

Date Due: Sept 23, 2020  
DUE NO LATER THAN 11:00 A.M.  
LOCAL TIME IN HOUSTON, TEXAS  
*Proposals received later than the above  
date and time will not be considered.*

**YES Prep Public  
Schools  
REQUEST FOR PROPOSAL  
Cover Sheet**

**REQUEST FOR PROPOSAL: FY21\_2 YES Prep HVAC and Plumbing Projects**

***NOTE TO PROPOSERS!!! Carefully read all instructions, requirements, and specifications. Fill out all forms properly and completely. Submit your proposal with all appropriate supplements and/or samples and return as instructed in Special Requirements/Instructions.***

**RETURN PROPOSAL TO:**

**Cheris Kotalik**

Construction Manager  
5515 S Loop E, Suite B  
Houston, Texas 77033

For additional information, contact **Cheris Kotalik, [cheris.kotalik@yesprep.org](mailto:cheris.kotalik@yesprep.org) or 346-235-5776.**

**You must sign below in INK; failure to sign WILL disqualify the proposal. All prices must be typewritten or printed in ink.**

Vendor Name: \_\_\_\_\_

Vendor Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Taxpayer Identification Number (T.I.N.): \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email: \_\_\_\_\_

Print Name: \_\_\_\_\_ Signature: \_\_\_\_\_

**[Your signature attests to your proposal to provide the goods and/or services in this proposal according to the published provisions of this Request for Proposal unless modifications or alterations are clearly noted in your proposal submission.]**

## TABLE OF CONTENTS – REQUEST FOR PROPOSAL PACKAGE

The items below represent components which comprise this Request for Proposal (hereinafter “RFP”) package. Suppliers are asked to review the package to be sure that all applicable parts are included. If any portion of the package is missing, please notify Cheris Kotalik, Construction Manager immediately at [cheris.kotalik@yesprep.org](mailto:cheris.kotalik@yesprep.org) or 346-235-5776.

It is the Vendor’s responsibility to be thoroughly familiar with all Requirements and Specifications. Be sure you understand the following before you return your proposal packet.

**1. Cover Sheet**

Your company name, address, and your signature (**IN INK**) should appear on this page.

**2. Table of Contents**

This page is the Table of Contents.

**3. General Requirements**

You should be familiar with all of the General Requirements.

**4. Special Requirements/Instructions**

This section provides information you must know in order to make a complete and proper proposal.

**5. Specifications**

This section contains the detailed description of the products/services sought.

**6. Attachments**

- A. Submittals 1 - 4
- B. Questionnaire
- C. Workers’ Compensation Certification
- D. Insurance Coverage Requirements
- E. Proposed Exceptions, Alterations, Additions, or Modifications to RFP (if any)
- F. Scoring Rubric

## INTRODUCTION

YES Prep Public Schools is a free, open-enrollment public school system that serves 15,000 students across nineteen (19) schools in the Houston area. YES Prep has been ranked as among the top 100 public high schools in the nation by Newsweek and U.S. News & World Report. Every year, 100 percent of YES Prep's graduating seniors have been accepted into four-year colleges, including Harvard, Yale, Columbia, Rice, and Stanford. YES Prep combines a highly successful 6th-12th grade model along with high standards for student achievement.

## GENERAL REQUIREMENTS

Proposals will be accepted by Yes Prep Public Schools no later than 11:00 a.m. (local time), **Sept 23, 2020**. Every proposal must be enclosed in an envelope clearly marked "FY21\_3 YES Prep HVAC and Plumbing Projects" and shall include one copy.

All questions, requests, responses, and proposals shall be submitted to:

**Cheris Kotalik, Construction Manager**

**YES Prep Public Schools**

**5515 S Loop E, Suite B**

**Houston, TX 77033**

[Cheris.kotalik@yesprep.org](mailto:Cheris.kotalik@yesprep.org)

Questions and responses regarding this RFP will be posted to the YES Prep Public Schools web site during the RFP phase so all interested parties will have access to the same information. Web site is located at: <http://www.yesprep.org/notices>

The appropriate committee shall review all timely responses, and if necessary, the full Board of Trustees prior to acceptance/bid award. Responses may be hand delivered. Any response or proposal received after the above deadline shall be considered late, and will not be opened or considered.

## Time Frame

The timeframe for all responses must be complete and in possession of YES Prep Public Schools by 11:00 a.m. (local time) on **Sept 23, 2020**. Each submission/proposal must be complete. Any incomplete responses may be rejected. All respondents will comply with this RFP as a basis for the award of the proposal.

***All questions are due by 5:00 p.m. (local time) on Sept 18, 2020.***

## Approval

The actual acceptance of any proposal may be delayed. Therefore, all responses must remain valid for a period of no less than one hundred and twenty (120) days. It is intended that proposals will be recommended to the Board of Trustees at an upcoming board meeting. The Board of Trustees reserves the right to reject any and all proposals.

## ACCESS TO RECORDS

Proposer (hereinafter "Vendor") may be required to allow duly authorized representatives of YES Prep Public Schools (hereinafter "YES"), and local, state, and federal governments, access to contracts, books, documents, and records necessary to verify the nature, extent, and cost of services provided by the Vendor.

## **AWARD**

YES reserves the right to reject any and all proposals, and reserves the sole right at its discretion to accept any proposal(s) it considers most favorable to the interest of YES and waive any and all minor irregularities in any proposal(s). YES further reserves the right to reject any proposal(s) and seek new proposals through the issuance of a new or amended Request for Proposal (hereinafter "RFP") if such action is deemed in the best interest of YES.

## **OFFER COMPLETION**

Fill out and return to Cheris Kotalik, Construction Manager, one complete proposal form, and two copies, as instructed under the Special Requirements section of this document. An authorized Vendor representative should sign the Cover Sheet. Completion of these forms is intended to verify that the Vendor has submitted the proposal, is familiar with its contents, and has submitted the material in accordance with all requirements.

The submission of a response shall be prima facie evidence that the Vendor has full knowledge of the scope, nature, quantity, and quality of work to be performed, the detailed requirements of the project, and the conditions under which the work is to be performed. All terms, conditions, specifications, stipulations, and Vendor requirements stated in the RFP, any attached Appendices to the RFP, and any and all Addenda issued shall become part of the contract entered into between YES and the Vendor.

## **OFFER RETURNS**

Vendors must return all completed proposals to the office of Cheris Kotalik as indicated on the Cover Sheet of this package. Late proposals will not be accepted. It is the responsibility of the responding Vendor to assure that the response is received prior to the date and time indicated on the Cover Sheet of this package.

## **DIGITAL FORMAT**

If Vendor obtained the proposal specifications in digital format in order to prepare a response, ***the proposal must be submitted in hard copy*** according to the instructions contained in this package. If, in its response, Vendor makes any changes whatsoever to the YES published RFP specifications, the RFP specifications ***as published*** by YES shall control. Furthermore, if an alteration of any kind to the RFP specifications as published is discovered after the contract is executed, the contract is subject to immediate cancellation at the sole option of YES.

## **DISQUALIFICATION OF VENDOR**

Upon signing this RFP, Vendor certifies that the proposal has not violated the antitrust laws of this state codified in §15.01, *et seq.*, Business & Commerce Code, or the federal antitrust laws, and has not communicated directly or indirectly the proposal made to any competitor or any other person engaged in such line of business. Any or all proposals may be rejected if YES believes that collusion exists among the Vendors. Proposals in which the prices are obviously unbalanced may be rejected.

## **EVALUATION**

In evaluating the proposals submitted, YES will apply the "Best Value" process in selecting the Vendor to be awarded a contract for this project. **Purchase price is not the only criteria that will be used in the evaluation process.** The selection process will include, but not be limited to, the following considerations:

1. The quality and range of goods and/or services the Vendor proposes to provide;
2. The extent to which the goods and/or services meet YES needs;
3. The Vendor's overall experience, reputation, expertise, stability, and financial responsibility;
4. The Vendor's past relationship, if any, with YES;
5. The experience and qualifications of the Vendor staff (i.e. drivers, supervisors, dispatchers, mechanics, etc.) that will be assigned to service the YES account;
6. The ability to provide service in a safe, reliable, expedient, and efficient manner;
7. Facilities and business processes and practices (computerized information systems, access to industry facilities, quality and range of management reports, etc.) that will be used in servicing the YES account;
8. The Vendor's financial terms offered to YES;
9. The total long-term cost to YES to acquire the Vendor's goods or services; and/or
10. Any other relevant factor(s) specifically listed in the RFP.

YES reserves the right to contact references from the Vendor's client list, or any other persons considered relevant by YES. YES reserves the right to conduct personal interviews of any or all potential Vendors prior to selection.

YES will not be liable for any costs incurred by the Vendor in connection with such interviews or with the submission of any response.

#### **DOCUMENT INTERPRETATION**

In the event of any conflict of interpretation of any part of this overall document, the interpretation of YES shall govern.

#### **GOVERNING LAW**

Any agreements resulting from this RFP shall be governed by, construed, and enforced in accordance with the laws of the State of Texas applicable to contracts made and wholly performed within such state (without regard to the conflicts or choice of law principles thereof). The parties irrevocably consent to the jurisdiction of the State of Texas, and agree that any court of competent jurisdiction sitting in the County of Harris, State of Texas, shall be an appropriate and convenient place of venue, and shall be the sole and exclusive place of venue, to resolve any dispute with respect to any such agreements.

## **HOLD HARMLESS AGREEMENT**

The successful Vendor(s) shall indemnify, hold harmless, and defend YES, its directors, officers, and employees (paid or volunteer) from and against any and all claims, demands, and causes of action of whatever kind or nature arising out of error, omission, misrepresentation, negligent act, conduct, or misconduct of the Vendor and its subcontractors, agents, and employees (paid or volunteer) in the provision of goods or the performance of services arising out of the preparation of this proposal and execution and performance of any contracts resulting therefrom. Such indemnification shall also include reasonable attorneys' fees, court costs, and expenses.

## **INSPECTIONS**

YES reserves the right to inspect any item(s) or service location for compliance with specifications, requirements, and needs of YES. If a Vendor cannot furnish a sample of a proposed item, where applicable, for review, or fails to satisfactorily show an ability to perform, YES can reject the Vendor as inadequate.

## **TESTING**

YES reserves the right to test equipment, supplies, materials, and goods proposed for quality, compliance with specifications, and ability to meet the needs of YES. Demonstration units must be available for review. Should the goods or services fail to meet requirements and/or be unavailable for evaluation, the proposal is subject to rejection.

## **INVOICES AND PAYMENTS**

YES standard payment terms are Net 30 days after receipt of invoice.

Invoices should be provided to YES in a timely manner. Vendors are requested to invoice YES within 30 days of providing goods and/or services to YES. Vendors who continuously invoice YES in a manner that is outside of generally accepted business practices may affect their continuing relationship with YES.

In the event a Vendor presents YES with invoices, statements, reports, etc. that are incomplete or inaccurate, YES may be required to perform substantial research which could result in delay of payment. YES will not be responsible for any interest charges and/or late fees as a result of delayed payment due to time delays caused by inadequate, incomplete, or inaccurate information provided in invoices by Vendor.

## **PRICING**

Prices for all goods and/or services shall be negotiated to a firm amount for the duration of this contract or as agreed to in terms of time frame and/or method of determining price escalations, if any, by Vendor. All prices and methods of determining prices must be written in ink or typewritten. Where unit pricing and extended pricing differ, unit pricing prevails.

## **SCANNED OR RE-TYPED RESPONSE**

If in its response, Vendor either electronically scans, re-types, or in some way reproduces the YES-published RFP package, then in the event of any conflict between the terms and provisions of the published RFP package, or any portion thereof, and the terms and provisions of the response made by the Vendor, the RFP package **as published** by YES shall control. Furthermore, if an alteration of any kind to the YES-published RFP package is only discovered after the contract is executed, the contract is subject to immediate cancellation at the sole option of YES.

**SEVERABILITY**

If any section, subsection, paragraph, sentence, clause, phrase, or word of these requirements or the specifications shall be held invalid, such holding shall not affect the remaining portions of these requirements and the specifications, and it is hereby declared that such remaining portions would have been included in these requirements and the specifications as though the invalid portion had been omitted.

**SUPPLEMENTAL MATERIALS**

Vendors are responsible for including all pertinent product data in the returned offer package. Literature, brochures, data sheets, specification information, completed forms requested as part of the offer package, and any other facts which may affect the evaluation and subsequent contract award should be included. Materials such as legal documents and contractual agreements, which the Vendor wishes to include as a condition of the proposal, must also be in the returned proposal package. Failure to include all necessary and proper supplemental materials may be cause to reject the entire proposal.

**TAXES**

YES is exempt from federal, state, and local taxes. In the event that taxes are imposed on the goods or services purchased, YES will not be responsible for payment of the taxes. The Vendor shall absorb the taxes entirely. Texas Limited Sales Tax Exemption Certificates will be furnished to Vendors upon written request to YES.

**TERM CONTRACTS**

The successful Vendor, as determined by YES, shall be required to execute a contract to furnish all goods and/or services and other deliverables required for successful completion of the proposed project. No Vendor shall obtain any interest or right in any award until YES has executed a contract, and any such interest and rights shall be subject to the terms and conditions as contained in such contract.

The successful Vendor may not assign, sell, or otherwise transfer its interest in the contract award, or any part thereof, without prior written consent from the YES.

**QUANTITY**

There is no guaranteed amount of business, expressed or implied, to be purchased or contracted for by YES. However, the Vendor(s) awarded the contract shall furnish all required goods and/or services to YES at the stated price, when and if required.

**CONTRACT TYPE**

The preferred contract type to be awarded is a fixed fee contract. However, if a Vendor has reason to believe a better (more cost effective) method is practical, then the Vendor is encouraged to offer that better pricing option as an alternative in its submitted proposal. YES will consider that type of contract as it compares with other recommended contract options.

**TERMINATION**

YES reserves the right to terminate the contract without cause with 60 days prior written notice for convenience and with 30 days prior written notice for cause if Vendor breaches any of the terms therein, including warranties of Vendor or if the Vendor becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other

remedies which YES may have in law or equity. Cause may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all services required to YES's satisfaction, and/or to meet all other obligations and requirements.

If the Vendor breaches any provision of the proposal stipulations, becomes insolvent, enters voluntary or involuntary bankruptcy, or receivership proceedings, or makes an assignment for the benefit of creditors, YES will have the right (without limiting any other rights or remedies that it may have in the contract or by law) to terminate any contract with 30 days prior written notice to the Vendor.

YES will then be relieved of all obligations, except to pay the reasonable value of the Vendor's prior performance (at a cost not exceeding the contract rate). The Vendor will be liable to YES for all costs exceeding the contract price that YES incurs in completing or procuring the service as described in the proposal. YES's right to require strict performance of any obligation in this contract will not be affected by any previous waiver, forbearance, or course of dealing.

#### **FUNDING OUT OPTION**

Any contract resulting from this RFP is contingent upon the continued availability of budget appropriations and is subject to cancellation, without penalty to YES, either in whole or in part, if funds are not appropriated by the YES Board of Directors or otherwise not made available to YES.

#### **WARRANTIES**

Vendors shall furnish all data pertinent to warranties or guarantees which may apply to items in the proposal. Vendors may not limit or exclude any implied warranties.

#### **ASSOCIATION**

Vendors may not use the YES official logo(s), or any phrase associated with YES, without written permission from YES.

#### **DISCLOSURE**

All information and documentation related to this RFP submitted by Vendors may be subject to public disclosure under the Texas Public Information Act (Texas Government Code Section 552.001, et seq.).

#### **EXCEPTIONS, ALTERATIONS, ADDITIONS, and MODIFICATIONS**

If any exceptions, alterations, additions, or modifications are submitted by Vendor to any portion of this RFP, the Vendor must clearly indicate the exceptions, alterations, additions, and modifications and include a full explanation as a separate attachment to the proposal. The failure to identify exceptions, alterations, additions, or modifications will constitute acceptance by the Vendor of the RFP as proposed by YES. YES reserves the right to reject a proposal containing exceptions, alterations, additions, or modifications.

#### **PROPOSAL PREPARATION COSTS**

All costs related to the preparation and submission of this proposal shall be paid by the Vendor. Issuance of this RFP does not commit YES, in any way, to pay any costs in the preparation and submission of the proposal, nor does the issuance of the RFP obligate YES to award a contract or purchase any goods and services stated in the RFP.

## **RETENTION OF PROPOSAL DOCUMENTATION**

All proposal materials and supporting documentation that is submitted in response to this proposal becomes the permanent property of YES.

## **MODIFICATION/WITHDRAWAL OF PROPOSAL**

Proposals may be modified in writing at any time prior to the due date. Proposals may be withdrawn in writing, by facsimile written transmission or in person, before the response date.

## **PAYMENT TERMS**

Invoices that are submitted by the awarded contractor are required to provide accurate and current addresses including any discounts for early payment. Payment of undisputed invoices will be paid monthly provided that the invoices are received by dates provided to the winning bid. Disputed portions of invoices will be held until the dispute is resolved.

## **PROPOSAL REQUIREMENTS**

- Vendor is required to provide evidence of a valid State of Texas Business License
- Vendor is required to provide an insurance certificate with YES Prep named as an additional insured.

**The entity legally responsible for fulfilling this agreement shall be identified in the proposal response.**

### **Right to Seek a New Proposal**

**YES Prep Public Schools reserves the right to receive, accept, or reject any and all proposals for any or all reasons.**

Proposals will be awarded to the best overall respondent as determined to be in the best interests of Yes Prep. In comparing the responses to this RFP and making awards, Yes Prep may consider such factors as quality and thoroughness of a proposal, the record of experience, the references of the respondents, and the integrity, performance and assurances in the proposal in addition to that of the proposal price.

It is the responsibility of the vendor to ensure that the equipment proposed is fully functional with existing two-way radio equipment: handheld radios, base stations and school bus radios.

### **Applicable Law**

The successful Contractor(s) agrees that they shall comply with all local, state and federal laws, statutes, rules, and regulations including, but not limited to, the Rehabilitation Act of 1973 and the Americans with Disabilities Act. In the event that any claims should arise with regards to this contract, for a violation of any such local, state, or federal law, statutes, rules, or regulations, the provider will indemnify and hold Huntington County Community School Corporation harmless for any damages, including court costs or attorney fees which might be incurred.

### **Dispute resolution**

It is expected that any conflicts or disagreements can be settled through face-to-face meetings. Unresolved disputes will require mediation before filing litigation. Both parties will split the cost of mediation.

## **SPECIAL REQUIREMENTS/INSTRUCTIONS**

### **EVALUATION AND AWARD**

This RFP in no manner obligates YES to the eventual rental, lease, or purchase of any equipment or service described, implied, or which may be proposed, until confirmed by a written contract. Progress toward this end is solely at the discretion of YES and may be terminated at any time prior to the signing of the contract.

YES may initiate discussions with Vendor personnel authorized to contractually obligate the Vendor. Discussions will develop into negotiating sessions with the successful Vendor(s). If YES is unable to agree to contract terms, YES reserves the right to terminate contract negotiations with a Vendor and initiate negotiations with another Vendor. YES reserves the right to select services and products from any number of Vendors if, in its sole discretion, it is in the best interest of YES to do so.

Evaluation will consider the Vendor(s) best meeting the needs and requirements of YES and such evaluation and determination of best value shall be solely at the discretion of YES.

**Purchase price is not the only criteria that will be used in the evaluation process.**

Submission of qualifications implies the Vendor's acceptance of the evaluation criteria and Vendor's recognition that subjective judgments can and will be made by those individuals evaluating qualifications.

References, site visits, and product inspections may be used to make judgments directly affecting the award of this contract.

### **NON-PERFORMANCE BY VENDOR**

Performance, before and during the contract term, will be a major consideration of current contract award, renewals, and future award considerations. Failure to perform, in any sense relative to this contract, may result in the probation and/or termination of this agreement by YES on the basis of nonperformance. Non-performance shall be determined as follows:

1. Failure to meet and maintain all qualifications required in this RFQ/RFP;
2. Failure to meet required personnel standards and operating performance standards;
3. Failure to maintain appropriate and/or necessary personnel licenses and certifications;
4. Failure to meet all vehicle inspections and certifications which are needed to comply with federal, state, and/or local requirements;
5. Failure to keep and maintain all required insurance coverage; and/or
6. Failure to cure deficiencies within a reasonable amount of time as stated herein.

### **INSURANCE**

All Vendors must provide evidence of insurance or insurability and a Workers' Compensation

Certificate (see Attachments C and D).

**GOVERNMENT VIOLATIONS**

Vendor shall notify YES of all health and safety violations, OSHA violations, wage and hour violations, or labor violations assessed by any city, state, or federal government department or agency.

**NON-COMPLIANCE NOTIFICATION**

In the event a Vendor is determined by YES to have failed to perform services in accordance with the requirements listed herein, YES will forward a written notification specifying the violation or the area of non-compliance to the Vendor. The Vendor in non-compliance shall immediately remedy all violations as determined by YES. Any violations not so remedied shall be grounds for termination of the contract, in whole or in part.

**OWNERSHIP**

YES shall retain ownership rights to all materials or any other product produced in conjunction with the work described herein.

## **SPECIAL CONDITIONS AND PROJECT INFORMATION**

YES Prep Public Schools is a free, open-enrollment public school system that currently serves 15,000 students across nineteen (19) schools in the Houston area. In August 2020, YES Prep will open 2 new elementary schools in the Houston area. YES Prep has been ranked as among the top 100 public high schools in the nation by Newsweek and U.S. News & World Report. Every year, 100 percent of YES Prep's graduating seniors have been accepted into four-year colleges, including Harvard, Yale, Columbia, Rice, and Stanford. YES Prep combines a highly successful 6th-12th grade model along with high standards for student achievement.

**One-time bid walk will be offered on Tues, Sept 15<sup>th</sup> starting at 8AM. Will start at the North Central location and then proceed to North Forest, Fifth Ward and Brays Oaks. Social distancing and masks will be required.**

- All work to be performed after-hours, weekends and during school holidays.
- Contractor is responsible for all drawings and spec information provided by H4 Engineers.
- Questions are due by 5PM, Sept 18<sup>th</sup>, 2020.
- YES Prep holds the right to not approve or more forward any single project in the overall RFP.

### **CONTRACTOR TO PROVIDE THE FOLLOWING:**

- Contractor will be allowed to use staff restrooms on campus.
- Contractor will be responsible for workers remaining in appropriate areas while on campus.
- All bids should be turn-key for complete removal of existing equipment from the building/campus and any additional trade work needed to complete the project.

***A schedule duration per campus MUST be included with RFP response.***

**Cost must be broken out as listed below including the manufacturer for all HVAC equipment.**

## **Fifth Ward-Custodial Sinks**

**Provide (3) new custodial sink and faucets to replace existing ones as shown in pictures below:**



<b>Project</b>	<b>Cost</b>	<b>Manufacturer</b>
Brays Oaks-AHUs		
Brays Oaks-Water Heaters		
Fifth Ward-HVAC		
Fifth Ward-Custodial Sinks		
North Central-Split Systems		
North Forest-AHUs		
White Oak-RTUs		

## **REQUIRED SUBMITTALS (Attachment A)**

### **Submittal 1**

Experience in Electrical

Vendor shall provide a statement of its qualifications to provide the specific materials and services requested herein.

### **Submittal 2**

Staffing Plan

Vendor shall submit a staffing plan that provides the qualifications of your employees.

### **Submittal 3**

References

Vendor shall supply a list of three (3) references for which Vendor has experience in the scope of work that the proposal is submitted for.

### **Submittal 4**

Customer Feedback

Vendor shall provide a description of its formal customer feedback system, provide sample tools used to gather data, and describe how results were shared with customers and used to improve service.

**All submittals must be included in the RFP package returned on **Sept 23, 2020** by 11:00 AM. It is recommended that each submittal be typed on a separate sheet of paper with the heading “Response to Submittal #\_\_\_ for YES RFP” at the top and the name of the Vendor underneath.**

## **QUESTIONNAIRE (Attachment B)**

All Vendor must provide answers to the following questions, typed on 8 ½ x 11 inch paper, in the order below. Attachments to the questionnaire answers should reference the question number.

1. Provide the full name and address of your organization.
2. Provide contact person(s) for information concerning this offer: name, title, phone, fax, email address.
3. What form of business is your organization (e.g. proprietorship, partnership, corporation) and is your organization local only, statewide, or nationwide?
4. List all the names under which this Vendor has operated in the last ten (10) years in the State of Texas.
5. Provide a copy of your insurance coverage.
6. Multi-part question:
  - a. Do you currently have any investigations pending by or on behalf of a government entity or other licensing entity?
  - b. Have you had investigations by or on behalf of a government entity or other licensing entity in the past?
    1. If the answer to either question is yes, please provide copies of relevant paperwork.
7. Do you have any relevant experience or projects in the past with education institutions? If so, please provide a high-level overview of these projects.

## **WORKERS' COMPENSATION CERTIFICATE (Attachment C)**

YES requires Vendor to provide workers' compensation as per state law requirements. The Vendor shall sign and submit the following certificate with the written proposal:

- Minimum Workers' Compensation and Employer's Liability Limits
  - Each Accident \$1,000,000
  - Disease – Each Employee \$1,000,000
  - Disease – Policy Limit \$1,000,000

\_\_\_\_\_  
Vendor Name

\_\_\_\_\_  
Signature of Authorized Agent

\_\_\_\_\_  
Date Signed

Note: Vendor may attach current certificate of coverage with a signed statement that if awarded the contract, they will obtain said aforementioned coverage if the current coverage does not meet the stated minimum requirements.

## **INSURANCE COVERAGE REQUIREMENTS (Attachment D)**

### **General and Excess Liability Minimum Coverages**

- General Liability: \$2,000,000
- Umbrella Liability: \$1,000,000

\_\_\_\_\_  
Vendor Name

\_\_\_\_\_  
Signature of Authorized Agent

\_\_\_\_\_  
Date Signed

**YES will be named as Additional Insured on the Certificate of Insurance if the Vendor is awarded a contract.**

## **Proposed Exceptions, Alterations, Additions, or Modifications to RFP (Attachment E)**

Vendor should submit as Attachment F, any and all proposed exceptions, alterations, additions, or modifications to the YES RFP for HVAC and Plumbing Projects.

## **SCORING RUBRIC (ATTACHMENT F)**

YES will utilize the following RFP Evaluation Rubric for evaluation of all YES Prep HVAC and Plumbing Projects.

**1. Charges/Cost to YES PREP: 40 Points.**

- a. Favorable = 30 Points. Unfavorable = 0 points.
- b. Evaluate the Overall Value of proposed materials and services to be provided.

**2. Technical and Education Experience: 20 Points.**

- a. Favorable = 20 Points. Unfavorable = 0 points.
- b. Proposal demonstrates the Vendor's ability to deliver quality services to schools.
- c. Includes references, Vendor staff, and/or Vendor's or certifications, qualifications, experience, expertise, and resumes.

**3. Proposed Operational Delivery: 10 Points.**

- a. Favorable = 10 Points. Unfavorable = 0 points.
- b. Proposal defines services and scope in enough detail that YES can confidently determine that the proposed services will be met.

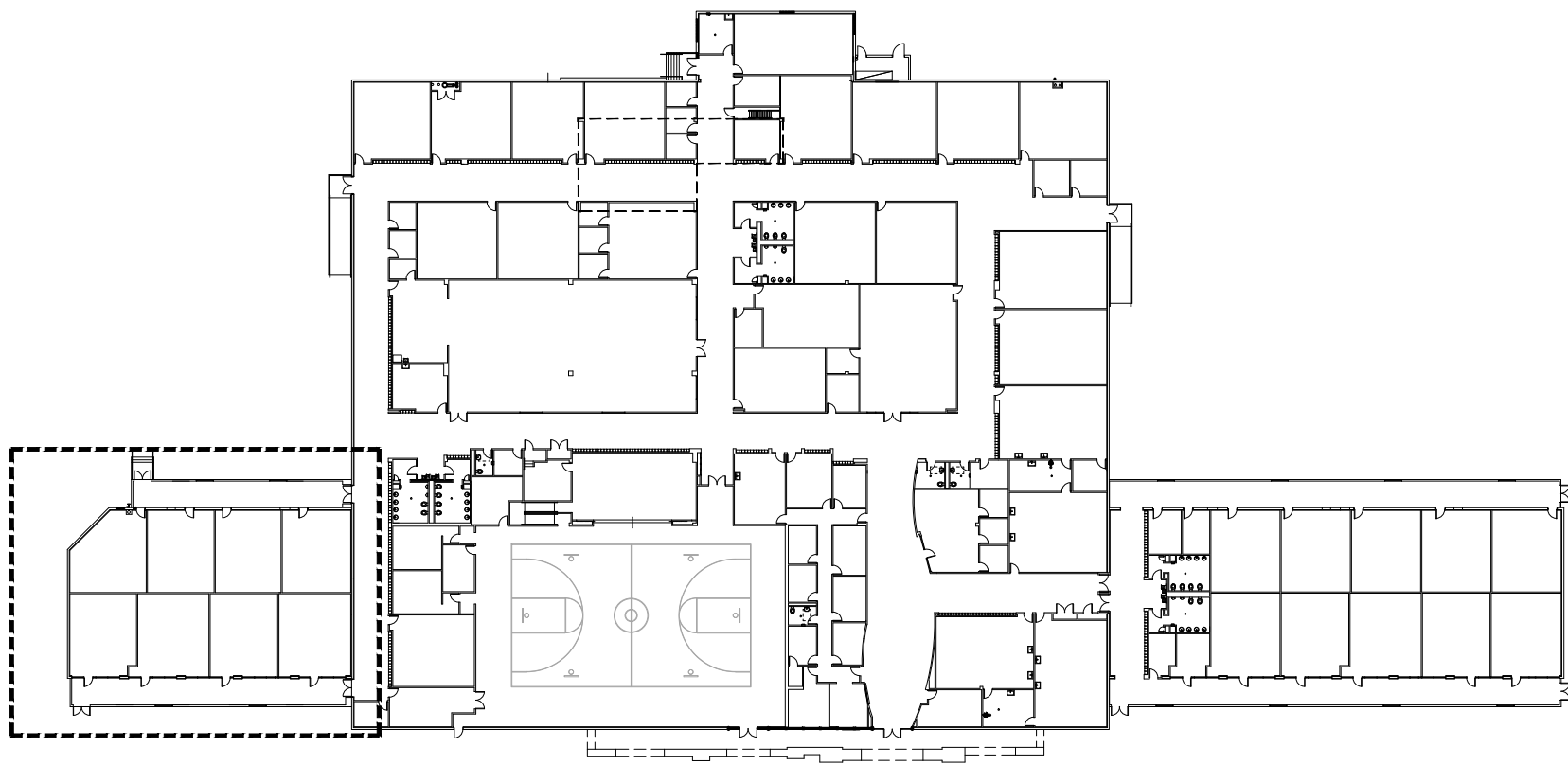
**4. Project Understanding and Methodology: 30 Points.**

- a. Favorable = 30 Points. Unfavorable = 0 points.
- b. Proposal addresses the project in terms of the scope of work and substantive issues essential to proper service and care of YES facilities. Proposal includes a detailed description of services to be provided and any constraints as to procedure, time, personnel, or equipment that needs to be communicated to YES for use during contract negotiations.

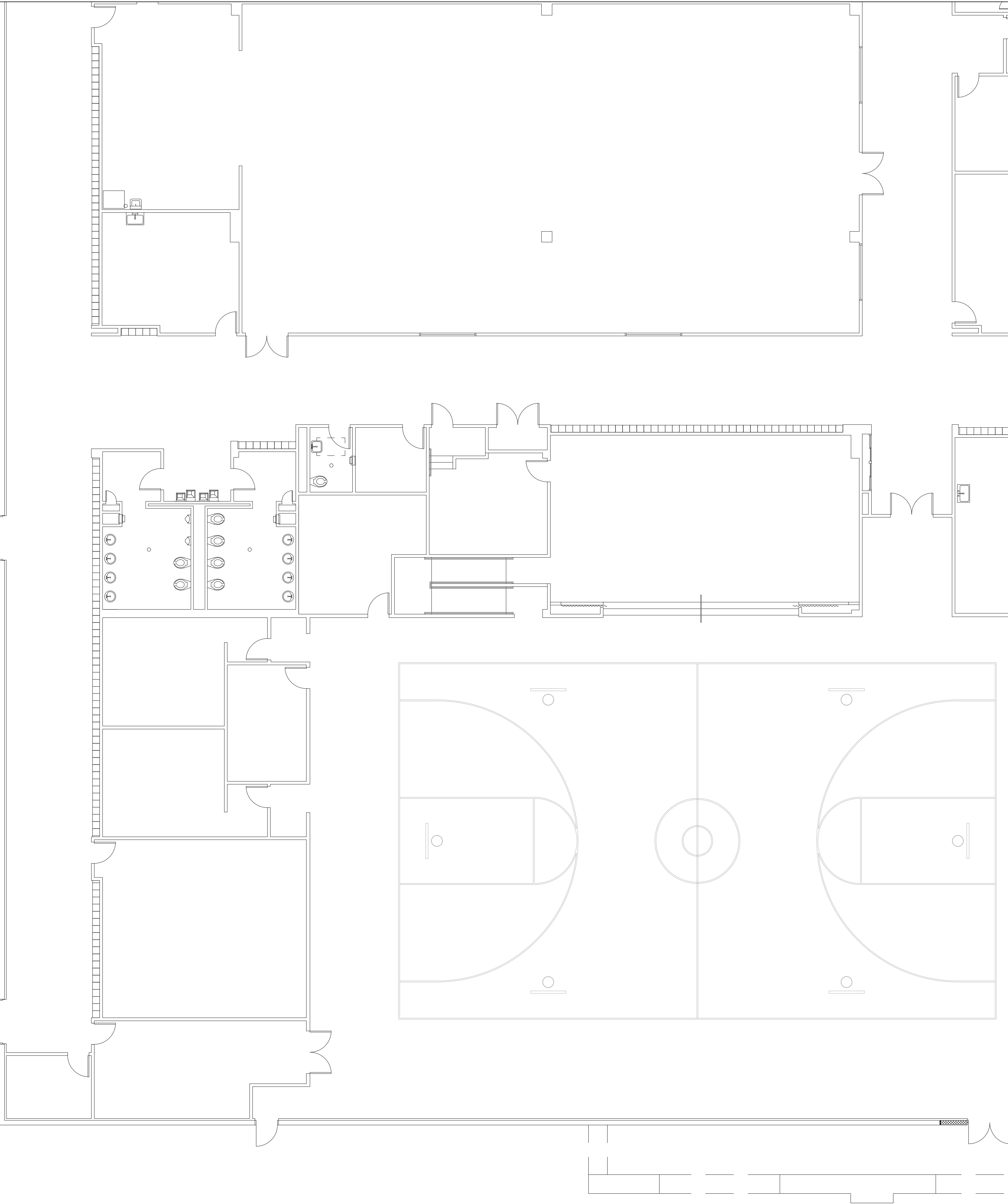
**END OF YES RFP PACKAGE FOR  
HVAC and Plumbing Project**

ROOF TOP UNIT SCHEDULE																		
EQUIPMENT NO	LOCATION	OUTSIDE AIR CFM	SUPPLY FAN			COND FAN HP	COOLING COIL			HEATING COIL		MANUFACTURER AND MODEL	MCA	MOCP (AMPS)	BREAKER/WIRE	SEER	WEIGHT (LBS)	NOTES
			CFM	ESP (IN WG)	HP		MBH (TH/SH)	EAT (DB/WB)	LAT	KW	ELECTRICAL V/PH/HZ							
RTU-1	ROOF	EXISTING SETTING	1600	1	0.85 BHP	1 1/2 FLA	48/35	77/65	57	8	240/3/60	CARRIER 50GC-M05A2A5-0A1CO	35	40	40A/3P, #8	16	578	1,3-9
RTU-2	ROOF	EXISTING SETTING	1600	1	0.85 BHP	1 1/2 FLA	48/35	77/65	57	8	240/3/60	CARRIER 50GC-M05A2A5-0A1CO	35	40	40A/3P, #8	16	578	1,3-9
RTU-3	ROOF	EXISTING SETTING	2000	1	1.19 BHP	1 1/2 FLA	62/44	77/65	57	10	240/3/60	CARRIER 50GC-M06A2A50-6W1CO	43	45	45A/3P, #6	16	621	ALL
<b>NOTES:</b> 1. SINGLE POINT ELECTRICAL CONNECTION. 2. PROVIDE DUCT SMOKE DETECTOR FOR UNITS 2000 CFM SUPPLY AND GREATER. 3. UNITS RATED AT 105°F AMBIENT CONDITIONS. 4. PROVIDE WATER LEVEL SENSING DEVICE IN DRAIN PAN TO SHUT-OFF UNIT IN THE EVENT THE DRAIN PAN BECOMES RESTRICTED. 5. UNIT MOUNTED NON-FUSED DISCONNECT. 6. TWO STAGE COOLING. 7. AIR DAMPER. 8. SET OUTSIDE AIR DAMPER TO EXISTING DAMPER SETTING. 9. ULTRA LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF. 10. PROVIDE UNPOWERED CONVENIENCE OUTLET.																		

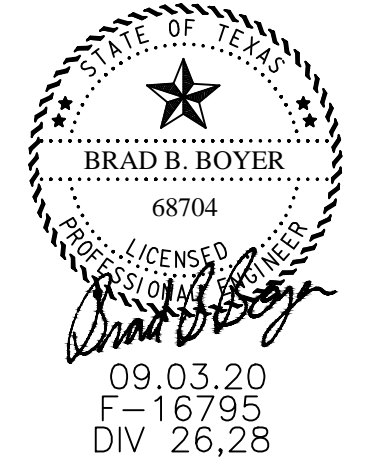
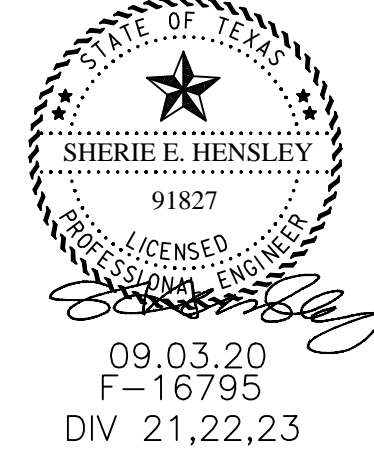
- GENERAL NOTES
- FIELD VERIFY ALL EXISTING CONDITIONS.
  - FIELD VERIFY LOCATION OF EXISTING ELECTRICAL PANELS. MODIFY BREAKER AND WIRE SIZE AS NEEDED TO RECONNECT NEW RTU. CIRCUIT BREAKER SHALL BE OF SAME MANUFACTURER AS EXISTING PANELS AND EQUAL AIC RATING.
  - REMOVE ALL ABANDONED CABLING AND CONDUIT IN SPACE. TERMINATE CONDUITS AT ELECTRICAL ROOM WITH JUNCTION BOX. TURN OFF UNUSED BREAKERS AND UPDATE PANEL DIRECTORY.
  - MODIFY SUPPLY AND RETURN DUCT CONNECTIONS TO RECONNECT TO NEW RTU.
  - MODIFY CURB AS NEEDED TO PLACE NEW RTU.
  - REPAIR ROOF AND WATERPROOF AROUND CURB AS NEEDED.
  - RECONNECT CONDENSATE AND ROUTE TO EXISTING GUTTER/ DOWNSPOUT. ENSURE PIPING IS SLOPED TO ALLOW DRAINAGE.
  - RECONNECT TO EXISTING TEMPERATURE SENSOR.
  - RECONNECT POWER TO CONVENIENCE OUTLETS PROVIDED WITH RTU.



2 KEY PLAN  
NOT TO SCALE



1 MEP ROOF PLAN  
1/8" = 1'-0"



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

DRAWN BY  
SEH

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SEH

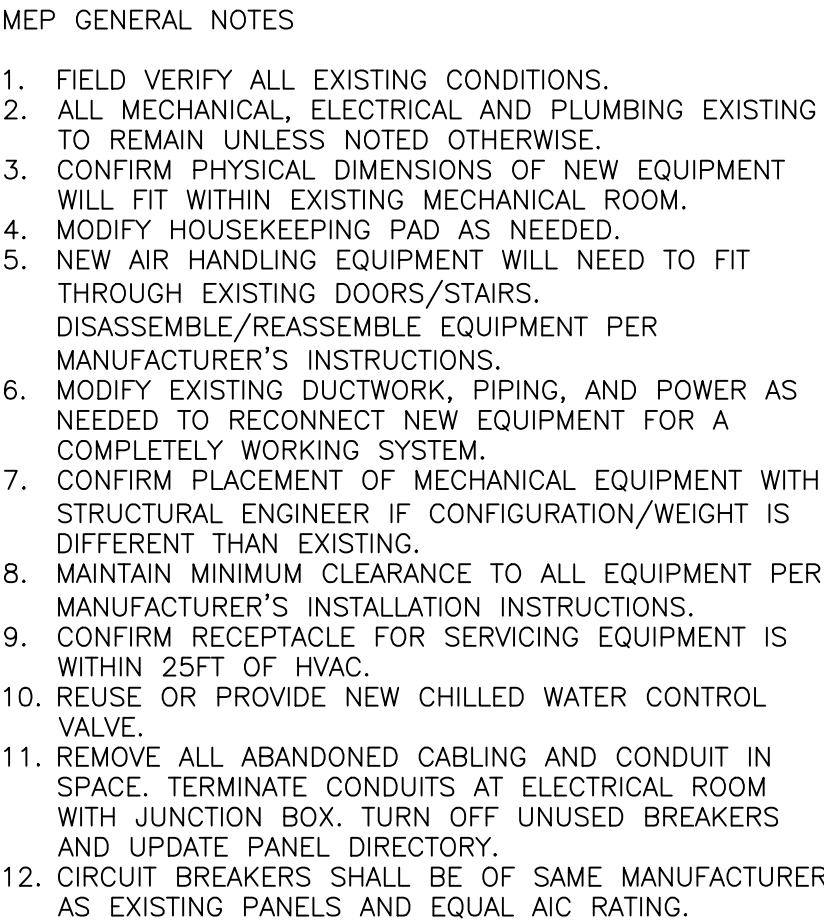
DRAWING NAME  
MEP ROOF PLAN  
WHITE OAK

DRAWING NUMBER  
MEP101

EQUIPMENT NO.	LOCATION	INPUT KW	NOMINAL STORAGE (GAL)	RECOVERY (GPH) @ 90°F	ELECTRICAL V/ø/Hz	BREAKER/WIRE	MANUFACTURER AND MODEL	UNIFORM ENERGY FACTOR (UEF)	TOTAL WEIGHT W/WATER (LBS)
EWH-1	JAN CL LVL1	4.5	30	21	208/1/60	30A/1P, #8	RHEEM PROE30 S2 RH95B WITH INSULATION BLANKET	0.92	335
EWH-2	JAN CL LVL2	4.5	30	21	208/1/60	30A/1P, #8	RHEEM PROE30 S2 RH95B WITH INSULATION BLANKET	0.92	335
EWH-3	JAN CL LVL3	4.5	30	21	208/1/60	30A/1P, #8	RHEEM PROE30 S2 RH95B WITH INSULATION BLANKET	0.92	335
EWH-4	JAN CL LVL4	4.5	30	21	208/1/60	30A/1P, #8	RHEEM PROE30 S2 RH95B WITH INSULATION BLANKET	0.92	335
EWH-5	JAN CL LV5	4.5	30	21	208/1/60	30A/1P, #8	RHEEM PROE30 S2 RH95B WITH INSULATION BLANKET	0.92	335

NOTES

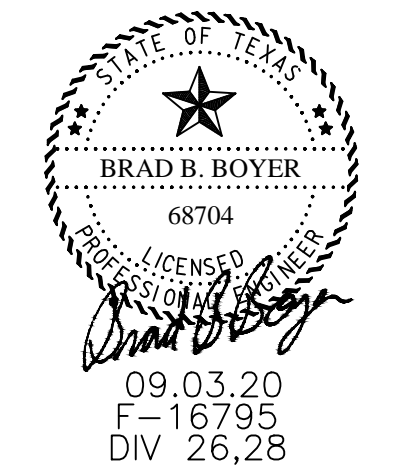
1. CONFIRM EXISTING AVAILABLE VOLTAGE.
2. UPPER AND LOWER HEATING ELEMENTS, NON-SIMULTANEOUS OPERATION.
3. INTEGRAL HEAT TRAPS.



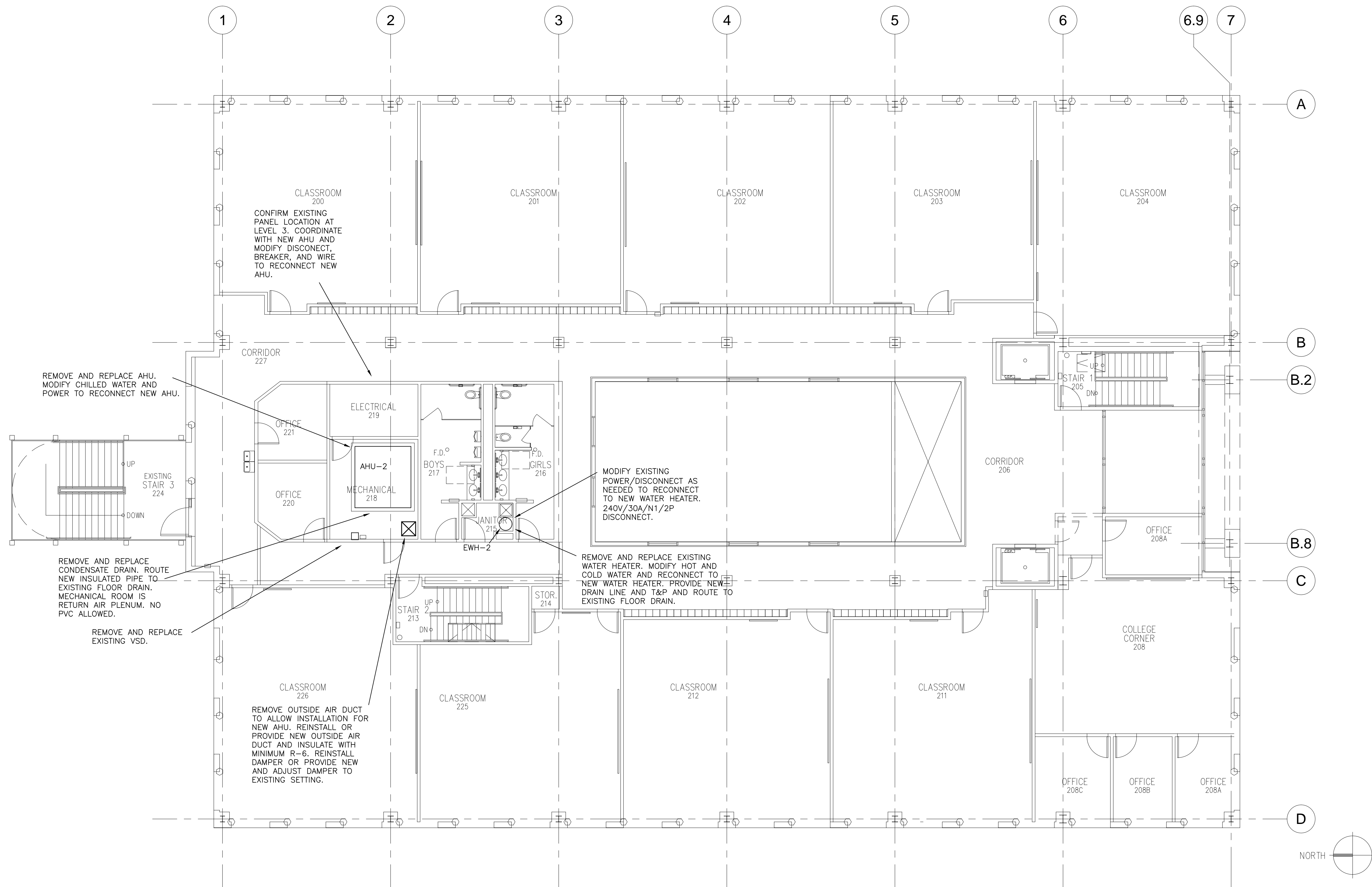
STATE OF TEXAS  
 ★  
 BRAD B. BOYER  
 68704  
 LICENSED  
 PROFESSIONAL ENGINEER  
*Brad B. Boyer*  
 09.03.20  
 F-16795  
 DIV 26,28

# YES PREP MEP REPLACEMENTS MULTI-CAMPUS

# MEP201



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING MECHANICAL ROOM.
  4. MODIFY HOUSEKEEPING PAD AS NEEDED.
  5. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT THROUGH EXISTING DOORS/STAIRS. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  6. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  7. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH STRUCTURAL ENGINEER IF CONFIGURATION/WEIGHT IS DIFFERENT THAN EXISTING.
  8. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  9. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  10. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.
  11. REMOVE ALL ABANDONED CABLING AND CONDUIT IN SPACE. TERMINATE CONDUITS AT ELECTRICAL ROOM WITH JUNCTION BOX. TURN OFF UNUSED BREAKERS AND UPDATE PANEL DIRECTORY.
  12. CIRCUIT BREAKERS SHALL BE OF SAME MANUFACTURER AS EXISTING PANELS AND EQUAL AIC RATING.

1 MEP LEVEL 2  
1/8" = 1'-0"

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

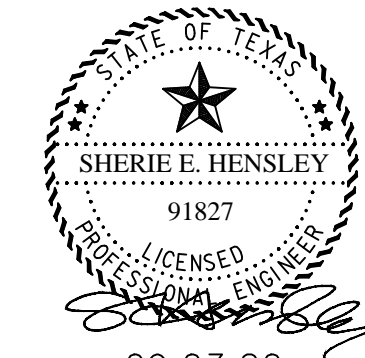
PROJECT NUMBER  
2020423

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SEH

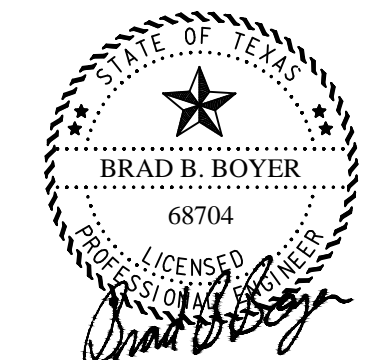
CHECKED BY  
SEH

DRAWING NAME  
MEP LEVEL 2  
BRAYS OAKS

DRAWING NUMBER  
MEP202

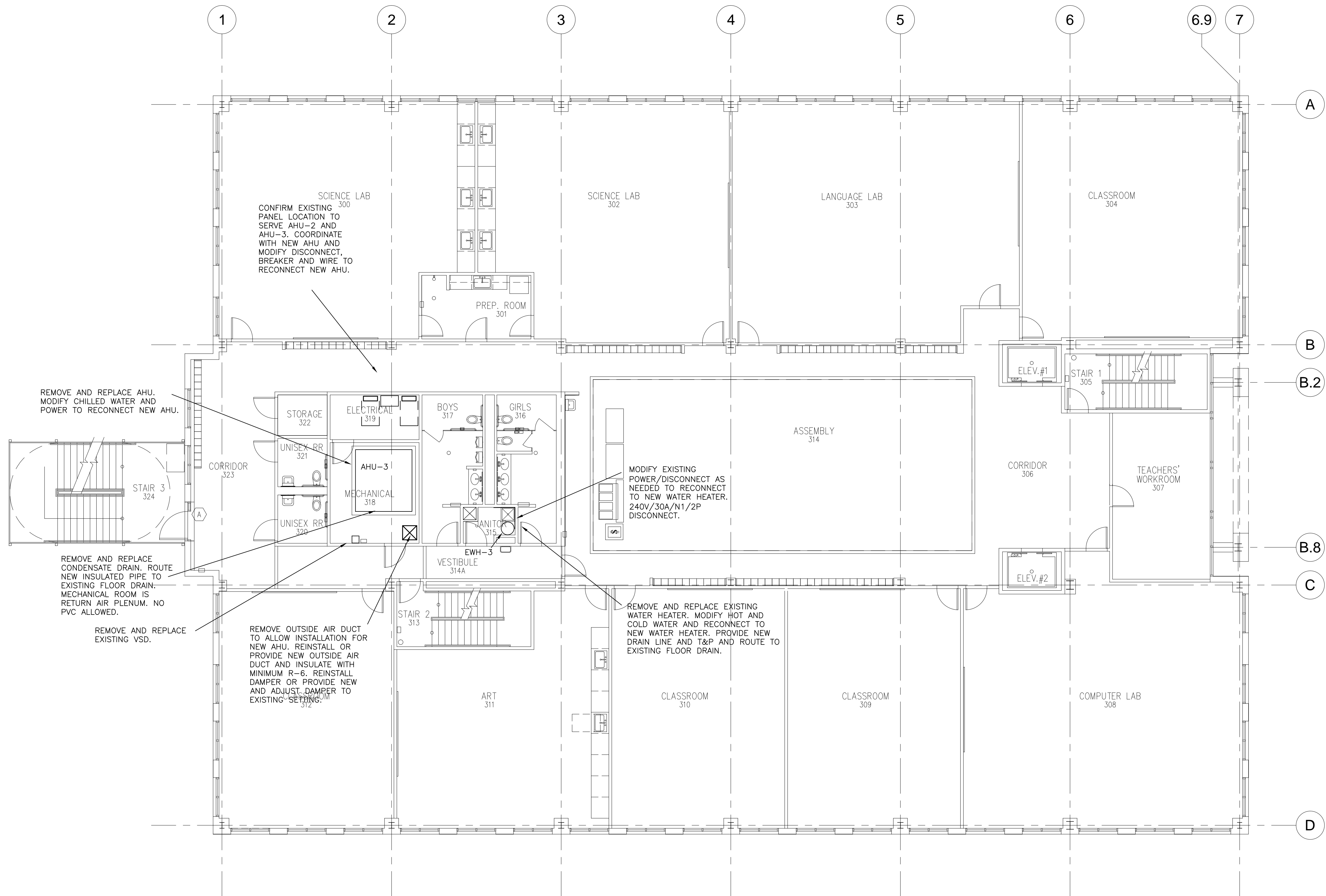


09.03.20  
F-16795  
DIV 21,22,23



09.03.20  
F-16795  
DIV 26,28

# YES PREP MEP REPLACEMENTS MULTI-CAMPUS



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING MECHANICAL ROOM.
  4. MODIFY HOUSEKEEPING PAD AS NEEDED.
  5. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT THROUGH EXISTING DOORS/STAIRS. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  6. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  7. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH STRUCTURAL ENGINEER IF CONFIGURATION/WEIGHT IS DIFFERENT THAN EXISTING.
  8. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  9. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  10. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.
  11. REMOVE ALL ABANDONED CABLING AND CONDUIT IN SPACE. TERMINATE CONDUITS AT ELECTRICAL ROOM WITH JUNCTION BOX. TURN OFF UNUSED BREAKERS AND UPDATE PANEL DIRECTORY.
  12. CIRCUIT BREAKERS SHALL BE OF SAME MANUFACTURER AS EXISTING PANELS AND EQUAL AIC RATING.

1 MEP LEVEL 3  
1/8" = 1'-0"

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

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SEH

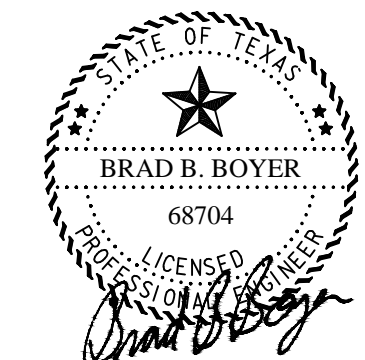
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DRAWING NAME

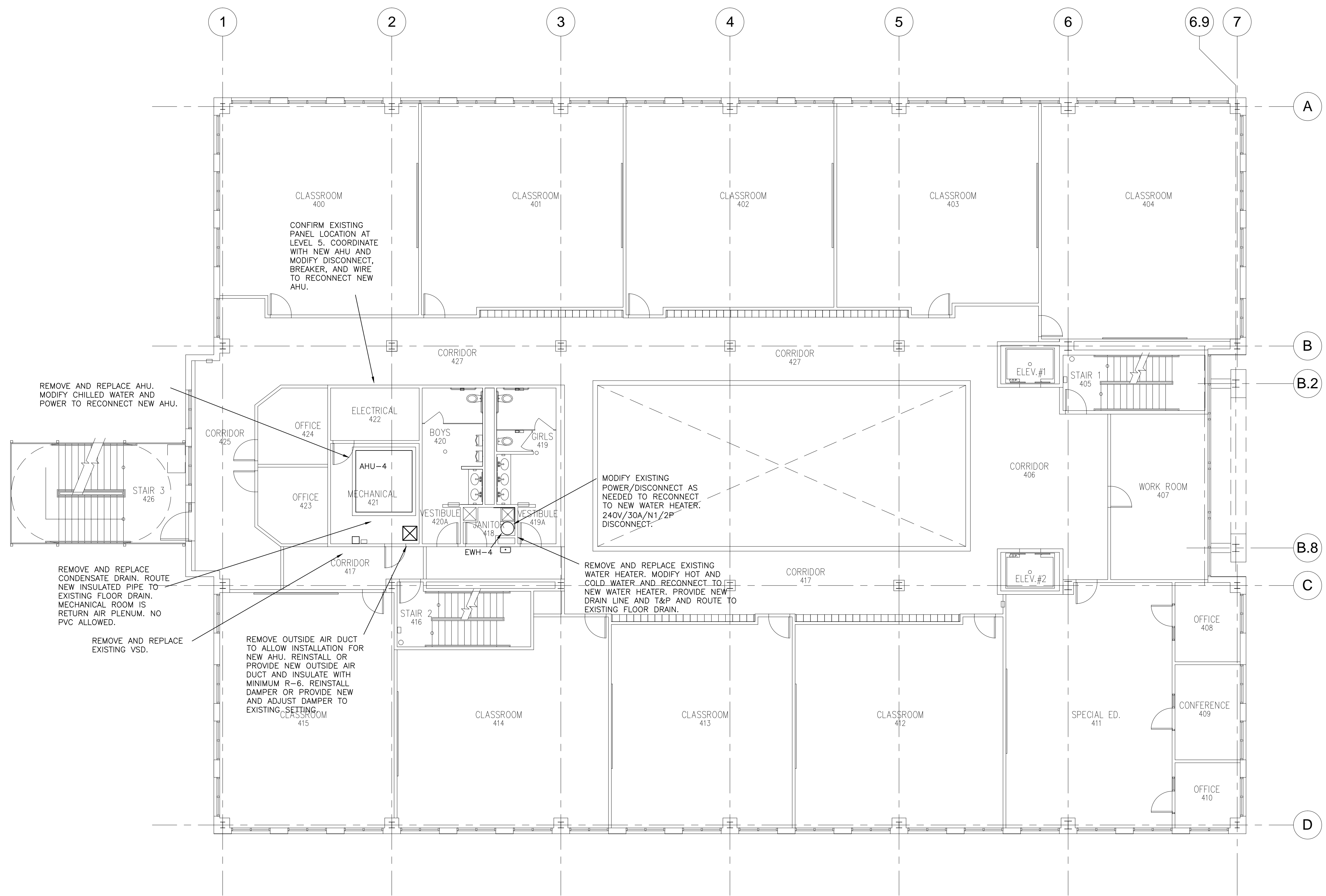
MEP LEVEL 3  
BRAYS OAKS

DRAWING NUMBER

MEP203



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING MECHANICAL ROOM.
  4. MODIFY HOUSEKEEPING PAD AS NEEDED.
  5. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT THROUGH EXISTING DOORS/STAIRS. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  6. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  7. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH STRUCTURAL ENGINEER IF CONFIGURATION/WEIGHT IS DIFFERENT THAN EXISTING.
  8. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  9. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  10. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.
  11. REMOVE ALL ABANDONED CABLING AND CONDUIT IN SPACE. TERMINATE CONDUITS AT ELECTRICAL ROOM WITH JUNCTION BOX. TURN OFF UNUSED BREAKERS AND UPDATE PANEL DIRECTORY.
  12. CIRCUIT BREAKERS SHALL BE OF SAME MANUFACTURER AS EXISTING PANELS AND EQUAL AIC RATING.

1 MEP LEVEL 4  
1/8" = 1'-0"

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

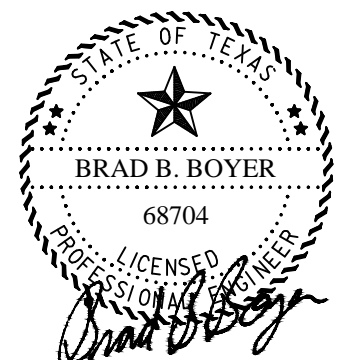
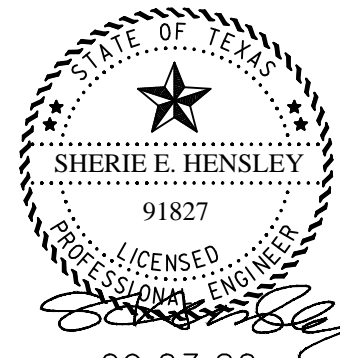
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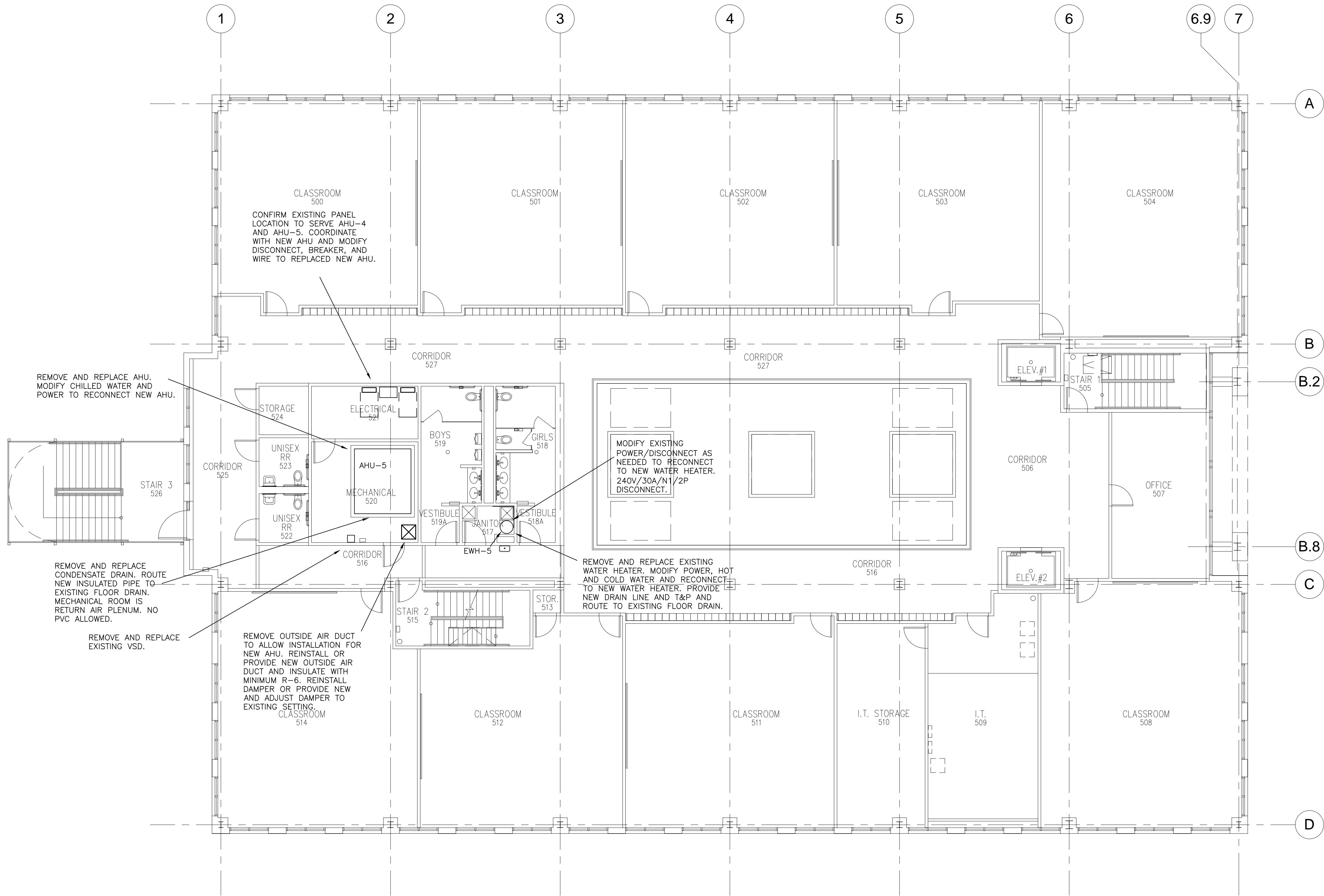
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DRAWING NAME  
MEP LEVEL 4  
BRAYS OAKS

DRAWING NUMBER  
MEP204



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING MECHANICAL ROOM.
  4. MODIFY HOUSEKEEPING PAD AS NEEDED.
  5. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT THROUGH EXISTING DOORS/STAIRS.
  6. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  7. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  8. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH STRUCTURAL ENGINEER IF CONFIGURATION/WEIGHT IS DIFFERENT THAN EXISTING.
  9. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  10. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  11. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.
  12. REMOVE ALL ABANDONED CABLING AND CONDUIT IN SPACE. TERMINATE CONDUITS AT ELECTRICAL ROOM WITH JUNCTION BOX. TURN OFF UNUSED BREAKERS AND UPDATE PANEL DIRECTORY.
  13. CIRCUIT BREAKERS SHALL BE OF SAME MANUFACTURER AS EXISTING PANELS AND EQUAL AIC RATING.

1 MEP LEVEL 5  
1/8" = 1'-0"

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

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SEH

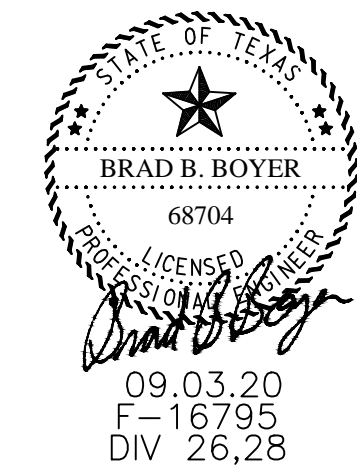
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DRAWING NAME

MEP LEVEL 5  
BRAYS OAKS

DRAWING NUMBER

MEP205



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

DRAWN BY  
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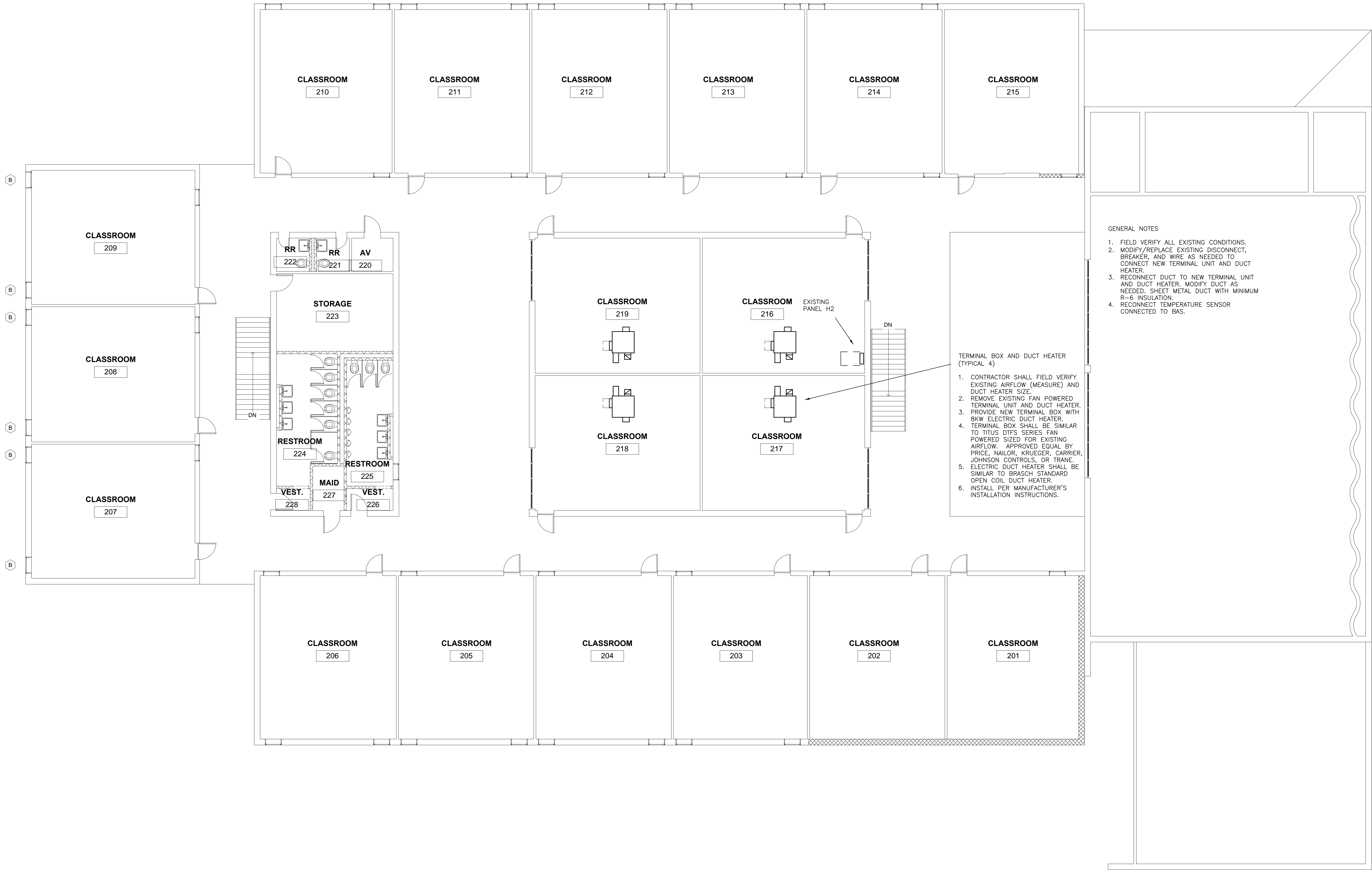
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SEH

DRAWING NAME

MEP LEVEL 2  
FIFTH WARD

DRAWING NUMBER

MEP301



1 MEP LEVEL 2  
1/8" = 1'-0"

EQUIPMENT NO	LOCATION	OUTSIDE AIR CFM	SUPPLY FAN			COOLING COIL					ELECTRICAL V/PH/HZ	MCA	MOCP	BREAKER/WIRE	MANUFACTURER AND MODEL	WEIGHT (LBS)	NOTES
			CFM	ESP (IN WG)	HP	MSH (TH/SH)	EAT (DB/WB)	LAT	GPM								
AHU-1	MECH NORTH LVL. 1	EXISTING SETTING	13190	0.75	10	741/448	86/72	54	142	460/3/60	15.6	25	25A/3P,#12	YORK SOLUTION-XTI-57X102	3690	ALL	
AHU-2	MECH SOUTH LVL. 1	EXISTING SETTING	11500	0.75	10	720/426	85/71	50	140	460/3/60	15.6	25	25A/3P,#12	YORK SOLUTION-XTI-54X90	3470	ALL	
AHU-3	MECH NORTH LVL. 2	EXISTING SETTING	12330	0.75	10	680/421	83/69	51	132	460/3/60	15.6	25	25A/3P,#12	YORK SOLUTION-XTI-57X90	3503	ALL	
AHU-4	MECH SOUTH LVL. 2	EXISTING SETTING	15050	0.75	10	782/498	85/70	54	152	460/3/60	15.6	25	25A/3P,#12	YORK SOLUTION-XTI-63X105	4255	ALL	

NOTES:

- VARIABLE SPEED DRIVE.
- PROVIDE DUCT SMOKE DETECTOR FOR UNITS 2000 CFM SUPPLY AND GREATER.
- 44 EWT/54 LWT.
- MINIMUM 6 ROW COIL.
- MOTORIZED OUTSIDE AIR DAMPER INTERLOCKED WITH FAN.

NOTES:

1. VARIABLE SPEED DRIVE.
2. PROVIDE DUCT SMOKE DETECTOR FOR UNITS 2000 CFM SUPPLY AND GREATER.
3. 44 EWT/54 LWT.
4. MINIMUM 6 ROW COIL.
5. MOTORIZED OUTSIDE AIR DAMPER INTERLOCKED WITH FAN.

ADD ALTERNATE: REPLACE VSDs.



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. ALL EXISTING PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING LOCATIONS.
  4. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT WITHIN EXISTING LOCATIONS AND LOCATIONS.
  5. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  6. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONFIGURE EQUIPMENT FOR COMPLETELY WORKING SYSTEM.
  - 7.6. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH SITE/ARCHITECT FOR RECONFIGURATION IF DIFFERENT THAN EXISTING.
  - 7.7. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  8. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  9. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.

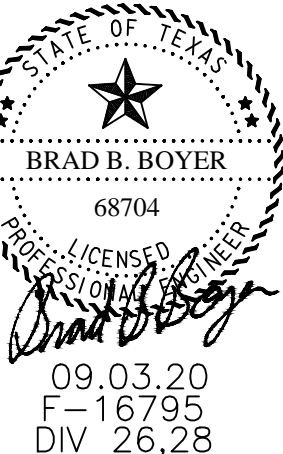
AHU-2

1. COORDINATE REMOVAL AND INSTALLATION OF NEW AHU.
2. BLANKED OFF EXTERIOR WALL SECTION MAY BE USED FOR REMOVAL/INSTALL. IF USED, ENSURE OPENING IS RESEALED WHEN COMPLETE.
3. MODIFY CHILLED WATER AS NEEDED AND RECONNECT TO NEW AHU.
4. MODIFY ELECTRICAL DISCONNECT, BREAKER, AND WIRE AS NEEDED AND RECONNECT TO NEW AHU.
5. MODIFY CONDENSATE AS NEEDED AND RECONNECT TO NEW AHU. CONDENSATE TO ELBOW OVER FLOOR DRAIN.
6. MODIFY HOUSEKEEPING PAD AS NEEDED.

1 MEP LEVEL 1  
1/16" = 1'-0"



09.03.20  
F-16795  
V 21,22,23



09.03.20  
F-16795  
DIV 26,28

# YES PREP MEP REPLACEMENTS MULTI-CAMPUS

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
020423

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SEH

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SEH

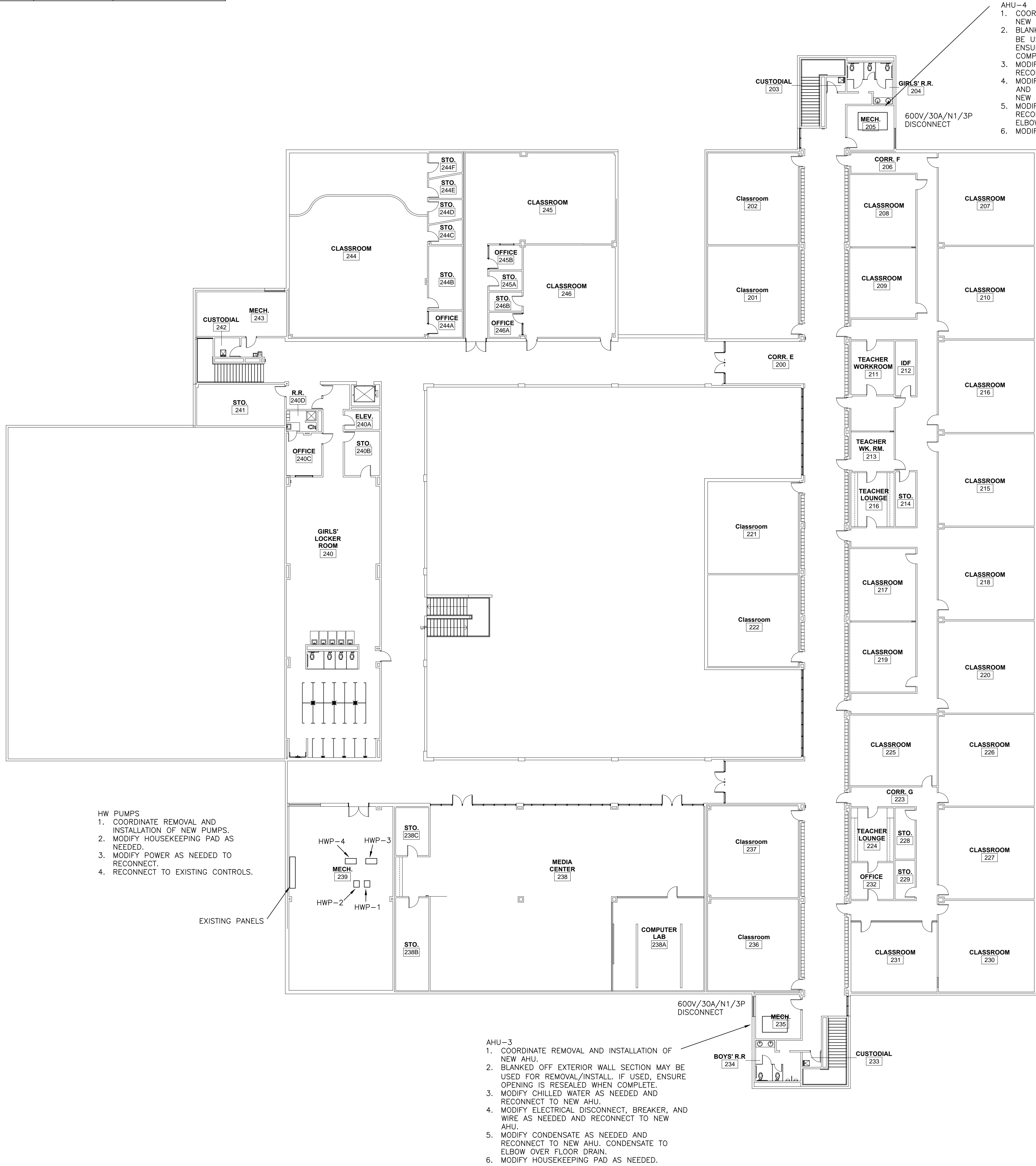
DRAWING NAME

MEP LEVEL 1  
NORTH FOREST

DRAWING NUMBER

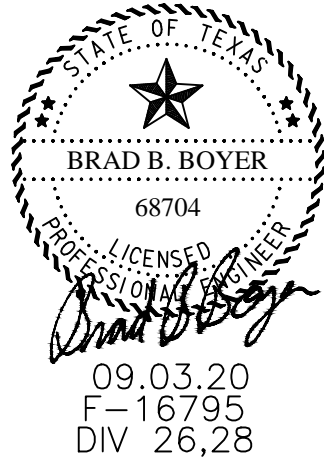
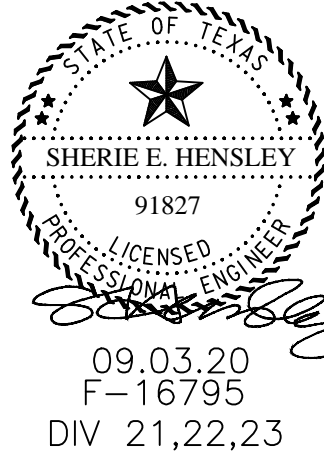
MEP401

PUMP SCHEDULE							
EQUIPMENT NO.	DESCRIPTION	LOCATION	GPM	HEAD (FT)	ELECTRICAL		MANUFACTURER AND MODEL
					HP/RPM	V/ø/Hz	
HWP-1	HOT WATER	MECH LVL 2	144	25	1.5/1800	460/3/60	BELL & GOSSETT E-80-5.625
HWP-2	HOT WATER	MECH LVL 2	144	25	1.5/1800	460/3/60	BELL & GOSSETT E-80-5.625
HWP-3	HOT WATER	MECH LVL 2	144	65	5/1800	460/3/60	PENTAIR 3801-2X2.5X9.5
HWP-4	HOT WATER	MECH LVL 2	144	65	5/1800	460/3/60	PENTAIR 3801-2X2.5X9.5



- MEP GENERAL NOTES
1. FIELD VERIFY ALL EXISTING CONDITIONS.
  2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING LOCATIONS.
  4. NEW AIR HANDLING EQUIPMENT WILL NEED TO FIT THROUGH EXISTING OPENINGS/DOORS/STAIRS. DISASSEMBLE/REASSEMBLE EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
  5. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  6. CONFIRM PLACEMENT OF MECHANICAL EQUIPMENT WITH STRUCTURAL ENGINEER IF CONFIGURATION/WEIGHT IS DIFFERENT THAN EXISTING.
  7. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  8. CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.
  9. REUSE OR PROVIDE NEW CHILLED WATER CONTROL VALVE.

1 MEP LEVEL 2  
1/16" = 1'-0"



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

DRAWN BY  
SEH

CHECKED BY  
SEH

DRAWING NAME  
MEP LEVEL 2  
NORTH FOREST

DRAWING NUMBER

MEP402

ADD ALTERNATE FOR FCU/ACCU-20, 21, 22, 23, 24

EQUIPMENT NO.	SERVICE	COOLING CAPACITY (TONS)	MIN EER (ARI)	AMBIENT TEMP (°F)	ELECTRICAL V/ø/Hz	MCA	MAX FUSE (AMPS)	BREAKER/WIRE	DISCONNECT	FANS	REFRIGERANT	MANUFACTURER AND MODEL	WEIGHT (LBS)	NOTES
ACCU-17	FCU-17	5	14 SEER	95	480/3/60	9.7	15	20A/3P, #12	600V/30A/N3R/3P W/15A FUSES	1	R410A	CARRIER 24AH4460A006	275	1-3
ACCU-18	FCU-18	5	14 SEER	95	480/3/60	9.7	15	20A/3P, #12	600V/30A/N3R/3P W/15A FUSES	1	R410A	CARRIER 24AH4460A006	275	1-3
ACCU-19	FCU-19	7.5	11.2	105	460/3/60	20	30	30A/3P, #12	600V/30A/N3R/3P W/15A FUSES	2	R410A	CARRIER 38AUZE08A0A6-0A2A0	391	ALL
ACCU-20	FCU-20	5	14 SEER	95	480/3/60	9.7	15	20A/3P, #12	600V/30A/N3R/3P W/15A FUSES	1	R410A	CARRIER 24AH4460A006	275	1-3
ACCU-21	FCU-21	3	14 SEER	95	480/3/60	9.6	15	20A/3P, #12	600V/30A/N3R/3P W/15A FUSES	1	R410A	CARRIER 24AH436A006	214	1-3
ACCU-22	FCU-22	5	14 SEER	95	480/3/60	7.7	15	20A/3P, #12	600V/30A/N3R/3P W/15A FUSES	1	R410A	CARRIER 24AH4460A006	275	1-3
ACCU-23	FCU-23	7.5	11.2	105	460/3/60	20	30	30A/3P, #12	600V/30A/N3R/3P W/30A FUSES	2	R410A	CARRIER 38AUZE08A0A6-0A2A0	391	ALL
ACCU-24	FCU-24	7.5	11.2	105	460/3/60	20	30	30A/3P, #12	600V/30A/N3R/3P W/30A FUSES	2	R410A	CARRIER 38AUZE08A0A6-0A2A0	391	ALL

NOTES:

1. PROVIDE THERMAL EXPANSION VALVE.
2. TEN YEAR WARRANTY.
3. PROVIDE MODEL SPECIFIED OR APPROVED EQUAL BY YORK OR TRANE.
4. SINGLE CIRCUIT, 2 STAGE WITH LOW AMBIENT REFRIGERANT OPTIONS.

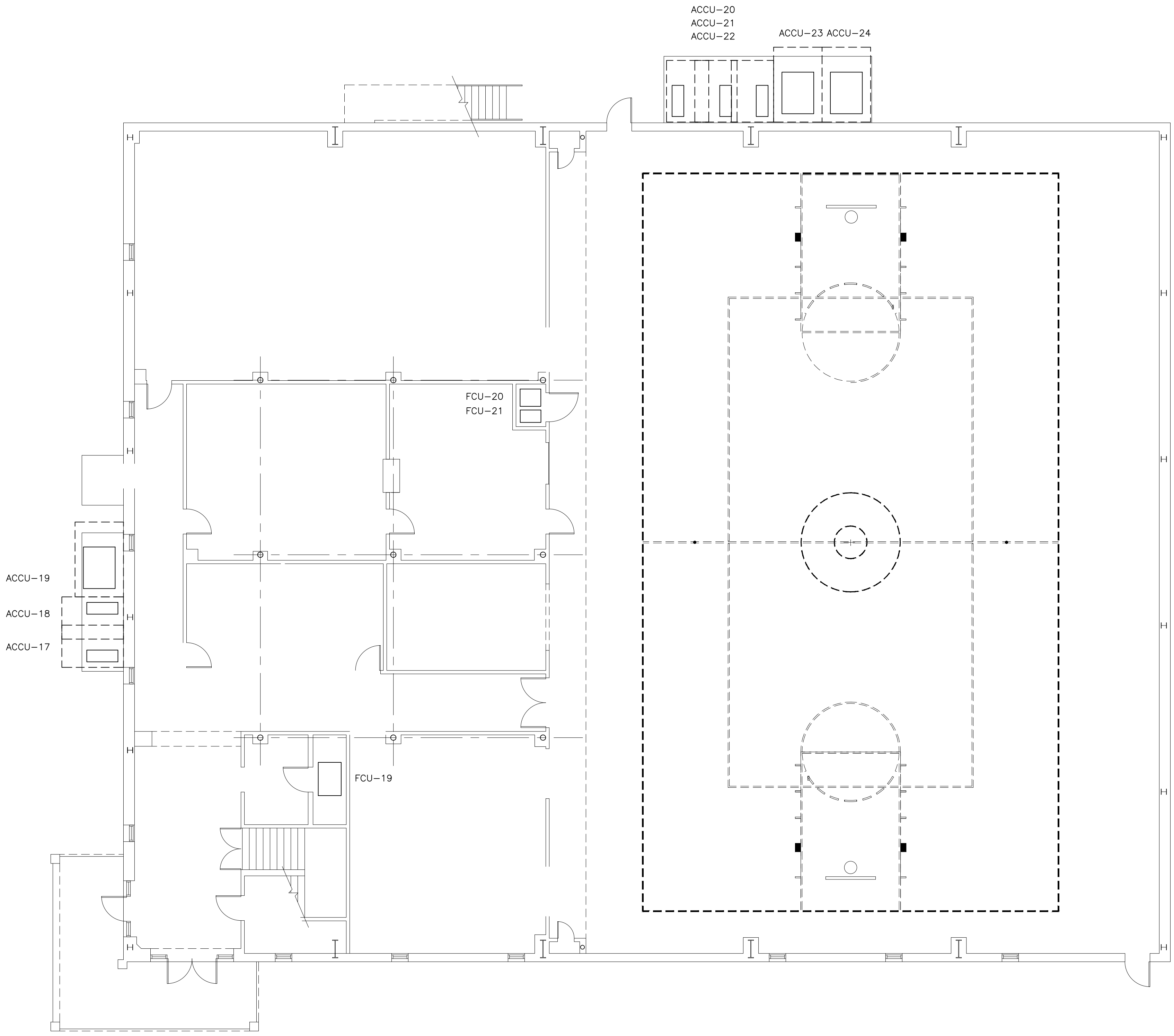
- NOTES:**
1. PROVIDE THERMAL EXPANSION VALVE.
  2. TEN YEAR WARRANTY.
  3. PROVIDE MODEL SPECIFIED OR APPROVED EQUAL BY YORK OR TRANE.
  4. SINGLE CIRCUIT, 2 STAGE WITH LOW AMBIENT REFRIGERANT OPTIONS.

EQUIPMENT NO.	SUPPLY CFM	OUTSIDE AIR CFM	FAN MOTOR ESP	ELECTRICAL V/ø/Hz	MCA	MOP (AMPS)	BREAKER/WIRE	DISCONNECT	COOLING COIL MBH (TH/SH)	COOLING COIL EAT (DB/WB)	COOLING COIL LAT	HEAT MBH	MANUFACTURER AND MODEL	WEIGHT (LBS)	NOTES
FCU-17	2000	MATCH EXISTING	0.5	115/1/60	9.7	15	20A/1P, #12	240V/30A/N1/1P W/15A FUSES	55/41	80/67	61	120	CARRIER CNPVP6124ALA WITH FURNACE 59SC2D120E24--20	253	1-6
FCU-18	2000	MATCH EXISTING	0.5	115/1/60	9.7	15	20A/1P, #12	240V/30A/N1/1P W/15A FUSES	55/41	80/67	61	120	CARRIER CNPVP5124ALA WITH FURNACE 59SC2D120E24--20	253	1-6
FCU-19	3000	MATCH EXISTING	0.5	230/1/60	12.7 FLA	20	20A/2P, #12	240V/30A/N1/2P W/20A FUSES	89/76	80/67	61	250	REZNOR CAUA 250 WITH ACUA 90 AND CW14.	700	1,3,4,6-10
FCU-20	2000	MATCH EXISTING	0.5	115/1/60	9.7	15	20A/1P, #12	240V/30A/N1/1P W/15A FUSES	55/41	80/67	61	120	CARRIER CNPVP5124ALA WITH FURNACE 59SC2D120E24--20	253	1-6
FCU-21	1200	MATCH EXISTING	0.5	115/1/60	7.6	15	20A/1P, #12	240V/30A/N1/1P W/15A FUSES	33/26	80/67	60	80	CARRIER CNPVP3617ALA WITH FURNACE 59SC5B080E17--116	195	1-3,5,6
FCU-22	2000	MATCH EXISTING	0.5	115/1/60	9.7	15	20A/1P, #12	240V/30A/N1/1P W/15A FUSES	55/41	80/67	61	120	CARRIER CNPVP5124ALA WITH FURNACE 59SC2D120E24--20	253	1-6
FCU-23	3000	MATCH EXISTING	0.5	230/1/60	12.7 FLA	20	20A/2P, #12	240V/30A/N1/2P W/20A FUSES	89/76	80/67	61	250	REZNOR CAUA 250 WITH ACUA 90 AND CW14.	700	1,3,4,6-10
FCU-24	3000	MATCH EXISTING	0.5	230/1/60	12.7 FLA	20	20A/2P, #12	240V/30A/N1/2P W/20A FUSES	89/76	80/67	61	250	REZNOR CAUA 250 WITH ACUA 90 AND CW14.	700	1,3,4,6-10

NOTES:

1. PROVIDE MERV 8 FILTERS.
2. PROVIDE MODEL SPECIFIED OR APPROVED EQUAL BY YORK OR TRANE.
3. PROVIDE AUXILIARY DRAIN ROUTED TO OBSERVABLE LOCATION, OR FLOAT SWITCH IN DRAIN PAN TO DE-ENERGIZE UNIT TO PREVENT OVERFLOW.
4. PROVIDE DUCT SMOKE DETECTOR FOR UNITS 2000 CFM SUPPLY AND GREATER.
5. PROVIDE UNITS 6 TONS AND LESS WITH RAWAL VALVE FOR HUMIDITY CONTROL.
6. MOTORIZED OUTSIDE AIR DAMPER INTERLOCKED WITH FAN. CONFIRM EXISTING OUTSIDE AIR SETTINGS.
7. VFD.
8. 2-STAGE GAS FURNACE.
9. COOLING COIL ACU.
10. FILTER CABINET BASE.

- NOTES:
1. PROVIDE MERV 8 FILTERS.
  2. PROVIDE MODEL SPECIFIED OR APPROVED EQUAL BY YORK OR TRANE.
  3. PROVIDE AUXILIARY DRAIN ROUTED TO OBSERVABLE LOCATION, OR FLOAT SWITCH IN DRAIN PAN TO DE-ENERGIZE UNIT TO PREVENT OVERFLOW.
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  5. PROVIDE UNITS 6 TONS AND LESS WITH RAWAL VALVE FOR HUMIDITY CONTROL.
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  7. VFD.
  8. 2-STAGE GAS FURNACE.
  9. COOLING COIL ACU.
  10. FILTER CABINET BASE.



## MEP GENERAL NOTES

1. FIELD VERIFY ALL EXISTING CONDITIONS.
2. ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
3. CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING LOCATIONS.
4. MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
5. MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. MODIFY HOUSEKEEPING TO ALLOW ACCESS TO EQUIPMENT.
7. MODIFY DUCT AS NEEDED AND RECONNECT TO NEW UNIT. INSULATION SHALL BE MINIMUM R-6.
8. MODIFY FLUE AS NEEDED AND RECONNECT TO NEW UNIT.
9. MODIFY FLUE AS NEEDED AND RECONNECT TO NEW UNIT.
10. CONFIRM LOCATION OF EXISTING ELECTRICAL PANEL. MODIFY DISCONNECT, BREAKER, AND WIRE AS NEEDED TO RECONNECT TO NEW UNIT.
11. MODIFY CONDENSATE AS NEEDED AND RECONNECT TO NEW UNIT. ENSURE CONDENSATE ROUTES TO SINK TAILPIPE OR ELBOWS OVER FLOOR DRAIN.
12. MODIFY REFRIGERANT AND RECONNECT TO NEW FCU AND ACCU.
13. PROVIDE MANUFACTURER'S NAMEPLATE DATA IN ACCESSIBLE LOCATION ON EQUIPMENT.
14. OBTAIN RECEIPT FOR SERVING EQUIPMENT IS WITHIN 25FT OF HVAC.

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2020423

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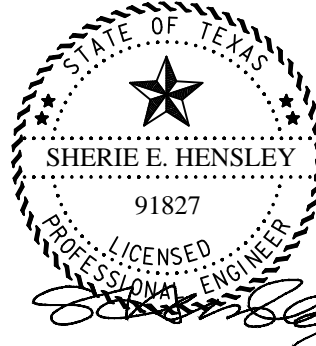
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MEP GYM  
LEVEL 1  
NORTH CENTRAL

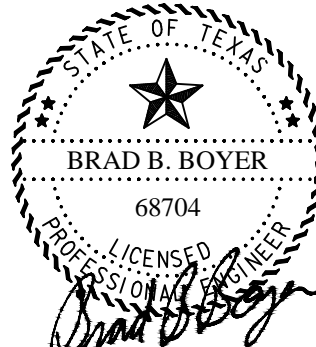
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## 1 MEP GYM LEVEL 1

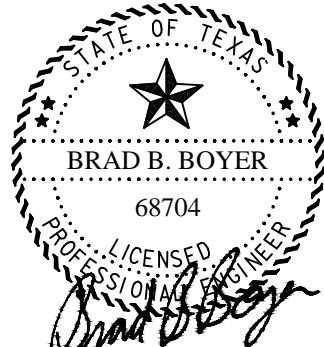
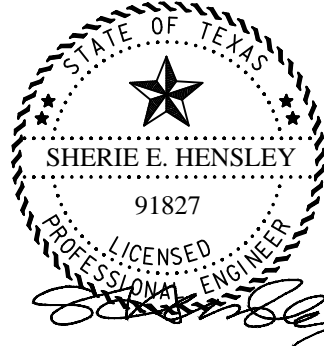
$$1/8'' = 1'-0''$$


09.03.20  
F-16795  
DIV 21,22,23



09.03.20  
F-16795  
DIV 26,28

# YES PREP MEP REPLACEMENTS MULTI-CAMPUS



YES PREP MEP REPLACEMENTS  
MULTI-CAMPUS

NO.	DESCRIPTION	DATE
	ISSUE FOR	09.03.20
	CONSTRUCTION	

PROJECT NUMBER  
2020423

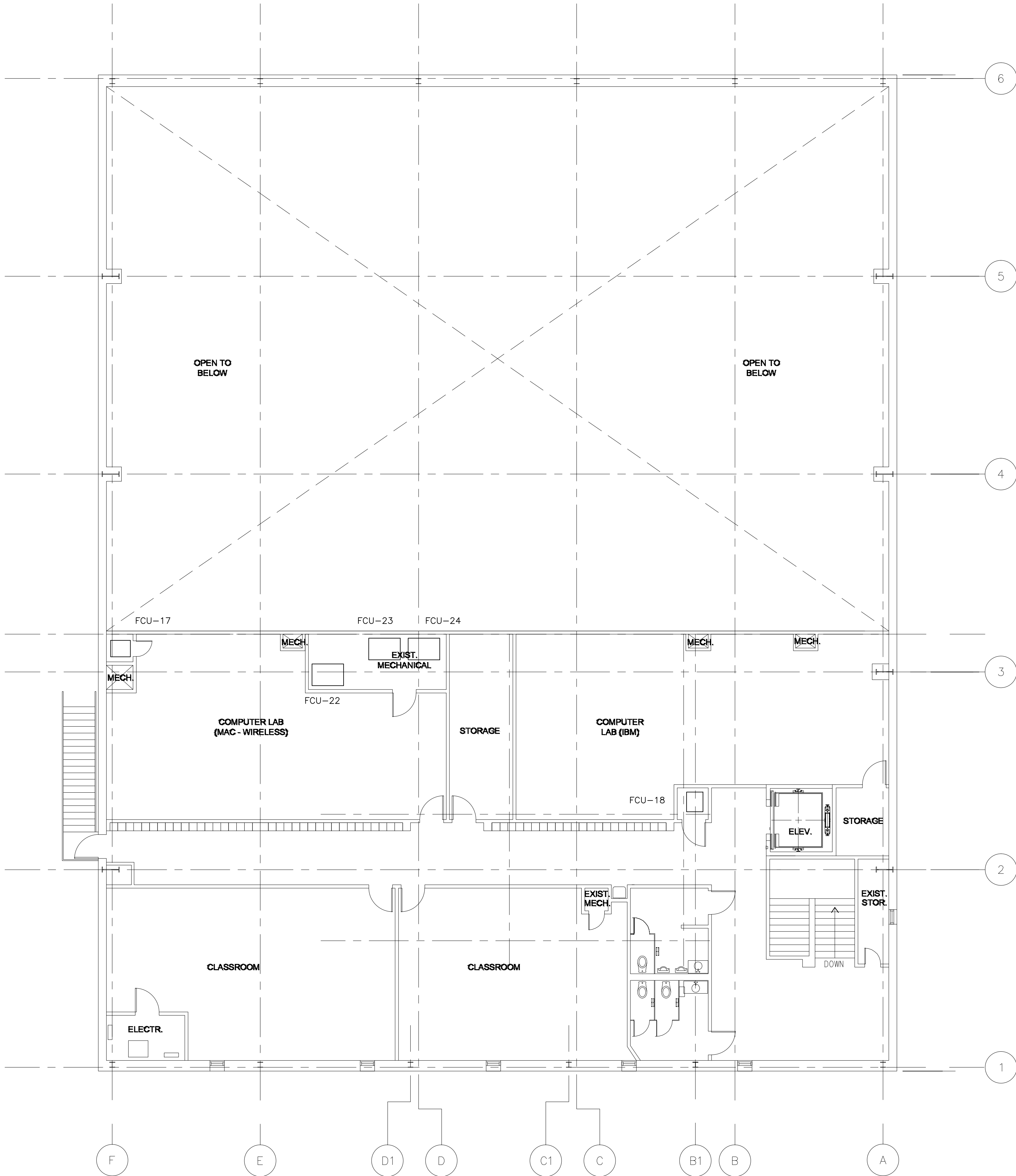
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MEP GYM  
LEVEL 2  
NORTH CENTRAL

DRAWING NUMBER

MEP502



- MEP GENERAL NOTES
- FIELD VERIFY ALL EXISTING CONDITIONS.
  - ALL MECHANICAL, ELECTRICAL AND PLUMBING EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
  - CONFIRM PHYSICAL DIMENSIONS OF NEW EQUIPMENT WILL FIT WITHIN EXISTING LOCATIONS.
  - MODIFY EXISTING DUCTWORK, PIPING, AND POWER AS NEEDED TO RECONNECT NEW EQUIPMENT FOR A COMPLETELY WORKING SYSTEM.
  - MAINTAIN MINIMUM CLEARANCE TO ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  - MODIFY HOUSEKEEPING PAD AS NEEDED.
  - MODIFY DUCT AS NEEDED AND RECONNECT TO NEW UNIT. INSULATION SHALL BE MINIMUM R-6.
  - MODIFY GAS AS NEEDED AND RECONNECT TO NEW UNIT.
  - MODIFY FLUE AS NEEDED AND RECONNECT TO NEW UNIT.
  - CONFIRM LOCATION OF EXISTING ELECTRICAL PANEL. MODIFY DISCONNECT, BREAKER, AND WIRE AS NEEDED AND RECONNECT TO NEW UNIT.
  - MODIFY CONDENSATE AS NEEDED AND RECONNECT TO NEW UNIT. ENSURE CONDENSATE ROUTES TO SINK TAILPIECE OR ELBOWS OVER FLOOR DRAIN.
  - MODIFY REFRIGERANT AND RECONNECT TO NEW FCU AND ACCU.
  - PROVIDE MANUFACTURER'S NAMEPLATE DATA IN ACCESSIBLE LOCATION ON EQUIPMENT.
  - CONFIRM RECEPTACLE FOR SERVICING EQUIPMENT IS WITHIN 25FT OF HVAC.

1 MEP GYM LEVEL 2  
1/8" = 1'-0"

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING

- 230000 HVAC BASIC REQUIREMENTS
- A. MINIMUM STANDARDS FOR ALL WORK SHALL BE CITY OF HOUSTON AMENDMENTS TO 2012 INTERNATIONAL BUILDING CODE, 2012 UNIFORM MECHANICAL CODE, AND 2015 INTERNATIONAL ENERGY CONSERVATION CODE.
- B. REFERENCES: THE STANDARDS MENTIONED HEREIN WILL BE REFERRED TO IN THE DESIGN OF MECHANICAL SYSTEMS. THE ENGINEER WILL SELECT APPROPRIATE SECTIONS OF THE STANDARD TO BE APPLIED IN ACCORDANCE WITH ESTABLISHED ENGINEERING PRINCIPLES AND PRACTICES.
1. APPLICABLE SECTIONS OF NFPA
2. AMERICANS WITH DISABILITIES ACT (ADA)
3. TEXAS ACCESSIBILITY STANDARDS (TAS)
- C. SITE CONDITIONS: BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND DETERMINE ANY CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE FOR FAILURE TO MAKE SURE EXAMINATIONS.
- D. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
- E. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES INCLUDING ARCHITECT, STRUCTURAL, CIVIL, PLUMBING, AND ELECTRICAL.
- F. DO NOT SCALE FROM THE ENGINEER DRAWINGS. REFER TO THE DIMENSIONED DRAWINGS OF THE ARCHITECT FOR EXACT LOCATIONS OF FIXTURES, EQUIPMENT, ETC.
- G. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THE INSTALLATION OF WORK AND PAY ALL INCIDENTAL CHARGES.
- H. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL TESTS NECESSARY TO PREVENT CONCEALMENT OF DEFECTIVE OR IMPROPER WORK. UPON COMPLETION OF WORK, TEST INSTALLATION THOROUGHLY AND RENDER IT FROM LEAKS OR IMPROPER CONNECTIONS.
- I. PROTECT EQUIPMENT AND WORK FROM DAMAGE DURING HANDLING AND INSTALLATION UNTIL COMPLETION OF CONSTRUCTION. REMOVE ALL EXCESS DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK. TOUCH UP WITH PAINT WHERE REQUIRED.
- 230513 COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
- A. PROVIDE HIGH EFFICIENCY MOTORS IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE.
- 230548 VIBRATION ISOLATION
- A. VIBRATION ISOLATION WILL BE PROVIDED AS REQUIRED TO MINIMIZE TRANSMISSION TO STRUCTURE. EQUIPMENT AND PIPING SHALL HAVE ISOLATORS INSTALLED AT POINTS OF SUPPORT. APPROVED MANUFACTURERS: AMBER/BOOTH, MASON, KINETICS NOISE CONTROL, VIBRO-ACOUSTICS.
1. ROOF MOUNTED AIR HANDLING UNITS GREATER THAN 10 TONS: VIBRO-ACOUSTICS RTR (ROOFTOP RAIL) CURB WITH WIND LOAD RATING WITH MINIMUM 0.75" DEFLECTION
2. SUSPENDED AIR HANDLING UNITS: VIBRO-ACOUSTICS SHRB COMBINATION SPRING AND NEOPRENE HANGER ISOLATORS WITH MINIMUM 0.75" DEFLECTION
3. ROOF MOUNTED CONDENSING UNITS: VIBRO-ACOUSTICS SFS RESTRAINED SPRING FLOOR MOUNT.
- 230593 TESTING, ADJUSTING, AND BALANCING FOR HVAC
- B. ADJUST ALL AIR SYSTEM DAMPERS AND VOLUME CONTROLLERS TO OBTAIN PROPER AIR BALANCE THROUGHOUT THE CONDITIONED AREA. THE AIR QUANTITIES SHOWN ON THE DRAWINGS FOR INDIVIDUAL OUTLETS MAY BE CHANGED TO OBTAIN UNIFORM TEMPERATURE WITHIN EACH ZONE, BUT THE TOTAL AIR QUANTITY SHOWN FOR EACH ZONE MUST BE OBTAINED WITHIN +/- 10% MAXIMUM TEMPERATURE VARIATION WITHIN A ZONE SHALL BE 2°F.
- C. ADJUST ALL BLOWER DRIVES TO OBTAIN PROPER TOTAL AMOUNTS OF AIR, INCLUDING EXHAUST AND OUTSIDE AIR SUPPLY.
- D. CALIBRATE, SET, AND ADJUST ALL AUTOMATIC TEMPERATURE CONTROLS.
- E. PROVIDE A WRITTEN REPORT TO THE OWNER AND ENGINEER IN ACCORDANCE WITH AABC, NEBB, OR ASHRAE 111.
- 230713 DUCT INSULATION
- A. INSULATION WRAP: 3/4" LB. DENSITY GLASS FIBER WRAP WITH FOIL BACK VAPOR BARRIER JACKET.
- B. ALL INSULATION THICKNESS SHALL MEET THE MINIMUM REQUIREMENTS OF INTERNATIONAL ENERGY CONSERVATION CODE.
- 230719 HVAC PIPING INSULATION
- A. CONDENSATE DRAIN PIPING SYSTEMS WITHIN AIR CONDITIONED SPACES: FACTORY MOLDED FIBERGLASS PIPE COVERING DENSITY NOT LESS THAN 3 LBS. PER CU.FT., CONDUCTIVITY (K) NOT HIGHER THAN 0.27 AT 75°F WITH FACTORY ATTACHED WHITE SELF SEALING LAP AS-J SSL VAPOR BARRIER JACKET.
- 233113 METAL DUCTS
- A. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCT SYSTEM, INDICATED DUCT LOCATIONS, CONFIGURATIONS, AND ARRANGEMENTS WERE USED TO SIZE DUCTS AND CALCULATE FRICTION LOSS FOR AIR-HANDLING EQUIPMENT SIZING AND FOR OTHER DESIGN CONSIDERATIONS. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON SHOP DRAWINGS.
- B. GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESS, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.
1. DUCTS CONNECTED TO AIR HANDLING EQUIPMENT: GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
- a. GALVANIZED COATING DESIGNATION: G60.
- C. HANGER SPACING: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," TABLE 5-1, "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT," FOR MAXIMUM HANGER SPACING. INSTALL HANGERS AND SUPPORTS WITHIN 24 INCHES OF EACH ELBOW AND WITHIN 48 INCHES OF EACH BRANCH INTERSECTION.
- 233300 AIR DUCT ACCESSORIES
- A. FLEXIBLE CONNECTORS: PROVIDE FLEXIBLE CONNECTORS AT ALL AIR HANDLING EQUIPMENT.
1. INDOOR FLEXIBLE CONNECTOR FABRIC: GLASS FABRIC DOUBLE COATED WITH NEOPRENE.
- a. MINIMUM WEIGHT: 26 OZ./SQ.YD.
- b. TENSILE STRENGTH: 480 LBF/INCH N THE WARP AND 360 LBF/INCH IN THE FILLING.
- c. SERVICE TEMPERATURE: MINUS 40 TO PLUS 200 DEG F.
2. OUTDOOR FLEXIBLE CONNECTOR FABRIC: GLASS FABRIC DOUBLE COATED WITH WEATHERPROOF, SYNTHETIC RUBBER RESISTANT TO UV RAYS AND OZONE.
- a. MINIMUM WEIGHT: 24 OZ./SQ.YD.
- b. TENSILE STRENGTH: 530 LBF/INCH N THE WARP AND 440 LBF/INCH IN THE FILLING.
- c. SERVICE TEMPERATURE: MINUS 50 TO PLUS 250 DEG F.
- 233600 FAN COIL UNITS (DX)
- A. CASINGS: CONSTRUCTED OF 18-GAUGE GALVANIZED STEEL, INSULATED WITH ONE-INCH, 1-1/2 LB DENSITY FIBERGLASS FIRE RESISTANT AND ODORLESS GLASS FIBER MATERIAL TO PROVIDE THERMAL AND ACOUSTICAL INSULATION. FAN HOUSING SIDES ARE DIRECTLY ATTACHED TO THE AIR HANDLER TOP AND BOTTOM PANELS STRENGTHENING THE ENTIRE UNIT ASSEMBLY. COIL ACCESS PANELS ARE LOCATED ON BOTH SIDES OF THE AIR HANDLER AND ALLOW EASY REMOVAL OF INTERNAL COILS AND DRAIN PAN. ACCESS PANELS PROVIDE ACCESS TO FAN, MOTOR, AND DRIVE FROM BOTH SIDES OF AIR HANDLER.
- B. INSULATION: INTERIOR SURFACE OF UNIT IS ACOUSTICALLY AND THERMALLY LINED WITH 1 INCH, 2.0 LB/CU FT, R-VALUE 4.3 DENSITY GLASS FIBER WITH A FOIL FACING. INSULATION IS UL LISTED AND MEETS NFPA-90A, UL 181, AND BACTERIOLOGICAL C665 STANDARDS.
- C. DX COIL: SEAMLESS COPPER TUBES EXPANDED INTO FULL FIN COLLARS FOR PERMANENT FIN-TUBE BOND AND TYPE H ALUMINUM FINS MECHANICALLY BONDED TO R-10 ROW COILS WITH 12 FINS PER INCH FIN SPACING. COILS HAVE ROUNDED, SEAMLESS, COPPER PIPE LIQUID LINES AND SUCTION HEADERS WITH MALE SWEAT CONNECTIONS. SUCTION HEADERS HAVE BOTTOM CONNECTIONS TO AID DRAINAGE OF ANY OIL THAT MAY COLLECT IN COIL. LIQUID LINE AND SUCTION CONNECTIONS ARE OUTSIDE THE UNIT CASING ON SAME SIDE OF UNIT TO FACILITATE FIELD REPAIRS. COILS ARE DEHYDRATED AND SEALED WITH A DRY AIR CHARGED. COILS ARE RATED PER AHRI 410.
- D. GAS HEAT: FACTORY PROVIDED AND MOUNTED GAS FURNACE TO MEET ANSI Z 21.47/CSA 2.3.
- E. RESET BACK-UP PROTECTION: SECONDARY MANUAL RESET BACK-UP PROTECTION PROVIDED.
- F. DISCONNECT SWITCH: FACTORY PROVIDED DISCONNECT SWITCH WITH

- AN INTERLOCKING DOOR ON THE HEATER CONTROL PANEL.
- G. LINE FUSE: SAFETY FUSE LOCATED IN ELECTRIC HEATER'S LINE OF POWER TO PREVENT POWER SURGE DAMAGE TO ELECTRIC HEATER.
- H. FAN: FANS ARE FORWARD CURVED, CENTRIFUGAL BLOWER TYPE, EQUIPPED WITH HEAVY-DUTY ADJUSTABLE SPEED V-BELT DRIVES. FAN SHAFT IS SUPPORTED BY HEAVY-DUTY, PERMANENTLY SEALED BALL BEARINGS. FAN IS DYNAMICALLY BALANCED.
- I. FILTER: UNITS ARE EQUIPPED WITH 2" FLAT PLEATED MEDIA FILTERS, MERV 8 PER ASHRAE 52.2.
- J. MOTOR: 60 HZ, 1750 RPM MOTOR WITH +/- 10% VOLTAGE UTILIZATION RANGE. MOTOR IS OPEN DRIP-PROOF WITH PERMANENTLY SEALED BALL BEARINGS, 1 INTERNAL OVERLOAD PROTECTION, MINIMUM 1.15 SERVICE FACTOR, AND SIZE 56 RESILIENT BASE FRAMES. MOTOR IS FACTORY INSTALLED AND WIRED TO THE AIR HANDLER JUNCTION BOX.
- K. DRAIN PAN: DRAIN PAN IS NONCORROSIIVE AND DOUBLE SLOPED TO ALLOW CONDENSATE DRAINAGE. DRAIN PAN IS CONSTRUCTED OF STAINLESS STEEL. COILS MOUNT ABOVE THE DRAIN PAN TO ALLOW THE DRAIN PAN TO BE FULLY INSPECTED AND CLEANED. DRAIN PAN CAN BE REMOVED FOR CLEANING. MAIN DRAIN CONNECTION IS LOWEST POINT OF DRAIN PAN. AN AUXILIARY DRAIN CONNECTION IS PROVIDED ON THE SAME SIDE AS THE MAIN CONNECTION.
- L. THERMOSTAT CONTROL INTERFACE: EXISTING TEMPERATURE SENSOR CONNECTED TO EXISTING BAS.
- M. ACCEPTABLE MANUFACTURERS: TRANE, YORK, CARRIER.
- 236313 AIR COOLED CONDENSING UNITS
- A. CONDENSING UNIT SHALL INCLUDE COMPRESSORS, AIR-COOLED COILS, CONDENSER FANS, SUCTION AND LIQUID CONNECTION VALVES, AND UNIT CONTROLS.
- B. CONSTRUCTION
1. UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED, PIPED, WIRED, AND SHIPPED IN ONE SECTION.
2. UNIT SHALL BE SPECIFICALLY DESIGNED FOR OUTDOOR APPLICATION.
- C. ELECTRICAL
1. UNIT SHALL BE PROVIDED WITH STANDARD POWER BLOCK FOR CONNECTING POWER TO THE UNIT.
2. CONTROL CIRCUIT TRANSFORMER AND WIRING SHALL PROVIDE 24 VAC CONTROL VOLTAGE FROM THE LINE VOLTAGE PROVIDED TO THE UNIT.
- D. REFRIGERATION SYSTEM
1. COMPRESSORS SHALL BE SCROLL TYPE WITH THERMAL OVERLOAD PROTECTION AND INDEPENDENTLY CIRCUITED.
2. EACH COMPRESSOR SHALL INCLUDE A CRANKCASE HEATER.
3. COMPRESSORS SHALL BE MOUNTED IN AN ISOLATED SERVICE COMPARTMENT WHICH CAN BE ACCESSED WITHOUT AFFECTING UNIT OPERATION. LOCKABLE HINGED ACCESS DOORS SHALL PROVIDE ACCESS TO COMPRESSORS.
4. COMPRESSORS SHALL BE ISOLATED FROM THE BASE PAN WITH COMPRESSOR MANUFACTURER'S RECOMMENDED RUBBER VIBRATION ISOLATORS.
5. EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH AUTOMATIC RESET LOW PRESSURE AND MANUAL RESET HIGH PRESSURE REFRIGERANT SAFETY CONTROL VALVES. SERVICE FITTINGS ON BOTH THE HIGH PRESSURE AND LOW PRESSURE SIDES, AND SERVICE VALVES FOR LIQUID AND SUCTION CONNECTIONS. LIQUID LINE FILTER DRIERS SHALL BE FACTORY PROVIDED. FINISHED FIELD INSTALLED REFRIGERANT CIRCUITS SHALL INCLUDE THE LOW SIDE COOLING COMPONENTS, REFRIGERANT, THERMAL EXPANSION VALVE, LIQUID LINE, INSULATED HOT GAS BYPASS LINE, AND INSULATED SUCTION LINE.
6. UNITS SHALL INCLUDE A FACTORY HOLDING CHARGE OF R-410A REFRIGERANT AND OIL.
7. DIGITAL COMPRESSOR SHALL BE EQUIPPED WITH A 5 MINUTE OFF DELAY TIMER TO PREVENT COMPRESSOR SHORT CYCLING.
8. THE UNIT SHALL BE CAPABLE OF STABLE COOLING OPERATION TO A MINIMUM OF 55°F OUTDOOR TEMPERATURE.
- E. CONDENSERS – AIR COOLED
1. CONDENSER FANS SHALL BE VERTICAL DISCHARGE, AXIAL FLOW, DIRECT DRIVE FANS.
2. FAN MOTOR SHALL BE WEATHER PROTECTED, SINGLE PHASE, DIRECT DRIVE, AND OPEN DRIP PROOF WITH INHERENT OVERLOAD PROTECTION.
3. COILS SHALL BE DESIGNED FOR USE WITH R-410A REFRIGERANT AND CONSTRUCTED OF COPPER TUBES WITH ALUMINUM FIN MECHANICALLY BONDED TO THE TUBES AND ALUMINUM END CASINGS. FIN DESIGN SHALL BE SINE WAVE RIPPLED.
4. COILS SHALL BE DESIGNED FOR A MINIMUM OF 10°F OF REFRIGERANT SUB-COOLING.
- F. CONTROLS
1. UNITS SHALL BE PROVIDED WITH THERMAL BLOCK FOR FIELD INSTALLATION OF CONTROLS.
- G. WARRANTY
1. COMPRESSOR: NOT LESS THAN 5 YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
- H. ACCEPTABLE MANUFACTURERS: TRANE, CARRIER, YORK.
- 237313 MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS
- A. CASINGS
1. G-90 GALVANIZED STEEL BASE RAILS, 14-GAUGE MINIMUM.
2. CASING PANELS CONSTRUCTED OF G-90 GALVANIZED STEEL, DOUBLE WALL PANEL ASSEMBLIES R-13 MINIMUM.
3. ACCESS DOORS: DOUBLE WALL PANEL ASSEMBLIES R-13 MINIMUM, HINGED, GASKETED.
4. CONDENSATE DRAIN PAN: DOUBLE WALL, STAINLESS STEEL.
- B. FAN: FORWARD CURVE, CENTRIFUGAL, BELT DRIVE, INTERNAL EXHAUSTION LOCATION, TOTALLY ENCLOSED, FAN COOLED MOTOR.
- C. COIL: ALUMINUM FINS WITH STAINLESS STEEL CASING, STEEL HEADER D. FILTRATION SECTION: 2" PLEATED MERV 8.
- E. ELECTRICAL: SINGLE POINT CONNECTION.
- F. ACCEPTABLE MANUFACTURERS: TRANE, CARRIER, YORK.
- G. ENERGY EFFICIENCY: PROVIDE HIGH EFFICIENCY UNITS EXCEEDING MINIMUM ENERGY EFFICIENCY RATINGS IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE.
- H. WARRANTY:
1. MANUFACTURER'S STANDARD, BUT NOT LESS THAN ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
- 237413 PACKAGED, OUTDOOR, CENTRAL STATION AIR HANDLING UNITS
- J. UNITS SHALL BE SPECIFICALLY DESIGNED FOR OUTDOOR APPLICATION. STRUCTURAL MEMBERS AND CASING PANELS SHALL BE ALL GALVANIZED. ROOF AND SIDE WALL PANELS SHALL BE GALVANIZED SHEET STEEL CONSTRUCTION WITH MINIMUM 1/2" THICK, 1 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION, NEOPRENE COATED ON THE AIR SIDE. ROOF AND SIDEWALL SEAMS SHALL BE CONTINUOUSLY CALKED AND COVERED WITH SEAM CAPS.
- K. COILS: ALUMINUM PLATE FIN AND SEAMLESS COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL. POLYMER STRIP SHALL PREVENT ALL COPPER COILS FROM CONTACTING STEEL COIL FRAME OR CONDENSATE PAN. COIL SPLIT: FACE SPLIT. FACE VELOCITY SHALL NOT EXCEED 500 FPM. CAPACITY RATINGS SHALL BE ARI CERTIFIED. COILS SHALL BE REMOVABLE. CAPACITY SHALL BE BASED ON 105°F AMBIENT.
- L. EVAPORATOR FAN: BLOWER FAN SHALL BE VAN AXIAL FAN DESIGN WITH 75% LESS MOVING PARTS THAN A CONVENTIONAL BELT DRIVE SYSTEM. CAST ALUMINUM STATOR AND HIGH IMPACT COMPOSITE MATERIAL ON ROTOR AND AIR INLET CASING.
- M. BELT-DRIVEN SUPPLY-AIR FANS: DOUBLE WIDTH, FORWARD CURVED, CENTRIFUGAL, WITH PERMANENTLY LUBRICATED, SINGLE-SPEED MOTOR INSTALLED ON AN ADJUSTABLE FAN BASE RESILIENTLY MOUNTED IN THE CASING. ALUMINUM OR PAINTED-STEEL WHEELS, AND GALVANIZED- OR PAINTED-STEEL FAN SCROLLS.
- N. CONDENSER-COIL FAN: PROPELLER, MOUNTED ON SHAFT OF PERMANENTLY LUBRICATED MOTOR.
- O. REFRIGERANT CIRCUIT COMPONENTS:
1. COMPRESSOR: HERMETIC, TWO STAGE SCROLL, MOUNTED ON VIBRATION ISOLATORS; WITH INTERNAL OVERCURRENT AND HIGH-TEMPERATURE PROTECTION, INTERNAL PRESSURE RELIEF, AND CRANKCASE HEATER.
2. REFRIGERATION SPECIALTIES:
- a. REFRIGERANT: R-410A.
- b. EXPANSION VALVE WITH REPLACEABLE THERMOSTATIC ELEMENT.
- c. REFRIGERANT FILTER/DRYER.
- d. MANUAL-RESET HIGH-PRESSURE SAFETY SWITCH.
- e. AUTOMATIC-RESET LOW-PRESSURE SAFETY SWITCH.
- f. MINIMUM OFF-TIME RELAY.
- g. AUTOMATIC-RESET COMPRESSOR MOTOR THERMAL OVERLOAD.
- h. BRASS SERVICE VALVES INSTALLED IN COMPRESSOR SUCTION AND LIQUID LINES.
- i. LOW-AMBIENT KIT HIGH-PRESSURE SENSOR.
- j. EQUIPMENT SHALL BE RATED FOR 105°F AMBIENT.
- G. ELECTRIC HEAT: HEATER ELEMENT OPEN COIL RESISTANCE WIRE, NICKEL-CHROME ALLOY, 0.21 DIAMETER, 1/2" STRUNG THROUGH CERAMIC INSULATORS MOUNTED ON METAL FRAME. COIL ENDS STAKED AND WELDED TO TERMINAL SCREW FLATS.
- H. PROVIDE FOR SINGLE CONNECTION OF POWER TO UNIT WITH

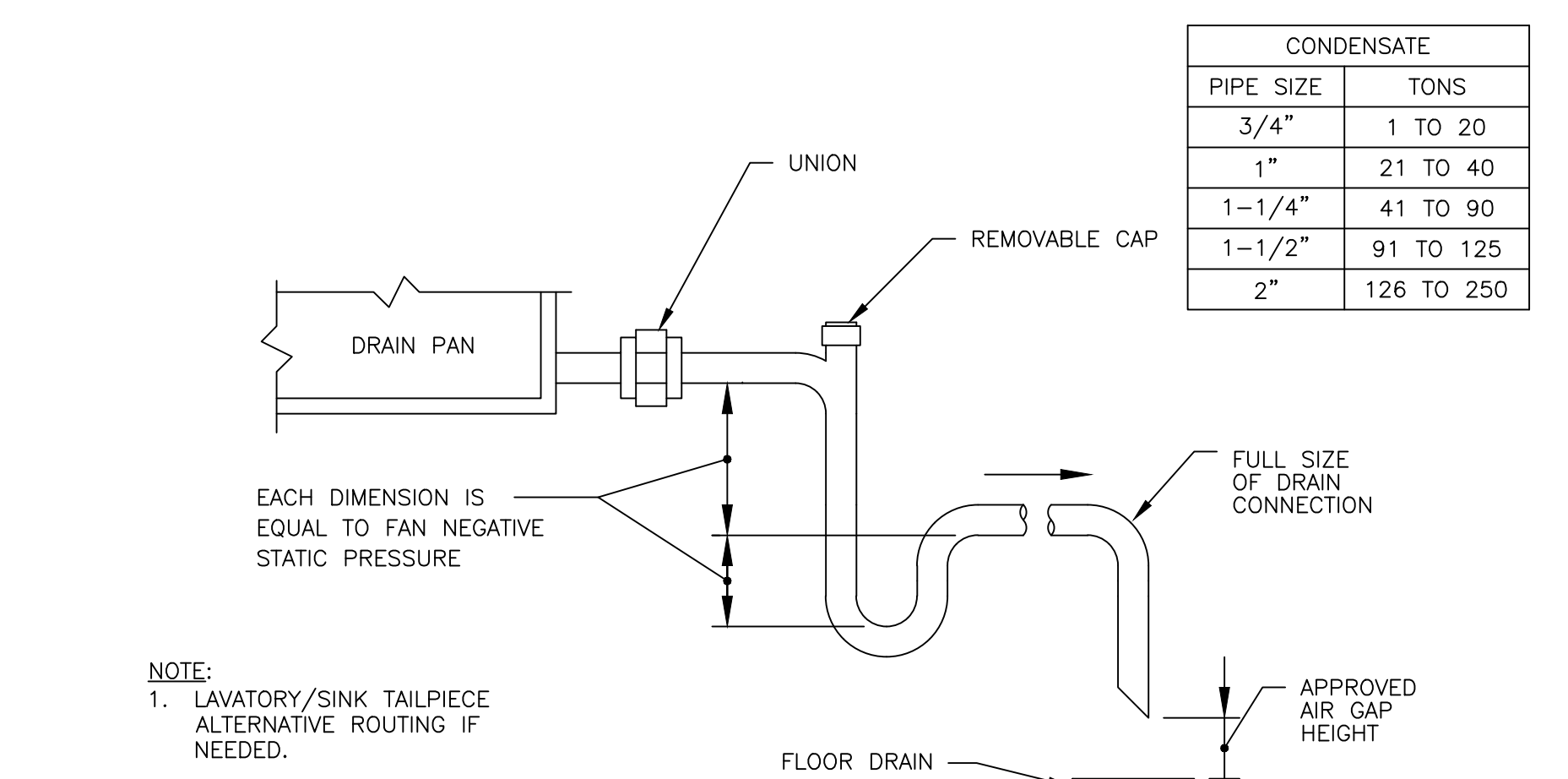
- UNIT-MOUNTED DISCONNECT SWITCH ACCESSIBLE FROM OUTSIDE UNIT AND CONTROL-CIRCUIT TRANSFORMER WITH BUILT-IN OVERCURRENT PROTECTION.
- I. FILTER VELOCITY: 350 FPM MAXIMUM (MERV 13).
- J. UNIT CONTROLS: EXISTING SENSOR CONNECTED TO BAS.
- K. ACCEPTABLE MANUFACTURERS: TRANE, CARRIER, YORK.
- L. ENERGY EFFICIENCY: PROVIDE HIGH EFFICIENCY UNITS EXCEEDING MINIMUM ENERGY EFFICIENCY RATINGS IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE.
- M. WARRANTY:
1. COMPRESSORS: MANUFACTURER'S STANDARD, BUT NOT LESS THAN FIVE (5) YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
2. ELECTRIC HEAT: MANUFACTURER'S STANDARD, BUT NOT LESS THAN FIVE (5) YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
3. PARTS: MANUFACTURER'S STANDARD, BUT NOT LESS THAN ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
- M. ROOF CURB: PROVIDE ROOF CURB IN ACCORDANCE WITH SECTION 230548 VIBRATION ISOLATION.

DUCT & PIPING MATERIAL & INSULATION SCHEDULE

SYSTEM	DUCT/PIPING MATERIAL	INSULATION MATERIAL
CONDENSATE DRAINS	TYPE "L" HARD DRAWN COPPER	AP ARMAFLEX (25/50 RATED), 3/4" THICKNESS MINIMUM, THICKER IF REQUIRED TO PREVENT CONDENSATION AT 85°F AND 70% RELATIVE HUMIDITY
SUPPLY & RETURN DUCT (RECTANGULAR)	GALVANIZED SHEET METAL LINER	JOHNS MANVILLE PERMACOTE LINACUSTIC OR EQUAL, 1-1/2 LB/CU FT, NFPA 25/50 FLAME SPREAD AND SMOKE DEVELOPED RATING, MINIMUM INSTALLED R-6 INSIDE AND R-8 OUTSIDE BUILDING ENVELOPE.
SUPPLY & RETURN DUCT (SPIRAL/ROUND)	SPIRAL/ROUND DUCT LINER INSULATION	CERTAINTED TOUGHGUARD ULTRA*ROUND SPIRAL DUCT LINER, NFPA 25/50 FLAME SPREAD AND SMOKE DEVELOPED RATING, MINIMUM INSTALLED R-6 INSIDE AND R-8 OUTSIDE BUILDING ENVELOPE.
SUPPLY, RETURN & OUTSIDE AIR DUCT	GALVANIZED SHEET METAL DUCT WRAP	1-1/2 LB/CU FT DENSITY FIBERGLASS FOIL-BACK, FLAME SPREAD RATING 25 OR LESS, SMOKE DEVELOPED RATING 50 OR LESS, MINIMUM INSTALLED R-6 INSIDE AND R-8 OUTSIDE BUILDING ENVELOPE.
CHILLED WATER SUPPLY & RETURN	SCHEDULE 40 BLACK STEEL	PHENOLIC FOAM INSULATION, 2" THICK
REFRIGERANT PIPING	TYPE "L" HARD DRAWN COPPER	ARMAFLEX 1" THICKNESS MINIMUM FOR LIQUID WITH MANUFACTURER-APPROVED PROTECTION FOR INSULATION EXPOSED TO WEATHER

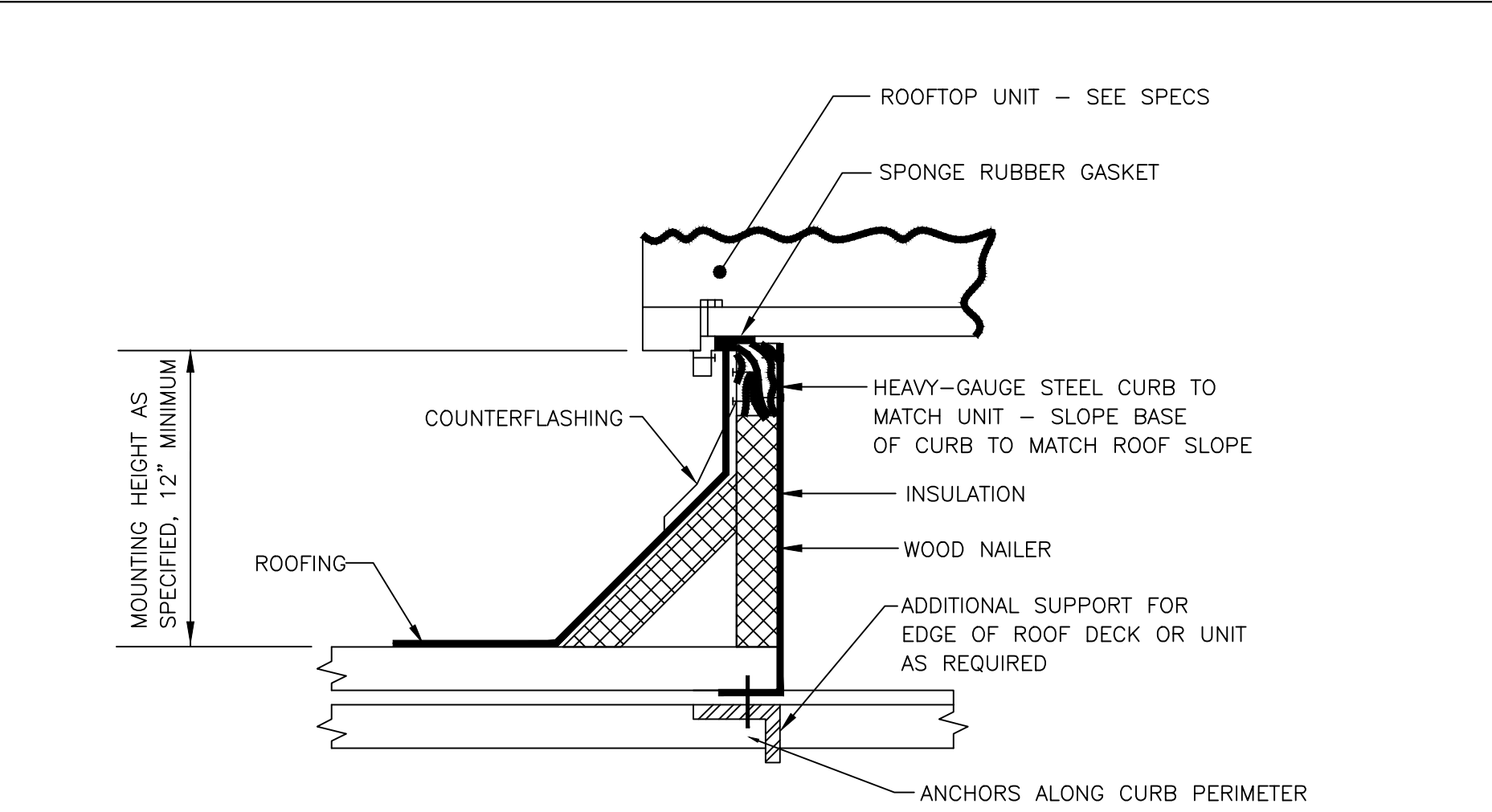
NOTES:

1. DUCT AND PLENUMS SHALL BE SEALED IN ACCORDANCE WITH THE MECHANICAL CODE AND SMACNA METHOD A.



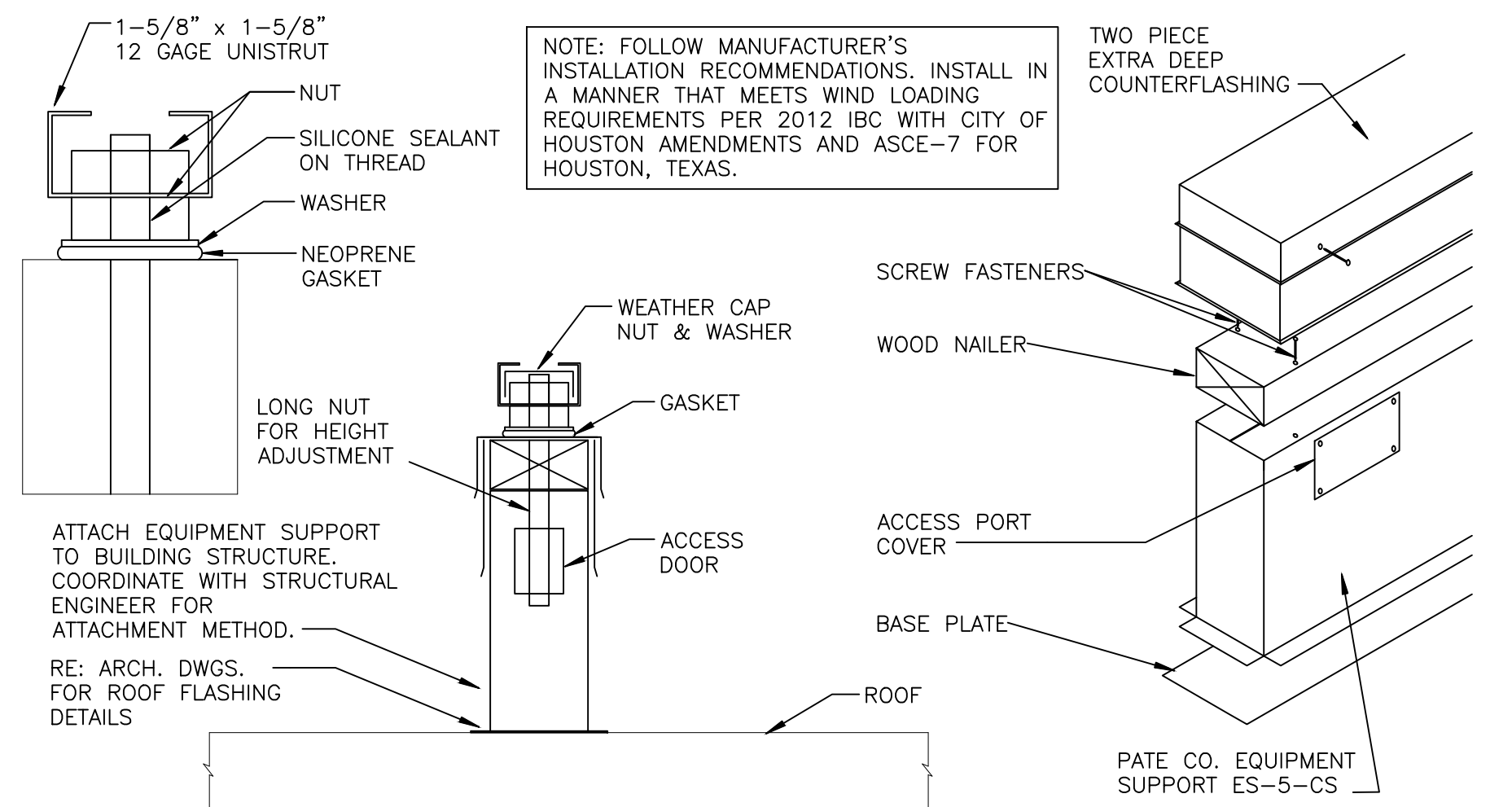
CONDENSATE DRAIN DETAIL

NOT TO SCALE



ROOFTOP EQUIPMENT CURB DETAIL

N.T.S.



EQUIPMENT SUPPORT – WIND LOADING

NOT TO SCALE

ENERGY CODE COMPLIANCE REQUIREMENTS

- COMMISSIONING PLAN
- A. AIR SYSTEM BALANCE
1. ADJUST ALL AIR SYSTEM DAMPERS AND VOLUME CONTROLLERS TO OBTAIN PROPER AIR BALANCE THROUGHOUT THE CONDITIONED AREA. THE AIR QUANTITIES SHOWN ON THE DRAWINGS FOR INDIVIDUAL OUTLETS MAY BE CHANGED TO OBTAIN UNIFORM TEMPERATURE WITHIN EACH ZONE AND SHALL BE WITHIN +/- 10% OF SCHEDULED VALUES AND THE TOTAL AIR QUANTITY SHOWN FOR EACH ZONE MUST BE OBTAINED WITHIN +/- 10% MAXIMUM TEMPERATURE VARIATION WITHIN A ZONE SHALL BE 2°F.
2. ADJUST ALL BLOWER DRIVES TO OBTAIN PROPER TOTAL AMOUNTS OF AIR, INCLUDING EXHAUST AND OUTSIDE AIR SUPPLY.
3. CALIBRATE, SET, AND ADJUST ALL AUTOMATIC TEMPERATURE CONTROLS.
4. PROVIDE A WRITTEN REPORT TO THE OWNER IN ACCORDANCE WITH AABC, NEBB, OR ASHRAE 111.
- B. FUNCTIONAL PERFORMANCE TESTING
1. EQUIPMENT FUNCTIONAL PERFORMANCE TESTING SHALL DEMONSTRATE THE INSTALLATION AND OPERATION OF COMPONENTS, SYSTEMS, AND SYSTEM-TO-SYSTEM INTERFACING RELATIONSHIPS IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS 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 UNDER FULL-LOAD, PART-LOAD, AND THE FOLLOWING EMERGENCY CONDITIONS:
- a. ALL MODES AS DESCRIBED IN SEQUENCE OF OPERATION.
- b. REDUNDANT OR AUTOMATIC BACK-UP MODE.
- c. PERFORMANCE OF ALARMS.
- d. MODE OF OPERATION UPON A LOSS OF POWER AND RESTORATION OF POWER.
- e. EXCEPTION: UNITARY OR PACKAGED HVAC EQUIPMENT LISTED IN TABLES C403.2.3(1) THROUGH C403.2.3(3) THAT DO NOT REQUIRE SUPPLY AIR ECONOMIZERS.
- C. CONTROLS
1. HVAC CONTROL SYSTEMS SHALL BE TESTED TO DOCUMENT THAT CONTROL DEVICES, COMPONENTS, EQUIPMENT, AND SYSTEMS ARE CALIBRATED AND ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
2. SEQUENCES OF OPERATION SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THEY OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
- D. ECONOMIZERS
1. AIR ECONOMIZERS SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THAT THEY OPERATE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- E. COMMISSIONING REPORT
1. MECHANICAL CONTRACTOR SHALL PROVIDE A REPORT OF THE ABOVE COMMISSIONING TEST PROCEDURES AND RESULTS AND PROVIDE TO GENERAL CONTRACTOR TO COMPLY WITH ELECTRICAL AND PLUMBING REPORTS.
2. REPORT SHALL IDENTIFY ANY DEFICIENCIES THAT HAVE NOT YET BEEN CORRECTED. DEFERRED TESTS THAT CANNOT BE PERFORMED AT THE TIME OF REPORT PREPARATION BECAUSE OF CLIMATIC CONDITIONS, AND CLIMATIC CONDITIONS REQUIRED FOR PERFORMANCE OF THE DEFERRED TESTS.
3. GENERAL CONTRACTOR SHALL PROVIDE COMPILED REPORT TO OWNER/REPRESENTATIVE.

- DOCUMENTATION REQUIREMENTS
- A. WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE THE FOLLOWING DOCUMENTS SHALL BE PROVIDED TO THE OWNER:
1. MANUALS: OPERATING AND MAINTENANCE MANUALS SHALL BE PROVIDED AND INCLUDE THE FOLLOWING:
- a. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
- b. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
- c. NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY.
- d. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR FOR DIGITAL CONTROL SYSTEMS IN PROGRAMMING COMMENTS.
- e. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET-POINTS.

NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER

2020423

DRAWN BY

SEH

CHECKED BY

SEH

DRAWING NAME

SPECIFICATIONS

DRAWING NUMBER

MEP601

DIVISION 22 – PLUMBING

220000 PLUMBING BASIC REQUIREMENTS

- A. MINIMUM STANDARDS FOR ALL WORK SHALL BE CITY OF HOUSTON AMENDMENTS TO 2012 INTERNATIONAL BUILDING CODE, 2012 UNIFORM PLUMBING CODE, AND 2015 INTERNATIONAL ENERGY CONSERVATION CODE.
- B. THE PLUMBING SYSTEMS SHALL INCLUDE DOMESTIC COLD WATER, DOMESTIC HOT WATER, SANITARY WASTE AND VENT, AND STORM DRAINAGE. EXTEND ALL UTILITIES TO 5'-0" OUTSIDE OF THE BUILDING. EXTENSION OF UTILITIES TO MAINS SHALL BE PROVIDED UNDER ANOTHER DIVISION (CIVIL).
- C. REFERENCES: THE STANDARDS MENTIONED HEREIN WILL BE REFERRED TO IN THE DESIGN OF PLUMBING SYSTEMS. THE ENGINEER WILL SELECT APPROPRIATE SECTIONS OF THE STANDARD TO BE APPLIED IN ACCORDANCE WITH ESTABLISHED ENGINEERING PRINCIPLES AND PRACTICES.
1. APPLICABLE SECTIONS OF NFPA
2. AMERICANS WITH DISABILITIES ACT (ADA)
3. TEXAS ACCESSIBILITY STANDARDS (TAS)
- D. SITE CONDITIONS: BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND DETERMINE ANY CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE FOR FAILURE TO MAKE SURE EXAMINATIONS.
- E. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
- F. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES INCLUDING ARCHITECT, STRUCTURAL, CIVIL, MECHANICAL, AND ELECTRICAL.
- G. DO NOT SCALE FROM THE ENGINEERED DRAWINGS. REFER TO THE DIMENSIONED DRAWINGS OF THE ARCHITECT FOR EXACT LOCATIONS OF FIXTURES, EQUIPMENT, ETC.
- H. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THE INSTALLATION OF WORK AND PAY ALL INCIDENTAL CHARGES.
- I. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL TESTS NECESSARY TO PREVENT CONCEALMENT OF DEFECTIVE OR IMPROPER WORK. UPON COMPLETION OF WORK, TEST INSTALLATION THOROUGHLY AND RENDER IT FROM LEAKS OR IMPROPER CONNECTIONS.
- J. PROTECT EQUIPMENT AND WORK FROM DAMAGE DURING HANDLING AND INSTALLATION UNTIL COMPLETION OF CONSTRUCTION. REMOVE ALL EXCESS DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK. TOUCH UP WITH PAINT WHERE REQUIRED.

221116 DOMESTIC WATER PIPING

- A. PIPING MATERIAL PER SCHEDULE.
1. PIPE, PIPE FITTINGS, JOINTS, VALVES, FAUCETS AND FIXTURE FITTINGS UTILIZED TO SUPPLY WATER FOR DRINKING OR COOKING PURPOSES SHALL COMPLY WITH NSF 61 AND NSF 372 AND SHALL HAVE A WEIGHTED AVERAGE LEAD CONTENT OF 0.25 PERCENT OR LESS.
- B. INSTALLATION
1. INSTALL PIPING LEVEL WITHOUT PITCH AND PLUMB.
2. INSTALL PIPING TO PERMIT VALVE SERVICING.
3. INSTALL PIPING FREE OF SAGS AND BENDS.
4. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
5. EACH WATER SUPPLIED FIXTURE AND PIECE OF EQUIPMENT SHALL BE PROVIDED WITH ITS OWN INDIVIDUAL AND ACCESSIBLE SHUT-OFF/STOP VALVE.
6. INSTALL DIELECTRIC FITTINGS IN PIPING AT CONNECTIONS OF DISSIMILAR METAL PIPING AND TUBING.
- C. HANGER AND SUPPORT INSTALLATION
1. PIPE HANGERS
- a. INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS
- i. 100 FEET AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS
2. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM DIAMETERS:
- a. NPS 3/4 AND SMALLER: 60 INCHES WITH 3/8-INCH ROD
- b. NPS 1 AND NPS 1-1/4: 72 INCHES WITH 3/8-INCH ROD
- c. NPS 1-1/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD
- d. NPS 2-1/2: 108 INCHES WITH 1/2-INCH ROD
3. INSTALL VINYL-COATED HANGERS FOR CPVC PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
- a. NPS 1 AND SMALLER: 36 INCHES WITH 3/8-INCH ROD
- b. NPS 1-1/4 TO NPS 2: 48 INCHES WITH 3/8-INCH ROD
- c. NPS 2-1/2: 48 INCHES WITH 1/2-INCH ROD

E. PIPING TESTS

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 SEGMENTS, 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.
4. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW IT TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
5. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS, RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
6. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION REQUIRED.
- F. CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING.

221216 NATURAL GAS PIPING

- A. PIPING MATERIAL PER SCHEDULE.
- B. OUTDOOR PIPING INSTALLATION
1. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
2. PROTECT PIPING FROM CORROSION PER CODE.
- C. INDOOR PIPING INSTALLATION
1. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.
2. FITTINGS SHALL BE LISTED FOR USE IN CONCEALED LOCATIONS.
3. 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.
4. INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL.
5. LOCATE VALVES FOR EASY ACCESS.
6. INSTALL PIPING FREE OF SAGS AND BENDS.
7. INSTALL FITTINGS FOR CHANGE IN DIRECTION AND BRANCH CONNECTIONS.
8. INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT, INCLUDING SERVICE-METER OUTLETS. LOCATE WHERE ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE IS SUBJECT TO FREEZING.
9. EXTEND RELIEF VENT CONNECTIONS FOR SERVICE REGULATORS, LINE REGULATORS, AND OVERPRESSURE PROTECTION DEVICES TO OUTDOORS AND TERMINATE WITH WEATHERPROOF VENT CAP. VENT PIPING SHALL BE CONSTRUCTED OF MATERIALS THAT COMPLY WITH THE CODE. MAINTAIN CODE-REQUIRED CLEARANCES.
10. CONCEALED LOCATION INSTALLATIONS: EXCEPT AS SPECIFIED BELOW, INSTALL CONCEALED NATURAL GAS PIPING AND PIPING INSTALLED UNDER THE BUILDING IN CONTAINMENT CONDUIT CONSTRUCTED OF STEEL PIPE WITH WELDED JOINTS. INSTALL A VENT PIPE FROM CONTAINMENT CONDUIT TO OUTDOORS AND TERMINATE WITH WEATHERPROOF VENT CAP.
- a. ABOVE ACCESSIBLE CEILINGS: NATURAL GAS PIPING, FITTINGS, VALVES, AND REGULATORS MAY BE INSTALLED IN ACCESSIBLE SPACES WITHOUT CONTAINMENT CONDUIT.
- b. IN WALLS OR PARTITIONS: PROTECT TUBING INSTALLED INSIDE PARTITIONS OR HOLLOW WALLS FROM PHYSICAL DAMAGE USING STRIKER BARRIERS AT RIGID SUPPORTS. EXCEPTION: TUBING PASSING THROUGH PARTITIONS OR WALLS DOES NOT REQUIRE STRIKER BARRIERS.
- c. PROHIBITED LOCATIONS
- i. DO NOT INSTALL NATURAL GAS PIPING IN OR THROUGH CIRCULATING AIR DUCTS, CLOTHES OR TRASH CHUTES, CHIMNEYS OR GAS VENTS (FLUES), VENTILATING DUCTS, OR DUMBWAITER OR ELEVATOR SHAFTS.
- ii. DO NOT INSTALL NATURAL GAS PIPING IN SOLID WALLS OR PARTITIONS.
11. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.
12. PROVIDE SYSTEM BONDING AS REQUIRED BY CODE.
13. PIPING FOR OTHER THAN DRY GAS CONDITIONS SHALL BE SLOPED NOT LESS THAN 1/4 INCH IN 15 FEET TO PREVENT TRAPS.
14. ENCASE INDOOR PIPING IN AN AIRTIGHT SLEEVE, OPEN TO OUTDOORS AT EACH END OF THE SLEEVE. SLEEVES THROUGH EXTERIOR SHALL ELBOW DOWN TO PREVENT ENTRANCE OF WATER AND SLEEVE OPENING SHALL BE COVERED WITH SECURE BRONZE SCREEN.
- D. INSTALL HANGERS FOR HORIZONTAL STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD DIAMETERS:
- a. NPS 1 AND SMALLER: 96 INCHES WITH 3/8-INCH ROD
- b. NPS 1-1/4: 108 INCHES WITH 3/8-INCH ROD
- c. NPS 1-1/2 TO NPS 2: 108 INCHES WITH 3/8-INCH ROD
- d. NPS 2-1/2 TO NPS 3-1/2: 10 FEET WITH 1/2-INCH ROD
- e. NPS 4 AND LARGER: 10 FEET WITH 5/8-INCH ROD

E. CONNECTIONS

1. INSTALL PIPING ADJACENT TO APPLIANCES TO ALLOW SERVICE AND MAINTENANCE OF APPLIANCES.
2. CONNECT PIPING TO APPLIANCES USING MANUAL GAS SHUT-OFF VALVES AND UNIONS. INSTALL VALVE WITHIN 72 INCHES OF EACH GAS-FIRED APPLIANCE AND EQUIPMENT. INSTALL UNION BETWEEN VALVE AND APPLIANCES OR EQUIPMENT.
3. SEDIMENT TRAPS: INSTALL TEE FITTING WITH CAPPED NIPPLE IN BOTTOM OF FORM DRIP, AS CLOSE AS PRACTICAL TO INLET OF EACH APPLIANCE.
- F. PRIOR TO ACCEPTANCE AND INITIAL OPERATION, ALL PIPING INSTALLATIONS SHALL BE VISUALLY INSPECTED AND PRESSURE TESTED TO DETERMINE THAT THE MATERIALS, DESIGN, FABRICATION, AND INSTALLATION PRACTICES COMPLY WITH THE CODE.
- G. PREPARE TEST AND INSPECTION REPORTS.

223300 DOMESTIC WATER HEATERS

- A. PROVIDE WATER HEATER IN ACCORDANCE WITH SCHEDULE ON DRAWINGS.
- B. INSTALLATION
1. INSTALL PER MANUFACTURER'S RECOMMENDATION.
2. PROVIDE WITH INTEGRAL HEAT TRAPS.
3. PROVIDE EXPANSION TANK.
4. DRAIN PAN: CORROSION-RESISTANT METAL WITH RAISED EDGE.
5. INSTALL SHUT-OFF VALVES ON DOMESTIC COLD AND HOT WATER.
6. FILL WATER HEATER WITH WATER.
7. CHARGE EXPANSION TANKS WITH AIR.
8. WHERE INSTALLING PIPING ADJACENT TO WATER HEATER, ALLOW SPACE FOR SERVICE AND MAINTENANCE OF WATER HEATER. ARRANGE PIPING FOR EASY REMOVAL OF WATER HEATER.
- C. TESTS AND INSPECTIONS
1. AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
2. AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER OPERATION.
3. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
- D. PREPARE TEST AND INSPECTION REPORTS.

PIPING MATERIAL SCHEDULE

SYSTEM	MATERIAL
DOMESTIC WATER ABOVE GRADE, INSIDE BLDG	TYPE "L" COPPER WITH SOLDER-JOINT FITTINGS OR CPVC PIPE AND FITTINGS

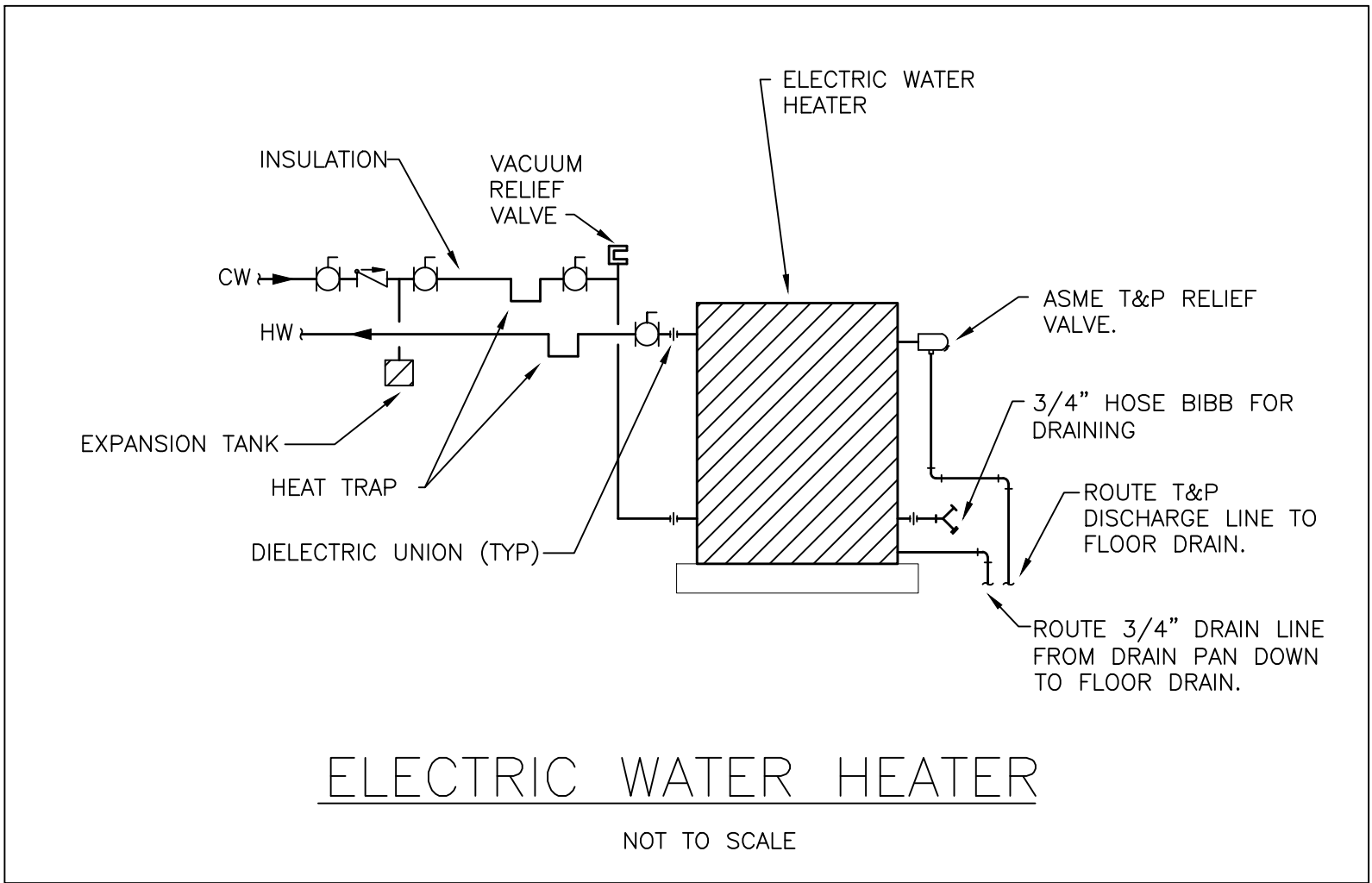
PIPING INSULATION SCHEDULE

SYSTEM	PIPE SIZE	MATERIAL
DOMESTIC HOT WATER 140°F OR LESS	LESS THAN 1-1/2"	MINERAL FIBER, PREFORMED, TYPE I, 1" THICK

ENERGY CODE COMPLIANCE REQUIREMENTS

- COMMISSIONING PLAN
- A. FUNCTIONAL PERFORMANCE TESTING
1. EQUIPMENT FUNCTIONAL PERFORMANCE TESTING SHALL DEMONSTRATE THE INSTALLATION AND OPERATION OF COMPONENTS, SYSTEMS, AND SYSTEM-TO-SYSTEM INTERFACING RELATIONSHIPS IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS 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 UNDER FULL-LOAD, PART-LOAD, AND THE FOLLOWING EMERGENCY CONDITIONS:
- a. ALL MODES AS DESCRIBED IN SEQUENCE OF OPERATION.
- b. REDUNDANT OR AUTOMATIC BACK-UP MODE.
- c. PERFORMANCE OF ALARMS.
- d. MODE OF OPERATION UPON A LOSS OF POWER AND RESTORATION OF POWER.
- B. CONTROLS
1. WATER HEATING CONTROL SYSTEMS SHALL BE TESTED TO DOCUMENT THAT CONTROL DEVICES, COMPONENTS, EQUIPMENT, AND SYSTEMS ARE CALIBRATED AND ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
2. SEQUENCES OF OPERATION SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THEY OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
- C. COMMISSIONING REPORT
1. PLUMBING CONTRACTOR SHALL PROVIDE A REPORT OF THE ABOVE COMMISSIONING TEST PROCEDURES AND RESULTS AND PROVIDE TO GENERAL CONTRACTOR TO COMPILE WITH MECHANICAL AND ELECTRICAL REPORTS.
2. REPORT SHALL IDENTIFY ANY DEFICIENCIES THAT HAVE NOT YET BEEN CORRECTED, DEFERRED TESTS THAT CANNOT BE PERFORMED AT THE TIME OF REPORT PREPARATION BECAUSE OF CLIMATIC CONDITIONS, AND CLIMATIC CONDITIONS REQUIRED FOR PERFORMANCE OF THE DEFERRED TESTS.
3. GENERAL CONTRACTOR SHALL PROVIDE COMPILED REPORT TO OWNER/REPRESENTATIVE.

- DOCUMENTATION REQUIREMENTS
- A. WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE THE FOLLOWING DOCUMENTS SHALL BE PROVIDED TO THE OWNER:
1. MANUALS: OPERATING AND MAINTENANCE MANUALS SHALL BE PROVIDED AND INCLUDE THE FOLLOWING:
- a. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
- b. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
- c. NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY.
- d. HOT WATER CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR FOR DIGITAL CONTROL SYSTEMS IN PROGRAMMING COMMENTS.
- e. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET-POINTS.



NO.	DESCRIPTION	DATE
	ISSUE FOR CONSTRUCTION	09.03.20

PROJECT NUMBER  
2020423

DRAWN BY  
SEH

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SEH

DRAWING NAME

SPECIFICATIONS

DRAWING NUMBER

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PROJECT NUMBER  
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SEH

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DRAWING NAME

## SPECIFICATIONS

DRAWING NUMBER

MEP603

VISION 26 – ELECTRICAL

260500

ELECTRICAL BASIC REQUIREMENTS

A.

MAXIMUM STANDARDS FOR ALL WORK SHALL BE CITY OF HOUSTON AMENDMENTS TO THE 2017 NATIONAL ELECTRICAL CODE, 2015 INTERNATIONAL ENERGY CONSERVATION CODE, AND 2012 INTERNATIONAL BUILDING CODE.

B.

REFERENCES: THE STANDARDS MENTIONED HEREIN WILL BE REFERRED TO IN THE DESIGN OF ELECTRICAL SYSTEMS. THE ENGINEER WILL SELECT APPROPRIATE SECTIONS OF THE STANDARD TO BE APPLIED IN ACCORDANCE WITH ESTABLISHED ENGINEERING PRINCIPLES AND PRACTICES.

1.

APPLICABLE SECTIONS OF NFPA

2.

AMERICANS WITH DISABILITIES ACT (ADA)

3.

TEXAS ACCESSIBILITY STANDARDS (TAS)

C.

CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID DATE AND THOROUGHLY FAMILIARIZE HIMSELF WITH ALL EXISTING INSTALLATIONS, DETERMINE THE EXTENT OF THE NEW WORK TO PERFORM THIS CONTRACT, NO ALLOWANCES WILL BE TAKEN. INSTALLATION THOROUGHLY IN ACCORDANCE WITH THIS REQUIREMENT OR LACK OF FAMILIARIZATION WITH EXISTING INSTALLATIONS.

D.

THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.

E.

THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES INCLUDING ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, AND PLUMBING.

F.

DO NOT SCALE FROM THE ENGINEERED DRAWINGS. REFER TO THE DIMENSIONED DRAWINGS OF THE ARCHITECT FOR EXACT LOCATIONS OF FIXTURES, EQUIPMENT, ETC.

G.

THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THE INSTALLATION OF WORK AND PAY ALL INCIDENTAL CHARGES.

H.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL TESTS NECESSARY TO PREVENT CONCEALMENT OF DEFECTIVE OR IMPROPER WORK, UPON COMPLETION OF THE TEST, INSTALLATION THOROUGHLY AND RENDER IT FROM MALFUNCTIONS, SAFETY ISSUES, AND IMPROPER CONNECTIONS.

I.

PROTECT EQUIPMENT AND WORK FROM DAMAGE DURING AND HANDLING AND INSTALLATION UNTIL COMPLETE OF CONSTRUCTION, REMOVE ALL EXCESS DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK, TOUCH UP WITH PAINT WHERE REQUIRED.

J.

MATERIAL SHALL BE NEW, UNDamAGED, AND UNBLEMISHED AND UL LISTED EXACT AS NOTED.

K.

ALL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE TIME OF OWNER ACCEPTANCE. WORK EQUIPMENTED FOR ONE YEAR TO BE SUB-STANDARD OR DEFECTIVE SHALL BE CORRECTED DURING THESE PERIODS AT NO COST TO OWNER.

260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

A.

ALL WIRE SHALL BE COPPER COMPLYING WITH ASTM B3 FOR BARE ANNEALED TYPE AND ASTM B8 FOR STRANDED CONDUCTORS. MINIMUM AWG NO. 12 AWG TYPE THW OR THHN.

B.

ALL WIRING SHALL BE UL LISTED AND LABELED AS DEFINED IN NFPA (NEC) 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND USE.

C.

NO WIRE SMALLER THAN #12 FEEDER WIRE SHALL BE THW OR THWN INSULATED.

D.

FIXTURE WIRE SHALL BE TYPE FF.

E.

CONDUCTOR INSULATION:

1.

TYPE NM: COMPLY WITH UL 83 AND UL 719.

2.

TYPES RHH AND RHW-2: COMPLY WITH UL 44.

3.

TYPES USE-2 AND SE: COMPLY WITH UL 854.

4.

TYPES THHN AND THWN-2: COMPLY WITH UL 83.

5.

TYPES THW AND THW-2: COMPLY WITH NEMA WC-70/ICEA S-95-655 AND UL 83.

6.

TYPE XHHW-2: COMPLY WITH UL 44.

F.

CONNECTORS AND SPLICES: FACTORY-FABRICATED CONNECTORS, SPLICES AND LUGS OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED, LISTED AND LABELED AS DEFINED IN NFPA (NEC) 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND USE.

G.

JACKETED CABLE CONNECTORS: FOR STEEL AND ALUMINUM JACKETED CABLES, ZINC DIE-CAST COPPER CONTACTS, DESIGNED TO CONNECT CONDUCTORS SPECIFIED IN THIS SECTION.

H.

LUGS: ONE-PIECE, SEAMLESS, COPPER, DESIGNED TO TERMINATE CONDUCTORS SPECIFIED IN THIS SECTION.

I.

FEEDERS AND BRANCH CIRCUITS: SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG-2 AND LARGER.

J.

SERVICE ENTRANCE: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY; TYPE XHHW-2, SINGLE CONDUCTORS IN RACEWAY; TYPE USE, SINGLE CONDUCTOR IN RACEWAY; TYPE SE, MULTICONDUCTOR CABLE.

K.

EXPOSED FEEDERS: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY; TYPE XHHW-2, SINGLE CONDUCTORS IN RACEWAY; TYPE AC, ARMORED CABLE; TYPE MC, METAL-CLAD CABLE; TYPE NM, NONMETALLIC-SHEATHED CABLE.

L.

FEEDERS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY; TYPE AC, ARMORED CABLE; TYPE MC, METAL-CLAD CABLE; TYPE NM, NONMETALLIC-SHEATHED CABLE.

M.

EXPOSED BRANCH CIRCUITS: REFER TO FEEDERS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS.

N.

BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: REFER TO FEEDERS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS.

O.

CORD DROPS AND STAINLESS-STEEL WIRE MESH, STRAIN RELIEF DEVICE WITH TERMINATIONS TO ATTACH TO EQUIPMENT.

P.

PERFORM TESTING IN ACCORDANCE WITH APPLICABLE NATIONAL ELECTRICAL TESTING ASSOCIATION STANDARDS TO ENSURE A SAFE INSTALLATION THAT OPERATES AS DESIGNED.

260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

A.

ALL WORK SHALL BE GROUNDED TO COMPLY WITHOUT EXCEPTION WITH ALL PROVISIONS OF ARTICLE 250 OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. ALL CIRCUITS SHALL CONTAIN INSULATED GROUNDING CONDUCTOR. ALL RECEPTACLES SHALL HAVE AN INSULATED GREEN GROUNDING CONDUCTOR TERMINATED ON THE DEVICE GROUND SCREW.

B.

COMPLY WITH IEEE C2 GROUNDING REQUIREMENTS FOR UNDERGROUND DISTRIBUTION SYSTEMS AND GROUNDING MATERIALS AND EQUIPMENT.

C.

INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.

D.

BARE COPPER CONDUCTORS:

1.

SOLID CONDUCTORS: ASTM B3.

2.

STRANDED CONDUCTORS: ASTM B8.

3.

TINNED CONDUCTORS: ASTM B33.

4.

BONDING CABLE: 25 KILMIL, 14 STRANDS OF NO. 17 AWG CONDUCTOR, 1"-1 1/4" IN DIAMETER.

5.

BONDING CONDUCTOR: NO. 4 OR NO. 6 AWG, STRANDED CONDUCTOR.

6.

BONDING JUMPER: COPPER TAPE, BRAIDED CONDUCTORS TERMINATED WITH COPPER FERRULES: 1-5/8" WIDE AND 1/16" THICK.

7.

TINNED BONDING JUMPER: TINNED-COPPER TAPE, BRAIDED CONDUCTORS TERMINATED WITH COPPER FERRULES: 1-5/8" WIDE AND 1/16" THICK.

E.

CONDUCTORS: LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY AND IN COMPLIANCE WITH THE FOLLOWING:

1.

BOLTED CONNECTORS (CONDUCTORS AND PIPES): COPPER OR COPPER ALLOY.

2.

WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS.

3.

BUS-BAR CONNECTORS: MECHANICAL TYPE, CAST SILICON BRONZE, SOLDERLESS COMPRESSION TYPE WIRE TERMINALS, AND LONG-BARREL, TWO-BOLT CONNECTION TO GROUND BUS BAR.

F.

GROUNDING ELECTRODES: COPPER-CLAD STEEL RODS, 3/4" x 10'.

G.

GROUNDING AND BONDING FOR PIPING:

1.

METAL WATER SERVICE PIPE: INSTALL INSULATED COPPER GROUNDING CONDUCTORS FROM CONDUIT, FROM BUILDING MAIN SERVICE EQUIPMENT, OR GROUNDING BUS, TO MAIN WATER SERVICE ENTRANCES TO BUILDING. CONDUIT GROUNDING CONDUCTORS TO MAIN SERVICE EQUIPMENT OR SERVICE PIPES, USE A BOLTED CLAMP CONNECTOR OR BOLT A LUG-TYPE CONNECTOR TO A PIPE FLANGE BY USING ONE OF THE LUG BOLTS OF THE FLANGE, WHERE THE DIELECTRIC MAIN WATER FITTING IS INSTALLED, CONDUIT GROUNDING CONDUCTOR ON STREET SIDE OF FITTING, BOND METAL GROUNDING CONDUCTOR CONDUIT OR SLEEVE TO CONDUCTOR AT EACH END.

2.

WATER METER PIPING: USE BRAIDED-TYPE BONDING JUMPERS TO ELECTRICALLY BYPASS WATER METERS, CONNECT TO PIPE WITH A BOLTED CONNECTOR.

3.

PERFORM TESTS, INSPECTIONS, INSPECT PHYSICAL AND MECHANICAL CONDITION, VERIFY TIGHTNESS OF ACCESSIBLE, BOLTED, ELECTRICAL CONNECTIONS WITH A CALIBRATED TORQUE WRENCH ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

A.

STEEL SLOTTED SUPPORT SYSTEMS: COMPLY WITH MFM-4 FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY.

B.

CONDUIT AND CABLE SUPPORT DEVICES: STEEL HANGERS, CLAMP, ASSOCIATED FITTINGS, DESIGNED FOR TYPES AND SIZES OF RACEWAYS OR CABLE TO BE SUPPORTED.

C.

SUPPORT FOR CONDUCTORS IN VERTICAL CONDUIT: THE FABRICATED ASSEMBLY, CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUGS OR PLUGS FOR NONARMORED CONDUCTORS OR CABLES IN RISER CONDUITS; PLUGS SHALL HAVE MINIMUM SIZE, AND THE HOLE MUST BE CAPACITATED APPROPRIATE FOR BODY TO SUIT INDIVIDUAL CONDUCTORS OR CABLES SUPPORTED. REQUIRE SHALL BE MADE OF MALLEABLE IRON.

D.

STEEL HANGERS, ANCHORING, AND ATTACHMENT COMPONENTS: ITEMS FOR FASTENING ELECTRICAL SYSTEMS OR THEIR SUPPORTS TO BUILDING SURFACES INCLUDE:

1.

POWDER-ACTUATED FASTENERS: THREADED-STEEL STUD, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE, STEEL, OR WOOD, WITH TENSION, SHEAR, AND PULL-OUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.

2.

MECHANICAL EXPANSION ANCHORS: INSERT-WEDGE-TYPE, STEELLESS STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE, WITH TENSION, SHEAR, AND PULL-OUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.

3.

CONCRETE INSERTS: STEEL OR MALLEABLE IRON, SLOTTED SUPPORT SYSTEM UNITS ARE SIMILAR TO MSS TYPE 18 UNITS AND COMPLY WITH MFM-4 OR MSS SP-58.

4.

CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS: MSS SP-58 UNITS ARE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT.

5.

TUGGLE BOLTS: STAINLESS STEEL.

6.

HANGER RODS: THREADED STEEL.

F.

FABRICATED METAL EQUIPMENT: CONDUIT ASSEMBLIES: WELDED OR BOLTED STRUCTURAL STEEL SHAPES, SHOP OR FIELD FABRICATED TO FIT DIMENSIONS OF SUPPORTED EQUIPMENT, COMPLY WITH INDUSTRY-ACCEPTED STANDARDS FOR STEEL SHAPES AND PLATES.

260533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

A.

METAL CONDUITS, TUBING, AND FITTINGS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA (NEC) 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

B.

APPLY RACEWAY PRODUCTS (MINIMUM 3/4" TRADE SIZE) AS SPECIFIED BELOW U.O.N.

1.

OUTDOORS:

1.1.

EXPOSED: RNC, EPC-80-PVC.

1.2.

CONCEALED ABOVEGROUND: EPC-80-PVC.

1.3.

UNDERGROUND: RNC, EPC-80-PVC, DIRECT BURIED.

1.4.

CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC.

1.5.

BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 3R.

2.

INDOORS:

2.1.

EXPOSED, NOT SUBJECT TO DAMAGE: EMT.

2.2.

EXPOSED, SUBJECT TO DAMAGE: GRC.

2.3.

CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: EMT OR MC.

2.4.

CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FM, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.

C.

IN ADDITION TO NFPA (NEC) 70 COMPLIANCE, COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS.

D.

SEAL ALL JOINT PENETRATIONS THROUGH WALLS WITH UL LISTED FIRE RETARDANT SEALANT.

E.

KEEP RACEWAYS AT LEAST 6" AWAY FROM PARALLEL RUNS OF HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER PIPING.

F.

BOXES, ENCLOSURES, AND CABINETS INSTALLED IN WET LOCATIONS SHALL BE LISTED FOR USE IN WET LOCATIONS.

G.

SHEET METAL OUTLET AND DEVICE BOXES: COMPLY WITH NEMA 051 AND 514.

H.

CAST-METAL OUTLET AND DEVICE BOXES: COMPLY WITH NEMA FB1, FERROUS ALLOY, TYPE FD, WITH GASKETED COVER.

I.

NONMETALLIC OUTLET AND DEVICE BOXES: COMPLY WITH NEMA 052 AND 514C.

J.

SMALL SHEET METAL PULL AND JUNCTION BOXES: COMPLY WITH NEMA 051.

K.

CAST-METAL ACCESS, PULL, AND UNION BOXES: COMPLY WITH NEMA FB1 AND UL 1773, GALVANIZED, CAST IRON WITH GASKETED COVER.

L.

HINGED-COVER ENCLOSURES: COMPLY WITH UL 50 AND NEMA 250, TYPE 1 OR TYPE 3R WITH CONTINUOUS HINGE COVER WITH FLUSH LATCH U.O.N.

M.

CABINETS:

1.

NEMA 250, TYPE 1 OR TYPE 3R, 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 HINGES.

3.

KEY LATCH TO MATCH PANELBOARDS.

4.

METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE.

5.

ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.

6.

NONMETALLIC CABINETS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA (NEC) 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

260544

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLES

A.

PROVIDE UL LISTED FIRESTOP SEALING SYSTEMS AT ALL ELECTRICAL PENETRATIONS OF FLOORS AND WALLS.

B.

WALL SLEEVES SHALL COMPLY WITH THE FOLLOWING:

1.

STEEL PIPE SLEEVES SHALL COMPLY WITH ASTM A53/A53M, TYPE E, GRADE B, SCH. 40, ZINC COATED, PLAN ENDS.

2.

CAST-IRON PIPE SLEEVES SHALL BE CAST OR FABRICATED "WALL PIPE" EQUIVALENT TO DUCTILE-IRON PRESSURE PIPE, WITH PLAN ENDS AND INTEGRAL WATERSTOP U.O.N.

260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

A.

COMPLY WITH ASME A13.1, IEEE C2, NFPA (NEC) 70, 29 CFR 1910.144, 29 CFR 1910.145, ASME Z535.4 (SAFETY SIGNS AND LABELS).

ADHESIVE-ATTACHED LABELING MATERIALS, INCLUDING LABEL STOCKS, LAMINATING ADHESIVES, AND INKS USED BY LABEL PRINTERS, SHALL COMPLY WITH UL 969.

C. ACCESSIBLE RACEWAYS AND METAL-CLAD CABLES, 600 V OR LESS, FOR SERVICE, FEEDER, AND BRANCH CIRCUITS, MORE THAN 30 A AND 120 V TO GROUND: IDENTIFY WITH SELF-ADHESIVE VINYL LABELS AT 30' MAXIMUM INTERVALS.

D. ACCESSIBLE RACEWAYS AND CABLES WITHIN BUILDINGS: IDENTIFY THE COVERS OF EACH JUNCTION AND PULL BOX WITH SELF-ADHESIVE VINYL LABELS CONTAINING THE WORD "POWER" AND SYSTEM VOLTAGE.

E. POWER-CIRCUIT CONDUCTOR IDENTIFICATION, 600 V OR LESS: WITHIN VAULTS, PULL AND JUNCTION BOXES, MANHOLES, AND HANDHOLES, USE COLOR-CODING CONDUCTOR TAPE TO IDENTIFY THE PHASE. USE INDUSTRY STANDARD COLORS FOR UNGROUNDED SERVICE FEEDER AND BRANCH-CIRCUIT CONDUCTORS.

F. CONTROL-CIRCUIT CONDUCTOR IDENTIFICATION: FOR CONDUCTORS AND CABLES IN PULL AND JUNCTION BOXES, MANHOLES, AND HANDHOLES, USE WRITE-ON TAGS WITH THE CONDUCTOR OR CABLE DESIGNATION, ORIGIN, AND DESTINATION.

G. CONTROL-CIRCUIT CONDUCTOR TERMINATION IDENTIFICATION: PROVIDE HEAT-SHRINK PREPRINTED TUBES WITH THE CONDUCTOR DESIGNATION. TAGS MARKER TAPE TO CONDUCTORS AND LIST SOURCE.

H. AUXILIARY ELECTRICAL SYSTEMS CONDUCTOR IDENTIFICATION: WRITE-ON TAGS SHALL BE EXTENDED IN THE FUTURE: ATTACH IDENTIFICATION TAGS TO CONDUCTORS.

I. LOCATIONS OF UNDERGROUND LINES: IDENTIFY WITH UNDERGROUND-LINE WARNING TAPE FOR POWER, LIGHTING, COMMUNICATION, CONTROL WIRING, AND OPTICAL-FIBER CABLE.

J. INSTALL-ALARM: CONTROL, AND SIGNAL CONNECTIONS.

K. WORKSPACE CLEARANCES IN THE DIRECTION OF ACCESS TO LIVE PARTS: WORKSPACE SHALL COMPLY WITH NFPA (NEC) 70 AND 29 CFR 1926.403 U.O.N.

L. WARNING LABELS: FOR INDOOR CABINETS, BOXES, AND ENCLOSURES FOR POWER AND LIGHTING: SELF-ADHESIVE WARNING LABELS.

M. ARC FLASH WARNING LABELING: SELF-ADHESIVE THERMAL TRANSFER VINYL LABELS. COMPLY WITH NFPA 70E AND ANSI Z535.4.

N. OPERATING INSTRUCTION SIGNS: INSTALL INSTRUCTION SIGNS TO FACILITATE PROPER OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS AND ITEMS TO WHICH THEY CONNECT.

O. EQUIPMENT IDENTIFICATION LABEL: ON EACH UNIT OF EQUIPMENT, INSTALL A UNIQUE DESIGNATION LABEL THAT IS CONSISTENT WITH WIRING DIAGRAMS, SCHEDULES, AND OPERATION AND MAINTENANCE MANUAL.

3 FUSES

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA (NEC) 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

B. COMPLY WITH NFPA (NEC) 70.

C. COORDINATE FUSE RATINGS WITH UTILIZATION EQUIPMENT NAMEPLATE LIMITATIONS OF MAXIMUM FUSE SIZE AND WITH SYSTEM SHORT-CIRCUIT CURRENT LEVELS.

D. NEMA FU 1, CURRENT-SENSING, NONRENEWABLE CARTRIDGE FUSES WITH VOLTAGE RATINGS CONSISTENT WITH CIRCUIT VOLTAGES.

1. TYPE RK-1: 250V OR 600V, 0-600A RATING, 200 KAIC TIME DELAY.

2. TYPE RK-5: 250V OR 600V, 0-600A RATING, 200 KAIC TIME DELAY.

3. TYPE CD: 600V, 31-60A RATING, 200 KAIC, FAST ACTING.

4. TYPE CD: 600V, 31-60A RATING, 200 KAIC, FAST ACTING.

5. TYPE J: 600V, 0-600A RATING, 200KAC TIME DELAY.

6. TYPE J: 600V, 601-6000A RATING, 200KAIC, TIME DELAY.

7. TYPE T: 250V, 0-1200A RATING, 200KAIC, TIME DELAY.

8. TYPE T: 600V, 0-800A RATING, 200KAIC, TIME DELAY.

6 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

A. FUSIBLE SWITCHES

1. TYPE GD, GENERAL DUTY, SINGLE THROW, 800A AND SMALLER: UL 98 AND NEMA KS 1, HORSEPOWER RATED, WITH CARTRIDGE FUSE INTERIORS TO ACCOMMODATE INDICATED FUSES, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.