

STATE OF CALIFORNIA DEPARTMENT OF GENERAL SERVICES
REAL ESTATE SERVICES DIVISION
PROJECT MANAGEMENT AND DEVELOPMENT BRANCH



Date: May 24, 2022

DOCUMENT 00 91 13

ADDENDUM No. 1 TO THE CONTRACT DOCUMENTS

Bid Due Date – June 02, 2022

**CALIFORNIA AFRICAN AMERICAN MUSEUM (CAAM) – CONFERENCE CENTER, STORAGE AND
 LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES
 LOS ANGELES, LOS ANGELES COUNTY, CALIFORNIA**

PROJECT NO. 4359

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON BID FORM AND
 REVISE THE CONTRACT DOCUMENTS AS FOLLOWS:

PROJECT MANUAL**INTRODUCTORY INFORMATION**1. COVER SHEET & ALL DIVISION 00 DOCUMENTSREVISE Project Name to:

CALIFORNIA AFRICAN AMERICAN MUSEUM (CAAM) CONFERENCE CENTER, STORAGE AND
 LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

2. DOCUMENT 00 01 10 - TABLE OF CONTENTSSPECIFICATIONSA. DIVISION 03 - CONCRETEDELETE Section 03 05 05 Concrete SealerB. DIVISION 06 – WOOD, PLASTICS, AND COMPOSITESDELETE Section 07 54 19 Polyvinyl Chloride (PVC) RoofingC. DIVISION 07 – THERMAL AND MOISTURE PROTECTIONADD Section 07 62 00 – Sheet Metal Flashing and TrimADD Section 07 84 13 – Penetration Firestopping

ADD Section 07 84 43 – Joint Firestopping in its entirety.

D. DIVISION 08 – OPENINGS

ADD Section 08 14 16 – Flush Wood Doors

ADD Section 08 41 13 – Glazed Aluminum Entrances and Storefronts

REVISE Section 08 62 50 Glazed Aluminum Entrances and Storefronts to 08 62 50 Tubular Daylighting Devices

E. DIVISION 09 – FINISHES

ADD Section 09 22 28 – Ceiling Grid Suspension System

F. ADD DIVISION 21 – FIRE SUPPRESSION

ADD Section 21 13 13 Fire-Suppression Sprinkler System

G. DIVISION 23H – HEATING, VENTILATING AND AIR CONDITIONING

ADD Section 23 00 00H HVAC General Requirements

ADD Section 23 05 29H Hangers and Supports for HVAC Piping and Equipment

ADD Section 23 22 13H Steam and Condensate Piping

ADD Section 23 34 00 HVAC Fans

ADD Section 23 84 13H Humidifiers

H. DIVISION 26 – ELECTRICAL

ADD Section 26 05 26 Grounding

I. DIVISION 27 – COMMUNICATIONS

ADD Section 27 11 00 Computer Network Wiring

J. ADD DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

ADD Section 28 31 00 Fire Alarm Systems in its entirety.

SPECIFICATIONS

1. ADD Section 05 12 00 Structural Steel Framing in its entirety.

2. SECTION 07 54 19 POLYVINYL CHLORIDE (PVC) ROOFING

Remove the following sentence from 3.04.A.2:

Fastening for recover board shall be into structural deck below insulating fill (see steel/concrete deck requirements).

3. ADD Section 07 62 00 – Sheet Metal Flashing and Trim in its entirety.
4. ADD Section 07 84 13 – Penetration Firestopping in its entirety.
5. ADD Section 07 92 00 – Joint Sealants in its entirety
6. ADD Section 21 13 13 - Fire-Suppression Sprinkler System in its entirety.
7. ADD Section 08 14 16 – Flush Wood Doors in its entirety.
8. ADD Section 09 22 28 – Ceiling Grid Suspension System in its entirety

9. SECTION 09 83 19 DECORATIVE ACOUSTICAL WALL PANELS

REVISE Section 2.2.A.6, 7, & 11

6. Color: Bitterwood
7. Patterns: AP-1, AP-3, AP-6
11. Panel Heights: 47-1/2 inches (1206mm)

10. SECTION 22 05 13 – BASIC PLUMBING MATERIALS AND METHODS

DELETE 1.01 B, 4. Section 33 11 00: Site Water Distribution Utilities.

11. SECTION 22 1000 – PLUMBING

DELETE Not applicable Reference Sections as follow:

2. Section 07 9200: Joint Sealants.
3. Section 10 4413: Fire Extinguishers and Cabinets.
9. Section 23 8000: Heating, Ventilating and Air Conditioning Equipment.
10. Section 31 2323: Excavation, Backfill for Utilities.
11. Section 33 3000: Site Sanitary Sewer Utilities.

DELETE Not applicable Products as follow:

2.04 CLEANOUT ASSEMBLIES: CO-3, CO-4, CO-5.

2.08 FLOOR DRAINS

2.10 HOSE BIBBS

2.14 SERVICE STOP GAS VALVES

2.19 YARD BOXES

DELETE Not applicable sections from PART 3 as follow:

3.02 - D-4,

3.02 – D-5 Partial note: Backing for urinals shall be 1/4-inch thick by 6-inch wide steel plate.

3.02 – D-9

- 3.02 – E-1b, e, f, g, h.
- 3.02 – E-9
- 3.06 – Condensate Drains – from air conditioning units
- 3.07 – Condensate Drains – from window type heat pump and exterior wall mount heat pump units
- 3.08 – Make-up Water Systems
- 3.09 – Grease Traps (Interceptors)
- 3.10 – Gas Service
- 3.14 – Valve – Gas Service
- 3.17 – Hot Water Circulating Pumps
- 3.18 – Water Temperature Controllers
- 3.19 – Compressed Air Systems

12. SECTION 23 00 00H – HVAC GENERAL REQUIREMENTS

A. ARTICLE 1.5, MECHANICAL SUBMITTAL PROCEDURES

Remove the following Sub-article 1.5C:

C. For DDC Building Automation Systems, see also SUBMITTALS in Part 1 of Section 25 50 00 for additional submittal requirements and a detailed submittal schedule.

Remove the following Sub-article 1.5G1:

1. Optional Pre-Submittals: At Contractor’s option, material may be submitted unofficially via email directly to the Engineer of Record for review and comment prior to formal submission. Comments provided by the Engineer are not official and may be changed or additional comments may be provided on the formal submittal. The intent of pre-submittals is to reduce paperwork and review time, and to provide a venue to discuss technologies, products, designs or implementation strategies that are novel or unique.

ARTICLE 1.20, TRAINING OF OWNER PERSONNEL

Remove the following Sub-article 1.20 C 6:

6. The DDC Contractor shall attend sessions other than the DDC System training, as requested, to discuss the interaction of the DDC System as it relates to the equipment being discussed.

13. SECTION 23 05 29H – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

REMOVE Specification section 23 05 29H from specification originally issued and ADD Addendum No. A1 specification section 23 84 13H, dated 5/02/22.

14. SECTION 23 22 13H – STEAM AND CONDENSATE PIPING

ADD Addendum No. A1 specification section 23 22 13H.

15. SECTION 23 34 00H – HVAC Fans

ADD Addendum No. A1 specification section 23 34 00H.

16. SECTION 23 84 13H – HUMIDIFIERS

REMOVE Specification section 23 84 13H from specification originally issued and ADD Addendum No. A1 specification section 23 84 13H, dated 5/02/22.

17. SECTION 26 05 26 – GROUNDING

ADD Section 26 05 26 Grounding in its entirety

18. SECTION 26 05 48H – SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

REMOVE reference to specification section 260529 paragraph 1.2(B)(1)

19. SECTION 26 28 16H – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

REMOVE reference to specification section 017823 and ADD reference to Division 1, paragraph 1.5(A)(1)

20. SECTION 27 11 00 – COMPUTER NETWORKING

ADD Section 27 11 00 Computer Networking in its entirety

21. SECTION 27 41 00 – AV SYSTEMS

A. ARTICLE 2.01, SUMMARY OF WORK

REVISE the following Subarticle 2.01 B.2.b:

B.2.b. Main Loudspeakers: Re-aim the existing stereo loudspeakers so that they best match the coverage area to the audience area. Adjust the control settings on the loudspeakers and other system components to optimize the frequency response of the outputs. Provide new wiring between the amplifier and the loudspeakers to improve the loudspeaker performance.

REVISE the following Subarticle 2.01 B.2.c:

B.2.c. Satellite loudspeakers: Relocate and re-aim the existing satellite loudspeakers to minimize overlap with the coverage of the Main loudspeakers. Adjust the programming of the audio processor to optimize the frequency response and delay for the satellite loudspeakers. Modify the programming so satellite loudspeakers receive the same input signal consisting of a monaural mix of the audio signals.

REVISE the following Subarticle 2.01 B.3.a:

B.3.a. Video Projector and Screen: The existing video projector and screen will be reused.

22. SECTION 28 31 00 FIRE ALARM SYSTEMS

ADD Specification Section 28 31 00 Fire Alarm Systems in its entirety

DRAWINGS

1. ALL DRAWING SHEETS

REVISE PROJECT NAME TO:

CALIFORNIA AFRICAN AMERICAN MUSEUM (CAAM) CONFERENCE CENTER, STORAGE AND LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

2. SHEET AG0000

GENERAL NOTES

DELETE Note 17 as written and REPLACE with the following:

17. "REMOVE: DETACH ITEMS FROM EXISTING CONSTRUCTION AND LEGALLY DISPOSE OF THEM OFF-SITE UNLESS INDICATED TO BE SALVAGED OR REINSTALLED.

SHEET INDEX

ADD Sheet PH2100 PLUMBING – OVERALL FLOOR PLAN

ADD Sheet PH6000 PLUMBING – PLUMBING DETAILS

ADD Sheet PH6001 PLUMBING – PLUMBING DETAILS

ADD Sheet MH6001 HVAC – MECHANICAL DETAILS

ADD Sheet MH7001 HVAC - MECHANICAL CONTROLS

3. SHEET A2000

REMOVE Sheet A2000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2000, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

4. SHEET A2001

REMOVE Sheet A2001 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2001, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

5. SHEET A2002

REMOVE Sheet A2002 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2002, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

6. SHEET A2003

REMOVE Sheet A2003 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2003, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

7. SHEET A2100

REMOVE Sheet A2100 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2100, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

8. SHEET A2101

REMOVE Sheet A2101 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2101, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

9. SHEET A2102

REMOVE Sheet A2102 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2102, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

10. SHEET A2700

REMOVE Sheet A2700 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2700, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

11. SHEET A2701

REMOVE Sheet A2701 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2701, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

12. SHEET A2800

REMOVE Sheet A2800 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A2800, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

13. SHEET A6000

REMOVE Sheet A6000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A6000, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

14. SHEET A6001

REMOVE Sheet A6001 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A6001, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

15. SHEET A7400

REMOVE Sheet A7400 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A7400, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

16. SHEET A8100

REMOVE Sheet A8100 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8100, dated 5/11/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

17. SHEET A8200

REMOVE Sheet A8200 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8200, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

18. SHEET A8300

REMOVE Sheet A8300 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8300, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

19. SHEET A8400

REMOVE Sheet A8400 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8400, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

20. SHEET A8401

REMOVE Sheet A8401 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8401, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

21. SHEET A8600

REMOVE Sheet A8600 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A8600, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

22. SHEET A9000

REMOVE Sheet A9000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet A9000, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

23. SHEET S0001

REVISED Note 21 of Structural Steel and REPLACE with the following:

CONTRACTOR TO PROVIDED FOR AN ALLOWANCE OF 2% OF TOTAL WEIGHT OF STRUCTURAL STEEL TO BE FABRICATED

24. SHEET S1001

REVISED Detail 3 and added section cut call

ADD Detail 4

25. SHEET S2200

ADD Roof Framing Plan Note 5

REVISED Roof Framing Legend

ADD (E) Roof Bottom of Metal Deck Elevations

ADD Mechanical equipment H-3, -4, -5, -6, -9, and -12 and supporting framing to roof plan

26. SHEET S3101

REVISED Detail 1, Note 3 to include maximum permitted load on open web joist chord without strengthening required.

REVISED Detail 4 to include plate

PLUMBING

27. SHEET P002

DELETE S-1 Sink model and description as written and REPLACE with the following:

Just DL-ADA-2133-16-GR

1. Fixture: Double compartment with integral-flow 16-gauge, stainless steel type 304 sink, sink: 33"x21"x5.5".

Remark: Provide dishwasher air gap fitting on sink rim.

5. Insulation: Water supply & all drainage pipes are under the sink removable plastic laminate apron panel per detail 4/A7400.

ADD WHA-1 Equal make and model: JR Smith Hydrotrol.

ADD Water Hammer Arrestor sizing chart.

DELETE HB-1

DELETE TP-1

28. SHEET P1000

DELETE NOTE 2 as written and REPLACE with the following:

- Existing plumbing fixture and all associated pipes to be removed to clear new closet (116D). Cap V, CW and HW pipe up to P.O.R.

ADD Scope of work

ADD call out for (E) pipes point of removal

Cap (E)V, CW & HW to P.O.R

ADD (E) for missing (E) pipes on plans as follow:

(E)2"SS, (E)1-1/4"HW, (E)1-1/2"CW, (E)4"SD, (E)4"OD

29. SHEET P1100

ADD Scope of work

ELECTRICAL

30. SHEET E0001– REVISED 5/11/22

REVISE lighting fixture Types E and F.

DELETE lighting fixture Type A3.

31. SHEET E0002– REVISED 5/11/22

REVISE Indoor Lighting NRCC-LT1-E.

32. SHEET E0004– REVISED 5/11/22

REVISE note on Single Line Diagram

33. SHEET E1001– REVISED 5/11/22

REVISE Key Notes # 1 and 3.

ADD Key Notes # 5 and 6.

ADD Panel names P2 and F.

ADD exit sign to be demolished.

ADD location of IDF at Demolition Key Plan.

34. SHEET E1101– REVISED 5/11/22

ADD Keyed Note #8.

REVISE receptacle symbols in Breakroom 116C and Closet 116D.

ADD mounting heights to curtain motors and screen projector j-boxes.

REVISE to show existing fire rated walls and reference penetration details

35. SHEET E1201– **REVISED 5/11/22**

REVISE lighting fixture type in Conference Center 116.

ADD lighting fixtures mounting heights.

REVISE to show existing fire rated walls

REMOVE light fixture D in west side of Entry Court/Sculpture Court 160 near Conference Center entrance

36. SHEET E1301 – **REVISED 5/11/22**

REVISE Key Note #1.

REVISE (E) to (RR) to fire alarm device at corridor.

REVISE to show existing fire rated walls

FIRE PROTECTION

37. SHEET FP0101

DELETE The following note in restrain & branch line bracing requirements

- Lateral sway brace, Longitudinal sway brace and sway bracing of riser notes.

DELETE Note as written and REPLACE The following note in Scope of work:

- Relocate three sprinkler heads, Add one new sprinkler head serving room Librarian-121A and Library reading room-121.
- Replace one sprinkler head from upright to pendent head in the break room-116C.
- Total 5 new sprinkler heads.
- All new pipe to be schedule 40.

ADD the following detail 1 and 2.

1. Hanger attachment detail.
2. Armover/ Drop detail.

ADD existing sprinkler head legend in fire sprinkler system legend.

38. SHEET FP1000

DELETE Note 1 as written and REPLACE The following note 1.

1. Point of removal for three sprinkler head locations in Librarian-121A and Library Reading room-121. Refer to FP1100 for new piping.

ADD The following note 2.

2. Replace existing upright sprinkler head to new pendent sprinkler head in break room-116C.

ADD The sprinkler head schedule table and legend.

ADD point of removal note.

DELETE head symbol and line type, as shown on plan and REPLACE the existing sprinkler head symbols, Line type for existing pipe.

39. SHEET FP1100

DELETE Note 1 as written and REPLACE The following note 1.

1. New pendent sprinkler head. Refer to detail 2.

ADD The following note 2, 3 and 4.

2. Add one sprinkler head in the Library Reading room.
3. New sprinkler pipe to be schedule 40.
4. Replace 1"X1" Elbow with 1"X1"X1" Tee.

ADD The sprinkler head schedule table and legend.

ADD point of connection note.

DELETE head symbol and line type, as shown on plan and REPLACE the existing sprinkler head and new sprinkler head symbols, Line type for existing pipe and new pipe.

PLUMBING – HVAC UPGRADE

40. SHEET PH0000

ADD PH2100, PH6000, & PH6001 to sheet list.

41. SHEET PH001

REVISE Gas connection to roof top equipment detail. Revised location of shut off valve and specified. Specified flex connection.

ADD Condensate pipe sizing table per 2019 CPC for reference.

42. SHEET PH2004

ADD Existing gas line pipe sizes called out. Indicated by "cloud" outline and triangle symbol No. A1.

43. SHEET PH2100

ADD Addendum No. A1 Drawing Sheet PH2100, showing humidifier steam condensate drain lines.

44. SHEET PH2800

REVISED Sheet PH2800 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet PH2800, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

45. SHEET PH6000

ADD Addendum No. A1 Drawing Sheet PH6000, showing additional installation details.

46. SHEET PH6001

ADD Addendum No. A1 Drawing Sheet PH6000, showing additional installation details.

MECHANICAL – HVAC UPGRADE

47. SHEET MH-0000

ADD the following definitions:

ECM - Electronically Commutated Motor
IEER – Integrated Energy Efficiency Ratio
ST – Sound Attenuator Trap

ADD symbols for control wiring.

48. SHEET MH-0100

REMOVE Sheets MH-0100 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet MH-0100, dated 5/02/22; showing revisions indicated by “cloud” outline and triangle symbol No. A1.

49. SHEET MH-0101

ADD the following notes to Mechanical Mini Split Schedule:

5. Refer to detail 3/MH-6000 for condenser unit support

REVISE Mechanical Mini Split Schedule note 4, to define fan coil unit hanger detail.

ADD “Condenser Unit” column to Mechanical Mini Split Schedule

ADD note 5 reference to “Notes” column of Mechanical Mini Split Schedule

50. SHEET MH-2000

ADD note indicating drawing continuation:

ADDENDUM NO. 1

See detail 2/MH2001 for continuation.

ADD regarding as built drawings:

Existing As-Built Drawings used as background for reference only

51. SHEET MH-2001

ADD note

Cap Existing Duct as wall

ADD note regarding demolition of dehumidifier

Remove Existing Dehumidifier

ADD regarding as built drawings:

Existing As-Built Drawings used as background for reference only

52. SHEET MH-2002

ADD regarding as built drawings:

Existing As-Built Drawings used as background for reference only

53. SHEETS MH-2100 AND MH-2101

REMOVE Sheets MH-2100 and MH-2101 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheets MH-2100 and MH-2101, dated **5/11/22**; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

54. SHEET MH-2001

ADD General Notes B and C

A. Refer to sheet MH6000 for equipment, piping, and ductwork installation details.

B. Refer to detail 3 A/2800 for detail of duct through roof.

RELOCATE humidifier H-9 to avoid new pipe runs

ADD duct sizes for exterior ducts from AC-10 and AC-15.

55. SHEET MH-6000

REMOVE Sheet MH-6000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet MH-6000, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

56. SHEET MH-6001

ADD Addendum No. A1 Drawing Sheet MH-6001, showing additional installation details.

57. SHEET MH-7000

REMOVE Sheet MH-7000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet MH-7000, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

58. SHEET MH-7001

ADD Addendum No. A1 Drawing Sheet MH-7001, showing additional controls details.

ELECTRICAL – HVAC UPGRADE

59. SHEET EH-0001

REVISED Sheet EH-0000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet EH-0000, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1.

60. SHEET EH-5000

REVISED Sheet EH-5000 from set of Drawings originally issued and ADD Addendum No. A1 Drawing Sheet EH-5000, dated 5/02/22; showing revisions indicated by "cloud" outline and triangle symbol No. A1

AUDIO VISUAL

61. SHEET AV0000

GENERAL INSTALLATION NOTES

REVISE II.B. to include the color of the paint (black).

62. SHEET AV2100

ADD FLOOR PLAN NOTE

1. Refer to AV1000 for the Conduit Riser.

63. SHEET AV2101

FLOOR PLAN NOTES

4. Refer to AV1000 for the Conduit Riser.

64. SHEET AV4000

DETAIL 1:

1. REVISE Detail Title to: Exhibit Storage (162) Demolition Expanded Rack Detail.

DETAIL 2:

1. REVISE Detail Title to: Exhibit Storage (162) Installation Expanded Rack Detail.
2. ADD: Note identifying 2 -1" conduits to IN Backbox.

65. SHEET AV4001

DETAIL 1:

1. REVISE Detail Title to: Exhibit Storage (162) Demolition Expanded Rack Elevation.

DETAIL 2:

1. REVISE Detail Title to: Exhibit Storage (162) Installation Expanded Rack Elevation.

66. SHEET AV4010

DETAIL 1:

1. REVISE Detail Title to: Storage Room (116A) Equipment Rack Expanded Plan.
2. REVISE Note to: Collector Box Above: 12"X24"X12" Install On Wall Above Doorway.

67. SHEET AV4011

DETAIL 1:

1. REVISE Detail Title to: Storage Room (162) Rack Elevation.

DETAIL 2:

1. REVISE Detail Title to: Storage Room (162) Rack Section.

68. SHEET AV5001

DETAIL 3:

1. REVISE Detail Note to: Remove Existing Wiring To Loudspeakers And Replace With New Wiring. Secure Cables Neatly To The Top Of The Beam Using Velcro Wire Wraps. Route New Wiring Using Same Pathways As Original Wiring.
2. REVISE Detail Note to: Existing JBL Control 28-1 Loudspeaker: Relocate To Opposite Side Of Beam.

END OF ADDENDUM NO. 1
ADDENDUM NO. 1

ATTACHMENTS:

Specification Section 05 12 00 – Structural Steel Framing in its entirety

Specification Section 07 62 00 – Sheet Metal Flashing and Trim in its entirety

Specification Section 07 84 13 - Penetration Firestopping in its entirety

Specification Section 07 84 43 – Joint Firestopping in its entirety

Specification Section 07 92 00 - Joint Sealants in its entirety

Specification Section 08 41 16 – Flush Wood Doors in its entirety

Specification Section 08 41 13 – Glazed Aluminum Entrances and Storefronts in its entirety

Specification Section 08 71 00 - Door Hardware in its entirety

Specification Section 09 22 28 – Ceiling Grid Suspension System in its entirety

Specification Section 21 13 13 – Fire Suppression Sprinkler System in its entirety.

Specification Section 23 00 00H – HVAC General Requirements in its entirety.

Specification Section 23 05 29H – Hangers and Supports for HVAC Piping and Equipment in its entirety.

Specification Section 23 22 13H – Steam and Condensate Piping in its entirety.

Specification Section 23 34 00H – HVAC Fans in its entirety.

Specification Section 23 84 13H – Humidifiers in its entirety.

Specification Section 26 05 26 – Grounding in its entirety.

Specification Section 26 05 48H – Seismic Controls for Electrical Systems in its entirety.

Specification Section 26 28 16H – Enclosed Switches and Circuit Breakers in its entirety.

Specification Section 27 11 00 - Computer Network Wiring in its entirety.

Specification Section 27 41 00 - AV Systems in its entirety.

Specification Section 28 31 00 – Fire Alarm System in its entirety.

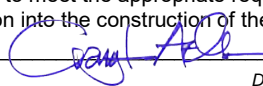
Addendum No. 1 (Issue: A1) Drawing Sheets:

G0000, A2000, A2001, A2002, A2003, A2100, A2101, A2102, A2700, A2701, A2800, A6000, A6001, A7400, **A8100**, A8200, A8300, A8400, A8401, A8600, A9000, S0001, S1001, S2200, S3101, P0002, P1000, P1100, E0001, E0002, **E0004**, E1001, E1101, E1201, E1301, FP0101, FP1000, FP1100, PH0000, PH0001, PH2004, PH2100, PH2800, PH6000, PH6001, MH0000, MH0100, MH0101, MH2000, MH2001, MH2101, MH2800, MH6000, MH6001, MH7000, MH7001, EH0001, EH5000, AV0000, AV2100, AV2101, AV4000, AV4001, AV4010, AV4011, AV5001

APPLICATION FOR SUBMITTAL OF POST-APPROVAL DOCUMENT

This application is for submittal of documents, after the initial approval of the project (post-approval documents), that require Division of the State Architect (DSA) review and approval. This form shall be completed by the Design Professional in General Responsible Charge of the project, in accordance with California Code of Regulations, Title 24, Part 1, Sections 4-317, 4-323 and 4-338 and in compliance with DSA IR A-6: Construction Change Document Submittal and Approval Process.

DSA documents referenced within this form are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

1. SUBMITTAL TYPE: (Is this a resubmittal? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>)			
Deferred Submittal <input type="checkbox"/>	Addendum Number: 1	Revision Number: V2	CCD Number: _____ Category A <input type="checkbox"/> or B <input type="checkbox"/>
2. PROJECT INFORMATION:			
School District/Owner: Department of General Services/California African American Museum		DSA File Number: RESD 37	
Project Name/School: Conference Center & Library Improvements, Re-Roof and HVAC Upgrades/California		DSA Application Number 03 121785	
3. APPLICANT INFORMATION:			
Date Submitted: 05/11/22		Attached Pages? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Number of pages? 305	
Firm Name: IBI Group		Contact Name: Angela Ball	
Work Email: angela.ball@ibigroup.com		Work Phone: (213) 769-0011	
Firm Address: 537 S Broadway, Suite 500		City: Los Angeles	State: CA Zip Code: 90013
4. REASON FOR SUBMITTAL: (Check applicable boxes)			
<input checked="" type="checkbox"/> For revision or addendum prior to construction.		<input type="checkbox"/> For a project currently under construction.	
<input type="checkbox"/> For a project that has a form <i>DSA 301-N: Notification of Requirement for Certification</i> , <i>DSA 301-P: Posted Notification of Requirement for Certification</i> or a 90-Day Letter issued.			
<input type="checkbox"/> To obtain DSA approval of an existing uncertified building or buildings.			
<input type="checkbox"/> For Category B CCD this is: <input type="checkbox"/> a voluntary submittal, <input type="checkbox"/> a DSA required submittal (attach DSA notice requiring submission).			
5. DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE:			
Name of the Design Professional In General Responsible Charge: Craig L. Atkinson			
Professional License Number: C-25387		Discipline: Architect	
Design Professional in General Responsible Charge Statement: The attached post-approval documents have been examined by me for design intent and appear to meet the appropriate requirements of Title 24, California Code of Regulations and the project specifications. They are acceptable for incorporation into the construction of the project.			
Signature:  DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE			
6. CONFIRMATION, DESCRIPTION AND LISTING OF DOCUMENTS:			
For addenda, revisions, or CCDs: CHECK THIS BOX <input checked="" type="checkbox"/> to confirm that <i>all</i> post-approval documents have been stamped and signed by the Responsible Design Professional listed on form <i>DSA 1: Application for Approval of Plans and Specifications</i> for this project. (For <i>Deferred Submittals</i> , refer to <i>IR A-18: Use of Construction Documents Prepared by Other Professionals</i> , and <i>IR A-19: Design Professional's Signature and Seal (Stamp) on Construction Documents</i> , when applicable, for signature and seal requirements.)			
Provide a brief description of construction scope for this post-approval document (attach additional sheets if needed): Refer to attached ADD_01_V2_Supporting Document for list of revisions to specifications and drawings. Clarification to notes, details and detail callouts and added missing specification sections pertaining to scope included in the drawings. This V2 set included 10 revised drawings based on the 4 comments received by OSFM and is OSFM approved.			
List of DSA-approved drawings affected by this post-approval document: Refer to attached ADD_01_V2_Supporting Document for list of drawings affected.			

DSA USE ONLY		
	Returned	DSA STAMP
SSS _____ Date _____ <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input checked="" type="checkbox"/> Not Required Comments: _____	Date: _____	<div style="border: 2px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: auto;"> <p style="margin: 0;">APPROVED DIV. OF THE STATE ARCHITECT</p> <p style="margin: 0; font-size: 1.2em;">APP. 03-121785 INC:0</p> <p style="margin: 0;">REVIEWED FOR</p> <p style="margin: 0;">SS <input type="checkbox"/> FLS <input type="checkbox"/> ACS <input checked="" type="checkbox"/></p> <p style="margin: 0;">DATE: <u>05/12/2022</u></p> </div>
FLS _____ Date _____ <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input checked="" type="checkbox"/> Not Required Comments: _____	By: _____	
ACS BAB Date 05/19/2021 <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Not Required Comments: _____		

California African American Museum (CAAM) Conference Center, Storage and Library Improvements, Re-Roof and HVAC Upgrades

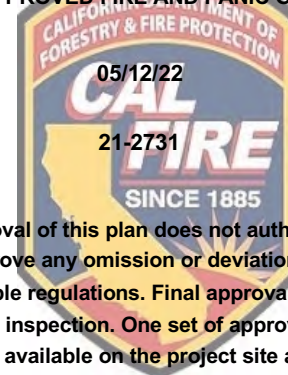
California African American Museum
State of California – Department of General Services

PROJECT MANUAL
100% Construction Documents
May 02, 2022
Addendum No. 1

IBI Group - Project No. 119020

OFFICE OF THE STATE FIRE MARSHAL

APPROVED FIRE AND PANIC ONLY



IBI GROUP

1001 Wilshire Blvd., Suite 100 #3100

Los Angeles, CA 90017 USA

Tel (213) 769-0011

Fax (213) 769-0016

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:

- 1. Structural steel.
- 2. Grout.

- B. Related Sections:

- 1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.

1.03 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.04 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication of structural-steel components.

- 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
- 2. Include embedment drawings.
- 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
- 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

- B. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing.

ADDENDUM NO. 1 STRUCTURAL STEEL FRAMING

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength bolt-nut-washer assemblies.
 - 4. Shop primers.
 - 5. Nonshrink grout.
- F. Source quality-control reports.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 358.
 - 4. AISC 360.
 - 5. RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 6. AWS D1.1/D1.1M.
 - 7. AWS D1.8/D1.8M.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's Testing Agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.08 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, M-, S-Shapes: ASTM A 36/A 36M
- C. Plates and Bars: ASTM A 572/A 572M, Grade 50, typical.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade C, structural tubing.
 - 1. Finish: Black
- E. Welding Electrodes: Comply with AWS requirements.

2.02 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.

- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 3125, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 - 1. Finish: Plain.
- C. Headed Anchor Rods: ASTM F 1554, Grade 36, typical; ASTM F 1554; straight.
 - 1. Nuts: ASTM A 563 heavy-hex carbon steel.
 - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 3. Washers: ASTM F 436, Type 1, hardened carbon steel.
 - 4. Finish: Plain.
- D. Threaded Rods: ASTM A 36/A 36M.
 - 1. Nuts: ASTM A 563 heavy-hex carbon steel.
 - 2. Washers: ASTM F 436, Type 1, hardened carbon steel.
 - 3. Finish: Plain.

2.03 PRIMER

- A. Primer: Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- B. Primer: SSPC-Paint 25, Type II, zinc oxide, alkyd, linseed oil primer.

2.04 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.05 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.06 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug-Tightened (ST) unless noted otherwise on Drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.07 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Top flange of beams supporting steel decking.
 - 4. Surfaces to be high-strength bolted with slip-critical connections.
 - 5. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 6. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 - 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Determine, furnish and install all temporary supports, such as temporary guys, beams, braces, falsework, cribbing or other elements required for the erection operation. These temporary supports shall be sufficient to secure the bare structural steel framing or any portion thereof against loads that are likely to be encountered during erection, including those due to wind and those that result from erection operations. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.03 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.04 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug-tightened unless noted otherwise on Drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.05 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified independent Testing Agency to inspect field welds and high-strength bolted connections and prepare test reports.
- B. Inspections: Verify and inspect structural steel Work as shown on Drawings.
- C. Bolted Connections: Bolted connections will be tested and inspected according to RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at Testing Agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.06 REPAIRS AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes:

1. Formed sheet metal flashings and fabrications, including the following
 - a. Parapet coping and wall cap flashings.
 - b. Wall flashings.
 - c. Roof penetration flashings.
 - d. Roof termination flashings and counterflashings.
 - e. Edge termination flashings.
 - f. Head and sill flashings.
 - g. Miscellaneous building sheet metal flashings.
 - h. Miscellaneous sheet metal fabrications.
2. Sealants associated with shop fabrication of sheet metal work.

- B. Related Sections include:

1. Section 05 50 00 "Metal Fabrications" for steel pipe downspouts.
2. Section 07 92 00 "Joint Sealants" for field-applied building sealants installed in conjunction with sheet metal work.
3. Section 09 91 00 "Painting" for field painting of non-factory-finished sheet metal items exposed to view.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):

1. AAMA 611: Voluntary Specification for Anodized Architectural Aluminum.
2. AAMA 2605: Superior Performing High Performance Organic Coatings on Aluminum Extrusions and Panels.

- B. ASTM International:

1. ASTM A 153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A240: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
4. ASTM A480: Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.

5. ASTM B32: Standard Specification for Solder Metal.
 6. ASTM B 209: Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
 7. ASTM B749: Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
 8. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
 9. ASTM D226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 10. ASTM D1970: Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 11. ASTM D4586: Standard Specification for Asphalt Roof Cement, Asbestos-Free.
 12. ASTM F2329: Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- C. California Building Code (CBC) - California Code of Regulations, Title 24, Part 2.
- D. International Organization for Standardization (ISO):
1. ISO 14021: Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labeling).
- E. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
1. Architectural Sheet Metal Manual.

1.4 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site to review pertinent issues related to sheet metal flashing and trim.
 1. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and conditions of other construction that affect sheet metal flashing and trim.
 2. Review sheet metal flashing observation and repair procedures after flashing installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For type of manufactured product indicated, including the following:
 1. Elastomeric sealant.
 2. Butyl sealant.
 3. Epoxy seam sealer.
- B. Shop Drawings:
 1. Include plans, elevations, sections, and attachment details.

2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for jointing supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 6. Include details of termination points and assemblies.
 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 8. Include details of roof-penetration flashing.
 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
 10. Include details of special conditions.
 11. Include details of connections to adjoining work.
 12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches (1:5).
- C. Mockup Samples: Build sheet metal mockups on site to demonstrate qualities of materials and execution and aesthetic effects, of the following conditions. Include fasteners, cleats, clips, closures, and other attachments.
1. Parapet coping flashings.
 2. Roof penetration flashings.
 3. Roof edge termination flashings.
 4. Door and window head and sill flashings.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
1. Build mockup of typical roof edge approximately 10 feet long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved in writing by Architect.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Wind Uplift Resistance: Manufacture and install copings and roof edge flashings capable of resisting wind pressures and stresses calculated based on requirements of the California Building Code, using factors defined therein and applicable to local site conditions and specific project parameters.
 - 1. Wind Speed (Ultimate Design Wind Speed V_{ult}): 115 mph.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance ASTM A653, G90 (Z275) coating designation.
 - 1. Surface: Smooth, flat, and mill phosphatized for field painting.
 - 2. Recycled Content: As specified in "LEED v4 Requirements" Article.
- C. Stainless-Steel Sheet: ASTM A240, Type 304, dead soft, fully annealed; with smooth, flat surface.
 - 1. Finish: ASTM A480, No. 2D (dull, cold-rolled) where concealed; No. 4 (polished directional satin) where exposed to view.
 - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

- b. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - i) Run grain of directional finishes with long dimension of each piece.
 - ii) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- D. Lead Sheet: ASTM B749 lead sheet.
- E. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 - 1. As-Milled Finish: Mill.
 - 2. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
 - 3. Coil-Coated Finish: AAMA 2605, two-coat fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- B. Self-Adhering, High-Temperature Underlayment: Self-adhering, cold-applied, sheet underlayment, specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer when recommended by underlayment manufacturer.
 - 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. GCP Applied Technologies; Grace Ultra.
 - b. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Thickness: 30 mils.
 - 3. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 - 4. Low Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
- C. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq ft minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless-steel.
 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless-steel.
 4. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless-steel or hot-dip galvanized-steel in accordance with ASTM A153 or ASTM F2329.
- C. Solder:
1. For Stainless-Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
 2. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic nonstaining tape, 1/2-inch wide and 1/8-inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 3. Fabricate sheet metal flashing and trim in longest practicable lengths to minimize number of end joints while still meeting requirements for expansion allowance.
 4. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 5. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 6. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners or faces exposed to view.
- B. Fabrication Tolerances:
1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.
- G. Seams:
1. Zinc-Coated (Galvanized) Steel: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 2. Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inches long, but not exceeding 10-foot long, sections. Shop fabricate inner and outer corners.
1. Material: Galvanized-steel.
 - a. Thickness: 0.0299 inch (22 gage).
 2. Joint Style: Overlapped, 4 inches wide.
- B. Copings: Fabricate minimum of 96-inches long, but not exceeding 10-foot long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight. Shop fabricate inner and outer corners.
1. Material: Galvanized-steel.
 - a. Thickness: 0.0359 inch (20 gage), except where indicated otherwise.
- C. Base Flashings, Flashing Receivers, and Counterflashings:
1. Material: Galvanized steel.
 - a. Thickness: 0.0299 inch (22 gage).
- D. Roof Drain Flashing:
1. Material: Lead.
 - a. Weight: 4.0 lb/sq ft.
- E. Vent Stack Roof Penetration:
1. Material: Lead.
 - a. Weight: 4.0 lb/sq ft.
 - b. Thickness: 0.0250 inch (24 gage).

2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch long, but not exceeding 12-foot long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch high end dams.
 - 1. Material: Stainless steel.
 - a. Thickness: 0.0250 inch (24 gage).
- B. Openings Flashing in Frame Construction: Fabricate head, sill, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high end dams.
 - 1. Material: Galvanized steel.
 - a. Thickness: 0.0299 inch (22 gage).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing of backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle-free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
 - 1. Install in shingle fashion to shed water.
 - 2. Lap joints not less than 2 inches.
- B. Install slip sheet, wrinkle-free, over underlayment before installing sheet metal flashing and trim.
 - 1. Install in shingle fashion to shed water.
 - 2. Lap joints not less than 4 inches.

3.3 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 5. Install continuous cleats with fasteners spaced not more than 12 inches on center.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 8. Do not field cut sheet metal flashing and trim by torch.
 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or SMACNA's "Architectural Sheet Metal Manual."
1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - i) Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.

1. Pretin edges of sheets with solder to width of 1-1/2 inches; however, reduce pretinning where pretinned surface would show in completed Work.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint.
 - a. Fill joint completely.
 - b. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering:
 - a. Tin edges of uncoated sheet, using solder for stainless-steel and acid flux.
 - b. Promptly remove acid-flux residue from metal after tinning and soldering.
 - c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual."
 1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing:
 1. Anchor to resist wind uplift and outward forces as specified in "Performance Requirements" Article, and in accordance with recommendations in SMACNA "Architectural Sheet Metal Manual," unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at spacing required by performance requirements.
- C. Copings:
 1. Anchor to resist wind uplift and outward forces as specified in "Performance Requirements" Article, and in accordance with recommendations in SMACNA "Architectural Sheet Metal Manual," unless otherwise indicated.
 - a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at spacing required by performance requirements.
 - b. Anchor interior leg of coping with washers and screw fasteners through slotted holes at spacing required by performance requirements.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4-inches over base flashing. Install stainless-steel drawband and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
 1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
 2. Extend counterflashing 4 inches over base flashing.
 3. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.

4. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant, or as otherwise indicated.

F. Roof Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof, except as noted below.

1. At top of open vent piping, turn lead flashing down to fit tightly to inside of pipe, so as to provide for clear, unobstructed airflow.

3.5 INSTALLATION OF WALL FLASHINGS

A. Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4 inches beyond wall openings, and as indicated.

3.6 INSTALLATION OF MISCELLANEOUS FLASHING

A. Equipment Support Flashing:

1. Coordinate installation of equipment support flashing with installation of roofing and equipment.

2. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and alignment of matching profiles.

3.8 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.9 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION

ADDENDUM NO. 1
SHEET METAL FLASHING AND TRIM
07 62 00-12

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SECTION 07 84 13

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Penetration firestopping systems for penetrations through the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:
 - a. Fire-resistance-rated walls.
- B. Related Sections include:
 - 1. Section 07 84 43 "Joint Firestopping" for joints in or between fire-resistance-rated construction

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E814: Standard Test Method for Fire Tests of Penetration Firestop Systems.
 - 3. ASTM E2174: Standard Practice for On-Site Inspection of Installed Firestops.
- B. California Department of Public Health (CDPH):
 - 1. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers – Version 1.1, February 2010.
- C. California Green Building Standards Code (CALGreen) – California Code of Regulations, Title 24, Part 11.
- D. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 1168 – Adhesive and Sealant Applications.
- E. UL Environment:
 - 1. GREENGUARD Gold certification program.
- F. Underwriters Laboratory (UL):
 - 1. Fire Resistance Directory.
 - 2. UL 1479: Fire Tests of Through-Penetration Firestops.

1.4 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.

- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

1.5 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site to review pertinent issues related to penetration firestopping.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. CALGreen Submittals:
 - 1. Manufacturer's product data for firestopping materials indicating compliance with product requirements specified in "CALGreen Requirements" Article.
- C. Product Schedule: For each penetration firestopping system. Include location illustration of firestopping system, and design designation of qualified testing and inspecting agency.
 - 1. Engineering Judgements: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment of equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.8 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing penetration firestopping systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or Installer engaged by Contractor does not in itself confer qualification on buyer.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

PART 2 - PRODUCTS

2.1 CALGREEN REQUIREMENTS

- A. General: Conform with all applicable requirements of the California Green Building Standards Code (CALGreen).
- B. Provide firestopping materials which comply with current VOC content limits of the South Coast Air Quality Management District (SCAQMD) Rule 1168, except as noted otherwise below. Such products shall also comply with Rule 1168 prohibition of the use of certain toxic compounds (chloroform, ethylene, dichloride, methylene chloride, perchloroethylene, and trichloroethylen).

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide penetration firestopping systems tested as follows:
 - 1. Penetration firestopping system tests performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Testing per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear the classification marking of UL in its "Fire Resistance Directory," or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.3 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items, if any.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering penetration firestopping system products that may be incorporated into the Work include, but are not limited to the following:
 - a. Firestopping Sealants and Other Fill Materials:
 - i) Hilti, Inc.
 - ii) 3M Fire Protection Products.
 - iii) Tremco, Inc.; Tremco Fire Protection Systems Group.
 - b. Firestopping Insulation:
 - i) Johns Manville, a Berkshire Hathaway Company.
 - ii) Rockwool International.
 - iii) Thermafiber, an Owens Corning Company.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

- D. VOC Content of Firestopping Sealants: Complies with requirements specified in "CALGreen Requirements" Article
- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

2.4 FILL MATERIALS

- A. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- B. Firestop Devices: Factory-assembled collars formed from galvanized-steel and lined with intumescent material sized to fit specific diameter of penetrant.
- C. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- D. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- E. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- F. Mortars: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- G. Pillows/Bags: Reusable, heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

2.5 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. **Surface Cleaning:** Before installing penetration firestopping systems, clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items, foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. **Priming:** Prime substrates where recommended in writing by penetration firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. **General:** Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping system.
- C. Install fill materials for penetration firestopping systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. **Penetration Identification:** Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type

labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following on labels:

1. The words "Warning – Penetration Firestopping – Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed due to testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING SCHEDULE

- A. UL-classified systems indicated refer to system numbers listed in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. Penetration Firestopping Systems with No Penetrating Items:
 1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-0001 thru 0999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-0001 thru 0999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-0001 thru 0999
 - d. Framed walls: W-L-0001 thru 0999.
 2. Type of Fill Materials: As required to achieve fire rating.
- C. Penetration Firestopping Systems for Metallic Pipes, Conduit, or Tubing:

1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum floor thickness of 5 inches or less; minimum wall thickness of 8 inches or less): C-AJ-1000 thru 1999.
 - b. Concrete/masonry floors and walls (minimum wall thickness of 8 inches or less): C-BJ-1000 thru 1999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-1000 thru 1999
 - d. Framed walls: W-L-1000 thru 1999.
 2. Type of Fill Materials: As required to achieve fire rating.
- D. Penetration Firestopping Systems for Nonmetallic Pipe, Conduit, or Tubing:
1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry and walls (minimum wall thickness of 8 inches or less): C-AJ-2000 thru 2999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-2000 thru 2999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-2000 thru 2999
 - d. Framed walls: W-L-2000 thru 2999.
 2. Type of Fill Materials: As required to achieve fire rating.
- E. Penetration Firestopping Systems for Electrical Cables:
1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-3000 thru 3999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-3000 thru 3999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-3000 thru 3999
 - d. Framed walls: W-L-3000-3999.
 2. Type of Fill Materials: As required to achieve fire rating.
- F. Penetration Firestopping Systems for Cable Trays with Electric Cables:
1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-4000 thru 4999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-4000 thru 4999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-4000 thru 4999
 - d. Framed walls: W-L-4000-4999.
 2. Type of Fill Materials: As required to achieve fire rating.

- G. Penetration Firestopping Systems for Insulated Pipes:
 - 1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-5000 thru 5999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-5000 thru 5999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-5000 thru 5999
 - d. Framed walls: W-L-5000 thru 5999.
 - 2. Type of Fill Materials: As required to achieve fire rating.

- H. Penetration Firestopping Systems for Miscellaneous Electrical Penetrants:
 - 1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-6000 thru 6999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-6000 thru 6999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-6000 thru 6999
 - d. Framed walls: W-L-6000 thru 6999.
 - 2. Type of Fill Materials: As required to achieve fire rating.

- I. Penetration Firestopping Systems for Miscellaneous Mechanical Penetrations:
 - 1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-7000 thru 7999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-7000 thru 7999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-7000 thru 7999
 - d. Framed walls: W-L-7000 thru 7999.
 - 2. Type of Fill Materials: As required to achieve fire rating.

- J. Penetration Firestopping Systems for Groupings of Penetrations:
 - 1. Subject to requirements in Part 2 of this Section, provide UL-classified systems from within the following numbering designations:
 - a. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-AJ-8000 thru 8999.
 - b. Concrete/masonry walls (minimum wall thickness of 8 inches or less): C-BJ-8000 thru 8999.
 - c. Concrete/masonry walls (minimum wall thickness of greater than 8 inches): C-BK-8000 thru 8999
 - d. Framed walls: W-L-8000 thru 8999.

2. Type of Fill Materials: As required to achieve fire rating.

END OF SECTION

SECTION 07 84 43

JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes:
 - 1. Joints in or between fire-resistance-rated constructions:
 - a. Wall-to-wall joints.
- B. Related Sections include:
 - 1. Section 07 84 13 "Penetration Firestop Systems" for penetrations in fire-resistance-rated walls assemblies.

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E1966: Standard Test Method for Fire-Resistive Joint Systems.
 - 3. ASTM E2307: Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus.
 - 4. ASTM E2393: Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
- B. California Department of Public Health (CDPH):
 - 1. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers – Version 1.1, February 2010.
- C. California Green Building Standards Code (CALGreen) – California Code of Regulations, Title 24, Part 11.
- D. Factory Mutual Global (FMG):
 - 1. FM Approvals 4991: Approval Standard for Firestop Contractors.
- E. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 1168 – Adhesive and Sealant Applications.
- F. UL Environment:
 - 1. GREENGUARD Gold certification program.
- G. Underwriters Laboratory (UL):
 - 1. Fire Resistance Directory.
 - 2. Qualified Firestop Contractor Program Requirements.

3. UL 2079: Standard for Tests for Fire Resistance of Building Joint Systems.

1.4 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

1.5 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site to review pertinent issues related to joint firestopping systems.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. CALGreen Submittals:
 - 1. Manufacturer's product data for firestopping materials indicating compliance with product requirements specified in "CALGreen Requirements" Article.
- C. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
 - 1. Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

1.8 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating joint firestopping systems have been installed in compliance with requirements and manufacturer's written recommendations.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

PART 2 - PRODUCTS

2.1 CALGREEN REQUIREMENTS

- A. General: Conform with all applicable requirements of the California Green Building Standards Code (CALGreen).
- B. Provide firestopping materials which comply with current VOC content limits of the South Coast Air Quality Management District (SCAQMD) Rule 1168, except as noted otherwise below. Such products shall also comply with Rule 1168 prohibition of the use of certain toxic compounds (chloroform, ethylene, dichloride, methylene chloride, perchloroethylene, and trichloroethylen).

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide joint firestopping systems tested as follows:
 - 1. Joint firestopping system tests performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Testing per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear the classification marking of UL in its "Fire Resistance Directory," or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist the spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering joint firestopping system products that may be incorporated into the Work include, but are not limited to the following
 - a. Firestopping Sealants and Other Fill Materials:
 - i) Hilti, Inc.
 - ii) 3M Fire Protection Products.
 - iii) Tremco, Inc.; Tremco Fire Protection Systems Group.
 - b. Firestopping Insulation:
 - i) Johns Manville, a Berkshire Hathaway Company.
 - ii) Rockwool International.
 - iii) Thermafiber, an Owens Corning Company.
- C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.
- D. VOC Content of Firestopping Sealants: Complies with requirements specified in "CALGreen Requirements" Article

- E. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Before installing joint firestopping systems, clean joints immediately to comply with joint firestopping system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates, foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of joint firestopping system.
- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning – Joint Firestopping – Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address, and phone number.
 3. Designation of applicable testing agency.
 4. Date of installation.
 5. Manufacturer's name.
 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing or repair, replace joint firestopping systems to comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. UL-classified systems indicated refer to system numbers listed in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.
- B. Wall-to-Wall, Joint Firestopping Systems:
1. Subject to requirements in Part 2 of this Section, provide UL-Classified Systems from within numbering designations WW-D-0001 thru 1999.
 2. Assembly Rating: Match rating of wall assembly.
 3. Nominal Joint Width: As indicated.
 4. Movement Capabilities: Class II – 14 percent compression or extension.
 5. L-Rating at Ambient: Less than 5 cfm/lin ft at 0.30 inch (7.47 Pa) of water.
 6. L-Rating at 400 deg F: Less than 5 cfm/lin ft at 0.30 inch (7.47 Pa) of water.

END OF SECTION

ADDENDUM NO. 1
JOINT FIRESTOPPING
07 84 43-6

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SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants and backing materials at the following locations:
 - 1. Exterior - Including, but not limited to:
 - a. Perimeter joints around glazed aluminum storefront frames.
 - b. Perimeter joints around hollow-metal steel door and window frames.
 - c. Joints between adjacent different materials.
 - d. Other miscellaneous exterior joints occurring in exterior envelope.
 - 2. Interior - Including, but not limited to:
 - a. Perimeter joints around door and window frames.
 - b. Joints around cabinets.
 - c. Perimeter joints around plumbing fixtures.
 - d. Joints between adjacent different materials.
 - e. Other miscellaneous interior joints occurring on the interior.
- B. Related Sections include:
 - 1. Section 07 62 00 "Sheet Metal Flashing and Trim" for sealants related to sheet metal flashing and gutters.
 - 2. Section 08 81 00 "Glass Glazing" for sealants used in glazing.
 - 3. Section 09 30 00 "Ceramic Tile" for joint sealants installed in ceramic tile expansion joints.

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM C 794: Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
 - 2. ASTM C 834: Standard Specification for Latex Sealants.
 - 3. ASTM C 919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 4. ASTM C 920: Standard Specification for Elastomeric Joint Sealants.
 - 5. ASTM C 974: Standard Practice for Preparing Test Specimens from Basic Refractory Castable Products by Casting.
 - 6. ASTM C 1021: Standard Practice for Laboratories Engaged in Testing of Building Sealants.
 - 7. ASTM C 1087: Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.

8. ASTM C 1193: Standard Guide for Use of Joint Sealants.
 9. ASTM C 1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 10. ASTM C 1330: Standard Specification for Cylindrical Sealant Backing for Use With Cold Liquid Applied Sealants.
 11. ASTM C 1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
- B. California Department of Public Health (CDPH):
1. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers – Version 1.1, February 2010.
- C. California Green Building Standards Code (CALGreen) – California Code of Regulations, Title 24, Part 11.
- D. Code of Federal Regulations (CFR):
1. 21 CFR, Chapter 1, Part 177, Section 177.2600: Substances for Use Only as Components of Articles Intended for Repeated Use.
- E. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168 – Adhesive and Sealant Applications.

1.4 DEFINITIONS

- A. Interior Sealant: All sealants occurring within the building waterproofing membrane.
- B. Exterior Sealant: Sealants occurring outside and inclusive of the primary and secondary weatherproofing system, including building waterproofing membrane and air- and water-resistant barrier materials.
- C. VOC: Volatile organic compounds.

1.5 COORDINATION

- A. Refer to Section 09 91 00 "Painting" for Paint Color Schedule where matching sealant colors to paint color of adjacent wall surface.

1.6 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site to review pertinent issues related to joint sealants, including, but not limited to the following:
1. Condition of substrates and preparatory work.
- B. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.7 ACTION SUBMITTALS

- A. Product Data: For each joint sealant product.
1. Include VOC content.

- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view, for selection by Architect.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint Sealant Schedule: Include the following information:
 - 1. Joint sealant application, joint location, and designation.
 - 2. Joint sealant manufacturer and product name.
 - 3. Joint sealant formulation.
 - 4. Joint sealant colors.
- E. CALGreen Submittals:
 - 1. Manufacturer's product data for sealants and sealant primers indicating compliance with product requirements specified in "CALGreen Requirements" Article.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Test Reports: For each type of joint sealant, for tests performed by a qualified testing agency.
- C. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- D. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- E. Field-Adhesion Test Reports: For each sealant application tested.
- F. Sample Warranties: For special warranties.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved for installation of sealants by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct testing indicated.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers

1.11 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted joint sealant manufacturer.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.12 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 2 years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period:
 - a. Silicone Sealants: 20 years from date of Substantial Completion.
 - b. Urethane Sealants: 5 years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 CALGREEN REQUIREMENTS

- A. Provide sealants and sealant primers which comply with current VOC content limits of the South Coast Air Quality Management District (SCAQMD) Rule 1168, except as noted otherwise below. Such products shall also comply with Rule 1168 prohibition of the use of certain toxic compounds (chloroform, ethylene, dichloride, methylene chloride, perchloroethylene, and trichloroethylen).

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer, based on testing and field experience.

- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- C. Colors of Exposed Joint Sealants: As indicated in Joint Sealant Schedule at end of this Section.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50 minimum, Use NT (exposure), Use G, A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 795 Silicone Building Sealant.
 - b. Momentive Performance Materials, Inc./GE; SCS2000 SilPruf.
 - c. Pecora Corporation; 890 FTS.
 - d. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Colors: As indicated in Joint Sealant Schedule at end of this Section.
- B. Nonstaining Single-Component, Nonsag, Neutral-Curing, Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50 minimum, Use NT (exposure), Use M, G, A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 756 SMS Building Sealant.
 - b. Momentive Performance Materials, Inc./GE; SCS9000 SilPruf NB.
 - c. Pecora Corporation; 890 FTS.
 - d. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
 - 3. Colors: As indicated in Joint Sealant Schedule at end of this Section.
- C. Nonstaining Multicomponent, Nonsag, Neutral-Curing, Silicone Joint Sealant: ASTM C 920, Type M, Grade NS, Class 50, Use NT (exposure), Use M, G, A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Tremco Incorporated; Spectrem 4-TS.
 - b. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
 - 3. Colors: As indicated in Joint Sealant Schedule at end of this Section.
- D. Mildew-Resistant, Single-Component, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, Use NT (exposure).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; 898 NST.
 - b. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
 - 3. Color(s): As indicated in Joint Sealant Schedule at end of this Section.

- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT (exposure).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 786 Sealant.
 - b. Momentive Performance Materials, Inc./GE; SCS1700 Sanitary.
 - c. Tremco Incorporated; Tremsil 200.
 - d. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
 - 3. Color(s): As indicated in Joint Sealant Schedule at end of this Section.

- F. FDA-Approved, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT (exposure).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 786 Sealant.
 - b. Momentive Performance Materials, Inc./GE; SCS1200 Construction.
 - c. Tremco Incorporated; Tremsil 200.
 - d. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. FDA Compliance: Compliant with 21 CFR 177.2600 and approved for direct contact with food.
 - 3. Color(s): As indicated in Joint Sealant Schedule at end of this Section.

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 35 minimum, Use NT (exposure), Use M,A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; MasterSeal NP1.
 - b. Pecora Corporation; DynaTrol I-XL.
 - c. Sika Corporation, Construction Products Division; Sikaflex – 1a.
 - d. Tremco Incorporated; Dymonic 100.
 - e. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Colors: As indicated in Joint Sealant Schedule at end of this Section.

- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25 minimum, Use NT (exposure), Use M, A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; MasterSeal NP2.
 - b. Pecora Corporation; DynaTrol II.
 - c. Sika Corporation, Construction Products Division; Sikaflex – 2c NS.
 - d. Tremco Incorporated; Dymeric 240 FC.
 - e. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Colors: As indicated in Joint Sealant Schedule at end of this Section.

- C. Multicomponent, Nonsag, Traffic-Grade Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25 minimum, Use T (exposure), Use M, A, O (joint substrate).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Building Systems; MasterSeal NP2.
 - b. Pecora Corporation; DynaTred.
 - c. Sika Corporation, Construction Products Division; Sikaflex – 2c NS.
 - d. Tremco Incorporated; Dymeric 240 FC.
 - e. Equal product in accordance with Division 1 requirements for product substitutions.
 - 2. Colors: As indicated in Joint Sealant Schedule at end of this Section.

2.5 JOINT SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), as approved in writing by joint sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Cement plaster.
 - d. Unglazed surfaces of ceramic tile.
 - e. Exterior insulation and finish systems.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint sealant manufacturer or as indicated by preconstruction joint sealant substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling on Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT SEALANT SCHEDULE

- A. Exterior Joint Sealant Schedule:
 - 1. Perimeter Joints Around Door and Window Frames, Storefront and Curtainwall Systems, and Metal Louvers, Occurring Adjacent to Non-Stone Surfaces:
 - a. Sealant Type: One of the following:
 - i) Single-component nonsag, neutral-curing silicone joint sealant.
 - ii) Nonstaining multicomponent nonsag, neutral-curing silicone joint sealant.
 - b. Color: As selected by Architect from manufacturer's full range.
 - i) For bidding purposes, assume two separate colors, in equal quantities for each color.

2. Perimeter Joints Around Door and Window Frames, Storefront and Curtainwall Systems, and Metal Louvers, Occurring Adjacent to Stone Surfaces:
 - a. Sealant Type: One of the following:
 - i) Nonstaining single-component nonsag, neutral-curing silicone joint sealant.
 - ii) Nonstaining multicomponent nonsag, neutral-curing silicone joint sealant.
 - b. Color: As selected by Architect from manufacturer's full range.
 - i) For bidding purposes, assume two separate colors, in equal quantities for each color.
 3. Other Miscellaneous Joints Occurring in Exterior Envelope:
 - a. Sealant Type: One of the following:
 - i) Single-component nonsag, neutral-curing silicone joint sealant.
 - ii) Nonstaining multicomponent nonsag, neutral-curing silicone joint sealant.
 - b. Color: As selected by Architect from manufacturer's full range.
 - i) For bidding purposes, assume two separate colors, in equal quantities for each color.
- B. Interior Joint Sealant Schedule: following categories are examples, only; modify and/or add categories to suit project; where colors are specified to "match adjacent wall," etc., verify wall finish colors are specified in other specification Sections or on drawings; coordinate Sealant Type designations used in subparagraphs below with Sealant Type designations in first paragraph of this Article
1. Perimeter Joints Around Door, Window, Storefront, and Curtainwall Frames:
 - a. Sealant Type: One of the following:
 - i) Single-component nonsag, urethane joint sealant.
 - ii) Multicomponent nonsag, urethane joint sealant.
 - b. Color: As selected by Architect from manufacturer's full range.
 2. Joints at Material Transitions:
 - a. Sealant Type: One of the following:
 - i) Single-component nonsag, urethane joint sealant.
 - ii) Multicomponent nonsag, urethane joint sealant.
 - b. Color: As selected by Architect from manufacturer's full range.
 3. Perimeter Joints Around Plumbing Fixtures:
 - a. Sealant Type: One of the following:
 - i) Mildew-resistant, single-component, neutral-curing silicone joint sealant.
 - ii) Mildew-resistant single-component, acid-curing silicone joint sealant.
 - b. Color: Translucent.
 4. Joints in Areas With Direct Food Contact:
 - a. Sealant Type:
 - i) FDA-approved, single-component, acid-curing silicone joint sealant.
 - b. Color: Translucent

END OF SECTION

ADDENDUM NO. 1
JOINT SEALANTS

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes:
 - 1. Solid-core wood doors
 - a. Plastic Laminate face
- B. Related Sections include:
 - 1. Section 08 71 00 "Door Hardware" for finish hardware installed on wood doors.
 - 2. Section 06 41 00 "Architectural Wood Cabinets" for plastic laminate on wood doors

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI A208.1: Particleboard.
- B. American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA):
 - 1. ANSI/BHMA A156.115-W: Hardware Preparation in Wood Doors with Wood or Steel Frames.
- C. California Air Resources Board:
 - 1. Airborne Toxic Control Measure to Reduce Formaldehyde Emissions From Composite Wood Products.
 - 2. Suggested Control Measure for Architectural Coatings.
- D. California Department of Public Health (CDPH):
 - 1. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers – Version 1.1, February 2010.
- E. California Green Building Standards Code (CALGreen) – California Code of Regulations, Title 24, Part 11.
- F. Door Hardware Institute (DHI):
 - 1. DHI-WDHS-3: Recommended Hardware Locations for Wood Flush Doors.
- G. European Standards (EN):
 - 1. EN 15804: Sustainability of Construction Works – Environmental Product Declarations – Core Rules for the Product Category of Construction Products.
- H. Forest Stewardship Council (FSC):

1. FSC STD-01-001: FSC Principles and Criteria for Forest Stewardship.
 2. FSC STD-40-004: FSC Standard for Chain of Custody Certification.
- I. International Organization for Standardization (ISO):
1. ISO 14021: Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labeling).
 2. ISO 14025: Environmental Labels and Declarations – Type III Environmental Declarations – Principals and Procedures.
 3. ISO 14040: Environmental Management – Life Cycle Assessment – Principals and Framework.
 4. ISO 14044: Environmental Management – Life Cycle Assessment – Requirements and Guidelines.
 5. ISO 21930: Sustainability in Building Construction – Environmental Declaration of Building Products.
- J. South Coast Air Quality Management District (SCAQMD):
1. Rule 1113 – Architectural Coatings.
- K. Underwriters Laboratory (UL):
1. UL 10C: Positive Pressure Fire Tests of Door Assemblies.
 2. UL 1784: Air Leakage Tests of Door Assemblies.
- L. Window & Door Manufacturers Association (WDMA):
1. WDMA I.S.1A: Industry Standard for Architectural Wood Flush Doors.
 2. WDMA T.M. 6: Adhesive Durability.

1.4 ACTION SUBMITTALS

- A. Product data: For each type of door. Include details of core and edge construction.
- B. Shop Drawings: Indicate location using same Door Schedule reference numbers used on Drawings, size, and hand of each door, elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data, including the following:
1. Dimensions and locations of blocking.
 2. Dimensions and locations of mortises and holes for hardware.
 3. Dimensions and locations of cutouts.
 4. Undercuts.
 5. Doors to be factory-finished, and finish requirements.
- C. CALGreen Submittals:
1. Manufacturer's product data for primers, stains, and transparent finishes, indicating compliance with product requirements specified in "CALGreen Requirements" Article.
 2. Manufacturer's product data for wood doors which incorporate particleboard core, indicating compliance with product requirements specified in "CALGreen Requirements" Article.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings, using temporary, removable, or concealed markings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.
 - 1. Comply with requirements of referenced standard and manufacturer's written instructions.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty group.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-inch by 84-inch section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 CALGREEN REQUIREMENTS

- A. General: Conform with all applicable requirements of the California Green Building Standards Code (CALGreen).
- B. Composite Wood Products: Provide wood doors manufactured with wood composite products which meet requirements of California Air Resources Board "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions From Composite Wood Products" for formaldehyde resin emission limits (in ppm) for composite wood products and as specified below:
 - 1. Particleboard: 0.09.

2.3 FLUSH WOOD DOORS, GENERAL

- A. Flush Wood Doors: Solid-core wood doors complying with WDMA I.S.1-A, "Architectural Wood Flush Doors."
 - 1. Manufacturers: Subject to compliance with requirements, provide wood doors by one of the following:
 - a. Eggers Industries.
 - b. Masonite Architectural.
 - c. VT Industries, Inc.
 - d. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.
 - 2. Contract Documents may contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- B. WDMA I.S.1-A Performance Grade: Heavy Duty.
- C. Particleboard-Core Doors:
 - 1. Particleboard: ANSI A208.1, Grade LD-2.
 - 2. Blocking: Provide solid-wood blocking in particleboard-core doors as follows:
 - a. 5-inch top-rail blocking in doors indicated to have non-thru-bolted closers.
 - b. 5-inch mid-rail blocking in doors indicated to have non-thru-bolted exit devices.
 - c. 5-inch bottom-rail blocking in doors requiring field-trimming of bottom edge of door to conform to site conditions.
 - 3. Minimum Recycled Content (As Percentage of Entire Door):
 - a. Preconsumer: 45 percent.

2.4 DOORS FOR PLASTIC LAMINATE FINISH

- A. Interior Solid-Core Doors:
 - 1. WDMA I.S.1-A Grade: Premium.
 - 2. Faces: MDO & Plastic Laminate
 - 3. Exposed Vertical and Top Edges: Any closed-grain hardwood.
 - 4. Core: Particleboard.
 - a. Provide manufacturer's mineral-core construction where needed to provide fire-protection rating indicated.
 - 5. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
 - 6. Adhesives: Type I per WDMA T.M. 6.

2.5 FABRICATION

- A. Factory-fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with NFPA 80 requirements for fire-rated doors.

- B. Factory-machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Where installing doors in existing frames, field verify locations and spacing of hinges and strike.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation refer to Section 08 71 00 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - 1. Comply with NFPA 80 requirements for fire-rated doors.

3.3 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

- 1. Swinging doors.
- 2. Sliding doors.
- 3. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

- 1. Mechanical door hardware.
- 2. Cylinders specified for doors in other sections.

- C. Related Sections:

- 1. Division 08 Section "Hollow Metal Doors and Frames".
- 2. Division 08 Section "Flush Wood Doors".
- 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- 2. ICC/IBC - International Building Code.
- 3. NFPA 70 - National Electrical Code.
- 4. NFPA 80 - Fire Doors and Windows.
- 5. NFPA 101 - Life Safety Code.
- 6. NFPA 105 - Installation of Smoke Door Assemblies.
- 7. State Building Codes, Local Amendments.

- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

- 1. ANSI/BHMA Certified Product Standards - A156 Series.
- 2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
- 3. ANSI/UL 294 - Access Control System Units.

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4. ULC-S319 - Electronic Access Control Systems.
5. ULC-60839-11-1, Alarm and Electronic Security Systems - Part 11-1: Electronic Access Control Systems - System and Components Requirements.
6. UL 305 - Panic Hardware.
7. ULC-S132, Emergency Exit and Emergency Fire Exit Hardware.
8. ULC-S533 - Egress Door Securing and Releasing Devices.
9. ANSI/UL 437- Key Locks.
10. ULC-S328, - Burglary Resistant Key Locks.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and

special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

- D. Proof of Compliance: (California located Projects): Provide a list of product(s) containing chemicals known to cause cancer or reproductive toxicity as defined by the Office of Environmental Health Hazard Assessment (OEHHA) under Proposition 65 (CA Code of Regulations, Title 27, Section 27001). The list includes the specific chemical(s), if the chemical will be exposed to consumers, the means of warning, and an illustration of the label.
- E. Informational Submittals:
 - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through the Norton Preferred Installer (NPI) program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.
- F. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- G. California Building Code: Provide hardware that complies with CBC Section 11B.
1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
 2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
 3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
 4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
 - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
 5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.
 - a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
 - b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
 - c. The 5 pound (22.2 N) maximum force shall be validated for the size of the door used. The Building Materials Listing of the California State Fire Marshal shall indicate that the door hardware meets the 5 pound (22.2 N) force and shall also list the largest door that can be used.
 6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.
 7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
 8. Thresholds shall comply with CBC Section 11B-404.2.5.

ADDENDUM NO. 1
DOOR HARDWARE

- H. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- I. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- J. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- K. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check

Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Twenty five years for manual overhead door closer bodies.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

ADDENDUM NO. 1
DOOR HARDWARE

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

- a. Two Hinges: For doors with heights up to 60 inches.
- b. Three Hinges: For doors with heights 61 to 90 inches.
- c. Four Hinges: For doors with heights 91 to 120 inches.
- d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

- a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
- b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

- a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

- a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

- a. Bommer Industries (BO).
- b. McKinney (MK).
- c. Or Approved Equal

B. Hidden Sliding Door System: Provide sliding barn door system that is concealed behind the door for soft open and close applications. System shall support openings with up to a 176 pound

panel capacity, shall meet ADA push force requirements and shall have nylon wheels and steel ball bearings for smooth operation.

1. Manufacturers:
 - a. Hafele (HF) - Slido Design.
 - b. Pemko (PE) - Hide Slide.
 - c. Or Approved Equal

2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 5. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Door Controls International (DC).
 - c. Rockwood (RO).
 - d. Or Approved Equal
- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.
 1. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Door Controls International (DC).
 - c. Rockwood (RO).
 - d. Or Approved Equal
- C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:

- a. Burns Manufacturing (BU).
- b. Hiawatha, Inc. (HI).
- c. Rockwood (RO).
- d. Or Approved Equal

D. Flat Latch Locking Pulls: Post-mount style door pulls with integrated flat latch locking system in type and design as specified in the Hardware Sets. Full and half height with latching at top of door. Option for horizontal push bar. Mechanical or electric strike release as specified. Dogging and ADA thumbturn included. Customized sizing and configuration options.

1. Manufacturers:

- a. Rockwood (RO) - FL Series.
- b. Or Approved Equal

2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy. Manufacturer shall be based in the United States of America.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

C. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. International cylinders including Euro profile and Scandinavian Ovals.
6. Padlock cylinders.
7. Cam, switch, and other industrial cylinders
8. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
9. Keyway: Manufacturer's Standard.Match Facility Standard.Match Facility Restricted Keyway.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)

2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 KEY CONTROL

P. Intelligent Key Cabinet: Provide an electronically controlled key management solution that can secure, distribute and audit keys and other assets. Only authorized users shall be able to gain access to the cabinet via a biometric fingerprint reader or PIN code pad, or a combination of both; provide an optional access card reader. Cabinet shall be available in 32 or 64 port sizes.

1. Web-based administration software shall track all user and asset activity with email and SMS/text reporting capability.
2. Manufacturers:
 - a. Medeco (MC) - IKC.
 - b. Or Approved Equal

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 14 million cycles or greater.
2. Where specified, provide status indicators with highly reflective color and wording for "locked/unlocked" or "vacant/occupied" with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1" x 0.6" with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.
3. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML2000 Series.
 - b. Sargent Manufacturing (SA) - 8200 Series.
 - c. Or Approved Equal

B. Multi-Point Locksets, Blast and Hurricane: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed three-point deadbolt locking devices engineered for use on inswing and outswing door applications. Concealed, fortified steel construction shall secure the door to the frame at top, bottom, and center latching points. All three latching points shall be activated with one

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single motion when the device is closed for single motion egress. Devices shall come in mechanical and electro-mechanical functions as specified.

1. The locking system device shall be part of an integrated door, frame, and hardware assembly listed to the following standards:
 - a. Blast 6.16 psi Category I / Hurricane 150 psf and 50 fps
 - b. Blast 9.74 psi Category II / Hurricane 150 psf and 50 fps
 2. ANSI-BHMA listed to A156.37 Grade 1 for multi-point locks:
 - a. Lever torque to retract all bolts less than 28 in.lb.
 - b. Cycle tested to 800,000 cycles.
 3. UL10B or UL10C, 3-hour fire rated openings.
 4. Latchbolt construction:
 - a. Center Bolt: one piece, 3/4" throw anti-friction stainless steel latch and one piece, 1" throw, hardened stainless steel deadbolt; 2-3/4" backset standard.
 - b. Top and Bottom Bolt: 3/4" x 3/4" square stainless steel latchbolt with 3/4" projection
 5. Independent top and bottom bolt projection shall be field adjustable at the center mortise pocket, while the door is hung which does not require taking the door down to adjust.
 6. Bottom strike shall be offset and reversible to accommodate alignment issues due to rough opening tolerances
 7. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - BL6600 Series.
 - b. Sargent Manufacturing (SA) - BL7300 Series.
 - c. Or Approved Equal.
- C. Multi-Point Locksets, Security: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed three-point deadbolt locking devices are engineered for use on inswing and outswing door applications. Concealed, fortified steel construction secures the door to the frame at top, bottom, and center latching points. All three latching points shall be activated with one single motion when the device is closed and retracted with one single motion for egress. Devices shall come in mechanical and electro-mechanical functions as specified.
1. The locking system device shall be a part of an integrated door, frame, and hardware assembly listed to the following standards:
 - a. ANSI-BHMA listed to A156.37 Grade 1 for multi-point locks:
 - 1) Lever torque to retract all bolts less than 28 in.lb.
 - 2) Cycle tested to 800,000 cycles.
 - b. Meets NFPA 80 and NFPA 101 life safety requirements.
 - c. UL10B or UL10C, 3-hour fire rated openings.
 2. Latchbolt construction:

- a. Center Bolt: one piece, 3/4" throw anti-friction stainless steel latch and one piece, 1" throw, hardened stainless steel deadbolt; 2-3/4" backset standard.
 - b. Top and Bottom Bolt: 3/4" x 3/4" square stainless steel latchbolt with 3/4" projection.
 3. Independent top and bottom bolt projection shall be field adjustable at the center mortise pocket, while the door is hung which does not require taking the door down to adjust.
 4. Bottom strike shall be offset and reversible to accommodate alignment issues due to rough opening tolerances.
 5. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - MP6600 Series.
 - b. Sargent Manufacturing (SA) - 7300 Series.
 - c. Or Approved Equal.
- D. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.
1. Locks shall meet or exceed the requirements of ANSI/BHMA A156.2 Series 4000, Grade 1 with all standard trims, as follows:
 - a. Cycle Test: ANSI/BHMA A156.2 Grade 1 requirements with no lever sag.
 - b. Abusive Locked Lever Torque: Exceed 3,100 in-lb with no entry; lock to maintain egress functionality in compliance with BHMA certification requirements.
 - c. Offset Lever Pull: Exceed 1,600 lbs with no entry (8 times ANSI/BHMA A156.2 requirements).
 - d. Latch Retraction with Preload: Exceed 100 lb preload while maintaining ANSI/BHMA requirements for operation in warped doors (2 times ANSI/BHMA A156.2 requirements).
 2. Vertical Impact: Exceed 100 vertical impacts (20 times ANSI/BHMA A156.2 requirements).
 3. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
 4. Locks are to be non-handed and fully field reversible.
 5. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 12 million cycles.
 6. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - CLX3300 Series.
 - b. dormakaba Best (BE) - 9K Series.
 - c. Sargent Manufacturing (SA) - 10X Line.
 - d. Or Approved Equal.

2.1 INTEGRATED WIRED OUTPUT LOCKING DEVICES – MULTI-CLASS READER

- A. Integrated Wired Output Multi-Class Mortise Locks: Wiegand or Open Supervised Device Protocol (OSDP) output ANSI A156.13, Grade 1, mortise lockset with integrated card reader with or without keypad option, request-to-exit signaling, door position status switch, and latchbolt monitoring in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim, 3/4" deadlocking anti-friction latch, and 1" case-hardened steel deadbolt. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.
1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Latchbolt monitoring and door position switch act in conjunction to report door-in-frame (DPS) and door latched (door closed and latched) conditions.
 2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option.
 3. 12VDC external power supply required for reader and lock, with optional 24VDC lock solenoid. Fail safe or fail secure options.
 4. Energy Efficient Design: Provide lock bodies which have a holding current draw of 500mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
 5. Support end-of-line resistors contained within the lock case.
 6. Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
 7. Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
 8. Manufacturers:
 - a. Corbin Russwin (RU) – ML2000 SN Series.
 - b. Sargent Manufacturing (SA) – SN200/SN210 8200 Series.
 - c. Or Approved Equal.
- B. Integrated Wired Output Multi-Class Cylindrical Locks: Wiegand or Open Supervised Device Protocol (OSDP) output ANSI A156.2, Grade 1, Cylindrical Lockset with integrated card reader with or without keypad option, and request-to-exit signaling in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim with 1/2" deadlocking stainless steel latch. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings.
1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Inside lever handle

(request-to-exit) signaling standard with door position (open/closed status) monitoring (via separately connected DPS).

2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option
 3. 12VDC external power supply required for reader and lock, with optional 24VDC lock solenoid. Fail safe or fail secure options.
 4. Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
 5. Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
 6. Manufacturers:
 - a. Corbin Russwin (RU) – CL3300 SN Series.
 - b. Sargent Manufacturing (SA) – SN200/SN210 10 Line.
 - c. Or Approved Equal.
- C. Hurricane and Tornado Resistance Compliance: Integrated Wired output access control locking devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

2.2 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:

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1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.3 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.
3. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.
4. Egress Pathway Exit Devices: Egress pathway devices connect to the building fire alarm system and when activated begin a looping sequence of synchronized signals integrating flashing LEDs, a conical beam laser and white noise followed by voice commands creating clear pathway to safety and emergency exit locations.
5. Electroluminescent Exit Devices: Increase visibility of exit locations supplementing life safety codes requiring egress path marking systems. Integral "EXIT" green-blue electroluminescent signage provides 3 to 5 times the visibility of other light sources. Devices can be used as a stand-alone feature or wired in conjunction with the fire alarm system.
6. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED5000 Series.
 - b. dormakaba Precision (PR) - Apex 2000 Series.
 - c. Sargent Manufacturing (SA) - 80 Series.
 - d. Von Duprin (VD) - 35A/98 XP Series.
 - e. Yale (YA) - 7000 Series.
 - f. Or Approved Equal.

B. Electromechanical Push Rail Exit Devices (Commercial Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.

2. Manufacturers:
 - a. Yale (YA) - 6000 Series.
 - b. Or Approved Equal.

2.4 INTEGRATED WIRED OUTPUT EXIT DEVICES - MULTI-CLASS READER

- A. Integrated Wired Output Multi-Class Exit Hardware: Wiegand output ANSI 156.3 Grade 1 rim, mortise, and vertical rod exit device hardware with integrated card reader with or without keypad option, latchbolt and touchbar monitoring, and request-to-exit signaling, in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle exit trim with 3/4" throw latch bolt. U.L listed and labeled for either panic or "fire exit hardware" for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.
 1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Inside push bar (request-to-exit) signaling and door position (open/closed status) monitoring (via separately connected DPS).
 2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option
 3. 12VDC external power supply required for reader. 24VDC required for solenoid operated exit trim. Fail safe or fail secure options.
 4. Installation requires only one cable run from the exit hardware to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
 5. Competitor Alternates Allowed Option: Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
 6. Manufacturers:
 - a. Corbin Russwin (RU) – ED5000 SN Series.
 - b. Sargent Manufacturing (SA) – SN200/SN210 80 Series.
 - c. Or Approved Equal
- B. Hurricane and Tornado Resistance Compliance: Integrated Wired electronic access control exit devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

2.5 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC6000 Series.
 - b. Norton Rixson (NO) - 8500 Series.
 - c. Sargent Manufacturing (SA) - 1431 Series.
 - d. Or Approved Equal

C. Door Closers, Overhead Concealed Double Acting (Heavy Duty): Center pivot, double acting ANSI/BHMA 156.4 Grade 1 Certified Products Directory (CPD) overhead door closers. UL Listed and ADA-compliant for interior or exterior doors up to 250 lbs. Closers are non-handed, with adjustable spring strength, hydraulic back check, and two closing speed adjustments for sweep and latch. Latch speed can be independently adjustable per door direction. Cast iron body construction with 1-1/4" dual pistons and an optional hold open feature. Closer bodies shall fit in a 1-3/4" x 4" metal or aluminum transom and 2-1/2" x 4-1/2" wood frame.

1. Manufacturers:
 - a. dormakaba (DO) - RTS88 Series.
 - b. LCN Closers (LC) - 6030 Series.

- c. Norton Rixson (RF) - 73 Series.
 - d. Or Approved Equal.
- D. Door Closers, Overhead Concealed Single Acting (Heavy Duty): Single Acting (Heavy Duty): Center pivot, single acting ANSI/BHMA 156.4 Grade 1 Certified Products Directory (CPD) overhead door closers. UL Listed and ADA-compliant for interior or exterior doors up to 250 lbs. Closers are non-handed, with adjustable spring strength, hydraulic back check, and two closing speed adjustments for sweep and latch. Latch speed can be independently adjustable per door direction. Cast iron body construction with 1-1/4" dual pistons and an optional hold open feature. Closer bodies shall fit in a 1-3/4" x 4" metal or aluminum transom and 2-1/2" x 4-1/2" wood frame.
- 1. Manufacturers:
 - a. dormakaba (DO) - RTS88 Series.
 - b. LCN Closers (LC) - 2030 Series.
 - c. Norton Rixson (RF) - 93 Series.
 - d. Or Approved Equal.

2.6 ARCHITECTURAL TRIM

A. Door Protective Trim

- 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
- 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
- 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
- 4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
- 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
- 6. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood (RO).
 - d. Or Approved Equal.

2.7 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Rockwood (RO).
 - c. Trimco (TC).
 - d. Or Approved Equal.

2.8 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).
 - 2. Reese Enterprises, Inc. (RE).
 - 3. Or Approved Equal.

2.9 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.10 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.
 2. Submit documentation of incomplete items in the following formats:
 - a. PDF electronic file.
 - b. Electronic formatted file integrated with the Openings Studio™ door opening management software platform.
- B. Fire Door Assembly Inspection: Reference Division 01 Sections "Closeout Procedures". Conduct an initial fire door assembly inspection, including documentation reporting, upon completion of door hardware installation according to NFPA 80 Standard for Fire Doors and Other Opening Protectives, paragraph 5.2.4, requirements.
- C. Opening Tags: Provide readable, QR-type label with password protected link-out to Openings Studio™ BIM software suite and the installed door and hardware information. Affix label to door frame as instructed by architect or owner.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

- B. Manufacturer's Abbreviations:

1. GS - ASSA ABLOY Glass Solutions
2. MK - McKinney
3. RO - Rockwood
4. SA - SARGENT
5. OT - Other

- 6. HS - HES
- 7. FO - Folger Adam
- 8. RF - Rixson
- 9. NO - Norton
- 10. PE - Pemko
- 11. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 121A

1 Patch	As Required	US32D	GS
1 Pivot	PF-ADJ-PIVOT	US32D	GS
1 Locking Pull	LP3301FHD ADA_FinSet1	US32D	GS
1 Concealed Closer	OHC-609-90NHO		GS
1 Door Stop	403/441H as required	US26D	RO

Set: 2.0

Doors: 116G

8 Hinge, Full Mortise	TA2314	US26D	MK
1 Self latching top bolt only - Metal door	2805	US26D	RO
1 Classroom Lock	LC 8237 LNL	US32D	SA
1 Cylinder	Match Facility Standard		OT
1 Coordinator	2600 x FB x Mtg Brkts	US28	RO
2 Surface Closer	8501	689	NO
2 Kick Plate	K1050 10" CSK BEV	US32D	RO
2 Door Stop	403/441H as required	US26D	RO
1 Astragal	357C		PE
2 Silencer	608-RKW		RO

Set: 3.0

Doors: 116D

4 Hinge, Full Mortise	TA2314 NRP	US26D	MK
1 Storeroom/Closet Lock	LC 8204 LNL	US32D	SA
1 Cylinder	Match Facility Standard		OT
1 Surface Closer	8501	689	NO
1 Wall Stop	403	US26D	RO

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DOOR HARDWARE
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3 Silencer 608-RKW RO

Set: 4.0

Doors: 108E

1 Note all hardware by door manufacturer OT

Set: 5.0

Doors: 116BB, 166BA

8 Hinge, Full Mortise	TA2314 NRP	US26D	MK
1 Flush Bolt	555	US26D	RO
1 Storeroom/Closet Lock	LC 8204 LNL	US32D	SA
1 Cylinder	Match Facility Standard		OT
2 Surf Overhead Stop	10-336	689	RF
1 Astragal	357C		PE
2 Silencer	608-RKW		RO

END OF SECTION

SECTION 09 22 28

CEILING GRID SUSPENSION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes manufactured suspension grid system for supporting gypsum board ceilings
- B. Related Sections include:
 - 1. Section 09 22 16 "Cold-Formed Non-Structural Metal Framing" for non-structural cold-formed metal framing, including non-load-bearing interior partition walls, furring, framed soffits, and ceiling joists.
 - 2. Section 09 29 00 "Gypsum Board" for gypsum board panels supported by ceiling grid suspension system.
 - 3. Section 09 51 13 "Suspended Lay-In Panel Ceilings" for ceilings with exposed suspension grid and lay-in panels.
 - 4. Division 21 Section for fire sprinkler system in ceiling grid suspension system.
 - 5. Division 23 Section for air terminals in ceiling grid suspension system.
 - 6. Division 26 Section for light fixtures in ceiling grid suspension system.

1.3 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 318: Building Code Requirements for Structural Concrete.
- B. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - 1. ASCE 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- C. American Society of Mechanical Engineers (ASME):
 - 1. ASME B18.6.1: Wood Screws.
 - 2. ASME B18.6.4: Thread Forming and Thread Cutting Screws.
- D. ASTM International:
 - 1. ASTM A580: Standard Specification for Stainless Steel Wire.
 - 2. ASTM A641: Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

3. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 4. ASTM B633: Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 5. ASTM C635: Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 6. ASTM C636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 7. ASTM C645: Standard Specification for Nonstructural Steel Framing Members.
 8. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials.
 9. ASTM E488: Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
 10. ASTM E580: Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
 11. ASTM E1190: Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members.
 12. ASTM F593: Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 13. ASTM F594: Standard Specification for Stainless Steel Nuts.
 14. ASTM F1941: Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.
- E. California Building Code (CBC) – California Code of Regulations, Title 24, Part 2.
- F. Ceilings & Interior Systems Construction Association (CISCA):
1. Ceiling Systems Handbook.
- G. Division of the State Architect (DSA):
1. Interpretation of Regulations Document IR 25-3: Suspended Gypsum Board Ceiling: 2019 CBC (last revision: 8/24/21).
- H. European Standards (EN):
1. EN 15804: Sustainability of Construction Works – Environmental Product Declarations – Core Rules for the Product Category of Construction Products.
- I. Health Product Declaration Collaborative:
1. Health Product Declaration Open Standard.
- J. International Code Council Evaluation Service, Inc. (ICC-ES).
1. ICC-ES AC01: Acceptance Criteria for Expansion Anchors in Masonry Elements.

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2. ICC-ES AC70: Acceptance Criteria for Fasteners Power-Driven into Concrete, Steel, and Masonry Elements.
 3. ICC-ES AC308: Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.
- K. International Organization for Standardization (ISO):
1. ISO 14021: Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labeling).
 2. ISO 14025: Environmental Labels and Declarations – Type III Environmental Declarations – Principals and Procedures.
 3. ISO 14040: Environmental Management – Life Cycle Assessment – Principals and Framework.
 4. ISO 14044: Environmental Management – Life Cycle Assessment – Requirements and Guidelines.
 5. ISO 21930: Sustainability in Building Construction – Environmental Declaration of Building Products.
- M. Underwriters Laboratories (UL).
1. Fire Resistance Directory.

1.4 COORDINATION

- A. Coordinate layout and installation of ceiling grid suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression system.

1.5 PREINSTALLATION MEETING

- 1.6 Preinstallation Conference: Conduct conference at Project site to review methods and procedures related to installation of ceiling grid suspension system.

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.8 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
1. Ceiling grid suspension system components, including suspension system members and seismic compression strut and bracing assemblies.
 2. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
 3. Method of attaching hangers to building structure.
 4. Structural members to which suspension systems will be attached.

- a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 5. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Light fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - 6. Perimeter wall angles.
- B. Evaluation Reports:
- 1. For each ceiling grid suspension system, from ICC-ES.
 - 2. For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver suspension system components and accessories to Project site in original, unopened packages and store in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install ceiling grid suspension system until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Design Requirements: Provide ceiling suspension system that complies with requirements of the California Building Code (Title 24, Part 2), including ability to withstand effects of all design loads and earthquake motions calculated according to requirements using factors defined therein and applicable to local site conditions, without deformation of ceiling suspension system components, or permanent damage to fasteners and anchors.
 - 1. Comply with requirements of California Division of the State Architect Interpretation of Regulations IR 25-3, "Suspended Gypsum Board Ceiling: 2019 CBC." (last revision: 8/24/21).
 - 2. Dead Loads: Ceiling suspension system shall withstand effects of dead loads from weight of gypsum board panels specified in Section 09 29 00 "Gypsum Board."

- B. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency

2.2 CEILING GRID SUSPENSION SYSTEM

- A. Ceiling Grid Suspension System: Manufacturer's standard direct-hung metal suspension system for supporting screw-attached gypsum board finish surfaces; complies with applicable requirements of ASTM C635 and ASTM E580; wide-face, capped, double-web steel runners; main and cross runners roll formed from cold-rolled steel sheet, electrolytically zinc coated, or hot-dip galvanized according to ASTM A653, not less than G40 (Z120) coating designation, with 1-1/2-inch wide bottom flange for attachment of gypsum board.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid System.
 - i) Main Runner: #HD8906.
 - ii) Cross Runner: #XL8926 (2 feet long), #XL8945 (4 feet long).
 - iii) Product Report: ICC-ES Evaluation Report #ESR-1289.
 - b. USG Interiors, Inc.; Drywall Suspension System.
 - i) Main Runner: #DGLW26..
 - ii) Cross Runner: #DGLW224 (2 feet long), #DGLW424 (4 feet long).
 - iii) Product Report: ICC-ES Evaluation Report #ESR-4358.
 - c. Equal product in accordance with Division 1 requirements for product substitutions.
 2. Structural Classification: Heavy-duty system, as defined in ASTM C635.
 3. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 4. Face Design: Flat, with knurled surface.
 5. Provide manufacturer's curved main and cross runners as required for ceiling profile radii as indicated on Drawings.
 6. Perimeter Wall Angle: Manufacturer's standard perimeter wall angle where grid suspension system meets vertical surfaces. Mechanically join main runner and cross runners to each other and cut to fit into wall angle.
 - a. Width of Horizontal Leg: 2 inches.
 - b. Provide perimeter track fabricated to radius of curved ceiling profiles indicated.
 7. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces and maintain alignment of grid at sides where grid is not attached to wall angle for free movement.

2.3 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
1. Mechanical Fasteners: ASME B18.6.4, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 2. Wood Screws: ASME B18.6.1.
 3. Post-Installed Anchors for Concrete: Fastener systems with working capacity calculated according to ICC-ES Acceptance Criteria indicated, and ACI 318 greater than or equal to design load, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency, and according to evaluation report acceptable to authorities having jurisdiction, based on applicable substrate type.
 - a. Torque-Controlled Expansion Anchors: Working capacity calculated according to ICC-ES AC01.
 - i) Product: Subject to compliance with requirements, provide one of the following:
 - a) Hilti, Inc.; Kwik-Bolt TZ (KB-TZ), sizes as indicated on Drawings.
-Product Report: ICC-ES Evaluation Report #ESR-3785.
 - b) Simpson Strong-Tie Company; Strong-Bolt 2, sizes as indicated on Drawings.
-Product Report: ICC-ES Evaluation Report #ESR-3037.
 - c) Equal product in accordance with Division 1 requirements for product substitutions.
 - ii) Expansion Anchor Material: As indicated in referenced Product Report, and as follows:
 - a) Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn5, unless otherwise indicated.
 - b. Adhesive Anchors: Working capacity calculated according to ICC-ES AC308.
 - i) Product: Subject to compliance with requirements, provide one of the following:
 - a) Hilti, Inc.; HY 200, with HAS anchor rod, sizes as indicated on Drawings.
-Product Report: ICC-ES Evaluation Report #ESR-3187.
 - b) Simpson Strong-Tie Company; ET-HP, with anchor rod sizes as indicated on Drawings.
-Product Report: ICC-ES Evaluation Report #ESR-3372.
 - c) Equal product in accordance with Division 1 requirements for product substitutions.

- ii) Anchor Rod and Nut Material: As indicated in referenced Product Report, and as follows:
 - a) Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn5, unless otherwise indicated.
- B. Wire Hangers, Braces, Safety Wires, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A641, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage) wire or as otherwise indicated on Drawings.
- C. Anchor Clips: Angles with legs of width as indicated on Drawings, or if not indicated, 1-inch-wide at concrete decks and 3-inch-wide at steel decks (e.g. without concrete fill); provide hole for attaching hanger and bracing wires; unless otherwise indicated, formed of 0.1084-inch thick (12 gage) galvanized steel sheet complying with ASTM A653, G90 (Z275) coating designation; with attachment devices as indicated on Drawings.
- D. Compression Strut for Seismic Uplift: ASTM C645; standard C-shaped steel stud section; with stiffened flanges; unpunched.
 - 1. Stud Flange Width: 1-5/8 inch
 - 2. Stud Depth: 2-1/2 inches
 - 3. Base-Metal Thickness: 0.0346 inch (20 gage - Structural)
 - 4. Grade: 33 ksi minimum yield strength.
 - 5. Protective Coating: ASTM A653, G40 (Z120) hot-dip galvanized zinc coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which suspension systems attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect suspension system installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of ceiling grid suspension system.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Lay out openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. General: Install ceiling grid suspension system to comply with manufacturer's written instructions and the following, as applicable to Seismic Design Categories D, E, and F:
1. California Building Code.
 2. ASTM C636.
 3. ASTM E580.
 4. California Division of the State Architect Interpretation of Regulations IR 25-3: Suspended Gypsum Board Ceiling: 2019 CBC (last revision: 8/24/21)."
 5. CISCA's "Ceiling Systems Handbook."
 6. Fire-Rated Assembly: Install fire-rated ceiling systems according to referenced tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - a. Separate all hanger wires at least 6 inches from unbraced ducts, pipes, conduits, and other construction above ceiling.
 2. Space hangers not more than 48 inches on center along each member supported directly from hangers, unless otherwise indicated. Provide hangers not more than 6 inches from ends of each member, or within 1/4 of the length of the end runner, whichever is least, around the entire perimeter of the ceiling area.
 - a. Provide additional hangers as required at all ceiling breaks, soffits, or discontinuous areas.
 - b. When building structure does not permit installation of hangers at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 3. Splay hangers only where required to miss obstructions offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - a. Hanger wires more than 1 in 6 out of plumb are to have countersloping wires.
 - i) Countersloping is optional for perimeter hanger wires at main runners that are positively attached to perimeter closure angle.
 4. Where ductwork, piping, equipment, and other construction within ceiling plenum interferes with location of hangers at required spacing, install supplemental suspension members and hangers in the form of trapezes or equivalent devices, so hanger wires do not attach to or bend around interfering construction.
 5. Secure wire hangers to ceiling suspension members and to supports above by looping and wire tying with a minimum of three tight turns in 3 inches. Hanger wire loops shall be tightly wrapped and sharply bent to prevent vertical movement or rotation of the member within the loops. Connect hangers

directly either to structures or to anchor clips, eye bolts, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures

- a. Direction of anchor clip leg, eye bolt, or other anchoring device to align as closely as possible with the direction of the hanger wire.
 6. Do not support ceilings directly from metal floor deck. Fasten hangers to post-installed mechanical or adhesive anchors, or power-actuated fasteners that extends through metal deck and into concrete.
 7. Do not attach hangers to steel deck tabs.
 8. Do not attach hangers to ducts, pipe, or conduit.
 9. Splicing of hanger wires is not permitted.
 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Provide bracing assemblies consisting of a compression strut and four splayed bracing wires oriented 90 degrees from each other. Place bracing assemblies at a spacing of not more than 12 feet by 12 feet on center.
1. Provide bracing assemblies at locations at no more than 1/2 of the spacings indicated above, from each perimeter wall and at the edge of vertical ceiling offsets (e.g. where spacing is 8 feet, edge distance shall be a maximum of 4 feet from wall in direction of the 8-foot spacing; where spacing is 12 feet, edge distance shall be a maximum of 6 feet from wall in direction of the 12-foot spacing).
 2. Provide additional bracing assemblies as required at all ceiling breaks, soffits, or discontinuous areas.
 3. Configure or locate bracing wires so as to avoid obstructions while maintaining required maximum spacing of bracing assemblies. Bracing wires shall not attach to or bend around obstructions including but not limited to ductwork, piping, conduit, and equipment.
 4. Secure bracing wires to ceiling suspension members and to supports by looping and wire tying with a minimum of four tight turns in 1-1/2 inches. Connect bracing wires directly either to structures or to anchor clips, eye bolts, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures. Do not attach to steel deck tabs. Fasten anchor clips for bracing wires into concrete with post-installed anchors (power-actuated fasteners are not allowed for bracing wires).
 - a. Direction of anchor clip leg, eye bolt, or other anchoring device to align as closely as possible with the direction of the bracing wire.
 - b. At prestressed concrete, post-installed anchors shall not interfere with prestressing tendons and strands.
 5. Attachment of bracing wire shall be no more than two inches away from the compression strut.

6. Slope of bracing wires is not to exceed 45 degrees from the horizontal plane of the ceiling.
 7. Bracing wires shall be taut.
 8. Splicing of bracing wires is not permitted.
 9. Separate all bracing wires at least 6 inches from unbraced ducts, pipes, conduits, and other construction above ceiling.
 10. Compression struts to be adequate to resist vertical component of loads induced by bracing wires, and are not to be more than 1 (horizontal) in 6 (vertical) out of plumb.
- D. Do not attach ends of suspended ceiling runners to more than two adjacent walls, such that one end of main and cross runners is fixed, and one end is free to move, with 1 inch clear between free end of runner and wall. If walls run diagonally to suspended ceiling runners, one end of main and cross runners shall be free with a minimum of 1 inch clearance between end of runner and wall.
1. Install wall angle of type indicated at perimeter of ceiling grid suspension area.
 - a. Screw attach wall angle to substrate at intervals not more than 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 2. At those portions of ceiling perimeter in which free end of main or cross runners is not attached to wall angle, provide a seismic stabilizer bar for interconnection between adjacent runners at free end to prevent lateral spreading.
 - a. If perpendicular distance from wall to first parallel runner is 6 inches or less, interconnection of free ends of perpendicular runners is not required.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Mount all light fixtures, air terminals, and other devices and services in ceiling as follows:
1. Light fixtures, terminals, and other devices shall be mounted in a manner that will not compromise ceiling performance in accordance with ASCE 7, as amended by the California Building Code and ASTM E580.
 2. Gypsum board panels shall not support any light fixtures, air terminals, or devices.
 3. Attach all light fixtures, air terminals, flexible sprinkler hose fittings, and other devices and services, including fire alarm strobes, smoke detectors, speakers, exit signs, etc occurring in ceiling to ceiling suspension system main runners (Heavy-Duty classification) to resist a horizontal force equal to the weight of the fixture, terminal, or device, using screws or other approved fasteners. Minimum of two attachments are required at each fixture, terminal, or device.
 4. Services Within Ceiling:
 - a. Support surface-mounted light fixtures by at least two positive metal clamping devices of 14-gage minimum thickness which completely surrounds the ceiling runner and which are each connected to a 12-gage

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slack safety wire anchored to structure above. Spring clips or clamps and rotational spring catches that connect only to the runner are not acceptable. Provide additional supports when light fixtures are 8 feet long or longer or exceed 56 lbs. Maximum spacing between supports shall not exceed 8 feet

- b. Light fixtures, air terminals, flexible sprinkler hose fittings, and other services weighing 20 lbs and less than or equal to 56 lbs, may be supported directly on main runners of a Heavy-Duty classification suspended ceiling system. Fixtures weighing more than 10 lbs shall be provided with a minimum of one 12-gage slack safety wire, connected to the fixture housing and anchored to structure above.
 - c. Light fixtures, air terminals, flexible sprinkler hose fittings, and other services weighing more than 20 lbs and less than or equal to 56 lbs shall be independently supported by not less than two 12-gage taut safety wires, each connected to the housing and anchored to the structure above.
 - d. Light fixtures, air terminals, flexible sprinkler hose fittings, and other services weighing more than 56 lbs shall be independently supported by not less than four 12-gage taut safety wires, each connected to the housing and anchored to the structure above.
5. Support pendant-mounted light fixtures directly from structure above with hanger wires or cables passing through each pendant hanger and capable of supporting two times the weight of the fixture. Provide bracing assembly, as specified above, where pendants penetrate ceiling. Bracing assembly to be positively connected to pendant as required to transmit horizontal forces, so that pendant does not impose any lateral force on suspended ceiling system.
- G. Provide seismic separation/expansion joints in ceiling areas as follows:
1. As required to divide overall ceiling area into individual areas not exceeding 2500 square feet.
 2. In ceiling areas at intersections of corridors, and at junctions of corridors and lobbies or other similar areas.
 3. At penetrations through ceiling for sprinkler heads and other similar devices that are not integrally tied to ceiling system in the lateral direction, provide one of the following methods to accommodate movement:
 - a. 2-inch oversized ring, sleeve, or adapter through ceiling tile to allow free movement of 1 inch in all horizontal directions.
 - b. Flexible sprinkler hose fitting that can accommodate 1 inch of ceiling movement in any lateral direction.
- H. Refer to Section 09 29 00 "Gypsum Board" for installation of gypsum board panels over ceiling grid suspension system.

3.4 FIELD QUALITY CONTROL

- A. Owner will engage a qualified special inspector to perform the following special inspections:

1. Periodic inspection during the installation of suspended ceiling grids according to ASCE 7.
- B. Testing Agency: Project Inspector will perform tests and inspections and prepare test reports.
1. Notify Project Inspector at least 2 working days in advance of the time when Work that requires testing or inspecting is to be performed.
 2. Provide access to the Work as needed to perform testing and inspecting.
- C. Testing and Inspection: Testing and inspecting of completed installations of suspended lay-in panel ceiling hangers and anchors and fasteners shall take place in successive stages. Do not proceed with installations of suspended lay-in panel ceiling hangers for the next area until test results for previously completed installations of suspended lay-in panel ceiling hangers show compliance with requirements.
1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
 - a. Within each test area, testing agency will select 1 of every 10 power-actuated fasteners and post-installed anchors used to attach hangers to concrete and will test them for 200 lbf of tension. It will also select one of every two post-installed anchors used to attach bracing wires to concrete and will test them for required tension or torque loads as required by California Building Code, but not less than 440 lbf of tension.
 - b. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.
- D. Remove and replace suspended lay-in panel ceiling hangers and anchors and fasteners that do not pass tests and inspections and retest as specified above.
1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 21 13 13

FIRE-SUPPRESSION SPRINKLER SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fire sprinkler system for protection of buildings.

C. Related Requirements: The requirements of this Section, NFPA 13 and NFPA 14 shall take precedence over requirements found in the following:

1. Division 01 - General Requirements.
2. Section 09 91 00: Painting.

1.02 SUBMITTALS

A. Manufacturer's Data:

1. Submit complete and detailed equipment and material list of items to be furnished and installed under this section.
2. Submit manufacturer's specifications and other data required to demonstrate compliance the plans and specified requirements.

B. Drawings:

1. Submit shop drawings of wet pipe fire protection sprinkler system in compliance to NFPA 13, Standard for the Installation of Sprinkler Systems, Sprinkler systems shall comply with the provisions of NFPA 13.
2. Shop drawings shall fully comply with the most stringent provisions of this specification and plans, and with the applicable codes and standards.
3. Shop drawings shall be same size as the Contract Drawings and shall be produced using AutoCAD.

C. Regulatory Requirements:

1. Installation of fire sprinkler system shall not vary from the plans unless alterations have been approved by the State Fire Marshal at DSA.
2. Complete DSA standard testing forms and get sign-off by the Project Inspector.

D. Closeout Submittals: Submit in accordance to Section 01 7700, Contract Closeout, and as specified herein:

ADDENDUM NO. 1

FIRE-SUPPRESSION SPRINKLER SYSTEM

1. Record Drawings:
 - a. Record drawings of installed Work shall be maintained current on the Project site, available for Fire Marshal and the Project Inspector to review.
 - b. At completion of installation submit Record Drawings signed by installing Contractor in AutoCad format, including:
 - 1). Record Specifications.
 - 2). Record Product Data: Include specific model, type and size for equipment and material installed.
 3. Record Test Results.
 4. Maintenance Manuals.

1.03 QUALITY ASSURANCE

- A. Comply with applicable national or local codes and standards.
- B. Except where exceeded by the requirements of these specifications, the following are made part of this section: prints and details, and provisions of the NFPA 13 Standard for Installation of Sprinkler Systems and NFPA 14 Standard for the Installation of Standpipes and Hose Systems.
- C. Qualifications of Manufacturer: Products used in work of this section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a 5 year history of successful production that is acceptable to the Architect.
- D. Qualifications of Installer: Installer shall have a current C-16 license in the State of California in the installation of fire sprinkler systems.

1.04 JOB CONDITIONS

- A. Unscheduled utility flow interruptions are not permitted. Schedule service interruptions in advance, with the OAR.

1.05 EXTRA MATERIALS FOR MAINTENANCE

- A. Provide spare sprinkler heads in quantity equal to 2 percent of total number of each type of sprinkler head installed. There shall be no less than two heads of each type and temperature rating provided, and in no case less than six spare sprinkler heads per building. There shall be no fewer than 6 spare sprinkler heads for up to 300 sprinkler heads installed; no less than 12 spare sprinkler heads for up to 1,000 sprinkler heads installed; and no less than 24 spare sprinkler heads for the sites with more than 1,000 sprinkler heads installed. Spare sprinkler heads shall be kept inside of spare sprinkler head box(s). A spare sprinkler wrench for each type of sprinkler head shall also be provided inside of each spare sprinkler head box, at each building. Locations of spare sprinkler boxes shall be located at:
 1. Fire Sprinkler Riser, when enclosed and secure.
 2. Plant Manager's Office, when Fire Sprinkler Riser is exposed.

PART 2 - PRODUCTS

2.01 FIRE PROTECTION SYSTEM DESCRIPTION

- A. General: Provide systems complete including, but not limited to:
1. Provide underground and above ground sprinkler and standpipe piping including trenching and backfilling. Materials and equipment shall be UL/FM listed and approved as required by NFPA for their application. Required signage shall be provided and installed as required by NFPA 13 and NFPA 14.
 2. Provide overhead sprinkler system with sprinklers installed as required according to type, location and temperature rating.
- B. Sprinkler Heads:
1. Provide chrome pendant spray type sprinkler heads with matching escutcheons in areas with finished ceilings. Exterior escutcheons shall be poly-coated or concealed type to prevent rusting and oxidation.
 2. Provide upright sprinklers in areas with exposed piping.
 3. Provide poly-coated glass bulb corrosion resistance type sprinklers heads in areas exposed to a corrosive environment such as parking garages and coastal air.
 4. Sprinklers shall be glass bulb type, with hex-shaped wrench boss integrally cast into the sprinkler body to reduce the risk of damage during installation,
 5. Sprinklers in concealed spaces, exterior locations, and other areas that will experience over 100 degrees F ambient temperature shall be furnished with 200 to 225 degree rated sprinklers. Sprinkler heads in boiler rooms, furnace rooms, or heater rooms shall be furnished with sprinklers rated at 250 to 290 degrees F. If a sprinkler is directly affected by a spotlight, steam, or other heat source, a 350 degree F or higher sprinkler head shall be furnished. Sprinkler heads in other locations, unless otherwise noted, shall be 155 to 165 degrees F rated.
 6. Automatic fire sprinkler head type shall be as follows:
 - a. In areas with ceiling heights of nine-feet or lower, sprinkler heads installed shall be recessed or fully concealed.
 - b. Ceilings eight-feet or lower shall be provided with fully concealed sprinkler heads.
 - c. Areas with ceiling height of nine-feet or lower, that are not constantly supervised such as corridors, arcades, students restrooms, and other restrooms shall be provided with fully concealed sprinkler heads.
 7. Sprinkler heads in light hazard occupancies are required to be Quick Response sprinklers as required in NFPA 13. Sprinkler heads shall be of the same manufacturer throughout the building/site as indicated. Sprinklers shall

typically be ½ inches NPT, standard orifice, minimum 5.6 nominal K factor, UL listed for 175 psi, and listed for light and ordinary hazard occupancies.

8. Other specialized sprinkler heads such as walk-in refrigerator or freezer heads, side wall, ¾ inches sprinklers above 5.6 K factor, and those sprinklers with a K factor below 5.6, shall only be used where required by project condition. Large drop sprinkler heads and extended coverage sprinkler heads shall not be installed.
9. Sprinkler head location shall be designed and installed in an aesthetically pleasing manner and should generally be located in center of 24-inch by 24-inch ceiling tiles and in center of 24-inch by 48-inch ceiling tiles in the 24-inch direction and no closer than 12-inch from the edge in the 48-inch direction.
10. UL/FM listed Sprinkler head guards shall be provided on Sprinkler heads installed at seven feet six inches above floor or lower in exposed locations, or that are deemed subject to damage. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at seven feet six-inch heights or lower.

C. Fire Sprinkler Systems:

1. Pipe through ceilings at head locations shall be furnished with a two piece, or fully concealed escutcheon. Unless otherwise designated, escutcheons shall be identical and match the other escutcheons of the same type throughout the building or site. Piping through walls and ceilings shall have a split ring chrome escutcheon.
 - a. Flexible stainless steel sprinkler head drop system may be used. Flexible drops shall be UL listed, FM approved, and shall be compatible with ceiling systems. Flexible drop length shall be included in the Hydraulic Calculations. The drop system shall include the required support bracing.
2. Furnish and install required signs, spare heads, special wrenches, and spare sprinkler head boxes as required to satisfy NFPA 13, NFPA 14 and this specification.
3. Upon completion of the Work of this section, and before Substantial Completion, subject system, including underground supply connection, to tests required. A minimum hydrostatic test shall be two hundred pounds (200 psi) or fifty pounds (50 psi) in excess of the maximum system working pressure, whichever is greater, for two hours with no leaks or loss of pressure per NFPA 13. The Project Inspector shall be furnished with a NFPA 13 test certification.
4. Local fire sprinkler alarm requirements shall be accomplished with a vane or paddle type water flow detector switch and an electrically powered fire sprinkler horn located on the street side of the building and connected to the fire alarm control panel with secondary power provided from the fire alarm batteries. The drilled out disk shall be attached to the mounting U-bolt. Time delay shall be set at 45 to 60 seconds. Mechanically activated water bells with alarm valve and pressure switch are prohibited.

ADDENDUM NO. 1

FIRE-SUPPRESSION SPRINKLER SYSTEM

5. Hanging, bracing and support shall utilize only UL/FM listed approved products, and comply with NFPA 13, Chapter 9 requirements for rod and bolt sizes except for the following: 4 and 6 inch pipe shall be supported by a minimum ½ inch hanger rod, 8 inch pipe shall be supported by a minimum 5/8 inch hanger rod, 10 and 12 inch pipe shall be supported by a minimum ¾ inch hanger rod. Hanger rods in exterior locations and in parking structures shall have Electrodeposited Zinc Coating per ASTM B633 to prevent rusting.

2.02 MATERIALS

A. Automatic Fire Sprinkler Head, UL/FM listed:

AFSH-1	Brass pendant type for areas with suspended ceilings:				
	Victaulic V27	Tyco TY 3231	Viking VK302	Reliable F1FR56	Or equal
AFSH-2	Brass upright type for areas with no ceilings:				
	Victaulic V27	Tyco TY3131	Viking VK300	Reliable F1FR300	Or equal
AFSH-3	Chrome or poly coated semi recessed type with semi-recessed escutcheon:				
	Victaulic V27	Tyco TY3231	Viking VK302	Reliable F1FR56	Or equal

B. Escutcheons

ES-1	Chrome plated, or white poly-coated, 2-piece canopy (escutcheon), 2.25 to 3.5 inches in extended position:				
	FPPI 01 - 401 Chrome or White	Tyco No. 401 Chrome or White		Reliable HBC (chrome) HBW (white)	Or equal
ES-2	Chrome plated or white poly coated, 2-piece recessed:				
	FPPI 01 - 400 01 - 402	Tyco 410 420	Reliable (semi recessed) GF2-C (chrome) GF2-W (white)		Or equal

C. Sprinkler Guards:

SPG-1 Sprinklers installed at seven feet six inches above floor or lower in exposed locations, or that are deemed subject to damage shall be equipped with a UL/FM listed, head guard. Guards shall be listed, supplied and approved for use with the sprinkler by the sprinkler manufacturer. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at seven feet six-inch heights or lower.

ADDENDUM NO. 1

FIRE-SUPPRESSION SPRINKLER SYSTEM

Reliable Viking Tyco FPPI Victaulic
Or equal.

D. Hangers, Supports, Bracing:

HSB-1 Tolco products or UL listed and FM or equal.

E. Threaded fittings:

TF-1 Ductile iron, 300 psi rated, UL listed, FM or NFPA approved.

TF-2 Cast iron fittings, 175 psi rated, UL listed, FM or NFPA approved:

Anvil Ward Taylor Or equal

TF-3 Malleable Iron, 300 psi rated, UL, Listed, FM or NFPA approved

TF-4 Galvanized, 175 psi rated, UL Listed, FM or NFPA approved

F. Fire Sprinkler Pipes:

FSP-1 Fire sprinkler pipe: 1 inch through 8-inch, Schedule 40, black or galvanized steel meeting ASTM Standards A53, A135, or A795. Pipe Corrosion Resistance Ratio (CRR) shall be 1.00 or greater. Pipe may be threaded or grooved.

a. Piping 2 inches and smaller shall have threaded joints and fittings in concealed, non-accessible locations. Groove coupler connections (Victaulic, Viking VGS, or equal) on pipe sizes 1 inch through 2 inches are acceptable in accessible areas with required seismic bracing provided. Plain end connections such as "Plainlock" and "FIT" are prohibited.

b. For pipe sizes 2 ½-inch and larger, grooved type (Victaulic, Viking VGS, or equal), welded, threaded and flanged connections may be used. Any connection that does not utilize a threaded, welded or grooved connection is prohibited, except for mechanical tee bolt-on branch outlet fittings sizes 2-inch and smaller (Victaulic 920 and the 920N).

c. Submit Verification from manufacturer stating that piping material furnished meets above criteria; (i.e.: threadable pipe has a UL assigned CRR of 1.00 minimum, that it meets ASTM A53, A135 or A795, and it is UL listed, FM or NFPA approved.)

FSP-2 Ductile iron pipe, AWWA C151 (for pipes below grade). Gasketed self retaining joints per ASME/ANSI B16.4.

FSP-3 Plastic, PVC, thick wall (cast iron OD sized), DR 14 (200 PSI). UL listed for fire main service (underground). Gasketed self retaining joints - Johns Manville Blue Brute AWWA C900, JM Eagle C900 water pipe or equal.

ADDENDUM NO. 1

FIRE-SUPPRESSION SPRINKLER SYSTEM

FSP-4 Fire Sprinkler Pipe: 1 inch through 3-inch, Copper meeting NFPA 13 Standards. Pipe may be grooved.

FSP-5 Flexible Fire Sprinkler Head Connectors: 1 inch pipe size flexible stainless steel fire sprinkler head connectors "Flex Head Industries" Models 2024, 2036, 2048, 2060 and 2072, or equal..

2.03 ACCESSORIES AND APPURTENANCES

- A. Escutcheons: Polished chrome plated split-ring type for exposed piping at every penetration inside finished rooms.
- B. Guards: Provide sprinklers with guards at ceiling at or under seven feet six-inch high and where subject to damage or vandalism.
- C. Miscellaneous: Provide accessories and appurtenances for a complete system.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which Work of this section shall be performed. Correct conditions detrimental to proper and timely completion of Work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel or groove plain end ferrous pipe ends.
- B. Remove scale and foreign matter, from inside and outside of pipes, before assembly.
- C. Provide piping connections to equipment with flanged or grooved connections.

3.03 INSTALLATION

- A. Pipe through floors, wall, and ceilings, at head locations, shall be furnished with required sleeves, and escutcheons and fire caulking where indicated and/or required by code. Escutcheons shall be polished chrome plated unless other finish is selected by the Architect.
- B. Upon completion of the Work of this section, and before Substantial Completion, subject the entire system, including underground supply connections, to tests as required by NFPA 13, and CBC standards and furnish the Owner with a certificate of compliance as required.
- C. Close nipples are prohibited. Threaded unions are prohibited. Where a threaded union or coupling is needed, a groove type fitting (Victaulic or equal) shall be used instead. If a groove style coupling is used in a concealed area, an access panel allowing full access to that connection shall be provided.

- D. Fire sprinkler systems piping hangers, seismic bracing, anchors and supports shall conform to NFPA 13, CBC and other applicable codes and the requirements of this specification.
- E. Grooved joints shall be installed in accordance with the manufacturer's latest published installation instructions. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. Gaskets shall be of an elastomer grade suitable for the intended service, and shall be molded and produced by the coupling manufacturer.
- F. Tee branch outlets on fire sprinkler mains shall be by the use of a threaded ductile iron tee fitting, a groove type tee fitting, (Victaulic or equal), or by the use of a thread-a-let welded on by a certified welder as required by NFPA. Mechanical tee bolted branch outlet fittings are prohibited except for branch outlet sizes 2-inch and smaller.
- G. Sprinklers that have been dropped, damaged, have cracked bulbs, or show a visible loss of fluid shall not be installed.
- H. Sprinkler bulb protectors shall be removed by hand after sprinkler installation. Tools or other devices to remove the protector that could damage the bulb in any way shall not be used.
- I. Routing of piping in non-concealed exposed areas shall be subject to the Architect's review in the final shop drawings.

3.04 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.05 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose at off-project site.

END OF SECTION

SECTION 23 00 00H

HVAC GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Division 01.
- B. The requirements of the General Conditions and Supplementary Conditions.

1.2 SUMMARY

- A. Furnish and install a complete (fully tested, adjusted, and ready for operation) mechanical system and fully automatic indoor space thermal conditioning and ventilation (commonly "HVAC") system with associated controls as described by the Contract Drawings and Specifications.
- B. The HVAC systems and design described in the Project documents reflect a building designed for low consumption of energy and water and minimum environmental footprint. Any modifications to the systems described herein shall maintain or improve on the sustainability and energy efficiency features of the project.
- C. All design modifications that pertain to system selection, system energy efficiency and energy use, material selection and indoor air quality issues shall require the approval of Integral Group.
- D. Include incidental details not usually shown or specified, but necessary for proper installation and operation.
- E. Check, verify, and coordinate Work with Contract Drawings and Specifications prepared by all other trades. Include modifications, relocations, and adjustments necessary to complete work or avoid interference with other trades.
- F. Where architectural features govern location of Work, refer to Architectural Drawings.
- G. Contractor may install additional piping, fittings, and valves, not shown on the drawings, for testing purposes or convenience of installation. Where such materials are installed, they shall comply with the specifications and shall be properly sized for the system and operation. Remove such installed materials when they interfere with design conditions or as directed by the Architect.
- H. Commissioning: The scope of work for the Contractor shall not include the duties of the Commissioning Authority (CxA). Contractor will be required, however, to include in their scope of work duties relevant to the commissioning process, including but not limited to training of owner's personnel in the operation of the HVAC equipment, providing manufacturer's startup and pre functional checklists and contractor-provided pre-functional and startup checklists to Commissioning Authority, performing and documenting pre-functional tests for HVAC equipment, performing and documenting functional tests for HVAC equipment, supporting DDC Contractor and Test and Balance Contractor in the performance of their duties, and providing operations and maintenance manuals.

ADDENDUM NO. 1

HVAC GENERAL REQUIREMENTS

1.3 CODES AND STANDARDS

- A. All work and materials shall be in full accordance with the latest local rules and regulations, applicable sections of the California Code of Regulations, Title 24, State Fire Marshal, the Safety Orders of the Division of Industrial Safety, the California Electric Code and applicable State requirements. Nothing in these Plans and Specifications is to be construed to permit work not conforming to these requirements.
- B. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ductwork, pipework, and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or a contractor licensed to install HVAC systems.
- C. Wherever the Specifications call for or describe materials or construction of better quality or larger sizes than are required by the above rules and regulations, these Specifications shall govern. Should there be any direct conflict between the above rules and regulations and the Specifications the rules shall govern.
- D. Equipment shall have UL label listing.

1.4 DRAWINGS

- A. Layout of the equipment and work is diagrammatic, unless specifically dimensioned. Drawings and details shall be checked for interferences before installing the work. Any interference noted between different drawings, and between drawings and actual field conditions shall be brought to the attention of the Architect and Engineer of Record for a decision. The right is reserved to make any reasonable change in location of equipment without additional expense to the Owner.
- B. For purposes of clarity and legibility, drawings are diagrammatic to the extent that many offsets, bends, special fittings, exact locations of items are not indicated, unless specifically dimensioned. Exact routing of piping and ductwork and locations of equipment shall be governed by structural conditions and obstructions. Contractor shall make use of all data in Contract Drawings and Specifications and field conditions.
- C. In the event a major re-routing of a system appears necessary, Contractor shall prepare and submit for approval, shop drawings of the proposed rearrangement. Because of the diagrammatic nature and small scale of the Contract Drawings, all necessary offsets, adjustments, and transitions required for the complete installation are not shown. Contractor shall carefully investigate the structural and finish conditions affecting all the Work and shall arrange such work accordingly, furnishing such fittings, equipment, accessories, etc., as may be required to meet such conditions, at no increase in Contract Sum.
- D. The construction documents for this project were prepared by the design team using BIM (Building Information Modeling). Using this software by the design team does not relieve the Contractor from performing the necessary coordination to provide complete, code compliant and operational building systems. The plans and sections provided are diagrammatic and show the design intent, these are not intended to be used for fabrication or installation. Contractor is responsible for generating shop drawings for fabrication that meet the design intent as shown on the Contract Documents. The exact location of the piping, ductwork, electrical and support components are to be determined by the Contractor. All building sections and details provided are for information only and do not relieve the Contractor from performing final coordination. Contractor is responsible for coordinating with all other trades.

- E. All dimensions and locations of equipment, doors, partitions, etc., are to be taken from the architectural plans but shall be verified at the site.

1.5 MECHANICAL SUBMITTAL PROCEDURES

- A. See Division 01 “Administrative Requirements”, for submittal procedures.
- B. Mechanical and related submittals are, in addition, subject to the requirements of this Article. In the event of a conflict between the requirements of Division 01 and this Article, the requirements of this Article shall supersede and take precedence over those of Division 01.
- C. Engineer of Record will review submittals and provide comments within the following timeframe after receipt by the Engineer:
 - 1. For typical submittals, allow 10 working days.
 - 2. For large or complex submittals, allow 15 working days. Determination of “large and complex” submittal shall be at the discretion of the Engineer of Record.
 - 3. Do not send Engineer of Record more than 10 submittals in a contiguous period of 5 working days. If excess submittals are received, review period will be extended as necessary to perform proper review. Submittals will be reviewed in priority determined by Engineer of Record in consultation with Architect and Contractor.
 - 4. These submittal review periods supersede and take precedence over periods defined in Division 01, unless Division 01 allows for longer review periods.
 - 5. Submittal review periods shall not be reduced from the times herein except by agreement with the reviewing entity, in advance and in writing.
- D. Submittal documentation and drawings shall consistently use the same abbreviations, symbols, nomenclature and identifiers. Use the same identifiers (e.g. equipment tags) used in Contract Drawings.
- E. Submittals shall be provided in digital format.
 - 1. Provide a separate file for each submittal. For submittal packages, provide a separate file for each subsection (e.g. hardware cutsheets and shop drawings for the same Section shall be provided as separate files).
 - 2. Product cutsheets, test forms and other text documents shall be provided in word searchable digital format. Acceptable formats are MS Word, PDF (generated from another electronic document and word-searchable; scans of paper documents are not acceptable), and HTML; other formats require approval prior to submission.
 - 3. Drawings and schematics shall be provided in PDF format and in AutoCAD compatible format.
 - 4. Scanned paper documents are not acceptable
 - a. Exception: original signed documents, such as qualifications, inspection certificates, and warranty documents.
 - 5. Hardcopy (paper) submittals are not acceptable and shall not be provided except as noted elsewhere).
 - 6. Submittals provided in the wrong format will be returned without action.
- F. Submission and Resubmission Procedure

1. Each submittal shall have a unique serial number that includes the associated Specification Section followed by a number for each sub-part of the submittal for that Specification Section, such as SUBMITTAL 23 00 00-01. There is no requirement to assign particular serial numbers to any specific submittals – serial number assignment is arbitrary. The only requirements are that the serial numbers be sequential (to avoid confusing gaps) and, most importantly, consistent across all submittal correspondence.
 2. Each resubmittal shall have the original unique serial number plus unique revision number such as SUBMITTAL 23 00 00-01 REVISION 1.
 3. Submit one copy of submittal in electronic format. Submissions made in the wrong format will be returned without action.
 4. Include with each submittal and resubmittal a copy of the relevant specification section(s) noting on each paragraph and sub-paragraph(s) the following:
 - a. CONFORMS: Contractor has verified that the submitted product conforms to the noted requirement(s).
 - b. CONFORMS AS NOTED: Contractor has verified that the submitted product conforms to the noted requirement(s) by means of being equal to or higher quality and / or performance.
 - c. NON-CONFORM: Contractor has verified that the submitted product does not conform to the noted requirement(s) and delineates each deviation from the specification requirements.
 - d. NOT APPLICABLE: Contractor has verified that the noted requirement(s), in their opinion do not apply to this product, delineating the reasons for this decision.
 - e. Include with each submittal and resubmittal a copy of the relevant specification section(s) the printed name of the contractor reviewer, their signature, the company name, and date of review.
 5. Revise submittal
 - a. Respond to all comments:
 - 1) Revise initial submittal to resolve review comments and corrections.
 - 2) Provide complete responses to comments or suggestions which are not practical to implement in the opinion of the Contractor.
 - b. Indicate any changes that have been made other than those requested.
 - c. Clearly identify resubmittal by original submittal number and revision number.
 - d. Resubmittals that are not responsive to all comments will be returned without action.
 6. Resubmit revised submittals until no exceptions are taken.
 7. Once submittals are accepted with “No Exceptions Taken” or “Approved As Noted”, provide:
 - a. Complete submittal of all accepted drawings and products in a single electronic file.
 - b. Copies for coordination with other trades, if and as required by the General Contractor or Owner’s Representative.
- G. Submit shop drawings, a list of proposed material and equipment manufacturers and the names of Subcontractors.
- H. Shop drawings shall be provided for all mechanical systems for all floors of the building.
- I. Materials and methods with which the words "for approval" or "approved" are used, and materials and methods which differ from those specified, shall be submitted.

- J. Prepare and submit shop drawings, sections, details and diagrams to minimum scale 1/4" = 1'-0". Drawings shall be coordinated, dimensioned and indicate equipment, pipe, duct, fire protection, and electrical in relation to architectural and structural features. Include minor piping, drains, air vents, etc. Indicate exact locations and elevations of valves, piping specialties, access doors, dampers, etc. Electronic submittal is encouraged.
- K. Submit manufacturer's specifications, product source, data sheets, certified equipment drawings and installation instructions, including installation dimensions, clearances, weights, materials, finishes, color selection, accessories, acoustical characteristics, capacity and full load and part load performance curves; complete with electrical data, motor horse power, KW; motor efficiency, amperage, voltage phases and wiring diagrams. Identify the particular specification section number, paragraph and equipment identification number per equipment schedule. Note that suppliers (wholesalers and distributors) data sheets are not acceptable unless they are also manufacturers of the product being submitted.
- L. Fan systems, with equipment in parallel, shall have performance curves noting single equipment operation and all iterations of additional equipment.
- M. Certified Equipment Drawings (8-1/2" x 11" sheets) shall be indexed in accordance with Specification Section. Drawings to be submitted at a later date shall be marked with a page as a placeholder for insertion when submitted. The original submittal shall note which shop drawings will be submitted later. Marked-up catalogs are not acceptable and will be returned without action. Electronic submittal is required.
- N. Engineer of Record's review of submittals is for limited purpose of verifying conformance with information given and design concept expressed in Contract Drawings and Specifications. Engineer's review is not for purpose of determining accuracy or completeness of items such as dimensions and quantities, which remain responsibility of Contractor.
- O. Contractor shall not commence with fabrication or installation of any equipment or system until the associated submittals have been approved by the Engineer of Record and returned with "no exceptions" taken. Contractor shall be solely liable for any costs incurred from starting fabrication before approved submittals are returned.
- P. All final approved submittals and equipment datasheets shall be provided, in PDF format, to the owner as part of the as-built drawing set and shall be text searchable.

1.6 COORDINATION DRAWINGS

- A. Utilize the latest version of 3D AutoCAD, Navisworks, and/or Revit software for the Coordination Drawings. No proprietary software of any kind shall be used other than that indicated. Drawing paper size shall not be larger than FULL SIZED Contract Drawings, and in no case larger than 30" x 42". Coordinate available space with ALL other trades involved.
- B. Provide Coordination Drawings in digital electronic format. Provide both native file format (AutoCAD, Navisworks, or Revit) and PDF format files. Hardcopy drawings are not acceptable.

- C. These drawings are to show registers, grilles, diffusers, duct sizes, elevation of bottom of duct, pipe sizes, valves and accessories, elevation of bottom of pipe, all elevations of materials and/or systems throughout each floor inclusive of hanger components, seismic bracing if applicable, and any component of construction that impacts vertical and/or horizontal space. In addition, the locations of all valves, dampers, and other items requiring access for service and maintenance are to be shown. The drawings are to also show electrical, structural beams, architectural bracing, structural bracing, ceiling heights, access doors, walls, floor to floor dimensions, columns, doors and other major architectural and structural features as shown on the architectural and structural drawings. Where the routing of work differs from that indicated on the Contract Drawings, such areas are to be indicated by highlighting with a note describing the reason for the change.
- D. Rerouting of any system or part thereof shall be submitted separately in order to obtain concurrence of the Engineer of Record. Submitted rerouting must include fully documented proposed solutions with all trades coordinated. Contractor is fully responsible for coordination of systems included herein. Any effort by Engineer of Record beyond answering Contractor's questions will be at Contractor's expense, including attending coordination meetings, review of interim plans, or review of incomplete questions (routing issues without suggested solutions).
- E. The Contractor and subcontractors are responsible to review and resolve any real or apparent interferences or conflicts as indicated by the coordination drawings produced by each trade.
- F. After all conflicts or interferences are resolved, develop a final composite drawing showing the agreed upon routing, layout and juxtaposition of all duct work, conveyers, piping, major conduit, valves, panels, lighting fixtures and all other major mechanical, plumbing and electrical installations. In the preparation of all the final Coordination Drawings, large scale details as well as cross and longitudinal sections are required to fully delineate all conditions.
- G. Submit the Coordination Drawings as digital electronic files to Engineer of Record for review and comment, as indicated under "Shop Drawings" above. Coordination Drawings shall be digitally signed-off by all other trades.
- H. Contractor shall not commence with fabrication or installation of any equipment or system until the associated shop drawings have been reviewed and returned by the Engineer of Record. Engineer's review of shop drawings shall not be taken as approval of their contents. Contractor shall be solely liable for any costs incurred due to deviations from the Contract Drawings.
- I. No extra compensation will be paid for relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all trades involved. If any improperly coordinated work, or installed work that is not in accordance with the approved coordination composites, or is specifically noted by the Architect or Engineer of Record for a valid reason, necessitates additional work by the other trades, the costs of all such additional work is to be borne solely by the Contractor.
- J. All changes in the scope of work due to revisions formally issued and approved are to be shown on both the individual subcontractor's Shop Drawings and the Coordination Drawings.

1.7 REQUESTS FOR INTERPRETATION AND CLARIFICATION

- A. See Division 01 "Project Management", for RFI procedures and forms.
- B. Mechanical RFIs are, in addition, subject to the requirements of this Article. In the event of a conflict between the requirements of Division 01 and this Article, the requirements of this Article shall supersede and take precedence over those of Division 01.

- C. Limit each RFI to a single issue or group of related issues.
- D. Each RFI shall include a workable no-cost or lowest cost solution recommendation by Contractor.
- E. Allow 3 working days from time of RFI receipt by Engineer of Record for review and response.
- F. Do not send Engineer of Record more than 10 RFIs in a contiguous period of 5 working days. If excess RFIs are received, review period will be extended as necessary to provide a professional response. RFIs will be reviewed in priority determined by Engineer of Record in consultation with Architect and Contractor.

1.8 MATERIALS AND SUBSTITUTIONS

- A. Comply with Division 01 "Product Requirements".
- B. Requests for product or equipment substitution shall be accompanied by a marked up copy of the Engineer of Record's original specification. For each specified product feature or requirement, Contractor shall note the equivalent feature or attribute of the proposed substitute product or equipment.
- C. Shop drawings of proposed material and equipment that differ from the specified materials and equipment, shall be accompanied by drawings that define changes. These drawings shall show modifications of architectural, plumbing, electrical and mechanical work required by the proposed materials and equipment, such as relocation of flues, drains, revised electrical circuits, relocation of roof or wall penetrations, revised foundations, etc.

1.9 COORDINATION WITH OTHER WORK

- A. Contractor performing Work under this Section shall become thoroughly familiar with the Drawings and Specifications. Contractor shall adjust the Work to conform with the conditions shown on these drawings to provide the best possible assembly of the combined Work.
- B. Obtain necessary information from the other trades regarding location of their work in order that the Work in this Section may be placed in correct position.
- C. The inclusion and proper location of supports, pads, sleepers, openings, anchorages, etc. provided by others is the responsibility of the Contractor under this Section. Cutting and/or boring shall be permitted under this Section only with the written approval of the Architect.
- D. It shall be the Contractor's responsibility to coordinate and have provided by other trades where not covered by the Contractor's scope of work, all electrical wiring and power to equipment, controls and devices, and any other work from other trades as required to provide fully functioning HVAC systems per the Contract Drawings and Specifications.
- E. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified with no cost impact to the owner. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.10 MANUFACTURER'S DIRECTIONS

- A. Manufacturer's directions shall be followed in cases where the manufacturers of articles used in this contract furnish directions covering points not shown in the Contract Drawings and Specifications.

1.11 PROTECTION OF WORK

- A. Equipment and materials shall be stored on dunnage and remain wrapped at all times until installed.
- B. Duct and piping shall be remain capped during delivery and storage.
- C. During installation, all installed duct and piping shall be capped and protected at the end of each working day.
- D. Equipment shall be protected from weather and stored in an enclosed, indoor location.
- E. Until final acceptance of the work, protect materials from damage and provide adequate and proper storage facilities. Replace damaged or defective work, material, and equipment before requesting final acceptance.

1.12 WORKMANSHIP

- A. Equipment and materials shall be installed in a neat and workmanlike manner. Materials and equipment not so installed shall, upon order of the Architect or Engineer of Record, be removed and replaced in a satisfactory manner, without change in Contract Sum or additional cost to the Owner.

1.13 CLOSING IN UNINSPECTED WORK

- A. Do not allow or cause any work to be covered up or enclosed until it has been inspected, tested, and accepted by the Architect, Engineer of Record, and/or Commissioning Authority.
- B. Any work enclosed or covered-up prior to inspection and testing shall be uncovered. After the work has been tested, inspected and accepted, repair such materials as may be necessary to restore disturbed work to its original and proper condition at no extra cost to the Owner.

1.14 EQUIPMENT ANCHORING

- A. Equipment shall be securely anchored to the building structure to prevent shifting or overturning during earthquakes.

1.15 PRELIMINARY OPERATION

- A. Under this section, Contractor shall supervise and direct preliminary operation of systems should the Owner demand that any portion of the plant, apparatus, or equipment be operated previous to the final completion and acceptance of the work. Expenses for such preliminary operation will be paid by the Owner. Such preliminary operation or payment shall not be construed as an acceptance of the work.

1.16 "AS-BUILT" DRAWINGS

- A. Comply with Section Division 01 "Project Closeout".
- B. As-built drawings shall be furnished in an electronic format. Provide in drafting software (AutoCAD or Revit) native format and also in PDF format.

1.17 FINAL INSPECTION

- A. At the time of final inspection, a service representative shall be available to make final adjustments.

1.18 FINAL OPERATION

- A. After acceptance of the installation, instruct the Owner's Representative in operation and maintenance, for a period of three (3), non-consecutive working days at a time requested by the Owner during the first year of warranty.
- B. At the beginning of the instruction period, deliver to the Owner three (3) copies of a durable binder as described under "Operating Instructions".

1.19 OPERATING INSTRUCTIONS

- A. The following O&M manual requirements do not replace O&M manual documentation requirements elsewhere in these Specifications.
- B. Division 23 shall compile and prepare documentation for all equipment and systems covered in Division 23 and deliver this documentation to the General Contractor for inclusion in the O&M manuals prior to the training of Owner personnel.
- C. Provide a summary of operating sequences (start-up, normal run, and shut-down), and control shop drawings in the main mechanical room.
- D. Provide three (3) complete sets of Operating Instructions. These instructions shall include brochures, diagrams, maintenance, and operating instructions and parts lists.
- E. Provide a copy of the O&M manuals to the Commissioning Authority for review.

1.20 TRAINING OF OWNER PERSONNEL

- A. The General Contractor shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed.
- B. The Commissioning Authority (CxA) shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment.
- C. The Mechanical Contractor shall have the following training responsibilities:
 - 1. Provide the CxA with a training plan two weeks before the planned training.

2. Provide designated Owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of HVAC equipment including, but not limited to, pumps, air conditioning units, air handling units, fans, boilers, terminal units, controls, water treatment systems, etc.
3. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
6. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
7. Training shall include:
 - a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
 - b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - c. Discussion of relevant health and safety issues and concerns.
 - d. Discussion of warranties and guarantees.
 - e. Common troubleshooting problems and solutions.
 - f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
 - g. Discussion of any peculiarities of equipment installation or operation.
 - h. Instruction in the use of equipment controls that are integral to equipment or are provided by the equipment manufacturer, such as VRF System controls. This is in addition to and separate from DDC System training (see below) and does not replace or satisfy the requirement for such training, if specified. Equipment controls training shall include at least the following:
 - 1) Specific hardware configuration of installed systems in this building and specific instruction for operating the installed system and any interface with security and communication systems.
 - 2) Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing setpoints and alarms and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.
 - 3) If system supports trending, all trending and monitoring features (values, change of state, totalization, etc.), including setting up, executing, downloading, viewing both tabular and graphically and printing trends. Trainees will actually set-up trends in the presence of the trainer.
 - 4) Every screen shall be completely discussed, allowing time for questions.
 - 5) Use of keypad or plug-in laptop computer for mobile control access.

- 6) Use of remote access to the system via phone lines or networks, if applicable.
 - 7) Graphics generation, if applicable.
 - 8) Point database entry and modifications, if applicable
- i. The format and training agenda in The HVAC Commissioning Process, ASHRAE Guideline 1-1989R, 1996 is recommended.
 - j. Classroom sessions shall include the use of overhead projections, slides, video/audio-taped material as might be appropriate. A video record of the training session is suggested but not required.
- 8. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.
 - 9. The Mechanical Contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.
 - 10. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.
- D. Test and Balance (TAB) Contractor. The TAB Contractor shall have the following training responsibilities:
- 1. TAB Contractor shall meet with facility staff after completion of TAB and instruct them on the following:
 - a. Go over the final TAB report, explaining the layout and meanings of each data type.
 - b. Discuss any outstanding deficient items in control, ducting or design that may affect the proper delivery of air or water.
 - c. Identify and discuss any terminal units, duct runs, diffusers, coils, fans and pumps that are close to or are not meeting their design capacity.
 - d. Discuss any temporary settings and steps to finalize them for any areas that are not finished.
 - e. Other salient information that may be useful for facility operations, relative to TAB.

1.21 WARRANTY

- A. In accordance with Division 01 Project Closeout requirements, Guarantees, Warranties, Bonds, Service & Maintenance Contracts and as follows.
- B. Contractor shall leave entire installation in complete working order and free from defects in material, workmanship, or finish.
- C. Warranty all materials, equipment, apparatus, and workmanship to be free of defective materials and faulty workmanship for a minimum period of one (1) year from date of Certificate of Occupancy, or per Division 01, whichever is longer.
- D. Warranty also services including instructions, adjusting, testing, noise, balancing, etc.
- E. For each piece of equipment or device with a manufacturer's warranty in excess of one year, Contractor shall furnish certificate of manufacturer's warranty and contact information for manufacturer's warranty service. Contractor shall also provide a list or table of all equipment with warranties exceeding one (1) year in duration.

- F. Provide new materials, equipment, apparatus, labor and/or service, and support to correct or replace that determined by the Owner to be defective or faulty.
- G. The Owner reserves the right to make temporary repairs as necessary to keep equipment in operating condition without voiding the guarantees or relieving responsibility during the guarantee period.
- H. After a period of 90 calendar days from date of acceptance of systems by Owner, provide, at no cost to the Owner, one service mechanic for an 8-hour period over as many working days as required to repair, replace any latent deficiency.

1.22 SUBMITTALS

- A. Welding certificates.

1.23 ACTION SUBMITTALS

- A. Product Data: For each type of product in Part 2.

1.24 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

PART 2 - PRODUCTS

2.1 JOINING MATERIALS

- A. Refer to individual Division 23 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12.

PART 3 - EXECUTION

3.1 CUTTING AND OPENINGS

- A. Comply with Division 01 "Cutting and Patching".

3.2 EQUIPMENT INSTALLATION

- A. Install equipment to minimize pressure drop and allow adequate access headroom unless specific mounting heights are indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated in drawings (note that in some cases non-parallel installation is indicated in the drawing to reduce pressure drop).
- C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.4 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION

SECTION 23 05 29H

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Metal framing systems.
3. Thermal-hanger shield inserts.
4. Fastener systems.
5. Pipe stands.
6. Equipment supports.

- B. Related Sections:

1. Section 23 31 13H "Metal Ducts" for duct hangers and supports.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
 3. Design seismic-restraint hangers and supports for piping and equipment.
- C. All mechanical equipment shall be anchored or braced to meet the horizontal and vertical forces/displacements prescribed in the 2019 CBC and ASCE/SEI 7.

ADDENDUM NO. 1

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1. The attachment of the following items shall be designed to resist the forces as prescribed above, but need not be detailed on the plans:
 - a. Equipment weighing less than 400 pounds supported directly on the floor or roof.
 - b. Temporary or movable equipment.
 - c. Equipment weighing less than 20 pounds supported by vibration isolators.
 - d. Equipment weighing less than 20 pounds suspended from a roof or floor or hung from a wall.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Signed and sealed by a qualified civil or structural professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
 1. Metal framing systems.
 2. Pipe stands.
 3. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Detail fabrication and assembly of trapeze hangers.
 2. Design Calculations: Calculate requirements for designing trapeze hangers.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.

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4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of zinc plated carbon steel.

B. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper or plastic-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of zinc plated carbon steel.

2.2 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. National Pipe Hanger Corporation.
2. Pipe Shields Inc.
3. Value Engineered Products, Inc.

B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier. For pipes 10-inch diameter and greater Water-repellent treated, ASTM C 533, Type I calcium silicate with 450-psig or minimum compressive strength.

C. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig or minimum compressive strength, 450 psig compressive strength on pipes 10-inch diameter and greater.

D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.3 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.4 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.5 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.6 MISCELLANEOUS MATERIALS

- A. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
 1. Properties: Non-staining, noncorrosive, and nongaseous.
 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- C. Fastener System Installation:
 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- D. Pipe Stand Installation:
 1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.

- E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- G. No valve or piece of apparatus shall be used to support the weight of any pipe.
- H. Piping shall not be hung from other piping.
- I. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- J. Install lateral bracing with pipe hangers and supports to prevent swaying.
- K. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- L. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- N. Piping shall be supported with maximum spacing per 2019 CBC chapter 3, table 313.3.
- O. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 4: 12 inches long and 0.048 inch thick.

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HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1 inch.

3.3 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.4 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
- F. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
- G. Use padded hangers for piping that is subject to scratching.
- H. Use thermal-hanger shield inserts for insulated piping and tubing.
- I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes NPS 1/2 to NPS 30.

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- J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
 2. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 3. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 4. C-Clamps (MSS Type 23): For structural shapes.
 5. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 6. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 7. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 8. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 9. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 10. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 11. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 12. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 13. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- L. following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- M. Spring Hangers and Supports: Refer to specification section 23 0529 "Hangers and Supports for HVAC Piping and Equipment".
- N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

ADDENDUM NO. 1

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

- O. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

END OF SECTION

SECTION 23 22 13H

STEAM AND CONDENSATE HEATING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes pipe and fittings for LP steam and condensate piping:

1.3 ACTION SUBMITTALS

- A. Delegated-Design Submittal:
 - 1. Locations of and details for penetrations, including sleeves and sleeve seals for roof.
 - 2. Locations of and details for penetration and firestopping for fire- and smoke-rated wall and floor and ceiling assemblies.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Piping layout, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Other building services.
 - 3. Structural members.
- B. Qualification Data: For Installer.
- C. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressures and temperatures unless otherwise indicated:
 - 1. LP Steam Piping: 12 psig maximum.
 - 2. Steam Condensate Piping: at 250 deg F.

3. Air-Vent and Vacuum-Breaker Piping: Equal to pressure of the piping system to which it is attached.

2.2 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, plain ends, welded and seamless, as indicated in piping applications articles.
- B. Cast-Iron Threaded Fittings: ASME B16.4; Class 150.
- C. Malleable-Iron Threaded Fittings: ASME B16.3; Class 150.
- D. Malleable-Iron Unions: ASME B16.39; Class 150.
- E. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
- F. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, black steel of same Type, Grade, and Schedule as pipe in which installed.

PART 3 - EXECUTION

3.1 LP STEAM PIPING APPLICATIONS

- A. LP Steam Piping:
 1. Schedule 40, Type S, Grade B, steel pipe; Class 125 cast-iron fittings; and threaded joints, domestic source.
- B. Condensate piping above grade, shall be the following:
 1. Schedule 80XS, Type E, Grade B, steel pipe; Class 125 cast-iron fittings; and threaded joints, domestic source.

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless otherwise indicated.
- C. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- D. Install piping to permit valve servicing.
- E. Install piping free of sags and bends.
- F. Install fittings for changes in direction and branch connections.

- G. Install piping to allow application of insulation.
- H. Only 90-degree fittings/transitions shall be used, 45 degree bends will not be permitted. All bends shall be long-radius type.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- K. Install steam supply piping at a minimum uniform grade of 0.8 percent downward in direction of steam flow (1-inch per 10 feet).
- L. Install condensate return piping at a minimum uniform grade of 0.4 percent downward in direction of condensate flow.
- M. Reduce pipe sizes using eccentric reducer fitting installed with level side down.
- N. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- O. Comply with requirements in Section 23 05 53H "Identification for HVAC Piping and Equipment" for identifying piping.
- P. Install drip legs at low points and natural drainage points such as ends of mains and bottoms of risers.
 - 1. Size drip legs same size as main.
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 23 05 17H "Sleeves and Sleeve Seals for HVAC Piping."
- R. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.3 HANGERS AND SUPPORTS

- A. Comply with requirements in Section 23 05 29H "Hangers and Supports for HVAC Piping and Equipment" for installation of hangers and supports. Comply with requirements below for maximum spacing.
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
- C. Install hangers for steel steam supply piping per spacing in 2019 CMC.

3.4 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

3.5 FIELD QUALITY CONTROL

- A. Prepare steam and condensate piping according to ASME B31.9, "Building Services Piping," and as follows:
 - 1. Leave joints, including welds, uninsulated and exposed for examination during test.
 - 2. Flush system with clean water. Clean strainers.
 - 3. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- D. Perform the following tests and inspections:
 - 1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
 - 2. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength.
 - 3. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
- E. Prepare test and inspection reports.

END OF SECTION

SECTION 23 34 00H

HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Inline centrifugal fans.

B. Related Requirements:

1. Section 23 05 13H - Common Motor Requirements for HVAC Equipment.
2. Section 23 07 13H - Duct Insulation.
3. Section 26 27 17H - Equipment Wiring: Electrical characteristics and wiring connections.

1.2 PERFORMANCE REQUIREMENTS

- ###### A. Project Altitude: Base fan-performance ratings on sea level.

- ###### B. Operating Limits: Classify according to AMCA 99.

1.3 REFERENCE STANDARDS

- ###### A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; American Bearing Manufacturers Association, Inc.; 1990 (Reapproved 2008).
- ###### B. ABMA STD 11 - Load Ratings and Fatigue Life for Roller Bearings; American Bearing Manufacturers Association, Inc.; 2014
- ###### C. AMCA 99 - Standards Handbook; Air Movement and Control Association International, Inc.; 2010.
- ###### D. AMCA 204 – Balance Quality and Vibration Levels for Fans.
- ###### E. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating; Air Movement and Control Association International, Inc.; 2007 (ANSI/AMCA 210, same as ANSI/ASHRAE 51).
- ###### F. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; Air Movement and Control Association International, Inc.; 2008.
- ###### G. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; Air Movement and Control Association International, Inc.; 2007.
- ###### H. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- ###### I. SMACNA (DCS) - HVAC Duct Construction Standards; 2005.

1.4 ACTION SUBMITTALS

- A. See Division 01 - Administrative Requirements and Section 23 05 00H "HVAC and Plumbing General Requirements", for submittal procedures.
- B. Product Data: Provide data on centrifugal fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
 - 1. Fan operating efficiency.
 - 2. Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 3. Material gages and finishes, including color charts.
- C. Shop Drawings: Indicate assembly of centrifugal fans and accessories including fan curves with specified operating point clearly plotted, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
 - 1. Detail equipment assemblies and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 - a. Wiring Diagrams: Power, signal, and control wiring.
- D. Delegated-Design Submittal: For unit hangars and supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - a. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.
 - b. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Structural supports.

1.6 CLOSEOUT SUBMITTALS

- A. Submit under provisions of General Conditions and Division 01 as applicable.
- B. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.
- C. Manufacturer's Installation Instructions.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum ten years of documented experience.

- B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.
- C. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.
- D. UL Standards: Fans shall comply with UL 705.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect motors, shafts, and bearings from weather and construction dust.

1.9 FIELD CONDITIONS

- A. Permanent fans may be used for ventilation during construction only after ductwork is clean, filters are in place, bearings have been lubricated, and fan has been test run under observation.
- B. Lift and support units with manufacturer's designated lifting or supporting points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Motors:
 1. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 23 05 13 "Common Motor Requirements for HVAC Equipment."
 2. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 3. Speed Control: Fans shall be provided with Electronically Commutated Motors (ECM) unless noted otherwise.
- C. Fabrication: Conform to AMCA 99. Fan construction class shall be sufficient to meet fan design air flow and pressure
- D. Selected fans shall be capable of accommodating static pressure and flow variations of plus or minus 15 percent of scheduled values.
- E. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.

2.2 INLINE CENTRIFUGAL FANS

- A. Manufacturers:

1. Loren Cook Company.
 2. Greenheck.
 3. Penn Barry.
 4. Twin City.
- B. Description:
1. Factory-fabricated, -assembled, -tested, and -finished, belt- or direct-driven inline centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor, drive assembly, and support structure.
- C. Construction:
1. Housing: Heavy gauge galvanized steel, inlet and outlet flanges, removable access panels, lifting lugs, and support bracket adaptable to floor, side wall, or ceiling mounting.
 2. Direct-Drive Units: Motor mounted in airstream factory wired to disconnect switch located on outside of fan housing.
 3. Fan Wheels: Aluminum, blades welded to aluminum hub.
- D. Accessories:
1. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.
 2. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.
 3. Disconnect Switch: Nonfusible type, with thermal-overload protection factory-mounted outside fan housing, factory wired through an internal aluminum conduit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install fans level and plumb.
- C. Support suspended units from structure. Comply with four 0.5" deflection spring isolators.
- D. Install fans with resilient electrical leads; refer to Division 26.
- E. Provide safety screen where inlet or outlet is exposed.
- F. Install units with clearances for service and maintenance.
- G. Label fans according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

- A. Install flexible connections between fan inlet and discharge ductwork; refer to Section 23 33 00 "Air Duct Accessories". Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.

- B. Connect wiring according to Division 26.
- C. Ground spark-resistant fans according to Division 26.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 - 1. Verify that shipping, blocking, and bracing are removed.
 - 2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
 - 3. Verify that cleaning and adjusting are complete.
 - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
 - 5. Verify lubrication for bearings and other moving parts.
 - 6. See Section 23 05 93H "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.
 - 7. Remove and replace malfunctioning units and retest as specified above.
- C. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.
- D. Test and adjust controls and safeties. Controls and equipment will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION

SECTION 23 84 13H

HUMIDIFIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following humidifiers:
 - 1. Steam injection.
 - 2. Self-contained.

1.3 REFERENCES

- A. Certifications:
 - 1. ETL, C ETL
 - 2. CE
 - 3. IBC 2009 Seismic Qualification

1.4 DEFINITION

- A. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.5 ACTION SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Detail fabrication and installation of humidifiers. Include piping details, plans, elevations, sections, details of components, manifolds, and attachments to other work.
 - 1. Wiring Diagrams: Power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Detail humidifiers and adjacent equipment. Show support locations, type of support, weight on each support, required clearances, and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Structural members to which humidifiers will be attached.

2. Size and location of initial access modules for acoustical tile.

B. Field quality-control test reports.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For humidifiers to include in operation and maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Supply one replacement electrode cylinder with each self-contained humidifier.

1.9 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with ARI 640, "Commercial and Industrial Humidifiers."

1.10 COORDINATION

A. Coordinate location and installation of humidifiers with manifolds in ducts and air-handling units or occupied space. Revise locations and elevations to suit field conditions and to ensure proper humidifier operation.

PART 2 - PRODUCTS

2.1 SELF-CONTAINED HUMIDIFIERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Armstrong International, Inc.
2. DRI-STEEM Humidifier Company.
3. Nortec Industries Inc.

B. Fabrication requirements:

1. Tank and cover: 14- gauge 316-stainless steel with Heli-arc welded seams
2. Quick removable cover with threaded knobs and gasketed flanges
3. Heater cover interlock safety switch: A factory-mounted and wired interlock safety switch shall de energize the heaters when the heater cover is removed.
4. Terminal strip to allow all control wiring connections at the humidifier to be made in a single location
5. Accessible cleanout plate

6. Steam outlet on top of tank cover to connect to pipe union connection
- C. Immersion heater(s): Heater(s) shall be Incoloy alloy-sheathed resistance type designed for no more than 86 watts per square inch. Two threaded ends of each heater element shall pass through the top of the evaporating chamber and be secured and sealed with washer and threaded nuts to evaporating chamber.
- D. Over-temperature switch: A factory-mounted and -wired UL-listed limit control sensor with manual reset shall sense an over-temperature condition and de-energize heater circuit controls.
- E. Drain: An electric drain valve shall be mounted on humidifier assembly to allow tank to drain automatically at the end of a humidification season (standard water models only).
- F. Humidifier shall generate steam from ordinary tap water.
- G. Factory insulation: Humidifier shall be covered with 1-inch thick, rigid, foil-faced fiberglass insulation. All surfaces except front face panel and heater terminal cover shall have insulation.
- H. Mounting: Humidifier shall have four painted angle-iron support legs that provide 24-inch minimum clearance between underside of humidifier and floor.

2.2 Humidifier Dispersion

- A. Rapid-sorb® dispersion panel:
 1. Each tube bank shall consist of a horizontal header/separator and designated quantity of stainless steel vertical dispersion tubes necessary to achieve the required steam capacity and absorption distance.
 2. Header/separator shall span the width of the duct, be constructed of stainless steel and be fitted with connections for dispersion tubes.
 3. The dispersion tubes shall extend the height of the duct and shall be fitted with two rows of tubelets on the diametric centerline and spaced 1 ½-inches apart.
 4. Each tubelet shall be made of a thermal-resin material designed for high steam temperatures.
 5. Each tubelet shall extend through the wall of and into the center of the dispersion tube and contain a steam orifice sized for its required steam capacity.
 6. For securing the upper ends of the tubes, a 3/4" x 2" stainless steel L-bracket and hardware shall be furnished, which the installer shall attach to the duct or housing.
- B. Single tube dispersion:
 1. Dispersion tube(s) shall be fabricated of stainless steel tubing with uniformly spaced tubelets for steam dispersion. Each tubelet shall be made of a thermal-resin material designed for high steam temperatures. Each tubelet shall extend through the wall and to the center of dispersion tube and incorporate a properly sized calibrated orifice.
 2. Dispersion tube(s) shall be pitched 2"/ft (15%) toward humidifier to allow condensate to return to humidifier.
- C. Single tube dispersion with condensate drain:
 1. Dispersion tube(s) shall be fabricated of stainless steel tubing with uniformly spaced tubelets for steam dispersion. Each tubelet shall be made of a thermal-resin material designed for high steam temperatures. Each tubelet shall extend through the wall and to the center of dispersion tube and incorporate a properly sized calibrated orifice.

2. Dispersion tube(s) shall be pitched 1/8"/ft (1%) minimum toward the condensate drain to allow condensate to leave the dispersion tube via the condensate drain tube.
3. The condensate drain tube shall be stainless steel tubing.

2.3 Humidifier Controls

- A. Time-proportioning (TP) modulation control: The humidifier shall cycle a single output on and off corresponding to an input demand signal.
- B. Control cabinet: NEMA 12 control cabinet shall be shipped loose. An ETL/C ETL listed control cabinet assembly comprising control devices shall be mounted on a subpanel. Control devices shall include a microprocessor control system, a magnetic contactor for each heating stage, a control circuit transformer, a fuse set for each heating stage, a numbered terminal strip, and all interconnecting wiring. All wiring diagrams shall be included in the control cabinet.
- C. Microprocessor controller with the following features or functions:
 1. Web interface and server.
 - a. Web interface shall have same functionality as keypad/display
 - b. Web interface shall allow multiple remotely located users to simultaneously view system operation and/or change system parameters.
 - c. Web interface shall have password-protected secure access.
 - d. Web interface shall be compatible with standard Internet browsers.
 - e. Web interface shall connect directly to a personal computer or through a system network via Ethernet cable.
 2. Interoperable with any Modbus® network
 3. Redundant over-temperature safety control
 4. Fully modulating (0% to 100%) control of humidifier outputs
 5. PID control capability with field-adjustable settings
 6. Water level control for hard water:
 - a. Automatic refill, low water cutoff, field-adjustable skimmer bleed-off functions and automatic drain-down of humidifier. System shall consist of:
 - 1) A water level sensing unit comprised of three metallic probes screwed into a threaded probe head. Probe head shall incorporate probe isolation chamber to eliminate short-circuiting between probes caused by mineral coating of probe head. Probe head shall be mounted on the humidifier assembly.
 - 2) A solenoid operated fill valve factory mounted on the humidifier assembly
 - 3) End-of-season drain automatically drains humidifier tank after a user-defined period of system inactivity.
 7. Temperature sensor: A factory mounted sensor, with a temperature range of 40 to 248 Deg. F mounted on the humidifier to enable the following functions:
 - a. Maintain a user-defined preset evaporating chamber water temperature
 - b. Allow rapid warm-up of water in evaporating chamber after a call for humidity, providing 100% operation until steam production occurs
 8. USB port on the control board for software updates, data backups, and data restoration
 9. Up-time optimizer function to keep humidifier(s) operating through conditions such as fill, drain, or run-time faults, as long as safety conditions are met, minimizing production down-time
 10. Real-time clock to allow time-stamped alarm/message tracking, and scheduled events
 11. Factory commissioning of humidifier and control board, including system configuration as-ordered

12. Keypad/display operable within a temperature range of 32 to 158 °F (0 to 70 °C), and that provides backlighting for viewing in low light
13. Alarms, unit configuration, and usage timer values shall remain in nonvolatile memory indefinitely during a power outage.
14. The capability to monitor, control, and/or adjust the following parameters:
 - a. Relative humidity (RH) set point, actual conditions in the space (from humidity transmitter), RH offset
 - b. Dew point set point, actual conditions in the space (from dew point transmitter), dew point offset
 - c. Relative humidity (RH) duct high limit set point (switch) and actual conditions
 - d. Relative humidity (RH) duct high limit set point, actual conditions (from transmitter), high limit span, and high limit offset
 - e. Total system demand in % of humidifier capacity
 - f. Total system output in lbs/hour (kg/h)
 - g. Drain/flush duration
 - h. End-of-season drain status (on standard water systems and if ordered as a DI water option) and hours humidifier is idle before end of season draining occurs
 - i. Air temperature or other auxiliary temperature monitoring with programmable offset (using sensor ordered as an option)
 - j. System alarms and system messages, current and previous
 - k. Adjustable water skim duration
 - l. Programmable outputs for remote signaling of alarms and/or messages, device activation (such as a fan), or for signaling tank heating and/or steam production
 - m. System diagnostics that include:
 - 1) Test outputs function to verify component operation
 - 2) Test humidifier function, by simulating demand to validate performance
 - 3) Data collection of RH, air temperature, water use, energy use, alarms, and service messages for viewing from the keypad/display or Web interface
 - n. Service notification scheduling
 - o. Password-protected system parameters
15. Interoperability using BACnet MS/TP.

D. Control cabinet:

1. Mounted on humidifier: NEMA 12 control cabinet shall be factory attached to the side of humidifier with all wiring between cabinet and humidifier completed at factory. An ETL/C ETL listed control cabinet assembly comprising control devices shall be mounted on a subpanel. Control devices shall include a Vapor-logic microprocessor control system, a magnetic contactor for each heat stage, a control circuit transformer, a fuse set for each heating stage (for multiple heat stages only), a numbered terminal strip, and all interconnecting wiring. A wiring diagram shall be included in the control cabinet.
2. Cabinet door interlock switch: The control cabinet shall have an interlock control switch with manual override to remove control voltage when door is opened.
3. Cabinet door lock: Control cabinet shall have a lock with keys provided.
4. Keypad mounted on cabinet option: The keypad shall be factory mounted on the side of the control cabinet.

E. Control output:

1. 100% SSR modulation control option: The humidifier shall have all humidifier heat stages modulating through electronic power controllers, which provide a total 0% to 100% modulation of humidifier output. All SSR controls are mounted and wired through the cabinet door.

F. Control input:

1. Humidity transmitter, room: Humidity transmitter shall be a room-mounted device that measures from 0% to 100% of RH range and provides a linear output (10% to 90% RH) from 4 to 20 mA. Accuracy \pm 2% RH. Supply voltage 21 VDC. Operating temperature range: 4 to 140 \square F (20 to 60 \square C).
2. Modulating high limit control: The modulating high limit control system shall include a modulating electronic humidity transmitter (duct-mounted downstream from the humidifier). It shall transmit to the microprocessor controller to modulate humidifier output and maintain the highest desired space humidity possible, at all airflow volumes, without saturation of the airstream.
3. Airflow proving switch, sail type: Airflow proving switch shall be a sail operated electric switch for field installation. Switch makes @ 250 fpm, breaks @ 75 fpm. Maximum operating temperature for sail: 170 Deg. F. Maximum operating temperature for switch: 125 Deg F.

2.4 OUTDOOR ENCLOSURE

- A. Factory assembled and tested with the humidifier installed to provide complete weather protection and to operate within the following temperature limits: -40 to 120 Deg. F.
- B. Humidifier and outdoor enclosure shall be shipped as one unit.
- C. Frame construction: 5-inch, 14-gauge, G-90 galvanized steel formed frame, suitably reinforced and braced to permit loading, shipping, unloading and rigging to the unit destination without damage to external or internal components. The base frame shall be corrosion resistant without painting or further coating.
- D. Housing construction: 14-gauge, G-90 galvanized steel panels fabricated into self-framing, double standing seam-type construction. All joints shall be caulked weather-tight with a silicone sealant. All interior surfaces shall be insulated with 1-inch, 2.2 lbs/sq ft rigid, noncombustible glass fiber insulation. No exposed insulation shall be permitted on the top-wearing surface of the floor of the unit. The floor shall be insulated from underneath. The floor shall have a drain connection.
- E. Access door construction: Access door shall provide access to all internal components, be constructed of 14 gauge, G-90 galvanized steel with a gasket around the full perimeter of the doorframe, with heavy-duty stainless steel hinges, and latches.
- F. Ventilation fan: wired to a thermostat to ventilate the control cabinet and the enclosure.
- G. The outdoor enclosure shall be provided without electric heaters, control thermostat and wiring.
- H. Roof curb: The roof curb shall be manufactured of 14-gauge, galvanized steel and provided with necessary hardware for bolt-together assembly. A 1-inch by $\frac{1}{4}$ -inch closed cell curb gasket with adhesive on one side is to be supplied with the hardware.
 1. Curb Height: Height to be coordinated with field conditions by contractor. Curb height shall maintain minimum 12-inch clearance between finished roof surface and underside of humidifier enclosure.
- I. The outdoor enclosure shall have piping to discharge steam through the base of the unit.
- J. Seismic Restraints: Metal brackets compatible with the curb and casing, painted to match enclosure, used to anchor unit to the curb, and designed for loads at Project site.

2.5 CONDENSATE DRAIN TEMPERING

- A. Drane-kooler: A thermostatically controlled water valve shall meter an amount of cold water into a stainless steel mixing chamber to temper 212 Deg F water with a 6 gpm in-flow rate to a 140 Deg F discharge temperature to sanitary system.
- B. Body and fittings shall be constructed of 304 stainless steel with welded seams.
- C. Cold water supply valve shall be brass, controlled by thermostatic element.
- D. Unit shall have integral air gap to allow for hard piping into plumbing system.
- E. Unit shall be installed horizontally and shall drain completely without using separate drain valve.
- F. Overflow connection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine ducts, air-handling units, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before humidifier installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install humidifiers with required clearance for service and maintenance. Maintain path, downstream from humidifiers, clear of obstructions.
- B. Seal humidifier manifold duct or plenum penetrations with flange.
- C. Install humidifier manifolds in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."
- D. Install stainless-steel drain pan under each manifold mounted in duct.
 - 1. Construct drain pans with connection for drain; insulated.
 - 2. Connect to condensate trap and drainage piping.
 - 3. Extend drain pan upstream and downstream from manifold a minimum distance recommended by manufacturer but not less than required by ASHRAE 62.1.
- E. Install stainless steel duct downstream of humidifiers for a distance of 150% of the humidifier absorption length. Base of duct shall be sloped at minim 1% slope back to humidifier drain pan.
- F. Equipment Mounting:
 - 1. Install humidifiers in outdoor enclosure mounted on roof curb, on roof structure level and secure, according to NRCA's "Low-Slope Membrane Roofing

Construction Details Manual,". Secure enclosure to upper curb rail, and secure curb base to roof framing or with anchor bolts.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
 - 1. Install piping adjacent to humidifiers to allow service and maintenance.
 - 2. Install shutoff valve, strainer, backflow preventer, and union in humidifier makeup line.
- B. Install electrical devices and piping specialties furnished by manufacturer but not factory mounted.
- C. Install piping from safety relief valves to nearest floor drain.
- D. Connect combustion-air inlet to intake terminal using PVC piping with solvent-cemented joints. Run from boiler connection to outside and terminate adjacent to flue termination.
- E. Connect wiring according to Section 26 05 19H "Low-Voltage Electrical Power Conductors and Cables."

3.4 CONDENSATE TEMPERING DEVICE

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install shutoff valve on cold water inlet. Hard connect condensate drain to tank inlet.
- C. Install 6-inch P-trap.
- D. Route overflow to nearest floor sink for atmospheric reference.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain humidifiers.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1: GENERAL

1.01 PROVIDE REQUIRED GROUNDING.

1.02 SYSTEM DESCRIPTION

- A. All metallic objects on the premises that enclose electrical conductors or that are likely to be energized by electrical currents shall be effectively grounded.
- B. All metal equipment parts such as enclosures, raceways, and equipment grounding conductors and all earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.
- C. All metallic systems shall be solidly interconnected to the electrical system as provided by the service entrance and for each grounded separately derived system that is installed.
- D. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by use of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of approved size within each raceway connected to isolated metallic raceways, or enclosures at each end. Each flexible conduit shall be provided with a green insulated grounding conductor of approved size. In addition to using metallic conduits as ground, provide a ground wire sized per code in every conduit.
- E. Non-current-carrying metal parts of high voltage equipment enclosure, signal and power conduits, switchboard and panelboard enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded.
- F. Metallic or semi-conducting shields, and lead sheaths of cables operating at high voltage, shall be permanently and effectively grounded at each splice and termination.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 48.16H

SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Restraint channel bracings.
 2. Seismic-restraint accessories.
 3. Mechanical anchor bolts.
 4. Adhesive anchor bolts.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
- B. Delegated-Design Submittal: For each seismic-restraint device.
 1. Include design calculations and details for selecting seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 2. Design Calculations: Calculate static and dynamic loading caused by equipment weight, operation, and seismic forces required to select seismic restraints and for designing vibration isolation bases.
 3. Seismic Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints. Electrical components include:
 - 1. Control and monitoring panels.
 - 2. Panelboards.
- B. Qualification Data: For testing agency.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Seismic-restraint devices shall have horizontal and vertical load testing and analysis. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MECHANICAL ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. B-line, an Eaton business.
 - 2. Hilti, Inc.
 - 3. Kinetics Noise Control, Inc.
 - 4. Mason Industries, Inc.
- B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.

- B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods caused by seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 033000 "Cast-in-Place Concrete."
- B. Equipment and Hanger Restraints:
 - 1. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
 - 2. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- E. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- F. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where connection is terminated to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

ADDENDUM NO. 1

SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
 - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 - 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 - 5. Test to 90 percent of rated proof load of device.
- C. Seismic controls will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION

SECTION 26 28 16H

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Molded-case circuit breakers (MCCBs).
 - 4. Molded-case switches.
 - 5. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 INFORMATIONAL SUBMITTAL

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Division 1 specifications, include the following:
 - a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 - 2. Fuse Pullers: Two for each size and type.

1.7 QUALITY ASSURANCE

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
 - 2. Altitude: Not exceeding 6600 feet (2010 m).

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.2 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- D. Comply with NFPA 70.

2.3 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ABB Inc.
 - 2. Eaton.
 - 3. General Electric Company.
 - 4. SIEMENS Industry, Inc.; Energy Management Division.
 - 5. Square D; by Schneider Electric.
- B. Type HD, Heavy Duty:
 - 1. Single throw.
 - 2. Three pole.
 - 3. 600-V ac.
 - 4. 1200 A and smaller.
 - 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses.

6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 240-V ac.
2. Hookstick Handle: Allows use of a hookstick to operate the handle.
3. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.4 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.
2. General Electric Company.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square D; by Schneider Electric.

- B. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.5 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.
2. General Electric Company.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square D; by Schneider Electric.

- B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

- C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

- D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated Series rating is not allowed.

- E. MCCBs shall be equipped with a device for locking in the isolated position.

- F. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.
- G. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2.6 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Enclosure Finish: The enclosure shall be gray baked enamel paint, electrodeposited on cleaned, phosphatized galvanized steel (NEMA 250 Types 3R, 12) [copper-free cast aluminum alloy (NEMA 250 Types 7, 9)].
- C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.
- D. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.
- E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.
- F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
 - 2. Indicate method of providing temporary electric service.

ADDENDUM NO. 1

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

3. Do not proceed with interruption of electric service without Owner's written permission.
4. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 2. Outdoor Locations: NEMA 250, Type 3R.
 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
 4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.4 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Comply with mounting and anchoring requirements specified in Section 26 05 48H "Seismic Controls for Electrical Systems."
- D. Install fuses in fusible devices.
- E. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

- A. Comply with requirements in Section 26 05 53H "Identification for Electrical Systems."
 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections with the assistance of a factory-authorized service representative].
- C. Tests and Inspections for Switches:
 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.

- g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
 - i. Verify correct phase barrier installation.
 - j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
2. Electrical Tests:
- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
 - d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
 - e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

D. Tests and Inspections for Molded Case Circuit Breakers:

- 1. Visual and Mechanical Inspection:
 - a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
 - b. Inspect physical and mechanical condition.
 - c. Inspect anchorage, alignment, grounding, and clearances.
 - d. Verify that the unit is clean.
 - e. Operate the circuit breaker to ensure smooth operation.
 - f. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

ADDENDUM NO. 1

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - g. Inspect operating mechanism, contacts, and chutes in unsealed units.
 - h. Perform adjustments for final protective device settings in accordance with the coordination study.
- 2. Electrical Tests:
 - a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
 - c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
 - d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.
 - e. Determine the following by primary current injection:
 - 1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.
 - f. Test functionality of the trip unit by means of primary current injection. Pickup values and trip characteristics shall be as specified and within manufacturer's published tolerances.
 - g. Perform minimum pickup voltage tests on shunt trip and close coils in accordance with manufacturer's published data. Minimum pickup voltage of the shunt trip and close coils shall be as indicated by manufacturer.
 - h. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function; and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.
 - i. Verify operation of charging mechanism. Investigate units that do not function as designed.
- 3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- 4. Perform the following infrared scan tests and inspections and prepare reports:

ADDENDUM NO. 1

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.
 - c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

E. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.7 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION

SECTION 27 11 00

COMPUTER NETWORKING WIRING SYSTEM

PART 1: GENERAL

1.01 RELATED DOCUMENTS

- A. Addenda, Alternates, Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specifications collectively apply to work of this Section.

1.02 DESCRIPTION

- A. Provide a complete Cable & Wiring Telecommunications Infrastructure. Provide equipment, materials and labor to render the cabling systems complete and operable for all outlet locations of the buildings, as specified within this document. This Project will use Category 6 wires, therefore, any reference of "Category 5e or Category 6" shall mean Category 6.

- B. Principal items of work shall include but not be limited to:

1. Category 5e or Category 6 Data outlets.
2. Category 5e or Category 6 cables.
3. Cable management support rings in accessible ceiling space and conduits in inaccessible ceiling space.
4. Category 5e or Category 6 patch panel.
5. Testing.

1.03 CODES AND STANDARDS

- A. Comply with current versions of the following applicable codes and standards:

1. Underwriters Laboratories Inc. (UL): Applicable listings and ratings
2. California Electrical Code, current enforced edition
3. National, State, and Local Occupational Safety and Health Administration (OSHA) building and fire codes
4. ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Cabling Standard
5. ANSI/TIA/EIA-569-A, Commercial Building Standard for Telecommunications Pathways and Spaces
6. ANSI/TIA/EIA-606-A, Administration Standard for Commercial Telecommunications Infrastructure

7. ANSI/TIA/EIA-607-A, Commercial Building Grounding and Bonding Requirements for Telecommunications, current issue
8. NFPA 70, National Electric Code, 2005 or current enforced addition
9. Institute of Electrical and Electronic Engineers (IEEE) 802.3 (Ethernet), 802.3u (100BaseTX/FX), 802.3Z (Gigabit Ethernet over optical fiber), 802.3ab (Gigabit Ethernet over 4 pair category 5 or higher), 802.11 (Wireless LAN)
10. Institute of Electrical and Electronic Engineers (IEEE) 802.1d (spanning tree protocol), 802.1p (QOS), 802.1q (VLAN tagging), 802.1x (Port Based Network Access Control)
11. National Electrical Manufacturer's Association (NEMA)
12. National Fire Protection Association (NFPA), NFPA-70
13. CCR Part 3 - California Electrical Code
14. CCR Part 2 - Uniform Building Code
15. ANSI, ASTM, UL, NEMA, IEEE and FCC standards as applicable.
16. The terms MC and MDF are used interchangeably.
17. The terms IC and IDF are used interchangeably.

1.04 SYSTEM DESCRIPTION

A. System Topology

1. The Backbone Topology shall be the Star Topology with the MC at the center of the star. The backbone cabling and pathway shall include multi-mode fiber optic cabling, connectors, patch cords, panels, ferrules, and enclosures required to provide the specified connectivity between the MC, ICs and the TRs.
2. The Horizontal Topology shall be the Star Topology and shall consist of Category 5e or Category 6, 100 Ohm Unshielded Twisted Pair (UTP) cables from TR's to data outlets. The horizontal cabling and pathway shall include Category 5e or Category 6 cabling from outlets to TRs and patch panels, wire management panels, vertical distribution rings, patch cords, and other miscellaneous items required to extend connectivity from IDFs to outlets. In the user areas, each Category 5e or Category 6 horizontal cabling drop outlet shall be terminated per TIA/EIA-568A, T568B.
3. There shall be one dedicated 6-strand multimode fiber optic cable from each IC to the MC.
4. Locations of MC and IC's are generally as shown on the drawings. Final locations must be verified in the field to suit the actual field condition and approved by the District during construction.

1.05 SUBMITTALS

ADDENDUM NO. 1
COMPUTER NETWORK WIRING

- A. Furnish catalog cuts, technical data and descriptive literature on components. Data shall be clearly marked and noted to identify specific ranges, model numbers, sizes and other pertinent data.
- B. Shop drawings shall indicate wiring and schematics, details, panel configurations, sizes and a point-to-point wiring diagram of all circuits. Shop drawings shall indicate interfaces to equipment furnished by others, identifying numbers of wires, termination requirements, voltages and other pertinent details. Responsibility for each end of interfaces shall be noted on shop drawings.
- C. Entire system shall be supported by engineering documentation including:
 - 1. Riser diagrams indicating all devices, cabinets and their point-to-point connections.
- D. Operating and Servicing Manuals:
 - 1. Deliver required copies of "Operating and Servicing Manual" for each system. Each manual shall be bound in a flexible binder and data shall be typewritten or drafted.
 - 2. Each manual shall include instructions necessary for proper operation and servicing of system and shall include circuit diagrams of systems.
- E. Record Drawings:
 - 1. Submit two "As Built" marked up drawings for all as contractor installed cable and infrastructure. To include all conduit, underground, aerial and above ground cable and pathways to/from for all buildings and each building floor.
 - 2. Submit a full size (E) drawing of plot plan and building plans, indicating location of conduit and cable runs. Contractor shall provide drawing describing the cable pathways used in his/her installation. It is to include conduit sizes, conduit runs, conduit ID number, number of cables and types in conduit, cable type size, number of cables being carried, and the use of any inner duct. A separate redline markup (field drawn) size E drawing shall also be provided to the District Representative.
 - 3. Contractor shall provide AutoCAD drawing in block form delineating all cable runs from beginning to end point. Drawing shall include the cable identification number, cable type, workstation faceplate ID, Patch Panel Port ID, and all empty panel ports. This drawing shall utilize a separate AutoCAD layer. Two printed E size drawings shall be presented to the District Representative and two copies of the AutoCAD V14 or newer files on Floppies.

1.06 QUALITY ASSURANCE

- A. Ordinances and Regulations: The work of this Section shall conform to California Code of Regulations, Part 3, and all other applicable codes and standards.
- B. Only a qualified Contractor holding C-7 or C-10 and other licenses required by legally constituted authorities having jurisdiction over the work shall do work. Contractor shall have completed at least 5 projects of equal scope to systems described herein and shall

have been engaged in business of supplying and installing specified type of systems for at least 5 years. Use equipment manufacturers' certified contractors.

- C. Contractor shall warranty that all work executed and materials furnished shall be free from defects of material and workmanship for a period of 1 year from acceptance date of Contract Completion, excluding specific items of work that require a warranty of a greater period as set forth in this Specification. Immediately upon receipt of written notice from the District, Contractor shall repair or replace at no expense to the District: Any defective material or work that may be discovered before final acceptance of work or within warranty period, any material or work damaged thereby; and adjacent material or work that may be displaced in repair or replacement. Examination of or failure to examine work by the District shall not relieve Contractor from these obligations.
- D. Persons skilled in trade represented by work, and in accordance with all applicable building codes, shall install system in accordance with best trade practice.
- E. Contractor shall include in the Material List Submission copies of the manufacturers' certifications that the Contractor is an authorized installer of Berk-Tek and Ortronics or the submitted approved equal manufacturers' products and has been adequately trained in the installation of those products. This applies to all fiber optic components and fiber optic cable.
- F. Contractor shall include in the Material List Submission a list of five projects of similar scope acceptable to the District. Contractor shall include the telephone number of the customer's client contact for each project and a letter signed by a corporate officer, partner, or owner of the contracting company describing the service capability of the company and stating the company's commitment to maintain that service capability through the warranty period.

PART 2: PRODUCTS

2.01 EQUIPMENT STANDARDS

- A. Where applicable all components installed under this Contract shall be listed by UL.
- B. All equipment and components including cable shall be like products of a single manufacturer.
- C. Equipment Requirements:
 - 1. All cabling and connectors shall be covered by a Berk-Tek or approved equal manufacturer warranty of not less than twenty-five years.

2.02 LOCAL AREA NETWORK CABLING

- A. Category 5e and Category 6 data Cable. Horizontal enhanced category 5e cabling shall be 24 AWG, or in the case of Category 6, 23 AWG, 4-pair UTP, UL/NEC rated, with appropriately rated riser or plenum insulation and jacket materials as appropriate to the installation environment per Article 800 of the N.E.C. Individual conductors shall be FEP or polyethylene insulated as appropriate to the installation environment. Cables installed in cable trays or on "J"-hooks shall carry a CMP rating. Cable shall meet ANSI/TIA/EIA

minimum requirements for attenuation (insertion loss), return loss, propagation delay, delay skew, NEXT loss, PSNEXT loss, FEXT loss, ELFEXT, and PSELFEXT for 4-pair Category 5e and Category 6 cabling as detailed in ANSI/TIA/EIA-568-A. Category 5e and Category 6 data cabling and patch cables shall be blue or green.

1. Manufacturer: Berk-Tek NetClear or approved equal
- B. Category 5e and Category 6 Inserts. All Category 5e and Category 6 data inserts shall be wired to the T568B wiring pattern. Category 5e and Category 6 data inserts shall meet the appropriate ANSI/TIA/EIA minimum requirements for attenuation (insertion loss), return loss, propagation delay, delay skew, NEXT loss, PSNEXT loss, FEXT loss, ELFEXT, and PSELFEXT for connecting hardware as detailed in ANSI/TIA/EIA-568-A.
1. Ortronics NetClear or approved equal.
- C. Category 5e and Category 6 Patch Cords. Patch cords shall be Category 5e or Category 6 rated, 24 AWG, 4 pair assemblies. Patch cords shall be factory assembled by the manufacturer of the cabling system. LAN Patch cords shall be the same color (blue or green) as the cabling system.
1. One ten-foot Category 5e or Category 6 patch cord for each work area outlet installed.
 2. In the wiring closets, patch cords shall be provided in a like manner (one per user port).
 3. Manufacturer: Ortronics NetClear or Approved Equal.
- D. Category 5e or Category 6 Patch Panels. Patch Panels shall be provided in 24 or 48 port compliments with modular jack ports wired to T568B. Patch panels shall be augmented with cable support bars in rear to properly dress cable. All patch panels shall meet ANSI/TIA/EIA minimum requirements for attenuation (insertion loss), return loss, propagation delay, delay skew, NEXT loss, PSNEXT loss, FEXT loss, ELFEXT, and PSELFEXT for Category 5e connecting hardware as detailed in ANSI/TIA/EIA-568-A. Quantity and size of patch panels must be selected to provide 20% expansion capacity. One EIA rack unit of horizontal wire management shall be provided adjacent to each patch panel (above and below).
1. Manufacturer: Ortronics NetClear or approved equal.
- E. Faceplates. Faceplates shall be constructed of ABS molding compound and have the ability to accommodate one insert.
1. Manufacturer: Ortronics NetClear or approved equal.
- F. Horizontal Cable Management panels shall be 19-inch rack mount with a minimum of four-management rings one-rack unit (1.75 inches) in height. Rings shall not exceed more than 1.75 inches in depth unless otherwise noted in the construction documents.
1. Manufacturer: Ortronics NetClear or approved equal.

PART 3: EXECUTION AND INSTALLATION

ADDENDUM NO. 1
COMPUTER NETWORK WIRING

PREMISE WIRING INSTALLATION

Site Conditions: Installer shall examine the areas and conditions under which the work of this Section will be performed. Unsatisfactory conditions shall be reported to Owner before the contractor begins work.

A. Local Area Network MCs/ICs.

1. MC/IC Category 5e and Category 6 Termination Installation.

- a. Category 5e or Category 6 patch panels shall be installed in 24 or 48 port compliments. Installer shall provide and install all necessary patch cords, both copper and fiber optic, for internal cabinet interconnections.
- b. One EIA rack unit of horizontal wire management shall be provided adjacent to each patch panel (above and below).
- c. Cables shall be dressed and terminated in accordance with TIA/EIA-568-A, manufacturer recommendations, and this Specification.
- d. Pair untwist at the termination shall not exceed one half an inch for Category 5e or Category 6 connecting hardware.
- e. Bend radius of the cable in the termination area shall not be less than 4 times the outside diameter of the cable.
- f. Cables shall be neatly bundled, not overly tight, and dressed to their respective panels or blocks. Cable wraps shall not be tight enough to disturb the internal cable pair twists.
- g. The cable jacket shall be maintained as close as possible to the termination point.
- h. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties.
- i. Patch cords used at the rack or cabinet shall be either single-mode or multi-mode duplex fiber or Category 6, 24 AWG, 4-pair assemblies, as required.

2. Horizontal Cabling

- a. Copper Horizontal distribution cable shall be TIA/EIA-568-A, Category 5e or Category 6, 4-pair unshielded twisted pair (UTP), and CMP or CMR rated cable, as required. Each Category 5e or Category 6 cable shall be terminated on an 8-position, 8-conductor Category 5e or Category 6 jack (at the workstation locations) or patch panel (in the MC/IC/TR) wired in accordance with T568B. Associated faceplates shall accommodate four jacks. Quantities of cables to each outlet shall be in accordance with the location type and project document.

- (1) Cable shall be installed in accordance with manufacturers' recommendations and best industry practices.

- (2) Copper horizontal cable shall not exceed 90 meters in length.
- (3) Cable raceways shall not be filled greater than the NEC maximum fill for the particular raceway type.
- (4) Cables shall be installed in continuous lengths from origin to destination (no splices or cross-connects).
- (5) The cable's minimum bend radius and maximum pulling tension shall not be exceeded.
- (6) Unshielded twisted pair cable shall be installed so that there are no bends less than four times the cable outside diameter.
- (7) When cable runs are being installed, provide additional slack at both ends to accommodate future cabling system changes. The minimum amount of allowable slack at the:
 - (a) MC, IC, TC will be 3 ft.
 - (b) Work Area Outlets will be 12 inches
- (8) If a J-Hook or trapeze system is used to support cable bundles in dropped ceiling or concealed ceiling spaces, all horizontal cables distributed using J-Hooks shall be supported at a maximum of four-foot intervals. At no point shall cable(s) rest on acoustic ceiling grids or panels.
 - (a) Cable installed above fire-sprinkler systems shall not be attached to the system plumbing or any ancillary equipment or hardware.
 - (b) Cables shall not be attached to ceiling grid or lighting support wires.
- (9) Pulling tension on 4-pair UTP cables shall not exceed 25 pounds for a single cable or cable bundle.
- (10) The Installer will replace, before terminations are completed, any cables damaged or subjected to installation practices outside of those specified within this document, at Installer's expense.

3. Labeling and Marking

- a. Provide complete cable location chart and as-built documentation in an envelope and attach to the inside rear doors of distribution frame cabinets in wiring spaces.
- b. Mark distribution panels, cables and cover plates with computer-generated labels. Drops shall be labeled with the same identifier on the receptacle faceplate, inside each junction box, on the cable at the jack, on the cable at the patch panel, on the termination side of the patch panel, and on the patch side of the patch panel. Cable markers shall be located within 2 inches of the end of the cable jacket and shall be directly readable. Panel labels shall be computer-generated and printed using a laser printer. A disk with the label files shall be submitted as part of the project record documents.

3.02 CERTIFICATION AND TESTING

Provide the Owner's Authorized Representative with copies of factory calibration certificates for each test set used in the testing procedures. All test equipment used shall have been

factory calibrated within the previous 12 month period. Operators of the test equipment shall have factory training in the use of the equipment and its software. All cables and termination hardware shall be 100% tested for defects in installation and to verify cable performance under installed conditions. All conductors of each installed cable shall be verified useable by the Installer prior to system acceptance. Any defect in the cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.

A. Local Area Network

1. Copper

- a. Each cable shall be tested for continuity on all pairs and/or conductors.
- b. Category 5e and Category 6 data cable shall be performance verified using an automated test set for Category 5e link or Category 6 configurations.
- c. Test set shall be certified Level IIE for Category 5e or Level III for Category 6. To ensure verifiable equipment calibration, the Owner may require field calibration each time a new set of tests are performed. Test for the continuity parameters defined above, and provide results for the performed tests. This test set shall be capable of testing for the continuity and length parameters defined above, and provide results for the following tests:
 - (1) Attenuation (insertion loss)
 - (2) Wire Map
 - (3) Attenuation to Crosstalk Ratio ACR
 - (4) Pair-to-pair NEXT loss
 - (5) PSNEXT loss
 - (6) Return Loss
 - (7) Pair-to-pair ELFEXT
 - (8) PSELFEXT
 - (9) Propagation delay
 - (10) Delay skew
 - (11) Cable length
- d. Cable length shall be tested using the cable manufacturers' published Nominal Velocity of Propagation (NVP) parameter. Owners Quality Assurance Agent shall verify the NVP setting. Generic settings not using the published NVP parameter will not be accepted.

- e. Test results shall be automatically evaluated by equipment, using the most up-to-date criteria from the ANSI/TIA/EIA-568-A standard and the result shown as pass/fail.
 - f. Test results shall be printed directly from the test unit in native format, and both hard and soft copies in native format shall be provided to the Owner. The printed test results shall include tests performed, the expected test result, and the actual test result.
2. Completion. Installer's work for the installation shall be considered complete after the following have been accomplished:
- a. All system testing has been completed; Installer certifies that entire system is in working order Cable Test Forms and equipment specific test documentation (both files and paper records) have been submitted to the Owner.
 - b. All ceiling panels previously removed have been put back in place.
 - c. All system labels have been put in place.
 - d. All construction debris and scrap materials have been removed from project site.
 - e. All marked up, project record documents have been returned to the Owner.
 - f. All unused customer material has been returned to the Owner.
 - g. The Owner has successfully completed acceptance testing of the network wiring installation.
 - h. The Owner's Inspector has inspected and accepted the installation.

3.03 PROJECT RECORD DOCUMENTS

A. As-Built Documentation

- 1. Block diagrams indicating all items and their point-to-point connections in a manner following floor plan layout.

B. Operating and Servicing Manuals, Record Drawings:

- 1. Deliver three (3) copies of operating, specification descriptions, and/or service manual. Each complete manual shall be bound in a three ring binder, and all data shall be typewritten or drafted.
 - a. Each manual shall include a page with Project site and Project name, date of Substantial Completion, Contractor name, address, telephone, and fax numbers.

- b. Each manual shall contain a letter, signed by an officer of the company indicating the beginning and ending date of any warranties described in subsection 1.07 of this specification and shall describe the companies' commitment to service the warranty during the terms specified.
 - c. Each manual shall include all specifications and instructions necessary for proper operation and servicing of system.
 - d. Each Manual shall include installation and coordination drawings specifically related to this section shall be included as follows:
 - (1) Size A (8-1/2 inch x 11 inch) and size B (11 inch x 17 inch) shall be bound into the manual.
 - (2) Larger drawings shall be folded and inserted into transparent envelopes and bound into the manual.
2. Deliver two (2) copies of Record drawings on labeled CD's (Compact Disks) representative of the work performed shall be presented at completion of work in the most recent Autodesk's AutoCAD format (.dwg), for Microsoft Windows.
- a. The submittal shall contain all systems wiring installed including telephone, LAN, and any other low voltage system Contractor-installed wiring.
 - b. The submittal shall consist of two electronic copies on CD-ROM and three paper record copies on no less than "E" size drawings, presented prior to the acceptance inspection.
 - c. Owner utilizes layers as a key tool in controlling visibility of drawing elements and to provide consistent information between drawings, yet provide control over what is seen on each sheet. Premise wiring shall be shown on a separate layer, labeled as "Premise Wiring" that uses both building floor plans and conduit supporting structure layers below. The use of any version control blocks or company logos shall be on a layer separate from the premise wiring as-built drawings.
 - d. All AutoCAD files (software copies) supplied shall be multi-layer drawings with the following layers as a minimum:
 - (1) Layer 1 shall contain title blocks only.
 - (2) Layer 2 shall contain building or site plan backgrounds only.
 - (3) Layer 3 shall contain terminal cabinets, devices, cabling and other system components.

C. Cable Numbering Records

- 1. Owner requires both labeling and record documentation at the conclusion of each cable installation project. Labels and cable records allow the Owner to locate, identify and diagnose cases of trouble more efficiently. They are required for each cable installation project regardless of size and scope.
 - a. Installation Contractor shall provide a cable management spread sheet that shall include the following:

- (1) Cable Schedule
- (2) Cable Test Forms
- (3) Cable Labels
- (4) Network planning chart.

- b. Present the data in an Excel spread sheet that will operate on Windows 98/2000/XP platforms. Information shall be presented in paper and electronic forms in a format that will be provided by the Owner.
- c. A paper copy of the cable schedule in a transparent plastic sleeve shall be affixed to the front door of each Intermediate and Local distribution frame (IDF and LDF). In the MDF cabinet, the cable schedule shall be affixed to the rear door of the cabinet.

3.04 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.05 CLEANUP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.06 OWNER ORIENTATION

- A. Completed shop drawings, as specified in Section 3.04 above shall serve as the Owner's orientation.

END OF SECTION

SECTION 27 41 00

AUDIO/VIDEO SYSTEMS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions of the Contract and Instruction to Bidders including Supplementary Conditions apply to Work under this section.
- B. The Contractor acknowledges and warrants that the Contract Documents have been closely examined, that the Contract Documents are suitable and sufficient to enable the Contractor to complete the Work in the time allotted for the Contract Sum as accepted by the Owner and that the Contract Documents imply Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in full compliance with applicable codes, laws, ordinances, rules, and regulations.
- C. Execution of the Contract by the Contractor is a representation and warranty that the Contractor has carefully examined the Contract Documents, and that the Contractor is thoroughly familiar with the nature and location of the Work, the Site, the specific conditions under which the Work is to be performed, and matters which may in any way affect the Work or its performance. The Contractor further represents that as a result of such examinations and investigations, the Contractor has thoroughly reviewed and understands the Contract Documents and their intent and purpose, and is familiar with applicable codes, ordinances, laws, regulations and rules as they apply to the Work, and that the Contractor shall abide by same.
- D. Claims for additional time or additional compensation as a result of the Contractor's failure to thoroughly review and understand the Contract Documents and be familiar with local conditions and the Contract Documents shall not be permitted.
- E. Related Work Specified Elsewhere:
 - 1. AC Power provided under Division 26.
 - 2. AV System infrastructure including raceways including conduits, boxes, cover plates cable trays, enclosures, terminal cabinets and loudspeaker back-boxes provided under Division 26.
 - 3. Category AV drawings.

1.02 SUMMARY OF WORK

- A. Conference Center: The Conference Center will be used for meetings, presentations and film screenings. The AV system will include the following components:
 - 1. Sound System: a sound reinforcement system for program audio playback and speech reinforcement. This will consist of distributed ceiling loudspeakers for speech reinforcement and a stereo pair of loudspeakers for program audio. The sound system will include two channels of wireless microphones and hardwired microphone inputs at the front of the room.
 - 2. Projection: A video projector and electric roll down screen will be provided at the front of the room for presentations and movies. Video sources will include a Blu-ray player

ADDENDUM NO. 1
AV SYSTEMS

- and TV tuner. A wireless network interface will be provided to allow users to project an image via the dedicated wireless access point in the room. There will also be an input for portable video and computer equipment at the front of the room.
3. Remote Control: A remote control system will be provided to control the AV system functions via a rack mounted touch panel.
 4. Hearing Assistance: An ADA compliant hearing assistance system will be provided to support the sound system. This system will consist of an RF transmission system and a pool of receivers for audience members.
- B. Entry: The existing Entry AV system will be upgraded to improve function and increase functionality.
1. Hearing Assistance System: Provide a hearing assistance system for the Entry. The hearing assistance system will use RF transmission.
 2. Sound System:
 - a. Audio Processor: Provide a new audio processor.
 - b. Main Loudspeakers: Re-aim the existing stereo loudspeakers so that they best match the coverage area to the audience area. Adjust the control settings on the loudspeakers and other system components to optimize the frequency response of the outputs. Provide new wiring between the amplifier and the loudspeakers to improve the loudspeaker performance.
 - c. Satellite loudspeakers: Relocate and re-aim the existing satellite loudspeakers to minimize overlap with the coverage of the Main loudspeakers. Adjust the programming of the audio processor to optimize the frequency response and delay for the satellite loudspeakers. Modify the programming so satellite loudspeakers receive the same input signal consisting of a monaural mix of the audio signals.
 3. Video Projection:
 - a. Video Projector and Screen: The existing video projector and screen will be reused.
 - b. Video Switcher: Provide a video distribution system to add a computer input and camera input in the Entry adjacent to the lecturer's position.
 - c. Cabling: As part of the replacement of the Video Switcher we will specify replacement of the cabling for the video distribution system.
 - d. Network Interface: We will specify an interface that will allow connection of a computer to the system wirelessly via the AV system wireless access point.
 4. Remote Control System: Provide a touch panel at the equipment rack to provide control of the AV system. Provide an emulation of the touch panel on an OFE iPad.
 5. Overflow to the Conference Center: Provide the Entry video and audio signal to the Conference Center.
 6. IMAG Camera: Provide a portable camera to project a close up of a lecturer on the projection screen. A dedicated input for the camera will be provided.
 7. Audio Source Equipment: Provide Media player for use with the portable mixing console.
- C. Scope:
1. Provide sound and video systems including apparatus and equipment, wiring, termination, labor, and services required to provide systems as specified and shown on the Category AV Drawings.

2. Provide any incidental equipment needed in order to meet the functional requirements stated herein and on the Category AV Drawings. This shall include support and restraint for fixed equipment, including loudspeakers and projection equipment.
3. Set up and adjustment of specified hardware and software.
4. Furnish test equipment and the services of the project engineer and the project manager to assist the Owner's Representative in onsite observations.
5. Make any adjustments to any part of the system, including the re-aiming of loudspeakers, which may be found necessary during the acceptance observation.
6. Provide a total of 8 hours of training in the operation of the systems to the person or persons selected by the Owner. Videotape training sessions and provide 3 copies edited on DVD format to the Owner.

D. Coordination:

1. Schedule installation operations in sequence required to obtain the best completion results.
2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

E. Coordinate specialty sub-Contracting including installation of telecommunications lines and equipment as shown on the Contract Documents.

1.03 EQUIPMENT AND MATERIALS

A. Verify that characteristics of interrelated equipment and components are compatible.

B. Coordinate work having interdependent responsibilities for installing, connecting to, and placing in service system components and equipment.

C. Requests for Substitutions:

1. The Contractor shall represent that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior to the specified product.
2. The Contractor shall represent that the warranty for the substitution is equal to or greater than to warranty provided for the specified product.
3. The Contractor shall certify that the cost data presented in conjunction with the proposed substitution is complete and includes related costs under this Contract, and waives claims for additional costs related to the substitution which may later become apparent.
4. The Contractor shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete including, but not limited to, in full compliance with applicable codes, laws, ordinances, rules, and regulations and completion in the time allotted for the Contract Sum as accepted by the Owner and Consultant.
5. If a requested substitution requires a change in the engineering of the system the Contractor shall submit applicable design revisions as part of the substitution request.
6. The Consultant shall be the final judge of the acceptability of substitutions.

1.04 SCHEDULE

- A. Within ten calendar days of the receipt of the notice to proceed the Contractor shall prepare and submit for approval, in accordance with the Contract, a schedule which shall include, but is not limited to, the following:
1. Submission dates for submittal packages:
 - a. Field and Shop Drawings Submittal
 - b. As-built Drawings
 2. Start and Completion date(s) for shop fabrication work.
 3. Completion Dates for programming of remote control system and DSP driven devices.
 4. Start and Completion date(s) for field installation work.
 - a. Installation dates of wires and cables in conduits and required cable trays.
 - b. Delivery dates of systems and subsystems to the project site.
 5. Completion dates for the following tests:
 - a. Performance tests on individual A/V components as they are received from the manufacturer in the Contractor's shop.
 - b. Performance tests on completed assemblies and subassemblies assemblies, including racks in the Contractor's shop.
 - c. Performance tests on the completed systems as a whole prior to shipment to the project site.
 - d. General performance testing of systems at the project site.
 6. Completion dates for the following Shop and Field Observations.
 - a. Shop fabricated assembly and subassembly observation.
 - b. Substantial Completion Observation at the project site.
 - c. Final acceptance observation at the project site.
 7. Submission date for delivery of operating and maintenance manuals, as-built drawings, documentation and closeout materials.
- B. In the event the Contractor wishes to deviate from the schedule once it is established and approved, he may do so only receiving written approval from the Owner.

1.05 SUBMITTALS

- A. Submittals shall be in accordance with the Contract requirements.
- B. Substitutions of equal equipment beyond the alternatives listed will be permitted only in accordance with the General Conditions.
- C. Field and Shop Drawing Submittal: Submit the following:
1. Material listed below shall be provided in a single comprehensive package: partial or incomplete submittals will not be reviewed and will be returned to the Contractor for completion.
 2. Bill of Materials and Specification Sheets: The following material shall be incorporated into a single pdf file.
 - a. Review Stamp: A blank page shall be provided at the front of the pdf to accommodate the review stamp.

- b. Table of Contents: A table of contents shall be provided for the pdf file and each item identified below shall have an entry in the table of contents. Each item shall have a bookmark associated with it and the bookmark will be accessible via hyperlink in the table of contents to the actual item.
 - c. Statement of Contractors: A statement outlining subcontractors, franchises, distributorship, dealerships, arrangements and agreements with manufacturers of equipment to be used for this work.
 - d. Certifications: The Contractor shall provide the copies of the certifications noted in Article 1.06, below.
 - e. Bill of Materials: A bill of materials shall be provided for each system within the Work. Each bill of materials shall be listed separately in the table of contents and provided with its own bookmark. Each bill of materials shall be identified by the Room number and room name. Each bill of materials shall include the material, components, devices and equipment required for the work. The Bill of Materials will be ordered in the same manner as the product specifications in Part 2, below (i.e. the product specified in Paragraph 2.02.A shall be listed first, etc.). Each Bill of Materials shall include the following information for each item listed:
 - 1) Quantity
 - 2) Description
 - 3) Manufacturer's name and model number
 - f. Specification Sheets: Manufacturer's specification sheets for each product shall be provided. Each specification sheet shall be uniquely identified in the table of contents and provided with its own bookmark. The specification sheets shall be ordered in the same manner as the product specifications in Part 2, below. Each specification sheet shall be identified by its paragraph number in the specifications and the Manufacturer's make and model (i.e. 2.02A –Mackie 1604VLZ4). Where specification sheets contain multiple products, the Contractor shall clearly identify the specific product intended for use.
3. Drawing Set: The following material shall be incorporated into a single pdf file.
- a. Drawings shall be equal in size to the Contract Drawings and ordered in a manner consist with the Category AV drawings. Drawings shall be clear and legible. The minimum text size for full sized drawings shall be 1/8" high.
 - b. Cover Sheet: The Cover sheet shall include:
 - 1) Project Name
 - 2) Project Address
 - 3) Drawing Index
 - c. Schedules: Provide schedules describing drawing symbols used.
 - d. Location Plan: Provide scaled floor plans of the relevant parts of the work showing the location of system connection panels, conduits, wireways, cable trays, pull boxes, junction boxes, equipment racks equipment and other fixed equipment with appropriate designations.
 - e. Riser diagrams, showing elevations, room numbers, conduit sizes, service level and wire fill for conduit, connector panel backbox sizes and types, devices, equipment and rack designations.

- f. AV System Panel details: Provide a unique scale drawing of each AV wall and rack panel showing the panel label, location and labeling of connectors and cable pass-throughs.
 - g. Equipment rack elevation, drawings scaled (1-1/2" = 1'-0" or larger), including equipment designation, manufacturer's name, model number, rack location and rack designation.
 - h. Patch bay elevations, showing patch bay wiring details and labeling designations.
 - i. Cable schedules and run sheets, associated with each equipment rack and/or any isolated piece of equipment or device, including cable designation, type, manufacturer and manufacturer's type number, wire color, length of run, device and terminal designation and device location, keyed to both the system block diagram and equipment rack elevation drawings. Cable schedules shall also include cable testing results for cables as outlined in Article 3.02.
 - j. Shop drawings of Contractor fabricated items. Provide detailed drawings showing components, devices and equipment, including dimensions, component values, terminal designations, types, locations, manufacturer's name and model number.
 - k. Shop Drawings of fixed equipment support and mounting details. These shop drawings shall be stamped and signed by a Structural Engineer licensed in the project state. Include loads, location of attachment to building structure, complete layout of components, devices and equipment, including dimensions, methods of assembly, connections to supporting construction, details of hardware, locations, manufacturer's name and model number. Design calculations, loads, etc. shall be shown on the drawings. Drawings shall be 1/4" = 1'-0" scale minimum. Permissible scales shall be 1/4", 3/4", 1", 1-1/2", and 3" = 1'-0" and full scale.
 - l. Functional Diagram: Single-line block diagrams showing interconnection of equipment, components, panel connectors, terminal blocks, controls, transformers, loudspeakers and intermediate wiring devices shall be provided. Labels for connectors, terminals, cables and system component shall be included on the drawings. Show detailed system component information including but not limited to manufacturer's name, model number, any specialized part number option and input and output connection information, for each component. No drawing codes shall be permitted. Wiring terminations to connectors, equipment and intermediate wiring devices shall be detailed showing specific wiring conventions and connection methods.
4. Control Panel Layouts: The following material shall be incorporated into a single pdf file.
- a. Table of Contents: A table of contents shall be provided for the pdf file and touch panel layout shall have an entry in the table of contents. Each layout shall have a bookmark associated with it and the bookmark will be accessible via hyperlink in the table of contents to the actual item.
 - b. Submit a "storyboard" showing the complete layout of each remote control panel and touch panel screen layout for Owner review prior to programming. The layouts shall be presented in full size with respect to the actual panel or touch screen. The layouts shall be complete, showing the integration of pop-up menus and other partial screen components into the overall layout of the panel. Partial panel layouts will not be acceptable.
5. Samples for approval by the Owner of finishes and materials visible in the completed installation. The Contractor shall provide, at a minimum, samples for the AV connector panels, control panels, trim rings and plates and loudspeaker baffles and grilles.

ADDENDUM NO. 1
AV SYSTEMS

6. Electronic Files: The Contractor shall submit electronic files of AutoCAD drawing files for the shop drawings and source code files for remote control programming, touch panel layouts and DSP programming. These files shall be delivered in a zip file. Provide separate folders in the zip file for shop drawings, remote control programming and DSP programs. Each file shall be logically and descriptively named.
- D. As-Built Drawing Submittal: Prior to the Final Acceptance Observation, the Contractor shall submit the following:
1. Provide one copy of documents required by the Field and Shop Drawings. These documents shall be corrected as noted by the review comments and to reflect the actual installation conditions.
 2. Submit a copy of each of the following schedules, lists and data prior to - and as a requirement of - Owner Acceptance of the work of this section:
 - a. AutoCAD files of the as-built drawings on CD-ROM.
 - b. Control and DSP programming source code. The Owner shall maintain ownership of remote control system and DSP source code at the conclusion of the project and be provided with the source code on CD-ROM as part of the as-built documentation.
 - c. Final bills of quantities: complete bills of quantities material as delivered, including a separate schedule of portable equipment.
 - d. Equipment schedules: complete, final schedules of equipment and devices provided in each room, by room number and name.
 - e. Performance, test and adjustment data: comprehensive documentation of performance verification and correction procedures and measurements, including raw and equalized house curves and equalizer settings.
 - f. Maintenance and spare parts schedules: a comprehensive tabulation of equipment, devices, miscellaneous parts and maintenance items, including manufacturer's name, address, model number, systems use and miscellaneous information.
 3. The Work will not be accepted until the above documents are reviewed and accepted by the Owner.
 4. Aids to Use: submit three copies of each of the following manuals prior to, and as a requirement of, Owner Acceptance of the Work of this section:
 - a. Equipment operating instructions; complete, comprehensive instructions for the operations of contractor-fabricated devices and equipment items provided as part of the work of this section.
 - b. Manufacturer's installation, operating and service information including schematic diagrams for each item of equipment furnished. This information shall be bound. The manuals shall be ordered in the same manner as the product specifications in Part 2, below. Provide a tab between each manual. Provide a detailed index at the front of each binder indicating specification reference number, manufacturer's trade name, model number and part description.
 - c. Printed material for the Contractor-fabricated equipment and systems: operating manuals shall be bond paper copies, offset or laser printed. Drawings, charts and graphs shall be bond paper offset or laser printed. The Contractor-fabricated equipment instruction manuals shall be composed using a single, consistent visual format and writing style; text shall be derived from component equipment manufacturer's instruction manuals and may include reproductions of artwork and

other materials. As needed to clearly indicate the operation and maintenance of the Contractor fabricated items.

5. No more than thirty days after Acceptance Testing, submit the As-Built drawings including corrections and comments made during the Acceptance Observation.
6. No more than thirty days after Acceptance Testing, provide one copy of the following:
 - a. Certificates; any and licenses, certificates of operation and/or compliance as required.

1.06 QUALITY ASSURANCE

- A. Unless otherwise stated, electrical, electronic and optical equipment shall be a product of firms regularly engaged in the manufacture of electrical, electronic or optical equipment. The equipment shall be the latest model or type offered which meets the applicable specifications at the time of the submittal. Discontinued items replaced by newer models or versions are prohibited and shall not be submitted for review.
- B. Quality of workmanship and fabrication of equipment and components, which are custom fabricated shall be comparable to professional equipment produced by specialized manufacturers of the trade involved and shall be verified by observation. Only firms having 5 years experience in the fabrication and installation of similar systems shall be allowed to perform the work.
- C. Materials and products shall be new and of professional quality. Unless specifically stated in the drawings or specifications, no existing or used materials shall be installed.
- D. The Work specified herein, and in each of the allied sections, shall be accomplished by a single Contractor experienced in the design, fabrication, installation, checkout and warranty contract management of systems such as those described in each section. This Contractor shall have complete responsibility for the systems described herein and shall be the single contact point for the Owner with respect to work specified herein.
- E. The Contractor shall have on staff a qualified project engineer. The project engineer shall:
 1. Be a university graduate engineer in electrical or electronic engineering or physics, and have at least five years experience with similar electronic and optical specialty systems or other educational experience background as approved by the Owner.
 2. Observe a good working relation with the Owner's Representatives, and cooperate with engineers and technicians assigned by the Owner, who are charged with the operation and maintenance of the system.
 3. Provide technical liaison between the Contractor and the Owner. This shall include participation in meetings and conferences. The project engineer shall be required to be present at the project site for observations, approve the operating and maintenance manuals, and provide the specified instruction to designated members of the Owner's staff.
 4. Be responsible for supervision of technical work that is part of the contract. This supervision includes the following:
 - a. Preparation of construction drawings from information within the specifications and the drawings, including approval and signing of shop drawings.
 - b. Supervision of shop fabrication and field installation work to assure conformance with the contract drawings, the specifications, and the approved shop drawings to

assure workmanship of the highest quality. The project engineer shall oversee the testing of assemblies and sub-assemblies prior to delivery to the project site.

- c. Take a leading role in the specified testing of the completed installation to assure for the Contractor that specifications are met. Work with and assist the Consultant in the observations for approval and acceptance of the system for the Owner.
- F. Digital Media System: The Contractor shall have on staff an engineer that has been certified by Crestron Electronics, Inc as a Digital Media Certified Engineer (DMC-E) to assist in the design integration and testing of the Digital Media Transport system.
1. The Contractor shall provide a copy of the engineer's certificate including the certification number and date.
 2. The DMC-E shall provide design and integration services for the Digital Media System.
 3. The DMC-E shall perform the required testing for the Digital Media System and document the results. These results will be included in the As-Built Documentation for the system.

1.07 WARRANTY AND SERVICE

- A. Installation shall be warranted free of faulty workmanship.
- B. Components, including solid-state devices, warranted free of defects for a minimum period of one year from date of acceptance. This minimum warranty provision shall not diminish the terms of individual equipment manufacturers' warranties.
- C. Paint and exterior finishes, fuses and lamps excluded from above warranties except when damage or failure results from defective materials or workmanship covered by warranty.
- D. Provide maintenance service for a period of one year after acceptance of installation. Service shall consist of a minimum of two semiannual visits to the site for checking and adjustment of equipment.
- E. Response: Provide four hour telephone warranty service, with 48-hour on-site technical response time. Provide a technician on call from 7 a.m. to 7 p.m. seven days a week.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Performance Standards: Equipment shall meet the following minimum performance standards unless specified otherwise:
 1. Power Amplifiers:
 - a. Input: balanced, bridging, furnish transformer if required for balancing or to eliminate hum.
 - b. Output: impedance and power as shown on Drawings, do not ground common, do not combine commons of amplifiers.
 - c. THD: less than 0.1%, 30-20,000 Hz, any power.
 - d. Dynamic range: at least 110 dB.
 - e. Response: +/- 1 dB, 20-20,000 Hz.
 2. Audio Amplifiers and Signal Processors:

- a. Input: balanced, bridging, furnish transformer if required to balance or to eliminate hum.
 - b. Output: balanced, 600 ohm, transformer. Equipment having provision for plug-in transformers shall have transformers installed; otherwise external transformers shall be installed.
 - c. THD: less than 0.05%, 30-20,000 Hz, +18 dBm.
 - d. Dynamic range: at least 90 dB.
 - e. Response: +/- 1 dB, 20-20,000 Hz.
3. Microphones:
- a. Output: balanced, floating, nominal 150 ohms.
 - b. Portable wired units with 12' to 18' cord terminated in male XLR-3 connector with pin 2 positive.
 - c. Wireless microphone receiver with cord as in b., above, except 3' long.
- B. Safety Laboratory Listings: Equipment powered from the mains shall be labeled as listed by a testing laboratory acceptable to the local code authority. Underwriters Laboratories, Edison Testing Laboratories, or the City of Los Angeles testing lab will meet this requirement.

2.02 AUDIO AMPLIFIERS AND SIGNAL PROCESSORS

A. DSP Processor (DSP)

1. Features:

- a. 12 input, 8 output Digital audio signal processing with user-programmable software.
- b. 12 mic/line level analog inputs.
- c. 8 mic/line level analog inputs.
- d. Frequency Response: 20 Hz to 20 kHz + 0.25/-0.5 dB.
- e. Total Harmonic Distortion: <0.0006% at 4 dBu.
- f. Cross Talk: < -85dB.
- g. 48 KHz sample rate A/D and D/A.
- h. Analog to Digital: 24-bit.
- i. Digital to Analog: 24-bit.
- j. RS-232 control.
- k. Ethernet Ports
- l. Software shall include feedback suppression modules.

2. Product: Biamp TesiraFORTE AI or equal.

B. DSP Programming:

- 1. Contractor shall provide the latest version of the DSP operating system.
- 2. Software: The Contractor shall provide the digital signal processor software for use in the unit. This software shall be based upon the hardware topology shown on the Category AV drawings and shall include operational components necessary to create a fully functional system. A description of the major audio components and control interface are outlined below. It shall be the Contractor's responsibility to include

programming to interface between the DSP processor and the remote control system to allow the functions noted in the remote control section of the specifications.

- a. Conference Center: The room is provided with audio mixing for microphones and program sources. The following signal chain will be provided:
 - 1) Microphone inputs: Microphone inputs will feed a gain sharing automatic microphone mixer. The output of the automatic mic mixer will feed a feedback suppression module to avoid feedback. The output of the feedback suppression feeds a level control to control the Speech Audio volume via the remote control system. The output of the level control feeds the Speech Loudspeaker Output and the Hearing Assistance Output, see below.
 - 2) Program Input: Provide a stereo input from the DM SW. The inputs feed input 1 of the Program Router.
 - 3) Overflow Input: Provide a stereo input from the Entry AV system. The inputs feed input 2 of the Program Router.
 - 4) Program Router: The program inputs from the DM SW and Entry feed a two channel stereo router to select the current source. When the remote control system program source is set to Entry Overflow, the router will be set to the Entry program signal. Otherwise, the router is set to the DM SW program signal. The output of the router feeds a stereo level control to control the Program Audio volume via the remote control system. The outputs of the level control feed the Stereo Loudspeaker Output and the Hearing Assistance Output, see below.
 - 5) Speech Loudspeaker Output: The output of the speech level control feeds a 5 band parametric equalizer to optimize the output frequency response of the distributed ceiling loudspeakers and a feedback suppression module to avoid feedback. The output of the equalizer feeds the amplifier input.
 - 6) Stereo Loudspeaker Output: The output of the stereo level controls feed 5 band parametric equalizers to optimize the output frequency response of the stereo loudspeakers. The output of the equalizer feeds the amplifier inputs.
 - 7) Hearing Assistance: The outputs of the speech and stereo level controls feeds a three input mixer to blend the speech and stereo signals to a mono signal. The output of the mixer feeds a 3 band parametric equalizer to optimize the output frequency response of the hearing assistance headsets. The output of the equalizer feeds a digital delay to delay the audio signal to be time aligned with the acoustic output of the loudspeakers for a listener in a seated position in the middle of the room. The output of the delay feeds the RF TRANS.
- b. Entry: The room is provided with audio mixing for microphones and program sources. The following signal chain will be provided:
 - 1) Microphone inputs: Microphone inputs will feed a gain sharing automatic microphone mixer. The output of the automatic mic mixer will feed a feedback suppression module to avoid feedback. The output of the feedback suppression feeds a level control to control the Speech Audio volume via the remote control system. The output of the level control feeds the Left, Right and Satellite Mixers, see below.
 - 2) Program Input: Provide a stereo input from the DM SW. The inputs feed input 1 of the Program Router.

- 3) Internet Radio Input: Provide a stereo input from the Denon 350 UI. The inputs feed input 2 of the Program Router.
- 4) Manual Mixer Input: Provide a stereo input from the IN Panel. The inputs feed input 3 of the Program Router.
- 5) Program Router: The program inputs from the DM SW, Denon 350 UI and IN Panel feed a three channel stereo router to select the current source. The output of the router feeds a stereo level control to control the Program Audio volume via the remote control system. The outputs of the level controls feed the Left, Right and Satellite Mixers, see below.
 - a) When the remote control system program source is set to the IN panel, Blu-Ray or NET INT the router will be set to the DM SW signal.
 - b) When the remote control system program source is set to Internet Radio, the router will be set to the Denon 350 UI signal.
 - c) When the remote control system is set to Manual Mixer the router is set to the IN Panel inputs. When set to Manual Mixing, the Speech Audio Level control is muted.
- 6) Left Mixer: Provide a 2 channel mixer. Input 1 is from the output of the Speech Level Control and Input 2 is from the Left channel of the Program Level Control. The output of the Left Mixer feeds the Left Loudspeaker Output and the Overflow Output.
- 7) Right Mixer: Provide a 2 channel mixer. Input 1 is from the output of the Speech Level Control and Input 2 is from the Right channel of the Program Level Control. The output of the Right Mixer feeds the Right Loudspeaker Output and the Overflow Output.
- 8) Satellite Mixer: Provide a 3 channel mixer. Input 1 is from the output of the Speech Level Control and Inputs 2 and 3 are from the Left and Right channels of the Program Level Control. The output of the Satellite Mixer feeds the Satellite Loudspeaker Outputs and the Hearing Assistance Output.
- 9) Left Loudspeaker Output: The output of the Left Mixer feeds Left Main loudspeaker.
 - a) The Contractor shall provide signal processing to optimize the output of the loudspeaker. This signal processing may take place in either the DSP or the Amplifier.
 - b) The Contractor shall review the DSP settings of the applicable existing amplifier channel for any existing signal processing. The Contractor shall verify these settings are correct if they wish to leave the signal processing in the Amplifier or they shall remove the existing signal processing in the amplifier and provide the signal processing in the DSP.
 - c) The Contractor shall roll off the low end to minimize low frequency build up and muddiness in the Entry.
- 10) Right Loudspeaker Output: The output of the Right Mixer feeds the Right Main loudspeaker.
 - a) The Contractor shall provide signal processing to optimize the output of the loudspeaker. This signal processing may take place in either the DSP or the Amplifier.

- b) The Contractor shall review the DSP settings of the applicable existing amplifier channel for any existing signal processing. The Contractor shall verify these settings are correct if they wish to leave the signal processing in the Amplifier or they shall remove the existing signal processing in the amplifier and provide the signal processing in the DSP.
 - c) The Contractor shall roll off the low end to minimize low frequency build up and muddiness in the Entry.
 - 11) Satellite Loudspeaker Outputs: The output of the Satellite Mixer feeds the outputs for the Satellite loudspeakers. Provide two outputs for the two amplifier channels as shown on the drawings.
 - a) The Contractor shall provide signal processing to optimize the output of the loudspeaker. This signal processing may take place in either the DSP or the Amplifier.
 - b) The Contractor shall review the DSP settings of the applicable existing amplifier channel for any existing signal processing. The Contractor shall verify these settings are correct if they wish to leave the signal processing in the Amplifier or they shall remove the existing signal processing in the amplifier and provide the signal processing in the DSP. The signal processing shall include, at a minimum, equalization to optimize the frequency response of the loudspeakers and a delay to time align the output with the Main Loudspeakers.
 - c) The Contractor shall roll off the low end to minimize low frequency build up and muddiness in the Entry.
 - 12) Hearing Assistance: The output of the Satellite Mixer feeds a 3 band parametric equalizer to optimize the output frequency response of the hearing assistance headsets. The output of the equalizer feeds a digital delay to delay the audio signal to be time aligned with the acoustic output of the loudspeakers for a listener in a seated position in the middle of the room. The output of the delay feeds the RF TRANS.
 - 13) Overflow Outputs: Provide the output from the Left and Right Mixers to the left and right Overflow signal outputs.
- 3. Adjustment: The Contractor shall be responsible for adjustment of control parameters within the digital signal processor program to allow for optimal operation of the system as if the signal processing components within the program were physical audio devices.

C. Passive Mixer (PASS MIX):

- 1. Features
 - a. Resistive Branching Network.
 - b. 10 kOhm impedance.
 - c. 4 inputs/outputs minimum.
- 2. Product: RDL STD-10k or equal.

D. Power Amplifier (AMP):

- 1. Features:
 - a. 4 Channel Power Amplifier

- b. Protection features: Clip Limiting, Thermal muting, Short Circuit Protection, Ultrasonic, RF protection, DC Voltage Fault Protection, Turn-On/Turn-Off muting.
 - c. Continuously variable speed fans.
 - d. Terminal Block balanced input connectors.
 - e. Two rack units.
 - f. Class D power circuitry.
 - g. Power rating: 300 Watts per channel at 8 ohms.
 - h. Frequency Response: (at 1 Watt, 20 Hz – 20 kHz): +/- 0.25 dB.
 - i. Signal to Noise Ratio: below rated power (20 Hz to 20 kHz): > 108 dB A-weighted.
 - j. Total Harmonic Distortion: at full rated power from 20 Hz to 20 kHz: <0.35%.
 - k. Damping Factor: 10 Hz to 100 Hz: > 900.
 - l. Crosstalk (below rated power, 20 Hz to 1 kHz): > 80 dB.
 - m. Common Mode Rejection (CMR) (20 Hz to 1 kHz, typical): 70 dB.
2. Product: Crown DCi 4|300 or equal.

2.03 AUDIO TRANSDUCERS

A. Wireless Microphone System (WM):

- 1. Features:
 - a. Diversity receiver with mic/line level output.
 - b. Select clear operating frequencies at 25 kHz increments.
 - c. Operation in UHF band, 470 to 932 MHz; each system on a separate non-interfering frequency.
 - d. Provide ½ Wave Antennas to match frequency range selected.
 - e. Provide installation hardware, including connectors, coax cable, mounts, etc. required to install antennas and receivers.
 - f. Provide rechargeable batteries and chargers for transmitters.
 - g. Coordinate frequency range of wireless microphone systems based on site specific survey of existing RF activity.
 - h. Provide one handheld transmitter and one body pack transmitter for each receiver channel.
 - i. Label each transmitter noting “Conference Center” and number of receiver.
 - j. 12 hour battery life.
 - k. RF Carrier Frequency Range: 470 to 932 MHz.
 - l. Audio Frequency Response: 30 Hz to 20 kHz.
 - m. Range: 500’ minimum.
- 2. Product:
 - a. Receiver (WMREC): Shure ULXD4 or equal.
 - b. Antenna Coupler: (ANT CPLR): Shure UA221 or equal.
 - c. Antenna RF Amplifier (RF AMP): Shure UA 830 USPV or equal.
 - d. RF Antenna: Shure UA8 Series or equal.
 - e. Body-pack Transmitter (WM LAV): Shure ULXD1 or equal.

- f. Lavalier Microphones: Provide a lavalier microphone for each Body-pack transmitter.
 - 1) Lavalier: Shure WL185 or equal.
 - g. Handheld transmitter (WM HH): Shure ULXD2/58 or equal.
 - h. Rechargeable Battery: Shure SB900A or equal.
 - i. Battery Charger: Shure SBC 200 or equal.
3. Quantities:
- a. Receiver (WMREC): as shown on drawings.
 - b. Antenna Coupler (ANT CPLR): as shown on drawings.
 - c. Antenna RF Amplifier (RF AMP): as required.
 - d. RF Antenna: Provide antennas for remote mounting as shown on the drawings.
 - e. Body-pack Transmitter (WM LAV): Provide one per each wireless microphone channel provided.
 - f. Lavalier Microphone: Provide one lavalier/head worn microphone for each body pack transmitter.
 - g. Handheld transmitter (WM HH): Provide one per each wireless microphone channel provided.
 - h. Rechargeable Battery: Provide 1 battery for each wireless transmitter.
 - i. Battery Charger: Provide enough chargers to simultaneously charge transmitter batteries.
- B. Microphone Carrying Case
- 1. Features:
 - a. Provide a carrying case for the microphones.
 - b. Provide a separate compartment within the foam for each microphone.
 - 2. Product: Refer to Article 2.07 for carrying case specifications.
 - 3. Quantity: 1.
- C. CD Player (CD):
- 1. Features:
 - a. Professional single well CD player with Bluetooth and USB connectivity.
 - b. Provide controls for Skip forward and reverse, fast audible forward and reverse.
 - c. Random play capability
 - d. Dual 16 bit D/A converters
 - e. Signal to Noise Ratio: >106dB.
 - f. Distortion: < 0.007%.
 - g. Bluetooth pairing of up to 8 devices with Bluetooth 5.0.
 - h. USB host port.
 - i. 3.5mm stereo input.
 - j. RS-232c Control port.
 - k. Provide the manufacturer's IR remote.

- I. Install in Manual Mixer Console Case for the existing Allen+Heath QU16 (See below).
 2. Product: Denon DN-500CB or equal.
- D. RF Hearing Assistance System (RF TRANS, RF ANT, RF RCVR):
 1. Features:
 - a. Single Channel FM hearing assistance system with fixed transmitter and battery-powered, portable personal receivers.
 - b. Modulator Carrier Frequencies: 72 MHz or 216 MHz.
 - c. Transmission range: 1,500 feet minimum.
 - d. Transmitter output power: 100 mW.
 - e. Audio Frequency Response: 50 Hz – 15 kHz.
 - f. Signal to Noise Ratio: 80 dB minimum.
 - g. Provide separate frequencies for the Conference Center and Entry systems.
 - h. The Contractor shall perform a site survey to determine the clearest frequency bands (72 or 216 MHz) available at the site and provide models operating in those bands.
 - i. Signage:
 - 1) A code compliant sign shall be provided at each entry point of a room with a permanent assistive listening system alerting the public to the availability of the system.
 - 2) Provide Owner with code required signage and coordinate the location and installation of the signage with the Owner.
 - 3) Coordinate the color of the sign with the Owner.
 - j. Transmitter:
 - 1) Provide rack mount kit.
 - 2) Select separate channels within the Modular Carrier Frequency for the Conference Center and Entry.
 - k. Antenna: Mount antenna in dipole configuration.
 - l. Receiver:
 - 1) Provide stereo headphones for each receiver.
 - 2) Provide inductive neck loops as required by code.
 - 3) The Contractor shall label the receivers to note which space the receivers will operate in.
 - m. Battery Charger/Case: Provide carrying cases for receivers, headsets and spare batteries. The cases shall include an integral battery charger.
 - n. Provide rechargeable battery packs for receivers.
 - o. Installed Assistive Listening System shall meet the requirements of CBC Section 1104B.2.
 2. Product:
 - a. RF Transmitter (RF TRANS): Listen LT-800 + LT 326 or equal.
 - b. RF Antenna (RF ANT): Listen LA-122 or equal.
 - c. RF Receiver (RF RCVR): Listen LR-3200 + LA 402 or equal.

- d. Inductive Loop (RF IND): Listen LA-166 or equal.
 - e. Case/Battery charger: Listen LA-380 or equal.
 - f. Signage: My Door Sign - Assistive Listening System Sign or equal.
3. Quantity:
- a. Conference Center:
 - 1) RF Transmitter (RF TRANS): As shown on drawings.
 - 2) RF Antenna (RF ANT): As shown on drawings.
 - 3) RF Receiver (RF RCVR): 6
 - 4) Inductive Loop (RF IND): 2
 - 5) Case/Battery charger: 1
 - 6) Signage: Provide one sign per entry point.
 - b. Entry:
 - 1) RF Transmitter (RF TRANS): As shown on drawings.
 - 2) RF Antenna (RF ANT): As shown on drawings.
 - 3) RF Receiver (RF RCVR): 12
 - 4) Inductive Loop (RF IND): 3
 - 5) Case/Battery charger: 1
 - 6) Signage: Provide one sign per entry point.
- E. Distributed Loudspeaker (D):
- 1. Features:
 - a. 8" full range, coaxial point source driver.
 - b. 1.0" High Frequency driver.
 - c. 80 degrees conical dispersion.
 - d. 60 Watt 70 Volt multi-tap transformer.
 - e. Sensitivity: 90 dB at 1Watt/1meter, minimum.
 - f. Frequency Response: 75 Hz to 20 kHz.
 - g. Max power handling: 140 Watts (16 Ohms).
 - h. Integral ported Enclosure
 - i. Provide Manufacturer's Mounting hardware.
 - j. Color: Black.
 - 2. Product: Tannoy OCV8 or equal.
- F. Full Range Loudspeaker (LS):
- 1. Features:
 - a. 2-Way full range loudspeaker system.
 - b. Low Frequency 1-8" cone driver
 - c. High Frequency System: 1" driver.
 - d. Dispersion: 100 degrees conical at -6dB.
 - e. Sensitivity: 91 dB SPL/1Watt at 1meter, minimum.
 - f. Frequency Response: 62Hz to 16 kHz.

- g. Max power handling: 240 Watts at 8 ohms.
 - h. Integral 60 Watt, multi-tap 70 Volt Transformer. Tap at 8 Ohms.
 - i. Mounting: Provide manufacturer's ball joint mounting bracket.
 - j. Color: White.
2. Product: JBL Control C-28-1 or equal.

2.04 VIDEO

A. VGA to HDMI Convertor (HD15 TO HDMI)

1. Features:
 - a. VGA to HDMI convertor.
 - b. Input: VGA
 - c. Output: HDMI
 - d. Supports Output resolution to 1920 x 1080, progressive.
 - e. Provide power supply.
 - f. Provide 10' HD-15 + stereo audio and 10' HDMI cable with each Convertor.
2. Product: Monoprice LKV-350 or equal.
3. Quantity: 2

B. TV Tuner (TUNER) [Owner Furnished]:

1. Features:
 - a. Digital Cable Tuner
 - b. Owner Furnished Equipment.
2. The Contractor shall coordinate installation of the tuner with the Owner and provide wiring and connections to the system per the Category AV drawings.

C. Blu-Ray Disk Player (BLU RAY):

1. Features:
 - a. Universal Blue Ray, DVD-Video and Audio CD disc playback.
 - b. Video Outputs: HDMI.
 - c. Audio Outputs: HDMI, XLR.
 - d. HDMI 1.3a compliant with Deep Color support.
 - e. RS-232C serial control interface.
 - f. Provide manufacturer supplied IR remote.
 - g. 1 RU Rack Mount.
2. Product: Denon DN-500BD or equal.

D. Network Presentation Interface (NET INT):

1. Features:
 - a. Network interface that allows computers to transmit an image from a computer to the presentation system over the network.
 - b. Input: 1 - RJ-45 LAN connectors for connection to network.
 - c. Output: HDMI.

- d. Maximum Resolution: 4096 x 2160 at 60 Hz.
- e. RS-232 control port.
- f. HDCP 2.2 compliant.
- g. Compatible with Windows, MacOS, Android and iOS operating systems.
- h. Provide rack mount kit as required.
- i. Lock out front panel controls.
- j. Welcome Screen:
 - 1) Provide a custom Welcome screen on device with instructions for connecting. Coordinate the instructions with Owner.
 - 2) Background: Coordinate welcome screen background with Owner.
 - a) Do not place any necessary information on the background screen that will be obscured by the Status Bar.
 - b) Provide instructions to connect to the NET INT for Windows, iOS and Android devices.
 - c) Provide instructions for Websharing (see below).
 - 3) IP Address Labels: Rename the IP Address Labels as follows:
 - a) IP Address A: CAAM
 - 4) IP Address: Coordinate IP address for the NET INT with the Owner.
 - 5) Hostname Labels: Rename the hostname labels.
 - 6) Hostnames:
 - a) Conference Center: Set the hostname to Room 116.
 - b) Entry: Set the hostname to Room 160.
 - 7) Code: Enable use of the code and set the Code to match the Hostname.
 - a) Conference Center: Set the Code to 1160.
 - b) Entry: Set the Code to 1600.
 - 8) Web share: Provide instructions on the Welcome screen for the Web sharing capability of the NET INT.

2. Product: Extron Sharepoint Pro 500 or equal.

E. SDI to HDMI Converter (SDI TO HDMI):

1. Features:

- a. HD SDI to HDMI Converter with embedded audio.
- b. Input: HD-SDI/SDI, Autosensing.
- c. Outputs: HD-SDI loop through and HDMI
- d. Formats: 4k, UltraHD, 2K, HD and SD
- e. Contractor shall verify that the convertor will accept the maximum native resolution from the provided IMAG Camera System (see below) and output a matching output to the DM SW.

2. Product: AJA Hi5-12G or equal.

F. IMAG Camera System

1. Provide a camera, tripod and rear lens control system to provide an IMAG image for the Entry AV system.
 - a. Provide wiring between camera and Lens Rear Control Unit.
 - b. Provide soft cases for the camera and tripod.
 - c. Training: The Contractor shall include setup and operation of the camera as part of the system training.
2. Video Camera (CAM):
 - a. Features:
 - 1) High definition handheld color camera.
 - 2) 1/2.84" CMOS type chip, 3.1 Megapixel progressive scan.
 - 3) Lens: 20x Optical Zoom
 - 4) Focal Length: 3.67 – 73 mm
 - 5) Viewfinder: .24 inch LCD
 - 6) Minimum Illumination: 0.1 lux.
 - 7) Shutter Speed: 1/6 s to 1/2000 s.
 - 8) Recording Media: 2 – SDHC/ SDXC slots.
 - 9) Output: 1 – HD-SDI, 1 – HDMI
 - 10) Audio Inputs: 2 – XLR phantom power mic inputs.
 - 11) Provide AC Power Adapter and Soft Carrying Case.
 - 12) Provide 1 – 16 GB memory card.
 - 13) Output Resolutions: 1080/59.94p, 1080/29.97p, 1080/23.98p and 1080/59.94i.
 - b. Product: Canon XA15 + SC2000 or equal.
 - c. Quantity: 1
3. Lens Rear Control Kit:
 - a. Features:
 - 1) Pan bar remote control for CAM.
 - 2) Controls:
 - a) Record
 - b) Stop
 - c) Zoom or Focus controls with selection switch.
 - d) Focus: Auto or manual.
 - 3) LANC control protocol.
 - 4) Mount to Tripod Pan bar. Provide adapter as needed.
 - b. Product: Manfrotto MVR901EPLA or equal.
 - c. Quantity: 1
4. Tripod:
 - a. Features:
 - 1) Aluminum tripod with fluid head.
 - 2) Maximum Height: 67"

- 3) Load Capacity: 16 lbs.
- 4) Leg Sections: 3
- 5) Head:
 - a) Maximum weight: 165 lbs.
 - b) Independent pan and tilt locks.
 - c) Front tilt: -70/+90 degrees
 - d) Provide 1 pan bar.
 - e) Fixed pan and tilt drag.
- 6) Mount Camera to Tripod.
- 7) Mount Zoom control on pan bar.
- 8) Provide soft carrying case for tripod.
- b. Product: Manfrotto MVK500190X3 or equal.
- c. Quantity: 1

G. Video Projector (VP):

1. Features:
 - a. 1 DLP chip video projector.
 - b. Native resolution: 1920 x 1200.
 - c. Light output: Minimum 6,000 ANSI lumens.
 - d. Solid State laser phosphor light source.
 - e. Contrast Ratio: 2500:1, minimum.
 - f. Horizontal Scan Rates: 15 to 91 kHz.
 - g. Vertical Scan Rates: 24 to 120 Hz.
 - h. HDMI, DVI-D and HD-15 inputs.
 - i. Color: White
2. Product:
 - a. Projector: Christie DWU630-GS or equal.
 - b. Lens: Christie 1.52 – 2.89 Zoom Lens or equal.
 - 1) Projection image shall fill the screen image from mounting location.
Contractor shall verify focal length in the field prior to installation.

H. Video Projector Mount:

1. Features:
 - a. Integral Security Hardware.
 - b. Roll: +/- 5% adjustment.
 - c. Pitch +/-20% adjustment.
 - d. Yaw: 360% adjustment.
 - e. Provide the Owner with security keys for projectors. Label keys by room.
 - f. Provide additional ancillary hardware as required by the on-site conditions.
2. Product: Chief RPAU Series or equal.

2.05 DIGITAL MEDIA TRANSPORT

A. General:

1. The Contractor's DMC-E engineer shall oversee the integration and installation of the Digital Media System and shall be responsible for coordination of IT related issues with the Owner.
2. Provide static IP addresses as required for each Digital Media device. Coordinate the IP addresses with the Owner prior to installation.
3. Coordinate connection of Digital Media switchers to the building network with the Owner. If the building network makes use of managed switches with Rapid Spanning Tree Protocol (rSTP), disable the rSTP feature of any Digital Media switchers.

B. Digital Media Transmitter (DM TR):

1. Features:
 - a. 1 Gang wall mount HDMI to Digital Media signal format transmitter.
 - b. HDMI input.
 - c. Resolutions supported up to 4k: 30 FPS, 4:2:2 sampling and 36 bit color depth.
 - d. Output: 1 Cat5e, Digital Media 8G+ Copper format.
 - e. EDID format management.
 - f. CEC control
 - g. HDCP 2.2
 - h. Finish: White
 - i. Power to device provided over DM cable.
2. Product: Crestron DM-TX-4K-100-C-1G-W-T or equal.

C. Digital Media Presentation Switcher (DM SW):

1. Features:
 - a. Ten input, one output multi-format video and audio switcher with integral microphone mixer and remote control processor.
 - b. Inputs:
 - 1) 4 – HDMI
 - 2) 4 – multi-format HD15
 - 3) 2 – Single Wire Digital Media Copper format
 - c. Outputs:
 - 1) 1 – HDMI
 - 2) 1 – Single Wire Digital Media Copper format.
 - d. Converts analog video and computer signals to HDMI format. Formats supported include VGA, SVGA, XGA, SXGA, UXGA, Component, S-Video and Composite input signals.
 - e. Stereo audio inputs for HD15 inputs.
 - f. Microphone Input.
 - g. Stereo program output.
 - h. Integral remote control processor.

- 1) 1 - IR outputs.
 - 2) 2 – Digital I/O ports.
 - 3) 2 – Relay outputs
 - 4) 1 – RS232 outputs.
 - 5) 1 - Remote control buss outputs.
 - i. EDID format management.
 - j. HDCP Key management.
 - k. LAN port.
 - l. One rack unit.
2. Product: Crestron DMPS3-4K-150-C or equal.
- D. Digital Media Receiver with Scaler (DM SCALER):
1. Features:
 - a. Digital Media to HDMI signal format receiver with integral scaler.
 - b. Input: 1 RJ45, Digital Media 8G+Copper format.
 - c. Output: HDMI
 - d. IR Control: 2 – IR control ports.
 - e. Relay: 2 relay outputs.
 - f. RS-232 Port
 - g. USB HID port.
 - h. Ethernet Port
 - i. EDID format management.
 - j. Set the output resolution of the scaler to match the video resolution of the display.
 2. Product: Crestron DM-RMC-4KZ-SCALER-C or equal.
- E. Digital Media Distribution Amplifier (DM DA):
1. Features:
 - a. HDMI to Digital Media distribution amplifier.
 - b. Input: HDMI
 - c. Output: 4 RJ45, Digital Media 8G+Copper format and HDMI loop-through.
 - d. Ethernet Port
 - e. EDID format management.
 2. Product: Crestron DM-DA4-4K-C or equal.

2.06 REMOTE CONTROL

- A. General: The remote control system shall be an integrated control system based around a microprocessor driven master control device capable of controlling devices via a wide variety of protocols. The system shall be expandable via peripheral devices including control interfaces, additional control I/O ports and other devices.
- B. Control System Features:
1. 32 bit, microprocessor 257 MIPS, min.

2. 32 MB onboard memory with expansion capabilities.
 3. Proprietary Control bus for internal wiring of control devices.
 4. Integral I/O ports including RS-232, RS-422, RS-485, Serial IR, contact closure.
 5. Controller shall include card frame expansion capabilities for additional I/O including 10/100 BASE T Ethernet, USB, and Firewire.
 6. Control system shall include outboard components to provide additional control functionality. These outboard devices shall communicate with the master controller via the system's proprietary buss.
 7. Contractor shall provide ancillary components and wiring devices necessary to provide a complete, fully functioning system.
- C. Touch Panel (TP):
1. Features:
 - a. 7" wall rack mount touch panel.
 - b. Control via LAN.
 - c. Provide black finish.
 - d. Provide Rack Panel mount.
 - e. Contractor shall provide GUI developed using Crestron Smart Graphics platform. The GUI of the touch panel shall match the GUI of the Apple iPad Interface (see below).
 2. Product: Crestron TSW-770- B-S + TSW 570/1070-RMK-1 (as needed) or equal.
- D. Apple iPad Interface:
1. Features:
 - a. The Contractor shall provide the Owner with the specified App to enable the Owner to control the AV system with an Owner Furnished iPad.
 - b. The Contractor shall coordinate the downloading of the App to the Owner's iPad and pay for the in App purchase to provide full control of the AV system.
 - c. The Contractor shall configure that App and in-App purchase so that the Owner retains full control and ownership of the App and the GUI.
 - d. The Contractor shall provide the GUI for the App so that it matches the look and feel of the rack mounted touch panel. The App GUI shall have the same functionality as the touch panel GUI.
 2. Product: Crestron - Go - Touch + In App purchase + Smart Graphics or equal.
- E. POE Ethernet Gigabit Switcher (POE SWITCH):
1. Features:
 - a. 16 Port 10/100/1000 Base T Switcher.
 - b. 8 ports with POE, 80 Watt total POE power.
 - c. Unmanaged, plug and play operation.
 - d. Provide rack shelf for mounting.
 2. Product: Linksys LGS116P or equal.
- F. General Control System Description:

1. The contractor shall provide programming for the remote control systems as described below.
2. Labels and Text: Avoid abbreviations and acronyms. Device selection and control buttons will be labeled with clear text descriptions. Transport control buttons will use graphical icons. Lettering is 1/8" minimum sans serif font, maintaining a high background to text contrast. Use contrasting color to highlight function or feedback status.
3. Use positive logic. Avoid conditions that may cause command synchronization conflicts. Provide power sensors or other devices to ensure that positive logic conditions are maintained. Wherever possible, use RS-232 or RS-422 devices that provide feedback of equipment status to the control system.
4. Feedback shall be indicated in a logical manner on the touch screens. The status of each controllable device shall be polled to reflect the most accurate state of the overall system condition.
5. Link functions to require the fewest number of user actions to control the audio-visual equipment.
6. Each media selection clears the previous audio and visual selection (i.e. Blu-Ray "ON" clears the audio as well as the visual selection of the previous display material) unless the system is expressly directed to provide breakaway or asynchronous signals.
7. Default conditions shall be established for the system at power-up including device on/off, warm-up routine, power conditions, switcher routing and other default conditions.
8. Buttons (hard and soft) shall incorporate pilot lights or inverted illumination capabilities to designate active states.
9. The programming shall be "foolproof" to the extent that each operation or sequence of operations does not cause the control system to become inoperable to interfere with further procession, correct operations or execution of commands.
10. The compiled program code for the system touch panel shall be resident on the remote control processor to allow loading onto the touch panel directly from the system. Provide adequate system memory for storage of the touch panel code.
11. The un-compiled source program code for the remote control processor shall be resident on the remote control processor. Provide adequate system memory for storage of the source code.

G. Remote Control Submittals and Owner Review:

1. Prior to programming the remote control system, the Contractor shall include as part of the shop drawing submittal and touch panel and Ipad App layouts with control descriptions of the remote control system functions for review. The Contractor shall incorporate comments from the shop drawings review into the programming of the systems.
2. After the installation of the AV systems has been deemed substantially complete, but prior to final acceptance of the system, the Owner shall have a review period of thirty days to observe the operation of the remote control system. At the end of this review period, the Owner may request programming changes relating to the look and feel of the remote control panels or the functionality of commands. The Contractor shall make these changes prior to acceptance of the systems.
3. The Owner shall maintain ownership of the un-compiled source code at the conclusion of the project and be provided with the source code on CD-ROM as part of the as-built documentation.

- H. Conference Center Touch Screen Functional Description: The Contractor shall provide programming for the remote control systems as described below and shown on the Category AV drawings.
1. General: This programming description applies to the general function and control of the AV system as expressed through the control interface on the Touch Screen.
 2. Programming: The touch screen control interface shall be ordered, mapped, and the buttons defined as described below. The goal of the remote control system programming is to provide a simple, user-friendly interface to the audio-visual system. With this in mind, each button on the remote control panels may initiate control of multiple devices to streamline operation of the system.
 3. Title Screen: Contractor shall obtain a bitmap file from the Owner for this screen. This is the default start up screen for power up and sleep modes. Touching the screen in any location will bring user to the Main Screen.
 4. Touch Screen: The touch screen shall include a command ribbon across the top of the screen with separate tabs for each control page. The contents of the control pages will be displayed under the command ribbon. The command ribbon will include the following tabs: Room Controls, Video Projection, Room Setup and System Shutdown.
 5. Room Controls:
 - a. Speech Audio: These buttons control the output level of the speech reinforcement system.
 - 1) Increase Volume: This button is represented graphically as an up arrow. Pressing this button increases the volume of the speech reinforcement system.
 - 2) Decrease Volume: This button is represented graphically as a down arrow. Pressing this button decreases the volume of the speech reinforcement system.
 - 3) Mute: Selecting this button will mute the speech signal and display a graphic noting this. Selecting the button again will engage the speech signal and remove the graphic.
 - 4) Visual Indicator: Provide a vertical bar indicator showing the relative level of the speech reinforcement system.
 - b. Program Audio: These buttons control the output level of the program audio system.
 - 1) Increase Volume: This button is represented graphically as an up arrow. Pressing this button increases the volume of the program audio system.
 - 2) Decrease Volume: This button is represented graphically as a down arrow. Pressing this button decreases the volume of the program audio system.
 - 3) Mute: Selecting this button will mute the program signal and display a graphic noting this. Selecting the button again will engage the program signal and remove the graphic.
 - 4) Visual Indicator: Provide a vertical bar indicator showing the relative level of the program audio system.
 - c. Screen Controls: These buttons provide access to control of the projection screen.
 - 1) Up: Selecting this button will raise the projection screen to its fully closed position.

- 2) Down: Selecting this button will lower the projection screen to fully lowered position. This will be the lower limit switch of the projection screen.
- d. Video Projector: These buttons control the output of the video projector:
 - 1) On: This button turns on the video projector.
 - 2) Off: This button turns off the video projector.
 - 3) Mute: Selecting this button disables the output of the video projector at the projector itself. When this command is enabled, it still allows viewing the output of the video switcher on the preview window. Reselecting this button when the projector is disabled will return the display.
- 6. Video Projection: This screen section contains buttons to select the source equipment for display on the Projection System. These buttons are located at the left hand side of the screen. The transport controls will be located on the right hand side of the screen. When a source is first selected, the system will automatically lower the projection screen and route the source selected to the video projector.
 - a. BLU-RAY: Selects BLU-RAY as the source and enables the BLU-RAY Transport Pop-Up Screen.
 - 1) BLU-RAY Transport pop Up Screen:
 - a) Stop Icon: Stops the BLU-RAY player.
 - b) Play Icon: Starts playing the BLU-RAY player.
 - c) Pause Icon: Pauses the BLU-RAY player.
 - d) Chapter Back Icon: Selecting this button moves the BLU-RAY player back to the previous chapter.
 - e) Chapter Forward Icon: Selecting this button moves the BLU-RAY player forward one chapter.
 - f) REW Icon: Rewinds the BLU-RAY player. Additional button pushes will increase the pace of the rewind.
 - g) FFWD Icon: Fast forwards the BLU-RAY player. Additional button pushes will increase the pace of the fast forward.
 - h) Menu Button: Selecting this button brings up the menu for the BLU-RAY disk in use.
 - i) Enter Button: This button performs the “enter” or “select” function of the BLU-RAY player.
 - j) Cursor Controls: These buttons are up, down, left and right cursor control buttons for navigating the BLU-RAY menu system.
 - k) Close: Selecting this button closes the pop up menu.
 - b. TV Tuner: Selects Stereo TV Tuner as the source and enables the TV Tuner Pop Up Screen.
 - 1) TV Tuner Transport Pop Up Screen:
 - a) Channel Up button: Increases channel number 1 position
 - b) Channel Down button: Decreases channel number 1 position
 - c) Channel Keypad: Allows selection of channel by entry into numeric keypad.
 - d) Channel Display: Shows the channel number entered into the system.

- e) Enter: This button tunes the TV Tuner to the channel shown in the Channel Display.
 - f) Close: Selecting this button closes the pop up menu.
 - c. Entry Overflow: Selects the Overflow from the video signal from the Entry as the video source and selects the overflow audio via the DSP as the program Audio source.
 - 1) Provide a note in the transport control area that states: "No User Controls Available."
 - d. AV Panel: Selecting this button displays the HDMI signal from the AV Panel.
 - 1) Provide a note in the transport control area that states: "No User Controls Available."
 - e. Wireless Input: Selecting this button displays the output of the NET INT.
 - 1) Provide a graphic in the transport control area that outlines the instructions to connect to the NET INT. Refer to the specification of the NET INT for a description of the connection information.
- 7. System Setup Screen: The room setup controls allow authorized operators to alter parameters of the room setup. Selecting the Room Setup button on the main menu will enable the Password Access Screen menu centered on the touch panel. Other controls will be unavailable while in the setup menus.
 - a. Password Access Screen: The room setup controls are password protected so that only authorized technicians can alter the settings. This screen includes a keypad to enter a password, a display to show the entered values and buttons to enter the room set up controls or exit the screen. Coordinate the password with the Owner.
 - 1) Keypad: A standard number keypad to allow entry of a password into the system for access.
 - 2) Display: The display will show the keystrokes entered on the keypad.
 - 3) Enter: Selecting this button will test the password displayed against allowable passwords. If the password is incorrect, the display will be blanked and the user may enter another password. If the password is correct, the Setup Selection Screen is enabled.
 - 4) Exit: Selecting this button returns the user to the Main screen.
 - b. Room Setup Screen: This screen allows the operator to select the system parameters to adjust.
 - 1) Video Projector: Selecting this button displays the Video Projector Setup Screen.
 - 2) Presentation Switcher (DM SW): Selecting this button displays the Presentation Switcher Setup Screen.
 - 3) Audio DSP: Selecting this button displays the Audio DSP Setup Screen.
 - 4) Close: Selecting this button returns the user to the Room Control screen.
 - c. Video Projector Setup Screen: This screen contains controls for the video projector setup.
 - 1) Provide Navigation buttons and an Enter button to control the projector's on screen menus via RS-232 or IR remote control.
 - 2) Provide a button to return to the Room Setup Screen.

- d. Presentation Switcher Setup Screen:
 - 1) Provide separate buttons for each video and audio input and output to allow independently selecting the video and audio sources for each output. This will allow set up of breakaway audio.
 - 2) Provide a button to return to the Room Setup Screen.
- e. Audio DSP Setup Screen: This screen contains volume controls for each microphone input on the DSP to allow the user to adjust volume levels of individual microphones.
 - 1) Provide level up/down controls and a visual indicator for each microphone input.
 - 2) Provide a "Reset" button to return microphone levels to the default condition for microphones determined by the Contractor based upon the typical microphone selections.
 - 3) Provide a button to return to the Room Setup Screen.
- 8. System Shutdown: Selecting this tab will display the System Shutdown Pop Up Menu.
 - a. System Shutdown Pop Up Menu: This menu will display the question: "Are you sure you want to turn off the AV System?" and include the following buttons:
 - 1) Yes: Selecting this button will shut the AV system down via the AC Sequencing system and individual component controls. The projection screen will be raised, the video projector will turn off and the AC sequencer will power down the AV system.
 - 2) No: Selecting this button will close the Pop Up Menu.
- I. Entry Touch Screen Functional Description: The Contractor shall provide programming for the remote control systems as described below and shown on the Category AV drawings.
 - 1. General: This programming description applies to the general function and control of the AV system as expressed through the control interface on the Touch Screen.
 - 2. Programming: The touch screen control interface shall be ordered, mapped, and the buttons defined as described below. The goal of the remote control system programming is to provide a simple, user-friendly interface to the audio-visual system. With this in mind, each button on the remote control panels may initiate control of multiple devices to streamline operation of the system.
 - 3. Title Screen: Contractor shall obtain a bitmap file from the Owner for this screen. This is the default start up screen for power up and sleep modes. Touching the screen in any location will bring user to the Main Screen.
 - 4. Touch Screen: The touch screen shall include a command ribbon across the top of the screen with separate tabs for each control page. The contents of the control pages will be displayed under the command ribbon. The command ribbon will include the following tabs: Room Controls, Video Projection, Room Setup and System Shutdown.
 - 5. Room Controls:
 - a. Speech Audio: These buttons control the output level of the speech reinforcement system.
 - 1) Increase Volume: This button is represented graphically as an up arrow. Pressing this button increases the volume of the speech reinforcement system.

- 2) Decrease Volume: This button is represented graphically as a down arrow. Pressing this button decreases the volume of the speech reinforcement system.
 - 3) Mute: Selecting this button will mute the speech signal and display a graphic noting this. Selecting the button again will engage the speech signal and remove the graphic.
 - 4) Visual Indicator: Provide a vertical bar indicator showing the relative level of the speech reinforcement system.
- b. Program Audio: These buttons control the output level of the program audio system.
- 1) Increase Volume: This button is represented graphically as an up arrow. Pressing this button increases the volume of the program audio system.
 - 2) Decrease Volume: This button is represented graphically as a down arrow. Pressing this button decreases the volume of the program audio system.
 - 3) Mute: Selecting this button will mute the program signal and display a graphic noting this. Selecting the button again will engage the program signal and remove the graphic.
 - 4) Visual Indicator: Provide a vertical bar indicator showing the relative level of the program audio system.
- c. Audio Control: These buttons control the audio mode of the AV system.
- 1) Automatic Mixer: Selecting this button selects the automatic microphone mixer and program router in the DSP as the audio sources via the Audio Control Router.
 - 2) Manual Mixer: Selecting this button selects the Manual Mixer inputs as the audio source via the Audio Control Router.
- d. Video Projector: These buttons control the output of the video projector:
- 1) On: This button turns on the video projector.
 - 2) Off: This button turns off the video projector.
 - 3) Mute: Selecting this button disables the output of the video projector at the projector itself. When this command is enabled, it still allows viewing the output of the video switcher on the preview window. Reselecting this button when the projector is disabled will return the display.
6. Video Projection: This screen section contains buttons to select the source equipment for display on the Projection System. These buttons are located at the left hand side of the screen. The transport controls will be located on the right hand side of the screen. When a source is first selected, the system will automatically lower the projection screen and route the source selected to the video projector.
- a. BLU-RAY: Selects BLU-RAY as the source and displays the BLU-RAY Transport Pop-Up Menu.
- 1) BLU-RAY Transport Pop Up Screen:
 - a) Stop Icon: Stops the BLU-RAY player.
 - b) Play Icon: Starts playing the BLU-RAY player.
 - c) Pause Icon: Pauses the BLU-RAY player.
 - d) Chapter Back Icon: Selecting this button moves the BLU-RAY player back to the previous chapter.

- e) Chapter Forward Icon: Selecting this button moves the BLU-RAY player forward one chapter.
 - f) REW Icon: Rewinds the BLU-RAY player. Additional button pushes will increase the pace of the rewind.
 - g) FFWD Icon: Fast forwards the BLU-RAY player. Additional button pushes will increase the pace of the fast forward.
 - h) Menu Button: Selecting this button brings up the menu for the BLU-RAY disk in use.
 - i) Enter Button: This button performs the “enter” or “select” function of the BLU-RAY player.
 - j) Cursor Controls: These buttons are up, down, left and right cursor control buttons for navigating the BLU-RAY menu system.
 - k) Close: Selecting this button closes the pop up menu.
- b. Internet Radio: Selects the Denon 350 UI as the program source via the DSP and Mutes the output of the video projector and displays the Internet Radio Pop Up Menu.
- 1) Internet Radio Pop Up Menu:
 - a) Stop Icon: Stops the Internet Radio.
 - b) Play Icon: Starts playing the Internet Radio.
 - c) Pause Icon: Pauses the Internet Radio.
 - d) REW Icon: One press reverses the Internet Radio one track position. Holding the button rewinds the current track.
 - e) FFWD Icon: Advances the Internet Radio one track position. Holding the button fast forwards the current track.
 - f) Repeat: Repeats the current selection.
 - g) Close: Selecting this button closes the pop up menu.
- c. IN Panel: Selecting this button displays the HDMI signal from the IN Panel.
- d. Wireless Input: Selecting this button displays the output of the NET INT.
- 1) Provide a graphic in the transport control area that outlines the instructions to connect to the NET INT. Refer to the specification of the NET INT for a description of the connection information.
- e. Camera: Selects the SDI Camera input as the program source.
- 1) The Camera input of the DM SW shall be configured so that the audio is always muted.
7. System Setup Screen: The room setup controls allow authorized operators to alter parameters of the room setup. Selecting the Room Setup button on the main menu will enable the Password Access Screen menu centered on the touch panel. Other controls will be unavailable while in the setup menus.
- a. Password Access Screen: The room setup controls are password protected so that only authorized technicians can alter the settings. This screen includes a keypad to enter a password, a display to show the entered values and buttons to enter the room set up controls or exit the screen. Coordinate the password with the Owner.

- 1) Keypad: A standard number keypad to allow entry of a password into the system for access.
 - 2) Display: The display will show the keystrokes entered on the keypad.
 - 3) Enter: Selecting this button will test the password displayed against allowable passwords. If the password is incorrect, the display will be blanked and the user may enter another password. If the password is correct, the Setup Selection Screen is enabled.
 - 4) Exit: Selecting this button returns the user to the Main screen.
- b. Room Setup Screen: This screen allows the operator to select the system parameters to adjust.
- 1) Video Projector: Selecting this button displays the Video Projector Setup Screen.
 - 2) Presentation Switcher (DM SW): Selecting this button displays the Presentation Switcher Setup Screen.
 - 3) Audio DSP: Selecting this button displays the Audio DSP Setup Screen.
 - 4) Close: Selecting this button returns the user to the Room Control screen.
- c. Video Projector Setup Screen: This screen contains controls for the video projector setup.
- 1) Provide Navigation buttons and an Enter button to control the projector's on screen menus via RS-232 or IR remote control.
 - 2) Provide a button to return to the Room Setup Screen.
- d. Presentation Switcher Setup Screen:
- 1) Provide separate buttons for each video and audio input and output to allow independently selecting the video and audio sources for each output. This will allow set up of breakaway audio.
 - 2) Provide a button to return to the Room Setup Screen.
- e. Audio DSP Setup Screen: This screen contains volume controls for each microphone input on the DSP to allow the user to adjust volume levels of individual microphones.
- 1) Provide level up/down controls and a visual indicator for each microphone input.
 - 2) Provide a "Reset" button to return microphone levels to the default condition for microphones determined by the Contractor based upon the typical microphone selections.
 - 3) Provide a button to return to the Room Setup Screen.
8. System Shutdown: Selecting this tab will display the System Shutdown Pop Up Menu.
- a. System Shutdown Pop Up Menu: This menu will display the question: "Are you sure you want to turn off the AV System?" and include the following buttons:
- 1) Yes: Selecting this button will shut the AV system down via the AC Sequencing system and individual component controls. The projection screen will be raised, the video projector will turn off and the AC sequencer will power down the AV system.
 - 2) No: Selecting this button will close the Pop Up Menu.

J. Defaults: The system will make the following adjustments upon system power up or rest.

1. Refer to the Category AV drawings for information on the default signal routing of the AV system.
 2. Program audio: The program audio signal shall follow the video source of the video switcher.
 3. Audio volume: Default audio volume is the midpoint setting of the volume controls.
- K. Network Control: The Contractor shall provide a web browser based control interface for each touch panel included in the AV systems so that it may be accessed via the building network. The browser page shall be password protected to allow only authorized users access.
- L. Mobile Device Control: The Contractor shall provide the Crestron – Go – Tablet app and necessary in App purchases to replicate controls for both the Entry and Conference Center touch panels.
1. The APP GUI's shall be programmed using the Crestron Smart Graphics package and the look and feel of the App GUI's shall match that of the touch panels.
 2. The Contractor shall coordinate the installation of the Apps on Owner Furnished iPads, payment of the in-App purchase fees and programming of the GUI's with the Owner. The Apps for each room may be installed on separate iPads, one for each room, or a single iPad.
 3. The Owner shall maintain ownership of the un-compiled source code for the GUI's at the conclusion of the project and be provided with the source code on CD-ROM as part of the as-built documentation.
- M. Fire/Life Safety Loudspeaker Cutoff: Control signals from the fire and life safety will be connected to the remote control processor or digital signal processor. In the event of a fire or life safety alarm, the remote control system will mute the sound system.

2.07 RACKS, WIRE, CONNECTORS AND MISC. HARDWARE

- A. Wall Mounted Equipment Rack:
1. Features:
 - a. Wall mounted hinged equipment cabinet.
 - b. Cable management track.
 - c. 3/4" rack space elevation.
 - d. Accepts EIA standard 19 panel" width, 22" overall depth.
 - e. 1/2", 3/4", 1", 1-1/2", electrical knockouts top and bottom rear.
 - f. 12 Ga. construction.
 - g. Ventilated side panels.
 - h. Secure rack to wall using manufacture's recommended method.
 - i. Provide vented locking front door.
 - j. Size rack per the rack elevations on the Category AV drawings.
 - k. Racks shall be attached to building structure per the manufacturer's recommended method.
 2. Product: Middle Atlantic DWR Series with LVFD Series door or equal.
- B. Manual Mixer Console Case:

1. Features:
 - a. Provide a mixer road case for the existing Allen+Heath GU16 Mixing Console with 4 RU rack under the mixer.
 - b. Constructed of 3/8" plywood, interior braced and faced with plastic laminate.
 - c. Doghouse top with locking front and rear panels.
 - d. 1" foam padding on interior compartment.
 - e. Mixer shall be mounted to top facing equipment rack rails using manufacturer's hardware. Provide 4 RU vertical rack space below mixer for CD and other equipment.
 - f. Color: Black.
 2. Acceptable: Custom by Grundorf or equal.
 3. Quantity: 1
- C. Carrying Case:
1. Features:
 - a. Watertight plastic equipment cases.
 - b. Polypropylene Structural Resin case material.
 - c. Neoprene Sponge O-rings to seal lid.
 - d. Provide 1.7 lb/cubic foot foam inserts with custom sized cavities for each piece of equipment as required.
 - e. Size to accommodate required equipment into a single case.
 2. Product: Pelican, Masco or equal.
 3. Quantity: Provide carrying cases as noted.
- D. Blank Panels:
1. Features:
 - a. 1/8" anodized brushed aluminum finish.
 - b. 19" standard EIA width.
 2. Product: Middle Atlantic PHBL Series or equal.
- E. Vent Panels:
1. Features:
 - a. 16 Ga. perforated steel with black power coat finish.
 - b. 60% minimum open area.
 - c. 19" standard EIA width.
 2. Product: Middle Atlantic VT Series or equal.
- F. Rack Kit(s):
1. Features:
 - a. 1/8" anodized brushed aluminum finish.
 - b. Custom manufactured for each piece of equipment.
 - c. 19" standard EIA width.
 - d. Provide 1 for each non-standard 19" EIA piece of equipment.

2. Product: Middle Atlantic or equal.
- G. Rack Drawer (DRAWER):
1. Features:
 - a. Rack-mountable drawer with lock.
 - b. RU height as shown on drawings.
 - c. 14" Deep.
 2. Product: Middle Atlantic D Series with LK option or equal.
- H. Security Rack Screws:
1. Use for mounting rack mounted equipment.
 2. Provide Owner with 6 mounting bits for provided screws.
 3. Product: Middle Atlantic Star Post HTX or equal.
- I. Power Sequencer (AC SEQ):
1. Features:
 - a. Programmable sequencing of AC receptacles in rack mount enclosure.
 - b. Remote power on switch to control position.
 - c. Controls a minimum of eight 15 amp duplex output circuits.
 - d. Use additional standard outlet strips to provide additional outlets as required.
 2. Sequence:
 - a. Power On Sequence: Power audio sources and "head end" equipment on first. Then energize power amplifiers delaying 5 second between each amplifier. The DM SW shall remain on at all times.
 - b. Power Off Sequence: Reverse the above description waiting until the amplifier capacitors completely discharge to eliminate any transit pops due to source equipment power off.
 3. Product: Furman CN-1800S or equal.
- J. Rear Rack Work Light:
1. Features:
 - a. Movable work light with magnetic base.
 - b. 60 Watt rough service bulb.
 - c. On/Off switch.
 - d. Adjustable arm.
 2. Product: Middle Atlantic WL-60 or equal.
 3. Quantity: Provide 1 per equipment rack provided.
- K. Audio Terminal Blocks:
1. Audio lines leaving an equipment rack shall be connected via barrier-type screw terminal blocks.
 2. Acceptable: Kukla or equal.
- L. Installed Wiring:

1. Pre-manufactured cables with molded consumer grade connectors are not acceptable and shall not be used.
2. Loudspeaker lines in conduit: standard electrical wire, stranded copper, color coded, THHN type.
 - a. Low Z: AWG #12.
 - 1) Product: West Penn 227, Belden 5000UP, or equal.
 - b. 70 Volt: AWG #16
 - 1) Product: West Penn C225, Belden 8471, or equal.
 - c. 70 Volt Plenum Rated, AWG #16
 - 1) Product: West Penn 25294B or equal.
3. Mic and Line, shielded pair #22,
 - a. Product: Belden 8761, West Penn 291 or equal.
4. SDI Video 75 ohm Coax:
 - a. Product: Belden 1694A or equal.
5. Control System Buss:
 - a. Crestron CRESNET-NP or equal.
6. DC Control Lines:
 - a. Low current loads (mute, VCA, LED): AWG #20.
 - b. Medium current loads (relays, switch lamps): AWG #18.
7. Wireless Microphone Antenna: Provide cables recommended by Wireless Microphone equipment manufacturer for given length of cable run based upon field conditions.
8. Hearing Assistance Antenna: Provide cables recommended by Hearing Assistance equipment manufacturer for given length of cable run based upon field conditions.
9. RS-232 Control Lines:
 - a. Product: Belden 8102, West Penn 271, or equal.
10. Category 6:
 - a. Product: Belden 1872A, West Penn M57622 or equal.
11. Digital Media:
 - a. Product: Crestron DM-CBL-ULTRA-NP or equal.
12. Wire labels: Permanent cables shall be marked with wire labels at both ends of the cable. The wire labels shall utilize plastic shrink-wrap, protecting the text and ensuring they remain affixed to the wiring.

M. Connectors:

1. Loudspeaker:
 - a. Panel: Neutrik NL4MP or equal.
 - b. Cords: NL4FC or equal.
 - c. Cable couplers: Neutrik NL4MM or equal.
 - d. Wooden box mounting: Neutrik NL4MPR or equal.
2. Mic and Line XLR-type:
 - a. 3-pin female XLR-type cable end.

- 1) Product: Neutrik NC3FX or equal.
- b. 3-pin male XLR-type cable end:
 - 1) Product: Neutrik NC3MX or equal.
- c. 3-pin female XLR-type panel.
 - 1) Product: Neutrik NC3FDL or equal.
- d. 3-pin male XLR-type panel:
 - 1) Product: Neutrik NC3MDL or equal.
- e. 4-pin male XLR-type cable end:
 - 1) Product: Neutrik NC4MX or equal.
- f. 4-pin female XLR-type panel.
 - 1) Product: Neutrik NC4FDL or equal.
3. Mic and Line Phone-type:
 - a. ¼" male cable end.
 - 1) Product: Switchcraft 35HDNN, Neutrik NP3C or equal.
 - b. ¼" female panel.
 - 1) Product: Switchcraft 35RAPC2BH3, Neutrik NJ3FP6C or equal.
4. SDI Video: 75 ohm Coax
 - a. Provide correct connector for each coaxial cable type.
 - b. Cable End: Neutrik NBNC75BTU11 or equal.
 - c. Chassis: Neutrik NBB75DFI or equal.
5. Digital Media:
 - a. CAT7a: Crestron DM-CONN or equal.
 - b. Cable Connector Carrier: Neutrik NE8MC-1 or equal.
 - c. Panel Connectors: Neutrik NE8FDP or equal.
6. Control and Data:
 - a. RJ -45: TIA/568-A or B.
 - b. DB-9/ RS-232C:
 - c. Products: Markertek 9M, Pacific Custom Cable D9MS, or equal.
7. DC power: Provide locking connector

N. Portable Cables:

1. Refer to the Category AV drawings and other portions of the specifications for additional requirements. Unless otherwise noted, microphone and line level portable cables shall be by Whirlwind or equal.
2. Microphone Extension Cables: Ready-made with XLR connectors with rubber jackets by Whirlwind or equal.
 - a. Quantity:
 - 1) 4 - 25' cables.
 - 2) 2 - 50' cables.
3. Video extension cables: HD-SDI with BNC connectors:
 - a. Quantity:

- 1) 1 - 25' cable.
 - 2) 1 - 50' cable.
 - 3) 1 - 100' cable.
4. HDMI Cables: distance rated HDMI cables with locking connectors.
 - a. 15' cable
 - b. 25' cable
 - c. Cable retention: 25 lbs, minimum.
 - d. Provide 1 set of HDMI cables for each HDMI input.
 - e. Product: Perfect Path 700 Series or equal.
 5. Cat6 Extension Cables:
 - a. Quantity:
 - 1) 2 - 15' cables
 - 2) 2 - 25' cables
 - 3) 1-100' cable
 6. Reusable Portable Cable Tie
 - a. Products: Rip Tie, Cord Lox or equal.
 - b. Quantity: 1 per portable cable provided.
- O. Receptacle Panels, aluminum:
1. Material: 1/8" thick aluminum.
 2. Sizes:
 - a. Verify panel sizes required each backbox in the field.
 - b. Surface Mount: Panels for surface mounted backboxes shall be equal in dimension to the backbox so that the panel edges are flush with the sides of the backbox.
 - c. Flush Mount: Panels for backboxes mounted flush to a finished wall or ceiling shall have dimensions at least 1/2" greater than the backbox dimensions so that the panel covers the gap between the backbox and the finished surface.
 3. Finish: Panels shall be brushed aluminum.
 4. Engraving: Panels shall be engraved with text a minimum of 1/8" in height and back-filled in a contrasting color to the finish surface of the panel.
 - a. Brushed aluminum panels shall have black backfill.
 5. Submit engraved sample for approval by Owner.
 6. Product: Custom by Contractor.
- P. Wire Clamp:
1. Features:
 - a. Material: nylon, UV stabilized.
 - b. Color: black
 - c. Size: holding diameter sized as required based on conductor size.
 2. Product: Richco N Series, or equal.

Q. Wire Harness Cover:

1. Exposed wiring (i.e. wiring from AV plates to fixed equipment) shall be bundled together and covered with a flexible expandable mesh covering to protect the cables. Wire harness covering shall be sized as required to accommodate each cable bundle.
2. The ends of the mesh covering shall be dressed at each end of the cable length using shrink wrap plastic tubing.
3. The cable harness cover shall be black. Provide a sample to the Owner for review and approval prior to installation.
4. Product: Techflex Flexo PET or equal.

R. Anti-Theft Hardware:

1. Features:
 - a. For fixed AV system components located in classrooms or public spaces (except distributed ceiling loudspeakers) mounted 12'0" or less above the finished floor the Contractor shall provide anti-theft hardware to prevent the theft of the equipment.
 - b. Secure anti theft hardware to AV component and mounting bracket or building structure.
 - c. Provide glue down security plate, lock and steel cable.
 - d. Provide the Owner with three sets of keys per lock. Label keys by Room Number and Equipment description.
2. Product: Security Kit, Tufnut or equal.

S. DC Power Supplies:

1. 12, 24 volt, capacity as required with 100% extra, UL (or other) listed (PS): Condor linear or approved equal, submit cut sheets.
2. Products: Condor, Equipment Manufacturer's power supply or equal.

T. Loudspeaker Rigging:

1. Category AV drawings are for information only. The Contractor shall supply Shop Drawings of mounting details stamped by a California registered structural engineer prior to installation.

U. Microphone Stands:

1. General Purpose Microphone Stand:
 - a. Features:
 - 1) 12" dia. base.
 - 2) 37" to 66" vertical extension.
 - 3) Black matte finish.
 - b. Product: Atlas MS-20E or equal.
 - c. Quantity: 2
2. Desk Microphone Stand:
 - a. Features:
 - 1) 6" dia. base.
 - 2) 8" to 13" vertical extension.

- 3) Black matte finish.
- b. Product: Atlas DS-7E or equal.
- c. Quantity: 2

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. The following installation requirements shall govern the design, fabrication and installation of the system(s) specified herein. In case of a discrepancy between these overall system standards and the individual equipment item specifications, the latter shall govern:
 - a. The equipment specified shall be installed according to standards of good human engineering practice and the conditions specified herein.
 - b. Workmanship on the installed systems shall be of professional quality, best commercial practice and accomplished by persons experienced in the techniques and standards of the particular industries involved.
 - c. The specifications describe required performance. The specifications with the contract drawings indicate a general design; the Contractor shall supply from his background of experience and knowledge the necessary supporting details to provide a fully functioning system.
 - d. In general, the drawings show dimensions, positions, and kind of construction. The specifications describe materials, qualities and methods. Any work called for on the drawings and not mentioned in the specifications, or vice versa, shall be performed as though fully set forth in both. In case of differences between the drawings and the specifications, the decision of the Owner shall govern. Work not particularly detailed, marked or specified shall be construed to be the same as similar parts or areas that are detailed, marked, or specified.
2. Equipment markings shall present only needed information and shall be readable from the operator's normal work position. These markings shall be designed to minimize ambiguous interpretation.
3. Control panels shall be designed to reduce chances of human error and controls shall be natural and consistent with normal operator expectations.
4. Control consoles and their panel mountings shall be provided with the necessary controls, indicators and switches, etc., as outlined in the pertinent sections of this specification. The grouping of the controls shall be in accordance with the drawings and shall be arranged to present an orderly, functional appearance. The layout of controls shall be such that priority of accessibility shall be given to those facilities that frequently require attention.
5. The design of the system shall simplify the operator's task and insure maximum performance and reliability while minimizing possibilities for human error and providing a comfortable environment for the operator during operation.
6. At the operational level (i.e., patch panels, Audio-Visual connector panels, etc.) connectors shall be clearly labeled by function and number. When there are multiples of the same function (For example, a given microphone line may appear at several locations.), the same label shall be shown at each location.

B. The Conduit System:

1. The Category AV drawings indicate the number, type and location of the receptacle, wire and cable requirements and Equipment Room layouts, which are the responsibility of the Contractor. The conduit diagrams indicate schematically the functions served by the conduit system. Also, the conduit diagrams may indicate the locations at which functions are served at several locations in the facility. See the general installation notes for additional information and requirements as shown on the Category AV drawings.
2. The Contractor shall inspect the conduit and report any discrepancies to the Owner in writing.
3. The Contractor shall verify continuity of conduits as described on the Category AV drawings.
4. The Contractor shall be responsible for supplying any additional conduit that may be required to complete the system installation in accordance with the drawings.
5. It shall be the responsibility of the Contractor to obtain the exact location of any pull boxes, "LBs" or other intermediate junction boxes.
6. The Contractor shall also verify that conduits are adequate for the wiring and functions specified. If the Contractor substitutes cables from the specified wiring the Contractor shall bear the sole responsibility for reengineering the conduit as required.
7. Each conduit shall contain wires or cable of the same signal level or the same type of circuitry only. Each separate service level designation shown on the AV conduit riser shall be run in their respective, separate conduits and conduit landings in backboxes or equipment racks shall be grouped by service level.
8. Ground power conduits to the power system ground. Do not connect power system conduits to the racks or to the audio-visual system ground.

C. Equipment Arrangement:

1. The general layout is indicated in the drawings. The Contractor shall prepare and submit a detailed layout of fixed equipment for approval by the Owner.
2. The Contractor shall maintain accessibility to the rear of the equipment racks. See specification section 3.01.D.5 for minimum clearance information.

D. Equipment Rack Assemblies:

1. General:
 - a. Equipment rack(s) shall be completely assembled, tested and programmed in the Contractor's shop. No rack assembly shall be performed at the project site. After the equipment racks are tested the Contractor shall notify the Owner in writing that the equipment rack assemblies are ready for observation by the Owner. The Contractor shall allow adequate time in the project schedule for any modifications noted during the observation necessary to satisfy the contract drawings and specifications prior to delivery of the racks to the jobsite.
 - b. Use rear and mid rails for intermediate terminations. Maintain accessibility to the rear of the equipment.
 - c. Mid rails must be used to support equipment weighing more than 50 pounds.
2. Wiring Harnesses:
 - a. Equipment rack wiring shall be "Harness" style. "Point to Point" rack wiring is not acceptable. The individual wiring harnesses shall be located at the sides of the

- equipment rack and individual cables shall be broken out to the rear of components where the connectors are located. Patch bay cabling shall be harnessed in such a way as to allow any cable to be reconnected to any patch location within a single patch bay.
- b. Wiring service levels shall not be mixed in an individual harness; there shall be a separate wiring harness for each service level.
 - c. Low level signal harnesses shall be separated from the AC power lines and high level signal harnesses by a minimum of 12 inches.
 - d. When 3 or more equipment racks are used, interconnection between equipment racks shall be performed with multi channel cable and multi-pin connector assemblies. It is the intent that each rack shall be a complete, stand-alone assembly allowing the system to be completely tested in the Contractor's shop.
3. Equipment Labels:
- a. Rack-mounted equipment shall be labeled on front and back, as to function using engraved black/white laminated plastic blocks. For example: "LEFT HI-FREQ AMPLIFIER" or "CENTER EQUALIZER"
 - b. Use permanent professional quality labels such as "Gravelply" or approved equal. Stick-on strip labels such as those from Dyno or Brother are not acceptable.
4. Internal A/C Receptacles:
- a. Maintain grounding as shown on the Category AV drawings and described herein.
 - b. Locate internal AC receptacles on the left side of the rack and harnesses on the right side of the rack. In the event that there are 2 equipment racks side by side locate the A/C receptacles in the middle of the equipment racks and the wiring harnesses to the outer sides.
 - c. Provide 1 work lamp at the top rear of each equipment rack.
5. Installation:
- a. The equipment rack(s) shall be installed in the Equipment Room(s) in the configuration shown on the Category AV drawings. The location of the racks shall allow for an absolute minimum of 36 inches, preferably 42 inches, of clear space measured from the front of the rack(s) and from the rear of the equipment rack(s) to any installed equipment or walls.
 - b. Stationary equipment rack(s) shall be secured to the building structure to meet seismic and code requirements.
 - c. Interconnecting multi-channel cabling shall be led laterally from equipment rack to the vertical rack member, opposite from the AC power and then run vertically, remaining as exposed and accessible as possible. Wherever corners in multi-channel cabling occur strain relief spiral covering shall be used. Cable clamps shall be non-conducting or have soft insulating covers.
 - d. Audio field lines entering the Equipment Racks shall be connected to the rack wiring via an intermediate terminal block. Video field lines may be connected directly to the equipment or patch bays. In the event that a patch bay with an E3 or E90 connector is used, the patch bay may serve as the terminal block. This configuration will also facilitate the testing of the systems in the Contractor's shop.
 - e. Connections of lines at terminal blocks, as well as at signal receptacles, shall be mechanically secured and then soldered. No unsoldered connections shall be permitted. Where lines approach the racks and terminal blocks they shall also be

mechanically anchored at the rack, and provided with sufficient slack length to avoid strain, abrasion or wear.

E. Wiring and Cabling:

1. General:

- a. Physically segregate and separate high level signal lines from low level signal lines by a minimum of 6" within the equipment racks.
- b. Control cables and power distribution wiring shall not be installed adjacent to signal cables. Power distribution cabling shall be on the opposite side from signal wiring in equipment enclosures and shall be uniformly located throughout an installation.
- c. A wall location near the racks shall be chosen and suitable suspension "fingers" provided so that patch cords of a given type can be grouped and suspended.
- d. Wire and cable utilized in systems interconnection shall be of the flame-retardant type (FR-1 flame test).
- e. Cabling or system interconnection which passes through or into acoustically isolated areas, such as sound locks and studios, shall be suitably sealed after cable has been installed.

2. Wire Labels:

- a. During installation both ends of wires or cables shall be clearly labeled with permanent, machine lettered wire labels. The Contractor shall submit a sample to the Owner for review and approval.
- b. The wire labels shall be numbered consecutively with a leading service level designation.
- c. The wire labels shall not be more than 6 inches or less than 2 inches from the connector or termination at each end of the cable.
- d. Wire labels shall be covered with clear plastic shrink-wrap, protecting the text and ensuring the labels remain affixed to the wiring.

3. Documentation:

- a. Maintain a log including label, route and termination information for each cable.
- b. A detailed wiring diagram shall be furnished with wire numbers shown as part of the as-built documentation. Spare cable shall be shown on the As-Built documentation.

4. Cable Management:

- a. Cabling and wiring within the Equipment Room(s) that are semi-permanent (i.e., those leading from rack to rack, rack to conduit terminus or rack to equipment locations) shall be carried not within conduit, but rather within ducts, troughs or cable trays mounted along walls or below the ceiling.
- b. Appropriate hooks along the wall or on the ceiling will aid in running occasional or frequently changed extension cables to use position.
- c. Cables shall be grouped and bundled by type and routed from source to termination in a uniform manner throughout equipment housings. Care shall be taken not to break the insulation or deform the cable by harness supports. Cables shall not change relative position in a cable group throughout a cable route.

- d. Cable support bars shall be installed to support cables in areas of dense harness breakouts such as behind patch panels, distribution amplifiers and other multiple input/output devices.
 - e. Edge protection material ("cat track") or grommets shall be installed on the edges of holes, lips of ducts or any other point where cables or harnesses cross metallic edges.
5. Terminations:
- a. The Contractor shall employ the latest termination practices and materials.
 - b. Signal and control cable ends shall be neatly formed, and shrinkable tubing shall be applied where necessary to secure the insulation against fraying or raveling.
 - c. Internal rack terminations and field terminations shall be made with terminal blocks.
 - d. Punch block terminations are not acceptable and shall not be allowed.
 - e. Coaxial connectors shall be crimp-on and then soldered.
 - f. Audio and control wires shall be terminated with crimp-on lugs, and then soldered.
 - g. Bare wire shall be tinned prior to termination unless the connector manufacturer recommends otherwise.
 - h. Unused line level shields shall be individually insulated using shrinkable tubing and attached to the cable using an additional piece of shrinkable tubing.
- F. System Grounding:
- 1. The "spider" concept, as indicated in the grounding diagram, is designed to avoid ground loops and inductive coupling.
 - 2. The systems shall be hum free, stable and free of oscillation with the earth ground temporarily disconnected.
 - 3. The earth ground shall be made at only one point in the system as indicated and shall be in accordance with National Electric Code.
 - 4. The grounding method shall insure that the system is free of the following problems under any mode of operation:
 - a. RF oscillation, pickup and interference.
 - b. Distortion.
 - c. Crosstalk.
 - d. Signal Leakage.
 - e. Very high frequency feedback.
 - f. Audio Hum.
 - 5. Major wiring ducts or trays in the Equipment Room(s) shall be grounded to the conduit system.
 - 6. The equipment racks shall be isolated from, and not electrically connected to, the building grounding system. This means that the conduit system shall not be electrically connected to the equipment racks and that the equipment racks shall be installed so that they are electrically isolated from the building structural steel. The racks shall be electrically connected at only one point to the isolated grounding system as shown on the Category AV drawings.
- G. Seismic Restraints:

1. Hanging or freestanding equipment and cabinets furnished by the Contractor (including but not limited to racks, loudspeakers, projection screens, and video displays) shall be secured to substantial building structure. Equipment shall resist seismic acceleration in any direction up to a limit of the greater of 1.0 G or the limit prescribed by the local governing codes.
2. Loudspeaker hanging details, rack bracing, and other seismic restraints are not shown on the contract drawings; it shall be the Contractor's responsibility to develop these drawings and submit them as part of the shop drawings package for approval.
3. Submit the drawings to the Owner for review after they have been approved and signed by a certified structural engineer engaged in regular practice in the Project's State.

H. Loudspeaker Installation:

1. Verify loudspeaker aiming and positioning with Owner.
2. Submit loudspeaker mounting (rigging) drawings to the Owner for review after they have been approved and signed by a certified structural engineer engaged in regular practice in the Project's State.

I. Video Projector Installation:

1. The video projector shall be converged, registered and color balanced. At a minimum, the Contractor shall adjust and save the projector settings for standard scan rates and resolutions:
2. Submit video projector mounting drawings to the Owner for review after they have been approved and signed by a certified structural engineer engaged in regular practice in the Project's State.

3.02 SYSTEM PERFORMANCE TESTS:

A. General:

1. The Contractor shall pre-assemble and test systems and sub-systems in the Contractor's facility before completed assemblies are delivery to the project site.
2. Tests shall include but are not limited to those listed below in order to verify that the system meets design requirements.
3. The Contractor shall perform the system testing and adjustment of the installed systems prior to scheduling the final system acceptance observations.
4. Tests shall be fully documented and a neat copy presented for review by the Owner during the acceptance observation and a copy of the test results shall be included in the system manual.

B. Performance Tests on Individual Components:

1. Perform in the Contractor's facility.
2. Verify that the manufacturer's specifications are met.
3. Measure and record the impedance on each loudspeaker driver, and verify the acoustical output and freedom from rattles and distortion of loudspeakers.

C. Performance Tests on Completed Component Sub-assemblies:

1. Perform in Contractor's facilities.
2. Before delivery of the equipment to the project site, the Contractor shall demonstrate to Owner at the Contractor's facilities that sub-assemblies are operating as specified.

3. Verify the achievement of the specifications for each electronic component in situ, i.e., as assembled in its console, rack or other enclosure, powered by the system power supply and with other components also activated, powered and interconnected. The magnitude and character of the threshold noise shall be observed for appearance of hum in excess of that present with individual activation, or the appearance of high frequency oscillation.
 4. Projection equipment shall be tested to verify that the manufacturer's specifications are met after it has been incorporated into a complete subassembly.
 5. Video equipment shall be tested to verify that its operation meets the manufacturer's specifications and EIA RS-170A after assembly into complete subsystems.
- D. Performance Tests on the Complete System:
1. Verify that wiring is correctly and completely installed. Verify that there are no short circuits between conductors within any cable, or from cable to cable. Verify the integrity of each conductor, i.e., that the conductor is not open circuited. In addition, the correct polarity of each connector, including those in patch panels, shall be verified and the color-coding scheme shall be recorded and included in the documentation provided to the Owner.
 2. Verify that the entire system performance is in accordance with the design requirements. Specific attention is directed to the following for each system:
 - a. Projection Equipment.
 - b. Videotape Transports.
 - c. Video Switchers.
 - d. Remote Control Components.
 - e. Video Distribution Amplifiers.
 - f. Audio Amplifiers.
 - g. Consoles.
 3. The threshold noise output of the system, measured at the output of the power amplifier, must equal the input when its gain control is full on, and of the line or booster amplifier input when channel controls are off. No hum shall be audible in the system within the noise signal, or with the inputs terminated in microphone impedance and controls full on. No high frequency oscillation shall be observed at the system output. No audible radio signal shall be detectable in the system at any control setting. Depending upon the proximity of local radio stations or the cable configuration of the system, RF oscillation or leakage may be a problem and the Contractor shall be prepared to install a RF low pass filter appropriately in the system as a final remedy.
 4. Cross talk between channels shall be measured with signal equivalent to 1.0 Volts output into one channel with its gain off and the gain of each other channel varied over their full range. Maximum signal leakage at the system output must be equivalent to -70 dB re 1.0 Volt at the pre-amp output at 1 kHz, increasing to -52 dB at 8 kHz.
 5. The general performance of each loudspeaker unit in situ shall be verified by applying pink noise signal at 10.0 Volt level and verifying the specified output SPL at a distance of 1 foot. Normal undistorted sound quality shall be verified by headphone listening at the output of the calibrated system. Each loudspeaker shall also be fed with an oscillator signal at 10.0 Volt level within its intended frequency range, verifying absence or abnormal distortion of rattles due to installation.
- E. Optical projection system performance shall be in accordance with the following:

1. Projected images shall properly fill their respective screens to full size without "cropping".
 2. Projection lenses shall provide distortion free images without color fringing or aberration.
 3. Screen brightness and screen brightness ratio shall reasonably approach the theoretical value based on the projector's specified light output value with the necessary light loss corrections.
 4. Equipment items shall be 100% tested for correct functional operation.
- F. Digital Media System Testing:
1. The Contractor's designated Digital Media Certified Engineer shall conduct the following tests on the Digital Media Transport systems and document the results in the As-Built document submittal.
 2. Digital Media Hardware:
 - a. For each component of the Digital Media hardware provide the Model Number, firmware version and IP address.
 - b. For each switcher provide a table showing the input/output compatibility for the system.
 3. Sources:
 - a. Number of HDCP KSV keys supported by each permanent AV source.
 - b. Video timing, HDCP usage and audio format for each permanent source.
 - c. List of EDID video timings and audio formats presented to each source.
 4. Output Devices:
 - a. List of EDID video timings and audio formats supported by each output device.
 5. System Infrastructure:
 - a. Twisted Pair Cables:
 - 1) Length of cable run.
 - 2) Data rate supported each cable run.
 - b. Fiber Cables:
 - 1) Length of cable run.
 - 2) Data rate supported each cable run.
- G. Test results shall be recorded and provided as part of the As-Built Document Submittal.
- H. These tests, and any others that the Contractor may wish for his own satisfaction, shall have been performed and successfully achieved before observation requested. The Owner's Representative may request repetition and demonstration during observation of certain of these tests or other critical tests if problems become apparent. If specifications are not met, further observations will be at the Contractor's expense.

3.03 DEMONSTRATION AND ACCEPTANCE OBSERAVTION

- A. Acceptance Observation:
1. The Contractor shall file a written notice with the Owner when the aids to use described in paragraph 1.06, above, have been submitted for approval, tests described in

paragraph 3.02, are complete and the systems and sub-systems are ready for the Acceptance Observation.

2. The Contractor shall be prepared to demonstrate the overall system performance including but not limited to functionality, control system programming, operation, optics performance and DSP software control (where applicable). In addition, the Observation of the systems may include repetition or demonstration of any tests described in Paragraph 3.02 above or other critical tests if problems become apparent and the specifications are not met. After the Observation, written notice noting whether the systems meet the criteria set forth in the Contract for Substantial Completion, along with a list of items for the Contractor to correct shall be provided to the Contractor.
3. Assist in the observation by performing demonstration tests and final system adjustments. Provide labor, materials and tools necessary for these tests and adjustments. Provide necessary test equipment to complete the tests.
4. If final acceptance is delayed because the system(s) are not in proper working order or are incomplete, the Contractor shall pay for additional time and expenses for any resultant extension or re-scheduling of the acceptance observation.
5. Any measurements of frequency response, distortion, noise or other characteristics and any adjustments deemed necessary may be performed on any item or group of items, including re-orientation of loudspeakers, to insure optimum performance of the system.

B. Contractor Participation in the Observations:

1. The Contractor shall make two representatives: the Project Engineer and a technician available during the system observation. They shall assist the Owner's Representative in performing the observations. Their assistance shall include demonstrating the performance of the system by carrying out tests on the system as directed by the Owner's Representative and making any final system adjustments as deemed necessary.
2. The Contractor shall provide labor, materials and tools necessary to repeat or carry out any tests on the system during the observations and to make any adjustments to the system during the inspections.
3. The Contractor shall budget 8 hours to provide assistance during the observations. If additional time is required for the observations because the system installation is not complete or system testing or adjustment has not been completed, the Contractor shall solely bear the cost of providing additional man hours necessary to complete the inspections.
4. System testing and adjustment shall be completed prior to the observations. If final acceptance is delayed because the installation is not in proper working order or is incomplete, the Contractor shall pay for additional time and expenses for any resultant extension or re-scheduling of the acceptance testing period.

C. Acceptance:

1. After observations and tests indicate that the entire system and sub-systems as specified herein and indicated on the drawings are in total compliance with the drawings and specifications, a letter indicating said compliance shall be issued.
2. Acceptance of the system shall be accomplished as described in the Contract.
3. Final acceptance of the installation will be granted when it is clear to the Owner that the following conditions have been met:

- a. Fixed equipment has been furnished and installed according to the drawings and specifications.
 - b. Portable equipment has been turned over to the Owner.
 - c. Equipment and installation have been tested and shown to perform as specified.
 - d. Instruction manuals, software source code and as-built documentation have been completed and delivered to the Owner's Representative.
4. The Warranty period will begin only when the above listed items have been performed to the satisfaction of the Owner and Consultant.

3.04 CLEANING

- A. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of the equipment. Remove construction debris from equipment area and dispose of properly.

3.05 TRAINING

- A. Submit training materials to the Owner's representative for approval prior to scheduling training sessions.
- B. Provide 8 hours of hands on training practical operation of the system to the Owner's Representative. Address in the training, the general configuration of the system, basic functionality, correct operation procedures, routine maintenance and upkeep.
 1. Provide instruction in operation of the CAM and connection to the system.
 2. Provide instruction in connection of OFE portable mixer to system.
- C. Videotape training sessions and provide 3 edited copies to the Owner on DVD format.

END OF SECTION

SECTION 28 31 00

FIRE ALARM SYSTEMS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

- A. Addenda, Alternates, Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specifications collectively apply to work of this Section.

1.02 WORK INCLUDED

A. Section Includes:

1. The work under this section includes all labor, material, equipment, supplies, labor, testing, and accessories required to furnish and install a complete Fire Alarm System as indicated on the drawings and as specified herein.
2. It is the intent of the Drawings and Specifications for the Contractor to provide and install a complete, fully operational, and tested system.
3. All miscellaneous system components including, but not limited to control panels, digital communicator, alarm detection devices, alarm initiation devices, alarm indicating devices, remote power supplies, terminal cabinets, terminal blocks, conduits, wires, programming, testing, etc, as well as any other related items, shall be furnished and installed complete under this section, such that the system shall perform all functions listed herein in compliance with all of the specified requirements.
4. The complete installation shall conform to the following codes:

2019 Building Standards Administrative Code, Part 1, Title 24 C.C.R.
2019 California Building Code (CBC), Part 2, Title 24 C.C.R.

2019 California Electrical Code (CEC), Part 3, Title 24 C.C.R.

2019 California Mechanical Code (CMC), Part 4, Title 24 C.C.R.

2019 California Plumbing (CPC), Part 5, Title 24 C.C.R.

2019 California Fire Code (CFC), Part 9, Title 24, C.C.R.

2019 California Referenced Standards Code, Part 12, Title 24 C.C.R.

Title 19, CCR, Public Safety, State Fire Marshal Regulations.

B. Related Sections:

1. Section 26 01 00: Basic Materials and Methods.
2. Section 26 05 19: Wire and Cable

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3. Section 26 05 26: Grounding

4. Section 26 05 33: Conduit

1.03 SYSTEM REQUIREMENTS

- A. Fire detection system shall continually supervise and monitor the following initiating, signaling, and monitoring circuits:
1. Manual fire-pull stations.
 2. Smoke and heat detectors, duct detectors, including those installed under other sections.
 3. Fire sprinkler flow and tamper switches including PIV tamper switches.
 4. Alarm signaling circuits including alarm, horns and visual alarm units.
 5. Annunciators.
 6. Power supplies and batteries.
 7. Interconnection with HVAC system where applicable, kitchen fire suppression system and elevator equipment for control of recall function and elevator circuit breaker shunt trip to control power.
- B. System controls shall be UL listed for power limited applications in accordance with California Electrical Code.
- C. The fire alarm devices and equipment shall be listed for installation for the fire alarm control panel to which they are being connected.
- D. Complete installation shall conform to the version of NFPA 72, California Fire Code, California Building Code (CBC), and California Electrical Code (CEC) as approved by DSA on stamped drawings.
- E. System labels and devices programming addresses shall be based on final signage and building labeling submittals.

1.04 CERTIFICATION

- A. Certification: Installation of fire alarm system shall not begin until Shop Drawings, including State Fire Marshal listing numbers of fire alarm components, are submitted and reviewed by the Architect. Written certification by fire alarm equipment distributor or manufacturer shall be submitted to the Architect stating that system and its component parts are as approved and listed by the State Fire Marshal, and that the design conforms to requirements set forth in CBC.

1.05 PERFORMANCE

- A. System shall be fully programmable, configurable, and expandable in the field without special tools or PROM programmers and shall not require replacement of memory ICs. Installer shall provide a CD of all system installed software, site specific system programming and all information and tools required to re-program or modify the system.

1.06 SYSTEM FUNCTIONAL OPERATION

- A. When a fire alarm condition is detected by one of the system alarm initiating devices, the following functions shall occur:
1. System alarm LED shall flash.
 2. Local sounding device in panel shall be activated.
 3. The LCD display shall indicate type of device, custom label location label and point status alarm condition.
 4. Appropriate change of status message shall be transmitted to remote annunciator(s).
 5. Automatic programs assigned to alarm point shall be executed and associated indicating devices and relays activated.
 6. UDACT (Universal Digital Alarm Communicator Transmitter) shall activate.
- B. Trouble and Supervisory Conditions.
1. When any trouble condition is detected the following functions shall occur:
 - a System trouble LED shall flash.
 - b Local sounding device in panel shall be activated.
 - c The LCD display shall indicate the type of trouble and custom label location associated with the trouble condition and its location. Unacknowledged alarm messages shall have priority over trouble messages. If such an alarm is displayed, then trouble messages shall not be displayed.
 - d Appropriate message shall be transmitted to remote annunciators.
 - e UDACT shall activate.
 2. When any supervisory condition occurs such as a sprinkler valve tamper, the following function shall occur:
 - a System supervisory LED shall flash.
 - b Local sounding device in panel shall be activated.
 - c Appropriate message shall be transmitted to remote annunciators.
 - d UDACT shall activate.
- C. Activation of control panel ACKNOWLEDGE switch in response to a single new alarm, trouble or supervisory condition shall silence panel sounding device and change system alarm, trouble, or supervisory LED from flashing to steady-ON. If additional new alarm, trouble, or supervisory conditions exist in the system; activation of this switch shall advance display to next alarm, trouble, or supervisory condition that exists, and shall not silence local audible device or change LED to steady until new conditions have been so

acknowledged. New alarm conditions shall always be displayed before new trouble conditions. Occurrence of a new alarm, trouble, or supervisory condition shall cause panel to resound, and sequences as described above, shall repeat.

- D. Activation of the signal silence switch shall cause appropriate notification (indicating appliances and relays to return to normal condition. Selection of notification appliance circuits and relays silenced by this switch shall be fully programmable.
- E. Activation of system reset switch shall cause electronically latched initiating devices or zones, as well as associated output devices and circuits, to return to normal condition after sixty seconds of alarm. If alarm conditions exist in system after system reset switch activation, system shall then re-sound alarm conditions as indicated hereafter.
- F. Activation of lamp test switch shall turn on LED indicators, LCD display, and local sounding device in panel, and then return to previous condition.
- G. Fire alarm indicating appliances may be silenced, after one minute, by operating signal silence switch at the FACP or by use of key supervised alarm silence switch at remote annunciators. A subsequent zone alarm shall reactivate signals. Fire alarm indicating appliances shall be automatically silenced after 4 minutes of operation; visual indicating appliances shall be extinguished at system reset or automatically after 4 minutes of operation. Fire sprinkler flow alarm bells shall not silence until the contacts in the fire sprinkler flow switch return to the normal non-alarm state. Appropriate signage must be installed on or next to the sprinkler alarm bell.
- H. Elevator lobby smoke detectors shall, in addition to operations listed above, cause elevator cars to be recalled as follows:
 - 1. Elevator cars shall be recalled to main level of egress.
 - 2. Elevator cars shall be recalled to predetermined alternate level if main lobby smoke detector is activated.
- I. Initiation and indicating circuits shall be monitored for open/short circuit and ground fault conditions, these conditions shall be indicated on the Fire Alarm Control Panel and Annunciator displays while remaining circuits continue to operate normally.
- J. All notification appliance circuits shall be silenceable for testing purposes by authorized persons. Protected pass-codes, keys, or another secure method that does not require entering into the system programming shall be used.

1.07 POWER REQUIREMENTS

- A. The fire alarm control panel and remote power supply shall receive 120 VAC power, 60 Hz, through a dedicated 20 amps circuit. Circuit breaker protection for the dedicated fire alarm power circuits shall be equipped with a handle lock-on device, the breaker handle shall be colored red and labeled "FIRE ALARM". Clearly label the Electrical panel name, location and circuit number on the inside of the fire alarm control panel and all remote power supplies using a p-touch style labeling system. Transient voltage surge suppression shall be provided at the 120VAC input terminal.
- B. System shall be provided with sufficient battery capacity to operate entire system upon loss of normal 120 VAC power, in a normal quiescent mode, for a period of 24 hours with 5 minutes of alarm indication at end of this period. System shall automatically transfer to standby batteries upon power failure. Battery charging and recharging operations shall be

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automatic. Batteries, once discharged, shall recharge at a rate to provide a minimum of 70 percent capacity in 12 hours.

- C. Circuits requiring system operating power shall be 24 VDC and shall be individually protected at control panel.

1.08 SUBMITTALS

- A. Component Plan Submittal: Availability and listing for its application shall be verified for all system components before presentation of the submittal. Include the following information and details as applicable:

1. Installer name, address, telephone number.
2. List of system components, equipment and devices, including manufacturer model numbers, quantity and California State Fire Marshal listing numbers, mounting heights, and symbols per LAUSD symbol list.
3. Copies of manufacturer specification sheets for equipment and devices indicated. Highlight or identify the specific components on Catalog cut sheets.
4. Voltage Drop Calculations: Include the following information for the worst case:
 - a Point-to-point or Ohms law calculations.
 - b Zone used in calculations.
 - c Voltage drop percent. Voltage drop shall not exceed manufacturer's requirements. If voltage drop exceeds 10 percent, indicate manufacturer listed operating voltage ranges for equipment and devices.
5. Battery types, amp hours, and load calculations including the following:
 - a Normal operation: 100 percent of applicable devices for 24 hours to equal control panel amps plus list of amps per device that draw power from the panel during standby power condition including, but not limited to, zone modules, detectors and devices as identified.
 - b Alarm condition: 100 percent of applicable devices for 5 minutes to equal control panel amps plus list of amps per device that draw power from panel during alarm condition including, but not limited to, the following:
 - (1) Zone modules.
 - (2) Signal modules.
 - (3) Detectors.
 - (4) Signal devices.
 - (5) Annunciator.
 - (6) Other devices as identified.
 - c Normal operation plus alarm operation load calculation shall include total amp hours required and total amp hours provided.
6. Provide one copy of testing procedures.

- B. Shop Drawings: Provide Shop Drawings, in the same size as the design Drawings, Shop Drawings shall include the following:
1. Provide drawing scale, elevations of all system enclosures, and actual layout of the Fire Alarm Control Panel, power supply, annunciator, and all main system components.
 2. Site Plan indicating PIV and all related fire sprinkler system devices and equipment to be monitored or supervised; such as water flow valves, and main equipment such as control panels, power supplies, annunciators, and components such as outdoor wall-mounted horns, sprinkler bells, pull boxes, underground pull boxes, wiring routes on buildings exterior and underground locations. In each conduit or raceway run indicate conduit sizes, and quantities and type of wires.
 3. Complete battery calculations, and voltage drop calculation shall be included; these calculations shall be based on the devices maximum UL current rating.
 4. One line drawing for the entire system network indicating all system components and wiring. The one line diagram shall show but not be limited to panel to panel interconnections, conductors gauge and quantity, conduit size and type (designation) and specific function.
 5. System panel one-line drawings indicating the quantity and type (designation) of conductors entering and exiting the fire alarm terminal cabinet in each building (enclosure) for initiating, notification, or other command control functions required for complete system operation:
 - a Individual floor/building plan view drawings indicating all device locations including end of line resistors "EOLR" in accordance with the legend provided.
 - b Individual point addresses for all initiation and notification devices.
 - c Device "typical" wiring diagrams. These drawings shall indicate specific termination details for all peripheral equipment and/or interface devices.
 6. Provide interfacing with equipment furnished by others including voltages, and other required coordination items.
 7. Each of the pictorial diagrams included shall appear identical to the products they are intended to depict, in order to speed installation of the system, and to enhance the accuracy of the installation Work. Typical wiring diagrams or catalog sheets are not permitted.
 8. Background Drawings with device locations of DSA approved drawings are available in electronic format and may be obtained from the Owner Authorized Representative (OAR). Contractor is solely responsible for the accuracy and completeness of shop drawings. Buildings that are not part of the contract shall be clearly identified "NOT IN CONTRACT". Shop Drawings shall be prepared in the latest version of AutoCAD with 3 – CD ROM electronic copies submitted along
 9. Other installation and coordination drawings specifically related to this section shall be included as follows:

- a Size A (8-1/2 inch x 11 inches) and size B (11 inch x 17 inch) shall be bound into the manual.
 - b Larger drawings shall be folded and inserted into transparent envelopes and bound into the manual.
10. Installation and coordination drawings for items in other sections shall be included with submittal of Shop Drawings. Submit blue line copies and one reproducible copy of installation and coordination drawings.
11. Samples: Provide Samples of material and equipment as required by the Architect. If Samples are requested, they shall be submitted within 10 days from date of request.
- C. In addition to the above requirements, provide submittals to meet any additional requirements of DSA.

1.09 QUALITY ASSURANCE

- A. Installer shall have successfully completed at least 5 projects of equal scope in the past 5 years, and have been in business of furnishing and installing fire alarm systems of this type for at least 5 years.
- B. Installer shall be a factory authorized distributor and service provider for the brand of equipment offered and shall provide documentation to the Architect upon request.
- C. Installer shall maintain a fully equipped service organization capable of furnishing repair service to the equipment and shall maintain a spare set of major parts for the system at all times.
- D. Installer shall furnish a letter from manufacturer of equipment certifying equipment has been installed according to factory standards and that system is operating properly.
- E. Certifications: Installer shall submit certification from the equipment manufacturer indicating that installer is an authorized representative of the equipment manufacturer and is trained on network applications.
- F. All materials and equipment installed shall be new.
- G. All of the equipment in this specification shall be furnished and installed by the Authorized Factory Distributor of the equipment. Furnish a letter from the manufacturer of all major equipment, which certifies that the installer is an authorized distributor and that the equipment has been installed according to factory intended practices. Furnish a written guarantee from the manufacturer that they will have a service representative assigned to this area for the life of the equipment.
- H. Contractor/Installer's electricians and fire/life safety technicians shall be certified in accordance with Labor Code sections 3099, and 3099.2, and section 209.0 of the California Code of Regulations.
- I. System startup and testing shall be performed under the direct observation of the IOR and OAR. The Contractor at this time shall provide a legible half size reproduction of the original completed fire alarm red-line drawings (this copy will be retained by the Owner), an accurate copy of the fire alarm system points list, and a copy of the construction drawings on CD in AutoCad format,

- J. Provide and install the most current software package available at the time of installation. At the time of Owner Acceptance of the installation, all equipment, including any and all updated software which is to include the appropriate operating system, pass-codes, electronic keys and program disks, manuals and cables employed in the installation of the system, shall be delivered to the OAR who will, in turn, forward the items to the appropriate maintenance area Electrical Department. In addition, when the programming software is available in disk format, a backup copy of the most up to date revision, in disk format, shall be delivered to the OAR at the completion of the project. A software license agreement shall be made available for the responsible Owner representative to sign at the time of training.

1.10 WARRANTY

- A. The Fire Alarm Equipment Manufacturer shall provide a 3 year material warranty. Installer shall provide a 3 year labor warranty.
- B. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer for a period of 5 years after expiration of the warranty.

PART 2: PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Fire alarm equipment shall match the existing devices in the building.

2.02 FIRE ALARM CONTROL PANEL (FACP)

- A. Fire Alarm Control Panel is existing to remain. Reprogram the existing fire alarm control panel for the removed/added devices in the system.
- B. Network Control Annunciator (Existing to remain)

2.03 PERIPHERAL DEVICES AND EQUIPMENT

- A. Match existing type in the existing building.

PART 3: EXECUTION

3.01 GENERAL

- A. Fire alarm system shall not be used for any purpose other than fire alarm functions.
- B. Fire alarm shall be interconnected but not limited to the following systems:
 - 1. All systems required by code to be connected to the fire alarm systems shall be connected.
 - 2. Ventilation systems where required for the purpose of fan shutdown
 - 3. Damper control or smoke management systems.
 - 4. Water based fire sprinkler systems.
 - 5. Chemical fire extinguisher systems.

- C. Fire alarm system shall not be interconnected to any of the following:
 - 1. Sump warning systems,
 - 2. Carbon monoxide detection systems,
 - 3. Any other unrelated system.

3.02 SYSTEM INSTALLATION

- A. Install required conductors to devices indicated on Drawings. Provide required conductor terminations to devices for a complete system to function as specified and indicated on Drawings. Refer to Section 260519: Wire and Cable, for installation and color coding requirements.
- B. Splices are not allowed in junction boxes. Terminations shall be in terminal cabinets or on equipment terminals. There shall not be any splicing in underground boxes, no exception.
- C. Conductors shall be installed within conduits, boxes, and terminal cabinets in a totally enclosed installation. Furnish and install conductors required to connect incoming and outgoing circuits, including spare conductors, to terminal strips within terminal cabinets.
- D. Wiring within equipment and terminal cabinets shall be installed to conform to contract documentation and NFPA 72 standards, and shall be terminated on terminal blocks having terminals for required connections. Wiring shall be cabled, laced, and securely fastened in place so that no weight is imposed on equipment or terminals.
- E. Install required terminal blocks within terminal cabinets. Terminal blocks shall be installed on inside back of cabinets only, not on side. Incoming wiring shall be terminated on the left side of terminal blocks; outgoing wiring shall be terminated on the right side of the terminal blocks.
- F. Conductors shall be color-coded per specification section 260519 Low Voltage wires and tagged with code markers at terminal cabinets, and equipment. A wire index shall be typed and installed on terminal cabinet doors. Index shall be covered with clear plastic adhesive covers. Wiring shall be identified as to building and location of devices in the index.
- G. Wiring within equipment and terminal cabinets shall be carefully strapped, and shall be formed in rectangular configuration. Wires shall be properly numbered in numerical order and shall maintain same number throughout the Project site.
- H. Complete installation shall comply with local building codes and applicable provisions of the California Electrical Code, California Fire Code and the NFPA 72 National Fire Alarm Code.
- I. Location of outlet boxes and equipment on Drawings is approximate, unless dimensions are indicated. Do not scale Drawings to determine locations and routing of conduits and outlet boxes. Location of outlet boxes and equipment shall conform to architectural features of the building and other Work already in place, and must be ascertained in the field before the start of Work.

- J. Drawings generally indicate Work to be provided, but do not indicate all bends, transitions or special fittings required to clear beams, girders or other Work already in place. Investigate conditions where conduits are to be installed, and furnish and install required fittings.
- K. Provide p-touch label of approximately 1 inch wide with red lettering for each initiating device that is hidden from view. Tags shall indicate the name and type of device: Heat Detector, or Duct Smoke Detector. Tags shall be permanently attached on access panel or t-bar grid which is used to access a hidden device.

3.03 SYSTEM OPERATION

- A. Unless otherwise specified, but not limited to actuation of manual stations, smoke detectors, heat detectors, linear heat or smoke detectors, or water-flow switches shall cause the following operations to occur:
 - 1. Activate audible circuits.
 - 2. Actuate strobe units until the panel is reset or strobe circuit time-out.
 - 3. Release magnetic door holders to doors to adjacent zones on the floor from which the alarm was initiated.
 - 4. Duct type smoke detectors shall, in addition to the above functions, shut down the ventilation system or close associated control dampers as required.
 - 5. Activation of fire sprinkler system low-pressure switches, post indicator valve or tamper switches shall initiate a system supervisory alarm indication.
 - 6. UL listed central station shall be notified via – Universal Digital Alarm Communicator Transmitter (UDACT).

3.04 TESTING

- A. A 48 hour notice shall be provided to the IOR before final testing.
- B. Testing of fire detection system shall be as required by the State Fire Marshal and local authorities having jurisdiction. Installer is responsible for identifying required testing, coordinating, scheduling, and conducting tests before Substantial Completion. Tests shall include the following:
 - 1. Operation of all signal-initiating devices (smoke detectors, heat detectors, pull stations etc.).
 - 2. Operation of all indicating devices (alarm horns, alarm bells and alarm strobes).
 - 3. Operation of all system features under normal operation.
 - 4. Operation of all system supervisory features.
 - 5. Operation of all system features on standby power, with primary power turned off.
 - 6. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

7. Close sprinkler system flow valves and verify proper supervisory alarm at the FACP.
 8. Verify activation of flow switches.
 9. Open initiating device circuits and verify that trouble signal actuates.
 10. Open signaling line circuits and verify that trouble signal actuates.
 11. Open and short notification appliance circuits and verify that trouble signal actuates.
 12. Open and short (wire only) network communications and verify that trouble signals are received at network annunciators or reporting terminals.
 13. Ground initiating device circuits and verify response of trouble signals.
 14. Ground signaling line circuit and verify response of trouble signals.
 15. Ground notification appliance circuit and verify response of trouble signals.
 16. Check alert tone to alarm notification devices.
 17. Check installation, supervision, and operation of intelligent smoke detectors.
 18. Alarm conditions that the system is required to detect shall be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
 19. When the system is equipped with optional features, consult the manufacturer manual to determine proper testing procedures.
- C. Upon completion of installation of fire alarm equipment, provide to the OAR a signed, written statement confirming that fire alarm equipment was installed in accordance with the Specifications, Shop Drawings, instructions and directions provided by the manufacturer.
- D. Demonstrate in presence of the IOR that circuit and wiring tests are free of shorts and grounds and that installation performs as specified herein and within manufacturer's guidelines.
- E. Software Modifications:
1. Provide the services of a factory trained and authorized technician to perform system software modification, upgrades or changes. Response time of the technician to the Project site shall not exceed 24 hours.
 2. Provide hardware, software, programming tools, and documentation necessary to modify the fire alarm network on the Project site. Modification includes: addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modification on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being provided.

- F. Complete the inspection and testing form as required by NFPA 72, and submit one copy of the completed form to the Architect and IOR.

3.05 OPERATING/SERVICE MANUALS

- A. Deliver to OAR, 3 copies of service manuals including the following:
 - 1. Installation manuals, programming manuals and user manual if applicable for every control panel, control panel power supply, FACP input/output/relay or control module, auxiliary power supply, UDACT, remote NAC extender power supply, door holder power supplies, all installed annunciators, initiating and indicating devices and all addressable monitor, relay and control modules. Catalog cut sheets are not acceptable.
 - 2. A printed copy of the system configuration as programmed, including all system labeling codes, and passwords.
 - 3. An electronic copy on compact disk of the system configuration program
 - 4. Final test report.
 - 5. Detailed explanation of the operation of the system.
 - 6. Instructions for routine maintenance.
 - 7. Detailed wiring diagram for the connection of relays, addressable monitor, control or relay modules as applied in the interfacing of peripheral systems or equipment to the fire alarm system.
 - 8. An electronic copy (CD) of the posted site/fire alarm map in Auto-Cad and pdf formats.
 - 9. A single reproducible set of record drawings reflecting the system exactly as it was installed including exact location of components.
 - 10. Provide codes and passwords for fire alarm system at testing.

3.06 SPARE PARTS

- A. The following new spare parts shall be furnished in unopened boxes:
 - 1. 5% spare pull stations including the associated monitor module (minimum one spare pull station per type).
 - 2. 5% spare smoke and heat detectors (minimum one spare smoke and heat detector per type).
 - 3. 5% spare audible devices (minimum one spare audible device per type).
 - 4. 5% spare strobe devices (minimum one spare strobe device per type).

3.07 SYSTEM USER AND MAINTENANCE PERSONNEL TRAINING

A. Before Substantial Completion, provide one instruction period for the Project site based Owner operators and system users.

1. The instruction period shall be scheduled and coordinated by the OAR.

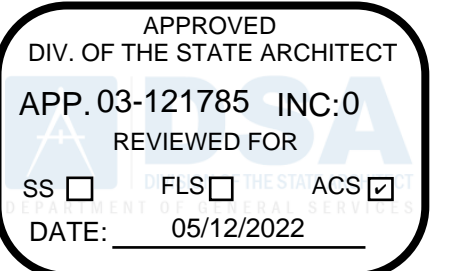
3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.09 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION



CALIFORNIA AFRICAN AMERICAN MUSEUM (CAAM) CONFERENCE CENTER / LIBRARY / STORAGE IMPROVEMENTS

600 STATE DRIVE, LOS ANGELES, CA 90037

100% CONSTRUCTION DOCUMENTS

CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel 213 769 0011 fax 213 769 0016
ibigroup.com



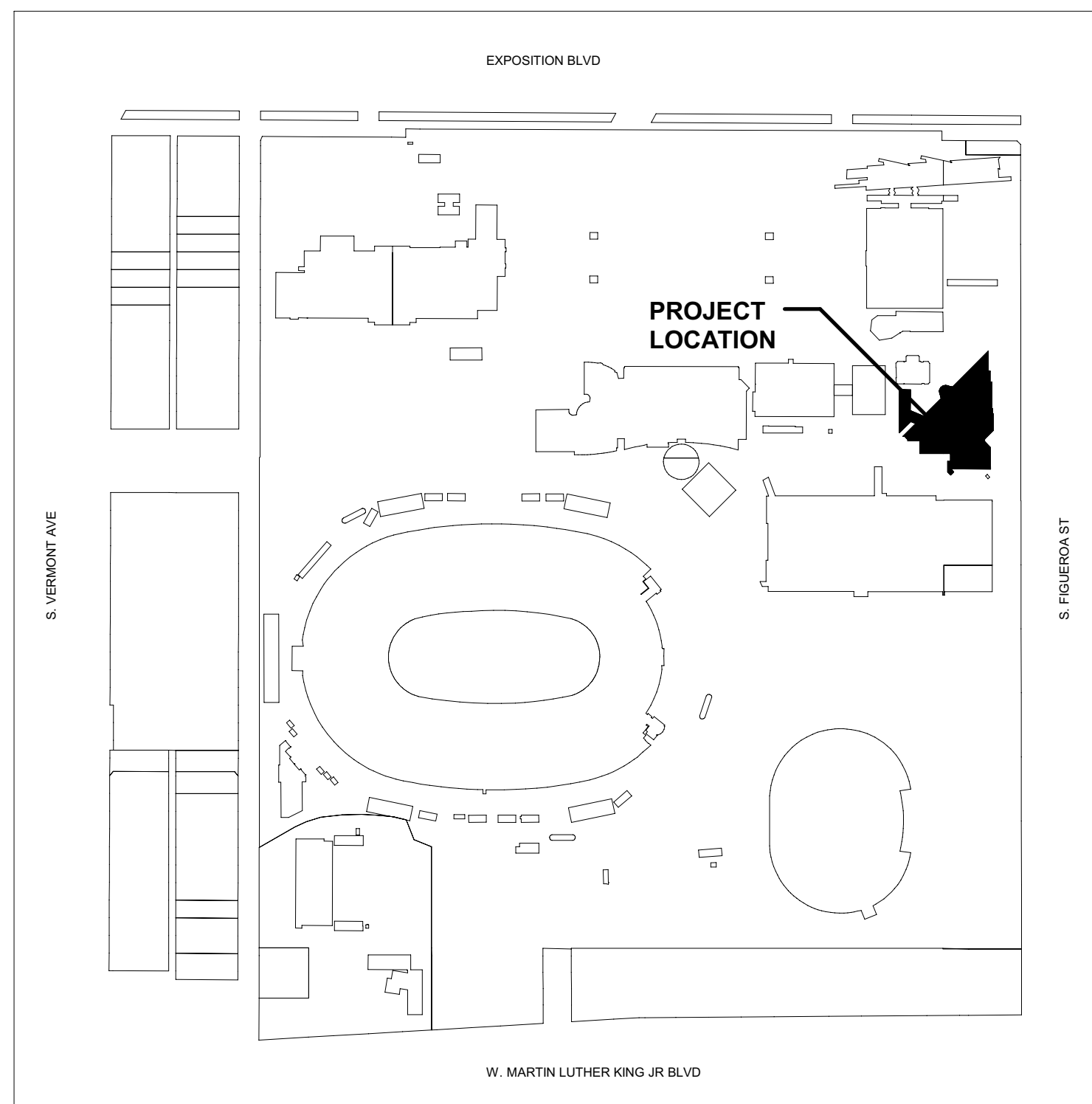
SUB CONSULTANT

NO.	ISSUANCE	STATUS	DATE
D	SCHEMATIC DESIGN		2018-10-11
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11

SHEET TITLE
COVER SHEET

DATE:	2022-05-02
DRAWN BY:	RR
CHKD BY:	AB
SCALE:	As Indicated
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	ISSUE
G0000	A1

VICINITY MAP



DEFERRED APPROVALS

- FIRE PROTECTION SYSTEM (NFPA 13) - RELOCATION OF (E) FIRE SPRINKLER HEADS IN THE CONFERENCE ROOM, BREAK ROOM AND LIBRARY SHOWN ON DRAWINGS SHALL BE USED FOR BIDDING PURPOSES ONLY. IT SHALL NOT BE USED FOR CONSTRUCTION.**
SYSTEM SHOP DRAWINGS SHALL BE SUBMITTED TO THE STATE FIRE MARSHAL FOR APPROVAL PRIOR TO INSTALLATION.
- FIRE DETECTION AND ALARM SYSTEM (NFPA 72): MODIFICATION OF EXISTING FIRE ALARM SYSTEM IN THE CONFERENCE CENTER AND LIBRARY PER THE NEW CONFIGURATION. IT SHALL NOT BE USED FOR CONSTRUCTION.**
SYSTEM SHOP DRAWINGS SHALL BE SUBMITTED TO THE STATE FIRE MARSHAL FOR APPROVAL PRIOR TO INSTALLATION.

CONSTRUCTION PHASING

- THE CONSTRUCTION PHASING SHALL BE AS FOLLOWS AND AS SHOWN ON THE DEMOLITION, FLOOR AND CEILING PLANS ACCORDINGLY AND IN THE PROJECT MANUAL. ALL DEMO AND NEW GALLERY WORK MUST BE PHASED BELOW CONCURRENT WITH PHASE 1 (OVERALL PROJECT). THE SECURITY UPGRADE SCOPE PER SEPARATE DSA A# 03-121173 SHALL ALSO ALIGN WITH THESE PHASES.
- PHASE 1 OVERALL PROJECT**
(CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
- A. EXTERIOR AND ROOF TOP WORK CAN OCCUR OUTSIDE OF THE GALLERY PHASES BELOW PENDING IT DOES NOT INTERFERE WITH GALLERY INTERIORS DURING MUSEUM HOURS
- PHASE 2 THEATER GALLERY, GALLERY 2 - 10/01/2022 - 01/09/2023**
(CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
- PHASE 3 GALLERY 3 - 10/17/2022 - 01/09/2023**
(CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
- PHASE 4 GALLERY OF DISCOVERY & GALLERY 1 - 11/15/2022 - 02/08/2023**
(CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

SHEET INDEX

1.0 General		
G0000	COVER SHEET	
G1000	GENERAL NOTES & SYMBOLS	
G1100	BUILDING ANALYSIS	
3.0 Architectural		
A1001	SITE PLAN	
A2000	OVERALL DEMOLITION FLOOR PLAN	
A2001	PARTIAL DEMOLITION FLOOR PLAN - CONFERENCE CENTER, LIBRARY & STORAGE	
A2002	PARTIAL DEMOLITION CEILING PLAN	
A2003	ROOF DEMOLITION PLAN	
A2100	OVERALL FLOOR PLAN	
A2101	PARTIAL FLOOR PLAN - CONFERENCE CENTER & LIBRARY	
A2102	PARTIAL FLOOR PLAN & ELEVATIONS - STORAGE ROOMS	
A2103	PARTIAL FURNITURE PLAN - CONFERENCE CENTER & LIBRARY	
A2700	REFLECTED CEILING PLAN	
A2701	PARTIAL REFLECTED CEILING PLAN - CONFERENCE CENTER & LIBRARY	
A2800	ROOF PLAN	
A6000	INTERIOR ELEVATIONS	
A6001	INTERIOR ELEVATIONS	
A7400	DETAILS - CASEWORK	
A8100	DETAILS	
A8200	FRAMING DETAILS	
A8300	DETAILS - CEILING	
A8301	DETAILS - CEILING	
A8400	DETAILS - ROOF	
A8401	DETAILS - ROOF	
A8600	DETAILS - OPENINGS & STOREFRONT	
A9000	SCHEDULES	
4.0 Structural		
S0000	COVER SHEET AND SHEET LIST	
S0001	GENERAL NOTES	
S0002	ABBREVIATIONS AND REFERENCE SYMBOLS	
S1001	TYPICAL DETAILS	
S2200	OVERALL ROOF PLAN	
S3101	SECTIONS AND DETAILS	
5.0 - Plumbing		
P0001	LEGEND, GENERAL NOTES AND SHEET INDEX	
P0002	SCHEDULES	
P1000	ENLARGED DEMOLITION FLOOR PLAN	
P1100	ENLARGED NEW FLOOR PLAN	
7.0 Electrical		
E0001	ELECTRICAL SYMBOLS, NOTES, AND FIXTURE SCHEDULE	
E0002	TITLE 24 FORMS	
E0003	TITLE 24 FORMS	
E0004	SINGLE LINE DIAGRAM & PANEL SCHEDULE	
E1001	ENLARGED DEMOLITION FLOOR PLAN	
E1101	ELECTRICAL PLAN	
E1201	LIGHTING PLAN	
E1301	FIRE ALARM PLAN	
8.0 - Fire Protection		
FP0101	LEGENDS, NOTES & SHEET INDEX	
FP1000	ENLARGED DEMOLITION FLOOR PLAN	
FP1100	ENLARGED NEW FLOOR PLAN	
9.0 Plumbing - HVAC UPGRADE		
PH0000	PLUMBING LEGEND, ABBREVIATIONS, AND GENERAL NOTES	
PH0001	PLUMBING GENERAL, EQUIPMENT SCHEDULE	
PH2004	PLUMBING - ROOF DEMOLITION PLAN	
PH2100	PLUMBING - OVERALL FLOOR PLAN	
PH2800	PLUMBING - ROOF PLAN	
PH6000	PLUMBING - PLUMBING DETAILS	
PH6001	PLUMBING - PLUMBING DETAILS	
10.0 Mechanical HVAC UPGRADE		
MH0000	MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES	
MH0100	HVAC EQUIPMENT SCHEDULE	
MH0101	HVAC EQUIPMENT SCHEDULE	
MH2000	HVAC - OVERALL DEMOLITION FLOOR PLAN	
MH2001	HVAC - PARTIAL DEMOLITION FLOOR PLAN	
MH2004	HVAC - ROOF DEMOLITION PLAN	
MH2100	HVAC - OVERALL FLOOR PLAN	
MH2101	HVAC - PARTIAL FLOOR PLAN	
MH2800	HVAC - ROOF PLAN	
MH6000	HVAC - MECHANICAL DETAILS	
MH6001	HVAC - MECHANICAL DETAILS	
MH7000	HVAC - MECHANICAL CONTROLS	
MH7001	HVAC - MECHANICAL CONTROLS	
MH8000	MECHANICAL T24 COMPLIANCE FORMS	
MH8001	MECHANICAL T24 COMPLIANCE FORMS	
MH8002	MECHANICAL T24 COMPLIANCE FORMS	
MH8003	MECHANICAL T24 COMPLIANCE FORMS	
11.0 Electrical - HVAC UPGRADE		
EH0001	ELECTRICAL GENERAL NOTES AND ABBREVIATIONS	
EH2004	ELECTRICAL - ROOF DEMOLITION PLAN	
EH2100	ELECTRICAL - OVERALL FLOOR PLAN	
EH2800	ELECTRICAL - ROOF PLAN	
EH5000	ELECTRICAL - SINGLE LINE DIAGRAM	
12.00 - Audio Visual		
AV0000	AUDIO VISUAL GENERAL NOTES AND SCHEDULES	
AV0001	AUDIO VISUAL GENERAL NOTES AND SCHEDULES	
AV0002	AUDIO VISUAL GENERAL NOTES AND SCHEDULES	
AV1000	AUDIO VISUAL CONDUIT RISER	
AV2000	AUDIO VISUAL ENTRY DEMOLITION FLOOR PLAN	
AV2100	AUDIO VISUAL ENTRY FLOOR PLAN	
AV2101	AUDIO VISUAL CONFERENCE CENTER FLOOR PLAN	
AV3000	AUDIO VISUAL PANEL DETAILS	
AV4000	AUDIO VISUAL ENTRY EQUIPMENT RACK EXPANDED PLAN	
AV4001	AUDIO VISUAL ENTRY EQUIPMENT RACK ELEVATION	
AV4010	AUDIO VISUAL CONFERENCE CENTER EQUIPMENT RACK EXPANDED PLAN	
AV4011	AUDIO VISUAL CONFERENCE CENTER EQUIPMENT RACK ELEVATION	
AV5000	AUDIO VISUAL MOUNTING DETAILS	
AV5001	AUDIO VISUAL MOUNTING DETAILS	
AV6000	ENTRY AUDIO VISUAL DEMOLITION SINGLE LINE DIAGRAM	
AV6001	ENTRY AUDIO VISUAL INSTALLATION SINGLE LINE DIAGRAM	
AV6010	AUDIO VISUAL CONFERENCE CENTER SINGLE LINE DIAGRAM	
Grand total: 93		

PROJECT TEAM

OWNER:
California African American Museum
600 State Drive
Los Angeles, CA 90037

CLIENT:
Department of General Services
707 3rd Street
West Sacramento, CA 95605

Dianna Brown
Project Director
dianna.brown@dgs.ca.gov

ARCHITECTURAL:
IBI GROUP
315 West 9th Street
Los Angeles, CA 90015

Craig Atkinson
Principal
craig.atkinson@ibigroup.com

Angela Ball
Project Manager
angela.ball@ibigroup.com

STRUCTURAL:
Saiful Bouquet
155 N. Lake Ave., 6th Floor
Pasadena, CA 91101

Ron Lee
Principal
rlee@saifulbouquet.com

PLUMBING:
Maroko & Shwe
1106-B West Magnolia Blvd.
Burbank, CA 91506

James Shwe
Principal
jshwe@marokoshwe.com

ELECTRICAL:
Pacific Engineer Group
2740 W Magnolia Blvd
Burbank CA, 91505

Jimmy Fong
Principal
jimmyfong@pacifceng.net

MECHANICAL, ELECTRICAL, PLUMBING (HVAC UPGRADE ONLY):
Integral Group
15760 Ventura Blvd #1902
Encino, CA 91436

John Gautrey
Principal
jgautrey@integralgroup.com

AUDIO VISUAL:
Media System Design Group
4253 Stewart Avenue
Los Angeles, California 90066

Tim Hart
Principal
thart@msd-group.com

2000-DEMOLITION NOTES

1. ALL DEMOLITION ITEMS AND MATERIALS INDICATED TO BE REMOVED ARE TO BE DISPOSED OF OFF SITE IN A LEGAL MANNER, UNLESS INDICATED TO BE SALVAGED OR REINSTALLED.
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14. REMOVE AND REPLACE ANY DETERIORATING WOOD NAILERS, OR MISCELLANEOUS FRAMING.
15. NOTIFY THE ARCHITECT IMMEDIATELY IF EXISTING MOISTURE CONDITIONS AND ROT AT THE ROOF DECK AND OR THE STRUCTURAL ELEMENTS ARE FOUND.
16. PORTION OF EXISTING LIGHT WEIGHT CONCRETE SUBSTRATE CAN BE REMOVED TO ACCOMMODATE HVAC EQUIPMENT AND OR PLATFORMS. VERIFY WITH THE STRUCTURAL DRAWINGS THE MAXIMUM ALLOWED EXTENT OF DECK REMOVAL AND REINFORCING REQUIREMENTS.
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KEYNOTES

2065 (E) METAL SHELVING, EQUIPMENT AND/OR LOOSE ITEMS TO BE REMOVED BY OWNER PRIOR TO CONSTRUCTION

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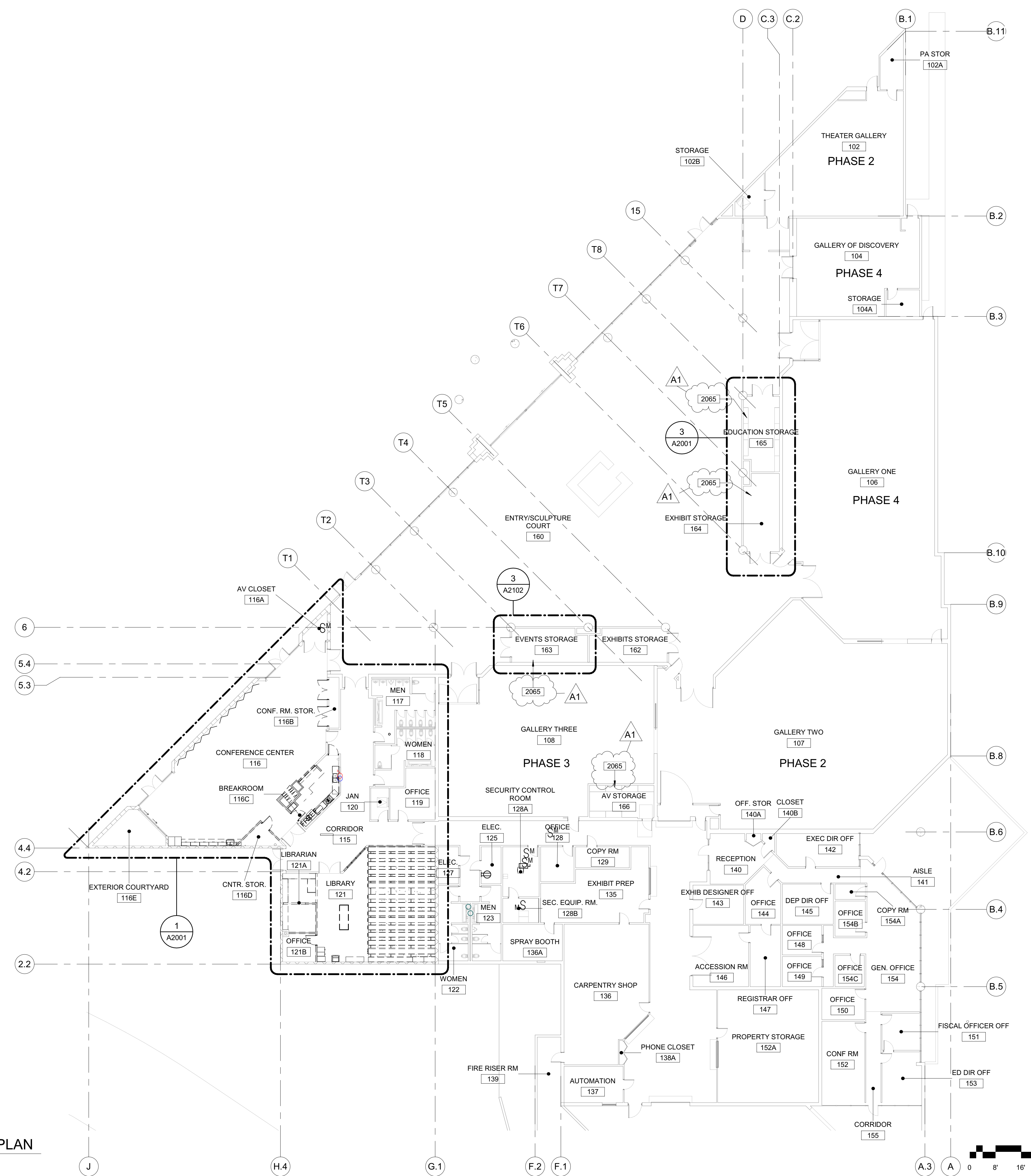
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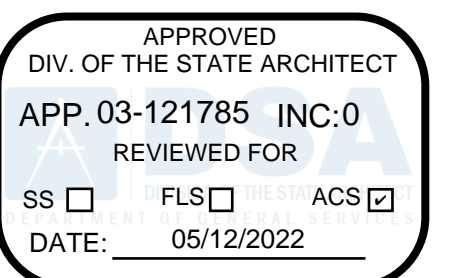
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1 OVERALL DEMO FLOOR PLAN
SCALE: 1/16" = 1'-0"



CLIENT
State of California
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DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
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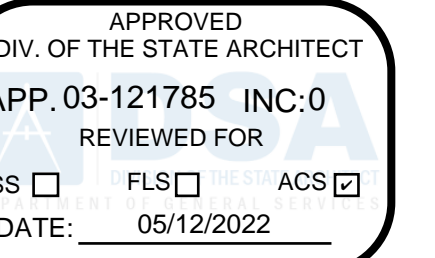


SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD			2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DSAS/OSFM SUBMITTAL			2021-09-14
A1	ADDENDUM #1			2022-05-02

SHEET TITLE
**OVERALL DEMOLITION
FLOOR PLAN**

DATE:	2022-05-02
DRAWN BY:	RR
CHKD BY:	AB
SCALE:	As indicated
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	A2000
ISSUE	A1



Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

CLIENT
State of California
 Dept. of General Services

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H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PARTIAL DEMOLITION
 FLOOR PLAN -
 CONFERENCE CENTER,
 LIBRARY & STORAGE**

DATE: 2022-05-02
 DRAWN BY: RR
 CHKD BY: AB
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
A2001
 ISSUE
A1

LEGEND

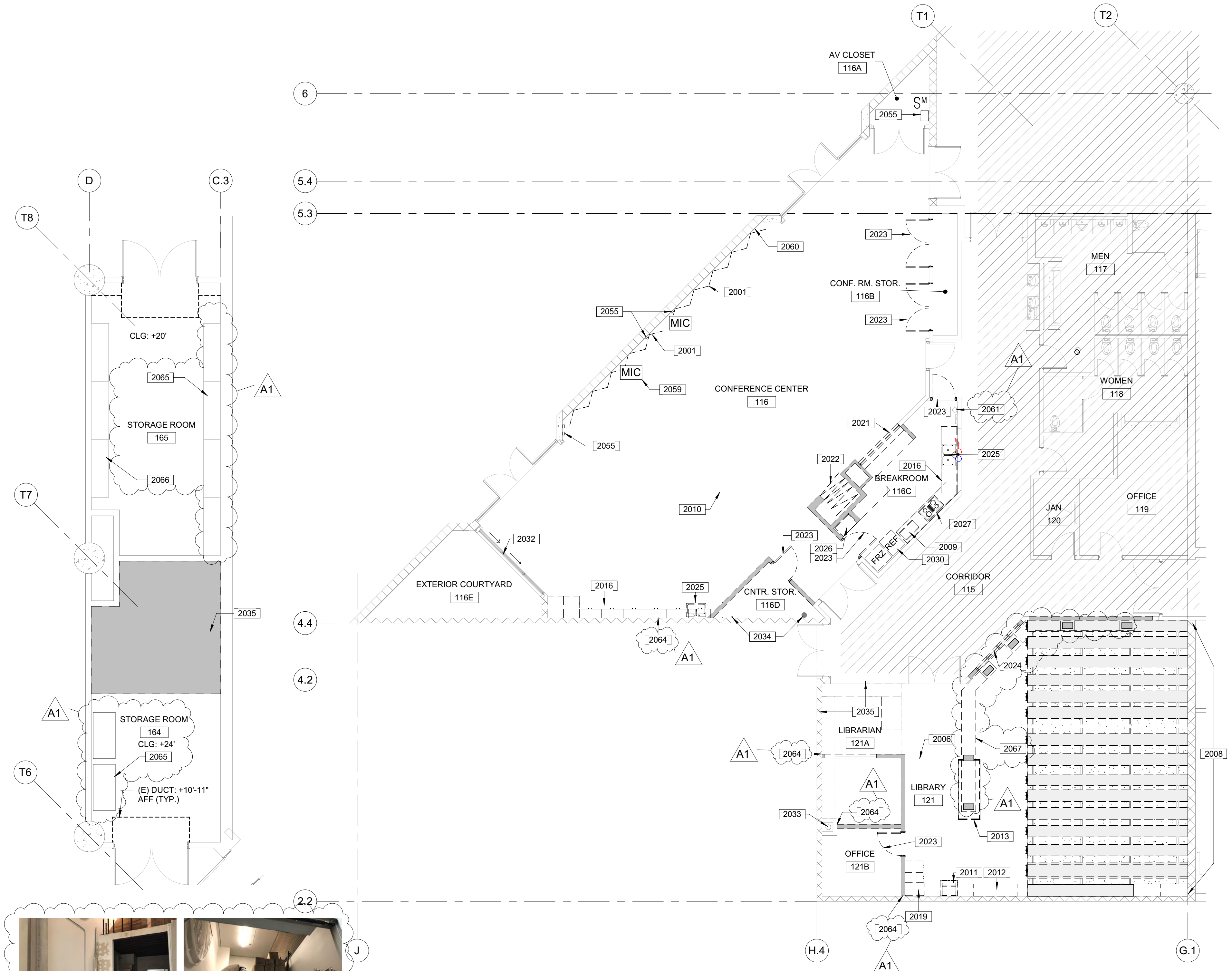
- NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.
- (E) MASONRY WALL
 - (E) WALL TO REMAIN
 - (E) CONCRETE COLUMN TO REMAIN
 - REMOVE (E) WALL OR PORTION OF WALL IN ITS ENTIRETY
 - REMOVE (E) DOOR & FRAME IN ITS ENTIRETY
 - REMOVE (E) WINDOW & FRAME IN ITS ENTIRETY
 - REMOVE (E) CONSTRUCTION, REFER TO KEYNOTES FOR ADDITIONAL INFORMATION
 - (E) OVERHEAD ITEMS TO REMAIN
 - AREA SHOWN HATCHED NOT IN SCOPE OF WORK
 - ELECTRICAL FLOOR RECEPTACLE. SEE SHEET E1101 AND DETAIL 1/S1001

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KEYNOTES

- 2001 REMOVE CURTAINS AND OVERHEAD RAILS
- 2006 REMOVE CARPET THROUGHOUT
- 2008 REMOVE (E) SHELVING, TRACK, AND PLATFORM IN ITS ENTIRETY
- 2009 REMOVE COUNTERTOP MICROWAVE AND STORE FOR RE-INSTALL
- 2010 REMOVE FLOOR FINISH
- 2011 REMOVE AND STORE PRINTER SCANNER FOR REINSTALL
- 2012 REMOVE AND STORE CARD CATALOGUE
- 2013 REMOVE (E) WOOD TABLE AND SALVAGE TO CLIENT
- 2016 REMOVE CASEWORK
- 2019 PROTECT AND STORE MICROFICHE MACHINE FOR REINSTALL
- 2021 REMOVE (E) ROLL-UP DOOR
- 2022 REMOVE FOLDING PARTITION AND TRACK
- 2023 REMOVE DOOR. REFER TO DOOR SCHEDULE FOR FRAME CONDITION
- 2024 REMOVE WINDOW
- 2025 REMOVE PLUMBING FIXTURE. CAP DISCARDED PIPING BEHIND WALL, PATCH AND REPAIR WALL SURFACE TO MATCH ADJACENT FINISH. REFER TO PLUMBING DRAWINGS.
- 2026 REMOVE MICROWAVE/OVEN AND STORE FOR RE-INSTALL
- 2027 REMOVE GAS RANGE AND HOOD. SALVAGE TO OWNER, CAP UTILITY BEHIND WALL, RESURFACE CEILING PENETRATION TO MATCH ADJACENT FINISH
- 2030 REMOVE REFRIGERATOR AND FREEZER AND STORE FOR RE-INSTALL
- 2032 SLIDING DOOR AND STOREFRONT WINDOW TO REMAIN
- 2033 (E) CONCEALED DOWNSPOUT TO REMAIN
- 2034 (E) UTILITY PIPING TO REMAIN
- 2035 REMOVE (E) WOOD MEZZANINE PLATFORM & WALL STRUCTURE
- 2055 (E) AV EQUIPMENT RACK, REFER TO AV PLANS SCOPE OF WORK.
- 2059 REMOVE (E) SURFACE MOUNT MICROPHONE INPUT PANEL, TYPICAL
- 2060 REMOVE (E) OCCUPANCY AND ASSIST. LISTENING DEVICE SIGNAGE
- 2061 REMOVE AND STORE (E) FIRE EXTINGUISHER TO BE REINSTALLED
- 2064 PATCH AND CLEAN (E) CMU/GWB WALL AFTER GWB WALL REMOVAL
- 2065 (E) METAL SHELVING, EQUIPMENT AND/OR LOOSE ITEMS TO BE REMOVED BY OWNER PRIOR TO CONSTRUCTION
- 2066 (E) METAL SHELVING TO REMAIN, OWNER TO REMOVE PRIOR TO CONSTRUCTION AND REINSTALL AFTER NEW SHELVING IS INSTALLED
- 2067 SAWCUT AND FILL (E) SLAB AS NECESSARY PER DETAIL 1/S1001 FOR PLACEMENT OF NEW FLOOR OUTLETS PER ELECTRICAL SHEET E1101.



(E) WOOD FRAMED MEZZANINE STRUCTURE W/GYPSUM BOARD FINISH TO BE REMOVED IN STORAGE ROOM 164 PER KEYNOTE 2035

3 STOR. ROOMS 164 DEMOLITION PLAN
 SCALE: 3/16" = 1'-0"

1 PARTIAL DEMOLITION FLOOR PLAN
 SCALE: 1/8" = 1'-0"



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1. ALL DEMOLITION ITEMS AND MATERIALS INDICATED TO BE REMOVED ARE TO BE DISPOSED OF OFF SITE IN A LEGAL MANNER, UNLESS INDICATED TO BE SALVAGED OR REINSTALLED.
2. CONTRACTOR SHALL PROTECT PORTIONS OF EXISTING CONSTRUCTION NOT INDICATED TO BE DEMOLISHED. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT AND REPAIR OF ITEMS TO REMAIN.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR DEMOLITION OF MECHANICAL, ELECTRICAL, AND PLUMBING ITEMS.
4. REFER TO FLOOR PLANS FOR PATCHING AND REINSTALLATION OF EXISTING CONSTRUCTION.
5. PARTIAL DEMOLITION SHALL INCLUDE TRIMMING AND CAPPING SYSTEMS THAT ARE TO REMAIN OPERABLE.
6. DEMOLITION PLAN IS DIAGRAMMATIC. CONTRACTOR SHALL REMOVE EXTENT REQUIRED FOR THE INSTALLATION OF WORK INDICATED IN THIS CONTRACT.
7. NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING DEMOLITION WORK HAVE BEEN APPROVED BY DSA AND OSFM.
8. CONTRACTOR SHALL PROVIDE CONSTRUCTION SUPPORT, SHORING AND BRACING AS REQUIRED TO INSURE WORKER'S SAFETY AND INTEGRITY OF EXISTING CONDITIONS.
9. ALL ELECTRICAL CONDUITS TO REMAIN U.O.N. REFER TO ELECTRICAL DRAWINGS.
10. EVERYTHING IS EXISTING TO REMAIN UNLESS OTHERWISE NOTED
11. GENERAL CONTRACTOR SHALL FAMILIARIZE WITH THE EXISTING ROOF PENETRATIONS AND THE FLASHING REQUIREMENTS PRIOR TO PROCEEDING WITH THE INSTALLATION OF THE NEW ROOF. ALL SHOWN ROOF PENETRATIONS AND DRAINAGE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED
12. REMOVE EXISTING MODIFIED BITUMEN ROOF, MEMBRANE BARRIER AND FLASHING, DOWN TO THE LIGHT WEIGHT CONCRETE DECK IN THEIR ENTIRETY.
13. REMOVE SHEET METAL FLASHING INCLUDING COUNTERFLASHING, COPING METALS, SCUPPERS AND HVAC CURB PANS.
14. REMOVE AND REPLACE ANY DETERIORATING WOOD NAILERS, OR MISCELLANEOUS FRAMING.
15. NOTIFY THE ARCHITECT IMMEDIATELY IF EXISTING MOISTURE CONDITIONS AND ROT AT THE ROOF DECK AND OR THE STRUCTURAL ELEMENTS ARE FOUND.
16. PORTION OF EXISTING LIGHT WEIGHT CONCRETE SUBSTRATE CAN BE REMOVED TO ACCOMMODATE HVAC EQUIPMENT AND OR PLATFORMS, VERIFY WITH THE STRUCTURAL DRAWINGS THE MAXIMUM ALLOWED EXTENT OF DECK REMOVAL, AND REINFORCING REQUIREMENTS.
17. EXISTING CAST IRON CLAMPING, RING DRAINS AND DRAIN LINES, ARE TO BE REUSED, VERIFY DRAIN LINES ARE CONNECTED, FREE FLOWING, AND IN WATER TIGHT CONDITIONS, REPLACE ANY MISSING OR DAMAGED COUPLING RINGS, BASKETS OR BOLTS.
18. ALL EXISTING AV EQUIPMENT SHOULD BE REMOVED INCLUDING THE WIRING AND SURFACE MOUNTED RACEWAYS.

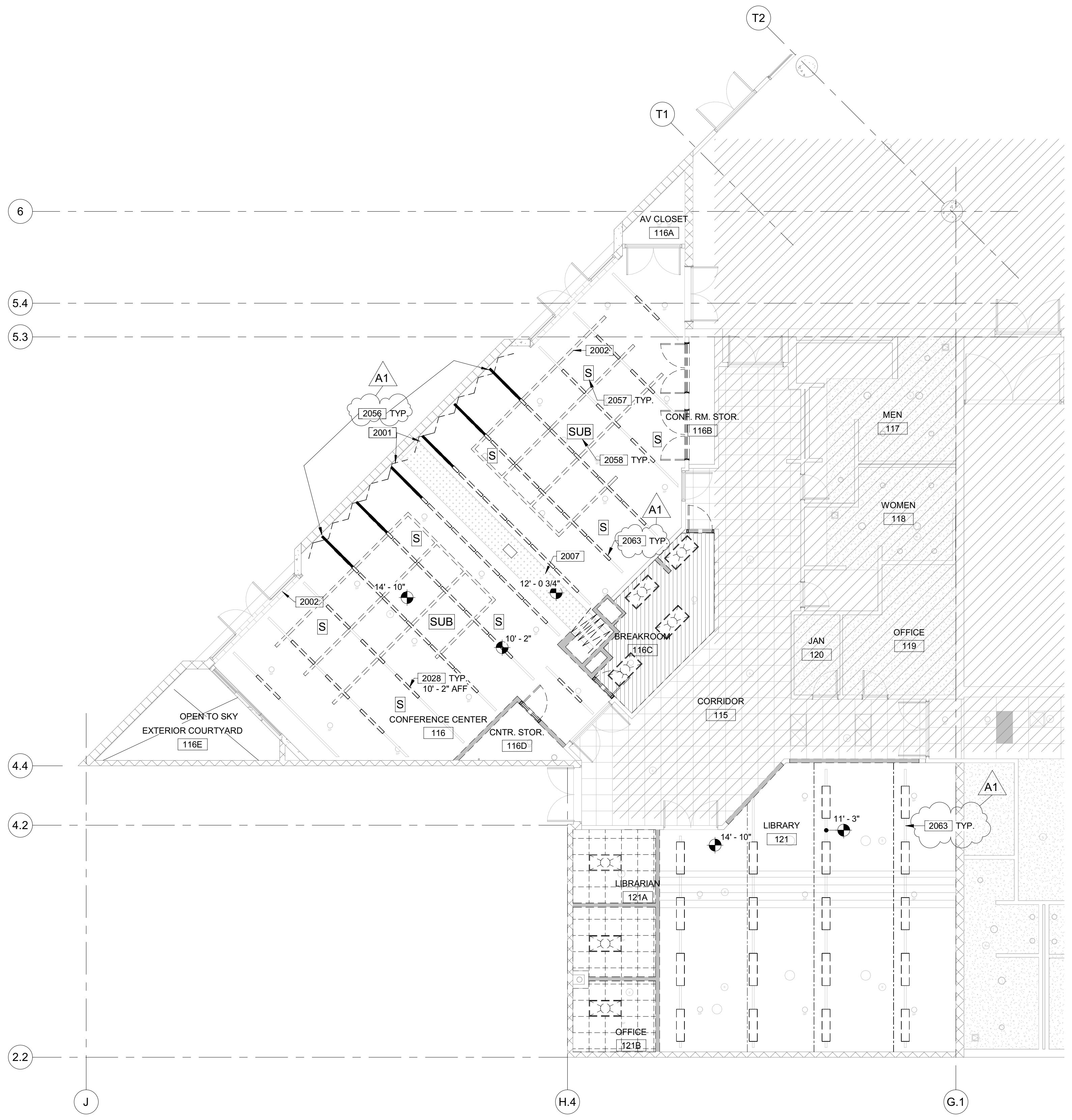
KEYNOTES

- 2001 REMOVE CURTAINS AND OVERHEAD RAILS
- 2002 REMOVE TRACK AND LIGHTING
- 2007 (E) SOFFIT TO BE MODIFIED
- 2028 REMOVE LIGHTING, UNISTRUT SUSPENSION SYSTEM TO REMAIN
- 2056 CUT BACK 4' OF (E) UNISTRUT AND REINSTALL VERTICAL SUPPORT TO STRUCTURE ABOVE
- 2057 REMOVE (E) CEILING MOUNTED LOUD-SPEAKER, TYPICAL
- 2058 REMOVE (E) CEILING MOUNTED SUBWOOFER, TYPICAL
- 2063 (E) UNISTRUT TO REMAIN

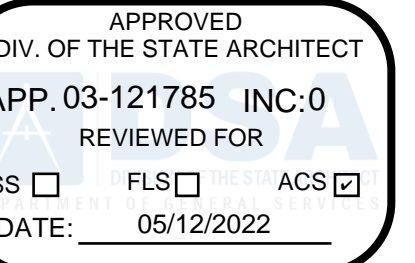
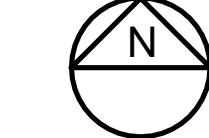
LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- (E) MASONRY WALL
- (E) WALL TO REMAIN
- DEMO (E) WALL
- (E) CONCRETE COLUMN TO REMAIN
- (E) EXPOSED CEILING TO REMAIN
- (E) GYP. BOARD CEILING/SOFFIT TO REMAIN
- DEMO GYP. BOARD CEILING/SOFFIT
- DEMO 24" X 24" SUSPENDED ACOUSTICAL CEILING
- DEMO (E) LIGHT FIXTURES - SEE ELEC. DWGS. FOR MORE INFO
- AREA NOT IN CONTRACT



1 PARTIAL DEMOLITION CEILING PLAN
SCALE: 1/8" = 1'-0"



CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD	- SCOPE REVISION		2019-12-13
F	50% CD	- SCOPE REVISION		2020-11-25
G	100% CD			2021-02-08
H	100% CD	- SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM	SUBMITTAL		2021-09-14
V2	DSA/OSFM	BACKCHECK		2022-03-11
A1		ADDENDUM #1		2022-05-02

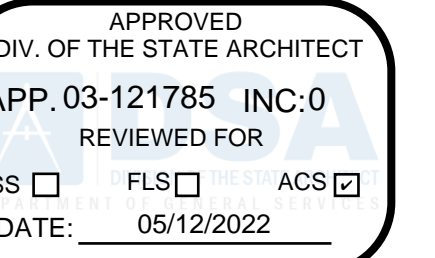
SHEET TITLE
**PARTIAL DEMOLITION
CEILING PLAN**

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
A2002
ISSUE
A1

2100-GENERAL NOTES

1. REFER TO DEMOLITION PLAN, A2000 FOR EXISTING CONSTRUCTION TO BE REMOVED.
2. REFER TO SHEET A9000 FOR FINISH SCHEDULE.
3. REFER TO INTERIOR ELEVATION FOR ALL WALL MOUNTED ITEMS AND CABINET TYPES.
4. ALL EXISTING DIMENSIONS ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY. GENERAL CONTRACTOR SHALL VERIFY ACCURACY OF EXISTING DIMENSIONS IN THE FIELD PRIOR TO BIDDING AND COMMENCING OF WORK.
5. ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS PRIOR TO COMMENCING OF WORK.



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 ibigroup.com

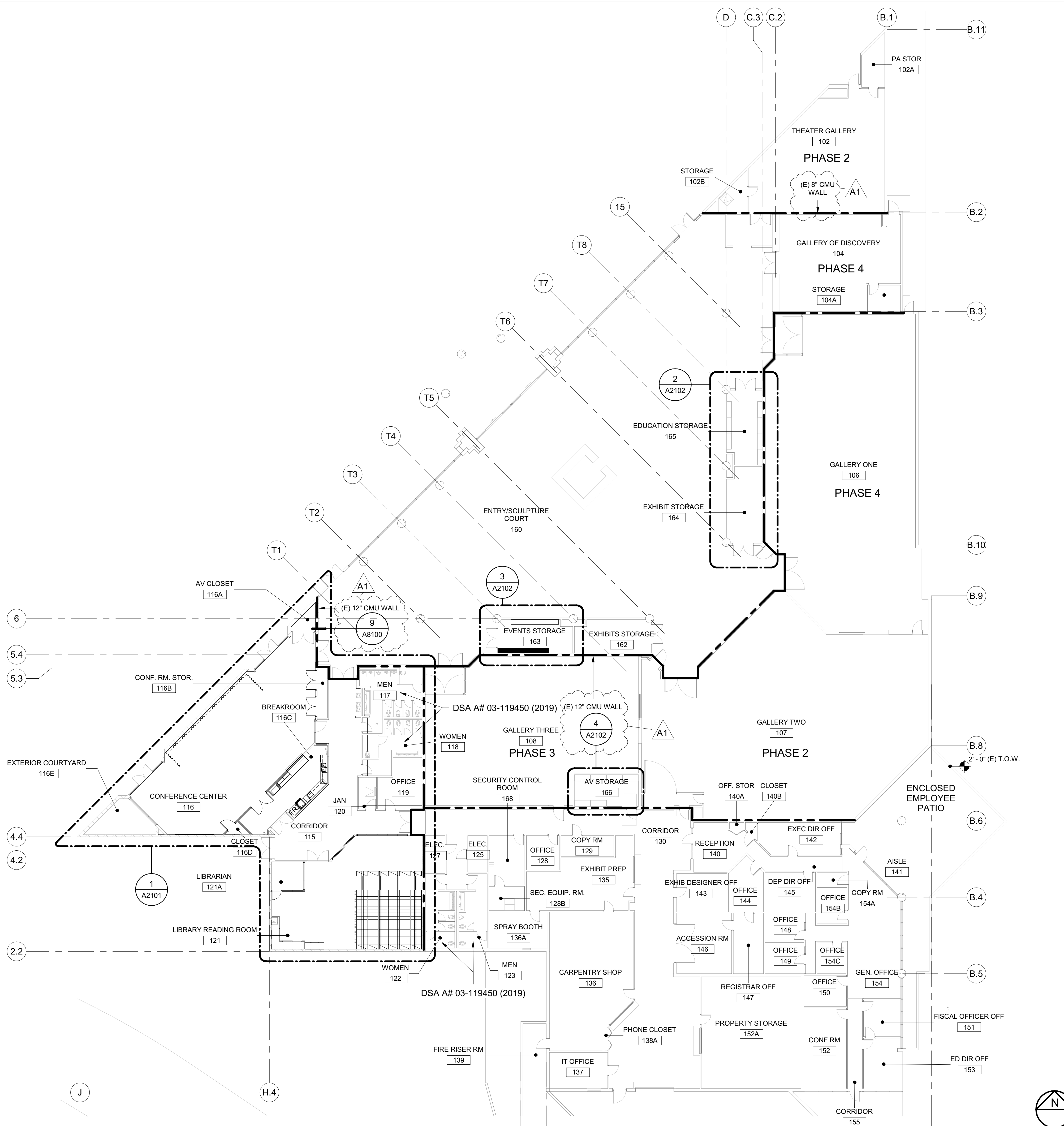


SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD			2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DS/O/S/FM SUBMITTAL			2021-09-14
V2	DS/O/S/FM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

SHEET TITLE
OVERALL FLOOR PLAN

DATE:	2022-05-02
DRAWN BY:	RR
CHK'D BY:	AB
SCALE:	As indicated
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	A2100
ISSUE NUMBER	A1



LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

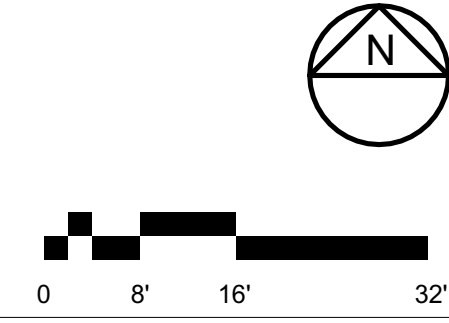
- (E) MASONRY WALL
- (N) STOREFRONT SYSTEM PER DETAILS 1, 2, 3 & 4/A8600
- (E) WALL
- (N) WALL TYPE 'A' PER DETAIL 4/A8200
- CARPET
- AREA NOT IN CONTRACT
- (E) CONCRETE COLUMN TO REMAIN
- 60" DIA. ACCESSIBLE FLOOR SPACE LOCATION
- ACCESSIBLE FLOOR SPACE LOCATION @ DOOR
- PHASE #**
PHASING INDICATED FOR GALLERY WORK ONLY PER CONSTRUCTION PHASING NOTE BELOW.
- OL OCCUPANT LOAD SIGN - SEE 8 / A8100
- ALD ASSISTIVE LISTENING SIGNAGE - SEE 7 / A8100
- (E) 4 HOUR RATED WALL
- (E) 2 HOUR RATED WALL

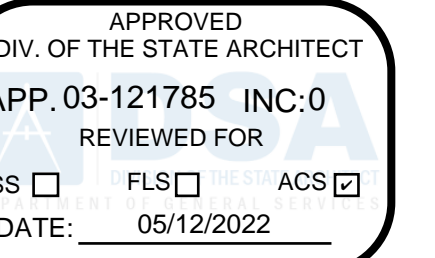
CONSTRUCTION PHASING

THE CONSTRUCTION PHASING SHALL BE AS FOLLOWS AND AS SHOWN ON THE DEMOLITION, FLOOR AND CEILING PLANS ACCORDINGLY AND IN THE PROJECT MANUAL. ALL DEMO AND NEW GALLERY WORK MUST BE PHASED BELOW CONCURRENT WITH PHASE 1 (OVERALL PROJECT). THE SECURITY UPGRADE SCOPE PER SEPARATE DSA A# 03-121173 SHALL ALSO ALIGN WITH THESE PHASES.

- PHASE 1 OVERALL PROJECT
 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
 A. EXTERIOR AND ROOF TOP WORK CAN OCCUR OUTSIDE OF THE GALLERY PHASES BELOW PENDING IT DOES NOT INTERFERE WITH GALLERY INTERIORS DURING MUSEUM HOURS
- PHASE 2 THEATER GALLERY, GALLERY 2 - 10/01/2022 - 01/09/2023
 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
- PHASE 3 GALLERY 3 - 10/17/2022 - 01/09/2023
 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)
- PHASE 4 GALLERY OF DISCOVERY & GALLERY 1 - 11/15/2022 - 02/08/2023
 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

1 OVERALL FLOOR PLAN
 SCALE: 1/16" = 1'-0"





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APPROVED FIRE AND PANIC ONLY



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SUB CONSULTANT

NO.	ISSUANCE	STATUS	DATE
D	SCHEMATIC DESIGN		2019-10-11
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PARTIAL FLOOR PLAN -
CONFERENCE CENTER &
LIBRARY**

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
A2101
ISSUE
A1

FINISH LEGEND

REFER TO SPECIFICATION SECTION 09 06 00 COLORS AND FINISHES

CARPET
C-1
MANUFACTURER: MASLAND CONTRACTOR
TYPE: TILE
STYLE: T516 DIMINISHING GRID
COLOR: 51503 GRATING
LOCATION: LIBRARY AND LIBRARIAN (50%)

C-2
MANUFACTURER: MASLAND CONTRACTOR
TYPE: TILE
STYLE: T516 DIMINISHING GRID
COLOR: 51503 GRATING
LOCATION: LIBRARY AND LIBRARIAN (50%)

RESILIENT BASE
RB-1
MANUFACTURER: BURKE
PRODUCT: RUBBER WALL BASE
COLOR: 204 GRAY
LOCATION: LIBRARY, LIBRARIAN

RB-2
MANUFACTURER: BURKE
PRODUCT: RUBBER WALL BASE
COLOR: 523 BLACKBROWN
LOCATION: CONFERENCE CENTER, BREAKROOM
AND ASSOCIATED STORAGE SPACES

RESILIENT FLOORING
BS-1
MANUFACTURER: WINEO
PRODUCT: BIOPLASTIC SHEET FLOORING
COLOR: 1500 FUSION COOL
LOCATION: CONFERENCE CENTER & BREAKROOM

CERAMIC TILE
CT-1
MANUFACTURER: FIRECLAY TILE
STYLE: TRIANGLE
COLOR: CARIBBEAN
SIZE: 3"
LOCATIONS: BREAKROOM

WOOD CABINETS
PL-1
MANUFACTURER:
STYLE: PLASTIC LAMINATE
COLOR: WILSONART ALABASTER D431-60 MATTE
LOCATIONS: BREAKROOM

PL-2
MANUFACTURER:
STYLE: PLASTIC LAMINATE
COLOR: NEVAMAR VISABLE VAVA VA 2001T
LOCATIONS: BREAKROOM

PL-3
MANUFACTURER:
STYLE: PLASTIC LAMINATE
COLOR: NEVAMAR LN6001 FRAPPE
LOCATIONS: LIBRARY

SS-1
MANUFACTURER: CORIAN
STYLE: SOLID SURFACE
COLOR: RICE PAPER
LOCATIONS: BREAKROOM

DECORATIVE ACOUSTICAL WALL PANELS
AP-1
MANUFACTURER: PLYBOO
STYLE: FUTURA SOUND
COLOR: BITTERWOOD 1
LOCATION: CONFERENCE CENTER

AP-3
MANUFACTURER: PLYBOO
STYLE: FUTURA SOUND
COLOR: BITTERWOOD 3
LOCATION: CONFERENCE CENTER

AP-6
MANUFACTURER: PLYBOO
STYLE: FUTURA SOUND
COLOR: BITTERWOOD 6
LOCATION: CONFERENCE CENTER

PAINTING
IP-1
MANUFACTURER: DUNN EDWARDS
COLOR: WHITE DEW380
LOCATION: FIELD

IP-2
MANUFACTURER: DUNN EDWARDS
COLOR: SILVER SPOON DE6366
LOCATION: EXPOSED CEILING STRUCTURE,
DUCTS, ETC. IN CONFERENCE CENTER & LIBRARY

IP-3
MANUFACTURER: DUNN EDWARDS
COLOR: MATCH (E) COLOR
LOCATION: DOORS & FRAMES

STAGE CURTAINS
SC-1
MANUFACTURER: DESIGNTEX
STYLE: KABUTO
FABRIC COLOR: 4120-804
LOCATION: CONFERENCE CENTER

ROLLER SHADES
RS-1
MANUFACTURER: MECHOSHAD
STYLE: SOHO 1600 SERIES (3% OPEN)
COLOR: 1618 BLACK BROWN
LOCATION: CONFERENCE CENTER

2100-GENERAL NOTES

- REFER TO DEMOLITION PLAN, A2000 FOR EXISTING CONSTRUCTION TO BE REMOVED.
- REFER TO SHEET A9000 FOR FINISH SCHEDULE.
- REFER TO INTERIOR ELEVATION FOR ALL WALL MOUNTED ITEMS AND CABINET TYPES.
- ALL EXISTING DIMENSIONS ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY. GENERAL CONTRACTOR SHALL VERIFY ACCURACY OF EXISTING DIMENSIONS IN THE FIELD PRIOR TO BIDDING AND COMMENCING OF WORK
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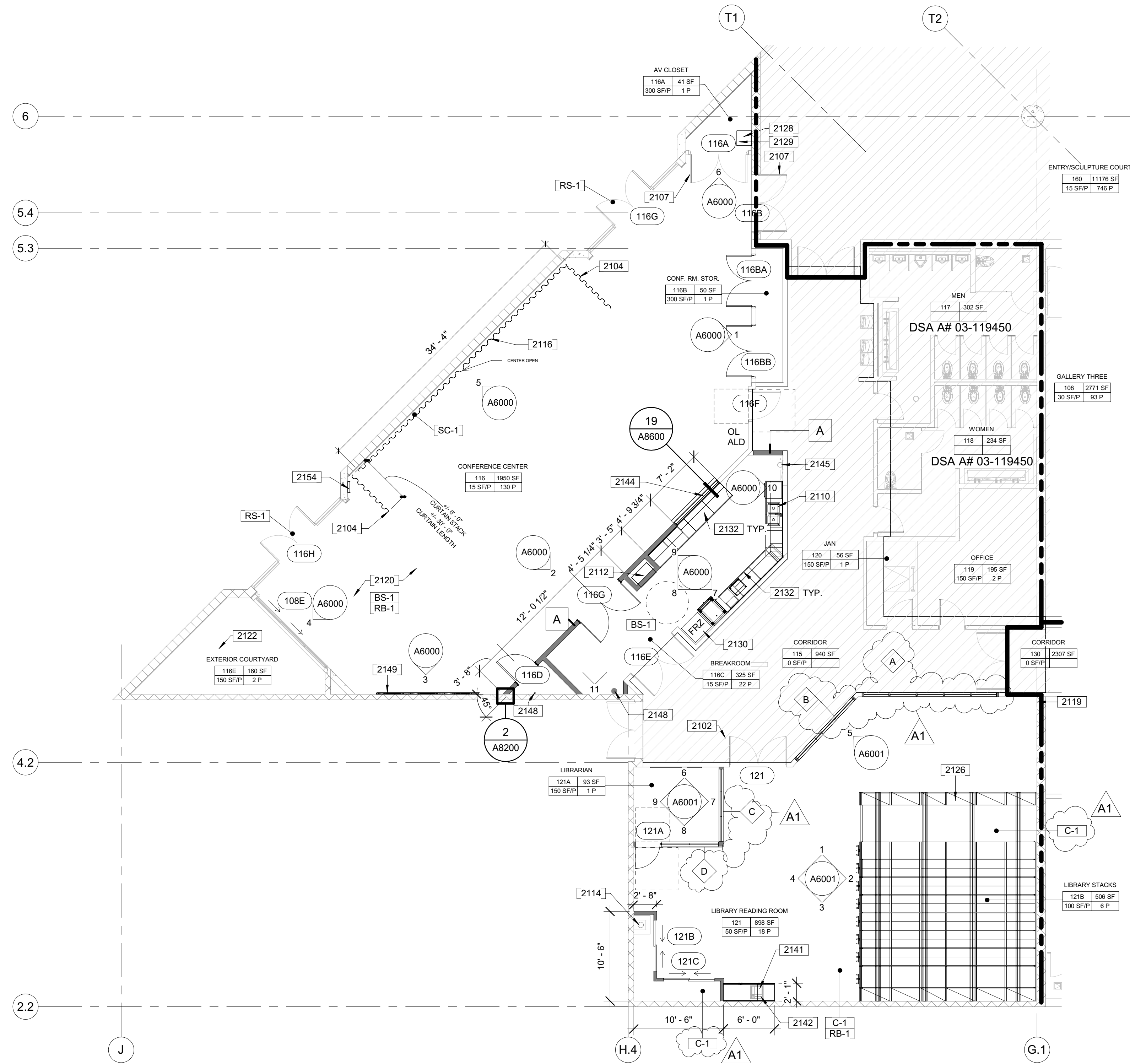
KEYNOTES

- 2102 (E) GLASS INTERIOR DOOR TO REMAIN
- 2104 MOTORIZED CURTAIN SYSTEM
- 2107 REPAINT DOORS
- 2110 ADA SINK. REFER TO PLUMBING DRAWINGS. SEE 4/A7400
- 2112 REINSTALL (E) ELECTRIC MICROWAVE/OVEN
- 2114 (E) CONCEALED DOWNSPOUT
- 2116 FIXED CURTAIN SYSTEM
- 2119 ADDITIONAL ELECTRICAL AND DATA FLOOR FINISH THROUGHOUT
- 2120 POWER WASH (E) CONCRETE FLOOR
- 2126 NEW MOBILE BOOK SHELVING AND PLATFORM (FOI). GC TO COORDINATE INSTALL OF CARPET OVER NEW PLATFORM WITH SHELVING INSTALLER.
- 2128 AV RACK & EQUIPMENT CONTROL. REFER TO AV DRAWINGS.
- 2129 PROVIDE ELECTRICAL AND LOW VOLTAGE
- 2130 (E) FREEZER TO BE REINSTALLED (OFCI)
- 2132 COUNTERTOP, BASE CABINETS, AND UPPER CABINETS
- 2141 WORKSURFACE WITH BASE CABINETS. PROVIDE ELECTRICAL AND LOW VOLTAGE
- 2142 SCANNER/PRINTER (LOCAL CONNECTION ONLY) (FOI)
- 2144 ROLL-UP DOOR
- 2145 RE-INSTALL (E) FIRE EXTINGUISHER
- 2148 (E) UTILITY PIPING TO REMAIN
- 2149 ACOUSTICAL WOOD PANELS. REFER TO INTERIOR ELEVATION 3/A6000
- 2154 PROJECTION SCREEN CONTROL. REFER TO AV DRAWINGS.

LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- (E) MASONRY WALL
- (N) STOREFRONT SYSTEM PER DETAILS 1, 2, 3 & 4/A8600
- (E) WALL
- (N) WALL TYPE 'A' PER DETAIL 4/A8200
- CARPET
- AREA NOT IN CONTRACT
- (E) CONCRETE COLUMN TO REMAIN
- 60" DIA. ACCESSIBLE FLOOR SPACE LOCATION
- ACCESSIBLE FLOOR SPACE LOCATION @ DOOR
- PHASE #
PHASING INDICATED FOR GALLERY WORK ONLY PER CONSTRUCTION PHASING NOTE BELOW.
- OL OCCUPANT LOAD SIGN - SEE 8 / A8100
- ALD ASSISTIVE LISTENING SIGNAGE - SEE 7 / A8100
- (E) 4 HOUR RATED WALL
- (E) 2 HOUR RATED WALL



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



2100-GENERAL NOTES

1. REFER TO DEMOLITION PLAN, A2000 FOR EXISTING CONSTRUCTION TO BE REMOVED.
2. REFER TO SHEET A9000 FOR FINISH SCHEDULE.
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5. ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS PRIOR TO COMMENCING OF WORK

KEYNOTES

- 2150 18" D x 60" W x 84" H HEAVY DUTY METAL SHELVING
- 2151 24" D x 60" W x 84" H HEAVY DUTY METAL SHELVING
- 2152 18" D x 48" W WALL MOUNTED METAL SHELF WITH ANGLED BRACKET SUPPORT @ 24" O.C.
- 2153 (E) METAL SHELVING TO REMAIN. OWNER TO REMOVE PRIOR TO CONSTRUCTION AND REINSTALL AFTER NEW SHELVING IS INSTALLED
- 2156 PATCH AND PAINT WALLS WHERE MEZZANINE STRUCTURE WAS REMOVED

LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- (E) MASONRY WALL
- (E) WALL TO REMAIN
- CARPET
- AREA NOT IN CONTRACT
- (E) CONCRETE COLUMN TO REMAIN
- 60" DIA. ACCESSIBLE FLOOR SPACE LOCATION
- ACCESSIBLE FLOOR SPACE LOCATION @ DOOR

ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD	-		2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DSA/OSFM SUBMITTAL			2021-09-14
V2	DSA/OSFM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

SHEET TITLE
PARTIAL FLOOR PLAN & ELEVATIONS - STORAGE ROOMS

DATE: 2022-05-02

DRAWN BY: RR

CHKD BY: AB

SCALE: As indicated

DGS NO: 4359

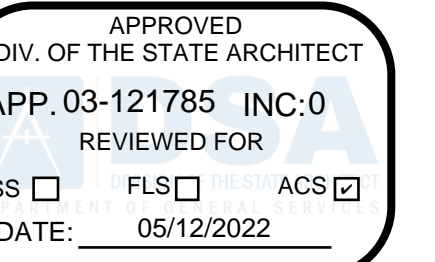
IBI PROJECT NO: 119020

SHEET NUMBER

A2102

ISSUE

A1



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APPROVED FIRE AND PANIC ONLY



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PROJECT
CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

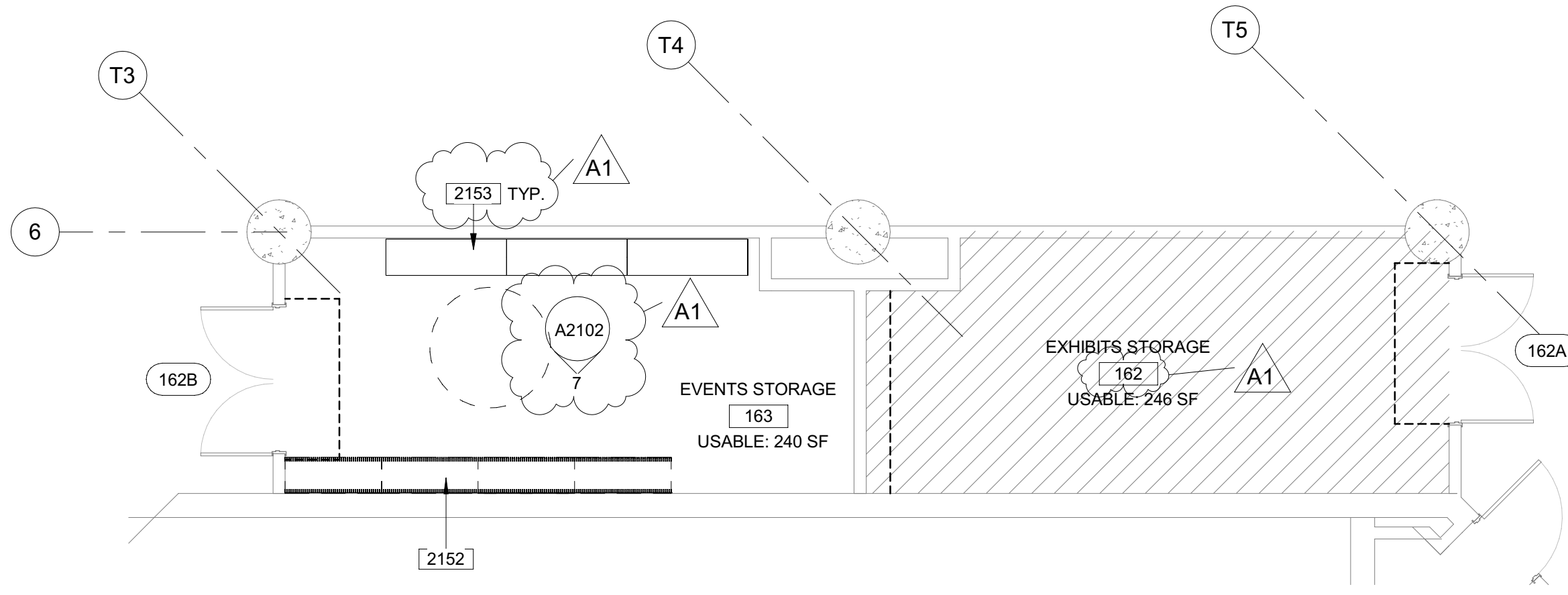


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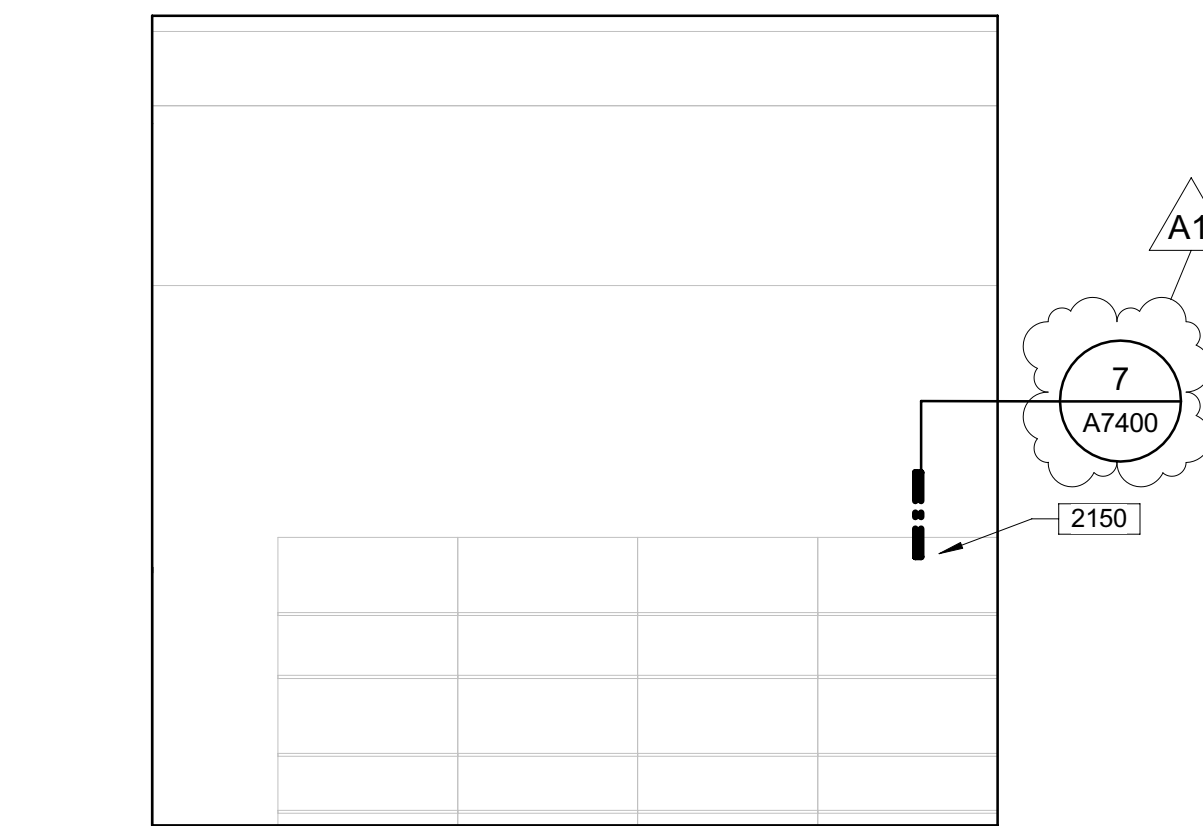


SUB CONSULTANT

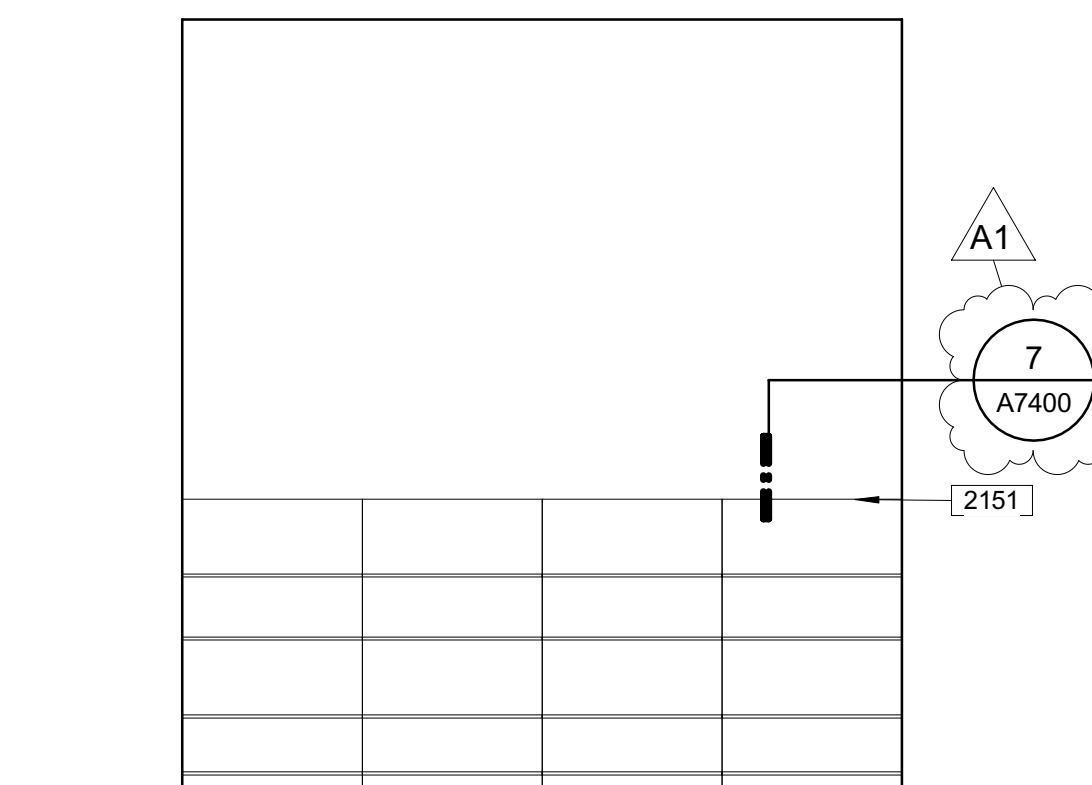


3 EVENTS STORAGE ROOM 163
A2000 SCALE: 3/16" = 1'-0"

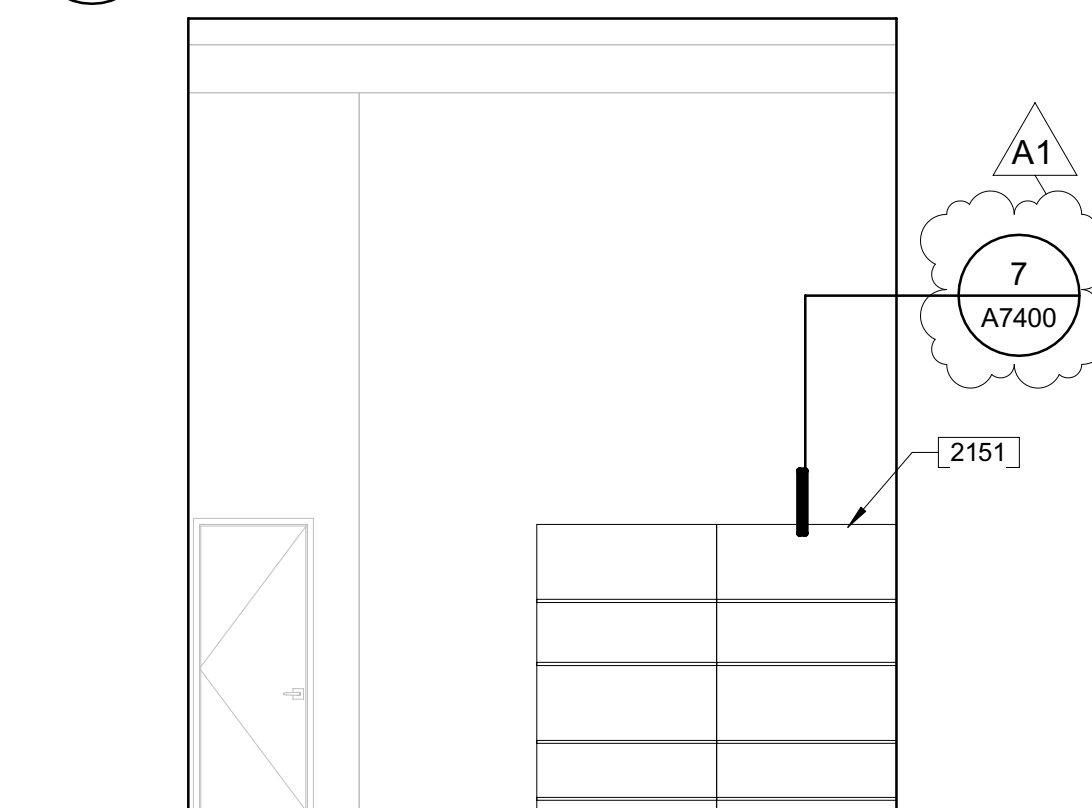
7 163 EVENTS STORAGE - S
A2102 SCALE: 3/16" = 1'-0"



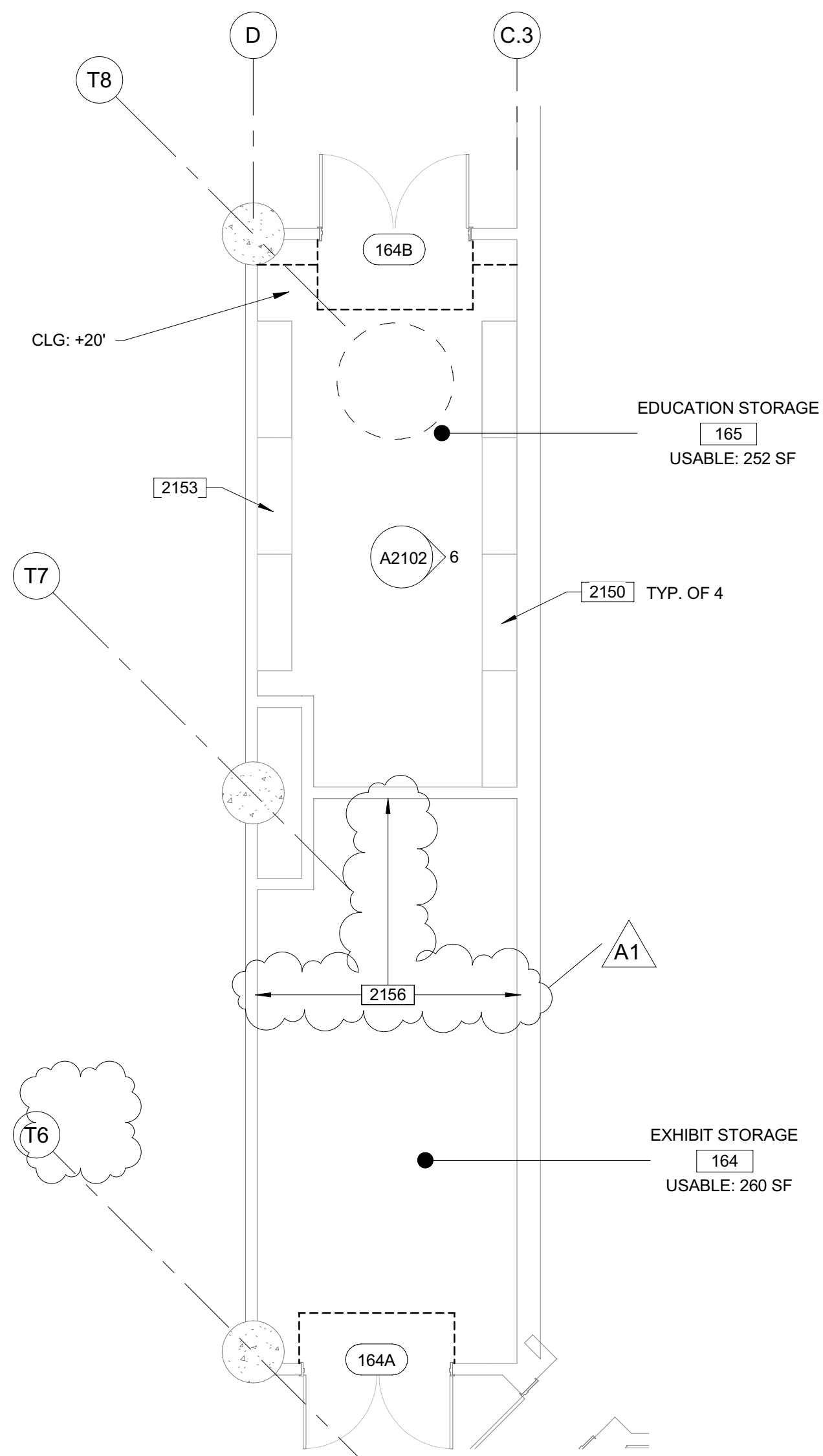
6 165 EDUCATION STORAGE - E
A2102 SCALE: 3/16" = 1'-0"



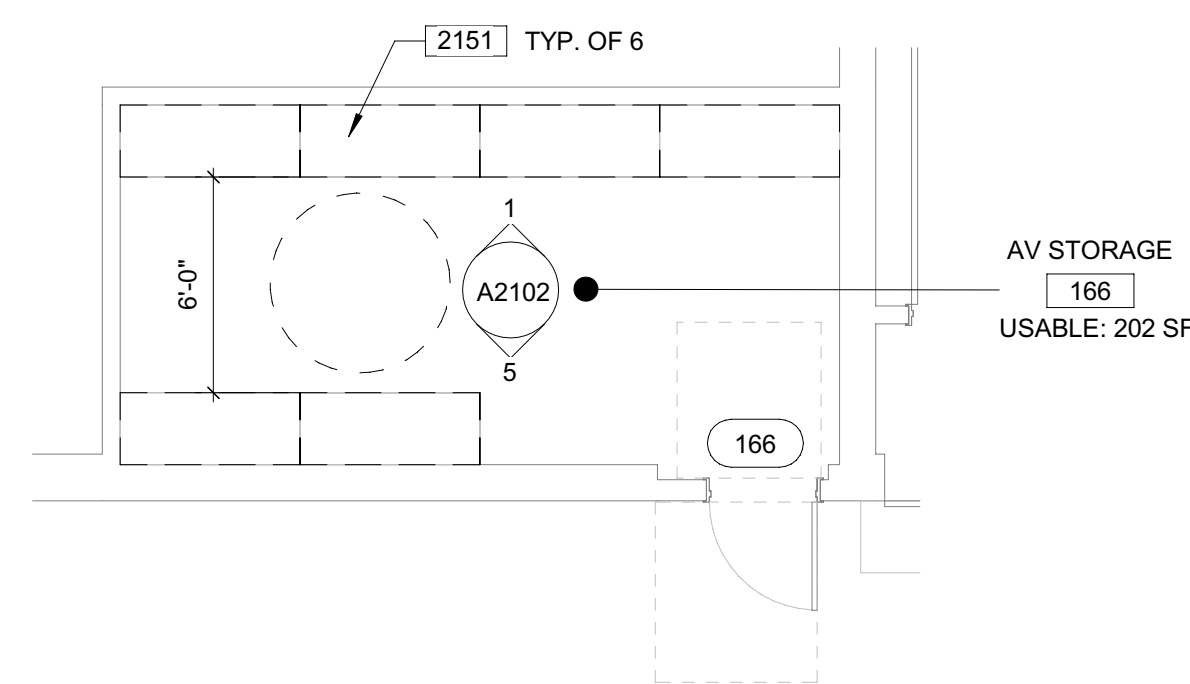
1 166 AV STORAGE - N
A2102 SCALE: 3/16" = 1'-0"



5 166 AV STORAGE - S
A2102 SCALE: 3/16" = 1'-0"

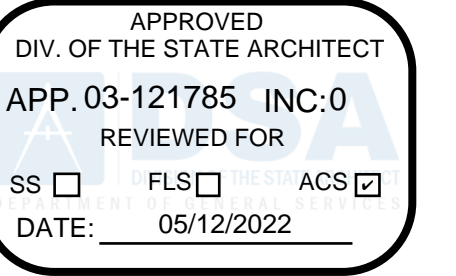


2 EDUCATION STORAGE ROOM 165
A2100 SCALE: 3/16" = 1'-0"



4 AV STORAGE ROOM 166
A2100 SCALE: 3/16" = 1'-0"





2700-GENERAL NOTES

1. CEILING HEIGHTS GIVEN ON REFLECTED CEILING PLANS ARE RELATIVE TO TOP OF FLOOR ELEVATION OF THAT ROOM. ASSUME TOP OF FLOOR ELEVATION OF +0'-0" REGARDLESS OF WHETHER THE ROOM IS FIRST OR SECOND FLOOR LEVEL.
2. MECHANICAL AND ELECTRICAL ITEMS ARE SHOWN ON THIS PLAN FOR PLACEMENT PURPOSES ONLY. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR DETAILED INFORMATION AND ADDITIONAL ITEMS NOT SHOWN ON THIS PLAN.
3. ALL GYPSUM BOARD CEILING INDICATED ON CEILING PLAN IS A SUSPENSION SYSTEM UNLESS UNLESS CROSS-HATCH PER LEGEND.
4. CONTRACTOR TO CAREFULLY COORDINATE AND ROUTE LOCATIONS OF FIRE SPRINKLERS TO NOT INTERFERE WITH CEILING LIGHTS, MECHANICAL DUCTS, GRILLES, CEILING CLOUDS, ETC.

KEYNOTES

- 2719 (E) PROJECTION SCREEN TO REMAIN. REFER TO AV DRAWINGS
- 2720 (E) MAIN LOUDSPEAKER TO REMAIN. REFER TO AV DRAWINGS
- 2721 (E) VIDEO PROJECTOR TO REMAIN. REFER TO AV DRAWINGS
- 2722 MOUNTED RF ANTENNA. REFER TO AV DRAWINGS
- 2723 PATCH AND PAINT PREVIOUS EXISTING SPEAKERS LOCATIONS TO MATCH EXISTING
- 2724 AV CONDUIT ALONG TOP OF WALL, PAINT TO MATCH ADJACENT SURFACE. REFER TO AV DRAWINGS.
- 2726 NEW MECHANICAL UNIT ABOVE. CEILING REMOVED AND REINSTALLED AS PART OF CONCURRENT SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173
- 2727 REINSTALL ACOUSTICAL CEILING TILES UPON COMPLETION OF STRUCTURAL WORK ABOVE

LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- AREA NOT IN CONTRACT
- (E) MASONRY WALL
- (N) STOREFRONT SYSTEM
- (E) WALL TO REMAIN
- (N) WALL TYPE 'A'
- (E) EXPOSED CEILING TO REMAIN; PAINT AS NOTED ON PLANS
- (N) GYP. BOARD CEILING/SOFFIT; PAINT AS NOTED ON PLANS
- (N) SUSPENDED ACOUSTICAL TILE CEILING
- (E) SUSPENDED ACOUSTICAL TILE CEILING
- LIGHT FIXTURE - REFER TO ELECTRICAL DRAWINGS
- JOIST CROSS-BRACING
- EXIT LIGHT - REFER TO ELECTRICAL DRAWINGS
- CONTRACTOR TO COORDINATE WITH OWNER TO CLEAR THIS AREA FOR STRUCTURAL WORK ABOVE. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION. FINISH NEW CONSTRUCTION TO MATCH EXISTING.
- PHASE # PHASING INDICATED FOR GALLERY WORK ONLY PER CONSTRUCTION PHASING NOTE BELOW.
- AREA OF WORK ONLY FOR THE AV UPGRADES IN THE ENTRY/SCULPTURE COURT. REFER TO AV DRAWINGS. CONFIRM WITH OWNER PRIOR TO CONSTRUCTION.
- (E) SPRINKLER HEAD TO REMAIN

CONSTRUCTION PHASING

THE CONSTRUCTION PHASING SHALL BE AS FOLLOWS AND AS SHOWN ON THE DEMOLITION, FLOOR AND CEILING PLANS ACCORDINGLY AND IN THE PROJECT MANUAL. ALL DEMO AND NEW GALLERY WORK MUST BE PHASED BELOW CONCURRENT WITH PHASE 1 (OVERALL PROJECT). THE SECURITY UPGRADE SCOPE PER SEPARATE DSA A# 03-121173 SHALL ALSO ALIGN WITH THESE PHASES.

PHASE 1 OVERALL PROJECT (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

A. EXTERIOR AND ROOF TOP WORK CAN OCCUR OUTSIDE OF THE GALLERY PHASES BELOW PENDING IT DOES NOT INTERFERE WITH GALLERY INTERIORS DURING MUSEUM HOURS

PHASE 2 THEATER GALLERY, GALLERY 2 - 10/01/2022 - 01/09/2023 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

PHASE 3 GALLERY 3 - 10/17/2022 - 01/09/2023 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

PHASE 4 GALLERY OF DISCOVERY & GALLERY 1 - 11/15/2022 - 02/08/2023 (CONCURRENT WITH SECURITY UPGRADE PROJECT UNDER SEPARATE DSA A# 03-121173)

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West Sacramento, CA 95605

Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT

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CAAM

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PRIME CONSULTANT

IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



SUB CONSULTANT

A1

ISSUES

NO.	ISSUANCE	STATUS	DATE
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSAC/SFM SUBMITTAL		2021-08-14
V2	DSAC/SFM BACKCHECK		2022-03-11

SHEET TITLE

REFLECTED CEILING PLAN

DATE: 2022-05-02

DRAWN BY: CD

CHKD BY: AB

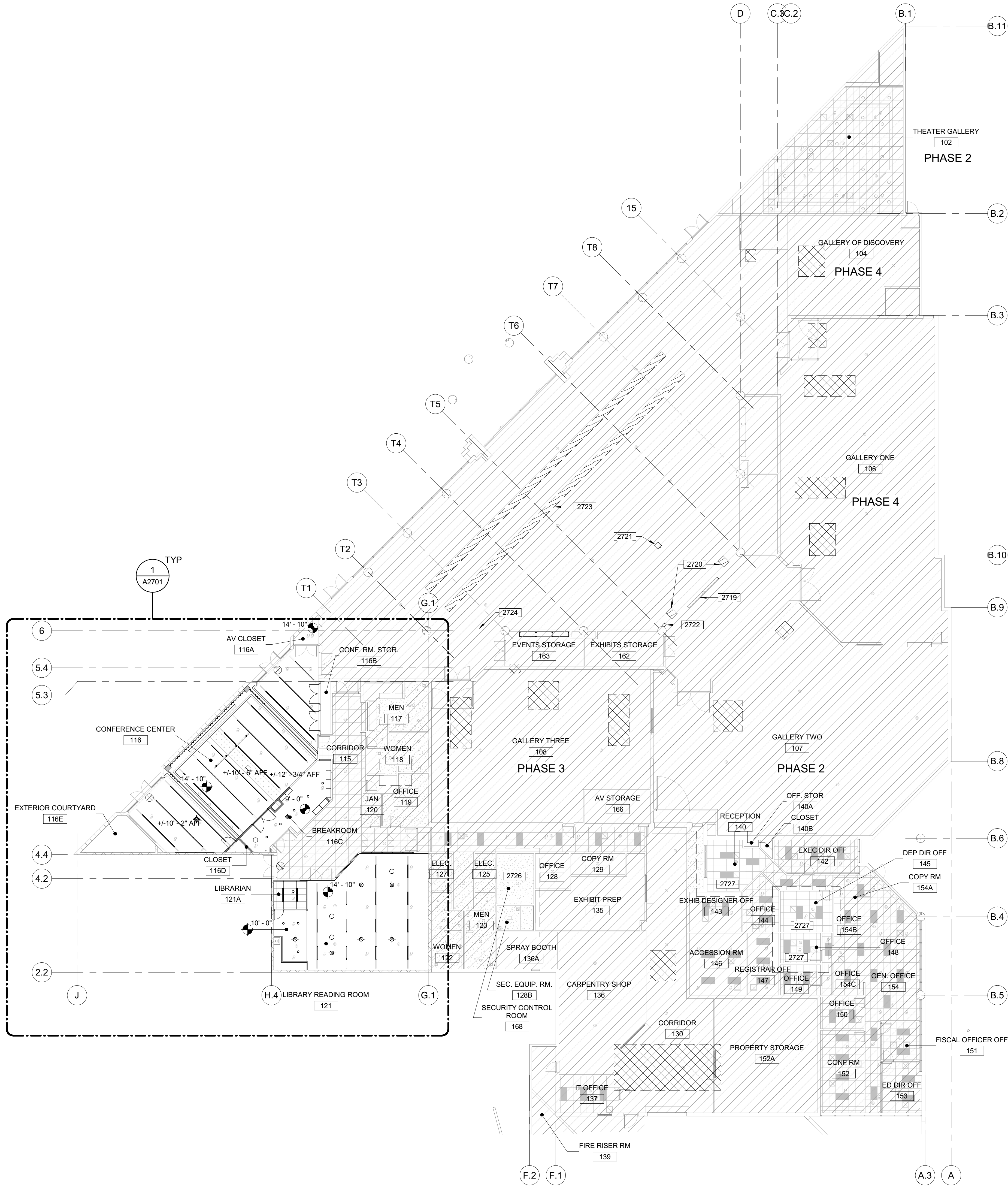
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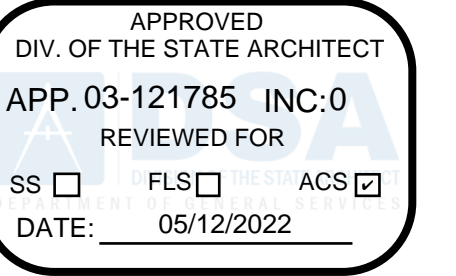
DGS NO: 4359

IBI PROJECT NO: 119020

SHEET NUMBER

A2700 A1





ROOF PLAN NOTES:

- 1 ALL ELEVATIONS REFERENCED FROM FINISHED FLOOR 0'-0", UNLESS NOTED OTHERWISE.
- 2 NOT ALL ROOF PENETRATIONS ARE SHOWN. COORDINATE WITH STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL ROOF PENETRATIONS.
- 3 LOADING OF CONSTRUCTION MATERIALS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.
- 4 GENERAL CONTRACTOR SHALL FAMILIARIZE WITH EXISTING ROOF PENETRATIONS AND THE FLASHING REQUIREMENTS PRIOR TO PROCEED WITH THE INSTALLATION OF THE NEW ROOF. ALL ROOF PENETRATIONS AND DRAINAGE ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.
- 5 ROOM ELEVATIONS DATA HAVE BEEN PROVIDED BY OWNER AND BROUGHT UP FROM THE ORIGINAL "AS BUILT" DRAWING SET DATED 3/4/83. GENERAL CONTRACTOR SHALL VERIFY INTEGRITY OF THE DATA AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO COMMENCING OF WORK.
- 6 ALL HVAC UNITS SHALL BE MOUNTED ON ISOLATION CURBS PER DETAIL 10/A8400. UNLESS OTHERWISE NOTED. REFER TO MECHANICAL DRAWINGS.
- 7 EXISTING ROOF PARAPET WALLS ARE TO REMAIN UNTOUCHED EXCEPT FOR MECHANICAL PENETRATIONS AND THE INSTALLATION OF ROOF FLASHINGS, REFER TO DETAILS 6, 8, & 11 SHEET A8400 FOR TYPICAL ROOFING DETAILS AT THESE WALLS.

KEYNOTES

- 2801 TUBULAR DAYLIGHTING DEVICE, REFER TO DETAIL 1/A8300
- 2802 (E) PARAPET WALL TO REMAIN
- 2803 (E) ROOF DRAIN TO REMAIN, REFER TO DETAIL 2 & 8/A8400
- 2805 (E) SKYLIGHT FRAMING TO REMAIN
- 2806 (E) GLAZING AND FRAMING TO REMAIN
- 2807 (E) WALL ASSEMBLY BELOW ROOF TO REMAIN
- 2809 (E) ENTRY PORTAL TO REMAIN
- 2810 (E) RIDGE TO REMAIN
- 2811 MECHANICAL EQUIPMENT. REFER TO MECHANICAL DRAWINGS
- 2812 (E) ROOF ACCESS HATCH TO REMAIN
- 2814 (E) METAL STAIR TO REMAIN
- 2815 (E) THROUGH WALL SCUPPER TO REMAIN
- 2817 (E) WALL OPENINGS FOR ROOF DRAINAGE
- 2818 (E) ROOF FAN TO REMAIN
- 2819 (E) OVERFLOW DRAIN TO REMAIN
- 2820 PVC ROOFING OVER EXISTING STRUCTURE. SEE DETAIL 1/A8400
- 2822 (E) ROOF PIPING TO REMAIN UNLESS OTHERWISE NOTED. REFER TO 7/A8400 FOR NEW ROOFING PENETRATION TREATMENT
- 2823 (E) ROOF LADDER
- 2824 (N) WALK PADS

LEGEND

- NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.
- (E) WALL OR PARAPET WALL TO REMAIN
 - (E) ROOF DRAIN TO REMAIN
 - (E) ROOF VENT TO REMAIN
 - (E) ROOF STAIR TO REMAIN
 - (E) TOP OF PARAPET (T.O.P.) OR ROOF (T.O.R.)
 - POWER OUTLET. REFER TO ELECTRICAL DRAWINGS
 - 3' WIDE ROOF WALK PAD

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 West Sacramento, CA 95605
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 dianna.brown@dgs.ca.gov

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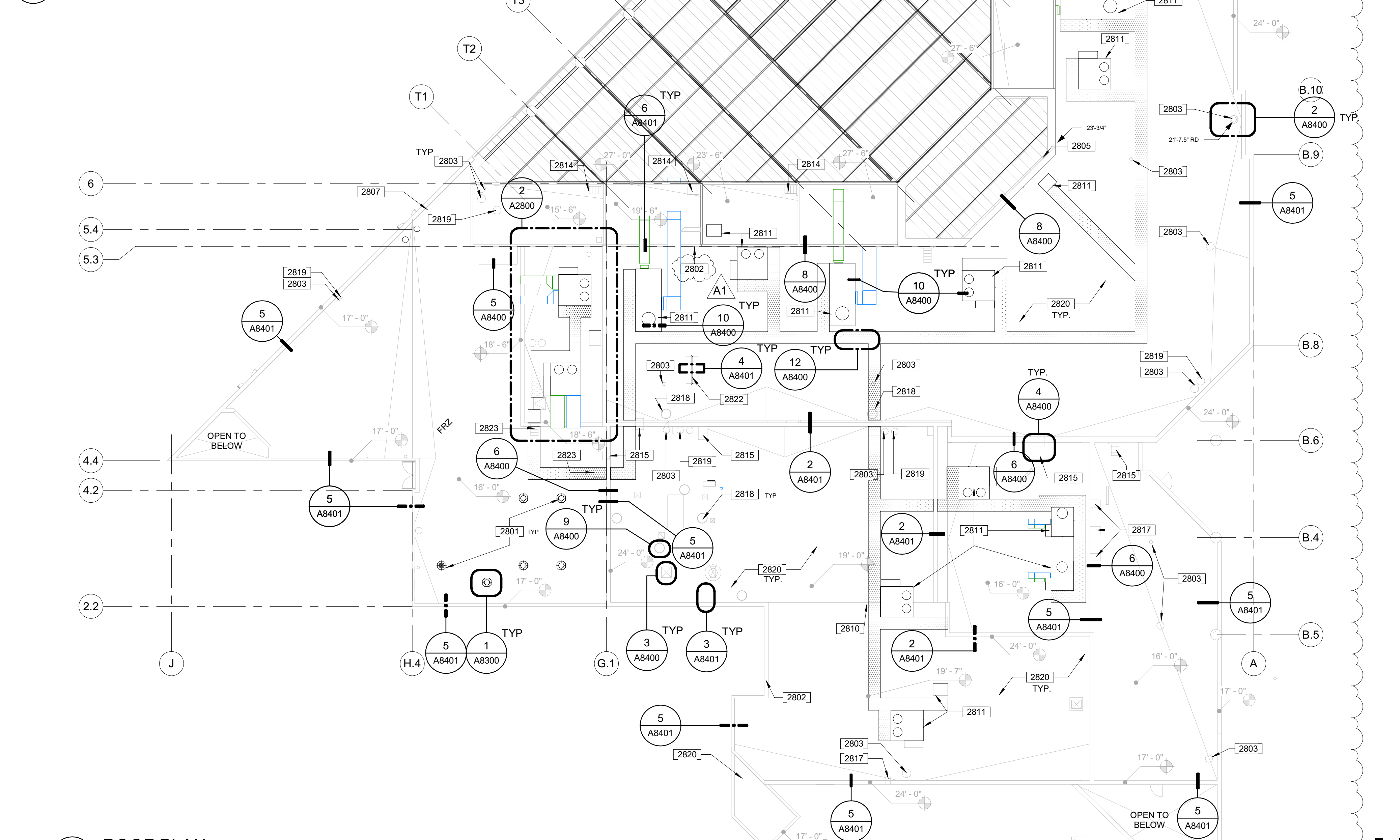
SUB CONSULTANT

NO.	ISSUANCE	STATUS	DATE
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
ROOF PLAN

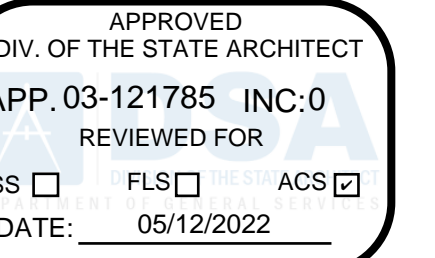
DATE:	2022-05-02
DRAWN BY:	JL
CHKD BY:	AB
SCALE:	As indicated
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	A2800
ISSUE	A1

2 ENLARGED ROOF PLAN
 SCALE: 1/8" = 1'-0"



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





6000-GENERAL NOTES

1. PROVIDE SOLID BACKING IN WALL AS PER DETAIL 1/A7400 AT ALL LOCATIONS OF WALL MOUNTED ITEMS, INCLUDING BUT NOT LIMITED TO CABINETRY, OWNER PROVIDED ACCESSORIES, ELECTRICAL AND FIRE ALARM DEVICES, AND BRACKETS FOR WALL MOUNTED EQUIPMENT.
2. WALL MOUNTED ELECTRICAL ITEMS ARE SHOWN ON THIS DRAWING ONLY WHERE PLACEMENT IS CRITICAL TO VISUAL APPEARANCE. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL RECEPTACLES, SWITCHES, AND OTHER WALL MOUNTED ELECTRICAL DEVICES NOT SHOWN ON THIS DRAWING.
3. REFER TO DETAILS 2 & 5/A7400 FOR CASEWORK ANCHORAGE.
4. REFER TO FLOOR AND SCHEDULES FOR MOUNTING HEIGHTS OF WINDOWS AND SIZES OF STOREFRONTS.
5. REFER TO DOOR SCHEDULE FOR SIGNAGE ASSOCIATED TO EACH DOOR.
6. DOOR FRAMES TO MATCH DOORS. PAINT DOOR FRAMES PER DOOR FINISH DESIGNATION.

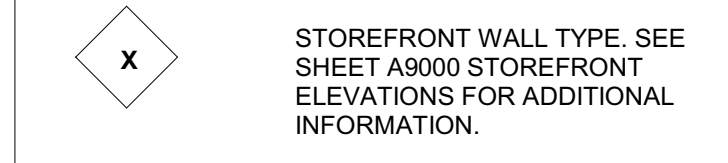
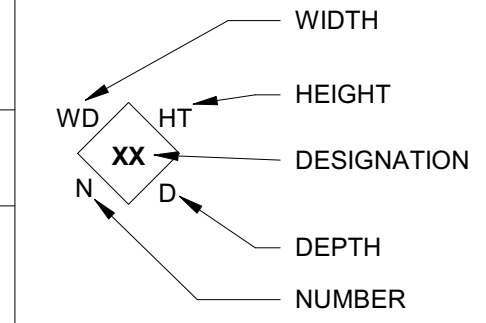
KEYNOTES

- 6003 ROLL-UP DOOR
- 6004 REFER TO DOOR SCHEDULE
- 6005 TRANSLUCENT WINDOW FILM; 3M FASARA OR APPROVED EQUIVALENT. ARCHITECT TO SELECT FROM FULL MANUFACTURERS PRODUCTION
- 6007 WHITE-OUT FILM ON LOWER HALF OF DOOR; 3M FASARA OR APPROVED EQUIVALENT
- 6008 ROLLER SHADE
- 6009 CLEAN (E) MASONRY WALL
- 6010 (E) UTILITY PIPING TO REMAIN
- 6011 (E) FIRE EXTINGUISHER AND ELEC. BOX TO REMAIN
- 6020 CERAMIC TILE BACKSPLASH
- 6027 4" RUBBER BASE
- 6028 ACOUSTICAL WOOD WALL PANELS
- 6029 RE-INSTALL (E) MICROWAVE/ELECTRONIC OVEN; VERIFY EQUIPMENT DIMENSIONS PRIOR TO FRAMING OF OPENING
- 6031 INFILL DOOR
- 6036 CASEWORK FILLER PANEL PER DETAIL 3/A7400
- 6037 (E) FREEZER TO BE INSTALLED
- 6038 CASEWORK TOP FILLER PANEL
- 6041 PATCH AND REPAIR WALL AS-NEEDED PRIOR TO PAINTING
- 6042 MOTORIZED PROJECTOR SCREEN - SEE AV DWGS
- 6043 REINSTALL (E) REFRIGERATOR
- 6044 REINSTALL (E) COUNTERTOP MICROWAVE
- 6045 REINSTALL (E) COUNTERTOP ICE MAKER

LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- NEW OR INFILL GYPSUM BOARD WALL
- ACCENT PAINT
- WHITE-OUT FILM
- TRANSLUCENT FILM
- ROLLER SHADE
- WALL TILE BACKSPLASH



FINISH DESIGNATIONS

- REFER TO FINISH LEGEND ON SHEET A2101 AND SPECIFICATION SECTION 09 06 00 COLORS AND FINISHES
- AP-1 ACOUSTIC PANEL STYLE 1
 - AP-3 ACOUSTIC PANEL STYLE 3
 - AP-6 ACOUSTIC PANEL STYLE 6
 - CT-1 CERAMIC TILE 1
 - IP-1 INTERIOR PAINT COLOR 1 (FIELD, TYP.)
 - IP-2 INTERIOR PAINT COLOR 2 (CEILING STRUCTURE, TYP.)
 - IP-3 INTERIOR PAINT COLOR 3 (DOORS AND FRAMES, TYP.)
 - PL-1 PLASTIC LAMINATE 1
 - PL-2 PLASTIC LAMINATE 2
 - RB-2 RUBBER BASE
 - RS-1 ROLLER SHADE
 - SC-1 STAGE CURTAINS
 - SS-1 SOLID SURFACE COUNTERTOP

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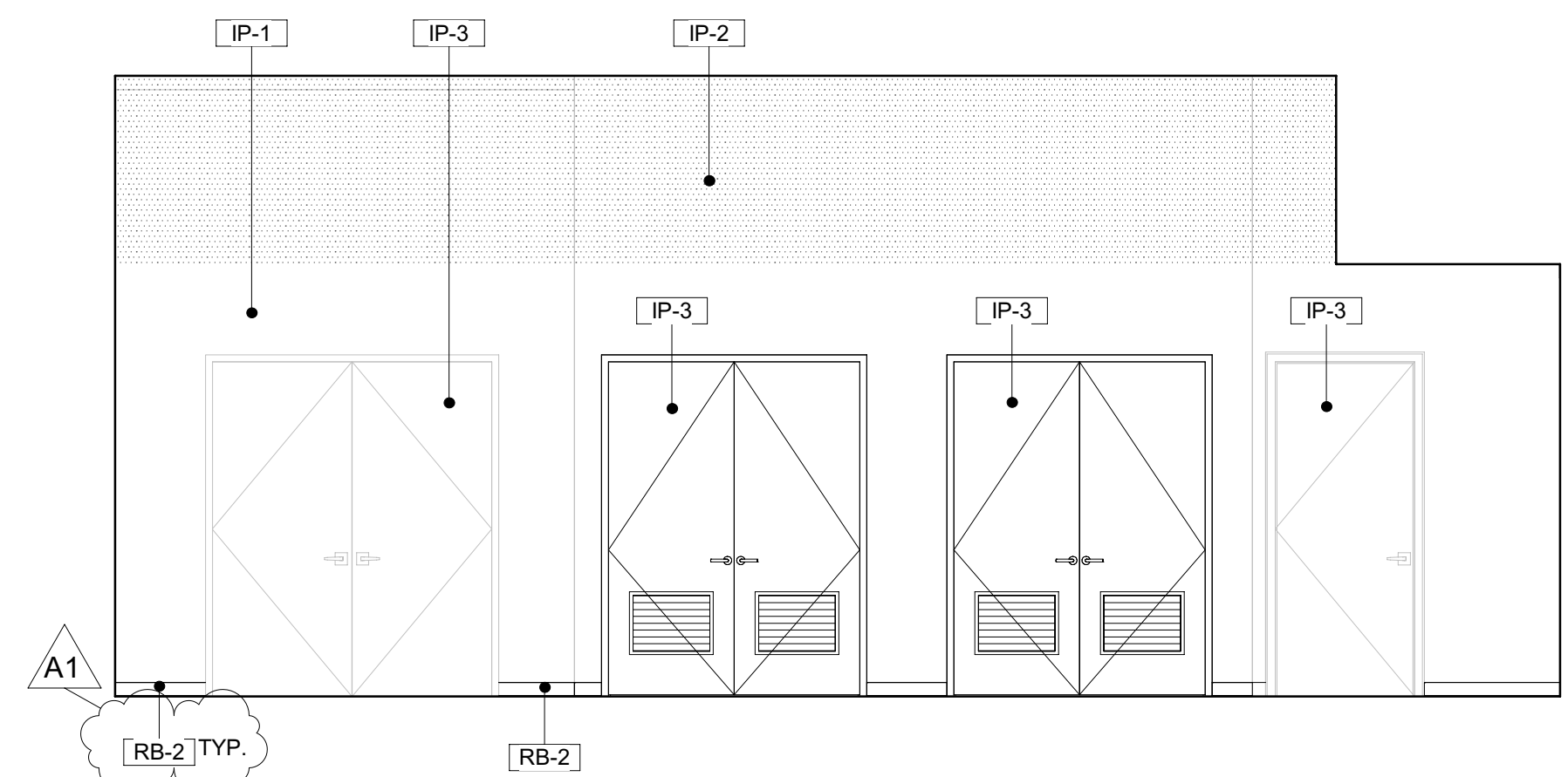
ISSUES

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E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

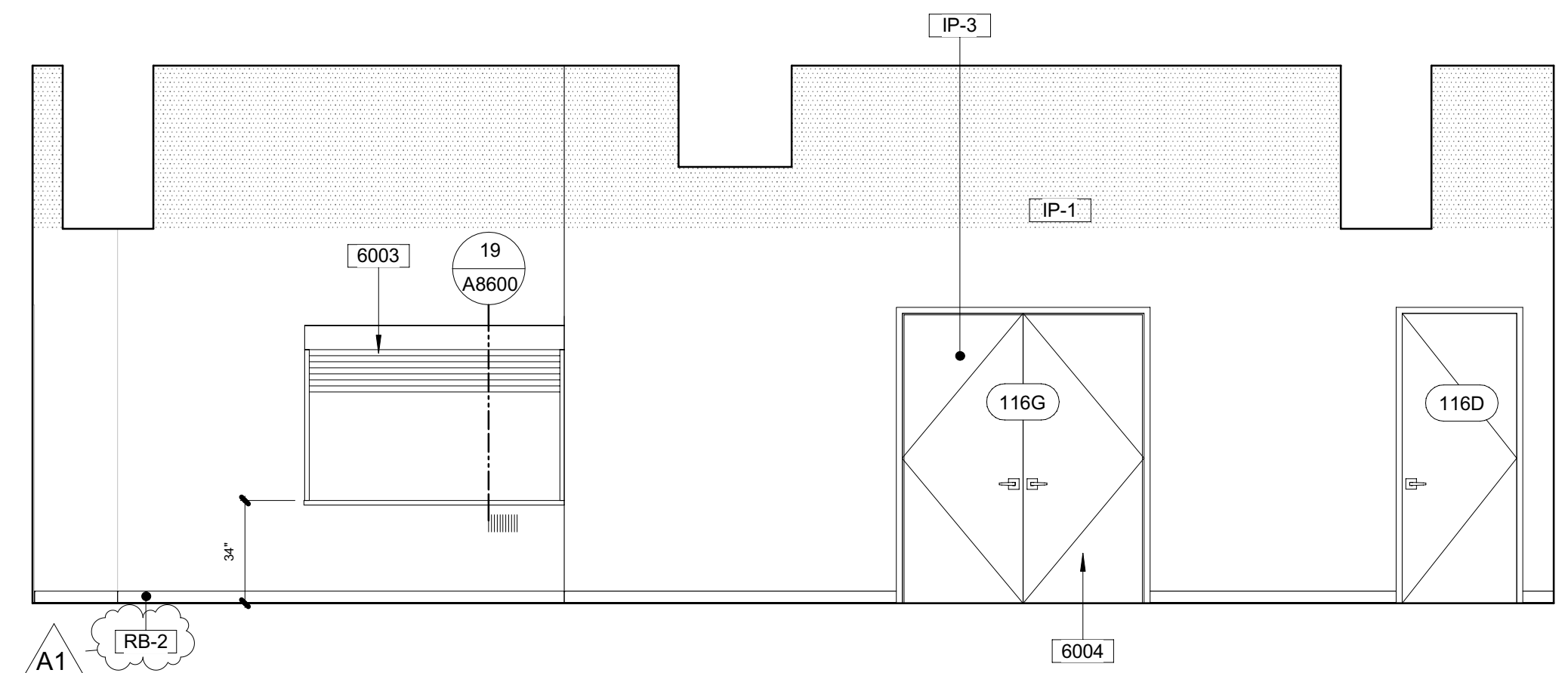
SHEET TITLE
INTERIOR ELEVATIONS

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: 1/4" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

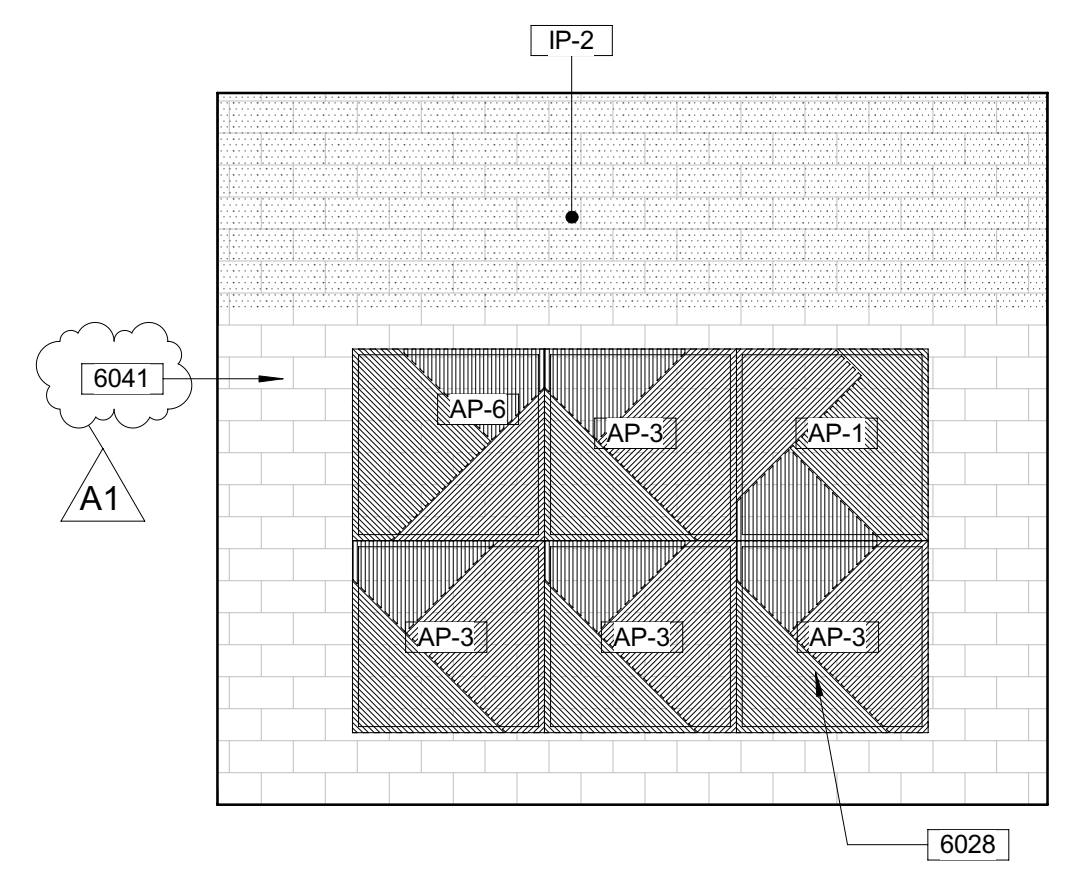
SHEET NUMBER
A6000
ISSUE
A1



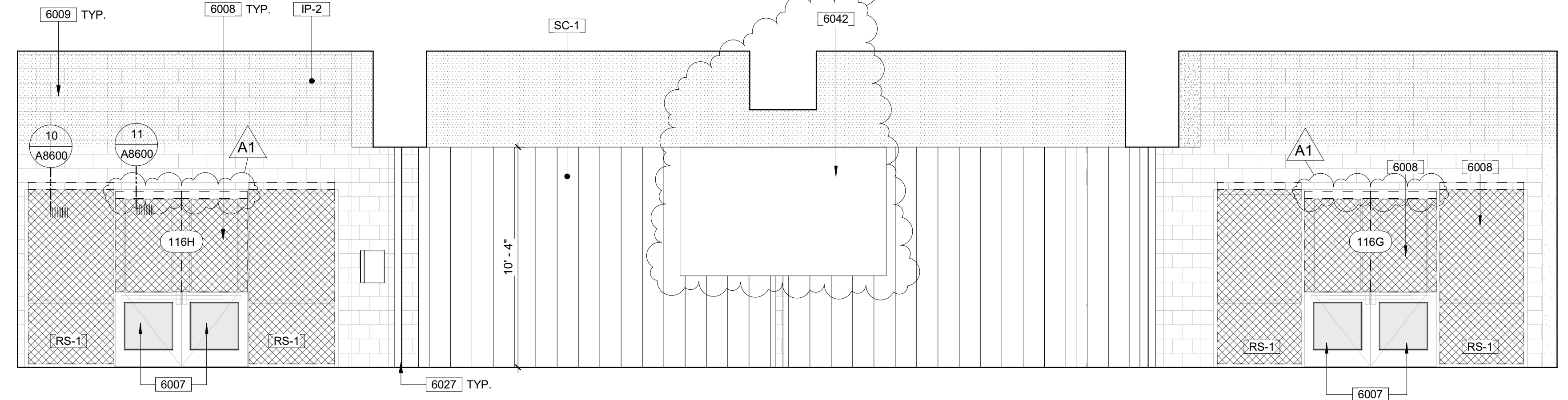
1 CONFERENCE ROOM - E
A2101 SCALE: 1/4" = 1'-0"



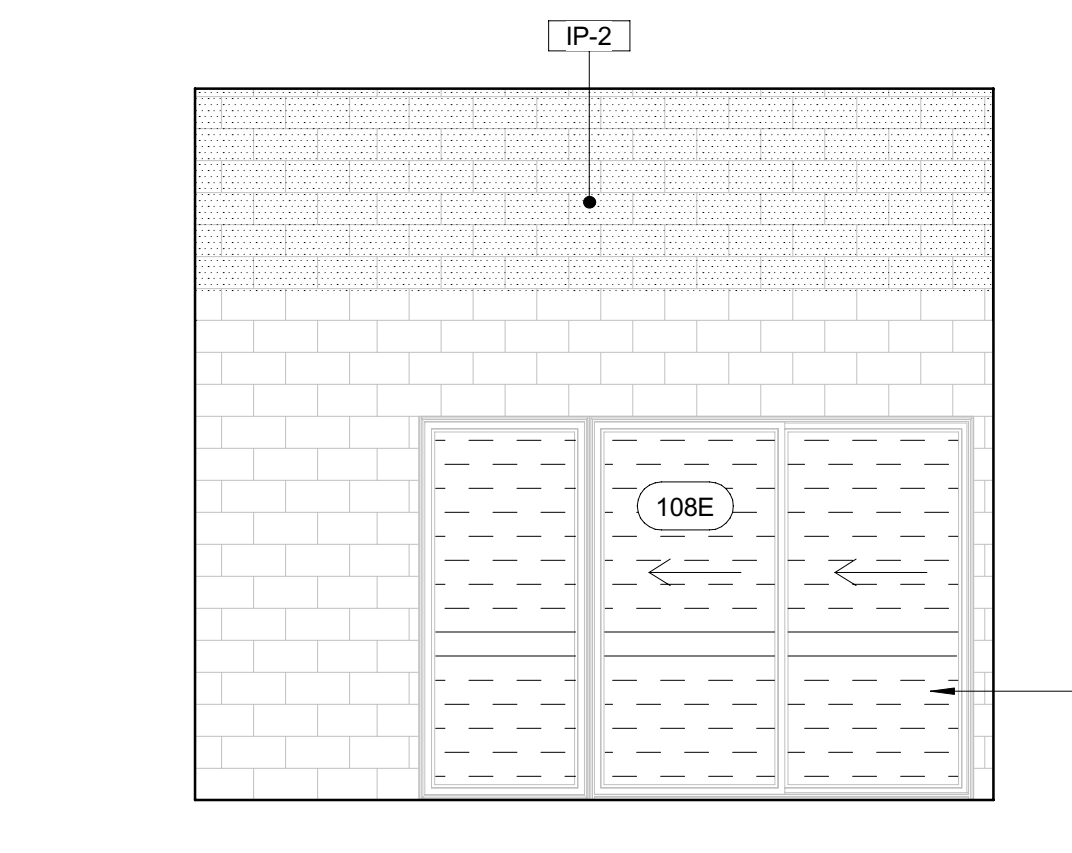
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A2101 SCALE: 1/4" = 1'-0"



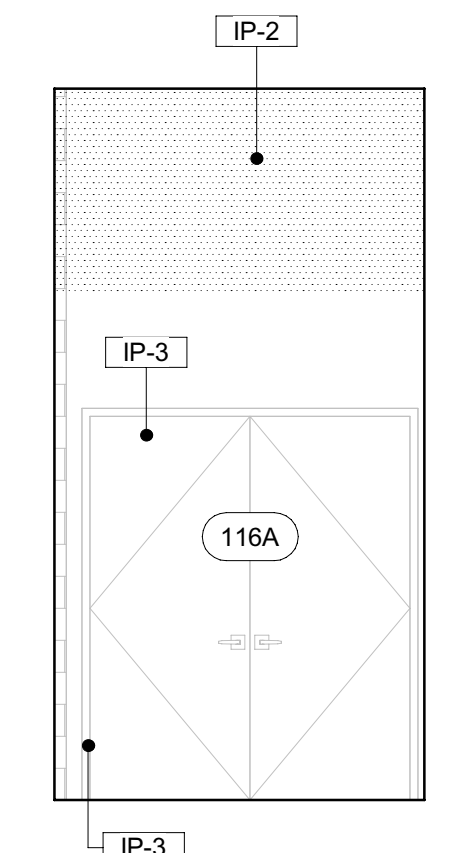
3 CONFERENCE ROOM - S
A2101 SCALE: 1/4" = 1'-0"



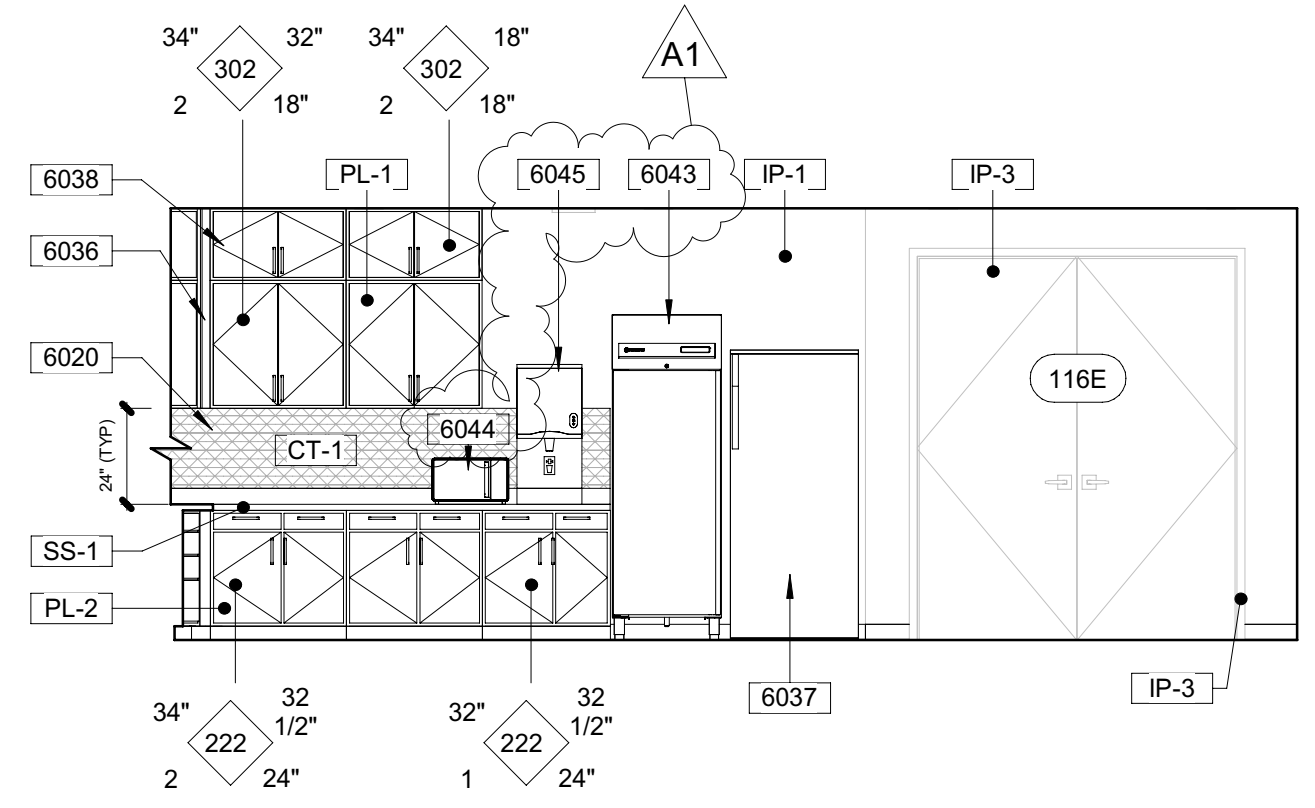
5 CONFERENCE ROOM - NW
A2101 SCALE: 1/4" = 1'-0"



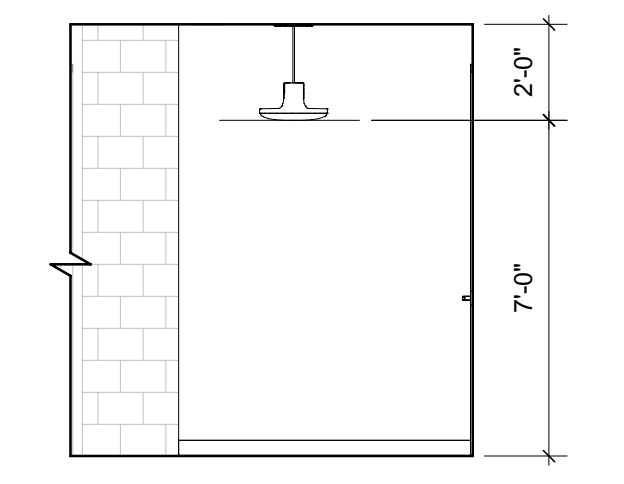
4 CONFERENCE ROOM - SW
A2101 SCALE: 1/4" = 1'-0"



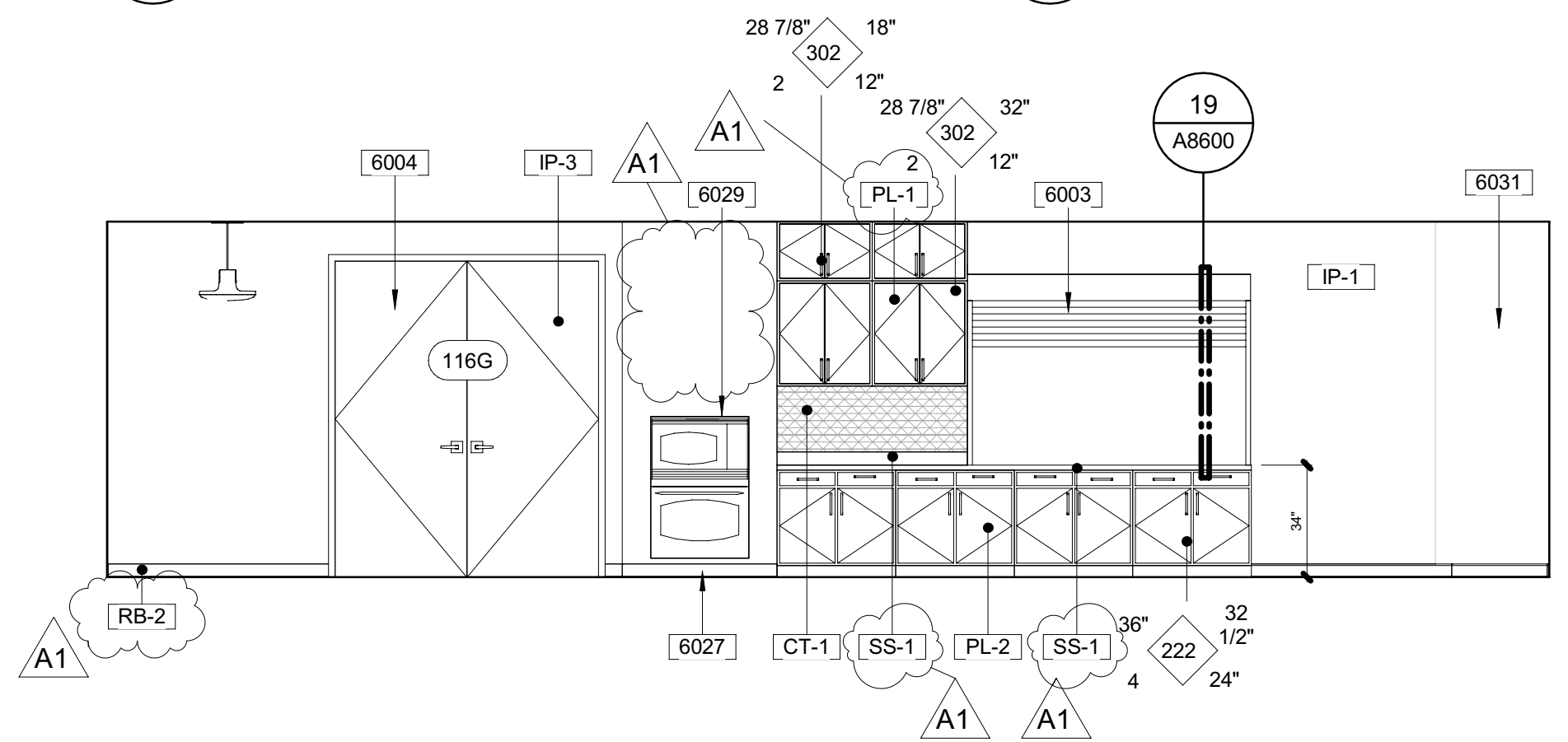
6 CONFERENCE ROOM - N
A2101 SCALE: 1/4" = 1'-0"



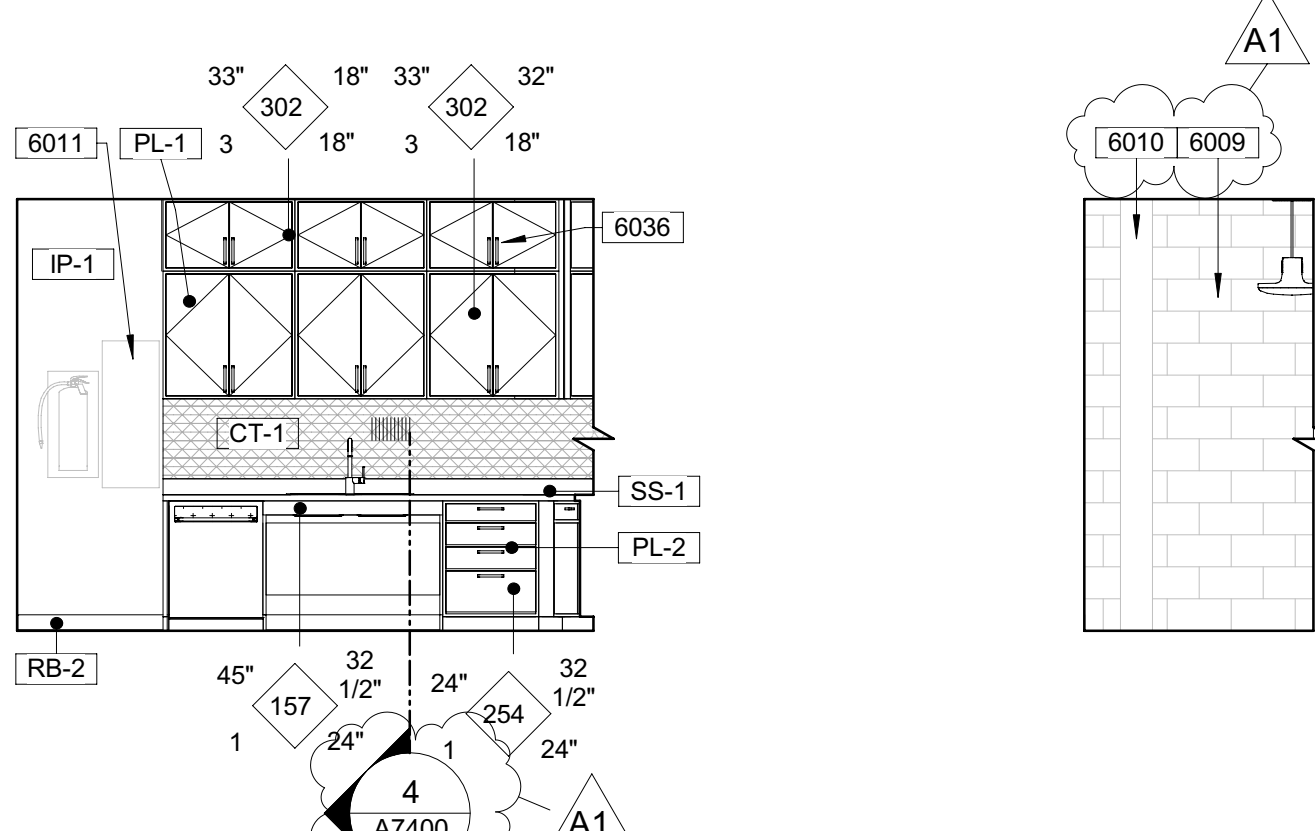
7 BREAKROOM - SE
A2101 SCALE: 1/4" = 1'-0"



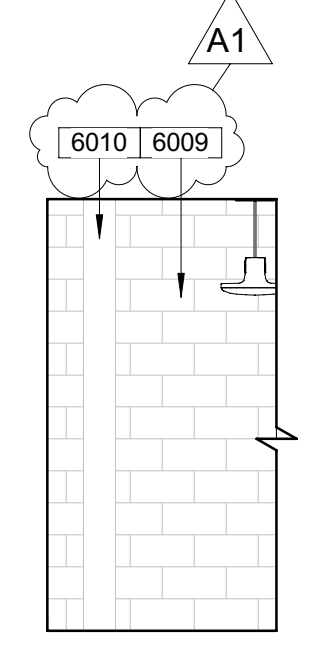
8 BREAKROOM - SW
A2101 SCALE: 1/4" = 1'-0"



9 BREAKROOM - NW
A2101 SCALE: 1/4" = 1'-0"



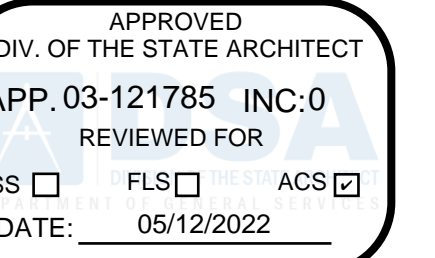
10 BREAKROOM - E
A2101 SCALE: 1/4" = 1'-0"



11 BREAKROOM - S
A2101 SCALE: 1/4" = 1'-0"

6000-GENERAL NOTES

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4. REFER TO FLOOR AND SCHEDULES FOR MOUNTING HEIGHTS OF WINDOWS AND SIZES OF STOREFRONTS.
5. REFER TO DOOR SCHEDULE FOR SIGNAGE ASSOCIATED TO EACH DOOR.
6. DOOR FRAMES TO MATCH DOORS. PAINT DOOR FRAMES PER DOOR FINISH DESIGNATION.



KEYNOTES

- 6005 TRANSLUCENT WINDOW FILM; 3M FASARA OR APPROVED EQUIVALENT. ARCHITECT TO SELECT FROM FULL MANUFACTURERS PRODUCTION
- 6006 STRIP AND PAINT (E) H.M. DOORS
- 6009 CLEAN (E) MASONRY WALL
- 6012 STANDARD ALUMINUM GLASS STOREFRONT
- 6030 LIGHT FIXTURE
- 6033 (E) MICROFICHE
- 6034 (E) PRINTER SCANNER
- 6039 TUBULAR DAYLIGHTING DEVICE
- 6040 NEW MOBILE BOOK SHELVING AND PLATFORM (OFOI)

LEGEND

NOTE: ALL SYMBOLS AND PATTERNS MAY NOT NECESSARILY OCCUR ON THIS SHEET.

- NEW OR INFILL GYPSUM BOARD WALL
- ACCENT PAINT
- WHITE-OUT FILM
- TRANSLUCENT FILM
- ROLLER SHADE
- WALL TILE BACKSPLASH
- WIDTH
- HEIGHT
- DESIGNATION
- DEPTH
- NUMBER
- STOREFRONT WALL TYPE. SEE SHEET A8000 STOREFRONT ELEVATIONS FOR ADDITIONAL INFORMATION.

FINISH DESIGNATIONS

- REFER TO FINISH LEGEND ON SHEET A2101 AND SPECIFICATION SECTION 09 06 00 COLORS AND FINISHES
- IP-1 INTERIOR PAINT COLOR 1 (FIELD, TYP.)
 - IP-2 INTERIOR PAINT COLOR 2 (CEILING STRUCTURE, TYP.)
 - PL-3 PLASTIC LAMINATE 3
 - RB-1 RUBBER BASE
 - SS-1 SOLID SURFACE COUNTERTOP

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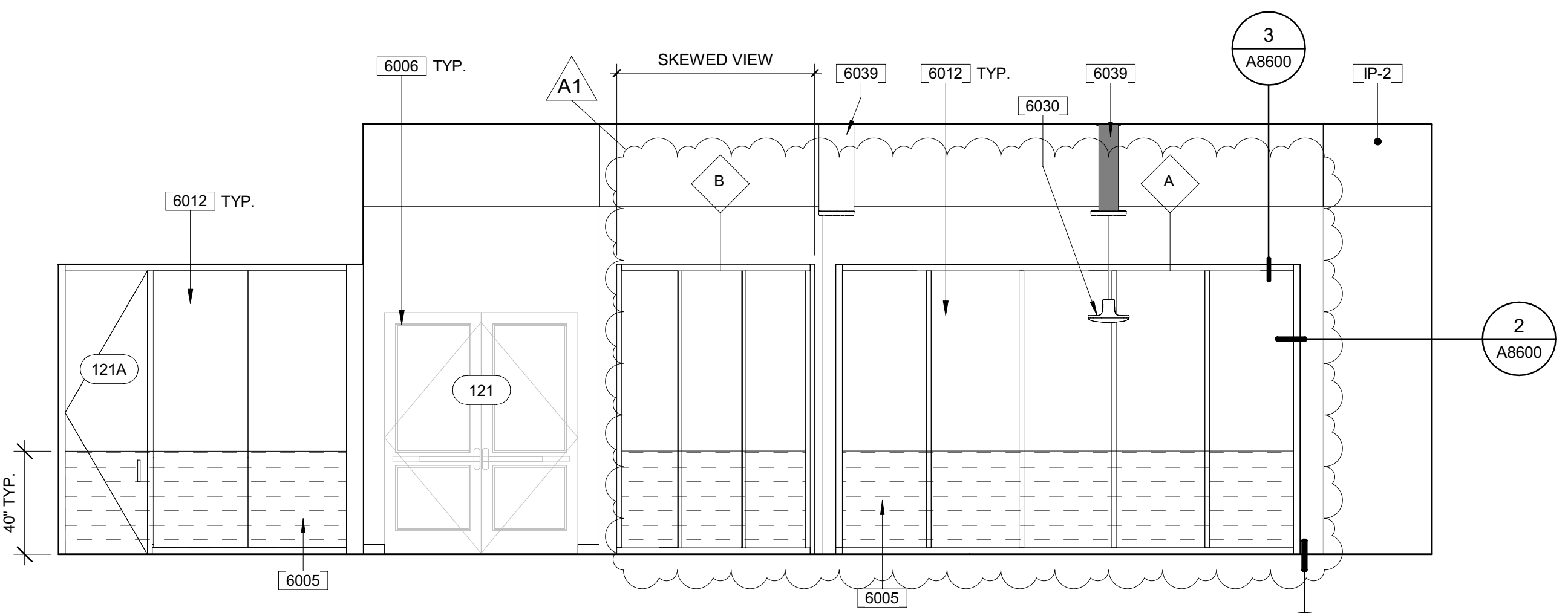
SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
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E	50% CD			2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DSA/OSFM SUBMITTAL			2021-09-14
V2	DSA/OSFM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

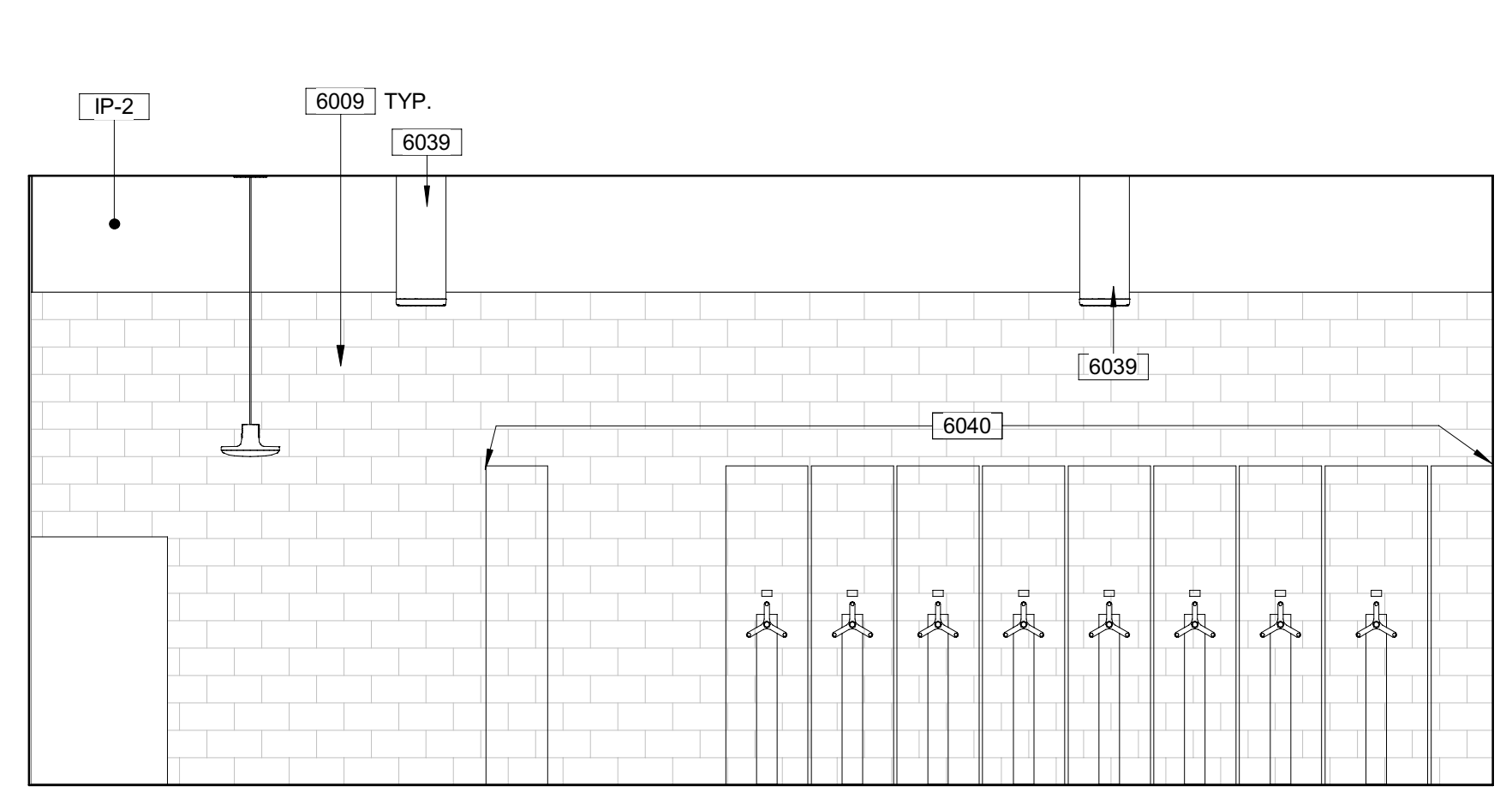
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INTERIOR ELEVATIONS

DATE:	2022-05-02
DRAWN BY:	RR
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DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	ISSUE

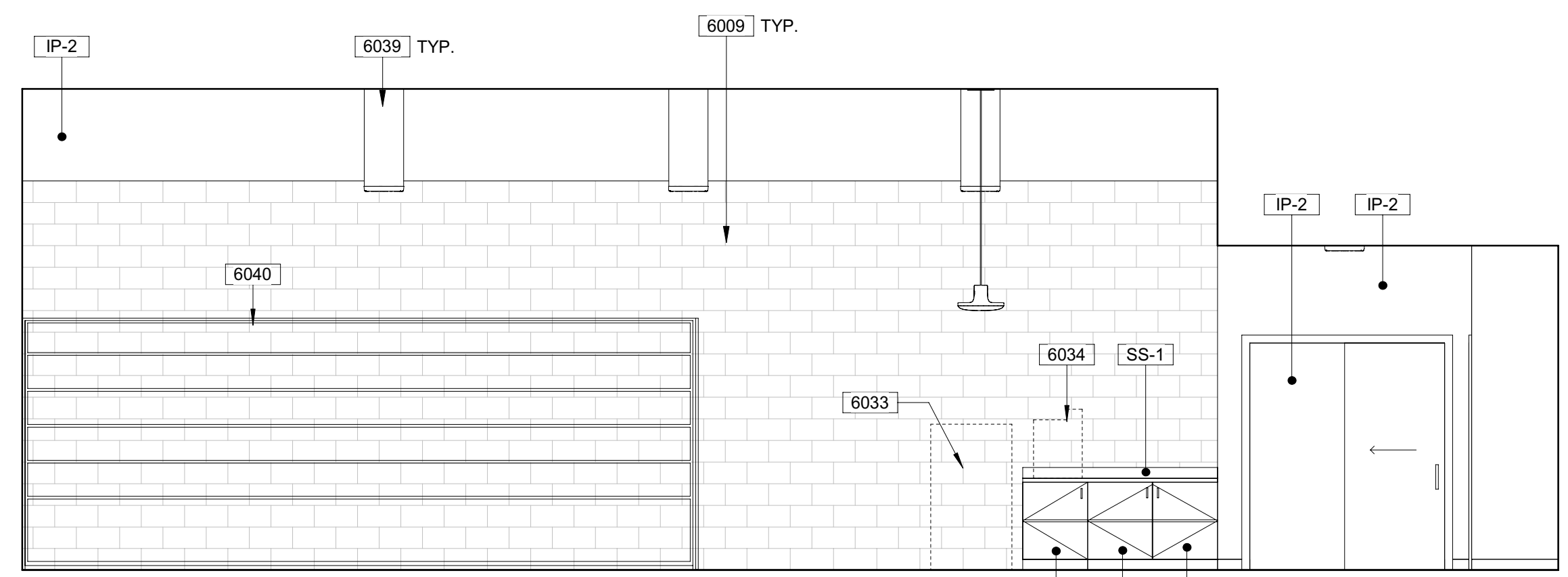
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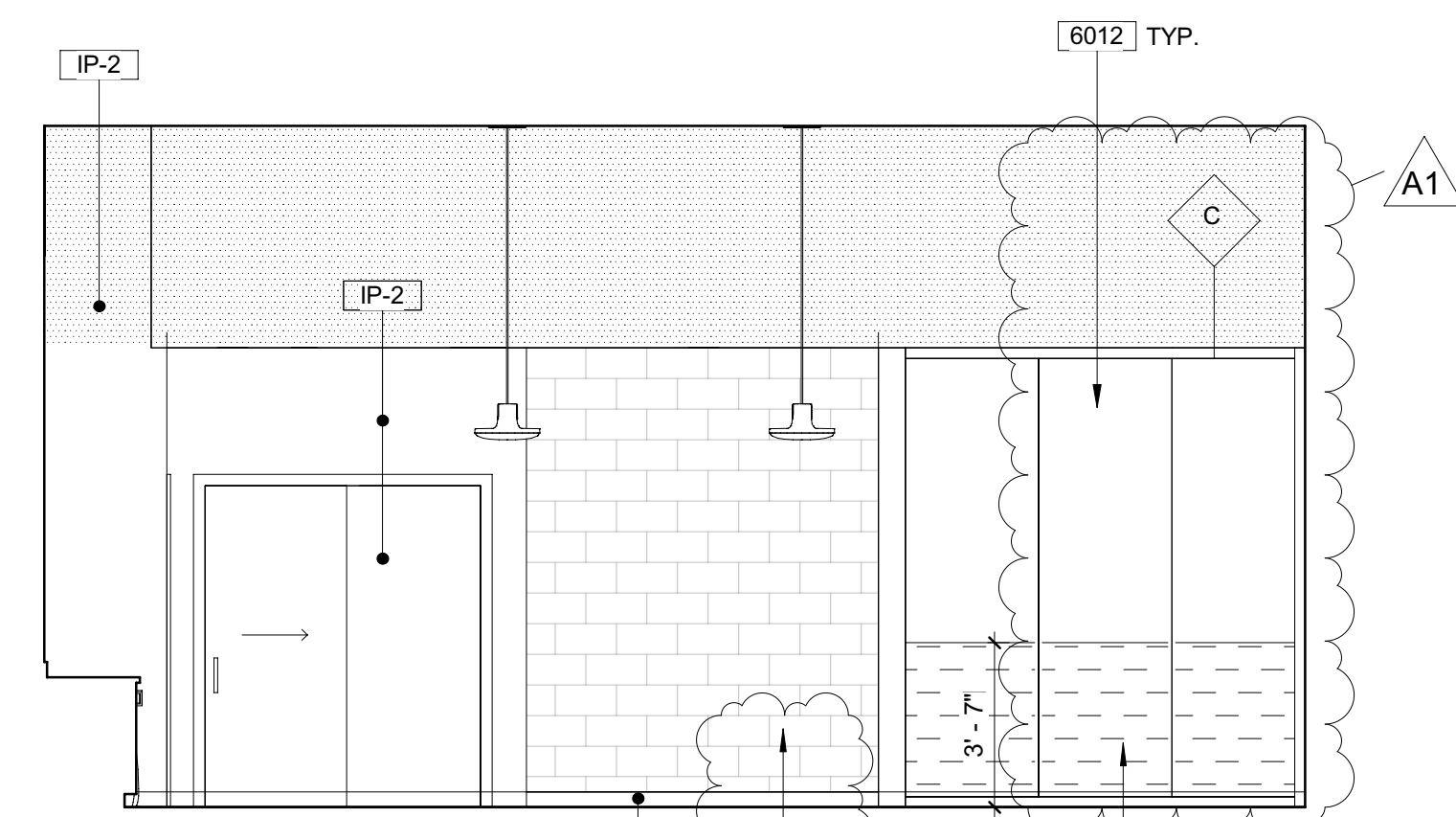
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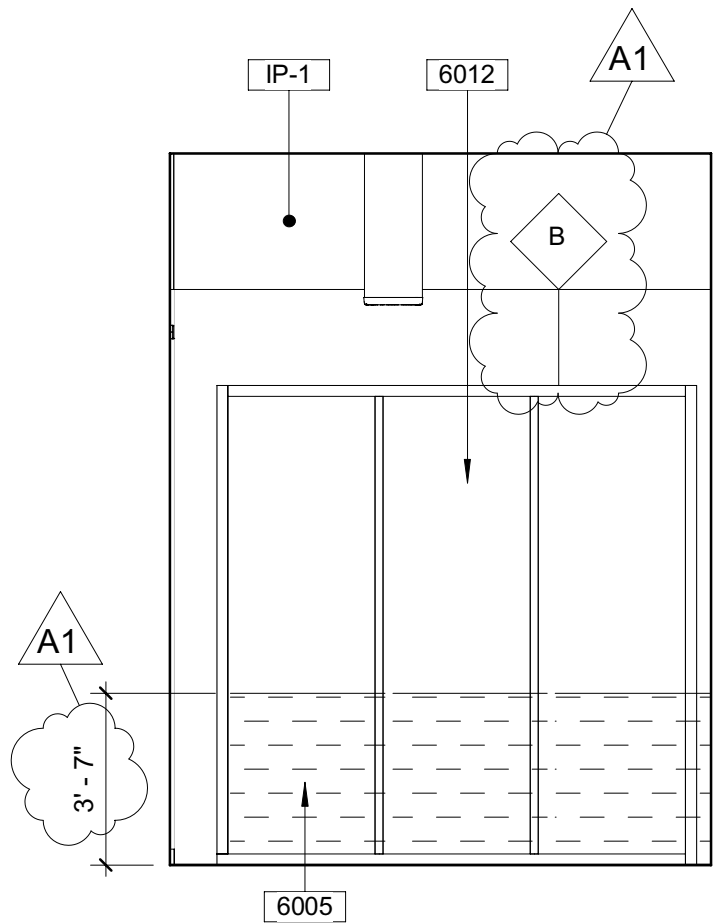
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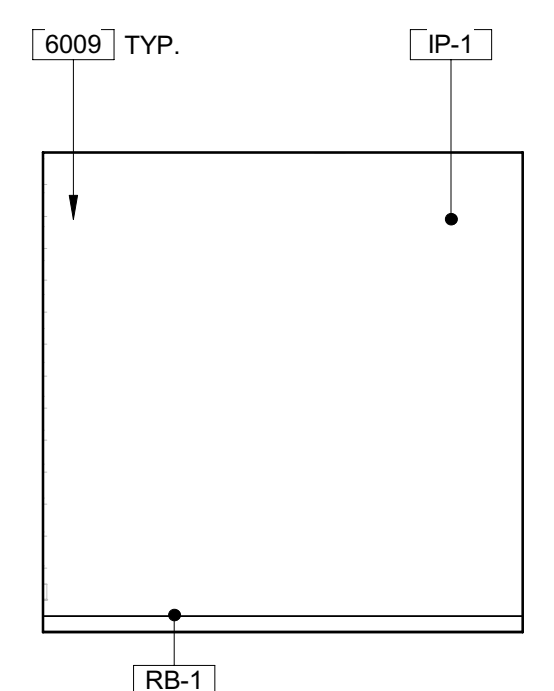
3 LIBRARY - S
A2101 SCALE: 1/4" = 1'-0"



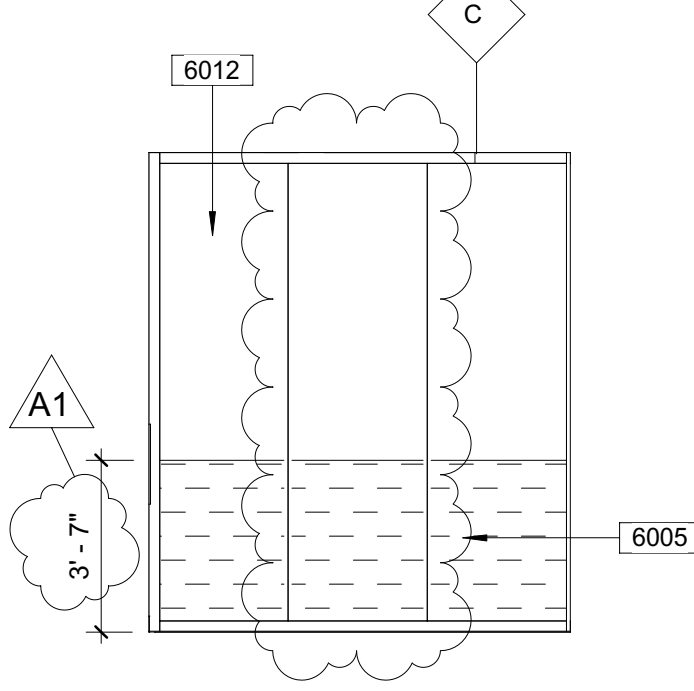
4 LIBRARY - W
A2101 SCALE: 1/4" = 1'-0"



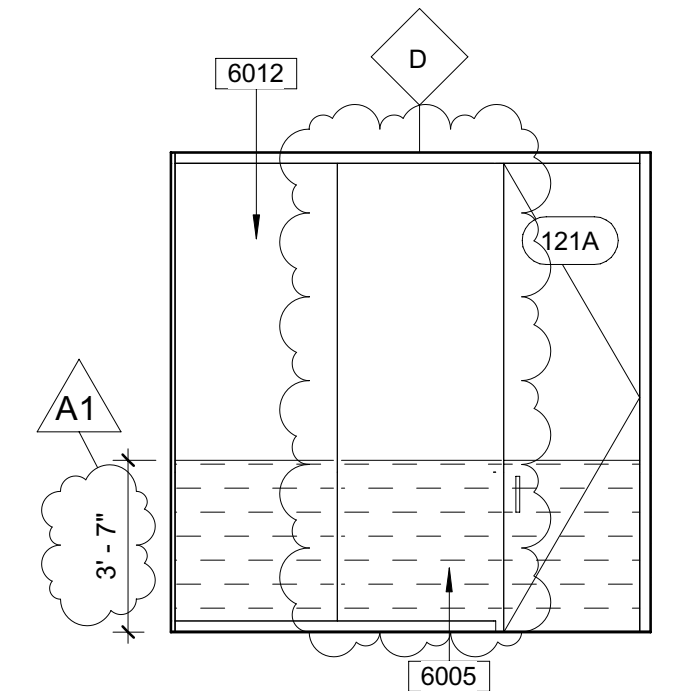
5 LIBRARY - NW
A2101 SCALE: 1/4" = 1'-0"



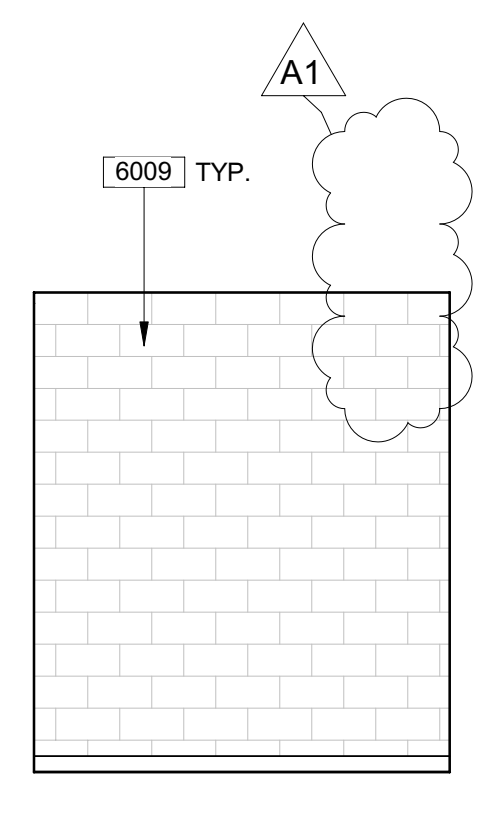
6 LIBRARIAN - N
A2101 SCALE: 1/4" = 1'-0"



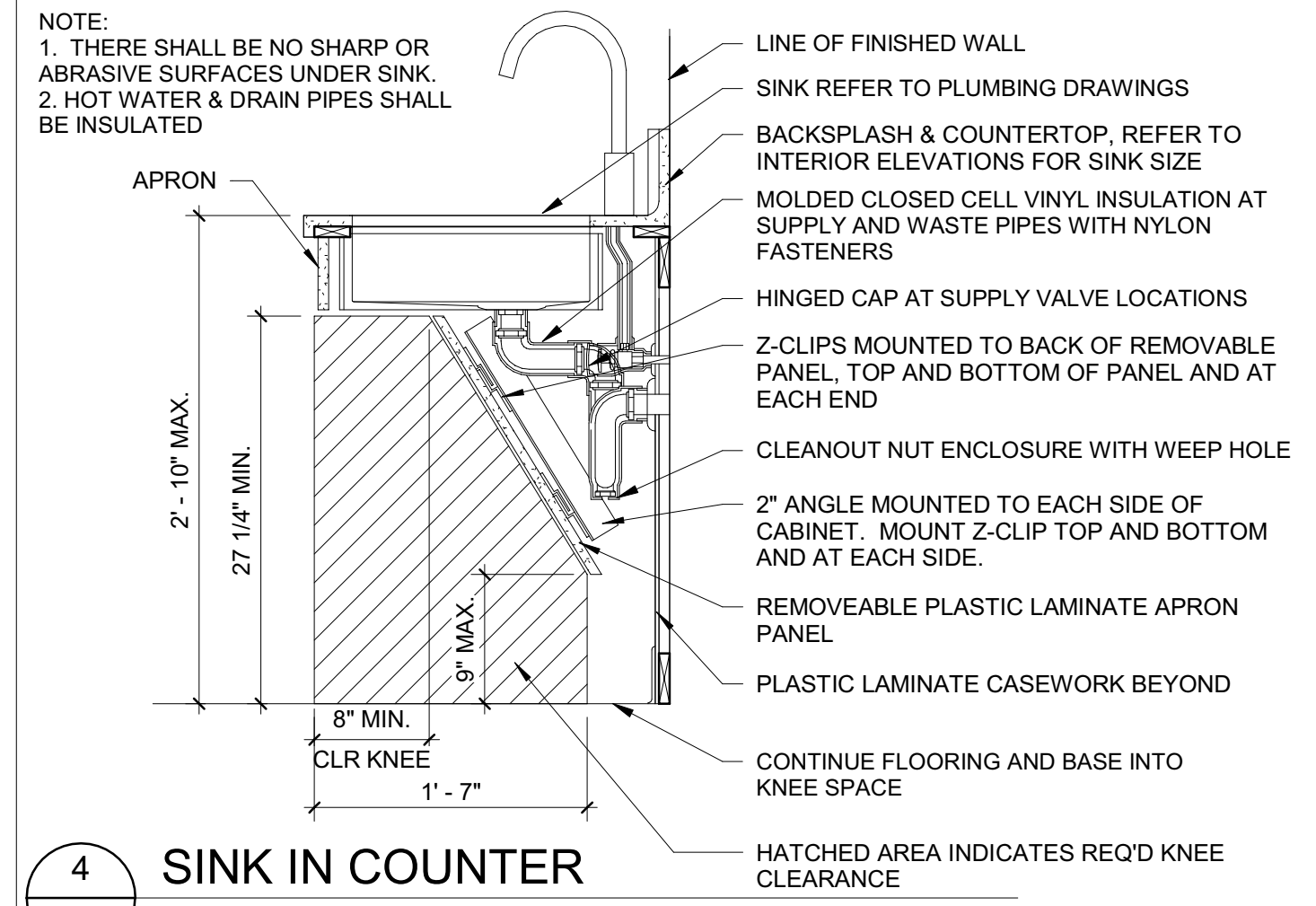
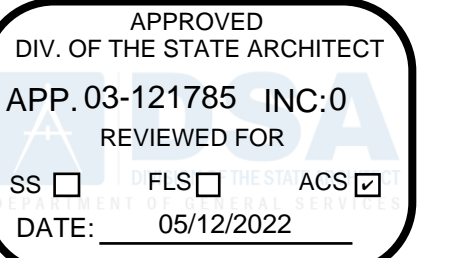
7 LIBRARIAN - E
A2101 SCALE: 1/4" = 1'-0"



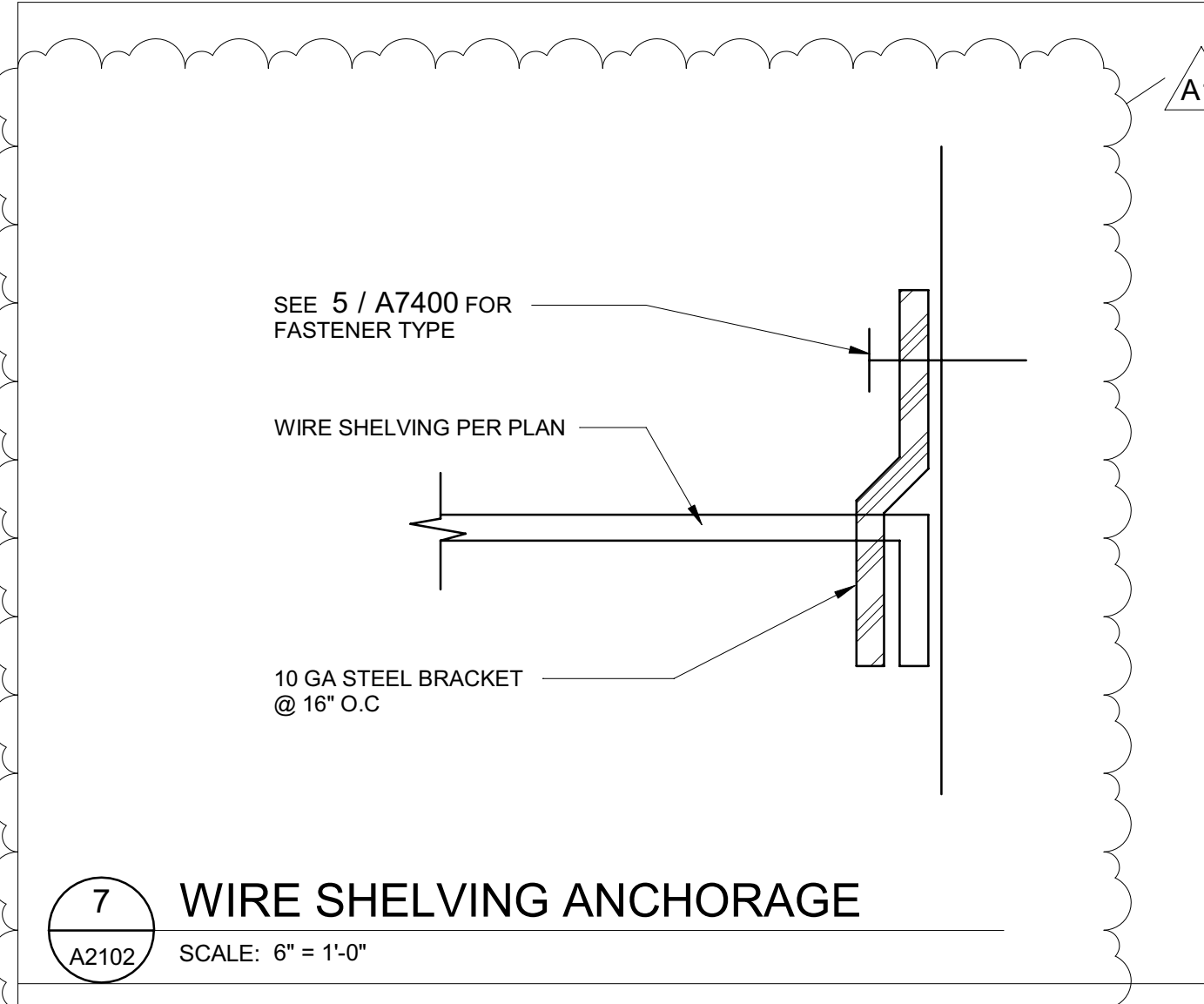
8 LIBRARIAN - S
A2101 SCALE: 1/4" = 1'-0"



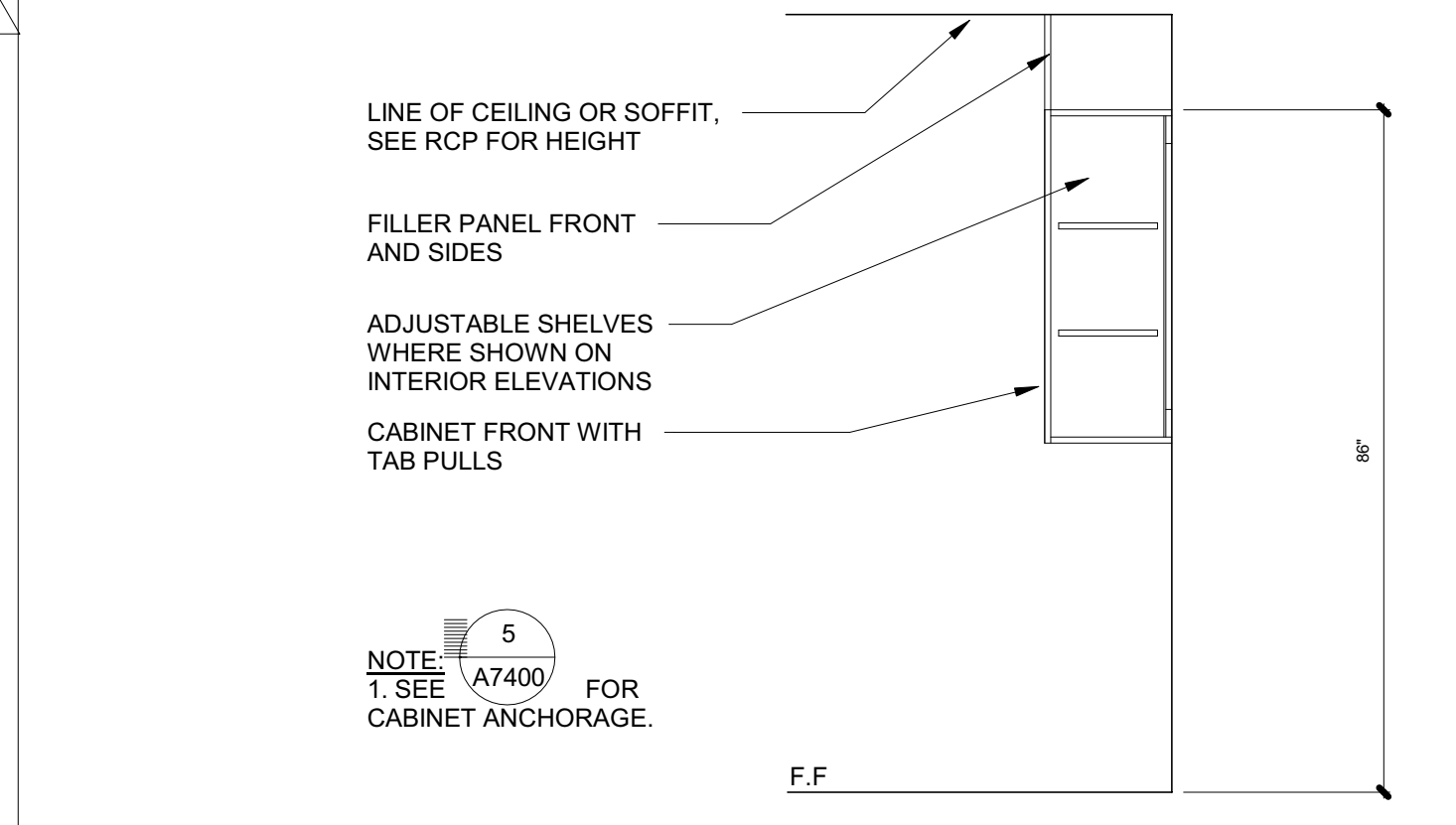
9 LIBRARIAN - W
A2101 SCALE: 1/4" = 1'-0"



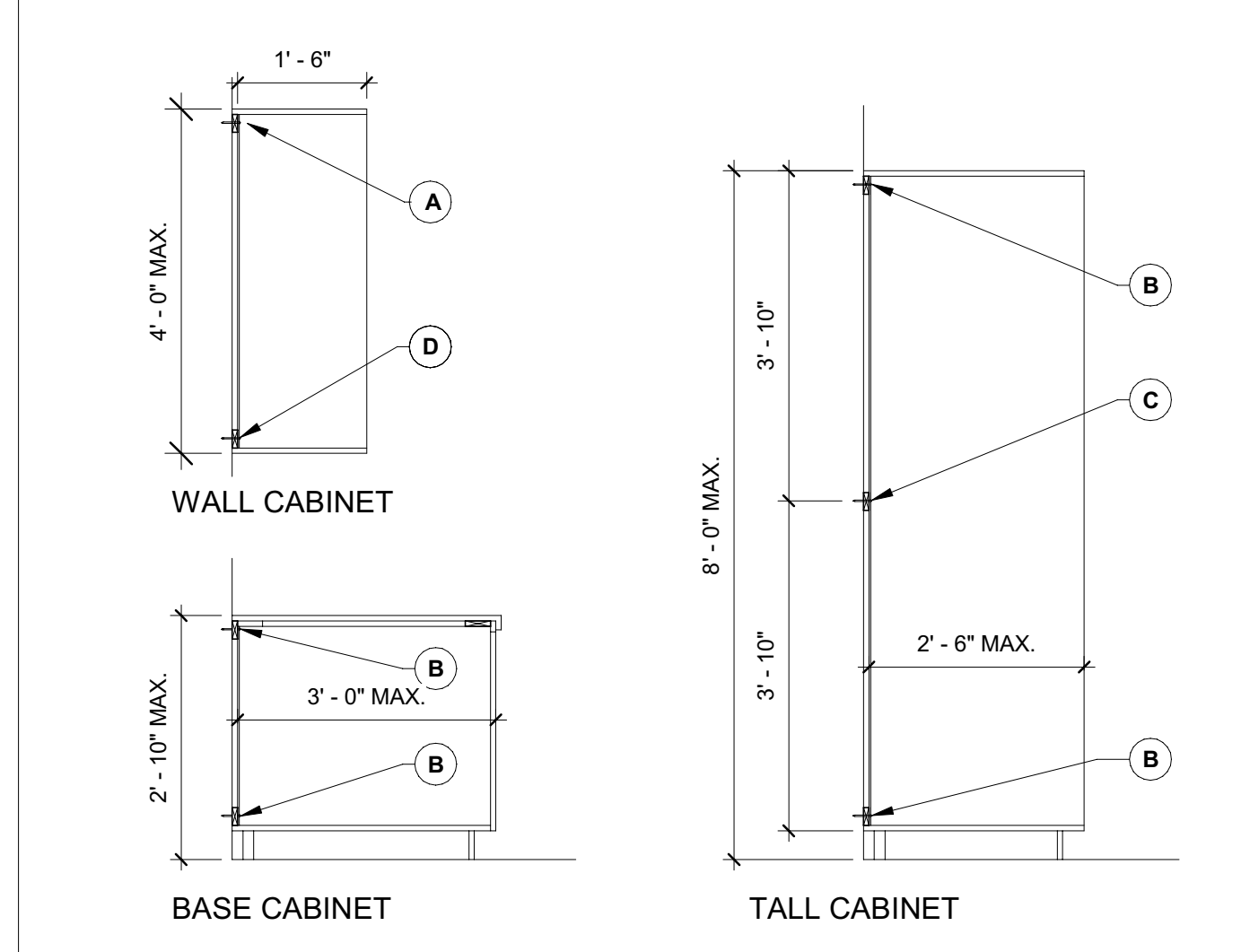
4 SINK IN COUNTER
SCALE: 1" = 1'-0"



7 WIRE SHELVING ANCHORAGE
SCALE: 6" = 1'-0"



3 UPPER CABINET PROFILE
SCALE: 1/2" = 1'-0"



GENERAL CASEWORK NOTES:

A. 1/4" PLYWOOD BACK WITH 3/4" x 3 1/2" NAILERS TO BE ATTACHED TO 3/4" CABINET SIDE, TOP AND BOTTOM PER WOODWORK INSTITUTE "MANUAL OF MILLWORK".
NOTE: FOR BLOCKING REFER TO DTL., 1 / A7400

FASTENER SPACING:

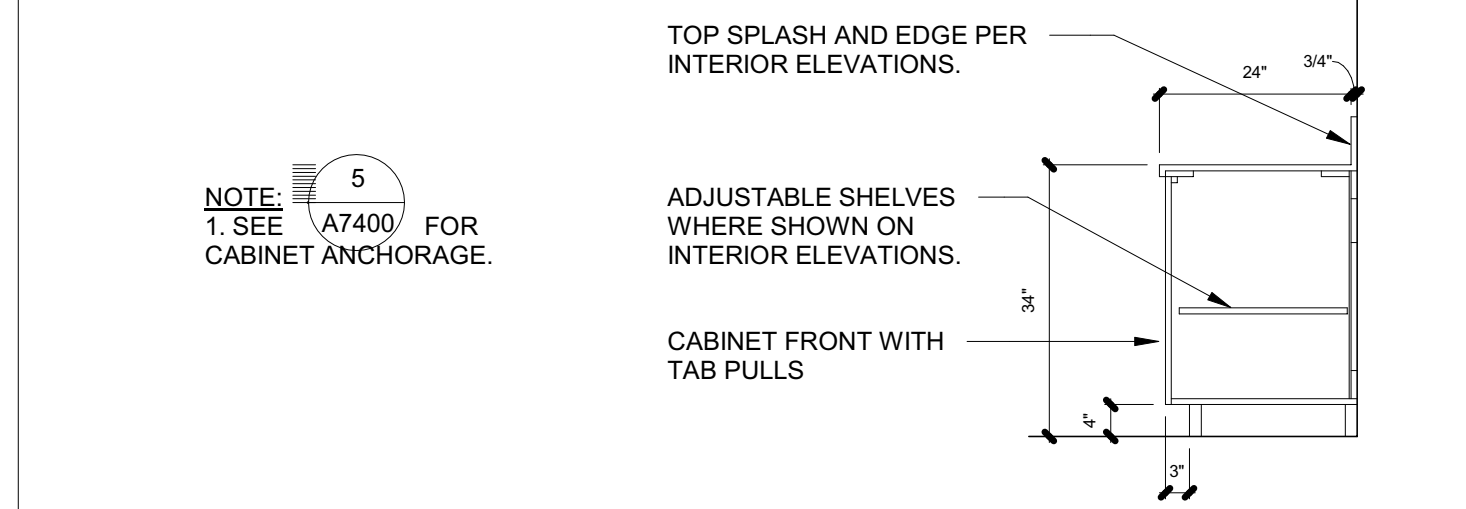
1. FASTENERS SHALL BE WITHIN 2" OF EACH CABINET END.
2. FASTENER SPACING SHALL BE AS FOLLOWS (MIN 4 FASTENERS, TWO AT TOP AND TWO AT BTM, PER CABINET):
A 16" O.C.
B 16" O.C.
C 32" O.C.
D 32" O.C.

3. FASTENERS TO VARYING SUPPORT ELEMENTS SHALL BE AS FOLLOWS:

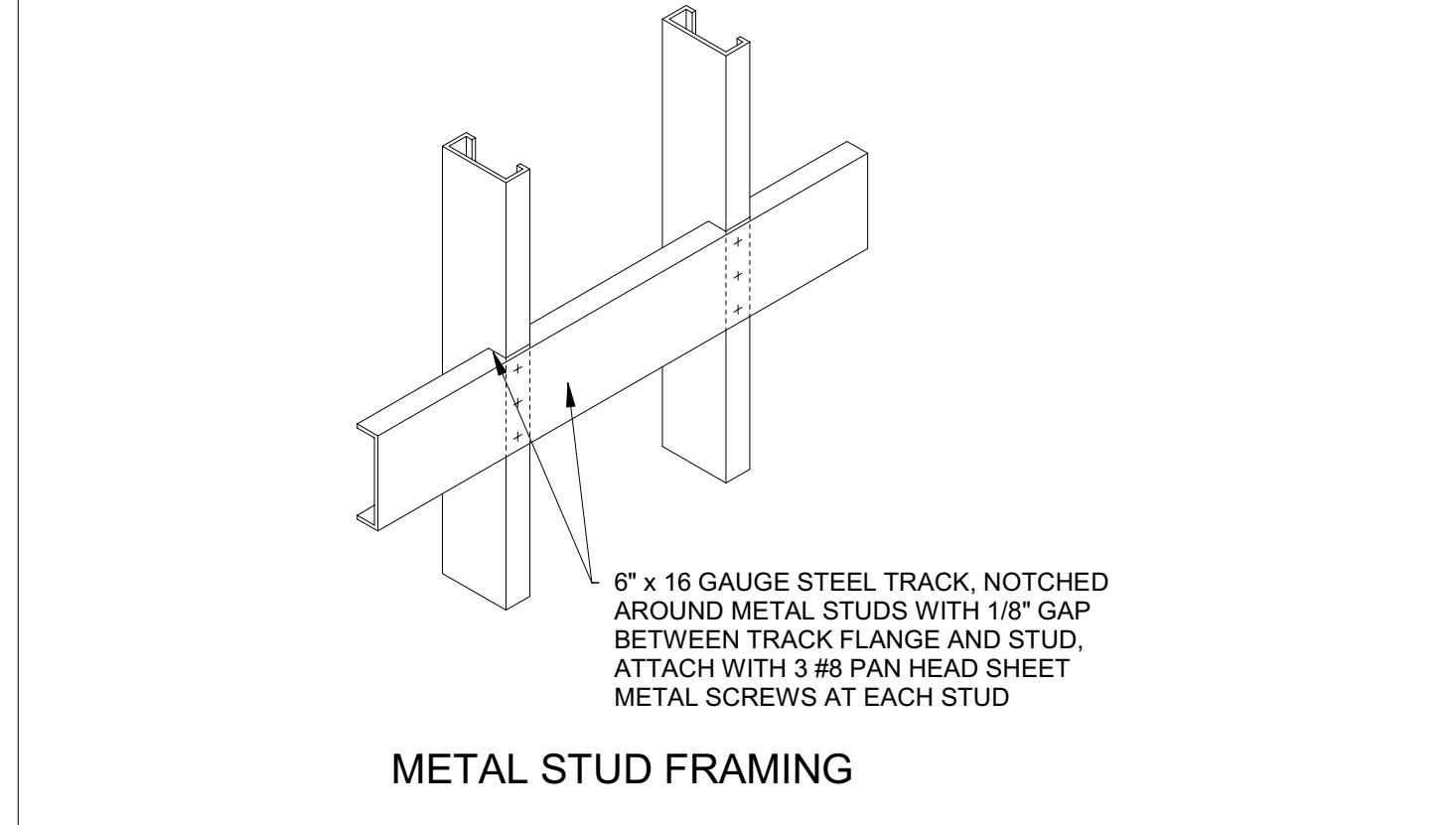
CONCRETE WALLS:
3/8" DIA "HILTI" KB-TZ ANCHOR WITH 2 5/8" MIN EMBED AND 25 FT LB TORQUE (PER ICC ER-1917)

METAL STUD FRAMING:
#14 PAN HEAD TEK-SCREW WITH WASHER

5 CABINET ANCHORAGE
SCALE: 1/2" = 1'-0"



2 BASE CABINET PROFILE
SCALE: 1/2" = 1'-0"



1 BLOCKING
SCALE: 1" = 1'-0"

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**State of California
Dept. of General Services**
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



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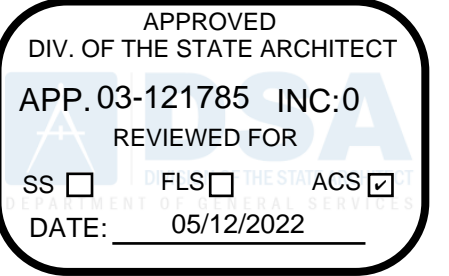
ISSUES

NO.	ISSUANCE	STATUS	DATE
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
DETAILS - CASEWORK

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
A7400
ISSUE
A1



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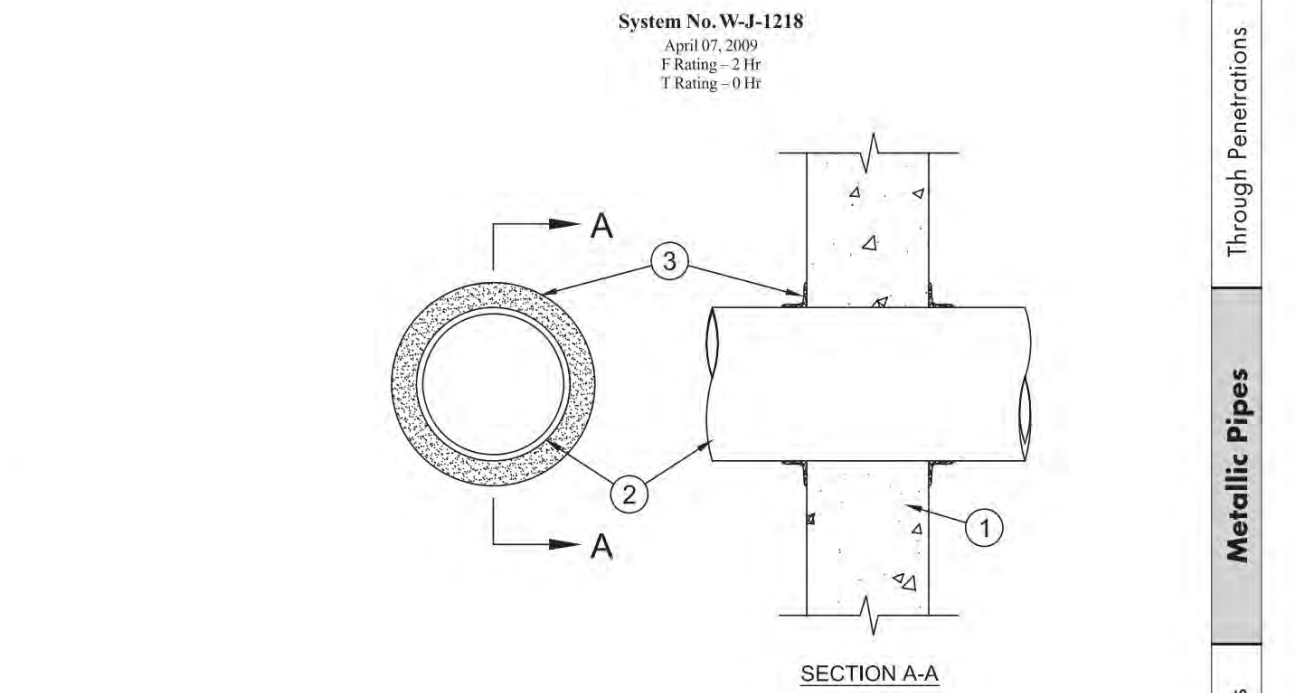
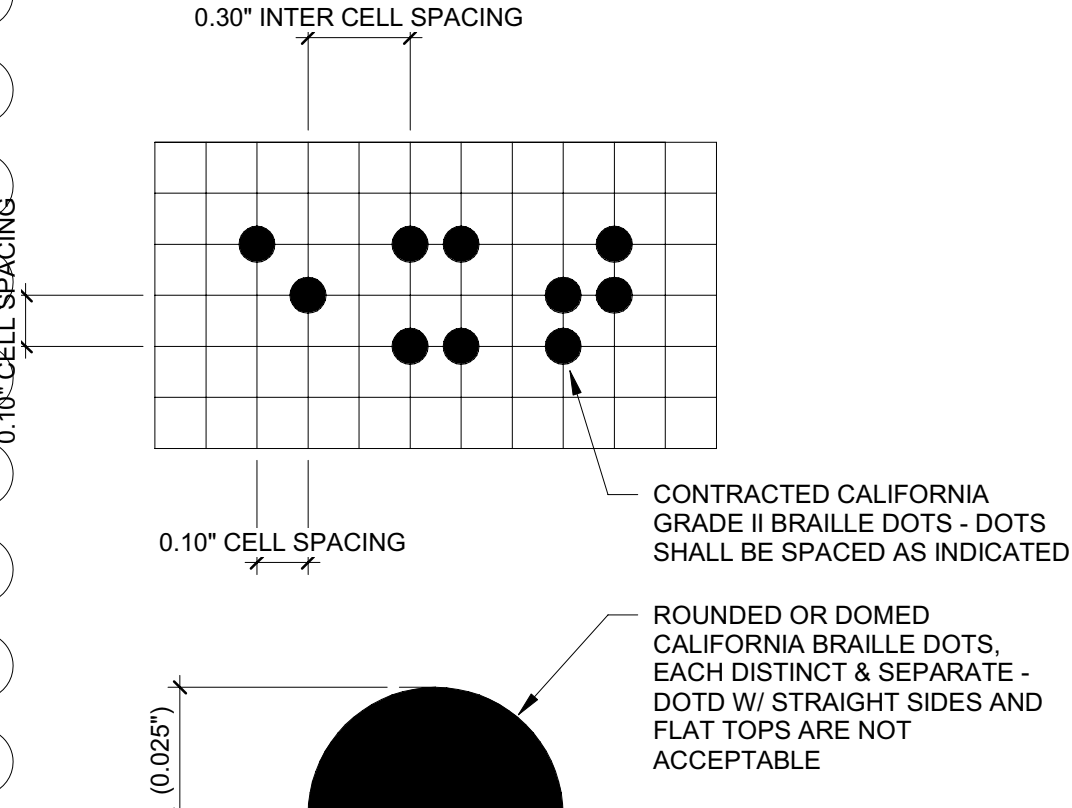
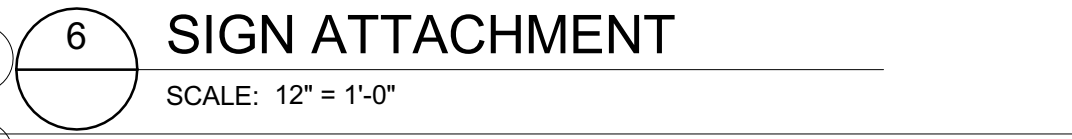
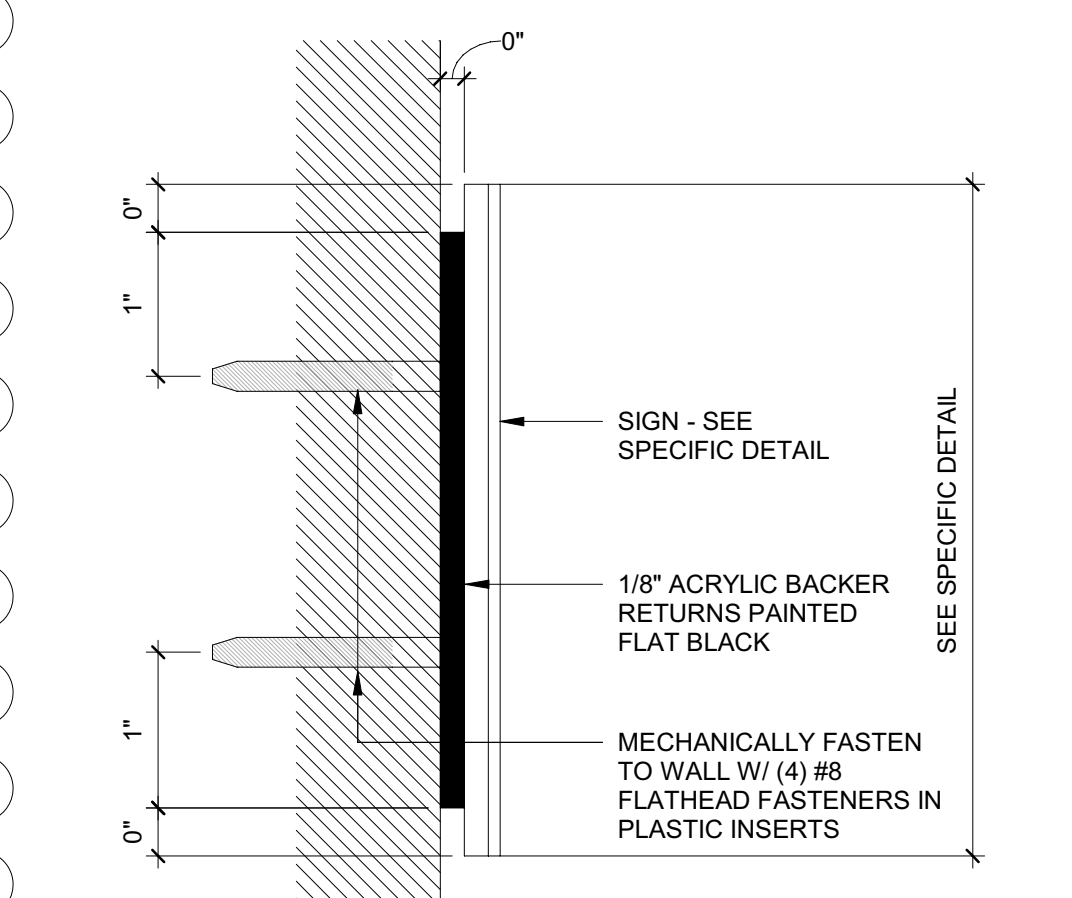
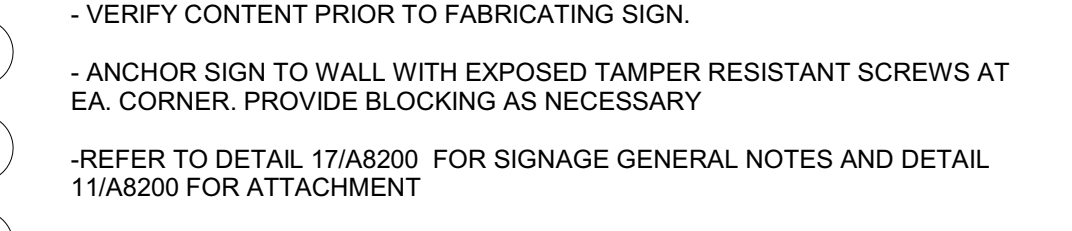
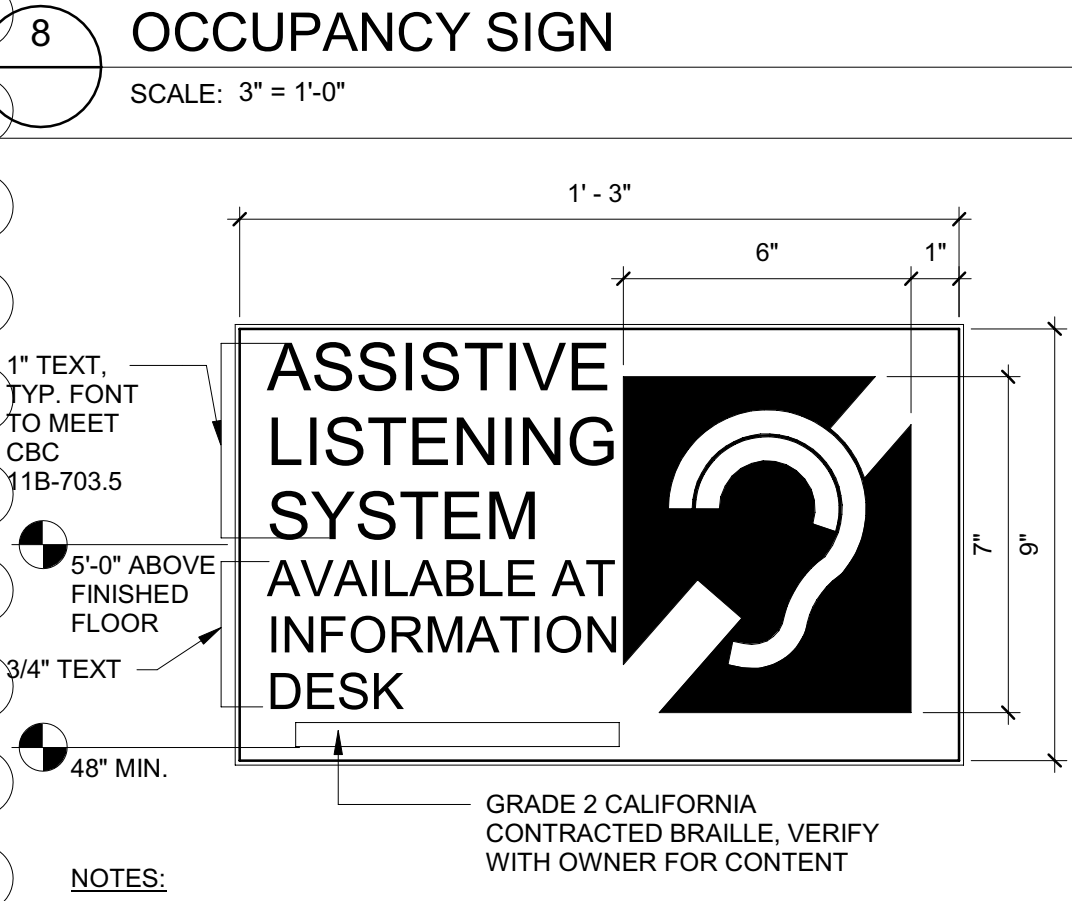
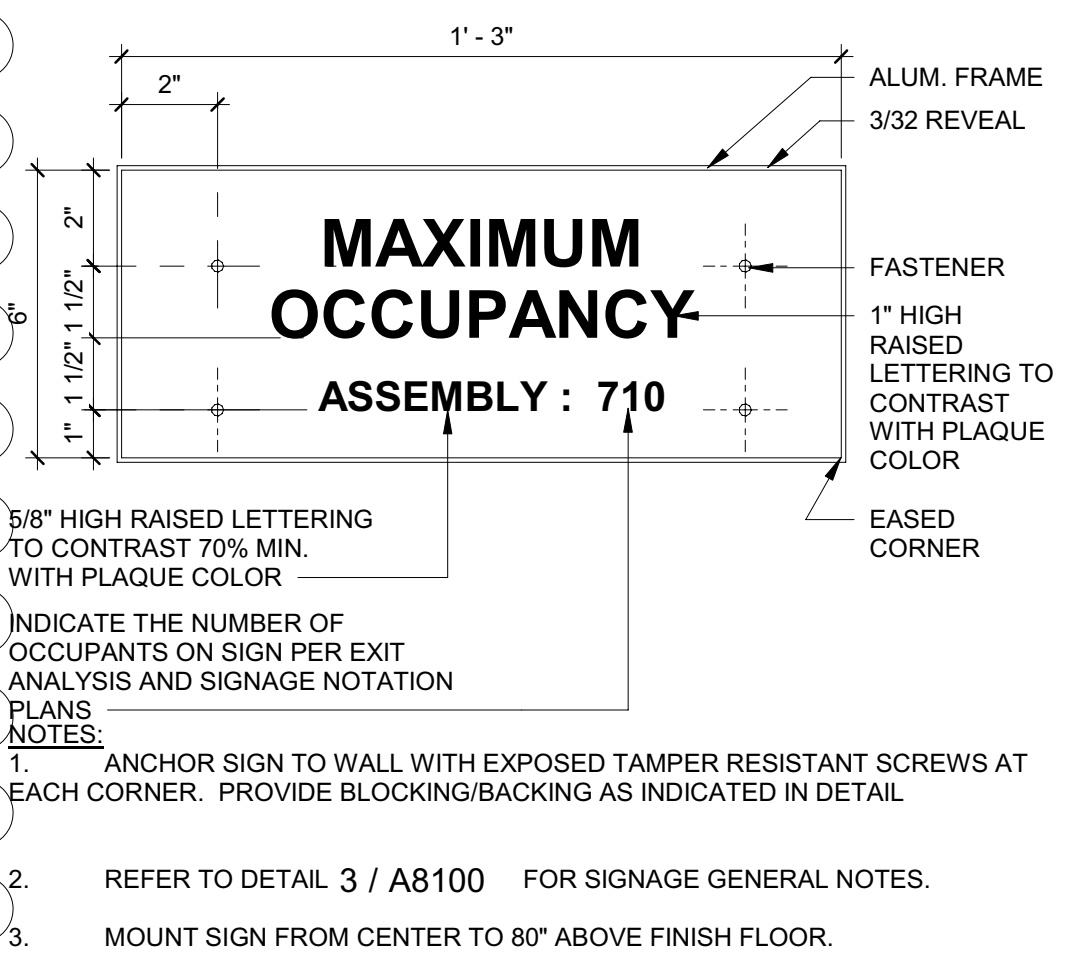
NO.	ISSUANCE	STATUS	DATE
F	50% CD - SCOPE REVISION		2020-11-29
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
DETAILS

DATE:	2022-05-11
DRAWN BY:	CD
CHK'D BY:	AB
SCALE:	As indicated
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	ISSUE
A8100	A1

SIGNAGE GENERAL NOTES

- ALL SIGNS AND PLAQUES TO BE 1/4" THICK.
- RAISE ALL SYMBOLS AND LETTERS 1/32" ABOVE SIGN/PLAQUE SURFACE UNLESS OTHERWISE NOTED.
- CONTRAST BETWEEN SIGN AND SIGN CONTENT SHALL BE 70% MIN. AND HAVE A NON-GLARE FINISH.
- CONTRAST BETWEEN SIGN AND MOUNTING SURFACE SHALL BE 70% MINIMUM.
- REFER TO DOOR ELEVATION FOR TYP. SIGNAGE LOCATION
- CALIFORNIA GRADE 2 DOTS SHALL BE DOMES RAISED A MINIMUM OF 1/40" (0.635mm), 1/10" (2.54mm) BETWEEN DOTS WITHIN CELLS, WITH 1/5" (5.08mm) BETWEEN EACH CELL.
- SIGNAGE SHALL COMPLY WITH CALIFORNIA BUILDING CODE SECTION 11-8702.1 THROUGH 11B-703.7.2.6.3.
- WHERE GLAZING OCCURS ADJACENT TO STRIKE SIDE OF DOOR, ADHERE SIGNAGE TO GLAZING AND PROVIDE "BLANK-OFF" PANEL ON OPPOSITE SIDE OF GLAZING.
- ROOM NAMES AND NUMBERING SHALL BE DETERMINED BY THE OWNER DURING THE CONSTRUCTION SUBMITTAL PROCESS.
- TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48" MIN. A.F.F. OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE LOWEST BRAILLE TACTILE CHARACTER AND 60" MAX. A.F.F. OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER (2019 CBC ARTICLE 11B-703.4.1).
- SIGNS AND IDENTIFICATION SHALL BE FIELD INSPECTED PER 2013 CBC 11B-703 AFTER INSTALLATION AND APPROVED BY THE ENFORCING AGENCY PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY PER APPENDIX CHAPTER 1, SECTION 110.2. OR FINAL APPROVAL WHERE NO CERTIFICATE OF OCCUPANCY IS ISSUED. THE INSPECTION SHALL INCLUDE, BUT NOT BE LIMITED TO, VERIFICATION THAT BRAILLE DOTS AND CELLS ARE PROPERLY SPACED AND THE SIZE, PROPORTION AND TYPE OF RAISED CHARACTERS ARE IN COMPLIANCE WITH THESE REGULATIONS. 2019 CBC 11B-703.3 - 703.4



- Wall Assembly - Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Block*. Max diam of opening is 12-3/4 in. (324 mm).
- Through-Penetration - One metallic pipe, conduit or tubing installed within the firestop system. The through penetration is to be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 - A. Steel Pipe - Nom 12 in. (305 mm) diam (or smaller) regular (or heavier) steel pipe.
 - B. Iron Pipe - Nom 12 in. (305 mm) diam (or smaller) galv service conduit or nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
 - C. Conduit - Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit or nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
 - D. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 - E. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
- Fill Void or Cavity Material* - Caulk or Sealant - Applied to fill the annular space flush with top surface of floor. In wall assemblies, required caulk thickness to be installed symmetrically on both sides of wall. Flush with wall surface. At point contact location between penetrant and sleeve or between penetrant and concrete, a min 1/4 in. (6 mm) diam bead of caulk shall be applied at top surface of floor and at both surfaces of wall. The hourly F Rating and the min required caulk thickness are dependent upon a number of parameters, as shown in the following table:

Min Floor or Wall Thickness (in. (mm))	Non Pipe Tube or Conduit (Diam. in. (mm))	Max Annular Space (in. (mm))	Min Caulk Thickness (in. (mm))	F Rating Hr.
2-1/2 (64)	12-12 (31.305)	1-3/8 (35)	1/2 (13)	2
2-1/2 (64)	12-12 (31.305)	1-3/4 (43)	1/2 (13)	2
4-1/2 (114)	12-12 (31.305)	1-3/8 (35)	1/2 (13)	2
4-1/2 (114)	12-12 (31.305)	1-3/4 (43)	1/2 (13)	3
4-1/2 (114)	12-20 (31.589)	2 (51)	1/2 (13)	3
4-1/2 (114)	12-20 (31.589)	2 (51)	1/2 (13)	3
4-1/2 (114)	12-12 (31.305)	1-3/4 (43)	1/2 (13)	3
4-1/2 (114)	12-20 (31.589)	2 (51)	1/2 (13)	3
5-1/2 (140)	12-14 (31.572)	1-3/8 (35)	1/2 (13)	4

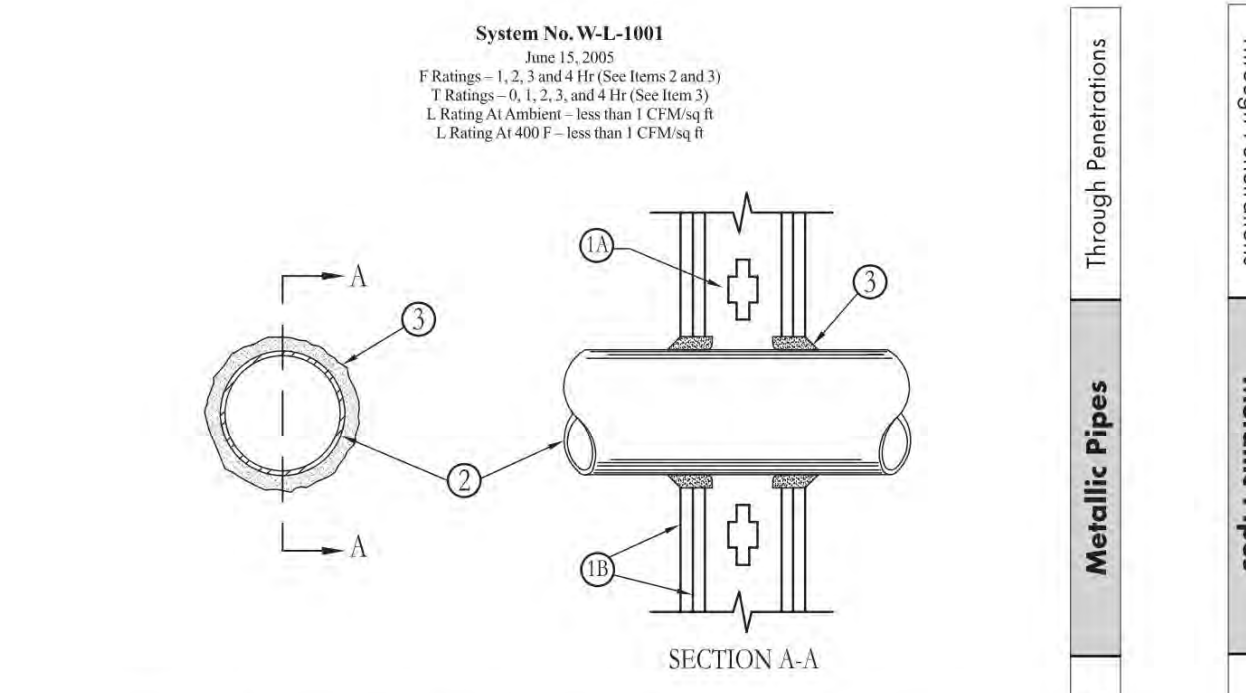
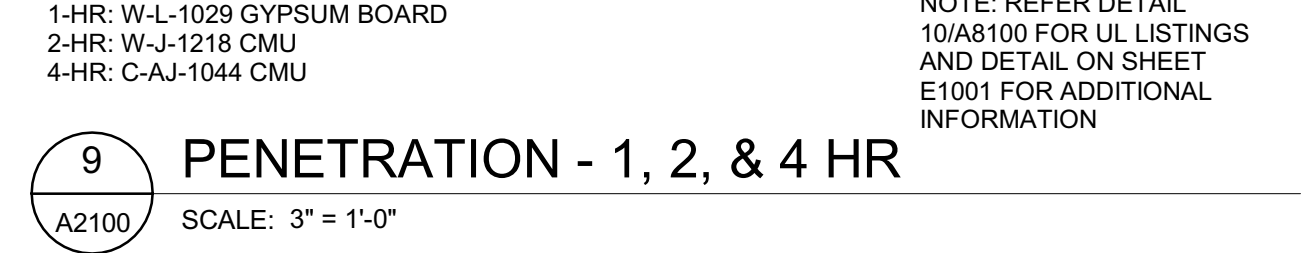
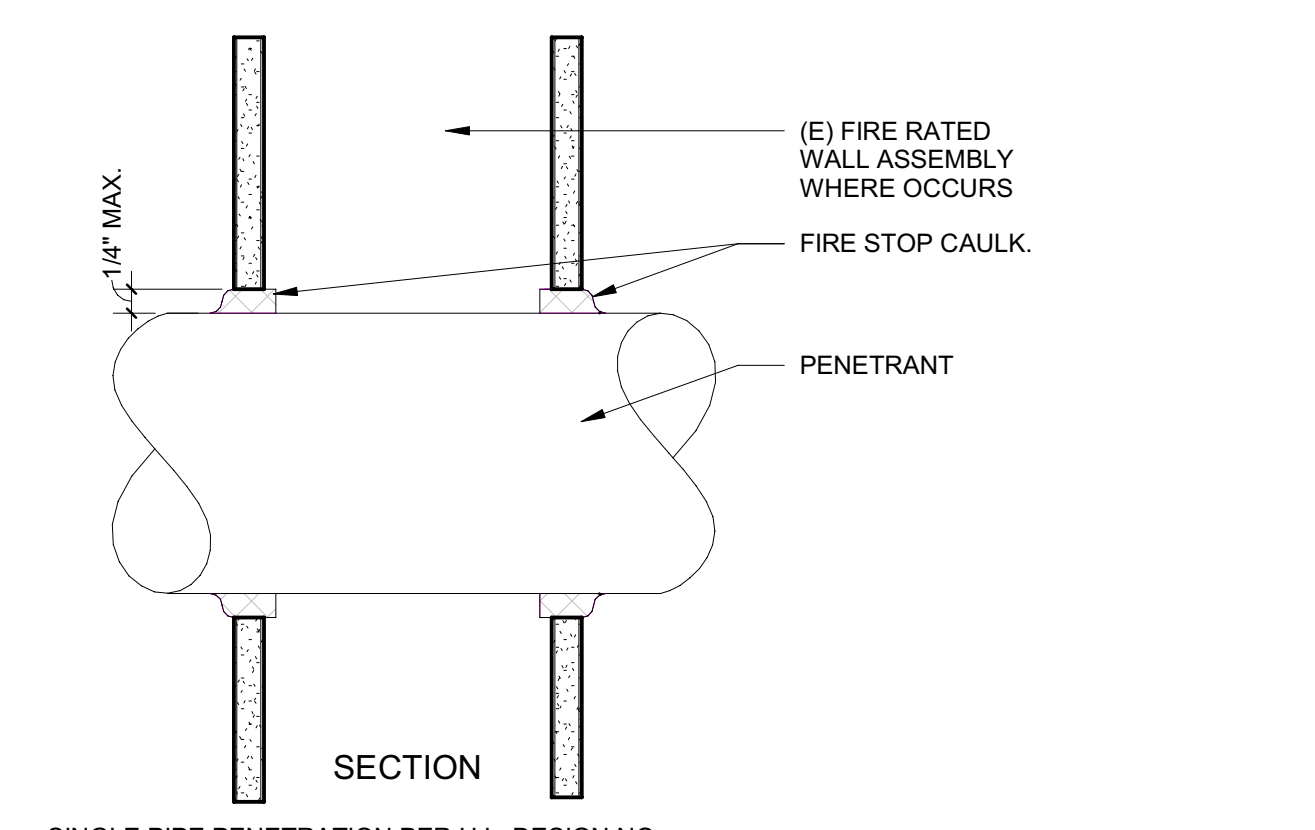
*When copper pipe is used, F Rating is 0 hr.
JM COMPANY - CP 25W/B - caulk or FB-3000 WT sealant.
*Bearing the UL Classification Marking
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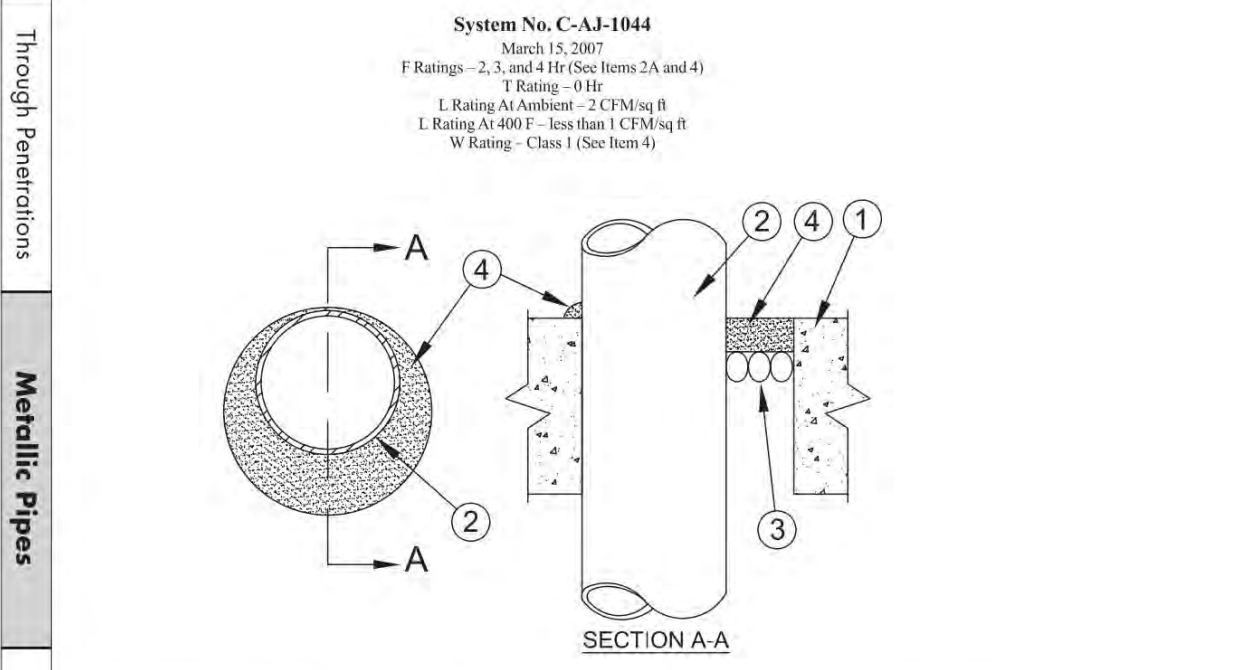
- Floor or Wall Assembly - Lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Except as noted in table under Item 6, min thickness of solid concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor may also be constructed of any min (152 mm) thick UL Classified hollow core Precast Concrete Units*. When floor is constructed of hollow core precast concrete units, packing material (Item 2) and caulk fill material (Item 4) is to be installed symmetrically on both sides of floor. Flush with floor surface. Wall assembly may also be constructed of any UL Classified Concrete Block*. Max diam of opening in solid lightweight or normal weight concrete floor is 32 in. (813 mm). Max diam of opening in floor constructed of hollow core precast concrete units is 7 in. (178 mm). See Concrete Blocks (CBZ) and Precast Concrete Units (CTU) categories in the Fire Resistance Directory for names of manufacturers.
- Steel Sleeve - (Optional, Not Shown) - Nom 1 in. (25 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or ground into floor or wall assembly. Sleeve may extend a max of 2 in. (51 mm) above top of floor or beyond other surface of wall. As an alternate, nom 1 1/2 in. (38 mm) diam (or smaller) min 0.028 (0.71 mm) thick galvanized steel sleeve cast or ground into floor or wall assembly flush with floor or wall surface.
- Through Penetrations - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Max annular space between pipe, conduit or tubing and edge of through opening is to be dependent on the parameters shown in Item 4. Min annular space between pipe or conduit and edge of through opening is 0 in. (point contact). Max annular space is to be shown in the table in Item 6. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 - A. Steel Pipe - Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 - B. Iron Pipe - Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
 - C. Conduit - Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
 - D. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
 - E. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 - F. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
- Packing Material - Polyethylene beaker end or nom 1 in. (25 mm) thickness of rigidly packed mineral wool batt or glass fiber insulation (Item 1) installed in an opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material (Item 4).
- Forming Material* - As an alternate to the packing material (Item 1), nom 4 in. (102 mm) wide strips of min 1/2 (13 mm) thick compressible mat to be stacked to a thickness greater than the width of the annular space and compression-fitted, edge-to-edge, to fill the annular space to a min 1 in. (25 mm) depth. As an option, the strips of min 1/2 (13 mm) thick compressible mat may be folded in half, lengthwise, and stacked to a thickness greater than the width of the annular space and compression-fitted, edge-to-edge, to fill the annular space to a min 2 in. (51 mm) depth. Top of forming material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material. JM COMPANY - Fire Barrier Packing Material.

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- Wall Assembly - The 1, 2, 3 or 4 hr fire-rated gypsum wallboard wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
 - A. Studs - Wall framing may consist of either wood studs (nom 2 in fire rated assembly) or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) on center with nom 2 by 4 in. (51 by 102 mm) lumber on plates and cross braces. Steel studs to be min 3-5/8 in. (92 mm) wide by 1-3/8 in. (35 mm) deep channel spaced 24 in. (610 mm) C.C.
 - B. Gypsum Board* - Nom 1/2 x 5/8 in. (13 or 16 mm) thick, 4 ft. (122 mm) wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 20 in. (508 mm).
 - C. Through Penetration - One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and periphery of opening shall be min 0 in. (0 mm) (point contact) to max 2 in. (51 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 - A. Steel Pipe - Nom 24 in. (610 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 - B. Iron Pipe - Nom 24 in. (610 mm) diam (or smaller) service weight or heavier cast iron steel pipe, nom 12 in. (305 mm) diam (or smaller) or Class 50 (or heavier) ductile iron pressure pipe.
 - C. Conduit - Nom 6 in. (152 mm) diam (or smaller) steel conduit or nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
 - D. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 - E. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
 - F. Through Penetrating Product* - Flexible Metal Piping - The following types of steel flexible metal gas piping may be used:
 - 1. Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering or piping may or may not be removed on both sides of floor or wall assembly.
 - 2. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering or piping may or may not be removed on both sides of floor or wall assembly.
 - 3. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering or piping may or may not be removed on both sides of floor or wall assembly.

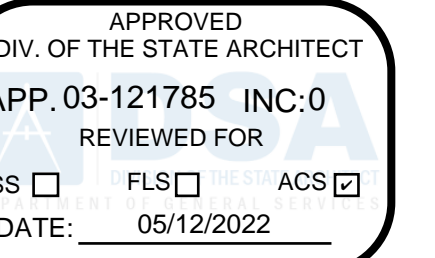
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- Floor or Wall Assembly - Lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Except as noted in table under Item 6, min thickness of solid concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor may also be constructed of any min (152 mm) thick UL Classified hollow core Precast Concrete Units*. When floor is constructed of hollow core precast concrete units, packing material (Item 2) and caulk fill material (Item 4) is to be installed symmetrically on both sides of floor. Flush with floor surface. Wall assembly may also be constructed of any UL Classified Concrete Block*. Max diam of opening in solid lightweight or normal weight concrete floor is 32 in. (813 mm). Max diam of opening in floor constructed of hollow core precast concrete units is 7 in. (178 mm). See Concrete Blocks (CBZ) and Precast Concrete Units (CTU) categories in the Fire Resistance Directory for names of manufacturers.
- Steel Sleeve - (Optional, Not Shown) - Nom 1 in. (25 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or ground into floor or wall assembly. Sleeve may extend a max of 2 in. (51 mm) above top of floor or beyond other surface of wall. As an alternate, nom 1 1/2 in. (38 mm) diam (or smaller) min 0.028 (0.71 mm) thick galvanized steel sleeve cast or ground into floor or wall assembly flush with floor or wall surface.
- Through Penetrations - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Max annular space between pipe, conduit or tubing and edge of through opening is to be dependent on the parameters shown in Item 4. Min annular space between pipe or conduit and edge of through opening is 0 in. (point contact). Max annular space is to be shown in the table in Item 6. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
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 - D. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
 - E. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 - F. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
- Packing Material - Polyethylene beaker end or nom 1 in. (25 mm) thickness of rigidly packed mineral wool batt or glass fiber insulation (Item 1) installed in an opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material (Item 4).
- Forming Material* - As an alternate to the packing material (Item 1), nom 4 in. (102 mm) wide strips of min 1/2 (13 mm) thick compressible mat to be stacked to a thickness greater than the width of the annular space and compression-fitted, edge-to-edge, to fill the annular space to a min 1 in. (25 mm) depth. As an option, the strips of min 1/2 (13 mm) thick compressible mat may be folded in half, lengthwise, and stacked to a thickness greater than the width of the annular space and compression-fitted, edge-to-edge, to fill the annular space to a min 2 in. (51 mm) depth. Top of forming material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material. JM COMPANY - Fire Barrier Packing Material.

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Approval of this plan does not authorize or approve any omission or deviation from applicable requirements. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

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State of California
 Dept. of General Services

 Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT
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 600 State Drive
 Los Angeles, CA 90037

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 IBI GROUP
 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 tel 213 769 0011 fax 213 769 0016
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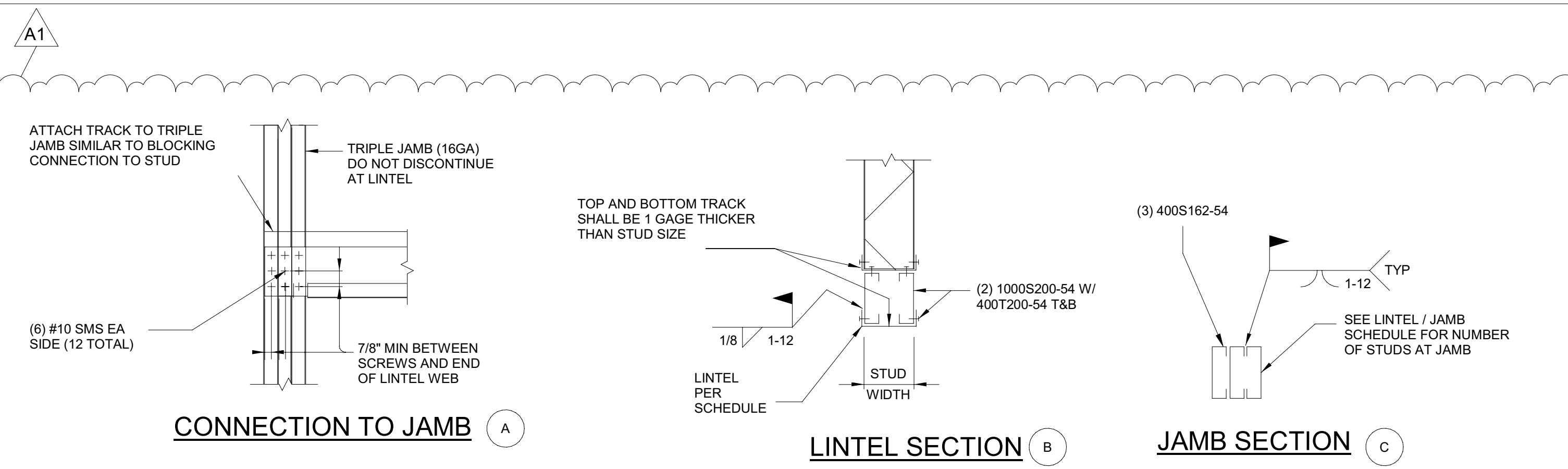
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G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
FRAMING DETAILS

DATE: 2022-05-02
 DRAWN BY: RR
 CHKD BY: AB
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
A8200
 ISSUE
A1



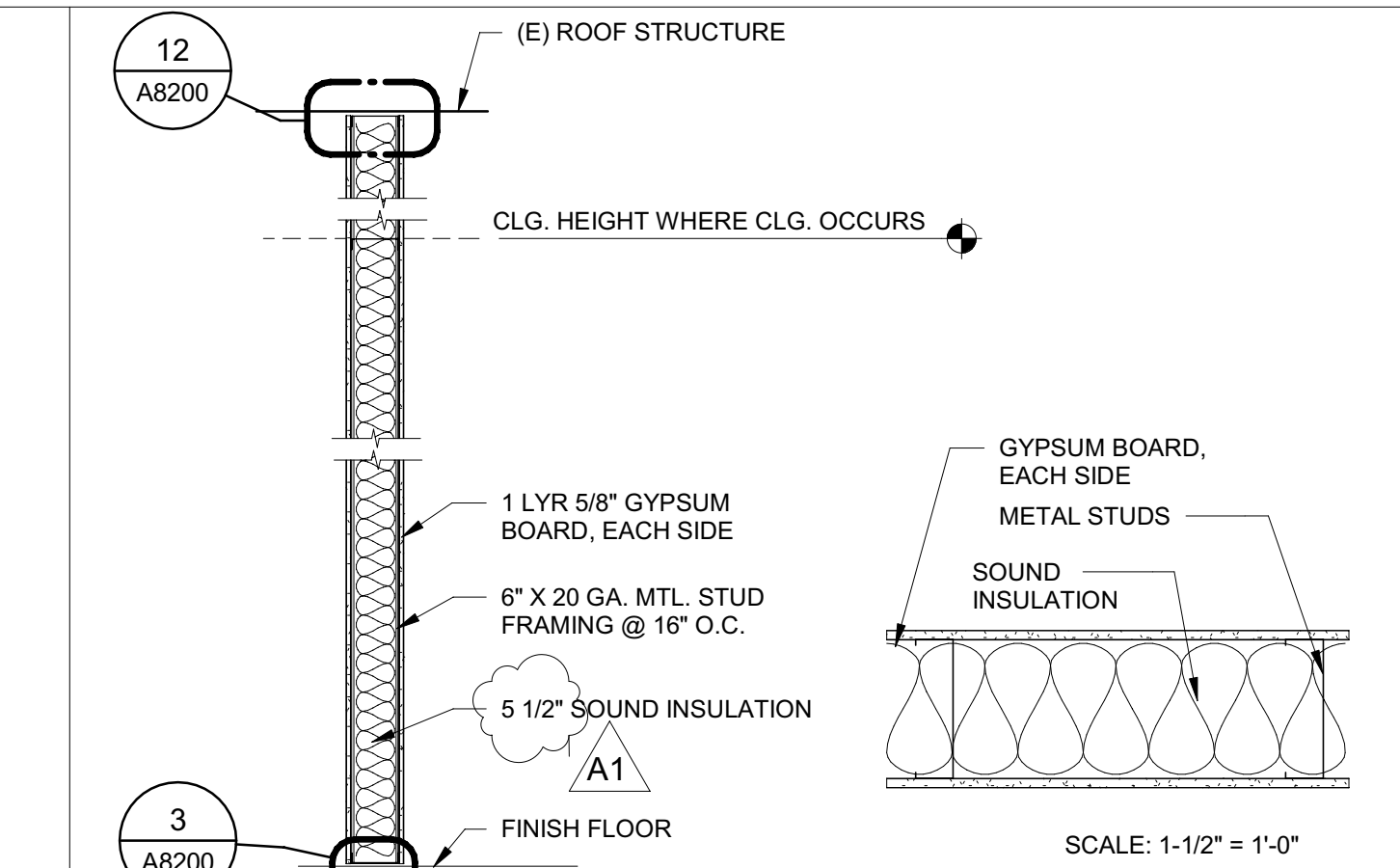
10 LINTEL/JAMB @ STOREFRONT
 SCALE: 1" = 1'-0"

HEADER JAMB AND SILL SCHEDULE

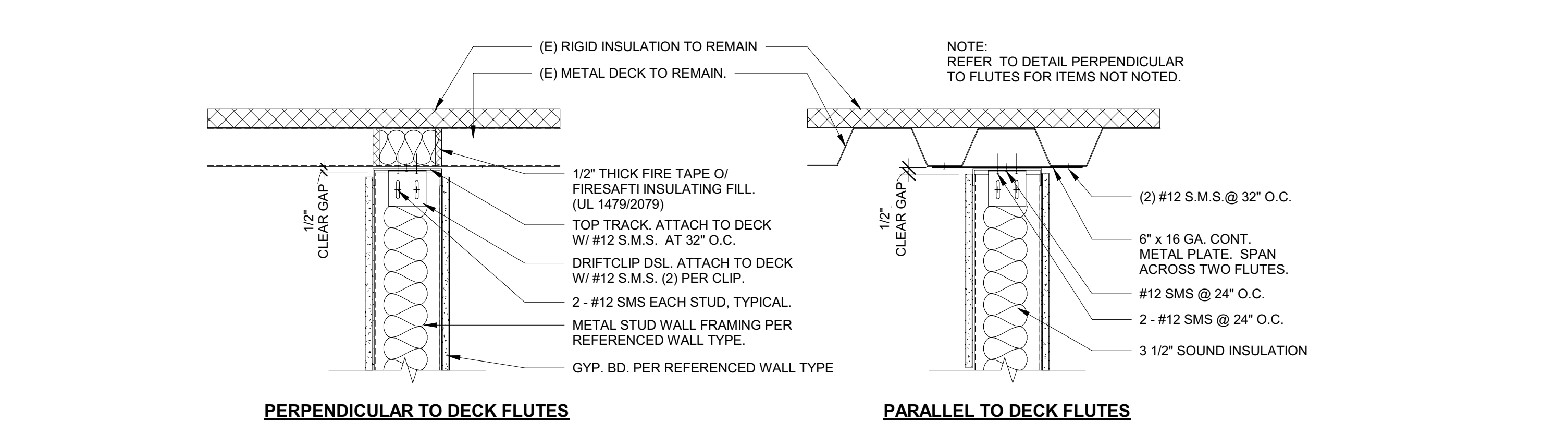
	HEADER	JAMB	SILL
OPENING WIDTH	INTERIOR NON-BEARING WALL	INTERIOR NON-BEARING WALL	INTERIOR NON-BEARING WALL
W' < 4'-0"	2-600S162-43 & 2-XXXT150-43	XXXS162-54	XXXT150-43
4'-0" < W' < 10'-0"	2-600S162-43 & 2-XXXT150-43	(2) XXXS162-68	XXXT150-54
10'-0" < W' < 14'-0"	(2) 400S125-43 STUDS & (2) 400T150-43 TRACKS		
17'-0" MAX	(2) 1000S200-54 STUDS & (2) 400T200-54 TRACKS T&B	(3) 400S162-54	

NOTES:
 1. HEADER AND JAMB THICKNESS SHALL BE IN ACCORDANCE WITH THE SCHEDULE OR TYPICAL WALL STUD THICKNESS WHICHEVER IS GREATER
 2. XXX = WALL STUD WIDTH

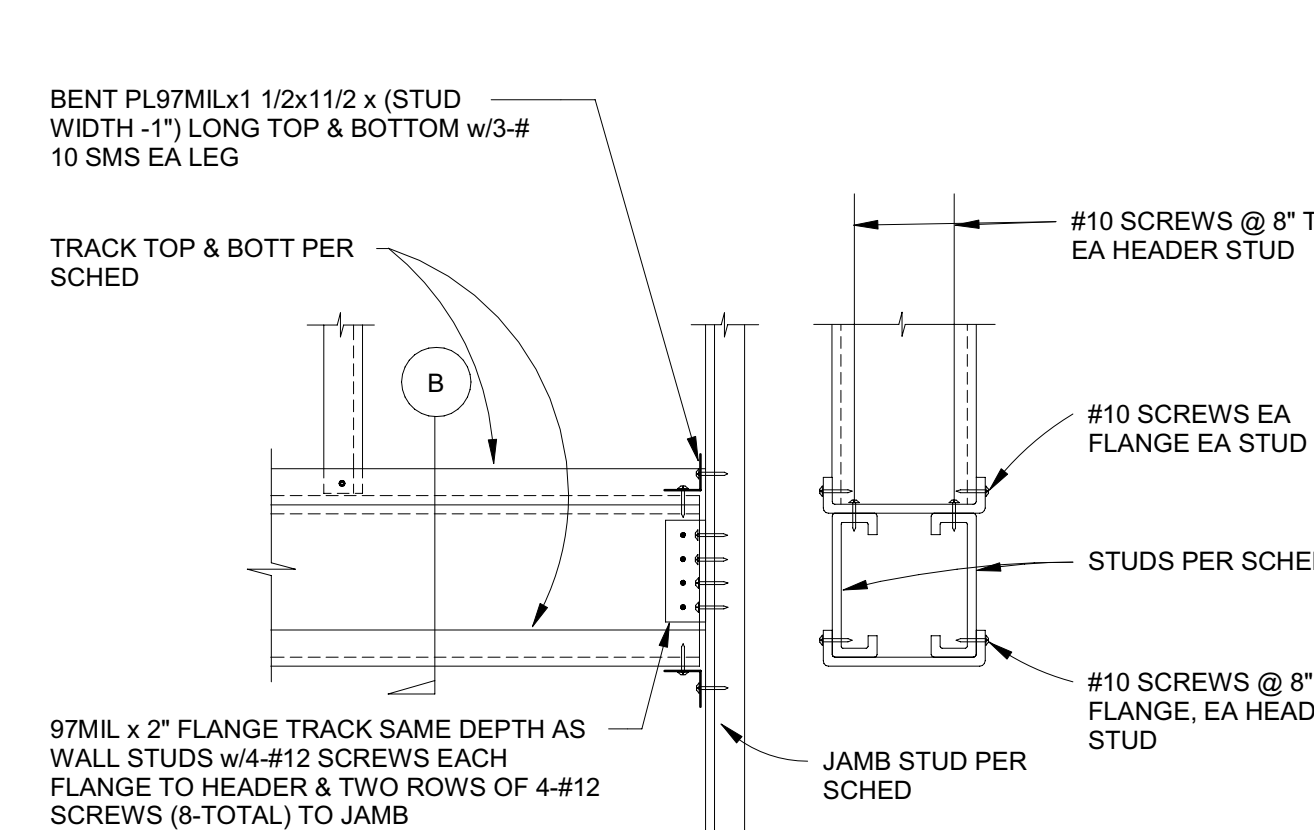
8 HEADER JAMB AND SILL SCHEDULE
 SCALE: 3/4" = 1'-0"



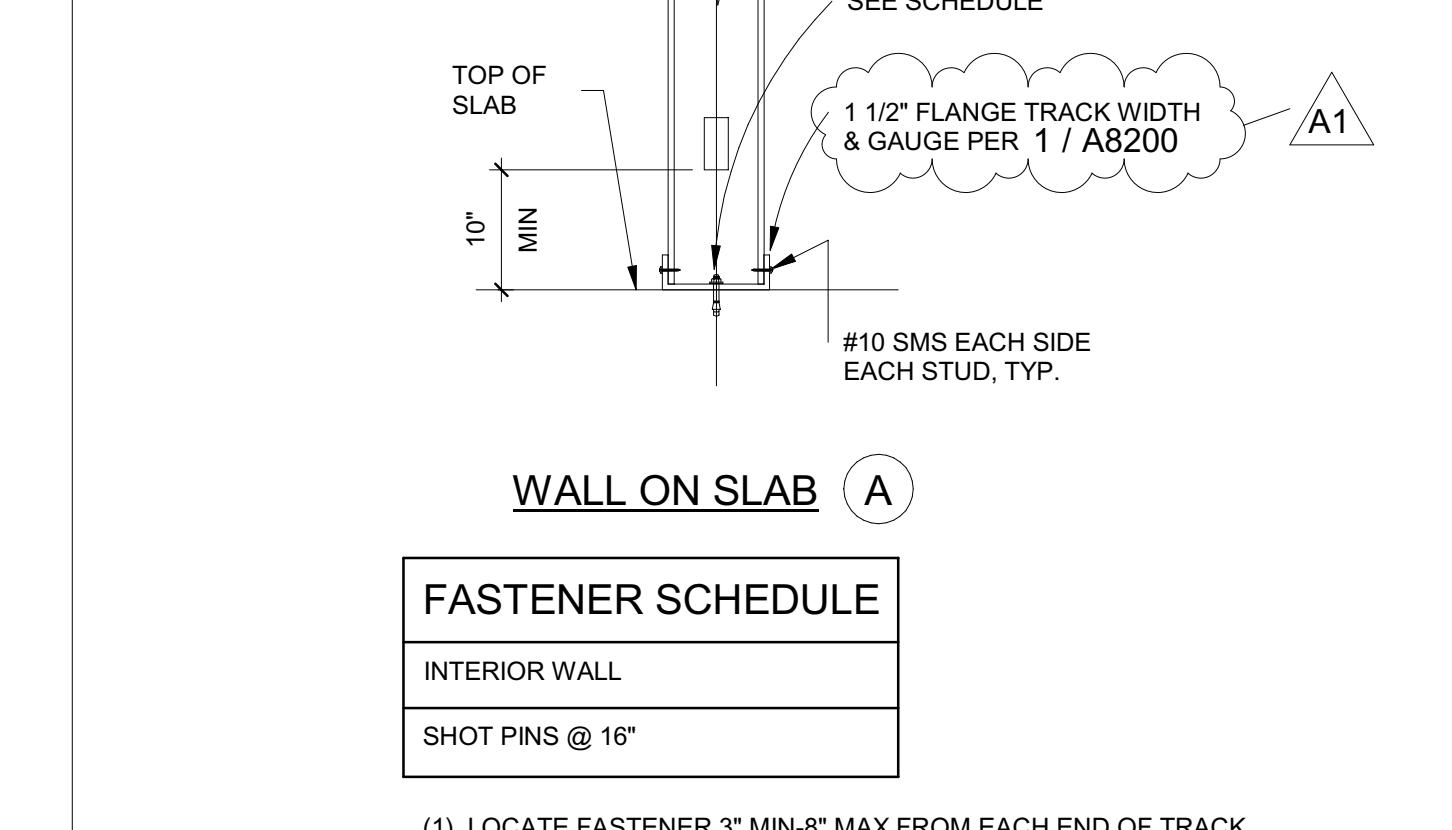
4 INTERIOR-MTL. STUD - TYPE 'A'
 SCALE: 1/2" = 1'-0"



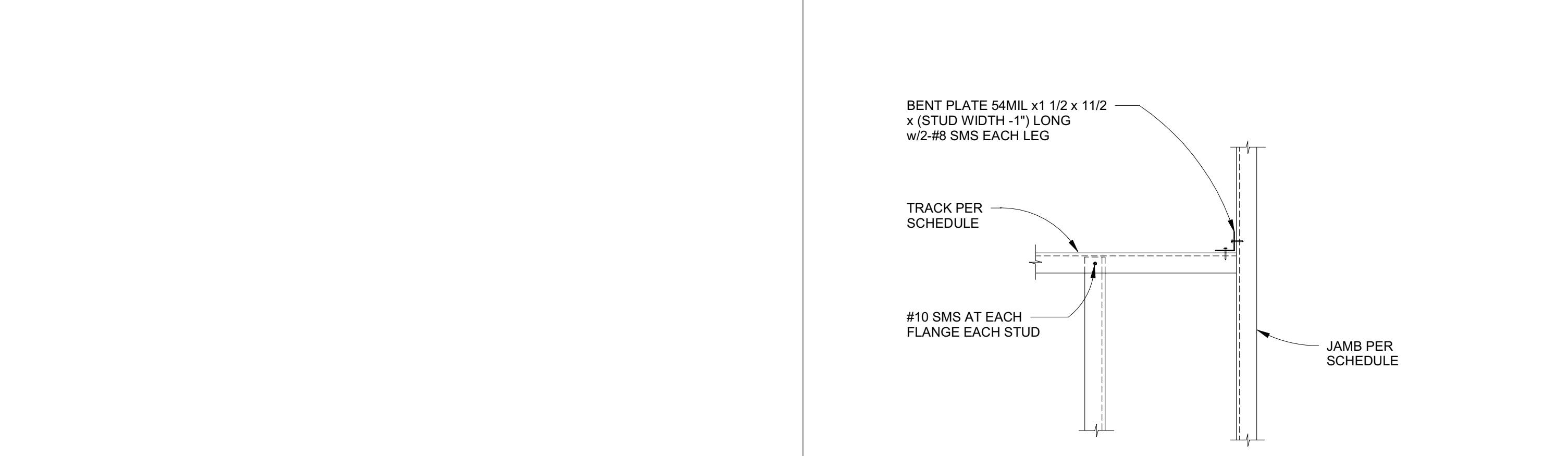
12 TOP TRACK ANCHORAGE
 SCALE: 1 1/2" = 1'-0"



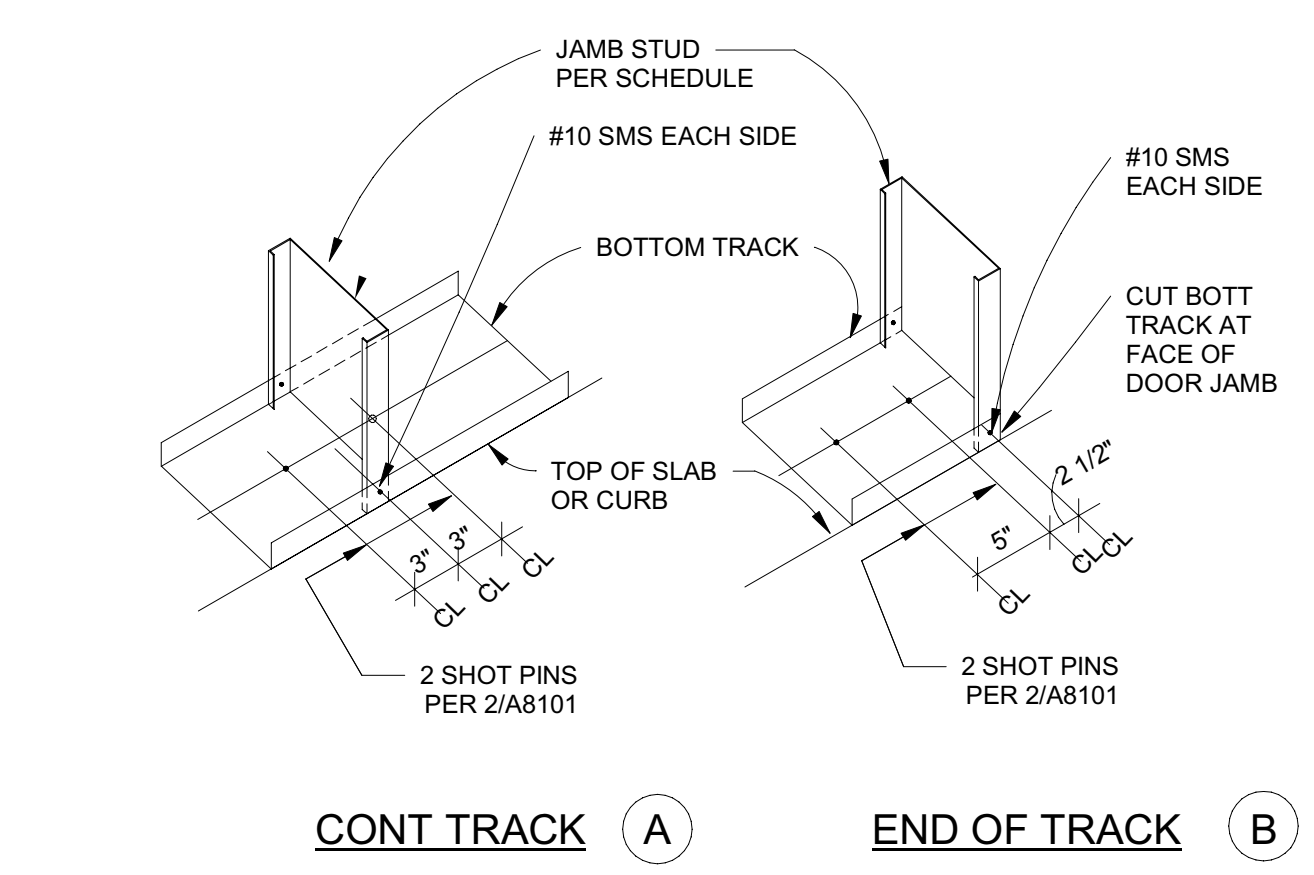
7 HEADER
 SCALE: 3/4" = 1'-0"



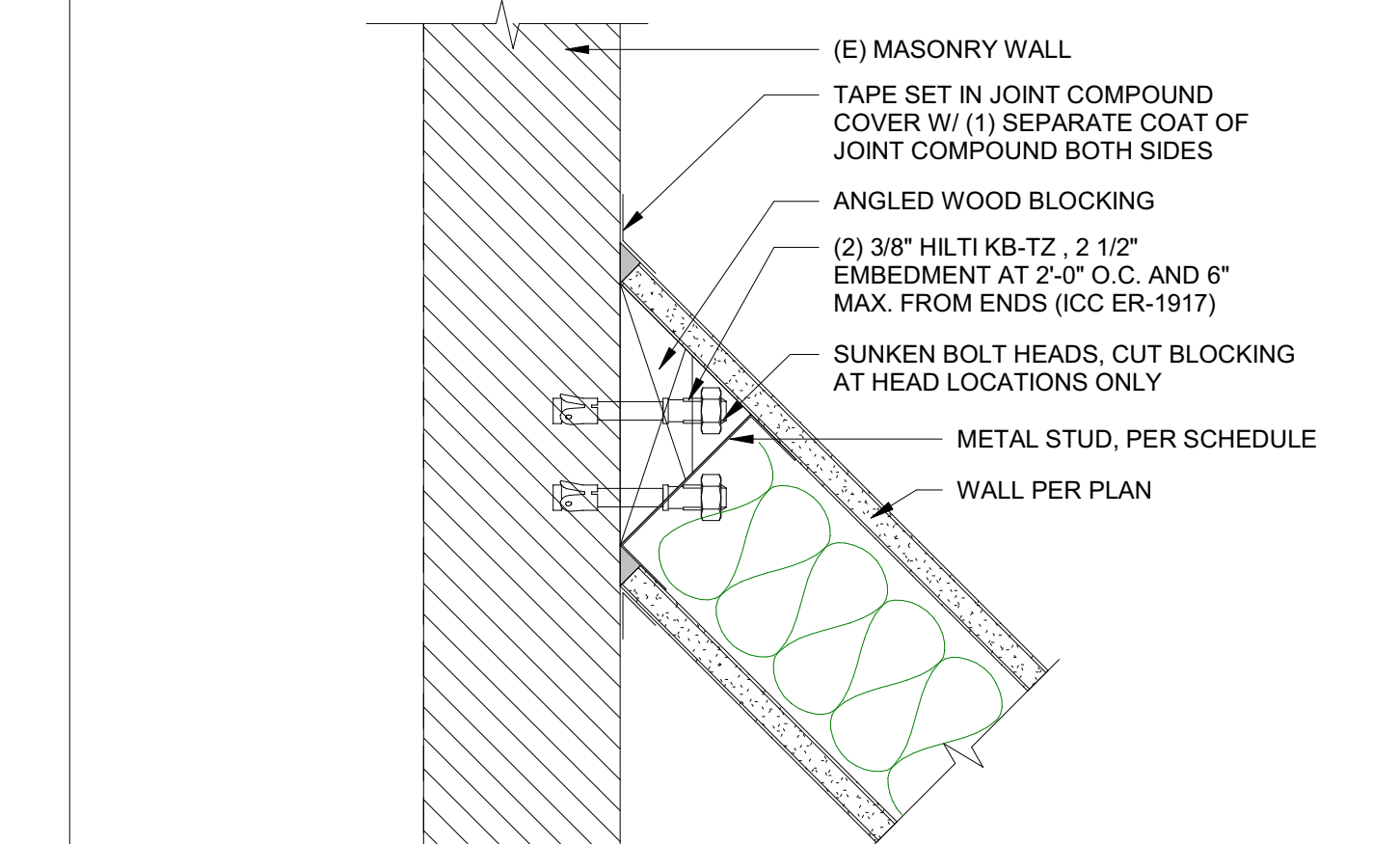
3 WALL BASE AT FLOOR
 SCALE: 3/4" = 1'-0"



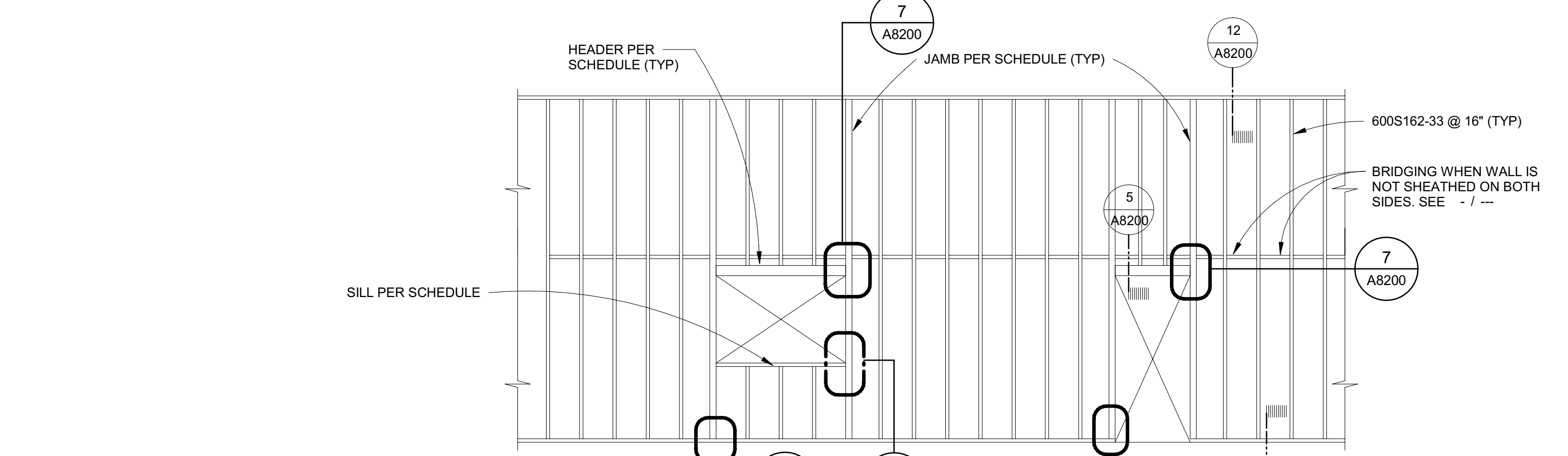
11 SILL
 SCALE: 3/4" = 1'-0"



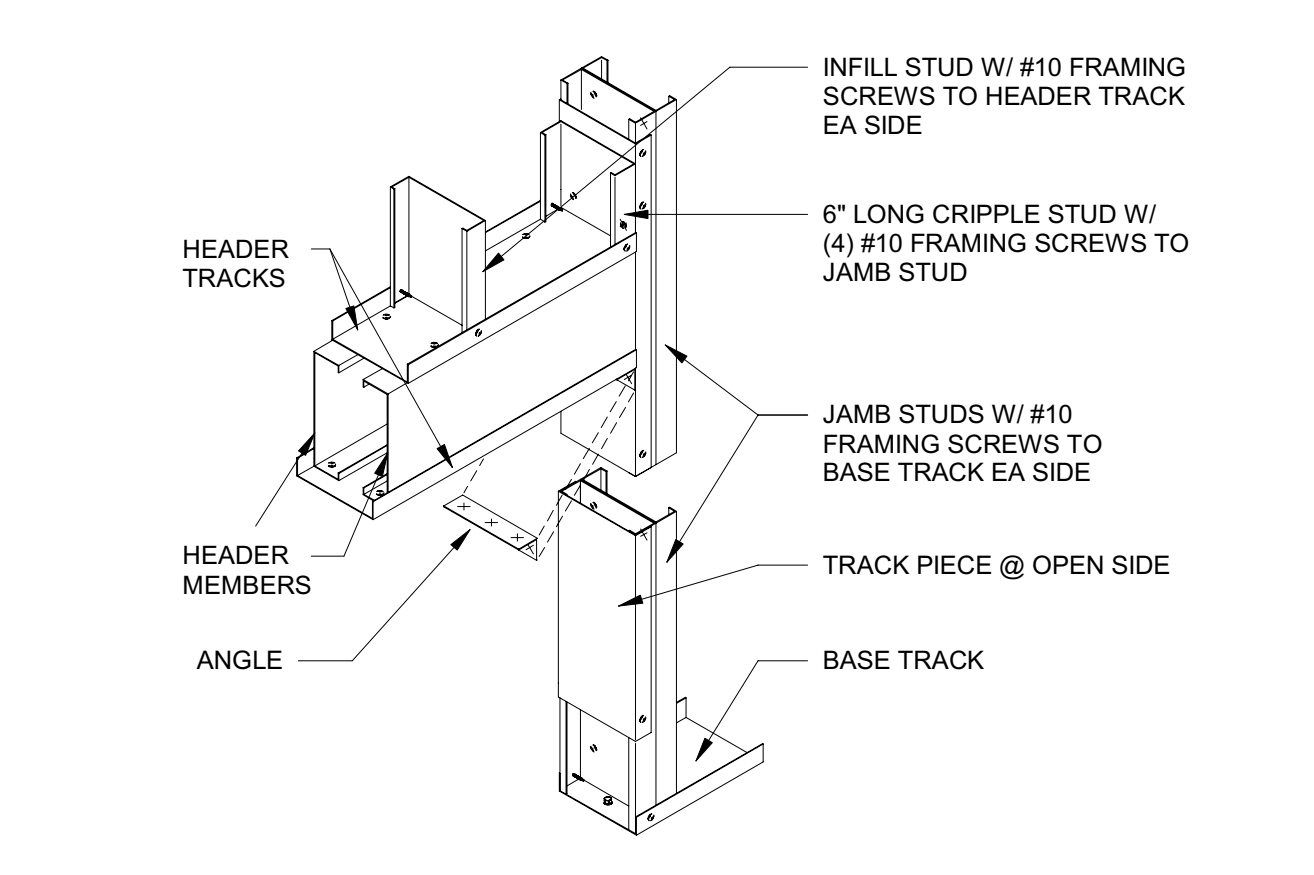
6 JAMB BASE
 SCALE: 3/4" = 1'-0"



2 (N) STUD WALL TO (E) MASONRY WALL
 SCALE: 3" = 1'-0"



9 INTERIOR NON-BEARING STUD WALL FRAMING
 SCALE: 3/4" = 1'-0"



5 HEADER DETAIL AT OPENING >4'-0"
 SCALE: 1 1/2" = 1'-0"

MAXIMUM ALLOWABLE HEIGHT (H) SCHEDULE

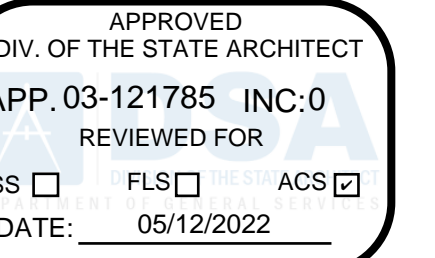
METAL STUD (S-STUD) SIZE (MIN. 1 5/8" FLANGE)					
GAUGE	MIL.	3 5/8"	4"	6"	8"
14	68	19'-2"	20'-8"	28'-6"	-
16	54	17'-11"	19'-4"	26'-7"	-
18	43	16'-8"	18'-0"	24'-9"	31'-2"

NOTES:
 1. MAXIMUM STUD HEIGHT "H" FOR STUDS @ 16" O.C.
 2. HILTI X-U LOW VELOCITY POWER DRIVEN FASTENER SHALL BE PER ICC REPORT NO. ESR 2269, UNO
 3. ALL TRACKS SHALL BE 1 GAUGE THICKER THAN STUDS WITH 1 1/2" FLANGE, UNO.

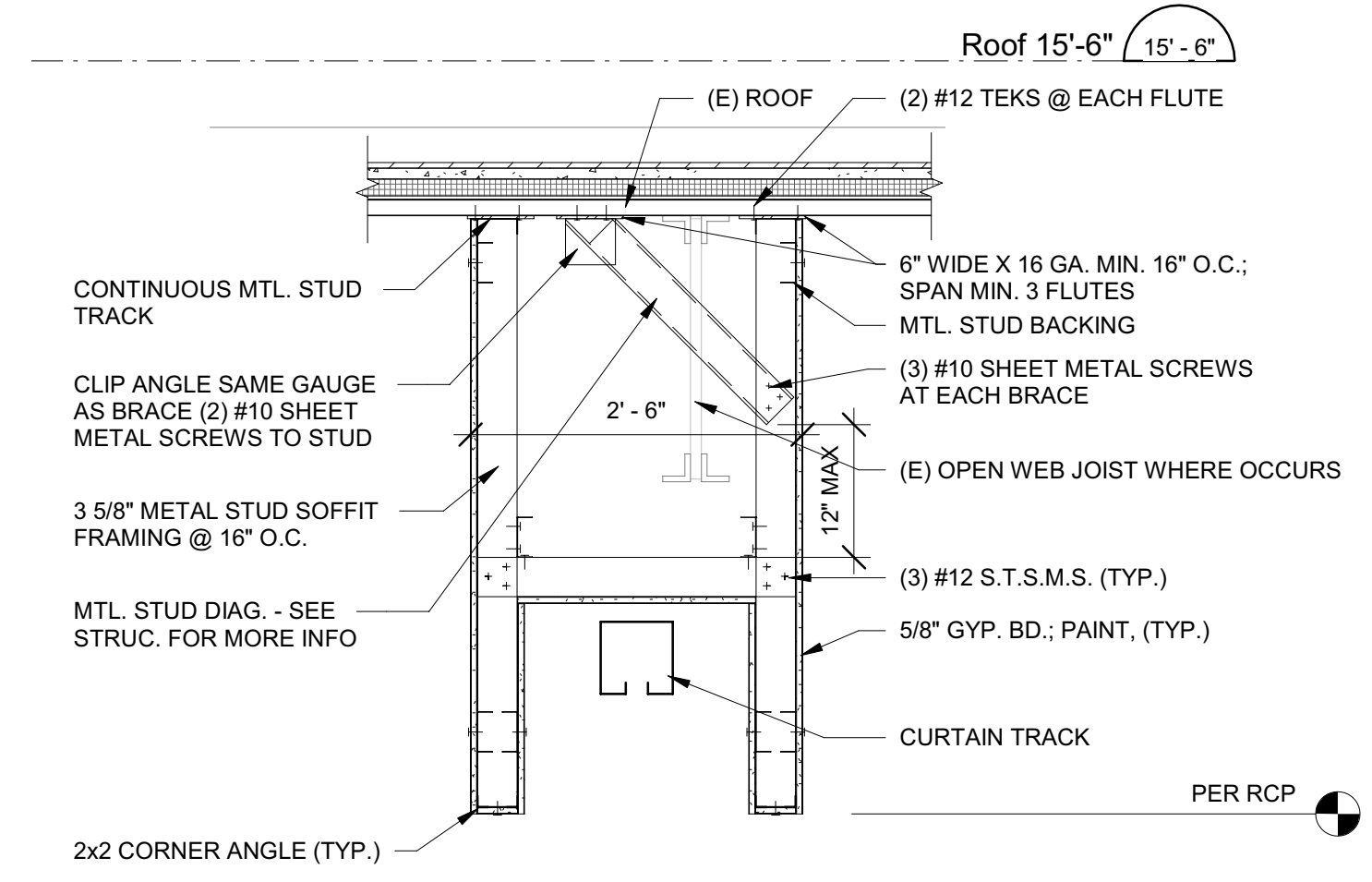
MINIMUM PARTITION STUD SIZE

WALL HEIGHT < 12'-1"	WALL HEIGHT < 16'-1"	WALL HEIGHT < 12'-1"
400S137-43	400S137-43 OR 600S137-33	400S137-54

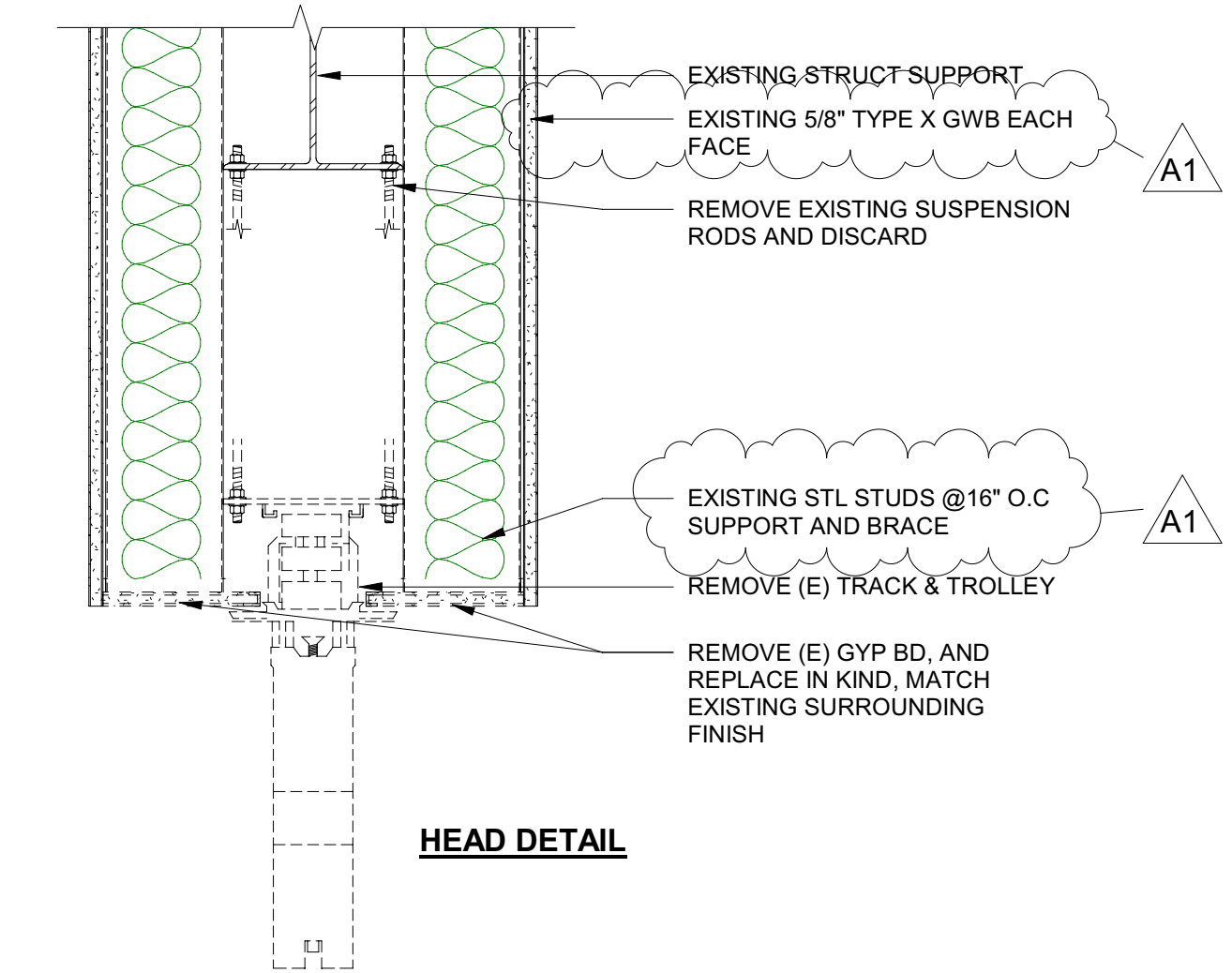
1 STUD WALL SCHEDULE
 SCALE: 1 1/2" = 1'-0"



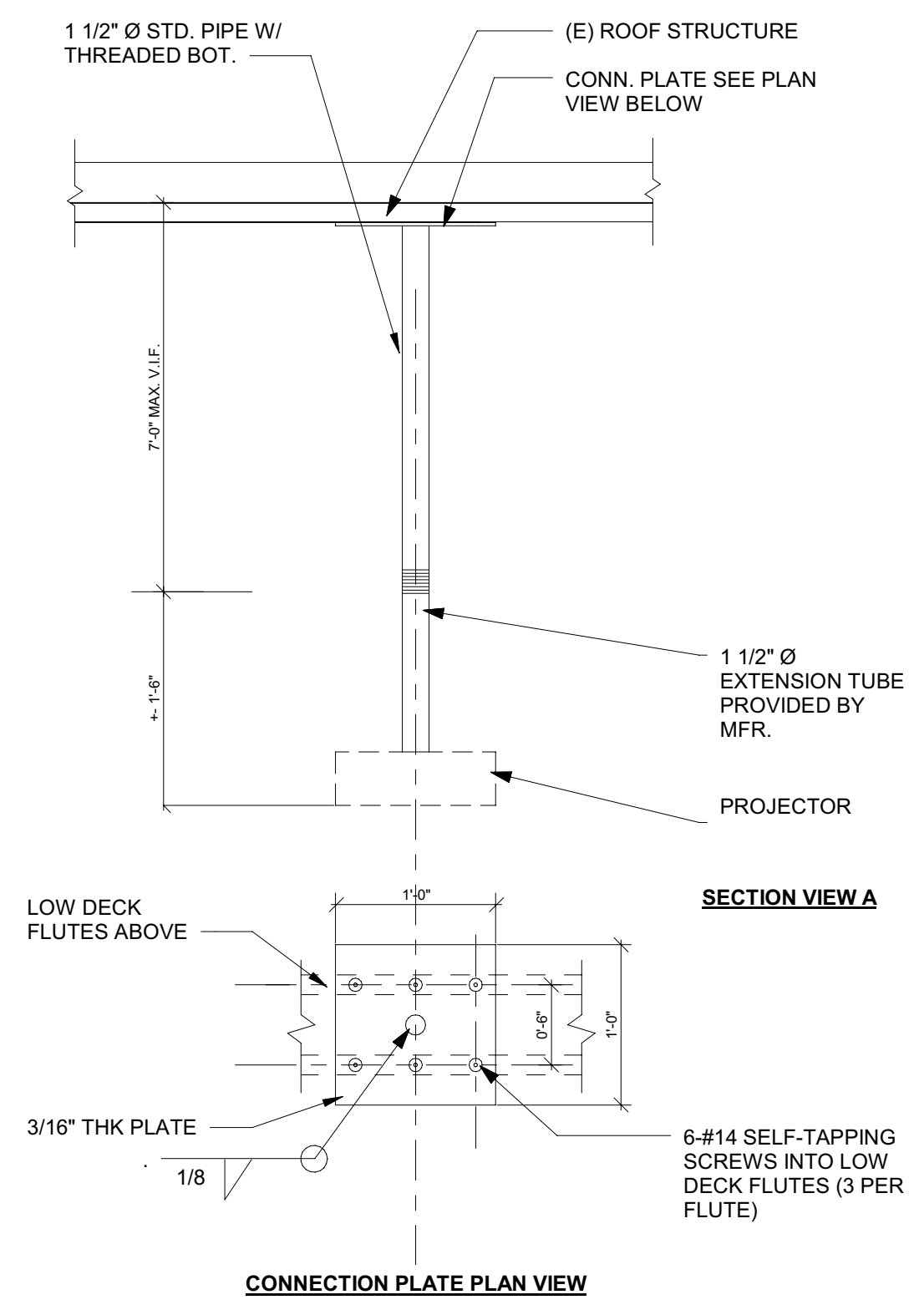
Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.



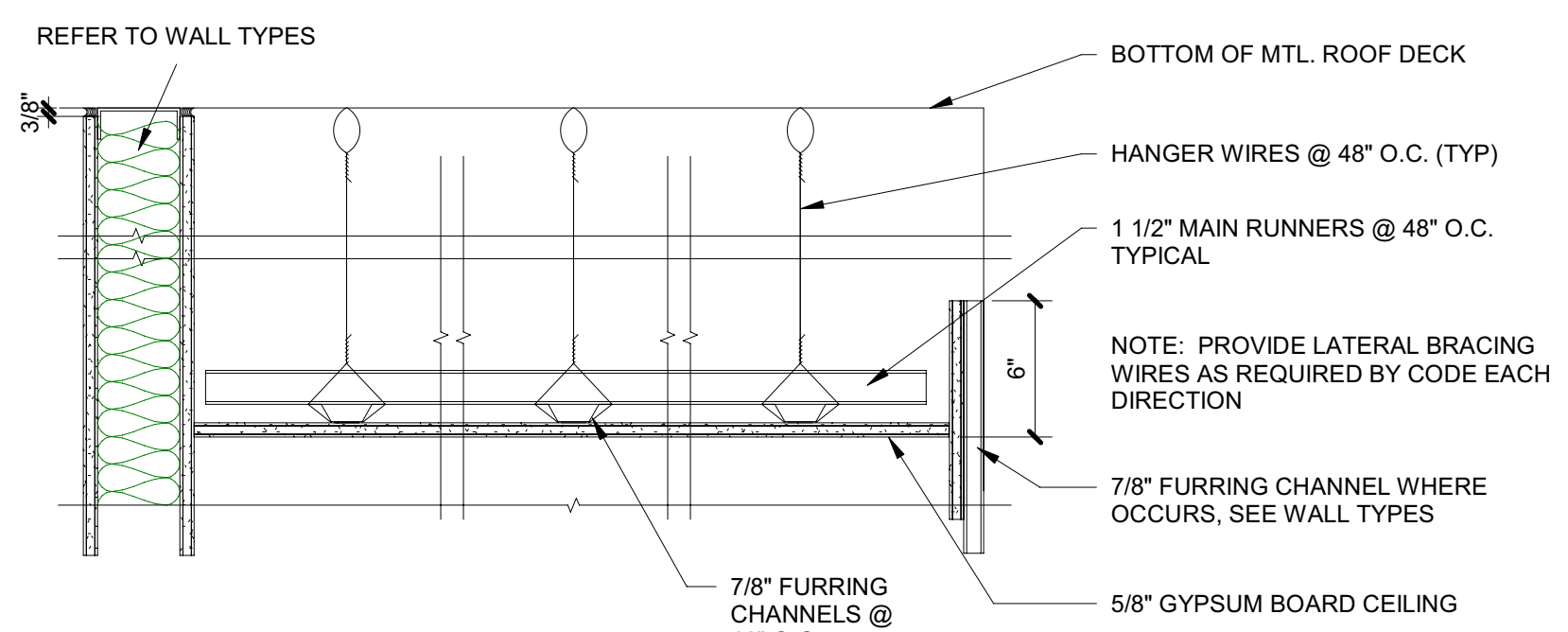
4 CURTAIN TRACK/SOFFIT
A2701 SCALE: 3/4" = 1'-0"



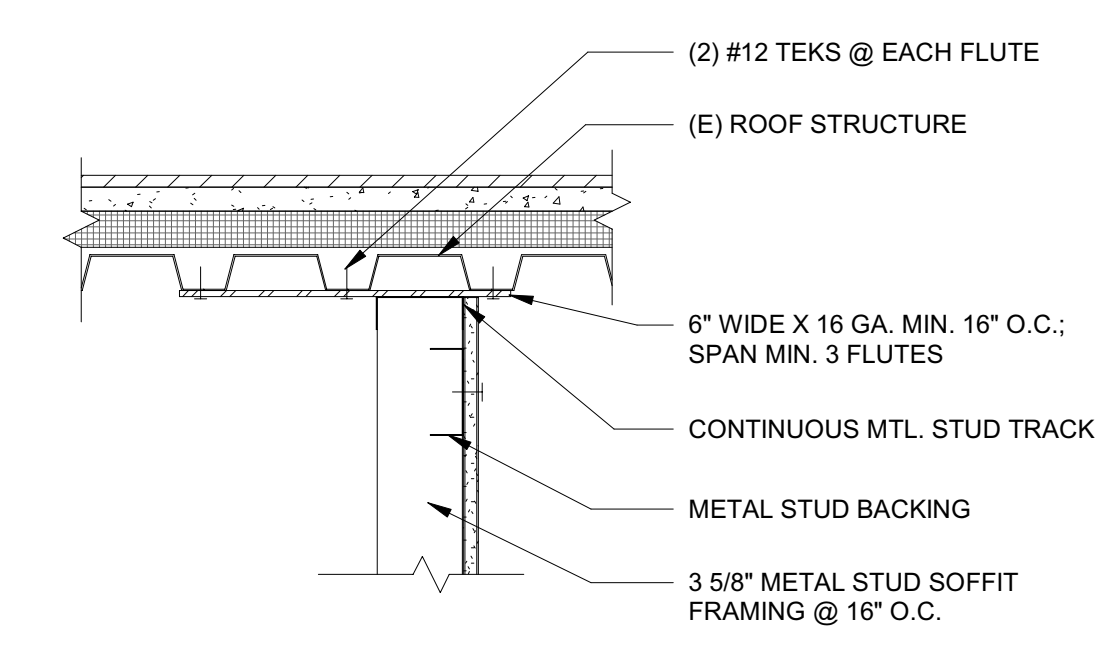
3 SOFFIT @ (E) FOLDABLE WALL TO BE REMOVED
A2701 SCALE: 1 1/2" = 1'-0"



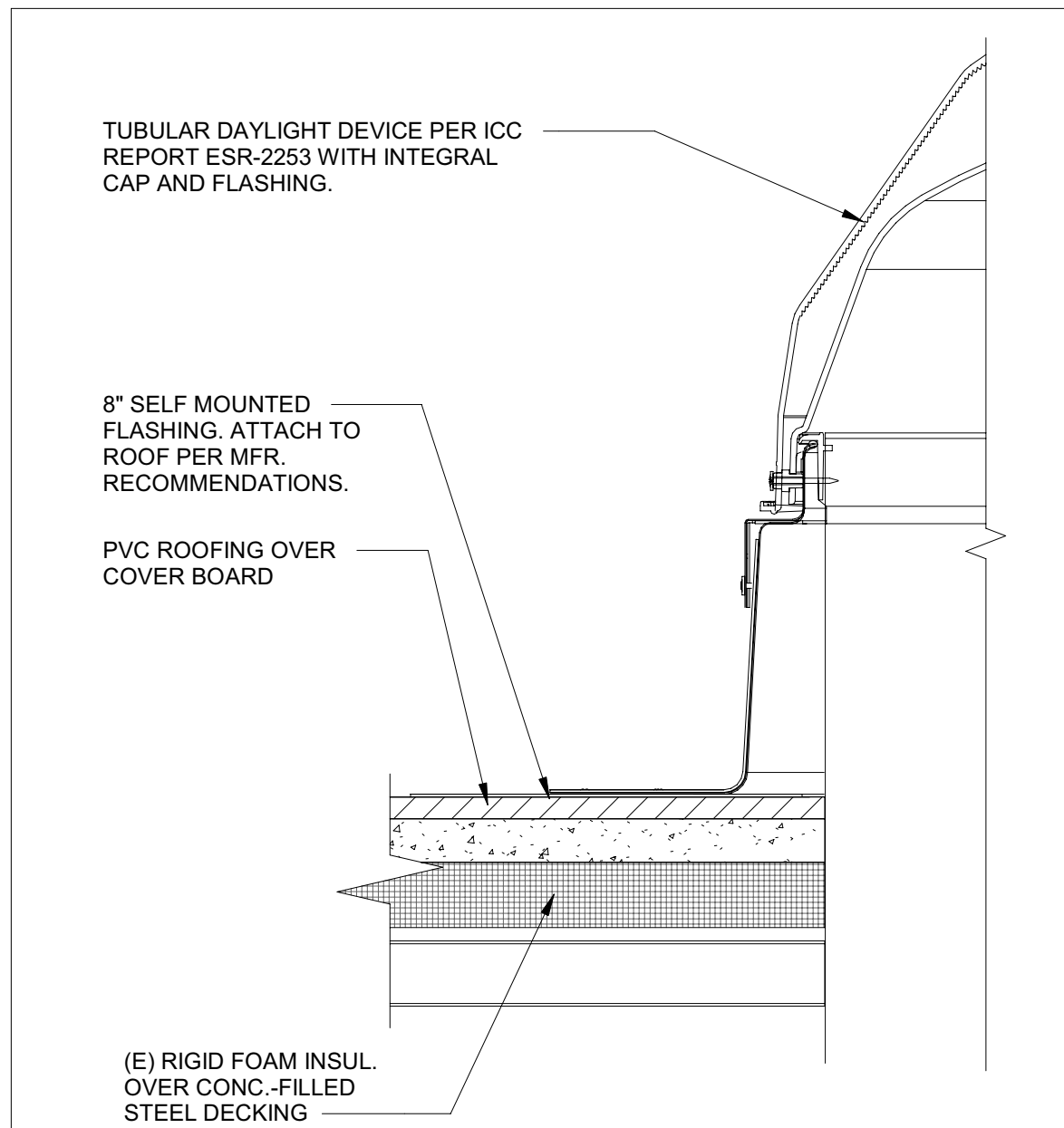
7 PROJECTOR MOUNT
A2701 SCALE: 1" = 1'-0"



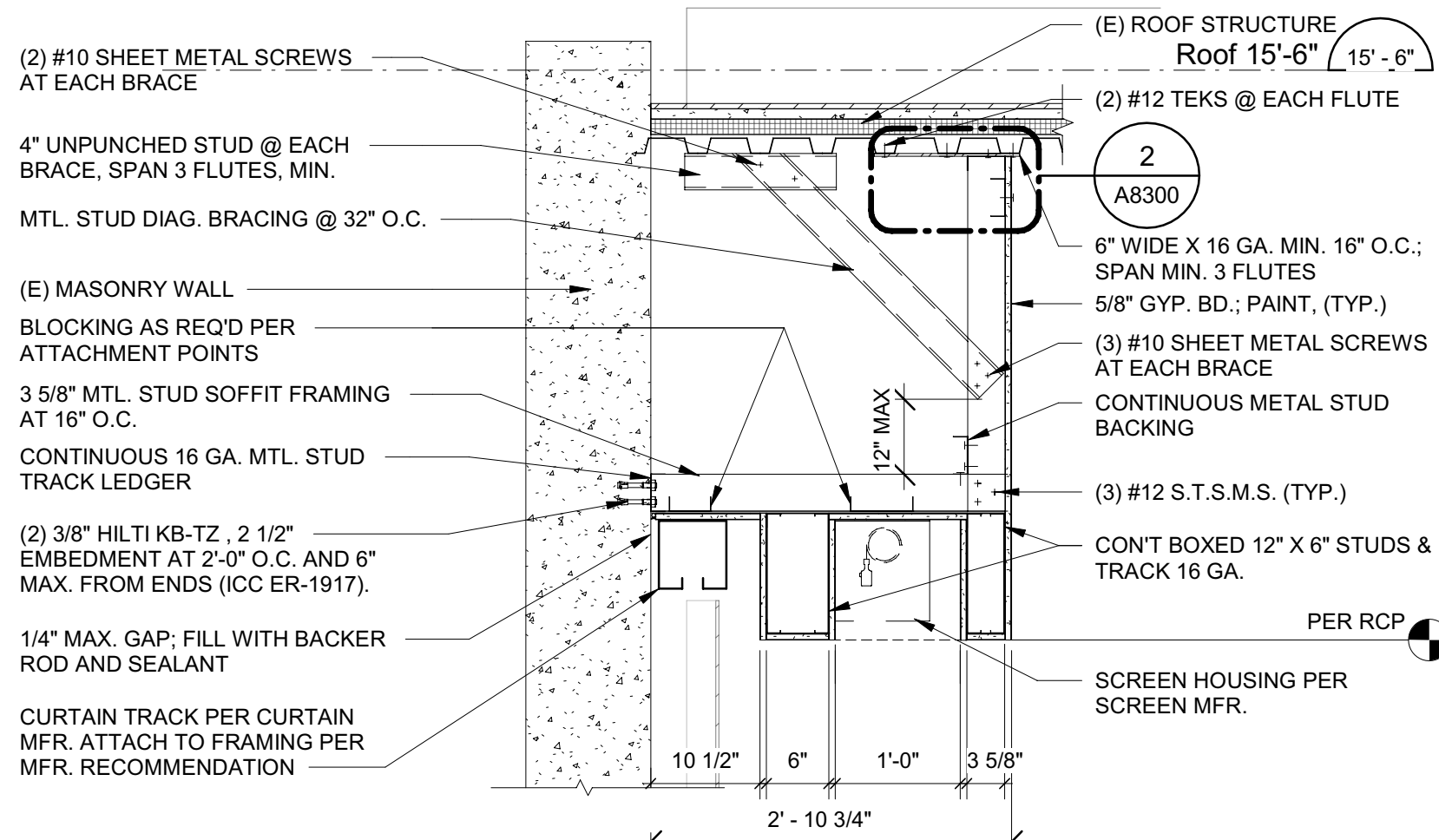
6 SUSPENDED GYP. BOARD CEILING
A2701 SCALE: 1 1/2" = 1'-0"



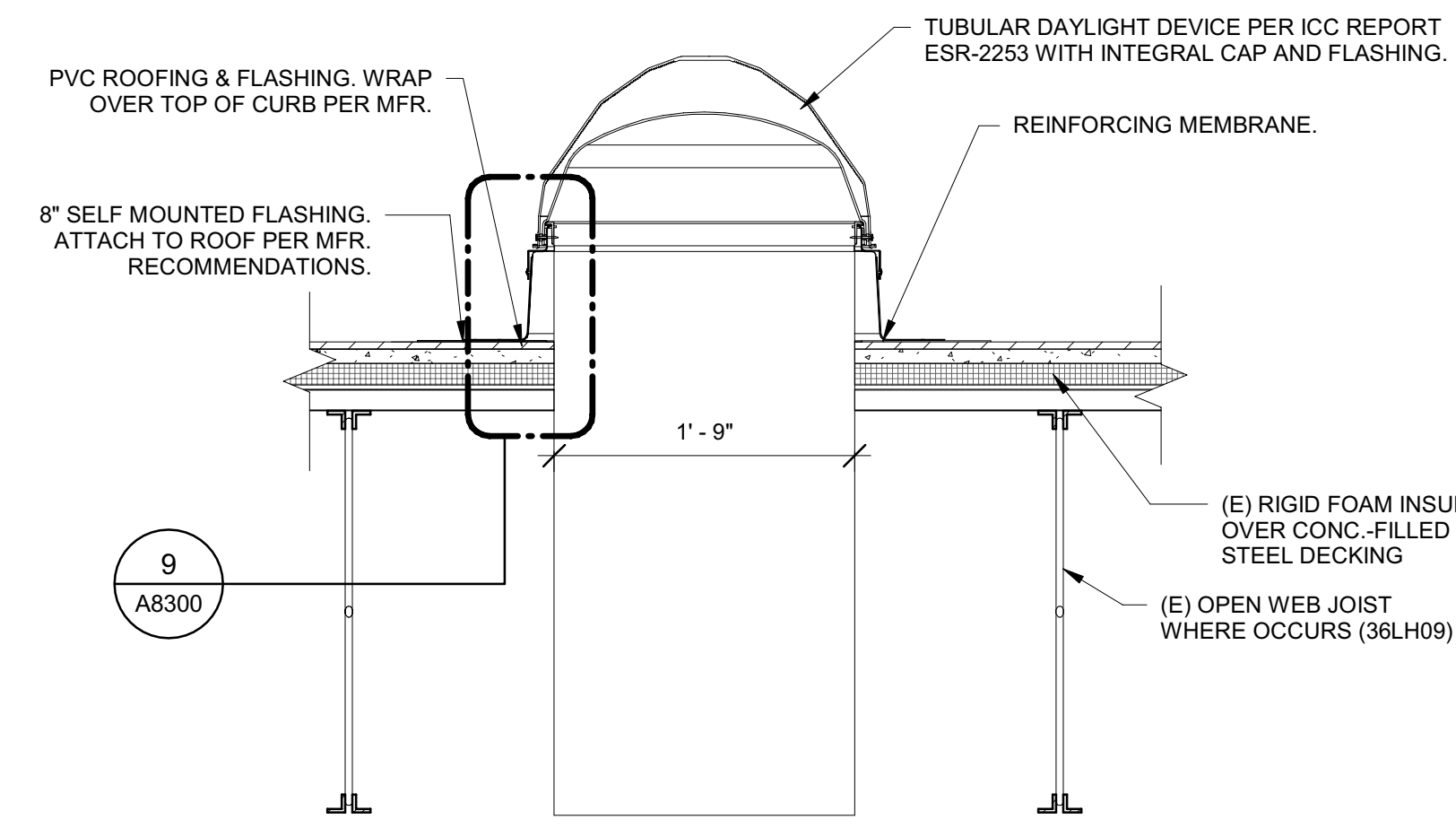
2 SOFFIT WALL AT MTL. DECK
A2701 SCALE: 1 1/2" = 1'-0"



9 DAYLIGHT DEV. CONN. TO ROOF
A8300 SCALE: 3" = 1'-0"



5 CURTAIN TRACK/SOFFIT @ PROJECTOR SCREEN
A2701 SCALE: 3/4" = 1'-0"



1 TUBULAR DAYLIGHT DEVICE
A2701 SCALE: 1" = 1'-0"

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DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
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West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

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California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
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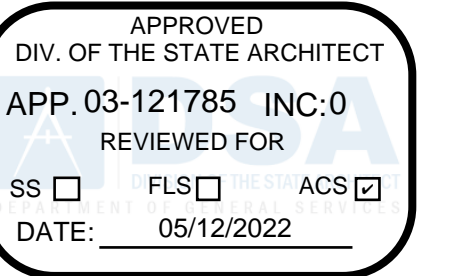
SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD			2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DSA/OSFM SUBMITTAL			2021-09-14
V2	DSA/OSFM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

SHEET TITLE
DETAILS - CEILING

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
A8300
ISSUE
A1



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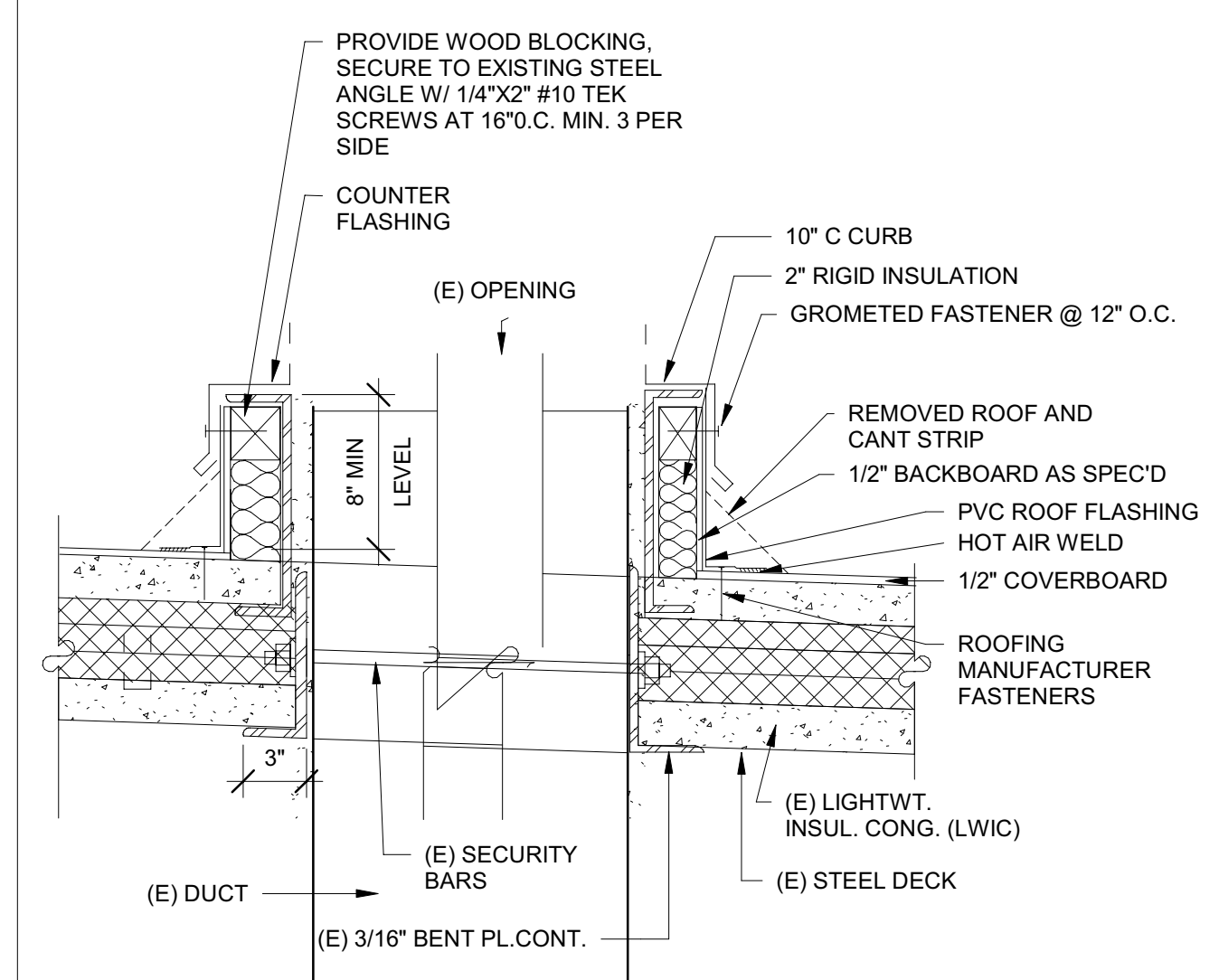
SUB CONSULTANT

NO.	ISSUANCE	STATUS	DATE
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

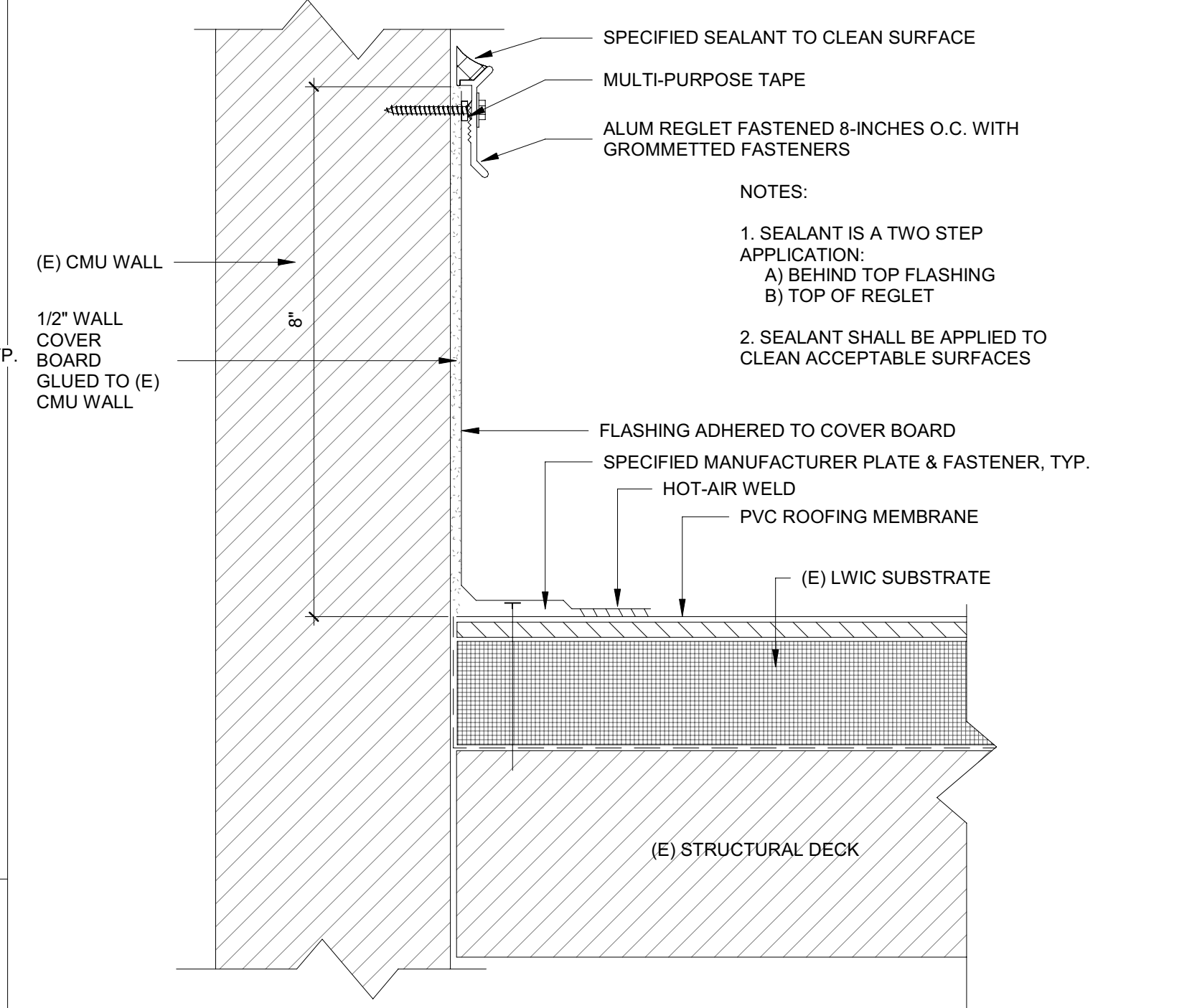
SHEET TITLE
DETAILS - ROOF

DATE: 2022-05-02
 DRAWN BY: JL
 CHKD BY: AB
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

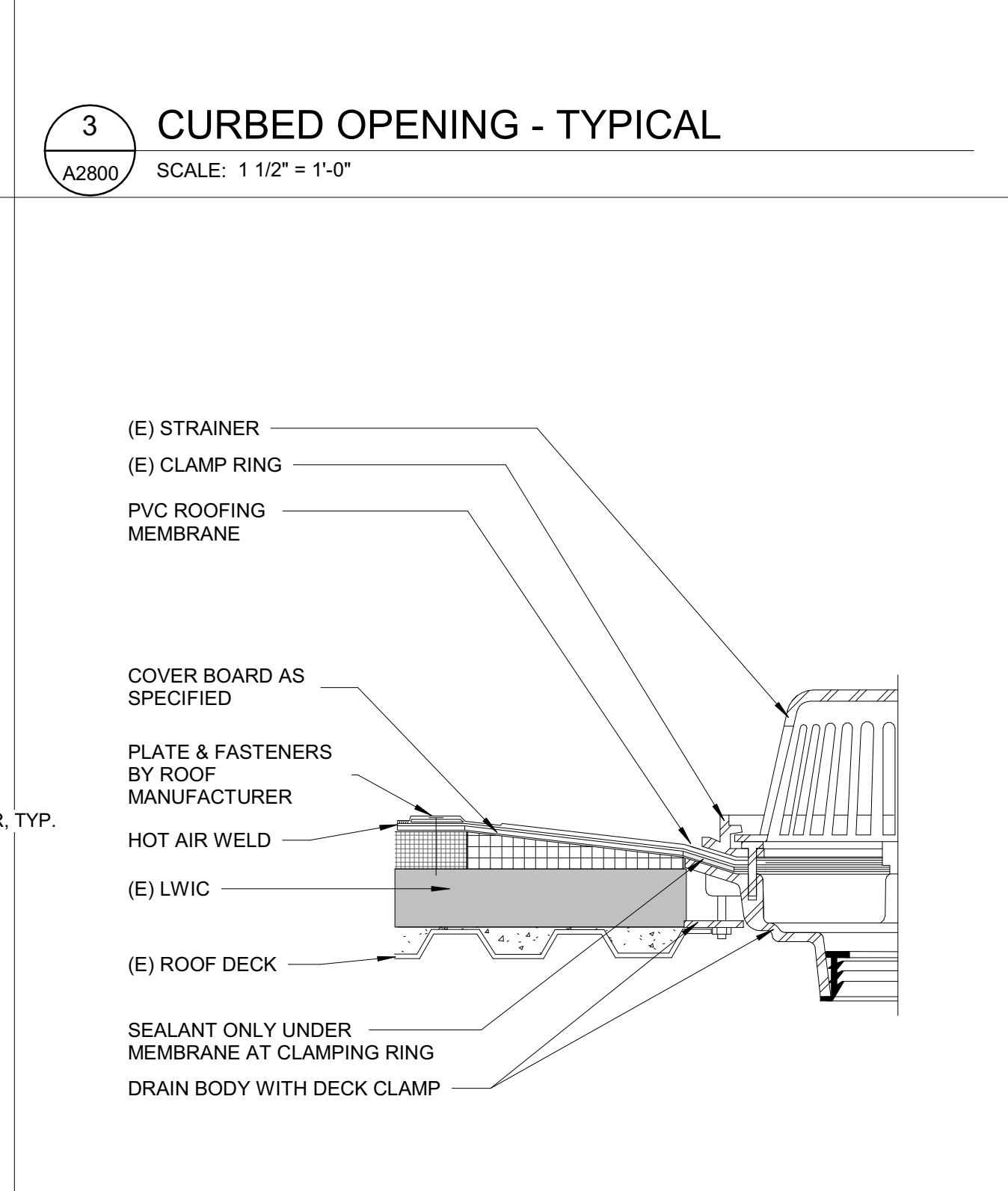
SHEET NUMBER
A8400
 ISSUE
A1



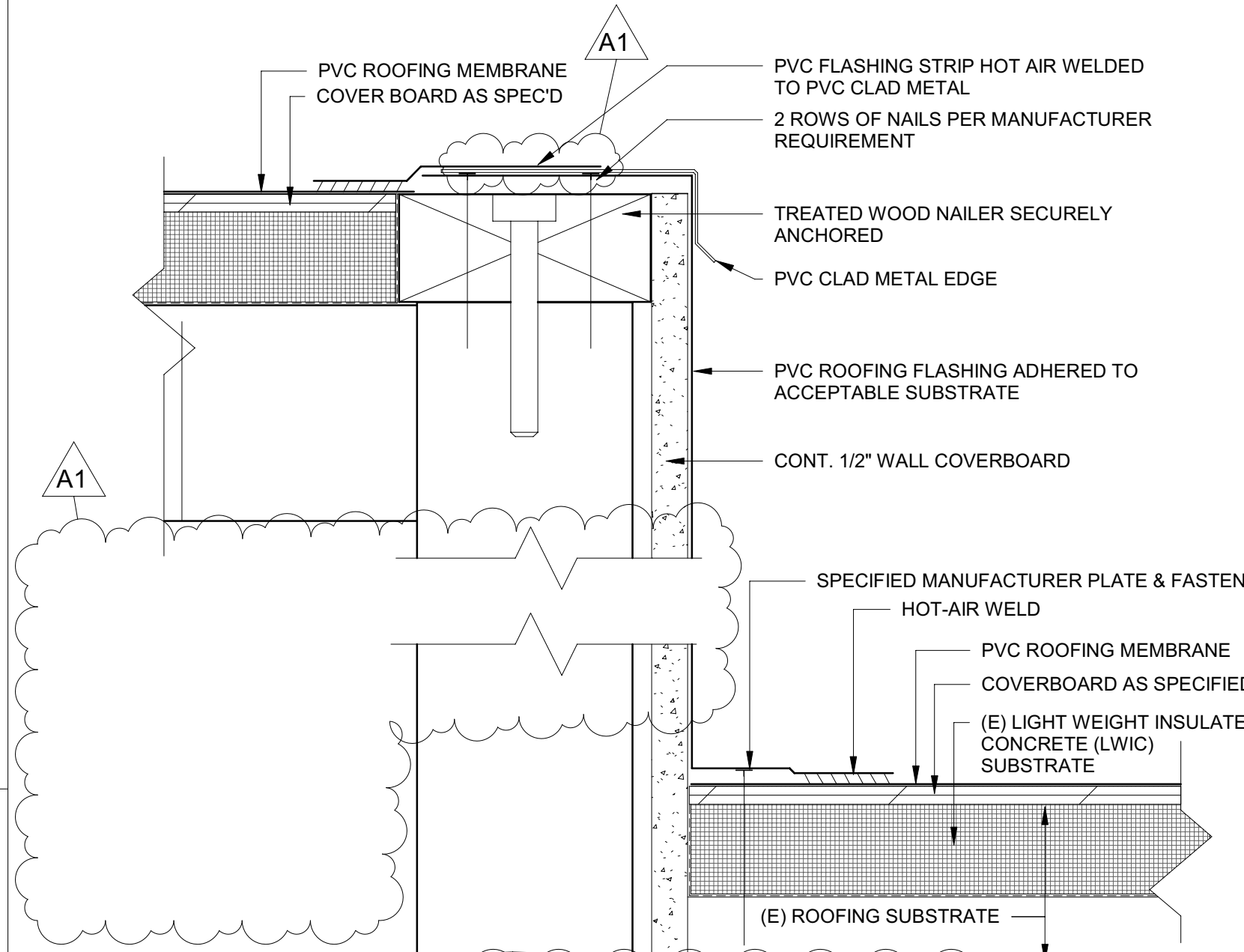
3 CURBED OPENING - TYPICAL
 SCALE: 1 1/2" = 1'-0"



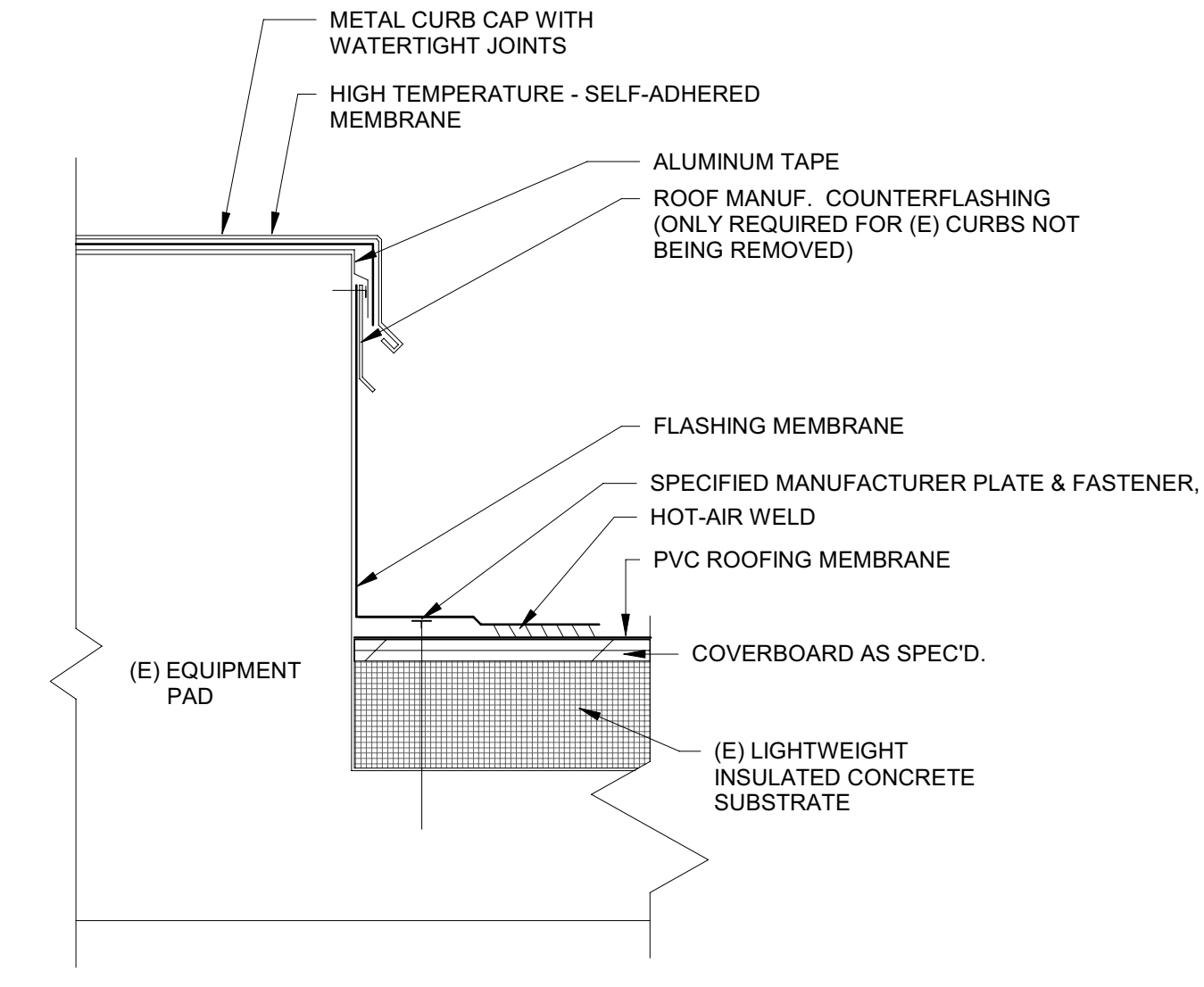
6 REGLET SECTION
 SCALE: 6" = 1'-0"



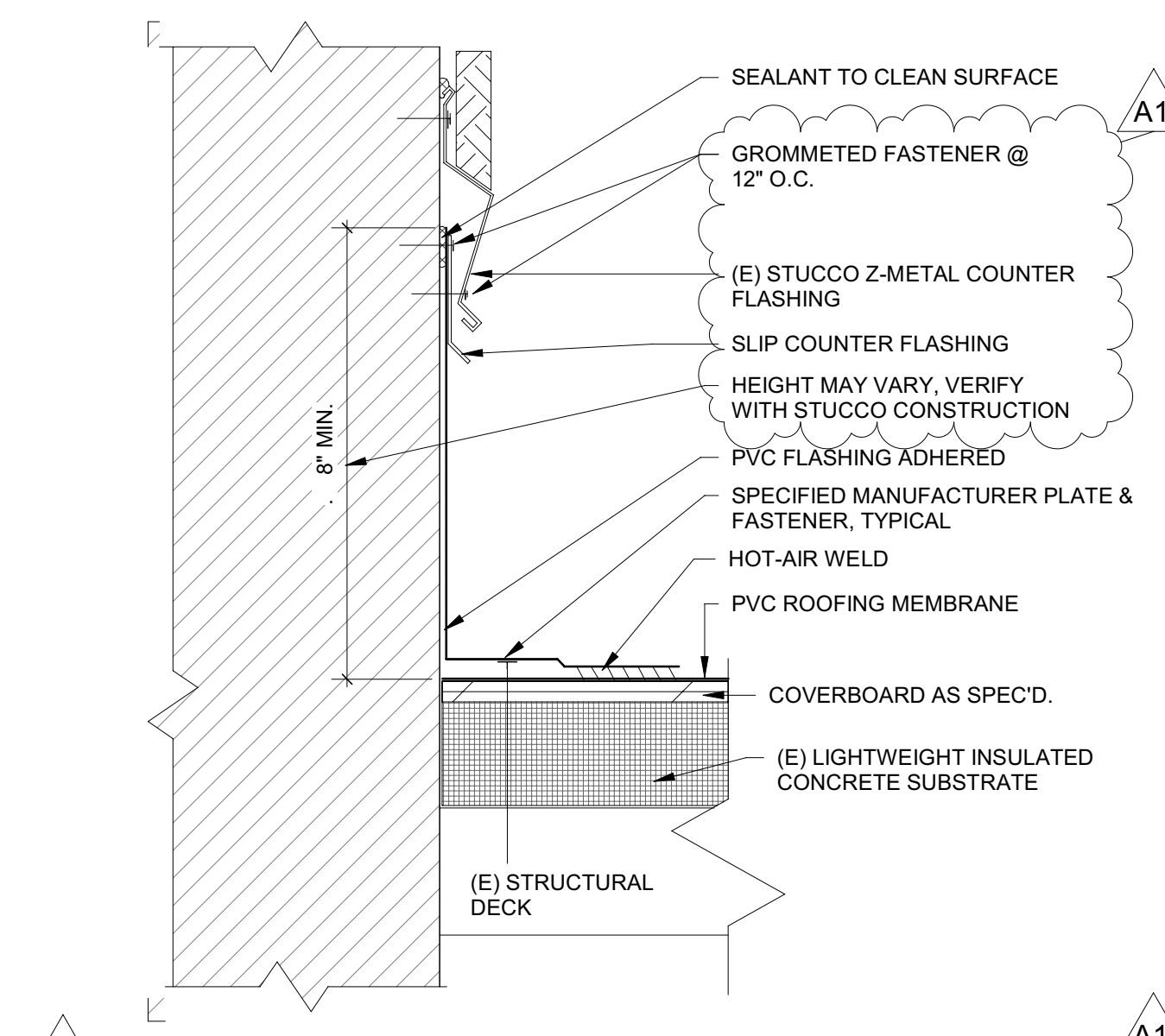
2 ROOF DRAIN
 SCALE: 1 1/2" = 1'-0"



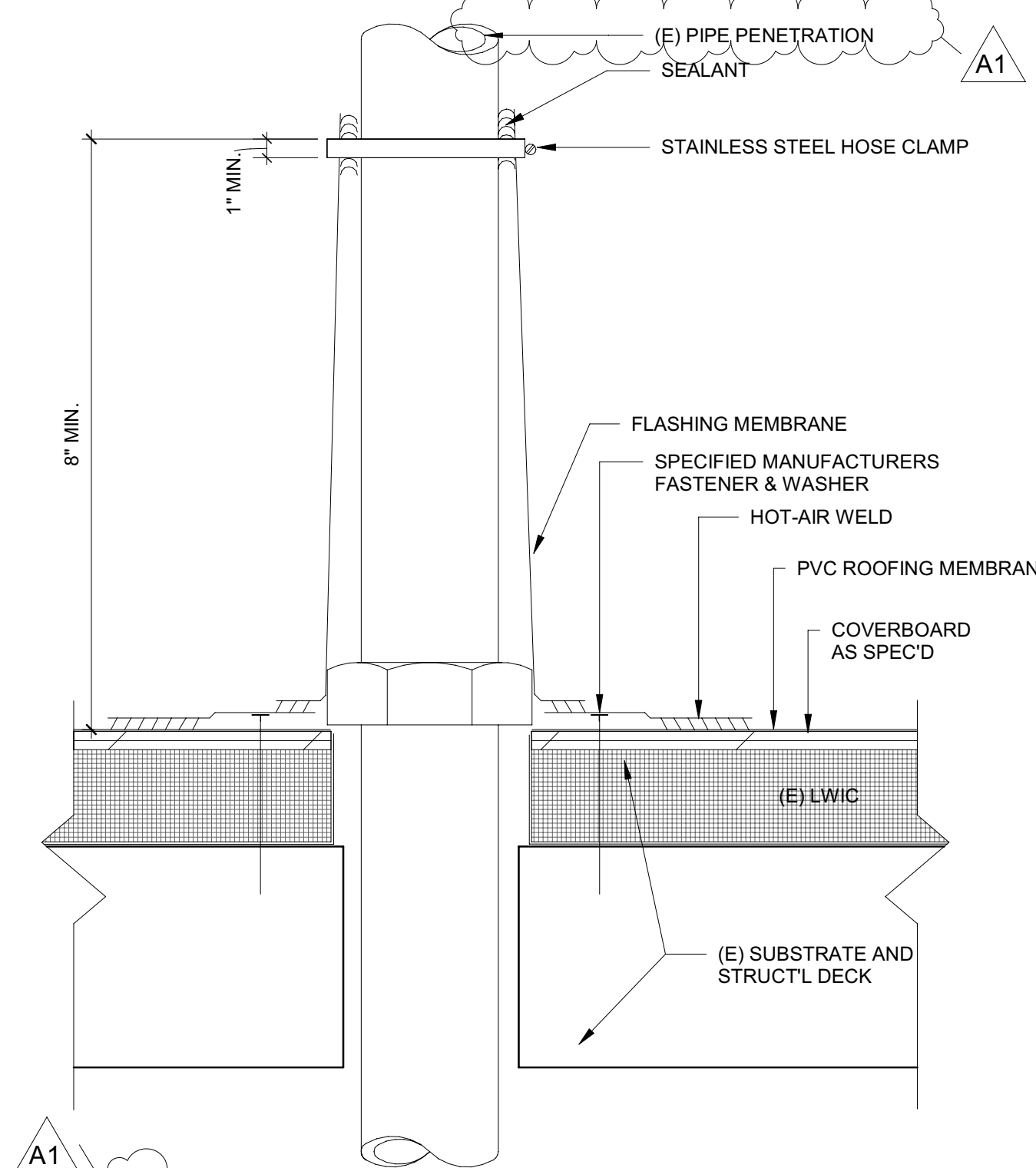
5 WALL SECTION @ SMALL POP-OUT ROOF
 SCALE: 6" = 1'-0"



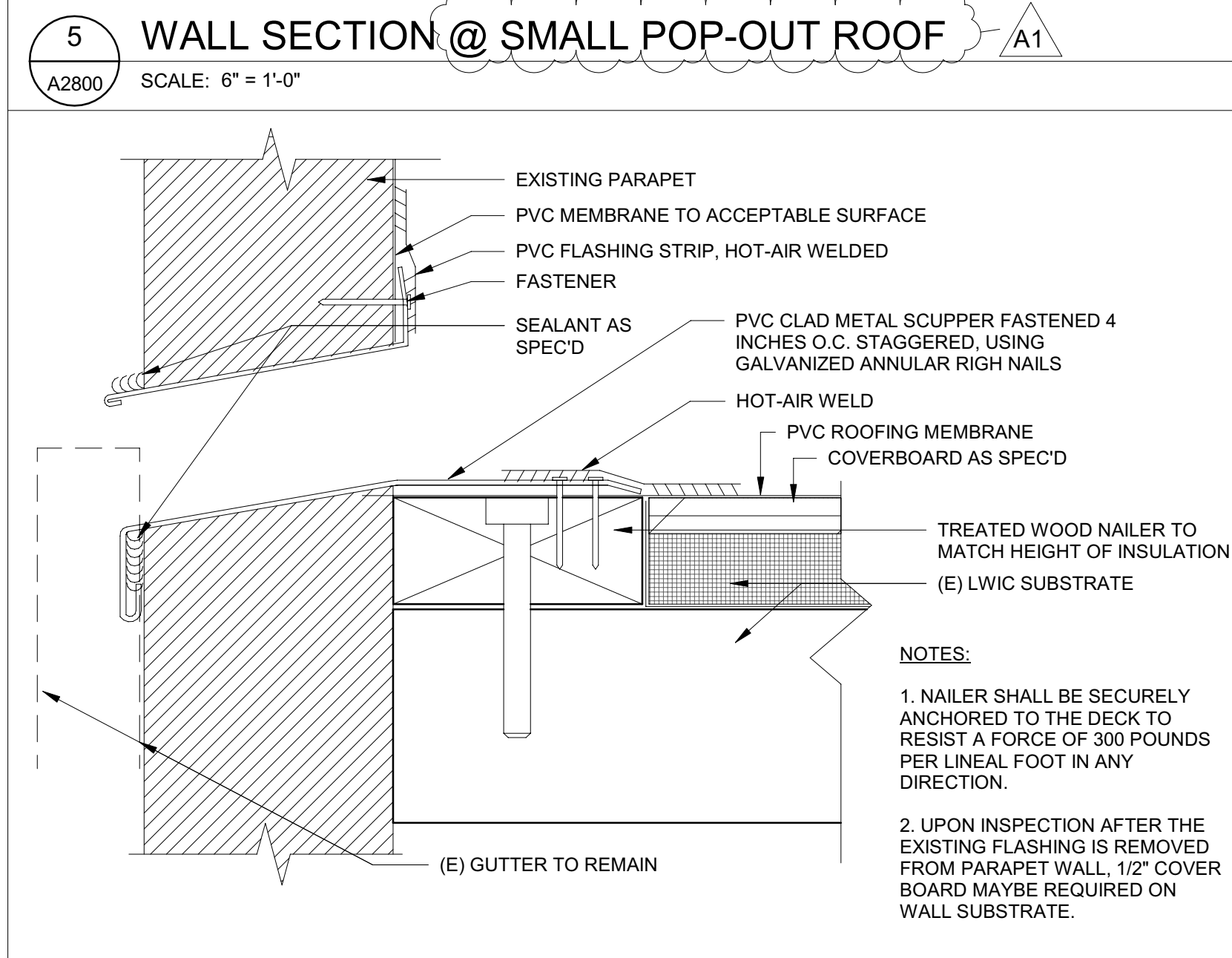
9 PAD DETAIL SECTION
 SCALE: 6" = 1'-0"



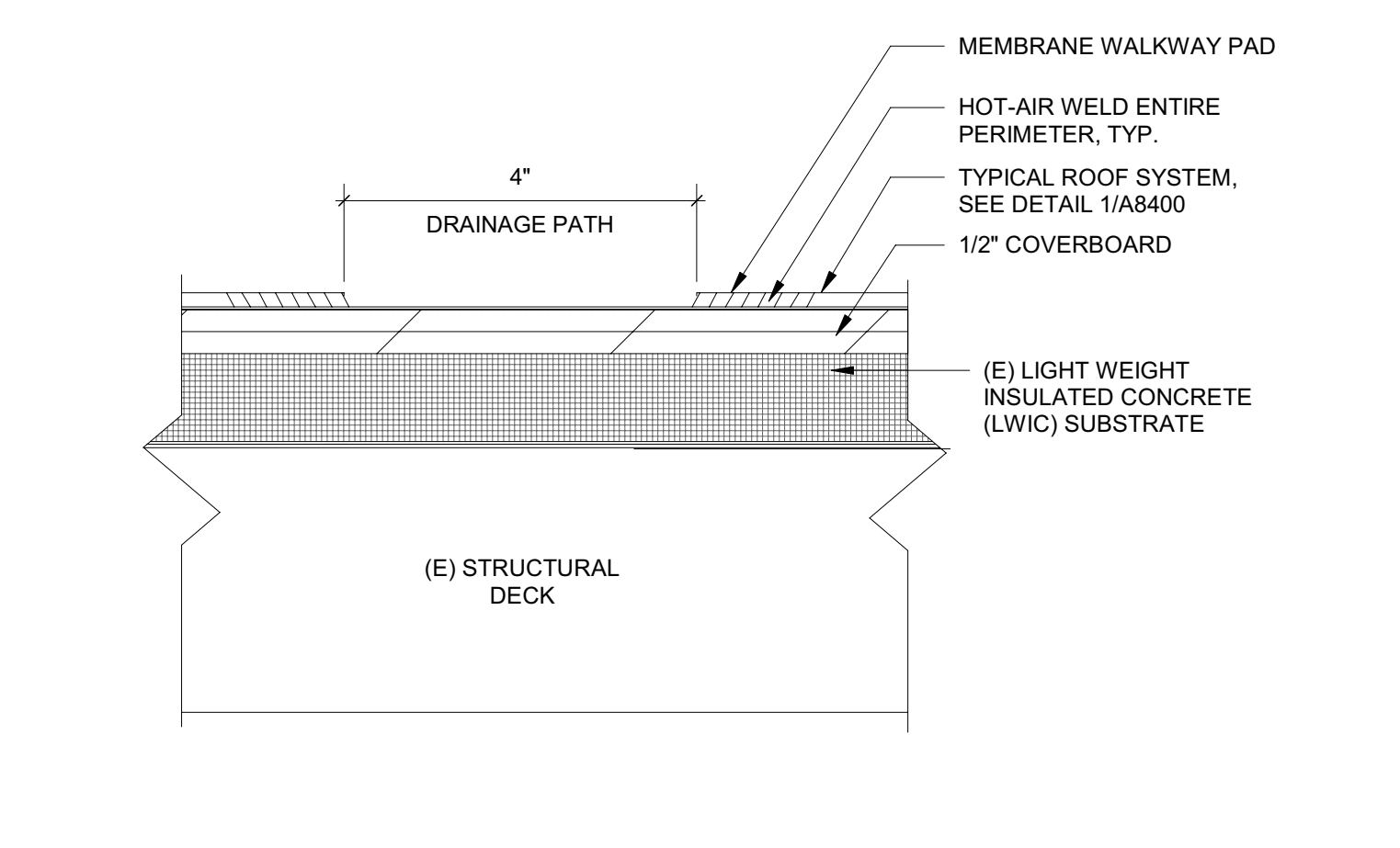
8 BASE & COUNTER FLASHING SECTION @ STUCCO WALLS
 SCALE: NTS



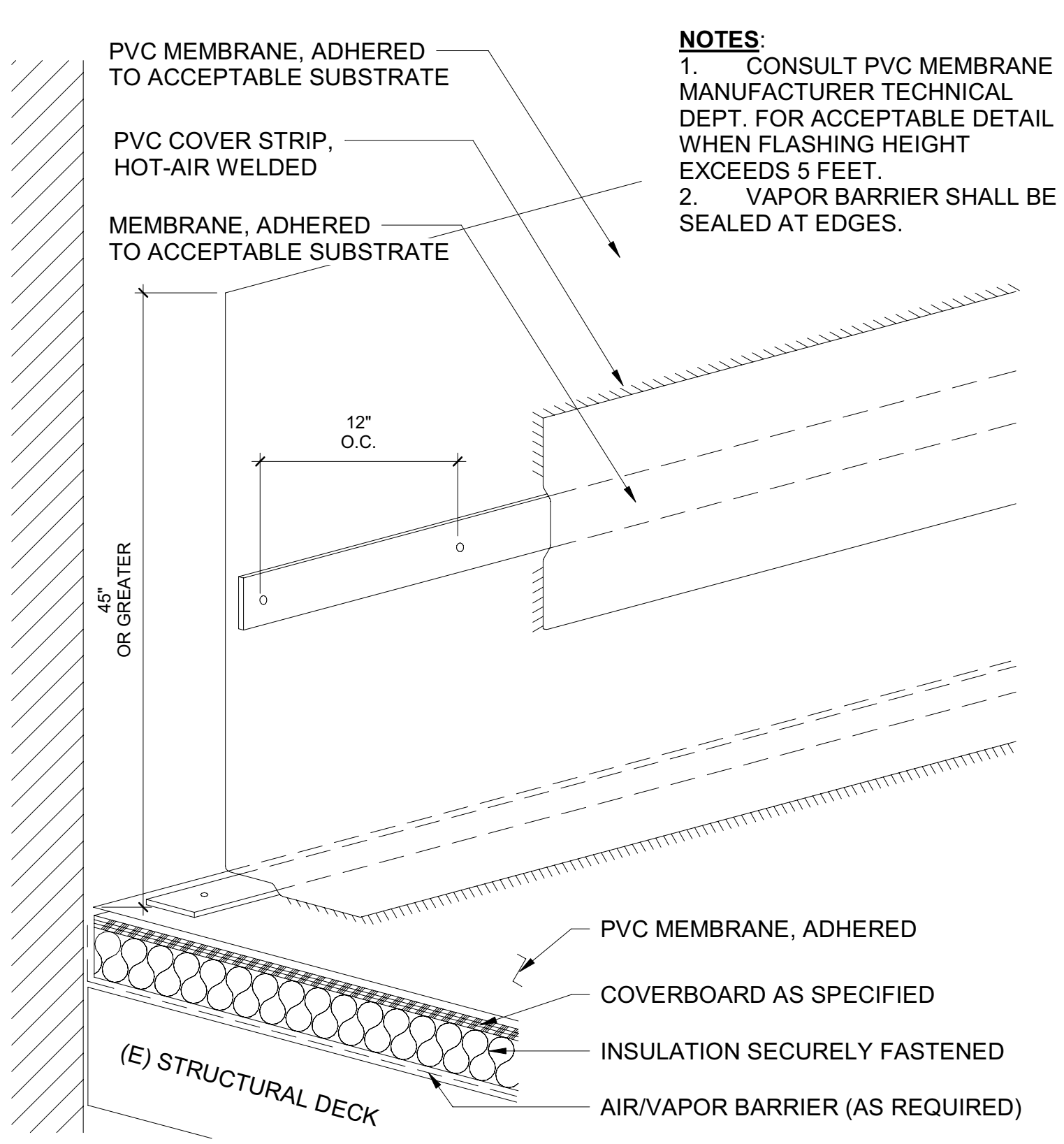
7 (E) PIPE PENETRATION
 SCALE: 6" = 1'-0"



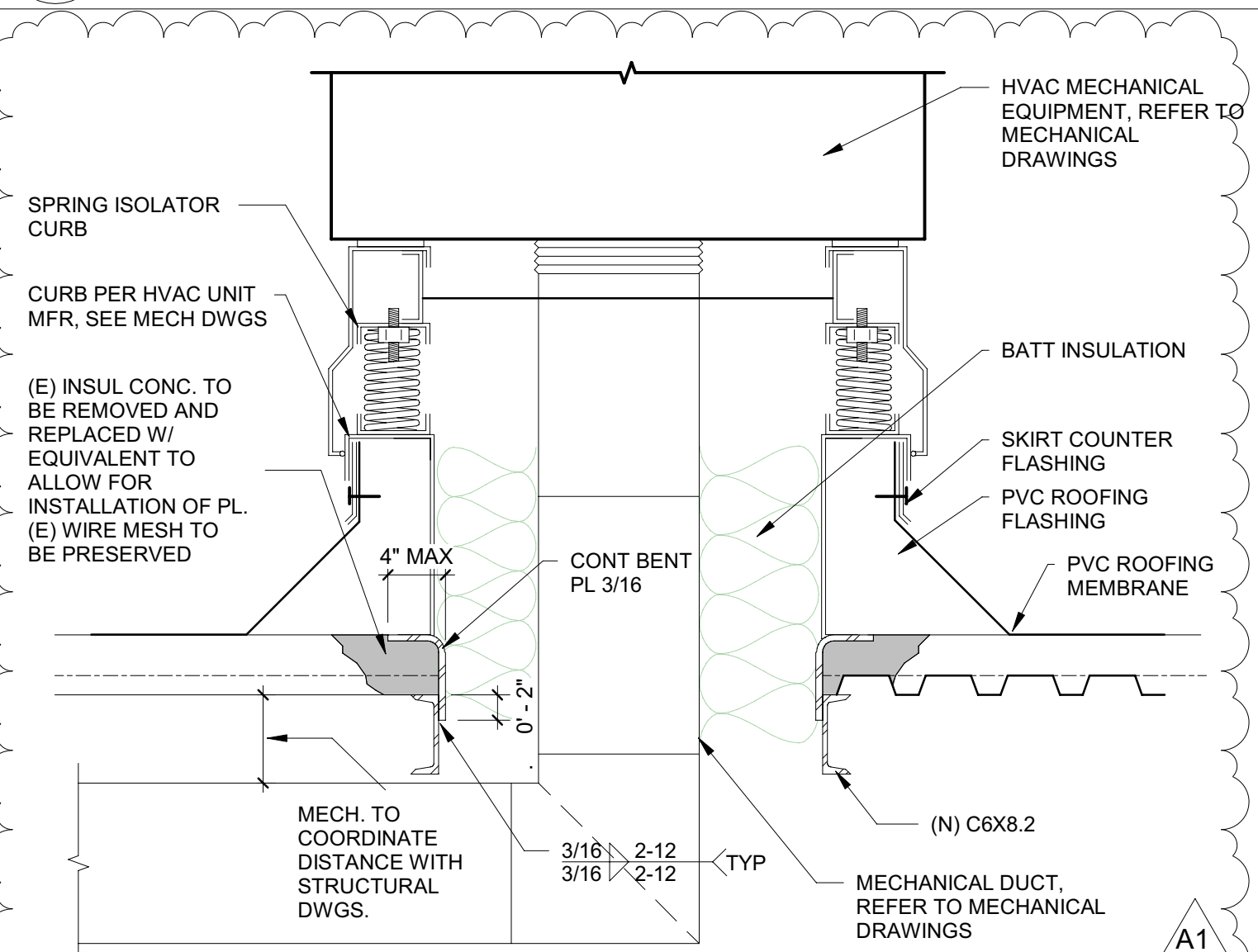
4 SCUPPER SECTION
 SCALE: 6" = 1'-0"



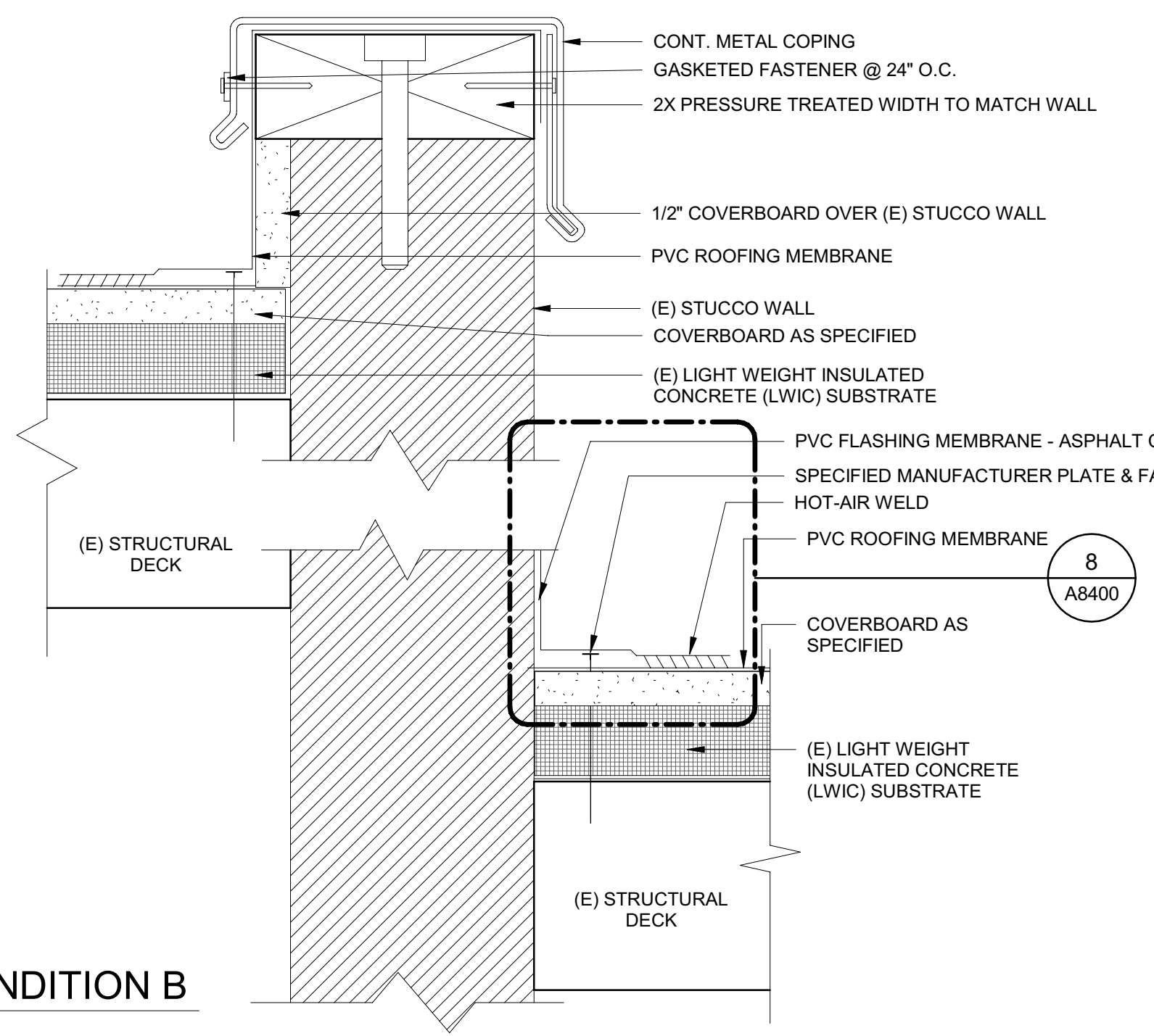
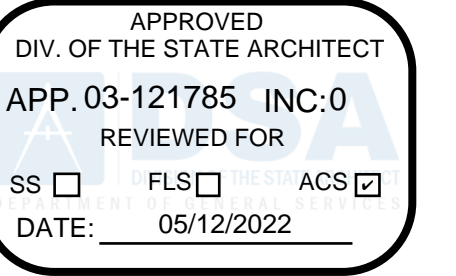
12 WALKWAY PAD
 SCALE: NTS



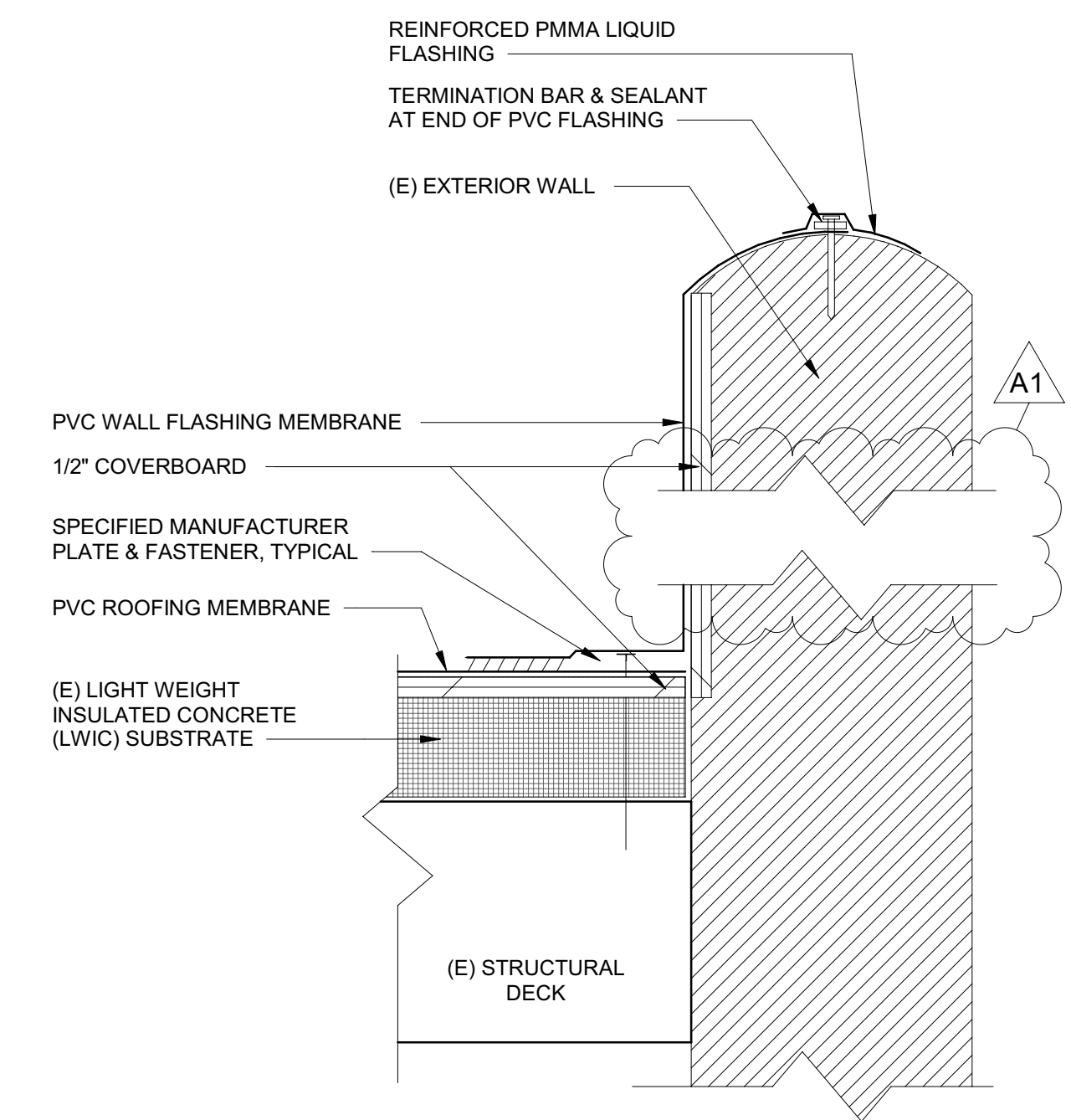
11 ADHERED HIGH WALL FLASHING
 SCALE: NTS



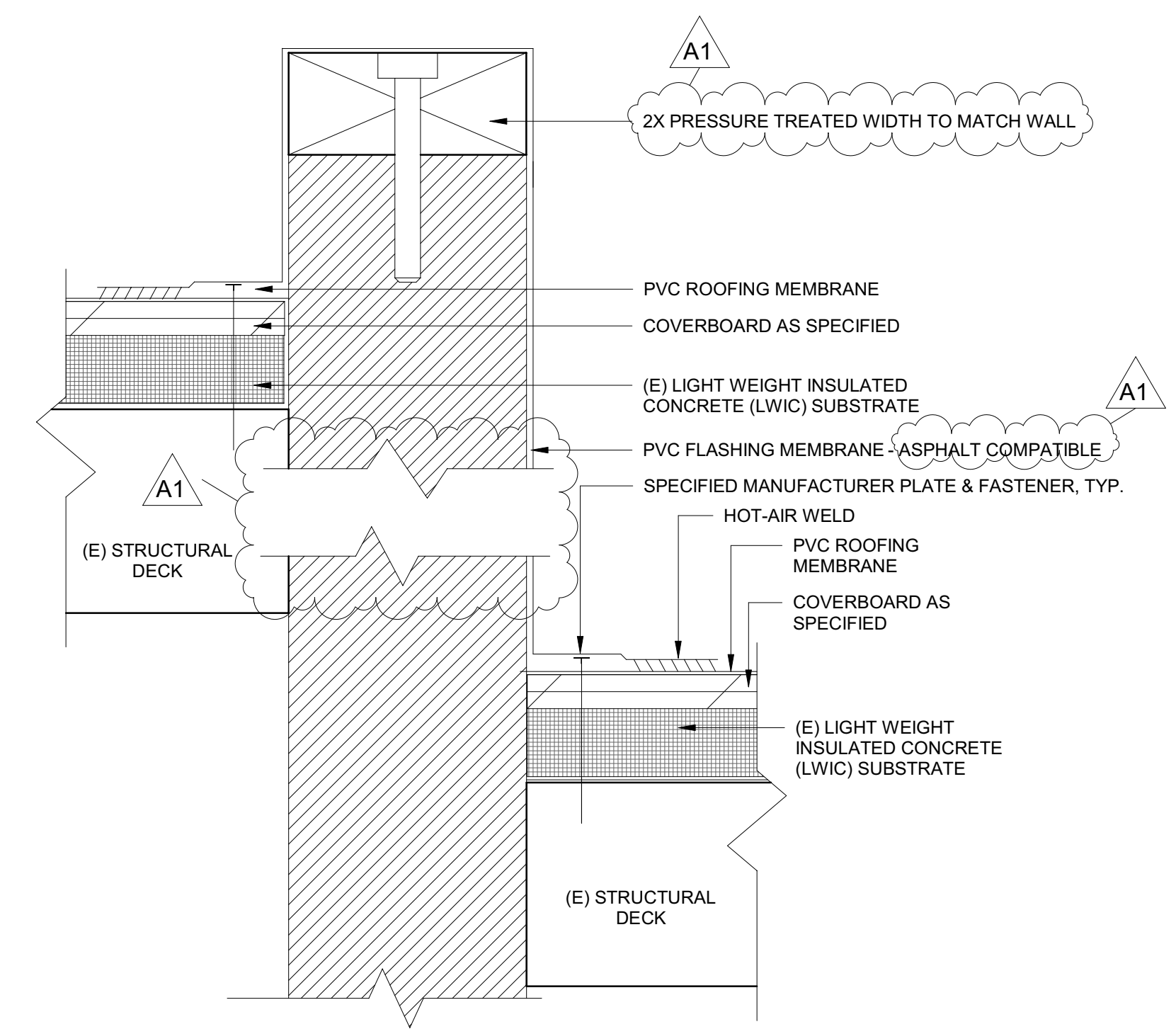
10 ISOLATION CURB INSTALLATION DETAIL
 SCALE: NTS



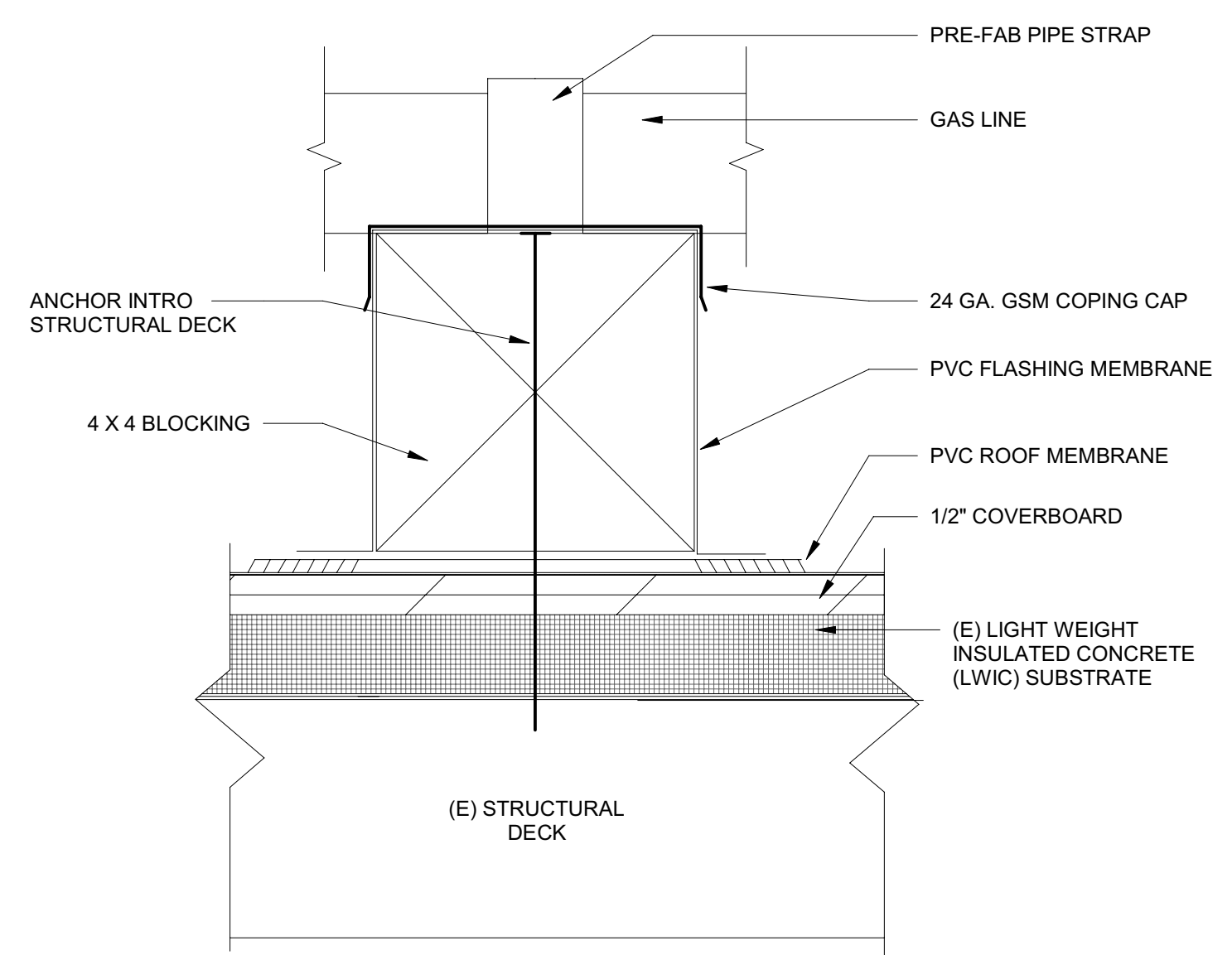
8 LOW TRANSITION WALL, CONDITION B
SCALE: 6" = 1'-0"



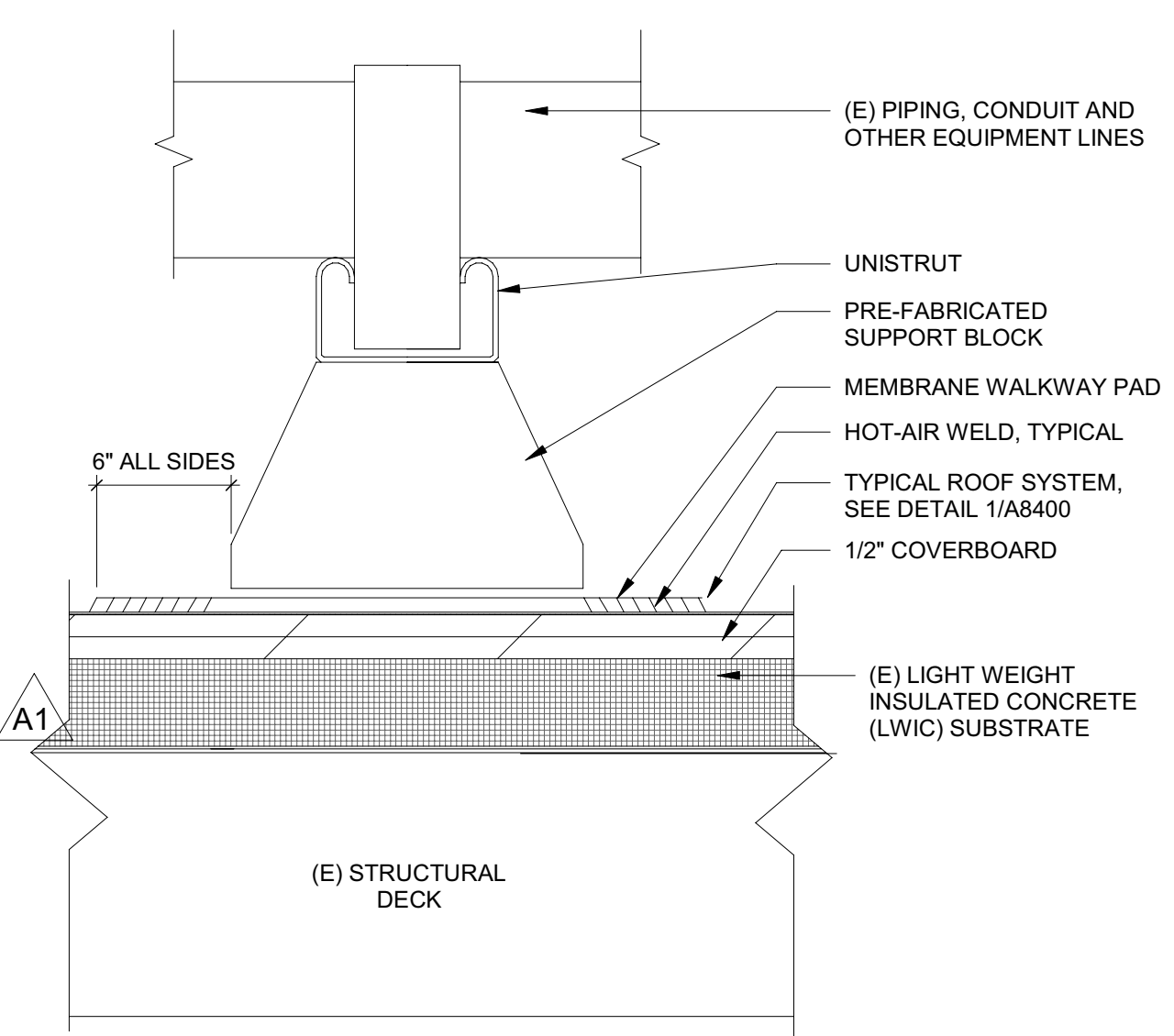
5 PERIMETER PARAPET WALL
SCALE: NTS



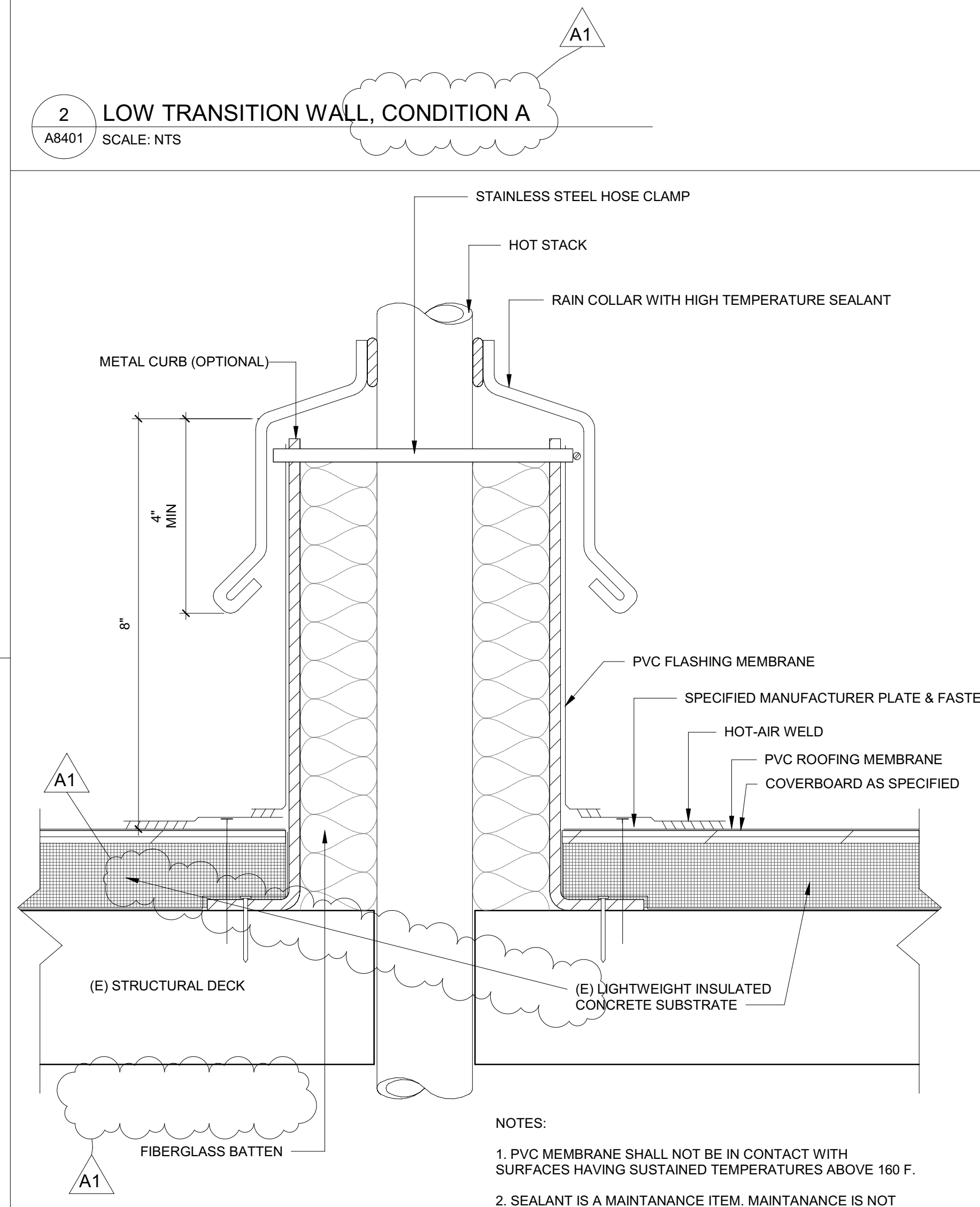
2 LOW TRANSITION WALL, CONDITION A
SCALE: NTS



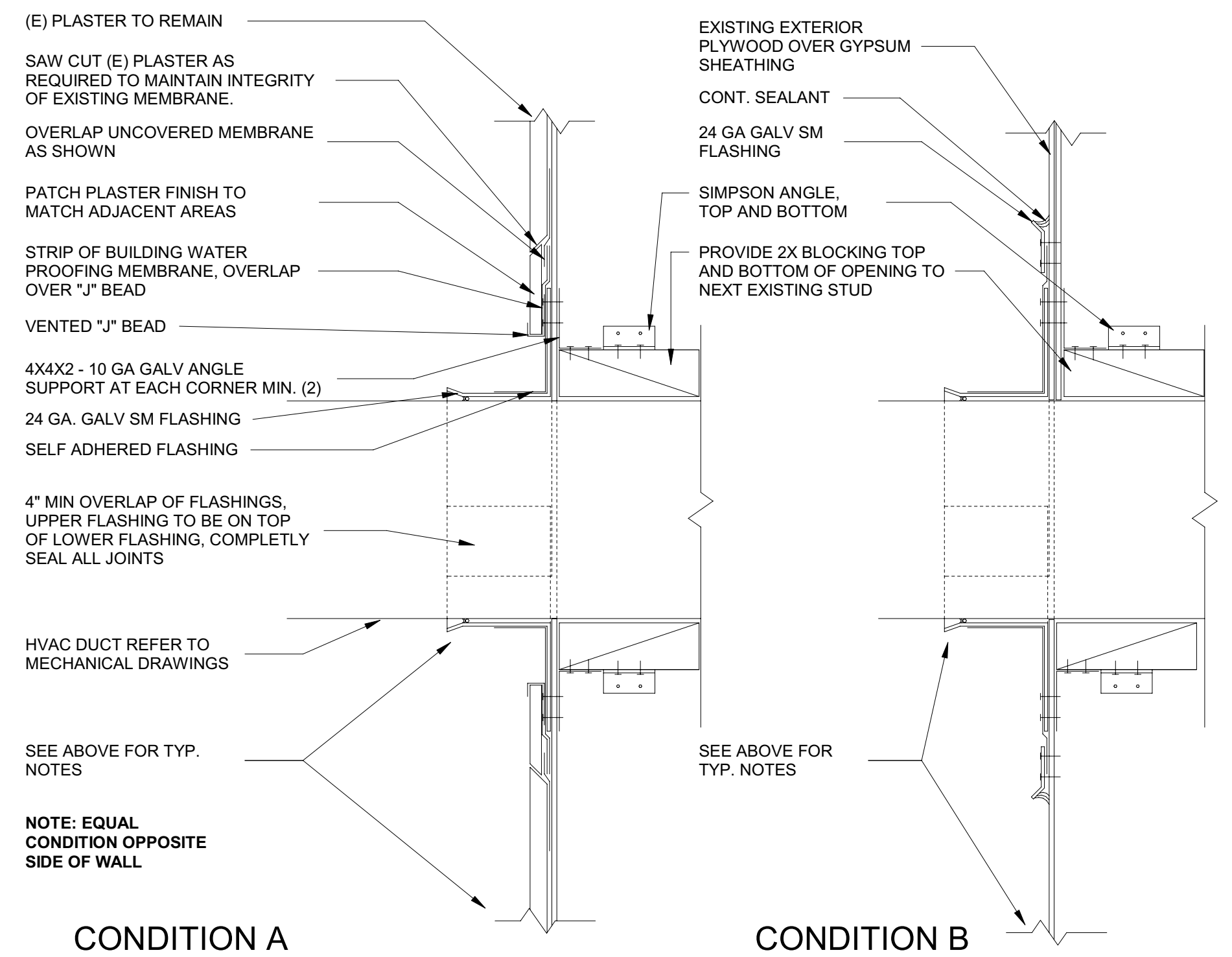
7 ENCAPSULATED CURB RAIL SUPPORT BLOCK
SCALE: 6" = 1'-0"



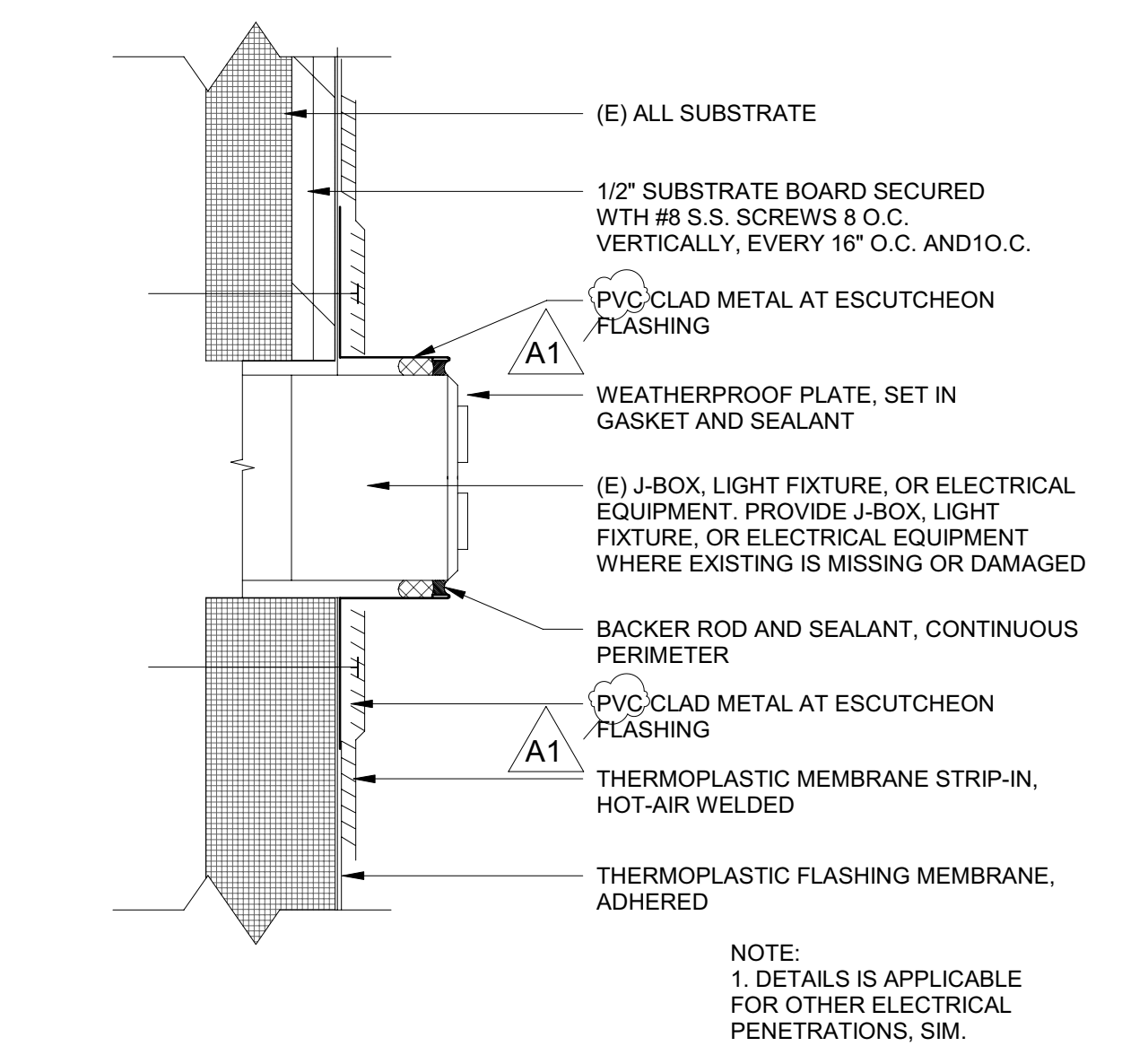
4 SUPPORT BLOCK
SCALE: NTS



1 HEATED STACK FLASHING
SCALE: 6" = 1'-0"



6 DUCT PENETRATION SECTION
SCALE: NTS



3 ELECTRICAL OUTLET IN WALL
SCALE: NTS

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Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

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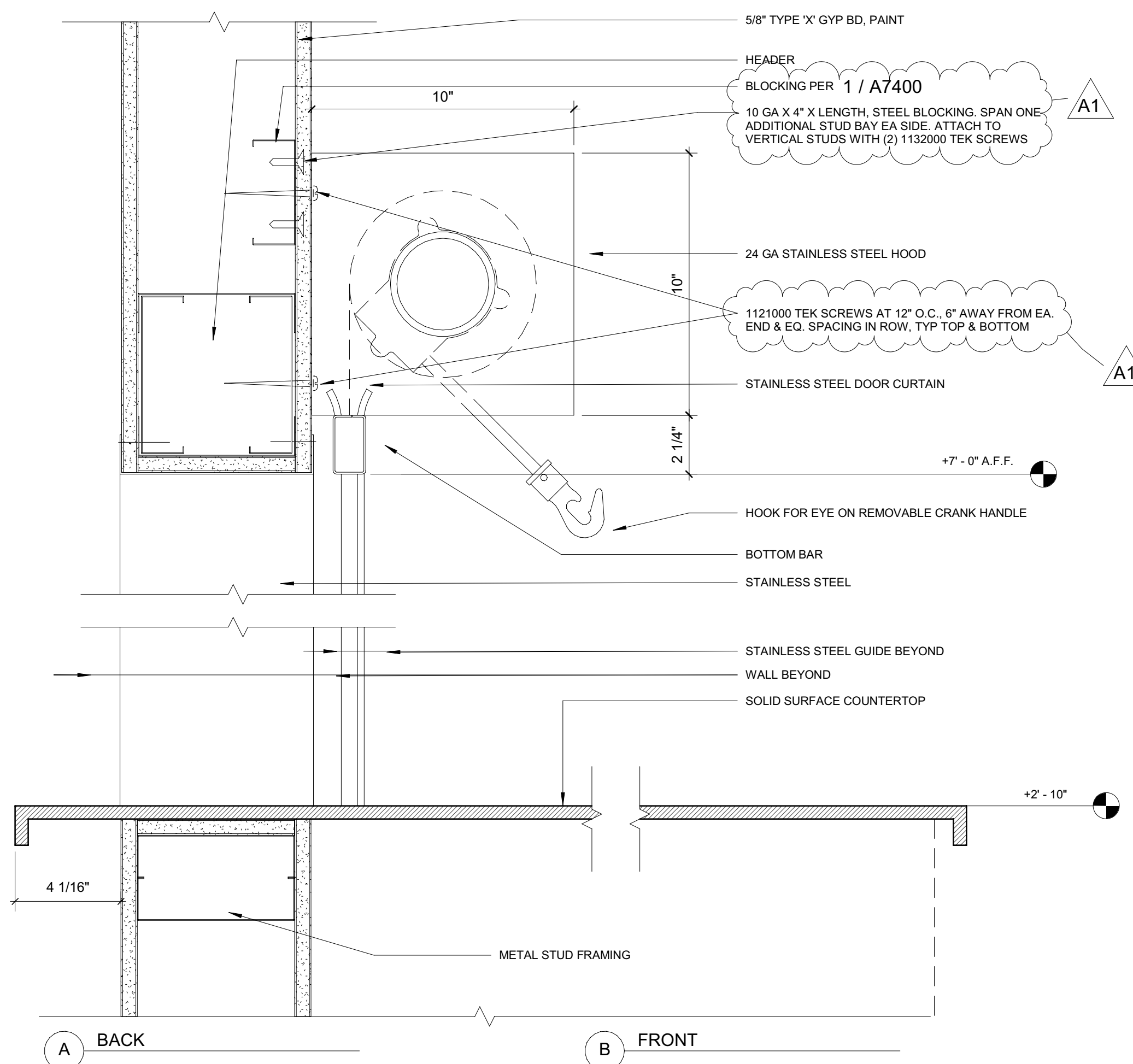
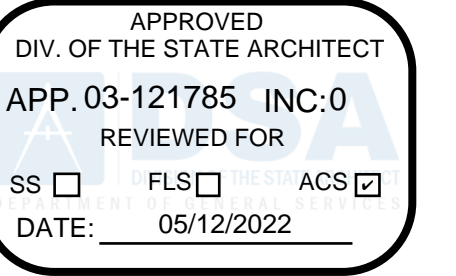
SUB CONSULTANT

ISSUES	NO.	ISSUANCE	STATUS	DATE
G	100% CD			2021-02-08
H	100% CD - SCOPE REVISIONS			2021-08-31
V1	DS/CSFM SUBMITTAL			2021-08-14
V2	DS/CSFM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

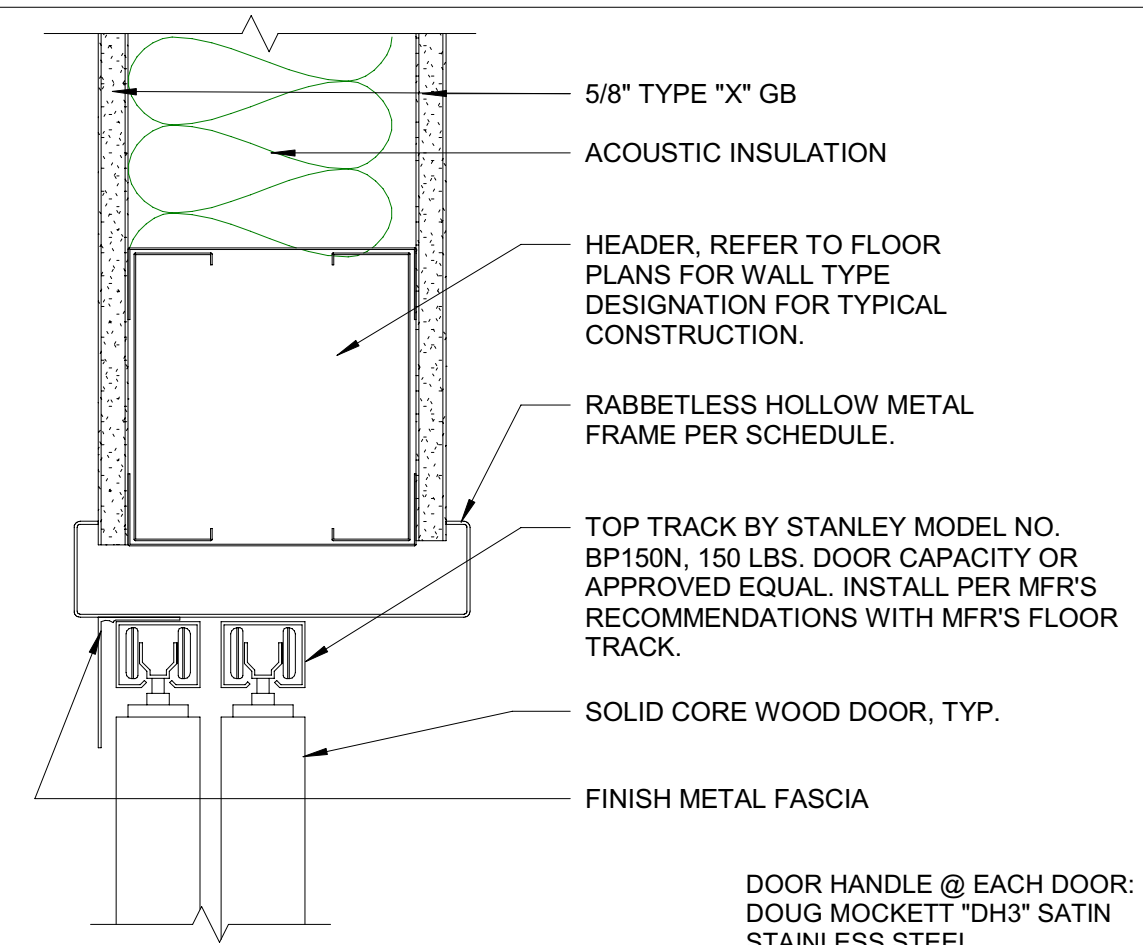
SHEET TITLE
DETAILS - ROOF

DATE: 2022-05-02
DRAWN BY: CD
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

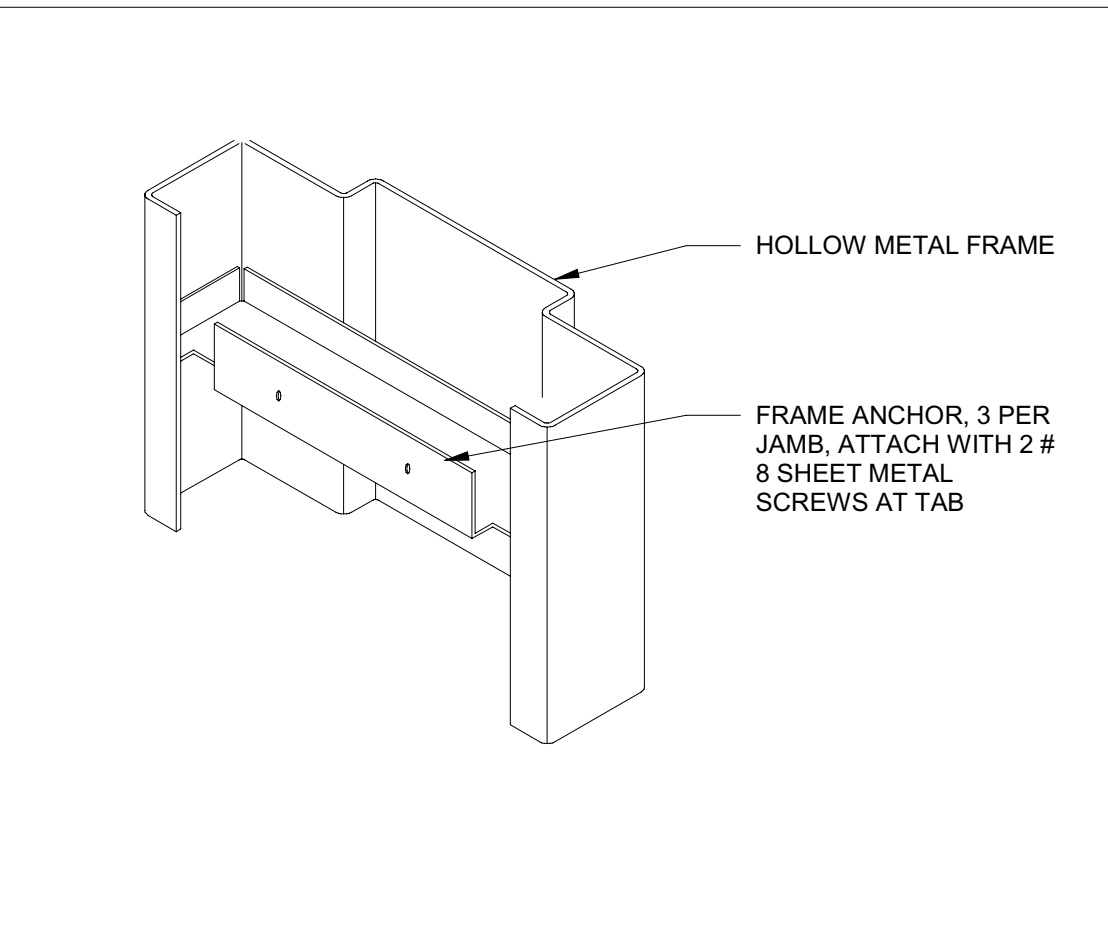
SHEET NUMBER
A8401
ISSUE
A1



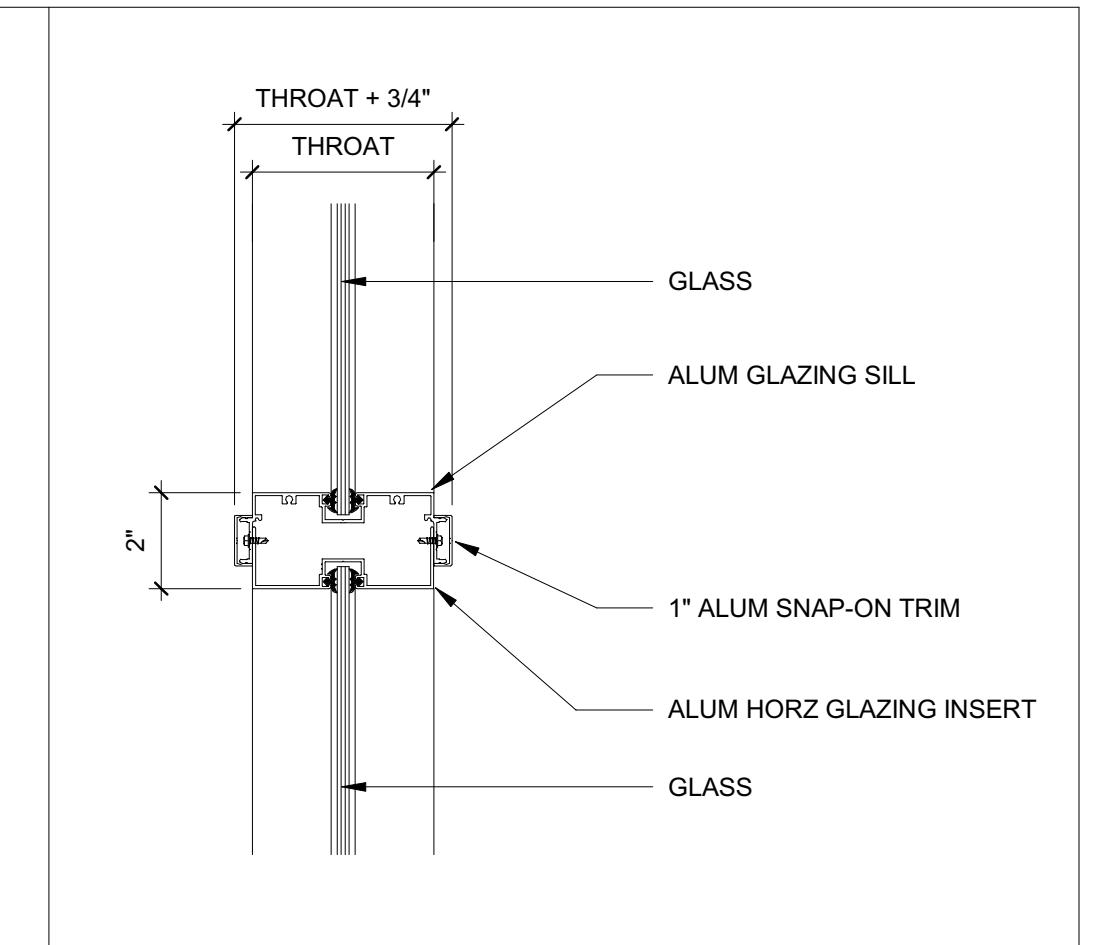
19 COILING COUNTER DOOR HEAD
SCALE: 3" = 1'-0"



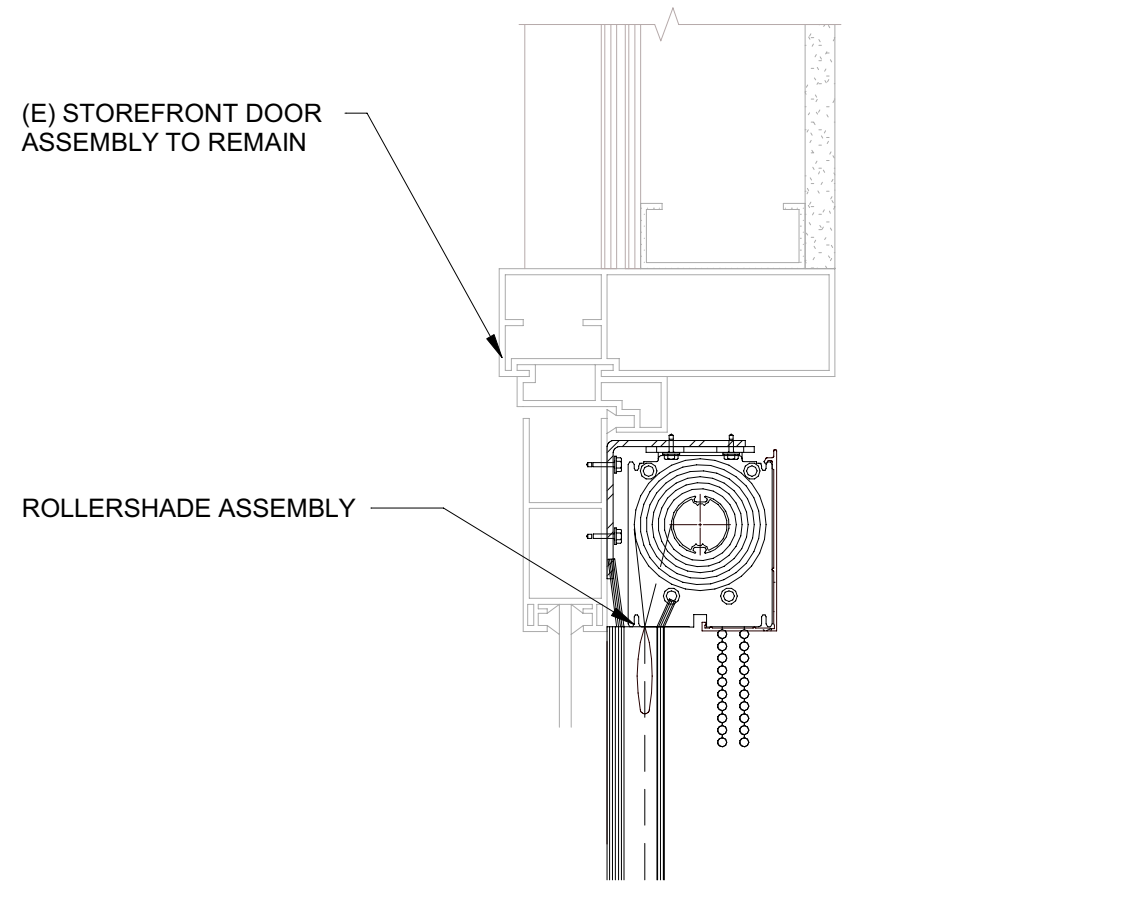
12 SLIDING DOOR HEAD
SCALE: 3" = 1'-0"



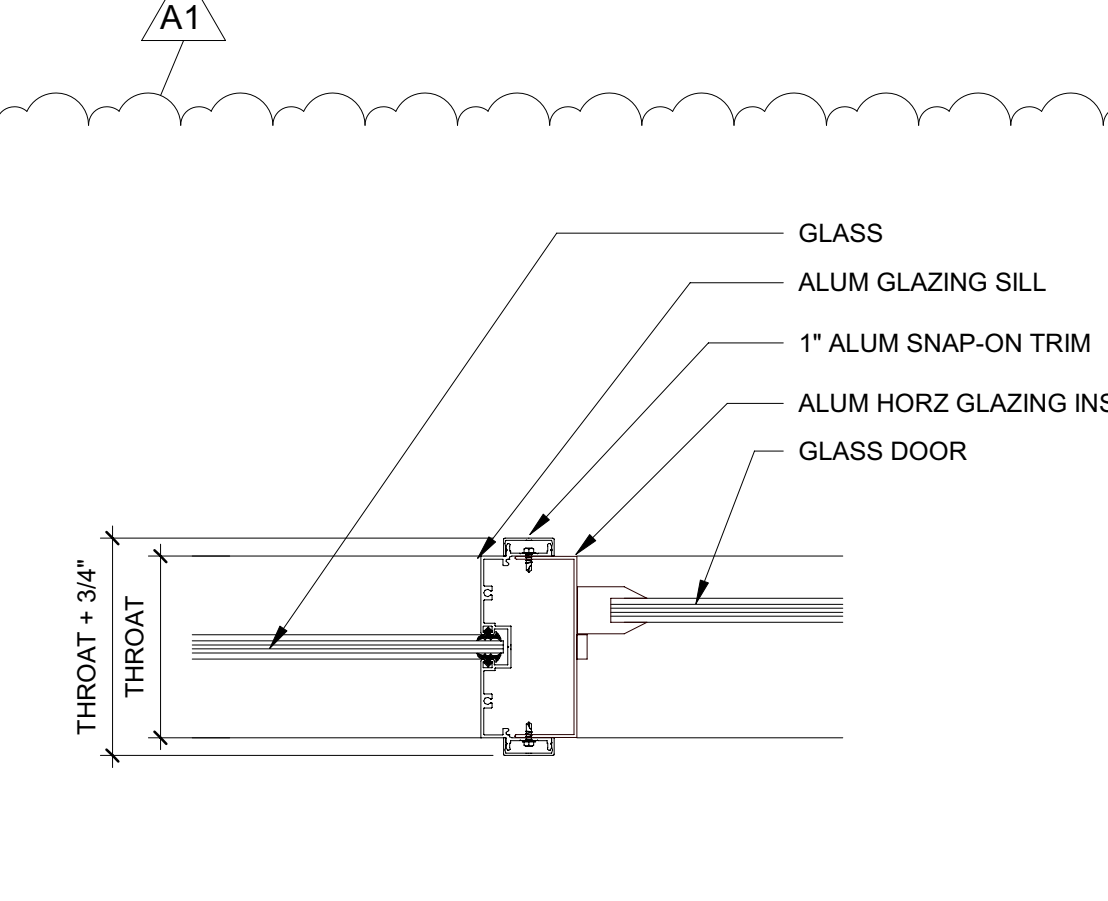
8 FRAME ANCHOR
SCALE: 1 1/2" = 1'-0"



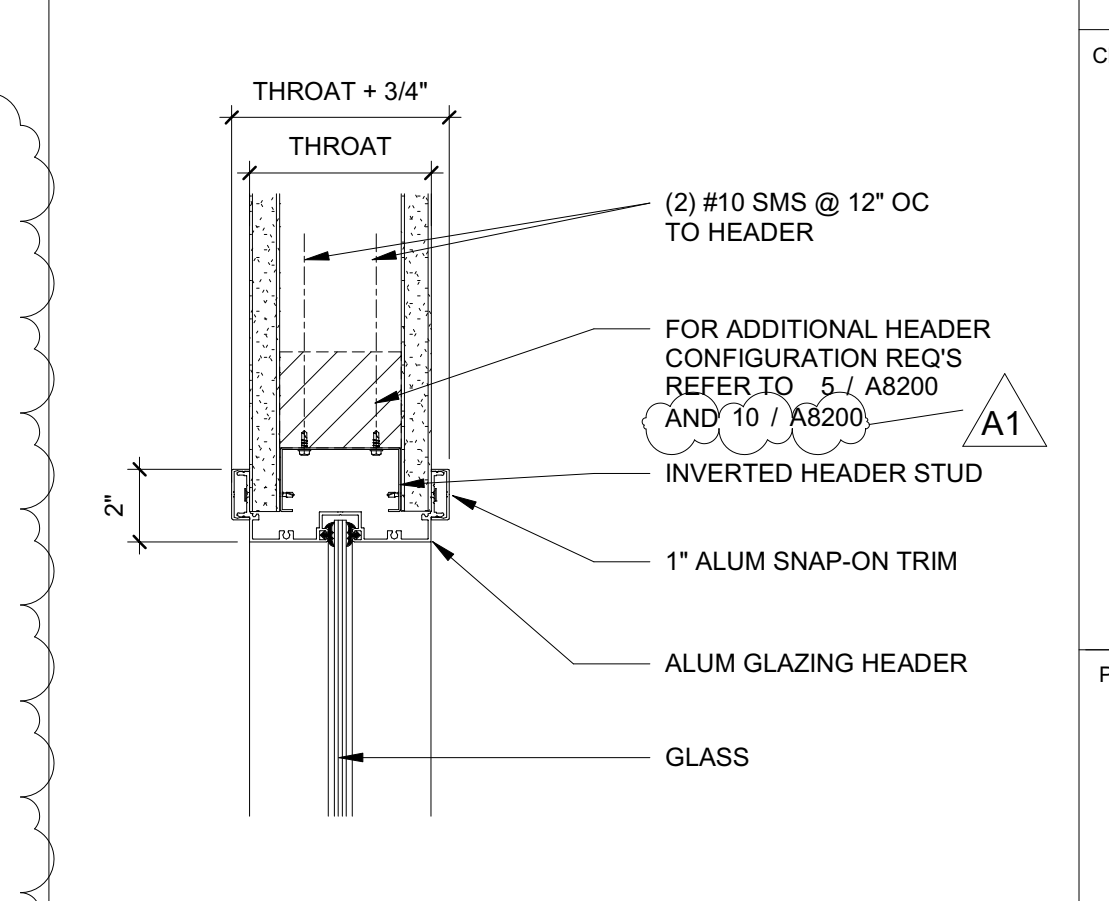
4 GLAZING INTERMEDIATE MUNTIN
SCALE: 3" = 1'-0"



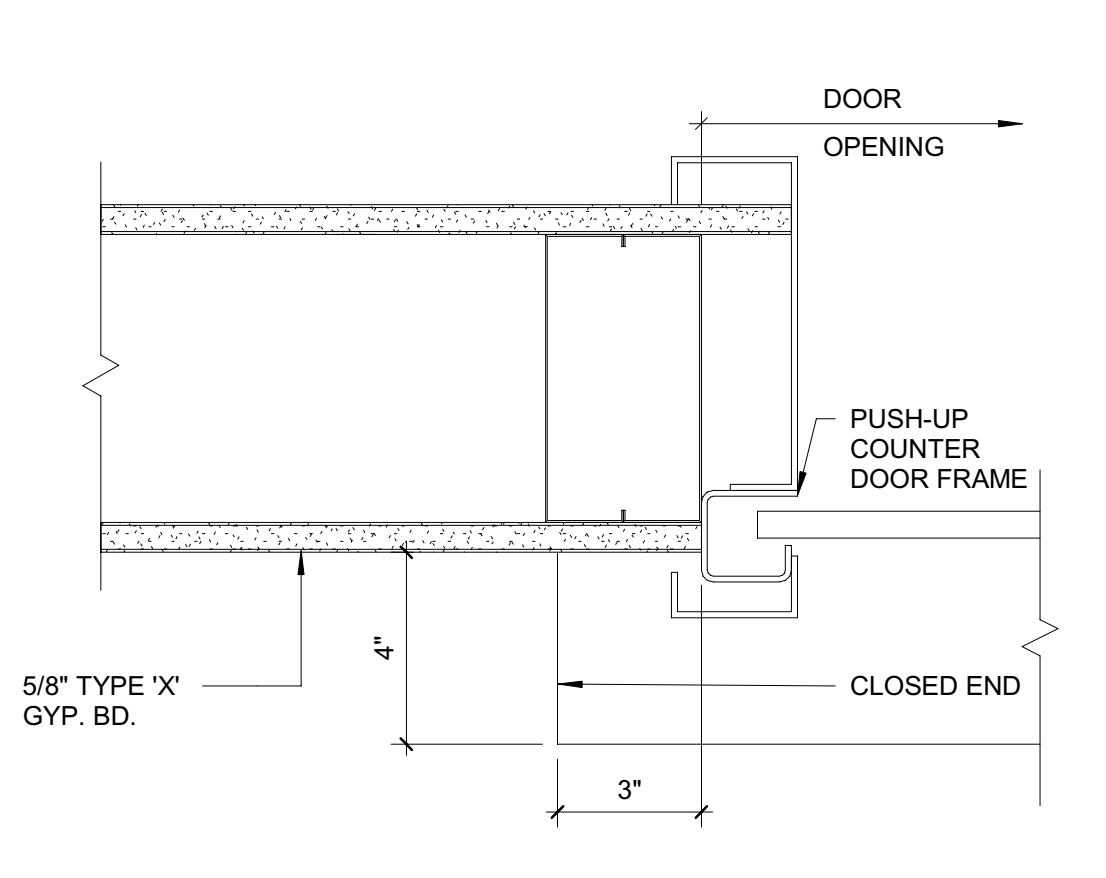
11 ROLLER SHADE @ DOOR
SCALE: 3" = 1'-0"



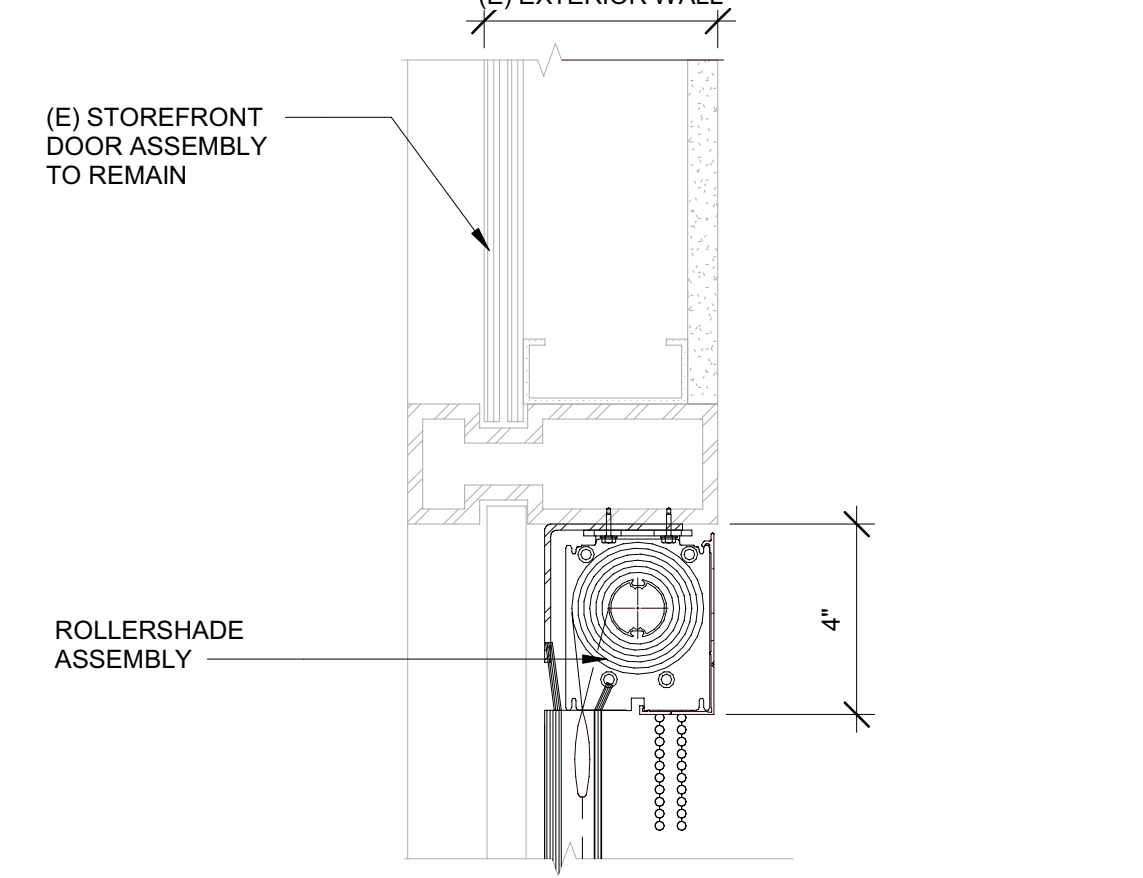
7 GLAZING DOOR JAMB
SCALE: 3" = 1'-0"



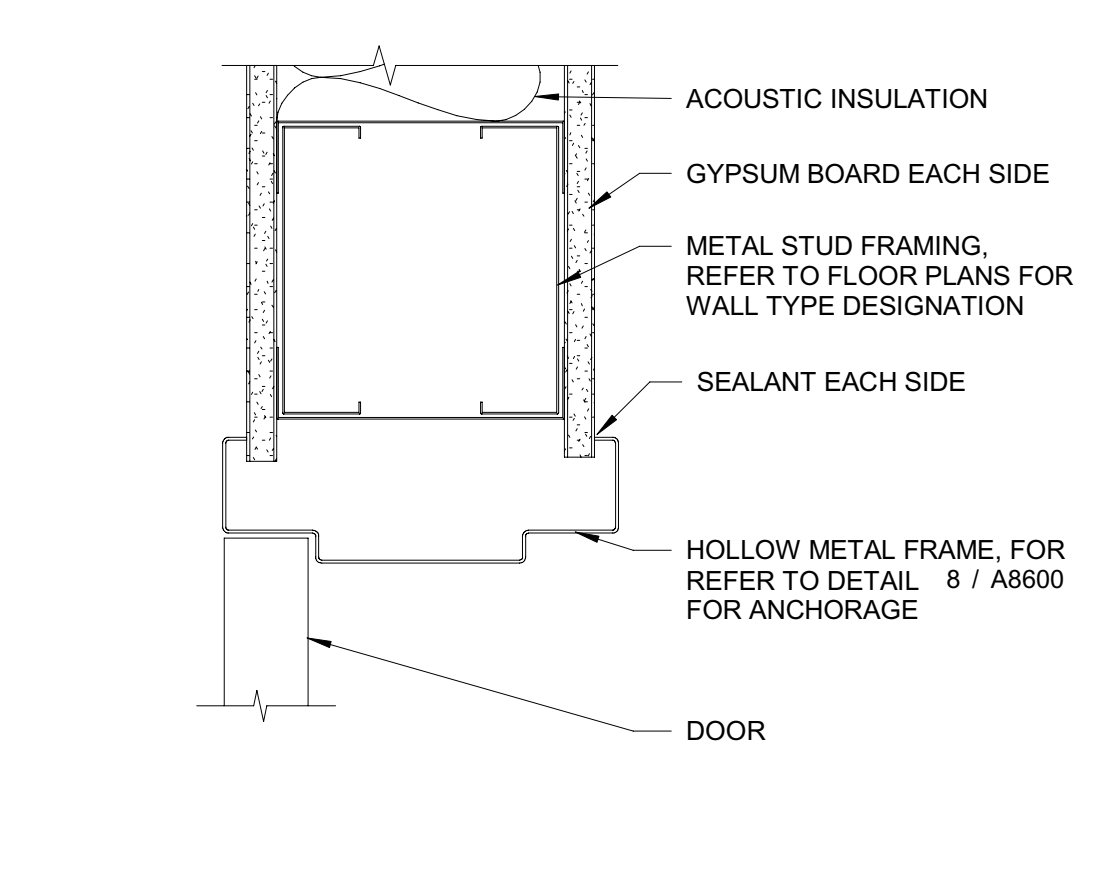
3 STOREFRONT HEADER
SCALE: 3" = 1'-0"



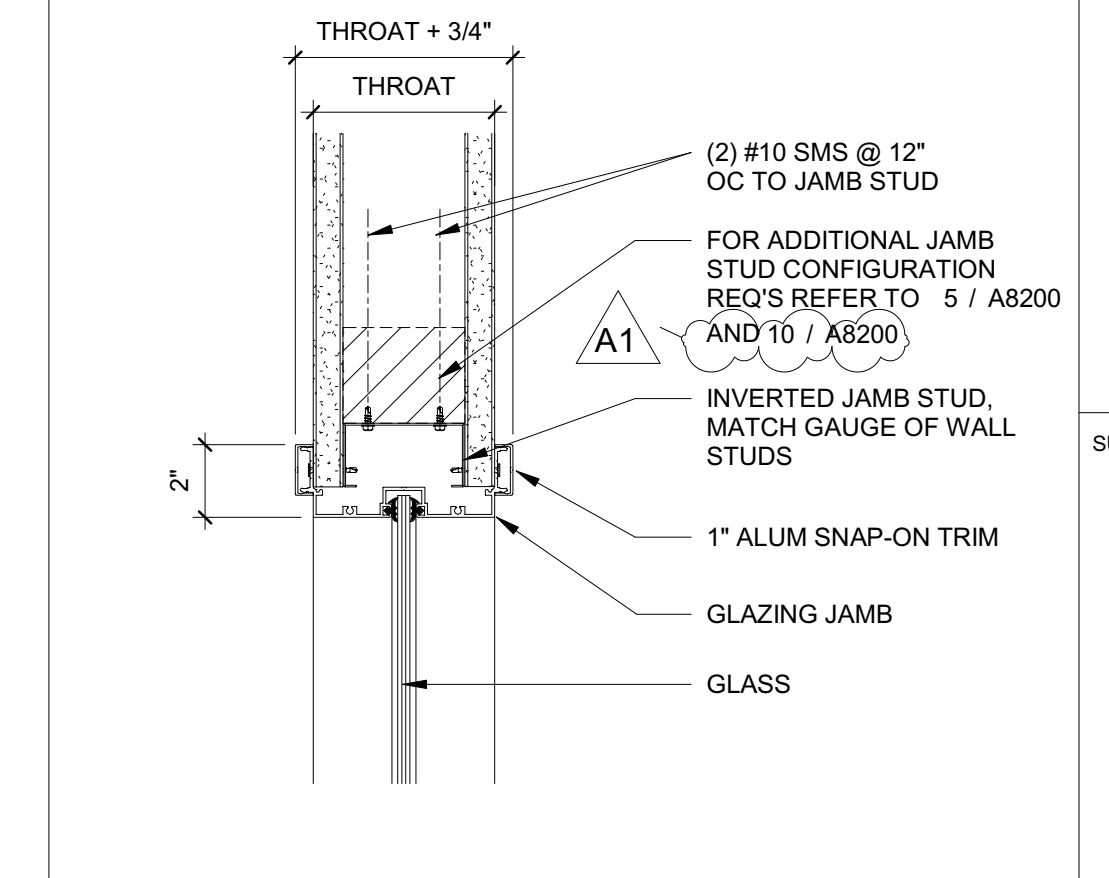
14 COILING COUNTER DOOR JAMB
SCALE: 3" = 1'-0"



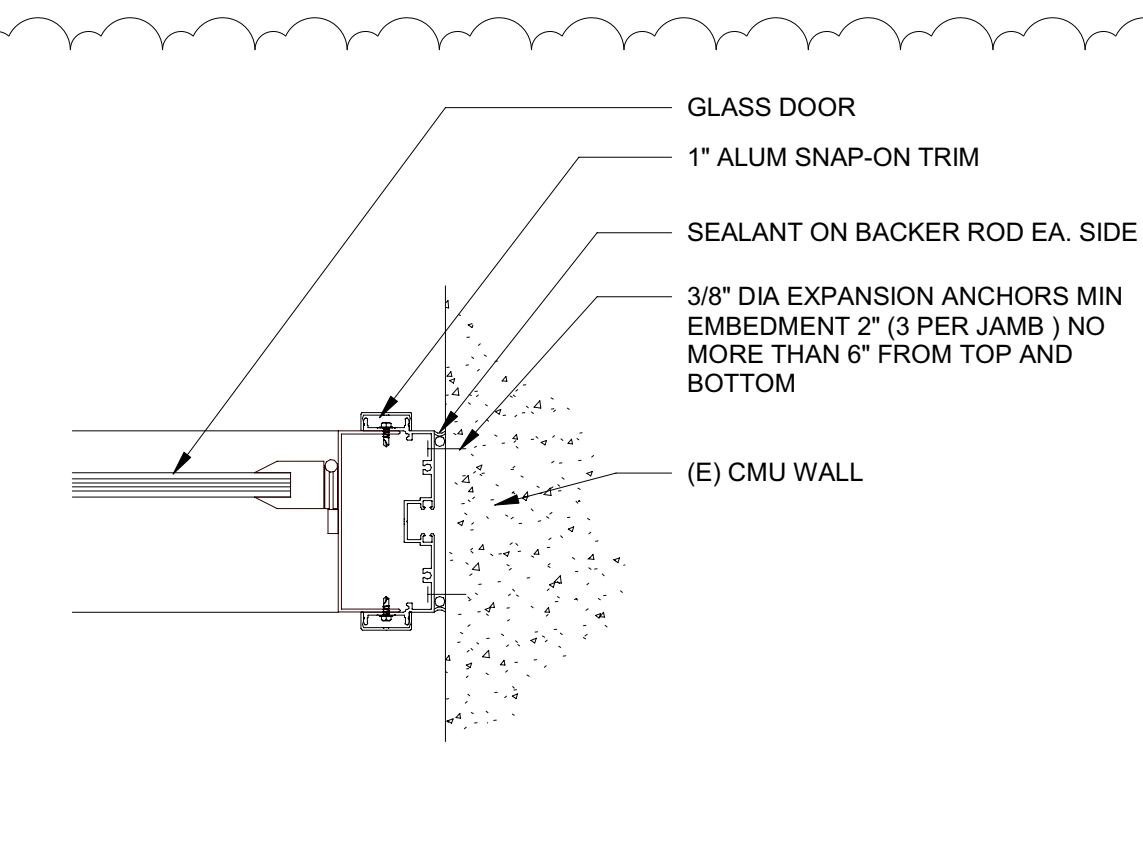
10 ROLLER SHADE @ WINDOW
SCALE: 3" = 1'-0"



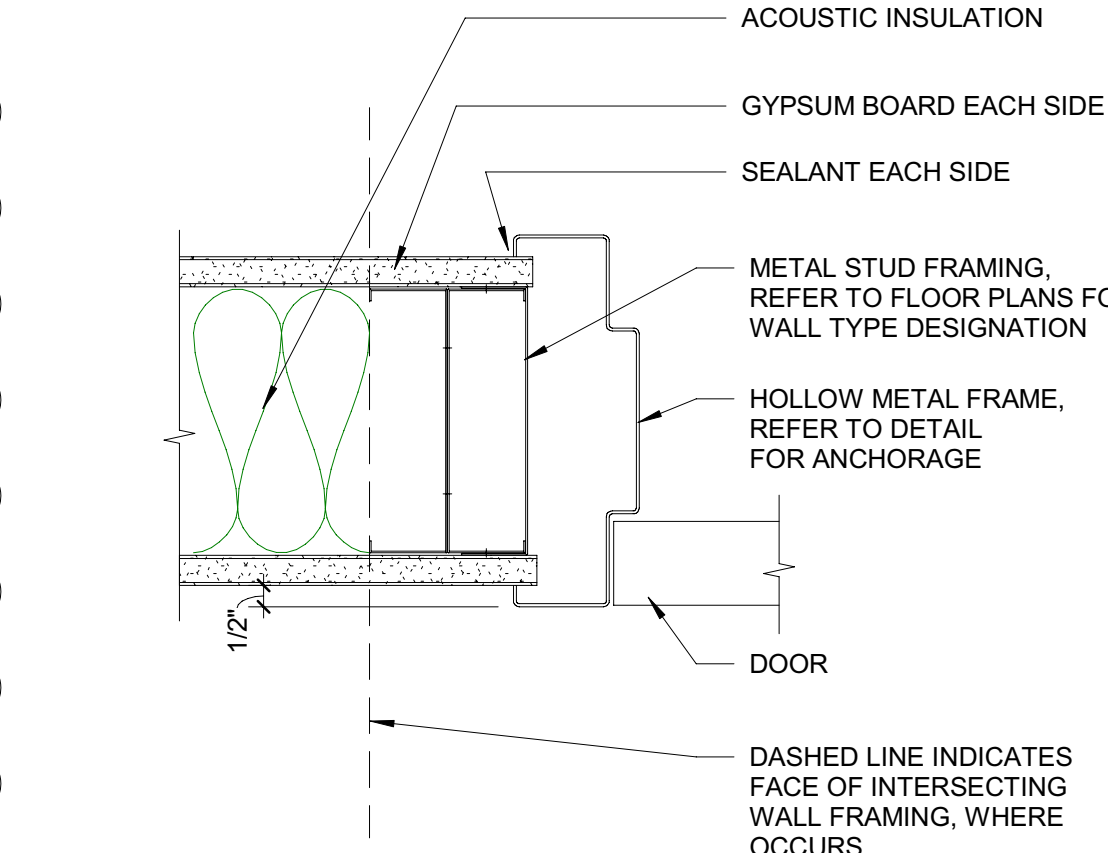
6 INTERIOR DOOR HEAD
SCALE: 3" = 1'-0"



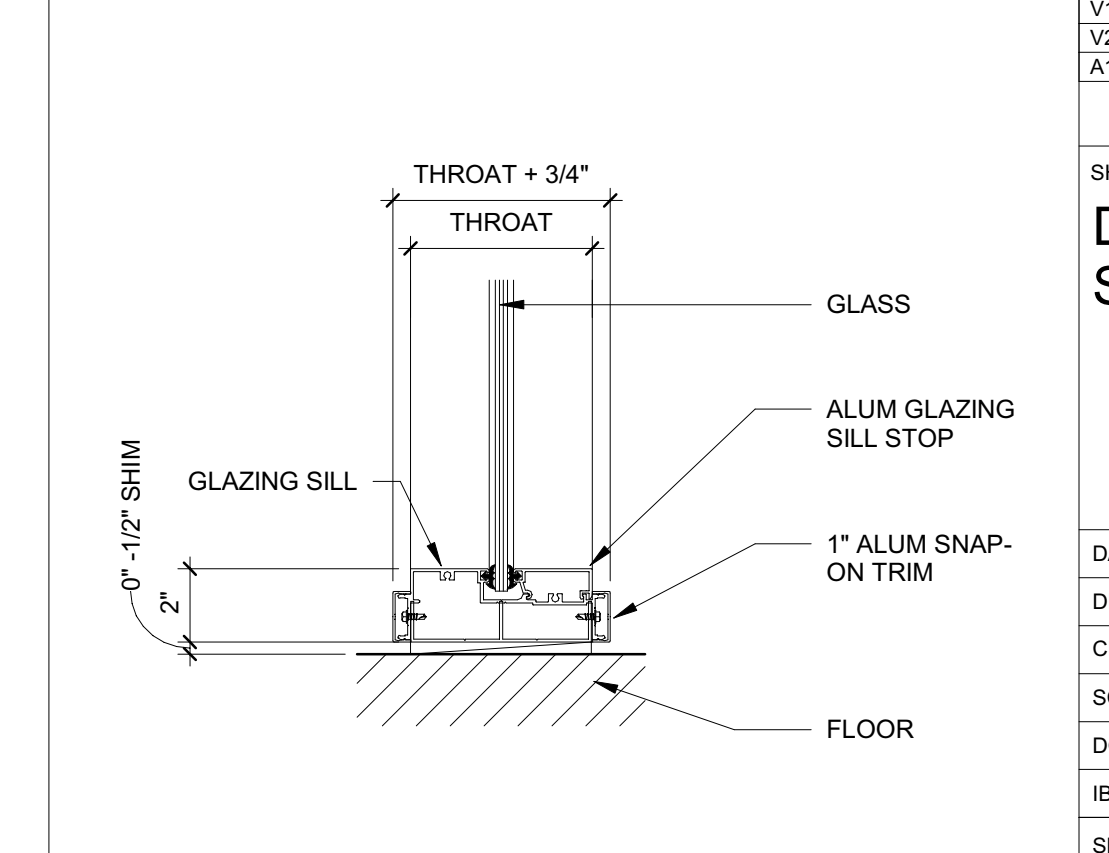
2 STOREFRONT JAMB
SCALE: 3" = 1'-0"



9 GLAZING DOOR JAMB @ WALL
SCALE: 3" = 1'-0"



5 INTERIOR DOOR JAMB
SCALE: 3" = 1'-0"



1 STOREFRONT SILL
SCALE: 3" = 1'-0"

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1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



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ISSUES

NO.	ISSUANCE	STATUS	DATE
E	50% CD - SCOPE REVISION		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
DETAILS - OPENINGS & STOREFRONT

DATE: 2022-05-02
DRAWN BY: RR
CHKD BY: AB
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
A8600
ISSUE
A1

GENERAL NOTES

DEMOLITION

- VERIFY EXISTING BUILDING DIMENSIONS AND ELEVATIONS. NOTIFY ARCHITECT (STRUCTURAL ENGINEER) OF ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
- DEMOLITION WORK SHALL BE CONDUCTED IN SUCH A MANNER AS TO NOT DAMAGE EXISTING ELEMENTS THAT ARE TO REMAIN IN THE FINISHED BUILDING.
- EXISTING ELEMENTS OF THE STRUCTURE THAT ARE TO REMAIN IN THE FINISHED BUILDING SHALL BE PROTECTED AS NECESSARY TO MINIMIZE DAMAGE DURING DEMOLITION WORK. ANY SUCH DAMAGE SHALL BE REPAIRED AND/OR REPLACED AT NO ADDED COST.
- PROVIDE MEASURES NECESSARY TO PROTECT THE EXISTING STRUCTURE DURING DEMOLITION WORK. PROTECTIVE MEASURES SHALL REMAIN IN PLACE UNTIL THE FINAL STRUCTURAL ELEMENTS ARE IN PLACE AND ABLE TO SAFELY CARRY ALL IMPOSED EXISTING BUILDING LOADS. SUCH MEASURES INCLUDE, BUT NOT LIMITED TO, BRACING AND SHORING.
- EXISTING CONCRETE ELEMENTS THAT ARE TO BE REMOVED BY CHIPPING SHALL BE STARTED WITH A 3/4 INCH DEEP SAW CUT. CORNERS SHALL BE DRILLED TO PREVENT OVER-CUTTING. EXPOSED SAW CUT LINES SHALL BE CLEAN, STRAIGHT AND SMOOTH.
- ROUGHEN EXISTING CONCRETE SURFACES AGAINST WHICH FRESH CONCRETE IS TO BE PLACED TO A FULL AMPLITUDE OF 1/4 INCH.
- EXISTING REINFORCING STEEL TO REMAIN SHALL BE CLEANED TO BARE METAL.
- DEMOLISHED MATERIALS PLACED ON EXISTING FLOORS SHALL BE SPREAD OUT SUCH THAT IMPOSED LOADS DO NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT. PROVIDE ADEQUATE SHORING WHERE OVERLOAD IS ANTICIPATED.

POST-INSTALLED ANCHORS

- POST-INSTALLED ANCHORS OF EQUAL QUALITY AND WITH CURRENT ICC-ES REPORT MAY BE SUBSTITUTED IF APPROVED BY THE ARCHITECT (STRUCTURAL ENGINEER).
- INSTALL POST-INSTALLED ANCHORS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REINFORCING STEEL DOWELS, THREADED RODS, AND ANCHORS SHALL BE FREE OF DUST, GREASE, RUST AND OTHER MATERIALS THAT WILL IMPAIR BOND WITH CONCRETE.
- USE ONLY NON-REBAR CUTTING DRILL BITS TO DRILL HOLES IN CONCRETE AND CONCRETE MASONRY UNITS. EXISTING REINFORCING STEEL SHALL BE POSITIVELY LOCATED BY NON-DESTRUCTIVE MEANS PRIOR TO DRILLING HOLES. DO NOT CUT OR DAMAGE EXISTING REINFORCING STEEL UNLESS APPROVED BY THE ARCHITECT (STRUCTURAL ENGINEER).
- WHERE EXISTING CONCRETE IS DAMAGED AND/OR DRILLED HOLES ABANDONED, THE DAMAGED CONCRETE OR ABANDONED HOLES SHALL BE REPAIRED OR FILLED WITH NON-SHRINK GROUT, RESPECTIVELY. BRING EACH CONDITION TO THE ATTENTION OF THE ARCHITECT (STRUCTURAL ENGINEER) PRIOR TO IMPLEMENTING REPAIRS.
- DO NOT DRILL HOLES WITHIN 4 INCHES OF EXISTING ELECTRICAL OUTLETS THAT ARE EMBEDDED IN SUBSTRATE.
- BRING TO THE ATTENTION OF THE ARCHITECT (STRUCTURAL ENGINEER) ANY POST-INSTALLED ANCHOR LOCATION THAT CANNOT COMPLY WITH THE PARAMETERS STATED HEREIN AND INDICATED ON THE DRAWINGS.

STRUCTURAL STEEL (CONTINUED)

- WELDING SHALL CONFORM TO LATEST EDITION OF AWS D1.1/ D1.1M, AS AMENDED IN CBC SECTION 2204.1.
 - WELDING PROCESS SHALL BE ELECTRIC ARC USING E70XX ELECTRODES. SUBMERGED ARC PROCESS (SAW) WITH AUTOMATIC WELDING MAY BE USED AS AN ALTERNATIVE.
 - WELDERS SHALL BE CERTIFIED TO CONFORM WITH AWS STANDARDS AND APPROVED BY THE GOVERNING CODE AUTHORITY.
 - SHOP WELDING, INCLUDING ULTRASONIC TESTING OF FULL PENETRATION GROOVE WELDS, SHALL BE PERFORMED ON THE PREMISES OF AN APPROVED FABRICATOR.
 - MINIMUM FILLET WELD SIZE SHALL CONFORM TO AISC SPECIFICATION TABLE J2.4. WELDS LENGTHS NOTED ON DRAWINGS ARE THE NET EFFECTIVE LENGTHS REQUIRED.
 - FIELD WELD SYMBOLS NOTED ON THE DRAWINGS SHOW ENGINEERING INTENT, BUT NO ATTEMPT HAS BEEN MADE TO CLASSIFY ALL WELDS. AT FABRICATOR'S OPTION, ANY WELD INDICATED AS A FIELD WELD MAY BE SHOP WELDED AND ANY WELD INDICATED AS A SHOP WELD MAY BE FIELD WELDED.
- WELDS SHALL BE PREQUALIFIED PER AWS D1.1/D1.1M. NON-PREQUALIFIED WELDED JOINTS SHALL BE QUALIFIED BY TEST PER AWS D1.1/ D1.1M.
- SUBMIT TO ARCHITECT (STRUCTURAL ENGINEER) FOR REVIEW A WRITTEN WELDING PROCEDURE SPECIFICATION (WPS) FOR ALL WELDS USED ON PROJECT PRIOR TO FABRICATION. FOR WELDS NOT PREQUALIFIED, THE SUPPORTING PROCEDURE QUALIFICATION RECORD (PQR) SHALL ALSO BE SUBMITTED WITH THE WPS. WPS SHALL BE IN ACCORDANCE TO AWS D1.1/D1.1M, SECTION 4.6 AND SHALL INCLUDE THE FOLLOWING INFORMATION FOR EACH WELD TYPE AND POSITION:
 - SKETCH OF JOINT DESCRIBING GEOMETRY AND APPLICABLE DIMENSIONS, WELD TYPE AND SIZE, SEQUENCE OF WELD DEPOSITION, AND MAXIMUM LAYER THICKNESS AND BEAD WIDTHS. LAYER THICKNESS SHALL NOT EXCEED 1/4 INCH, AND BEAD WIDTH SHALL NOT EXCEED 5/8 INCH.
 - BASE METAL TYPES AND THICKNESS.
 - APPLICABLE WELD PROCESS (SMAW OR FCAW).
 - FILLER METAL PER AWS STANDARD AND ELECTRODE SPECIFICATION AND CLASSIFICATION, AS WELL AS DETAILS OF SHIELDING MATERIAL.
 - ELECTRICAL CHARACTERISTICS FOR WELD PROCESS USED SUCH AS TYPE OF CURRENT AND ACCEPTABLE RANGE OF CURRENT MEASURED IN AMPERAGE, VOLTAGE RANGE, AND ELECTRODE DIAMETER. FOR WELD FEED PROCESS, INDICATE MANUFACTURER RECOMMENDED WIRE SPEED, CONTACT DISTANCE, MELT OFF RATE AND DEPOSITION RATE.
 - A COPY OF ELECTRODE MANUFACTURER'S TECHNICAL INFORMATION AND CERTIFICATE OF CONFORMANCE.
- TESTING LABORATORY WILL VERIFY COMPLIANCE WITH ACCEPTED WPS AND WILL PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER) IF DEVIATIONS ARE FOUND.
- ELECTRODE DIAMETER SHALL NOT EXCEED PREQUALIFIED LIMITS SHOWN IN AWS D1.1/ D1.1M TABLE 3.7, AS APPLICABLE. FOR FCAW PROCESS, MAXIMUM ELECTRODE SIZE SHALL NOT EXCEED 1/8 INCH.
- DIFFUSIBLE HYDROGEN LEVEL FOR ELECTRODES AND ELECTRODE-FLUX COMBINATION SHALL MEET THE REQUIREMENTS OF TABLE 6.3 OF AWS D1.8/D1.8M.
- DETAILS, MATERIALS, WORKMANSHIP, AND TESTING AND INSPECTION REQUIREMENTS OF WELDED JOINTS COMPRISING THE SFERS SHALL CONFORM TO THE FOLLOWING APPLICABLE STANDARDS:
 - AWS D1.1/ D1.1M "STRUCTURAL WELDING CODE - STEEL."
 - AWS D1.8/ D1.8M "STRUCTURAL WELDING CODE - SEISMIC SUPPLEMENT."
 - ANSI/AISC 341, "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS", CHAPTER J (QUALITY CONTROL AND QUALITY ASSURANCE).
 - ANSI/AISC 358 "PREQUALIFIED CONNECTIONS FOR SPECIAL AND INTERMEDIATE STEEL MOMENT FRAMES FOR SEISMIC APPLICATIONS."
- WELD MATERIALS USED IN SFERS WELDED CONNECTIONS SHALL CONFORM TO THE FOLLOWING TOUGHNESS REQUIREMENTS:
 - WELDED CONNECTIONS SHALL BE MADE WITH A FILLER METAL THAT CAN PRODUCE WELDS THAT HAVE A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LB AT 0°F AS DETERMINED BY THE APPROPRIATE AWS CLASSIFICATION TEST METHOD.
 - WELDED CONNECTIONS DESIGNATED AS "DEMAND CRITICAL", SHALL BE MADE WITH A FILLER METAL CAPABLE OF PROVIDING A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 40 FT-LB AT 70°F BASED ON WPS HEAT INPUT ENVELOPE TESTING PRESCRIBED IN ANNEX A OF AWS D1.8/D1.8M.
- INTERMIX OF FILLER METAL: WHEN FCAW-S FILLER METALS ARE USED IN COMBINATION WITH FILLER METALS FOR OTHER PROCESSES, INCLUDING FCAW-G, SUPPLEMENTAL CVN NOTCH TOUGHNESS TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH ONE OR MORE OF THE FOLLOWING:
 - TESTS AS DESCRIBED IN ANNEX B OF AWS D1.8/D1.8M.
 - PQR TESTS THAT CONTAIN INTERMIX WELD METAL, WHEREIN CVN TEST SPECIMENS HAVE BEEN TAKEN FROM THE INTERMIX ZONE.
- WELDING OF SHEET METAL AND METAL STUDS SHALL BE IN ACCORDANCE WITH AWS D1.3/ D1.3M.
- CONTRACTOR SHALL PROVIDE FOR AN ALLOWANCE OF 2% OF TOTAL WEIGHT OF STRUCTURAL STEEL TO BE FABRICATED AND/OR ERECTED DURING THE PROGRESS OF WORK AS MAY BE DIRECTED BY THE ARCHITECT (STRUCTURAL ENGINEER). THE UNUSED PORTION SHALL BE CREDITED TO THE OWNER AT THE COMPLETION OF STRUCTURAL STEEL WORK.

STRUCTURAL STEEL

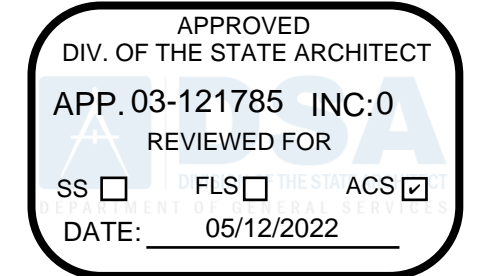
- STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF ANSII/AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", ANSII/AISC 341 "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS", AND ANSII/AISC 303 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AS AMENDED BY CALIFORNIA BUILDING CODE (CBC) SECTIONS 2203, 2204 AND 2205.
- SEISMIC FORCE RESISTING SYSTEM (SFERS) IS THAT PART OF THE STRUCTURAL SYSTEM THAT HAS BEEN CONSIDERED IN THE DESIGN TO PROVIDE THE REQUIRED RESISTANCE TO THE SEISMIC FORCES PRESCRIBED IN ASCE/SEI 7.
- STRUCTURAL STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS, UNLESS NOTED OTHERWISE ON DRAWINGS:

WIDE FLANGE SHAPES	ASTM A992/A992M
CHANNELS, ANGLES, M- & S-SHAPES	ASTM A36/A36M
PLATES	ASTM A572/A572M, GRADE 50
UNFINISHED MACHINE BOLTS	ASTM A307
THREADED ROUND STOCK	ASTM A36/A36M
- FURNISH READILY IDENTIFIABLE STRUCTURAL STEEL IN COMPLIANCE WITH CBC SECTION 2203.1.
- HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", AS AMENDED BY CBC SECTION 2204.2. WHEN ASSEMBLED, ALL JOINT SURFACES, INCLUDING THOSE ADJACENT TO WASHERS, SHALL BE FREE OF SCALE, EXCEPT TIGHT MILL SCALE. USE STANDARD HOLES UNLESS NOTED OTHERWISE.
 - PROVIDE ASTM A325, TYPE I, SNUG-TIGHTENED (ST) BOLTS WITH THREADS INCLUDED IN SHEAR PLANE, UNLESS NOTED OTHERWISE. PROVIDE ASTM A325, TYPE I, SLIP-CRITICAL (SC) BOLTS AT CONNECTIONS IN SFERS AND WHERE SPECIFICALLY INDICATED. FAYING SURFACES FOR SLIP-CRITICAL CONNECTIONS SHALL MEET CLASS A SLIP RESISTANCE, UNLESS OTHERWISE NOTED. NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM A563 AND ASTM F436, RESPECTIVELY.
 - ASTM A325-ST BOLTS SHALL BE SNUG TIGHTENED IN ACCORDANCE WITH RCSC SPECIFICATION SECTION 8.1, UNLESS NOTED OTHERWISE. FULLY TENSION ALL ASTM A325-SC BOLTS AND ALL BOLTS REQUIRED TO BE TENSIONED BY AISC SPECIFICATION SECTION J1.10 AND RCSC SPECIFICATION SECTIONS 4.2 AND 4.3. FULLY TENSIONED BOLTS SHALL BE TIGHTENED TO THE MINIMUM TENSION USING TURN-OFF-THE-NUT PRETENSIONING METHOD, CALIBRATED WRENCH PRETENSIONING METHOD, OR DIRECT-TENSION-INDICATOR PRETENSIONING METHOD USING DIRECT TENSION INDICATORS THAT MEET THE REQUIREMENTS OF ASTM F959.
 - TWIST-OFF-TYPE TENSION-CONTROL BOLTS THAT MEET THE REQUIREMENTS OF ASTM F3125/F3125M, TYPE 1, MAY BE USED IN LIEU OF ASTM A325-ST OR ASTM A325-SC BOLTS.
- COMPOSITE STRUCTURAL BEAMS AND GIRDERS ARE DESIGNED FOR UNSHORED CONSTRUCTION UNLESS NOTED OTHERWISE.
- PROVIDE UPWARD CAMBER TO ALL BEAMS SPECIFIED TO HAVE CAMBER. AMOUNT MEASURES IN THE FIELD PRIOR TO ERECTION SHALL NOT DEVIATE MORE THAN ALLOWED BY AISC SPECIFICATIONS. BEAMS WITHOUT SPECIFIED CAMBER SHALL BE FABRICATED TO SO THAT ANY MINOR CAMBER DUE TO ROLLING SHALL BE UPWARD AFTER ERECTION.
- PRIOR TO FABRICATION, SUBMIT SHOP DRAWINGS TO ARCHITECT (STRUCTURAL ENGINEER) FOR REVIEW AND, UPON REQUEST, TO GOVERNING CODE AUTHORITY. INDICATE AN ERECTION SEQUENCE OF WELDING TO MINIMIZE LOCKED-UP STRESSES OR DISTORTION FOR MOMENT-RESISTING STEEL FRAMES.
- HOURLY FIRE RESISTIVE REQUIREMENTS FOR STRUCTURAL STEEL MEMBERS SHALL BE DETERMINED USING CBC TABLE 601. BUILDING TYPES OF CONSTRUCTION AND FIREPROOFING MATERIALS ARE AS INDICATED ON ARCHITECTURAL DRAWINGS.
- ALL STEEL NOT ENCASED IN CONCRETE, MASONRY, OR FIREPROOFING SHALL BE SHOP PRIMED AND PAINTED PER SPECIFICATIONS, EXCEPT FOR TOP FLANGE OF BEAMS SUPPORTING METAL DECK. ANY ABRASIONS OR UNPAINTED AREAS SHALL BE TOUCHED UP AFTER ERECTION.
- ALL STRUCTURAL STEEL AND MISCELLANEOUS METALS EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION UNLESS NOTED OTHERWISE ON ARCHITECTURAL DRAWINGS.

GENERAL

- ALL WORK SHALL CONFORM TO THE STANDARDS OF THE 2019 CALIFORNIA BUILDING CODE, AISC/SEI-7-10, ACI 318-14, AISC 341-10, AISC 360-10, AND THOSE CODES AND STANDARDS LISTED IN THE CONTRACT DOCUMENTS.
- THE PROJECT MANUAL FORMS A PART OF THESE GENERAL NOTES, CODES, STANDARDS, AND SPECIFICATIONS, INCLUDING ADDENDA AND SUPPLEMENTS. REFERENCED IN THE CONTRACT DOCUMENTS SHALL BE THE LATEST APPROVED ISSUE, UNLESS SPECIFICALLY NOTED.
- NOTES AND DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. IF CONFLICT OCCURS BETWEEN THE CONTRACT DRAWINGS AND THE PROJECT MANUAL, IMMEDIATELY NOTIFY ARCHITECT (STRUCTURAL ENGINEER) FOR RESOLUTION. DIMENSIONS TAKE PRECEDENCE OVER SCALED DRAWINGS.
- CONTRACT DOCUMENTS INDICATE INFORMATION SUFFICIENT TO CONVEY DESIGN INTENT. REVIEW CONTRACT DOCUMENTS AND VERIFY FIELD AND EXISTING CONDITIONS. PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER), PRIOR TO PROCEEDING WITH WORK, IF FURTHER CLARIFICATION OF DESIGN INTENT IS NEEDED.
- UNLESS SPECIFICALLY SHOWN ON THE PLANS NO STRUCTURAL MEMBER SHALL BE CUT, DRILLED OR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER.
- SEE ARCHITECTURAL DRAWINGS FOR:
 - SIZE AND LOCATION OF FLOOR OPENINGS AND SLAB EDGES
 - DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS

DSA A# 03-121785



CLIENT

**State of California
Dept. of General Services**

DGS
GENERAL SERVICES

Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605

Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT

CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES

CAAM
California African American Museum
680 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT

IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com

SUB CONSULTANT

Sb saiful-bouquet
structural engineers SB Job No:18681

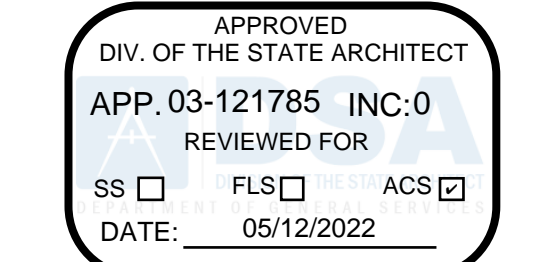
155 North Lake Avenue,
8th Floor
Pasadena, CA 91101
Telephone 626.304.2616
www.saifubouquet.com

NO.	ISSUANCE	STATUS	DATE
E	50% CONSTRUCTION DOCUMENTS		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DS/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

GENERAL NOTES

DATE:	2022-05-02
DRAWN BY:	Author
CHKD BY:	Checker
SCALE:	12" = 1'-0"
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	ISSUE
S0001	A1



Approval of this plan does not authorize or approve any omission or deviation from applicable requirements. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

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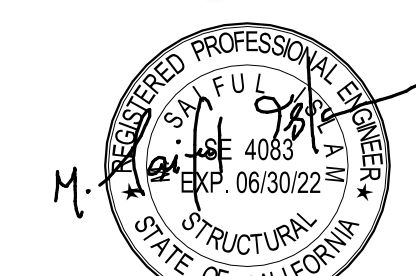
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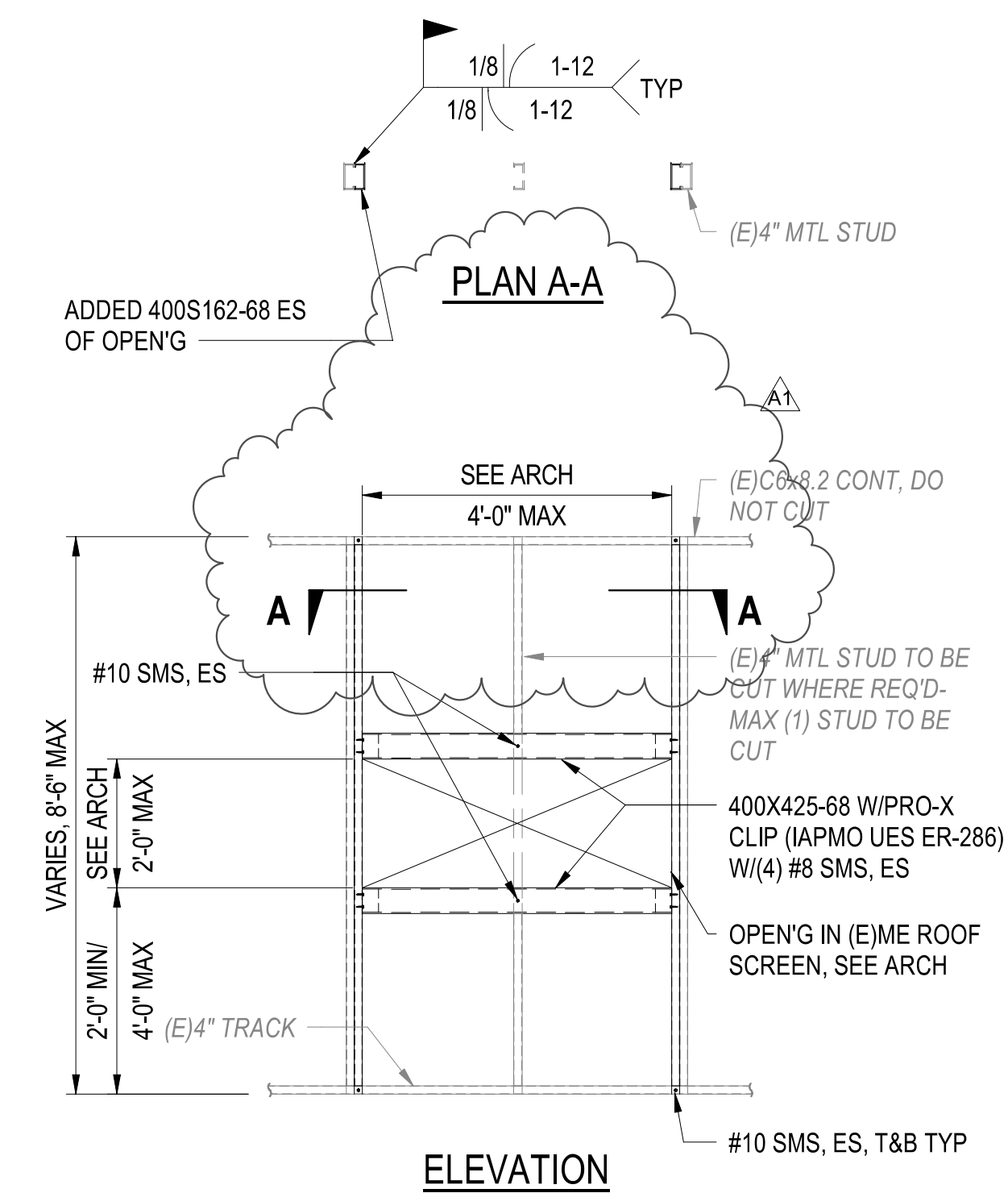


NO.	ISSUANCE	STATUS	DATE
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

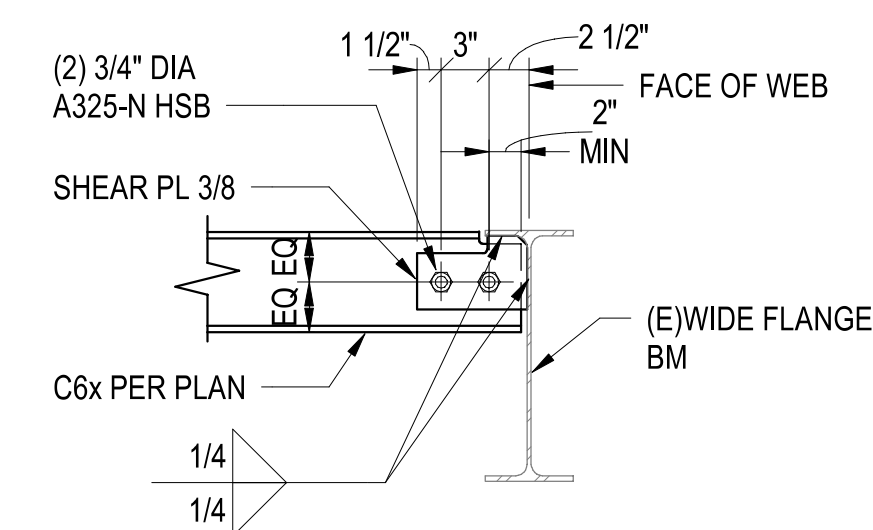
SHEET TITLE
TYPICAL DETAILS

DATE: 2022-05-02
 DRAWN BY: Author
 CHK'D BY: Checker
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

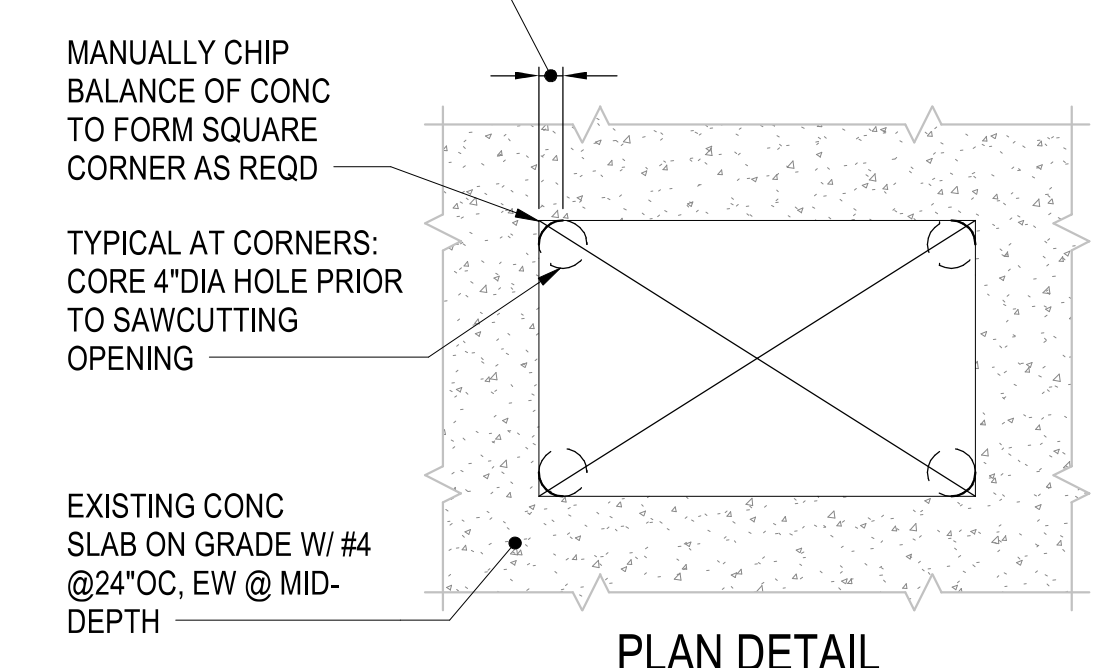
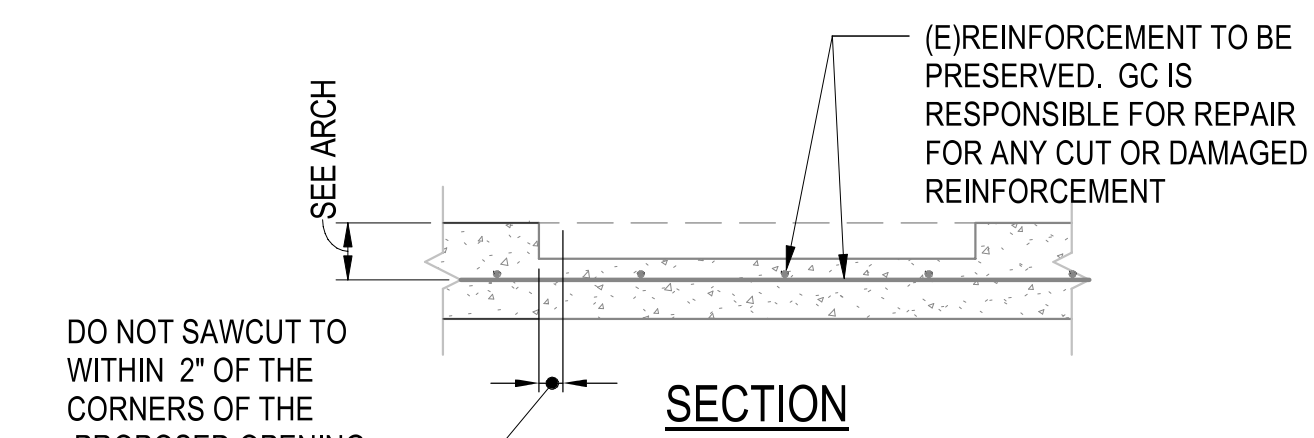
SHEET NUMBER
S1001
 ISSUE
A1



(N)DUCT OPENING IN (E)MECHANICAL SCREEN WALL **3**
 SCALE: NTS



(N)C6x TO (E)WIDE FLANGE BEAM **2**
 SCALE: NTS
 STEEL-WBEM-0001 (REV.1)



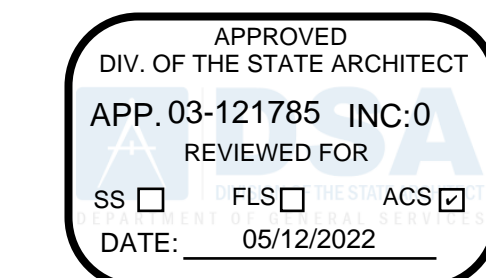
NOTE:
 SEE ARCH DRAWINGS FOR NEW OPENING LOCATIONS AND DIMS, & DEPTH.

TYPICAL SAWCUT DETAIL IN SLAB ON GRADE **1**
 SCALE: NTS

FOR INSULATING CONCRETE FILL ON METAL ROOF DECKING:

- USE ROOF DECK WITH FACTORY PUNCHED VENT TABS PROVIDING 1 TO 1.5 PERCENT OPENING FOR POSITIVE VENTING.
- PROVIDE INSULATING CONCRETE, WITH OR WITHOUT INSULATING BOARD, AS SPECIFIED ON DRAWINGS. AGGREGATE SHALL COMPLY WITH ASTM C150, TYPE I OR TYPE III. OVEN DRY UNIT WEIGHT OF INSULATING CONCRETE SHALL BE 25 TO 30 PCF WITH A MINIMUM COMPRESSIVE STRENGTH OF 140 PSI, TESTED IN ACCORDANCE TO ASTM C495.
- REINFORCE WITH 2-INCH HEXAGONAL MESH WOVEN WITH NO. 19 GAGE GALVANIZED WIRE WITH AN ADDITIONAL NO. 16 GAGE GALVANIZED WIRE WOVEN INTO THE MESH AT 3 1/2". THE MESH SHALL BE PULLED UP TO APPROXIMATELY 1/2 INCH BELOW THE SURFACE AFTER FINIAL SCREENING.

INSULATING CONCRETE NOTES **4**
 SCALE: NTS



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West Sacramento, CA 95605
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(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

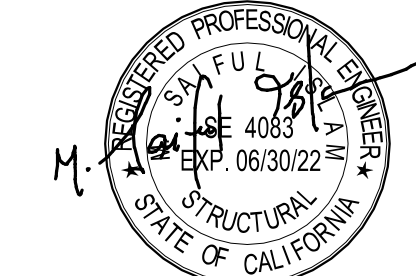
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NO.	ISSUANCE	STATUS	DATE
F	50% CD - SCOPE REVISION		2020-11-26
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DISA/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
OVERALL ROOF PLAN

DATE: 2022-05-02
DRAWN BY: Author
CHKD BY: Checker
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

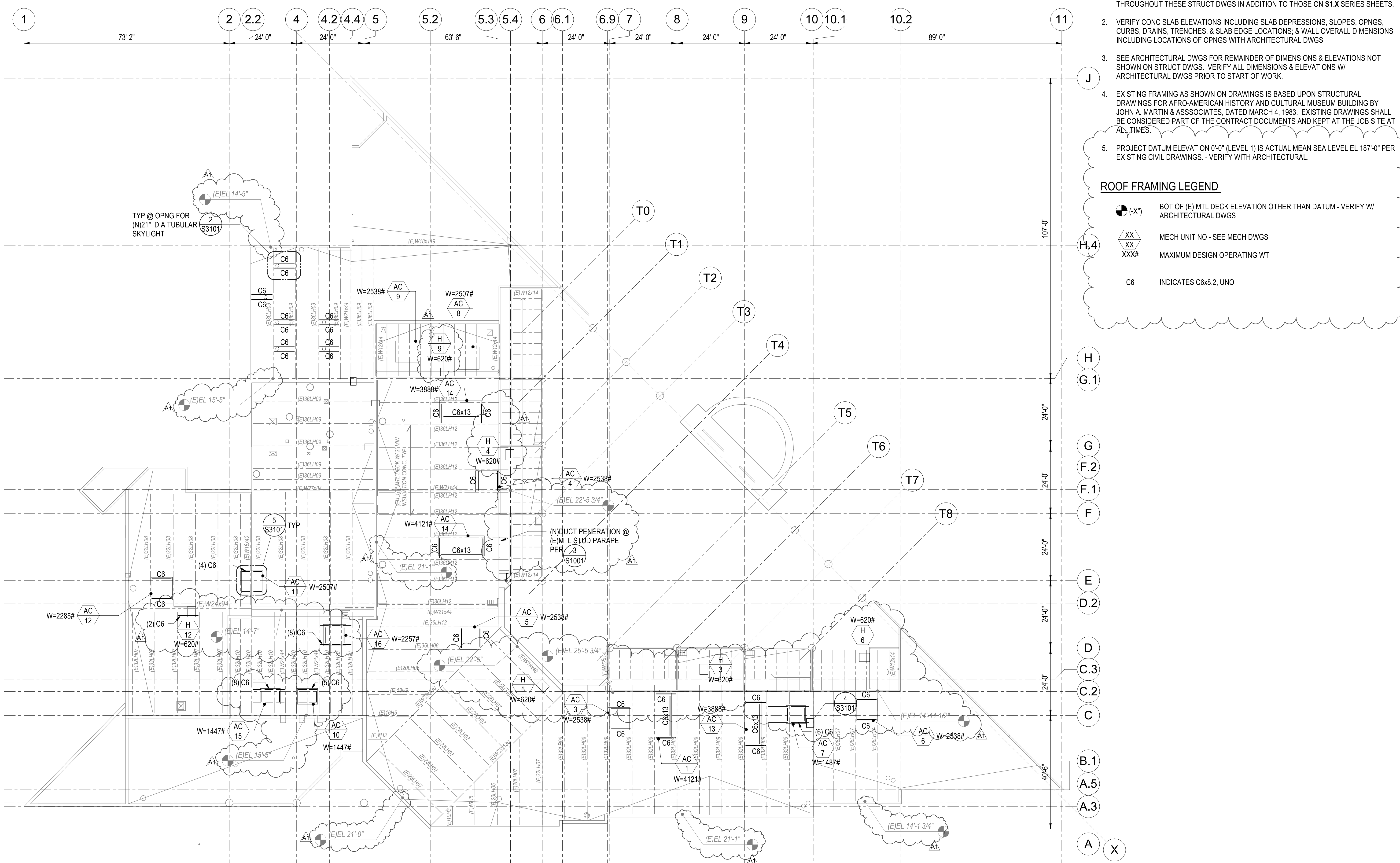
SHEET NUMBER
S2200
ISSUE
A1

ROOF FRAMING PLAN NOTES

- FOR GENERAL NOTES SEE S0.X SERIES SHEETS. TYPICAL DETAILS OCCUR THROUGHOUT THESE STRUCT DWGS IN ADDITION TO THOSE ON S1.X SERIES SHEETS.
- VERIFY CONC SLAB ELEVATIONS INCLUDING SLAB DEPRESSIONS, SLOPES, OPNGS, CURBS, DRAINS, TRENCHES, & SLAB EDGE LOCATIONS; & WALL OVERALL DIMENSIONS INCLUDING LOCATIONS OF OPNGS WITH ARCHITECTURAL DWGS.
- SEE ARCHITECTURAL DWGS FOR REMAINDER OF DIMENSIONS & ELEVATIONS NOT SHOWN ON STRUCT DWGS. VERIFY ALL DIMENSIONS & ELEVATIONS W/ ARCHITECTURAL DWGS PRIOR TO START OF WORK.
- EXISTING FRAMING AS SHOWN ON DRAWINGS IS BASED UPON STRUCTURAL DRAWINGS FOR AFRO-AMERICAN HISTORY AND CULTURAL MUSEUM BUILDINGS BY JOHN A. MARTIN & ASSOCIATES, DATED MARCH 4, 1983. EXISTING DRAWINGS SHALL BE CONSIDERED PART OF THE CONTRACT DOCUMENTS AND KEPT AT THE JOB SITE AT ALL TIMES.
- PROJECT DATUM ELEVATION 0'-0" (LEVEL 1) IS ACTUAL MEAN SEA LEVEL EL 187'-0" PER EXISTING CIVIL DRAWINGS. - VERIFY WITH ARCHITECTURAL.

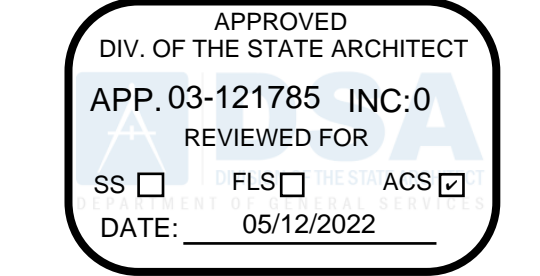
ROOF FRAMING LEGEND

- (-X") BOT OF (E) MTL DECK ELEVATION OTHER THAN DATUM - VERIFY W/ ARCHITECTURAL DWGS
- XX
XX
XXX# MECH UNIT NO - SEE MECH DWGS
- XXX# MAXIMUM DESIGN OPERATING WT
- C6 INDICATES C6x8.2, UNO



OVERALL ROOF PLAN
SCALE: 1/16" = 1'-0"
1





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 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT
 CONFERENCE CENTER & LIBRARY
 IMPROVEMENTS, RE-ROOF AND HVAC
 UPGRADES
CAAM
 California African American Museum
 600 State Drive
 Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com



SUB CONSULTANT
Sb saiful-bouquet
 structural engineers SB Job No:18681
 155 North Lake Avenue,
 8th Floor
 Pasadena, CA 91101
 Telephone 626.304.2616
 www.saifubouquet.com

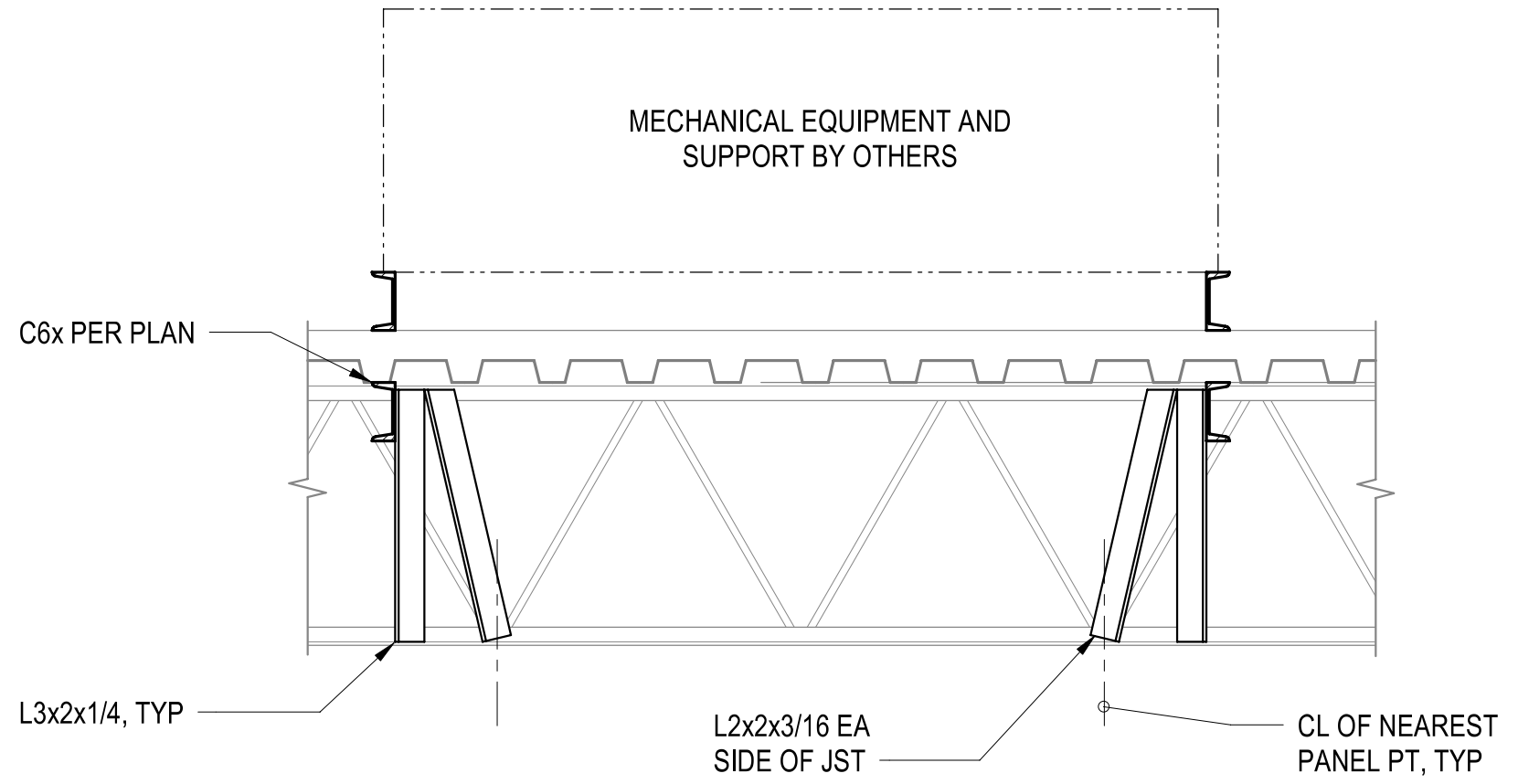


NO.	ISSUANCE	STATUS	DATE
E	50% CONSTRUCTION DOCUMENTS		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
SECTIONS AND DETAILS

DATE:	2022-05-02
DRAWN BY:	Author
CHKD BY:	Checker
SCALE:	As indicated
DGS NO:	4359
IBI PROJECT NO:	119020

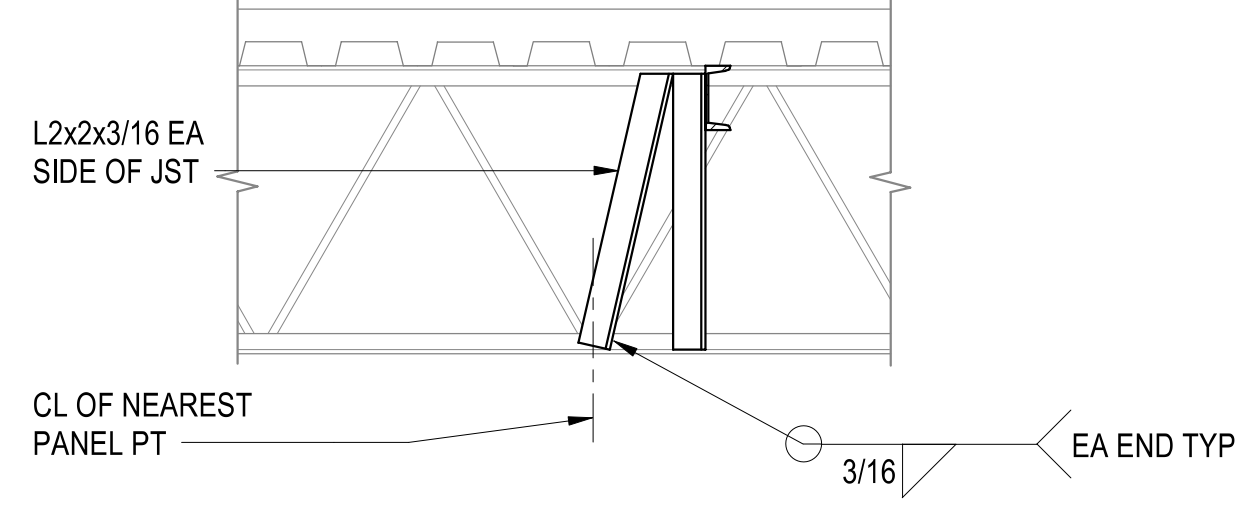
SHEET NUMBER	ISSUE
S3101	A1



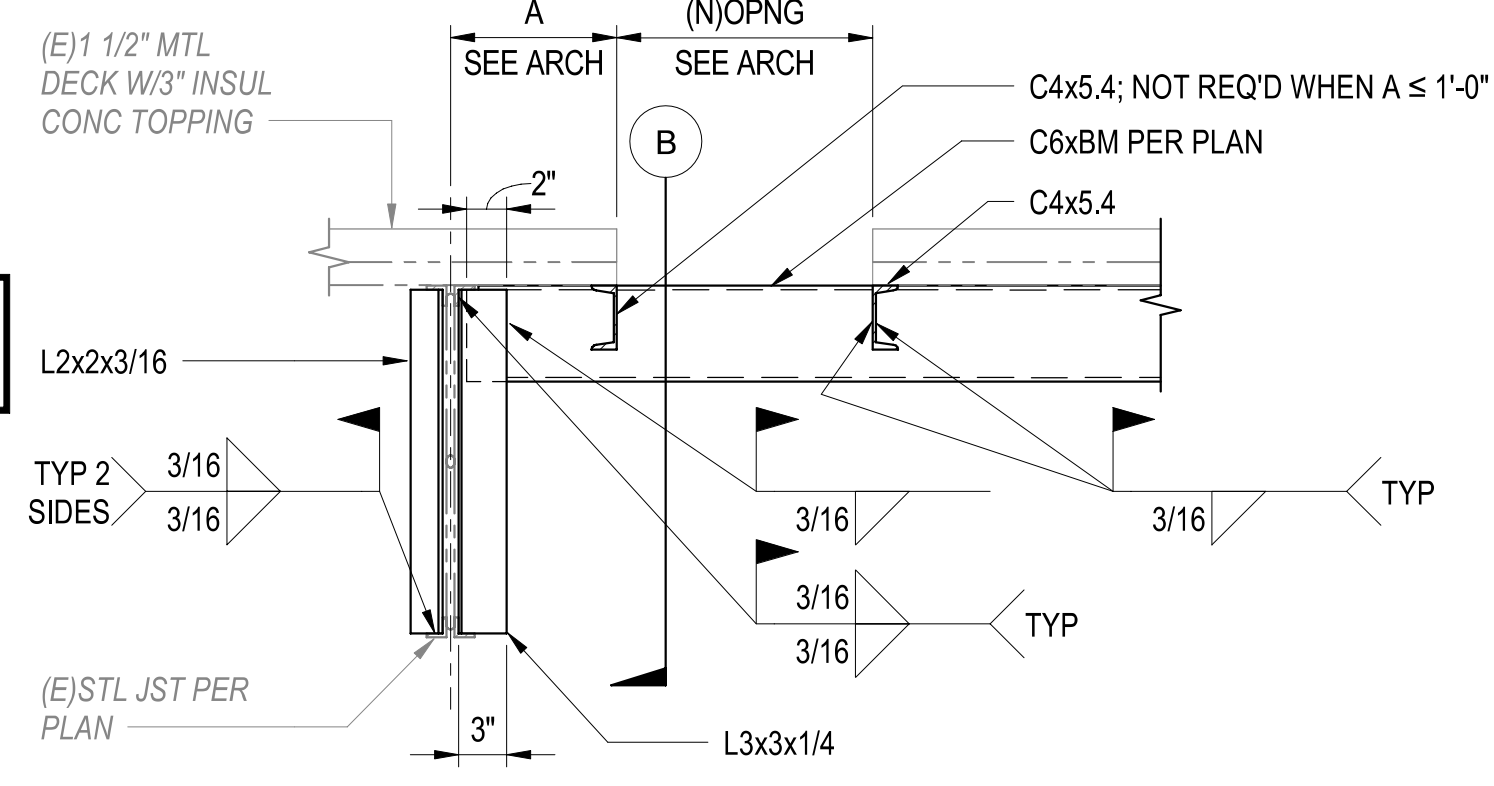
NOTE:
 FOR BAL OF INFO SEE DET 2 / S3101

EXISTING STL JOIST DETAIL - ELEVATION

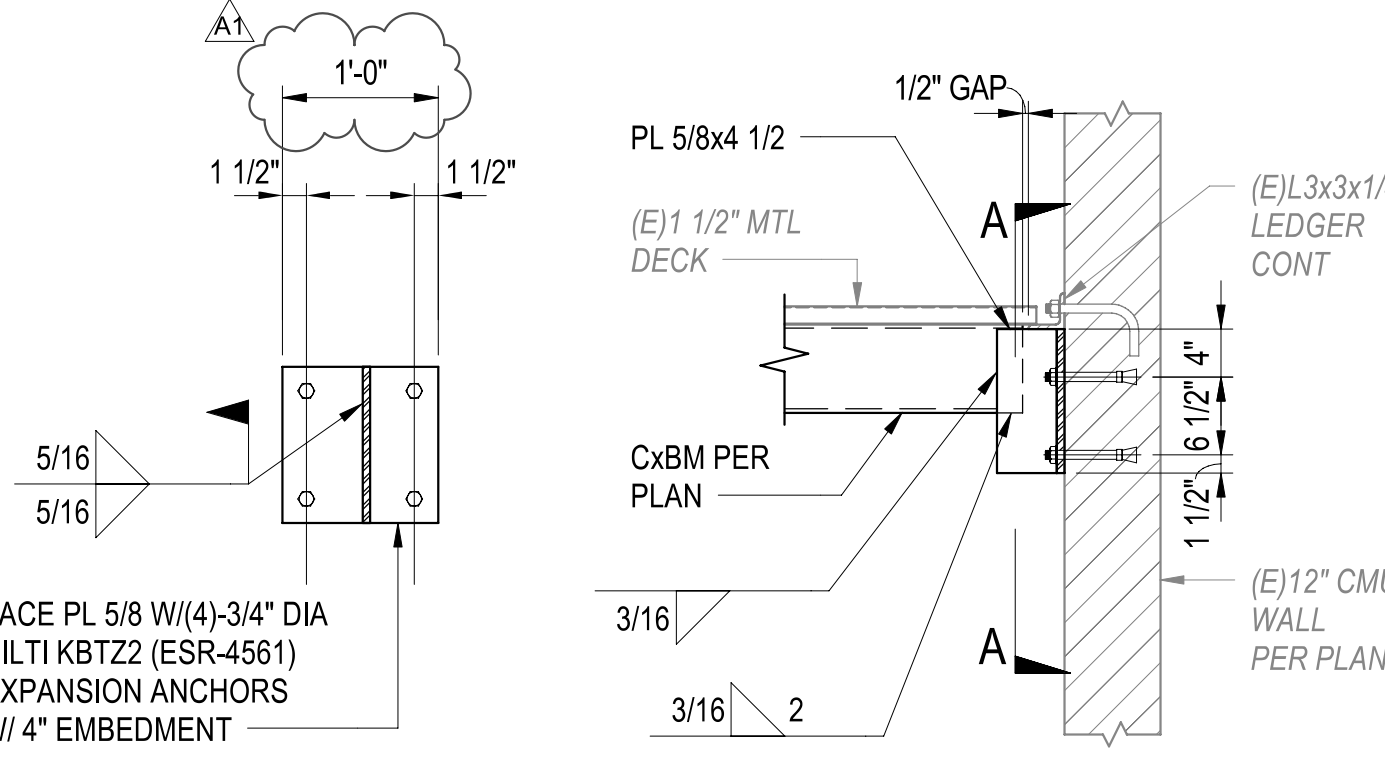
SCALE: NTS **5**



ELEVATION AT (E)STL JOIST B

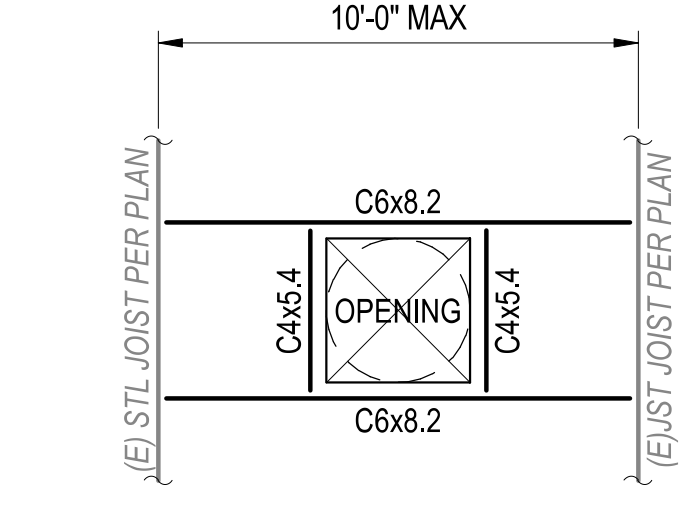


SECTION AT (E)STL JOIST A



STEEL BEAM TO CMU WALL DETAIL

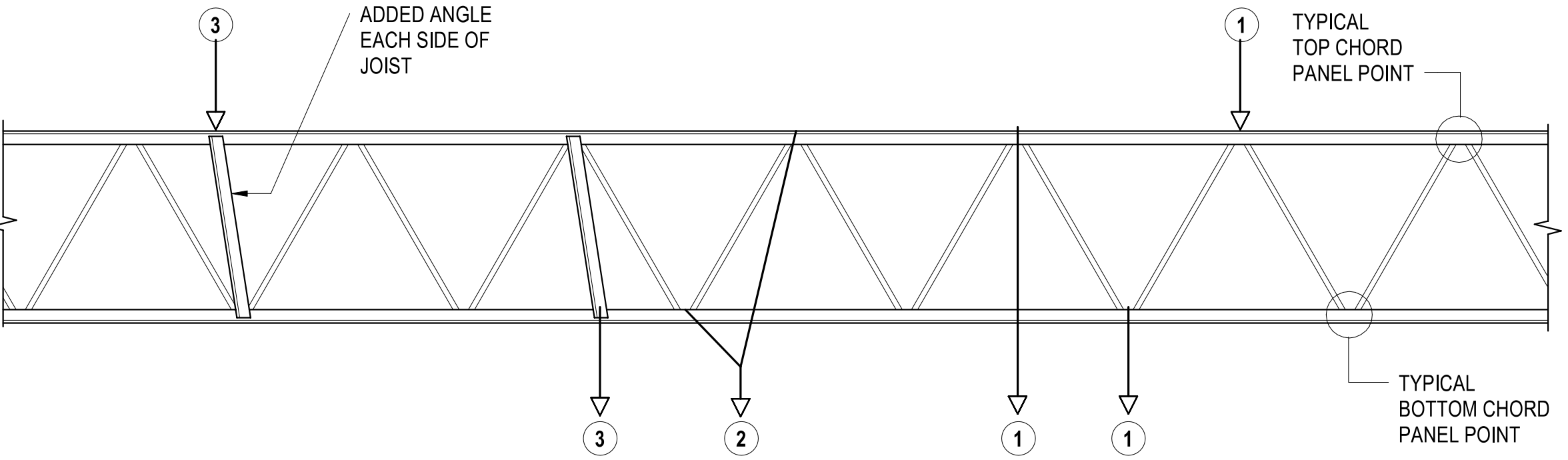
SCALE: NTS **4**



3'-0" x 3'-0" MAXIMUM OPENING-PLAN

(N)OPENING AT (E)ROOF DETAILS

SCALE: NTS **2**



- 1 CONCENTRATED LOAD OCCURS AT PANEL POINTS
- 2 CONCENTRATED LOAD TRAPEZED BETWEEN PANEL POINTS
- 3 WHERE CONCENTRATED LOAD DOES NOT OCCUR AT PANEL POINTS REINFORCE JOIST W/ ADDED L2x2x3/16 ANGLE EACH SIDE. (WHERE CONCENTRATED LOAD(S) DOES NOT EXCEED 100# WITHIN PANEL, ADDED L2x2x3/16 IS NOT REQUIRED).

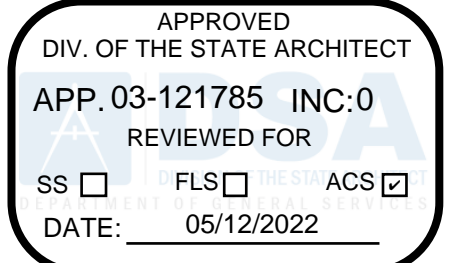
NOTES:
 1. DO NOT CUTOR DRILL ANY JOIST MEMBER.
 2. THIS DETAIL IS APPLICABLE TO SUPPORTING MECHANICAL EQUIPMENT, PIPES SPRINKLER, ETC.

TYPICAL STEEL JOIST ALLOWABLE LOCATIONS AND METHODS FOR SUPPORTING LOADS DETAIL

SCALE: NTS **1**

PLUMBING ROUGH-IN SCHEDULE, CONNECTIONS & SPECIFICATIONS

TAG	DESCRIPTION	FIXTURE UNIT		MIN. BRANCH SIZE (INCH)				TRAP SIZE (INCH)	ELECTRICAL			TYPE	APPLICATION	MANUFACTURER & MODEL	SPECIFICATIONS	REMARKS	
		W/S	CW	W	V	CW	HW		TW	FLA	VOLT						HZ
S-1	DOUBLE COMPARTMENT SINK	2	2	2	1-1/2	3/4	3/4	*	2	-	-	-	UNERMOUNTED	ADA	JUST DL-ADA-2133-16-GR OR EQUAL	1. FIXTURE: DOUBLE COMPARTMENT WITH INTEGRAL-FLOW 16 GAUGE, STAINLESS STEEL TYPE 304 SINK, SINK: 33"X21"X5.5". 2. FAUCET: GROHE CONCETTO 32665003, DECK MOUNTED, SINGLE-HANDLE KITCHEN FAUCET WITH SWIVEL SPOUT, INTEGRATED NON-RETURN VALVE AND GROHE SLIKMOVE 1.4 CERAMIC CARTRIDGE INCLUDED. MAX FLOW RATE: 1.7 GPM. 3. DRAIN: JUST J-35-SSF DRAIN. 4. SUPPLIES: CHICAGO NO. 1017ARCP-MM 1/2" I.P.S. FLEXIBLE SUPPLIES WITH LOOSE KEY STOPS. 5. INSULATION: WATER SUPPLY & ALL DRAINAGE PIPES ARE UNDER THE SINK REMOVABLE PLASTIC LAMINATE APRON PANEL PER DETAIL 4/A7400.	PROVIDED DISHWASHER AIR GAP FITTING ON SINK RIM.
WHA-1	WATER HAMMER ARRESTOR	*	*	*	*	*	*	*	*	-	-	-	-	-	J.R. SMITH, HYDROTRON OR PPR INC	1. TYPE "K" COPPER SIZED IN ACCORDANCE WITH PDI METHOD STANDARD WH-L01 OR PPP SIZING AND SELECTION TABLE.	PROVIDED BEHIND A WALL ACCESS PANEL.



When the weight in "fixture-units" for cold and hot water branch lines serving a group of fixtures has been determined, this data can be applied to Table V.

Note: Ideally the flow pressure in branch lines serving fixtures should never exceed 55 p.s.i.g. Pressure reducing valves should be installed to maintain proper pressure. When, however, the flow pressure exceeds 65 p.s.i.g., the next larger size water hammer arrester should be selected.

If the Fixture-unit total has a 1/2 fraction, it is to be rounded up to the next larger, or whole number. Thus, if the total is 11 1/2 fixture-units, change it to 12 fixture-units.

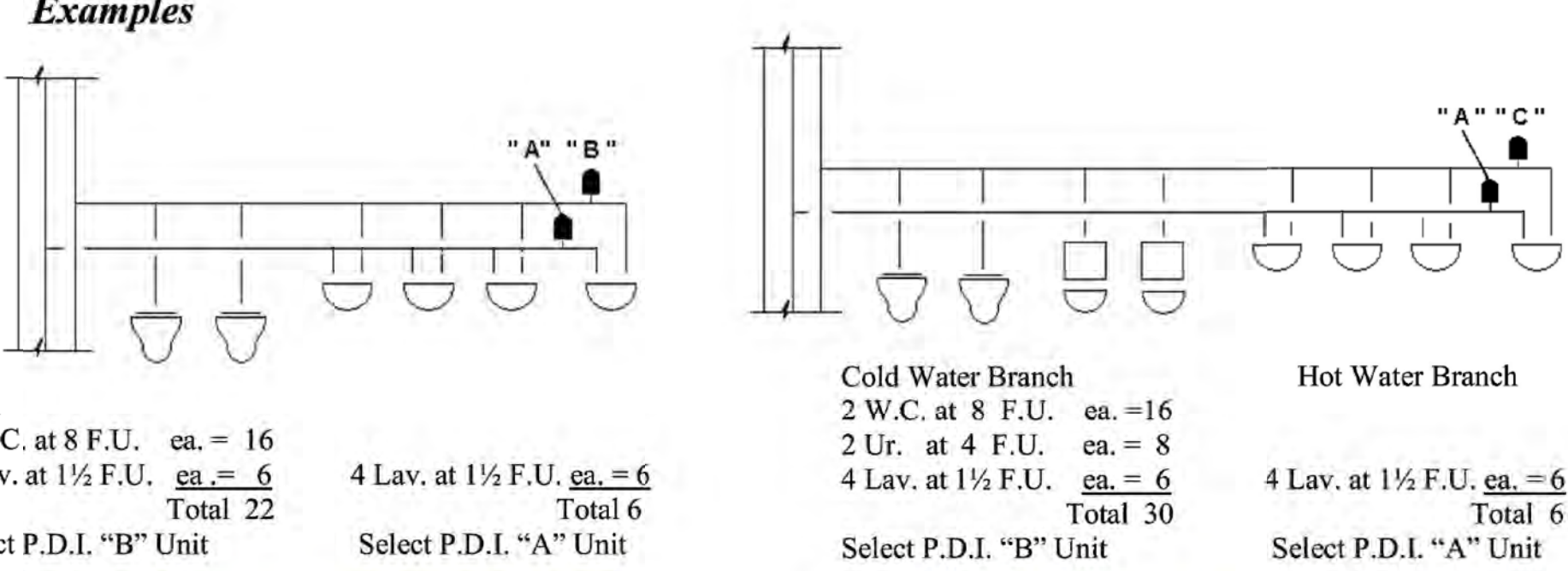
TABLE IV

Fixture	Type of Supply Control	Weight in Fixture - Units					
		Public			Private		
		Total	C.W.	H.W.	Total	C.W.	H.W.
Water Closet 1.66 PF	Flush Valve	8	8	-	5	5	-
Water Closet 1.66 PF	Flush Tank	5	5	-	2.5	2.5	-
Pedestal Urinal 1.06 PF	Flush Valve	4	4	-	-	-	-
Stall or Wall Urinal	Flush Valve 1.06 PF	4	4	-	-	-	-
Stall or Wall Urinal	Flush Tank 1.06 PF	2	2	-	-	-	-
Lavatory	Faucet	2	1-1/2	1-1/2	1	1	1
Bathtub	Faucet	4	2	3	2	1-1/2	1-1/2
Shower Head	Mixing Valve	4	2	3	2	1	2
Bathroom Group	Flush Valve Closet	-	-	-	8	8	3
Bathroom Group	Flush Tank Closet	-	-	-	6	6	3
Separate Shower	Mixing Valve	-	-	-	2	1	2
Service Sink	Faucet	3	3	3	-	-	-
Laundry Tubs (1-3)	Faucet	-	-	-	3	3	3
Combination Fixture	Faucet	-	-	-	3	3	3

TABLE V

P.D.I. Units	AA	A	B	C	D	E	F
FIXTURE-UNITS	1-3	1-11	12-32	33-60	61-113	114-154	155-330

Table V will permit engineers and contractors to select the proper water hammer arrester for each application. The following examples show the relative ease with which sizing can be accomplished using Tables IV and V.



Example 1:

Example 2:

20 Standard PDI-WH 201 - Water Hammer Arrestors

1. STANDARD PDI-WH201 WATER HAMMER ARRESTOR SIZING TABLE

CLIENT

State of California Dept. of General Services

DGS GENERAL SERVICES

Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605

Dianna Brown, Project Director
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 dianna.brown@dgs.ca.gov

PROJECT

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IBI GROUP
 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 Tel: 213.769.0011 Fax: 213.769.0016
 ibigroup.com



SUB CONSULTANT

James H. Brown
 No. 26903
 Renewal: 9/30/22
 MECHANICAL
 STATE OF CALIFORNIA

ISSUES

NO.	ISSUANCE	STATUS	DATE
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-09-31
V1	DSAS/SPM SUBMITTAL		2021-09-11
V2	DSAS/SPM BACKCHECK		2022-03-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

SCHEDULES

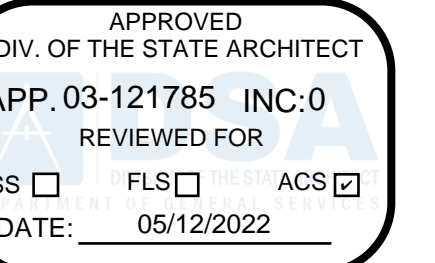
DATE: 2022-05-02
 DRAWN BY: SC
 CHECK BY: JS
 SCALE: NOT TO SCALE
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER

P0002 A1

NOTES:

- ◊ EXISTING PLUMBING FIXTURE TO BE REMOVED. CAP ALL ASSOCIATED PIPES FOR NEW CONNECTIONS
- ◊ EXISTING PLUMBING FIXTURE AND ALL ASSOCIATED PIPES TO BE REMOVED TO CLEAR NEW CLOSET (116D). CAP V, CW AND HW PIPE UP TO P.O.R.



Approval of this plan does not authorize or approve any omission or deviation from applicable requirements. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

CLIENT
State of California
Dept. of General Services

GENERAL SERVICES
 Real Estate Services Division
 Project Management and Development Branch
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 West Sacramento, CA 95605
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 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

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V1	DS/OFSM SUBMITTAL		2021-09-14
V2	DS/OFSM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

ENLARGED DEMOLITION
FLOOR PLAN

DATE: 2022-05-02
 DRAWN BY: SC
 CHK'D BY: JS
 SCALE: AS INDICATED
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER: **P1000**
 ISSUE: **A1**

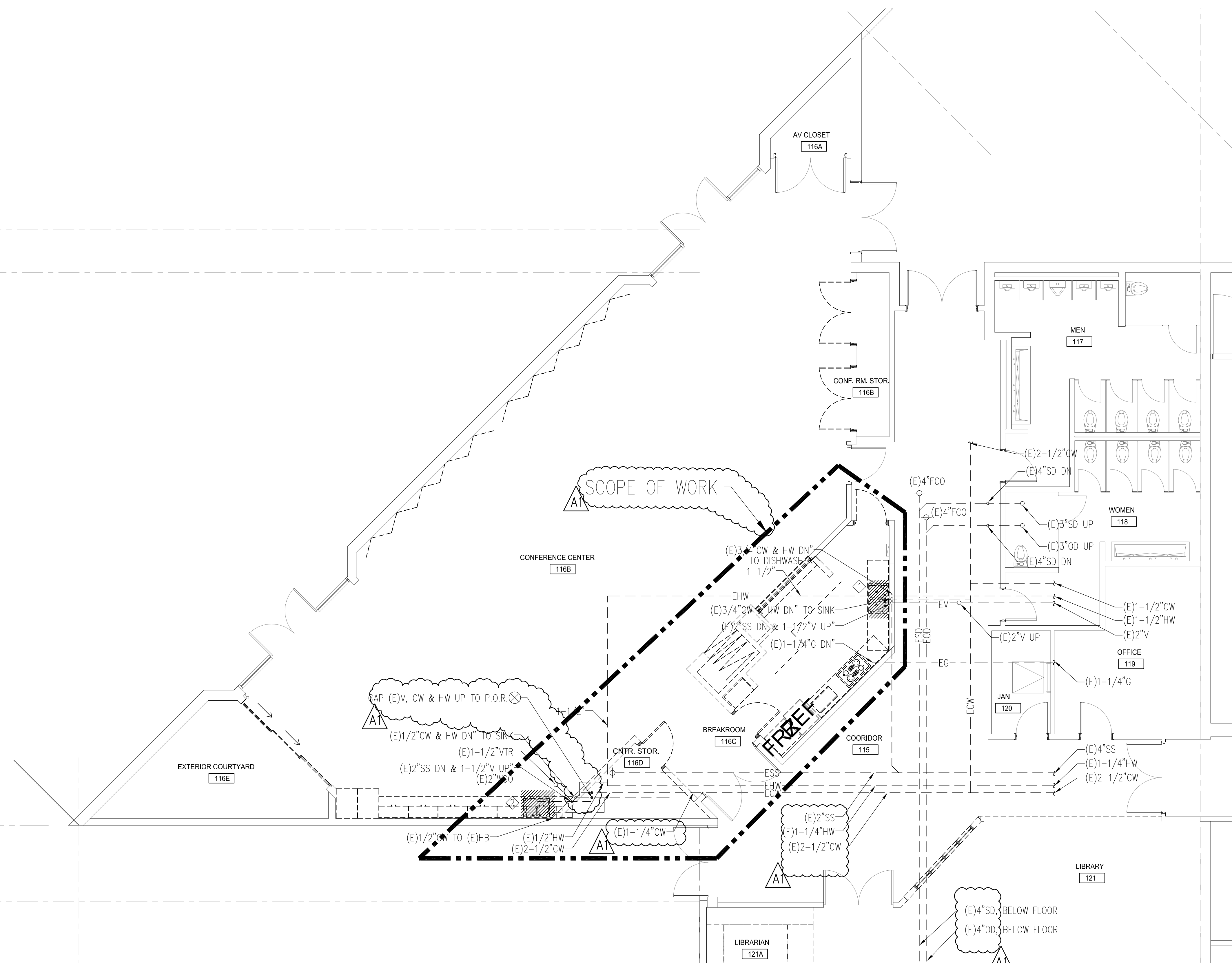
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5.4

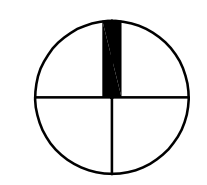
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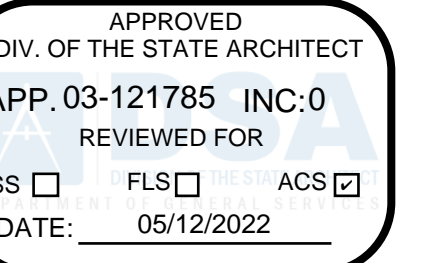
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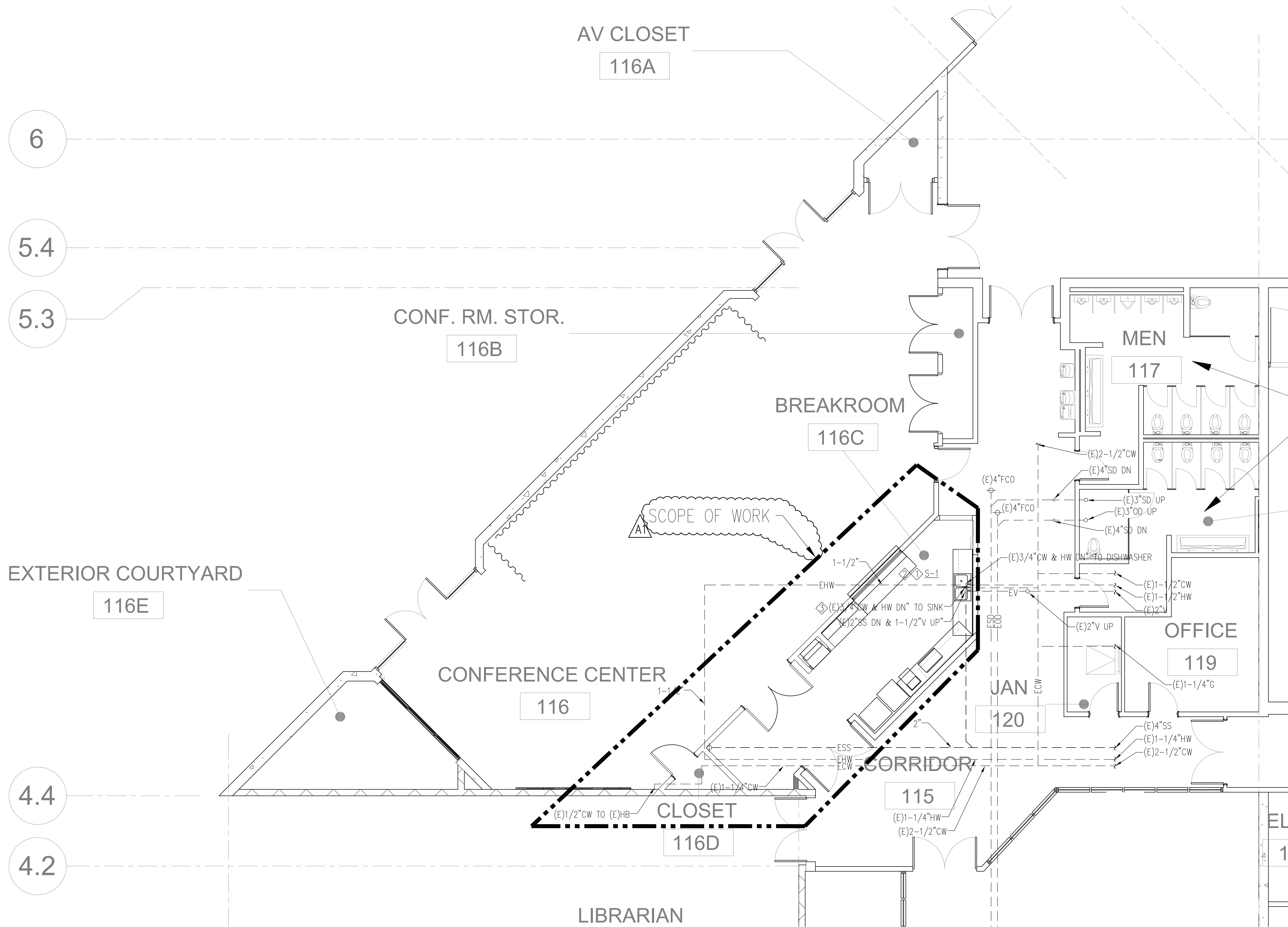


1 ENLARGED DEMOLITION FLOOR PLAN - CONFERENCE ROOM AND LIBRARY
 SCALE: 3/16" = 1'-0"





- NOTES:
- ◇ NEW PLUMBING FIXTURE, ASSOCIATE PLUMBING PIPES SHALL RECONNECT TO NEAREST EXISTING PLUMBING PIPES
 - ◇ 2"W, 1-1/2"V, 3/4"CW & HW
 - ◇ CONNECT TO (E)WATER FILTER SYSTEM AQUATRON MODEL GOM-550. VERIFY WITH THE MANUFACTURER FOR NEW CONNECTIONS.



6
5.4
5.3
4.4
4.2

1 ENLARGED NEW FLOOR PLAN - CONFERENCE ROOM AND LIBRARY
SCALE: 3/16" = 1'-0"

CLIENT
**State of California
Dept. of General Services**
DGS
GENERAL SERVICES
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West Sacramento, CA 95605
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(916) 375-4323 (Voice)
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PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd. Suite 100-3100
Los Angeles, CA 90017, USA
Tel: 213 769 0011 Fax: 213 769 0016
ibigroup.com



SUB CONSULTANT
PROFESSIONAL MECHANICAL ENGINEER
No. 26903
Renewal: 9/30/22
STATE OF CALIFORNIA

NO.	ISSUANCE	STATUS	DATE
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-09-31
V1	DSASPM SUBMITTAL		2021-09-14
V2	DSASPM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**ENLARGED NEW FLOOR
PLAN**

DATE: 2022-05-02
DRAWN BY: SC
CHKD BY: JS
SCALE: AS INDICATED
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
P1100
ISSUE
A1

ELECTRICAL SYMBOLS

A1	8 FT LED LIGHTING FIXTURE, UPPER CASE "A1" DENOTES FIXTURE TYPE.
A	4 FT LED LIGHTING FIXTURE, UPPER CASE "A" DENOTES FIXTURE TYPE.
BO	RECESSED CEILING MOUNTED FIXTURE: UPPER LETTER INDICATES TYPE (U.O.N.)
A1	LED LIGHT FIXTURE ON EMERGENCY INVERTER UNIT.
EXIT SIGN	EXIT SIGN.
LED TRACK LIGHT	LED TRACK LIGHT.
CEILING MOUNT LIGHTING OCCUPANCY SENSOR "DOUGLAS #WORSODG1-P-N"	CEILING MOUNT LIGHTING OCCUPANCY SENSOR "DOUGLAS #WORSODG1-P-N".
POWER PACK "DOUGLAS #WRC-3160"	POWER PACK "DOUGLAS #WRC-3160".
WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSD-3501"	WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSD-3501".
WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSW-3524"	WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSW-3524".
WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSW-3528"	WALL MOUNT LOW VOLTAGE DIMMER SWITCH "DOUGLAS #WSW-3528".
ROOM CONTROLLER "DOUGLAS #WRC-3160 WITH WUL-3924"	ROOM CONTROLLER "DOUGLAS #WRC-3160 WITH WUL-3924".
LINE VOLTAGE OCCUPANCY SENSOR "DOUGLAS #WOSSDU1" OR EQUAL	LINE VOLTAGE OCCUPANCY SENSOR "DOUGLAS #WOSSDU1" OR EQUAL.
KEY SWITCH, LINE VOLTAGE	KEY SWITCH, LINE VOLTAGE.
FLUSH WALL MOUNT DUPLEX OUTLET, NEMA 5-20R, +18" A.F.F., U.O.N.	FLUSH WALL MOUNT DUPLEX OUTLET, NEMA 5-20R, +18" A.F.F., U.O.N.
FLUSH WALL MOUNT QUAD OUTLET, NEMA 5-20R, +18" A.F.F., U.O.N.	FLUSH WALL MOUNT QUAD OUTLET, NEMA 5-20R, +18" A.F.F., U.O.N.
SPECIAL WALL MOUNT RECEPTACLE, NEMA 6-50R	SPECIAL WALL MOUNT RECEPTACLE, NEMA 6-50R.
FLUSH FLOOR DUPLEX RECEPTACLE (NEMA 5-20R) AND DUAL DATA OUTLET.	FLUSH FLOOR DUPLEX RECEPTACLE (NEMA 5-20R) AND DUAL DATA OUTLET.
FLUSH MOUNT DUAL DATA OUTLET, +18" A.F.F., U.O.N.	FLUSH MOUNT DUAL DATA OUTLET, +18" A.F.F., U.O.N.
FLUSH MOUNT DUAL TEL/DATA OUTLET, +18" A.F.F., U.O.N.	FLUSH MOUNT DUAL TEL/DATA OUTLET, +18" A.F.F., U.O.N.
SMOKE DETECTOR	SMOKE DETECTOR.
FIRE ALARM STROBE LIGHT	FIRE ALARM STROBE LIGHT.
FIRE ALARM HORN/STROBE	FIRE ALARM HORN/STROBE.
FIRE ALARM MANUAL PULL STATION	FIRE ALARM MANUAL PULL STATION.
FLUSH WALL MOUNT DUPLEX OUTLET, GFCI TYPE, NEMA 5-20R	FLUSH WALL MOUNT DUPLEX OUTLET, GFCI TYPE, NEMA 5-20R.
SPECIAL WALL MOUNT RECEPTACLE (NEMA 5-30R)	SPECIAL WALL MOUNT RECEPTACLE (NEMA 5-30R).
LV	LIGHTING CONTROL CABLE 2#18 AWG.
D	DIMMING CONTROL CABLE 2#16TSP.
A	PANEL DESIGNATION, LETTER IDENTIFIES THE PANEL.
—	LIGHTING PANEL.
⊙	JUNCTION BOX: MOUNTED IN CEILING SPACE OR ON CEILING IF NO CEILING SPACE.
(E)	EXISTING. (XR) DISCONNECT & REMOVE DEVICE.
(N)	NEW. (RR) DISCONNECT & RELOCATE DEVICE.
G	GROUND. (ER) NEW LOCATION OF RELOCATED DEVICE.
A.F.F.	ABOVE FINISHED FLOOR.
U.O.N.	UNLESS OTHERWISE NOTED.
GFCI	GROUND FAULT CIRCUIT INTERRUPTER.

ELECTRICAL SYMBOLS CONT.

A-1,3,5	HOMERUN TO PANEL "A", CIRCUITS 1, 3, 5.
— E —	(E) CONDUIT AND WIRES TO REMAIN.
—	CONDUIT: EXPOSED IN UNFINISHED AREAS; CONCEALED ABOVE CEILING OR IN WALL IN FINISHED AREAS.
—	3/4"C,2#12 & 1#12G
—	3/4"C,3#12 & 1#12G
—	3/4"C,4#12 & 1#12G

COMPUTER DATA CABLE & WIRING

—1C—	3/4" CONDUIT WITH ONE "C" CABLE.
—2C—	1-1/4" CONDUIT WITH TWO "C" CABLES.
—3C—	1-1/4" CONDUIT WITH THREE "C" CABLES.
—4C—	1-1/4" CONDUIT WITH FOUR "C" CABLES.
—7C—	1-1/4" CONDUIT WITH SEVEN "C" CABLES.

FIRE ALARM CABLE & WIRING

—2A,2V—	3/4"C, WITH (2) "A" & (2) "V" CABLES.
—2A—	3/4"C, WITH (2) "A" CABLES.
—2F—	3/4"C, WITH (2) "F" CABLES.
"A" CABLE -	2#12 THWN-CU FOR HORN.
"V" CABLE -	2#12 THWN-CU FOR STROBE LIGHT.
"F" CABLE -	"WEST PENN" NO. AQC225, 2 PAIR #16 NON-SHIELDED - FIRE ALARM ADDRESSABLE LOOP.

GENERAL NOTES

- THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO COVER A COMPLETE INSTALLATION OF SYSTEMS. THE OMISSION OF EXPRESSED REFERENCE TO ANY ITEM OF LABOR OR MATERIAL FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH PRESENT PRACTICE OF THE TRADE SHALL NOT RELIEVE THE CONTRACTOR FROM PROVIDING SUCH ADDITIONAL LABOR AND MATERIALS.
- WORK INCLUDES ALL LABOR, MATERIALS, APPLIANCES, TOOLS, EQUIPMENT, FACILITIES, TRANSPORTATION AND SERVICES NECESSARY FOR AND INCIDENTAL TO PERFORMING ALL OPERATIONS IN CONNECTION WITH FURNISHING, DELIVERY AND INSTALLATION OF ELECTRICAL SYSTEM, COMPLETE, AS SHOWN ON THE DRAWINGS AND/OR SPECIFIED HEREIN.
- CONSTRUCT PROJECT IN ACCORDANCE WITH FOLLOWING CODES: REGULATIONS OF STATE AND LOCAL FIRE MARSHAL; NATIONAL ELECTRIC CODE, NATIONAL FIRE PROTECTION ASSOCIATION, EDITION IN FORCE; LOCAL CODES AND ORDINANCES; TITLE 19, 21 AND 24 CALIFORNIA ADMINISTRATIVE CODE.
- PERMITS, FEES AND INSPECTIONS: OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND FEES REQUIRED BY ANY CONSTITUTED AUTHORITY HAVING JURISDICTION INCLUDING UTILITIES. ARRANGE AND PAY FOR ALL REQUIRED INSPECTIONS OR EXAMINATIONS AND DELIVER CERTIFICATES OF INSPECTION TO ARCHITECT.
- RECORD DRAWINGS: ON COMPLETION OF WORK, OBTAIN ONE SET OF XEROX VELLUMS FROM ARCHITECT AT COST OF PRINTING, AND NOTE NEATLY IN SCALE ALL CHANGES ON RECORD SET. DELIVER COMPLETE SET OF VELLUMS TOGETHER WITH ONE SET OF BLUELINE PRINTS TO ARCHITECT TOGETHER WITH CONTRACTOR'S NAME, ADDRESS AND PHONE NUMBER. INCORRECT, NON-LEGIBLE OR NON-REPRODUCIBLE DRAWINGS WILL NOT BE ACCEPTED.
- SUBMIT A LIST OF MATERIALS AND EQUIPMENT MANUFACTURERS THAT CONTRACTOR INTENDS TO USE. SUBMIT SHOP DRAWINGS FOR: LIGHT FIXTURES, AND SWITCHES.
- THE TERM "PROVIDE" USED ON DRAWINGS SHALL BE CONSIDERED TO MEAN "FURNISH AND INSTALL".
- BEFORE PROCEEDING WITH WORK CAREFULLY CHECK AND VERIFY ALL DIMENSIONS AND SIZES AND ASSUME ALL RESPONSIBILITY FOR FITTING OF MATERIALS AND EQUIPMENT TO OTHER PARTS OF EQUIPMENT AND TO STRUCTURE. WHERE APPARATUS AND EQUIPMENT HAVE BEEN INDICATED ON DRAWINGS, DIMENSIONS HAVE BEEN TAKEN FROM TYPICAL EQUIPMENT OF CLASS INDICATED. CAREFULLY CHECK DRAWINGS AND SEE THAT EQUIPMENT WILL FIT INTO SPACES PROVIDED.
- LOCATIONS OF CONDUITS, OUTLETS, APPARATUS AND EQUIPMENT INDICATED ON DRAWINGS ARE APPROXIMATE ONLY AND SHALL BE CHANGED TO MEET ARCHITECTURAL AND STRUCTURAL CONDITIONS AS REQUIRED.
- BE CAUTIONED THAT DIAGRAMS SHOWING ELECTRICAL CONNECTIONS ARE DIAGRAMMATIC ONLY AND MUST NOT BE USED FOR OBTAINING LINEAL RUNS OF WIRING OR CONDUIT. WIRING DIAGRAMS DO NOT NECESSARILY SHOW EXACT PHYSICAL ARRANGEMENT OF EQUIPMENT.
- EXTRA WORK OR COSTS TO THIS CONTRACTOR DUE TO OTHER CONTRACTORS OR TRADES SHALL BE ADJUSTED BETWEEN THIS CONTRACTOR AND OFFENDING CONTRACTOR AT NO EXTRA COST TO OWNER. NOTIFY ARCHITECT BEFORE SUCH EXTRA WORK IS DONE.

LIGHTING FIXTURE SCHEDULE

TYPE	MTG.	CLASS	MANUFACTURER AND CATALOG NUMBER	FINISH	LAMP	TOTAL WATTS	VOLT	DESCRIPTION
					TYPE			
A	CLG	LED	PRUDENTIAL #BOLT-LED4-SO-4'-SAL-TMW-UNV-SUR-DM01	WHITE	LED 7 WATT/FT	28W	120	4FT LINEAR LED MOUNTED ON UNISTRUT
A1	CLG	LED	PRUDENTIAL #BOLT-LED4-SO-8'-SAL-TMW-UNV-SUR-DM01	WHITE	LED 7 WATT/FT	56W	120	8FT LINEAR LED MOUNTED ON UNISTRUT
A2	CLG	LED	PRUDENTIAL #BOLT-LED4-SO-5'-SAL-TMW-UNV-SUR-DM01	WHITE	LED 7 WATT/FT	35W	120	5FT LINEAR LED MOUNTED ON UNISTRUT
B	CLG	LED	BRUCK #VERSA-350430-21LM-30K-90-120-ELV-BK-ECOBK	WHITE	LED	18.4W	120	TRACK LIGHT
C	CLG	LED	USAI LIGHTING #B4RD-F-24G1-35KS-50-S-WH-NC-UNV-D6E	WHITE	LED	24W	120	6" LED DOWNLIGHT
D	CLG	LED	USAI LIGHTING #B4RD-F-09G1-35KS-50-S-WH-NC-UNV-D6E	WHITE	LED	9W	120	6" LED DOWNLIGHT
E	PEN	LED	EUREKA #HENRI 4275-17-LED-LO-35-90-120-DV-6-RC1-BLKE	BLACK	LED	27W	120	PENDANT LED
F	CLG	LED	PRUDENTIAL BIONIC PRO4 #BP4RD-REC-FLSH-LED35-MO-4'-TMW-LP-SC-UNV-XX-DM01	WHITE	LED	24W	120	RECESSED 4" LINEAR LED
X	UNV	LED	EVENLITE #SOY-EM-G-IC-WH-SC-UC	WHITE	LED	3W	120	EXIT SIGN.

GENERAL NOTES CONT.

- WHERE CONDUITS PASS THROUGH SLEEVES IN INTERIOR WALLS, FLOORS, OR CEILINGS, COMPLETELY FILL SPACE BETWEEN EACH CONDUIT AND ITS SLEEVE TO PROVIDE AN AIRTIGHT SEAL.
- USE GLASS FIBER MATERIAL, "DUXSEAL" COMPOUND, FOR ACOUSTIC SEALS.
- ALIGN WALL-MOUNTED OUTLET BOXES FOR SWITCHES, THERMOSTATS, AND SIMILAR DEVICES.
- WHERE BOXES ARE INSTALLED IN FIRE RATED CEILING OR WALLS, BE RESPONSIBLE FOR PRESERVING INTEGRITY OF FIRE RATING AS REQUIRED.
- IN FIRE-RATED WALL, USE 4" SQUARE DEEP BOXES. DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES OF BOXES FOR ANY 100 SQUARE FEET OF WALL OR PARTITIONS. SEPARATE OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITION BY A MINIMUM HORIZONTAL DISTANCE OF 24 INCHES.
- PROVIDE COPPER CONDUCTORS ONLY.
- PROVIDE TYPE "THHN" OR "THWN" WIRES ONLY.
- MOUNT LIGHT SWITCHES, T-STATS, ETC. AT +48" UNLESS OTHERWISE NOTED.
- PROVIDE "U.L. APPROVED" OR "U.L. LISTED" ELECTRICAL EQUIPMENT ONLY.
- PROVIDE WHEREVER NECESSARY ALL ADDITIONAL BACKING, BLOCKING AND SUPPORTS FOR LIGHT FIXTURES.
- USE RIGID GALVANIZED STEEL CONDUIT FOR ALL SIZES WHERE DIRECTLY EXPOSED TO WEATHER; WHERE SUBJECT TO ABNORMAL CONDITIONS OF HEAT, COLD, MOISTURE, HUMIDITY, FUMES AND HAZARDOUS ELEMENTS; WHERE INSTALLED EXPOSED BELOW 7-1/2 FEET, IN AREAS WHERE SUBJECT TO MECHANICAL INJURY INCLUDING MECHANICAL AND EQUIPMENT ROOMS; AND IN CONCRETE SLABS ON GRADE.
- EMT CONDUIT WITH COMPRESSION TYPE FITTINGS MAY BE USED FOR ALL SIZES UP TO 1-1/2 INCHES MAXIMUM TRADE SIZE IN DRY LOCATIONS AS IN STUD PARTITIONS AND FURRED CEILING SPACES. CONDUITS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET TO PANEL EXCEPT WHERE RIGID STEEL CONDUIT IS REQUIRED OR INDICATED. EMT SHALL NOT BE RUN EXPOSED, IN CONCRETE, RUNS MORE THAN 100 FEET FOR POWER FEEDERS.
- ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY AND INDICATE GENERAL ARRANGEMENT OF WORK. BE RESPONSIBLE FOR CHECKING AND COORDINATING WITH OTHER TRADES AND VERIFYING SPACE IN WHICH WORK WILL BE INSTALLED.
- EXISTING CONDITIONS AS INDICATED ON THESE DRAWINGS HAVE BEEN OBTAINED FROM BEST SOURCES AVAILABLE BUT CANNOT BE GUARANTEED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS BEFORE PROCEEDING WITH WORK. INCLUDE AS PART OF CONTRACT ALL WORK REQUIRED TO PRODUCE THE INDICATED RESULT.
- SEAL ALL SPACE AROUND CONDUIT PENETRATION THROUGH FIRE-RATED WALL WITH A UL LISTED FIRE BARRIER COMPOUND. "3M" CAULKING OR EQUAL.

GENERAL NOTES CONT.

- INCLUDE ALL ELECTRICAL DEMOLITION AS PART OF THIS CONTRACT. REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF WALL REMOVALS, CEILING CHANGES AND ALL OTHER SIMILAR WORK. ELECTRICAL DEMOLITION SHALL INCLUDE DISCONNECTION AND REMOVAL OF AFFECTED LIGHTS, OUTLETS AND ALL OTHER ELECTRICAL DEVICES. REMOVE AND PLUG OR CAP ALL AFFECTED CONDUITS. REMOVE WIRES. IF REMOVED OUTLETS AFFECT DOWNSTREAM ACTIVE OUTLETS, PROVIDE ALL WORK NECESSARY TO REROUTE AND RECONNECT AFFECTED CIRCUITS.
- THESE DRAWINGS INDICATE THE FINISHED REQUIREMENTS FOR THE ELECTRICAL SYSTEMS, EQUIPMENT, LIGHTING FIXTURES, OUTLETS AND DEVICES. DUE TO STRUCTURAL CONDITIONS, MECHANICAL OR DUCT PIPING INTERFERENCE, RETAINED EXISTING FACILITIES OR FOR OTHER REASONS, THE CONTRACTOR MAY DESIRE TO INSTALL THE WORK IN A MANNER DIFFERENT FROM THAT SHOWN. SUCH CHANGES SHALL BE PRESENTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING, AND THE RECORD DRAWINGS SHALL BE ACCURATELY REVISED TO SHOW THE CHANGES AS COMPLETED.
- EXISTING ELECTRICAL WIRING MAY BE RE-USED WHERE IT IS IN COMPLIANCE WITH THE JOB REQUIREMENTS AND CODE PROVISIONS AND DOES NOT INTERFERE WITH ACCOMPLISHMENT OF THE WORK BEING DONE.
- ALL EXISTING LIGHTING FIXTURE NOT TO BE RE-USED IN THEIR PRESENT LOCATIONS SHALL BE CAREFULLY REMOVED AND STORED IN A SAFE PLACE. THEY SHALL BE MADE AVAILABLE FOR INSPECTION BY THE OWNER'S REPRESENTATIVE WHO WILL DESIGNATE THOSE TO BE RE-USED, THOSE TO BE STORED BY THE OWNER AND THOSE TO BE REMOVED FROM THE PREMISES BY THE CONTRACTOR.
- THE OUTLETS SHOWN ON THE DRAWINGS ARE THOSE THAT NOW EXIST. THE CONTRACTOR SHALL VISIT THE JOB SITE TO DETERMINE WHICH EXISTING OUTLETS AND DEVICES ARE TO REMAIN AND THE CONDUIT AND OTHER MATERIALS WHICH MAY BE REMOVED TO PROVIDE THE DESIRED ARRANGEMENT.
- IN AREAS WHERE THERE ARE NO ALTERATIONS INDICATED, THE EXISTING FACILITIES SHALL BE RETAINED IN SERVICE. IN CASE OF DOUBT, ASSUME THAT THE ELECTRICAL WIRING IS TO REMAIN IN OPERATION THROUGHOUT THE CONSTRUCTION PERIOD AND THEREAFTER.
- THE ALTERATION OF EXISTING SPACE IS A WORK OF A COMPLEX NATURE WHICH WILL REQUIRE ACCURATE PLANNING, CAREFUL PREPARATION AND EXECUTION, ATTENTION TO DETAIL AND CLOSE SUPERVISION BY THE CONTRACTOR. HE WILL BE REQUIRED TO DO HIS SCHEDULING ARRANGEMENT TO MINIMIZE DISRUPTION OF NORMAL ACTIVITIES OF THE BUILDING. WHERE SHUTDOWN OF POWER TO EXISTING PANELS IS REQUIRED TO ALTERATION WORK, IT SHALL BE DONE AT A TIME SPECIFIED AND SCHEDULED BY THE OWNER'S REPRESENTATIVE.
- WHERE INTERRUPTION OF A CIRCUIT FEEDING EXISTING EQUIPMENT, RECEPTACLES, LIGHTING FIXTURES OR BECAUSE OF NEW WORK, THE CIRCUIT SHALL BE REHABILITATED AND MADE CONTINUOUS FROM PANEL TO LAST EXISTING OUTLET.

CODES, STANDARDS & GUIDES

PARTIAL LIST OF APPLICABLE CODES AS OF January 1, 2020

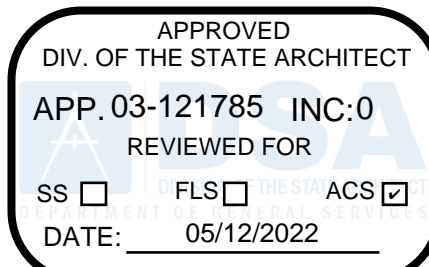
2019 California Administrative Code, Part 1, Title 24 C.C.R.*
 2019 California Building Code (CBC), Part 2, Title 24 C.C.R.
 (2015 International Building Code Volumes 1-2 and 2013 California Amendments)
 2019 California Electrical Code (CEC), Part 3, Title 24 C.C.R.
 (2014 National Electrical Code and 2019 California Amendments)
 2019 California Mechanical Code (CMC) Part 4, Title 24 C.C.R.
 (2015 Uniform Mechanical Code and 2019 California Amendments)
 2019 California Plumbing Code (CPC), Part 5, Title 24 C.C.R.
 (2015 Uniform Plumbing Code and 2019 California Amendments)
 2019 California Energy Code (CEC), Part 6, Title 24 C.C.R.*
 2019 California Fire Code, Part 9, Title 24 C.C.R.
 (2015 International Fire Code and 2019 California Amendments)
 2019 California Green Building Standards Code, Part 11, Title 24 C.C.R.
 2019 California Referenced Standards, Part 12, Title 24 C.C.R.*
 Title 19 C.C.R., Public Safety, State Fire Marshal Regulations.
 2007 ASME A17.1(w/ A17.1a/CSA B44a-08 addenda) Safety Code For Elevators And Escalators

PARTIAL LIST OF APPLICABLE STANDARDS

NFPA 13	Automatic Sprinkler Systems	2016 Edition
NFPA 14	Standpipe Systems	2016 Edition
NFPA 17	Dry Chemical Extinguishing Systems	2016 Edition
NFPA 17a	Wet Chemical Systems	2016 Edition
NFPA 20	Stationary Pumps	2016 Edition
NFPA 22	Water tanks for Private Fire Protection	2016 Edition
NFPA 24	Private Fire Mains	2016 Edition
NFPA 72	National Fire Alarm Code	2016 Edition
NFPA 80	Fire doors and Other Opening Protectives	2016 Edition
NFPA 92	Standard for Smoke Control Systems	2012 Edition
NFPA 253	Critical Radiant Flux of Floor Covering Systems	2015 Edition
NFPA 2001	Clean Agent Fire Extinguishing Systems	2015 Edition
ICC 300	ICC Standards on Bleachers, Folding and Telescoping Seating and Grand stands	2012 Edition
UL 300	Fire Testing of Fire Extinguishing Systems for Protection Of Restaurant Cooking Areas	2005 Edition
UL 464	Audible Signal Appliances	2003 Edition
UL 521	Heat Detectors for Fire Protective Signaling Systems	1999 Edition

Reference code section for NFPA Standards- 2013 CBC (SFM) Chapter 35. See Chapter 35 for State of California amendments to NFPA Standards.

* All parts of the 2013 California Building Code become effective January 1, 2014 except the effective date for the use of the 2013 Building Energy Efficiency Standards (Title 24, Part 1, Chapter 10 and Part 6, and affected provisions in Part 11 [Cal. Green Building Standards Code]) is July 1, 2014 and the effective date for California Administrative Code, Part 1, Title 24 is February 28, 2013.



CLIENT

State of California
 Dept. of General Services

DGS
 GENERAL SERVICES

Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605

Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT

CONFERENCE CENTER & LIBRARY
 IMPROVEMENTS, RE-ROOF AND HVAC
 UPGRADES

CAAM
 California African American Museum
 600 State Drive
 Los Angeles, CA 90037

PRIME CONSULTANT

IBI GROUP
 1001 Wilshire Blvd., Suite 100-3100
 Los Angeles, CA 90017
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com

Professional Engineer Seal: JIMMY LEI #00782, No. C25387, REN 04/23, STATE OF CALIFORNIA

SUB CONSULTANT

Professional Engineer Seal: JIMMY LEI #00782, No. E14126, SIGNED 05/11/22, EXP. 06/09/25, STATE OF CALIFORNIA

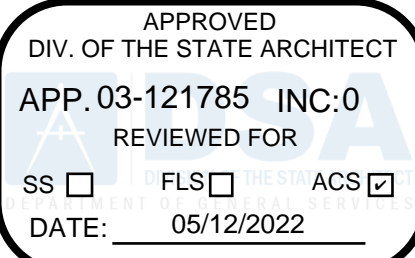
PACIFIC ENGINEERS GROUP
 Consulting Electrical Engineers
 1106 W. Magnolia Blvd. Suite A
 Burbank, CA 91506
 (818) 859-7081 Y19-034 R20

NO.	ISSUANCE	STATUS	DATE
D	SCHEMATIC DESIGN		2019-10-11
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISION		2021-08-31
V1	DSASOFEM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

ELECTRICAL SYMBOLS, NOTES, AND FIXTURE SCHEDULE

DATE:	2022-05-11
DRAWN BY:	HY
CHK'D BY:	JF
SCALE:	1/8" = 1'-0"
DGS NO:	4359
IBI PROJECT NO:	119020
SHEET NUMBER	ISSUE
E0001	A1



OFFICE OF THE STATE FIRE MARSHAL APPROVED FIRE AND PANIC ONLY



Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

CLIENT

State of California Dept. of General Services



Real Estate Services Division Project Management and Development Branch 707 Third St, 4th Floor West Sacramento, CA 95605

Dianna Brown, Project Director (916) 375-4323 (Voice) dianna.brown@dgs.ca.gov

PROJECT

CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

CAAM

California African American Museum 600 State Drive Los Angeles, CA 90037

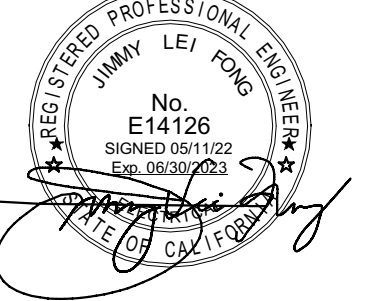
PRIME CONSULTANT



IBI GROUP 1001 Wilshire Blvd., Suite 100-3100 Los Angeles, CA 90017 tel 213 769 0011 fax 213 769 0016 ibigroup.com



SUB CONSULTANT



PACIFIC ENGINEERS GROUP Consulting Electrical Engineers 1106 W. Magnolia Blvd, Suite A Burbank, CA 91506 (818) 859-7081 Y19-034 R20

ISSUES

Table with 4 columns: NO., ISSUANCE, STATUS, DATE. Rows include SCHEMATIC DESIGN, 50% CD, SCOPE REVISION, 100% CD, SCOPE REVISION, DS/OFSM SUBMITTAL, ADDENDUM #1.

SHEET TITLE TITLE 24 FORMS

Table with 2 columns: FIELD, VALUE. Rows include DATE, DRAWN BY, CHKD BY, SCALE, DGS NO, IBI PROJECT NO.

SHEET NUMBER E0002 ISSUE A1

STATE OF CALIFORNIA Indoor Lighting CERTIFICATE OF COMPLIANCE. Project Name: CAAM CONFERENCE CENTER/LIBRARY/STORAGE IMPROVEMENTS. Report Page: Page 3 of 7. Date Prepared: 08-27-2021.

A. GENERAL INFORMATION. Table with 4 columns: 01 Project Location (city), 02 Climate Zone, 03 Occupancy Types Within Project, 04 Total Conditioned Floor Area (ft²), 05 Total Unconditioned Floor Area (ft²), 06 # of Stories (Habitable Above Grade).

B. PROJECT SCOPE. Table with 4 columns: 01 Scope of Work, 02 Conditioned Spaces, 03 Unconditioned Spaces, 04 Calculation Method, 05 Area (ft²).

C. COMPLIANCE RESULTS. Table with 9 columns: 01 Lighting in conditioned and unconditioned spaces, 02-05 Allowed Lighting Power per §140.6(b) (Watts), 06-08 Adjusted Lighting Power per §140.6(a) (Watts), 09 Compliance Results.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: https://www.energy.ca.gov/title24/2019standards January 2020

STATE OF CALIFORNIA Indoor Lighting CERTIFICATE OF COMPLIANCE. Project Name: CAAM CONFERENCE CENTER/LIBRARY/STORAGE IMPROVEMENTS. Report Page: Page 3 of 7. Date Prepared: 08-27-2021.

G. MODULAR LIGHTING SYSTEMS. This Section Does Not Apply.

H. INDOOR LIGHTING CONTROLS (Not Including PAFs). Table with 12 columns: 04 Area Description, 05 Complete Building or Area Category, 06 Area Controls, 07 Multi-Level Controls, 08 Shut-Off Controls, 09 Primary/Skylight Daylighting, 10 Secondary Daylighting, 11 Interlocked Systems, 12 Field Inspector.

Building Level Controls. Table with 3 columns: 01 Mandatory Demand Response, 02 Shut-Off Controls, 03 Field Inspector.

Area Level Controls. Table with 12 columns: 04 Area Description, 05 Complete Building or Area Category, 06 Area Controls, 07 Multi-Level Controls, 08 Shut-Off Controls, 09 Primary/Skylight Daylighting, 10 Secondary Daylighting, 11 Interlocked Systems, 12 Field Inspector.

*NOTES: Controls with a * require a note in the space below explaining how compliance is achieved. EX: Conference 1: Primary/Skylight Daylighting: Exempt because less than 120 watts of general lighting; EXCEPTION 1 to §130.1(d)(2).

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS. Table with 6 columns: 01 Area Description, 02 Complete Building or Area Category, 03 Allowed Density (W/ft²), 04 Area (ft²), 05 Allowed Wattage (Watts), 06 Additional Allowances / Adjustment.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: https://www.energy.ca.gov/title24/2019standards January 2020

STATE OF CALIFORNIA Indoor Lighting CERTIFICATE OF COMPLIANCE. Project Name: CAAM CONFERENCE CENTER/LIBRARY/STORAGE IMPROVEMENTS. Report Page: Page 2 of 7. Date Prepared: 08-27-2021.

Controls Compliance (See Table H for Details) COMPLIES. Rated Power Reduction Compliance (See Table Q for Details) Not Applicable.

D. EXCEPTIONAL CONDITIONS. This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form. No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS. This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. INDOOR LIGHTING FIXTURE SCHEDULE. Table with 10 columns: 01 Name of Item Tag, 02 Complete Luminaire Description, 03 Modular (Track) Fixture, 04 Small Aperture & Color Change, 05 Watts per luminaire, 06 How Wattage is determined, 07 Total number luminaires, 08 Exempt per §140.6(a)(1), 09 Design Watts, 10 Field Inspector.

Table with 10 columns: 01 Name of Item Tag, 02 Complete Luminaire Description, 03 Modular (Track) Fixture, 04 Small Aperture & Color Change, 05 Watts per luminaire, 06 How Wattage is determined, 07 Total number luminaires, 08 Exempt per §140.6(a)(1), 09 Design Watts, 10 Field Inspector.

*FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per §140.6(a)(5) is adjusted to be 75% of their rated wattage. Table F automatically makes this adjustment. The permit applicant should enter full rated wattage in column 05. *Authority Having Jurisdiction may ask for luminaire cut sheets to confirm wattage used for compliance per §130.1(d)(2). Wattage used must be the maximum rated for the luminaire, not the lamp.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: https://www.energy.ca.gov/title24/2019standards January 2020

STATE OF CALIFORNIA Indoor Lighting CERTIFICATE OF COMPLIANCE. Project Name: CAAM CONFERENCE CENTER/LIBRARY/STORAGE IMPROVEMENTS. Report Page: Page 4 of 7. Date Prepared: 08-27-2021.

J. ADDITIONAL LIGHTING ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM. Table with 6 columns: 01 Area Description, 02 Complete Building or Area Category, 03 Allowed Density (W/ft²), 04 Area (ft²), 05 Allowed Wattage (Watts), 06 Additional Allowances / Adjustment.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE. This Section Does Not Apply.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY. This Section Does Not Apply.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING. This Section Does Not Apply.

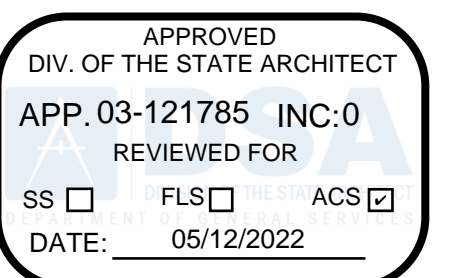
N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED ORNAMENTAL/SPECIAL EFFECTS. This Section Does Not Apply.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE. This Section Does Not Apply.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF)). This Section Does Not Apply.

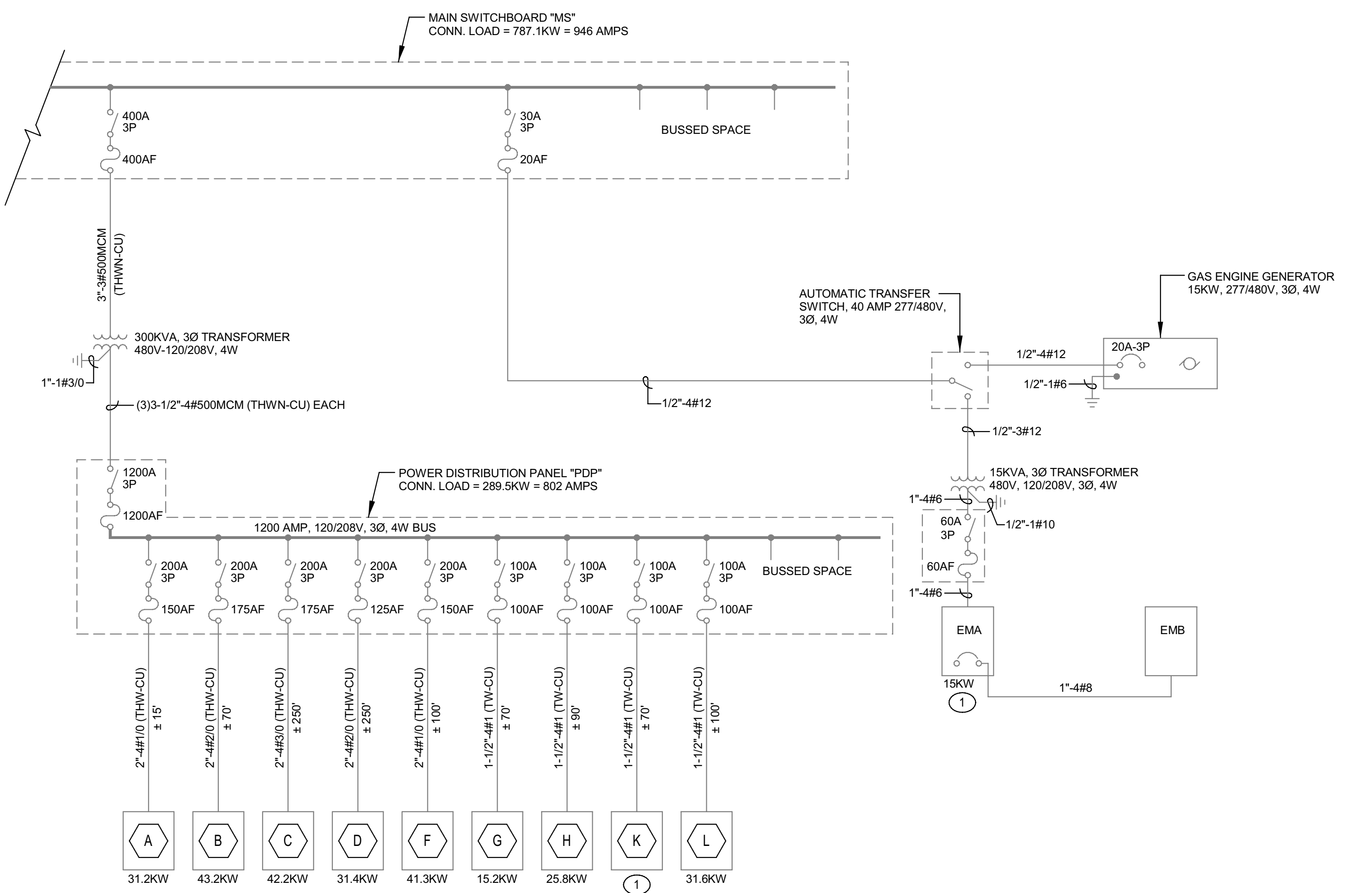
Q. RATED POWER REDUCTION COMPLIANCE FOR ALTERATIONS. This Section Does Not Apply.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: https://www.energy.ca.gov/title24/2019standards January 2020



(E) PANEL "K"																	
120/208 VOLTS			PHASE			LOCATION			KITCHEN AREA								
3			WIRE			MAIN BRK:			BUS RATING: 100A / COPPER								
4			WIRE			S.C. RATING: 120/208			MOUNTING: SURFACE								
LOCATION	WATTAGE			LTG	REC	MIS	CIR	BKR	LOCATION	WATTAGE							
	PH-A	PH-B	PH-C							PH-A	PH-B	PH-C					
RM-121 LIBRARY, 121A LIBRARIAN	540				3		1	20-1	20-1	2			3	540			RM-121 LIBRARY
RM-121 LIBRARY		540					3	20-1	20-1	4				540			RM-121 LIBRARY
DEDICATED AV (VIA ISO. TRANSFORMER)			1500		2		5	20-1	20-1	6							(E) SPARE
KITCHEN COUNTER TOP	540				3		7	20-1	20-1	8			3	540			KITCHEN, STORAGE, BREAK RM
DISHWASHER		180			1		9	20-1	20-1	10			3	540			KITCHEN, STORAGE, BREAK RM
LIGHTING (6" DOWNLIGHT)			27	3			11	20-1	20-1	12							SPARE
FREEZER	1200				1		13	20-1	20-1	14			2	360			SCREEN MOTOR, AV-BACKBOX
REFRIGRATOR		1200			1		15	20-1	20-1	16			2	360			SCREEN MOTOR, CURTAIN
SPARE							17	20-1	20-1	18			1	500			(E) CORRIDOR E.W.C.
1/12 HP H.W. PUMP	180						19	20-1	20-1	20			2	1000			(E) CORRIDOR E.W.C.
1/6 HP EXH. FAN		500					21	20-1	20-1	22							(E) SPARE
(E) SPARE							23	20-1	20-1	24							(E) SPARE
(E) SPARE							25	20-1	20-1	26			1	1000			OVEN/MICROWAVE
(E) SPARE							27	20-1	20-1	28				1000			OVEN/MICROWAVE
(E) SPARE							29	20-1	20-1	30			1	2650			RANGE
RM-121A, 121 LIBRARY	200				19		31	20-1	20-1	32			-	2650			RANGE
SPARE							33	20-1	20-1	34							SPACE
RM-116 CONF (LEFT-RIGHT), BREAK RM			230		16		35	20-1	20-1	36							SPACE
RM-116 CONF CENTER (MIDDLE)	520				26		37	20-1	20-1	38							SPACE
SPACE							39	20-1	20-1	40							SPACE
SPACE							41	20-1	20-1	42							SPACE
PH-A= 9270 VA							PH-B= 4860 VA				PH-C= 4907 VA						
TOTAL CONNECTED LOAD:	19037 VA	OR	52.8806 AMPS @ 120/208 VOLTS				3 PHASE										
LCL: 27 VA	X	1.25%	=	33.75 VA													
FDL: 19010 VA	+	33.75 VA (LCL)	=	19043.8 VA	OR	52.9 A											

(E) PANEL "EMA"																	
120/208 VOLTS			PHASE			LOCATION			ELECTRICAL ROOM								
3			WIRE			MAIN BRK: MLO			BUS RATING: 100A / COPPER								
4			WIRE			S.C. RATING: 120/208			MOUNTING: SURFACE								
LOCATION	WATTAGE			LTG	REC	MIS	CIR	BKR	LOCATION	WATTAGE							
	PH-A	PH-B	PH-C							PH-A	PH-B	PH-C					
(E)CORRIDOR	1262			11			10	1	20-1	20-1	2	3		5	535		(E) GALLERY 1, 2
(E) FIRE ALARM CONTROL PANEL		300					1	3	20-1	20-1	4			6	552		(E) GALLERY 1, 2
(E) FIRE ALARM CONTROL			300				1	5	20-1	20-1	6	1			500		(E) SECURITY PANELS
CONFERENCE CENTER	575			9			7	20-1	20-1	8							SPARE
SPARE							9	20-1	20-1	10							SPARE
SPARE							11	20-1	20-1	12							SPARE
SPARE							13	20-1	20-1	14	3			1678			(E) SUB-FEED "EMB"
SPARE							15	20-1	20-1	16	-			1300			
SPARE							17	20-1	20-1	18	-			1300			
PH-A= 4050 VA							PH-B= 2152 VA				PH-C= 2100 VA						
TOTAL CONNECTED LOAD:	8302 VA	OR	23.0611 AMPS @ 120/208 VOLTS				3 PHASE										
LCL: 2924 VA	X	1.25%	=	3655 VA													
FDL: 5378 VA	+	3655 VA (LCL)	=	9033 VA	OR	25.09 A											



SINGLE LINE DIAGRAM
N.T.S.

NOTE: ALL ITEMS SHOWN ARE EXISTING TO REMAIN. PANELS K AND EMA WERE FIELD VERIFIED. CONTRACTOR HAS TO FIELD VERIFY ALL OTHER ITEMS SHOWN ON THE SINGLE LINE DIAGRAM AND REPORT ANY DISCREPANCIES TO THE OWNER/ENGINEER.

KEYED NOTES:
① SEE PANEL SCHEDULE.

CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
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1001 Wilshire Blvd., Suite 100-3100
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Tel: 213 769 0011 Fax: 213 769 0016
ibigroup.com



SUB CONSULTANT
PACIFIC ENGINEERS GROUP
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1106 W. Magnolia Blvd. Suite A
Burbank, CA 91506
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NO.	ISSUANCE	STATUS	DATE
D	SCHEMATIC DESIGN		2019-10-11
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISION		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

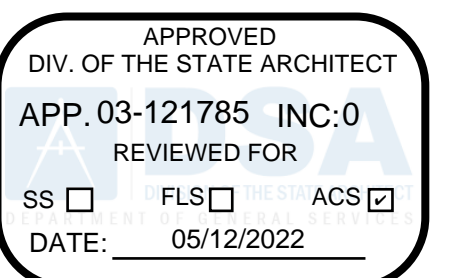
SHEET TITLE
SINGLE LINE DIAGRAM & PANEL SCHEDULE

DATE: 2022-05-11
DRAWN BY: HY
CHKD BY: JF
SCALE: 1/8" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
E0004
ISSUE
A1

KEYNOTES

- 1 DISCONNECT & REMOVE (E) LIGHTING FIXTURES, TRACK LIGHTS, SWITCHES, WIRES, CONDUITS, & J-BOXES DOWN TO PANELBOARD.
- 2 REMOVE, REINSTALL, & RECONNECT (E) RECEPTACLES TO (E) CIRCUIT. REPLACE WITH NEW OUTLET & FACEPLATES IF NECESSARY.
- 3 REMOVE (E) DUPLEX RECEPTACLES, WIRES, CONDUITS, & J-BOXES DOWN TO PANELBOARD.
- 4 DISCONNECT & REMOVE (E) DUPLEX RECEPTACLE INCLUDING CONDUIT & WIRE BACK TO SERVING PANELBOARD.
- 5 DEMOLISH EXISTING SURFACE MOUNT CONDUITS FROM PANEL TO PA RACK.
- 6 DISCONNECT AND REMOVE EXISTING EXIT SIGN INCLUDING CONDUIT AND WIRES.



CLIENT
State of California
 Dept. of General Services
DGS
 GENERAL SERVICES
 Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES
CAAM
 California African American Museum
 600 State Drive
 Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
 1001 Wilshire Blvd., Suite 100-3100
 Los Angeles, CA 90017
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com



SUB CONSULTANT
PACIFIC ENGINEERS GROUP
 Consulting Electrical Engineers
 1106 W. Magnolia Blvd. Suite A
 Burbank, CA 91506
 (818) 859-7061 Y19-034 R20

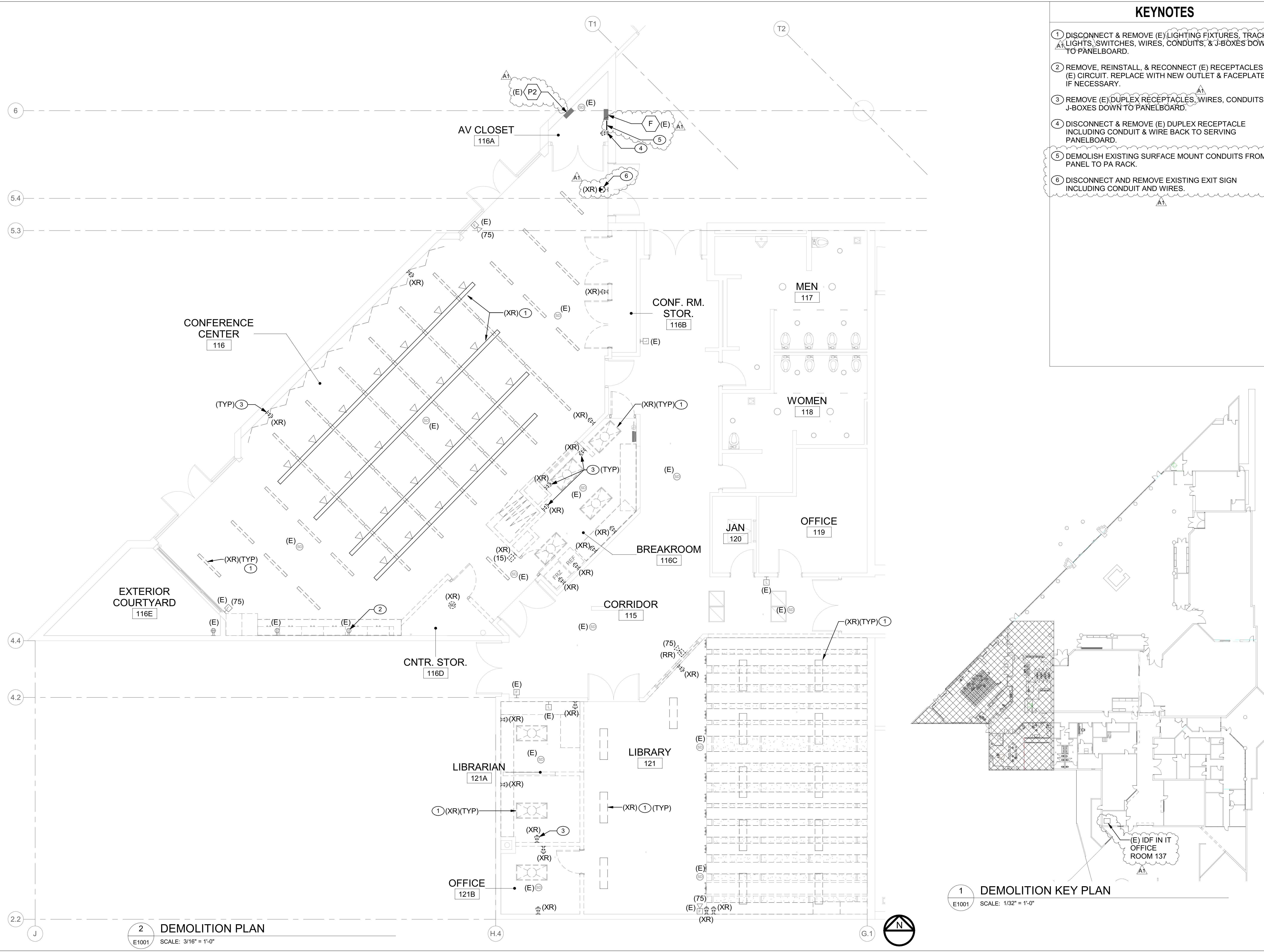
ISSUES

NO.	ISSUANCE	STATUS	DATE
D	SCHEMATIC DESIGN		2019-10-11
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISION		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
ENLARGED DEMOLITION FLOOR PLAN

DATE: 2022-05-11
 DRAWN BY: HY
 CHKD BY: JF
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER **E1001** ISSUE **A1**

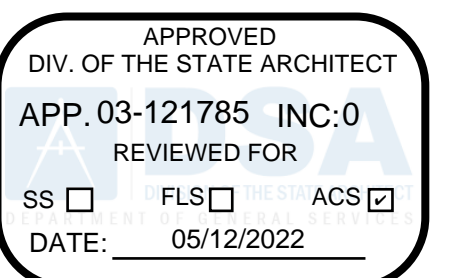


1 DEMOLITION KEY PLAN
 E1001 SCALE: 1/32" = 1'-0"

2 DEMOLITION PLAN
 E1001 SCALE: 3/16" = 1'-0"

KEYNOTES

- 1 CONNECT TO MOTORIZED CURTAIN.
- 2 CONNECT TO SCREEN MOTOR.
- 3 FOR AV PROJECTOR.
- 4 ISOLATION TRANSFORMER. MOUNT UP ON WALL, ABOVE PANEL "K".
- 5 TO CIRCUIT K-5 VIA 1500 VA, 120/120V, 1Ø ISOLATION TRANSFORMER.
- 6 DATA OUTLET MOUNTED ON CEILING.
- 7 SEE PANEL LOAD SCHEDULE.
- 8 CUT FLOOR TO INSTALL CONDUIT 6" BELOW FLOOR FINISH. REPAIR FLOOR.
- 9 RATED WALL. ALL CONDUIT PENETRATING THIS WALL SHALL BE SEALED FOR THE WALL RATING. SEE ARCHITECTURAL DRAWING A2100 AND ARCHITECTURAL DETAILS 9/A8100 AND 10/A8100.



OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY



Approval of this plan does not authorize or approve any omission or deviation from applicable requirements. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

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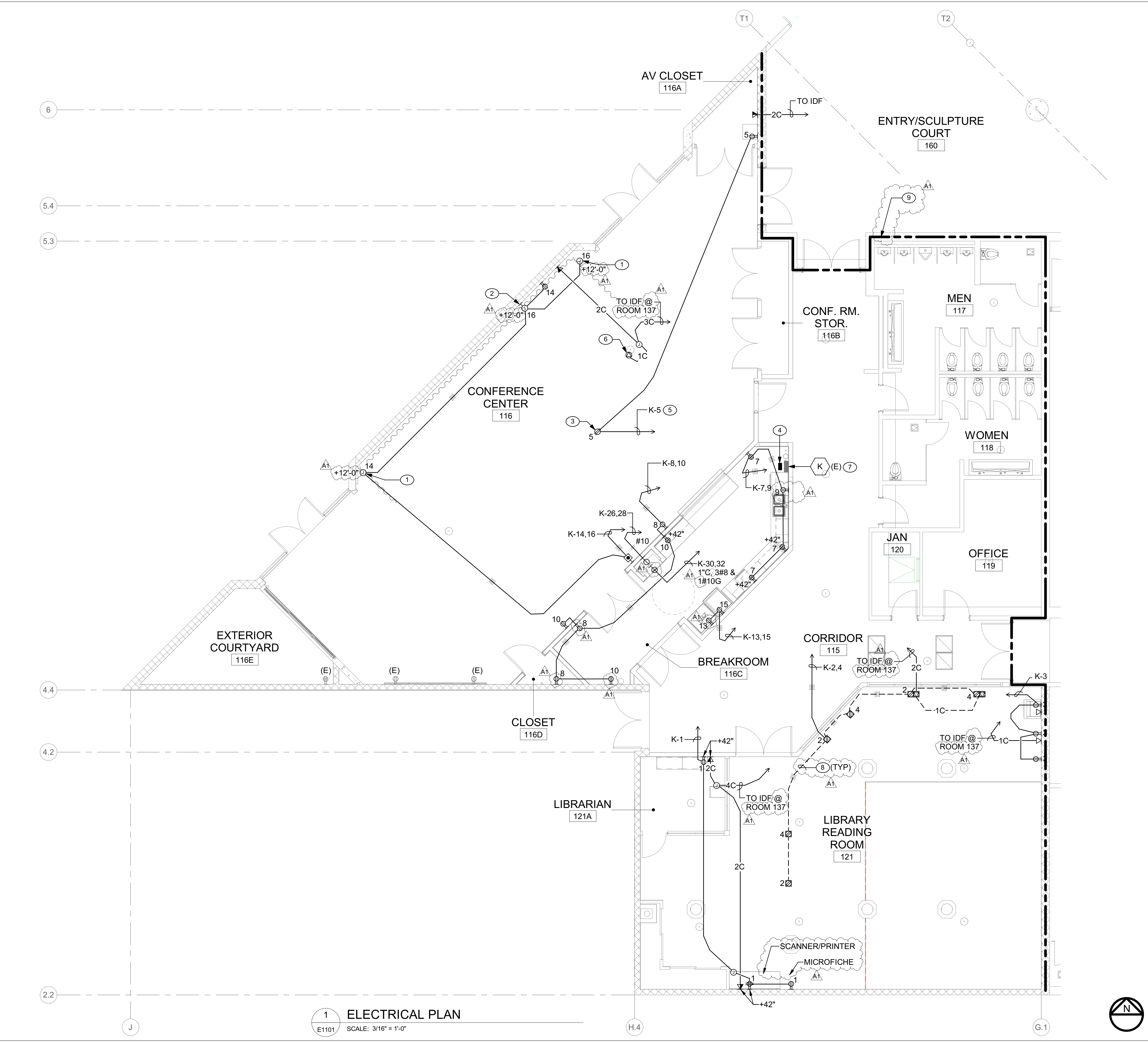
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PACIFIC ENGINEERS GROUP
Consulting Electrical Engineers
1106 W. Magnolia Blvd, Suite A
Burbank, CA 91506
(818) 859-7061 Y19-034 R20

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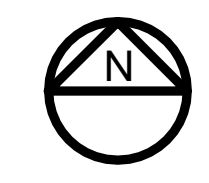
SHEET TITLE
ELECTRICAL PLAN

DATE: 2022-05-02
DRAWN BY: HY
CHKD BY: JF
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER: **E1101**
ISSUE NUMBER: **A1**

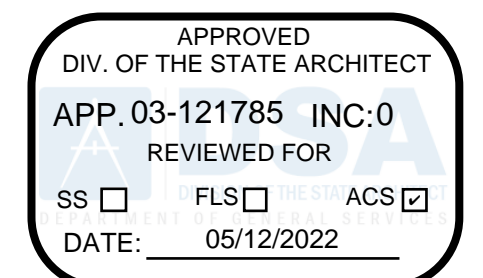


1 ELECTRICAL PLAN
E1101 SCALE: 3/16" = 1'-0"



KEYNOTES

- ① SEE PANEL SCHEDULE.
- ② RATED WALL. ALL CONDUIT PENETRATING THIS WALL SHALL BE SEALED FOR THE WALL RATING. SEE ARCHITECTURAL DRAWING A2100 AND ARCHITECTURAL DETAILS 9/A8100 AND 10/A8100.



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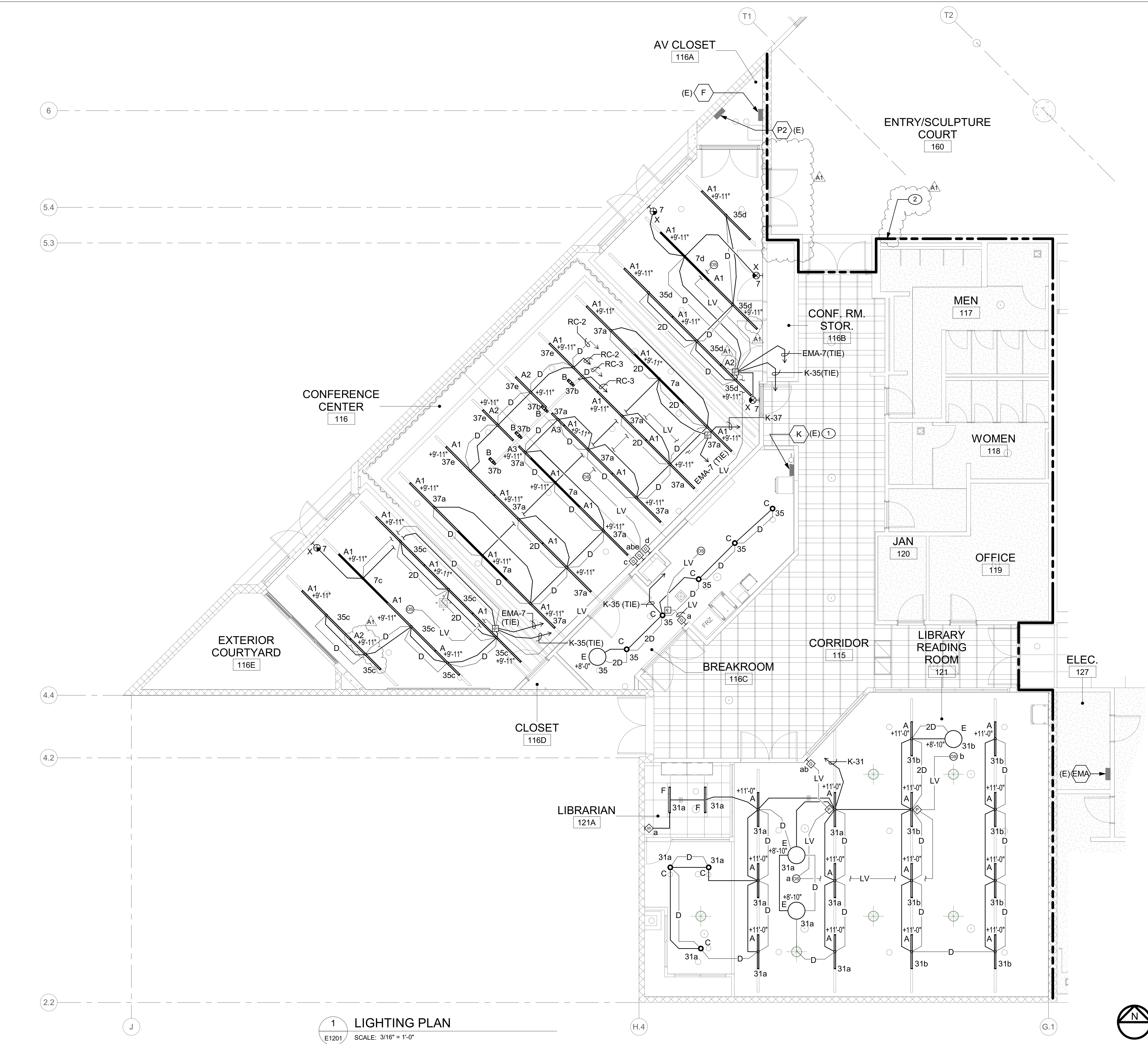
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 Consulting Electrical Engineers
 1106 W. Magnolia Blvd. Suite A
 Burbank, CA 91506
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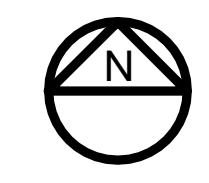
SHEET TITLE
LIGHTING PLAN

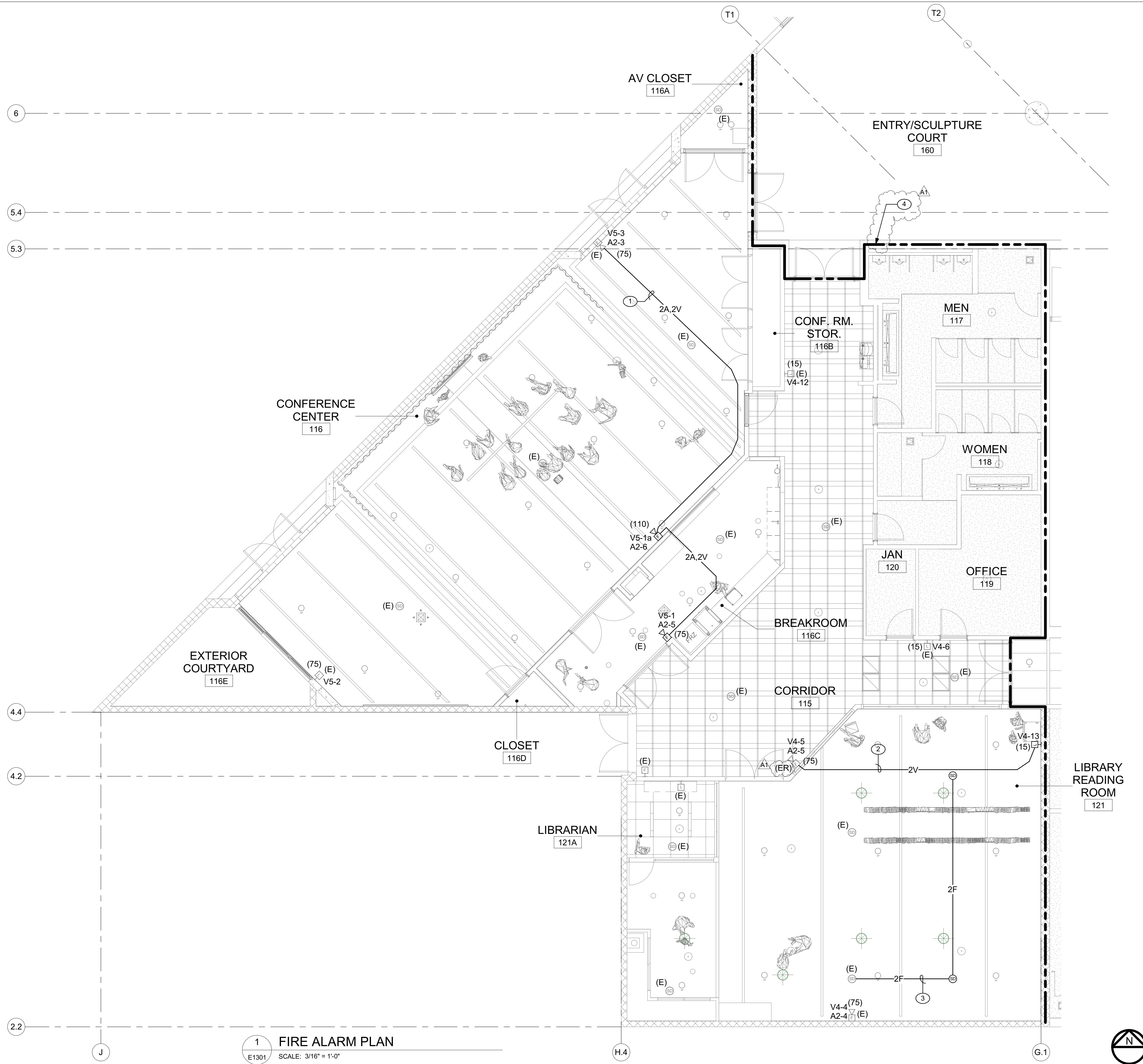
DATE: 2022-05-02
 DRAWN BY: HY
 CHK'D BY: JF
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER: **E1201** ISSUE: **A1**



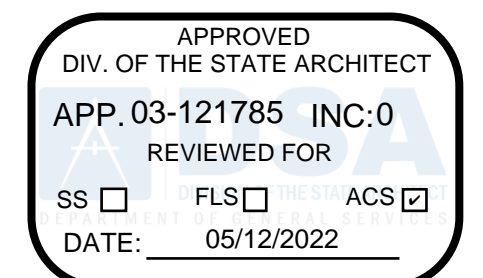
1 LIGHTING PLAN
 E1201 SCALE: 3/16" = 1'-0"





KEYNOTES

- ① CONNECT TO (E) V5 & A2 CIRCUITS.
- ② CONNECT TO (E) V4 CIRCUIT.
- ③ CONNECT TO (E) ADDRESSABLE SMOKE DETECTOR.
- ④ RATED WALL. ALL CONDUIT PENETRATING THIS WALL SHALL BE SEALED FOR THE WALL RATING. SEE ARCHITECTURAL DRAWING A2100 AND ARCHITECTURAL DETAILS 9/A8100 AND 10/A8100.



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 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

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PRIME CONSULTANT

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SUB CONSULTANT

PACIFIC ENGINEERS GROUP
 Consulting Electrical Engineers
 1106 W. Magnolia Blvd. Suite A
 Burbank, CA 91506
 (818) 859-7081 Y19-034 R20

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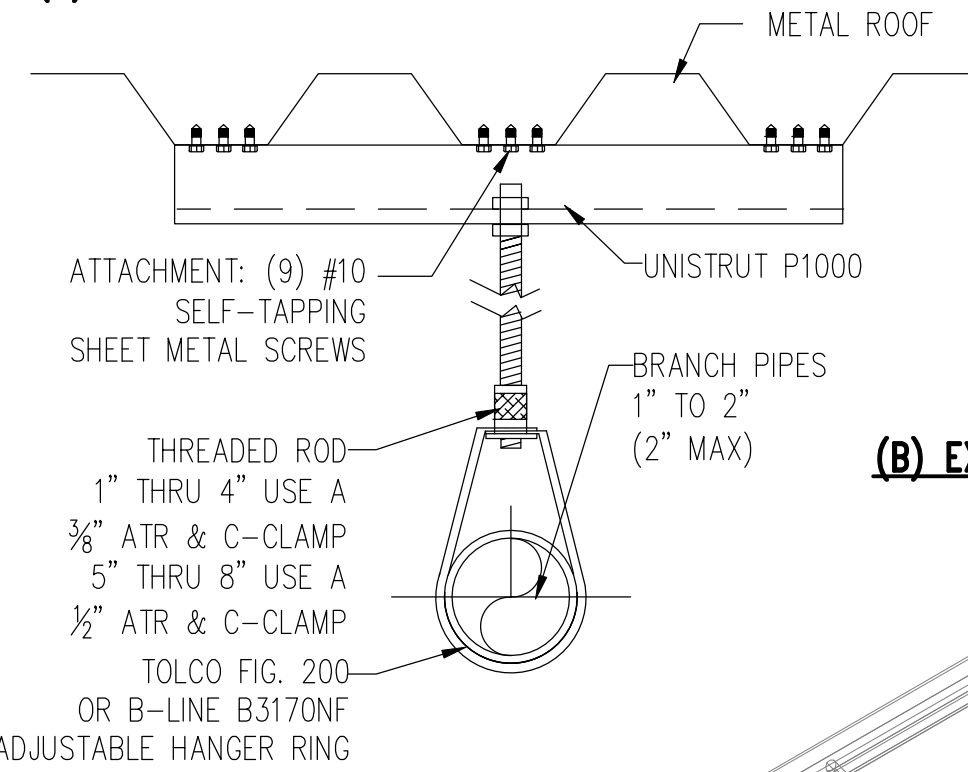
SHEET TITLE
FIRE ALARM PLAN

DATE: 2022-05-02
 DRAWN BY: HY
 CHK'D BY: JF
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

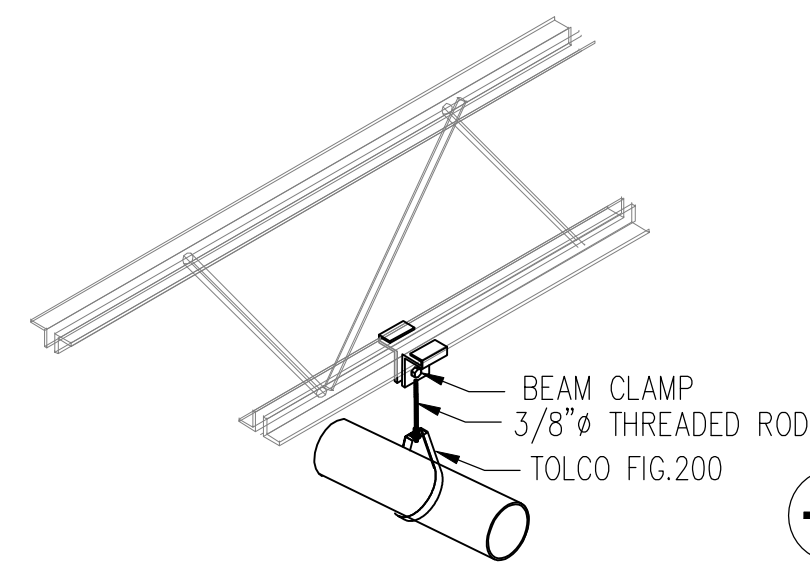
SHEET NUMBER
E1301
 ISSUE
A1

1 FIRE ALARM PLAN
 E1301 SCALE: 3/16" = 1'-0"

(A) METAL DECK ATTACHMENT



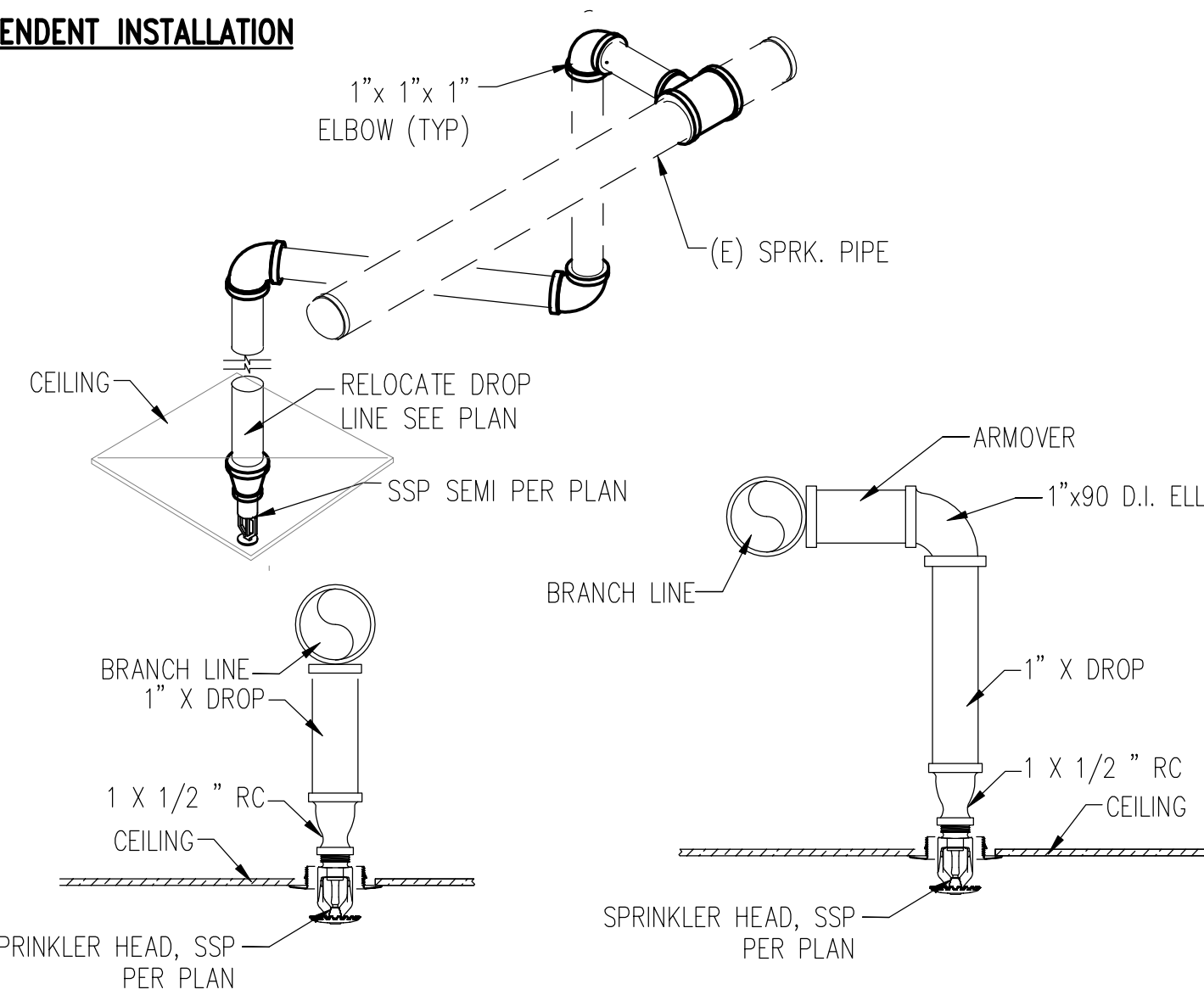
(B) EXISTING STEEL JOIST ATTACHMENT



HANGER ATTACHMENT DETAIL

SCALE NOT TO SCALE 1

PENDENT INSTALLATION



ARMOVER/DROP DETAIL

SCALE NOT TO SCALE 2

FIRE SPRINKLER NOTES

(SUBMITTAL FOR ABOVE GROUND PIPING ONLY EXCEPT FOR 6" ABOVE FINISHED FLOOR @ RISER LOCATION).

- PLANS SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER (CIVIL, MECHANICAL, OR FIRE PROTECTION), LICENSED BY THE STATE OF CALIFORNIA (BOARD OF PROFESSIONAL ENGINEERS). (BUSINESS & PROFESSIONAL CODE)
- INSTALLATION SHALL BE IN ACCORDANCE WITH PLANS AND SPECIFICATIONS "APPROVED" BY THE AUTHORITY HAVING JURISDICTION (AHJ'S).
- INSTALLATION WORK SHALL BE PERFORMED BY C16 LICENSED CONTRACTOR ONLY, FULLY EXPERIENCED AND RESPONSIBLE PERSONS.
- PIPING SHALL BE "LISTED" FOR FIRE PROTECTION SERVICE AND COMPLY WITH AWWA STANDARDS, WHERE APPLICABLE. (NFPA-24, 10.1.1)
- FITTINGS SHALL BE OF AN "APPROVED" TYPE. (NFPA-24, 10.2)
- TESTS SHALL BE MADE BY THE INSTALLING CONTRACTOR IN THE PRESENCE OF THE AUTHORITY HAVING JURISDICTION (AHJ'S) IF THEY DESIRE TO BE PRESENT. (NFPA-24, 10.10.2.3)
- VERIFY ALL COSTS & RELATED ITEMS WITH THE FIRE SPRINKLER SYSTEM DESIGN & INSTALL SUBCONTRACTOR PRIOR TO SUBMISSION OF BID.
- FIRE SPRINKLER SYSTEMS PIPING HANGER AND SUPPORTS SHALL CONFORM TO THE NFPA 13 SEISMIC BRACING REQUIREMENTS.
- IN CASE OF CONFLICT WITH REQUIREMENTS OF DIFFERENT AUTHORITIES HAVING JURISDICTION, MOST STRINGENT SHALL APPLY.
- AUXILIARY DRAIN SHALL BE PROVIDED WHERE A CHANGE IN PIPING DIRECTION PREVENTS DRAINAGE OF SYSTEM PIPING THROUGH THE MAIN DRAIN VALVE. (2019 NFPA 13, SECTION 8.16.2.5.1)
- CLEARANCE SHALL BE PROVIDED AROUND ALL PIPING EXTENDING THROUGH WALLS, FLOOR, PLATFORM, AND FOUNDATIONS, INCLUDING DRAINS, FIRE DEPARTMENT CONNECTIONS, AND OTHER AUXILIARY PIPING. (2019 NFPA 13, SECTION 9.3.4.1)
THE HOLES SHALL BE SIZED SUCH THE DIAMETER OF THE HOLES IS NORMINALLY 2 IN. LARGER THAN THE PIPE FOR 1 IN. NORMINAL TO 3-1/2 IN. NORMINAL AND 4 IN. LARGER THAN THE PIPE FOR 4 IN. NORMINAL AND LARGER. (2019 NFPA 13, SECTION 9.3.4.2)

RESTRAIN & BRANCH LINE BRACING REQUIREMENTS

9.3.6.2 WIRE RESTRAIN

- 9.3.6.2.1 WIRE USED FOR RESTRAINT SHALL BE LOCATED WITHIN 2 FT (600MM) OF A HANGER.
- 9.3.6.2.2 THE HANGER CLOSEST TO A WIRE RESTRAINT SHALL BE OF A TYPE THAT RESISTS UPWARD MOVEMENT OF A BRANCH LINE.
- 9.3.6.3 THE END SPRINKLER ON A BRANCH LINE SHALL BE RESTRAINED.
- 9.3.6.4* BRANCH LINES SHALL BE LATERALLY RESTRAINED AT INTERVALS NOT EXCEEDING THOSE SPECIFIED IN TABLE 9.3.6.4(A) OR TABLE 9.3.6.4(B) BASED ON BRANCH LINE DIAMETER AND VALUE OF Cp.
- 9.3.6.5 WHERE THE BRANCH LINES ARE SUPPORTED BY RODS LESS THAN 6 IN. (150MM) LONG MEASURED BETWEEN THE TOP OF THE PIPE AND THE POINT OF ATTACHMENT TO THE BUILDING STRUCTURE, THE REQUIREMENTS OF 9.3.6.1 THROUGH 9.3.6.4 SHALL NOT APPLY AND ADDITIONAL RESTRAINT SHALL NOT BE REQUIRED FOR THE BRANCH LINES.

GENERAL NOTES

- (A) IT IS RESPONSIBILITY OF THE OWNER TO MAINTAIN THE INTEGRITY OF THE SPRINKLER SYSTEM.
- (B) THE FIRE PROTECTION CONTRACTOR WILL PROVIDE THE OWNER WITH THE NECESSARY INSTRUCTION MANUAL NFPA 25, FOR THE UPKEEP OF THE SYSTEM AS WELL AS A COPY OF NFPA 13.
- (C) ONLY SPECIFIED SPRINKLER SHALL BE EMPLOYED IN THE INSTALLATION OF THE SPRINKLER SYSTEM.
- (D) THE SYSTEM SHALL ONLY EMPLOY THE USE OF APPROVED MATERIAL AND DEVICES.
- (E) SPRINKLER PLANS SHALL BE MAINTAINED AT ALL TIMES ON THE JOBSITE.
- (F) AN APPOINTMENT SHALL BE MADE A MINIMUM OF TWO WORKING DAYS IN ADVANCE WITH THE APPROPRIATE FIRE PREVENTION OFFICE FOR ALL INSPECTIONS AND TESTS.
- (G) ALL SYSTEM PIPING SHALL BE HYDROSTATICALLY TESTED AT 200 PSI FOR TWO HOURS OR AT 50 PSI ABOVE THE SYSTEM OPERATION PRESSURE, WHICHEVER IS GREATER.
- (H) A STOCK OF SPARE SPRINKLER OF EACH STYLE, TYPE, AND TEMPERATURE RATING ALONG WITH A SPRINKLER WRENCH SHALL BE LOCATED AT THE MAIN RISER.
- (I) THE PROTECTION OF SPRINKLER HEADS FROM PAINT IS TO BE THE RESPONSIBILITY OF OTHERS.
- (J) ALL ELECTRICAL WIRING REQUIRED IS TO BE PERFORMED BY OTHERS.
- (K) FIRE SPRINKLER HEADS SHALL BE LOCATED IN STRAIGHT LINES PARALLEL TO THE WALL.
- (L) PENETRATIONS OF RATED AND DEMISING WALLS SHALL BE SEALED AGAINST FIRE, SMOKE SOUND PER ARCHITECTURAL SHEET A8501 AND A8502.
- (M) USE #401 CANOPIES IN AREAS W/SURFACE MOUNTED LIGHTS.

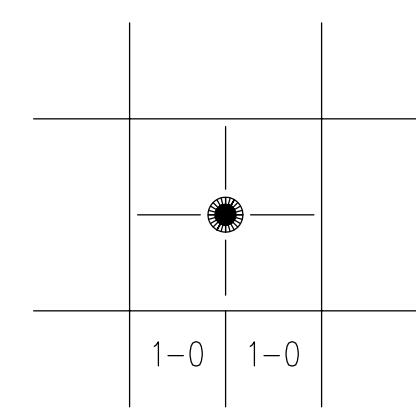
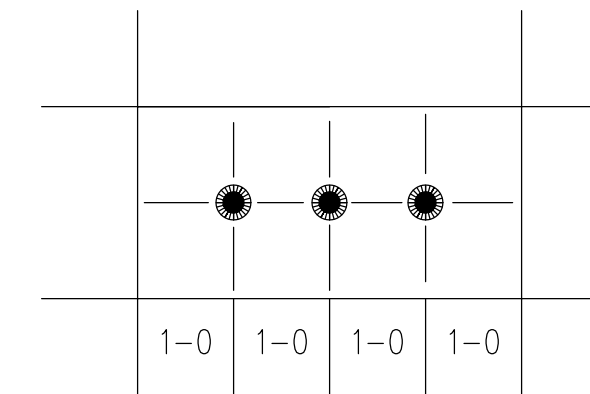
DESIGN CRITERIA:

- SPRINKLER SPACING SHALL BE AS FOLLOWS:
NFPA 13, 2019, SECTION 8.6.2.2.
NFPA 13, 2019, TABLE 8.6.2.2.1 (a) PROTECTION AREA AND MAXIMUM SPACING OF STANDARD PENDENT AND UPRIGHT SPRAY SPRINKLER FOR LIGHT HAZARD.
NFPA 13, 2019, TABLE 8.6.2.2.1 (b) PROTECTION AREA AND MAXIMUM SPACING OF STANDARD PENDENT AND UPRIGHT SPRAY SPRINKLER FOR ORDINARY HAZARD.
NFPA 13, 2019, TABLE 8.6.2.2.1 (c) PROTECTION AREA AND MAXIMUM SPACING OF STANDARD PENDENT AND UPRIGHT SPRAY SPRINKLER FOR EXTRA HAZARD.
NFPA 13, 2019, TABLE 8.7.2.2.1 PROTECTION AREA AND MAXIMUM SPACING (STANDARD SIDEWALL SPRAY SPRINKLER).
NFPA 13, 2019, TABLE 8.8.2.1.2 PROTECTION AREAS AND MAXIMUM SPACING (EXTENDED COVERAGE PENDENT AND UPRIGHT SPRAY SPRINKLERS).
- ALL GROOVED COUPLINGS ARE TO BE RIGID TYPE UNLESS NOTED OTHERWISE.
- THE DISTANCE BETWEEN THE SPRINKLERS DEFLECTORS AND THE CEILING ABOVE SHALL BE SELECTED BASED ON THE TYPE OF SPRINKLER AND THE TYPE OF CONSTRUCTION. (2019 NFPA 13 SECTION 8.5.4.1.1)
b. DEFLECTORS OF SPRINKLERS SHALL BE ALIGNED PARALLEL TO THE CEILINGS, ROOFS, OR THE INCLINE OF STAIRS. (2019 NFPA 13 SECTION 8.6.4.2.1)
- UNDER UNOBSTRUCTED CONSTRUCTION, THE DISTANCE BETWEEN THE SPRINKLER DEFLECTOR AND THE CEILING SHALL BE A MINIMUM OF 1 IN. AND MAXIMUM OF 12 IN. THROUGHOUT THE AREA OF COVERAGE OF THE SPRINKLER. (2019 NFPA 13 SECTION 8.6.4.1.1.1).
- UNDER OBSTRUCTED CONSTRUCTION, THE SPRINKLER DEFLECTOR SHALL BE LOCATED WITHIN THE HORIZONTAL PLANES OF 1 IN. TO 6 IN. BELOW THE STRUCTURAL MEMBERS AND A MAXIMUM DISTANCE OF 22 IN. BELOW THE CEILING/ROOF DECK. (2019 NFPA 13 SECTION 8.6.4.1.2).

-(SEE SHEET G1000 FOR DETAILED PROJECT DATA AND PLANNING CODE ANALYSIS.)

SPRINKLER HEAD LOCATION

- GYPSUM BOARD CEILING:
HEAD WILL BE LINED UP WITH CEILING FIXTURES HOWEVER, IF THIS VIOLATES HEAD SPACING RULES, NFPA - 13 CODE SPACING REQUIREMENTS SHALL TAKE PRECEDENCE.
- 2' X 2' ACOUSTIC TITLE:
SPRINKLER HEAD SHALL BE ALIGNED IN BOTH DIRECTIONS WHEREVER POSSIBLE AND THEY WILL BE LOCATED IN CENTER OF TITLE WITH (+ / - 1") ACCURACY UNLESS SUCH LOCATION CONFLICT WITH CODE SPACING REQUIREMENTS; WHERE SPACING REQUIREMENTS SHALL TAKE PRECEDENCE
- 2' X 4' ACOUSTIC TITLE:
SPRINKLER HEADS SHALL BE LOCATED AT QUARTER POINTS ALONG LONGER DIMENSION AND @ CENTER LINE ALONG SMALLER SIDE WITH (+ / - 1") ACCURACY.

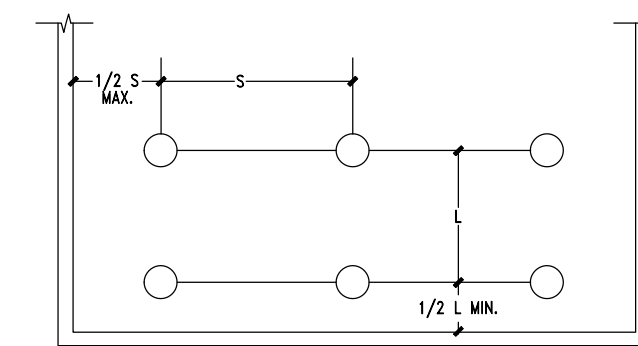


MINIMUM DISTANCE FROM WALL

PER 2019 NFPA13 SEC. 8.6.3.3
SPRINKLERS SHALL NOT BE LOCATED AT MINIMUM OF 4IN. (100MM) FROM A WALL.

MAXIMUM DISTANCE FROM WALL

PER 2019 NFPA13 SEC. 8.6.3.2.1
THE DISTANCE FROM SPRINKLERS TO WALL SHALL NOT EXCEED ONE-HALF OF THE ALLOWABLE DISTANCE BETWEEN SPRINKLERS AS INDICATED IN TABLE 8.6.3.2.1 (A) THROUGH TABLE 8.6.2.2.1 (B).



CSFM FIRE SPRINKLER SHOP DRAWING NOTES.

- * THE AUTOMATIC SPRINKLER SYSTEM SHALL CONFORM TO NFPA 13, 2016 EDITION, WITH CALIFORNIA AMENDMENTS.
- * UPON COMPLETION OF THE INSTALLATION OF THE AUTOMATIC FIRE SPRINKLER SYSTEM, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE CALIFORNIA STATE FIRE MARSHAL.
- * A MINIMUM OF 72 HOURS' NOTICE SHALL BE REQUIRED FOR ANY TESTING AND/OR INSPECTION.
- * A STAMPED SET OF APPROVED AUTOMATIC FIRE SPRINKLER DRAWINGS SHALL BE ON THE JOB SITE & USED FOR INSTALLATION. ANY DEVIATION FROM THE APPROVED PLANS, INCLUDING THE SUBSTITUTION OF COMPONENTS, SHALL BE APPROVED BY THE CALIFORNIA STATE FIRE MARSHAL.
- * ANY DISCREPANCIES BETWEEN THE DRAWING AND THE CODE OR RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF THE INSPECTOR OF RECORD.
- * A CERTIFICATE OF COMPLIANCE SHALL BE PREPARED BY THE INSTALLER AND GIVEN TO THE CALIFORNIA STATE FIRE MARSHAL UPON COMPLETION OF THE INSTALLATION.

SCOPE OF WORK:

- RELOCATE THREE SPRINKLER HEADS, ADD ONE NEW SPRINKLER HEAD SERVING ROOM LIBRARIAN-121A AND LIBRARY READING ROOM-121.
- REPLACE ONE SPRINKLER HEAD FROM UPRIGHT TO PENDENT HEAD IN THE BREAK ROOM-116C.
- TOTAL 5 NEW SPRINKLER HEADS.
- ALL NEW PIPE TO BE SCHEDULE 40.

FIRE SPRINKLER SYSTEM LEGEND

(SPRINKLER HEAD SYMBOL'S AT BOTTOM OF SHT.)

	CHANGE IN ELEVATION UPWARD
	CHANGE IN ELEVATION DOWNWARD
	AUTOMATIC SPRINKLER RISER
	ELECTRIC/ALARM BELL
	HANGER TYPE AND LOCATION
	HANGER FOR MAINLINES
	RISER NIPPLE
	OH DENOTES ORDINARY HAZARD
	ECO EXTENDED COVERAGE HEAD FOR ORDINARY HAZARD
	ECL EXTENDED COVERAGE HEAD FOR LIGHT HAZARD
	DN DENOTES BRANCHLINE NUMBER
	CM DENOTES CROSSMAIN NUMBER
	RIGID GROOVE COUPLING
	FLEXIBLE GROOVE COUPLING
	SLOPE PIPING DOWNWARDS
	DN DENOTES HYDRAULIC REF. NUMBER
	DN DENOTES PIPE CONTINUATION
	* 12" BRANCHLINE @ BELOW DECK ELEVATION
	* * 36" CROSSMAIN @ BELOW DECK ELEVATION
	+ 12' 0" PIPE ELEVATION ABOVE FINISH FLOOR
	DN DENOTES 2 WAY BRANCING
	DN DENOTES 4 WAY BRANCING
	DN DENOTES END OF LINE RESTRAINT
	DN DENOTES SLEEVE THRU BEAM OR WALL
	DN DENOTES E.Q. BRACE AREA CALCULATED
	OS&Y GATE VALVE
	WATER FLOW SWITCH (ELECTRIC)
	ROOF MANIFOLD
	SEISMIC JOINT
	NEW FIRE LINE
	EXISTING FIRE LINE
	RELOCATE HEAD

LEGEND

AFS	AUTO FIRE SPRINKLER	GG	GROOVE BOTH END
AFF	ABOVE FINISH FLOOR	GT	GROOVE-THREAD ENDS
BBD	BELOW BOT. OF DECK	GR	GROOVE REDUCING CPLG
BFV	BUTTERFLY VALVE	GV	GATE VALVE
B.L.	BRANCH LINE	HGR	HANGER
BTS	BELOW TOP OF STEEL	(N)	NEW
CIP	CAST IRON PIPE	OS&Y	OUTSIDE SCREW & YOKE
CM	CROSS MAIN	OH	OVER HEAD
CPLG	COUPLING	PIV	POST INDICATOR VALVE
CSP	COMBINATION STANDPIPE	POC	POINT OF CONNECTION
CV	CHECK VALVE	PRV	PRES. REGULATING VALVE
DIP	DUCTILE IRON PIPE	S.B.	SWAY BRACE
DSP	DRY STAND PIPE	SCH-	SCHEDULE (-10,-40)
(E)	EXISTING	SOV	SHUT OFF VALVE
ETR	EXISTING TO REMAIN	SP	STANDPIPE
EX.H.	EXTRA HEAVY	SPRK	SPRINKLER
FDC	FIRE DEPT CONNECTION	SSP	PENDENT SPRINKLER
FH	FIRE HYDRANT	SSU	UPRIGHT SPRINKLER
FHC	FIRE HOSE CABINET	STD	STANDARD (WEIGHT)
FHV	FIRE HOSE VALVE	T.B.R.	TO BE REMOVED
FPTH	FIRE PUMP TEST HEADER	TS	TAMPER SWITCH
FW	FIRE WATER	UG	UNDERGROUND
FIT	FITTING	VA	VALVE
FS	FLOW SWITCH	WSP	WET STANDPIPE
GR	GROOVE END		

FIRE SPRINKLER SHEET INDEX

NO.	SHEET NO.	SHEET DESCRIPTION
1	FP0101	LEGENDS, NOTES & INDEX
2	FP1000	ENLARGED DEMOLITION FLOOR PLAN
3	FP1100	ENLARGED NEW FLOOR PLAN

CLIENT

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Dept. of General Services

DGS
GENERAL SERVICES

Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605

Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT

CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES

CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT

IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel: 213 769 9011 Fax: 213 769 9016
ibi@ibi.com

STATE OF CALIFORNIA ARCHITECT

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MECHANICAL ENGINEER

STATE OF CALIFORNIA

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E	50% CD		2019-12-13
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G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSAS/CSFM SUBMITTAL		2021-09-14
V2	DSAS/CSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

LEGENDS, NOTES & SHEET INDEX

DATE: 2022-05-02

DRAWN BY: NM

CHKD BY: JS

SCALE: NOT TO SCALE

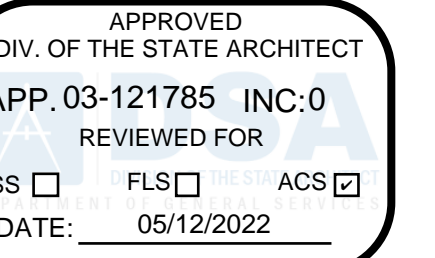
DGS NO: 4359

IBI PROJECT NO: 119020

SHEET NUMBER

ISSUE

FP0101 A1



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 707 Third St, 4th Floor
 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
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PRIME CONSULTANT

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 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 Tel 213 769 0011 Fax 213 769 0016
 ibigroup.com



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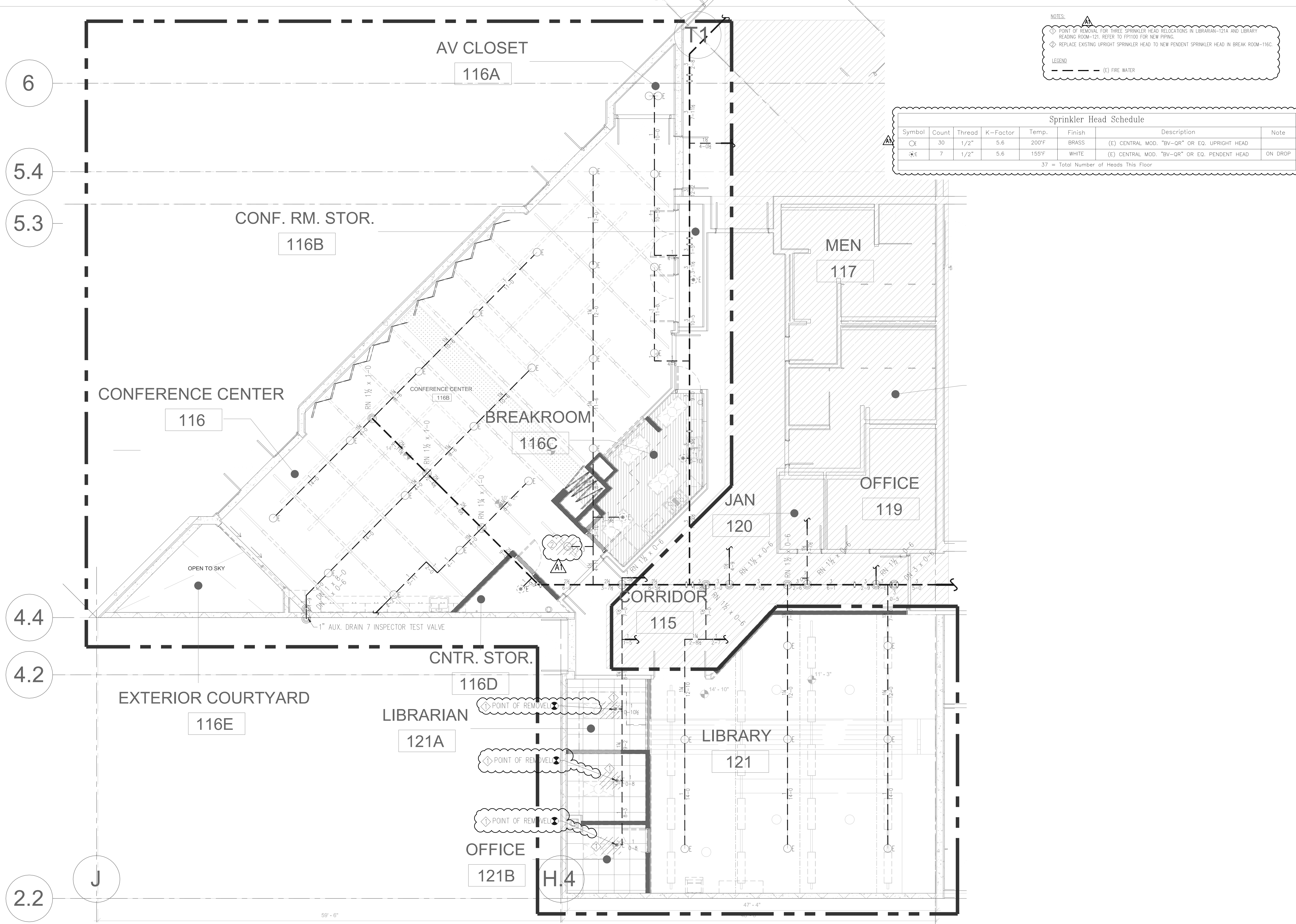
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V1	DS/OSFM SUBMITTAL			2021-09-14
V2	DS/OSFM BACKCHECK			2022-03-11
A1	ADDENDUM #1			2022-05-02

SHEET TITLE

ENLARGED DEMOLITION FLOOR PLAN

DATE: 2022-05-02
 DRAWN BY: NM
 CHK'D BY: JS
 SCALE: AS INDICATED
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
FP1000 A1



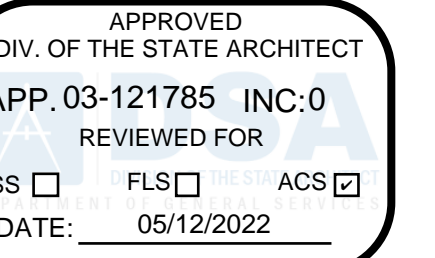
NOTES:
 POINT OF REMOVAL FOR THREE SPRINKLER HEAD RELOCATIONS IN LIBRARIAN-121A AND LIBRARY READING ROOM-121. REFER TO FP1100 FOR NEW PIPING.
 REPLACE EXISTING UPRIGHT SPRINKLER HEAD TO NEW PENDENT SPRINKLER HEAD IN BREAK ROOM-116C.
 LEGEND:
 (E) FIRE WATER

Sprinkler Head Schedule

Symbol	Count	Thread	K-Factor	Temp.	Finish	Description	Note
☉	30	1/2"	5.6	200°F	BRASS	(E) CENTRAL MOD. "BV-QR" OR EQ. UPRIGHT HEAD	
☉	7	1/2"	5.6	155°F	WHITE	(E) CENTRAL MOD. "BV-QR" OR EQ. PENDENT HEAD	ON DROP

37 = Total Number of Heads This Floor

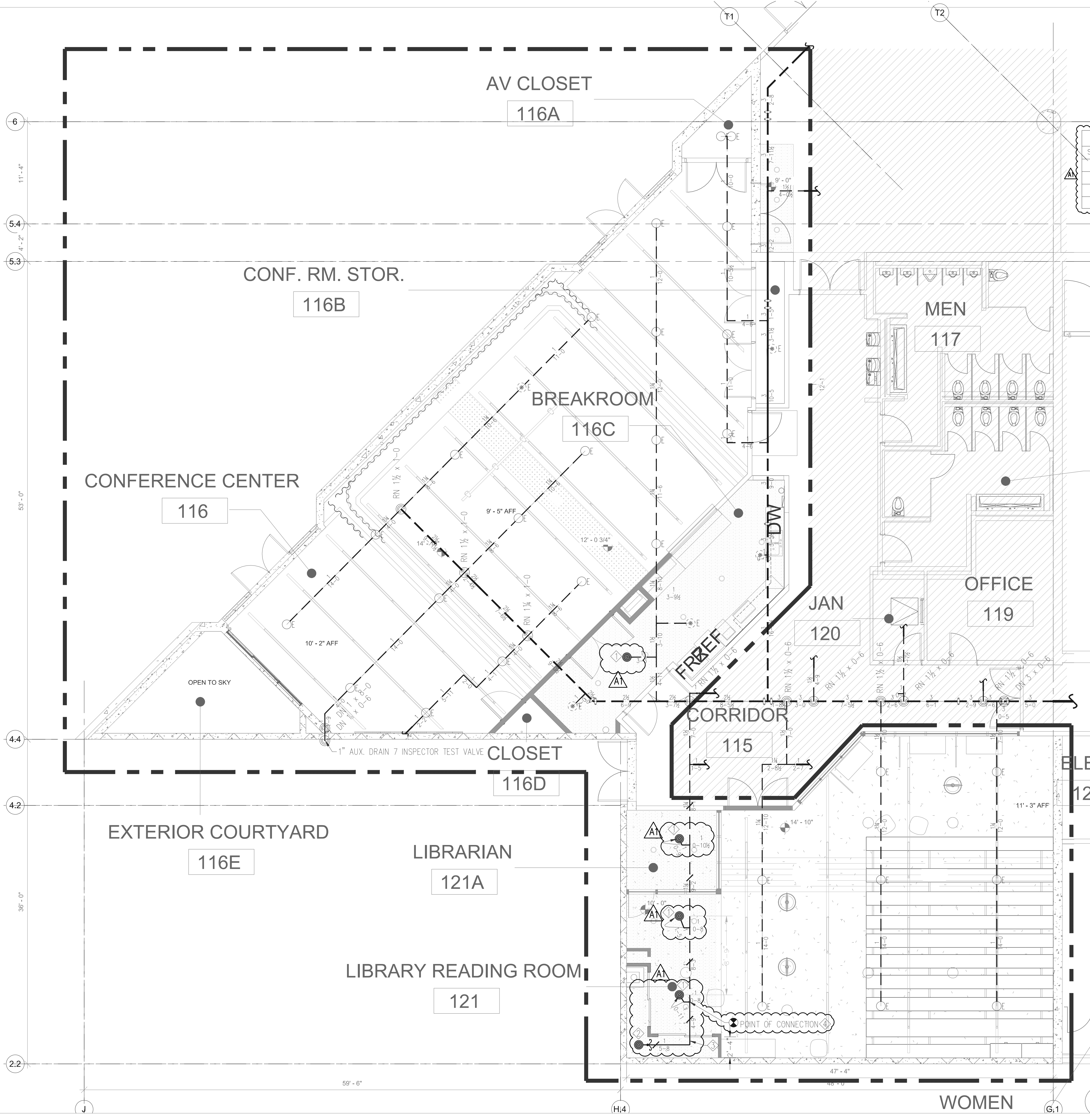
1 ENLARGED DEMOLITION FLOOR PLAN - CONFERENCE ROOM AND LIBRARY
 SCALE: 3/16" = 1'-0"



- NEW PENDENT SPRINKLER HEAD. REFER TO DETAIL 2.
 - ADD ONE SPRINKLER HEAD IN THE LIBRARY READING ROOM.
 - NEW SPRINKLER PIPE TO BE SCHEDULE 40.
 - REPLACE 1"x1" ELBOW WITH 1"x1"x1" TEE.
- LEGEND
- (N) FIRE WATER
 - (E) FIRE WATER

Symbol	Count	Thread	K-Factor	Temp.	Finish	Description	Note
○	28	1/2"	5.6	200°F	BRASS	(E) CENTRAL MOD. "BV-QR" OR EQ. UPRIGHT HEAD	
○	5	1/2"	5.6	155°F	WHITE	(E) CENTRAL MOD. "BV-QR" OR EQ. PENDENT HEAD	ON DROP
●	5	1/2"	5.6	155°F	WHITE	(N) TY3231 1/2 QR 155 WHITE PD	ON DROP

38 = Total Number of Heads This Floor



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IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel 213 769 9011 Fax 213 769 0016
ibigroup.com



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REGISTERED PROFESSIONAL ARCHITECT
No. 26903
Renewal: 9/30/22
MECHANICAL
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ISSUES	NO.	ISSUANCE	STATUS	DATE
E	50% CD			2019-12-13
F	50% CD - SCOPE REVISION			2020-11-25
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H	100% CD - SCOPE REVISIONS			2021-09-31
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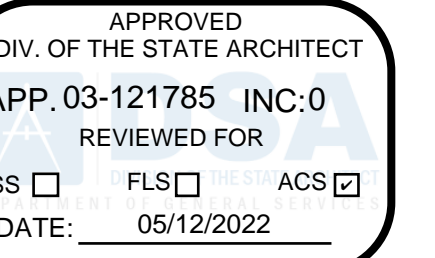
SHEET TITLE

ENLARGED NEW FLOOR PLAN

DATE: 2022-05-02
DRAWN BY: NM
CHKD BY: JS
SCALE: AS INDICATED
DGS NO: 4359
IBI PROJECT NO: 119020

1 ENLARGED NEW FLOOR PLAN - CONFERENCE ROOM AND LIBRARY
SCALE: 3/16" = 1'-0"

SHEET NUMBER
FP1100 A1



2019 CPC TABLE 814.3 MINIMUM CONDENSATE PIPE SIZE	
CAPACITY (TON)	MIN. PIPE DIA. (IN)
UP TO 20	3/4
21-40	1
41-90	1-1/4
91-125	1-1/2
126-250	2

FUEL GAS PIPING

TABLE 1216.2(1)
SCHEDULE 40 METALLIC PIPE [NFPA 54: TABLE 6.2(b)]^{1, 2}

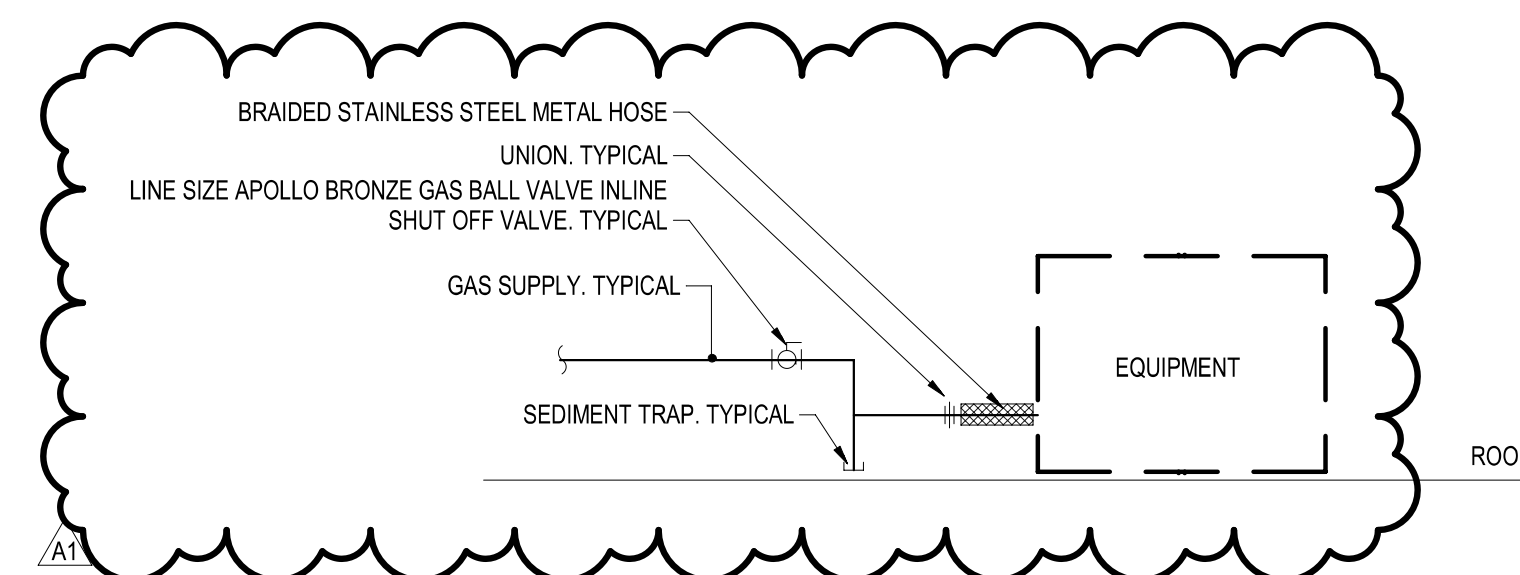
		GAS: NATURAL												
		INLET PRESSURE: LESS THAN 2 psi												
		PRESSURE DROP: 0.5 in. w.c.												
		SPECIFIC GRAVITY: 0.60												
		PIPE SIZE (Inch)												
NOMINAL:	1/4	3/8	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
ACTUAL ID:	0.622	0.824	1.049	1.380	1.610	2.067	3.068	4.026	5.047	6.065	7.981	10.020	11.938	
LENGTH (feet)	CAPACITY IN CUBIC FEET OF GAS PER HOUR													
10	172	360	678	1390	2090	4020	6400	11300	23100	41800	67600	139000	252000	399000
20	118	247	466	957	1430	2760	4400	7780	15900	28700	46500	95500	173000	275000
30	95	199	374	768	1150	2220	3530	6250	12700	23000	37300	76700	139000	220000
40	81	170	320	657	985	1900	3020	5350	10900	19700	31900	65600	119000	189000
50	72	151	284	583	873	1680	2680	4740	9660	17500	28300	58200	106000	167000
60	65	137	257	528	791	1520	2430	4290	8760	15800	25600	52700	95700	152000
70	60	126	237	486	728	1400	2230	3950	8050	14600	23600	48500	88100	139000
80	56	117	220	452	677	1300	2080	3670	7490	13600	22000	45100	81900	130000
90	52	110	207	424	635	1220	1950	3450	7030	12700	20600	42300	76900	122000
100	50	104	195	400	600	1160	1840	3260	6640	12000	19500	40000	72600	115000
125	44	92	173	355	532	1020	1630	2890	5890	10600	17200	35400	64300	102000
150	40	83	157	322	482	928	1480	2610	5330	9650	15600	32100	58300	92300
175	37	77	144	296	443	854	1360	2410	4910	8880	14400	29500	53600	84900
200	34	71	134	275	412	794	1270	2240	4560	8260	13400	27500	49900	79000
250	30	63	119	244	366	704	1120	1980	4050	7320	11900	24300	44200	70000
300	27	57	108	221	331	638	1020	1800	3670	6630	10700	22100	40100	63400
350	25	53	99	203	305	587	935	1650	3370	6100	9880	20300	36900	58400
400	23	49	92	189	283	546	870	1540	3140	5680	9190	18900	34300	54300
450	22	46	86	177	266	512	816	1440	2940	5330	8620	17700	32200	50900
500	21	43	82	168	251	484	771	1360	2780	5030	8150	16700	30400	48100
550	20	41	78	159	239	459	732	1290	2640	4780	7740	15900	28900	45700
600	19	39	74	152	228	438	699	1240	2520	4560	7380	15200	27500	43600
650	18	38	71	145	218	420	669	1180	2410	4360	7070	14500	26400	41800
700	17	36	68	140	209	403	643	1140	2320	4190	6790	14000	25300	40100
750	17	35	66	135	202	389	619	1090	2230	4040	6540	13400	24400	38600
800	16	34	63	130	195	375	598	1060	2160	3900	6320	13000	23600	37300
850	16	33	61	126	189	363	579	1020	2090	3780	6110	12600	22800	36100
900	15	32	59	122	183	352	561	992	2020	3660	5930	12200	22100	35000
950	15	31	58	118	178	342	545	963	1960	3550	5760	11800	21500	34000
1000	14	30	56	115	173	333	530	937	1910	3460	5600	11500	20900	33100
1100	14	28	53	109	164	316	503	890	1810	3280	5320	10900	19800	31400
1200	13	27	51	104	156	301	480	849	1730	3130	5070	10400	18900	30000
1300	12	26	49	100	150	289	460	813	1660	3000	4860	9980	18100	28700
1400	12	25	47	96	144	277	442	781	1590	2880	4670	9590	17400	27600
1500	11	24	45	93	139	267	426	752	1530	2780	4500	9240	16800	26600
1600	11	23	44	89	134	258	411	727	1480	2680	4340	8920	16200	25600
1700	11	22	42	86	130	250	398	703	1430	2590	4200	8630	15700	24800
1800	10	22	41	84	126	242	386	682	1390	2520	4070	8370	15200	24100
1900	10	21	40	81	122	235	375	662	1350	2440	3960	8130	14800	23400
2000	NA	20	39	79	119	229	364	644	1310	2380	3850	7910	14400	22700

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m³/h, 1 pound-force per square inch = 6.8947 kPa, 1 inch water column = 0.249 kPa
 Notes:
 1 Table entries are rounded to 3 significant digits.
 2 NA means a flow of less than 10 ft³/h (0.283 m³/h).

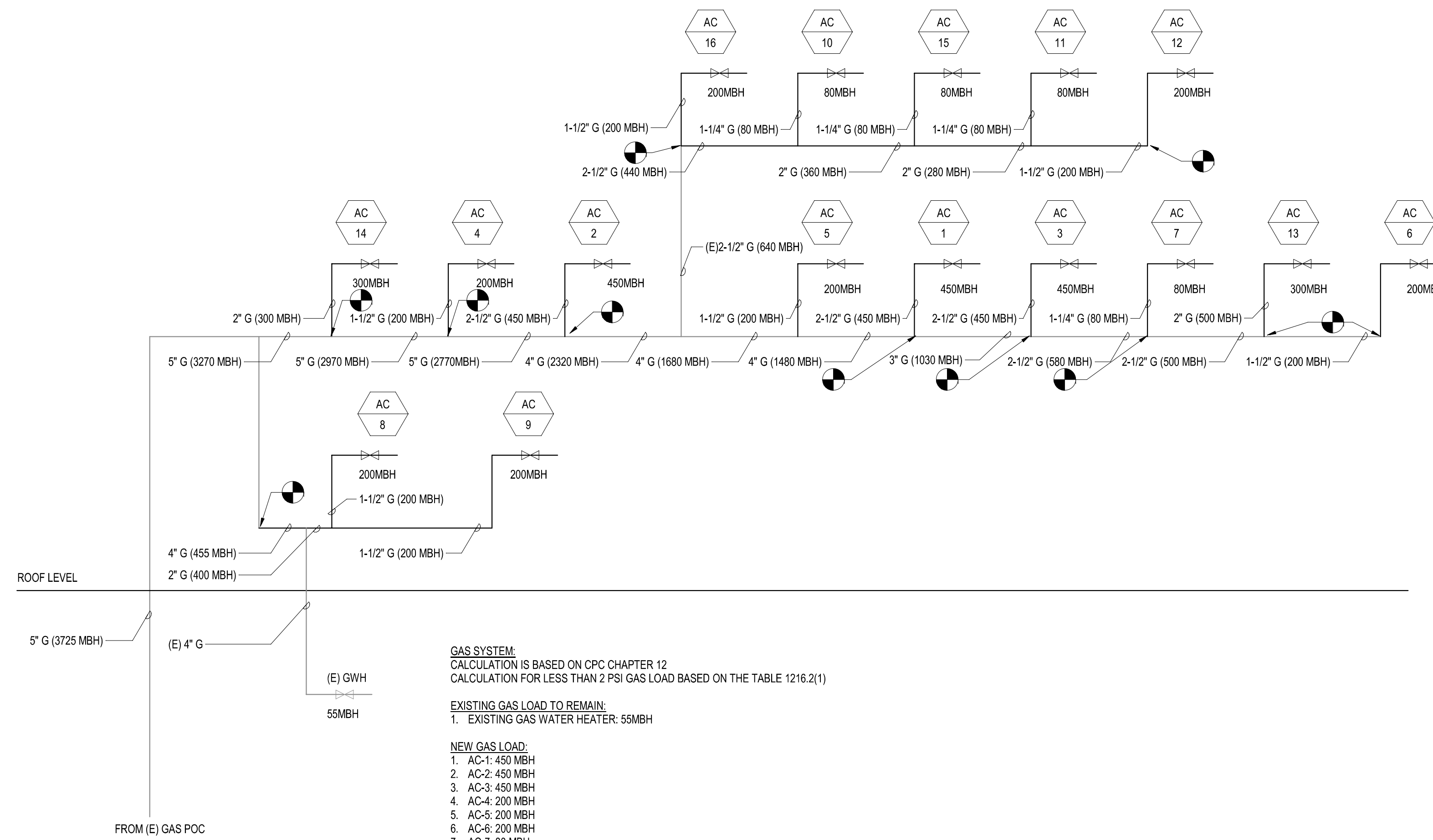
PLUMBING - PIPE MATERIAL SCHEDULE

PLUMBING SERVICE	MATERIAL	COPPER TYPE 'L'	COPPER TYPE 'K'	COPPER TYPE DWV (SOLDERED)	HUBLESS CAST IRON SOIL PIPE CIPSI HUBLESS COUPLINGS WITH NSF CERTIFICATION	SCHEDULE 40 PVC	SCHEDULE 40 BLACK STEEL PIPE & FITTINGS	REMARKS
SANITARY WASTE	ABOVE GRADE				✓			
	BELOW GRADE					✓		
SANITARY VENT	ABOVE GRADE				✓			
	BELOW GRADE					✓		
DOMESTIC COLD & HOT WATER	ABOVE GRADE	✓						
	BELOW GRADE		✓					BRAZED
CONDENSATE	ABOVE GRADE			✓				
NATURAL GAS	ABOVE GRADE						✓	

NOTES:
 1. FOR ADDITIONAL INFORMATION ABOUT PIPE MATERIAL SEE SPECIFICATION SECTION PERTAINING TO THE SPECIFIC SYSTEMS



4 GAS CONNECTION TO ROOF TOP EQUIPMENT, TYPICAL
 N.T.S.



GAS SYSTEM:
 CALCULATION IS BASED ON CPC CHAPTER 12
 CALCULATION FOR LESS THAN 2 PSI GAS LOAD BASED ON THE TABLE 1216.2(1)
 EXISTING GAS LOAD TO REMAIN:
 1. EXISTING GAS WATER HEATER: 55MBH
 NEW GAS LOAD:
 1. AC-1: 450 MBH
 2. AC-2: 450 MBH
 3. AC-3: 450 MBH
 4. AC-4: 200 MBH
 5. AC-5: 200 MBH
 6. AC-6: 200 MBH
 7. AC-7: 80 MBH
 8. AC-8: 200 MBH
 9. AC-9: 200 MBH
 10. AC-10: 80 MBH
 11. AC-11: 80 MBH
 12. AC-12: 200 MBH
 13. AC-13: 300 MBH
 14. AC-14: 300 MBH
 15. AC-15: 80 MBH
 16. AC-16: 200 MBH
 TOTAL NEW GAS LOAD: 3670 MBH
 TOTAL OVERALL GAS LOAD: 3725 MBH
 LONGEST DEVELOPED RUN FROM POC TO LAST GAS FIRED ITEM (11" W.C.) = 450 FT

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 (916) 375-4323 (Voice)
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IBI GROUP
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 Tel: 213 769 0011 Fax: 213 769 0016
 ibigroup.com



SUB CONSULTANT
INTEGRAL
 15700 Ventura Blvd, Suite 1902
 Los Angeles, CA 91436
 310.325.9655 Telephone
 E-Mail: info@integralgroup.com
 www.integralgroup.com



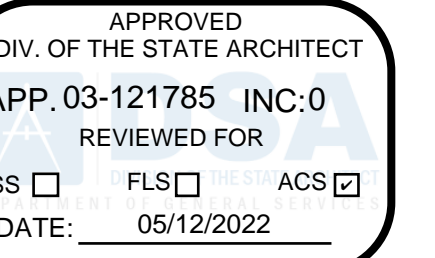
ISSUES

NO.	ISSUANCE	STATUS	DATE
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSAS/FSM SUBMITTAL		2021-09-14
V2	DSAS/FSM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PLUMBING GENERAL,
 EQUIPMENT SCHEDULE**

DATE: 2022-05-02
 DRAWN BY: JT
 CHKD BY: JAR
 SCALE: As Indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
PH0001
 ISSUE
A1



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APPROVED FIRE AND PANIC ONLY



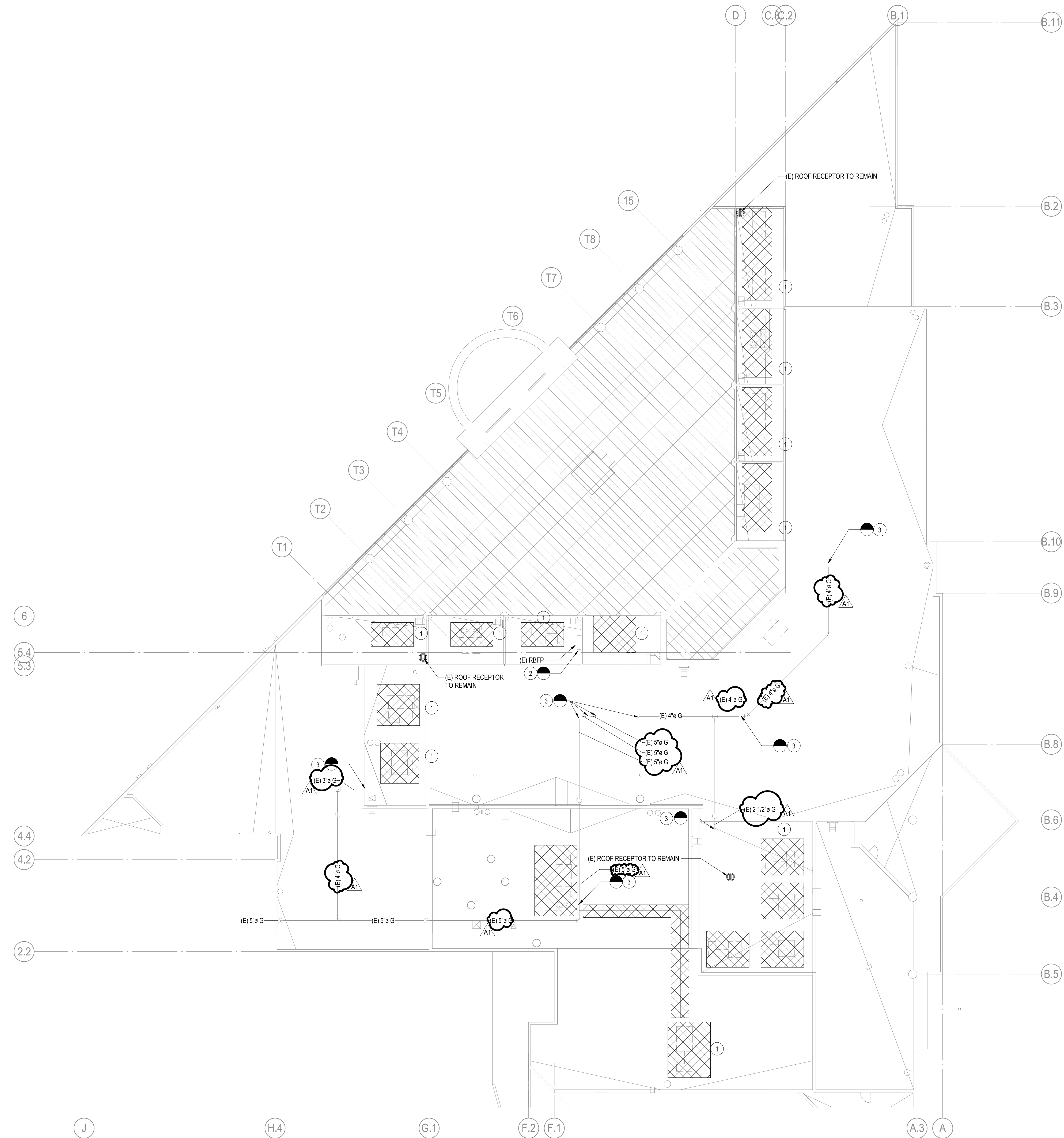
Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

GENERAL NOTES:

1. REFERENCE ARCHITECTURAL DOCUMENTS FOR SCOPE OF DEMOLITION AS RELATED TO PLUMBING, WHERE APPLICABLE.
2. REMOVE, CUT AND CAP ALL EXISTING, AND/OR ABANDONED PLUMBING PIPING REQUIRED TO BE REMOVED BY REMOVAL OF ASSOCIATED PLUMBING FIXTURES, AND/OR EQUIPMENT.
3. ALL EXISTING UTILITIES THAT SHALL REMAIN IN PLACE MAY BE EITHER TEMPORARILY DISCONNECTED AND REMOVED OR MAY BE TEMPORARILY LIFTED, IF REQUIRED FOR DEMOLITION. THIS IS NOT LIMITED TO UTILITIES ROUTING TO/FROM UPPER FLOOR LEVELS. VERIFY ALL EXISTING SERVICES TO REMAIN PRIOR TO PERFORMING PLUMBING DEMOLITION WORK. EXISTING ROOF DRAINAGE SYSTEM TO REMAIN.
- 4.

SHEET NOTES

- 1 DEMO (E) GAS PIPING AND CONDENSATE PIPING SERVING MECH UNIT
- 2 DEMO (E) ICW DOWNSTREAM OF (E) RBFP, SEAL ROOF PENETRATION
- 3 DEMO (E) EXISTING GAS PIPING SERVING MECHANICAL UNIT BACK TO BRANCH MAIN AND CAP OFF.



1 PLUMBING ROOF DEMO PLAN
SCALE: 1/16" = 1'-0"



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Los Angeles, CA 91436
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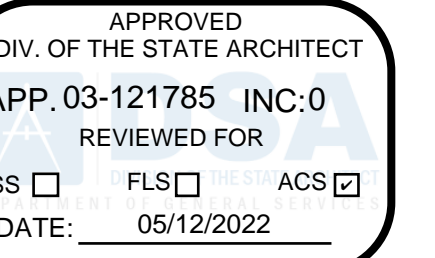
ISSUES

NO.	ISSUANCE	STATUS	DATE
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G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PLUMBING - ROOF
DEMOLITION PLAN**

DATE: 2022-05-02
DRAWN BY: JT
CHKD BY: JAR
SCALE: 1/16" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER **PH2004** ISSUE **A1**



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 Tel 213 769 0011 fax 213 769 0016
 ibigroup.com



SUB CONSULTANT
INTEGRAL
 15700 Ventura Blvd, Suite 1902
 Los Angeles, CA 91436
 323.822.9955 Telephone
 E-Mail: info@integralgroup.com
 www.integralgroup.com



ISSUES

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100%CD		2021-02-08
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PLUMBING - OVERALL
 FLOOR PLAN**

DATE: 2022-05-02
 DRAWN BY: Author
 CHK'D BY: Checker
 SCALE: 1/16" = 1'-0"
 DGS NO: 4359
 IBI PROJECT NO: 119020

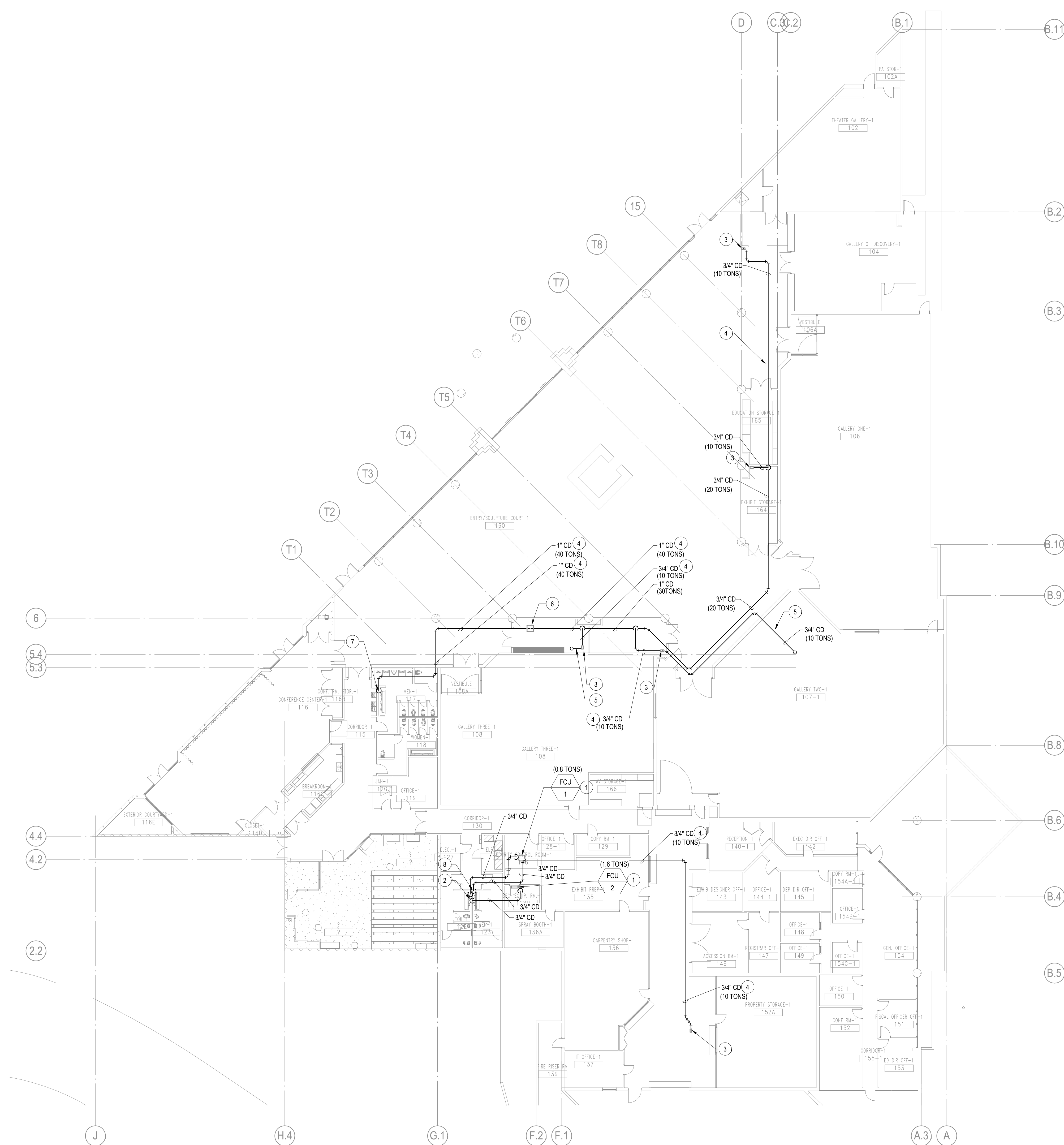
SHEET NUMBER: **PH2100** ISSUE: **A1**

GENERAL NOTES:

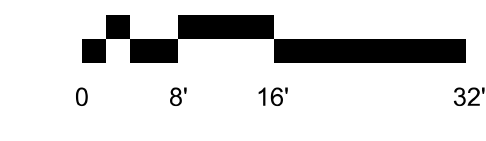
- REFER TO PIPE SUPPORT, BRACING, ANCHORING AND PIPE PENETRATION DETAILS ON PH6000 & PH6001 FOR ADDITIONAL INFORMATION.
- PROVIDE LINE SIZED CLEANOUT AT EACH 90° CHANGE IN DIRECTION FOR CONDENSATE LINES.
- REFER TO TABLE 614.3 ON SHEET PH0001 FOR CONDENSATE PIPE SIZING.

SHEET NOTES

- SEE MECHANICAL DRAWINGS FOR EXACT MECH UNIT LOCATIONS
- TERMINATE CONDENSATE LINES TO LAVATORY TAILPIECES. SEE DETAIL 6/PH6001 FOR ADDITIONAL INFORMATION.
- LITTLE GIANT HT-VCL-30P SERIES, 115 VOLT, 1/8HP, 60HZ SERVING HUMIDIFIER STEAM CONDENSATE DRAIN ABOVE. REFER TO MECHANICAL ROOF PLAN FOR EXACT EQUIPMENT LOCATIONS. REFER TO 6/PH6000 FOR HUMIDIFIER DETAILS AND 7/PH6000 FOR CONDENSATE TRAP AND PIPING INFORMATION.
- PUMPED STEAM CONDENSATE DRAIN
- GRAVITY CONDENSATE LINE FROM TRAP.
- DRISTREAM DRAPE COOLER. REFER TO NOTE 5 ON MECHANICAL HUMIDIFIER SCHEDULE ON SHEET MH100.
- TERMINATE TEMPERED CONDENSATE LINES TO LAVATORY TAILPIECES. SEE DETAIL 6/PH6001 FOR ADDITIONAL INFORMATION.
- TERMINATE CONDENSATE LINES TO LAVATORY TAILPIECES. SEE DETAIL 6/PH6001 FOR ADDITIONAL INFORMATION. PROVIDE WITH TEMPERING VALVE WITH COLD WATER CONNECTION PRIOR TO DISCHARGING.



1 PLUMBING OVERALL PLAN
 SCALE: 1/16" = 1'-0"



GENERAL NOTES:

1. REFER TO PIPE SUPPORT, BRACING ANCHORING AND PIPE PENETRATION DETAILS ON PH6000 & PH6001 FOR ADDITIONAL INFORMATION.
2. PROVIDE LINE SIZED CLEANOUT AT EACH 90° CHANGE IN DIRECTION FOR CONDENSATE LINES.
3. REFER TO TABLE 614.3 ON SHEET PH0001 FOR CONDENSATE PIPE SIZING.

SHEET NOTES

1. PROVIDE BALL VALVE, DIRT LEG, FLEXIBLE CONNECTOR, TYP. REFER TO 4/PH0001 FOR ADDITIONAL INFORMATION.
2. SEE MECHANICAL DRAWINGS FOR EXACT MECH UNIT LOCATIONS.
3. TERMINATE CONDENSATE ABOVE ROOF RECEPTOR WITH 1" AIR GAP.
4. PROVIDE 1/2" AND 3/4" ICW CONNECTIONS TO MECH UNIT, SMD.
5. CONNECT TO OUTLET OF (E) 3/4" RBFP. CONFIRM SIZE OF RBFP, REPLACE IF TOO SMALL.
6. PIPE 1" CD FROM MECH UNIT SLOPED TO (E) RR-1.
7. PIPE 3/4" CD FROM MECH UNIT SLOPED TO (E) RR-1.
8. PIPE 1-1/4" CD FROM TEMPERING UNIT SLOPED TO (E) RR-1.
9. CONNECT NEW NATURAL GAS PIPING TO EXISTING NATURAL GAS MAIN DISTRIBUTION PIPING. FIELD VERIFY EXACT SIZE AND LOCATION OF EXISTING PIPING.
10. REFER TO DEMOLITION PLAN ON PH2004 FOR EXISTING PIPE SIZE AND INFORMATION.

APPROVED
DIV. OF THE STATE ARCHITECT
APP. 03-121785 INC. 0
REVIEWED FOR
SS FLS ACS
DATE: 05/12/2022

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY



Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
650 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel: 213 769 0011 fax: 213 769 0016
ibigroup.com



SUB CONSULTANT
INTEGRAL
15700 Ventura Blvd, Suite 1902
Los Angeles, CA 91436
Tel: 310 522 9655 Telephone
E-Mail: info@integralgroup.com
www.integralgroup.com



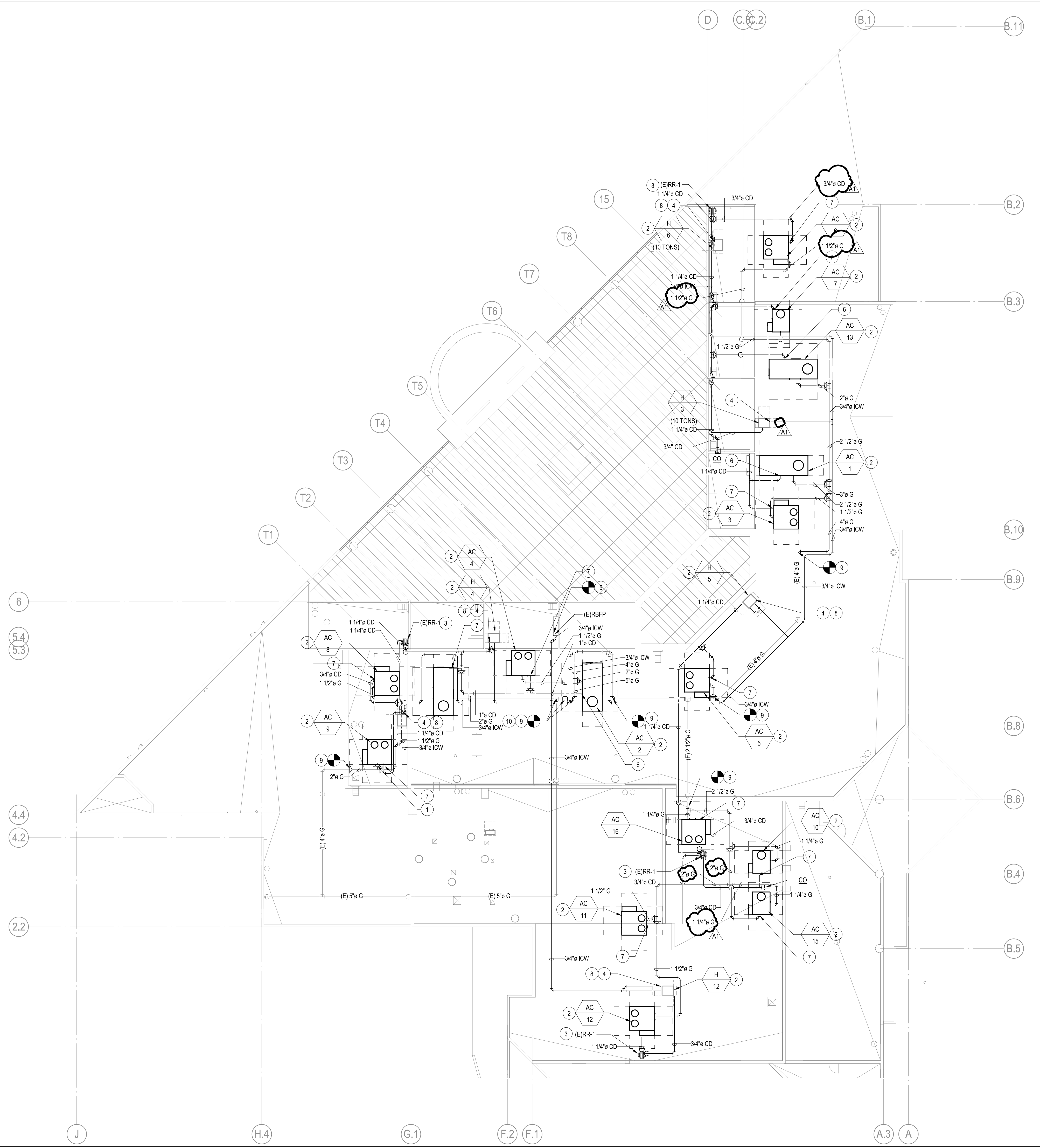
ISSUES

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSACOSFM SUBMITTAL		2021-09-14
V2	DSACOSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

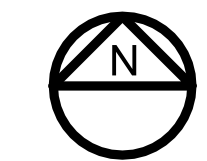
SHEET TITLE
PLUMBING - ROOF PLAN

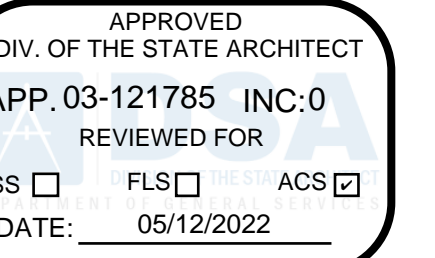
DATE: 2022-05-02
DRAWN BY: JT
CHK'D BY: JAR
SCALE: 1/16" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
PH2800 A1



1 PLUMBING ROOF PLAN
SCALE: 1/16" = 1'-0"
0 8' 16' 32'





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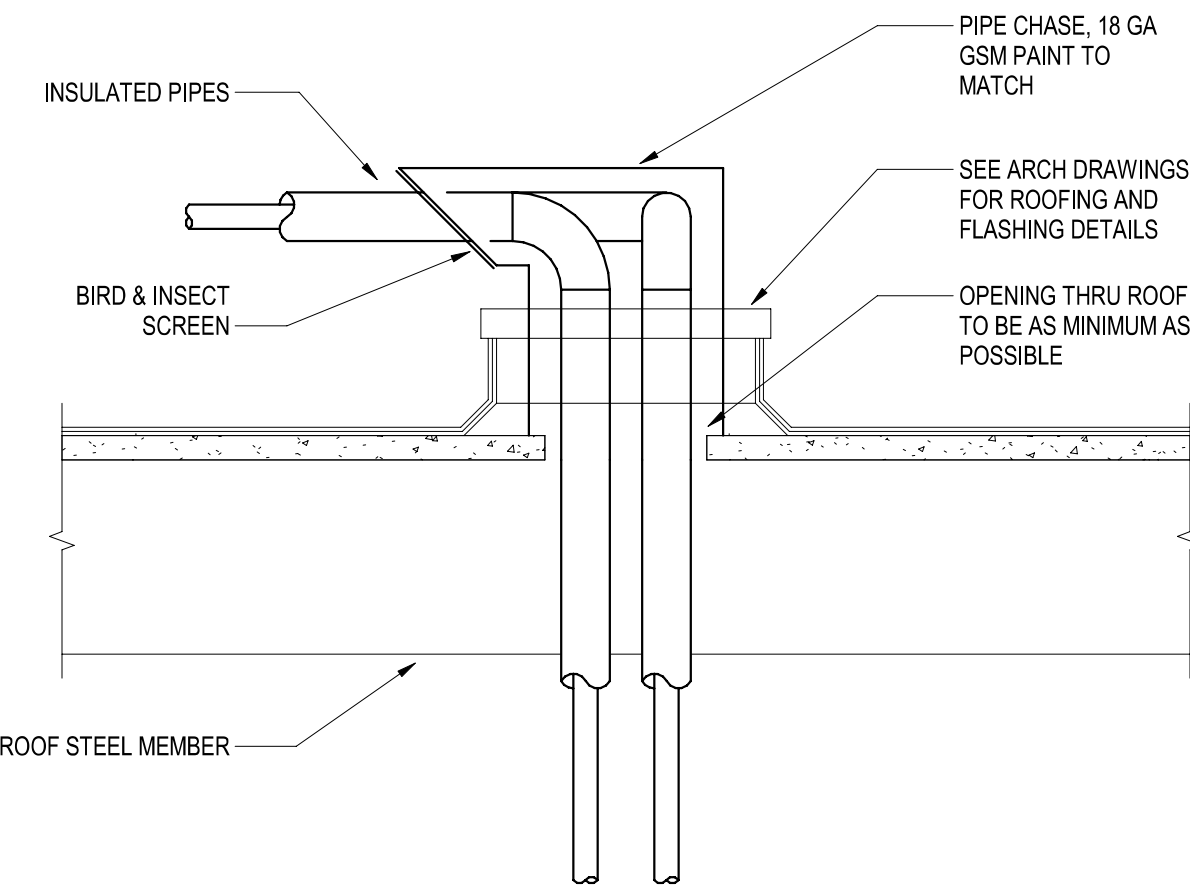


ISSUES	NO.	ISSUANCE	STATUS	DATE
	A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PLUMBING - PLUMBING
 DETAILS**

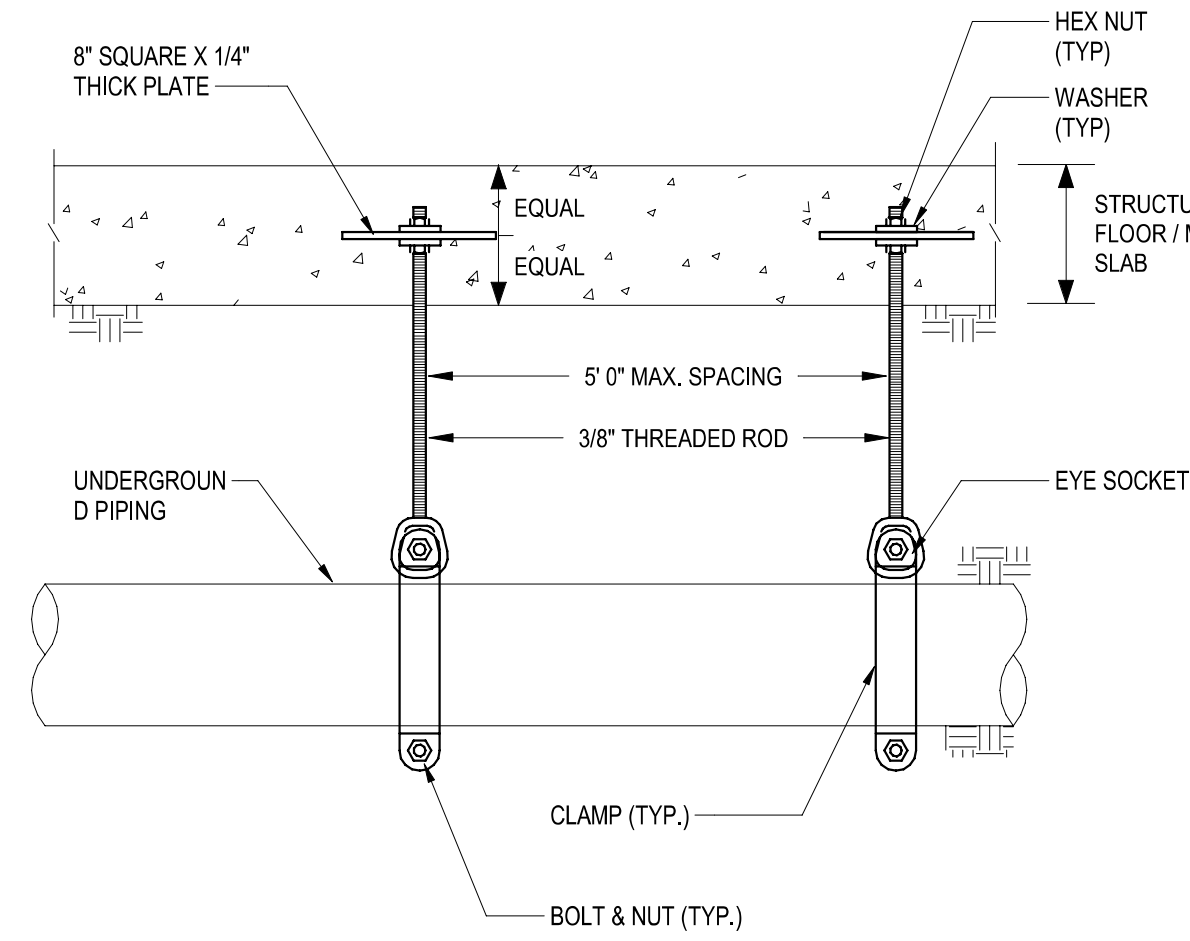
DATE: 2022-05-02
 DRAWN BY: IG
 CHK'D BY: JG
 SCALE: 1/2" = 1'-0"
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER: **PH6000** ISSUE: **A1**



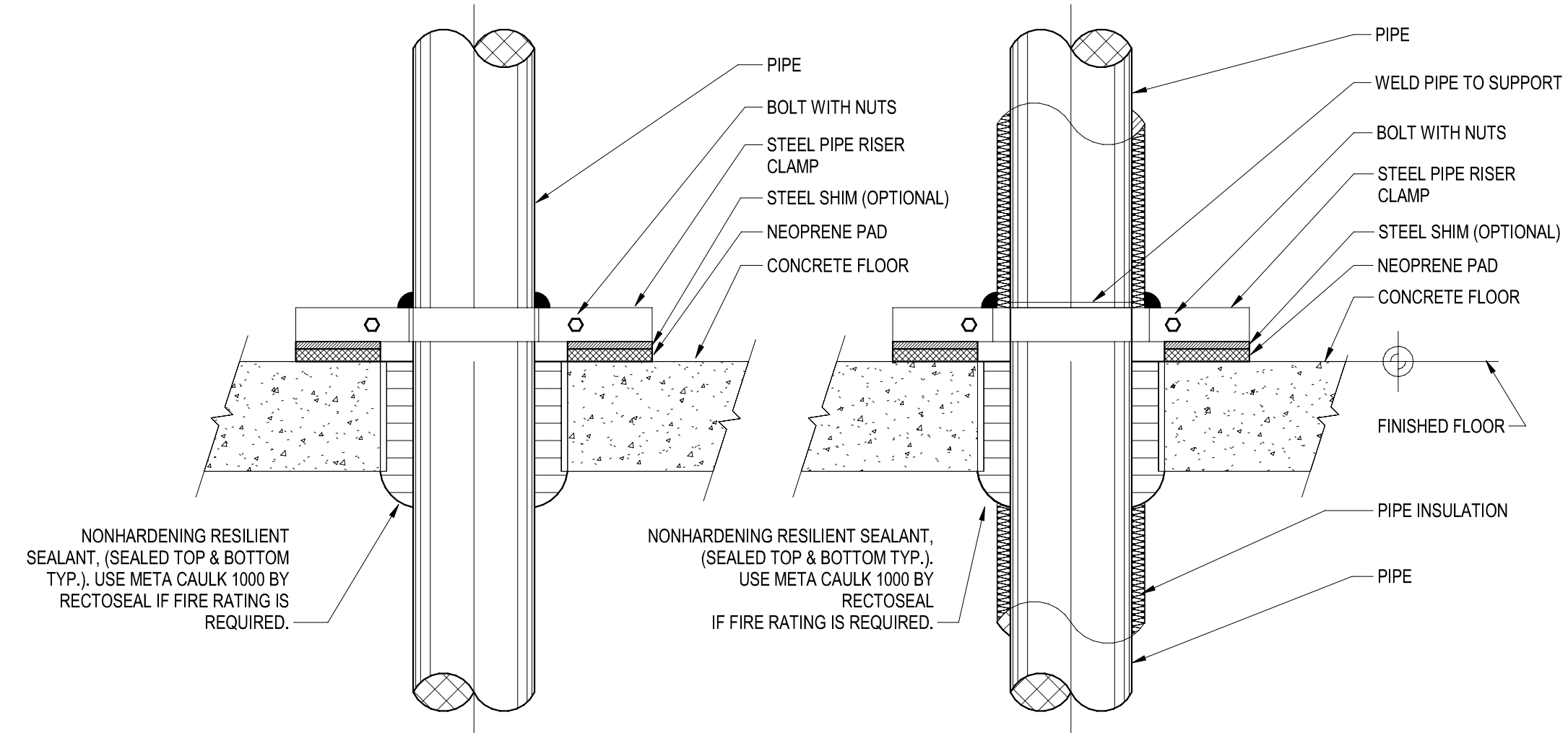
- NOTES:
 1. PIPING SECURED BY MINIMUM 1/4" BANDS TO ROOF STRUCTURE

6 PIPE THROUGH ROOF DETAIL
 N.T.S.



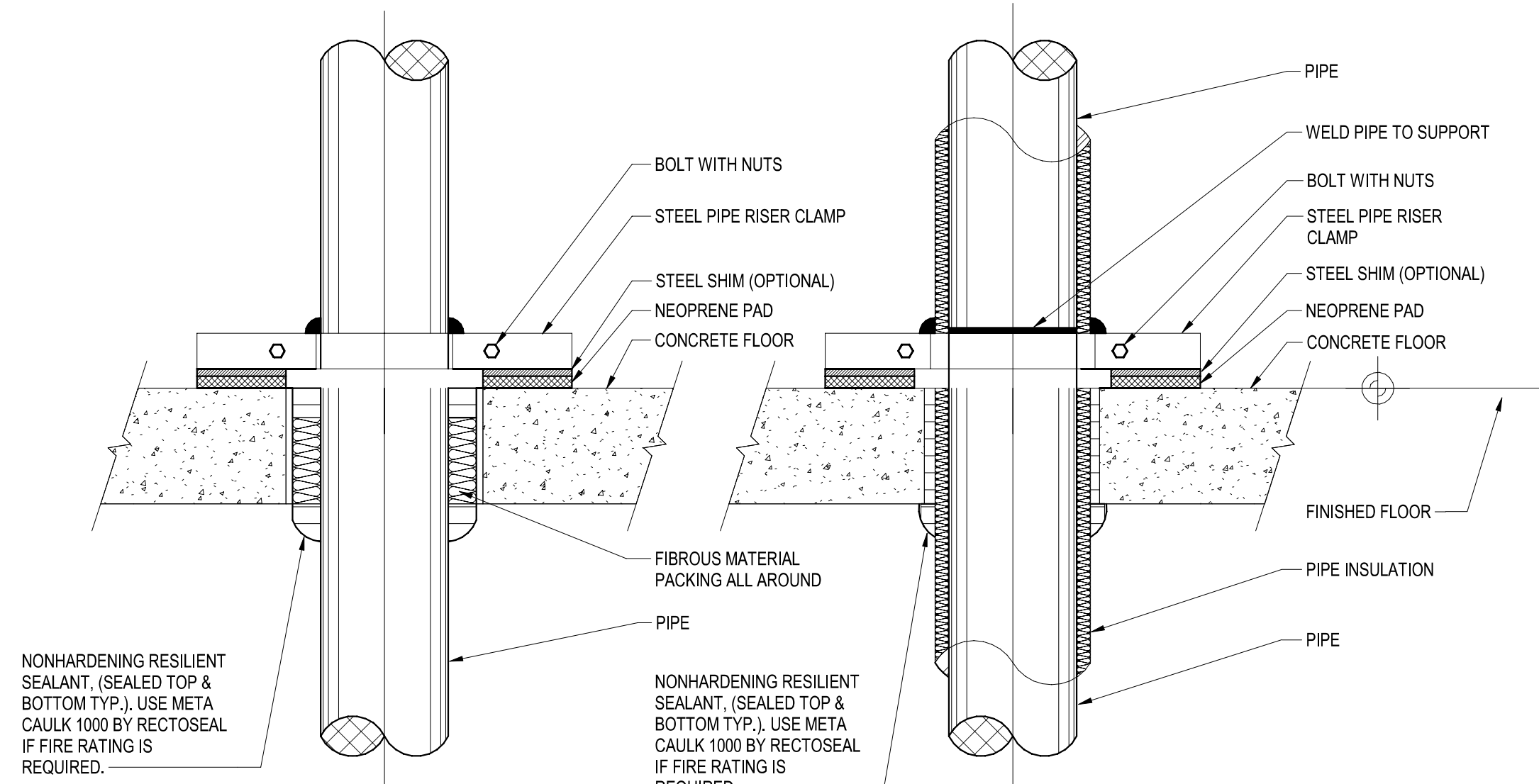
1. ALL PIPE HANGERS AND SUPPORTS SHALL BE COOPER B-LINE.
 2. PROVIDE A MINIMUM OF 2 HANGERS PER PIPE SECTION.
 3. ALL COMPONENTS OF HANGER SYSTEM SHALL BE HOT DIP GALVANIZED.
 4. AFTER FABRICATION AND BITUMINUSTIC COATED AFTER INSTALLATION.
 5. PROVIDE HANGERS AT ALL UNDERGROUND PIPING.

5 TYPICAL SUPPORT FOR PIPES BELOW FLOOR/MAT
 N.T.S.



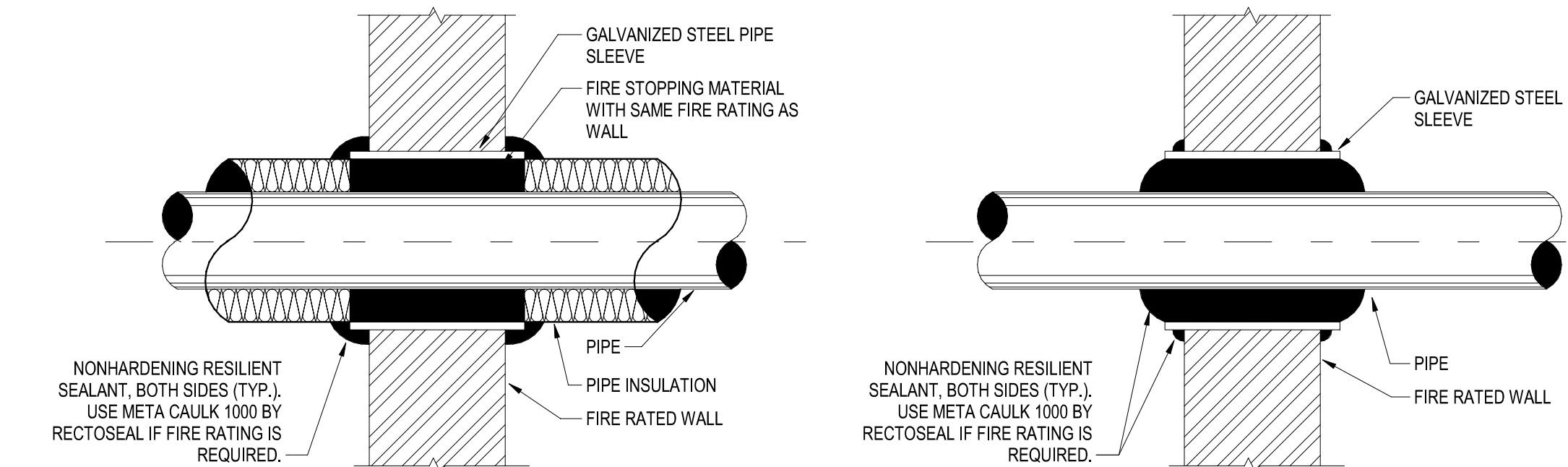
- NOTES:
 1. REFER TO SPECIFICATIONS FOR INSULATED PIPE RISER SUPPORTS.
 2. COORDINATE RISER CLAMP ORIENTATION TO BE WITHIN WALL CAVITY.
 3. INSTALL FIRE STOPPING MATERIAL PER MANUFACTURER'S RECOMMENDATION.
 4. REFER TO ARCHITECTURAL DRAWING FOR FLOOR FIRE RATING.

4 PIPE PENETRATION THRU FIRE-RATED FLOOR
 N.T.S.



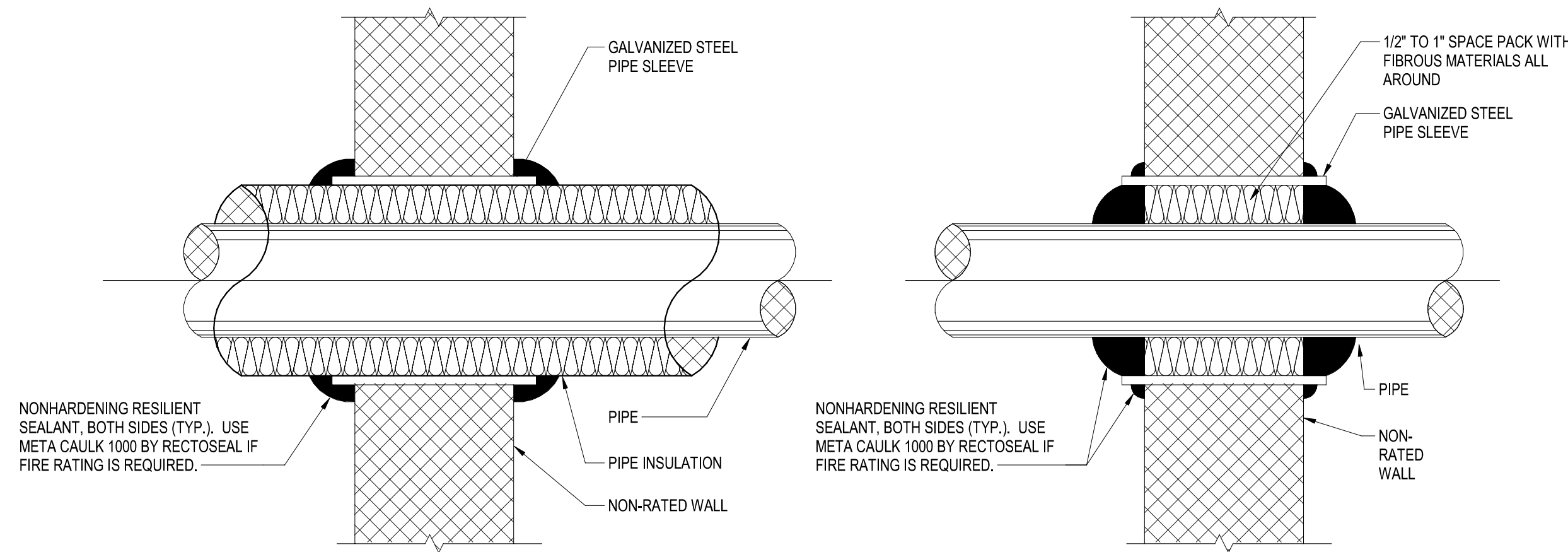
- NOTES:
 1. REFER TO SPECIFICATIONS FOR INSULATED PIPE RISER SUPPORTS.
 2. COORDINATE RISER CLAMP ORIENTATION TO BE WITHIN WALL CAVITY.

3 PIPE PENETRATION THRU FLOOR
 N.T.S.



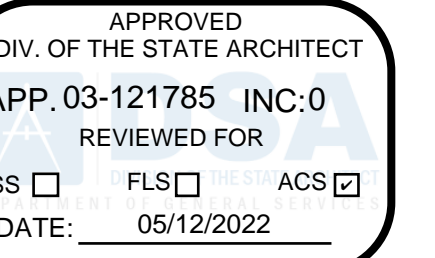
- NOTES:
 1. INSTALL FIRE STOPPING MATERIAL PER MANUFACTURER'S DETAIL.
 2. REFER TO ARCHITECTURAL DRAWING FOR WALL FIRE RATING.

2 PIPE PENETRATION THRU FIRE-RATED WALL
 N.T.S.



- NOTES:
 1. INSTALL FIRE STOPPING MATERIAL PER MANUFACTURER'S DETAIL.

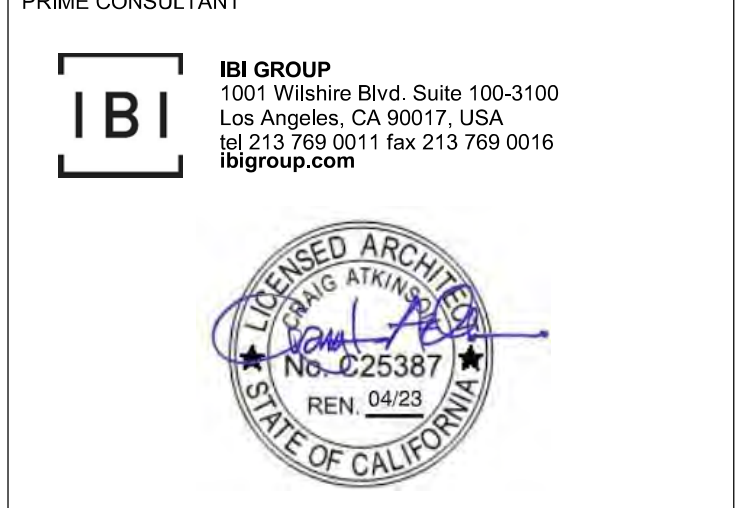
1 PIPE PENETRATION THRU WALL
 N.T.S.



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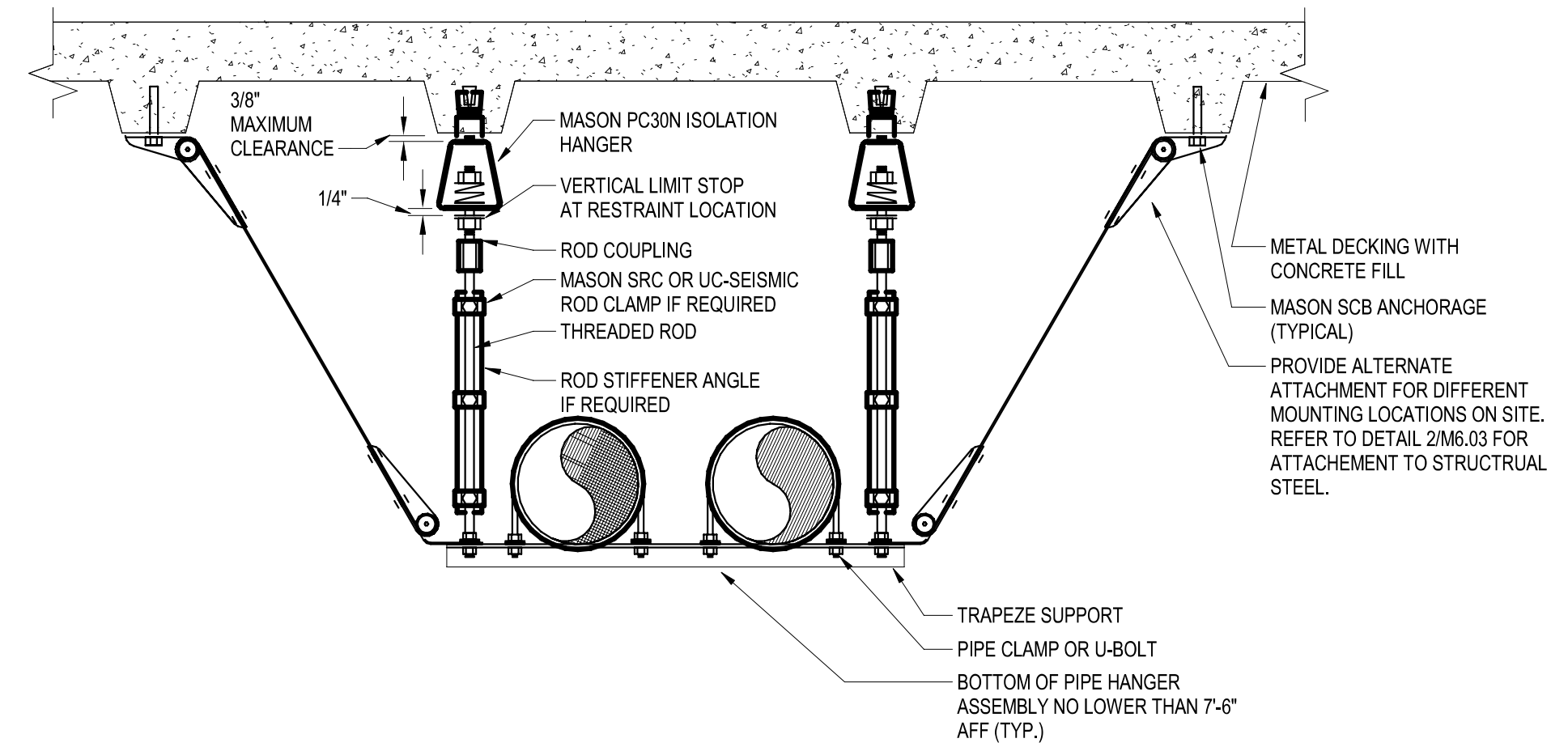


NO.	ISSUANCE	STATUS	DATE
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**PLUMBING - PLUMBING
DETAILS**

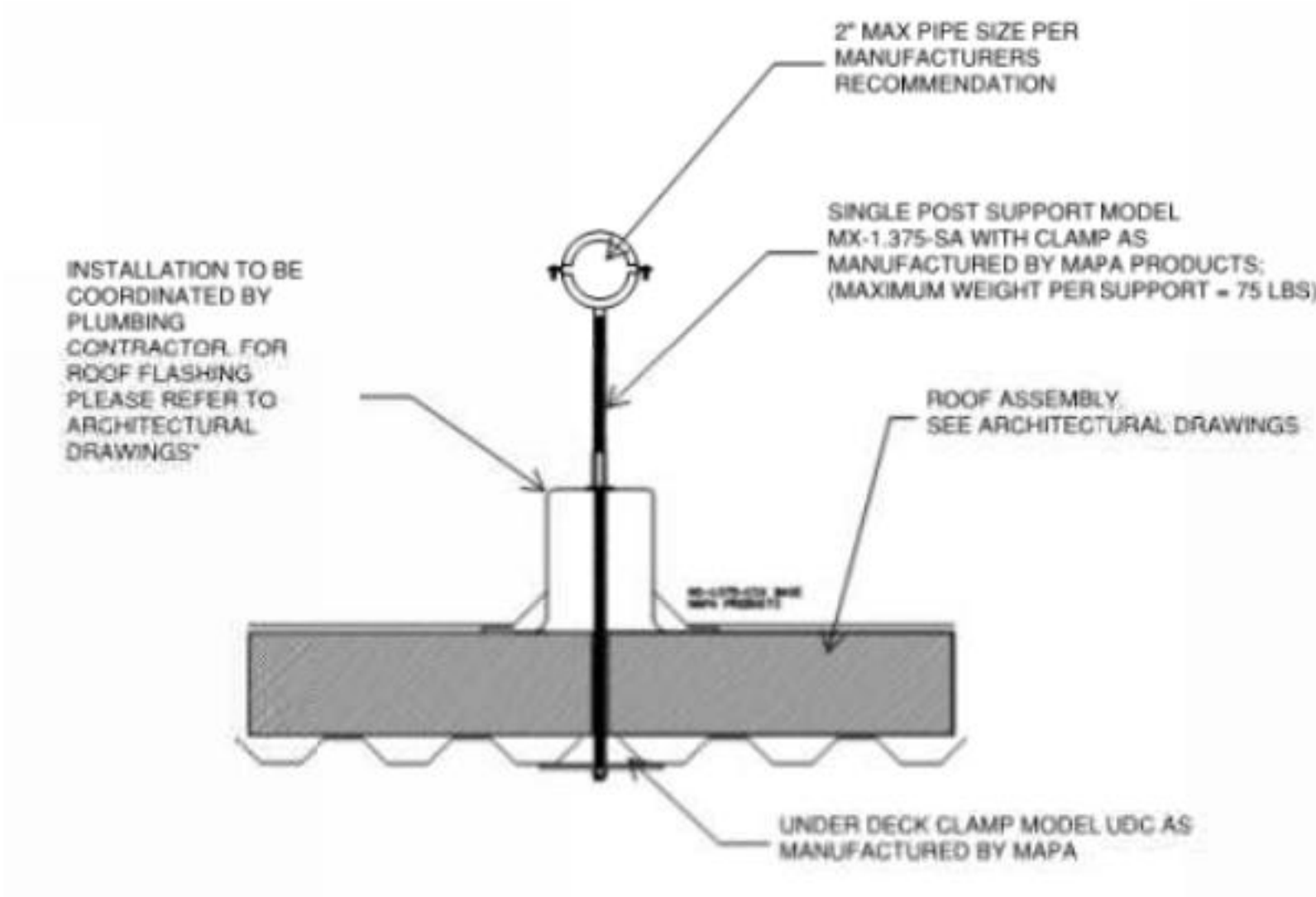
DATE:	2022-05-02
DRAWN BY:	IG
CHKD BY:	JG
SCALE:	NTS
DGS NO:	4359
IBI PROJECT NO:	119020

SHEET NUMBER
PH6001
ISSUE
A1



- NOTES:
- PIPE HANGER DETAIL IS FOR REFERENCE PURPOSES ONLY. ALL PIPE HANGERS SHALL BE STRUCTURALLY AND SEISMICALLY DESIGNED BY CONTRACTOR.
 - COMPLY WITH TITLE 24, 2007 CBC AND SMACNA SEISMIC RESTRAINT REQUIREMENTS FOR HANGER SIZE AND SWAY BRACING.
 - PIPE INSULATION SHIELD REQUIRED FOR ALL INSULATED PIPE AT HANGERS. NEOPRENE SLEEVES REQUIRED FOR ALL COPPER AND PLASTIC PIPE AT HANGERS.
 - MASON SCBH ONLY SHOWN IN TRANSVERSE DIRECTION FOR CLARITY. ADDITIONAL SCBHs IN LONGITUDINAL DIRECTION AS REQUIRED PER CODE AND SMACNA SEISMIC RESTRAINT REQUIREMENTS FOR HANGER SIZE AND SWAY BRACING.
 - SEE SPECIFICATIONS FOR PIPE SUPPORT SPACING REQUIREMENTS.

2 MULTIPLE PIPE SUPPORT DSA DETAIL
N.T.S.

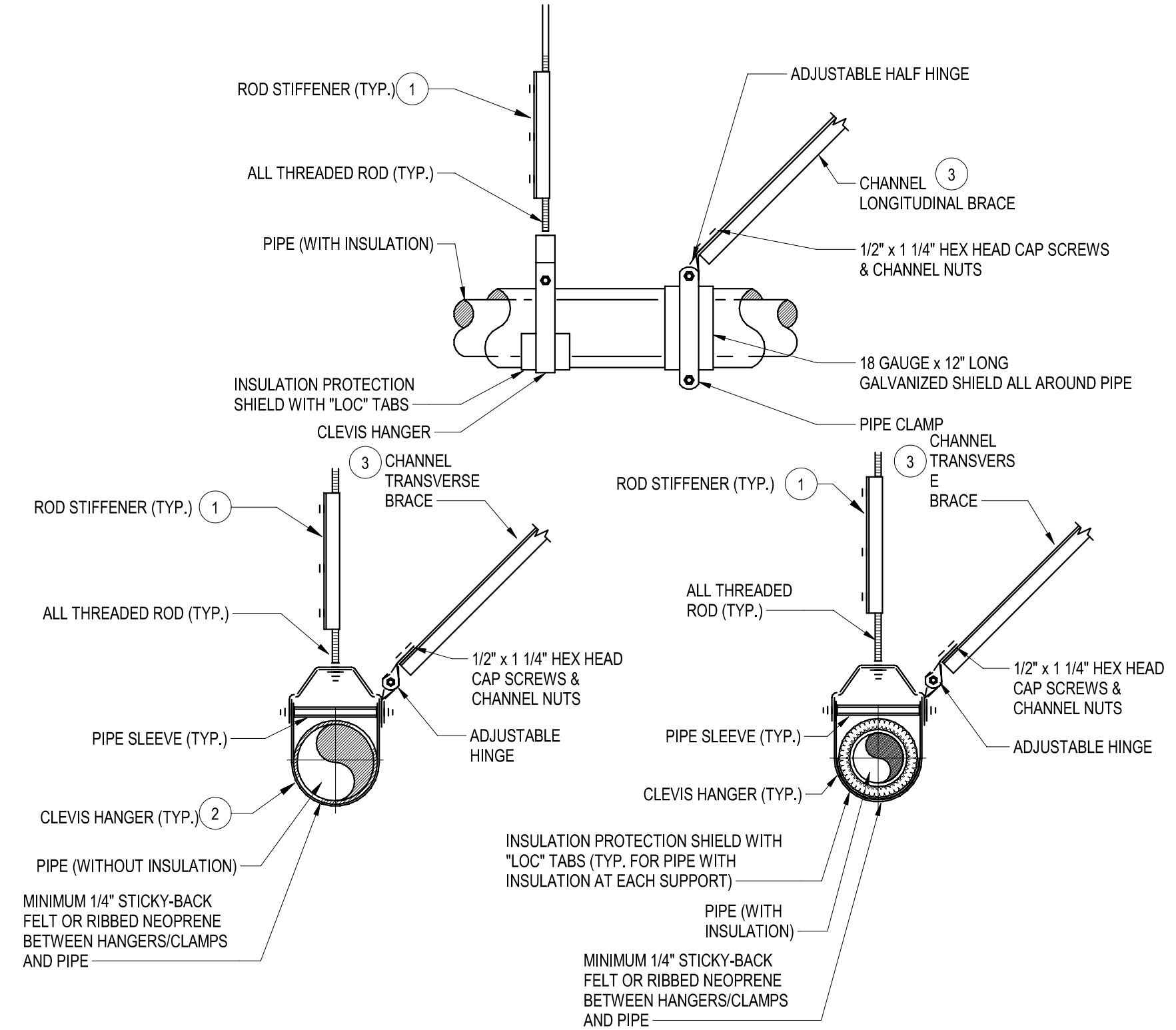


The MX-1.375-SA Series is available with 3/8", 1/2", and 3/4" ATR mounting rods providing a 2" attachment point above the shroud or as a single post pipe support assembly sized as specified for the application. The standard 3" diameter by 6" high shroud is constructed of grade 304-18 gauge stainless steel with continuously welded seams through which the 16" ATR shaft penetrated the roof deck and is attached to the provided 9" diameter 14 gauge primed steel plate with appropriate fasteners thus anchoring the support to the roof deck.

The MX-1.375-SA is designed in accordance with MSS SP 127-2001, MSP SP-69-2002 and MSS SP-58-2002

MAPA PRODUCTS PIPE SUPPORTS ARE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL FUEL GAS CODE AS REFERRED BY THE 2003 INTERNATIONAL BUILDING CODE SPECIFICALLY TO MEET THE MSS SP-58 REQUIREMENTS

1 GAS LINE SUPPORT
N.T.S.

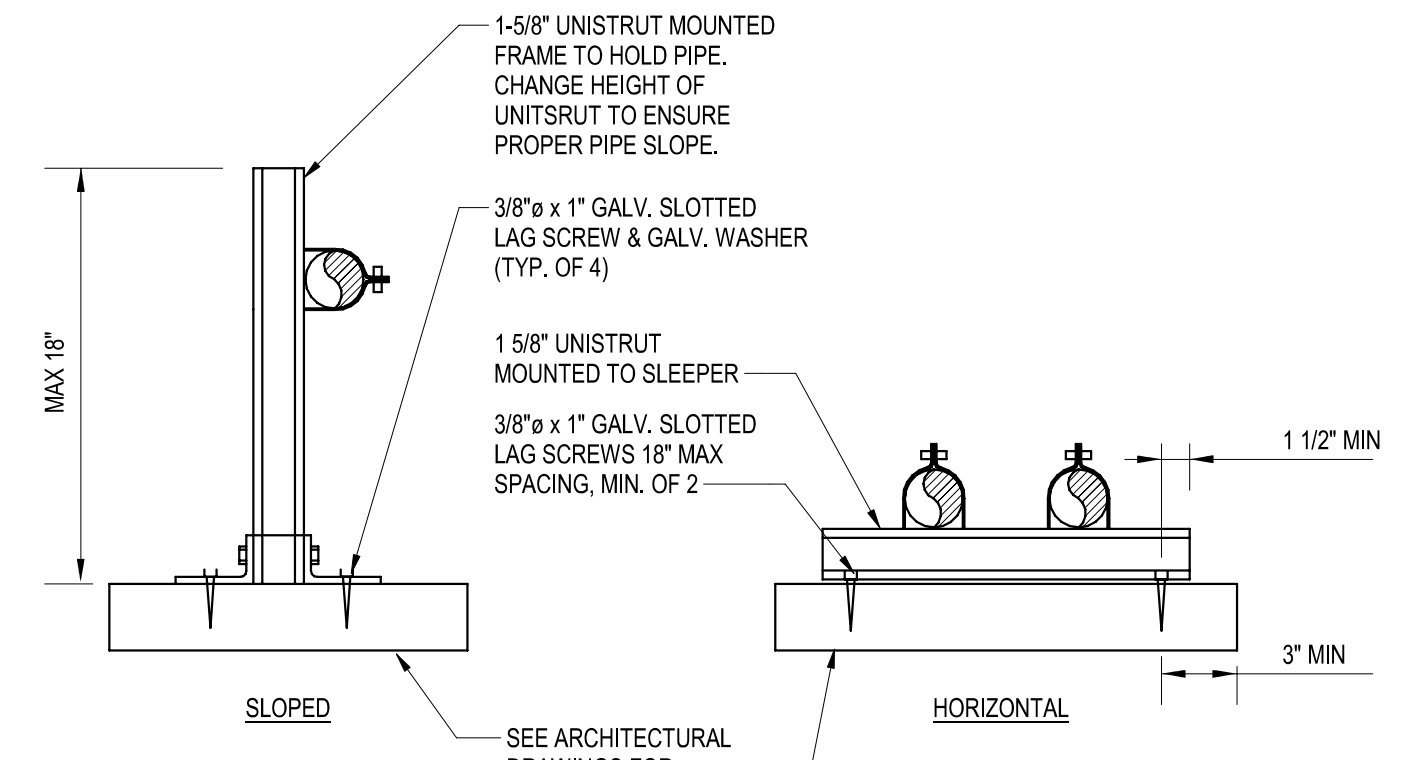


- NOTES:
- COMPLY WITH 2013 CBC.
 - BRACE ALL PIPING AND EQUIPMENT TRANSVERSELY AND LONGITUDINALLY ACCORDING TO SMACNA GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PIPING SYSTEMS.
 - ALL PIPE SUPPORTS SHALL BE PIPING TECHNOLOGY & PRODUCTS, INC. OR EQUAL.
 - PROVIDE TRANSVERSE SEISMIC BRACING AT 20'-0" MAXIMUM AND AT EVERY CHANGE OF DIRECTION.
 - PROVIDE LONGITUDINAL SEISMIC BRACING AT 40'-0" O.C. MAXIMUM. MINIMUM OF 2 REQUIRED.
 - REFER TO RELEVANT ATTACHMENT DETAILS AND STRUCTURAL FOR CONTINUATION.

SHEET NOTES:

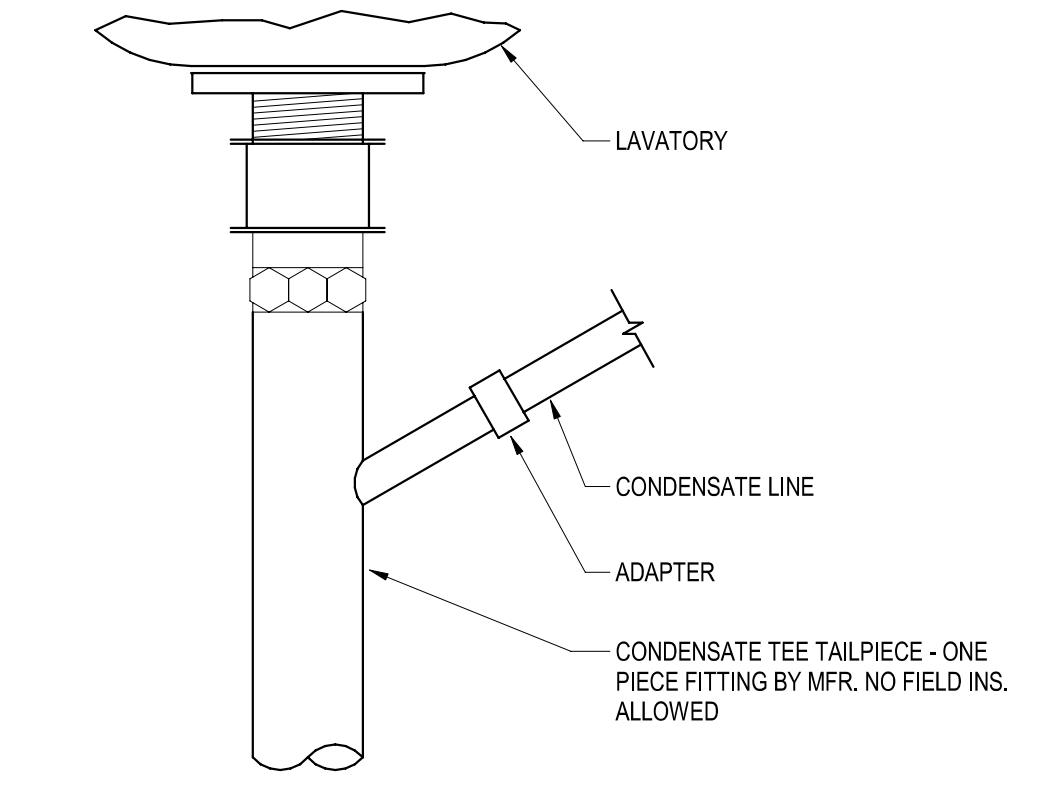
- INSTALL ROD STIFFENER WHEN LENGTH EXCEEDS THE SCHEDULE LENGTH
- | MAX. PIPE SIZE, IN. | ROD SIZE, IN. | MAX. ROD LENGTH, IN. |
|---------------------|---------------|----------------------|
| 1/2 UP TO 2 | 3/8 | 19 |
| 3 | 1/2 | 25 |
- PROVIDE NONMETALLIC SEPARATION BETWEEN UNINSULATED COPPER PIPING AND METAL SUPPORTS. PLASTIC COATED OR FELT LINED CLEVIS HANGER. PLASTIC COATED PIPE CLAMP.
 - SPACE PIPE HANGERS AND SUPPORTS PER MECHANICAL SPECIFICATION.

4 TYPICAL SINGLE AND TRAPEZE PIPE SUPPORT DSA DETAIL
N.T.S.

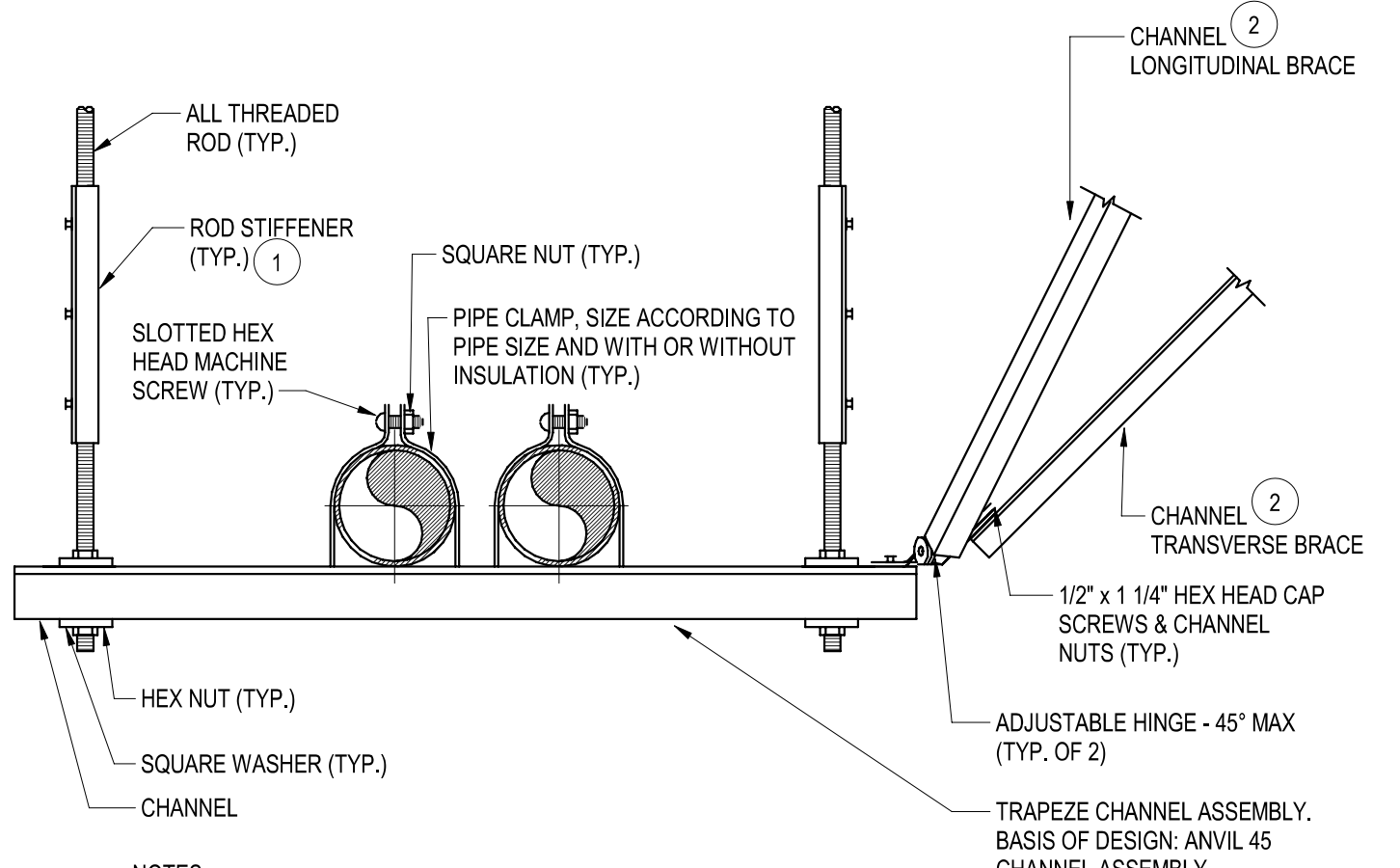


- NOTES:
- FOR CONDENSATE DRAIN PIPE, SLOPE 1/8" PER FT.

3 ROOF MOUNTED SLOPED PIPE SUPPORT COMPOSITE SLEEPER DSA DETAIL
N.T.S.



6 LAVATORY CONDENSATE CONNECTION
N.T.S.



- NOTES:
- COMPLY WITH 2013 CBC.
 - BRACE ALL PIPING AND EQUIPMENT TRANSVERSELY AND LONGITUDINALLY ACCORDING TO SMACNA GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PIPING SYSTEMS.
 - ALL PIPE SUPPORTS SHALL BE PIPING TECHNOLOGY & PRODUCTS, INC. OR EQUAL.
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 - PROVIDE LONGITUDINAL SEISMIC BRACING AT 40'-0" O.C. MAXIMUM. MINIMUM OF 2 REQUIRED.
 - REFER TO RELEVANT ATTACHMENT DETAILS AND STRUCTURAL FOR CONTINUATION.

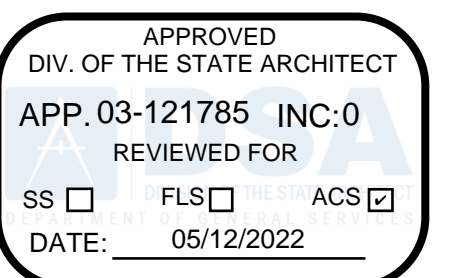
SHEET NOTES:

- INSTALL ROD STIFFENER WHEN LENGTH EXCEEDS THE SCHEDULE LENGTH

MAX. PIPE SIZE, IN.	ROD SIZE, IN.	MAX. ROD LENGTH, IN.
1/2 UP TO 2	3/8	19
3	1/2	25

- SPACE PIPE HANGERS AND SUPPORTS PER MECHANICAL SPECIFICATION.

5 TYPICAL SINGLE AND TRAPEZE PIPE SUPPORT DSA DETAIL
N.T.S.



OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
 APPROVAL OF THIS PLAN DOES NOT AUTHORIZE OR APPROVE ANY MODIFICATION OR DEVIATION FROM APPLICABLE REGULATIONS. FINAL APPROVAL IS SUBJECT TO FIELD INSPECTION. ONE SET OF APPROVED PLANS SHALL BE AVAILABLE ON THE PROJECT SITE AT ALL TIMES.

PROJECT
CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

PRIME CONSULTANT
IBI GROUP
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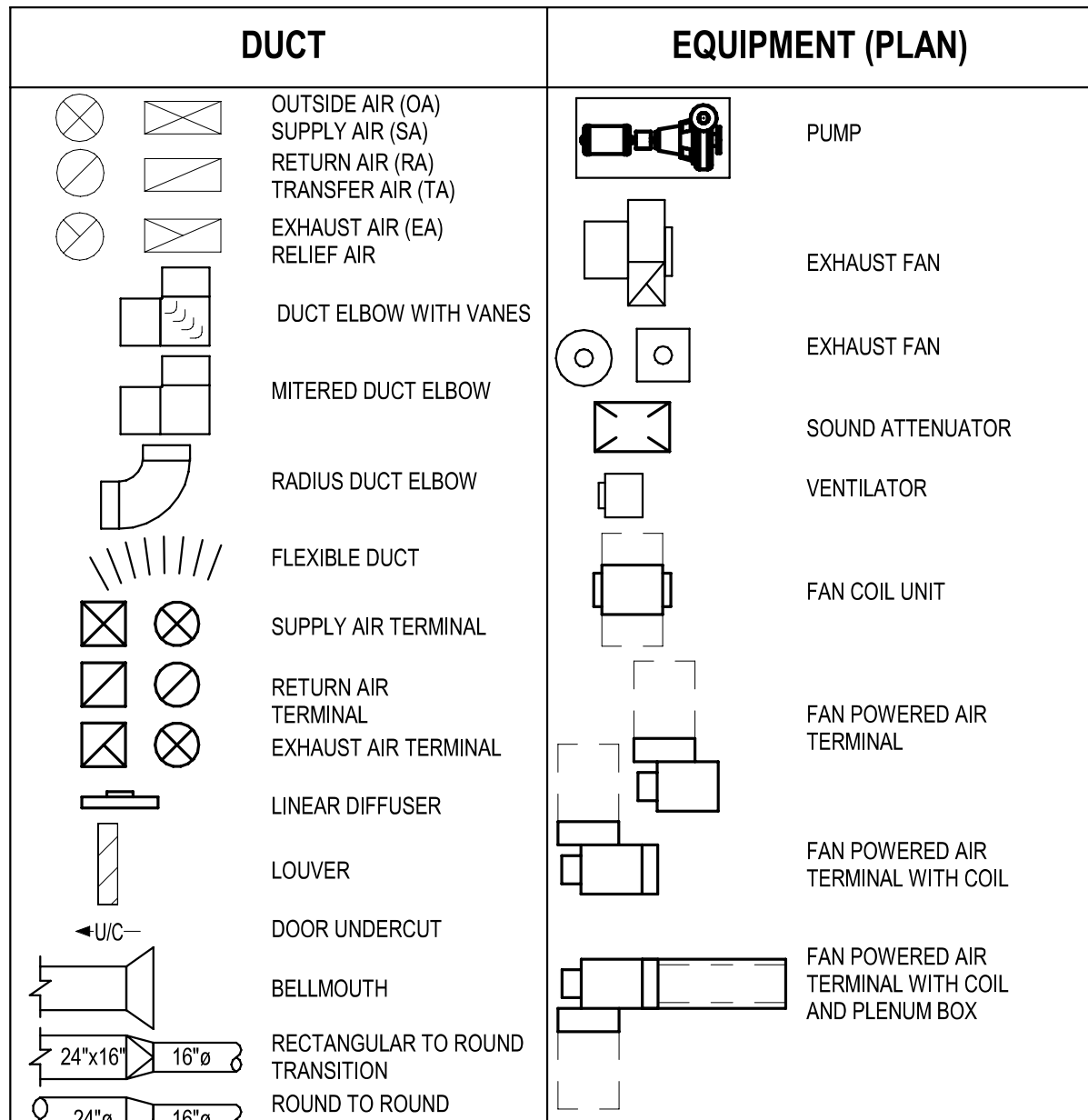
NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-26
G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DS/AOS/FM SUBMITTAL		2022-09-14
V2	DS/AOS/FM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES

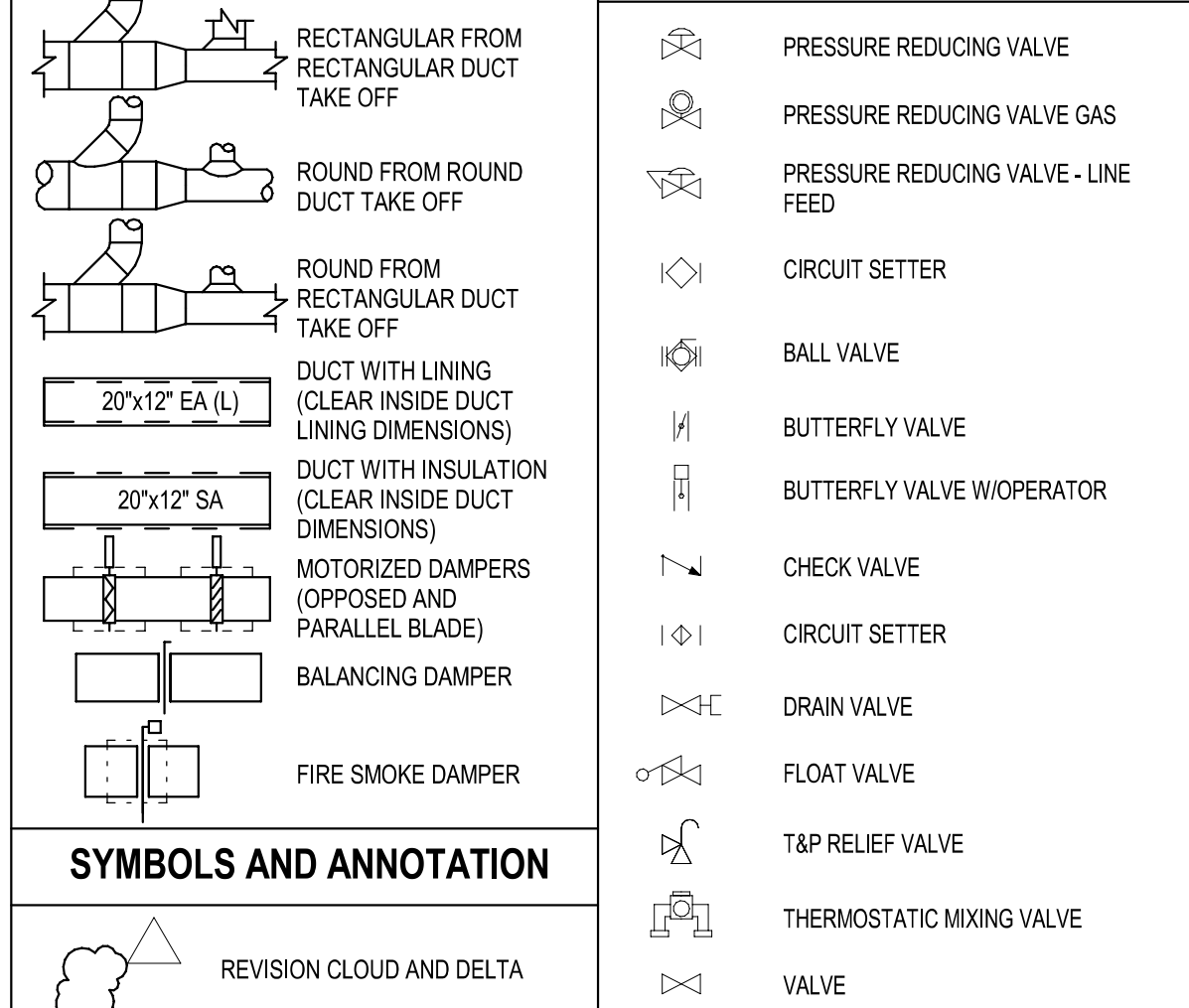
DATE: 2022-05-02
 DRAWN BY: IG
 CHECKD BY: JG
 SCALE: NTS
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
MH0000
 IBI PROJECT NO: 119020
 SHEET NUMBER
A1

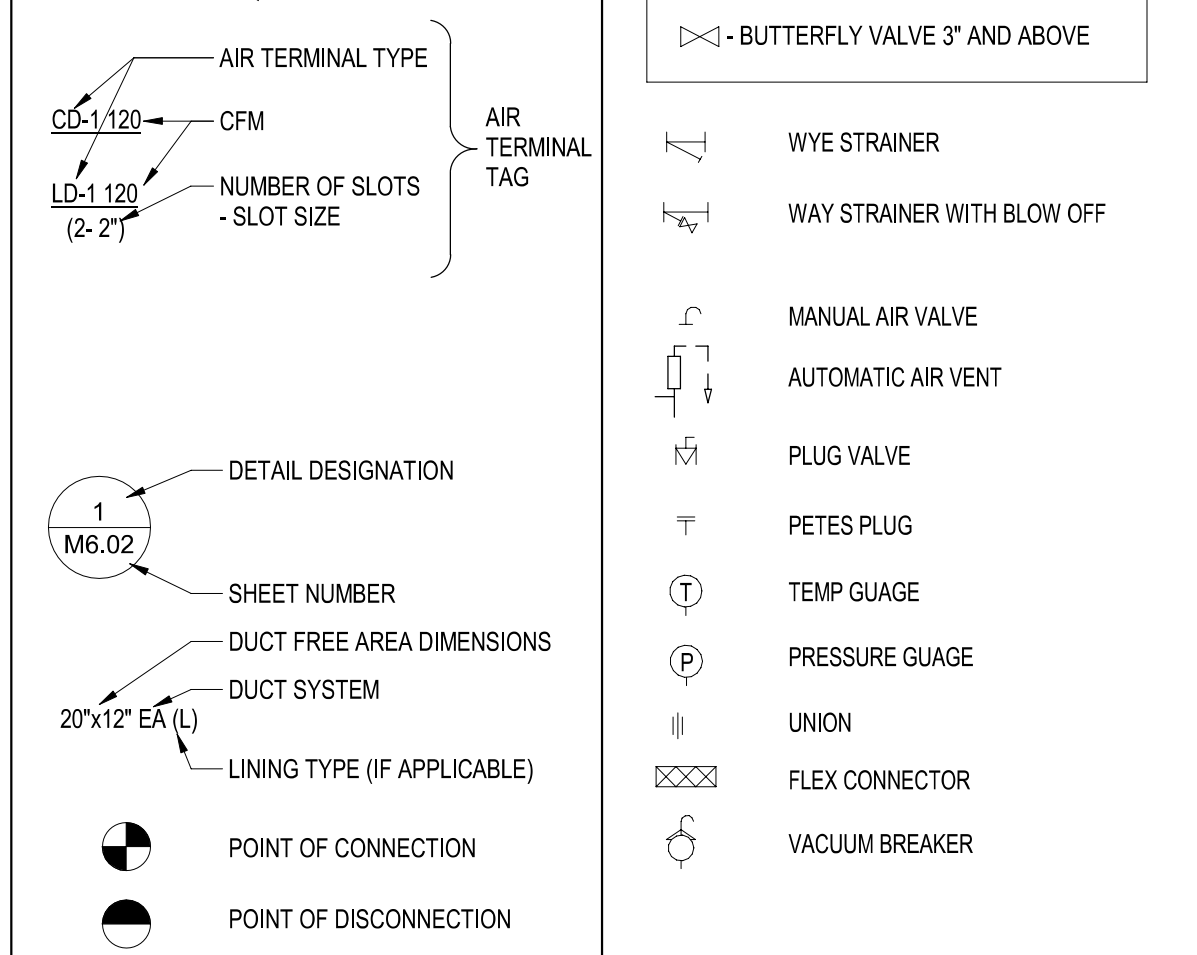
MECHANICAL LEGEND



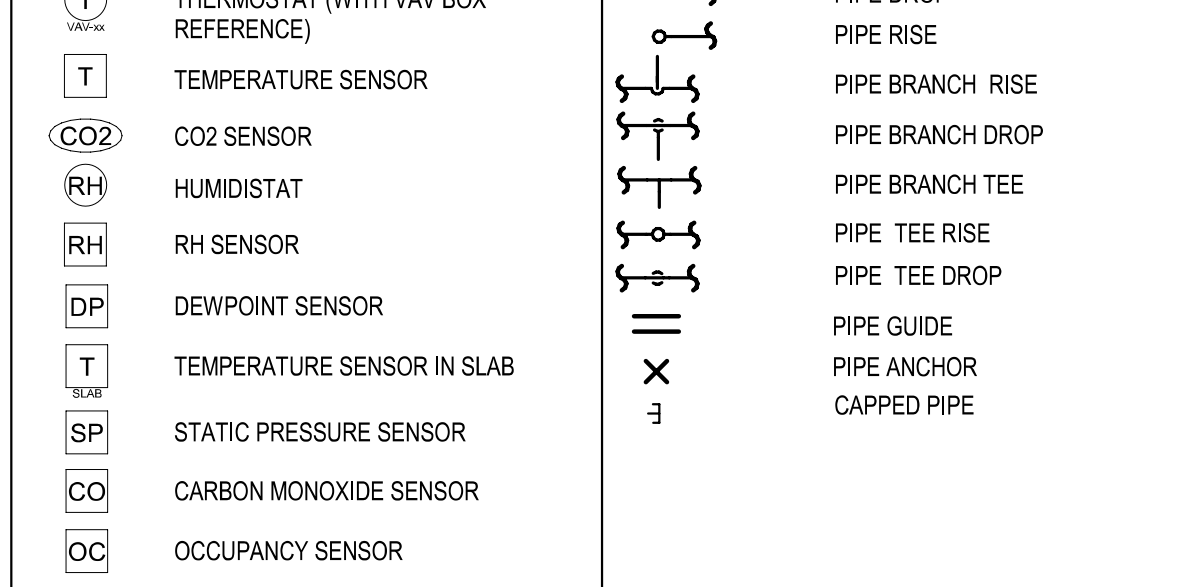
VALVES AND HYDRONIC ACCESSORIES



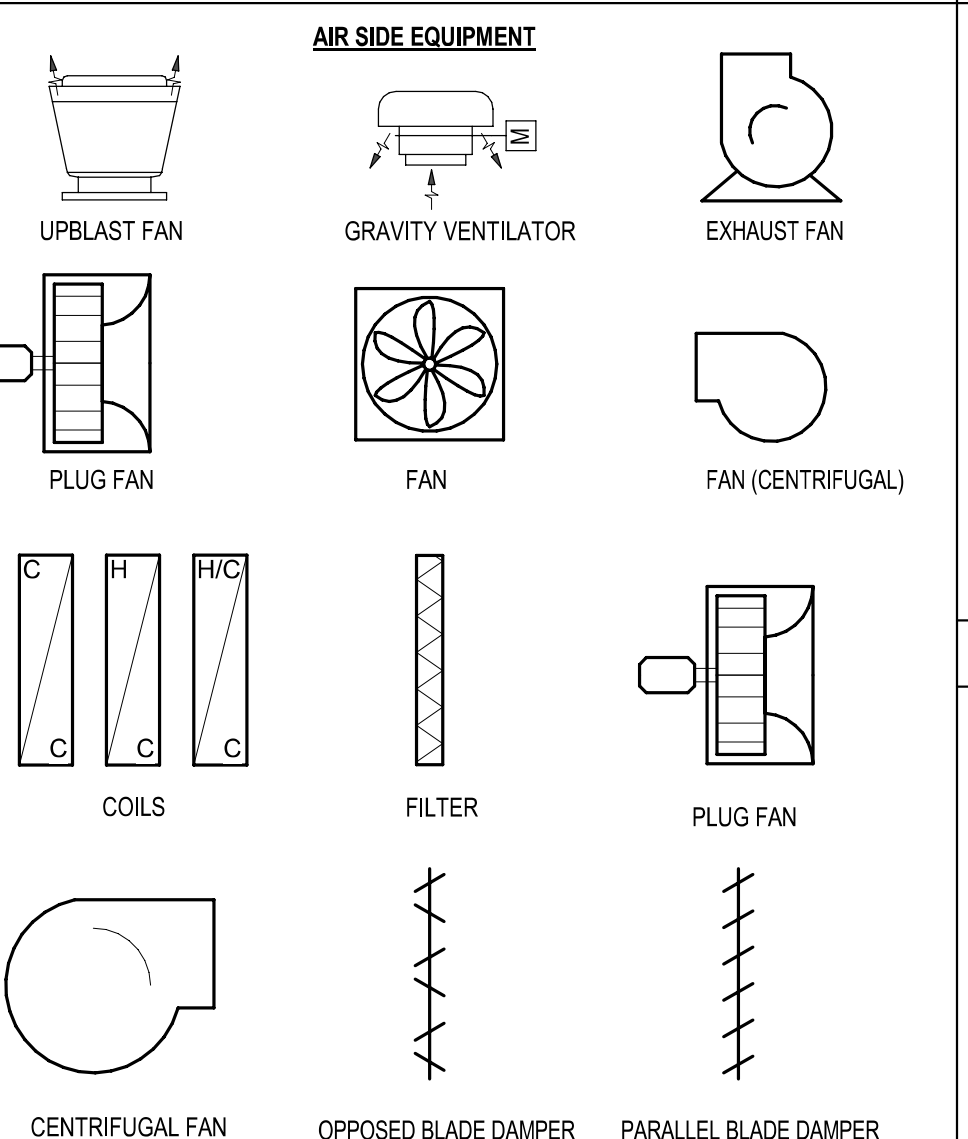
SYMBOLS AND ANNOTATION



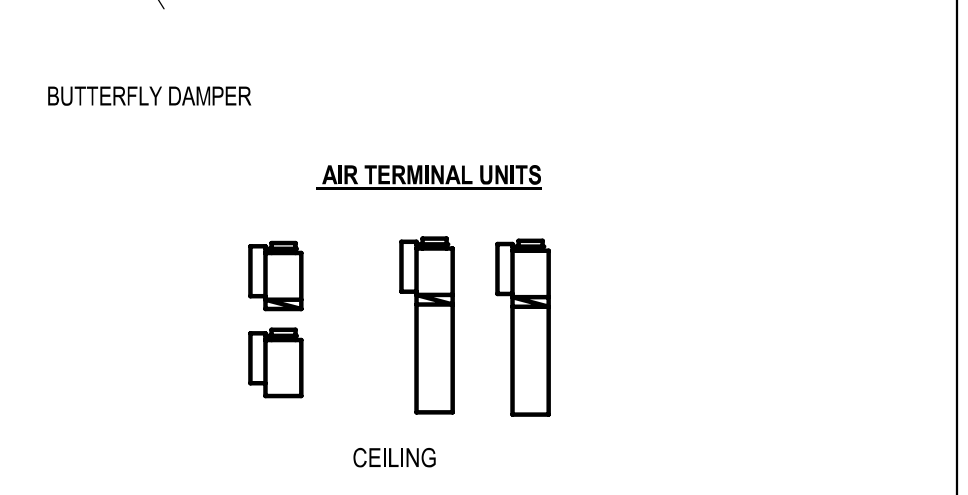
ROOM SENSORS (PLAN)



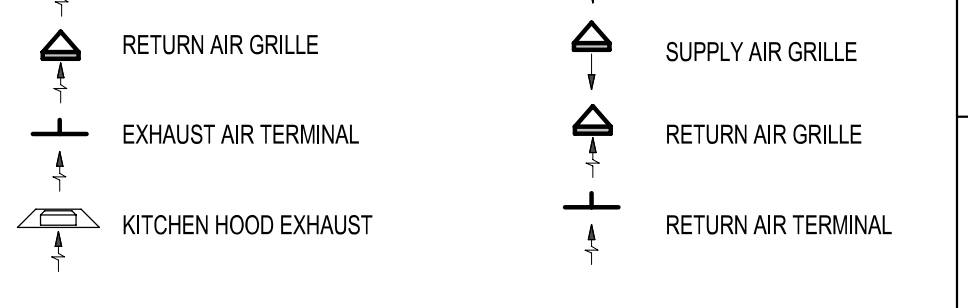
AIRSIDE EQUIPMENT (DIAGRAMS)



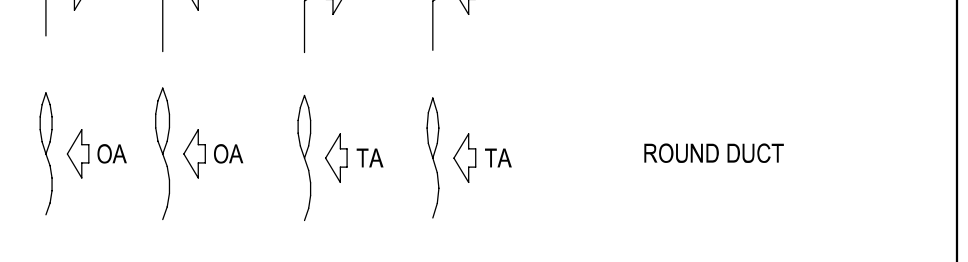
AIR TERMINAL UNITS



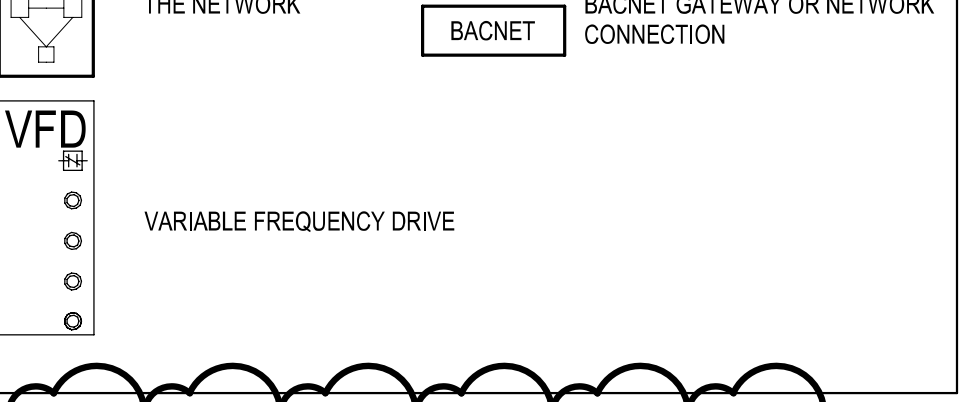
AIR TERMINALS (DIFFUSERS, REGISTERS, GRILLES)



AIR SYSTEM AND DIRECTION



ELECTRICAL OR NETWORK EQUIPMENT (DIAGRAMS)



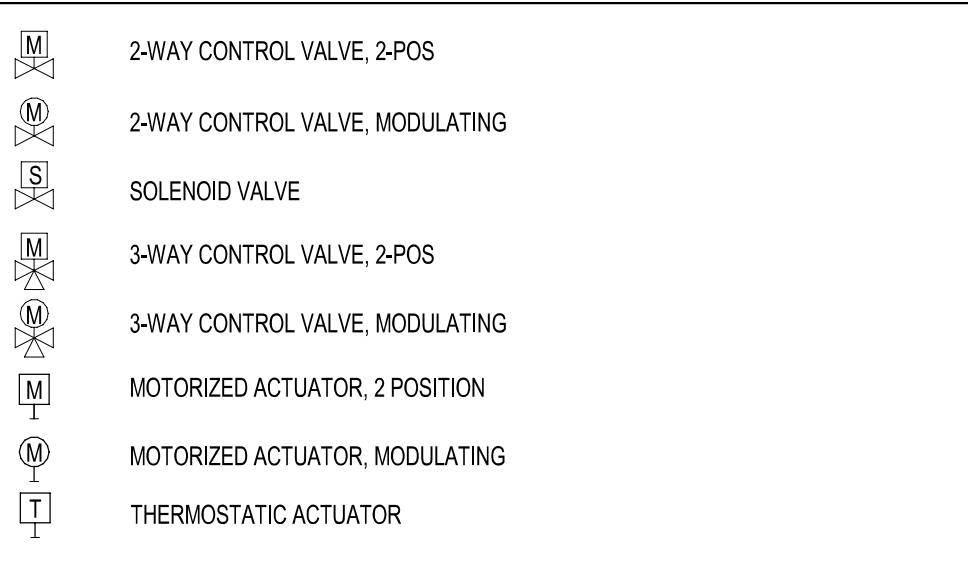
CONTROL WIRING



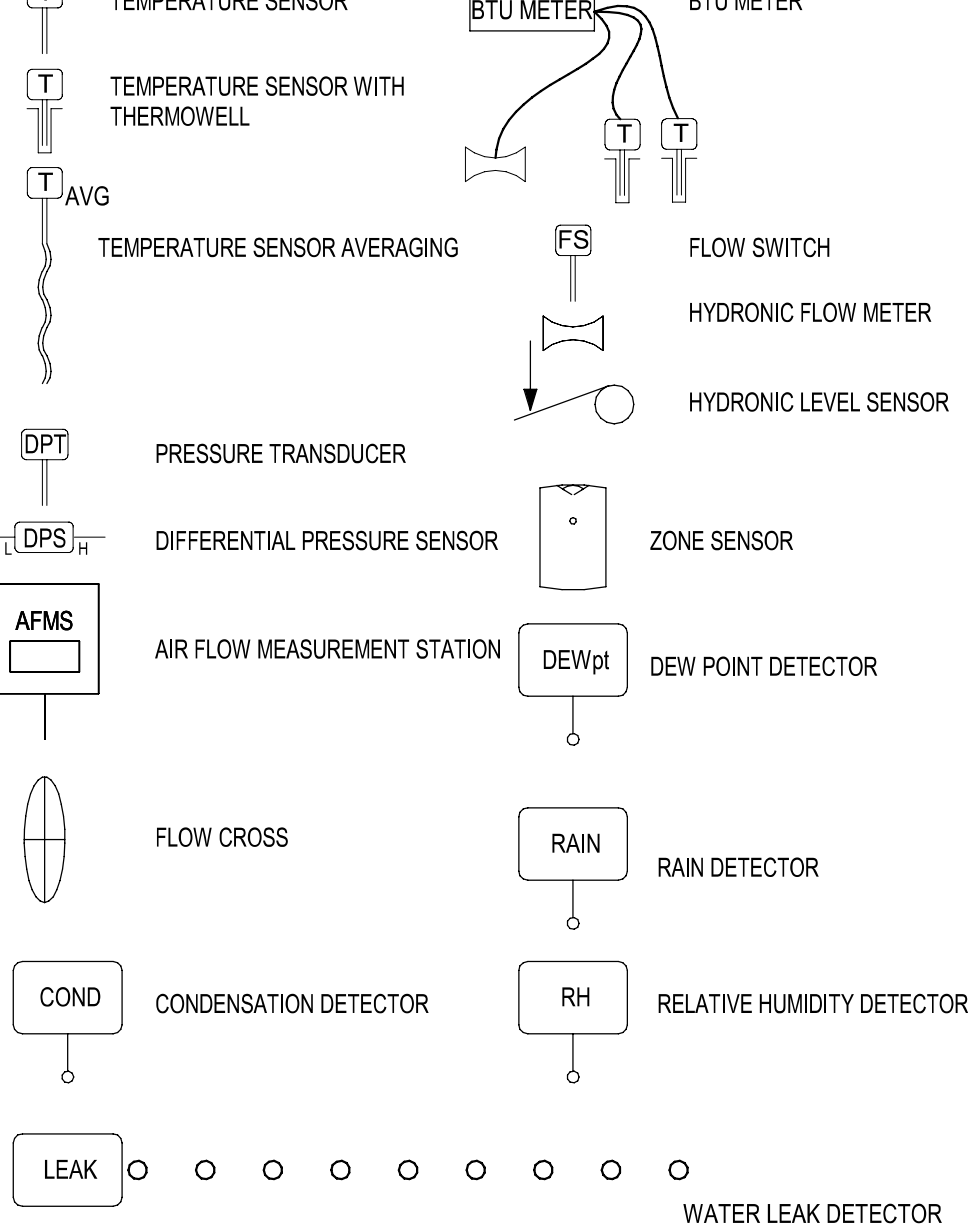
CALIFORNIA CODES AND STANDARDS

- 2019 CALIFORNIA BUILDING CODE
- 2019 CALIFORNIA ELECTRICAL CODE
- 2019 CALIFORNIA MECHANICAL CODE
- 2019 CALIFORNIA PLUMBING CODE
- 2019 CALIFORNIA ENERGY CODE
- 2019 CALIFORNIA FIRE CODE
- 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE

CONTROL VALVES & ACTUATORS



SENSORS

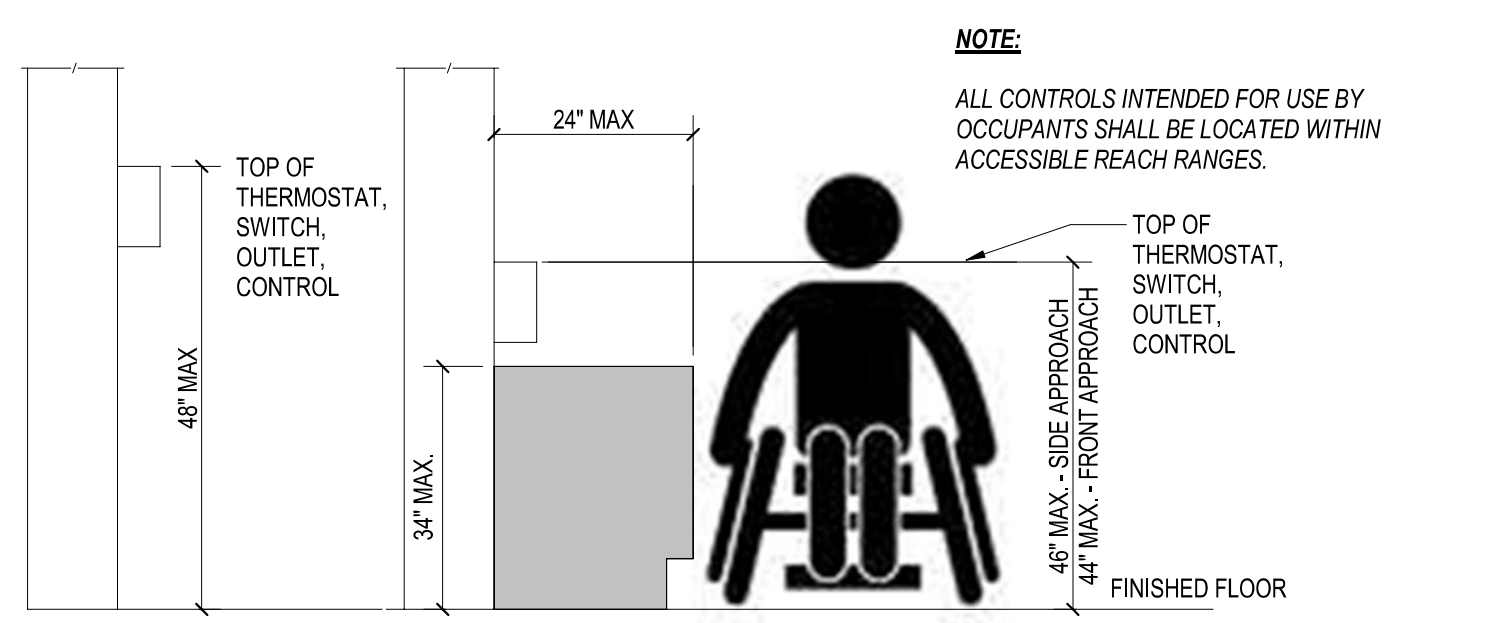


CALIFORNIA GREEN NOTES:

- AT THE TIME OF ROUGH INSTALLATION AND DURING STORAGE ON THE CONSTRUCTION SITE UNTIL FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST, WATER AND DEBRIS WHICH MAY ENTER THE SYSTEM. (CAL GREEN SECTION: 5.504.3).
- IN MECHANICALLY VENTILATED BUILDINGS, REGULARLY OCCUPIED AREAS OF THE BUILDING SHALL BE PROVIDED WITH AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR THAT PROVIDES AT LEAST A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8. MERV 8 FILTERS SHALL BE INSTALLED PRIOR TO OCCUPANCY, AND RECOMMENDATIONS FOR MAINTENANCE WITH FILTERS OF THE SAME VALUE SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL. (CAL GREEN SECTION: 5.504.5.3)
- INSTALLATIONS OF HVAC REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT SHALL COMPLY WITH SECTIONS 5.508.1.1 AND 5.508.1.2. HVAC REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CHLOROFLUOROCARBONS (CFCs) AND SHALL NOT CONTAIN HALONS (SECTION: 5.508.1).
- PROVIDE THE BUILDING OWNER OR REPRESENTATIVE WITH DETAILED OPERATING AND MAINTENANCE INSTRUCTIONS AND COPIES OF WARRANTIES/WARRANTIES FOR EACH SYSTEM. O&M INSTRUCTIONS SHALL BE CONSISTENT WITH OSHA REQUIREMENTS IN CFR, TITLE 8, SECTION 5142, AND OTHER RELATED REGULATIONS.

MECHANICAL ABBREVIATIONS

AC	AIR CONDITIONING UNIT ABOVE FINISHED FLOOR	KW	KILOWATT
AFF	AIR HANDLING UNIT	LAT	LEAVING AIR TEMPERATURE
AL	ACOUSTIC LINING	LWT	LEAVING WATER TEMPERATURE
ARCH	ARCHITECT/ARCHITECTURAL	LB	POUND WEIGHT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS	MAX	MAXIMUM
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	MFR	MANUFACTURER
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MIN	MINIMUM
AW	ACID WASTE	(N)	NEW
		N/A	NOT APPLICABLE
BLDG	BUILDING	NC	NORMALLY CLOSED
BOD	BOTTOM OF DUCT	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
BOP	BOTTOM OF PIPE	NG	NATURAL GAS
BOS	BOTTOM OF STEEL	NO	NORMALLY OPEN
BRD	BAROMETRIC RELIEF DAMPER	NPT	NATIONAL PIPE THREAD
		NTS	NOT TO SCALE
CAV	CONSTANT AIR VOLUME	OA	OUTSIDE AIR
CC	COOLING COIL	OPNG	OPENING
CDW	CONDENSER WATER	P	PUMP
CFM	CUBIC FEET PER MINUTE	POC	POINT OF CONNECTION
CHW	CHILLED WATER	PRV	PRESSURE REDUCING VALVE
CLG	CEILING	PSI	POUNDS PER SQUARE INCH
CBC	CALIFORNIA BUILDING CODE	PSIA	PSI - ABSOLUTE
CH	CHILLER	PSIG	PSI - GAUGE
CI	CAST IRON	PVC	POLYVINYL CHLORIDE
CT	COOLING TOWER	QTY	QUANTITY
CU	COPPER	(R)	REMOVE
CL	CENTERLINE	RA	RETURN AIR
COL	COLUMN	RAH	RECIIRC AIR HANDLER
CONC	CONCRETE	RC	REHEAT COIL
CONT	CONTINUATION	REF	ROOF EXHAUST FAN
CW	COLD WATER		
DB	DRY BULB	SA	SUPPLY AIR / SOUND ATTENUATOR
DH	DEHUMIDIFIER	SC	SCRUBBER
DIM	DIMENSION	SCFM	STANDARD CUBIC FEET PER MINUTE
DN	DIAMETER	SCHD	SCHEDULE
DIA	DOWN	SD	SMOKE DETECTOR
DWG	DRAWING	SF	SUPPLY FAN
(E)	EXISTING	SIM	SIMILAR
(ER)	EXISTING TO BE RELOCATED	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
ENT	ENTERING AIR TEMPERATURE	SMEF	SMOKE EXHAUST FAN
EM	ELECTRICALLY COMMUTATED MOTOR	SPEC(S)	SPECIFICATIONS
EL	ELEVATION	SS	STAINLESS STEEL
ELEC	ELECTRICAL	SSE	STEADY STATE EFFICIENCY
ET	EXPANSION TANK	ST	SOUND ATTENUATOR TRAP
EW	EMERGENCY EYEWASH	STD(S)	STANDARDS
EWT	ENTERING WATER TEMPERATURE	STS	STEAM SUPPLY
EXH	EXHAUST	TA	TRANSFER AIR
		TE	TEMPERATURE ELEMENT
		TEMP	TEMPERATURE
		TI	TEMPERATURE INDICATOR
		TOS	TOP OF STEEL
		TYP	TYPICAL
(F)	FUTURE	UH	UNIT HEATER
FCU	FAN COIL UNIT	UNO	UNLESS NOTED OTHERWISE
FD	FIRE DAMPER	V	VOLTS
FFE	FINISHED FLOOR ELEVATION	VAV	VARIABLE AIR VOLUME
FLR	FLOOR	VB	VACUUM BREAK
FM	FLOW METER	VERT	VERTICAL
FOB	FLAT ON BOTTOM	VFD	VARIABLE FREQUENCY DRIVE
FOT	FLAT ON TOP	VTR	VENT THROUGH ROOF
FFM	FEET PER MINUTE	VVR	VARIABLE VOLUME UNIT WITH REHEAT
FS	FLOW SWITCH	W	WIDTH
FSD	COMBINATION FIRE SMOKE DAMPER WITH ACCESS	W/O	WITHOUT
FT	FEET	WB	WET BULB
GPM	GALLONS PER MINUTE	WH	WATER HEATER
GR	GRADE	WLD	WELDED
GV	GRAVITY VENTILATOR	WT	WEIGHT
HC	HEATING COIL		
HHW	HEATING HOT WATER		
HORIZ	HORIZONTAL		
HVAC	HEATING, VENTILATING AND AIR CONDITIONING		
HW	HOT WATER		
HX	HEAT EXCHANGER		
ID	INSIDE DIAMETER		
IEER	INTEGRATED ENERGY EFFICIENCY RATIO		



01 SHEET LIST - MECHANICAL

NUMBER	NAME
MH0000	MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES
MH0100	HVAC EQUIPMENT SCHEDULE
MH0101	HVAC EQUIPMENT SCHEDULE
MH2000	HVAC - OVERALL DEMOLITION FLOOR PLAN
MH2001	HVAC - PARTIAL DEMOLITION FLOOR PLAN
MH2004	HVAC - ROOF DEMOLITION PLAN
MH2100	HVAC - OVERALL FLOOR PLAN
MH2101	HVAC - PARTIAL FLOOR PLAN
MH2800	HVAC - ROOF PLAN
MH6000	HVAC - MECHANICAL DETAILS
MH6001	HVAC - MECHANICAL DETAILS
MH7000	HVAC - MECHANICAL CONTROLS
MH7001	HVAC - MECHANICAL CONTROLS
MH8000	MECHANICAL T24 COMPLIANCE FORMS
MH8001	MECHANICAL T24 COMPLIANCE FORMS
MH8002	MECHANICAL T24 COMPLIANCE FORMS
MH8003	MECHANICAL T24 COMPLIANCE FORMS
Grand total:	17

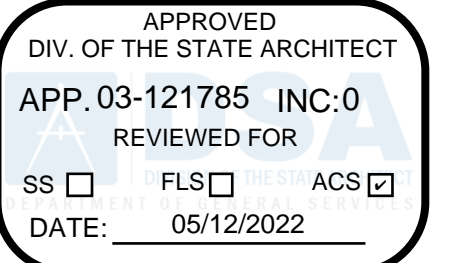
MECHANICAL - PACKAGED GAS ELECTRIC UNIT SCHEDULE

NOTES:

1. PROVIDE UNITS WITH INTEGRAL DISCONNECT.
2. PROVIDE UNIT WITH CONTROLS TO INTEGRATE WITH EXTERNAL HUMIDIFIER. UNIT SHALL CONTROL TO RELATIVE HUMIDITY.
3. GAS HEATER TO HAVE 10:1 TURNDOWN.
4. PROVIDE MATCHED ISOLATED ROOF CURB WITH 1" STATIC DETECTION ISOLATORS.
5. PROVIDE HOT GAS REHEAT.
6. PROVIDE MATCHED ISOLATED SIDE DISCHARGE PLENUM CURB WITH 1" STATIC DEFLECTION ISOLATORS.
7. PROVIDE WITH INTEGRATED ECONOMIZER AND POWER EXHAUST.
8. PROVIDE A DUCT MOUNTED SMOKE DETECTOR IN SUPPLY DUCT PER CMC 808 FOR UNITS 2,000 CFM AND ABOVE.
9. PROVIDE BMS INTERFACE.
10. SELECT UNIT FOR COOLING COIL DEHUMIDIFICATION INLET CONDITION 82 db/68 wb.
11. SELECT UNIT FOR COOLING COIL DEHUMIDIFICATION INLET CONDITION 78 db/65 wb.
12. SELECT UNIT FOR COOLING COIL DEHUMIDIFICATION INLET CONDITION 75 db/62 wb.
13. SELECT UNIT FOR COOLING COIL DEHUMIDIFICATION INLET CONDITION 74 db/61 wb.
14. SELECT UNIT FOR COOLING COIL DEHUMIDIFICATION INLET CONDITION 73 db/61 wb.
15. PROVIDE COMBINATION THERMOSTAT/HUMIDISTAT TO REPLACE EXISTING.
16. PROVIDE SPACE MOUNTED CO2 SENSOR.
17. REFER TO DETAIL 10-A2800 AND DETAIL 1MM-6000 FOR CURB ATTACHMENT DETAILS.
18. PROVIDE INTEGRATED ECONOMIZER WITH BAROMETRIC EXHAUST.
19. PROVIDE PROGRAMMABLE THERMOSTAT.
20. PROVIDE HARD WIRED SMOKE DETECTOR.

* CELLS WITH SHADED BACKGROUNDS ARE UNASSIGNED OR UNDER REVIEW

TYPE	EQUIP. NO.	MFR	MODEL	LOCATION	SERVICE	FAN				MERV	FILTER INITIAL PRESSURE LOSS (IN-WG)	COOLING				REFRIGERANT		COM PRESOR	CONDENSER			GAS HEATING				HOT GAS REHEAT CAPACITY (BTU/H)	ECM (Y/N)	ELECTRICAL				OPERATING WEIGHT (LB)	NOTES				
						AIR FLOW (CFM)	MIN OA (CFM)	MIN DCV OA (CFM)	ESP (IN-WG)			SENSIBLE CAPACITY (BTU/H)	TOTAL CAPACITY (BTU/HR)	IEER	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)		LAT WB (°F)	TYPE	QTY. (LBS)	QTY.	SUMMER OA (°F)	WINTER OA (°F)	HEATING INPUT (BTU/H)			HEATING OUTPUT (BTU/H)	GAS CONN. (INCHES)	SSE [%]	FLA			MOC P(A)	VOL T (V)	PHASE	Hz
AC	1	DAIKIN	DPS025A	ROOF	ENTRY COURT	8,750	1595	195	1.2	14	0.3	226,883	298,224	17.6	80.0	62.0	56.3	56.2	R410A	35.5	2	105.0	40 °F	450,000	360,000	0.75	80	0	Yes	Yes	63.6	90.0	460	3	60	412	1, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20
AC	2	DAIKIN	DPS025A	ROOF	ENTRY COURT	8,000	1595	195	1.2	14	0.3	216,150	294,217	17.6	80.0	62.0	55.3	55.2	R410A	35.5	2	105.0	40 °F	450,000	360,000	0.75	80	0	Yes	Yes	63.6	90.0	460	3	60	412	1, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20
AC	3	DAIKIN	DPS015A	ROOF	GALLERY #1	4,000	2685	270	1.0	14	0.3	166,843	166,843	17.5	94.0	67.0	55.9	53.2	R410A	30.2	2	105.0	40 °F	200,000	160,000	0.75	80	61,387	Yes	Yes	30.5	45.0	460	3	60	2701	1, 2, 3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 19, 20
AC	4	DAIKIN	DPS015A	ROOF	GALLERY #3	4,000	1725	175	1.0	14	0.3	96,866	121,387	18.8	86.0	64.0	57.9	57.5	R410A	25.8	2	105.0	40 °F	200,000	160,000	0.75	80	52,713	Yes	Yes	18.2	25.0	460	3	60	2538	1, 2, 3, 4, 5, 7, 8, 11, 15, 16, 17, 19, 20
AC	5	DAIKIN	DPS015A	ROOF	GALLERY #2	4,000	2820	285	1.0	14	0.3	166,843	166,843	17.5	94.0	67.0	55.9	53.2	R410A	30.2	2	105.0	40 °F	200,000	160,000	0.75	80	61,387	Yes	Yes	30.5	45.0	460	3	60	2701	1, 2, 3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 19, 20
AC	6	DAIKIN	DPS015A	ROOF	LITTLE THEATER	4,000	870	90	1.0	14	0.3	96,866	121,387	18.8	80.0	62.0	57.9	57.5	R410A	25.8	2	105.0	40 °F	200,000	160,000	0.75	80	52,713	Yes	Yes	22.2	30.0	460	3	60	2538	1, 2, 3, 4, 7, 8, 9, 12, 15, 16, 17, 19, 20
AC	7	DAIKIN	DPS006A	ROOF	GIFT SHOP	2,000	705	70	1.0	14	0.3	52,334	69,702	19.3	83.0	63.0	56.1	55.9	R410A	15.3	1	105.0	40 °F	80,000	64,000	0.5	80	0	Yes	Yes	13.1	20.0	460	3	60	148	1, 3, 4, 7, 8, 9, 15, 16, 17, 19
AC	8	DAIKIN	DPS015A	ROOF	MULTI-PURPOSE	4,000	3115	140	1.0	14	0.3	168,506	168,506	17.5	95.0	67.0	56.5	53.0	R410A	30.2	2	105.0	40 °F	200,000	160,000	0.75	80	61,387	Yes	Yes	30.5	45.0	460	3	60	267	1, 3, 6, 7, 8, 9, 15, 16, 17, 19, 20
AC	9	DAIKIN	DPS015A	ROOF	LIBRARY	4,000	355	175	1.0	14	0.3	96,866	121,387	18.8	77.0	61.0	57.9	57.5	R410A	25.8	2	105.0	40 °F	200,000	160,000	0.75	80	52,713	Yes	Yes	22.2	30.0	460	3	60	2538	1, 2, 3, 5, 6, 7, 8, 9, 13, 15, 16, 17, 19, 20
AC	10	DAIKIN	DPS004A	ROOF	ADMINISTRATION OFFICES	1,600	325	130	1.0	14	0.3	39,183	48,103	16.2	80.0	67.0	57.6	57.5	R410A	8.5	1	105.0	40 °F	80,000	64,000	0.5	80	0	Yes	Yes	10.3	15.0	460	3	60	144	1, 3, 4, 6, 9, 15, 16, 17, 18, 19
AC	11	DAIKIN	DPS010A	ROOF	SHOP	4,000	1275	475	1.0	14	0.3	96,866	121,387	18.8	82.0	62.0	57.9	57.5	R410A	20	2	105.0	40 °F	200,000	160,000	0.75	80	0	Yes	Yes	22.2	30.0	460	3	60	2507	1, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20
AC	12	DAIKIN	DPS007A	ROOF	PROPERTY STORAGE	3,000	175	135	1.0	14	0.3	74,070	92,164	19.8	76.0	61.0	57.4	57.3	R410A	17.8	2	105.0	40 °F	200,000	160,000	0.75	80	52,713	Yes	Yes	17.4	20.0	460	3	60	2285	1, 2, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20
AC	13	DAIKIN	DPS016A	ROOF	ENTRY COURT	6,750	1480	180	1.2	14	0.3	159,871	189,865	19.8	80.0	62.0	58.3	58.2	R410A	30.3	1	105.0	40 °F	300,000	240,000	0.75	80	0	Yes	Yes	40.1	60.0	460	3	60	3888	1, 3, 4, 5, 7, 8, 9, 14, 15, 16, 17, 19, 20
AC	14	DAIKIN	DPS016A	ROOF	ENTRY COURT	6,750	1495	180	1.2	14	0.3	159,871	189,865	19.8	80.0	62.0	58.3	58.2	R410A	30.3	1	105.0	40 °F	300,000	240,000	0.75	80	0	Yes	Yes	40.1	60.0	460	3	60	3888	1, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20
AC	15	DAIKIN	DPS004A	ROOF	ADMINISTRATION OFFICES	1,600	305	35	1.0	14	0.3	39,183	48,103	16.2	77.0	61.0	57.6	57.5	R410A	8.5	1	105.0	40 °F	80,000	64,000	0.5	80	0	Yes	Yes	10.3	15.0	460	3	60	1447	1, 3, 4, 6, 7, 9, 15, 16, 17, 18, 19
AC	16	DAIKIN	DPS007A	ROOF	ADMINISTRATION OFFICES	3,000	180	75	1.0	14	0.3	74,070	92,164	19.8	76.0	61.0	57.4	57.3	R410A	14.4	2	105.0	40 °F	200,000	160,000	0.75	80	0	Yes	Yes	17.4	20.0	460	3	60	2285	1, 3, 4, 7, 8, 9, 15, 16, 17, 19, 20



CLIENT

State of California
Dept. of General Services

DGS
GENERAL SERVICES

Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605

Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT

CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES

CAAM
California African American Museum
650 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT

IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel 213 769 0011 Fax 213 769 0016
ibi@ibi.com



SUB CONSULTANT

INTEGRAL
15700 Ventura Blvd, Suite 1902
Los Angeles, CA 91436
310.325.9555 Telephone
E-Mail: info@integralgroup.com
www.integralgroup.com

REGISTERED PROFESSIONAL ENGINEER
No. MCB991
Exp. 06-30-22

ISSUES

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

HVAC EQUIPMENT SCHEDULE

DATE: 2022-05-02
DRAWN BY: JG
CHKD BY: IG
SCALE:
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER: **MH0100**
ISSUE: **A1**

MECHANICAL - HUMIDIFIER (ELECTRIC) SCHEDULE

NOTES:

1. HUMIDIFIER SIZED FOR OSA 105°F DB, 5GR/LB, SANTA ANA CONDITION
2. PROVIDE DUCT MOUNTED HIGH LIMIT HUMIDISTAT
3. PROVIDE PROTECTIVE HOUSING
4. PROVIDE OUTDOOR ENCLOSURE AND ROOF CURB, REFER TO DETAIL 1MM-6001 FOR ATTACHMENT DETAIL.
5. PROVIDE DRISTEEM DRAIN COOLER OR EQUIEL WITH 1/2" CW CONNECTION ON DRAIN LINE
6. PROVIDE BAS INTEGRATION

* CELLS WITH SHADED BACKGROUNDS ARE UNASSIGNED OR UNDER REVIEW

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TOTAL CFM	TOTAL CAPACITY (LB/HR)	DUCT VELOCITY (FPM)	HUMIDIFIER TYPE	EAT DB (°F)	EAT WB (°F)	ROOM DB (°F)	ROOM RH (%)	ELECTRICAL			SIZE			WEIGHT (LB)	NOTES		
														FLA	MOC P	VOLTAGE (V)	FREQUENCY (HZ)	PHASE	LENGTH			WIDTH	HEIGHT
H	3	DRISTEEM	VLC-21-1	ROOF	AC-3, GALLERY #1	4,000	44.93	564	ELECTRIC	92.0	60	72	50	25.3	35	460	60	3	35"	44"	66"	610	1,2,3,4,5,6
H	4	DRISTEEM	VLC-21-1	ROOF	AC-4, GALLERY #3	4,000	44.93	564	ELECTRIC	86.0	60	72	50	25.3	35	460	60	3	35"	44"	66"	610	1,2,3,4,5,6
H	5	DRISTEEM	VLC-21-1	ROOF	AC-5, GALLERY #2	4,000	44.93	564	ELECTRIC	92.0	60	72	50	25.3	35	460	60	3	35"	44"	66"	610	1,2,3,4,5,6
H	6	DRISTEEM	VLC-21-1	ROOF	AC-6, LITTLE THEATER	4,000	44.93	564	ELECTRIC	80.0	60	72	50	25.3	35	460	60	3	35"	44"	66"	610	1,2,3,4,5,6
H	9	DRISTEEM	VLC-21-1	ROOF	AC-9, LIBRARY	4,000	44.93	564	ELECTRIC	75.0	60	72	50	25.3	35	460	60	3	35"	44"	66"	610	1,2,3,4,5,6
H	12	DRISTEEM	VLC-16-1	ROOF	AC-12, PROPERTY STORAGE	3,000	33.69	423	ELECTRIC	75.0	60	72	50	19.2	25	460	60	3	35"	44"	66"	610	1,2,3,4,5,6

DIFFUSER SCHEDULE

ITEM	MANUFACTURER & MODEL NO.	TYPE	MOUNTING	MANUFACTURER'S BORDER TYPE	OVERALL DIMENSION (IN. X IN.)	NECK (IN or IN. X IN.)	SIZE (IN.)	MAX. TOTAL PRESSURE (IN. W.C.)	OPPOSED BLADE DAMPER PERMITTED (Y/N)				NOTES		
									NC 30	NC 35	NC 40	NC 45			
SUPPLY DIFFUSERS															
CD-1	PRICE	SPDIAPD	SQUARE PLAQUE DIFFUSER	T-BAR CEILING HARD CEILING	T-BAR TYPE 31	HARD CEILING TYPE 31	12X12	60	0.08	90	110	110	110	N	1,2,3,4,7,8
							12X12	80	0.15	160	185	195	210	N	1,2,3,4,7,8
							24X24	60	0.02	90	110	110	110	N	1,2,3,4,7,8
							24X24	80	0.05	160	185	195	210	N	1,2,3,4,7,8
							24X24	100	0.06	250	280	305	330	N	1,2,3,4,7,8
							24X24	120	0.1	350	400	440	480	N	1,2,3,4,7,8
							24X24	140	0.12	500	540	600	650	N	1,2,3,4,7,8
24X24	150	0.15	700	750	800	850	N	1,2,3,4,7,8							

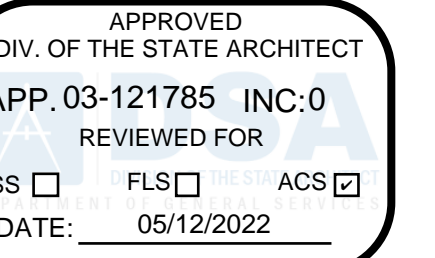
NOTES:

1. ALL ROOMS TO BE NC-35 UNLESS SCHEDULED OTHERWISE
2. PROVIDE DUCT TO NECK TRANSITION AS REQUIRED.
3. MAXIMUM AVAILABLE DIFFUSER NC LEVEL TO BE 5 (FIVE) POINTS LOWER THAN NC CRITERION FOR ROOM SERVED.
4. PROVIDE SIZE LISTED BASED ON AIRFLOW AND NC LEVEL UNLESS NOTED OTHERWISE ON PLANS.
5. HARD LID DIFFUSER DIMENSIONS 3" SMALLER
6. PROVIDE LINED LIGHT BOX
7. AIRFLOW VALUES ARE BASED ON FINAL RUN OUT DUCT TO DIFFUSER EQUAL TO NECK SIZE.
8. FOR ROOMS NC25 AND BELOW REFER TO PLANS FOR SIZES
9. UNDUCTED PLENUM

GRILLE SCHEDULE

ITEM	MANUFACTURER & MODEL NO.	TYPE	MOUNTING	MANUFACTURER'S BORDER TYPE	MAX. TOTAL PRESSURE (IN. W.C.)	NOTES
SG-1	PRICE 520 AND 620	DOUBLE DEFLECTION	WALL, DUCT	STANDARD	0.08	1,2,3,4
EXHAUST/RETURN GRILLES						
RG-1	PRICE 530 AND 630	GRILLE, 45 DEGREE DEFLECTION 3/4" SPACING	WALL, DUCT, HARD CEILING	STANDARD	0.08	1,2,3,4
EG-1						
TG-1						

- NOTES:
1. PROVIDE DUCT TO NECK TRANSITION AS REQUIRED.
 2. REFER TO PLANS FOR SIZES.</



MECHANICAL - MINI SPLIT SCHEDULE

* CELLS WITH SHADED BACKGROUNDS ARE UNASSIGNED OR UNDER REVIEW

- NOTES:
 (1) FAN COIL UNITS POWERED FROM CONDENSING UNIT CU-1
 (2) PROVIDE VIBRATION ISOLATION REFER TO SPECIFICATION 230548
 (3) OUTDOOR UNITS CONNECT TO FCU-1 AND FCU-2
 (4) REFER TO DETAIL ON DRAWING AB301 FOR CONNECTION OF FAN COIL UNIT HANGERS TO STRUCTURE
 (5) REFER TO DETAIL 3/MH#000 FOR CONDENSER UNIT SUPPORT

TYPE	EQUIPMENT NUMBER	MANUFACTURER	INDOOR MODEL	TYPE	OUTDOOR MODEL	CONDENSER UNIT	AREA SERVED	INDOOR FAN		FILTER		COOLING (AT INDOOR UNIT)				HEATING (AT INDOOR UNIT)		REFRIGERANT		ELECTRICAL				SINGLE POINT OF CONNECTION	OPERATING WEIGHT INDOOR (LB)	OPERATING WEIGHT OUTDOOR (LB)	NOTES			
								CFM	MIN OA FLOW (CFM)	TYPE	MERV	SENS CAPACITY (BTU/H)	TOTAL CAPACITY (BTU/H)	EAT DB (°F)	EAT WB (°F)	TOTAL CAPACITY (BTU/H)	ENT AIR TEMP (°F)	TYPE	QTY (LB)	GAS PIPE CONNECTION (IN)	LIQUID PIPE CONNECTION (IN)	MCA	MOP					VOLTAGE	FREQUENCY (HZ)	PHASE
FCU	1	DAIKIN	FXZQ09TAVJU	CASSETTE	RXTQ36TAVJ9A	CU-1	OFFICE	315	30	PANEL	8	6,600	9,500	80	67.0	10,500	70	R-410A	6.40	1/2"	1/4"	16.5	20	208	60	1	Yes	36	172	1,2,3,4,5
FCU	2	DAIKIN	FXAQ24PVJU	WALL MOUNTED	RXTQ36TAVJ9A	CU-1	IT ROOM	635	0	PANEL	3	18,000	24,000	80	67.0	26,500	70	R-410A	6.40	5/8"	3/8"	0.0	0	0	0	1	Yes	31	0	1,2,3,4,5

MECHANICAL - FAN SCHEDULE

* CELLS WITH SHADED BACKGROUNDS ARE UNASSIGNED OR UNDER REVIEW

- NOTES:
 (1) PROVIDE WITH AND CONTROL BY LINE VOLTAGE THERMOSTAT SET TO 90 °F.
 (2) REFER TO DETAIL 3/MH#000 FOR SUPPORT AND ANCHORAGE.

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	TYPE	FAN			MOTOR DRIVE		ELECTRICAL			EMERG. PWR. (Y/N)	OPERATING WEIGHT (LB)	NOTES	
							AIR FLOW (CFM)	ESP (IN-WG)	SPEED (RPM)	HP	VFD (Y/N)	VOLT (V)	PH	HZ				
TF	1	GREENHECK	SQ-70-VG	AV CLOSET 116A	AV CLOSET 116A	INLINE	75	0.2	1172	0.070	Yes	No	115	1	60	No	30	1, 2

CLIENT
State of California
 Dept. of General Services

 Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT
 CONFERENCE CENTER & LIBRARY
 IMPROVEMENTS, RE-ROOF AND HVAC
 UPGRADES

 California African American Museum
 600 State Drive
 Los Angeles, CA 90037

PRIME CONSULTANT

 IBI GROUP
 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com



SUB CONSULTANT

 INTEGRAL
 15700 Ventura Blvd, Suite 1902
 Los Angeles, CA 91436
 310.325.5555 Telephone
 E-Mail: info@integralgroup.com
 www.integralgroup.com



NO.	ISSUANCE	STATUS	DATE
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
HVAC EQUIPMENT SCHEDULE

DATE: 2022-05-02

DRAWN BY: IG

CHKD BY: JG

SCALE:

DGS NO: 4359

IBI PROJECT NO: 119020

SHEET NUMBER: **MH0101**
 ISSUE: **A1**

APPROVED
DIV. OF THE STATE ARCHITECT
APP. 03-121785 INC. 0
REVIEWED FOR
SS FLS ACS
DATE: 05/12/2022

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
05/12/22
21-2731
FIRE
SINCE 1850
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CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
650 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



SUB CONSULTANT
INTEGRAL
15700 Ventura Blvd., Suite 1902
Los Angeles, CA 91436
310.325.9555 Telephone
E-Mail: info@integralgroup.com
www.integralgroup.com



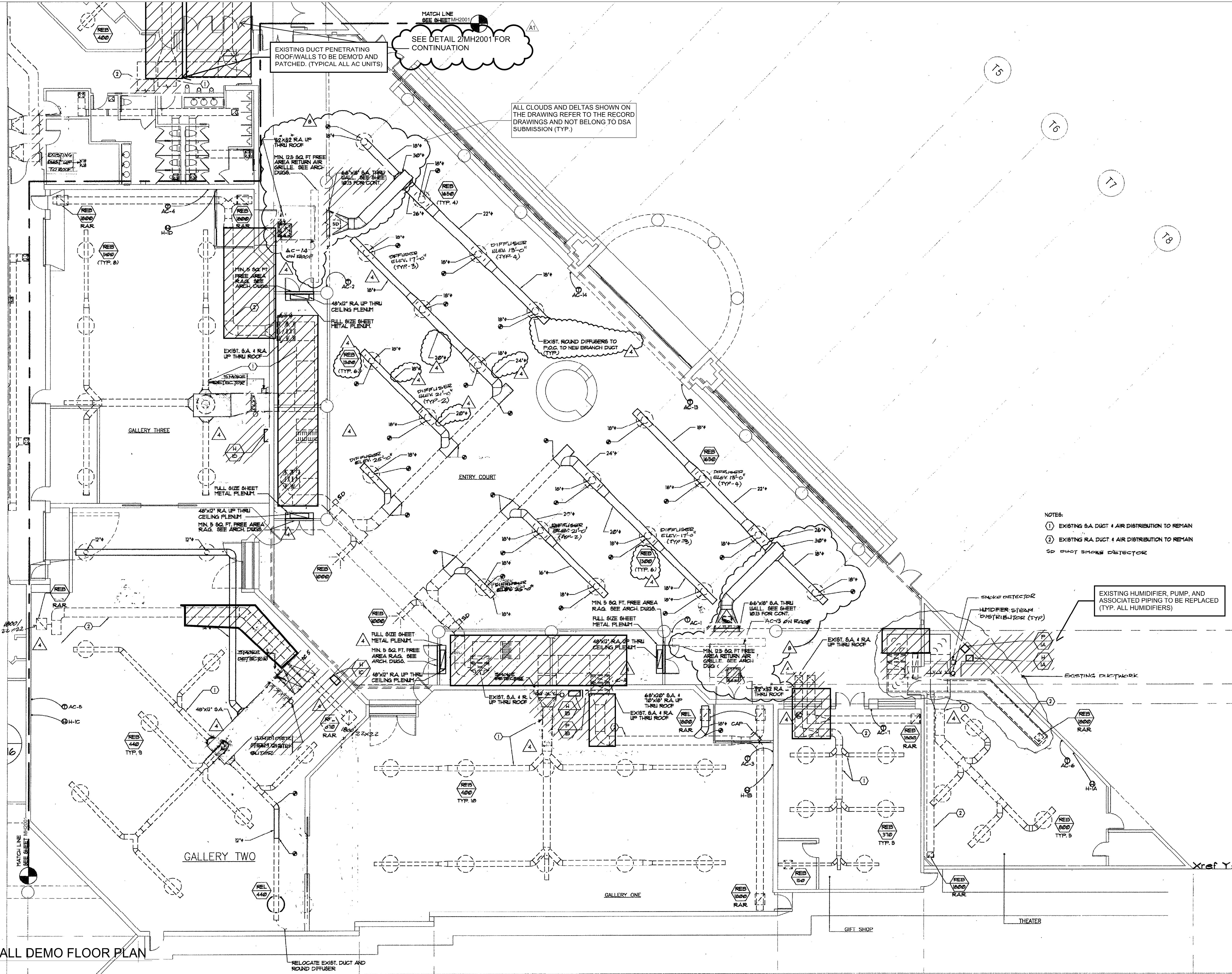
ISSUES

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**HVAC - OVERALL
DEMOLITION FLOOR PLAN**

DATE: 2022-05-02
DRAWN BY: IG
CHKD BY: JG
SCALE: 1/16" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
MH2000 A1



1 MECHANICAL OVERALL DEMO FLOOR PLAN
SCALE: 1/16" = 1'-0"

EXISTING AS BUILT DRAWINGS USED AS
BACKGROUND FOR REFERENCE ONLY



APPROVED
 DIV. OF THE STATE ARCHITECT
 APP. 03-121785 INC. 0
 REVIEWED FOR
 SS FLS ACS
 DATE: 05/12/2022

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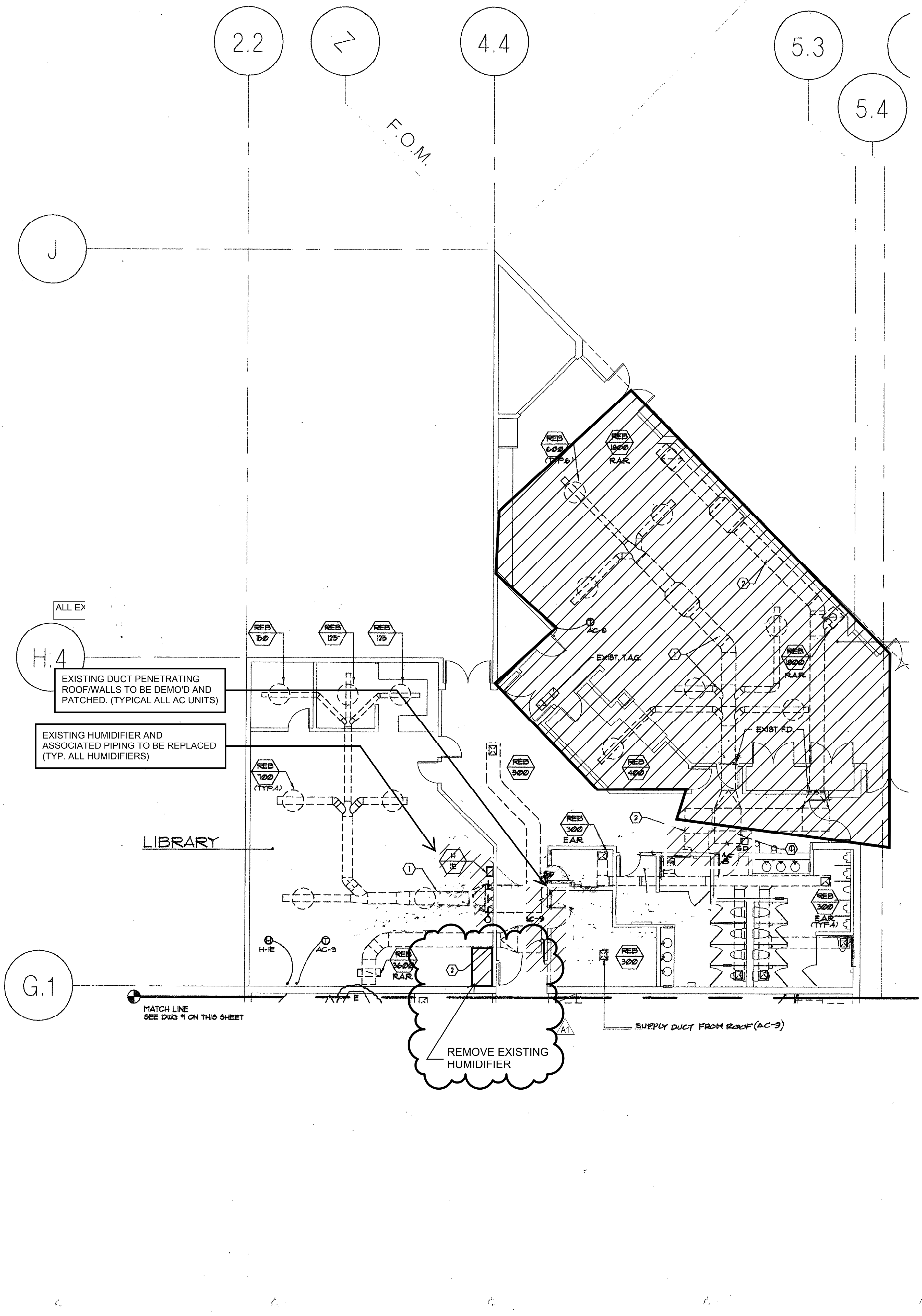
ISSUES

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSASCFM SUBMITTAL		2021-09-14
V2	DSASCFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**HVAC - PARTIAL
 DEMOLITION FLOOR PLAN**

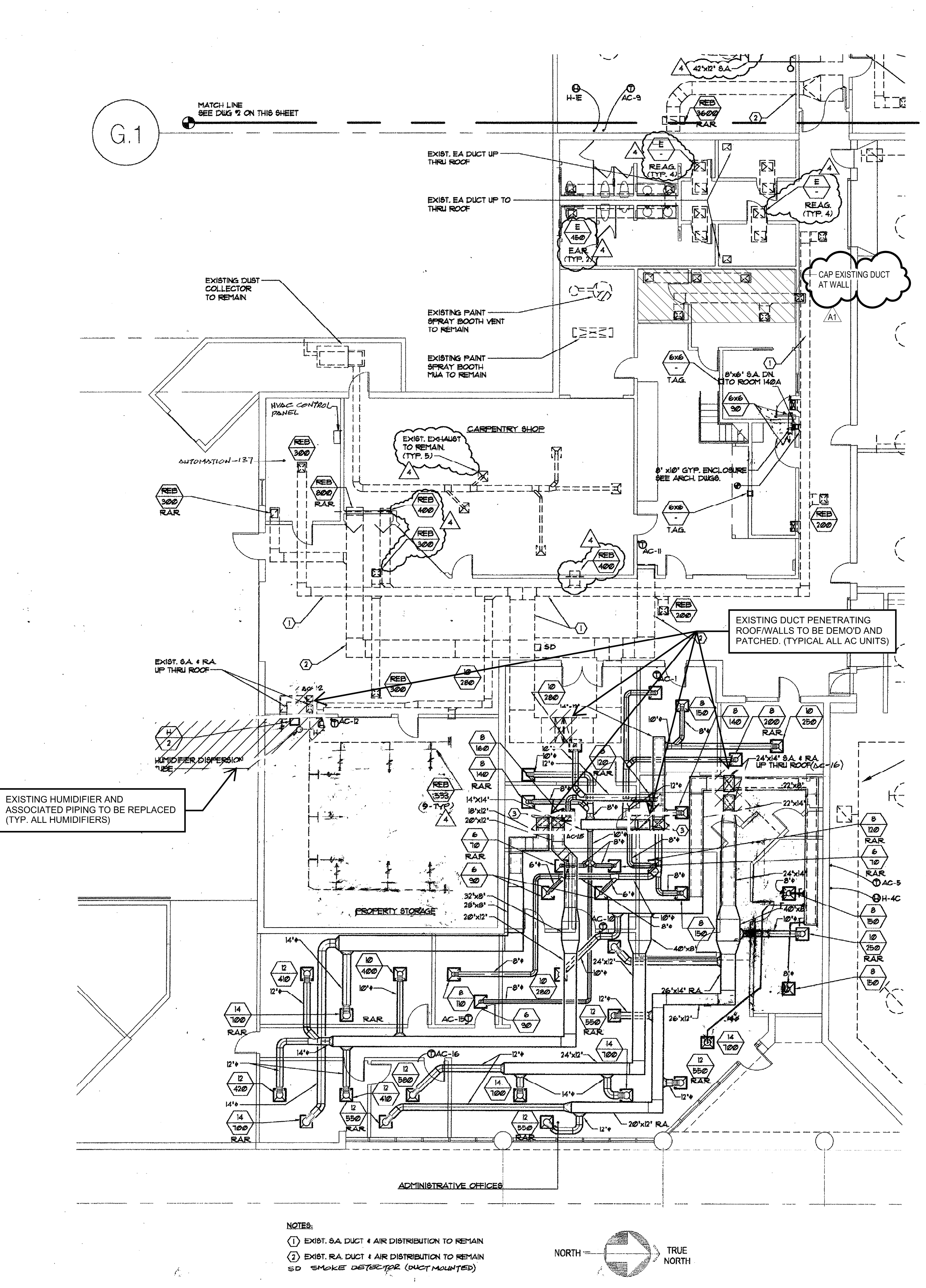
DATE: 2022-05-02
 DRAWN BY: IG
 CHKD BY: JG
 SCALE: 3/16" = 1'-0"
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER
MH2001 A1



2 MECHANICAL PARTIAL DEMO FLOOR PLAN
 SCALE: 1/16" = 1'-0"

EXISTING AS BUILT DRAWINGS USED AS
 BACKGROUND FOR REFERENCE ONLY



1 MECHANICAL PARTIAL DEMO FLOOR PLAN
 SCALE: 1/16" = 1'-0"

EXISTING AS BUILT DRAWINGS USED AS
 BACKGROUND FOR REFERENCE ONLY



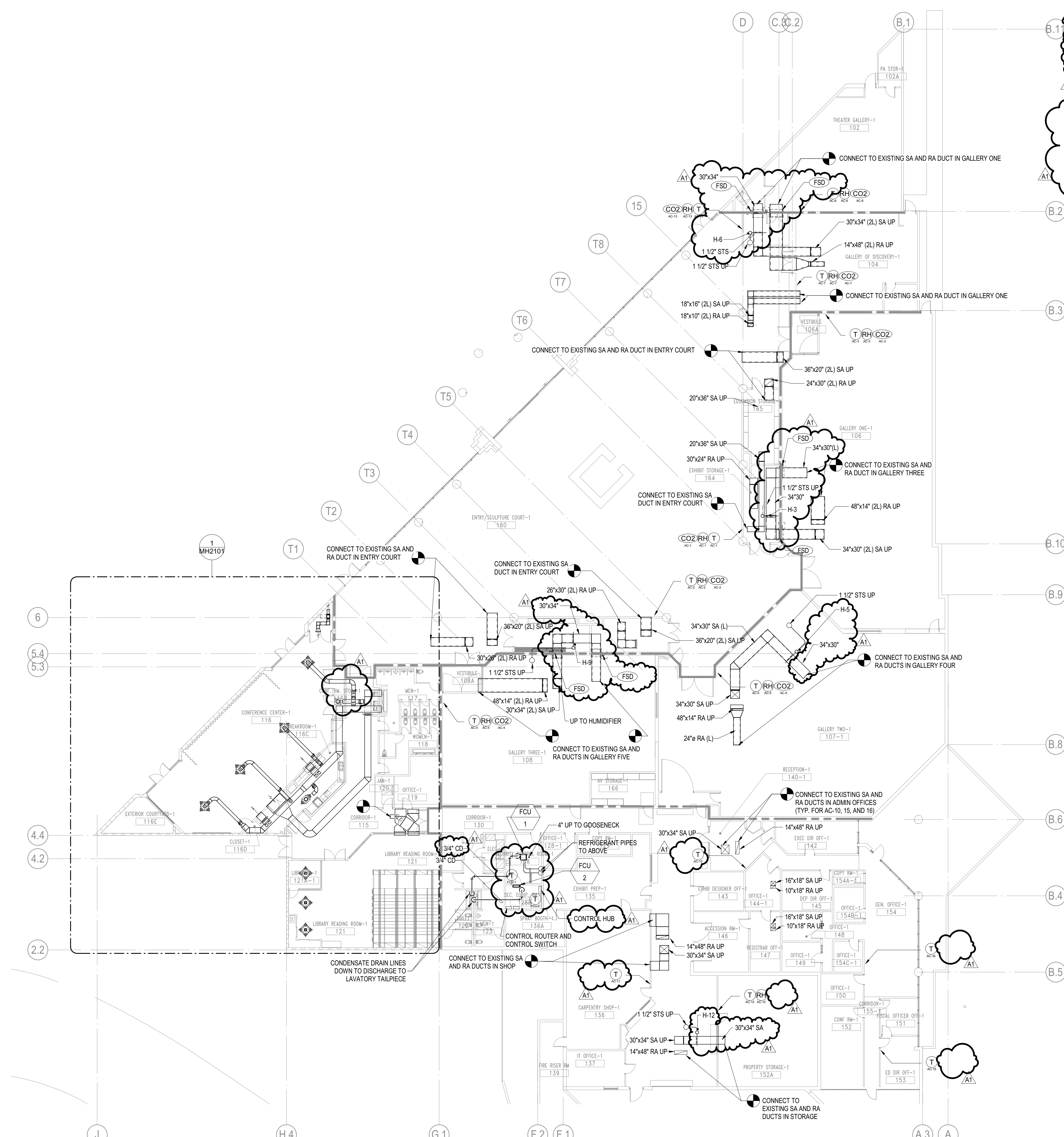
Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

GENERAL NOTES:

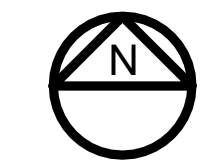
- A. CONSTRUCTION WILL BE PHASED. REFER TO ARCHITECTURAL DRAWINGS FOR PHASING INFORMATION.
- B. REFER TO DRAWING MH6000 AND MH8001 FOR EQUIPMENT, PIPING AND DUCTWORK INSTALLATION DETAILS.
- C. MUSEUM IT VENDOR TO PROVIDE DATA DROP AT CONTROL SWITCH AND CONTROL HUB.
- D. CONTRACTOR TO PROVIDE HARDWIRED BACNET/MSTP CONNECTION FROM EACH AC UNIT, HUMIDIFIER AND CONDENSING UNIT TO CONTROL SWITCH. NO INTERNAL LINING PERMITTED WITHIN 60" AFTER STEAM HUMIDIFIER.

FIRE WALL LEGEND

- (E) 4 HOUR RATED WALL
- (E) 2 HOUR RATED WALL



1 MECHANICAL OVERALL PLAN
SCALE: 1/16" = 1'-0"



SHEET NUMBER
MH2100 A1

CLIENT
**State of California
Dept. of General Services**
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

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Los Angeles, CA 90037

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310.422.9655 Telephone
E-Mail: info@integralgroup.com
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ISSUES

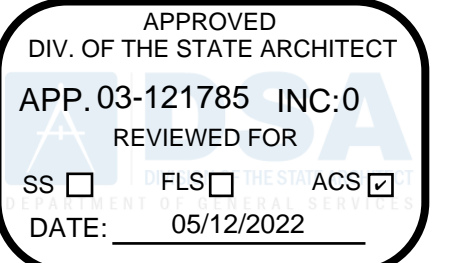
NO.	ISSUANCE	STATUS	DATE
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V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
HVAC - OVERALL FLOOR PLAN

DATE: 2022-05-11
DRAWN BY: IG
CHKD BY: JG
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

ISSUE
MH2100 A1

GENERAL NOTES:
 A. CONSTRUCTION WILL BE PHASED. REFER TO ARCHITECTURAL DRAWINGS FOR PHASING INFORMATION.
 B. REFER TO DRAWING M8000 FOR EQUIPMENT, PIPING AND DUCTWORK INSTALLATION DETAILS.
 C. ALL NEW EXPOSED DUCTWORK SHALL BE PAINTED TO MATCH EXISTING.



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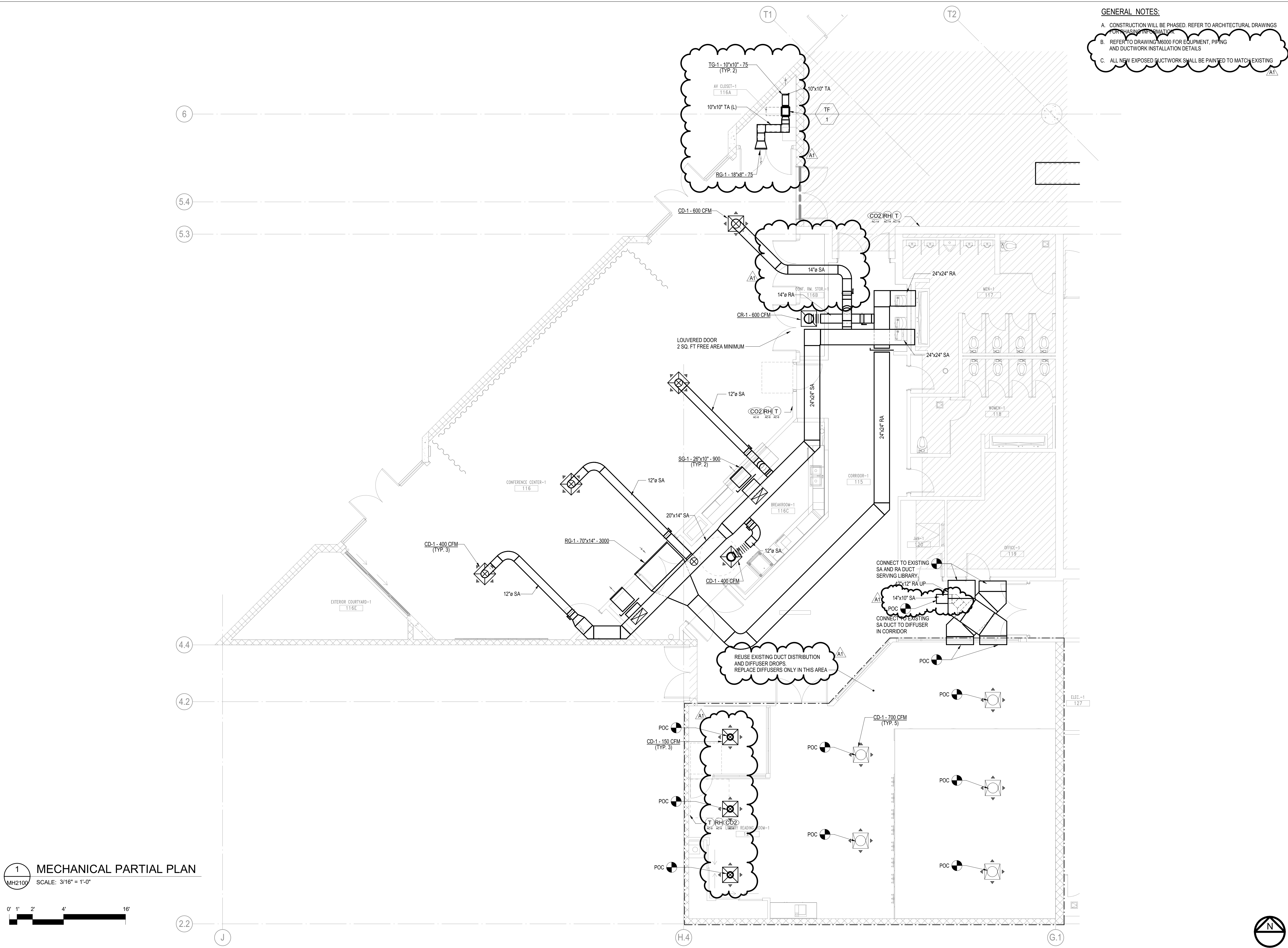
ISSUES

NO.	ISSUANCE	STATUS	DATE
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G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
HVAC - PARTIAL FLOOR PLAN

DATE: 2022-05-11
 DRAWN BY: IG
 CHKD BY: JG
 SCALE: 3/16" = 1'-0"
 DGS NO: 4359
 IBI PROJECT NO: 119020

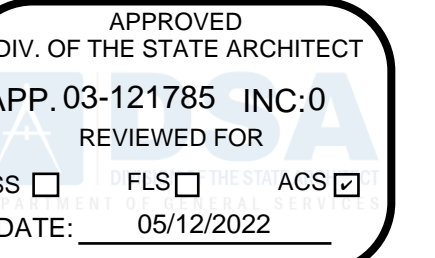
SHEET NUMBER **MH2101** ISSUE **A1**



1 MECHANICAL PARTIAL PLAN
 MH2101 SCALE: 3/16" = 1'-0"
 0' 1' 2' 4' 16'

GENERAL NOTES:

- A. CONSTRUCTION WILL BE PHASED. REFER TO ARCHITECTURAL DRAWINGS FOR PHASING INFORMATION.
- B. REFER TO SHEET MH2800 FOR EQUIPMENT, PIPING AND DUCTWORK INSTALLATION DETAILS.
- C. REFER TO DETAIL 3 A2800 FOR DETAIL OF DUCT THROUGH ROOF.



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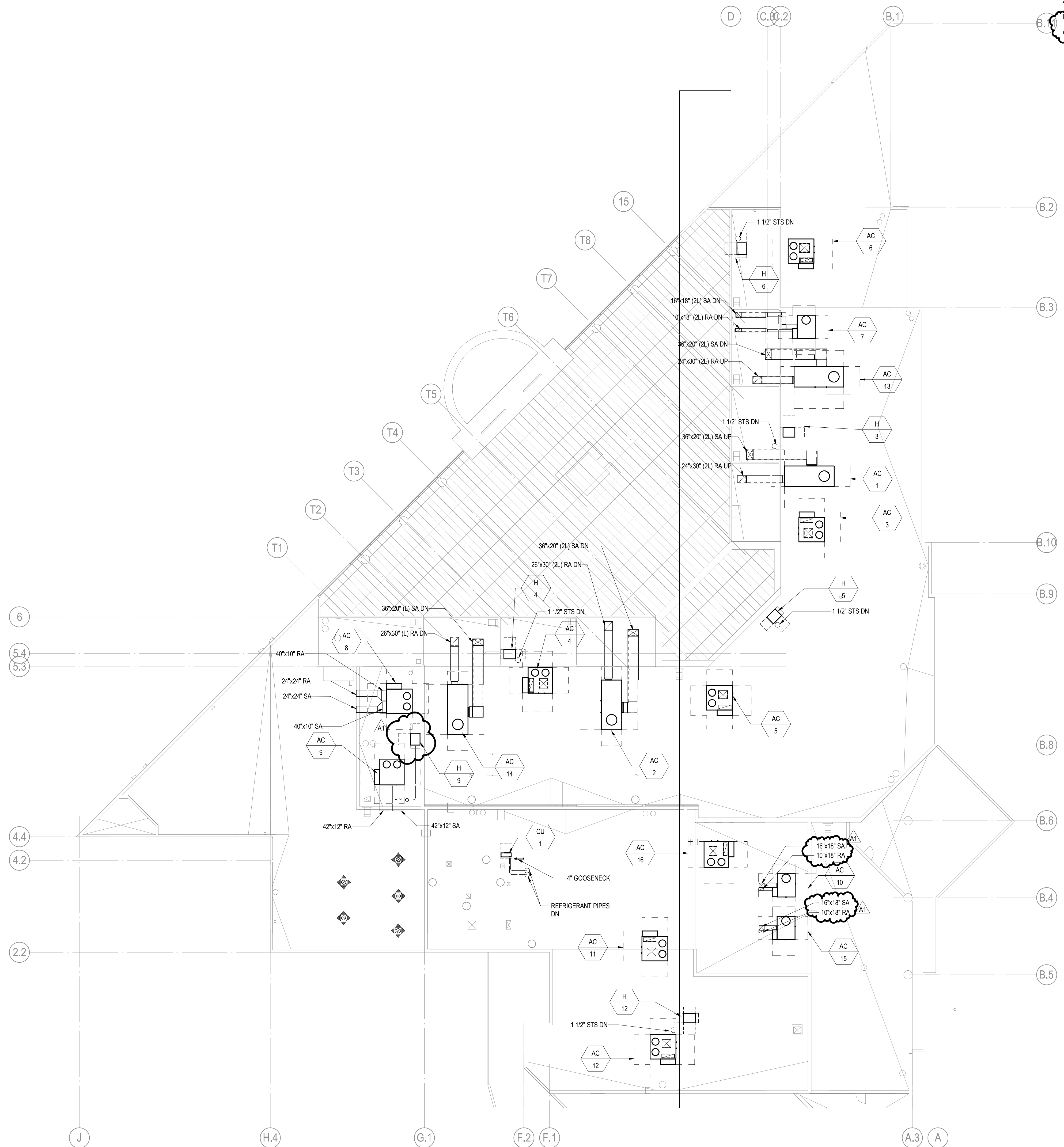
ISSUES

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A1	ADDENDUM #1		2022-05-02

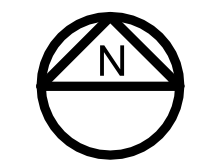
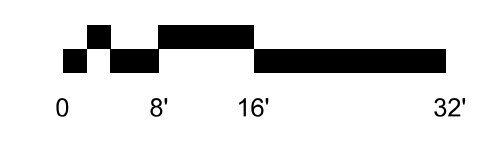
SHEET TITLE
HVAC - ROOF PLAN

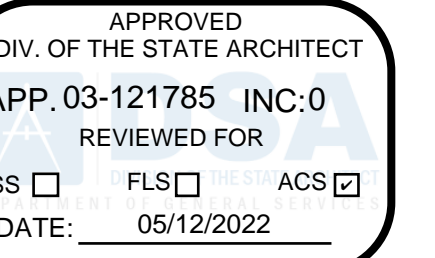
DATE: 2022-05-02
DRAWN BY: IG
CHKD BY: JG
SCALE: 1/16" = 1'-0"
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
MH2800
ISSUE
A1

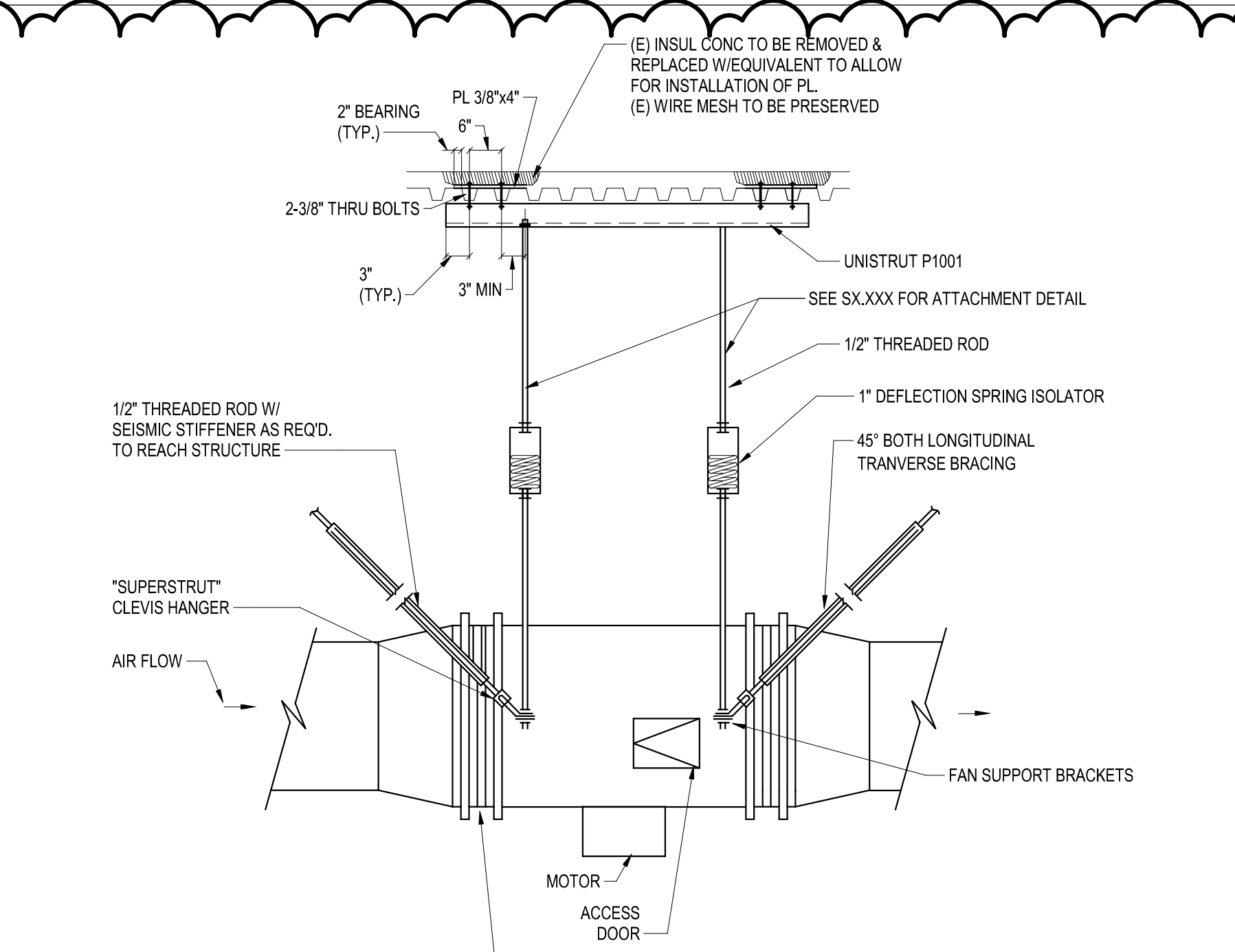
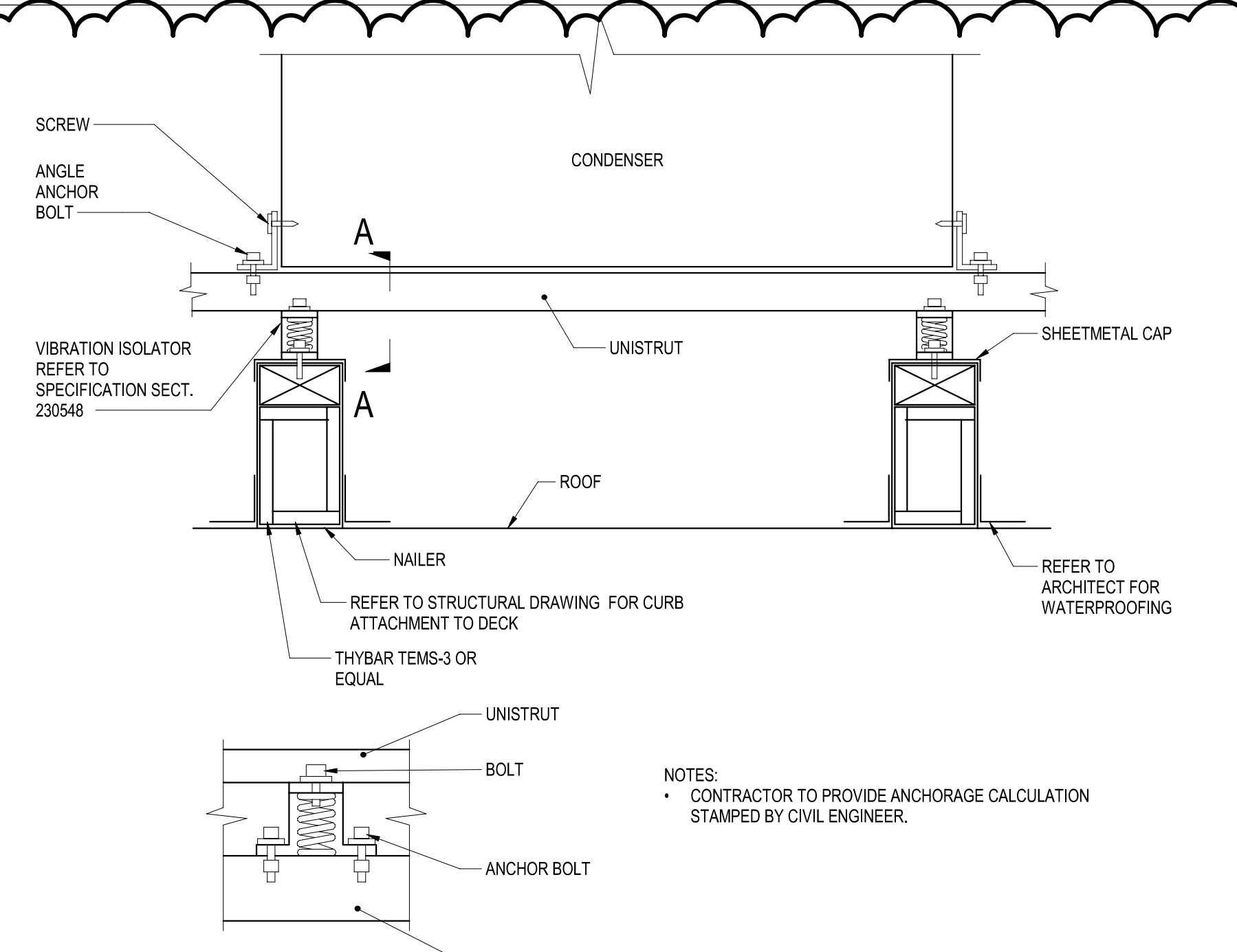
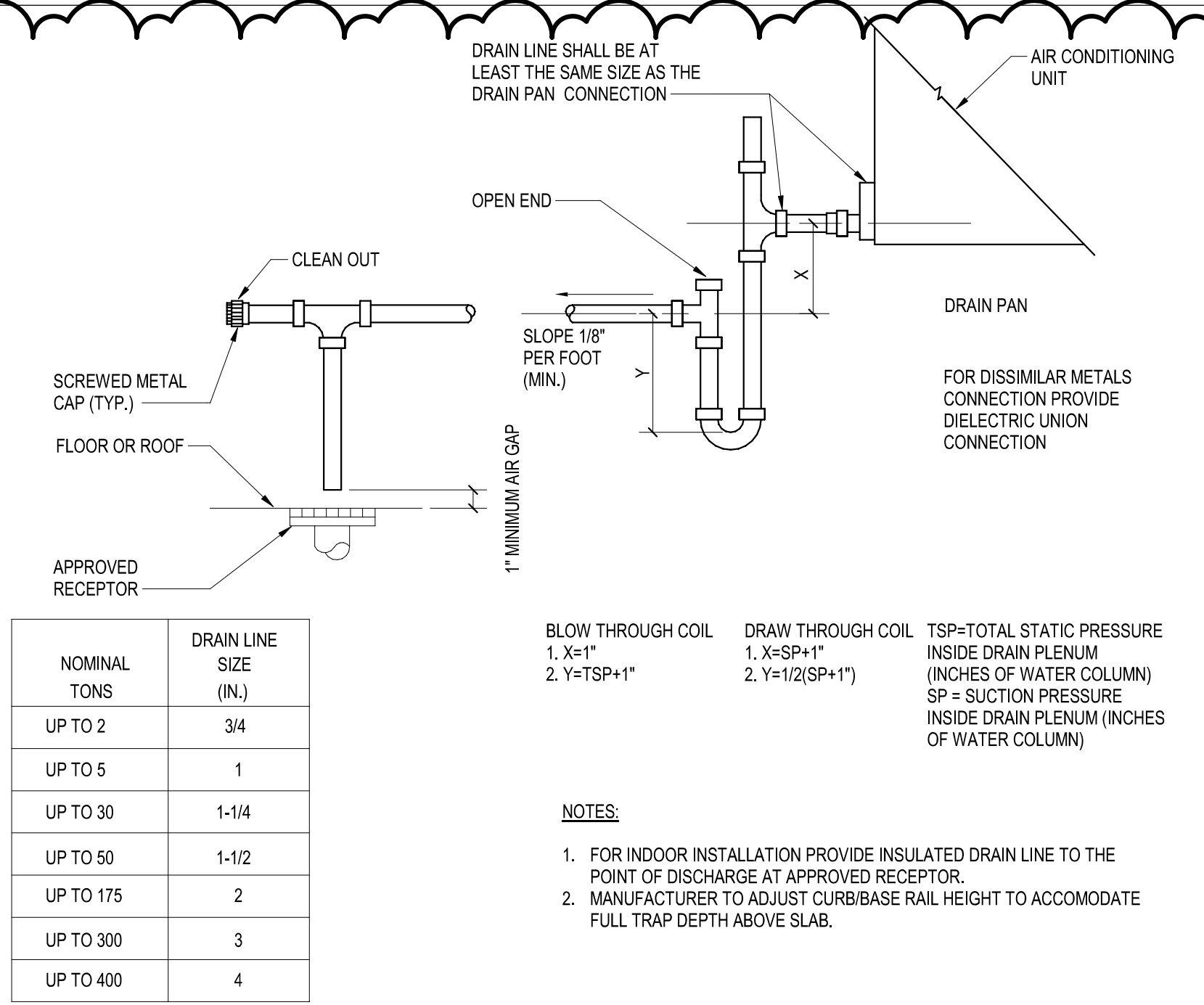


1 MECHANICAL ROOF PLAN
SCALE: 1/16" = 1'-0"





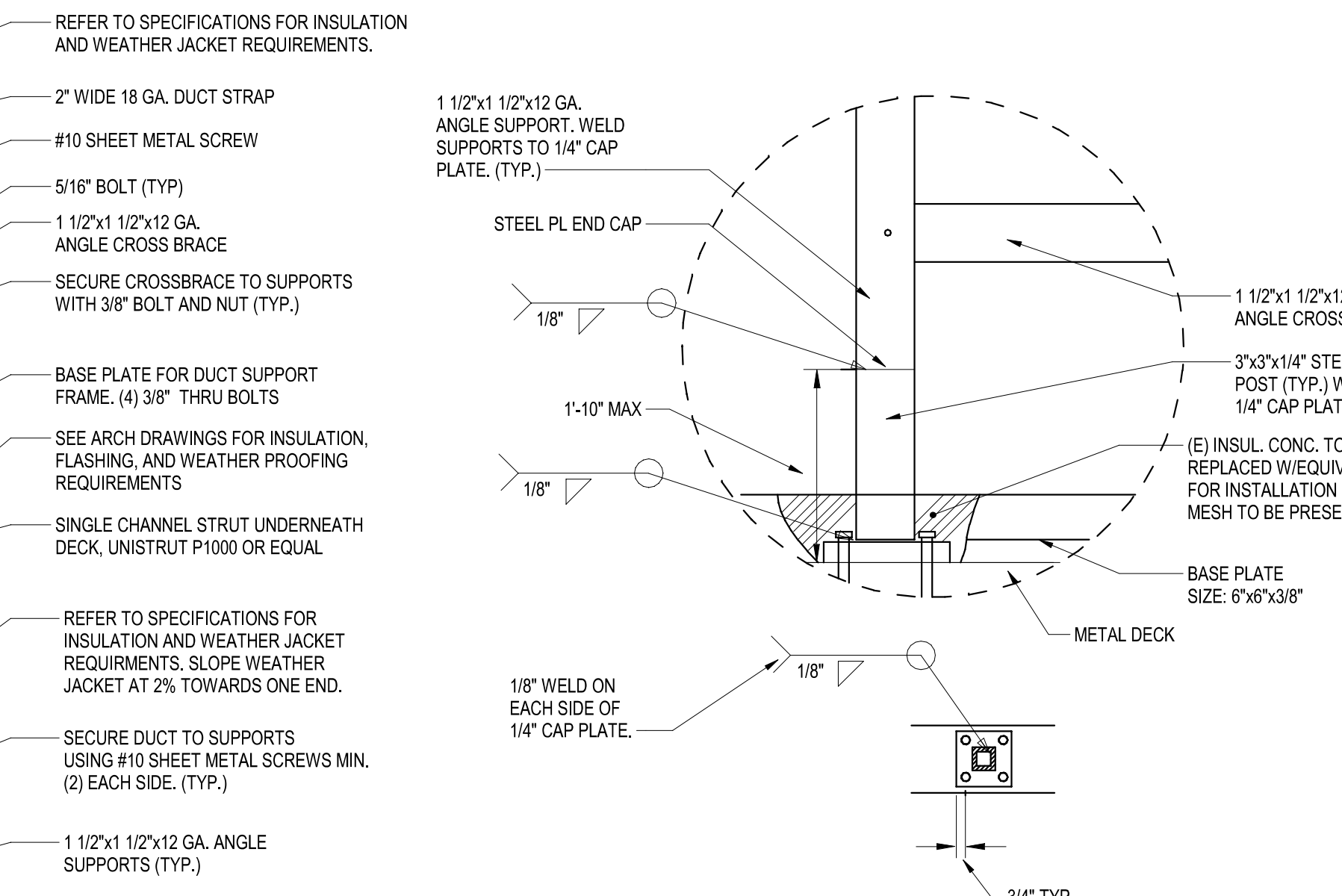
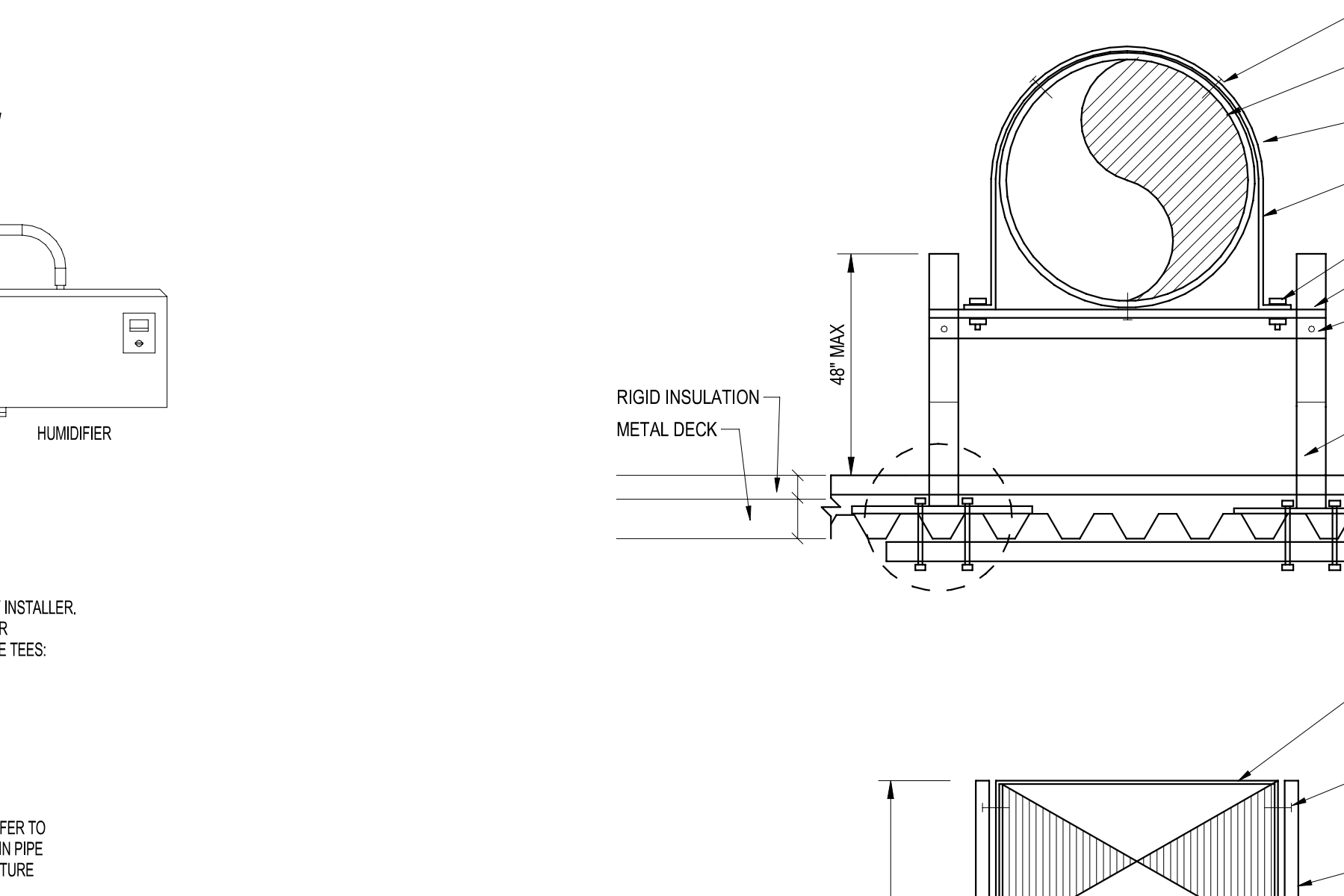
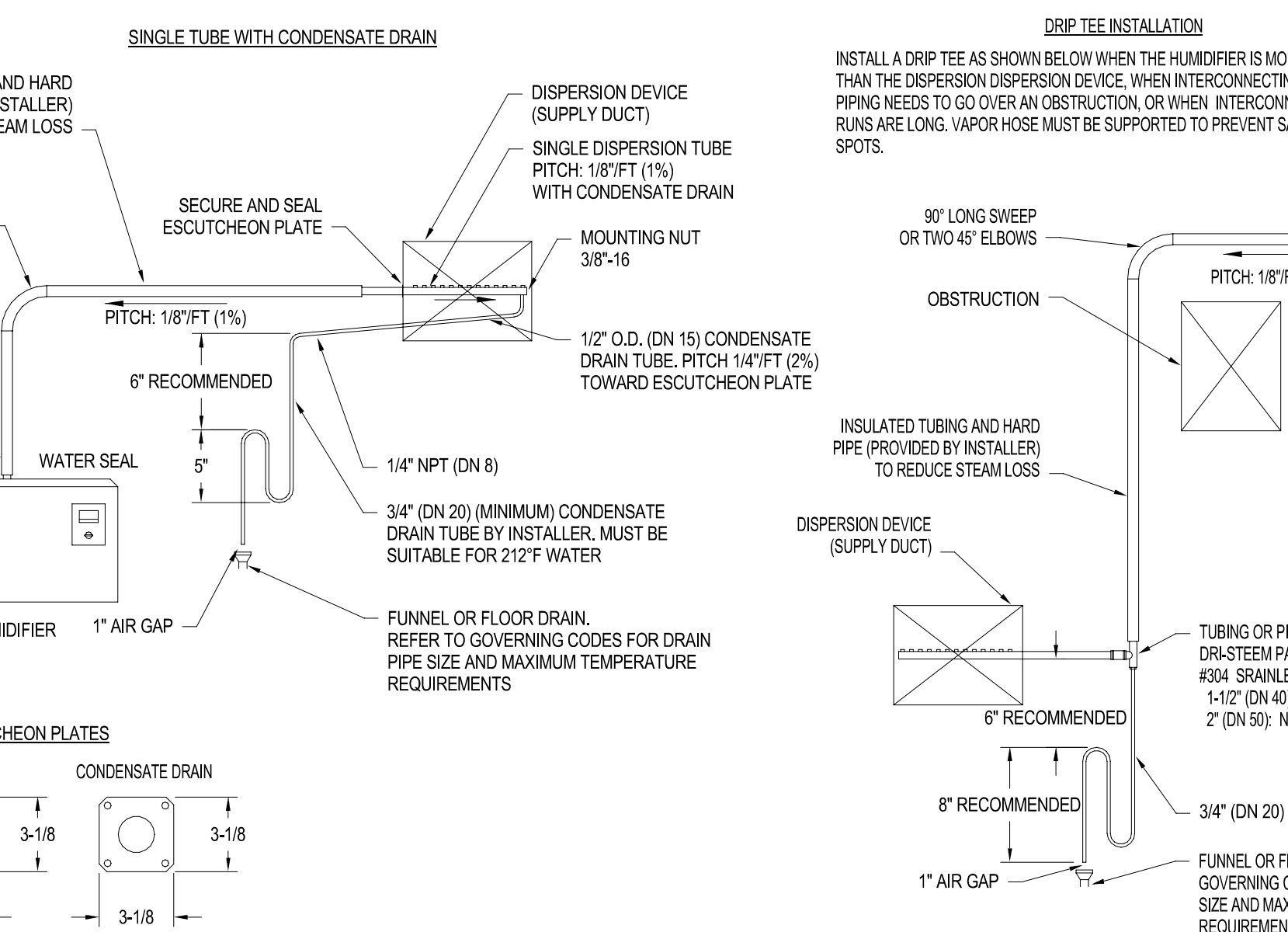
Client: State of California Dept. of General Services
 Project: CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES
 Prime Consultant: IBI GROUP
 Sub Consultant: INTEGRAL



7 CONDENSATE TRAP DETAIL N.T.S.

5 CONDENSER MOUNTING DETAIL N.T.S.

3 INLINE EXHAUST FAN MOUNTING DETAIL N.T.S.



NOTES:
 1. USE DRI-STEEM'S HARD PIPE ADAPTER KIT TO CONNECT THE STEAM OUTLET TO HARD PIPE. USE A HOSE CLAMP TO CONNECT THE STEAM OUTLET TO VAPOR HOSE. USE A HOSE CUFF AND CLAMPS TO CONNECT THE STEAM OUTLET TO TUBING.
 2. THIN-WALLED TUBING HEATS UP FASTER THAN HEAVY-WALLED PIPE CAUSING LESS STEAM LOSS AT START-UP.
 3. HARD PIPE OR TUBING DIAMETER MUST MATCH HUMIDIFIER STEAM OUTLET SIZE 1 1/2" (DN 40) OR 2" (DN 50).
 4. MAXIMUM CAPACITY OF DISPERSION TUBE WITH CONDENSATE DRAIN: 1 1/2" (DN 40): 56.8 LBS/HR 2" (DN 50): 85.2 LBS/HR
 5. ORIENT DISPERSION TUBE SO THAT TUBELETS (STEAM ORIFICES) POINT UP.
 6. THE DISPERSION TUBE MUST BE PITCHED A MINIMUM OF 1/8" (1%) TOWARD THE DRAIN WHEN USING A CONDENSATE DRAIN. CONDENSATE DRAIN TUBING MUST BE PITCHED A MINIMUM OF 1/4" (2%) TOWARD THE DRAIN.

NOTES:
 1. MAXIMUM 1'-10" HIGH 3"X3" STEEL TUBE POST IS FROM TOP OF CONCRETE.
 2. ALL EXPOSED STEEL TO BE HOT-DIP GALVANIZED

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 1. MAXIMUM 1'-10" HIGH 3"X3" STEEL TUBE POST IS FROM TOP OF CONCRETE.
 2. ALL EXPOSED STEEL TO BE HOT-DIP GALVANIZED

6 HUMIDIFIER PIPING N.T.S.

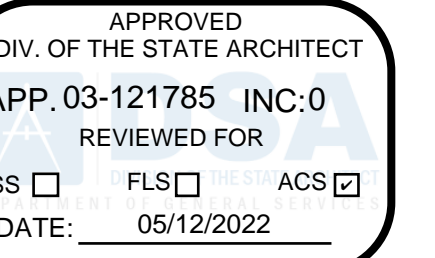
2 DSA 230529-07 DUCT SUPPORT ON METAL DECK ROOF DSA DETAIL N.T.S.

1 ISOLATION CURB INSTALLATION DETAIL N.T.S.

NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSA/OSFM SUBMITTAL		2022-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE: HVAC - MECHANICAL DETAILS

DATE: 2022-05-02
 DRAWN BY: IG
 CHKD BY: JG
 SCALE: NTS
 DGS NO: 4359
 IBI PROJECT NO: 119020
 SHEET NUMBER: MH6000
 ISSUE NUMBER: A1



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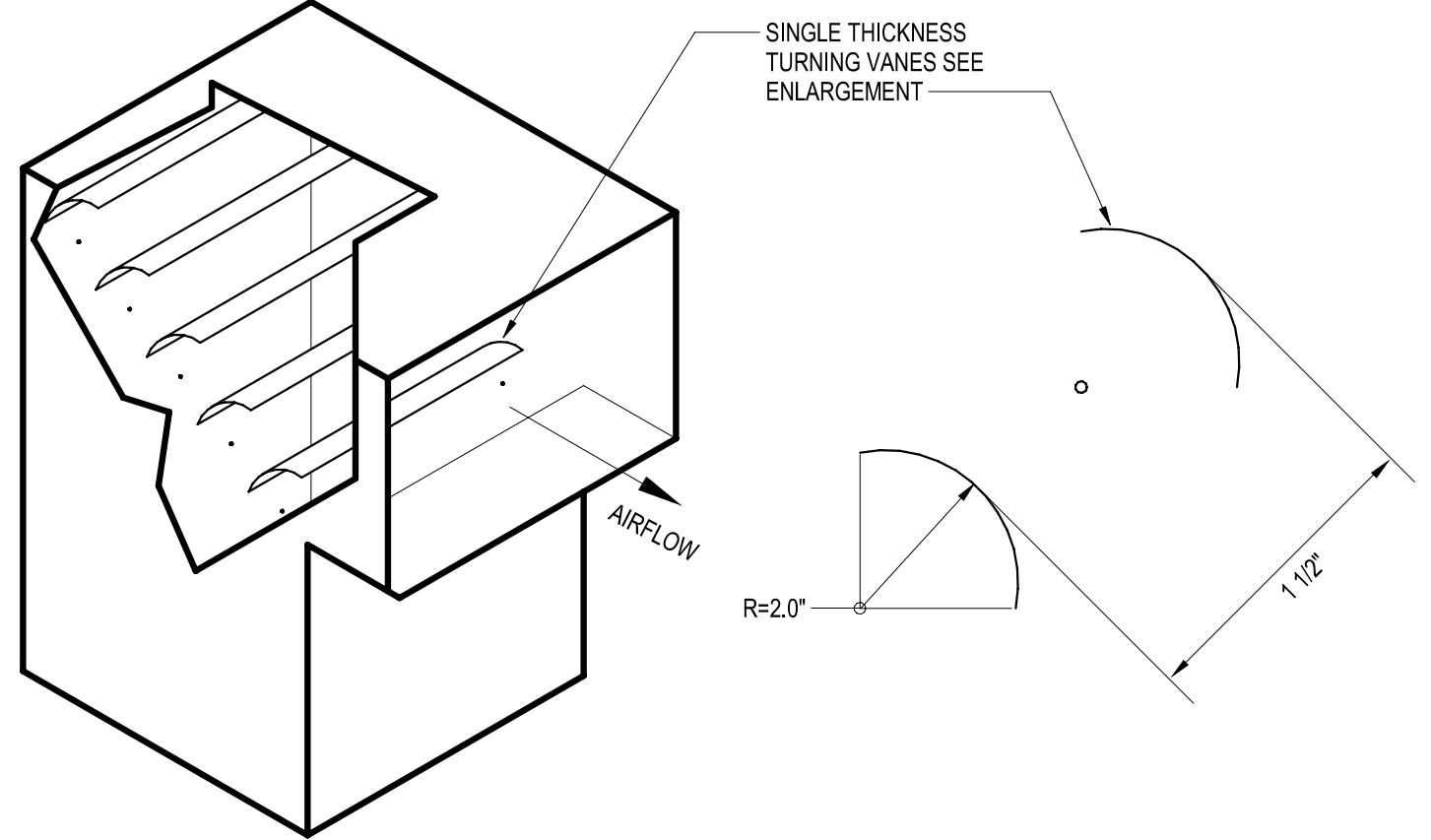


NO.	ISSUANCE	STATUS	DATE
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**HVAC - MECHANICAL
DETAILS**

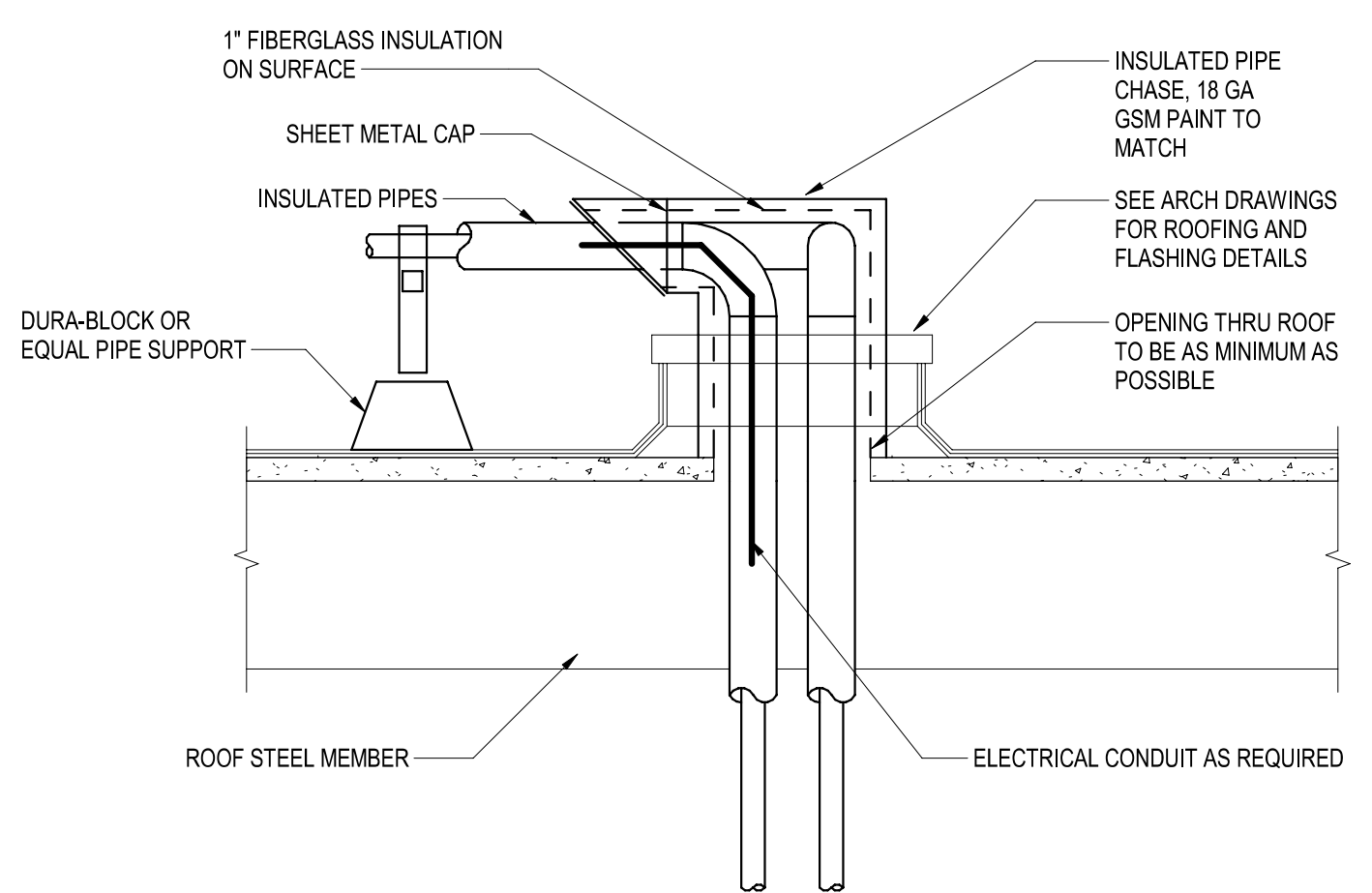
DATE: 2022-05-02
DRAWN BY: IG
CHKD BY: JG
SCALE: 12" = 1'-0"
DGS NO: 4359

PROJECT NO: 119888
SHEET NUMBER: **MH6001**
ISSUE: **A1**



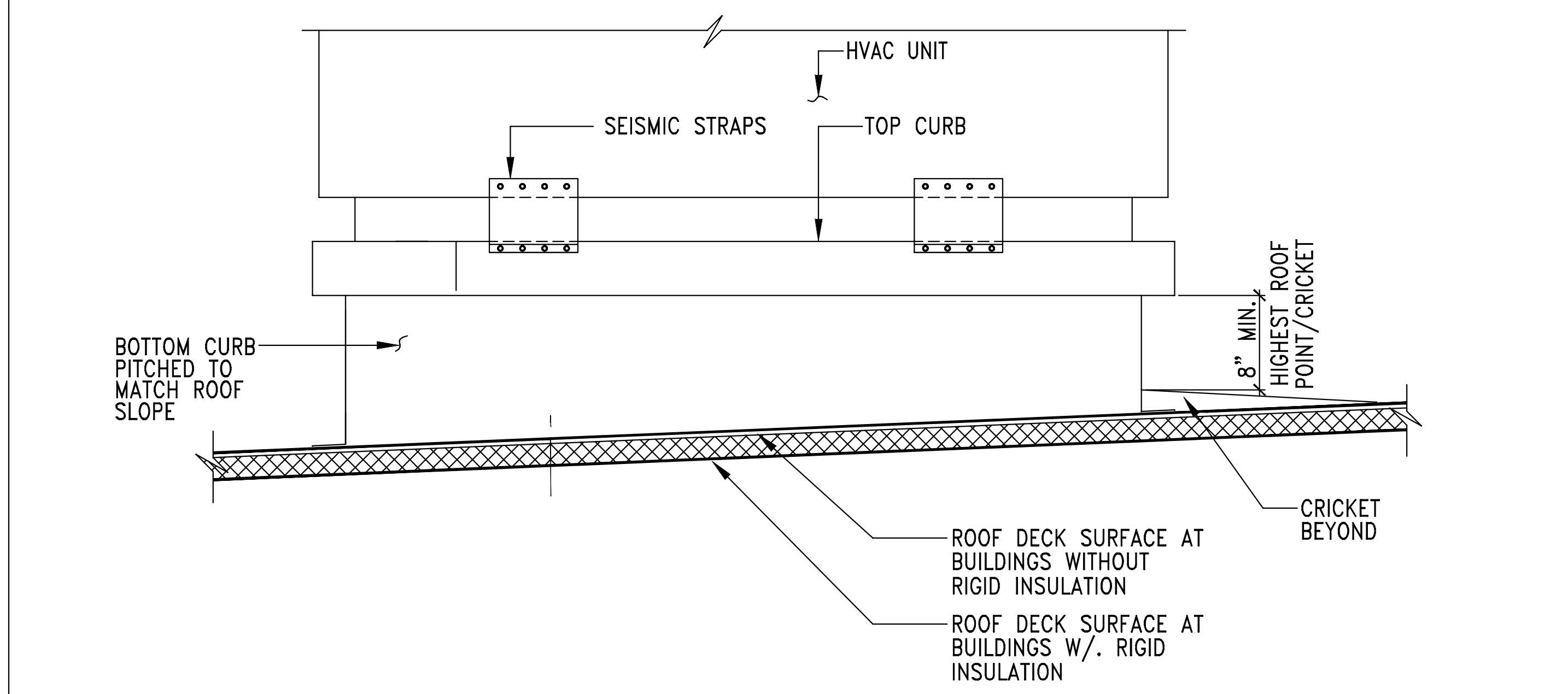
NOTES:
1. TURNING VANES REQUIRED AT ALL 90° RECTANGULAR DUCT ELBOWS UNLESS NOTED OTHERWISE.

3 RECTANGULAR DUCT ELBOW W/ SGL VANE
N.T.S.



NOTES:
1. PIPING SECURED BY MINIMUM 1/4" BANDS TO ROOF STRUCTURE
2. SLOPE PIPE AND CONDUIT AWAY FROM PIPE CHASE ENCLOSURE AT 1:200 SLOPE

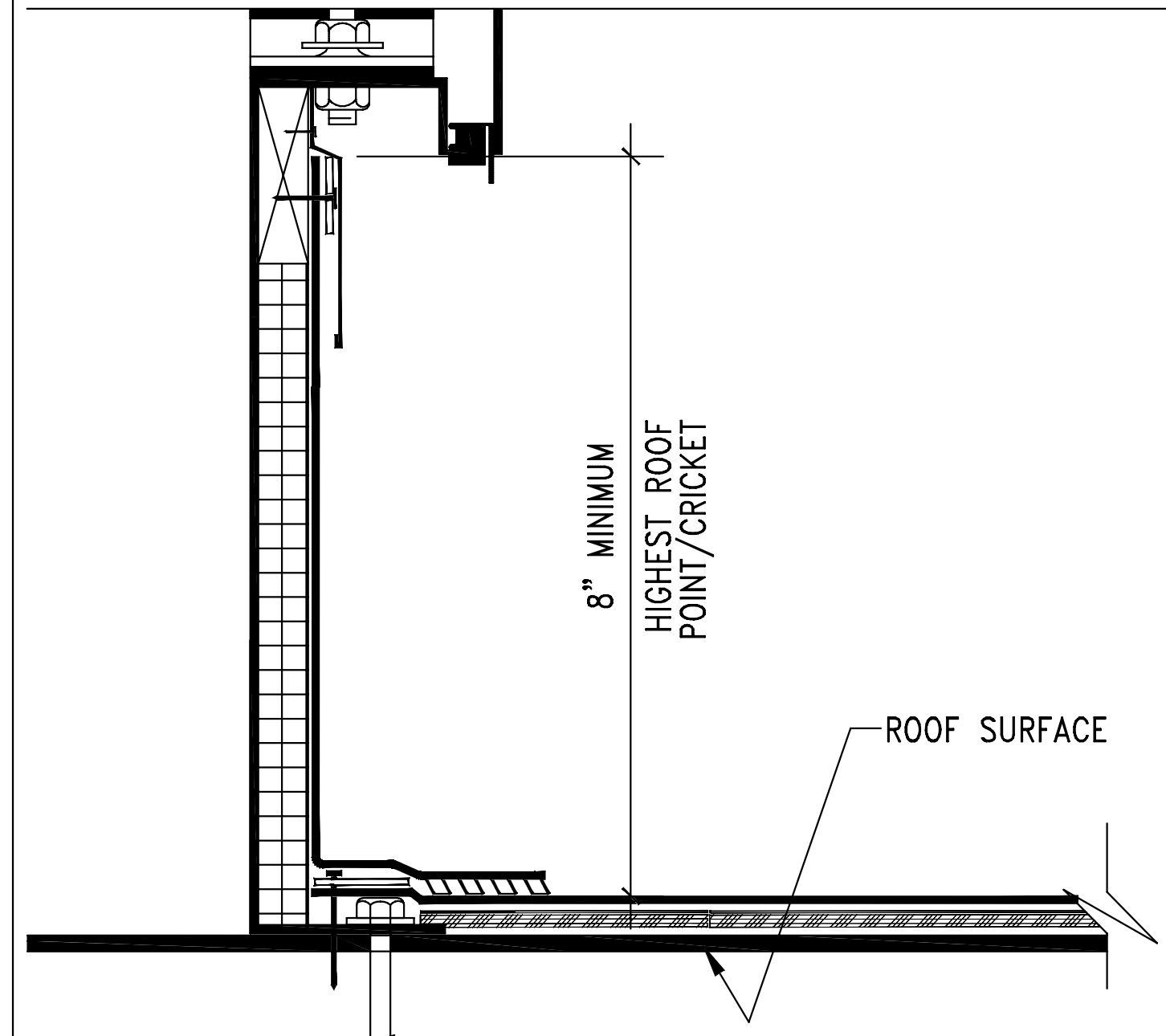
2 PIPE THROUGH ROOF DETAIL
N.T.S.



ELEVATION

SCALE:
NTS

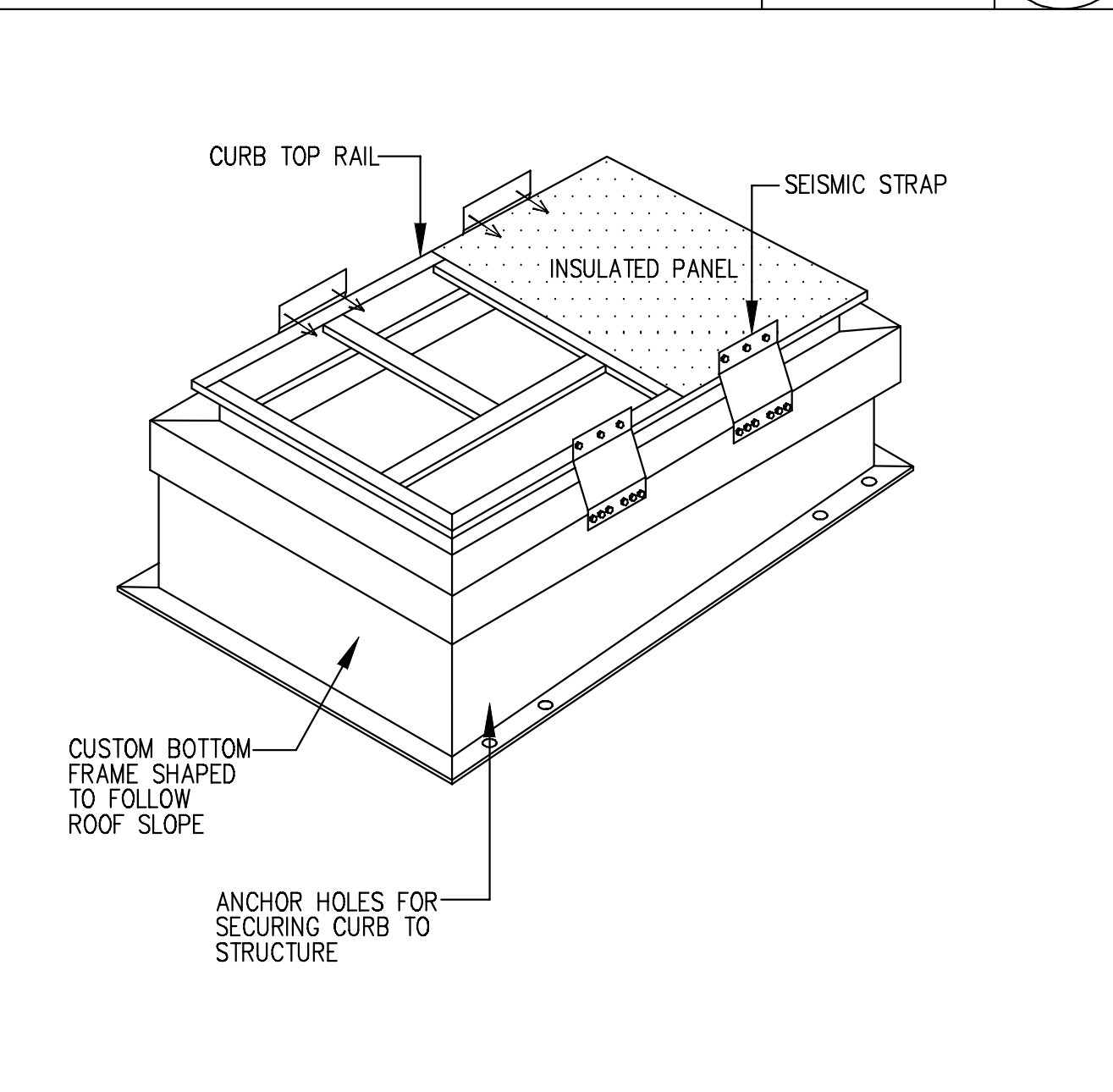
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DETAIL

SCALE:
NTS

3

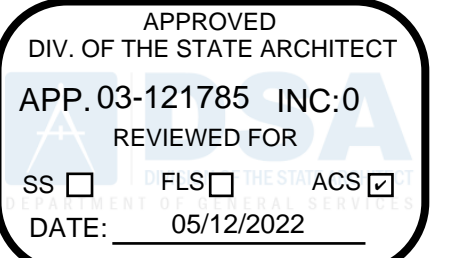


ISOMETRIC

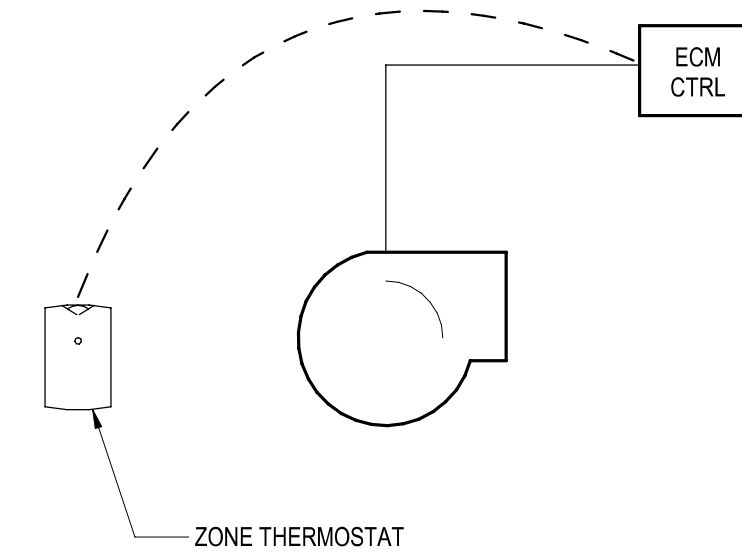
SCALE:
NTS

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1 CURB ATTACHMENT DETAIL
N.T.S.

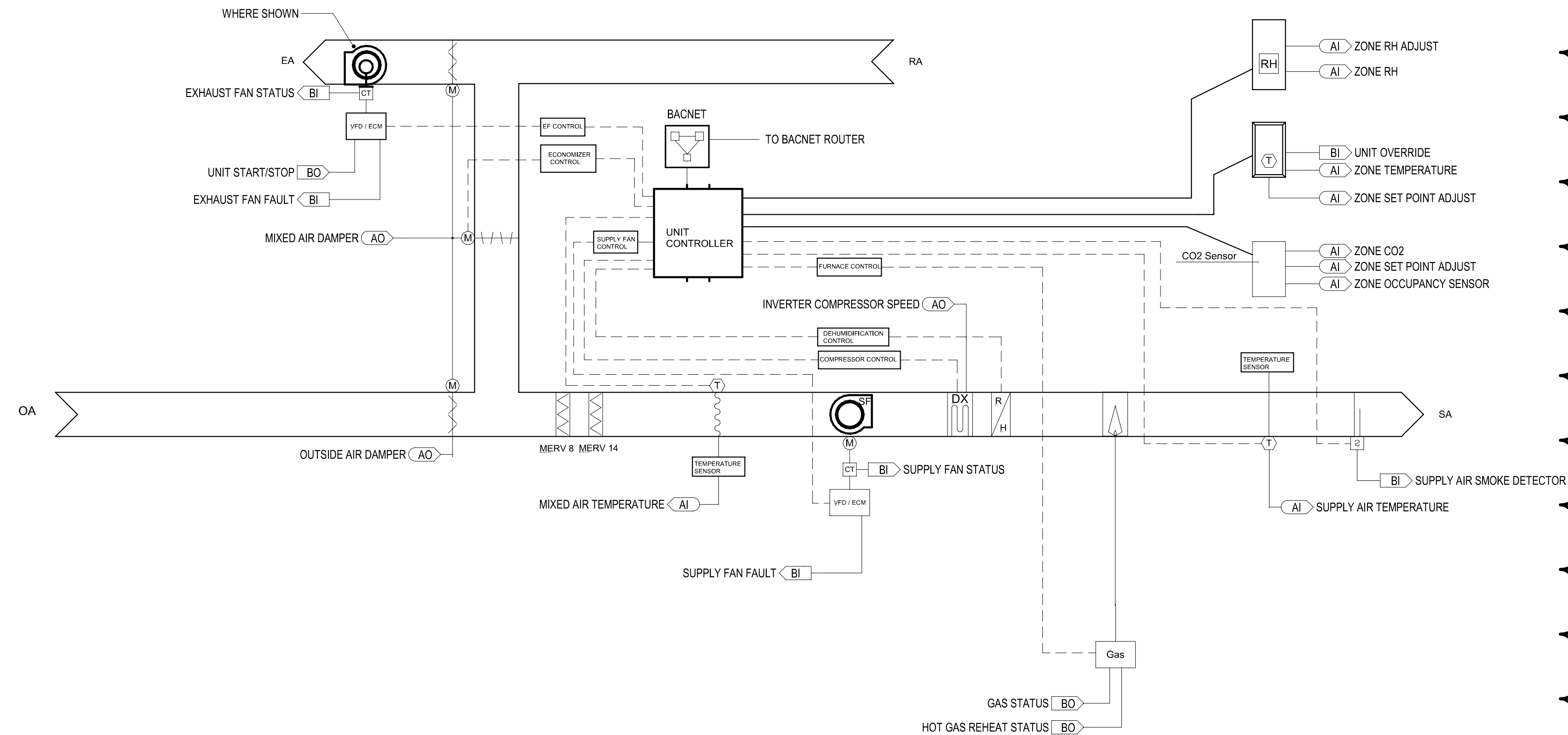


POINTS TABLE SELF CONTAINED HUMIDIFIER		
POINT DESCRIPTION		READ /WRITE
AIRFLOW	PROOF SWITCH	R
SENSOR DUCT	HIGH LIMIT	R

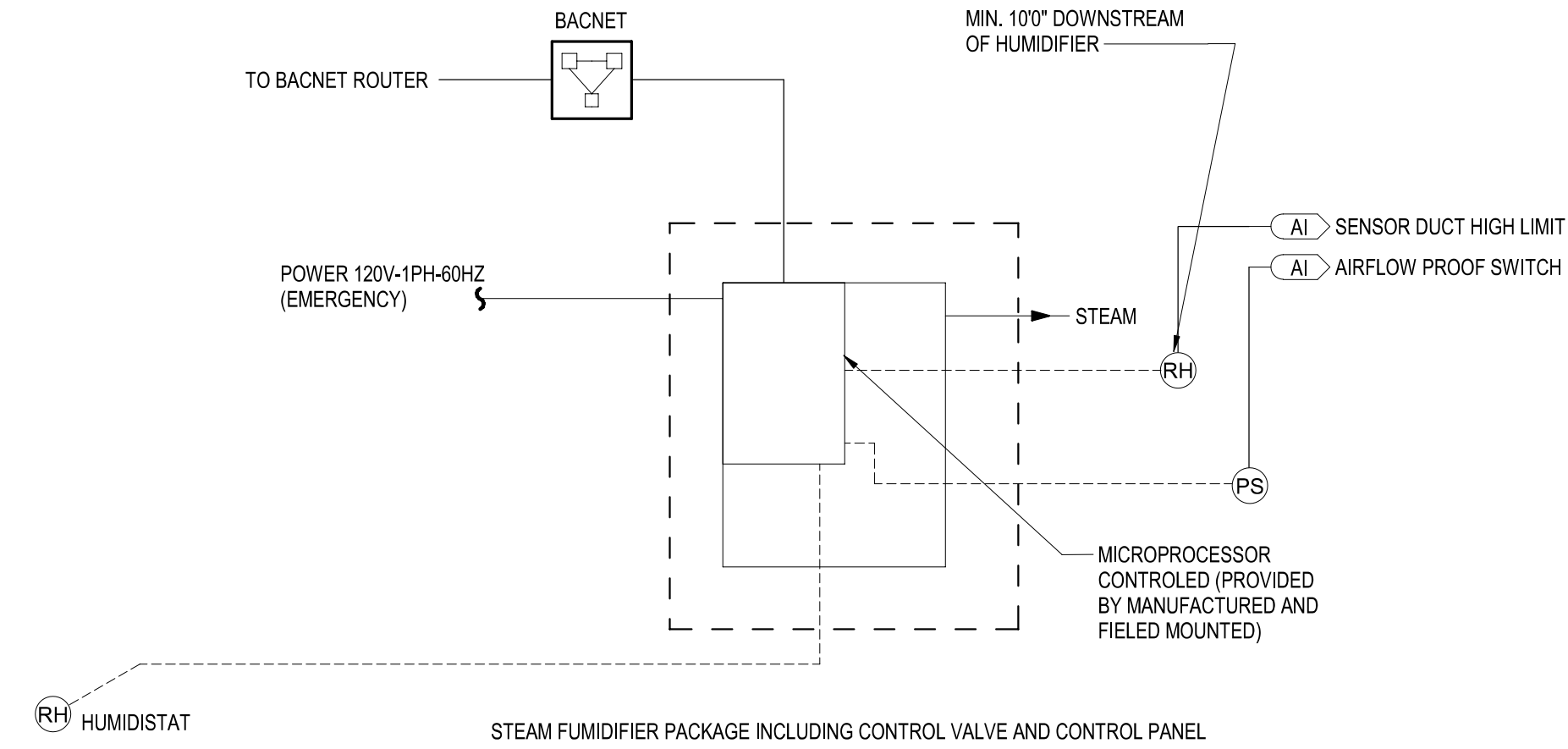


3 EXHAUST FAN, TEMPERATURE CONTROLLED CONTROL
N.T.S.

POINTS TABLE SPLIT SYSTEM CONTROL		
POINT DESCRIPTION		READ/WRITE
MIXED AIR	TEMPERATURE	R
SUPPLY AIR	TEMPERATURE	R
	ZONE OCCUPANCY SENSOR	R
ZONE	SET POINT ADJUST	W
ZONE	CO2	R
ZONE	SET POINT ADJUST	W
ZONE	TEMPERATURE	R
ZONE	RH	R
ZONE	RH ADJUST	W
OUTSIDE AIR DAMPER		R
MIXED AIR DAMPER	DAMPER	R
INVERTER COMPRESSOR	SPEED	R
EXHAUST FAN	STATUS	R
EXHAUST FAN	FAULT	R
SUPPLY FAN	FAULT	N
SUPPLY FAN	STATUS	N
SUPPLY AIR	SMOKE DETECTOR	N
UNIT	VERRIDE	W
UNIT	START/STOP	W
GAS	STATUS	R
HOT GAS REHEAT	STATUS	R



1 TYPICAL AC CONTROL DIAGRAM
N.T.S.



2 HUMIDIFIER CONTROL
N.T.S.

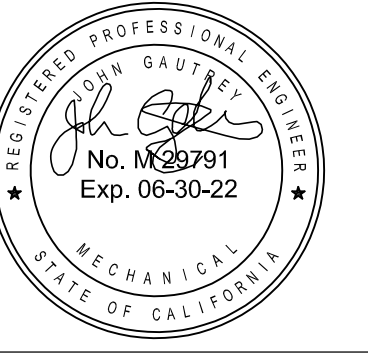
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E-Mail: info@integralgroup.com
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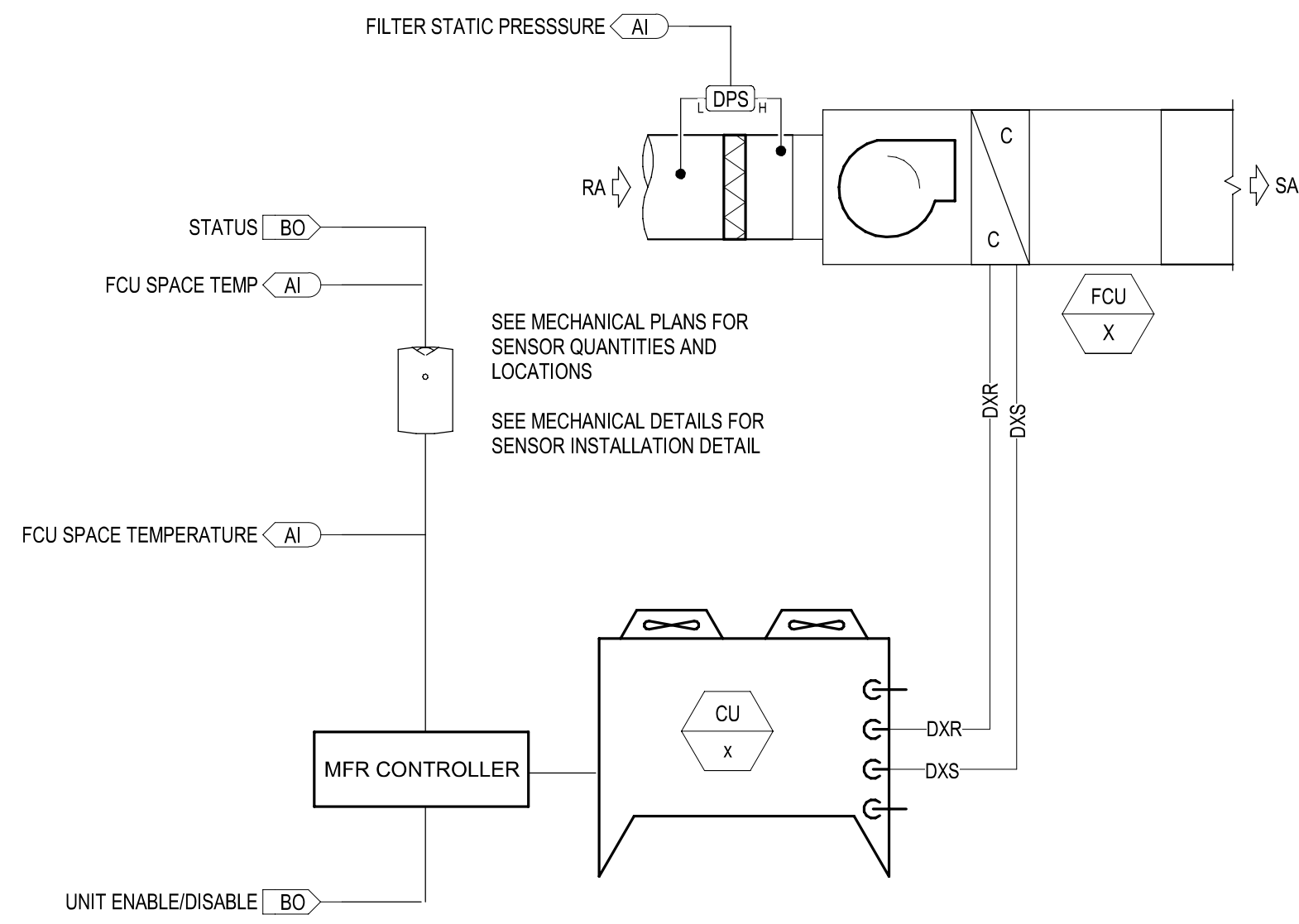
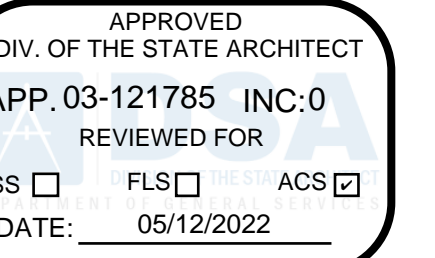


ISSUES			
NO.	ISSUANCE	STATUS	DATE
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSAC/SFM SUBMITTAL		2021-09-14
V2	DSAC/SFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

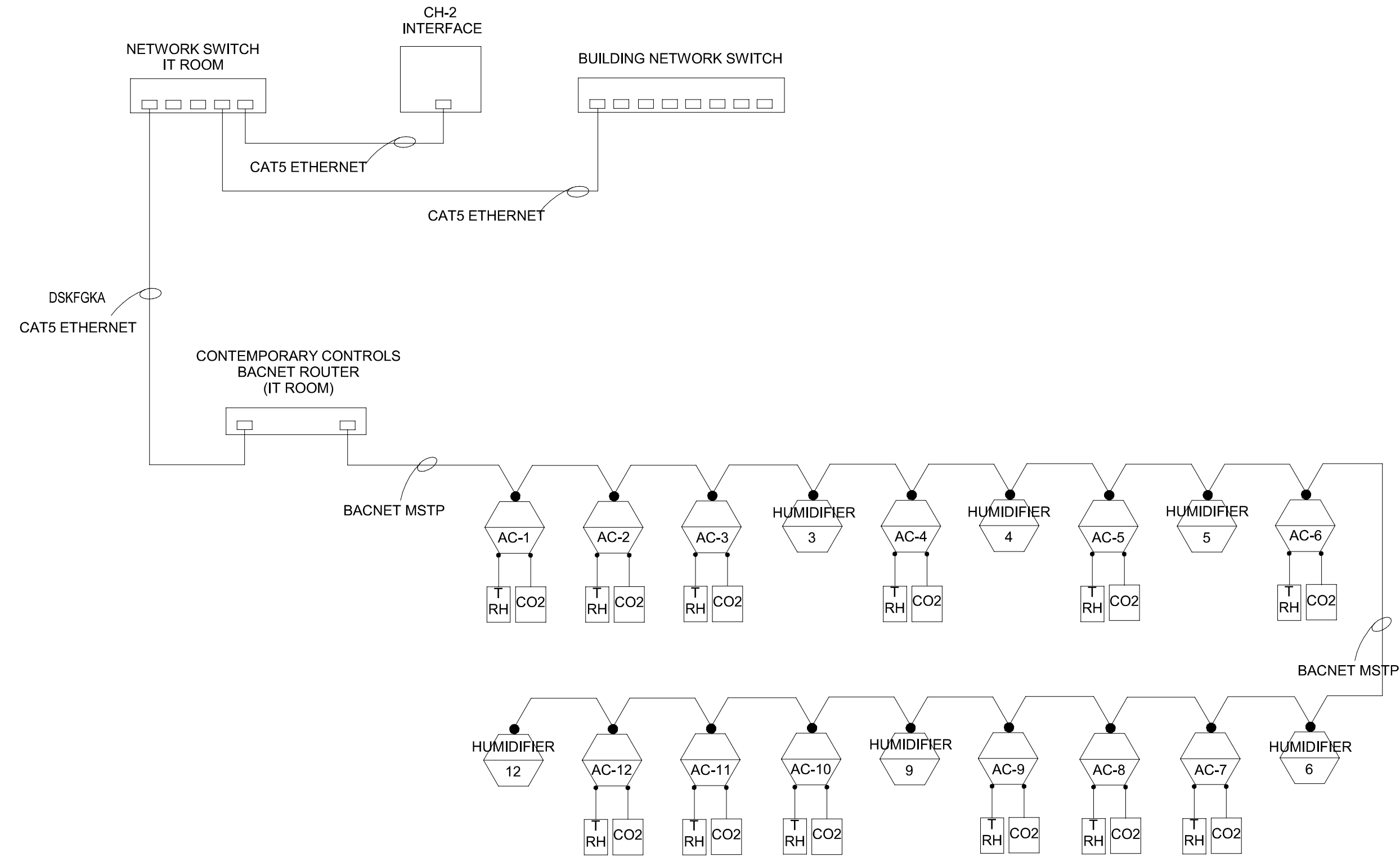
SHEET TITLE
**HVAC - MECHANICAL
CONTROLS**

DATE: 2022-05-02
DRAWN BY: IG
CHKD BY: JG
SCALE: NTS
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
MH7000
ISSUE
A1



2 SPLIT SYSTEM CONTROL
N.T.S.



1 BACNET NETWORK LAYOUT
N.T.S.

CLIENT
State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
Tel: 213 769 0011 Fax: 213 769 0016
ibi.com



SUB CONSULTANT
INTEGRAL
15760 Ventura Blvd, Suite 1902
Los Angeles, CA 91436
310 325 9955 Telephone
E-Mail: info@integralgroup.com
www.integralgroup.com



NO.	ISSUANCE	STATUS	DATE
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**HVAC - MECHANICAL
CONTROLS**

DATE: 2022-05-02
DRAWN BY: IG
CHKD BY: JG
SCALE: 12" = 1'-0"
DGS NO: 4359

PROJECT NO: 119029
SHEET NUMBER: **MH7001**
ISSUE: **A1**

GENERAL ELECTRICAL NOTES

- A. GENERAL PROVISIONS:**
- IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT A COMPLETE AND WORKMANLIKE ELECTRICAL INSTALLATION BE PROVIDED FOR ALL THE EQUIPMENT DESCRIBED OR SHOWN AS BEING IN THIS CONTRACT. TOWARD THIS END, CONTRACTOR SHALL FURNISH ALL LABOR AND TOOLS NECESSARY, FURNISH AND INSTALL ALL APPARATUS, MATERIALS, AND EQUIPMENT IN A MANNER COMPLYING WITH ALL APPLICABLE CODES, INCLUDING ITEMS REQUIRED BUT NOT NECESSARILY SHOWN, SUCH AS LAMPS, COUPLINGS, HANGERS, BRACKETS, CLAMPS, BOXES, CONNECTORS, AND HARDWARE.
 - ALL CONDUCTORS SHALL BE COPPER, TYPE "THW/THHN" 90 DEGREE INSULATION. ALL LUGS SHALL BE 75 DEGREE MINIMUM. ALL CONDUIT SHALL BE EMT OR RIGID STEEL. USE OF FLEX IS NOT ALLOWED EXCEPT UP TO 6 FOOT FOR FINAL CONNECTION TO LIGHTING FIXTURES OR VIBRATING EQUIPMENT.
 - BEFORE SUBMITTING THE BID PROPOSAL, CONTRACTOR SHALL VISIT THE JOB SITE TO BECOME FAMILIAR WITH THE SITE CONDITIONS, REQUIREMENTS, INCLUDING ALL NECESSARY ADDITIONAL SCOPE OF WORK, WHETHER SHOWN ON DRAWING(S) OR NOT, BUT REQUIRED FOR PROVIDING A COMPLETE AND FUNCTIONING ELECTRICAL SYSTEM.
 - CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS AND WIRING DIAGRAMS FOR ITEMS AND DEVICES TO BE FURNISHED, INSTALLED AND/OR CONNECTED FOR A COMPLETE AND OPERABLE HEATING, VENTILATION AND AIR CONDITIONING (HVAC) SYSTEM. VERIFY EXACT LOCATION OF HVAC EQUIPMENT AND CONDUIT TERMINATION AT EQUIPMENT WITH MECHANICAL CONTRACTOR.
 - THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND INDICATE THE LOCATION OF OUTLETS AND EQUIPMENT THOUGH NOT NECESSARILY INDICATING THE ACTUAL ROUTES OF CONDUITS. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS PROPER COORDINATION WITH THE WORK OF OTHER TRADES AND SPACE WILL PERMIT. SIMPLY INSTALLATION WHEREVER POSSIBLE BUT SUBJECT TO APPROVAL OF OWNERS REPRESENTATIVE FOR VISUAL AND STRUCTURAL REASONS. IT IS NOT WITHIN THE SCOPE OF THE DRAWINGS TO SHOW ALL NECESSARY OFFSETS, BENDS, PULL BOXES AND OBSTRUCTIONS. THE DRAWINGS ARE NOT INTENDED TO BE SCALED AND THE CONTRACTOR SHALL REFER TO THE GENERAL CONSTRUCTION DRAWINGS FOR DIMENSIONS.
 - ALL PERMITS SHALL BE PROCURED FROM ALL LEGALLY CONSTITUTED AUTHORITIES. ARRANGE FOR ALL INSPECTION AND PAY ALL COSTS FOR FEES AND TESTS IN CONNECTION THEREWITH, COMPLY WITH CODES. PRESENT THE SIGNED CERTIFICATE OF FINAL INSPECTION TO THE OWNERS REPRESENTATIVE PRIOR TO PRESENTING THE WORK FOR FINAL ACCEPTANCE.
 - CONTRACTOR SHALL ERECT AND MAINTAIN SUITABLE BARRIERS, PROTECTIVE DEVICES, LIGHTS AND WARNING SIGNS WHERE REQUIRED FOR THE PROTECTION OF THE PUBLIC AND EMPLOYEES ABOUT THE BUILDING.
 - CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL SERVICE FOR CONSTRUCTION POWER AND ILLUMINATION FOR ALL TRADES. ALL COSTS OF LABOR AND COST MATERIAL REQUIRED FOR THE TEMPORARY ELECTRICAL SERVICE SHALL BE INCLUDED IN THE ELECTRICAL CONTRACT.
 - ELECTRICAL ROOMS HAVING A TRANSFORMER(S) RATED 112.5KVA OR ABOVE SHALL BE PROVIDED WITH 1-HOUR FIRE-RATED ENCLOSURE.
 - REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR SUBMITTALS, ACCEPTABLE MATERIALS, COORDINATION REQUIREMENTS, TESTING, STARTUP, TRAINING AND PROJECT CLOSURE.
 - PROVIDE A CODE APPROVED DISCONNECT SWITCH OR BREAKER WITHIN SIGHT OF EVERY MOTOR. FOR LOCATION OF DISCONNECT SWITCH, COORDINATE WITH EQUIPMENT SUPPLIER TO DETERMINE THE BEST LOCATION ON SITE WHILE REMAINING ACCESSIBLE.
 - CONTRACTOR SHALL TEST ALL WIRING AND CONNECTIONS FOR CONTINUITY, GROUNDS, SHORT CIRCUITS, AND OTHER DEFECTS BEFORE ANY EQUIPMENT OR FIXTURES ARE CONNECTED THERETO. CABLES SHALL BE CHECKED FOR CONTINUITY, SHORTS, INSULATION RESISTANCE, AND PROPER PHASING.
 - PROVIDE PULL ROPE IN ALL EMPTY CONDUITS.
 - COORDINATE ROUTING OF RACEWAYS FEEDERS AND HOMERUNS IN COOPERATION WITH THE WORK OF OTHER TRADES.
 - EXPOSED RACEWAYS ON ROOF SHALL BE AMBIENT TEMPERATURE COMPENSATED PER NEC TABLE 310-15(B)(2)(C) BASED UPON DISTANCE RACEWAY IS MOUNTED ABOVE ROOF AND DESIGN TEMPERATURE OF ROOF.
 - NO MORE THAN THREE CIRCUITS PER HOME RUN. DO NOT COMBINE HOMERUNS WITHOUT PRIOR APPROVAL.
 - NO INTERMEDIATE SPLICING OF FEEDERS OR BRANCH CIRCUITS SHALL BE DONE WITHOUT PRIOR APPROVAL.
 - MINIMUM SIZE FOR EXTERIOR BELOW GRADE CONDUIT SHALL BE 1-1/4 INCH.
 - FOR 120V, 20 AMP CIRCUITS, WHERE CIRCUIT DISTANCE FROM PANELBOARD TO FARTHEST DEVICE EXCEEDS 75 FEET, PROVIDE #10 SIZE CONDUCTOR.

- B. POWER:**
- PROVIDE CONCRETE PADS (MINIMUM 4" HIGH OR AS INDICATED) FOR ALL FLOOR MOUNTED ELECTRICAL EQUIPMENT INSTALLED IN EQUIPMENT ROOMS AND IN AREAS SUSCEPTIBLE TO BEING WET OR HOSED DOWN. SUBMIT PAD DETAIL PLANS INCLUDING DIMENSIONS FOR APPROVAL.
 - THE LOCATION OF ALL OUTLETS SHALL BE COORDINATED WITH ARCHITECTURAL PLANS BY THE CONTRACTOR PRIOR TO INSTALLATION. MOUNTING HEIGHTS OF RECEPTACLES, SWITCHES, WIRING DEVICES AND DEDICATED EQUIPMENT OUTLETS SHALL BE COORDINATED WITH OTHER TRADES PRIOR TO INSTALLATION.
 - ALL DISCONNECT SWITCHES SHALL BE PAD-LOCKABLE IN THE "OFF" POSITION.
 - ALL FEEDER LENGTHS SHOWN ON DIAGRAM ARE FOR VOLTAGE DROP CALCULATION ONLY. DO NOT USE FOR ANY OTHER PURPOSES.
 - VERIFY AND COORDINATE EXACT LOCATION, POWER REQUIREMENTS AND METHOD OF CONNECTION OF ALL MECHANICAL EQUIPMENT AND PERMINT ITEMS AND DEVICES PRIOR TO INSTALLATION OF ELECTRICAL SYSTEM.
 - PROVIDE A MINIMUM OF 12" SEPARATION BETWEEN POWER AND COMMUNICATION CONDUITS, WHERE THEY ARE INSTALLED IN PARALLEL OR IN THE SAME TRENCH.
 - LABEL ALL RECEPTACLES, J-BOXES, DISCONNECT SWITCHES AND CONTROL DEVICES WITH THEIR SERVING CIRCUIT NUMBERS. LABELS SHALL BE PER THE SPECIFICATION.
 - PROVIDE A MINIMUM 24" HORIZONTAL SEPARATION THAT USUALLY APPLIES BETWEEN BOXES INSTALLED ON OPPOSITE SIDES OF THE WALL IN ORDER TO MAINTAIN THE FIRE-RESISTIVE RATING OF ASSEMBLIES WHERE PENETRATION OR OPENINGS ARE MADE.

- C. GROUNDING:**
- THE EQUIPMENT GROUNDING CONDUCTOR SHALL RUN CONTINUOUS FROM PANEL TO LAST OUTLET. THIS WIRE SHALL BE PITGALED TO BOX AND DEVICE. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED GREEN CONDUCTORS.
 - GROUNDING OF CABLE TRAY SHALL BE PER NEC 392-60 A, B, C.
 - PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL LIGHTING AND POWER CONDUITS.
- D. PENETRATIONS:**
- PENETRATIONS IN WALLS REQUIRING PROTECTED OPENINGS MUST BE FIRESTOPPED WITH AN APPROVED MATERIAL IN ACCORDANCE WITH CBC SECTION 709.6. SPACE BETWEEN PENETRATING MATERIALS (DESCRIBED BELOW) MUST BE DESIGNED TO PREVENT THE SPREAD OF HOT FLAME OR GASS.
 - COPPER OR FERROUS PIPES OR CONDUITS MAY PENETRATE THE WALLS OR PARTITIONS, PROVIDED THEY ARE FIRESTOPPED.
 - OPENINGS FOR STEEL ELECTRICAL OUTLET BOXES NOT EXCEEDING 16 SQUARE INCHES ARE PERMITTED PROVIDED OPENINGS DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES OR 100 SQUARE FEET OF WALL OR PARTITIONS. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.

- F. AESTHETIC CRITERIA NOTES:**
- WHERE BENDING MULTIPLE CONDUITS ALONG A COMMON PATH, FIELD BEND THE CONDUITS AROUND A COMMON CENTER POINT FOR ALL CONDUITS SO THAT THE SEPARATION BETWEEN CONDUITS REMAINS CONSTANT THROUGH ENTIRE LENGTH OF BEND.
 - CONDUIT FITTING SHALL BE ALIGNED AND PERPENDICULAR TO THE DIRECTION OF THE RACEWAYS. FITTINGS SHALL HAVE SET SCREWS LOCATED ON TOP OF RACEWAYS AND NOT VISIBLE FROM THE FLOOR.
 - ALL EXPOSED CONDUIT, RACEWAYS AND BOXES SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO ADJACENT BUILDING ELEMENTS AND FASTENED NEATLY AND CONSISTENTLY. IN PUBLIC AREAS, GROUP RACEWAYS IN MINIMUM GROUPS OF THREE RACEWAYS ON A COMMON SUPPORT SYSTEM.
 - MANUFACTURERS LABELS SHALL BE TURNED AWAY FROM PUBLIC VIEW. NO CONSTRUCTION ANNOTATIONS SHALL BE VISIBLE IN AREAS EXPOSED TO PUBLIC VIEW.
 - ALL NEW DEVICES, OUTLETS, SWITCHES, CONTROLS, ETC. SHALL BE INSTALLED WITH CONCERN FOR ALIGNMENT WITH WORK OF OTHER TRADES. PROVIDE VERTICAL AND HORIZONTAL ALIGNMENT WITH EQUAL SPACING BETWEEN CENTER LINES. IF DOCUMENTS DO NOT INDICATE ALIGNMENT AND/OR SPACING CONSULT WITH ARCHITECT PRIOR TO START.
- G. ACOUSTICAL NOTES:**
- ALL PENETRATIONS INTO SOUND RATED PARTITIONS OR FLOOR-CEILING ASSEMBLIES WILL BE SEALED, LINED OR INSULATED WITH APPROVED PERMANENT RESILIENT ACOUSTIC SEALANT AND FIRE CAULK (WHERE APPLIES).
 - ALL RIGID CONDUIT LOCATED IN SOUND ASSEMBLIES WILL BE ISOLATED FROM THE BUILDING CONSTRUCTION BY MEANS OF RESILIENT SLEEVES, MOUNTS OR MINIMUM 1/4" THICK APPROVED RESILIENT MATERIAL.
 - ELECTRICAL OUTLETS/BOXES IN OPPOSITE FACES OF SEPARATION WALLS WILL BE SEPARATED HORIZONTALLY BY 24" AND NOTE THAT BACK AND SIDES OF BOXES WILL BE SEALED WITH 1/8" RESILIENT SEALANT AND BACKED BY MINIMUM OF 2" THICK MATERIAL FIBER INSULATION. (TV, TELEPHONE AND INTERCOM OUTLETS MUST BE INSTALLED IN BOXES ACCORDINGLY).
 - NO ELECTRICAL TRANSFORMER OR RELAYS SHALL BE INSTALLED ON OR IN SOUND RATED PARTITIONS.
- H. COORDINATION**
- THERE IS NO ASSURANCE THAT THE LOCATION OF SUBSTRUCTURES SHOWN ON THIS DRAWING ARE ACCURATE, OR THAT ALL EXISTING SUBSTRUCTURES ARE SHOWN ON THIS DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL SUBSTRUCTURES WHETHER SHOWN OR NOT, ANY DAMAGE TO THE EXISTING SUBSTRUCTURES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 - CONTRACTOR TO CLEAR PROJECT SITE AREA WITHIN THE CONFINES OF THE DEMOLITION LIMIT LINE CONTRACTOR SHALL DEMOLISH AND REMOVE FROM THE SITE ALL EXISTING UTILITIES, STRUCTURES, PLANTERS, TREES, AND ALL OTHER SITE FEATURES, UNLESS OTHERWISE NOTED ON THE PLAN.
 - COORDINATE WITH LANDSCAPE CONSULTANT FOR TREE LOCATIONS. DO NOT DISTURB ROOT BALL.
 - CONTRACTOR SHALL PROVIDE 1/4" SCALE DRAWING FOR ALL ELECTRICAL ROOMS, CLOSETS AND EQUIPMENT SPACES DEMONSTRATING THAT INSTALLATION HAS BEEN COORDINATED WITH WORK OF OTHER TRADES. USE ACTUAL DIMENSIONS FROM APPROVED EQUIPMENT SUBMITTALS TO COORDINATE LAYOUT AND INSTALLATION OF ELECTRICAL EQUIPMENT, DEVICES AND COMPONENTS WITH OTHER CONSTRUCTION INCLUDING HOUSEKEEPING PADS, CONDUIT, PIPING, EQUIPMENT, AND ADJACENT SURFACES. MAINTAIN MAXIMUM MOUNTING HEIGHTS FOR OPERABLE DEVICES AND REQUIRED WORKSPACE CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS.

- I. STRUCTURAL NOTES:**
- DO NOT EMBED CONDUITS OR SLEEVES IN STRUCTURAL CONCRETE, INCLUDING CONCRETE ON METAL DECK WITHOUT SPECIFIC ACCEPTANCE FROM ARCHITECT. LOCATE ELECTRICAL CONDUIT MINIMUM OF 3" APART AND WITHIN MIDDLE 1/3 OF MEMBER.
 - CONDUITS MUST BE SUPPORTED ON APPROVED CHAIRS AFFIXED TO THE SLAB FORMWORK, AND TIGHTLY SECURED TO ADJACENT REINFORCING STEEL WHERE FEASIBLE SO AS TO ASSURE NO MOVEMENT DURING CONCRETE PLACEMENT.
 - MULTIPLE LAYERS OF CONDUIT CROSSING EACH OTHER WITHIN THE 12" PLACEMENT ZONE IS ACCEPTABLE; HOWEVER, NO LESS THAN 3/4" VERTICAL CLEARANCE BETWEEN STACKED CONDUITS IS ALLOWED, AND NO MORE THAN THREE LAYERS OF CONDUIT WITHIN THE 12" PLACEMENT ZONE ARE ALLOWED AT ANY ONE LOCATION.
 - MULTIPLE CONDUITS PLACED SIDE-BY-SIDE MUST MAINTAIN AT LEAST 3 CONDUIT DIAMETER HORIZONTAL CLEARANCE, BASED ON THE LARGER OF ADJACENT CONDUITS.
 - CONDUIT "BANKS" CONSISTING OF 4 OR MORE CONDUITS MUST BE PLACED IN PLAN VIEW WITHIN THE MIDDLE THIRD OF THE DISTANCE BETWEEN COLUMNS OR BETWEEN COLUMNS AND ENDS/FACES OF WALLS. NO SINGLE "BANK" OF CONDUITS SHALL EXCEED 25 CONDUITS OR A TOTAL WIDTH OF 5 FEET, INCLUDING REQUIRED SPACING BETWEEN CONDUITS.
 - NO CONDUITS ARE ALLOWED TO CROSS OVER THE STUD RAILS/BETWEEN STUDS LOCATED AT COLUMNS AND CERTAIN WALL LOCATIONS. CONDUITS RUNNING ADJACENT TO STUD RAILS MUST HAVE AT LEAST 12" CLEARANCE BETWEEN STUDS AND CONDUIT.
 - JUNCTION BOXES ARE NOT ALLOWED IN THE ZONE AROUND COLUMNS OR ENDS OF WALLS WHERE STUD RAILS ARE LOCATED. THE OUTER PERIMETER OF THE ZONE OF EXCLUSION IS DEFINED BY CONNECTING THE ENDS OF ALL STUD RAILS BY A STRAIGHT LINE.
 - WHERE NO STUD RAILS ARE SHOWN NEAR COLUMNS OR ENDS OF WALLS, JUNCTION BOXES ARE NOT ALLOWED WITHIN 18" OF THE COLUMN FACE OR WITHIN A ZONE DEFINED BY A 36" DIAMETER CIRCLE CENTERED ON THE FACE OF THE WALL AT THE CENTER OF THE WALL.
 - JUNCTION BOXES MAY NOT BE PLACED CLOSER TO EACH OTHER THAN THE LARGEST PLAN DIMENSION OF THE BOX IN EITHER DIRECTION. NO MORE THAN TWO JUNCTION BOXES MAY BE PLACED ADJACENT TO EACH OTHER.
 - THE CONTRACTOR MUST SUBMIT FOR APPROVAL A DETAILED LAYOUT OF CONDUIT BANKS. THE LOCATIONS OF INDIVIDUAL CONDUIT RUNS OR RUNS OF UP TO THREE ADJACENT CONDUITS DO NOT NEED TO BE PRE-APPROVED, BUT MUST FOLLOW ALL APPLICABLE REQUIREMENTS SET FORTH IN THE DOCUMENTS.
 - NO CONCRETE FLOOR SLABS ARE ALLOWED TO BE POURED WITHOUT APPROVAL OF THE CONDUIT LAYOUT PLAN.
 - EXCEPTIONS TO THE ABOVE RULES WILL BE EVALUATED BY THE STRUCTURAL ON A CASE-BY-CASE BASIS.
- J. DEMOLITION:**
- EXISTING CONDITIONS INDICATED ON DOCUMENTS ARE BASED UPON REVIEW OF AVAILABLE RECORD DOCUMENTS AND VISUAL FIELD SURVEY AND ARE FOR REFERENCE ONLY. CONTRACTOR SHALL VERIFY ACTUAL EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
 - SURVEY EXISTING CONDITIONS, INVENTORY AND RECORD THE CONDITION OF ITEMS TO BE REMOVED AND REINSTALLED.
 - RECORD EXISTING CONDITION BY USE OF MEASURED DRAWINGS, PRECONSTRUCTION PHOTOGRAPHS, AND/OR VIDEO TAPES. RECORD CONDITION OF AREAS ADJACENT TO DEMOLITION IN ADDITION TO AREAS TO BE DEMOLISHED.
 - WHERE UTILITIES, FEEDERS, RACEWAYS PASS THROUGH AREAS OR WALLS TO BE DEMOLISHED, DETERMINE SOURCE, FUNCTION AND LOAD PRIOR TO DEMOLITION. IF THESE ARE SERVING AREAS OR LOADS THAT ARE TO REMAIN, PROVIDE PROVISIONS FOR RELOCATING PRIOR TO DEMOLITION.
 - AREAS OR LOADS THAT ARE TO REMAIN, PROVIDE PROVISIONS FOR RELOCATING PRIOR TO DEMOLITION. SOURCE OR FIRST UP STREAM DEVICE TO REMAIN IN SERVICE.
 - REMOVE ALL ABANDONED RACEWAY, CABLES AND EQUIPMENT FROM AREAS TO BE DEMOLISHED/REMODELED UNLESS NOTED OTHERWISE. DEMOLITION TO INCLUDE POWER, LIGHTING FIRE ALARM DEVICES AND RACEWAYS, COMMUNICATION DEVICES AND RACEWAYS, LOW VOLTAGE AND CONTROL SYSTEMS.
 - WHERE RACEWAYS ENTER OR EXIT SLABS OR PARTITIONS TO REMAIN, CUT RACEWAYS FLUSH WITH FINISH SURFACE, REMOVE CONDUCTORS AND PREPARE FOR REFINISH OF AREA.
 - VERIFY THAT ALL UTILITIES HAVE BEEN DISCONNECTED AND MADE SAFE PRIOR TO COMMENCING DEMOLITION.

ELECTRICAL ABBREVIATIONS

A, AMP	AMPERE	KV	KILOVOLT
AC	ALTERNATING CURRENT	KVA	KILOVOLT-AMPERE
AF	AMPERE FRAME, AMPERE FUSE	KW	KILOWATT
AFC	ABOVE FINISHED CEILING	KWH	KILOWATT-HOUR
AFF	ABOVE FINISHED FLOOR	KVAR	KILOVAR
AFG	ABOVE FINISHED GRADE	LCL	LONG CONTINUOUS LOAD
AIC	AMPERE INTERRUPTING CAPACITY	LF	LINEAR FOOT
ANN	ANNUNCIATOR	LRA	LOCKED ROTOR AMP
AS	AMPERE SWITCH	LTG	LIGHTING
AT	AMPERE TRIP	LV	LOW VOLTAGE
ATS	AUTOMATIC TRANSFER SWITCH	M	MAGNETIC STARTER COIL
AWG	AMERICAN WIRE GAUGE	MAX	MAXIMUM
BATT	BATTERY	MC	METAL CLAD CABLE
BC	BARE COPPER	MCB	MAIN CIRCUIT BREAKER
BCW	BARE COPPER WIRE	MCC	MOTOR CONTROL CENTER
BKBD	BACKBOARD	MCM	THOUSAND CIRCULAR MILS
BKR	BREAKER	MDF	MAIN DISTRIBUTION FRAME
BLDG	BUILDING	MDP	MAIN DISTRIBUTION PANEL
C	CONDUIT	MFR	MANUFACTURER
CATV	CABLE TELEVISION	MH	METAL HALIDE
CB	CIRCUIT BREAKER	MI	MINERAL INSULATED
CEC	CALIFORNIA ELECTRICAL CODE	MIN	MINIMUM
CIRC	CIRCUIT	MLO	MAIN LUGS ONLY
CLG	CEILING	MTD	MOUNTED
CO	CONDUIT ONLY	MTR	MOTOR
COM	COMMON	MTS	MANUAL TRANSFER SWITCH
COMM	COMMUNICATIONS	(N)	NEW
CONN	CONNECT	N	NEUTRAL
CONT	CONTINUE	NB	NEUTRAL BUS
CT	CURRENT TRANSFORMER	NEC	NATIONAL ELECTRIC CODE
CU	COPPER	NF	NON-FUSED
(D)	DEMOLISH	NIC	NOT IN CONTRACT
DB	DIRECT BURIED	NO	NORMALLY OPEN
DEF	DUAL ELEMENT FUSE	NC	NORMALLY CLOSED
DIA	DIAMETER	NTS	NOT TO SCALE
DIM	DIMENSION	P	POLE(S)
DISC	DISCONNECT	PF	POWER FACTOR
DIST	DISTRIBUTION	PHØ	PHASE
DN	DOWN	PNL	PANEL
DP	DISTRIBUTION PANEL	PR	PRIMARY
DPDT	DOUBLE-POLE DOUBLE-THROW	PT	POTENTIAL TRANSFORMER
DWG	DRAWING	PV	PHOTOVOLTAIC
(E)	EXISTING	PVC	POLYVINYL CHLORIDE
EGC	EQUIPMENT GROUND CONDUCTOR	PWR	POWER
ELEC	ELECTRICAL	QTY	QUANTITY
EM, EMER	EMERGENCY	(R)	EXISTING TO BE RELOCATED
EMT	ELECTRICAL METALLIC TUBING	RECP	RECEPTACLE
ENCL	ENCLOSURE	RGS	RIGID GALVANIZED STEEL CONDUIT
EPO	EMERGENCY POWER OFF	RM, RMS	ROOM, ROOMS
EQUIP	EQUIPMENT	RT	RADIOTOUCH SYSTEM
(F)	FUTURE	SCA	SHORT CIRCUIT AMPS
F	FUSE(D)	SEC	SECONDARY
FA	FIRE ALARM	SFD	SMOKE FIRE DAMPER
FACP	FIRE ALARM CONTROL PANEL	SFR	SPEAKER
FATC	FIRE ALARM TERMINAL CABINET	SQ FT	SQUARE FEET
FLA	FULL LOAD AMPERES	SUSP	SUSPEND(ED)
FLEX	FLEXIBLE	SW	SWITCH
FLR	FLOOR	SWBD	SWITCHBOARD
FT	FOOT, FEET	SWGR	SWITCHGEAR
G, GND	GROUND (GALVANIZED)	TC	TIME CLOCK
GEN	GENERATOR	TEL	TELEPHONE
GFI	GROUND FAULT CIRCUIT INTERRUPTER	TEMP	TEMPORARY
HID	HIGH INTENSITY DISCHARGE	TTB	TELECOMMUNICATIONS BACKBOARD
HGA	HAND-OFF-AUTOMATIC TRANSFORMER	TMH	TELECOMMUNICATIONS MANHOLE
HP	HORSEPOWER, HEAT PUMP	TRANSF	TRANSFORMER
HPF	HIGH POWER FACTOR	TYP	TYPICAL
HPS	HIGH PRESSURE SODIUM	TVSS	TRANSIENT VOLTAGE SUPPRESSION SYSTEM
HV	HIGH VOLTAGE	UG	UNDERGROUND
HVC	HEATING, VENTILATING AND AIR CONDITIONING	UNO	UNLESS OTHERWISE NOTED
HZ	HERTZ	UNO	UNLESS NOTED OTHERWISE
IC	INTERRUPTING CAPACITY IN AMPS RMS	UPS	UNINTERRUPTIBLE POWER SUPPLY
IDF	INTERMEDIATE DISTRIBUTION FRAME	V	VOLT, VOLTS
IG	ISOLATED GROUND	VA	VOLT-AMPERES
IMB	MAX POWER CURRENT	VAV	VARIABLE AIR VOLUME
IN	INCH, INCHES	VFD	VARIABLE FREQUENCY DRIVE
INV	INVERTER	VMP	VOLTAGE AT MAXIMUM POWER
ISC	SHORT CIRCUIT CURREN	VOC	VOLTAGE OPEN CIRCUIT
J, JB	JUNCTION BOX	W	WATT OR WIRE
KAIC	KILOAMPERE INTERRUPTING CAPACITY	WAP	WIRELESS ACCESS POINT
KA	THOUSAND AMPERES	WP	WEATHER PROOF
KCMIL	THOUSAND CIRCULAR MILS	WT	WATERTIGHT
		XFMR	TRANSFORMER

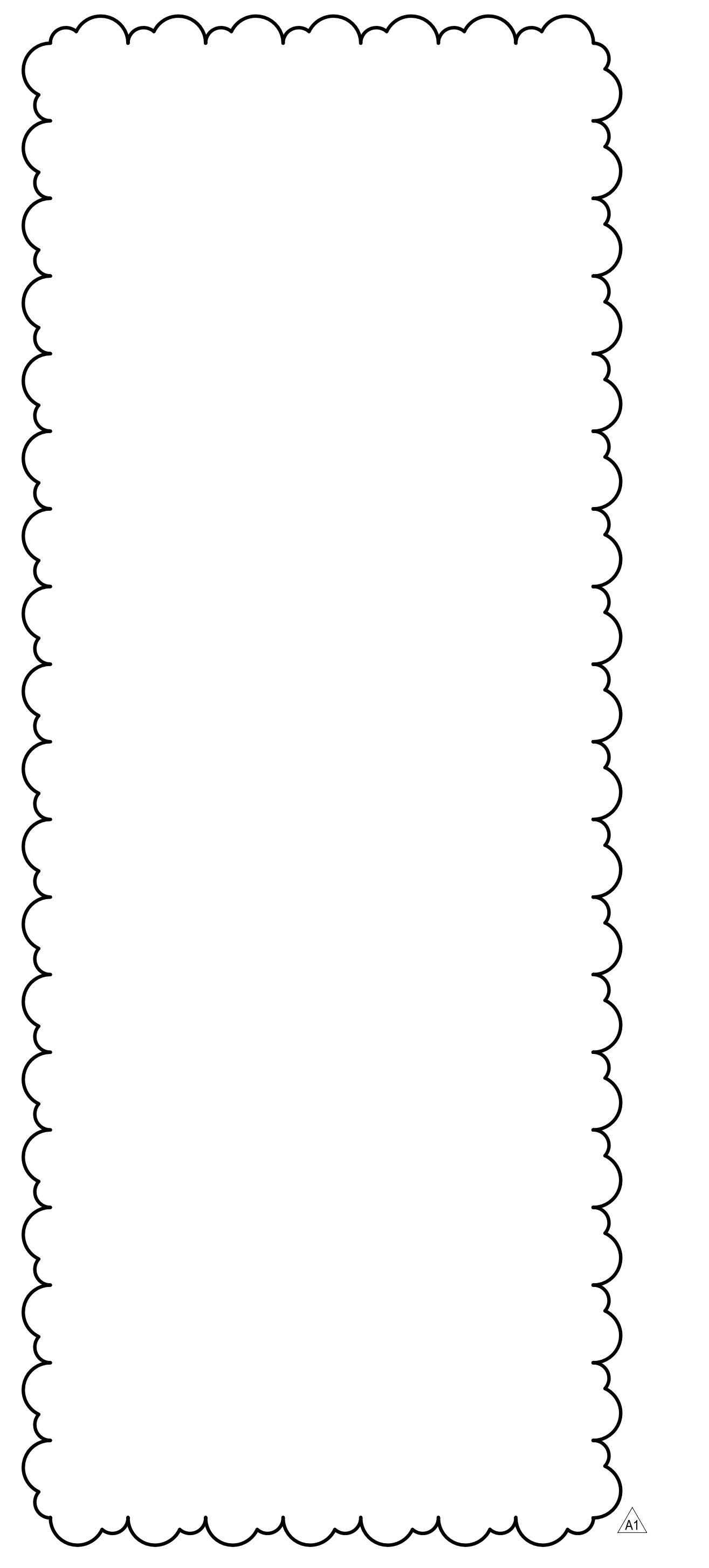
MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAIL ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAILS IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2019 CBC, SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTER 13, 26 AND 30.

- ALL PERMANENT EQUIPMENT AND COMPONENTS.
 - TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
 - TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESYTAINED IN MANNER APPROVED BY DSA.
- THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCED DESIGN COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:
- COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
 - COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.
- THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL. IN GENERAL, RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO SYSTEM WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTION 13.6.6, 13.6.7, 13.6.8, AND 2019 CBC, SECTION 1617A.1.24, 1617A.1.25, AND 1617A.1.26. THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW, WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., OSHPD OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS. ELECTRICAL DISTRIBUTION SYSTEMS SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVAL (OMP#): OPM-0052-13



NUMBER OF CONDUCTORS AND CONDUIT SIZE

—	3#12,3/4"	— ⁸	2#8,1#10G,3/4"
—	4#12,3/4"	— ⁸	3#8,1#10G,3/4"
—	5#12,3/4"	— ⁸	4#8,1#10G,3/4"
—	6#12,3/4"	— ⁸	5#8,1#10G,1"
—	7#12,3/4"	— ⁸	6#8,1#10G,1"
—	8#12,3/4"	— ⁸	7#8,1#10G,1"
—	9#12,3/4"	— ⁸	8#8,1#10G,1 1/2"
— ¹⁰	3#10,3/4"	— ⁶	2#6,1#10G,3/4"
— ¹⁰	4#10,3/4"	— ⁶	3#6,1#10G,1"
— ¹⁰	5#10,3/4"	— ⁶	4#6,1#10G,1"
— ¹⁰	6#10,3/4"	— ⁶	5#6,1#10G,1"
— ¹⁰	7#10,3/4"	— ⁶	6#6,1#10G,1 1/2"
— ¹⁰	8#10,1"	— ⁶	7#6,1#10G,1 1/2"
— ¹⁰	9#10,3/4"	— ⁶	8#6,1#10G,1 1/2"

CONDUCTOR COUNT INCLUDES GROUNDING AND NEUTRAL CONDUCTORS THAT ARE NOT INDICATED IN THE HATCH COUNT. CONDUIT SIZES ARE BASED UPON COPPER CONDUCTORS MINIMUM AND MAY BE INCREASED AT CONTRACTORS OPTION FOR LONG OR DIFFICULT RUNS.

01 SHEET LIST - ELECTRICAL

NUMBER	NAME
EH0001	ELECTRICAL GENERAL NOTES AND ABBREVIATIONS
EH2004	ELECTRICAL - ROOF DEMOLITION PLAN
EH2100	ELECTRICAL - OVERALL FLOOR PLAN
EH2800	ELECTRICAL - ROOF PLAN
EH5000	ELECTRICAL - SINGLE LINE DIAGRAM
Grand total: 5	

ELECTRICAL SYMBOLS AND LEGEND

EXISTING / DEMOLITION	
—	EXISTING EQUIPMENT / RACEWAYS TO REMAIN
—	EXISTING EQUIPMENT / RACEWAYS TO BE REMOVED
—	NEW EQUIPMENT / RACEWAYS

GENERAL ELECTRICAL SYMBOLS

□	DISCONNECT SWITCH, 30 AMP MINIMUM UNLESS NOTED OTHERWISE
□	FUSED DISCONNECT SWITCH, 30 AMP MINIMUM UNLESS NOTED OTHERWISE
□	COMBINATION DISCONNECT SWITCH MOTOR STARTED
⊙	MOTOR, 5 HP INDICATED
⊙	TRANSFORMER
⊙	RELAY OR EQUIPMENT CABINET AS INDICATED ON PLAN
⊙	LIGHTING OR POWER PANEL BOARD

RACEWAYS AND WIRING

FLOOR	WALL	CEILING	
---	---	---	CONDUIT CONCEALED IN CEILING OR WALL SPACE
---	---	---	CONDUIT RUN EXPOSED
---	---	---	CONDUIT RUN UNDERGROUND OR CONCEALED IN FLOOR SPACE
---	---	---	EXISTING CONDUIT TO REMAIN
---	---	---	CONDUIT RISING UP FROM RUN
---	---	---	CONDUIT DROPPING DOWN FROM RUN
---(MS-01)	---(MS-01)	---(MS-01)	HOMERUN TO PANELBOARD, CABINET OR TERMINAL BACKBOARD AS INDICATED
---(MS-01)	---(MS-01)	---	HOMERUN TO SWITCHBOARD OR MCC AS INDICATED. REFER TO SINGLE LINE DIAGRAM FOR CONDUIT AND WIRE SIZES
---(MS-01)	---(MS-01)	---	HOMERUN TO PANEL VIA INDICATED LIGHTING CONTROL RELAY CABINET. REFER TO INDICATED LIGHTING CONTROL SCHEDULE FOR ADDITIONAL INFORMATION AND CONTROL REQUIREMENTS

APPROVED
DIV. OF THE STATE ARCHITECT
APP. 03-121785 INC.0
REVIEWED FOR
SS FLS ACS
DATE: 05/12/2022

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
05/12/22
2-2731
Approval of this plan does not authorize or approve any omission or deviation from applicable requirements. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

State of California
Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

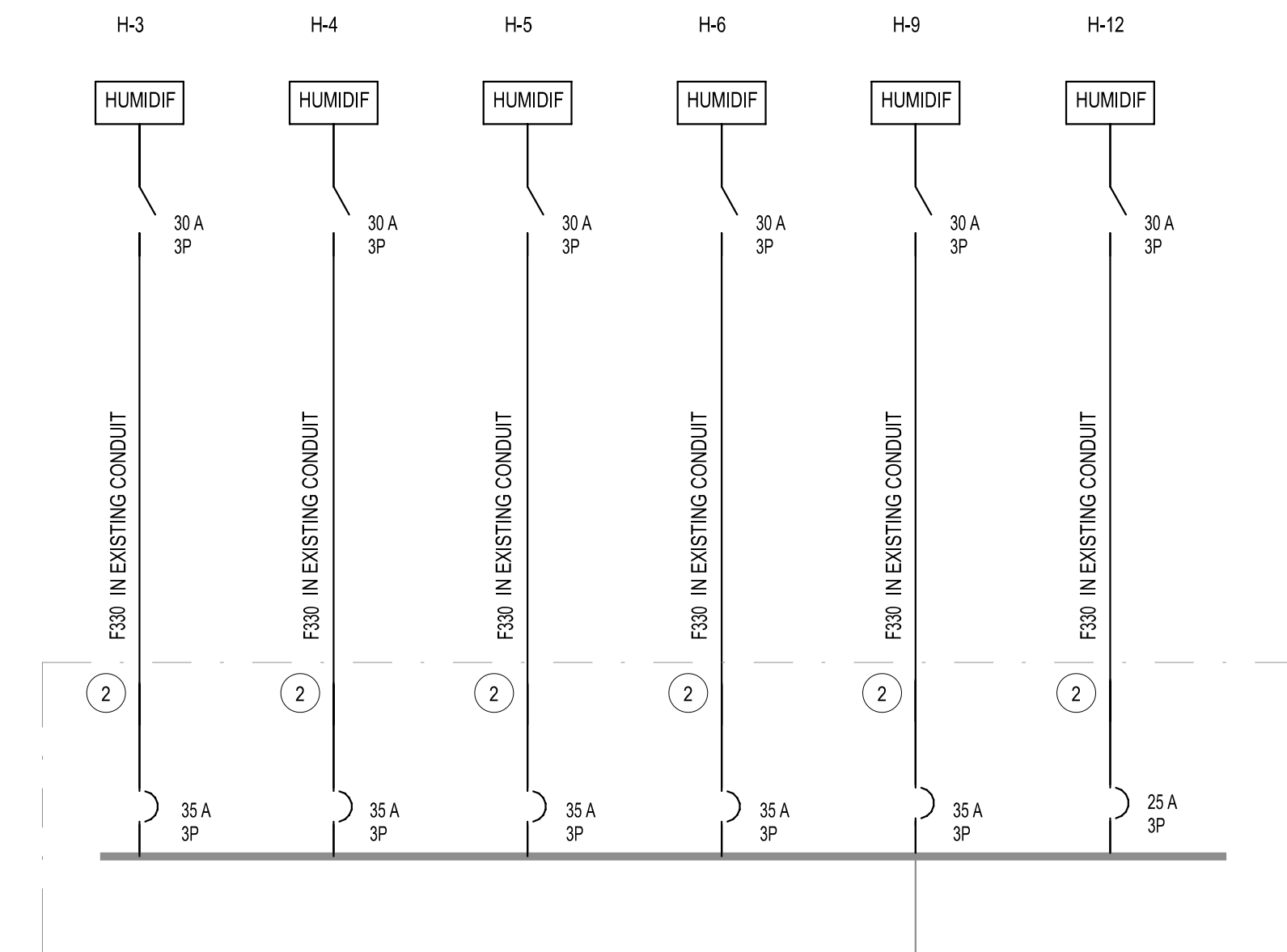
PROJECT
CONFERENCE CENTER & LIBRARY
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UPGRADES
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Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
310.202.9555 Telephone
ibigroup.com

SEAL OF THE ARCHITECT
No. 025387
REN 0423

ELECTRICAL FEEDER TABLE

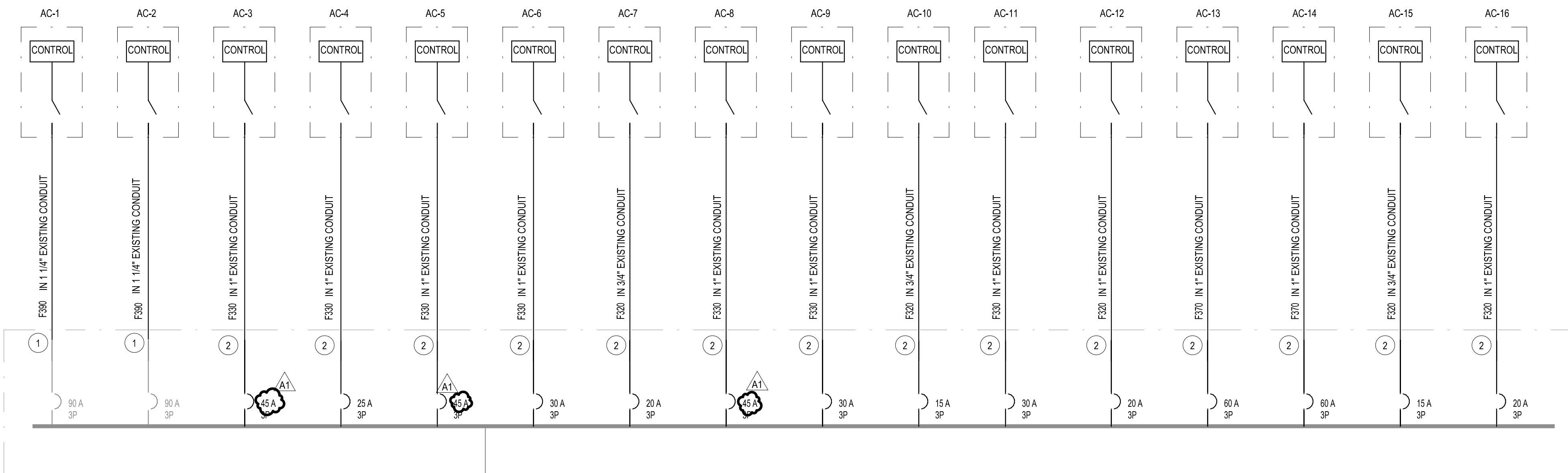
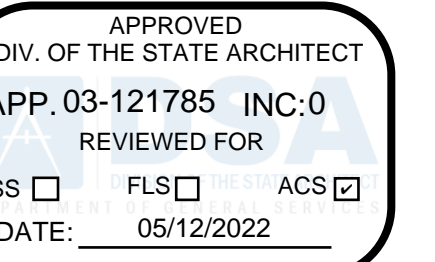
FEEDER CODE	3 WIRE + GROUND					4 WIRE + GROUND					
	CONDUIT	PHASE	NEUTRAL	EQUIP. GROUND	ISOLATED GROUND	FEEDER CODE	CONDUIT	PHASE	NEUTRAL	EQUIP. GROUND	ISOLATED GROUND
F320	(1)3/4	3#12	-	1#12	-	F420	(1)3/4	3#12	1#12	1#12	-
F330	(1)3/4	3#10	-	1#10	-	F430	(1)3/4	3#10	1#10	1#10	-
F340	(1)1	3#8	-	1#8	-	F440	(1)1	3#8	1#8	1#10	-
F350	(1)1	3#6	-	1#6	-	F450	(1)1 1/4	3#6	1#6	1#8	-
F370	(1)1 1/4	3#4	-	1#8	-	F470	(1) 1 1/4	3#4	1#4	1#8	-
F390	(1) 1 1/4	3#2	-	1#8	-	F490	(1) 1 1/2	3#2	1#2	1#8	-
F3125	(1) 1 1/2	3#1	-	1#6	-	F4125	(1) 2	3#1	1#1	1#6	-
F3150	(1) 1 1/2	3#1/0	-	1#6	-	F4150	(1)2	3#1/0	1#1/0	1#6	-
F3175	(1) 2	3#2/0	-	1#6	-	F4175	(1)2	3#2/0	1#2/0	1#6	-
F3200	(1)2	3#3/0	-	1#6	-	F4200	(1)2 1/2	3#3/0	1#3/0	1#6	-
F3225	(1)2	3#4/0	-	1#4	-	F4225	(1)2 1/2	3#4/0	1#4/0	1#4	-
F3250	(1)2 1/2	3#250	-	1#4	-	F4250	(1)3	3#250	1#250	1#4	-
F3300	(1)3	3#350	-	1#4	-	F4300	(1)3	3#350	1#350	1#4	-
F3350	(1)4	3#500	-	1#2	-	F4350	(1)4	3#500	1#500	1#2	-
F3400	(2)2	6#3/0	-	2#2	-	F4400	(2)2 1/2	6#3/0	2#3/0	2#2	-
F3450	(2)2 1/2	6#4/0	-	2#1	-	F4450	(2)2 1/2	6#4/0	2#4/0	2#1	-
F3500	(2)2 1/2	6#250	-	2#1	-	F4500	(2)3	6#250	2#250	2#1	-
F3600	(2)3	6#350	-	2#1	-	F4600	(2)3	6#350	2#350	2#1	-
F3700	(2)3	6#500	-	2#1/0	-	F4700	(2)4	6#500	2#500	2#1/0	-
F3800	(3)3	9#350	-	3#1/0	-	F4800	(3)3	9#350	3#350	3#1/0	-
F31000	(3)4	9#500	-	3#2/0	-	F41000	(3)4	9#500	3#500	3#2/0	-
F31200	(4)3	12#350	-	4#3/0	-	F41200	(4)3	12#350	4#350	4#3/0	-
F31500	(5)3	15#350	-	4#4/0	-	F41500	(5)3	15#350	5#350	4#4/0	-
F31600	(5)3	15#500	-	5#4/0	-	F41600	(5)4	15#500	5#500	5#4/0	-
F32000	(6)4	18#500	-	6#250	-	F42000	(6)4	18#500	6#500	6#250	-



EXISTING PANEL "DBHM"
277/480V, 3PH, 4W
225 AMP BUS

GENERAL NOTES:

- A. FEEDERS SHOWN ARE COPPER CONDUCTORS WITH THHN/THWN INSULATION TYPE UNLESS NOTED OTHERWISE.
- B. PROVIDE PROTECTION FROM PHYSICAL DAMAGE AGAINST ACCIDENTAL CONTACT FOR SWITCHBOARDS, PANEL BOARDS, AND OTHER ELECTRICAL EQUIPMENT AS REQUIRED PER CEC 110.27 (A), (B) AND (C).
- C. EXISTING CONDUITS TO EXISTING HVAC UNITS WHICH WILL BE REPLACED WITH NEW HVAC UNIT SHALL BE EXTENDED AND CONNECTED TO NEW HVAC UNITS.
- D. REFER TO MECHANICAL EQUIPMENT SCHEDULE SHEET M0100 FOR ADDITIONAL INFORMATION.



EXISTING DISTRIBUTION BOARD "DPA"
277/480V, 3PH, 3W
600 AMP BUS

SHEET NOTES:

- 1. EXISTING CIRCUIT BREAKER AND CONDUIT TO REMAIN. PROVIDE NEW CONDUCTOR TO POWER THE NEW HVAC UNIT.
- 2. REPLACE EXISTING CIRCUIT BREAKER WITH NEW CIRCUIT BREAKER WITH THE SAME SHORT CIRCUIT CURRENT RATING AS THE EXISTING BOARD. EXISTING CONDUIT TO REMAIN. PROVIDE NEW CONDUCTOR TO POWER THE NEW EQUIPMENT.
- 3. EXISTING TO REMAIN.



EXISTING MAIN SWITCHBOARD "MSB"
277/480V, 3PH, 4W
1200 AMP BUS

CLIENT

State of California
Dept. of General Services

DGS
GENERAL SERVICES

Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605

Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT

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UPGRADES

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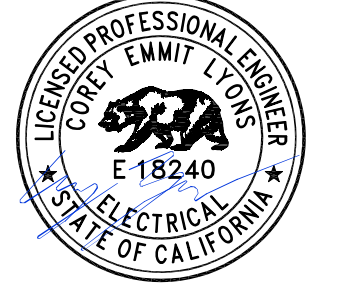
PRIME CONSULTANT

IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



SUB CONSULTANT

INTEGRAL
15700 Ventura Blvd, Suite 1902
Los Angeles, CA 91436
310.325.9655 Telephone
E-Mail: info@integralgroup.com
www.integralgroup.com



ISSUES

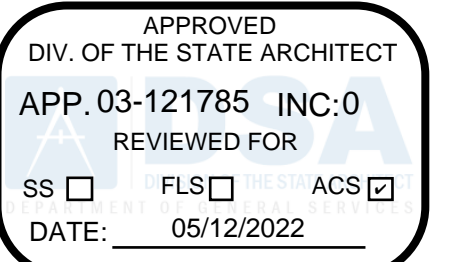
NO.	ISSUANCE	STATUS	DATE
F	50% CD - REVISED SCOPE		2020-11-25
G	100%CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-06-31
V1	DSA/OSFM SUBMITTAL		2021-09-14
V2	DSA/OSFM BACKCHECK		2022-03-11
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

**ELECTRICAL - SINGLE
LINE DIAGRAM**

DATE: 2022-05-02
DRAWN BY: NH
CHKD BY: CL
SCALE: NTS
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER: **EH5000**
ISSUE: **A1**



BACKBOX SCHEDULE					
DRAWING SYMBOL	FUNCTIONAL DESCRIPTION	BACKBOX SIZE	PANEL DETAIL	EQUIPMENT MOUNTING	MOUNTING HEIGHT (TO CENTER OF BACKBOX) AND NOTES
4M	MICROPHONE INPUT PANEL	2 GANG/SMR	1/AV3000	1/AV5000	+15" AFF, SURFACE MOUNT
70J	EXISTING JBL CBT70J + 70JE SPEAKERS	NA	NA	NA	SPEAKERS TO REMAIN
815	EXISTING EIKI EK-815 PROJECTOR	NA	NA	NA	PROJECTOR TO REMAIN
AV	VIDEO INPUT PANEL	2 GANG/SMR	2/AV3000	1/AV5000	+15" AFF, SURFACE MOUNT
C28	EXISTING JBL CONTROL 28-1 SPEAKERS	NA	NA	3/AV5001	+252" AFF. MOVE TO REVERSE SIDE OF BEAM
COL	COLLECTOR BOX	NEMA 122412	NA	NA	+96" AFF
D	DISTRIBUTED LOUDSPEAKER	***	NA	3/AV5000	SUSPENDED, BOTTOM ALIGNS WITH LIGHTS
IN	INPUT PANEL	4 GANG/SMR	7/AV3000	NA	+15" AFF
J	JUNCTION BOX	2 GANG/SMR	BLANK	1/AV5000	ABOVE SUSPENDED LIGHTING
L	LEFT LOUDSPEAKER PANEL	2 GANG/1	3/AV3000	2/AV5000	+11'6" AFF ON FACE OF SOFFIT
R	RIGHT LOUDSPEAKER PANEL	2 GANG/1	3/AV3000	2/AV5000	+11'6" AFF ON FACE OF SOFFIT
RF	RF HEARING ASSISTANCE PANEL	2 GANG	4/AV3000	4/AV5000	+11'0" AFF OR AS NOTED.
SC	SCREEN CONTROL PANEL	1 GANG/SMR	NA	NA	+45" AFF, SURFACE MOUNT
SM	SCREEN CONTROL MOTOR	2 GANG	NA	NA	ADJACENT TO SCREEN MOTOR HOUSING
VP	VIDEO PROJECTOR PANEL	2 GANG	5/AV3000	1/AV5001	FLUSH IN CEILING
WM	WIRELESS ANTENNA PANEL	2 GANG	6/AV3000	2/AV5001	+11'0" AFF

BOX SIZE BACKBOX SIZES ARE GIVEN EITHER AS STANDARD GANG SIZES OR AS NEMA STANDARD BACKBOX DIMENSIONS. NEMA DIMENSIONS ARE GIVEN AS HEIGHT X WIDTH X DEPTH.

*** REFER TO SPECIFICATION SECTION 274100 FOR DIMENSIONS.

1 GANG/SMR DENOTES A 1 GANG SURFACE MOUNTED RACEWAY BACKBOX REFER TO SPECIFICATION SECTION 260580.

2 GANG/SMR DENOTES A 2 GANG SURFACE MOUNTED RACEWAY BACKBOX REFER TO SPECIFICATION SECTION 260580.

4 GANG/SMR DENOTES A 4 GANG SURFACE MOUNTED RACEWAY BACKBOX REFER TO SPECIFICATION SECTION 260580.

2 GANG/1 DENOTES A 2 GANG BACKBOX WITH A SINGLE GANG PLASTER RING

PROJECTION SCREEN SCHEDULE						
SCREEN NUMBER	ROOM NUMBER	SCREEN HOUSING TYPE	SCREEN MATERIAL	SCREEN OPERATION	IMAGE SIZE (HEIGHT X WIDTH)	MOUNTING HEIGHT (TO BOTTOM OF HOUSING)
1	116	WALL MOUNT	MATTE WHITE	ELECTRIC	6'0"-1/2" X 9'8"	12" +10'6" AFF

CONDUIT RISER LEGEND	
	WALL, CATWALK OR ABOVE CEILING
	FLUSH IN CEILING UNLESS OTHERWISE NOTED
	FLUSH IN FLOOR
SLASH MARKS INDICATE QUANTITY OF CONDUIT; QUANTITY OF WIRES IS SHOWN ON THE SINGLE LINE DIAGRAMS.	
EXAMPLE:	TWO 1" CONDUITS WITH PRODUCTION COMMUNICATIONS WIRING.

WIRE TYPE SCHEDULE	
A	MIC, 2 CONDUCTOR SHIELDED
B	LINE, 2 CONDUCTION SHIELDED
C	PRODUCTION COMMUNICATIONS
D	SPEAKER, LOW Z, PAIR #10 THHN
E	SPEAKER 70V, PAIR #10 THHN
F	DIGITAL MEDIA
G	RF CO-AX
H	VIDEO CO-AX
J	CONTROL, DC
K	CONTROL, DIGITAL
L	OPTICAL FIBER
M	FUTURE

GENERAL INSTALLATION NOTES	
REFER TO SPECIFICATION SECTIONS 274100 FOR ADDITIONAL INFORMATION. REFER TO SPECIFICATION SECTION 260580 FOR ADDITIONAL AV CONDUIT INSTALLATION INSTRUCTIONS. AC POWER FOR AV SYSTEMS PROVIDED BY ELECTRICAL CONTRACTOR PER DIVISION 26.	
I. CONDUIT AND WIRE PULLING:	<p>A. CONDUIT, PULL BOXES AND BACK BOXES TO BE INSTALLED PER DIVISION 26.</p> <p>B. INSTALL A LENGTH OF YELLOW PULL LINE IN EACH CONDUIT RUN BETWEEN SUCCESSIVE BACK BOXES AND PULL BOXES.</p> <p>C. CONDUIT SHALL BE RIGID FERROUS METAL THIN WALL (EMT). NON METALLIC CONDUIT SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED ON THE AV CATEGORY CONDUIT RISER.</p> <p>D. PULL BOXES REQUIRED BY CODE ARE NOT SHOWN ON THE AV CONDUIT RISERS, BUT SHALL BE INSTALLED AFTER EACH 270 DEGREES OF BEND OR AS REQUIRED BY APPLICABLE CODES.</p> <p>E. CONDUIT SHALL BE ISOLATED FROM THE A/V GROUNDING SYSTEM. INSULATED MOUNTING SHALL BE USED FOR AV CONNECTORS. CONDUIT ENTERING THE AV EQUIPMENT RACKS SHALL BE INSULATED FROM THE RACKS WITH NONCONDUCTIVE BUSHINGS.</p> <p>F. THE CONTRACTOR SHALL VERIFY THE CONTINUITY OF AV CONDUIT BY PASSING A MOUSE THROUGH EACH CONDUIT RUN.</p> <p>G. AUDIO AND CONTROL CABLES MAY BE CUT AT TERMINAL CABINETS FOR EASE OF INSTALLATION. SPLICES SHALL BE MADE USING BARRIER TERMINAL STRIPS OR OTHER APPROVED METHODS.</p> <p>H. VIDEO LINES MAY BE CUT AT TERMINAL CABINETS FOR PULLING, IF NECESSARY. VIDEO CABLES SHALL BE CONNECTED USING BNC COUPLERS.</p> <p>I. CABLES AND WIRE SHALL BE PULLED THROUGH JUNCTION BOXES WITHOUT CUTS OR SPLICES.</p> <p>J. SPLICING OF CABLES OR WIRES SHALL NOT BE PERMITTED EXCEPT AS NOTED ABOVE.</p>
II. BACK BOX LOCATIONS AND MOUNTING:	<p>A. BACKBOX LOCATIONS AND MOUNTING HEIGHTS SHALL BE VERIFIED IN THE FIELD BY THE ARCHITECT PRIOR TO ROUGH IN.</p> <p>B. BACKBOXES DESIGNATED AS "FUTURE" SHALL BE PROVIDED WITH A BLANK COVER. THE BACKBOX IDENTIFICATION SHALL BE PAINTED IN BLACK ON THE INSIDE OF THE COVER.</p>
III. WIRING:	<p>A. WIRE RACKS COMPLETELY PRIOR TO DELIVERY AT THE JOBSITE. NO INTERNAL RACK WIRING SHALL BE PERMITTED ONSITE.</p> <p>B. WIRING SHALL BE ROUTED TO MINIMIZE INDUCED HUM IN AUDIO LINES AND EQUIPMENT.</p> <p>C. THE AV GROUNDING SCHEME DESCRIBED IN THE PLANS AND SPECIFICATIONS SHALL BE USED.</p> <p>D. SWITCHES, CONTROLS, RECEPTACLES AND GENERAL INFORMATION SHALL BE LABELING WITH ENGRAVED PLASTIC LAMINATE OR ENGRAVED METAL PLATES. DRY TRANSFER OR OTHER TYPES OF ADHESIVE (LABEL GUNS) ARE NOT ACCEPTABLE.</p> <p>E. LOW LEVEL AUDIO AND CONTROL WIRING SHALL BE LANDED AT THE EQUIPMENT RACKS USING BARRIER TERMINAL STRIPS OR DIRECT CONNECTION TO THE AV EQUIPMENT.</p> <p>F. LOUDSPEAKER LINES LANDED AT THE EQUIPMENT RACKS SHALL USE BARRIER TERMINAL STRIPS WITH SPADE LUGS. LOUDSPEAKER COMMONS SHALL NOT BE BUSSED TOGETHER. LOUDSPEAKER LINES SHALL NOT BE CONNECTED TO GROUND.</p> <p>G. TYPICAL WIRING OF 3-PIN (BALANCED) AUDIO CONNECTORS: PIN 1 OR SLEEVE: SHIELD, DO NOT GROUND PIN 2 OR TIP: RED (OR WHITE), (+) HIGH PIN 3 OR RING: BLACK, (-) LOW</p> <p>H. TYPICAL WIRING OF 2-PIN (UNBALANCED) AUDIO CONNECTORS: PIN 1 OR (-): BLACK, COMMON PIN 2 OR (+): RED (OR WHITE), HOT</p> <p>I. AUDIO EQUIPMENT SHALL HAVE BALANCED INPUTS AND OUTPUTS. INPUT/OUTPUT TRANSFORMERS SHALL BE PROVIDED AS NECESSARY. UNBALANCED AUDIO LINES ARE NOT ACCEPTABLE UNLESS NOTED OTHERWISE IN THE DRAWINGS OR SPECIFICATIONS.</p> <p>J. PRODUCTION COMMUNICATION WIRING SHIELDS SHALL NOT BE GROUNDED AT ANY POINT EXCEPT WITHIN THE MAIN SYSTEM POWER SUPPLY.</p>
IV. WIRE NUMBERING:	EACH CABLE SHALL HAVE A UNIQUE ALPHANUMERIC DESIGNATION. THE DESIGNATION SHALL BE PROVIDED AT EACH END OF THE CABLE USING PERMANENT MACHINE PRINTED LABELS. HANDWRITTEN LABELS ARE NOT ACCEPTABLE. LABELS SHALL BE COVERED WITH CLEAR SHRINK WRAP FOR PROTECTION. THE WIRE DESIGNATIONS SHALL BE DOCUMENTED ON THE AS-BUILT DRAWINGS AND COMPILED IN A WIRING SCHEDULE ACCEPTABLE TO THE OWNER.
V. SEISMIC RESTRAINTS:	<p>A. SUSPENDED OR FREE STANDING AV EQUIPMENT SHALL BE SECURED TO THE PERMANENT BUILDING STRUCTURE PER APPLICABLE SEISMIC CODES.</p> <p>B. EQUIPMENT MOUNTING DETAILS ARE NOT DESCRIBED IN THE PLANS OR SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING MOUNTING DETAILS.</p> <p>C. SUBMIT SHOP DRAWINGS OF MOUNTING DETAILS TO THE OWNER FOR REVIEW AFTER THEY HAVE BEEN APPROVED, STAMPED AND SIGNED BY A STRUCTURAL ENGINEER REGISTERED AND LICENSED IN THE PROJECT'S STATE. SHOP DRAWINGS SHALL INCLUDE ENGINEER'S CALCULATIONS.</p>

CLIENT

State of California
 Dept. of General Services

Real Estate Services Division
 Project Management and Development Branch
 707 Third St. 4th Floor
 West Sacramento, CA 95605

Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

PROJECT

CAAM CONFERENCE CENTER & LIBRARY IMPROVEMENTS, RE-ROOF AND HVAC UPGRADES

California African American Museum
 600 State Drive
 Los Angeles, CA 90037

PRIME CONSULTANT

IBI GROUP
 1001 Wilshire Blvd. Suite 100-3100
 Los Angeles, CA 90017, USA
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com

SUB CONSULTANT

Media Systems Design Group

P.O. Box 66337
 Los Angeles, CA 90066
 Phone: 310-291-3461
 WWW.MSD-GROUP.COM

ISSUES			
NO.	ISSUANCE	STATUS	DATE
E	50% CD		2019-12-13
F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-31
V1	DSAVOSFM SUBMITTAL		2021-09-14
V2	DSAVOSFM BACKCHECK		2022-03-02
A1	ADDENDUM #1		2022-05-02

SHEET TITLE

AUDIO VISUAL GENERAL NOTES AND SCHEDULES

DATE: 2022-05-02

DRAWN BY: TSH

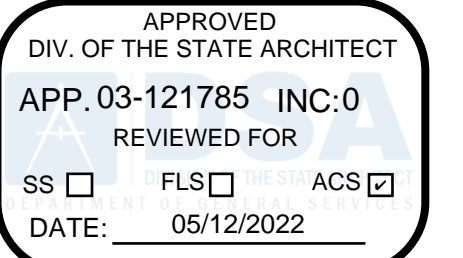
CHKD BY: TSH

SCALE: As indicated

DGS NO: 4359

IBI PROJECT NO: 119020

SHEET NUMBER	ISSUE
AV0000	A1



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 Los Angeles, CA 90037

PRIME CONSULTANT

 IBI GROUP
 1001 Wilshire Blvd, Suite 100-3100
 Los Angeles, CA 90017, USA
 tel 213 769 0011 fax 213 769 0016
 ibigroup.com

SUB CONSULTANT
Media Systems Design Group
 P.O. Box 66337
 Los Angeles, CA 90066
 Phone: 310-291-3461
 WWW.MSD-GROUP.COM

ISSUES

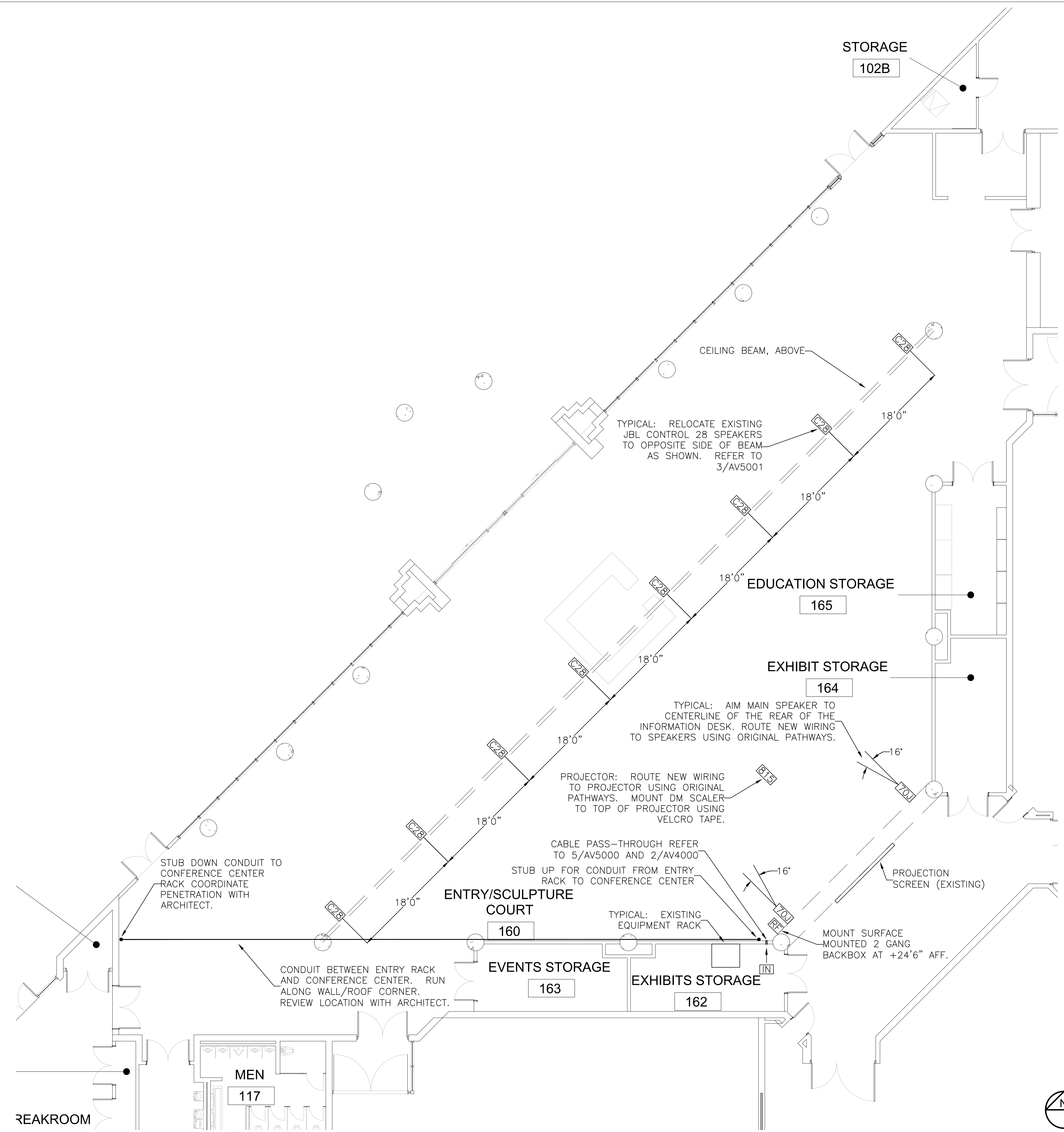
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F	50% CD - SCOPE REVISION		2020-11-25
G	100% CD		2021-02-08
H	100% CD - SCOPE REVISIONS		2021-08-21
V1	DS/OSFM SUBMITTAL		2021-09-14
V2	DS/OSFM BACKCHECK		2022-03-02
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**AUDIO VISUAL
 ENTRY FLOOR PLAN**

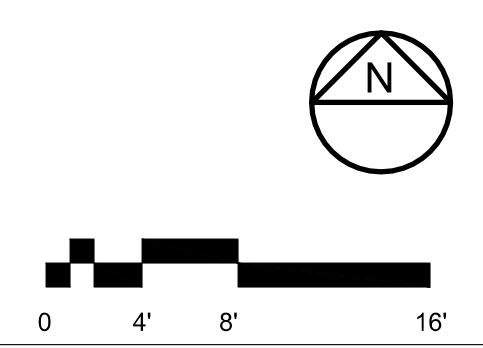
DATE: 2022-08-08
 DRAWN BY: TSH
 CHKD BY: TSH
 SCALE: As indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

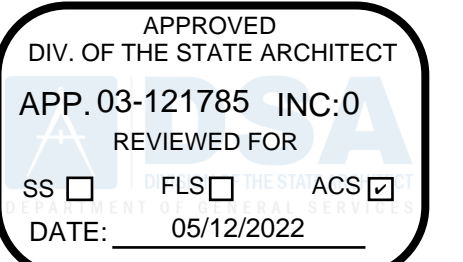
SHEET NUMBER
AV2100
 ISSUE
A1

FLOOR PLAN NOTES:
 1. REFER TO AV1000 FOR CONDUIT RISER.



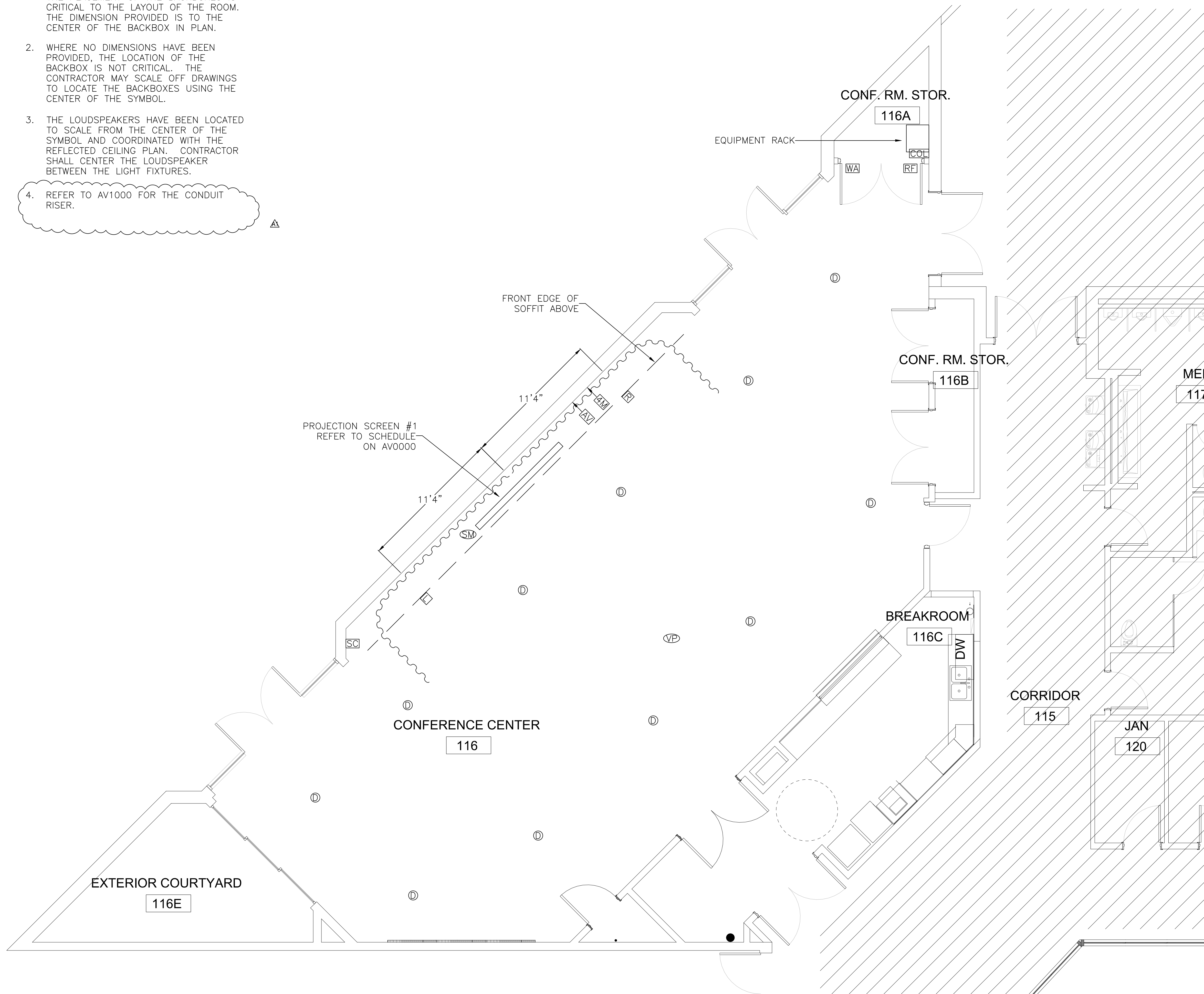
1 AV ENTRY FLOOR PLAN
 SCALE: 1/8" = 1'-0"



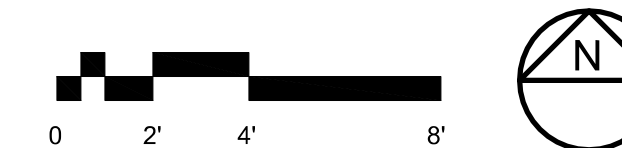


FLOOR PLAN NOTES:

1. DIMENSIONS HAVE BEEN PROVIDED WHERE THE PLACEMENT OF THE BACKBOXES IS CRITICAL TO THE LAYOUT OF THE ROOM. THE DIMENSION PROVIDED IS TO THE CENTER OF THE BACKBOX IN PLAN.
2. WHERE NO DIMENSIONS HAVE BEEN PROVIDED, THE LOCATION OF THE BACKBOX IS NOT CRITICAL. THE CONTRACTOR MAY SCALE OFF DRAWINGS TO LOCATE THE BACKBOXES USING THE CENTER OF THE SYMBOL.
3. THE LOUDSPEAKERS HAVE BEEN LOCATED TO SCALE FROM THE CENTER OF THE SYMBOL AND COORDINATED WITH THE REFLECTED CEILING PLAN. CONTRACTOR SHALL CENTER THE LOUDSPEAKER BETWEEN THE LIGHT FIXTURES.
4. REFER TO AV1000 FOR THE CONDUIT RISER.



1 CONFERENCE CENTER FLOOR PLAN
SCALE: 1/4" = 1'-0"



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State of California
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DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St. 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CAAM CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
690 State Drive
Los Angeles, CA 90037

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IBI GROUP
1001 Wilshire Blvd. Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
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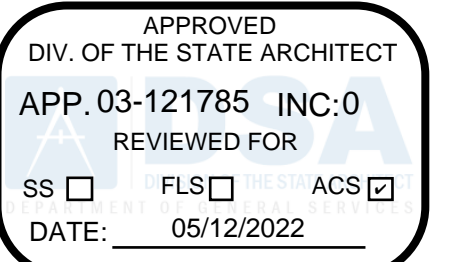
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Media Systems Design Group
P.O. Box 66337
Los Angeles, CA 90066
Phone: 310-291-3461
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V2	DSA/OSFM BACKCHECK		2022-03-02
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**AUDIO VISUAL
CONFERENCE CENTER
FLOOR PLAN**

DATE: 2022-05-02
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CHKD BY: TSH
SCALE: As indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
AV2101
ISSUE
A1



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Dept. of General Services

 Real Estate Services Division
 Project Management and Development Branch
 707 Third St, 4th Floor
 West Sacramento, CA 95605
 Dianna Brown, Project Director
 (916) 375-4323 (Voice)
 dianna.brown@dgs.ca.gov

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CAAM CONFERENCE CENTER & LIBRARY
 IMPROVEMENTS, RE-ROOF AND HVAC
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 California African American Museum
 600 State Drive
 Los Angeles, CA 90037

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 Los Angeles, CA 90017, USA
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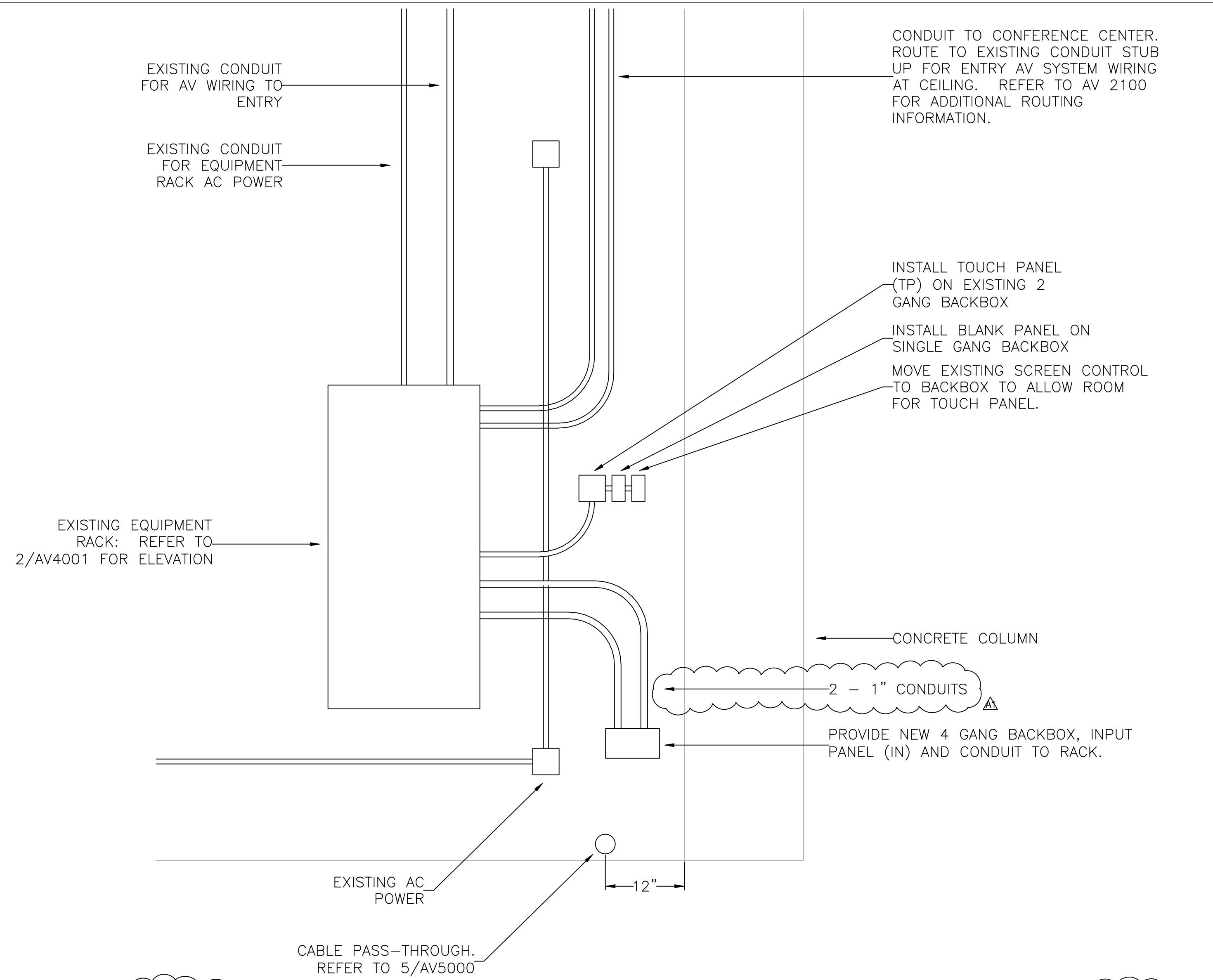
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Media Systems Design Group
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 Los Angeles, CA 90066
 Phone: 310-291-3461
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A1	ADDENDUM #1		2022-05-02

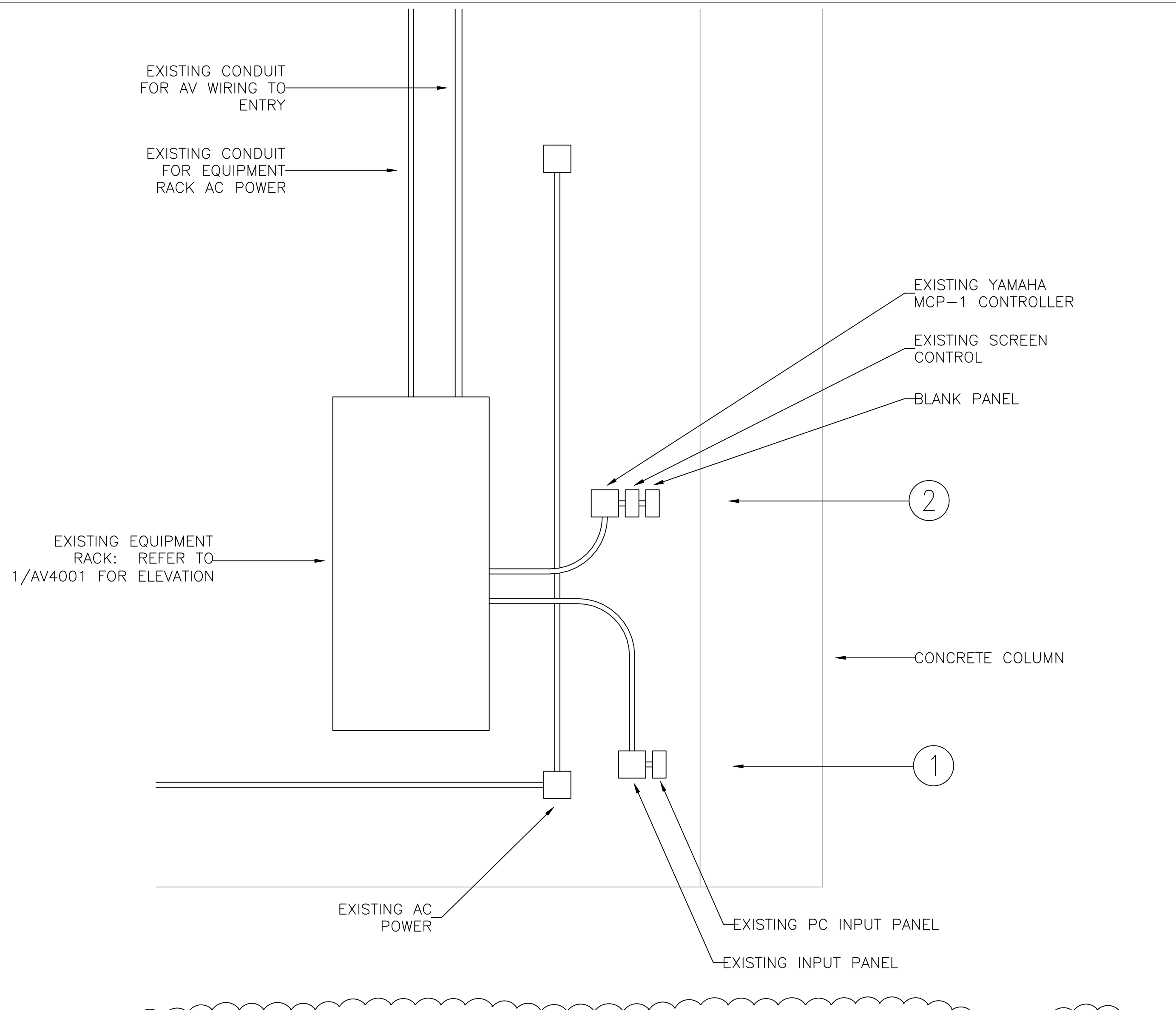
SHEET TITLE
AUDIO VISUAL
ENTRY
EQUIPMENT RACK
EXPANDED PLAN

DATE: 2022-05-02
 DRAWN BY: TSH
 CHKD BY: TSH
 SCALE: As Indicated
 DGS NO: 4359
 IBI PROJECT NO: 119020

SHEET NUMBER: **AV4000** ISSUE: **A1**



② EXHIBIT STORAGE (162) INSTALLATION EXPANDED RACK ELEVATION
 SCALE: 1"=1'0"



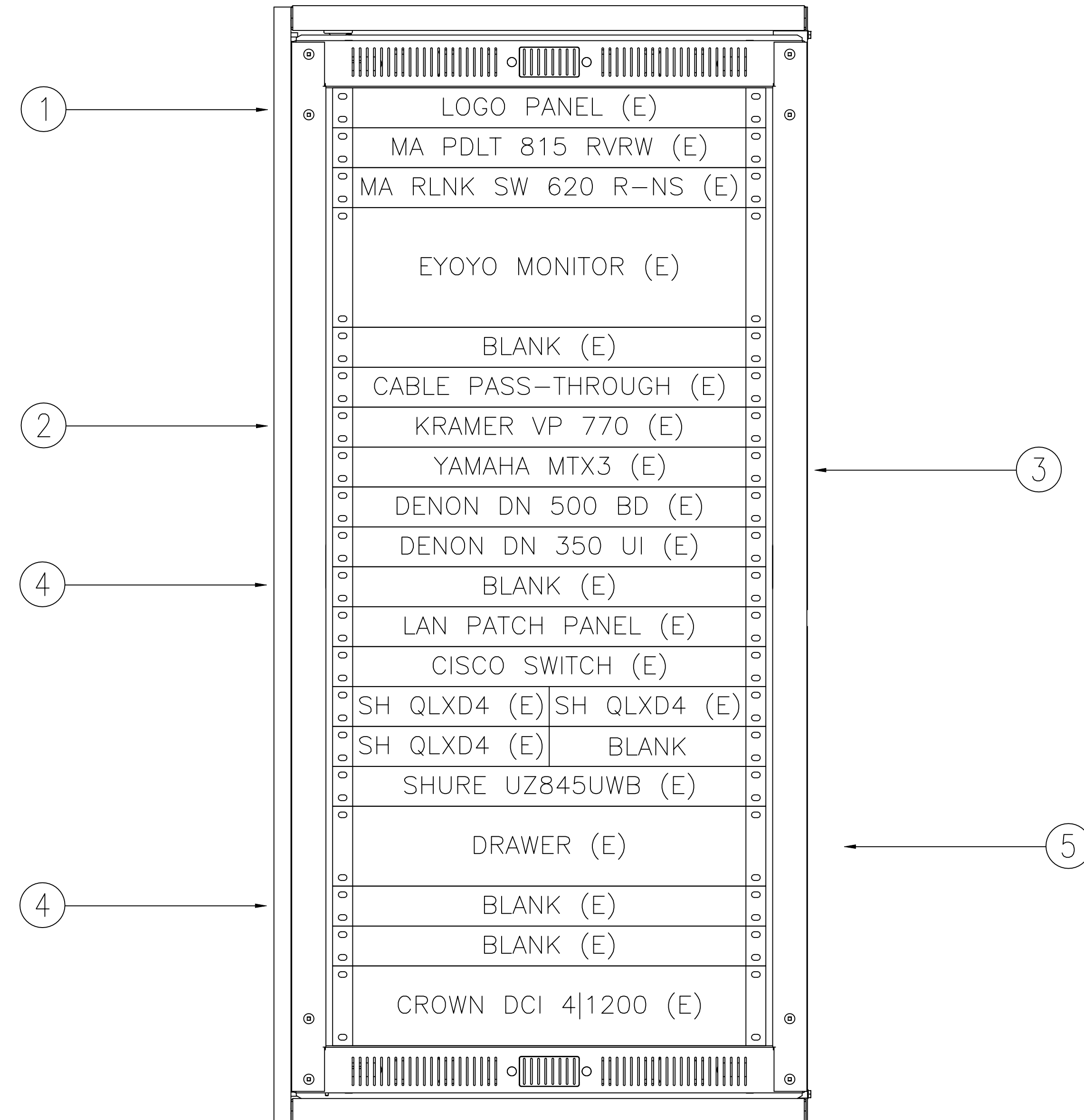
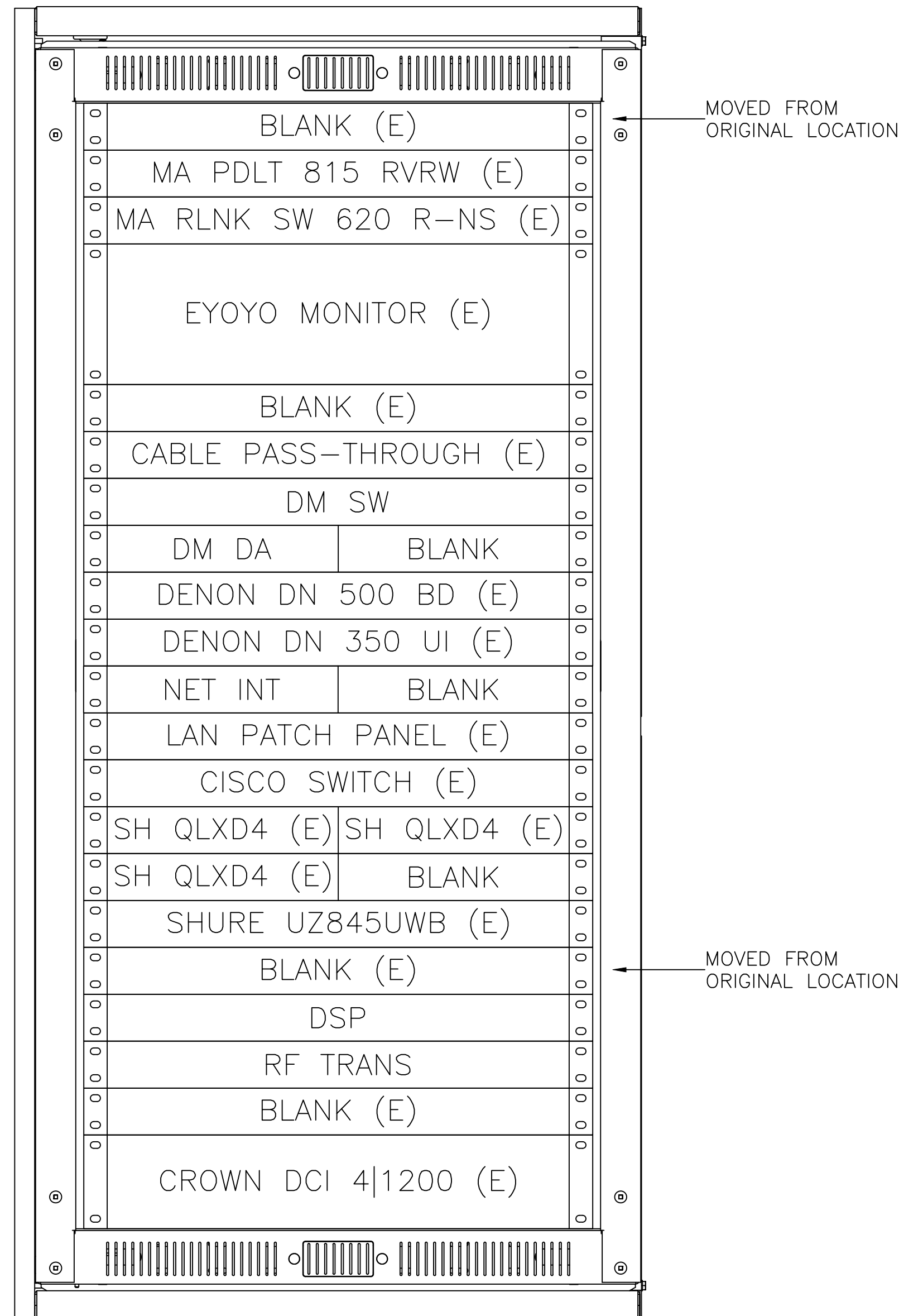
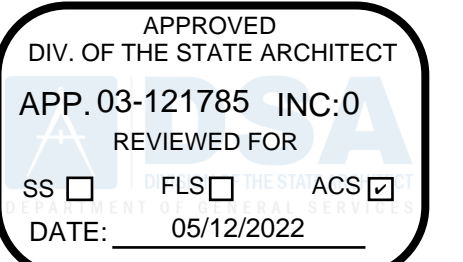
① EXHIBIT STORAGE (162) DEMOLITION EXPANDED RACK ELEVATION
 SCALE: 1"=1'0"

AV DEMOLITION NOTES

1. THE CONTRACTOR SHALL REMOVE WIRING AS DIRECTED. THE CONTRACTOR SHALL NOT ABANDON WIRING IN PLACE UNLESS DIRECTED.
2. THE CONTRACTOR SHALL DISPOSE OF REMOVED EQUIPMENT AND WIRING IN ACCORDANCE WITH OWNER REQUIREMENTS AND APPLICABLE LAWS.
3. THE CONTRACTOR SHALL PATCH, REPAIR AND PAINT TO MATCH EXISTING FINISHES OF ANY AREA AFFECTED BY THE DEMOLITION WORK.
4. CONTRACTOR SHALL REPLACE ANY WIRING DAMAGED BY THE DEMOLITION WORK AT NO ADDITIONAL COST TO THE OWNER.

AV DEMOLITION KEYNOTES

- ① INPUT PANELS: REMOVE AND DISPOSE OF INPUT PANEL, PC INPUT PANEL, SURFACE MOUNTED BACKBOXES, CONDUIT TO EQUIPMENT RACK AND WIRING.
- ② CONTROL PANELS: REMOVE YAMAHA MPC-1 AND PROVIDE TO OWNER. LEAVE LAN CABLE TO EQUIPMENT RACK IN PLACE FOR USE WITH TOUCH PANEL. REMOVE BLANK PANEL AND SCREEN CONTROL AND RELOCATE AS SHOWN ON 2/AV4000. LEAVE WIRING TO SCREEN CONTROL IN PLACE FOR RECONNECTION TO PANEL IN NEW LOCATION.



2 EXHIBIT STORAGE (162) INSTALLATION RACK ELEVATION
SCALE: 3"=1'0"

1 EXHIBIT STORAGE (162) DEMOLITION RACK ELEVATION
SCALE: 3"=1'0"

AV DEMOLITION NOTES

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2. THE CONTRACTOR SHALL DISPOSE OF REMOVED EQUIPMENT AND WIRING IN ACCORDANCE WITH OWNER REQUIREMENTS AND APPLICABLE LAWS.
3. THE CONTRACTOR SHALL PATCH, REPAIR AND PAINT TO MATCH EXISTING FINISHES OF ANY AREA AFFECTED BY THE DEMOLITION WORK.
4. CONTRACTOR SHALL REPLACE ANY WIRING DAMAGED BY THE DEMOLITION WORK AT NO ADDITIONAL COST TO THE OWNER.

AV DEMOLITION KEYNOTES

- 1 LOGO PANEL: REMOVE AND DISPOSE OF PANEL.
- 2 KRAMER VP 770: REMOVE DEVICE AND PROVIDE TO OWNER.
- 3 YAMAHA MTX3: REMOVE FROM RACK AND PROVIDE TO OWNER.
- 4 BLANK PANEL: REMOVE FROM RACK AND RE-USE AS PART OF RACK RECONFIGURATION .
- 5 DRAWER: REMOVE FROM RACK AND PROVIDE TO OWNER.

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Dept. of General Services
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CAAM CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
1001 Wilshire Blvd, Suite 100-3100
Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
ibigroup.com



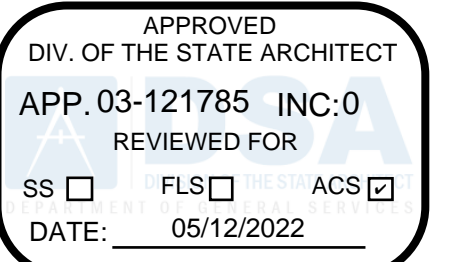
SUB CONSULTANT
Media Systems Design Group
P.O. Box 66337
Los Angeles, CA 90066
Phone: 310-291-3461
WWW.MSD-GROUP.COM

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V2	DSA/OSFM BACKCHECK		2022-03-02
A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**AUDIO VISUAL
ENTRY
EQUIPMENT RACK
ELEVATION**

DATE: 2022-05-02
DRAWN BY: TSH
CHKD BY: TSH
SCALE: As Indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
AV4001 A1



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Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

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**State of California
Dept. of General Services**
DGS
GENERAL SERVICES
Real Estate Services Division
Project Management and Development Branch
707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

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CAAM CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
630 State Drive
Los Angeles, CA 90037

PRIME CONSULTANT
IBI GROUP
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Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
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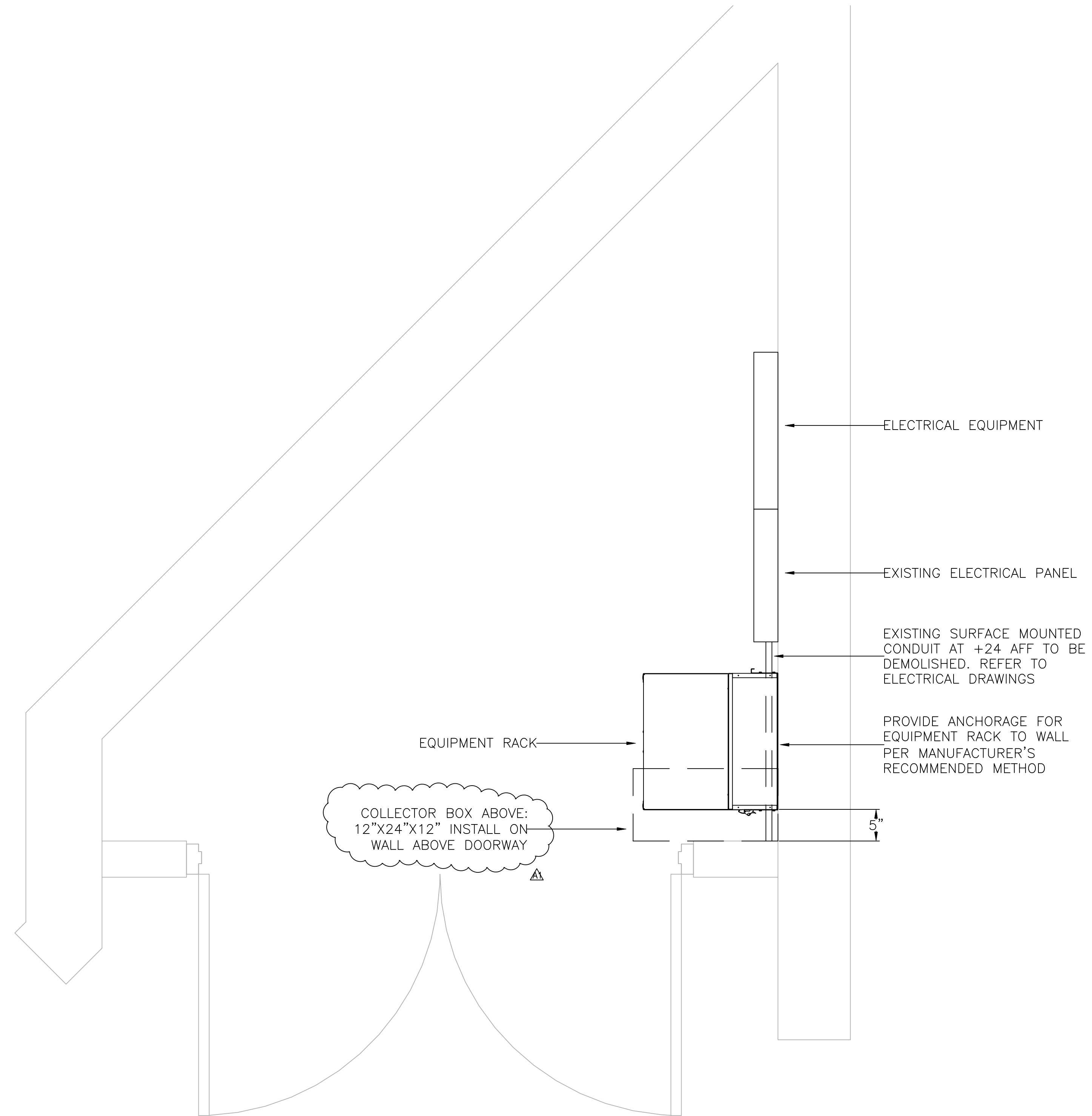
SUB CONSULTANT
**Media Systems
Design Group**
P.O. Box 66337
Los Angeles, CA 90066
Phone: 310-291-3461
WWW.MSD-GROUP.COM

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A1	ADDENDUM #1		2022-05-02

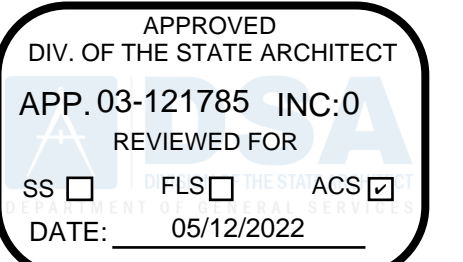
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**AUDIO VISUAL
CONFERENCE CENTER
EQUIPMENT RACK
EXPANDED PLAN**

DATE: 2022-05-02
DRAWN BY: TSH
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SCALE: As Indicated
DGS NO: 4359
IBI PROJECT NO: 119020

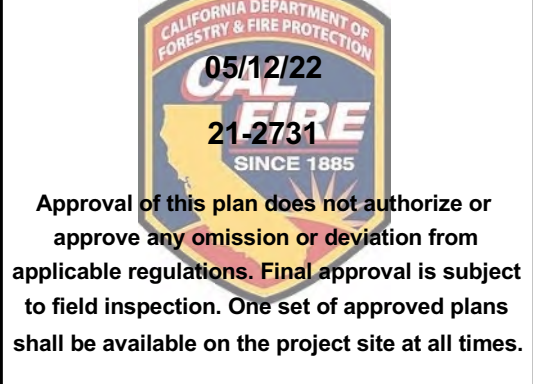
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AV4010
ISSUE
A1



1 STORAGE ROOM (116A) EQUIPMENT RACK EXPANDED PLAN
SCALE: 1"=1'0"



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707 Third St, 4th Floor
West Sacramento, CA 95605
Dianna Brown, Project Director
(916) 375-4323 (Voice)
dianna.brown@dgs.ca.gov

PROJECT
CAAM CONFERENCE CENTER & LIBRARY
IMPROVEMENTS, RE-ROOF AND HVAC
UPGRADES
CAAM
California African American Museum
600 State Drive
Los Angeles, CA 90037

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Los Angeles, CA 90017, USA
tel 213 769 0011 fax 213 769 0016
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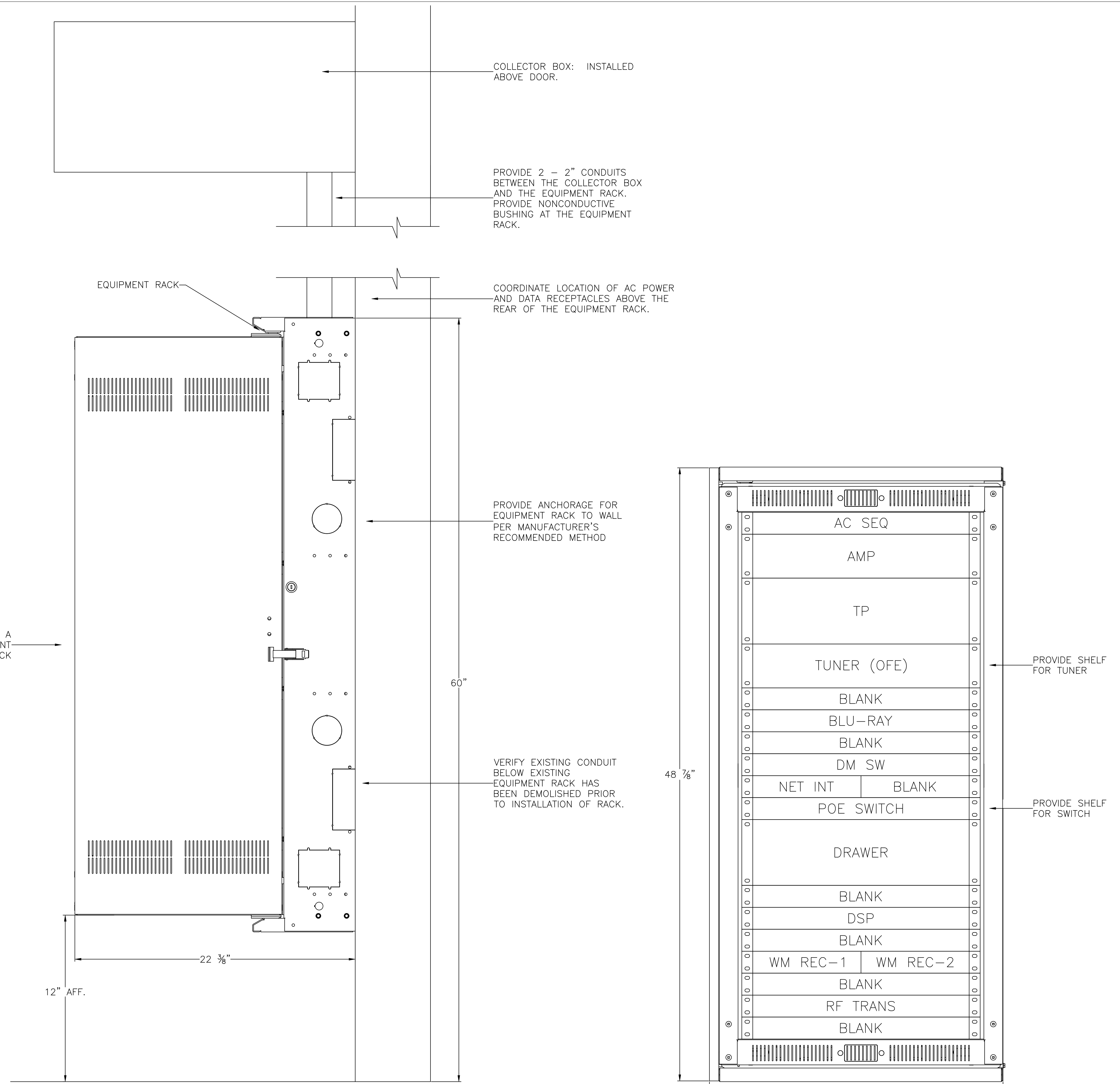
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Media Systems Design Group
P.O. Box 66337
Los Angeles, CA 90066
Phone: 310-291-3461
WWW.MSD-GROUP.COM

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A1	ADDENDUM #1		2022-05-02

SHEET TITLE
**AUDIO VISUAL
CONFERENCE CENTER
EQUIPMENT RACK
ELEVATION**

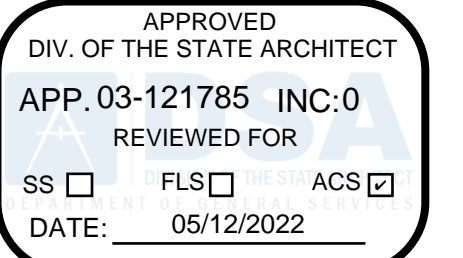
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SCALE: As Indicated
DGS NO: 4359
IBI PROJECT NO: 119020

SHEET NUMBER
AV4011
ISSUE
A1



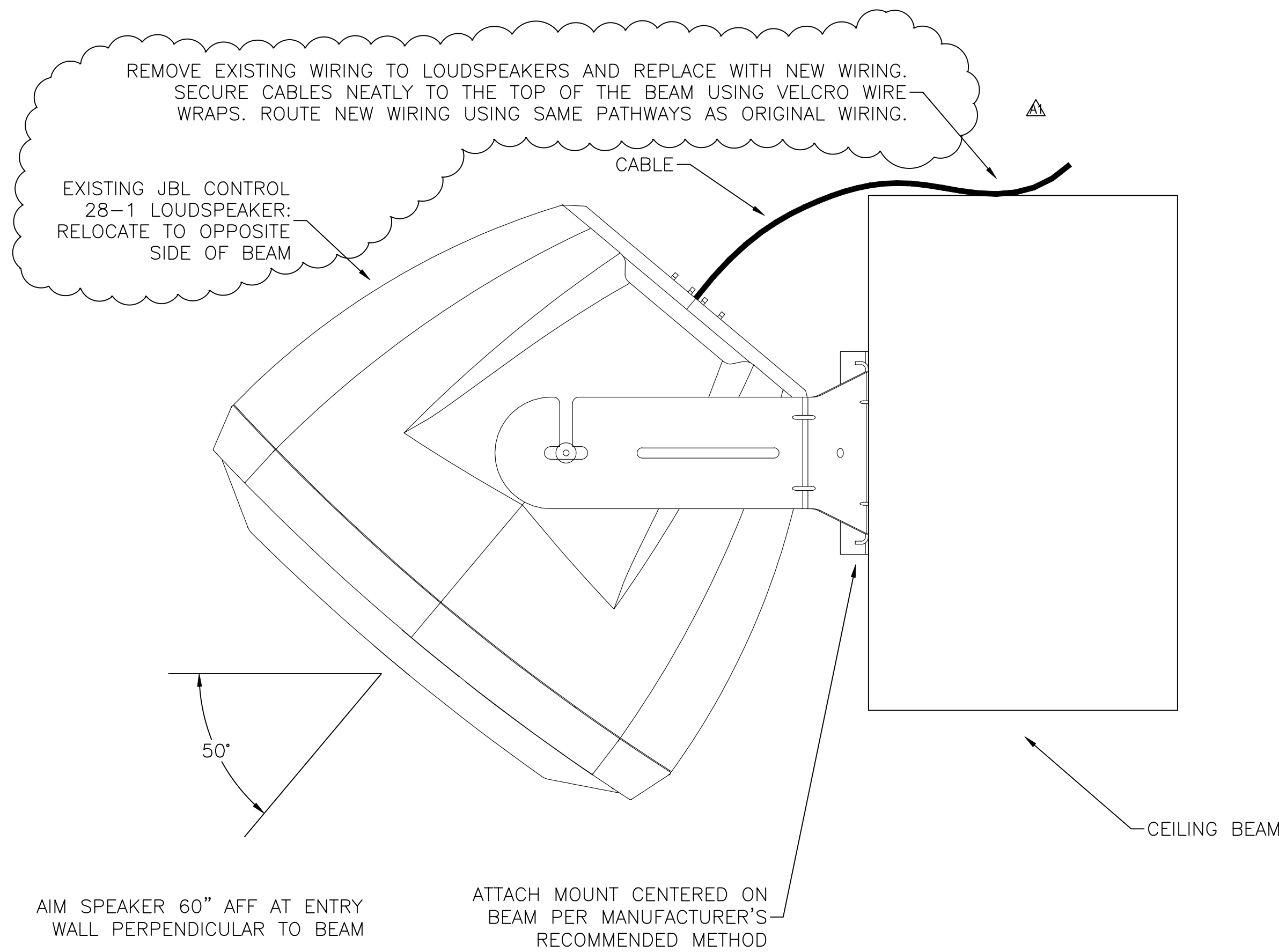
2 STORAGE ROOM (116A) RACK SECTION
SCALE: 3"=1'0"

1 STORAGE ROOM (116A) RACK ELEVATION
SCALE: 3"=1'0"

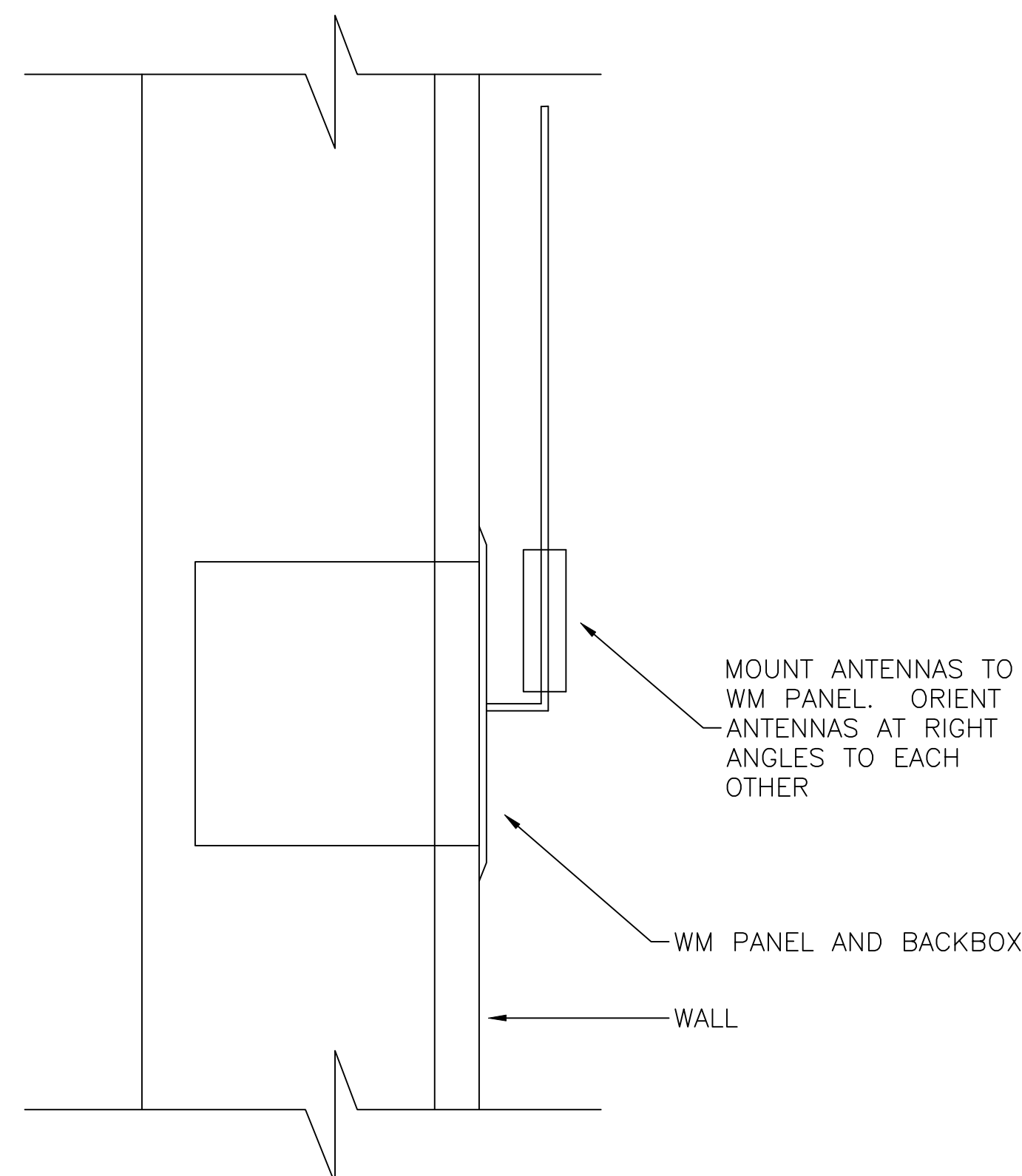


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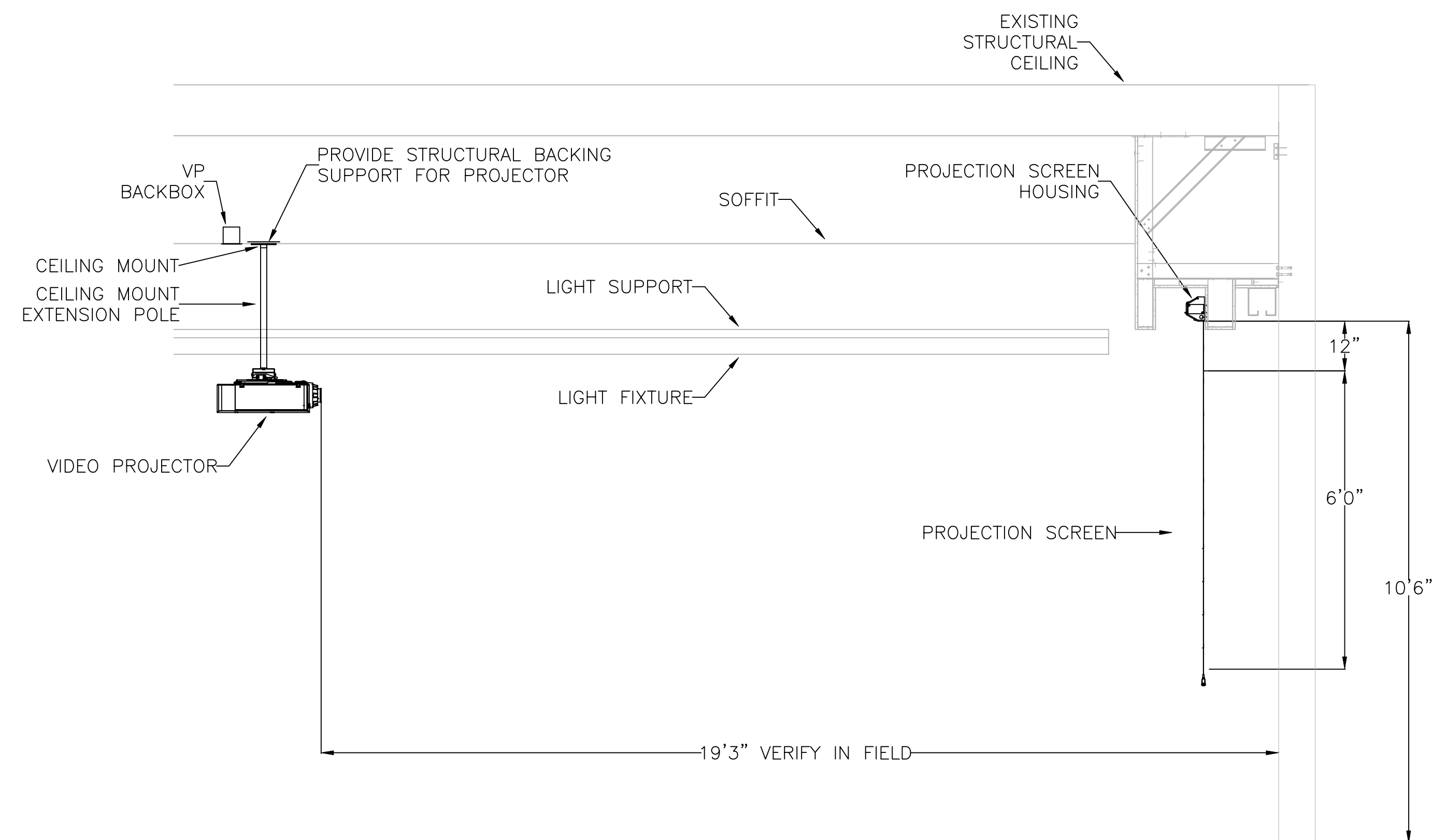
1. ALL DETAILS ARE FOR GENERAL INFORMATION ONLY. COORDINATE ACTUAL LOCATIONS AND CONSTRUCTION MATERIALS AND METHODS WITH THE OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL DEVELOP ACTUAL MOUNTING METHODS AND DOCUMENT THEM IN SHOP DRAWINGS FOR REVIEW PRIOR TO INSTALLATION. THE SHOP DRAWINGS SHALL BE STAMPED BY A REGISTERED STRUCTURAL ENGINEER ENGAGED IN REGULAR PRACTICE IN THE PROJECT'S STATE.



3 ENTRY JBL CONTROL 28 MOUNTING DETAIL
SCALE: 1/2" = 1"



2 WIRELESS MIC ANTENNA MOUNTING DETAIL
SCALE: 1/2" = 1"



SECTION

PROJECTOR MOUNTING NOTES:

1. PROVIDE PROJECTOR MOUNT, CEILING MOUNT AND EXTENSION POLE.
2. VIDEO PROJECTOR MOUNT SHOWN ATTACHED DIRECTLY TO UNDERSIDE OF SOFFIT. PROVIDE STRUCTURAL SUPPORT IN UNDERSIDE OF SOFFIT.
3. VERIFY MOUNTING DISTANCE FROM PROJECTION SCREEN TO VIDEO PROJECTOR IN THE FIELD AND PROVIDE THE APPROPRIATE LENS TO FILL THE SCREEN.
4. INSTALL PROJECTOR MOUNT SO THAT THE VIDEO PROJECTOR LENS IS ON THE CENTERLINE OF THE PROJECTION SCREEN WITH THE LENS IN LINE WITH THE TOP OF THE IMAGE AREA. VERIFY THAT THE PROJECTION BEAM IS NOT INTERRUPTED BY THE LIGHTS.
5. VERIFY VP BACKBOX AND AC POWER ARE MOUNTED BEHIND THE VIDEO PROJECTOR MOUNTING LOCATION.
6. THE FINISH OF MOUNTING HARDWARE SHALL BE FLAT BLACK.

1 VIDEO PROJECTION MOUNTING
SCALE: 1/2" = 1'0"

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SHEET TITLE
AUDIO VISUAL MOUNTING DETAILS

DATE: 2022-05-02
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SCALE: As Indicated
DGS NO: 4359
IBI PROJECT NO: 119020

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