Mission Consolidated Independent School District

- 1201 Bryce Drive, Mission, Texas 78572
- Telephone: (956) 323 5505 Fax: (956) 323 5634
- Website: www.mcisd.net

Notice and Agenda

The Board of Trustees of the Mission Consolidated Independent School District will hold a **Board of Trustees WORKSHOP** on **Wednesday, January 18, 2023, at 6:30 PM** in the **Mission CISD Annex, 925 E. Business HWY. 83, Mission, Tx 78572**. At this meeting, the Board may deliberate or act on any of the subjects listed on the following agenda. The President may change the order of items listed below for the convenience of the Board.

A G E N D A

I. Call Meeting to Order
II. Acknowledge Board Members Present
III. Public Comment(s) on Specific Agenda Item(s)
IV. Superintendent's Update and Recognitions
The Superintendent may provide information to update the Board of Trustees on the following subjects: Student Extracurricular and Co-Curricular Achievement; District Awards and Recognitions; Recent and Upcoming Professional Staff and Leadership Development; Progress Reports on Student and Staff Initiatives Previously Approved by the Board of Trustees; and Communications Received from Other Governmental Entities Not Requiring Action by the Board of Trustees. This will be for informational purposes only. Board consideration of any subject included in the Superintendent's Report will not take place until the subject is placed on the agenda of a future board meeting for consideration and possible action. The Board's consideration of any subject at the present meeting will be limited to those subjects appearing elsewhere on the meeting agenda.

V. *FACILITIES/ENVIRONMENT*

1. Construction Projects

a. Allowance Expenditure Authorization (AEA) #1 for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium – Javier Hinojosa Engineering **4**
b. Substantial Completion for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium - Javier Hinojosa Engineering **11**
c. Allowance Expenditure Authorization (AEA) #1 for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering **16**
d. Substantial Completion for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering **20**

e. Change Order #2 for Delay Days for the Child Nutrition Program (CNP) Freezer Installation at Elementary Campuses - Chanin Engineering **22**
f. Change Order #2 for Delay Days for the Child Nutrition Program (CNP) Freezer – DBR Engineering **26**
g. Final Design for the Indoor Air Quality Projects for Cavazos, Midkiff, and Salinas Elementary – DBR Engineering **32**
h. Final Completion, Less Betterment Fund Allowance, Less Liquidated Damages, and Final Payment for the Culinary Arts at Veterans Memorial High School – PBK Architects **109**
2. Board of Trustees Information Items
a. Job Order Contracting (JOC) Various Projects:
(1) Award Contract for the Farmers Parking Lot **116**
VI. *SUPPORT SERVICES*
1. Recommendation and Possible New Employment Positions:
a. ESSER Learning Loss Academic Tutors
2. Recommendation of Possible Positions for Next Board Meeting:
a. Child Nutrition Program Coordinator for Operations
b. Mission Collegiate High School Assistant Principal/Dean of Instruction
VII. *FINANCE*
1. Presentation(s) to the Board of Trustees
a. Self-Funded Health Insurance **119**
2. Discussion and Possible Action for Next Board Meeting
a. Bids, Proposals, and Purchases of $50,000 and Over
(1) Professional Auctioneer Services **125**
(2) Renewal Contract for Emergent and Non-Emergent Medical Transportation Services **128**
b. Functional Budget Amendment **135**
c. Approval of Donation **136**
3. Board of Trustees Information Items
a. Financial Reports for November 2022
(1) General Funds and Debt Service **142**
(2) Tax Levy Adjustments **145**
(3) Cash Disbursements **173**
VIII. Important Dates to Remember
1. January 25, 2023, Regular Board of Trustees Meeting
2. February 1, 2023, Board of Trustees Workshop
3. February 8, 2023, Regular Board of Trustees Meeting Postponed to February 15, 2023
IX. Adjournment

In accordance with the Texas Open Meetings Act, the Board may enter into a closed meeting to deliberate any item that is listed above that fits within an exception listed in Subchapter D. Any final action, decision, or vote on a subject deliberated in closed meeting will be taken in an open meeting held in compliance with the Texas Open Meetings Act.

This Notice was posted by 5:00 p.m., on January 13, 2023.

Carol G. Perez, Ed. D.

Dr. Carol G. Perez, Superintendent of Schools
Mission Consolidated Independent School District

SUBJECT: Allowance Expenditure Authorization (AEA) #1 for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium – Javier Hinojosa Engineering

PRESENTER: Rick Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The installation of synthetic turf and resurfacing of existing tracks at Tom Landry Stadium and VMHS Stadium were approved by the Board of Trustees on Wednesday, March 19, 2014. At the meeting, the Board approved the best and final offer (BAFO) with Hellas Construction at a total construction cost of $2,712,000.00. Notice to Proceed (NTP) was issued on April 11, 2014, and the projects were substantially completed in early August and the final completion was in early September 2014. Javier Hinojosa Civil Engineering was the design firm for this project.

As per initial planning and design meetings with firms, the synthetic field turf longevity is from eight to ten years. Eight years was the consensus discussed due to the extreme heat conditions in our area and the damage caused due to this.

The fields are currently eight years old and the extreme heat conditions have left the synthetic turf fibers to become excessively brittle as was discussed at the initial planning stages in 2014. Conducting preventative maintenance field brushing has shown that the fibers are breaking and thus thinning of the turf. The thinning of the turf and the loss of fibers causes the turf to lose its required cushion and only makes the playing surface hard and solid which may lead to a higher probability of injuries for our students and athletes. G-Max testing is a test method for shock-absorbing properties of playing surface systems and materials and was conducted at both fields in February of this year by Tait-Pitkin Sports Engineers, PLLC. Reports indicate that the playing surfaces have lost much of its cushion properties and are in need of replacement.

In the past eight years, there have been new technology and advancements in synthetic turf concerning the cooling factor and safety padding and there is a huge difference between synthetic turf and products while improving the quality of playing fields. With these new advancements, the safety factor has also improved.

If approved, the preliminary project timeline is to begin the administrative and design process with all approvals and advertise for CSP's in November 2022, after the football season is over. The primary goal is to have this project completed by April of 2023. The additional construction time has to be considered due to the continuing delays and uncertainty of available materials. Coaches at both campuses are in agreement with the proposed schedule and agree to make alternative arrangements for any other sports that use the fields during this time.

At the Regular Board of Trustees meeting held on June 08, 2022, the Board approved Project and Proposed Budget for the Replacement of Synthetic Turf at Tom Landry Stadium and the Veterans Memorial High School Stadium.

Administration will use Competitive Sealed Proposals (CSPs) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects.
Request for Qualifications (RFQs) will be advertised for professional design services and Administration will schedule presentations to the Board for selection.

The Board of Trustees must take the necessary action in accordance with Texas Education Code 44.035 which consisted of the selection/designation of an architect and/or engineer to prepare construction documents for this project. The engineer and/or architect selected or designated will have full responsibility for complying with the Texas Engineering Practice Act (Article 3271a, Vernon's Texas Civil Statues) or Chapter 478, Acts of the 45th Legislature, Regular Session, 1937 (Article 249a, Vernon's Texas Civil Statues) as applicable.

If the engineer or architect is not a full-time employee of the District, the Board must select the engineer or architect based on demonstrated competence and qualifications as provided by Section 2254.004, Government Code. The selected architect/engineer along with preparing construction documents will be required to provide MCISD with an estimated project budget.

The preliminary timeline is to advertise for RFQs on or about June 14, 2022, with presentations to the Board of Trustees for evaluation and ranking at the next scheduled meeting. Possible selection and approval to enter into a design contract in August. All designs and approvals are tentatively scheduled for November.

Advertisements in the local newspapers were posted on June 14, 2022, and June 21, 2022. The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. The submission of RFQs was on June 30, 2022, and six (6) proposals were received. The Administration ranking team reviewed and pre-ranked the RFQs on July 13, 2022.

Both Millennium Engineers Group (MEG) and Terracon Consultants, Inc. are geotechnical testing firms and are not design professionals for this project, their submission was a possible miscommunication.

At the Special Board Meeting held on Wednesday, August 03, 2022, Administration presented the Administrations's pre-ranking evaluation, and the top three firms presented to the Board of Trustees their expertise, competence, and qualifications. The firms had time for presentations and time for questions and answers. Once the presentations had concluded the Board of Trustees officially ranked the firms with Javier Hinojosa Engineering being ranked first, PBK Architects second, and ADM Group third.

<u>FIRMS</u>

ADM Group INC.	PBK,
Javier Hinojosa Engineering	Millennium Engineers Group (MEG)
Sam Garcia Architect LLC	Terracon Consultants INC

At the same meeting, the Board approved entering into negotiations in the order of ranking for the professional design services for the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium with Javier Hinojosa Engineering.

Initial project negotiations were held on August 08, 2022, with Mr. Javier Hinojosa Engineering, Mr. Adrian Hernandez, and Mr. Adan Rivera. During the negotiations, Mr. Javier Hinojosa Engineering presented as their Best and Final Offer (BAFO) of $70,000.00.

At the Regular Board Meeting held on Wednesday, August 10, 2022, the Board approved the Best and Final Offer (BAFO) from Mr. Javier Hinojosa Engineering of $70,000.00.

At the Regular Board Meeting held on Wednesday, September 21, 2022, the Board approved Schematic/Final Designs for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium. Designs have been reviewed and approved by staff. If approved Administration will begin the advertisement for competitive sealed proposals.

As presented at the Board Workshop a decision will need to be made on the center logo to be used at Tom Landry Stadium before the final design can be completed and advertisements can be made. At the Board, meeting Administration presented that Mission CISD has permission from the Hall of Fame to continue using the current midfield logo.

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
Communicating the design intent through further refinement of the written and graphic representation of all building materials, components, and equipment that can be quantified and useful to contractors.

Advertisements in the local newspapers were posted on October 12, 2022, and October 24, 2022. The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. Proposal(s) Bid Opening was Thursday, October 27, 2022. After the review Administration will then recommend those firms to be reviewed and ranked in order of selection. The recommendations will be presented for review at the Wednesday, November 02, 2022, Board Work Shop. The Administrative review was conducted by Mr. Adrian Hernandez, Mr. Adan Rivera, Coach Leticia Ibarra Athletic Director, Coach Daniel Longoria MHS Athletic Coordinator, Mr. Jose Mejia MHS Principal and Mr. Fidel Garza VMHS Principal, Coach David Gilpin VMHS Athletic Coordinator was unable to attend. Hellas Construction was the lone proposal.

Company Name	Base Bid for MHS	Base Bid for VMHS	Days
Hellas Construction	$761,520.00	$856,968.00	40 total

Note: Each project has a $50,000.00 betterment fund allowance included in the base proposal

At the Special Board of Trustees meeting held on November 02, 2022, the Board approved the rankings and to enter into negotiations in the order of ranking for the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium.

A virtual project negotiations meeting was held on November 03, 2022, with Mr. Saulo Hernandez and Mr. Ben Millet from Hellas Construction, Mr. Adrian Hernandez, and Mr. Ricardo Rivera from MCISD.

Hellas Construction had Tuesday, November 08, 2022, 12:00 p.m. deadline to submit its best and final offer (BAFO).

The Board of Trustees had the option to accept this BAFO or decline the offer, direct Administration to continue negotiations with the contractor, or to reject all offers, and re-advertise the project using the same specifications and design or direct the engineer to re-design the project.

If approved, Administration will work with our legal counsel to write and execute the contract so that the contractor can begin as soon as possible.

At the Regular Board of Trustees meeting held on November 09, 2022, the Board approved Best and Final Offer (BAFO)

Tom Landry Stadium - $736,520.00 with 50 Construction Days
Contingency Amount $50,000.00

Veterans Memorial High School Stadium - $1,568,488.00 with 50 Construction Days
Contingency Amount $50,000.00

Notice to Proceed (NTP) was issued on December 05, 2022
Substantial Completion due on January 30, 2023
Final Completion due on March 01, 2023

ADMINISTRATIVE CONSIDERATIONS

As per Athletics and the VMHS campus, there is a request to install agility ladders and circles at the Veterans Memorial High School Stadium for practicing and conditioning exercises, thus, Javier Hinojosa Engineering and Hellas Construction present the Allowance Expenditure Authorization (AEA) #1 for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium.

Note: Tom Landry Stadium does not have the field space area for this addition.

Contingency Amount for VMHS:	$50,000.00
(AEA) #1 Agility ladders & circles:	$ 9,000.00
Balance:	$41,000.00

FUNDING SOURCE

General Funds

Estimated Project Cost: $1,472,000.00

Tom Landry Field w/logos: $590,000.00
VMHS Field w/logos: $690,000.00 (larger sq. ft.)
Project Contingency 15%: $192,000.00

RECOMMENDATION

Administration presents Allowance Expenditure Authorization (AEA) #1 for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium – Javier Hinojosa Engineering

EXHIBIT
AEA #1
Rendering

CONTACT PERSONS
Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

ALLOWANCE EXPENDITURE AUTHORIZATION

ENGINEER: JAVIER HINOJOSA ENGINEERING

Project: Mission C.I.S.D. Synthetic Turf Replacments at Tom Landry Stadium and Veterans Memorial High School

Authorization No. 1

Project Number: CSP #500-23-2

Date: 12-13-2022

To: Hellas Construction, Inc.
Attn: Aldo Ferrino, Turf Project Manager
12000 West Parmer Lane
Cedar Park, Texas 78613

You are authorized to perform the following item(s) of work and to adjust the allowance sum accordingly, as indicated below. This is not a **change** order and does not increase nor decrease the contract amount.

Description of Work - Construction Cost Request #1

This Allowance Expenditure Authorization is for the labor and materials necessary for the installation of Agility latters and circles at Veterans Memorial High School. Price Includes materials, labor, per diem and equipment as follows:

1. Agility latters and circles at Veterans Memorial High School (10 agility latters and 5 circles)	$	9,000.00
Total:	$	9,000.00

Owner's Contingency Allowance:

1. Original Owner's Contingency Allowance Budget	$	100,000.00
2. Prior Owner's Contingency Allowance Expenditures		0.00
3. Owner's Contingency Allowance Balance Prior To This Authorization	$	100,000.00
4. Owner's Contingency Allowance Will be **Decreased** By this Authorization	$	9,000.00
5. New Project Contingency Balance As Of This Authorization	$	91,000.00

Signature	Javier Hinojosa, P.E. **Javier Hinojosa Engineering**	12/13/22 **Date**
Signature	Aldo Ferrino, Turf Project Manager **Hellas Construction, Inc.**	12/13/22 **Date**
Carol G. Perez (Dec 14, 2022 12:03 CST) **Owner Signature**	By: Carolina "Carol" G. Perez, Ed. D., Superintendent of Schools **Mission C.I.S.D.**	**Date**

Reviewed and Approved by Mission CISD

Ricardo Rivera (Dec 14, 2022 08:53 CST)
Ricardo Rivera
Assistant Superintendent for Operations

Joel Garcia (Dec 14, 2022 09:15 CST)
Joel Garcia, CPM
Assistant Superintendent for Finance

12/13/2022

MEASUREMENTS & QUANTITIES	
FEATURES/MATERIALS	DETAILS
AREA OF TURF	111,475 SQ. FT.
TURF PERIMETER	1,302 LF



1 COLOR RENDERING
Scale: 1:40

Hellas Construction, Inc.
12000 West Parmer Lane
Austin, TX 78613
(P) (512) 250-2910
(F) (512) 250-1960
hellasconstruction.com

OWNER:
Veterans Memorial High School - Mission CISD
700 E. 2 Mile Road
Mission,Texas 78574
(956) 323-3000

PROJECT:
SYNTHETIC TURF FOOTBALL FIELD

PROJECT LOCATION:
MISSION,TEXAS

matrix H TURF

COLOR RENDERINGS WITHIN THIS TURF SUBMITTAL REPRESENT TURF SCOPE ONLY. IF SHOWN, TRACK LAYOUT, TRACK COLORS AND AERIAL IMAGE ARE DEPICTED FOR GENERAL OVERVIEW.

10

COMMENTS:
Drawing scale accurate ONLY when printed on 11x17 paper.

DRAWN BY: BMR

All drawings and written material appearing herein constitute original unpublished work, and may not be duplicated, used or disclosed without the written consent of Hellas Construction, Inc.

DATE:
NOVEMBER 22, 2022

REVISION:
1.2

SHEET TITLE:
COLOR RENDERING

SHEET NUMBER:
6 OF 6

SCALE: 1:40
0 20 40 60

SUBJECT: Substantial Completion for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium – Javier Hinojosa Engineering

PRESENTER: Rick Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

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As presented at the Board Workshop a decision will need to be made on the center logo to be used at Tom Landry Stadium before the final design can be completed and advertisements can be made. At the Board, meeting Administration presented that Mission CISD has permission from the Hall of Fame to continue using the current midfield logo.

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
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Company Name	Base Bid for MHS	Base Bid for VMHS	Days
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Note: Each project has a $50,000.00 betterment fund allowance included in the base proposal

At the Special Board of Trustees meeting held on November 02, 2022, the Board approved the rankings and to enter into negotiations in the order of ranking for the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium.

A virtual project negotiations meeting was held on November 03, 2022, with Mr. Saulo Hernandez and Mr. Ben Millet from Hellas Construction, Mr. Adrian Hernandez, and Mr. Ricardo Rivera from MCISD.

Hellas Construction had Tuesday, November 08, 2022, 12:00 p.m. deadline to submit its

best and final offer (BAFO).

The Board of Trustees had the option to accept this BAFO or decline the offer, direct Administration to continue negotiations with the contractor, or to reject all offers, and re-advertise the project using the same specifications and design or direct the engineer to re-design the project.

If approved, Administration will work with our legal counsel to write and execute the contract so that the contractor can begin as soon as possible.

At the Regular Board of Trustees meeting held on November 09, 2022, the Board approved the Best and Final Offer (BAFO)

Tom Landry Stadium - $736,520.00 with 50 Construction Days
Contingency Amount $50,000.00

Veterans Memorial High School Stadium - $1,568,488.00 with 50 Construction Days
Contingency Amount $50,000.00

Notice to Proceed (NTP) was issued on December 05, 2022
Substantial Completion due on January 30, 2023
Final Completion due on March 01, 2023

Pending:
Allowance Expenditure Authorization (AEA) #1 for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium.

Contingency Amount for VMHS:	$50,000.00
(AEA) #1 Agility ladders & circles:	$ 9,000.00
Balance:	$41,000.00

ADMINISTRATIVE CONSIDERATIONS – IF APPLICABLE AT THIS TIME
As per the project site review with Administration, Javier Hinojosa Engineering, and Hellas Construction the replacement of the synthetic turf at both stadiums was reviewed, inspected, and determined to be substantially completed as per contract documents and specifications. Thus, they present Substantial Completion of the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium.

Note: Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

FUNDING SOURCE
General Funds

Estimated Project Cost: $1,472,000.00

Tom Landry Field w/logos: $590,000.00
VMHS Field w/logos: $690,000.00 (larger sq. ft.)

Project Contingency 15%: $192,000.00

RECOMMENDATION – IF APPLICABLE

Administration presents Substantial Completion for the Replacement of the Synthetic Turf for the Tom Landry Stadium and the Veterans Memorial High School Stadium – Javier Hinojosa Engineering

EXHIBIT

Substantial Completion Form - pending

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

SUBJECT: Allowance Expenditure Authorization (AEA) #1 for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The Athletics Department, R. Cantu Jr. High, and K. White Jr. High are to purchase a scoreboard at the football/soccer fields. Electrical and technology circuits are not required as per Ms. Ibarra, Athletic Director. On-site is electrical power available and uses wireless wi-fi. The Purchasing department is assisting with the procurement. Due to the type of installation and concerns about wind-load structural engineering is required.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects. However, at the November 10, 2021, Board of Trustees meeting, the Board approved Job Order Contracting (JOC) and this method may be used for this smaller project.

Administration will use the on-call professional services agreement for project administration. It will be the responsibility of the design/engineer professional to provide an estimated project budget. When provided, Administration will advise the Board of Trustees as an informational update.

At the Regular Board of Trustees Meeting held on September 8, 2021, the Board approved the project, and proposed budget, and utilized the on-call professional services for the scoreboard installation at K. White Jr. High and R. Cantu Jr. High project. - Chanin Structural Engineering estimated project cost is $30,000.00 for each campus.

At the Regular Board of Trustees Meeting held on December 15, 2021, the Board approved Schematic Design for the K. White Jr. High and R. Cantu Jr. High Scoreboard Project – Chanin Engineering

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
Communicating the design intent through further refinement of the written and graphic representation of all building materials, components, and equipment that can be quantified and useful to contractors.

At the Regular Board of Trustees Meeting held on January 19, 2022, the Board approved Final Design for the K. White Jr. High and R. Cantu Jr. High Scoreboard Project – Chanin Engineering. Designs have been reviewed and approved by staff.

At the Regular Board of Trustees Meeting held on June 08, 2022, the Board approved a change of procurement method for the various projects to utilize JOC.

At the Board Workshop of September 07, 2022, the Board has been informed of the Best and Final Offer (BAFO) for the Job Ordering Contracting on Various Projects.

Project	Vendor Name	Cost
Scoreboard installation at RCJH & KWJH	8/A Builders, LLC	$86,100.00

(K. White Jr. High $40,950.00 R. Cantu Jr. High $45,150.00)

Notice to Proceed was effective October 14, 2022, with 98 contract days. Substantial Completion will be on January 20, 2023.

ADMINISTRATIVE CONSIDERATIONS

As per Chanin Engineering, and 8/A Builders, LLC, the scoreboard at KWJH needed to be rewired with an electrical cable due to a faulty junction box. Thus, they present Allowance Expenditure Authorization (AEA) #1 for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

Contingency amount for KWJH:	$2,500.00
AEA#1 rewire electrical:	$2,149.26 (pending)
Balance:	$350.74

FUNDING SOURCE

Local Funds

Est. Project Budget per School:	$30,000.00
Project Contingency 20%:	$ 6,000.00
Est. Professional Service 15%:	$ 4,500.00
Est. Total Project Cost:	$40,500.00 per school

RECOMMENDATION

Administration presents Allowance Expenditure Authorization (AEA) #1 for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

EXHIBIT:

AEA#1

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT

DATE: 01/11/23

SCOREBOARD INSTALLATIONS AT K.WHITE JHS AND R. CANTU JHS
ALLOWANCE EXPENDITURE AUTHORIZATION #1

Description:

Furnish the necessary materials for the Electrical Cable current - rewiring due to the faulty electrical Junction Box located at K. White JHS.

K. WHITE JHS CONTINGENCY:

The contract has changed as follows:	$2,149.26
Scope of work (Refer to attached CR-1) shall be funded	
through the Owner's K. White Contingency allowance of $2,500.00 Upon approval, the remaining	18
Total K. White Contingency Allowance amount shall be $350.74	
TOTAL:	$2,149.26

R. CANTU JHS CONTINGENCY: N/A

The contract has changed as follows:	$0.00
Scope of work (Refer to attached CR-1) shall be funded	
through the Owner's R. Cantu Contingency allowance of $2,500.00 Upon approval, the remaining	
Total R. Cantu Contingency Allowance amount shall be $2,500.00	
TOTAL:	$0.00

NOT VALID UNTIL SIGNED BY THE ENGINEER, CONTRACTOR AND OWNER.

Chanin Engineering, LLC ENGINEER (Firm name)	8/A Builders, LLC CONTRACTOR (Firm name)	**Mission CISD** OWNER (Firm name)
400 Nolana Suite H2 McAllen, TX 78504 ADDRESS	7706 W. Expressway 83 Mission, TX 78572 ADDRESS	1201 Bryce Drive Mission, Texas 78572 ADDRESS
BY (Signature)	BY (Signature)	BY (Signature)
Miguel Chanin,PE, Principal-in-Charge (Typed name)	Arnoldo Ochoa, President (Typed name)	(Typed name)
01/12/2023 DATE	01/12/2023 DATE	DATE

dealers electrical supply

DEALERS BR 38MA MCALLEN
1401 EAST UPAS AVE.
MCALLEN, TX 78501-5546
Phone 956-630-2233
Fax

EXPIRATION DATE	
02/06/2023	S100472155
DEALERS BR 38MA MCALLEN 1401 EAST UPAS AVE. MCALLEN, TX 78501-5546 Phone 956-630-2233 Fax	PAGE NO. 1 of 1

SHIP TO:

JAIMES ELECTRIC
3009 N MOOREFIELD RD
MISSION, TX 78574

JAIMES ELECTRIC
3009 N MOOREFIELD RD
MISSION, TX 78574

CUSTOMER NUMBER	CUSTOMER PO NUMBER	JOB NAME / RELEASE NUMBER	SALESPERSON
19985	K WHITE		HOUSE ACCOUNT

WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
38MA		VENDOR 10TH PROX	01/06/2023	No

ORDER QTY	DESCRIPTION	UNIT PRICE	EXT PRICE
1440ft	THHN-4-BLACK-STRANDED Cuts: 1 @ 1440 ft	1462.530/m	2106.04
6ea	SUPERFLEX 125 1.25 IN SUPERFLX	241.107/e	12.66
2ea	SUPERFLX 125STGN 1.25N STRGHTC	1097.740/e	21.95
2ea	PVC 1-1/4 FEMALE ADPT	113.100/e	2.26
1ea	SQD PK7GTA GRNDG BAR KIT	6.947/ea	6.95

Subtotal	2149.26
S&H Charges	0.00
Amount Due	2149.26

19

Printed By: JBARBO on 1/6/2023 4:38:31 PM CST

SUBJECT: Substantial Completion for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The Athletics Department, R. Cantu Jr. High, and K. White Jr. High are to purchase a scoreboard at the football/soccer fields. Electrical and technology circuits are not required as per Ms. Ibarra, Athletic Director. On-site is electrical power available and uses wireless wi-fi. The Purchasing department is assisting with the procurement. Due to the type of installation and concerns about wind-load structural engineering is required.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects. However, at the November 10, 2021, Board of Trustees meeting, the Board approved Job Order Contracting (JOC) and this method may be used for this smaller project.

Administration will use the on-call professional services agreement for project administration. It will be the responsibility of the design/engineer professional to provide an estimated project budget. When provided, Administration will advise the Board of Trustees as an informational update.

At the Regular Board of Trustees Meeting held on September 8, 2021, the Board approved the project, and proposed budget, and utilized the on-call professional services for the scoreboard installation at K. White Jr. High and R. Cantu Jr. High project. - Chanin Structural Engineering estimated project cost is $30,000.00 for each campus.

At the Regular Board of Trustees Meeting held on December 15, 2021, the Board approved Schematic Design for the K. White Jr. High and R. Cantu Jr. High Scoreboard Project – Chanin Engineering

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
Communicating the design intent through further refinement of the written and graphic representation of all building materials, components, and equipment that can be quantified and useful to contractors.

At the Regular Board of Trustees Meeting held on January 19, 2022, the Board approved Final Design for the K. White Jr. High and R. Cantu Jr. High Scoreboard Project – Chanin Engineering. Designs have been reviewed and approved by staff.

At the Regular Board of Trustees Meeting held on June 08, 2022, the Board approved a change of procurement method for the various projects to utilize JOC.

At the Board Workshop of September 07, 2022, the Board has been informed of the Best and Final Offer (BAFO) for the Job Ordering Contracting on Various Projects.

Project	Vendor Name	Cost
Scoreboard installation at RCJH & KWJH	8/A Builders, LLC	$86,100.00
(K. White Jr. High $40,950.00 R. Cantu Jr. High $45,150.00)		

Notice to Proceed was effective October 14, 2022, with 98 contract days. Substantial Completion will be on January 20, 2023.

Pending:
Allowance Expenditure Authorization (AEA) #1 for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

Contingency amount for KWJH:	$2,500.00
AEA#1 rewire electrical:	$2,149.26 (pending)
Balance:	$350.74

ADMINISTRATIVE CONSIDERATIONS
As per the project site review with Administration, Chanin Engineering, and 8/A Builders, LLC, the scoreboards at RCJH and KWJH were reviewed, inspected, and determined to be substantially completed as per contract documents and specifications. Thus, they present substantial completion for the Scoreboards at R. Cantu Jr. High & K. White Jr. High.

Note: Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. Review and trainings were conducted with Athletic Director Ibarra and campus coaches and controllers were issued to each.

FUNDING SOURCE
Local Funds

Est. Project Budget per School:	$30,000.00
Project Contingency 20%:	$ 6,000.00
Est. Professional Service 15%:	$ 4,500.00
Est. Total Project Cost:	$40,500.00 per school

RECOMMENDATION
Administration presents Substantial Completion for the Scoreboards at R. Cantu Jr. High & K. White Jr. High – Chanin Structural Engineering

EXHIBIT:
Substantial Completion Form (to be presented at the meeting)

CONTACT PERSONS
Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

SUBJECT: Change Order #2 for Delay Days for the Child Nutrition Program (CNP) Freezer Installation at Elementary Campuses - Chanin Engineering

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The Child Nutrition Program (CNP) is in needs to add three stand-alone walk-in freezers at Bryan Elementary, Marcell Elementary, and Salinas Elementary near the campus cafeteria area. The three walk-in freezers are required to be placed/installed on concrete slabs and electrical work is required for the connection.

An on-call structural engineer will be the prime engineer and may require an electrical, mechanical, and plumbing engineer (MEP) as a consultant. Professional services are needed to oversee the project due to design weight and electrical connection requirements.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects. However, at the November 10, 2021, Board of Trustees meeting, the Board approved Job Order Contracting (JOC) and this method may be used for this smaller project.

Administration used the on-call professional services agreement for the project assessment. Chanin Structural Engineering's estimated project cost is $90,000.00.

At the Regular Board of Trustees, Meeting held on August 11, 2021, the Board approved of Utilizing the On-call Professional Services for the Child Nutrition Program Walk-in Freezer at Bryan, Salinas & Marcell Elementary Project – Chanin Structural Engineering.

At the Regular Board of Trustees Meeting held on December 15, 2021, the Board approved Schematic Design for the Child Nutrition Program Walk-in Freezers for Bryan, Marcell, and Salinas Elementary Project – Chanin Engineering.

At the Regular Board of Trustees Meeting held on January 19, 2022, the Board approved Final Design for the Child Nutrition Program Walk-in Freezers for Bryan, Marcell, and Salinas Elementary Project – Chanin Engineering. Designs have been reviewed and approved by staff.

At the Regular Board of Trustees Meeting held on June 08, 2022, the Board approved a change of procurement method for the various projects to utilize JOC.

At the Board Workshop of September 07, 2022, the Board was informed of the Best and Final Offer (BAFO) for the Job Ordering Contracting on Various Projects.
56 days for completion.

Project	Vendor Name	Cost
CNP Freezer Installation at Elem.	8/A Builders, LLC	$100,485.00

Notice to Proceed (NTP) was issued on October 19, 2022
Substantial Completion due on December 14, 2022
Final Completion due on January 14, 2023

At the Regular Board of Trustees Meeting held on November 30, 2022, the Board approved Change Order #1 for forty-nine (49) additional delay days for the Child Nutrition Program (CNP) Freezer Installation at Elementary Campuses. If approved the new substantial completion date will be February 01, 2023.

ADMINISTRATIVE CONSIDERATIONS

Chanin Engineering and 8/A Builders state that there are delays in shipment for the three (3) stand-alone freezers, thus, they will be submitting Change Order #2 for eighty-nine (89) additional delay days for the Child Nutrition Program (CNP) Freezer Installation at Elementary Campuses. If approved the new substantial completion date will be May 01, 2023.

FUNDING SOURCE

Federal Funds/Local Funds

Est. Project Budget:	$90,000.00
Project Contingency 20%:	$18,000.00
Est. Professional Services 12%:	$10,800.00
Est. Total Project Cost:	$118,800.00

RECOMMENDATION

Administration presents Change Order #2 for Delay Days for the Child Nutrition Program (CNP) Freezer Installation at Elementary Campuses - Chanin Engineering

EXHIBIT:

Change Order #2

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

CONSTRUCTION CHANGE ORDER

PROJECT:	Bryan, Marcell, and Salinas New Stand Alone Freezers	CHANGE ORDER NUMBER: DATE: ENGINEER'S PROJECT NO.:	2 1/10/23 21-184	OWNER ■ ENGINEER ■ CONTRACTOR ■
TO CONTRACTOR: 8/A Builders, LLC 7706 W. Exp. 83, Mission, TX 78572		CONTRACT DATED: CONTRACT FOR: SUBSTANTIAL COMPLETION	9/21/22 8A-004 2/1/23	FIELD □ PROJECT MANAGER ■

You are hereby directed to make the following change(s) in this Contract:

(Describe briefly any proposed changes or list any attached information in the alternative)

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum is as follows:

A. Request for extension of time in construction.

(89) additional calendar days will be added to the contract for the pending shipment of (3) three stand-alone freezers that are to be provided by the Owner and installation by the Contractor.

Total amount to be deducted from contingency	
Owner's Contingency Allowance	$ 5,000.00
Remaining Contingency Amount	$ 5,000.00
The original Contract Sum was	$ 100,485.00
The net change by previously authorized Change Orders	
The Contract Sum prior to this Change Order was	$ 100,485.00
The Contract Sum will be increased by this Change Order in the amount of	$ -
The new Contract Sum including this Change Order, will be	$ 100,485.00
The Contract Time will be changed by an additional	89 days
New substantial completion date	May 1, 2023

When signed by the Owner and Engineer and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Order (CCO), and the Contractor shall proceed with the change(s) described above.

Contractor signature indicates agreement with the proposed adjustments in Contract Sum and Contractor Time set forth in this CCO.

Chanin Engineering, LLC	8/A Builders, LLC	Mission CISD
ENGINEER *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
400 Nolana Ste H2, McAllen, TX 78504	7706 W. Exp. 83, Mission, TX 78572	
Address	Address	Address
BY *(Signature)*	BY *(Signature)*	BY *(Signature)*
Miguel Chanin,PE-Principal in Charge	Arnoldo Ochoa, President	
Typed name	*Typed name*	*Typed name*
01/12/2023	01/12/2023	
DATE	DATE	DATE

Amanda Pena <amanda@chaninengineering.com>

MCISD-Stand Alone Freezers

Elizabeth Barron <ElizabethB@missionrs.com> Thu, Jan 5, 2023 at 1:56 PM
To: "Hernandez, Adrian" <adrian.hernandez@mcisd.org>
Cc: Larry Cantu <LarryC@missionrs.com>, "Woodrum, Maria D" <rwoodrum@mcisd.org>, "Garcia, Joel" <joel.garcia@mcisd.org>, "Ortiz, Linda C" <Lcorte30@mcisd.org>, "Rivera, Ricardo" <rriver49@mcisd.org>, "Gandaria, Nelda" <Ngandari@mcisd.org>, Amanda Pena <amanda@chaninengineering.com>, Cristian Guajardo <cristian@chaninengineering.com>

Good afternoon,

We have received confirmation that these units will ship out 3/10/23. Thank you.

Liz Barron | Project Manager
Mission Restaurant Supply
3422 N. 10th St., McAllen, TX 78501
Phone: 956-467-1295 | **Fax:** 956-467-1294
Mobile: 210-859-5122 www.MissionRS.com | **Email:**elizabethb@missionrs.com

> On Jan 5, 2023, at 1:04 PM, Hernandez, Adrian <adrian.hernandez@mcisd.org> wrote:
>
> **[EXTERNAL EMAIL] Please note that this email is from an external source. Exercise caution regarding links and attachments.**
> [Quoted text hidden]

SUBJECT: Change Order #02 for Delay Days for the Child Nutrition Program (CNP) Freezer – DBR Engineering

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

Child Nutrition Program is needing to repair the existing refrigeration system that feeds the bulk storage freezer with a newer system that can add additional capacity. An assessment was done back on December 18, 2019, by DBR Engineering. DBR Engineering assessed that the refrigeration circuits are separate, they are connected to a single condensing unit. The current unit has a circuit that is not operational. It is the desire of the Child Nutrition Program (CNP) to replace the system with a new system that utilizes one refrigeration condensing unit with a matching evaporator, this allows for greater reliability to the system and an increased capacity for the system for future growth.

The administration will use competitive sealed proposals (CSPs) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects.

At the Regular Board meeting held on August 11, 2021, the board approved Utilizing the On-call Professional Services for the Child Nutrition Program Freezer Project – DBR MEP Engineering with an estimated project cost is $100,000.00.

At the Regular Board meeting held on November 10, 2021, the Board approved the Schematic Design for the Child Nutrition Program (CNP) Freezer Project. Designs have been reviewed, approved, and signed off by CNP Director Ms. Rosie Woodrum and CNP Staff.

The first advertisements in the local newspapers were posted on December 08, 2021, and December 15, 2021. The proposal bid opening was January 04, 2022, no bidders submitted a proposal. Advertisements were extended for two more weeks, and one bid was submitted but was placed on hold by Administration due to more information being needed from the professional design team at DBR Engineering on this project. On Feb. 11, 2022, Administration then posted on Buy Board to see if any vendors wanted to submit a bid. After posting on Buy Board for several weeks on Feb. 25, 2022, no bidders were received from Buy Board.

The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. Pre-ranking was done on the sole proposal earlier submitted and after the review Administration will then present the recommended firm to be reviewed and ranked in order of selection. The recommendation will then be presented for approval at the next sequential Board of Trustees meeting and the Administration will then enter into negotiations in the order of selection.

Administrations pre-ranking was conducted on Friday, April 29, 2022, by Ms. Dora Garcia, Ms. Daisy Cuevas, Mr. Adan Rivera, Mr. Adrian Hernandez, and Mr. Martin Castaneda.

At the Regular Board of Trustees Meeting held on May 11, 2022, the Board approved the Rankings and to Enter Into Negotiations in the Order of Ranking for the Child Nutrition Program (CNP) Freezer Replacement Project.

Company Name	Base Bid	Days
Aircool Tech. - ACT Corp.	$254,870.00	120

Since the approval of May 11, 2022, to enter into negotiations with Aircool Tech., we have requested Aircool Tech. to provide us a date and time so that we could enter into negotiations for the best and final offer so that we may be able to request approval.

On Wednesday, May 25, 2022, a virtual meeting was held with Ms. Maria Woodrum and Mr. Robert Meave from CNP, Mr. Joel Garcia, Mr. Adan Rivera, Mr. Adrian Hernandez from MCISD, and Mr. Samuel Cantu from Aircool Tech.. Mr. Cantu expressed that he was continuing to work with his subcontractors on his proposal.

On May 27, 2022, Air Cool Tech submitted two BAFO offers:

Option #1: Original proposal of $254,870.00 excluding the Johnson Controls (JCI) BAC System for system monitoring and advanced temperature controls and required concrete slabs – these were on the original bidding package.

Option #2: Proposal of $289,860.00 which will not include JCI Controls but include InteleGen Refrigeration Controller. This technique will give us alerts and monitor equipment such as temps, sensors, pressures, and many other functions that you're able to control/view online (all we would need on your end would be an IP Address) and with no concrete slabs.

Option #3: Submitted on June 02, 2022 – Proposal of $340,185.00 as per original plans and specifications to include JCI controls and concrete slabs.

Difference of $85,315.00
Concrete Slabs: $8,750.00
JCI Controls: $76,565.00

As per consultation with DBR MEP Engineering, Ms. Rosie Woodrum, and Mr. Joel Garcia, Administration recommends Option #1.

At the Regular Board of Trustees Meeting held on June 08, 2022, the Board approved the Best and Final Offer (BAFO) from Aircool Tech. of $254,870.00 with 120 days. Notice to Proceed was issued on August 02, 2022 with a Substantial Completion date of November 30, 2022.

At the Regular Board of Trustees Meeting held on October 12, 2022, the Board approved Change Order #1 for Seventy-nine (79) additional delay days. The new substantial completion date will be February 17, 2023.

ADMINISTRATIVE CONSIDERATIONS

As per DBR Engineer and Aircool Tech. there are delays from the supplier for the new electrical gear, thus, they will be submitting Change Order #2 for Twenty-six (26) additional delay days. If approved the new substantial completion date will be March 15, 2023.

FUNDING SOURCE

General Fund

Est. Project Budget:	$100,000.00
Project Contingency 20%:	$ 20,000.00
Est. Professional Services 12%:	$ 12,000.00
Est. Total Project Cost:	$132,000.00

RECOMMENDATION

Administration presents Change Order #02 for Delay Days for the Child Nutrition Program (CNP) Freezer Replacement Project – DBR Engineering

EXHIBIT:

Change Order #02

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

AIA® Document G701™ – 2017

Change Order

PROJECT: *(Name and address)*
Mission CISD - Child Nutrition Program - Freezer Replacement
Mission, Texas

OWNER: *(Name and address)*
Mission Consolidated Independent School District
1201 Bryce Dr.
Mission, Texas 78572

CONTRACT INFORMATION:
Contract For: General Construction

Date: August 2, 2022

ARCHITECT: *(Name and address)*
DBR Enginering, Inc.
200 S. 10th St
McAllen, Texas 78501

CHANGE ORDER INFORMATION:
Change Order Number: 002

Date: January 5, 2023

CONTRACTOR: *(Name and address)*
Aircool Tech
1432 N. Alamo Rd
Alamo, Tx 8516

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)
Due to extended delivery of electrical gear, the contractor is asking for an additional 26 days from the previous time extention. This allows the contractor to receive, install and train the District on the new electrical gear. Refer to attached request and supplier information on estimated delivery date.

The original Contract Sum was	$	254,870.00
The net change by previously authorized Change Orders	$	0.00
The Contract Sum prior to this Change Order was	$	254,870.00
The Contract Sum will be increased by this Change Order in the amount of	$	0.00
The new Contract Sum including this Change Order will be	$	254,870.00

The Contract Time will be increased by Seventy Nine (26) days.
The new date of Substantial Completion will be 3/15/2023

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

DBR Engineering Consultants	Aircool Tech	Mission Consolidated Independent School District
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
SIGNATURE	**SIGNATURE**	**SIGNATURE**
Hugo H. Avila	Samuel Cantu	
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**	**PRINTED NAME AND TITLE**
January 5, 2023	January 5, 2023	
DATE	**DATE**	**DATE**

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User Notes:
(3B9ADA3C)

Change Order# 002



Change Order Form

Lic.#TACLA26381C
1432 N. Rudy Villarreal Rd
Alamo, TX 78516
Off Ph:(956)702-8700
Alt Ph:(956)827-1731
Fax:(956)702-8704
email: service@aircooltechcorp.com
Regulated by The Texas Department of Licensing and Regulation
P.O. Box 12157 • Austin, Texas 78711 • 1-800-803-9202

Date: January 5, 2023

Owner: Mission CISD
Attn:
1201 Bryce Dr.
Mission, TX 78572

Original Contract Date: June 9, 2022

Project Name / Number: MCISD Child Nutrition Program Freezer Replacement – Re-Extension of Substantial Completion

Change the work to be performed under the original contract as follows: To Re-Extend Substantial Completion date from 02/17/2023 to 3/15/2023, Re-Extending it an additional of 26 days prior to CO#1 substantial date. Re-Extension is due to the fact that we will be receiving the Electrical guts that go inside the Electrical Panel on 01/18/2023 (date given by Supplier). We are needing the extension time to be sure we will receive all Electrical parts on time, we would not like to rely on date given from supplier/vendor as Factories have been giving us potential Shipping Delays.

Acceptance of Change Order: Signature_____

Date of Acceptance: _____

Change Order Respectfully Submitted by: Samuel Cantu

SE Order Ref No.44711316

Line #	002	**PO Number**	p000029404
Catalogue #	I-Line ML Panel (INTERIOR)	**SE Order Ref No.**	44711316
Product #			

Actual Ship Date	Shipment #	Qty Shipped/Canc Qty/Unfilled Qty	Shipping Location	Carrier	Routing	Estimated Delivery Date	Estimated Delivery Date	Not Before Date	Status/Link to Tracking Site	P
	01	Qty Shipped 0 Cancelled Qty 0 Unfilled Qty 1	EL PASO PLANT	STANDARD	STANDARD	Jan 18, 2023		Jan 1, 1901		31

Drawings | Engineering | Assembly | Ready To Ship | Shipped

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SUBJECT: Final Design for the Indoor Air Quality Projects for Cavazos, Midkiff, and Salinas Elementary – DBR MEP Engineering

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

Mission CISD prioritizes the safety and health of its students, staff, and community and ensures that all safety and health measures are addressed as a priority including air quality. School indoor air quality is particularly important as it may affect the health, performance, and comfort of school staff and students. The MCISD Five (5) Year Improvement Plan consists of facilities improvements district-wide that include improvements for drainage, roof replacements, lighting improvements, and replacement of HVAC systems. The plan shows that due to the campuses' age, certain items need to be assessed such as air handlers, blowers, and control systems.

Due to laws and requirements that regulate such equipment and the cost, this project is being considered a construction project, and as such the Texas Education Code 44.031 (a) requires the board of a school district considering a construction project to comply with bidding requirements.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects.

At the Regular Board of Trustees, Meeting held on September 8, 2021, the Board approved the project, and proposed budget, and utilized the on-call professional services. The administration approved the on-call professional services agreement for the project assessment. DBR MEP Engineering estimated project cost is $33,000,000.00 for all district projects.

Administration will use the on-call professional services agreement for project administration. It will be the responsibility of the design/engineer professional to provide an estimated project budget. When provided, Administration will advise the Board of Trustees as an informational update.

ADMINISTRATIVE CONSIDERATIONS

DBR Engineering has continued to meet with MCISD Staff on the designs. DBR Engineering presents the Final Design for the Indoor Air Quality Projects for Cavazos, Midkiff, and Salinas Elementary – DBR MEP Engineering

Note: Most campuses are scheduled for air quality projects with some more complicated and intensive than others. These three can be worked on quicker than others and we will begin. We continue to be in the design phase and those will be presented as completed by DBR MEP Engineering.

Salinas Elementary School (Est. Cost $2,775,000.00)

The project scope consists of replacing the aging 27-year-old HVAC systems. This work includes air handlers, VAV boxes, air-cooled chillers, and associated pumps. The design increased air quality by providing air handlers with higher MERV filter rating capabilities and replacing the existing HVAC control system. In addition, the

project includes converting the heating from hot water to electric heat to reduce maintenance upkeep.

Hurla M. Midkiff Elementary School (Est. Cost $2,325,000.00)
The project scope consists of replacing the aging 21-year-old HVAC systems. This work includes outside air units, VAV boxes, and air handlers. The design increased air quality by replacing the nonfunctioning outside air units, providing air handlers with higher MERV filter rating capabilities, and replacing the existing HVAC control system.

Raquel Cavazos Elementary (Est. Cost $2,325,000.00)
The project scope consists of replacing the aging 21-year-old HVAC systems. This work includes outside air units, VAV boxes, and air handlers. The design increased air quality by replacing the nonfunctioning outside air units, providing air handlers with higher MERV filter rating capabilities, and replacing the existing HVAC control system.

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
Communicating the design intent through further refinement of the written and graphic representation of all building materials, components, and equipment that can be quantified and useful to contractors.

FUNDING SOURCE – ESSER FUNDS

Local Fund

Est. Project Budget:	$29,000,000.00
Project Contingency 20%:	$ 5,800,000.00
Est. Professional Services 12%:	$ 3,480,000.00
Est. Total Project Cost:	$38,280,000.00

RECOMMENDATION

Administration is presenting the Final Design for the Indoor Air Quality Projects for Cavazos, Midkiff, and Salinas Elementary – DBR MEP Engineering

EXHIBIT

Final Designs

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - CAVAZOS ELEMENTARY SCHOOL - INDOOR AIR QUALITY IMPROVEMENTS

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Iris Iglesias	Secretary
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Jerry Zamora	Member
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PROJECT TEAM

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LOCATION



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SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
G0.01	COVER SHEET
M0.01	MECHANICAL SYMBOL
MD2.11	DEMO COMPOSITE MECHANICAL DEMO PLAN
MD2.12	DEMO MECHANICAL PLAN - AREA A
MD2.13	DEMO MECHANICAL PLAN - AREA B
MD2.14	DEMO MECHANICAL PLAN - AREA C
MD3.01	DEMO MECHANICAL ENLARGED PLANS
M2.11	COMPOSITE MECHANICAL PLANS
M2.12	MECHANICAL PLAN - AREA A
M2.13	MECHANICAL PLAN - AREA B
M2.14	MECHANICAL PLAN - AREA C
M3.01	MECHANICAL ENLARGED PLAN
M4.01	MECHANICAL FLOW DIAGRAMS
M5.01	MECHANICAL SCHEDULES
M6.01	MECHANICAL DETAILS
E0.01	ELECTRICAL SYMBOL LEGEND
ED2.11	DEMO COMPOSITE ELECTRICAL PLAN
ED2.12	DEMO ELECTRICAL PLAN - AREA A
ED2.13	DEMO ELECTRICAL PLAN - AREA B
ED2.14	DEMO ELECTRICAL PLAN - AREA C
E2.11	COMPOSITE ELECTRICAL PLAN
E2.12	ELECTRICAL PLAN A
E2.13	ELECTRICAL PLAN B
E2.14	ELECTRICAL PLAN C
E5.01	ELECTRICAL SCHEDULES
E6.01	ELECTRICAL DETIALS

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DBR Project Number 218033.005

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PROJECT NUMBER 218033.005

SHEET TITLE: COVER SHEET

SHEET NUMBER: G0.01

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ABBREVIATIONS

A

A	AIR (COMPRESSED)
ABV	ABOVE
AC	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AV	ACID VENT, AIR VENT
AVG	AVERAGE
AW	ACID WASTE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

B

B	BOILER
BC	BELOW COUNTER
B/C	BACK OF CURB
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BH	BOX HYDRANT
BLDG	BUILDING
BM	BENCHMARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STRUCTURE
BP	BACKFLOW PREVENTER
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BWV	BACK WATER VALVE

C

C	CELSIUS
CAB	CABINET
CB	CATCH BASIN
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CI	CAST IRON
CIRC	CIRCULATING
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE, CONCENTRIC
COND	CONDENSER, CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS,CONTINUATION
CTR	CENTER
CU	COPPER

D

D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DDMB	DUAL DUCT MIXING BOX
DESIG	DESIGNATION
DTL	DETAIL
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EVAP	EVAPORATOR
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EX	EXPLOSION PROOF
EXT	EXTERNAL
EXTG	EXISTING

F

F	FAHRENHEIT, FIRE
FBO	FURNISHED BY OTHERS
FCO	FLOOR CLEAN OUT
FCS	FLOOR CONTROL STATION
FCU	FAN COIL UNIT
FD	FLOOR DRAIN, FIRE DAMPER
FDC	FIRE DEPARTMENT SIAMESE CONNECTION
FDV	FIRE DEPARTMENT VALVE
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FPTU	FAN POWERED TERMINAL UNIT
FT	FOOT, FEET
FUT	FUTURE

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GND	GROUND
GPM	GALLONS PER MINUTE
GV	GATE VALVE

H

HORIZ	HORIZONTAL
HP	HORSEPOWER
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INFRARED HEATER
IN	INCH
INSUL	INSULATION
INT	INTERNAL, INTERIOR
INV	INVERT
IW	INDIRECT WASTE

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
KVA	KILOVOLT- AMPS
KW	KILOWATT

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LVL	LEVEL
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE

M

MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND OF BTU'S
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MP	MEDIUM PRESSURE
MS	MOP SINK
MTD	MOUNTED
MU	MAKE-UP
MVD	MANUAL VOLUME DAMPER
MSAH	MINI-SPLIT AIR HANDLER
MSCU	MINI-SPLIT CONDENSING UNIT

N

N.C.	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OFCU	OUTSIDE AIR FAN COIL UNIT
OPG	OPENING
OS&Y	OPEN STEM AND YOLK

P

PG	PRESSURE GAUGE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILLE
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	REFERENCE, REFER
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAN	SANITARY SEWER
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SD	STORM DRAIN
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SK	SINK
SM	SHEETMETAL
SP	STATIC PRESSURE, SUMP PUMP
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	SERVICE SINK
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT
SW	SOFT WATER

T

TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CORNEAL COMPRESSOR
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TH BLK	THRUST BLOCK
THERM	THERMOMETER
TMV	THERMOSTATIC MIXING VALVE
TP	TRAP PRIMER
TPD	TRAP PRIMER DEVICE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TW	TEMPERED HOT WATER
TYP	TYPICAL

U

U	URINAL
UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V

V	VOLT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VR	VARIABLE AIR VOLUME REHEAT
VTR	VENT THRU ROOF

W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WH	WALL HYDRANT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WWF	WELDED WIRE FABRIC

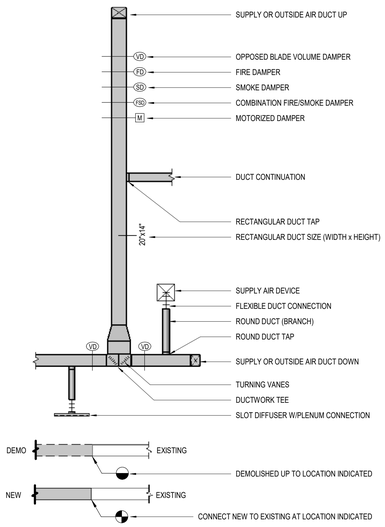
Y

Y	YARD HYDRANT

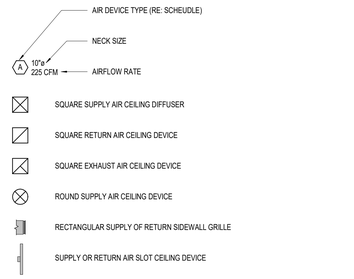
Z

Z	ZONE

DUCTWORK



AIR DEVICE TYPES



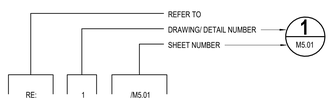
WALL MOUNTED SENSOR TYPES

T	THERMOSTAT
H	HUMIDISTAT
C	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
N	NITROGEN DIOXIDE SENSOR
S	ON/OFF SWITCH

PIPING TYPES

CD	CONDENSATE DRAIN LINE
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
REF	REFRIGERANT PIPING SIZED BY MFR.

DRAWING/DETAIL REFERENCE KEY



MECHANICAL GENERAL NOTES

1. PIPING AND DUCTWORK SHOWN ON PLANS ARE SCHEMATIC ONLY. COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATIONS.
2. EXACT LOCATIONS OF EQUIPMENT, GRILLES, AND DAMPERS SHALL BE FIELD COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS AND ALLOW ADEQUATE CLEARANCES.
3. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER DRAWINGS AND CUTSHEETS BEFORE FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS.
4. SHEET METAL INLET DUCTS TO VAV TERMINAL UNITS SHALL BE SAME SIZE AS THE BOX INLET SIZE. PROVIDE RIGID ROUND DUCT THAT IS ONE SIZE LARGER THAN THE INLET BOX SIZE IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE VAV BOX IS MORE THAN 6'-0".
5. PROVIDE CONICAL SPIN-IN CONNECTOR FOR ALL ROUND DUCT CONNECTIONS TO VAV TERMINAL UNITS.
6. INSTALL EQUIPMENT TO ENSURE ACCESS PANELS ARE NOT BLOCKED. ACCESS FOR SERVICE MUST BE PROVIDED.
7. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS.
8. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS.
9. PROVIDE RECTANGULAR BRANCH DUCT TAP FOR ALL RECTANGULAR DUCT CONNECTIONS TO RECTANGULAR DUCT TRUNKS.
10. ALL DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION.
11. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATION 23 07 13 DUCT INSULATION FOR FURTHER INFORMATION AND ADDITIONAL REQUIREMENTS.
12. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATION 23 31 13 METAL DUCTWORK FOR FURTHER INFORMATION.
13. ALL EXPOSED DUCTWORK AND PIPING WITH ASSOCIATED ACCESSORIES IN AREAS WITH NO CEILING OR PARTIAL CEILING SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR.
14. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO ACTUAL INSTALLATION OF TEMPERATURE SENSORS AND HUMIDITY SENSORS.
15. PROVIDE REMOTE SPIN-IN DAMPER OPERATOR FOR SPIN-IN CONNECTIONS AND VOLUME DAMPERS LOCATED OVER GYPSUM CEILINGS.
16. PROVIDE AIRFOIL TYPE TURNING VANES IN ALL 90 DEGREE ELBOWS.
17. PROVIDE INSULATED ACCESS DOORS FOR DUCTWORK DOWNSTREAM OF AIR HANDLING UNITS AT EVERY 20'-0" TO FACILITATE DUCT CLEANING. PROVIDE ACCESS DOORS WITHIN 5'-0" OF EACH ELBOW.
18. COORDINATE LOCATIONS OF FLOOR AND WALL OPENINGS WITH ARCHITECT AND STRUCTURAL ENGINEER.
19. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE. CONTRACTOR SHALL COORDINATE COLOR WITH ARCHITECT.
20. NO PIPE HANGERS SHALL BE SPACED MORE THAN 10'-0" O.C. COMPLY WITH PIPE SPACING AS SPECIFIED IN THE PIPING SUPPORT SPECIFICATIONS.
21. ALL PIPING LOCATED INSIDE BUILDING SHALL BE SUPPORTED FROM THE STRUCTURE WITH SADDLE OR TRAPEZE HANGERS WITH ADJUSTABLE CLEVIS OR THREADED RODS.
22. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL OUTSIDE AIR INTAKES TO MAINTAIN 15 FEET DISTANCE BETWEEN OUTSIDE AIR INTAKES AND ANY EXHAUST AIR OUTLET, FLUES OR PLUMBING VENTS.
23. MECHANICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR ALL CONDENSATE DRAIN PIPES CONNECTING TO A SINK DRAIN TAIL PIECE.
24. ALL KITCHEN GREASE EXHAUST DUCTWORK SHALL BE CONTINUOUSLY WELDED 16 GA. CARBON STEEL. ALL GREASE EXHAUST DUCTS SHALL BE WRAPPED WITH 3M 2 HR. FIRE RATED WRAP OR INSTALLED WITHIN A FIRE RATED ENCLOSURE.

CONTROLS SCHEMATIC SYMBOLS LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL/BINARY INPUT
DO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATNG COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

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TBPE Firm Registration No. 2234

DATE: 01/05/2023

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PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL SYMBOL LEGEND

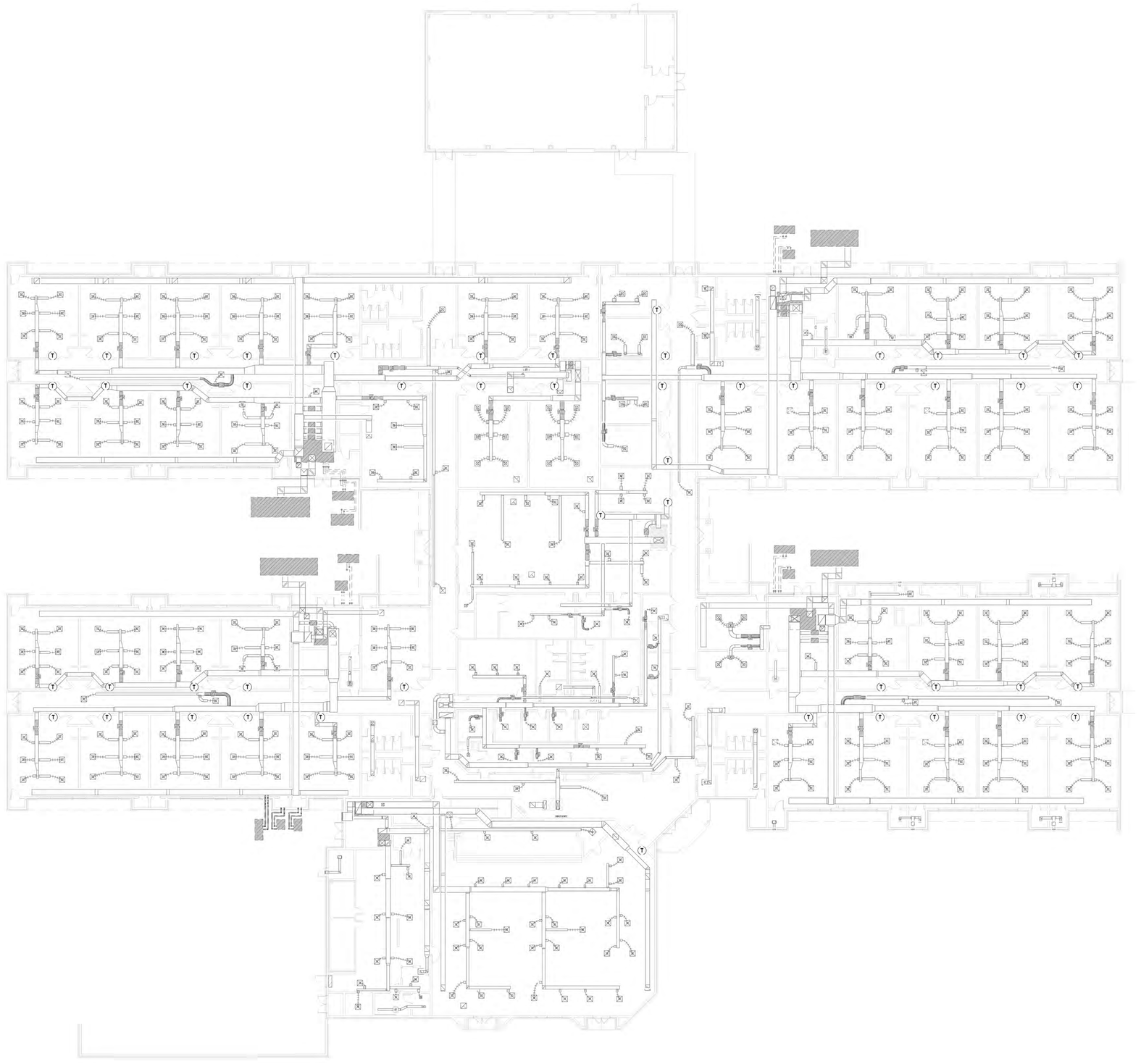
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1 MD2.11 **DEMO COMPOSITE MECHANICAL PLAN**
1/16" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL DEMO KEYED NOTES

1 DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.

2 DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.

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No.	DATE	DESCRIPTION

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PROFESSIONAL ENGINEER
01/05/2023

MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMNTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: DEMO COMPOSITE MECHANICAL PLAN

SHEET NUMBER: MD2.11

DBR
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f
TBPE Firm Registration No. 2234

DBR Project Number 218033.005

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MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

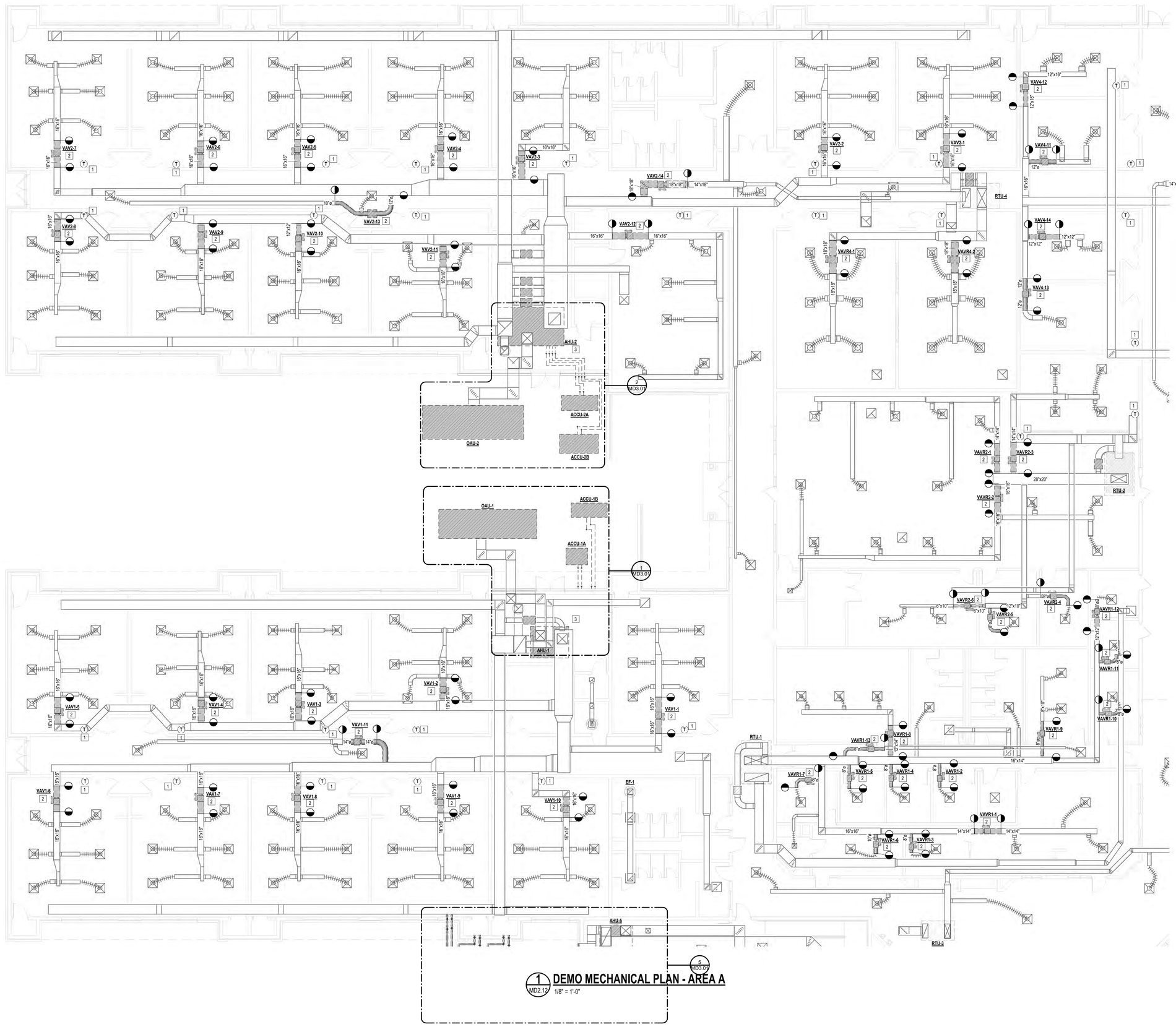
B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL DEMO KEYED NOTES

1. DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.
2. DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.



1 MD2.12 **DEMO MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

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01/05/2023

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SHEET TITLE: DEMO MECHANICAL PLAN - AREA A

SHEET NUMBER: MD2.12

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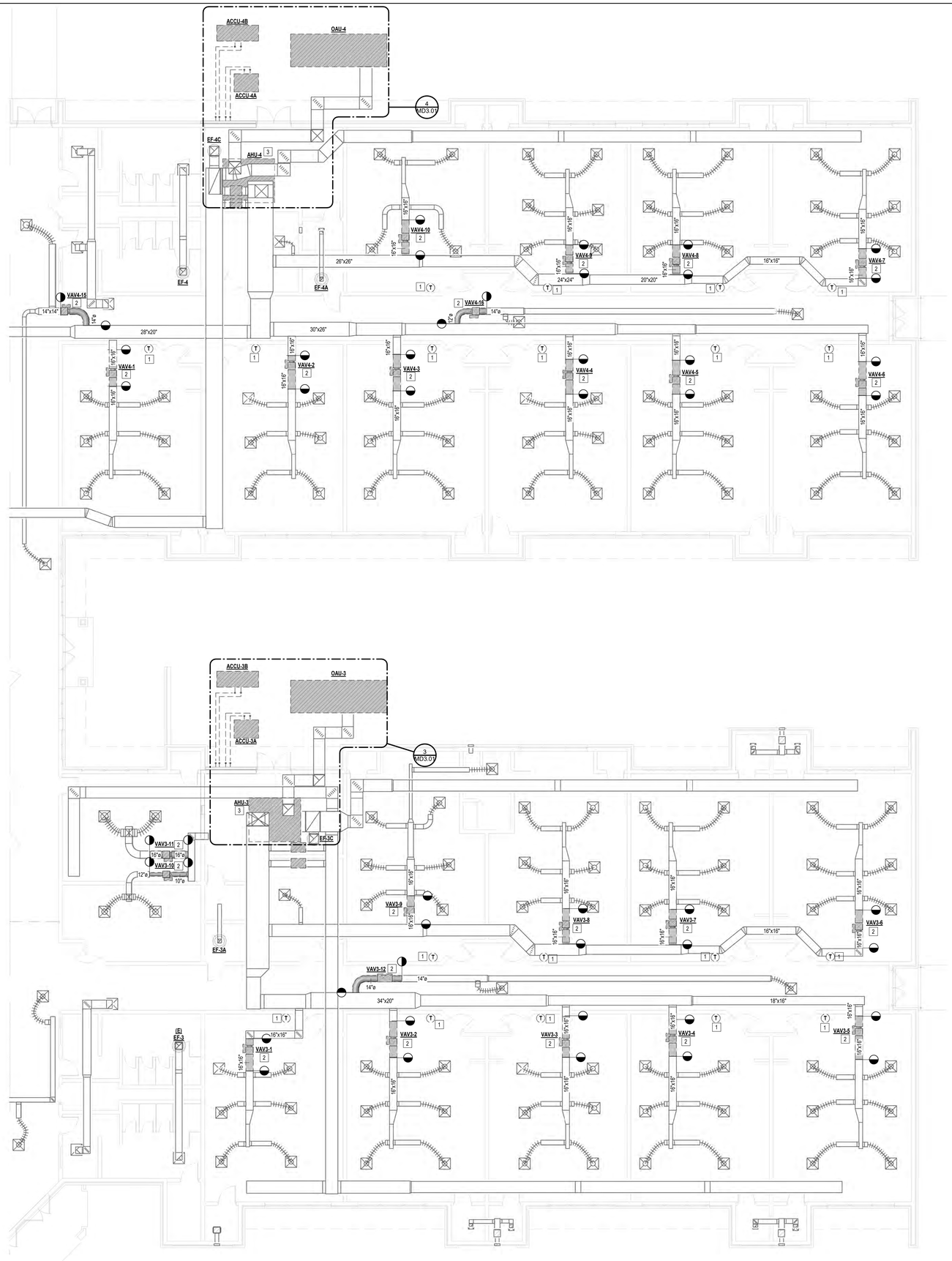
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1 DEMO MECHANICAL PLAN - AREA B
MD2.13 — 1/8" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

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MECHANICAL DEMO KEYED NOTES

1 DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.

2 DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.

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SHEET TITLE: DEMO MECHANICAL PLAN - AREA B

SHEET NUMBER: MD2.13

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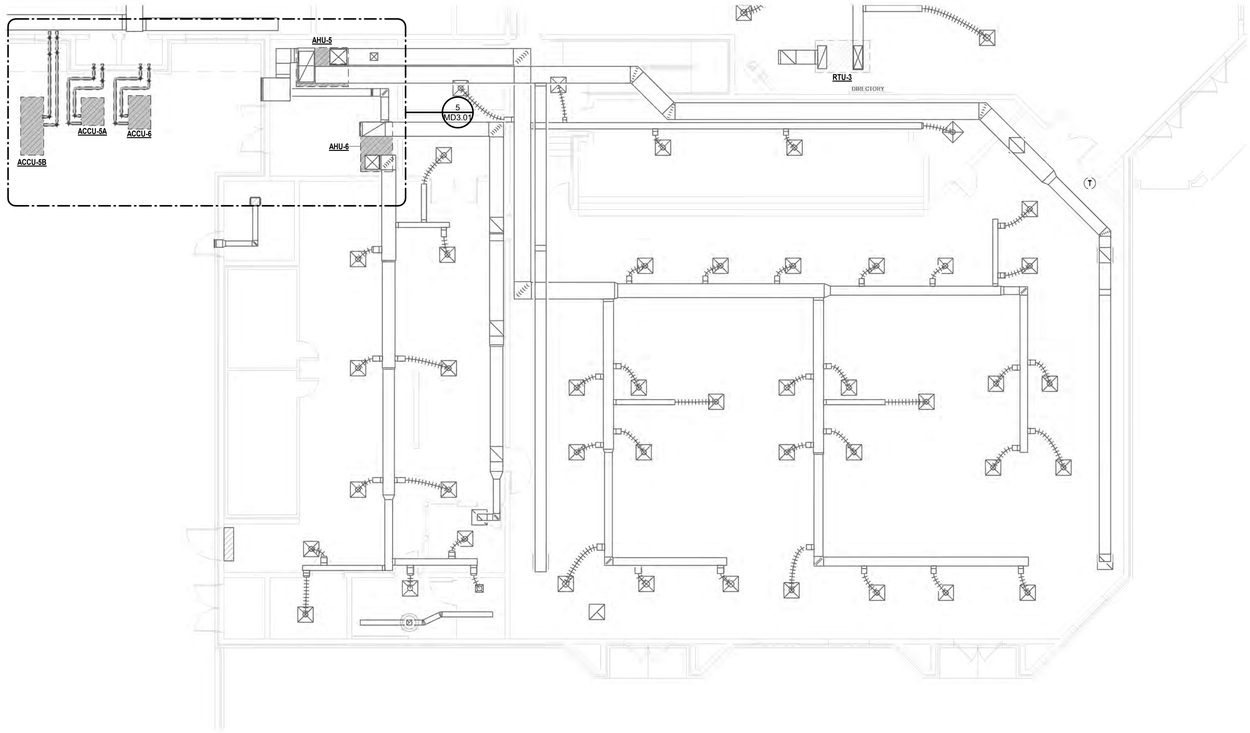
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MECHANICAL KEYED NOTES



1 MD2.14 **DEMO MECHANICAL PLAN - AREA C**
1/8" = 1'-0"

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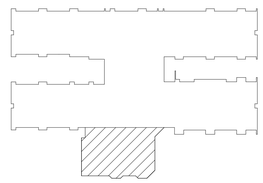
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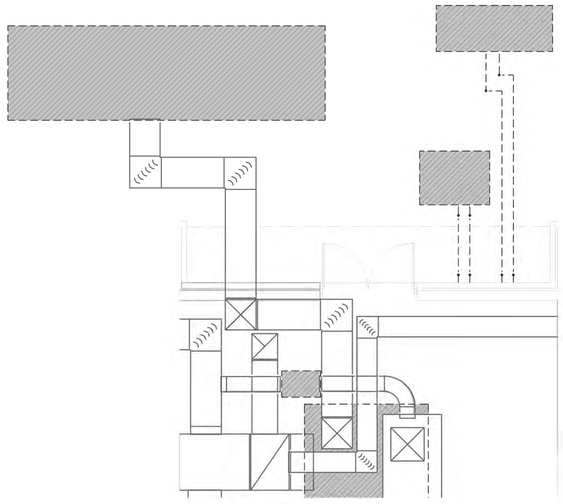
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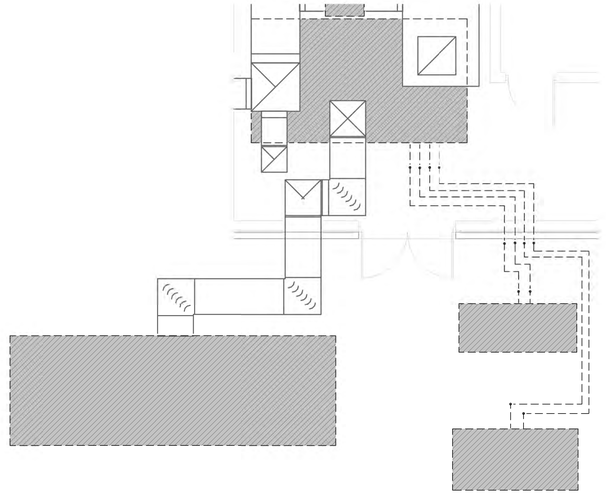
SHEET TITLE: DEMO MECHANICAL PLAN - AREA C

SHEET NUMBER: MD2.14

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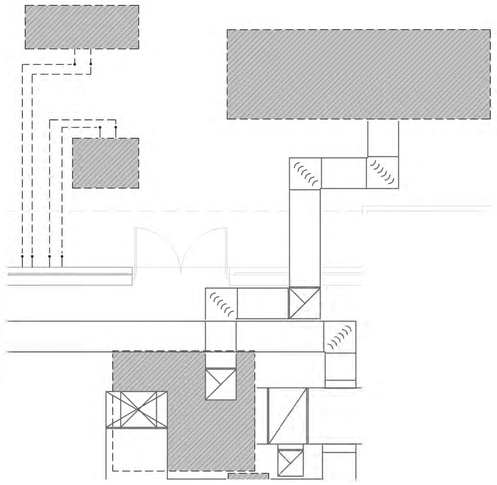
1 MD3.01 **DEMO MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



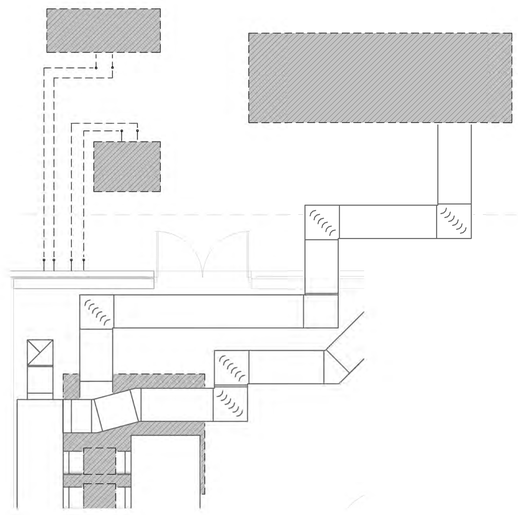
2 MD3.01 **DEMO MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"

MECHANICAL GENERAL NOTES

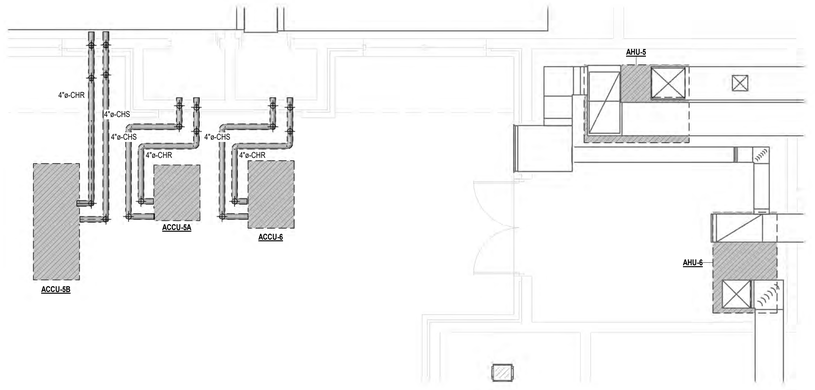
A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.



3 MD3.01 **DEMO MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"



4 MD3.01 **DEMO MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"



5 MD3.01 **DEMO MECHANICAL PLAN - AHU-5-6**
1/4" = 1'-0"

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SHEET TITLE: DEMO MECHANICAL ENLARGE PLAN

SHEET NUMBER: MD3.01

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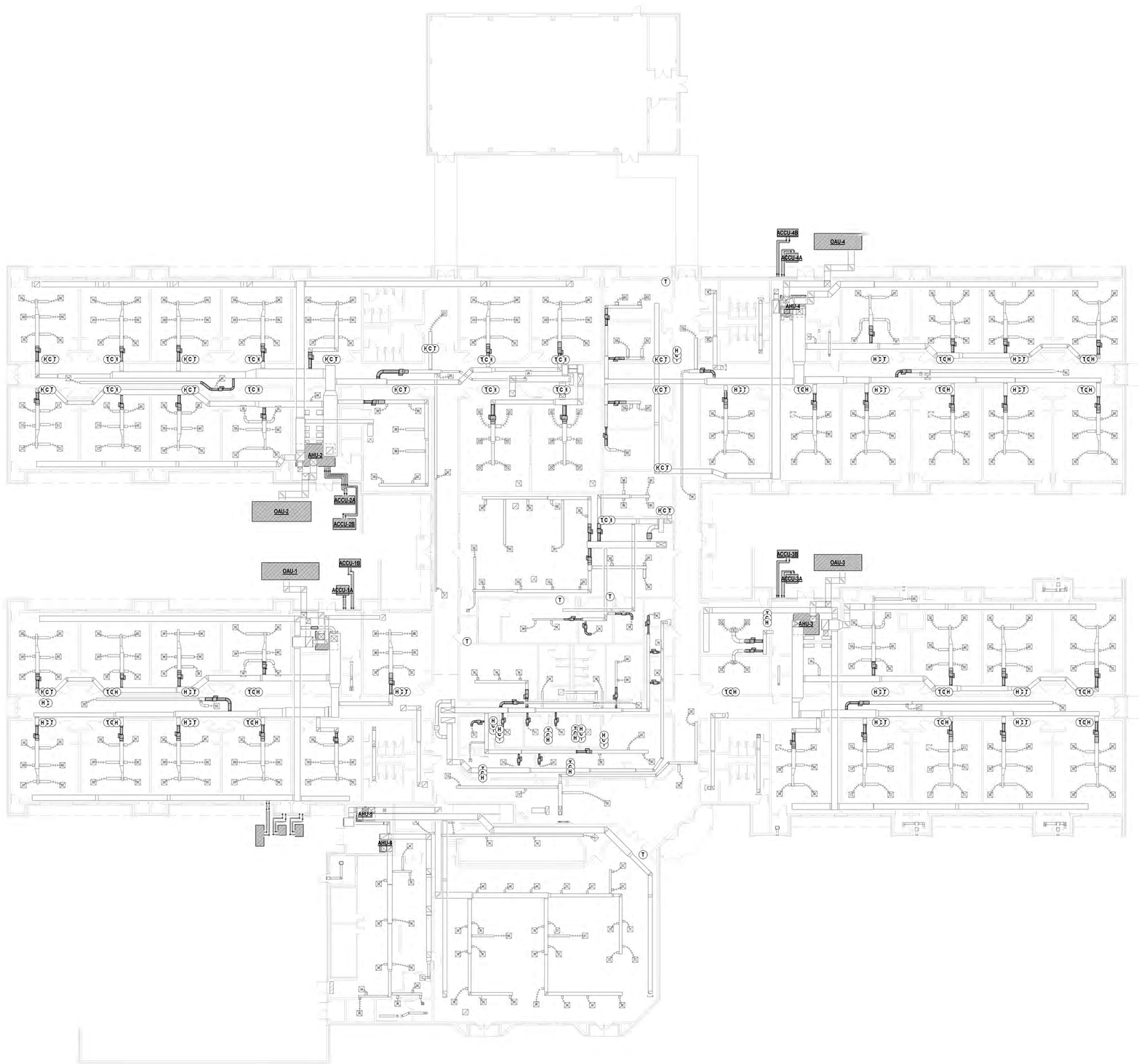
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MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL GENERAL NOTES

1. APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.
2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.



1 M2.11 **COMPOSITE MECHANICAL PLAN**
1/16" = 1'-0"

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SHEET TITLE: COMPOSITE MECHANICAL PLAN

SHEET NUMBER: M2.11

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MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL GENERAL NOTES

1. APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.
2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

1 M2.12 **MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

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DATE: 01/05/2023

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PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL PLAN - AREA A

SHEET NUMBER: M2.12

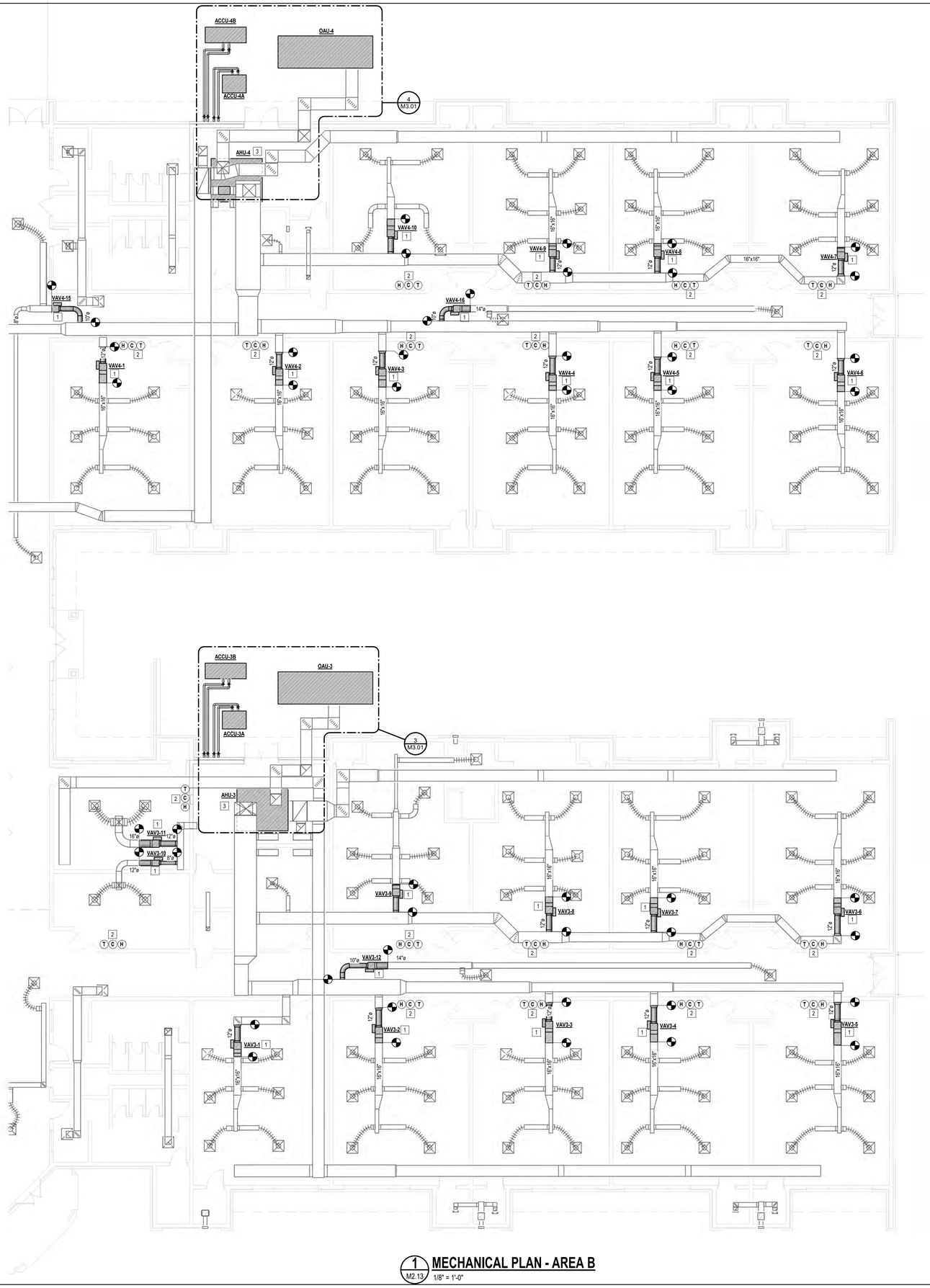
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1 **MECHANICAL PLAN - AREA B**
M2.13 1/8" = 1'-0"

MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

#MECHANICAL KEYED NOTES

1. APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.
2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

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SHEET TITLE: MECHANICAL PLAN - AREA B

SHEET NUMBER: M2.13

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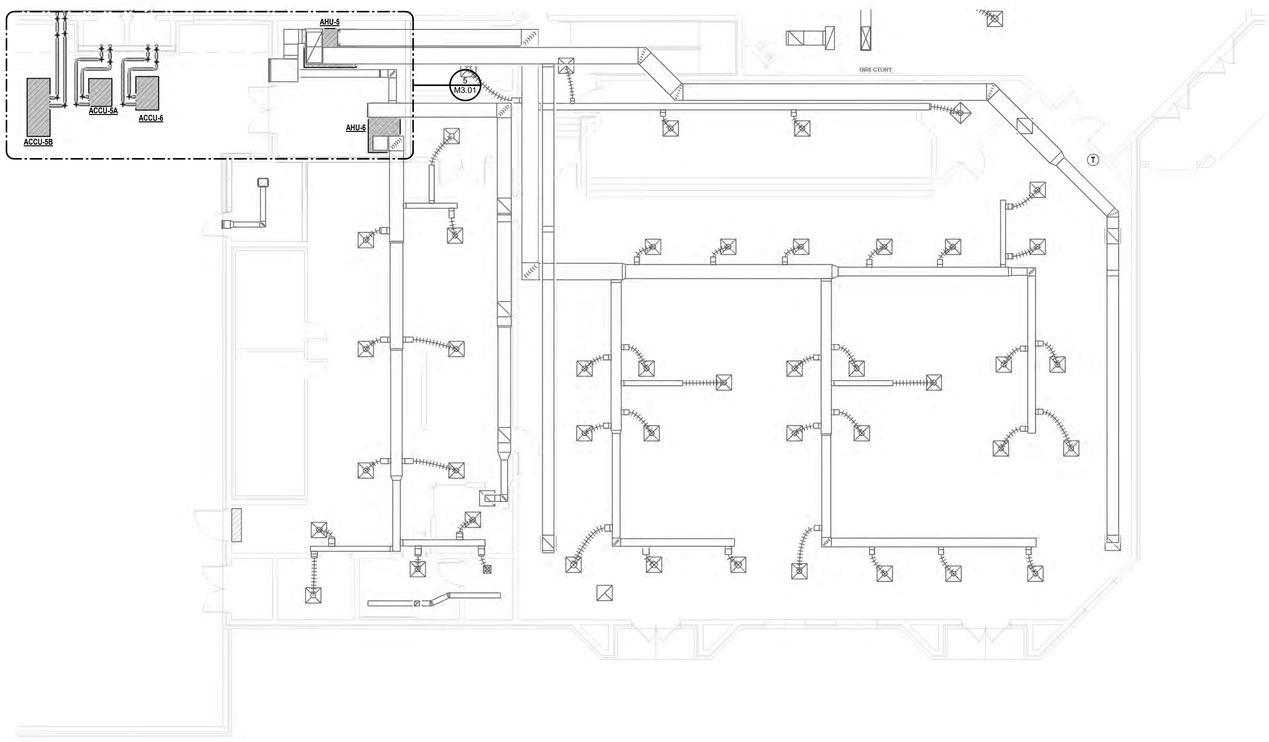
MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

#MECHANICAL KEYED NOTES

1 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

2 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.



1 M2.14 **MECHANICAL PLAN - AREA C**
1/8" = 1'-0"

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SHEET TITLE: MECHANICAL PLAN - AREA C

SHEET NUMBER: M2.14

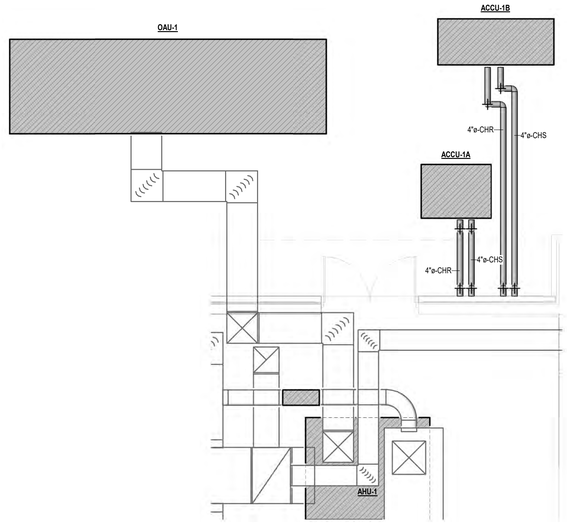
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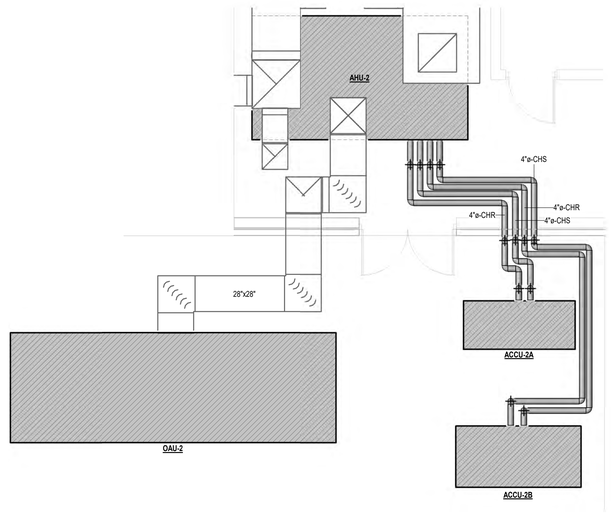
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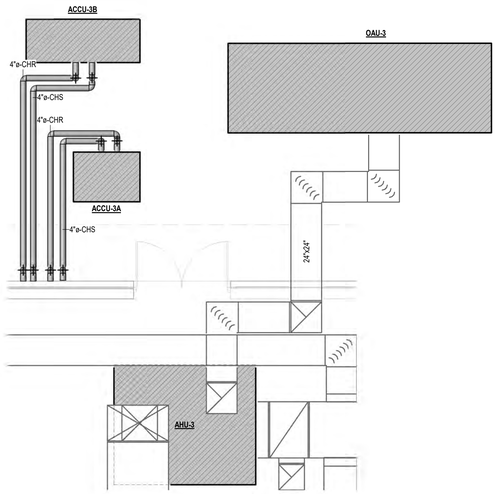
1 M3.01 **MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



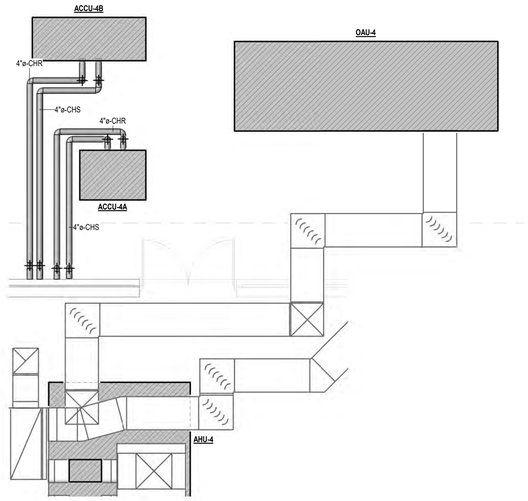
2 M3.01 **MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"

MECHANICAL GENERAL NOTES

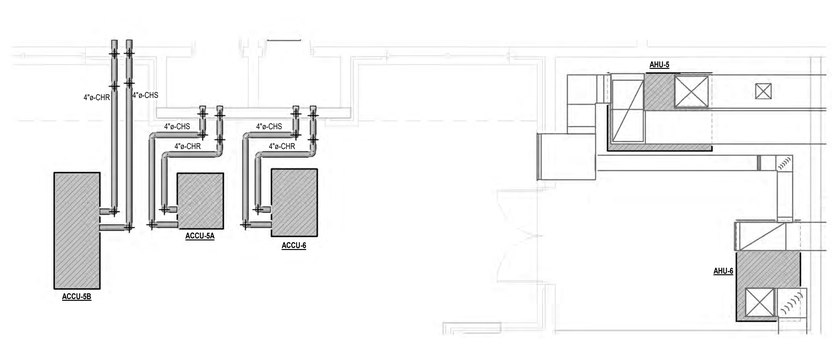
A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.



3 M3.01 **MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"



4 M3.01 **MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"



5 M3.01 **MECHANICAL PLAN - AHU-5-6**
1/4" = 1'-0"

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PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL ENLARGE PLAN

SHEET NUMBER: M3.01

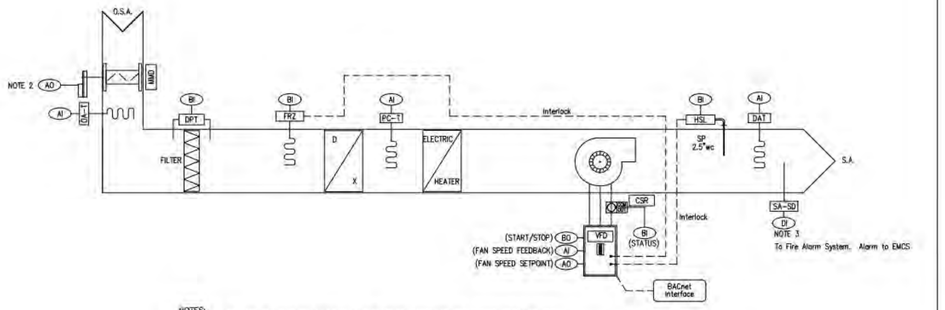
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DBR Project Number 218033.005

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Autodesk Docs://218033.009-Mission CISD-Midkiff ES 115-Indoor Air Quality Improvements/218033.009_MIDKIFF_MEP22.rvt



NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Damper provided and installed by mechanical contractor, wired by mechanical contractor, and controlled thru EMCS.
3. Wire to fire alarm system. Alarm to EMCS. Duct smoke detectors provided by fire alarm contractor and installed be mechanical contractor. Existing duct smoke detectors may be re-used where possible.

System Off - When the system is off:
The outside air damper shall be closed.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its maximum scheduled flow. The speed of the fan shall remain constant.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured and balanced by TAB Contractor.

The outside air temperature shall determine whether the unit is in HEATING, COOLING, OR DEHUMIDIFICATION.

A. When outside air is 72°F or above, unit shall enter COOLING mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor e as required to provide a 55°F coil discharge air temperature. The hot water coil control valve shall then modulate to provide a supply air temperature of 65°F.

B. When outside air temperature is greater than 55°F and less than 72°F, unit shall operate in DEHUMIDIFICATION mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor as required to provide 55°F coil discharge air temperature. The heating coil shall then modulate to provide a supply air temperature of 65°F.

C. When outside air temperature is below 55°F, unit shall operate in HEATING mode. In this mode, supply fan shall be running, cooling shall be disabled, and heating coil shall modulate to provide a 65°F supply air temperature.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.

The heating coil discharge air temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 48°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 65°F (adj) with a high-limit alarm of 80°F (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).

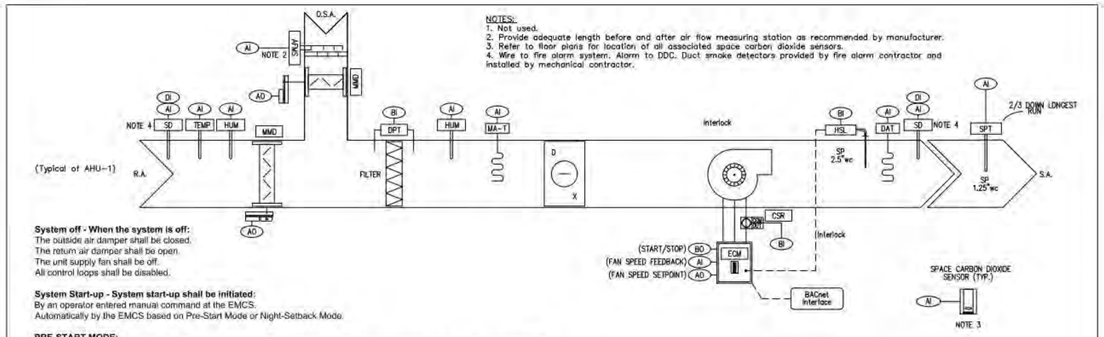
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the unit freeze-stat trips.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

1 Outside Air AHU - Control Schematic and Sequence of Operations
NOT TO SCALE

- AI — ANALOG INPUT
- AO — ANALOG OUTPUT
- DI/BI — DIGITAL/BINARY INPUT
- DO/BO — DIGITAL/BINARY OUTPUT
- MD — ON-OFF MOTORIZED DAMPER
- MMD — MODULATING TYPE: MOTORIZED DAMPER
- AFMS — AIR FLOW MEASURING STATION
- MCV — CONTROL VALVE MODULATING TYPE
- VFD — VARIABLE FREQUENCY DRIVE
- CSR — CURRENT SENSING RELAY
- FRZ — FREEZESTAT
- HSL — HIGH STATIC LIMIT
- SPT — STATIC PRESSURE TRANSMITTER
- DPT — DIFFERENTIAL PRESSURE TRANSDUCER
- FM — FLOW METER
- FS — FLOW SWITCH
- DAT — DISCHARGE AIR TEMPERATURE SENSOR
- S T — WALL SENSOR/THERMOSTAT
- CO2 — CARBON DIOXIDE SENSOR
- SP — SET POINT
- S/A — SUPPLY AIR
- R/A — RETURN AIR
- O/A — OUTSIDE AIR
- HC — HEATING COIL
- CC — COOLING COIL
- DX — DIRECT EXPANSION COOLING COIL
- PICV — PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
- AFC — AIRFLOW CROSS
- DPS — DIFFERENTIAL PRESSURE SWITCH

2 CONTROL SCHEMATIC LEGEND
NOT TO SCALE



NOTES:
1. Not used.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Refer to floor plans for location of all associated space carbon dioxide sensors.
4. Wire to fire alarm system. Alarm to DDC. Duct smoke detectors provided by fire alarm contractor and installed by mechanical contractor.

System off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The unit supply fan shall be off.
All control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated terminal units whose space temperature has exceeded the terminal units Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below, and the Demand Control Ventilation sequence shall be active.

Demand Control Ventilation - The outside air intake damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint. If the space carbon dioxide concentration for any zone served by the associated AHU is above the defined high-limit, then the OSA damper shall be modulated to maintain the scheduled maximum outside air flowrate setpoint. If the OSA damper is above 95% open and the maximum outside air flowrate setpoint cannot be met, then modulate the return air damper closed until the flowrate is achieved. Do not modulate the return air damper to less than 60% open. Once the space carbon dioxide concentration for all associated zones has been below the defined high limit for 5 minutes (adj.), the OSA damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint.

System Operation - When system start-up has been initiated:
The variable speed supply fans shall start at its minimum speed. Following a confirmation of fan start status, the supply fans speed shall be modulated in parallel to maintain the supply air static pressure at setpoint. The speed of the fans shall not be adjusted by more than 20% in any one-minute period. The static pressure setpoint shall be reset via the control algorithm below to optimize the energy usage.

Supply Air Static Pressure Reset - The static pressure setpoint shall be reset up in defined increments at defined intervals until the primary air damper position to all of the associated terminal units have been below the defined value for more than the defined interval. The static pressure setpoint shall be reset down in defined increments at defined intervals until the primary air damper position to at least one (critical zone) of the associated terminal units has been above the defined value for more than the defined interval. The setpoints are detailed in the **System Setpoint** section below.

Temperature Control - The VRF coil shall be modulated to maintain the active supply air temperature setpoint. The supply air temperature setpoint shall be reset via the control algorithm below to optimize the energy usage.

Supply Air Temperature Reset - The supply air temperature setpoint shall be reset based on the actual return air temperature, according to the defined reset schedule detailed in the **System Setpoint** section below. If the Demand Control Ventilation sequence is in maximum flow mode, then the supply air temperature reset shall be disabled and the setpoint shall be set to the initial value.

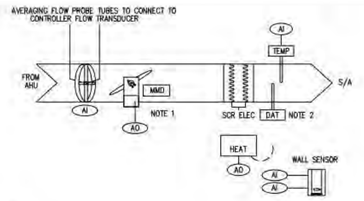
Humidity Control - A return air, duct mounted, humidity sensor shall monitor the R/A relative humidity to 50% (ADJ.). When return air relative humidity is above setpoint by 5% (not to exceed 60%), the VRF coil shall modulate to provide 50°F cooling coil discharge temperature and signal the terminal units to go into humidity control. When relative humidity attains set point, the system will return to normal operation.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the ECM speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be ECM speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The supply air static pressure setpoint shall be set initially at 1.25 inches w.c. (adj) and shall have reset limits of 0.20 to 2.00 inches w.c. (adj)
The time interval for static pressure reset shall be set at 10 minutes (adj).
The static pressure reset increment shall be set at 0.05 inches w.c. (adj)
The terminal unit primary damper position setpoint shall be 90% open. (adj)
The time interval for terminal unit primary damper position shall be set at 15 minutes. (adj)
The supply air temperature setpoint shall be set initially at 54 °F. (adj)
The supply air temperature setpoint shall be reset to 54 °F (adj) when the return air temperature is at 78 °F. (adj)
The supply air temperature setpoint shall be reset to 58 °F (adj) when the return air temperature is at 72 °F. (adj)
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).

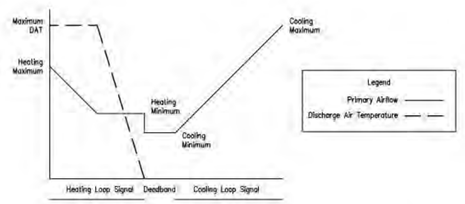
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm if:
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If any associated space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
If return air RH is 60% or above.
All alarms shall be inhibited when the supply fan is not operating.

3 MULTIZONE VAV Air Handling Unit - Control Schematic and Sequence of Operations
NOT TO SCALE



NOTES:
1. TERMINAL UNIT CONTROLLER AND DAMPER ACTUATOR SHALL BE SHIPPED TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AND WIRING.
2. DAT SENSOR SUPPLIED BY UNIT VENDOR AND MOUNTED BY EMCS CONTRACTOR.



System Off - When the system is off:
The primary air damper shall be closed.
The heating coil shall be disabled.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The primary air damper shall be modulated between the cooling minimum and maximum flow values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint. When the space temperature falls below the deadband, the primary air damper shall modulate to maintain the heating minimum flow value and the SCR electric heat shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.
If the space temperature drops below the active Heating Setpoint and the discharge air temperature is at its active setpoint, the primary air damper shall be modulated between the heating minimum and maximum heating flow values to maintain the space temperature within +/- 0.5°F of the active Heating Setpoint and the SCR electric heat shall be modulated to maintain the discharge air temperature setpoint. The SCR electric heat controller shall be set to maintain a maximum discharge air temperature of 85 °F (adjustable). When relative humidity, as determined by either space or AHU return air relative humidity sensor is above setpoint by 5% (not to exceed 60%) in any conditioning mode, terminal unit damper shall modulate to 50% of scheduled cooling CFM and electric heater shall modulate to maintain programmed or override temperature. Unit shall operate in this mode until return air relative humidity attains setpoint.

System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The maximum heating mode discharge air temperature shall be set at 85 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

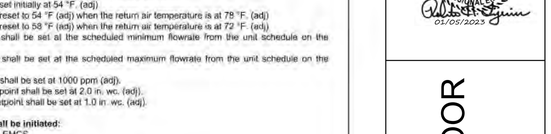
4 VAV Terminal Unit with Electric Reheat - Control Schematic and Sequence of Operations
NOT TO SCALE

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REVISION:

No.	DATE	DESCRIPTION

SEAL:



MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL FLOW DIAGRAMS

SHEET NUMBER: M4.01

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SINGLE INLET VAV BOX WITH REHEAT SCHEDULE

MARK	COOLING CFM		HEATING CFM		REHEAT	INLET SIZE	VOLTS/PHASE/HZ	MANUFACTURER	MODEL
	MAX.	MIN.	MAX.	MIN.	KW				
VAV1-1	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-2	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-3	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-4	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-5	1,380	415	690	415	5	12"Ø	480/3/60	ETI	SDR
VAV1-6	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-7	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-8	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-9	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-10	870	265	435	265	5	10"Ø	480/3/60	ETI	SDR
VAV1-11	1,110	335	555	335	3	12"Ø	480/3/60	ETI	SDR
VAV2-1	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-2	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-3	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-4	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-5	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-6	1,380	415	690	415	6	12"Ø	480/3/60	ETI	SDR
VAV2-7	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-8	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-9	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-10	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-11	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-12	1,470	445	735	445	7	12"Ø	480/3/60	ETI	SDR
VAV2-13	600	180	300	180	4	8"Ø	480/3/60	ETI	SDR
VAV2-14	1,795	540	900	540	8	14"Ø	480/3/60	ETI	SDR
VAV3-1	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-2	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-3	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-4	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-5	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV3-6	1,410	425	705	425	7	12"Ø	480/3/60	ETI	SDR
VAV3-7	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-8	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-9	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-10	490	150	245	150	2	8"Ø	480/3/60	ETI	SDR
VAV3-11	1,160	350	580	350	5	12"Ø	480/3/60	ETI	SDR
VAV3-12	870	265	435	265	3	10"Ø	480/3/60	ETI	SDR
VAV4-1	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-2	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-3	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-4	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-5	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-6	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-7	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-8	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-9	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-10	960	290	480	290	4	10"Ø	480/3/60	ETI	SDR
VAV4-11	450	135	225	135	2	8"Ø	480/3/60	ETI	SDR
VAV4-12	890	270	445	270	4	10"Ø	480/3/60	ETI	SDR
VAV4-13	390	120	195	120	2	6"Ø	480/3/60	ETI	SDR
VAV4-14	750	225	375	225	3	10"Ø	480/3/60	ETI	SDR
VAV4-15	830	250	415	250	3	10"Ø	480/3/60	ETI	SDR
VAV4-16	720	220	360	220	3	10"Ø	480/3/60	ETI	SDR
VAVR1-1	885	270	445	270	5	10"Ø	480/3/60	ETI	SDR
VAVR1-2	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-3	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-4	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-5	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-6	225	70	115	70	2	6"Ø	480/3/60	ETI	SDR
VAVR1-7	175	55	90	55	1	6"Ø	480/3/60	ETI	SDR
VAVR1-8	840	255	420	255	5	10"Ø	480/3/60	ETI	SDR
VAVR1-9	310	95	155	95	3	6"Ø	480/3/60	ETI	SDR
VAVR1-10	200	60	100	60	1	6"Ø	480/3/60	ETI	SDR
VAVR1-11	155	50	80	50	1	6"Ø	480/3/60	ETI	SDR
VAVR1-12	115	35	60	35	1	6"Ø	480/3/60	ETI	SDR
VAVR1-13	885	270	445	270	4	10"Ø	480/3/60	ETI	SDR
VAVR2-1	1,050	315	525	315	8	10"Ø	480/3/60	ETI	SDR
VAVR2-2	1,140	345	570	345	10	12"Ø	480/3/60	ETI	SDR
VAVR2-3	1,140	345	570	345	5	12"Ø	480/3/60	ETI	SDR
VAVR2-4	155	50	80	50	1	6"Ø	480/3/60	ETI	SDR
VAVR2-5	275	85	140	85	2	6"Ø	480/3/60	ETI	SDR
VAVR2-6	230	70	115	70	2	6"Ø	480/3/60	ETI	SDR
VAVR4-1	2,280	685	1140	685	5	16"Ø	480/3/60	ETI	SDR
VAVR4-2	2,280	685	1140	685	5	16"Ø	480/3/60	ETI	SDR

NOTES:
1. PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN AIR INLET.
2. PROVIDE TERMINAL UNIT CASING WITH 1/2" INTERNALLY LINED FIBERGLASS FREE INSULATION.
3. PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
4. PROVIDE ELECTRIC REHEAT COIL WITH 0-10V SCR MODULATING CAPACITY CONTROL.

PACKAGED DX ROOF TOP UNIT SCHEDULE

MARK	OAU-1	OAU-2	OAU-3	OAU-4
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
DUCT CONFIGURATION	SIDE DISCHARGE	SIDE DISCHARGE	SIDE DISCHARGE	SIDE DISCHARGE
DESIGN OUTDOOR AIR (CFM)	3,840	5,120	3,920	4,550
MINIMUM OUTDOOR AIR (CFM)	1,152	1,536	1,176	1,365
E.E.R. / I.E.E.R. (AT AHRI CONDITIONS)	11.1 / 18	9.6 / 15.5	11.1 / 18	10.2 / 21.4
EXT. S.P. (IN. W.G.)	1.00	1.00	1.00	1.00
FAN MOTOR HORSEPOWER	2.0	QTY(2) 2.2	2.0	3.0
FAN TYPE	VFD PLENUM	(2) ECM PLENUM	VFD PLENUM	VFD PLENUM
FAN DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
COOLING DATA				
AMBIENT AIR (°F)	100.0	100.0	100.0	100.0
TOTAL COOLING CAPACITY (MBH)	296.7	384.9	295.5	331.8
TOTAL SENSIBLE CAPACITY (MBH)	195.1	257.5	197.4	224.6
EAT DB (°F)	100.0/76.0	100.0/76.0	100.0/76.0	100.0/76.0
LAT DB/WB (°F)	53.5/53.5	54.0/54.0	53.9/53.9	54.9/54.8
HEATING DATA				
HEATING CAPACITY (KW) / STAGES	45KW / SCR	55KW / SCR	45KW / SCR	45KW / SCR
EAT DB/WB (°F)	36.0	36.0	36.0	36.0
LAT DB (°F)	72.9	69.8	72.1	67.1
ELECTRICAL DATA				
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60
MCA	74.1	80.4	74.1	75.9
MOCP	80.0	100.0	80.0	80.0
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL NO.	DPS025	DPSA034	DPS025	DPS028
OPERATING WEIGHT (LBS)	3,705	5,816	3,705	3,859
NOTES	ALL	ALL	ALL	ALL

NOTES:
1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION AND PHASE FAILURE MONITOR.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE COMBO 2" / 4" FILTER RACK WITH MERV 8 AND 13 FILTERS.
6. PROVIDE UNIT CONTROLLER BY MANUFACTURER. PROVIDE CONTROLLER WITH BACNET INTERFACE CARD FOR INTEGRATION WITH EMCS.
7. PROVIDE UNIT WITH MODULATING HOT GAS REHEAT WITH DUAL TEMPERATURE SENSORS FOR HUMIDITY CONTROL.
8. PROVIDE UNIT WITH CONDENSER HAIL GUARD AND 14" PREFABRICATED TDI RATED ROOF CURB WITH TEXAS PE STAMP.
9. PROVIDE UNIT WITH CONSTANT VOLUME FAN AND 100% OA DAMPER.
10. PROVIDE UNIT WITH INTEGRAL DISCONNECT SWITCH AND POWERED CONVENIENCE OUTLET.
11. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,200 CFM.
12. PROVIDE DOUBLE WALL CONSTRUCTION WITH MINIMUM 1" R-7 FOAM INSULATION (UP TO 15 TONS) OR 2" R-13 FOAM INSULATION (OVER 15 TONS).
13. FACTORY APPLIED CONDENSER COIL COATING WITH MINIMUM 10,000 HOUR SALT SPRAY RATING PER ASTM B 117 AND UV TOPCOAT.
14. PROVIDE STAINLESS STEEL DRAIN PAN AND STAINLESS STEEL COIL CASINGS.

AIR COOLED CONDENSING UNIT SCHEDULE

MARK	ACCU-1A	ACCU-1B	ACCU-2A	ACCU-2B	ACCU-3A	ACCU-3B	ACCU-4A	ACCU-4B	ACCU-5A	ACCU-5B	ACCU-6
SERVES	AHU-1	AHU-1	AHU-2	AHU-2	AHU-3	AHU-3	AHU-4	AHU-4	AHU-5	AHU-5	AHU-6
TOTAL COOLING CAPACITY (MBH)	184.2	184.2	250.7	250.7	184.2	184.2	184.2	184.2	175.7	175.7	131.25
AMBIENT TEMP. (°F)	100	100	100	100	100	100	100	100	100	100	100
STEPS OF CAPACITY	2	2	2	2	2	2	2	2	2	2	2
EER (SEER)	11.0	11.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
MCA	37.0	37.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0	23.0
MOCP	50	50	70	70	50	50	50	50	50	50	30
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	LENNOX
MODEL NUMBER	RCH15H180D	RCH15H180D	RCH20H240D	RCH20H240D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	EL150XCSDT
OPERATING WEIGHT (LBS.)	832	832	832	832	832	832	832	832	832	832	535
NOTES	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

NOTES:
1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. REFRIGERANT LINES TO BE SIZED BY MANUFACTURER.
3. PROVIDE 5 YEAR COMPRESSOR PARTS WARRANTY.
4. PROVIDE WITH CONDENSER COIL HAIL GUARD.
5. PROVIDE WITH LOW AMBIENT HEAD PRESSURE CONTROL.
6. PROVIDE CONDENSER COIL COATING WITH MINIMUM 6000 HR ASTM B117 SALT SPRAY RATING.
7. PROVIDE SINGLE CIRCUIT, DUAL STAGE CONDENSING UNITS, EXCEPT ACCU-6 IS DUAL CIRCUIT.

PACKAGED DX ROOF TOP UNIT SCHEDULE

MARK	RTU-1	RTU-2	RTU-3	RTU-4
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
UNIT TYPE	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
DUCT CONFIGURATION	BOTTOM	BOTTOM	BOTTOM	BOTTOM
DESIGN SUPPLY AIR (CFM)	4,150	4,290	1,340	4,560
MINIMUM SUPPLY AIR (CFM)	1,245	1,287	402	1,368
DESIGN OUTDOOR AIR (CFM)	1,240	1,205	100	750
MINIMUM OUTDOOR AIR (CFM)	372	362	30	225
E.E.R. (AT AHRI CONDITIONS)	12.0	12.0	13.5	12.0
IEER/SEER (AT AHRI CONDITIONS)	15.0	15.0	/ 17.0	15.7
EXT. S.P. (IN. W.G.)	2.00	2.00	1.80	2.00
FAN MOTOR HORSEPOWER	5.0	5.0	1.5	5.0
FAN TYPE	ECM	ECM	ECM	ECM
FAN DRIVE	BELT	BELT	DIRECT	BELT
COOLING DATA				
AMBIENT AIR (°F)	100.0	100.0	100.0	100.0
TOTAL COOLING CAPACITY (MBH)	167.0	171.0	35.0	146.0
TOTAL SENSIBLE CAPACITY (MBH)	98.0	113.0	25.0	101.0
EAT DB/WB (°F)	78.0/68.0	82.0/69	74/64	76.0/65.0
LAT DB/WB (°F)	55.1/54.6	56.4/55.9	55.9/54.9	54.8/54.0
HEATING DATA				
HEATING AIRFLOW (CFM)	--	--	--	--
HEATING CAPACITY (KW)	--	--	--	--
EAT DB/WB (°F)	--	--	--	--
LAT DB/WB (°F)	--	--	--	--
ELECTRICAL DATA				
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60
MCA	36.0	36.0	9.0	35.0
MOCP	40.0	40.0	15.0	40.0
MANUFACTURER	LENNOX	LENNOX	LENNOX	LENNOX
MODEL NO.	LCT180	LCT180	LCT036	LCT156
OPERATING WEIGHT (LBS)	2,605	2,605	892	2,605
NOTES				

NOTES:
1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE UNITS WITH MINIMUM 2" MERV 8 + 4" MERV 13 FILTERS.
6. PROVIDE UNIT CONTROLLER BY MANUFACTURER. PROVIDE CONTROLLER WITH BACNET INTERFACE CARD FOR INTEGRATION WITH EMCS.
7. PROVIDE UNIT WITH ON/OFF HOT GAS REHEAT FOR HUMIDITY CONTROL.
8. PROVIDE UNIT WITH CONDENSER HAIL GUARD AND 14" PREFABRICATED ROOF CURB.
9. PROVIDE UNIT WITH COMPARATIVE ENTHALPY ECONOMIZER AND BAROMETRIC RELIEF.
10. PROVIDE MINIMUM 2-STAGE COOLING UNITS
11. PROVIDE UNIT WITH INTEGRAL FUSED DISCONNECT SWITCH AND POWERED CONVENIENCE OUTLET. PROVIDE PHASE FAILURE MONITOR.
12. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,000 CFM.
13. PROVIDE FACTORY E-COATED CONDENSER COIL COATINGS WITH MINIMUM 6000 HR ASTM B117 SALT SPRAY RATING.
14. CONTROLS, THERMOSTATS, AND SENSORS (T, RH, CO2) TO BE PROVIDED BY THE CONTROLS CONTRACTOR

SPLIT AIR HANDLING UNIT SCHEDULE

MARK	AHU-1	AHU-2	AHU-3	AHU-4	AHU-5	AHU-6
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
UNIT CONFIGURATION	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
DISCHARGE	TOP	TOP	TOP	TOP	TOP	TOP
SUPPLY AIR (CFM)	13,560	18,455	14,605	16,625	5,250	3,475
OUTSIDE AIR (CFM)	3,840	5,120	3,920	4,550	3,150	650
EXT. S.P. (IN. W.G.)	2.8	3.0	3.0	2.9	3.3	2.0
FAN MOTOR (QTY) HORSEPOWER	(4)4.42	(6)4.42	(5)4.42	(5)4.42	(2)4.42	(1)4.42
FAN MOTOR CONTROL (VFD, ECM 0-10VDC)	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC
FAN RPM	3194	3096	3038	3181	3064	3041
MAX COIL VELOCITY (FPM)	500	500	500	500	500	500
MINIMUM COIL ROWS	4	4	4	4	6	6
MAX. FINS PER INCH	10	10	10	10	10	10
COOLING EAT DB/WB (°F)	74.4/61.0	74.7/61.1	74.5/61.0	74.6/61.0	86.4/73.6	79.0/66.0
COOLING LAT DB/WB (°F)	55.3/52.9	56/53.2	56/53.3	56.1/53.3	54.3/53.5	55.1/53.6
TOTAL COOLING CAPACITY (MBH)	311.4	412.1	321.4	364.4	350.3	130.9
SENSIBLE COOLING CAPACITY (MBH)	283.4	377.2	295.0	336.4	184.0	90.9
QTY REFRIGERANT CIRCUITS / TYPE	2 / INTERLACED	4 / INTERLACED	2 / INTERLACED	2 / INTERLACED	2 / INTERLACED	2 / INTERLACED
HEATING CAPACITY (KW)	-	-	-	-	-	-
NO. OF HEATING STAGES	-	-	-	-	-	-
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL NO.	CAH029GDCM	CAH040GDCM	CAH032GDCM	CAH036GDCM	CAH013GDCM	CAH008GDCM
OPERATING WEIGHT (LBS.)	2522	3213	2684	2886	1362	1035
UNIT CABINET DIMENSIONS, W x L x H (IN.)	86 x 108 x 66	96 x 116 x 78	92 x 106 x 66	102 x 108 x 66	60 x 80 x 46	48 x 80 x 40
NOTES	ALL	ALL	ALL	ALL	ALL	ALL

NOTES:
1. PROVIDE 2" DOUBLE WALL R-13 CHILLED WATER AHU WITH 2" MERV 13 FILTERS.
2. PROVIDE DX COIL WITH STAINLESS STEEL COIL CASING AND STAINLESS STEEL DRAIN PAN FOR R-410A.
3. PROVIDE 12" ACCESS DOOR BETWEEN COIL AND FAN SECTION.
4. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
5. PROVIDE ECM FAN ARRAY WITH HAND/OFF/AUTO SWITCH, 0-10 VDC SIGNAL INPUT, FAN FAULT TERMINAL, FUSED DISCONNECT, MOTOR CONTROL PANEL, LINE AND LOW VOLTAGE WIRING, INDIVIDUAL FAN MOTOR OVERCURRENT PROTECTION/ISOLATION SWITCH, AND POTENTIOMETER FOR MANUAL CONTROL OVERRIDE.
6. HOA PANELS TO BE FACTORY INSTALLED EXCEPT AHU-5 AND 6 ARE FIELD INSTALLED AND FIELD WIRED BY ELECTRICAL CONTRACTOR.
7. PROVIDE 6" BASE RAIL.
8. HEADER AHU-2 STACKED COILS FOR EACH CIRCUIT WITH SEPARATE TXVs PER COIL CONNECTION, ONE SOLENOID PER ACCU.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

REVISION:

No.	DATE	DESCRIPTION

SEAL:



MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL SCHEDULES

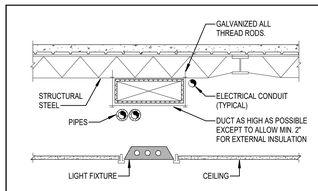
SHEET NUMBER: M5.01

DBR
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f
TBPE Firm Registration No. 2234

DBR Project Number 218033.005

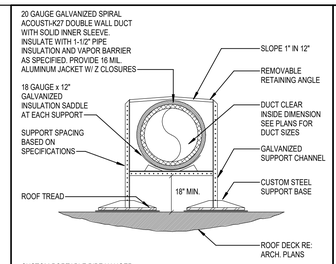
HA	RT	JR		

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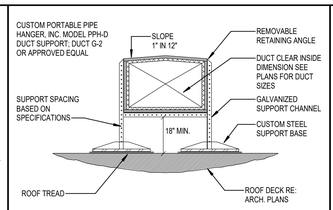
NOTES:
1. PIPES (INCLUDING SPRINKLER PIPING) AND ELECTRICAL CONDUIT CAN BE ROUTED BETWEEN JOISTS OR THROUGH JOIST WEB SPACE AS REQUIRED. DUCT SHALL BE LOCATED AS HIGH AS POSSIBLE.
2. U.L. DESIGN ASSEMBLY NUMBERS ARE SHOWN ON ARCHITECTURAL PLANS WHEN REQUIRED.
3. INSTALLATION OF ALL SERVICES MUST BE COORDINATED BY THE CONTRACTOR.

1 TYP. MEP INSTALLATION DETAIL
NOT TO SCALE M00-01



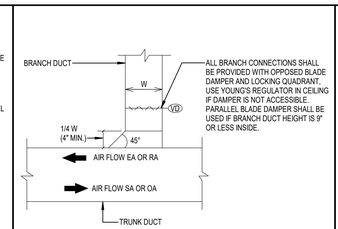
CUSTOM PORTABLE PIPE HANGER, INC. MODEL PPH-D DUCT SUPPORT; DUCT G-2 OR APPROVED EQUAL

2 DUCT SUPPORT ON ROOF
NOT TO SCALE M00-01



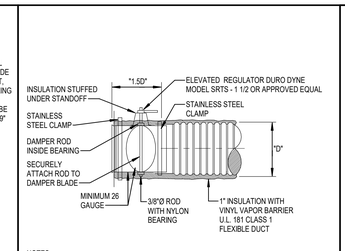
NOTES:
1. ANGLE STEEL FRAME TO BE WELDED AT ALL CORNERS AND BASE PLATE.
2. PROVIDE 12" WIDE 18 GAUGE GALVANIZED STEEL INSULATION SADDLE, FULL WIDTH AND HEIGHT OF DUCT.

3 EXPOSED RECT. DUCT ON ROOF
NOT TO SCALE M00-01



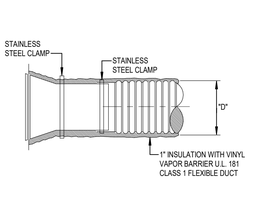
NOTES:
THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO RECTANGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

4 RECTANGULAR BRANCH DUCT TAP
NOT TO SCALE M00-01



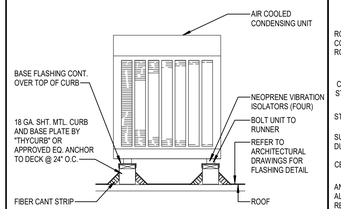
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0"
2. TYPICAL OF ROUND DUCT CONNECTIONS TO RECTANGULAR DUCTS
3 ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

5 SPIN-IN DETAIL
NOT TO SCALE M00-01



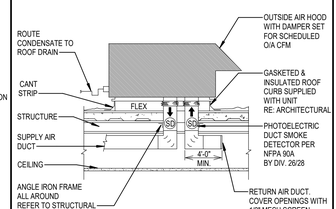
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO VAV BOXES FROM RECTANGULAR MAIN DUCTS.
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

6 CONICAL SPIN-IN DETAIL
NOT TO SCALE M00-01



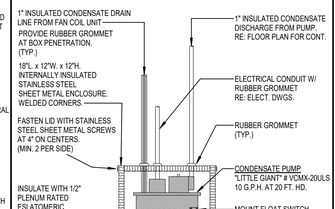
NOTE:
1. PROVIDE CLEARANCE AROUND UNIT FOR AIRFLOW AND SERVICE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

7 CONDENSING UNIT ROOF MOUNTED
NOT TO SCALE

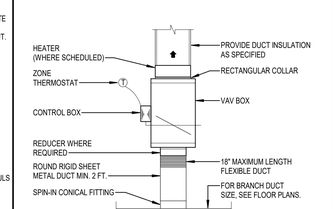


NOTE:
ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

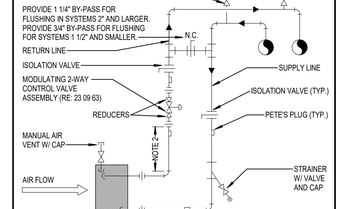
8 ROOF TOP UNIT MOUNTING DETAIL
NOT TO SCALE



9 COOLING COIL CONDENSATE PUMP
NOT TO SCALE

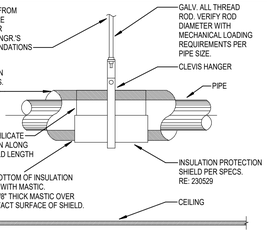


10 INTERIOR VAV TERMINAL UNIT
NOT TO SCALE M01-01



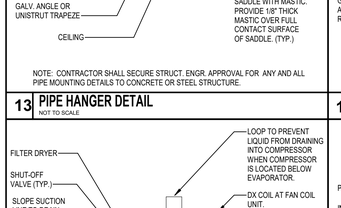
NOTES:
1. INSTALL 2-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS.
2. PROVIDE STRAIGHT PIPE LENGTH 5 TIMES NOMINAL PIPE DIA. UPSTREAM OF CTRL. VALVE.

11 2-WAY CONTROL VALVE AND COIL PIPING
NOT TO SCALE



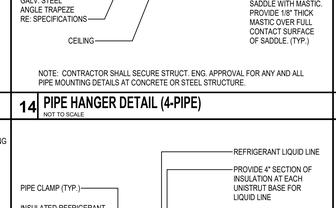
NOTE:
CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE. CONTRACTOR SHALL CONFORM TO ALL MAXIMUM SPAN DISTANCES PER SPECIFICATIONS FOR HANGER SPACING. RE: 230529

12 PIPE HANGER DETAIL (1-PIPE)
NOT TO SCALE



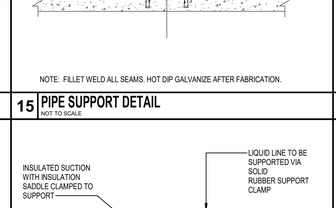
NOTE: CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE.

13 PIPE HANGER DETAIL
NOT TO SCALE



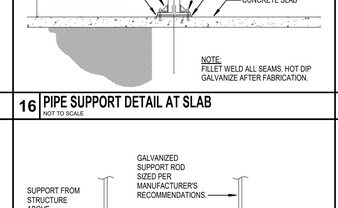
NOTE: CONTRACTOR SHALL SECURE STRUCT. ENG. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

14 PIPE HANGER DETAIL (4-PIPE)
NOT TO SCALE



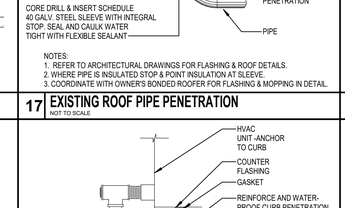
NOTE: FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

15 PIPE SUPPORT DETAIL
NOT TO SCALE



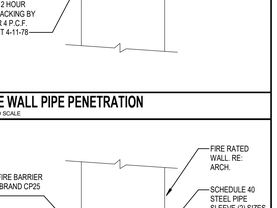
NOTE:
FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

16 PIPE SUPPORT DETAIL AT SLAB
NOT TO SCALE

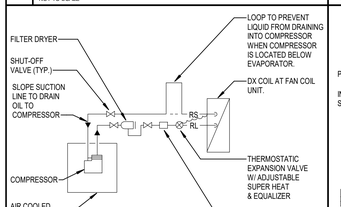


NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FLASHING & ROOF DETAILS.
2. WHERE PIPE IS INSULATED STOP & POINT INSULATION AT SLEEVE.
3. COORDINATE WITH OWNER'S BONDED ROOFER FOR FLASHING & MOPPING IN DETAIL.

17 EXISTING ROOF PIPE PENETRATION
NOT TO SCALE

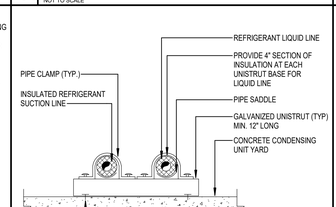


18 FIRE WALL PIPE PENETRATION
NOT TO SCALE



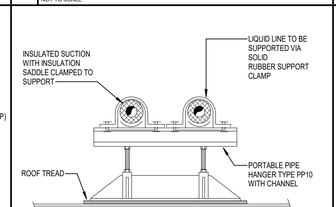
NOTE:
1. COMPLY WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
2. TYPICAL FOR EACH SEPARATE REFRIGERANT CIRCUIT.
3. PROVIDE FILTER DRYER ON ALL SYSTEMS.
4. USE "ACR" HARD DRAWN COPPER REFRIGERANT PIPE.

19 REFRIGERANT PIPING SCHEMATIC
NOT TO SCALE

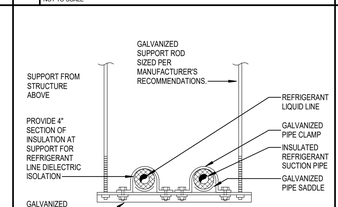


NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

20 FLOOR MOUNTED REFR. PIPE
NOT TO SCALE

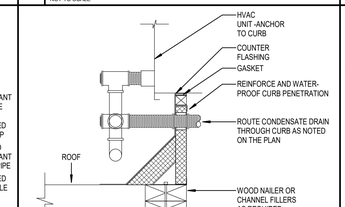


21 ROOF MTD. REFR. PIPE SUPPORT
NOT TO SCALE



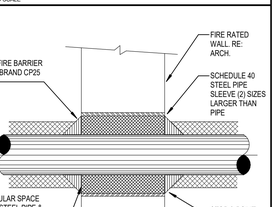
NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER MAX. AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

22 REFRIGERANT PIPE HANGER
NOT TO SCALE

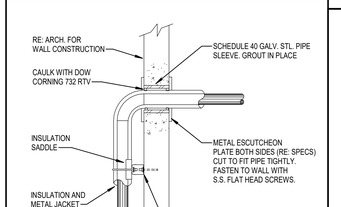


NOTE:
1. COORDINATE WITH APPROVED ROOFING CONTRACTOR. ROOF PENETRATION AND LOCATION SHALL BE COORDINATED AND APPROVED BY ROOFING CONTRACTOR.
2. ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

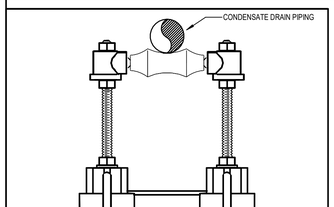
23 CONDENSATE DRAIN THRU CURB
NOT TO SCALE



24 FIRE WALL INSULATED PIPE PENETRATION
NOT TO SCALE



25 PIPE ENTRY THRU EXTERIOR WALL
NOT TO SCALE



NOTE:
1. PROVIDE PORTABLE PIPE HANGER MODEL SS8-R OR APPROVED EQUAL.
2. SPACE PIPE SUPPORTS AT MAXIMUM INTERVALS OF 10'-0" ON CENTER.
3. INSTALL PER MANUFACTURER'S SPECIFICATIONS AND INSTALLATION REQUIREMENTS.

26 DRAIN LINE SUPPORT ON ROOF
NOT TO SCALE

ELECTRIC DUCT HEATER SCHEDULE

MARK	EDH-1	EDH-2
SERVES	AHU-5	AHU-6
HEATER TYPE	INLINE	INLINE
DESIGN AIRFLOW (CFM)	5,250	3,475
CAPACITY (KW)	60.0	15.0
EAT/LAT (°F)	49.6/85.0	
DUCT DIMENSION WxH (INSIDE)	26X24	22X22
VOLTS/PHASE/HERTZ	480/3/60	480/3/60
CONTROL TYPE	SCR	SCR
MANUFACTURER	REDD-I	REDD-I
MODEL	HF	HF
NOTES	ALL	ALL

NOTES:
1. PROVIDE WITH AIRFLOW PROVING SWITCH AND DIGITAL DUCT MOUNTED DISCHARGE AIR TEMPERATURE SENSOR.
2. PROVIDE GALVANIZED FLANGE MOUNTED DUCT HEATER.
3. INSTALL DUCT HEATER PER MANUFACTURER'S RECOMMENDATIONS.
4. DUCT HEATER SHALL BE CONTROLLED BY DDC SYSTEM.
5. PROVIDE DISCONNECT SWITCH.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

48

REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01/05/2023

MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMNTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: MECHANICAL DETAILS

SHEET NUMBER: M6.01

DBR
200 South 10th Street, Suite 901
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TBPE Firm Registration No. 2234

DBR Project Number 218033.005

HA	RT	JR		

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Autodesk Docs://218033.009-Mission CISD-Midkiff ES 115-Indoor Air Quality Improvements/218033.009_MIDKIFF_MEP22.rvt

ABBREVIATIONS

A

A	AMPERES
ABV	ABOVE
AIC	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR, ABOVE COUNTER
ACC	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
AF	AMPERE FUSE, AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPT CAPACITY
AL	ALUMINUM
AM	AMMETER
AMP	AMPLIFIER
ANN	ANNUNICATOR
AP	ACCESS PANEL, ALARM PANEL
ARCH	ARCHITECT, ARCHITECTURAL
ASC	AMPERES SHORT CIRCUIT
AT	AMPERE TRIP RATING
ATS	AUTOMATIC TRANSFER SWITCH
AVG.	AVERAGE
AUX.	AUXILIARY
AWG.	AMERICAN WIRE GAUGE

B

BAS	BUILDING AUTOMATION SYSTEM
BC	BELOW COUNTER
BKR	BREAKER
BLDG.	BUILDING

C

C	CONDUIT, CELSIUS
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CWP	CONDENSER WATER PUMP
CH	CHILLER
CHP	CHILLED WATER PUMP
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTERLINE
CLG.	CEILING
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT.	CONTINUOUS,CONTINUATION
CONTR.	CONTROLLER, CONTRACTOR
CP.	CIRCULATING PUMP
CPUC	CPU CHILLER
CR	CARD READER, CORD REEL
CRU	CONDENSATE RETURN UNIT
CT	CURRENT TRANSFORMER, COOLING TOWER
CTR	CENTER
CU	COPPER

D

dB	DECIBEL
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DR	DROPPED RECEPTACLE
DS	DAYLIGHT SENSOR
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DXFC	DX FAN COIL UNIT
DZ	DAYLIGHT ZONE

E

(E)	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
E.C.	EMPTY CONDUIT
EDF	ELECTRIC DRINKING FOUNTAIN
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMCS	ENERGY MANAGEMENT AND CONTROLS SYSTEM
EMERG	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
ENCL.	ENCLOSURE
ENGR.	ENGINEER
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
(ER)	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WATER HEATER
EXH	EXHAUST

F

F	FAHRENHEIT, FAN, FIRE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FF	FURNITURE FEED
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FLUOR	FLUORESCENT
FP	FIRE PUMP, FAN POWERED
FPTB	FAN POWERED TERMINAL BOX
FRZR	FREEZER
FS	FUSED SWITCH, FLOW SWITCH
FSD	MOTORIZED FIRE SMOKE DAMPER
FT	FOOT, FEET
FTL	FEED-THRU LUGS
FUT	FUTURE
FVNR	FULL-VOLTAGE, NON-REVERSING

G

GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GTD	GENERATOR TRANSFER DEVICE
GUH	GAS UNIT HEATER

H

HACR	HEATING, AIR CONDITIONING RATED CIRCUIT BREAKER
HD	ELECTRIC HAND DRYER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HS	HAND SET
HSC	HAND SCANNER
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HVU	HEATING/ VENTILATING UNIT
HWB	HOT WATER BOILER
HWC	HOT WATER CIRCULATOR
HWP	HEATING WATER PUMP
HZ	HERTZ

I

ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCH
INCAND	INCANDESCENT
INT	INTERNAL, INTERIOR

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
kVA	KILOVOLT-AMPS
kW	KILOWATT
kWH	KILOWATT-HOUR

L

LED	LIGHT EMITTING DIODE
LF	LINEAR FEET
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE TRANSFORMER
LVL	LEVEL

M

M	METER
MAP	MASTER ALARM PANEL
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX.	MAXIMUM
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MECH.	MECHANICAL
MFR	MANUFACTURER
MH	METAL HALIDE
MIC	MICROPHONE
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MV	MERCURY VAPOR

N

N3R	NEMA 3R ENCLOSURE
N4X	NEMA 4X ENCLOSURE
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRICAL
OPG	OPENING

P

P	POLE, PUMP
PB	PUSHBUTTON
PC	PHOTOCELL
PH	PHASE
PL	PILOT LIGHT
PLBG	PLUMBING
PNEU	PNEUMATIC
PNL	PANEL
POS	POINT OF SALE
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PS	PHOTOSENSOR
PVC	POLYVINYL CHLORIDE
PWR	POWER

Q

QTY	QUANTITY

R

R	EXISTING TO BE REMOVED
RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RC	RECONNECT EXISTING DEVICE TO CIRCUIT INDICATED
RCP	REFLECTED CEILING PLAN
RCPT	RECEPTACLE
RE	REFERENCE, REFER
REC	RECEPTACLE
REFR	REFRIGERATOR
REINF	REINFORCING
REL	EXISTING TO BE RELOCATED
RELEX	NEW LOCATION OF RELOCATED EQUIPMENT
REQD	REQUIRED
REV	REVISION, REVISE
RGS	RIGID GALVANIZED STEEL
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE AND REPLACE
RTU	ROOFTOP UNIT

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SCHED	SCHEDULE
SE	SEWAGE EJECTOR
SEC	SECONDARY
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SKVA	STARTING KILOVOLT-AMPS
SKW	STARTING KILOWATTS
SP	SUMP PUMP
SPEC	SPECIFICATION
SPF	STAIR PRESSURIZATION FAN
SPKR	SPEAKER
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
SQ.	SQUARE
SRF	SMOKE REMOVAL FAN
SS	START-STOP PUSH BUTTON
SSSC	SOLID STATE SPEED CONTROL
ST	SHUNT TRIP
STB	STEAM BOILER
STD	STANDARD
STL	STEEL
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD

T

TC	TEMPERATURE CONTROL
TEL	TELEPHONE
TF	TRANSFER FAN
TL	TWIST-LOCK
TOC	TOP OF CURB
TOS	TOP OF STEEL
TP	CHILD TAMPER PROOF DEVICE
TSTAT	THERMOSTAT
TTB	TELEPHONE TERMINAL BOARD
TTC	TELEPHONE TERMINAL CABINET
TU	TERMINAL UNIT
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL

U

UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SYSTEM

V

V	VOLT
VA	VOLT-AMPERE
VAV	VARIABLE AIR VOLUME
VC	VOLUME CONTROL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VP	VACUUM PUMP
VM	VOLT METER

W

W	WATT, WIRE, WIDTH
WG	WIREGUARD
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WS	WATER SOFTENER
WT	WATERTIGHT, WEIGHT
WWF	WELDED WIRE FABRIC
W/FT^2	WATTS PER SQUARE FOOT

X

XFMR	TRANSFORMER

Z

Z	ZONE

ELECTRICAL SYMBOLS

MOTORS AND CONTROLS

- MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE. "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP.
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/80" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
  - "GFCI" DENOTES GROUND FAULT INTERRUPTER,
  - "WP" DENOTES WEATHERPROOF,
  - "IG" DENOTES ISOLATED GROUND,
  - "TP" DENOTES SAFETY TYPE, (TAMPER PROOF)
  - "DR" DENOTES DROPPED RECEPTACLE,
  - "USB" DENOTES RECEPTACLE WITH UNIVERSAL SERIAL BUS,
  - "AC" DENOTES ABOVE COUNTER MOUNTING, SEE
  - "UC" DENOTES UNDER COUNTER MOUNTING, SEE
  - "H" DENOTES HORIZONTALLY ORIENTED RECEPTACLE, SEE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHT.
- R — DUPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- DUPLEX WALL RECEPTACLE ON A CIRCUIT DEDICATED TO DATA PROCESSING, GRAY COLOR. PROVIDE ISOLATED GROUND TYPE RECEPTACLES WHERE NOTED.
- SPLIT WIRED RECEPTACLE, TOP RECEPTACLE SHALL BE SWITCHED ACCORDING TO PLANS, AND BOTTOM SHALL REMAIN UNSWITCHED.
- SP — CONTROLLED DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. "SP" DENOTES SPLIT WIRED
- FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- R — FOURPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- CONTROLLED FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- SPECIAL RECEPTACLE, NEMA CONFIGURATION AS NOTED.
- TWO-GANG FLOOR OUTLET
- THREE-GANG FLOOR OUTLET
- MULTI-OUTLET SURFACE RACEWAY. SEE ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHTS.
- J — JUNCTION BOX.
  - "MD" DENOTES MOTOR DAMPER,
  - "CR" DENOTES CORD REEL,
  - "D" DENOTES DROP CORD RECEPTACLE,
- DUPLEX RECEPTACLE WITH HOMERUN
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- TWO-GANG CEILING OUTLET
- D, R, P — FLUSH ELECTRICAL FLOOR OUTLET, "P" DENOTES POKE-THRU. "D" INDICATES DUPLEX RECEPTACLE, "R" INDICATES RED RECEPTACLE ON EMERGENCY POWER. REFER TO FLOOR BOX SCHEDULE, FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- PP — POWER POLE
- DIRECT CONNECTION TO EQUIPMENT
- P — PULL BOX (OVER 4" SQUARE)
- C (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

- 2' X 4' LIGHTING FIXTURE.
- 2' X 2' LIGHTING FIXTURE.
- 1' X 4' LIGHTING FIXTURE.
- 1' X 2' LIGHTING FIXTURE.
- 1' X 1' LIGHTING FIXTURE.
- STRIP LIGHTING FIXTURES.
- STAGGERED STRIP LIGHTING FIXTURE.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SECURITY WALL PACK
- SITE LIGHTING FIXTURE.
- POST-TOP FIXTURE/ACORN FIXTURE BRACKET ARM INDICATES WALL MOUNT WITH ARM
- EMERGENCY LIGHT FIXTURE WITH BATTERY PACK. PROVIDE WITH UNSWITCHED HOT FOR LOSS OF VOLTAGE AND CHARGING (SAME CIRCUIT AS NORMAL POWER LIGHTING). FIXTURES SHALL BE WIRED IN A MANNER AS TO ALLOW SWITCHING OF FIXTURES WITHOUT DISCHARGING THE EMERGENCY BATTERY. BATTERY PACK IS TO ONLY OPERATE IN THE EVENT OF A POWER OUTAGE.
- EM CIRCUIT — LIGHT FIXTURE ON EMERGENCY BRANCH CIRCUIT, CIRCUIT NUMBER ADJACENT TO FIXTURE INDICATES EMERGENCY CIRCUIT CONNECTED TO FIXTURE. PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL EMERGENCY LIGHTING ORIGINATING FROM THE EMERGENCY CIRCUIT SHOWN.
- NL — EMERGENCY "NIGHT LIGHT" LIGHT FIXTURE. LIGHT FIXTURE IS UNSWITCHED AND INTENDED FOR 24 HOUR OPERATION. FEED VIA UNSWITCHED HOT.
- DAYLIGHT ZONE/PRIMARY DAYLIGHT ZONE
- SECONDARY DAYLIGHT ZONE

RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- CONDUIT UNDERSLAB OR UNDERGROUND
- EM — EMERGENCY CONDUIT
- EXPOSED CONDUIT
- DB — UNDERGROUND CONDUIT, "DB" DENOTES DUCTBANK ENCASED IN CONCRETE
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT TURNED UP
- CONDUIT TURNED DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT:PHASE/NEUTRAL/SWITCH LEG/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES 2# 12, PLUS GROUND, UNLESS NOTED OTHERWISE.
- 1LA-2,4 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON)1LA-6 — PARTIAL CIRCUIT HOMERUN TO PANEL.
- T — COMMUNICATIONS CONDUIT OR CABLE:
  - "C" DENOTES MASTER CLOCK,
  - "CA" DENOTES MASTER CLOCK,
  - "CR" DENOTES CASH REGISTER
  - "D" DENOTES DATA,
  - "FA" DENOTES FIRE ALARM,
  - "I" DENOTES INTERCOM,
  - "OHE" DENOTES OVERHEAD ELECTRICAL LINE.
  - "PA" DENOTES PAGING,
  - "S" DENOTES SECURITY,
  - "T" DENOTES TELEPHONE,
  - "V" DENOTES VIDEO,
- TELECOMMUNICATIONS CABLE TRAY TO BE CONCEALED ABOVE ACCESSABLE CEILING.

ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE
- TERMINAL CABINET (FLUSH/SURFACE MOUNT), TYPE AS NOTED, 24" X 48" X 3-1/2" UNLESS NOTED OTHERWISE.
- BAT — BATTERY/INVERTER UNIT
- LV — LOW VOLTAGE TRANSFORMER.

COMMUNICATIONS

ALL OUTLET BOXES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.
THE FOLLOWING NOTATIONS REFER TO ALL COMMUNICATIONS OUTLETS:
"FAX" DENOTES OUTLET DEDICATED FOR A FAX,
"W" DENOTES WALL PHONE SHALL BE MOUNTED AT 42" A.F.F.
"PAY" DENOTES PAY PHONE SHALL BE MOUNTED 42" A.F.F.

- HS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.
- TV — TV ROUGH-IN: 3-GANG RECESSED TV BOX, CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DELTA.
- INDICATES THE LOCATION OF A NEW TECHNOLOGY WALL OUTLET, PROVIDE DUAL GANG BACK BOX. REFERENCE TECHNOLOGY SHEET FOR CONTENT.
- M W — MICROPHONE FLOOR OUTLET, "W" INDICATES WALL MOUNTED "F" INDICATES FLOOR MOUNTED "H" INDICATES HANGING MOUNTED
- S VC — CEILING MOUNTED SPEAKER. "VC" INDICATES VOLUME CONTROL ON SPEAKER.
- S L — WALL MOUNTED SPEAKER. "L" INDICATED LOCAL SOUND REINFORCEMENT.
- CB — SCHOOL INTERCOMMUNICATION SYSTEM CALL-IN. PUSH BUTTON
- BELL, BUZZER OR CHIME AT 80+ A.F.F.
- VC — VOLUME CONTROL - WALL MOUNTED
- AX W — AUXILIARY INPUT JACK. "W" INDICATES WALL MOUNTED "F" INDICATES FLOOR MOUNTED "H" INDICATES HANGING MOUNTED
- AVO — "HIGH" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- AVI — "LOW" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- C (2) LV — LOW VOLTAGE CLOCK SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

ONE LINE AND RISER DIAGRAMS

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- CL — CIRCUIT BREAKER, RATING AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE. "CL" DENOTES CURRENT LIMITING
- DRAWOUT CIRCUIT BREAKER, RATINGS AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE
- ST — SHUNT TRIP
- GF — GROUND FAULT RELAY
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER
- A 0-2000 — AMMETER, RANGE AS SHOWN
- AS — AMMETER SWITCH
- V 0-600 — VOLTMETER, RANGE AS SHOWN
- VS — VOLTMETER SWITCH
- WH D-15 — WATT-HOUR METER, "D" DENOTES DEMAND REGISTER "15" DENOTES MINUTES OF DEMAND INTERVAL
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- 2.47KV/120V — POTENTIAL TRANSFORMER, RATING AS SHOWN
- GROUND CONNECTION
- LIGHTING ARRESTOR
- G — GENERATOR SET
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- M — ELECTRICAL METER
- SPD — SURGE PROTECTION DEVICE

MISCELLANEOUS

- F — SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- EX.X — DRAWING NOTE REFERENCE
- 1 — STARTER/DISCONNECT SCHEDULE REFERENCE
- 1 — FEEDER SCHEDULE REFERENCE
- LC — LIGHTING CONTACTOR
- TS — TIME SWITCH
- PC — PHOTOCELL
- PUSH BUTTON/DOOR BELL
- TC — TIMECLOCK
- R — RELAY
- SOS — AREA OF RESCUE ASSISTANCE
- B — BELL

FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S # — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE "D" INDICATES DUCT TYPE "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER STROBE / WALL MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- S — FIRE ALARM SPEAKER / WALL MOUNTED
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) WALL MOUNT +80" AFF- 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- REMOTE LED INDICATOR LIGHT

SECURITY

- KP — KEYPAD
- GB — GLASS BREAK SENSOR
- H — HOLD UP BUTTON
- DS — INTERCOM DOOR STATION
- MS — INTERCOM MASTER STATION
- LONG RANGE MOTION DETECTOR
- WALL MOUNTED MOTION DETECTOR
- CEILING MOUNTED MOTION DETECTOR
- IDP — INTRUSION DETECTION PANEL
- DC — DOOR CONTACT
- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — CARD READER
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

SWITCHES & LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON 'LIGHTING CONTROL DEVICE SCHEDULE' LOCATED ON ELECTRICAL SCHEDULES SHEETS

SWITCH ANNOTATION AS FOLLOWS:

- S x a,b,c — TYPE, PER SCHEDULE
  - NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH
  - SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:

- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE
  - CEILING SENSOR
  - WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:

- PC — DIGITAL PHOTOSENSOR
- DS — DAYLIGHT HARVESTING SENSOR

DRAWING/DETAIL REFERENCE KEY

REFER TO DRAWING/DETAIL NUMBER — 1 / E3-2
RE: 1 /E3-2 — SHEET NUMBER

GENERAL NOTES

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

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SHEET TITLE: ELECTRICAL SYMBOL LEGEND

SHEET NUMBER: E0.01

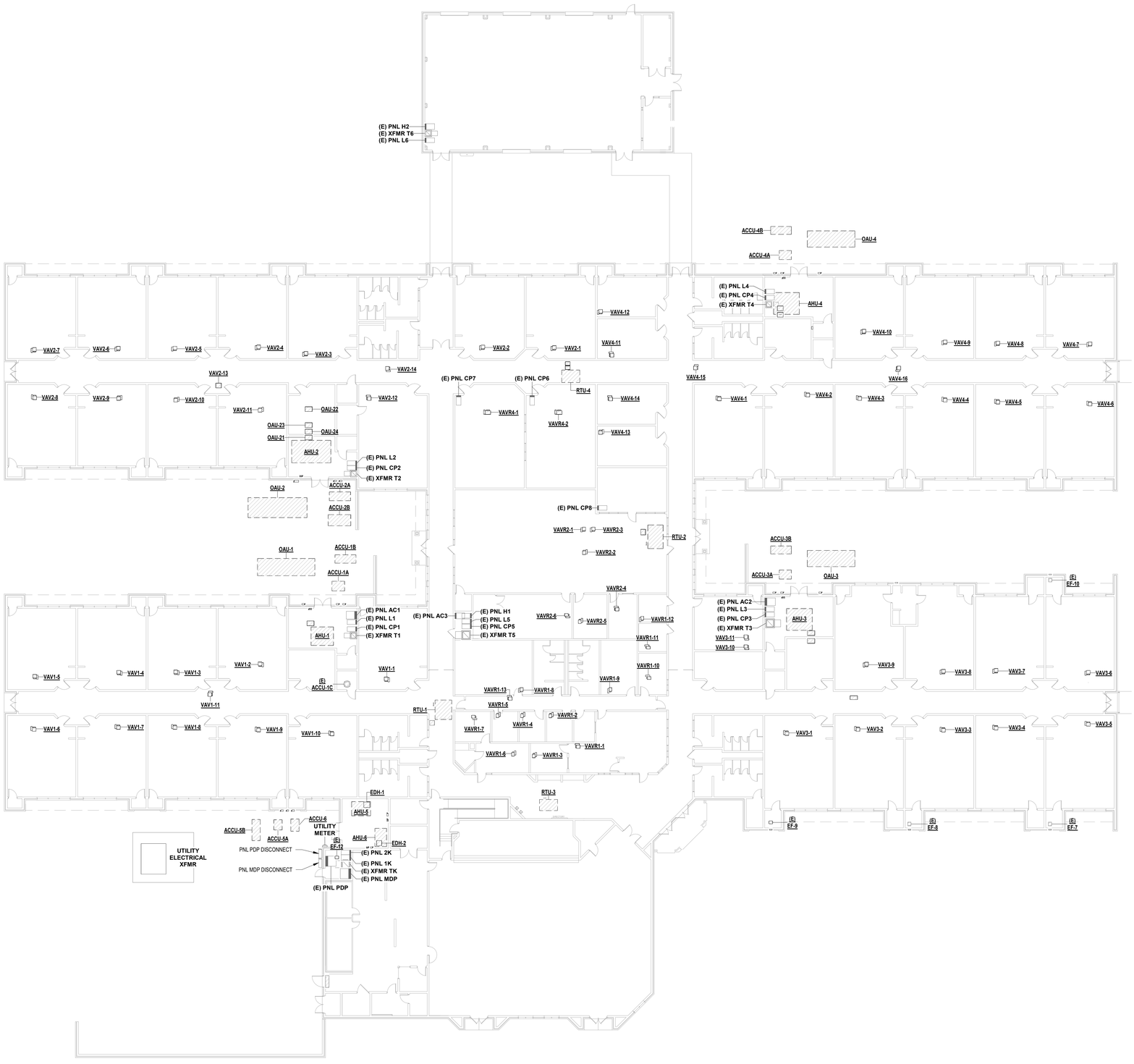
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1 DEMO COMPOSITE ELECTRICAL PLAN

ED2.11 1/16" = 1'-0"

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SHEET TITLE: DEMO COMPOSITE ELECTRICAL PLAN

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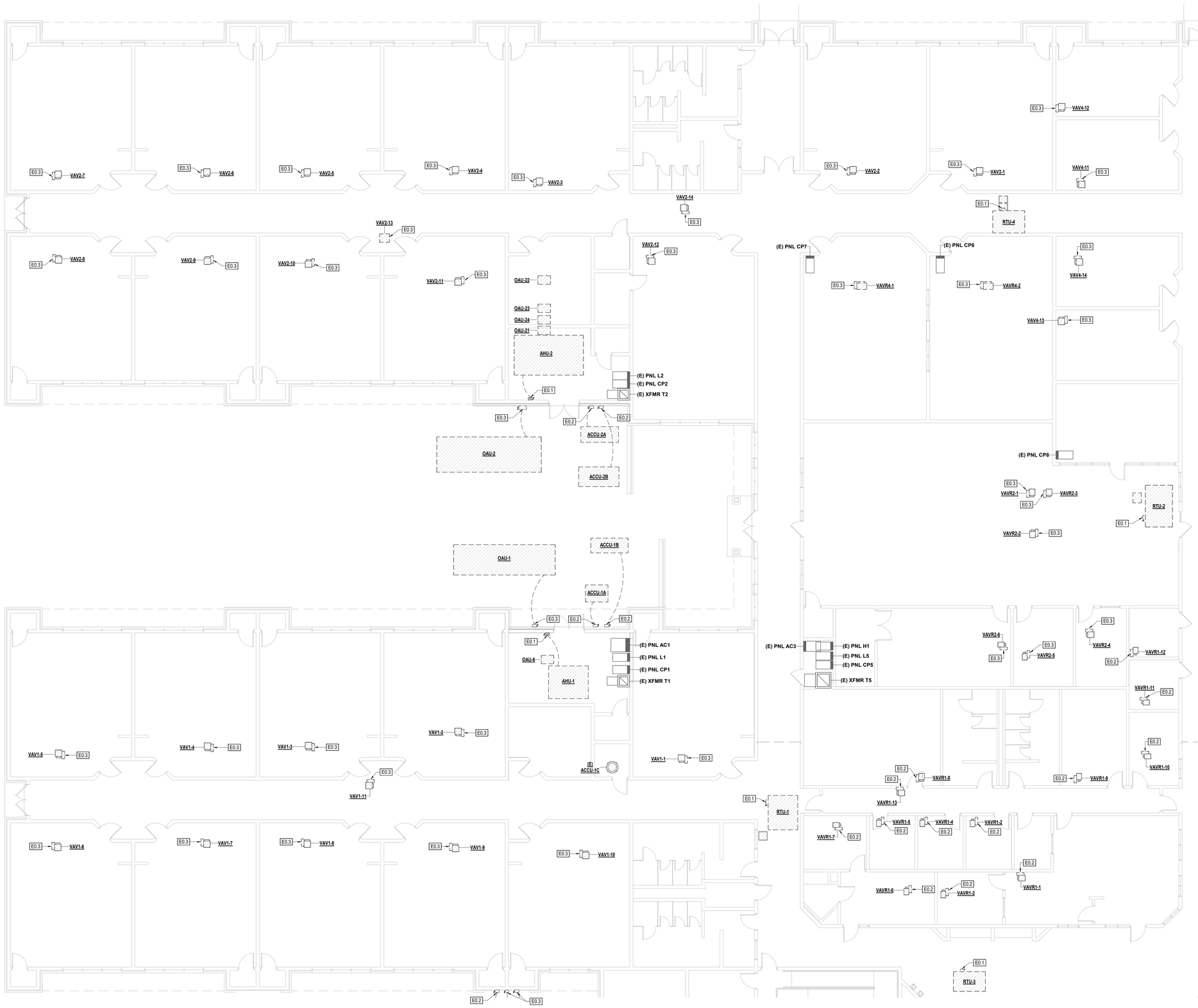
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ELECTRICAL KEYED NOTES

E0.1 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN. EXISTING CONTROL PANEL CIRCUIT AND BYPASS DAMPER CIRCUIT TO REMAIN.

E0.2 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. DEMOLISH EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD.

E0.3 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN.



1 ED2.12 **DEMO ELECTRICAL PLAN - AREA A**
1/8" = 1'-0"

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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA A

SHEET NUMBER: ED2.12

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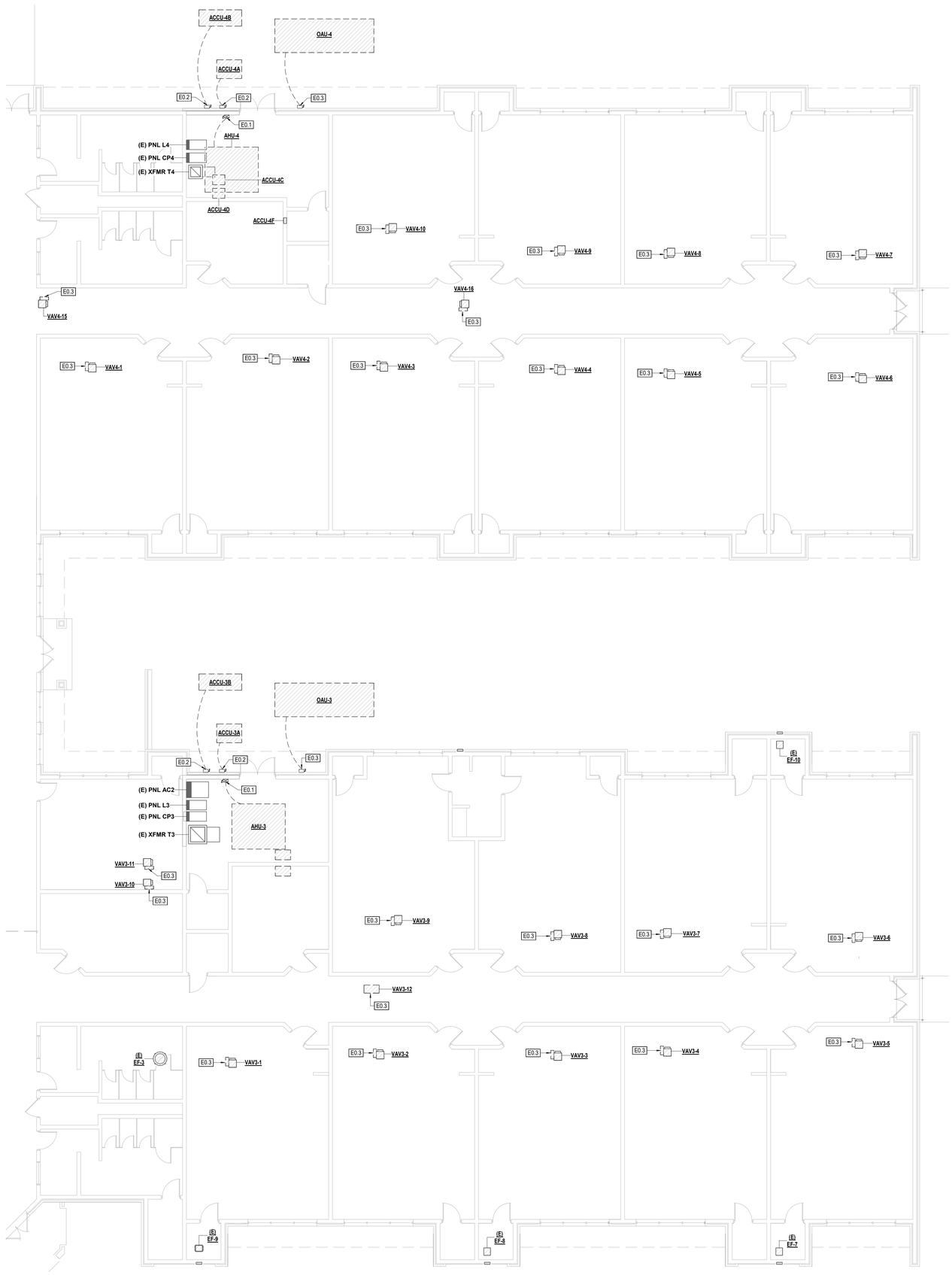
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1 ED2.13 **DEMO ELECTRICAL PLAN - AREA B**
1/8" = 1'-0"

ELECTRICAL KEYED NOTES

E0.1 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN. EXISTING CONTROL PANEL CIRCUIT AND BYPASS DAMPER CIRCUIT TO REMAIN.

E0.2 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. DEMOLISH EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD.

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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA B

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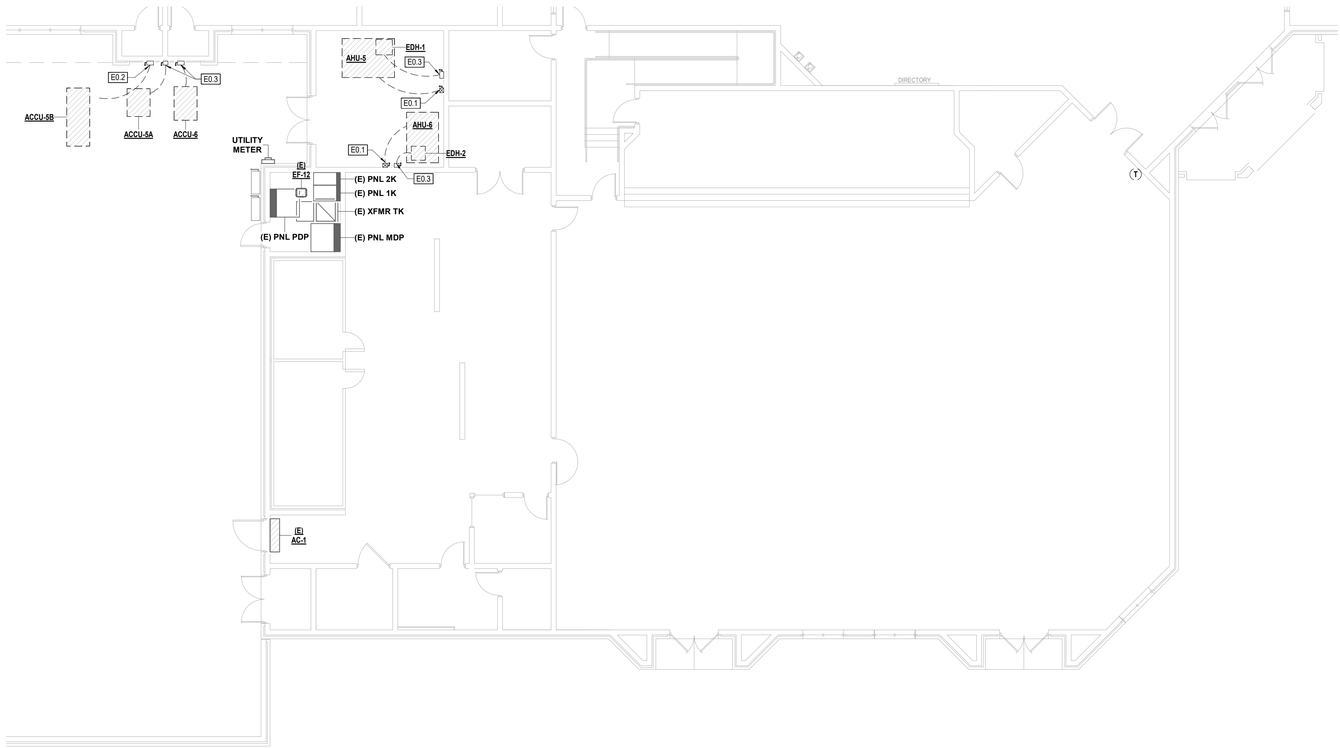
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ELECTRICAL KEYED NOTES

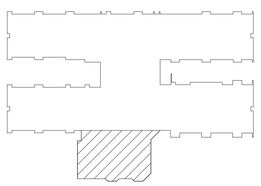
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1 ED2.14 **DEMO ELECTRICAL PLAN - AREA C**
1/8" = 1'-0"



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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA C

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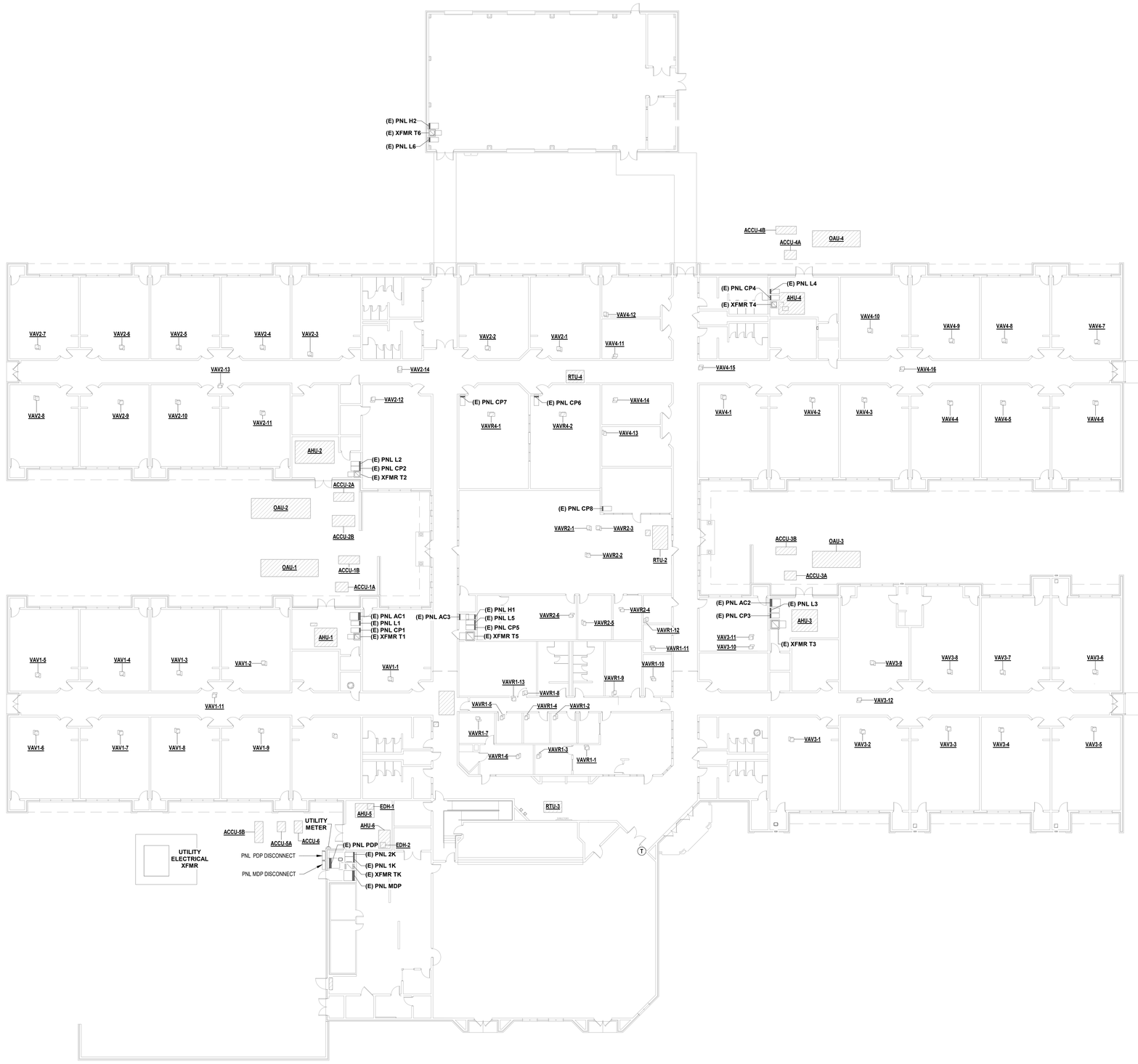
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1 COMPOSITE ELECTRICAL PLAN

E2.11 1/16" = 1'-0"

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SHEET TITLE: COMPOSITE ELECTRICAL PLAN

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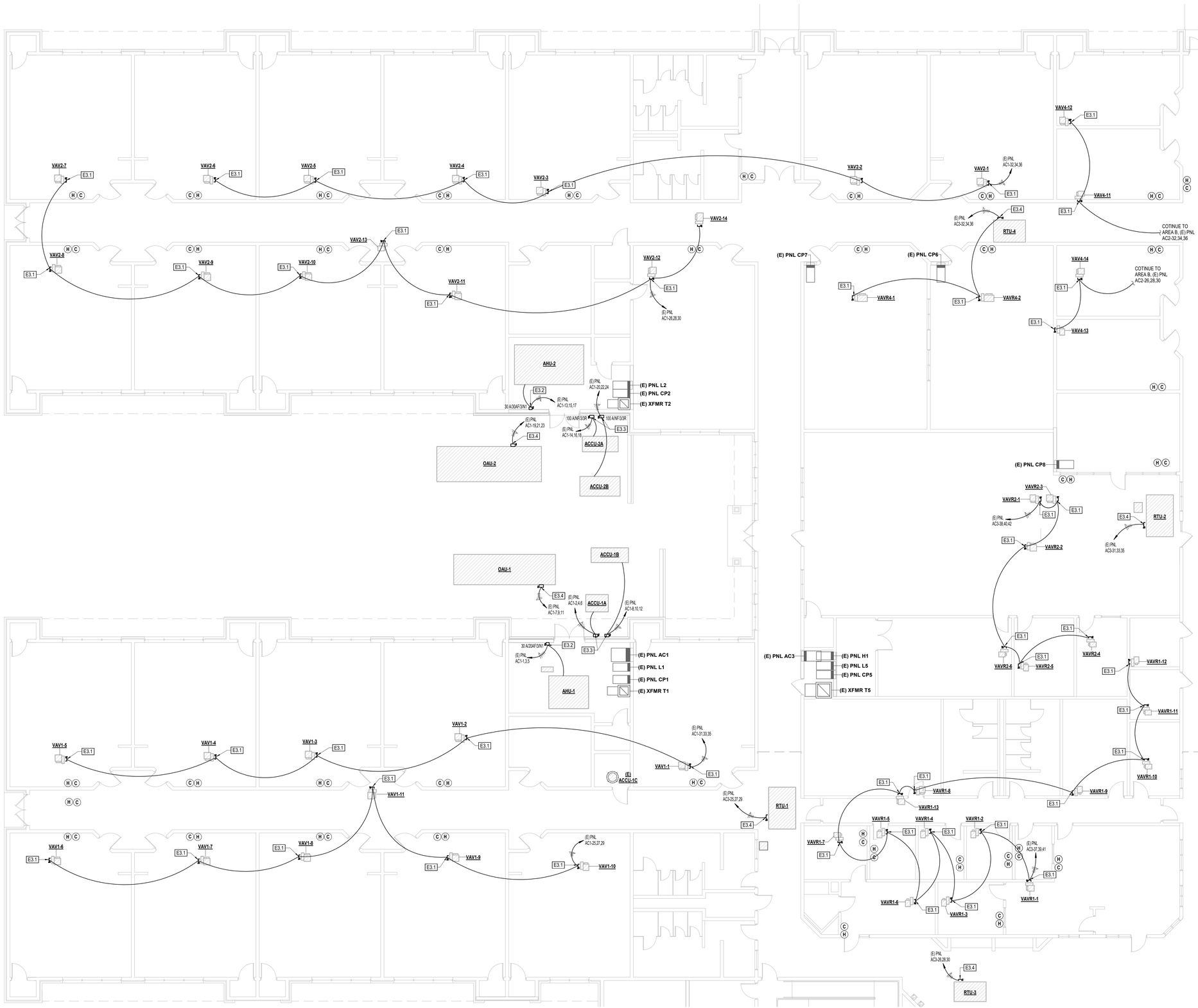
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ELECTRICAL KEYED NOTES

E3.1 CONNECT NEW VAV BOX TO EXISTING CIRCUIT. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO RECONNECT NEW UNIT. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL CONTRACTOR. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

E3.2 CONNECT NEW HVAC EQUIPMENT. PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. RECONNECT TO EXISTING CIRCUIT BACK TO EXISTING BREAKER AT PANEL.

E3.3 CONNECT NEW HVAC EQUIPMENT, PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED WITH NEW FEEDER BACK TO NEW BREAKER AT EXISTING PANEL. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES.

E3.4 CONNECT NEW HVAC EQUIPMENT, PROVIDE NEW ELECTRICAL CONNECTION AS INDICATED. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. RECONNECT TO EXISTING CIRCUIT BACK TO EXISTING BREAKER AT PANEL. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

1 E2.12 **ELECTRICAL PLAN - AREA A**
1/8" = 1'-0"

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SHEET TITLE: ELECTRICAL PLAN - AREA

SHEET NUMBER: E2.12

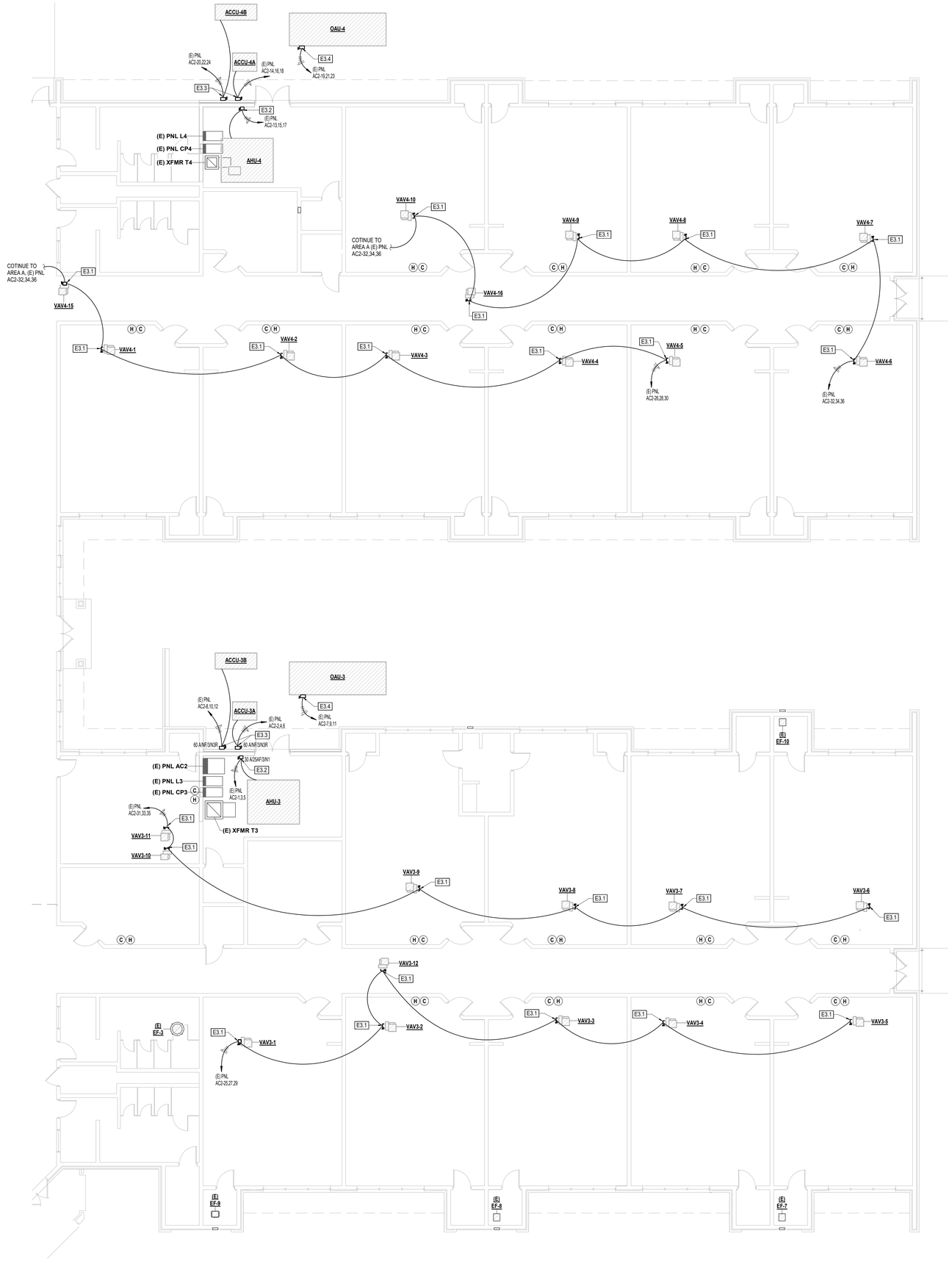
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1 E2.13 **ELECTRICAL PLAN - AREA B**
1/8" = 1'-0"

ELECTRICAL KEYED NOTES

E3.1 CONNECT NEW VAV BOX TO EXISTING CIRCUIT. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO RECONNECT NEW UNIT. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL CONTRACTOR. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

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E3.4 CONNECT NEW HVAC EQUIPMENT, PROVIDE NEW ELECTRICAL CONNECTION AS INDICATED. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. RECONNECT TO EXISTING CIRCUIT BACK TO EXISTING BREAKER AT PANEL. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

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No.	DATE	DESCRIPTION

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STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01/05/2023

MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMNTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: ELECTRICAL PLAN - AREA B

SHEET NUMBER: E2.13

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DBR Project Number 218033.005

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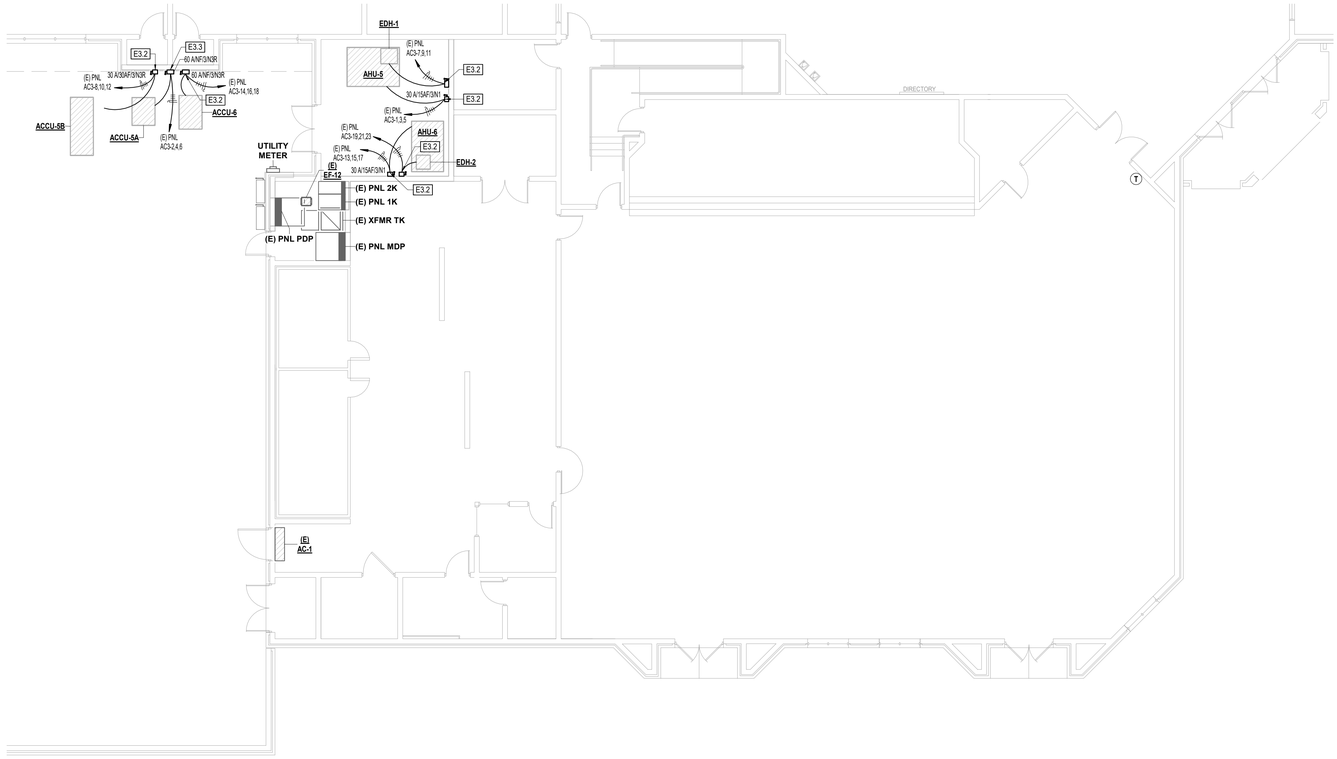
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ELECTRICAL KEYED NOTES

E3.2 CONNECT NEW HVAC EQUIPMENT. PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. RECONNECT TO EXISTING CIRCUIT BACK TO EXISTING BREAKER AT PANEL.

E3.3 CONNECT NEW HVAC EQUIPMENT. PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED WITH NEW FEEDER BACK TO NEW BREAKER AT EXISTING PANEL. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES.



1 E2.14 **ELECTRICAL PLAN - AREA C**
1/8" = 1'-0"

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PROFESSIONAL ENGINEER
01/05/2023

MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: ELECTRICAL PLAN - AREA C

SHEET NUMBER: E2.14

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DBR Project Number 218033.005

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FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#8, 1#10 G.	1"
50A	1	4#6, 1#10 G.	1"
60A	1	4#6, 1#10 G.	1"
70A	1	4#4, 1#8 G.	1 1/4"
80A	1	4#4, 1#8 G.	1 1/4"
90A	1	4#3, 1#8 G.	1 1/4"
100A	1	4#3, 1#8 G.	1 1/4"
125A	1	4#1, 1#6 G.	1 1/2"
150A	1	4#1/0, 1#6 G.	1 1/2"
175A	1	4#2/0, 1#6 G.	2"
200A	1	4#3/0, 1#6 G.	2"
225A	1	4#4/0, 1#4 G.	2 1/2"
250A	1	4#250, 1#4 G.	2 1/2"
300A	1	4#350, 1#4 G.	3"
350A	1	4#500, 1#3 G.	3 1/2"
400A	1	4#600, 1#3 G.	4"
450A	2	4#4/0, 1#2 G.	2 1/2"
500A	2	4#250, 1#2G.	2 1/2"
600A	2	4#350, 1#1G.	3"
700A	2	4#500, 1#1/0G.	4"
800A	2	4#600, 1#1/0G.	4"
1000A	3	4#500, 1#2/0G.	4"
1200A	4	4#350, 1#3/0G.	3"
1600A	4	4#600, 1#4/0G.	4"
	5	4#500, 1#4/0G.	4"
2000A	5	4#600, 1#250 G.	4"
	6	4#500, 1#250 G.	4"
2500A	6	4#600, 1#350 G.	4"
	7	4#500, 1#350 G.	4"
3000A	8	4#500, 1#400 G.	4"
3500A	9	4#600, 1#500 G.	4"
	10	4#500, 1#500 G.	4"
4000A	10	4#600, 1#500 G.	4"
	11	4#500, 1#500 G.	4"
5000A	12	4#600, 1#750 G.	4"
	14	4#500, 1#750 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

Panelboard (E) PNL AC1

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 600 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1 2						
	12720 VA	M	AHU-1	6	60 A	3 4	50 A	8	ACCU-1A	M	24610 VA	1
						5 6						
	59300 VA	M	OAU-1	4	80 A	7 8	50 A	8	ACCU-1B	M	24610 VA	1
						9 10						
						11 12						
	18710 VA	M	AHU-2	4	80 A	13 14	70 A	4	ACCU-2A	M	31925 VA	1
						15 16						
						17 18						
	53475 VA	M	OAU-2	1	110 A	19 20	70 A	4	ACCU-2B	M	31925 VA	1
						21 22						
						23 24						
	28000 VA	M	VAV BOXES (28 KW)	8	45 A	25 26	60 A	6	VAV BOXES (36 KW)	M	44000 VA	
						27 28						
						29 30						
	25000 VA	M	VAV BOXES (25 KW)	8	40 A	31 32	60 A	6	VAV BOXES (39 KW)	M	31000 VA	
						33 34						
						35 36						
	0 VA	--	Space	12	--	37 38	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	39 40	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	41 42	--	12	Space	--	0 VA	

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	385275 VA	100.00%	385275 VA		(SP)Sub Pnl.			
Total Connected Load:		385275 VA	VA =	463 A	Location of Panel:				
Total Load (Diversified):		385275 VA	VA =	463 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

Panelboard (E) PNL AC2

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 600 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1 2						
	15715 VA	M	AHU-3	4	80 A	3 4	50 A	8	ACCU-3A	M	31925 VA	1
						5 6						
	49300 VA	M	OAU-3	4	80 A	7 8	50 A	8	ACCU-3B	M	31925 VA	1
						9 10						
						11 12						
	15715 VA	M	AHU-4	4	80 A	13 14	50 A	8	ACCU-4A	M	31925 VA	1
						15 16						
						17 18						
	50465 VA	M	OAU-4	3	100 A	19 20	50 A	8	ACCU-4B	M	31925 VA	1
						21 22						
						23 24						
	28000 VA	M	VAV BOXES (28 KW)	8	45 A	25 26	50 A	8	VAV BOXES (33 KW)	M	33000 VA	
						27 28						
						29 30						
	29000 VA	M	VAV BOXES (29 KW)	8	45 A	31 32	50 A	8	VAV BOXES (33 KW)	M	33000 VA	
						33 34						
						35 36						
	0 VA	--	Spare	8	40 A	37 38	40 A	8	Spare	--	0 VA	
						39 40						
						41 42						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	381895 VA	100.00%	381895 VA		(SP)Sub Pnl.			
Total Connected Load:		381895 VA	VA =	459 A	Location of Panel:				
Total Load (Diversified):		381895 VA	VA =	459 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

Panelboard (E) PNL AC3

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 400 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1 2						
	6720 VA	M	AHU-5	10	30 A	3 4	50 A	8	ACCU-5A	M	31925 VA	1
						5 6						
	60000 VA	M	EDH-1 (AHU-5 HEATER, 60 KW)	3	90 A	7 8	50 A	8	ACCU-5B	M	15300 VA	
						9 10						
						11 12						
	3725 VA	M	AHU-6	12	20 A	13 14	35 A	8	ACCU-6	M	31925 VA	
						15 16						
						17 18						
	15000 VA	M	EDH-2 (AHU-6 HEATER, 15 KW)	10	30 A	19 20	50 A	8	Spare	--	0 VA	
						21 22						
						23 24						
	23950 VA	M	RTU-1	8	45 A	25 26	15 A	12	RTU-3	M	5990 VA	
						27 28						
						29 30						
	23950 VA	M	RTU-2	8	45 A	31 32	60 A	6	RTU-4 & VAV BOXES	M	33280 VA	
						33 34						
						35 36						
	27000 VA	M	VAV BOXES (RTU-1, 27KW)	8	40 A	37 38	40 A	8	VAV BOXES (RTU-2, 28KW)	M	28000 VA	
						39 40						
						41 42						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	306765 VA	100.00%	306765 VA		(SP)Sub Pnl.			
Total Connected Load:		306765 VA	VA =	369 A	Location of Panel:				
Total Load (Diversified):		306765 VA	VA =	369 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

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PROFESSIONAL ENGINEER
01/05/2023

MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

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CHECKED BY: DBR

PROJECT NUMBER: 218033.005

SHEET TITLE: ELECTRICAL SCHEDULES

SHEET NUMBER: E5.01

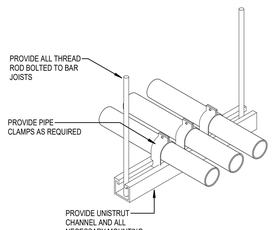
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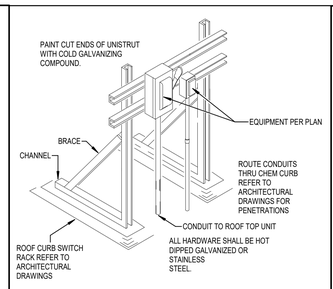
DBR Project Number 218033.005

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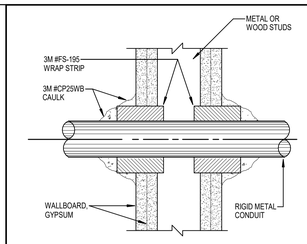
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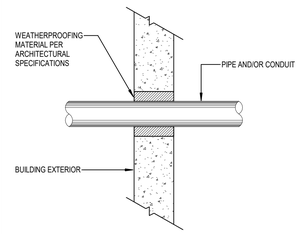
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E10003



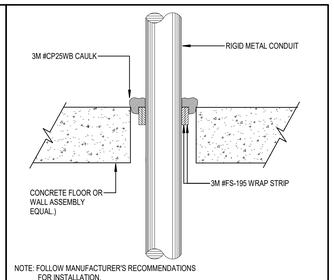
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NOT TO SCALE
E10015



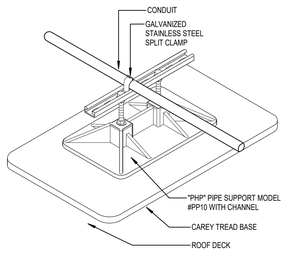
3 2 HR. GYPSUM WALLBOARD PIPE PENETRATION
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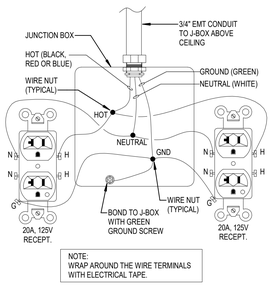
4 PIPE AND/OR CONDUIT PENETRATION
NOT TO SCALE
E10018



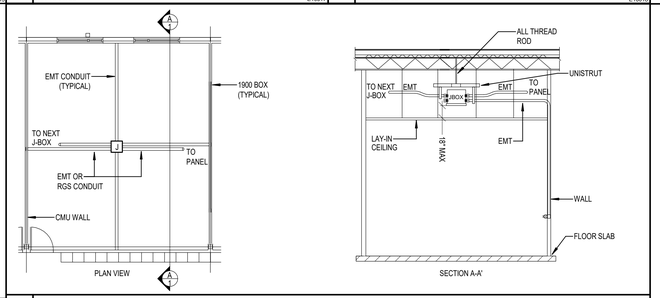
5 2, 3 AND 4 HR. PENETRATIONS FOR CONCRETE
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E10019



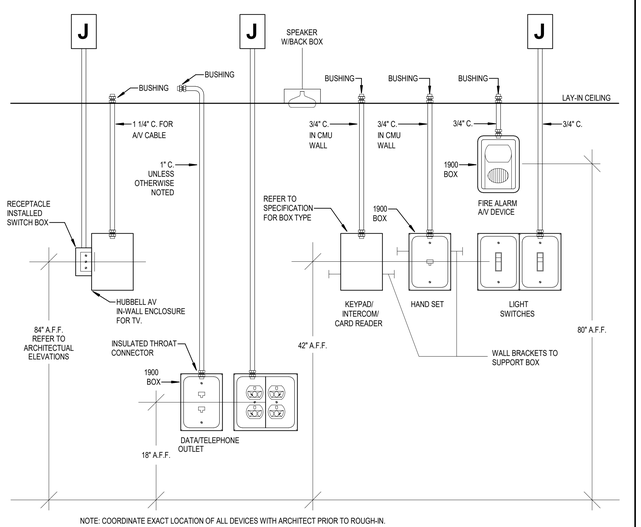
6 ROOF CONDUIT SUPPORT DETAIL
NOT TO SCALE



7 20A,125V. RECEPTACLE WIRING DETAIL
NOT TO SCALE
E13029



8 TYPICAL RACEWAY CONFIGURATION
NOT TO SCALE
E18002



9 TYPICAL DEVICE ELEVATIONS
NOT TO SCALE
E11001

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MISSION CISD - CAVAZOS ES 114 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.005

SHEET TITLE: ELECTRICAL DETAILS

SHEET NUMBER: E6.01

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DBR Project Number 218033.005

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Veronica R. Mendoza	President
Roy Vela	Vice President
Iris Iglesias	Secretary
Petra B. Ramirez	Member
Minnie R. Rodgers	Member
Jerry Zamora	Member
Juan M. Gonzalez	Member

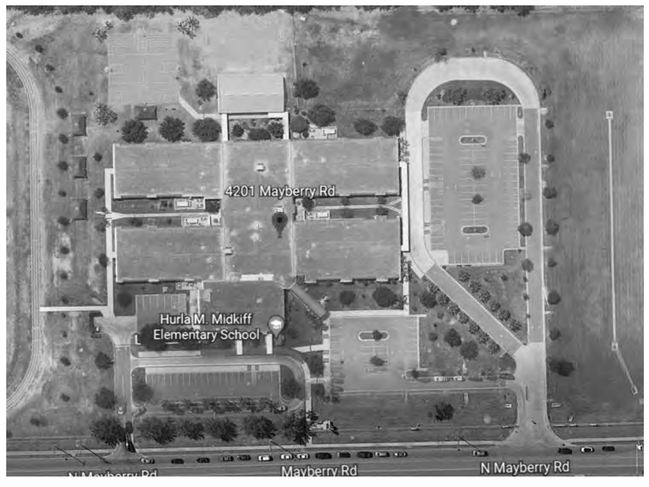
PROJECT TEAM

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LOCATION



4201 Mayberry Rd, Mission, TX 78574

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
G0.01	COVER SHEET
M0.01	MECHANICAL SYMBOL
MD2.11	DEMO COMPOSITE MECHANICAL DEMO PLAN
MD2.12	DEMO MECHANICAL PLAN - AREA A
MD2.13	DEMO MECHANICAL PLAN - AREA B
MD2.14	DEMO MECHANICAL PLAN - AREA C
MD3.01	DEMO MECHANICAL ENLARGED PLANS
M2.11	COMPOSITE MECHANICAL PLANS
M2.12	MECHANICAL PLAN - AREA A
M2.13	MECHANICAL PLAN - AREA B
M2.14	MECHANICAL PLAN - AREA C
M3.01	MECHANICAL ENLARGED PLAN
M4.01	MECHANICAL FLOW DIAGRAMS
M5.01	MECHANICAL SCHEDULES
M6.01	MECHANICAL DETAILS
E0.01	ELECTRICAL SYMBOL LEGEND
ED2.11	DEMO COMPOSITE ELECTRICAL PLAN
ED2.12	DEMO ELECTRICAL PLAN - AREA A
ED2.13	DEMO ELECTRICAL PLAN - AREA B
ED2.14	DEMO ELECTRICAL PLAN - AREA C
E2.11	COMPOSITE ELECTRICAL PLAN
E2.12	ELECTRICAL PLAN A
E2.13	ELECTRICAL PLAN B
E2.14	ELECTRICAL PLAN C
E5.01	ELECTRICAL SCHEDULES
E6.01	ELECTRICAL DETIALS

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SHEET TITLE: COVER SHEET

SHEET NUMBER: G0.01

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ABBREVIATIONS

A

A	AIR (COMPRESSED)
ABV	ABOVE
AC	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AV	ACID VENT, AIR VENT
AVG	AVERAGE
AW	ACID WASTE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

B

B	BOILER
BC	BELOW COUNTER
B/C	BACK OF CURB
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BH	BOX HYDRANT
BLDG	BUILDING
BM	BENCHMARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STRUCTURE
BP	BACKFLOW PREVENTER
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BWV	BACK WATER VALVE

C

C	CELSIUS
CAB	CABINET
CB	CATCH BASIN
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CI	CAST IRON
CIRC	CIRCULATING
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE, CONCENTRIC
COND	CONDENSER, CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS,CONTINUATION
CTR	CENTER
CU	COPPER

D

D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DDMB	DUAL DUCT MIXING BOX
DESIG	DESIGNATION
DTL	DETAIL
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EVAP	EVAPORATOR
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EX	EXPLOSION PROOF
EXT	EXTERNAL
EXTG	EXISTING

F

F	FAHRENHEIT, FIRE
FBO	FURNISHED BY OTHERS
FCO	FLOOR CLEAN OUT
FCS	FLOOR CONTROL STATION
FCU	FAN COIL UNIT
FD	FLOOR DRAIN, FIRE DAMPER
FDC	FIRE DEPARTMENT SIAMESE CONNECTION
FDV	FIRE DEPARTMENT VALVE
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FPTU	FAN POWERED TERMINAL UNIT
FT	FOOT, FEET
FUT	FUTURE

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GND	GROUND
GPM	GALLONS PER MINUTE
GV	GATE VALVE

H

HORIZ	HORIZONTAL
HP	HORSEPOWER
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INFRARED HEATER
IN	INCH
INSUL	INSULATION
INT	INTERNAL, INTERIOR
INV	INVERT
IW	INDIRECT WASTE

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
KVA	KILOVOLT- AMPS
KW	KILOWATT

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LVL	LEVEL
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE

M

MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND OF BTU'S
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MP	MEDIUM PRESSURE
MS	MOP SINK
MTD	MOUNTED
MU	MAKE-UP
MVD	MANUAL VOLUME DAMPER
MSAH	MINI-SPLIT AIR HANDLER
MSCU	MINI-SPLIT CONDENSING UNIT

N

N.C.	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OFCU	OUTSIDE AIR FAN COIL UNIT
OPG	OPENING
OS&Y	OPEN STEM AND YOLK

P

PG	PRESSURE GAUGE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILLE
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	REFERENCE, REFER
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAN	SANITARY SEWER
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SD	STORM DRAIN
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SK	SINK
SM	SHEETMETAL
SP	STATIC PRESSURE, SUMP PUMP
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	SERVICE SINK
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT
SW	SOFT WATER

T

TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CORNEAL COMPRESSOR
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TH BLK	THRUST BLOCK
THERM	THERMOMETER
TMV	THERMOSTATIC MIXING VALVE
TP	TRAP PRIMER
TPD	TRAP PRIMER DEVICE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TW	TEMPERED HOT WATER
TYP	TYPICAL

U

U	URINAL
UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V

V	VOLT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VR	VARIABLE AIR VOLUME REHEAT
VTR	VENT THRU ROOF

W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WH	WALL HYDRANT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WWF	WELDED WIRE FABRIC

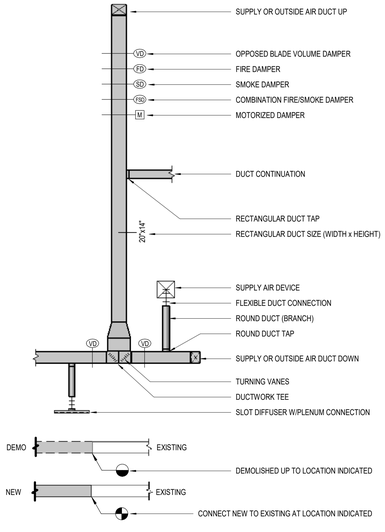
Y

Y	YARD HYDRANT

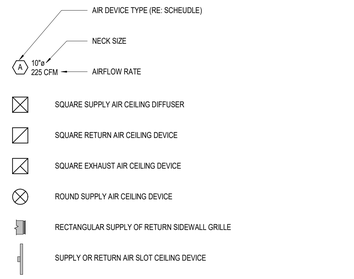
Z

Z	ZONE

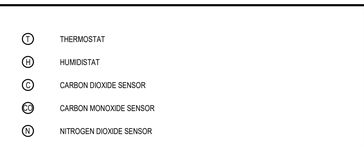
DUCTWORK



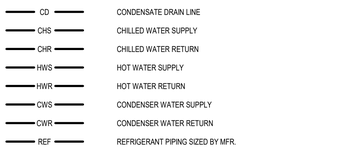
AIR DEVICE TYPES



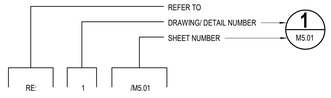
WALL MOUNTED SENSOR TYPES



PIPING TYPES



DRAWING/DETAIL REFERENCE KEY



MECHANICAL GENERAL NOTES

1. PIPING AND DUCTWORK SHOWN ON PLANS ARE SCHEMATIC ONLY. COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATIONS.
2. EXACT LOCATIONS OF EQUIPMENT, GRILLES, AND DAMPERS SHALL BE FIELD COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS AND ALLOW ADEQUATE CLEARANCES.
3. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER DRAWINGS AND CUTSHEETS BEFORE FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS.
4. SHEET METAL INLET DUCTS TO VAV TERMINAL UNITS SHALL BE SAME SIZE AS THE BOX INLET SIZE. PROVIDE RIGID ROUND DUCT THAT IS ONE SIZE LARGER THAN THE INLET BOX SIZE IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE VAV BOX IS MORE THAN 6'-0".
5. PROVIDE CONICAL SPIN-IN CONNECTOR FOR ALL ROUND DUCT CONNECTIONS TO VAV TERMINAL UNITS.
6. INSTALL EQUIPMENT TO ENSURE ACCESS PANELS ARE NOT BLOCKED. ACCESS FOR SERVICE MUST BE PROVIDED.
7. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS.
8. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS.
9. PROVIDE RECTANGULAR BRANCH DUCT TAP FOR ALL RECTANGULAR DUCT CONNECTIONS TO RECTANGULAR DUCT TRUNKS.
10. ALL DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION.
11. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATION 23 07 13 DUCT INSULATION FOR FURTHER INFORMATION AND ADDITIONAL REQUIREMENTS.
12. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATION 23 31 13 METAL DUCTWORK FOR FURTHER INFORMATION.
13. ALL EXPOSED DUCTWORK AND PIPING WITH ASSOCIATED ACCESSORIES IN AREAS WITH NO CEILING OR PARTIAL CEILING SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR.
14. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO ACTUAL INSTALLATION OF TEMPERATURE SENSORS AND HUMIDITY SENSORS.
15. PROVIDE REMOTE SPIN-IN DAMPER OPERATOR FOR SPIN-IN CONNECTIONS AND VOLUME DAMPERS LOCATED OVER GYPSUM CEILINGS.
16. PROVIDE AIRFOIL TYPE TURNING VANES IN ALL 90 DEGREE ELBOWS.
17. PROVIDE INSULATED ACCESS DOORS FOR DUCTWORK DOWNSTREAM OF AIR HANDLING UNITS AT EVERY 20'-0" TO FACILITATE DUCT CLEANING. PROVIDE ACCESS DOORS WITHIN 5'-0" OF EACH ELBOW.
18. COORDINATE LOCATIONS OF FLOOR AND WALL OPENINGS WITH ARCHITECT AND STRUCTURAL ENGINEER.
19. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE. CONTRACTOR SHALL COORDINATE COLOR WITH ARCHITECT.
20. NO PIPE HANGERS SHALL BE SPACED MORE THAN 10'-0" O.C. COMPLY WITH PIPE SPACING AS SPECIFIED IN THE PIPING SUPPORT SPECIFICATIONS.
21. ALL PIPING LOCATED INSIDE BUILDING SHALL BE SUPPORTED FROM THE STRUCTURE WITH SADDLE OR TRAPEZE HANGERS WITH ADJUSTABLE CLEVIS OR THREADED RODS.
22. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL OUTSIDE AIR INTAKES TO MAINTAIN 15 FEET DISTANCE BETWEEN OUTSIDE AIR INTAKES AND ANY EXHAUST AIR OUTLET, FLUES OR PLUMBING VENTS.
23. MECHANICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR ALL CONDENSATE DRAIN PIPES CONNECTING TO A SINK DRAIN TAIL PIECE.
24. ALL KITCHEN GREASE EXHAUST DUCTWORK SHALL BE CONTINUOUSLY WELDED 16 GA. CARBON STEEL. ALL GREASE EXHAUST DUCTS SHALL BE WRAPPED WITH 3M 2 HR. FIRE RATED WRAP OR INSTALLED WITHIN A FIRE RATED ENCLOSURE.

CONTROLS SCHEMATIC SYMBOLS LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL/BINARY INPUT
DO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

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MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

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PROJECT NUMBER 218033.009

SHEET TITLE: MECHANICAL SYMBOL LEGEND

SHEET NUMBER: M0.01

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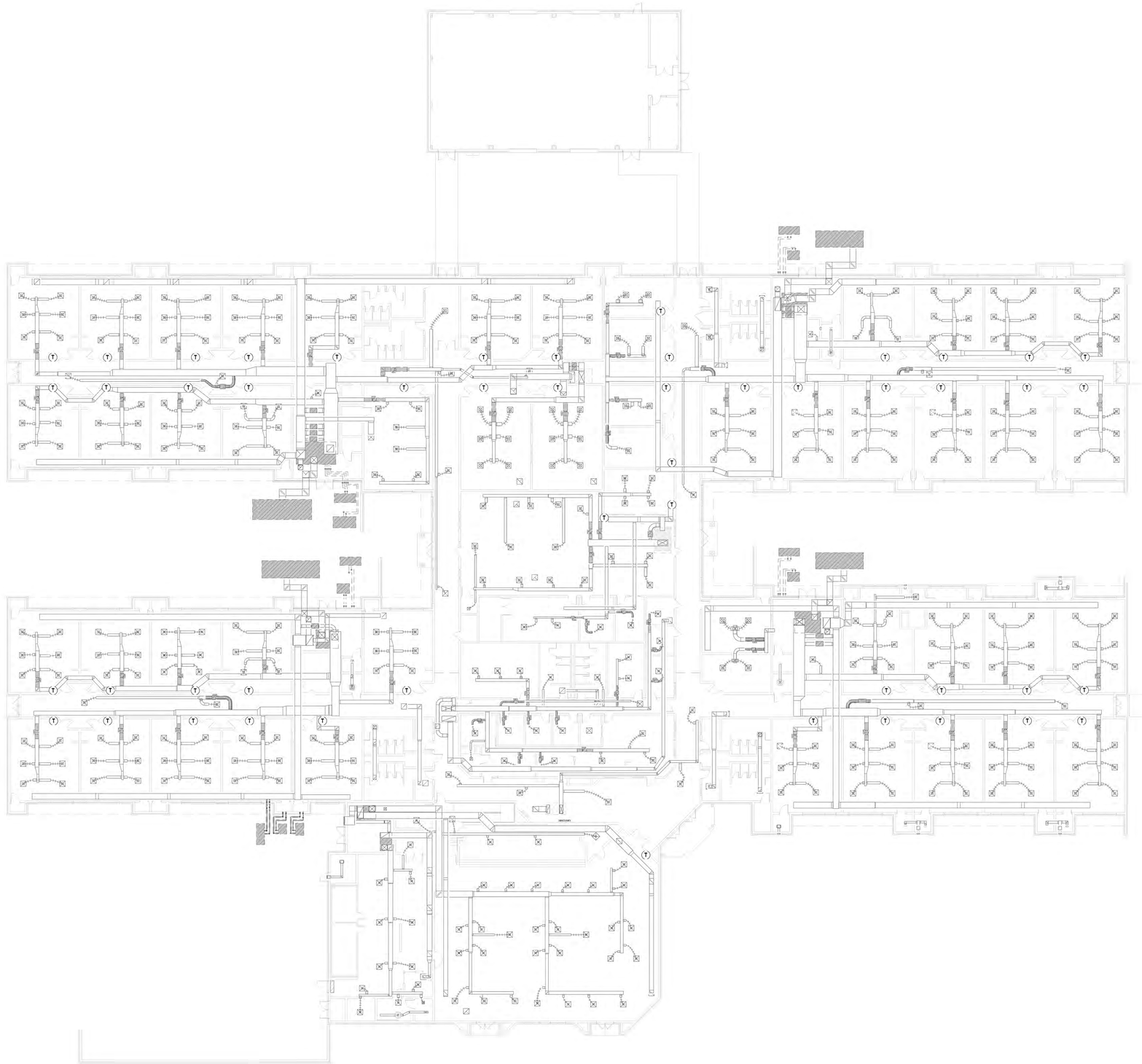
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1 MD2.11 **DEMO COMPOSITE MECHANICAL PLAN**
1/16" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL DEMO KEYED NOTES

1 DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.

2 DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.

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STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01-05-2023

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DATE: 01/05/2023

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PROJECT NUMBER 218033.009

SHEET TITLE: DEMO COMPOSITE MECHANICAL PLAN

SHEET NUMBER: MD2.11

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MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

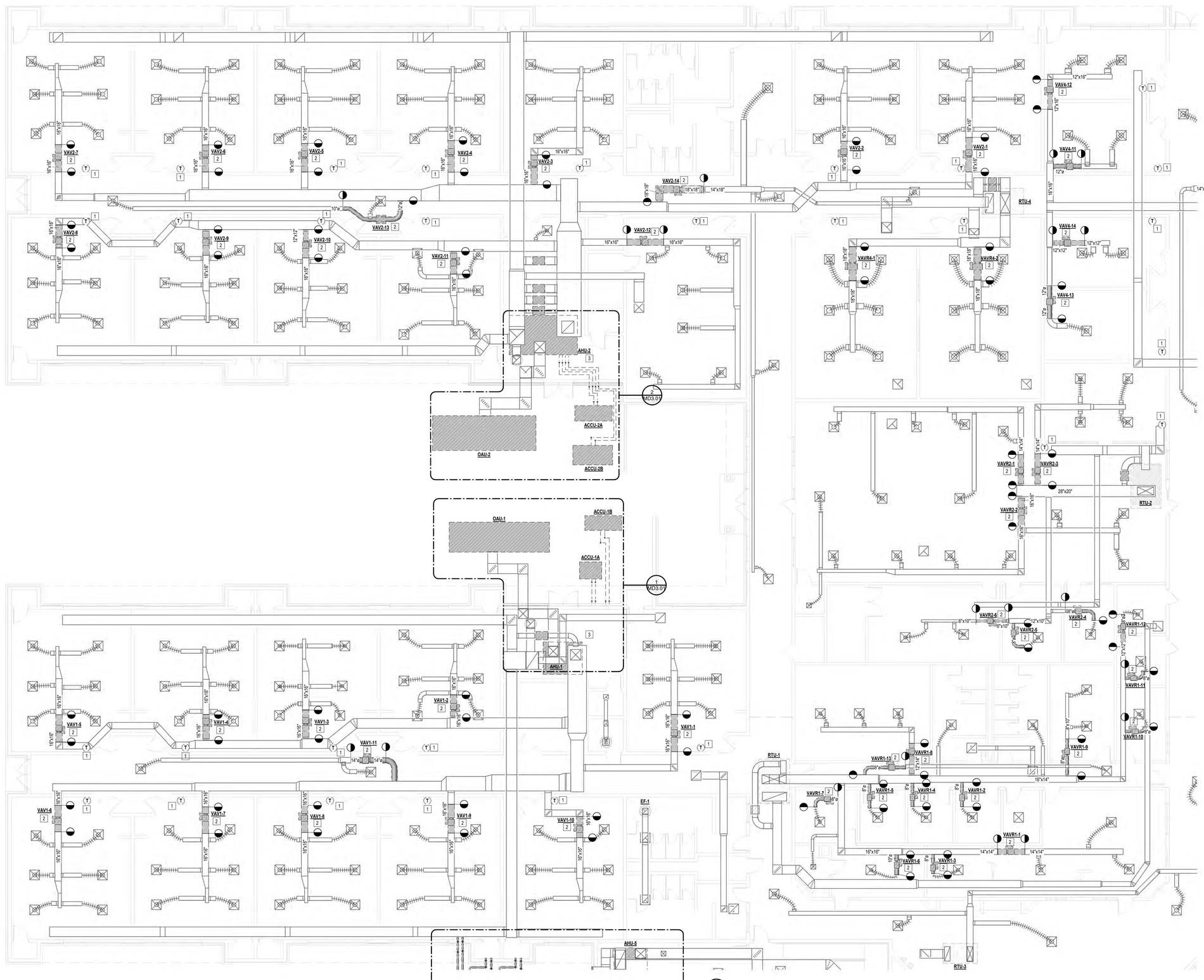
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MECHANICAL DEMO KEYED NOTES

1. DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.
2. DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.



1 MD2.12 **DEMO MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

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01-05-2023

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SHEET TITLE: DEMO MECHANICAL PLAN - AREA A

SHEET NUMBER: MD2.12

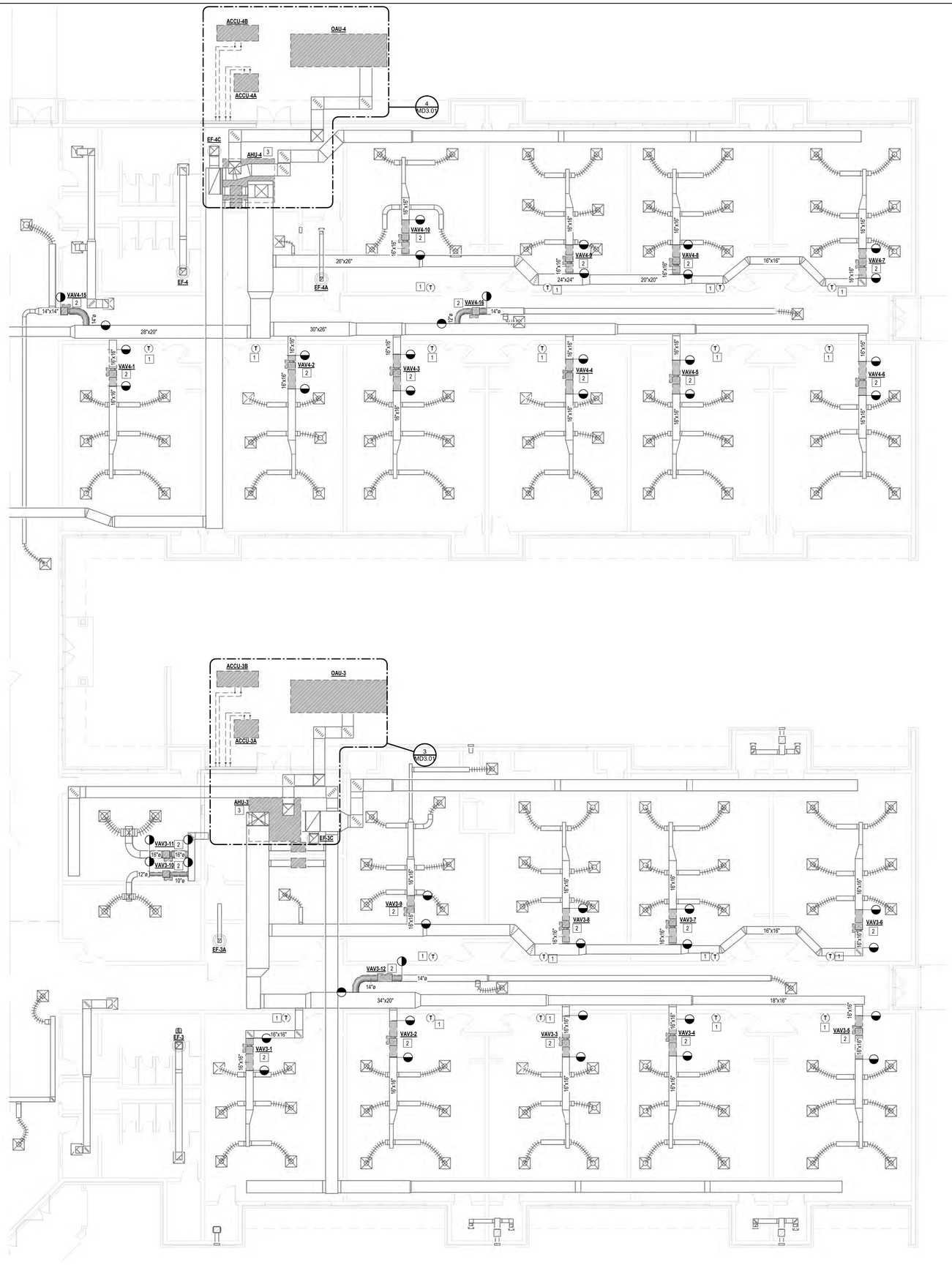
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1 MD2.13 **DEMO MECHANICAL PLAN - AREA B**
1/8" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL DEMO KEYED NOTES

1 DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.

2 DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.

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DEMO MECHANICAL PLAN - AREA B

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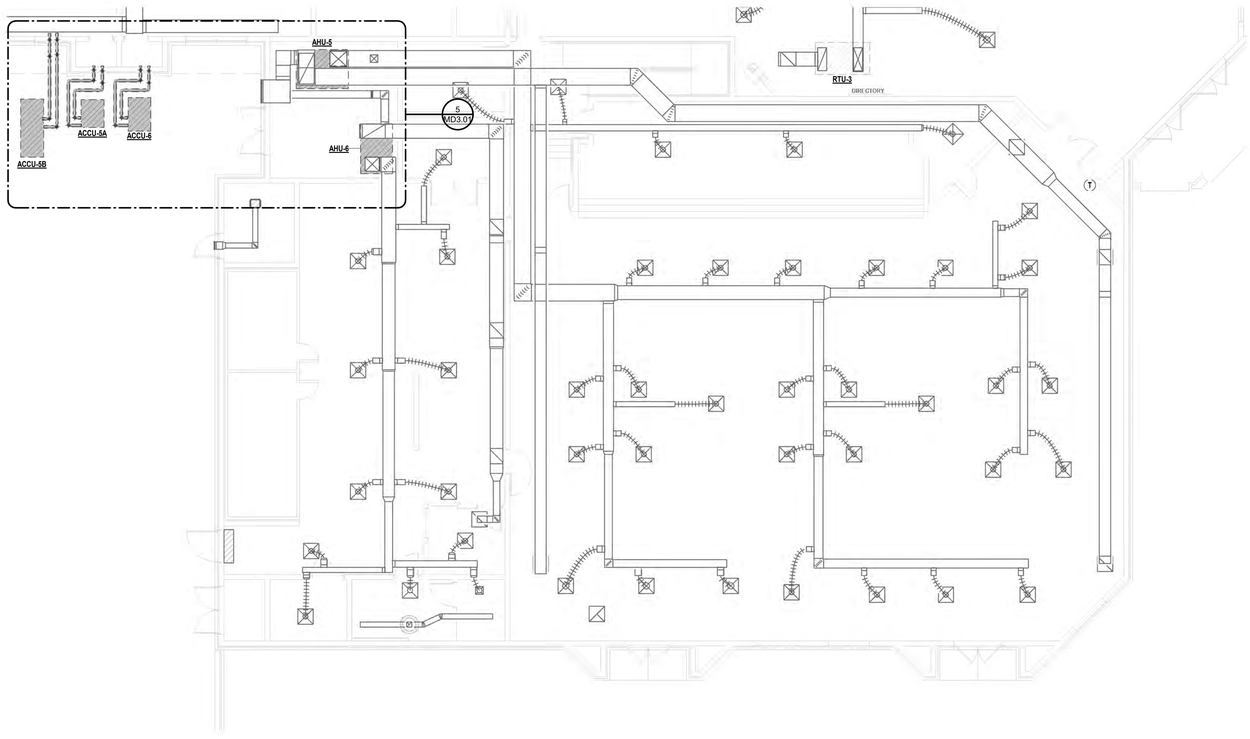
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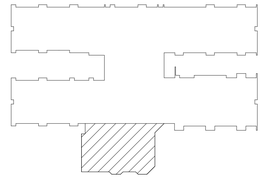
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MECHANICAL KEYED NOTES



1 MD2.14 **DEMO MECHANICAL PLAN - AREA C**
1/8" = 1'-0"



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SHEET TITLE: DEMO MECHANICAL PLAN - AREA C

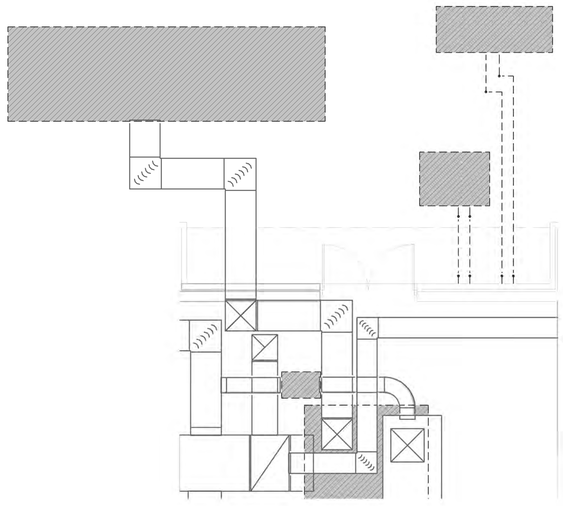
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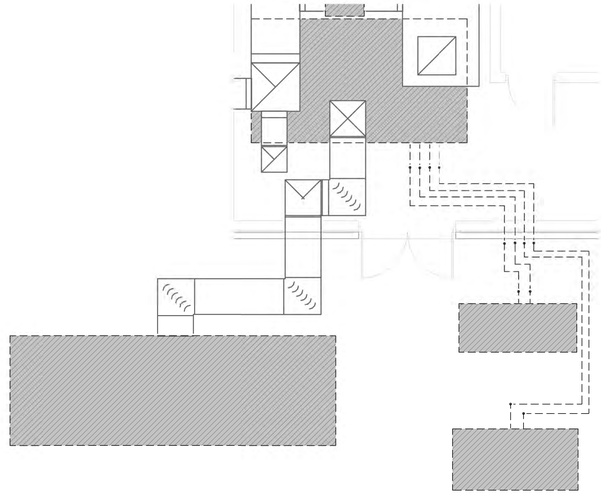
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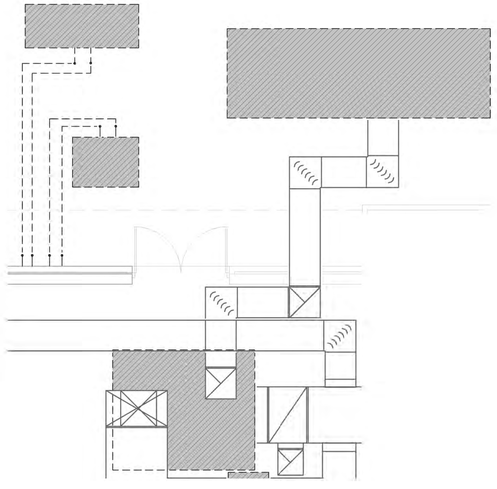
1 MD3.01 **DEMO MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



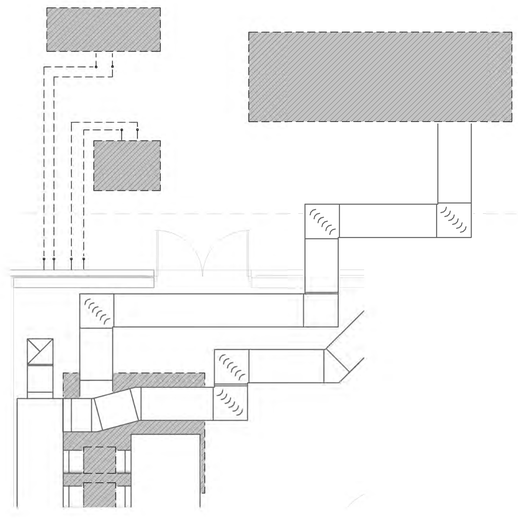
2 MD3.01 **DEMO MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"

MECHANICAL GENERAL NOTES

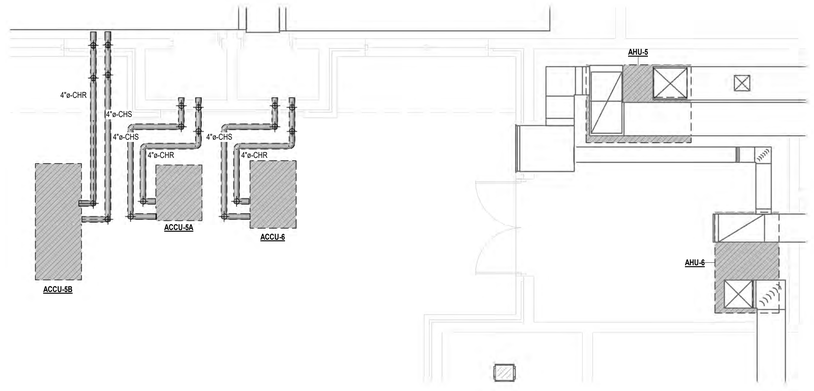
A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.



3 MD3.01 **DEMO MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"



4 MD3.01 **DEMO MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"



5 MD3.01 **DEMO MECHANICAL PLAN - AHU-5-6**
1/4" = 1'-0"

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SHEET TITLE:

DEMO MECHANICAL ENLARGE PLAN

SHEET NUMBER:

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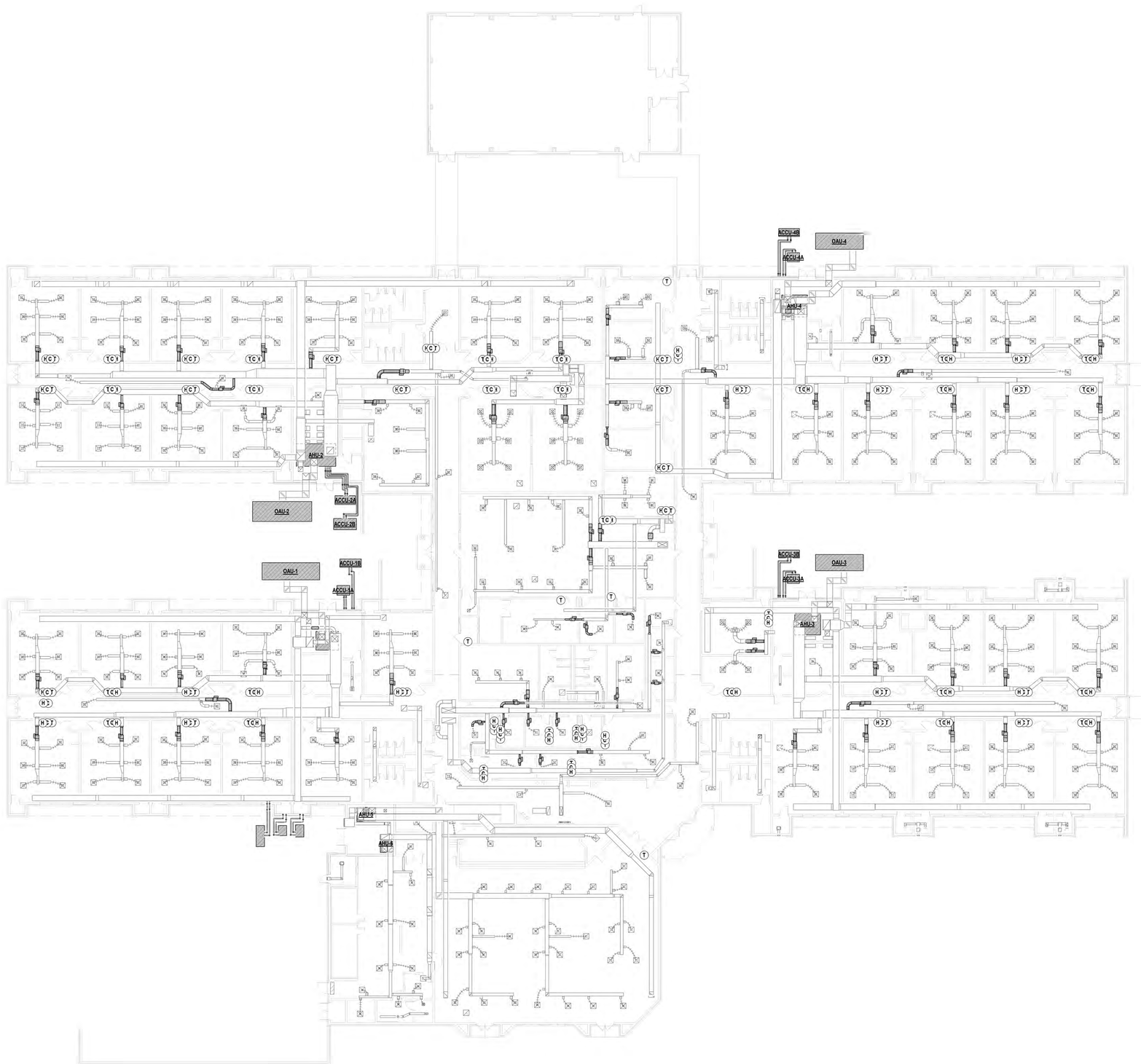
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MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL GENERAL NOTES

1. APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.
2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.



1 M2.11 **COMPOSITE MECHANICAL PLAN**
1/16" = 1'-0"

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SHEET TITLE: COMPOSITE MECHANICAL PLAN

SHEET NUMBER: M2.11

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MECHANICAL GENERAL NOTES

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2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

1 M2.12 **MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

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SHEET TITLE: MECHANICAL PLAN - AREA A

SHEET NUMBER: M2.12

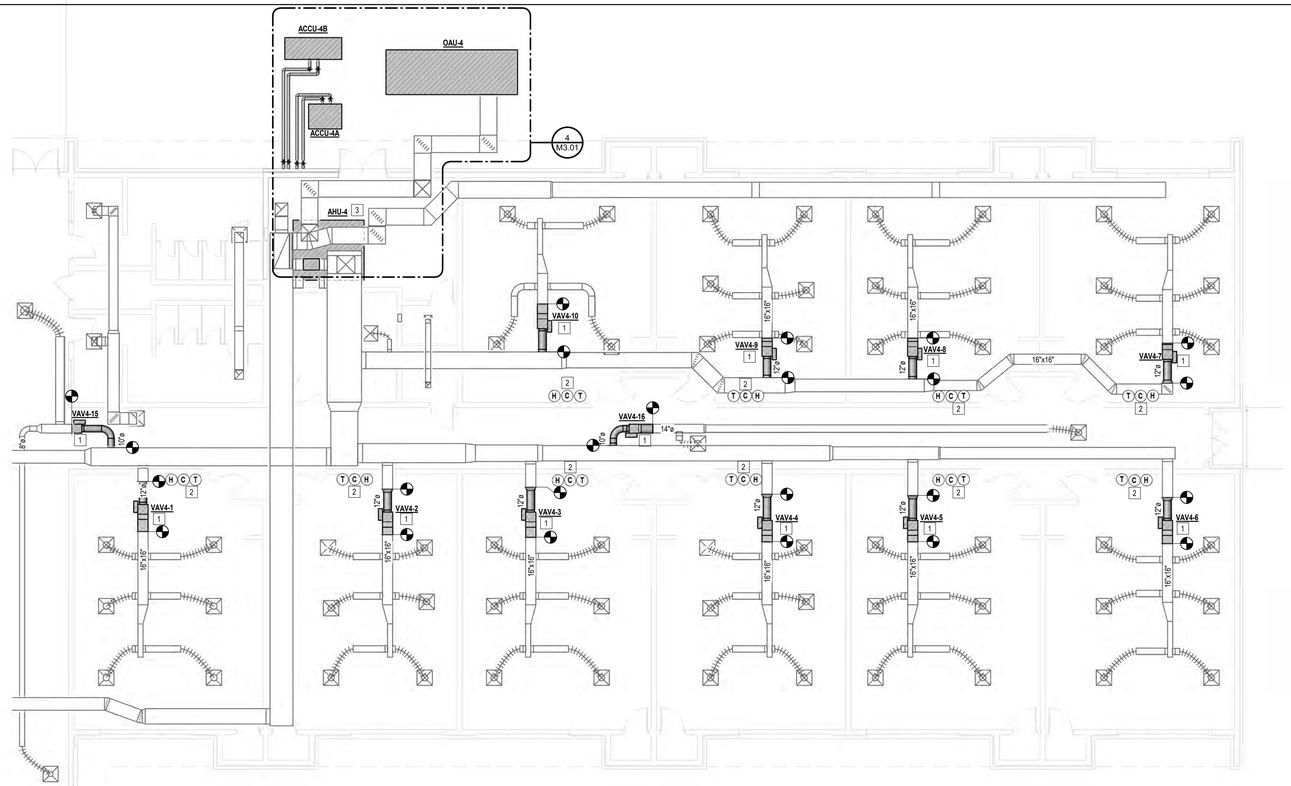
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MECHANICAL GENERAL NOTES

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#MECHANICAL KEYED NOTES

1. APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.
2. NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.
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1 M2.13 **MECHANICAL PLAN - AREA B**
1/8" = 1'-0"

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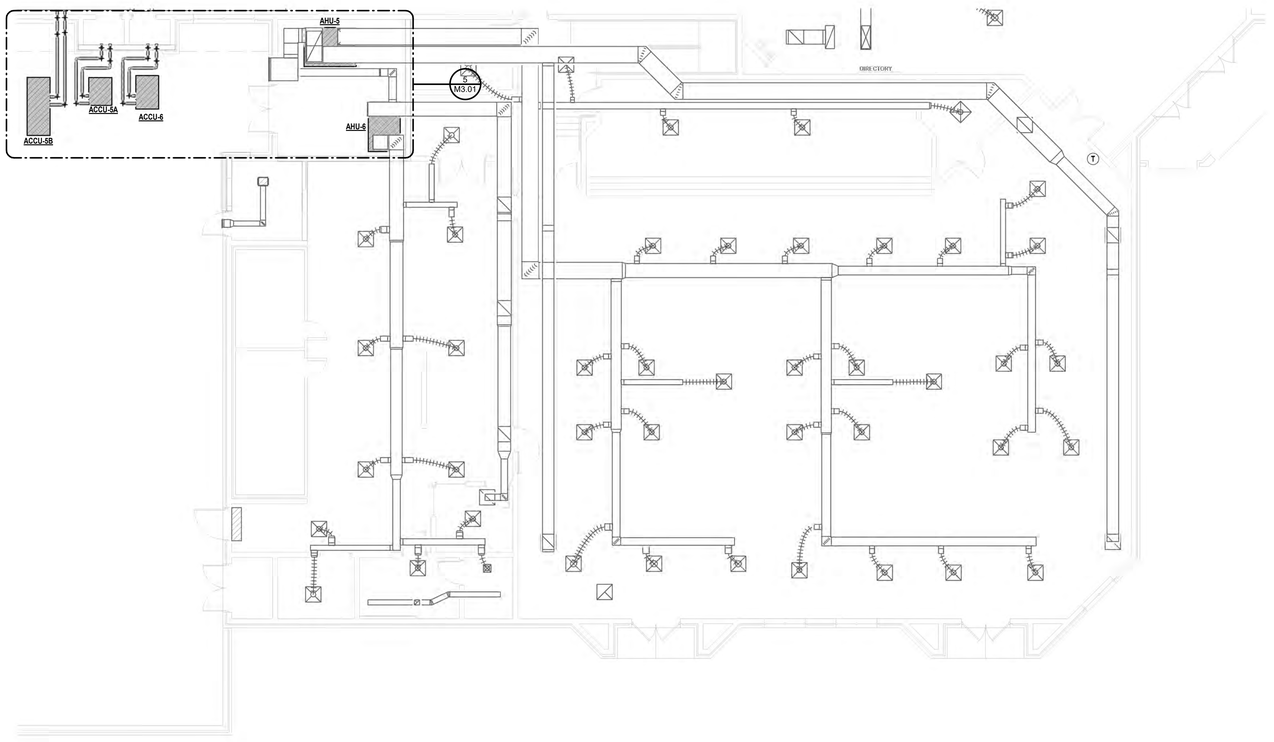
MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

#MECHANICAL KEYED NOTES

1 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

2 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.



1 M2.14 **MECHANICAL PLAN - AREA C**
1/8" = 1'-0"

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SHEET TITLE: MECHANICAL PLAN - AREA C

SHEET NUMBER: M2.14

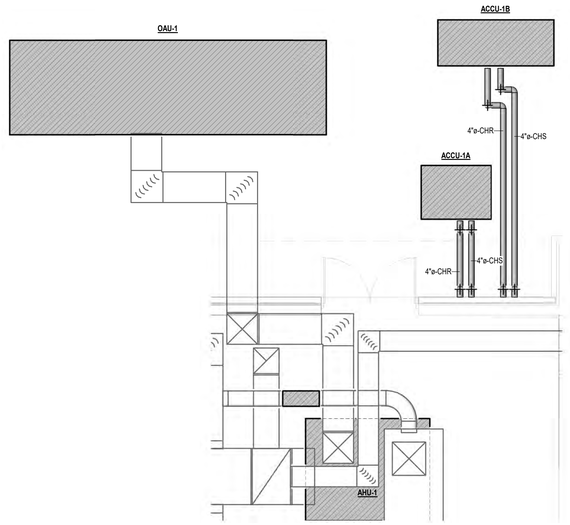
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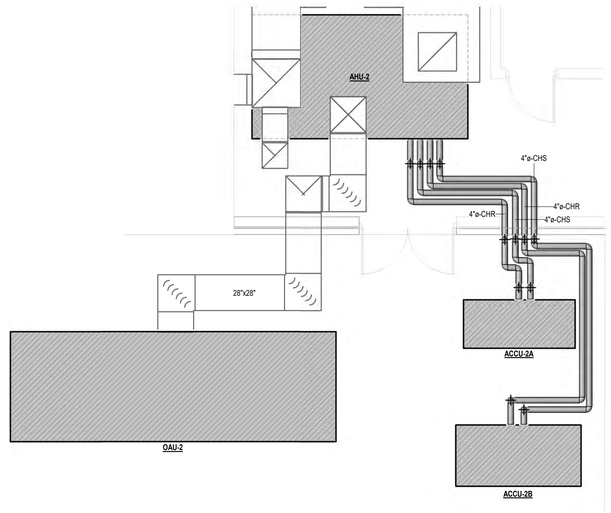
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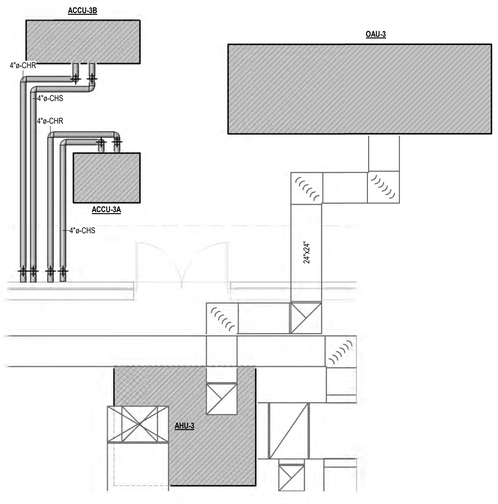
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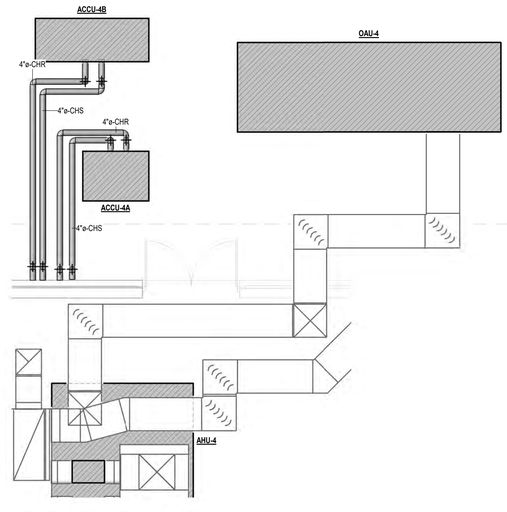
1 M3.01 **MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



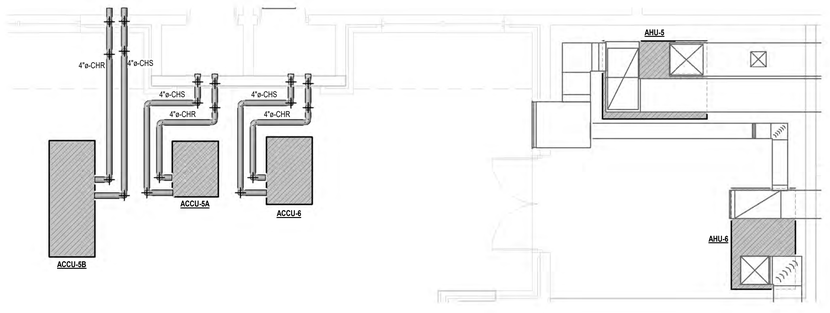
2 M3.01 **MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"



3 M3.01 **MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"



4 M3.01 **MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"



5 M3.01 **MECHANICAL PLAN - AHU-5-6**
1/4" = 1'-0"

MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

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SHEET NUMBER:

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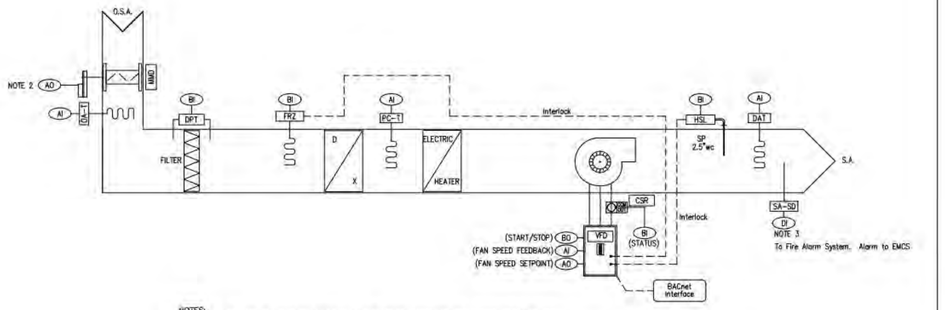
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NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Damper provided and installed by mechanical contractor, wired by mechanical contractor, and controlled thru EMCS.
3. Wire to fire alarm system. Alarm to EMCS. Duct smoke detectors provided by fire alarm contractor and installed be mechanical contractor. Existing duct smoke detectors may be re-used where possible.

System Off - When the system is off:
The outside air damper shall be closed.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its maximum scheduled flow. The speed of the fan shall remain constant.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured and balanced by TAB Contractor.

The outside air temperature shall determine whether the unit is in HEATING, COOLING, OR DEHUMIDIFICATION.

A. When outside air is 72°F or above, unit shall enter COOLING mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor e as required to provide a 55°F coil discharge air temperature. The hot water coil control valve shall then modulate to provide a supply air temperature of 65°F.

B. When outside air temperature is greater than 55°F and less than 72°F, unit shall operate in DEHUMIDIFICATION mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor as required to provide 55°F coil discharge air temperature. The heating coil shall then modulate to provide a supply air temperature of 65°F.

C. When outside air temperature is below 55°F, unit shall operate in HEATING mode. In this mode, supply fan shall be running, cooling shall be disabled, and heating coil shall modulate to provide a 65°F supply air temperature.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.

The heating coil discharge air temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 48°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 65°F (adj) with a high-limit alarm of 80°F (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).

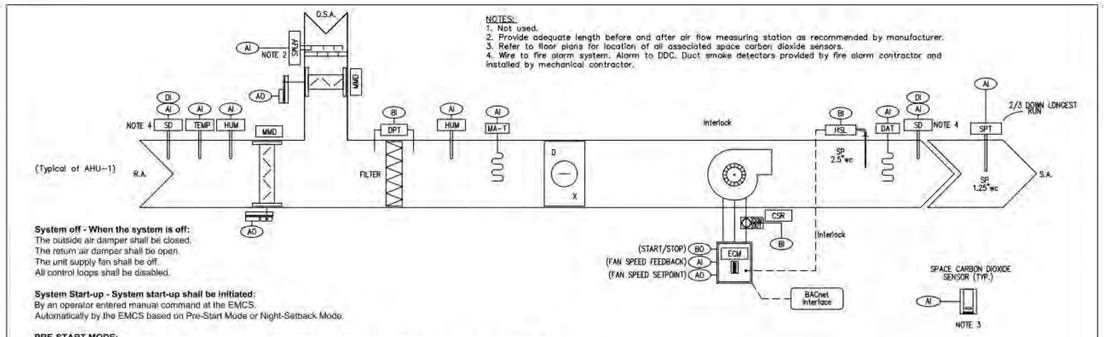
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the unit freeze-stat trips.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

1 Outside Air AHU - Control Schematic and Sequence of Operations
NOT TO SCALE

- AI — ANALOG INPUT
- AO — ANALOG OUTPUT
- DI/BI — DIGITAL/BINARY INPUT
- DO/BO — DIGITAL/BINARY OUTPUT
- MD — ON-OFF MOTORIZED DAMPER
- MMD — MODULATING TYPE MOTORIZED DAMPER
- AFMS — AIR FLOW MEASURING STATION
- MCV — CONTROL VALVE MODULATING TYPE
- VFD — VARIABLE FREQUENCY DRIVE
- CSR — CURRENT SENSING RELAY
- FRZ — FREEZESTAT
- HSL — HIGH STATIC LIMIT
- SPT — STATIC PRESSURE TRANSMITTER
- DPT — DIFFERENTIAL PRESSURE TRANSDUCER
- FM — FLOW METER
- FS — FLOW SWITCH
- DAT — DISCHARGE AIR TEMPERATURE SENSOR
- S T — WALL SENSOR/THERMOSTAT
- CO2 — CARBON DIOXIDE SENSOR
- SP — SET POINT
- S/A — SUPPLY AIR
- R/A — RETURN AIR
- O/A — OUTSIDE AIR
- HC — HEATING COIL
- CC — COOLING COIL
- DX — DIRECT EXPANSION COOLING COIL
- PICV — PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
- AFC — AIRFLOW CROSS
- DPS — DIFFERENTIAL PRESSURE SWITCH

2 CONTROL SCHEMATIC LEGEND
NOT TO SCALE



NOTES:
1. Not used.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Refer to floor plans for location of all associated space carbon dioxide sensors.
4. Wire to fire alarm system. Alarm to DDC. Duct smoke detectors provided by fire alarm contractor and installed by mechanical contractor.

System off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The unit supply fan shall be off.
All control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated terminal units whose space temperature has exceeded the terminal units Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below, and the Demand Control Ventilation sequence shall be active.

Demand Control Ventilation - The outside air intake damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint. If the space carbon dioxide concentration for any zone served by the associated AHU is above the defined high-limit, then the OSA damper shall be modulated to maintain the scheduled maximum outside air flowrate setpoint. If the OSA damper is above 95% open and the maximum outside air flowrate setpoint cannot be met, then modulate the return air damper closed until the flowrate is achieved. Do not modulate the return air damper to less than 60% open. Once the space carbon dioxide concentration for all associated zones has been below the defined high limit for 5 minutes (adj.), the OSA damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint.

System Operation - When system start-up has been initiated:
The variable speed supply fans shall start at its minimum speed. Following a confirmation of fan start status, the supply fans speed shall be modulated in parallel to maintain the supply air static pressure at setpoint. The speed of the fans shall not be adjusted by more than 20% in any one-minute period. The static pressure setpoint shall be reset via the control algorithm below to optimize the energy usage.

Supply Air Static Pressure Reset - The static pressure setpoint shall be reset up in defined increments at defined intervals until the primary air damper position to all of the associated terminal units have been below the defined value for more than the defined interval. The static pressure setpoint shall be reset down in defined increments at defined intervals until the primary air damper position to at least one (critical zone) of the associated terminal units has been above the defined value for more than the defined interval. The setpoints are detailed in the **System Setpoint** section below.

Temperature Control - The VRF coil shall be modulated to maintain the active supply air temperature setpoint. The supply air temperature setpoint shall be reset via the control algorithm below to optimize the energy usage.

Supply Air Temperature Reset - The supply air temperature setpoint shall be reset based on the actual return air temperature, according to the defined reset schedule detailed in the **System Setpoint** section below. If the Demand Control Ventilation sequence is in maximum flow mode, then the supply air temperature reset shall be disabled and the setpoint shall be set to the initial value.

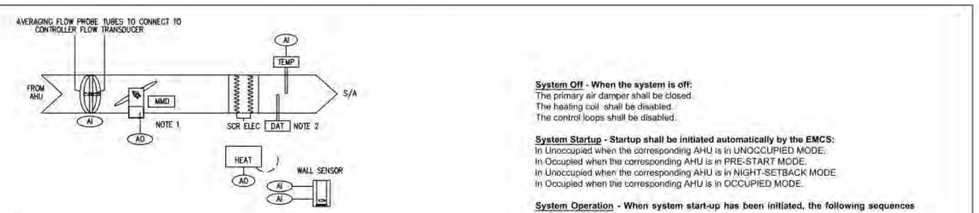
Humidity Control - A return air, duct mounted, humidity sensor shall monitor the R/A relative humidity to 50% (ADJ.). When return air relative humidity is above setpoint by 5% (not to exceed 60%), the VRF coil shall modulate to provide 50°F cooling coil discharge temperature and signal the terminal units to go into humidity control. When relative humidity attains set point, the system will return to normal operation.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the ECM speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be ECM speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The supply air static pressure setpoint shall be set initially at 1.25 inches w.c. (adj) and shall have reset limits of 0.20 to 2.00 inches w.c. (adj).
The time interval for static pressure reset shall be set at 10 minutes (adj).
The static pressure reset increment shall be set at 0.05 inches w.c. (adj)
The terminal unit primary damper position setpoint shall be 90% open. (adj)
The time interval for terminal unit primary damper position shall be set at 15 minutes. (adj)
The supply air temperature setpoint shall be set initially at 54 °F. (adj)
The supply air temperature setpoint shall be reset to 54 °F (adj) when the return air temperature is at 78 °F. (adj)
The supply air temperature setpoint shall be reset to 58 °F (adj) when the return air temperature is at 72 °F. (adj)
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).

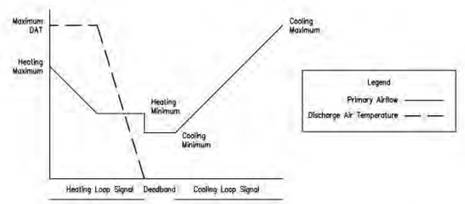
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm if:
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If any associated space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
If return air RH is 60% or above.
All alarms shall be inhibited when the supply fan is not operating.

3 MULTIZONE VAV Air Handling Unit - Control Schematic and Sequence of Operations
NOT TO SCALE



NOTES:
1. TERMINAL UNIT CONTROLLER AND DAMPER ACTUATOR SHALL BE SHIPPED TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AND WIRING.
2. DAT SENSOR SUPPLIED BY UNIT VENDOR AND MOUNTED BY EMCS CONTRACTOR.



System Off - When the system is off:
The primary air damper shall be closed.
The heating coil shall be disabled.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The primary air damper shall be modulated between the cooling minimum and maximum flow values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint. When the space temperature falls below the deadband, the primary air damper shall modulate to maintain the heating minimum flow value and the SCR electric heat shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.
If the space temperature drops below the active Heating Setpoint and the discharge air temperature is at its active setpoint, the primary air damper shall be modulated between the heating minimum and maximum heating flow values to maintain the space temperature within +/- 0.5°F of the active Heating Setpoint and the SCR electric heat shall be modulated to maintain the discharge air temperature setpoint. The SCR electric heat controller shall be set to maintain a maximum discharge air temperature of 85 °F (adjustable). When relative humidity, as determined by either space or AHU return air relative humidity sensor is above setpoint by 5% (not to exceed 60%) in any conditioning mode, terminal unit damper shall modulate to 50% of scheduled cooling CFM and electric heater shall modulate to maintain programmed or override temperature. Unit shall operate in this mode until return air relative humidity attains setpoint.

System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The maximum heating mode discharge air temperature shall be set at 85 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

4 VAV Terminal Unit with Electric Reheat - Control Schematic and Sequence of Operations
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

REVISION:

No.	DATE	DESCRIPTION

SEAL:
STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01-05-2023

MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.009

SHEET TITLE: MECHANICAL FLOW DIAGRAMS

SHEET NUMBER: M4.01

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TBPE Firm Registration No. 2234

DBR Project Number 218033.009

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Autodesk Docs://218033.009-Mission CISD-Midkiff ES 115-Indoor Air Quality Improvements/218033.009_MIDKIFF_MEP22.rvt

SINGLE INLET VAV BOX WITH REHEAT SCHEDULE

MARK	COOLING CFM		HEATING CFM		REHEAT	INLET SIZE	VOLTS/PHASE/HZ	MANUFACTURER	MODEL
	MAX.	MIN.	MAX.	MIN.	KW				
VAV1-1	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-2	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-3	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-4	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV1-5	1,380	415	690	415	5	12"Ø	480/3/60	ETI	SDR
VAV1-6	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-7	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-8	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-9	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV1-10	870	265	435	265	5	10"Ø	480/3/60	ETI	SDR
VAV1-11	1,110	335	555	335	3	12"Ø	480/3/60	ETI	SDR
VAV2-1	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-2	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-3	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-4	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-5	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV2-6	1,380	415	690	415	6	12"Ø	480/3/60	ETI	SDR
VAV2-7	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-8	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-9	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-10	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-11	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV2-12	1,470	445	735	445	7	12"Ø	480/3/60	ETI	SDR
VAV2-13	600	180	300	180	4	8"Ø	480/3/60	ETI	SDR
VAV2-14	1,795	540	900	540	8	14"Ø	480/3/60	ETI	SDR
VAV3-1	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-2	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-3	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-4	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV3-5	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV3-6	1,410	425	705	425	7	12"Ø	480/3/60	ETI	SDR
VAV3-7	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-8	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-9	1,320	400	660	400	5	12"Ø	480/3/60	ETI	SDR
VAV3-10	490	150	245	150	2	8"Ø	480/3/60	ETI	SDR
VAV3-11	1,160	350	580	350	5	12"Ø	480/3/60	ETI	SDR
VAV3-12	870	265	435	265	3	10"Ø	480/3/60	ETI	SDR
VAV4-1	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-2	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-3	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-4	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-5	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-6	1,260	380	630	380	5	12"Ø	480/3/60	ETI	SDR
VAV4-7	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-8	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-9	1,290	390	645	390	5	12"Ø	480/3/60	ETI	SDR
VAV4-10	960	290	480	290	4	10"Ø	480/3/60	ETI	SDR
VAV4-11	450	135	225	135	2	8"Ø	480/3/60	ETI	SDR
VAV4-12	890	270	445	270	4	10"Ø	480/3/60	ETI	SDR
VAV4-13	390	120	195	120	2	6"Ø	480/3/60	ETI	SDR
VAV4-14	750	225	375	225	3	10"Ø	480/3/60	ETI	SDR
VAV4-15	830	250	415	250	3	10"Ø	480/3/60	ETI	SDR
VAV4-16	720	220	360	220	3	10"Ø	480/3/60	ETI	SDR
VAVR1-1	885	270	445	270	5	10"Ø	480/3/60	ETI	SDR
VAVR1-2	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-3	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-4	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-5	145	45	75	45	1	6"Ø	480/3/60	ETI	SDR
VAVR1-6	225	70	115	70	2	6"Ø	480/3/60	ETI	SDR
VAVR1-7	175	55	90	55	1	6"Ø	480/3/60	ETI	SDR
VAVR1-8	840	255	420	255	5	10"Ø	480/3/60	ETI	SDR
VAVR1-9	310	95	155	95	3	6"Ø	480/3/60	ETI	SDR
VAVR1-10	200	60	100	60	1	6"Ø	480/3/60	ETI	SDR
VAVR1-11	155	50	80	50	1	6"Ø	480/3/60	ETI	SDR
VAVR1-12	115	35	60	35	1	6"Ø	480/3/60	ETI	SDR
VAVR1-13	885	270	445	270	4	10"Ø	480/3/60	ETI	SDR
VAVR2-1	1,050	315	525	315	8	10"Ø	480/3/60	ETI	SDR
VAVR2-2	1,140	345	570	345	10	12"Ø	480/3/60	ETI	SDR
VAVR2-3	1,140	345	570	345	5	12"Ø	480/3/60	ETI	SDR
VAVR2-4	155	50	80	50	1	6"Ø	480/3/60	ETI	SDR
VAVR2-5	275	85	140	85	2	6"Ø	480/3/60	ETI	SDR
VAVR2-6	230	70	115	70	2	6"Ø	480/3/60	ETI	SDR
VAVR4-1	2,280	685	1140	685	5	16"Ø	480/3/60	ETI	SDR
VAVR4-2	2,280	685	1140	685	5	16"Ø	480/3/60	ETI	SDR

NOTES:
1. PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN AIR INLET.
2. PROVIDE TERMINAL UNIT CASING WITH 1/2" INTERNALLY LINED FIBERGLASS FREE INSULATION.
3. PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
4. PROVIDE ELECTRIC REHEAT COIL WITH 0-10V SCR MODULATING CAPACITY CONTROL.

PACKAGED DX ROOF TOP UNIT SCHEDULE

MARK	OAU-1	OAU-2	OAU-3	OAU-4
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
DUCT CONFIGURATION	SIDE DISCHARGE	SIDE DISCHARGE	SIDE DISCHARGE	SIDE DISCHARGE
DESIGN OUTDOOR AIR (CFM)	3,840	5,120	3,920	4,550
MINIMUM OUTDOOR AIR (CFM)	1,152	1,536	1,176	1,365
E.E.R. / I.E.E.R. (AT AHRI CONDITIONS)	11.1 / 18	9.6 / 15.5	11.1 / 18	10.2 / 21.4
EXT. S.P. (IN. W.G.)	1.00	1.00	1.00	1.00
FAN MOTOR HORSEPOWER	2.0	QTY(2) 2.2	2.0	3.0
FAN TYPE	VFD PLENUM	(2) ECM PLENUM	VFD PLENUM	VFD PLENUM
FAN DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
COOLING DATA				
AMBIENT AIR (°F)	100.0	100.0	100.0	100.0
TOTAL COOLING CAPACITY (MBH)	296.7	384.9	295.5	331.8
TOTAL SENSIBLE CAPACITY (MBH)	195.1	257.5	197.4	224.6
EAT DB (°F)	100.0/76.0	100.0/76.0	100.0/76.0	100.0/76.0
LAT DB/WB (°F)	53.5/53.5	54.0/54.0	53.9/53.9	54.9/54.8
HEATING DATA				
HEATING CAPACITY (KW) / STAGES	45KW / SCR	55KW / SCR	45KW / SCR	45KW / SCR
EAT DB/WB (°F)	36.0	36.0	36.0	36.0
LAT DB (°F)	72.9	69.8	72.1	67.1
ELECTRICAL DATA				
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60
MCA	74.1	80.4	74.1	75.9
MOCP	80.0	100.0	80.0	80.0
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL NO.	DPS025	DPSA034	DPS025	DPS028
OPERATING WEIGHT (LBS)	3,705	5,816	3,705	3,859
NOTES	ALL	ALL	ALL	ALL

NOTES:
1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION AND PHASE FAILURE MONITOR.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE COMBO 2" / 4" FILTER RACK WITH MERV 8 AND 13 FILTERS.
6. PROVIDE UNIT CONTROLLER BY MANUFACTURER. PROVIDE CONTROLLER WITH BACNET INTERFACE CARD FOR INTEGRATION WITH EMCS.
7. PROVIDE UNIT WITH MODULATING HOT GAS REHEAT WITH DUAL TEMPERATURE SENSORS FOR HUMIDITY CONTROL.
8. PROVIDE UNIT WITH CONDENSER HAIL GUARD AND 14" PREFABRICATED TDI RATED ROOF CURB WITH TEXAS PE STAMP.
9. PROVIDE UNIT WITH CONSTANT VOLUME FAN AND 100% OA DAMPER.
10. PROVIDE UNIT WITH INTEGRAL DISCONNECT SWITCH AND POWERED CONVENIENCE OUTLET.
11. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,200 CFM.
12. PROVIDE DOUBLE WALL CONSTRUCTION WITH MINIMUM 1" R-7 FOAM INSULATION (UP TO 15 TONS) OR 2" R-13 FOAM INSULATION (OVER 15 TONS).
13. FACTORY APPLIED CONDENSER COIL COATING WITH MINIMUM 10,000 HOUR SALT SPRAY RATING PER ASTM B 117 AND UV TOPCOAT.
14. PROVIDE STAINLESS STEEL DRAIN PAN AND STAINLESS STEEL COIL CASINGS.

AIR COOLED CONDENSING UNIT SCHEDULE

MARK	ACCU-1A	ACCU-1B	ACCU-2A	ACCU-2B	ACCU-3A	ACCU-3B	ACCU-4A	ACCU-4B	ACCU-5A	ACCU-5B	ACCU-6
SERVES	AHU-1	AHU-1	AHU-2	AHU-2	AHU-3	AHU-3	AHU-4	AHU-4	AHU-5	AHU-5	AHU-6
TOTAL COOLING CAPACITY (MBH)	184.2	184.2	250.7	250.7	184.2	184.2	184.2	184.2	175.7	175.7	131.25
AMBIENT TEMP. (°F)	100	100	100	100	100	100	100	100	100	100	100
STEPS OF CAPACITY	2	2	2	2	2	2	2	2	2	2	2
EER (SEER)	11.0	11.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
MCA	37.0	37.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0	23.0
MOCP	50	50	70	70	50	50	50	50	50	50	30
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	LENNOX
MODEL NUMBER	RCH15H180D	RCH15H180D	RCH20H240D	RCH20H240D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	RCH15H180D	EL150XCSDT
OPERATING WEIGHT (LBS.)	832	832	832	832	832	832	832	832	832	832	535
NOTES	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

NOTES:
1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. REFRIGERANT LINES TO BE SIZED BY MANUFACTURER.
3. PROVIDE 5 YEAR COMPRESSOR PARTS WARRANTY.
4. PROVIDE WITH CONDENSER COIL HAIL GUARD.
5. PROVIDE WITH LOW AMBIENT HEAD PRESSURE CONTROL.
6. PROVIDE CONDENSER COIL COATING WITH MINIMUM 6000 HR ASTM B117 SALT SPRAY RATING.
7. PROVIDE SINGLE CIRCUIT, DUAL STAGE CONDENSING UNITS, EXCEPT ACCU-6 IS DUAL CIRCUIT.

PACKAGED DX ROOF TOP UNIT SCHEDULE

MARK	RTU-1	RTU-2	RTU-3	RTU-4
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
UNIT TYPE	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
DUCT CONFIGURATION	BOTTOM	BOTTOM	BOTTOM	BOTTOM
DESIGN SUPPLY AIR (CFM)	4,150	4,290	1,340	4,560
MINIMUM SUPPLY AIR (CFM)	1,245	1,287	402	1,368
DESIGN OUTDOOR AIR (CFM)	1,240	1,205	100	750
MINIMUM OUTDOOR AIR (CFM)	372	362	30	225
E.E.R. (AT AHRI CONDITIONS)	12.0	12.0	13.5	12.0
IEER/SEER (AT AHRI CONDITIONS)	15.0	15.0	/ 17.0	15.7
EXT. S.P. (IN. W.G.)	2.00	2.00	1.80	2.00
FAN MOTOR HORSEPOWER	5.0	5.0	1.5	5.0
FAN TYPE	ECM	ECM	ECM	ECM
FAN DRIVE	BELT	BELT	DIRECT	BELT
COOLING DATA				
AMBIENT AIR (°F)	100.0	100.0	100.0	100.0
TOTAL COOLING CAPACITY (MBH)	167.0	171.0	35.0	146.0
TOTAL SENSIBLE CAPACITY (MBH)	98.0	113.0	25.0	101.0
EAT DB/WB (°F)	78.0/68.0	82.0/69	74/64	76.0/65.0
LAT DB/WB (°F)	55.1/54.6	56.4/55.9	55.9/54.9	54.8/54.0
HEATING DATA				
HEATING AIRFLOW (CFM)	--	--	--	--
HEATING CAPACITY (KW)	--	--	--	--
EAT DB/WB (°F)	--	--	--	--
LAT DB/WB (°F)	--	--	--	--
ELECTRICAL DATA				
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60
MCA	36.0	36.0	9.0	35.0
MOCP	40.0	40.0	15.0	40.0
MANUFACTURER	LENNOX	LENNOX	LENNOX	LENNOX
MODEL NO.	LCT180	LCT180	LCT036	LCT156
OPERATING WEIGHT (LBS)	2,605	2,605	892	2,605
NOTES				

NOTES:
1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE UNITS WITH MINIMUM 2" MERV 8 + 4" MERV 13 FILTERS.
6. PROVIDE UNIT CONTROLLER BY MANUFACTURER. PROVIDE CONTROLLER WITH BACNET INTERFACE CARD FOR INTEGRATION WITH EMCS.
7. PROVIDE UNIT WITH ON/OFF HOT GAS REHEAT FOR HUMIDITY CONTROL.
8. PROVIDE UNIT WITH CONDENSER HAIL GUARD AND 14" PREFABRICATED ROOF CURB.
9. PROVIDE UNIT WITH COMPARATIVE ENTHALPY ECONOMIZER AND BAROMETRIC RELIEF.
10. PROVIDE MINIMUM 2-STAGE COOLING UNITS
11. PROVIDE UNIT WITH INTEGRAL FUSED DISCONNECT SWITCH AND POWERED CONVENIENCE OUTLET. PROVIDE PHASE FAILURE MONITOR.
12. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,000 CFM.
13. PROVIDE FACTORY E-COATED CONDENSER COIL COATINGS WITH MINIMUM 6000 HR ASTM B117 SALT SPRAY RATING.
14. CONTROLS, THERMOSTATS, AND SENSORS (T, RH, CO2) TO BE PROVIDED BY THE CONTROLS CONTRACTOR

SPLIT AIR HANDLING UNIT SCHEDULE

MARK	AHU-1	AHU-2	AHU-3	AHU-4	AHU-5	AHU-6
SERVES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES	MIDKIFF ES
UNIT CONFIGURATION	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
DISCHARGE	TOP	TOP	TOP	TOP	TOP	TOP
SUPPLY AIR (CFM)	13,560	18,455	14,605	16,625	5,250	3,475
OUTSIDE AIR (CFM)	3,840	5,120	3,920	4,550	3,150	650
EXT. S.P. (IN. W.G.)	2.8	3.0	3.0	2.9	3.3	2.0
FAN MOTOR (QTY) HORSEPOWER	(4)4.42	(6)4.42	(5)4.42	(5)4.42	(2)4.42	(1)4.42
FAN MOTOR CONTROL (VFD, ECM 0-10VDC)	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC	ECM 0-10VDC
FAN RPM	3194	3096	3038	3181	3064	3041
MAX COIL VELOCITY (FPM)	500	500	500	500	500	500
MINIMUM COIL ROWS	4	4	4	4	6	6
MAX. FINS PER INCH	10	10	10	10	10	10
COOLING EAT DB/WB (°F)	74.4/61.0	74.7/61.1	74.5/61.0	74.6/61.0	86.4/73.6	79.0/66.0
COOLING LAT DB/WB (°F)	55.3/52.9	56/53.2	56/53.3	56.1/53.3	54.3/53.5	55.1/53.6
TOTAL COOLING CAPACITY (MBH)	311.4	412.1	321.4	364.4	350.3	130.9
SENSIBLE COOLING CAPACITY (MBH)	283.4	377.2	295.0	336.4	184.0	90.9
QTY REFRIGERANT CIRCUITS / TYPE	2 / INTERLACED	4 / INTERLACED	2 / INTERLACED	2 / INTERLACED	2 / INTERLACED	2 / INTERLACED
HEATING CAPACITY (KW)	-	-	-	-	-	-
NO. OF HEATING STAGES	-	-	-	-	-	-
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL NO.	CAH029GDCM	CAH040GDCM	CAH032GDCM	CAH036GDCM	CAH013GDCM	CAH008GDCM
OPERATING WEIGHT (LBS.)	2522	3213	2684	2886	1362	1035
UNIT CABINET DIMENSIONS, W x L x H (IN.)	86 x 108 x 66	96 x 116 x 78	92 x 106 x 66	102 x 108 x 66	60 x 80 x 46	48 x 80 x 40
NOTES	ALL	ALL	ALL	ALL	ALL	ALL

NOTES:
1. PROVIDE 2" DOUBLE WALL R-13 CHILLED WATER AHU WITH 2" MERV 13 FILTERS.
2. PROVIDE DX COIL WITH STAINLESS STEEL COIL CASING AND STAINLESS STEEL DRAIN PAN FOR R-410A.
3. PROVIDE 12" ACCESS DOOR BETWEEN COIL AND FAN SECTION.
4. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
5. PROVIDE ECM FAN ARRAY WITH HAND/OFF/AUTO SWITCH, 0-10 VDC SIGNAL INPUT, FAN FAULT TERMINAL, FUSED DISCONNECT, MOTOR CONTROL PANEL, LINE AND LOW VOLTAGE WIRING, INDIVIDUAL FAN MOTOR OVERCURRENT PROTECTION/ISOLATION SWITCH, AND POTENTIOMETER FOR MANUAL CONTROL OVERRIDE.
6. HOA PANELS TO BE FACTORY INSTALLED EXCEPT AHU-5 AND 6 ARE FIELD INSTALLED AND FIELD WIRED BY ELECTRICAL CONTRACTOR.
7. PROVIDE 6" BASE RAIL.
8. HEADER AHU-2 STACKED COILS FOR EACH CIRCUIT WITH SEPARATE TXVs PER COIL CONNECTION, ONE SOLENOID PER ACCU.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

73

REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01-05-2023

MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.009

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.01

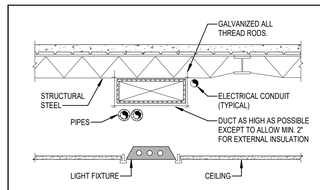
DBR
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f
TBPE Firm Registration No. 2234

DBR Project Number 218033.009

HA	RT	JR		

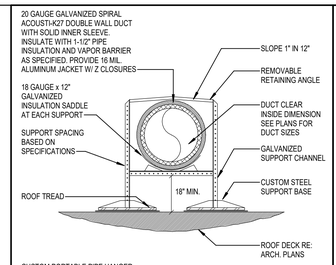
TN PN

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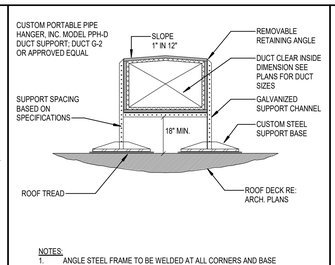
NOTES:
1. PIPES (INCLUDING SPRINKLER PIPING) AND ELECTRICAL CONDUIT CAN BE ROUTED BETWEEN JOISTS OR THROUGH JOIST WEB SPACE AS REQUIRED. DUCT SHALL BE LOCATED AS HIGH AS POSSIBLE.
2. U.L. DESIGN ASSEMBLY NUMBERS ARE SHOWN ON ARCHITECTURAL PLANS WHEN REQUIRED.
3. INSTALLATION OF ALL SERVICES MUST BE COORDINATED BY THE CONTRACTOR.

1 TYP. MEP INSTALLATION DETAIL
NOT TO SCALE M40-01



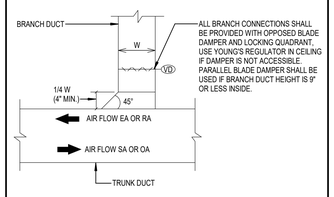
CUSTOM PORTABLE PIPE HANGER, INC. MODEL PPH-D DUCT SUPPORT; DUCT G-2 OR APPROVED EQUAL

2 DUCT SUPPORT ON ROOF
NOT TO SCALE M40-02



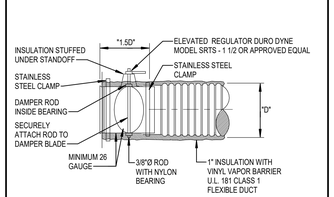
NOTES:
1. ANGLE STEEL FRAME TO BE WELDED AT ALL CORNERS AND BASE PLATE.
2. PROVIDE 12" WIDE 18 GAUGE GALVANIZED STEEL INSULATION SADDLE, FULL WIDTH AND HEIGHT OF DUCT.

3 EXPOSED RECT. DUCT ON ROOF
NOT TO SCALE M40-03



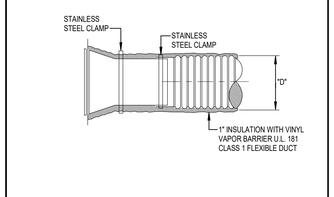
NOTES:
THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO RECTANGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

4 RECTANGULAR BRANCH DUCT TAP
NOT TO SCALE M40-04



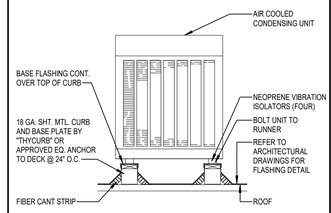
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0"
2. TYPICAL OF ROUND DUCT CONNECTIONS TO RECTANGULAR DUCTS
3 ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

5 SPIN-IN DETAIL
NOT TO SCALE M40-05



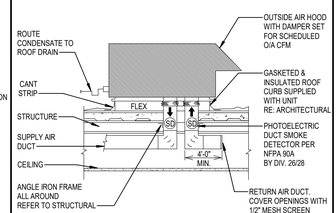
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO VAV BOXES FROM RECTANGULAR MAIN DUCTS.
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

6 CONICAL SPIN-IN DETAIL
NOT TO SCALE M40-10



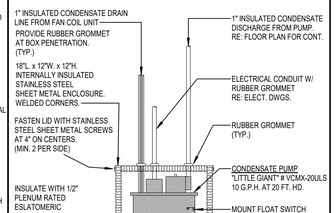
NOTE:
1. PROVIDE CLEARANCE AROUND UNIT FOR AIRFLOW AND SERVICE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

7 CONDENSING UNIT ROOF MOUNTED
NOT TO SCALE



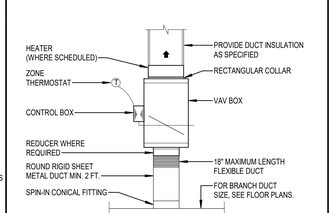
NOTE:
ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

8 ROOF TOP UNIT MOUNTING DETAIL
NOT TO SCALE

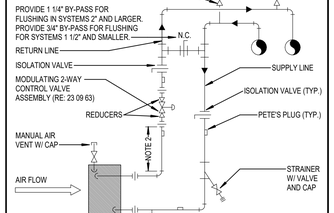


NOTE:
ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

9 COOLING COIL CONDENSATE PUMP
NOT TO SCALE

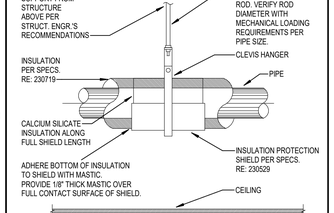


10 INTERIOR VAV TERMINAL UNIT
NOT TO SCALE M5-01



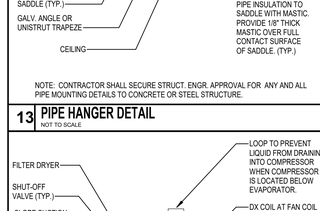
NOTES:
1. INSTALL 2-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS.
2. PROVIDE STRAIGHT PIPE LENGTH 5 TIMES NOMINAL PIPE DIA. UPSTREAM OF CTRL. VALVE.

11 2-WAY CONTROL VALVE AND COIL PIPING
NOT TO SCALE



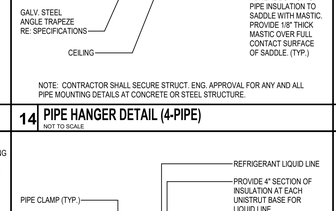
NOTE:
CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE. CONTRACTOR SHALL CONFORM TO ALL MAXIMUM SPAN DISTANCES PER SPECIFICATIONS FOR HANGER SPACING. RE: 230529

12 PIPE HANGER DETAIL (1-PIPE)
NOT TO SCALE



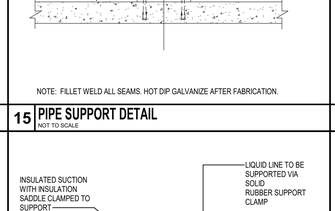
NOTE: CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE.

13 PIPE HANGER DETAIL
NOT TO SCALE



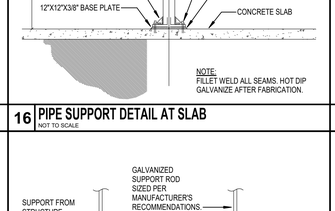
NOTE: CONTRACTOR SHALL SECURE STRUCT. ENG. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

14 PIPE HANGER DETAIL (4-PIPE)
NOT TO SCALE



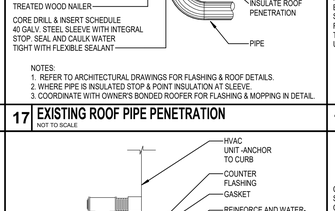
NOTE: FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

15 PIPE SUPPORT DETAIL
NOT TO SCALE



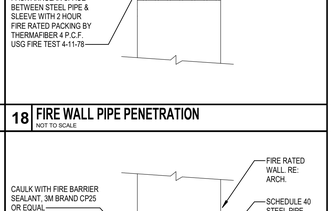
NOTE:
FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

16 PIPE SUPPORT DETAIL AT SLAB
NOT TO SCALE

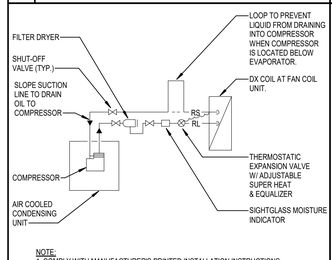


NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FLASHING & ROOF DETAILS.
2. WHERE PIPE IS INSULATED STOP & POINT INSULATION AT SLEEVE.
3. COORDINATE WITH OWNER'S BONDED ROOFER FOR FLASHING & MOPPING IN DETAIL.

17 EXISTING ROOF PIPE PENETRATION
NOT TO SCALE

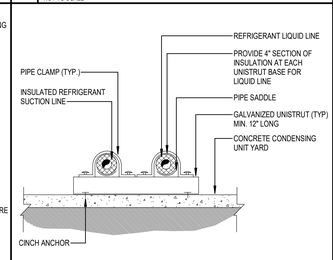


18 FIRE WALL PIPE PENETRATION
NOT TO SCALE



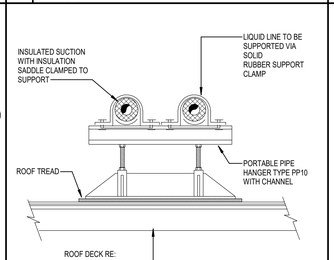
NOTE:
1. COMPLY WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
2. TYPICAL FOR EACH SEPARATE REFRIGERANT CIRCUIT.
3. PROVIDE FILTER DRYER ON ALL SYSTEMS.
4. USE "ACR" HARD DRAWN COPPER REFRIGERANT PIPE.

19 REFRIGERANT PIPING SCHEMATIC
NOT TO SCALE

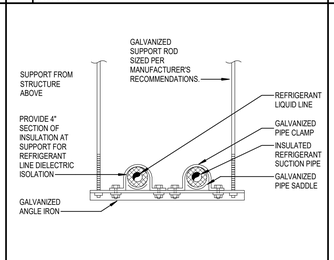


NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

20 FLOOR MOUNTED REFR. PIPE
NOT TO SCALE

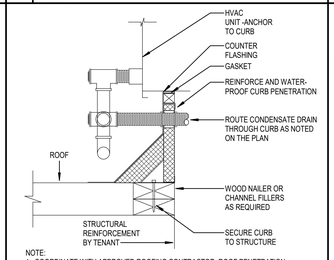


21 ROOF MTD. REFR. PIPE SUPPORT
NOT TO SCALE



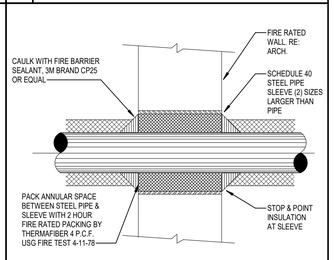
NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER MAX. AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

22 REFRIGERANT PIPE HANGER
NOT TO SCALE

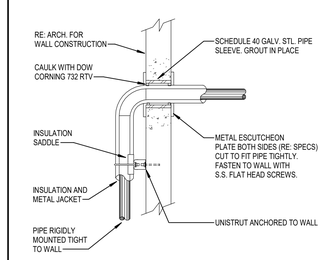


NOTE:
1. COORDINATE WITH APPROVED ROOFING CONTRACTOR. ROOF PENETRATION AND LOCATION SHALL BE COORDINATED AND APPROVED BY ROOFING CONTRACTOR.
2. ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

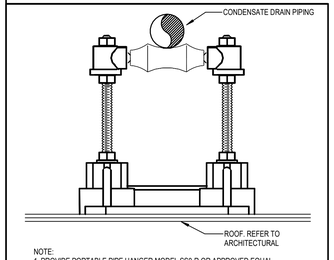
23 CONDENSATE DRAIN THRU CURB
NOT TO SCALE



24 FIRE WALL INSULATED PIPE PENETRATION
NOT TO SCALE



25 PIPE ENTRY THRU EXTERIOR WALL
NOT TO SCALE



NOTE:
1. PROVIDE PORTABLE PIPE HANGER MODEL SS8-R OR APPROVED EQUAL.
2. SPACE PIPE SUPPORTS AT MAXIMUM INTERVALS OF 10'-0" ON CENTER.
3. INSTALL PER MANUFACTURER'S SPECIFICATIONS AND INSTALLATION REQUIREMENTS.

26 DRAIN LINE SUPPORT ON ROOF
NOT TO SCALE

ELECTRIC DUCT HEATER SCHEDULE

MARK	EDH-1	EDH-2
SERVES	AHU-5	AHU-6
HEATER TYPE	INLINE	INLINE
DESIGN AIRFLOW (CFM)	5,250	3,475
CAPACITY (KW)	60.0	15.0
EAT/LAT (°F)	49.6/85.0	
DUCT DIMENSION WxH (INSIDE)	26X24	22X22
VOLTS/PHASE/HERTZ	480/3/60	480/3/60
CONTROL TYPE	SCR	SCR
MANUFACTURER	REDD-I	REDD-I
MODEL	HF	HF
NOTES	ALL	ALL

NOTES:
1. PROVIDE WITH AIRFLOW PROVING SWITCH AND DIGITAL DUCT MOUNTED DISCHARGE AIR TEMPERATURE SENSOR.
2. PROVIDE GALVANIZED FLANGE MOUNTED DUCT HEATER.
3. INSTALL DUCT HEATER PER MANUFACTURER'S RECOMMENDATIONS.
4. DUCT HEATER SHALL BE CONTROLLED BY DDC SYSTEM.
5. PROVIDE DISCONNECT SWITCH.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

74

REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS — ROBERTO H. TIJERINA — 121946 — LICENSED PROFESSIONAL ENGINEER — 01-05-2023

MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.009

SHEET TITLE: MECHANICAL DETAILS

SHEET NUMBER: M6.01

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TN PN | HA | RT | JR

1/5/2023 5:17:32 PM
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ABBREVIATIONS

A

A	AMPERES
ABV	ABOVE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR, ABOVE COUNTER
ACC	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
AF	AMPERE FUSE, AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPT CAPACITY
AL	ALUMINUM
AM	AMMETER
AMP	AMPLIFIER
ANN	ANNUNICATOR
AP	ACCESS PANEL, ALARM PANEL
ARCH	ARCHITECT, ARCHITECTURAL
ASC	AMPERES SHORT CIRCUIT
AT	AMPERE TRIP RATING
ATS	AUTOMATIC TRANSFER SWITCH
AVG.	AVERAGE
AUX.	AUXILIARY
AWG.	AMERICAN WIRE GAUGE

B

BAS	BUILDING AUTOMATION SYSTEM
BC	BELOW COUNTER
BKR	BREAKER
BLDG.	BUILDING

C

C	CONDUIT, CELSIUS
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CWP	CONDENSER WATER PUMP
CH	CHILLER
CHP	CHILLED WATER PUMP
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTERLINE
CLG.	CEILING
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT.	CONTINUOUS,CONTINUATION
CONTR.	CONTROLLER, CONTRACTOR
CP.	CIRCULATING PUMP
CPUC	CPU CHILLER
CR	CARD READER, CORD REEL
CRU	CONDENSATE RETURN UNIT
CT	CURRENT TRANSFORMER, COOLING TOWER
CTR	CENTER
CU	COPPER

D

dB	DECIBEL
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DR	DROPPED RECEPTACLE
DS	DAYLIGHT SENSOR
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DXFC	DX FAN COIL UNIT
DZ	DAYLIGHT ZONE

E

(E)	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
E.C.	EMPTY CONDUIT
EDF	ELECTRIC DRINKING FOUNTAIN
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMCS	ENERGY MANAGEMENT AND CONTROLS SYSTEM
EMERG	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
ENCL.	ENCLOSURE
ENGR.	ENGINEER
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
(ER)	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WATER HEATER
EXH	EXHAUST

F

F	FAHRENHEIT, FAN, FIRE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FF	FURNITURE FEED
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLEX.	FLEXIBLE
FLR	FLOOR
FLUOR	FLUORESCENT
FP	FIRE PUMP, FAN POWERED
FPTB	FAN POWERED TERMINAL BOX
FRZR	FREEZER
FS	FUSED SWITCH, FLOW SWITCH
FSD	MOTORIZED FIRE SMOKE DAMPER
FT	FOOT, FEET
FTL	FEED-THRU LUGS
FUT	FUTURE
FVNR	FULL-VOLTAGE, NON-REVERSING

G

GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GTD	GENERATOR TRANSFER DEVICE
GUH	GAS UNIT HEATER

H

HACR	HEATING, AIR CONDITIONING RATED CIRCUIT BREAKER
HD	ELECTRIC HAND DRYER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HS	HAND SET
HSC	HAND SCANNER
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HVU	HEATING/ VENTILATING UNIT
HWB	HOT WATER BOILER
HWC	HOT WATER CIRCULATOR
HWP	HEATING WATER PUMP
HZ	HERTZ

I

ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCH
INCAND	INCANDESCENT
INT	INTERNAL, INTERIOR

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
kVA	KILOVOLT-AMPS
kW	KILOWATT
kWH	KILOWATT-HOUR

L

LED	LIGHT EMITTING DIODE
LF	LINEAR FEET
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE TRANSFORMER
LVL	LEVEL

M

M	METER
MAP	MASTER ALARM PANEL
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX.	MAXIMUM
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MECH.	MECHANICAL
MFR	MANUFACTURER
MH	METAL HALIDE
MIC	MICROPHONE
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MV	MERCURY VAPOR

N

N3R	NEMA 3R ENCLOSURE
N4X	NEMA 4X ENCLOSURE
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRICAL
OPG	OPENING

P

P	POLE, PUMP
PB	PUSHBUTTON
PC	PHOTOCELL
PH	PHASE
PL	PILOT LIGHT
PLBG	PLUMBING
PNEU	PNEUMATIC
PNL	PANEL
POS	POINT OF SALE
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PS	PHOTOSENSOR
PVC	POLYVINYL CHLORIDE
PWR	POWER

Q

QTY	QUANTITY

R

R	EXISTING TO BE REMOVED
RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RC	RECONNECT EXISTING DEVICE TO CIRCUIT INDICATED
RCP	REFLECTED CEILING PLAN
RCPT	RECEPTACLE
RE	REFERENCE, REFER
REC	RECEPTACLE
REFR	REFRIGERATOR
REINF	REINFORCING
REL	EXISTING TO BE RELOCATED
RELEX	NEW LOCATION OF RELOCATED EQUIPMENT
REQD	REQUIRED
REV	REVISION, REVISE
RGS	RIGID GALVANIZED STEEL
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE AND REPLACE
RTU	ROOFTOP UNIT

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SCHED	SCHEDULE
SE	SEWAGE EJECTOR
SEC	SECONDARY
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SKVA	STARTING KILOVOLT-AMPS
SKW	STARTING KILOWATTS
SP	SUMP PUMP
SPEC	SPECIFICATION
SPF	STAIR PRESSURIZATION FAN
SPKR	SPEAKER
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
SQ.	SQUARE
SRF	SMOKE REMOVAL FAN
SS	START-STOP PUSH BUTTON
SSSC	SOLID STATE SPEED CONTROL
ST	SHUNT TRIP
STB	STEAM BOILER
STD	STANDARD
STL	STEEL
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD

T

TC	TEMPERATURE CONTROL
TEL	TELEPHONE
TF	TRANSFER FAN
TL	TWIST-LOCK
TOC	TOP OF CURB
TOS	TOP OF STEEL
TP	CHILD TAMPER PROOF DEVICE
TSTAT	THERMOSTAT
TTB	TELEPHONE TERMINAL BOARD
TTC	TELEPHONE TERMINAL CABINET
TU	TERMINAL UNIT
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL

U

UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SYSTEM

V

V	VOLT
VA	VOLT-AMPERE
VAV	VARIABLE AIR VOLUME
VC	VOLUME CONTROL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VP	VACUUM PUMP
VM	VOLT METER

W

W	WATT, WIRE, WIDTH
WG	WIREGUARD
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WS	WATER SOFTENER
WT.	WATERTIGHT, WEIGHT
WWF	WELDED WIRE FABRIC
W/FT^2	WATTS PER SQUARE FOOT

X

XFMR	TRANSFORMER

Z

Z	ZONE

ELECTRICAL SYMBOLS

MOTORS AND CONTROLS

- MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE. "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP.
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/80" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
  - "GFCI" DENOTES GROUND FAULT INTERRUPTER,
  - "WP" DENOTES WEATHERPROOF,
  - "IG" DENOTES ISOLATED GROUND,
  - "TP" DENOTES SAFETY TYPE. (TAMPER PROOF)
  - "DR" DENOTES DROPPED RECEPTACLE,
  - "USB" DENOTES RECEPTACLE WITH UNIVERSAL SERIAL BUS,
  - "AC" DENOTES ABOVE COUNTER MOUNTING, SEE
  - "UC" DENOTES UNDER COUNTER MOUNTING, SEE
  - "H" DENOTES HORIZONTALLY ORIENTED RECEPTACLE, SEE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHT.
- R — DUPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- DUPLEX WALL RECEPTACLE ON A CIRCUIT DEDICATED TO DATA PROCESSING, GRAY COLOR. PROVIDE ISOLATED GROUND TYPE RECEPTACLES WHERE NOTED.
- SPLIT WIRED RECEPTACLE, TOP RECEPTACLE SHALL BE SWITCHED ACCORDING TO PLANS, AND BOTTOM SHALL REMAIN UNSWITCHED.
- SP — CONTROLLED DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. "SP" DENOTES SPLIT WIRED
- FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- R — FOURPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- CONTROLLED FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- SPECIAL RECEPTACLE, NEMA CONFIGURATION AS NOTED.
- TWO-GANG FLOOR OUTLET
- THREE-GANG FLOOR OUTLET
- MULTI-OUTLET SURFACE RACEWAY. SEE ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHTS.
- J — JUNCTION BOX.
  - "MD" DENOTES MOTOR DAMPER,
  - "CR" DENOTES CORD REEL,
  - "D" DENOTES DROP CORD RECEPTACLE,
- DUPLEX RECEPTACLE WITH HOMERUN
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- TWO-GANG CEILING OUTLET
- D / R / P — FLUSH ELECTRICAL FLOOR OUTLET, "P" DENOTES POKE-THRU. "D" INDICATES DUPLEX RECEPTACLE, "R" INDICATES RED RECEPTACLE ON EMERGENCY POWER. REFER TO FLOOR BOX SCHEDULE, FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- PP — POWER POLE
- DIRECT CONNECTION TO EQUIPMENT
- P — PULL BOX (OVER 4" SQUARE)
- C (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

- 2' X 4' LIGHTING FIXTURE.
- 2' X 2' LIGHTING FIXTURE.
- 1' X 4' LIGHTING FIXTURE.
- 1' X 2' LIGHTING FIXTURE.
- 1' X 1' LIGHTING FIXTURE.
- STRIP LIGHTING FIXTURES.
- STAGGERED STRIP LIGHTING FIXTURE.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SECURITY WALL PACK
- SITE LIGHTING FIXTURE.
- POST-TOP FIXTURE/ACORN FIXTURE BRACKET ARM INDICATES WALL MOUNT WITH ARM
- EMERGENCY LIGHT FIXTURE WITH BATTERY PACK. PROVIDE WITH UNSWITCHED HOT FOR LOSS OF VOLTAGE AND CHARGING (SAME CIRCUIT AS NORMAL POWER LIGHTING). FIXTURES SHALL BE WIRED IN A MANNER AS TO ALLOW SWITCHING OF FIXTURES WITHOUT DISCHARGING THE EMERGENCY BATTERY. BATTERY PACK IS TO ONLY OPERATE IN THE EVENT OF A POWER OUTAGE.
- EM CIRCUIT — LIGHT FIXTURE ON EMERGENCY BRANCH CIRCUIT, CIRCUIT NUMBER ADJACENT TO FIXTURE INDICATES EMERGENCY CIRCUIT CONNECTED TO FIXTURE. PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL EMERGENCY LIGHTING ORIGINATING FROM THE EMERGENCY CIRCUIT SHOWN.
- NL — EMERGENCY "NIGHT LIGHT" LIGHT FIXTURE. LIGHT FIXTURE IS UNSWITCHED AND INTENDED FOR 24 HOUR OPERATION. FEED VIA UNSWITCHED HOT.
- DAYLIGHT ZONE/PRIMARY DAYLIGHT ZONE
- SECONDARY DAYLIGHT ZONE

RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- CONDUIT UNDERSLAB OR UNDERGROUND
- EM — EMERGENCY CONDUIT
- EXPOSED CONDUIT
- DB — UNDERGROUND CONDUIT, "DB" DENOTES DUCTBANK ENCASED IN CONCRETE
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT TURNED UP
- CONDUIT TURNED DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT:PHASE/NEUTRAL/SWITCH LEG/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES 2# 12, PLUS GROUND, UNLESS NOTED OTHERWISE.
- 1LA-2,4 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON):1LA-6 — PARTIAL CIRCUIT HOMERUN TO PANEL.
- T — COMMUNICATIONS CONDUIT OR CABLE:
  - "C" DENOTES MASTER CLOCK,
  - "CA" DENOTES MASTER CLOCK,
  - "CR" DENOTES CASH REGISTER
  - "D" DENOTES DATA,
  - "FA" DENOTES FIRE ALARM,
  - "I" DENOTES INTERCOM,
  - "OHE" DENOTES OVERHEAD ELECTRICAL LINE.
  - "PA" DENOTES PAGING,
  - "S" DENOTES SECURITY,
  - "T" DENOTES TELEPHONE,
  - "V" DENOTES VIDEO,
- TELECOMMUNICATIONS CABLE TRAY TO BE CONCEALED ABOVE ACCESSABLE CEILING.

ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE
- TERMINAL CABINET (FLUSH/SURFACE MOUNT), TYPE AS NOTED, 24" X 48" X 3-1/2" UNLESS NOTED OTHERWISE.
- BAT — BATTERY/INVERTER UNIT
- LV — LOW VOLTAGE TRANSFORMER.

COMMUNICATIONS

ALL OUTLET BOXES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

THE FOLLOWING NOTATIONS REFER TO ALL COMMUNICATIONS OUTLETS:
- "FAX" DENOTES OUTLET DEDICATED FOR A FAX,
- "W" DENOTES WALL PHONE SHALL BE MOUNTED AT 42" A.F.F.
- "PAY" DENOTES PAY PHONE SHALL BE MOUNTED 42" A.F.F.

- HS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.
- TV — TV ROUGH-IN: 3-GANG RECESSED TV BOX. CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DELTA.
- INDICATES THE LOCATION OF A NEW TECHNOLOGY WALL OUTLET, PROVIDE DUAL GANG BACK BOX. REFERENCE TECHNOLOGY SHEET FOR CONTENT.
- M W — MICROPHONE FLOOR OUTLET, "W" INDICATES WALL MOUNTED. "F" INDICATES FLOOR MOUNTED. "H" INDICATES HANGING MOUNTED
- S VC — CEILING MOUNTED SPEAKER. "VC" INDICATES VOLUME CONTROL ON SPEAKER.
- S L — WALL MOUNTED SPEAKER. "L" INDICATED LOCAL SOUND REINFORCEMENT
- CB — SCHOOL INTERCOMMUNICATION SYSTEM CALL-IN. PUSH BUTTON
- BELL, BUZZER OR CHIME AT 80+ A.F.F.
- VC — VOLUME CONTROL - WALL MOUNTED
- AX W — AUXILIARY INPUT JACK. "W" INDICATES WALL MOUNTED. "F" INDICATES FLOOR MOUNTED. "H" INDICATES HANGING MOUNTED
- AVO — "HIGH" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- AVI — "LOW" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- C (2) LV — LOW VOLTAGE CLOCK SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

ONE LINE AND RISER DIAGRAMS

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- CL — CIRCUIT BREAKER, RATING AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE. "CL" DENOTES CURRENT LIMITING
- DRAWOUT CIRCUIT BREAKER, RATINGS AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE
- ST — SHUNT TRIP
- GF — GROUND FAULT RELAY
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER
- A 0-2000 — AMMETER, RANGE AS SHOWN
- AS — AMMETER SWITCH
- V 0-600 — VOLTMETER, RANGE AS SHOWN
- VS — VOLTMETER SWITCH
- Wh D-15 — WATT-HOUR METER, "D" DENOTES DEMAND REGISTER "15" DENOTES MINUTES OF DEMAND INTERVAL
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- 12.47KV/120V — POTENTIAL TRANSFORMER, RATING AS SHOWN
- GROUND CONNECTION
- LIGHTING ARRESTOR
- G — GENERATOR SET
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- M — ELECTRICAL METER
- SPD — SURGE PROTECTION DEVICE

MISCELLANEOUS

- F — SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- EX.X — DRAWING NOTE REFERENCE
- 1 — STARTER/DISCONNECT SCHEDULE REFERENCE
- 1 — FEEDER SCHEDULE REFERENCE
- LC — LIGHTING CONTACTOR
- TS — TIME SWITCH
- PC — PHOTOCELL
- PUSH BUTTON/DOOR BELL
- TC — TIMECLOCK
- R — RELAY
- SOS — AREA OF RESCUE ASSISTANCE
- B — BELL

FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S # — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE. "D" INDICATES DUCT TYPE. "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER STROBE / WALL MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- S — FIRE ALARM SPEAKER / WALL MOUNTED
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) WALL MOUNT +80" AFF- 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- REMOTE LED INDICATOR LIGHT

SECURITY

- KP — KEYPAD
- GB — GLASS BREAK SENSOR
- H — HOLD UP BUTTON
- DS — INTERCOM DOOR STATION
- MS — INTERCOM MASTER STATION
- M — LONG RANGE MOTION DETECTOR
- M — WALL MOUNTED MOTION DETECTOR
- M — CEILING MOUNTED MOTION DETECTOR
- IDP — INTRUSION DETECTION PANEL
- DC — DOOR CONTACT
- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — CARD READER
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

SWITCHES & LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON 'LIGHTING CONTROL DEVICE SCHEDULE' LOCATED ON ELECTRICAL SCHEDULES SHEETS

SWITCH ANNOTATION AS FOLLOWS:

- S a,b,c — TYPE, PER SCHEDULE. NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH
- SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:

- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE
- CEILING SENSOR
- WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:

- PC — DIGITAL PHOTOSENSOR
- DS — DAYLIGHT HARVESTING SENSOR

DRAWING/DETAIL REFERENCE KEY

REFER TO DRAWING/DETAIL NUMBER — 1 / E3-2 — SHEET NUMBER. RE: 1 /E3-2

GENERAL NOTES

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

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STATE OF TEXAS — ROBERTO H. TIJERINA — 121946 — LICENSED PROFESSIONAL ENGINEER — 01-05-2023

MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.009

SHEET TITLE: ELECTRICAL SYMBOL LEGEND

SHEET NUMBER: E0.01

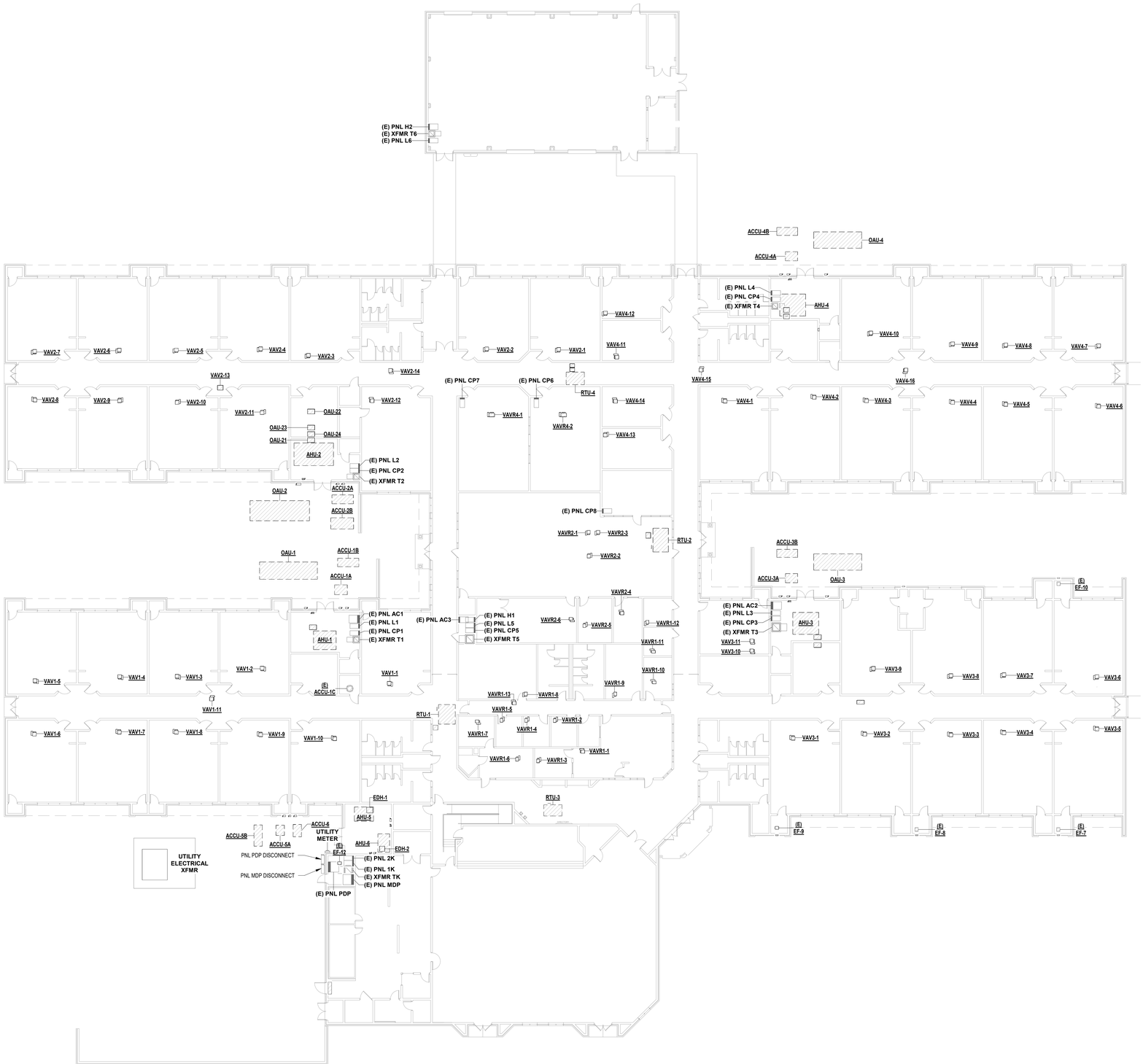
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1 DEMO COMPOSITE ELECTRICAL PLAN

ED2.11 1/16" = 1'-0"

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SHEET TITLE: DEMO COMPOSITE ELECTRICAL PLAN

SHEET NUMBER: ED2.11

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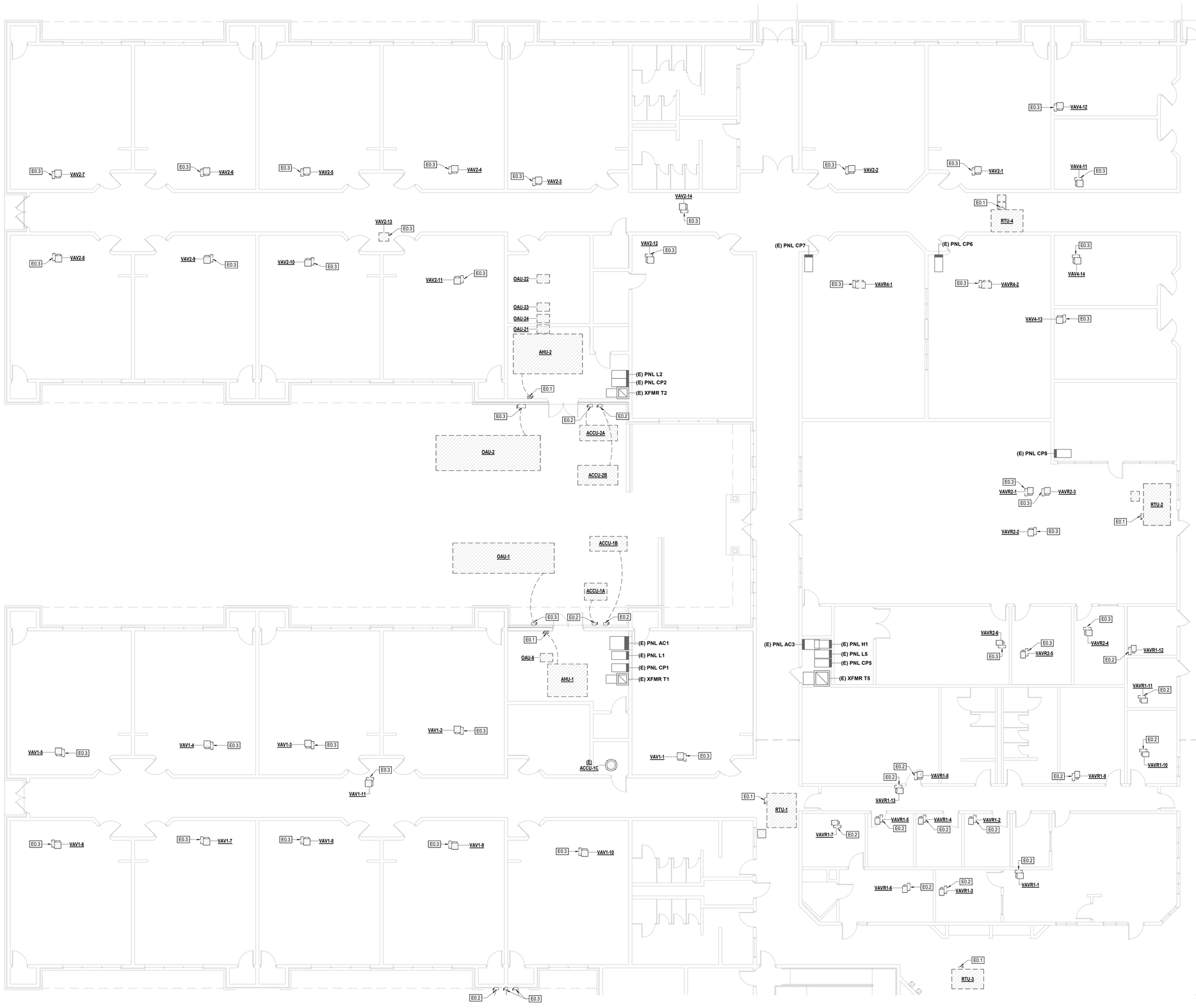
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ELECTRICAL KEYED NOTES

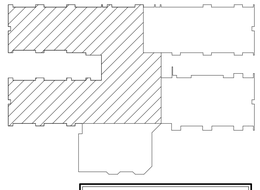
E0.1 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN. EXISTING CONTROL PANEL CIRCUIT AND BYPASS DAMPER CIRCUIT TO REMAIN.

E0.2 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. DEMOLISH EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD.

E0.3 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN.



1 ED2.12 **DEMO ELECTRICAL PLAN - AREA A**
1/8" = 1'-0"



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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA A

SHEET NUMBER: ED2.12

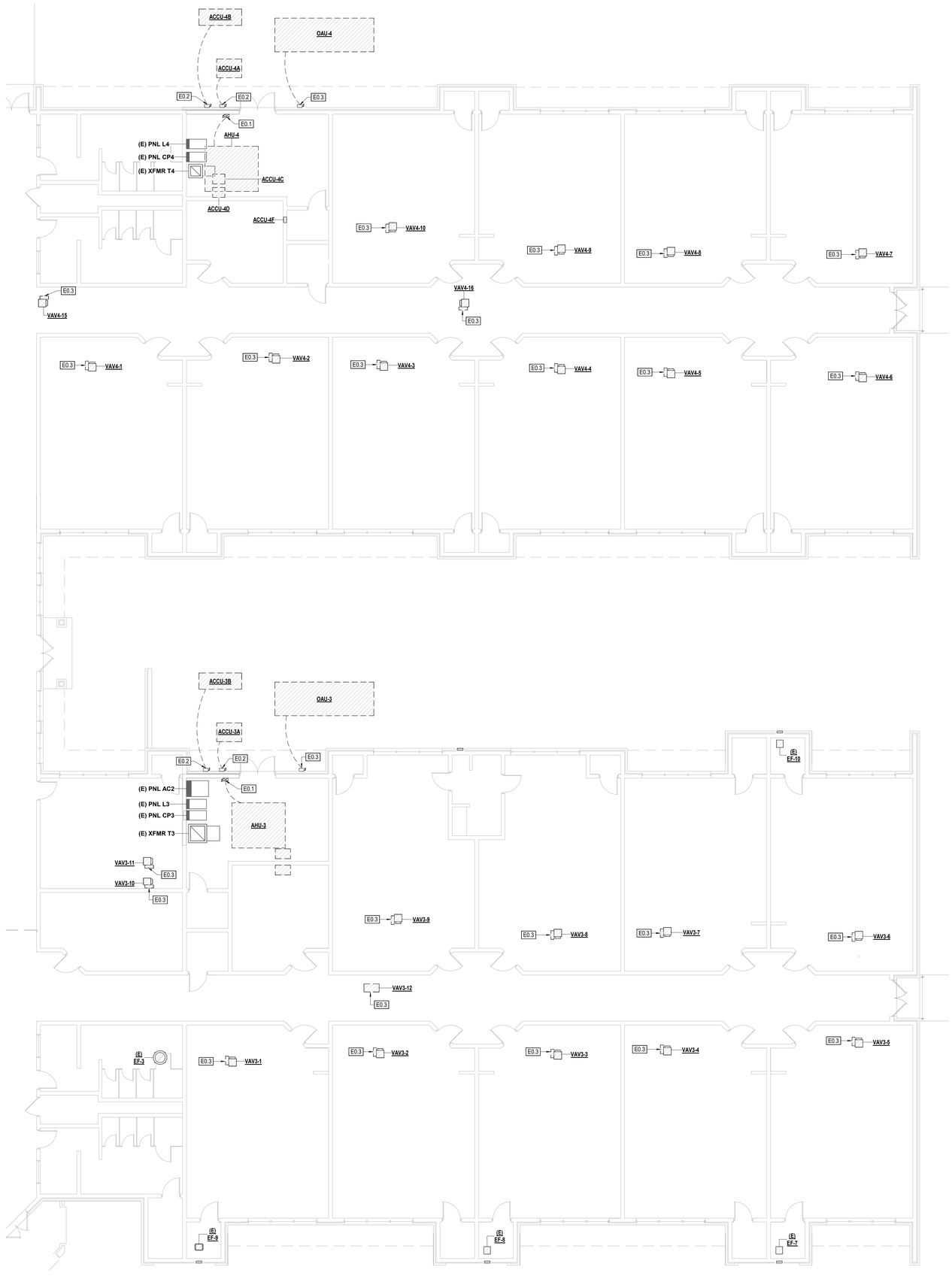
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1 ED2.13 **DEMO ELECTRICAL PLAN - AREA B**
1/8" = 1'-0"

ELECTRICAL KEYED NOTES

E0.1 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD TO REMAIN. EXISTING CONTROL PANEL CIRCUIT AND BYPASS DAMPER CIRCUIT TO REMAIN.

E0.2 DEMOLISH DISCONNECT AND ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION BY DIV 23. DEMOLISH EXISTING CONDUCTORS AND CONDUIT BACK TO ASSOCIATED PANEL, INCLUDING BREAKER SERVING LOAD.

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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA B

SHEET NUMBER: ED2.13

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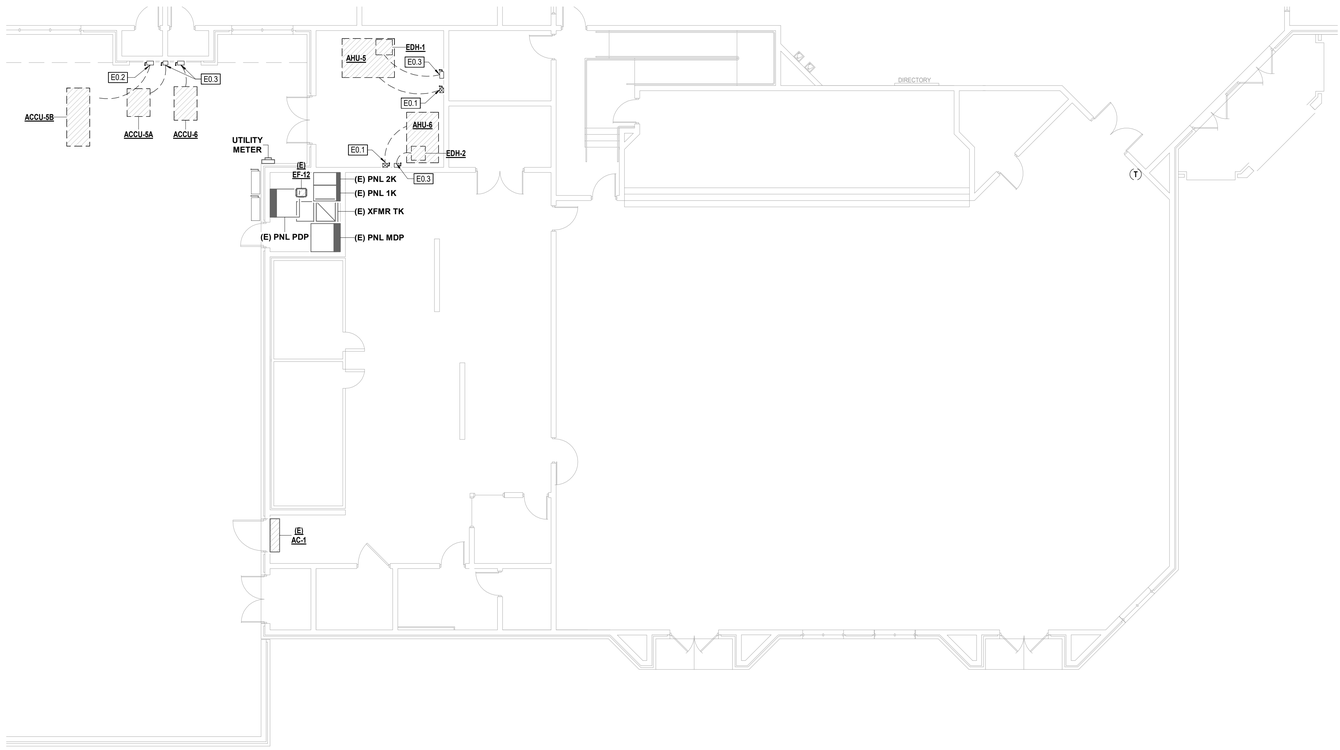
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ELECTRICAL KEYED NOTES

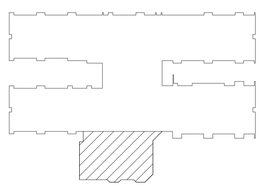
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1 ED2.14 **DEMO ELECTRICAL PLAN - AREA C**
1/8" = 1'-0"



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SHEET TITLE: DEMO ELECTRICAL PLAN - AREA C

SHEET NUMBER: ED2.14

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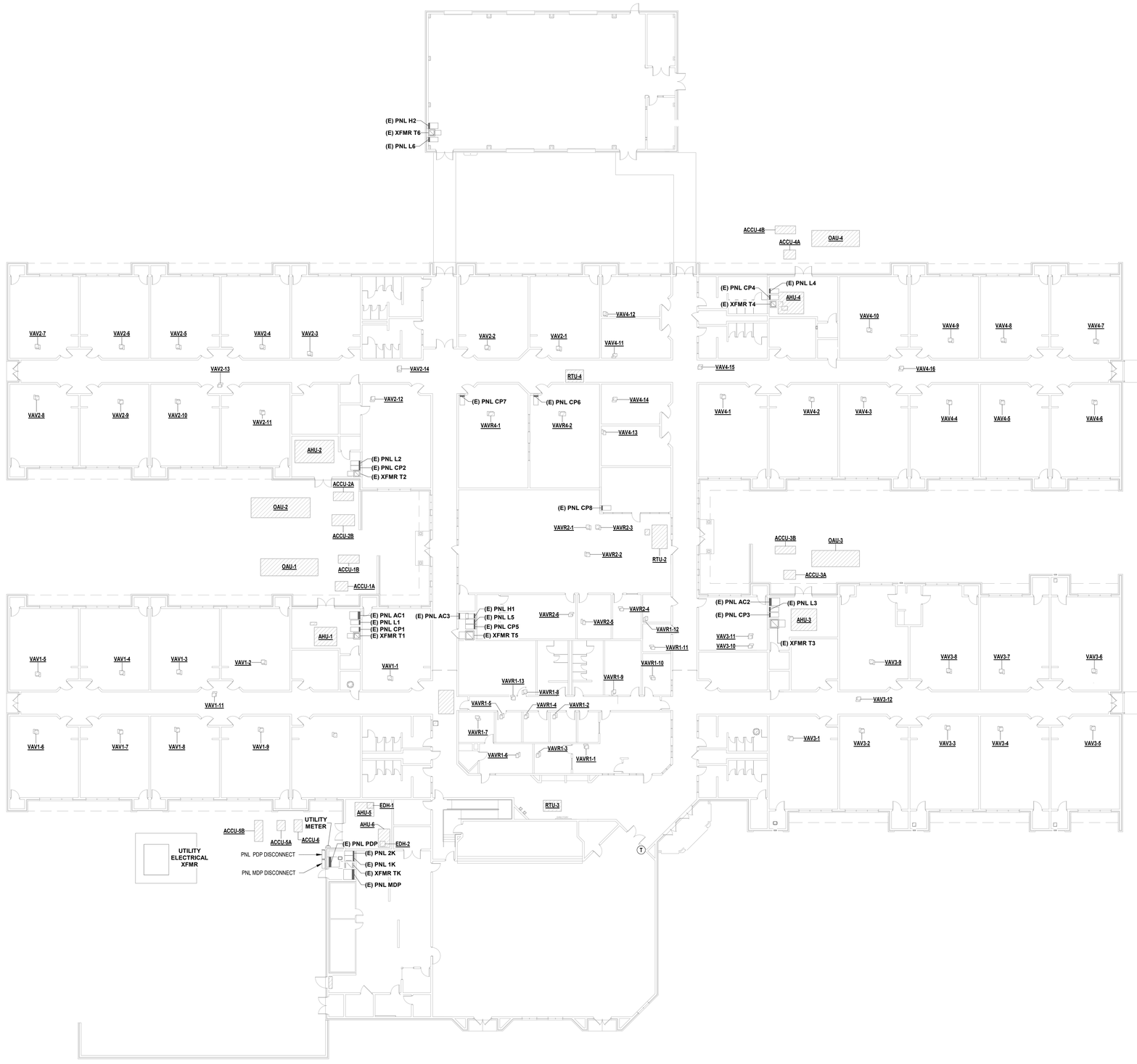
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1 COMPOSITE ELECTRICAL PLAN
E2.11 1/16" = 1'-0"

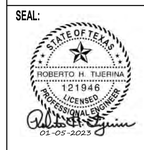
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SHEET TITLE: COMPOSITE ELECTRICAL PLAN

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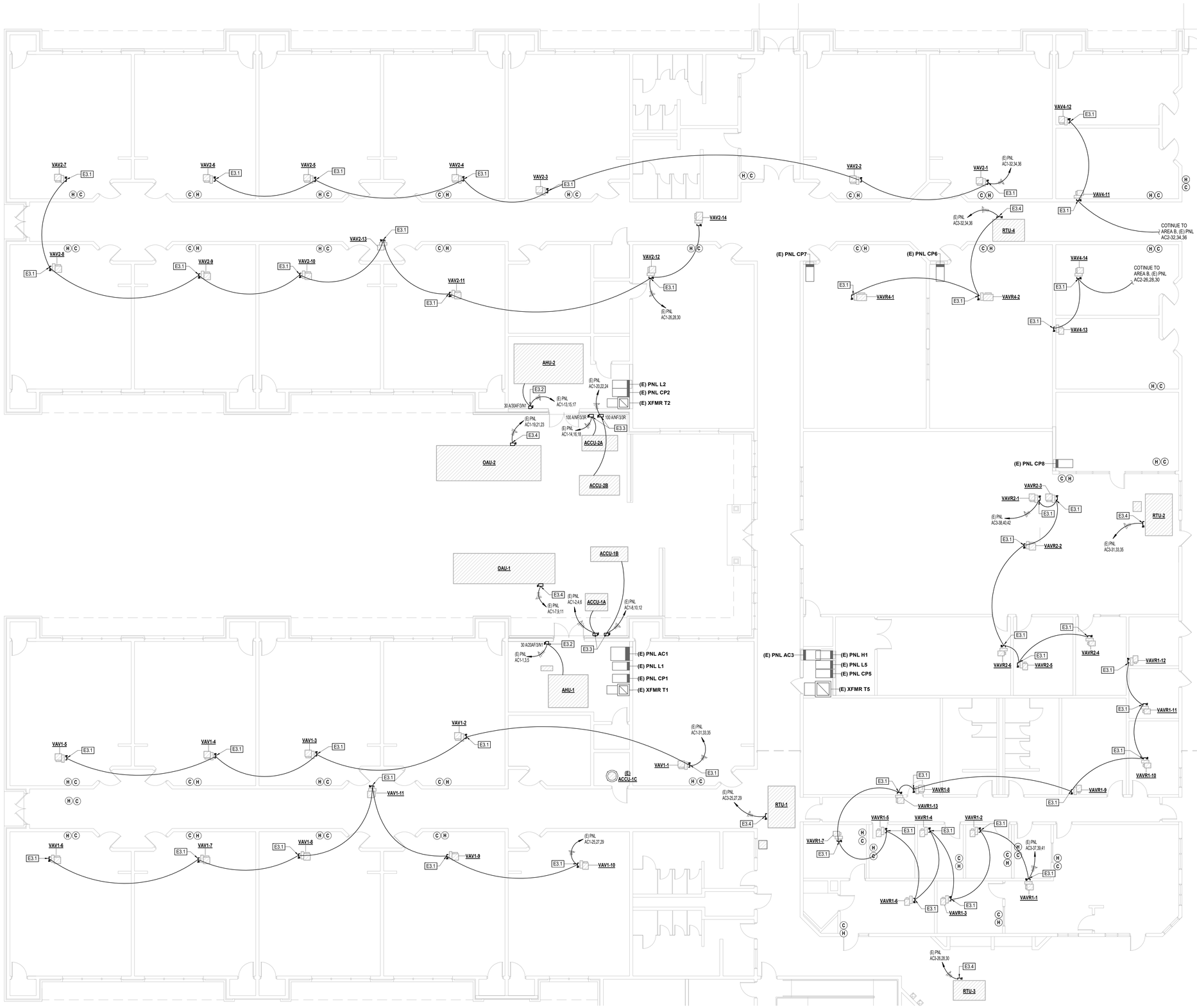
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1 E2.12 **ELECTRICAL PLAN - AREA A**

1/8" = 1'-0"

ELECTRICAL KEYED NOTES

E3.1 CONNECT NEW VAV BOX TO EXISTING CIRCUIT. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO RECONNECT NEW UNIT. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL CONTRACTOR. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

E3.2 CONNECT NEW HVAC EQUIPMENT. PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. RECONNECT TO EXISTING CIRCUIT BACK TO EXISTING BREAKER AT PANEL.

E3.3 CONNECT NEW HVAC EQUIPMENT, PROVIDE NEW ELECTRICAL CONNECTION AND DISCONNECT AS INDICATED WITH NEW FEEDER BACK TO NEW BREAKER AT EXISTING PANEL. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES.

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SHEET TITLE: ELECTRICAL PLAN - AREA

SHEET NUMBER: E2.12

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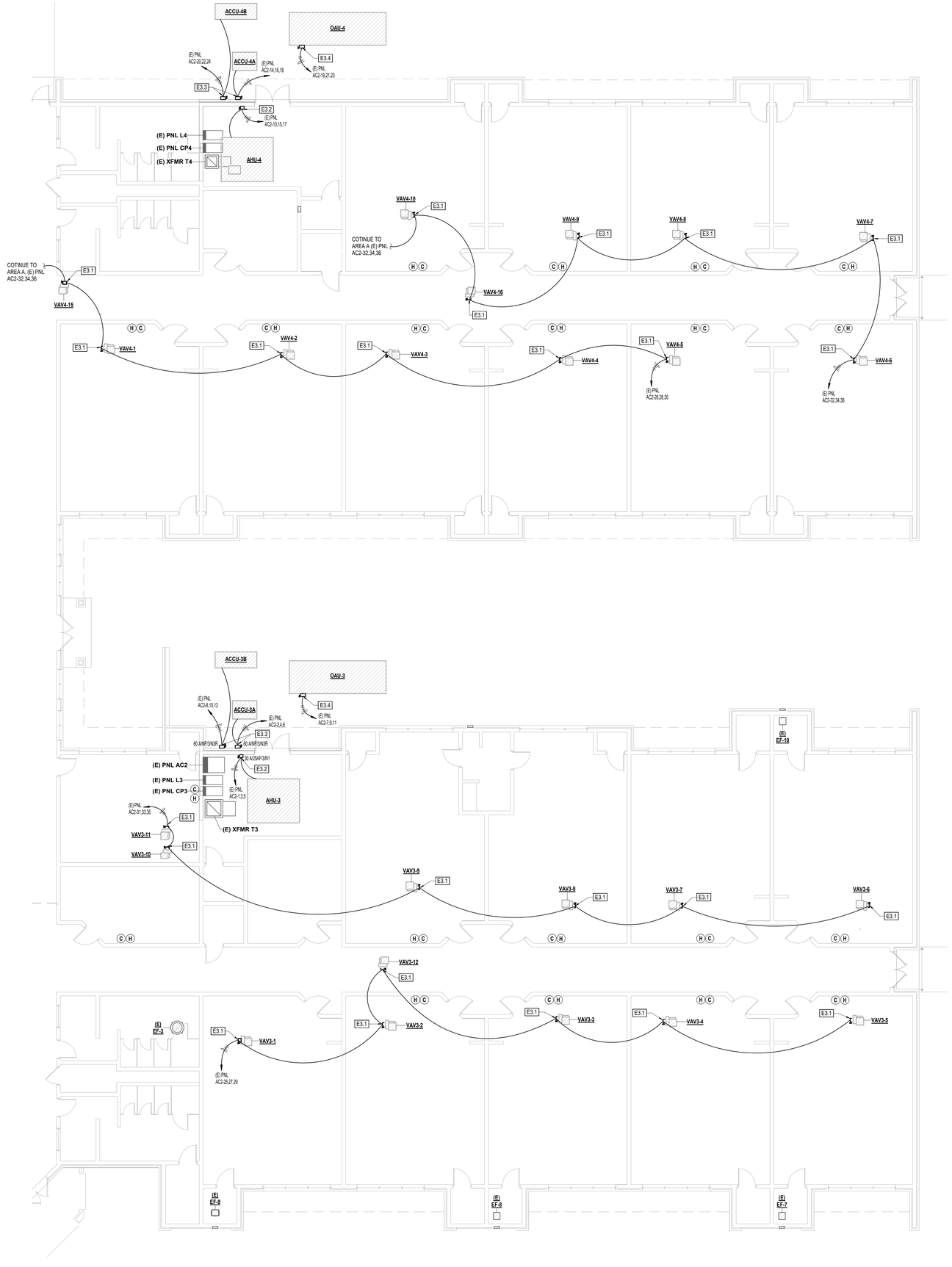
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ELECTRICAL KEYED NOTES

E3.1 CONNECT NEW VAV BOX TO EXISTING CIRCUIT. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO RECONNECT NEW UNIT. REFER TO FEEDER SCHEDULES FOR CONDUCTOR AND CONDUIT SIZES. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL CONTRACTOR. DISCONNECT SHOWN FOR REFERENCE ONLY, NEW EQUIPMENT IS PROVIDED WITH INTEGRAL FUSED DISCONNECT.

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1 E2.13 **ELECTRICAL PLAN - AREA B**
1/8" = 1'-0"

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SHEET TITLE: ELECTRICAL PLAN - AREA B

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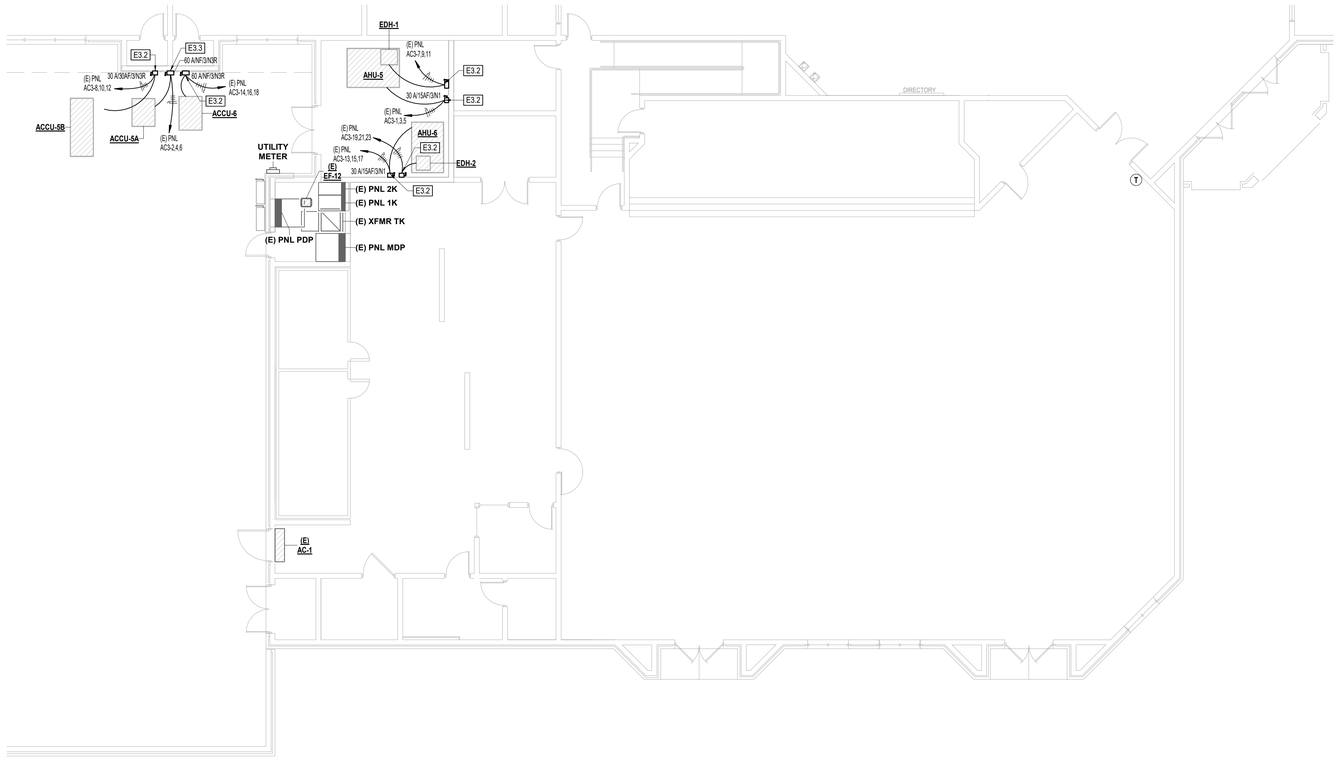
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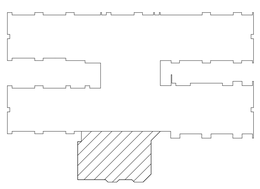
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1 E2.14 **ELECTRICAL PLAN - AREA C**
1/8" = 1'-0"



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PROJECT NUMBER 218033.009

SHEET TITLE: ELECTRICAL PLAN - AREA C

SHEET NUMBER: E2.14

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FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#8, 1#10 G.	1"
50A	1	4#6, 1#10 G.	1"
60A	1	4#6, 1#10 G.	1"
70A	1	4#4, 1#8 G.	1 1/4"
80A	1	4#4, 1#8 G.	1 1/4"
90A	1	4#3, 1#8 G.	1 1/4"
100A	1	4#3, 1#8 G.	1 1/4"
125A	1	4#1, 1#6 G.	1 1/2"
150A	1	4#1/0, 1#6 G.	1 1/2"
175A	1	4#2/0, 1#6 G.	2"
200A	1	4#3/0, 1#6 G.	2"
225A	1	4#4/0, 1#4 G.	2 1/2"
250A	1	4#250, 1#4 G.	2 1/2"
300A	1	4#350, 1#4 G.	3"
350A	1	4#500, 1#3 G.	3 1/2"
400A	1	4#600, 1#3 G.	4"
450A	2	4#4/0, 1#2 G.	2 1/2"
500A	2	4#250, 1#2G.	2 1/2"
600A	2	4#350, 1#1G.	3"
700A	2	4#500, 1#1/0G.	4"
800A	2	4#600, 1#1/0G.	4"
1000A	3	4#500, 1#2/0G.	4"
1200A	4	4#350, 1#3/0G.	3"
1600A	4	4#600, 1#4/0G.	4"
	5	4#500, 1#4/0G.	4"
2000A	5	4#600, 1#250 G.	4"
	6	4#500, 1#250 G.	4"
2500A	6	4#600, 1#350 G.	4"
	7	4#500, 1#350 G.	4"
3000A	8	4#500, 1#400 G.	4"
3500A	9	4#600, 1#500 G.	4"
	10	4#500, 1#500 G.	4"
4000A	10	4#600, 1#500 G.	4"
	11	4#500, 1#500 G.	4"
5000A	12	4#600, 1#750 G.	4"
	14	4#500, 1#750 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

Panelboard (E) PNL AC1

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 600 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1	2						
	12720 VA	M	AHU-1	6	60 A	3	4	50 A	8	ACCU-1A	M	24610 VA	1
						5	6						
	59300 VA	M	OAU-1	4	80 A	7	8	50 A	8	ACCU-1B	M	24610 VA	1
						9	10						
						11	12						
	18710 VA	M	AHU-2	4	80 A	13	14	70 A	4	ACCU-2A	M	31925 VA	1
						15	16						
						17	18						
	53475 VA	M	OAU-2	1	110 A	19	20	70 A	4	ACCU-2B	M	31925 VA	1
						21	22						
						23	24						
	28000 VA	M	VAV BOXES (28 KW)	8	45 A	25	26	60 A	6	VAV BOXES (36 KW)	M	44000 VA	
						27	28						
						29	30						
	25000 VA	M	VAV BOXES (25 KW)	8	40 A	31	32	60 A	6	VAV BOXES (39 KW)	M	31000 VA	
						33	34						
						35	36						
	0 VA	--	Space	12	--	37	38	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	39	40	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	41	42	--	12	Space	--	0 VA	

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	385275 VA	100.00%	385275 VA		(SP)Sub Pnl.			
Total Connected Load:		385275 VA	VA =	463 A	Location of Panel:				
Total Load (Diversified):		385275 VA	VA =	463 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

Panelboard (E) PNL AC2

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 600 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1	2						
	15715 VA	M	AHU-3	4	80 A	3	4	50 A	8	ACCU-3A	M	31925 VA	1
						5	6						
	49300 VA	M	OAU-3	4	80 A	7	8	50 A	8	ACCU-3B	M	31925 VA	1
						9	10						
						11	12						
	15715 VA	M	AHU-4	4	80 A	13	14	50 A	8	ACCU-4A	M	31925 VA	1
						15	16						
						17	18						
	50465 VA	M	OAU-4	3	100 A	19	20	50 A	8	ACCU-4B	M	31925 VA	1
						21	22						
						23	24						
	28000 VA	M	VAV BOXES (28 KW)	8	45 A	25	26	50 A	8	VAV BOXES (33 KW)	M	33000 VA	
						27	28						
						29	30						
	29000 VA	M	VAV BOXES (29 KW)	8	45 A	31	32	50 A	8	VAV BOXES (33 KW)	M	33000 VA	
						33	34						
						35	36						
	0 VA	--	Spare	8	40 A	37	38	40 A	8	Spare	--	0 VA	
						39	40						
						41	42						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	381895 VA	100.00%	381895 VA		(SP)Sub Pnl.			
Total Connected Load:		381895 VA	VA =	459 A	Location of Panel:				
Total Load (Diversified):		381895 VA	VA =	459 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

Panelboard (E) PNL AC3

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB; 400 A BUS (Copper); ISO. GRND. BUS | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1	2						
	6720 VA	M	AHU-5	10	30 A	3	4	50 A	8	ACCU-5A	M	31925 VA	1
						5	6						
	60000 VA	M	EDH-1 (AHU-5 HEATER, 60 KW)	3	90 A	7	8	50 A	8	ACCU-5B	M	15300 VA	
						9	10						
						11	12						
	3725 VA	M	AHU-6	12	20 A	13	14	35 A	8	ACCU-6	M	31925 VA	
						15	16						
						17	18						
	15000 VA	M	EDH-2 (AHU-6 HEATER, 15 KW)	10	30 A	19	20	50 A	8	Spare	--	0 VA	
						21	22						
						23	24						
	23950 VA	M	RTU-1	8	45 A	25	26	15 A	12	RTU-3	M	5990 VA	
						27	28						
						29	30						
	23950 VA	M	RTU-2	8	45 A	31	32	60 A	6	RTU-4 & VAV BOXES	M	33280 VA	
						33	34						
						35	36						
	27000 VA	M	VAV BOXES (RTU-1, 27KW)	8	40 A	37	38	40 A	8	VAV BOXES (RTU-2, 28KW)	M	28000 VA	
						39	40						
						41	42						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	306765 VA	100.00%	306765 VA		(SP)Sub Pnl.			
Total Connected Load:		306765 VA	VA =	369 A	Location of Panel:				
Total Load (Diversified):		306765 VA	VA =	369 A					

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER AS SHOWN, AIC RATING TO MATCH EXISITNG PANEL RATING.

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No.	DATE	DESCRIPTION

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01-05-2023

MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER: 218033.009

SHEET TITLE: ELECTRICAL SCHEDULES

SHEET NUMBER: E5.01

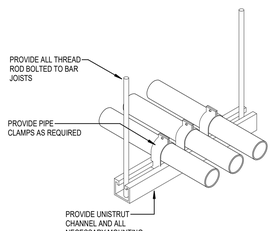
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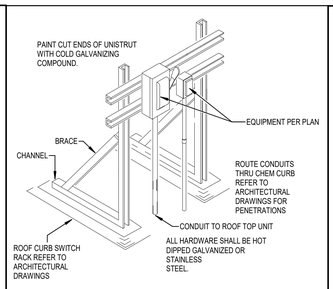
DBR Project Number 218033.009

HA	RT	JR		

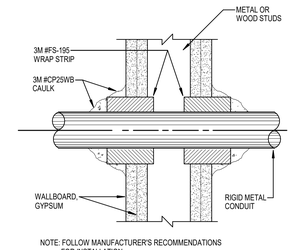
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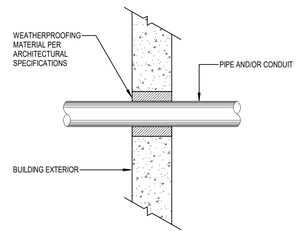
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E10003



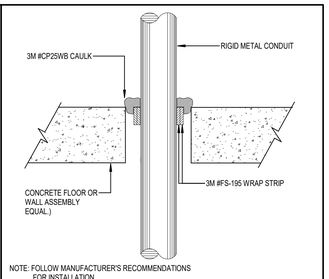
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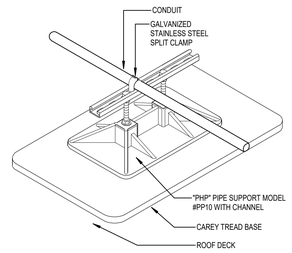
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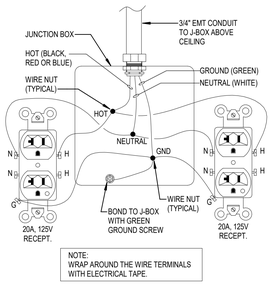
4 PIPE AND/OR CONDUIT PENETRATION
NOT TO SCALE
E10018



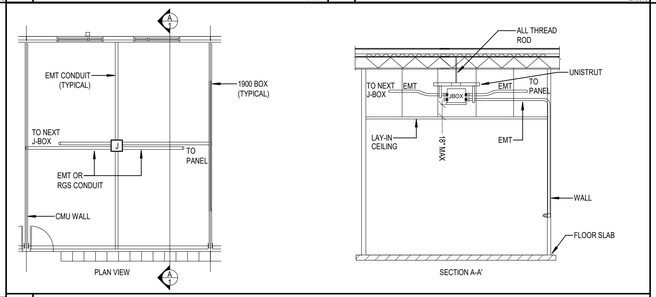
5 2, 3 AND 4 HR. PENETRATIONS FOR CONCRETE
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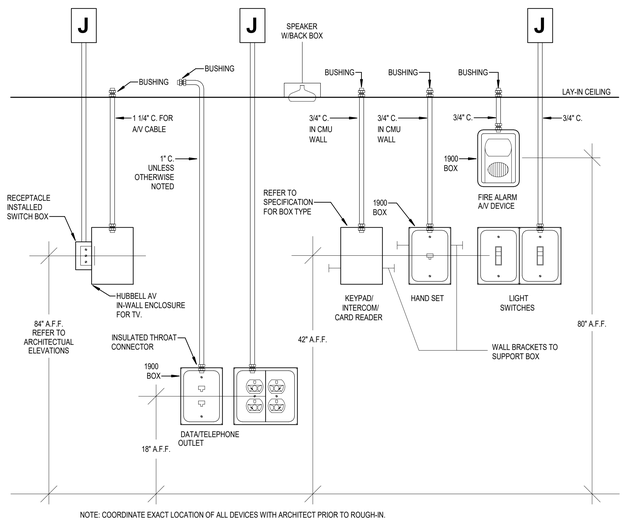
6 ROOF CONDUIT SUPPORT DETAIL
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7 20A,125V. RECEPTACLE WIRING DETAIL
NOT TO SCALE
E13029



8 TYPICAL RACEWAY CONFIGURATION
NOT TO SCALE
E18002



9 TYPICAL DEVICE ELEVATIONS
NOT TO SCALE
E11001

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MISSION CISD - MIDKIFF ES 115 - INDOOR AIR QUALITY IMPROVEMNTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.009

SHEET TITLE: ELECTRICAL DETAILS

SHEET NUMBER: E6.01

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TBPE Firm Registration No. 2234

DBR Project Number 218033.009

HA	RT	JR		

TN PN

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MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ELEMENTARY SCHOOL - INDOOR AIR QUALITY IMPROVEMENTS

Veronica R. Mendoza	President
Roy Vela	Vice President
Iris Iglesias	Secretary
Petra B. Ramirez	Member
Minnie R. Rodgers	Member
Jerry Zamora	Member
Juan M. Gonzalez	Member

PROJECT TEAM

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LOCATION



10820 N Conway Ave, Mission, TX 78574

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
G0.01	COVER SHEET
M0.01	MECHANICAL SYMBOL
MD1.11	COMPOSITE LEVEL 1 MECHANICAL DEMO PLAN
MD2.11	MECHANICAL DEMO PLAN SECTION A
MD2.12	MECHANICAL DEMO PLAN SECTION B
MD2.13	MECHANICAL DEMO PLAN SECTION C
MD2.14	MECHANICAL DEMO PLAN SECTION D
MD3.01	DEMO ENLARGED MECHANICAL PLANS
M1.11	COMPOSITE LEVEL 1 MECHANICAL PLANS
M2.11	MECHANICAL PLAN SECTION A
M2.12	MECHANICAL PLAN SECTION B
M2.13	MECHANICAL PLAN SECTION C
M2.14	MECHANICAL PLAN SECTION D
M3.01	ENLARGED MECHANICAL PLAN
M4.01	MECHANICAL DIAGRAM PLAN
M5.01	MECHANICAL SCHEDULES
M6.01	MECHANICAL DETAILS
E0.01	ELECTRICAL SYMBOL LEGEND
EPD1.11	DEMO COMPOSITE LEVEL 1 ELECTRICAL COMPOSITE PLAN
EPD2.11	ELECTRICAL DEMO POWER PLAN A
EPD2.12	ELECTRICAL DEMO POWER PLAN B
EPD2.13	ELECTRICAL DEMO POWER PLAN C
EPD2.14	ELECTRICAL DEMO POWER PLAN D
EP1.11	COMPOSITE LEVEL 1 POWER PLAN
EP2.11	ELECTRICAL POWER PLAN A
EP2.12	ELECTRICAL POWER PLAN B
EP2.13	ELECTRICAL POWER PLAN C
EP2.14	ELECTRICAL POWER PLAN D
E4.01	ONE-LINE DIAGRAM
E5.01	ELECTRICAL SCHEDULES
E6.01	ELECTRICAL DETIALS

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DBR Project Number 218033.013

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REVISION:

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01-05-2023

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TBPE Firm Registration No. 2234

DATE: 01/05/2023

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PROJECT NUMBER 218033.013

SHEET TITLE: COVER SHEET

SHEET NUMBER: G0.01

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ABBREVIATIONS

A

A	AIR (COMPRESSED)
ABV	ABOVE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AV	ACID VENT, AIR VENT
AVG	AVERAGE
AW	ACID WASTE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

B

B	BOILER
BC	BELOW COUNTER
B/C	BACK OF CURB
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BH	BOX HYDRANT
BLDG	BUILDING
BM	BENCHMARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STRUCTURE
BP	BACKFLOW PREVENTER
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BWV	BACK WATER VALVE

C

C	CELSIUS
CAB	CABINET
CB	CATCH BASIN
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CI	CAST IRON
CIRC	CIRCULATING
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE, CONCENTRIC
COND	CONDENSER, CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS,CONTINUATION
CTR	CENTER
CU	COPPER

D

D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DDMB	DUAL DUCT MIXING BOX
DESIG	DESIGNATION
DTL	DETAIL
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EVAP	EVAPORATOR
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EX	EXPLOSION PROOF
EXT	EXTERNAL
EXTG	EXISTING

F

F	FAHRENHEIT, FIRE
FBO	FURNISHED BY OTHERS
FCO	FLOOR CLEAN OUT
FCS	FLOOR CONTROL STATION
FCU	FAN COIL UNIT
FD	FLOOR DRAIN, FIRE DAMPER
FDC	FIRE DEPARTMENT SIAMESE CONNECTION
FDV	FIRE DEPARTMENT VALVE
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FPTU	FAN POWERED TERMINAL UNIT
FT	FOOT, FEET
FUT	FUTURE

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GND	GROUND
GPM	GALLONS PER MINUTE
GV	GATE VALVE

H

HORIZ	HORIZONTAL
HP	HORSEPOWER
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INFRARED HEATER
IN	INCH
INSUL	INSULATION
INT	INTERNAL, INTERIOR
INV	INVERT
IW	INDIRECT WASTE

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
KVA	KILOVOLT- AMPS
KW	KILOWATT

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LVL	LEVEL
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE

M

MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND OF BTU'S
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MP	MEDIUM PRESSURE
MS	MOP SINK
MTD	MOUNTED
MU	MAKE-UP
MVD	MANUAL VOLUME DAMPER
MSAH	MINI-SPLIT AIR HANDLER
MSCU	MINI-SPLIT CONDENSING UNIT

N

N.C.	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OFCU	OUTSIDE AIR FAN COIL UNIT
OPG	OPENING
OS&Y	OPEN STEM AND YOLK

P

PG	PRESSURE GAUGE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILLE
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	REFERENCE, REFER
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAN	SANITARY SEWER
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SD	STORM DRAIN
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SK	SINK
SM	SHEETMETAL
SP	STATIC PRESSURE, SUMP PUMP
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	SERVICE SINK
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT
SW	SOFT WATER

T

TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CORNEAL COMPRESSOR
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TH BLK	THRUST BLOCK
THERM	THERMOMETER
TMV	THERMOSTATIC MIXING VALVE
TP	TRAP PRIMER
TPD	TRAP PRIMER DEVICE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TW	TEMPERED HOT WATER
TYP	TYPICAL

U

U	URINAL
UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V

V	VOLT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VR	VARIABLE AIR VOLUME REHEAT
VTR	VENT THRU ROOF

W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WH	WALL HYDRANT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WWF	WELDED WIRE FABRIC

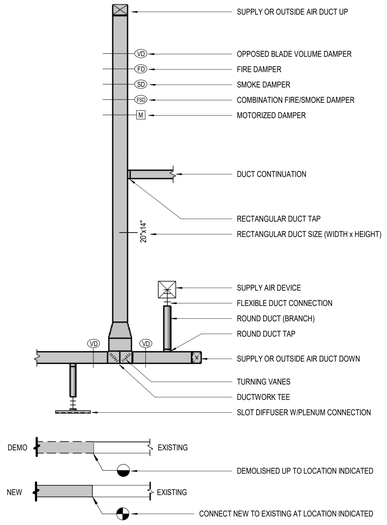
Y

Y	YARD HYDRANT

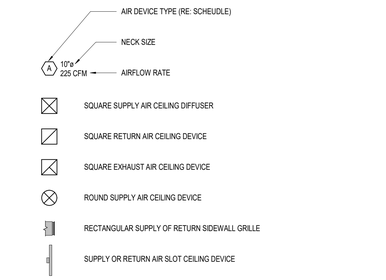
Z

Z	ZONE

DUCTWORK



AIR DEVICE TYPES



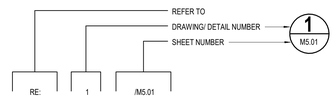
WALL MOUNTED SENSOR TYPES

T	THERMOSTAT
H	HUMIDISTAT
C	CARBON DIOXIDE SENSOR
CM	CARBON MONOXIDE SENSOR
N	NITROGEN DIOXIDE SENSOR
S	ON/OFF SWITCH

PIPING TYPES

CD	CONDENSATE DRAIN LINE
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
REF	REFRIGERANT PIPING SIZED BY MFR.

DRAWING/DETAIL REFERENCE KEY



MECHANICAL GENERAL NOTES

1. PIPING AND DUCTWORK SHOWN ON PLANS ARE SCHEMATIC ONLY. COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATIONS.
2. EXACT LOCATIONS OF VAV TERMINAL UNITS, GRILLES, AND DAMPERS SHALL BE FIELD COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS AND ALLOW ADEQUATE CLEARANCES.
3. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER DRAWINGS AND CUTSHEETS BEFORE FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS.
4. SHEET METAL INLET DUCTS TO VAV TERMINAL UNITS SHALL BE SAME SIZE AS THE BOX INLET SIZE. PROVIDE RIGID ROUND DUCT THAT IS ONE SIZE LARGER THAN THE INLET BOX SIZE IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE VAV BOX IS MORE THAN 6'-0".
5. PROVIDE CONICAL SPIN-IN CONNECTOR FOR ALL ROUND DUCT CONNECTIONS TO VAV TERMINAL UNITS.
6. INSTALL VAV TERMINAL UNITS TO ENSURE ACCESS PANELS ARE NOT BLOCKED. ACCESS FOR SERVICE MUST BE PROVIDED.
7. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS.
8. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS.
9. PROVIDE RECTANGULAR BRANCH DUCT TAP FOR ALL RECTANGULAR DUCT CONNECTIONS TO RECTANGULAR DUCT TRUNKS.
10. ALL MEDIUM AND LOW PRESSURE DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR MEDIUM AND LOW PRESSURE DUCTWORK.
11. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATION 23 07 13 DUCT INSULATION FOR FURTHER INFORMATION AND ADDITIONAL REQUIREMENTS.
12. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATION 23 31 13 METAL DUCTWORK FOR FURTHER INFORMATION.
13. ALL EXPOSED DUCTWORK AND PIPING WITH ASSOCIATED ACCESSORIES IN AREAS WITH NO CEILING OR PARTIAL CEILING SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR.
14. DIVISION 23 MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO ACTUAL INSTALLATION OF TEMPERATURE SENSORS AND HUMIDITY SENSORS.
15. PROVIDE REMOTE SPIN-IN DAMPER OPERATOR FOR SPIN-IN CONNECTIONS AND VOLUME DAMPERS LOCATED OVER GYPSUM CEILINGS.
16. PROVIDE AIRFOIL TYPE TURNING VANES IN ALL 90 DEGREE ELBOWS.
17. PROVIDE INSULATED ACCESS DOORS FOR DUCTWORK DOWNSTREAM OF AIR HANDLING UNITS AT EVERY 20'-0" TO FACILITATE DUCT CLEANING. PROVIDE ACCESS DOORS WITHIN 5'-0" OF EACH ELBOW.
18. COORDINATE LOCATIONS OF FLOOR AND WALL OPENINGS WITH ARCHITECT AND STRUCTURAL ENGINEER.
19. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE. CONTRACTOR SHALL COORDINATE COLOR WITH ARCHITECT.
20. NO PIPE HANGERS SHALL BE SPACED MORE THAN 10'-0" O.C. COMPLY WITH PIPE SPACING AS SPECIFIED IN THE PIPING SUPPORT SPECIFICATIONS.
21. ALL CHILLED WATER AND HOT WATER PIPING LOCATED INSIDE BUILDING SHALL BE SUPPORTED FROM THE STRUCTURE WITH SADDLE OR TRAPEZE HANGERS WITH ADJUSTABLE CLEVIS OR THREADED RODS.
22. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL OUTSIDE AIR INTAKES TO MAINTAIN 15 FEET DISTANCE BETWEEN OUTSIDE AIR INTAKES AND ANY EXHAUST AIR OUTLET, FLUES OR PLUMBING VENTS.
23. MECHANICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR ALL CONDENSATE DRAIN PIPES CONNECTING TO A SINK DRAIN TAIL PIECE.
24. ALL KITCHEN GREASE EXHAUST DUCTWORK SHALL BE CONTINUOUSLY WELDED 16 GA. CARBON STEEL. ALL GREASE EXHAUST DUCTS SHALL BE WRAPPED WITH 3M 2 HR. FIRE RATED WRAP OR INSTALLED WITHIN A FIRE RATED ENCLOSURE.

CONTROLS SCHEMATIC SYMBOLS LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL/BINARY INPUT
DO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

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01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL SYMBOL LEGEND

SHEET NUMBER: M0.01

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MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

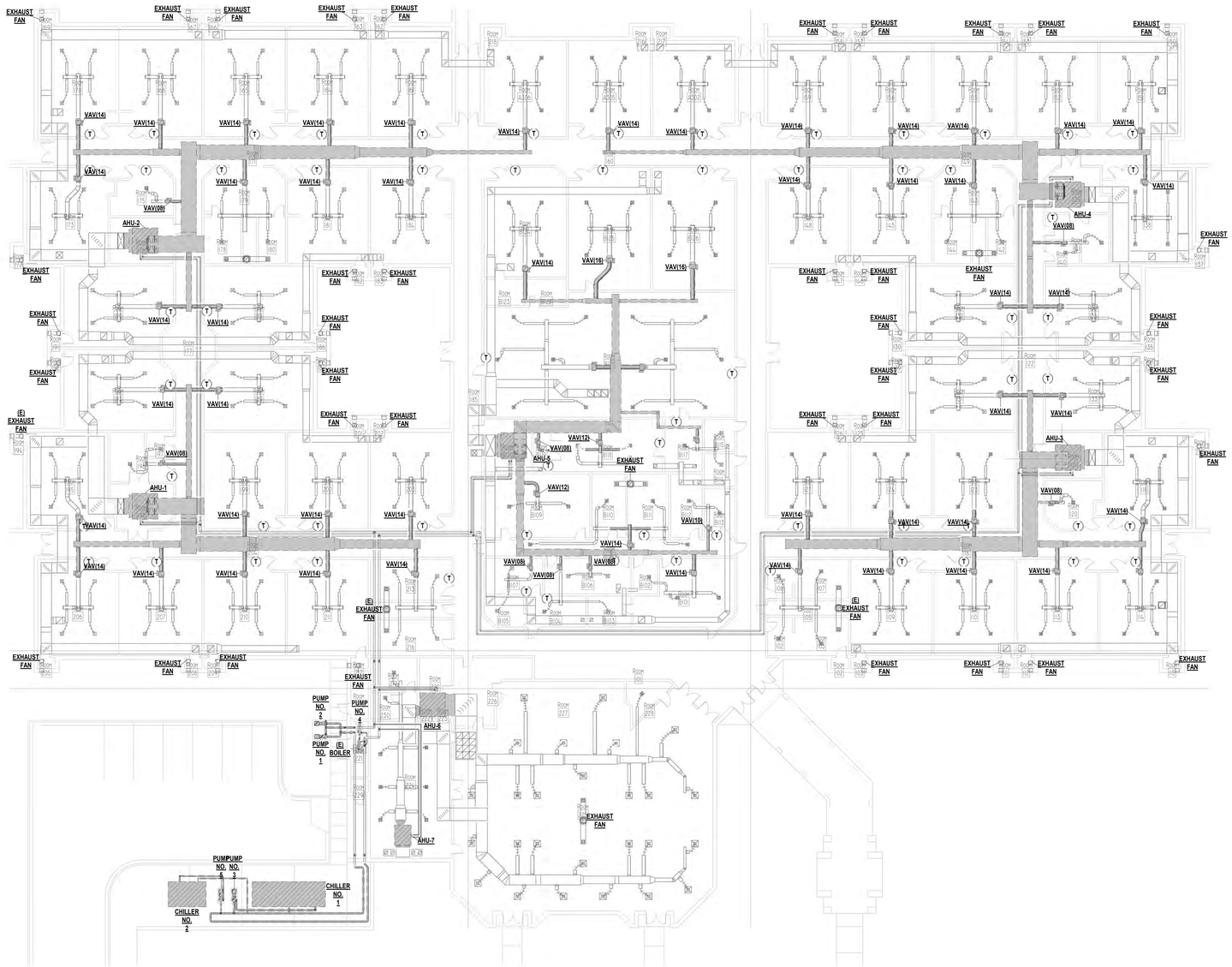
D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL KEYED DEMO NOTES

1 DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.

2 DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.



1 MD1.11 **DEMO COMPOSITE LEVEL 1 MECHANICAL PLAN**
1/16" = 1'-0"

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SHEET TITLE: COMPOSITE LEVEL 1 MECHANICAL DEMO PLAN

SHEET NUMBER: MD1.11

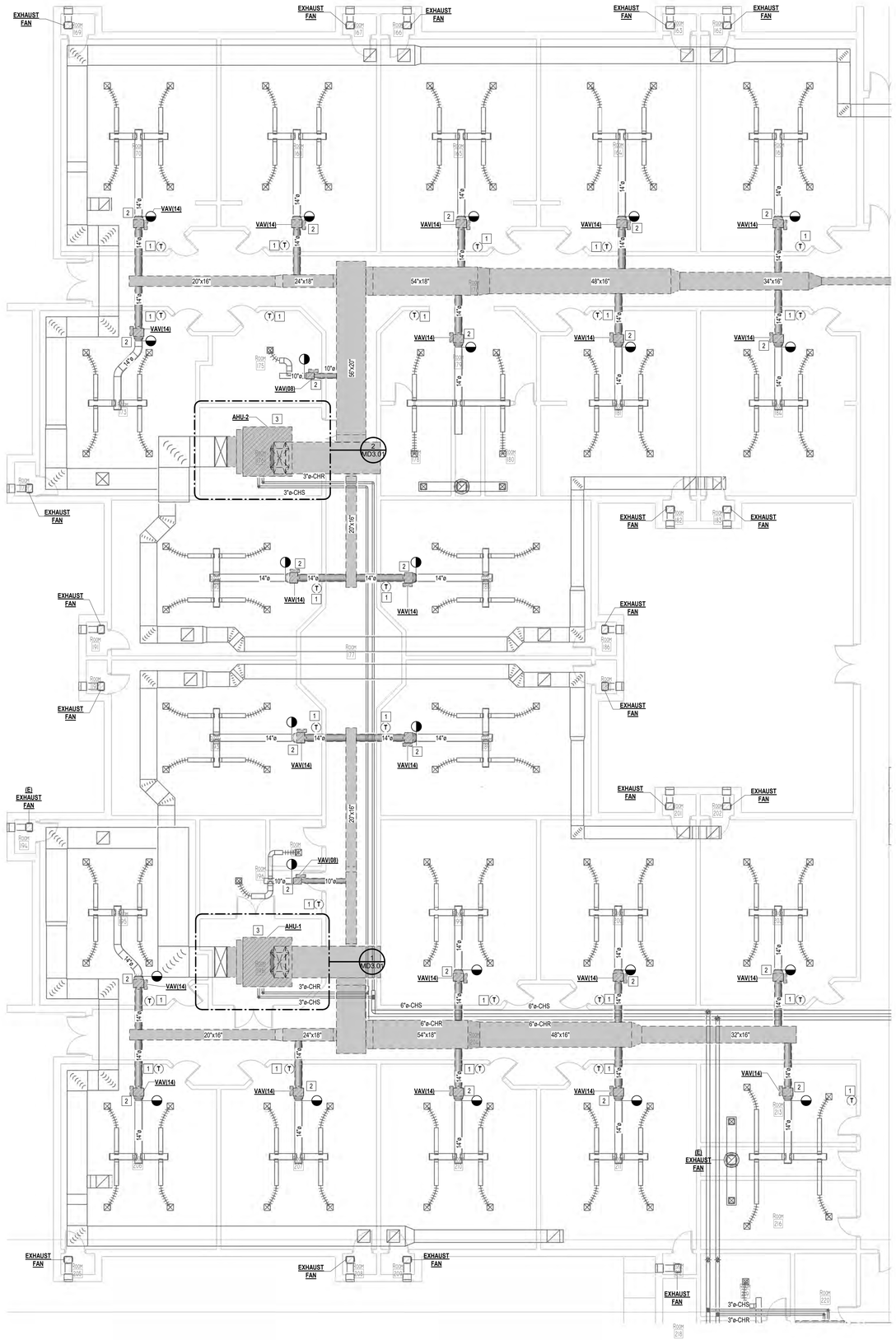
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1 MD2.11 **DEMO MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

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PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL DEMO PLAN SECTION A

SHEET NUMBER: MD2.11

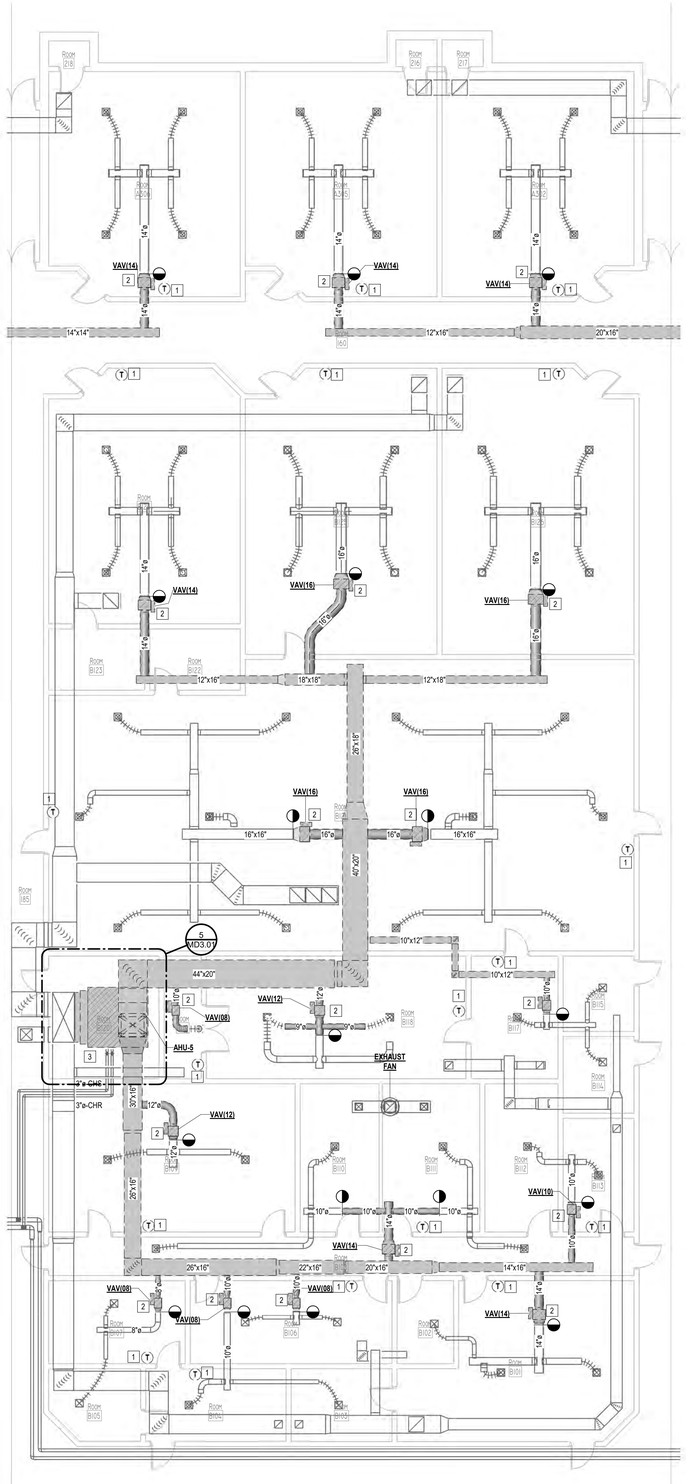
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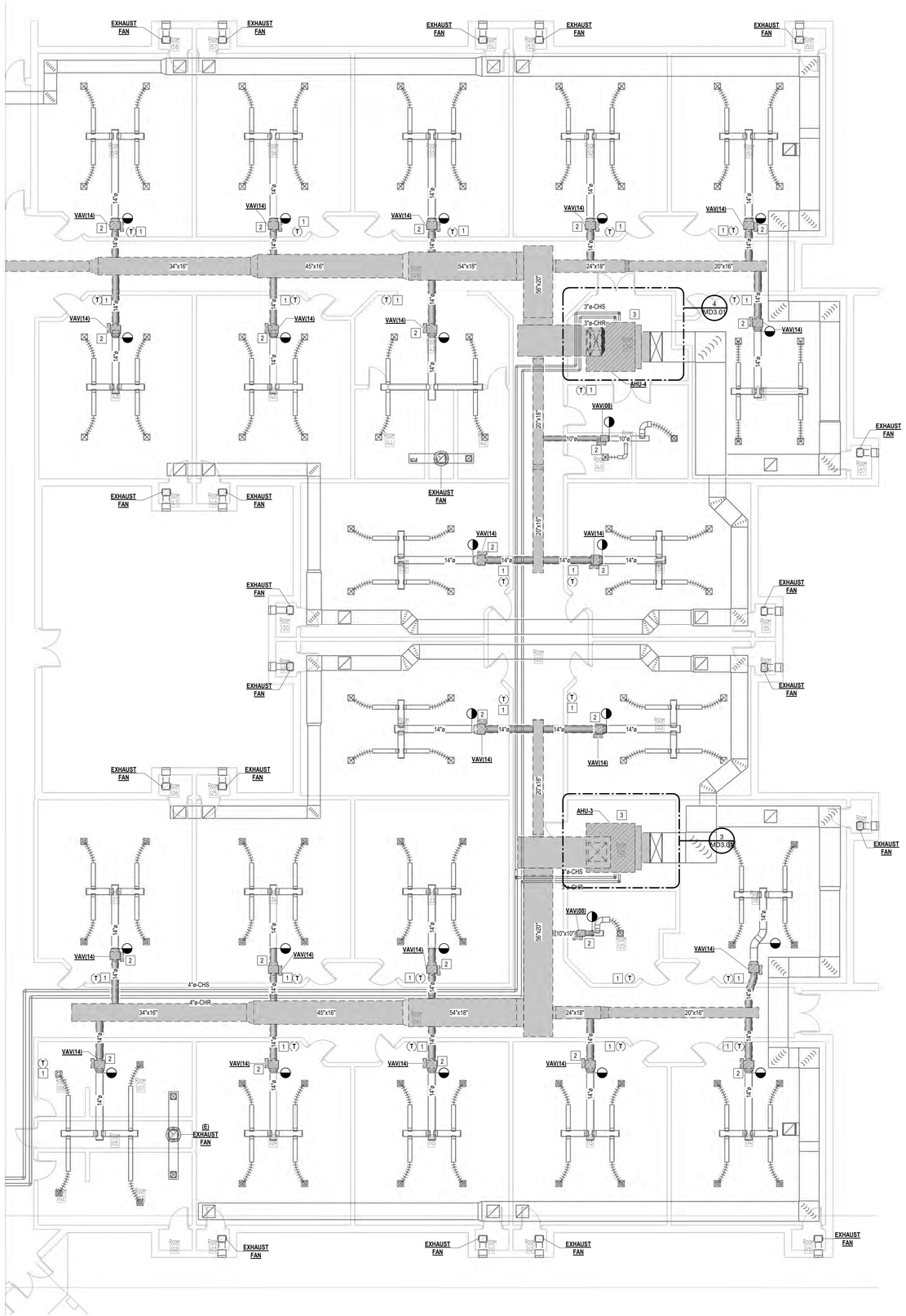
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ROOM 216
ROOM 217
ROOM B004
ROOM B005
ROOM B006
VAV(14)
14"x14"
12"x16"
20"x16"
ROOM B007
ROOM B008
ROOM B009
VAV(16)
16"x16"
18"x18"
12"x18"
ROOM B023
ROOM B022
ROOM B021
ROOM B020
ROOM B019
ROOM B018
ROOM B017
ROOM B016
ROOM B015
ROOM B014
ROOM B013
ROOM B012
ROOM B011
ROOM B010
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ROOM B099
ROOM B098
ROOM B097
ROOM B096
ROOM B095
ROOM B094
ROOM B093
ROOM B092
ROOM B091
ROOM B090
ROOM B089
ROOM B088
ROOM B087
ROOM B086
ROOM



1 MD2.13 **DEMO MECHANICAL PLAN - AREA C**
1/8" = 1'-0"

MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

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3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.

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121946
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PROFESSIONAL ENGINEER
01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL DEMO PLAN SECTION C

SHEET NUMBER: MD2.13

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MECHANICAL GENERAL DEMO NOTES

A. COORDINATE DEMOLITION WORK WITH ELECTRICAL AND OTHER DISCIPLINES AS REQUIRED.

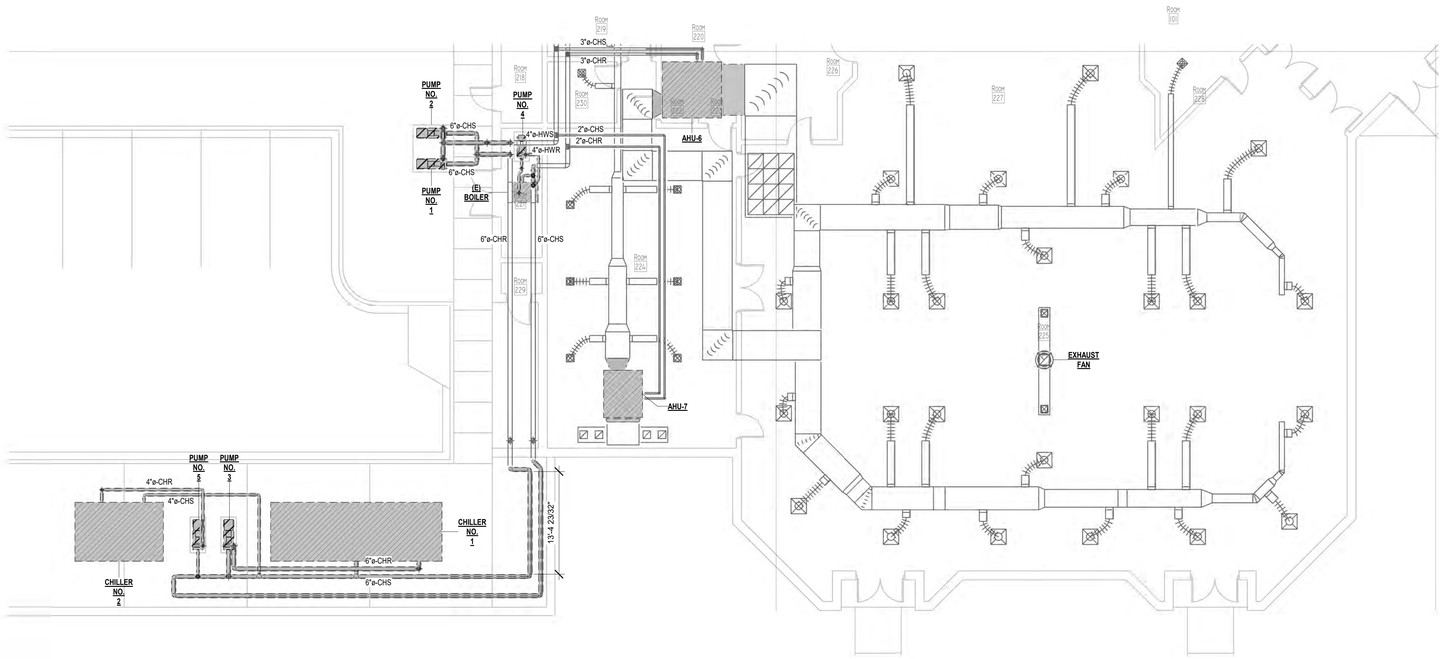
B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOBSITE CONDITIONS DURING THE BIDDING PERIOD, SO THEY WILL HAVE DISCOVERED THE FULL SCOPE OF WORK INVOLVED WITH THE MODIFICATION OF THIS EXISTING SPACE. THE SCOPE OF THE WORK SHALL INCLUDE ALL MATERIALS FOR A COMPLETE INSTALLATION INCLUDING DEVICES, EQUIPMENT, OR APPARATUS WHICH MUST BE REROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED TO ACCOMMODATE THE INDICATED REMODELING. NOT ALL EXISTING CONDITIONS ARE NECESSARILY INDICATED ON THE DRAWINGS. ALL HVAC SHOWN ARE TAKEN FROM AS-BUILT HARDCOPY AND MUST BE FIELD VERIFIED.

C. WHEN AN EQUIPMENT IS IDENTIFIED TO BE REMOVED, THE OWNER HAS FIRST RIGHT OF REFUSAL BEFORE DISPOSING OF THAT EQUIPMENT. PROVIDE OWNER ONE WEEK NOTICE PRIOR TO DEMOLITION.

D. PROVIDE ALL NECESSARY CLEAR PATH TO MOVE DEMOLISHED EQUIPMENT OUT OF THE FACILITY AS WELL TO BRING NEW EQUIPMENT INTO THE BUILDING. MODIFY EXISTING PIPING, DUCTWORK CONDUITS, AS REQUIRED TO COMPLETE THE DEMOLITION.

MECHANICAL KEYED DEMO NOTES

1. DEMOLISH EXISTING THERMOSTAT AND CONDUCTORS. EXISTING J-BOX AND CONDUIT TO REMAIN FOR RE-USE.
2. DEMOLISH EXISTING SINGLE DUCT BOX IN ITS ENTIRETY. DEMOLISH ASSOCIATED EXISTING TEMPERATURE SENSOR. EXISTING ELECTRICAL DISCONNECT TO REMAIN FOR NEW SINGLE DUCT TERMINAL UNIT. DEMOLISH EXISTING DUCTWORK UP TO LOCATION INDICATED ON PLAN. ALL DOWNSTREAM SUPPLY DUCTWORK AND AIR DEVICES SHALL REMAIN. CONTRACTORSHALL FIELD VERIFY EXACT LOCATION OF TEMPERATURE SENSOR.
3. REFER TO ENLARGED MECHANICAL ROOM PLANS FOR MECHANICAL ROOM VIEWS CONTINUATION.



1 MD2.14 **DEMO MECHANICAL PLAN - AREA D**
1/8" = 1'-0"

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SHEET TITLE: MECHANICAL DEMO PLAN SECTION D

SHEET NUMBER: MD2.14

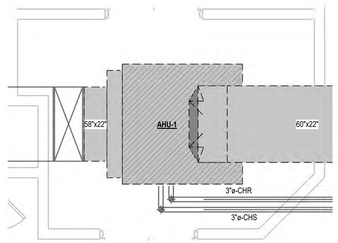
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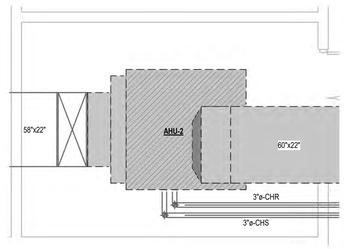
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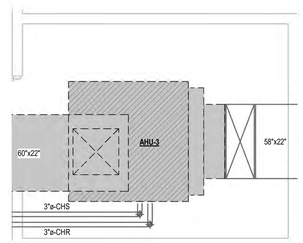
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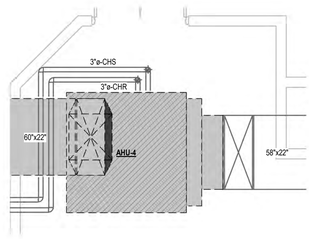
1 MD3.01 **DEMO MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



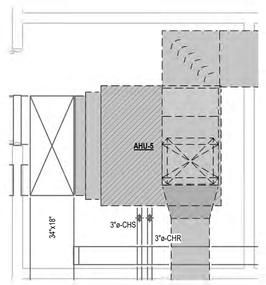
2 MD3.01 **DEMO MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"



3 MD3.01 **DEMO MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"



4 MD3.01 **DEMO MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"



5 MD3.01 **DEMO MECHANICAL PLAN - AHU-5**
1/4" = 1'-0"

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SHEET TITLE: DEMO ENLARGED MECHANICAL PLANS

SHEET NUMBER: MD3.01

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MECHANICAL GENERAL NOTES

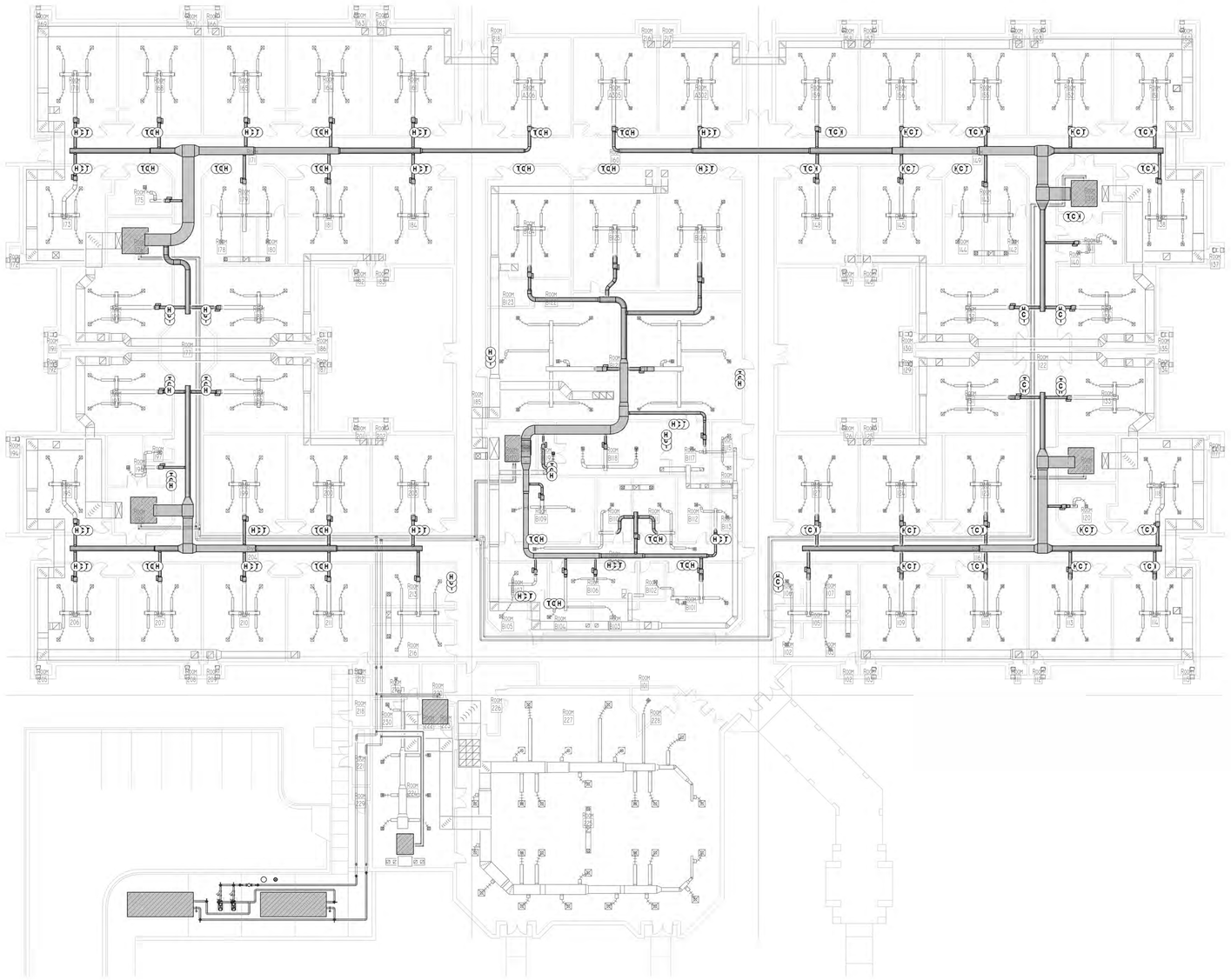
A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL KEYED NOTES

1 APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.

2 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.



1 M1.11 **COMPOSITE LEVEL 1 MECHANICAL PLAN**
1/16" = 1'-0"

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SHEET TITLE: COMPOSITE LEVEL 1 MECHANICAL PLAN

SHEET NUMBER: M1.11

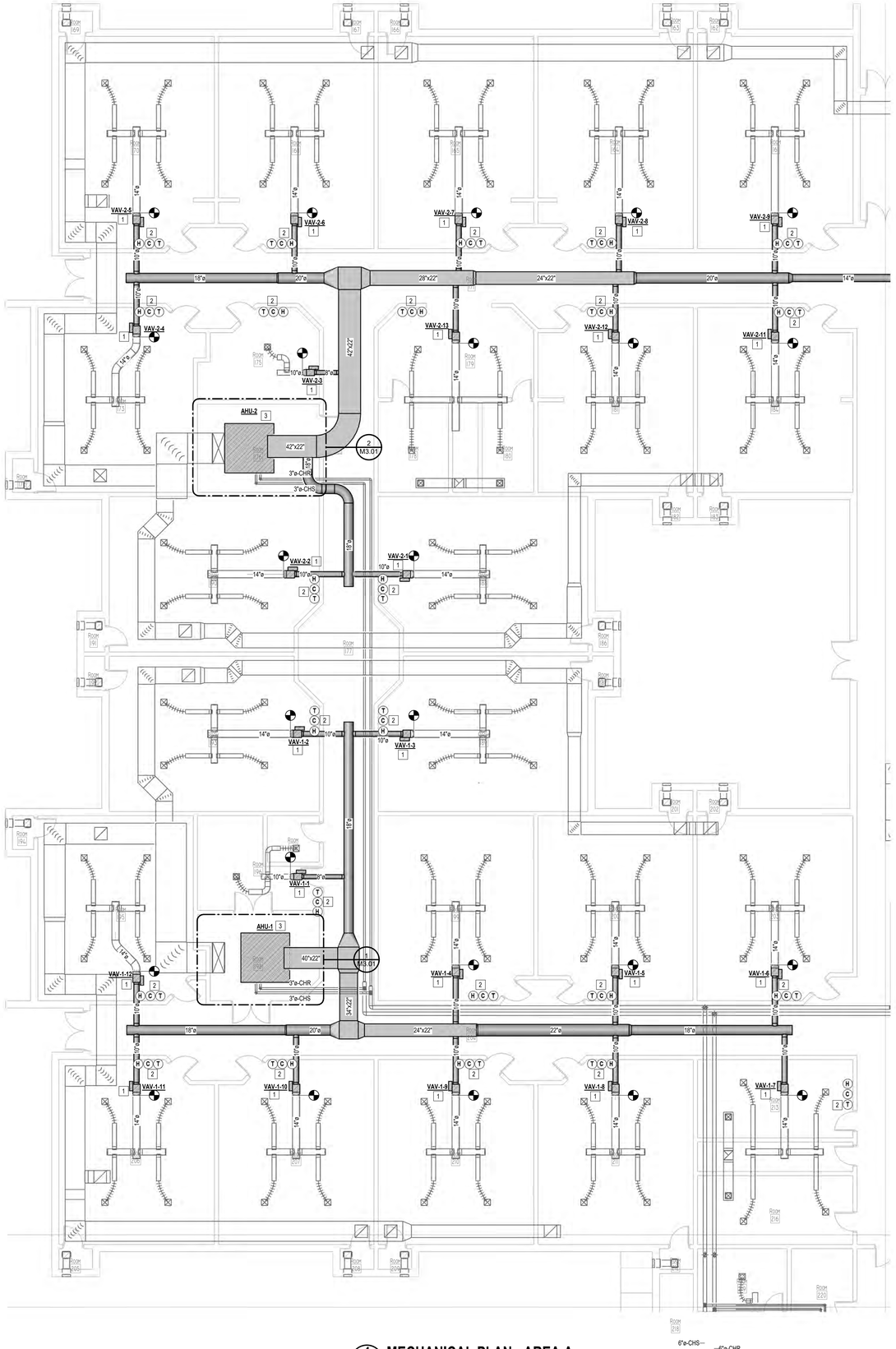
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1 M2.11 **MECHANICAL PLAN - AREA A**
1/8" = 1'-0"

MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL KEYED NOTES

1 APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTRSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.

2 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

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PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL PLAN SECTION A

SHEET NUMBER: M2.11

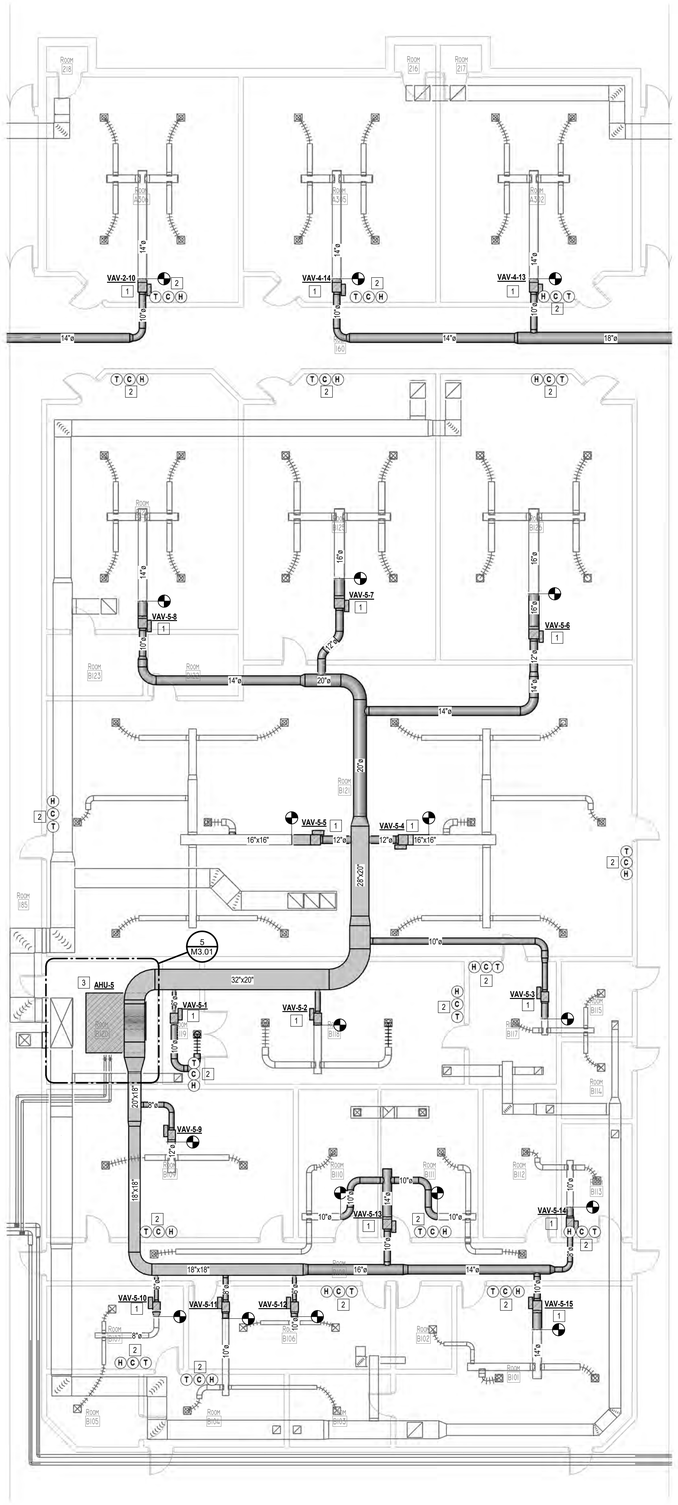
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1 M2.12 **MECHANICAL PLAN - AREA B**
1/8" = 1'-0"

MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL KEYED NOTES

1 APPROXIMIMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.

2 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

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SHEET TITLE:

MECHANICAL PLAN SECTION B

SHEET NUMBER:

M2.12

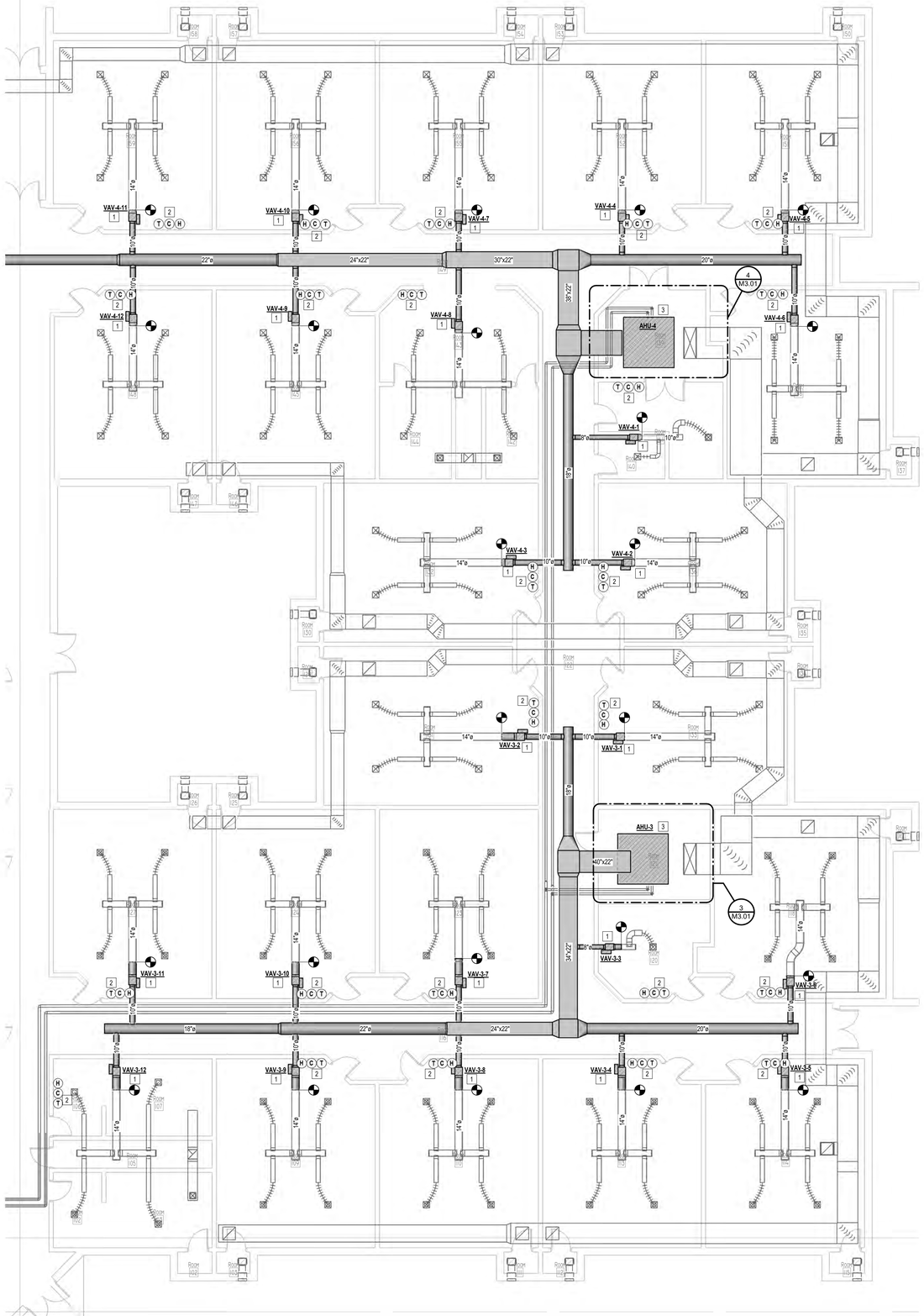
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MECHANICAL PLAN - AREA C

1/8" = 1'-0"

MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

MECHANICAL KEYED NOTES

1 APPROXIMMATE LOCATION OF NEW SINGLE DUCT BOX. THE CONTRACTOR SHALL INSTALL A NEW SINGLE DUCT BOX IN THE EXISTING DUCTWORK. THE CONTSCTOR SHALL REMOVE AND PATCH EXISTING DUCTWORK AS NECESSARY. TYP.

2 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

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SHEET TITLE: MECHANICAL PLAN SECTION C

SHEET NUMBER: M2.13

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MECHANICAL GENERAL NOTES

A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.

B. CONTRACTOR SHALL PROVIDE HOT-DIPPED GALVANIZED PIPE SUPPORTS. PIPE SHALL BE MOUNTED AT AN ELEVATION OF 7'-0" ABOVE FINISHED FLOOR.

C. SCOPE OF WORK REQUIRES CONTRACTOR TO CONNECT EXISTING CHILLED WATER DISTRIBUTION PIPING. CONTRACTOR SHALL USE ALL MEANS NECESSARY TO VERIFY THE FUNCTION (SUPPLY AND RETURN) OF THE CHILLED WATER PIPE PRIOR TO COMMENCEMENT OF WORK. ANY REWORK REQUIRED DUE TO REVERSE CONNECTION OF PIPE SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE.

MECHANICAL KEYED NOTES

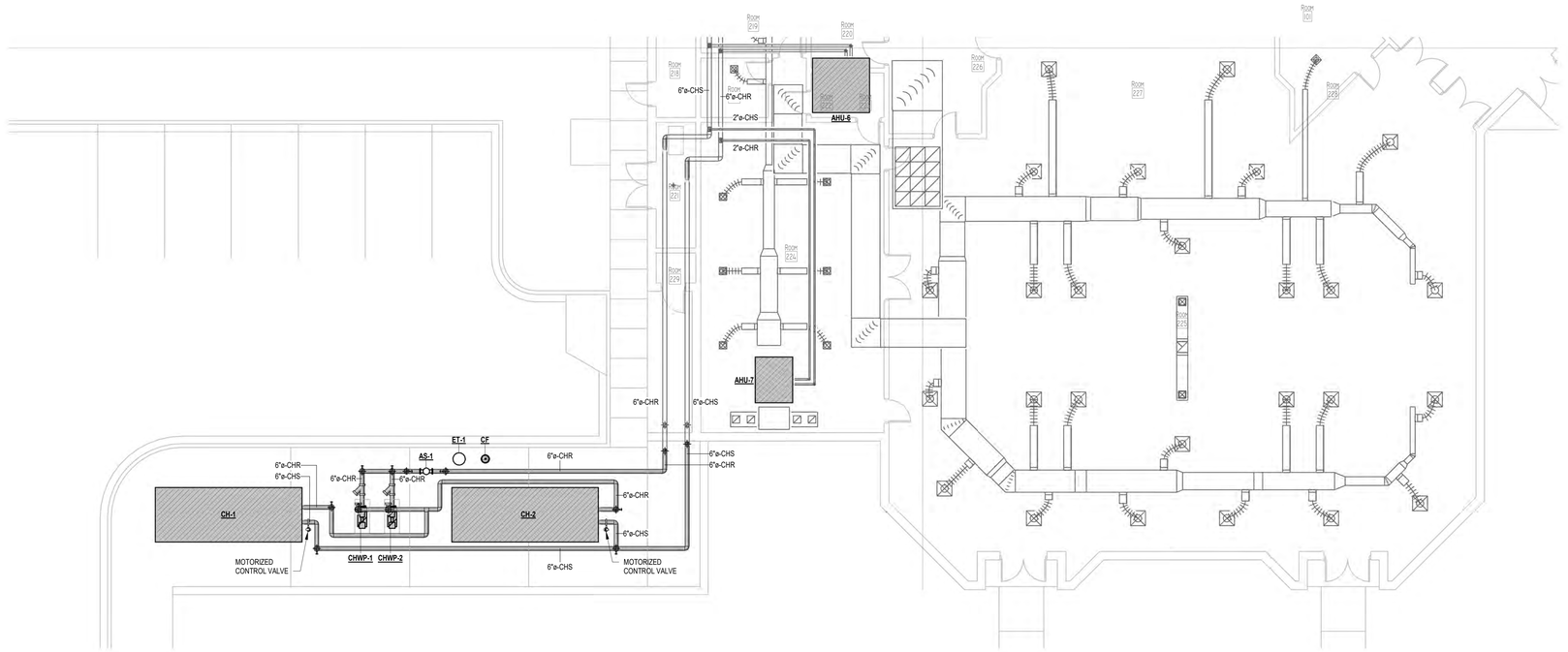
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2 NEW DDC TEMPERATURE, RELATIVE HUMITY, AND CO2 SENSORS.

3 REFER TO ENLARGED MECHANICAL ROOM PLANS FOR THE MECHANICAL ROOM VIEW CONTINUATION.

EXPANSION TANK, ET-1, SHALL BE FLOOR MOUNTED ON A 4 INCH HIGH CONCRETE HOUSE KEEPING PAD. PAD SHALL EXTEND 6 INCHES BEYOND TANK EDGES.

THREE-SOCK CHEMICAL FILTER FEEDER MOUNTED ON 4 INCH HOUSE KEEPING PAD.



1 M2.14 **MECHANICAL PLAN - AREA D**
1/8" = 1'-0"

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SHEET TITLE: MECHANICAL PLAN SECTION D

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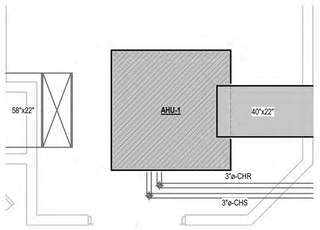
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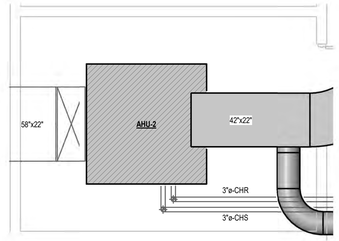
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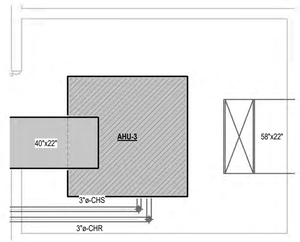
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1 M3.01 **MECHANICAL PLAN - AHU-1**
1/4" = 1'-0"



2 M3.01 **MECHANICAL PLAN - AHU-2**
1/4" = 1'-0"



3 M3.01 **MECHANICAL PLAN - AHU-3**
1/4" = 1'-0"

4 M3.01 **MECHANICAL PLAN - AHU-4**
1/4" = 1'-0"

5 M3.01 **MECHANICAL PLAN - AHU-5**
1/4" = 1'-0"

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PROJECT NUMBER 218033.013

SHEET TITLE: ENLARGED MECHANICAL PLANS

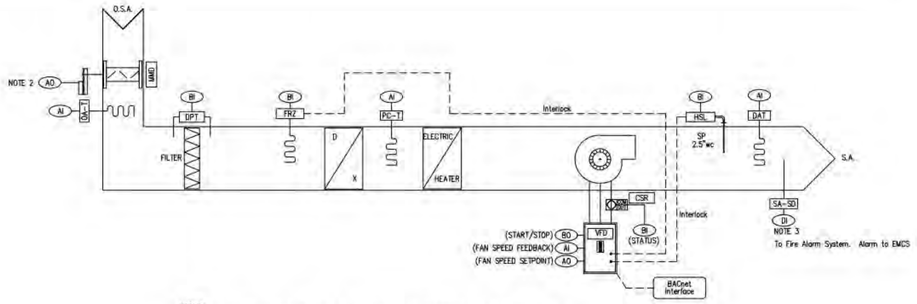
SHEET NUMBER: M3.01

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NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Damper provided and installed by mechanical contractor, wired by mechanical contractor, and controlled thru EMCS.
3. Wire to fire alarm system. Alarm to EMCS. Duct smoke detectors provided by fire alarm contractor and installed be mechanical contractor. Existing duct smoke detectors may be re-used where possible.

System Off - When the system is off:
The outside air damper shall be closed.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its maximum scheduled flow. The speed of the fan shall remain constant.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured and balanced by TAB Contractor.

The outside air temperature shall determine whether the unit is in HEATING, COOLING, OR DEHUMIDIFICATION.

A. When outside air is 72°F or above, unit shall enter COOLING mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor e as required to provide a 55°F coil discharge air temperature. The hot water coil control valve shall then modulate to provide a supply air temperature of 65°F.

B. When outside air temperature is greater than 55°F and less than 72°F, unit shall operate in DEHUMIDIFICATION mode. In this mode, supply fan shall be running, the EMCS shall modulate the compressor as required to provide 55°F coil discharge air temperature. The heating coil shall then modulate to provide a supply air temperature of 65°F.

C. When outside air temperature is below 55°F, unit shall operate in HEATING mode. In this mode, supply fan shall be running, cooling shall be disabled, and heating coil shall modulate to provide a 65°F supply air temperature.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.

The heating coil discharge air temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 48°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 65°F (adj) with a high-limit alarm of 80°F (adj)
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj)
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).

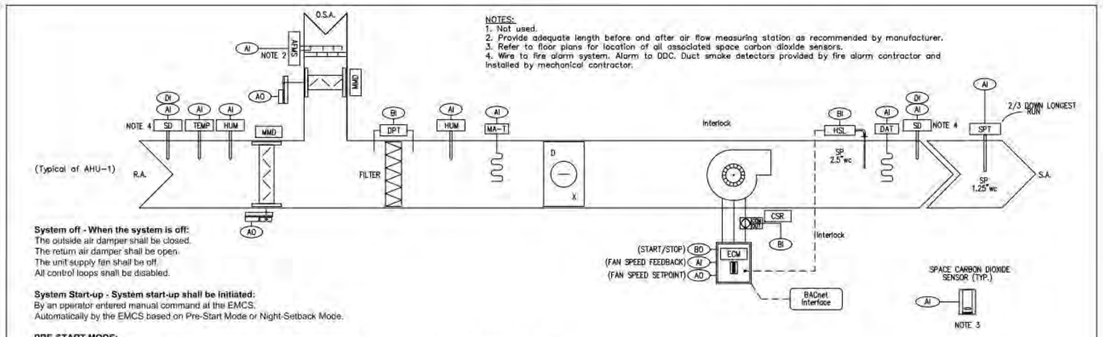
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the unit freeze-stat trips.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

1 Outside Air AHU - Control Schematic and Sequence of Operations
NOT TO SCALE

AI	ANALOG INPUT
AO	ANALOG OUTPUT
BI/BI	DIGITAL/BINARY INPUT
BO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
T	WALL SENSOR/THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

2 CONTROL SCHEMATIC LEGEND
NOT TO SCALE



NOTES:
1. Not used.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Refer to floor plans for location of all associated space carbon dioxide sensors.
4. Wire to fire alarm system. Alarm to DDC. Duct smoke detectors provided by fire alarm contractor and installed by mechanical contractor.

System off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The unit supply fan shall be off.
All control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated terminal units whose space temperature has exceeded the terminal units Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below, and the Demand Control Ventilation sequence shall be active.

Demand Control Ventilation - The outside air intake damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint. If the space carbon dioxide concentration for any zone served by the associated AHU is above the defined high-limit, then the OSA damper shall be modulated to maintain the scheduled maximum outside air flowrate setpoint. If the OSA damper is above 95% open and the maximum outside air flowrate setpoint cannot be met, then modulate the return air damper closed until the flowrate is achieved. Do not modulate the return air damper to less than 60% open. Once the space carbon dioxide concentration for all associated zones has been below the defined high limit for 5 minutes (adj.), the OSA damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint.

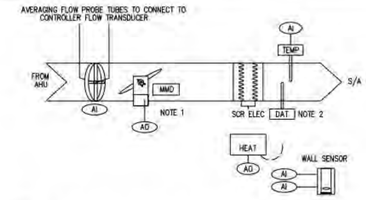
System Operation - When system start-up has been initiated:
The variable speed supply fans shall start at its minimum speed. Following a confirmation of fan start status, the supply fans speed shall be modulated in parallel to maintain the supply air static pressure at setpoint. The speed of the fans shall not be adjusted by more than 20% in any one-minute period. The static pressure setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Static Pressure Reset - The static pressure setpoint shall be reset up in defined increments at defined intervals until the primary air damper position to all of the associated terminal units have been below the defined value for more than the defined interval. The static pressure setpoint shall be reset down in defined increments at defined intervals until the primary air damper position to at least one (critical zone) of the associated terminal units has been above the defined value for more than the defined interval. The setpoints are detailed in the **System Setpoint** section below.
Temperature Control - The VRF coil shall be modulated to maintain the active supply air temperature setpoint. The supply air temperature setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Temperature Reset - The supply air temperature setpoint shall be reset based on the actual return air temperature, according to the defined reset schedule detailed in the **System Setpoint** section below. If the Demand Control Ventilation sequence is in maximum flow mode, then the supply air temperature reset shall be disabled and the setpoint shall be set to the initial value.
Humidity Control - A return air, duct mounted, humidity sensor shall monitor the R/A relative humidity to 50% (ADJ.). When return air relative humidity is above setpoint by 5% (not to exceed 60%), the VRF coil shall modulate to provide 50°F cooling coil discharge temperature and signal the terminal units to go into humidity control. When relative humidity attains set point, the system will return to normal operation.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the ECM speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be ECM speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The supply air static pressure setpoint shall be set initially at 1.25 inches w.c. (adj) and shall have reset limits of 0.20 to 2.00 inches w.c. (adj)
The time interval for static pressure reset shall be set at 10 minutes (adj).
The static pressure reset increment shall be set at 0.05 inches w.c. (adj)
The terminal unit primary damper position setpoint shall be 90% open. (adj)
The time interval for terminal unit primary damper position shall be set at 15 minutes. (adj)
The supply air temperature setpoint shall be set initially at 54 °F. (adj)
The supply air temperature setpoint shall be reset to 54 °F (adj) when the return air temperature is at 78 °F. (adj)
The supply air temperature setpoint shall be reset to 58 °F (adj) when the return air temperature is at 72 °F. (adj)
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).

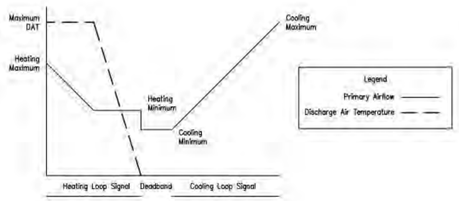
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by a supply fan current sensor status failure.

System Alarms - The EMCS shall generate an alarm if:
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If any associated space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
If return air RH is 60% or above.
All alarms shall be inhibited when the supply fan is not operating.

3 MULTIZONE VAV Air Handling Unit - Control Schematic and Sequence of Operations
NOT TO SCALE



NOTES:
1. TERMINAL UNIT CONTROLLER AND DAMPER ACTUATOR SHALL BE SHIPPED TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AND WIRING.
2. DAT SENSOR SUPPLIED BY UNIT VENDOR AND MOUNTED BY EMCS CONTRACTOR.



System Off - When the system is off:
The primary air damper shall be closed.
The heating coil shall be disabled.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The primary air damper shall be modulated between the cooling minimum and maximum flow values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.
When the space temperature falls below the deadband, the primary air damper shall modulate to maintain the heating minimum flow value and the SCR electric heat shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.
If the space temperature drops below the active Heating Setpoint and the discharge air temperature is at its active setpoint, the primary air damper shall be modulated between the heating minimum and maximum heating flow values to maintain the space temperature within +/- 0.5°F of the active Heating Setpoint and the SCR electric heat shall be modulated to maintain the discharge air temperature setpoint. The SCR electric heat controller shall be set to maintain a maximum discharge air temperature of 85 °F (adjustable). When relative humidity, as determined by either space or AHU return air relative humidity sensor is above setpoint by 5% (not to exceed 60%) in any conditioning mode, terminal unit damper shall modulate to 50% of scheduled cooling CFM and electric heater shall modulate to maintain programmed or override temperature. Unit shall operate in this mode until return air relative humidity attains setpoint.

System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The maximum heating mode discharge air temperature shall be set at 85 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

4 VAV Terminal Unit with Electric Reheat - Control Schematic and Sequence of Operations
NOT TO SCALE

DBR
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PROFESSIONAL ENGINEER
01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL FLOW DIAGRAMS

SHEET NUMBER: M4.01

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TBPE Firm Registration No. 2234

DBR Project Number 218033.013

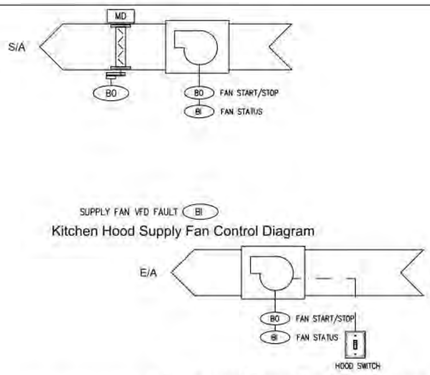
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SINGLE INLET VAV BOX WITH ELECTRIC HEAT SCHEDULE

MARK	COOLING CFM		HEATING CFM		ELEC. HEATING		INLET SIZE	VOLTS/ PHASE/ HZ	MFR	MODEL NO.
	MAX.	MIN.	MAX.	MIN.	KW	NO. OF STEPS				
VAV-1-1	575	175	405	275	3.8	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-1-2	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-3	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-4	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-5	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-6	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-7	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-8	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-9	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-10	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-11	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-1-12	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-1	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-2	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-3	400	120	280	190	2.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-2-4	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-5	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-6	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-7	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-8	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-9	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-10	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-11	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-12	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-2-13	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-3-1	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-3-2	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-3-3	400	120	280	190	2.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-3-4	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
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VAV-3-10	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-3-11	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-3-12	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-1	400	120	280	190	2.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-4-2	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-3	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-4	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-5	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-6	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
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VAV-4-11	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-12	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-13	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-4-14	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-5-1	300	90	210	145	2.0	SCR	6"Ø	277/1/60	TITUS	DESV-6
VAV-5-2	550	165	385	260	3.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-5-3	400	120	280	190	2.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-5-4	1500	450	1050	705	10.0	SCR	12"Ø	460/3/60	TITUS	DESV-12
VAV-5-5	1500	450	1050	705	10.0	SCR	12"Ø	460/3/60	TITUS	DESV-12
VAV-5-6	1200	360	840	565	8.0	SCR	12"Ø	460/3/60	TITUS	DESV-12
VAV-5-7	1200	360	840	565	8.0	SCR	12"Ø	460/3/60	TITUS	DESV-12
VAV-5-8	1000	300	700	470	6.6	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-5-9	550	165	385	260	3.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-5-10	250	75	175	120	1.7	SCR	6"Ø	277/1/60	TITUS	DESV-6
VAV-5-11	350	105	245	165	2.3	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-5-12	300	90	210	145	2.0	SCR	6"Ø	277/1/60	TITUS	DESV-6
VAV-5-13	800	240	560	375	5.3	SCR	10"Ø	460/3/60	TITUS	DESV-10
VAV-5-14	400	120	280	190	2.7	SCR	8"Ø	277/1/60	TITUS	DESV-8
VAV-5-15	800	240	560	375	5.3	SCR	10"Ø	460/3/60	TITUS	DESV-10

NOTES:
1. PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN PRIMARY AIR INLET.
2. PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
3. PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
4. PROVIDE ELECTRIC REHEAT COIL WITH 0-10V SCR MODULATING CAPACITY CONTROL.



Run Conditions - Interlocked:
The kitchen hood supply and exhaust fans shall be interlocked to operate together. The hood fans shall be enabled to run by the EMCS based on an operator assigned schedule. When the fans are enabled to run they will be controlled via a local HOA switch mounted at the hood.

Supply Fan Damper:
The outside air damper shall open anytime the unit runs and shall close anytime the unit stops. The supply fan shall start only after the damper status has proven the damper is open.

Hand Mode:
The supply air and exhaust air fan shall start. Following a conformation of fan start status, the supply and exhaust fan speed shall be balanced to the design speed reference values. The speed reference values shall be determined during Testing and Balancing and coordinated by the contractors.

Off Mode:
Exhaust fan and supply fan shall be off. The outside air damper shall close 4sec (adj.) after the supply fan stops.

Auto Mode:
Following a conformation of fan start status, the supply and exhaust fan speed shall be balanced to the design speed reference values. The speed reference values shall be determined during Testing and Balancing and coordinated by the contractors.

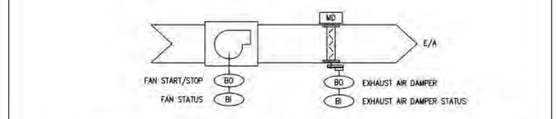
Fan Status:
The controller shall monitor the fan status.
Alarms shall be provided as follows:
- Fan Failure: Commanded on, but the status is off.
- Fan in Hand: Commanded off, but the status is on.
- Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

2 Kitchen Hood Fans Schematic and Sequence of Operation
NOT TO SCALE

AIR HANDLING UNIT SCHEDULE

MARK		AHU-1	AHU-2	AHU-3	AHU-4	AHU-5	AHU-6	AHU-7
SERVES		CLASSROOMS	CLASSROOMS	CLASSROOMS	CLASSROOMS	ADMINISTRATION	CAFETERIA	KITCHEN
TYPE		MULTIZONE	MULTIZONE	MULTIZONE	MULTIZONE	MULTIZONE	SINGLE ZONE	SINGLE ZONE
SUPPLY AIR (CFM)		11575	12400	11300	13400	11100	14150	2,800
OUTSIDE AIR (CFM)		3675	3675	3675	3675	2000	1890	340
EXT. S.P. (IN. W.G.)		2	2	2	2	0.75	1.25	0.5
VOLTS/PHASE/HERTZ		480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
FAN MOTOR HORSEPOWER		2 x 6.63	2 x 6.63	2 x 6.63	2 x 7.01	2 x 6.63	2 x 7.01	2 x 2.55
FAN MOTOR CONTROL (BY CONTRACTOR)		EC MOTOR	EC MOTOR	EC MOTOR	EC MOTOR	EC MOTOR	EC MOTOR	EC MOTOR
MAX. FAN RPM		2600	2600	2600	1690	2600	1690	2,815
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500
	COOLING COIL CFM	11575	12400	11300	13400	11100	14150	2,800
	MIN. ROWS/MAX. FINS PER INCH	6/10	6/10	6/10	5/10	6/10	6/10	6/10
	EAT DB/WB (°F)	83.1/66.8	82.5/66.5	83.3/66.9	82.0/66.2	79.6/64.9	78.4/64.3	78.1/64.1
	LAT DB/WB (°F)	55.0/54.0	55.0/54.0	55.0/54.0	55.0/54.0	55.0/54.0	55.0/54.0	55.0/540
	TOTAL COOLING CAPACITY (MBH)	468.6	488.5	462	512.5	370.5	438.1	84.9
	SENSIBLE COOLING CAPACITY (MBH)	350.8	368.7	344.9	390.3	294.6	357.5	69.8
	EWT/LWT (°F)	43/59	43/59	43/59	43/59	43/59	43/59	43/59
	COIL WATER FLOW (GPM)	58.6	61.1	57.8	64.1	46.3	54.8	10.6
	MAX. WATER P.D. (FT. HD.)	15.1	16.5	14.2	16.7	9.5	14.8	2
	CONTROL VALVE (2-WAY/3-WAY)	2-WAY	2-WAY	2-WAY	2-WAY	2-WAY	2-WAY	2-WAY
REHEAT COIL	HEATING COIL CFM	--	--	--	--	--	--	--
	EAT (°F)	--	--	--	--	--	--	--
	LAT (°F)	--	--	--	--	--	--	--
	HEATING CAPACITY (KW)	--	--	--	--	--	--	--
	NUMBER OF STAGES	--	--	--	--	--	--	--
	VOLTS/PHASE/HERTZ	--	--	--	--	--	--	--
MANUFACTURER		DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL NUMBER		CAH	CAH	CAH	CAH	CAH	CAH	CAH
NOTES		ALL	ALL	ALL	ALL	ALL	ALL	ALL

NOTES:
1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH VERTICAL TOP DISCHARGE FOR AHU-1 THROUGH 5, FRONT DISCHARGE FOR AHU-6,7.
3. PROVIDE 2" DOUBLE WALL CONSTRUCTION WITH INJECTED FOAM MINIMUM R-13 INSULATION IN ALL SECTIONS INCLUDING UNDER THE DRAIN PAN.
4. PROVIDE UNIT WITH FLAT FILTER, CHILLED WATER COIL, AND ECM FAN ARRAY.
5. PROVIDE WITH STAINLESS STEEL DRAIN PAN, COIL CASING AND COIL SUPPORTS. PROVIDE STAINLESS STEEL INNER CABINET LINER IN COOLING COIL SECTION.
6. PROVIDE ECM FAN ARRAY WITH MANUAL BLANKOFF PLATE.
7. PROVIDE FAN ARRAY WITH HAND/OFF/AUTO SWITCH, 0-10 VDC SIGNAL INPUT, FAN FAULT TERMINAL, FUSED DISCONNECT, MOTOR CONTROL PANEL, LINE AND LOW VOLTAGE WIRING, INDIVIDUAL FAN MOTOR OVERCURRENT PROTECTION/ISOLATION SWITCH, AND POTENTIOMETER FOR MANUAL CONTROL OVERRIDE.

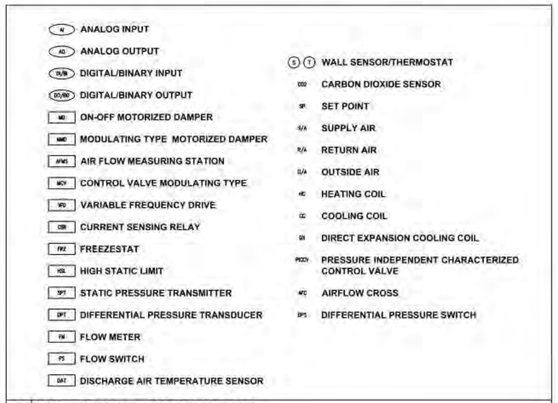


(TYPICAL OF EF-1 THRU EF-50)
System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The ventilation exhaust fan shall be integrated with the EMCS to monitor fan status and to schedule run times. The exhaust air damper shall open anytime the unit runs and shall close anytime the unit stops. The exhaust fan shall start only after the damper status has proven the damper is open. The exhaust air damper shall close 30 sec.(adj.) after the fan stops.

System Setpoints - The setpoints for the system shall be set as follows:
The design airflow rates shall be set at the values given in the Mechanical Drawings.

Fan Status:
The controller shall monitor the fan status.
Alarms shall be provided as follows:
- Fan Failure: Commanded on, but the status is off.
- Fan in Hand: Commanded off, but the status is on.
- Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

3 Ventilation Exhaust Fan - Control Schematic and Sequence of Operations
NOT TO SCALE



2 CONTROL SCHEMATIC LEGEND
NOT TO SCALE

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REVISION:

No.	DATE	DESCRIPTION

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01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL SCHEDULES

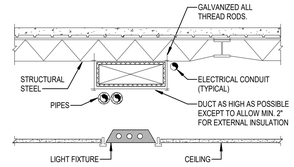
SHEET NUMBER: M5.01

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TBPE Firm Registration No. 2234

DBR Project Number 218033.013

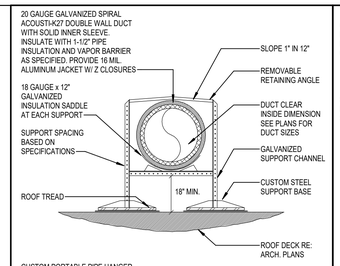
HA | RT/MG | JR

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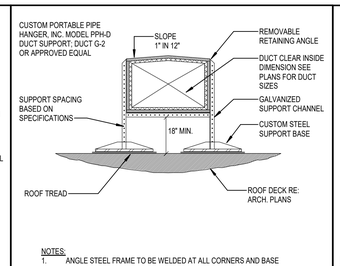


NOTES:
1. PIPES (INCLUDING SPRINKLER PIPING) AND ELECTRICAL CONDUIT CAN BE ROUTED BETWEEN JOISTS OR THROUGH JOIST WEB SPACE AS REQUIRED. DUCT SHALL BE LOCATED AS HIGH AS POSSIBLE.
2. U.L. DESIGN ASSEMBLY NUMBERS ARE SHOWN ON ARCHITECTURAL PLANS WHEN REQUIRED.
3. INSTALLATION OF ALL SERVICES MUST BE COORDINATED BY THE CONTRACTOR.

1 TYP. MEP INSTALLATION DETAIL
NOT TO SCALE

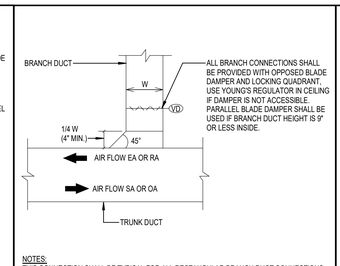


2 DUCT SUPPORT ON ROOF
NOT TO SCALE



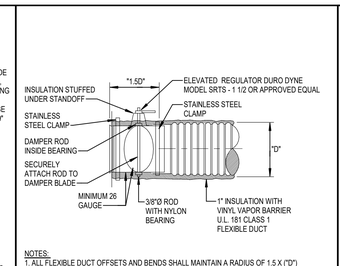
NOTES:
1. ANGLE STEEL FRAME TO BE WELDED AT ALL CORNERS AND BASE PLATE.
2. PROVIDE 12" WIDE 18 GAUGE GALVANIZED STEEL INSULATION SADDLE, FULL WIDTH AND HEIGHT OF DUCT.

3 EXPOSED RECT. DUCT ON ROOF
NOT TO SCALE



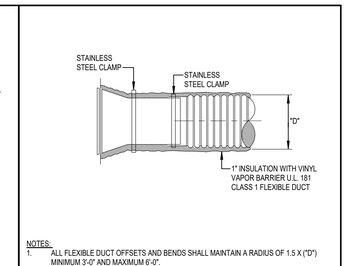
NOTES:
THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO RECTANGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

4 RECTANGULAR BRANCH DUCT TAP
NOT TO SCALE



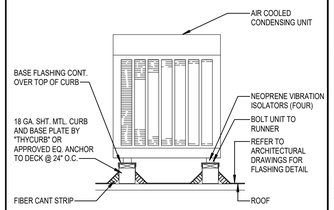
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO RECTANGULAR DUCTS
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

5 SPIN-IN DETAIL
NOT TO SCALE



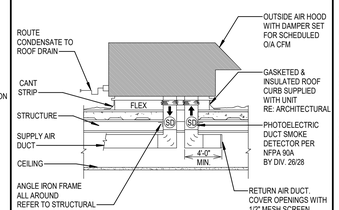
NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 6'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO VAV BOXES FROM RECTANGULAR MAIN DUCTS.
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

6 CONICAL SPIN-IN DETAIL
NOT TO SCALE

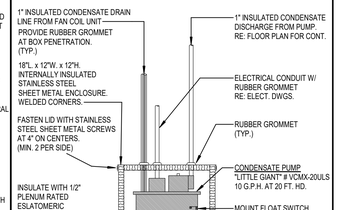


NOTE:
1. PROVIDE CLEARANCE AROUND UNIT FOR AIRFLOW AND SERVICE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

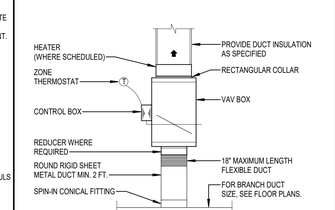
7 CONDENSING UNIT ROOF MOUNTED
NOT TO SCALE



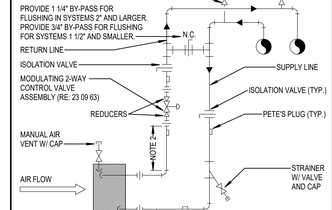
8 ROOF TOP UNIT MOUNTING DETAIL
NOT TO SCALE, CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.



9 COOLING COIL CONDENSATE PUMP
NOT TO SCALE

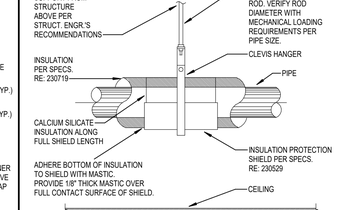


10 INTERIOR VAV TERMINAL UNIT
NOT TO SCALE



NOTE:
1. INSTALL PER MFGR. CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS.
2. PROVIDE STRAIGHT PIPE LENGTH 5 TIMES NOMINAL PIPE DIA. UPSTREAM OF CTRL. VALVE.

11 2-WAY CONTROL VALVE AND COIL PIPING
NOT TO SCALE



NOTE:
CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE. CONTRACTOR SHALL CONFORM TO ALL MAXIMUM SPAN DISTANCES PER SPECIFICATIONS FOR HANGER SPACING. RE: 230529

12 PIPE HANGER DETAIL (1-PIPE)
NOT TO SCALE

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS TO CONCRETE OR STEEL STRUCTURE.

13 PIPE HANGER DETAIL
NOT TO SCALE

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENG. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

14 PIPE HANGER DETAIL (4-PIPE)
NOT TO SCALE

NOTE: FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

15 PIPE SUPPORT DETAIL
NOT TO SCALE

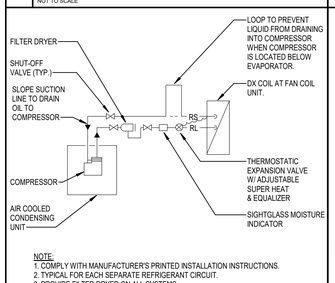
NOTE:
FILLET WELD ALL SEAMS. HOT DIP GALVANIZE AFTER FABRICATION.

16 PIPE SUPPORT DETAIL AT SLAB
NOT TO SCALE

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FLASHING & ROOF DETAILS.
2. WHERE PIPE IS INSULATED STOP & POINT INSULATION AT SLEEVE.
3. COORDINATE WITH OWNER'S BONDED ROOFER FOR FLASHING & MOPPING IN DETAIL.

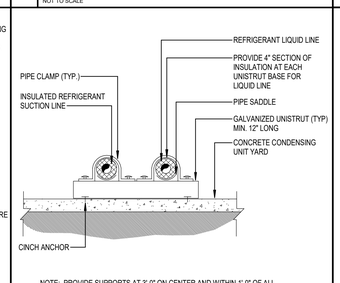
17 EXISTING ROOF PIPE PENETRATION
NOT TO SCALE

18 FIRE WALL PIPE PENETRATION
NOT TO SCALE



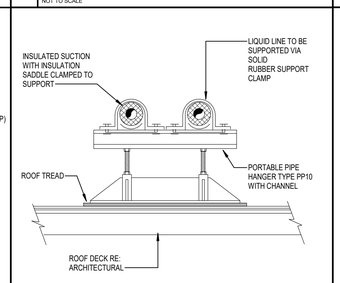
NOTE:
1. COMPLY WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
2. TYPICAL FOR EACH SEPARATE REFRIGERANT CIRCUIT.
3. PROVIDE FILTER DRYER ON ALL SYSTEMS.
4. USE "ACR" HARD DRAWN COPPER REFRIGERANT PIPE.

19 REFRIGERANT PIPING SCHEMATIC
NOT TO SCALE

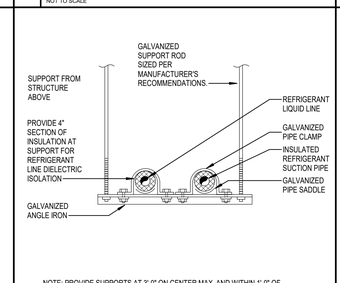


NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

20 FLOOR MOUNTED REFR. PIPE
NOT TO SCALE

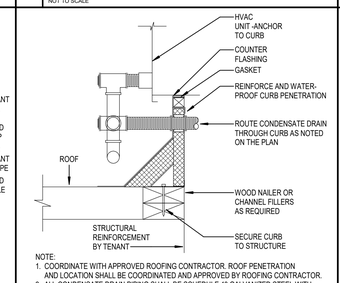


21 ROOF MTD. REFR. PIPE SUPPORT
NOT TO SCALE



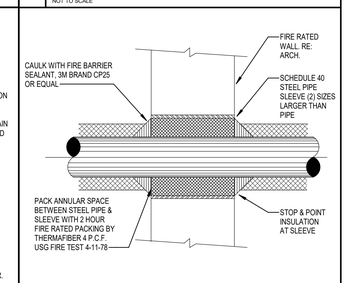
NOTE: PROVIDE SUPPORTS AT 3'-0" ON CENTER MAX. AND WITHIN 1'-0" OF ALL CHANGES IN PIPE DIRECTION.

22 REFRIGERANT PIPE HANGER
NOT TO SCALE

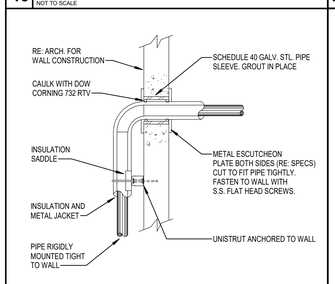


NOTE:
1. COORDINATE WITH APPROVED ROOFING CONTRACTOR. ROOF PENETRATION AND LOCATION SHALL BE COORDINATED AND APPROVED BY ROOFING CONTRACTOR.
2. ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH MALLEABLE IRON SCREWED FITTINGS.

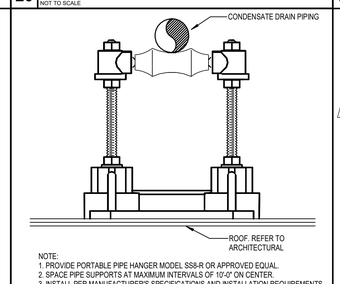
23 CONDENSATE DRAIN THRU CURB
NOT TO SCALE



24 FIRE WALL INSULATED PIPE PENETRATION
NOT TO SCALE

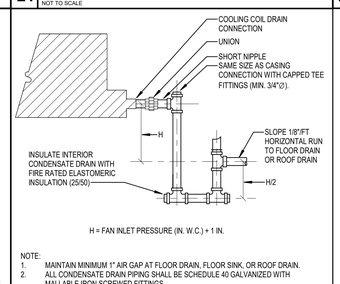


25 PIPE ENTRY THRU EXTERIOR WALL
NOT TO SCALE



NOTE:
1. PROVIDE PORTABLE PIPE HANGER MODEL SSR-R OR APPROVED EQUAL.
2. SPACE PIPE SUPPORTS AT MAXIMUM INTERVALS OF 10'-0" ON CENTER.
3. INSTALL PER MANUFACTURER'S SPECIFICATIONS AND INSTALLATION REQUIREMENTS.

26 DRAIN LINE SUPPORT ON ROOF
NOT TO SCALE



H = FAN INLET PRESSURE (IN. W.C.) + 1 IN.

NOTE:
1. MAINTAIN MINIMUM 1" AIR GAP AT FLOOR DRAIN, FLOOR SINK, OR ROOF DRAIN.
2. ALL CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED WITH MALLABLE IRON SCREWED FITTINGS.

27 COOLING COIL CONDENSATE DRAIN
NOT TO SCALE

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REVISION:

No.	DATE	DESCRIPTION

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LICENSED
PROFESSIONAL ENGINEER
01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: MECHANICAL DETAILS

SHEET NUMBER: M6.01

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TBPE Firm Registration No. 2234

DBR Project Number 218033.013

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ABBREVIATIONS

A

A	AMPERES
ABV	ABOVE
AC	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR, ABOVE COUNTER
ACC	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
AF	AMPERE FUSE, AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPT CAPACITY
AL	ALUMINUM
AM	AMMETER
AMP	AMPLIFIER
ANN	ANNUNCIATOR
AP	ACCESS PANEL, ALARM PANEL
ARCH	ARCHITECT, ARCHITECTURAL
ASC	AMPERES SHORT CIRCUIT
AT	AMPERE TRIP RATING
ATS	AUTOMATIC TRANSFER SWITCH
AVG.	AVERAGE.
AUX.	AUXILIARY
AWG.	AMERICAN WIRE GAUGE

B

BAS	BUILDING AUTOMATION SYSTEM
BC	BELOW COUNTER
BKR	BREAKER
BLDG.	BUILDING

C

C	CONDUIT, CELSIUS
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CWP	CONDENSER WATER PUMP
CH	CHILLER
CHP	CHILLED WATER PUMP
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTERLINE
CLG.	CEILING
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT.	CONTINUOUS,CONTINUATION
CONTR.	CONTROLLER, CONTRACTOR
CP.	CIRCULATING PUMP
CPUC	CPU CHILLER
CR	CARD READER, CORD REEL
CRU	CONDENSATE RETURN UNIT
CT	CURRENT TRANSFORMER, COOLING TOWER
CTR	CENTER
CU	COPPER

D

dB	DECIBEL
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DR	DROPPED RECEPTACLE
DS	DAYLIGHT SENSOR
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DXFC	DX FAN COIL UNIT
DZ	DAYLIGHT ZONE

E

(E)	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
E.C.	EMPTY CONDUIT
EDF	ELECTRIC DRINKING FOUNTAIN
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMCS	ENERGY MANAGEMENT AND CONTROLS SYSTEM
EMERG	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
ENCL.	ENCLOSURE
ENGR.	ENGINEER
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
(ER)	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WATER HEATER
EXH	EXHAUST

F

F	FAHRENHEIT, FAN, FIRE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FF	FURNITURE FEED
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FLUOR	FLUORESCENT
FP	FIRE PUMP, FAN POWERED
FPTB	FAN POWERED TERMINAL BOX
FRZR	FREEZER
FS	FUSED SWITCH, FLOW SWITCH
FSD	MOTORIZED FIRE SMOKE DAMPER
FT	FOOT, FEET
FTL	FEED-THRU LUGS
FUT	FUTURE
FVNR	FULL-VOLTAGE, NON-REVERSING

G

GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GTD	GENERATOR TRANSFER DEVICE
GUH	GAS UNIT HEATER

H

HACR	HEATING, AIR CONDITIONING RATED CIRCUIT BREAKER
HD	ELECTRIC HAND DRYER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HS	HAND SET
HSC	HAND SCANNER
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HVU	HEATING/ VENTILATING UNIT
HWB	HOT WATER BOILER
HWC	HOT WATER CIRCULATOR
HWP	HEATING WATER PUMP
HZ	HERTZ

I

ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCH
INCAND	INCANDESCENT
INT	INTERNAL, INTERIOR

J

JB	JUNCTION BOX
JP	JOCKEY PUMP

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
kVA	KILOVOLT- AMPS
kW	KILOWATT
kWH	KILOWATT-HOUR

L

LED	LIGHT EMITTING DIODE
LF	LINEAR FEET
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE TRANSFORMER
LVL	LEVEL

M

M	METER
MAP	MASTER ALARM PANEL
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX.	MAXIMUM
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MECH.	MECHANICAL
MFR.	MANUFACTURER
MH	METAL HALIDE
MIC	MICROPHONE
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MV	MERCURY VAPOR

N

N3R	NEMA 3R ENCLOSURE
N4X	NEMA 4X ENCLOSURE
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
(N)	NEW

O

OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRICAL
OPG	OPENING

P

P	POLE, PUMP
PB	PUSHBUTTON
PC	PHOTOCELL
PH	PHASE
PL	PILOT LIGHT
PLBG	PLUMBING
PNEU	PNEUMATIC
PNL	PANEL
POS	POINT OF SALE
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PS	PHOTOSENSOR
PVC	POLYVINYL CHLORIDE
PWR	POWER

Q

QTY	QUANTITY

R

R	EXISTING TO BE REMOVED
RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RC	RECONNECT EXISTING DEVICE TO CIRCUIT INDICATED
RCP	REFLECTED CEILING PLAN
RCPT	RECEPTACLE
RE	REFERENCE, REFER
REC	RECEPTACLE
REFR	REFRIGERATOR
REINF	REINFORCING
REL	EXISTING TO BE RELOCATED
REL/EX	NEW LOCATION OF RELOCATED EQUIPMENT
REQD	REQUIRED
REV	REVISION, REVISE
RGS	RIGID GALVANIZED STEEL
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE AND REPLACE
RTU	ROOFTOP UNIT

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SCHED	SCHEDULE
SE	SEWAGE EJECTOR
SEC	SECONDARY
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SKVA	STARTING KILOVOLT-AMPS
SKW	STARTING KILOWATTS
SP	SUMP PUMP
SPEC	SPECIFICATION
SPF	STAIR PRESSURIZATION FAN
SPKR	SPEAKER
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
SQ.	SQUARE
SRF	SMOKE REMOVAL FAN
SS	START-STOP PUSH BUTTON
SSSC	SOLID STATE SPEED CONTROL
ST	SHUNT TRIP
STB	STEAM BOILER
STD	STANDARD
STL	STEEL
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD

T

TC	TEMPERATURE CONTROL
TEL	TELEPHONE
TF	TRANSFER FAN
TL	TWIST-LOCK
TOC	TOP OF CURB
TOS	TOP OF STEEL
TP	CHILD TAMPER PROOF DEVICE
TSTAT	THERMOSTAT
TTB	TELEPHONE TERMINAL BOARD
TTC	TELEPHONE TERMINAL CABINET
TU	TERMINAL UNIT
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL

U

UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SYSTEM

V

V	VOLT
VA	VOLT-AMPERE
VAV	VARIABLE AIR VOLUME
VC	VOLUME CONTROL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VP	VACUUM PUMP
VM	VOLT METER

W

W	WATT, WIRE, WIDTH
WG	WIREGUARD
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WS	WATER SOFTENER
WT	WATERTIGHT, WEIGHT
WWF	WELDED WIRE FABRIC
W/FT^2	WATTS PER SQUARE FOOT

X

XFMR	TRANSFORMER

Z

Z	ZONE

ELECTRICAL SYMBOLS

MOTORS AND CONTROLS

- MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE, "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/K5" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
  - "GFCI" DENOTES GROUND FAULT INTERRUPTER,
  - "WP" DENOTES WEATHERPROOF,
  - "IG" DENOTES ISOLATED GROUND,
  - "TP" DENOTES SAFETY TYPE. (TAMPER PROOF)
  - "DR" DENOTES DROPPED RECEPTACLE,
  - "USB" DENOTES RECEPTACLE WITH UNIVERSAL SERIAL BUS,
  - "AC" DENOTES ABOVE COUNTER MOUNTING. SEE
  - "UC" DENOTES UNDER COUNTER MOUNTING. SEE
  - "H" DENOTES HORIZONTALLY ORIENTED RECEPTACLE. SEE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHT.
- DUPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- DUPLEX WALL RECEPTACLE ON A CIRCUIT DEDICATED TO DATA PROCESSING, GRAY COLOR. PROVIDE ISOLATED GROUND TYPE RECEPTACLES WHERE NOTED.
- SPLIT WIRED RECEPTACLE. TOP RECEPTACLE SHALL BE SWITCHED ACCORDING TO PLANS, AND BOTTOM SHALL REMAIN UNSWITCHED.
- SP — CONTROLLED DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. "SP" DENOTES SPLIT WIRED
- FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- FOURPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.
- CONTROLLED FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.
- SPECIAL RECEPTACLE, NEMA CONFIGURATION AS NOTED.
- TWO-GANG FLOOR OUTLET
- THREE-GANG FLOOR OUTLET
- MULTI-OUTLET SURFACE RACEWAY. SEE ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHTS.
- JUNCTION BOX
  - "MD" DENOTES MOTOR DAMPER,
  - "CR" DENOTES CORD REEL
  - "D" DENOTES DROP CORD RECEPTACLE,
- DUPLEX RECEPTACLE WITH HOMERUN
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- TWO-GANG CEILING OUTLET
- FLUSH ELECTRICAL FLOOR OUTLET, "P" DENOTES POKE-THRU "D" INDICATES DUPLEX RECEPTACLE, "R" INDICATES RED RECEPTACLE ON EMERGENCY POWER. REFER TO FLOOR BOX SCHEDULE. FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- PP — POWER POLE
- DIRECT CONNECTION TO EQUIPMENT
- P — PULL BOX (OVER 4" SQUARE)
- (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

- 2' X 4' LIGHTING FIXTURE.
- 2' X 2' LIGHTING FIXTURE.
- 1' X 4' LIGHTING FIXTURE.
- 1' X 2' LIGHTING FIXTURE.
- 1' X 1' LIGHTING FIXTURE.
- STRIP LIGHTING FIXTURES.
- STAGGERED STRIP LIGHTING FIXTURE.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SECURITY WALL PACK
- SITE LIGHTING FIXTURE.
- POST-TOP FIXTURE/ACORN FIXTURE BRACKET ARM INDICATES WALL MOUNT WITH ARM
- EMERGENCY LIGHT FIXTURE WITH BATTERY PACK. PROVIDE WITH UNSWITCHED HOT FOR LOSS OF VOLTAGE AND CHARGING (SAME CIRCUIT AS NORMAL POWER LIGHTING). FIXTURES SHALL BE WIRED IN A MANNER AS TO ALLOW SWITCHING OF FIXTURES WITHOUT DISCHARGING THE EMERGENCY BATTERY. BATTERY PACK IS TO ONLY OPERATE IN THE EVENT OF A POWER OUTAGE.
- EM CIRCUIT — LIGHT FIXTURE ON EMERGENCY BRANCH CIRCUIT, CIRCUIT NUMBER ADJACENT TO FIXTURE INDICATES EMERGENCY CIRCUIT CONNECTED TO FIXTURE. PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL EMERGENCY LIGHTING ORIGINATING FROM THE EMERGENCY CIRCUIT SHOWN.
- NL — EMERGENCY "NIGHT LIGHT" LIGHT FIXTURE. LIGHT FIXTURE IS UNSWITCHED AND INTENDED FOR 24 HOUR OPERATION. FEED VIA UNSWITCHED HOT.
- DAYLIGHT ZONE/PRIMARY DAYLIGHT ZONE
- SECONDARY DAYLIGHT ZONE

RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- CONDUIT UNDERSLAB OR UNDERGROUND
- EM — EMERGENCY CONDUIT
- EXPOSED CONDUIT
- DB — UNDERGROUND CONDUIT, "DB" DENOTES DUCTBANK ENCASED IN CONCRETE
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT TURNED UP
- CONDUIT TURNED DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT-PHASE/NEUTRAL/SWITCH LEG/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES 2# 12, PLUS GROUND, UNLESS NOTED OTHERWISE.
- 1LA-2,4 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON)1LA-6 — PARTIAL CIRCUIT HOMERUN TO PANEL.
- T — COMMUNICATIONS CONDUIT OR CABLE:
  - "C" DENOTES MASTER CLOCK,
  - "CA" DENOTES MASTER CLOCK,
  - "CR" DENOTES CASH REGISTER
  - "D" DENOTES DATA,
  - "FA" DENOTES FIRE ALARM,
  - "I" DENOTES INTERCOM,
  - "OHE" DENOTES OVERHEAD ELECTRICAL LINE.
  - "PA" DENOTES PAGING,
  - "S" DENOTES SECURITY,
  - "T" DENOTES TELEPHONE,
  - "V" DENOTES VIDEO,
- TELECOMMUNICATIONS CABLE TRAY TO BE CONCEALED ABOVE ACCESSABLE CEILING.

ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE
- TERMINAL CABINET (FLUSH/SURFACE MOUNT), TYPE AS NOTED, 24" X 48" X 3-1/2" UNLESS NOTED OTHERWISE.
- BAT — BATTERY/INVERTER UNIT
- LV — LOW VOLTAGE TRANSFORMER.

COMMUNICATIONS

ALL OUTLET BOXES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.

THE FOLLOWING NOTATIONS REFER TO ALL COMMUNICATIONS OUTLETS:
"FAX" DENOTES OUTLET DEDICATED FOR A FAX,
"W" DENOTES WALL PHONE SHALL BE MOUNTED AT 42" A.F.F.
"PAY" DENOTES PAY PHONE SHALL BE MOUNTED 42" A.F.F.

- HS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.
- TV — TV ROUGH-IN: 3-GANG RECESSED TV BOX, CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DELTA.
- INDICATES THE LOCATION OF A NEW TECHNOLOGY WALL OUTLET, PROVIDE DUAL GANG BACK BOX. REFERENCE TECHNOLOGY SHEET FOR CONTENT.
- M — MICROPHONE FLOOR OUTLET, "W" INDICATES WALL MOUNTED "F" INDICATES FLOOR MOUNTED "H" INDICATES HANGING MOUNTED
- S — CEILING MOUNTED SPEAKER. "VC" INDICATES VOLUME CONTROL ON SPEAKER.
- S — WALL MOUNTED SPEAKER. "L" INDICATED LOCAL SOUND REINFORCEMENT
- CB — SCHOOL INTERCOMMUNICATION SYSTEM CALL-IN. PUSH BUTTON
- BELL, BUZZER OR CHIME AT 80+ A.F.F.
- VC — VOLUME CONTROL - WALL MOUNTED
- AX — AUXILIARY INPUT JACK, "W" INDICATES WALL MOUNTED "F" INDICATES FLOOR MOUNTED "H" INDICATES HANGING MOUNTED
- AVO — "HIGH" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- AVI — "LOW" PORTION OF "HIGH/LOW" OUTLETS, REFER TO OUTLET DETAIL.
- (2) LV — LOW VOLTAGE CLOCK SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

ONE LINE AND RISER DIAGRAMS

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- CL — CIRCUIT BREAKER, RATING AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE. "CL" DENOTES CURRENT LIMITING
- DRAWOUT CIRCUIT BREAKER, RATINGS AS SHOWN, 3 POLE UNLESS NOTED OTHERWISE
- ST — SHUNT TRIP
- GF — GROUND FAULT RELAY
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER
- A 0-2000 — AMMETER, RANGE AS SHOWN
- AS — AMMETER SWITCH
- V 0-600 — VOLTMETER, RANGE AS SHOWN
- VS — VOLTMETER SWITCH
- WH 0-15 — WATT-HOUR METER. "D" DENOTES DEMAND REGISTER "15" DENOTES MINUTES OF DEMAND INTERVAL
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- 12.47KV/120V — POTENTIAL TRANSFORMER, RATING AS SHOWN
- GROUND CONNECTION
- LIGHTING ARRESTOR
- G — GENERATOR SET
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- M — ELECTRICAL METER
- SPD — SURGE PROTECTION DEVICE

MISCELLANEOUS

- F — SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- EXX — DRAWING NOTE REFERENCE
- 1 — STARTER/DISCONNECT SCHEDULE REFERENCE
- 1 — FEEDER SCHEDULE REFERENCE
- LC — LIGHTING CONTACTOR
- TS — TIME SWITCH
- PC — PHOTOCELL
- PUSH BUTTON/DOOR BELL
- TC — TIMECLOCK
- R — RELAY
- SOS — AREA OF RESCUE ASSISTANCE
- B — BELL

FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE "D" INDICATES DUCT TYPE "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER STROBE / WALL MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- S — FIRE ALARM SPEAKER / WALL MOUNTED
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) WALL MOUNT +80" AFF- 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- REMOTE LED INDICATOR LIGHT

SECURITY

- KP — KEYPAD
- GB — GLASS BREAK SENSOR
- H — HOLD UP BUTTON
- DS — INTERCOM DOOR STATION
- MS — INTERCOM MASTER STATION
- LONG RANGE MOTION DETECTOR
- WALL MOUNTED MOTION DETECTOR
- CEILING MOUNTED MOTION DETECTOR
- IDP — INTRUSION DETECTION PANEL
- DC — DOOR CONTACT
- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — CARD READER
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

SWITCHES & LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON "LIGHTING CONTROL DEVICE SCHEDULE" LOCATED ON ELECTRICAL SCHEDULES SHEETS

SWITCH ANNOTATION AS FOLLOWS:

- TYPE, PER SCHEDULE
  NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH
- SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:

- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE
- CEILING SENSOR
- WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:

- PC — DIGITAL PHOTOSENSOR
- DS — DAYLIGHT HARVESTING SENSOR

DRAWING/DETAIL REFERENCE KEY

REFER TO DRAWING/DETAIL NUMBER — 1 / E3-2 — SHEET NUMBER
RE: 1 /E3-2

GENERAL NOTES

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

103

REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS — ROBERTO H. TIJERINA — 121946 — LICENSED PROFESSIONAL ENGINEER — 01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: ELECTRICAL SYMBOL LEGEND

SHEET NUMBER: E0.01

DBR
200 South 10th Street, Suite 901
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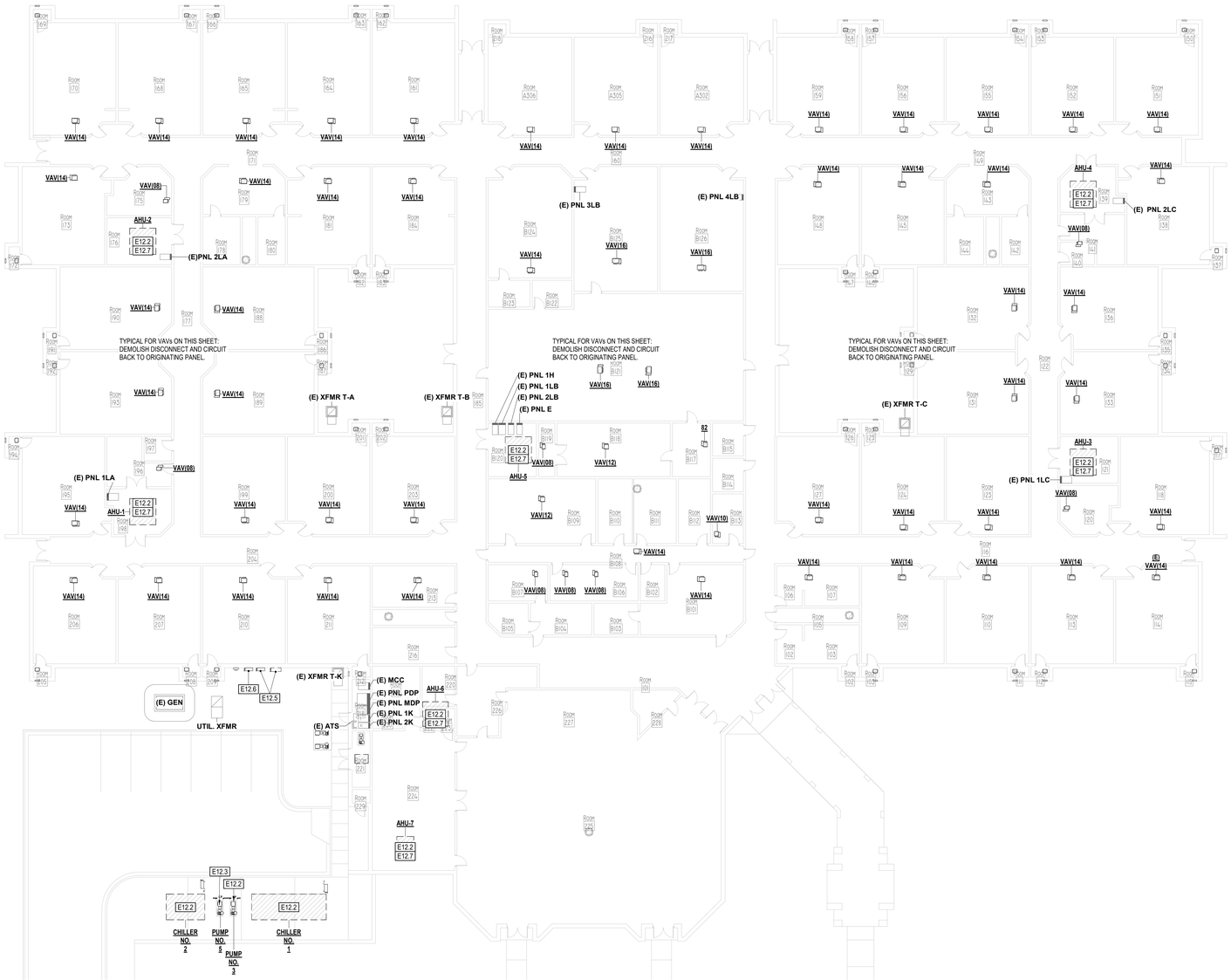
TBPE Firm Registration No. 2234

DBR Project Number 218033.013

HA | RT/MG | JR

TN PN

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1 EPD1.11 **DEMO LEVEL 1 POWER PLAN COMPOSITE**
1/16" = 1'-0"

GENERAL DEMOLITION SCOPE NOTES:

A. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRESENT ON SITE PRIOR TO BIDDING, AND SHALL BE EXPECTED TO PERFORM DEMOLITION AND INSTALL NEW AS SHOWN ON THE DOCUMENTS, INCLUDING SCOPE THAT MAY NOT FEASIBLY BE INDICATED ON PLAN.

B. CONTRACTOR SHALL VERIFY AND DOCUMENT EXISTING CONDITIONS OF ALL OUTLETS (AS DEFINED BY NEC) THAT ARE INDICATED OR REQUIRED TO BE REMOVED AND REINSTALLED TO FACILITATE THE WORK REQUIRED BY ALL TRADES. WHERE OUTLETS ARE REINSTALLED IN NON-OPERABLE CONDITION, THE CONTRACTOR SHALL REPLACE AT NO COST TO THE OWNER. DOCUMENT OUTLETS IN NON-WORKING CONDITION PRIOR TO REMOVE AND NOTIFY THE OWNER.

C. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL TO ALL REMOVED MATERIALS. CONTRACTOR SHALL COORDINATE WITH OWNER FOR LOCATION TO RETURN ANY AND ALL MATERIAL FOR OWNER STORAGE. FAILURE TO TURN OVER REMOVED MATERIAL TO OWNER MAY REQUIRE CONTRACTOR TO REPLACE EQUIPMENT REMOVED WITH NEW.

D. REMOVE ALL ELECTRICAL DEVICES WITHIN DEMOLISHED WALLS INCLUDING RECEPTACLES, SWITCHES, DATA/TELEPHONE DROPS, FIRE ALARM DEVICES, P/A DEVICES, CONDUIT, AND WIRING. REMOVE CONDUIT AND WIRING BACK TO PANEL OR LAST ACTIVE JUNCTION BOX. REFER TO ARCHITECTURAL DEMO PLAN. THIS SCOPE MAY NOT BE DIRECTLY IMPLIED BY NOTES ON DEMO PLANS AS IT IS ASSUMED THIS SCOPE EXISTS BASED ON ARCHITECTURAL DEMOLITION PLANS.

E. ALL ABANDONED CONDUIT AND BOXES FOUND IN CRAWLSPACES, CEILINGS SPACES, CHASES, OR UTILITY SPACES SHALL BE REMOVED. ANY EXISTING CONDUIT THAT IS UNDERGROUND MAY BE ABANDONED.

F. CONTRACTOR SHALL REVIEW DEMO AND NEW WORK PLANS SIMULTANEOUSLY TO IDENTIFY SCOPE THAT IS TO BE MODIFIED FOR REUSE WITH NEW SCOPE.

GENERAL POWER DEMOLITION NOTES:

A. GENERAL DEMOLITION NOTES APPLY TO ALL DEMO/REMODELING SCOPE.

B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.

C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.

D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.

E. EXISTING CIRCUITS MODIFIED IN FIELD SHALL NOT EXCEED 80% CAPACITY BASED ON AMP-RATING OF CIRCUIT.

F. DO NOT LEAVE ABANDONED CONDUIT, BOXES, EQUIPMENT, OR ENCLOSURES AFTER DEMOLITION. ALL ABANDONED MATIERAL MUST BE REMOVED.

G. IDENTIFICATION AND LABELING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS AND/OR NEW-WORK GENERAL ELECTRICAL NOTES.

H. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL RELABEL ALL CIRCUIT DIRECTORIES WITH LOAD NAMES FOR ALL EXISTING AND NEW PANELS THAT WERE MODIFIED WITHIN THIS PROJECT.

I. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS AND TURNED TO THE 'OFF' POSITION.

J. WHERE INDICATED OR REQUIRED BY OTHER TRADES, CONTRACTOR SHALL REMOVE ALL ELECTRICAL CONNECTIONS TO EXISTING PREWIRED FURNITURE. REMOVE CONDUIT AND WIRING BACK TO LAST ACTIVE JUNCTION. ALL DATA CABLING SHALL BE REMOVED BACK TO LAST ACTIVE JUNCTION AND SALVAGED FOR REINSTALLATION.

ELECTRICAL KEYED NOTES

E12.2 CONTRACTOR SHALL REUSE EXISTING CIRCUIT. FOR MECHANICAL EQUIPMENT SCHEDULED TO BE REMOVED.

E12.3 CONTRACTOR SHALL DEMOLISH EXISTING CIRCUIT. FOR MECHANICAL EQUIPMENT SCHEDULED TO BE REMOVED. CONDUIT MAY REMAIN WHERE FEASIBLE AND SIZED CORRECTLY PER NEC.

E12.5 EXISTING SERVICE DISCONNECT SWITCH SHALL BE DEMOLISHED. CONDUITS AND CONDUCTORS SHALL BE ROUTED TO A PULL BOX. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.

E12.6 EXISTING DISCONNECT SWITCH SHALL BE DEMOLISHED. CONDUITS AND CONDUCTORS SHALL BE DEMOLISHED. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.

E12.7 EXISTING ELECTRICAL CIRCUITS FOR HVAC DCC PANEL, AHU AFMS CONTROL DAMPER, AND DUCT SMOKE DETECTOR SHALL REMAIN FOR REUSE. COORDINATE EXACT DEVICE LOCATIONS AND PREPARE FOR NEW WORK.

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REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: DEMO COMPOSITE LEVEL 1 ELECTRICAL COMPOSITE PLAN

SHEET NUMBER: EPD1.11

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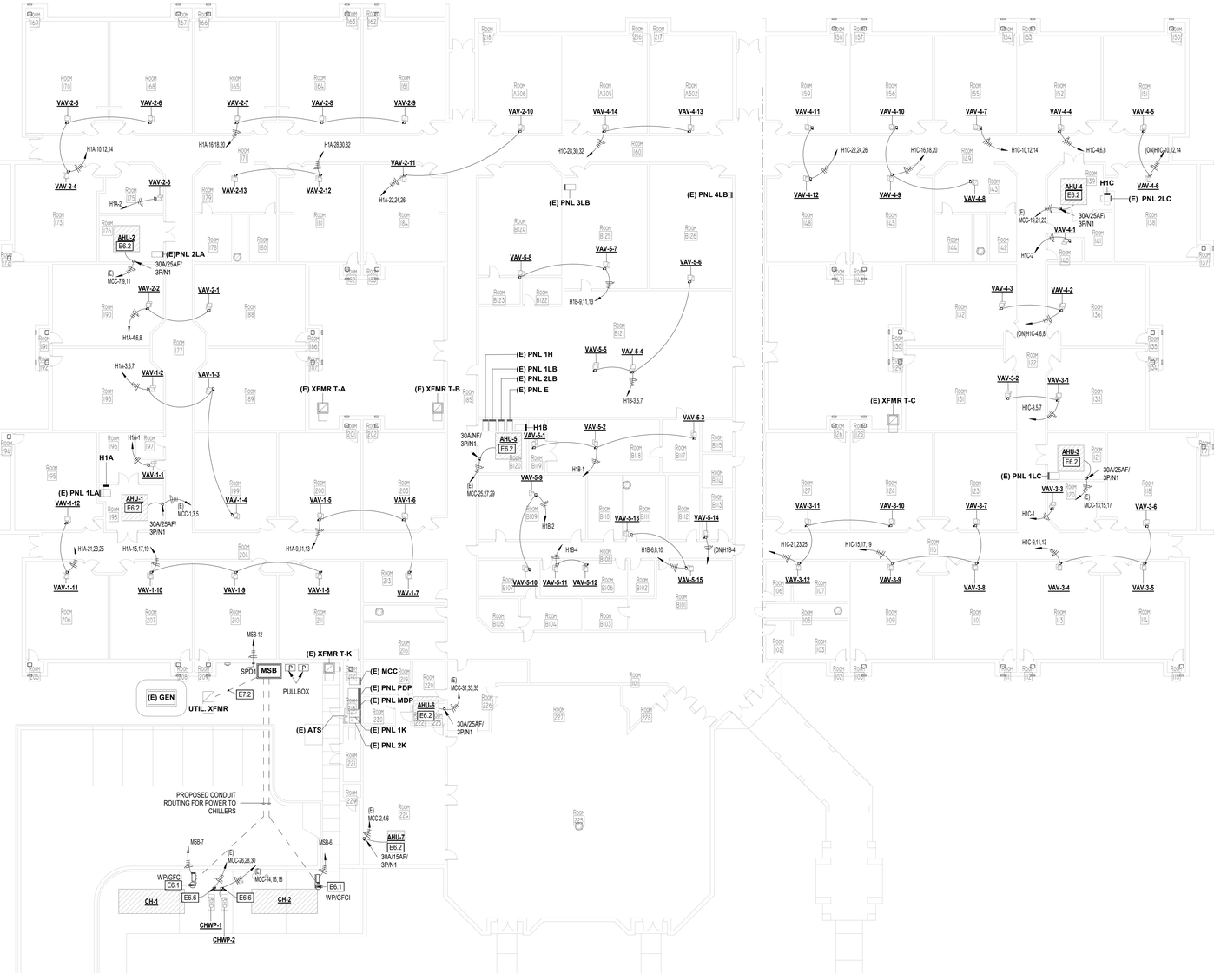
TBPE Firm Registration No. 2234

DBR Project Number 218033.013

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1 COMPOSITE LEVEL 1 POWER PLAN
EP1.11 — 1/16" = 1'-0"

GENERAL ELECTRICAL NOTES:

A. ELECTRICAL DEVICES SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. HVAC AND PLUMBING EQUIPMENT LOCATIONS ARE NOT EXACT, AND THE EXACT POINT OF CONNECTION TO EQUIPMENT MAY VARY. COORDINATE EXACT ROUGH-IN REQUIREMENTS IN FIELD AND WITH FINAL SUBMITTALS FOR ALL DIV. 21/22/23 EQUIPMENT.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. MINIMIZE ROOF PENETRATIONS. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. ALL RECEPTACLES LOCATED IN RESTROOMS, JANITOR CLOSETS, MECHANICAL ROOMS, ELEVATOR PITS OR SHAFTS, ELEVATOR EQUIPMENT ROOMS, SERVING ELECTRIC DRINKING FOUNTAINS OR VENDING MACHINES, LOCATED WITHIN 6' OF A SINK, LOCATED ABOVE A WET COUNTERTOP OR IN A KITCHEN OR COFFEE BAR SHALL BE GFCI. FEED-THRU GFCI/GFI IS PROHIBITED, ALL GFCI/GFI DEVICES SHALL BE PROVIDED WITH INDIVIDUAL TEST/RESET FEATURES.

F. MULTI-WIRE HOME RUNS SHALL NOT BE ALLOWED. PROVIDE DEDICATED NEUTRALS FOR ALL CIRCUITS. SHARING CONDUIT IS PERMISSIBLE WHERE TOTAL CONDUCTOR AMPACITY DERATING HAS BEEN PERFORMED BY ELECTRICAL CONTRACTOR. THE NEUTRAL IS CONSIDERED CURRENT-CARRYING.

G. ALL RECEPTACLES SHALL BE TAMPER RESISTANT TYPE. CONTRACTOR MAY PROVIDE NON-TAMPER-RESISTANT RECEPTACLES WHERE NOT REQUIRED PER CURRENT NEC ARTICLE 406

H. LABEL ALL CIRCUITS AT ALL JUNCTION BOXES AND OUTLETS (AS DEFINED BY NEC) WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES OR ON COVER OF JUNCTION BOX. IF A BOX HAS MULTIPLE CIRCUITS WITHIN, LABEL ALL CIRCUITS.

I. ALL VAV BRANCH CIRCUITS WITH MULTIPLE TAPS, SHALL BE SIZED 100% ACROSS THE ENTIRE CIRCUIT. DO NOT REDUCE WIRE SIZE AFTER EACH TAP AT EACH DISCONNECT.

ELECTRICAL KEYED NOTES

E6.1 PROVIDE UNISTRUT MOUNTED RECEPTACLE, PROVIDE 20A/1P BREAKER WITH 1#12 LINE, 1#12 NEU, AND 1#12 GND IN A 3/4"C IN EXISTING PANEL. 2X' . LOCATED IN ROOM 218.

E6.2 RECONNECT EXISTING PREPARED CIRCUITS TO NEW HVAC DDC PANEL, AHU AFMS CONTROL DAMPER, AND DUCT SMOKE DETECTOR. COORDINATE WITH MECHANICAL EXACT DEVICE LOCATIONS.

E6.6 PUMP VFDS ARE PROVIDED BY MECHANICAL CONTRACTOR. COORDINATE WITH MECHANICAL.

E7.2 PROPOSED ROUTING OF NEW UNDERGROUND SECONDARY FROM UTILITY XFMR.

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STATE OF TEXAS — ROBERTO H. TIJERINA — 121946 — LICENSED — PROFESSIONAL ENGINEER — 01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

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PROJECT NUMBER 218033.013

SHEET TITLE: COMPOSITE LEVEL 1 POWER PLAN

SHEET NUMBER: EP1.11

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Load Analysis - Salinas Elementary School

480 / 277 , 3 -PHASE, 4 -WIRE — Date: 1/5/2023

DESCRIPTION					NEC	KVA
EXISTING BUILDING LOAD						
KWs		485	KW			
		539	KVA	X 125%		674.0
LOADS REMOVED:						
COOLING (CHILLERS)=		-196,116	VA			-196.1
PUMPS CWP=		-7,800	VA			-7.8
AHU:		-56,400	VA			-56.4
VAVs:		-2,640	VA			-2.6
LOADS ADDED:						
COOLING (CHILLERS)=		479,986	VA			480.0
VAV=		397,900	VA			0.0
PUMPS CWP=		18,282	VA			18.3
AHUs=		78,114	VA			78.1
25% LARGEST MOTOR =		36,398	VA			36.4
					TOTAL KVA:	1023.8
					TOTAL AMPS:	1231.4
					SERVICE SIZE:	1600.0
NOTE: EXISTING BUILIDING LOAD TAKEN FROM PEAK DEMAND DATED ON 09/16/2020					SPARE AMPACITY:	368.6

ONE-LINE DIAGRAM GENERAL NOTES:

A. MANUFACTURER OF ELECTRICAL GEAR SHALL PROVIDE A COORDINATION STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SET BREAKERS. REFER TO SPECIFICATIONS. MANUFACTURER SHALL ALSO PROVIDE A FAULT CIRCUIT STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SELECT INTERRUPTING RATINGS OF ALL CIRCUIT BREAKERS, DISTRIBUTION PANELBOARDS, PANELBOARDS, ETC. A SERIES RATED SYSTEM SHALL BE USED. SUBMIT INTERRUPTING RATING FOR ALL ELECTRICAL GEAR IN SUBMITTALS. CONTRACTOR SHALL SUPPLY WITH THEIR SUBMITTALS ON ALL NEW EQUIPMENT THE MANUFACTURERS UL DATA LISTING THE SERIES RATING OF ALL EQUIPMENT. THIS SWITCHBOARD AND ALL NEW EQUIPMENT CONNECTED DOWNSTREAM SHALL BEAR LABELS INDICATING "SERIES RATED EQUIPMENT" ON THEIR EXTERIOR AS SPECIFIED IN THE SPECIFICATIONS. CONTRACTOR SHALL INSTRUCT MANUFACTURER TO INCLUDE IN THEIR SUBMITTALS ALL TRIP CURVES AND ALL LITERATURE INDICATING THE INTERRUPTING RATING CHARACTERISTICS OF EQUIPMENT BEING SUPPLIED.

B. METERING EQUIPMENT ENCLOSURE PROVIDED BY POWER CO., INSTALLED BY ELECTRICAL CONTRACTOR PER POWER COMPANY SPECIFICATIONS. METERS INSTALLED BY POWER COMPANY.

C. ALL CONDUCTORS SHALL BE COPPER.

D. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

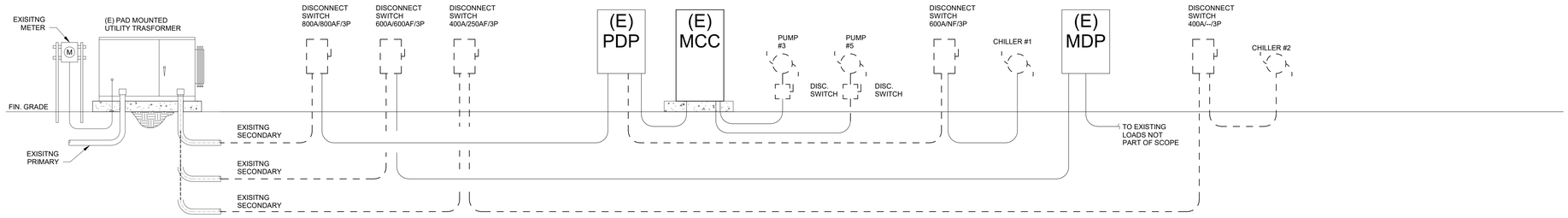
E. SERVICE EQUIPMENT IN OTHER THAN DWELLING UNITS SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

F. PRIOR TO INSTALLATION OF UNDERGROUND FEEDERS, THE ELECTRICAL CONTRACTOR SHALL SUBMIT AN UNDERGROUND ROUTING PLAN TO THE ENGINEER OF RECORD., INDICATING THE EXACT ROUTING PATH FOR ALL UNDERGROUND CONDUIT. INDICATE STUB-UP LOCATIONS, SIZE AND QUANTITY OF CONDUIT. ALL ELECTRICAL PANELS AND EQUIPMENT SHALL BE SHOWN ON THIS PLAN FOR REFERENCE OF CONDUIT TERMINATION.

G. DIVISION 26 INSTALLER SHALL COORDINATE NEW ELECTRICAL SERVICE WITH UTILITY COMPANY. PROVIDE CONDUIT, TRANSFORMER PAD, AND TAP BOX, WHERE REQUIRED. ALL NEW UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY SPECIFICATIONS.

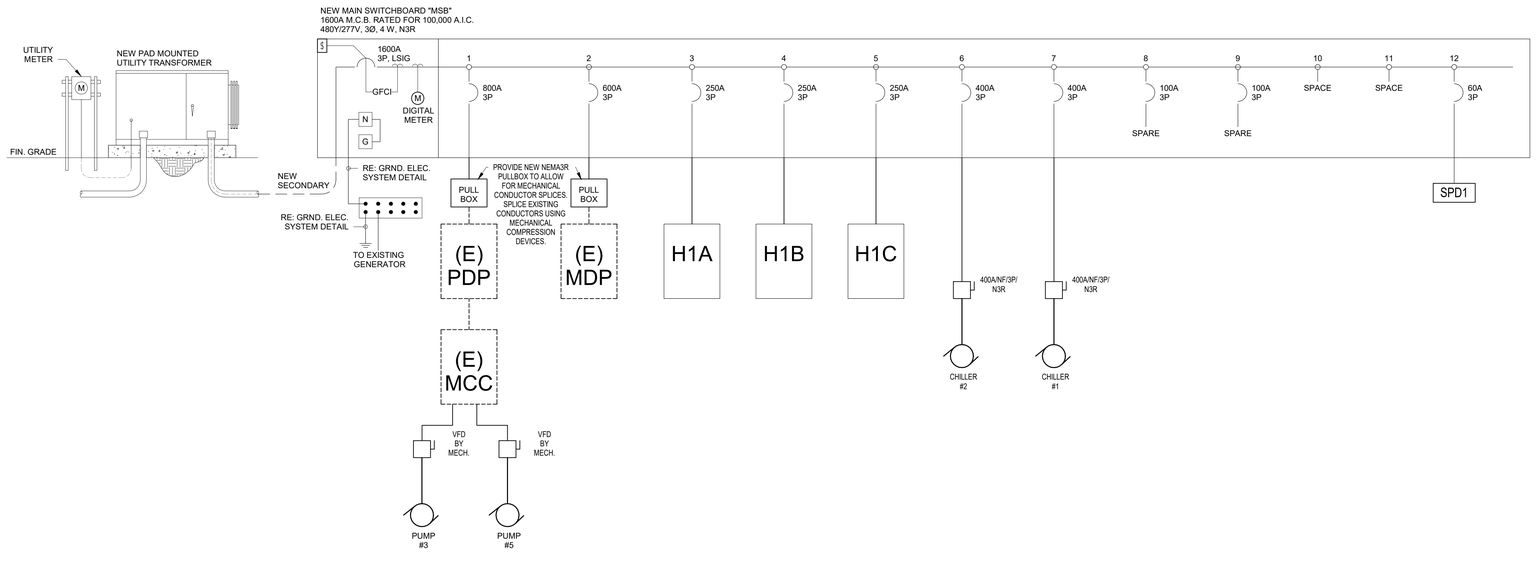
H. A PERMANENTLY AFFIXED LABEL SHALL BE APPLIED WITH THE AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2 X 3 IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

LEGEND:
TO BE DEMOLISHED
TO REMAIN



3 EXISTING ELECTRICAL ONE-LINE DIAGRAM SALINAS
E4.01 NOT TO SCALE

LEGEND:
EXISTING :
NEW :



1 REVISED ELECTRICAL ONE-LINE DIAGRAM SALINAS
E4.01 NOT TO SCALE

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No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS
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01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: ONE-LINE DIAGRAM

SHEET NUMBER: E4.01

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FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#8, 1#10 G.	1"
50A	1	4#8, 1#10 G.	1"
60A	1	4#6, 1#10 G.	1"
70A	1	4#4, 1#8 G.	1 1/4"
80A	1	4#4, 1#8 G.	1 1/4"
90A	1	4#3, 1#8 G.	1 1/4"
100A	1	4#3, 1#8 G.	1 1/4"
125A	1	4#1, 1#6 G.	1 1/2"
150A	1	4#1/0, 1#6 G.	1 1/2"
175A	1	4#2/0, 1#6 G.	2"
200A	1	4#3/0, 1#6 G.	2"
225A	1	4#4/0, 1#4 G.	2 1/2"
250A	1	4#250, 1#4 G.	2 1/2"
300A	1	4#350, 1#4 G.	3"
350A	1	4#500, 1#3 G.	3 1/2"
400A	1	4#600, 1#3 G.	4"
450A	2	4#4/0, 1#2 G.	2 1/2"
500A	2	4#250, 1#2G.	2 1/2"
600A	2	4#350, 1#1G.	3"
700A	2	4#500, 1#1/0G.	4"
800A	2	4#600, 1#1/0G.	4"
1000A	3	4#500, 1#2/0G.	4"
1200A	4	4#350, 1#3/0G.	3"
1600A	4	4#600, 1#4/0G.	4"
	5	4#500, 1#4/0G.	4"
2000A	5	4#600, 1#250 G.	4"
	6	4#500, 1#250 G.	4"
2500A	6	4#600, 1#350 G.	4"
	7	4#500, 1#350 G.	4"
3000A	7	4#600, 1#400 G.	4"
	8	4#500, 1#400 G.	4"
3500A	9	4#600, 1#500 G.	4"
	10	4#500, 1#500 G.	4"
4000A	10	4#600, 1#500 G.	4"
	11	4#500, 1#500 G.	4"
5000A	12	4#600, 1#750 G.	4"
	14	4#500, 1#750 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

Panelboard (E) MCC

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating; Mains Type: MLO; 0 A MCB; 400 A BUS (Copper); ISO. GRND. BUS; X Single / Double / Feed - Thru; Mounting: X Surface / Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT		CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
						1	2						
1	12631 VA	F	AHU-1	6	60 A	3	4	40 A	8	AHU-7	F	4188 VA	1
						5	6						
						7	8						
1	12631 VA	F	AHU-2	6	60 A	9	10	60 A	6	EXIST. PUMP #1, 2	MT	22500 VA	
						11	12						
						13	14						
1	12631 VA	F	AHU-3	6	60 A	15	16	30 A	10	CHWP-2	MT	9141 VA	1
						17	18						
						19	20						
1	11700 VA	F	AHU-4	6	60 A	21	22	15 A	12	EXIST. PUMP #4	MT	3000 VA	
						23	24						
						25	26						
2	12631 VA	F	AHU-5	10	25 A	27	28	25 A	10	CHWP-1	MT	9141 VA	2
						29	30						
						31	32	60 A	6	EXIST. SPARE	--	0 VA	
1	11700 VA	F	AHU-6	8	40 A	33	34	60 A	6	EXIST. SPARE	--	0 VA	
						35	36	60 A	6	EXIST. SPARE	--	0 VA	
	0 VA	--	Space	12	--	37	38						
	0 VA	--	Space	12	--	39	40	20 A	12	TVSS	SP	0 VA	
	0 VA	--	Space	12	--	41	42						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans	78112 VA	100.00%	78112 VA	220.5	(MT)Lrg. Motor	43782 VA	112.85%	49407 VA
	(M)Misc.					(SP)Sub Pnl.	0 VA	Not Computed	0 VA
Total Connected Load:		121894 VA	VA =	147 A	Location of Panel: Space 202				
Total Load (Diversified):		127519 VA	VA =	153 A					

NOTES:
1. REUSE EXISTING BREAKER AND CIRCUIT AS INDICATED.
2. PROVIDE NEW BREAKER AND CIRCUIT AS INDICATED.

Panelboard (E) PNL PDP

AIC Rating: New / X Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating; Mains Type: MLO; 0 A MCB; 800 A BUS (Copper); ISO. GRND. BUS; X Single / Double / Feed - Thru; Mounting: X Surface / Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT		CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	0 VA	--	EXIST. 3P SPARE	8	50 A	1	2	600 A	(2) 4/0	EXIST. 3P SPARE	--	0 VA	
	0 VA	--	--	8	50 A	3	4	600 A	(2) 4/0	--	--	0 VA	
	0 VA	--	--	8	50 A	5	6	600 A	(2) 4/0	--	--	0 VA	
						7	8						
	121894 VA	Spare ; SP; F; MT	(E) MCC	350	300 A	9	10	600 A	(2) 4/0	EXIST. BOILER	H	400000 VA	
						11	12						

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating	400000 VA	100.00%	400000 VA		(WH)Wat. Htr.			
220.60	(F)Fans	78112 VA	100.00%	78112 VA	220.5	(MT)Lrg. Motor	43782 VA	112.85%	49407 VA
	(M)Misc.					(SP)Sub Pnl.	0 VA	Not Computed	0 VA
Total Connected Load:		521894 VA	VA =	628 A	Location of Panel: Space 202				
Total Load (Diversified):		527519 VA	VA =	635 A					

Panelboard H1A

22,000 AIC Rating: X New / Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating; Mains Type: MLO; 0 A MCB; 250 A BUS (Copper); ISO. GRND. BUS; X Single / Double / Feed - Thru; Mounting: X Surface / Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT		CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	3800 VA	H	VAV-1-1	12	20 A	1	2	15 A	12	VAV-2-3	H	2700 VA	
						3	4						
	19800 VA	H	VAV-1-2,3,4	10	30 A	5	6	20 A	12	VAV-2-1,2	H	13200 VA	
						7	8						
	19800 VA	H	VAV-1-5,6,7	10	30 A	9	10	30 A	10	VAV-2-4,5,6	H	19800 VA	
						11	12						
	19800 VA	H	VAV-1-8,9,10	10	30 A	13	14	30 A	10	VAV-2-7,8,9	H	19800 VA	
						15	16						
	13200 VA	H	VAV-1-11,12	12	20 A	17	18	20 A	12	VAV-2-10,11	H	13200 VA	
						19	20						
						21	22						
	0 VA	--	Spare	12	20 A	23	24	20 A	12	VAV-2-12,13	H	13200 VA	
	0 VA	--	Spare	12	20 A	25	26						
	0 VA	--	Spare	12	20 A	27	28						
	0 VA	--	Spare	12	20 A	29	30						
	0 VA	--	Spare	12	20 A	31	32						
	0 VA	--	Spare	12	20 A	33	34	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	35	36	20 A	12	Spare	--	0 VA	
	0 VA	--	Space	12	--	37	38	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	39	40	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	41	42	--	12	Space	--	0 VA	

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating	158300 VA	100.00%	158300 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.					(SP)Sub Pnl.			
Total Connected Load:		158300 VA	VA =	190 A	Location of Panel: Space 270				
Total Load (Diversified):		158300 VA	VA =	190 A					

Panelboard H1B

22,000 AIC Rating: X New / Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating; Mains Type: MCB; 150 A MCB; 250 A BUS (Copper); ISO. GRND. BUS; X Single / Double / Feed - Thru; Mounting: X Surface / Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT		CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	8400 VA	H	VAV-5-1,2,3	8	35 A	1	2	25 A	10	VAV-5-9,10	H	5400 VA	
						3	4	30 A	10	VAV-5-11,12	H	6300 VA	
	28000 VA	H	VAV-5-4,5,6	8	45 A	5	6						
						7	8	20 A	12	VAV-5-13,15	H	10600 VA	
	14600 VA	H	VAV-5-7,8	10	25 A	9	10						
						11	12	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	13	14	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	15	16	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	17	18	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	19	20	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	21	22	20 A	12	Spare	--	0 VA	
	0 VA	--	Space	12	--	23	24	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	25	26	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	27	28	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	29	30	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	31	32	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	33	34	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	35	36	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	37	38	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	39	40	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	41	42	--	12	Space	--	0 VA	

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating	73300 VA	100.00%	73300 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.					(SP)Sub Pnl.			
Total Connected Load:		73300 VA	VA =	88 A	Location of Panel: Space 161				
Total Load (Diversified):		73300 VA	VA =	88 A					

Panelboard H1C

10,000 AIC Rating: X New / Existing

480/277 Wye Volt, 3 Phase, 4 Wire; 1 Section; Type 1 -Nema Rating; Mains Type: MLO; 0 A MCB; 250 A BUS (Copper); ISO. GRND. BUS; X Single / Double / Feed - Thru; Mounting: X Surface / Flush

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT		CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	2700 VA	H	VAV-3-3	12	20 A	1	2	20 A	12	VAV-4-1	H	2700 VA	
						3	4						
	13200 VA	H	VAV-3-1,2	12	20 A	5	6	30 A	10	VAV-4-2,3,4	H	19800 VA	
						7	8						
	19800 VA	H	VAV-3-4,5,6	10	30 A	9	10	30 A	10	VAV-4-5,6,7	H	19800 VA	
						11	12						
	19800 VA	H	VAV-3-7,8,9	10	30 A	13	14	30 A	10	VAV-4-8,9,10	H	19800 VA	
						15	16						
	19800 VA	H	VAV-3-10,11,12	10	30 A	17	18	30 A	10	VAV-4-11,12	H	13200 VA	
						19	20						
						21	22						
	0 VA	--	Spare	12	20 A	23	24	20 A	12	VAV-4-13,14	H	13200 VA	
	0 VA	--	Spare	12	20 A	25	26						
	0 VA	--	Spare	12	20 A	27	28						
	0 VA	--	Spare	12	20 A	29	30	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	31	32						
	0 VA	--	Spare	12	20 A	33	34	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	35	36	20 A	12	Spare	--	0 VA	
	0 VA	--	Space	12	--	37	38	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	39	40	--	12	Space	--	0 VA	
	0 VA	--	Space	12	--	41	42	--	12	Space	--	0 VA	

N.E.C. (2020)	Load Type	Conn.	Fct.	Diversity	N.E.C.(2020)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating	163800 VA	100.00%	163800 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.					(SP)Sub Pnl.			
Total Connected Load:		163800 VA	VA =	197 A	Location of Panel: Space 265				
Total Load (Diversified):		163800 VA	VA =	197 A					

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

107

REVISION:

No.	DATE	DESCRIPTION

SEAL:



MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: ELECTRICAL SCHEDULES

SHEET NUMBER: E5.01

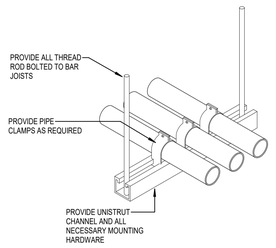
DBR
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f
TBPE Firm Registration No. 2234

DBR Project Number 218033.013

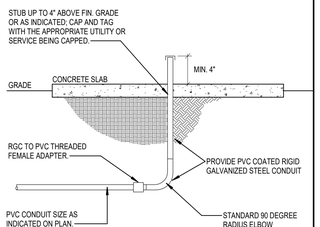
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TN PN

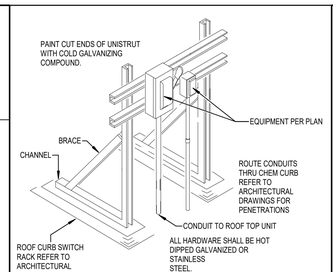
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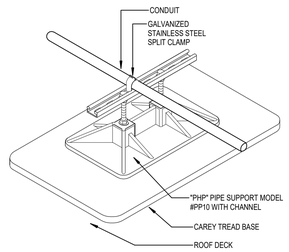
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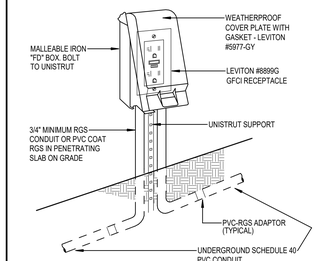
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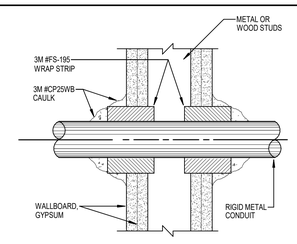
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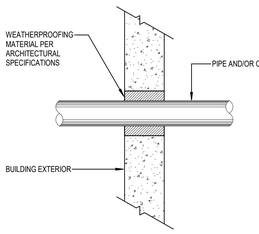
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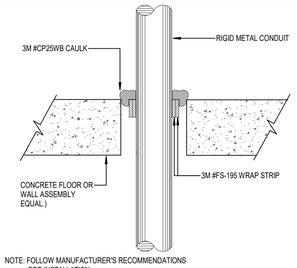
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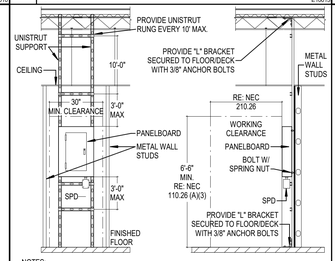
6 2 HR. GYPSUM WALLBOARD PIPE PENETRATION
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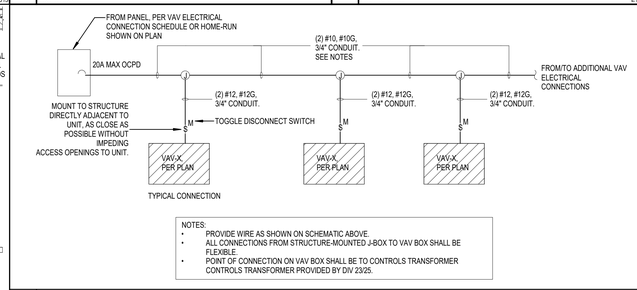
7 PIPE AND/OR CONDUIT PENETRATION
NOT TO SCALE E10018



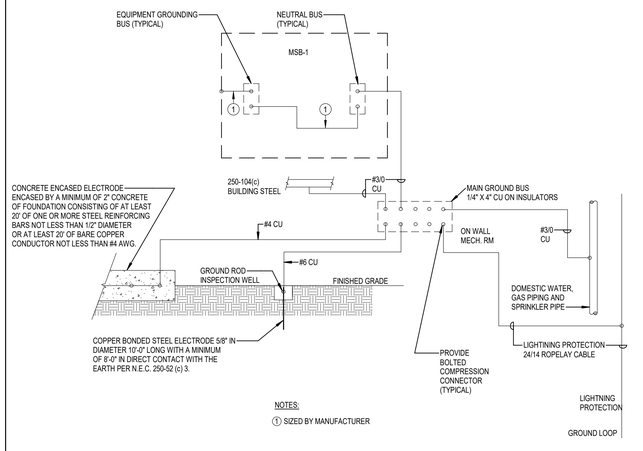
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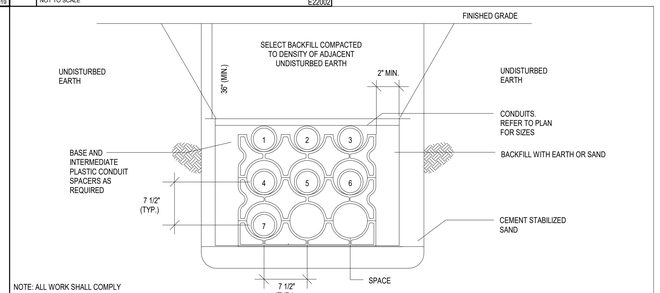
9 PANELBOARD MOUNTING DETAIL
NOT TO SCALE E22000



10 TYPICAL VAV BOX ELECTRICAL CONNECTION DETAIL
NOT TO SCALE E13010



11 GROUNDING ELECTRODE SYSTEM DETAIL
NOT TO SCALE 17015



12 SECONDARY SERVICE TRENCH DETAIL
NOT TO SCALE E23010

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200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f

REVISION:

No.	DATE	DESCRIPTION

SEAL:

STATE OF TEXAS
ROBERTO H. TIJERINA
121946
LICENSED
PROFESSIONAL ENGINEER
01-05-2023

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT - SALINAS ES - INDOOR AIR QUALITY IMPROVEMENTS

TBPE Firm Registration No. 2234

DATE: 01/05/2023

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 218033.013

SHEET TITLE: ELECTRICAL DETAILS

SHEET NUMBER: E6.01

DBR
200 South 10th Street, Suite 901
McAllen, Texas 78501
956.683.1640 p 956.683.1903 f
TBPE Firm Registration No. 2234

DBR Project Number 218033.013

HA | RT/MG | JR

TN PN

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SUBJECT: Consideration Final Completion, Less Betterment Fund Allowance, Less Liquidated Damages, and Final Payment for the Culinary Arts at Veterans Memorial High School – PBK Architects

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The CTE program and Veterans Memorial High School currently have a culinary arts lab. As per a field inspection at VMHS, the culinary lab is requiring possible renovations to be in code compliance. Areas of note are the current vent/hood suppression systems.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects.

At the Regular Board of Trustees meeting held on August 11, 2021, the Board approved the project, proposed the budget, and utilized the on-call professional services for the Culinary Arts Laboratory at Veterans Memorial High School Project – PBK Architects. PBK Architects estimated project cost is $10,000.00.

At the Regular Board of Trustees held on February 09, 2022, the Board approved Schematic Design for the Culinary Arts Laboratory at Veterans Memorial High School Project – PBK Architects.

Schematic Design:
Rough sketches that develop a feasible conceptual design of the project.

Construction Documents:
Communicating the design intent through further refinement of the written and graphic representation of all building materials, components, and equipment that can be quantified and useful to contractors.

At the Regular Board meeting held on April 13, 2022, the Board approved Final Design for the Culinary Arts Laboratory at Veterans Memorial High School Project. Designs were reviewed and approved by staff.

Note: After further evaluation of the project during the design process PBK Architects stated that their estimated cost may need to be increased.

Advertisements in the local newspapers were posted on May 11, 2022, and May 23, 2022. The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. The bid opening was June 9, 2022, and we received one (1) proposal which was not within the estimated budget. Administration is currently exploring other options for this project or may re-advertise.

Firm	Proposal	Pts.
G&G Contractors	$155,700.00	94.0

At the Regular Board meeting held on August 10, 2022, the Board approved to reject of all proposals for the Culinary Arts for Veterans Memorial High School – PBK Architects.

First Advertisements in the local newspapers were posted on May 11, 2022, and May 23, 2022. The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. The bid opening was June 9, 2022, and we received one (1) proposal which was not within the estimated budget. Administration is currently re-advertising for additional five days to extend through the Associated General Contractors of America (AGC) to see if any vendors submit a proposal.

The process is for the submittals to be reviewed by the Purchasing Department Staff and the Administration Ranking Team to assure that firms meet the criteria based on demonstrated expertise, competence, and qualifications. Pre-ranking will be done and after the review, Administration will then present the recommended firm to be reviewed and ranked in order of selection. The recommendations will then be presented for approval at the next sequential Board of Trustees meeting and the Administration will then enter into negotiations in the order of selection.

Note: Administration did not receive any new Competitive Sealed Proposals (CSP's) for this project. Should no proposals be received Administration will request the Board to approve using Job Order Contracting (JOC) as the procurement method of delivery.

At the Regular Board of Trustees meeting held on September 21, 2022, the Board approved using Job Order Contracting (JOC) as the procurement method of delivery.

At the Board Workshop meeting held on November 02, 2022, the Board has been informed of the Best and Final Offer (BAFO) for the Job Ordering Contracting at the Culinary Arts Veterans Memorial High School of $45,960.73 with 30 days of construction time. Notice to Proceed is on November 07, 2022, with Substantial Completion on December 07, 2022.

Project	Vendor Name	Cost
Culinary Arts VMHS	Rio United Builders	$45,960.73

At the Regular Board of Trustees meeting held on December 07, 2022, the Board approved substantial completion for the Culinary Arts at Veterans Memorial High School. The substantial completion is scheduled to be the day of the Board Meeting and if completed Administration will be presenting Consideration and Approval of Substantial Completion for the Culinary Arts at Veterans Memorial High School – PBK Architects

Note: Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

ADMINISTRATIVE CONSIDERATIONS

PBK Architects and Rio United Builders are presenting Final Completion, Less Betterment Fund Allowance, Less Liquidated Damages, and Final Payment for the Culinary Arts at Veterans Memorial High School. The project was completed on time with all punch list items completed. This project has no liquated damages and a contingency balance credit for the amount of $5,000.00.

FUNDING SOURCE
Local Fund

Est. Project Budget:	$10,000.00
Project Contingency 20%:	$ 2,000.00
Est. Professional Services 12%:	$ 1,200.00
Est. Total Project Cost:	$13,200.00

RECOMMENDATION
Administration is presenting Final Completion, Less Betterment Fund Allowance, Less Liquidated Damages, and Final Payment for the Culinary Arts at Veterans Memorial High School.

EXHIBIT:
Final Completion Letter

CONTACT PERSONS
Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management

6316 N 10th Street, Bldg A, Suite 1
McAllen, Texas 78504
Phone: 956-687-1330
PBK.com

January 06, 2023 **VIA: E-mail**

Mr. Ricardo Rivera
Assistant Superintendent for Operations
520 Holland Ave.
Mission TX 78572

Re: Veterans Memorial HS- Culinary Arts
Final Completion

Mr. Rivera,

As of January 6, 2023 the punch list items have been completed and the closeout documents have been submitted in accordance with the contract documents. Also included is the final Payment Applications. With this information, we recommend Final Completion of this project.

Please do not hesitate to call me should you have any questions.

Respectfully submitted,



David I. Iglesias
Associate Principal, PBK

CC: File

APPLICATION AND CERTIFICATION FOR PAYMENT

AIA DOCUMENT G702

TO OWNER:
Mission CISD
1201 Bryce Road
Mission, Texas 78573

PROJECT: Mission CISD Veterans HS
Culinary Arts Classroom

APPLICATION NO: 1

PERIOD TO: 6-Jan-23

Distribution to:
X OWNER
X ARCHITECT
X CONTRACTOR

FROM CONTRACTOR:
Rio United Builders
219 N Missouri St
Alton, Texas 78573

NOTICE TO PROCEED: Nov. 7. 2022
CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM		$ 45,903.73
2. Net change by Change Orders		$ 0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$ 45,903.73
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$ 45,903.73
5. RETAINAGE:		
a. 0 % of Completed Work	$ 0.00	
b. ____ % of Stored Material	$	
Total Retainage (Lines 5a + 5b or Total in Column I of G703)		$ 0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)		$ 45,903.73
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)		$ 0.00
8. CURRENT PAYMENT DUE		$ 45,903.73
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)		$ 0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: [signature] Date: 1/6/2023

State of: Texas County of: Hidalgo
Subscribed and sworn to before me this 6 day of January 2023
Notary Public: [signature]
My Commission expires: 01/05/2025

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED . . . . . $ 45,903.73

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and onthe Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT: PBK Architects, Inc.

By: [signature] Date: 1/6/2023

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA DOCUMENT G702 · APPLICATION AND CERTIFICATION FOR PAYMENT · 1992 EDITION · AIA® · © 1992 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 NEW YORK AVE., N.W., WASHINGTON, DC 20006-5292
Users may obtain validation of this document by requesting a completed AIA Document D401 - Certification of Document's Authenticity from the Licensee.

CONTINUATION SHEET -Mission CISD Veterans Memorial HS Culinary Art Classroom Remodel *AIA DOCUMENT G703*

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing
Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: 1
APPLICATION DATE: 6-Jan-23
PERIOD TO: 6-Jan-23

A	B	C	D	E	F	G		H	I
ITEM NO	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
1	Supervision	$3,000.00		$3,000.00		$3,000.00	100.00%	$0.00	$0.00
2	Permit	$500.00		$500.00		$500.00	100.00%	$0.00	$0.00
3	Cabinets	$1,300.00		$1,300.00		$1,300.00	100.00%	$0.00	$0.00
4	Stain Work	$1,100.00		$1,100.00		$1,100.00	100.00%	$0.00	$0.00
5	Exhaust Fans	$1,500.00		$1,500.00		$1,500.00	100.00%	$0.00	$0.00
6	Lecture Exhaust Fan	$1,700.00		$1,700.00		$1,700.00	100.00%	$0.00	$0.00
7	Electrical & Fire Alarm	$6,500.00		$6,500.00		$6,500.00	100.00%	$0.00	$0.00
8	Guardian System	$18,500.00		$18,500.00		$18,500.00	100.00%	$0.00	$0.00
9	General Labor	$5,000.00		$5,000.00		$5,000.00	100.00%	$0.00	$0.00
10	Bonding & Insurance	$2,000.00		$2,000.00		$2,000.00	100.00%	$0.00	$0.00
11	Overhead & Profit	$4,803.73		$4,803.73		$4,803.73	100.00%	$0.00	$0.00
	GRAND TOTALS	$45,903.73	$0.00	$45,903.73	$0.00	$45,903.73	100.00%	$0.00	$0.00

AIA® Document G701™ – 2017

Change Order

PROJECT: *(Name and address)*
Veterans Memorial High School
Culinary Arts

CONTRACT INFORMATION:
Contract For: General Construction
Date: October 22, 2022

CHANGE ORDER INFORMATION:
Change Order Number: 001
Date: 1/06/2023

OWNER: *(Name and address)*
Mission Consolidated Independent School District
1201 Bryce Dr.
Mission, TX 78572

ARCHITECT: *(Name and address)*
PBK Architects, Inc.
6316 N. 10th Street, Bldg A, Ste 1
McAllen, TX 78504

CONTRACTOR: *(Name and address)*
Rio United Builders
219 N. Missouri Street
Alton, TX 78573

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)
Credit for the remaining balance of the Owner Contigency of Five-Thousand dollars ($5,000.00).

The original Contract Sum was	$	45,903.73
The net change by previously authorized Change Orders	$	0.00
The Contract Sum prior to this Change Order was	$	45,903.73
The Contract Sum will be decreased by this Change Order in the amount of	$	5,000.00
The new Contract Sum including this Change Order will be	$	40,903.73

The Contract Time will be unchanged by zero (0) days.
The new date of Substantial Completion will be as indicated in the Notice to Proceed.

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
PBK Architects, Inc	Rio United Builders	Mission Consolidated Independent School District
SIGNATURE	**SIGNATURE**	**SIGNATURE**
David I. Iglesias,Associate Principal	Dagoberto Perez Jr., Owner	Dr. Carol G. Perez, Superintendent of Schools
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**	**PRINTED NAME AND TITLE**
1/06/2023	1/06/2023	
DATE	**DATE**	**DATE**

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User Notes: (3B9ADA43)

SUBJECT: Job Order Contracting (JOC) Various Projects:

a. The Best and Final Offer (BAFO) – Farmers Parking Lot

PRESENTER: Ricardo Rivera, Assistant Superintendent for Operations

BACKGROUND INFORMATION

The Mission CISD CTE program is establishing a citrus horticulture laboratory program at the 18 acres of citrus grove, immediate plans are to demo an area of groves to bring in portable building classrooms. Utilities including streets, water, fire protection, drainage, electrical, and sewer need to be engineered.

A civil engineer is recommended to be the prime design engineer for this project.

Administration will use competitive sealed proposals (CSP's) as the procurement method as approved by the Board of Trustees in the February 2021 Board of Trustees meeting. This method was approved as the primary default method for projects.

At the Regular Board of Trustees, Meeting held on September 8, 2021, the Board approved the project, and proposed budget, and utilized the on-call professional services. Administration approved the on-call professional services agreement for the project assessment. Javier Hinojosa Civil Engineering's estimated project cost is $536,101.00.

Administration will use the on-call professional services agreement for project administration. It will be the responsibility of the design/engineer professional to provide an estimated project budget. When provided, Administration will advise the Board of Trustees as an informational update.

However, at the November 10, 2021, Board of Trustees meeting, the Board approved Job Order Contracting (JOC) and this method may be used for this smaller project.

Portable classrooms and restroom facilities have already been set-up at the property. Water lines and a water meter have already been installed at our property. The power company has just recently connected electrical power to the property. Maintenance will soon make the final connections to the portable buildings. The City of Mission is continuing with a drainage/sewer line project to provide those utilities to the property. At this time we have no definite timeline for completion.

ADMINISTRATIVE CONSIDERATIONS

1. Job Order Contracting (JOC) Various Projects:

a. The Best and Final Offer (BAFO) – Farmers Parking Lot

Project	Vendor Name	Cost
FARMERS Parking Lot	8/A Builders LLC	$64,242.15

FUNDING SOURCE

Local Fund

Est. Project Budget:	$536,101.00
Project Contingency 20%:	$107,220.20
Est. Professional Services 12%:	$ 64,332.12
Est. Total Project Cost:	$707,653.32

RECOMMENDATION

Job Order Contracting (JOC) Various Projects:

A. The Best and Final Offer (BAFO) – Farmers Parking Lot

EXHIBIT:

Quote Tabulation Sheet

CONTACT PERSONS

Ricardo Rivera, Assistant Superintendent for Operations
Adrian Hernandez, Coordinator for Project & Energy Management
Adan Rivera, Assistant Coordinator for Maintenance

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT
QUOTE TABULATION FORM

DATE: 12/6/2022 **REQ NO.**

DEPARTMENT/CAMPUS: Maintenance/Farmers Project

VENDOR NAME:		8A Builders LLC					Rio United Builders					Basic IDIQ				
		Contact Name:			**Phone #**		**Contact Name:**			**Phone #**		**Contact Name:**			**Phone #**	
		Arnold Ochoa			956-627-1327		Dago Perez			956-222-6624		Kevin Crowley			512-960-9486	
Qty	**Detailed Desc. - color, size, etc.**	**Page No.**	**Quoted Price**	**Sub-total**	**Disc. %**	**Total**	**Page No.**	**Quoted Price**	**Sub-total**	**Disc. %**	**Total**	**Page No.**	**Quoted Price**	**Sub-total**	**Disc. %**	**Total**
1	Parking lot area & entrance, per plan		61,183.00	61,183.00		$61,183.00		73,000.00	73,000.00		73,000.00		117,595.12	117,595.12		117,595.12
1	Payment & performance Bond		3,059.15	3,059.15		3,059.15		1,900.00	1,900.00		1,900.00		2,939.88	2,939.88		2,939.88
GRAND TOTAL						64,242.15					74,900.00					120,535.00

If not using lowest vendor, please explain why:

Principal or Administrator Signature: _____ Date: _____

Purchasing Department Signature (20K<): _____ Date: _____

SUBJECT: Financial Report for the Month of December 2022 – Self-Funded Health Insurance Fund

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

Mission CISD offers a self-funded group health insurance plan to its employees administered by Blue Cross Blue Shield of Texas. District employees have the option to elect health insurance coverages from three plans (High Deductible, Base, and High Plan).

As a self-funded group health insurance plan, Mission CISD assumes the financial risk for providing health care benefits to its employees and their dependents. In practical terms, Mission CISD pays for each out of pocket claim as they are incurred instead of paying a fixed premium to an insurance carrier. Mission CISD has set up the Health Insurance Fund to account for premiums funded by the District and its employees and to pay incurred claims and administrative costs.

ADMINISTRATIVE CONSIDERATIONS

Actual revenues for December 2022 totaled $1,359,369.09 and actual expenditures totaled $1,690,254.60 The excess revenues over expenditures was $(330,885.51). The total net position as of December totaled $(571,521.17)

The Self-Funded Group Health Insurance Financial Report is also attached. There were four large claims for December: $61,077.16, $59,468.90, $66,317.84, and $82,684.00

FUNDING SOURCE AND AMOUNT

Not applicable.

RECOMMENDATION

Information item only.

CONTACT PERSON(S)

Joel Garcia, Assistant Superintendent for Finance
Sylvia Cruz, Director for Payroll, Employee Benefits & Risk Management

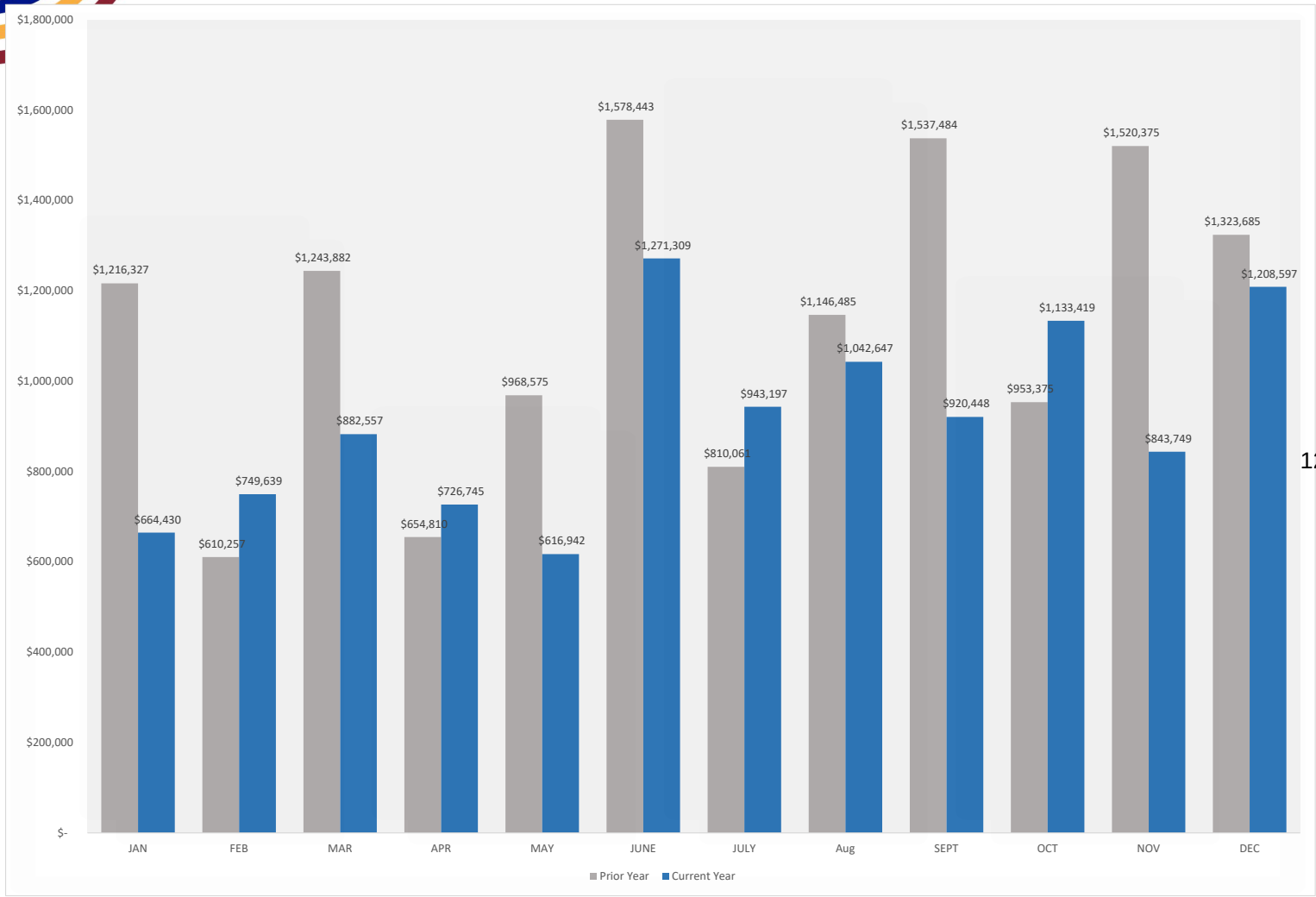


120

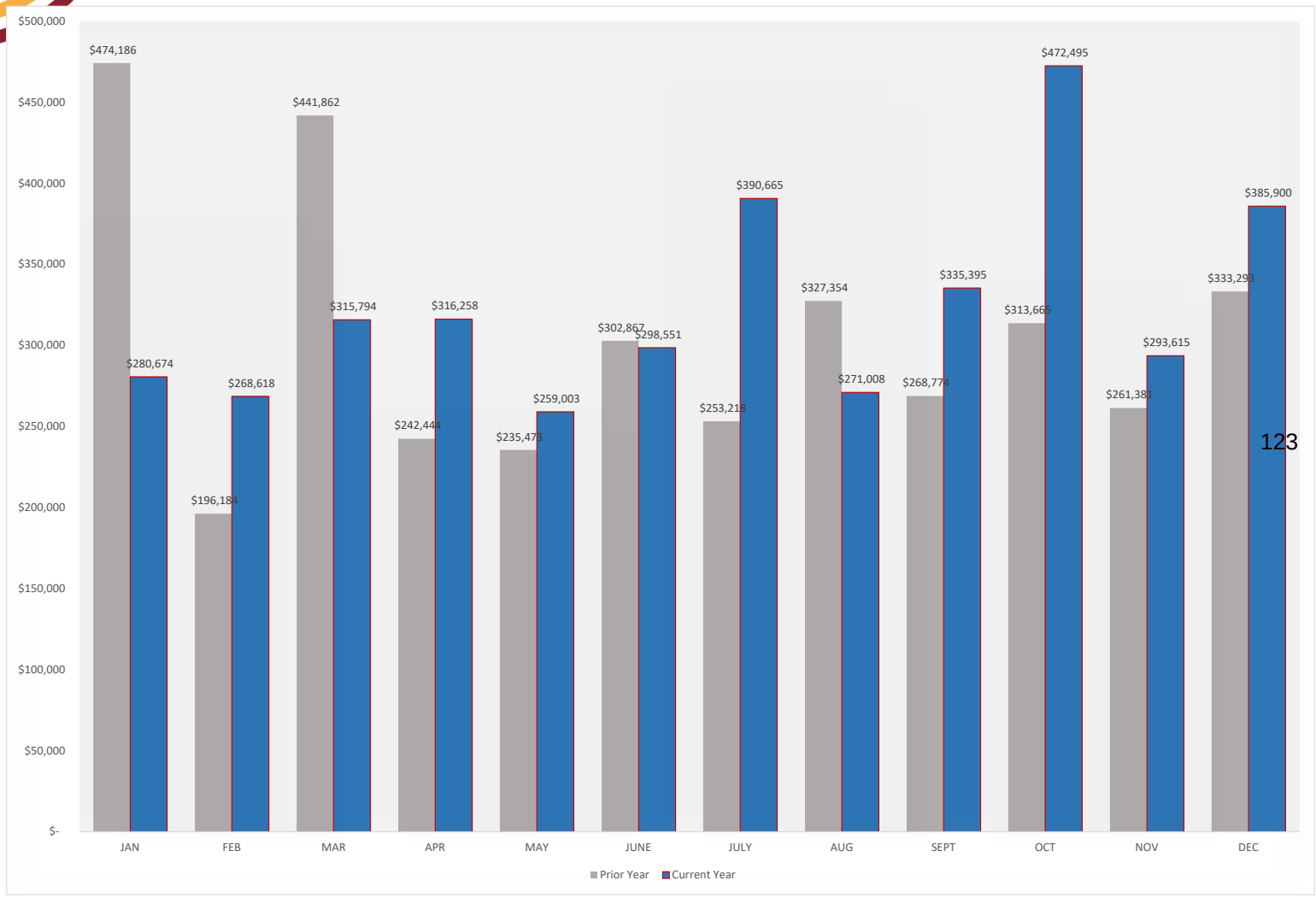
Self Funded Health Insurance Fund
Statement of Revenues, Expenditures and Changes in Net Position for 6 months ending December 2022

Operating Revenues	Actual	%
Premiums:		
Medical - Employee	$ 1,491,875.29	18.20%
Medical - Employer	$ 6,614,418.37	80.70%
Administrative Fees-Refunds	$ -	0.00%
Claim Credits		0.00%
Pharmacy Credits/Rebates		0.00%
Stop Loss Insurance	$ 90,248.01	1.10%
Cobra		0.00%
Non - Operating Revenues		
Interest Revenue	$ 69.24	0.00%
Total Revenues	**$ 8,196,610.91**	**100%**
Operating Expenses		
Claims:		
Medical	$ 6,092,056.87	69.48%
Pharmacy - RX	$ 2,149,077.84	24.51%
Administrative Fees:		
Medical	$ 26,060.07	0.30%
Aggregate Stop Loss	$ 28,236.15	0.32%
Specific Stop Loss	$ 461,967.15	5.27%
Independent External Review Fees	$ 700.00	0.01%
Vendor Fees	$ -	0.00%
PCORI Fees		0.00%
Consulting Fees	$ 4,500.00	0.05%
Non-Operating Expenses		
Other Expenses	$ 5,534.00	0.06%
Total Expenses	**$ 8,768,132.08**	100.00%
Operating Income (Loss)	**$ (571,521.17)**	
Income (Loss) Before Contributions & Transfers	**$ (571,521.17)**	
Contributions & Transfers		
Transfers In	$ -	
Change in Net Position	$ (571,521.17)	
Total Net Position - Beginning Audited	$ -	
Total Net Position - Ending Unaudited	**$ (571,521.17)**	

Medical Claims Expenditures Overview
12 Month Trend – December 2022

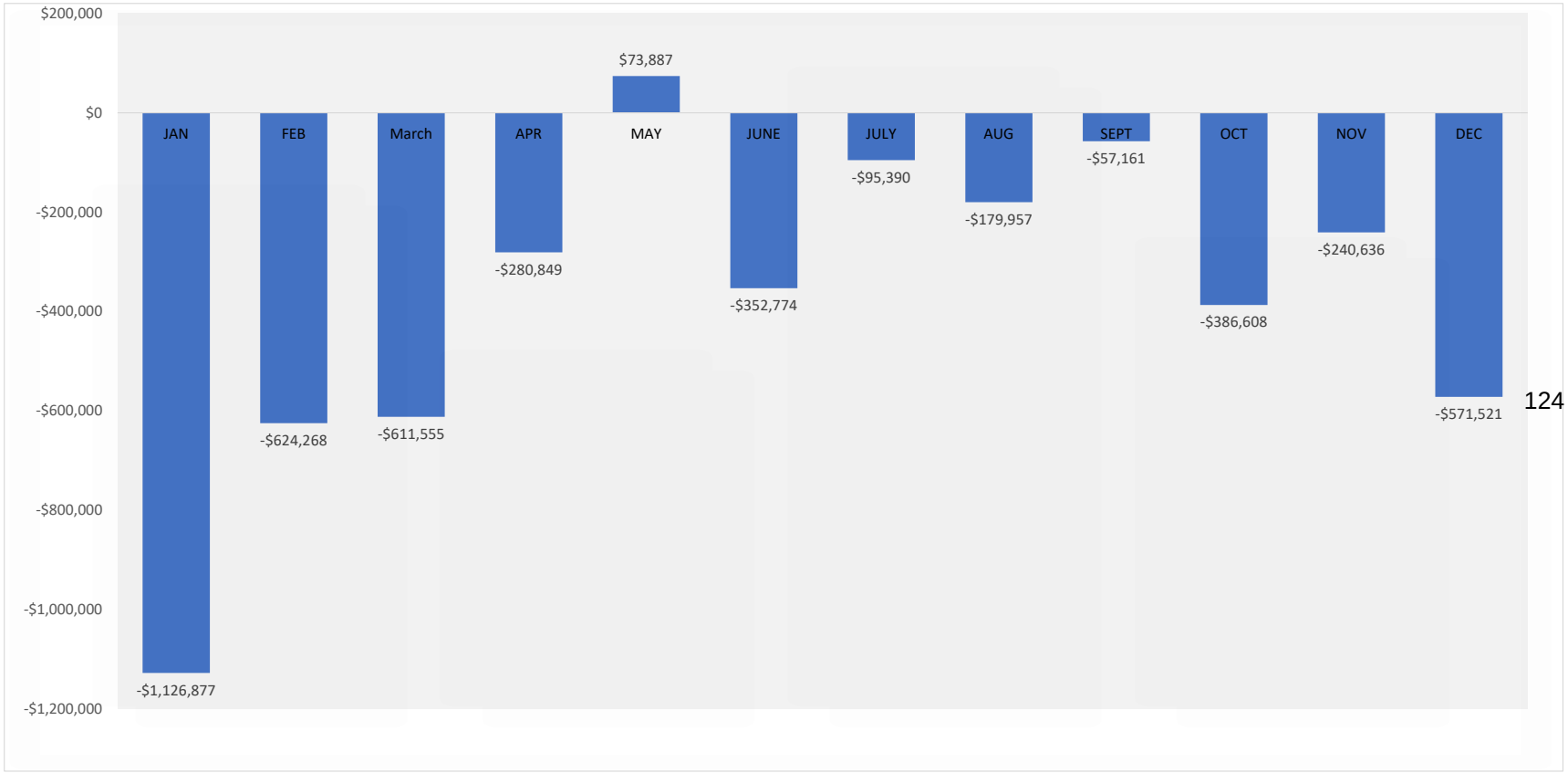


Pharmacy Claims Expenditures Overview
12 Month Trend – December 2022



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Net Position Overview
12 month Trend – December 2022



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SUBJECT: Award Contract for Professional Auctioneer Services #109-23-0

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

This contract intends to provide a method to procure Professional Auctioneer Services to meet the District's needs.

ADMINISTRATIVE CONSIDERATIONS

The District solicited Requests for Proposals in compliance with TEC Sec 44.031(a), requiring an approved procurement method for expenditures of similar categories valued at an annual aggregate of $50,000 or greater.

A summary of the response review and evaluation process is as follows:

1. Number of responses received: 3
2. Number of vendors awarded: 3

FUNDING SOURCE AND AMOUNT

Respective campus and departmental budgets

Estimated $50,000

RECOMMENDATION

Administration recommends awarding the contract to all vendors listed on the tabulation form with no specific ranking.

CONTACT PERSON(S)

Joel Garcia, Assistant Superintendent for Finance
Ana Vely Uresti-Munoz, Coordinator for Fixed Assets, Warehouse, Textbooks, and Records
Anabel Garza, Coordinator for Purchasing

FY2023 Term Contract:	Professional Auctioneer Services #109-23-0
Awarded To:	1. AMT Auction Marketing 2. Galindo Auctions, LLC 3. Liquidity Services Operations LLC (GovDeals)
Term:	One Year/Two-year (one-year terms) option to renew
Term Period :	January 2023 – December 2023

Mission Consolidated Independent School District
Tabulation Form
Professional Auctioneer Services 109-23-0

	VENDOR NAME:	AMT Auction Marketing		Galindo Auctions, LLC		Liquidity Services Operations LLC (GovDeals)	
		Contact Name:	Felix Barreras	Contact Name:	Ismael Galindo	Contact Name:	Heidi Feiden
		Phone #	210-376-9267	Phone #	956-609-9109	Phone #	903-752-4951
		Email	fmbarreras@yahoo.com	Email	galindoauctions@gmail.com	Email	hfeiden@govdeals.com
Qty	Detailed Desc	Note	Commission	Note	Commission	Note	Commission
1	Fee to Mission CISD		3.50%		9.75%		5.00%
1	Buyers Premium		15.00%		13.50%		12.50%
1	Transportation Fee				lowest price from 3 towing companies		towing fees will be charged to the winning bidders at cost
1	Advertising Fee				$100 taken from Auction Proceeds		
	Total						

Note:	
	Award all vendors equally in rank

SUBJECT: Renewal Contract for Emergent and Non-Emergent Medical Transportation Services #420-23-0

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

Under the current medical plans offered by the District to its employees, ground and air ambulance are not covered at 100%. Ground and air ambulances are covered only for medical emergencies in the following manner:

High Deductible Plan	70% after deductible ($1,750) is met
Base Plan	80% after deductible ($1,500) is met
High Plan	80% after deductible ($500) is met

Ground and air ambulance services are not covered for non-emergencies. If the District employee chooses to purchase this insurance product, the insurance would cover the costs not covered by the District's current medical plans.

To reduce the out-of-pocket expenses for our employees with in and out-of-network emergent and non-emergent medical transportation services, employees will be offered an option to cover these out-of-pocket expenses.

MASA Global transportation services include:

- Emergent Air Transportation
- Emergent Group Transportation
- Non-Emergent Inter Facility Transportation
- Repatriation and Recuperation

The pricing for MASA Global services is listed below on a monthly and annual basis. MASA Global services can be elected by Mission CISD employees voluntarily without additional expenses to the District.

Emergent Plus:

$14 per month	$168 per year

ADMINISTRATIVE CONSIDERATIONS

On January 20, 2021, the Board of Trustees awarded Bid No. 420-21-0, for Emergent and Non-Emergent Medical Transportation for one year, with the option to renew for two additional one-year terms. This is the last renewal option.

FUNDING SOURCE AND AMOUNT

Not applicable. This is not a District expense but rather an expense to the employee's voluntary participation.

RECOMMENDATION

Administration recommends renewing the contract with MASA Global.

CONTACT PERSON(S)

Joel Garcia, Assistant Superintendent for Finance
Sylvia Cruz, Director of Payroll, Employee Benefits & Risk Management
Anabel Garza, Coordinator for Purchasing

FY2023 Term Contract:	Emergent and Non-Emergent Medical Transportation Services #420-23-0
Awarded To:	1. MASA Global
Term:	One Year
Term Period :	March 2023 – February 2024

MASA Medical Transport Solutions®

$14/MONTH

DID YOU KNOW?

25 MILLION PEOPLE

are sent to the emergency room through ground or air ambulance every year*.

Insurance companies may not cover all air and ground ambulance expenses which can result in max in-network out-of-pocket costs of:**

$8,700 Individual
$17,400 Family

Ground ambulance out-of-network transportation costs may be even higher than in-network since the No Surprises Act does not apply to ground ambulance at this time.



EMERGENT PLUS MEMBERSHIP BENEFITS

A MASA MTS Membership provides the ultimate peace of mind at an affordable rate for emergency ground and air transportation assistance expenses within the continental United States, Alaska, Hawaii, and while traveling in Canada, regardless of whether the provider is in or out of your group healthcare benefits network. After the group health plan pays its portion, MASA works with providers to make certain our Members have no out-of-pocket expenses~ for emergency ambulance transportation assistance and other related services.

Emergency Air Ambulance Coverage[1]

MASA MTS covers out-of-pocket expenses associated with emergency air transportation to a medical facility for serious medical emergencies deemed medically necessary for you or your dependent family member.

Emergency Ground Ambulance Coverage[1]

MASA MTS covers out-of-pocket expenses associated with emergency ground transportation to a medical facility for serious medical emergencies deemed medically necessary for you or your dependent family member.

Hospital to Hospital Ambulance Coverage[1]

MASA MTS covers out-of-pocket expenses that you or a dependent family member may incur for hospital transfers, due to a serious emergency, to the nearest and most appropriate medical facility when the current medical facility cannot provide the required level of specialized care by air ambulance to include medically equipped helicopter or fixed-wing aircraft.

Repatriation to Hospital Near Home Coverage[1]

MASA MTS provides services and covers out-of-pocket expenses for the coordination of a Member's non-emergency transportation by a medically equipped, air or ground ambulance in the event of hospitalization more than one hundred (100) miles from the Member's home if the treating physician and MASA MTS' Medical Director says it's medically appropriate and possible to transfer the Member to a hospital nearer to home for continued care and recuperation.

Contact Your MASA MTS Representative to learn more about membership plan options.

Brice Calahan
☎ 956.252.6818
@ BCalahan@masamts.com

Jaran Floyd
☎ 830.377.8637
@ JFloyd@masamts.com

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The information provided in this product information sheet is for informational purposes only. The benefits listed and the descriptions thereof do not represent the full terms and conditions applicable for usage and may only be offered in some memberships. Premiums and benefits vary depending on the benefits selected. Commercial air and Worldwide coverage are not available in all territories. For a complete list of benefits, premiums, and full terms, conditions, and restrictions, please refer to the applicable member services agreement for your territory. MASA MTS products and services are not available in AK, NY, WA, ND, and NJ. MASA MTS utilizes third-party transportation service providers for all transportation services. MASA Global, MASA MTS and MASA TRS are registered service marks of MASA Holdings, Inc., a Delaware corporation. Void where prohibited by law.

~If a member has a high deductible health plan that is compatible with a health savings account, benefits will become available under the MASA membership for expenses incurred for medical care (as defined under Internal Revenue Code ("IRC") section 213 (d)) once a member satisfies the applicable statutory minimum deductible under IRC section 223(c) for high-deductible health plan coverage that is compatible with a health savings account.

COVERAGE TERRITORIES:

1. All coverage provided by this membership is limited to the continental United States, Alaska, Hawaii, and Canada, and must originate and conclude therein.

SOURCES:
**ACEP NOW 2014*
*** Patient Protection and Affordable Care Act; HHS Notice of Benefit and Payment Parameters for 2022 and Pharmacy Benefit Manager Standards. May 5, 2021.*

MASA Medical Transport Solutions®

1250 S. Pine Island Rd., Suite 500,
Plantation, FL 33324

800-643-9023 I www.masamts.com

MASA Medical Transport Solutions®

Contact: Jaran Floyd or Brice Calahan

@ bcalahan@masamts. ☎ 830-377-8637

WOULD YOUR **GROUP BENEFITS** COVER THIS?

You can protect you and your family from unexpected ambulance transportation out-of-pocket costs.**



Modern Health Insurance is Leaving You Exposed

Most people assume that their health insurance policy will cover them for ambulance rides and other emergency transportation. Unfortunately, this is not always the case. During the last ten years, gaps have opened in most insurance plans, which can leave you and your family exposed to unexpected out of pocket expenses for ground and air ambulance, **particularly when emergency ground ambulance transportation is involved.**

62% think employee benefits are more important than ever due to pandemic *MetLife, 2021*

2 out of 3 Americans worry about impact of unexpected high-cost medical bills *Kaiser Family Foundation, 2018*

72% of employees say safety and protection are more important than ever before *MetLife, 2021*

An Industry Pioneer in Protection

As the medical transport solutions industry pioneer for almost 50 years, MASA MTS works hand-in-hand with the benefits health plan administrators and transport companies to ensure you and your family have **no out-of-pocket costs** no matter which provider completes the ambulance transport** within the continental United States, Alaska, Hawaii, and while traveling in Canada based on benefi t coverage area.

MASA MTS - Now More Than Ever

You may have heard of "The No Surprises Act" and believe you'll no longer need to bridge the potential gap in your Group Benefits plan.

Before mistakenly giving into a false sense of security, it's important to note that "The No Surprises Act" **does NOT include ground ambulance services**.

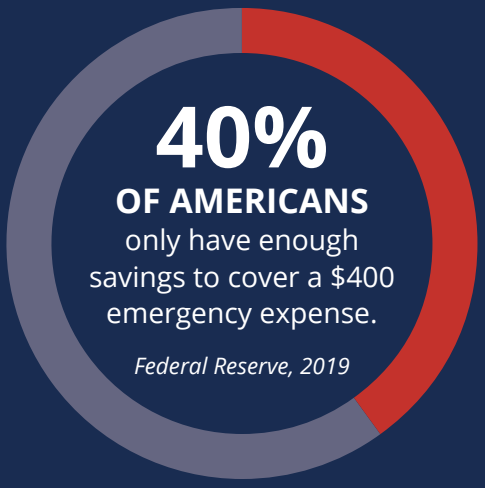
Unfortunately, ground ambulance services are among the most common sources of out-of-network bills and can cost consumers thousands of dollars. According to Consumer Reports, **79% of ground ambulance providers are out-of-network***, which means two things; 1) their charges do **NOT** count toward the MAX out-of-pocket, and 2) this most likely could result in out-of-pocket costs.

Contact your Group Benefits Manager today to learn how MASA MTS can protect you and your family from out-of-pocket costs** associated with ground and air ambulance transportation.

WHY MASA MTS

Unexpected medical bills rank as the #1 concern for Americans

KFF - Kaiser Family Foundation, 2020



WHY NOW

1. Nearly 4 in 10 Americans would borrow money to cover a $1,000 Emergency.
   Bankrate, 2020
2. Over 200 Million medical claims are denied every year.
   AARP, 2009
3. Medical bills are the #1 cause of bankruptcy in America.
   Metlife, 2021

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**If a member has a high deductible health plan that is compatible with a health savings account, benefits will become available under the MASA membership for expenses incurred for medical care (as defined under Internal Revenue Code ("IRC") section 213 (d)) once a member satisfies the applicable statutory minimum deductible under IRC section 223(c) for high-deductible health plan coverage that is compatible with a health savings account.

SOURCES:

* Your Ambulance Ride Could Still Leave You With a Surprise Medical Bill, ***Consumer Reports, 2021***

MASA Medical® Transport Solutions

1250 S. Pine Island Rd., Suite 500,
Plantation, FL 33324

800-643-9023 I www.masamts.com

SUBJECT: Functional Budget Amendments

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

In accordance with TEA budget and accounting procedures guidelines, the District's official budget includes the General Fund and Debt Service. The adoption of the budgets associated with these funds, and subsequent amendments, should be approved by the Board of Trustees. The authority to approve a budget or a budget amendment for a grant program, however, lies with the granting agency and not with the District's Board.

The budget amendments are broken down into the following two categories:

1. Programmatic or policy changes – amendments that are necessary because of policy changes or program revisions that increase/decrease the budget.

2. Adjustment of original estimates – amendments that are necessary because the original amounts required adjustments but do not increase/decrease the budget.

ADMINISTRATIVE CONSIDERATIONS

All requests for budget amendments have been reviewed and are justified for the programmatic or policy changes and adjustments of original estimates.

FUNDING SOURCE AND AMOUNT

Details of the amendment will be provided at the Board Workshop.

RECOMMENDATION:

Administration recommends approving the Functional Budget Amendments.

CONTACT PERSONS

Joel Garcia, Assistant Superintendent for Finance
Dora Garcia, Director for Budget and Finance

SUBJECT: Approval of Donations

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

In accordance with Board Policy CDC (Legal), all bequest of property for the benefit of the public schools shall, when not otherwise directed by the grantor, vest the property in the Board. Funds or other property donated, or the income therefrom, may be expended:

1. For any purpose designated by the donor that is in keeping with the lawful purposes of the schools that are to benefit from the donation; or
2. For any legal purpose if the donor designated no specific purpose.

The district receives donations from various sources throughout the school year. The majority of donations are given to the student activity funds to be used for student travel and awards. Some donations are in cash and some are non-cash, such as equipment, food, and services.

ADMINISTRATION CONSIDERATION

For the period reported, total donations were $2,094.74. The largest cash donation received was $1,894.74 and the largest non-cash donation received was $100. These donations benefit our students.

FUNDING SOURCE AND AMOUNT

N/A

RECOMMENDATION:

Approval of donations.

CONTACT PERSON (S)

Joel Garcia, Assistant Superintendent for Finance
Dora Garcia, Director for Budget and Finance
Alyssa Gonzales, Accountant

Mission Consolidated Independent School District
Donations
December 2022

Date	Campus / Scholarship	Cash	Non-Cash	Donor	Purpose
12/13/22	Alton Memorial Jr. High	100.00		Charities Aid Foundation America	$100 cash to support programs at the school
12/14/22	Cantu Elementary	1,894.74		Canto PTO (Rocio Salinas)	50% was granted for staff & 50% for student
11/14/22	Veterans Memorial High School (Special Ed)		100.00	Alberto Vela	Gift card to be purchased for food/supplies for holiday celebrations
	Total donations	$ 1,994.74	$ 100.00		

MISSION CISD
CASH and INKIND/NONCASH DONATION FORM

Cantu Elementary
CAMPUS NAME

12/12/2022
Date

Cantu PTO
NAME OF DONOR

920 W Main Ave
Address

Alton Tx 78573
City, State, Zip

956-323-7400
Telephone Number

$1,894.74
DONATION AMOUNT

[X] Check [ ] Cash [ ] Inkind/Noncash donation

461-00-5749-000-108-00-0-00
461-00-5749-001-108-00-0-00
Revenue Account Number

58600040
Check #

Description of Noncash donation-(Include an estimated value).

List below any restrictions for this donation: (Attach letter from donor if one is provided)

No restrictions. Except that the money will be divided between Student Activity Account (50%) and Staff Account (50%)

PRINCIPAL'S SIGNATURE

12-15-22
Date

Instructions:

This form is to be used whenever a campus receives a donation. Send completed form to the Chief Financial Officer. The account number should be included and any restrictions stated by the donor. If funds are restricted, call the Business Office for account number. Some grants or donations will be classified as special revenues and require a new grant budget to be set up.

MISSION CISD
CASH and INKIND/NONCASH DONATION FORM

VMHS — Laura Duran, Sepcial Ed department
CAMPUS NAME

11/14/22
Date

Alberto Vela
NAME OF DONOR

1302 Claborne St. Mission, TX 78572
Address

Mission, TX 78572
City, State, Zip

956-249-2807
Telephone Number

100.00
DONATION AMOUNT

Check	Cash	Inkind/Noncash donation
		gift card

Revenue Account Number

Check #

Description of Noncash donation-(Include an estimated value).

A giftcard from Wal-Mart with a credit for 100.00 dollars to be used for the purchase of food/ supplies for holiday celebrations.

List below any restrictions for this donation: (Attach letter from donor if one is provided)

There are no restrictions.

PRINCIPAL'S SIGNATURE

11/16/22
Date

Instructions:

MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT
ACTIVITY FUND RECEIPT

No:500043

CAMPUS: AMJH

12/13/2022
Date

Received from: Charities Aid Foundation America CyberGrants L.
$ Amount: one hunared dollars Dollars
In payment of: Donation

Cash $ ~~0~~
Checks $ 100.00
Total $ ~~0~~ 100.00

By PMB

For vendor refunds: Code deposit to the expense account from the corresponding PO: Do NOT code to revenue

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Student Group	$ Amount	Student Group	$ Amount
461-00-57XX-XXX-XXX		**865-00-2191-XXX-**	
5744. Donation		.058 Drill Team	
5744.002 Donation for Charity	100.00	.06A Team 6-1	
5749.000 Misc. Revenue		.06B Team 6-2	
5749.001 Staff Misc Revenue		.06C Team 6-3	
5749.031 Lost Textbooks		.07A Team 7-1	
5749.036 Lost Library Books		.07B Team 7-2	
5749.037 Library Fines		.07C Team 7-3	
5755.000 Student Sales		.08A Team 8-1	
5755.001 Staff Sales		.08B Team 8.2	
5755.037 Library Sales		.08C Team 8-3	
5755.054 Publications		.0GU Gear Up	
5749.068 UIL Fees		.0RB Robotics	
5755.068 UIL Sales			
865-00-2191-XXX-XXX-XXXXX			
.005 Special Ed.			
.006 Student Council			
.013 Nat'l Honor Society			
.022 Girl's Athletics			
.027 Cheerleaders			
.033 Criminal Justice			
.034 Orchestra			
.039 Industrial Technology			
.048 Boy's Athletics		2181.000 Taxes due from Sales	
.051 Band			
.052 Choir			
.055 Math			
.057 Drama			

Supporting Documentation:
Receipt #s _____ thru _____ Depositor's Signature Check by mail Date _____

White: Depositor Yellow: Business Office Pink : Book

Donation

CAF AMERICA

Charities Aid Foundation America
C/O CyberGrants LLC
300 Brickstone Square, Suite 601
Andover, MA 01810

September 07, 2022

>003905 4432815 0001 092574 10Z
ALTON MEMORIAL J H
1201 BRYCE DR
MISSION TX 78572

CHECK DATE:	09/07/2022
CHECK NUMBER:	0001270431
CHECK AMOUNT:	$100.00

The attached check represents funds being disbursed by CyberGrants, LLC on behalf of Charities Aid Foundation of America (CAF America). This donation was recommended by our client - The Wonderful Company - in the amount of $100.00 to support one or more of your programs. To view the details of this donation - including any information released by the participating donor(s) - please sign into the following web portal:

www.cybergrants.com/npo/3834

If you are a first time visitor to the portal, please utilize this unique Access Code to create credentials and access the site:

LOSMKKEIWGHSOZCDKHUS

If you have any difficulty accessing the site or questions regarding this payment, please use the "Need Support" link that is located on the web portal. Make sure you reference the check number of this payment in your correspondence.

CyberGrants LLC will distribute electronic donation receipts to participating donors as appropriate.

Thank you,
The CAF America & CyberGrants Team
Client ID: 3834
Check Number: 1270431

CyberGrants is becoming Bonterra™ - visit www.bonterratech.com for more information

303R6 (08/16)

CAF AMERICA

Charities Aid Foundation America
C/O CyberGrants LLC
300 Brickstone Square, Suite 601
Andover, MA 01810

0001270431
September 07, 2022

55 - 277 / 312

VOID AFTER 180 DAYS

**********$100.00***

Pay To The Order Of: ALTON MEMORIAL J H
1201 BRYCE DR
MISSION, TX 78572

Amount: ONE HUNDRED DOLLARS AND 00/100

Authorized Signature

Authorized Signature

PNC Bank, N.A. 060

DOCUMENT CONTAINS COLORED BACKGROUND ON WHITE PAPER, "VOID" FEATURE, SIMULATED WATERMARK (REVERSE SIDE,) MICRO-PRINT BORDER.

⑈0001270431⑈ ⑆031202770⑆ 80 26377 0158⑈

SUBJECT: Financial Report for November 2022

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

As per Board Policy CFA (LEGAL), The Board shall prepare an annual financial statement that shows the following for each fund subject to its authority during the fiscal year:

1. The total receipts of the fund, itemized by the source of revenue, including taxes, assessments, service charges, grants of state money, gifts, or other general sources from which funds are derived.

2. The total disbursements of the fund, itemized by the nature of the expenditure.

3. The balance in the fund at the close of the fiscal year.

Monthly financial reports are prepared throughout the year by Administration for information purposes only.

ADMINISTRATIVE CONSIDERATIONS

The General Fund Financial reports compare the budgeted revenues and expenditures.

Actual revenues through November 2022 totaled $60,359,118 and actual expenditures totaled $55,690,065. The excess total revenues and other uses over expenditures is $4,669,053.

These numbers do not include outstanding encumbrances for payroll and supplies. Budget by function is sufficient to meet expenditures.

The Debt Fund financial report is also attached.

FUNDING SOURCE AND AMOUNT

Not applicable.

RECOMMENDATION

Information item only.

CONTACT PERSON(S)

Joel Garcia, Assistant Superintendent for Finance
Dora Garcia, Director for Budget and Finance

Mission Consolidated Independent School District
General Fund
November 30, 2022

		Budget	Actual	Difference	%
Revenues					
5700	Local and Intermediate Sources	$ 28,786,444	$3,967,193	$ 24,819,251	13.78%
5800	State Program Revenues	117,988,061	49,882,710	$ 68,105,351	42.28%
5900	Federal Program Revenues	19,381,608	6,509,216	$ 12,872,392	33.58%
	Total Revenues	**$ 166,156,113**	**$ 60,359,118**	**$ 105,796,995**	
Expenditures					
11	Instruction	$ 69,834,025	$20,310,748	$ 49,523,277	29.08%
12	Instrucional Resources & Media Services	2,563,714	648,468	1,915,246	25.29%
13	Curriculum and Personnel Development	1,919,003	976,028	942,975	50.86%
21	Instructional Administration	2,581,407	1,012,563	1,568,844	39.23%
23	School Administration	9,915,030	3,362,307	6,552,723	33.91%
31	Guidance and Counseling Services	6,395,686	1,804,160	4,591,526	28.21%
32	Attendance and Social Work Services	583,397	145,263	438,134	24.90%
33	Health Services	1,750,067	489,577	1,260,490	27.97%
34	Pupil Transportation	5,025,001	2,748,671	2,276,330	54.70%
35	Food Services	14,100,666	5,648,351	8,452,315	40.06%
36	Co-Curricular Activities	7,372,412	2,383,217	4,989,195	32.33%
41	General Administration	6,504,408	2,649,892	3,854,516	40.74%
51	Plant Maintenance and Operations	24,889,339	8,403,846	16,485,494	33.76%
52	Security and Monitoring	6,925,817	769,971	6,155,846	11.12%
53	Data Processing Services	3,329,866	1,439,099	1,890,767	43.22%
61	Community Services	323,077	170,755	152,322	52.85%
71	Debt Service	1,350,320	294,736	1,055,584	21.83%
81	Facilities Acquisition and Construction	13,391,645	2,358,971	11,032,674	17.62%
95	Juvenile Justice Alt. Education	20,000	-	20,000	0.00%
99	Other Intergovernmental Charges	298,185	73,445	224,741	24.63%
	Total Expenditures	**$ 179,073,065**	**$55,690,065**	**$ 123,383,000**	
1100	**Excess (Deficiency)**	**$ (12,916,952)**	**$4,669,053**	**$ (17,586,006)**	
Non-Operating Revenue					
7915	Operating Transfers In	19,559,082	$ -	19,559,082	0.00%
	Total Non-Operating Revenue	**$ 19,559,082**	**$ -**	**$ 19,559,082**	
Non-Operating Expenses					
8911	Other Uses	$ (19,559,082)	$ -	$ (19,559,082)	0.00%
	Total Non-Operating Expenses	**$ (19,559,082)**	**$ -**	**$ (19,559,082)**	
1200	**Excess (Deficiency)**	**$ (12,916,952)**	**$ 4,669,053**	**$ (17,586,006)**	
0100	**Fund Balance - Beginning Audited**	**$ 107,685,067**	**$ 107,685,067**	**$ -**	
3000	**Fund Balance - Ending Un-Audited**	**$ 94,768,115**	**$ 112,354,120**	**$ (17,586,006)**	

Mission Consolidated Independent School District
Debt Service Fund
November, 2022

		Budget	Actual	Difference	%
Revenues					
5700	Local and Intermediate Sources	$ 4,815,916	$ 525,714	$ 4,290,202	10.92%
5800	State Program Revenues	3,661,581	-	3,661,581	0.00%
	Total Revenues	**$ 8,477,497**	**$ 525,714**	**$ 7,951,783**	
Expenditures					
7100	Debt Services	$ 8,477,497	$ 1,691,699	$ 6,785,799	19.96%
	Total Expenditures	**$ 8,477,497**	**$ 1,691,699**	**$ 6,785,799**	
1100	**Excess (Deficiency)**	**$ -**	**$ (1,165,985)**	**$ 1,165,985**	
Non-Operating Revenue					
7900	Operating Transfers In	$0	$0	$0	0.00%
Non-Operating Expenses					
8900	Operating Transfers Out	$ -	$ -	$ -	0.00%
1200	**Excess (Deficiency)**	**$ -**	**$ (1,165,985)**	**$ 1,165,985**	
0100	**Fund Balance - Beginning Audited**	**$ 4,463,810**	**$ 4,463,810**	**$ -**	
3000	**Fund Balance - Ending Un-Audited**	**$ 4,463,810**	**$ 3,297,825**	**$ 1,165,985**	

Fund Balance - Beginning Audited 107685067

SUBJECT: Tax Levy Adjustments for the Month of November 2022

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION

The Hidalgo County Assessor & Collector has been collecting the District's taxes since December 1999. Both current and delinquent taxes are collected by Hidalgo County on our behalf.

ADMINISTRATIVE CONSIDERATIONS

Tax roll adjustments due to corrections, rollbacks, homesteads, dropped years, etc., resulted in a net decrease of $53,650.82. Adjustments are reviewed and posted to the general ledger on a monthly basis. These modifications are included as part of the monthly tax report.

Collections totaled $2,255,198.64 The monthly fee for this service is $6,584.00.

Attached is the November 2022 Tax Collection Report

FUNDING SOURCE AND AMOUNT

Local Maintenance Levy Modification ($45,650.24)
Debt Service Levy Modification ($8,000.58)
Rollbacks $0

RECOMMENDATION:

Information item only; no recommendation is required.

CONTACT PERSON (S)

Joel Garcia, Assistant Superintendent for Finance
Dora Garcia, Director for Budget and Finance
Alyssa Gonzales, Accountant

PREPARED BY: M.A.M Mark Martinez

PABLO "PAUL" VILLARREAL JR., ASSESSOR & COLLECTOR
MISSION C.I.S.D. TAXES COLLECTED FOR:
NOVEMBER 2022

COMPARATIVE RATE OF COLLECTIONS

MISSION C.I.S.D. SMS - 48	ORIGINAL TAX LEVY	COLLECTED TO DATE	DROPPED YRS AFTER PURGE	MODIF. TO DATE	TAXES OUTSTANDING	PERCENT 2022/2023	COLLECTED 2021/2022
2022 TAX ROLL	31,332,080.80	2,369,402.89	-	155,003.09	29,117,681.00	7.52%	9.39%
2021 & PRIOR YRS	4,331,743.31	710,420.35	(26,461.75)	(136,599.13)	3,458,262.08	17.04%	17.93%
ROLLBACK	30,298.57	31,013.40	-	5,732.88	5,018.05	86.07%	38.04%
TOTALS	35,694,122.68	3,110,836.64	(26,461.75)	24,136.84	32,580,961.13		

BREAKDOWN OF TAX COLLECTIONS AND FEES FOR THE MONTH OF NOVEMBER 2022

	MISSION C.I.S.D.	MONTHLY MODIFICATIONS	
CURRENT YEAR-BASE TAX	2,093,362.36	(34,598.62)	CURRENT
CURRENT YEAR-P&I	-		
PRIOR YEARS-BASE TAX	97,034.64	(19,052.20)	PRIOR
PRIOR YEARS-P&I	43,238.58		
ROLLBACK	-	-	ROLLBACK
ROLLBACK P&I	-		
ATTORNEY FEES	21,563.06	-	PURGED
TOTAL COLLECTIONS	2,255,198.64	(53,650.82)	
LESS TRANSFERRED	1,421,986.09		
LESS IN TRANSIT	826,534.84		
LESS DUE TO HCAD COMM FEES	93.71		
LESS DUE TO CO TREASURER	6,584.00		
	-		
BALANCE	0.00		

**********AFFIDAVIT**********

I, PABLO "PAUL" VILLARREAL JR., ASSESSOR-COLLECTOR OF TAXES FOR THE MISSION C.I.S.D., DO SOLEMNLY SWEAR THAT THE ABOVE STATEMENT OF TAXES COLLECTED BY ME FOR THE MONTH OF NOVEMBER IS CORRECT.

Pablo Paul Villarreal Jr.

ASSESSOR-COLLECTOR OF TAXES FOR MISSION C.I.S.D., TEXAS

ASSESSOR & COLL OF TEXAS HIDALGO COUNTY

SWORN AND SUBSCRIBED BEFORE ME THIS 12TH DAY OF DECEMBER 2022 A.D.

Flor E Zarate

NOTARY PUBLIC, HIDALGO COUNTY, TEXAS

NOTARY PUBLIC STATE OF TEXAS Flor E. Zarate Notary ID# 12614626-8 My Comm. Exp. 04-18-2026

1/13/2023

PABLO "PAUL" VILLARREAL JR., ASSESSOR & COLLECTOR
MISSION CONSOLIDATED INDEPENDENT SCHOOL DISTRICT
TAX COLLECTION REPORT
FOR THE MONTH OF NOVEMBER 2022

AD VALOREM - MISSION CISD	2022-2023	2021-2022	DIFFERENCE
2022 CURRENT			
ORIGINAL LEVY	31,332,080.80	28,363,668.26	2,968,412.54
MODIFICATIONS	155,003.09	744,575.39	(589,572.30)
CURRENT LEVY	31,487,083.89	29,108,243.65	2,378,840.24
CURRENT COLLECTIONS THIS MONTH	2,093,362.36	2,449,832.75	(356,470.39)
CURRENT COLLECTIONS TO DATE	2,369,402.89	2,732,124.66	(362,721.77)
OUTSTANDING TO DATE	29,117,681.00	26,376,118.99	2,741,562.01
PERCENT COLLECTED/ORIGINAL	7.56%	9.63%	-2.07%
PERCENT COLLECTED/MODIFIED	7.52%	9.39%	-1.87%
TOTAL COLLECTIONS FISCAL YEAR	**2,369,402.89**	**2,732,124.66**	
DELINQUENT			
ORIGINAL LEVY	4,331,743.31	4,597,051.27	(265,307.96)
MODIFICATIONS	(163,060.88)	(87,131.04)	(75,929.84)
DELINQUENT LEVY	4,168,682.43	4,509,920.23	(341,237.80)
DELINQUENT COLLECTIONS THIS MONTI	97,034.64	86,395.80	10,638.84
DELINQUENT COLLECTIONS TO DATE	710,420.35	808,572.05	(98,151.70)
OUTSTANDING TO DATE	3,458,262.08	3,701,348.18	(243,086.10)
PERCENT COLLECTED/ORIGINAL	16.40%	17.59%	-1.19%
PERCENT COLLECTED/MODIFIED	17.04%	17.93%	-0.89%
TOTAL COLLECTIONS FISCAL YEAR	**710,420.35**	**808,572.05**	
ROLLBACK			
ORIGINAL LEVY	30,298.57	8,099.31	22,199.26
MODIFICATIONS	5,732.88	0.00	5,732.88
ROLLBACK LEVY	36,031.45	8,099.31	27,932.14
ROLLBACK COLLECTIONS THIS MONTH	26,800.60	0.00	26,800.60
ROLLBACK COLLECTIONS TO DATE	31,013.40	3,081.26	27,932.14
OUTSTANDING TO DATE	5,018.05	5,018.05	0.00
PERCENT COLLECTED/ORIGINAL	102.36%	38.04%	64.32%
PERCENT COLLECTED/MODIFIED	86.07%	38.04%	48.03%
TOTAL COLLECTIONS FISCAL YEAR	**31,013.40**	**3,081.26**	

PABLO (PAUL) VILLARREAL, JR. ASSR/COLL
MISSION CISD
TAX COLLECTION FOR: NOVEMBER 2022

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REPORT DATE	CURR BASE	CURR P&I	CURR RB	CURR RB P/I	DEL BASE	DEL P&I	DEL RB	RB P&I	ATTY FEES	RB ATTY FEES	TOTAL	TOTAL M/O TRANSF.	TOTAL I/S TRANSF.	DIFF.	DATE TRANSF.
											-			-	
1-Nov	93,944.61	-			5,670.65	2,267.20			1,190.68		103,073.14			103,073.14	
2-Nov	89,084.13	-			1,855.18	875.19			393.27		92,207.77			92,207.77	
3-Nov	127,994.13	-			3,389.66	954.17			625.78		132,963.74			132,963.74	
4-Nov	56,247.13	-			17,674.22	14,947.55			4,886.46		93,755.36			93,755.36	
7-Nov	118,330.01	-			6,816.61	2,783.85			1,438.67		129,369.14			129,369.14	
8-Nov	124,521.04	-			2,422.46	686.08			366.86		127,996.44	571,765.47	101,016.12	(544,785.15)	17-Nov
9-Nov	44,036.58	-			3,557.51	859.75			662.58		49,116.42			49,116.42	
10-Nov	147,733.21	-			4,349.67	1,166.52			827.41		154,076.81	172,471.54	30,721.69	(49,116.42)	18-Nov
12-Nov	(1,921.79)	-			(18,523.62)	(109.39)			(49.41)		(20,604.21)			(20,604.21)	
14-Oct	85,251.13	-			5,924.14	1,541.76			1,117.95		93,834.98			93,834.98	
15-Nov	109,840.13	-			10,327.78	2,697.06			1,912.37		124,777.34	168,226.70	29,781.41	(73,230.77)	22-Nov
16-Nov	70,279.60	-			7,051.79	1,806.84			1,319.33		80,457.56	68,458.13	11,999.43	-	23-Nov
17-Nov	136,277.01	-			1,407.37	352.60			211.74		138,248.72	117,175.63	21,073.09	-	25-Nov
18-Nov	58,865.08	-			8,333.20	2,139.27			1,556.52		70,894.07	60,409.09	10,484.98	-	29-Nov
21-Nov	56,074.80	-			1,756.38	349.34			222.29		58,402.81	49,536.61	8,866.20	-	30-Nov
22-Nov	69,897.85	-			919.05	332.53			177.74		71,327.17	60,473.43	10,853.74	-	1-Dec
23-Nov	107,639.78	-			7,436.09	1,752.99			493.14		117,322.00	99,580.15	17,741.85	-	2-Dec
28-Nov	120,559.93	-			10,375.16	2,646.08			1,583.09		135,164.26	114,911.79	20,252.47	-	5-Dec
29-Nov	271,632.25	-			10,685.11	2,567.20			1,418.61		286,303.17	242,949.90	43,353.27	-	6-Dec
30-Nov	207,075.75	-			5,606.23	2,621.99			1,207.98		216,511.95	183,635.28	32,782.96	93.71	12-Dec
											-			-	
											-			-	
											-			-	
											-			-	
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											-			-	
TOTAL	2,093,362.36	0.00	0.00	0.00	97,034.64	43,238.58	0.00	0.00	21,563.06	0.00	2,255,198.64	1,909,593.72	338,927.21	6,677.71	

TOTAL COLLECTED	2,255,198.64
LESS REFFUNDS	0.00
LESS RENDITION PENALTY	93.71
LESS COMMISSION	6,584.00
BALANCE	2,248,520.93
LESS M&O TRANSFERRED	1,208,043.17
LESS I&S TRANSFERRED	213,942.92
LESS M&O TRANSFERS IN TRANSIT	701,550.55
LESS I&S TRANSFERS IN TRANSIT	124,984.29
BALANCE PENDING	(0.00)

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HIDALGO COUNTY TAX OFFICE
MISSION CISD

MODIFICATIONS FOR THE MONTH OF NOVEMBER 2022

YR	RATE	M&O	%	ADJ	M&O	I&S	%	I&S
2022	1.113	0.9429	84.72%	(34,598.62)	(29,310.91)	0.1701	15.28%	(5,287.71)
2021	1.1332	0.9719	85.77%	(17,076.15)	(14,645.53)	0.1613	14.23%	(2,430.62)
2020	1.19930	1.02800	85.72%	(1,976.05)	(1,693.80)	0.1713	14.28%	(282.25)
2019	1.23955	1.06835	86.19%	-	0.00	0.1712	13.81%	0.00
2018	1.3398	1.1700	87.33%	-	0.00	0.1698	12.67%	0.00
2017	1.3502	1.1700	86.65%	-	0.00	0.1802	13.35%	0.00
2016	1.3582	1.1700	86.14%	-	0.00	0.1882	13.86%	0.00
2015	1.3672	1.1700	85.58%	-	0.00	0.1972	14.42%	0.00
2014	1.3300	1.1700	87.97%	-	0.00	0.1600	12.03%	0.00
2013	1.3000	1.1700	90.00%	-	0.00	0.1300	10.00%	0.00
2012	1.3000	1.1700	90.00%	-	0.00	0.1300	10.00%	0.00
2011	1.3000	1.1700	90.00%	-	0.00	0.1300	10.00%	0.00
2010	1.3000	1.0400	80.00%	-	0.00	0.2600	20.00%	0.00
2009	1.2800	1.0400	81.25%	-	0.00	0.2400	18.75%	0.00
2008	1.2400	1.0400	83.87%	-	0.00	0.2000	16.13%	0.00
2007	1.1800	1.0400	88.14%	-	0.00	0.1400	11.86%	0.00
2006	1.4574	1.3374	91.77%	-	0.00	0.1200	8.23%	0.00
2005	1.5632	1.4632	93.60%	-	0.00	0.1000	6.40%	0.00
2004	1.5691	1.4632	93.25%	-	0.00	0.1059	6.75%	0.00
2003	1.5841	1.4632	92.37%	-	0.00	0.1209	7.63%	0.00
2002	1.5841	1.4500	91.53%	-	0.00	0.1341	8.47%	0.00
2001	1.5341	1.4394	93.83%	-	0.00	0.0947	6.17%	0.00
			TOTAL	**(53,650.82)**	**(45,650.24)**			**(8,000.58)**

		M&O	I&S
CURRENT	**(34,598.62)**	**(29,310.91)**	**(5,287.71)**
DELINQUENT	**(19,052.20)**	**(16,339.33)**	**(2,712.87)**
TOTAL	**(53,650.82)**	**(45,650.24)**	**(8,000.58)**

ROLLBACK MODIFICATIONS FOR THE MONTH OF NOVEMBER 2022

YR	RATE	M&O	%	ADJ	M&O	I&S	%	I&S
2022	1.113	0.9429	84.72%	-	0.00	0.1701	15.28%	0.00
2021	1.1332	0.9719	85.77%	-	0.00	0.1613	14.23%	0.00
2020	1.1993	1.0280	85.72%	-	0.00	0.1713	14.28%	0.00
2019	1.2396	1.0684	86.19%	-	0.00	0.1712	13.81%	0.00
2018	1.3398	1.1700	87.33%	-	0.00	0.1698	12.67%	0.00
2017	1.3502	1.1700	86.65%	-	0.00	0.1802	13.35%	0.00
			TOTAL	**0.00**	**0.00**			**0.00**

		M&O	I&S
CURRENT	-	-	-
DELINQUENT	-	-	-
TOTAL	-	-	-

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2022	M & O	.942900	1,773,433.22	.00	.00	.00	1,773,433.22	.00	.00	.00	1,773,433.22
	I & S	.170100	319,929.14	.00	.00	.00	319,929.14	.00	.00	.00	319,929.14
	TOTAL	1.113000	2,093,362.36	.00	.00	.00	2,093,362.36	.00	.00	.00	2,093,362.36
2021	M & O	.971900	37,754.55	.00	10,856.85	.00	48,611.40	10,316.35	.00	.00	58,927.75
	I & S	.161300	6,265.99	.00	1,801.83	.00	8,067.82	.00	.00	.00	8,067.82
	TOTAL	1.133200	44,020.54	.00	12,658.68	.00	56,679.22	10,316.35	.00	.00	66,995.57
2020	M & O	1.028000	14,992.23	.00	5,179.07	.00	20,171.30	3,477.60	.00	.00	23,648.90
	I & S	.171300	2,498.21	.00	863.03	.00	3,361.24	.00	.00	.00	3,361.24
	TOTAL	1.199300	17,490.44	.00	6,042.10	.00	23,532.54	3,477.60	.00	.00	27,010.14
2019	M & O	1.068350	10,685.32	.00	4,434.29	.00	15,119.61	2,350.71	.00	.00	17,470.32
	I & S	.171200	1,712.31	.00	710.59	.00	2,422.90	.00	.00	.00	2,422.90
	TOTAL	1.239550	12,397.63	.00	5,144.88	.00	17,542.51	2,350.71	.00	.00	19,893.22
2018	M & O	1.170000	6,225.50	.00	3,080.92	.00	9,306.42	1,406.28	.00	.00	10,712.70
	I & S	.169800	903.47	.00	447.13	.00	1,350.60	.00	.00	.00	1,350.60
	TOTAL	1.339800	7,128.97	.00	3,528.05	.00	10,657.02	1,406.28	.00	.00	12,063.30
2017	M & O	1.170000	3,182.12	.00	1,689.16	.00	4,871.28	614.54	.00	.00	5,485.82
	I & S	.180200	490.10	.00	260.13	.00	750.23	.00	.00	.00	750.23
	TOTAL	1.350200	3,672.22	.00	1,949.29	.00	5,621.51	614.54	.00	.00	6,236.05
2016	M & O	1.170000	2,084.91	.00	1,303.87	.00	3,388.78	403.98	.00	.00	3,792.76
	I & S	.188200	335.36	.00	209.72	.00	545.08	.00	.00	.00	545.08
	TOTAL	1.358200	2,420.27	.00	1,513.59	.00	3,933.86	403.98	.00	.00	4,337.84
2015	M & O	1.170000	2,000.33	.00	1,438.19	.00	3,438.52	405.32	.00	.00	3,843.84
	I & S	.197200	337.15	.00	242.41	.00	579.56	.00	.00	.00	579.56
	TOTAL	1.367200	2,337.48	.00	1,680.60	.00	4,018.08	405.32	.00	.00	4,423.40
2014	M & O	1.170000	1,831.08	.00	1,694.50	.00	3,525.58	483.44	.00	.00	4,009.02
	I & S	.160000	250.41	.00	231.72	.00	482.13	.00	.00	.00	482.13
	TOTAL	1.330000	2,081.49	.00	1,926.22	.00	4,007.71	483.44	.00	.00	4,491.15
2013	M & O	1.170000	1,151.67	.00	1,358.09	.00	2,509.76	418.29	.00	.00	2,928.05
	I & S	.130000	127.97	.00	150.90	.00	278.87	.00	.00	.00	278.87
	TOTAL	1.300000	1,279.64	.00	1,508.99	.00	2,788.63	418.29	.00	.00	3,206.92
2012	M & O	1.170000	824.43	.00	1,053.00	.00	1,877.43	305.15	.00	.00	2,182.58
	I & S	.130000	91.60	.00	117.00	.00	208.60	.00	.00	.00	208.60
	TOTAL	1.300000	916.03	.00	1,170.00	.00	2,086.03	305.15	.00	.00	2,391.18
2011	M & O	1.170000	594.25	.00	829.45	.00	1,423.70	231.46	.00	.00	1,655.16
	I & S	.130000	66.02	.00	92.17	.00	158.19	.00	.00	.00	158.19
	TOTAL	1.300000	660.27	.00	921.62	.00	1,581.89	231.46	.00	.00	1,813.35

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2010	M & O	1.040000	98.65	.00	151.81	.00	250.46	46.97	.00	.00	297.43
	I & S	.260000	24.67	.00	37.95	.00	62.62	.00	.00	.00	62.62
	TOTAL	1.300000	123.32	.00	189.76	.00	313.08	46.97	.00	.00	360.05
2009	M & O	1.040000	43.37	.00	67.66	.00	111.03	18.57	.00	.00	129.60
	I & S	.240000	10.00	.00	15.61	.00	25.61	.00	.00	.00	25.61
	TOTAL	1.280000	53.37	.00	83.27	.00	136.64	18.57	.00	.00	155.21
2008	M & O	1.040000	494.91	.00	880.95	.00	1,375.86	246.07	.00	.00	1,621.93
	I & S	.200000	95.18	.00	169.41	.00	264.59	.00	.00	.00	264.59
	TOTAL	1.240000	590.09	.00	1,050.36	.00	1,640.45	246.07	.00	.00	1,886.52
2006	M & O	1.337400	665.28	.00	1,343.86	.00	2,009.14	328.41	.00	.00	2,337.55
	I & S	.120000	59.69	.00	120.58	.00	180.27	.00	.00	.00	180.27
	TOTAL	1.457400	724.97	.00	1,464.44	.00	2,189.41	328.41	.00	.00	2,517.82
2005	M & O	1.463200	830.52	.00	1,760.48	.00	2,591.00	411.36	.00	.00	3,002.36
	I & S	.100000	56.76	.00	120.31	.00	177.07	.00	.00	.00	177.07
	TOTAL	1.563200	887.28	.00	1,880.79	.00	2,768.07	411.36	.00	.00	3,179.43
2004	M & O	1.463200	17.23	.00	31.75	.00	48.98	6.18	.00	.00	55.16
	I & S	.105900	1.25	.00	2.30	.00	3.55	.00	.00	.00	3.55
	TOTAL	1.569100	18.48	.00	34.05	.00	52.53	6.18	.00	.00	58.71
2003	M & O	1.463200	138.75	.00	273.22	.00	411.97	58.36	.00	.00	470.33
	I & S	.120900	11.46	.00	22.57	.00	34.03	.00	.00	.00	34.03
	TOTAL	1.584100	150.21	.00	295.79	.00	446.00	58.36	.00	.00	504.36
2002	M & O	1.450000	14.83	.00	36.93	.00	51.76	8.48	.00	.00	60.24
	I & S	.134100	1.37	.00	3.41	.00	4.78	.00	.00	.00	4.78
	TOTAL	1.584100	16.20	.00	40.34	.00	56.54	8.48	.00	.00	65.02
1998	M & O	1.231000	53.77	.00	127.40	.00	181.17	25.54	.00	.00	206.71
	I & S	.274000	11.97	.00	28.36	.00	40.33	.00	.00	.00	40.33
	TOTAL	1.505000	65.74	.00	155.76	.00	221.50	25.54	.00	.00	247.04
ALL	M & O		1,857,116.92	.00	37,591.45	.00	1,894,708.37	21,563.06	.00	.00	1,916,271.43
ALL	I & S		333,280.08	.00	5,647.13	.00	338,927.21	.00	.00	.00	338,927.21
ALL	TOTAL		2,190,397.00	.00	43,238.58	.00	2,233,635.58	21,563.06	.00	.00	2,255,198.64
DLQ	M & O		83,683.70	.00	37,591.45	.00	121,275.15	21,563.06	.00	.00	142,838.21
DLQ	I & S		13,350.94	.00	5,647.13	.00	18,998.07	.00	.00	.00	18,998.07
DLQ	TOTAL		97,034.64	.00	43,238.58	.00	140,273.22	21,563.06	.00	.00	161,836.28

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
CURR	M & O		1,773,433.22	.00	.00	.00	1,773,433.22	.00	.00	.00	1,773,433.22
CURR	I & S		319,929.14	.00	.00	.00	319,929.14	.00	.00	.00	319,929.14
CURR	TOTAL		2,093,362.36	.00	.00	.00	2,093,362.36	.00	.00	.00	2,093,362.36

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2022	M & O	.942900	1,773,433.22	.00	.00	.00	1,773,433.22	.00	.00	.00	1,773,433.22
	I & S	.170100	319,929.14	.00	.00	.00	319,929.14	.00	.00	.00	319,929.14
	TOTAL	1.113000	2,093,362.36	.00	.00	.00	2,093,362.36	.00	.00	.00	2,093,362.36
2021	M & O	.971900	37,754.55	.00	10,856.85	.00	48,611.40	10,316.35	.00	.00	58,927.75
	I & S	.161300	6,265.99	.00	1,801.83	.00	8,067.82	.00	.00	.00	8,067.82
	TOTAL	1.133200	44,020.54	.00	12,658.68	.00	56,679.22	10,316.35	.00	.00	66,995.57
2020	M & O	1.028000	14,992.23	.00	5,179.07	.00	20,171.30	3,477.60	.00	.00	23,648.90
	I & S	.171300	2,498.21	.00	863.03	.00	3,361.24	.00	.00	.00	3,361.24
	TOTAL	1.199300	17,490.44	.00	6,042.10	.00	23,532.54	3,477.60	.00	.00	27,010.14
2019	M & O	1.068350	10,685.32	.00	4,434.29	.00	15,119.61	2,350.71	.00	.00	17,470.32
	I & S	.171200	1,712.31	.00	710.59	.00	2,422.90	.00	.00	.00	2,422.90
	TOTAL	1.239550	12,397.63	.00	5,144.88	.00	17,542.51	2,350.71	.00	.00	19,893.22
2018	M & O	1.170000	6,225.50	.00	3,080.92	.00	9,306.42	1,406.28	.00	.00	10,712.70
	I & S	.169800	903.47	.00	447.13	.00	1,350.60	.00	.00	.00	1,350.60
	TOTAL	1.339800	7,128.97	.00	3,528.05	.00	10,657.02	1,406.28	.00	.00	12,063.30
2017	M & O	1.170000	3,182.12	.00	1,689.16	.00	4,871.28	614.54	.00	.00	5,485.82
	I & S	.180200	490.10	.00	260.13	.00	750.23	.00	.00	.00	750.23
	TOTAL	1.350200	3,672.22	.00	1,949.29	.00	5,621.51	614.54	.00	.00	6,236.05
2016	M & O	1.170000	2,084.91	.00	1,303.87	.00	3,388.78	403.98	.00	.00	3,792.76
	I & S	.188200	335.36	.00	209.72	.00	545.08	.00	.00	.00	545.08
	TOTAL	1.358200	2,420.27	.00	1,513.59	.00	3,933.86	403.98	.00	.00	4,337.84
2015	M & O	1.170000	2,000.33	.00	1,438.19	.00	3,438.52	405.32	.00	.00	3,843.84
	I & S	.197200	337.15	.00	242.41	.00	579.56	.00	.00	.00	579.56
	TOTAL	1.367200	2,337.48	.00	1,680.60	.00	4,018.08	405.32	.00	.00	4,423.40
2014	M & O	1.170000	1,831.08	.00	1,694.50	.00	3,525.58	483.44	.00	.00	4,009.02
	I & S	.160000	250.41	.00	231.72	.00	482.13	.00	.00	.00	482.13
	TOTAL	1.330000	2,081.49	.00	1,926.22	.00	4,007.71	483.44	.00	.00	4,491.15
2013	M & O	1.170000	1,151.67	.00	1,358.09	.00	2,509.76	418.29	.00	.00	2,928.05
	I & S	.130000	127.97	.00	150.90	.00	278.87	.00	.00	.00	278.87
	TOTAL	1.300000	1,279.64	.00	1,508.99	.00	2,788.63	418.29	.00	.00	3,206.92
2012	M & O	1.170000	824.43	.00	1,053.00	.00	1,877.43	305.15	.00	.00	2,182.58
	I & S	.130000	91.60	.00	117.00	.00	208.60	.00	.00	.00	208.60
	TOTAL	1.300000	916.03	.00	1,170.00	.00	2,086.03	305.15	.00	.00	2,391.18
2011	M & O	1.170000	594.25	.00	829.45	.00	1,423.70	231.46	.00	.00	1,655.16
	I & S	.130000	66.02	.00	92.17	.00	158.19	.00	.00	.00	158.19
	TOTAL	1.300000	660.27	.00	921.62	.00	1,581.89	231.46	.00	.00	1,813.35

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2010	M & O	1.040000	98.65	.00	151.81	.00	250.46	46.97	.00	.00	297.43
	I & S	.260000	24.67	.00	37.95	.00	62.62	.00	.00	.00	62.62
	TOTAL	1.300000	123.32	.00	189.76	.00	313.08	46.97	.00	.00	360.05
2009	M & O	1.040000	43.37	.00	67.66	.00	111.03	18.57	.00	.00	129.60
	I & S	.240000	10.00	.00	15.61	.00	25.61	.00	.00	.00	25.61
	TOTAL	1.280000	53.37	.00	83.27	.00	136.64	18.57	.00	.00	155.21
2008	M & O	1.040000	494.91	.00	880.95	.00	1,375.86	246.07	.00	.00	1,621.93
	I & S	.200000	95.18	.00	169.41	.00	264.59	.00	.00	.00	264.59
	TOTAL	1.240000	590.09	.00	1,050.36	.00	1,640.45	246.07	.00	.00	1,886.52
2006	M & O	1.337400	665.28	.00	1,343.86	.00	2,009.14	328.41	.00	.00	2,337.55
	I & S	.120000	59.69	.00	120.58	.00	180.27	.00	.00	.00	180.27
	TOTAL	1.457400	724.97	.00	1,464.44	.00	2,189.41	328.41	.00	.00	2,517.82
2005	M & O	1.463200	830.52	.00	1,760.48	.00	2,591.00	411.36	.00	.00	3,002.36
	I & S	.100000	56.76	.00	120.31	.00	177.07	.00	.00	.00	177.07
	TOTAL	1.563200	887.28	.00	1,880.79	.00	2,768.07	411.36	.00	.00	3,179.43
2004	M & O	1.463200	17.23	.00	31.75	.00	48.98	6.18	.00	.00	55.16
	I & S	.105900	1.25	.00	2.30	.00	3.55	.00	.00	.00	3.55
	TOTAL	1.569100	18.48	.00	34.05	.00	52.53	6.18	.00	.00	58.71
2003	M & O	1.463200	138.75	.00	273.22	.00	411.97	58.36	.00	.00	470.33
	I & S	.120900	11.46	.00	22.57	.00	34.03	.00	.00	.00	34.03
	TOTAL	1.584100	150.21	.00	295.79	.00	446.00	58.36	.00	.00	504.36
2002	M & O	1.450000	14.83	.00	36.93	.00	51.76	8.48	.00	.00	60.24
	I & S	.134100	1.37	.00	3.41	.00	4.78	.00	.00	.00	4.78
	TOTAL	1.584100	16.20	.00	40.34	.00	56.54	8.48	.00	.00	65.02
1998	M & O	1.231000	53.77	.00	127.40	.00	181.17	25.54	.00	.00	206.71
	I & S	.274000	11.97	.00	28.36	.00	40.33	.00	.00	.00	40.33
	TOTAL	1.505000	65.74	.00	155.76	.00	221.50	25.54	.00	.00	247.04
ALL	M & O		1,857,116.92	.00	37,591.45	.00	1,894,708.37	21,563.06	.00	.00	1,916,271.43
ALL	I & S		333,280.08	.00	5,647.13	.00	338,927.21	.00	.00	.00	338,927.21
ALL	TOTAL		2,190,397.00	.00	43,238.58	.00	2,233,635.58	21,563.06	.00	.00	2,255,198.64
DLQ	M & O		83,683.70	.00	37,591.45	.00	121,275.15	21,563.06	.00	.00	142,838.21
DLQ	I & S		13,350.94	.00	5,647.13	.00	18,998.07	.00	.00	.00	18,998.07
DLQ	TOTAL		97,034.64	.00	43,238.58	.00	140,273.22	21,563.06	.00	.00	161,836.28

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
CURR	M & O		1,773,433.22	.00	.00	.00	1,773,433.22	.00	.00	.00	1,773,433.22
CURR	I & S		319,929.14	.00	.00	.00	319,929.14	.00	.00	.00	319,929.14
CURR	TOTAL		2,093,362.36	.00	.00	.00	2,093,362.36	.00	.00	.00	2,093,362.36

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE		TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	0	01.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00	7.52	0.00
2021	1,488,893.45	17,076.15-	87,647.08-	44,020.54	461,209.14	940,037.23	32.91	0.00
2020	556,262.58	1,976.05-	36,269.12-	17,490.44	94,962.80	425,030.66	18.26	0.00
2019	368,583.48	.00	4,830.43-	12,397.63	61,787.83	301,965.22	16.99	0.00
2018	250,722.27	.00	7,852.50-	7,128.97	32,341.68	210,528.09	13.32	0.00
2017	197,106.98	.00	17,637.44-	3,672.22	18,270.76	161,198.78	10.18	0.00
2016	157,749.31	.00	2,459.53-	2,420.27	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	.00	374.15-	2,337.48	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	.00	196.07-	2,081.49	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	.00	114.13-	1,279.64	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	.00	121.55-	916.03	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	.00	126.57-	660.27	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	123.32	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	53.37	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	590.09	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	0.00	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	724.97	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	887.28	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	18.48	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	150.21	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	16.20	83.87	41,335.94	.20	0.00
2001	158,544.45	.00	5,432.31-	65.74	337.17	152,774.97	.22	0.00
****	35,663,824.11	53,650.82-	8,057.79-	2,190,397.00	3,079,823.24	32,575,943.08		0.00
CURR	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00		0.00
DELQ	4,331,743.31	19,052.20-	163,060.88-	97,034.64	710,420.35	3,458,262.08		0.00

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE		TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	0	0	0	0	00.000000	0.00	0

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2021	0.00	.00	2,236.22	0.00	2,236.22	0.00		0.00
2020	9,010.29	.00	1,720.86	0.00	10,731.15	0.00		0.00
2019	10,966.81	.00	1,775.80	0.00	11,084.43	1,658.18	86.99	0.00
2018	8,598.90	.00	0.00	0.00	6,961.60	1,637.30	80.96	0.00
2017	1,722.57	.00	0.00	0.00	0.00	1,722.57		0.00
****	30,298.57	.00	5,732.88	0.00	31,013.40	5,018.05		0.00
CURR	0.00	.00	0.00	0.00	0.00	0.00		0.00
DELQ	30,298.57	.00	5,732.88	0.00	31,013.40	5,018.05		0.00

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE		TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	0	01.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00	7.52	0.00
2021	1,488,893.45	17,076.15-	85,410.86-	44,020.54	463,445.36	940,037.23	33.02	0.00
2020	565,272.87	1,976.05-	34,548.26-	17,490.44	105,693.95	425,030.66	19.92	0.00
2019	379,550.29	.00	3,054.63-	12,397.63	72,872.26	303,623.40	19.36	0.00
2018	259,321.17	.00	7,852.50-	7,128.97	39,303.28	212,165.39	15.63	0.00
2017	198,829.55	.00	17,637.44-	3,672.22	18,270.76	162,921.35	10.08	0.00
2016	157,749.31	.00	2,459.53-	2,420.27	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	.00	374.15-	2,337.48	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	.00	196.07-	2,081.49	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	.00	114.13-	1,279.64	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	.00	121.55-	916.03	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	.00	126.57-	660.27	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	123.32	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	53.37	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	590.09	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	0.00	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	724.97	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	887.28	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	18.48	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	150.21	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	16.20	83.87	41,335.94	.20	0.00
2001	158,544.45	.00	5,432.31-	65.74	337.17	152,774.97	.22	0.00
****	35,694,122.68	53,650.82-	2,324.91-	2,190,397.00	3,110,836.64	32,580,961.13		0.00
CURR	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00		0.00
DELQ	4,362,041.88	19,052.20-	157,328.00-	97,034.64	741,433.75	3,463,280.13		0.00

JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	1.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00	7.52	0.00
ADJUSTMENT REFUNDS		1,921.79-	1,921.79-					
2021	1,488,893.45	17,076.15-	87,647.08-	44,020.54	461,209.14	940,037.23	32.91	0.00
ADJUSTMENT REFUNDS		16,904.59-	78,643.55-					
2020	556,262.58	1,976.05-	36,269.12-	17,490.44	94,962.80	425,030.66	18.26	0.00
ADJUSTMENT REFUNDS		1,619.03-	31,166.54-					
2019	368,583.48	.00	4,830.43-	12,397.63	61,787.83	301,965.22	16.99	0.00
ADJUSTMENT REFUNDS		.00	210.72-					
2018	250,722.27	.00	7,852.50-	7,128.97	32,341.68	210,528.09	13.32	0.00
ADJUSTMENT REFUNDS		.00	3,320.02-					
2017	197,106.98	.00	17,637.44-	3,672.22	18,270.76	161,198.78	10.18	0.00
2016	157,749.31	.00	2,459.53-	2,420.27	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	.00	374.15-	2,337.48	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	.00	196.07-	2,081.49	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	.00	114.13-	1,279.64	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	.00	121.55-	916.03	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	.00	126.57-	660.27	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	123.32	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	53.37	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	590.09	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	0.00	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	724.97	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	887.28	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	18.48	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	150.21	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	16.20	83.87	41,335.94	.20	0.00
2001	158,544.45	.00	5,432.31-	65.74	337.17	152,774.97	.22	0.00
****	35,663,824.11	53,650.82-	8,057.79-	2,190,397.00	3,079,823.24	32,575,943.08		0.00
ADJUSTMENT REFUNDS		20,445.41-	115,262.62-					

JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	0	0	0	1.133200	2,236.22	1

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2021	0.00	.00	2,236.22	0.00	2,236.22	0.00		0.00
ADJUSTMENT REFUNDS		16,904.59-	78,643.55-					
2020	9,010.29	.00	1,720.86	0.00	10,731.15	0.00		0.00
ADJUSTMENT REFUNDS		1,619.03-	31,166.54-					
2019	10,966.81	.00	1,775.80	0.00	11,084.43	1,658.18	86.99	0.00
ADJUSTMENT REFUNDS		.00	210.72-					
2018	8,598.90	.00	0.00	0.00	6,961.60	1,637.30	80.96	0.00
ADJUSTMENT REFUNDS		.00	3,320.02-					
2017	1,722.57	.00	0.00	0.00	0.00	1,722.57		0.00
****	30,298.57	.00	5,732.88	0.00	31,013.40	5,018.05		0.00
ADJUSTMENT REFUNDS		18,523.62-	113,340.83-					

JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	1.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	34,598.62-	155,003.09	2,093,362.36	2,369,402.89	29,117,681.00	7.52	0.00
ADJUSTMENT REFUNDS		1,921.79-	1,921.79-					
2021	1,488,893.45	17,076.15-	85,410.86-	44,020.54	463,445.36	940,037.23	33.02	0.00
ADJUSTMENT REFUNDS		16,904.59-	78,643.55-					
2020	565,272.87	1,976.05-	34,548.26-	17,490.44	105,693.95	425,030.66	19.92	0.00
ADJUSTMENT REFUNDS		1,619.03-	31,166.54-					
2019	379,550.29	.00	3,054.63-	12,397.63	72,872.26	303,623.40	19.36	0.00
ADJUSTMENT REFUNDS		.00	210.72-					
2018	259,321.17	.00	7,852.50-	7,128.97	39,303.28	212,165.39	15.63	0.00
ADJUSTMENT REFUNDS		.00	3,320.02-					
2017	198,829.55	.00	17,637.44-	3,672.22	18,270.76	162,921.35	10.08	0.00
2016	157,749.31	.00	2,459.53-	2,420.27	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	.00	374.15-	2,337.48	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	.00	196.07-	2,081.49	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	.00	114.13-	1,279.64	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	.00	121.55-	916.03	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	.00	126.57-	660.27	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	123.32	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	53.37	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	590.09	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	0.00	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	724.97	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	887.28	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	18.48	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	150.21	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	16.20	83.87	41,335.94	.20	0.00
2001	158,544.45	.00	5,432.31-	65.74	337.17	152,774.97	.22	0.00
****	35,694,122.68	53,650.82-	2,324.91-	2,190,397.00	3,110,836.64	32,580,961.13		0.00
ADJUSTMENT REFUNDS		20,445.41-	115,262.62-					

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2022	M & O	.942900	2,007,286.34	.00	.00	.00	2,007,286.34	.00	.00	.00	2,007,286.34
	I & S	.170100	362,116.55	.00	.00	.00	362,116.55	.00	.00	.00	362,116.55
	TOTAL	1.113000	2,369,402.89	.00	.00	.00	2,369,402.89	.00	.00	.00	2,369,402.89
2021	M & O	.971900	395,559.88	.00	80,898.95	.00	476,458.83	81,420.96	.00	.00	557,879.79
	I & S	.161300	65,649.26	.00	13,426.28	.00	79,075.54	.00	.00	.00	79,075.54
	TOTAL	1.133200	461,209.14	.00	94,325.23	.00	555,534.37	81,420.96	.00	.00	636,955.33
2020	M & O	1.028000	81,399.03	.00	31,819.96	.00	113,218.99	22,761.50	.00	.00	135,980.49
	I & S	.171300	13,563.77	.00	5,302.20	.00	18,865.97	.00	.00	.00	18,865.97
	TOTAL	1.199300	94,962.80	.00	37,122.16	.00	132,084.96	22,761.50	.00	.00	154,846.46
2019	M & O	1.068350	53,254.06	.00	22,183.42	.00	75,437.48	12,335.87	.00	.00	87,773.35
	I & S	.171200	8,533.77	.00	3,554.71	.00	12,088.48	.00	.00	.00	12,088.48
	TOTAL	1.239550	61,787.83	.00	25,738.13	.00	87,525.96	12,335.87	.00	.00	99,861.83
2018	M & O	1.170000	28,242.83	.00	16,144.70	.00	44,387.53	7,526.04	.00	.00	51,913.57
	I & S	.169800	4,098.85	.00	2,343.05	.00	6,441.90	.00	.00	.00	6,441.90
	TOTAL	1.339800	32,341.68	.00	18,487.75	.00	50,829.43	7,526.04	.00	.00	58,355.47
2017	M & O	1.170000	15,832.28	.00	9,849.78	.00	25,682.06	4,028.67	.00	.00	29,710.73
	I & S	.180200	2,438.48	.00	1,517.02	.00	3,955.50	.00	.00	.00	3,955.50
	TOTAL	1.350200	18,270.76	.00	11,366.80	.00	29,637.56	4,028.67	.00	.00	33,666.23
2016	M & O	1.170000	11,500.99	.00	8,696.32	.00	20,197.31	3,314.16	.00	.00	23,511.47
	I & S	.188200	1,849.91	.00	1,398.79	.00	3,248.70	.00	.00	.00	3,248.70
	TOTAL	1.358200	13,350.90	.00	10,095.11	.00	23,446.01	3,314.16	.00	.00	26,760.17
2015	M & O	1.170000	6,128.84	.00	5,188.04	.00	11,316.88	1,785.34	.00	.00	13,102.22
	I & S	.197200	1,033.00	.00	874.45	.00	1,907.45	.00	.00	.00	1,907.45
	TOTAL	1.367200	7,161.84	.00	6,062.49	.00	13,224.33	1,785.34	.00	.00	15,009.67
2014	M & O	1.170000	4,170.87	.00	3,926.31	.00	8,097.18	1,175.50	.00	.00	9,272.68
	I & S	.160000	570.38	.00	536.93	.00	1,107.31	.00	.00	.00	1,107.31
	TOTAL	1.330000	4,741.25	.00	4,463.24	.00	9,204.49	1,175.50	.00	.00	10,379.99
2013	M & O	1.170000	3,457.77	.00	3,301.28	.00	6,759.05	868.79	.00	.00	7,627.84
	I & S	.130000	384.19	.00	366.84	.00	751.03	.00	.00	.00	751.03
	TOTAL	1.300000	3,841.96	.00	3,668.12	.00	7,510.08	868.79	.00	.00	8,378.87
2012	M & O	1.170000	2,096.80	.00	2,301.82	.00	4,398.62	584.06	.00	.00	4,982.68
	I & S	.130000	232.97	.00	255.77	.00	488.74	.00	.00	.00	488.74
	TOTAL	1.300000	2,329.77	.00	2,557.59	.00	4,887.36	584.06	.00	.00	5,471.42
2011	M & O	1.170000	1,232.57	.00	1,448.05	.00	2,680.62	382.51	.00	.00	3,063.13
	I & S	.130000	136.94	.00	160.90	.00	297.84	.00	.00	.00	297.84
	TOTAL	1.300000	1,369.51	.00	1,608.95	.00	2,978.46	382.51	.00	.00	3,360.97

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2010	M & O	1.040000	921.35	.00	991.50	.00	1,912.85	259.17	.00	.00	2,172.02
	I & S	.260000	230.35	.00	247.88	.00	478.23	.00	.00	.00	478.23
	TOTAL	1.300000	1,151.70	.00	1,239.38	.00	2,391.08	259.17	.00	.00	2,650.25
2009	M & O	1.040000	910.41	.00	1,081.09	.00	1,991.50	271.49	.00	.00	2,262.99
	I & S	.240000	210.09	.00	249.48	.00	459.57	.00	.00	.00	459.57
	TOTAL	1.280000	1,120.50	.00	1,330.57	.00	2,451.07	271.49	.00	.00	2,722.56
2008	M & O	1.040000	1,258.06	.00	1,833.16	.00	3,091.22	473.44	.00	.00	3,564.66
	I & S	.200000	241.94	.00	352.53	.00	594.47	.00	.00	.00	594.47
	TOTAL	1.240000	1,500.00	.00	2,185.69	.00	3,685.69	473.44	.00	.00	4,159.13
2007	M & O	1.040000	1,102.37	.00	1,692.38	.00	2,794.75	386.23	.00	.00	3,180.98
	I & S	.140000	148.40	.00	227.82	.00	376.22	.00	.00	.00	376.22
	TOTAL	1.180000	1,250.77	.00	1,920.20	.00	3,170.97	386.23	.00	.00	3,557.20
2006	M & O	1.337400	835.30	.00	1,680.49	.00	2,515.79	411.23	.00	.00	2,927.02
	I & S	.120000	74.94	.00	150.78	.00	225.72	.00	.00	.00	225.72
	TOTAL	1.457400	910.24	.00	1,831.27	.00	2,741.51	411.23	.00	.00	3,152.74
2005	M & O	1.463200	1,674.97	.00	3,491.02	.00	5,165.99	811.44	.00	.00	5,977.43
	I & S	.100000	114.47	.00	238.58	.00	353.05	.00	.00	.00	353.05
	TOTAL	1.563200	1,789.44	.00	3,729.60	.00	5,519.04	811.44	.00	.00	6,330.48
2004	M & O	1.463200	555.39	.00	1,054.88	.00	1,610.27	215.92	.00	.00	1,826.19
	I & S	.105900	40.19	.00	76.35	.00	116.54	.00	.00	.00	116.54
	TOTAL	1.569100	595.58	.00	1,131.23	.00	1,726.81	215.92	.00	.00	1,942.73
2003	M & O	1.463200	289.70	.00	594.86	.00	884.56	130.23	.00	.00	1,014.79
	I & S	.120900	23.94	.00	49.14	.00	73.08	.00	.00	.00	73.08
	TOTAL	1.584100	313.64	.00	644.00	.00	957.64	130.23	.00	.00	1,087.87
2002	M & O	1.450000	76.77	.00	189.31	.00	266.08	43.60	.00	.00	309.68
	I & S	.134100	7.10	.00	17.50	.00	24.60	.00	.00	.00	24.60
	TOTAL	1.584100	83.87	.00	206.81	.00	290.68	43.60	.00	.00	334.28
2001	M & O	1.439400	61.49	.00	158.65	.00	220.14	35.19	.00	.00	255.33
	I & S	.094700	4.05	.00	10.44	.00	14.49	.00	.00	.00	14.49
	TOTAL	1.534100	65.54	.00	169.09	.00	234.63	35.19	.00	.00	269.82
2000	M & O	1.400000	59.81	.00	161.49	.00	221.30	36.38	.00	.00	257.68
	I & S	.134100	5.73	.00	15.47	.00	21.20	.00	.00	.00	21.20
	TOTAL	1.534100	65.54	.00	176.96	.00	242.50	36.38	.00	.00	278.88
1999	M & O	1.420800	26.28	.00	74.12	.00	100.40	15.95	.00	.00	116.35
	I & S	.084200	1.56	.00	4.39	.00	5.95	.00	.00	.00	5.95
	TOTAL	1.505000	27.84	.00	78.51	.00	106.35	15.95	.00	.00	122.30

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
1998	M & O	1.231000	112.46	.00	279.17	.00	391.63	59.06	.00	.00	450.69
	I & S	.274000	25.04	.00	62.14	.00	87.18	.00	.00	.00	87.18
	TOTAL	1.505000	137.50	.00	341.31	.00	478.81	59.06	.00	.00	537.87
1996	M & O	1.248600	16.68	.00	43.63	.00	60.31	8.45	.00	.00	68.76
	I & S	.206400	2.76	.00	7.21	.00	9.97	.00	.00	.00	9.97
	TOTAL	1.455000	19.44	.00	50.84	.00	70.28	8.45	.00	.00	78.73
1995	M & O	1.184200	18.09	.00	49.49	.00	67.58	9.65	.00	.00	77.23
	I & S	.210800	3.22	.00	8.81	.00	12.03	.00	.00	.00	12.03
	TOTAL	1.395000	21.31	.00	58.30	.00	79.61	9.65	.00	.00	89.26
ALL	M & O		2,618,081.39	.00	199,133.87	.00	2,817,215.26	139,350.83	.00	.00	2,956,566.09
ALL	I & S		461,741.85	.00	31,455.46	.00	493,197.31	.00	.00	.00	493,197.31
ALL	TOTAL		3,079,823.24	.00	230,589.33	.00	3,310,412.57	139,350.83	.00	.00	3,449,763.40
DLQ	M & O		610,795.05	.00	199,133.87	.00	809,928.92	139,350.83	.00	.00	949,279.75
DLQ	I & S		99,625.30	.00	31,455.46	.00	131,080.76	.00	.00	.00	131,080.76
DLQ	TOTAL		710,420.35	.00	230,589.33	.00	941,009.68	139,350.83	.00	.00	1,080,360.51
CURR	M & O		2,007,286.34	.00	.00	.00	2,007,286.34	.00	.00	.00	2,007,286.34
CURR	I & S		362,116.55	.00	.00	.00	362,116.55	.00	.00	.00	362,116.55
CURR	TOTAL		2,369,402.89	.00	.00	.00	2,369,402.89	.00	.00	.00	2,369,402.89

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2021	M & O	.971900	1,917.92	.00	.00	.00	1,917.92	.00	.00	.00	1,917.92
	I & S	.161300	318.30	.00	.00	.00	318.30	.00	.00	.00	318.30
	TOTAL	1.133200	2,236.22	.00	.00	.00	2,236.22	.00	.00	.00	2,236.22
2020	M & O	1.028000	9,198.38	.00	.00	.00	9,198.38	.00	.00	.00	9,198.38
	I & S	.171300	1,532.77	.00	.00	.00	1,532.77	.00	.00	.00	1,532.77
	TOTAL	1.199300	10,731.15	.00	.00	.00	10,731.15	.00	.00	.00	10,731.15
2019	M & O	1.068350	9,553.51	.00	.00	.00	9,553.51	.00	.00	.00	9,553.51
	I & S	.171200	1,530.92	.00	.00	.00	1,530.92	.00	.00	.00	1,530.92
	TOTAL	1.239550	11,084.43	.00	.00	.00	11,084.43	.00	.00	.00	11,084.43
2018	M & O	1.170000	6,079.32	.00	.00	.00	6,079.32	.00	.00	.00	6,079.32
	I & S	.169800	882.28	.00	.00	.00	882.28	.00	.00	.00	882.28
	TOTAL	1.339800	6,961.60	.00	.00	.00	6,961.60	.00	.00	.00	6,961.60
ALL	M & O		26,749.13	.00	.00	.00	26,749.13	.00	.00	.00	26,749.13
ALL	I & S		4,264.27	.00	.00	.00	4,264.27	.00	.00	.00	4,264.27
ALL	TOTAL		31,013.40	.00	.00	.00	31,013.40	.00	.00	.00	31,013.40
DLQ	M & O		26,749.13	.00	.00	.00	26,749.13	.00	.00	.00	26,749.13
DLQ	I & S		4,264.27	.00	.00	.00	4,264.27	.00	.00	.00	4,264.27
DLQ	TOTAL		31,013.40	.00	.00	.00	31,013.40	.00	.00	.00	31,013.40
CURR	M & O		.00	.00	.00	.00	.00	.00	.00	.00	.00
CURR	I & S		.00	.00	.00	.00	.00	.00	.00	.00	.00
CURR	TOTAL		.00	.00	.00	.00	.00	.00	.00	.00	.00

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2022	M & O	.942900	2,007,286.34	.00	.00	.00	2,007,286.34	.00	.00	.00	2,007,286.34
	I & S	.170100	362,116.55	.00	.00	.00	362,116.55	.00	.00	.00	362,116.55
	TOTAL	1.113000	2,369,402.89	.00	.00	.00	2,369,402.89	.00	.00	.00	2,369,402.89
2021	M & O	.971900	397,477.80	.00	80,898.95	.00	478,376.75	81,420.96	.00	.00	559,797.71
	I & S	.161300	65,967.56	.00	13,426.28	.00	79,393.84	.00	.00	.00	79,393.84
	TOTAL	1.133200	463,445.36	.00	94,325.23	.00	557,770.59	81,420.96	.00	.00	639,191.55
2020	M & O	1.028000	90,597.41	.00	31,819.96	.00	122,417.37	22,761.50	.00	.00	145,178.87
	I & S	.171300	15,096.54	.00	5,302.20	.00	20,398.74	.00	.00	.00	20,398.74
	TOTAL	1.199300	105,693.95	.00	37,122.16	.00	142,816.11	22,761.50	.00	.00	165,577.61
2019	M & O	1.068350	62,807.57	.00	22,183.42	.00	84,990.99	12,335.87	.00	.00	97,326.86
	I & S	.171200	10,064.69	.00	3,554.71	.00	13,619.40	.00	.00	.00	13,619.40
	TOTAL	1.239550	72,872.26	.00	25,738.13	.00	98,610.39	12,335.87	.00	.00	110,946.26
2018	M & O	1.170000	34,322.15	.00	16,144.70	.00	50,466.85	7,526.04	.00	.00	57,992.89
	I & S	.169800	4,981.13	.00	2,343.05	.00	7,324.18	.00	.00	.00	7,324.18
	TOTAL	1.339800	39,303.28	.00	18,487.75	.00	57,791.03	7,526.04	.00	.00	65,317.07
2017	M & O	1.170000	15,832.28	.00	9,849.78	.00	25,682.06	4,028.67	.00	.00	29,710.73
	I & S	.180200	2,438.48	.00	1,517.02	.00	3,955.50	.00	.00	.00	3,955.50
	TOTAL	1.350200	18,270.76	.00	11,366.80	.00	29,637.56	4,028.67	.00	.00	33,666.23
2016	M & O	1.170000	11,500.99	.00	8,696.32	.00	20,197.31	3,314.16	.00	.00	23,511.47
	I & S	.188200	1,849.91	.00	1,398.79	.00	3,248.70	.00	.00	.00	3,248.70
	TOTAL	1.358200	13,350.90	.00	10,095.11	.00	23,446.01	3,314.16	.00	.00	26,760.17
2015	M & O	1.170000	6,128.84	.00	5,188.04	.00	11,316.88	1,785.34	.00	.00	13,102.22
	I & S	.197200	1,033.00	.00	874.45	.00	1,907.45	.00	.00	.00	1,907.45
	TOTAL	1.367200	7,161.84	.00	6,062.49	.00	13,224.33	1,785.34	.00	.00	15,009.67
2014	M & O	1.170000	4,170.87	.00	3,926.31	.00	8,097.18	1,175.50	.00	.00	9,272.68
	I & S	.160000	570.38	.00	536.93	.00	1,107.31	.00	.00	.00	1,107.31
	TOTAL	1.330000	4,741.25	.00	4,463.24	.00	9,204.49	1,175.50	.00	.00	10,379.99
2013	M & O	1.170000	3,457.77	.00	3,301.28	.00	6,759.05	868.79	.00	.00	7,627.84
	I & S	.130000	384.19	.00	366.84	.00	751.03	.00	.00	.00	751.03
	TOTAL	1.300000	3,841.96	.00	3,668.12	.00	7,510.08	868.79	.00	.00	8,378.87
2012	M & O	1.170000	2,096.80	.00	2,301.82	.00	4,398.62	584.06	.00	.00	4,982.68
	I & S	.130000	232.97	.00	255.77	.00	488.74	.00	.00	.00	488.74
	TOTAL	1.300000	2,329.77	.00	2,557.59	.00	4,887.36	584.06	.00	.00	5,471.42
2011	M & O	1.170000	1,232.57	.00	1,448.05	.00	2,680.62	382.51	.00	.00	3,063.13
	I & S	.130000	136.94	.00	160.90	.00	297.84	.00	.00	.00	297.84
	TOTAL	1.300000	1,369.51	.00	1,608.95	.00	2,978.46	382.51	.00	.00	3,360.97

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2010	M & O	1.040000	921.35	.00	991.50	.00	1,912.85	259.17	.00	.00	2,172.02
	I & S	.260000	230.35	.00	247.88	.00	478.23	.00	.00	.00	478.23
	TOTAL	1.300000	1,151.70	.00	1,239.38	.00	2,391.08	259.17	.00	.00	2,650.25
2009	M & O	1.040000	910.41	.00	1,081.09	.00	1,991.50	271.49	.00	.00	2,262.99
	I & S	.240000	210.09	.00	249.48	.00	459.57	.00	.00	.00	459.57
	TOTAL	1.280000	1,120.50	.00	1,330.57	.00	2,451.07	271.49	.00	.00	2,722.56
2008	M & O	1.040000	1,258.06	.00	1,833.16	.00	3,091.22	473.44	.00	.00	3,564.66
	I & S	.200000	241.94	.00	352.53	.00	594.47	.00	.00	.00	594.47
	TOTAL	1.240000	1,500.00	.00	2,185.69	.00	3,685.69	473.44	.00	.00	4,159.13
2007	M & O	1.040000	1,102.37	.00	1,692.38	.00	2,794.75	386.23	.00	.00	3,180.98
	I & S	.140000	148.40	.00	227.82	.00	376.22	.00	.00	.00	376.22
	TOTAL	1.180000	1,250.77	.00	1,920.20	.00	3,170.97	386.23	.00	.00	3,557.20
2006	M & O	1.337400	835.30	.00	1,680.49	.00	2,515.79	411.23	.00	.00	2,927.02
	I & S	.120000	74.94	.00	150.78	.00	225.72	.00	.00	.00	225.72
	TOTAL	1.457400	910.24	.00	1,831.27	.00	2,741.51	411.23	.00	.00	3,152.74
2005	M & O	1.463200	1,674.97	.00	3,491.02	.00	5,165.99	811.44	.00	.00	5,977.43
	I & S	.100000	114.47	.00	238.58	.00	353.05	.00	.00	.00	353.05
	TOTAL	1.563200	1,789.44	.00	3,729.60	.00	5,519.04	811.44	.00	.00	6,330.48
2004	M & O	1.463200	555.39	.00	1,054.88	.00	1,610.27	215.92	.00	.00	1,826.19
	I & S	.105900	40.19	.00	76.35	.00	116.54	.00	.00	.00	116.54
	TOTAL	1.569100	595.58	.00	1,131.23	.00	1,726.81	215.92	.00	.00	1,942.73
2003	M & O	1.463200	289.70	.00	594.86	.00	884.56	130.23	.00	.00	1,014.79
	I & S	.120900	23.94	.00	49.14	.00	73.08	.00	.00	.00	73.08
	TOTAL	1.584100	313.64	.00	644.00	.00	957.64	130.23	.00	.00	1,087.87
2002	M & O	1.450000	76.77	.00	189.31	.00	266.08	43.60	.00	.00	309.68
	I & S	.134100	7.10	.00	17.50	.00	24.60	.00	.00	.00	24.60
	TOTAL	1.584100	83.87	.00	206.81	.00	290.68	43.60	.00	.00	334.28
2001	M & O	1.439400	61.49	.00	158.65	.00	220.14	35.19	.00	.00	255.33
	I & S	.094700	4.05	.00	10.44	.00	14.49	.00	.00	.00	14.49
	TOTAL	1.534100	65.54	.00	169.09	.00	234.63	35.19	.00	.00	269.82
2000	M & O	1.400000	59.81	.00	161.49	.00	221.30	36.38	.00	.00	257.68
	I & S	.134100	5.73	.00	15.47	.00	21.20	.00	.00	.00	21.20
	TOTAL	1.534100	65.54	.00	176.96	.00	242.50	36.38	.00	.00	278.88
1999	M & O	1.420800	26.28	.00	74.12	.00	100.40	15.95	.00	.00	116.35
	I & S	.084200	1.56	.00	4.39	.00	5.95	.00	.00	.00	5.95
	TOTAL	1.505000	27.84	.00	78.51	.00	106.35	15.95	.00	.00	122.30

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
1998	M & O	1.231000	112.46	.00	279.17	.00	391.63	59.06	.00	.00	450.69
	I & S	.274000	25.04	.00	62.14	.00	87.18	.00	.00	.00	87.18
	TOTAL	1.505000	137.50	.00	341.31	.00	478.81	59.06	.00	.00	537.87
1996	M & O	1.248600	16.68	.00	43.63	.00	60.31	8.45	.00	.00	68.76
	I & S	.206400	2.76	.00	7.21	.00	9.97	.00	.00	.00	9.97
	TOTAL	1.455000	19.44	.00	50.84	.00	70.28	8.45	.00	.00	78.73
1995	M & O	1.184200	18.09	.00	49.49	.00	67.58	9.65	.00	.00	77.23
	I & S	.210800	3.22	.00	8.81	.00	12.03	.00	.00	.00	12.03
	TOTAL	1.395000	21.31	.00	58.30	.00	79.61	9.65	.00	.00	89.26
ALL	M & O		2,644,830.52	.00	199,133.87	.00	2,843,964.39	139,350.83	.00	.00	2,983,315.22
ALL	I & S		466,006.12	.00	31,455.46	.00	497,461.58	.00	.00	.00	497,461.58
ALL	TOTAL		3,110,836.64	.00	230,589.33	.00	3,341,425.97	139,350.83	.00	.00	3,480,776.80
DLQ	M & O		637,544.18	.00	199,133.87	.00	836,678.05	139,350.83	.00	.00	976,028.88
DLQ	I & S		103,889.57	.00	31,455.46	.00	135,345.03	.00	.00	.00	135,345.03
DLQ	TOTAL		741,433.75	.00	230,589.33	.00	972,023.08	139,350.83	.00	.00	1,111,373.91
CURR	M & O		2,007,286.34	.00	.00	.00	2,007,286.34	.00	.00	.00	2,007,286.34
CURR	I & S		362,116.55	.00	.00	.00	362,116.55	.00	.00	.00	362,116.55
CURR	TOTAL		2,369,402.89	.00	.00	.00	2,369,402.89	.00	.00	.00	2,369,402.89

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE		TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	0	01.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	155,003.09	155,003.09	2,369,402.89	2,369,402.89	29,117,681.00	7.52	0.00
2021	1,488,893.45	87,647.08-	87,647.08-	461,209.14	461,209.14	940,037.23	32.91	0.00
2020	556,262.58	36,269.12-	36,269.12-	94,962.80	94,962.80	425,030.66	18.26	0.00
2019	368,583.48	4,830.43-	4,830.43-	61,787.83	61,787.83	301,965.22	16.99	0.00
2018	250,722.27	7,852.50-	7,852.50-	32,341.68	32,341.68	210,528.09	13.32	0.00
2017	197,106.98	17,637.44-	17,637.44-	18,270.76	18,270.76	161,198.78	10.18	0.00
2016	157,749.31	2,459.53-	2,459.53-	13,350.90	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	374.15-	374.15-	7,161.84	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	196.07-	196.07-	4,741.25	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	114.13-	114.13-	3,841.96	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	121.55-	121.55-	2,329.77	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	126.57-	126.57-	1,369.51	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	1,151.70	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	1,120.50	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	1,500.00	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	1,250.77	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	910.24	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	1,789.44	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	595.58	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	313.64	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	83.87	83.87	41,335.94	.20	0.00
2001	158,544.45	5,432.31-	5,432.31-	337.17	337.17	152,774.97	.22	0.00
****	35,663,824.11	8,057.79-	8,057.79-	3,079,823.24	3,079,823.24	32,575,943.08		0.00
CURR	31,332,080.80	155,003.09	155,003.09	2,369,402.89	2,369,402.89	29,117,681.00		0.00
DELQ	4,331,743.31	163,060.88-	163,060.88-	710,420.35	710,420.35	3,458,262.08		0.00

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	0	0	0 0	00.000000	0.00	0

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2021	0.00	2,236.22	2,236.22	2,236.22	2,236.22	0.00		0.00
2020	9,010.29	1,720.86	1,720.86	10,731.15	10,731.15	0.00		0.00
2019	10,966.81	1,775.80	1,775.80	11,084.43	11,084.43	1,658.18	86.99	0.00
2018	8,598.90	.00	0.00	6,961.60	6,961.60	1,637.30	80.96	0.00
2017	1,722.57	.00	0.00	0.00	0.00	1,722.57		0.00
****	30,298.57	5,732.88	5,732.88	31,013.40	31,013.40	5,018.05		0.00
CURR	0.00	.00	0.00	0.00	0.00	0.00		0.00
DELQ	30,298.57	5,732.88	5,732.88	31,013.40	31,013.40	5,018.05		0.00

FISCAL START: 07/01/2022 END: 06/30/2023 JURISDICTION: 0048 MISSION CISD

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE		TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	2,869,114,178	16,929,252	2,886,043,430	0	01.113000	31,487,083.89	4,975

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2022	31,332,080.80	155,003.09	155,003.09	2,369,402.89	2,369,402.89	29,117,681.00	7.52	0.00
2021	1,488,893.45	85,410.86-	85,410.86-	463,445.36	463,445.36	940,037.23	33.02	0.00
2020	565,272.87	34,548.26-	34,548.26-	105,693.95	105,693.95	425,030.66	19.92	0.00
2019	379,550.29	3,054.63-	3,054.63-	72,872.26	72,872.26	303,623.40	19.36	0.00
2018	259,321.17	7,852.50-	7,852.50-	39,303.28	39,303.28	212,165.39	15.63	0.00
2017	198,829.55	17,637.44-	17,637.44-	18,270.76	18,270.76	162,921.35	10.08	0.00
2016	157,749.31	2,459.53-	2,459.53-	13,350.90	13,350.90	141,938.88	8.60	0.00
2015	132,716.63	374.15-	374.15-	7,161.84	7,161.84	125,180.64	5.41	0.00
2014	116,629.45	196.07-	196.07-	4,741.25	4,741.25	111,692.13	4.07	0.00
2013	102,397.49	114.13-	114.13-	3,841.96	3,841.96	98,441.40	3.76	0.00
2012	98,527.46	121.55-	121.55-	2,329.77	2,329.77	96,076.14	2.37	0.00
2011	91,176.06	126.57-	126.57-	1,369.51	1,369.51	89,679.98	1.50	0.00
2010	84,961.54	.00	0.00	1,151.70	1,151.70	83,809.84	1.36	0.00
2009	88,676.21	.00	0.00	1,120.50	1,120.50	87,555.71	1.26	0.00
2008	86,440.93	.00	0.00	1,500.00	1,500.00	84,940.93	1.74	0.00
2007	72,286.80	.00	0.00	1,250.77	1,250.77	71,036.03	1.73	0.00
2006	71,093.88	.00	0.00	910.24	910.24	70,183.64	1.28	0.00
2005	65,685.76	.00	0.00	1,789.44	1,789.44	63,896.32	2.72	0.00
2004	59,922.84	.00	0.00	595.58	595.58	59,327.26	.99	0.00
2003	41,945.93	.00	0.00	313.64	313.64	41,632.29	.75	0.00
2002	41,419.81	.00	0.00	83.87	83.87	41,335.94	.20	0.00
2001	158,544.45	5,432.31-	5,432.31-	337.17	337.17	152,774.97	.22	0.00
****	35,694,122.68	2,324.91-	2,324.91-	3,110,836.64	3,110,836.64	32,580,961.13		0.00
CURR	31,332,080.80	155,003.09	155,003.09	2,369,402.89	2,369,402.89	29,117,681.00		0.00
DELQ	4,362,041.88	157,328.00-	157,328.00-	741,433.75	741,433.75	3,463,280.13		0.00

ACCOUNT	YEAR	DEPOSIT	LEVY COLLECTED	RENDITION PENALTY	P & I COLLECTED	RENDITION P & I	RENDITION DISCOUNT	APPRAISAL COMMISSION	DISBURSEMENT AMOUNT
CURR FOR 0047 MCALLEN ISD			112,976.52	10,683.79	0.00	0.00	0.00	534.27	112,442.25
BY COUNTY 108			112,976.52	10,683.79	0.00	0.00	0.00	534.27	112,442.25
DELQ FOR 0047 MCALLEN ISD			5,981.39	549.13	1,335.21	156.00	0.00	35.29	7,281.31
BY COUNTY 108			5,981.39	549.13	1,335.21	156.00	0.00	35.29	7,281.31
TOTAL FOR 0047 MCALLEN ISD			118,957.91	11,232.92	1,335.21	156.00	0.00	569.56	119,723.56
BY COUNTY 108			118,957.91	11,232.92	1,335.21	156.00	0.00	569.56	119,723.56
CURR FOR 0048 MISSION CISD			18,498.03	1,686.31	0.00	0.00	0.00	84.34	18,413.69
BY COUNTY 108			18,498.03	1,686.31	0.00	0.00	0.00	84.34	18,413.69
DELQ FOR 0048 MISSION CISD			884.68	147.31	267.24	40.05	0.00	9.37	1,142.55
BY COUNTY 108			884.68	147.31	267.24	40.05	0.00	9.37	1,142.55
TOTAL FOR 0048 MISSION CISD			19,382.71	1,833.62	267.24	40.05	0.00	93.71	19,556.24
BY COUNTY 108			19,382.71	1,833.62	267.24	40.05	0.00	93.71	19,556.24
CURR FOR 0049 LA JOYA ISD			30,010.01	3,159.87	0.00	0.00	0.00	158.00	29,852.01
BY COUNTY 108			30,010.01	3,159.87	0.00	0.00	0.00	158.00	29,852.01
DELQ FOR 0049 LA JOYA ISD			1,071.97	97.90	414.58	40.87	0.00	6.93	1,479.62
BY COUNTY 108			1,071.97	97.90	414.58	40.87	0.00	6.93	1,479.62
TOTAL FOR 0049 LA JOYA ISD			31,081.98	3,257.77	414.58	40.87	0.00	164.93	31,331.63
BY COUNTY 108			31,081.98	3,257.77	414.58	40.87	0.00	164.93	31,331.63
CURR FOR 0050 PROGRESO ISD			7,215.20	734.73	0.00	0.00	0.00	36.74	7,178.46
BY COUNTY 108			7,215.20	734.73	0.00	0.00	0.00	36.74	7,178.46
DELQ FOR 0050 PROGRESO ISD			684.12	118.70	182.91	29.05	0.00	7.40	859.63
BY COUNTY 108			684.12	118.70	182.91	29.05	0.00	7.40	859.63
TOTAL FOR 0050 PROGRESO ISD			7,899.32	853.43	182.91	29.05	0.00	44.14	8,038.09
BY COUNTY 108			7,899.32	853.43	182.91	29.05	0.00	44.14	8,038.09
CURR FOR 0051 SHARYLAND ISD			12,728.17	1,157.11	0.00	0.00	0.00	57.83	12,670.34
BY COUNTY 108			12,728.17	1,157.11	0.00	0.00	0.00	57.83	12,670.34
DELQ FOR 0051 SHARYLAND ISD			653.38	203.76	143.74	44.83	0.00	12.44	784.68
BY COUNTY 108			653.38	203.76	143.74	44.83	0.00	12.44	784.68
TOTAL FOR 0051 SHARYLAND ISD			13,381.55	1,360.87	143.74	44.83	0.00	70.27	13,455.02
BY COUNTY 108			13,381.55	1,360.87	143.74	44.83	0.00	70.27	13,455.02
CURR FOR 0052 VALLEY VIEW ISD			8,358.14	759.82	0.00	0.00	0.00	37.96	8,320.18
BY COUNTY 108			8,358.14	759.82	0.00	0.00	0.00	37.96	8,320.18
DELQ FOR 0052 VALLEY VIEW ISD			165.80	33.09	39.23	7.53	0.00	2.02	203.01
BY COUNTY 108			165.80	33.09	39.23	7.53	0.00	2.02	203.01
TOTAL FOR 0052 VALLEY VIEW ISD			8,523.94	792.91	39.23	7.53	0.00	39.98	8,523.19
BY COUNTY 108			8,523.94	792.91	39.23	7.53	0.00	39.98	8,523.19

SUBJECT: Disbursements for the Month of November 2022

PRESENTER: Joel Garcia, Assistant Superintendent for Finance JG

BACKGROUND INFORMATION:

The District's disbursements list all of the checks and other payments made during the reporting month. The check registers, wire transfers, and automated clearing house (ACH) transactions are available for inspection at the office of the Assistant Superintendent for Finance.

Monthly disbursement reports are prepared throughout the year by administration for information purposes only.

ADMINISTRATIVE CONSIDERATIONS:

The District's total disbursements for the Month of October totaled $15,671,092.70 as follows:

Disbursement Type	Amount
Accounts Payable Vendor Checks	$ 3,035,900.55
District Purchasing Cards	$ 353,557.70
ACH	$ 3,515,653.56
Wire Transfers	$ 447,559.68
Payroll	$ 8,318,421.21
TOTAL	**$ 15,671,092.70**

FUNDING SOURCE AND AMOUNT:

N/A

RECOMMENDATION:

Information item only; no recommendation is required.

CONTACT PERSON (S):

Joel Garcia, Assistant Superintendent for Finance
Dora Garcia, Director for Budget and Finance
Alyssa Gonzales, Accountant