



November 10, 2022

Aedis Architects
387 S. First St., Suite 300
San Jose, CA 95113

Subject: Beresford Elementary School HVAC Replacement
San Mateo - Foster City School District
Aedis Project No. 2021011.04
DSA Application #01-120124

ADDENDUM NO. 1

CHANGES AND/OR CLARIFICATIONS OF THE DRAWINGS AND SPECIFICATIONS ARE AS FOLLOWS:

SPECIFICATION

ITEM NO. 1.1: TABLE OF CONTENTS

Add: 26 05 73 OVERCURRENT PROTECTION DEVICE COORDINATION

ITEM NO. 1.2: SECTION 26 05 73 – OVERCURRENT PROTECTION DEVICE COORDINATION

Add: The specification in its entirety per 26 05 73 – Overcurrent Protection Device Coordination

DRAWINGS

ARCHITECTURAL

ITEM NO. 1.3: DRAWING SHEET A1.01 – SITE PLAN

Add: Partial Floor Plan callout at building 200 in Site Plan as clouded per AD1-A1.01

Revise: Electrical Enclosure Plan and notes as clouded per AD1-A1.01

ITEM NO. 1.4: DRAWING SHEET A2.02 – PARTIAL FLOOR PLAN – BUILDING 200 & DETAILS

Add: Sheet A2.02 in its entirety.

ITEM NO. 1.5: DRAWING SHEET A8.10 - DETAILS

Revise: Detail #12 Sleeper Flashing as clouded per AD1-A8.10

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STRUCTURAL**ITEM NO. 1.6: DRAWING SHEET S8.01 – FRAMING DETAILS AND NAILING SCHEDULE**

Add: Details #9 & 10 as clouded per AD1-S8.01

MECHANICAL**ITEM NO. 1.7: DRAWING SHEET MP0.02 – SCHEDULES – MECHANICAL & PLUMBING**

Revise: VRF Indoor Fan Coil Units Schedule note #4 as clouded per AD1-MP0.02

Revise: Packaged Indoor Wall Heat Pumps Schedule as clouded per AD1-MP0.02

Add: Packaged Indoor Wall Heat Pumps Schedule note #4 as clouded per AD1-MP0.02

Revise: Wall Heat Pumps Schedule as clouded per AD1-MP0.02

Revise: Classroom Split System Heat Pumps Schedule notes #8 and #9 as clouded per AD1-MP0.02.

Revise: Packaged Rooftop Air Conditioning Units Schedule as clouded per AD1-MP0.02

Revise: Packaged Rooftop Air Conditioning Units Schedule notes #2 & #6 as clouded per AD1-MP0.02

Add: Packaged Rooftop Air Conditioning Units Schedule notes #7 & #8 as clouded per AD1-MP0.02

ITEM NO. 1.8: DRAWING SHEET MP2.01 – MULTI-PURPOSE BLDG FLOOR PLAN – DEMOLITION – MECHANICAL & PLUMBING

Add: Multi-Purpose Bldg Floor Plan Demo Mechanical & Plumbing note as clouded per AD1-MP2.01

ITEM NO. 1.9: DRAWING SHEET MP2.02 – MODULAR BLDG FLOOR PLAN – DEMOLITION – MECHANICAL & PLUMBING

Add: Modular Bldg Floor Plan Demo Mechanical & Plumbing note as clouded per AD1-MP2.02

Revise: Demolition Sheet Note #2 as clouded per AD1-MP2.02

ITEM NO. 1.10: DRAWING SHEET MP2.04 – MODULAR BLDG FLOOR PLAN – NEW – MECHANICAL & PLUMBING

Revise: New Sheet Note #2 as clouded per AD1-MP2.04

ITEM NO. 1.11: DRAWING SHEET MP5.01 – CONTROLS – MECHANICAL

Add: Notes for EMS System Architecture as clouded per AD-MP5.01

Revise: Note numbering at Classroom Split System Heat Pump/Fan Coil Unit Control Schematic as clouded per AD1-MP5.01

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- Add: Sequence of operation note #12 and wiring for condensate pump overflow protection to Classroom Split System Heat Pump/Fan Coil Unit Control Schematic as clouded per AD1-MP5.01
- Revise: Sequence of operation numbering at Classroom Split System Heat Pump/Fan Coil Unit Control Schematic as clouded per AD1-MP5.01

ITEM NO. 1.12: DRAWING SHEET MP5.02 – CONTROLS – MECHANICAL

- Add: Sequence of operation note #8 and wiring for condensate pump overflow protection to Wall Mount Split System Control Schematic as clouded per AD1-MP5.02

ITEM NO. 1.13: DRAWING SHEET MP6.01 – DETAILS – MECHANICAL & PLUMBING

- Revise: Detail 13 as clouded per AD1-MP6.01.
- Revise: Detail 11 detail note 7 as clouded per AD1-MP6.01.

ELECTRICAL

ITEM NO. 1.14: DRAWING SHEET E2.2 – DEMOLITION FLOOR PLAN – MODULAR BUILDING

- Revise: Demolition Sheet Note #3 as clouded per AD1-E2.2
- Add: Demolition Sheet Note #8 and associated tag as clouded per AD1-E2.2

ITEM NO. 1.15: DRAWING SHEET E3.2 – NEW FLOOR PLAN – MODULAR BUILDING

- Revise: Sheet Note #15 as clouded per AD1-E3.2

ITEM NO. 1.16: DRAWING SHEET E4.1 – PARTIAL DEMO SINGLE LINE DIAGRAM

- Revise: General Note #7 as clouded per AD1-E4.1

ITEM NO. 1.17: DRAWING SHEET E4.2 – NEW SINGLE LINE DIAGRAM

- Revise: General Note #11 as clouded per AD1-E4.2
- Add: General Note #12 as clouded per AD1-E4.2
- Add: OFCI note tag at New Single Line Diagram as clouded per AD1-E4.2

ITEM NO. 1.18: DRAWING SHEET E5.1 – ELECTRICAL DETAILS

- Revise: NEMA 3R Main Switchboard Elevation and Anchorage Detail as clouded per AD1-E5.1

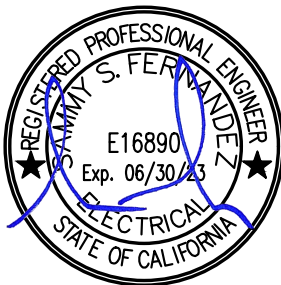
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Aedis Architects
June, Yip, Principal



Electrical, American Consulting Engineers Electrical
Sammy Fernandez



Mechanical, Cypress Engineering Group
Metin Serttunc

Division of the State Architect

ADDENDUM NO. 1

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Attachments:

Specifications:

26 05 73 – Overcurrent Protection Device Coordination (5 pages)

Drawing:

ARCHITECTURAL:

SHEET AD1-A1.01

SHEET AD1-A2.02

SHEET AD1-8.10

STRUCTURAL

SHEET AD1-S8.01

MECHANICAL:

SHEET AD1-MP0.02

SHEET AD1-MP2.01

SHEET AD1-MP2.02

SHEET AD1-MP2.04

SHEET AD1-MP5.01

SHEET AD1-MP5.02

SHEET AD1-MP6.01

ELECTRICAL:

SHEET AD1-E2.2

SHEET AD1-E3.2

SHEET AD1-E4.1

SHEET AD1-E4.2

SHEET AD1-E5.1

SECTION 26 05 73

OVER-CURRENT PROTECTIVE DEVICE COORDINATION AND ARC FLASH STUDY

PART 1 - GENERAL

1.1 Related Documents

Drawing and general provision of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 Summary

This Section includes computer-based, arc flash, fault-current and over current protective device coordination studies, and the setting of these devices.

1.3 Submittals

- A. Product Data: For computer software program to be used for studies.
- B. Other Action Submittals:
 - 1. Coordination-study including computed computer program input data sheets.
 - 2. Submit completed Coordination Study for review and coordination with data provided by PG&E. If required, revisions shall be made to the completed Coordination Study based upon any revised and/or updated data provided by PG&E. Include in the scope of work, (1) round of review and coordination and (1) revised set of Coordination Study Calculations based upon the PG&E data coordination indicated above.

1.4 Quality Assurances

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study Specialist Qualifications: An organization experience in application of computer software used for studies, having performed successful studies in similar magnitude on electrical distribution systems using similar devices.
- C. Comply with IEEE 399 for general study procedures.
- D. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

PART 2 - PRODUCTS

2.1 Computer Software Developers

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San Mateo-Foster City School District

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Addendum #1

- A. Available Computer Software Developer: Subject to compliance with requirements, companies offering computer software may be used in Work include, but not are limited, to the following:
- B. CYME International, Inc.
- C. EDSA Micro Corporation.
- D. Electrical System Analysis, Inc.
- E. SKM System Analysis, Inc.

2.2 Computer Software Program Requirements

- A. Comply with IEEE 399
- B. Analytical features of fault-current-study computer program shall include “mandatory,” “very desirable,” and “desirable” features as listed in IEEE 399, Table 7-4.
- C. Computer software program shall be capable to plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report devices setting and ratings of all over current protective devices.

PART 3 - EXECUTION

3.1 Examination

- A. Examine Project over current protective devices submittals for compliance with electrical disruption system coordination requirements and other conditions affecting performance.
- B. Proceed with coordination study only after relevant equipment submittals have been assembled. Over current protection devices not submitted for approval with coordination study may not be used in study.

3.2 Coordination Study

- A. Gather and tabulate the following input data to support coordination study.
 - 1. Obtain the required information from the utility company (PG&E). If complete information is not provided, contact the utility company to request any additional information required for the study.
 - 2. Product data for over current protective specified in the Division 26 Sections and involved in over current protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, over current protective device submittals, input and output data, and recommended device setting.

3. Impedance of utility service entrance.
4. Electrical distribution system diagram showing the following:
 - a. Load current that is the basis for sizing continuous ratings of circuits for cable and equipment.
 - b. Circuit breakers and fuse-current ratings and type.
 - c. Relays and associated power and current transformer rating and ratios.
 - d. Transformer kilovolt ampreses, primary and secondary voltages, connection type, impedance, and X/R ratios.
 - e. Generator kilovolt amperes, size, voltage, and source impedance.
 - f. Cables. Indicate conduit material, size of conductors, conductor insulation, and length.
 - g. Busway ampacity and impedance.
 - h. Motor horsepower and code letter designation according to NEMA MG 1.
 - i. Datasheets to supplement electrical distribution system diagram, cross referenced with tag numbers on diagram.
 - j. Special load considerations, including starting inrush current and frequent starting and stopping.
 - k. Magnetic inrush current overload capabilities of transformers
 - l. Motor full-load current, locked rotor current, services factor, starting time, type of start, and thermal-damage curve.
 - m. Ratings, type, and setting of utility company's over current protective devices.
 - n. Special over current protective device settings or type stipulated by utility company.
 - o. Time-current-characteristic curves of devices indicated to be coordinated.
 - p. Manufacturer, frames size, interrupting rating in amperes symmetrical, amperes or current sensor rating, long-time adjustment range, short-time adjustment range and instantaneous adjustment range for circuit breakers.
 - q. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment, and current transformer ratios for over current relays.

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- r. Panel boards, switchboards, motor control center ampacity and interrupting rating in amperes rms symmetrical.
- B. Perform coordination study and prepare a written report using the result of fault-current study and approved computer software program. Comply with IEEE 399.
- C. Comply with NFPA 70 for over current protection of circuit elements and devices.
- D. Transformer Primary Over Current Protective Devices:
 - 1. Devices shall not operate in repose to the following:
 - a. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
 - b. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
 - 2. Devices shall protect transformers according to IEEE C7.12.00, for fault currents.
- E. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-82, and conductor melting curves in IEEE 242. Verify adequacy of phase conductors at maximum three-phase bolted fault currents, equipment grounding conductors, and grounding electrode conductors at maximum ground-fault currents.
- F. Coordination-Study Reports: Prepare a written report indicating the following results of coordination study:
 - 1. Tabular Formatting of Setting Selected for Over Current Protective Devices
 - 2. Device tag:
 - a. Relay-current transformer ratios; and tap, time-dial and instantaneous setting.
 - b. Fuse-current rating and type.
 - c. Ground-fault relay-pickup and time delay setting.
 - 3. Coordination Curves: Prepared to determine setting of over current protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between series devices, including power utility company' upstream devices. Show the following specific information:
 - a. Device tags.
 - b. Voltage and current ratio for curves.

- c. Three-phase and single-phase damage points for each transformer,
- d. No damage, melting, and clearing curves for fuses,
- e. Cable damage curves
- f. Transformer inrush points
- g. Maximum fault-current cutoff points.
- h. Completed data sheets for setting of over current protective devices.
- i. Arc Flash Recommendations

G. Coordination Study Revisions:

- 1. One revision to the coordination study shall be included in the scope of work.
- 2. Revision shall include the request of additional information from the utility company (PG&E) as needed.

3.3 Over Current Protective Device Setting

- A. Manufacturer's Field service: Engage a factory-authorized service representative of electrical distribution equipment being set and adjusted, to assist in the setting of over current protective devices within equipment.
- B. Testing: Perform the following device setting and prepare reports:
 - 1. After installing over current protective devices and during energizing process of electrical distribution system, perform the following:
 - a. Verify that over current protective devices meet parameter used in studies.
 - b. Adjust device to values listed in study results.
 - c. Adjust devices according to recommendations in Chapter 7, "Inspection and Testing Procedures, and "Table 10.7 and 10.8 in NETA ATS.

3.4 Arc Flash Labeling

- A. Provide all required arc flash labeling for the switchgear.

END OF SECTION

GENERAL SHEET NOTES

- A BUILDINGS ARE UNSPRINKLERED, TYPE V-B CONSTRUCTION UNLESS OTHERWISE NOTED.
- B NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING THE DEMOLITION WORK HAVE BEEN APPROVED BY DSA.
- C CONTRACTOR SHALL MAINTAIN FIRE LANE ACCESS THROUGHOUT PROJECT.
- D DO NOT INTERRUPT EXISTING UTILITY SERVICES SERVING OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AND COORDINATED WITH THE OWNER.
- E PROTECT EXISTING & NEW STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, TREES AND SHRUBS FROM DAMAGE DURING CONSTRUCTION.
- F REFER TO STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR EXTENT OF STRUCTURAL, MECHANICAL, AND ELECTRICAL WORK.
- G ALL EXISTING FINISHES OR MATERIALS DAMAGED OR DEMOLISHED DUE TO NEW CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL STATE, INCLUDING BUT NOT LIMITED TO REINSTALLING OR REPLACING EXISTING CHAINLINK FENCING AS REQUIRED AND RESTRIPIING PAVING IN KIND. S.E.D. FOR TRENCH ROUTING, SEE ARCHITECTURAL SITE PLAN FOR STRIPING AT EXISTING PAVING.

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PROJECT

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REPLACEMENT

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SCHOOL DISTRICT

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SITE PLAN KEYNOTES

- 02.001 (E) PLANTER
02.002 (E) ASPHALT PAVING
02.004 (E) CONCRETE PAVING
02.013 (E) SHADE STRUCTURE, DSA #01-117094
02.047 (E) STRIPING
02.048 (E) TRASH ENCLOSURE
10.002 GAS SHUT-OFF SIGN, SEE DETAIL 19/A8.10.

BUILDING SUMMARY

BUILDING 100:
(E) CLASSROOMS/MULTIPURPOSE/ADMIN

TYPE OF CONSTRUCTION V-NR
OCCUPANCY TYPE E/A2/B
SPRINKLERED: YES
HEIGHT: 1-STORY








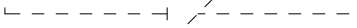
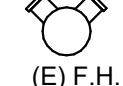
BLDG 200:

TYPE OF CONSTRUCTION V-NR
OCCUPANCY TYPE E
SPRINKLERED: NO
HEIGHT: 1-STORY

BLDG 300:

TYPE OF CONSTRUCTION V-NR
OCCUPANCY TYPE E
SPRINKLERED: NO
HEIGHT: 1-STORY

GRAPHIC KEY

-  EXISTING TOILET ROOMS
-  EXISTING CONSTRUCTION TO REMAIN
-  EXISTING COVERED STRUCTURE
-  PROPERTY LINE
-  (E) CHAINLINK FENCE LINE
-  CHAINLINK FENCE LINE
-  (E) ORNAMENTAL FENCE
-  (E) FIRE DEPARTMENT ACCESS
-  EXISTING FIRE HYDRANT
(E) F.H.

STAMP



STATE

DSA FILE NUMBER 41-26

APPL # 01-120124

REVISIONS

No.	Description	Date
1	ADDENDUM 1	11/10/2022

MILESTONES

SD	02/16/2022
90% CD	05/02/2022
DSA SUB	05/10/2022
BACKCHECK	08/23/2022

SHEET

SITE PLAN

DATE

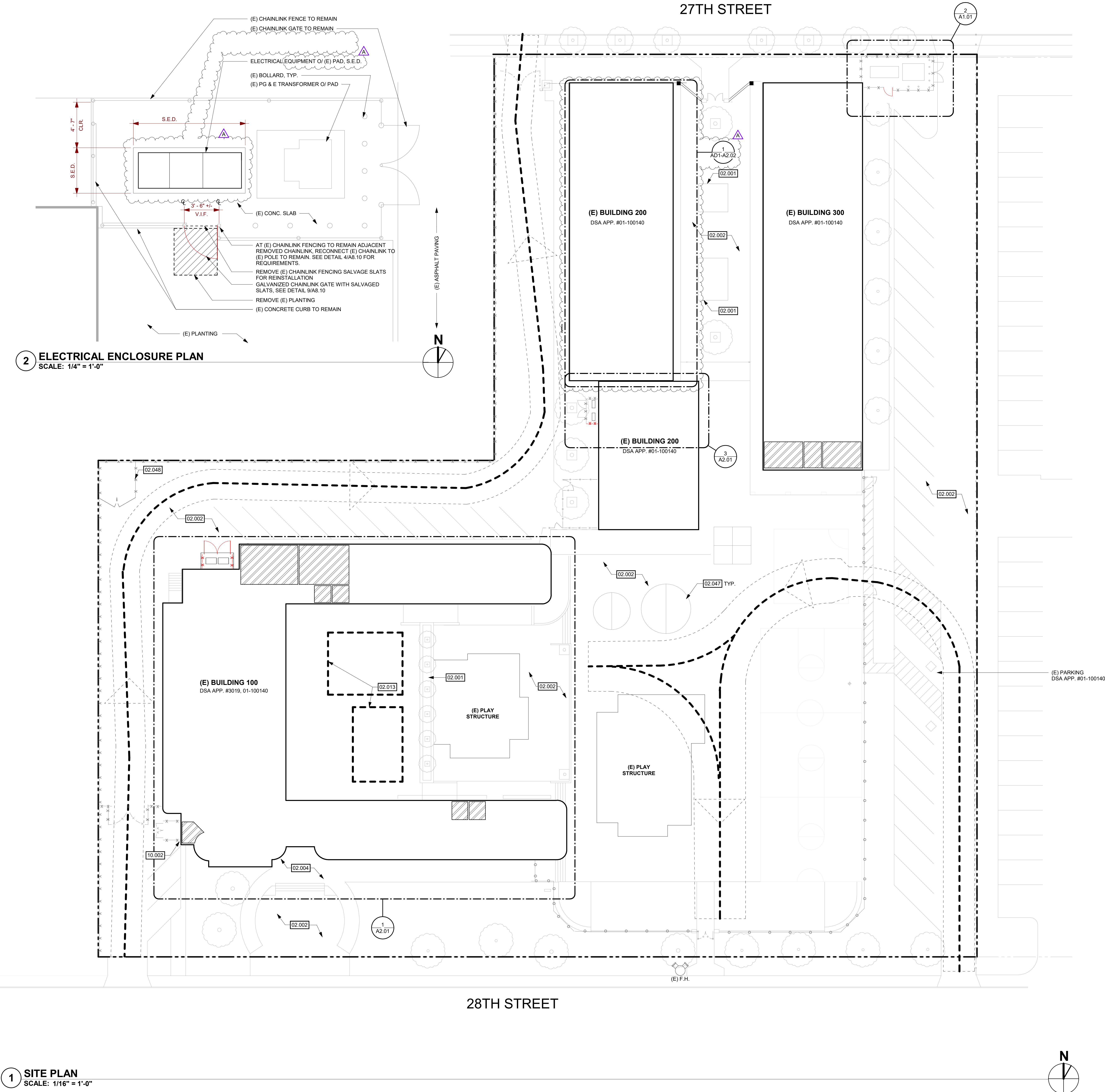
11/10/2022

JOB #

2021011.04

SHEET #

AD1-
A1.01



2 ELECTRICAL ENCLOSURE PLAN
SCALE: 1/4" = 1'-0"

1 SITE PLAN
SCALE: 1/16" = 1'-0"

GENERAL SHEET NOTES

- A REFER TO STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EXTENT OF STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL WORK.
- B DIMENSIONS FOR EXISTING BUILDING ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO START OF CONSTRUCTION.
- C VERIFY LIMITS OF DEMOLITION WITH SCOPE OF NEW WORK PRIOR TO COMMENCING WORK.
- D ALL ITEMS SHOWN DASHED ARE TO BE DEMOLISHED, UNLESS OTHERWISE NOTED ON PLANS.
- E REMOVE ALL MISCELLANEOUS TRIM, CASEWORK, EQUIPMENT, CONDUIT, BASES AND OTHER SURFACE MOUNTED ITEMS WHETEHR OR NOT, AS REQUIRED TO FACILITATE SCOPE OF WORK. REMOVE AND GAP ALL OUTLETS, SWITCHES, WIRES, THERMOSTATS, ETC. TO THEIR SOURCE AS REQUIRED. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION AND SCOPE OF WORK.
- F REMOVE ADJACENT FINISHES AS REQUIRED TO FACILITATE SCOPE OF WORK.PATCH BACK IN KIND.
- G EXISTING EQUIPMENT INDICATED TO BE RELOCATED PER NEW PLAN IS TO BE STROED AND PROTECTED DURING CONSTRUCTION.
- H NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING THE DEMOLITION WORK HAVE BEEN APPROVED BY DSA.
- I SCRIBE FINISHES TIGHT TO ADJACENT CONDITIONS INCLUDING BUT NOT LIMITED TO WALL FINISHES, WINDOWS, AND DUCTWORK.
- J AT INTERIOR AND EXTERIOR PAINT ALL NEW EXPOSED CONDUITS, PIPES, HANGERS, ATTACHMENTS, AND DUCTWORK TO MATCH (E) ADJACENT FINISH
- K PATCH AND PAINT WALL AT WALL MODIFICATIONS INCLUDING BUT NOT LIMITED TO BACKING INSTALLATIONS, REMOVED CASEWORK, REMOVED WALL MOUNTED OBJECTS, THERMOSTATS, CONTROLS OR RECONFIGURED RACEWAY.
- L REFER TO "HVAC AND POWER UPGRADE PROJECT HAZARDOUS MATERIALS SURVEY REPORT." CONTRACTOR TO ABATE AREAS AFFECTED BY SCOPE OF WORK. REMOVE AND DISPOSE OF MATERIALS PER REPORT RECOMMENDATIONS.

FLOOR PLAN KEYNOTES

- 02 055 23.103 PREP (E) OPENING FOR NEW WORK. SEE ELEVATIONS 8/AD1-A2.02 AND 12/AD1-A2.02 HVAC EQUIPMENT, S.M.D.

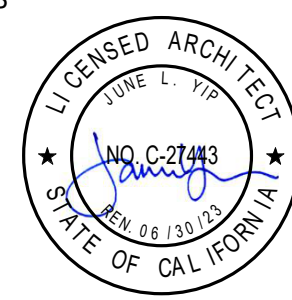
PROJECT

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DSA FILE NUMBER

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REVISIONS

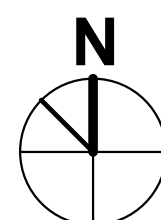
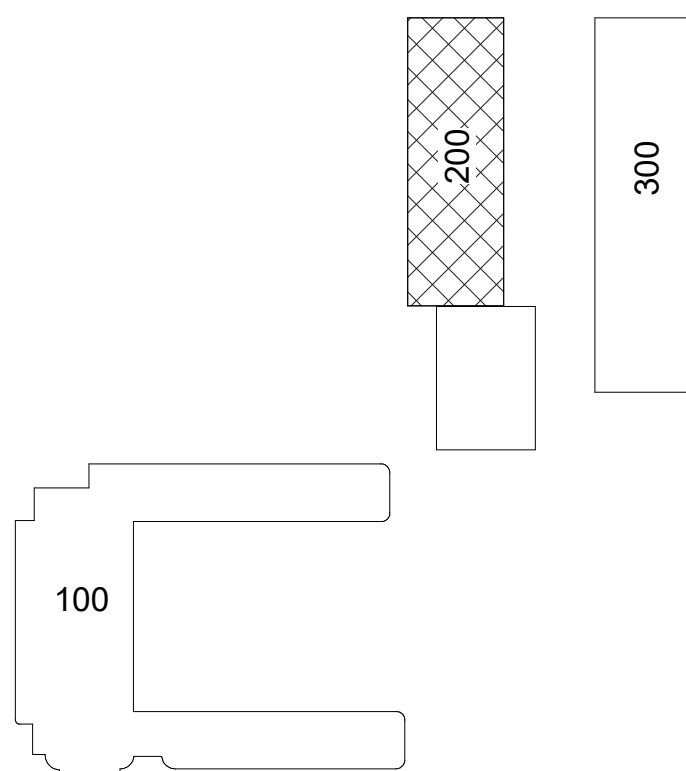
No.	Description	Date
1	ADDENDUM 1	11/10/2022

GRAPHIC KEY

- EXISTING WALL TO REMAIN.
- EXISTING 1HR RATED WALL TO REMAIN
- EXISTING STOREFRONT OR WINDOW TO REMAIN.

WALL TYPE. REFER TO SHEET A8.11 FOR WALL TYPE DESCRIPTION, FIRE RATING LISTING, AND SOUND RATING WHERE APPLICABLE, TYP.

BUILDING KEY



DATE

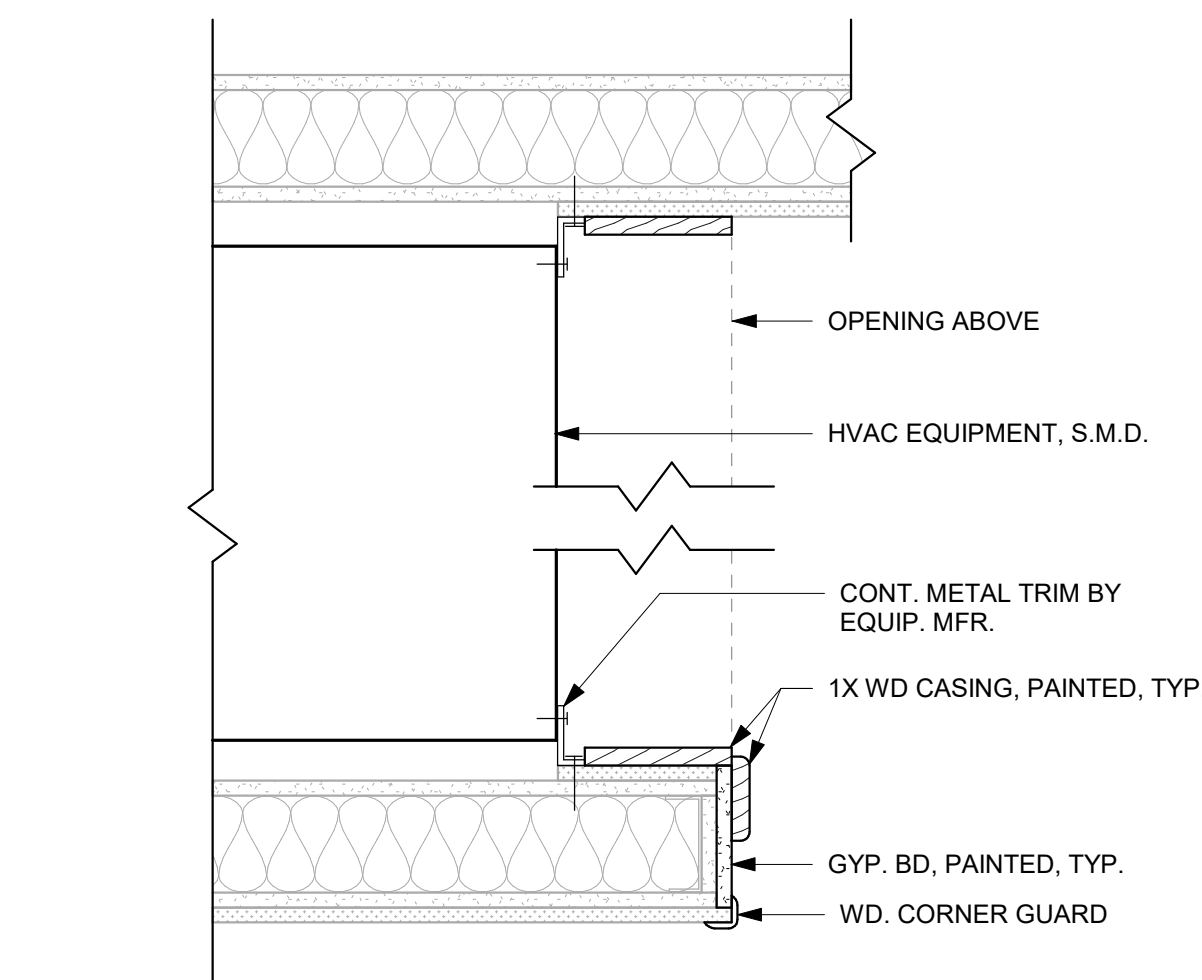
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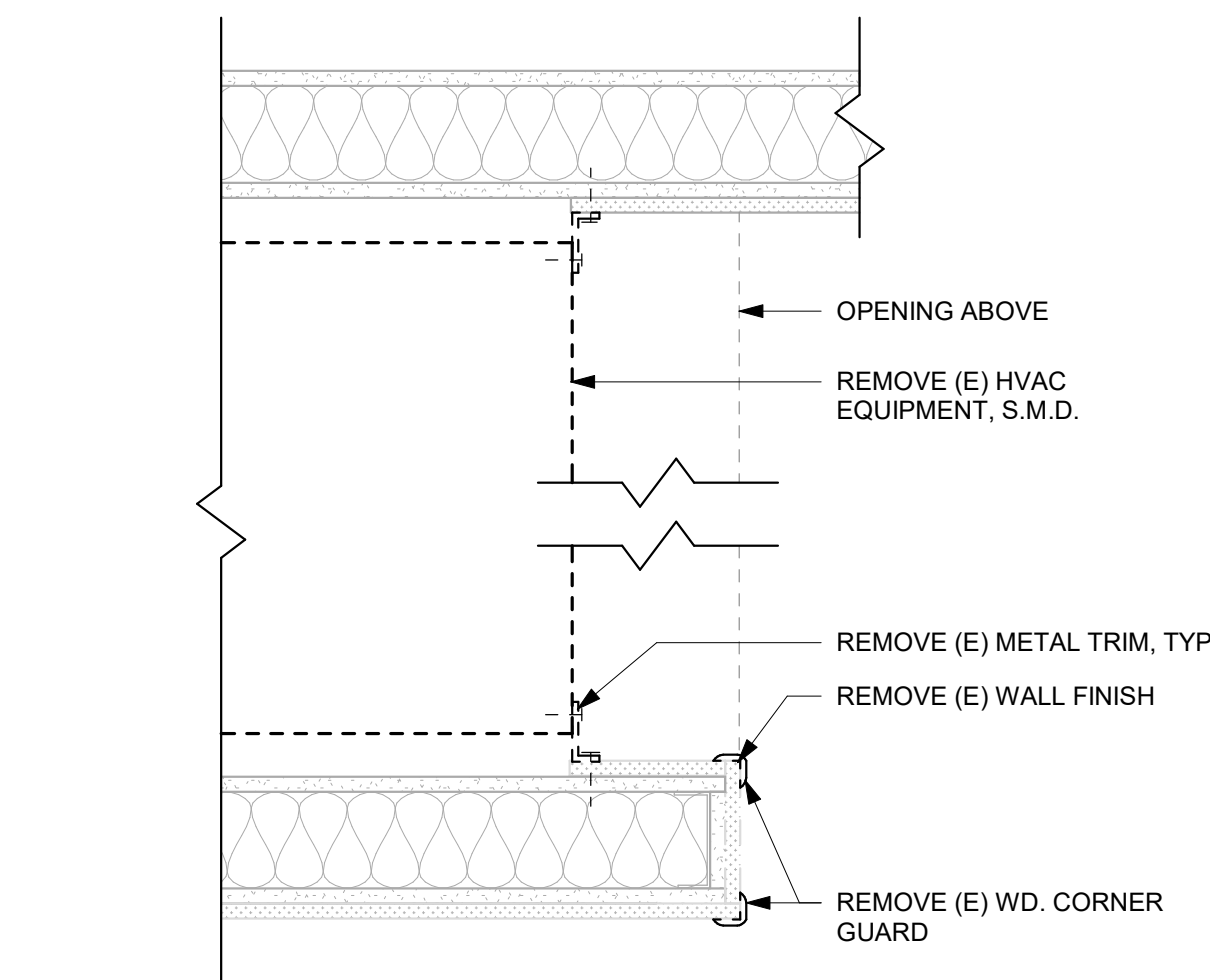
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SHEET #

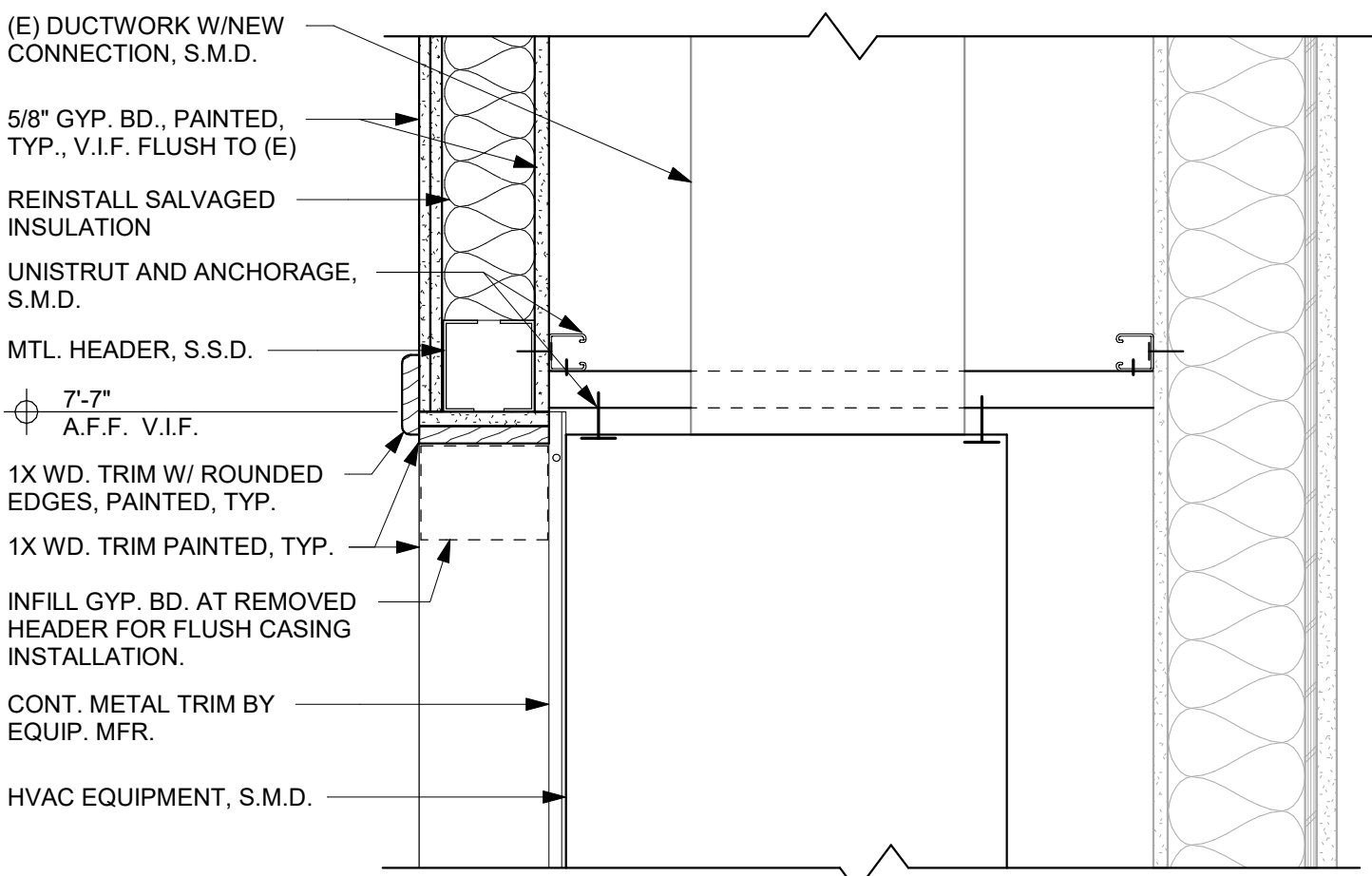
AD1-A2.02



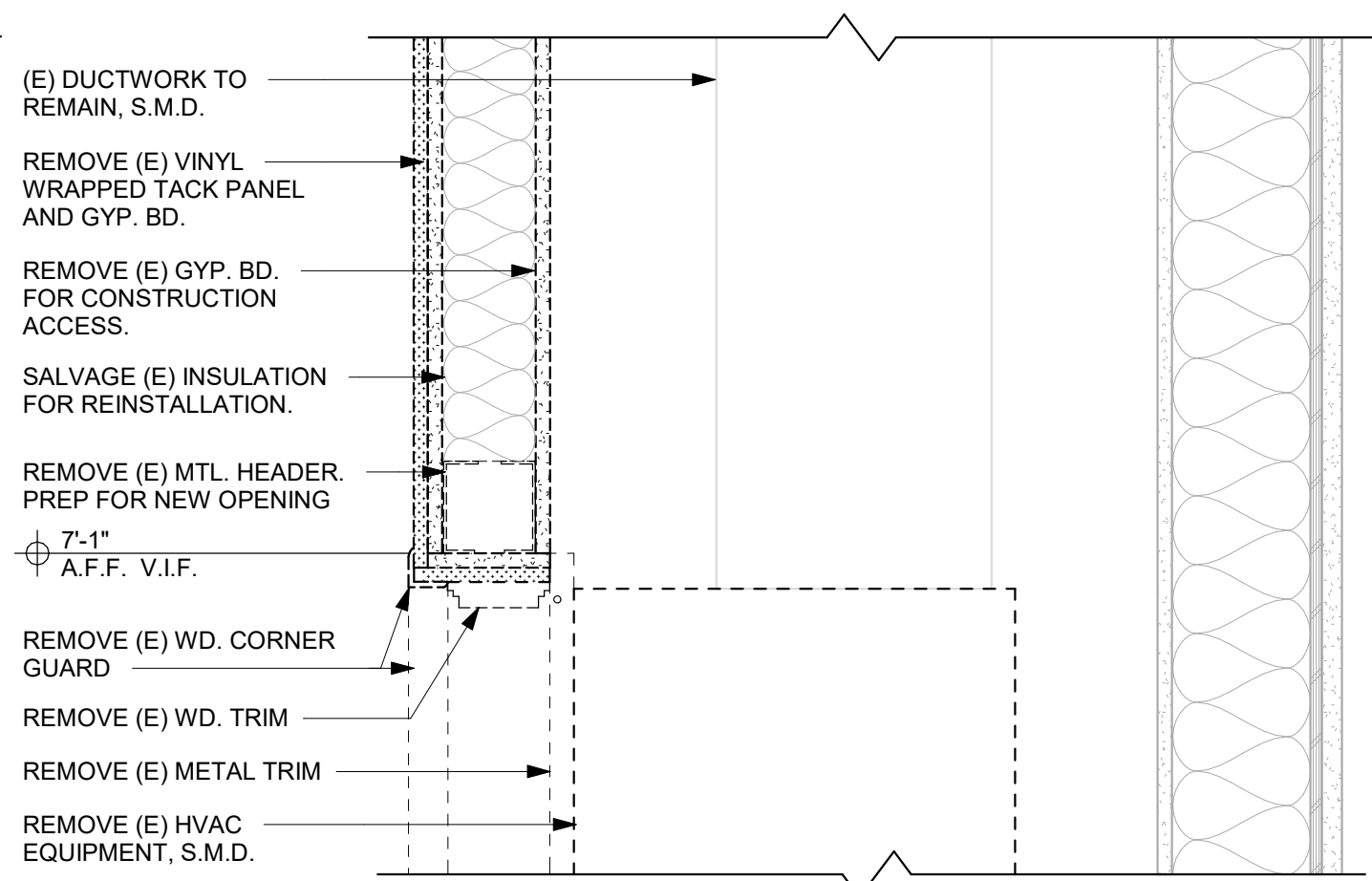
10 HVAC ENCLOSURE NEW FLOOR PLAN
SCALE: 1 1/2" = 1'-0"



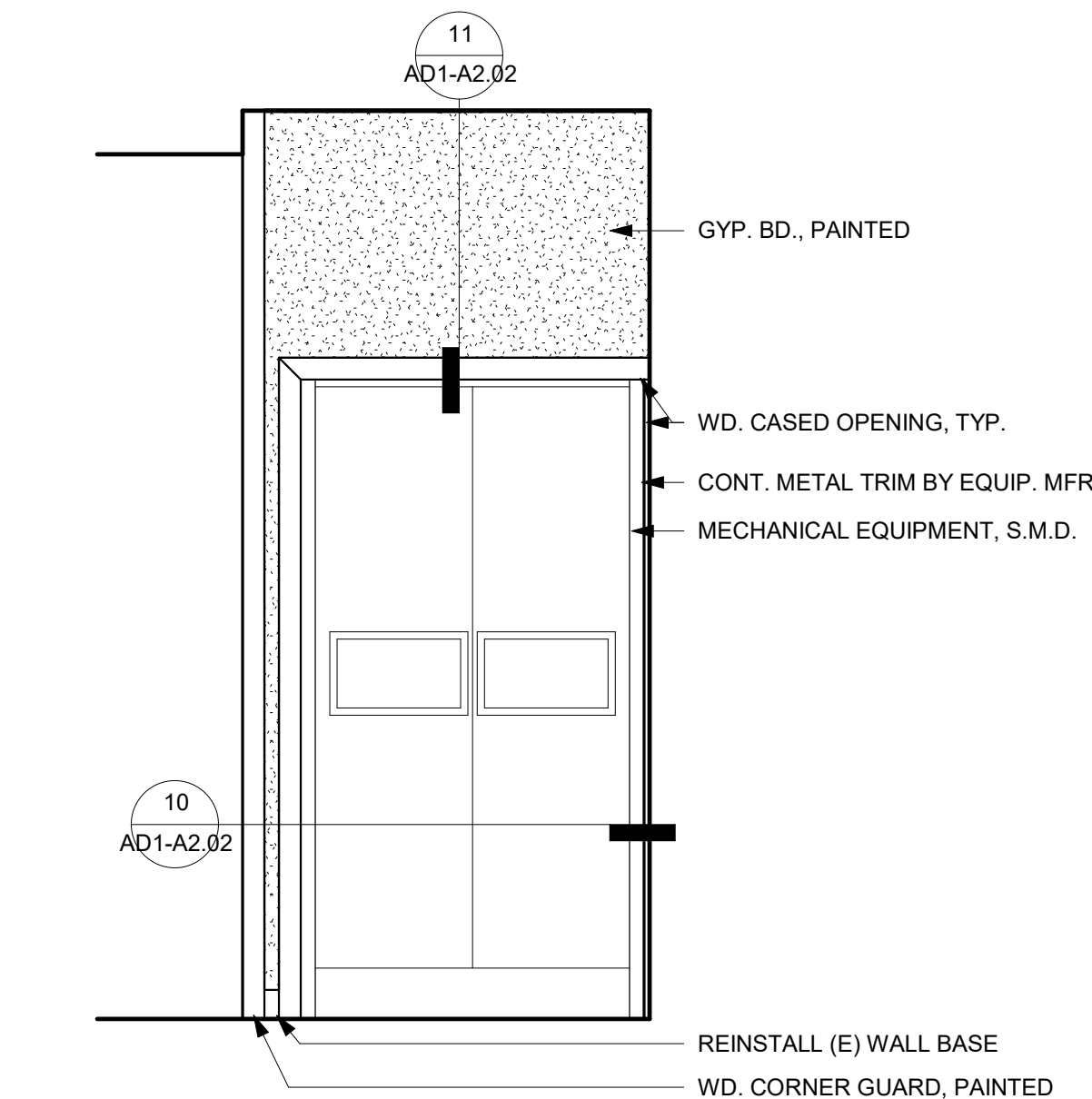
6 HVAC ENCLOSURE DEMOLITION PLAN
SCALE: 1 1/2" = 1'-0"



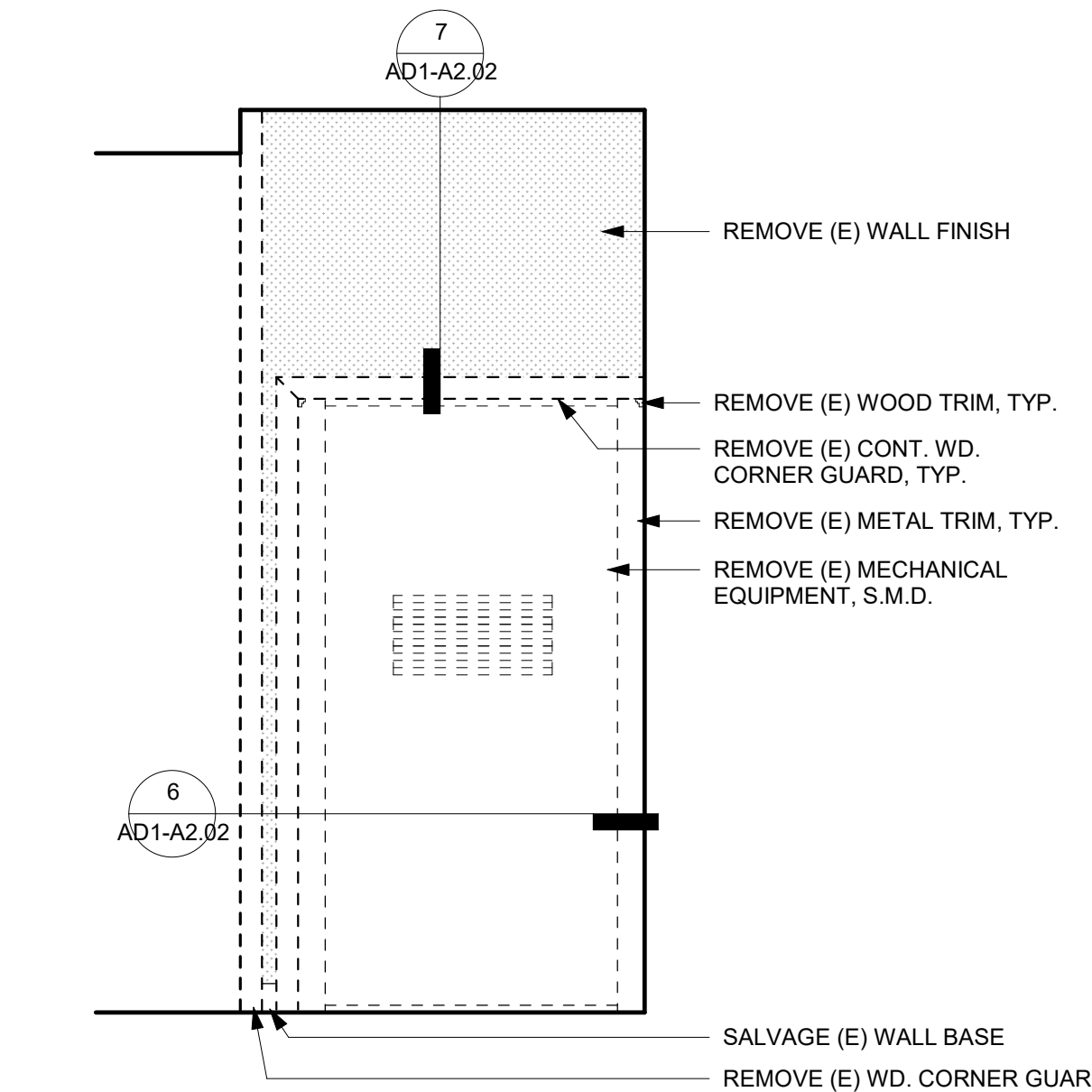
11 HVAC ENCLOSURE NEW SECTION
SCALE: 1 1/2" = 1'-0"



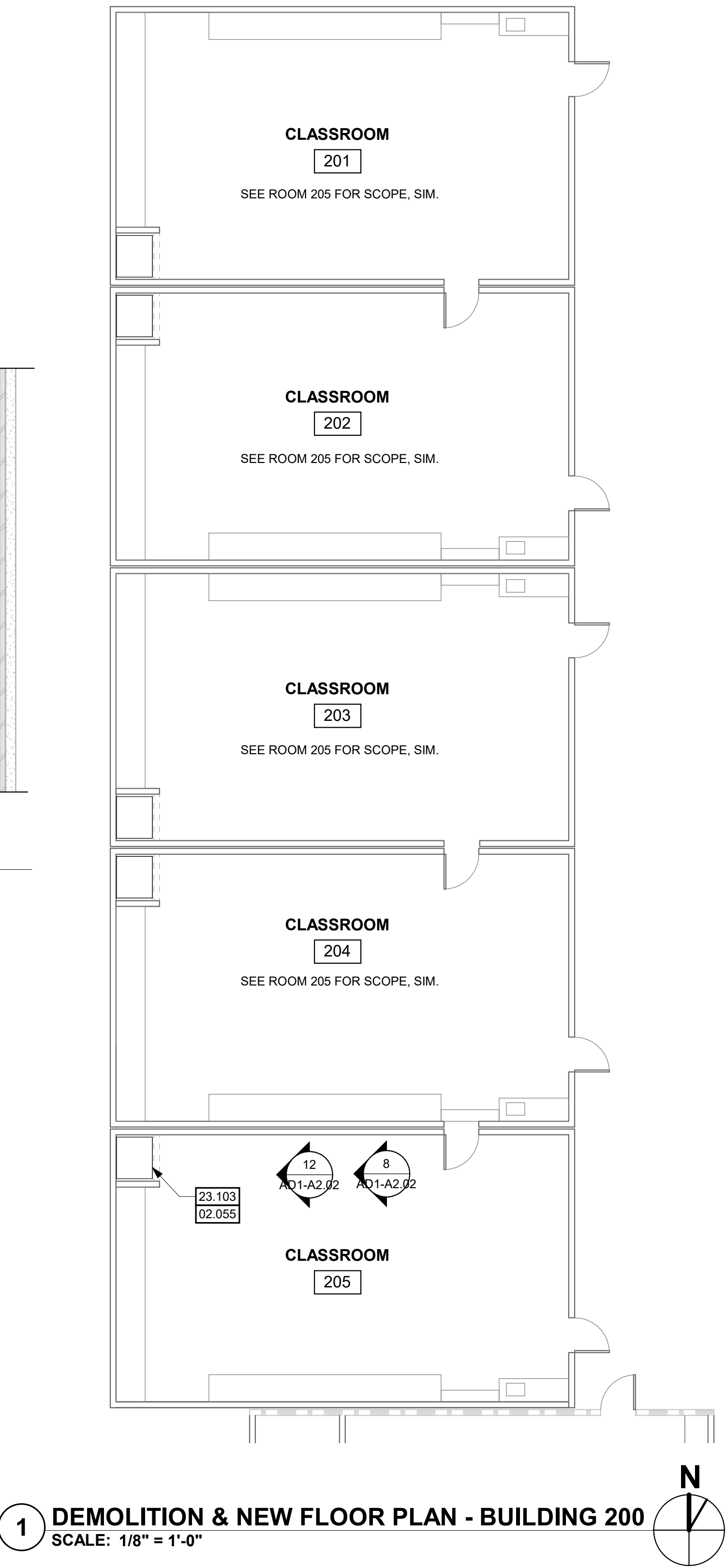
7 HVAC ENCLOSURE DEMOLITION SECTION
SCALE: 1 1/2" = 1'-0"



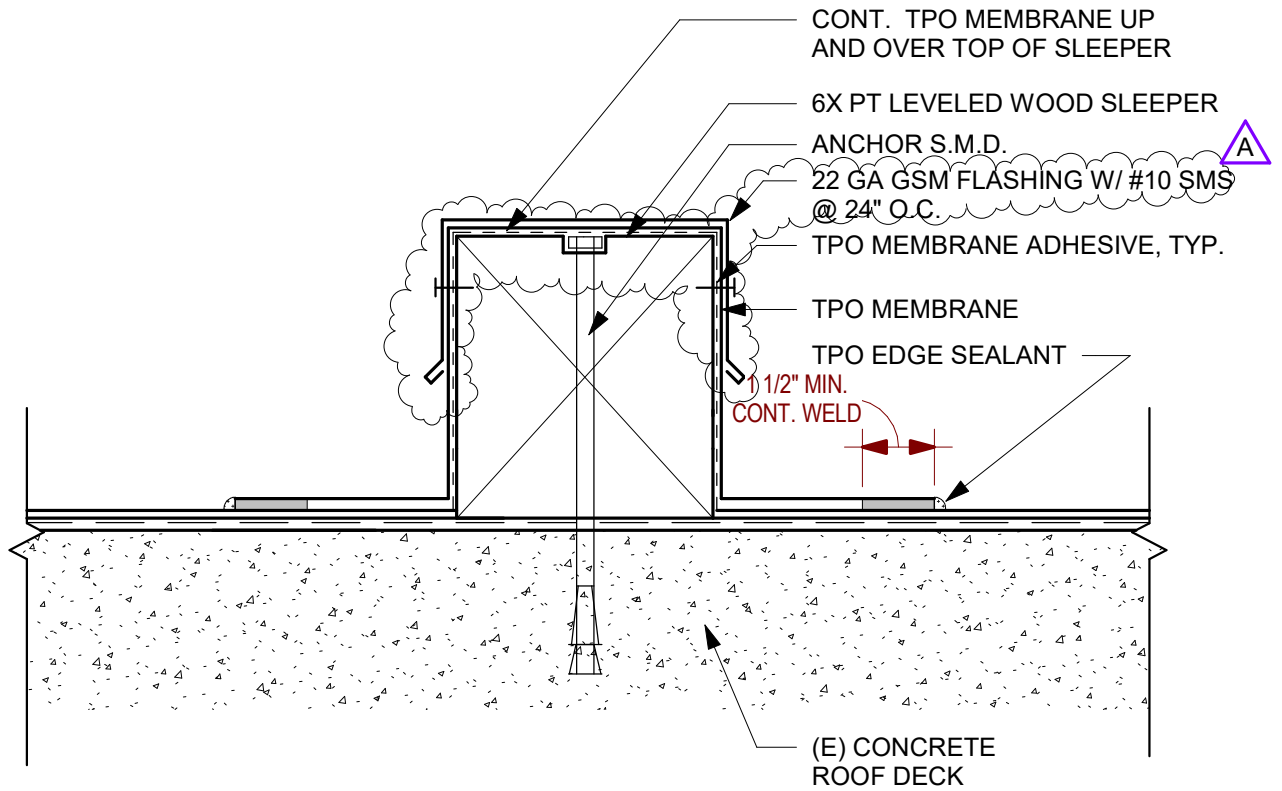
12 HVAC ENCLOSURE NEW ELEVATION
SCALE: 1/2" = 1'-0"



8 HVAC ENCLOSURE DEMOLITION ELEVATION
SCALE: 1/2" = 1'-0"



1 DEMOLITION & NEW FLOOR PLAN - BUILDING 200
SCALE: 1/8" = 1'-0"



NOTES:

1. FOR CORNER FLASHING, SEE DETAIL 17 / A8.10
2. FOR TRANSITION AT PATCH EDGE, SEE DETAIL 6 / A8.10

12 SLEEPER FLASHING

SCALE: 3" = 1'-0"

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BERESFORD ELEMENTARY SCHOOL
HVAC REPLACEMENT
SAN MATEO-FOSTER CITY SCHOOL DISTRICT

FILE NO.: 41-26
APPL NO.: 01-120124
JOB NO.: 2021011.04
DATE: 11/10/22

SHEET

AD1-A8.10

FASTENING SCHEDULE		
DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
ROOF		
1. Blocking between ceiling joists, rafters or trusses to top plate or other framing below	3-8d common (2 1/2" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Each end, toenail
Blocking between rafters or truss not at the wall top plate, to rafter or truss	2-8d common (2 1/2" x 0.131") 2-3" x 0.131" nails 2-3" 14 gage staples	Each end, toenail
	2-16 d common (3 1/2" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	End nail
Flat blocking to truss and web filler	16d common (3 1/2" x 0.162") @ 6" o.c. 3" x 0.131" nails @ 6" o.c. 3" x 14 gage staples @ 6" o.c	Face nail
2. Ceiling joists to top plate	3-8d common (2 1/2" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Each joist, toenail
3. Ceiling joist not attached to parallel rafter, laps over partitions (no thrust)	3-16d common (3 1/2" x 0.163") 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail
4. Ceiling joist attached to parallel rafter (heel joint)	Per Table 2308.7.3.1, CBC 2019	Face nail
5. Collar tie to rafter	3-10d common (3" x 0.148"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail
6. Rafter or roof truss to top plate	3-10 common (3" x 0.148"); or 3-16d box (3 1/2" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Toenail
7. Roof rafters to ridge valley or hip rafters; or roof rafter to 2-inch ridge beam	2-16d common (3 1/2" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown; or	End nail
	3-10d common (3 1/2" x 0.148"); or 4-16d box (3 1/2" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Toenail
WALL		
8. Stud to stud (not at braced wall panels)	16d common (3 1/2" x 0.162");	24" o.c. face nail
	10d box (3" x 0.128"); or 3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	16" o.c. face nail
9. Stud to stud and abutting studs at intersecting wall corners (at braced wall panels)	16d common (3 1/2" x 0.162"); or 16d box (3 1/2" x 0.135"); or 3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	16" o.c. face nail
	16d box (3 1/2" x 0.135"); or 12" o.c. face nail	12" o.c. face nail
10. Built-up header (2" to 2" header)	16d common (3 1/2" x 0.162"); or 16d box (3 1/2" x 0.135")	16" o.c. each edge, face nail
11. Continuous header to stud	4-8d common (2 1/2" x 0.131"); or 4-10d box (3" x 0.128")	Toenail
12. Top plate to top plate	16d common (3 1/2" x 0.162"); or 10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	16" o.c. face nail
	12" o.c. face nail	12" o.c. face nail
13. Top plate to top plate, at end joints	8-16d common (3 1/2" x 0.162"); or 12-10d box (3" x 0.128"); or 12-3" x 0.131" nails; or 12-3" 14 gage staples, 7/16" crown	Each side of end joint, face nail (minimum 24" lap splice length each side of end joint)
14. Bottom plate to joist, rim joist, band joist or blocking (not at braced wall panels)	16d common (3 1/2"x0.163"); or 16d box (3 1/2" x 0.135"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	16" o.c. face nail
	12" o.c. face nail	12" o.c. face nail
15. Bottom plate to joist, rim joist, band joist or blocking at braced wall panels	2-16d common (3 1/2" x 0.162"); or 3-16d box (3 1/2" x 0.135"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	16" o.c. face nail
	16" o.c. face nail	16" o.c. face nail
16. Stud to top or bottom plate	4-8d common (2 1/2" x 0.131"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown; or	Toenail
	2-16d common (3 1/2" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	End nail
17. Top plates, laps at corners and intersections	2-16d common (3 1/2" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Face nail
18. 1" brace to each stud and plate	2-8d common (2 1/2" x 0.131"); or 2-10d box (3" x 0.128"); or 2-3" x 0.131" nails; or 2-3" 14 gage staples, 7/16" crown	Face nail
19. 1" x 6" sheathing to each bearing	2-8d common (2 1/2" x 0.131"); or 2-10d box (3" x 0.128")	Face nail
20. 1" x 8" and wider sheathing to each bearing	3-8d common (2 1/2" x 0.131"); or 3-10d box (3" x 0.128")	Face nail

For SI: 1 inch = 25.4 mm.

a. Nails spaced at 6 inches at intermediate supports where spans are 48 inches or more. Nails for wall sheathing are permitted to be common, box or casing.

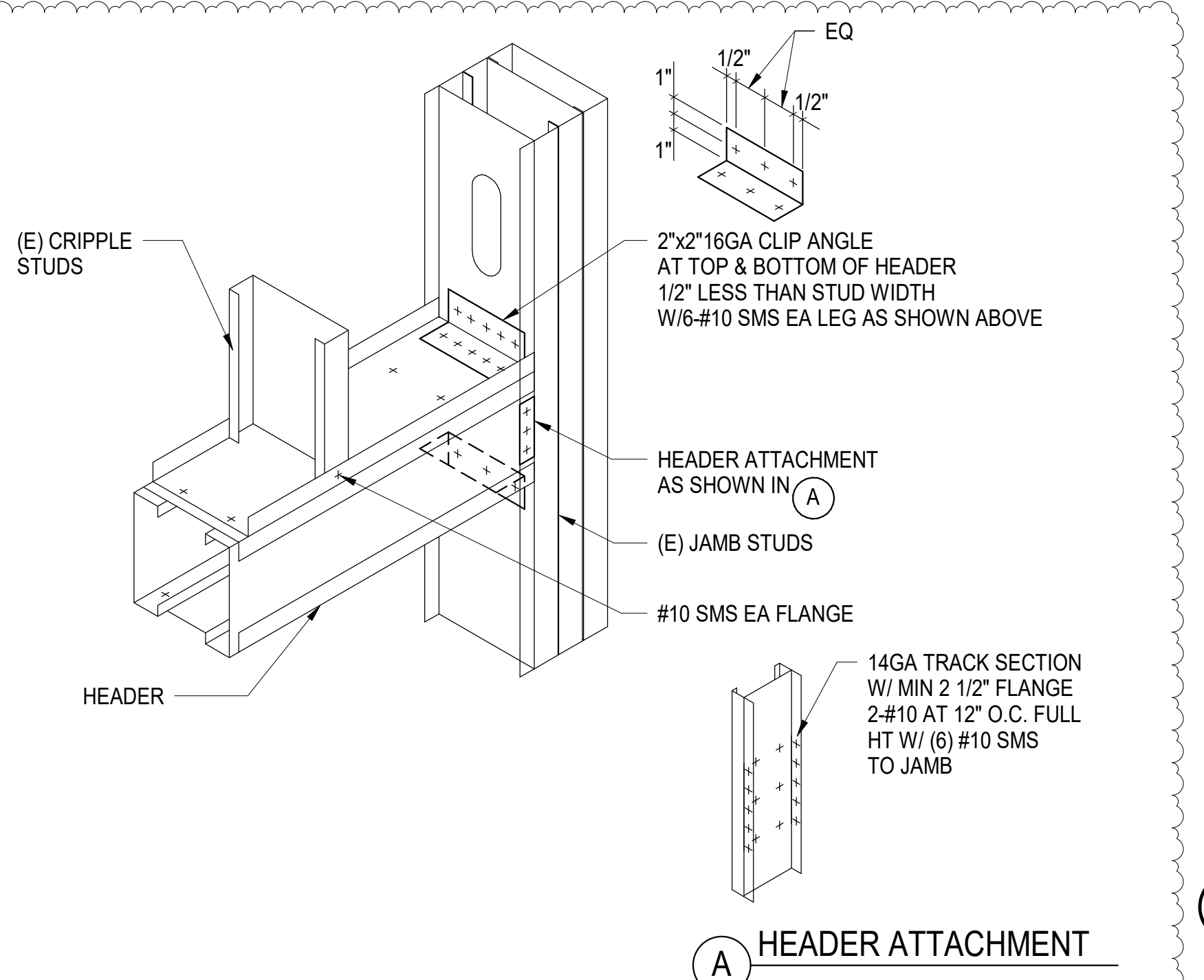
b. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked).

c. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule and the ceiling joist is fastened to the top plate in accordance with this schedule, the number of toenails in the rafter shall be permitted to be reduced by one nail.

d. RSR5-01 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667.

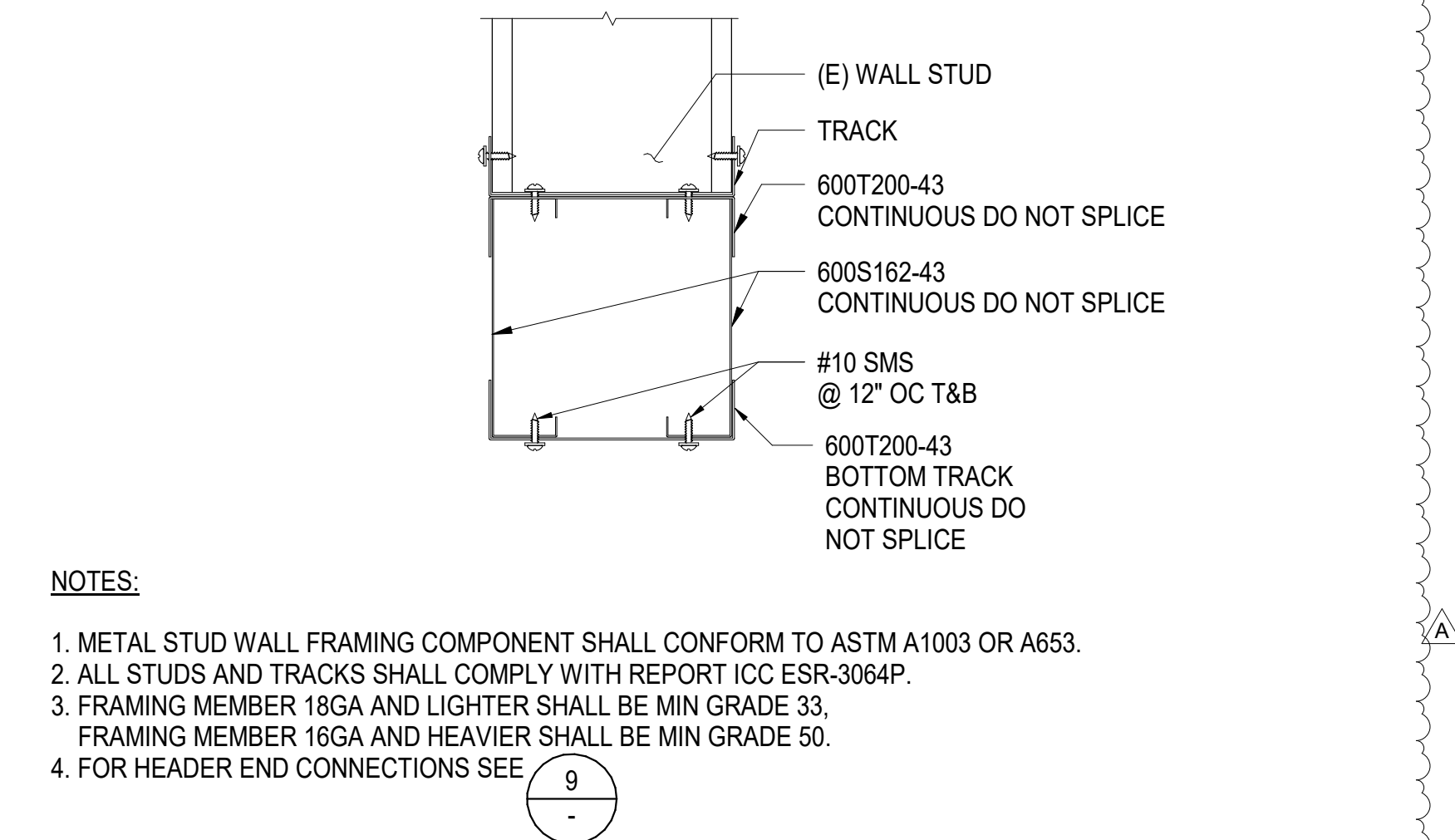
12 NAILING SCHEDULE

NTS



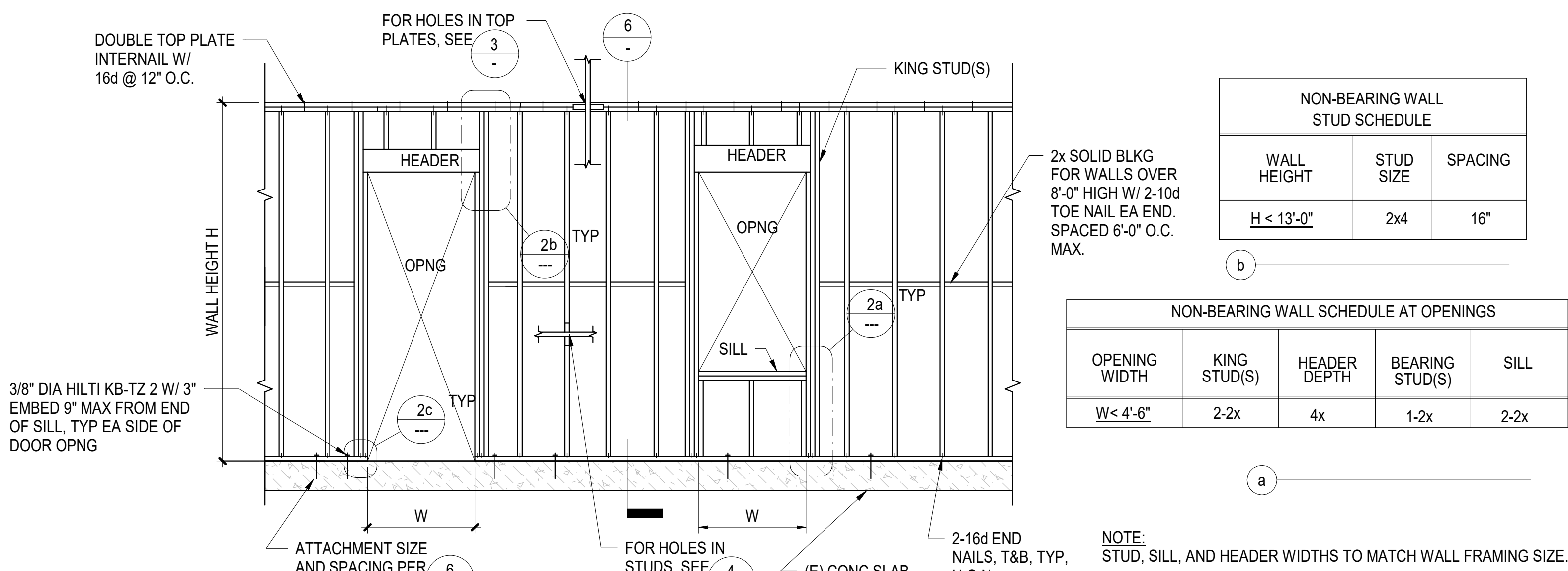
9 HEADER AND JAMB CONNECTION

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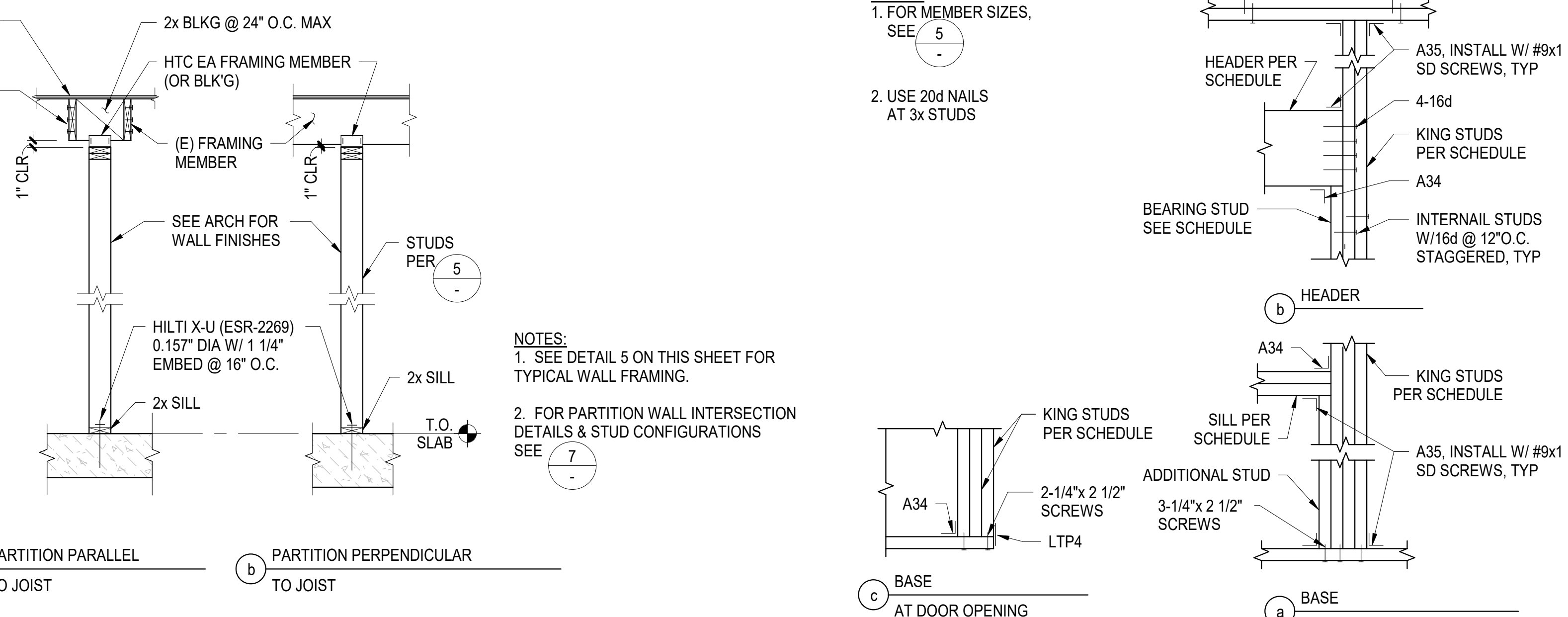
10 BOXED HEADER SECTION

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5 TYPICAL INTERIOR NON-BEARING WALL FRAMING

NTS

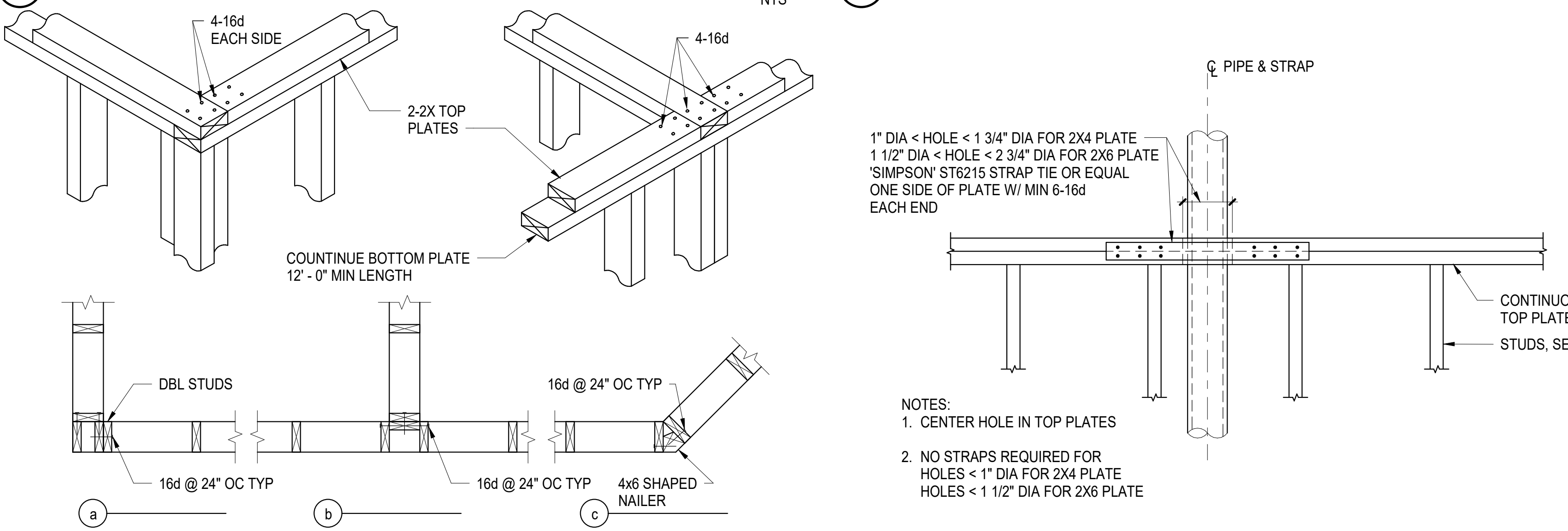


2 WALL OPENING

NTS

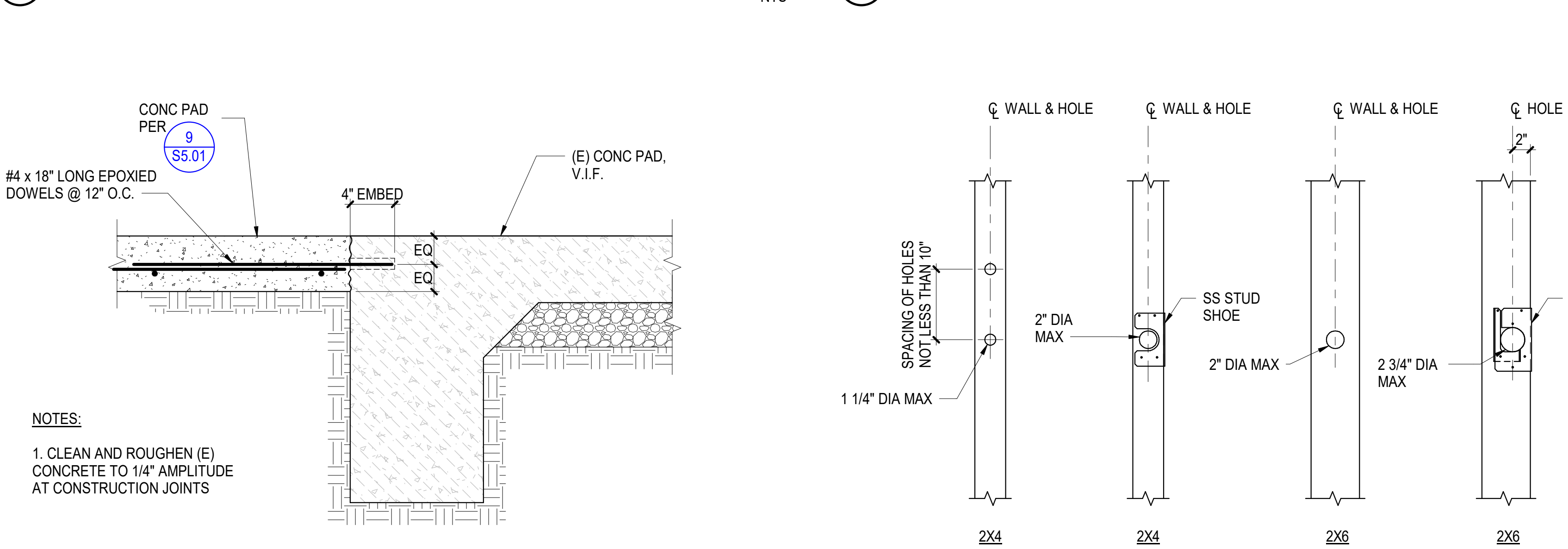
6 NON-BEARING WALL PARTITION

NTS



7 WALL INTERSECTIONS

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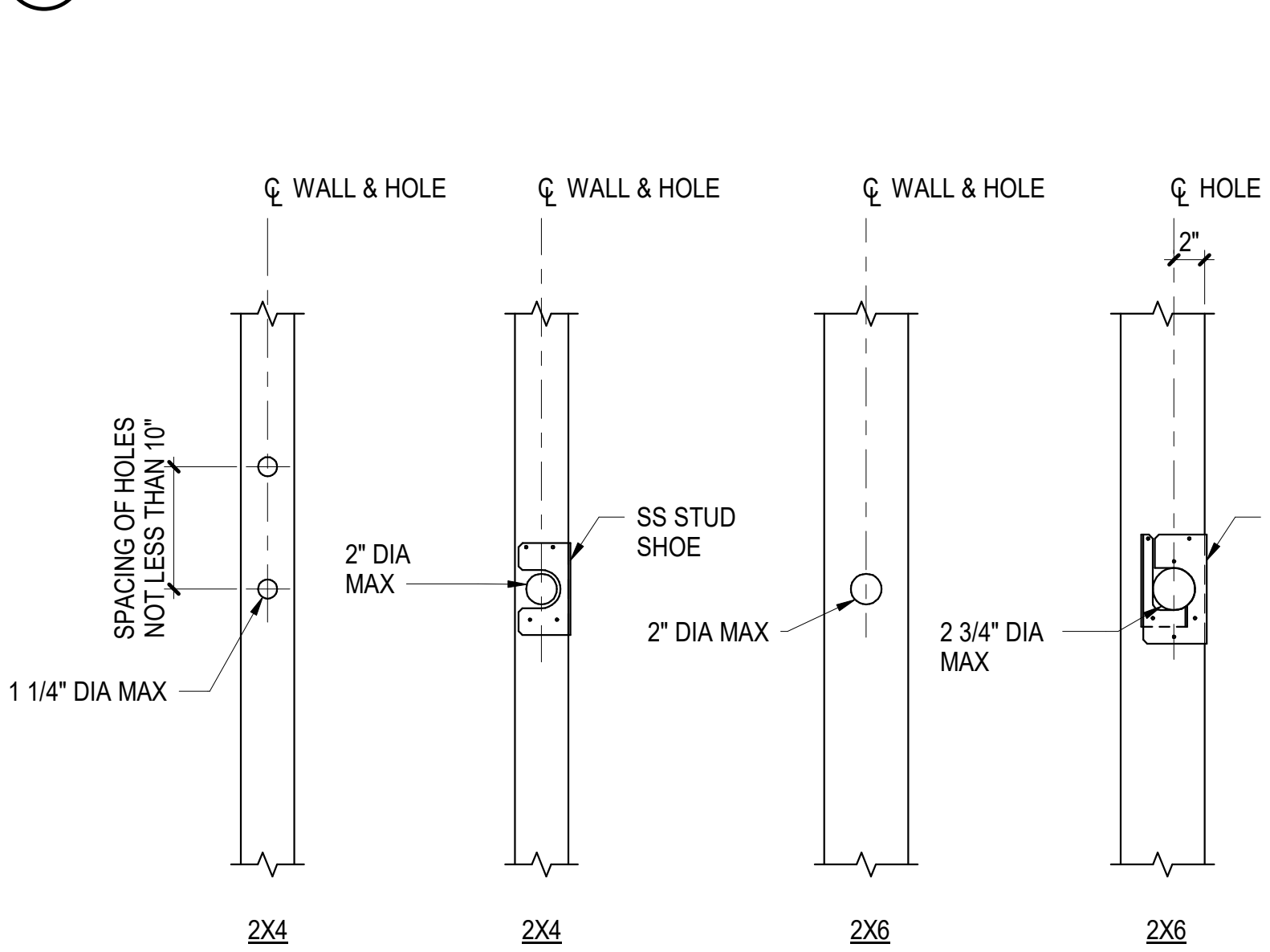


8 SLAB CONNECTION DETAIL

NTS

3 TOP PLATE PENETRATIONS

NTS



4 PENETRATIONS IN STUDS

NTS

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DSA FILE NUMBER 41-26
APPL # 01-120124

REVISIONS

No. Description Date
A ADDENDUM 11/10/2022

MILESTONES

SD 02/16/2022
90% CD 05/02/2022
DSA SUB 05/10/2022
BACKCHECK 08/23/2022

SHEET

FRAMING DETAILS
AND NAILING
SCHEDULE

DATE

11/10/2022
JOB # 2021011.04

SHEET #

AD1-S8.01

PACKAGED ROOFTOP AIR CONDITIONING UNITS SCHEDULE																				
TAG	MANUFACTURER	MODEL NO.	DISCHARGE ORIENTATION	COOLING MBH		GAS HEATING MBH		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR CFM	FAN RPM	MOTOR BHP	EER / IEER	TE	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				TOTAL	SENSIBLE	INPUT	OUTPUT								V / PH	MCA	MOCP			
AC-1	CARRIER	48FCDM07	VERTICAL	75.5	55.03	67	54	2200	1.0	450	2463	1.60	11 15	81	208 / 3	28	45	680	11MP6.01	1, 2, 3, 4, 5, 7, 8
AC-2	CARRIER	48FCDM07	VERTICAL	75.5	55.03	67	54	2200	1.0	450	2463	1.60	11 15	81	208 / 3	28	45	680	11MP6.01	1, 2, 3, 4, 5, 7, 8
AC-3	CARRIER	48FCDM07	VERTICAL	75.5	55.03	67	54	2200	1.0	450	2463	1.60	11 15	81	208 / 3	28	45	680	11MP6.01	1, 2, 3, 4, 5, 7, 8
AC-4	CARRIER	48FCDM07	VERTICAL	75.5	55.03	67	54	2200	1.0	450	2463	1.60	11 15	81	208 / 3	28	45	680	11MP6.01	1, 2, 3, 4, 5, 7, 8
AC-5	CARRIER	48GCDM06	VERTICAL	59.86	41.32	50 67	40 54	1500	1.0	450	2037	0.91	SEER 16.1	81	208 / 3	31	40	680	11MP6.01	1, 3, 4, 6, 7, 8
AC-6	CARRIER	48GCDM06	VERTICAL	59.86	41.32	50 67	40 54	1500	1.0	450	2037	0.91	SEER 16.1	81	208 / 3	31	40	680	11MP6.01	1, 3, 4, 6, 7, 8

1. WEIGHT INCLUDES ALL OPTIONS AND ACCESSORIES.
2. OFCI - LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF, TWO STAGE COOLING, MEDIUM STATIC DIRECT DRIVE FAN, COVERED HAIL GUARDS, HINGED ACCESS PANELS, UNPOWERED CONVENIENCE OUTLET, AND E-COAT COILS.
3. PROVIDE WITH MERV 13 FILTERS.
4. PROVIDE WITH DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.
5. CONNECT TO (E) SMOKE DETECTOR AND COORDINATE TIE-IN WITH BUILDING ALARM SYSTEMS.
6. OFCI - LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF, MEDIUM STATIC DIRECT DRIVE FAN, LOUVERED HAIL GUARDS, HINGED ACCESS PANELS, UNPOWERED CONVENIENCE OUTLET, AND E-COAT COILS.

7. ROOFTOP UNIT TO BE OFCI.
8. OFCI - ALL DURA SURFACE COATING ON COMPLETE UNIT, ECONOMIZER, OUTSIDE AIR HOOD AND CURBS.

SPLIT SYSTEM AIR CONDITIONERS SCHEDULE																
TAG	MANUFACTURER	MODEL	AREA SERVED BLDG 100	LOCATION	COOLING	HEATING	AIRFLOW CFM	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
					TOTAL MBH	TOTAL MBH		LIQUID	GAS		V / PH	MCA	MOCP			
SSO-100-1	SAMSUNG	AR24TSFYBWKXCV	100	ROOF	22	24	—	1/4"	5/8"	18	208 / 1	20	30	125	17MP6.01	1
SSI-100-1	SAMSUNG	AR24TSFYBWKXCV		COMM 119			657	1/4"	5/8"	—	NOTE 4			30	15MP6.01	2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. PROVIDE WITH SAMSUNG MIM-ABOUN 24VAC THERMOSTAT ADAPTER AND 24VAC TRANSFORMER.
3. PROVIDE DELTA TSTAT. SEE MP5.02 FOR CONTROLS.
4. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT.
5. PROVIDE CONDENSATE PUMP, LITTLE GIANT VCMX-200LS WITH OVERFLOW PROTECTION, OR APPROVED EQUAL.

EXHAUST FANS SCHEDULE												
TAG	MANUFACTURER	MODEL NO.	AREA SERVED BLDG 200	AIRFLOW CFM	ESP IN. W.G.	FAN RPM	SOUND POWER SONES	MOTOR		WEIGHT LBS	MOUNTING DETAIL	NOTES
								WATTS	V / PH			
EF-200-1	GREENHECK	SP-A390-VG	ELEC 211	250	0.25	1064	3.0	35	115 / 1	25	16/MP6.01	1, 2

1. PROVIDE WITH UL LISTING, FAN MOUNTED SPEED CONTROL, FACTORY MOUNTING BRACKET, AND VIBRATION ISOLATORS.
2. PROVIDE WITH LINE VOLTAGE TSTAT. SEE MP5.02 FOR CONTROLS.

VRF INDOOR FAN COIL UNITS SCHEDULE																	
TAG	MANUFACTURER	MODEL NO.	HP UNIT	AREA SERVED BLDG 100	COOLING MBH	HEATING MBH	AIRFLOW CFM	MIN. OA CFM	DCV MAX. OA CFM	REFRIGERANT PIPING		ELECTRICAL			WEIGHT	MOUNTING DETAIL	NOTES
										LIQUID	GAS	V / PH	MCA	MOCP			
FC-1	SAMSUNG	AM076FNHDC4AA	HP-1	MULTI-PURPOSE ROOM	76.8	85.2	1600	150	750	3/8"	3/4"	208/1	4.8	15	240	1MP6.01	1, 2, 3, 4, 5, 6
FC-2	SAMSUNG	AM076FNHDC4AA			76.8	85.2	1600	150	750	3/8"	3/4"	208/1	4.8	15	240	1MP6.01	1, 2, 3, 4, 5, 6
FC-3	SAMSUNG	AM076FNHDC4AA	HP-2		76.8	85.2	1600	150	750	3/8"	3/4"	208/1	4.8	15	240	1MP6.01	1, 2, 3, 4, 5, 6
FC-4	SAMSUNG	AM076FNHDC4AA			76.8	85.2	1600	150	750	3/8"	3/4"	208/1	4.8	15	240	1MP6.01	1, 2, 3, 4, 5, 6

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. PROVIDE WITH SAMSUNG MIM-ABOUN 24VAC THERMOSTAT ADAPTER AND 24VAC TRANSFORMER.
3. PROVIDE WITH DELTA CONTROL THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.
4. PROVIDE CONDENSATE PUMP, LITTLE GIANT VCMX-200LS WITH OVERFLOW PROTECTION, OR APPROVED EQUAL AND SAMSUNG 2 PIN WIRING HARNESS FOR CONDENSATE ALARM AND UNIT SHUT-DOWN PROVIDE.
5. WITH SAMSUNG FP-H7696 FILTER BOX. WEIGHT INCLUDES FILTER BOX.

VRF OUTDOOR UNIT HEAT PUMP SCHEDULE														
TAG	MANUFACTURER	MODEL NO.	NOMINAL CAPACITY, MBH		REFRIGERANT PIPING		IEER / SEER	COP	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
			COOLING	HEATING	LIQUID	GAS			V / PH	MCA	MOCP			
HP-1	SAMSUNG	AM120FXVAFH2AA	120	135	1/2"	1-1/8"	22.4 11.2	3.38	208 / 3	43	50	620	3MP/6.01	1, 2
HP-2	SAMSUNG	AM120FXVAFH2AA	120	135	1/2"	1-1/8"	22.4 11.2	3.38	208 / 3	43	50	620	3MP/6.01	1, 2

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

PACKAGED INDOOR WALL HEAT PUMPS SCHEDULE																	
TAG	MANUFACTURER	MODEL NO.	AREA SERVED BLDG 200	COOLING MBH	HEATING MBH	AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR CFM	MOTOR HP	EER	COP	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
												V / PH	MCA	MOCP			
WHP-201	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.25"	200	1/2	11.0	3.3	208 / 1	53	60	580	13MP6.01	1, 2, 3, 4
WHP-202	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.25"	200	1/2	11.0	3.3	208 / 1	53	60	580	13MP6.01	1, 2, 3, 4
WHP-203	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.25"	200	1/2	11.0	3.3	208 / 1	53	60	580	13MP6.01	1, 2, 3, 4
WHP-204	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.25"	200	1/2	11.0	3.3	208 / 1	53	60	580	13MP6.01	1, 2, 3, 4
WHP-205	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.25"	200	1/2	11.0	3.3	208 / 1	53	60	580	13MP6.01	1, 2, 3, 4

1. PROVIDE WITH ECONOMIZER AND 2" MERV 13 FILTERS.
2. PROVIDE WITH 5 KW ELECTRIC HEAT.
3. PROVIDE WITH DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.02 FOR CONTROLS.
4. PROVIDE WITH QWS42A-19 WALL SLEEVE AND QCD546A DRAIN KIT.

WALL HEAT PUMPS SCHEDULE																	
TAG	MANUFACTURER	MODEL NO.	AREA SERVED BLDG 300	COOLING MBH	HEATING MBH	AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR CFM	MOTOR HP	EER	COP	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
												V / PH	MCA	MOCP			
WHP-301	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3
WHP-302	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3
WHP-303	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3
WHP-304	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3
WHP-305	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3
WHP-306	BARD	T48S1-A05	SEE PLANS	39.5	39	1250	0.25"	200	3/4	11.0	3.3	208 / 1	57	60	650	12MP6.01	1, 2, 3

1. PROVIDE WITH 5KW ELECTRIC HEAT.
2. PROVIDE WITH ECONOMIZER AND 2" MERV 13 FILTERS.
3. PROVIDE WITH DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.02 FOR CONTROLS.

CLASSROOM SPLIT SYSTEM HEAT PUMPS SCHEDULE																		
TAG	MANUFACTURER BASIS OF DESIGN	MODEL	BUILDING	LOCATION	COOLING	HEATING	AIRFLOW CFM	OUTSIDE AIR CFM	REFRIGERANT PIPING		SEER	HSPF	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
					TOTAL MBH	TOTAL MBH			LIQUID	GAS			V / PH	MCA	MOCP			
FC-210	SAMSUNG	AC024KNZDCH4AA	COMPUTER LAB	MECHANICAL CLOSET	24	27	760	450	5/8"	1/4"	-	-	NOTE 7			150	14MP6.01	2, 3, 4, 5, 6, 7, 8, 9
HP-210	SAMSUNG	AC024JXADCH4AA		SLAB			-	-	5/8"	1/4"	19.5	11.5	208 / 1	13.58	20	100	3MP6.01	1
FC-212	SAMSUNG	AM054TNZDCH4AA	LIBRARY	MECHANICAL CLOSET	53	61	1160	450	3/8"	3/4"	-	-	208/1	2.6	15	230	14MP6.01	2, 3, 4, 5, 6, 8, 9
HP-212	SAMSUNG	AM053TXMDCH4AA		SLAB			-	-	3/8"	3/4"	17.5	10	208 / 1	34	50	230	3MP6.01	1

1. SPLIT SYSTEM SHALL BE ABLE TO OPERATE AT 94% HEATING CAPACITY DOWN TO 32°F OUTDOOR AMBIENT TEMPERATURE.
2. CFM BASED ON 0.55 ESP.
3. PROVIDE WITH SAMSUNG MIM-ABOUN 24VAC THERMOSTAT ADAPTER AND 24VAC TRANSFORMER.
4. PROVIDE DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.

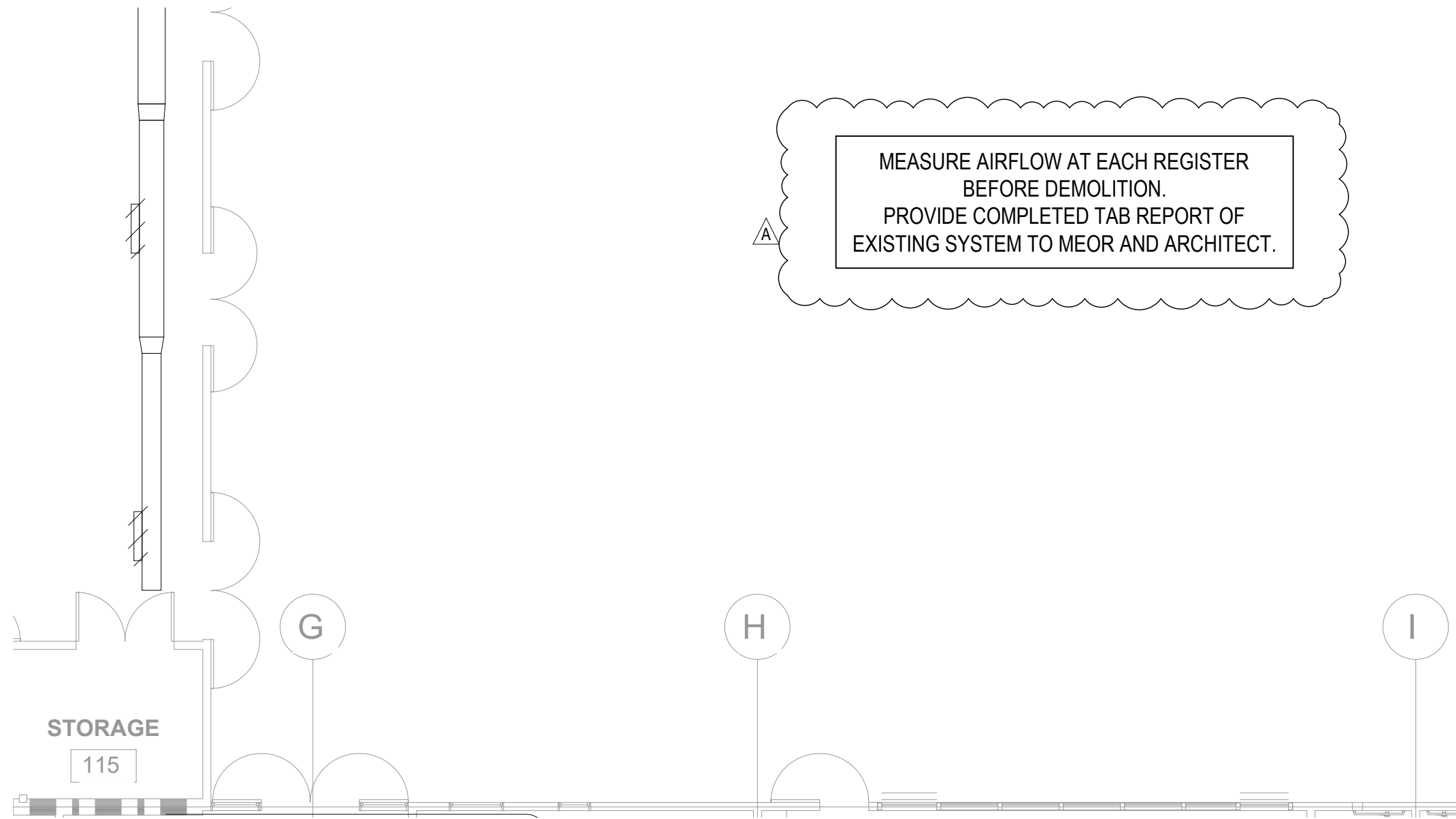
5. PROVIDE WITH TOOL-LESS ENTRY HINGED FILTER ACCESS PANEL AND WITH 4" MERV-13 FILTER.
6. FAN COIL SHALL BE ADJUSTED TO OPERATE AT CONSTANT SPEED AT INDICATED CFM.
7. INDOOR UNIT POWERED BY OUTDOOR UNIT.
8. PROVIDE WITH LITTLE GIANT VCMX-200LS WITH OVERFLOW PROTECTION, OR APPROVED EQUAL AND SAMSUNG 2 PIN WIRING HARNESS FOR CONDENSATE ALARM AND UNIT SHUT-DOWN.
9. NOT USED.

AIR DISTRIBUTION SCHEDULE						
TAG	MANUFACTURER	MODEL NO.	DESCRIPTION	BORDER TYPE	MOUNTING DETAIL	NOTES
RG-1	TITUS	350RL	HIGH SIDEWALL RETURN	TYPE 1	5MP6.01	1
HSS-1	TITUS	300RL	HIGH SIDEWALL SUPPLY	TYPE 1	6MP6.01	1, 2

1. PRIME AND PAINT PER ARCHITECT'S INSTRUCTIONS. REGISTER COLOR SELECTED BY ARCHITECT.
2. SET BLADES AT 22.5° DEFLECTION.

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1 **MULTI-PURPOSE BLDG FLOOR PLAN - DEMO - MECHANICAL & PLUMBING**
MP2.01 SCALE: 1/8" = 1'-0"




CEG JOB NO: 21105

CYPRESS
Engineering Group

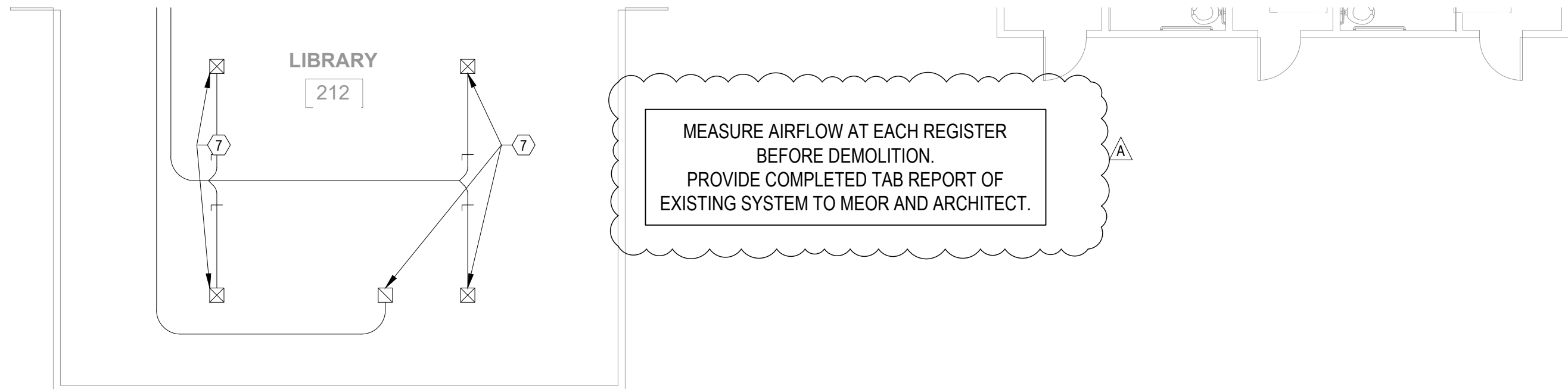
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	APPL NO.: 01-120124	
	JOB NO. 2021011.04	
tel: (408) 300 - 5160 fax: (408) 300 - 5121		DATE 11/10/22

DEMOLITION SHEET NOTES

1. REMOVE (E) EXTERIOR WALL HEAT PUMP, PROTECT (E) DUCT OPENINGS FOR NEW, CAULK AND ABANDON (E) ANCHORAGE HOLES.
2. REMOVE (E) INTERIOR WALL HEAT PUMP AND WALL SLEEVE PROTECT (E) OPENING FOR INSTALLATION OF NEW WALL SLEEVE.
3. REMOVE (E) TSTAT AND WIRING BACK TO (E) UNIT.
4. REMOVE (E) OUTDOOR UNIT AND REFRIGERANT PIPING COMPLETE, (E) HOUSEKEEPING PAD TO REMAIN.
5. REMOVE (E) INDOOR UNIT, (E) DUCTWORK TO REMAIN.
6. (E) DUCTWORK TO REMAIN, TYP.
7. (E) REGISTERS TO REMAIN, TYP.
8. REMOVE (E) OUTSIDE AIR AND RETURN DUCT BACK TO POC.
9. REMOVE (E) SUPPLY DUCT BACK TO POC.
10. (E) OUTSIDE AIR PLENUM AT (E) OUTSIDE AIR LOUVER TO REMAIN.



1
MP2.02

MODULAR BLDG FLOOR PLAN - DEMO - MECHANICAL & PLUMBING

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

CEG JOB NO: 21105



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Engineering Group

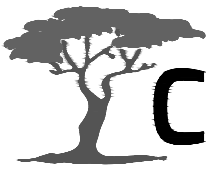
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387 S. 1st Street, Suite 300 San Jose, CA., 95113	FILE NO.: 41-26	SHEET AD1-MP2.02
	APPL NO.: 01-120124	
	JOB NO. 2021011.04	
	DATE 11/10/22	
tel: (408) 300 - 5160 fax: (408) 300 - 5121		

NEW SHEET NOTES


- 1. INSTALL EXTERIOR WALL HEAT PUMP AND CONNECT TO (E) REGISTERS.
- 2. INSTALL INTERIOR HEAT PUMP AND AND CONNECT TO (E) SUPPLY DUCT W/ FLEX CONNECTION. INSTALL FACTORY TRIM AT SIDES AND ABOVE UNIT TO CONCEAL (E) OPENING.
- 3. INSTALL THERMOSTAT ON WALL 48" MAX AFF AND WIRE TO UNIT.
- 4. INSTALL FAN COIL UNIT. CONNECT TO (E) CD IN ATTIC SPACE. SEE 2/MP2.04 FOR ENLARGED PLAN, SEE 10/MP6.01 FOR CD CONNECTION TO UNIT.
- 5. INSTALL HEAT PUMP ON (E) SLAB AND PROVIDE REFRIGERANT PIPING TO INDOOR UNIT.
- 6. INSTALL CEILING EXHAUST FAN AND CONNECT TO (E) OUTSIDE AIR LOUVER PLENUM.
- 7. CLEARANCE REQUIRED FOR FILTER REPLACEMENT.
- 8. 20"x16" LOW VOLTAGE MOTORIZED DAMPER.
- 9. 23"x15" LOW VOLTAGE MOTORIZED DAMPER.
- 10. FLEX DUCT AT CONNECTION TO UNIT.
- 11. MIXING PLENUM BELOW FAN COIL.
- 12. FILTER BOX THAT CAN FIT 4" AND 2" FILTER.
- 13. INSTALL 14"x72" OUT AIR LOUVER 12"AFF. SEE ARCHITECTS DRAWINGS FOR MOUNTING.



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CEG JOB NO: 21105

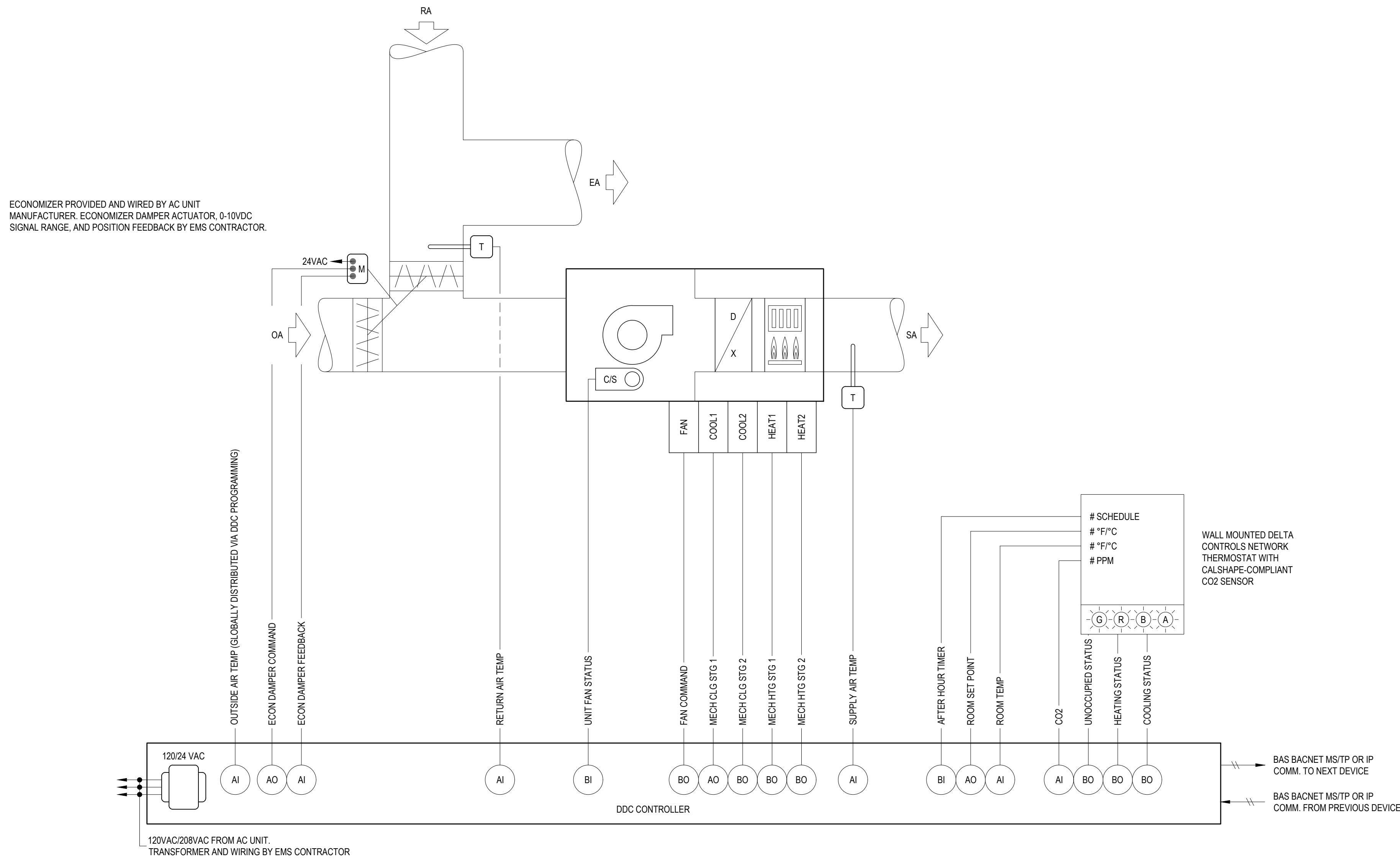
 387 S. 1st Street, Suite 300 San Jose, CA., 95113	BERESFORD ELEMENTARY SCHOOL HVAC REPLACEMENT SAN MATEO-FOSTER CITY SCHOOL DISTRICT	
	FILE NO.: 41-26	SHEET AD1-MP2.04
	APPL NO.: 01-120124	
	JOB NO. 2021011.04	
	DATE 11/10/22	

SEQUENCE OF OPERATION

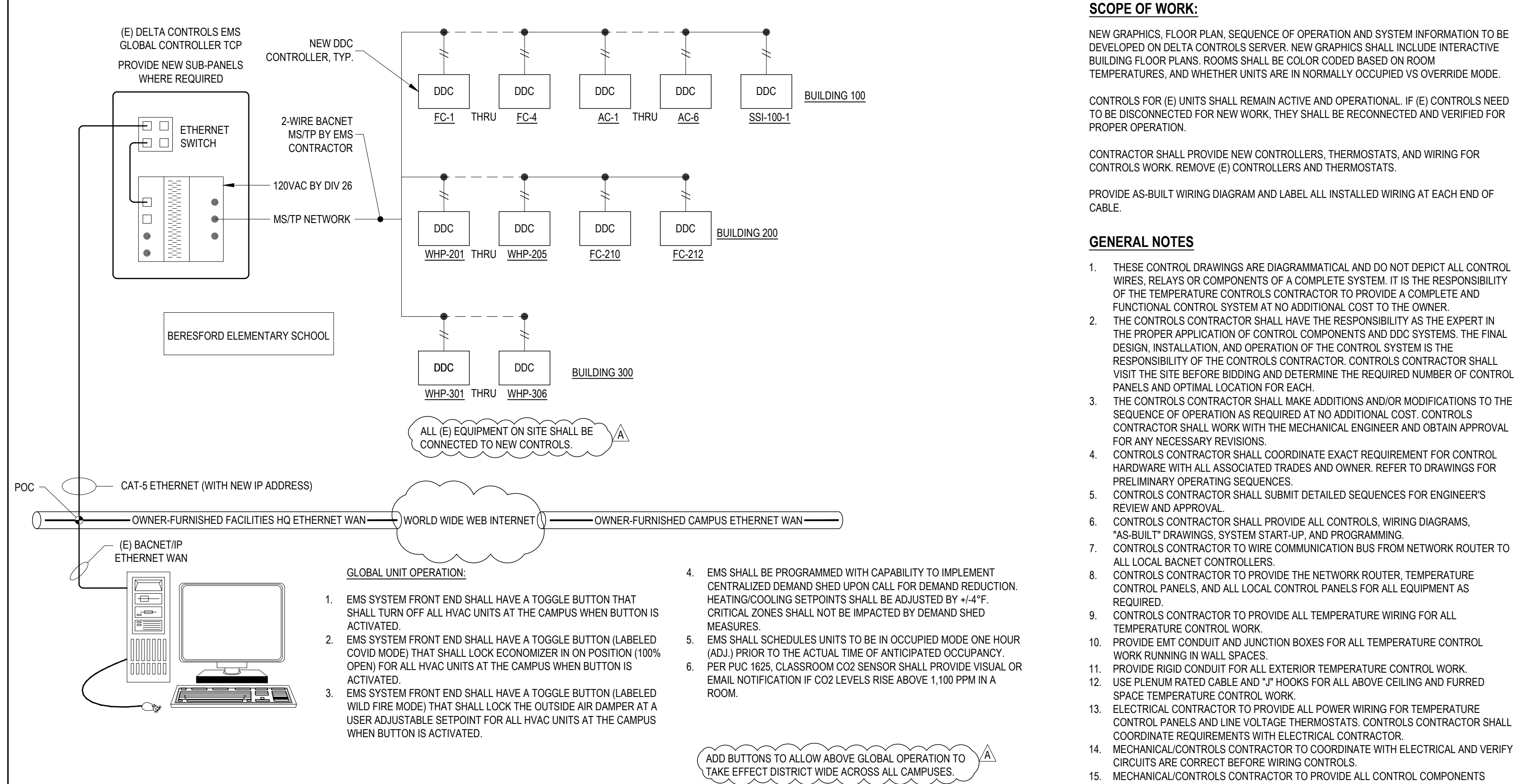
1. SYSTEM OVERVIEW
A. AC UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE TEMPERATURE SENSOR WITH INTEGRAL CO2 SENSOR.
C. ELECTRONIC ZONE TEMPERATURE SENSOR SHALL HAVE A TOUCH SCREEN LCD INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL, 2) VISUAL DISPLAY OF ROOM TEMPERATURE, ROOM CO2 AND AMBIENT OSA TEMPERATURE, AND 3) PUSHBUTTON AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. UNIT FAN OPERATION
A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTER-HOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.
B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. MINIMUM OUTDOOR AIR VENTILATION
A. WITH REFERENCE TO MECHANICAL EQUIPMENT SCHEDULE OSA DESIGN REQUIREMENTS, THE AIR BALANCER SHALL PROVIDE THE EMS SYSTEM WITH INFORMATION FOR TWO (2) SEPARATE MINIMUM OUTDOOR AIR (DESIGN OSA CFM) DAMPER SETPOINTS: ONE FOR LOW FAN SPEED AND ANOTHER FOR HIGH FAN SPEED. DESIGN OSA CFM IS LISTED ON EQUIPMENT SCHEDULE.
4. DEMAND CONTROL VENTILATION
A. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED CO2 SENSOR TO MONITOR ZONE CO2 CONCENTRATION.
B. DURING OCCUPIED MODE, A PROPORTIONAL CONTROL LOOP SHALL BE USED TO MAINTAIN THE CO2 CONCENTRATION BELOW 1,000 PPM (ADJUSTABLE), AS CO2 CONCENTRATION VARIES BETWEEN 800 PPM (ADJUSTABLE) AND 1,000 PPM (ADJUSTABLE), THE OUTSIDE AIR DAMPER SHALL MODULATE BETWEEN MINIMUM OSA SETPOINT AND FULLY OPEN.
C. SHOULD THE CO2 SENSOR FAIL TO OPERATE WITHIN ACCEPTABLE RANGE, THE OUTSIDE AIR DAMPER SHALL BE SET TO 30% (ADJUSTABLE) MORE THAN MINIMUM OUTSIDE AIR SETPOINT.
5. AUTOMATIC DEMAND SHED CONTROLS
A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.
B. UPON THE ACTIVATION OF A DEMAND SHED COMMAND FROM THE EMS SERVER, THE THERMOSTATS OCCUPIED COOLING AND HEATING SETPOINTS SHALL BE OFFSET UP AND DOWN BY 4°F OR MORE.
C. IN ADDITION TO THE IMPLEMENTATION OF AUTOMATIC DEMAND SHED CONTROL STRATEGIES, THE EMS SHALL ALLOW FOR SYSTEM-WIDE GLOBAL ADJUSTMENT TO ALL COOLING AND HEATING

- SETPOINTS FROM MAIN EMS SERVER APART FROM DEMAND SHED CONSERVATION MEASURES AND SHALL ALLOW FOR ALL GLOBAL SETPOINT CHANGE COMMANDS TO BE DEACTIVATED.
6. ZONE PRE-OCCUPANCY PURGE
A. THE EMS SHALL SCHEDULE THE ZONE TO BE IN OCCUPIED MODE ONE HOUR PRIOR TO THE ACTUAL TIME OF ANTICIPATED OCCUPANCY.
7. ECONOMIZER CONTROL
A. EMS UNITARY CONTROLLER SHALL BE DIRECTLY CONNECTED TO DISCHARGE AIR AND RETURN AIR TEMPERATURE SENSORS. GLOBAL DDC PROGRAMMING SHALL BE USED TO BROADCAST CENTRALIZED AMBIENT OUTSIDE AIR TEMPERATURE.
B. EMS UNITARY CONTROLLER SHALL ALSO BE DIRECTLY CONNECTED TO ECONOMIZER (OUTSIDERETURN AIR) DAMPER ACTUATOR, INCLUDING POSITION FEEDBACK SIGNAL.
C. SEE MINIMUM OUTDOOR AIR VENTILATION FOR OUTSIDE AIR DAMPER MINIMUM CFM SETPOINT.
D. THE EMS UNITARY CONTROLLER SHALL CONTINUOUSLY COMPARE THE CURRENT OSA TEMPERATURE TO THE ESTABLISHED AIR ECONOMIZER HIGH LIMIT SHUT OFF (ECON LOCK OUT) TEMPERATURE SET POINT (ADJUSTABLE) AND RETURN AIR TEMPERATURE.
E. WHEN CURRENT OSA TEMP IS LESS THAN OR EQUAL TO ECON LOCK OUT TEMP AND THE RETURN AIR TEMPERATURE, EMS UNITARY CONTROLLER SHALL USE THE OUTSIDE AIR FOR FREE COOLING.
F. WHEN THE OUTDOOR AIR DAMPER IS OPEN 100% FOR MORE THAN 5 MINUTES (ADJUSTABLE) AND THE NEED-COOLING SIGNAL CONTINUES TO INCREASE OR REACHES A MAXIMUM OF 100%, MECHANICAL COOLING WILL BE ACTIVATED.
G. THE ECONOMIZER WILL REMAIN IN USE DURING MECHANICAL COOLING AS LONG AS DISCHARGE AIR TEMPERATURE REMAINS ABOVE 55°F (ADJUSTABLE) AND CURRENT OSA TEMP IS LESS THAN ECON LOCK OUT TEMP AND RETURN AIR TEMP.
H. WHEN OSA TEMP IS ABOVE ECON LOCK OUT TEMP OR RETURN AIR TEMP, ECONOMIZER WILL BE DEACTIVATED AND ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.
I. ECONOMIZER WILL BE COMMANDED TO MINIMUM CFM SETPOINT WHEN UNIT IS IN HEATING MODE.
J. WHEN UNIT FAN IS NOT OPERATING, OUTSIDE AIR DAMPER SHALL BE COMMANDED CLOSED.
8. HEATING OPERATION
A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO STAGE A GAS REGULATING VALVE ON THE UNIT.
B. ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT AND MECHANICAL COOLING SHALL BE LOCKED OUT DURING HEATING MODE.
9. COOLING OPERATION
A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING SIGNAL.

- C. THE SECOND STAGE WILL ENABLE THE COMPRESSOR(S).
D. MECHANICAL HEATING SHALL BE LOCKED OUT DURING COOLING MODE.
10. FAULT DETECTION DIAGNOSTICS
A. THE EMS DDC CONTROLLER SHALL MONITOR FAULT STATUS OF THE FOLLOWING FAULT DETECTION DIAGNOSTIC CONDITIONS AND BROADCAST RESULTS VIA EMS NETWORK.
B. UNIT NOT ECONOMIZING WHEN ENABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS DOES NOT MATCH THE COMMANDED ECONOMIZER SETPOINT WHEN THE ECONOMIZER IS ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
C. UNIT ECONOMIZING WHEN DISABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND THE MIN CFM SETPOINT WHEN THE ECONOMIZER IS NOT ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
D. DAMPER MODULATION FAULT - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK PERCENT DOES NOT MATCH THE COMMANDED ECONOMIZER DAMPER PERCENT FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
E. EXCESS OUTDOOR AIR - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND MIN CFM SETPOINT IN HEATING MODE, AN ALARM SHALL BE GENERATED AND BROADCAST.
11. SETPOINTS
A. OCCUPIED HOURS SETPOINTS SHALL BE 68°F TO 74°F. (USER ADJUSTABLE AT THERMOSTAT WITHIN THIS RANGE).
B. UNOCCUPIED HOURS SETPOINTS SHALL BE 60°F HEATING AND 90°F COOLING.
C. DEADBAND SHALL BE 2°F.
12. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT BMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:
A. SUPPLY, RETURN AND OUTSIDE AIR TEMPERATURES.
B. ROOM TEMPERATURE.
C. ROOM CO2 CONCENTRATION.
D. CURRENT MODE (HEATING/COOLING/FAN).
E. CURRENT COMMAND STATUS OF FAN, ECONOMIZER, COMPRESSOR AND GAS VALVE.
F. FAN STATUS THRU CURRENT SWITCH.
G. ECONOMIZER ACTUATOR FEEDBACK STATUS.
13. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:
A. ROOM TEMPERATURE OUT OF BOUNDS.
B. ROOM CO2 TOO HIGH.
C. FAN NOT RUNNING.
D. DAMPER POSITION DOES NOT MATCH COMMAND.



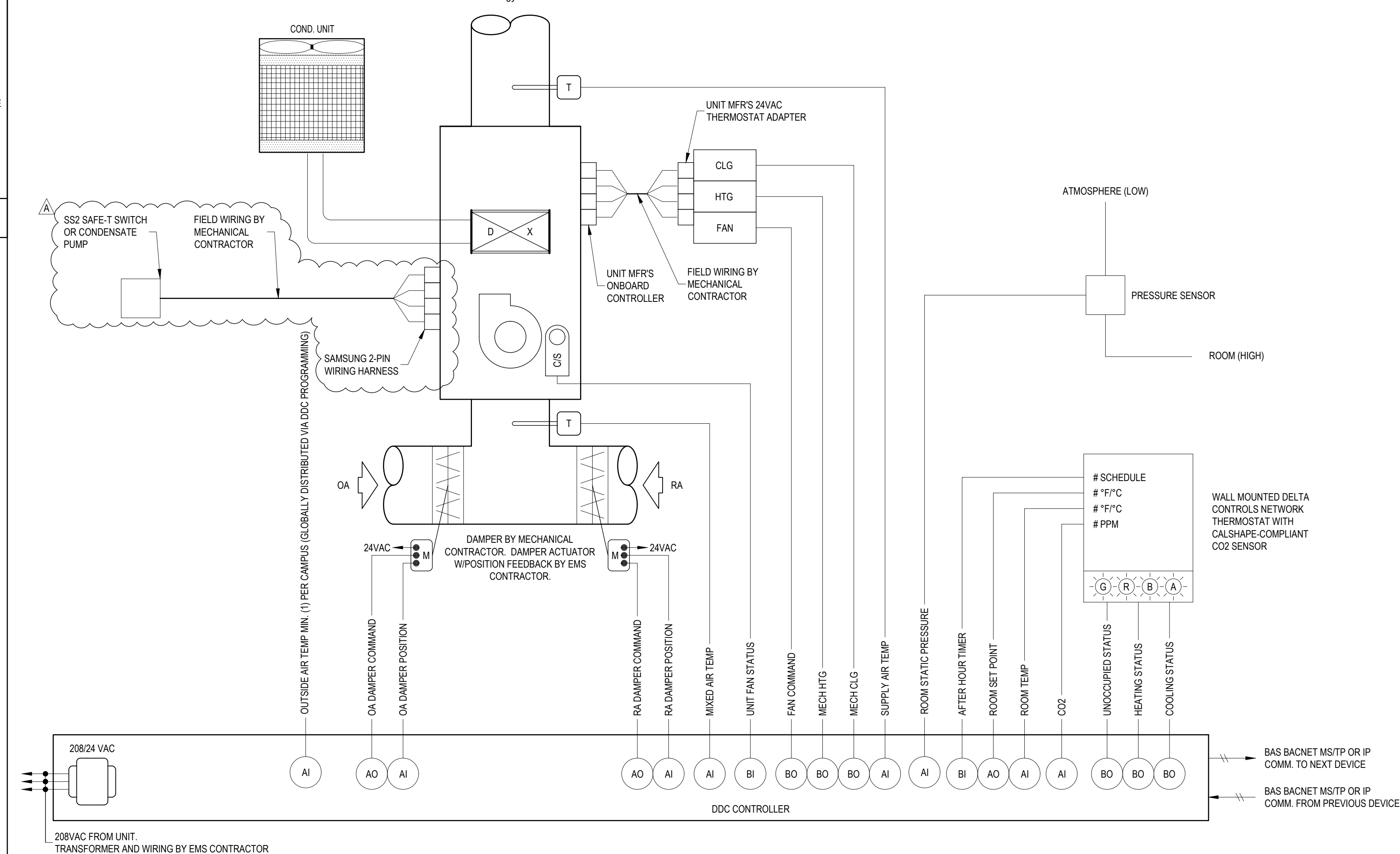
3 PACKAGED AC UNIT CONTROL SCHEMATIC



1 EMS SYSTEM ARCHITECTURE

SEQUENCE OF OPERATION

1. SYSTEM OVERVIEW
A. EACH FAN COIL HEAT PUMP UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC THERMOSTAT.
C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL, 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2, AND 3) AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION (2 HOURS MAX), THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. UNIT FAN OPERATION
A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN OVERRIDE MODE, THE FAN SHALL RUN CONTINUOUSLY.
B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. MINIMUM OUTDOOR AIR VENTILATION
A. DURING OCCUPIED MODE OR AFTER-HOURS MODE, THE OUTSIDE AIR DAMPER SHALL BE COMMANDED BY THE EMS UNITARY CONTROLLER TO MAINTAIN A POSITION WHICH SATISFIES THE MINIMUM (DESIGN) OUTDOOR AIR VENTILATION REQUIREMENTS FOR THE ZONE. DESIGN OSA CFM IS LISTED ON EQUIPMENT SCHEDULE. DAMPER POSITION(S) DETERMINED BY AIR BALANCING CONTRACTOR. RETURN AIR DAMPER SHALL BE ADJUSTED TO BE INVERSE OF OUTSIDE AIR DAMPER.
4. DEMAND CONTROL VENTILATION
A. IF ROOM CO2 LEVELS RISE ABOVE 1000 PPM (ADJ.), THE OUTSIDE AIR DAMPER SHALL BE MODULATED OPEN TO MAXIMUM POSITION UNTIL CO2 LEVELS DROP BELOW 800 PPM (ADJ.).
5. HEATING OPERATION
A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO MAINTAIN SETPOINT.
B. MECHANICAL COOLING TO BE LOCKED OUT DURING HEATING MODE.
6. ECONOMIZER CONTROL
A. EMS UNITARY CONTROLLER SHALL BE DIRECTLY CONNECTED TO DISCHARGE AIR AND RETURN AIR TEMPERATURE SENSORS. GLOBAL DDC PROGRAMMING SHALL BE USED TO BROADCAST CENTRALIZED AMBIENT OUTSIDE AIR TEMPERATURE.
B. EMS UNITARY CONTROLLER SHALL ALSO BE DIRECTLY CONNECTED TO ECONOMIZER (OUTSIDERETURN AIR) DAMPER ACTUATOR, INCLUDING POSITION FEEDBACK SIGNAL.
C. SEE MINIMUM OUTDOOR AIR VENTILATION FOR OUTSIDE AIR DAMPER MINIMUM CFM SETPOINT.
D. THE EMS UNITARY CONTROLLER SHALL CONTINUOUSLY COMPARE THE CURRENT OSA TEMPERATURE TO THE ESTABLISHED AIR ECONOMIZER WHEN HIGH LIMIT SHUT OFF (ECON LOCK OUT) TEMPERATURE SETPOINT (ADJUSTABLE) AND RETURN AIR TEMPERATURE.
E. WHEN CURRENT OSA TEMP IS LESS THAN OR EQUAL TO ECON LOCK OUT TEMP AND THE RETURN AIR TEMPERATURE, EMS UNITARY CONTROLLER SHALL USE THE OUTSIDE AIR FOR FREE COOLING.
F. WHEN THE OUTDOOR AIR DAMPER IS OPEN 100% FOR MORE THAN 5 MINUTES (ADJUSTABLE) AND THE NEED-COOLING SIGNAL CONTINUES TO INCREASE OR REACHES A MAXIMUM OF 100%, MECHANICAL COOLING WILL BE ACTIVATED.
G. THE ECONOMIZER WILL REMAIN IN USE DURING MECHANICAL COOLING AS LONG AS DISCHARGE AIR TEMPERATURE REMAINS ABOVE 55°F (ADJUSTABLE) AND CURRENT OSA TEMP IS LESS THAN ECON LOCK OUT TEMP AND RETURN AIR TEMP.
H. WHEN OSA TEMP IS ABOVE ECON LOCK OUT TEMP OR RETURN AIR TEMP, ECONOMIZER WILL BE DEACTIVATED AND ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.
I. ECONOMIZER WILL BE COMMANDED TO MINIMUM CFM SETPOINT WHEN UNIT IS IN HEATING MODE.
J. WHEN UNIT FAN IS NOT OPERATING, OUTSIDE AIR DAMPER SHALL BE COMMANDED CLOSED.
7. COOLING OPERATION
A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING SIGNAL.
B. FREE COOLING (ECONOMIZER) WILL BE USED FIRST WHEN POSSIBLE. MECHANICAL COOLING SHALL BE ENGAGED IF SETPOINT IS UNABLE TO BE MET WITH ECONOMIZING.
C. THE CONTROLLER WILL ENABLE THE COMPRESSOR(S) TO MAINTAIN THE ROOM SET POINT.
8. SETPOINTS
A. OCCUPIED HOURS SETPOINTS SHALL BE 68°F TO 74°F. (USER ADJUSTABLE AT THERMOSTAT WITHIN THIS RANGE).
B. UNOCCUPIED HOURS SETPOINTS SHALL BE 60°F HEATING AND 90°F COOLING.
C. DEADBAND SHALL BE 2°F.
9. FAULT DETECTION DIAGNOSTICS
A. THE EMS DDC CONTROLLER SHALL MONITOR FAULT STATUS OF THE FOLLOWING FAULT DETECTION DIAGNOSTIC CONDITIONS AND BROADCAST RESULTS VIA EMS NETWORK.
B. UNIT NOT ECONOMIZING WHEN ENABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS DOES NOT MATCH THE COMMANDED ECONOMIZER SETPOINT WHEN THE ECONOMIZER IS ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
C. UNIT ECONOMIZING WHEN DISABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND THE MIN CFM SETPOINT WHEN THE ECONOMIZER IS NOT ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
D. DAMPER MODULATION FAULT - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK PERCENT DOES NOT MATCH THE COMMANDED ECONOMIZER DAMPER PERCENT FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
E. EXCESS OUTDOOR AIR - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND MIN CFM SETPOINT IN HEATING MODE, AN ALARM SHALL BE GENERATED AND BROADCAST.
10. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT BMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:
A. SUPPLY AIR TEMPERATURE.
B. RETURN AIR TEMPERATURE.
C. OUTSIDE AIR TEMPERATURE.
D. ROOM TEMPERATURE.
E. ROOM CO2 LEVEL.
F. ROOM STATIC PRESSURE.
G. CURRENT MODE (HEATING/COOLING/FAN).
H. FAN STATUS THRU CURRENT SWITCH.
I. RETURN AIR DAMPER POSITION.
J. OUTSIDE AIR DAMPER POSITION.
K. RELIEF DAMPER POSITION.
11. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:
A. ROOM TEMPERATURE OUT OF BOUNDS.
B. ROOM CO2 TOO HIGH.
C. FAN NOT RUNNING.
D. DAMPER POSITION DOES NOT MATCH COMMAND.
E. OVERFLOW PROTECTION
A. UPON SIGNAL FROM SECONDARY CONDENSATE SWITCH OR IN-BUILT OVERFLOW PROTECTION FROM CONDENSATE PUMP, UNIT SHALL SHUT-DOWN.



2 CLASSROOM SPLIT SYSTEM HEAT PUMP / FAN COIL UNIT CONTROL SCHEMATIC

SCOPE OF WORK:

NEW GRAPHICS, FLOOR PLAN, SEQUENCE OF OPERATION AND SYSTEM INFORMATION TO BE DEVELOPED ON DELTA CONTROLS SERVER. NEW GRAPHICS SHALL INCLUDE: INTERACTIVE BUILDING FLOOR PLANS, ROOMS SHALL BE COLOR CODED BASED ON ROOM TEMPERATURES, AND WHETHER UNITS ARE IN NORMALLY OCCUPIED VS OVERRIDE MODE.

CONTROLS FOR (E) UNITS SHALL REMAIN ACTIVE AND OPERATIONAL. IF (E) CONTROLS NEED TO BE DISCONNECTED FOR NEW WORK, THEY SHALL BE RECONNECTED AND VERIFIED FOR PROPER OPERATION.

CONTRACTOR SHALL PROVIDE NEW CONTROLLERS, THERMOSTATS, AND WIRING FOR CONTROLS WORK. REMOVE (E) CONTROLLERS AND THERMOSTATS.

PROVIDE AS-BUILT WIRING DIAGRAM AND LABEL ALL INSTALLED WIRING AT EACH END OF CABLE.

GENERAL NOTES

1. THESE CONTROL DRAWINGS ARE DIAGRAMMATICAL AND DO NOT DEPICT ALL CONTROL WIRES, RELAYS OR COMPONENTS OF A COMPLETE SYSTEM. IT IS THE RESPONSIBILITY OF THE TEMPERATURE CONTROLS CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONAL CONTROL SYSTEM AT NO ADDITIONAL COST TO THE OWNER.
2. THE CONTROLS CONTRACTOR SHALL HAVE THE RESPONSIBILITY AS THE EXPERT IN THE PROPER APPLICATION OF CONTROL COMPONENTS AND DDC SYSTEMS. THE FINAL DESIGN, INSTALLATION, AND OPERATION OF THE CONTROL SYSTEM IS THE RESPONSIBILITY OF THE CONTROLS CONTRACTOR. CONTROLS CONTRACTOR SHALL VISIT THE SITE BEFORE BIDDING AND DETERMINE THE REQUIRED NUMBER OF CONTROL PANELS AND OPTIMAL LOCATION FOR EACH.
3. THE CONTROLS CONTRACTOR SHALL MAKE ADDITIONS AND/OR MODIFICATIONS TO THE SEQUENCE OF OPERATION AS REQUIRED AT NO ADDITIONAL COST. CONTROLS CONTRACTOR SHALL WORK WITH THE MECHANICAL ENGINEER AND OBTAIN APPROVAL FOR ANY NECESSARY REVISIONS.
4. CONTROLS CONTRACTOR SHALL COORDINATE EXACT REQUIREMENT FOR CONTROL HARDWARE WITH ALL ASSOCIATED TRADES AND OWNER. REFER TO DRAWINGS FOR PRELIMINARY OPERATING SEQUENCES.
5. CONTROLS CONTRACTOR SHALL SUBMIT DETAILED SEQUENCES FOR ENGINEERS REVIEW AND APPROVAL.
6. CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROLS, WIRING DIAGRAMS, "AS-BUILT" DRAWINGS, SYSTEM START-UP, AND PROGRAMMING.
7. CONTROLS CONTRACTOR TO WIRE COMMUNICATION BUS FROM NETWORK ROUTER TO ALL LOCAL BACNET CONTROLLERS.
8. CONTROLS CONTRACTOR TO PROVIDE THE NETWORK ROUTER, TEMPERATURE CONTROL PANELS, AND ALL LOCAL CONTROL PANELS FOR ALL EQUIPMENT AS REQUIRED.
9. CONTROLS CONTRACTOR TO PROVIDE ALL TEMPERATURE WIRING FOR ALL TEMPERATURE CONTROL WORK.
10. PROVIDE EMT CONDUIT AND JUNCTION BOXES FOR ALL TEMPERATURE CONTROL WORK RUNNING IN WALL SPACES.
11. PROVIDE RIGID CONDUIT FOR ALL EXTERIOR TEMPERATURE CONTROL WORK.
12. USE PLENUM RATED CABLE AND "T" HOOPS FOR ALL ABOVE CEILING AND FURRED SPACE TEMPERATURE CONTROL WORK.
13. ELECTRICAL CONTRACTOR TO PROVIDE ALL POWER WIRING FOR TEMPERATURE CONTROL PANELS AND LINE VOLTAGE THERMOSTATS. CONTROLS CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
14. MECHANICAL/CONTROLS CONTRACTOR TO COORDINATE WITH ELECTRICAL AND VERIFY CIRCUITS ARE CORRECT BEFORE WIRING CONTROLS.
15. MECHANICAL/CONTROLS CONTRACTOR TO PROVIDE ALL CONTROL COMPONENTS NECESSARY TO FULFILL THE DESIGN INTENT OF THE DRAWINGS.

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SCHOOL - HVAC
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SAN MATEO-FOSTER CITY
SCHOOL DISTRICT

CONSULTANT

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REGISTERED PROFESSIONAL ENGINEER
Mechanical
No. M31059
EXP. JUNE 30, 2023
STATE OF CALIFORNIA

STATE

DSA FILE NUMBER 41-26

APPL # 01-120124

REVISIONS

No.	Description	Date
A	Addendum 1	11/10/2022

MILESTONES

SD	04/01/2022
90% CD	05/02/2022
DSA SUB	05/10/2022
BACKCHECK	08/23/2022

SHEET

CONTROLS -
MECHANICAL

DATE

11/10/2022

JOB #

2021011.04

SHEET #

AD1-
MP5.01

1. THE EXHAUST FAN SHALL BE CONTROLLED BY LINE VOLTAGE THERMOSTAT SET AT 85°F (ADJ.).



1. SYSTEM OVERVIEW
 - A. EACH HEAT PUMP UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
 - B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE THERMOSTAT.
 - C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COLDER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2; AND 3) AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ACCESSIBLE LOCKOUT. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. UNIT FAN OPERATION
 - A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTER-HOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.
 - B. DURING UNOCCUPIED MODES, AS DETERMINED BY EMS, THE FAN SHALL FOLLOW THE UNITARY FAN SCHEDULE WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. MINIMUM OUTDOOR AIR VENTILATION
 - A. DURING OCCUPIED MODE OR AFTER-HOURS MODE, THE OUTSIDE AIR DAMPER SHALL BE COMMANDED BY THE UNITS OWN INTERNAL CONTROLLER TO MAINTAIN A POSITION WHICH SATISFIES THE MINIMUM OUTDOOR AIR VENTILATION REQUIREMENTS FOR THE ZONE (DAMPER POSITIONS) DETERMINED BY AIR BALANCING CONTRACTOR.
4. DEMAND CONTROL VENTILATION
 - A. IF ROOM CO2 LEVELS RISE ABOVE 1000 PPM (ADJ.), THE OUTSIDE AIR DAMPER SHALL BE MODULATED UPON TO MAXIMUM POSITION UNTIL CO2 LEVELS DROP BELOW 800 PPM (ADJ.).
5. AUTOMATIC DEMAND REDUCTION CONTROLS
 - A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES UPON RECEIPT OF AUTOMATIC DEMAND REDUCTION. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.



2 WALL MOUNT SPLIT SYSTEM CONTROL SCHEMATIC

- A. EACH UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
- B. EACH UNIT WILL BE DIRECTLY CONNECTED TO A WALL MOUNTED ELECTRONIC THERMOSTAT.
- C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SET POINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2; AND 3) A "TIMER" FUNCTION. TIMER CONTROL, WITH USER ADJUSTABLE DURATION (20-60 MIN), MAY BE USED AFTER HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
- D. EMS UNITARY CONTROLLER SHALL BE WIRED TO MANUFACTURER'S THERMOSTAT ADAPTER.
- A. THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. HEATING OPERATION
A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO MAINTAIN SETPOINT.
- B. MECHANICAL COOLING TO BE LOCKED OUT DURING HEATING MODE.
4. COOLING OPERATION
A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING SIGNAL.
- B. THE CONTROLLER WILL ENABLE THE COMPRESSOR(S) TO MAINTAIN THE ROOM SET POINT.
- C. MECHANICAL HEATING TO BE LOCKED OUT DURING COOLING MODE.
5. SETPOINTS
A. ROOM COOLING HOURS SETPOINTS SHALL BE 68° TO 74° (USER ADJUSTABLE AT THERMOSTAT WITHIN THIS RANGE).
B. UNOCCUPIED HOURS SETPOINTS SHALL BE 60° HEATING AND 50° F COOLING.
C. DEADBAND SHALL BE 2° F.
6. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT EMS OPERATOR WORKSTATION GRAPHICAL USER INTERFACE:
A. OUTSIDE AIR TEMPERATURE.
B. ROOM TEMPERATURE.
C. ROOM CO2 LEVEL.
C. CURRENT MODE (HEATING/COOING/FAN).
7. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:
A. ROOM TEMPERATURE OUT OF BOUNDS.
B. ROOM CO2 TOO HIGH.
8. OVERFLOW PROTECTION
A. A SIGNAL FROM IN-BUILT OVERFLOW PROTECTION FROM CONDENSATE PUMP UNIT SHALL SHUT-DOWN.

8. OVERFLOW PROTECTION

A. UPON SIGNAL FROM IN-BUILT OVERFLOW PROTECTION FROM CONDENSATE PUMP, UNIT SHALL SHUT-DOWN.

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01-120124

REVISIONS

No.	Description	Date
A	Addendum 1	11/10/2022

MILESTONES

SD	04/01/2022
90% CD	05/02/2022
DSA SUB	05/10/2022
BACKCHECK	08/23/2022

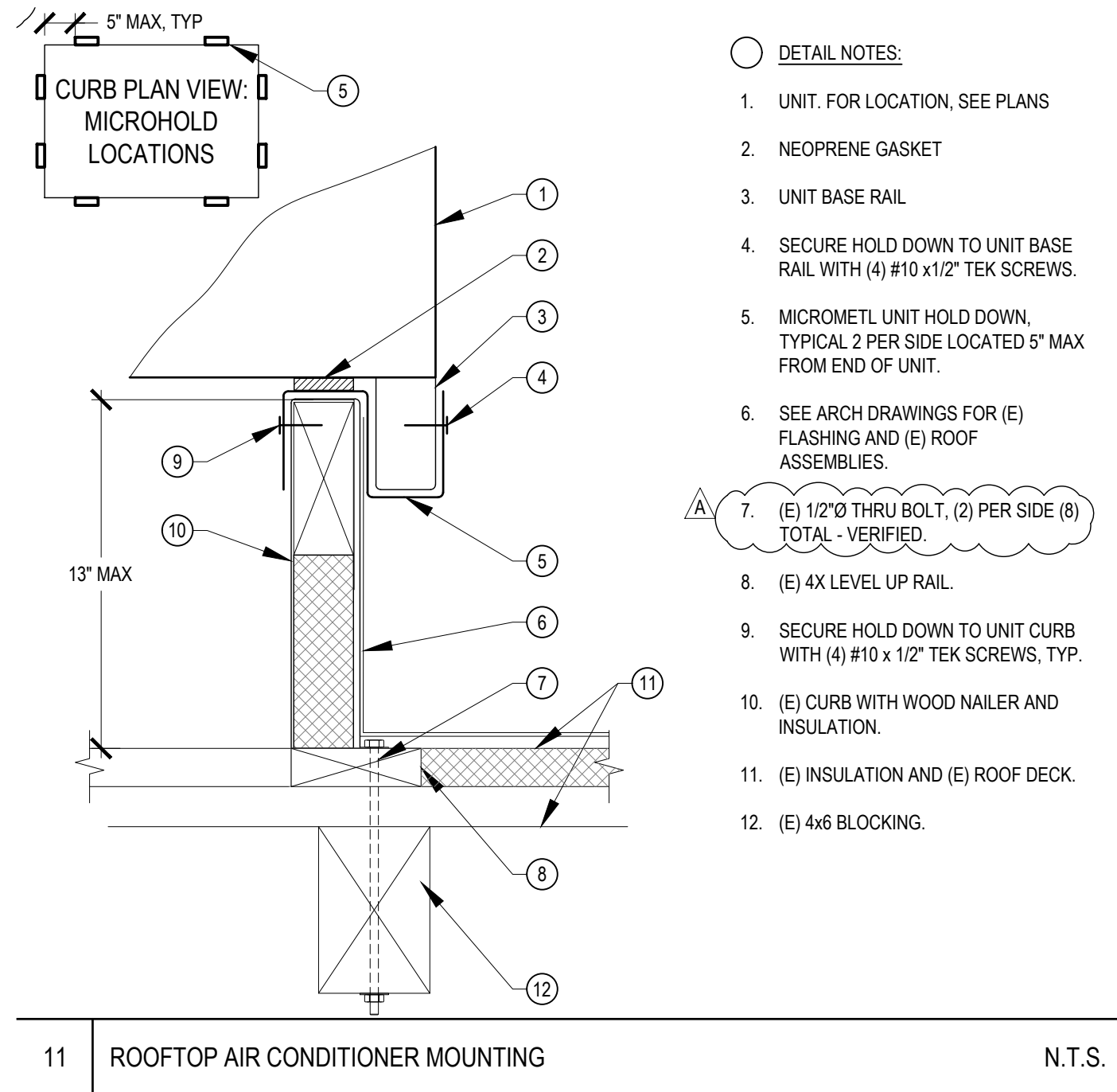
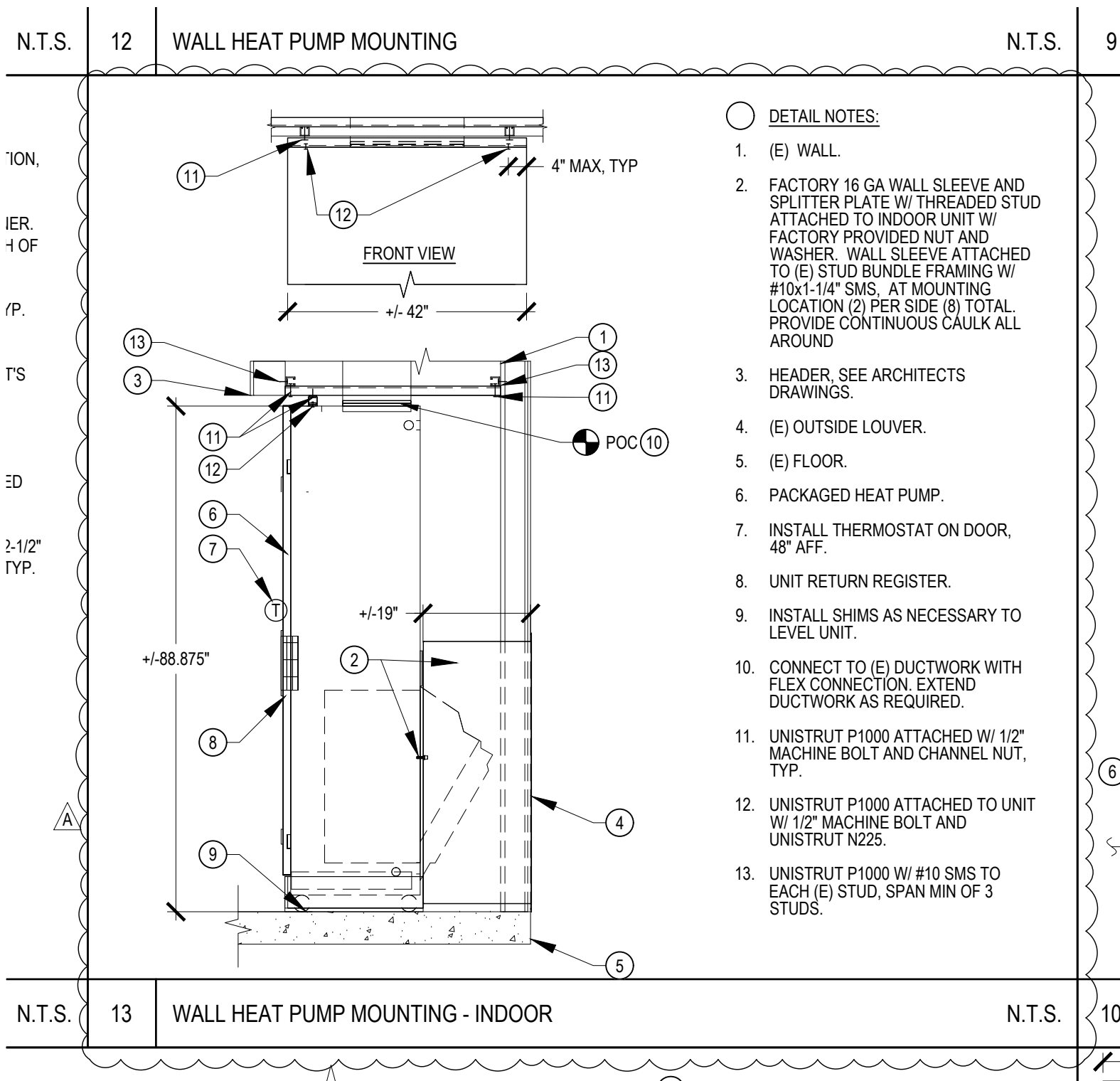
SHEET

CONTROLS - MECHANICAL

DATE 11/10/2022

JOB # 2021011.04


SHEET # **AD1-
MP5.02**

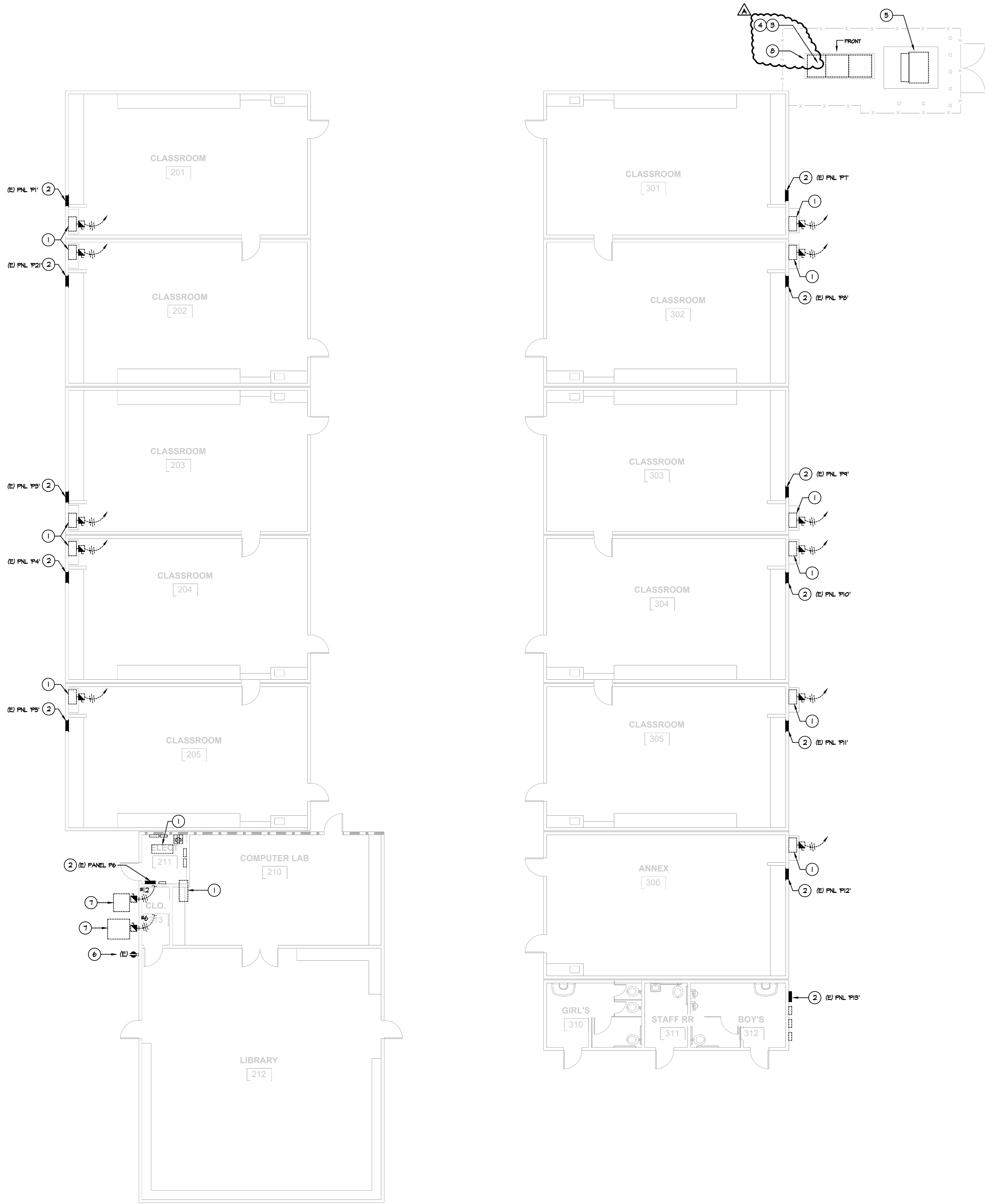


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<div></div> <div>387 S. 1st Street, Suite 300 San Jose, CA., 95113</div> <div>tel: (408) 300 - 5160 fax: (408) 300 - 5121</div>		BERESFORD ELEMENTARY SCHOOL HVAC REPLACEMENT	
		SAN MATEO-FOSTER CITY SCHOOL DISTRICT	
		FILE NO.: 41-26	SHEET AD1-MP6.01
		APPL NO.: 01-120124	
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		DATE 11/10/22	



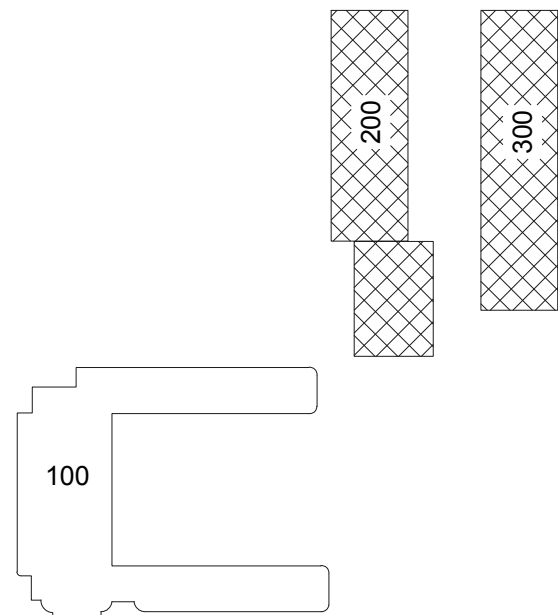
GENERAL NOTES:

1. CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL DEMO REQUIREMENTS.
2. EXISTING ELECTRICAL PANELS ARE TO REMAIN.
3. SEE NEW ELECTRICAL FLOOR PLANS FOR ADDITIONAL REQUIREMENTS.
4. SEE DEMO AND NEW SINGLE LINE DIAGRAMS FOR ADDITIONAL REQUIREMENTS.
5. THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIMENSIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL 1/ES.1 FOR ADDITIONAL REQUIREMENTS.

DEMOLITION SHEET NOTES:

1. EXISTING MECHANICAL UNIT TO BE DEMOLISHED. PULL EXISTING ELECTRICAL CIRCUITRY BACK TO SOURCE AND REMOVE. REMOVE ALL CONDUITS, J-BOXES AND DISCONNECT SWITCH ASSOCIATED WITH THE DEMOLISHED UNIT.
2. EXISTING ELECTRICAL PANEL TO REMAIN.
3. EXISTING MAIN SWITCHBOARD TO BE REMOVED AND REPLACED WITH NEW SWITCHBOARD IN EXISTING LOCATION. COORDINATE WITH P64E FOR DISCONNECT AND REMOVAL UTILITY METER. SEE DEMO AND NEW SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
4. CONTRACTOR SHALL VERIFY THE FOOTPRINTS OF THE EXISTING MAIN SWITCHBOARD SECTIONS IN THE FIELD AND VERIFY THE LOCATION OF THE EXISTING UNDERGROUND STUB UP. THE EXISTING UNDERGROUND CONDUIT STUB UPS AND CIRCUITRY ARE TO BE REUSED AND RECONNECTED. PROTECT AND SECURE THE EXISTING UNDERGROUND CIRCUITRY DURING DEMOLITION. COORDINATE THE EXISTING CONDITION WITH THE INSTALLATION OF THE NEW ELECTRICAL EQUIPMENT AT THE SAME LOCATION.
5. EXISTING PAD MOUNTED P64E TRANSFORMER TO REMAIN. COORDINATE WITH P64E FOR THE DISCONNECTION AND RECONNECTION OF THE EXISTING P64E SECONDARY CONDUCTORS. SEE DEMO AND SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
6. EXISTING EXTERIOR DUPLEX RECEPTACLE TO REMAIN.
7. EXISTING MECHANICAL UNIT TO BE DISCONNECTED AND DEMOLISHED. EXISTING CIRCUITRY AND HOVERIN CONDUIT TO REMAIN FOR REUSE. EXISTING FUSED DISCONNECT SWITCH TO REMAIN FOR REUSE. REMOVE FUSE AND REPLACE WITH NEW.
8. EXISTING CONCRETE PAD IS TO REMAIN FOR REUSE. REMOVE EXISTING SWITCHBOARD AND INSTALL NEW SWITCHBOARD ON EXISTING PAD. EXISTING STAINLESS STEEL EXPANSION ANCHORS INSIDE THE PAD SHALL BE CUT OFF. ANY EXISTING EXPANSION ANCHORS IN THE PAD THAT ARE NOT STAINLESS STEEL SHALL BE COMPLETELY REMOVED. FILL THE HOLES WITH GROUT OR EPOXY. ANY NEW ANCHORS USED FOR THE NEW SWITCHBOARD SHALL BE AT LEAST THREE INCHES AWAY FROM ANY EXISTING ANCHORS REMAINING IN THE PAD.

BUILDING KEY



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APPL # 01-120124

REVISIONS

No.	Description	Date
1	APPENDIX 1	11/10/2022

MILESTONES

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90% CD	05/02/2022
DSA SUB	05/10/2022
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SHEET

**DEMOLITION
FLOOR PLAN -
MODULAR
BUILDING**

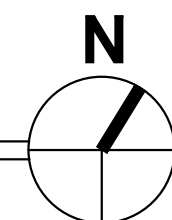
DATE 11/10/2022

JOB # 2021011.04

SHEET # AD1-
E2.2

1 DEMOLITION FLOOR PLAN - MODULAR BUILDING

E2.2 SCALE: 1/8" = 1'-0"



SHEET NOTES:

15

INSTALL NEW MAIN SWITCHBOARD "MSB-1" ON EXISTING CONCRETE PAD. SWITCHBOARD SHALL BE OFCI PER ADI-E4.2. INSTALL AT EXISTING LOCATION. COORDINATE WITH EXISTING CONDITION AND EXISTING CONDUIT STUB UP LOCATIONS. NEW EXPANSION ANCHORS SHALL BE INSTALLED A MINIMUM OF THREE INCHES AWAY FROM ANY EXISTING EXPANSION ANCHORS REMAINING IN THE EXISTING PAD. SEE DEMO AND SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

A



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APPL NO.:	01-120124	
JOB NO.	2021011.04	
DATE	11/10/22	

GENERAL NOTES:

1. SEE NEW ELECTRICAL FLOOR PLAN E3.2 FOR ADDITIONAL SWITCHBOARD REQUIREMENTS.
2. SEE NEW SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
3. COORDINATE WITH THE PG&E UTILITY COMPANY FOR THE DISCONNECTING AND REMOVAL OF ALL ASSOCIATED EQUIPMENT AND CABLES.
4. CONTRACTOR SHALL CONFIRM THE EXISTING CIRCUIT BREAKERS ON THE EXISTING MAIN SWITCHBOARD IN THE FIELD WITH THE INFORMATION NOTED ON THE DEMOLITION SINGLE LINE DIAGRAM AND INFORM THE DESIGN TEAM OF ANY DISCREPANCIES.
5. CONTRACTOR SHALL NOTE THE EXISTING LABELS AND IDENTIFICATION NAMEPLATES AT THE EXISTING MAIN SWITCHBOARD'S CIRCUIT BREAKERS. TAG AND LABEL THE EXISTING CABLES AS REQUIRED TO IDENTIFY AND RECONNECT DURING NEW WORK.
6. THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIMENSIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL I/E5.1 FOR ADDITIONAL REQUIREMENTS.



7. EXISTING CONDUITS AND SUBSTRUCTURE/CABLING SHALL REMAIN PROTECTED DURING DEMOLITION AND NEW INSTALLATION OF MAIN SWITCHBOARD IN SAME LOCATION.



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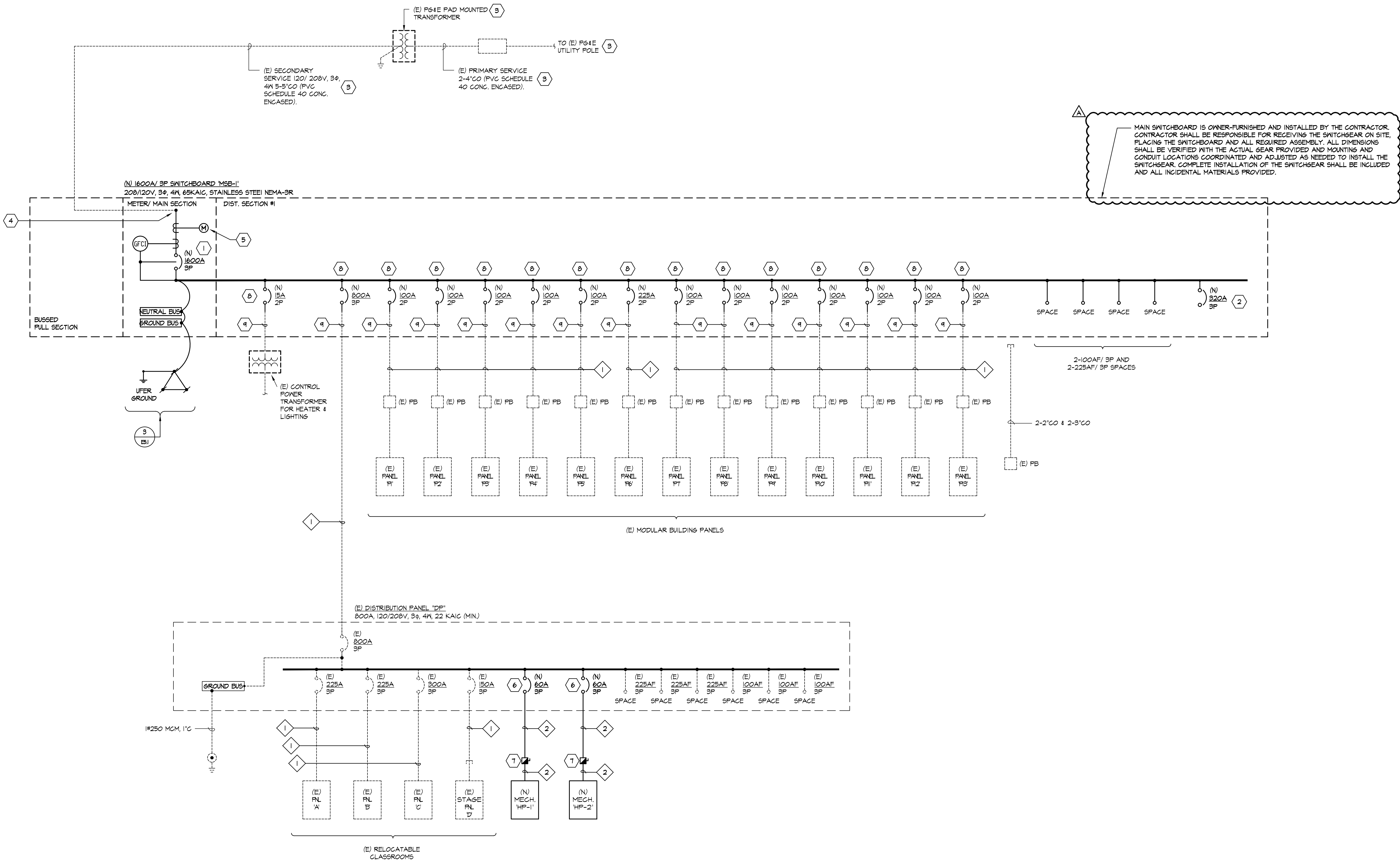


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GENERAL NOTES:

- SEE DEMO SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- SEE DETAIL 5/ES.1 FOR MAIN SWITCHBOARD GROUNDING REQUIREMENTS.
- SEE PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS.
- FUSED AND UNFUSED DISCONNECT SWITCHES SHALL BE 600V RATED, HEAVY DUTY CYCLE, RATED FOR MECHANICAL UNITS SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION.
- SEE THE DEMO FLOOR PLANS AND NEW FLOOR PLANS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE THE REQUIRED ARC FLASH HAZARD WARNING LABEL TO MEET THE REQUIREMENTS OF CEC 110.16. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE MAINTENANCE SWITCH FOR ARC ENERGY REDUCTION TO MEET THE REQUIREMENTS OF CEC 240.81.
- PROPERLY LABEL CIRCUIT BREAKER'S NAMEPLATE IDENTIFICATION IN NEW MAIN SWITCHBOARD "MSB-1" TO MATCH THE IDENTIFICATION PREVIOUSLY USED.
- THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIVISIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL 1/ES.1 FOR NEW SWITCHBOARD DIMENSIONS AND ADDITIONAL REQUIREMENTS.
- PROVIDE THE ADDRESS OF THE SITE ON AN ENGRAVED NAMEPLATE. LOCATE AT THE PG&E METER SECTION. INSTALL AND PROVIDE PER THE PG&E GREENBOOK REQUIREMENTS.
- EXISTING CONDUITS AND SUBSTRUCTURE/CABLING SHALL REMAIN PROTECTED DURING DEMOLITION AND NEW INSTALLATION OF MAIN SWITCHBOARD IN SAME LOCATION.
- SEAL ALL CONDUITS ENTERING THE NEW SWITCHBOARD TO PREVENT WATER INTRUSION.

SHEET NOTES:

- MAIN BREAKER SHALL BE 600 PER NEC.
- PV BREAKER TO BE INSTALLED AT THE FURTHEST POINT ON THE BUS BAR.
- EXISTING PG&E UTILITY TO REMAIN FOR REUSE.
- EXISTING PG&E SECONDARY CABLE TO BE CONNECTED TO NEW MAIN SWITCHBOARD "MSB-1". COORDINATE WITH PG&E FOR ADDITIONAL REQUIREMENTS.
- PROVIDE PG&E METER PER PG&E REQUIREMENTS.
- PROVIDE NEW CIRCUIT BREAKER IN AVAILABLE SPACE. NEW CIRCUIT BREAKER TO MATCH EXISTING FRAME, STYLE AND AIC RATINGS. PROVIDE ALL HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
- NEW 60A-3P, NEMA-3R FUSED DISCONNECT SWITCH FOR MECHANICAL UNIT.
- RECONNECT THE EXISTING FEEDER CABLES. TERMINATE THE EXISTING FEEDER CABLES TO THE ASSOCIATED CIRCUIT BREAKER SIZE. COORDINATE WITH THE INFORMATION OBTAINED FROM THE DEMOLISHED MAIN SWITCHBOARD.
- CONTRACTOR SHALL COORDINATE THE EXISTING CABLE LENGTH WITH THE ASSOCIATED CIRCUIT BREAKER TO BE CONNECTED. THE PLACEMENT OF THE CIRCUIT BREAKER IN THE NEW MAIN SWITCHBOARD SHALL BE COORDINATED WITH THE LENGTH OF THE EXISTING CABLES. CIRCUIT BREAKER SHALL BE ARRANGED SUCH THAT ITS LOCATION WILL ALLOW THE LENGTH OF THE EXISTING FEEDER CABLES TO PROPERLY TERMINATE WITHOUT SPLICING.

CONDUIT SCHEDULE:

- EXISTING FEEDER TO REMAIN.
- (N) 1 1/2" - (3) #4 + (1) #8 GND.

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SHEET

NEW SINGLE
LINE DIAGRAM

DATE

11/10/2022

JOB #

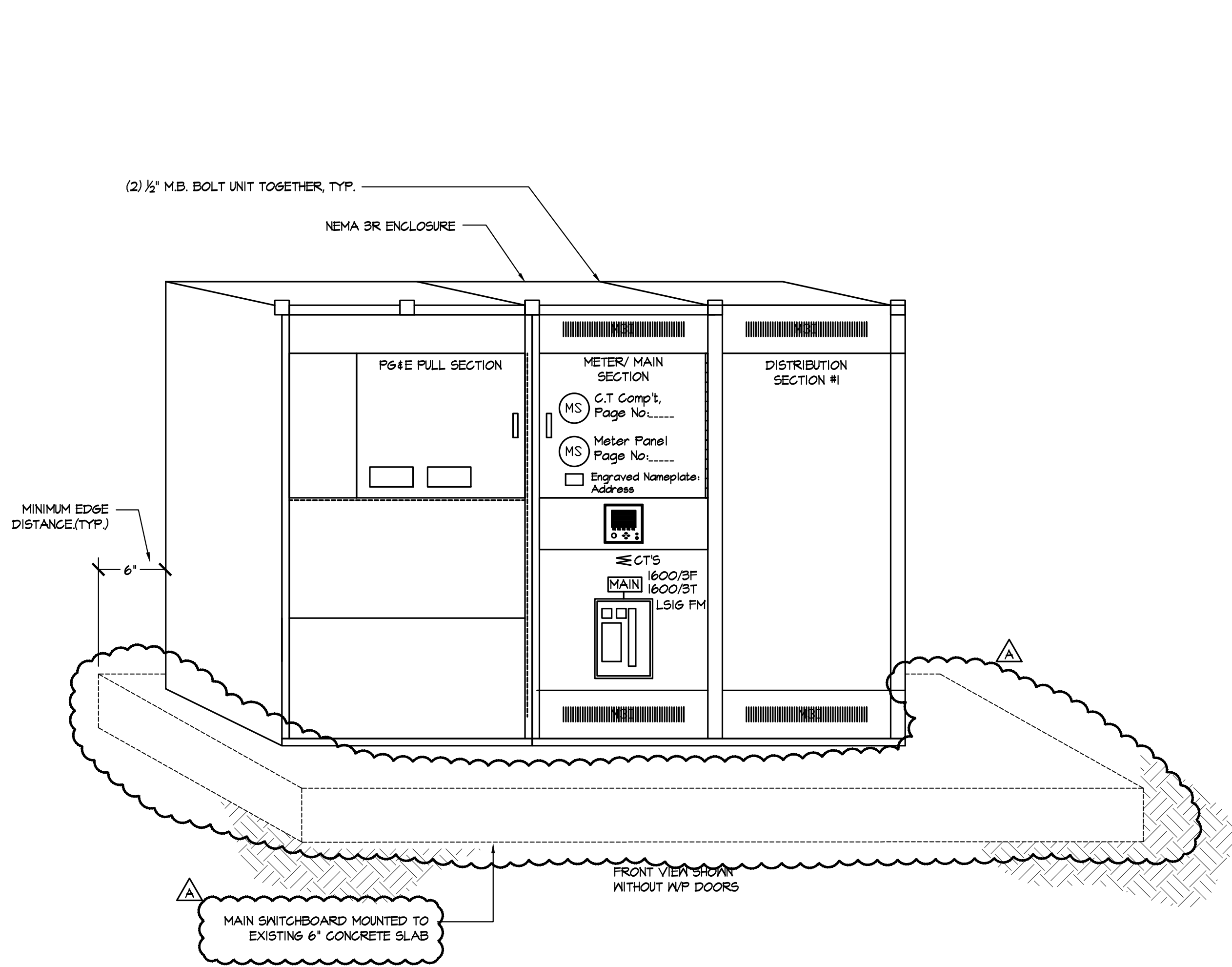
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AD1-
E4.2

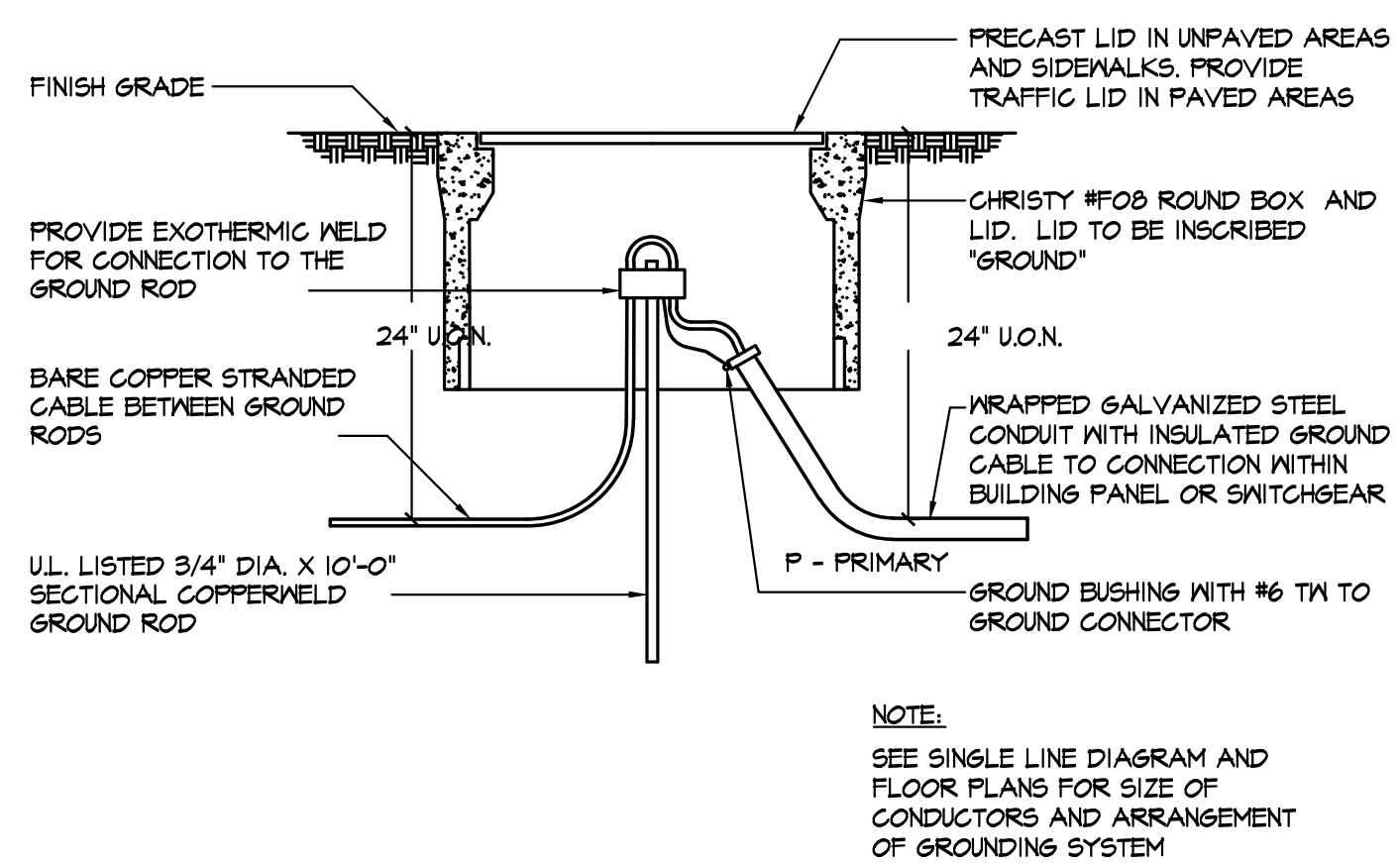
1 NEW SINGLE LINE DIAGRAM

E4.2 NOT TO SCALE



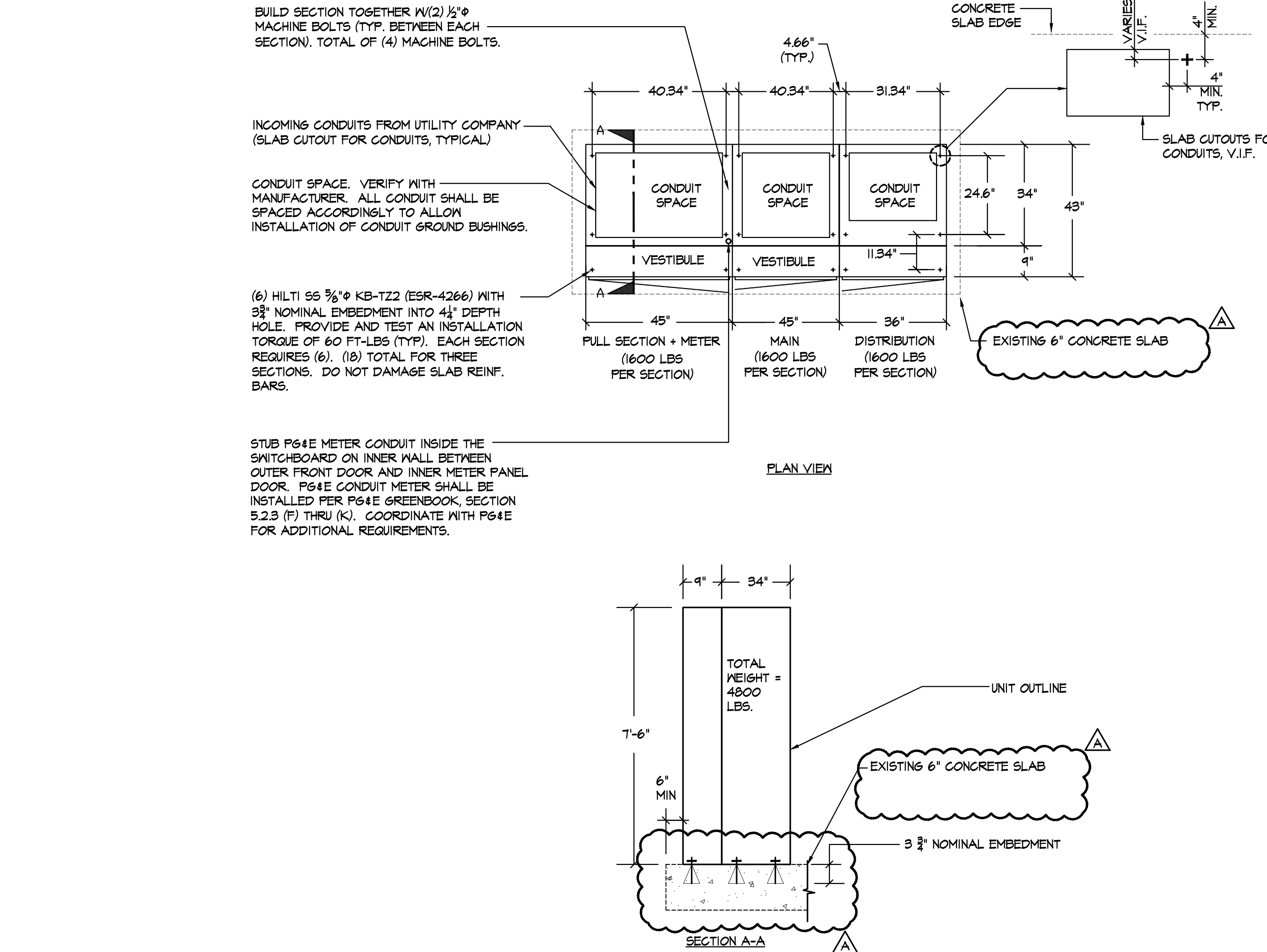
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E5.1 NOT TO SCALE

NEMA 3R MAIN SWITCHBOARD ELEVATION AND ANCHORAGE DETAIL



2
E5.1 NOT TO SCALE

GROUND ROD INSPECTION WELL FOR MULTIPLE GROUND RODS



- NOTES:**
- THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED FOR GROUNDING OR BONDING OF EQUIPMENT, STRUCTURES OR FRAMES REQUIRED TO BE GROUND OR BONDED (250.32(B)). PROVIDE ALL OF THE CONNECTIONS BELOW AND BOND TO THE EQUIPMENT GROUNDING CONDUCTOR.
 - GROUNDING ELECTRODE CONDUCTOR. GROUNDING ELECTRODE CONDUCTOR SHALL BE BARE OR INSULATED COPPER AND SHALL BE SIZED PER TABLE 250.66.
 - NOT USED.
 - EQUIPMENT BONDING JUMPER. EQUIPMENT BONDING JUMPER SHALL BE INSULATED COPPER AND SHALL BE SIZED PER TABLE 250.102.
 - PROVIDE A MINIMUM OF (3) GROUND ROD. GROUND ROD SHALL BE 10' LONG BY 3/4" DIAMETER COPPERCLAD. GROUNDING ELECTRODE CONDUCTOR SHALL BE BONDED TO THE GROUND ROD VIA EXOTHERMIC WELD. GROUND RODS SHALL BE INSTALLED IN A ROUND BOX. SEE DETAIL FOR BOX/INSTALLATION REQUIREMENTS.
 - PROVIDE GROUNDING ELECTRODE CONDUCTOR CONNECTION TO THE NEAREST UNDERGROUND WATER PIPE IN DIRECT CONTACT WITH EARTH FOR A MINIMUM OF 10 FEET. WATER PIPE SHALL BE ELECTRICALLY CONTINUOUS TO POINTS OF CONNECTION OF THE GROUNDING ELECTRODE CONDUCTOR. CONNECTION POINT SHALL NOT BE GREATER THAN 5' FROM THE POINT OF ENTRANCE OF THE UNDERGROUND WATER PIPE.
 - PROVIDE GROUNDING ELECTRODE CONDUCTOR CONNECTION TO THE NEAREST METAL FRAME OR STRUCTURAL STEEL.
 - PROVIDE GROUNDING ELECTRODE CONDUCTOR CONNECTION TO ALL OTHER LOCAL METAL UNDERGROUND SYSTEMS OR STRUCTURES, AS REQUIRED WHEN AVAILABLE.
 - PROVIDE A CONCRETE ENCASED ELECTRODE (UFER) IN AND NEAR THE BOTTOM OF THE STRUCTURAL FOOTING OR SLAB ON GRADE THAT IS IN DIRECT CONTACT WITH EARTH. THE ELECTRODE SHALL BE A MINIMUM OF 20 FEET LONG INSIDE THE PAD, FOOTING OR SLAB. THE ELECTRODE CONDUCTOR SHALL BE BARE COPPER AND SIZED PER TABLE 250.66 BUT SHALL NOT BE LESS THAN #4AWG.
 - MAIN UTILITY TRANSFORMER SHALL BE GROUND PER THE REQUIREMENTS OF THE UTILITY COMPANY.
 - NOT USED.
 - PROVIDE GROUNDING ELECTRODE CONDUCTOR CONNECTION TO THE SECONDARY SIDE OF ALL WYE CONNECTED BUILDING TRANSFORMERS. GROUNDING ELECTRODE CONDUCTOR MAY BE CONNECTED TO THE NEAREST STRUCTURAL STEEL OR THE MAIN SERVICE GROUNDING ELECTRODE ONLY. SEE TRANSFORMER GROUNDING DETAIL FOR ADDITIONAL REQUIREMENTS.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL GROUNDING AND BONDING AS REQUIRED PER THE CEC.
 - SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

3
E5.1 NOT TO SCALE

MAIN SERVICE GROUNDING DETAIL

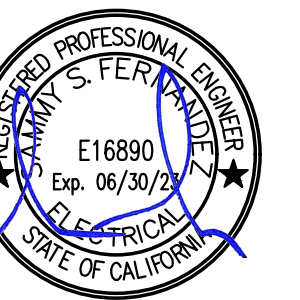
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SHEET
**ELECTRICAL
DETAILS**

DATE **11/10/2022**
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