

INVITATION FOR BIDS

CITY OF CONROE

**BID #0604-2020 HVAC UPGRADES
FIRE STATIONS #4 AND #6**



**CITY OF CONROE
P.O. BOX 3066
CONROE, TEXAS 77305**

RESPONSES DUE JUNE 4, 2020 AT 2:00 PM

NOTICE TO BIDDERS

The City of Conroe will receive sealed bids in triplicate for HVAC Upgrades at Fire Stations #4 & #6, located in Montgomery County, Texas. The Bids shall be appropriately marked “**Bid #0604-2020 HVAC Upgrades at Fire Stations #4 & #6**” and delivered to the City Secretary 300 West Davis, 3rd Floor, Conroe Texas 77301. Bids will be publicly opened and read on **Thursday, June 4, 2020 at 2:00 p.m.** in the 3rd Floor conference room at City Hall (300 West Davis).

A pre-bid meeting including site visits will be held on May 20, 2020 at 9:00 AM located at Fire Station #4, 14901 Walter Woodson Drive, Conroe Texas 77384. A site visit to Station #6 will follow.

Bids must be accompanied by a certified check upon some responsible bank of the State of Texas or a bid bond from a Surety Company holding a permit in the State of Texas in the amount of 10% of the bid. The amount of said check or bond will be forfeited to the Owner and the bank or surety shall be liable to the Owner for the amount in the event the successful proposer shall fail or refuse to enter into a contract or furnish bonds as hereafter required.

The successful proposer must furnish a performance bond and a payment bond on the forms provided, each in the amount of 100% of the contract price from a Surety Company holding a permit in the State of Texas and approved by the Federal Government.

Bid documents may be reviewed and downloaded online at Vendor Registry www.cityofconroe.org with instructions to download documents from Vendor Registry

No bid may in any way qualify, modify, substitute or change any part of the specifications or contract documents. The City of Conroe reserves the right to reject any and all offers, award parts of bids, award to multiple vendors and to waive informalities in submission of bids. The City of Conroe also reserves the right to award this bid to the lowest most qualified responsible bidder meeting all the specifications or to the bidder who provides goods or services at the best value for the City.

CC: 5/19/2020 & 5/26/2020

CITY OF CONROE, TEXAS

**CITY OF CONROE
PURCHASING DEPARTMENT
REQUEST FOR SEALED BID**

The City of Conroe will receive sealed bids in triplicate for the HVAC Upgrades at Fire Stations #4 and #6, located in Montgomery County, Texas. The Bids shall be appropriately marked “**Bid #0604-2020 HVAC Upgrades at Fire Stations #4 and #6**” and delivered to the City Secretary 300 West Davis, 3rd Floor, Conroe Texas 77301. Bids will be publicly opened and read on **Thursday, June 4, 2020 at 2:00 p.m.** in the 3rd Floor conference room at City Hall (300 West Davis).

Date: May 18, 2020

Bids will be received until: 2:00 P.M. on June 4, 2020

Pre-Bid Meeting and Site Visits: May 20, 2020 @9:00 AM located at Fire Station #4 14901 Walter Woodson Drive, Conroe Texas 77384, followed by a site visit to Station #6.

For: HVAC Upgrades Fire Stations #4 and #6

DESCRIPTION	LUMP SUM FOR STATION #4 PROJECT
Complete price for Fire Station #4 HVAC Upgrades	\$ _____
DESCRIPTION	LUMP SUM FOR STATION #6 PROJECT
Complete price for Fire Station #6 HVAC Upgrades	\$ _____
TOTAL FOR FIRE STATIONS #4 & #6	\$ _____

Company Name

**CITY OF CONROE
PURCHASING DEPARTMENT
REQUEST FOR SEALED RFP**

INSTRUCTIONS TO PROPOSER - - - - -PLEASE READ CAREFULLY

1. The City of Conroe, Tax No. 74-6000-555 is exempt from all Federal Excise Taxes. Do not include tax in your bid price or invoice. Taxable items must be so designated, and the City will supply contractor with Tax Exemption Certificate, properly executed. Prices should be itemized.
2. The City of Conroe will pay for articles or services purchased under this bid within thirty (30) days after due and proper delivery or performance of service is made and accompanied by an invoice.
3. This purchasing contract is subject to the attached **Purchasing Terms and General Conditions**.
4. In case of discrepancy between the unit price and the extension price, the unit price will be taken.
5. **ALL PROPOSALS MUST BE SIGNED BY HAND.**

The undersigned hereby offers to furnish and deliver the articles or services as specified above at the prices and terms there stated and in strict accordance with the specifications and general conditions of bidding, all of which are made a part of this offer. This offer is not subject to withdrawal.

Names of
Business: _____

Mailing
Address: _____

City _____ State _____ Zip _____

By: _____ Title _____

Phone: _____ E-mail Address: _____

CITY OF CONROE

1. **Preparation of Bids:**

Unless otherwise directed in the Notice to Bidders, submit bids in triplicate to the City Secretary, 300 West Davis, 3rd floor, Conroe Texas, 77301. Prepare bids in accordance with the requirements of the Notice to Bidders, and any instructions on the Bid Sheet.

2. **Questions and Inquiries:**

Information about this proposal should be directed to:

Jim Joyner, Asset Coordinator
jjoyner@cityofconroe.org
936-522-3166

3. **Pre-Bid/Site Visits**

A pre-bid meeting and site visits will be held May 20th at 9:00 AM, located at Fire Station #4, 14901 Walter Woodson Drive, Conroe Texas 77384. The site visit at Fire Station #6 will immediately follow.

4. **Submission of Bids:**

Three (3) copies of each proposal shall be **CLEARLY MARKED** “**Bid# 0604-2020 HVAC Upgrades at Fire Stations #4 and #6**” and submitted by mail or in person to the address below by the time and date set forth. Responses received later than the due date will not be accepted, and returned unopened.

Due Date: June 4, 2020 @ 2:00 PM

USPS: City of Conroe
Soco Gorjon, City Secretary
P.O. Box 3066
Conroe, TX. 77305

Physical: City of Conroe
Soco Gorjon, City Secretary
300 West Davis St.
Conroe, TX. 77301

5. **Bid / Bid Bond:**

Each bid must be accompanied by a bid bond or other acceptable security in an amount equal to ten percent (10%) of the base offer amount. The bond may consist of a surety bid bond executed by a surety licensed to do business in the State of Texas, or a certified check or cashiers check in the required amount drawn on a bank doing business in the State of Texas and made payable to the City of Conroe, Texas.

The bid / bid bond of the successful proposer shall be returned upon issuance of a notice to proceed to the proposer. The bonds of unsuccessful proposer's shall be returned upon the earlier of (1) the issuance of a notice to proceed to the successful proposer, or (2) the expiration of thirty (30) days following the bid opening.

6. Insurance Requirements:

The Proposer shall procure and maintain, at its expense, during the term of this proposal, at least the following insurance, covering work performed. The City shall be an additional named insured under the Contractors policy, which may not be reduced or terminated without ten (10) days written notice to the City.

	COVERAGE	LIMITS
A.	Worker's Compensation Law	- Minimum required by Texas
B.	Employer's Liability	- \$ 500,000 each occurrence
C.	Public Liability (Bodily injury)	- \$1,000,000 combined single limit
D.	Public Liability (Property damage)	- \$1,000,000 combined single limit
E.	Automobile Liability (Bodily injury)	- \$ 200,000 each person
F.	Automobile Liability (Property damage)	- \$ 50,000 each occurrence

The Proposer agrees to furnish insurance certificates, showing the Proposer's compliance with this section prior to commencing any work under this agreement.

7. Bid Evaluation and Award:

The bid award will be made on the basis of ***Texas Local Government Code Section 252.043***. This section allows the City of Conroe to develop and apply award evaluation criteria for procurement in order to obtain goods or services that provide the ***best value*** to the City. Under these guidelines, a vendor is not automatically awarded a bid simply because they submit the lowest bid response. In the event that the selected bidder fails to enter into agreement to provide the goods or services which are the subject of this invitation the City retains the right to award the bid to the next qualified bidder.

8. Reservations:

All Bids and associated materials received with your response will become the property of the City of Conroe and will be returned at the discretion of the City.

The Laws of the State of Texas, County of Montgomery, and the City of Conroe, with any Rules and Regulations issued, prevail with regard to any contract documents, possible terms and conditions, arbitration or litigation.

9. Owner:

The City reserves the right to award parts of bids, reject any or all bids and to waive technical irregularities in bidding. Contract award will be made on the basis of the lowest qualified responsible bidder or the bidder who provides the goods and services at the best value for the City, considering the evaluation selection criteria below. No bid may be withdrawn before 90 days after submittal.

Best Value Selection Criteria:

- | | |
|---|---------|
| a) Purchase price. | 40 Pts. |
| b) Meets all bid specifications. | 20 Pts. |
| c) Bidder's principle place of business (§271.905). | 10 Pts. |
| d) References of current customers | 20 Pts. |
| e) Cities past history / experience with Vendor. | 10 Pts. |

10. Bidders:

Should a Bidder discover a discrepancy or an omission in the plans or specifications, he should at once notify the Purchasing Department so that an addendum can be issued. No oral explanation or interpretation other than written addendum issued by the City will be considered official or binding. All such addendums shall become part of the contract documents and all bidders shall be bound by such addenda, whether or not received by the bidders.

11. Communications:

The City of Conroe shall not be responsible for any verbal communication between any representative of the City and any potential firm. All modifications to this solicitation must be made in writing. A proposer's failure to examine relevant documents or specifications will not relieve proposer from any obligation with regard to their response to this invitation.

12. Substitutions:

Where services or equipment are specified by a trade or brand name, it is not the intention of the City to discriminate against an equal product of another manufacturer, but to set a definite standard of quality or performance, and to establish an equal basis for the evaluation of bids. In preparing his bid, each bidder is expected to include in his base bid the cost of the items so specified.

13. Default:

The City reserves the right to terminate the contract immediately for failure to meet delivery or completion schedules, or otherwise perform in accordance with the general conditions of this proposal.

14. References:

The City of Conroe may request bidders to supply, with this Invitation to Bid, a list of at least five (5) references where like services have been supplied by their firm. Include name of firm, contact person, address, telephone number and e-mail address.

15. Delivery of Bids:

It is the bidder's responsibility to submit his bid at the proper time to the proper place.

16. Corrections:

Erasures or other corrections in the proposal must be noted over with the proposer's initials.

17. Materials and Services:

The Bidder warrants that goods, materials or services delivered to the City will meet the minimum specifications set forth therein. Bidder shall furnish all data pertinent to specifications and warranties, which apply to items in the bid.

18. Equal Employment Opportunity:

Attention is called to the requirements for ensuring that employees and applicants for employment are not discriminated against because of their age, race, color, creed, sex or national origin.

19. Price of Materials and Sales Tax:

Prices for all goods or services shall remain firm for the duration of this contract and shall be stated on the bid sheet. Prices shall be all inclusive. Any price not shown on the bid sheet will not be honored by invoice. No price changes, additions or subsequent qualifications will be honored during the course of this contract. All prices must be written in ink or typewritten. Transportation, freight or other charges are to be prepaid by the bidder and included in the bid price. If there are additional charges of any kind, other than those mentioned above, specified or unspecified, Bidder must indicate both items required and attendant cost or forfeit the right to payment. Invoices must be submitted by the vendor in duplicate to the City of Conroe Purchasing Dept., P.O. Box 3066, Conroe TX 77305.

This Contract is issued by an organization, which qualifies for exemption pursuant to the provisions of Article 20.04 (F) of the Texas Limited Sales, Excise and Use Tax Act.

20. Indemnification:

The Proposer shall, defend, indemnify, and hold harmless the City of Conroe, their officers, and agents from and against any and all claims, demands, causes of action, orders, decrees, or judgments for injury, death, damage to person or property, loss, damage, or liability of any kind (including without limitation liability under any federal, state, or local environmental law, Compensation and Liability Act; fees and costs (including all costs or settlements and reasonable attorney's fees incurred in defending any claim, demand, or cause of action) occasioned by, growing out of, or arising from (a) the performance of any product or service to be supplied by the Proposer, or (b) by any act, error or omission on the part of the Proposer, its agents, employees, or subcontractors, and or (c) any failure to fully comply with all applicable laws and regulations by the Proposer, its agents, employees, or subcontractors.

21. Conditions of Conduct:

At all times any agent, officer, or employee of Proposer shall be present upon property owned by the City of Conroe, the terms and conditions of the Drug and Alcohol Policy currently adopted by the City of Conroe, shall be deemed applicable to such persons. Violations of terms and conditions while present on the premises owned by the City of Conroe shall be grounds for termination of any contract between the City and Proposer. A copy of this policy is available for public inspection in the office of the City Secretary and copies may be obtained at a nominal charge.

22. Ethical Standard:

No City official or employee shall have interest in any contract resulting from this bid. Individuals with a possible conflict will enact a public disclosure record by completing a "Statement of Financial Interest" form.

Refer to "Project Number and Title" on the 1295 form.

Example forms are included with this Bid.

- **1295 certificate of Interested Parties**
- **Conflict of Interest Questionnaire**
- **HB 89 Verification Form**
- **SB 252 Verification Form**

The four forms stated above MUST be returned as part of your Bid response. Failure to include these forms may result in your Bid being considered unresponsive and therefor disqualified. Sample copies of these forms are included in the Bid. The web address to the Texas Ethics Commission website with instructions is listed below:

(Sample Forms are attached)

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

23. Alternate Bid Items:

No alternate bids or bid items will be considered unless they are specifically requested by the bid.

24. Unit Prices:

The unit price of each of the bid items in the bid proposal shall include its pro-rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price bid represents the total bid. Any bid not conforming to the condition may be rejected. The unit prices will be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

25. Payment:

Payment will be scheduled within thirty (30) days upon complete delivery and acceptance of all equipment/material and receipt of an original invoice for the equipment/material complying with the terms and conditions of the award. The City

reserves the right to withhold up to ten percent (10%) of the purchase price in the event there is a conditional acceptance.

26. Proposal Agreements and Certification:

The Undersigned Agrees That:

- A. No Federal, State, County or Municipal taxes have been included in the quoted prices and none will be added.
- B. Prices in this proposal have not knowingly been disclosed with any other provider and will not be prior to award.
- C. Prices in this proposal have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.
- D. No attempt has been made nor will be to induce any other person or firm to submit a proposal for the purpose of restricting competition.
- E. The individual signing this proposal certifies that he/she is a legal agent of the proposer, authorized to represent the proposer and is legally responsible for the offer with regard to supporting documentation and prices provided.

By my signature below I agree to comply with all the provisions, terms and conditions pertaining to this Bid.

(Company Name)
Printed)

(Name of Authorized Agent –

(Street Address / P.O. Box)

(Authorized Agent Signature)

(City / State / Zip Code)

(Date)

(Phone)

(E-Mail Address)

DOCUMENT 00520
BID BOND

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

BID DUE DATE: _____

PROJECT (Brief Description Including Location):

BOND

BOND NUMBER: _____

DATE: (Not later than Bid Due Date): _____

PENAL SUM: _____

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents, or
 - 3.2 All bids are rejected by Owner, or
 - 3.3 Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid Due Date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety, and in no case later than one year after Bid Due Date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notice required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "bid" as used herein includes a bid, offer or proposal as applicable.

STATE OF TEXAS
COUNTY OF MONTGOMERY

LET IT BE KNOWN BY THIS INSTRUMENT:

That we, _____, as Principal, and _____, a corporation duly authorized to do business in this State, as Surety, are this date held and firmly bound unto the City of Conroe, Texas in the amount of _____

_____ Dollars (\$ _____) for payment of which indemnity the said Principal and Surety, by this declaration, do firmly bind themselves, their heirs, executors, administrators, successors and assigns, jointly and individually.

This bond is made to secure the performance of Principal with respect to a contract dated _____ made by and between Principal and the City of Conroe, Texas for _____

The conditions of this obligation are, therefore, such that it shall remain in full force and effect until the Principal shall faithfully perform the Contract in accordance with the Contract Documents.

In the event of Principal's failure to faithfully perform the Contract, Surety will assume full responsibility for completion of the Contract and become entitled to payment of the balance of the Contract amount.

The liabilities, rights, limitations, and remedies concerning this Bond shall be determined in accordance with the provisions of Chapter 2253 of the Texas Government Code, pursuant to which this bond is executed and given.

IN WITNESS TO THIS DECLARATION, the said Principal and Surety have signed and sealed this instrument,

this _____ day of _____, 2_____.

PRINCIPAL

SURETY*

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Address of Attorney-In-Fact

Telephone No. of Attorney-In Fact

PAYMENT BOND

Bond Identification No. _____

STATE OF TEXAS
COUNTY OF MONTGOMERY

LET IT BE KNOWN BY THIS INSTRUMENT:

That we, _____, as Principal, and _____, a corporation duly authorized to do business in this State, as Surety, are this date held and firmly bound unto the City of Conroe, Texas in the amount of _____

_____ Dollars (\$ _____) for payment of which indemnity the said Principal and Surety, by this declaration, do firmly bind themselves, their heirs, executors, administrators, successors and assigns, jointly and individually.

This bond is made to secure the performance of Principal with respect to a contract dated _____ made by and between Principal and the City of Conroe, Texas for _____

This Bond is entered into for the protection of claimants supplying labor and material in the prosecution of the Work provided for in said Contract Documents, and all such claimants shall have a direct right of action under the Bond as provided in Chapter 2253, Texas Government Code.

The liabilities, rights, limitations, and remedies concerning this Bond shall be determined in accordance with the provisions of Chapter 2253 of the Texas Government Code, pursuant to which this bond is executed and given.

IN WITNESS TO THIS DECLARATION, the said Principal and Surety have signed and sealed this instrument,

this _____ day of _____, 2_____.

PRINCIPAL

SURETY*

By: _____
Name: _____
Title: _____

By: _____
Name: _____
Address of Attorney-In-Fact

Telephone No. of Attorney-In Fact

**ATTACH CERTIFICATE OF LIABILITY INSURANCE
(HERE)**

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

OFFICE USE ONLY

Complete Nos. 1 - 4 and 6 if there are interested parties.
 Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the goods or services to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is NO Interested Party.

6 AFFIDAVIT I swear, or affirm, under penalty of perjury, that the above disclosure is true and correct.

 Signature of authorized agent of contracting business entity

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said _____, this the _____ day of _____, 20 _____, to certify which, witness my hand and seal of office.

 Signature of officer administering oath Printed name of officer administering oath Title of officer administering oath

ADD ADDITIONAL PAGES AS NECESSARY

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

2 Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information is being disclosed.

Name of Officer

4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes No

5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6 Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed;
- or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

_____ (“Company or Business Name”)
House Bill 89 Verification

I, _____ (Person name), the undersigned representative of _____(Company or Business Name) hereafter referred to as “Company”; being an adult over the age of eighteen (18) years of age, after being duly sworn by the undersigned notary, do hereby depose and verify under oath that the company named-above, under the provisions of Subtitle F, Title 10, Government Code Chapter 2270:

1. Does not boycott Israel currently; and
2. Will not boycott Israel during the term of the contract.

Pursuant to Section 2270.001, Texas Government Code:

1. *“Boycott Israel” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and*
2. *“Company” means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.*

DATE

SIGNATURE OF COMPANY REPRESENTATIVE

On this the ____ day of _____, 20____, personally appeared _____, the above-named person, who after by me being duly sworn, did swear and confirm that the above is true and correct.

NOTARY SEAL

NOTARY SIGNATURE

Date

**CITY OF CONROE
PURCHASING DEPARTMENT**

SENATE BILL 252 CERTIFICATION

On this day, I, _____, the Purchasing Representative for the City of Conroe, Texas, pursuant to Chapter 2252, Section 2252.152 of the Texas Government Code, certify that I did review the website list prepared, maintained, and made available to the City of Conroe by the Comptroller of the State of Texas of companies known to have contracts with or provide supplies or services to Iran, Sudan or any foreign terrorist organization. I have ascertained that the below-named company is not contained on said list of companies that do business with Iran, Sudan or any Foreign Terrorist Organization.

Company Name

RFP or Vendor number

CERTIFICATION CHECK PERFORMED BY:

Purchasing Representative

Date

CONROE FIRE STATION #4

HVAC RENOVATION

14901 WALTER WOODSON DR.
CONROE, TX 77384

CONTRACT DOCUMENTS

ISSUE FOR BID 4/21/2020

APRIL 2020

A2S PROJECT NUMBER 00061

ARCHITECTURAL:

A2STUDIO ARCHITECTS, PLLC

MEP ENGINEER:

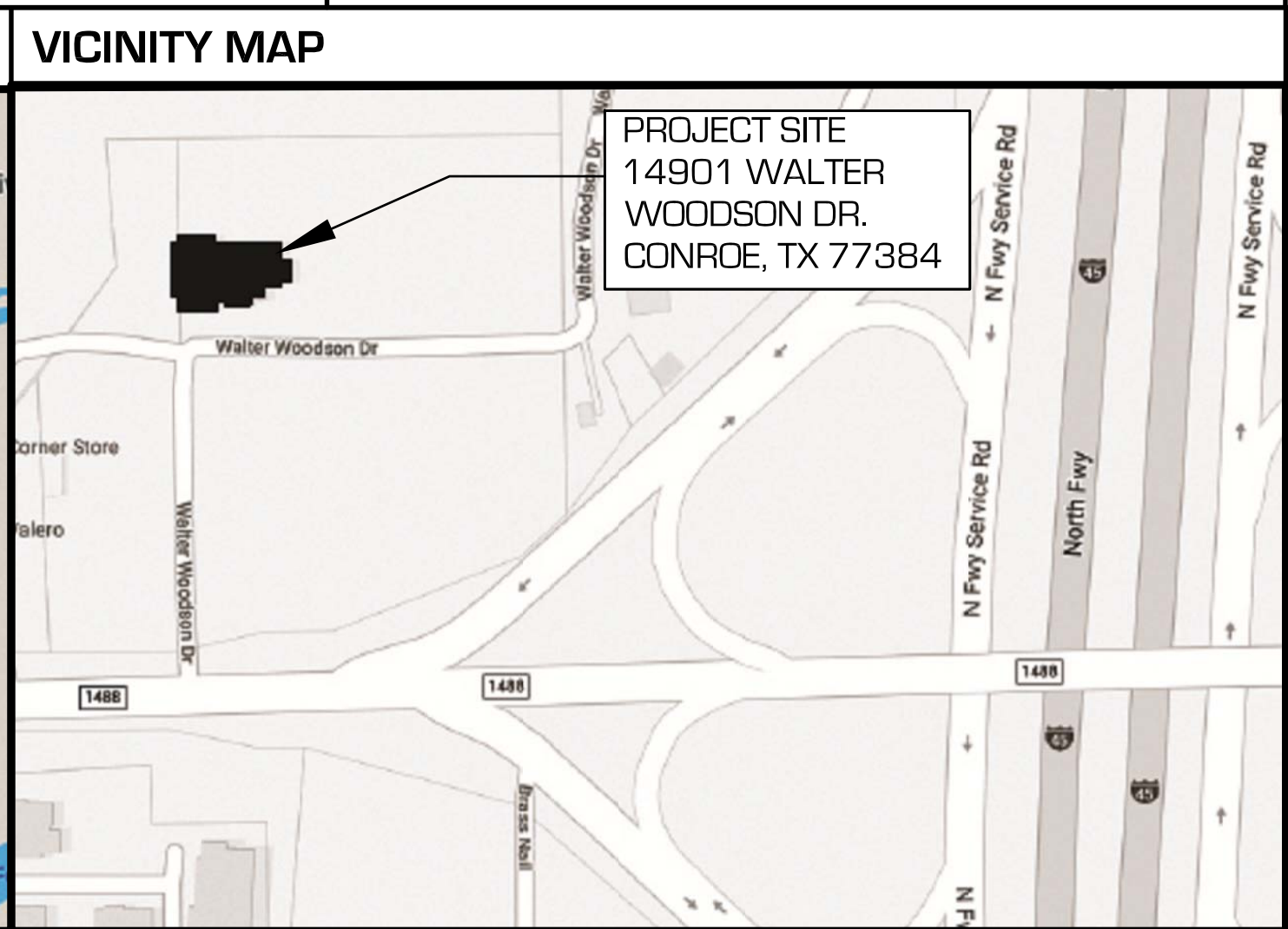
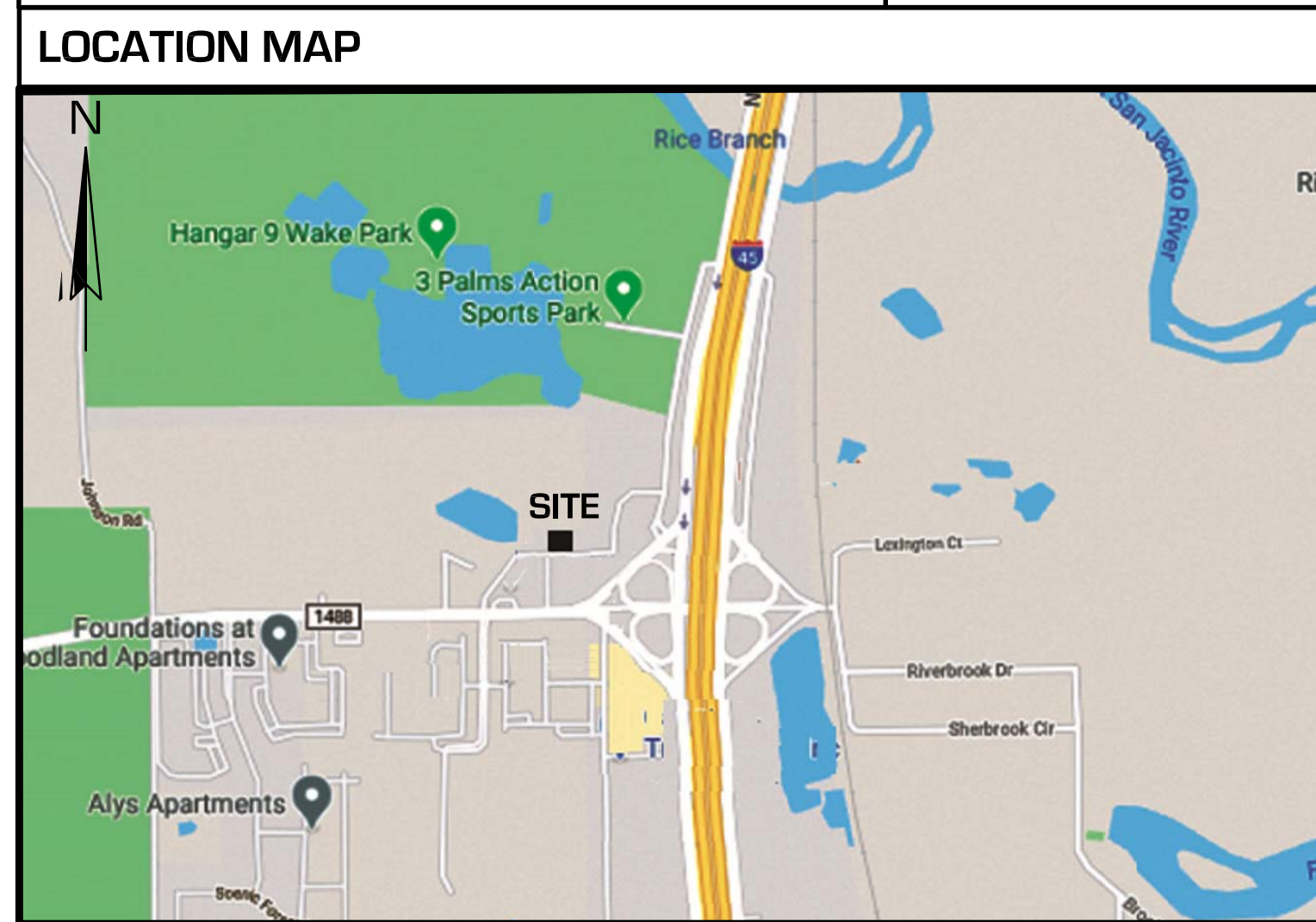
E/B/E, INC.



1010 N. SAN JACINTO | SUITE 105
HOUSTON, TEXAS 77002
o 713 955 9177
www.a2studioarchitects.com

00061 - CONROE FIRE STATION #4, CONROE TX

STANDARD ABBREVIATIONS	PLAN LEGEND	GENERAL NOTES	SHEET INDEX	DATE ISSUED																																																						
<p>AFF - ABOVE FINISH FLOOR CG - CORNER GUARD CJ - CONTROL JOINT DIA - DIAMETER DS - DOWN SPOUT DW - DISH WASHER EJ - EXPANSION JOINT EQ - EQUAL EWC - ELECTRIC WATER COOLER FD - FLOOR DRAIN FDC - FIRE DEPARTMENT CONNECTION FE - FIRE EXTINGUISHER FEC - FIRE EXTINGUISHER CABINET HVAC - HEATING, VENTILATING & AIR CONDITIONING MEP - MECHANICAL, ELECTRICAL, PLUMBING DRAWINGS MO - MASONRY OPENING NIC - NOT IN CONTRACT NTS - NOT TO SCALE OD - OVERFLOW DRAIN OFCI - OWNER FURNISHED CONTRACTOR INSTALLED OFIO - OWNER FURNISHED OWNER INSTALLED OH - OPPOSITE HAND R - RADIUS RCP - REFLECTED CEILING PLAN RD - ROOF DRAIN RE - REFERENCE RO - ROUGH OPENING REF - REFRIGERATOR SF - SQUARE FOOT SIM - SIMILAR STC - SOUND TRANSMISSION CLASS STRUCT. - STRUCTURAL DRAWINGS TYP - TYPICAL T.O. - TOP OF UL - UNDERWRITERS LABORATORIES UNO - UNLESS NOTED OTHERWISE VF - VERIFY IN FIELD WC - WATER CLOSET WH - WATER HEATER</p>	<p>SMOKE RESISTANT WALL 1 HOUR FIRE RATED WALL 2 HOUR FIRE RATED WALL SMOKE BARRIER WALL</p> <p>BUILDING SECTION TAG SECTION CUT TAG ELEVATION TAG</p> <p>DETAIL CALLOUT TAG</p> <p>WINDOW NUMBER TAG DOOR NUMBER TAG ROOM NUMBER TAG PARTITION TYPE TAG</p> <p>REVISION TAG AND CLOUD KEY NOTE TAG</p> <p>NORTH ARROW ANNOTATION LEADERS</p> <p>ELEVATION CALL OUT (ELEVATIONS, SECTIONS AND DETAILS) BREAK LINE DIMENSION STRING</p>	<ol style="list-style-type: none"> ALL MATERIAL AND WORK SHALL BE IN ACCORDANCE WITH ADOPTED CODES, REGULATIONS AND GUIDELINES, INCLUDING BUT NOT LIMITED TO: IBC, IMC, IPC, NFPA 101 LIFE SAFETY CODE, ADAAG, NEC, AND STATE PLUMBING CODES. UNLESS OTHERWISE NOTED IN THE PROJECT MANUAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING ALL FEES ASSOCIATED WITH OBTAINING ANY BUILDING PERMITS. THE CONTRACTOR SHALL PROVIDE A PERFORMANCE AND PAYMENT BOND AND ASSOCIATED GENERAL LIABILITY INSURANCE POLICIES INCLUDING BUILDERS RISK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SAFETY AND SECURITY AND SHALL COMPLY WITH ALL LAWS AND REGULATIONS INCLUDING BUT NOT LIMITED TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING SITE UTILITIES AND SYSTEMS CAUSED IN HIS EXECUTION OF THE WORK. WHERE RENOVATION WORK OCCURS, THE CONTRACTOR SHALL PROTECT ALL ADJACENT AREAS AND FINISHES. THE CONTRACTOR SHALL TAKE STEPS TO CONTROL THE SPREAD OF DUST AND CONSTRUCTION DEBRIS ON SITE AND THROUGH THE HVAC SYSTEM IN NEW AND EXISTING CONSTRUCTION WHERE APPLICABLE. THE CONTRACTOR SHALL SCHEDULE ANY INTERRUPTIONS TO UTILITY SERVICES WITH THE OWNER AND THE UTILITY COMPANY AT LEAST 72 HOURS IN ADVANCE OF THE PLANNED OUTAGE. THE CONTRACTOR SHALL PROVIDE FOR HIS OWN TEMPORARY ELECTRICAL POWER OR THE CONTRACTOR SHALL ARRANGE FOR USE OF OWNERS ELECTRICITY. THE CONTRACTOR SHALL PROVIDE DOMESTIC WATER ON SITE FOR HIS EXECUTION OF THE WORK OR THE CONTRACTOR SHALL ARRANGE FOR USE OF THE OWNERS DOMESTIC WATER SUPPLY. THE CONTRACTOR SHALL PROVIDE HIS OWN TEMPORARY RESTROOM FACILITIES IN A LOCATION APPROVED BY THE OWNER. THE CONTRACTOR SHALL MAINTAIN APPROPRIATE FIRE EXTINGUISHMENT EQUIPMENT DURING CONSTRUCTION IN ACCORDANCE WITH NATIONAL AND LOCAL CODES AND GUIDELINES. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND FIELD CONDITIONS PRIOR TO COMMENCING WORK AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION OR INSTALLATION. THE CONTRACTOR SHALL COMPLY WITH ALL LAWS AND REGULATIONS WITH REGARDS TO EXCAVATION WORK AND UNDERGROUND UTILITIES AND SHALL NOTIFY THE PROPER AUTHORITIES PRIOR TO COMMENCING SUCH WORK. THE CONTRACTOR SHALL PROTECT UTILITIES ABOVE AND BELOW GROUND DURING THE COURSE OF EXCAVATION WORK. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY SHOULD MATERIALS SUSPECTED TO CONTAIN ASBESTOS OR OTHER HAZARDOUS SUBSTANCES BE DISCOVERED IN THE COURSE OF THE WORK. MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR SHALL COORDINATE THE WORK OF ALL TRADES FOR THE INSTALLATION OF DUCTWORK, OVER-HEAD PIPING, ELECTRICAL FIXTURES AND DEVICES, FIRE ALARM DEVICES, SPRINKLER PIPING AND HEADS, DETECTORS. THE CONTRACTOR SHALL NOT SUBSTITUTE ANY MATERIALS, SYSTEMS OR PRODUCTS WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL IMMEDIATELY PROVIDE THE ARCHITECT WITH A COPY OF ALL CORRESPONDENCE RECEIVED BY REGULATORY AGENCIES INCLUDING BUT NOT LIMITED TO BUILDING PERMITS/STIPULATIONS AND ON-SITE INSPECTION REPORTS. THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE TO ALL FLOOR AND ROOF DRAIN SYSTEMS. 	<table border="1"> <thead> <tr> <th>SHEET</th> <th>SHEET NAME</th> <th>DATE ISSUED</th> </tr> </thead> <tbody> <tr> <td>CS-01</td> <td>COVER SHEET</td> <td></td> </tr> <tr> <td>A-001</td> <td>GENERAL INFORMATION & SHEET INDEX</td> <td></td> </tr> <tr> <td>A-002</td> <td>ARCHITECTURAL SPECIFICATIONS</td> <td></td> </tr> <tr> <td>A-003</td> <td>ARCHITECTURAL SPECIFICATIONS</td> <td></td> </tr> <tr> <td colspan="3">ARCHITECTURAL</td> </tr> <tr> <td>A-001</td> <td>EXISTING SITE PLAN</td> <td></td> </tr> <tr> <td>A-101</td> <td>EXISTING ARCHITECTURAL FLOOR PLANS</td> <td></td> </tr> <tr> <td>A-111</td> <td>EXISTING REFLECTED CEILING PLANS</td> <td></td> </tr> <tr> <td>A-301</td> <td>EXISTING BUILDING SECTIONS</td> <td></td> </tr> <tr> <td colspan="3">MECHANICAL</td> </tr> <tr> <td>M 1.01</td> <td>MECHANICAL DEMO PLAN</td> <td></td> </tr> <tr> <td>M 1.02</td> <td>MECHANICAL PLAN</td> <td></td> </tr> <tr> <td>M 2.01</td> <td>MECHANICAL SCHEDULES</td> <td></td> </tr> <tr> <td>M 3.01</td> <td>MECHANICAL DETAILS</td> <td></td> </tr> <tr> <td colspan="3">ALTERNATE</td> </tr> <tr> <td colspan="3"> ALT. 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1010 N. SAN JACINTO | SUITE 105
HOUSTON, TEXAS 77002
o 713 955 9177
www.a2studioarchitects.com

Project:
**CONROE
HVAC STATION #4
RENOVATION**
CONROE, TEXAS

Consultant:

Seal:



Revisions:
ISSUE FOR BID 4/21/2020

Sheet Title:

**GENERAL INFORMATION
AND SHEET INDEX**

Drawn By: ALD
Checked By: LDA
Project No.: 00061
Project Phase: CONTRACT DOCUMENTS
Date: APRIL 2020
Sheet No.:

A-001

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DIVISION 01 - GENERAL REQUIREMENTS

- ALL WORK IDENTIFIED AS "BY OWNER" SHALL BE PERFORMED BY THE OWNER UNDER SEPARATE CONTRACTS WITH OWNERS.
- ALL SAMPLES REQUIRED SHALL BE SUBMITTED FOR APPROVAL PRIOR TO ORDERING AND/OR INSTALLATION OF SAID MATERIAL.
- THE CONTRACTOR SHALL PREPARE AND FURNISH SHOP DRAWINGS AND PRODUCT DATA SHEETS, SOME OF THE SHOP DRAWINGS/SUBMITTALS REQUIRED (BUT NOT LIMITED TO) ARE AS FOLLOWS:

MISC. METAL FABRICATIONS	TOILET ACCESSORIES
ARCHITECTURAL WOODWORK	FIREFIGHTING DEVICES
CAULKING/SEALANTS	FINISHES
DOORS, WINDOWS, FRAMES & HARDWARE	MECHANICAL
GLASS/GLAZING	PLUMBING
TOILET COMPARTMENTS	ELECTRICAL
- THE CONTRACTOR, IN THE WORK OF ALL TRADE DISCIPLINES, WILL PERFORM ANY AND ALL CUTTING, PATCHING, REPAIRING, RESTORING, AND THE LIKE NECESSARY TO COMPLETE THE WORK AND TO RESTORE DAMAGED OR AFFECTED SURFACES RESULTING FROM THE WORK OF THIS CONTRACT TO THEIR ORIGINAL CONDITION AND TO THE SATISFACTION OF THE ARCHITECT.
- THE CONTRACTOR SHALL COORDINATE WORK PERFORMED BY HIS/HER SUBCONTRACTORS AND BY OTHER CONTRACTORS CONTRACTED BY OWNER, ALL OVERLAPS AND/OR GAPS IN THE WORK, IF ANY, SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT FOR RESOLUTION PRIOR TO COMMENCEMENT OF THE WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, AND DIMENSIONS FOR ACCURACY AND CONFIRMING THAT WORK IS BUILDABLE AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. IF THERE ARE ANY QUESTIONS REGARDING THESE OR OTHER COORDINATING QUESTIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE PROCEEDING WITH WORK IN QUESTION OR ANY OTHER RELATED WORK.
- SHOULD THERE BE ANY DISCREPANCY IN THE REQUIREMENTS OF THE DRAWINGS OR THE SPECIFICATIONS, THE BETTER QUALITY AND/OR GREATER QUANTITY OF WORK AND MATERIALS SHALL BE PRICED, AND UNLESS OTHERWISE ORDERED OR IN WRITING, SHALL BE FURNISHED AND INSTALLED.
- IF ANY ERROR AND/OR OMISSION IS EVIDENT IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY VIA TELEPHONE CALL AND IN WRITING OF SUCH ERROR OR OMISSION PRIOR TO PROCEEDING WITH THE WORK.
- PROVIDE ALL WORK AND MATERIALS AS REQUIRED BY THE DRAWINGS, AND IN FULL ACCORDANCE WITH ALL CODES AND ORDINANCES.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS NECESSARY TO ENSURE GOOD WORKMANSHIP AND A COMPLETE INSTALLATION.
- LEGENDS AND NOTES APPEAR ON DRAWINGS TO WHICH THEY RELATE, BUT ARE NOT LIMITED TO THAT DRAWING AND MAY BE APPLICABLE TO OTHER CONTRACT DOCUMENTS. DETAILS ARE TYPICALLY KEYED ONLY ONCE ON THE PLANS OR ELEVATIONS WHEN THEY FIRST OCCUR, AND ARE TYPICAL FOR SIMILAR CONDITIONS THROUGHOUT UNLESS OTHERWISE NOTED.
- DIMENSIONS NOTED ON DRAWINGS AS "CLEAR" AND "HOLD" ARE CRITICAL FOR ACCESSIBILITY AND EQUIPMENT CLEARANCES.
- PROVIDE STIFFENERS, BRACING, BACK-UP PLATES, ETC. AS REQUIRED AT STUD WALLS FOR SUPPORT OF FIXTURES OR EQUIPMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY ARRIVAL OF ALL SPECIFIED FINISH MATERIALS, EQUIPMENTS, LIGHT FIXTURES, AND ANY OTHER MATERIALS TO BE UTILIZED ON THIS PROJECT. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING WITHIN 10 DAYS OF AWARD OF CONTRACT ON ANY SPECIFIC ITEMS THAT MAY NOT BE READILY AVAILABLE AND THE ALTERNATE ITEMS THAT THE CONTRACTOR RECOMMENDS AS READILY AVAILABLE AND OF EQUAL QUALITY. IF NOTIFICATION IS NOT RECEIVED BY THE ARCHITECT, THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR THE ORDERING AND FOLLOW-UP OF SPECIFIED ITEMS AND WILL PURSUE WHATEVER MEANS NECESSARY, AT NO ADDITIONAL COST TO THE OWNER, TO ENSURE AVAILABILITY OF ALL SPECIFIED ITEMS SO AS NOT TO DELAY PROGRESS OF THE WORK. NO EXTENSION OF TIME TO THE CONTRACT WILL BE ALLOWED FOR THE CONTRACTOR'S INABILITY TO SECURE SPECIFIED ITEMS.
- MATERIALS, PRODUCTS, OR METHODS SPECIFIED SHALL BE FURNISHED UNDER THE CONTRACT UNLESS WRITTEN APPROVAL FOR SUBSTITUTION IS PROVIDED BY THE ARCHITECT.
- ALL ITEMS ARE TO BE DELIVERED TO THE SITE IN ORIGINAL, UNOPENED CONTAINERS. ITEMS SHALL BE DELIVERED AND STORED IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE ITEMS FROM OCCURRING DURING CONSTRUCTION.
- ALL MATERIALS SHALL BE INSTALLED, APPLIED, SECURED, PROTECTED, AND CLEANED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND RECOMMENDATIONS.
- EXISTING SURFACES (AND SUB-SURFACES) TO RECEIVE NEW FINISHES SHALL BE PREPARED AS REQUIRED TO ELIMINATE DEFECTS.
- PENETRATIONS OF ONE HOUR WALLS SHALL BE PROTECTED BY 45-MINUTE FIRE RATED OPENING ASSEMBLIES OR BY FIRESTOPPING PROVIDING EQUIVALENT PROTECTION. FIRE DAMPER ASSEMBLIES WITH SLEEVES SHALL SIMILARLY BE PROVIDED WHERE DUCTWORK PENETRATES ON HOUR WALLS.
- THE CONTRACTOR SHALL AT TIMES KEEP THE PREMISES FREE OF RUBBISH OR WASTE MATERIAL CAUSED BY THE WORK. CONTRACTOR IS RESPONSIBLE FOR ON-GOING CLEAN UP FOR THE DURATION OF THE PROJECT.
- THE CONTRACTOR SHALL CLOSELY COORDINATE HIS WORK, PROTECTION AND CLEAN UP WITH THE OWNER, WHENEVER FACILITIES WILL REMAIN IN USE BY THE OWNER DURING CONSTRUCTION.
- UPON SUBSTANTIAL COMPLETION OF THE PROJECT, CONTRACTOR WILL PROVIDE FIRST A "CONSTRUCTION CLEANING" USING HIS OWN FORCES AND SECONDLY A "FINAL CLEANING" JUST PRIOR TO OCCUPANCY. SCHEDULE "FINAL CLEANING" USING A PROFESSIONAL CLEANING COMPANY THAT IS ACCEPTABLE TO OWNER.
- THE ARCHITECT AND OWNER SHALL HAVE ACCESS TO OBSERVE CONSTRUCTION PROGRESS DURING NORMAL WORKING HOURS.
- OBTAIN PERMISSION FOR ALL MODIFICATIONS OR CHANGES TO THE DRAWINGS. IN CASE OF DISPUTE, BRING TO THE IMMEDIATE ATTENTION OF ARCHITECT FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK IN QUESTION.
- CONTRACTOR SHALL PROVIDE WASTE REMOVAL FACILITIES AND SERVICES AS REQUIRED TO MAINTAIN THE SITE IN CLEAN AND ORDERLY CONDITION. PROVIDE CONTAINERS AND REMOVE TRASH FROM SITE WEEKLY.
- REQUIRED EXITS SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 21 00 - THERMAL INSULATION
SCOPE: BATT INSULATION FOR FILLING PERIMETER WINDOW AND DOOR SHIM SPACES AND CREVICES IN EXTERIOR AND INTERIOR WALLS.

SUBMITTALS:

- PRODUCT DATA: PROVIDE DATA ON PRODUCT CHARACTERISTICS, PERFORMANCE CRITERIA, AND PRODUCT LIMITATIONS.
- MANUFACTURER'S CERTIFICATE: CERTIFY THAT PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS.

PRODUCTS: GLASS FIBER BATT INSULATION: FLEXIBLE UNFACED PREFORMED BATT OR BLANKET, COMPLYING WITH ASTM C665; FRICTION FIT.

- FLAME SPREAD INDEX: 25 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- SMOKE DEVELOPED INDEX: 50 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- COMBUSTIBILITY: NON-COMBUSTIBLE, WHEN TESTED IN ACCORDANCE WITH ASTM E136.
- THERMAL RESISTANCE: R-VALUE OF 19, U.N.O.

ACOUSTIC (SOUND ATTENUATION) BATS FIBER GLASS INSULATION: COMPLYING WITH ASTM C665, TYPE I AND ASTM E136; UNFACED PREFORMED FIBERGLASS BATTS WITHOUT VAPOR BARRIER, BATTS IN FIRE-RATED ASSEMBLIES TO BE UL LISTED.

- FLAME SPREAD INDEX: 10 OR LESS, WHEN TESTED IN ACCORDANCE ASTM E84.
- SMOKE DEVELOPED INDEX: 10 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- NRG: 0.85.
- THICKNESS: AS INDICATED.

MANUFACTURERS: (MATCH EXISTING)

CERTAINTEE CORPORATION: WWW.CERTAINTEE.COM.
JOHNS MANVILLE: WWW.JM.COM.
OVENS CORNING CORPORATION: WWW.OCCBUILDINGSPEC.COM/ SLE.

EXECUTION: VERIFY THAT SUBSTRATE, ADJACENT MATERIALS, AND INSULATION MATERIALS ARE DRY AND THAT SUBSTRATES ARE READY TO RECEIVE INSULATION.

VERIFY SUBSTRATE SURFACES ARE FLAT, FREE OF HONEYCOMB, FINIS, IRREGULARITIES, OR MATERIALS OR SUBSTANCES THAT MAY IMPEDE ADHESIVE BOND.

INSTALL INSULATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL IN EXTERIOR WALL SPACES WITHOUT GAPS OR VOIDS. DO NOT COMPRESS INSULATION. TRIM INSULATION NEATLY TO FIT SPACES. INSULATE MISCELLANEOUS GAPS AND VOIDS. FIT INSULATION TIGHTLY IN CAVITIES AND TIGHTLY TO EXTERIOR SIDE OF MECHANICAL AND ELECTRICAL SERVICES WITHIN THE PLANE OF THE INSULATION.

DO NOT PERMIT INSTALLED INSULATION TO BE DAMAGED PRIOR TO ITS CONCEALMENT.

MEMBRANE FASTENERS: TYPE AND SIZE AS REQUIRED BY ROOF MEMBRANE MANUFACTURER FOR ROOFING SYSTEM AND WARRANTY TO BE PROVIDED; USE ONLY FASTENERS FURNISHED BY ROOF MEMBRANE MANUFACTURER.

CURB AND PARAPET FLASHING: SAME MATERIAL AS MEMBRANE, WITH ENCAPSULATED EDGE WHICH ELIMINATES NEED FOR SEAM SEALING THE FLASHING-TO-ROOF SPLICE; PRECUT TO 18" WIDE.

SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

SCOPE: FOAMED-IN-PLACE INSULATION IN NEWLY CONDITIONED ATTIC SPACE, WALLS, ROOF AND ALL EXTERIOR WALL CREVICES EXPOSED.

SUBMITTALS:

- PRODUCT DATA: PROVIDE DATA ON PRODUCT CHARACTERISTICS, PERFORMANCE CRITERIA, AND PRODUCT LIMITATIONS.
- MANUFACTURER'S CERTIFICATE: CERTIFY THAT PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS.

PRODUCTS: FOAMED-IN-PLACE INSULATION: LOW DENSITY, FLEXIBLE, OPEN CELLED, WATER VAPOR PERMEABLE POLYURETHANE FOAM; FOAMED ON-SITE, USING BLOWING AGENT OF WATER USING BLOWING AGENT OF WATER OR NON-OZONE-DEPLETING GAS, COMPLYING WITH ASTM C518, ASTM E84, ASTM E283, AND ASTM E2178.

MANUFACTURERS:

CERTAINTEE CORPORATION: WWW.CERTAINTEE.COM. CERTASPRAY OPEN CELL FOAM.
JOHNS MANVILLE: WWW.JM.COM/ #SLE. JM ocSPF OPEN CELL FOAM

EXECUTION: VERIFY WORK WITHIN CONSTRUCTION SPACES OR CREVICES IS COMPLETE PRIOR TO INSULATION APPLICATION. VERIFY THAT SURFACES ARE CLEAN, DRY, AND FREE OF MATTER THAT MAY INHIBIT INSULATION ADHESION.

PREPARATION: MASK AND PROTECT ADJACENT SURFACES FROM OVER SPRAY OR DUSTING. APPLY PRIMER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

APPLICATION: APPLY INSULATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. APPLY OVERCOT MONOLITHICALLY, WITHOUT VOIDS TO FULLY COVER FOAM INSULATION. WHERE APPLIED TO VOIDS AND GAPS ASURE SPACE FOR EXPANSION TO AVOID PRESSURE ON ADJACENT MATERIALS THAT MAY BIND OPERABLE PARTS. TRIM ACCESS AWAY FROM APPLIED TRIM OR REMOVE AS REQUIRED FOR CONTINUOUS SEALANT BEAD.

PROTECTION: DO NOT PERMIT SUBSEQUENT CONSTRUCTION WORK TO DISTURB APPLIED INSULATION.

SECTION 07 25 00 - WEATHER BARRIERS

SCOPE: WATER-RESISTIVE BARRIER: UNDER EXTERIOR WALL CLADDING, OVER SHEATHING OR OTHER SUBSTRATE; NOT AIR TIGHT OR VAPOR RETARDANT.

AIR AND WATER BARRIERS: MATERIALS THAT FORM A SYSTEM TO STOP PASSAGE OF AIR THROUGH EXTERIOR WALLS, JOINTS BETWEEN EXTERIOR WALLS AND ROOF, AND JOINTS AROUND FRAMES OF OPENINGS IN EXTERIOR WALLS.

DEFINITIONS: WEATHER BARRIER: ASSEMBLIES THAT FORM EITHER WATER-RESISTIVE BARRIERS, AIR BARRIERS, OR VAPOR RETARDERS.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 25 00 - WEATHER BARRIERS (CONT)

AIR BARRIER: AIR TIGHT BARRIER MADE OF MATERIAL THAT IS RELATIVELY AIR IMPERMEABLE BUT WATER VAPOR PERMEABLE. BOTH TO THE DEGREE SPECIFIED, WITH SEALED SEAMS AND WITH SEALED JOINTS TO ADJACENT SURFACES. NOTE: FOR THE PURPOSES OF THIS SPECIFICATION, VAPOR IMPERMEABLE AIR BARRIERS ARE CLASSIFIED AS VAPOR RETARDERS.

WATER-RESISTIVE BARRIER: WATER-SHEDDING BARRIER MADE OF MATERIAL THAT IS MOISTURE RESISTANT, TO THE DEGREE SPECIFIED, INTENDED TO BE INSTALLED TO SHED WATER WITHOUT SEALED SEAMS.

SUBMITTALS:

- PRODUCT DATA: PROVIDE DATA ON MATERIAL CHARACTERISTICS.
- MANUFACTURER'S INSTALLATION INSTRUCTIONS: INDICATE PREPARATION.

INSTALL AIR BARRIER, VAPOR RETARDER, AND WATER-RESISTIVE BARRIER MATERIALS IN MOCK-UP AS SPECIFIED IN SECTION 01 43 39 - MOCK UP WALL CONSTRUCTION.

FIELD CONDITIONS: MAINTAIN TEMPERATURE AND HUMIDITY RECOMMENDED BY THE MATERIALS MANUFACTURERS BEFORE, DURING AND AFTER INSTALLATION.

WEATHER-RESISTIVE BARRIER: PROVIDE ONE LAYER OF BUILDING WRAP OVER FLUID-APPLIED COATING.

PRODUCTS: WATER-RESISTIVE BARRIER: ON OUTSIDE SURFACE OF FLUID APPLIED WEATHER BARRIER AT STUCCO AND MASONRY CLADED EXTERIOR WALLS.

DUPONT BUILDING INNOVATIONS: TYVEK STUCCOWRAP AND RELATED ASSEMBLY COMPONENTS: WWW.DUPONT.COM.

BUILDING WRAP: TEXTURED, SPUNBOUNDED POLYOLEFIN, NON-WOVEN, NON-PERFORATED WEATHER BARRIER.

- AIR PENETRATION: 0.004 CFM/FT² AT 75 PA, WHEN TESTED IN ACCORDANCE WITH ASTM E2178. TYPE I PER ASTM E1677.
- WATER VAPOR TRANSMISSION: 50 PERMS, WHEN TESTED IN ACCORDANCE WITH ASTM E96, METHOD B.
- WATER PENETRATION RESISTANCE: 210 CM WHEN TESTED IN ACCORDANCE WITH AATCC TEST METHOD 127.
- BASIS WEIGHT: 2.1 OZ./YD², WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-410.
- AIR RESISTANCE: 300 SECONDS, WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-460.
- TENSILE STRENGTH: 30/30 LBS./IN., WHEN TESTED IN ACCORDANCE WITH ASTM D882, METHOD A.
- TEAR RESISTANCE: 7/9 LBS, WHEN TESTED IN ACCORDANCE WITH ASTM D1117.
- SURFACE BURNING CHARACTERISTICS: CLASS A, WHEN TESTED IN ACCORDANCE WITH ASTM E84. FLAME SPREAD: 5, SMOKE DEVELOPED: 25

AIR AND WATER BARRIER: ON OUTSIDE SURFACE OF STUCCO AND MASONRY CLADED EXTERIOR WALLS USE AIR BARRIER COATING; ON OUTSIDE SURFACE OF SHEATHING OF EXTERIOR WALLS USE AIR BARRIER COATING.

PARTEX USA, INC. PARTEX USA WEATHERSEAL SPRAY & ROLL-ON: WWW.PARTEXUSA.COM.

SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

AIR BARRIER COATING (WATER VAPOR PERMEABLE AND WATER-RESISTIVE), FLUID APPLIED; VAPOR PERMEABLE, ELASTOMERIC WATERPROOFING:

- AIR PERMEANCE: 0.001 CUBIC FEET PER MINUTE PER SQUARE FOOT, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E2178.
- WATER VAPOR PERMEANCE: 5 PERMS, MINIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M, PROCEDURE B.
- ULTRAVIOLET AND WEATHERING RESISTANCE: APPROVED IN WRITING BY MANUFACTURER FOR MINIMUM OF 6 MONTHS WEATHER EXPOSURE AFTER APPLICATION.
- SURFACE BURNING CHARACTERISTICS: FLAME SPREAD INDEX OF 25 OR LESS, SMOKE DEVELOPED INDEX OF 450 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.

ACCESSORIES: SEALANTS, TAPES, AND ACCESSORIES FOR SEALING WEATHER BARRIER AND SEALING WEATHER BARRIER TO ADJACENT SUBSTRATES: AS SPECIFIED OR AS RECOMMENDED BY WEATHER BARRIER MANUFACTURER.

FLEXIBLE FLASHING: SELF-ADHESIVE SHEET FLASHING COMPLYING WITH ASTM D1970/ D1970M, EXCEPT SLP RESISTANCE REQUIREMENT IS WAIVED IF NOT INSTALLED ON A ROOF. COMPOSITION, THICKNESS AND PRODUCT AS RECOMMENDED BY MANUFACTURER.

THINNERS AND CLEANERS: AS RECOMMENDED BY MATERIAL MANUFACTURER.

EXECUTION: VERIFY THAT SURFACES AND CONDITIONS ARE READY TO ACCEPT THE WORK OF THIS SECTION.

REMOVE PROJECTIONS, PROTRUDING FASTENERS, AND LOOSE OR FOREIGN MATTER THAT MIGHT INTERFERE WITH PROPER INSTALLATION.

CLEAN AND PRIME SUBSTRATE SURFACES TO RECEIVE ADHESIVES AND SEALANTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

AIR BARRIERS: INSTALL CONTINUOUS AIR TIGHT BARRIER OVER SURFACES INDICATED, WITH SEALED SEAMS AND WITH SEALED JOINTS TO ADJACENT SURFACES.

COATINGS: PREPARE SUBSTRATE IN MANNER RECOMMENDED BY COATING MANUFACTURER; TREAT JOINTS IN SUBSTRATE AND BETWEEN DISSIMILAR MATERIALS AS RECOMMENDED BY MANUFACTURER, WHERE EXTERIOR MASONRY VENEER IS TO BE INSTALLED, INSTALL MASONRY ANCHORS BEFORE INSTALLING WEATHER BARRIER OVER MASONRY; SEAL AROUND ANCHORS AIR TIGHT, USE FLASHING TO SEAL TO ADJACENT CONSTRUCTION AND TO BRIDGE JOINTS.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 25 00 - WEATHER BARRIERS (CONT)

OPENINGS AND PENETRATIONS IN EXTERIOR WEATHER BARRIERS:

- INSTALL FLASHING OVER SILLS, COVERING ENTIRE SILL FRAME MEMBER, EXTENDING AT LEAST 5" ONTO WEATHER BARRIER AND AT LEAST 6" UP JAMBS, MECHANICALLY FASTEN STRETCHED EDGES.
- AT OPENINGS TO BE FILLED WITH FRAMES HAVING NAILING FLANGES, SEAL HEAD AND JAMB FLANGES USING A CONTINUOUS BEAD OF SEALANT COMPRESSED BY FLANGE AND COVER FLANGES WITH AT LEAST 4" WIDE; DO NOT SEAL SILL FLANGE.
- AT OPENINGS TO BE FILLED WITH NON-FLANGED FRAMES, SEAL WEATHER BARRIER TO ALL SIDES OF OPENING FRAMING, USING FLASHING AT LEAST 9" WIDE, COVERING ENTIRE DEPTH OF FRAMING.
- AT HEAD OF OPENINGS, INSTALL FLASHING UNDER WEATHER BARRIER EXTENDING AT LEAST 2" BEYOND FACE OF JAMBS, SEAL WEATHER BARRIER TO FLASHING.
- AT INTERIOR FACE OF OPENINGS, SEAL GAP BETWEEN WINDOW/ DOOR FRAME AND ROUGH FRAMING, USING JOINT SEALANT OVER BACKER ROD.
- SERVICE AND OTHER PENETRATIONS: FORM FLASHING AROUND PENETRATING ITEM AND SEAL TO WEATHER BARRIER SURFACE.

FIELD QUALITY CONTROL:

- DO NOT COVER INSTALLED WEATHER BARRIERS UNTIL REQUIRED INSPECTIONS HAVE BEEN COMPLETED.
- OBTAIN APPROVAL OF INSTALLATION PROCEDURES BY THE WEATHER BARRIER MANUFACTURER BASED ON A MOCK-UP INSTALLED IN PLACE, PRIOR TO PROCEEDING WITH REMAINDER OF INSTALLATION.

PROTECTION: DO NOT LEAVE MATERIALS EXPOSED TO WEATHER LONGER THAN RECOMMENDED MANUFACTURER.

SECTION 07 84 00 - FIRESTOPPING

SCOPE: FIRESTOPPING SYSTEMS AND FIRESTOPPING OF ALL JOINTS PENETRATIONS IN FIRE RESISTANCE RATED AND SMOKE RESISTANT ASSEMBLIES, WHETHER INDICATED ON DRAWINGS OR NOT, AND OTHER OPENINGS INDICATED.

SUBMITTALS:

- PRODUCT DATA: PROVIDE PRODUCT DATA ON PRODUCT CHARACTERISTICS, PERFORMANCE RATINGS, AND LIMITATIONS.
- INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- CERTIFY THAT THE PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS.

FIELD CONDITIONS:

- COMPLY WITH FIRESTOPPING MANUFACTURER'S RECOMMENDATIONS FOR TEMPERATURE AND CONDITIONS DURING AND AFTER INSTALLATION. MAINTAIN MINIMUM TEMPERATURE AND CONDITIONS DURING AND AFTER INSTALLATION. MAINTAIN MINIMUM TEMPERATURE BEFORE, DURING, AND FOR 3 DAYS AFTER INSTALLATION OF MATERIALS.
- PROVIDE VENTILATION IN AREAS WHERE SOLVENT-CURED MATERIALS ARE BEING INSTALLED.

MANUFACTURERS:

HILTI, INC: WWW.US.HILTI.COM/ #SLE OR APPROVED EQUAL

FIRESTOPPING ASSEMBLY REQUIREMENTS:

- FLOOR-TO-FLOOR, WALL-TO-WALL, AND WALL-TO-FLOOR JOINTS, EXCEPT PERIMETER, WHERE BOTH ARE FIRE-RATED: USE ANY SYSTEM THAT HAS BEEN TESTED ACCORDING TO ASTM E1966 OR UL 2079 TO HAVE FIRE RESISTANCE F RATING EQUAL TO REQUIRED FIRE RATING OF THE ASSEMBLY IN WHICH THE JOINT OCCURS.
- THROUGH PENETRATION FIRESTOPPING: USE ANY SYSTEM THAT HAS BEEN TESTED ACCORDING TO ASTM E814 TO HAVE FIRE RESISTANCE F RATING EQUAL TO REQUIRED FIRE RATING OF PENETRATED ASSEMBLY.

FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS: GYPSUM BOARD WALLS

- WALL TO WALL JOINTS THAT HAVE NOT BEEN TESTED FOR MOVEMENT CAPABILITIES (STATIC): 1 HOUR CONSTRUCTION: UL SYSTEM WWW-S-0063; SPECIFIED TECHNOLOGIES INC. SPEEDFLEX TTG TRACK TOP GASKET.
- WALL TO WALL JOINTS THAT HAVE MOVEMENT CAPABILITIES (DYNAMIC): 1 HOUR CONSTRUCTION: WUL SYSTEM WW-D-0067; HILTI CP 606 FLEXIBLE FIRESTOP SEALANT.
- TOP OF WALL JOINTS AT UNDERSIDE OF STEEL BEAM AND CONCRETE OVER METAL DECK FLOOR WITH SPRAYED ON FIREPROOFING: 1 HOUR CONSTRUCTION: UL SYSTEM HW-D-0259; HILTI CFS-SP WB FIRESTOP JOINT SPRAY AND CP 672.
- TOP OF WALL JOINTS AT UNDERSIDE OF FLAT CONCRETE: 1 HOUR CONSTRUCTION: UL SYSTEM HW-D-1068; HILTI CFS-SP WB FIRESTOP JOINT SPRAY AND CP 672.

FIRESTOPPING FOR FLOOR-TO-WALL JOINTS:

- FLOOR TO WALL JOINTS THAT HAVE MOVEMENT CAPABILITIES (DYNAMIC): 2 HOUR CONSTRUCTION: UL SYSTEM FW-D-1069; TREMCO, TREMstop ACRYLIC FIRESTOP SEALANT.

FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION:

- BLANK OPENINGS: IN FLOORS OR WALLS; 2 HOUR CONSTRUCTION: UL SYSTEM CAJ-0090; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
- PENETRATIONS THROUGH FLOORS BY:
 - MULTIPLE PENETRATIONS IN LARGE OPENINGS: 2 HOUR CONSTRUCTION: UL SYSTEM F-A-8012; HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT GUN-GRADE OR CFS-S SIL SL FIRESTOP SILICONE SEALANT SELF-LEVELING.
 - UNINSULATED METALLIC PIPE, CONDUIT, AND TUBING: 2-HOUR CONSTRUCTION: UL SYSTEM F-A-1016; HILTI CP-680-P/M CAST-IN DEVICE.
 - UNINSULATED NON-METALLIC PIPE, CONDUIT, AND TUBING: 2 HOUR CONSTRUCTION: UL SYSTEM F-A-2065; HILTI CP 680-P CAST-IN DEVICE.
 - ELECTRICAL CABLE NOT IN CONDUIT: 2 HOUR CONSTRUCTION: UL SYSTEM F-A-3033; HILTI CP 680-P/M CAST-IN DEVICE.
 - ELECTRICAL BUSWAYS: 2 HOUR CONSTRUCTION: UL SYSTEM F-A-6002; HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT.
 - INSULATED PIPES: 2 HOUR CONSTRUCTION: UL SYSTEM F-A-5015; HILTI CP 653 SPEED SLEEVE.



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DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 84 00 - FIRESTOPPING (CONT.)

FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS:

- BLANK OPENINGS: 1 HOUR CONSTRUCTION: UL SYSTEM WL-3334; HILTI CP 653 SPEED SLEEVE.
- PENETRATIONS BY:
 - MULTIPLE PENETRATIONS IN LARGE OPENINGS: 1 HOUR CONSTRUCTION: UL SYSTEM WL-1408; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
 - UNINSULATED METALLIC PIPE, CONDUIT, AND TUBING: 1 HOUR CONSTRUCTION: UL SYSTEM WL-1054; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
 - UNINSULATED NON-METALLIC PIPE, CONDUIT, AND TUBING: 1 HOUR CONSTRUCTION: UL SYSTEM WL-2078; HILTI CP 643N/ 644 FIRESTOP COLLAR.
 - ELECTRICAL CABLES NOT IN CONDUIT: 1 HOUR CONSTRUCTION: UL SYSTEM WL-3065; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT, CP 606 FLEXIBLE FIRESTOP SEALANT, CD 601S ELASTOMERIC FIRESTOP SEALANT, OR CP 618 FIRESTOP PUTTY STICK.
 - CABLE TRAYS WITH ELECTRICAL CABLES: 1 HOUR CONSTRUCTION: UL SYSTEM WL-4060; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
 - INSULATED PIPES: 1 HOUR CONSTRUCTION: UL SYSTEM WL-5028; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
 - HVAC DUCTS, INSULATED: 1 HOUR CONSTRUCTION: UL SYSTEM WL-7156; HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

EXECUTION: CLEAN SUBSTRATE SURFACES OF DIRT, DUST, GREASE, OIL, LOOSE MATERIAL, OR OTHER MATTER THAT COULD ADVERSELY AFFECT BOND OF FIRESTOPPING MATERIAL. REMOVE INCOMPATIBLE MATERIALS THAT COULD ADVERSELY AFFECT BOND.

INSTALLATION: INSTALL MATERIALS IN MANNER DESCRIBED IN FIRE TEST REPORT AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COMPLETELY CLOSING OPENINGS. DO NOT COVER INSTALLED FIRESTOPPING UNTIL INSPECTED BY AUTHORITIES HAVING JURISDICTION.

SECTION 07 60 00 - FLASHING AND SHEET METAL

SCOPE: THIS SECTION REQUIRES FABRICATION AND INSTALLATION OF PRE-FINISHED METAL FLASHING AND TRIM.

SUBMITTALS: FURNISH SHOP DRAWINGS FOR ALL REQUIRED SHEET METAL TRIM AND FABRICATIONS AND ANTICIPATED SHEET METAL FLASHING CONDITIONS. SHOW CLEARLY RELATIONSHIPS TO SUBSTRATES AND ADJACENT CONSTRUCTION. ADDRESS SJP JOINTS, SPLICES, END CONDITIONS, AND FASTENING METHODS.

MATERIALS:

- PRE-FINISHED ALUMINUM: MINIMUM 24 GAUGE ALUMINUM WITH KYNAR 500 HIGH PERFORMANCE PAINT FINISH (TOP SIDE) AND NEUTRAL POLYESTER PAINT FINISH (BOTTOM SIDE). WHEN USED FOR EXPOSED METAL FLASHING OR FABRICATION.
- STAINLESS STEEL: ASTM A240/ 240M; TYPE 316. DEAD SOFT FULLY ANNEALED, 24 GAUGE MINIMUM, SIZE AS SCHEDULED; SMOOTH SURFACE, NUMBER 2B FINISH.

EXECUTION: WORK SHALL CONFORM TO BEST INDUSTRY PRACTICES AND SMACNA ARCHITECTURAL SHEET METAL MANUAL. USE CONCEALED FASTENERS AND ANCHORS TO MAXIMUM EXTENT POSSIBLE. USE STAINLESS STEEL FASTENERS WITH NEOPRENE WASHERS OR POP RIVETS ONLY IF NOT OTHER ALTERNATIVE EXISTS. ALLOW FOR THERMAL EXPANSION AND CONTRACTION IN FABRICATED ASSEMBLIES.

SECTION 07 92 00 - JOINT CAULKING

SCOPE: THIS SECTION INCLUDES ALL INTERIOR AND EXTERIOR SEALANT WORK.

SUBMITTALS:

- PRODUCT DATA: MANUFACTURER'S PRODUCT LITERATURE AND DATA SHEETS FOR EACH SEALANT PRODUCT TO BE USED ON PROJECT AS WELL AS FOR ALL SEALANT BACKER MATERIAL TO BE UTILIZED.
- SAMPLES: FULL LINE COLOR CHARTS OF EACH SEALANT PRODUCT PROPOSED FOR SELECTION BY ARCHITECT. IF REQUESTED BY ARCHITECT, PROVIDE ACTUAL CURED SEALANT SAMPLES ILLUSTRATING FULL RANGE OF AVAILABLE COLORS FOR SELECTION.

MATERIALS:

PRODUCTS:

- DOW CORNING 756 OR GE SILICONES SCS9000NB: ONE PART SILICONE SEALANT FOR SPECIALIZED EXTERIOR CAULKING OF ITEMS, SUCH AS STONE MASONRY, METAL PANELS, AND EXPOSED SHEET METAL FLASHING JOINTS.
- DOW CORNING 786 OR GE SILICONES SCS1700: ONE PART SILICONE SEALANT FOR INTERIOR SANITARY CAULKING CONDITIONS AND WALL/ FLOOR TILE MOVEMENT JOINTS.
- TREMCO 834 OR SONNEBORN SONOLAC: ONE PART SILICONIZED ACRYLIC LATEX SEALANT FOR GENERAL INTERIOR CAULKING CONDITIONS. (NON-MOVING JOINT)
- TREMCO DYMONIC OR SONNEBORN NP1: ONE PART, FAST CURING POLYURETHANE SEALANT FOR GENERAL INTERIOR SEALANT CONDITIONS. (MOVING JOINT)
- TREMCO DYMERIC OR SONNEBORN NP2: TWO PART, FAST-CURING POLYURETHANE SEALANT FOR GENERAL EXTERIOR SEALANT CONDITIONS.
- TREMCO THC901 OR SONNEBORN SL2: ONE PART SEMI-SELF-LEVELING POLYURETHANE SEALANT FOR CURB AND SIDEWALK JOINT CONDITIONS.
- NOMACO, INC. GREEN ROD OR APPROVED EQUAL: CLOSED CELL POLYETHYLENE FOAM PLASTIC BACKER ROD FOR EXTERIOR JOINTS.
- NOMACO, INC. SOF ROD OR APPROVED EQUAL: BICELLULAR POLYOLEFIN FOAM PLASTIC BACKER ROD MATERIAL FOR INTERIOR JOINTS.

EXECUTION: ALL SURFACES TO BE THOROUGHLY CLEAN AND DRY, WHERE JOINTS ARE DEEPER THAN 1/2" USE BACKER ROD AND POSITION WITHIN 1/2" OF THE SURFACE.

SEALANTS SHALL BE GUN APPLIED THROUGH A NOZZLE OPENING OF SUCH DIAMETER SO THAT THE FULL BEAD OF SEALANT IS GUNNED INTO THE JOINTS. TOOL BEAD IMMEDIATELY AFTER APPLICATION TO ENSURE FIRM FULL CONTACT.

DIVISION 09 - FINISHES

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

SCOPE: THIS SECTION INCLUDES PERFORMANCE CRITERIA FOR GYPSUM BOARD ASSEMBLIES, CEMENTITIOUS BACKING BOARD, GYPSUM WALLBOARD, JOINT TREATMENT AND ACCESSORIES, AND TEXTURED FINISH SYSTEM.

SUBMITTALS:

- SHOP DRAWINGS: INDICATE SPECIAL DETAILS ASSOCIATED WITH FIREPROOFING AND ACOUSTIC SEALS.
- PRODUCT DATA: PROVIDE DATA ON METAL FRAMING, GYPSUM BOARD, ACCESSORIES, AND JOINT FINISHING SYSTEM.
- SAMPLES: SUBMIT TWO SAMPLES OF GYPSUM BOARD FINISHED WITH PROPOSED TEXTURE APPLICATION. 12" X 12" IN SIZE, ILLUSTRATING FINISH COLOR AND TEXTURE.

QUALITY ASSURANCE: INSTALLER SPECIALIZING IN PERFORMING GYPSUM BOARD INSTALLATION AND FINISHING, WITH MINIMUM 5 YEARS OF EXPERIENCE.

GYPSUM BOARD ASSEMBLIES: PROVIDE COMPLETED ASSEMBLIES COMPLYING WITH ASTM C840 AND GA-216.

GYPSUM WALLBOARD: 5/ 8" THICK, PAPER-FACED GYPSUM PANELS AS DEFINED IN ASTM C1396/ C1396M; SIZES TO MINIMIZE JOINTS IN PLACE; ENDS SQUARE CUT. USE FOR VERTICAL SURFACES AND CEILINGS, UNLESS OTHERWISE INDICATED.

5/ 8" THICK, MOLD RESISTANCE GYPSUM WALLBOARD IS REQUIRED WHEREVER BOARD IS BEING INSTALLED BEFORE THE BUILDING IS ENCLOSED AND CONDITIONED. WALLBOARD SHALL HAVE A SCORE OF 10, WHEN TESTED IN ACCORDANCE WITH ASTM D3273. PROVIDE IN TOILET ROOMS, BREAK ROOMS, AND OTHER WET AREAS.

MANUFACTURERS:

AMERICAN GYPSUM COMPANY: WWW.AMERICANGYPSUM.COM.
CERTAINTEED CORPORATION: WWW.CERTAINTEED.COM.
GEORGIA-PACIFIC GYPSUM: WWW.GPGYPSUM.COM.
NATIONAL GYPSUM COMPANY: WWW.NATIONALGYPSUM.COM/ #SLE.
SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

CEMENT BOARD: 1/2" THICK, ANSI CEMENT-BASED BOARD, NON-GYPSUM-BASED; AGGREGATED PORTLAND CEMENT PANELS WITH GLASS FIBER MESH EMBEDDED IN FRONT AND BACK SURFACES COMPLYING WITH ANSI A118.9 OR ASTM C1325.

- APPLICATION: EXTERIOR SHEATHING AND SURFACES BEHIND TILE IN WET AREAS, INCLUDING BEHIND TOILETS AND SINKS.
- MOLD RESISTANCE: SCORE OF 10, WHEN TESTED IN ACCORDANCE WITH ASTM D3273.

BASIS OF DESIGN: NATIONAL GYPSUM COMPANY; PERMABASE CEMENT BOARD.
SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

BEADS, JOINT ACCESSORIES, AND OTHER TRIM: ASTM C1047, RIGID PLASTIC, GALVANIZED STEEL, OR ROLLED ZINC, UNLESS NOTED OTHERWISE. ARCHITECTURAL REVEAL BEADS SHALL BE 1/2" D X 1/2" W; V GROOVE SHAPE.

JOINT MATERIALS: ASTM C475 / C475M AND AS RECOMMENDED BY GYPSUM BOARD MANUFACTURER FOR PROJECT CONDITIONS. USE 2" WIDE, COATED GLASS FIBER TAPE OR CREAMED PAPER TAPE FOR JOINTS AND CORNERS, UNLESS OTHERWISE INDICATED; READY-MIXED VINYL-BASED JOINT COMPOUND; AND CHEMICAL HARDENING TYPE COMPOUND.

TEXTURED FINISH MATERIALS: LATEX-BASED COMPOUND; PLAIN.

SCREWS FOR FASTENING OF GYPSUM PANEL PRODUCTS TO COLD-FORMED STEEL STUDS LESS THAN 0.033" IN THICKNESS AND WOOD MEMBERS: ASTM C1002; SELF-PIERCING TAPPING SCREWS, CORROSION RESISTANT.

SCREWS FOR FASTENING OF GYPSUM PANEL PRODUCTS TO STEEL MEMBERS FROM 0.033" TO 0.112" THICKNESS: ASTM C954; STEEL DRILL SCREWS, CORROSION RESISTANT.

EXECUTION:

- VERIFY THAT PROJECT CONDITIONS ARE APPROPRIATE FOR WORK OF THIS SECTION TO COMMENCE.
- LEVEL CEILING SYSTEM TO A TOLERANCE OF 1/ 1200.

ACOUSTIC INSULATION AND SEALANT INSTALLATION: PLACE TIGHTLY WITHIN SPACES, AROUND CUT OPENINGS, BEHIND AND AROUND ELECTRICAL AND MECHANICAL ITEMS WITHIN PARTITIONS, AND TIGHT TO ITEMS PASSING THROUGH PARTITIONS. INSTALL ACOUSTIC SEALANT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

BOARD INSTALLATION: COMPLY WITH ASTM C840, GA-216, AND MANUFACTURER'S INSTRUCTIONS. INSTALL TO MINIMIZE BUTT END JOINTS, ESPECIALLY IN HIGHLY VISIBLE LOCATIONS.

EXTERIOR SHEATHING: COMPLY WITH ASTM C1280. INSTALL SHEATHING VERTICALLY, WITH EDGES BUTTED TIGHT AND ENDS OCCURRING OVER FIRM BEARING. SEAL JOINTS, CUT EDGES, AND HOLES WITH WATER-RESISTANT SEALANT.

CEMENTITIOUS BACKING BOARD: INSTALL OVER WOOD FRAMING MEMBERS AND PLYWOOD SUBSTRATE WHERE INDICATED, IN ACCORDANCE WITH ANSI A108.11 AND MANUFACTURER'S INSTRUCTIONS.

INSTALLATION OF TRIM AND ACCESSORIES:

- CONTROL JOINTS: PLACE CONTROL JOINTS CONSISTENT WITH LINES OF BUILDING SPACES AND AS INDICATED. NOT MORE THAN 30'-0" APART ON WALLS AND CEILINGS OVER 50'-0" LONG. AT EXTERIOR SOFFITS, NOT MORE THAN 30'-0" APART IN BOTH DIRECTIONS.
- CORNER BEADS: INSTALL AT EXTERNAL CORNERS, USING LONGEST PRACTICAL LENGTHS.
- EDGE TRIM: INSTALL AT LOCATIONS WHERE GYPSUM BOARD ABUTS DISSIMILAR MATERIALS.

PAPER FACED GYPSUM BOARD JOINT TREATMENT: USE PAPER JOINT TAPE, BEDDED WITH READY-MIXED VINYL-BASED JOINT COMPOUND AND FINISHED WITH READY-MIXED VINYL-BASED JOINT COMPOUND.

DIVISION 09 - FINISHES

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

FINISH GYPSUM BOARD IN ACCORDANCE WITH LEVELS DEFINED IN ASTM C840, AS FOLLOWS:

- LEVEL 4: WALLS AND CEILINGS TO RECEIVE PAINT FINISH OR WALL COVERINGS, UNLESS OTHERWISE INDICATED. ALL GYPSUM BOARD WALLS AND CEILINGS EXPOSED TO VIEW SHALL BE A MINIMUM LEVEL 4 FINISH.
- LEVEL 2: IN UTILITY AREAS, BEHIND CABINETS, AND ON BACKING BOARD TO RECEIVE TILE FINISH.
- LEVEL 1: WALL AREAS ABOVE FINISHED CEILINGS, WHETHER OR NOT ACCESSIBLE IN THE COMPLETED CONSTRUCTION. ALL LEVEL 1 WALLS ARE REQUIRED TO BE TAPED AND FLOATED.

TAPE, FILL, AND SAND EXPOSED JOINTS, EDGES, AND CORNERS TO PRODUCE SMOOTH SURFACE READY TO RECEIVE FINISHES. FEATHER COATS OF JOINT COMPOUND SO THAT CAMBER IS MAXIMUM 1/ 32".

FILL AND FINISH JOINTS AND CORNERS OF CEMENTITIOUS BACKING BOARD AS RECOMMENDED BY MANUFACTURER.

APPLY FINISH TEXTURE COATING BY MEANS OF SPRAYING APPARATUS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND TO MATCH APPROVED SAMPLE.

TOLERANCES: MAXIMUM VARIATION OF FINISHED GYPSUM BOARD SURFACE FROM TRUE FLATNESS: 1/ 8" IN 10'-0" IN ANY DIRECTION.



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EXISTING
 SITE PLAN

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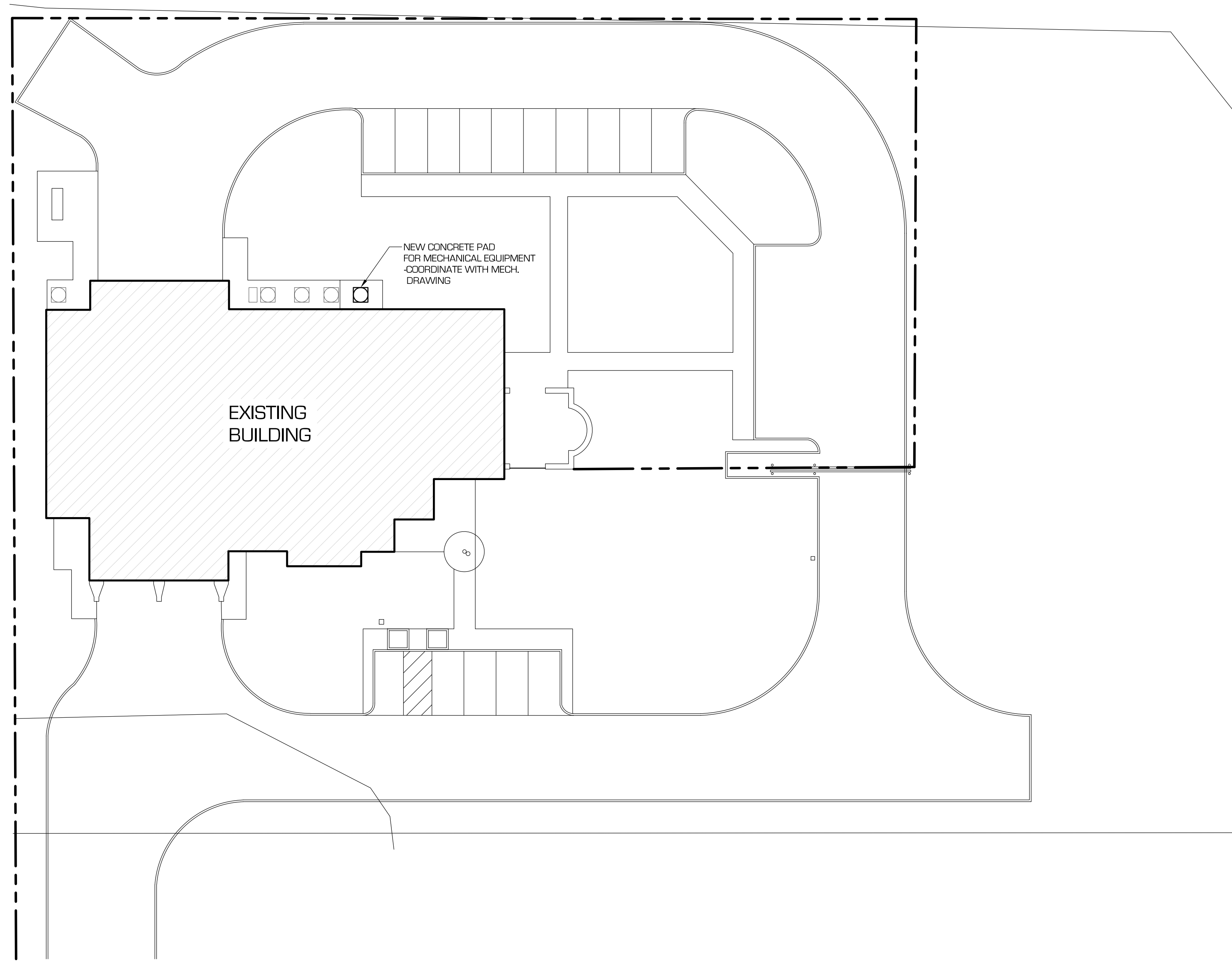
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 01
 AS-101 EXISTING SITE PLAN
 SCALE: 1"=30'-0"

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GENERAL NOTES:

1. ALL CONSTRUCTION IS EXISTING TO REMAIN. REPAIR/PATCH/REPAINT AS REQUIRED.
2. PROVIDE A COMPLETE AIR WEATHER BARRIER AT ALL EXTERIOR & INTERIOR WALLS. SEAL ALL WALLS, FLOORS AND UNDERSIDE OF STRUCTURAL DECK. CAULK TOP, BOTTOM AND ALL PENETRATIONS. CONTRACTOR SHALL SEAL ALL PENETRATIONS AT EXTERIOR TO PROVIDE A COMPLETE BUILDING ENVELOPE TO PREVENT THE INFILTRATION OF MOISTURE, AIR AND LIGHT TRANSMISSION.

KEYNOTE:

1. REPAIR EXISTING PARTITION TO RUN CONTINUOUS TO STRUCTURE ABOVE. ENSURE ALL PENETRATIONS ABOVE AND BELOW CEILING ARE PROPERLY TREATED AND THE EXISTING FIRE RATED ASSEMBLY IS MAINTAINED AROUND ALL SLEEPING UNITS, RE: SPECIFICATIONS.
2. NEW CONCRETE PAD FOR MECHANICAL EQUIPMENT TO MATCH EXISTING. COORDINATE WITH MECHANICAL DRAWINGS.



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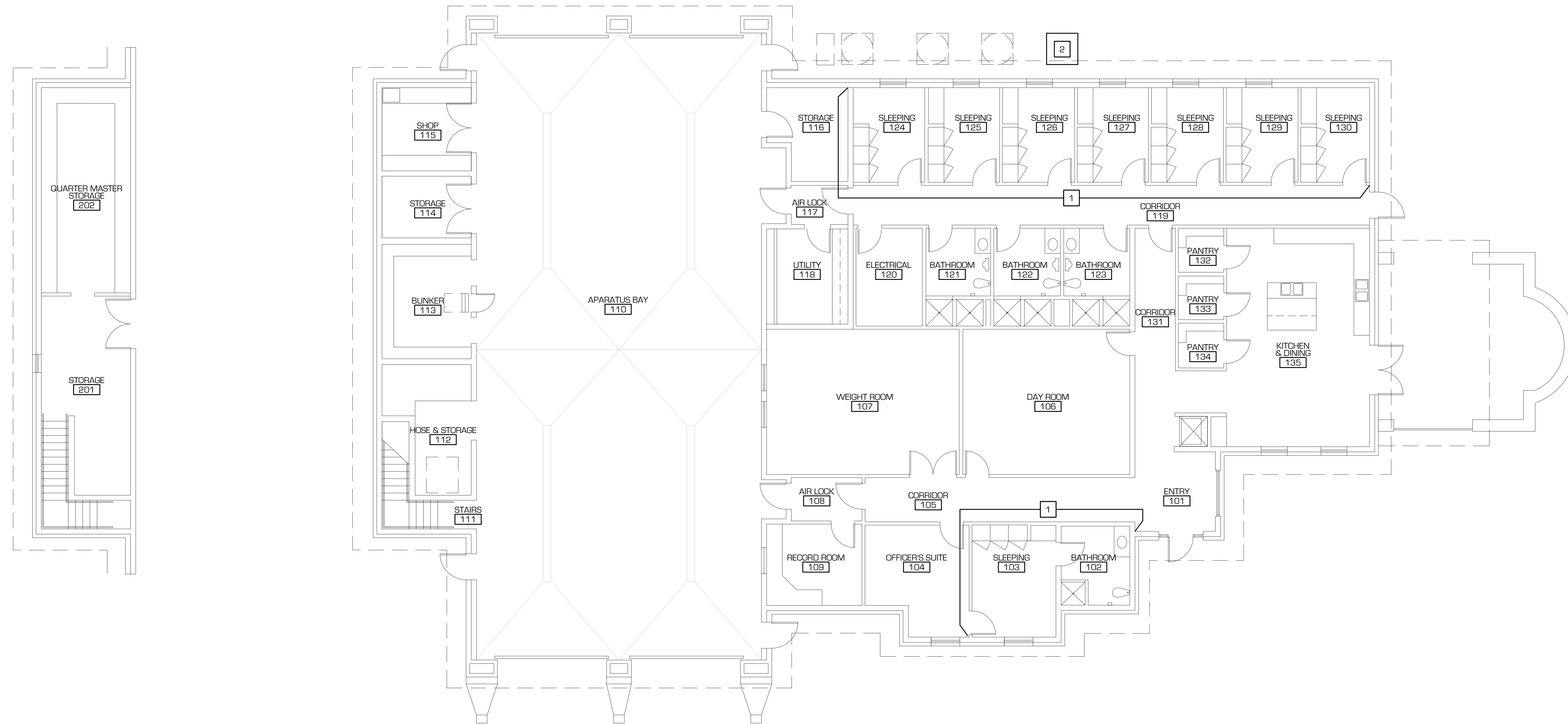
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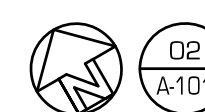
EXISTING
ARCHITECTURAL
FLOOR PLANS

Drawn By: ALD
Checked By: LDA
Project No.: 00061
Project Phase: CONTRACT DOCUMENTS
Date: APRIL 2020
Sheet No.:

A-101

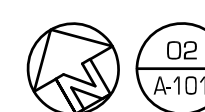


EXISTING
LEVEL TWO FLOOR PLAN



D2
A-101 SCALE: 1/8"=1'-0"

EXISTING
FIRST FLOOR PLAN



D2
A-101 SCALE: 1/8"=1'-0"

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GENERAL NOTES:

1. ALL CEILINGS AND LIGHT FIXTURES ARE EXISTING TO REMAIN.
2. REPAIR/ REPLACE ALL AREAS WITH CEILING OR MOISTURE DAMAGE.
3. REFER TO MECHANICAL DRAWINGS FOR SYSTEM MODIFICATIONS ABOVE CEILING.

KEYNOTE:

- 1 REPLACE DAMAGED CEILING TILE, NEW TO MATCH EXISTING. REPAIR GRID AS REQUIRED - TYP. ALL LOCATIONS
- 2 REPAIR AND REPAINT DAMAGED GYPSUM BOARD CEILING. REMOVE ENTIRE AREA AFFECTED BY MOISTURE, - TYP. ALL LOCATIONS
- 3 ALT: PROVIDE AND INSTALL NEW PRE-MANUFACTURED ATTIC ACCESS PULL DOWN PANEL AND STAIR AT EXISTING ATTIC ACCESS LOCATION. COORDINATE OPENING SIZE WITH ABOVE CEILING EQUIPMENT. RE: MECHANICAL
- 4 NEW ACCESS PANEL FOR EX-HAUST FAN RE: MECHANICAL
- 5 NEW EXTERIOR MAKE-UP AIR LOUVER. RE: MECHANICAL



1010 N. SAN JACINTO | SUITE 105
HOUSTON, TEXAS 77002
o 713 955 9177
www.a2studioarchitects.com

Project:

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FIRE STATION #4
HVAC RENOVATION
CONROE, TEXAS

Consultant:

Seal:



Revisions:

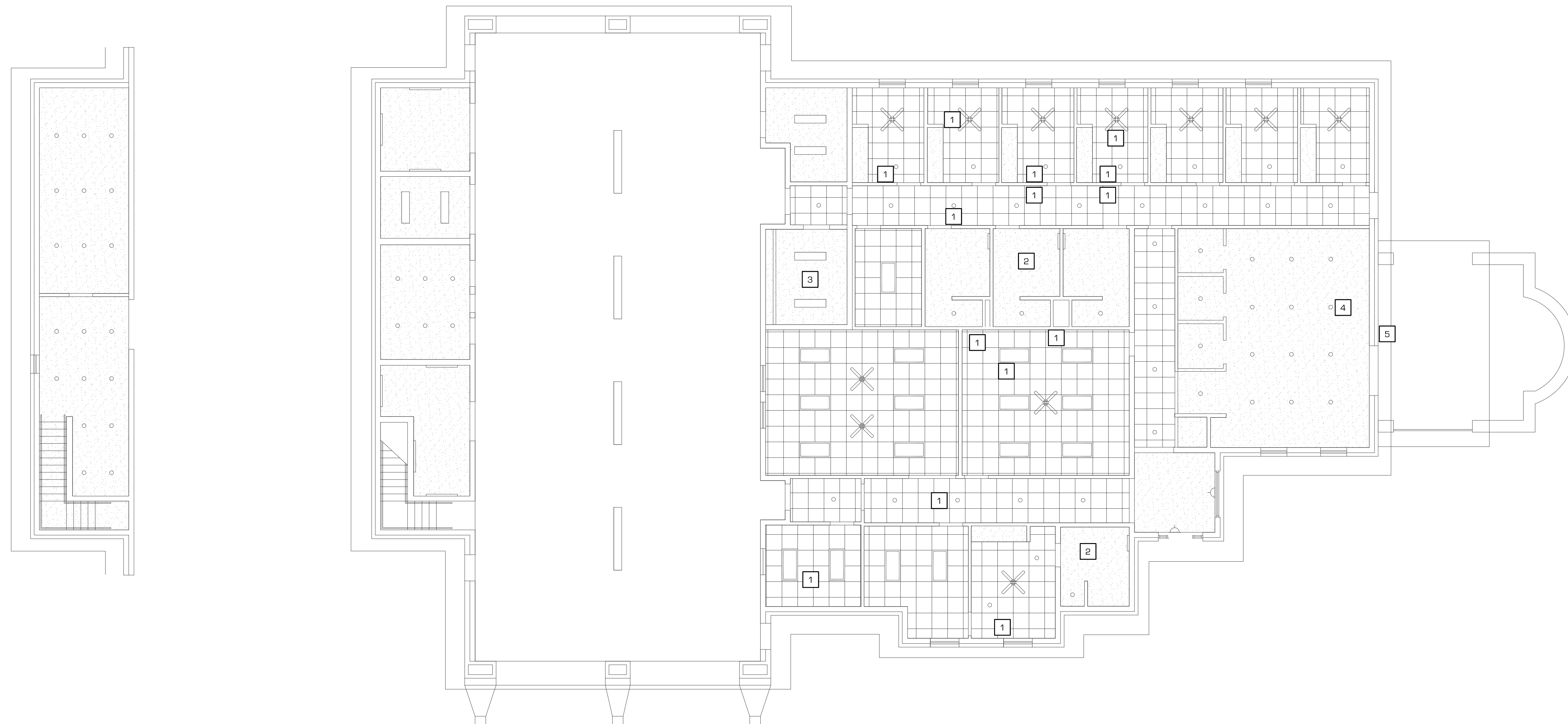
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EXISTING
REFLECTED CEILING PLAN

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EXISTING LEVEL TWO
REFLECTED CEILING PLAN



A-111
02

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

EXISTING FIRST FLOOR
REFLECTED CEILING PLAN



A-111
02

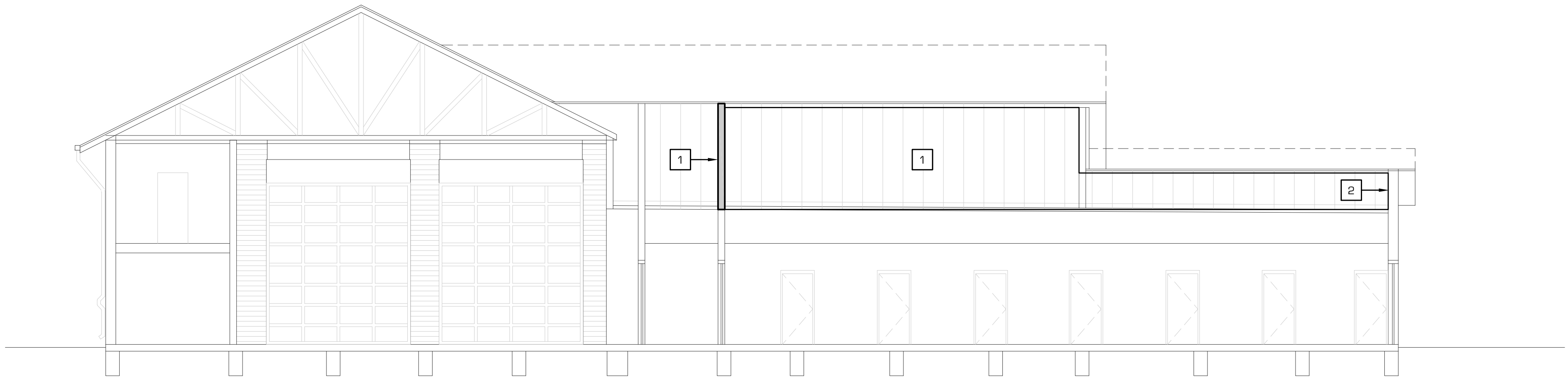
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GENERAL NOTES:	KEYNOTE:				
<ol style="list-style-type: none"> ALL CONSTRUCTION IS EXISTING TO REMAIN. ALL FIRE RATED ASSEMBLIES MUST BE MAINTAINED OR REPAIRED AS REQUIRED - RE: SPECIFICATIONS PROVIDE A COMPLETE AIR WEATHER BARRIER AT EXTERIOR WALLS INCLUDING SPACES ABOVE SUSPENDED CEILINGS AND SOFFITS. CONTRACTOR SHALL SEAL ALL PENETRATIONS AT EXTERIOR BUILDING CONSTRUCTION TO PROVIDE A COMPLETE BUILDING ENVELOPE TO PREVENT THE INFILTRATION OF MOISTURE VAPOR, AIR AND LIGHT TRANSMISSION. 	<table border="0"> <tr> <td>1</td> <td>VERIFY AND EXTEND EXISTING FIRE-RATED CORRIDOR WALL TO BOTTOM OF ROOF DECK AS REQUIRED. SEAL ALL NEW PENETRATIONS. RE: SPECIFICATIONS & MEP.</td> </tr> <tr> <td>2</td> <td>ENCLOSE ALL OPENINGS/AIR INFILTRATION IN ATTIC, VARIOUS LOCATIONS (V.I.F.)</td> </tr> </table>	1	VERIFY AND EXTEND EXISTING FIRE-RATED CORRIDOR WALL TO BOTTOM OF ROOF DECK AS REQUIRED. SEAL ALL NEW PENETRATIONS. RE: SPECIFICATIONS & MEP.	2	ENCLOSE ALL OPENINGS/AIR INFILTRATION IN ATTIC, VARIOUS LOCATIONS (V.I.F.)
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01 EXISTING BUILDING SECTION
A-301 SCALE: 1/8"=1'-0"



02 EXISTING BUILDING SECTION
A-301 SCALE: 1/8"=1'-0"

Project:

CONROE
FIRE STATION #4
HVAC RENOVATION
CONROE, TEXAS

Consultant:

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EXISTING
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GENERAL MEP NOTES

COORDINATION

EACH CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK...

- 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...
2. COORDINATE INSTALLATION OF DIFFERENT COMPONENTS WITH OTHER CONTRACTORS TO INSURE MAXIMUM PERFORMANCE AND ACCESSIBILITY FOR REQUIRED MAINTENANCE, SERVICE, AND REPAIR.
3. MAKE ADEQUATE PROVISIONS TO ACCOMMODATE ITEMS SCHEDULED FOR LATER INSTALLATION.
4. VISIT THE SITE PRIOR TO SUBMITTING A BID TO VERIFY THE EXISTING CONDITIONS AND DESIGN CONSTRAINTS...
5. SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR WORK, AND PAY ALL FEES FOR REQUIRED WORK.
6. COMPLY WITH ALL CURRENT LAWS, BUILDING CODES AND REGULATIONS FEDERAL, STATE AND LOCAL...
7. PENETRATIONS OF WALLS AND FLOORS OF FIRE-RATED ASSEMBLIES SHALL COMPLY WITH ASTM U.L. AND THE AUTHORITY HAVING JURISDICTION...
8. IF THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT THE GREATER AMOUNT OF WORK SHALL PREVAIL...
9. DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW ALL FITTINGS, COMPONENTS AND OFFSETS...
10. CONFIRM DIMENSIONS AND LOCATIONS IN THE FIELD, DRAWINGS ARE NOT TO BE SCALED AND ARE NOT INTENDED TO SHOW EXACT LOCATIONS BASED ON SCALING DIMENSIONS.
11. GUARANTEE LABOR AND MATERIALS OF ENTIRE INSTALLATION FOR ONE YEAR, WORK BELOW FLOOR OR OVER CORRIDORS SHALL BE PERFORMED AT THE OWNER'S CONVENIENCE AND MAY BE REQUIRED TO BE DONE DURING EVENINGS AND WEEKENDS...
12. ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS

ACOUSTIC TREATMENT

- IT IS THE INTENT OF THESE DRAWINGS TO SPECIFY AND FOR THE CONTRACTOR TO INSTALL SYSTEMS THAT ARE QUIET AND FREE OF VIBRATION. EQUIPMENT SHALL BE BALANCED AND VIBRATION ISOLATED TO MEET THE REQUIREMENTS SPECIFIED HEREIN FOR BOTH THE EQUIPMENT ITSELF AND CONDITIONS WITHIN OCCUPIED SPACES...
EQUIPMENT NOT MEETING THESE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR TO AN ACCEPTABLE LEVEL, BUT WITHIN THE REQUIREMENTS OF THE SPECIFICATIONS AT NO COST TO THE OWNER, ARCHITECT OR ENGINEER.
AIR DISTRIBUTION EQUIPMENT SHALL BE SOUND TESTED AT THE DESIGN OPERATING CONDITIONS AND SHALL NOTIFY THE MAXIMUM DISCHARGE NOISE RATING OF 25 OR A RADIATED NOISE RATING OF 30 AT RATED CMH.
DUE TO UNEXPECTED NOISE HEREIN OR ON THE DRAWINGS, THE NOISE LEVEL IN ALL OCCUPIED SPACES SHALL NOT EXCEED THE "LOWEST VALUE IN THE RANGE" OF THE NOISE CRITERIA CURVES PUBLISHED IN THE CURRENT FUNDAMENTALS EDITION OF THE ASHRAE GUIDE AND DATA BOOK...
SHOULD A QUESTION ARISE REGARDING THE ACCEPTABLE LEVEL OF NOISE OR VIBRATION IN A PARTICULAR SPACE OR PIECE OF EQUIPMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE SERVICES OF AN APPROVED ACOUSTICAL CONSULTANT TO DETERMINE ACTUAL NOISE/VIBRATION CONDITIONS.

SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS.
COORDINATE PREPARATION AND PROCESSING OF SUBMITTALS WITH PERFORMANCE OF CONSTRUCTION ACTIVITIES. COORDINATE EACH SUBMITTAL WITH FABRICATION, PURCHASING, TESTING, DELIVERY, OTHER SUBMITTALS, AND RELATED ACTIVITIES THAT REQUIRE SEQUENTIAL ACTIVITY. SUBMIT ALL ITEMS REQUIRED FOR EACH SPECIFICATION SECTION CONCURRENTLY.
ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING THE TIME FOR RESUBMITTALS, AS FOLLOWS: TIME FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTALS, 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 7 DAYS FOR INITIAL REVIEW OF EACH SUBMITTAL EXCLUSIVE OF TRAVEL TIME. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS REQUIRED.
2. RESUBMITTAL REVIEW: ALLOW 7 DAYS FOR REVIEW OF EACH RESUBMITTAL EXCLUSIVE OF TRAVEL TIME.
PLACE A PERMANENT LABEL OR TIE BLOCK ON EACH PAPER COPY SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON LABEL OR TIE BLOCK.

- INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN:
1. PROJECT NAME.
2. DATE.
3. NAME OF ARCHITECT.
4. NAME OF ENGINEER.
5. NAME OF CONTRACTOR.
6. NAME OF SUBCONTRACTOR.
7. NAME OF SUPPLIER.
8. NAME OF MANUFACTURER.

- CONTRACTOR'S REVIEW: REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ARCHITECT/ENGINEER.
STAMP EACH SUBMITTAL WITH A UNIFORM, APPROVAL STAMP. PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
IF THE GENERAL CONTRACTOR IS DEFERRING THE ABOVE REQUIREMENTS TO THE SUBCONTRACTOR, THEN THE SUBCONTRACTOR MUST ALSO REVIEW, STAMP AND CERTIFY THE SUBMITTAL.

- ENGINEER'S ACTION: ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND WILL RETURN THEM. ENGINEER WILL REVIEW EACH SUBMITTAL, NOTE CORRECTIONS OR MODIFICATIONS REQUIRED, AND RETURN IT. ENGINEER WILL PROVIDE SUBMITTAL WITH AN ACTION SHEET TO INDICATE ACTION.

MECHANICAL SPECIFICATIONS

REQUESTS FOR INFORMATION (RFI)

IMMEDIATELY ON DISCOVERY OF THE NEED FOR ADDITIONAL INFORMATION OR INTERPRETATION OF THE CONTRACT DOCUMENTS, CONTRACTOR SHALL PREPARE AND SUBMIT AN RFI IN THE FORM SPECIFIED.

- ENGINEER WILL RETURN RFIS SUBMITTED TO ENGINEER BY OTHER ENTITIES CONTROLLED BY CONTRACTOR WITH NO RESPONSE.
COORDINATE AND SUBMIT RFIS IN A PROMPT MANNER SO AS TO AVOID DELAYS IN CONTRACTOR'S WORK OR WORK OF SUBCONTRACTORS.
INCLUDE A PROPOSED SOLUTION AS WELL AS INCLUDE A DETAILED, LEGIBLE DESCRIPTION OF ITEM NEEDING INFORMATION OR INTERPRETATION, INCLUDING SECTIONS, DESCRIPTIONS, MEASUREMENTS, PHOTOS, PRODUCT DATA, SHOP DRAWINGS, COORDINATION DRAWINGS, AND OTHER INFORMATION NECESSARY TO FULLY DESCRIBE ITEMS NEEDING INTERPRETATION.

RECORD DRAWINGS

- WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "AS BUILT" DRAWINGS PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PAPER SETUPS AND ONE SET OF CAD FILES IN AUTOCAD 2007 FORMAT. ENGINEER AND ARCHITECT SEALS AND LOGOS SHALL BE REMOVED FROM THE DRAWINGS AND THEY SHALL BE STAMPED "AS-BUILT DRAWINGS".
WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "O&M MANUALS", EQUIPMENT DATA, HVAC AIR AND WATER BALANCING REPORT, AND LIGHTING CONTROL TESTING REPORT FOR COMPLIANCE WITH CURRENT ENERGY CODE. THE CONTRACTOR SHALL PROVIDE A WRITTEN CERTIFICATION THAT ALL NEW MATERIALS AND COMPONENTS DO NOT CONTAIN ASBESTOS OR PCBs.

REQUIRED SUBMITTALS

- PROVIDE FOUR BOUND PRODUCT DATA SUBMITTALS FOR THE NEW EQUIPMENT LISTED BELOW TO THE ARCHITECT/ENGINEER. EACH CONTRACTOR RESPONSIBLE FOR THE WORK SHALL REVIEW AND CERTIFY THE SUBMITTAL DATA TO BE IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS:
1. AIR HANDLING UNITS
2. FAN COIL UNITS
3. AIR DISTRIBUTION DEVICES
4. ELECTRICAL PANELS
5. WIRING DEVICES
6. PLUMBING FIXTURES
7. AIR AND WATER BALANCE REPORTS
8. CIRCUIT DIRECTORY CARDS

MECHANICAL AND SERVICE WATER HEATING COMMISSIONING

- ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.
SYSTEMS ADJUSTING AND BALANCING: HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. AIR AND WATER FLOW RATES SHALL BE MEASURED AND ADJUSTED TO DELIVER THE FLOW RATES WITHIN TOLERANCES PROVIDED IN THE PRODUCT SPECIFICATIONS. TEST AND BALANCE ACTIVITIES SHALL INCLUDE AIR SYSTEM AND HYDRONIC SYSTEM BALANCING. THE FOLLOWING SYSTEMS ARE EXEMPT:
1. MECHANICAL SYSTEMS AND SERVICE WATER HEATER SYSTEMS IN BUILDINGS WHERE THE TOTAL MECHANICAL EQUIPMENT CAPACITY IS LESS THAN 450,000 Btu/h COOLING CAPACITY AND 600,000 Btu/h COMBINED SERVICE WATER HEATING AND SPACE HEATING CAPACITY.
2. SYSTEMS THAT SERVE INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS.
AIR SYSTEMS BALANCING: EACH SUPPLY AIR OUTLET AND ZONE TERMINAL DEVICE SHALL BE EQUIPPED WITH MEANS FOR AIR BALANCING. DISCHARGE DAMPERS USED FOR AIR SYSTEM BALANCING ARE PROHIBITED ON CONSTANT VOLUME FANS AND VARIABLE VOLUME FANS WITH MOTORS 1/2 HP AND LARGER. AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN FOR FANS WITH SYSTEM POWER OF GREATER THAN 1 HP, FAN SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EXCEPTIONS: FANS WITH MOTORS OF 1 HP OR LESS ARE NOT REQUIRED TO BE PROVIDED WITH A MEANS FOR AIR BALANCING.
HYDRONIC SYSTEM BALANCING: INDIVIDUAL HYDRONIC HEATING AND COOLING COILS SHALL BE EQUIPPED WITH A MEANS FOR BALANCING AND CONTROLLING FLOW. HYDRONIC SYSTEMS SHALL BE PROPORTIONATELY BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN THE PUMP IMPELLER SHALL BE ADJUSTED TO DELIVER THE FLOW RATES WITHIN TOLERANCES PROVIDED IN THE PRODUCT SPECIFICATIONS. EACH HYDRONIC SYSTEM SHALL HAVE EITHER THE CAPABILITY TO MEASURE PRESSURE ACROSS THE PUMP, OR TEST PORTS AT EACH SIDE OF EACH PUMP. THE EQUIPMENT IS NOT REQUIRED TO BE EQUIPPED WITH A MEANS FOR BALANCING OR MEASURING FLOW.
1. PUMPS WITH PUMP MOTORS OF 5 HP (3.7 KW) OR LESS.
2. WHERE THROTTLING LOSSES ARE GREATER THAN 5 PERCENT OF THE NAMEPLATE HORSEPOWER DRAW ABOVE THAT REQUIRED IF THE IMPELLER WERE TRIMMED.
FUNCTIONAL PERFORMANCE TESTING: FUNCTIONAL PERFORMANCE TESTING SHALL BE CONDUCTED.
1. EQUIPMENT, EQUIPMENT PERFORMANCE, PERFORMANCE TESTING SHALL DEMONSTRATE THE INSTALLATION AND OPERATION OF COMPONENTS, SYSTEMS, AND SYSTEM-TO-SYSTEM INTERFACING RELATIONSHIPS IN ACCORDANCE WITH APPROVED PLANS AND OPERATIONS SUCH THAT OPERATION, FUNCTION, AND MAINTENANCE SERVICEABILITY FOR EACH OF THE COMMISSIONED SYSTEMS IS CONFIRMED. TESTING SHALL INCLUDE ALL MODES AND SEQUENCE OF OPERATION, INCLUDING LOAD AND UNLOAD, PART-LOAD AND THE FOLLOWING EMERGENCY CONDITIONS:
1.1. ALL MODES AS DESCRIBED IN THE SEQUENCE OF OPERATION.
1.2. REDUNDANT OR AUTOMATIC BACK-UP MODE.
1.3. PERFORMANCE OF ALARMS.
1.4. MODE OF OPERATION UPON A LOSS OF POWER AND RESTORATION OF POWER.
EXCEPTION: UNITARY OR PACKAGED HVAC EQUIPMENT THAT DO NOT REQUIRE SUPPLY AIR ECONOMIZERS.
CONTROLS, HVAC AND SERVICE WATER-HEATING CONTROL SYSTEMS SHALL BE TESTED TO DOCUMENT THAT CONTROL SEVERITY AND OPERATIONS SUCH THAT SYSTEMS ARE CALIBRATED AND ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. SEQUENCES OF OPERATION SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THEY OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
ECONOMIZERS, AIR ECONOMIZERS SHALL UNDERGO A FUNCTIONAL TEST TO DETERMINE THAT THEY OPERATE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

LIGHTING SYSTEM FUNCTIONAL TESTING

- ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.
OCCUPANT SENSOR CONTROLS, WHERE OCCUPANT SENSOR CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:
1. CERTIFY THAT THE OCCUPANT SENSOR HAS BEEN LOCATED AND AIMED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. FOR PROJECTS WITH SEVEN OR FEWER OCCUPANT SENSORS, EACH SENSOR SHALL BE TESTED.
3. FOR PROJECTS WITH MORE THAN SEVEN OCCUPANT SENSORS, TESTING SHALL BE DONE FOR EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY, WHERE MULTIPLES OF EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY ARE PROVIDED, NOT LESS THAN 10 PERCENT, BUT IN NO CASE LESS THAN ONE, OF EACH COMBINATION SHALL BE TESTED UNLESS THE CODE OFFICIAL OR DESIGN PROFESSIONAL REQUIRES A HIGHER PERCENTAGE TO BE TESTED.
4. VERIFY THAT ANY BATTERY BACKUP IS ENERGIZED.
5. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.
6. SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA CONTROL SWITCH.
6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.
7. SIMULATE UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
7.1. NONEXEMPT LIGHTING TURNS OFF.
7.2. MANUAL OVERRIDE SWITCH REVERTS ONLY THE LIGHTS IN THE ENCLOSED SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.
8. ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL.
TIME-SWITCH CONTROLS, WHERE TIME-SWITCH CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:
1. CONFIRM THAT THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES.
2. PROVIDE DOCUMENTATION TO THE OWNER OF TIMESWITCH CONTROLS PROGRAMMING INCLUDING WEEKDAY, WEEKEND, HOLIDAY SCHEDULES, AND SET-UP AND PREFERENCE SETTINGS.
3. VERIFY THE CORRECT TIME AND DATE IN THE TIME SWITCH.
4. VERIFY THAT ANY BATTERY BACKUP IS ENERGIZED.
5. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.
6. SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA CONTROL SWITCH.
6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.
7. SIMULATE UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
7.1. NONEXEMPT LIGHTING TURNS OFF.
7.2. MANUAL OVERRIDE SWITCH REVERTS ONLY THE LIGHTS IN THE ENCLOSED SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.
8. ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL.
DAYLIGHT RESPONSIVE CONTROLS, WHERE DAYLIGHT RESPONSIVE CONTROLS ARE PROVIDED, THE FOLLOWING SHALL BE VERIFIED:
1. CONTROL DEVICES HAVE BEEN PROPERLY LOCATED, FIELD CALIBRATED AND SET FOR APPROPRIATE SETPOINTS.
2. DAYLIGHT CONTROLLED LIGHTING LOADS ADJUST TO LIGHT LEVEL SET POINT IN RESPONSE TO AVAILABLE DAYLIGHT.
3. THE LOCATIONS OF CALIBRATION ADJUSTMENT EQUIPMENT ARE READILY ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL.

SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON REQUIRED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS

- GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT," BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
FLAT-OVAL DUCTS: INDICATED DIMENSIONS ARE THE DUCT WIDTH (MAJOR DIMENSION) AND DIAMETER OF THE ROUND SIDES CONNECTING THE FLAT PORTIONS OF THE DUCT (MINOR DIMENSION).
TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

SHEET METAL DUCTWORK

- GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF FITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER DEFECTS.
GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED WITH EXTERNAL BLANKET INSULATION. DUCTWORK SHALL BE INTERNALLY LINED ONLY WHERE SPECIFICALLY INDICATED.
DUCTWORK SHALL BE SEALED AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND AS REQUIRED TO LIMIT LEAKAGE, LEAKAGE IN EXCESS OF 5% SHALL NOT BE ACCEPTABLE.
DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.
THE INTERIOR SURFACE OF ALL DUCTWORK SHALL BE SMOOTH WITH NO SHEETMETAL OR OTHER PARTS PROJECTING INTO THE AIR STREAM. ALL SEAMS AND JOINTS SHALL BE EXTERNAL. THE INSIDE OF ALL DUCTWORK SHALL BE THOROUGHLY CLEANED AND ALL FANS OPERATED TO REMOVE ANY DEBRIS PRIOR TO CONNECTION OF AIR DISTRIBUTION DEVICES.
ALL DUCTWORK DIMENSIONS ON THE DRAWINGS ARE CLEAR INSIDE.
INSTALL ALL DUCTWORK TIGHT TO STRUCTURE UNLESS OTHERWISE NOTED. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO THE CONSTRUCTION OR INSTALLATION OF DUCTWORK.
ALL TRANSVERSE JOINTS SHALL BE SEALED WITH A WATER BASE ADHESIVE SEALER DESIGNED FOR USE IN MEDIUM VELOCITY DUCT SYSTEMS. SEALER SHALL BE EFFECTIVE AGAINST BOTH NEGATIVE AND POSITIVE PRESSURE LOSSES. SEALER SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. APPLY UN-THINNED WITH BRUSH, TROWEL, OR CAULKING GUN AS PER THE MANUFACTURER'S RECOMMENDATIONS AND ALLOW TO DRY FOR A MINIMUM OF 48 HOURS BEFORE AIR IS APPLIED TO THE SYSTEM. SEALER SHALL BE "IRON GRIP WATER BASE DUCT SEALANT #601" AS MANUFACTURED BY HARDCAST, INC., UNI-GRIP AS MANUFACTURED BY UNITED MCGILL, OR AN APPROVED EQUAL.
ALL ROUND TAKE-OFFS SHALL BE MADE WITH A DAMPER EXTRACTOR SPIN-IN COLLAR. SPIN-INS SHALL BE INSTALLED WITH THEIR DAMPER AXIS PARALLEL TO AIR FLOW.
ALL DUCTWORK SUPPORTS SHALL BE PER TABLE 5-1 OF THE SMOAONA MANUAL WITH ALL SUPPORTS DIRECTLY ANCHORED TO THE BUILDING STRUCTURE. SUPPORTS SHALL BE ON MAXIMUM 4'-0" CENTERS WITH ADDITIONAL SUPPORTS AS REQUIRED TO PREVENT SAGGING.
FLEXIBLE DUCT FABRIC CONNECTIONS SHALL BE INSTALLED ON THE INLET AND OUTLET CONNECTIONS TO ALL POWERED AIR MOVING EQUIPMENT WHICH IS NOT CONNECTED WITH FLEXIBLE DUCT. A MINIMUM OF 1" OF SLACK SHALL BE ALLOWED IN ALL FLEXIBLE CONNECTIONS TO INSURE VIBRATION ISOLATION. FLEXIBLE FABRIC SHALL BE A MINIMUM OF 3 INCHES WIDE WITH "GRIP-LOC" SEAM TO 24 GAUGE GALVANIZED METAL SIDE CONNECTORS A MINIMUM OF 3 INCHES WIDE EACH. FLEXIBLE CONNECTION ARE TO FABRICATED WITH ELGEN "ZIPPERLOCK" #2LN-4 NEPRENE COATED 30 OZ. FIBERGLASS WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS, OR DURO DINE EXCELON "METAL-FAB" VINYL COATED 22 OZ. NYLON WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS OR "APPROVED EQUAL".
INSTALL MANUAL SPALTER DAMPERS IN BRANCH TAKE-OFFS WHERE SHOWN. SPALTER DAMPERS SHALL BE MINIMUM 16 GAUGE GALVANIZED SHEET METAL AND SHALL BE 3/4 OF THE WIDTH OF THE SMALLEST TAKE-OFF BUT NO LESS THAN 4" LONG. DAMPERS SHALL HAVE 1/8" OF CLEARANCE TO THE DUCT IN WHICH THEY ARE INSTALLED. SPALTER DAMPERS SHALL BE CONTROLLED BY ONE OR MORE CONTROL ROLES IN ACCORDANCE WITH FIG. 2-5 OF THE SMOAONA MANUAL. WHERE SPALTERS ARE IN CONCEALED INACCESSIBLE LOCATIONS, SUBMIT PROPOSED CONTROL ROLE DETAILS FOR APPROVAL.
DUCTWORK WHICH IS EXPOSED TO WEATHER SHALL HAVE SOLDERED JOINTS AND SEAMS AND SHALL BE PAINTED WITH A SUITABLE EPoxy COATING.

FLEXIBLE DUCTWORK

- FLEXIBLE DUCT SHALL BE USED FOR CONNECTIONS TO AIR DISTRIBUTION DEVICES WHERE SHOWN ON THE DRAWINGS OR SPECIFIED. MAXIMUM LENGTH SHALL BE 8'-0" FOR AIR DISTRIBUTION DEVICE CONNECTIONS, WHERE LONGER RUNS ARE REQUIRED, PROVIDE RIGID DUCTWORK.
INSULATED FLEXIBLE DUCT SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF A GALVANIZED STEEL OR SPIRAL ALUMINUM HEEL. STAINLESS INSET LINER SHALL BE COMPOSED OF 3-PLY ALUMINUM FOIL OR HEAVILY COATED FIBERGLASS WITH A MAXIMUM THERMAL CONDUCTANCE OF .23 BTU/IN/H/FT/7. THE ASSEMBLY SHALL BE SHEATHED IN A REINFORCED METALIZED VAPOR BARRIER OUTER JACKET.
THE FLEXIBLE DUCT ASSEMBLY SHALL BE SUITABLE FOR A MINIMUM OF 6" W.C. WORKING PRESSURE AND SHALL BE LISTED CLASS I BY THE UNDERWRITERS LABORATORY AT A FLAME SPREAD OF NOT OVER 25 AND A SMOKE DEVELOPED RATE OF NOT OVER 50. DUCTS SHALL ALSO COMPLY WITH NFPA STANDARD 91A.
FLEXIBLE DUCTS SHALL BE SUPPORTED IN SUCH A MANNER TO PREVENT SAGS AND KINKS. BENDS IN ANY LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 90° FOR AIR DISTRIBUTION DEVICE CONNECTIONS.
ALL JOINTS AND CONNECTIONS SHALL BE MADE WITH 1/2" WIDE STAINLESS STEEL DUCT CLAMPS OR 100% NYLON SELF-LOCKING CLAMPS MANUFACTURED BY PANDUIT CORPORATION OR AN APPROVED EQUAL.
IF IT COMPLIES WITH THESE SPECIFICATIONS, FLEXIBLE DUCTWORK OF THE FOLLOWING TYPES WILL BE ACCEPTABLE:
1. END CONNECTIONS: BUTT WELDING.
2. TRANSVERSE JOINTS: BUTT WELDING.
3. FANGES: RASSED FACE.
GROOVED MECHANICAL-JOINT FITTINGS AND COUPLINGS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. ANVI, INTERNATIONAL, INC.
2. CENTRAL SPRINKLER COMPANY; A DIVISION OF TYCO FIRE & BUILDING PRODUCTS.
3. NATIONAL FITTINGS, INC.
4. S.P. FITTINGS; A DIVISION OF STAR PIPE PRODUCTS.
5. VTC/ALCO COMPANY.

CONTROLS

PROVIDE ALL TEMPERATURE CONTROLS MODIFICATIONS REQUIRED FOR A COMPLETE AND FUNCTIONING CONTROL SYSTEM. ALL CONTROLS SHALL MATCH BUILDING STANDARD.

CHILLED WATER / CONDENSATE PIPING

- STEEL PIPE: ASTM A 53/A 53M, BLACK STEEL WITH FLAM EINDS.
CAST-IRON THREADED FITTINGS: ASME B16.4, CLASSES 125 AND 250.
MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASSES 150 AND 300.
MALLEABLE-IRON UNIONS: ASME B16.39; CLASSES 150, 250, AND 300.
CAST-IRON PIPE FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASSES 25, 125, AND 250; RAISED GROUND FACE, AND BOLT HOLES SPOT FACED.
WROUGHT-STEEL FITTINGS: ASTM A 234/A 234M, WALL THICKNESS TO MATCH ADJOINING PIPE.
WROUGHT CAST- AND FORGED-STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5, INCLUDING BOLTS, NUTS, AND GASKETS OF THE FOLLOWING MATERIAL GROUP, END CONNECTIONS, AND FANGES:
1. MATERIAL GROUP: 1.1.
2. END CONNECTIONS: BUTT WELDING.
3. FANGES: RASSED FACE.
GROOVED MECHANICAL-JOINT FITTINGS AND COUPLINGS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. ANVI, INTERNATIONAL, INC.
2. CENTRAL SPRINKLER COMPANY; A DIVISION OF TYCO FIRE & BUILDING PRODUCTS.
3. NATIONAL FITTINGS, INC.
4. S.P. FITTINGS; A DIVISION OF STAR PIPE PRODUCTS.
5. VTC/ALCO COMPANY.
JOINT FITTINGS: ASTM A 536, GRADE 65-45-12 DUCTILE IRON; ASTM A 47/A 47M, GRADE 32510 MALLEABLE IRON; ASTM A 53/A 53M, TYPE F, E, OR S, GRADE B FABRICATED STEEL; OR ASTM A 106, GRADE B STEEL FITTINGS WITH GROOVES OR SHOULDERS CONSTRUCTED TO ACCEPT GROOVED-END COUPLERS, WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.
COUPLINGS: "DIFLOR"-OR MALLEABLE-IRON HOUSING AND SYNTHETIC RUBBER GASKET OF CENTRAL CAVITY PRESSURE-RESPONSIVE DESIGN; WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.
CHILLED-WATER PIPING, ABOVEGROUND, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
1. SCHEDULE 40 STEEL PIPE: CLASS 150, MALLEABLE-IRON, 250, CAST-IRON AND 300, MALLEABLE-IRON FITTINGS; CAST-IRON FLANGES AND FLANGE FITTINGS; AND THREADED JOINTS.
CHILLED-WATER PIPING, ABOVEGROUND, NPS 2-1/2 (DN 65) AND LARGER, SHALL BE ANY OF THE FOLLOWING:
1. SCHEDULE 40 STEEL PIPE, WROUGHT-STEEL FITTINGS AND WROUGHT-CAST OR FORGED-STEEL FLANGES AND FLANGE FITTINGS, AND WELDED AND FLANGED JOINTS.
2. SCHEDULE 40 PIPE; GROOVED, MECHANICAL JOINT COUPLING AND FITTINGS; AND GROOVED, MECHANICAL JOINTS.
CONDENSATE-DRAIN PIPING: TYPE M (C) DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND SOLDERED JOINTS.
HANGERS AND SUPPORTS: INSTALL THE FOLLOWING PIPE ATTACHMENTS:
1. ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 20 FEET (6 M) LONG.
2. ADJUSTABLE ROLLER HANGERS AND SPRING HANGERS FOR INDIVIDUAL HORIZONTAL PIPING 20 FEET (6 M) OR LONGER.
3. PIPE ROLLER: MISS SP-58, TYPE 44 FOR MULTIPLE HORIZONTAL PIPING 20 FEET (6 M) OR LONGER, SUPPORTED ON A TRAPEZOID.
4. SPRING HANGERS TO SUPPORT VERTICAL RUNS.
5. PROVIDE COPPER-CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN DIRECT CONTACT WITH COPPER PIPE.
INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:
1. NPS 3/4 (DN 20): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
2. NPS 1 (DN 25): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
3. NPS 1-1/2 (DN 40): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
4. NPS 2 (DN 50): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
5. NPS 2-1/2 (DN 65): MAXIMUM SPAN, 11 FEET (3.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
6. NPS 3 (DN 75): MAXIMUM SPAN, 12 FEET (3.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
7. NPS 4 (DN 100): MAXIMUM SPAN, 14 FEET (4.3 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM).
8. NPS 6 (DN 150): MAXIMUM SPAN, 17 FEET (5.2 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM).
9. NPS 8 (DN 200): MAXIMUM SPAN, 19 FEET (5.8 M); MINIMUM ROD SIZE, 5/8 INCH (16 MM).
10. NPS 10 (DN 250): MAXIMUM SPAN, 20 FEET (6.1 M); MINIMUM ROD SIZE, 5/8 INCH (16 MM).
11. NPS 12 (DN 300): MAXIMUM SPAN, 23 FEET (7 M); MINIMUM ROD SIZE, 7/8 INCH (22 MM).
12. NPS 14 (DN 350): MAXIMUM SPAN, 25 FEET (7.6 M); MINIMUM ROD SIZE, 1 INCH (25 MM).
INSTALL HANGERS FOR DRAWN-TEMPER COPPER PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:
1. NPS 3/4 (DN 20): MAXIMUM SPAN, 6 FEET (1.8 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
2. NPS 1 (DN 25): MAXIMUM SPAN, 8 FEET (2.4 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
3. NPS 1-1/2 (DN 40): MAXIMUM SPAN, 8 FEET (2.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
4. NPS 2 (DN 50): MAXIMUM SPAN, 8 FEET (2.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
5. NPS 2-1/2 (DN 65): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
6. NPS 3 (DN 80): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).

DUCT INSULATION

- MINERAL-FIBER BLANKET INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE I AND ASTM C 1290, TYPE III WITH FACTORY APPLIED FIBERGLASS OR POLYESTER FIBER REINFORCED PRODUCTS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. CERTAINTED CORP.; SOFTOUCH DUCT WRAP.
2. JOWNS MANVILLE; MEGROUTE.
3. KNAUF INSULATION; FRIENDLY FEEL DUCT WRAP.
4. MANSON INSULATION INC.; ALLEY WRAP.
5. MENCS CORP.; ALL-SEALER DUCT WRAP.
MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A, PRODUCTS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 35-01/35-02.
2. FULLER COMPANYS; MARATHON INDUSTRIES; 225.
3. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 25-40/25-70.
4. MON-ECO INDUSTRIES, INC.; 22-25.
FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
ASJ ADHESIVE, AND FSK JACKET ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A FOR BONDING INSULATION JACKET LAP SEAMS AND JOINTS.
FILLER PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 35-01/35-02.
2. EAGLE BRIDGES - MARATHON INDUSTRIES; 225.
3. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 25-40/25-70.
4. MON-ECO INDUSTRIES, INC.; 22-25.
FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
MASTICS: MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES; COMPLY WITH MIL-PRF-19565C, TYPE II.
1. FOR INDOOR APPLICATIONS, USE MASTICS THAT HAVE A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR USE ON BELOW AMBIENT SERVICES. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 35-01/35-02.
2. WMSGO CORPORATION; 749.
WATER-VAPOR PERMEANCE: ASTM E 96/E 96M, PROCEDURE B, 0.013 PERM (0.009 PERMEANCE PERM) AT 43-48L (1.09-m) DRY FILM THICKNESS.
SERVICE TEMPERATURE RANGE: MINUS 20 TO PLUS 180 DEG F (MINUS 20 TO PLUS 82 DEG C).
SOLIDS CONTENT: ASTM D 1644, 58 PERCENT BY VOLUME AND 70 PERCENT BY WEIGHT.
COLOR: WHITE.
SEALANTS AND METAL JACKET FLASHING SEALANTS: PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; CF-70.
2. EAGLE BRIDGES - MARATHON INDUSTRIES; 405.
3. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY; 95-44.
4. MON-ECO INDUSTRIES, INC.; 44-05.
MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES. FIRE- AND WATER-RESISTANT, FLEXIBLE, ELASTOMERIC SEALANT. SERVICE TEMPERATURE RANGE: MINUS 40 TO PLUS 250 DEG F (MINUS 40 TO PLUS 121 DEG C).
COLOR: ALUMINUM.
FOR INDOOR APPLICATIONS, USE SEALANTS THAT HAVE A VOC CONTENT OF 420 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
FSK TAPE: FOLL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH CORRY-ADHESIVE. PROVIDE ONE OF THE FOLLOWING:
1. AR, IDEAL TAPE DIVISION; 491 ANF FSK.
2. ADERT DILATION; ADVERTON, SPECIALTY TAPES DIVISION; FASSON 0827.
3. COMPAQ CORPORATION; 110 AND 111.
4. VENTURE TAPE; 1525 CW NT, 1528 CW, AND 1528 CW/50.
NOTE: 3 INCHES (76.2 MM) MINIMUM.
THICKNESS: 6.5 MILS (0.16 MM).
ADHESION: 90 POUNDS FORCE/INCH (1.0 N/MM) IN WIDTH.
ELONGATION: 2 PERCENT.
TENSILE STRENGTH: 40 LBS/INCH (7.2 N/MM) IN WIDTH.
FSK TAPE DIMS AND SQUARES: PRECUT DIMS OR SQUARES OF FSK TAPE.
SECUREMENTS BANDS: PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. ITIV INSULATION SYSTEMS; GERRARD STRAPPING AND SEALS.
2. RPR PRODUCTS, INC.; INSUL-MATE STRAPPING, SEALS, AND SPRINGS.
ALUMINUM (ASTM B 208 (ASTM B 209M)), 3003, 3005, 3105, OR 5005; TEMPER H-14, 0.020 INCH (0.51 MM) THICK; 1/2 INCH (13 MM) WIDE WITH WING SEAL OR CLOSED SEAL.
INSULATION PINS AND HANGERS: CAPACITOR-DISCHARGE-WELD PINS: COPPER- OR ZINC-COATED STEEL PIN, FULLY ANNEALED FOR CAPACITOR-DISCHARGE WELDING, 0.106-INCH- (2.68-MM-) DIAMETER SHAFT, LENGTH TO SUIT DEPTH OF INSULATION INDICATED. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
1. AGM INDUSTRIES, INC.; CWP-1.
2. MONEST FASTENERS, INC.; CO.
3. NELSON STUO WELDING; TPA, TPC, AND TPS.
INSTALLATION OF MINERAL-FIBER INSULATION: BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS APPLYING ADHESIVE TO MANUFACTURER'S RECOMMENDED COVERAGE RATES PER UNIT AREA, FOR 100 PERCENT COVERAGE OF DUCT AND PLENUM SURFACES. APPLY ADHESIVE TO ENTIRE CIRCUMFERENCE OF DUCTS AND TO ALL SURFACES OF FITTINGS AND TRANSITIONS INCLUDING CAPACITOR-DISCHARGE WELD PINS AND SPEED WASHERS OR CLIPPED-HEAD, CAPACITOR-DISCHARGE-WELD PINS ON SIDES AND BOTTOM OF HORIZONTAL DUCTS AND SIDES OF VERTICAL DUCTS AS FOLLOWS:
1. ON DUCT WITH WIDENING: INSULATE 450 MM (18 IN) AND SMALLER, PLACE PINS INSULATION END JOINTS, AND 16 INCHES (400 MM) ON DUCT.
2. ON DUCT SIDES WITH DIMENSIONS LARGER THAN 16 INCHES (400 MM), PLACE PINS 16 INCHES (400 MM) ON EACH WIDE AND 3 INCHES (76.2 MM) MAXIMUM FROM INSULATION JOINTS. INSTALL ADDITIONAL PINS TO HOLD INSULATION TIGHTLY AGAINST SURFACE AT CROSS BRACINGS.
3. PINS MAY BE OMITTED FROM TOP SURFACE OF HORIZONTAL, RECTANGULAR DUCTS AND PLENUMS.
4. DO NOT OVERCOMPRESS INSULATION DURING INSTALLATION.
5. IMPALE INSULATION OVER PINS AND ATTACH SPEED WASHERS.
6. CUT EXCESS PORTION OF PINS EXTENDING BEYOND SPEED WASHERS OR BEND PARALLEL WITH INSULATION SURFACE. COVER EXPOSED PINS AND WASHERS WITH TAPE MATCHING INSULATION FINISH.
FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS UNBROKEN VAPOR BARRIER GREAT ENOUGH LAP FOR LONGITUDINAL SEAMS AND END JOINTS WITH INSULATION BY REMOVING 2 INCHES (50 MM) FROM ONE EDGE AND ONE END OF INSULATION SECTION. SECURE LAPS TO ADJACENT INSULATION SECTION WITH 1/2-INCH (13-MM) OUTWARD-CLIPPING STAPLES, 1 INCH (25 MM) O.C. INSTALL VAPOR BARRIER CONSISTING OF FACTORY- OR FIELD-APPLIED JACKET, ADHESIVE, VAPOR-BARRIER MASTIC, AND SEALANT AT JOINTS, SEAMS, AND PROTRUSIONS.
1. REPAIR PUNCTURES, TEARS, AND PENETRATIONS WITH TAPE OR MASTIC TO MAINTAIN VAPOR-BARRIER SEAL.
2. INSTALL VAPOR STOPS FOR DUCTWORK AND PLENUMS OPERATING BELOW 50 DEG F (10 DEG C) AT IN-FLIGHT INTERIOR

ELECTRICAL SPECIFICATIONS

ELECTRICAL CONDUCTORS

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - ALCAN PRODUCTS CORPORATION; ALCAN CABLE DIVISION.
 - AMERICAN INSULATED WIRE CORP.; A LEVITON COMPANY.
 - GENERAL CABLE CORPORATION.
 - SENIOR WIRE & CABLE COMPANY.
 - SOUTHWIRE COMPANY.
- B. COPPER CONDUCTORS: COMPLY WITH NEMA WC 70. CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70 FOR TYPES THW, THHN-THHN, XHHW, UF, USE, AND SE. MULTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70 FOR ARMORED CABLE, TYPE AC, METAL-CLAD CABLE, TYPE MC, TYPE SO, AND TYPE USE WITH GROUND WIRE.
- C. CONDUCTOR MATERIAL APPLICATIONS:
 - COPPER: SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.
 - CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS:
 - 1. SERVICE ENTRANCE: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY, TYPE SE OR USE MULTICONDUCTOR CABLE.
 - 2. EXPOSED FEEDERS: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY.
 - 3. FEEDERS CONCEALED IN CONCRETE, BELOW SLABS-ON-BRACE, AND UNDERGROUND: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY.
 - 4. FEEDERS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY.
 - 5. FEEDERS INSTALLED BELOW RAISED FLOORING: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY.
 - 6. EXPOSED BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY, METAL-CLAD CABLE, TYPE MC.
 - 7. BRANCH CIRCUITS CONCEALED IN CEILING, WALLS, AND PARTITIONS: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY, ARMORED CABLE, TYPE AC, METAL-CLAD CABLE, TYPE MC.
 - 8. BRANCH CIRCUITS INSTALLED IN CONCRETE, BELOW SLABS-ON-BRACE, AND UNDERGROUND: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY.
 - 9. BRANCH CIRCUITS INSTALLED IN CONCRETE, BELOW RAISED FLOORING: TYPE THHN-THHN, SINGLE CONDUCTORS IN RACEWAY OR ARMORED CABLE, TYPE AC, METAL-CLAD CABLE, TYPE MC.
 - 10. BRANCH CIRCUITS INSTALLED IN PATIENT CARE AREAS: TYPE H07-NA-CAP OR AC-H07 WITH ASSEMBLY LISTED AS AN EQUIPMENT GROUNDING CONDUCTOR AND A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO ALL RECEPTABLES, METALLIC BOXES CONTAINING RECEPTABLES, AND ALL METALLIC EQUIPMENT CASINGS.

GROUNDING

- A. INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.
- B. BARE COPPER CONDUCTORS:
 - 1. SOLID CONDUCTORS: ASTM B 3.
 - 2. STRANDED CONDUCTORS: ASTM B 8.
 - 3. BONDING CABLE: 28 KCMIL, 14 STRANDS OF NO. 17 AWG CONDUCTOR, 1/4 INCH (6 MM) IN DIAMETER.
 - 4. BONDING CONDUCTOR: NO. 4 OR NO. 6 AWG, STRANDED CONDUCTOR.
 - 5. BONDING JUMPER: COPPER TAPE, BRAIDED CONDUCTORS TERMINATED WITH COPPER TERMOLEDS, 1-1/2 INCHES (41 MM) WIDE AND 1/16 INCH (1.6 MM) THICK.
- C. GROUNDING BUS: PREDRILLED RECTANGULAR BARS OF ANNEALED COPPER, 1/4 BY 4 INCHES (6.3 BY 100 MM) IN CROSS SECTION, WITH 1/2-INCH (12.7-MM) HOLES SPACED 11-1/8 INCHES (28 MM) APART. STAND-OFF INSULATORS FOR MOUNTING SHALL COMPLY WITH UL 591 FOR USE IN SWITCHBOARDS, 600 V. LEXAN, IMPULSE TESTED AT 500 V.
- D. CONNECTORS: LISTED AND LABELED BY AN NRTL, ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED.
- E. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES: COPPER OR COPPER ALLOY, PRESSURE TYPE WITH AT LEAST TWO BOLTS. PIPE CONNECTORS: CLAMP TYPE, SIZED FOR PIPE.
- F. WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS.
- G. BUS-BAR CONNECTORS: MECHANICAL TYPE, CAST SILICON BRONZE, SOLDERLESS COMPRESSION-TYPE WIRE TERMINALS, AND LONG-BARREL, TWO-BOLT CONNECTION TO GROUND BUS BAR.
- H. CONDUCTORS: INSTALL SOLID CONDUCTOR FOR NO. 8 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR NO. 6 AWG AND LARGER UNLESS OTHERWISE INDICATED.
- I. ISOLATED GROUNDING CONDUCTORS: GREEN-COLORED INSULATION WITH CONTINUOUS YELLOW STRIP ON FEEDERS WITH ISOLATED GROUND. IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AND YELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO BANDS OF YELLOW.
- J. CONDUCTOR TERMINATIONS AND CONNECTIONS:
 - PIPE AND EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS: BOLTED CONNECTORS.
 - UNDERGROUND CONNECTIONS: WELDED CONNECTORS EXCEPT AT TEST WELLS AND AS OTHERWISE INDICATED. CONNECTIONS TO GROUND RODS AT TEST WELLS: BOLTED CONNECTORS. CONNECTIONS TO STRUCTURAL STEEL: WELDED CONNECTORS.
- K. EQUIPMENT GROUNDING:
 - INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS TO COMPLY WITH THE NEC AND AS INDICATED ON THE DRAWINGS.

ELECTRICAL HANGERS AND SUPPORTS

- A. COMPLY WITH NECA 1 AND NECA 101 FOR APPLICATION OF HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEMS EXCEPT IF REQUIREMENTS IN THIS SECTION ARE STRICTER. MAXIMUM SUPPORT SPACING AND MINIMUM HANGER ROD SIZE FOR RACEWAY:
 - SUPPORTS FOR EMT, IMC, AND RMC AS SCHEDULED IN NECA 1, WHERE ITS TABLE 1 LISTS MAXIMUM SPACINGS LESS THAN STATED IN NFPA 70. MINIMUM ROD SIZE SHALL BE 1/4 INCH (6 MM) IN DIAMETER. MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE-TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED OR OTHER SUPPORT SYSTEM, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 25 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS. SPRING-STEELED CLAMPS DESIGNED FOR SUPPORTING SINGLE CONDUITS WITHOUT BOLTS MAY BE USED FOR 1-1/2-INCH (38-MM) AND SMALLER RACEWAYS SERVING BRANCH CIRCUITS AND COMMUNICATION SYSTEMS ABOVE SUSPENDED CEILING AND FOR FASTENING RACEWAYS TO TRAPEZE SUPPORTS.
- B. SUPPORT INSTALLATIONS: COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT AS SPECIFIED IN THIS ARTICLE.
- C. RACEWAY SUPPORT METHODS: IN ADDITION TO METHODS DESCRIBED IN NECA 1, EMT, IMC, AND RMC MAY BE SUPPORTED BY OPENINGS THROUGH STRUCTURE MEMBERS, AS PERMITTED IN NFPA 70.
- D. STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LB (90 KG).
- E. MOUNTING AND ANCHORAGE OF SURFACE-MOUNTED EQUIPMENT AND COMPONENTS: ANCHOR AND FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO BUILDING STRUCTURAL ELEMENTS BY THE FOLLOWING METHODS UNLESS OTHERWISE INDICATED BY CODE:
 - 1. TO WOOD: FASTEN WITH LAG SCREWS OR THROUGH BOLTS.
 - 2. TO NEW CONCRETE: BOLT TO CONCRETE INSERTS.
 - 3. TO MASONRY: APPROVED TOGGLE-TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION ANCHOR FASTENERS ON SOLID MASONRY UNITS.
 - 4. TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS.
 - 5. INSTEAD OF EXPANSION ANCHORS, POWER-ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD-WEIGHT CONCRETE 4 INCHES (100 MM) THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT-AGGREGATE CONCRETE OR FOR SLABS LESS THAN 4 INCHES (100 MM) THICK.
 - 6. TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D1.1/D1.1M, WITH LOCK WASHERS AND NUTS OR BEAM CLAMPS (MSX TYPE 19, 21, 23, 25, OR 27) COMPLYING WITH MSS 3P-69.
 - 7. TO LIGHT STEEL: SHEET METAL SCREWS.
 - 8. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND TO DEPTHS THAT AVOID REINFORCING BARS.

ELECTRICAL CONDUIT

- A. METAL CONDUIT AND TUBING MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. AFC CABLE SYSTEMS, INC.
 - 2. ALFLEX INC.
 - 3. ALLED TUBE & CONDUIT; A TYCO INTERNATIONAL LTD. CO.
 - 4. ANAHEIM ELECTRICAL, INC.; ANACONDA METAL HOSE.
 - 5. ELECTRIFLEX CO.
 - 6. HANOVER TUBE CORPORATION.
 - 7. O-Z/GEDNEY; A UNIT OF GENERAL SIGNAL.
 - 8. GREATLAND TUBE COMPANY.
 - 9. RIGID STEEL CONDUIT: ANS C80.5.
 - 10. ALUMINUM RIGID CONDUIT: ANS C80.5.
 - 11. IMC: ANS C80.6.
 - 12. PVC-COATED RIGID STEEL CONDUIT.
 - 13. COMPLY WITH NEMA RN 1.
 - 14. COATING THICKNESS: 0.040 INCH (1 MM), MINIMUM.
 - 15. EMT: ANS C80.
 - 16. FMC: ZINC-COATED STEEL.
 - 17. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- B. FITTINGS FOR CONDUIT (INCLUDING ALL TYPES AND FLEXIBLE AND LIQUIDTIGHT), EMT, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED:
 - 1. FITTINGS FOR EMT: STEEL SET-SCREW OR COMPRESSION TYPE. DIE-CAST IS NOT ACCEPTABLE.
 - 2. COATING FOR FITTINGS FOR PVC-COATED CONDUIT: MINIMUM THICKNESS, 0.040 INCH (1 MM), WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- L. JOINT COMPOUND FOR RIGID STEEL CONDUIT OR IMC: LISTED FOR USE IN CABLE CONNECTIONS AND COMPOUNDED FOR USE TO LUBRICATE AND PROTECT THREADED RACEWAY JOINTS FROM CORROSION AND ENHANCE THEIR CONDUCTIVITY.
- M. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS. MANUFACTURER'S STANDARD ENAMEL FINISH IN COLOR SELECTED BY ARCHITECT. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. THOMAS & BETTS CORPORATION.
 - 2. WALKER SYSTEMS, INC.; WIREMOLO COMPANY (THE).
 - 3. WIREMOLO COMPANY (THE); ELECTRICAL SALES DIVISION.
- N. BOXES, ENCLOSURES, AND CABINETS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. COOPER CRUISE-HINDS, DIV. OF COOPER INDUSTRIES, INC.
 - 2. ESS/APPLETON ELECTRIC.
 - 3. HOFFMAN.
 - 4. HUBBELL INCORPORATED; KILLARK ELECTRIC MANUFACTURING CO. DIVISION.
 - 5. O-Z/GEDNEY; A UNIT OF GENERAL SIGNAL.
 - 6. RADC; A HUBBELL COMPANY.
 - 7. ROBROY INDUSTRIES, INC.; ENCLOSURE DIVISION.
 - 8. THOMAS & BETTS CORPORATION.
 - 9. WALKER SYSTEMS, INC.; WIREMOLO COMPANY (THE).
- O. SHEET METAL OUTLET AND DEVICE BOXES: NEMA OS 1.
- P. CAST-METAL OUTLET AND DEVICE BOXES: NEMA FB 1, FERROUS ALLOY, TYPE FD, WITH GASKETED COVER.
- Q. METAL FLOOR BOXES: CAST METAL, FULLY ADJUSTABLE, RECTANGULAR.
- R. SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.
- S. CAST-METAL ACCESS, PULL, AND JUNCTION BOXES: NEMA FB 1, GALVANIZED, CAST IRON WITH GASKETED COVERS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. THOMAS & BETTS CORPORATION.
 - 2. WALKER SYSTEMS, INC.; WIREMOLO COMPANY (THE).
 - 3. WIREMOLO COMPANY (THE); ELECTRICAL SALES DIVISION.
- T. HINGED-COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS-GALVANIZED WITH FLUSH LATCH, UNLESS OTHERWISE INDICATED.
 - 1. METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
 - A. IN STANDARD PARTITIONS, WHERE 1/2" AND 3/4" CONDUITS ARE EMPLOYED: 4" SQUARE BY 2-1/8" DEEP BOXES WITH 1-GANG OR 2-GANG PLASTER COVERS SHALL BE USED, NO. 4S-SPL.
 - B. IN THIN PARTITIONS MEASURING 3-1/2" OR LESS: 4" SQUARE BY 1-1/2" DEEP COVERS WITH 1-GANG OR 2-GANG PLASTER COVERS SHALL BE USED, NO. 4S-SPL.
 - C. WHEREVER NO TWO (2) OUTLET BOXES ARE INSTALLED CLOSER THAN 24" ON CENTER, AND SECURELY ATTACHED TO THE PARTITION STUDS, WITH AT LEAST ONE (1) PARTITION STUD SEPARATING THE OUTLET BOXES, IT IS NOT ACCEPTABLE TO SECURE OUTLET BOXES ONLY TO DRYPALL PARTITION.
 - 2. CONCEALED CONDUIT ABOVEGROUND: RIGID STEEL CONDUIT, EMT, RMC.
 - 3. UNDERGROUND CONDUIT: RMC, TYPE EPC-40-PVC, DIRECT BURIED.
 - 4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC.
 - 5. BOXES AND ENCLOSURES ABOVEGROUND: NEMA 250, TYPE 3R.
- U. CABINETS:
 - 1. NEMA 250, TYPE 1, GALVANIZED-STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
 - 2. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE.
 - 3. KEY LATCH TO MATCH PANELBOARDS.
 - 4. METAL PARTITIONS TO SEPARATE CIRCUITS OF DIFFERENT SYSTEMS AND VOLTAGE.
 - 5. ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.
- V. OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW, UNLESS OTHERWISE INDICATED:
 - 1. EXPOSED CONDUIT: RIGID STEEL CONDUIT.
 - 2. CONCEALED CONDUIT ABOVEGROUND: RIGID STEEL CONDUIT, EMT, RMC.
 - 3. UNDERGROUND CONDUIT: RMC, TYPE EPC-40-PVC, DIRECT BURIED.
 - 4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMG, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
 - 5. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
 - 6. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE IN SPACES USED FOR ENVIRONMENTAL AIR: PNEUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 7. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE RISERS IN VERTICAL SHAFTS: RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 8. RACEWAYS FOR CONCEALED GENERAL PURPOSE DISTRIBUTION OF OPTICAL FIBER OR COMMUNICATIONS CABLE: GENERAL-USE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, PNEUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 9. COVER AND ENCLOSURES ABOVEGROUND: NEMA 250, TYPE 3R.
 - 10. STAINLESS STEEL IN DAMP OR WET LOCATIONS.
- W. COMPLY WITH THE FOLLOWING INDOOR APPLICATIONS, UNLESS OTHERWISE INDICATED:
 - 1. EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
 - 2. EXPOSED, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT.
 - 3. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: RIGID STEEL CONDUIT. INCLUDES RACEWAYS IN THE FOLLOWING LOCATIONS: LOADING DOCK, CORRIDORS USED FOR TRAFFIC OF MECHANIZED CARTS, FORKLETS, AND PALLET-HANDLING UNITS, MECHANICAL ROOMS.
 - 4. CONCEALED IN CEILING AND INTERIOR WALLS AND PARTITIONS: EMT.
 - 5. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMG, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
 - 6. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
 - 7. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE IN SPACES USED FOR ENVIRONMENTAL AIR: PNEUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 8. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE RISERS IN VERTICAL SHAFTS: RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 9. RACEWAYS FOR CONCEALED GENERAL PURPOSE DISTRIBUTION OF OPTICAL FIBER OR COMMUNICATIONS CABLE: GENERAL-USE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, PNEUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
 - 10. COVER AND ENCLOSURES ABOVEGROUND: NEMA 250, TYPE 3R.
- X. MINIMUM RACEWAY SIZE: 1/2-INCH (16-MM) TRADE SIZE.
 - 1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS OTHERWISE INDICATED.
 - 2. PVC EXTERNALLY COATED RIGID STEEL CONDUITS: USE ONLY FITTINGS LISTED FOR USE WITH THAT MATERIAL. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY FITTING MANUFACTURER.
 - 3. CHANGE FROM EMT TO RMC, TYPE EPC-40-PVC, RIGID STEEL CONDUIT, OR IMC BEFORE FINISHING ABOVE THE FLOOR.
- Y. THREADED ABOVE THE FLOOR: EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.
- Z. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS, INCLUDING CONDUCTORS SMALLER THAN NO. 4 AWG.
- AA. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB (90-KG) TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES (300 MM) OF SLACK AT EACH END OF PULL WIRE.
- AB. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CABLE: INSTALL RACEWAYS, METALLIC AND NONMETALLIC, RIGID AND FLEXIBLE, AS FOLLOWS:
 - 1. 3/4-INCH (19-MM) TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 50 FEET (15 M).
 - 2. 1-INCH (25-MM) TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 75 FEET (23 M).
 - 3. INSTALL A MINIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.
- AC. INSTALL RACEWAY SEALING FITTINGS AT SUITABLE, APPROVED, AND ACCESSIBLE LOCATIONS AND FILL THEM WITH LISTED SEALING COMPOUND. FOR CONCEALED RACEWAYS, INSTALL EACH FITTING IN A FLUSH STEEL BOX WITH A BLANK COVER PLATE HAVING A FINISH SIMILAR TO THAT OF ADJACENT PLATES OR SURFACES. INSTALL RACEWAY SEALING FITTINGS AT THE FOLLOWING POINTS:
 - 1. WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, SUCH AS BOUNDARIES OF REFRIGERATED SPACES.
 - 2. WHERE OTHERWISE REQUIRED BY NFPA 70.

DEVICE MOUNTING HEIGHTS

- IN GENERAL, UNLESS OTHERWISE NOTED ON THE ARCHITECTURAL DRAWINGS OR THE ELECTRICAL DRAWINGS, MOUNTING HEIGHTS SHALL BE AS FOLLOWS: (HEIGHTS SHOWN ARE ABOVE FINISHED FLOOR TO CENTER LINE OF OUTLET)
- | | |
|---|-----------|
| WALL SWITCHES | 48 INCHES |
| ELECTRICAL, VOICE, DATA OUTLETS | 18 INCHES |
| CLOCK OUTLETS | 90 INCHES |
| RECEPTABLES (MOUNTED ABOVE A COUNTER) | 42 INCHES |
| FIRE ALARM PULL STATIONS | 42 INCHES |
| FIRE ALARM SYSTEM AUDIO/VISUAL STROBES | 80 INCHES |
| FIRE ALARM SYSTEM VISUAL STROBES | 80 INCHES |
| WALL MOUNTED TELEPHONE | 42 INCHES |

FIRE PROTECTION

FIRE ALARM


- A. DO NOT INTERRUPT FIRE-ALARM SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY GUARD SERVICE ACCORDING TO REQUIREMENTS IN ADVANCE.
- B. NOTIFY ARCHITECT AND OWNER NO FEWER THAN TWO DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF FIRE-ALARM SERVICE. DO NOT PROCEED WITH INTERRUPTION OF FIRE-ALARM SERVICE WITHOUT ARCHITECT'S AND OWNER'S WRITTEN PERMISSION.
- C. MAINTAIN EXISTING EQUIPMENT FULLY OPERATIONAL UNTIL NEW EQUIPMENT HAS BEEN TESTED AND ACCEPTED. AS NEW EQUIPMENT IS INSTALLED, LABEL IT "NOT IN SERVICE" UNTIL IT IS ACCEPTED. REMOVE LABELS FROM NEW EQUIPMENT WHEN PUT INTO SERVICE AND LABEL EXISTING FIRE-ALARM EQUIPMENT "NOT IN SERVICE" UNTIL REMOVED FROM THE BUILDING.
- D. AFTER ACCEPTANCE OF NEW FIRE-ALARM SYSTEM, REMOVE EXISTING DISCONNECTED FIRE-ALARM EQUIPMENT AND WIRING.
- E. COMPLY WITH NFPA 72 FOR INSTALLATION OF FIRE-ALARM EQUIPMENT.
- F. VERIFY THAT EXISTING FIRE-ALARM SYSTEM IS OPERATIONAL BEFORE MAKING CHANGES OR CONNECTIONS. CONNECT NEW EQUIPMENT TO EXISTING CONTROL PANEL IN EXISTING PART OF THE BUILDING. CONNECT NEW EQUIPMENT TO EXISTING MONITORING EQUIPMENT AT THE SUPERVISING STATION. EXPAND, MODIFY, AND SUPPLEMENT EXISTING CONTROL AND MONITORING EQUIPMENT AS NECESSARY TO EXTEND EXISTING CONTROL AND MONITORING FUNCTIONS TO THE NEW POINTS. NEW COMPONENTS SHALL BE CAPABLE OF MERGING WITH EXISTING CONFIGURATION WITHOUT DEGRADING THE PERFORMANCE OF EITHER SYSTEM.
- G. COMPLY WITH NFPA 72, "SMOKE-SENSING FIRE DETECTORS" SECTION IN THE "INITIATING DEVICES" CHAPTER, FOR SMOKE-DETECTOR SPACING. COMPLY WITH NFPA 72, "HEAT-SENSING FIRE DETECTORS" SECTION IN THE "INITIATING DEVICES" CHAPTER, FOR HEAT-DETECTOR SPACING. SMOOTH CEILING SPACING SHALL NOT EXCEED 30 FEET (9.1 M). SPACING OF DETECTORS FOR IRREGULAR AREAS, FOR IRREGULAR CEILING CONSTRUCTION, AND FOR HIGH CEILING AREAS SHALL BE DETERMINED ACCORDING TO APPENDIX A OR APPENDIX B IN NFPA 72.
- H. LOCATE DETECTORS NOT CLOSER THAN 3 FEET (1 M) FROM AIR-SUPPLY DIFFUSER OR RETURN-AIR OPENING.
- I. LIGHTING FIXTURES: LOCATE DETECTORS NOT CLOSER THAN 12 INCHES (300 MM) FROM ANY PART OF A LIGHTING FIXTURE.
- J. DUCT SMOKE DETECTORS: COMPLY WITH NFPA 72 AND NFPA 90A. INSTALL SAMPLING TUBES SO THEY EXTEND THE FULL WIDTH OF DUCT.
- K. REMOTE STATUS AND ALARM INDICATORS: INSTALL NEAR EACH SMOKE DETECTOR AND EACH SPRINKLER WATER-FLOW SWITCH AND VALVE-TAMPER SWITCH THAT IS NOT READILY VISIBLE FROM NORMAL VIEWING POSITION.
- L. AUDIBLE ALARM-INDICATING DEVICES: INSTALL NOT LESS THAN 6 INCHES (150 MM) BELOW THE CEILING. INSTALL BELLS AND HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GUILLET.
- M. VISUAL ALARM-INDICATING DEVICES: INSTALL ADJACENT TO EACH ALARM BELL OR ALARM HORN AND AT LEAST 6 INCHES (150 MM) BELOW THE CEILING.
- N. PROVIDE FIELD TESTING AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
- O. VISUAL ALARMS SHALL BE PROVIDED IN EACH OF THE FOLLOWING AREAS: RESTROOMS AND ANY OTHER GENERAL USE AREAS, MEETING ROOMS, HALLWAYS, LOBBIES, AND ANY OTHER AREA OF COMMON USE.
- P. AUDIBLE ALARMS SHALL PRODUCE A SOUND THAT EXCEEDS THE AMBIENT SOUND LEVEL IN A ROOM OR SPACE BY AT LEAST 5 DBA. EXCEPT IN AREAS WITH AN AMBIENT SOUND LEVEL DURATION OF 60 SECONDS BY 5 DBA, WHICHEVER IS LOWER. SOUND LEVELS FOR ALARM SIGNALS SHALL NOT EXCEED 110 DBA.
- Q. VISUAL ALARM SIGNAL APPLIANCES SHALL BE INTEGRATED INTO THE BUILDING OR FACILITY ALARM SYSTEM. IF SINGLE STATION AUDIBLE ALARMS ARE PROVIDED THEN SINGLE STATION VISUAL SIGNALS SHALL BE PROVIDED.
- R. VISUAL ALARMS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:
 - 1. THE LAMP SHALL BE A XENON STROBE TYPE OR EQUIVALENT.
 - 2. THE COLOR SHALL BE CLEAR OR WHITE.
 - 3. MAXIMUM PULSE DURATION SHALL BE 0.2 SECONDS WITH MAXIMUM DUTY CYCLE OF 40%.
 - 4. INTENSITY SHALL BE A MINIMUM OF 75 CANDELA.
 - 5. FLASH RATE SHALL BE A MINIMUM OF 1 HZ AND A MAXIMUM OF 3 HZ.
 - 6. THE APPLIANCE SHALL BE PLACED 80° ABOVE THE HIGHEST FLOOR LEVEL WITHIN THE SPACE OR 6° BELOW THE CEILING, WHICHEVER IS LOWER.
 - 7. IN GENERAL, NO PLACE IN ANY ROOM OR SPACE SHALL BE MORE THAN 50' FROM THE SIGNAL. IN LARGER ROOMS OR SPACES EXCEEDING 100' CIRCUMFERENCE, WITHOUT OBSTRUCTIONS 6' ABOVE THE FLOOR, SUCH AS AUDITORIUMS, DEVICES MAY BE PLACED AROUND THE PERIMETER, SPACED A MAXIMUM 100' APART, IN LINE OF SUSPENDING APPLIANCES FROM THE CEILING.
 - 8. NO PLACE IN COMMON CORRIDORS OR HALLWAYS SHALL BE MORE THAN 50' FROM THE SIGNAL. SIGNALS SHALL NOT BE GREATER THAN 15' FROM THE END OF A CORRIDOR OR HALLWAY.

FIRE SUPPRESSION

- A. COMPLY WITH REQUIREMENTS FOR INSTALLATION OF SPRINKLER PIPING IN NFPA 13.
- B. STEEL PIPE AND FITTINGS: SCHEDULE 40 BLACK STEEL PIPE, ASTM A 53/A 53M. PIPE ENDS MAY BE FACTORY OR FIELD FORWELDED TO MATCH JOINTING METHOD.
- C. USE LISTED FITTINGS TO MAKE CHANGES IN DIRECTION, BRANCH TAKEOFFS FROM MAINS, AND REDUCTIONS IN PIPE SIZES.
- D. INSTALL UNIONS ADJACENT TO EACH VALVE IN PIPES NPS 2 (DN 50) AND SMALLER.
- E. INSTALL FLANGES, FLANGE ADAPTERS, OR COUPLINGS FOR GROOVED-END PIPING ON VALVES, APPARATUS, AND EQUIPMENT HAVING NPS 2-1/2 (DN 65) AND LARGER END CONNECTIONS.
- F. INSTALL "INSPECTOR'S TEST CONNECTIONS" IN SPRINKLER SYSTEM PIPING, COMPLETE WITH SHUTOFF VALVE, AND SIZED AND LOCATED ACCORDING TO NFPA 13.
- G. INSTALL SPRINKLER PIPING WITH DRAINS FOR COMPLETE SYSTEM DRAINAGE.
- H. INSTALL SPRINKLER CONTROL VALVES, TEST ASSEMBLIES, AND DRAIN RISERS ADJACENT TO STANDPIPES WHEN SPRINKLER PIPING IS CONNECTED TO STANDPIPES.
- I. INSTALL ALARM DEVICES IN PIPING SYSTEMS.
- J. INSTALL HANGERS AND SUPPORTS FOR SPRINKLER SYSTEM PIPING ACCORDING TO NFPA 13, COMPLY WITH REQUIREMENTS FOR HANGER MATERIALS IN NFPA 13.
- K. FILL SPRINKLER SYSTEM PIPING WITH WATER.
- L. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILING, AND FLOORS.
- M. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILING, AND FLOORS.
- N. SPRINKLER INSTALLATION: INSTALL SPRINKLERS IN SUSPENDED CEILING IN CENTER OF ACOUSTICAL CEILING PANELS.
- O. FIRE SPRINKLER CONTRACTOR SHALL VERIFY LOCATION OF EXISTING SPRINKLER HEADS AND SHALL BE RESPONSIBLE FOR THE NECESSARY MODIFICATIONS TO PIPING. SPRINKLER CONTRACTOR SHALL REVISE PIPING TO ACCOMMODATE CEILING SPRINKLER HEADS TO MATCH BUILDING STANDARD, AND SHALL ADD OR RELOCATE SPRINKLER HEADS AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH NFPA STATE AND LOCAL CODES. VERIFY CLEARANCES IN CEILING SPACE PRIOR TO INSTALLATION.
- P. BEFORE SHUTTING OFF A SECTION OF THE FIRE SERVICE SYSTEM TO MAKE SPRINKLER SYSTEM CONNECTIONS, NOTIFY THE FIRE DEPARTMENT, PLAN THE WORK CAREFULLY, AND ASSEMBLE ALL MATERIALS TO ENABLE COMPLETION IN THE SHORTEST POSSIBLE TIME. WORK STARTED ON CONNECTIONS SHOULD BE RUSHED TO COMPLETION WITHOUT INTERRUPTION, AND PROTECTION RESTORED AS PROMPTLY AS POSSIBLE. DURING THE IMPAIRMENT, PROVIDE EQUIPMENT HOSE LINES, ADDITIONAL FIRE PALS AND EXTINGUISHERS, AND MAINTAIN WATCH SERVICE IN THE AREAS AFFECTED.
- Q. WHEN CHANGES INVOLVE SHUTTING OFF WATER FROM ANY CONSIDERABLE NUMBER OF SPRINKLERS FOR MORE THAN A FEW HOURS, TEMPORARY WATER SUPPLY CONNECTIONS SHOULD BE MADE TO SPRINKLER SYSTEMS SO THAT REASONABLE PROTECTION CAN BE MAINTAINED. IN ADDING TO OLD SYSTEMS OR REVAMPING THEM, PROTECTION SHOULD BE RESTORED EACH NIGHT SO FAR AS POSSIBLE. THE FIRE DEPARTMENT SHALL BE NOTIFIED AS TO CONDITIONS.
- R. IDENTIFICATION: INSTALL LABELING AND PIPE MARKERS ON EQUIPMENT AND PIPING ACCORDING TO REQUIREMENTS IN NFPA 13.
- S. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEMS AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT. FLUSH, TEST, AND INSPECT SPRINKLER SYSTEMS ACCORDING TO NFPA 13, "SYSTEMS ACCEPTANCE" CHAPTER. COORDINATE WITH FIRE-ALARM TESTS. OPERATE AS REQUIRED. COORDINATE WITH FIRE-PUMP TESTS. OPERATE AS REQUIRED. SPRINKLER PIPING SYSTEMS WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.
- T. USE SPRINKLER TYPES IN SUPPLEMENTARY BELOW FOR THE FOLLOWING APPLICATIONS:
 - 1. ROOMS WITHOUT CEILING: UPRIGHT SPRINKLERS.
 - 2. ROOMS WITH SUSPENDED CEILING: PENDENT, RECESSED, FLUSH, AND CONCEALED SPRINKLERS AS REQUIRED BY OWNER, WITH FINISH SELECTED BY ARCHITECT AND OWNER.
 - 3. WALL MOUNTING: SIDEWALL SPRINKLERS.

REVISIONS		
NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
14901 WALTER WOODSON DR.
CONROE, TEXAS 77384



24 Greenway Plaza, Ste 1211, Houston, TX 77046
 Tel: (713) 840-0177 / Firm Reg. No: 5638

NOT
FOR
CONSTRUCTION

SCALE: NONE

MEP SPECIFICATIONS

MEP2.01

DATE: 04/21/2020 PROJECT #: 19172.00

REVISIONS

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HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
14901 WALTER WOODSON DR.
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E|B|E Mechanical
Electrical
Plumbing
CONSULTING ENGINEERS
24 Greenway Plaza, Ste 1211, Houston, Tx 77046
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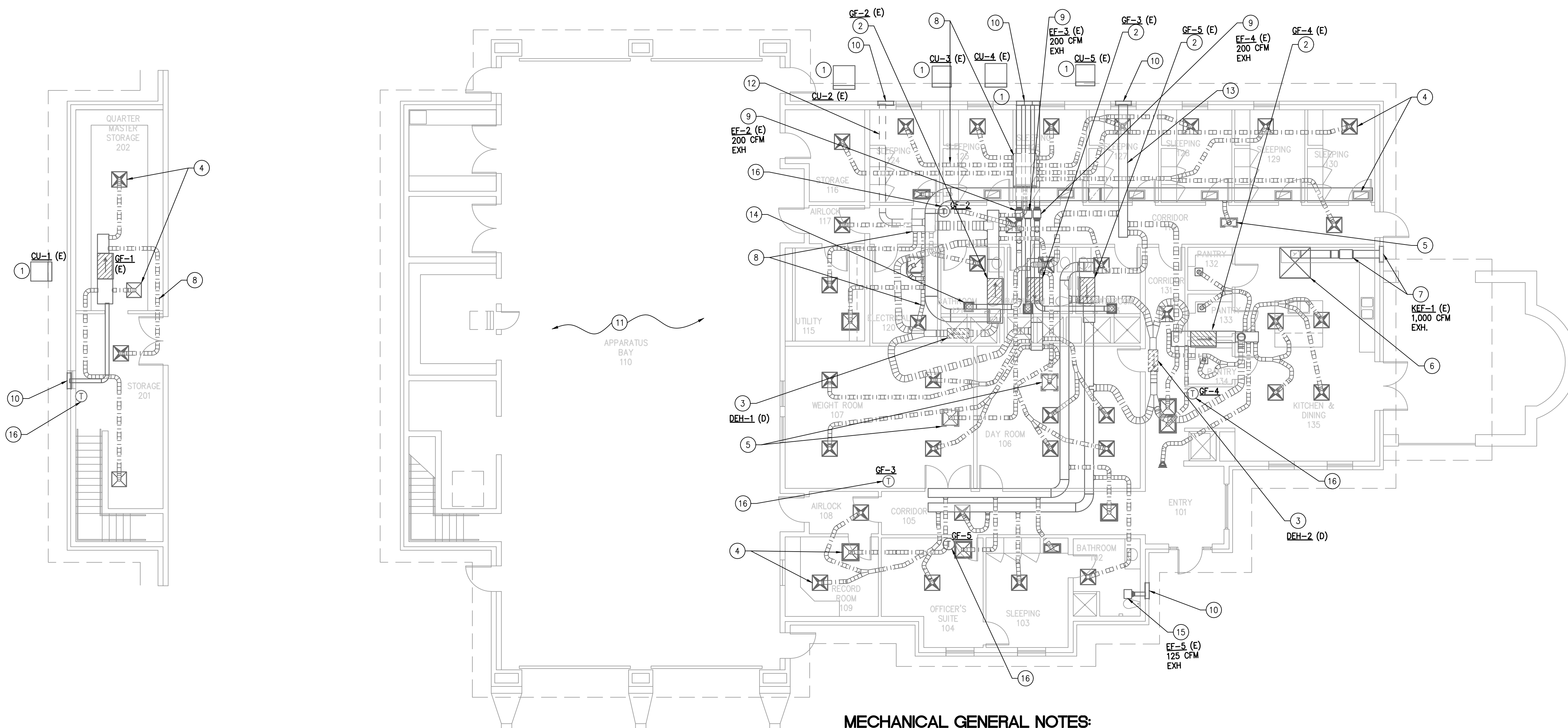
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SCALE: 1/8"=1'-0"

MECHANICAL DEMO PLAN

M1.01

DATE: 04/21/2020 PROJECT #: 19172.00



02 MECHANICAL DEMO PLAN - LEVEL 2
SCALE: 1/8"=1'-0"

01 MECHANICAL DEMO PLAN - LEVEL 1
SCALE: 1/8"=1'-0"

MECHANICAL KEYED NOTES:

- EXISTING OUTDOOR CONDENSING UNIT TO REMAIN. CONTRACTOR SHALL PERFORM A COMPLETE REQUIRED SERVICE AND MAINTENANCE TO RESTORE TO GOOD WORKING CONDITION. FINE TUNE AND PROPERLY CHECK AND RECHARGE FOR REFRIGERANT PER MANUFACTURER GUIDELINE ALONG WITH INDOOR UNIT TO ENSURE ITS OPTIMAL PERFORMANCE AS REQUIRED. NOTIFY THE OWNER AND ENGINEER FOR ANY DEFICIENCY. MAINTAIN ALL DISCHARGE TEMPERATURE AT SUPPLY DUCTWORK TO BE NOT LESS THAN 53F TO PREVENT CONDENSATE AT DUCTWORK. PROVIDE ALUMINUM JACKET AND NEW INSULATION TO THE REFRIGERANT PIPING.
- EXISTING INDOOR UNIT (GAS FURNACE WITH DIRECT VENT AND COOLING COIL) TO REMAIN. PERFORMANCE ITS REQUIRED MAINTENANCE. KEEP REFRIGERANT PIPING ROUTING TO BE ABOVE THE TOP OF THE COOLING COILS FOR OIL RETURN. REPLACE EXISTING AUXILIARY DRAIN PAN WITH A NEW ONE TO COVER UNDER THE FURNACE, COOLING COIL, AND DISCHARGE PLENUM. RESTORE INSULATION TO DRAIN PIPING TO GOOD WORKING CONDITION.
- EXISTING DEHUMIDIFIER ALONG WITH ITS DUCTWORK SHALL BE DEMOLISHED AND RETURNED TO THE OWNER FOR STORAGE. ONE OF THE UNITS SHALL REUSED IN OTHER AREA. SEE SHEET M1.2.
- EXISTING DIFFUSERS (SUPPLY/RETURN) TO REMAIN. DEMOLISH ANY DAMAGED, INCORRECT NECKSIZE, OR RUSTED, AND REPLACE WITH NEW ONES MATCH EXISTING STYLE AS REQUIRED. TYPICAL.
- EXISTING RETURN AIR DIFFUSER TO BE DEMOLISHED FROM THIS LOCATION. SEE SHEET M1.2 FOR ITS NEW LOCATION.
- EXISTING KITCHEN HOOD TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION.
- EXISTING KITCHEN EXHAUST FAN AND EXHAUST LOUVER TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION. RE-BALANCE TO CFM EXHAUST SHOWN.
- DEMOLISH EXISTING FLEXIBLE DUCTS AND RIGID DUCTWORK AS SHOWN. TYPICAL.
- EXISTING RESTROOM EXHAUST INLINE FAN TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION. RE-BALANCE TO CFM EXHAUST SHOWN.
- EXISTING LOUVER TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION.
- EXISTING MECHANICAL IN THIS AREA TO REMAIN.
- EXISTING OUTSIDE AIR DUCT TO BE DEMOLISHED.
- EXISTING OUTSIDE AIR DUCT TO BE REUSE IF IT HAS THE CORRECT DUCT SIZE. REFER TO SHEET M1.2.
- EXISTING RESTROOM EXHAUST VENT TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION. REPLACE WITH NEW IF DAMAGED. TYPICAL.
- EXISTING RESTROOM CEILING EXHAUST FAN TO REMAIN. CLEAN AND RESTORE TO GOOD WORKING CONDITION. RE-BALANCE TO CFM EXHAUST SHOWN.
- EXISTING THERMOSTAT TO REMAIN. CLEAN AND RE-CALIBRATE TO GOOD WORKING CONDITION. REPLACE IF DAMAGED OR MISSING.

MECHANICAL GENERAL NOTES:

- ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
- NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE LANDLORD AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANY SHUTDOWN, REMOVAL OR DISCONNECTION, SUFFICIENT ADVANCE NOTICE MUST BE GIVEN TO THE LANDLORD INDICATING WHICH AREAS WILL BE AFFECTED, WHEN THE PROPOSED SHUTDOWN WILL OCCUR, AND FOR HOW LONG A PERIOD OF TIME.
- ALL ITEMS REMOVED SHALL BECOME PROPERTY OF THE LANDLORD AND SHALL BE DISPOSED OF AS PER THE LANDLORD'S INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY OWNERS SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
- THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE LANDLORD AND/OR ENGINEER FOR EXPEDITING AND THE RESOLUTION.
- CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
- EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED AS BEING RELOCATED.
- PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
- WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE LANDLORD AND ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK.
- SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- ALL WORK SHALL CONFORM TO ALL STATE AND LOCAL CODES, RULES AND REGULATIONS AND ORDINANCES.
- CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO THE CONTRACT.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
- CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
- WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AS IT RELATES TO HIS WORK.
- CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S RULES AND REGULATIONS TO COMPLY WITH BUILDING STANDARDS.
- FLEXIBLE DUCTWORK LENGTHS SHALL NOT EXCEED 5'-0". USE INSULATED RIGID ROUND DUCTWORK WHERE REQUIRED. ALL NEW FLEXIBLE DUCTWORK CONNECTIONS TO AIR DEVICES SHOWN ON THE DRAWING SHALL BE SIZED ACCORDING TO THE NECK SIZE SCHEDULE.
- THE ENTIRE AIR SUPPLY SYSTEM SHALL BE RE-BALANCED TO THE AIR QUANTITIES INDICATED ON THIS DRAWING BY AN INDEPENDENT AIR BALANCE CONTRACTOR. THE AIR BALANCE CONTRACTOR SHALL SUBMIT NEBB CERTIFIED AIR BALANCE REPORTS FOR ENGINEERING REVIEW AND TO BUILDING MANAGEMENT. PROVIDE AHU DRIVE ADJUSTMENTS AS REQUIRED.
- REFER TO DRAWING MEP FOR SPECIFICATIONS THAT APPLY TO THIS SHEET.
- CONTRACTOR SHALL VERIFY THAT SUFFICIENT RETURN AIR OPENINGS ARE PROVIDED IN EXISTING WALLS ABOVE CEILING. AIR IS RETURNED TO THE CEILING PLENUM AND THEN TO THE AIR HANDLING UNITS THROUGH RETURN AIR GRILLES, ARCHITECTURAL CEILING OPENING AND LIGHT FIXTURES.
- EXISTING TAPS TO SUPPLY DUCTWORK SHALL BE USED WHERE POSSIBLE. ANY UNUSED TAPS TO EXISTING SUPPLY DUCTWORK SHALL BE CAPPED, SEALED AIRTIGHT, AND INSULATED.
- EXISTING MAIN TRUNK SUPPLY DUCTWORK SHALL REMAIN. CONTRACTOR SHALL VERIFY EXISTING LOCATION AND LIGHTING FIXTURE CLEARANCES AND INCLUDE IN THEIR COST THE RELOCATION OR REMOVAL OF EXISTING EQUIPMENT REQUIRED TO COMPLY WITH THIS DRAWING.
- CONTRACTOR SHALL PROVIDE TO BUILDING OWNER THE AS-BUILT RECORD DRAWINGS AND THE OPERATING AND MAINTENANCE MANUALS WITHIN 90 DAYS OF SYSTEMS ACCEPTANCE. RECORD DRAWINGS SHALL INCLUDE PERFORMANCE DATA FOR EQUIPMENT, DUCT AND PIPE DISTRIBUTION SYSTEMS, AND AIR AND WATER FLOW RATES. O&M MANUALS SHALL INCLUDE EQUIPMENT AND ASSOCIATED OPTIONS REQUIRING SERVICE, REQUIRED MAINTENANCE ACTIVITIES, CONTACT INFO OF SERVICE AGENCIES, HVAC CONTROLS CALIBRATION INFORMATION AND SET-POINTS, AND DESCRIPTION OF EQUIPMENTS' INTENDED OPERATIONS.
- FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.
- ALL DUCTWORK (FLEX AND RIGID) SHALL BE INSULATED WITH MINIMUM R-8.

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HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
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CONROE, TEXAS 77384


 CONSULTING ENGINEERS
 24 Greenway Plaza, Ste 1211, Houston, Tx 77046
 Tel: (713) 840-0177 / Firm Reg. No: 5638

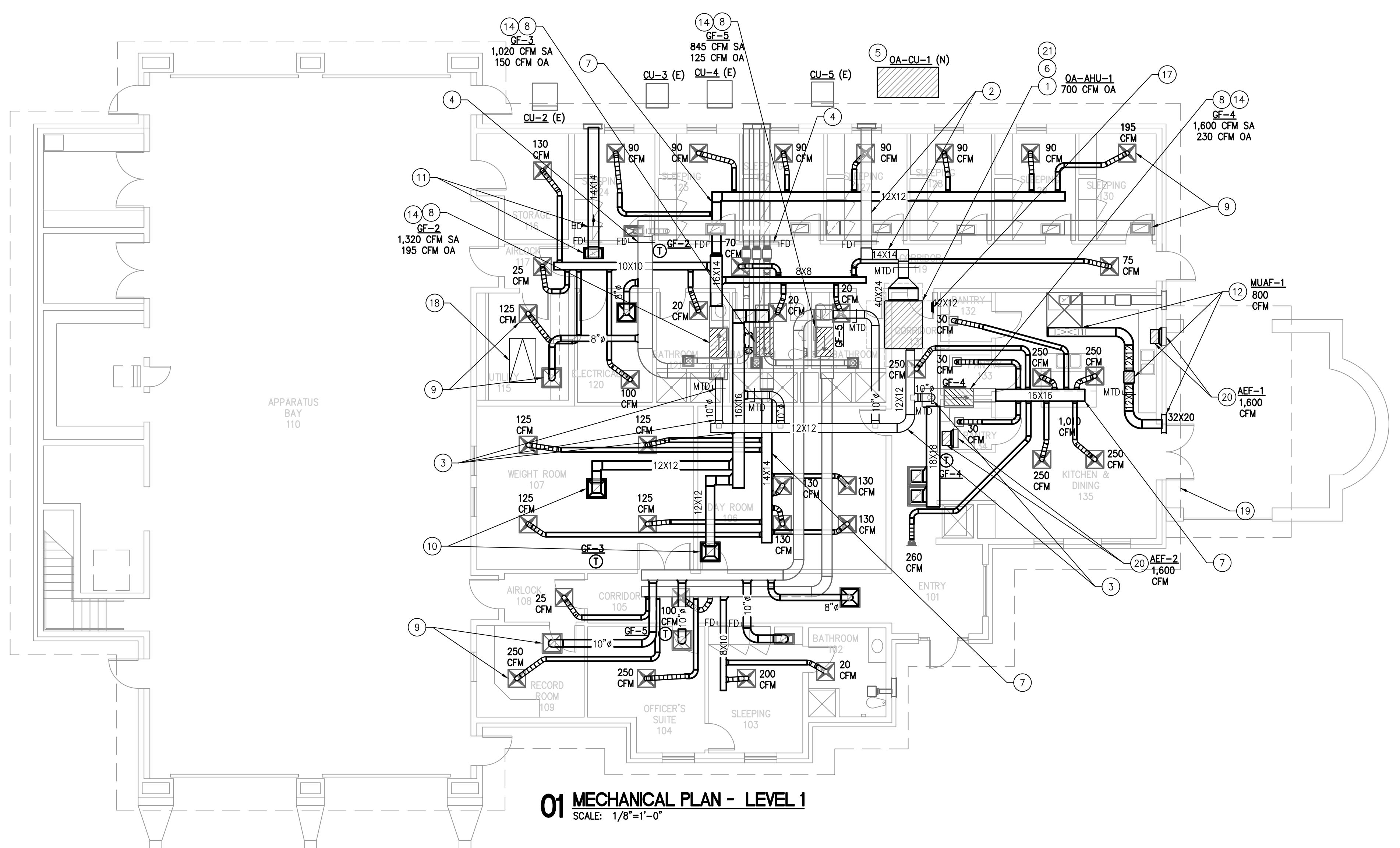
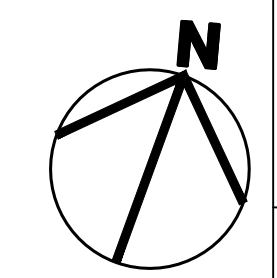


SCALE: 1/8"=1'-0"

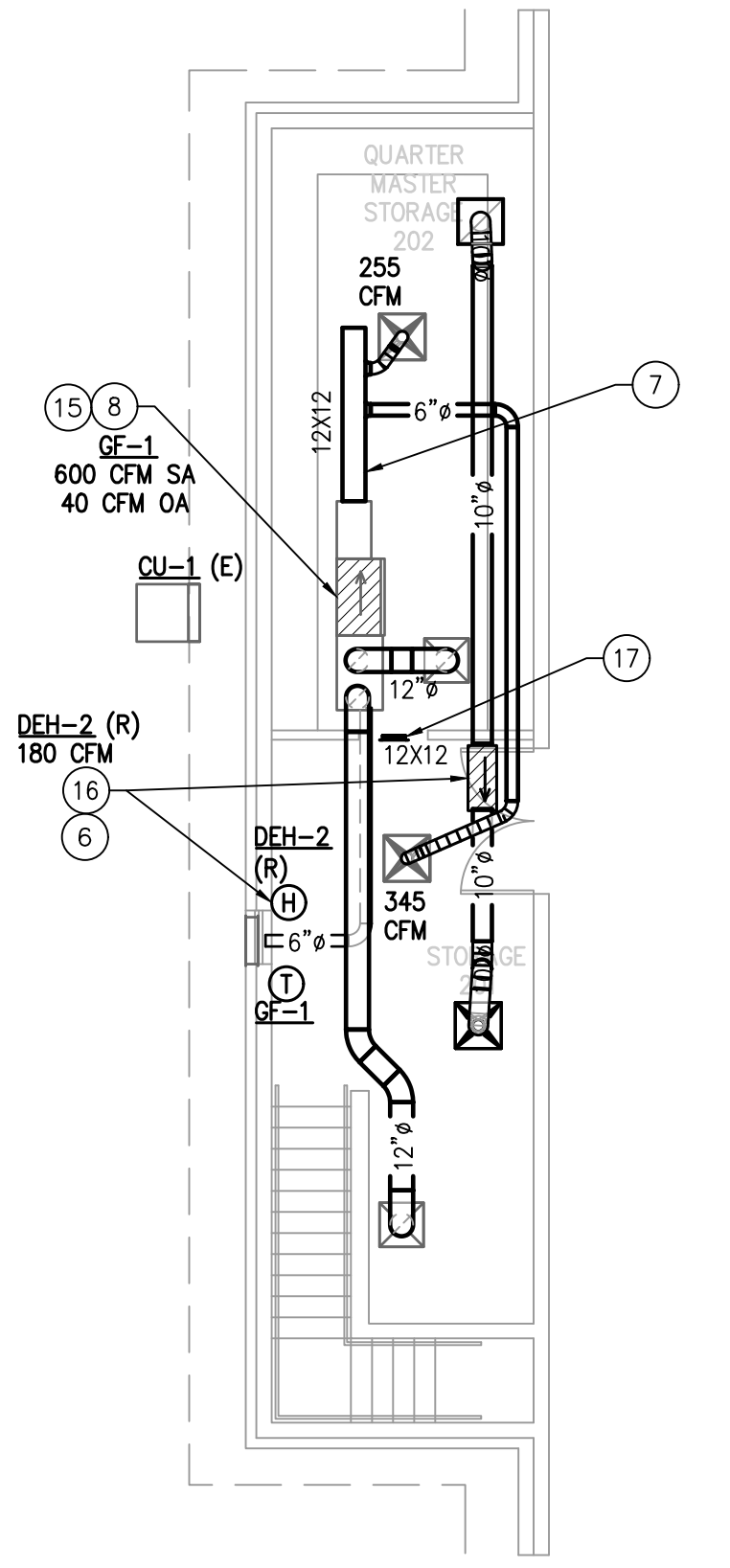
MECHANICAL PLAN

M1.02

 DATE: 04/21/2020 PROJECT #: 19172.00



01 MECHANICAL PLAN - LEVEL 1
 SCALE: 1/8"=1'-0"



02 MECHANICAL PLAN - LEVEL 2
 SCALE: 1/8"=1'-0"

MECHANICAL KEYED NOTES:

- 1 PROVIDE NEW DEDICATED INDOOR OA UNIT (OA-AHU-1) TO SERVE GF-2 TO GF-5. FIELD VERIFY AND COORDINATE FOR EXACT LOCATION IN ATTIC. PROVIDE CLEARANCE AND SERVICE AREAS AS REQUIRED. DURING COOLING SEASON, IT SHALL TREAT THE OA TO 55°F TO REMOVE MOISTURE. IT SHALL MODULATE ITS REHEAT WITH GHRH AND MAINTAIN THE DISCHARGE AIR TEMPERATURE AT NEUTRAL TEMPERATURE AT 70°F TO EACH EXISTING GAS FURNACE'S MIXING BOX. DURING HEATING SEASON, IT SHALL TREAT THE OA TO 70°F WITH ELECTRIC HEATER WITH SCR CONTROL. CONTRACTOR SHALL INSTALL PER CODE REQUIREMENT AND MANUFACTURER GUIDELINE AS REQUIRED. BALANCE TO CFM OA INDICATED. FIELD VERIFY AND COORDINATE PRIOR TO START OF WORK. THE MOTORIZED OA DAMPER SHALL BE CLOSED WHEN THE UNIT IS DE-ENERGIZED. SEE SCHEDULE.
- 2 EXISTING OA DUCTWORK CAN BE REUSED IF IT HAS THE CORRECT DUCT SIZE. EXTEND OA DUCTWORK TO OA-AHU-1 WITH SIZE INDICATED. FIELD VERIFY AND COORDINATE PRIOR TO START OF WORK.
- 3 PROVIDE NEW OA DUCTWORK FROM OA-AHU-1 TO EACH EXISTING GAS FURNACE AS SHOWN. PROVIDE A MOTORIZED CONTROL DAMPER FOR EACH OA AIR TAP. BALANCE FOR THE CFM OF OA TO EACH GF UNIT. THE DAMPER SHALL OPEN WHEN THE UNIT IS ENERGIZED. TYPICAL.
- 4 PROVIDE FIRE DAMPER WHERE DUCT PENETRATES RATED WALL. EXISTING FIRE DAMPER CAN BE REUSED IF IT IS STILL IN GOOD WORKING CONDITION AND HAVE CORRECT SIZE. TYPICAL.
- 5 PROVIDE NEW OUTDOOR UNIT OF OA-AHU-1 (OA-CU-6). PROVIDE 1" THICK INSULATION AND ALUMINUM JACKET ON REFRIGERANT PIPING. FIELD VERIFY AND COORDINATE FOR THE BEST ROUTING PRIOR TO START OF WORK.
- 6 ROUTE 3/4" CONDENSATE DRAIN PIPE TO THE NEAREST LAVATORY TAILPIECE BELOW WITH A SLOPE AT 1/8" PER FOOT TOWARD THE TAILPIECE DRAIN. FIELD COORDINATE/VERIFY.
- 7 PROVIDE NEW DUCTWORK WITH SIZES AS SHOWN. FIELD VERIFY AND COORDINATE. PROVIDE A FIRE DAMPER WHERE IT PENETRATES ANY RATED WALL. TYPICAL.
- 8 EXISTING GAS FURNACE. RESTORE TO GOOD WORKING CONDITION. BALANCE TO THE NEW SUPPLY AND OUTSIDE AIR CFMS INDICATED.
- 9 PROVIDE A VOLUME DAMPER TO EACH AIR DEVICE (SUPPLY/RETURN). BALANCE THE SUPPLY AIR DEVICE TO CFM INDICATED. USE THE CFM RATIO OF RETURN/SUPPLY TO BALANCE THE RETURN AIR DEVICE IN THE SAME ZONE. TYPICAL.
- 10 RELOCATE THE EXISTING RETURN AIR DEVICE TO THIS LOCATION TO MINIMIZE SHORT CYCLING. PROVIDE A VOLUME DAMPER FOR BALANCING.
- 11 RELOCATE THE EXISTING RETURN AIR IN THE CORRIDOR TO THIS LOCATION. IT SHALL BE USE AS A RELIEF AIR. PROVIDE A NEW DUCT, FIRE DAMPER, AND A BAROMETRIC DAMPER. BALANCE THE DAMPER TO MAINTAIN THE POSITIVE PRESSURE INDOORS TO BE 0.05" TO 0.1"W.G. (ADJUSTABLE).
- 12 PROVIDE SUPPLY PLENUM OPTION TO THE EXISTING KITCHEN HOOD. PROVIDE NEW MAKEUP INLINE AIR FAN IN ATTIC. PROVIDE NEW DUCTWORK WITH SIZE INDICATED. PROVIDE NEW INTAKE LOUVER MATCH EXISTING. PROVIDE 36X36 OPENING ACCESS DOOR AT CEILING FOR FUTURE SERVICE AND ACCESS TO THE FAN. SEE SCHEDULE.
- 13 RELOCATE ONE OF THE TWO EXISTING DEHUMIDIFIER FROM THE MAIN BUILDING TO THIS LOCATION. PROVIDE NEW DUCTWORK AND DIFFUSERS TO MATCH EXISTING. ROUTE ITS CONDENSATE TO FLOOR BELOW TO LAVATORY TAILPIECE.
- 14 SET THE EXISTING GAS FURNACES (GF) AND THE NEW OA AIR HANDLING UNIT TO RUN CONTINUOUSLY DURING OCCUPIED PERIOD. GFS SHALL HAVE THEIR FANS IN "ON" MODE DURING THIS PERIOD.
- 15 GF-1 SHALL HAVE ITS FAN IN AUTO MODE.
- 16 RELOCATE THE EXISTING HUMIDISTAT OF THE DEHUMIDIFIER DEH-2 (PROVIDE IT IS STILL IN GOOD WORKING CONDITION) TO THIS LOCATION. PROVIDE NEW DUCTWORK WITH SUPPLY AND RETURN AIR TO MATCH EXISTING.
- 17 PROVIDE NEW RETURN DOOR GRILLE (12X12) FOR AIR TRANSFER.
- 18 ENLARGE THE ATTIC ACCESS OPENING TO BE MINIMUM 36"x60" FOR AN OPENING PATH OF MOVING OA-AHU-1 INTO ATTIC. FIELD VERIFY AND COORDINATE WITH ARCHITECT FOR EXACT LOCATION.
- 19 EXISTING PERFORATED SOFFIT VENT WITH A GROSS AREA OF 520 SQFT (ESTIMATED). THE ESTIMATED FREE AREA FOR VENTING IS 104SQFT (20% FREE AREA). THE TOTAL AREA OF THE VENTED SPACE IS 5,432 SQFT (ESTIMATED). CONTRACTOR SHALL VERIFY AND COORDINATE TO ENSURE ALL VENTING OPENING AREAS IN SOFFIT ARE FREE OF OBSTRUCTION OR BLOCKED AIR PATH.
- 20 EXISTING GABLE VENT TO REMAIN. PROVIDE ATTIC EXHAUST FAN (AEF), MASTER FLOW - MODEL EG6HT - 1,600 CFM POWER GABLE MOUNT ATTIC FAN WITH HUMIDISTAT/THERMOSTAT, 120V/1PH/60HZ, 1.65AMPS, 1/9HP, 140WATTS. FIELD VERIFY AND COORDINATE TO AVOID THE EXISTING FIRE SPRINKLER PIPE. FIELD VERIFY AND FABRICATE DUCT AND TRANSITION FROM THE FAN TO THE GABLE VENT. THE SETPOINTS FOR HUMIDISTAT AND THERMOSTAT ARE ADJUSTABLE; 55°F RH AND 80°F.
- 21 CONTRACTOR MAY REQUIRE TO DISASSEMBLE THE INDOOR UNIT INTO SMALLER COMPONENTS TO CARRY THEM INTO THE ATTIC. CONTRACTOR SHALL BE REQUIRED TO PUT ALL OF THEM BACK TO ORIGINAL WORKING CONDITION WITH FULL ORIGINAL WARRANTY FOR THE EQUIPMENT.

MAKE-UP AIR FAN SCHEDULE

MARK	MUAF-1	AEF-1	AEF-2
SERVES	KITCHEN HOOD	ATTIC VENTILATION	ATTIC VENTILATION
CFM	800	1,600	1,600
TYPE/DRIVE	INLINE/DIRECT	GABLE MOUNT	GABLE MOUNT
S.P. IN. WG.	0.5	-	-
HORSEPOWER (WATTS)	1/4	1/9	1/9
RPM	1,349	-	-
VOLTS/PHASE/HERTZ	115/1/60	120/1/60	120/1/60
MANUFACTURER	GREENHECK	MASTER FLOW	MASTER FLOW
SERIES NO.	SQ-100-VG	EGV6HT	EGV6HT
NOTES	1-5	6	6

- NOTES:
- PROVIDE FAN WITH MOTORIZED BACKDRAFT DAMPER, BIRDSCREEN, FAN-MOUNTED SPEED CONTROLLER - VG CONTROLLER, DISCONNECT SWITCH.
 - INTERLOCK FAN SWITCH ON/OFF OPERATION WITH THE EXHAUST HOOD SWITCH TO OPERATE WHEN SWITCH IS TURNED ON.
 - BALANCE TO SCHEDULE CFM.
 - THE FAN SHALL SERVE MAKEUP AIR FOR THE KITCHEN HOOD BELOW. PROVIDE FACTORY SUPPLY PLENUM (ASP, FRONT, 48L X 14W X 10H, FACTORY MOUNTING, 10W X 32L COLLAR, 0.18 S.P., RATED FOR 800 CFM MUA). CONTACT LEE DOCTOROFF WITH ACCUREX GREATER HOUSTON AT 512-934-0699 FOR HOOD SUPPLY PLENUM SELECTION.
 - ALTERNATE MANUFACTURERS ARE ACCEPTABLE PROVIDED THEY MEET THE PERFORMANCE AND SPECIFICATIONS.
 - PROVIDE ADJUSTABLE HUMIDISTAT AND THERMOSTAT CONTROL.

OUTSIDE AIR SYSTEM ANALYSIS

LOCAL CODE FOR CITY OF CONROE, TX.:

OUTSIDE AIR SHALL BE PROVIDED IN ACCORDANCE WITH THE 2009 IMC:

STORAGE/CORRIDOR	=	2.495SOFT X 0.06CFM/SOFT	=	150 CFM
SLEEPING	=	965SOFT X 0.06CFM/SOFT + 7PPL X 5CFM/PER	=	108 CFM
OFFICE AREA	=	1,348SOFT X 0.06CFM/SOFT + 12PPL X 5CFM/PER	=	141 CFM
KITCHEN/DINING	=	546SOFT X 0.18CFM/SOFT + 15PPL X 7.5CFM/PER	=	221 CFM

TOTAL OA REQUIRED = 150 + 108 + 141 + 221 = 610 CFM

GF-1 (E)	40 CFM
OA-AHU-1 (N)	700 CFM PROVIDED TO GF-2, -3, -4, AND -5.
TOTAL	740 CFM OUTSIDE AIR PROVIDED

INDOOR SPLIT DX SYSTEM SCHEDULE

MARK	GF-1(E)	GF-2(E)	GF-3 (E)	GF-4(E)	GF-5(E)
SERVES	STORAGE AREA	SLEEPING AREA	DAY RM. AREA	KITCHEN AREA	OFFICE AREA
CONFIGURATION	DUCTED HORIZ.	DUCTED HORIZ.	DUCTED HORIZ.	DUCTED HORIZ.	DUCTED HORIZ.
TOTAL CFM	600	1,320	1,020	1,600	845
O.A. CFM	40	195 (TREATED)	150 (TREATED)	230 (TREATED)	125 (TREATED)
EXT. S.P. "H O ₂	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
HORSEPOWER	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
COOLING					
EAT DB/WB	76.20/63.93	75.00/62.45	75.00/62.45	75.00/62.45	75.00/62.45
LAT DB/WB	56.00/55.47	55.00/54.22	55.00/54.42	55.00/53.28	55.00/54.72
SEN. HT. BTU/HR	13.28K	28.9K	22.3K	35.1K	18.5K
TOTAL HT. BTU/HR	15.22K	31.6K	23.9K	42.4K	19.1K
AMB. TEMP.	95	95	95	95	95
GAS FURNACE					
HEATING CAPACITY (BTUH)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
TOTAL NATURAL GAS (BTUH)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
VOLTS/PHASE/CYCLES	120/1/60	120/1/60	120/1/60	120/1/60	120/1/60
TOTAL MCA/MOCP	---	---	---	---	---
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE
GAS FURNACE SERIES	TU1B040A9241AA	TU1B060A9361AA	TU1B060A9351AA	TU1B060A9361AA	TU1B040A9241AA
COOLING COIL SERIES (AHU)	4TXC002D53	4TXC0006D53	4TXC0004D53	TU1B060A9361AA	TU1B040A9241AA
WEIGHT (LBS)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
NOTES	1-2,7	1-2,5,7	3-12,14	1-2,5,7	1-2,5,7

- VERIFY UNIT IS IN GOOD WORKING ORDER. NOTIFY OWNER IF UNIT REQUIRES REPAIR OR REPLACEMENT.
- EXTEND AUXILIARY DRAIN PANS UNDER THE FURNACE, COOLING COIL, AND DISCHARGE PLENUM.
- PROVIDE WALL MOUNTED IECC COMPLIANT ELECTRONIC PROGRAMMABLE THERMOSTAT BY UNIT MANUFACTURER.
- REFRIGERANT PIPING SHOULD BE ROUTED ABOVE THE TOP OF THE COOLING COILS.
- PROVIDE CONDENSATE PUMP AND ROUTE 3/4" DRAIN LINE AT 1/8" SLOPE PER FOOT TO APPROVED WASTE RECEPTOR.
- CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT ROUTING AND SIZE OF INSULATED REFRIGERANT PIPING. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE REQUIRED MAINTENANCE ACCESS PER MANUFACTURER FOR AHU IN MECHANICAL ATTIC SPACE.
- PROVIDE STAINLESS STEEL DRAIN PAN.
- PROVIDE PRIMARY AND AUXILIARY DRAIN LINES FROM CONDENSER UNIT TO NEAREST FLOOR DRAIN. SUPPORT PIPE FOR 1/8" PER FOOT SLOPE TO DRAIN.
- PROVIDE A FACTORY-INSTALLED FLOAT SWITCH TO SHUTDOWN THE UNIT UPON HIGH WATER CONDITION.
- SHEET METAL DUCTWORK WITH R-8.0 INSULATION.
- INTERLOCK GF-6 WITH GF-2, 3, 4, AND 5 TO RUN WHENEVER THESE UNITS ARE RUNNING.

CONDENSING UNIT SCHEDULE

MARK	CU-1(E)	CU-2(E)	CU-3(E)	CU-4(E)	CU-5(E)
SERVES	GF-1	GF-2	GF-3	GF-4	GF-5
CAPACITY (BTUH)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
AMBIENT TEMP. °F	105	105	105	105	105
VOLTS/PH/Hz	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
MCA/MOCP	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
EER/SEER	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE
SERIES	4TTB4018E1	4TTB4042E1	4TTR4018L1000A	4TTB4048E1	4TTB4024E1
WEIGHT (LBS)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
NOTES	1	1	1	1	1

- NOTES:
- VERIFY UNIT IS IN GOOD WORKING ORDER. NOTIFY OWNER IF UNIT REQUIRES REPAIR OR REPLACEMENT.

DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
0 - 120	6 X 6	6"ø
125 - 220	8 X 8	8"ø
225 - 330	10 X 10	10"ø
335 - 450	12 X 12	12"ø
455 - 530	15 X 15	14"ø
540 - 700	16 X 16	16"ø

INDOOR DOAS DX SYSTEM SCHEDULE

MARK	OA-AHU-1
SERVES	GF-2,3,4,&5
CONFIGURATION	DUCTED HORIZ.
TOTAL CFM	700
O.A. CFM	700
EXT. S.P. "H O ₂	0.75
HORSEPOWER	0.25
COOLING	
EAT DB/WB	96.0/80.0
LAT DB/WB AT OFF COIL	55.00/55.00
LAT DB FROM UNIT MAX	75.0
SEN. HT. BTU/HR (GROSS)	31.9K
TOTAL HT. BTU/HR (GROSS)	63.7K
AMB. TEMP.	95
ELECTRIC HEATING	
HEATER WATTS	10.0K
NUMBER OF STAGES	SCR
VOLTS/PHASE/CYCLES	208/3/60
TOTAL MCA/MOCP	34.4/45.0
MANUFACTURER	UNITED COOLAIR
INDOOR SERIES	OSAHS63ASDTA-F
NOMINAL TONS	5.0
WEIGHT (LBS)	669
NOTES	1-2,7

- UNIT SHALL HAVE TEMPERATURE DISCHARGE CONTROL WITH DIGITAL SCROLL COMPRESSOR.
- REFRIGERANT PIPING SHOULD BE ROUTED ABOVE THE TOP OF THE COOLING COILS.
- PROVIDE CONDENSATE PUMP AND ROUTE 3/4" DRAIN LINE AT 1/8" SLOPE PER FOOT TO APPROVED WASTE RECEPTOR.
- CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT ROUTING AND SIZE OF INSULATED REFRIGERANT PIPING. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE MOTORIZED DAMPER FOR O.A. INTAKE. DAMPER SHALL BE CLOSED WHEN THE SYSTEM IS DE-ENERGIZE.
- PROVIDE A FACTORY-INSTALLED FLOAT SWITCH TO SHUTDOWN THE UNIT UPON HIGH WATER CONDITION.
- SHEET METAL DUCTWORK WITH R-8.0 INSULATION.
- INTERLOCK GF-6 WITH GF-2, 3, 4, AND 5 TO RUN WHENEVER THESE UNITS ARE RUNNING.

CONDENSING UNIT SCHEDULE

MARK	OA-CU-1
SERVES	OA-AHU-1
CAPACITY (BTUH)	60K
AMBIENT TEMP. °F	95
VOLTS/PH/Hz	208/1/60
MCA/MOCP	8.1/15.0
EER/SEER	-/13
MANUFACTURER	UNITED COOLAIR
SERIES	PBC10G1ASTA
WEIGHT (LBS)	400
NOTES	ALL

- NOTES:
- REFRIGERANT TYPE IS R-410A.
 - COORDINATE WITH ELECTRICAL DRAWINGS FOR DISCONNECT AND ADDITIONAL ELECTRICAL REQUIREMENTS.
 - ALL WORK SHALL COMPLY WITH BUILDING MANAGEMENT'S CONTRACTOR RULES AND REGULATIONS.
 - PROVIDE ALL REFRIGERANT LINE ACCESSORIES AND SIZES PER MANUFACTURER.
 - PROVIDE CONDENSING UNIT ON THE GRADE.
 - ALTERNATE MANUFACTURERS ARE ACCEPTABLE PROVIDED THEY MEET THE PERFORMANCE AND SPECIFICATIONS.

REVISIONS

NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
14901 WALTER WOODSON DR.
CONROE, TEXAS 77384



24 Greenway Plaza, Ste 1211, Houston, TX 77046
Tel: (713) 840-0177 / Firm Reg. No: 5638

NOT
 FOR
 CONSTRUCTION

SCALE: NONE

MECHANICAL
SCHEDULES

M2.01

REVISIONS

NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
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E|B|E Mechanical
 CONSULTING ENGINEERS
 Electrical Plumbing
 24 Greenway Plaza, Ste 1211, Houston, Tx 77046
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NOT
 FOR
 CONSTRUCTION

SCALE: NONE

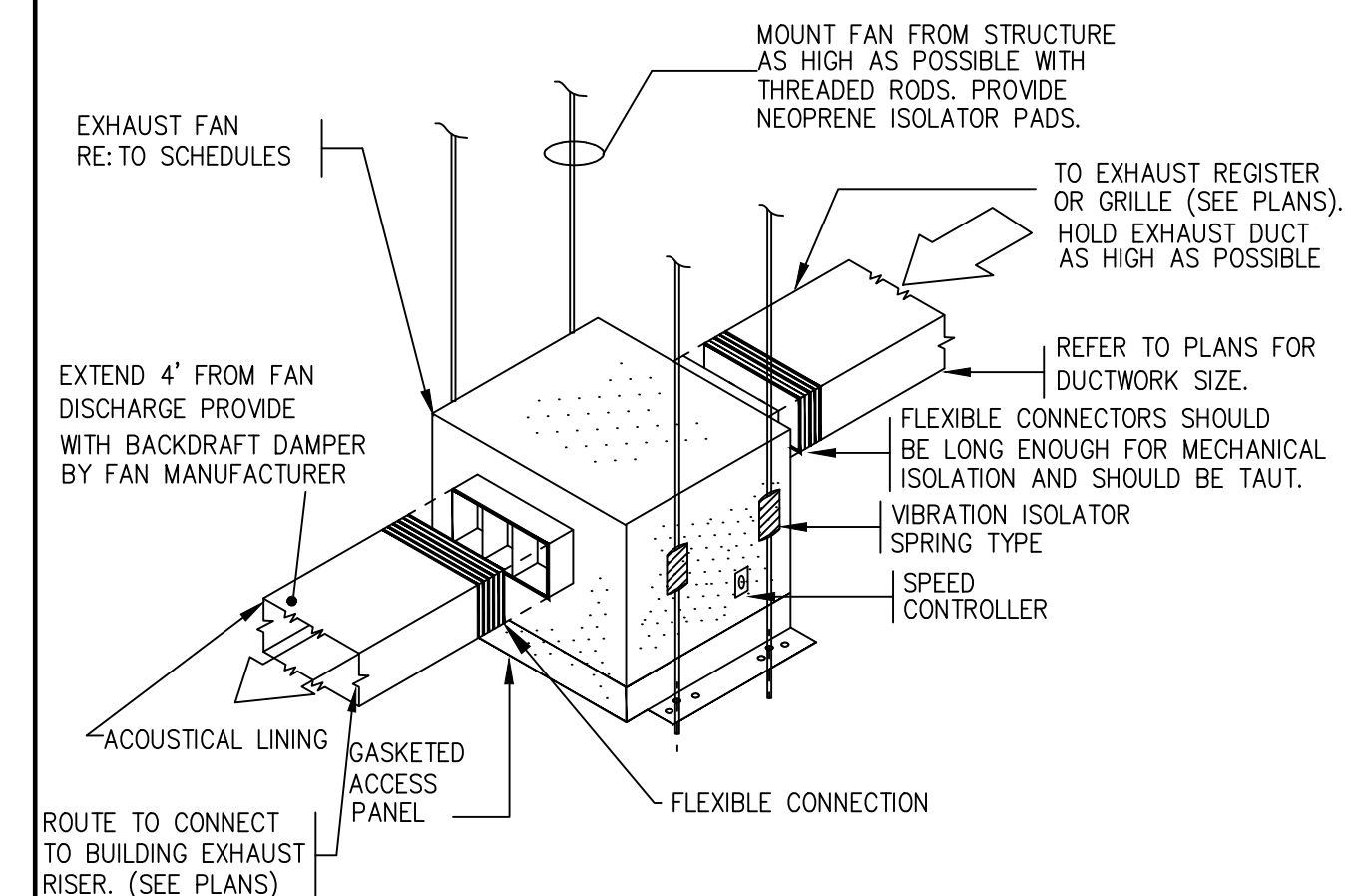
MECHANICAL DETAILS

M3.01

LEGEND OF MECHANICAL SYMBOLS

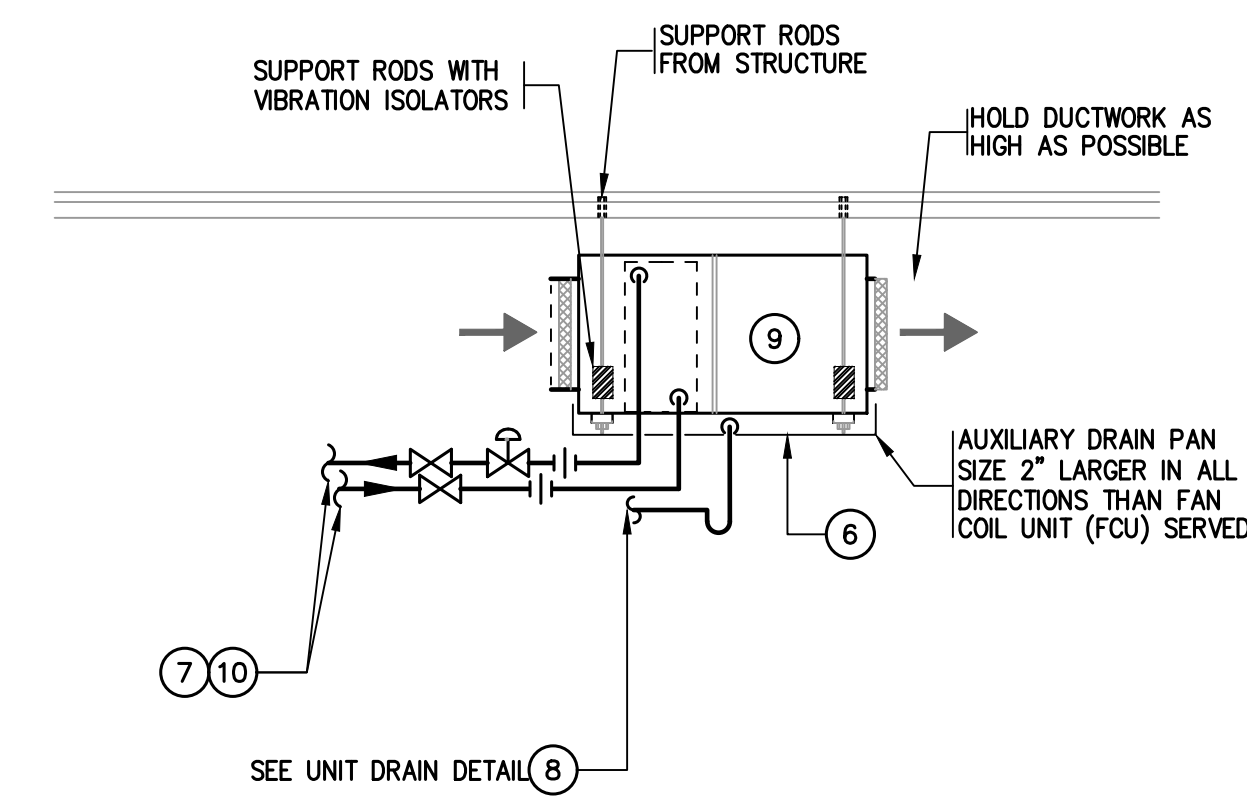
SYMBOL	DESCRIPTION
	SUPPLY DUCT VIEW INTO DUCT
	SUPPLY DUCT VIEW HEEL OF ELBOW
	RETURN OR EXHAUST DUCT VIEW INTO DUCT
	RETURN OR EXHAUST DUCT VIEW HEEL OF ELBOW
	SQUARE TO ROUND TRANSITION
	SQUARE ELBOW WITH TURNING VANES
	RADIUS ELBOW WITHOUT TURNING VANES
	SUPPLY SIDEWALL REGISTER
	RETURN OR EXHAUST SIDEWALL REGISTER
	EXISTING S.A. DIFFUSER
	ROUND S.A. DIFFUSER
	EXISTING FLEX DUCT
	NEW FLEX DUCT
	EXISTING DUCTWORK
	NEW DUCTWORK
	DUCTWORK TO BE REMOVED
	SQUARE CEILING DIFFUSER
	RETURN AIR GRILLE
	RETURN OR EXHAUST AIR REGISTER W/ SQUARE NECK
	PLENUM SLOT DIFFUSER
	MANUAL DAMPER
	FIRE DAMPER WITH ACCESS DOOR
	DRAIN LINE
	PIPE RISING
	PIPE TURNING DOWN
	EXHAUST FAN SPEED CONTROL
	THERMOSTAT
	EXISTING TO REMAIN
	RELOCATED
	RETURN AIR
	SUPPLY AIR
	CUBIC FEET PER MINUTE
	AIR HANDLER UNIT

NOTES:
1. ALL SYMBOLS MAY NOT BE USED ON THIS DRAWINGS.



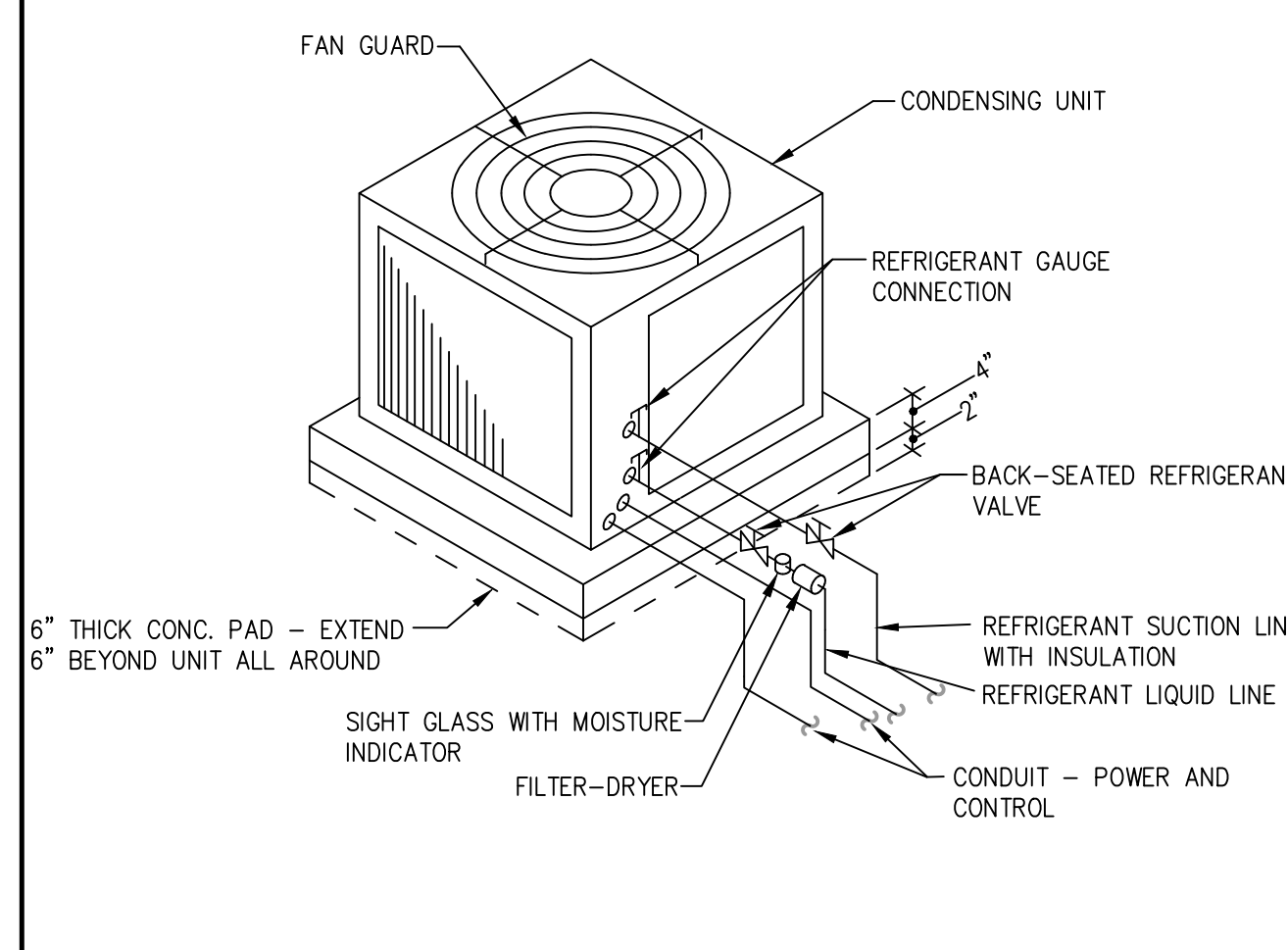
NOTES:
1. REFER TO PLANS FOR DUCTWORK CONFIGURATION FOR EACH INDIVIDUAL ROOM EXHAUST FAN. REFER TO PLANS AND SPECIFICATION FOR SPECIFIC EXHAUST FAN, VIBRATION ISOLATOR, FLEXIBLE DUCT, EXHAUST DUCT, AND FAN INSTALLATION REQUIREMENTS ETC.
2. SET VARIABLE SPEED CONTROLLER TO FAN SCHEDULED AIR QUANTITY.
3. PROVIDE SPEED CONTROLLER MOUNTED ON FAN CABINET. (SEE SCHEDULES)
4. PROVIDE FLEXIBLE CONNECTION AT FAN INLET AND OUTLET.
5. PROVIDE BACKDRAFT DAMPER AT FAN OUTLET.
EBC DETAIL HD327

IN-LINE FAN INSTALLATION 06
SCALE: NONE

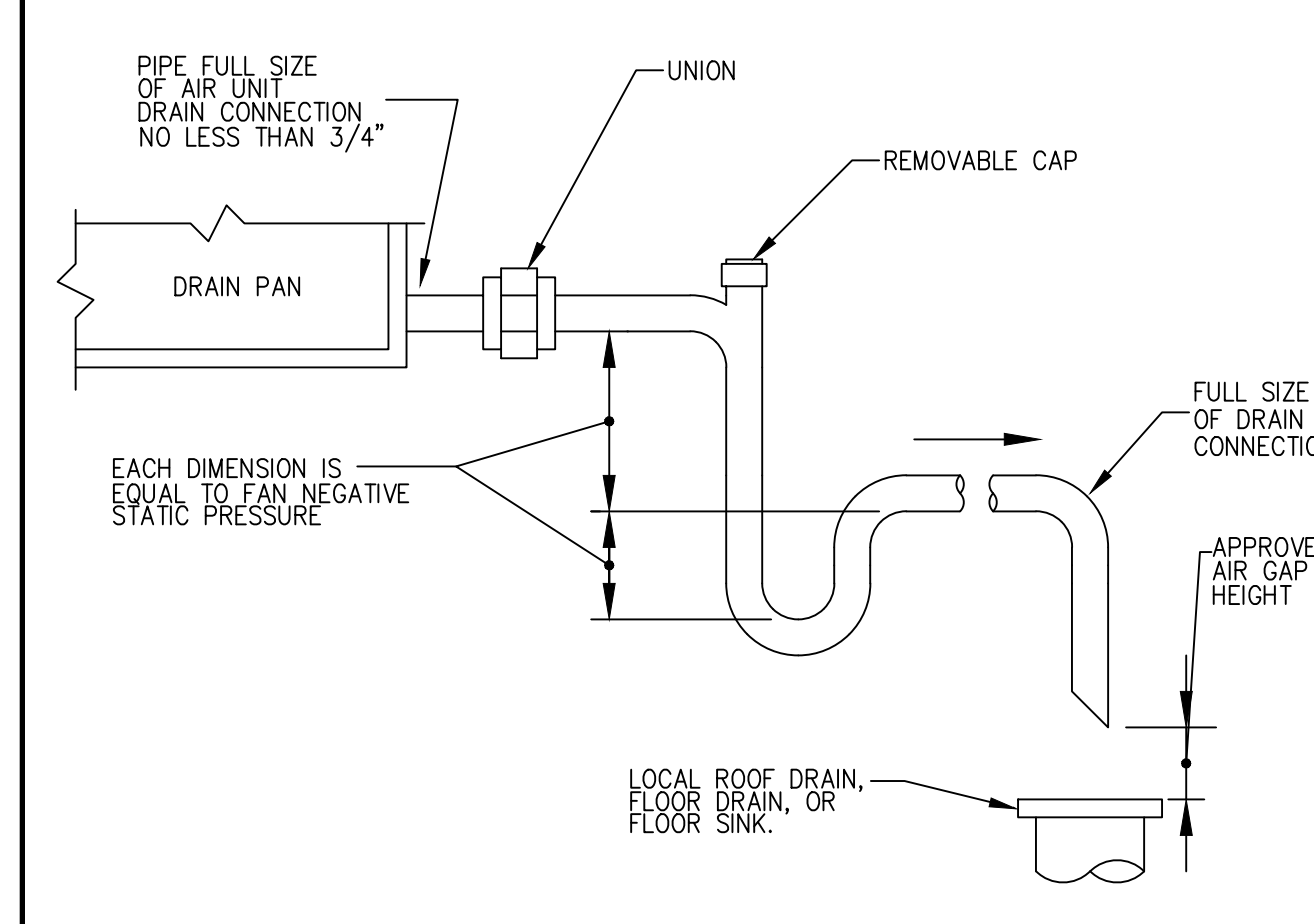


NOTES:
1 REFER TO PLANS FOR DUCTWORK CONFIGURATION FOR EACH INDIVIDUAL FAN COIL UNIT. REFER TO PLANS AND SPECIFICATION FOR SPECIFIC FAN COIL, VIBRATION ISOLATOR, FLEXIBLE DUCT, DUCTWORK, PIPING, STOP VALVES, CONTROLS AND FAN COIL INSTALLATION REQUIREMENTS, ETC.
2 REFER TO PLANS FOR FAN COIL UNIT DESIGN AIR QUANTITY.
3 PROVIDE CONDUCTIVITY SWITCH IN AUXILIARY DRAIN PAN TO DE-ENERGIZE FAN COIL UNIT WHEN WATER IS DETECTED IN AUXILIARY DRAIN PAN.
4 PROVIDE FLEXIBLE CONNECTION AT FAN COIL UNIT DISCHARGE & RETURN AIR PLENUM.
5 PROVIDE VIBRATION ISOLATOR SPRING TYPE W/ FAN COIL UNIT.
6 PROVIDE INSULATED AUXILIARY DRAIN PAN UNDER COIL UNIT. ROUTE AUXILIARY DRAIN & CONDENSATE DRAIN LINES TO FLOOR DRAIN. RE: TO PLANS FOR DRAIN LOCATION
7 COORDINATE REFRIGERANT LINE ROUTINGS WITH CLEARANCE REQUIRED FOR SERVICE, ACCESS AND FILTER REMOVAL. REFER TO PIPING ISOMETRIC FOR ADDITIONAL INFORMATION.
8 INSULATED, TRAPPED CONDENSATE DRAIN AND AUXILIARY PAN DRAIN LINES.
9 FAN COIL UNIT TO BE INSTALLED AS HIGH AS POSSIBLE COORDINATE FCU LOCATION WITH STRUCTURAL AND ARCHITECTURAL ELEMENTS TO MAINTAIN REQUIRED ACCESS TO MOTORS, FILTERS, VALVES, AND ACCESS TO PANEL ON UNIT. CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING WORKING CLEARANCES FREE OF PIPING, CONDUIT, DUCTS, AND OTHER OBSTRUCTIONS.
10 REFRIGERANT LINES SIZED AS PER MANUFACTURER RECOMMENDATIONS. COORDINATE PIPE ROUTING WITH FILTER REMOVAL ACCESS.
11 PROVIDE A CONDENSATE PUMP. INTERLOCK THE PUMP WITH FCU TO STOP FCU IF THE PUMP FAILS.

FAN COIL (DX) INSTALLATION DETAIL 01
SCALE: NONE

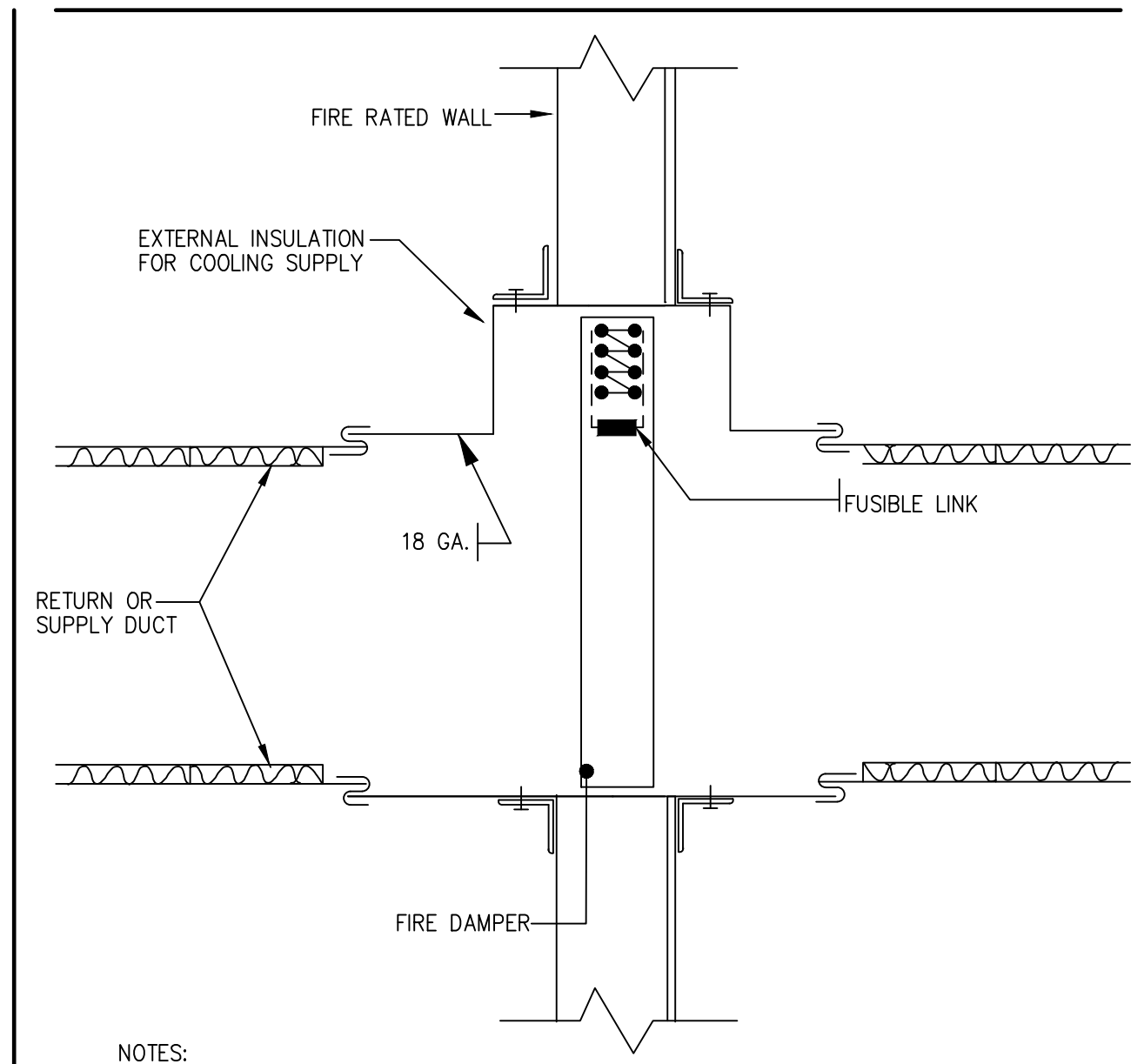


AIR-COOLED UNIT - SLAB MOUNT 02
SCALE: NONE



NOTE:
1. LOCATE TRAPS SA AS TO BE ACCESSIBLE FOR CLEANING.
2. TO DETERMINE OFFSET, SUBTRACT SCHEDULED E.S.P. FROM T.S.P. THEN ADD 1".
3. ROUTE TO NEAREST SANITARY DRAIN.

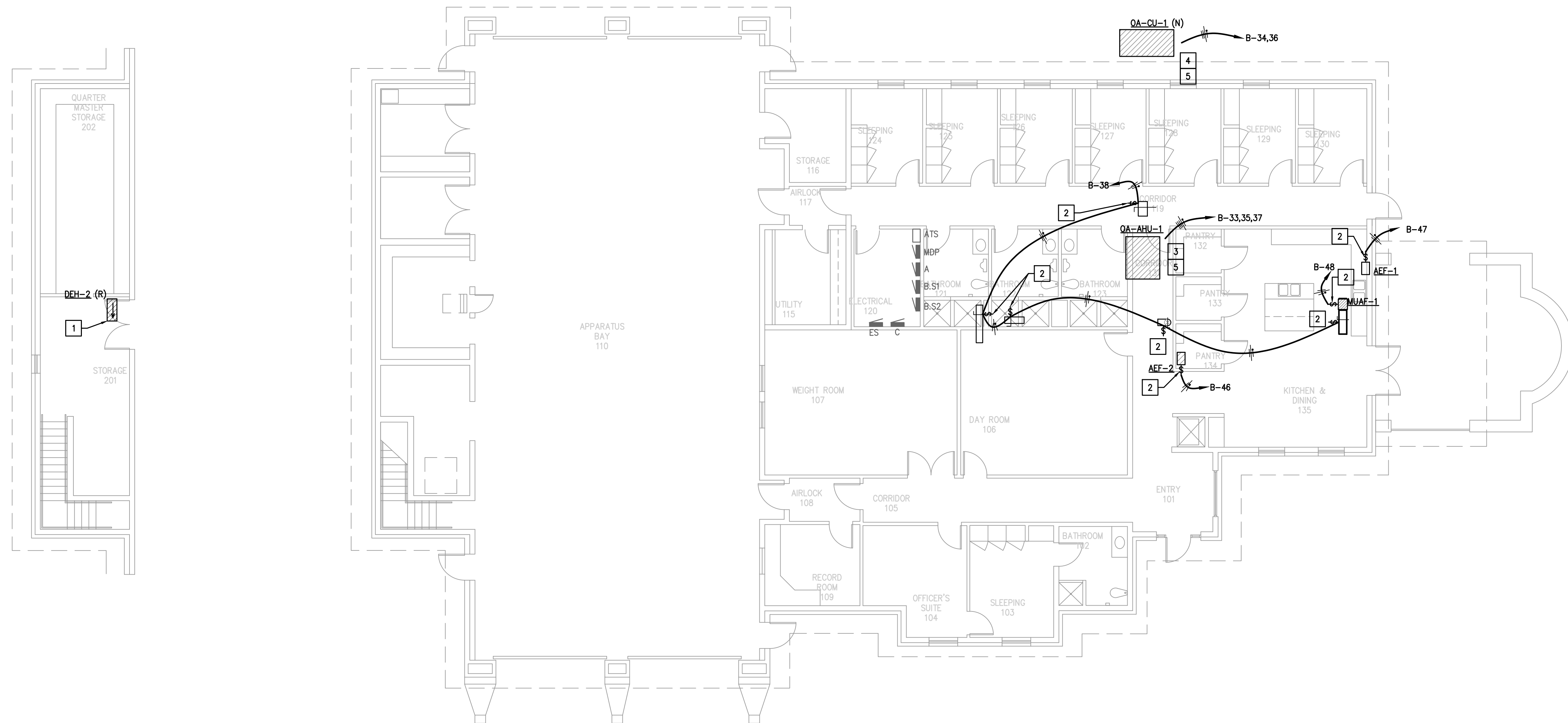
CONDENSATE DRAIN 04
SCALE: NONE



NOTES:
1 THIS DETAIL IS PROVIDED FOR GENERAL INFORMATION ONLY. THE DAMPER MANUFACTURER'S RECOMMENDATIONS AND U.L. APPROVED INSTALLATION DETAILS SHALL HAVE PRIORITY OVER THIS DETAIL.
2 DAMPER ASSEMBLY SHALL BE INSTALLED IN AND FASTENED TO THE DAMPER SLEEVE ASSEMBLY. SLEEVES SHALL BE 16GA. MINIMUM OR GREATER AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
3 MAINTAIN FULL DUCT SIZE. DAMPER HOUSING SHALL NOT OBSTRUCT AIR FLOW. (TYPE "B").
4 PROVIDE A MINIMUM EXPANSION CLEARANCE SPACE BETWEEN THE SLEEVE AND TOP OF WALL OPENING OF 1/8" PER LINEAR FOOT OF SLEEVE DIMENSION. SEAL OPENING WITH AN APPROVED FIRE/SMOKE SEALANT.
5 RETAINING ANGLES SHALL BE PROVIDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, U.L. LISTING REQUIREMENTS, AND THE AUTHORITIES HAVING JURISDICTION. RETAINING ANLES SHALL BE INSTALLED ON FOUR SIDES OF THE SLEEVE AND ON EACH SIDE OF THE WALL OPENING. ANGLES SHALL BE FASTENED TO THE SLEEVE ONLY WITH 1/2" BOLTS OR 3/4" LONG WELDS WITH A MINIMUM OF TWO FASTENINGS PER SIDE, BEGINNING AT 2" FROM EACH CORNER OF THE SLEEVE AND 6" O.C. MAXIMUM. RETAINING ANGLES SHALL OVERLAP THE WALL A MINIMUM OF 1" AROUND THE ENTIRE OPENING. ANGLES SHALL BE A MINIMUM OF 12GA.. USE 1-1/2"x 1-1/2" ANGLES FOR DUCT DIMENSIONS 48" AND LESS. USE 2"x 2" ANGLES FOR DUCT DIMENSIONS 49" TO 72". USE 2"x 2"x 1/4" ANGLES FOR DUCT DIMENSIONS OVER 72".
6 DUCT CONNECTION TO DAMPER ASSEMBLY SHALL BE MADE WITH "S" SLIP CONNECTIONS OR SIMILAR BREAK-AWAY TYPE CONNECTIONS IF APPROVED BY THE AUTHORITIES HAVING JURISDICTION. SEAL DUCT SEAM WITH NON-HARDENING SEALANT.
7 PROVIDE DUCT ACCESS DOORS FOR EACH DAMPER TO ALLOW DAMPER CATCH TO BE RELEASED WITH THE DAMPER IN A CLOSED POSITION, AND THE FUSIBLE LINK REPLACED TO ALLOW ACCESS TO THE CONCEALED DAMPER ACTUATORS. EACH ACCESS DOOR SHALL BE MARKED "FIRE/SMOKE DAMPER ACCESS" OR SIMILAR WORDING APPROVED BY THE AUTHORITIES HAVING JURISDICTION. ACCESS DOORS SHALL BE APPROVED FOR SUCH USE.
8 DUCTWORK SHALL BE SUPPORTED FROM THE STRUCTURE AND NOT THE DAMPER ASSEMBLY.

FIRE DAMPER INSTALLATION 05
SCALE: NONE

REVISIONS		
NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID



01 ELECTRICAL EQUIPMENT PLAN
SCALE: 1/8"=1'-0"

ELECTRICAL POWER GENERAL NOTES:

- MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
- REFER TO ARCHITECT FOR EXACT HEIGHT AND LOCATION OF ALL FLOOR AND WALL OUTLETS.
- CONTRACTOR SHALL PROVIDE NEW CIRCUIT DIRECTORY CARD AT PANELS. CIRCUITS SHALL BE LABELED TO CORRESPOND TO THE CIRCUITS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CONNECT CIRCUITS AS REQUIRED TO COMPLY WITH THIS DRAWING.
- CONDUCTORS SHALL BE #12 AWG SOLID COPPER (THIN) IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED.
- CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
- COORDINATE THE INSTALLATION OF ELECTRICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, MECHANICAL EQUIPMENT AND SYSTEMS, AND STRUCTURAL COMPONENTS. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.
- VERIFY MECHANICAL EQUIPMENT SWITCH AND CONNECTION REQUIREMENTS, ITEM BY ITEM, WITH THE MECHANICAL CONTRACTOR, BEFORE WIRING EQUIPMENT. RESOLVE ALL DISCREPANCIES WITHOUT FURTHER COST TO OWNER.

ELECTRICAL POWER KEYED NOTES:

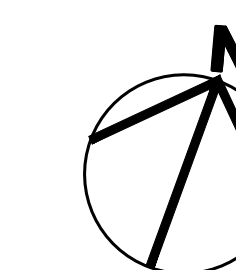
- REUSE EXISTING DISCONNECT AND RELOCATE. EXTEND/REROUTE EXISTING WIRING TO NEW LOCATION.
- PROVIDE 20 AMP, 120V, N/1-POLE/HD TOGGLE SWITCH IN ACCESSIBLE LOCATION.
- PROVIDE 60A, 240V, 3-POLE/N3R DISCONNECT IN ACCESSIBLE LOCATION.
- PROVIDE 30A, 240V, 2-POLE/N3R DISCONNECT IN ACCESSIBLE LOCATION.
- CONFIRM THAT AN EXISTING CONVENIENCE RECEPTACLE EXISTS WITHIN 25 FEET OF EQUIPMENT. OTHERWISE, PROVIDE NEW WEATHERPROOF/GFI RECEPTACLE AND CONNECT TO EXISTING EXTERIOR RECEPTACLE CIRCUIT.

E|B|E Mechanical
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24 Greenway Plaza, Ste 1211, Houston, Tx 77046
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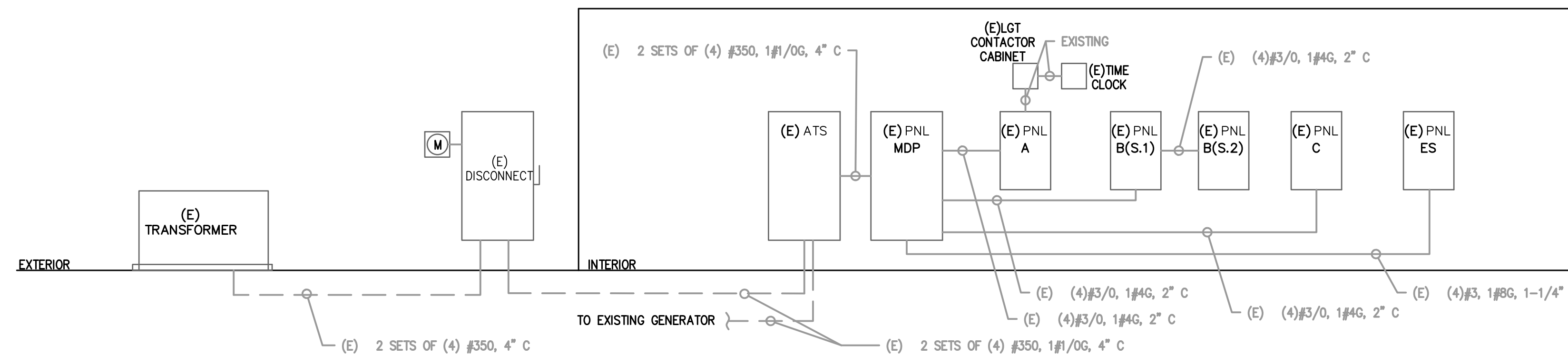
NOT FOR CONSTRUCTION

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

ELECTRICAL EQUIPMENT PLAN



E1.01



01 PARTIAL DISTRIBUTION DIAGRAM
SCALE: NO SCALE

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUCTOR DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE, "I" INDICATES INSULATED OR ISOLATED GROUND, "2" INDICATES SWITCHLEG, AND NO HATCHES INDICATES TWO CONDUCTORS.
	PARTIAL HOME RUN. SAME AS ABOVE.
	CONDUIT RUN CONCEALED IN FLOOR SLAB, BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	QUADRUPLEX RECEPTACLE OUTLET GANGED WITH A COMMON WALL PLATE; (2)-20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE. (IF REQUIRED)
	MOTOR STARTER / DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE.
	TRANSFORMER - REFER TO DRAWINGS FOR VOLTAGE AND AMPERAGE.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 120/208 VOLT.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 277/480 VOLT.

NOTES: 1. ALL SYMBOLS MAY NOT BE USED ON THIS DRAWINGS.
2. REFER TO SPECIFICATIONS FOR MOUNTING HEIGHTS

BRANCH CIRCUIT SCHEDULE

OCFD AMP/POLES	DESCRIPTION	OCFD AMP/POLES	DESCRIPTION
20/1	(2)#12, (1)#12G, 1/2" C	70/1	(2)#4, (1)#8G, 3/4" C
20/2	(3)#12, (1)#12G, 1/2" C	70/2	(3)#4, (1)#8G, 1" C
20/3	(4)#12, (1)#12G, 1/2" C	70/3	(4)#4, (1)#8G, 1-1/4" C
25/1	(2)#10, (1)#10G, 1/2" C	80/1	(2)#3, (1)#8G, 1" C
25/2	(3)#10, (1)#10G, 1/2" C	80/2	(3)#3, (1)#8G, 1-1/4" C
25/3	(4)#10, (1)#10G, 1/2" C	80/3	(4)#3, (1)#8G, 1-1/4" C
30/1	(2)#10, (1)#10G, 1/2" C	90/1	(2)#2, (1)#8G, 1" C
30/2	(3)#10, (1)#10G, 1/2" C	90/2	(3)#2, (1)#8G, 1-1/4" C
30/3	(4)#10, (1)#10G, 1/2" C	90/3	(4)#2, (1)#8G, 1-1/4" C
35/1	(2)#8, (1)#10G, 1/2" C	100/2	(3)#1, (1)#8G, 1-1/4" C
35/2	(3)#8, (1)#10G, 3/4" C	100/3	(4)#1, (1)#8G, 1-1/2" C
35/3	(4)#8, (1)#10G, 3/4" C	110/2	(3)#1, (1)#6G, 1-1/2" C
40/1	(2)#8, (1)#10G, 1/2" C	110/3	(4)#1, (1)#6G, 1-1/2" C
40/2	(3)#8, (1)#10G, 3/4" C	125/2	(3)#1, (1)#6G, 1-1/2" C
40/3	(4)#8, (1)#10G, 3/4" C	125/3	(4)#1, (1)#6G, 1-1/2" C
45/1	(2)#6, (1)#10G, 1" C	150/2	(3)#1/0, (1)#6G, 1-1/2" C
45/2	(3)#6, (1)#10G, 1" C	150/3	(4)#1/0, (1)#6G, 1-1/2" C
45/3	(4)#6, (1)#10G, 1" C	175/2	(3)#2/0, (1)#6G, 1-1/2" C
50/1	(2)#6, (1)#10G, 1" C	175/3	(4)#2/0, (1)#6G, 2" C
50/2	(3)#6, (1)#10G, 1" C	200/2	(3)#3/0, (1)#6G, 2" C
50/3	(4)#6, (1)#10G, 1" C	200/3	(4)#3/0, (1)#6G, 2" C
60/1	(2)#4, (1)#10G, 3/4" C	225/2	(3)#4/0, (1)#4G, 2" C
60/2	(3)#4, (1)#10G, 1" C	225/3	(4)#4/0, (1)#4G, 2-1/2" C
60/3	(4)#4, (1)#10G, 1" C	250/2	(3)#250kcmil, (1)#4G, 2-1/2" C
		250/3	(4)#250kcmil, (1)#4G, 2-1/2" C

NOTE: THIS SCHEDULE IS FOR TYPICAL BRANCH CIRCUITS THAT ARE NOT DESIGNATED ON THE ONE-LINE OR RISER DIAGRAM. REFER TO PANELBOARD SCHEDULES FOR CIRCUIT BREAKER/ FUSE SIZES AND NUMBER OF POLES. REFER TO FLOOR PLANS FOR DISCONNECT SWITCH SIZES.

REVISIONS

NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATIONS
CITY OF CONROE FIRE STA. #4
14901 WALTER WOODSON DR.
CONROE, TEXAS 77384



24 Greenway Plaza, Ste 1211, Houston, Tx 77046
Tel: (713) 840-0177 / Firm Reg. No: 5638

NOT FOR CONSTRUCTION

SCALE: NONE

ELECTRICAL LEGENDS

E2.01

PROJECT NAME: HVAC RENOVATION - 14901 WALTER WOODSON												
PROJECT NUMBER: 19172.00												
PANEL: MDP EXISTING PANEL												
VOLTAGE: 120/208V, 3PH, 4W BUS: 600 AMP MAINS: 600A, M.C.B. ACCESSORIES:												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION	LOAD	CODE		
		SPACE	1	A	2	603		TV/SS		2		
		SPACE	3	B	4	--				2		
		SPACE	5	C	6	--				2		
		SPACE	7	A	8	--		SPACE				
		SPACE	9	B	10	--						
		SPACE	11	C	12	--						
7		PANELS	1003	13	A	14	2003	PANEL A		7		
7			--	15	B	16	--			7		
7			--	17	C	18	--			7		
7		PANEL C	2003	19	A	20	2003	PANEL B		7		
7			--	21	B	22	--			7		
7			--	23	C	24	--			7		
		LIGHTS						PHASE	CONN KVA	LOAD FACTORS	DES. KVA	DES. AMP
	0	0	0	0	0	0	0	A	0.0	LIGHTS @ 125%	0.0	0
	0	0	0	0	0	0	0	B	0.0	EQUIP @ 100%	0.0	0
	0	0	0	0	0	0	0	C	0.0	LG. MOTOR @ 125%	0.0	0
	0	0	0	0	0	0	0	TOTAL	0.0	RECEPS @ 10kW+50%	0.0	0
SUB-FEED PANELS:												
		PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP						
		PANEL A	29.4	SUB FEED @ 100%	29.4	82						
		PANEL B	69.5	SUB FEED @ 100%	69.5	193						
		PANEL C	44.0	SUB FEED @ 100%	44.0	122						
		PANLES	14.1	SUB FEED @ 100%	14.1	39						
		GRAND TOTAL	156.9		436							

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
 ** EXISTING SPARE CIRCUIT BREAKER
 *** EXISTING BREAKER SPACE
 **** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: HVAC RENOVATION - 14901 WALTER WOODSON												
PROJECT NUMBER: 19172.00												
PANEL: A EXISTING PANEL												
VOLTAGE: 120/208V, 3PH, 4W BUS: 250 AMP MAINS: M.L.O. ACCESSORIES:												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION	LOAD	CODE		
2	350	STORM DOOR #2	20/1	1	A	2	20/1	RECEPT APP BAY GFI RM 113	360	1		
2	480	SECT DOOR #4	20/1	3	B	4	20/1	RECEPT RM 114 & OUTSIDE BELL	540	1		
2	350	STORM DOOR #1	20/1	5	C	6	20/1	RECEPT RM 112	540	1		
2	450	STORM DOOR #2	20/1	7	A	8	20/1	RECEPT RM 201	720	1		
5	160	EXISTING	20/1	9	B	10	20/1	RECEPT RM 202	540	1		
1	540	CORD REEL IN APP BAY	20/1	11	C	12	20/1	RECEPT 113	360	1		
1	540	CORD REEL IN APP BAY	20/1	13	A	14	20/1	EXISTING	360	5		
1	360	CORD REEL IN APP BAY	20/1	15	B	16	20/1	EXISTING	490	5		
1	360	CORD REEL IN APP BAY	20/1	17	C	18	20/1	WATER HEATER CONTROLS	260	2		
2	1000	HEATER #1	20/1	19	A	20	20/1	EXISTING	450	5		
2	1000	HEATER #2	20/1	21	B	22	20/1	EXISTING	320	5		
5	320	EXISTING	20/1	23	C	24	20/1	RECEPT APP BAY & GFI	540	1		
5	1120	EXISTING	100/2	25	A	26	20/1	GEN BATTERY BELMART & HEAT	400	2		
5	420	EXISTING	--	27	B	28	20/1	GEN BATTERY CHARGER	460	2		
5	1200	EXISTING	20/1	29	C	30	20/1	GEN BLOCK HEATER	1100	2		
5	1320	EXISTING	20/1	31	A	32	20/1	APP BAY LIGHTS	960	0		
1	540	RECEPT IN APP BAY & GFCI	20/1	33	B	34	20/1	APP BAY LIGHTS	1120	0		
1	720	RECEPT IN APP BAY & TRAFFIC CC	20/1	35	C	36	20/1	APP BAY LIGHTS	1120	0		
1	720	RECEPT IN APP BAY & RM113	20/1	37	A	38	20/1	APP BAY LIGHTS	1320	0		
1	540	RECEPT IN RM 115 & 114	20/1	39	B	40	20/1	LIGHTS HOSE RM 112 & 202	1100	0		
1	540	RECEPT IN RM 115	20/1	41	C	42	20/1	EXISTING	460	5		
		LIGHTS						PHASE	CONN KVA	LOAD FACTORS	DES. KVA	DES. AMP
	2280	2520	2200	4063	0	A	11.1	LIGHTS @ 125%	11.6	97		
	2220	2340	1920	1738	0	B	8.2	EQUIP @ 100%	8.8	73		
	1120	3420	1710	2475	0	C	8.7	LG. MOTOR @ 125%	9.0	75		
	5620	8280	5830	8275	0	TOTAL	28.0	RECEPS @ 10kW+50%	28.4	82		

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
 ** EXISTING SPARE CIRCUIT BREAKER
 *** EXISTING BREAKER SPACE
 **** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: HVAC RENOVATION - 14901 WALTER WOODSON												
PROJECT NUMBER: 19172.00												
PANEL: B SECT 1 EXISTING PANEL												
VOLTAGE: 120/208V, 3PH, 4W BUS: 250 AMP MAINS: M.L.O. ACCESSORIES: FEED THRU LUGS												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION	LOAD	CODE		
1	720	RECEPT RM 106 & 107	20/1	1	A	2	20/1	RECEPT RM 101, 15	540	1		
1	360	KITCHEN ISLAND	20/1	3	B	4	20/1	RECEPT RM 135, KITCHEN	540	1		
1	600	RECEPT GFCI RM 102	20/1	5	C	6	20/1	RECEPT RM 103, 106, 135	360	1		
1	540	RECEPT RM 109 & 104	20/1	7	A	8	20/3	EXISTING	450	5		
5	360	EXISTING	20/1	9	B	10	--		450	5		
0	650	PATIO FAN & LIGHTS	20/1	11	C	12	--		450	5		
1	900	PLUGS RM 119, 128, 129	20/1	13	A	14	20/1	RECEPT KITCHEN GFI	360	1		
1	450	RECEPT RM 118	20/1	15	B	16	20/1	RECEPT KITCHEN GFI	360	1		
2	800	RECEPT RM 118 WASHING MACH	20/1	17	C	18	20/1	RECEPT KITCHEN	540	1		
2	800	RECEPT RM 118 DRYER	30/2	19	A	20	20/1	RECEPT KITCHEN RANGE	540	1		
2	800	--	--	21	B	22	20/2	VENTHOOD FAN IN KITCHEN	600	2		
5	620	EXISTING	20/3	23	C	24	--		600	2		
5	620	--	--	25	A	26	20/1	KITCHEN DISHWASHER	1200	6		
5	620	--	--	27	B	28	20/1	RECEPT KITCHEN ISLAND GFI	540	1		
1	540	RECEPT 107	20/1	29	C	30	20/1	RECEPT PATIO FOR GAS GRILL	720	1		
1	720	RECEPT 118	20/1	31	A	32	20/1	RECEPT PATIO FOR CONVENIENCE	540	1		
3	4128	OA-AHU-1	****	45/3	33	34	15/2	OA-CU-1	****	842	3	
3	4128	--	****	--	35	36	--	--	****	842	3	
3	4128	--	****	--	37	38	20/1	DAMPERS	****	200	2	
5	320	EXISTING	20/1	39	B	40	20/1	RECEPT ARK FAULT RM 116	540	1		
1	540	RECEPT ARK FAULT 126	20/1	41	C	42	20/1	RECEPT ARK FAULT RM 124	540	1		
1	360	RECEPT ARK FAULT	20/1	43	A	44	20/1	RECEPT ARK FAULT	540	1		
1	900	RECEPT ARK FAULT 125, 124	20/1	45	B	46	15/1	AEF-2	****	500	3	
3	500	AEF-1	***	15/1	47	C	48	15/1	MUAF-1	****	670	3
		LIGHTS						PHASE	CONN KVA	LOAD FACTORS	DES. KVA	DES. AMP
	0	5760	2200	5466	0	A	13.4	LIGHTS @ 125%	12.2	102		
	0	3690	1400	7658	0	B	12.7	EQUIP @ 100%	12.6	105		
	650	3840	1400	7478	0	C	13.4	LG. MOTOR @ 125%	13.3	111		
	650	13290	5000	20601	0	TOTAL	39.5	RECEPS @ 10kW+50%	38.1	106		
SUB-FEED PANELS:												
		PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP						
		PANEL B SECT 2	31.4	SUB FEED @ 100%	31.4	87						
		GRAND TOTAL	69.5		193							

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
 ** EXISTING SPARE CIRCUIT BREAKER
 *** EXISTING BREAKER SPACE
 **** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: HVAC RENOVATION - 14901 WALTER WOODSON												
PROJECT NUMBER: 19172.00												
PANEL: B SECT 2 EXISTING PANEL												
VOLTAGE: 120/208V, 3PH, 4W BUS: 250 AMP MAINS: M.L.O. ACCESSORIES:												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION	LOAD	CODE		
		SPACE	49	A	50	--		SPACE				
		SPACE	51	B	52	--		SPACE				
2	600	RECEPT R. 118 ICE MACHINE	20/1	53	C	54	20/1	LIGHTS SLEEPING 127, 129, 130	960	0		
2	600	RECEPT KITCHEN ICE MACHINE	20/1	55	A	56	20/1	LIGHTS SLEEPING 124, 125, 126	850	0		
2	800	RECEPT VENDING ICE MACHINE	20/1	57	B	58	20/1	LIGHTS CORRIDOR 119	960	0		
1	540	RECEPT ELECTRICAL RM 120	20/1	59	C	60	20/1	LIGHTS CORRIDOR 119	960	0		
0	860	LIGHTS #4 SIGNS	20/1	61	A	62	20/1	LIGHTS KITCHEN	560	0		
1	720	RECEPT RM 107	20/1	63	B	64	20/1	LIGHTS CORRIDOR 131	860	0		
1	900	RECEPT RM 107	20/1	65	C	66	20/1	LIGHTS BATH RM & EX. FAN	400	0		
1	540	RECEPT RM 103	20/1	67	A	68	20/1	LIGHTS DAY RM 106	540	0		
1	800	RECEPT KITCHEN MW	20/2	69	B	70	20/1	LIGHTS WEIGHT RM 107	420	0		
1	800	RECEPT KITCHEN MW	--	71	C	72	20/1	LIGHTS RECORD RM 106	540	0		
5	630	EXISTING	20/1	73	A	74	20/2	POLE LIGHTS	550	0		
5	890	EXISTING	20/1	75	B	76	--		550	0		
5	624	EXISTING	20/1	77	C	78	20/2	POLE LIGHTS	550	0		
0	800	DLR LIGHTS	20/1	79	A	80	--		550	0		
5	460	EXISTING	20/1	81	B	82	--		400	2		
2	600	RECEPT DRINK FOUNTAIN	20/1	83	C	84	20/1	GATE POWER	1200	0		
1	540	RECEPT EXTERIOR GFCI	20/1									

CONROE FIRE STATION #6

HVAC RENOVATION

15663 TX-105, MONTGOMERY, TX 77356

CONTRACT DOCUMENTS

ISSUE FOR BID 4/21/2020

APRIL 2020

A2S PROJECT NUMBER 00062

ARCHITECTURAL:

A2STUDIO ARCHITECTS, PLLC

MEP ENGINEER:

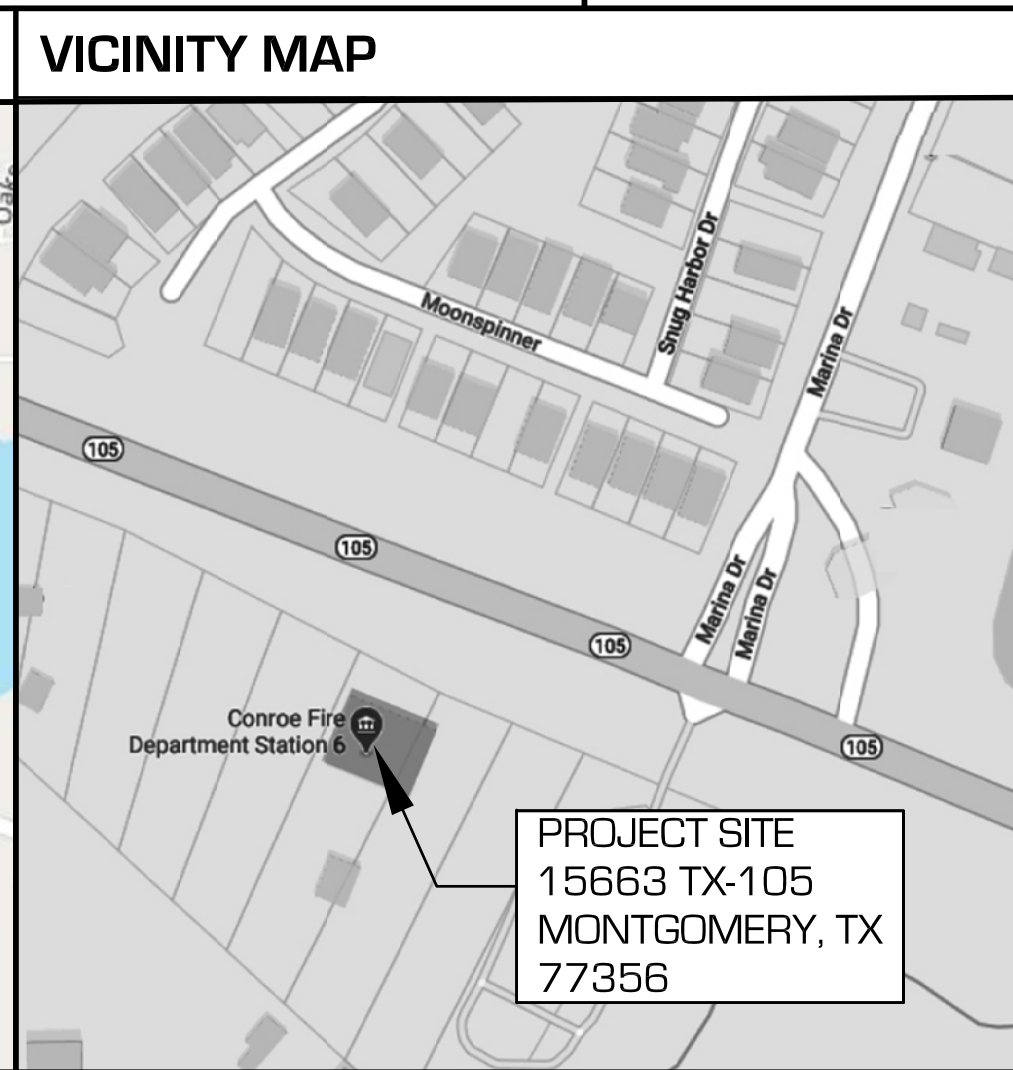
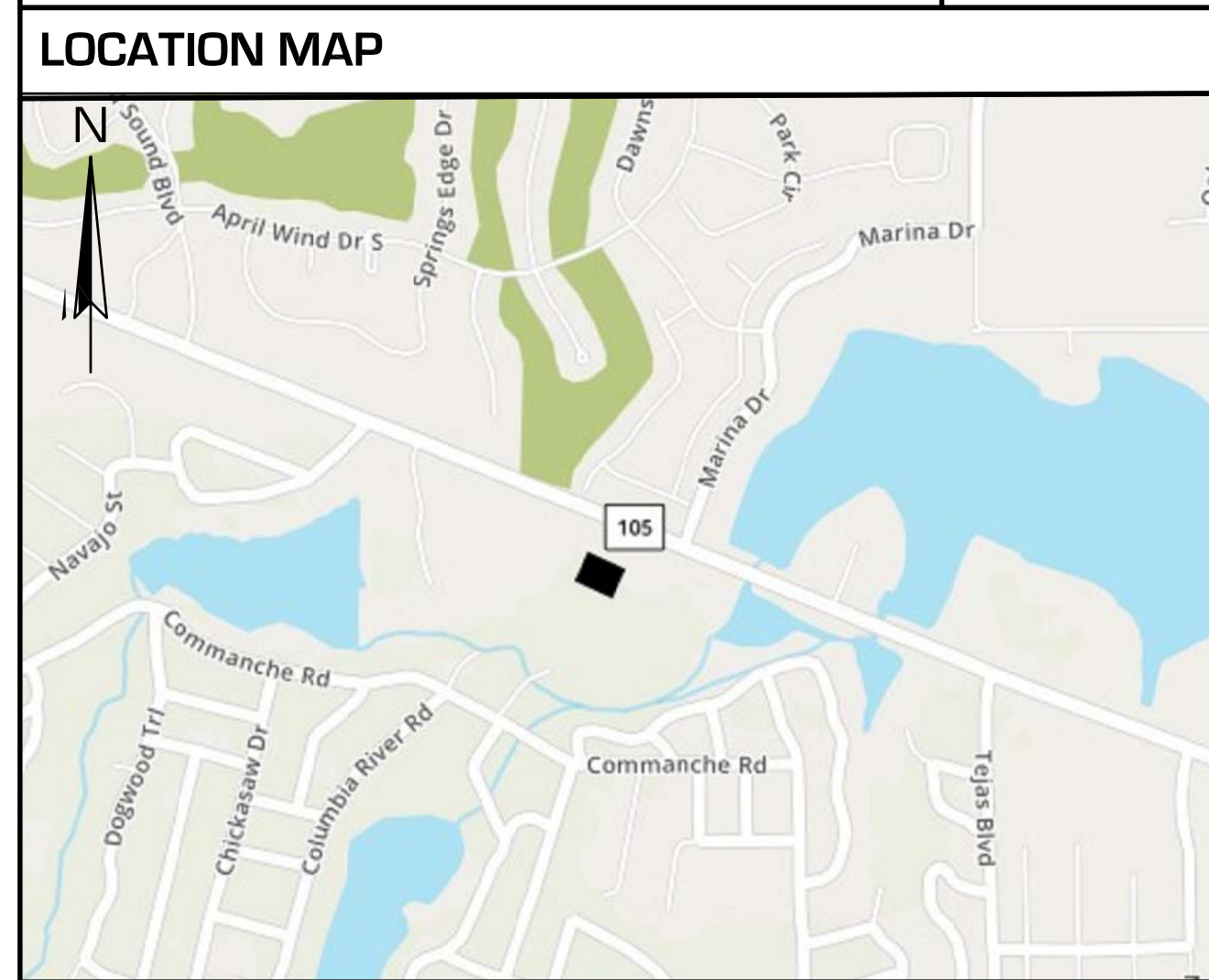
E/B/E, INC.

00062 - CONROE FIRE STATION #6, CONROE TX



1010 N. SAN JACINTO | SUITE 105
HOUSTON, TEXAS 77002
o 713 955 9177
www.a2studioarchitects.com

STANDARD ABBREVIATIONS		PLAN LEGEND		GENERAL NOTES		SHEET INDEX		DATE ISSUED																																																																																																																																																																																																																	
<p>AFF - ABOVE FINISH FLOOR CG - CORNER GUARD CJ - CONTROL JOINT DIA - DIAMETER DS - DOWN SPOUT DW - DISH WASHER EJ - EXPANSION JOINT EQ - EQUAL EWC - ELECTRIC WATER COOLER FD - FLOOR DRAIN FDC - FIRE DEPARTMENT CONNECTION FE - FIRE EXTINGUISHER FEC - FIRE EXTINGUISHER CABINET HVAC - HEATING, VENTILATING & AIR CONDITIONING MEP - MECHANICAL, ELECTRICAL, PLUMBING DRAWINGS MO - MASONRY OPENING NIC - NOT IN CONTRACT NTS - NOT TO SCALE OD - OVERFLOW DRAIN OFCI - OWNER FURNISHED CONTRACTOR INSTALLED OFOI - OWNER FURNISHED OWNER INSTALLED OH - OPPOSITE HAND R - RADIUS RCP - REFLECTED CEILING PLAN RD - ROOF DRAIN RE - REFERENCE RO - ROUGH OPENING REF - REFRIGERATOR SF - SQUARE FOOT SIM - SIMILAR STC - SOUND TRANSMISSION CLASS STRUCT. - STRUCTURAL DRAWINGS TYP - TYPICAL T.O. - TOP OF UL - UNDERWRITERS LABORATORIES UNO - UNLESS NOTED OTHERWISE VIF - VERIFY IN FIELD WC - WATER CLOSET WH - WATER HEATER</p>		<p>█ █ █ █ █ SMOKE RESISTANT WALL █ █ █ █ █ 1 HOUR FIRE RATED WALL █ █ █ █ █ 2 HOUR FIRE RATED WALL █ █ █ █ █ SMOKE BARRIER WALL</p> <p>01/A-301 BUILDING SECTION TAG 01/A-301 SECTION CUT TAG 01/A-201 ELEVATION TAG</p> <p>○ XX ○ XXXX DETAIL CALLOUT TAG</p> <p>△ A WINDOW NUMBER TAG ○ XXXX DOOR NUMBER TAG LOBBY 101 ROOM NUMBER TAG</p> <p>A PARTITION TYPE TAG</p> <p>☁ 1 REVISION TAG AND CLOUD</p> <p>XX KEY NOTE TAG</p> <p>⊕ NORTH ARROW</p> <p>— ANNOTATION LEADERS</p> <p>PARAPET CAP ELEV. +20'-4" ELEVATION CALL OUT (ELEVATIONS, SECTIONS AND DETAILS)</p> <p>— BREAK LINE</p> <p>3'-0" DIMENSION STRING</p>		<p>1. ALL MATERIAL AND WORK SHALL BE IN ACCORDANCE WITH ADOPTED CODES, REGULATIONS AND GUIDELINES, INCLUDING BUT NOT LIMITED TO: IBC, IMC, IPC, NFPA 101 LIFE SAFETY CODE, ADAAG, NEC, AND STATE PLUMBING CODES.</p> <p>2. UNLESS OTHERWISE NOTED IN THE PROJECT MANUAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING ALL FEES ASSOCIATED WITH OBTAINING ANY BUILDING PERMITS. THE CONTRACTOR SHALL PROVIDE A PERFORMANCE AND PAYMENT BOND AND ASSOCIATED GENERAL LIABILITY INSURANCE POLICIES INCLUDING BUILDERS RISK.</p> <p>3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SAFETY AND SECURITY AND SHALL COMPLY WITH ALL LAWS AND REGULATIONS INCLUDING BUT NOT LIMITED TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES.</p> <p>4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING SITE UTILITIES AND SYSTEMS CAUSED IN HIS EXECUTION OF THE WORK. WHERE RENOVATION WORK OCCURS, THE CONTRACTOR SHALL PROTECT ALL ADJACENT AREAS AND FINISHES.</p> <p>5. THE CONTRACTOR SHALL TAKE STEPS TO CONTROL THE SPREAD OF DUST AND CONSTRUCTION DEBRIS ON SITE AND THROUGH THE HVAC SYSTEM IN NEW AND EXISTING CONSTRUCTION WHERE APPLICABLE.</p> <p>6. THE CONTRACTOR SHALL SCHEDULE ANY INTERRUPTIONS TO UTILITY SERVICES WITH THE OWNER AND THE UTILITY COMPANY AT LEAST 72 HOURS IN ADVANCE OF THE PLANNED OUTAGE.</p> <p>7. THE CONTRACTOR SHALL PROVIDE FOR HIS OWN TEMPORARY ELECTRICAL POWER OR THE CONTRACTOR SHALL ARRANGE FOR USE OF OWNERS ELECTRICITY.</p> <p>8. THE CONTRACTOR SHALL PROVIDE DOMESTIC WATER ON SITE FOR HIS EXECUTION OF THE WORK OR THE CONTRACTOR SHALL ARRANGE FOR USE OF THE OWNERS DOMESTIC WATER SUPPLY.</p> <p>9. THE CONTRACTOR SHALL PROVIDE HIS OWN TEMPORARY RESTROOM FACILITIES IN A LOCATION APPROVED BY THE OWNER.</p> <p>10. THE CONTRACTOR SHALL MAINTAIN APPROPRIATE FIRE EXTINGUISHMENT EQUIPMENT DURING CONSTRUCTION IN ACCORDANCE WITH NATIONAL AND LOCAL CODES AND GUIDELINES.</p> <p>11. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND FIELD CONDITIONS PRIOR TO COMMENCING WORK AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION OR INSTALLATION.</p> <p>12. THE CONTRACTOR SHALL COMPLY WITH ALL LAWS AND REGULATIONS WITH REGARDS TO EXCAVATION WORK AND UNDERGROUND UTILITIES AND SHALL NOTIFY THE PROPER AUTHORITIES PRIOR TO COMMENCING SUCH WORK. THE CONTRACTOR SHALL PROTECT UTILITIES ABOVE AND BELOW GROUND DURING THE COURSE OF EXCAVATION WORK.</p> <p>13. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY SHOULD MATERIALS SUSPECTED TO CONTAIN ASBESTOS OR OTHER HAZARDOUS SUBSTANCES BE DISCOVERED IN THE COURSE OF THE WORK.</p> <p>14. MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR SHALL COORDINATE THE WORK OF ALL TRADES FOR THE INSTALLATION OF DUCTWORK, OVER-HEAD PIPING, ELECTRICAL FIXTURES AND DEVICES, FIRE ALARM DEVICES, SPRINKLER PIPING AND HEADS, DETECTORS.</p> <p>15. THE CONTRACTOR SHALL NOT SUBSTITUTE ANY MATERIALS, SYSTEMS OR PRODUCTS WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.</p>		<p>FEB. 24, 2020 APR. 21, 2020</p> <table border="1"> <thead> <tr> <th>SHEET</th> <th>SHEET NAME</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>CS-01</td> <td>COVER SHEET</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-001</td> <td>GENERAL INFORMATION & SHEET INDEX</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-002</td> <td>ARCHITECTURAL SPECIFICATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-003</td> <td>ARCHITECTURAL SPECIFICATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">ARCHITECTURAL</td> </tr> <tr> <td>A-101</td> <td>EXISTING ARCHITECTURAL FLOOR PLAN AND PARTITION DETAIL</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-111</td> <td>EXISTING REFLECTED CEILING PLAN</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-201</td> <td>BUILDING ELEVATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">MECHANICAL</td> </tr> <tr> <td>MEP 1.01</td> <td>MECHANICAL SPECIFICATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MEP 2.01</td> <td>ELECTRICAL SPECIFICATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MEP 3.01</td> <td>PLUMBING SPECIFICATIONS</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>M 1.01</td> <td>MECHANICAL PLAN</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>M 2.01</td> <td>MECHANICAL SCHEDULES</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">PLUMBING</td> </tr> <tr> <td>P 1.01</td> <td>PLUMBING PLAN</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P 2.01</td> <td>PLUMBING RISER</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">ELECTRICAL</td> </tr> <tr> <td>E 1.01</td> <td>ELECTRICAL PLAN</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>E 2.01</td> <td>ELECTRICAL SCHEDULES</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		SHEET	SHEET NAME									CS-01	COVER SHEET	•	•							A-001	GENERAL INFORMATION & SHEET INDEX	•	•							A-002	ARCHITECTURAL SPECIFICATIONS	•	•							A-003	ARCHITECTURAL SPECIFICATIONS	•	•							ARCHITECTURAL										A-101	EXISTING ARCHITECTURAL FLOOR PLAN AND PARTITION DETAIL	•	•							A-111	EXISTING REFLECTED CEILING PLAN	•	•							A-201	BUILDING ELEVATIONS	•	•							MECHANICAL										MEP 1.01	MECHANICAL SPECIFICATIONS	•	•							MEP 2.01	ELECTRICAL SPECIFICATIONS	•	•							MEP 3.01	PLUMBING SPECIFICATIONS	•	•							M 1.01	MECHANICAL PLAN	•	•							M 2.01	MECHANICAL SCHEDULES	•	•							PLUMBING										P 1.01	PLUMBING PLAN	•	•							P 2.01	PLUMBING RISER	•	•							ELECTRICAL										E 1.01	ELECTRICAL PLAN	•	•							E 2.01	ELECTRICAL SCHEDULES	•	•						
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1010 N. SAN JACINTO | SUITE 105
 HOUSTON, TEXAS 77002
 o 713 955 9177
 www.a2studioarchitects.com

Project:
**CONROE
 FIRE STATION #6
 HVAC RENOVATION**
 CONROE, TEXAS

Consultant:

Seal:

Revisions:

ISSUE FOR BID	4/21/2020

Sheet Title:

**GENERAL INFORMATION
 AND SHEET INDEX**

Drawn By: ALD
 Checked By: LDA
 Project No.: 00062
 Project Phase: CONTRACT DOCUMENTS
 Date: APRIL 2020
 Sheet No.:

A-001

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DIVISION 01 - GENERAL REQUIREMENTS

- ALL WORK IDENTIFIED AS "BY OWNER" SHALL BE PERFORMED BY THE OWNER UNDER SEPARATE CONTRACTS WITH OWNERS.
- ALL SAMPLES REQUIRED SHALL BE SUBMITTED FOR APPROVAL PRIOR TO ORDERING AND/OR INSTALLATION OF SAID MATERIAL.
- THE CONTRACTOR SHALL PREPARE AND FURNISH SHOP DRAWINGS AND PRODUCT DATA SHEETS, SOME OF THE SHOP DRAWINGS/SUBMITTALS REQUIRED (BUT NOT LIMITED TO) ARE AS FOLLOWS:

MISC. METAL FABRICATIONS ARCHITECTURAL WOODWORK CAULKING/SEALANTS DOORS, WINDOWS, FRAMES & HARDWARE GLASS/GLAZING TOILET COMPARTMENTS	TOILET ACCESSORIES FIREFIGHTING DEVICES FINISHES MECHANICAL PLUMBING ELECTRICAL
--	--
- THE CONTRACTOR, IN THE WORK OF ALL TRADE DISCIPLINES, WILL PERFORM ANY AND ALL CUTTING, PATCHING, REPAIRING, RESTORING, AND THE LIKE NECESSARY TO COMPLETE THE WORK AND TO RESTORE DAMAGED OR AFFECTED SURFACES RESULTING FROM THE WORK OF THIS CONTRACT TO THEIR ORIGINAL CONDITION AND TO THE SATISFACTION OF THE ARCHITECT.
- THE CONTRACTOR SHALL COORDINATE WORK PERFORMED BY HIS/HER SUBCONTRACTORS AND BY OTHER CONTRACTORS CONTRACTED BY OWNER, ALL OVERLAPS AND/OR GAPS IN THE WORK, IF ANY, SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT FOR RESOLUTION PRIOR TO COMMENCEMENT OF THE WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, AND DIMENSIONS FOR ACCURACY AND CONFIRMING THAT WORK IS BUILDABLE AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. IF THERE ARE ANY QUESTIONS REGARDING THESE OR OTHER COORDINATING QUESTIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE PROCEEDING WITH WORK IN QUESTION OR ANY OTHER RELATED WORK.
- SHOULD THERE BE ANY DISCREPANCY IN THE REQUIREMENTS OF THE DRAWINGS OR THE SPECIFICATIONS, THE BETTER QUALITY AND/OR GREATER QUANTITY OF WORK AND MATERIALS SHALL BE PRICED, AND UNLESS OTHERWISE ORDERED OR IN WRITING, SHALL BE FURNISHED AND INSTALLED.
- IF ANY ERROR AND/OR OMISSION IS EVIDENT IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY VIA TELEPHONE CALL AND IN WRITING OF SUCH ERROR OR OMISSION PRIOR TO PROCEEDING WITH THE WORK.
- PROVIDE ALL WORK AND MATERIALS AS REQUIRED BY THE DRAWINGS, AND IN FULL ACCORDANCE WITH ALL CODES AND ORDINANCES.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS NECESSARY TO ENSURE GOOD WORKMANSHIP AND A COMPLETE INSTALLATION.
- LEGENDS AND NOTES APPEAR ON DRAWINGS TO WHICH THEY RELATE, BUT ARE NOT LIMITED TO THAT DRAWING AND MAY BE APPLICABLE TO OTHER CONTRACT DOCUMENTS. DETAILS ARE TYPICALLY KEYED ONLY ONCE ON THE PLANS OR ELEVATIONS WHEN THEY FIRST OCCUR, AND ARE TYPICAL FOR SIMILAR CONDITIONS THROUGHOUT UNLESS OTHERWISE NOTED.
- DIMENSIONS NOTED ON DRAWINGS AS "CLEAR" AND "HOLD" ARE CRITICAL FOR ACCESSIBILITY AND EQUIPMENT CLEARANCES.
- PROVIDE STIFFENERS, BRACING, BACK-UP PLATES, ETC. AS REQUIRED AT STUD WALLS FOR SUPPORT OF FIXTURES OR EQUIPMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY ARRIVAL OF ALL SPECIFIED FINISH MATERIALS, EQUIPMENTS, LIGHT FIXTURES, AND ANY OTHER MATERIALS TO BE UTILIZED ON THIS PROJECT. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING WITHIN 10 DAYS OF AWARD OF CONTRACT ON ANY SPECIFIC ITEMS THAT MAY NOT BE READILY AVAILABLE AND THE ALTERNATE ITEMS THAT THE CONTRACTOR RECOMMENDS AS READILY AVAILABLE AND OF EQUAL QUALITY. IF NOTIFICATION IS NOT RECEIVED BY THE ARCHITECT, THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR THE ORDERING AND FOLLOW-UP OF SPECIFIED ITEMS AND WILL PURSUE WHATEVER MEANS NECESSARY, AT NO ADDITIONAL COST TO THE OWNER, TO ENSURE AVAILABILITY OF ALL SPECIFIED ITEMS SO AS NOT TO DELAY PROGRESS OF THE WORK. NO EXTENSION OF TIME TO THE CONTRACT WILL BE ALLOWED FOR THE CONTRACTOR'S INABILITY TO SECURE SPECIFIED ITEMS.
- MATERIALS, PRODUCTS, OR METHODS SPECIFIED SHALL BE FURNISHED UNDER THE CONTRACT UNLESS WRITTEN APPROVAL FOR SUBSTITUTION IS PROVIDED BY THE ARCHITECT.
- ALL ITEMS ARE TO BE DELIVERED TO THE SITE IN ORIGINAL, UNOPENED CONTAINERS. ITEMS SHALL BE DELIVERED AND STORED IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE ITEMS FROM OCCURRING DURING CONSTRUCTION.
- ALL MATERIALS SHALL BE INSTALLED, APPLIED, SECURED, PROTECTED, AND CLEANED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND RECOMMENDATIONS.
- EXISTING SURFACES (AND SUB-SURFACES) TO RECEIVE NEW FINISHES SHALL BE PREPARED AS REQUIRED TO ELIMINATE DEFECTS.
- PENETRATIONS OF ONE HOUR WALLS SHALL BE PROTECTED BY 45-MINUTE FIRE RATED OPENING ASSEMBLIES OR BY FIRESTOPPING PROVIDING EQUIVALENT PROTECTION. FIRE DAMPER ASSEMBLIES WITH SLEEVES SHALL SIMILARLY BE PROVIDED WHERE DUCTWORK PENETRATES AN HOUR WALLS.
- THE CONTRACTOR SHALL AT TIMES KEEP THE PREMISES FREE OF RUBBISH OR WASTE MATERIAL CAUSED BY THE WORK. CONTRACTOR IS RESPONSIBLE FOR ONGOING CLEAN UP FOR THE DURATION OF THE PROJECT.
- THE CONTRACTOR SHALL CLOSELY COORDINATE HIS WORK, PROTECTION AND CLEAN UP WITH THE OWNER, WHENEVER FACILITIES WILL REMAIN IN USE BY THE OWNER DURING CONSTRUCTION.
- UPON SUBSTANTIAL COMPLETION OF THE PROJECT, CONTRACTOR WILL PROVIDE FIRST A "CONSTRUCTION CLEANING" USING HIS OWN FORCES AND SECONDLY A "FINAL CLEANING" JUST PRIOR TO OCCUPANCY. SCHEDULE "FINAL CLEANING" USING A PROFESSIONAL CLEANING COMPANY THAT IS ACCEPTABLE TO OWNER.
- THE ARCHITECT AND OWNER SHALL HAVE ACCESS TO OBSERVE CONSTRUCTION PROGRESS DURING NORMAL WORKING HOURS.
- OBTAIN PERMISSION FOR ALL MODIFICATIONS OR CHANGES TO THE DRAWINGS. IN CASE OF DISPUTE, BRING TO THE IMMEDIATE ATTENTION OF ARCHITECT FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK IN QUESTION.
- CONTRACTOR SHALL PROVIDE WASTE REMOVAL FACILITIES AND SERVICES AS REQUIRED TO MAINTAIN THE SITE IN CLEAN AND ORDERLY CONDITION. PROVIDE CONTAINERS AND REMOVE TRASH FROM SITE WEEKLY.
- REQUIRED EXITS SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 21 00 - THERMAL INSULATION

SCOPE: BATT INSULATION FOR FILLING PERIMETER WINDOW AND DOOR SHIM SPACES AND CREVICES IN EXTERIOR AND INTERIOR WALLS.

SUBMITTALS:

- PRODUCT DATA: PROVIDE DATA ON PRODUCT CHARACTERISTICS, PERFORMANCE CRITERIA, AND PRODUCT LIMITATIONS.
- MANUFACTURER'S CERTIFICATE: CERTIFY THAT PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS.

PRODUCTS: GLASS FIBER BATT INSULATION: FLEXIBLE UNFACED PREFORMED BATT OR BLANKET, COMPLYING WITH ASTM C665; FRICTION FIT.

- FLAME SPREAD INDEX: 25 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- SMOKE DEVELOPED INDEX: 50 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- COMBUSTIBILITY: NON-COMBUSTIBLE, WHEN TESTED IN ACCORDANCE WITH ASTM E136.
- THERMAL RESISTANCE: R-VALUE OF 19, U.N.O.

ACOUSTIC (SOUND ATTENUATION) BATS FIBER GLASS INSULATION: COMPLYING WITH ASTM C665, TYPE I AND ASTM E136; UNFACED PREFORMED FIBERGLASS BATTS WITHOUT VAPOR BARRIER, BATTS IN FIRE-RATED ASSEMBLIES TO BE UL LISTED.

- FLAME SPREAD INDEX: 10 OR LESS, WHEN TESTED IN ACCORDANCE ASTM E84.
- SMOKE DEVELOPED INDEX: 10 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- NRC: 0.85.
- THICKNESS: AS INDICATED.

MANUFACTURERS: (MATCH EXISTING)

CERTAINTEED CORPORATION: WWW.CERTAINTEED.COM.
JOHNS MANVILLE: WWW.JM.COM.
OWENS CORNING CORPORATION: WWW.OCBUILDINGSPEC.COM/SL.

EXECUTION: VERIFY THAT SUBSTRATE, ADJACENT MATERIALS, AND INSULATION MATERIALS ARE DRY AND THAT SUBSTRATES ARE READY TO RECEIVE INSULATION.

VERIFY SUBSTRATE SURFACES ARE FLAT, FREE OF HONEYCOMB, FINS, IRREGULARITIES, OR MATERIALS OR SUBSTANCES THAT MAY IMPEDE ADHESIVE BOND.

INSTALL INSULATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL IN EXTERIOR WALL SPACES WITHOUT GAPS OR VOIDS. DO NOT COMPRESS INSULATION. TRIM INSULATION NEATLY TO FIT SPACES. INSULATE MISCELLANEOUS GAPS AND VOIDS.
FIT INSULATION TIGHTLY IN CAVITIES AND TIGHTLY TO EXTERIOR SIDE OF MECHANICAL AND ELECTRICAL SERVICES WITHIN THE PLANE OF THE INSULATION.

DO NOT PERMIT INSTALLED INSULATION TO BE DAMAGED PRIOR TO ITS CONCEALMENT.

MEMBRANE FASTENERS: TYPE AND SIZE AS REQUIRED BY ROOF MEMBRANE MANUFACTURER FOR ROOFING SYSTEM AND WARRANTY TO BE PROVIDED; USE ONLY FASTENERS FURNISHED BY ROOF MEMBRANE MANUFACTURER.

CURB AND PARAPET FLASHING: SAME MATERIAL AS MEMBRANE, WITH ENCAPSULATED EDGE WHICH ELIMINATES NEED FOR SEAM SEALING THE FLASHING-TO-ROOF SPLICE; PRECUT TO 18" WIDE.

SECTION 07 25 00 - WEATHER BARRIERS

SCOPE: WATER-RESISTIVE BARRIER: UNDER EXTERIOR WALL CLADDING, OVER SHEATHING OR OTHER SUBSTRATE; NOT AIR TIGHT OR VAPOR RETARDANT.

AIR AND WATER BARRIERS: MATERIALS THAT FORM A SYSTEM TO STOP PASSAGE OF AIR THROUGH EXTERIOR WALLS, JOINTS BETWEEN EXTERIOR WALLS AND ROOF, AND JOINTS AROUND FRAMES OF OPENINGS IN EXTERIOR WALLS.

DEFINITIONS: WEATHER BARRIER: ASSEMBLIES THAT FORM EITHER WATER-RESISTIVE BARRIERS, AIR BARRIERS, OR VAPOR RETARDERS.

AIR BARRIER: AIR TIGHT BARRIER MADE OF MATERIAL THAT IS RELATIVELY AIR IMPERMEABLE BUT WATER VAPOR PERMEABLE, BOTH TO THE DEGREE SPECIFIED, WITH SEALED SEAMS AND WITH SEALED JOINTS TO ADJACENT SURFACES. NOTE: FOR THE PURPOSES OF THIS SPECIFICATION, VAPOR IMPERMEABLE AIR BARRIERS ARE CLASSIFIED AS VAPOR RETARDERS.

WATER-RESISTIVE BARRIER: WATER-SHEDDING BARRIER MADE OF MATERIAL THAT IS MOISTURE RESISTANT, TO THE DEGREE SPECIFIED, INTENDED TO BE INSTALLED TO SHED WATER WITHOUT SEALED SEAMS.

SUBMITTALS:

- PRODUCT DATA: PROVIDE DATA ON MATERIAL CHARACTERISTICS.
- MANUFACTURER'S INSTALLATION INSTRUCTIONS: INDICATE PREPARATION.

INSTALL AIR BARRIER, VAPOR RETARDER, AND WATER-RESISTIVE BARRIER MATERIALS IN MOCK-UP AS SPECIFIED IN SECTION 01 43 39 - MOCK UP WALL CONSTRUCTION.

FIELD CONDITIONS: MAINTAIN TEMPERATURE AND HUMIDITY RECOMMENDED BY THE MATERIALS MANUFACTURERS BEFORE, DURING AND AFTER INSTALLATION.

WEATHER-RESISTIVE BARRIER: PROVIDE ONE LAYER OF BUILDING WRAP OVER FLUID-APPLIED COATING.

PRODUCTS: WATER-RESISTIVE BARRIER: ON OUTSIDE SURFACE OF FLUID APPLIED WEATHER BARRIER AT STUCCO AND MASONRY CLADDED EXTERIOR WALLS.

DUPONT BUILDING INNOVATIONS: TYVEK STUCCOWRAP AND RELATED ASSEMBLY COMPONENTS: WWW.DUPONT.COM.

BUILDING WRAP: TEXTURED, SPUNBOUNDED POLYOLEFIN, NON-WOVEN, NON-PERFORATED WEATHER BARRIER.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 25 00 - WEATHER BARRIERS (CONT)

- AIR PENETRATION: 0.004 CFM/FT² AT 75 PA, WHEN TESTED IN ACCORDANCE WITH ASTM E2178, TYPE I PER ASTM E1677.
- WATER VAPOR TRANSMISSION: 50 PERMS, WHEN TESTED IN ACCORDANCE WITH ASTM E96, METHOD B.
- WATER PENETRATION RESISTANCE: 210 CM WHEN TESTED IN ACCORDANCE WITH AATCC TEST METHOD 127.
- BASIS WEIGHT: 2.1 OZ./YD², WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-410.
- AIR RESISTANCE: 300 SECONDS, WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-460.
- TENSILE STRENGTH: 30/30 LBS./IN., WHEN TESTED IN ACCORDANCE WITH ASTM D882, METHOD A.
- TEAR RESISTANCE: 7/9 LBS. WHEN TESTED IN ACCORDANCE WITH ASTM D1117.
- SURFACE BURNING CHARACTERISTICS: CLASS A, WHEN TESTED IN ACCORDANCE WITH ASTM E84. FLAME SPREAD: 5, SMOKE DEVELOPED: 25

AIR AND WATER BARRIER: ON OUTSIDE SURFACE OF STUCCO AND MASONRY CLADDED EXTERIOR WALLS USE AIR BARRIER COATING; ON OUTSIDE SURFACE OF SHEATHING OF EXTERIOR WALLS USE AIR BARRIER COATING.

PALEX USA, INC; PALEX USA WEATHERSEAL SPRAY & ROLL-ON: WWW.PAREXUSA.COM.

SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

AIR BARRIER COATING (WATER VAPOR PERMEABLE AND WATER-RESISTIVE), FLUID APPLIED: VAPOR PERMEABLE, ELASTOMERIC WATERPROOFING:

- AIR PERMEANCE: 0.001 CUBIC FEET PER MINUTE PER SQUARE FOOT, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E2178.
- WATER VAPOR PERMEANCE: 5 PERMS, MINIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M, PROCEDURE B.
- ULTRAVIOLET AND WEATHERING RESISTANCE: APPROVED IN WRITING BY MANUFACTURER FOR MINIMUM OF 6 MONTHS WEATHER EXPOSURE AFTER APPLICATION.
- SURFACE BURNING CHARACTERISTICS: FLAME SPREAD INDEX OF 25 OR LESS, SMOKE DEVELOPED INDEX OF 450 OR LESS, WHEN TESTED IN ACCORDANCE WITH ASTM E84.

ACCESSORIES: SEALANTS, TAPES, AND ACCESSORIES FOR SEALING WEATHER BARRIER AND SEALING WEATHER BARRIER TO ADJACENT SUBSTRATES: AS SPECIFIED OR AS RECOMMENDED BY WEATHER BARRIER MANUFACTURER.

FLEXIBLE FLASHING: SELF-ADHESIVE SHEET FLASHING COMPLYING WITH ASTM D1970/D1970M, EXCEPT SLIP RESISTANCE REQUIREMENT IS WAIVED IF NOT INSTALLED ON A ROOF. COMPOSITION, THICKNESS AND PRODUCT AS RECOMMENDED BY MANUFACTURER.

THINNERS AND CLEANERS: AS RECOMMENDED BY MATERIAL MANUFACTURER.

EXECUTION: VERIFY THAT SURFACES AND CONDITIONS ARE READY TO ACCEPT THE WORK OF THIS SECTION.

REMOVE PROJECTIONS, PROTRUDING FASTENERS, AND LOOSE OR FOREIGN MATTER THAT MIGHT INTERFERE WITH PROPER INSTALLATION.

CLEAN AND PRIME SUBSTRATE SURFACES TO RECEIVE ADHESIVES AND SEALANTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

AIR BARRIERS: INSTALL CONTINUOUS AIR TIGHT BARRIER OVER SURFACES INDICATED, WITH SEALED SEAMS AND WITH SEALED JOINTS TO ADJACENT SURFACES.

COATINGS: PREPARE SUBSTRATE IN MANNER RECOMMENDED BY COATING MANUFACTURER; TREAT JOINTS IN SUBSTRATE AND BETWEEN DISSIMILAR MATERIALS AS RECOMMENDED BY MANUFACTURER. WHERE EXTERIOR MASONRY VENEER IS TO BE INSTALLED, INSTALL MASONRY ANCHORS BEFORE INSTALLING WEATHER BARRIER OVER MASONRY; SEAL AROUND ANCHORS AIR TIGHT; USE FLASHING TO SEAL TO ADJACENT CONSTRUCTION AND TO BRIDGE JOINTS.

OPENINGS AND PENETRATIONS IN EXTERIOR WEATHER BARRIERS:

- INSTALL FLASHING OVER SILLS, COVERING ENTIRE SILL FRAME MEMBER, EXTENDING AT LEAST 5" ONTO WEATHER BARRIER AND AT LEAST 6" UP JAMBS; MECHANICALLY FASTEN STRETCHED EDGES.
- AT OPENINGS TO BE FILLED WITH FRAMES HAVING NAILING FLANGES, SEAL HEAD AND JAMB FLANGES USING A CONTINUOUS BEAD OF SEALANT COMPRESSED BY FLANGE AND COVER FLANGES WITH AT LEAST 4" WIDE; DO NOT SEAL SILL FLANGE.
- AT OPENINGS TO BE FILLED WITH NON-FLANGED FRAMES, SEAL WEATHER BARRIER TO ALL SIDES OF OPENING FRAMING, USING FLASHING AT LEAST 9" WIDE, COVERING ENTIRE DEPTH OF FRAMING.
- AT HEAD OF OPENINGS, INSTALL FLASHING UNDER WEATHER BARRIER EXTENDING AT LEAST 2" BEYOND FACE OF JAMBS; SEAL WEATHER BARRIER TO FLASHING.
- AT INTERIOR FACE OF OPENINGS, SEAL GAP BETWEEN WINDOW/DOOR FRAME AND ROUGH FRAMING, USING JOINT SEALANT OVER BACKER ROD.
- SERVICE AND OTHER PENETRATIONS: FORM FLASHING AROUND PENETRATING ITEM AND SEAL TO WEATHER BARRIER SURFACE.

FIELD QUALITY CONTROL:

- DO NOT COVER INSTALLED WEATHER BARRIERS UNTIL REQUIRED INSPECTIONS HAVE BEEN COMPLETED.
- OBTAIN APPROVAL OF INSTALLATION PROCEDURES BY THE WEATHER BARRIER MANUFACTURER BASED ON A MOCK-UP INSTALLED IN PLACE, PRIOR TO PROCEEDING WITH REMAINDER OF INSTALLATION.

PROTECTION: DO NOT LEAVE MATERIALS EXPOSED TO WEATHER LONGER THAN RECOMMENDED MANUFACTURER.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 60 00 - FLASHING AND SHEET METAL

SCOPE: THIS SECTION REQUIRES FABRICATION AND INSTALLATION OF PRE-FINISHED METAL FLASHING AND TRIM.

SUBMITTALS: FURNISH SHOP DRAWINGS FOR ALL REQUIRED SHEET METAL TRIM AND FABRICATIONS AND ANTICIPATED SHEET METAL FLASHING CONDITIONS. SHOW CLEARLY RELATIONSHIPS TO SUBSTRATES AND ADJACENT CONSTRUCTION. ADDRESS SLIP JOINTS, SPLICES, END CONDITIONS, AND FASTENING METHODS.

MATERIALS:

- PRE-FINISHED ALUMINUM: MINIMUM 24 GAUGE ALUMINUM WITH KYNAR 500 HIGH PERFORMANCE PAINT FINISH (TOP SIDE) AND NEUTRAL POLYESTER PAINT FINISH (BOTTOM SIDE), WHEN USED FOR EXPOSED METAL FLASHING OR FABRICATION.
- STAINLESS STEEL: ASTM A240/240M; TYPE 316, DEAD SOFT FULLY ANNEALED, 24 GAUGE MINIMUM, SIZE AS SCHEDULED; SMOOTH SURFACE, NUMBER 2B FINISH.

EXECUTION: WORK SHALL CONFORM TO BEST INDUSTRY PRACTICES AND SMACNA ARCHITECTURAL SHEET METAL MANUAL. USE CONCEALED FASTENERS AND ANCHORS TO MAXIMUM EXTENT POSSIBLE. USE STAINLESS STEEL FASTENERS WITH NEOPRENE WASHERS OR POP RIVETS ONLY IF NOT OTHER ALTERNATIVE EXISTS. ALLOW FOR THERMAL EXPANSION AND CONTRACTION IN FABRICATED ASSEMBLIES.

SECTION 07 92 00 - JOINT CAULKING

SCOPE: THIS SECTION INCLUDES ALL INTERIOR AND EXTERIOR SEALANT WORK.

SUBMITTALS:

- PRODUCT DATA: MANUFACTURER'S PRODUCT LITERATURE AND DATA SHEETS FOR EACH SEALANT PRODUCT TO BE USED ON PROJECT AS WELL AS FOR ALL SEALANT BACKER MATERIAL TO BE UTILIZED.
- SAMPLES: FULL LINE COLOR CHARTS OF EACH SEALANT PRODUCT PROPOSED FOR SELECTION BY ARCHITECT. IF REQUESTED BY ARCHITECT, PROVIDE ACTUAL CURED SEALANT SAMPLES ILLUSTRATING FULL RANGE OF AVAILABLE COLORS FOR SELECTION.
MATERIALS:

PRODUCTS:

- DOW CORNING 756 OR GE SILICONES SCS9000NB: ONE PART SILICONE SEALANT FOR SPECIALIZED EXTERIOR CAULKING OF ITEMS SUCH AS STONE MASONRY, METAL PANELS, AND EXPOSED SHEET METAL FLASHING JOINTS.
- DOW CORNING 786 OR GE SILICONES SCS1700: ONE PART SILICONE SEALANT FOR INTERIOR SANITARY CAULKING CONDITIONS AND WALL/FLOOR TILE MOVEMENT JOINTS.
- TREMCO 834 OR SONNEBORN SONOLAC: ONE PART SILICONIZED ACRYLIC LATEX SEALANT FOR GENERAL INTERIOR CAULKING CONDITIONS. (NON-MOVING JOINT)
- TREMCO DYMONIC OR SONNEBORN NP1: ONE PART, FAST CURING POLYURETHANE SEALANT FOR GENERAL INTERIOR SEALANT CONDITIONS. (MOVING JOINT)
- TREMCO DYMERIC OR SONNEBORN NP2: TWO PART, FAST-CURING POLYURETHANE SEALANT FOR GENERAL EXTERIOR SEALANT CONDITIONS.
- TREMCO THC901 OR SONNEBORN SL2: ONE PART SEMI-SELF-LEVELING POLYURETHANE SEALANT FOR CURB AND SIDEWALK JOINT CONDITIONS.
- NOMACO, INC. GREEN ROD OR APPROVED EQUAL: CLOSED CELL POLYETHYLENE FOAM PLASTIC BACKER ROD FOR EXTERIOR JOINTS.
- NOMACO, INC. SOF ROD OR APPROVED EQUAL: BICELLULAR POLYOLEFIN FOAM PLASTIC BACKER ROD MATERIAL FOR INTERIOR JOINTS.

EXECUTION: ALL SURFACES TO BE THOROUGHLY CLEAN AND DRY. WHERE JOINTS ARE DEEPER THAN 1/2" USE BACKER ROD AND POSITION WITHIN 1/2" OF THE SURFACE.

SEALANTS SHALL BE GUN APPLIED THROUGH A NOZZLE OPENING OF SUCH DIAMETER SO THAT THE FULL BEAD OF SEALANT IS GUNNED INTO THE JOINTS. TOOL BEAD IMMEDIATELY AFTER APPLICATION TO ENSURE FIRM FULL CONTACT.



1010 N. SAN JACINTO | SUITE 105
HOUSTON, TEXAS 77002
o 713 955 9177
www.a2studioarchitects.com

Project:

CONROE
FIRE STATION #6
HVAC RENOVATION
CONROE, TEXAS

Consultant:

Seal:



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Checked By: LDA

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DIVISION 09 - FINISHES

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

SCOPE: THIS SECTION INCLUDES PERFORMANCE CRITERIA FOR GYPSUM BOARD ASSEMBLIES, CEMENTITIOUS BACKING BOARD, GYPSUM WALLBOARD, JOINT TREATMENT AND ACCESSORIES, AND TEXTURED FINISH SYSTEM.

SUBMITTALS:

1. SHOP DRAWINGS: INDICATE SPECIAL DETAILS ASSOCIATED WITH FIREPROOFING AND ACOUSTIC SEALS.
2. PRODUCT DATA: PROVIDE DATA ON METAL FRAMING, GYPSUM BOARD, ACCESSORIES, AND JOINT FINISHING SYSTEM.
3. SAMPLES: SUBMIT TWO SAMPLES OF GYPSUM BOARD FINISHED WITH PROPOSED TEXTURE APPLICATION, 12" X 12" IN SIZE, ILLUSTRATING FINISH COLOR AND TEXTURE.

QUALITY ASSURANCE: INSTALLER SPECIALIZING IN PERFORMING GYPSUM BOARD INSTALLATION AND FINISHING, WITH MINIMUM 5 YEARS OF EXPERIENCE.

GYPSUM BOARD ASSEMBLIES: PROVIDE COMPLETED ASSEMBLIES COMPLYING WITH ASTM C840 AND GA-216.

GYPSUM WALLBOARD: 5/8" THICK, PAPER-FACED GYPSUM PANELS AS DEFINED IN ASTM C1396/C1396M; SIZES TO MINIMIZE JOINTS IN PLACE; ENDS SQUARE CUT. USE FOR VERTICAL SURFACES AND CEILINGS, UNLESS OTHERWISE INDICATED.

5/8" THICK, MOLD RESISTANCE GYPSUM WALLBOARD IS REQUIRED WHEREVER BOARD IS BEING INSTALLED BEFORE THE BUILDING IS ENCLOSED AND CONDITIONED. WALLBOARD SHALL HAVE A SCORE OF 10, WHEN TESTED IN ACCORDANCE WITH ASTM D3273, PROVIDE IN TOILET ROOMS, BREAK ROOMS, AND OTHER WET AREAS.

MANUFACTURERS:

AMERICAN GYPSUM COMPANY: WWW.AMERICANGYPSUM.COM.
CERTAINTEED CORPORATION: WWW.CERTAINTEED.COM.
GEORGIA-PACIFIC GYPSUM: WWW.GPGYPSUM.COM.
NATIONAL GYPSUM COMPANY: WWW.NATIONALGYPSUM.COM/ #SLE.
SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

CEMENT BOARD: 1/2" THICK, ANSI CEMENT-BASED BOARD, NON-GYPSUM-BASED; AGGREGATED PORTLAND CEMENT PANELS WITH GLASS FIBER MESH EMBEDDED IN FRONT AND BACK SURFACES COMPLYING WITH ANSI A118.9 OR ASTM C1325.

1. APPLICATION: EXTERIOR SHEATHING AND SURFACES BEHIND TILE IN WET AREAS, INCLUDING BEHIND TOILETS AND SINKS.
2. MOLD RESISTANCE: SCORE OF 10, WHEN TESTED IN ACCORDANCE WITH ASTM D3273.

BASIS OF DESIGN: NATIONAL GYPSUM COMPANY; PERMABASE CEMENT BOARD.
SUBSTITUTIONS: SEE SECTION 01 60 00 - PRODUCT REQUIREMENTS.

BEADS, JOINT ACCESSORIES, AND OTHER TRIM: ASTM C1047, RIGID PLASTIC, GALVANIZED STEEL, OR ROLLED ZINC, UNLESS NOTED OTHERWISE. ARCHITECTURAL REVEAL BEADS SHALL BE 1/2" D X 1/2" W; V GROOVE SHAPE.

JOINT MATERIALS: ASTM C475/C475M AND AS RECOMMENDED BY GYPSUM BOARD MANUFACTURER FOR PROJECT CONDITIONS. USE 2" WIDE, COATED GLASS FIBER TAPE OR CREASED PAPER TAPE FOR JOINTS AND CORNERS, UNLESS OTHERWISE INDICATED; READY-MIXED VINYL-BASED JOINT COMPOUND; AND CHEMICAL HARDENING TYPE COMPOUND.

TEXTURED FINISH MATERIALS: LATEX-BASED COMPOUND; PLAIN.

SCREWS FOR FASTENING OF GYPSUM PANEL PRODUCTS TO COLD-FORMED STEEL STUDS LESS THAN 0.033" IN THICKNESS AND WOOD MEMBERS: ASTM C1002; SELF-PIERCING TAPPING SCREWS, CORROSION RESISTANT.

SCREWS FOR FASTENING OF GYPSUM PANEL PRODUCTS TO STEEL MEMBERS FROM 0.033" TO 0.112" THICKNESS: ASTM C954; STEEL DRILL SCREWS, CORROSION RESISTANT.

EXECUTION:

1. VERIFY THAT PROJECT CONDITIONS ARE APPROPRIATE FOR WORK OF THIS SECTION TO COMMENCE.
2. LEVEL CEILING SYSTEM TO A TOLERANCE OF 1/1200.

ACOUSTIC INSULATION AND SEALANT INSTALLATION: PLACE TIGHTLY WITHIN SPACES, AROUND CUT OPENINGS, BEHIND AND AROUND ELECTRICAL AND MECHANICAL ITEMS WITHIN PARTITIONS, AND TIGHT TO ITEMS PASSING THROUGH PARTITIONS. INSTALL ACOUSTIC SEALANT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

BOARD INSTALLATION: COMPLY WITH ASTM C840, GA-216, AND MANUFACTURER'S INSTRUCTIONS. INSTALL TO MINIMIZE BUTT END JOINTS, ESPECIALLY IN HIGHLY VISIBLE LOCATIONS.

EXTERIOR SHEATHING: COMPLY WITH ASTM C1280. INSTALL SHEATHING VERTICALLY, WITH EDGES BUTTED TIGHT AND ENDS OCCURRING OVER FIRM BEARING. SEAL JOINTS, CUT EDGES, AND HOLES WITH WATER-RESISTANT SEALANT.

CEMENTITIOUS BACKING BOARD: INSTALL OVER WOOD FRAMING MEMBERS AND PLYWOOD SUBSTRATE WHERE INDICATED, IN ACCORDANCE WITH ANSI A108.11 AND MANUFACTURER'S INSTRUCTIONS.

INSTALLATION OF TRIM AND ACCESSORIES:

1. CONTROL JOINTS: PLACE CONTROL JOINTS CONSISTENT WITH LINES OF BUILDING SPACES AND AS INDICATED, NOT MORE THAN 30'-0" APART ON WALLS AND CEILINGS OVER 50'-0" LONG. AT EXTERIOR SOFFITS, NOT MORE THAN 30'-0" APART IN BOTH DIRECTIONS.
2. CORNER BEADS: INSTALL AT EXTERNAL CORNERS, USING LONGEST PRACTICAL LENGTHS.
3. EDGE TRIM: INSTALL AT LOCATIONS WHERE GYPSUM BOARD ABUTS DISSIMILAR MATERIALS.

PAPER FACED GYPSUM BOARD JOINT TREATMENT: USE PAPER JOINT TAPE, BEDDED WITH READY-MIXED VINYL-BASED JOINT COMPOUND AND FINISHED WITH READY-MIXED VINYL-BASED JOINT COMPOUND.

DIVISION 09 - FINISHES

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

FINISH GYPSUM BOARD IN ACCORDANCE WITH LEVELS DEFINED IN ASTM C840, AS FOLLOWS:

1. LEVEL 4: WALLS AND CEILINGS TO RECEIVE PAINT FINISH OR WALL COVERINGS, UNLESS OTHERWISE INDICATED. ALL GYPSUM BOARD WALLS AND CEILINGS EXPOSED TO VIEW SHALL BE A MINIMUM LEVEL 4 FINISH.
2. LEVEL 2: IN UTILITY AREAS, BEHIND CABINETRY, AND ON BACKING BOARD TO RECEIVE TILE FINISH.
3. LEVEL 1: WALL AREAS ABOVE FINISHED CEILINGS, WHETHER OR NOT ACCESSIBLE IN THE COMPLETED CONSTRUCTION. ALL LEVEL 1 WALLS ARE REQUIRED TO BE TAPED AND FLOATED.

TAPE, FILL, AND SAND EXPOSED JOINTS, EDGES, AND CORNERS TO PRODUCE SMOOTH SURFACE READY TO RECEIVE FINISHES. FEATHER COATS OF JOINT COMPOUND SO THAT CAMBER IS MAXIMUM 1/32".

FILL AND FINISH JOINTS AND CORNERS OF CEMENTITIOUS BACKING BOARD AS RECOMMENDED BY MANUFACTURER.

APPLY FINISH TEXTURE COATING BY MEANS OF SPRAYING APPARATUS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND TO MATCH APPROVED SAMPLE.

TOLERANCES: MAXIMUM VARIATION OF FINISHED GYPSUM BOARD SURFACE FROM TRUE FLATNESS: 1/8" IN 10'-0" IN ANY DIRECTION.



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Project:

CONROE
FIRE STATION #6
HVAC RENOVATION
CONROE, TEXAS

Consultant:

Seal:



Revisions:

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Sheet Title:

ARCHITECTURAL
SPECIFICATIONS
CONT.

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A-003

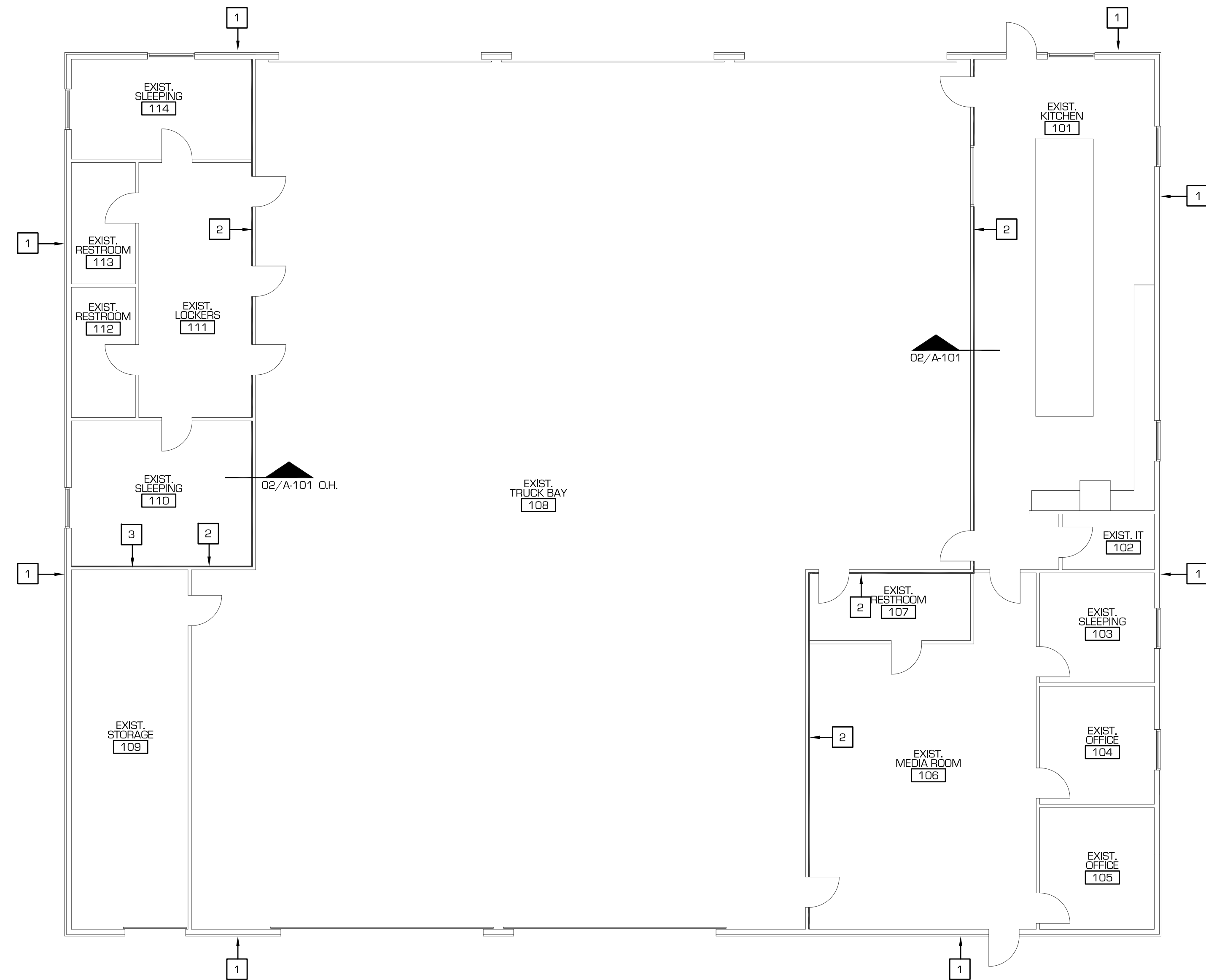
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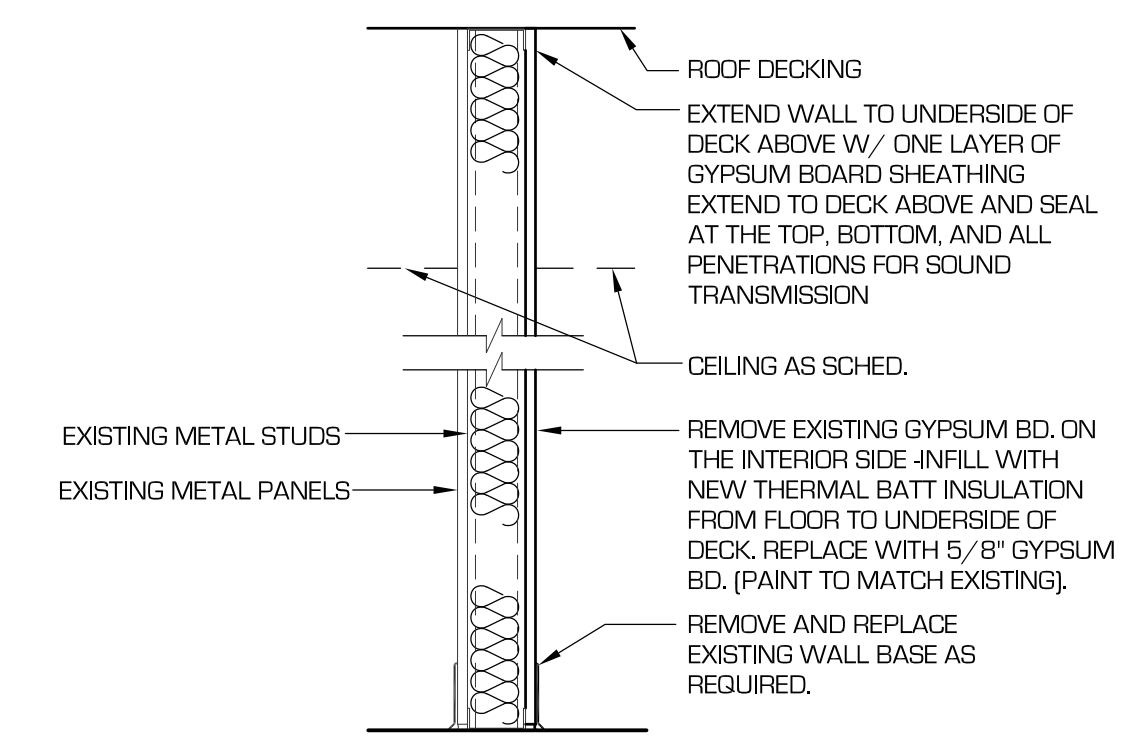
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- GENERAL NOTES:**
1. ALL CONSTRUCTION IS EXISTING TO REMAIN. REPAIR/PATCH/REPAINT AS REQUIRED.
 2. PROVIDE A COMPLETE AIR WEATHER BARRIER AT ALL EXTERIOR & INTERIOR WALLS. SEAL ALL WALLS, FLOORS AND UNDERSIDE OF STRUCTURAL DECK. CAULK TOP, BOTTOM AND ALL PENETRATIONS. CONTRACTOR SHALL SEAL ALL PENETRATIONS AT EXTERIOR TO PROVIDE A COMPLETE BUILDING ENVELOPE TO PREVENT THE INFILTRATION OF MOISTURE, AIR AND LIGHT TRANSMISSION.
 3. REPAIR VINYL JACKET INSULATION AT ALL ROOF AND EXTERIOR WALLS AS REQUIRED, TYP. AT ALL NEWLY SEALED TO DECK SPACES AS INDICATED.
 4. PROVIDE MINIMUM OF R-19 UNFACED FIBERGLASS BATT INSULATION AT EXTERIOR WALLS.
 5. PROVIDE MINIMUM OF R-13 UNFACED FIBERGLASS BATT INSULATION AT INTERIOR WALLS.

- KEYNOTE:**
1. REPLACE PORTION OF METAL PANEL AS REQUIRED. REPLACE FULL PANEL SHEET TO MATCH EXISTING. REPAIR AND REPLACE AIR WEATHER BARRIER AND EXTERIOR SHEATHING AS REQUIRED.
 2. REMOVE EXISTING GYPSUM BOARD ON INTERIOR SIDE OF WALL. INFILL WITH BATT INSULATION FROM FLOOR TO UNDERSIDE OF STRUCTURAL DECK. FULLY SEAL AS INDICATED IN GENERAL NOTES.
 3. EXTEND EXISTING PARTITION TO DECK. MATCH EXISTING PARTITION SIZE AND CONSTRUCTION. PROVIDE MINIMUM R-13 BATT INSULATION TO UNDERSIDE OF STRUCTURAL DECK. FULLY SEAL AS INDICATED IN GENERAL NOTES. REPLACE WITH 5/8" GYPSUM BOARD (BOTH SIDES) TO DECK.



01 FIRST FLOOR PLAN
A-101 SCALE: 1/8"=1'-0"



02 TYP. EXST. PARTITION WALL
A-101 SCALE: 1" = 1'-0"

Project:

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CONROE, TEXAS

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Sheet Title:

EXISTING ARCHITECTURAL
FLOOR PLAN AND
PARTITION DETAIL

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Date: APRIL 2020
Sheet No.:

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GENERAL NOTES:

1. ALL CEILINGS AND LIGHT FIXTURES ARE EXISTING TO REMAIN.
2. REPAIR/REPLACE ALL AREAS WITH CEILING OR MOISTURE DAMAGE.
3. REFER TO MECHANICAL DRAWINGS FOR SYSTEM MODIFICATIONS ABOVE CEILING.

RCP DEMOLITION KEYNOTE:

- 1 REPLACE DAMAGED CEILING TILE. NEW TO MATCH EXISTING. REPAIR GRID AS REQUIRED - G.C. TO VERIFY ALL LOCATIONS.
- 2 EXISTING LOUVERS TO BE REMOVED. PATCH AND REPAIR AS REQUIRED. -RE: MEP FOR EXACT LOCATIONS.



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EXISTING REFLECTED
CEILING PLAN

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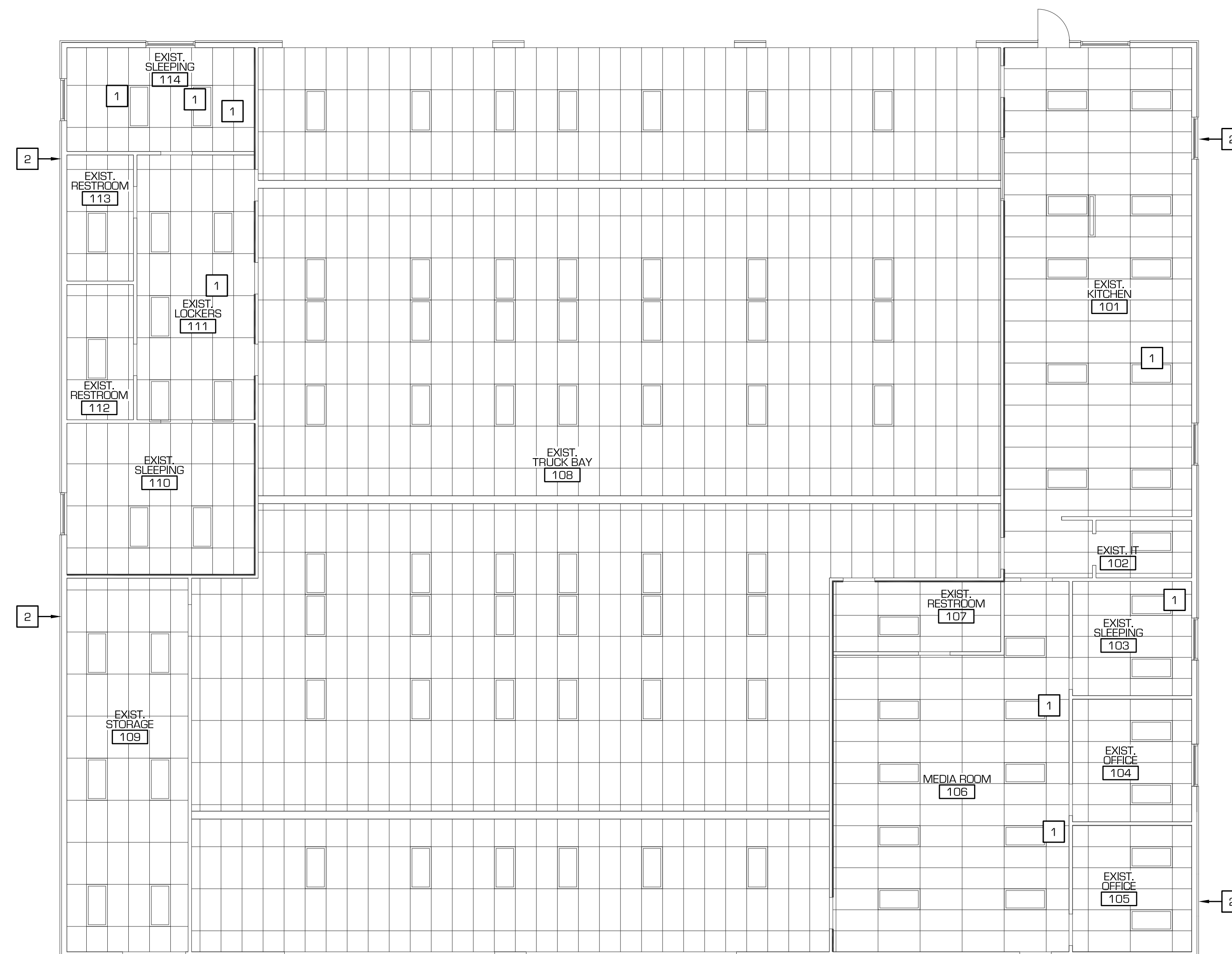
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Project Phase: CONTRACT DOCUMENTS

Date: APRIL 2020

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01 FIRST FLOOR DEMO REFLECTED CEILING PLAN
A-111 SCALE: 1/8"=1'-0"

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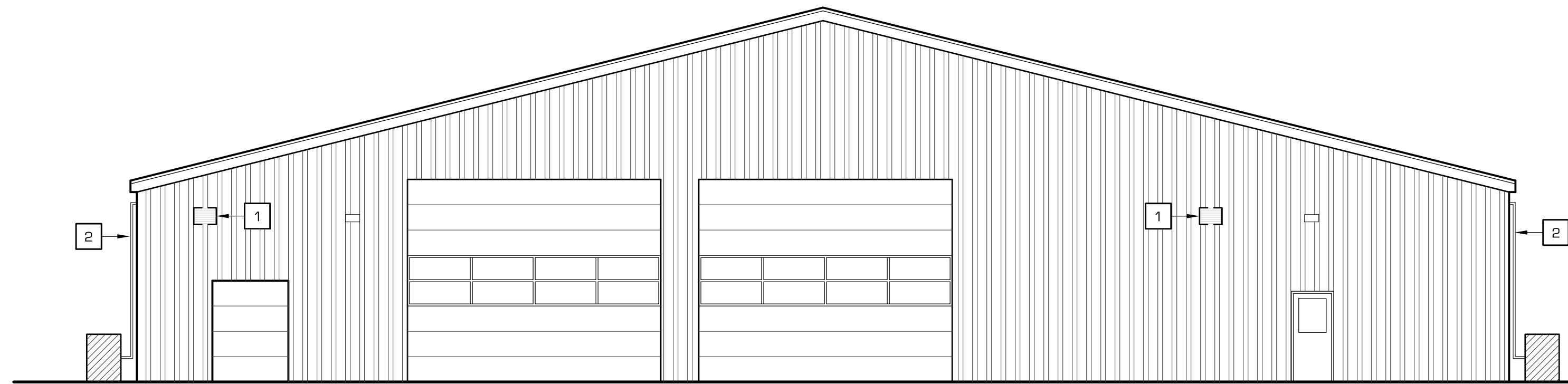
ELEVATION NOTES:	KEYNOTE:
1. PROVIDE A COMPLETE AIR WEATHER BARRIER AT ALL EXTERIOR WALLS. SEAL ALL WALLS, FLOORS AND UNDERSIDE OF STRUCTURAL DECK. CAULK TOP, BOTTOM AND ALL PENETRATIONS. CONTRACTOR SHALL SEAL ALL PENETRATIONS AT EXTERIOR TO PROVIDE A COMPLETE BUILDING ENVELOPE TO PREVENT THE INFILTRATION OF MOISTURE, AIR AND LIGHT TRANSMISSION.	1. REPLACE PORTION OF METAL PANEL AS REQUIRED. REPLACE FULL PANEL SHEET TO MATCH EXISTING. REPAIR AND REPLACE AIR WEATHER BARRIER AND EXTERIOR SHEATHING AS REQUIRED.
	2. PROVIDE JOINT SEALANT AT ALL NEW PENETRATIONS. RE: MEP FOR ADDITIONAL LOCATIONS.

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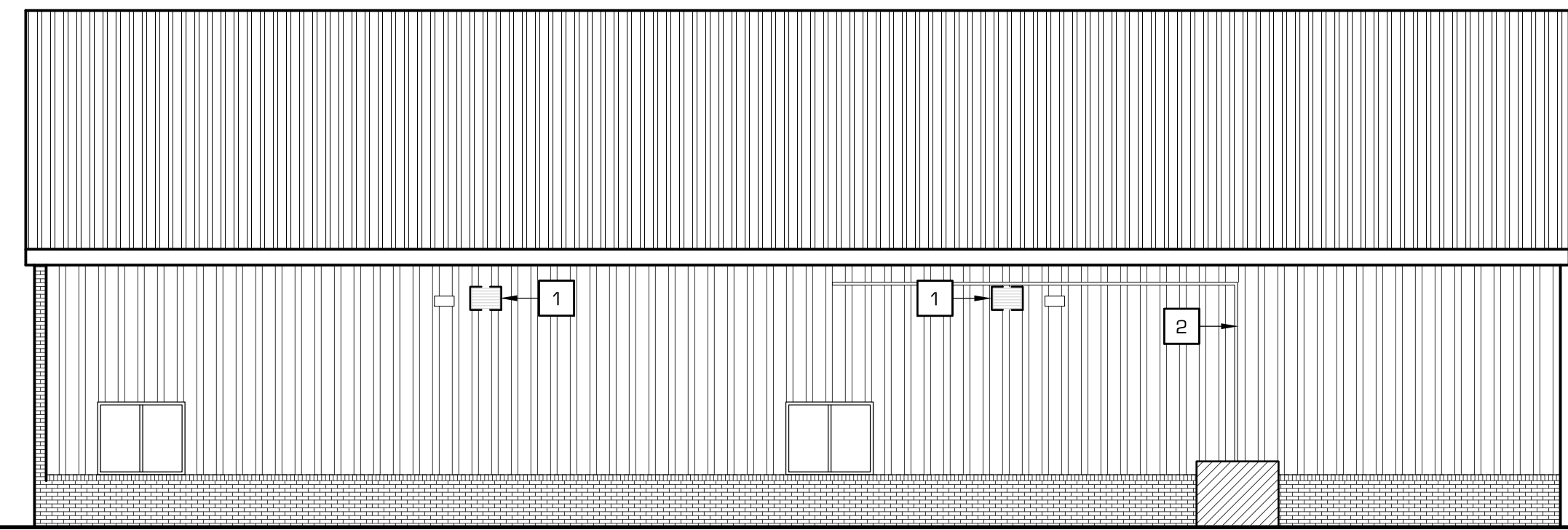
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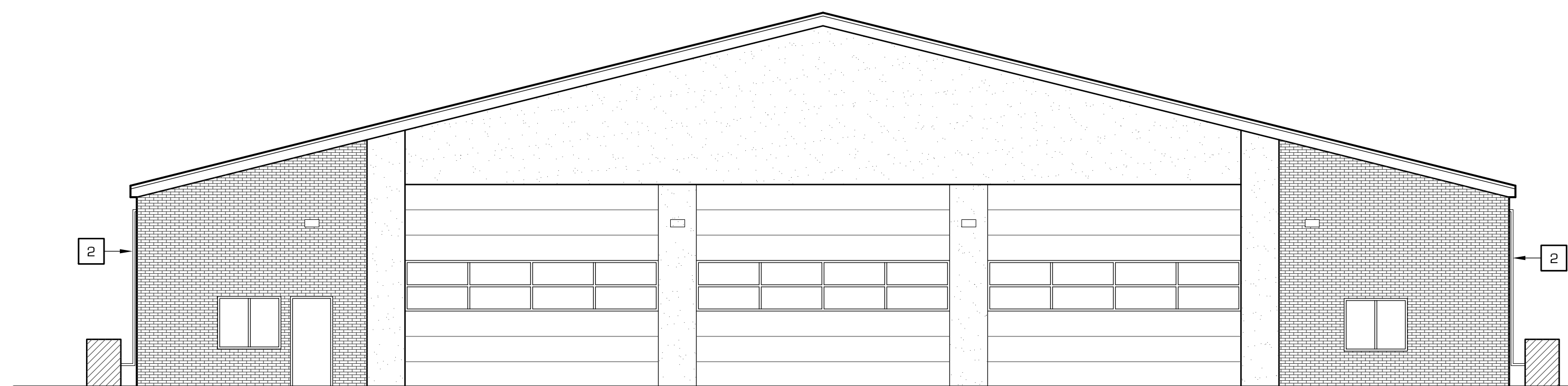
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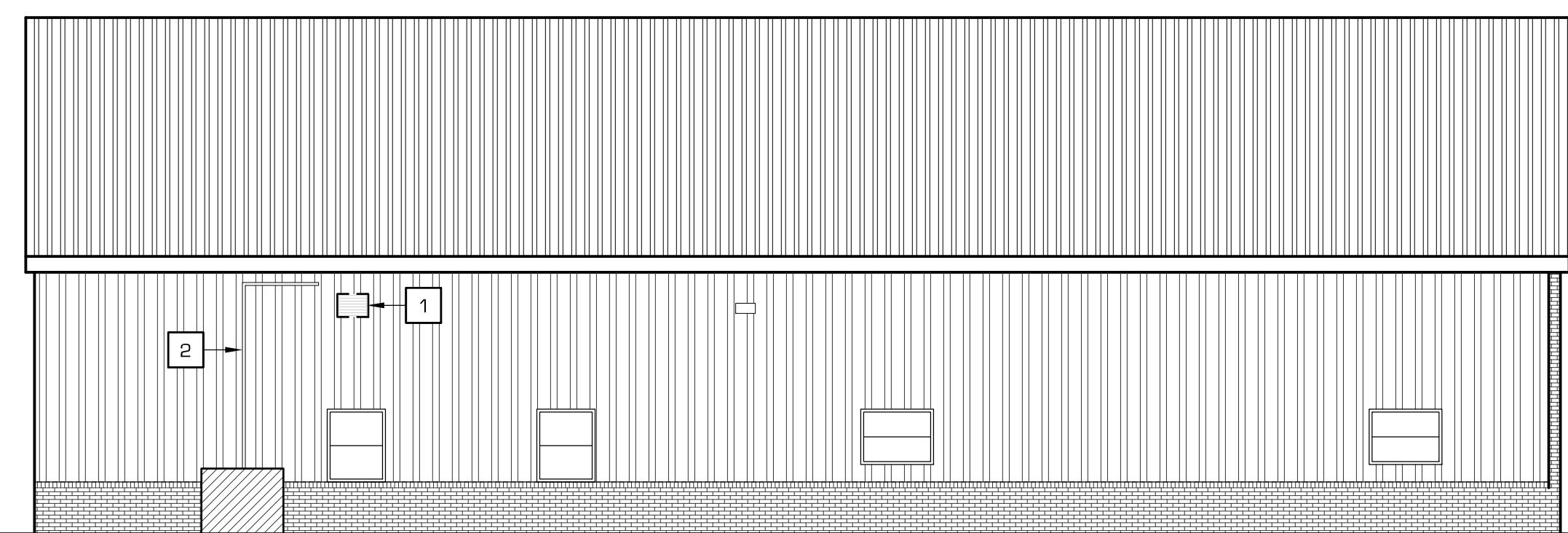
01 BUILDING ELEVATION
A-201 SCALE: 1/8"=1'-0"



02 BUILDING ELEVATION
A-201 SCALE: 1/8"=1'-0"



03 BUILDING ELEVATION
A-201 SCALE: 1/8"=1'-0"



04 BUILDING ELEVATION
A-201 SCALE: 1/8"=1'-0"



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Sheet Title:

EXISTING ELEVATIONS

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GENERAL MEP NOTES

COORDINATION

EACH CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK...

- 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...
2. COORDINATE INSTALLATION OF DIFFERENT COMPONENTS WITH OTHER CONTRACTORS TO ENSURE MAXIMUM PERFORMANCE AND ACCESSIBILITY FOR REQUIRED MAINTENANCE, SERVICE, AND REPAIR.
3. MAKE ADEQUATE PROVISIONS TO ACCOMMODATE ITEMS SCHEDULED FOR LATER INSTALLATION.
4. VISIT THE SITE PRIOR TO SUBMITTING A BID TO VERIFY THE EXISTING CONDITIONS AND DESIGN CONSTRAINTS...

ACOUSTIC TREATMENT

- IT IS THE INTENT OF THESE DRAWINGS TO SPECIFY AND FOR THE CONTRACTOR TO INSTALL SYSTEMS THAT ARE QUIET AND FREE OF VIBRATION. EQUIPMENT SHALL BE BALANCED AND VIBRATION ISOLATED TO MEET THE REQUIREMENTS SPECIFIED HEREIN FOR BOTH THE EQUIPMENT ITSELF AND CONDITIONS WITHIN OCCUPIED SPACES...
EQUIPMENT NOT MEETING THESE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR TO AN ACCEPTABLE LEVEL...
AIR DISTRIBUTION EQUIPMENT SHALL BE SOUND TESTED AT THE DESIGN OPERATING CONDITIONS AND SHALL NOTIFY THE OWNER OF ANY EXCESSIVE NOISE RATING...

SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS.
COORDINATE PREPARATION AND PROCESSING OF SUBMITTALS WITH PERFORMANCE OF CONSTRUCTION ACTIVITIES. COORDINATE EACH SUBMITTAL WITH FABRICATION, PURCHASING, TESTING, DELIVERY, OTHER SUBMITTALS, AND RELATED ACTIVITIES THAT REQUIRE SEQUENTIAL ACTIVITY. SUBMIT ALL ITEMS REQUIRED FOR EACH SPECIFICATION SECTION CONCURRENTLY.
ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING THE TIME FOR SUBMITTALS, AS FOLLOWS: TIME FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTALS...

- 1. INITIAL REVIEW: ALLOW 7 DAYS FOR INITIAL REVIEW OF EACH SUBMITTAL EXCLUSIVE OF TRAVEL TIME. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS REQUIRED.
2. RESUBMITTAL REVIEW: ALLOW 7 DAYS FOR REVIEW OF EACH RESUBMITTAL EXCLUSIVE OF TRAVEL TIME.
PLACE A PERMANENT LABEL OR TIE BLOCK ON EACH PAPER COPY SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON LABEL OR TIE BLOCK.

- INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN:
1. PROJECT NAME.
2. DATE.
3. NAME OF ARCHITECT.
4. NAME OF ENGINEER.
5. NAME OF CONTRACTOR.
6. NAME OF SUBCONTRACTOR.
7. NAME OF SUPPLIER.
8. NAME OF MANUFACTURER.
CONTRACTOR'S REVIEW: REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ARCHITECT/ENGINEER.

- STAMP EACH SUBMITTAL WITH A UNIFORM, APPROVAL STAMP. PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
IF THE GENERAL CONTRACTOR IS DEFERRING THE ABOVE REQUIREMENTS TO THE SUBCONTRACTOR, THEN THE SUBCONTRACTOR MUST ALSO REVIEW, STAMP, AND CERTIFY THE SUBMITTAL.

- ENGINEER'S ACTION: ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND WILL RETURN THEM.
ENGINEER WILL REVIEW EACH SUBMITTAL, NOTE CORRECTIONS OR MODIFICATIONS REQUIRED, AND RETURN IT. ENGINEER WILL PROVIDE SUBMITTAL WITH AN ACTION SHEET TO INDICATE ACTION.
TIME-SWITCH CONTROLS: WHERE TIME-SWITCH CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:
1. CONFIRM THAT THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND, AND HOLIDAY SCHEDULES.
2. PROVIDE DOCUMENTATION TO THE OWNER OF TIMESWITCH CONTROLS PROGRAMMING INCLUDING WEEKDAY, WEEKEND, HOLIDAY SCHEDULES, AND SET-UP AND PREFERENCE SETTINGS.
3. VERIFY THE CORRECT TIME AND DATE IN THE TIME SWITCH.
4. VERIFY THAT ANY BATTERY BACKUP IS ENERGIZED.
5. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.
6. SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA CONTROL SWITCH.
6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.
6.3. UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
7.1. UNOCCUPY LIGHTING TURNS OFF.
7.2. MANUAL OVERRIDE SWITCH RESTORES ONLY THE LIGHTS IN THE ENCLOSED SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.
8. ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL.

- DAYLIGHT RESPONSIVE CONTROLS: WHERE DAYLIGHT RESPONSIVE CONTROLS ARE PROVIDED, THE FOLLOWING SHALL BE VERIFIED:
1. CONTROL DEVICES HAVE BEEN PROPERLY LOCATED, FIELD CALIBRATED AND SET FOR APPROPRIATE SETPOINTS AND OPERATING MODES.
2. DAYLIGHT CONTROLLED LIGHTING LOADS ADJUST TO LIGHT LEVEL SET POINTS IN RESPONSE TO AVAILABLE DAYLIGHT.
3. THE LOCATIONS OF CALIBRATION ADJUSTMENT EQUIPMENT ARE READILY ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL.

MECHANICAL SPECIFICATIONS

SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON REQUIRED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS" FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

RECORD DRAWINGS

- WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF AS-BUILT DRAWINGS PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PAPER SEPARAS AND ONE SET OF CAD FILES IN AUTOCAD 2007 FORMAT. ENGINEER AND ARCHITECT SEALS AND LOGOS SHALL BE REMOVED FROM THE DRAWINGS AND THEY SHALL BE STAMPED "AS-BUILT DRAWINGS".
WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "O&M MANUALS," EQUIPMENT DATA, HVAC AIR AND WATER BALANCING REPORT, AND LIGHTING CONTROL TESTING REPORT FOR COMPLIANCE WITH CURRENT ENERGY CODE. THE CONTRACTOR SHALL PROVIDE A WRITTEN CERTIFICATION THAT ALL NEW MATERIALS AND COMPONENTS DO NOT CONTAIN ASBESTOS OR PCBs.

REQUIRED SUBMITTALS

- PROVIDE FOUR BOUND PRODUCT DATA SUBMITTALS FOR THE NEW EQUIPMENT LISTED BELOW TO THE ARCHITECT/ENGINEER. EACH CONTRACTOR RESPONSIBLE FOR THE WORK SHALL REVIEW AND CERTIFY THE SUBMITTAL DATA TO BE IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS:
1. AIR HANDLING UNITS
2. FAN COIL UNITS
3. AIR DISTRIBUTION DEVICES
4. ELECTRICAL PANELS
5. WIRING DEVICES
6. PLUMBING FIXTURES
7. AIR AND WATER BALANCE REPORTS
8. CIRCUIT DIRECTORY CARDS
MECHANICAL AND SERVICE WATER HEATING COMMISSIONING
ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.
SYSTEMS ADJUSTING AND BALANCING: HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. AIR AND WATER FLOW RATES SHALL BE MEASURED AND ADJUSTED TO DELIVER THE FLOW RATES WITHIN TOLERANCES PROVIDED IN THE PRODUCT SPECIFICATIONS. TEST AND BALANCE ACTIVITIES SHALL INCLUDE AIR SYSTEM AND HYDRONIC SYSTEM BALANCING. THE FOLLOWING SYSTEMS ARE EXEMPT:
1. MECHANICAL SYSTEMS AND SERVICE WATER HEATER SYSTEMS IN BUILDINGS WHERE THE TOTAL MECHANICAL EQUIPMENT CAPACITY IS LESS THAN 450,000 Btu/h (131,600 kW) AND THE TOTAL MECHANICAL EQUIPMENT CAPACITY IS LESS THAN 100,000 Btu/h (29,300 kW) COMBINED SERVICE WATER HEATING AND SPACE HEATING CAPACITY.
2. SYSTEMS THAT SERVE INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS.

SHEET METAL DUCTWORK

- GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF FITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER DEFECTS.
GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
SUPPLY AND RETURN DUCTWORK SHALL BE INTERNALLY INSULATED WITH EXTERNAL BLANKET INSULATION. DUCTWORK SHALL BE INTERNALLY UNLINED UNLESS SPECIFICALLY INDICATED.
DUCTWORK SHALL BE SEALED AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND AS REQUIRED TO LIMIT LEAKAGE. LEAKAGE IN EXCESS OF 5% SHALL NOT BE ACCEPTABLE.
DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.
THE INTERIOR SURFACE OF ALL DUCTWORK SHALL BE SMOOTH WITH NO SHEETMETAL OR OTHER PARTS PROJECTING INTO THE AIR STREAM. ALL SEAMS AND JOINTS SHALL BE EXTERNAL. THE INSIDE OF ALL DUCTWORK SHALL BE THOROUGHLY CLEANED AND ALL FANS OPERATED TO REMOVE ANY DEBRIS PRIOR TO CONNECTION OF AIR DISTRIBUTION DEVICES.
ALL DUCTWORK DIMENSIONS ON THE DRAWINGS ARE CLEAR INSIDE.
INSTALL ALL DUCTWORK TIGHT TO STRUCTURE UNLESS OTHERWISE NOTED. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO THE CONSTRUCTION OR INSTALLATION OF DUCTWORK.
ALL TRANSVERSE JOINTS SHALL BE SEALED WITH A WATER BASE ADHESIVE SEALER DESIGNED FOR USE IN MEDIUM VELOCITY DUCT SYSTEMS. SEALER SHALL BE EFFECTIVE AGAINST BOTH NEGATIVE AND POSITIVE PRESSURE LOSSES. SEALER SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. APPLY UN-THINNED WITH BRUSH, TROWEL, OR CAULKING GUN AS PER THE MANUFACTURER'S RECOMMENDATIONS AND ALLOW TO DRY FOR A MINIMUM OF 48 HOURS BEFORE AIR IS APPLIED TO THE SYSTEM. SEALER SHALL BE "IRON GRIP WATER BASE DUCT SEALANT #601" AS MANUFACTURED BY HARDCAST, INC., UNI-GRIP AS MANUFACTURED BY UNITED MCGILL, OR AN APPROVED EQUAL.

LIGHTING SYSTEM FUNCTIONAL TESTING

- ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.
OCCUPANT SENSOR CONTROLS: WHERE OCCUPANT SENSOR CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:
1. CERTIFY THAT THE OCCUPANT SENSOR HAS BEEN LOCATED AND AIMED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. FOR PROJECTS WITH SEVEN OR FEWER OCCUPANT SENSORS, EACH SENSOR SHALL BE TESTED.
3. FOR PROJECTS WITH MORE THAN SEVEN OCCUPANT SENSORS, TESTING SHALL BE DONE FOR EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY. WHERE MULTIPLES OF EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY ARE PROVIDED, NOT LESS THAN 10 PERCENT, BUT IN NO CASE LESS THAN ONE, OF EACH COMBINATION SHALL BE TESTED UNLESS THE CODE OFFICIAL OR DESIGN PROFESSIONAL REQUIRES A HIGHER PERCENTAGE TO BE TESTED.
3.1. WHERE TESTING OF OCCUPANT SENSOR CONTROLS INCLUDE STATUS INDICATORS, VERIFY CORRECT OPERATION.
3.2. CONTROL SHALL TURN OFF OR DOWN TO THE PERMITTED LEVEL WITHIN THE REQUIRED TIME.
3.3. FOR AUTO-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON TO THE PERMITTED LEVEL WITHIN THE REQUIRED TIME.
3.4. FOR MANUAL-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON ONLY WHEN MANUALLY ACTIVATED.
3.5. THE LIGHTS SHALL BE MANUALLY TURNED ON BY MOVEMENT IN ADJACENT AREAS OR BY HVAC OPERATION.
TIME-SWITCH CONTROLS: WHERE TIME-SWITCH CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:
1. CONFIRM THAT THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND, AND HOLIDAY SCHEDULES.
2. PROVIDE DOCUMENTATION TO THE OWNER OF TIMESWITCH CONTROLS PROGRAMMING INCLUDING WEEKDAY, WEEKEND, HOLIDAY SCHEDULES, AND SET-UP AND PREFERENCE SETTINGS.
3. VERIFY THE CORRECT TIME AND DATE IN THE TIME SWITCH.
4. VERIFY THAT ANY BATTERY BACKUP IS ENERGIZED.
5. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.
6. SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA CONTROL SWITCH.
6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.
6.3. UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
7.1. UNOCCUPY LIGHTING TURNS OFF.
7.2. MANUAL OVERRIDE SWITCH RESTORES ONLY THE LIGHTS IN THE ENCLOSED SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.
8. ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL.
DAYLIGHT RESPONSIVE CONTROLS: WHERE DAYLIGHT RESPONSIVE CONTROLS ARE PROVIDED, THE FOLLOWING SHALL BE VERIFIED:
1. CONTROL DEVICES HAVE BEEN PROPERLY LOCATED, FIELD CALIBRATED AND SET FOR APPROPRIATE SETPOINTS AND OPERATING MODES.
2. DAYLIGHT CONTROLLED LIGHTING LOADS ADJUST TO LIGHT LEVEL SET POINTS IN RESPONSE TO AVAILABLE DAYLIGHT.
3. THE LOCATIONS OF CALIBRATION ADJUSTMENT EQUIPMENT ARE READILY ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL.

FLEXIBLE DUCTWORK

- FLEXIBLE DUCT SHALL BE USED FOR CONNECTIONS TO AIR DISTRIBUTION DEVICES WHERE SHOWN ON THE DRAWINGS. PROVIDE MAXIMUM LENGTH SHALL BE 8'-0" FOR AIR DISTRIBUTION DEVICE CONNECTIONS. WHERE LONGER RUNS ARE REQUIRED, PROVIDE RIGID DUCTWORK.
INSULATED FLEXIBLE DUCT SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF A GALVANIZED STEEL OR SPIRAL ALUMINUM HEEL. STAINLESS INSET LINER SHALL BE COMPOSED OF 3-PLY ALUMINUM FOIL OR HEAVILY COATED FIBERGLASS WITH A MAXIMUM THERMAL CONDUCTANCE OF .23 BTU/IN/H x SQ FT. THE ASSEMBLY SHALL BE SHEATHED IN A REINFORCED METALLIZED VAPOR BARRIER OUTER JACKET.
THE FLEXIBLE DUCT ASSEMBLY SHALL BE SUITABLE FOR A MINIMUM OF 6" W.C. WORKING PRESSURE AND SHALL BE LISTED CLASS I BY THE UNDERWRITERS LABORATORY AT A FLAME SPREAD OF NOT OVER 25 AND A SMOKE DEVELOPED RATE OF NOT OVER 50. DUCTS SHALL ALSO COMPLY WITH NFPA STANDARD 91A.
FLEXIBLE DUCTS SHALL BE SUPPORTED IN SUCH A MANNER TO PREVENT SAGS AND KINKS. BENDS IN ANY LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 90° FOR AIR DISTRIBUTION DEVICE CONNECTIONS.
ALL JOINTS AND CONNECTIONS SHALL BE MADE WITH 1/2" WIDE STAINLESS STEEL DUCT CLAMPS OR 100% NYLON SELF-LOCKING CLAMPS MANUFACTURED BY PANDETT CORPORATION OR AN APPROVED EQUAL.
IF IT COMPLIES WITH THESE SPECIFICATIONS, FLEXIBLE DUCTWORK OF THE FOLLOWING TYPES WILL BE ACCEPTABLE:
1. END CONNECTIONS: BUTT WELDING.
2. FANINGS: RANSED FACE.
GROoved MECHANICAL-JOINT FITTINGS AND COUPLINGS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. ANVI, INTERNATIONAL, INC.
2. CENTRAL SPRINKLER COMPANY; A DIVISION OF TYCO FIRE & BUILDING PRODUCTS.
3. NATIONAL FITTINGS, INC.
4. S.P. FITTINGS: A DIVISION OF STAR PIPE PRODUCTS.
5. VICTAULIC COMPANY.
JOINT FITTINGS: ASTM A 536, GRADE 65-45-12 DUCTILE IRON; ASTM A 47/A 47M, GRADE 32510 MALLEABLE IRON; ASTM A 53/A 53M, TYPE F, E, OR S, GRADE B FABRICATED STEEL; OR ASTM A 106, GRADE B STEEL FITTINGS WITH GROOVES OR SHOULDER CONSTRUCTED TO ACCEPT GROOVED-END COUPLERS, WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.
COUPLINGS: "DIPLOLE" OR MALLEABLE-IRON HOUSING AND SYNTHETIC RUBBER GASKET OF CENTRAL CAVITY PRESSURE-RESPONSIVE DESIGN; WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.

CHILLED WATER / CONDENSATE PIPING

- STEEL PIPE: ASTM A 53/A 53M, BLACK STEEL WITH FLAM EVID.
CAST-IRON THREADED FITTINGS: ASME B16.4, CLASSES 125 AND 250.
MALLEABLE-IRON THREADED FITTINGS: ASME B16.4, CLASSES 150 AND 300.
MALLEABLE-IRON UNIONS: ASME B16.39; CLASSES 150, 250, AND 300.
CAST-IRON PIPE FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASSES 25, 125, AND 250; RAISED GROUND FACE, AND BOLT HOLES SPOT FACED.
WROUGHT-STEEL FITTINGS: ASTM A 234/A 234M, WALL THICKNESS TO MATCH ADJOINING PIPE.
WROUGHT CAST- AND FORGED-STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5, INCLUDING BOLTS, NUTS, AND GASKETS OF THE FOLLOWING MATERIAL GROUP, END CONNECTIONS, AND FACINGS:
1. MATERIAL GROUP: 1.1.
2. END CONNECTIONS: BUTT WELDING.
3. FACINGS: RANSED FACE.
GROoved MECHANICAL-JOINT FITTINGS AND COUPLINGS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. ANVI, INTERNATIONAL, INC.
2. CENTRAL SPRINKLER COMPANY; A DIVISION OF TYCO FIRE & BUILDING PRODUCTS.
3. NATIONAL FITTINGS, INC.
4. S.P. FITTINGS: A DIVISION OF STAR PIPE PRODUCTS.
5. VICTAULIC COMPANY.
JOINT FITTINGS: ASTM A 536, GRADE 65-45-12 DUCTILE IRON; ASTM A 47/A 47M, GRADE 32510 MALLEABLE IRON; ASTM A 53/A 53M, TYPE F, E, OR S, GRADE B FABRICATED STEEL; OR ASTM A 106, GRADE B STEEL FITTINGS WITH GROOVES OR SHOULDER CONSTRUCTED TO ACCEPT GROOVED-END COUPLERS, WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.
COUPLINGS: "DIPLOLE" OR MALLEABLE-IRON HOUSING AND SYNTHETIC RUBBER GASKET OF CENTRAL CAVITY PRESSURE-RESPONSIVE DESIGN; WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.

- CHILLED-WATER PIPING, ABOVEGROUND, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
1. SCHEDULE 40 STEEL PIPE: CLASS 150, MALLEABLE-IRON, 250, CAST-IRON AND 300, MALLEABLE-IRON FITTINGS; CAST-IRON FLANGES AND FLANGE FITTINGS; AND THREADED JOINTS.
CHILLED-WATER PIPING, ABOVEGROUND, NPS 2-1/2 (DN 65) AND LARGER, SHALL BE ANY OF THE FOLLOWING:
1. SCHEDULE 40 STEEL PIPE, WROUGHT-STEEL FITTINGS AND WROUGHT-CAST OR FORGED-STEEL FLANGES AND FLANGE FITTINGS, AND WELDED AND FLANGED JOINTS.
2. SCHEDULE 40 PIPE: GROOVED, MECHANICAL JOINT COUPLING AND FITTINGS; AND GROOVED, MECHANICAL JOINTS.
CONDENSATE-DRAIN PIPING: TYPE M (C) DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND SOLDERED JOINTS.
HANGERS AND SUPPORTS: INSTALL THE FOLLOWING PIPE ATTACHMENTS:
1. ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 20 FEET (6 M) LONG.
2. ADJUSTABLE ROLLER HANGERS AND SPRING HANGERS FOR INDIVIDUAL HORIZONTAL PIPING 20 FEET (6 M) OR LONGER.
3. PIPE ROLLER: MISS SP-58, TYPE 44 FOR MULTIPLE HORIZONTAL PIPING 20 FEET (6 M) OR LONGER, SUPPORTED ON A TRAPEZOID.
4. SPRING HANGERS TO SUPPORT VERTICAL RUNS.
5. DIRECT COPPER-CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN DIRECT CONTACT WITH COPPER PIPE.
INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:
1. NPS 3/4 (DN 20): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
2. NPS 1 (DN 25): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
3. NPS 1-1/2 (DN 40): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
4. NPS 2 (DN 50): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
5. NPS 2-1/2 (DN 65): MAXIMUM SPAN, 11 FEET (3.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
6. NPS 3 (DN 75): MAXIMUM SPAN, 12 FEET (3.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
7. NPS 4 (DN 100): MAXIMUM SPAN, 14 FEET (4.3 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM).
8. NPS 4 (DN 100): MAXIMUM SPAN, 14 FEET (4.3 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM).
9. NPS 4 (DN 100): MAXIMUM SPAN, 14 FEET (4.3 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM).
10. NPS 10 (DN 250): MAXIMUM SPAN, 30 FEET (9.1 M); MINIMUM ROD SIZE, 3/4 INCH (19 MM).
11. NPS 12 (DN 300): MAXIMUM SPAN, 35 FEET (10.7 M); MINIMUM ROD SIZE, 1 INCH (25 MM).
12. NPS 14 (DN 350): MAXIMUM SPAN, 35 FEET (10.7 M); MINIMUM ROD SIZE, 1 INCH (25 MM).
INSTALL HANGERS FOR DRAWN-TEMPER COPPER PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:
1. NPS 3/4 (DN 20): MAXIMUM SPAN, 6 FEET (1.8 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
2. NPS 1 (DN 25): MAXIMUM SPAN, 6 FEET (1.8 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
3. NPS 1-1/2 (DN 40): MAXIMUM SPAN, 8 FEET (2.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
4. NPS 2 (DN 50): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
5. NPS 2-1/2 (DN 65): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
6. NPS 3 (DN 75): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).

- CHILLED WATER AND BRINE, ABOVE 40 DEG F (5 DEG C):
NPS 12 (DN 300) AND SMALLER: INSULATION SHALL BE THE FOLLOWING: MINERAL-FIBER PREFORMED PITA, TYPE I, 1-1/2 INCHES (38 MM) THICK.
NPS 14 (DN 350) AND LARGER: INSULATION SHALL BE ONE OF THE FOLLOWING: MINERAL-FIBER PREFORMED PIPE, TYPE I, 1-1/2 INCHES (38 MM) THICK.
CONDENSATE AND EQUIPMENT DRAIN WATER BELOW 60 DEG F (16 DEG C):
1. ALL PIPE SIZES: INSULATION SHALL BE ONE OF THE FOLLOWING: MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH (25 MM) THICK.

- OVERLAP UNFACED BLANKETS A MINIMUM OF 2 INCHES (50 MM) ON LONGITUDINAL SEAMS AND END JOINTS. AT END JOINTS, BLANKETS SHALL BE LAPPED BY A MINIMUM OF 4 INCHES (100 MM) O.C. INSTALL INSULATION ON RECTANGULAR DUCT ELBOWS AND TRANSITIONS WITH A FULL INSULATION SECTION FOR EACH SURFACE. INSTALL INSULATION ON ROUND AND FLAT-OVAL DUCT ELBOWS WITH INSULATION BORES TO FIT THE ELBOW. INSULATE DUCT STIFFENERS, HANGERS, AND FLANGES THAT PROTRUDE BEYOND INSULATION SURFACE WITH 6-INCH- (150-MM-) WIDE STRIPS OF SAME MATERIAL USED TO INSULATE DUCT. SECURE ON ALTERNATE SIDES OF STIFFENER, HANGER, AND FLANGE WITH PINS SPACED 6 INCHES (150 MM) O.C.
DUCT LINER
FIBROUS-GLASS DUCT LINER: COMPLY WITH ASTM C 1071, NFPA 90A, OR NFPA 90B; AND WITH NAMA AH24, "FIBROUS GLASS DUCT LINER STANDARD."
MAXIMUM THERMAL CONDUCTIVITY:
TYPE I, FLEXIBLE: 0.27 BTU X IN/H x SQ. FT. X DEG F (0.039 W/M x K) AT 75 DEG F (24 DEG C) MEAN TEMPERATURE, R8 EQUIVALENT.
TYPE II, RIGID: 0.23 BTU X IN/H x SQ. FT. X DEG F (0.033 W/M x K) - R8 EQUIVALENT.
ANTIMICROBIAL EROSION-RESISTANT COATING: APPLY TO THE SURFACE OF THE LINER THAT WILL FORM THE INTERIOR SURFACE OF THE DUCT TO ACT AS A MOISTURE REPELLENT AND EROSION-RESISTANT COATING. ANTIMICROBIAL COMPOUND SHALL BE TESTED FOR EFFECTACY BY AN INTEL AND RESISTED BY THE FIRM FOR OVER 100 HOURS.
WATER-BASED LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916. FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).

- SHOP APPLICATION OF DUCT LINER: COMPLY WITH SMOAONA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 7, "FLEXIBLE LINER INSTALLATION." ADHERE A SINGLE LAYER OF INDICATED THICKNESS OF DUCT LINER WITH 100 PERCENT ADHESIVE COVERAGE AT LINER CONTACT SURFACE AREA. ATTAINING INDICATED THICKNESS WITH MULTIPLE LAYERS OF DUCT LINER IS PROHIBITED.
DATE: 04/21/2020 PROJECT #: 19173.00

REVISIONS table with columns: NO, DATE, DESCRIPTION. Row 1: 04/21/20, ISSUED FOR BID

HVAC RENOVATION CONROE FIRE DEPARTMENT STATION #6 15663 HWY 105 MONTGOMERY, TEXAS 77356
EIB/E Mechanical Electrical Plumbing CONSULTING
24 Greenway Plaza, Ste 1211, Houston, TX 77046
Tel: (713) 840-0177 / Firm Reg. No: 5638
NOT FOR CONSTRUCTION

MECHANICAL SPECIFICATIONS
SCALE: NONE
MEP 1.01
DATE: 04/21/2020 PROJECT #: 19173.00

PLUMBING SPECIFICATIONS

DOMESTIC WATER PIPING - COPPER TUBE AND FITTINGS

- A. HARD COPPER TUBE: ASTM B 88, TYPE L (ASTM B 88M, TYPE B) WATER TUBE, DRAWN TEMPER.
 - 1. CAST-COPPER SOLDER-JOINT FITTINGS: ASME B16.18, PRESSURE FITTINGS.
 - 2. WROUGHT-COPPER SOLDER-JOINT FITTINGS: ASME B16.22, WROUGHT-COPPER PRESSURE FITTINGS.
- B. SOFT COPPER TUBE: ASTM B 88, TYPE K (ASTM B 88M, TYPE A) AND ASTM B 88, TYPE L (ASTM B 88M, TYPE B) WATER TUBE, ANNEALED TEMPER.
 - 1. COPPER SOLDER-JOINT FITTINGS: ASME B16.22, WROUGHT-COPPER PRESSURE FITTINGS.
 - 2. COPPER PRESSURE-SEAL-JOINT FITTINGS: MANUFACTURERS' SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. NIBCO INC.
 - 2. VEGA PLUMBING AND HEATING SYSTEMS.
- C. DIELECTRIC FITTINGS
 - 1. GENERAL REQUIREMENTS: ASSEMBLY OF COPPER ALLOY AND FERROUS MATERIALS WITH SEPARATING NONCONDUCTIVE INSULATING MATERIAL. INCLUDE END CONNECTIONS COMPATIBLE WITH PIPES TO BE JOINED.
- D. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DOMESTIC WATER PIPING. INDICATED LOCATIONS AND ARRANGEMENTS ARE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS, EXPANSION, AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.
- E. INSTALL COPPER TUBING UNDER BUILDING SLAB ACCORDING TO OIA'S "COPPER TUBE HANDBOOK".
- F. INSTALL SHUTOFF VALVE IMMEDIATELY UPSTREAM OF EACH DIELECTRIC FITTING.
- G. INSTALL DOMESTIC WATER PIPING LEVEL, WITH 0.125 PERCENT SLOPE DOWNWARD TOWARD DRAIN AND PLUMB.
- H. INSTALL PIPING CONCEALED FROM VIEW AND PROTECTED FROM PHYSICAL CONTACT BY BUILDING OCCUPANTS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.
- I. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.
- J. INSTALL PIPE ABOVE ACCESSIBLE CEILING TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL, AND COORDINATE WITH OTHER SERVICES OCCUPYING THAT SPACE.
- K. INSTALL PIPING ADJACENT TO EQUIPMENT AND SPECIALTIES TO ALLOW SERVICE AND SUBMITTANCE.
- L. INSTALL PIPING TO PERMIT VALVE SERVICING.
- M. INSTALL NIPPLES, UNIONS, SPOUTS, FITTINGS, AND VALVES WITH PRESSURE RATINGS THE SAME AS OR HIGHER THAN SYSTEM PRESSURE. RATING USED IN APPLICATIONS BELOW UNLESS OTHERWISE INDICATED.
- N. INSTALL PIPING FREE OF SAGS AND BENDS.
- O. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
- P. INSTALL UNIONS IN COPPER TUBING AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, MACHINE, AND SPECIALTY.
- Q. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.
- R. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.
- S. INSTALL SHUTOFF VALVE CLOSE TO WATER MAIN ON EACH BRANCH AND RISER SERVING PLUMBING FIXTURES OR EQUIPMENT, ON EACH WATER SUPPLY TO EQUIPMENT, AND ON EACH WATER SUPPLY TO PLUMBING FIXTURES THAT DO NOT HAVE SHUTOFF STOPS. USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE GATE VALVES FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
- T. HANGER AND SUPPORT INSTALLATION: SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.
- U. DIAMETER SHALL BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH (10 MM).
- V. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
 - 1. NPS 3/4 (DN 20) AND SMALLER: 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
 - 2. NPS 1 AND NPS 1-1/4 (DN 25 AND DN 32): 72 INCHES (1800 MM) WITH 3/8-INCH (10-MM) ROD.
 - 3. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 96 INCHES (2400 MM) WITH 3/8-INCH (10-MM) ROD.
 - 4. NPS 2-1/2 (DN 65): 108 INCHES (2700 MM) WITH 1/2-INCH (13-MM) ROD.
 - 5. NPS 3 TO NPS 5 (DN 80 TO DN 125): 10 FEET (3 M) WITH 1/2-INCH (13-MM) ROD.
 - 6. NPS 6 (DN 150): 10 FEET (3 M) WITH 5/8-INCH (16-MM) ROD.
 - 7. NPS 8 (DN 200): 10 FEET (3 M) WITH 3/4-INCH (19-MM) ROD.
- W. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET (3 M).
- X. FIELD QUALITY CONTROL PERFORM TESTS AND INSPECTIONS.
 - 1. PIPING INSPECTIONS:
 - 1. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT HAS BEEN INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
 - 2. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST ONE DAY BEFORE INSPECTION MUST BE MADE. PERFORMANCE TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION.
 - 3. ROUGH-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGH-IN AND BEFORE SETTING FITTINGS.
 - 4. FINAL INSPECTION: ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
 - 5. REPORTS: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TESTS OR INSPECTIONS, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.
 - 6. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
- Y. PIPING
 - 1. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER.
 - 2. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEQUENTS, SUBMIT A SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
 - 3. LEAVE NEW, ALTERED, EXTENDED, OR REPLACED DOMESTIC WATER PIPING UNCOVERED AND UNCONCEALED UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT HAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
 - 4. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG (345 KPA) ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND TEST PORTION OF PIPING THAT WILL NOT PASS TEST AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
 - 5. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
 - 6. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION REQUIRED.
- Z. DOMESTIC WATER PIPING WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.

- AA. PREPARE TEST AND INSPECTION REPORTS.
- AB. CLEAN AND DISINFECT POTABLE AND NON-POTABLE DOMESTIC WATER PIPING AS FOLLOWS:
 - AC. PURGE NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED BEFORE USING.
 - AD. USE PURGING AND DISINFECTING PROCEDURES PRESCRIBED BY AUTHORITIES HAVING JURISDICTION; IF METHODS ARE NOT PRESCRIBED, USE PROCEDURES DESCRIBED IN EITHER ANNA C105 OR FOLLOW PROCEDURES DESCRIBED BELOW.
 - 1. FLUSH PIPING SYSTEM WITH CLEAN, POTABLE WATER UNTIL DRIFT WATER DOES NOT APPEAR AT OUTLETS.
 - 2. SUBMIT WATER SAMPLES IN STERILE BOTTLES TO AUTHORITIES HAVING JURISDICTION FOR LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
 - 3. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED.
- AE. UNDER-BUILDING-SLAB, DOMESTIC WATER PIPING, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
 - 1. SOFT COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); WROUGHT-COPPER SOLDER-JOINT FITTINGS, AND BRAZED JOINTS.
- AF. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
 - 1. HARD COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); WROUGHT-COPPER SOLDER-JOINT FITTINGS, AND SOLDERED JOINTS.
 - 2. COOPER PRESS FITTINGS: AT THE CONTRACTOR'S OPTION ON THE DOMESTIC HOT AND COLD WATER PIPING, COOLING COIL, CONDENSATE DRAINS IN OPTION LINES 1/2" DIAMETER UP THROUGH 2-1/2" DIAMETER MECHANICAL PRESS (PRO-PRESS) JOINTS AND FITTINGS INCLUDING THE SMART CONNECTION FEATURE OPTION TO ENSURE THAT IMPRESSED FITTING WILL EASILY AND RELIABLY DETECTED DURING PRESSURE TESTING AS MANUFACTURED BY BECA, NIBCO AND ARIOLLO PRESS WILL BE ACCEPTABLE PROVIDED THE FITTING MANUFACTURER'S RECOMMENDED CRIMPING TOOL WITH PROPERLY SIZED REPLACEABLE ANVLS ARE UTILIZED RIGID TOOL COMPANY. INSTALLATION WILL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED PUBLISHED GUIDELINES.
- AG. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2-1/2 TO NPS 4 (DN 65 TO DN 100), SHALL BE ONE OF THE FOLLOWING:
 - 1. HARD COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); WROUGHT-COPPER SOLDER-JOINT FITTINGS, AND SOLDERED JOINTS.
 - 2. GALVANIZED-STEEL PIPE, GROOVED-JOINT, GALVANIZED-STEEL-PIPE APPURTENANCES, AND GROOVED JOINTS.
- AH. DRAWINGS INDICATE VALVE TYPES TO BE USED. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE FOLLOWING REQUIREMENTS APPLY:
 - 1. SHUTOFF DUTY: USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE GATE VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
 - 2. THROTTLING DUTY: USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE BALL VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
 - 3. HOT-WATER CIRCULATION PIPING, BALANCING DUTY: CALIBRATED BALANCING VALVES, DRAIN DUTY: HOSE-END DRAIN VALVES.
- AI. USE CHECK VALVES TO MAINTAIN CORRECT DIRECTION OF DOMESTIC WATER FLOW TO AND FROM EQUIPMENT.
- AJ. IRON GROOVED-END VALVES MAY BE USED WITH GROOVED-END PIPING.

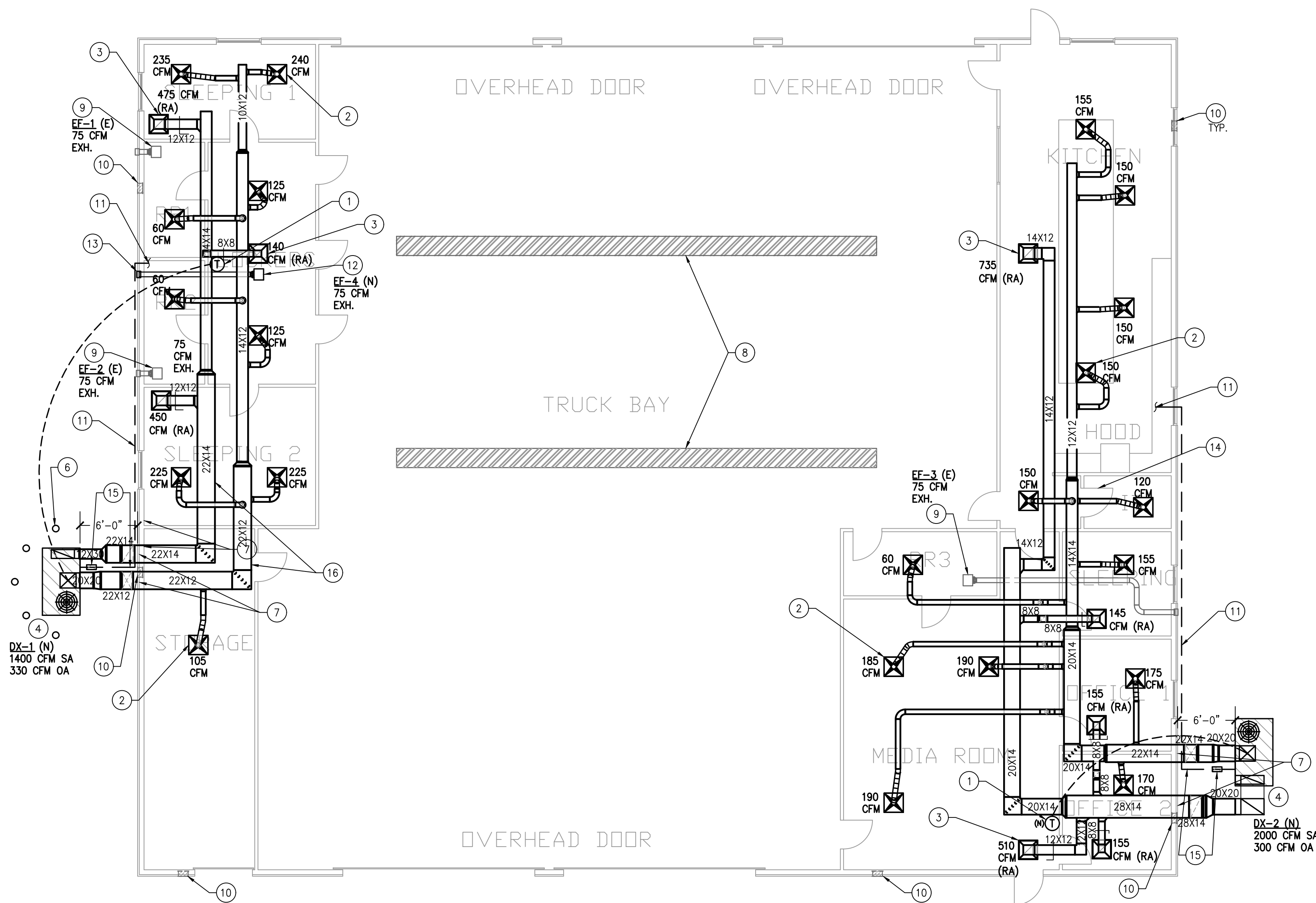
SANITARY WASTE AND STORM PIPING

- A. HUB-AND-SPOUT, CAST-IRON SOIL PIPE AND FITTINGS PIPE AND FITTINGS: ASTM A 74, SERVICE CLASS(ES). GASKETS: ASTM C 864, RUBBER.
 - 1. JOSAM COMPANY, JOSAM DIV.
 - 2. MIFAB, INC.
- B. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS
 - 1. PIPE AND FITTINGS: ASTM A 112.2M FOR CAST IRON FOR CLEANOUT TEST TEE.
 - 2. SOLENT STACK FITTINGS: ASME B16.45 OR ASSE 1043, HUBLESS, CAST-IRON AERATOR AND DRAINER DRAINAGE FITTINGS.
 - 3. HUBLESS-PIPE COUPLINGS: MANUFACTURERS' SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1. ANACH-HENRY, SD-4000.
 - 2. MIFAB, INC.
 - 3. MESSON RUBBER COMPANY; A DIVISION OF MCP INDUSTRIES, INC.
 - 4. CLAMP-ALL CORP.
 - 5. STANDARDS: ASTM C 1277 AND CSPI 310.
 - 4. DESCRIPTION: STAINLESS-STEEL CORROLATED SHEILD WITH STAINLESS-STEEL BANDS AND FIBERGLASS REINFORCING. ASTM A 564, RUBBER SLEEVE WITH INTEGRAL CENTER PIPE STOP.
- C. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS. INDICATED LOCATIONS AND ARRANGEMENTS WERE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS, EXPANSION, PUMP SIZING, AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.
- D. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.
- E. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.
- F. INSTALL PIPING ABOVE ACCESSIBLE CEILING TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL.
- G. INSTALL PIPING TO PERMIT VALVE SERVICING.
- H. INSTALL PIPING TO ALLOW APPLICATION OF UP OR DOWN FLOW IS PROHIBITED.
- I. INSTALL PIPING FREE OF SAGS AND BENDS.
- J. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
- K. INSTALL PIPING TO ALLOW APPLICATION OF UP OR DOWN FLOW IS PROHIBITED.
- L. MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, BENDS, AND LONG-SWEEP BENDS. SANITARY TEES AND SHORT-SWEEP 1/4 BENDS MUST BE USED ON VERTICAL STACKS. CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG-TURN, DOUBLE Y-BRANCH AND 1/8-BEND FITTINGS IF TWO FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON DRAIN PIPE. STRAIGHT DRIVES AND LONG SWEEP BENDS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.
- M. LAY BURIED BUILDING DRAINAGE PIPING BEGINNING AT LOW POINT OF EACH SYSTEM. INSTALL TIE TO GRADES AND ALIGNMENT INDICATED, WITH UNBROKEN CONTINUITY OF WVERT. PLACE HUB ENDS OF PIPING UPSTREAM. INSTALL REQUIRED GASKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR USE OF LUBRICANTS, CEMENTS, AND OTHER INSTALLATION REQUIREMENTS. MAINTAIN SWAG IN PIPING AND PULL PART EACH JOINT AS REQUIRED.
- N. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES UNLESS OTHERWISE INDICATED:
 - 1. BUILDING SANITARY DRAIN: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 (DN 80) AND SMALLER; 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 4 (DN 100) AND LARGER.
 - 2. HORIZONTAL SANITARY DRAINAGE PIPING: 1 PERCENT DOWNWARD IN DIRECTION OF FLOW.
 - 3. VENT PIPING: 1 PERCENT DOWN TOWARD VERTICAL FIXTURE VENT OR TOWARD VENT STACK.
- O. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CSPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK", CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS."
 - 1. INSTALL BACKSUPPORT ON UNDERGROUND PIPING ACCORDING TO ASTM A 874 OR ANNA C105/A 215.
 - 2. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
 - 3. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.
 - 4. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.
- S. HANGER AND SUPPORT INSTALLATION
 - 1. COMPLIANT WITH REQUIREMENTS FOR PIPE HANGER AND SUPPORT DEVICES AND INSTALLATION.
 - 1. INSTALL CARRIER SUPPORTS FOR HORIZONTAL PIPING IN NONCORROSIVE ENVIRONMENTS.
 - 2. INSTALL STAINLESS-STEEL PIPE HANGERS FOR HORIZONTAL PIPING IN CORROSIVE ENVIRONMENTS.
 - 3. INSTALL CARBON-STEEL PIPE SUPPORT CLAMPS FOR VERTICAL PIPING IN NONCORROSIVE ENVIRONMENTS.
 - 4. INSTALL STAINLESS-STEEL PIPE SUPPORT CLAMPS FOR VERTICAL PIPING IN CORROSIVE ENVIRONMENTS.
 - 5. VERTICAL PIPING: MSS TYPE 8 OR TYPE 42, CLAMPS.
 - 6. INSTALL INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS:
 - 7. 100 FEET (30 M) AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS.
 - 8. LONGER THAN 100 FEET (30 M): MSS TYPE 43, ADJUSTABLE, ROLLER HANGERS.
 - 9. LONGER THAN 100 FEET (30 M) IF INDICATED: MSS TYPE 48, STEEL CUSHION ROLLS.
 - 10. MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET (30 M) OR LONGER: MSS TYPE 44, PIPE ROLLS. SUPPORT PIPE ROLLS ON TRAVELERS.
 - 11. BASE OF VERTICAL PIPING HANGERS:
 - 1. SUPPORT HORIZONTAL PIPING AND TUBING WITHIN 12 INCHES (300 MM) OF EACH FITTING, VALVE, AND COUPLING.
 - U. SUBJECT VERTICAL PIPING TUBING AT BASE AND AT EACH FLOOR.
 - V. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, WITH 3/8-INCH (10-MM) MINIMUM RODS.
 - W. INSTALL HANGERS FOR CAST-IRON SOIL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
 - 1. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
 - 2. NPS 3 (DN 80): 60 INCHES (1500 MM) WITH 1/2-INCH (13-MM) ROD.
 - 3. NPS 4 AND NPS 5 (DN 100 AND DN 125): 60 INCHES (1500 MM) WITH 5/8-INCH (16-MM) ROD.
 - 4. NPS 6 AND NPS 8 (DN 150 AND DN 200): 60 INCHES (1500 MM) WITH 3/4-INCH (19-MM) ROD.
 - 5. INSTALL SUPPORTS FOR VERTICAL CAST-IRON SOIL PIPING EVERY 15 FEET (4.5 M).
- X. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST 24 HOURS BEFORE INSPECTION MUST BE MADE. PERFORMANCE TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION.
 - ROUGH-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGH-IN AND BEFORE SETTING FITTINGS.
 - FINAL INSPECTION: ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
 - Z. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
- AA. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
 - 1. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEQUENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
 - 2. LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED, OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT HAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
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 - 2. LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED, OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT HAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
 - 3. ROUGH-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGH-IN AND BEFORE SETTING FITTINGS.
 - 4. FINAL INSPECTION: ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
- Y. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
- Z. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
- AA. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
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- Z. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
- AA. TEST SANITARY DRAINAGE AND VENT PIPING

MECHANICAL GENERAL NOTES:

- ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
- NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE LANDLORD AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED.
- ALL ITEMS REMOVED SHALL BECOME PROPERTY OF THE LANDLORD AND SHALL BE DISPOSED OF AS PER THE LANDLORD'S INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY OWNERS SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
- THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE LANDLORD AND/OR ENGINEER FOR EXPEDITING AND THE RESOLUTION.
- CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
- USE OF THE LANDLORD'S BUILDING FACILITIES FOR HANDLING OF THE LANDLORD'S REMOVED EQUIPMENT AND MATERIALS SHALL BE AT THE DIRECTION OF THE LANDLORD AND SHALL BE COORDINATED WITH HIS OPERATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
- PROVIDE ALL NECESSARY PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
- WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE LANDLORD AND ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK.
- SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- ALL WORK SHALL CONFORM TO ALL STATE AND LOCAL CODES, RULES AND REGULATIONS AND ORDINANCES.
- CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO THE CONTRACT.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
- CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
- CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S RULES AND REGULATIONS TO COMPLY WITH BUILDING STANDARDS.
- FLEXIBLE DUCTWORK LENGTHS SHALL NOT EXCEED 5'-0". USE INSULATED RIGID ROUND DUCTWORK WHERE REQUIRED. ALL NEW FLEXIBLE DUCTWORK CONNECTIONS TO AIR DEVICES SHOWN ON THE DRAWING SHALL BE SIZED ACCORDING TO THE NECK SIZE SCHEDULE.
- THE ENTIRE AIR SUPPLY SYSTEM SHALL BE RE-BALANCED TO THE AIR QUANTITIES INDICATED ON THIS DRAWING BY AN INDEPENDENT AIR BALANCE CONTRACTOR. THE AIR BALANCE CONTRACTOR SHALL SUBMIT NEBB CERTIFIED AIR BALANCE REPORTS FOR ENGINEERING REVIEW AND TO BUILDING MANAGEMENT.
- REFER TO DRAWING MEP FOR SPECIFICATIONS THAT APPLY TO THIS SHEET.
- CONTRACTOR SHALL PROVIDE TO BUILDING OWNER THE AS-BUILT RECORD DRAWINGS AND THE OPERATING AND MAINTENANCE MANUALS WITHIN 90 DAYS OF SYSTEMS ACCEPTANCE. RECORD DRAWINGS SHALL INCLUDE PERFORMANCE DATA FOR EQUIPMENT, DUCT AND PIPE DISTRIBUTION SYSTEMS, AND AIR AND WATER FLOW RATES. O&M MANUALS SHALL INCLUDE EQUIPMENT AND ASSOCIATED OPTIONS REQUIRING SERVICE, REQUIRED MAINTENANCE ACTIVITIES, CONTACT INFO OF SERVICE AGENCIES, HVAC CONTROLS CALIBRATION INFORMATION AND SET-POINTS, AND DESCRIPTION OF EQUIPMENTS' INTENDED OPERATIONS.

CONTRACTOR NOTE:
DEMOLISH ALL EXISTING SUPPLY AND RETURN DUCTWORK, FITTINGS, AND ASSOCIATED AIR DEVICES, AS WELL AS EXISTING CONDENSING UNITS, FURNACES, AND ASSOCIATED PIPING. PATCH ALL WALL PENETRATIONS. RESTROOM EXHAUST FANS, ASSOCIATED EXHAUST DUCTWORK, AND KITCHEN EXHAUST HOOD TO REMAIN.



01 MECHANICAL PLAN
SCALE: 1/8"=1'-0"

MECHANICAL KEYED NOTES:

- PROVIDE NEW THERMOSTAT AT 48" A.F.F. CONTRACTOR TO FIELD VERIFY FOR EXACT LOCATION WITH THE BUILDING OWNER.
- PROVIDE NEW 24" X 24" SUPPLY AIR DEVICE AT LOCATION INDICATED. BALANCE TO CFM INDICATED. SEE SCHEDULE AND DETAILS. TYPICAL.
- PROVIDE NEW 24" X 24" RETURN AIR GRILLE AT LOCATION INDICATED. PROVIDE A VOLUME DAMPER FOR AIR BALANCING. BALANCE TO RA CFM INDICATED. SEE SCHEDULE. TYPICAL.
- NEW DX-1. FIELD VERIFY AND COORDINATE EXACT LOCATION WITH EXISTING CONSTRAINTS. MOUNT UNIT ON 14" CURB. THE CURB SHALL SIT ON A CONCRETE SLAB. PROVIDE A CONDENSATE PUMP AND 3/4" CONDENSATE DRAIN LINE TO ROUTE THE CONDENSATE FROM DX-1 TO THE TAILPIECE CONNECTION AT THE LAVATORY IN THE RESTROOM. BALANCE TO SA AND OA CFM VALUES INDICATED. SEE SCHEDULE.
- NEW DX-2 WITH FIELD INSTALLED ECONOMIZER ALONG WITH FIELD FABRICATED AND INSTALLED RETURN AIR DUCT TRANSITION. FOLLOW MANUFACTURER GUIDELINES FOR PROPER INSTALLATION. FIELD VERIFY AND COORDINATE EXACT LOCATION WITH EXISTING CONSTRAINTS. MOUNT UNIT ON 14" CURB. THE CURB SHALL SIT ON A CONCRETE SLAB. PROVIDE A CONDENSATE PUMP AND 3/4" CONDENSATE DRAIN LINE TO ROUTE THE CONDENSATE FROM DX-2 TO THE TAILPIECE CONNECTION AT THE SINK IN THE KITCHEN. BALANCE TO SA AND OA CFM VALUES INDICATED. SEE SCHEDULE.
- PROVIDE NEW REMOVABLE LOCKABLE BOLLARD POSTS WITH SLEEVES SURROUNDING DX-1. TYPICAL.
- PENETRATE EXTERIOR WALL ABOVE CEILING WITH NEW SUPPLY AND RETURN DUCTWORK. FIELD VERIFY AND COORDINATE FOR EXACT LOCATION PRIOR TO START OF WORK.
- EXISTING RADIANT GAS HEATER TO REMAIN. COORDINATE WITH PLUMBING FOR NEW SUPPLY NATURAL GAS LINES. CONTRACTOR MUST PROVIDE A CONVERSION KIT TO CONVERT ITS GAS VALVE FROM PROPANE TO NATURAL GAS AS REQUIRED.
- EXISTING EXHAUST FAN (EF-1,2,3) TO REMAIN. CLEAN AND REPAIR TO GOOD WORKING CONDITION. REPAIR IF DAMAGED. BALANCE TO CFM INDICATED. ENSURE FANS CONNECT TO THE EXHAUST DUCTWORK. NOTIFY OWNER AND ENGINEER/ARCHITECT IF UNIT CANNOT BE REPAIRED.
- DEMO EXISTING SIDEWALL LOUVERS TO ATTIC SPACE. PATCH REMAINING SIDEWALL PENETRATION AND RETURN TO LIKE NEW CONDITION. TYPICAL.
- ROUTE 3/8" COPPER CONDENSATE DRAIN PIPING ALONG EXTERIOR WALL TOWARDS THE PLUMBING TAILPIECE FROM THE CONDENSATE PUMP. PENETRATE EXTERIOR WALL AND TERMINATE AT THE TAILPIECE. THE DRAIN LINE SHALL BE SLOPED AT LEAST 1/8" PER FOOT TOWARD THE DOWNSPOUT. FIELD VERIFY AND COORDINATE FOR BEST ROUTING.
- PROVIDE NEW EXHAUST FAN EF-4. ROUTE 6" EXHAUST DUCT HORIZONTALLY THROUGH EXTERIOR SIDEWALL. BALANCE TO CFM INDICATED. FIELD VERIFY AND COORDINATE FOR BEST ROUTING. SEE SCHEDULE AND DETAIL.
- PROVIDE WALL CAP EXHAUST MATCH EXISTING WITH BACKDRAFT DAMPER AT LOCATION INDICATED FOR EF-4 EXHAUST. ENSURE OUTLET IS A MINIMUM 10' FROM ANY BUILDING INTAKE AIR OPENING.
- UNDERCUT DOOR 1.5" FOR RETURN AIR.
- CONDENSATE PUMP LOCATED OUTDOORS. ENCLOSED IN A FIELD FABRICATED WEATHER PROOF GALVANIZED METAL (MIN 22 GAUGE) BOX, AND ELEVATED AT MIN 8" ABOVE GROUND. PROVIDE 120V/1PH/60HZ, 60 WATTS, RATED AT 25GPH AT 10FTH (LITTLE GIANT VOMA-ISUL). PROVIDE 3/8" COPPER DISCHARGE LINE AND SECURED TO EXTERIOR WALL TO THE TAILPIECE INDOORS. FIELD VERIFY AND COORDINATE.
- PROVIDE NEW DUCTWORK SUPPLY AND RETURN WITH SIZES INDICATED. FIELD VERIFY AND COORDINATE FOR THE BEST ROUTING PRIOR TO START OF WORK.

REVISIONS		
NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATION
CONROE FIRE DEPARTMENT
STATION #6
15663 HWY 105
MONTGOMERY, TEXAS 77356

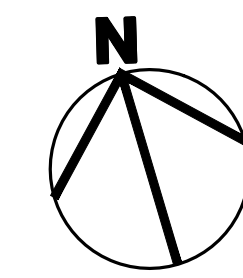


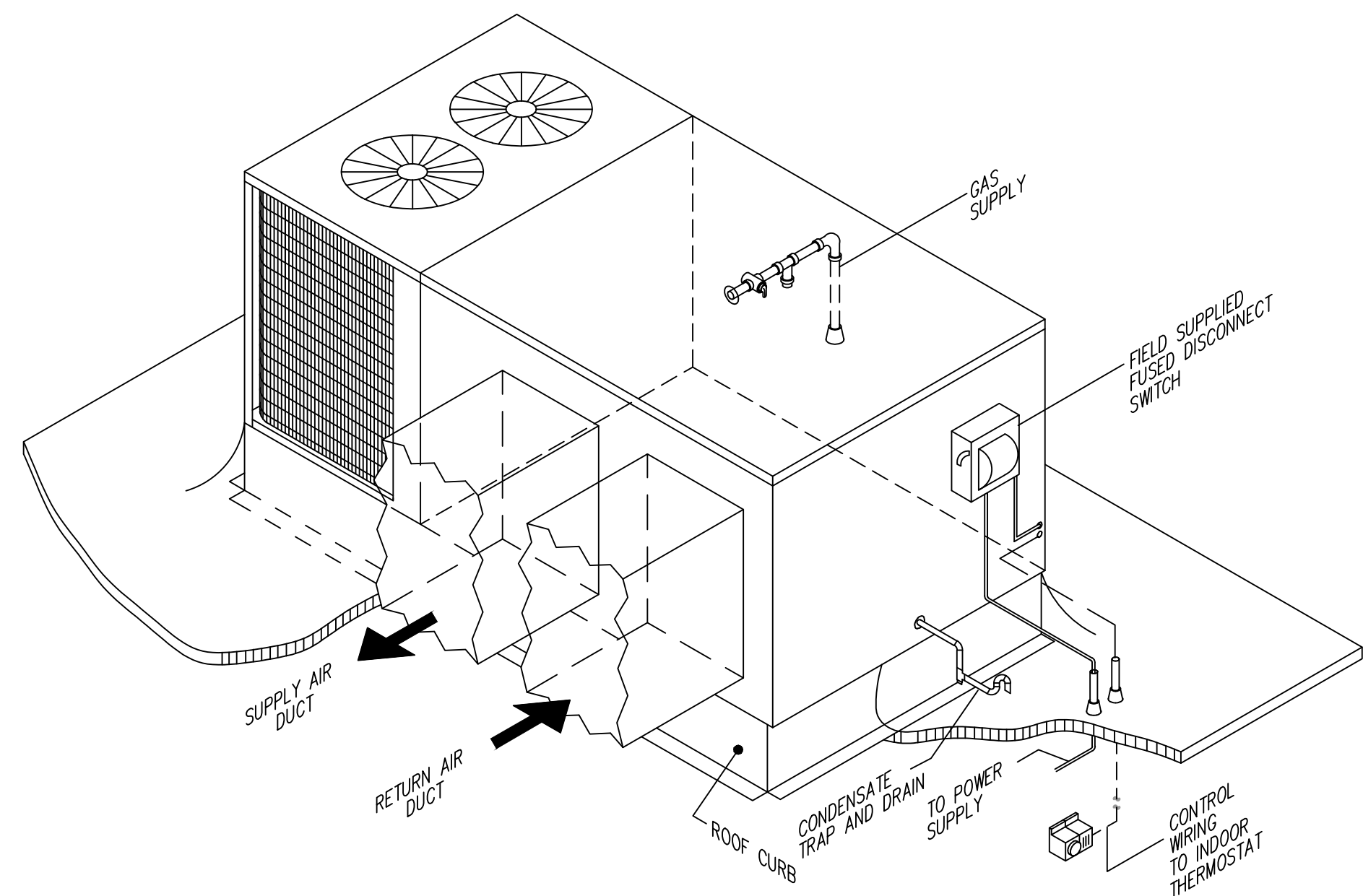
NOT
 FOR
 CONSTRUCTION

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

MECHANICAL
PLAN

M1.01





NOTES:

- REFER TO MECHANICAL PLANS FOR DUCT WORK CONFIGURATION FOR EACH UNIT. TO SCHEDULES FOR SPECIFIC UNIT TYPE. TO MEP SPECIFICATION FOR ALL APPROPRIATE CONNECTIONS TO UNIT.
- PROVIDE FLEXIBLE DUCT CONNECTION ON SUPPLY AND RETURN DUCTS AT UNIT.
- PROVIDE SMOKE DETECTORS IN SUPPLY AND RETURN DUCTS AT UNIT FOR UNITS WITH 2000 CFM OR GREATER.
- PROVIDE AUTOMATIC DAMPER IN OUTSIDE AIR INTAKE TO BALANCE OUTSIDE AND TO CLOSE WHEN UNIT IS NOT IN OPERATION.
- PROVIDE SINGLE POINT CONNECTION FOR UNITS WITH ELECTRIC HEAT.
- ROOFING MEMBRANE TO EXTEND TO TOP OF CURB AND OVER.
- ANCHOR CURB AND UNIT TO GROUND FOR STORM RESISTANCE SEE GOVERNING BODY'S REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
- ROUTE CONDENSATE DRAINS TO APPROPRIATE LOCATION. INSULATE CONDENSATE DRAIN TRAP. SEE MECHANICAL PLANS.

PACKAGED HVAC UNIT WITH HORIZONTAL SUPPLY AND RETURN DUCTS 02

SCALE: NONE

FAN SCHEDULE

MARK	EF-1 (E)	EF-2 (E)	EF-3 (E)	EF-4 (N)
SERVES	RESTROOM 1	RESTROOM 2	RESTROOM 3	LOCKER ROOMS
CFM	75	75	75	75
TYPE/DRIVE	CEILING/DIRECT	CEILING/DIRECT	CEILING/DIRECT	CEILING/DIRECT
S.P. IN. WC	EXISTING	EXISTING	EXISTING	0.3
HORSEPOWER	1/10	1/10	1/10	17 WATTS
RPM MAX. / SONES	EXISTING	EXISTING	EXISTING	623 / <0.3
VOLTS/PHASE/HERTZ	EXISTING	EXISTING	EXISTING	115/60
MANUFACTURER	EXISTING	EXISTING	EXISTING	GREENHECK
MODEL NO.	EXISTING	EXISTING	EXISTING	CSP-A200
NOTES	ALL	ALL	ALL	ALL

PACKAGED DX UNIT SCHEDULE

MARK	DX-1	DX-2
SERVES	LIVING QUARTERS (WEST SIDE)	KITCHEN/OFFICE (EAST SIDE)
TOTAL CFM	1,400	2,000
O.A. CFM	330	300
SUPPLY FAN HP	1.0	1.0
EXT. S.P. IN. WC	0.75	0.75
SEER / IEER / EER	17.1/-/12.7	17.1/-/12.7
COOLING - REFRIGERANT R410a		
EAT (DB/WB)	79.95/66.99	78.30/65.42
LAT (DB/WB)	55.00/54.79	55.00/54.67
MAX. OFF COIL TEMPERATURE	54.64	54.44
SEN. HT. BTU/HR (NET)	36.3K	51.1K
TOTAL HT. BTU/HR (NET)	52.8K	64.2K
AMB. TEMP.	100	100
HEATING (NATURAL GAS)		
HEATING INPUT HIGH/LOW (MBH)	70/53	70/53
HEATING OUTPUT HIGH/LOW (MBH)	57/43	57/43
HEATING STAGES	2	2
VOLTS/PHASE/CYCLES	240/1/60	240/1/60
MCA/MOCP (AMPERE)	41.0/60	41.0/60
MANUFACTURER	LENNOX	LENNOX
SERIES NO.	LGH060H4E	LGH060H4E
APPROXIMATE UNIT WEIGHT LB.	804	804
DIMENSIONS (LxHxW) INCHES	85.3X46.9X47.0	85.3X46.9X47.0
APPROXIMATE NOMINAL TONNAGE	4.5	5.0
NOTES	ALL	ALL

- NOTES:
- EF-1, -2, AND -4 INTERLOCKED TO DX-1'S OPERATION. EF-3 INTERLOCKED TO DX-2'S OPERATION.
 - BALANCE TO SCHEDULED CFM.
 - EXHAUST FAN'S OUTLET MUST BE AT A MINIMUM OF 10 FEET FROM ALL FRESH AIR INTAKE OPENINGS. CONTRACTOR SHALL COORDINATE AND VERIFY IN THE FIELD.
 - EF-4: PROVIDE A BACK DRAFT DAMPER, AND SOLID STATE SPEED CONTROL.

OUTSIDE AIR ANALYSIS

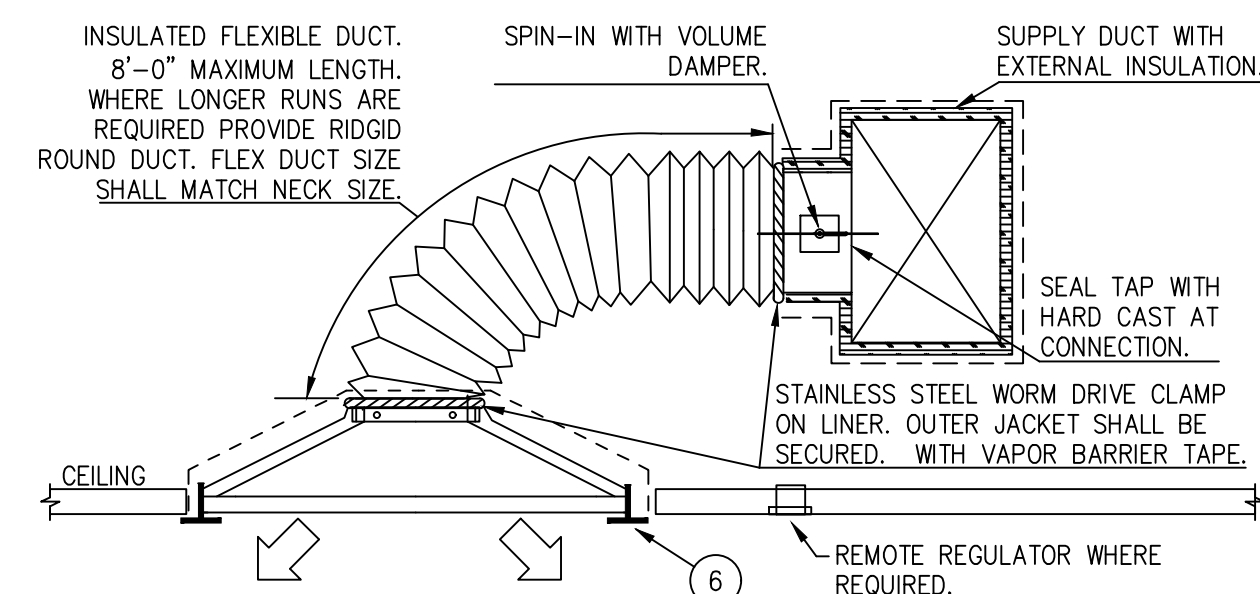
OUTSIDE AIR SHALL BE PROVIDED IN ACCORDANCE WITH THE 2009 INTERNATIONAL MECHANICAL CODE PER TABLE 403.3

WEST SIDE OF THE BUILDING:		
STORAGE/UTIL./RESTROOMS/LOCKER:	850SQFT X 0.06CFM/SQFT	= 51 CFM
SLEEPING:	(5CFM X 4PER) + (433SQFT X 0.06CFM/SQFT)	= 46 CFM
OUTSIDE AIR REQUIRED:		= 97 CFM
EAST SIDE OF THE BUILDING:		
OFFICE AREA:	(5CFM X 4PER) + (1,792SQFT X 0.06CFM/SQFT)	= 128 CFM
SLEEPING:	(5CFM X 2PER) + (123SQFT X 0.06CFM/SQFT)	= 18 CFM
UTI./IT/RESTROOM:	156SQFT X 0.06CFM/SQFT	= 10 CFM
OUTSIDE AIR REQUIRED:		= 156 CFM
TOTAL OA REQUIRED:	97 + 156 =	253 CFM
BUILDING PROVIDES:		
DX-1 FOR WEST SIDE:	330 CFM	
DX-2 FOR EAST SIDE:	300 CFM	
TOTAL OA PROVIDED:	330 + 300 =	630 CFM

- PROVIDE IECC COMPLIANT THERMOSTAT FOR EACH UNIT. THERMOSTAT SHALL BE CALIBRATED TO DISPLAY SPACE TEMPERATURE AT +/- 1F. THE THERMOSTAT SHALL CONTROL MODULATING HGRH, DISCHARGE AIR TEMPERATURE, SPACE TEMPERATURE, AND HUMIDITY SETPOINTS.
- AHRI360 STANDARD EFFICIENCY AND ASHRAE 90.1-2016 COMPLIANT. MEET OR EXCEED THE EFFICIENCIES IN SCHEDULE.
- PROVIDE 2" MERV 8 FILTER.
- ALL SUPPLY FANS MOTORS PROVIDED AS ECM.
- PROVIDE FACTORY INSTALLED DUAL 115 VOLT GFCI SERVICE OUTLET.
- PROVIDE FACTORY INSTALLED DISCONNECT AND SINGLE POINT ELECTRICAL CONNECTION.
- PROVIDE WITH LOW AMBIENT KIT, FREEZSTAT, CRANKCASE HEATER, HIGH PRESSURE CONTROL AND FAN DELAY RELAY KIT.
- PROVIDE FACTORY MINIMUM 14" CURB.
- LOCATE UNITS OUTSIDE AIR INTAKE A MINIMUM OF 15 FT FROM ALL EXHAUST/VENT OUTLETS.
- ROUTE CONDENSATE DRAIN LINES TO NEAREST APPROVED DRAIN.
- UNIT TO HAVE RAIN ENTRAPMENT THAT SATISFIES ASHRAE 62.1-2007 AND DEVICES UTILIZED SHALL CONFORM TO UL 1995, SECTION 58.
- PROVIDE OA INTAKE HOOD WITH BIRDSCREEN. PROVIDE BAROMETRIC RELIEF DAMPER FOR MAINTAINING BUILDING PRESSURIZATION. DX-2 HAS ECONOMIZER WITH ENTHALPY DIFFERENTIAL SENSORS, AND POWER EXHAUST WITH PRESSURE SENSOR FOR BUILDING PRESSURE CONTROL. ECONOMIZER SECTION ALONG ITS ACCESSORIES ARE FIELD INSTALLED.
- FACTORY INSTALLED CONDENSER COIL WITH HAIL GUARDS.
- 5 YEAR COMPRESSOR WARRANTY. FIRST YEAR LABOR WARRANTY WHOLE UNIT.
- PROVIDE HOT GAS REHEAT FOR HUMIDITY CONTROL AND PART LOAD CONDITIONS. HGRH SHALL PROVIDE AT LEAST 20° REHEAT. UNIT SHALL BE ABLE TO ADJUST THE DISCHARGE AIR TEMPERATURE TO MAINTAIN THE INDOOR SETPOINT. RELATIVE HUMIDITY SETPOINT IS 50%RH +/-5%.
- UNIT SHALL HAVE SIDE SUPPLY AND RETURN OPENING.
- FOR SALE ENGINEERING, CONTACT NICK DEL VILLAR WITH HTS AT 832-731-6289.

CONDENSATE DRAIN 01

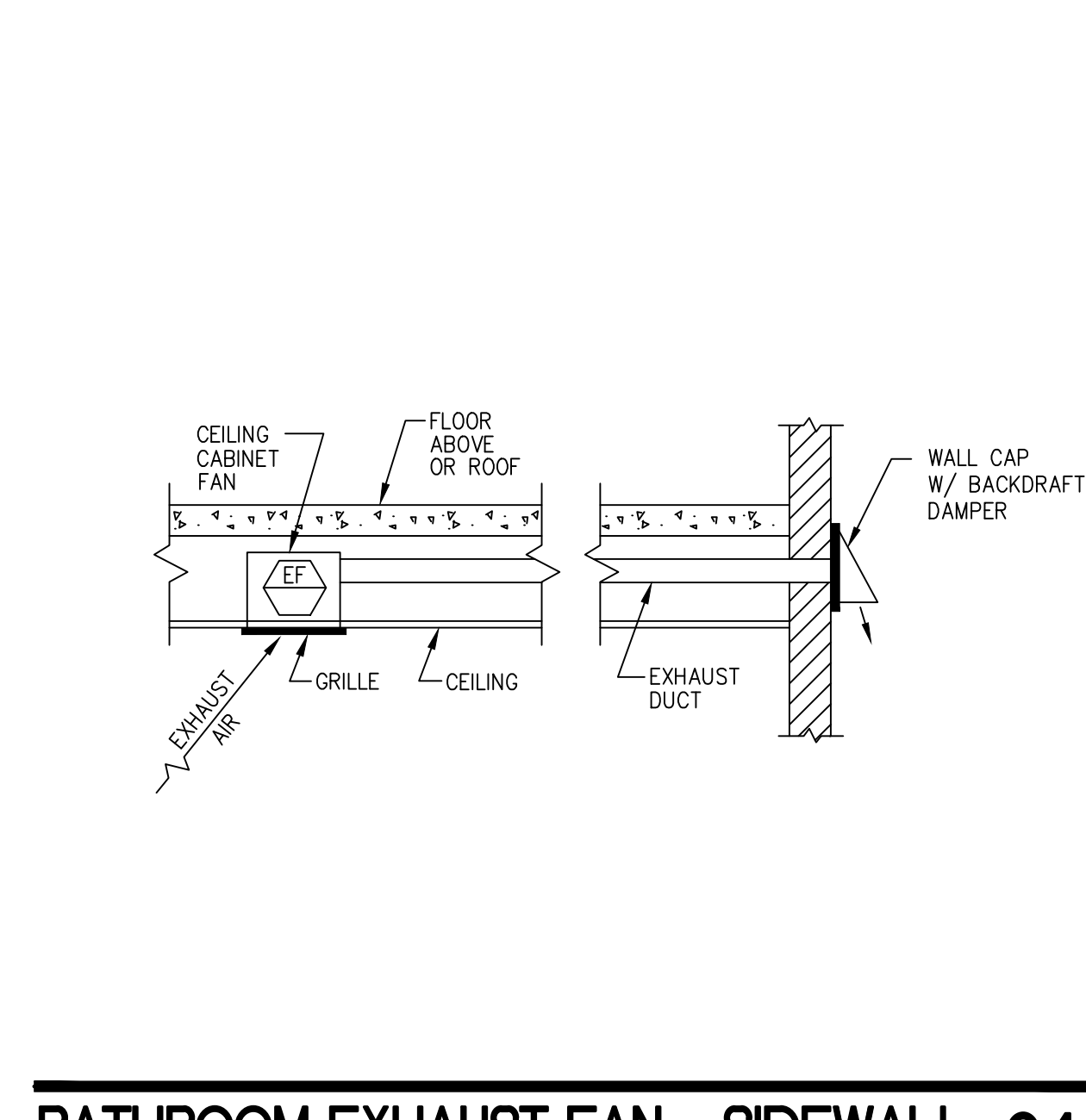
SCALE: NONE



- NOTE:
- LOCATE TRAPS SA AS TO BE ACCESSIBLE FOR CLEANING.
 - TO DETERMINE OFFSET, SUBTRACT SCHEDULED E.S.P. FROM T.S.P. THEN ADD 1".
 - ROUTE TO NEAREST SANITARY DRAIN.
- NOTES:
- CEILING DIFFUSER SHALL BE INSTALLED SUCH THAT THE FACE OF DIFFUSER IS FLUSH WITH CEILING. REFER TO AIR DEVICE SCHEDULE FOR EXACT DEVICE.
 - SUPPORT FLEXIBLE DUCT FROM STRUCTURE. FLEXIBLE DUCT SHALL NOT KINK, SAG OR REST ON LIGHT FIXTURE, CEILING SUPPORT "TEES" OR CEILING TILE.
 - PROVIDE SQUARE TO ROUND TAP AT BRANCH DUCT WHERE FLEXIBLE DUCT SIZE EXCEEDS DIMENSION OF RECTANGULAR DUCT.
 - FOR UNCONDITIONED CEILING PLENUMS, INSULATE BACK OF CEILING DIFFUSER WITH 1" DUCT WRAP AND SEAL WITH VAPOR BARRIER TAPE.
 - METALLIC FLEXIBLE DUCT SHALL BE USED WHERE FLEXIBLE DUCT CONNECTIONS ARE SHOWN ON THE DRAWING TO ALL AIR DEVICES INSTALLED IN INACCESSIBLE LOCATIONS SUCH AS ABOVE GYPSUM BOARD OR PLASTER CEILINGS. (REFER TO ARCH. DRAWINGS FOR CEILING TYPE.)
 - CEILING "TEE" OR DRYWALL TRIM PIECE BY OTHERS.

CEILING DIFFUSER 03

SCALE: NONE



BATHROOM EXHAUST FAN - SIDEWALL 04

SCALE: NONE

LEGEND OF MECHANICAL SYMBOLS

SYMBOL	DESCRIPTION
[Symbol]	SUPPLY DUCT VIEW INTO DUCT
[Symbol]	SUPPLY DUCT VIEW HEEL OF ELBOW
[Symbol]	RETURN OR EXHAUST DUCT VIEW INTO DUCT
[Symbol]	RETURN OR EXHAUST DUCT VIEW HEEL OF ELBOW
[Symbol]	SQUARE TO ROUND TRANSITION
[Symbol]	SQUARE ELBOW WITH TURNING VANES
[Symbol]	RADIUS ELBOW WITHOUT TURNING VANES
[Symbol]	SUPPLY SIDEWALL REGISTER
[Symbol]	RETURN OR EXHAUST SIDEWALL REGISTER
[Symbol]	ROUND S.A. DIFFUSER
[Symbol]	EXISTING FLEX DUCT
[Symbol]	NEW FLEX DUCT
[Symbol]	EXISTING DUCTWORK
[Symbol]	NEW DUCTWORK
[Symbol]	DUCTWORK TO BE REMOVED
[Symbol]	SQUARE CEILING DIFFUSER
[Symbol]	RETURN AIR GRILLE
[Symbol]	RETURN OR EXHAUST AIR REGISTER W/ SQUARE NECK
[Symbol]	PLENUM SLOT DIFFUSER
[Symbol]	MANUAL DAMPER
[Symbol]	FIRE DAMPER WITH ACCESS DOOR
[Symbol]	DRAIN LINE
[Symbol]	PIPE RISING
[Symbol]	PIPE TURNING DOWN
[Symbol]	EXHAUST FAN SPEED CONTROL
[Symbol]	THERMOSTAT
(E)	EXISTING TO REMAIN
(R)	RELOCATED
R.A.	RETURN AIR
S.A.	SUPPLY AIR
C.F.M.	CUBIC FEET PER MINUTE
AHU	AIR HANDLER UNIT

DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
0 - 120	6 X 6	6"ø
125 - 220	8 X 8	8"ø
225 - 330	10 X 10	10"ø
335 - 450	12 X 12	12"ø
455 - 530	15 X 15	14"ø
540 - 700	16 X 16	16"ø

AIR DEVICE SCHEDULE

MARK	MANUF. + MODEL	TYPE	REMARKS
[X]	TITUS TMS OR EQUAL	CEILING SUPPLY	24x24 LOUVERED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. PROVIDE AIR PATTERN CONTROLS. FACE AND FRAME SHALL HAVE AN OFF-WHITE ENAMEL FINISH. BACK PAN INTERIOR SHALL BE PAINTED FLAT BLACK. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE.
[X]	TITUS PAR OR EQUAL	CEILING RETURN /EXHAUST	24x24, 12x12 PERFORATED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. FACE AND FRAME SHALL HAVE A WHITE ENAMEL FINISH. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE.

REVISIONS

NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID

HVAC RENOVATION
CONROE FIRE DEPARTMENT
STATION #6
15663 HWY 105
MONTGOMERY, TEXAS 77356



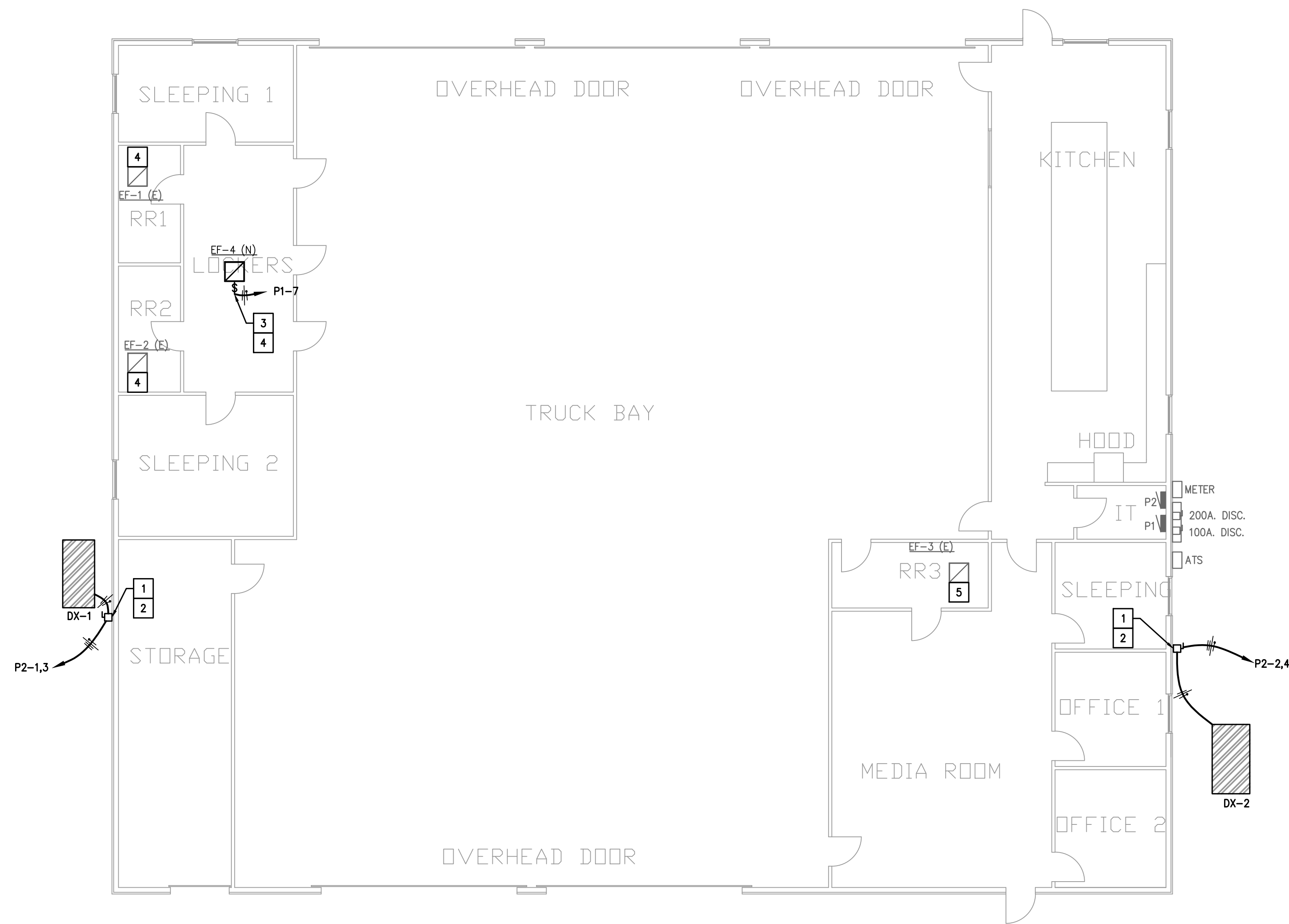
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SCALE: NONE

MECHANICAL SCHEDULES

M2.01

REVISIONS		
NO	DATE	DESCRIPTION
	04/21/20	ISSUED FOR BID



01 ELECTRICAL EQUIPMENT PLAN
SCALE: 1/8"=1'-0"

ELECTRICAL POWER GENERAL NOTES:

- MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PROVIDE NEW CIRCUIT DIRECTORY CARD AT PANELS. CIRCUITS SHALL BE LABELED TO CORRESPOND TO THE CIRCUITS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CONNECT CIRCUITS AS REQUIRED TO COMPLY WITH THIS DRAWING.
- CONDUCTORS SHALL BE #12 AWG SOLID COPPER (THWN) IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED.
- ALL OUTLETS TO BE MOUNTED VERTICALLY UNLESS OTHERWISE INDICATED.
- CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
- VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.
- COORDINATE THE INSTALLATION OF ELECTRICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, MECHANICAL EQUIPMENT AND SYSTEMS, AND STRUCTURAL COMPONENTS. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.
- VERIFY MECHANICAL EQUIPMENT SWITCH AND CONNECTION REQUIREMENTS, ITEM BY ITEM, WITH THE MECHANICAL CONTRACTOR, BEFORE WIRING EQUIPMENT. RESOLVE ALL DISCREPANCIES WITHOUT FURTHER COST TO OWNER.

ELECTRICAL POWER KEYED NOTES:

- PROVIDE 60A./240V./NF/N3R/2-POLE DISCONNECT IN ACCESSIBLE LOCATION.
- CONFIRM THAT A CONVENIENCE RECEPTACLE EXISTS WITHIN 25 FEET OF NEW PACKAGED DX UNIT. OTHERWISE, PROVIDE NEW WEATHERPROOF, GFI-PROTECTED RECEPTACLE AND CONNECT TO EXISTING EXTERIOR RECEPTACLE CIRCUIT.
- PROVIDE 20A./120V./HD TOGGLE SWITCH IN ACCESSIBLE LOCATION.
- PROVIDE RELAY TO INTERLOCK FAN OPERATION WITH DX-1.
- PROVIDE RELAY TO INTERLOCK FAN OPERATION WITH DX-2.

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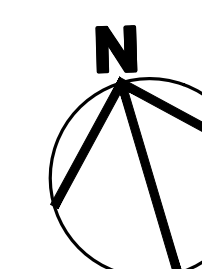
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 CONSULTING ENGINEERS
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SCALE: 1/8"=1'-0"

ELECTRICAL
PLAN

E1.01



ELECTRICAL CONTRACTOR SHALL PERFORM A CIRCUIT TRACE OF ALL CIRCUITS WITHIN THE AREA OF WORK. IDENTIFY CIRCUITS MADE AVAILABLE THROUGH DEMOLITION AND UTILIZE FOR NEW CIRCUITS. ADJUSTMENTS TO CIRCUIT NUMBERS AND/OR PANEL USED MAY BE NECESSARY. UTILIZE THE AVAILABLE SPARE CIRCUITS AS NECESSARY.

PROJECT NAME		HVAC-15663 HWY105										
PROJECT NUMBER		19173.00										
PANEL		P1										
VOLTAGE		120/240V, 1PH, 3W										
BUS		100 AMP										
MAINS		M.L.O.										
ACCESSORIES												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	LOAD	CODE								
0	420	EMERGENCY LIGHTS	420	1								
0	800	REFRIGERATOR	800	3								
1	540	KITCHEN	540	5								
2	100	EF-4	100	7								
2	1000	AUTO DOOR OPENER	1000	9								
2	1000	AUTO DOOR OPENER	1000	11								
2	1000	AUTO DOOR OPENER	1000	13								
0	450	EMERGENCY LIGHTS	450	15								
4	800	SHOP HEATER	800	17								
2	450	COMPUTER ROOM	450	19								
2	3200	PORTABLE BUILDING	3200	21								
2	3200	---	3200	23								
LIGHTS		RECEP	EQUIP	MOTORS	EL. HEAT	PHASE	PHASE	CONN	KVA	LOAD FACTORS	DES. KVA	DES. AMP
380	1500	8340	400	800	A	1	A	2	9	LIGHTS @ 125%	9.9	35
450	0	7670	675	600	C	1	C	1	9.4	EQUIP @ 100%	9.5	79
1410	1500	13710	1075	1400	TOTAL				19.3	LG. MOTOR @ 125%	19.4	81

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
 ** EXISTING SPARE CIRCUIT BREAKER
 *** EXISTING BREAKER SPACE
 **** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME		HVAC-15663 HWY105										
PROJECT NUMBER		19173.00										
PANEL		P2										
VOLTAGE		120/240V, 1PH, 3W										
BUS		200 AMP										
MAINS		M.L.O.										
ACCESSORIES												
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED												
CODE	LOAD	CIRCUIT DESCRIPTION	LOAD	CODE								
3	4920	DX1	4920	3								
3	4920	---	4920	3								
2	1200	WASHING MACHINE	1200	5								
2	1200	---	1200	7								
1	540	DORM RECEP	540	9								
2	1200	WASHING MACHINE	1200	11								
0	890	WEST LIGHTS	890	13								
2	600	COKE MACHINE	600	15								
1	540	EQUIP RM RECEP	540	17								
1	540	LUNCH AREA RECEP	540	19								
2	1400	HAND DRYER	1400	21								
1	540	CONF RM RECEP	540	23								
1	360	RESTROOM RECEP	360	25								
1	540	CONF RM RECEP	540	27								
0	150	FLA G POLE LIGHT	150	29								
1	720	WEST RECEP	720	31								
0	450	WALL PACKS FRONT	450	33								
6	600	ICE MACHINE	600	35								
5	420	EXISTING	420	37								
2	400	VENT HOOD	400	39								
LIGHTS		RECEP	EQUIP	MOTORS	EL. HEAT	PHASE	PHASE	CONN	KVA	LOAD FACTORS	DES. KVA	DES. AMP
3740	2340	5120	11565	0	A	1	A	2	22.8	LIGHTS @ 125%	23.7	198
1650	4320	5060	10777.5	0	C	1	C	1	22.4	EQUIP @ 100%	22.8	190
5390	6660	10780	22342.5	0	TOTAL				45.2	LG. MOTOR @ 125%	46.5	194

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
 ** EXISTING SPARE CIRCUIT BREAKER
 *** EXISTING BREAKER SPACE
 **** REPLACE EXISTING BREAKER AS SHOWN

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUIT DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE, "I" INDICATES INSULATED OR ISOLATED GROUND, "2" INDICATES SWITCHLEG, AND NO HATCHES INDICATES TWO CONDUCTORS.
	PARTIAL HOME RUN. SAME AS ABOVE.
	CONDUIT RUN CONCEALED IN FLOOR SLAB, BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	QUADRUPLEX RECEPTACLE OUTLET GANGED WITH A COMMON WALL PLATE; (2)-20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE. (IF REQUIRED)
	MOTOR STARTER / DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE.
	TRANSFORMER - REFER TO DRAWINGS FOR VOLTAGE AND AMPERAGE.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 120/208 VOLT.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 277/480 VOLT.

NOTES: 1. ALL SYMBOLS MAY NOT BE USED ON THIS DRAWINGS.
 2. REFER TO SPECIFICATIONS FOR MOUNTING HEIGHTS

BRANCH CIRCUIT SCHEDULE

OCFD AMP/POLES	DESCRIPTION	OCFD AMP/POLES	DESCRIPTION
20/1	(2)#12, (1)#12G, 1/2"C	70/1	(2)#4, (1)#6G, 3/4"C
20/2	(3)#12, (1)#12G, 1/2"C	70/2	(3)#4, (1)#6G, 1"C
20/3	(4)#12, (1)#12G, 1/2"C	70/3	(4)#4, (1)#6G, 1-1/4"C
25/1	(2)#10, (1)#10G, 1/2"C	80/1	(2)#3, (1)#6G, 1"C
25/2	(3)#10, (1)#10G, 1/2"C	80/2	(3)#3, (1)#6G, 1-1/4"C
25/3	(4)#10, (1)#10G, 1/2"C	80/3	(4)#3, (1)#6G, 1-1/4"C
30/1	(2)#10, (1)#10G, 1/2"C	90/1	(2)#2, (1)#6G, 1"C
30/2	(3)#10, (1)#10G, 1/2"C	90/2	(3)#2, (1)#6G, 1-1/4"C
30/3	(4)#10, (1)#10G, 1/2"C	90/3	(4)#2, (1)#6G, 1-1/4"C
35/1	(2)#8, (1)#10G, 1/2"C	100/2	(3)#1, (1)#6G, 1-1/4"C
35/2	(3)#8, (1)#10G, 3/4"C	100/3	(4)#1, (1)#6G, 1-1/2"C
35/3	(4)#8, (1)#10G, 3/4"C	110/2	(3)#1, (1)#6G, 1-1/2"C
40/1	(2)#8, (1)#10G, 1/2"C	110/3	(4)#1, (1)#6G, 1-1/2"C
40/2	(3)#8, (1)#10G, 3/4"C	125/2	(3)#1, (1)#6G, 1-1/2"C
40/3	(4)#8, (1)#10G, 3/4"C	125/3	(4)#1, (1)#6G, 1-1/2"C
45/1	(2)#6, (1)#10G, 1"C	150/2	(3)#1/0, (1)#6G, 1-1/2"C
45/2	(3)#6, (1)#10G, 1"C	150/3	(4)#1/0, (1)#6G, 1-1/2"C
45/3	(4)#6, (1)#10G, 1"C	175/2	(3)#2/0, (1)#6G, 1-1/2"C
50/1	(2)#6, (1)#10G, 1"C	175/3	(4)#2/0, (1)#6G, 2"C
50/2	(3)#6, (1)#10G, 1"C	200/2	(3)#3/0, (1)#6G, 2"C
50/3	(4)#6, (1)#10G, 1"C	200/3	(4)#3/0, (1)#6G, 2"C
60/1	(2)#4, (1)#10G, 3/4"C	225/2	(3)#4/0, (1)#4G, 2"C
60/2	(3)#4, (1)#10G, 1"C	225/3	(4)#4/0, (1)#4G, 2-1/2"C
60/3	(4)#4, (1)#10G, 1"C	250/2	(3)#250kcmil, (1)#4G, 2-1/2"C
		250/3	(4)#250kcmil, (1)#4G, 2-1/2"C

NOTE: THIS SCHEDULE IS FOR TYPICAL BRANCH CIRCUITS THAT ARE NOT DESIGNATED ON THE ONE-LINE OR RISER DIAGRAM. REFER TO PANELBOARD SCHEDULES FOR CIRCUIT BREAKER / FUSE SIZES AND NUMBER OF POLES. REFER TO FLOOR PLANS FOR DISCONNECT SWITCH SIZES.

REVISIONS

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 STATION #6
 15663 HWY 105
 MONTGOMERY, TEXAS 77356

E|B|E Mechanical
 Electrical
 CONSULTING ENGINEERS
 Plumbing
 24 Greenway Plaza, Ste 1211, Houston, Tx 77046
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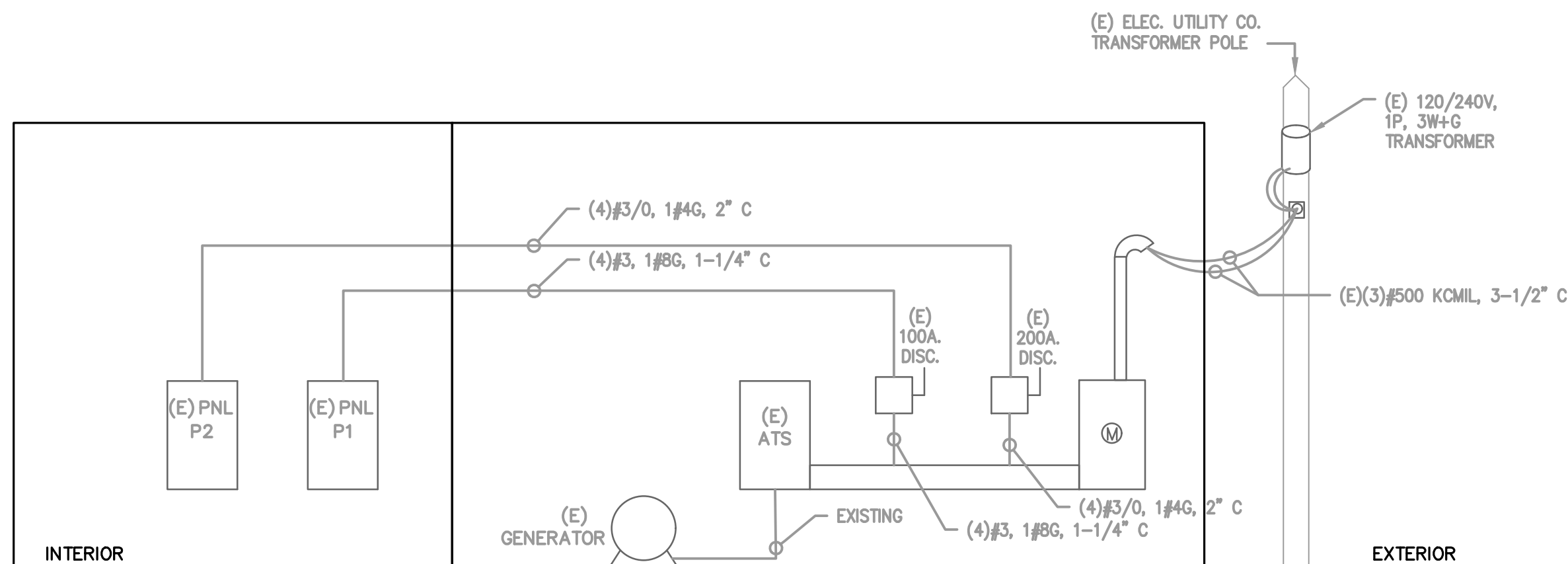
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SCALE: NONE

ELECTRICAL SCHEDULES

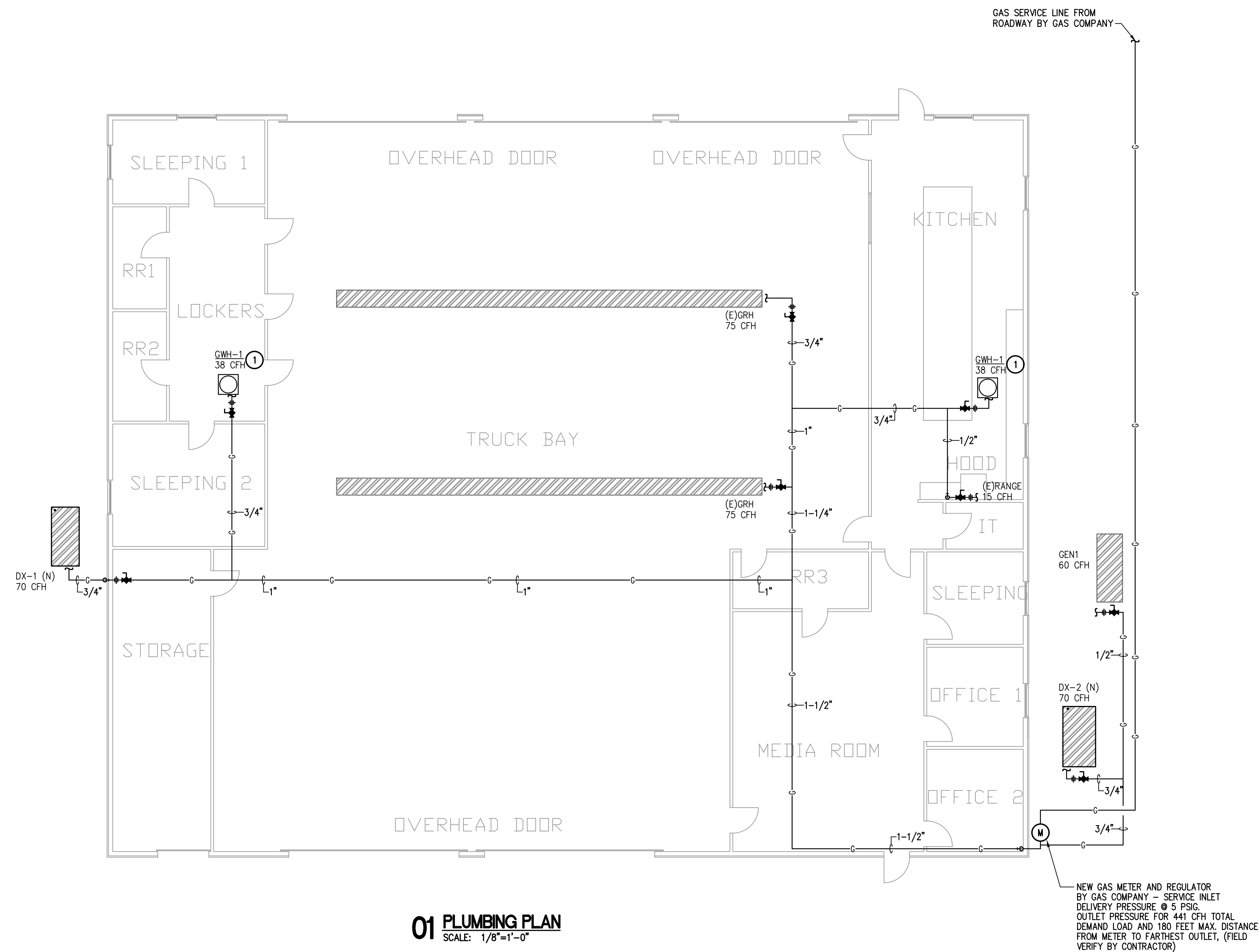
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DATE: 04/21/2020 PROJECT #: 19173.00



01 PARTIAL DISTRIBUTION DIAGRAM
 SCALE: NO SCALE

REVISIONS		
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FIRE PROTECTION NOTES:

1. MODIFY EXISTING FULLY AUTOMATIC WET PIPE SYSTEM HYDRAULICALLY CALCULATED IN ACCORDANCE WITH THE STATE FIRE MARSHAL AND THE LATEST EDITION N.F.P.A. 13, 14, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL FIRE PROTECTION EQUIPMENT, I.E. PIPING, VALVES, FITTINGS AND ACCESSORIES, ETC. SHALL BE RATED FOR A MAXIMUM WORKING PRESSURE OF 250 PSI.
3. PROVIDE PRESSURE REDUCING VALVES AT ALL SPRINKLER SYSTEM AND FIRE DEPARTMENT HOSE CONNECTIONS WHERE PRESSURES EXCEED 175 PSIG IN ACCORDANCE WITH CODE REQUIREMENTS. CONTRACTOR SHALL FIELD PRESSURE TEST SYSTEM AND DETERMINE WHERE PRESSURE REDUCING VALVES ARE REQUIRED.
4. USE PIPING AND FITTINGS FOR FIRE SUPPRESSION SYSTEMS WHICH ARE APPROVED FOR USE BY UNDERWRITERS' LABORATORIES AND FACTORY MUTUAL SYSTEM ANDS OF THE FOLLOWING TYPES; AND IN ACCORDANCE WITH NFPA, LOCAL CODES ALL AUTHORITIES HAVING JURISDICTION.
 - o) **BLACK STEEL PIPING:** MANUFACTURED TO SATISFY ASTM STANDARDS A53 OR A135.
5. ALL SPRINKLER PIPING SHALL BE INSTALLED SO THAT ALL PORTIONS OF THE SYSTEM CAN BE DRAINED BACK THROUGH THE DRAIN VALVE WHERE REQUIRED. PROVIDE DRAIN VALVES FOR ALL TRAPPED PORTIONS OF THE SYSTEM.
6. ALL FIRE EQUIPMENT THREADS SHALL CONFORM TO LOCAL FIRE DEPARTMENT STANDARDS.
7. ALL CONTROL VALVES - CHECK VALVES AND FLOW ALARM SWITCHES LOCATED ABOVE FINISHED CEILING SHALL BE ACCESSIBLE AND HAVE A NOTIFICATION MARKING TAG AS REQUIRED FOR INSPECTION VERIFICATION.
8. CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL PLUMBING/SPRINKLER PIPING TO MAINTAIN PROPER CLEARANCES OVER AREA.
9. SPRINKLER SHOP DRAWINGS AND HYDRAULIC CALCULATIONS PREPARED BY A LICENSED SPRINKLER CONTRACTOR SHALL BE SUBMITTED TO THE CITY OF MONTGOMERY AND ARCHITECT FOR REVIEW AND APPROVAL.

PLUMBING GENERAL NOTES:

1. MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
2. ALL CONNECTIONS BETWEEN PIPES OF DISSIMILAR MATERIALS SHALL BE MADE WITH DIELECTRIC UNIONS. PROVIDE ACCESS PANELS WHERE REQUIRED.
3. CONTRACTOR SHALL NOTIFY OWNER OF ANY REQUIRED SHUT DOWNS AND COORDINATE THESE WITH OWNER. DOWNTIME SHALL BE HELD TO A MINIMUM.
4. CONTRACTOR SHALL COORDINATE ALL WORK CLOSELY WITH EXISTING AND NEW MECHANICAL AND ELECTRICAL ITEMS.
5. ALL PROPOSED CORE DRILL LOCATIONS THROUGH (E) FLOOR SLAB ARE TO BE COORDINATED WITH AND APPROVED BY THE OWNER PRIOR TO CORING.
6. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
7. COORDINATE PLUMBING FIXTURE SIZES WITH MILLWORK PRIOR TO INSTALLATION. COORDINATE ROUGH-IN ELEVATIONS WITH MOUNTING HEIGHTS.
8. DEMOLISH ANY ABANDONED PVC PIPING IN CEILING SPACE. REPLACE ANY EXISTING PVC PIPING STILL IN SERVICE WITH APPROVED MATERIALS. PROVIDE A SEPARATE LINE ITEM PRICE.
9. NEW DOMESTIC WATER SHUT-OFF VALVES TO BE NIBCO MODEL NO. T-585-66-LF. FURNISH WITH EXTENDED STEM FOR VALVES IN INSULATED LINES.
10. REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.
11. REFER TO RISER DIAGRAMS FOR PIPE SIZES NOT SHOWN ON THE DRAWINGS.
12. FOR COMMERCIAL ENERGY CODE, ALL HOT WATER PIPING SHALL BE INSULATED: 1-1/4" AND BELOW 1 1/2" REQUIRED, 1-1/2" AND ABOVE 2" REQUIRED PER TABLE 6.8.3. REFER TO SPECS. FOR ADDITIONAL INFORMATION.

PLUMBING KEYED NOTES:

- 1 REMOVE AND REPLACE EXISTING WATER HEATER WITH NEW WATER HEATER, AS SPECIFIED. MODIFY EXISTING UTILITIES AS NEEDED TO ACCOMMODATE NEW WATER HEATER.

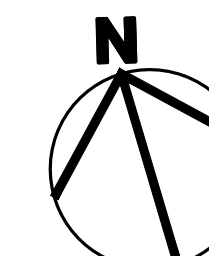
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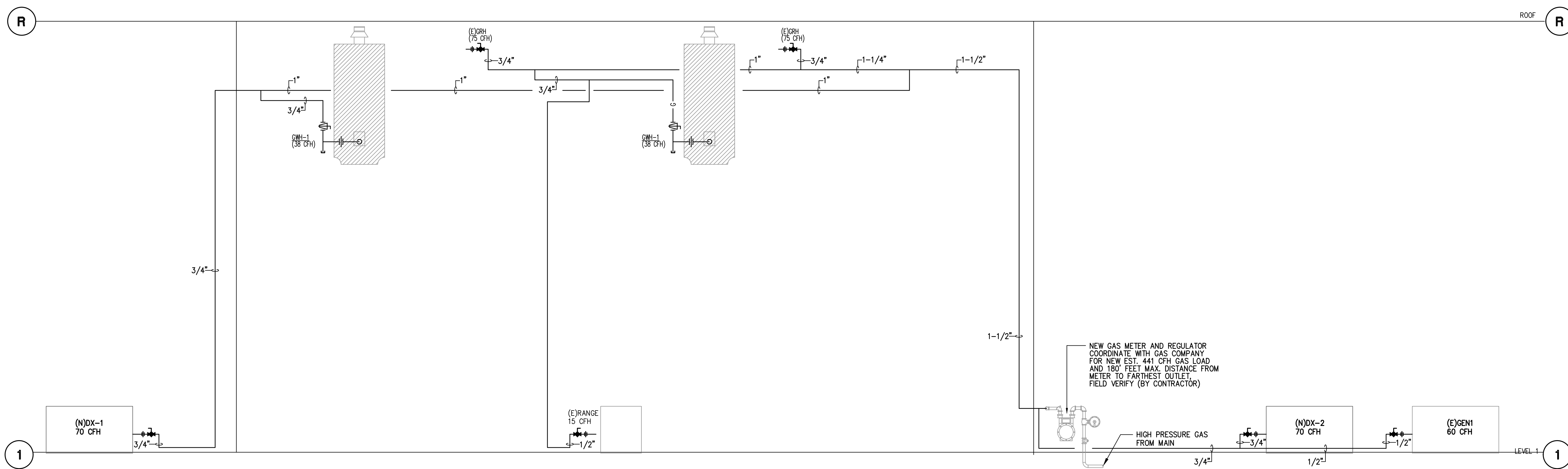
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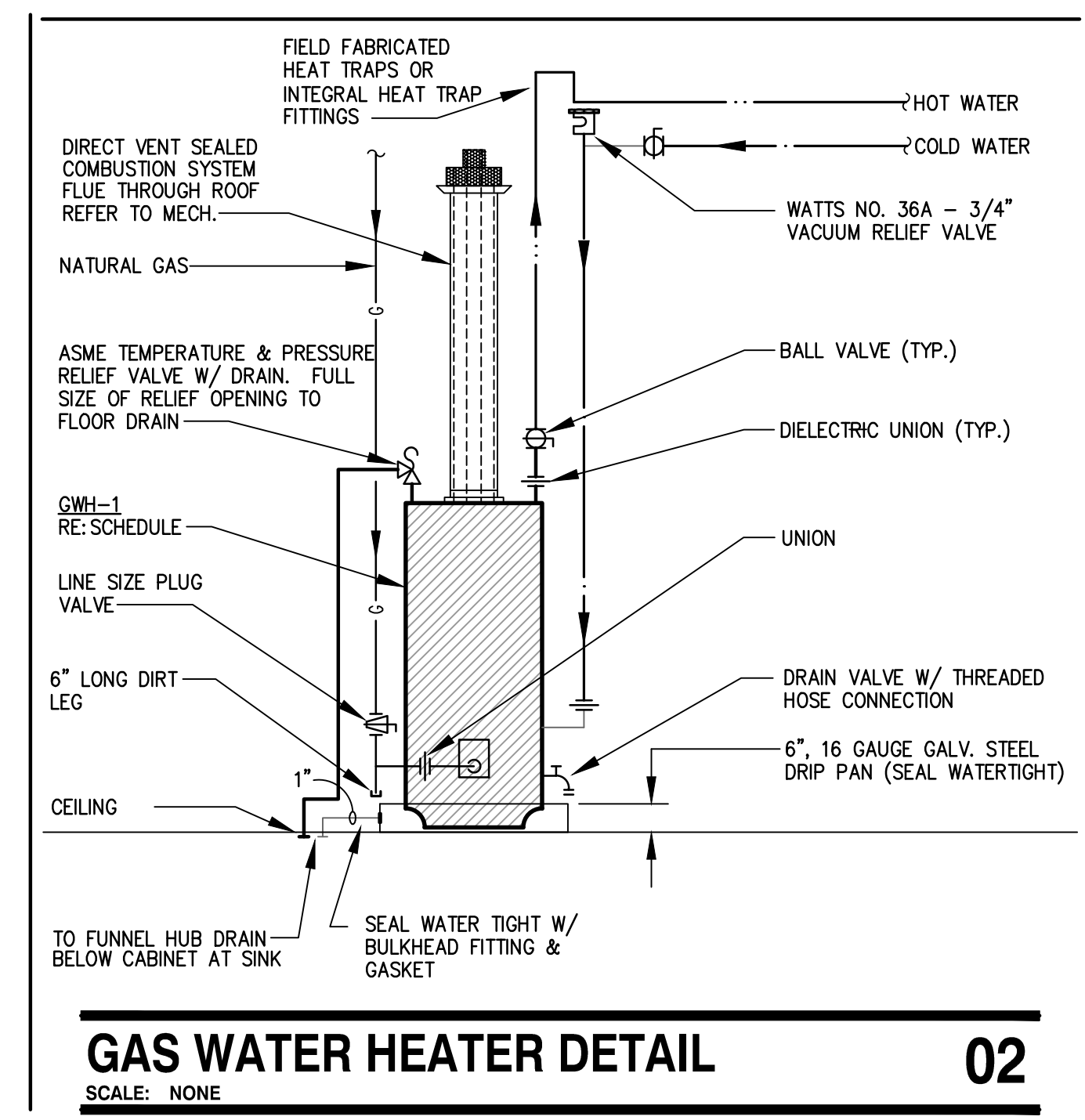
PLUMBING PLAN



P1.01



01 NATURAL GAS RISER DIAGRAM
SCALE: NONE



02 GAS WATER HEATER DETAIL
SCALE: NONE

GAS WATER HEATER SCHEDULE						
MARK	SERVICE	STORAGE IN GALLONS	RECOVERY AT 90° RISE	NATURAL GAS	ELEMENT WATTAGE	MAKE AND MODEL
GW-1	GAS WATER HEATER	50	41	38 CFH	---	A.O. SMITH GDN-50L PROLINE ULTRA-LOW NOx, DIRECT VENT, GLASS LINED TANK. ASME RATED

PLUMBING LEGEND	
SYMBOL	DESCRIPTION
—G—	GAS PIPING
—AFF—	ABOVE FINISHED FLOOR
—VTR—	VENT THRU ROOF
—GV—	GATE VALVE
—CV—	CHECK VALVE
—PRV—	PRESSURE RELIEF VALVE
—U—	UNION
—PG—	PRESSURE GAUGE
—T—	THERMOMETER
—CDL—	CONDENSATE DRAIN LINE
(E)	EXISTING
(D)	ITEMS TO BE REMOVED
—EUB—	ELBOW UP
—EOR—	ELBOW RISE OR DN. THROUGH SLAB
—FC—	FLOOR CLEANOUT
—C—	CLEANOUT
—FD—	FLOOR DRAIN

DISREGARD LEGEND ITEMS NOT INDICATED ON DRAWINGS

PIPING MATERIAL SCHEDULE	
PIPING FUNCTION	PIPING MATERIAL
GAS	BLACK STEEL SCHEDULE 40

NOTE:
NO HUB COUPLING SHALL HAVE A SHIELD CONSTRUCTED OF 304 CORRUGATED STAINLESS STEEL WITH A MINIMUM THICKNESS OF .016. COUPLING SIZE 1-1/2" - 4" SHALL HAVE FOUR (4) BANDS: APPROVED MANUFACTURERS HUSKY SD 4000 AND MISSION, AND CLAMP-ALL.

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SCALE: NONE

PLUMBING RISER

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