INVITATION TO BID

#21329

For

Lincoln West High School Rooftop Equipment (Chiller) Project

FOR THE CLEVELAND MUNICIPAL SCHOOL DISTRICT
DBA: CLEVELAND METROPOLITAN SCHOOL DISTRICT
BOARD OF EDUCATION, 1111 SUPERIOR AVENUE E, SUITE 1800
CLEVELAND, OHIO 44114

UNDER THE DIRECTION OF OPERATIONS DEPARTMENT OF THE BOARD OF EDUCATION OF THE CLEVELAND METROPOLITAN SCHOOL DISTRICT - CUYAHOGA COUNTY, OHIO

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Part I: NOTICE OF INVITATION TO BID #21329

Separate Sealed Responses for the requirement set forth below will be received in the Cashier's Office of the Cleveland Metropolitan School District located at 1111 Superior Avenue E, Cleveland, Ohio 44114, until **1:00 pm current local time on November 15, 2021. Mailing of ITB responses are encouraged. However, hand deliveries will only be accepted from 11:00 AM to 1:00 PM on November 15, 2021. PPE IS REQUIRED TO BE WORN FOR ENTRANCE TO AND WHILE IN THE BUILDING.** This ITB will be opened following the Bid cutoff time at 1:30 PM via Zoom. The Bid Opening information will be forwarded via Addendum.

Lincoln West High School Rooftop Equipment Project

Copies of Instructions to Bidders, Specifications, and Drawings may be obtained directly from the District's Webpage. Go to **clevelandmetroschools.org/purchasing** and click on the ITB number (21329). If you require assistance, please email **seletha.thompson@clevelandmetroschools.org.**

There will be a Pre-Bid Meeting for the **Lincoln West High School Rooftop Equipment Project** on **October 27, 2021 at 9:00 AM** at the **Cleveland Metropolitan School District, Lincoln West High School site, 3202 West 30th Street, Cleveland, Ohio 44109, (meet in garage breezeway).** Attendance at the Pre-Bid Meeting is encouraged but not mandatory.

All questions and correspondence related to this ITB must be submitted in writing ONLY by **12:00 pm on November 3, 2021** at the email address given above. All answers to corresponding questions and concerns will be sent directly to those submitting the question. A comprehensive question and answer list will also be posted at clevelandmetroschools.org/purchasing. Any errors and/or omissions reported will be addressed via Addenda. Addenda will be issued no later than November 5, 2021**.**

A certified check for 10% of the total amount of the bid payable to the Treasurer of the Cleveland Metropolitan School District, or a satisfactory bid bond executed by the bidder and a Surety company shall be submitted with each bid on a form supplied by the bondsman. The Surety Company must be licensed to do business in the State of Ohio and acceptable to the Chief Financial and Administrative Officer. The successful bidder will be required to furnish a satisfactory bid bond amounting to 100% of the contract amount.

No bid may be withdrawn for at least ninety (90) days after the deadline for submittal.

The Cleveland Metropolitan School District reserves the right to reject any and all Proposals, to waive any and all informalities or irregularities, and to disregard all non-conforming responsive conditional Proposals.

The Cleveland Metropolitan School District does not discriminate in educational programs, activities or employment on the basis of race, color, national origin, sex, age, religion or disability.

The new Uniform Grant Guidance, 2 CFR200 (UGG) will go into effect for Cleveland Metropolitan School District (CMSD) on July 1, 2018 and will apply to awards or funding increments issued on or after this date. Purchases funded by federal grant funds must adhere to regulations found in Uniform Guidance "Super Circular", 2 CFR 200 (UGG), as a condition of receiving funds and to meet annual audit compliance. In an effort to keep policy for all grants consistent, the CMSD will implement the new federal guidelines regarding procurement utilized with federal grants immediately.

Bidders on this work shall be required to comply with all applicable requirements pertaining to fair labor, state and local government.

M. Angela Foraker
Executive Director, Procure to Pay
October 22, 2021

Section I: Instructions to Bidders

Lincoln West High School Rooftop Equipment Project

1. All Responses shall be made upon the Bid Form(s) furnished. All information requested in the bid and in the bid package must be filled in legibly and completely with blue ink signatures, or the bid may be considered non-responsive. No oral, telephonic or telegraphic bids or modifications will be considered. The **ITB Name and Number** must be stated on the exterior of the submission envelope(s), including shipping labels**.**

2. Separate Sealed Responses for the requirement set forth below will be received in the Cashier's Office of the Cleveland Metropolitan School District located at 1111 Superior Avenue E, Cleveland, Ohio 44114, until **1:00 pm current local time on November 15, 2021. Mailing of ITB responses are encouraged. However, hand deliveries will only be accepted from 11:00 AM to 1:00 PM on November 15, 2021. PPE IS REQUIRED TO BE WORN FOR ENTRANCE TO AND WHILE IN THE BUILDING.** This ITB will be opened following the Bid cutoff time at 1:30 PM via Zoom. The Bid Opening information will be forwarded via Addendum.

3. All submissions must include **One (1) original, with blue ink signatures, two (2) copies, and one (1) electronic format bid on a USB flash drive.** Vendors not complying with this requirement will be notified that they have twenty-four (24) hours in which to comply with this requirement or their Bid will be **disqualified.** This applies to **copies only**.

4. No Response may be withdrawn for at least ninety (90) days after receipt of bids at **1:00 p.m.** current local time, on **November 19, 2021.**

5. Written questions may be directed to the Purchasing Division via email to: **seletha.thompson@clevelandmetroschools.org no later than 12:00 pm on November 3, 2021.** The District will **NOT ACCEPT** any telephone calls regarding any of the submittals and/or "short lists." Under no circumstances should any firm interested in providing the services identified in this Bid, their designees, or anyone affiliated with their form, contact any other District employee or official during the Bid process, in an attempt to lobby or influence the selection of a vendor pursuant to this Bid. No oral, telephonic, telegraphic, or electronic modifications will be considered.

6. The Cleveland Metropolitan School District reserves the right to reject any and all Bids, to waive any and all informalities or irregularities, and to disregard all non-conforming responsive conditional bids.

7. Bidder understands and agrees that subsequent to submission of the Bid, any District resolution authorizing the award of a contract or agreement does not vest any contractual rights in the bidder.

8. Bidder understands and agrees that any such District resolution operates only to encumber funds necessary for the project and does not create a binding contract.

9. Bidder further acknowledges and agrees that any such District resolution may be revoked, at any time prior to execution of a formal, written contract.

10. Bidder acknowledges and agrees that it has no vested contractual right until such time as a purchase order and contract have been issued.

11. Bidder further acknowledges and agrees that execution of a contract and issuance of a purchase order is not a ministerial function, but is a formal requirement for acceptance of the bid.

12. Bidder must present evidence to the District, upon request, that they are fully competent and have the necessary facilities, equipment and financial resources to perform the work required in the Specifications within the time frame required.

13. Each and every page must have the bidder's company name in the header or footer.

14. No binding of any kind should be used: use only binder clips. No staples, No paper clips, No binders, No tabs should be used; use colored paper to separate Sections. Failure to comply with submission formation may result in the submittal being disqualified.

15. Any and all changes must be initialed by the bidder.

16. The District reserves the right to award the bid in whole or in parts, by item, by group of items, to a single vendor; or to multiple vendors, where such action serves the best interests of the District.

17. This Bid should be submitted before **1:00 p.m.** current local time, **November 15, 2021** to the Cleveland Metropolitan School District, Cashiers Office of the Cleveland Metropolitan School District, 1111 Superior Avenue E, Suite 1800 Cleveland, Ohio 44114, the submission to include **One (1) original, with blue ink signatures, two (2) copies, and one (1) electronic format bid on a USB flash drive** of the following:

a. Transmittal Cover Letter

b. Completed Bid Form with Addendum Acknowledgement including evidence of State certification to perform the work required.
Please note: ***Failing to acknowledge a published Addendum may cause your response to be rejected.***

c. Signed Acknowledgement for Instructions to Bidders.

d. Completed and notarized Bidder's Qualification Form.

e. Signed Conflict of Interest Form

f. Completed and notarized Non-Collusion Affidavit.

g. Completed and notarized EOA Compliance Declaration documents.

h. Completed and notarized Diversity Business Enterprise Participation Forms.

i. Properly executed Affidavit and/or Company Board of Directors Resolution authorizing certain person to sign legal documents such as the Bid Form, Bidder's Qualification Form, etc.

j. Completed Debarment Form

k. A certified check for 10% of the total amount of the bid payable to the Treasurer of the Cleveland Metropolitan School District, or satisfactory bid bond executed by the bidder and a Surety company shall be submitted with each bid on a form supplied by the bondsman.

18. Bidder shall not include Ohio Sales Tax in the price quoted. The Cleveland Metropolitan School District will provide tax exempt certificate to the successful Bidder upon request.

19. SECURITY

Vendor's workmen, foremen, other personnel, and subcontractors on CMSD sight will be required to meet Cleveland Metropolitan School District security requirements. Contractor must issue personnel I.D. badges. Any worker not complying with CMSD security requirements will immediately be ordered off project and without prejudice or recourse to CMSD.

- Vendor agrees to successfully complete background checks on all of its employees, agents, and subcontractors who provide services under this Agreement to CMSD facilities. Vendor agrees to warrant that it will not at any time hire or utilize any individual to provide services under this Agreement on CMSD premises where such person has been convicted of, or pleaded guilty to, any criminal offense enumerated in O.R.C. 3319.39(B).

20. INSURANCE

The successful company, their subcontractors and suppliers of labor and/or materials for providing Repair Services for the Cleveland Metropolitan School District, including organizations having personnel, equipment and vehicles on District property, shall provide evidence of insurance as follows:

a. Commercial General Liability $1,000,000.00 Limit of Liability	-	including limited contractual liability (per occurrence)
b. Automobile Liability $1,000,000.00 Limit of Liability	-	including non-owned, and hired (per occurrence)
c. Workers Compensation	-	Workers compensation and employer's Insurance to the full extent as required
d. Professional Liability $1,000,000/ $3,000,000	-	By applicable law per occurrence/in the aggregate

This requirement must be fulfilled by the successful vendor providing the Purchasing Office of the CMSD with a current Certificate of Insurance (standard ACORD form), showing the Board of Education of the Cleveland Municipal School District as an additional insured (Certificate Holder does not constitute being an additional insured), within five (5) days of Notice of Intent to Award Agreement. The certificates of insurance shall contain a provision that the policy or policies shall not be canceled without thirty (30) days' prior written notice to the District.

The required insurance must be provided by a company licensed by the State of Ohio, which company must be financially acceptable to the Administration of the Cleveland Municipal School District

The District is not liable for vandalism which results in damage(s) to the property or vehicles of the Vendor. The school District will not reimburse for private insurance deductibles for such vandalism.

- Vandalism damage is defined as damage resulting from criminal conduct for which an individual may (but not necessarily be processed under the Ohio Revised Code

21. DIVERSITY BUSINESS GOAL

The Diversity Business and Vendor Contract Compliance Programs shall make every good faith effort to ensure that certified diversity business enterprises in the Cleveland Metropolitan School's relevant geographic market area shall be afforded the maximum opportunity to compete for contracts, services, and purchases. The general goals for diversity business participation are: 15% for services, 20% for goods and supplies, and 30% for maintenance, construction, and repair.

Non-diversity vendors will have their diversity business participation counted toward their goal attainment only with minority vendors who are certified and demonstrate previous experience in the respective business classification of the prime contractor. Only direct participation in the subcontract will be counted toward diversity business enterprise goal attainment.

Vendors shall refer to Section V of this ITB for further information and requirements on the District's diversity goals.

The diversity business goal for this ITB is: 30% Maintenance/Construction Repair

22. ADVERTISING

In submitting a bid, Vendors agree, unless specifically authorized in writing by an authorized representative of CMSD on a case by case basis, that it shall have no right to use, and shall not use, the name of Cleveland Metropolitan School District, its officials or employees, (a) in any advertising, publicity, promotion, nor (b) to express or imply any endorsement of Agent's services.

23. The term of this agreement will begin on immediately upon selection, approval and contract execution through completion to the lowest responsive and responsible vendor. The Contract Documents consist of the following:

a. All Purchasing Documents set forth in Part I herein;
b. Certified Purchase Order or Supplier Contract to be issued to Lowest Responsive and Responsible Bidder;
c. Specifications herein;
d. Notice to Bidders;
e. Instructions to Bidders;
f. Bid Form;
g. Bid Guaranty;
h. All applicable addenda, attachments, and exhibits hereto.

The awarded Bidder shall perform all Work described in the Contract Documents, including without limitation, all terms and conditions of the specifications contained herein or otherwise stated in the bid documents and reasonably inferable therefrom by the Bidder as necessary to produce the results intended thereby for specifications and scope of work requested herein by the District.

Bids will be evaluated, first, as responsive or non-responsive to the Bid specifications. A preliminary review will be conducted of all bids submitted on time to ensure the bid adheres to the mandatory requirements specified in the Bid. Bids that do not meet the mandatory requirements will be deemed non-responsive and may be rejected. CMSD reserves the right to select the bid which most closely meets the requirements specified in the Bid. Second, the bids will be evaluated based on the information presented in the bid. The Bid will be awarded to the lowest responsive and responsible vendor

CMSD reserves the right to reject all bids and deviate from this purchasing process to utilize other purchasing mechanisms available to the district under Ohio Law. Scope review and follow-up discussions with the apparent low bidder may be requested. CMSD reserves the right to interview or to seek additional information related to criteria already specified in the Invitation to Bid after opening the bids prior to issuance a certified Purchase Order or Supplier Contract.

Part II: DISTRICT RELATED FORMS

Required Purchasing Division Documents and Instructions

Section I: Addendum Acknowledgement Form for ITB #21329

Having read and examined the Request for Proposal Documents, including the specifications, prepared by the Cleveland Metropolitan School District for the above-referenced Project, and the following Addenda:

Addendum Number	Date of Receipt
_____	_____
_____	_____
_____	_____
_____	_____

Bidder: _____.

The undersigned Vendor proposes to perform all work for the applicable contract, in accordance with the contract document for the proposed sums.

Failing to acknowledge a published Addendum may cause your bid to be rejected.

Signature: _____ Date: _____

Section II: Acknowledgement

_____
(Name of Company)

Hereby acknowledges receipt of this Request for proposal and the reading of these Instructions to Bidder s. We further agree that if awarded the contract, we will submit the required Performance Bond and Insurance Certificate within five (5) days of written notification that the District has adopted a resolution authorizing the encumbrance of funds for the project. We understand, however, that a formal written contract, similar to the one contained in the ITB Package, will need to be executed and purchase order issued by the District before we have any vested contractual rights. Wherever, we agree to commence the work as required herein and timely complete the project pursuant to the Specifications by the date stated in the Notice to Proceed.

By: _____
(Name and Title)

Date: _____

Section III: Vendor Request Form

VENDOR INFORMATION

VENDOR NUMBER (IF APPLICABLE) _____

VENDOR NAME _____

ADDRESS LINE 1 _____

ADDRESS LINE 2 _____

CITY _____ **STATE** _____ **ZIP** _____

TELEPHONE NO. _____ _____ **FAX NO** _____ _____

Area Code *Number* *Area Code* *Number*

E-MAIL ADDRESS _____

PRIMARY CONTACT PERSON _____

REMIT TO (IF DIFFERENT FROM ABOVE)

VENDOR NAME _____

ADDRESS LINE 1 _____

ADDRESS LINE 2 _____

CITY _____ **STATE** _____ **ZIP** _____

TELEPHONE NO. _____ _____ **FAX NO** _____ _____

(Area Code) *Number* *(Area Code)* *Number*

PRIMARY SERVICE, PRODUCT, OR SPECIALTY:

-

NOTE: VENDOR NAME AND TAX ID NUMBER MUST BE AS FILED WITH THE INTERNAL REVENUE SERVICE.

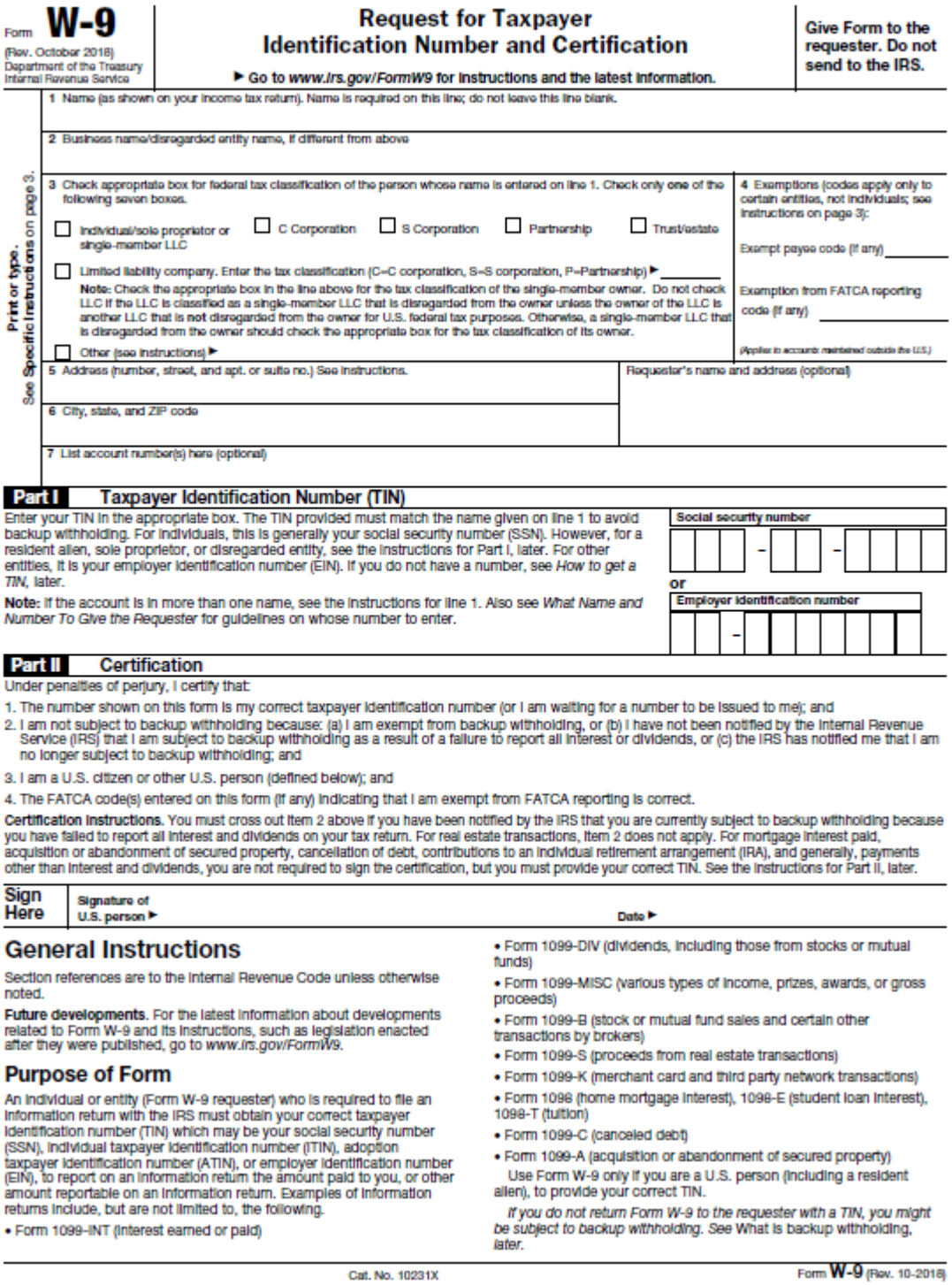
PLEASE INDICATE WHERE APPLICABLE

DIVERSITY BUSINESS ENTERPRISE: **YES** ☐ **NO** ☐

MINORITY BUSINESS ENTERPRISE: **YES** ☐ **NO** ☐

FEMALE BUSINESS ENTERPRISE: **YES** ☐ **NO** ☐

PLEASE NOTE: FAILURE TO UTILIZE THE MOST CURRENT TAXPAYER ID FORM (DATED October 2018) MAY CAUSE YOUR RESPONSE TO BE REJECTED



Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

___ - ___ - ____

or

Employer identification number

__ - _____

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Date ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Cat. No. 10231X Form **W-9** (Rev. 10-2018)

Section V: No Proposal Form

ITB #21329

This form must be completed only if vendor is not submitting a proposal

To all prospective bidders/proposers:

Each company or person receiving this package has at some point in time requested to be placed on the proposal list of the Cleveland Metropolitan School District for this product and/or service.

It is the intent of the District to update this list subsequent to the contract cycle. Please note the following and take action accordingly.

If you are making a bid/proposal this cycle, disregard the remainder of this letter. Your name will remain on the active bidder list.

_____ (1) If you are not making a bid/proposal this cycle, but want to remain on the active's list for the future ITBs, place a check mark in the box to the left. Complete the name and address section below and return this letter to Purchasing at the address below.

_____ (2) If you do not wish to remain on the active bidder's list, place a check mark to the left. Complete the name and address section below and return this letter to Purchasing at the address below.

Name of Company:_____

Company Representative: _____

Address:_____

City, State:_____ Zip Code:_____

Telephone Number: _____

Fax Number: _____

Date: _____

Section VI: Certificate of Debarment

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 13 CFR Part 145. The regulations were published as Part VII of the May 26, 1988 *Federal Register* (pages 19160-19211). Copies of the regulations are available from local offices of the U.S. Small Business Administration.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective primary participant certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective primary participant shall attach an explanation to this proposal.

Business Name _____

Date _____ By _____
Name and Title of Authorized Representative

_____
Signature of Authorized Representative

SBA Form 1623 (10-88) Federal Recycling Program Printed on Recycled Paper

This form was electronically produced by Elite Federal Forms, Inc.

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If is is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

4. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations (13 CFR Part 145).

6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the ineligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Section VII: Conflict of Interest Form

Statement of Potential Conflicts of Interest

Vendor Name:	Primary Contact:
Address 1:	Telephone #:
Address 2:	Fax #:
City:	Email:
State, Zip:	Website:

Cleveland Metropolitan School District (CMSD) adheres to Ohio Ethics Law and strictly follows the opinion of the Ohio Ethics Commission. As such, each vendor is requested to submit this statement declaring any potential conflicts of interest in doing business with the District. Please answer the following two questions providing all requested information.

1. Are any current Cleveland Metropolitan School District (CMSD) employees, Cleveland Board of Education members, or any of their immediate family members, also members of the vendor's board of directors, hold any officer position with the vendor, or own any shares of any stock issued by the vendor?

Yes_____ No_____

If **Yes**, and if the CMSD employee, CMSD board member, or immediately family member is a member of the vendor's board of directors or holds an office with the vendor, please state the person's name and position with the vendor.

Name: _____

Position: _____

If **Yes**, and if the CMSD employee, CMSD board member, or immediate family member owns share of any stock in the vendor organization or company, state the percentage of all outstanding company shares owned by the CMSD employee or board member.

_____%

2. Are any current CMSD employees, CMSD board members, or any immediate family members also employees of the vendor?

Yes_____ No_____

If **Yes**, please state the person's name and provide a description of their job duties for the provider:

Name: _____

Job Duties:_____

If **Yes**, please describe the contact that the vendor will have with the CMSD employee or CMSD board member in the course of providing services to the District:

_____

_____

CERTIFICATION

I do hereby certify that the foregoing statements are true and accurate, and that my signature below attests to the authenticity of my identity as the person actually signing this form. This document is not a contract. In order for a binding Agreement to exist, a signed Agreement will be required prior to any legally binding commitment by the District.

NOTARIZED STATEMENT

_____being duly sworn and deposes says

That he/she is the _____of
(title)

_____, and answers to all the
(organization)
foregoing questions and all statements therein contained are true and correct.

_____
(signature)

Subscribed and sworn before me this ____day of _____, 20____

Notary Public: _____

My commission expires: _____

Section VIII: Bidder Qualifications Form

Bidder must answer all questions or attach a written explanation for each question.

PROPOSER NAME:_____

ADDRESS:_____

CITY; STATE:_____ ZIP:_____

CONTACT PERSON:_____

TITLE:_____

TELEPHONE: ( )_____ __ TOLL FREE: ( )_____

TAXPAYER IDENTIFICATION NUMBER:_____

1. What type of organization? (i.e. corporation, partnership, etc.)

2. How many years has your organization been in business?

3. How many years has your organization been in business under its current name?

4. List any other aliases your organization has utilized in the last two years and the form of Business

5. If you are currently a corporation, list the following:
    a. State of incorporation
    b. Date of incorporation
    c. President's name
    d. Secretary's name
    e. Treasurer's name
    f. Statutory agent's name
    g. Name of shareholders, if less than 10

h. Principal place of doing business

6. If you are currently in a partnership, list the following:
    a. Name and address of all general and limited partners.

    b. Original name and date of organization's inception

7. If you are neither a corporation nor a partnership, please describe your organization and list principals.

8. Are you legally qualified to do business in the State of Ohio?

9. Are you legally qualified to do business in Cuyahoga County and licensed by the City of Cleveland?

10. Has your organization ever been (i) declared by a customer to be in default under a contractor and/or (ii) sued by a customer for failure to completely a contract or properly perform services in a timely manner? If yes, please state where, when, and why.

11. Has your organization ever been cited by a local, county, state, or federal authority for violation of a regulation or statute or failing to timely complete a contract in accordance with specifications? I yes, please state date, agency, and final disposition.

12. Has your organization ever filed for bankruptcy? If yes, please state where, when and why?

13. On a separate sheet, list the major customers for whom your organization has provided this type of equipment or service in the past five years. Include owner's name and type of work performed.

14. Has your organization ever been sued by a supplier for failure to timely pay for materials or equipment provided? If yes, please provide details.

15. What is the dollar limit of your firm's General (CLS) Liability Insurance?

    Name of insuring company: _____

    Policy number: _____

16. What is the dollar limit of your firm's Automotive Liability Insurance?

Owned vehicles_____

Non-Owned vehicles_____

Name of insuring company_____

Policy number_____

17. List the name and address of every person having an interest in this ITB.

18. Has any federal, state or local government entity ever cited or taken any action against your organization or any of its principals for failure to pay or remit any taxes including but not limited to income, withholding, sales, franchise, or personal property taxes? If yes, please give name of agency, date and amount of taxes overdue and resolution of the issue.

19. Is your organization and its' principals current in payment of personal property taxes?

20. The prospective lower tier participant certifies, by submission of this ITB, that neither it nor its principals is presently debarred, suspended, proposed, for debarment or suspension, declared ineligible, or voluntarily excluded from participation in this transaction by any State and/or Federal Department or Agency.

21. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participants shall attach an explanation to this ITB.

Notarized Statement

_____being duly sworn and deposes says

that he/she is the _____of
(title)

_____, and answers to all the
(organization)

foregoing questions and all statements therein contained are true and correct.

_____
(signature)

Subscribed and sworn before me this _____day of _____, 20____

Notary Public:_____

My commission expires: _____

Sample: Acord Certificate of Insurance

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

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

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

PRODUCER	CONTACT NAME:
	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
	☐ CLAIMS-MADE ☐ OCCUR						MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
								$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	☐ EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N						☐ WC STATU-TORY LIMITS ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICE/MEMBER EXCLUDED? ☐	N/A					E.L. EACH ACCIDENT	$
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
		☐	☐					

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

CERTIFICATE HOLDER	CANCELLATION
	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

Section X: Non-Collusion Affidavit

This Affidavit must be executed and shall accompany the proposal in order for the proposal to be considered.

NON-COLLUSION AFFIDAVIT
State of Ohio, Cuyahoga County

_____, being first duly sworn, deposes and says that

he/she is _____of _____

of the party making the foregoing proposal; that such proposal is genuine and not collusive or sham; that said proposer has not colluded, conspired, connived, or agreed, directly or indirectly, with any proposer or person, to put in a sham proposal, or that such other person shall refrain from proposing, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the proposal price of affiant or any other proposer, to fix any overhead, profit or cost element of said proposal price, or of that of any proposer, or to secure any advantage against the Board of Education of the Cleveland Metropolitan School District, or any person or persons interested in the proposal; and that all statements contained in said proposal are true; and further that such proposer has not, directly or indirectly, submitted this proposal, or the contents thereof, or divulged information or data relative thereto to any Association or to any member or agent thereof.

_____
Affiant

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

_____
Notary Public in and for Cuyahoga County, Ohio

My commission expires: _____

Section XI: Diversity Business Enterprise Program and Participation Forms

PROGRAM OVERVIEW

It is the goal of the Diversity Business Enterprise (DBE) program to ensure the firms owned and/or controlled by minorities and women have the opportunity to compete for any expenditure of funds including but not limited to contracts, lease purchase, requisitions, and all forms of equipment, work services, materials, construction, etc.

The DBE program shall make every good faith effort to ensure that certified DBE's in the relevant Cleveland Municipal School District geographic market have the maximum opportunity to proposal for contracts. The Cleveland Municipal School District geographic market is Cuyahoga, Summit, Lake, and Lorain counties.

The District has established goals for DBE participation in all contracts that it awards. The goals range from 15 to 30 percent and vary by the type of contract awarded:

- 15% Service Contracts
- 20% Goods and Supplies
- 30% Maintenance/Construction Repair

A Diversity Business Enterprise encompasses Minority Business Enterprises (MBEs) and Female Business Enterprises (FBEs)

A DBE is an enterprise in which minorities, African Americans, Native Americans, Hispanic or Latin Americans, Asian Pacific Islander Americans, and/or women own at least 51% of the shares of stock or controlling interest.

A FBE is a female-owned enterprise with at least 51% of the shares of stock or controlling interest, which is held by female.

A company may be in compliance with the District's DBE program although the applicable numerical goal is not met if a company makes a good faith commitment to comply with DBE regulations. The Purchasing Director determines whether a company has made a good faith commitment.

DBE requirements under certain circumstances can be waived by the district with convincing proof of good faith efforts.

TERMS AND CONDITIONS OF NOTICE AND REQUIREMENTS TO ENSURE DIVERSITY BUSINESS ENTERPRISE (DBE) OPPORTUNITY

Definition of DBE: A Diversity Business Enterprise (DBE)

"Small Diversity business concern" means a small business concern that is at least fifty-one (51) percent unconditionally owned by one or more individuals who are both socially and economically diverse, or a publicly owned business that has at least fifty-one (51) percent of its stock unconditionally owned by one or more socially and economically diverse individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least fifty-one (51) percent unconditionally owned by an economically diverse Indian tribe or Native Hawaiian Organization, or a publicly owned business that has at least fifty-one (51) percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by members of an economically diverse Indian tribe or Native Hawaiian organization.

1. “Socially diverse individuals” means individuals who have been subjected to racial or ethnic prejudice or culture bias because of their identity as a member of a group without regard to their qualities as individuals.

2. “Economically diverse individuals” means socially diverse individuals whose ability to compete in the free enterprise system is impaired due to diminished opportunities to obtain capital and credit as compared to others in the same line of business who are not socially diverse. Individuals who certify that they are members of named groups (African Americans, Hispanic Americans or Latin Americans, Native Americans, Asian-Pacific Islander Americans, Subcontinent Asian Americans) are to be considered socially and economically diverse.

Definition of FBE: Female Business Enterprise (FBE)

“Female-owned small business concern” means a small business concern:

1. Which is at least fifty-one (51) percent owned by one or more women; or, in the case of any publicly owned business, at least fifty-one (51) percent of the stock of which is owned by one or more women and;

2. Whose management and daily business operations are controlled by one or more woman.

TERMS

1. DBE participation will be counted toward meeting the goals outlined in the notice as follows:
    a. The total dollar value of a correct contract or subcontractor indirect subcontract awarded toward a certified DBE will be counted toward the applicable goal.

    b. In the case of a joint venture, certified by the Cleveland Municipal School District, the portion of the total dollar value of the contract equal to the percentage of the ownership and control of the DBE partner in the join vendor will be counted toward the applicable goal. (PLEASE RETURN DBE FORM E)

    c. Only expenditures to DBE that perform a commercially useful function in the work of a contract or subcontract, or indirect subcontract will be counted toward DBE goals. A DBE is considered to perform a commercially useful function when it is responsible for execution of a distinct element of work of a contract or subcontract and carries out its responsibilities by actually performing, managing, and supervising the work involved. If a DBE contractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of normal industry practices, the DBE is presumed not to be performing a commercially useful function. The DBE may present evidence to rebut this presumption.

    d. The total dollar value of materials and supplies obtained from DBE suppliers and manufacturers will be counted toward DBE goals if the DBE assumes the actual and contractual responsibility for the provision of the materials and supplies.

2. A proposer who fails or refuses to complete and return this Notice may be deemed a non-responsive proposer.

3. The contractor's goals as set forth in this Notice shall express the contractor's commitment to the percentage of DBE utilization during the term of this contract. The contract shall be deemed to have met its commitment for DBE utilization if the DBE utilization rate of the contractor meets the goals established by this Notice.

4. The contractor must receive the approval of the District before making substitutions for any subcontractors listed in the Notice. Substitution of DBE is not allowed unless the contractor receives District approval.

5. The contractor's commitment to a specific goal is to meet the DBE objectives and is not INTENDED and shall not be used to discriminate against any qualified company or group or companies.

6. The contractor's commitment to a specific goal for DBE utilization as required by this Notice shall constitute a commitment to make every good faith effort to meet such goal by a subcontracting to or undertaking to joint venture with DBE firms. If the contractor fails to meet the goal, it will carry the burden of furnishing sufficient documentation as part of the proposal response of its good faith efforts to justify a grant of relief from the goals set forth in this Notice. Such justification will take the forms of a detailed report which will document at least the following information:
    a. Attendance at the pre-proposal meeting, if any, scheduled by the District to inform DBE's of Subcontracting opportunities under a given solicitation.

    b. Advertisement in general circulation media, trade association publications, and minority-focus media for at least twenty (20) days before bids or proposals are due. If twenty (20) days are not available, publication for a shorter reasonable time is acceptable.

    c. Written notification to DBE that their interest in the contract is solicited, and follow-up contact to determine whether the DBE's were interested.

    d. Efforts made to select portions of the proposed work to be performed by DBE in order to increase the likelihood of achieving the stated goals.

    e. Efforts to negotiate with DBE for specific sub-proposal, including at a minimum:

        i. The names, addresses, and telephone numbers of DBE's that were contacted.

        ii. A description of the information provided to DBE regarding the plans and specifications for portion of the work to be performed; and

        iii. A statement of why additional agreements with DBE were not reached.

        iv. Completion of (Form E) if DBE's are not involved in the ITB.

    f. Concerning each DBE the supplier/contractor contacted but rejected as unqualified, the reasons for the supplier's/contractor's conclusion.

    g. Efforts made to help the DBE's contacted that needed assistance in obtaining required bonding, lines of credit, or insurance.

    h. Use of the services of minority community organizations, minority contractor's groups, governmental minority business assistance offices, and other organizations that assist in the recruitment and placement of DBE's.

7. Suppliers/contractors that fail to meet DBE goals and fail to demonstrate sufficient good faith efforts are not eligible for contract awarded.

8. The District, through its Diversity Officer will review the contractor's minority business enterprise involvement efforts during performance of this contract. Such review will include, but not be limited to,

contractor's quarterly statement of income from the District and what portion of said income went to the DBE enterprise(s) as evidenced by affirmation of the DBE enterprise(s) which the contractor hereby agrees to supply each quarter during the term of its contract with the District. If the contractor meets its goal or if the contractor demonstrates that every reasonable effort has been made to meet its goal, the contractor shall be presumed to be in compliance. Where the Diversity Officer finds that the contractor shall be presumed to be in compliance. Where the Diversity Officer finds that the contractor has failed to comply with the requirements of this Notice, said Diversity Officer shall inform the Purchasing Director who shall immediately notify the contractor to take corrective action. If the contractor fails or refuses to comply promptly, then the Purchasing Director, upon approval of the District, shall issue an order shopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made subject of claim for extension of time or for excess costs or damages by the contractor. When the District proceeds with such formal action it has the burden of proving that the contractor has not met the requirements of coming forward and showing that it has met the good faith requirements of the Notice, specifically including paragraph 7 hereof. Where the contractor is found to have failed to exert every good faith effort to involve DBE in the work provided, the District may declare that the contractor is ineligible to receive further District funds, whether as a contractor, subcontractor, or as a consultant, for a period of up to three (3) years.

9. The contractor will keep records and documents for three (3) years following performances of this contract to indicate compliance with this Notice. These records and documents, or copies thereof, will be made available at reasonable times and places for inspection by any authorized representative of the District upon request together with any other compliance information which such representative may require.

10. Proposers and contractors are bound by all requirements, terms and conditions of this Notice.

11. Nothing in this Notice shall be interpreted to diminish the present contract compliance review

1: DBE Form A

Name of Firm:_____

Address:_____

City, State, Zip Code:_____

Telephone Number: _____

Type of Business (Product or Service): _____

_____

Date of Proposed Contract Award: _____

Amount of Proposed Contract Award: _____

Diversity Business Enterprise Subcontractor(s):

_____

Dollar Amount Subcontract Award: _____

Percent of Subcontract Award: _____

D.B.E. Participation: _____ $_____

F.B.E. Participation: _____ $_____

Name of EEO Officer:_____

_____
(Signature of owner, partner, or authorized officer)

Name:_____ Dated:_____
(printed)

Title:_____

DO NOT COMPLETE BELOW THIS LINE

___Compliant ___Compliance Pending___Non-Compliant

Compliance Date: _____

_____ _____
(signature, DBE Department) (date)

NOTICE OF REQUIREMENT TO ENSURE
DIVERSITY BUSINESS ENTERPRISE (DBE) OPPORTUNITY

Note: All eligible proposers for award of the contract should comply with the Requirements, Terms, and Conditions of this Notice.

The undersigned proposer hereby agrees that the goal it has established for DBE participation in this project through either subcontracting or entering into a joint Venture with DBEs in conformity with the Requirements. Terms and Conditions of this Notice is a goal of thirty (30%) percent for a construction/repair/ maintenance contract, twenty (20%) percent for a supply contract, and fifteen (15%) for a service contract of the total contract amount of this project. In no event will the absence of goals as stated above be deemed as compliance with the requirements, terms and conditions of this notice.

In addition, the undersigned will complete and attach hereto the DBE (Form C) Schedule for DBE participation, showing all DBE/FBE that will participate as subcontractors or joint ventures in this contract and a DBE (Form D), DBE Letter of Intent form for each DBE/FBE listed on the Schedule.

Proposer: _____

Date: _____

By: _____

Title: _____

Definition of DBE: A Diversity Business Enterprise (DBE)

"Small Diversity business concern" means a small business concern that is a least (51) percent unconditionally owned by one or more individuals who are both socially and economically diverse, or a publicly owned business that has at least (51) percent of its stock unconditionally owned by one or more socially and economically diverse individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least (51) percent unconditionally owned by an economically diverse Indian tribe or Native Hawaiian Organization, or a publicly owned business that has least (51) percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by members of an economically diverse Indian tribe or Native Hawaiian Organization.

SCHEDULE MBE/FBE PARTICIPATION

Project Name:_____

Name of Non-DBE Contractor: _____

Identification Number:_____

Location:_____

Name of Minority Contractor: _____

Address:_____

City, State, Zip:_____

Type of work to be performed and work hours involved:

_____

Projected commencement and completion dates for work:

_____

Agreed price in dollars or percentage:

_____

The undersigned will enter into a formal agreement with DBE for work listed in this schedule conditioned upon execution for a contract with the Cleveland Municipal School District

TO BE RETURNED WITH THE PROPOSAL

_____
Signature of Non-DBE Prime Contractor

Date: _____

DBE LETTER OF INTENT

To: _____
Non-DBE Prime or General Proposer

Project:_____

NON-DBE PRIME OR GENERAL PROPOSER
The Undersigned intends to perform work in connection with the above-referenced project as (check one):

☐ an individual ☐ a corporation ☐ a partnership ☐ a joint venture

DBE status of the undersigned is confirmed in the Cleveland Municipal School District's DBE file of bona fide enterprises with a certification date of: _____

The Undersigned is prepared to perform the following described work in connection with the above referenced project. Specify in detail particular work items or parts thereof to be performed:

_____

_____

_____

at the following price or percent of contract: $_____
You have projected the following commencement date of such work, and the undersigned is projecting completion of such work as follows:
Items _____
Projected Commencement Date _____
Projected Completion Date _____

_____% (percent) of the dollar value of the subcontract will be sublet and/or awarded to NON-DBE contractor (s) and/or NON-FBE SUPPLIERS. The undersigned will enter into a formal agreement for the above work with you conditioned upon your execution of a contract with the Cleveland Municipal School District.

_____ _____
Date **Name of DBE Firm (where applicable)**

_____ _____
Signature of DBE (where applicable) Signature of MBE Firm

(TO BE RETURNEDWITH ITB)

_____ _____
Name of FBE Firm **Signature of FBE Firm**

DBE Unavailability Certification

I, _____,_____
Name *Title*

Of _____, certify that on_____
Date

I contacted the following DBE to obtain a Proposal for work items to be performed on:

Board Project: _____

Minority Contractor: _____

Work Items Sought: _____

Form of Proposal Sought:_____

Female Contractor: _____

Work Items Sought: _____

Form of Proposal Sought: _____

To the best of my knowledge and belief said minority business enterprise was unavailable (exclusive of the unavailability due to lack of agreement on price) for work on this project or unable to prepare a proposal for the following reason (s):

_____
_____
_____

_____ _____
Signature, Non-DBE prime Proposer *Date*

_____was offered an opportunity to proposal on the above-referenced work on
_____ by _____
Date *Non-DBE Prime Proposer*

_____
Signature, Non-DBE Prime Proposer

The above statement is a true and accurate account of why I did not submit a Proposal on this project.

_____
Signature, Non-DBE prime Proposer

Non-Minority Prime Affidavit For DBE

STATE OF }
COUNTY OF } SS. AFFIDAVIT

The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each party in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual subcontract work and the payments thereof, and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the subcontract or those of each party relevant to the subcontract, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

Name of Firm:_____

Signature:_____

Name and Title:_____

Date: _____

STATE OF }
COUNTY OF } SS.

On this _____day of _____ 20_____, before me appeared _____

_____, to me personally known, who being duly sworn,

did execute the foregoing affidavit, and did state that they were properly authorized by _____

_____to execute the affidavit and did so as their free act and deed.

(Seal)

Notary Public_____

Commission expires_____

7: DBE Form G

This form need not be completed if all join venture firms are diversity business enterprises

1. Name of Joint Venture: _____

2. Address of Joint Venture: _____

3. Phone Number of Joint Venture: _____

4. Identify the firms which comprise this joint venture. (The DBE partner must complete DBE Form A or have current DBE Certification)

_____

_____

   a. Describe the roll of the DBE firm in the joint venture: _____

   _____

   b. Describe briefly the experience and business qualifications of each non-DBE Joint Venture:_____

   _____

5. Nature of Joint Venture's Business: _____

_____

6. Provide a copy of the Joint Venture Agreement.

7. What is the percentage of DBE Ownership? DBE_____% FBE_____%

8. Ownership of Joint Venture: (This need not be completed if described in the Joint Venture agreement provided in response to question 6).

   a. Profit and loss sharing: _____

   _____

   b. Capital contributions, including equipment: _____

   _____

   c. Other applicable ownership interest: _____

   _____

9. Control of and participation in this contract. Identify by name, race, and "firm" those individuals and their titles who are responsible for day-to-day management and policy decision making, including, but not limited to, those prime responsibility form:

a. Financial decisions: _____

_____

b. Management decisions, such as:

   i. Estimating: _____

   ii. Marketing and Sales: _____

   iii. Hiring and firing of management personnel: _____

   _____

   iv. Purchasing of major items or supplies: _____

   _____

c. Supervision of field operations: _____

_____

Note: If after complete the DBE Form B and before the completion of the joint venture's work on any contract awarded, there is any significant change in the information submitted, the joint venture must inform the Cleveland Municipal School District, either directly or through the non-DBE prime subcontractor if the joint vendor is a subcontractor.

Non-Minority Prime Affidavit (Joint Venture)

STATE OF OHIO CUYAHOGA COUNTY AFFIDAVIT

The undersigned swear that the forgoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each joint venture in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual joint venture work and the payments thereof and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the joint venture or those of each party relevant to the joint venture, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

_____	_____
Name of Firm (Prime)	***Name of Firm (DBE)***
_____	_____
Signature	***Signature***
_____	_____
Name and Title	***Name and Title***
_____	_____
Date	***Date***

STATE OF] COUNTY OF]SS.

On this _____ day of _____ 20 ___ , before me appeared _____, to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that they were properly authorized by _____ to execute the affidavit and did so as their free act and deed.

(Seal)

_____
Notary Public

_____
Commission expires

Vendor Contract Compliance, Procedures and Guidelines

Note: Please read carefully all of the information contained in these documents.

Pursuant to the Affirmative Action Policy Adopted by the Cleveland Municipal School District, the following guidelines and procedures will be implemented to ensure that all vendors doing business with the District are in compliance with Equal Employment Opportunity Standards.

A. SUBMISSION OF VENDOR EMPLOYMENT PRACTICE REPORT

All vendors and contractors who propose to provide goods, services, supplies, and equipment through formal proposals, informal proposals, and contract term agreements are required to submit a Vendor Employment Practice Report with each Proposal. Approved status by the Vendor Employment Practice Report includes the following documents which must be completed in their entirety and returned with the proposal.

Please note, compliance approval consists of both DBE and Vendor Contract Compliance approval.

1. General Information Sheet (Form 1): Provides basic information on the vendor.

1a. SMSA/OR RECRUITMENT AREA: Indicates the relevant labor area in which your facility is located. Designate the Standard Metropolitan Statistical Area, county, or city from which the facility can draw applicants or recruit for most positions.

In making relevant labor area determinations, examine the statistics on racial, ethnic, and gender composition of the Standard Metropolitan Statistical Area, county, or city surrounding your organization, as well as other appropriate adjacent areas.

The relevant labor area should be the SMSA county or city with the highest population of minorities and women.

1b. DEFINITION: As defined by the U.S. Bureau of the Census, SMSA is: "Except in the New England States, a county or group of contiguous counties which contains at least one city of 50,000; in addition contiguous counties if they are socially and economically integrated within the central city; in the New England States towns and cities instead of counties. Each SMSA must include at least one central city."

2. **Compliance Declaration Form** (Form 2) - The Agreement indicating the vendor is in compliance with Equal Employment Opportunity requirements, will take affirmative action, and will comply with all Fair Labor Standard practices.

3. **Current Employment Data Form** (Form 3) – Current personnel data indicating employees in each job category classified by gender and race.

4. **Existing Affirmative Action Program** – If any and copies of any agreement between the vendor and the Equal Employment Opportunity Commission, Office of Federal Contract Compliance Program or court order pertaining to equal employment opportunity.

B. EVALUATION OF COMPLIANCE DATA

1. The Diversity Officer will evaluate data submitted by vendors who are recommended to receive District proposals and contracts. Vendors found in compliance with the District's Equal employment opportunity standards (Affirmative Action and DBE Program) will be placed on the approved vendor's list.

2. In the event that a vendor is found not in compliance with the District's equal employment opportunity standards, the Diversity Officer will inform the Purchasing Director of the Reason(s) and ask that the Purchasing Director not award the contract or proposal to the vendor pending compliance. The Purchasing Director of Manager of Diversity will inform the vendor of reason(s) for non-compliance. Vendors found not in compliance will be given ten (10) business days from the time of notification by the Purchasing Director or Manager of Diversity to submit an acceptable affirmative action program to the Diversity Officer.

3. If the vendor which has been found not in compliance submits an acceptable affirmative action plan to the Diversity Officer within ten (10) business days of notification, the vendor may be given conditional approval.

C. AFFIRMATIVE ACTION PLAN

1. Vendor found not in compliance with the District's equal employment opportunity standards are expected to develop and implement affirmative action programs if they expect to be eligible to successfully propose for District contracts.

2. While it is the vendor's responsibility to develop an affirmative action program which will result in equal employment opportunity for persons from all sectors of the community, the Officer in Charge of the Diversity Program may refer prospective proposers to resources which may be of assistance in developing affirmative action programs.

3. In the event that a vendor who has been awarded a District contract does not make satisfactory progress toward goals in the affirmative action program, the District will not negotiate a new contract until the vendor assures the Diversity Officer that significant progress will be made.

D. CONDITIONS UNDER WHICH PROPOSALS MAY BE REJECTED OR CONTRACTS TERMINATED ON EQUAL EMPLOYMENT OPPORTUNITY GROUNDS

1. Vendor fails to submit completed and signed EEO documents with proposal or other requested information in a timely manner.
2. The vendor is found not to be in compliance with EEO laws, regulations and District policy, and does not have an acceptable Affirmative Action Program, or if the vendor has an acceptable Affirmative Action Program but the Diversity Officer determines the vendor has not made satisfactory progress toward goals in the plan and shows no promise of achieving the goals.
3. Any inconsistencies of misrepresentation of the facts in any of the requested information designed to portray the vendor in a more favorable position with respect to Equal Employment Opportunity Compliance will be grounds for cancellation of the contract by the Purchasing Director upon recommendation by the Diversity Officer and confirmation by the Cleveland Municipal School District.

Form 1: Vendor Contract Compliance Form

Name of Firm:_____

Address:_____

City, State, Zip Code:_____

Telephone Number:_____

Standard Metropolitan Statistical Area: _____

Recruitment Area:_____

Type of Business (product or service): _____

Name of EEO Officer:_____

Signature of Owner, Partner, or Authorized Officer: _____

Name (type or print):_____

Date:_____ Title:_____

Do not complete below this line

Status of Vendor:

___ Compliance ___ Conditional Compliance

___ Non-Compliance ___Compliance Pending

Comments:_____

_____

Date:_____ Signature:_____

Form 2: Compliance Declaration

The following must be filled out completely:

It is the policy of _____that equal employment opportunity be afforded to all qualified persons without regard to race, religion, color, sex, national origin, age, or handicap.

In support of this policy, _____will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, or handicap.

_____will take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to race, color, sex, national origin, age, or handicap. Such action will include, but not be limited to:

Recruitment, advertising, or solicitation for employment, hiring, placement, upgrading, transfer or demotion, selection for training including apprenticeship rates of pay or other forms of compensation, layoffs or termination.

The undersigned company states that they are of current applicable requirement pertaining to Fair Labor Standards and Non-Discriminatory Practices of Federal, State, and Local Governments.

The undersigned further acknowledges that if the contract is awarded to the undersigned, that the undersigned will comply with all Fair Labor Standard Practice.

_____
(Name of Company)

_____ Date: _____

(Signature of Company Official)

STATE OF ( )
COUNTY OF ( ) SS.

BEFORE ME, a Notary Public in and for said County and State personally appeared the above-named Company _____by _____

It's_____, who acknowledged that they knowingly signed the aforesaid instrument, and that the same is their free act and deed duly authorized and the free act and deed of said company.

IN TESTIMONY WHEREOF, I have hereto set my hand and affixed seal at

_____, _____, this

day of _____, 20___.

DESCRIPTION OF JOB CATEGORIES

OFFICIALS, MANAGERS, AND SUPERVISORS
Occupations requiring administrative personnel who set District policies, exercise overall responsibility of the places, and direct individual departments or special phases of a firm's operations includes: officials, executives, middle management, plant managers, department managers, and superintendents, salaried supervisors who are members of management, purchasing agents, buyers, and kindred workers.

PROFESSIONALS
Occupations requiring either college graduation or experience of such kind and amount as to provide background. Includes: accountants and auditors, airplane pilots and editors, engineers, layers, librarians, mathematicians, natural scientists, personnel and labor relations workers, physical scientists, physicians, social scientists, teacher's and kindred workers.

TECHNICIANS
Occupations requiring a combination of basic scientific knowledge and manual skill which can be obtained through (about) two years of post-high school education, such as that which is offered in many technical institutes and junior colleges, or through equivalent on-the-job training. Includes: drafters, engineering aides, junior engineers, mathematical aids, nurses, photographers, radio operators, scientific assistants, surveyor of technical illustrators, technicians (medical, dental, electronic, physical sciences), and kindred workers.

SALES WORKERS
Occupations engaging wholly or primarily in direct selling. Includes: advertising agents and salespersons, insurance agents and brokers, real estate agents and brokers, stock bond salespersons, demonstrators, salespersons, sales clerks, and kindred workers.

OFFICE AND CLERICAL
Includes all clerical-type work regardless of level of difficulty, where the activities are predominantly non-manual, includes: bookkeepers, cashiers, collectors (bills and account), messengers and office clerks, office machine operators, shipping and receiving clerks, stenographers, typists and secretaries, telegraph and telephone operators and kindred workers.

CRAFTWORKERS (SKILLED)
Manual workers of relatively high skill level having a thorough and comprehensive knowledge of the process involved in their work, exercise considerable independent judgment, and usually receive an extension period of training. Includes: the building trades hourly paid foremen who are not members of management, mechanics and repairers, skilled machine operators, compositors and typesetters, electricians, engravers, job setters (metal), motion picture projectionists, pattern and model makers, stationary engineers, tailors and kindred workers.

OPERATIVE (SEMI-SKILLED)
Workers who operate machine or processing equipment or perform other factory-type duties of intermediate skill level which can be mastered in a few weeks and require limited training.

LABORERS (UNSKILLED)
Workers in manual occupations which generally require no special training. Perform elementary duties that may be learned in a few days and require the application of little or no independent judgment. Includes: garage laborers, car washers and greasers, gardeners (except farmers), ground-keepers, long-shore workers, craftsperson and stevedores, lumber's and woodchippers, laborers performing lifting, digging, mixing, loading, and pulling operations, and kindred workers.

SERVICE WORKERS

Workers in both protective and non-protective service occupations. Includes: attendants (hospital and other instruction, professional and personal service), barbers, and cleaners, cooks, guards, door keepers, stewards, janitors, police officers and detectives, porters, food services, and kindred workers.

APPRENTICES

Persons employed in a program including work training and related instruction to learn a trade or craft which is traditionally considered an apprentice, regardless of whether the program is registered with a Federal or State agency.

Form 3: Employment Data Form

Please note this data may be obtained by visual survey or post-employment record. Neither visual surveys nor post-employment records are prohibited by any federal, state or local law. All specified data is required to be filled in by District policy.

	All EMPLPOYEES			MALES					FEMALES				
Job Categories	TOALS MALES & FEMALES	MALES	FEMALES	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDER	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDE	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC
OFFICIALS, MGRS & SUPERVISORS													
PROFESSIONALS													
TECHNICIANS													
SALES WORKERS													
OFFICE/CLERICAL													
CRAFTWORKERS (SKILLED)													
OPERATIONS (SEMI-SKILLED)													
LABORERS (UNSKILLED)													
SERVICE WORKERS													
APPRENTICES													
TOTAL													

Additional information (optional):
Describe any other actions taken which show that all employees are recruited, hired, or trained or promoted without regard to their race, religion, color, sex, handicap, age or national origin. Use second sheet if additional space is needed:

The undersigned certifies that they are legally authorized by the proposer to make the statements and representations contained in this report, and that they have red all of the foregoing statements and representations which are true and correct to the best of their knowledge and belief.

FIRM OR CORPORATE NAME: _____ DATE: _____

SIGNATURE: _____ TITLE: _____

SAMPLE ONLY
DO NOT COMPLETE

CLEVELAND MUNICIPAL SCHOOL DISTRICT
CONSTRUCTION AGREEMENT

This Construction Agreement (the "Agreement") is made as of April 10, 2017 by and between **THE CLEVELAND MUNICIPAL SCHOOL DISTRICT**, 1111 Superior Ave. E, Suite 1800, Cleveland, Ohio 44114 (the "District") and **SELECTED VENDOR**, Address, City, State, Zip (the "Contractor" and, together with District, the "Parties") and is for the purposes described below.

1. **CONTRACT PURPOSE.** The purpose of this contract is XXXXXXXX (the "Project"). The Contractor shall perform all work ("Work") described in ITB #21205. The bidding documents, drawings and specifications and the Contractor's bid are included in the contract terms and conditions as if rewritten herein.

2. **TERM.** This Agreement shall commence on the date first written above, and Contractor shall attain final completion of the Work not later than XX calendar days following issuance of a Purchase Order unless an extension is granted in writing by the District; provided, however, that the District may terminate this Agreement at any time without obligation and without cause by giving fourteen (14) days' written notice to the Contractor under the Termination for Convenience clause below. Contractor acknowledges that time is of the essence in this Agreement and that the Project shall be completed on or before the date set forth herein for final completion. If Contractor fails to complete the Project on or before the date set forth herein for final completion for any reason other than a default or delay caused by the District, the Contractor hereby agrees to pay the District, as liquidated damages, the sum of $200.00 per day for each calendar day beyond the date set forth herein for final completion that the Contractor fails to complete the Project. The amount of liquidated damages is fixed and agreed on between the District and the Contractor because of the impracticality and difficulty of ascertaining the true value of damages that the District will sustain by failure of the Contractor to complete the Project on time. Contractor may work on the Project during ordinary business hours unless otherwise agreed to by the District.

3. **COMPENSATION.** This is a fixed-price contract. Subject to the terms and conditions of this Agreement, the District shall pay the Contractor the amount of **$XXXX** (the "Contract Sum"), based upon the Base Bid plus Alternate option on the bid form submitted by Contractor submitted by the Contractor on **date**. The Contractor shall submit to the District, before the first invoice, a schedule of values, allocating the entire Contract Sum to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the District may require. This schedule, unless objected to by the District, shall be used in reviewing the Contractor's invoices. If all or part of any funds of the Contractor that are held by the District, whether it be

retainage, escrowed funds or otherwise, should be attached, garnished or levied upon under any order of court, or if the delivery thereof shall be stayed or enjoined by any order of court, or if any other writ, order, judgment, or decree shall be made or entered by any court affecting the held funds, or any part thereof whether with or without jurisdiction, and in case District obeys and complies with any such writ, order judgment, or decree, District shall not be liable to the Contractor, its successors, or assigns, and Contractor shall indemnify and hold District harmless for its compliance with such writ, order, judgment or decree, notwithstanding that such writ, order, judgment or decree be subsequently reversed, modified, annulled, set aside, or vacated.

4. **COORDINATION OF THE WORK.** The Contractor is responsible for scheduling the Work and coordinating the subcontractors. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as other permits, fees, licenses, tests, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall give the District timely notice of when and where tests and inspections are to be made so that the District may be present for such procedures.

5. **PAYMENTS.** Subject to the retainage provisions of Ohio Revised Code Sections 153.12, 153.13 and 153.14, the Contractor will provide an invoice each month on or about the 15th day of the month containing a detailed summary of the Work completed by the Contractor for the previous month. Each invoice shall be accompanied by a certified payroll report as more specifically set forth in Article 37 herein. The District will render payment to Contractor within ninety (90) days after receiving such invoice. Contractor shall provide such documentation as requested by the District that the Work described in the invoice was actually provided. Failure to provide such documentation upon the District's request shall excuse the District from paying for the invoiced Work. Contractor will not submit invoices for materials stored off site unless the off-site storage has been approved by the District, which approval may be withheld in the District's sole discretion. The Contractor warrants that title to all Work covered by an invoice will pass to the District no later than the time of payment. The Contractor further warrants that upon submittal of an invoice, all Work for which payments have been received from the District shall be free and clear of liens, claims, security interests or other encumbrances adverse to the District's interests.

   The Contractor shall pay in full all bills incurred by the Contractor for the Contractor's Work, and shall submit upon the District's request receipted invoices or waivers of lien as evidence of payment in full of Contractor's bills. The District reserves the right to withhold from any payment hereunder amounts claimed against the Contractor or the Contractor's surety company representing obligations arising out of the Contractor's Work, until Contractor provides to the District evidence of payment of such obligations. The District also reserves the right to withhold from any payment hereunder the amount of any expense, loss or damage that the District sustained or reasonably expects to sustain as a result of nonperformance or faulty or delayed performance by the Contractor under this Agreement. The District may apply such amount in payment of the expense, loss or damage sustained.

   Final payment on this Agreement shall be payable within ninety (90) days after final completion of

the Contractor's Work, the final acceptance thereof by the District, and receipt of a final invoice from the Contractor. No payment made shall be evidence of the performance of Contractor's Work, either in whole or in part, and no payment, including the final payment, shall be construed to be an acceptance of defective Work or improper materials used by the Contractor. Anything herein contained to the contrary notwithstanding, acceptance by the Contractor of the final payment shall constitute a full and final release by the Contractor of all claims against the District. As a condition precedent to the Contractor receiving final payment the Contractor shall also submit to the District (a) as-built drawings, (b) a complete list of Subcontractors and principal vendors on the Project, including addresses and telephone numbers, (c) an indexed, loose leaf binder containing complete installation, operation, and maintenance manuals, including all manufacturers' literature, of equipment and materials used in the Work, (d) an indexed, loose leaf binder containing all inspection reports, permits, and temporary and final certificates of occupancy and licenses necessary for the occupancy of the project, and (e) any and all other items required pursuant to the Contract Documents. The making of final payment shall constitute a waiver of claims by the District except those arising from (1) liens, claims, security interests or encumbrances arising out of the Contract and unsettled; (2) failure of the Work to comply with the requirements of the Contract Documents; (3) terms of special warranties required by the Contract Documents; or (4) Contractor's indemnity obligations under this Agreement

The Contractor is not entitled to payment of the Contract Sum if the Work under this Agreement is no longer needed, required or requested by the District, or if this Agreement is terminated by the District with or without cause. The District is not liable in any manner for expenses incurred by the Contractor through its utilization of third-party vendors or contractors.

6. **FUNDING SOURCE**

Budget Number/Code

0	0	0	.	0	0	0	0	.	0	0	0	0	·	0	0	0	..	0	0	0
FUND				*SCC*					*FUNCTION*					*OBJECT*				*OPU*		

7. **INDEMNIFICATION AND HOLD HARMLESS.** The Contractor shall indemnify, defend, and hold harmless the District, all of its members, officers, employees, and agents, from and against any and all liability (whether real or asserted), claims, demands, expenses, costs (including legal fees) and causes of action of any nature whatsoever for injury or death of persons, or damage or destruction of property which may result from or arise out of the negligence or intentional misconduct of the Contractor or its employees, officers, or agents, in the course of the Contractor's performance of this Agreement or the Contractor's failure to perform. This indemnification and hold harmless obligation survives the term of this Agreement.

8. **INDEPENDENT CONTRACTOR STATUS.** Contractor and the District acknowledge and agree that Contractor is an independent contractor and has no authority to bind the District or otherwise act as a representative of the District. The District will provide **no** benefits such as health insurance, unemployment insurance, or worker's compensation insurance to the Contractor. Contractor will be responsible for payment of all federal, state and local income taxes, unemployment and workers' compensation coverage.

9. **CONFIDENTIALITY/OWNERSHIP.** The Contractor agrees that all information provided by the District or any information that the Contractor may acquire, directly or indirectly, if any, which relates to the District and which the District identifies to the Contractor as confidential will be kept

confidential and not used by or released to any third party or parties without the prior written consent of the District.

10. **NO DAMAGES FOR DELAY.** The District shall not be held responsible for any loss, damage, costs, or expenses sustained by the Contractor as the result of any project delays, disruptions, suspensions, Work stoppages, or interruptions of any kind, whether reasonable or unreasonable or whether occasioned by changes ordered in the Work or otherwise caused by an act or omission of the District, its agents, employees, or representatives, or by any cause whatsoever beyond the control of the Contractor.

11. **FINDINGS FOR RECOVERY/ DEBARMENT OR SUSPENSION.** Contractor represents that it has no unresolved findings for recovery against it by the Ohio Auditor of State or any notice of debarment or suspension from any Federal Agency. The District may terminate this contract at any time if the vendor or any of its directors or officers is found at any time to have any unresolved findings for recovery by the Auditor of State or any notice of debarment or suspension from any Federal Agency. Certification from the Ohio Auditor of State's website and the Federal System for Award Management (SAM) website is attached to this Agreement as Exhibit B.

12. **CRIMINAL BACKGROUND CHECK.** Contractor shall perform or cause to be performed an Ohio Bureau of Criminal Investigation and Identification and Federal Bureau of Investigation criminal background check of the employees of Contractor or of any subcontractor that will perform Work or services or otherwise be present at the Project site within the proximity of students of the District. Prior to the performance of any services by such employees, the criminal background check shall be performed and completed at Contractor's sole cost and expense. No person shall be employed on site by Contractor or by any subcontractor who has been found guilty of any of the criminal offenses enumerated in Ohio Revised Code Section 3319.39 or any equivalent provisions under Federal law or the laws of any of the other states. Contractor shall remove (and shall cause its subcontractor to remove) any person from the Project site found (during the criminal background check or otherwise) to have violated any of the offenses listed in Section 3319.39 of the Ohio Revised Code or equivalent provisions thereof under Federal law or the laws of any of the other states. The foregoing shall not (i) be cause for any claim against the District for any reason, including without limitation, interference or delay, and (ii) excuse Contractor or any subcontractor from meeting the construction schedule.

13. **DISCRIMINATION.** Contractor agrees that (A) in the hiring of employees for the performance of Work under the contract or any subcontract, Contractor, by reason of race, color, religion, sex, age, disability or military status as defined in section 4112.01 of the Revised Code, national origin, or ancestry, shall not discriminate against any citizen of this state in the employment of a person qualified and available to perform the Work to which the contract relates; (B) Contractor or any subcontractor or person acting on behalf of Contractor or its subcontractors, in any manner, shall not discriminate against, intimidate, or retaliate against any employee hired for the performance of Work under the contract on account of race, color, religion, sex, age, disability or military status as defined in section 4112.01 of the Revised Code, national origin, or ancestry; (C) Contractor shall have a written affirmative action program for the employment and effective utilization of economically disadvantaged persons, as referred to in division (E)(1) of section 122.71 of the Revised Code and shall file a description of the affirmative action program and a progress report on its implementation with the equal employment opportunity office of the Department of Administrative Services; and (D) Any provision of a hiring hall contract or agreement which obligates the Contractor to hire, if available, only employees referred to the Contractor by a labor

organization shall be void as against public policy and unenforceable with respect to employment under any public improvement contract unless at the date of execution of the hiring hall contract or agreement, or within thirty (30) days thereafter, the labor organization has procedures in effect for referring qualified employees for hire without regard to race, color, religion, national origin, military status as defined in Revised Code Section 4112.01, or ancestry and unless the labor organization includes in its apprentice and journeyperson's membership, or otherwise has available for job referral without discrimination, qualified employees, both whites and non-whites (including African-Americans).

14. **PERSONNEL.** Upon the District's request, and in its sole discretion, Contractor shall replace any personnel assigned to the Project by the Contractor.

15. **LABOR DISPUTE.** If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this Agreement, the Contractor shall immediately give notice, including all relevant information, to the District.

16. **PROMPT PAYMENT DISCOUNT.** If the Contractor offers a prompt payment discount on any other contract, public or private, then the District shall be extended the same discount on this Agreement and shall be so notified of the existence of the discount and the terms thereof.

17. **DAMAGE TO BUILDINGS, EQUIPMENT, AND VEGETATION.** The Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation on the District premises. If the Contractor's failure to use reasonable care causes damage to any District property, the Contractor shall replace or repair the damage at no expense to the District as the District directs. If the Contractor fails or refuses to make such repair or replacement, the Contractor shall be liable for the cost, which may be deducted from the contract price.

18. **NOTICE OF BANKRUPTCY.** In the event that Contractor enters into bankruptcy proceedings, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic mail, written notification of the bankruptcy to the District office responsible for administering the contract. This notification shall be furnished within five (5) days of the initiation of proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of District contract numbers and contracting offices for all District contracts against which final payment has not been made. This obligation remains in effect until the District makes final payment under this Agreement.

19. **AVAILABILITY OF FUNDS.** The Parties acknowledge and agree that the District is a governmental entity and due to statutory provisions cannot commit to the payment of funds beyond its current fiscal year (July 1 through June 30). If funds are not allocated for the Project for any succeeding fiscal year during which this Agreement may continue, the District may terminate this Agreement at the end of the last fiscal period for which funds have been allocated without liability for any termination charges, fees, or penalties. The District shall be obligated to pay all charges incurred through the end of the last fiscal period for which funds were appropriated.

20. **RECORDS.** The Contractor shall maintain all records pertaining to this Agreement on file for not less than ten (10) years and until any audit issues are resolved. The Contractor shall make such records available to the District or any duly authorized representative of the District upon request. If this is a federally funded contract, the Contractor shall comply with all federal records retention rules, regulations and laws and shall allow access to such records as required by federal law.

21. **TERMINATION BY THE OWNER FOR CAUSE.**

21.1The District may terminate the Contract if the Contractor:

21.1.1 refuses or fails to supply enough properly skilled workers or proper materials;

21.1.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

21.1.3 disregards applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of a public authority; or

21.1.4 otherwise is guilty of breach of a provision of the Contract Documents.

21.2.When any of the above reasons exists, the District may, without prejudice to any other remedy the District may have and after giving the Contractor seven days' written notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever reasonable method the District may deem expedient. Upon request of the Contractor, the District shall furnish to the Contractor a detailed accounting of the costs incurred by the District in finishing the Work.

21.3 When the District terminates the Contract for one of the reasons stated in this Article 21, the Contractor shall not be entitled to receive further payment until the Work is finished.

21.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including expenses of the District made necessary thereby, and other damages incurred by the District and not expressly waived, such excess shall be paid to the Contractor to the extent of Work that was actually and satisfactorily performed by the Contractor. If such costs and damages exceed the unpaid balance, the Contractor and/or the Contractor's surety shall pay the difference to the District.

22. **WAIVER OF DEFAULT**. If the District consents to or waives the breach of any provision of covenant in this Agreement, such waiver shall not constitute a waiver of such provisions or covenant as to the future, and the District shall not be estopped from later enforcing any provision or covenant it may have previously waived or elected not to enforce; nor shall such waiver have any effect on the enforcement of any other provision of this contract.

23. **TERMINATION FOR CONVENIENCE OF DISTRICT**. The District may terminate this Agreement at its option without obligation upon fourteen (14) days written notice to the Contractor. The District may terminate this Agreement for any reason or no reason at all. Should the District terminate this Agreement for cause, but that cause be subsequently found to be insufficient to support termination, the termination shall be deemed one of convenience.

24. **EFFECT OF TERMINATION FOR CONVENIENCE**. If the District terminates this Agreement for its convenience, then the District shall only remit payment to the Contractor for Work satisfactorily performed up to the date of termination. In no event shall the Contractor be entitled to lost or anticipatory profits. Upon receipt of written notice from the District of a termination for convenience, the Contractor shall with respect to the Work that is terminated: (i) cease operations as directed by the District in the notice; (ii) take actions necessary, or that the District may direct, for the protection and preservation of the Work; and (iii) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all

existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

25. **MISCELLANEOUS**

a. Contractor represents and warrants that it possesses the requisite qualifications and personnel to provide the services agreed to herein.

b. Neither party may assign or sub-contract this Agreement or any right or interest herein without the prior written consent of the other party. The subcontract form between the Contractor and a subcontractor shall meet the applicable requirements of Ohio Administrative Code 153:1-3-01 and 153:1-3-02.

c. This Agreement shall be binding upon and inure to the benefit of the Parties, their successors, and permitted assigns.

d. In the event of inconsistencies within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes, and ordinances that are not clarified through a modification, the Contractor shall (i) provide the better quality or greater quantity of Work or (ii) comply with the more stringent requirement; either or both in accordance with the Owner's interpretation. Anything shown in the drawings and not mentioned in the specifications, or mentioned in the specifications and not shown on the drawings, shall have the same effect as if shown or mentioned respectively in both. Any Work shown on one drawing shall be construed to be shown in all drawings.

e. The paragraph headings are for convenience only and shall not affect the interpretation of this Agreement.

f. The validity and construction of this Agreement shall be determined in accordance with the laws of the State of Ohio, without regard to any conflict of law provisions. The Court of Common Pleas of Cuyahoga County, Ohio shall have exclusive jurisdiction over any action concerning this Agreement except that if the U.S. District Court is determined to have exclusive jurisdiction, then the forum shall be the U.S. District Court for the Northern District of Ohio.

g. The Contractor and all subcontractors shall comply with all local, state and federal laws, rules, regulations and ordinances.

h. No travel expense reimbursement is authorized unless specifically stated in this contract. If so stated, the meals, travel, and lodging are reimbursable only in strict compliance with the Ohio Auditor of State Technical Bulletins, Guidance and Rules and Regulations and, if this contract is federally funded in whole or in part, in strict compliance with all rules, regulations and guidance of the U.S. Office of Management and Budget and any other federal office or agency having jurisdiction over federally funded contracts.

i. This document contains the entire Agreement between the parties with respect to the services to be provided hereunder. The Parties hereby represent that there are no representations, understandings or agreements between the Parties related to the Project, whether oral or written, which are not included herein.

26. **CONFLICT OF INTEREST.** The Contractor represents that none of its employees, directors, officers or agents is an employee or board member of the Cleveland Municipal School District. The Contractor further represents that no employee or board member of the Cleveland Municipal School District has any ownership interest in or fiduciary duties to the Contractor or any of its affiliates. The District's signatory to this Agreement represents that neither he/she or any family member have any ownership interest in or fiduciary duties to the Contractor or any of its affiliates.

27. **TAXES.** The Contractor shall pay applicable sales, consumer, use and other similar taxes that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect. District will provide to Contractor, upon request, a completed State of Ohio Sales and Use Tax Construction Contract Exemption Certificate.

28. **INSURANCE.** During the term of this Agreement, the Contractor shall, at its own expense, purchase and maintain insurance in no less that the following amounts and with the following conditions:

    a. Workers' Compensation and employers' liability insurance to the fullest extent required by applicable law;

    b. Commercial general liability coverage for bodily injury and property damage, including stopgap employers' liability coverage, contractual liability coverage and an exception to any applicable pollution or asbestos exclusion. If a claims policy is used, it must have an unaltered extended discovery period provision, in not less than the following amounts:

        i. General Aggregate Limit: $2,000,000 CSL per location;

        ii. Each Occurrence Limit: $1,000,000 CSL per location; and

        iii. Commercial automobile liability coverage, including non-owned and hired automobiles, in an amount not less than $1,000,000; and

    c. property insurance on an "all-risk" or equivalent policy form, including builder's risk. The amount of the insurance shall be equal to the Contractor's Contract Sum plus the value of subsequent modifications and cost of materials supplied and installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the District has an insurable interest in the property required by this Article to be covered, whichever is later. This insurance shall include interests of the District, the Contractor, Subcontractors and sub-subcontractors in the Project.

    d. The Contractor shall provide the District with certificates of insurance evidencing the required coverages and amounts, including without limitation any certificates of renewal. Each policy required to be purchased or maintained by the Contractor, with the exception of the Workers' Compensation policy, shall name the District as an additional insured (for the purposes of this Agreement, being a certificate holder does not constitute being named as an additional insured). The certificates of insurance shall contain a provision that the policy or policies will not be cancelled without thirty (30) days' prior written notice to the District. Upon the District's request, the Contractor shall provide complete copies of any or all policies for the District to review. All certificates must be received and approved by the District before any Work under this Agreement commences.

29. **PAYMENT AND PERFORMANCE BONDS.** If applicable, the Contractor shall furnish payment and performance bonds as required by Ohio Revised Code Section 153.54, in the form required by Ohio Revised Code Section 153.57 and 153.571, and shall provide the District with proof of such bonds at the time of entering into this Agreement.

30. **PROTECTION OF PERSONS AND PROPERTY.** The Contractor will take no action that would jeopardize the safety of the District's students, employees or guests. The Contractor will not take any action that would interfere with the District's activities without the District's prior written approval. The District reserves the right to require Contractor, its employees and agents to wear identification and stay in designated Work areas at all times while on the District's property. The District shall have the right to require Contractor to remove any of its employees or agents from the Project for failing to wear proper identification, being outside the designated Work area, fraternizing with or engaging in any improper behavior directed towards or in the vicinity of students, employees or guests of the District, or for any other good cause shown.

    The Contractor shall take all reasonable safety precautions with respect to its Work and shall comply with all safety measures of the District and all applicable laws, ordinances, rules and regulations for the safety of persons or property in connection with the Contractor's performance under this Agreement. Contractor shall take any precautions necessary to protect the Work of other trades from damages cause by its operations.

31. **WARRANTY AND CORRECTION OF WORK.** Contractor warrants that (i) all materials and equipment furnished and incorporated by it in the Project shall be new, (ii) all materials, equipment and Work provided by it shall be of good quality, free from any faults and defects and (iii) all materials, equipment and Work provided by it shall be in conformity with all applicable laws, rules and regulations and with the Contract Documents. Contractor shall correct any Work that fails to conform with any applicable law, rule or regulation or with the requirements of the Contract Documents if such failure to conform appears during the progress of the Project. The Contractor agrees to assign to the District at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

    In addition to, and not in limitation of the foregoing warranties, Contractor shall also remedy any defects due to faulty materials or workmanship which appear within a period of one (1) year from the date of completion of the Project. One month prior to the expiration of the one (1) year period, the Contractor shall attend a walk-through of the Project.

32. **ANTI-ABUSE OF DRUGS AND ALCOHOL.** The Contractor shall make a good-faith effort to ensure that no employee of the Contractor will purchase, transfer, use, possess or be under the influence of alcohol or illegal drugs or abuse legally-obtained drugs while on or about the Project. Except for the term "employee," terms in this paragraph are used as defined in Rule 123:1-76 of the Ohio Administrative Code.

33. **CHANGES TO THE PROJECT.** By appropriate modification, changes in the Project may be accomplished after execution of this Agreement. The District, without invalidating this Agreement, may order changes within the general scope of the Project consisting of additions, deletions or other revisions, with the Contract Sum and term of the Agreement being adjusted accordingly. Such changes in the Project shall be authorized by either (i) mutual agreement of the Parties through a

written Change Order signed by the District and the Contractor, or (ii) in the absence of mutual agreement, by written Construction Change Directive signed only by the District.

In the case of a Construction Change Directive signed only by the District, adjustments in the Contract Sum shall be determined by calculating the Contractor's cost of additional labor, material and equipment and a reasonable allowance for overhead and profit, unless the Parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive, and the District will make an interim determination of the amount of payment due for purposes of certifying the Contractor's invoice for payment. When the District and Contractor agree on adjustments to the Contract Sum and/or the term of this Agreement arising from a Construction Change Directive, the District will prepare a Change Order. The Contractor shall proceed diligently with the performance of the changes in the Project following receipt of and as set forth in the Construction Change Directive pending resolution of a Change Order.

The District will have authority to order minor changes in the Project not involving adjustment in the Contract Sum or extension of the term of this Agreement and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the District and Contractor. The Contractor shall carry out such written orders promptly.

Agreement on any Change Order shall constitute a final settlement of all claims of the Contractor relating to the change in the Project that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

34. **SUBMITTALS.** The Contractor shall review for compliance with the Contract Documents and submit to the District shop drawings, product data, samples and similar submittals required by the Contract Documents in such sequence as to allow the District reasonable time for review. By submitting shop drawings, product data, samples and similar submittals, the Contractor represents to the District that the Contractor has (1) reviewed and approved them; (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so; and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Work shall be in accordance with approved submittals. shop drawings, product data, samples and similar submittals are not Contract Documents. In the event of a conflict between submittals and the Contract Documents, the Contract Documents take precedence and govern the Work unless the variance in the submittals is accepted by Change Order.

35. **OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE.** Instruments of service, including drawings and documents that are required to be provided or prepared by the Contractor or Subcontractor pursuant to this Agreement shall become, upon payment of all undisputed payments due the Contractor, the property of the District whether or not the Project for which they are prepared is commenced or completed. The Contractor may retain copies, including reproducible copies of such instruments of service for information and reference. Such instruments of service may be used by the District or others employed by the District for reference in any completion, correction, remodeling, renovation, reconstruction, alteration, modification of or addition to the Project, without compensation to the Contractor or Subcontractors. Such instruments of service shall not be given

or sold by the District to be used by others on other projects except by agreement in writing and with agreed upon appropriate compensation to the Contractor or Subcontractor, as applicable. The Contractor shall not be held liable if (i) a third party receives the instruments of service and either modifies, changes or uses them for the Project in a way not originally anticipated when the documents were created, or (ii) the instruments of service are used by others not related to the Project without the involvement of the Contractor. If any event occurs for which the Contractor may be liable, the District shall notify the Contractor of such event as soon as practical after such event and shall provide access to the Project to the Contractor, Subcontractor and their representatives.

36. **COMMUNITY INCLUSION PLAN PROGRAM.** Contractor shall adhere to the requirements of the District's Community Inclusion Plan Program as detailed in the ITB and the District's goals with respect to its Diversity Business Enterprise Program and Workforce Participation Program.

37. **CLAIMS AND DISPUTES.**

37.1 The parties are fully committed to working with each other throughout the project and agree to communicate regularly with each other at all times so as to avoid or minimize disputes or disagreements.

37.2 Contractor and District will first attempt to resolve any dispute, disagreement, controversy or claim (including a claim that is not resolved in accordance with Section 37.1) through direct discussions. Upon the request of either party, Contractor and District shall meet as soon as possible, but in no case later than thirty (30) days after such a request is made, to attempt to resolve such dispute or disagreement. Prior to any meetings between Contractor and District, the parties will exchange relevant information that will assist the parties in resolving their dispute or disagreement. If the meeting does not occur within the thirty (30) day period, or if after meeting Contractor and District determine that the dispute or disagreement cannot be resolved on terms satisfactory to both parties, the parties may, within thirty (30) days thereafter, follow the process set forth in Section 37.3 herein.

37.3 Any dispute, disagreement, controversy or claim between District and Contractor arising out of or related to this Contract, or the breach thereof not resolved through the process set forth in Section 37.2, shall be settled by litigation as the method of binding dispute resolution. In addition, the Parties may, by written agreement, submit any disputes to non-binding mediation upon such terms as shall be mutually agreeable and such mediation shall take place at an agreed-upon location in Cuyahoga County, Ohio. The mediation may occur concurrently with or prior to litigation. This Article shall not prevent either party from bringing a third party claim in pending litigation for indemnity and/or contribution.

38. **MINIMUM WAGES.** Laborers and mechanics employed on the Project will be paid the full amount of wages and bona fide fringe benefits or cash equivalents thereof at rates not less than those contained in the applicable general wage determinations by the United States Department of Labor ("DOL") in accordance with the Davis-Bacon Act, 40 USC 3141 et seq. and 29 CFR, Parts 1, 3, 5, 6 and 7. The current DOL general wage determination is attached as Exhibit D. In the event that the class of work of any of the laborers or mechanics for the Project are not covered by the DOL's general wage determination, the Contractor shall use good faith efforts to obtain a classification and wage rate determination from the DOL. In the event the Contractor is unable to obtain the classification and determination from the DOL, then the Contractor shall utilize the rate

and classification for Cuyahoga County, Ohio as established in the applicable collective bargaining agreement for the Work, regardless of whether the Contractor is a party to the collective bargaining agreement. The District will not seek enforcement of the wage rates through the DOL or the mechanisms of 40 USC 3141 et seq. Rather, the District shall be entitled to rely upon the accuracy and completeness of certified payroll reports of compliance with the wage rate requirements submitted by Contractor. When submitting certified payroll reports, Contractor shall utilize the DOL Form WH-347 or equivalent form. Failure to pay the wage rates will be deemed non-compliance and a material breach of the terms and conditions of this Agreement.

[Signature Page Follows]

CONTRACT MUST BE APPROVED BY CMSD LEGAL DEPARTMENT <u>PRIOR</u> TO SIGNATURE

Approved as to form:

____

Law Department
Cleveland Municipal School District

DATE: ___________________________

****

<u>NOTICE TO VENDORS</u>

GOODS AND/OR SERVICES ARE NOT TO BE PROVIDED UNTIL AFTER THE CONTRACT HAS BEEN SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF CMSD AND A CERTIFIED PURCHASE ORDER HAS BEEN ISSUED TO THE VENDOR

THE CLEVELAND MUNICIPAL SCHOOL DISTRICT IS NOT OBLIGATED TO PAY FOR GOODS AND/OR SERVICES PROVIDED PRIOR TO THE DATE THIS CONTRACT HAS BEEN SIGNED BY AN AUTHORIZED CMSD REPRESENTATIVE.

****

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by them or their authorized representatives as of the day and year first above written.

[CONTRACTOR]	**CLEVELAND MUNICIPAL SCHOOL DISTRICT**
By: ____________________________	By: ____________________________
Name: ____________________________	Name: ____________________________
Title: ____________________________	Title: ____________________________

Section XIV: References

Include below three references of equal or larger size to this current ITB project. Public sector experience is preferred, but not required. Please attach relevant supporting documentation, such as project plans, scope of work.

Reference #1:
Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax#: _____

Dates of Service: _____

Description of Services Provided: _____

_____

Reference #2:
Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax #: _____

Dates of Service: _____

Description of Services Provided: _____

_____

Reference #3:
Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax#: _____

Dates of Service: _____

Description of Services Provided: _____

PART III: GENERAL CONDITIONS, FORMS AND SPECIFICATIONS

ITB #21329

Lincoln West High School Rooftop Equipment Project

CLEVELAND METROPOLITAN SCHOOL DISTRICT

1111 Superior Avenue E., Suite 1800
Cleveland, Ohio 44114

ISSUED FOR BID

ROOFTOP EQUIPMENT

LINCOLN-WEST HIGH SCHOOL

3202 West 30th Street, Cleveland, OH 44109

Structural Engineer:

Barber and Hoffman, Inc.

2217 East 9th Street, Suite 350
Cleveland, Ohio 44115

Architect:

Perspectus Architecture

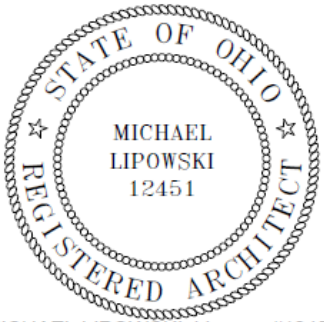
1300 East 9th Street, Suite 910
Cleveland, Ohio 44114

M/E/P Engineer:

Karpinski Engineering

3135 Euclid Avenue
Cleveland, Ohio 44115

September 20, 2021



MICHAEL LIPOWSKI, License #12451
Expiration Date 12-31-2021

Project Manual Volume 1 of 1

Bidding & Construction

CLEVELAND METROPOLITAN SCHOOL DISTRICT
LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

TABLE OF CONTENTS

NOTES:
Upon receipt of these Bidding Documents, Bidders shall compare the Table of Contents with the actual pages of the Project Manual and the Index of Drawings with the actual sheets of Drawings to verify that each set of Bidding Documents is complete and in order as received from the Printer. If any discrepancies are noted, Bidders shall contact the Design Team Representative immediately. If no such contact is made within five (5) days of Receipt of Bidding Documents, the Owner and the Design Team Representative will take that to indicate that Bidders have complete and entire sets of Bidding Documents. Unless noted otherwise all Sections have been authored by Perspectus Architecture.

(BH) Sections authored by Barber and Hoffman Engineering
(KE) Sections authored by Karpinski Engineering

00 00 00a – Specification Cover Page

00 00 00b - Table of Contents

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

All Work shall be in accordance with the Cleveland Metropolitan School District (CMSD) issued and on-line documentation for Instructions to Bidders, Supplemental Instructions to Bidders, General Conditions, Supplemental General Conditions, Bid Forms, and other Bidding, Contract Agreement and/or Purchase order conditions.

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00 – Summary
01 25 00 – Substitution Procedures
01 26 00 – Contract Modification Procedures
01 29 00 – Payment Procedures
01 31 00 – Project Management and Coordination
01 32 00 – Construction Progress Documentation
01 33 00 – Submittal Procedures
01 40 00 – Quality Requirements
01 42 00 - References
01 50 00 – Temporary Facilities and Controls
01 60 00 – Product Requirements
01 73 00 – Execution
01 73 10 – Cutting & Patching
01 74 19 – Construction Waste Management and Disposal
01 77 00 – Closeout Procedures
01 78 23 – Operation and Maintenance Data
01 79 00 – Demonstration and Training

DIVISION 02 – EXISTING CONDITIONS

02 41 19 – Selective Demolition

DIVISION 03 – CONCRETE (Not Used)

DIVISION 04 – MASONRY (Not Used)

DIVISION 05 – METALS (BH)

05 12 00 - Structural Steel Framing

DIVISION 06 – WOOD, PLASTICS AND COMPOSITES (Not Used)

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 01 50.19 – Preparation for Re-Roofing
07 27 15 – Modified Bituminous Sheet Roofing
07 92 00 – Joint Sealants

DIVISION 08 – OPENINGS (Not Used)

DIVISION 09 – FINISHES

09 91 23 – Painting

DIVISION 010 – SPECIALTIES

10 82 13 – Roof Screens

DIVISIONS 11 Through 22 (Not Used)

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC) (KE)

23 01 00 – HVAC General Provisions
23 01 01 – HVAC Supplemental General Provisions
23 02 00 – HVAC Demolition
23 03 00 – HVAC Basic Materials and Methods
23 04 00 – HVAC Firestopping
23 05 05 – HVAC Equipment Motor Requirements
23 07 00 – HVAC Insulation
23 09 00 – HVAC Instrumentation and Controls
23 20 00 – HVAC Piping and Accessories
23 60 00 – Central Cooling Equipment

DIVISION 26 - ELECTRICAL (KE)

26 01 00 – Electrical General Provisions
26 01 01 – Electrical Supplemental General Provisions
26 02 00 – Electrical Demolition
26 03 00 – Electrical Basic Materials and Methods
26 03 10 – Low-Voltage Electrical Power Conductors and Cables
26 03 20 – Raceway and Boxes for Electrical Systems
26 03 40 – Wiring Devices
26 04 00 – Electrical Firestopping
26 21 00 – Power Distribution Equipment
26 22 35 – Overcurrent Protection Devices

DIVISION 27 – TECHNOLOGY (Not Used)

END OF TABLE OF CONTENTS

CLEVELAND METROPOLITAN SCHOOL DISTRICT
LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 GENERAL REQIREMENTS

A. All Drawings and General provisions of the Contract, including General and Supplementary conditions and other Division 1 Specifications Sections, apply to this and all Sections of this Specification.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.

B. Related Requirements:

1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Lincoln-West High School Rooftop Equipment for the Cleveland Metropolitan School District.

1. Project Location: 3202 West 30th Street, Cleveland, OH 44109

B. Owner: Cleveland Metropolitan School District (CMSD), 1111 Superior Avenue E., Suite 1800 Cleveland, Ohio 44114.

1.4 DESIGN TEAM

A. Structural Engineer: The Project was designed by: Barber and Hoffman, Inc., 2217 East 9th Street, Suite 350, Cleveland, Ohio 44115.

B. Architect: Perspectus Architecture, 1300 East 9th Street, Suite 910, Cleveland, Ohio 44114.

C. Mechanical and Electrical Engineering: Karpinski Engineering, 3135 Euclid Ave. Cleveland, Ohio 44115

1.5 WORK COVERED BY CONTRACT DOCUMENTS

D. The Work of Project is defined by the Contract Documents and consists of the following:

1. Replacement of an existing rooftop located chiller unit and all applicable mechanical and electrical support services and related structural and roof and siding repair services.
2. Installation of a new air-cooled chiller system complete with all applicable utility connections, structural supports, and roof patching.

E. Type of Contract:

1. Project will be constructed under a Single Prime Contract.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits on Use of Site: Confine construction operations to area designated for work access.
2. Driveways, Walkways, and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.7 SUPERVISION

A. Assign to the Work a competent resident Superintendent and necessary assistants, all satisfactory to the Owner's Representative. Superintendent shall represent Contractor and all instructions given to him shall be as binding as if given to Contractor. Contractor's superintendent is not to be replaced during progress of work without consent of the Owner's Representative.

B. Superintendent and at least two assistants must have attended and passed the primary materials manufacturer's installation course. Evidence of completion of manufacturer's training must be presented prior to Project start.

1.8 CLEVELAND METROPOLITAN SCHOOL DISTRICT (CMSD) RULES AND REGULATIONS

A. Contractor shall see to it that his personnel work in complete harmony with the Owner's employees.

B. No interruption of Owner's operations will be permitted, and Contractor shall schedule and perform his work accordingly

C. Contractor employees shall be instructed to refrain from fraternization with the Building occupants.

D. The Owner's security service shall retain the right to inspect all packages, material, equipment, and property of any nature, entering and/ or leaving the plant, as circumstances warrant. The guard shall hold any material, which he deems irregular or about which he has any doubt until it is inspected and passed by the Owner's representative.

E. Motor vehicles will be permitted at the designated dock, to load or unload materials, equipment, tools, trash, etc. All motor vehicles while on Owner's property shall be driven slowly with extreme caution, obeying all posted traffic signs.

F. Contractor has the responsibility to protect all of his personal property, materials, equipment, etc, from theft. All material, equipment tools, etc. must be stored in a locked temporary storage unit, due to the high theft rate in the area.

G. Contractor shall not leave materials, tools, etc., lying in an unsafe manner while working on the Owner's property. Do not store tools or materials, which block an exit or path to an exit.

H. Provide barricades and warning signs at all operation of the work which are deemed hazardous by the Owner's representative to the movement of both Contractor's and Owner's personnel.

I. Maintain good housekeeping. Do not allow accumulation of rubbish or scrap materials. Remove rubbish and scrap daily.

J. CMSD prohibits the use, possession, distribution, or sale on the Project premises, facilities, or workplace of any of the following: firearms, alcoholic beverage, intoxicants, drugs, and related drug paraphernalia, also, the sale, distribution or use on any tobacco products on the Project premises is prohibited.

K. Contractor Employees or Subcontractor personnel must not report for duty or perform work while under the influence of any drug, alcoholic beverage, or intoxicant. Employees on the Project premises may be subject to search as provided herein. Applicants and employees will be required to consent to drug/alcohol testing as provided herein.

L. Contact Owner's representative on job prior to placing or using any rigging, hoists cranes, temporary stairs, towers, etc.

M. Provide the owner's representative with sufficient advance noticed, when planning to work outside normal hours so that his manpower, security forces and other interested parties may be advised.

N. Provide barricades and warning signs at holes cut through walls, floors, or roofs in building, also as required about any working area.

O. Smoking is prohibited in school district buildings and vehicles.

P. Use only 3-wire electrical equipment with ground fault protection. Electrical extension cords shall be kept clear of egress pathways.

Q. All emergency accesses from the buildings must be kept clear at all times.

R. All ladders are to be taken down at the end of each day.

1.9 PROTECTION OF WORK AND BUILDING

A. The Contractor shall protect and maintain all Building entrances and egress pathways to allow safe pedestrian entrance to and from the Building.

B. Provide protection of equipment and personnel during operations creating dust from drilling, chipping, etc.

C. The Contractor shall be responsible for the protection of the Building exterior and grounds from Contractor operations. When hoisting materials and / or removing materials, cover exterior walls, including all items in the work area with tarps or other required protection.

1.10 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and **existing** during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1.11 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

    a. On-Site Work Hours: Limit work in the existing building to normal business working hours 6:30 a.m. to 5:30 p.m., Monday through Friday, unless otherwise indicated.
    b. Weekend and Holiday work will be permitted if approved by the Owner’s Representative in advance.
    c. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

B. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

C. Smoking and Controlled Substance Restrictions: Use of tobacco and other smoking products, alcoholic beverages, and other controlled substances on Owner's property is not permitted.

D. Employee Identification: **Provide** identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

E. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

F. Maintain list of approved screened personnel with Owner's Representative.

1.12 REMOVAL OF WORKERS

A. Contractor shall be responsible for all personnel employed in work and shall have power to employ and discharge such personnel, or remove from Project site, personnel employed in the work, who in the judgment of Owner's Representative, are detrimental to the best interest of Owner and the Project.

1.13 SPECIFICATIONS AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 00 26 00 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 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.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Owner and Design Team Representative.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product, fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions 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 as well as names and addresses of Design Team Representatives and Owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Detailed comparison of Contractor's construction schedule using proposed substitutions 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.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. 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.
l. 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. Design Team’s Action: If necessary, A representative from the Design Team will request additional information or documentation for evaluation within seven] (7) days of receipt of a request for substitution and will be notified of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or other Supplemental Instructions for minor changes in the Work.
b. Use product specified if Design Team Representative does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (**15)** days prior to time required for preparation and review of related submittals.

1. Conditions: Design Team Representative will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Design Team Representative will return requests without action, except to record noncompliance with these requirements:

    a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    b. Substitution request is fully documented and properly submitted.
    c. Requested substitution will not adversely affect Contractor's construction schedule.
    d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    e. Requested substitution is compatible with other portions of the Work.
    f. Requested substitution has been coordinated with other portions of the Work.
    g. Requested substitution provides specified warranty.
    h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

1. Conditions: Design Team Representative will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied and 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 Design Team Representative for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    b. Requested substitution does not require extensive revisions to the Contract Documents.
    c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    d. Substitution request is fully documented and properly submitted.
    e. Requested substitution will not adversely affect Contractor's construction schedule.
    f. Requested substitution has received necessary approvals of authorities having jurisdiction.
    g. Requested substitution is compatible with other portions of the Work.
    h. Requested substitution has been coordinated with other portions of the Work.
    i. Requested substitution provides specified warranty.
    j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Design Team Representative will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Design Team Representative are not instructions either to stop work in progress or to execute the proposed change.
2. Within twenty (20) days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Design Team Representative.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.3 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Change Proposal Request, Design Team Representative will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.4 CONSTRUCTION CHANGE DIRECTIVE

A. Changes in the work shall be authorized by the Owner or his representative. Authorization shall be secured by the Contractor prior to commencement of the work, by submitting to the Owner's representative a properly executed and signed Change Order (AIA DOCUMENT G701 OR CMSD CHANGE ORDER DOCUMENT).

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Design Team Representative at earliest possible date, but no later than *seven (7) days before* the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Arrange schedule of values consistent with format of AIA Document G703.
2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five (5) percent of the Contract Sum.
3. 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.

4. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
5. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
6. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling [**five**] **<Insert number>** percent of the Contract Sum and subcontract amount.
7. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Design Team Representative and paid for by Owner.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

1. Submit draft copy of Application for Payment seven (7) days prior to due date for review by Design Team Representative.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 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. Design Team Representative will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Unless otherwise amended, submit three (3) signed and notarized original copies of each Application for Payment to Design Team Representative by a method ensuring receipt within twenty-four (24) hours. One (1) 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: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

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 (preliminary if not final).
5. Sustainable design action plans, including preliminary project materials cost data.
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

H. Application for Payment at Substantial Completion: After Design Team Representative issues the Certificate of Substantial Completion submit an Application for Payment showing one-hundred percent (100%) completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Evidence that claims have been settled.
5. Final liquidated damages settlement statement (if any).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address 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.

1.3 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.4 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated 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. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Design Team Representative 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 or Roof Plans: Show architectural and structural elements, and mechanical, plumbing, 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 sub-framing for support of mechanical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings.
3. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
4. Review: Design Team Representative will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Design Team Representative determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Design Team Representative will so inform Contractor, who shall make suitable modifications and resubmit.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format:

a. Same digital data software program, version, and operating system as original Drawings.

2. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format (PDF format).
3. BIM File Incorporation: Develop and incorporate coordination drawing files into BIM established for Project.
4. Design Team Representative will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

    a. Design Team Representative makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
    b. Contractor shall execute a data licensing agreement in the form acceptable to Owner and Design Team Representative.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Design Team Representative will return without response those RFIs submitted to Design Team Representative by other entities controlled by Contractor.
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. Owner name.
2. Owner's Project number.
3. Name of Design Team Representative.
4. Design Team Representative's Project number.
5. Date.
6. Name of Contractor.
7. RFI number, numbered sequentially.
8. RFI subject.
9. Specification Section number and title and related paragraphs, as appropriate.
10. Drawing number and detail references, as appropriate.
11. Field dimensions and conditions, as appropriate.
12. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
13. Contractor's signature.
14. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: Document acceptable to Owner and Design Team Representative.

D. Design Team Representative's Action: Design Team Representative will review each RFI, determine action required, and respond. Allow **seven (7)** days for Design Team Representative's response for each RFI. RFIs received by Design Team after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.

b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Design Team Representative's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Design Team Representative's action may include a request for additional information, in which case Design Team Representative's time for response will date from time of receipt by Design Team Representative additional information.
3. Design Team Representative's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Design Team Representative in writing within five (5) days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Design Team Representative.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Design Team Representative's response was received.

F. On receipt of Design Team Representative's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Design Team Representative within seven (7) days if Contractor disagrees with response.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Design Team Representative's Digital Data Files: Digital data files of Design Team Representative's BIM model or CAD drawing] will be provided by Design Team Representative for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
2. Design Team Representative makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Contractor shall execute a data licensing agreement in the form acceptable to Owner and Design Team Representative.

a. Subcontractors, and other parties granted access by Contractor to Design Team Representative's digital data files shall execute a data licensing agreement in the form acceptable to Owner and Design Team Representative.

B. PDF Document Preparation: Where PDFs are required to be submitted to Design Team Representative, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.7 PROJECT MEETINGS

A. General: meetings and conferences are to be conducted at the Project site unless otherwise indicated.

B. Preconstruction Conference: Within ten (10) days after Notice to Proceed, and before any Work is started, schedule and **conduct** a Pre-Construction conference before starting construction, at a time convenient to Owner.

1. Attendees: Authorized representatives of Owner**,** Design Team Representative, 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.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Establish construction tart date.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.
g. Procedures for processing field decisions and Change Orders.
h. Procedures for RFIs.
i. Procedures for testing and inspecting.
j. Procedures for processing Applications for Payment.
k. Submittal procedures.
l. Preparation of Record Documents.
m. Use of the premises and existing building.
n. Temporary utilities; water and power.
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.

3. Minutes: Entity responsible for conducting this Pre-Construction Meeting will record and distribute meeting minutes.

C. Pre-installation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for 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 Design Team Representative and Owner 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. Sustainable design requirements.
    i. Review of mockups.
    j. Possible conflicts.
    k. Compatibility requirements.
    l. Time schedules.
    m. Weather limitations.
    n. Manufacturer's written instructions.
    o. Warranty requirements.
    p. Compatibility of materials.
    q. Acceptability of substrates.
    r. Temporary facilities and controls.
    s. Space and access limitations.
    t. Regulations of authorities having jurisdiction.
    u. Testing and inspecting requirements.
    v. Installation procedures.
    w. Coordination with other work.
    x. Required performance results.
    y. Protection of adjacent work.
    z. 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. Progress Meetings: **Conduct** progress meetings at bi-weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner**,** Design Team Representative, 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) Status of sustainable design documentation.
        5) Deliveries.
        6) Off-site fabrication.
        7) Access.
        8) Site use.
        9) Temporary facilities and controls.
        10) Progress cleaning.
        11) Quality and work standards.
        12) Status of correction of deficient items.
        13) Field observations.
        14) Status of RFIs.
        15) Status of Proposal Requests.
        16) Pending changes.
        17) Status of Change Orders.
        18) Pending claims and disputes.
        19) 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a Project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

C. Event: The starting or ending point of an activity.

D. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.
2. PDF file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

C. Construction Schedule Updating Reports: Submit with Applications for Payment.

D. Daily Construction Reports: Submit at monthly intervals.

E. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

B. Time Frame: Extend schedule from date established for the Notice of Award, the Notice to Proceed, Commencement of the Work, to date of Substantial Completion and Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than twenty (20) days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than sixty (60) days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery for all materials and equipment items.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than fifteen (15) days for startup and testing.
5. Commissioning Time: Include no fewer than (15) days for commissioning.
6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for the Design Team Representative administrative procedures necessary for certification of Substantial Completion.
7. Punch List and Final Completion: Include not more than thirty (30) days for completion of punch list items and final completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Use-of-premises restrictions.
    e. Seasonal variations.
    f. Environmental control.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:

1. National and School holidays

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and the Contract Time.

G. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

H. Recovery Schedule: When periodic update indicates the Work is fourteen (14) or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

I. Distribution: Distribute copies of approved schedule to the Design Team Representative, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their

assigned portion of the Work and are no longer involved in performance of construction activities.

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within thirty (30) days of date established for the [the Notice to Proceed, the Notice of Award, and Commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in ten percent (10%) increments within time bar.

C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project Schedule.

D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or Subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediately preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

1.7 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of Subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.

5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Stoppages, delays, shortages, and losses.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial completions and occupancies.
18. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between building or site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Design Team Representative's responsive action. Action submittals are those submittals indicated in individual Specification Sections or as indicated on the Drawings as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Design Team Representative'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."

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Design Team Representative and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Design Team Representative.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of Subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.

13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

B. Options: Identify options requiring selection by Design Team Representative.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Design Team Representative on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package and transmit to Design Team Representative by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Design Team Representative.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Design Team Representative'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 fifteen (15) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Design Team Representative will advise Contractor when a submittal being processed must be delayed for coordination.
2. Resubmittal Review: Allow fifteen (15) days for review of each resubmittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

E. 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.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Design Team Representative's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. 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 unsuitable 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 that show 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 Shop Drawings, and before or concurrent with Samples.

B. 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 on Design Team Representative'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.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.

c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Paper Transmittal: Include paper transmittal including complete submittal information indicated.
5. 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 or indicated on the Drawings. 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.

6. 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 (2) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Design Team Representative will return submittal with options selected.

7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work 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 (3) sets of Samples. Design Team Representative will retain two (2) Sample sets; remainder will be returned. Mark up and retain one (1) 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.

D. 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:

E. 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 Design Team Representatives and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit 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. Provide a notarized signature where indicated.
2. 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.
3. 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.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. 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 substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. 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.
4. 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.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. 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:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.7 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 insufficient to perform services or certification required, submit a written request for additional information to Design Team Representative.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three (3) paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals 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 Design Team Representative.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with **a uniform approval stamp**. Include 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.

1. Design Team Representative will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 DESIGN TEAM REPRESENTATIVE'S REVIEW

A. Action Submittals: Design Team Representative will review each submittal, indicate corrections or revisions required**, and return it**.

1. PDF Submittals: Design Team Representative will indicate, via markup on each submittal, the appropriate action**.**

B. Informational Submittals: Design Team Representative will review each submittal and will not return it or will return it if it does not comply with requirements. Design Team Representative will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Design Team Representative.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Design Team Representative will either return without review or discard submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Design Team Representative without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection 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. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-assurance and quality-control services required by Design Team Representative, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
3. Parts of the Specification state that the Owner's Representative or a Testing Laboratory retained by the Owner will perform certain tests, Contractor to cooperate with the Owner's Representative and assist the Laboratory technician at the site in the performance of tests.
4. Notify the Owner's Representative in advance of test and inspections the Contractor is to perform at the site. The Owner may witness same at their option. It is the Contractor's responsibility to notify the proper AHJ Building Department authorities, insurance carriers, etc. of scheduled test and inspections and perform those functions to their satisfaction.
5. Notify the Owner's Representative of any scheduled test dates that are away from the job site, with at least one (1) week advance notice. All factory tests shall be witnessed by the owner's representative, unless otherwise directed. Release of materials and / or equipment or waiver of inspection shall not relieve the supplier or Contractor from responsibility nor invalidate any claim which the owner may make because of unsatisfactory material and/ or construction.
6. the owner's representative shall have access during working hours to all parts of the factory or fabricator's shop where materials and / or equipment is being fabricated or manufactured for this project and is provided with all reasonable inspection facilities.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five (5) 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.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. 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, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by 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 Tests and Inspections: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

H. 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.

I. 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. Contractor's quality-control services do not include contract administration activities performed by Design Team Representative.

1.3 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 Design Team Representative.

B. Delegated Design Services Statement: Submit a statement, 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, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Design Team Representative regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Design Team Representative for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is 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 Design Team Representative for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

B. 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.

C. Permits, Licenses, and Certificates: For Owner's record, 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.

1.6 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, telephone number, and email address 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 inspection.
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. Statement on condition of substrates and their acceptability for installation of product.
2. Statement that products at Project site comply with requirements.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. 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. Statement that equipment complies with requirements.
2. Results of operational and other tests and a statement of whether observed performance complies with requirements.
3. Other required items indicated in individual Specification Sections.

1.7 QUALITY ASSURANCE

A. 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. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

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, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

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, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Pre-Construction 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. When testing is complete, remove test specimens and test assemblies, not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Design Team Representative 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.

1.8 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 inspection they are engaged to perform.
2. 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, whether specified or not, to verify and document that the Work complies with requirements.

1. Engage a qualified testing agency to perform quality-control services.

    a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspection will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. 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.

D. Testing Agency Responsibilities: Cooperate with Design Team Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Design Team Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations 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 duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."

F. 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.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives 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 inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspection equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified **testing agency or a special inspector** to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, 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 Design Team Representative 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 Design Team Representative 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. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Design Team Representative.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Design Team Representative's reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

1. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
2. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
3. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
4. AIA - American Institute of Architects (The); www.aia.org.
5. AISC - American Institute of Steel Construction; www.aisc.org.
6. AISI - American Iron and Steel Institute; www.steel.org.
7. ANSI - American National Standards Institute; www.ansi.org.
8. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
9. ASCE - American Society of Civil Engineers; www.asce.org.
10. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
11. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
12. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
13. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
14. ASSP - American Society of Safety Professionals (The); www.assp.org.
15. ASTM - ASTM International; www.astm.org.
16. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
17. AWS - American Welding Society; www.aws.org.
18. AWWA - American Water Works Association; www.awwa.org.
19. CDA - Copper Development Association; www.copper.org.
20. CSA - CSA Group; www.csa-group.org.
21. CSI - Construction Specifications Institute (The); www.csiresources.org.
22. CTA - Consumer Technology Association; www.cta.tech.
23. CTI - Cooling Technology Institute; www.coolingtechnology.org.
24. ECA - Electronic Components Association; (See ECIA).
25. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
26. ECIA - Electronic Components Industry Association; www.ecianow.org.
27. EIA - Electronic Industries Alliance; (See TIA).
28. EOS/ESD Association; (Electrostatic Discharge Association); www.esda.org.
29. EVO - Efficiency Valuation Organization; www.evo-world.org.
30. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
31. FM Approvals - FM Approvals LLC; www.fmglobal.com.
32. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
33. FSA - Fluid Sealing Association; www.fluidsealing.com.
34. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
35. IAS - International Accreditation Service; www.iasonline.org.
36. ICC - International Code Council; www.iccsafe.org.
37. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
38. IEC - International Electrotechnical Commission; www.iec.ch.
39. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
40. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
41. ISA - International Society of Automation (The); www.isa.org.
42. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
43. ISO - International Organization for Standardization; www.iso.org.
44. ITU - International Telecommunication Union; www.itu.int.
45. MBMA - Metal Building Manufacturers Association; www.mbma.com.

46. MCA - Metal Construction Association; www.metalconstruction.org.
47. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
48. MHIA - Material Handling Industry of America; www.mhia.org.
49. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
50. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
51. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
52. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
53. NEBB - National Environmental Balancing Bureau; www.nebb.org.
54. NECA - National Electrical Contractors Association; www.necanet.org.
55. NEMA - National Electrical Manufacturers Association; www.nema.org.
56. NETA - InterNational Electrical Testing Association; www.netaworld.org.
57. NFHS - National Federation of State High School Associations; www.nfhs.org.
58. NFPA - National Fire Protection Association; www.nfpa.org.
59. NFPA - NFPA International; (See NFPA).
60. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
61. NRCA - National Roofing Contractors Association; www.nrca.net.
62. NSPE - National Society of Professional Engineers; www.nspe.org.
63. NWRA - National Waste & Recycling Association; www.wasterecycling.org.
64. PDI - Plumbing & Drainage Institute; www.pdionline.org.
65. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
66. SDI - Steel Deck Institute; www.sdi.org.
67. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
68. SIA - Security Industry Association; www.siaonline.org.
69. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
70. SPRI - Single Ply Roofing Industry; www.spri.org.
71. SSINA - Specialty Steel Industry of North America; www.ssina.com.
72. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
73. TIA - Telecommunications Industry Association (The); www.tiaonline.org.
74. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
75. UL - Underwriters Laboratories Inc.; www.ul.com.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
2. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
3. DOE - Department of Energy; www.energy.gov.
4. EPA - Environmental Protection Agency; www.epa.gov.
5. FG - Federal Government Publications; www.gpo.gov/fdsys.

6. OSHA - Occupational Safety & Health Administration; www.osha.gov.
7. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
8. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.govinfo.gov.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.

6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services [and metering] as required for construction operations.

B. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Advertising, References and Pictures

1. No references to the Project are to be made or photographs of the Work in any advertisement without written permission of the Owner. These limitations also apply to Subcontractors and Vendors.

B. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
2. Indicate sequencing of work that requires water and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

3. Indicate methods to be used to avoid trapping water in finished work.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Relocation of Materials, Equipment, and Facilities

1. Owner's representative will make all reasonable effort to provide suitable and undisturbed space to the Contractor; however, if it becomes necessary at any time during progress of work to move temporary storage facilities, field offices, equipment or materials, the contractor, when instructed by the owner's representative, shall move such components without additional cost to the Owner

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

D. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

F. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

G. Access to Site:

1. All Contractors' employees and trucking for Construction purposes shall have access to the site as directed by the Owner's Representative. The Contractor shall be liable for any damages caused to existing roadways, sidewalks, and fire protection system components as a result of the Contractor's operation or that of his personnel. All such damage shall be repaired as soon as possible at the Contractor's expense.

2. All delivery of material and equipment shall be directly to the Contractor at the Construction area. Material deliveries shall be arranged so as not to interfere with Owner's employees entering and leaving the site.

3.4 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1. By executing the Contract and or Purchase Order, Contractor warrants to owner that all materials and equipment furnished under the Contract will be new unless otherwise specified, and that all materials, equipment, and labor will be of good quality, free of defects and in accordance with the contract documents.

B. Related Requirements:

1. Section 01 25 00 "Substitution Procedures" for requests for Substitutions.

1.2 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. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, 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 single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating com-

parable products.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title, and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 "Submittal Procedures."

F. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.

1.3 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.

1.4 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.

1.5 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 standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to 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 in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

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 meeting 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.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."

4. Non-Limited List of Products: Where Specifications include a list of names of both availa-

ble manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
b. Provision of an unnamed product is not considered a substitution if the product complies with requirements.

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.

a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally 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.

a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Design Team Representative's sample," provide a product that complies with requirements and matches Design Team Representative's sample. Design Team Representative's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Design Team Representative from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Design Team Representative 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 of Comparable Products: Design Team Representative will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Design Team Representative may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
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 Design Team Representatives and owners, if requested.
5. Samples, if requested.

B. Design Team Representative's Action on Comparable Products Submittal: If necessary, Design Team Representative will request additional information or documentation for evaluation, as specified in Section 01 33 00 "Submittal Procedures."

1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
2. Use product specified if Design Team Representative does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by the Design Team Representative of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

D. Submittal Requirements, Single-Step Process: When acceptable to Design Team Representative, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Design Team Representative of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 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. Installation of the Work.
3. Cutting and patching.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.

B. Related Requirements:

1. Section 01 10 00 "Summary" for limits on use of Project site.
2. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
3. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Design Team Representative of locations and details of cutting and await directions from Design Team Representative before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in

reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

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 Design Team Representative's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
5. All work not conforming to the requirements of the Contract Documents will be considered defective and shall be replaced without additional cost to the Owner. If required by Owner's representative, furnish evidence as to the kind and quality of materials and equipment furnished by Contractor.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment

C. Coordinate work in order to eliminate interference. Examine in advance the location of mechanical and electrical systems and equipment to be installed and properly coordinate the installation of resolved by the Contractor, bring the situation to the attention of the Owner's Representative before proceeding any further with the work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections and requirements indicated on the Drawings.

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 Design Team Representative for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. 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 products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. 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.

1. Obtain or verify all dimensions for the accommodation of equipment and/or materials furnished by the owner and / or the contractor and installed by the Contractor. Dimension on the Drawings indicate nominal sizes under ideal conditions and shall not under any circumstances by so construed as to relieve the contractor of the responsibility of taking measurements in the field and furnishing material of the correct dimensions.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Design Team Representative in accordance with requirements in Section 01 31 00 "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 and existing conditions. If discrepancies are discovered, notify Design Team Representative promptly.

3.4 INSTALLATION

A. 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.

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 satisfactory results as judged by Design Team Representative. 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 of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Design Team Representative.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Design Team Representative. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.5 CUTTING AND PATCHING

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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of Work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. 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 minimize interruption to occupied areas.

F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including methods least likely to damage elements retained or adjoining construction.

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. 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.
4. 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, as judged by Design Team Representative. 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 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. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

A. 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.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

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, 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. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls.

G. 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.

H. 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.

I. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.8 PROTECTION AND REPAIR 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. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00

SECTION 01 73 10 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching in existing work.

B. Definition: Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and repair required to restore surfaces to their original condition. Drilling holes for fasteners and similar operations are not "cutting and patching".

C. Refer to other Sections and Drawings for other requirements and limitations applicable to cutting and patching individual parts of the Work.

D. Coordinate cutting and patching with demolition requirements as specified in Section 01 73 20 "Selective Demolition".

E. Coordinate with section 01 74 19 "Construction Waste Management & Disposal" requirements.

F. It shall be assumed in this Project's scope that all materials, surfaces, and finishes, disturbed by demolition and new construction work shall be patched or refinished to match all existing adjacent material or finish textures, sheen, and color.

1.2 SUBMITTALS

A. Cutting and Patching Plan: In accordance with Section 01 33 00 "Submittal Procedures", submit a schedule describing procedures at least ten (10) calendar days in advance of the time cutting and patching will initially be performed.

1. Include the following information, as applicable:

a. Description of the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.
b. Description of the anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in appearance and other significant visual elements.
c. List of products to be used and entities that will perform work.
d. Dates and hours of operation when cutting and patching will be performed.
e. Compatibility and cohesion characteristics of patching compounds with adjacent materials.
f. Details and engineering calculations showing integration of reinforcement with the original structure, where cutting and patching involve adding reinforcement to structural elements.
g. Temporary protection of existing structures, surfaces, finishes, equipment, etc. to remain in place during construction.
h. List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
i. Obtain approval of cutting and patching work by CMSD's Structural Engineer or Architect

B. Approval by the CMSD to proceed with cutting and patching does not waive the right to later require complete removal and replacement of unsatisfactory work.

1.3 QUALITY CONTROL

A. Visual Requirements: Do not cut and patch construction exposed in occupied spaces in a manner that would, in CMSD's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction that is cut and patched in a visually unsatisfactorily manner.

1. Retain the original installer or fabricator to cut and patch exposed work if the original installer or fabricator is identified in the Contract Documents or is known to the Contractor and is available for the work.
2. If it is not possible to engage the original installer or fabricator, engage a Specialist who is specifically experienced in the work.
3. The cutting and patching plan shall include work required at visual elements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials identical to existing materials to the maximum extent available.

B. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

C. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. Before cutting, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

B. Before proceeding with cutting and patching involving two or more trades, meet at the Project site with the entities providing or affected by the cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Provide temporary support of work to be cut.

B. Protect existing conditions during cutting and patching to prevent damage. Provide protection from conditions for portions of the Project that might be exposed to public areas during cutting and patching operations.

C. Avoid interference with the occupancy or use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

A. Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

B. Cutting: Cut existing construction using methods least likely to damage elements retained and adjoining construction. Where possible, review proposed procedures with the original installer and comply with the original installer's recommendations.

1. In general, use hand or small power tools designed for sawing or grinding, not for hammering and chopping.
2. 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.
3. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
4. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load —deflection ratio.

C. Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or those results in increased maintenance or decreased operation life or safety.

1. Primary operation systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems
7. Electrical systems.

D. Do not cut and patch the following 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 those results in increased maintenance or decrease operation life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise and vibration control elements and systems.

E. 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 reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed work. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

F. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface that contains the patch.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove all evidence of the Work.

END OF SECTION 01 73 10

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.

1.3 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within seven (7) days of date established for the Notice to Proceed or the Notice of Award.

1.4 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements.

B. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.5 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, Subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three (3) days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner’s property.

C. Burning: Do not burn waste materials.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 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. Manufactures warranties.
4. Material and supplier's warranty.
5. List of Subcontractors, materials, and equipment suppliers with current address and phone numbers.
6. Waiver of Lien.
7. Affidavit of Contractor.
8. Completed Punchlist and or Verification letter.
9. Copy of Custodial Overtime Check (where applicable).
10. As-Built Drawings
11. Final cleaning.

B. Related Requirements:

1. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
2. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release or Inspection Approvals: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "Punch List"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by the Design Team Representative. Label with manufacturer's name and model number.
5. Submit testing, adjusting, and balancing records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Complete startup and testing of systems and equipment.
3. Perform preventive maintenance on equipment used prior to Substantial Completion.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
5. Complete final cleaning requirements.
6. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten (10) days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, the Design Team Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. the Design Team Representative 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 the Design Team Representative, that must be completed or corrected before certificate will be issued.

1.5 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures", or as directed by the Owner.
2. List of Incomplete Items: Submit copy of the Design Team Representative Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by the Design Team Representative. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of ten (10) days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, the Design Team Representative 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.

1.6 LIST OF INCOMPLETE ITEMS

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.

1.7 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of the Design Team Representative for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

E. 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 local Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHASE CLEANING

A. Throughout the construction period, Prime and Sub Contractors shall maintain construction site in a standard of cleanliness.

B. Prime and Sub Contractors shall conduct daily inspection to verify standards of cleanliness of this section are being met.

C. Prime and Sub Contractors shall keep his work areas free of accumulation of waste material, rubbish, and debris.

D. Contractors shall collect waste, rubbish and debris daily and place in areas designated, for removal from site.

E. Prime and Sub Contractors shall remove waste materials, rubbish, and debris from site and legally dispose of it at public or private dumping areas off the owner's site.

F. Prime and Sub Contractors shall handle materials in a controlled manner with as few handling as possible.

3.2 FINAL CLEANING

A. Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
b. Clean exposed 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.
c. Remove debris and surface dust from limited-access spaces, including roofs.
d. Clean according to manufacturer's recommendations.
e. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint, sealant, and mortar droppings, and other foreign substances.
f. No burning of rubbish / debris will be permitted on the owner property.

B. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 50 00

3.3 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Design Team Representative will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. Unless otherwise directed by the Owner, submit on digital media acceptable to Design Team Representative by email. Enable reviewer comments on draft submittals.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Design Team Representative will return copy with comments.

1. Correct or revise each manual to comply with Design Team comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Design Team Representative's comments and prior to commencing demonstration and training.

D. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.3 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. 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: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

B. 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**] [**post-type**] binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
2. 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.

1.4 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: 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 Design Team Representative.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Design Team Representative 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.

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. 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."

1.5 EMERGENCY MANUALS

A. 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.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. 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.

D. 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.

E. 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.

1.6 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. 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.

D. 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.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.7 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

B. 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 warranties and bonds, as described below.

C. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; 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.

    a. 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.

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.

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. 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.

H. 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.

1.8 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. 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.

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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 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.

1.2 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.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training: Submit two copies within seven (7) days of end of each training module.

1. 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 01 78 23 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.

B. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.5 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.

1.6 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 or as indicated on the Drawings.

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.

1.7 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 01 78 23 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.8 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.

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 with at least seven (7) 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.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 NOT USED

PART 2 - EXECUTION

END OF SECTION 01 79 00

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.3 PRE-DEMOLITION OR INSTALLATION MEETINGS

A. Pre-Demolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.

B. Schedule of selective demolition activities with starting and ending dates for each activity.

C. Pre-demolition photographs or video.

1.5 FIELD CONDITIONS

A. Owner (CMSD) will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Design Team Representative of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Design Team Representative and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against

damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
2. Disconnect, demolish, and remove HVAC systems, equipment, and components indicated on Drawings to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

3.2 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Remove temporary barricades and protections where hazards no longer exist.

3.3 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Design Team Representative, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.4 CLEANING

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Shrinkage-resistant grout.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303, except as modified in this section.

1.3 COORDINATION

A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PREINSTALLATION MEETINGS

B. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

C. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, 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.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

D. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, and AISC-recommended simple shear connections.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, shop-painting applicators, and professional engineer.

B. Welding certificates.

C. Mill test reports for structural-steel materials, including chemical and physical properties.

D. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.

E. Survey of existing conditions.

F. Source quality-control reports.

G. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

D. Special Inspector Qualifications: A qualified person employed or retained by an approved agency that has the recommended experience and certifications as summarized in Appendix C of the current International Code Council (ICC) Special Inspection Manual.

1.7 DELIVERY, STORAGE, AND HANDLING

A. 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.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 360.
3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:
1. For simple shear connections: Fabricator's experienced steel detailer shall select or complete connections in accordance with ANSI/AISC 303.

a. Select and complete connections using schematic details indicated and ANSI/AISC 360.
b. Use Allowable Stress Design; data are given at service-load level.

C. Engineering Responsibility: Fabricator's responsibilities include using a qualified professional engineer to prepare structural analysis data for structural-steel connections.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A572/A572M, Grade 50.

B. Channels, Angles: ASTM A36/A36M.

C. Plate and Bar: ASTM A36/A36M.

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3 (Class 10S3), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

B. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating.
2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.

2.4 PRIMER

A. Steel Primer:

1. Galvanizing Repair Paint: ASTM A780/A780M.

2.5 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2.

E. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Slip critical.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

C. Design of Connections: Typical AISC connections are to be used except where otherwise shown. Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.

Promptly notify Architect whenever design of members and connections for any portion of structure are not clearly indicated.

D. Fabricate length of diagonal bracing to provide nominal tension in member when erected.

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize:
   a. All exterior steel unless specifically noted on drawings.
3. All welded assemblies to be galvanized shall be prepared according to Recommended Practice for Providing High Quality Zinc Coatings (Hot-Dip) on Assembled Products (ASTM A 385).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. 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, and bracing are in place unless otherwise indicated on Drawings.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.

2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. 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 are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

E. Do not use thermal cutting during erection.

F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Slip critical.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.5 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

3.6 FIELD QUALITY CONTROL

A. Special Inspections and field quality control testing: [Owner will engage][Engage] a qualified special inspector to perform field tests and inspections and prepare test reports.

1. Refer to drawings for testing and special inspection requirements.

2. Prepare and submit reports within 7 days of completing tests and inspections. Distribute reports to Architect, Engineer, Owner (or owner’s representative), and Contractor. Clearly indicate non-compliance on reports.

B. Non-Compliant Work:

1. The contractor shall remove and replace all non-compliant work, or, at the contractor's expense, perform additional testing to verify compliance. Contractor shall submit results of additional testing to Architect, Engineer, and Owner (or owner's representative) for review and approval.

END OF SECTION 051200

SECTION 07 01 50.19 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Partial tear-off of roof area at new penetrations where work is to be performed.
2. Re-cover preparation of entire roof areas where work is to be performed.
3. Removal of flashings and counterflashings.

1.2 PRE-INSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.

1.3 INFORMATIONAL SUBMITTALS

A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.

1. Submit before Work begins.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

1.5 FIELD CONDITIONS

A. Existing Roofing System: Verify existing Modified Bitumen built-up roofing conditions prior to Work.

1. Owner will occupy portions of building immediately below reroofing area.
2. Conduct reroofing so Owner's operations are not disrupted.
3. Provide Owner with not less than seventy-two (72) hours' written notice of activities that may affect Owner's operations.
4. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.

a. Verify that occupants below work area have been evacuated before proceeding with work.

B. Protect building, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty issued by the manufacturer for existing warranted roof system.

PART 2 - PRODUCTS

2.1 AUXILIARY RE-ROOFING MATERIALS

A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Test existing roof drains to verify that they are not blocked or restricted.

1. Immediately notify Design Team Representative of any blockages or restrictions.

B. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.

1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.

1. Prevent debris from entering or blocking roof drains and conductors.

a. Use roof-drain plugs specifically designed for this purpose.
b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.

    a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 PARTIAL ROOF TEAR-OFF

A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Lower removed roofing materials to ground using dust-tight chutes or other acceptable means of removing materials from roof areas.

C. Roof Tear-off: Where indicated on Drawings or implied for required roofing removal, remove portions of existing roofing and other roofing system components down to the existing roof deck.

1. Remove substrate board, vapor retarder, roof insulation, and cover board.
2. Remove base flashings and counter flashings.
3. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.

    a. Remove unadhered bitumen, unadhered felts, and wet felts.

4. Remove fasteners from deck or cut fasteners off slightly above deck surface.
5. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.

    a. Remove unadhered bitumen, unadhered felts, and wet felts.

6. Remove excess asphalt from steel deck that is exposed by removal of wet or damp materials.

    a. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.

D. Remove blisters, ridges, buckles, mechanically attached roofing fastener buttons projecting above roofing, and other substrate irregularities from existing roofing that inhibit new recover boards roofing from conforming to substrate.

1. Verify that existing substrate is dry before proceeding with installation.

    a. Spot check substrates with an electrical capacitance moisture-detection meter.

2. Remove materials that are wet and damp.

END OF SECTION 07 01 50.19

SECTION 07 27 15 - MODIFIED BITUMINOUS SHEET ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes patching of existing granulated modified bituminous sheet roofing matching the existing roofing material color, texture, and thickness at new and removed mechanical equipment support posts.

1.2 ACTION SUBMITTALS

A. Product Data: For type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of modified bituminous sheet roofing material.

B. Product test reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Roofing Performance: Roofing patching assembly and seals with adjacent construction shall be capable of performing as a continuous roofing barrier. Roofing assembly shall be capable of accommodating substrate movement and of sealing construction material changes, penetrations, and transitions at perimeter conditions without deterioration and leakage.

2.2 ACCESSORY MATERIALS

A. Requirement: Provide primers, transition strips, termination strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by roofing manufacturer to produce a complete barrier assembly and that are compatible with primary material and adjacent construction to which they may seal.

B. Primer: Liquid primer recommended for substrate by roofing material manufacturer.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for sheet roofing application.

B. Mask off adjoining surfaces not covered by roofing barrier to prevent spillage and overspray affecting other construction.

C. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in roofing with substrate-patching membrane.

D. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

3.2 INSTALLATION

A. Install materials according to manufacturer's written instructions and details and according to recommendations in ASTM D6135 to form a seal with adjacent construction and ensure continuity of barrier.

1. When ambient and substrate temperatures range between 25 and 40 deg F, install modified bituminous roofing sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F.
2. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by -barrier sheet on same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive new roofing. Accurately align sheets and maintain uniform 6”-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure tight installation.

D. Install roofing sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous barrier.

E. Connect and seal roofing sheet continuously to existing adjacent roofing-membrane and other construction used in exterior materials.

F. Repair punctures, voids, and deficient lapped seams roofing barrier. Slit and flatten fishmouths and blisters. Patch with barrier sheet extending 6 inches beyond repaired areas in all directions.

G. Correct deficiencies in or remove barrier that does not comply with requirements; repair substrates and reapply barrier components.

3.3 CLEANING AND PROTECTION

A. Protect roofing system from damage during application and remainder of construction period, according to manufacturer's written instructions.

END OF SECTION 07 27 15

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealing of all interior and exterior abutments of dissimilar materials with silicone joint sealant material including:

a. Metal/masonry walls.
b. Metal /concrete.
c. New masonry/existing masonry.
d. Metal to metal.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

E. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When joint substrates are wet.
2. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
3. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Disintegration of joint substrates from natural causes exceeding design specifications.
2. Mechanical damage caused by individuals, tools, or other outside agents.
3. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Design Team Representativeural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Colors of Exposed Joint Sealants: As selected by Design Team Representative from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
b. Pecora Corporation; 301 NS
c. Tremco Incorporated; Spectrem 1

2.3 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Remove laitance and form-release agents from concrete.
3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or

curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 09 91 23 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and field painting of exposed interior and exterior items and surfaces.

1. Interior painting work will include:

a. Painting of all existing and new construction disturbed by demolition and new construction.

2. Exterior work shall include:

a. Painting of steel structural supports for mechanical equipment and screen wall framing.

3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Design Team Representative will select from standard colors and finishes available.

1. Painting includes field painting of new exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Finished mechanical and electrical equipment.
b. Light fixtures.

2. Operating parts include moving parts of operating equipment and the following:

a. Valve and damper operators.
b. Linkages.
c. Sensing devices.
d. Motor and fan shafts.

3. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.2 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter. Locations:

a. All steel pipe, posts, beams, and other structural support items.

1.3 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain and primers for each coating system from the same manufacturer as the finish coats.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.5 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

B. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.6 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

1. Quantity: Furnish Owner with an additional two (2) unopened gallon cans of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Sherwin-Williams Co. (Sherwin-Williams).

2.2 PAINT MATERIALS, GENERAL

A. Contractor shall review current CCF Standard Specifications for details regarding Surface Preparation, Primer Coat, & Finish Coat for specific applications.

B. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

D. Colors and Sheens: To be determined by the Design Team Representative from the manufacturer’s available paint selections.

2.3 INTERIOR PRIMERS

A. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.

1. Sherwin-Williams; Pro-Cryl Universal Primer: Applied at a dry film thickness of not less than 3.0 mils.

B. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.

1. Sherwin-Williams; Pro-Cryl Universal Primer: Applied at a dry film thickness of not less than 3.0 mils.

2.4 EXTERIOR PRIMERS

A. Exterior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.

1. Sherwin-Williams; Pro-Cryl Universal Primer: Applied at a dry film thickness of not less than 3.0 mils.

B. Exterior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.

1. Sherwin-Williams; Pro-Cryl Universal Primer: Applied at a dry film thickness of not less than 3.0 mils.

2.5 INTERIOR FINISH COATS

A. Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell acrylic-latex interior enamel.

1. Sherwin-Williams; Harmony Interior Latex Egg-Shell Enamel Series: Applied at a dry film thickness of not less than 1.6 mils.

B. Interior Semigloss Acrylic Enamel: Factory-formulated semigloss acrylic-latex enamel for interior application.

1. Sherwin-Williams; Harmony Interior Latex Semi-Gloss Enamel Series: Applied at a dry film thickness of not less than 1.3 mils.

2.6 EXTERIOR FINISH COATS

A. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss acrylic-latex enamel for interior application.

1. Sherwin-Williams; Harmony Interior Latex Semi-Gloss Enamel Series: Applied at a dry film thickness of not less than 1.3 mils.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Design Team Representative about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.

    a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
    b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
    c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

3. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

C. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes areas visible when permanent or built.
5. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

F. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

G. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Design Team Representative.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.6 INTERIOR PAINT SCHEDULE

A. Existing and new Ferrous and Galvanized Metals: Provide the following finish systems over ferrous metal:

1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.

a. Primer: Interior ferrous-metal primer.
b. Finish Coats: Interior semigloss acrylic enamel.

3.7 EXTERIOR PAINT SCHEDULE

A. Existing and new steel:

B. Existing and new galvanized steel:

1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.

a. Primer: Exterior ferrous-metal primer.
b. Finish Coats: Exterior semigloss acrylic enamel.

END OF SECTION 09 91 23

SECTION 10 82 13 - ROOF SCREENS

PART 1- GENERAL

2.1 SECTION INCLUDES

A. Stand-alone roof equipment screens supporting by steel framework provided by Steel subcontractor.

B. Screens shall be designed to attach to the new structure and not the equipment being screened.

C. Roof screen accessories.

2.2 RELATED SECTIONS

A. Section 05 12 00 - Structural Steel Framing.

B. Division 23 - Roof Top HVAC Equipment.

2.3 COORDINATION

A. Coordinate Work with other operations and installation of structural steel and roofing materials to avoid damage to installed insulation and membrane materials.

2.4 ACTION SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Layout and erection drawings showing typical cross sections and dimensioned locations of erection drawings, elevations, and details where applicable.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square, representing actual product, shape, and patterns.

2.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with a minimum five years documented experience

in producing pre-manufactured metal-framed equipment screens.

B. Welders: AWS certified within previous 12 months.

C. Pre-Installation Meeting:

1. Convene at job site, at least seven calendar days prior to scheduled beginning of construction activities of this Section, to review requirements of this Section.
2. Require attendance by representatives of the installing Subcontractor (who will represent the system manufacturer), the roofer, and other entities affected by construction activities of this section.
3. Notify Design Team Representative four (4) calendar days in advance of scheduled meeting date.

2.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the project site clearly marked for proper identification.

B. Receive, handle and store materials in conformance with the manufacturers printed instructions.

C. Store products under cover, in manufacturer's unopened packaging until ready for installation.

D. Protect materials from exposure to moisture.

E. Store materials in a dry, warm, ventilated weathertight location.

F. Protect metal fabrications from damage by exposure to weather.

G. Handling: Use a forklift or crane to move material. Do not lift the bundles by the metal bands.

1. Fork Lift: Spread the forks as far as possible to balance the load. Drive slowly when moving long bundles over uneven surfaces to avoid tipping the load
2. Crane: Position the canvas sling straps so that the space between the straps is at least 1/3 the length of the bundle. Use sling straps with looped ends running one end of the strap through the loop at the other end to cinch the bundle when lifted. When setting the load on the roof, put wood blocks under it to protect the roof and allow space to remove the sling straps.
3. Roof Placement: Spread the bundles and crates out as much as possible to avoid overloading the roof structure. Place the material directly over major supports such as beams or trusses.

2.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Field Measurements: Verify roof screen dimensions and conditions of the installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating equipment enclosure without field measurements. Coordinate construction to ensure that actual dimensions

correspond to established dimensions.

2.8 WARRANTY

A. Panel Finish:

1. Provide written warranty stating that the paint finish applied on all equipment enclosure panels will be warranted against chipping, peeling, cracking, fading, or blistering for the coverage period of twenty (20) years.

2. Provide warranty signed by the panel manufacturer and paint finish applicator (if separate from manufacturer).

B. The above warranties are in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

PART 2 - PRODUCTS

2.2 MANUFACTURERS

A. Basis of Design: RoofScreen Mfg., which is located at: 347 Coral St.; Santa Cruz, CA 95060; Toll Free Tel: 866-766-3727; Tel: 831-421-9230; Fax: 866-253-0738; Email: request info (info@roofscreen.com); Web: www.roofscreen.com.

B. Substitutions will be considered in accordance with provisions of Section 01 25 00, Substitutions Procedures

2.3 MATERIALS

A. Hardware: Bolts, nuts and washers: 18-8 stainless steel.

B. Self-Drilling Screws: Carbon steel with factory applied protective coating conforming to ASTM B 117 salt spray testing.

C. Panel: 3” deep Rib Panel

1. Base Metal:24 Gauge Steel.
2. Finish: Factory applied Kynar finish in a color to be selected by Design Team Representative.
3. Panel Fasteners: Exposed fasteners with painted screws matching panel finish.
4. Panel Trim: 24 Gauge Steel with finish matching panels.
5. Installation: Vertical Installation.

2.4 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Supply components required for anchorage of fabrications. Fabricate anchors and related

components of same material and finish as fabrication, except where specifically noted otherwise.

D. Fabricate system components so that portions of screen can be dismantled for repairs to equipment being screened and for future roof replacement.

E. Trim and Closures: Fabricated from 24-gauge metal and finished with the manufacturer's standard coating system.

PART 3 - EXECUTION

2.5 EXAMINATION

A. Examine area where work will be installed to verify the installation can be performed in accordance with the Drawings and structural calculation requirements without interference from other equipment or trades.

B. If preparation is the responsibility of another installer, notify Design Team Representative of unsatisfactory preparation before proceeding.

C. Do not begin installation until conditions have been properly prepared.

2.6 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.7 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects.

C. Exercise care when installing components so as not to damage finish surfaces. Touch up as required to repair damaged finishes.

D. Remove all protective masking from material immediately after installation.

2.8 CLEANING AND PROTECTION

A. Remove all protective masking from framing and trim material immediately after installation. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. Maintain in a clean condition during construction.

B. Protect installed products until completion of project.

1. If minor damage to finishes occurs, repair damage in accordance with manufacturer's recommendations; provide replacement components if repaired finishes are unacceptable to Design Team Representative.

C. Prior to Substantial Completion: Remove dust or other foreign matter from component surfaces; clean finishes in accordance with manufacturer's instructions.

D. Replace metal wall panels and framing members that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 81 13

SECTION 230100 - HVAC GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED CONTRACT DOCUMENTS

A. Refer to this Division's Supplemental General Provisions for additional Project requirements.

B. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates and Addenda are a part of this Specification. Contractors and Subcontractors shall examine these provisions as they may affect work under this Division.

C. Contractor shall examine Division 1 Contract Documents for general project requirements.

D. Contractor shall also examine the Contract Documents of all Divisions which may affect and require work under this Division and be responsible for all work required under this Division.

1.2 DESCRIPTION OF WORK

A. This project involves work in an existing operating facility and will require close communication with Owner with regard to access and work hours. Coordinate all work schedules prior to bidding with Owner. When project includes a Construction Manager, all work schedules shall also be coordinated with the Construction Manager, prior to bidding.

B. All Drawings as well as the Specifications for all Divisions shall be defined as the Contract Documents. Contractor shall review entire set of Contract Documents prior to bidding.

C. Drawings and Specifications are to be considered as supplementing each other. Work specified but not shown, or shown but not specified, shall be performed or furnished as though mentioned in both the Specifications and the Drawings.

D. Prior to submitting bid, Contractor shall examine all Drawings and Specifications to develop a complete understanding of the project scope. Contractor shall ask for clarifications during the pre-bid phase of the project. Failure to do so will not relieve the Contractor of their responsibility to perform all required work.

E. Where the project scope involves renovations and additions, it is required that Contractors visit the site of the work and become familiar with the conditions affecting the installation. Submission of a Bid shall presuppose knowledge of such conditions and no additional compensation shall be allowed where extra labor or materials are required because of the lack of knowledge of these conditions.

F. Bid shall include any special phasing requirements related to the construction work as described in the Contract Documents. Coordinate with Division 1.

G. Extra costs which might result from deviations from the Drawings, so as to avoid interferences, shall be considered a "Job Condition", and no additional compensation shall be considered applicable. In the event that such interferences occur in course of the work, due to an error, omission, or oversight by the Contractor, no additional compensation shall be allowed. Interferences that may occur during the course of construction shall be brought to the immediate attention of the Architect and Engineer, and the Architect and Engineer's decision, confirmed in writing, shall be final.

H. The following general terms as used within the context of the Contract Documents shall be defined as follows:

1. "Contract Documents" - The complete set of Drawings and Specifications for all Divisions included in the project.
2. "Drawings" - Drawings furnished as part of the Contract Documents.
3. "Contractor" - This Division's Contractor and the Subcontractors to this Division's Contractor.
4. "Responsible" - To perform work required.
5. "Furnish" - To supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations.
6. "Install" - Work which includes the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
7. "Provide" - To furnish and install, complete and ready for the intended use.
8. "Equal" - To meet or exceed the standards of the specified products or listed manufacturers.
9. "Mechanical" - HVAC, Plumbing and Fire Protection Divisions as applicable.

1.3 WORK INCLUDES

A. Include all labor, material, equipment, services, permits, fees, coordination, supervision and administration necessary for the proper completion of all work shown. Items omitted, but necessary, to make all systems complete and workable shall be understood to form part of the work.

B. Material for work required to complete installation such as , concrete, masonry, mortar, reinforcing steel, patching and painting shall be provided as specified in other applicable Divisions covering such work.

C. Provide material and labor which is neither drawn nor specified but which is obviously a component part of and necessary to complete work and which is customarily a part of work of similar character.

D. Include all testing, test reports, system programming, start-up reports and warranties for each system as outlined elsewhere in these Specifications. Refer to "Operating and Maintenance Manuals" for additional requirements.

1.4 PERMITS AND FEES

A. Secure and pay for permits and inspections required for all work related to this Division. Turn over certificates of approval to the Owner or Construction Manager promptly when received, and before payment is made for the work.

B. Give proper authorities notice as required by law relative to the work in their charge. Comply with the regulations regarding temporary enclosures, obstructions or excavations and pay all legal fees involved.

1.5 QUALITY ASSURANCE

A. Work shall be installed in accordance with provisions of all applicable codes, as interpreted by the local Authority Having Jurisdiction (AHJ), as well as any further modifications or regulations published by local or State Authorities.

B. Reference to the codes and standards listed shall constitute the minimum acceptable requirements. Nothing in the Specifications shall be construed to permit deviation from the requirements of the governing code. Where requirements of the Drawings and Specifications exceed those of the code listed, follow the Drawings and Specifications.

C. The following building codes with amendments shall be followed:

1. Ohio Building Code
2. Ohio Fire Code

D. Applicable portions of the following codes, standards, societies and agencies shall be followed. Where a specific edition is listed, it shall be used. Where not listed, the edition recognized by the Authority Having Jurisdiction shall be used. Listing of a specific portion of a code, standard, society or agency does not preclude the Contractor from following all other applicable portions of the code, standard, society or agency.

1. American National Standards Institute (ANSI)
2. American Society of Testing and Material (ASTM)
3. Americans with Disabilities Act (ADA) - Americans with Disabilities Act Accessibility Guidelines (ADAAG)
4. Federal Occupational Safety and Health Act (OSHA)
5. NFPA Standards as referenced by the Building Codes.
6. Ohio Facilities Construction Commission (OFCC)

1.6 ELECTRONIC MEDIA

A. Contractor shall deliver closeout documents on a portable memory device. Portable memory device shall refer to CD, DVD, Flash Drive, external hard drive or any other portable media used for storing electronic files.

1.7 SUBMITTALS

A. Conform to submittal requirements outlined in Division 1 Specifications. Provide the required quantity of hard copy Submittals.

B. Conform to submittal requirements outlined in Division 1 Specifications. Provide Submittals in an electronic format. The file format shall be portable data file (.pdf).

C. Submittal transmittal shall list corresponding Specification Section and a description of item(s) being submitted. Each submittal shall only include items from one Specification Section. Submittals which include items from multiple specification sections will be returned "REVISE AND RESUBMIT."

D. Prepare Submittals with adequate details and dimensions as necessary to clearly show construction. Clearly identify each item on the submittal with designation as indicated on Drawings including location and use. Include with Submittals Manufacturers published descriptive literature, specifications, performance data (normal operating characteristics, curves, ratings, etc.), wiring diagrams and installation instructions. Indicate for each item the operating characteristics, design conditions, features, and optional items that are intended for application on this project. Where contents of Submittal literature include data not pertinent to the Submittal, clearly indicate (highlight) which portion of content is being submitted for review.

E. Contract Documents include scheduled equipment which is the Basis of Design and used to establish design and space requirements. Contract Documents may also include alternative acceptable manufacturers. Where alternative manufacturer's equipment is submitted which alters the design or space requirements indicated in the Contract Documents, the Contractor shall be responsible for the revised design and construction including the costs of all associated trades involved. No costs associated with deviations from the Basis of Design shall be borne by the Owner.

F. If for any reason, the Submittal shows variations from the requirements of the Contract Documents, the Contractor shall make mention of such variation in the letter of transmittal. The Contractor shall note in red on the Submittal any change in design or dimension on the items submitted including changes made by the Manufacturer which may differ from catalog information.

G. Where additional installation drawings, wiring diagrams or other drawings are specified elsewhere as part of the project requirements, they shall be submitted at the same time as the Submittals. Partial Submittals are not acceptable.

H. Contractor shall review each Submittal prior to submission, and check for compliance with the Contract Documents. Corrections shall be noted. Mark with approval stamp prior to submission. Submittals that do not bear the Contractor's approval stamp will be returned without action.

I. The Submittals will be reviewed only for General compliance and not for dimensions, quantities, etc. The responsibility of correct procurement remains solely with the Contractor. The Submittal review shall not relieve the Contractor of responsibility for errors or omissions and deviations from the Contract Document requirements. Submittals which are not required under this Division shall be returned to the Contractor.

J. Where Submittal review format, whether hard copy or software based, includes pre-determined language that includes the word "Approved", the following shall apply:

1. "Approved" shall be defined as "Reviewed, No Exceptions Taken".
2. "Approved as Noted" or similar verbiage shall be defined as "Reviewed, Exceptions as Noted".

K. After review of submittals by the Engineer, the Contractor shall revise and resubmit if required to establish compliance with the Contract Document requirements. Resubmittal shall include a document with a written response to each of the Engineer's previous comments.

L. The Contractor shall notify the Engineer when all product data and/or shop drawings for all equipment, materials and systems have been submitted for review.

M. The Contractor agrees that Submittals, processed by the Engineer, are not change orders; that the purpose of submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design intent of the project. This understanding is demonstrated by indicating which equipment and material is required, and by what methods of fabrication and installation will be utilized.

N. The Contractor further agrees that if deviations, discrepancies or conflicts between the Submittals and the Contract Documents are discovered, either prior to or after Submittals are processed by the Engineer, the Drawings and Specifications shall control and shall be followed.

O. Final reviewed submittals shall be included in the Operating and Maintenance Manuals. Where Submittals are returned "REVIEWED, EXCEPTIONS AS NOTED", the final Submittals shall be updated to include the exceptions. Upon ordering equipment, order sufficient number of sets of product data literature for the Operating and Maintenance Manuals.

1.8 CONSTRUCTION DOCUMENTATION

A. Coordination Drawings

1. Refer to Division 1 for additional requirements.
2. Preparation of the Coordination Drawings shall be the responsibility of the HVAC Contractor.
3. Coordination Drawings shall include but not be limited to: locations of equipment and devices, ductwork, piping, and conduit routing and required service clearances for all trades. If used, include off-site prefabricated assemblies. Show the relationship of all components as related to installation and future access for maintenance and removal. Where access doors are required, indicate locations and type. Show locations of all ductwork, piping and conduit penetrations through wall and floors. Show existing items affecting new installation in remodeled areas.
4. Coordination meetings between all trades are required.
5. Proceed with installation, including off-site fabrication and assembly, only after review of Coordination Drawings by Architect and approval from other trades affected. Architect does not approve Coordination Drawings.
6. The Coordination Drawings shall be updated to include any deviations made during construction as required to create Record Drawings.

1.9 GUARANTEE AND WARRANTIES

A. Warrant that equipment and all work is installed in accordance with good workmanship practice. All equipment shall be installed in accordance with the Manufacturer's recommendations and shall meet the requirements specified. Any equipment failing to perform or function as specified shall be replaced with complying equipment without cost to the Owner. Warranty shall commence upon acceptance of substantial completion of construction by the Owner. Sign-off of individual equipment start-up procedures shall not activate the warranty commencement.

B. Guarantee against defects in workmanship and materials; repair or replace any defective work, material or equipment within one year from date of formal written warranty commencement. Longer product warranties provided by individual equipment manufacturers shall supersede this one year guarantee; however, the Contractor shall maintain the one year workmanship and materials guarantee for installation of such equipment. Coordinate guarantee and warranty requirements with Division 1 Specifications.

1.10 CLOSEOUT DOCUMENTS

A. Record Drawings:

1. Record Drawings shall consist of updated shop drawings as defined elsewhere in the Specifications. Refer to Division 1 for quantities, special formatting, and additional requirements.
2. Record Drawings shall consist of updated Coordination Drawings as defined elsewhere in the Specifications. Refer to Division 1 for quantities, special formatting, and additional requirements.

3. The Contractor shall maintain updated Coordination Drawings, reproduced electronically from the original Coordination Drawings in an approved format. Drawings shall include any deviations or changes made during construction. Drawings shall only include work of this Division. Work of other Divisions shall be removed. At the end of the project, the Contractor shall transfer the electronic drawing files onto a portable memory device. Both hard copy drawings and the portable memory device shall be provided as Record Drawings.
4. After the project is completed, the Record Drawings shall be delivered to the Architect/Engineer for inclusion into the Operating and Maintenance Manuals, as a permanent record of the installation as constructed.

1.11 SITE REPORTS AND PUNCHLISTS

A. The Engineer may visit the site periodically during construction and provide written Construction Observation Reports to the Contractor identifying areas where installation does not meet the intent of the Contract Documents. The Contractor shall provide a written response to these reports within 5 business days, indicating the reason the installation is out of compliance with the Contract Documents. After review, the Engineer may or may not require the Contractor to correct the installation. The Contractor shall correct the installation unless the reason for non-compliance is accepted, in writing, by the Engineer or Owner.

B. Final Punch List

1. The Engineer will visit the site to perform a scheduled Final Punch List to identify areas where the installation is incomplete or does not meet the intent of the Contract Documents.
2. If the Engineer is requested to perform the Final Punch List prior to the Contractor being 100% complete with their scope of work, the Contractor shall furnish a Contractor's Completion List, indicating all incomplete work. This list shall be furnished to the Engineer a minimum of 24 hours prior to the scheduled Final Punch List.
3. The Contractor shall respond to each punch list item along with a date, indicating that the item has been completed or corrected.
4. A copy of the Final Punch List with the Contractor's responses shall be included on the Operating and Maintenance Manual.

C. Where on-line documentation management services or project management software requires the author/initiator of a corrective action to close it, and the Engineer is the author/initiator, the following shall apply:

1. When the corrective action is reported as corrected/complete, by either the responsible Contractor or the Construction Manager, the Engineer will assume that the parties responsible for construction have reviewed and approved the correction.
2. By closing the corrective action, the Engineer is in no way approving nor assuming responsibility for the installation.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. All equipment and materials used on this project shall be new and listed or labeled by a Nationally Recognized Testing Laboratory (NRTL) such as UL, ETL, CSA, etc.or as approved by the local Authority Having Jurisdiction. Equipment and materials shall be installed or used in accordance with instructions included with the listing or labeling. Where possible, the same brand or manufacturer shall be used for each type of material or equipment. such as.

B. Equipment and materials for the construction shall be the responsibility of the Contractor and shall be protected by the Contractor until formally accepted by the Owner.

C. All Manufacturers of equipment shall verify to the satisfaction of the Contractor and Engineer that their equipment will function properly under the conditions of use, as shown on the Drawings and as specified herein. Dimensions, weights, operating characteristics and all other related appurtenances shall be verified before submittal of shop drawings.

2.2 MATERIAL SUBSTITUTIONS

A. Bids shall be based upon the specified products, suppliers or listed alternatives. The Drawings and Specifications are based on the products specified by type, model, size and suppliers if indicated and thus establish minimum qualities which substitutes must meet to qualify for review.

B. Should the Contractor propose to furnish materials, equipment and/or suppliers other than those specified, submit a written request for substitutions to the Architect or Engineer in accordance with Division 1 requirements. The request shall be an alternate to the original Bid and shall be accompanied with complete descriptive (manufacturer, brand name, catalog number, supplier name and references, etc.) and technical data for all items. Indicate any additions or deductions to the base Bid price.

C. Where substitutions alter the design or space requirements indicated in the Contract Documents, the Contractor shall be responsible for the revised design and construction including the costs of all associated trades involved. No costs associated with the use of a substitution shall be borne by the Owner.

D. Acceptance or rejection of the proposed substitutions shall be subject to approval of the Architect or Engineer. If requested, the Contractor shall submit inspection samples of both the specified and the proposed substitute items for review.

E. In all cases where substitutions are permitted, the Contractor shall bear any and all extra cost of evaluating the equality of the material and equipment to be installed.

F. Where only one Manufacturer or supplier is named in the Contract Documents, the system or equipment shall be provided as specified.

G. Verbal requests or approvals of substitutions shall not be binding on the Architect, Engineer or Owner.

PART 3 - EXECUTION

3.1 SAFETY

A. The Contractor shall follow all safety requirements as defined herein, as described in Division 1 and as defined by Owner safety protocols.

B. Work shall be performed on de-energized equipment in accordance with NFPA 70E.

C. Should suspected hazardous materials be encountered, Contractor shall adhere to procedures, methods and regulations of the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) and immediately notify Owner.

3.2 COORDINATION

A. Take all field measurements necessary and assume responsibility for the accuracy.

B. If any work is fabricated or assembled off-site, assume responsibility for the accuracy of such pre-manufactured assemblies.

C. Install work that is to be concealed within the building construction in sufficient time to secure proper location without delay to the work of other trades.

D. Assume responsibility for location of chases, other openings through masonry and concrete construction. When work cannot be installed concurrent with building construction, arrange for rough-in boxes, sleeves, inserts and other items, as necessary for installation thereof at a later date.

E. If any work is installed so that the architectural design cannot be adhered to, Contractor is responsible for making such changes as Architect may require. Before installing work, report any interferences between work of this Division and work of other Divisions to Architect as soon as discovered. Architect will determine which work must be relocated, or make adjustments to maintain clearances, maximum headroom and to avoid conflict with other work.

F. Become familiar with the construction where work attaches. Review Structural Drawings for coordination of openings. Cut no structural members or slabs without Architect's and/or Structural Engineer's written approval.

G. Exercise caution when working in areas where concealed systems or materials may exist. Any costs for repair of damage incurred shall be the responsibility of Contractor causing the damage.

3.3 PROTECTION

A. All finished surfaces shall be protected from damage and spills during construction.

1. Protect finished floors with a heavy duty flexible fiber reinforced floor protection board - Ram Board or equal.
2. When setting up pipe cutting and threading machines, protect area against staining and abrasion. Provide plywood protection over Ram Board underlayment.
3. Protect finished surfaces from chips and cutting oil by use of a chip receiving pan and oil proof cover.
4. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.

5. Protect finished surfaces from paint droppings, insulation adhesive, etc. by use of drop cloths.

B. The Contractor shall provide protection for any roof areas that will be affected by this scope of work. The roof protection shall be positioned such that it provides protection from falling objects such as tools and materials.

C. The cost of correcting any such condition will be charged against the respective Contractor.

3.4 EQUIPMENT INSTALLATION

A. Install equipment in accordance with equipment manufacturer's published installation instructions.

B. Should the Drawings and/or Specifications include procedures that exceed or call for materials that differ from the manufacturer's instructions, the Contractor shall follow the Drawings and/or Specifications. This requirement does not release the Contractor from the obligation to follow all other published instructions and installation recommendations. Contractor shall make Engineer aware, in writing, of discrepancies between the Drawings and Specifications and the manufacturer's published installation instructions, and/or confirm Engineer's design intent, prior to installation of the equipment. Failure to comply may result in reworking the equipment installation or replacement of materials associated with the equipment at no additional cost to the Owner.

3.5 CUTTING AND PATCHING

A. All cutting and patching in construction as necessary for installation of this work shall be the responsibility of this Division and performed by the Tradesmen related to that specific Division of work. Subcontract this work to the appropriate Trade Division.

B. Do not cut any structural member, including but not limited to steel framing and structural floors, without specific permission from the Architect and/or Structural Engineer.

C. Do not cut openings in roof or floor construction without specific permission from the Architect and/or Structural Engineer.

D. Where locations of penetrations are inaccurate or where building components are improperly cut by inadequate methods, the Contractor in error shall be responsible for complete repair.

E. The Contractor shall assume responsibility for removing and replacing existing ceiling tiles as required for installation of all work. Areas include that as outlined by the project scope and areas outside the scope where the Contractor is required to make connections to existing systems and install new work. Damaged tiles shall be replaced.

3.6 SERVICE SHUTDOWNS

A. This project involves remodeling of existing areas in an operating facility. Plan work including alterations and connections to existing facilities, to permit carrying on normal building functions. When necessary to temporarily interrupt a service, shutdowns shall be scheduled through the Owner and shall be done at a time as directed by the Owner. No additional compensation shall be allowed for these shutdown periods even though premium time work may be required unless specifically defined in Division 1.

B. Provide temporary service to equipment or systems that cannot be shut down, and as determined by Owner, or as described in the Contract Documents. Remove temporary services when permanent work is completed

C. Provide a minimum of two weeks' notice to the Owner before any service shutdown is scheduled.

3.7 INDOOR AIR QUALITY

A. All occupied areas of building shall remain free from odors, fumes, dust and smoke generated from installation of material and equipment.

B. Arrange with the Owner to schedule isolation of areas where paints, adhesives, solvents, etc., will be used. Areas shall remain isolated until all materials have cured sufficiently as to stop out-gassing of fumes or odors and area has been ventilated to remove all detectable traces of odors and fumes.

C. Provide temporary partitions and air seals to prevent the migration of airborne contaminants from unoccupied areas to occupied areas.

END OF SECTION

SECTION 230101 - HVAC SUPPLEMENTAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED CONTRACT DOCUMENTS

A. Refer to 23 01 00: HVAC General Provisions for additional Project requirements.

1.2 QUALITY ASSURANCE

A. Reference to the codes and standards listed shall constitute the minimum acceptable requirements. Nothing in the Specifications shall be construed to permit deviation from the requirements of the governing code. Where requirements of the Drawings and Specifications exceed those of the code listed, follow the Drawings and Specifications.

B. The following building codes with amendments shall be followed:

1. 2017 Ohio Mechanical Code
2. 2017 Ohio Plumbing Code
3. 2015 International Fuel Gas Code

C. Applicable portions of the following codes, standards, societies and agencies shall be followed. Where a specific edition is listed, it shall be used. Where not listed, the edition recognized by the Authority Having Jurisdiction shall be used. Listing of a specific portion of a code, standard, society or agency does not preclude the Contractor from following all other applicable portions of the code, standard, society or agency.

1. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
2. ASHRAE 90.1-2010: Energy Standard for Buildings
3. American Society of Mechanical Engineers (ASME)
4. ASME BPVC-2010: Boiler and Pressure Vessel Code
5. American Welding Society (AWS)
6. National Fire Protection Association (NFPA)
7. NFPA 70-2017: National Electric Code
8. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

D. All Contractor personnel who perform installation, maintenance or repair work who might have the opportunity to release CFC's, HCFC's, or HFC's into the atmosphere shall have a UNIVERSAL certification as required by Environmental Protection Agency, Section 608 Regulatory Requirements: Stationary Refrigeration and Air Conditioning.

1.3 SUBMITTALS

A. Prior to commencing work, submit product data and/or shop drawings for HVAC equipment, materials and systems as required in each individual Division 23 Specification section. Provide all Submittals far enough in advance of scheduled dates for installation to provide sufficient time for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.

1.4 CONSTRUCTION DOCUMENTATION

A. Testing, Adjusting and Balancing Report

1. Submit Testing, Adjusting and Balancing Report to Engineer upon completion.
2. Refer to Section 23 03 00 for additional information.
3. Final copy shall be included in Operating and Maintenance Manuals.

B. Pipe Cleaning and Pressure Tests

1. Submit pipe system cleaning and pressure testing documentation to Engineer upon completion of testing.
2. Refer to Section 230300 for additional information.
3. Final copies shall be included in the Operating and Maintenance Manuals.

1.5 GUARANTEE AND WARRANTIES

A. Guarantee air conditioning equipment refrigeration compressors for five years.

1.6 CLOSEOUT DOCUMENTS

A. Operating and Maintenance Manual (OMM)

1. Once submittals are completed, provide an OMM index to the Engineer for review. Once index is approved, submit an electronic copy of the OMM to the Engineer for acceptance.
2. Furnish electronic Portable Document Format (PDF) of Operating and Maintenance Manuals. Refer to Division 1 Specifications for additional requirements.
3. Each OMM shall be assembled into one electronic file or multiple files broken up by section if the file size is larger than 15Mb.
4. Combine all electronic files and arrange as follows, unless otherwise directed in Division 1 Specifications. Include a title tab for each section and an index at the beginning of each individual section. If a section listed below does not apply to the Project, renumber sections accordingly. Multiple files broken up by section are allowed if file size is greater than 15Mb.

    a. First Page --- Title of Project, Owner, Address, Date of Submittal, Name of Contractor and Name of Engineer, including contact information, phone numbers and email addresses.
    b. Second Page --- Index. Index shall include hyperlinks to each section listed.
    c. First Section --- Written description of system contents including where actually located in building, how each part functions individually, and how system works as a whole. Included step by step procedures for startup and shut down for each system and piece of equipment. Conclude with a list of items requiring service and either state the service needed or refer to the Manufacturer's data in the file that describes the proper service.
    d. Second Section --- A copy of each approved Submittal.

e. Third Section --- A copy of each equipment Manufacturer's operating and maintenance instructions and where applicable, a copy of the equipment startup report. Maintenance instructions shall include name of service agency, spare and replacements parts lists, lubrication instructions, and replacement belt information (size, type and length). For packaged equipment with manufacturer supplied controls, provide information listing any programming that is not a factory default.
f. Fourth Section --- Temperature Control System component information, drawings and sequences of operation.
g. Fifth Section --- A copy of the testing, adjusting and balancing report.
h. Sixth Section --- A copy of all test results performed by the Contractor. Test results shall include pipe cleaning and pressure tests, ductwork pressure tests and freeze protection cable testing.
i. Seventh Section --- A copy of all valve directories.
j. Eighth Section --- A copy of all guarantees and warranties.
k. Ninth Section --- Owner training sign-in sheets including all data utilized in the training sessions and a list of all digitally recorded training sessions].
    1) Include electronic format of all recorded training sessions on portable memory device (Optical media or USB stick).

l. Tenth Section --- Record Drawings.
m. Eleventh Section --- A list of attic stock furnished for the project.
n. Twelfth Section --- Final Punch List with Contractor's responses.

5. The electronic OMM shall be delivered to the Owner and Engineer on portable memory device or optical media - Owner shall be provided with up to 5 copies on separate portable memory devices or optical media and the Engineer shall be provided with a single copy.

    a. OMM index page shall have cross-reference links to each section.
    b. Sections containing more than 30 pages shall have a section index with cross-reference links.
    c. PDF text shall be recognizable and shall be searchable by use of a "Ctrl'-F" or "find text" function.

1.7 DEMONSTRATION AND TRAINING

A. Before final payment, demonstrate to the Owner's satisfaction the proper operation of each of the systems provided as part of the Contract Documents.

B. Provide to Owner after all equipment, systems and controls are in operation and at an agreeable time, instructions for the purpose of training Owner's maintenance personnel in the operation and maintenance of all HVAC equipment, systems and controls.

C. Provide a "sign-in" sheet at each training session. A copy of each "sign-in" sheet shall be included in the Operating and Maintenance Manual.

D. The Contractor shall video record training sessions for systems if required in other Specification sections. Turn one copy of each recording over to the Owner upon completion as part of Operating and Maintenance Manual. Coordinate preferred type of recording media with the Owner.

E. Refer to individual Division 23 sections for minimum time periods for training.

F. Deliver to the Owner all special tools and appurtenances for proper operation and maintenance of the equipment provided and request receipt for same. Attach to the Contractor's request for final payment.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 COORDINATION

A. Consult the Contract Documents and Submittals pertaining to the work for other trades. Review the field layouts for all trades and make adjustments accordingly in laying out the HVAC work.

B. Examine the work of all other trades when it comes in contact with, or is covered by, work in this Division. Do not attach to, cover up, or finish against any defective work, or install work in a manner which will prevent proper installation of the work of other trades. HVAC Contractor shall be responsible for the costs of adjustments required.

3.2 PRODUCT HANDLING

A. Pay all costs for transportation of materials, equipment to job site.

B. Provide all scaffolding, tackle, hoists, rigging necessary for placing HVAC materials and equipment in their proper place. Scaffolding, hoisting equipment: comply with applicable Federal, State, and Local regulations. Remove temporary work when no longer required.

C. Arrange for packaging of equipment, which must be hoisted, so that there will be no damage or distortion caused by hoisting operation. Protect all piping, ductwork, and equipment from any damage during hoisting operation.

D. Store equipment, controllers, insulation, ductwork, etc., in a dry location and protect from dirt and moisture until building is ready to receive them.

E. Coordinate location of stored items with other trades. Where necessary, store materials and equipment on movable carts so they may be moved when interfering with the work of other trades.

3.3 DAMAGE AND EMERGENCY REPAIRS

A. Assume responsibility for any damage to new or existing building components caused by work provided as part of the Contract Documents, including leaks in piping systems being installed or reworked. Repair all damage without extra cost to Owner.

B. Owner reserves the right to make emergency repairs as required to keep equipment in operation, without voiding Contractor's guarantee or relieving him of responsibility during warranty period.

C. Restore roads, grounds, paving, insulation, piping, ductwork, building components, etc., to their original condition whenever this work causes damage.

3.4 CLEANING

A. At all times keep premises and building in neat and orderly condition, follow explicitly any instructions in regard to storing of materials, protective measures and disposing of debris.

B. After all tests and adjustments have been completed, clean all equipment leaving everything in working order at the completion of this work. Thoroughly clean all piping, ductwork, and equipment of dirt, dust, grease, oil, debris and paint, after all other trades have completed their work.

C. All debris created by the execution of this work shall be removed as directed by the Architect or Owner.

D. Upon completion of work remove all tools, equipment and surplus materials.

3.5 PAINTING

A. Finish painting is included under Division 9 - Finishes, except where specifically called for in Section 230300.

B. Materials and equipment installed under this Division shall be left free from dirt, grease and foreign matter, ready for painting.

C. No equipment, piping or ductwork shall be painted before being tested.

D. Damaged surfaces of prefinished materials and equipment shall be touch-up painted to match existing finish.

E. Under no circumstance shall any open cabling be painted.

3.6 INDOOR AIR QUALITY

A. Provide temporary ventilation and/or filtration systems of sufficient size and quantity to ensure complete removal of all odors, fumes, and airborne contaminants generated. Maintain 25 feet clearance from all temporary exhaust outlets to all active building outdoor air intakes.

B. If the building HVAC system is used and adjustments are made for ventilation purposes, rebalance systems to maintain occupied areas pressurization and air change requirements.

C. Arrange with Owner to override the HVAC system control of night setback functions to assist with ventilation of building.

D. Comply with SMACNA guideline "IAQ Guidelines for Occupied Buildings Under Construction" Second Edition - 2007.

END OF SECTION 230101

SECTION 230200 – HVAC DEMOLITION

PART 1 - GENERAL

1.1 WORK INCLUDES

A. HVAC equipment, piping, ductwork, and systems indicated on the Demolition Drawings are shown to indicate the extent of demolition only and are not intended to be a record drawing of the existing conditions. The Drawings and Specifications establish the minimum standards for workmanship and materials.

1. If additional interpretation is required regarding the scope of demolition, contact the Engineer prior to bid.

B. Include all labor, materials, equipment, services, and permits necessary for completion of the demolition work.

C. Provide protection for all adjacent areas before, during, and after execution of the demolition work.

D. Comply with all the rules and regulations of local and state Authorities Having Jurisdiction, including applicable OSHA safety requirements.

E. Visit the site and become familiar with conditions affecting the demolition work. No additional compensation shall be approved on claims that arise from a lack of knowledge of the existing conditions.

F. Normal building functions shall be maintained during the demolition work. Coordinate the day and time of any temporary building system interruptions with the Owner. Additional compensation shall not be approved for premium time effort.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide materials and equipment for completion of the demolition work as described within the Specifications and on the Drawings.

B. Materials and equipment shall be new and UL labeled for the application.

PART 3 - EXECUTION

3.1 GENERAL DEMOLITION WORK

A. Disconnect and remove existing HVAC Work made necessary because of Project alterations as indicated or implied on the Contract Documents of all trades. Relocate equipment and/or devices where indicated. Existing HVAC equipment, piping, ductwork and systems not affected by these changes shall remain and shall be protected whether shown on the Drawings or not.

B. HVAC equipment, piping, ductwork and systems shall be de-energized prior to disconnection and removal.

C. Demolition Work under this Contract shall be accomplished by the Contractor in complete accordance with the Construction Procedure and Progress Schedule specified under Division 1. Proposal shall include any special phasing requirements related to demolition work as described in the Division 1 Specifications.

D. Remove existing equipment indicated including piping and ductwork connections. Existing equipment shown as being reused or relocated shall be carefully removed, stored on the premises, and refurbished before reinstallation.

E. Equipment to be salvaged by the Owner shall be carefully removed and stored on site by the Contractor for delivery to the Owner. All other materials, equipment and debris shall become the property of the Contractor and shall be removed from the site.

F. Remove all previously abandoned equipment, piping, and ductwork encountered.

G. Where required, re-support existing to remain piping and ductwork being removed.

H. Remove piping and ductwork as described on the Drawings. Cap or plug as indicated or as required by Code. Insulate portion of system left exposed by the piping or ductwork removal. Insulation shall match that of the existing adjacent insulation or be as specified for new service. Identify in the field where piping or ductwork connections are to be reused.

I. Provide drainage, capping, and re-filling as necessary to isolate portions of systems to enable full or partial demolition.

J. Provide valves as necessary whether indicated or not to isolate portions of systems to enable full or partial demolition and to make ready for re-connection of the new work.

K. In case of existing valves failures, replace valves in kind or as specified for new service to enable positive shut-off and keep with project schedule as much as possible. Report any such cases immediately upon discovery to the Architect or Engineer.

L. For portions of existing piping and ductwork systems to be re-used, visually inspect for signs of leaks. Report any such cases immediately upon discovery to the Architect or Engineer. Provide testing similar to that as required for new piping and ductwork systems to ensure adequate condition.

M. Remove temperature control devices and components associated with removed equipment, piping, and ductwork including controllers, sensors, actuators, wiring, conduit, etc.

N. Where Building Automation Systems wiring is interrupted because of the demolition Work, Contractor shall reroute or relocate, modify and reconnect to provide a continuous system.

O. Cutting, patching, finishing, etc., for removed or relocated HVAC equipment, piping, ductwork, and systems shall be included as part of the HVAC Work. All holes and damage caused by the demolition work shall be properly patched with suitable materials to match existing construction. Patching shall be performed by the qualified trade.

P. Where equipment, piping, ductwork and systems are removed from fire or smoke rated construction, penetrations shall be patched to match existing ratings with suitable materials matching existing construction. Patching shall be performed by the qualified trade.

3.2 MERCURY

A. Where existing thermostats contain mercury or mercury based products follow EPA universal waste rule, Regulation 40 CFR 273 for removal, transportation and recycling.

3.3 REFRIGERANTS

A. Existing water cooled chiller which contains CFCs, HCFCs, or HFCs shall be removed and reclaimed by the contractor. Contractor personnel shall have a UNIVERSAL certification as required by Environmental Protection Agency, Section 608 Regulatory Requirements: Stationary Refrigeration and Air Conditioning.

END OF SECTION

SECTION 230300 - HVAC BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Inserts, Hangers and Supports
B. Roof Supports
C. Roof Flashings
D. Electrical Connections
E. Vibration Isolation
F. Paint
G. Equipment Identification
H. Access to Equipment and Devices
I. Cleaning
J. Startups
K. Tests and Adjustments

1.2 SUBMITTALS

A. Refer to Sections 23 01 00 and 23 01 01 for additional requirements.
B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES. Exceptions: Paint.

1.3 CONSTRUCTION DOCUMENTATION

A. Refer to Section 230101.
B. Submit draft copies of testing, adjusting and balancing report for review prior to final acceptance of Project. Include final copies in the Operating and Maintenance Manuals.

PART 2 - PRODUCTS

2.1 INSERTS, HANGERS, AND SUPPORTS

A. Manufacturer: Basis of design shall be Anvil. Other acceptable manufacturers include Mason, Modern or Erico/Caddy.
B. Provide all inserts, hangers, anchors, guides and supports to properly support and retain piping, ductwork, conduits and equipment; to control expansion, contraction, anchorage, drainage and prevent sway and vibration.
C. Provide inserts for support of work in concrete construction.

D. Provide forged steel beam clamps when attaching to steel construction.

E. Provide supplementary steel angles, channels, and plates where supports are required between building structural members, span the space and attach to building structural members by welding, bolting or anchors.

F. Provide hangers, rollers, threaded rods, turnbuckles, saddles, insulation protectors, anchors, and all other miscellaneous specialties for the attachment of hangers and supports to structure.

1. For up to 3/4 inch diameter rod: Anvil Figure 92, 93, or 94 beam clamps.
2. For 7/8 inch and 1 inch diameter rod: Anvil Figure 134 beam clamp with Anvil Figure 290 eyenut.
3. Pressed steel beam clamps are not permitted.

G. Provide rods, angles, rails, struts, brace plates, and platforms required for suspension or support of piping, conduit and equipment.

H. Do not support piping or ductwork from another pipe or ductwork. Do not support piping or ductwork from conduit. Do not support ceiling framing or lighting from piping or ductwork. Do not support any item from metal roof deck.

I. Where fireproofing is removed or damaged to allow attachment to building structural members, repair to maintain integrity of fireproofing.

J. Refer to Specification 23 20 00 for additional piping support requirements.

2.2 ROOF SUPPORTS

A. Provide prefabricated roof equipment supports for pipe mounting.

B. Provide prefabricated roof supports for horizontal piping installed on the roof.

C. Units shall be as manufactured by Custom Curb, Roof Products & System Corp, Pate, or Thycurb; 18 gauge galvanized steel, insulated, continuous welded seams, wood nailer, counterflashing of type and style as indicated.

D. The height of roof curbs and supports shall be a minimum of 12 inches above the finished roof surface, total curb height shall accommodate the roof insulation thickness. Refer to Architectural Drawings for details.

2.3 ROOF FLASHINGS

A. Roof flashings for HVAC equipment are the responsibility of the contractor installing the equipment.

2.4 ELECTRICAL CONNECTIONS

A. Refer to those portions of the Contract Documents which establish electrical characteristics and furnish equipment to operate on that service.

B. Starters shall be provided under Division 26 Work, unless otherwise noted. Starters to be provided with proper NEMA enclosures, surface or flush application as required. Where equipment has magnetic starters furnished as an integral part of the equipment, disconnect switches shall be provided under Division 26 Work.

C. Provide coordinated wiring diagrams for motor equipment of heating, ventilating, air conditioning, and temperature control conforming to system operation specified. Provide line diagrams, power diagrams, terminal connections. Submit all such drawings as shop drawings.

D. Provide power wiring from closest available circuit breaker for powering of the temperature controls system. Install according to the requirements of Division 26.

E. Install all equipment requiring an electrical connection in such a manner so that proper clearance for service is provided per the National Electric Code.

2.5 VIBRATION ISOLATION

A. Furnish and install vibration isolating mountings to isolate from the structure, by means of resilient vibration and noise isolators, HVAC equipment having rotating or reciprocating parts. Guarantee that isolators to provide isolation efficiencies according to this Specification. Base selection on equipment purchased, power dissipated, frequency, weight distribution and nature of the building structure.

B. Design mountings to permit attachment to the equipment base or pad and to the structure and select for uniform deflection allowing for unequal weight distribution.

C. Vibration or noise created in any part of the building by the operation of any equipment furnished and/or installed under this Contract will be prohibited. Take all precautions by isolating the various items of equipment from the building structure.

D. Isolate HVAC equipment as follows:

1. Mount air cooled chillers directly on spring isolators. Provide isolators with 90 percent isolation efficiency.

E. Manufacturer: Mason Industries, Vibration Eliminator Co., Kinetics Noise Control or VCM Group.

2.6 PAINT

A. Painting shall be done with products of Sherwin-Williams, Pittsburgh Plate Glass, Pratt and Lambert, or Tnemec, according to the following Sherwin-Williams paints.

1. Paints applied to interior non-metal surfaces shall not exceed the VOC content limits established in the Green Seal Standard GS-11, first edition, May 20, 1993. VOC limits are as follows:

   a. Flat paints: 50 grams per liter
   b. Non-flat paints: 150 grams per liter

2. Paints applied to interior metal surfaces shall not exceed the VOC content limit of 250 grams per liter established in the Green Seal Standard GS-03, second edition, January 7, 1997.
3. Galvanized and Ferrous Metal Surfaces (Exterior)

   a. First Coat: ProCryl Universal Primer, B66-310 Series (2 to 4 mils dry)
   b. Second and Third coat: Duration Exterior Latex Acrylic Gloss coating, K34 Series (7 mils wet, 2.8 mils dry, per coat)

4. Galvanized and Ferrous Metal Surfaces (Interior)

a. First Coat: ProCryl Universal Primer, B66-310 Series (2 to 4 mils dry)
b. Second and Third coat: Sherwin-Williams DTM Acrylic Gloss paint, B66W00111 Series (6.5 mils wet, 2.5 mils dry, per coat)

5. Insulated Coverings

a. First Coat: ProGreen 200 Interior Latex Primer, B28W600 (4 mils wet, 1.5 mils dry)
b. Second and Third coat: ProClassic Waterborne Acrylic High Gloss, B21-351 Series (4 mils wet, 1.5 mils dry, per coat)

6. Where safety colors or facility standard colors are not available in the ProClassic paint, Sherwin-Williams DTM Acrylic Gloss paint, B66W00111 Series, may be used for the specific colors.

B. Colors shall conform to ANSI A13.1.

2.7 EQUIPMENT IDENTIFICATION

A. Equipment Nameplates

1. Equipment nameplates shall be laminated phenolic with a black surface and white core. Use 1/16 inch thick material for plates up to 2 inch by 4 inch. For larger sizes use 1/8 inch thick material.
2. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use ¼ inch minimum height letters which occupy four to the inch.
3. Nameplates shall be attached to equipment with brass screws or rivets; no adhesive attachments will be permitted.
4. Acceptable Manufacturers: Seton Nameplate Company, Marking Services Inc.

B. Stencils

1. Stencils shall be made with paint products as previously described in the Paint Specification Section. Apply one coat lacquer or vanish over the stencils.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Location of piping, equipment, ducts, etc., on the drawings are diagrammatic; indicated positions shall be followed as closely as possible, exact locations shall be subject to building construction and interferences with other work. In general, conceal piping and ductwork located outside of equipment rooms. Difficulties preventing the installation of any part of work as indicated, shall be called to the attention of the Architect. Architect will determine locations and changes. Contractor shall install the work accordingly. Architect reserves right to make minor changes in location of any part of the work up to the time of roughing-in without additional cost.

B. Attempts have been made to identify existing equipment locations and piping and ductwork routing and sizes with use of existing drawings and field observations. Contractor shall field verify all existing information, report any discrepancies to the Architect or Engineer and note on the Record Drawings.

C. At locations in project involving alterations, assume responsibility for removal, rerouting, protection and replacement of existing facilities as necessary to install new work. Work to be executed by craft which customarily or by jurisdictional award performs such service. Refer to 23 02 00 for additional information.

D. Install all materials and equipment in a neat and workmanlike manner by competent specialist for each subtrade. The installation of any materials and equipment not meeting these standards may require removal and reinstallation at no additional cost to the Owner.

E. Locate piping, ductwork and other services, in pipe spaces, to ensure maximum accessibility. Where necessary to cross pipe spaces, crossing must be made near the floor or 6 feet or more above floor.

F. Install, connect equipment, services, materials according to best engineering practice and in conformity with manufacturer's printed instructions. Provide complete auxiliary piping, water seals, valves, electric connections, controls, etc., as recommended by respective equipment manufacturer or required for proper operation.

G. Take all measurements and determine all elevations at the building.

H. All roof mounted equipment shall be installed a minimum of 10 feet from edge of roof, unless indicated otherwise.

3.2 ACCESS TO EQUIPMENT AND DEVICES

A. All valves, dampers, air vents, equipment, control components and other devices requiring examination, adjustment, service, and maintenance shall be accessible. If located above drywall ceiling or behind finished walls, provide an access door. Coordinate all access door locations with the Architect and General Trades.

B. To ensure accessibility during and after construction, when a device is installed, its location shall be marked with securely attached temporary signage. Signage shall indicate the amount of clearance required for the specific device. Signage shall remain in place until the ceiling or access door is installed or until substantial completion.

C. Clearance shall include not only code required clearance but also clearance for Owner’s staff to access the device. This access shall be from the floor or from the floor level using normal maintenance ladders and apparatus to meet all OSHA requirements. Consideration shall be given to accessing a device through an access door.

D. HVAC Contractor shall monitor these access locations until substantial completion and notify Architect, Owner and Engineer when the access area is encroached upon so that corrective action may be taken immediately.

E. Corrective action shall be the responsibility of the trade encroaching the access area unless identified that the equipment in question is installed incorrectly.

3.3 CLEANING

A. After all tests and adjustments have been completed, clean all equipment leaving everything in working order at the completion of this work. Thoroughly clean all piping, ductwork, and equipment of dirt, dust, grease, oil, debris and paint, after all other trades have completed their work.

B. Refer to Specification 23 20 00 for pipe cleaning requirements.

3.4 STARTUPS

A. Coordinate schedule for start-up of various equipment and systems. Notify Ownersevendays prior to start-up of each item.

B. Lubrication, Packing and Supplies

1. Properly lubricate all rotating, reciprocating equipment before it is started with correct grade, type and quantity of lubricant.
2. Check each shaft containing a packing gland for condition by backing packing gland off and examine for proper grade, amount and type of packing as recommended by manufacturer.
3. Maintain all lubrication, gaskets and packing during construction; assure that at the time of acceptance all are in first class condition.
4. Provide all supplies required to place equipment in operation

C. Verify that each piece of equipment or system has been checked for proper drive rotation, alignment, belt tension, control sequence, or other conditions which may cause damage.

D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up by service technicians employed or authorized by the manufacturer to provide startup service according to manufacturer's instructions.

G. Provide a factory authorized representative for startup of the following equipment. Representative shall be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

1. Air Cooled Chillers
2. Temperature control system

H. Provide written reports that equipment and systems have been properly installed and are functioning correctly. Where start-up is by a factory authorized representative, report shall be on manufacturer's forms intended for the purpose. Reports shall be included in the Operating and Maintenance Manual.

I. Equipment and systems not installed properly or operating correctly shall be corrected or replaced and its proper operation shall again be verified. This Contractor shall be responsible for the costs of any and all re-inspections.

3.5 TESTS AND ADJUSTMENTS

A. Obtain all inspections required by law, ordinances, rules, regulations of authorities having jurisdiction, furnish certificates of such inspections. Pay all fees, and provide all equipment, power and labor necessary for inspections and tests.

B. During testing period maintain on the project an engineer thoroughly familiar with all phases for as long a period as required to thoroughly adjust all systems and demonstrate that they are functioning properly.

C. Perform all tests, including but not limited to those specified, make necessary adjustments to obtain specified equipment and system characteristics.

D. Do not consider work under this Specification complete until required inspections have been obtained, tests performed, necessary adjustments made and satisfactory evidence of compliance has been submitted. Architect reserves right to make spot checks to determine accuracy and completeness of final adjustments.

E. Refer to Specification 23 20 00 for piping pressure testing requirements.

F. HVAC Systems Testing, Adjusting and Balancing

1. Provide services of a certified AABC or NEBB test agency to test and balance HVAC systems. Conduct all tests and provide a report in accordance with Associated Air Balance Council, National Standards for Field Measurements and Instrumentation.
2. The testing and balancing agency and the temperature control installer shall cooperate in a joint effort as necessary to achieve properly tested and balanced systems.

    a. The responsibility of the temperature control installer will be to establish the mode of operation required by the testing and balancing agency for proper testing and to perform programming and/or setpoint changes as required by the testing and balancing agency.
    b. The responsibility of the testing and balancing agency is to perform all the actual testing and balancing of all HVAC equipment and to verify the operation of HVAC temperature control system.

3. The Mechanical Contractor shall make all changes in sheaves, belts, and dampers and shall add dampers as requested by the Air Balance Agency for correct balance at no additional cost to the Owner.
4. Do not begin adjustments until systems have been completed and are in full working order. Put all heating, ventilating, exhaust and air conditioning systems and equipment into full operation and continue operation of same during each working day of testing and balancing. All testing and balancing shall be done under both summer and winter design conditions.
5. Perform tests and balance systems in accordance with following requirements:

    a. Balance all water using equipment, such as chillers, , etc., to obtain required water pressure drop and flow rate. List specified flow rate and water pressure drop for each piece of equipment. Tabulate an air/water balance showing entering and leaving water temperatures and entering and leaving air dry and wet bulb temperatures.
    b. List design data for each pump, obtain by measurement and tabulate pump motor voltage, pump motor operating current, pump head with no flow and with full flow. Submit manufacturer's pump curves, indicating operating point of each pump.
    c. Calibrate all temperature control and other automatic devices and thoroughly test. Guarantee all instruments to function on a variation of plus or minus 1-1/2 degrees and make adjustments to achieve this result during first year without cost to Owner.
    d. Record all final equipment data after system balancing is complete. Provide final operating condition of HVAC systems.
    e. Furnish 5 AABC or NEBB certified copies of balancing results.
    f. Perform a "spot" recheck of balancing conditions between 30 to 90 days after balancing operations jointly with a representative of the temperature control installer, who is capable of making adjustments to the temperature control system. Include a check of space temperatures, calibration of controls, pump heads, fan performance, and any adjustments, thereto. Submit written report to Architect.
    g. After or during one complete heating cooling season, make any minor adjustments that may be necessary to insure uniform temperatures throughout the space.

6. Submit Testing, Adjusting and Balancing Report to Engineer for review. After review, perform additional testing, adjusting and balancing as noted and revise report as required.

   a. At project completion, furnish one (1) AABC or NEBB certified hard copy of Final Report and one (1) electronic copy on a portable memory device. Refer to Section 230100.
   b. In addition, a final report shall be included in the Operating and Maintenance Manual

3.6 PAINTING

A. Division 23 Contractor shall be responsible for the painting of all exposed equipment, iron work, supports, hangers, pipe, pipe covering, ductwork and breechings, except factory finished items, installed in the Contract.

B. "Exposed" as indicated above, shall refer to exposed to view and shall not include piping concealed above ceilings or under floor slabs, buried in walls or installed in mechanical and electrical rooms.

C. Clean and prepare items to be painted as recommended in the paint manufacturer™™s printed recommendations.

3.7 EQUIPMENT IDENTIFICATION

A. Identify each piece of equipment as to nature of service and system number corresponding to designation in Contract Documents, by stenciling with 1 inch high letters or attaching two color engraved nameplates.

Item	Type Identification
Chillers	Nameplate

END OF SECTION

SECTION 230400 - HVAC FIRESTOPPING

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Work of this Section includes, but is not limited to, furnishing and installing firestopping for fire-rated construction in the following areas:

1. All openings in fire-rated floor, wall, ceiling and roof assemblies, both empty and those accommodating penetrating items.
2. Openings at each floor level in shafts or stairwells.
3. Empty openings intentionally designed as spare openings in fire rated Construction.

B. Penetrating items shall include the following:

1. Cables.
2. Conduit.
3. Pipes without insulation.
4. Pipes with insulation. All insulation must remain intact, undamaged and shall run continuously through walls and floors.
5. Ductwork without fire dampers. Where insulated, all insulation must remain intact, undamaged and shall run continuously through walls and floors.
6. Raceways.
7. Cable trays.
8. Busways

1.2 QUALITY ASSURANCE

A. General

1. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings required by local building code and as tested by nationally accepted test agencies per fire tests in a configuration that is representative of field conditions. The F rating must be a minimum of one (1) hour but not less than the fire resistance of the assembly being penetrated.
2. Manufacturer’s engineering judgments will be accepted for non-standard applications or where no tested system exists. Drawings for engineering judgments must indicate the UL tested system or systems upon which the judgment is based, in order to evaluate the engineering judgment against a known performance. Engineering judgments shall be approved by the Architect.
3. Firestopping materials and systems shall be capable of closing or filling openings created by:

    a. The burning or melting of combustible materials.
    b. Deflection of materials due to thermal expansion.

4. Firestopping material shall be non-halogenated, lead and asbestos free and shall not incorporate nor require the use of hazardous solvents.
5. Firestop products which dissolve in water after curing are not acceptable.
6. Firestopping materials shall not shrink upon drying as evidenced by cracking or pulling back from contact surfaces.

7. All firestopping materials shall be manufactured by one manufacturer (to the maximum extent possible).

B. Engage an experienced installer who is certified, licensed or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install firestop products per specified requirements. A manufacturer's willingness to sell its through-penetration firestop system products to a Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.

C. Manufacturer's Field Representative: The Manufacturer of the firestop material of this Section shall provide a qualified field representative at the site.

D. Pre-Installation Conference: Contractor shall hold a pre-installation conference with representatives of the Architect, Contractor, Installer, Materials Manufacturer and various trades involved in the Work, to review conditions affecting the installation and consistency of manufacturer to be used by all trades.

E. Conform to Manufacturer's printed instructions for installation in accordance with a U.L rated system or Manufacturer’s engineering judgement.

F. Codes and Standards

1. ASTM E 84
2. ASTM E 119
3. ASTM E 814
4. UL 263
5. UL 1479

1.3 SUBMITTALS

A. Refer to Sections 23 01 00 and 23 01 01 for additional requirements.

B. All submittals shall conform completely to the requirements of the Contract Documents.

C. Product Data: For each type of material to be installed, literature shall indicate product characteristics, typical uses, performance, test data and Manufacturer's installation procedures.

D. Shop Drawings: Include U.L. rated system number and details for each type of penetration or configuration.

1. Show typical installation details including:

a. Minimum and maximum allowable annular spacing.
b. Base material composition.
c. Firestop materials selected.
d. Applied thickness required to achieve the hourly rating.

E. Where required, submit Product Data and Shop Drawings to the Authority Having Jurisdiction (AHJ) for review and approval. Information shall include the Manufacturer's assembly detail with UL system number, technical data and installation instructions for each penetration type occurring on the project.

F. Close-out Documents

1. Final approved product data and shop drawings of all materials installed shall be included in operating and maintenance manuals.
2. Record Drawings shall indicate rated walls where firestop materials have been applied.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, UL label, date of manufacturer; lot number; shelf life, if applicable; qualified testing and inspection agency's classification marking; and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes. Materials shall be stored off the ground and protected from environmental conditions as required by manufacturer.

C. All firestop materials shall be installed prior to expiration of shelf life.

1.5 PROJECT CONDITIONS

A. Conform to manufacturer's printed instructions for installation and when applicable, provide for curing in accordance with manufacturer suggested temperature requirements.

B. Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limitations recommended by manufacturer.

C. Do not install through-penetration firestop systems when substrates are wet due to rain, frost, condensation, or other causes.

D. Do not use materials that contain flammable solvents.

E. Do not install water based or products that are conductive when wet in contact with energized electrical conductors. Exercise care when energizing penetrants.

1.6 PROTECTION

A. Where firestopping is installed at locations which shall remain exposed in the completed work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.

1.7 SEQUENCING

A. Coordinate this work as required with work of other trades.

B. Firestopping shall precede finishing of gypsum board.Schedule installation of cast-in-place firestop devices after completion of floor formwork, metal deck placement or composite deck installation but before placement of concrete.

1.8 WARRANTY

A. Contractor shall provide written certification that all firestopping was installed in accordance with the Manufacturer's written instructions for UL tested assemblies and that all firestop systems installed meet firestopping requirements as herein specified.

PART 2 - PRODUCTS

2.1 GENERAL

A. Firestopping materials shall meet the requirements specified herein.

B. For applications where combustible penetrants are involved, i.e. insulated or plastic pipe, a suitable intumescent material must be used.

2.2 ACCEPTABLE MANUFACTURERS

A. Specified Technologies, Inc. (STI)

B. 3M

C. Hilti, Inc.

2.3 FIRESTOP MATERIALS

A. Firestop Mortar

B. Intumescent Firestop Sealants and Caulks

C. Elastomeric Firestop Sealants and Caulks

D. Endothermic Firestop Sealants and Caulks

E. Firestop Putty

F. Rough-in Box Inserts

G. Firestop Pillows/Blocks

H. Fire Rated Pathways

I. Firestop Grommets

J. Firestop Collars

K. Wrap Strips

L. Cast in Place Devices

M. Firestop Foams

N. Composite Sheets

O. Intumescent Gaskets

PART 3 - EXECUTION

3.1 General

A. In an occupied building, permanent firestopping shall be installed within 24 hours of penetrating a fire rated assembly. If permanent firestopping cannot be installed within this time period, temporary firestop pillows/blocks are permitted, where installation allows, until permanent firestop materials can be properly installed.

3.2 INSPECTION

A. Examine the areas and conditions where firestops are to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with work until the Contractor, in a manner acceptable to the Architect has corrected unsatisfactory conditions.

B. Verify that environmental conditions are safe and suitable for the installation of the firestop products.

3.3 CONDITIONS REQUIRING FIRESTOPPING

A. General

1. Provide firestopping for conditions specified elsewhere whether or not firestopping is indicated and, if indicated whether such material is designed as insulation, safing, or otherwise.
2. All firestopping shall be installed in accordance to the UL rated system designed for the application.
3. Grout, Mortar or Gypsum based products shall not be installed in lieu of firestopping material specified herein.
4. All smoke walls (smoke barriers, smoke partitions, etc.), rated or non-rated, shall be firestopped with systems designed to maintain a minimum 1 hour rating or that which is equal to the rating of the wall.

B. Penetrations - Provide firestopping as follows:

1. Where penetrations pass through one or both surfaces of a fire rated floor or wall.
2. Where a penetration occurs through fire rated walls or partitions of hollow-type construction, provide firestopping to completely fill spaces around the penetration, on each side of the wall or partition.
3. Except for slab on grade, where penetrations pass through a non-fire rated floor.
4. The requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall opening. Upon installation of cabling through sleeve, firestop the remaining open area within the conduit.

C. Where demolition has occurred in rated walls, floors and assemblies, the material used to patch the opening shall match the material used for the assembly construction. Firestopping materials may be utilized upon approval of Architect and Engineer. Materials used shall be provided with submittals. Work performed shall be the responsibility of the Contractor whose work was removed, performed by the appropriate trade.

3.4 PREPARATION

A. Surface to receive firestop shall be free of dirt, dust, grease, oil, oil from release agents, or other matter that would impair the bond of the firestop material to the substrate or penetrating items.

B. Substrate shall be frost free.

3.5 INSTALLATIONS

A. General

1. Sleeves and core-drilled holes shall be sized at least 1-1/2" larger in diameter than penetrating items.
2. Installation of firestops shall be performed by applicators/installers qualified and trained by the Manufacturer. Installation shall be performed in strict accordance with the Manufacturer's detailed installation procedures.
3. Apply firestops in strict accordance with UL rated system designs, and Manufacturer's recommendations.
4. Coordinate with all other trades to assure that all items which penetrate fire rated construction have been permanently installed prior to installation of firestops. Schedule and sequence the work to assure that partitions and other Construction which would conceal penetrations are not erected prior to the installation of firestop.
5. Gun grade sealants and putties shall be tooled into place to insure proper adhesion to penetrations and surrounding surfaces.
6. Where existing penetrations are reused that contain remnants of existing firestop products remain, remove all existing firestopping.

B. Dam Construction

1. Install dams when required to properly contain firestopping materials within openings and as required to achieve required fire resistance rating.
2. Placement of dams shall not interfere with functions or adversely affect the appearance of adjacent construction.

C. Field Quality Control

1. Install work in full accordance with rules, regulations, and safety requirements of Federal, State, County and City authorities having jurisdiction over premises. Do not construe this as relieving Contractor from compliance with any requirements of the Specifications which are in excess of Code requirements and not in conflict therewith.
2. Correct unacceptable firestopping and provide additional inspection to verify compliance with this Specification at no additional cost.
3. Finish surfaces of firestopping that is to remain exposed in the completed work to a uniform and level condition.

3.6 LABELING

A. Where firestopping installations occur, Contractor shall provide a label adjacent to each penetration. Label shall include:

1. UL rated system used.
2. Date of installation.
3. Name of installing Contractor

B. Labels shall be furnished by the firestop manufacturer.

END OF SECTION

SECTION 230505 - HVAC EQUIPMENT MOTOR REQUIREMENTS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Motors

B. Drives and Guards

1.2 SUBMITTALS

A. Refer to Sections 23 01 00 and 23 01 01 for additional requirements.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

PART 2 - PRODUCTS

2.1 MOTORS

A. For each item of equipment requiring electric drive, provide a motor having starting and running characteristics consistent with the torque and speed requirements of the driven machine.

B. For design, construction, and performance characteristics, conform to applicable provisions of latest NEMA, IEEE, and NEC Standards.

C. Duty: Continuous duty at ambient temperature of 40 deg C.

D. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

E. For frame sizes 215T and above, furnish shouldered lifting eyebolts or cast provisions within for handling convenience.

F. Furnish with stainless steel nameplates with manufacturer's name, model number, serial number, horsepower, voltage, phase, frequency, RPM, full load amps, locked rotor amps or code, frame size, service factor, power factor, nominal full-load efficiency, bearing sizes, insulation class, and rated ambient temperature.

G. Three Phase Motors

1. Efficiency: NEMA premium efficient electric motors with efficiencies complying with NEMA MG 1 Table 12-12. Motors ¾ HP and smaller may be the equipment manufacturer's standard and need not conform to Table 12-12.
2. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
3. Thermal Protection: Conform to NEMA MG 1 requirements for thermally protected motors.
4. Insulation: Class F.
5. Service Factor: 1.15
6. Enclosure Types:

a. Open Drip Proof (ODP): Unless noted otherwise, all motors shall be ODP.
b. Totally Enclosed Fan Cooled (TEFC): Refer to equipment schedules.

7. All equipment specified to operate with variable frequency drives shall be provided with motors specifically designed for variable speed operation with high efficiency at part load conditions as required by NEMA MG-1 and with motor insulation rated for variable frequency drive operation.

a. Include a maintenance free, circumferential, conductive micro fiber shaft grounding ring to discharge shaft currents to ground (AEGIS SGR Bearing Protection Ring).
b. Motors less than 100 HP size shall be provided with a single shaft grounding ring provided on the drive end of the motor.

8. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for lubrication and suitable for radial and thrust loading.

H. Acceptable Manufacturers: Baldor, Lincoln, Marathon, or US Motor.

2.2 DRIVES AND GUARDS

A. For each item of belt driven equipment, provide an adjustable drive sheave with adjustable limits plus or minus 12-1/2 percent, based on a service factor of 1.5 as applied to motor nameplate rating. Provide drives of one horsepower and over with at least two belts, with all multiple belt sets matched. Non-adjustable drive sheaves will be acceptable for motors of 30 HP and over.

B. Provide substantial drive guard for each belt drive secured to the equipment. Provide openings in skirt guards for insertion of revolution counter at drive sheave and driven sheave centers. Provide conveniently removable coupling guard for direct driven equipment.

C. For each item of direct driven equipment which is not of extended shaft or close coupled design, provide an approved type flexible coupling.

D. Provide a typed list of belt drives, listing each item with pitch diameter, bore size, and key way dimensions of each sheave and manufacturer's replacement belt numbers. Bind lists in Operating and Maintenance Manuals.

E. Provide all necessary changes in drive sheaves and/or belts as required to obtain specified air deliveries.

PART 3 - EXECUTION

3.1 INSTALLATION

A. During submittal phase, verify all motor voltage and horsepower requirements with Division 26. Notify engineer if these do not match.

B. Install and align all motors. Prior to equipment startup recheck alignment after all piping and ductwork connections have been completed.

C. Where required, grease all motor bearings per manufacturer’s recommendations prior to equipment startup.

D. Motors shall be protected from damage and kept clean during construction. If dust collects on or in a motor, it shall be cleaned per the manufacturer's recommendations.

END OF SECTION

SECTION 230700 - HVAC INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDES

A. All labor, equipment, accessories, materials and services required to provide the following insulation systems:

1. Pipe Insulation

1.2 SUBMITTALS

A. Refer to Section 230100 and 23 01 01 for additional information.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

1.3 QUALITY ASSURANCE

A. The Insulation Contractor shall be regularly engaged in the installation of insulation systems and shall have a minimum of five (5) years of demonstrated experience in the installation of insulation systems similar in type and size.

B. Install insulation materials and accessories in accordance with the manufacturer's published instructions, recognized industry standards and this specification to ensure that it will serve its intended purpose.

PART 2 - PRODUCTS

2.1 GENERAL

A. Insulation material, performance and thickness shall comply with ASHRAE 90.1 - 2010 requirements.

B. Provide all insulation material (insulation, jackets, fitting covers, tapes, adhesives, cements, mastics, sealants, coatings and finishes) with a composite Fire and Smoke Hazard rating as tested under procedure ASTM E-84 or UL 723, not exceeding the following:

1. Flame Spread 25
2. Smoke Developed 50

C. Mastics, cements, coatings, adhesives, sealants and finishes shall be suitable for contact with the surface material for which it is applied to and rated for the working temperature of the service. All adhesives and sealants wet applied on site shall comply with chemical content requirements of the South Coastal Air Quality Management District (SCAQMQ) Rule 1168. Acceptable Manufacturers: Foster Products, Childers Products and Vimasco Corporation.

2.2 PIPE INSULATION

A. Insulation Types:

1. Fiberglass: Owens-Corning SSL II-ASJ one piece fiberglass pipe insulation with All Service Jacket and double adhesive longitudinal lap seal. Furnish as a complete system with pressure sensitive butt strip seals having factory applied adhesives. Other acceptable manufacturers: Knauf and Johns Manville.
2. Closed-Cell: Armacell AP/Armaflex Black Lapseal fiber free elastomeric tube insulation. Furnish as a complete system with contact adhesives, pressure-sensitive seam tape, prefabricated fitting covers and pre-insulated pipe hanger supports (Armacell Armafix Insulation Pipe Hanger). For non-EPDM elastomeric insulation located outdoors provide a UV resistant protective coating - Armaflex WB. Other acceptable manufacturers: K-Flex USA and Aeroflex USA, Inc.

B. Fiberglass Insulation Protection

1. PVC Fitting Covers and Jacketing System complete with premolded fiberglass inserts with vinyl vapor barrier facing, solvent weld adhesives, stainless steel tack fasteners, silicone caulking and adhesive tapes. Acceptable Manufacturers: Proto Corporation, Speedline Corporation and Zeston.
2. For fiberglass insulation installed outdoors provide aluminum jacketing system with stucco embossed finish. Thickness as follows. Acceptable Manufacturers: ITW Insulation Systems, Childers Products and RPR Products.

a. Insulation Outer Diameter (inches)	Jacketing Thickness (inch)
1) 24 or less	0.016
2) >24 thru 36	0.020
3) >36	0.024

C. Refer to Pipe Insulation Schedule on Drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Install insulation products according to manufacturer's published instructions, this specification and recognized industry standards to ensure it will serve its intended purpose.

B. Protect insulation stored on site and during delivery from damage and moisture such as rainwater and building system leaks.

C. Ensure that insulation is clean, dry, and in good mechanical condition and that all factory-applied facings are intact and undamaged. Wet, dirty, or damaged insulation is not acceptable for installation

D. Install insulation over clean dry surfaces. Install insulation subsequent to pressure testing and painting.

E. Install insulation materials with smooth and even surfaces. Rework poorly fitted joints. Do not use joint sealer or mastic as filler for joint gaps or excessive voids resulting from poor workmanship.

F. Once in place, all tape shall be sealed with a squeegee type device provided by the Manufacturer.

3.2 PIPE INSULATION

A. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Butt insulation joints firmly to ensure complete, tight fit over all piping surfaces.

B. Install insulation continuous through all sleeves and all wall, floor and ceiling penetrations. Sleeves and penetration openings shall be sized accordingly to allow application of full thickness insulation. Coordinate requirements with wall, floor and ceiling construction.

C. On exposed piping, locate insulation and cover seams in least visible locations.

D. Extend all pipe insulation through floors and countertops. Wherever subject to moisture or cleaning equipment provide 0.016 inch thick aluminum jacket of sufficient length for protection.

E. Cover exposed fiberglass pipe insulation located in mechanical rooms with PVC Jacket System. System to include straight runs, fittings, valves, flanges, etc.

F. Seal fiberglass pipe insulation longitudinal seams with integral lap seal and butt joints with butt strips. Taper all insulation ends, seal and cover with glass cloth. Insulate valve bodies, fittings, strainer bodies and flanges using premolded fiberglass inserts with PVC Fitting Covers.

G. Install insulation continuous through all pipe hanger locations with circumferential insulation joint made outside the hanger. Piping shall be supported in such a manner that the insulation is not compromised by the hanger or the effects of the hanger. Include hanger accessories as follows:

1. Chilled water piping and piping with a possibility of condensation (2-1/2 inches and larger) - provide thermal break between piping and hanger by use of an insulation protection shield with polyisocyanurate hard block insulation, capable of supporting the weight of the filled piping system. Polyisocyanurate insulation thickness shall match the adjacent pipe insulation thickness. Wood blocking is not acceptable.

H. Insulation system for chilled water piping and all piping with a possibility of condensation shall be continuous and provided with a vapor barrier jacket with vapor seal integrity maintained throughout the entire system, including valves and fittings.

1. Longitudinal seams shall be vapor sealed with factory-applied pressure-sensitive adhesive vapor retarder, self-sealing lap. All circumferential joints shall be vapor sealed with factory-furnished, matching pressure-sensitive butt strip seals. Coat all raw edges of pipe insulation with vapor retarder mastic extending onto the adjacent insulation jacketing a minimum of 2 inches.
2. PVC Fitting Covers, installed on fiberglass insulation systems are not vapor barriers. It is important that a separate vapor barrier is intact below and prior to installation of PVC Fitting Covers.
3. Cover valve bodies, unions and strainer cleanouts with prefabricated 1" thick closed-cell insulation, suitable for removal without damaging the permanent adjacent pipe insulation. All insulation shall be form fitted and tight to surface to prevent condensation.
4. Insulate chilled water system thermometer and pressure gage extensions with ½" thick closed-cell insulation.

I. Provide aluminum jacketing system for fiberglass pipe insulation installed outdoors. Install per Manufacturer's recommendations to ensure a continuous weatherproof system.

3.3 FIELD QUALITY ASSURANCE

A. Upon completion of all insulation work covered by this specification, visually inspect the work and verify that it has been correctly installed. This may be accomplished while work is in progress to assure compliance with requirements to cover and protect insulation materials during installation.

3.4 PROTECTION

A. Replace damaged insulation which cannot be satisfactorily repaired, including insulation with vapor barrier damage and moisture-saturated insulation.

B. Maintain the integrity of factory-applied vapor barrier jacketing on all insulation, protecting it against puncture, tears or other damage.

C. The insulation installer shall advise all other trades as to requirements for protection of the insulation work during the remainder of the construction period, to avoid damage and deterioration of the finished insulation work.

END OF SECTION 230700

SECTION 230900 - HVAC INSTRUMENTATION AND CONTROL

PART 1 - GENERAL

1.1 WORK INCLUDES

A. The BAS work shall consist of the provision of all labor, materials, tools, equipment, software, software licenses, software configurations and database entries, interfaces, wiring, installation, labeling, engineering, calibration, documentation, samples, submittals, testing, commissioning, training services, permits and licenses, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in these Division documents which are required for a complete, fully functional and commissioned BAS meeting the specified sequence of operation.

B. A fully integrated building automation system (BAS), incorporating direct digital control (DDC) for energy management, equipment monitoring and control.

C. INCLUDE THE FOLLOWING FOR CLEVELAND CLINIC PROJECTSThe BAS system shall be an extension of the existing Lincoln-West High School (Cleveland Public Schools) Management Network as manufactured by Honeywell. This contractor shall be responsible for providing all communication hardware, software and database necessary for seamless integration between the new DDC System and the existing workstations.

D. All wiring, conduit and panels for all temperature controls.

E. Controls installer shall be responsible for all electrical work associated with the BAS control system.

1. All wiring incidental to this temperature control system shall be provided by the BAS Installer.
2. The term "Wiring" shall be construed to include furnishing of wire, conduit, miscellaneous materials and labor as required for mounting and connecting electrical control devices, and providing electrical interlocks between equipment.
3. IMPORTANT THAT NUMBER OF CIRCUITS AND JUNCTION BOXES IS COORDINATED WITH THE ELECTRICAL ENGINEER. ON LARGER PROJECTS, CONSIDER USING A TEMPERATURE CONTROL POWER CENTRAL DISTRIBUTION CONTROL CABINET - COORDINATE WITH TECHNICAL MANAGER AND ELECTRICAL ENGINEER. IF USED, EDIT THE FOLLOWING.Division 26 work includes 120 volt, 20 amp circuits and circuit breakers from normal and/or emergency power terminated at junction boxes, only where indicated on the Electrical Drawings. Controls Contractor is responsible for additional line voltage power as required for control system.
4. Provide all control transformers as required for control system.
5. Conceal all wiring in occupied finished spaces.

F. Preparing Submittals and Shop Drawings for all hardware and software and submit within 30 days of the award of Contract.

G. Providing all stand-alone BAS panel hardware and related peripherals, including interconnecting cabling and power supply required.

H. Providing all field devices including remote input/output devices, sensors, transmitters, relays, contactors, transducers, and associated electronics required to effect all interfaces.

I. Providing all communications hardware necessary for implementing data links between the BAS panel(s) and all field devices.

J. Providing all specified software required to implement a complete and operational BAS, including verification and graphics of systems.

K. Furnishing complete Operating and Maintenance Manuals, and field training of operators and maintenance personnel.

L. Accomplishing all factory and field acceptance tests as indicated.

M. Graphics for operator workstations. Indicate via floor plans the location of mechanical equipment. The operator shall be viewing/controlling these systems via graphical displays.

N. System commissioning, checkout and Owner training.

1.2 USE THE FOLLOWING FOR CLEVELAND CLINIC PROJECTS. REVISE FOR OTHER PROJECTS BASED ON INPUT FROM PIC.APPROVED CONTROL SYSTEM CONTRACTORS AND MANAGERS

A. AGM Energy Services (Honeywell). Mr. Jacob Puschel, Operations Manager, 419-852-7730, jpuschel@agmenergyservices.com

1.3 SUBMITTALS

A. Refer to Section 230100 and 23 01 01 for additional information.

B. Submit complete temperature control Shop Drawings, including control diagrams, sequence of operation and component specification data prior to installation or fabrication of any equipment. Submittal data shall include a schedule of all devices and materials to be installed. Submittals shall also include all control devices, control panel and communication wiring diagrams.

C. Deviations in details from the specified sequence of operation shall be clearly noted on the submittal.

1.4 COORDINATE THE FOLLOWING WITH SPECIFICATION SECTION 233000 - HVAC AIR DISTRIBUTION.QUALITY ASSURANCE

A. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.

B. All BAS controllers shall be UL Listed at the time of bid.

1.5 SERVICE AND GUARANTEE

A. The BAS Supplier shall be fully responsible for the debugging, calibration and proper operation of the Building Automation System, including but not limited to, sensors, controls, communication links, and peripheral devices.

B. The BAS Supplier shall also be fully responsible for providing and loading the specified software packages, to include the loading of all necessary operational parameters. Any debugging of software shall be performed solely by the BAS Supplier.

C. The BAS system shall be designed and installed, commissioned and serviced by factory trained personnel. BAS contractor shall have an in-place support facility within 100 miles of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment. The BAS contractor shall provide an experienced project manager for this work, responsible for direct supervision of the design, installation, start up and commissioning of the BAS The Bidder shall be regularly engaged in the installation and maintenance of BAS systems and shall have a minimum of ten (10) years of demonstrated technical expertise and experience in the installation and maintenance of BAS systems similar in size and complexity to this project.

D. Warrant labor and materials for specified control system free from defects for a period of 12 months after final acceptance. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request.

E. Work shall have a single warranty date, even if Owner receives beneficial use due to early system start-up. If specified work is split into multiple contracts or a multi-phase contract, each contract or phase shall have a separate warranty start date and period.

F. Provide updates to operator workstation software, project-specific software, graphic software, database software, and firmware that resolve Contractor identified software deficiencies at no charge during warranty period. If available, Owner can purchase in-warranty service agreement to receive upgrades for functional enhancements associated with the above-mentioned items. Do not install updates or upgrades without Owner's written authorization.

1.6 TRAINING

A. Provide competent instructors to instruct Owner's designated personnel in the adjustment, operation and maintenance of the system installed. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach.

1. All training shall be held during normal working hours, 8:00 a.m. to 4:30 p.m. weekdays or as requested by the Owner:

B. Provide forty (40) hours on-site and sixteen (16) hours off-site Classroom training for Owner's operating personnel. Training shall include:

1. Explanation of Drawings, Operations and Maintenance Manuals.
2. Walk-thru of the job to locate control components.
3. Direct Digital Controller and Application Specific Controller operation/function.
4. Explanation of adjustment, calibration and replacement procedures.

PART 2 - PRODUCTS

2.1 BUILDING AUTOMATION SYSTEM AND DEVICE INTEGRATION

A. The building automation system (BAS) shall integrate multiple functions of the building including equipment supervision and control, alarm management, energy management, historical data collection and lighting control.

B. All new field controllers shall be BTL certified

C. All OEM controllers shall include BACnet MSTP/IP communications. Manufacturer shall furnish PICS state with equipment submittal.

D. Contractor shall ensure the Owner is delivered an open, non-proprietary system which can be serviced by any authorized integrator.

E. Integrator is responsible for creation of graphics, equipment schedules, system alarming, trending and any material or programming required to create an active connection between device controllers and systems. This interface must allow all hard-wired I/O and any user adjustable points readable, discoverable and writable.

F. All JACE Controllers shall be Series 8000.

G. Air-cooled chiller is provided with Building Automation System Interface: Temperature Control Contractor shall interface with packaged chiller BACnet controls. BAS will allow resetting of chilled water temperature and start/stop of chiller from operator's workstation. Refer to drawings for additional information.

PART 3 - EDIT THE FOLLOWING FOR THE PARTICULAR PROJECT.EDIT THE FOLLOWING ON A PER PROJECT BASIS.EDIT THE FOLLOWING ON A PER PROJECT BASIS.VALVES IN MEDIUM AND HIGH PRESSURE STEAM SYSTEMS SHALL HAVE PRESSURE RATING CORRESPONDING TO FITTINGS IN SECTION 230300 - BASIC MATERIALS AND METHODSIN THE FOLLOWING, UTILIZE MOLDED SYNTHETIC BEARINGS FOR ALUMINUM DAMPERSIN THE FOLLOWING, CD60 IS STEEL AND CD50 IS ALUMINUMFOR ABOVE PROVIDE APPROXIMATELY 1 SENSOR FOR EVERY 10,000 SQ. FT. OF FLOOR SPACE. WHEN DIRECT FIRED MAKE-UP AIR UNITS ARE UTILIZED, PROVIDE NITROGEN DIOXIDE (NO2) SENSORS IN LIEU OF CO2 SENSORS FOR DIESEL MONITORING.IN THE FOLLOWING, ENGINEER SHALL VERIFY WITH OWNER OR ARCHITECT WHERE THERMOSTATS, SPACE SENSORS AND/OR HUMIDISTATS MUST BE PROTECTED BY VENTED, LOCKABLE GUARD ENCLOSURE. INDICATE GUARD ENCLOSURE LOCATIONS ON THE DRAWINGSDETERMINE MOTOR HP AND COORDINATE WITH ELECTRICAL ENGINEER. IF DUPLEX AIR COMPRESSOR IS UTILIZED COORDINATE BOTH MOTORS RUNNING TOGETHERCOORDINATE THE FOLLOWING WITH SECTION 230548 - HVAC VIBRATION ISOLATION. RUBBER-IN-SHEAR VIBRATION ISOLATION MOUNTING PADS.COORDINATE A DEDICATED 120 VOLT CIRCUIT WITH ELECTRICAL ENGINEER. EXECUTION

3.1 GENERAL REQUIREMENTS

A. General

1. Install equipment, and wiring/raceway parallel to building lines (i.e., horizontal, vertical, and parallel to walls) wherever possible.
2. Install all equipment in readily accessible locations as defined by the National Electrical Code (NEC).
3. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

4. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.
5. As soon as the systems are operable, all controls, sensors and switches shall be properly calibrated.
6. Furnish and mount all relays, switches, pressure switches, extra contacts, as required in enclosures.
7. Each instrument shall be tagged by the use of embossed tape, corresponding to the symbol used on the control diagrams. Each Control panel and controller shall be identified by engraved nameplate.
8. Provide all line voltage temperature control devices. Wherever such devices are shown on electrical drawings, they shall be wired by Division 26; when not indicated on electrical drawings, they shall be wired by controls installer.
9. All controllers shall be provided with necessary contacts and devices for remote control point adjustment.
10. Provide all initial schedules and setpoints per the Owner's direction. All setpoints and schedules shall be adjustable.
11. All room names and numbers in the BAS interface shall be adjustable and shall be updated to match the final room names and numbers of the project.

3.2 THE FOLLOWING IS AN ASHRAE 90.1 - 2010 REQUIREMENT. THERE ARE EXCEPTIONS, MANY OF WHICH APPLY TO OUR PROJECTS WHERE WIDE TEMPERATURE RANGES ARE NOT ACCEPTABLE. SEE ASHRAE 90.1 - 2010, 6.4.3.1.2 FOR ADDITIONAL INFORMATION. SUGGEST INCLUDING THIS SENTENCE BECAUSE IT SAYS "CAPABLE OF" AND DESCRIBING ANY TYPE OF DEAD BAND IN THE SEQUENCE OF OPERATION.Wiring:

A. All control and interlock wiring shall comply with national and local electrical codes and Divisions 26of this specification.

B. All NEC Class 1 (line voltage) wiring shall be UL Listed in approved conduit according to NEC and Divisions 26 requirements.

C. All low-voltage wiring shall meet NEC Class 2 requirements. (Low-voltage power circuits shall be sub fused when required to meet Class 2 current limit.)

D. Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling return air plenums, approved cables not in conduit may be used provided that cables are UL Listed for the intended application. For example, cables used in ceiling plenums shall be UL Listed specifically for that purpose.

E. All wiring in mechanical, electrical, or service rooms—or where subject to mechanical damage— shall be installed in conduit.

F. Do not install Class 2 wiring in conduit containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment may not be used for low-voltage wiring except for the purpose of interfacing the two (e.g., relays and transformers).

G. Do not install wiring in conduit containing tubing.

H. Where plenum rated cable is run exposed, wiring is to be run parallel along a surface or perpendicular to it and neatly tied at 10 ft intervals.

I. Where plenum rated cable is used without conduit, it shall be supported from or anchored to structural members. Cables shall not be supported by or anchored to ductwork, electrical conduits, piping, or ceiling suspension systems.

J. All wire-to-device connections shall be made at a terminal block or wire nut. All wire-to-wire connections shall be at a terminal strip or wire nut.

K. All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

L. Maximum allowable voltage for control wiring shall be 120 V. If only higher voltages are available, the contractor shall provide step-down transformers or interposing relays.

M. All plenum rated wiring shall be installed as continuous lengths, with no splices permitted between termination points

N. All wiring in conduit shall be installed as continuous lengths, with no splices permitted between termination points or junction boxes.

O. Maintain fire rating at all penetrations. Install plenum wiring in sleeves where it passes through walls and floors.

P. Size and type of conduit and size and type of wire shall be the responsibility of the contractor, in keeping with the manufacturer's recommendations and NEC requirements, except as noted elsewhere.

Q. Conceal all conduit, except within mechanical, electrical, or service rooms. Install conduit to maintain a minimum clearance of 6 in. from high-temperature equipment (e.g., steam pipes or flues).

R. Secure conduit with conduit clamps fastened to the structure and spaced according to code requirements. Conduit and pull boxes may not be hung on flexible duct strap or tie rods. Conduits may not be run on or attached to ductwork.

S. Adhere to this specification's Divisions 26 requirements where conduit crosses building expansion joints.

T. The Contractor shall terminate all control and/or interlock wiring and shall maintain updated (as-built) wiring diagrams with terminations identified at the job site.

U. Flexible metal conduits and liquid-tight, flexible metal conduits shall not exceed 3 ft in length and shall be supported at each end. Flexible metal conduit less than 1/2 in. electrical trade size shall not be used. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal conduits shall be used.

V. Conduit must be adequately supported, properly reamed at both ends, and left clean and free of obstructions. Conduit sections shall be joined with couplings (according to code). Terminations must be made with fittings at boxes, and ends not terminating in boxes shall have bushings installed.

3.3 Communication Wiring:

A. All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.

B. Do not install communication wiring in raceway and enclosures containing Class 1 or other Class 2 wiring.

C. Maximum pulling, tension, and bend radius for cable installation, as specified by the cable manufacturer, shall not be exceeded during installation.

D. Contractor shall verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable.

E. When a cable enters or exits a building, a lightning arrestor shall be installed between the lines and ground. The lighting arrestor shall be installed according to the manufacturer's instructions.

F. All runs of communication wiring shall be unspliced length when that length is commercially available.

G. All communication wiring shall be labeled to indicate origination and destination data.

3.4 TESTING AND DEMONSTRATION

A. General

1. Whenever seasonal operating portions of the system occur at a time when final control settings and adjustments cannot be properly made due to outside weather conditions (cooling or heating), such final retesting and rebalancing as required shall be made during the first full load operating conditions of the respective seasons.
2. Demonstration: Upon complete installation and testing of the system, the controls installer shall demonstrate to the satisfaction of the Engineer that all requirements of the installation have been fulfilled as specified.

B. Testing and Balancing

1. The installation, programming, establishment of initial setpoints and debugging of all control systems is the responsibility of the controls supplier. The testing and balancing of the entire HVAC system including the temperature control system is the responsibility of the balancing agency.
2. During the testing and balancing phase of work, the controls supplier shall provide a technician to assist the balancing agency in the operation of the control system to establish the mode of operation required to properly test and balance the HVAC system and test and verify temperature control system operation.
3. Programming or setpoint changes required as a result of system analysis and balancing shall be made by the controls supplier.
4. Acceptance of tests by the Architect shall not relieve controls supplier of any responsibility for the complete system meeting the requirements of these Specifications after installation.

INCLUDE THE FOLLOWING FOR PNEUMATIC SYSTEMSINCLUDE FOR CLEVELAND CLINIC PROJECTSADD AS REQUIRED FOR PROJECTEND OF SECTION

SECTION 232000 - HVAC PIPING AND ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Pipe and Fittings
B. Valves
C. Air Vents
D. Unions
E. Thermometers
F. Pressure Gauges
G. Floor and Wall Plates
H. Sleeves
I. Inserts, Hangers and Supports
J. Markers and Tags
K. Welding
L. Cleaning
M. Piping Pressure Tests

1.2 SUBMITTALS

A. Refer to Section 230100 and 23 01 01 for additional information.
B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES. Exceptions: Floor, Ceiling and Wall Plates, Sleeves,

1.3 CONSTRUCTION DOCUMENTATION

A. Refer to Section 230101.
B. Submit pipe cleaning and pressure test documentation upon completion of cleaning and testing. Include final copies in the Operating and Maintenance Manuals.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Chilled water - Schedule 40 black steel (ASTM A53)
B. Fittings for black steel pipe.

1. Chilled Water - 125 PSIG, black cast iron screwed fittings on sizes through 2 inches and standard factory formed welding fittings on sizes over 2 inches. Flanges shall be Class 150 steel.

C. Fittings for copper pipe - Wrought copper solder joint type ASTM B16.22. Where silver brazing alloy is used to join pipe and fittings, fittings to be suitable for brazing.

2.2 VALVES

A. Provide all valves of the same manufacturer where possible. Manufacturers: Apollo, Milwaukee, NIBCO, Hammond, Spence (steam only) or Watts. All valves to be of domestic manufacture.

B. Steel and copper hydronic systems:

1. Shutoff and drain valves 2 inches and smaller: two-piece ball valves with cast bronze body, Teflon seats, conventional port, blow-out proof stem, adjustable packing gland, 316 stainless steel solid ball and stem, soldered or threaded ends, minimum 150 WSP, 600 WOG. Milwaukee BA-150S.
2. Shutoff valves 2-1/2 inches and larger: butterfly type, Class B cast iron body, stainless steel stem, aluminum bronze disc, and EPDM liner; 175 WOG. Lug type with lug drilled and tapped, extended neck. Operators: on-off throttling lever handles on sizes 2-1/2 inches to 6 inches, totally enclosed worm gear or Acme screw operators with hand wheel on sizes 8 inches to 20 inches. Equip valves used for balancing with memory stop. Milwaukee ML123E Series.

C. Valve Chain Operator: Provides for remote operation of valves. Sprocket rim attaches to valve wheel. Furnish with chain and chain guide. Sprocket rim constructed of cast iron. Chain guide constructed of malleable iron. Chain constructed of steel. Handwheel to match valve. Provide chain operators for valves located more than 10 feet above floor or as indicated.

D. Equip valves used for balancing with memory stop.

E. Equip valves with locking handle suitable of being locked in the full open or full closed position where indicated. Locking handle design shall accommodate a standard 5/16" pad-lock.

F. Water Pressure Relief Valve:

1. ASME labeled. Working pressure: 126 PSIG. Maximum operating temperature: 250 degrees F. The fluid should not discharge into the spring chamber. Valve body cast iron. Valve seat and all moving parts exposed to fluid shall be of nonferrous material.
2. Manufacturer: ITT Bell and Gossett or equivalent by Armstrong, Taco or Watts.

2.3 AIR VENTS

A. Make provisions for elimination of air from high points on all piping or equipment in closed loop water systems.

B. Air vents on piping mainsand equipment: ball valves 3/8 inch or 1/2 inch size, minimum 150 WSP, 600 WOG.

2.4 UNIONS

A. Unions in steel piping 2 inches and smaller, malleable iron, ground joint brass to iron seat suitable for 175 PSI working pressures.

B. Unions in copper piping 2 inches and smaller, cast brass solder fittings with machined and lapped seats suitable for 175 PSI working pressures.

C. Unions on all piping 2-1/2 inches and larger: Use flanged connections. Gaskets used with flanged fittings: 1/16 inch thick, ring type, compressed graphite sheet.

2.5 THERMOMETERS

A. Provide thermometers in piping at following locations:

1. Refrigeration machine chilled water inlet and outlet.
2. Where additionally indicated.

B. Thermometers: Blue color spirit filled glass type industrial thermometer with 9 inch Fahrenheit scale of proper range for service indicated, glass covered case with magnified liquid column, separable well, straight or angle mounted as required.

1. Bi-metal dial type thermometers may be supplied in lieu of spirit filled type.
2. Thermometers located below 6'-0" level: Spirit filled type with 9 inch scale, forward or straight type as required by project conditions. Thermometers serving locations above 6'-0" level to be dial type with remote bulb. Mount 4 inch diameter dials 5'-6" above floor on bracket at appropriate location.

C. Select scale ranges so temperature will fall approximately at mid-scale.

D. Manufacturers: Weiss Instruments, or equivalent by Trerice, Taylor or American.

2.6 PRESSURE GAUGES

A. Provide a steam gauge ahead of and after each pressure reducing valve. Provide gauges in the suction and discharge of all air cooled chillers. Provide gauges having proper ranges as required by conditions. Gauges to have 4-1/2 inch diameter dials, cocks, snubbers, and siphons.

B. Select scale ranges so pressure condition will fall approximately at mid-scale. Manufacturer: Trerice or equivalent by American Consolidated, Marsh or Ashcroft.

2.7 FLOOR AND WALL PLATES

A. Fit all pipe passing exposed through walls, or floors, or with steel or brass escutcheons. Where surface is to receive a paint finish make escutcheons prime painted; otherwise make escutcheons nickel or chrome plated. Where piping is insulated, fit escutcheons outside insulation.

2.8 SLEEVES

A. Where pipes pass through masonry or concrete walls, set Schedule 40 steel pipe sleeves 1 inch larger than outside diameter of pipe, with ends of sleeves flush with wall faces. Sleeves in walls other than masonry or concrete where firestopping is required: machine cut steel pipe or galvanized steel sheet sleeves as required by UL rated system penetration assembly.

B. Where pipes pass through floors above grade, set Schedule 40 galvanized steel pipe sleeves 1 inch larger than the outside diameter of the pipe. Top of sleeve to be 4 inches above finished floor in machine rooms and wet floor locations.

C. Where pipes are insulated, provide sleeves large enough to allow insulation to pass through sleeve. Center pipes in sleeves.

D. Set sleeves true to line, grade; position and plumb or level and so maintain throughout construction period.

E. Where concrete or masonry walls are core drilled for pipe passage steel sleeves are not required.

F. Provide fire stopping between pipe and sleeve or opening as required to maintain the integrity of the fire rating of all walls and floors.

2.9 INSERTS, HANGERS, AND SUPPORTS

A. Manufacturer: Basis of design shall be Anvil. Other acceptable manufacturers include Mason, Modern or Erico/Caddy.

B. Provide all inserts, hangers, anchors, guides and supports to properly support and retain piping, to control expansion, contraction, anchorage, drainage and prevent sway and vibration.

C. Provide inserts for support of work in concrete construction.

D. Provide forged steel beam clamps when attaching to steel construction.

E. Provide supplementary steel angles, channels, and plates where supports are required between building structural members, span the space and attach to building structural members by welding, bolting or anchors.

F. Provide hangers, rollers, threaded rods, turnbuckles, saddles, insulation protectors, anchors, and all other miscellaneous specialties for the attachment of hangers and supports to structure.

1. For up to 3/4 inch diameter rod: Anvil Figure 92, 93, or 94 beam clamps.
2. For 7/8 inch and 1 inch diameter rod: Anvil Figure 134 beam clamp with Anvil Figure 290 eyenut.
3. Pressed steel beam clamps are not permitted.

G. Provide rods, angles, rails, struts, brace plates, and platforms required for suspension or support of piping, conduit and equipment.

H. Support individual piping from hangers as follows:

1. Uninsulated piping 2 inches and smaller - Anvil Figure 69 galvanized, carbon steel adjustable swivel ring.
2. Uninsulated piping 2-1/2 inches and larger - Anvil Figure 260 carbon steel adjustable clevis hanger.

3. Copper tubing (uninsulated) - Anvil Figure CT-69 copper plated, carbon steel adjustable swivel ring.
4. Insulated piping 2 inches and smaller - Anvil Figure 260 carbon steel adjustable clevis hanger with the following to protect against insulation compression:

   a. Fiberglass insulation: Anvil Figure 167 18 gage galvanized steel shield between hanger and insulation, minimum 12" long.
   b. Closed-cell insulation: Preinsulated pipe hanger supports matching adjacent insulation.

5. Insulated piping 2-1/2 inches and larger (except chilled and cold water piping) - Anvil Figure 260 carbon steel adjustable clevis hanger with Anvil Series 160 pipe covering protection saddle. Provide specific Figure No. depending on insulation thickness.
6. Chilled water piping 2-1/2 inches and larger - Anvil Figure 260 carbon steel adjustable clevis hanger with Anvil Figure 167 18 gage galvanized steel shield, minimum 12" long. Provide hard block non-conducting type saddles, 180 degree segments, between shield and pipe. Saddle length shall match shield length. Saddle thickness shall match insulation thickness.
7. Rollers - Where thermal movement causes a hanger rod to deviate more than five degrees from the vertical or where longitudinal expansion may cause a movement of more than 1/2 inch in the piping, provide Anvil Figure 171, 175 or 181 pipe roller hangers or chairs. Install with pipe covering protection saddles.

I. Hanger spacing (steel pipe)

J.

	PIPE SIZE	MAXIMUM SPACING	MINIMUM ROD DIAMETER
1.	Up to 1"	6'	3/8"
2.	1-1/4"	8'	3/8"
3.	1-1/2", 2"	10'	3/8"
4.	2-1/2", 3"	12'	1/2"
5.	4", 5"	12'	5/8"
6.	6"	12'	3/4"
7.	8"	12'	3/4"
8.	10", 12"	12'	7/8"

K. Provide additional lock nut on each threaded support rod.

L. Provide additional hanger support within two feet of each elbow and at valves, strainers and other equipment in pipe lines.

M. Support copper pipe at intervals of not over 10 feet for 1-1/2 inch and larger, and not over 5 feet for 1-1/4 inch and smaller. Provide additional supports where necessary to maintain proper alignment.

N. Support vertical pipe risers with friction clamps at least at alternate floors.

O. Trapeze hangers may be used for multiple runs of piping. Construct of a steel channel with adjustable hanger rods. Determine hanger spacing by the smallest pipe supported. Install all piping free for independent movement on the trapeze hanger. Provide insulation protection saddles as specified for individual pipe support.

P. Do not support piping from another pipe or ductwork. Do not support piping or ductwork from conduit. Do not support ceiling framing or lighting from piping. Do not support any item from metal roof deck.

Q. Provide support saddles where pipes are insulated. All insulation shall be continuous through all hangers.

R. Where fireproofing is removed or damaged to allow attachment to building structural members, repair to maintain integrity of fireproofing.

2.10 MARKERS AND TAGS

A. Pipe Markers

1. Each marker background shall be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identifications of Piping Systems" (ANSI A13.1).
2. Flow direction arrows shall be included on each marker.
3. Snap-around markers shall be used for overall diameters up to 6" and strap-around markers shall be used above 6" overall diameters.
4. Underground pipe markers shall be detectable tape, color coded and labeled same as indoors.
5. Acceptable Manufacturers: Seton Nameplate Company, Marking Services Inc.

B. Valve Tags

1. Tags shall be 2" diameter, 1/16" thick, multilayered acrylic with engraved letters.
2. Lettering shall be ¾" high for type service and ½" for number. Tag shall indicate service and valve number. Letter and number designations shall be coordinated with the Owner.
3. Each service shall be a different color in conformance with the "Scheme for the Identifications of Piping Systems" (ANSI A13.1).
4. Tag shall be attached with chain similar to Seton No. 16 stainless steel jack chain. Use of beaded chain or wire is not acceptable.
5. Acceptable Manufacturers: Seton Nameplate Company, Marking Services Inc.

PART 3 - EXECUTION

3.1 GENERAL PIPING INSTALLATION

A. Drawings (floor plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.

B. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

C. Provide shutoff valves at all branch connections to main, at each piece of apparatus, and in mains to sectionalize the systems and elsewhere as indicated.

D. Install butterfly valves with the stems at the horizontal position and the handle pointing in the direction of flow.

E. Install all valves and equipment with unions or flanges or grooved couplings to facilitate removal.

F. Provide hose end drain valves with cap at all low points, trapped sections and on equipment side of all branch valves to permit draining of all or part of liquid piping systems. Install valves at high points of equipment and piping to allow venting.

G. Pipe equipment drip bases to nearest drain.

H. Locate covered piping a sufficient distance from walls, other pipe, ductwork, or other obstacles, to permit application of the full thickness of insulation specified; if necessary, use extra fittings and pipe.

I. Use Dielectric Connectors where pipe materials change from ferrous to copper.

J. Make piping connections to equipment indicated.

K. Install all piping, including shut-off valves to equipment line size with reduction in size being made only at inlet to equipment. Install outlet piping from equipment, including dirt pockets, full size of outlet connection. Increase to line size and install piping, check valves, strainers and shut-off valves line size.

L. Plug open ends of pipe or equipment at all times during installation to keep dirt and foreign material out of system.

M. Arrange and install all pipes, valves, cleanouts, access openings and equipment so as to be accessible for service. Locate equipment to maintain clearances for tube, coil pulling, periodic servicing.

N. Unless otherwise specified, make branch connections in welded steel piping less than 2/3 of main size with weldolets, butt, or threaded type. Make branch connections 2/3 of main size and larger with weld tees, laterals, or crosses. Shaped nipples are not acceptable.

O. Make reductions in piping lines with reducing coupling or weld fitting reducer.

P. Support piping so as not to place a strain on valves or equipment.

3.2 WELDING

A. Install all pressure piping systems to conform to requirements of State Piping and Welding Codes where applicable.

1. Perform any pipe welding not covered by code by certified welders according to code procedures.
2. Construct, install, and inspect all pressure piping systems according to the requirements of Ohio Pressure Piping System Rules, Chapter 4101:8.

3.3 JOINTS

A. All pipes must be reamed and cleaned before assembly. Apply pipe compound to male end of threaded joints. Make all welded joints as previously specified.

B. Assemble black steel pipe 2-1/2 inches and larger with welded joints, flanged joints or mechanically grooved joints, except for steam and condensate which shall be welded or flanged.

C. Assemble black steel pipe 2 inches and smaller with welded or screwed joints.

D. Assemble copper pipe with soldered joints. Make all soldered connections on copper piping by cleaning, fluxing, and soldering with 95-5 tin-antimony solder, except where a silver brazing alloy is specified.

3.4 INSTALLATION OF HYDRONIC PIPING SYSTEMS

A. Run mains in general as indicated. Where lines are reduced in size, eccentric reducing fittings to align top of all mains shall be used to prevent air pockets. Branch connections from mains to risers and equipment below mains shall be taken from the bottom of the main and provided with at least three elbow joints for expansion. Supply run outs shall pitch down away from main 1 inch in 5'-0".

B. Branch connections from mains to risers and equipment above mains shall be taken from the top of main. Supply runouts shall pitch up away from main 1 inch in 5'-0". Return runouts shall pitch down to main 1 inch in 5'-0". Mains to be provided with necessary loops or swing pieces where necessary to allow for expansion. Furnish and install hose end drain valves at all low points of the system.

C. Install air vents at the high points in all piping, in all equipment for complete air elimination from the system. Air vents are to be provided on supply mains or risers where indicated or otherwise needed due to rise in elevation of mains. All air vents shall be accessible for maintenance.

D. Install all air vents on air chambers made from pipe and fittings.

E. Provide a shutoff valve in the supply to each chiller and a balancing valve in the return line. Balancing device shall also serve as a shutoff valve.

3.5 CLEANING

A. Provide chemical cleaning for piping systems with an approved detergent to remove pipe dope, slushing compounds, oils, welding slag, loose mill scale and other extraneous materials. All flushing and cleaning shall be scheduled and documented. Include copy of flushing/cleaning report in the Operating and Maintenance Manual.

1. Fill hydronic systems with clean water and flush; refill with clean water to which proper amount of detergent has been added, circulate for at least 8 hours. Drain system and flush with clean cold water. Add water treatment at this time.

B. After initial period of operation clean all strainers.

3.6 PIPING PRESSURE TESTS

A. All piping shall be given the following pressure test without pressure drop. Equipment which would be damaged by the required test pressure shall be isolated from the system during test.

B.

	SERVICE	MEDIUM	(PSI)	HRS.
1.	Chilled Water	Water	125	6

C. Correct minor leaks in welded joints by chipping out weld and rewelding. Correct leaks in screwed joints by replacing thread or fitting or both. Caulking of threaded joints is not permitted. Repair leaks in copper tubing by sweating out joints, thoroughly cleaning both tube and fitting, and resoldering.

D. Perform all tests before piping is concealed or covered.

E. Be responsible for completely draining the systems after hydrostatic tests are performed. Any damage from freezing prior to acceptance of the completed installation shall be repaired at no additional cost to the Owner.

F. All tests shall be scheduled and documented. Include copy of the piping system pressure test reports in the Operating and Maintenance Manual.

3.7 SYSTEM IDENTIFICATION

A. Pipe Markers

1. Identify each new and existing pipe in Equipment Rooms, above accessible ceilings and in accessible shafts.
2. Markers shall be located:

    a. Adjacent to each valve.
    b. At each branch.
    c. At each cap for future.
    d. At each riser takeoff.
    e. At each pipe passage through wall (each side).
    f. At each pipe passage 20' - 0" intervals maximum.
    g. At each piece of equipment.
    h. At all access doors.
    i. A minimum of one (1) marker shall be provided at each room.

B. Valve Identification

1. Identify all valves with tags attached with chain. Local valves need not be tagged. All valves shall be designated by distinguishing numbers and letters carefully coordinated with a valve directory. All letter and number designations shall be coordinated with the Owner.
2. Designations and locations shall be accurately recorded on the Record Drawings.
3. At completion of project, provide, under Plexiglass, giving number of valve , service, building location by column coordinates, floor location, manufacturer's figure number, size, and equipment controlled. For service, use designation shown in legend on drawings. Mount where directed by Owner.
4. At completion of project, provide a minimum of two (2) framed valve directories, under Plexiglass, giving number of valve , location and purpose. It shall state other necessary information such as the required opening and closing of another valve when one valve is to be opened or closed. Mount where directed by Owner.

C. Valve Data Base.

1. Provide a valve data base for all valves to operate on the building computer.
2. Every valve shall include.

    a. Tag Number
    b. Service (Chilled Water, etc.)
    c. Size
    d. Operation
    e. Location
    f. Manufacturer
    g. Model Number
    h. Submittal Reference

END OF SECTION

CLEVELAND METROPOLITAN SCHOOL DISTRICT
LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

SECTION 236000 - CENTRAL COOLING EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Outdoor Packaged Air Cooled Chillers

1.2 SUBMITTALS

A. Refer to Section 230100 and 23 01 01 for additional information.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

1.3 QUALITY ASSURANCE

A. Conform to the following requirements:

1. American Society of Heating, Refrigerating, & Air Conditioning Engineers (ASHRAE) Compliance. Fabricate and install chillers to comply with ASHRAE 15 "Safety Code for Mechanical Refrigeration."
2. Underwriters' Laboratories, Inc. (UL) Compliance. Fabricate chillers to comply with UL 465 "Central Cooling Air Conditioners."
3. American Society of Mechanical Engineers (ASME) Compliance. Fabricate and stamp chillers to comply with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.
4. American National Standards Institute (ANSI)/ASHRAE 90A - Energy Conservation in New Building Design.
5. ANSI/ASME B31.S-1983 ASME Code for Pressure Piping and Refrigeration Piping.
6. Underwriters' Laboratory (UL) 984 - Safety Standards for Hermetic Motor Compressors.
7. Air Conditioning and Refrigeration Institute (ARI) Standard 550/590-98: Water chilling packages using the vapor compression cycle.
8. Anti-Friction Bearing Manufacturers' Association (AFBMA) 9 - Load Ratings and Fatigue Life for Ball Bearings. Bearings must have life of not less than 200,000 hours.

1.4 VERIFICATION OF CAPACITY AND EFFICIENCY

A. Factory performance test the chiller under full load conditions in an ARI certified test facility. The manufacturer shall supply a certified test report to confirm performance as specified. Proper ARI certification documents for the test loop shall be made available from the manufacturer upon request for inspection. The performance test shall be conducted in accordance with ARI Standard 550/590-98 procedures and tolerances.

B. All proposals for chiller performance must include an ARI approved selection method.

C. The performance test shall be run with clean tubes in accordance with ARI 550/590-98 to include the following:

1. A downward temperature adjustment per ARI 550/590-98 shall be made to the design leaving evaporator water temperature to adjust from the design fouling to the clean tube condition.

2. An upward temperature adjustments per ARI 550/590-98 shall be made to the design entering condenser water temperature to adjust from the design fouling to the clean tube condition.
3. Test temperature adjustment can be verified prior to test by the Vice President, Engineering, ARI. There shall be no exceptions to conducting the performance test with clean tubes and with temperature adjustments in (1) and (2). The manufacturer shall clean tubes, if necessary, prior to test to obtain a waterside evaporator test fouling factor of 0.0001 (hr, ft2. Degree F per btu), 0.000025 (hr. ft2. Degree F per btu) for the condenser water and 0.0000 for the refrigerant.

D. The factory test instrumentation shall be per ARI Standard 550, and the calibration of all instrumentation shall be traceable to the National Institute of Standards and Technology (formerly NBS).

E. A certified test report of all data shall be submitted to the Engineer prior to completion of the project. The factory certified test report shall be signed by an officer of the manufacturer's company. Preprinted certification will not be acceptable; certification shall be in the original.

F. The equipment will be accepted if the test procedures and results are in conformance with ARI Standard 550/590-98. If the equipment fails to perform within allowable tolerances, the manufacturer will be allowed to make necessary revisions to his equipment and retest as required. The manufacturer shall assume all expenses incurred by the Owner or his representative to witness the retest and all expenses incurred by the Owner, Contractor and the Engineer due to extensions to the construction schedule due to delays caused by retests to obtain certification.

G. Equipment manufacturer shall not invoice for the chillers until successful completion of the performance test and review of the certified test report by the Engineer. Manufacturer shall allow two weeks for review of the certified test report by the Engineer.

H. Unit shall bear the ARI certification label for water chilling packages using the vapor compression cycle as applicable.

I. The chiller IPLV and/or NPLV rating shall be equal to, or more efficient than, the IPLV/NPLV rating scheduled.

PART 2 - PRODUCTS

2.1 OUTDOOR PACKAGED AIR COOLED CHILLER

A. General: Provide factory assembled and tested outdoor packaged air cooled liquid chillers consisting of compressors, evaporator, condensers, thermal expansion valves, and control panels. Provide capacity and electrical characteristics as scheduled.

B. Refrigerant: Provide full operating charge of refrigerant and oil.

C. Housing: Manufacturer's standard equipment housing construction, corrosion protection coating, and exterior finish. Provide removable panels and/or access doors for inspection and access to internal parts and components.

D. Evaporator: Construct shell and tube design evaporator with seamless copper tubes roller expanded into tube sheets. Design, test, and stamp for refrigerant side working pressure of 235 PSIG minimum, and water side working pressure of 150 PSIG minimum, according to ASME Pressure Vessel Code. Provide two water pass with series of internal baffles. Insulate with 3/4 inch thick minimum flexible unicelluar insulation with maximum K-value of 0.26. Provide water drain connection and bulb wells for temperature controller and low temperature cutout. Single point evaporator connections.

1. Water boxes shall be removeable to permit tube cleaning and replacement. Water boxes shall include liquid nozzle connections suitable for ANSI/AWWA C-606 couplings, welding or flanges.
2. Provide independent multiple refrigerant circuits with gasketed evaporator heads for multiple compressor units.
3. Provide vent and drain fittings, and thermo-statically controlled heaters to protect at -20 degrees F (-29 degrees C.) ambient at no flow condition.

E. Condenser: Construct condenser coils with aluminum fins mechanically bonded to seamless copper tubing. Provide integral sub-cooling circuit with liquid accumulators. Leak test coils with air under water at 350 PSIG air pressure.

1. Provide multiple circuited condenser coils.
2. Provide low sound fans with variable frequency drives. All fans shall be powered by VFDs. Fans shall provide vertical air discharge from extended orifices. Fans shall be composed of corrosion resistant aluminum hub and glass-fiber-reinforced polypropylene composite blades molded into a low-noise airfoil section. Fan impeller shall be dynamically balanced for vibration-free operation. Fan guards of heavy gauge, PVC (polyvinyl chloride) coated or galvanized steel. Provide permanently lubricated ball bearing motors with overload protection. Provide protective grille over air discharge.
3. Provide head pressure type low ambient control, designed to operate at temperatures down to 0 degrees F. (-18 degrees C.).
4. Fan Motors: High efficiency, direct drive, 3-phase, insulation class “F”, current protected, Totally Enclosed Air-Over (TEAO), with double sealed, permanently-lubricated ball bearings. Open Drip Proof (ODP) fan motors will not be acceptable.
5. Condenser: Construct condenser coils with aluminum fins mechanically bonded to seamless copper tubing. Provide integral sub-cooling circuit with liquid accumulators. Leak test coils with air under water at 350 PSIG air pressure.

F. Compressor Motors: Refrigerant suction-gas cooled accessible hermetic compressor motor, full suction gas flow through 0.006” (0.1524 mm) maximum mesh screen, with inherent internal thermal overload protection and external current overload on all three phases.
1. Balancing Requirements: All rotating parts shall be statically and dynamically balanced.
2. Lubrication System: External oil separators with no moving parts, 450 psig (31 barg) design working pressure, and ETL listing shall be provided on the chiller. Refrigerant system differential pressure shall provide oil flow through service replaceable, 0.5 micron, full flow, cartridge type oil filter internal to compressor. Filter bypass, less restrictive media, or oil pump not acceptable.
3. Capacity Control: Compressors shall start at minimum load. Provide Microprocessor control to command compressor capacity to balance compressor capacity with cooling load.

G. Provide step control by means of compressor staging, from return water temperature to 10 percent of full load capacity. If minimum unloading is greater than 10 percent, provide factory piped hot gas bypass.

H. Acoustical Data

1. Provide acoustical sound power or sound pressure level data in decibels (db) at the eight (8) octave band frequencies. A-weighted sound data alone is not acceptable.

2. Provide all sound power or sound pressure level data at 100%, 75%, 50% and 25% load.
3. Supplied equipment shall not exceed scheduled sound power or sound pressure level data at any load point. The contractor shall be responsible for any additional costs associated with equipment deviation.

4. Acoustical performance ratings shall be in accordance with AHRI Standard 370.

I. Sound Attenuation Packages

1. Provide standard configuration low sound fans as described in condenser portion above.
2. Provide optional control input to limit sound output of the chiller based on time of day. Shall be programmable at the chiller panel or controlled remotely via signal (4-20 mA or 0-10 VDC) from BAS system.
3. Provide factory installed compressor sound enclosures with rigid walls lined with absorbent material.

J. Refrigerant Circuit Components:
1. Refrigerant: R-134a. Classified as Safety Group A1 according to ASHRAE 34.
2. Equipment supplied shall comply with LEED Energy & Atmosphere Credit 4, Enhanced Refrigerant Management.
3. Each independent refrigerant circuit shall incorporate all components necessary for the designed operation including: liquid line shut-off valve with charging port, low side pressure relief device, removable core filter-drier and sight glass with moisture indicator.
4. Chiller manufacturer shall provide an independent circuit for each compressor to provide maximum redundancy during chiller operation. If equipment does not have independent circuits per compressor, manufacturer shall provide owner one spare compressor of each unique size.
5. Discharge lines shall be provided with manual compressor shut-off service valves.

K. Provide the following options:

1. Liquid line solenoid valve.
2. Removable core filter dryer.
3. Liquid line sight glass.
4. Electronic thermal expansion valve.
5. Insulated suction line.
6. Suction and discharge valves.

L. Unit shall have a microprocessor based control panel. Provide weather tight control panels, factory wired for external connection only. Provide the following controls:

1. Power controls for starter.
2. Control power transformer for 115 volt control voltage.
3. Terminal strip.
4. Pump down control relay.
5. Compressor starter relay.
6. Reset relay.
7. Built-in recycle timer.
8. High pressure cutout.
9. Low pressure cutout.
10. Oil pressure cutout, except for low oil pressure compressor systems.
11. Low temperature cutout.
12. Chilled water temperature controller.
13. Cycle counter.
14. Hour meter.

M. Unit shall come standard with wye-delta starters for all compressor motors for all input voltages.

N. Provide the following accessories:

1. Vaporproof chilled water flow switch.
2. Factory mounted non-fused disconnect switch.

3. Condenser fin guard
4. Chilled Water Reset: Control logic and sensors for reset of leaving water temperature. Low ambient lockout to prevent starting below recommended temperature.
5. Spring type vibration isolators.
6. Building Automation System Interface: Chiller to accept BACnet MS/TP, N2 and Modbus protocol from BAS. BACnet Testing Laboratories (BTL) listed and support BACnet Automatic Discovery to eliminate field commissioning of chiller controls. Interface will also allow resetting of chilled water temperature. and start/stop of unit from a remote location.

O. Warranty: Provide one (1) year full parts warranty and five (5) year full compressor replacement warranty.

P. Start-up: Provide services of manufacturer's factory trained service representative to start-up chillers. Include in start-up procedures, testing controls, demonstration of compliance with requirements, and replacement of damaged or malfunctioning controls and equipment. Provide start-up report documentation for inclusion in operation and maintenance manuals.

Q. Manufacturers: York YVAA or equivalent by Trane.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting chiller unit.

B. Protect unit from physical damage. Leave factory shipping covers in place until installation.

C. Install according to manufacturer's instructions.

D. Align chiller on concrete foundations.

E. Locate the air cooled chiller on structural beams. Provide vibration isolation where specified.

F. Coordinate connection to electrical service (connection by Division 26).

G. Connect to chilled water piping.

H. Arrange piping for easy dismantling to permit tube cleaning.

3.2 MANUFACTURER'S FIELD SERVICES

A. Supply service of factory trained representative to supervise testing, dehydration and charging of machine, start-up, and instruction on operation and maintenance to Owner (see Section 230100).

B. Supply initial charge of refrigerant and oil.

C. A start-up log shall be furnished by the manufacturer to document the chiller's start-up date and shall be signed by the Owner or his authorized representative upon completion of commissioning the chillers.

END OF SECTION

SECTION 260100 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED CONTRACT DOCUMENTS

A. Refer to this Division's Supplemental General Provisions for additional Project requirements.

B. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates and Addenda are a part of this Specification. Contractors and Subcontractors shall examine these provisions as they may affect work under this Division.

C. Contractor shall examine Division 1 Contract Documents for general project requirements.

D. Contractor shall also examine the Contract Documents of all Divisions which may affect and require work under this Division and be responsible for all work required under this Division.

1.2 DESCRIPTION OF WORK

A. This project involves work in an existing operating facility and will require close communication with Owner with regard to access and work hours. Coordinate all work schedules prior to bidding with Owner. When project includes a Construction Manager, all work schedules shall also be coordinated with the Construction Manager, prior to bidding.

B. All Drawings as well as the Specifications for all Divisions shall be defined as the Contract Documents. Contractor shall review entire set of Contract Documents prior to bidding.

C. Drawings and Specifications are to be considered as supplementing each other. Work specified but not shown, or shown but not specified, shall be performed or furnished as though mentioned in both the Specifications and the Drawings.

D. Prior to submitting bid, Contractor shall examine all Drawings and Specifications to develop a complete understanding of the project scope. Contractor shall ask for clarifications during the pre-bid phase of the project. Failure to do so will not relieve the Contractor of their responsibility to perform all required work.

E. Where the project scope involves renovations and additions, it is required that Contractors visit the site of the work and become familiar with the conditions affecting the installation. Submission of a Bid shall presuppose knowledge of such conditions and no additional compensation shall be allowed where extra labor or materials are required because of the lack of knowledge of these conditions.

F. Bid shall include any special phasing requirements related to the construction work as described in the Contract Documents. Coordinate with Division 1.

G. Extra costs which might result from deviations from the Drawings, so as to avoid interferences, shall be considered a "Job Condition", and no additional compensation shall be considered applicable. In the event that such interferences occur in course of the work, due to an error, omission, or oversight by the Contractor, no additional compensation shall be allowed. Interferences that may occur during the course of construction shall be brought to the immediate attention of the Architect and Engineer, and the Architect and Engineer's decision, confirmed in writing, shall be final.

H. The following general terms as used within the context of the Contract Documents shall be defined as follows:

1. "Contract Documents" - The complete set of Drawings and Specifications for all Divisions included in the project.
2. "Drawings" - Drawings furnished as part of the Contract Documents.
3. "Contractor" - This Division's Contractor and the Subcontractors to this Division's Contractor.
4. "Responsible" - To perform work required.
5. "Furnish" - To supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations.
6. "Install" - Work which includes the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
7. "Provide" - To furnish and install, complete and ready for the intended use.
8. "Equal" - To meet or exceed the standards of the specified products or listed manufacturers.
9. "Mechanical" - HVAC, Plumbing and Fire Protection Divisions as applicable.

1.3 WORK INCLUDES

A. Include all labor, material, equipment, services, permits, fees, coordination, supervision and administration necessary for the proper completion of all work shown. Items omitted, but necessary, to make all systems complete and workable shall be understood to form part of the work.

B. Material for work required to complete installation such as , concrete, masonry, mortar, reinforcing steel, patching and painting shall be provided as specified in other applicable Divisions covering such work.

C. Provide material and labor which is neither drawn nor specified but which is obviously a component part of and necessary to complete work and which is customarily a part of work of similar character.

D. Include all testing, test reports, system programming, start-up reports and warranties for each system as outlined elsewhere in these Specifications. Refer to "Operating and Maintenance Manuals" for additional requirements.

1.4 PERMITS AND FEES

A. Secure and pay for permits and inspections required for all work related to this Division. Turn over certificates of approval to the Owner or Construction Manager promptly when received, and before payment is made for the work.

B. Give proper authorities notice as required by law relative to the work in their charge. Comply with the regulations regarding temporary enclosures, obstructions or excavations and pay all legal fees involved.

1.5 QUALITY ASSURANCE

A. Work shall be installed in accordance with provisions of all applicable codes, as interpreted by the local Authority Having Jurisdiction (AHJ), as well as any further modifications or regulations published by local or State Authorities.

B. Reference to the codes and standards listed shall constitute the minimum acceptable requirements. Nothing in the Specifications shall be construed to permit deviation from the requirements of the governing code. Where requirements of the Drawings and Specifications exceed those of the code listed, follow the Drawings and Specifications.

C. The following building codes with amendments shall be followed:

1. Ohio Building Code
2. Ohio Fire Code

D. Applicable portions of the following codes, standards, societies and agencies shall be followed. Where a specific edition is listed, it shall be used. Where not listed, the edition recognized by the Authority Having Jurisdiction shall be used. Listing of a specific portion of a code, standard, society or agency does not preclude the Contractor from following all other applicable portions of the code, standard, society or agency.

1. American National Standards Institute (ANSI)
2. American Society of Testing and Material (ASTM)
3. Americans with Disabilities Act (ADA) - Americans with Disabilities Act Accessibility Guidelines (ADAAG)
4. Federal Occupational Safety and Health Act (OSHA)
5. NFPA Standards as referenced by the Building Codes.
6. Ohio Facilities Construction Commission (OFCC)

1.6 ELECTRONIC MEDIA

A. Contractor shall deliver closeout documents on a portable memory device. Portable memory device shall refer to CD, DVD, Flash Drive, external hard drive or any other portable media used for storing electronic files.

1.7 SUBMITTALS

A. Conform to submittal requirements outlined in Division 1 Specifications. Provide the required quantity of hard copy Submittals.

B. Conform to submittal requirements outlined in Division 1 Specifications. Provide Submittals in an electronic format. The file format shall be portable data file (.pdf).

C. Submittal transmittal shall list corresponding Specification Section and a description of item(s) being submitted. Each submittal shall only include items from one Specification Section. Submittals which include items from multiple specification sections will be returned "REVISE AND RESUBMIT."

D. Prepare Submittals with adequate details and dimensions as necessary to clearly show construction. Clearly identify each item on the submittal with designation as indicated on Drawings including location and use. Include with Submittals Manufacturers published descriptive literature, specifications, performance data (normal operating characteristics, curves, ratings, etc.), wiring diagrams and installation instructions. Indicate for each item the operating characteristics, design conditions, features, and optional items that are intended for application on this project. Where contents of Submittal literature include data not pertinent to the Submittal, clearly indicate (highlight) which portion of content is being submitted for review.

E. Contract Documents include scheduled equipment which is the Basis of Design and used to establish design and space requirements. Contract Documents may also include alternative acceptable manufacturers. Where alternative manufacturer's equipment is submitted which alters the design or space requirements indicated in the Contract Documents, the Contractor shall be responsible for the revised design and construction including the costs of all associated trades involved. No costs associated with deviations from the Basis of Design shall be borne by the Owner.

F. If for any reason, the Submittal shows variations from the requirements of the Contract Documents, the Contractor shall make mention of such variation in the letter of transmittal. The Contractor shall note in red on the Submittal any change in design or dimension on the items submitted including changes made by the Manufacturer which may differ from catalog information.

G. Where additional installation drawings, wiring diagrams or other drawings are specified elsewhere as part of the project requirements, they shall be submitted at the same time as the Submittals. Partial Submittals are not acceptable.

H. Contractor shall review each Submittal prior to submission, and check for compliance with the Contract Documents. Corrections shall be noted. Mark with approval stamp prior to submission. Submittals that do not bear the Contractor's approval stamp will be returned without action.

I. The Submittals will be reviewed only for General compliance and not for dimensions, quantities, etc. The responsibility of correct procurement remains solely with the Contractor. The Submittal review shall not relieve the Contractor of responsibility for errors or omissions and deviations from the Contract Document requirements. Submittals which are not required under this Division shall be returned to the Contractor.

J. Where Submittal review format, whether hard copy or software based, includes pre-determined language that includes the word "Approved", the following shall apply:

1. "Approved" shall be defined as "Reviewed, No Exceptions Taken".
2. "Approved as Noted" or similar verbiage shall be defined as "Reviewed, Exceptions as Noted".

K. After review of submittals by the Engineer, the Contractor shall revise and resubmit if required to establish compliance with the Contract Document requirements. Resubmittal shall include a document with a written response to each of the Engineer's previous comments.

L. The Contractor shall notify the Engineer when all product data and/or shop drawings for all equipment, materials and systems have been submitted for review.

M. The Contractor agrees that Submittals, processed by the Engineer, are not change orders; that the purpose of submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design intent of the project. This understanding is demonstrated by indicating which equipment and material is required, and by what methods of fabrication and installation will be utilized.

N. The Contractor further agrees that if deviations, discrepancies or conflicts between the Submittals and the Contract Documents are discovered, either prior to or after Submittals are processed by the Engineer, the Drawings and Specifications shall control and shall be followed.

O. Final reviewed submittals shall be included in the Operating and Maintenance Manuals. Where Submittals are returned "REVIEWED, EXCEPTIONS AS NOTED", the final Submittals shall be updated to include the exceptions. Upon ordering equipment, order sufficient number of sets of product data literature for the Operating and Maintenance Manuals.

1.8 CONSTRUCTION DOCUMENTATION

A. Coordination Drawings

1. Refer to Division 1 for additional requirements.
2. Preparation of the Coordination Drawings shall be the responsibility of the HVAC Contractor.
3. Coordination Drawings shall include but not be limited to: locations of equipment and devices, ductwork, piping, and conduit routing and required service clearances for all trades. If used, include off-site prefabricated assemblies. Show the relationship of all components as related to installation and future access for maintenance and removal. Where access doors are required, indicate locations and type. Show locations of all ductwork, piping and conduit penetrations through wall and floors. Show existing items affecting new installation in remodeled areas.
4. Coordination meetings between all trades are required.
5. Proceed with installation, including off-site fabrication and assembly, only after review of Coordination Drawings by Architect and approval from other trades affected. Architect does not approve Coordination Drawings.
6. The Coordination Drawings shall be updated to include any deviations made during construction as required to create Record Drawings.

1.9 GUARANTEE AND WARRANTIES

A. Warrant that equipment and all work is installed in accordance with good workmanship practice. All equipment shall be installed in accordance with the Manufacturer's recommendations and shall meet the requirements specified. Any equipment failing to perform or function as specified shall be replaced with complying equipment without cost to the Owner. Warranty shall commence upon acceptance of substantial completion of construction by the Owner. Sign-off of individual equipment start-up procedures shall not activate the warranty commencement.

B. Guarantee against defects in workmanship and materials; repair or replace any defective work, material or equipment within one year from date of formal written warranty commencement. Longer product warranties provided by individual equipment manufacturers shall supersede this one year guarantee; however, the Contractor shall maintain the one year workmanship and materials guarantee for installation of such equipment. Coordinate guarantee and warranty requirements with Division 1 Specifications.

1.10 CLOSEOUT DOCUMENTS

A. Record Drawings:

1. Record Drawings shall consist of updated shop drawings as defined elsewhere in the Specifications. Refer to Division 1 for quantities, special formatting, and additional requirements.
2. Record Drawings shall consist of updated Coordination Drawings as defined elsewhere in the Specifications. Refer to Division 1 for quantities, special formatting, and additional requirements.

3. The Contractor shall maintain updated Coordination Drawings, reproduced electronically from the original Coordination Drawings in an approved format. Drawings shall include any deviations or changes made during construction. Drawings shall only include work of this Division. Work of other Divisions shall be removed. At the end of the project, the Contractor shall transfer the electronic drawing files onto a portable memory device. Both hard copy drawings and the portable memory device shall be provided as Record Drawings.
4. After the project is completed, the Record Drawings shall be delivered to the Architect/Engineer for inclusion into the Operating and Maintenance Manuals, as a permanent record of the installation as constructed.

1.11 SITE REPORTS AND PUNCHLISTS

A. The Engineer may visit the site periodically during construction and provide written Construction Observation Reports to the Contractor identifying areas where installation does not meet the intent of the Contract Documents. The Contractor shall provide a written response to these reports within 5 business days, indicating the reason the installation is out of compliance with the Contract Documents. After review, the Engineer may or may not require the Contractor to correct the installation. The Contractor shall correct the installation unless the reason for non-compliance is accepted, in writing, by the Engineer or Owner.

B. Final Punch List

1. The Engineer will visit the site to perform a scheduled Final Punch List to identify areas where the installation is incomplete or does not meet the intent of the Contract Documents.
2. If the Engineer is requested to perform the Final Punch List prior to the Contractor being 100% complete with their scope of work, the Contractor shall furnish a Contractor's Completion List, indicating all incomplete work. This list shall be furnished to the Engineer a minimum of 24 hours prior to the scheduled Final Punch List.
3. The Contractor shall respond to each punch list item along with a date, indicating that the item has been completed or corrected.
4. A copy of the Final Punch List with the Contractor's responses shall be included on the Operating and Maintenance Manual.

C. Where on-line documentation management services or project management software requires the author/initiator of a corrective action to close it, and the Engineer is the author/initiator, the following shall apply:

1. When the corrective action is reported as corrected/complete, by either the responsible Contractor or the Construction Manager, the Engineer will assume that the parties responsible for construction have reviewed and approved the correction.
2. By closing the corrective action, the Engineer is in no way approving nor assuming responsibility for the installation.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. All equipment and materials used on this project shall be new and listed or labeled by a Nationally Recognized Testing Laboratory (NRTL) such as UL, ETL, CSA, etc.or as approved by the local Authority Having Jurisdiction. Equipment and materials shall be installed or used in accordance with instructions included with the listing or labeling. Where possible, the same brand or manufacturer shall be used for each type of material or equipment. such as.

B. Equipment and materials for the construction shall be the responsibility of the Contractor and shall be protected by the Contractor until formally accepted by the Owner.

C. All Manufacturers of equipment shall verify to the satisfaction of the Contractor and Engineer that their equipment will function properly under the conditions of use, as shown on the Drawings and as specified herein. Dimensions, weights, operating characteristics and all other related appurtenances shall be verified before submittal of shop drawings.

2.2 MATERIAL SUBSTITUTIONS

A. Bids shall be based upon the specified products, suppliers or listed alternatives. The Drawings and Specifications are based on the products specified by type, model, size and suppliers if indicated and thus establish minimum qualities which substitutes must meet to qualify for review.

B. Should the Contractor propose to furnish materials, equipment and/or suppliers other than those specified, submit a written request for substitutions to the Architect or Engineer in accordance with Division 1 requirements. The request shall be an alternate to the original Bid and shall be accompanied with complete descriptive (manufacturer, brand name, catalog number, supplier name and references, etc.) and technical data for all items. Indicate any additions or deductions to the base Bid price.

C. Where substitutions alter the design or space requirements indicated in the Contract Documents, the Contractor shall be responsible for the revised design and construction including the costs of all associated trades involved. No costs associated with the use of a substitution shall be borne by the Owner.

D. Acceptance or rejection of the proposed substitutions shall be subject to approval of the Architect or Engineer. If requested, the Contractor shall submit inspection samples of both the specified and the proposed substitute items for review.

E. In all cases where substitutions are permitted, the Contractor shall bear any and all extra cost of evaluating the equality of the material and equipment to be installed.

F. Where only one Manufacturer or supplier is named in the Contract Documents, the system or equipment shall be provided as specified.

G. Verbal requests or approvals of substitutions shall not be binding on the Architect, Engineer or Owner.

PART 3 - EXECUTION

3.1 SAFETY

A. The Contractor shall follow all safety requirements as defined herein, as described in Division 1 and as defined by Owner safety protocols.

B. Work shall be performed on de-energized equipment in accordance with NFPA 70E.

C. Should suspected hazardous materials be encountered, Contractor shall adhere to procedures, methods and regulations of the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) and immediately notify Owner.

3.2 COORDINATION

A. Take all field measurements necessary and assume responsibility for the accuracy.

B. If any work is fabricated or assembled off-site, assume responsibility for the accuracy of such pre-manufactured assemblies.

C. Install work that is to be concealed within the building construction in sufficient time to secure proper location without delay to the work of other trades.

D. Assume responsibility for location of chases, other openings through masonry and concrete construction. When work cannot be installed concurrent with building construction, arrange for rough-in boxes, sleeves, inserts and other items, as necessary for installation thereof at a later date.

E. If any work is installed so that the architectural design cannot be adhered to, Contractor is responsible for making such changes as Architect may require. Before installing work, report any interferences between work of this Division and work of other Divisions to Architect as soon as discovered. Architect will determine which work must be relocated, or make adjustments to maintain clearances, maximum headroom and to avoid conflict with other work.

F. Become familiar with the construction where work attaches. Review Structural Drawings for coordination of openings. Cut no structural members or slabs without Architect's and/or Structural Engineer's written approval.

G. Exercise caution when working in areas where concealed systems or materials may exist. Any costs for repair of damage incurred shall be the responsibility of Contractor causing the damage.

3.3 PROTECTION

A. All finished surfaces shall be protected from damage and spills during construction.

1. Protect finished floors with a heavy duty flexible fiber reinforced floor protection board - Ram Board or equal.
2. When setting up pipe cutting and threading machines, protect area against staining and abrasion. Provide plywood protection over Ram Board underlayment.
3. Protect finished surfaces from chips and cutting oil by use of a chip receiving pan and oil proof cover.
4. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.

5. Protect finished surfaces from paint droppings, insulation adhesive, etc. by use of drop cloths.

B. The Contractor shall provide protection for any roof areas that will be affected by this scope of work. The roof protection shall be positioned such that it provides protection from falling objects such as tools and materials.

C. The cost of correcting any such condition will be charged against the respective Contractor.

3.4 EQUIPMENT INSTALLATION

A. Install equipment in accordance with equipment manufacturer's published installation instructions.

B. Should the Drawings and/or Specifications include procedures that exceed or call for materials that differ from the manufacturer's instructions, the Contractor shall follow the Drawings and/or Specifications. This requirement does not release the Contractor from the obligation to follow all other published instructions and installation recommendations. Contractor shall make Engineer aware, in writing, of discrepancies between the Drawings and Specifications and the manufacturer's published installation instructions, and/or confirm Engineer's design intent, prior to installation of the equipment. Failure to comply may result in reworking the equipment installation or replacement of materials associated with the equipment at no additional cost to the Owner.

3.5 CUTTING AND PATCHING

A. All cutting and patching in construction as necessary for installation of this work shall be the responsibility of this Division and performed by the Tradesmen related to that specific Division of work. Subcontract this work to the appropriate Trade Division.

B. Do not cut any structural member, including but not limited to steel framing and structural floors, without specific permission from the Architect and/or Structural Engineer.

C. Do not cut openings in roof or floor construction without specific permission from the Architect and/or Structural Engineer. Existing roof warranty must be maintained.

D. Where locations of penetrations are inaccurate or where building components are improperly cut by inadequate methods, the Contractor in error shall be responsible for complete repair.

E. The Contractor shall assume responsibility for removing and replacing existing ceiling tiles as required for installation of all work. Areas include that as outlined by the project scope and areas outside the scope where the Contractor is required to make connections to existing systems and install new work. Damaged tiles shall be replaced.

3.6 SERVICE SHUTDOWNS

A. This project involves remodeling of existing areas in an operating facility. Plan work including alterations and connections to existing facilities, to permit carrying on normal building functions. When necessary to temporarily interrupt a service, shutdowns shall be scheduled through the Owner and shall be done at a time as directed by the Owner. No additional compensation shall be allowed for these shutdown periods even though premium time work may be required unless specifically defined in Division 1.

B. Provide temporary service to equipment or systems that cannot be shut down, and as determined by Owner, or as described in the Contract Documents. Remove temporary services when permanent work is completed

C. Provide a minimum of two weeks' notice to the Owner before any service shutdown is scheduled.

3.7 INDOOR AIR QUALITY

A. All occupied areas of building shall remain free from odors, fumes, dust and smoke generated from installation of material and equipment.

B. Arrange with the Owner to schedule isolation of areas where paints, adhesives, solvents, etc., will be used. Areas shall remain isolated until all materials have cured sufficiently as to stop out-gassing of fumes or odors and area has been ventilated to remove all detectable traces of odors and fumes.

C. Provide temporary partitions and air seals to prevent the migration of airborne contaminants from unoccupied areas to occupied areas.

END OF SECTION

SECTION 260101 - ELECTRICAL SUPPLEMENTAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED CONTRACT DOCUMENTS

A. Refer to 260100: Electrical General Provisions for additional Project requirements.

1.2 WORK INCLUDES

A. The Electrical Contractor is responsible for all work scope included in the Division 26 Contract Documents.

1.3 QUALITY ASSURANCE

A. Reference to the code and standards listed shall constitute the minimum acceptable requirements. Nothing in the Specifications shall be construed to permit deviation from the requirements of the governing code. Where requirements of the Drawings and Specifications exceed those of the code listed, follow the Drawings and Specifications.

B. The following building codes with amendments shall be followed where applicable:

1. Codified Ordinances of the City of Cleveland, Title XII:
2. Cleveland Building Code Chapter 3137 - Electrical Wiring

C. Applicable portions of the following codes, standards, societies and agencies shall be followed. Where a specific edition is listed, it shall be used. Where not listed, the edition recognized by the Authority Having Jurisdiction shall be used. Listing of a specific portion of a code, standard, society or agency does not preclude the Contractor from following all other applicable portions of the code, standard, society or agency.

1. National Fire Protection Association (NFPA):

a. NFPA 70 - National Electrical Code, 2017

2. National Electrical Manufacturers Association (NEMA)
3. Institute of Electrical and Electronic Engineers (IEEE)

D. Workmanship shall be in accordance with the best NECA (National Electrical Contractor Association) practices of the trade. Electrical work shall be installed by journeymen electricians under the supervision of a competent foreman.

1.4 SUBMITTALS

A. Prior to commencing work, submit product data and/or shop drawings for Electrical equipment, materials and systems as required in each individual Division 26 Specification section. Provide all submittals far enough in advance of scheduled dates for installation to provide sufficient time for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 COORDINATION

A. Consult the Contract Documents and Submittals pertaining to the work for other trades. Review the field layouts for all trades and make adjustments accordingly in laying out the Division 26 work.

B. Examine the work of all other trades when it comes in contact with, or is covered by, work in this Division. Do not attach to, cover up, or finish against any defective work, or install work in a manner which will prevent proper installation of the work of other trades. Electrical Contractor shall be responsible for the costs of adjustments required.

3.2 PRODUCT HANDLING

A. Pay all costs for transportation of materials, equipment to job site.

B. Provide all scaffolding, tackle, hoists, rigging necessary for placing electrical materials and equipment in their proper place. Scaffolding, hoisting equipment: comply with applicable Federal, State, and Local regulations. Remove temporary work when no longer required.

C. Arrange for packaging of equipment, which must be hoisted, so that there will be no damage or distortion caused by hoisting operation.

D. Store Electrical equipment, etc., in a dry location and protect all Electrical equipment from dirt and moisture until the building is ready to receive them.

E. Coordinate location of stored items with other trades. Where necessary, store materials and equipment on movable carts so they may be moved when interfering with the work of other trades.

3.3 DAMAGE AND EMERGENCY REPAIRS

A. Assume responsibility for any damage to new or existing building components caused by work provided as part of Contract Documents. Repair all damage without extra cost to Owner.

B. Owner reserves the right to make emergency repairs as required to keep equipment in operation, without voiding Contractor's guarantee or relieving him of responsibility during warranty period.

3.4 CLEANING

A. At all times keep premises and building in neat and orderly condition, follow explicitly any instructions in regard to storing of materials, protective measures and disposing of debris.

B. After all tests and adjustments have been completed, clean all equipment leaving everything in working order at the completion of this work. Clean all equipment of dirt, dust, grease, oil, debris and paint, after all other trades have completed their work.

C. All debris created by the execution of this work shall be removed as directed by the Architect or Owner.

D. Upon completion of work remove all tools, equipment and surplus materials.

END OF SECTION

SECTION 260200 – ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Electrical equipment indicated on the Demolition Drawings is shown to indicate the extent of demolition only, and is not intended to be a record drawing of the existing conditions. The Drawings and Specifications establish the minimum standards for workmanship and materials.

1. If additional interpretation is required regarding the scope of demolition, contact the Engineer prior to bid.

B. Include all labor, materials, equipment, services, and permits necessary for completion of the demolition work.

C. Provide protection for all adjacent areas before, during and after execution of the demolition work.

D. "Electrical equipment" as used in this section shall refer to power system devices.

E. Comply with all the rules and regulations of local and state Authorities Having Jurisdiction, including applicable OSHA safety requirements.

F. Visit the site and become familiar with conditions affecting the demolition work. No additional compensation shall be approved on claims that arise from a lack of knowledge of the existing conditions.

G. Normal building functions shall be maintained during the demolition work. Coordinate the day and time of any temporary building system interruptions with the Owner. Additional compensation shall not be approved for premium time effort.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide materials and equipment for completion of the demolition work as described within the Specifications and on the Drawings.

B. Materials and equipment shall be new and UL labeled for the application.

PART 3 - EXECUTION

3.1 GENERAL DEMOLITION WORK

A. Disconnect and remove the existing Electrical Work made necessary because of Project alterations as indicated or implied on the Contract Documents of all trades. Existing electrical equipment and systems not affected by these changes shall remain and shall be protected or abandoned in place, whether shown on the Drawings or not. Maintain existing circuit continuity as described in the Specifications and on the Drawings, or as required for continued operation of the electrical equipment and systems.

B. The Contractor shall de-energize circuits and panel feeders as required to make areas being demolished safe for demolition work. Coordinate exact power shutdown procedures with the Owner. Maintain power to areas that cannot be shutdown as determined by the Owner. All work shown on Contract Documents assumes work is performed on de-energized equipment unless otherwise noted.

C. Demolition Work under this Contract shall be accomplished by the Contractor in complete accordance with the Construction Procedure and Progress Schedule specified under Division 1. Proposal shall include any special phasing requirements related to demolition work as described in the Division 1 Specifications.

D. Electrically disconnect devices and equipment to be removed at the point of power supply. Remove conduit and wiring complete to devices and equipment being removed. For building and mechanical equipment being removed by other trades, remove related disconnect switches, starters, and/or VFD's, as well as related conduit and wiring complete to the point of power supply where indicated.

E. Where existing electrical equipment is indicated on the Drawings to remain, the existing wiring shall remain, along with the related conduit system, unless otherwise shown or noted on the Drawings.

F. Cap existing empty conduits and plug open knockouts in existing electrical boxes or enclosures.

3.2 SERVICE WORK

A. Coordinate utility service outages with the Utility Companies.

B. Maintain existing electrical and low voltage communication systems in service until the new systems are complete and ready for service. Disable the systems only to make switchovers and connections. All shutdowns shall be performed as premium time work and all shutdowns shall be scheduled with the Owner. A minimum of a one week notice shall be given prior to any service shutdown. No additional compensation shall be allowed for these shutdown periods.

END OF SECTION

SECTION 260300 - ELECTRICAL BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Equipment Identification
B. Supporting Devices
C. Equipment Mounting
D. Equipment Connections
E. Access to Equipment and Devices

1.2 SUBMITTALS

A. Refer to Sections 260100 and 260101 for additional requirements.
B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment installed under this Contract shall be new and of the quality herein specified. Each class of materials shall be of the same type and make throughout the building.

2.2 EQUIPMENT IDENTIFICATION

A. Provide nameplates on all equipment of the type listed in the following schedule:

1. Panelboards including general Arc Flash Warning
2. Distribution Equipment including general Arc Flash Warning
3. Safety Switches including general Arc Flash Warning
4. Individual Overcurrent Protection Devices in Distribution Type Panelboards and Switchboards

B. Unless otherwise indicated on the Drawings, lettering shall include the name or designation of equipment, horsepower, voltage rating and service designation.

C. Junction box Identification shall comply with the following:

1. The outside of the coverplates for all junction boxes, splice boxes, pull boxes shall be permanently marked to identify the following systems:

   a. Normal System including voltage including panel and/or system serving box

2. The identification shall be inside of the coverplate where located in finished areas.
3. At minimum, high quality adhesive tape shall be utilized for labeling.

D. Identification of branch circuits shall be typewritten on directory cards as described elsewhere within these Specifications.

E. Modify directory cards with updated loads for all existing panels with new or modified circuits

PART 3 - EXECUTION

3.1 SUPPORTING DEVICES

A. All hardware, supports, hangers, brackets, angle iron, channels, rods and clamps necessary to install Electrical equipment shall be provided to suit the field conditions and the applications intended as shown on the Drawings. The use of perforated straps is not permitted. Approved Manufacturers are Unistrut, Allied, Kindorf or equal.

B. Where fireproofing is removed to install supporting hardware, it shall be patched and re-installed using approved products.

C. Supporting devices and hardware shall be galvanized steel or aluminum material.

D. Design all miscellaneous steel in accordance with American Institute of Steel Construction (AISC) Steel Construction Manual and as specified under other Divisions within these Specifications.

E. All supporting devices shall conform to latest requirements of ANSI Codes, and shall be UL Listed, where applicable.

3.2 EQUIPMENT MOUNTING

A. All Equipment mounted on interior or exterior block or masonry walls or on interior equipment room walls where additional support is required shall be attached to "Strut" type channel or equal. Where struts are used, provide additional wall support by furnishing and installing metal banding near top and bottom of wall mounted electrical equipment prior to drywall installation.

B. Disconnect switches mounted on or adjacent to mechanical and building Equipment shall be located to allow the proper working clearance as defined in Article 110 of the National Electrical Code.

3.3 EQUIPMENT CONNECTIONS

A. Install the required power and control feeds, and connect equipment being installed during the construction period. Provide facilities only for equipment that will be moved in, set and connected later by the Owner, as indicated on the Drawings.

3.4 ACCESS TO EQUIPMENT AND DEVICES

A. All electrical equipment and other devices requiring examination, adjustment, service, and maintenance shall be accessible. Coordinate all access door locations with the Architect and General Trades.

B. Clearance shall include not only code required clearance but also clearance for Owner's staff to access the device. This access shall be from the floor or from the floor level using normal maintenance ladders and apparatus to meet all OSHA requirements. Consideration shall be given to accessing a device through an access door.

END OF SECTION

SECTION 260310 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Copper Wire and Cable

1.2 SUBMITTALS

A. Refer to Sections 260100 and 260101 for additional requirements.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment installed under this Contract shall be new and of the quality herein specified. Each class of materials shall be of the same type and make throughout the building.

2.2 COPPER WIRE AND CABLE

A. Wire and cable for branch circuits and for feeders, 600 volt and below shall be 90°C., 600 volt, Type THHN/THWN-2, copper only, unless otherwise indicated on the Drawings. All 600 volt wiring shall be in conduit. Conduit shall be as specified elsewhere in these Specifications.

B. Where wire size is not indicated on the Drawings, use ampacity ratings of 60°C for wire 100 amperes and below, and 75°C for wire above 100 amperes, as listed in Table 310.15(B)(16) of the National Electrical Code.

C. Minimum size for power branch circuits shall be #12. Wire sizes #10 and smaller may be solid or stranded. Wire sizes #8 and larger shall be stranded.

D. Control wires shall be #14 stranded THWN copper. All control wiring shall be terminated with fork type "Sta-Kon" type connectors.

PART 3 - EXECUTION

3.1 WIRE AND CABLE

A. Wire shall be delivered to the project site in complete coils with Manufacturer's name and approval tag indicating wire size and type of insulation, fastened to each coil.

B. Neutral conductors shall not be shared. Neutral conductors shall be provided in each outlet box containing luminaire control devices.

C. For 120 volt branch circuits where size is not shown, conductor size #12 minimum shall be used for circuits less than 125 feet, and size #10 minimum shall be used for circuits 125 feet or greater. Ground conductors shall also be increased to #10 accordingly.

D. Identify wire and cable for branch circuits as follows: For 208Y/120V, 3-phase, 4-wire systems, phase A/B/C shall be black/red/blue respectively with white neutral and green ground conductors. For 480Y/277V, 3-phase, 4-wire systems, phase A/B/C shall be brown/orange/yellow with gray neutral and green ground conductors.

E. Color coding of feeders shall be by means of colored tape or colored insulation at terminals.

F. All mechanical wire and cable terminations shall be torque tightened with a torque wrench or a torque screwdriver to Manufacturer's recommended torque values.

G. It is the Contractor’s responsibility to coordinate wire sizes shown on Drawings with lugs provided on mechanical equipment during the submittal phase. Any compression cable adapters required shall be provided and shall be listed for the intended current carrying capacity of the conductors specified.

H. Pull wire and cables into conduit using Ideal Industries "Yellow 77 or 77 plus", or equivalent product or method.

I. Leave 6 inches free wire at all outlet boxes for wiring device connection.

J. Mechanical means may be used to pull conductor size #4 and larger.

K. Joints in conductor size #10 and smaller shall be made with Minnesota Mining and Manufacturing Co. (3M) insulated "Scotch Locks", Ideal Industries "Wing-Nut", Thomas and Betts (T & B) Co. "Marrette" connectors, or with mechanically crimped sleeves as manufactured by Thomas and Betts (T & B) Co. or Ideal Industries. Connector sleeves shall be insulated with pressure sensitive electrical tape equal to Minnesota Mining and Manufacturing Co. (3M) Scotch No. 33 plus.

L. Joints and splices in conductor size #8 and larger shall be made with pressure type mechanical connectors and insulated with electrical tape to 150% of the insulating value of the conductor insulation.

M. Splices and joints are not acceptable in panelboards and switchboards.

END OF SECTION

SECTION 260320 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Boxes

B. Conduits

1.2 SUBMITTALS

A. Refer to Sections 260100 and 260101 for additional requirements.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment installed under this Contract shall be new and of the quality herein specified. Each class of materials shall be of the same type and make throughout the building.

2.2 BOXES

A. Contractor shall provide junction boxes with covers in order to accommodate branch circuiting as shown on the Drawings.

B. Wiring device boxes for surface conduit work shall be stamped steel boxes listed for their applications.

C. All junction boxes and pullboxes shall be 4 inch x 4 inch x 2 inch deep minimum, or sized in accordance with the National Electrical Code if a larger box is required. Junction box and pullbox coverplates shall be suitable for their intended use. Provide identification on the coverplates as described elsewhere in these Specifications.

D. Exterior boxes shall be cast aluminum type. Where outdoor weatherproof receptacles are installed, weatherproof gasketing shall be provided.

2.3 CONDUITS

A. Electrical Metallic Tubing (EMT)

1. All conduits, unless otherwise specified herein, shall be Electrical Metallic Tubing (EMT). Conduits shall be ¾ inch trade size, minimum, unless otherwise noted on the Drawings or within these Specifications. Where sizes are not shown, conduits shall be as required to accommodate the number and type of conductors in accordance with the National Electrical Code wiring tables, but shall not be smaller than ¾ inch.

B. Rigid Galvanized Steel (RGS)

1. Conduits shall be heavy wall rigid galvanized steel or intermediate grade steel in the following areas unless otherwise noted:

   a. In damp or wet locations.

2. Conduits that are exposed shall be heavy wall rigid galvanized steel.

C. Conduit for Special Conditions

1. Conduits passing from exterior to interior require foam based adhesive to protect water leakage into building to be installed after conductors are installed. Acceptable Manufacturer shall be Polywater FST-250 or approved equal.
2. Conduits that stub through the roof shall be supplied with pipe seals as manufactured by the Pate Co. or approved equal and shall be installed as recommended by the Manufacturer by a licensed Roofing Contractor. Pipe seals shall be one piece aluminum base type with five inch sloped roof surface flanges, graduated stepped PVC boots and adjustable stainless steel clamps. RPS Corporation and Thycurb Corporation are approved equivalent Manufacturers.

D. Fittings and Couplings

1. Cold-rolled steel double set screw fittings shall be used for all EMT conduits. Provide single set screw for ¾ inch conduits and smaller.
2. Heavy wall rigid galvanized steel conduits shall have threaded fittings. Heavy wall rigid galvanized steel conduit couplings and hubs shall have no less than five (5) threads of conduit engaged and screwed tight.

PART 3 - EXECUTION

3.1 CONDUITS

A. Interior Conduits

1. Conduits shall be continuous and secured to all boxes in such a manner that each conduit system shall be electrically continuous from the point of service to all device boxes. Conduits shall be supported in accordance with the National Electrical Code. Terminals of all conduits shall be furnished with locknuts and insulating bushings. Plug ends of each conduit with an approved cap to prevent the entrance of foreign materials during construction.

   a. Actual routing of conduits shall be installed to suit the various field conditions. Any field changes necessary to conceal conduit or to avoid work of other trades shall be made without additional expense to the Owner.

2. Install exposed conduits parallel to, or at right angles to building structural members. Vertical runs shall be plumb.
3. All conduits terminating in sheet metal enclosures shall be provided with a single grounding/bonding type locknut with a set screw.
4. All exposed conduit ends within enclosures shall be provided with insulated bushings.

5. Provide expansion conduit fittings at all points where conduits cross building expansion joints.
6. Conduits, boxes or other raceway systems that penetrate through fire rated floors, walls, ceilings, decks, smoke partitions, etc. shall be constructed so as to maintain the integrity of the fire or smoke rated areas. Penetrations shall not exceed an aggregate area of 1 square foot in any 100 square feet of surface area, or as dictated by local codes.
7. A separation of 12 inches minimum is required between conduits and hot water piping, steam piping, and similar system piping.

B. Exterior Conduits and Special Conditions

1. Conduits in wet or damp areas shall be water tight. Joints shall be sealed with weatherproof sealing compound. Contractor shall provide covers during Construction to prevent water from entering conduits.
2. Conduits passing from the exterior to the interior of a building shall be filled with an approved material to prevent the circulation of warm air to a colder section of the raceway per Article 300.7(A) of the National Electrical Code. Provide pullbox or similar device at this location such that material is visible for inspection.
3. Conduit supporting systems shall be attached to the deck, slab, or structural framing only and not to any other appurtenances at the ceiling such as mechanical ducts, pipes and suspended ceiling hanger wires, framing members, etc.

C. Fittings and Couplings

1. Contractor shall utilize boxes, fittings and mounting accessories appropriate for the specific conduit systems installed as recommended by the conduit Manufacturer.

3.2 OUTLET BOXES

A. All boxes shall be rigidly supported from the building structure independent of the conduit system.

END OF SECTION

SECTION 260340 - WIRING DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Receptacles

1.2 SUBMITTALS

A. Refer to Sections 260100 and 260 01 for additional requirements.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment installed under this Contract shall be new and of the quality herein specified. Each class of materials shall be of the same type and make throughout the building.

2.2 RECEPTACLES

A. Duplex receptacles shall be tamper resistant, 20A, 125V, 2 pole, 3 wire grounding type as follows:

1. Heavy duty duplex receptacles:

a. Hubbell # HBL5362TR.

2. The equivalent series by Pass and Seymour, Cooper or Leviton shall be acceptable for receptacles specified above.

B. Duplex GFCI receptacles shall be tamper resistant, 20A, 125V, 2 pole, 3 wire, with UL943 integral ground fault circuit interrupter as follows:

1. Heavy duty duplex receptacles:

a. Hubbell # GF5362SG.

2. The equivalent series by Pass and Seymour, Cooper or Leviton shall be acceptable for GFCI receptacles specified above.

C. For damp or wet locations, duplex GFCI receptacles shall be tamper resistant and weather resistant, 20A, 125V, 2 pole, 3 wire, with UL943 integral ground fault circuit interrupter as follows:

1. Heavy duty duplex receptacles:

a. Hubbell # GF5362SG.

2. The equivalent series by Pass and Seymour, Cooper or Leviton shall be acceptable for receptacles specified above.

D. All receptacles shall be provided with a self-grounding clip at the mounting screw.

PART 3 - EXECUTION

3.1 RECEPTACLES

A. Install devices as indicated on the Drawings. All devices shall be flush mounted unless otherwise shown on the Drawings or indicated in these Specifications.

1. Provide individual duplex GFCI receptacles as shown on the Drawings. Standard receptacles wired to "upstream" GFCI receptacle for GFCI protection shall NOT be acceptable. GFCI receptacles shall not be through-wired.

B. Mounting heights to the center of outlet boxes shall be as indicated on the Drawings.

C. Verify mounting heights and locations with the Architect before rough-in. Refer to details and interior wall elevations shown on the Architectural Drawings.

D. Outlets shall not be installed back to back.

E. As described elsewhere in this Section, receptacles shall be permanently marked to indicate the panel and circuit number of the device. Panelboard abbreviations shown on Drawings are not permitted. Indicate complete panel name and circuit number.

F. All receptacles shall be installed with the ground opening above the phase and neutral openings.

G. All devices shall be secured with more than a single screw.

END OF SECTION

SECTION 260400 - ELECTRICAL FIRESTOPPING

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Work of this Section includes, but is not limited to, furnishing and installing firestopping for fire-rated construction in the following areas:

1. All openings in fire-rated floor, wall, ceiling and roof assemblies, both empty and those accommodating penetrating items.
2. Openings at each floor level in shafts or stairwells.
3. Empty openings intentionally designed as spare openings in fire rated Construction.

B. Penetrating items shall include the following:

1. Cables.
2. Conduit.
3. Pipes without insulation.
4. Pipes with insulation. All insulation must remain intact, undamaged and shall run continuously through walls and floors.
5. Ductwork without fire dampers. Where insulated, all insulation must remain intact, undamaged and shall run continuously through walls and floors.
6. Raceways.
7. Cable trays.
8. Busways

1.2 QUALITY ASSURANCE

A. General

1. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings required by local building code and as tested by nationally accepted test agencies per fire tests in a configuration that is representative of field conditions. The F rating must be a minimum of one (1) hour but not less than the fire resistance of the assembly being penetrated.
2. Manufacturer’s engineering judgments will be accepted for non-standard applications or where no tested system exists. Drawings for engineering judgments must indicate the UL tested system or systems upon which the judgment is based, in order to evaluate the engineering judgment against a known performance. Engineering judgments shall be approved by the Architect.
3. Firestopping materials and systems shall be capable of closing or filling openings created by:

    a. The burning or melting of combustible materials.
    b. Deflection of materials due to thermal expansion.

4. Firestopping material shall be non-halogenated, lead and asbestos free and shall not incorporate nor require the use of hazardous solvents.
5. Firestop products which dissolve in water after curing are not acceptable.
6. Firestopping materials shall not shrink upon drying as evidenced by cracking or pulling back from contact surfaces.

7. All firestopping materials shall be manufactured by one manufacturer (to the maximum extent possible).

B. Engage an experienced installer who is certified, licensed or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install firestop products per specified requirements. A manufacturer's willingness to sell its through-penetration firestop system products to a Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.

C. Manufacturer's Field Representative: The Manufacturer of the firestop material of this Section shall provide a qualified field representative at the site.

D. Pre-Installation Conference: Contractor shall hold a pre-installation conference with representatives of the Architect, Contractor, Installer, Materials Manufacturer and various trades involved in the Work, to review conditions affecting the installation and consistency of manufacturer to be used by all trades.

E. Conform to Manufacturer's printed instructions for installation in accordance with a U.L rated system or Manufacturer’s engineering judgement.

F. Codes and Standards

1. ASTM E 84
2. ASTM E 119
3. ASTM E 814
4. UL 263
5. UL 1479

1.3 SUBMITTALS

A. Refer to Sections 26 01 00 and 26 01 01 for additional requirements.

B. All submittals shall conform completely to the requirements of the Contract Documents.

C. Product Data: For each type of material to be installed, literature shall indicate product characteristics, typical uses, performance, test data and Manufacturer's installation procedures.

D. Shop Drawings: Include U.L. rated system number and details for each type of penetration or configuration.

1. Show typical installation details including:

a. Minimum and maximum allowable annular spacing.
b. Base material composition.
c. Firestop materials selected.
d. Applied thickness required to achieve the hourly rating.

E. Where required, submit Product Data and Shop Drawings to the Authority Having Jurisdiction (AHJ) for review and approval. Information shall include the Manufacturer's assembly detail with UL system number, technical data and installation instructions for each penetration type occurring on the project.

F. Close-out Documents

1. Final approved product data and shop drawings of all materials installed shall be included in operating and maintenance manuals.
2. Record Drawings shall indicate rated walls where firestop materials have been applied.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, UL label, date of manufacturer; lot number; shelf life, if applicable; qualified testing and inspection agency's classification marking; and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes. Materials shall be stored off the ground and protected from environmental conditions as required by manufacturer.

C. All firestop materials shall be installed prior to expiration of shelf life.

1.5 PROJECT CONDITIONS

A. Conform to manufacturer's printed instructions for installation and when applicable, provide for curing in accordance with manufacturer suggested temperature requirements.

B. Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limitations recommended by manufacturer.

C. Do not install through-penetration firestop systems when substrates are wet due to rain, frost, condensation, or other causes.

D. Do not use materials that contain flammable solvents.

E. Do not install water based or products that are conductive when wet in contact with energized electrical conductors. Exercise care when energizing penetrants.

1.6 PROTECTION

A. Where firestopping is installed at locations which shall remain exposed in the completed work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.

1.7 SEQUENCING

A. Coordinate this work as required with work of other trades.

B. Firestopping shall precede finishing of gypsum board.Schedule installation of cast-in-place firestop devices after completion of floor formwork, metal deck placement or composite deck installation but before placement of concrete.

1.8 WARRANTY

A. Contractor shall provide written certification that all firestopping was installed in accordance with the Manufacturer's written instructions for UL tested assemblies and that all firestop systems installed meet firestopping requirements as herein specified.

PART 2 - PRODUCTS

2.1 GENERAL

A. Firestopping materials shall meet the requirements specified herein.

B. For applications where combustible penetrants are involved, i.e. insulated or plastic pipe, a suitable intumescent material must be used.

2.2 ACCEPTABLE MANUFACTURERS

A. Specified Technologies, Inc. (STI)

B. 3M

C. Hilti, Inc.

2.3 FIRESTOP MATERIALS

A. Firestop Mortar

B. Intumescent Firestop Sealants and Caulks

C. Elastomeric Firestop Sealants and Caulks

D. Endothermic Firestop Sealants and Caulks

E. Firestop Putty

F. Rough-in Box Inserts

G. Firestop Pillows/Blocks

H. Fire Rated Pathways

I. Firestop Grommets

J. Firestop Collars

K. Wrap Strips

L. Cast in Place Devices

M. Firestop Foams

N. Composite Sheets

O. Intumescent Gaskets

PART 3 - EXECUTION

3.1 General

A. In an occupied building, permanent firestopping shall be installed within 24 hours of penetrating a fire rated assembly. If permanent firestopping cannot be installed within this time period, temporary firestop pillows/blocks are permitted, where installation allows, until permanent firestop materials can be properly installed.

3.2 INSPECTION

A. Examine the areas and conditions where firestops are to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with work until the Contractor, in a manner acceptable to the Architect has corrected unsatisfactory conditions.

B. Verify that environmental conditions are safe and suitable for the installation of the firestop products.

3.3 CONDITIONS REQUIRING FIRESTOPPING

A. General

1. Provide firestopping for conditions specified elsewhere whether or not firestopping is indicated and, if indicated whether such material is designed as insulation, safing, or otherwise.
2. All firestopping shall be installed in accordance to the UL rated system designed for the application.
3. Grout, Mortar or Gypsum based products shall not be installed in lieu of firestopping material specified herein.
4. All smoke walls (smoke barriers, smoke partitions, etc.), rated or non-rated, shall be firestopped with systems designed to maintain a minimum 1 hour rating or that which is equal to the rating of the wall.

B. Penetrations - Provide firestopping as follows:

1. Where penetrations pass through one or both surfaces of a fire rated floor or wall.
2. Where a penetration occurs through fire rated walls or partitions of hollow-type construction, provide firestopping to completely fill spaces around the penetration, on each side of the wall or partition.
3. Except for slab on grade, where penetrations pass through a non-fire rated floor.
4. The requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall opening. Upon installation of cabling through sleeve, firestop the remaining open area within the conduit.

C. Where demolition has occurred in rated walls, floors and assemblies, the material used to patch the opening shall match the material used for the assembly construction. Firestopping materials may be utilized upon approval of Architect and Engineer. Materials used shall be provided with submittals. Work performed shall be the responsibility of the Contractor whose work was removed, performed by the appropriate trade.

3.4 PREPARATION

A. Surface to receive firestop shall be free of dirt, dust, grease, oil, oil from release agents, or other matter that would impair the bond of the firestop material to the substrate or penetrating items.

B. Substrate shall be frost free.

3.5 INSTALLATIONS

A. General

1. Sleeves and core-drilled holes shall be sized at least 1-1/2" larger in diameter than penetrating items.
2. Installation of firestops shall be performed by applicators/installers qualified and trained by the Manufacturer. Installation shall be performed in strict accordance with the Manufacturer's detailed installation procedures.
3. Apply firestops in strict accordance with UL rated system designs, and Manufacturer's recommendations.
4. Coordinate with all other trades to assure that all items which penetrate fire rated construction have been permanently installed prior to installation of firestops. Schedule and sequence the work to assure that partitions and other Construction which would conceal penetrations are not erected prior to the installation of firestop.
5. Gun grade sealants and putties shall be tooled into place to insure proper adhesion to penetrations and surrounding surfaces.
6. Where existing penetrations are reused that contain remnants of existing firestop products remain, remove all existing firestopping.

B. Dam Construction

1. Install dams when required to properly contain firestopping materials within openings and as required to achieve required fire resistance rating.
2. Placement of dams shall not interfere with functions or adversely affect the appearance of adjacent construction.

C. Field Quality Control

1. Install work in full accordance with rules, regulations, and safety requirements of Federal, State, County and City authorities having jurisdiction over premises. Do not construe this as relieving Contractor from compliance with any requirements of the Specifications which are in excess of Code requirements and not in conflict therewith.
2. Correct unacceptable firestopping and provide additional inspection to verify compliance with this Specification at no additional cost.
3. Finish surfaces of firestopping that is to remain exposed in the completed work to a uniform and level condition.

3.6 LABELING

A. Where firestopping installations occur, Contractor shall provide a label adjacent to each penetration. Label shall include:

1. UL rated system used.
2. Date of installation.
3. Name of installing Contractor

B. Labels shall be furnished by the firestop manufacturer.

END OF SECTION

SECTION 262100 - POWER DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Power Distribution Equipment

B. Safety Switches

C. Equipment Room and Feeder Layouts

PART 2 - PRODUCTS

2.1 SAFETY SWITCHES

A. Safety switches shall be heavy duty fusible or nonfusible type as indicated on the Drawings, and shall be suitable for the voltage and current ratings as shown on the Drawings. Safety switches shall be UL Listed for their application.

B. Switches shall have switch blades which are visible in the "Off" position when the door is open. Switches shall have removable arc suppressors, where necessary, to permit easy access to the line side lugs. All current carrying parts shall be plated.

C. Switches shall have an integral quick-make, quick-break operating handle mechanism. Switches shall have a dual cover interlock to prevent opening of the switch door in the "ON" position or to prevent closing of the switch mechanism with the door open. Handle position shall indicate if the switch is "ON" or "OFF".

D. Fuse holders shall accept only Class R or L fuses.

E. Indoor enclosures shall be NEMA 1. Exterior enclosures shall be NEMA 3R. NEMA 1 enclosures shall be code gauge UL 98 sheet steel, treated with a rust inhibiting phosphate primer and finished in gray baked enamel. Enclosures shall be provided with padlocking provisions.

F. Acceptable manufacturers shall be: Eaton, Schneider Electric, Siemens, or ABB.

2.2 MATCHING EXISTING OVERCURRENT PROTECTION DEVICES

A. New circuit breakers or fusible switches installed in existing panels shall match the existing in type, manufacturer (if possible), and short circuit ratings.

PART 3 - EXECUTION

3.1 LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS

A. The Contractor shall balance the continuous load on each panel when the work is complete.

B. Spare circuit breakers shall be identified as such on the panel directory cards and shall be left in the "OFF" position.

3.2 EQUIPMENT ROOM AND FEEDER LAYOUTS

A. Submit reproducible vellum 1/8" scale (minimum) floor plans dedicated solely to indicate the exact location of all Distribution Equipment and to indicate the routing of distribution feeders. These drawings shall be submitted by the Contractor and approved by the Architect and Engineer before equipment is set in place and before feeder conduits are installed.

B. The Equipment Room layouts shall indicate, by dimensions, the size of equipment and working space between equipment.

END OF SECTION

SECTION 262235 - OVERCURRENT PROTECTION DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Fuses

B. Molded Case Thermal Magnetic Circuit Breakers

1.2 SUBMITTALS

A. Refer to Sections 260100 and 260101 for additional requirements.

B. Submit product data for all manufactured items listed in paragraph 1.1 WORK INCLUDES.

C. Submit wiring diagrams including interconnection wiring between components and remote devices.

D. Installation, operation and maintenance manual with pre-startup, detailed wiring, connections and diagrams, and instructions.

E. Field Test Results as specified herein.

1.3 QUALITY ASSURANCE

A. The overcurrent protection devices in this Specification shall be designed and manufactured according to the latest revision of the following standards (unless otherwise noted):

1. ANSI C37.13: Low Voltage AC Power Circuit Breakers Used In Enclosures
2. ANSI C37.27: Low Voltage AC Power Circuit Breakers with Separately Mounted Current Limiting Fuses
3. NEMA AB 3: Molded Case Breakers
4. UL 248: Low Voltage Fuses
5. UL 489: Molded Case Circuit Breakers, Molded Case Switches and Circuit Breaker Enclosures
6. UL 1066: Low Voltage AC and DC Power Circuit Breakers Used in Enclosures

1.4 WARRANTY

A. Manufacturer shall warrant overcurrent protection devices to be free from defects in materials and workmanship for one year from date of Owner's formal acceptance.

PART 2 - PRODUCTS

2.1 FUSES

A. Approved Manufacturers:

1. Bussman
2. Mersen
3. LittleFuse

B. Fuses for medium voltage applications shall be specified under equipment which utilize fuses operating over 600 volts.

C. The Electrical Contractor shall provide a complete set of fuses for all fusible equipment on the project.

D. All fuses shall be UL Listed, current limiting with 200,000 RMS amperes interrupting capacity, unless otherwise indicated on the Drawings or in the Specifications.

E. Fuses rated 601 amperes to 1200 amperes, 600 volts or less serving power distribution system and mechanical equipment shall be UL Class L, bolt type: Bussmann "HI-CAP", type KRP-C; Mersen type A4BQ; or LittelFuse type LittelFuse type KLPC.

F. Fuses rated 600 amperes or less, over 250 volts to 600 volts, serving power .distribution system and mechanical equipment shall be UL Class RK-1: Bussmann dual element, time delay "LOW PEAK", type LPS-RK; Mersen type A6DR; or LittelFuse type LLSRK.

G. Fuses rated 600 amperes or less, 250 volts or less, serving power distribution system and mechanical equipment shall be UL Class RK-1: Bussmann dual element, time delay "LOW PEAK", type LPN-RK; Mersen type A2DR; or LittelFuse type LLNRK.

H. Fuse Application for Motor Circuits and Motor Control Circuits:

1. Motor protection dual element fuses installed in individual branch circuits shall be sized at 125% of motor nameplate current rating or the next higher standard fuse size.
2. Where excessive ambient temperature, high inertia motor loads, or frequent "on-off" cycling require larger fuses, consult the Engineer.
3. Provide fuse reducers where fuse gaps are larger than fuse dimension.
4. Exact fuse type required for Variable Frequency Drive (VFD) applications shall be provided as recommended by the (VFD) manufacturer.
5. For motor control circuits, provide UL Class CC fuses, sized for maximum values allowed per NEC Article 430.72.

2.2 MOLDED CASE THERMAL MAGNETIC CIRCUIT BREAKERS

A. New circuit breakers installed in existing power branch circuit and distribution panelboards shall match the existing in type, manufacturer (if possible), and short circuit ratings.

B. The circuit breaker ampere rating shall be clearly visible without removing the panel cover.

C. Circuit breakers shall be single pole or multi-pole with an integral crossbar to assure simultaneous opening of all poles.

D. Circuit breakers shall have an over-center, trip-free, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication.

E. Handles shall have "ON", "OFF" and "TRIPPED" positions.

F. Circuit breakers shall be fully rated. Series ratings are not permitted.

G. For nominal 208Y/120 volt or 240 volt systems, provide minimum symmetrical short circuit current rating of 10,000 amperes, unless otherwise noted on the Drawings.

H. For nominal 480Y/277 volt systems, provide minimum symmetrical short circuit current rating of 18,000 amperes, unless otherwise noted on the Drawings.

I. For circuit breakers provided in power distribution panelboards, minimum symmetrical short circuit current rating shall be 35,000 amperes, unless otherwise noted on the Drawings.

J. Circuit breakers shall include factory installed mechanical lugs. Lugs shall be UL listed and rated 75 degrees C.

PART 3 - EXECUTION

3.1 DELIVERY, HANDLING and storage

A. Deliver, store, protect, and handle devices and components in accordance with recommended practices listed in manufacturer's installation manuals.

B. Store devices and components in a clean, dry space. Maintain factory protection or cover with plastic to keep out dirt, water, construction debris, etc until time of installation.

3.2 FUSES

A. Fuses shall not be installed until equipment is ready to be energized. All fuses shall be of the same manufacturer to assure selective coordination.

B. Spare fuses amounting to 20% (minimum of three) of each type and rating shall be supplied by the Electrical Contractor.

C. Field verify the exact fuse size required for all mechanical and building equipment with the nameplate data of the equipment prior to procurement. Advise the Engineer if the equipment nameplate fuse size differs from the size indicated on the Drawings.

D. Fuses shall be turned over to the Owner upon project completion.

END OF SECTION

LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

Cleveland Metropolitan School District

3202 West 30th Street, Cleveland, Ohio 44109

Issued for Bid - September 20, 2021

STRUCTURAL ENGINEER
Barber & Hoffman
2217 East 9th Street, Suite 350
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Phone: (216) 875-0100
Contact: Mike Mazzocco

ARCHITECT
Perspectus Architecture
1300 East 9th Street, Suite 910
Cleveland, OH 44114
Phone: (216) 752-1800
Contact: Tim Huffman

MEP ENGINEER
Karpinski Engineering
3135 Euclid Avenue
Cleveland, OH 44115
Phone: (216) 391-3700
Contact: Greg Blatnik (Electrical)
Rich Haas (Mechanical)

GENERAL
G0.1 COVER SHEET

STRUCTURAL
S0.1 GENERAL NOTES & SPECIAL INSPECTIONS
S1.1 ROOF FRAMING PLAN & SECTIONS

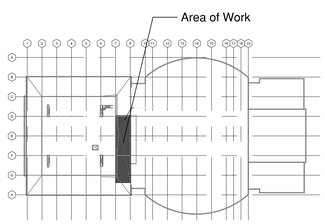
ARCHITECTURAL
A1.1 ROOF PLAN AND DETAILS

MECHANICAL
M0.1 HVAC LEGEND AND GENERAL NOTES
M0.2 HVAC SCHEDULES
MD.4 PENTHOUSE - ROOF HVAC DEMOLITION PLAN
M1.4 PENTHOUSE ROOF HVAC PIPING PLAN
M5.1 HVAC DETAILS AND DIAGRAMS

ELECTRICAL
E0.1 ELECTRICAL SYMBOL LEGEND AND GENERAL NOTES
ED.4 PENTHOUSE - ROOF ELECTRICAL DEMOLITION PLAN
E1.1 FIRST FLOOR ELECTRICAL PLAN
E1.4 PENTHOUSE - ROOF ELECTRICAL PLAN

LOCATION PLAN

KEY PLAN



CODE INFORMATION

CODE DATA

Applicable Codes: 2017 Ohio Building Code (OBC)
2010 ADA Standards for Accessible Design

Project Description: Remove existing rooftop cooling tower and install new air-cooled units. Construct new screen wall.

OBC Use Group: E

OBC Construction Classification: IB

Total Project Area: 2,304sf

PERSPECTUS

STATE OF OHIO
MICHAEL
LIPOWSKI
12451
REGISTERED ARCHITECT

Michael J. Lipowski, License #12451
Expiration Date 12/31/2021

BARBER & HOFFMAN, INC.
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barberhoffman.com

PROJECT NAME
LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
1	9-08-21	FOR OWNER REVIEW
2	9-20-21	FOR BID

DRAWN BY	DER
CHECKED BY	TH
DRAWING SCALE	AS NOTED
PROJECT NUMBER	21-114

DRAWING TITLE
COVER SHEET

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
G0.1

CODES AND STANDARDS

1. New construction has been designed to, and shall be constructed in accordance with the following building codes and standards:
   A. 2017 Ohio Building Code (OBC 2017)
   B. City of Cleveland, Ohio, Code of Ordinances
   C. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures
2. Unless explicitly modified in the Contract Drawings and Specifications, the Contractor shall comply with provisions of:
   A. AISC 360-10, Specification for Structural Steel Buildings
   B. AWS D1.1-10, Structural Welding Code - Steel

DESIGN LOADS (OBC 2017)

Roof live load

Roof live load ---------- 20 psf

Roof snow load data

Minimum roof snow load (City of Cleveland) ----------	30 psf
Ground snow load (ASCE 7, Figure 7-1) ----------	P_g = 20 psf
Flat-roof snow load (ASCE 7, 7.3) ----------	P_f = 20 psf (1)+5 psf (2)
Snow exposure factor (ASCE 7, Table 7-2) ----------	C_e = 1.0
Snow importance factor (ASCE 7, Table 1.5-2) ----------	I_s = 1.0
Thermal factor (ASCE 7, Table 7-3) ----------	C_t = 1.0

(1) Increased for snow buildup / unbalanced per ASCE 7, 7.6 to 7.9
(2) Rain-on-snow surcharge (ASCE 7, 7.10) applied only to balanced snow load

Wind design data

Minimum wind load (City of Cleveland - Allowable) ----------	20 psf
Ultimate design wind speed (ASCE 7, Figure 26.5-1) ----------	V_{ult} = 115 mph
Nominal design wind speed (OBC 1609.3.1) ----------	V_{asd} = 90 mph
Risk category (ASCE 7, Table 1.5-1) ----------	II
Exposure category (ASCE 7, 26.7.3) ----------	B
Internal pressure coefficient (ASCE 7, Table 26.11-1) ----------	GC_{pi} = ±0.18
Components and cladding (Ultimate)	
Effective Wind Area ----------	10 ft² (3)
Zone 1 (Roof Interior) ----------	+16.0, -27.5 psf
Zone 2 (Roof Edge) ----------	+16.0, -46.6 psf
Zone 3 (Roof Corner) ----------	+16.0, -69.9 psf
Zone 4 (Wall Interior) ----------	+30.3, -27.5 psf
Zone 5 (Wall Corner) ----------	+37.3, -27.5 psf

(+) Indicates pressure acting toward the surface
(-) Indicates pressure acting away from the surface
Edge and corner zones are defined as areas within 16'-0" of edge or corners

(3) Components and cladding engineer may calculate wind loads based on actual effective wind area per ASCE 7

DESIGN STRESSES

Structural steel W shapes (ASTM A992 or ASTM A572/50) ----------	F_y = 50,000 psi
Structural steel other shapes (ASTM A36) ----------	F_y = 36,000 psi
Anchor rods (ASTM F1554, Grade 55, weldable) ----------	F_y = 55,000 psi
Hollow structural sections (ASTM A500, Grade C)	
Rectangular ----------	F_y = 50,000 psi
Round ----------	F_y = 46,000 psi

GENERAL

1. All new construction shall comply with the Contract Documents and the Building Code.
2. Typical details and general notes apply to all parts of the work except where specifically detailed or unless otherwise noted.
3. The structural drawings illustrate structural members. Refer to architectural, mechanical, and electrical drawings for non-structural items which require special provisions during the construction of the structural members.
4. Drawings are not to be scaled.
5. Refer to architectural plans for openings and drains. Refer to mechanical and electrical plans for sleeves, openings, and hangers for pipes, ducts, and equipment.
6. No pipes or ducts shall be embedded into structural members unless so shown on the plans or approved by the Engineer.
7. Where penetrations through an existing concrete wall are indicated, the Contractor shall locate the existing reinforcement per Ground Penetrating Radar (GPR) testing. Existing reinforcing shall not be cut.
8. The Contractor shall verify and be responsible for all dimensions and conditions which impact the work. Field verify sizes, elevations, hole locations, etc., prior to fabrication.
9. The Contractor shall carefully review the drawings to identify the scope of work required, visit the site to relate the scope of work to existing conditions and determine the extent to which those conditions and physical surroundings will impact the work.
10. Existing conditions as shown on these plans are for reference only. The Contractor is required to field verify all existing conditions prior to construction.
11. The Contractor shall resolve any conflicts on the drawings or in the specifications with the Architect/Engineer before proceeding with the work.
12. Any deviation, modification, or substitution from the approved set of structural drawings shall be submitted to the Owner, Architect, and Engineer for review/approval prior to its use or inclusion on the shop drawings.
13. The Contractor shall provide all necessary shores, braces, and guys required to support all loads to which the building structure and components, soils, other structures, and utilities may be subjected during construction. Shoring systems shall be designed, signed, and sealed by a professional engineer licensed in the jurisdiction where the project is located.
14. The Contractor shall provide means, method, techniques, sequence, and procedure of construction as required.
15. The Contractor shall protect all work, materials, and equipment from damage and shall provide proper storage facilities for materials and equipment during construction.
16. Site visits performed by the Architect/Engineer do not constitute inspections of means and methods of construction performed by the Contractor.
17. Structural observations performed by the Architect/Engineer during construction are not the continuous and special inspection services and do not waive the responsibility for the inspections required of the Building Department Inspector or the testing agency. Observations also do not guarantee the Contractor's performance and shall not be considered as supervision of construction.
18. The Contractor shall review shop drawings for completeness and compliance with contract documents. The Contractor shall stamp shop drawings prior to submission to the Architect and Engineer.
19. Review of the shop drawings by the Architect's Engineers shall not be construed as an authorization to deviate from the Contract Documents.
20. Shop drawings will not be processed if they are incomplete, lack coordination with relevant portion of contract documents, lack calculations if required, or if deviations, modifications, and substitutions are indicated without prior written approval from the Architect/Engineer.

STEEL CONSTRUCTION

1. Steel detailing, fabrication, and erection shall conform to the AISC Specification for Structural Steel Buildings and Code of Standard Practice, and the AWS Structural Welding Code.
2. Stresses occurring during fabrication, shipment, and erection shall be temporary and not excessive. Stresses at all times shall be less than design and allowable stresses. The full design and load-carrying capacity of the steel work shall not be impaired due to fabrication, shipment, or erection procedures. Throughout the complete process, the stability of all individual members and assemblies shall be maintained.
3. The Contractor shall be responsible for the control of all erection procedures and sequences with relation to temperature differentials and weld shrinkage.
4. All additional steel required for erection purposes shall be provided at no additional cost and shall be removed unless approved by the Owner in writing.
5. Connections - welded or high strength bolted:
   A. Bolts shall be ASTM F3125 and shall be installed in accordance with "Specifications for Structural Joints Using High-Strength Bolts".
   B. Provide bearing type connections with thread included in the shear plane for all connections other than slip critical connections.
   C. Provide hardened washers under nuts at all high-strength bolts, except where plate washers are used per AISC Specifications.
   D. Unless snug tight connections are noted on the drawings as being permitted, all bolts should be tightened to full pretensioning load.
   E. Use standard holes with the following exceptions: oversize holes are permitted when bolts are loaded in tension; short slotted holes are permitted for shear loading perpendicular to the slot.
   F. Where minimum AISC fillet weld thickness requirement exceeds welds shown on details, or weld size is not specified, provide minimum AISC weld.
   G. The length of connection shall not be less than one-half of the T distance of the beam web.
   H. Where reaction is noted, develop same. Where not noted, for non-composite beams, connections shall develop one-half of the total uniform load capacity of the beam.
6. Welding electrodes shall be E70XX except where other electrodes are required for compatibility with material being welded.
7. Shop drawings are required and shall note type of electrodes, size of all welds, and type and size of all bolts. Shop drawings shall be prepared under the supervision of a professional engineer licensed in the jurisdiction where the project is located.
8. Primer, see specifications.
9. See all contract drawings for miscellaneous steel requirements.
10. All shop and field welding shall be performed by a recently certified welder.
11. All welding and high strength bolting must be inspected by a qualified testing laboratory. Laboratory shall be approved by the Architect and/or Engineer.
12. Do not weld to existing steel without written approval from the Engineer.
13. Provide fills at splices of parts differing by more than 1/8" in thickness.
14. Provide 1/4" closure plates at all open ends of HSS members.
15. Miscellaneous hanging loads such as pipes, mechanical units, etc., supported by steel members shall be applied in such a manner that no torsional forces are induced in the steel members, i.e., loads shall pass through the centerline of wide flange sections and through the shear center of channels.

POST-INSTALLED ANCHORS

1. Anchorage to hardened concrete shall include torque controlled expansion anchors and adhesive anchors of size, number and spacing as shown on the drawings.
2. All anchors shall be installed in accordance with the Manufacturer's Printed Installation Instructions (MPII).
3. Existing reinforcing bars in the concrete may conflict with specific anchor locations. Reinforcing bars shall not be cut unless specifically noted on the drawings or approved by the Engineer of Record. The contractor shall review the structural drawings and shall locate the position of reinforcing bars in the vicinity of the anchors, by ground penetrating radar (GPR), x-ray, or other means.
4. Anchors shall be installed in holes drilled with a rotary impact hammer drill. Core drilling of holes is not permitted. Holes and anchor shall be thoroughly cleaned per the MPII prior to installation of the anchor.
5. Stainless steel anchors shall be used at all exterior locations and where specifically noted on the drawings.
6. Remove and replace misplaced or malfunctioning anchors. Patch failed anchor locations with high-strength non-shrink, non-metallic grout.
7. Installed adhesive anchors shall be securely held in-place to prevent displacement while the adhesive cures.
8. Quality Control:
   A. All anchors shall be periodically inspected to meet the requirements of MPII and the ICC-ES ESR report for the product.
   B. All anchor installers shall be trained by the manufacturer or manufacturer's representative for each individual product being installed.
9. Submittals:
   A. Technical product literature, highlighting each anchor and size to be used on the project.
   B. Manufacturer's Printed Installation Instructions (MPII) for each anchor type.
10. Where a specific type of anchorage is indicated on the drawings, substitution for a different type of anchorage shall meet the requirements of ACI 355.2 Category 1 or ACI 355.4 Category 1 for anchorage into concrete or shall have an ICC-ES ESR report for anchorage into masonry. Substitution shall not be permitted without prior written approval of the Engineer of Record.
11. Anchors to hardened concrete shall be supplied as an entire system and shall be as follows:
   A. Adhesive anchors in cracked and un-cracked concrete indicated on the drawings shall be Hilti HIT-HY 200 Safe Set Adhesive Anchoring System (ICC-ES Evaluation Report: ESR# 3187). The following anchor rods shall be used with the system:
      1) Reinforcing bar meeting the requirements of ASTM A615/A706 Grade 60.
      2) All-threaded rod shall be Hilti HIT-Z rods.
12. Requirements and design parameters of post-installed anchors into hardened concrete:
   A. Concrete shall have a minimum compressive strength of 2,500 psi and a minimum age of 21-days at the time of installation for adhesive anchors and 7-days for expansion anchors.
   B. Concrete temperature at the time of installation of adhesive anchors shall be a minimum of 50°F.
   C. Concrete may be water saturated or dry; water filled holes shall not be allowed.
   D. Embedment depth and anchor projection shall be as detailed on the drawings. Unless otherwise noted, minimum embedment depths, spacing, and edge distance shall be by the table below.

Post-installed Concrete Anchors			
	Adhesive Anchors		
Diameter	Minimum Embed.	Min. Edge Distance	Minimum Spacing
3/8"	4 1/2"	3 1/2"	4 1/2"
1/2"	6"	4 1/2"	6"
5/8"	7 1/2"	5 1/2"	7 1/2"
3/4"	8 1/2"	7"	8 1/2"

Description of Structural Special Inspection & Testing Requirements

Verification and Inspection	Frequency	Referenced Standard	BC Reference	Additional Notes
Metals				
Structural Steel				
Inspection Tasks Prior to Welding:		AISC 360 Table N5.4-1	2204.1	
Verify procedure specifications (WPS) available	Perform	AISC 360 Section N5.4		
Manufacturer certifications for welding consumables available.	Perform	AISC 360 Section N5.4		
Material identification (type/grade)	Observe	AISC 360 Section N5.4		
Check identification system	Observe	AISC 360 Section N5.4		
Configuration and finish of access holes	Observe	AISC 360 Section N5.4		
Fit up of fillet welds a. Dimensions (alignment,gaps at root) b. Cleanliness (condition of steel surface) c. Tacking(tack weld quality and location)	Observe			
Inspection Tasks During Welding:		AISC 360 Table N5.4-2	2204.1	
Use of qualified welders	Observe	AISC 360 Section N5.4		
Control and handling of welding consumables a. Packing b. Exposure control	Observe	AISC 360 Section N5.4		
No welding over cracked tack welds	Observe	AISC 360 Section N5.4		
Environmental conditions a. Wind speed within limits b. Precipitation and temperature	Observe	AISC 360 Section N5.4		
WPS followed a. Settings on welding equipment b. Travel speed c. Selected welding material d. Shielding gas type/flow rate e. Preheat applied f. Interpass temperature maintained g. Proper position (F,V,H,OH)	Observe	AISC 360 Section N5.4		
Welding techniques a. Interpass and final cleaning b. Each pass within profile limitations c. Each pass meets quality requirements	Observe	AISC 360 Section N5.4		
Inspection Tasks After Welding:		AISC 360 Table N5.4-3	2204.1	
Welds cleaned	Observe	AISC 360 Section N5.4		
Size,length and location of welds	Perform	AISC 360 Section N5.4		
Welds meet visual acceptance criteria a. Crack prohibition b. Weld/base-metal fusion c. Crater cross section d. Weld profiles e. Weld size f. Undercut g. Porosity	Perform	AISC 360 Section N5.4		
Arc strikes	Perform	AISC 360 Section N5.4		
k-Area (When welding of doubler plate, continuity plates or stiffeners in k-area, visually inspect the wed k-area for crack with in 3 in.)	Perform	AISC 360 Section N5.4		
Backing removed and weld tabs removed (if required)	Perform	AISC 360 Section N5.4		
Repair activities	Perform	AISC 360 Section N5.4		
Document acceptance or rejection of welded joint or member	Perform	AISC 360 Section N5.4		
Inspection of Welding in Field and in Non AISC Certified Shops: a. Complete joint penetration groove welds subject to transversely applied tension loading in butt, T and corner joints with materials 5/16 inches or thicker. b. Welder qualifications.	Test 100% of welds by ultrasonic testing for risk category III or IV. Test 10% of welds by ultrasonic testing for risk category II.	AISC 360 Section N5.5		All welds subject to non-destructive testing shall also meet visual acceptance criteria per AWS Table 6.1.
Inspection Tasks Prior to Bolting:		AISC 360 Table N5.6-1	2204.2	
Manufacturer's certifications available for fastener materials	Perform	AISC 360 Section N5.6		
Fasteners marked in accordance with ASTM requirements	Observe	AISC 360 Section N5.6		
Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	Observe	AISC 360 Section N5.6		
Proper bolting procedure selected for joint detail	Observe	AISC 360 Section N5.6		
Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	Observe	AISC 360 Section N5.6		
Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used	Observe	AISC 360 Section N5.6		
Proper storage provided for bolts,nuts washers and other fastener components	Observe	AISC 360 Section N5.6		
Inspection Tasks During Bolting:		AISC 360 Table N5.6-2	2204.2	
Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required	Observe	AISC 360 Section N5.6		
Joint brought to the snug- tight condition prior to the pretensioning operation	Observe	AISC 360 Section N5.6		
Fastener component not turned by the wrench prevented from rotating	Observe	AISC 360 Section N5.6		
Fasteners are pretensioned in accordance with the RCSC specification, progressing systematically from the most rigid point toward the free edges	Observe	AISC 360 Section N5.6 AISC 348		
Inspection Tasks After Bolting:		AISC 360 Table N5.6-3	2204.2	
Document acceptance or rejection of bolted connections	Perform	AISC 360 Section N5.6		
Inspection of Steel Frame: a. Verify installation of all members. b. Verify proper application of details to each joint and connection. c. Verify bracing and stiffening of framing members. d. Verfy members and detail critical to frame stability.	Perform	AISC 360 Section N5.7		
Verify Material Grade of Structural Steel: a. Verify identification markings conform to AISC 360 for materials specified in the approved construction documents. b. Manufacturer's certificate of compliance required.	Observe	AISC 360 Section N5.7		
Inspection of anchor rods and other embedments supporting structural steel: a. Verify the diameter, grade, type and length of anchor rod or embedded item b. Verify the extent or depth of embedment into concrete prior to placement of concrete.	Observe	AISC 360 Section N5.7		
Inspection of Welding and Bolting in AISC Certified Shop: a. Review Fabricator's Certificate of Compliance for certified fabricators shop.	Once for Each Fabricator	AISC 360 Section N7	1704.2	

SEAL

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PROJECT NAME
LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

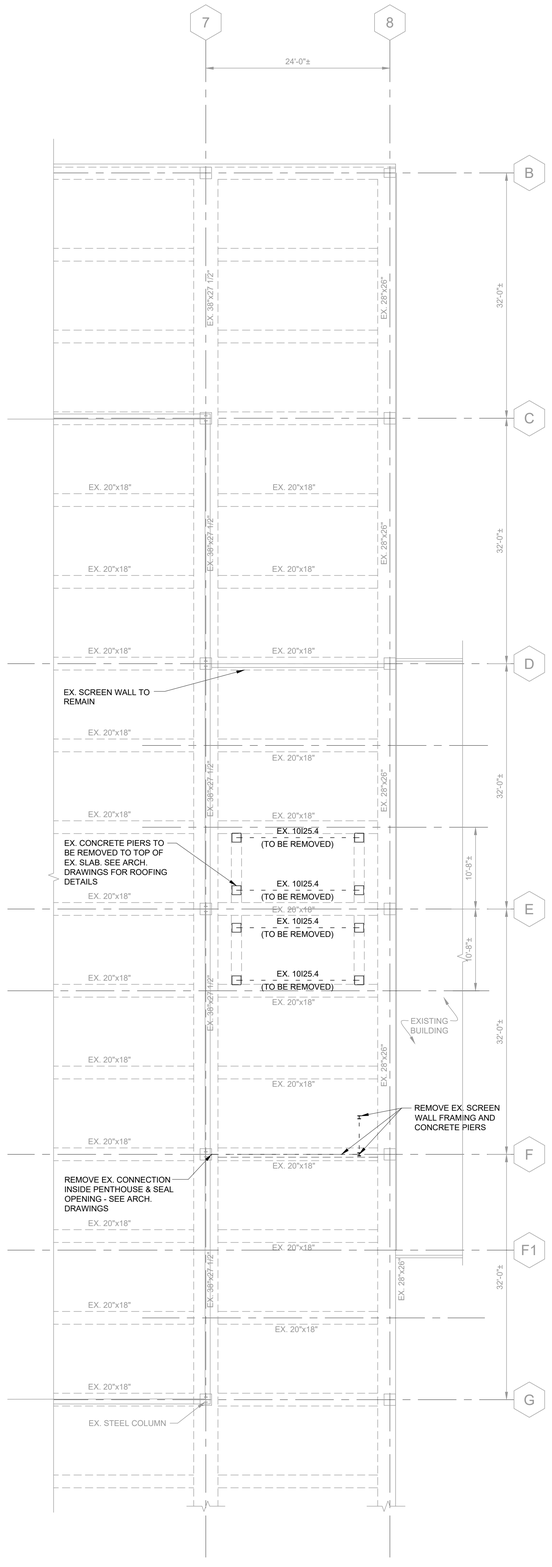
NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

DRAWN BY	LJP
CHECKED BY	MAM
DRAWING SCALE	AS NOTED
PROJECT NUMBER	21160

DRAWING TITLE
GENERAL NOTES & SPECIAL INSPECTIONS

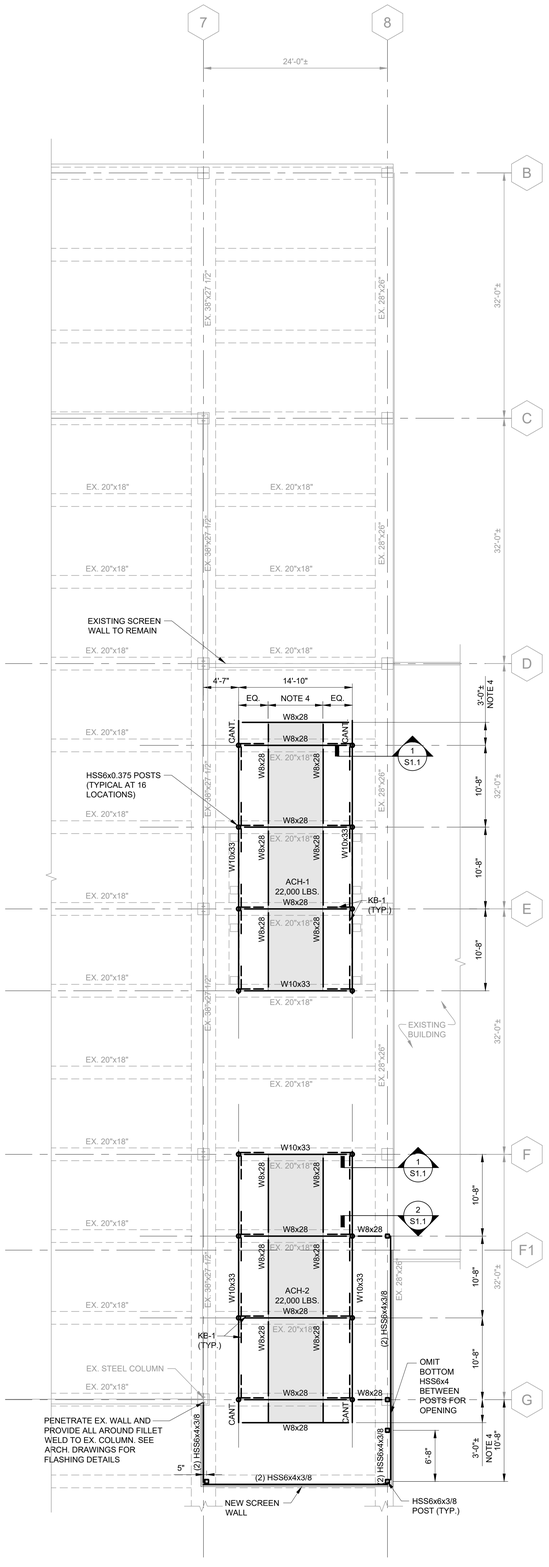
DATE SEPTEMBER 20, 2021

DRAWING NUMBER
S0.1



ROOF DEMOLITION PLAN

1/8"=1'-0"



ROOF FRAMING PLAN

1/8"=1'-0"

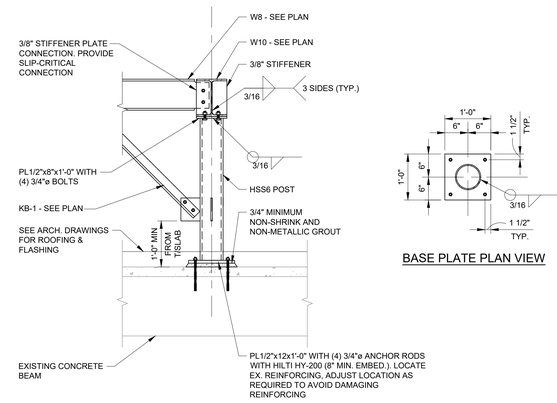
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO FABRICATION, AND NOTIFY THE ENGINEER IF CONDITIONS VARY FROM CONSTRUCTION DOCUMENTS.
2. ALL NEW STEEL EXPOSED TO WEATHERING SHALL BE HOT-DIPPED GALVANIZED.
3. TOP OF STEEL SHALL OCCUR (+4'-0") ABOVE TOP OF EX. CONCRETE SLAB (UNLESS OTHERWISE NOTED).
4. COORDINATE DIMENSIONS WITH MECHANICAL CONTRACTOR.

LEGEND:

KB-1 L2x2x3/8 DIAGONAL BRACE FROM POST TO UNDERSIDE OF BEAM. PROVIDE 3/8" GUSSET PLATE CONNECTIONS WITH (2) 3/4"ø SLIP-CRITICAL BOLTS.

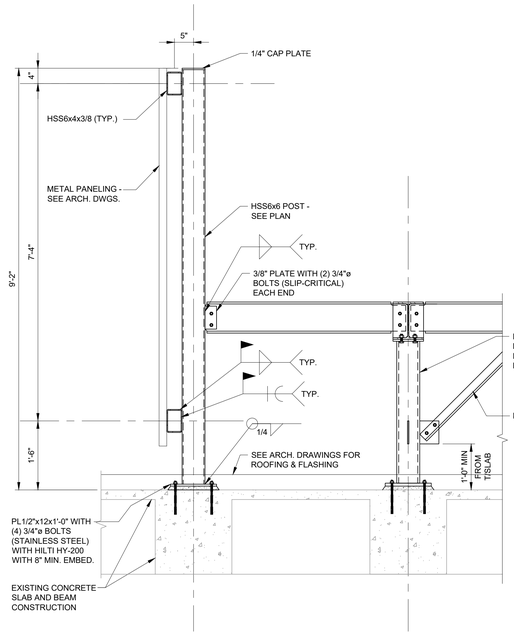
HB-1 L2x2x3/8 HORIZONTAL BRACE TO THE UNDERSIDE OF THE TOP BEAM FLANGE.



SECTION 1

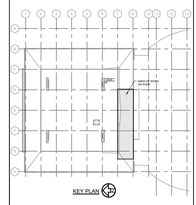
3/4"=1'-0"

BASE PLATE PLAN VIEW



SECTION 2

3/4"=1'-0"



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PROJECT NAME

LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS

3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
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DRAWN BY	LJP
CHECKED BY	MAM
DRAWING SCALE	AS NOTED
PROJECT NUMBER	21160

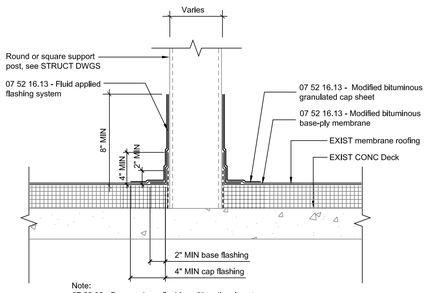
DRAWING TITLE

ROOF FRAMING PLAN AND SECTIONS

DATE SEPTEMBER 20, 2021

DRAWING NUMBER

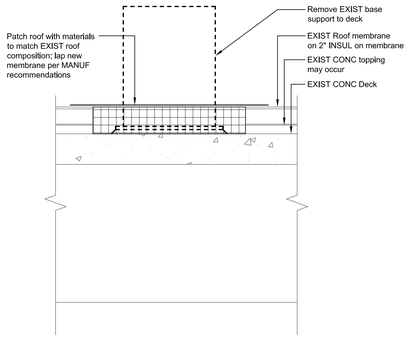
S1.1



Note:
07 60 00 - Base and cap flashing with optional cant may occur @ flat vertical surfaces and when recommended by manufacturer.

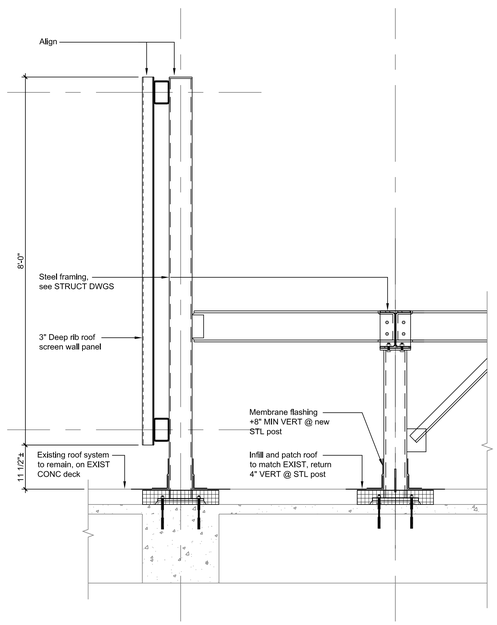
5 TYP FLASHING DETAIL
A1.1

0 4" 8" 16"
1 1/2" = 1'-0"



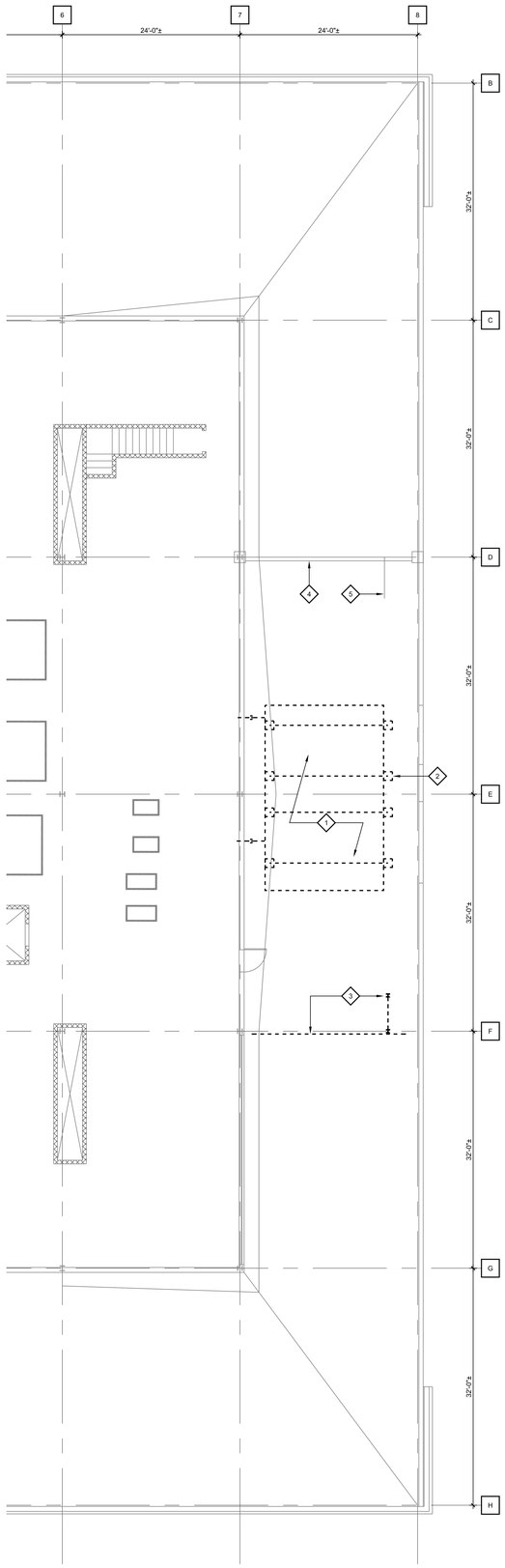
4 ROOF PATCHING DETAIL
A1.1

0 4" 8" 16"
1 1/2" = 1'-0"



3 SCREEN WALL SECTION
A1.1

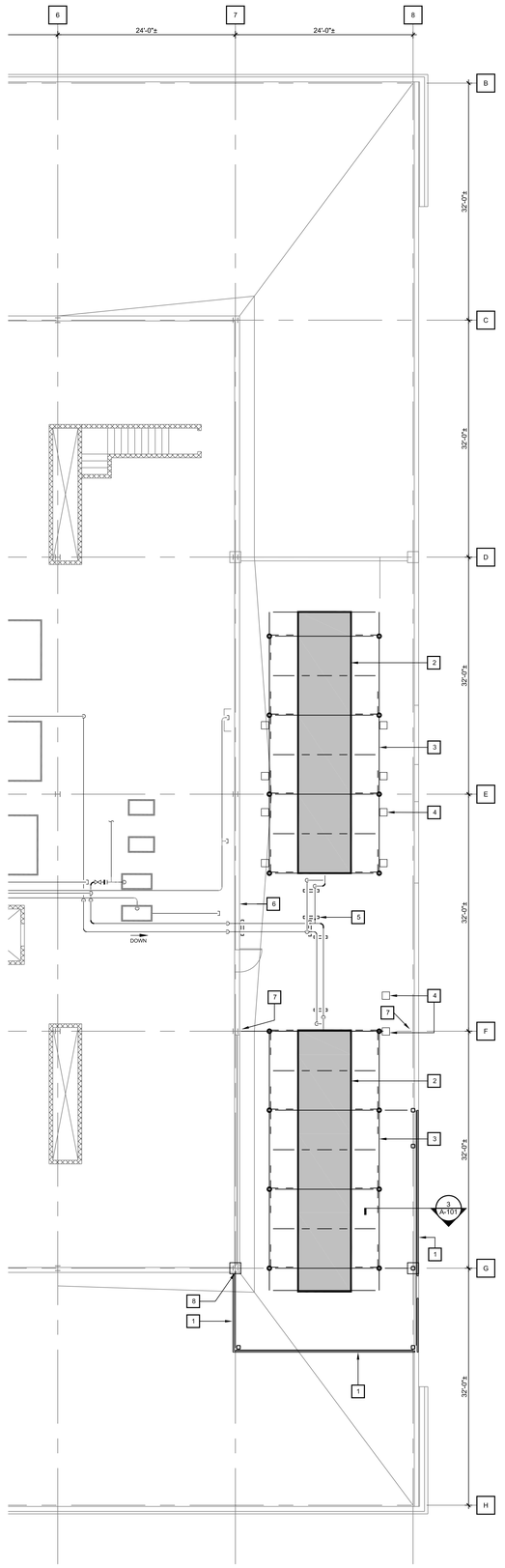
0 8" 16" 32"
3/4" = 1'-0"



2 ROOF DEMOLITION PLAN
A1.1

0 4' 8' 16'
1/8" = 1'-0"

NORTH



1 ROOF PLAN
A1.1

0 4' 8' 16'
1/8" = 1'-0"

NORTH

ROOF PLAN CODED DEMOLITION NOTES

1. Remove existing cooling tower; see MECH DWGS
2. Remove existing base supports (8 locations)
3. Remove existing screen wall, brace and base supports. Salvage portion of screen wall for patch at existing wall.
4. Existing screen wall to remain.
5. Existing screen wall bracing to remain.

GENERAL NOTES

1. Contractor shall provide (furnish and install) all labor, materials equipment and services required to complete the project.
2. Contractor certifies that by submitting a bid he has visited the site prior to bidding to confirm that all work required is included in the bid. Failure to do so shall preclude Contractor from additional compensation for the work.
3. All materials, equipment and devices incorporated into the work shall be new, unless noted otherwise.
4. Perform all work in compliance with all applicable building and construction codes. Contractor shall be responsible for coordinating final occupancy inspection.
5. Project safety and construction means and methods are solely the responsibility of the Contractor.
6. Construct all work in accordance with all applicable codes and regulations. Install work in accordance with generally accepted standards and in strict accordance with manufacturers printed instructions and specifications, whether or not specifically detailed in the construction documents.
7. Contractor shall report any and all discrepancies in the documents to the Engineer for clarification. Failure to report known discrepancies will not relieve contractor from responsibility to correct conditions.

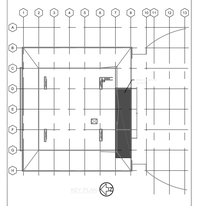
ROOF PLAN CODED NOTES

1. Roof screen wall panel, see STRUCT DWGS for framing
2. Air cooled chiller, see MECH DWGS
3. Steel support posts and beams, see STRUCT DWGS
4. Patch roof to match existing and to be watertight (10 locations)
5. Pipe supports (6 locations), see MECH DWGS for flashing detail
6. Patch and seal wall opening created by pipe removal, with portion of existing removed screen wall panel; patch to be watertight
7. Patch and seal wall opening created by steel beam removal, with portion of existing removed screen wall panel; patch to be watertight
8. Cut existing metal wall panel as required to make new steel tube connections to existing steel and seal to be watertight

PLAN / SYMBOL LEGEND

- Indicates section number / Indicates drawing sheet on which section is shown
- Indicates detail number / Indicates drawing sheet on which plan/detail is shown.
- Indicates elevation number / Indicates drawing sheet on which elevation is shown
- Coded Demolition Plan Note
- Coded Roof Plan Note
- Revision reference number

PERSPECTUS



STATE OF OHIO
MICHAEL LIPOWSKI
12451
REGISTERED ARCHITECT

Michael J. Lipowski, License #12451
Expiration Date 12/31/2021

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PROJECT NAME
LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
1	9-08-21	OWNER REVIEW
2	9-20-21	ISSUED FOR BID

DRAWN BY	DER
CHECKED BY	TH
DRAWING SCALE	AS NOTED
PROJECT NUMBER	21-114

DRAWING TITLE
ROOF PLANS AND DETAILS

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
A1.1

HVAC SYMBOLS	
SYMBOL	DESCRIPTION
	TURNING VANES
	VOLUME DAMPER
	MOTOR OPERATED DAMPER
T	DUCT TEMPERATURE SENSOR
H	DUCT HUMIDITY SENSOR
	SUPPLY DUCT
	RETURN OR EXHAUST DUCT
	EXISTING DUCTWORK & EQUIPMENT
	EXISTING DUCTWORK & EQUIPMENT TO BE REMOVED
	BALANCING VALVE
BFP	BACKFLOW PREVENTER
	CHECK VALVE
	CONTROL VALVE (2-WAY)
	CONTROL VALVE (3-WAY)
	EXISTING PIPING
	EXISTING PIPING TO BE REMOVED
	EXPANSION JOINT/COMPENSATOR
	FLEXIBLE PIPE CONNECTION
	PRESSURE REDUCING VALVE
	REMOVE TO POINT AND CAP
	REMOVE TO POINT FOR RECONNECTION
	SHUT OFF VALVE
	Y-STRAINER WITH BLOW DOWN
	UNION
	PIPE BRANCH TAKE-OFF FROM BOTTOM
	PIPE BRANCH TAKE-OFF FROM TOP
	PIPE DROP
	PIPE RISE
DP	PIPING DIFFERENTIAL PRESSURE SENSOR
	TEST PLUG
	PRESSURE GAUGE
	RELIEF OR SAFETY VALVE
	THERMOMETER

GENERAL HVAC ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
AAT	AMBIENT AIR TEMPERATURE
AC	AIR CONDITIONING
AD	ACCESS DOOR
AF	AIRFOIL
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
ATR	AIR TEMPERATURE RISE
AV	AIR VENT
AWT	AVERAGE WATER TEMPERATURE
BAS	BUILDING AUTOMATION SYSTEM
BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
CTE	CONNECT TO EXISTING
DDC	DIRECT DIGITAL CONTROL
DV	DRAIN VALVE
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
FPC	FIRE PROTECTION CONTRACTOR
GC	GENERAL CONTRACTOR
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MOP	MAXIMUM OVERCURRENT PROTECTION
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
PC	PLUMBING CONTRACTOR
REX	REMOVE EXISTING
RV	RELIEF VALVE
SP	STATIC PRESSURE
STR	STRAINER
TCC	TEMPERATURE CONTROL CONTRACTOR
TH	TOTAL HEAD
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
VTR	VENT THRU ROOF
WPD	WATER PRESSURE DROP

EQUIPMENT TAGGING LEGEND	
ABBREVIATION	TAGGING DESCRIPTION
ACH	XXX-X (ABBREVIATION – MARK)

PIPE SYSTEM ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
CR	CONDENSER WATER RETURN PIPING
CS	CONDENSER WATER SUPPLY PIPING
CWR	CHILLED WATER RETURN PIPING
CWS	CHILLED WATER SUPPLY PIPING
HWS	HEATING WATER SUPPLY PIPING

HVAC ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
ACH	AIR COOLED CHILLER
B	BOILER
CH	CHILLER
CT	COOLING TOWER
P	PUMP
TCP	TEMPERATURE CONTROL PANEL

DRAWING LIST - HVAC	
NUMBER	NAME
M0.1	HVAC LEGEND AND GENERAL NOTES
M0.2	HVAC SCHEDULES
MD.4	PENTHOUSE/ROOF HVAC DEMOLITION PLAN
M1.4	PENTHOUSE/ROOF HVAC PIPING PLAN
M5.1	HVAC DETAILS AND DIAGRAMS

GENERAL HVAC NOTES:

A. THE HVAC SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.

B. DRAWINGS ARE DIAGRAMMATIC. INDICATED POSITIONS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. EXACT EQUIPMENT LOCATIONS AND DUCTWORK AND PIPING ROUTING SHALL BE SUBJECT TO BUILDING CONSTRUCTION AND INTERFERENCES WITH OTHER TRADES. WHERE THE LOCATION OF A SPECIFIC PIPE, DUCT, OR DEVICE IS DIMENSIONED, ITS INSTALLED LOCATION SHALL BE AS DIMENSIONED UNLESS COORDINATED OTHERWISE WITH THE ARCHITECT OR ENGINEER.

C. ALTHOUGH ATTEMPTS HAVE BEEN MADE TO IDENTIFY EXISTING EQUIPMENT LOCATIONS, PIPE AND DUCTWORK ROUTING, AND SIZES WITH THE USE OF EXISTING DRAWINGS AND FIELD OBSERVATIONS, MC SHALL FIELD VERIFY EXISTING INFORMATION AND REPORT ANY DISCREPANCIES TO THE ARCHITECT OR ENGINEER. CONTRACTOR SHALL NOTE DISCREPANCIES ON THE RECORD DRAWINGS.

D. UNLESS NOTED OTHERWISE, SERVICES INDICATED AS BEING REMOVED SHALL BE REMOVED TO THE POINT INDICATED FOR RECONNECTION, OR BACK TO THE MAIN, CAPPED, AND IDENTIFIED. REMOVE PREVIOUSLY ABANDONED PIPING, DUCTWORK, SUPPORTS, ETC ENCOUNTERED ABOVE CEILINGS.

E. THE OWNER SHALL HAVE THE OPTION OF RETAINING ANY OR ALL REMOVED EQUIPMENT FOR SALVAGE. MC SHALL DISPOSE OF EQUIPMENT NOT RETAINED BY THE OWNER.

F. WHERE EXISTING THERMOSTATS, THERMOMETERS, OR OTHER EQUIPMENT CONTAINS MERCURY OR MERCURY BASED PRODUCTS, FOLLOW EPA UNIVERSAL WASTE RULES FOR REMOVAL, TRANSPORTATION, AND RECYCLING.

G. WHERE WORK OCCURS OUTSIDE THE PROJECT SCOPE BOUNDARY, THE CONTRACTOR PERFORMING THE WORK SHALL BE RESPONSIBLE FOR THE REMOVAL AND REINSTALLATION OF CEILINGS, GRIDS, AND LIGHTS AS REQUIRED TO PERFORM THE WORK.

H. COORDINATE WORK WITH THE PHASING OF THE PROJECT. SOME SERVICES SHALL REMAIN ACTIVE TO SERVE OCCUPIED SPACES DURING CONSTRUCTION. SCHEDULE SERVICE SHUTDOWNS WITH OWNER AND/OR CONSTRUCTION MANAGER.

I. CUTTING AND PATCHING OF WALLS AND FLOORS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE WORK REQUIRING THE PENETRATION. IF THE MC DEFACES OR DAMAGES WALLS, CEILINGS, FLOORS, OR FINISHES, THE MC SHALL BE RESPONSIBLE FOR PATCHING, REPAIRING, AND REFINISHING. PATCHING MATERIALS SHALL MATCH THE EXISTING CONDITIONS AS APPLICABLE. FINISH PAINTING SHALL BE BY THE GENERAL CONTRACTOR.

J. PROVIDE FIRESTOPPING AT PENETRATIONS OF FIRE-RATED ASSEMBLIES. FIRESTOPPING SHALL BE PERFORMED BY THE CONTRACTOR PERFORMING THE WORK REQUIRING THE PENETRATION.

K. EXCEPT FOR SLAB ON GRADE, PROVIDE FIRESTOPPING AT PENETRATIONS OF NON-FIRE-RATED FLOORS. FIRESTOPPING SHALL BE PERFORMED BY THE CONTRACTOR PERFORMING THE WORK REQUIRING THE PENETRATION.

L. WHERE DUCTS, CONDUITS, OR PIPES ARE REMOVED THROUGH FIRE-RATED FLOORS OR WALLS, THE CONTRACTOR REMOVING THE DEVICE/MATERIAL SHALL SEAL THE REMAINING OPENING TO MAINTAIN FIRE RATING.

M. PROVIDE FILLING AND SEALING OF THE AREA AROUND PENETRATIONS OF SMOKE-RATED ASSEMBLIES. MATERIALS USED SHALL BE COMPATIBLE WITH THE ASSEMBLY BEING PENETRATED.

N. INSTALL EQUIPMENT REQUIRING AN ELECTRICAL CONNECTION IN SUCH A MANNER SO THAT PROPER CLEARANCE IS PROVIDED FOR SERVICING PER THE NATIONAL ELECTRIC CODE.

O. PROVIDE ROOFING WORK WHERE THE INSTALLATION OF HVAC EQUIPMENT, PIPING, OR DUCTWORK PENETRATES OR DAMAGES AN EXISTING ROOF MEMBRANE.

P. EQUIPMENT LAYOUT IS BASED ON SCHEDULED EQUIPMENT. ACTUAL INSTALLED EQUIPMENT SIZE, CONFIGURATION, AND DUCTWORK/PIPING CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING AND DUCTWORK/PIPING LAYOUT.

Q. EQUIPMENT SCHEDULES CONTAIN BOTH NOTES AND REMARKS. NOTES APPLY TO ALL EQUIPMENT SCHEDULED. REMARKS APPLY ONLY TO SPECIFIC EQUIPMENT AS INDICATED.

R. HVAC SYSTEM PIPING AND DUCTWORK SHALL NOT BE INSTALLED IN ELEVATOR SHAFTS, ELEVATOR MACHINE ROOMS, ELECTRICAL ROOMS, OR INFORMATION TECHNOLOGY (LOW VOLTAGE) ROOMS. EXCEPTION – PIPING AND DUCTWORK DIRECTLY RELATED TO HVAC EQUIPMENT CONDITIONING THE ROOM. ROUTE PIPING AND DUCTWORK INTO THE ROOM OVER THE DOOR AND NOT OVER PANELS OR EQUIPMENT. CONTACT ARCHITECT/ENGINEER PRIOR TO INSTALLATION OF ANY OTHER PIPING OR DUCTWORK.

S. DO NOT SUPPORT PIPING FROM ANOTHER DUCT, PIPE, OR CONDUIT. DO NOT SUPPORT ANY ITEM FROM METAL ROOF DECK.

T. ATTENTION IS CALLED TO THE LIMITED CEILING SPACE. COORDINATE ALL WORK WITH CEILING HEIGHTS, SOFFITS, STRUCTURE, AND LIGHTS. HOLD DUCTWORK AS HIGH AS POSSIBLE, TO DECK BETWEEN BEAMS IF REQUIRED, AND TIGHT TO STRUCTURE. PROVIDE ANY AND ALL OFFSETS AND EFFORT REQUIRED TO FACILITATE THE INSTALLATION OF OTHER EQUIPMENT AND SYSTEMS. COORDINATE CLOSELY WITH OTHER TRADES.

U. PROVIDE AIR VENTS IN PIPING SYSTEMS AS REQUIRED FOR COMPLETE AIR ELIMINATION. PROVIDE HOSE END DRAIN VALVES AS REQUIRED TO ALLOW COMPLETE SYSTEM DRAINING. NOTE LOCATIONS ON AS-BUILT DRAWINGS.

V. BULLHEAD PIPING CONFIGURATIONS IN PIPING ARE PROHIBITED.

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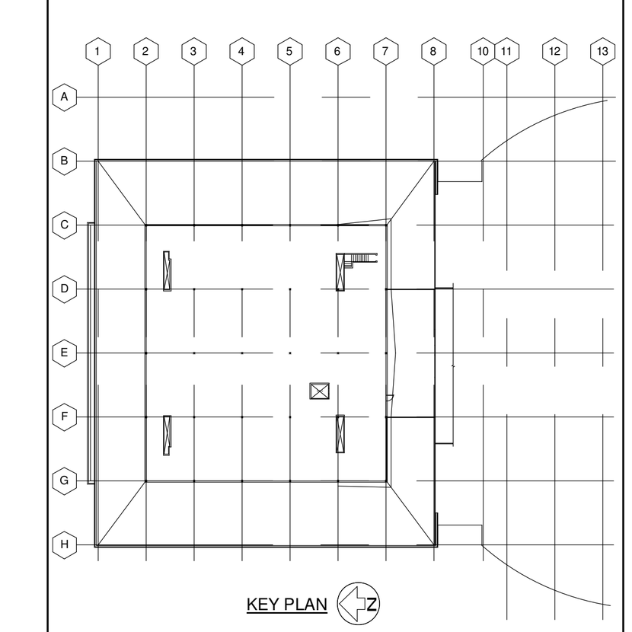

SEAL

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ROOFTOP EQUIPMENT

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CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

DRAWN BY	JW
CHECKED BY	RH
DRAWING SCALE	As indicated
PROJECT NUMBER	21160

DRAWING TITLE
HVAC LEGEND AND GENERAL NOTES

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
M0.1

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AIR COOLED CHILLER SCHEDULE

EQUIPMENT TAG		REFRIGERANT		NOMINAL TONS	EER		COMPRESSOR DATA		EVAPORATOR				CONDENSER DATA		ELECTRICAL					OPER. WEIGHT (LB)	MANUFACTURER	MODEL	REMARKS
ABBREV.	MARK	TYPE	LBS		FULL LOAD	IPLV	TYPE	NO	EWT (°F)	LWT (°F)	GPM	WPD (FT)	AAT (°F)	NO. FANS	VOLT	PH	KW	MCA	MOP				
ACH	1	R134A	590.9	275	11.43	20.03	VSD SCREW	2	54	44	658	10.1	95	18	480	3	288.6	472	600	21603	YORK	YVAA0308EVV46BAVBXO	-
ACH	2	R134A	590.9	275	11.43	20.03	VSD SCREW	2	54	44	658	10.1	95	18	480	3	288.6	472	600	21603	YORK	YVAA0308EVV46BAVBXO	-

NOTES:
A. SINGLE POINT POWER CONNECTION
B. LOW NOISE CONDENSER FAN AND COMPRESSOR SOUND PACKAGE - REFER TO SPECIFICATIONS.
C. BACNET COMMUNICATION TO BAS. REFER TO SPECIFICATIONS.
D. CONDENSER CIRCUIT 1 - 10 FANS, CIRCUIT 2 - 8 FANS
E. MANUFACTURER'S FACTORY START-UP SERVICE.
F. AHRI CERTIFIED.
G. FIELD INSTALLED FLOW SWITCH
H. FACTORY INSULATION PACKAGE.
I. FACTORY EVAPORATOR ELECTRIC HEATERS TO PROTECT TO -20 DEG F. REFER TO SPECIFICATIONS.
J. SPRING VIBRATION ISOLATORS.
K. 4-YEAR EXTENDED COMPRESSER WARRANTY.

AIR COOLED CHILLER - SOUND POWER LEVELS

LOAD %	AMBIENT (DEG F)	63 Hz (dB)	125 Hz (dB)	250 Hz (dB)	500 Hz (dB)	1 kHz (dB)	2 kHz (dB)	4 kHz (dB)	8 kHz (dB)
100	95	98	98	99	99	96	90	85	80
75	80	94	94	95	95	92	86	84	79
50	65	90	91	90	92	87	82	77	72
25	55	85	85	87	87	87	78	75	70

NOTES:
A. MEASUREMENT IN ACCORDANCE WITH AHRI 370.
B. UNIT EQUIPPED WITH LOW SOUND KIT AND LOW SOUND FANS WITH VARIABLE SPEED CONTROL.

HVAC PIPE INSULATION SCHEDULE

SERVICE	TYPE	THICKNESS TYPE
CHILLED WATER (40-55 DEGREES F)	FIBERGLASS	F

THICKNESS SCHEDULE TYPE	PIPE SIZES (INCHES)			
	1 TO 1-1/4	1-1/2 TO 3	4 TO 6	8 AND ABOVE
F	1	1-1/2	1-1/2	1-1/2

NOTES:
1. WHERE PIPING, INSTALLED OUTDOORS, IS INSULATED WITH FIBERGLASS, PROVIDE WEATHERPROOF COVER AS SPECIFIED IN 23 07 00.

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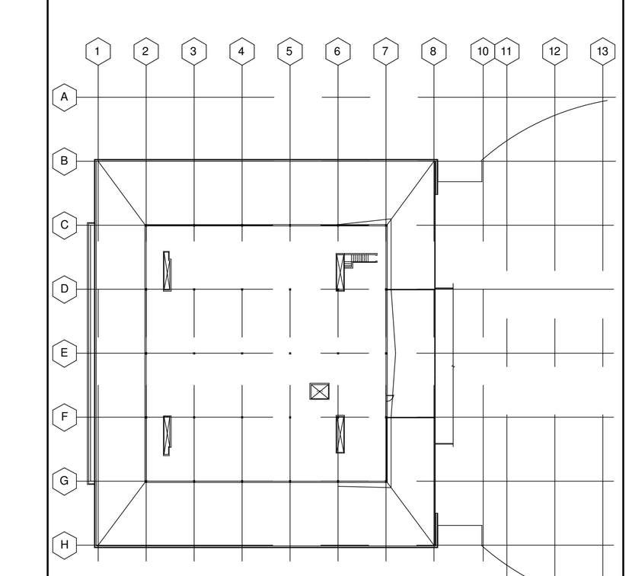

KEY PLAN

SEAL

STATE OF OHIO
RICHARD HAAS
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PROJECT NAME
LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

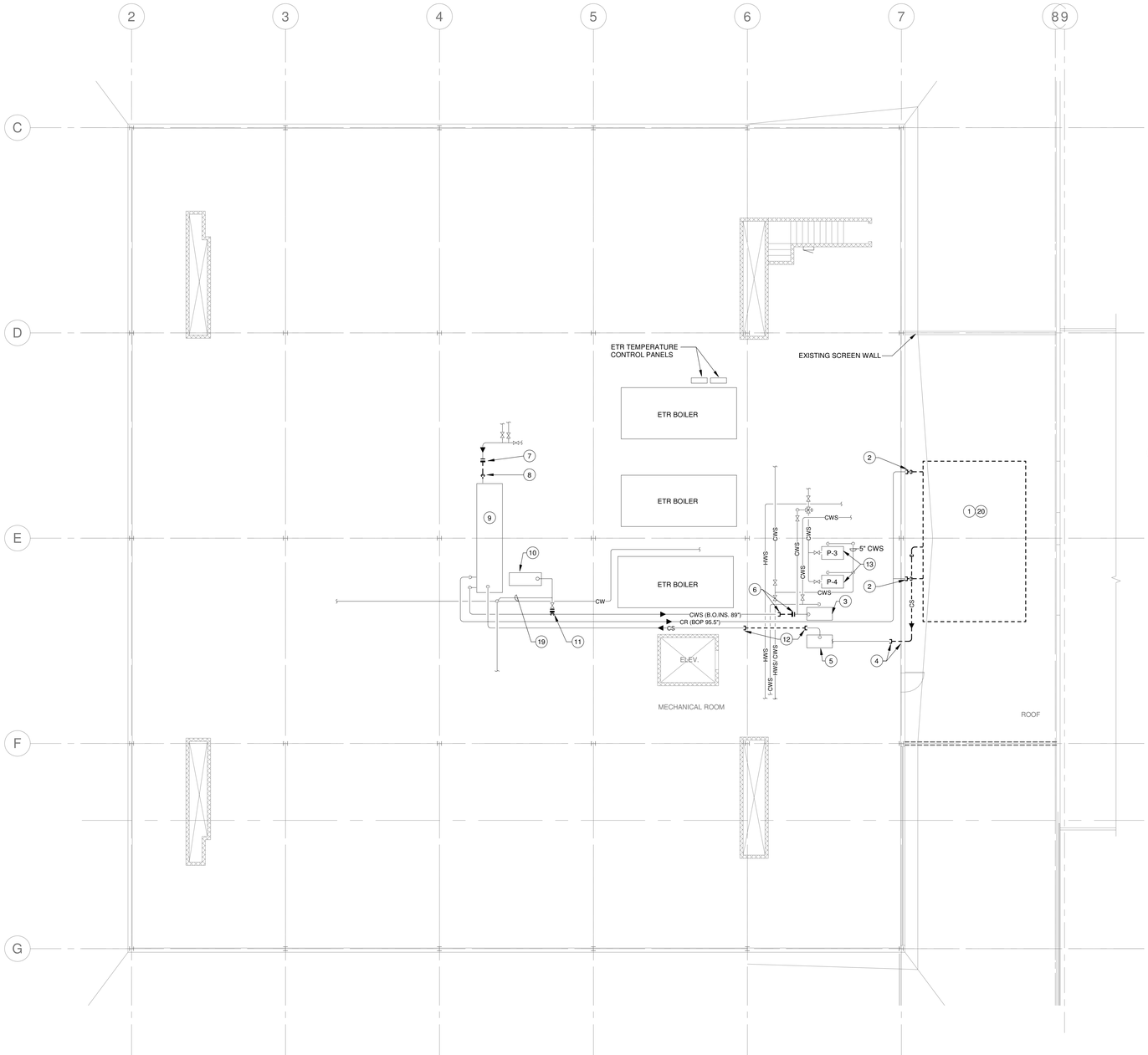
NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

DRAWN BY	JW
CHECKED BY	RH
DRAWING SCALE	12" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE
HVAC SCHEDULES

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
M0.2



PLAN NOTES

1 REMOVE EXISTING COOLING TOWER AND ASSOCIATED PIPING, SUPPORTS, WIRING, CONTROLS AND CURBS.
2 REX 8" CONDENSER WATER RETURN PIPING TO WALL AND CAP PIPING OUTSIDE.
3 ETR CHILLED WATER PRIMARY PUMP, P-5.
4 REX 10" CONDENSER WATER SUPPLY PIPING TO INSIDE MECHANICAL ROOM AND CAP. GC SHALL PATCH WALL OPENING TO MATCH EXISTING CONDITIONS.
5 EXISTING CONDENSER WATER PUMP SHALL BE ABANDONED IN PLACE.
6 REX PORTION INDICATED OF 10" CWS PIPING AND CAP. PREPARE FOR RECONNECTION.
7 REX 10" CWR PIPING TO POINT INDICATED FOR RECONNECTION.
8 CAP EXISTING 10" CWR PIPING AT ETR CHILLER.
9 ABANDON CHILLER IN PLACE. CAP ALL PIPING AS REQUIRED.
10 ETR CHILLED WATER EXPANSION TANK.
11 REX EXPANSION LINE PIPING CONNECTION TO POINT INDICATED FOR RECONNECTION.
12 REX PORTION OF 10" CS PIPING AND CAP TO MAKE ROOM FOR NEW CWS/R PIPING.
13 ETR PRIMARY AND STANDBY HWS & CWS CHANGEOVER PUMPS, P-3 & P-4.
19 ETR 3/4" COLD WATER MAKE-UP LINE.
20 MC SHALL REMOVE ALL REFRIGERANT WITHIN THE EXISTING WATER COOLED CHILLER. REFER TO SPECIFICATIONS.

SCALE: 1/8" = 1'-0"
0 2' 4' 6' 8' 12' 16'

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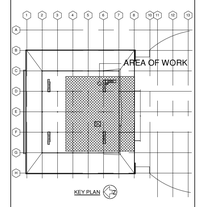

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ROOFTOP EQUIPMENT

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DRAWN BY	JW
CHECKED BY	RH
DRAWING SCALE	1/8" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE
PENTHOUSE/ROOF HVAC DEMOLITION PLAN

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
MD.4

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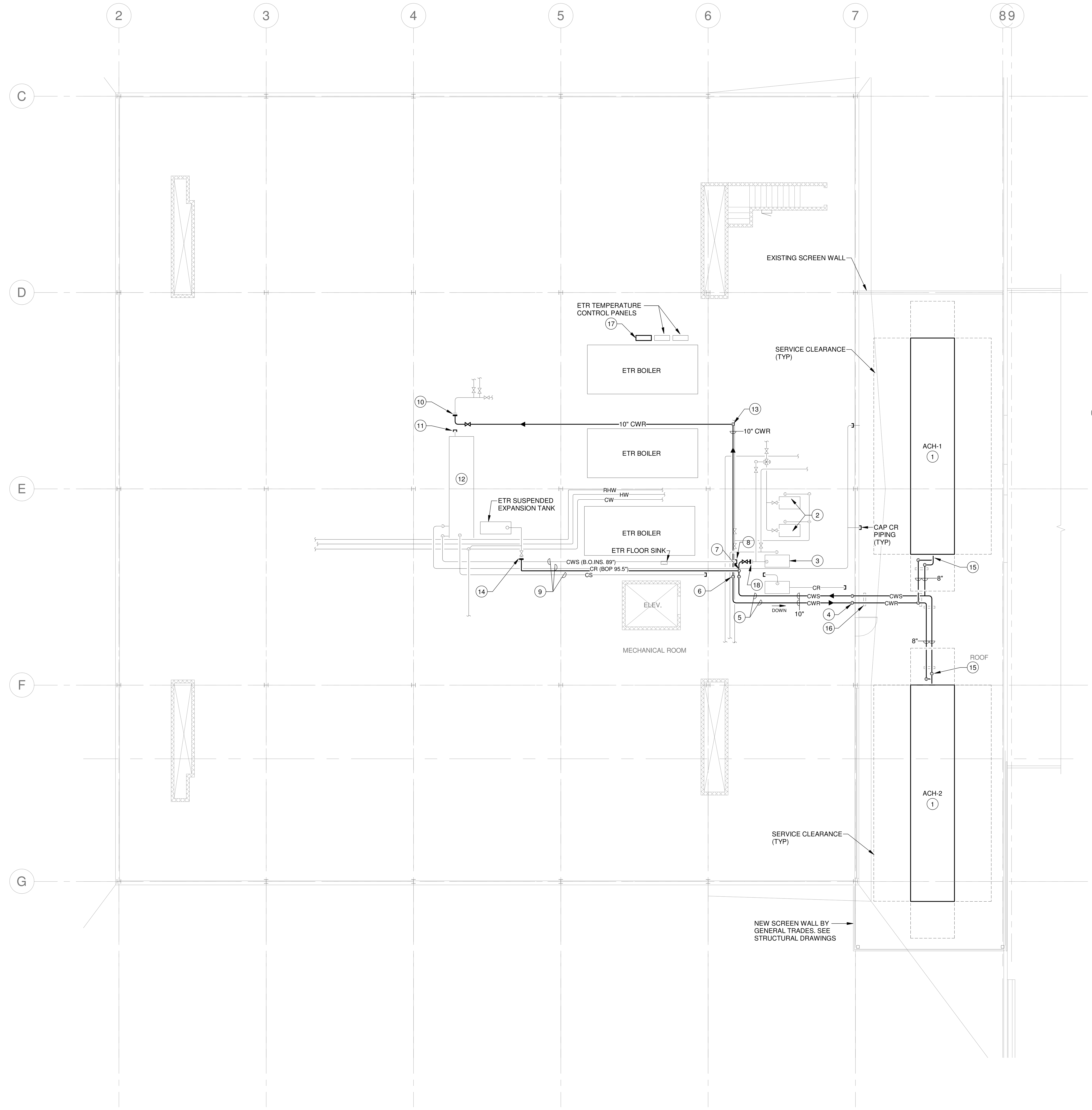

ⓧ PLAN NOTES

1. AIR COOLED CHILLER MOUNTED ON STRUCTURAL STEEL SUPPORTS AND SPRINGS. REFER TO DETAIL DRAWING M5.1 AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
2. ETR PRIMARY AND STANDBY HWS & CWS CHANGEOVER PUMPS, P-3 & P-4. BALANCE TO 250 GPM EACH.
3. ETR CHILLED WATER PRIMARY PUMP, P-5. BALANCE TO 1065 GPM.
4. DROP PIPING TIGHT ALONG INSIDE WALL AND PENETRATE WALL AT ROOF LEVEL. PROVIDE 3/4" DRAIN VALVES WITH HOSE THREAD AT BOTTOM OF CWS/R PIPING. SEAL PIPING PENETRATIONS WEATHERTIGHT.
5. 10" CWS/R PIPING TIGHT TO STRUCTURE. SLOPE PIPING AS REQUIRED TO FOLLOW ROOF PROFILE.
6. 10" CWS/R PIPING DOWN TO BELOW EXISTING PIPING. PROVIDE 3/4" DRAIN VALVES WITH HOSE THREAD AND CAP AT LOW POINT.
7. CONNECT 3/4" EXPANSION LINE FROM ETR EPXANSION TANK TO NEW CWS PIPING.
8. CAP EXISTING 10" CWS PIPING.
9. EXISTING PIPING SHALL BE ABANDONED IN PLACE.
10. CTE 10" CWR PIPING. EXISTING PIPE ELEVATION AT APPROX. 95" AFF CENTERLINE OF PIPE.
11. CAP EXISTING 10" CWR PIPING AT ETR CHILLER.
12. EXISTING CHILLER SHALL BE ABANDONED IN PLACE.
13. DROP 10" CWR PIPING TO APPROXIMATELY 84" (TO TOP OF INSULATION).
14. CTE 3/4" EXPANSION LINE AND EXTEND TO CWS PIPING.
15. 8" CWS/R CONNECTION TO CHILLER. COORDINATE WITH MANUFACTURER. PIPING TO BE HELD LOW TO ROOF AND RISE UP TO CONNECTIONS.
16. ROOF SUPPORTS. REFER TO DETAIL ON DRAWING M5.1.
17. PROVIDE JACE CONTROL PANEL. TIE INTO EXISTING HONEYWELL BAS.
18. CTE 10" CWS PIPING TO PUMP P-5 SUCTION.

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

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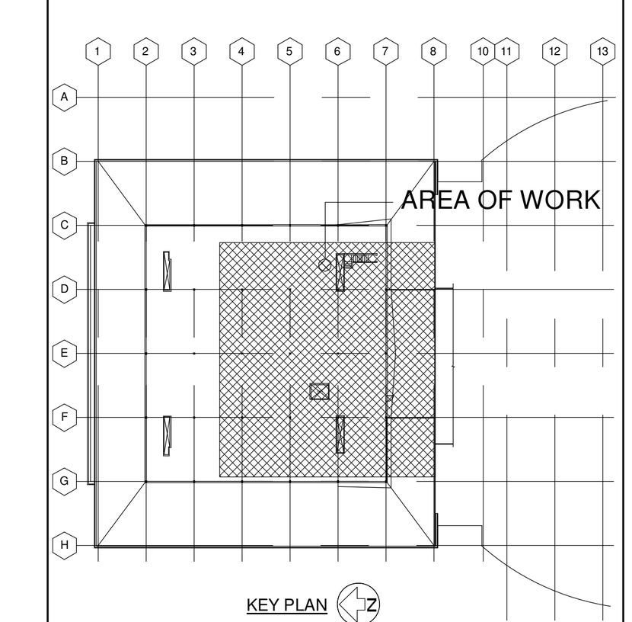

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PROJECT NAME

LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

PROJECT ADDRESS

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CLEVELAND, OHIO 44109

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DRAWING SCALE	1/8" = 1'-0"
PROJECT NUMBER	21160

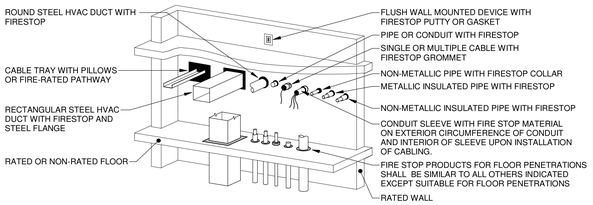
DRAWING TITLE

PENTHOUSE/ROOF HVAC PIPING PLAN

DATE SEPTEMBER 20, 2021

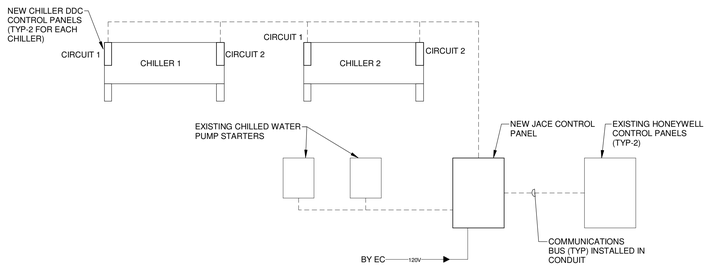
DRAWING NUMBER

M1.4



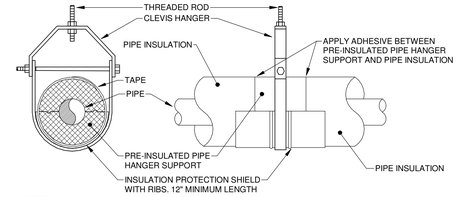
NOTES:
1. REFER TO UL FIRE RESISTANCE DIRECTORY FOR COMPLETE INSTALLATION REQUIREMENTS.
2. IN AN OCCUPIED BUILDING, PERMANENT FIRESTOPPING SHALL BE INSTALLED WITHIN 24 HOURS OF PENETRATING A FIRE-RATED ASSEMBLY. IF PERMANENT FIRESTOPPING CANNOT BE INSTALLED WITHIN THIS TIME PERIOD, TEMPORARY FIRESTOP PILLOWS/ BLOCKS ARE PERMITTED, WHERE INSTALLATION ALLOWS, UNTIL PERMANENT FIRESTOP MATERIALS CAN BE PROPERLY INSTALLED.

FIRESTOPPING DETAIL
SCALE: NONE



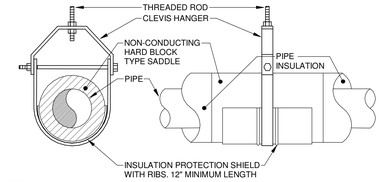
TEMPERATURE CONTROL DETAIL

CHILLED WATER SYSTEM SHALL BE ENABLED THROUGH THE NEW JACE PANEL INITIALLY PROVIDED FOR CHILLED WATER SYSTEM CONTROL ONLY. CHILLED WATER SYSTEM SHALL BE ENABLED WHEN OUTSIDE AIR TEMPERATURES ARE ABOVE 55 DEG. F (ADJUSTABLE). ONCE ENABLED, EXISTING CHILLED WATER PUMP SHALL BE STARTED BY NEW JACE PANEL VIA SIGNAL FROM THE CHILLER CONTROL PANEL. EXISTING OPERATING /STAND-BY PUMP SEQUENCE SHALL BE MAINTAINED THROUGH NEW JACE PANEL. ONCE PROOF OF FLOW IS PROVIDED AT CHILLER FLOW SWITCH, CHILLER SHALL START AND OPERATE ON ITS OWN FACTORY CONTROLS TO MAINTAIN CHILLED WATER TEMPERATURE SETPOINT. SETPOINT SHALL BE ADJUSTABLE THROUGH JACE PANEL. ALL CHILLER PACKAGE CONTROL POINTS/STATUS/ALARMS SHALL BE INTERFACED WITH EXISTING HONEYWELL BAS.



NOTES:
1. WHEN INSTALLED USING A TRAPEZE HANGER OR OTHER TYPE OF SUPPORT, LOCATE HANGER OR SUPPORT AND PIPE CLAMP IN SAME LOCATION AS CLEVIS HANGER.
2. PRE-INSULATED PIPE HANGER SUPPORT SHALL MATCH ADJACENT PIPE INSULATION.
3. INSULATION SYSTEM SHALL BE CONTINUOUS THROUGH HANGER WITH VAPOR SEAL INTEGRITY MAINTAINED THROUGHOUT THE ENTIRE SYSTEM.

CLOSED-CELL INSULATION

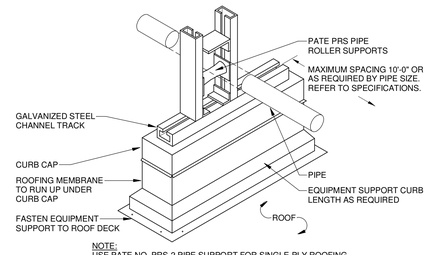


NOTES:
1. WHEN INSTALLED USING A TRAPEZE HANGER OR OTHER TYPE OF SUPPORT, LOCATE HANGER OR SUPPORT, PIPE CLAMP, INSULATION PROTECTION SHIELD AND SADDLE IN SAME LOCATION AS CLEVIS HANGER.
2. INSULATION PROTECTION SHIELD DIAMETER SHALL MATCH INSULATION OUTSIDE DIAMETER.
3. SADDLE LENGTH SHALL MATCH PROTECTION SHIELD LENGTH. THICKNESS SHALL MATCH PIPE INSULATION THICKNESS.
4. INSULATION SYSTEM SHALL BE CONTINUOUS THROUGH HANGER WITH VAPOR SEAL INTEGRITY MAINTAINED THROUGHOUT THE ENTIRE SYSTEM. APPLY TAPE TO ALL JOINTS.

FIBERGLASS INSULATION - PIPING 2 1/2" AND LARGER
FOR PIPING SYSTEMS WITH A POSSIBILITY OF CONDENSATION

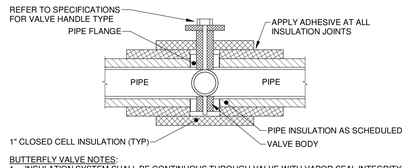
NOTE:
ALL ABOVE DETAILS MAY NOT APPLY TO THE PROJECT. PIPE INSULATION TYPE AND PIPE SIZE SHALL DETERMINE WHICH DETAILS APPLY. REFER TO SPECIFICATIONS.

HVAC - INSULATED PIPE HANGER DETAILS
SCALE: NONE



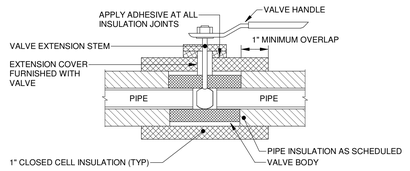
NOTE:
USE PATE NO. PRS-2 PIPE SUPPORT FOR SINGLE-PLY ROOFING AND PATE NO. PRS-5 PIPE SUPPORT FOR BUILT-UP ROOFING.

ROOFTOP PIPE SUPPORT DETAIL
(PIPE ROLLER) SCALE: NONE



BUTTERFLY VALVE NOTES:
1. INSULATION SYSTEM SHALL BE CONTINUOUS THROUGH VALVE WITH VAPOR SEAL INTEGRITY MAINTAINED THROUGHOUT THE ENTIRE SYSTEM.

BUTTERFLY VALVE

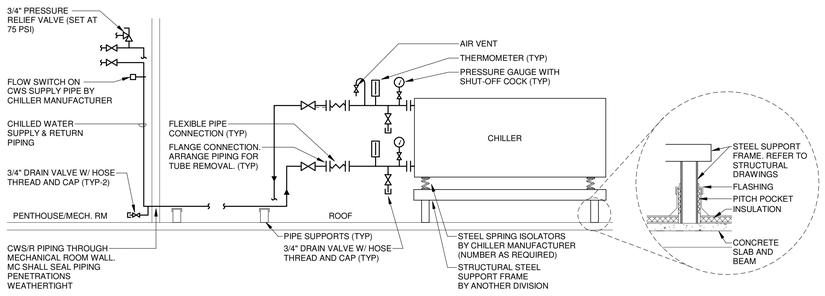


BALL VALVE NOTES:
1. BALL VALVE SHALL BE EQUIPPED WITH AN EXTENSION STEM WITH COVER.
2. IF SLEEVE TYPE EXTENSION IS USED, INSTALL TAPE CAP AT TOP OF COVER.
3. INSULATION SYSTEM SHALL BE CONTINUOUS THROUGH VALVE WITH VAPOR SEAL INTEGRITY MAINTAINED THROUGHOUT THE ENTIRE SYSTEM.

BALL VALVE

NOTES:
1. DETAILS ARE FOR VALVES INSTALLED IN PIPING SYSTEMS WITH A POSSIBILITY OF CONDENSATION.
2. DETAILS APPLY TO ALL VALVES INCLUDING SHUT-OFF, BALANCING AND CONTROL VALVES.
3. BOTH DETAILS MAY NOT APPLY TO THE PROJECT. REFER TO SPECIFICATIONS.

HVAC - VALVE INSULATION DETAILS
SCALE: NONE



AIR COOLED CHILLER PIPING DIAGRAM
(ROOF INSTALLATION) SCALE: NONE

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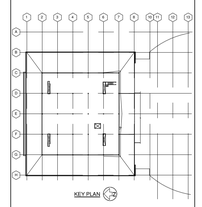

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DRAWING SCALE	1/8" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE
HVAC DETAILS AND DIAGRAMS

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
M5.1

LEGEND - ELECTRICAL DEVICES	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE (20A, 125V) TAMPER-RESISTANT SAFETY TYPE AT 18" AFF, UON
	DUPLEX RECEPTACLE (20A, 125V) GROUND-FAULT CIRCUIT INTERRUPTER, TAMPER-RESISTANT SAFETY TYPE AT 18" AFF, UON
(J)	JUNCTION BOX - MOUNTING HEIGHT AND SIZE AS REQUIRED BY CODE OR AS NOTED ON DRAWINGS
	NON-FUSED DISCONNECT SWITCH IN AN ENCLOSURE
	FUSED DISCONNECT SWITCH IN AN ENCLOSURE
	THREE PHASE COMBINATION MAGNETIC MOTOR STARTER/DISCONNECT SWITCH IN AN ENCLOSURE

LEGEND - ELECTRICAL DISTRIBUTION	
SYMBOL	DESCRIPTION
	PANELBOARD (208Y/120V, 3Ø, 4 WIRE)
DP-X	DISTRIBUTION PANELBOARD (480Y/277V, 3Ø, 4 WIRE)
	SWITCHBOARD

GENERAL ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
A	AMPERES
AF	AMP FUSED
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AS	AMP SWITCH
ATS	AUTOMATIC TRANSFER SWITCH
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
C/B	CIRCUIT BREAKER
CL	CENTER LINE
CM	CONSTRUCTION MANAGER
EC	ELECTRICAL CONTRACTOR
ETR	EXISTING ELECTRICAL DEVICE TO REMAIN
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER - PERSON PROTECTION
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
KEC	KITCHEN EQUIPMENT CONTRACTOR
KWC	KILOWATTS CONNECTED
KWD	KILOWATTS DEMAND
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
OBC	OHIO BUILDING CODE
OFE	OWNER FURNISHED EQUIPMENT
ø	PHASE
REX	REMOVE EXISTING ELECTRICAL DEVICE ALONG WITH RELATED CONDUIT AND WIRING, UON
TCC	TEMPERATURE CONTROL CONTRACTOR
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLTS
W	WIRE
WP	WEATHERPROOF

GENERAL ELECTRICAL NOTES:

A. ALL CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS, OR SHAFTS SHALL BE SEALED IN ACCORDANCE WITH ELECTRICAL FIRESTOPPING SPECIFICATIONS.

B. THE ROUTING OF ALL SURFACE MOUNTED/EXPOSED CONDUIT IN FINISHED AREAS INCLUDING ON FACE OF BUILDING SHALL BE COORDINATED WITH, AND SHALL BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.

C. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR. EXACT ELECTRICAL REQUIREMENTS SHALL BE VERIFIED IN THE FIELD WITH THE EQUIPMENT'S NAMEPLATE DATA. THE CONTRACTOR SHALL MAKE APPROPRIATE ADJUSTMENTS TO WIRE AND FUSE SIZES IN ACCORDANCE WITH THE NAMEPLATE DATA.

D. ALL BRANCH CIRCUITS AND FEEDERS SHALL CONTAIN AN INSULATED GROUNDING CONDUCTOR IN ACCORDANCE WITH ELECTRICAL SERVICE AND POWER DISTRIBUTION SPECIFICATIONS. NEUTRAL CONDUCTORS SHALL NOT BE SHARED IN ACCORDANCE WITH ELECTRICAL BASIC MATERIALS AND METHODS SPECIFICATIONS.

E. THE DISCONNECTING MEANS FOR ALL MOTORS AND EQUIPMENT SHALL BE INSTALLED IN A "READILY ACCESSIBLE" LOCATION AND SHALL HAVE PROPER WORKING SPACE AS DEFINED IN NEC ARTICLE 100 AND 110.

F. UTILIZATION OF THE PHRASE "PROVIDED BY" WITHIN THE CONTEXT OF THESE DOCUMENTS SHALL EXPLICITLY REPRESENT "FURNISHED AND INSTALLED BY".

GENERAL ELECTRICAL DEMOLITION NOTES:

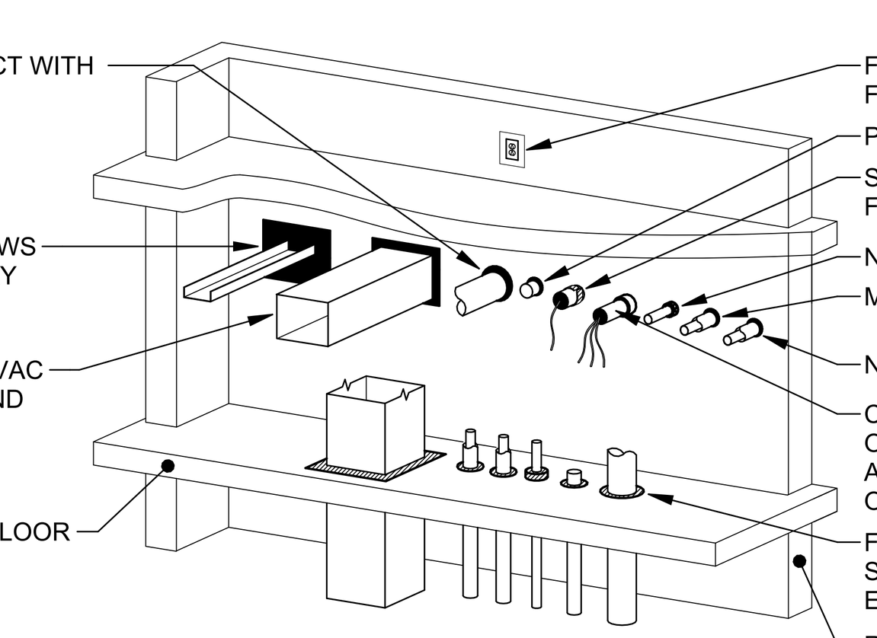
A. ALL DEVICES AND MISCELLANEOUS EXISTING CONDITIONS SHOWN ON THE DEMOLITION PLANS ARE THE RESULT OF FIELD INSPECTIONS AND ARE NOT INTENDED TO REPRESENT EXACT FIELD CONDITIONS, BUT RATHER THE EXTENT OF ELECTRICAL DEMOLITION. THE ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THE EXTENT OF DEMOLITION PRIOR TO SUBMITTING BID.

B. EXISTING CONDUITS, CIRCUITS OR SYSTEMS IN WALLS OR CEILINGS BEING REMOVED WHICH SERVE SURROUNDING UNREMODELED AREAS SHALL BE REWORKED AND MAINTAINED.

C. MAINTAIN CONTINUITY OF BRANCH CIRCUITS AND COMMUNICATION CIRCUITS TO ALL DEVICES AND LUMINAIRES SHOWN TO REMAIN (ETR). EXTEND AND MODIFY AS REQUIRED.

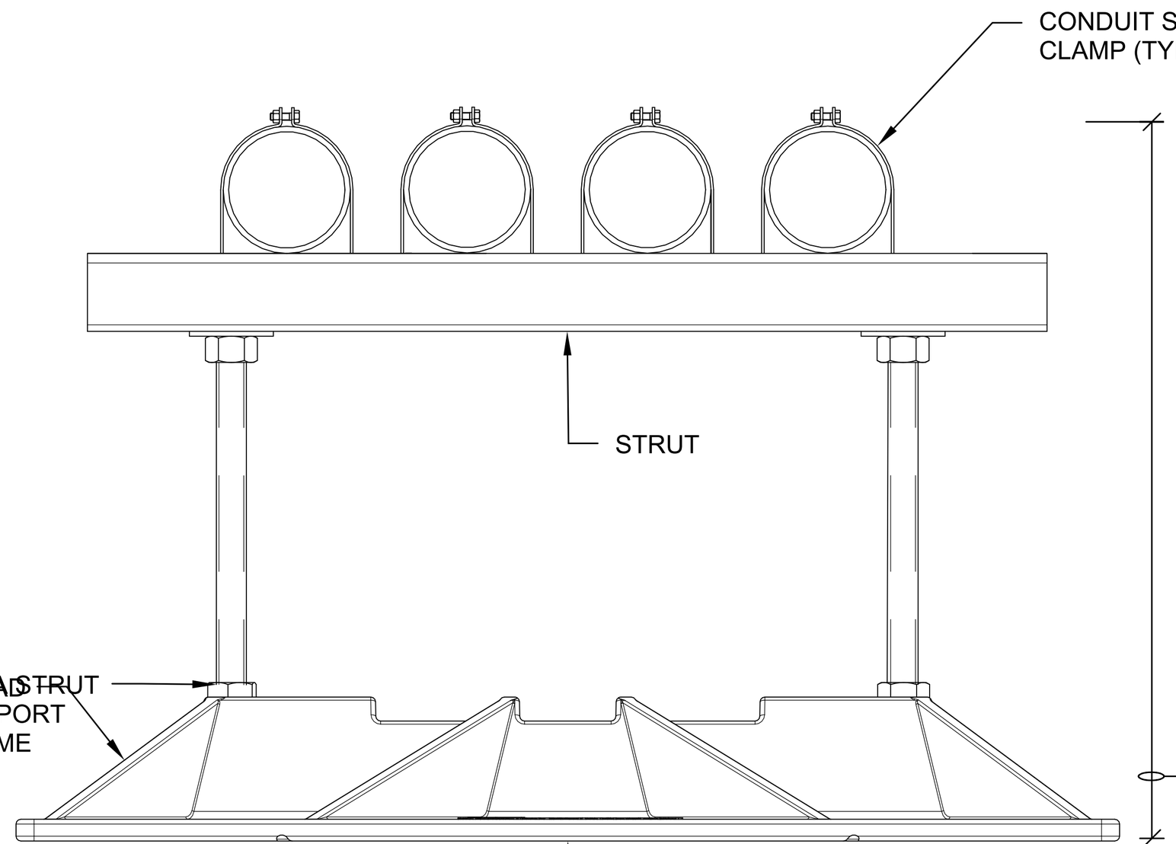
D. FOR ALL DEVICES BEING REMOVED (REX), REMOVE RELATED CONDUIT AND WIRING TO SOURCE. RE-LABEL EXISTING CIRCUIT BREAKERS AS "SPARE" WHEN LOAD IS COMPLETELY REMOVED OR REVISE LABEL ON PANEL DIRECTORY APPROPRIATELY.

CONDUIT SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	CONDUIT STUB
	CONDUIT TURNED DOWN
	CONDUIT TURNED UP
	CONDUIT INSTALLED BELOW GRADE OR BELOW FINISHED FLOOR
E-1 / E-1	ELECTRICAL CONNECTION TO EQUIPMENT ITEM 'E-1' (LETTER DESIGNATION AS APPLICABLE) - SEE CORRESPONDING EQUIPMENT CONNECTION SCHEDULE



NOTES:
1. REFER TO UL FIRE RESISTANCE DIRECTORY FOR COMPLETE INSTALLATION REQUIREMENTS.
2. IN AN OCCUPIED BUILDING, PERMANENT FIRESTOPPING SHALL BE INSTALLED WITHIN 24 HOURS OF PENETRATING A FIRE-RATED ASSEMBLY. IF PERMANENT FIRESTOPPING CANNOT BE INSTALLED WITHIN THIS TIME PERIOD, TEMPORARY FIRESTOP PILLOWS/ BLOCKS ARE PERMITTED, WHERE INSTALLATION ALLOWS, UNTIL PERMANENT FIRESTOP MATERIALS CAN BE PROPERLY INSTALLED.

FIRESTOPPING DETAIL
SCALE: NONE



ROOFTOP CONDUIT SUPPORT DETAIL
(CONDUIT STRUT) SCALE: NONE

NOTES:
1. BASIS OF DESIGN: MIRO 20-BASE STRUT-18.
2. PROVIDE CONDUIT SUPPORTS EVERY 6'-0".

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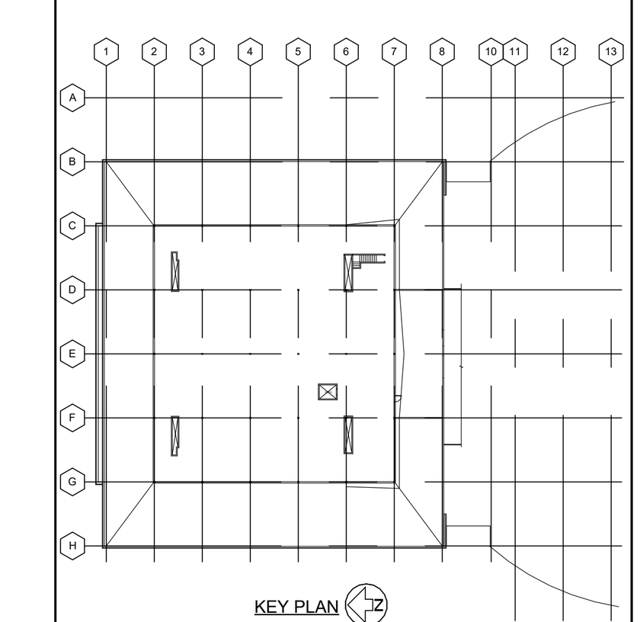

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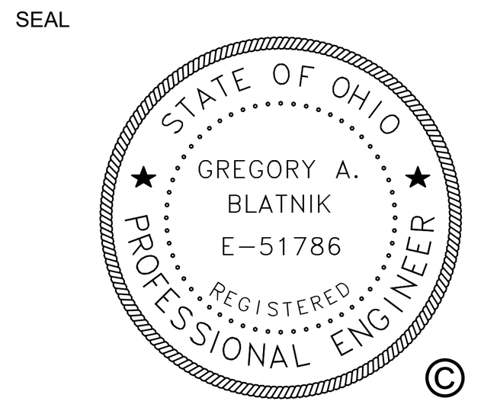

BARBER & HOFFMAN, INC
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Columbus, OH
Cranberry Twp., PA
2217 East 9th Street, Suite 350
Cleveland OH 44115-1257
216-875-0100/ (F) 216-875-0111
barberhoffman.com

PROJECT NAME
LINCOLN-WEST HIGH SCHOOL ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

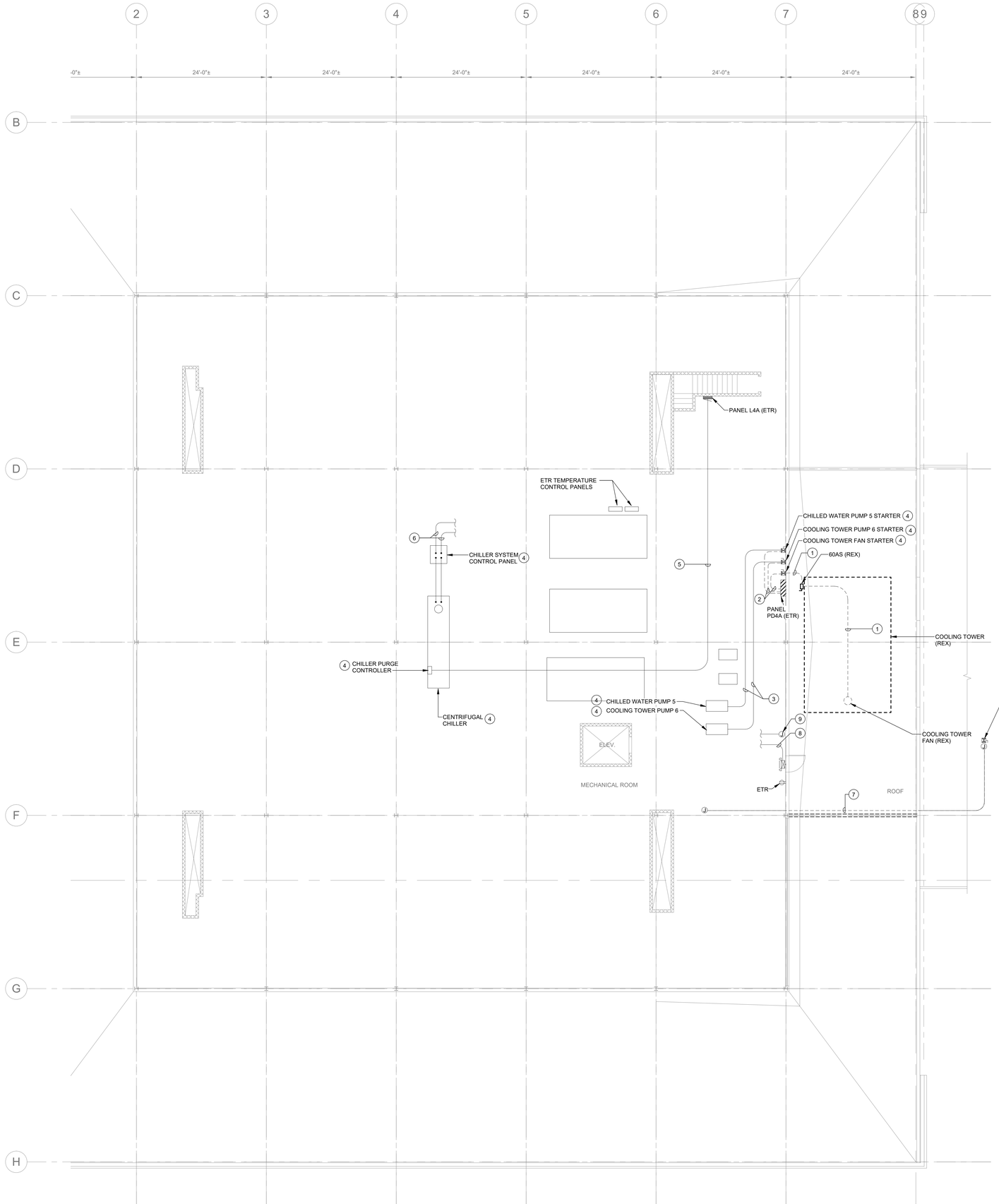
DRAWN BY	A. ASSEFA
CHECKED BY	G. BLATNIK
DRAWING SCALE	As indicated
PROJECT NUMBER	21160

DRAWING TITLE

ELECTRICAL SYMBOL LEGEND AND GENERAL NOTES

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
E0.1



PLAN NOTES

(#)

1. DISCONNECT AND REMOVE MOTOR BRANCH CIRCUIT CONDUCTORS AND CONDUIT TO STARTER.
2. DISCONNECT AND REMOVE MOTOR BRANCH CIRCUIT CONDUCTORS FROM STARTERS TO PANEL PD4A. TAG BREAKER (CIRCUIT 14 AND 16) AS "OUT-OF-SERVICE".
3. DISCONNECT MOTOR BRANCH CIRCUIT AT MOTOR AND AT STARTER AND MAKE SAFE.
4. EQUIPMENT ABANDONED IN PLACE.
5. DISCONNECT BRANCH CIRCUIT (L4A-4) AT PANEL AND CONTROLLER AND MAKE SAFE.
6. DISCONNECT CHILLER FEEDER (2 SETS OF 3-350 KCMIL) AT SYSTEM CONTROL PANEL AND MAKE SAFE.
7. HVAC CONTROL WIRING IN 1" CONDUIT TO BE REMOVED TO FACILITATE REMOVAL OF SCREEN WALL. ASSUME #12 CONDUCTORS TO BE PULLED BACK TO PULLBOX AND REWORKED PER DRAWING E1.4.
8. RELOCATE EMERGENCY EXIT LIGHTING CIRCUIT AS REQUIRED TO FACILITATE CHILLED WATER PIPING INSTALLATION.
9. RELOCATE PORTABLE LIGHTING OUTLET AND CIRCUIT AS REQUIRED TO FACILITATE CHILLED WATER PIPING INSTALLATION.

SCALE: 1/8" = 1'-0"
0 2' 4' 6' 8' 12' 16'

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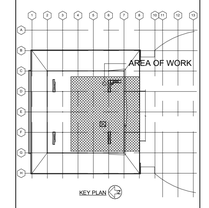

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PROJECT NAME
LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS
3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

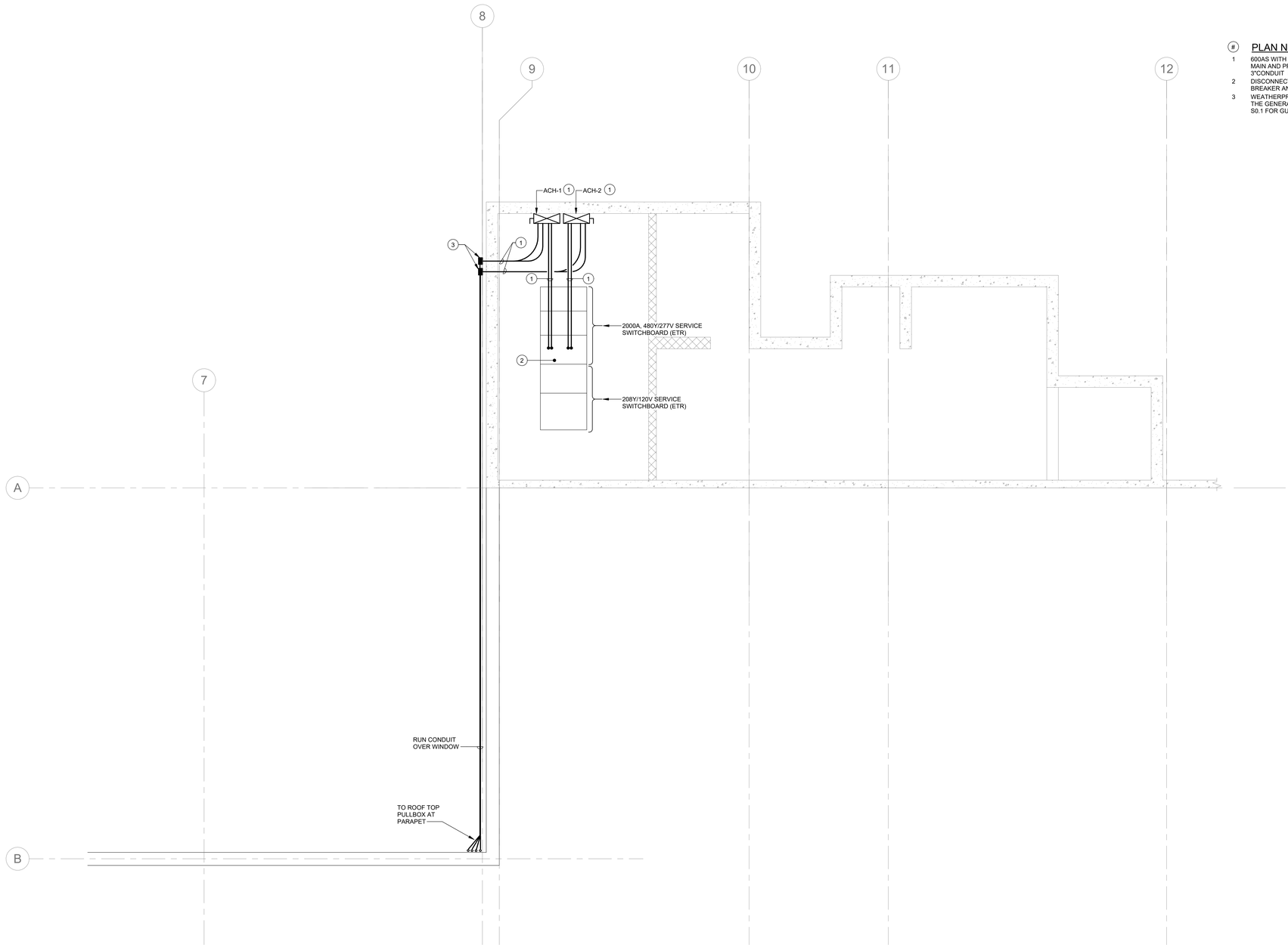
NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

DRAWN BY	A. ASSEFA
CHECKED BY	G. BLATNIK
DRAWING SCALE	1/8" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE
PENTHOUSE/ROOF ELECTRICAL DEMOLITION PLAN

DATE SEPTEMBER 20, 2021

DRAWING NUMBER
ED.4



PLAN NOTES

#	
1	600AS WITH 600A FUSES. TAP 480Y/277V SWITCHBOARD NEAR MAIN AND PROVIDE (2) SETS OF 3-400KCMIL, 1#2 GND - IN 3"CONDUIT FEEDER AS SHOWN ON PLANS.
2	DISCONNECT CHILLER FEEDER (2 SETS OF 3-350KCMIL) AT 600A BREAKER AND MAKE SAFE.
3	WEATHERPROOF LB FITTING OR PULLBOX. SEE NOTE 7 UNDER THE GENERAL SECTION OF GENERAL NOTES LISTED ON DRAWING S0.1 FOR GUIDELINES ON WALL PENETRATIONS.

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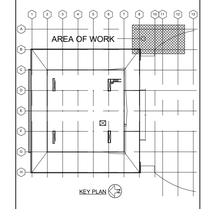

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PROJECT NAME

LINCOLN-WEST HIGH SCHOOL
ROOFTOP EQUIPMENT

PROJECT ADDRESS

3202 WEST 30TH STREET
CLEVELAND, OHIO 44109

NO.	DATE	DESCRIPTION
1	9/8/2021	OWNER REVIEW
2	9/20/2021	ISSUE FOR BID

DRAWN BY	A. ASSEFA
CHECKED BY	G. BLATNIK
DRAWING SCALE	1/4" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE

FIRST FLOOR ELECTRICAL PLAN

DATE SEPTEMBER 20, 2021

DRAWING NUMBER

E1.1

SCALE: 1/4" = 1'-0"
0 2 4 6' 8'

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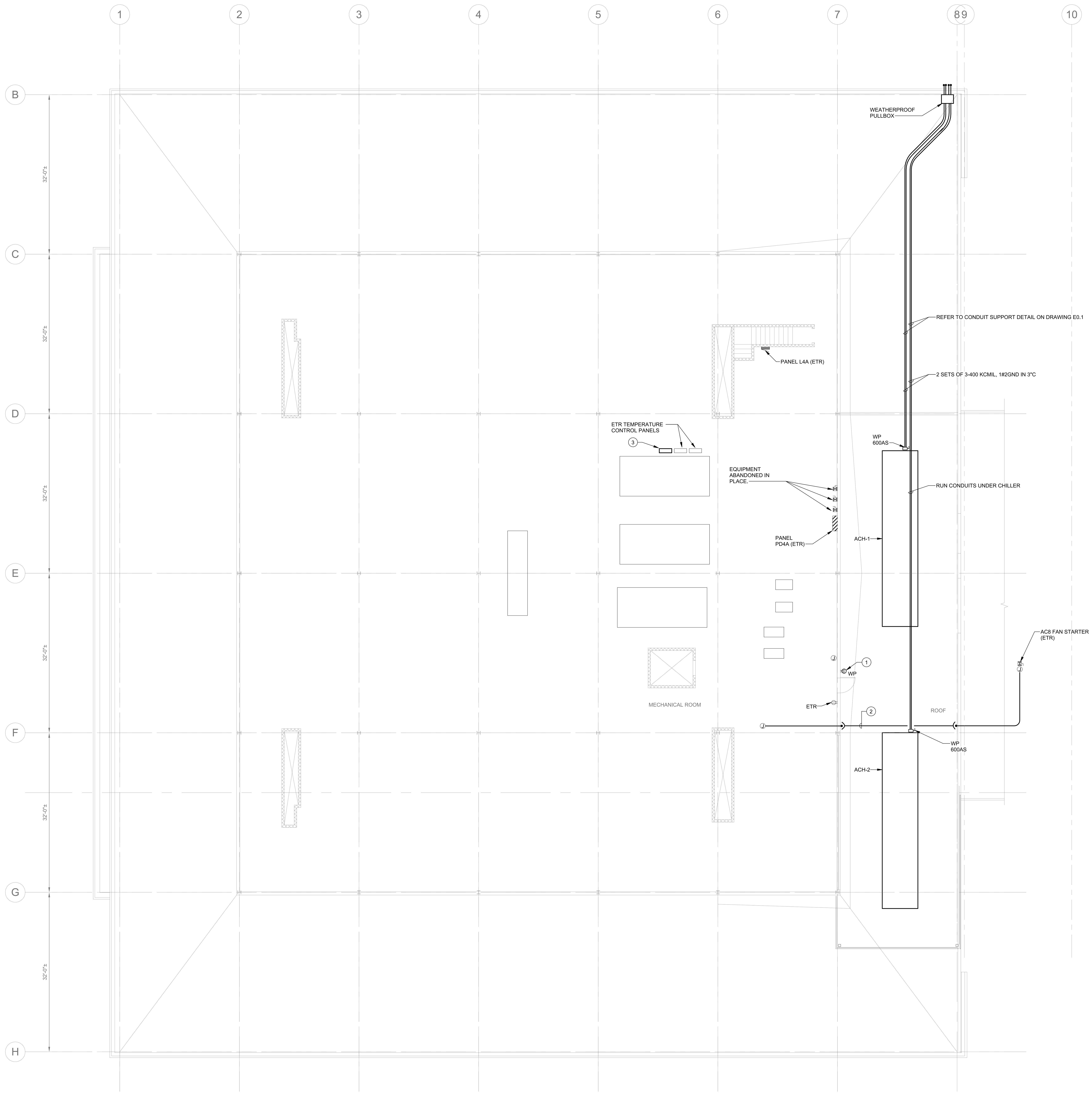

PLAN NOTES

1. NEW RECEPTACLE TIED INTO EXISTING RECEPTACLE CIRCUIT.
2. PROVIDE REWORKED CONDUIT ON ROOF FOR HVAC CONTROLS. ASSUME 8#12 IN 1" CONDUIT TO BE CONNECTED TO EXISTING CONDUCTORS.
3. JACE CONTROL PANEL, 120V. CIRCUIT TO PANEL L4A:4. BRANCH CIRCUIT SHALL BE 2#12, 1#12GND IN ¾" CONDUIT.

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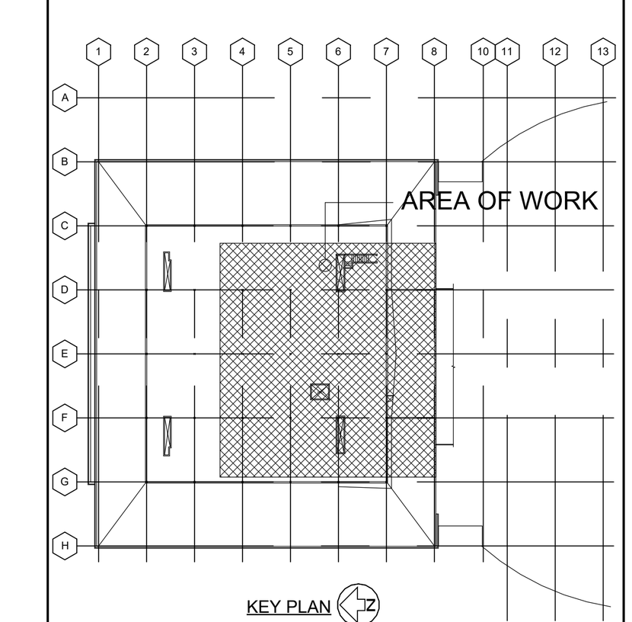

SEAL

STATE OF OHIO
GREGORY A. BLATNIK
E-51786
REGISTERED
PROFESSIONAL ENGINEER

BARBER & HOFFMAN, INC
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Columbus, OH
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PROJECT NAME

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NO.	DATE	DESCRIPTION
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DRAWN BY	A. ASSEFA
CHECKED BY	G. BLATNIK
DRAWING SCALE	1/8" = 1'-0"
PROJECT NUMBER	21160

DRAWING TITLE

PENTHOUSE/ROOF ELECTRICAL PLAN

DATE SEPTEMBER 20, 2021

DRAWING NUMBER

E1.4

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

END OF SCOPE OF WORK

BID FORM

Lincoln West High School Rooftop Equipment Project

DOCUMENT 004113 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: Lincoln West High School Chiller Project

C. Project Location: 3202 West 30th Street Cleveland, Ohio 44109

D. Owner: Cleveland Municipal School District.

E. Engineer: Barber & Hoffman Inc.

F. Engineer Project Number: 21160

1.2 CERTIFICATIONS AND BASE BID

A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Barber & Hoffman Inc. and Engineer's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. _____ Dollars ($_____).
2. The above amount may be modified by amounts indicated by the Bidder on the attached Document 004322 "Unit Prices Form" and Document 004323 "Alternates Form."

1.3 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid amount above:

1. _____ Dollars ($_____).

B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.4 SUBCONTRACTORS AND SUPPLIERS

A. The following companies shall execute subcontracts for the portions of the Work indicated:

1. Concrete Work: _____.
2. Masonry Work: _____.
3. Roofing Work: _____.
4. Plumbing Work: _____.
5. HVAC Work: _____.
6. Electrical Work: _____.

1.5 TIME OF COMPLETION

A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Owner, and shall fully complete the Work by April 8, 2022.

1.6 ACKNOWLEDGEMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

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

1.7 BID SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto.

1. Bid Form Supplement - Alternates.
2. Bid Form Supplement - Unit Prices.
3. Bid Form Supplement - Allowances.
4. Bid Form Supplement - Bid Bond Form (AIA Document A310-2010).

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in State of Ohio, City of Cleveland, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 SUBMISSION OF BID

A. Respectfully submitted this ____ day of _____, 2021.

B. Submitted By:_____(Name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

F. Witnessed By:_____(Handwritten signature).

G. Attest:_____(Handwritten signature).

H. By:_____(Type or print name).

I. Title:_____(Corporate Secretary or Assistant Secretary).

J. Street Address:_____.

K. City, State, Zip:_____.

L. Phone:_____.

M. License No.:_____.

N. Federal ID No.:_____(Affix Corporate Seal Here).

END OF DOCUMENT 004113