
ADDENDUM NO. 1

Date of Addendum: February 2, 2021

Project Name: Bioinformatics 4th Floor Build Out

SCO ID# 18-19041-03A

PROJECT INFORMATION

- A. Owner: University of North Carolina - Charlotte
- B. Architect: LS3P Associates
- C. Architect Project Number: 9202-194610

NOTICE TO BIDDERS

- A. This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual and Drawings. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.
- B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.
- C. The date for receipt of bids is unchanged by this Addendum, at same time and location.

ATTACHMENTS

- D. This Addendum includes the following attached Documents and Specification Sections:
 - 1. Document "2010 Campuswide Interior Signage and Graphics Systems", (new).
 - 2. Section 012100 Allowance, dated February 2, 2021, (new).
 - 3. Section 087100 Door Hardware, dated February 2, 2021, (reissued).
- E. This Addendum includes the following attached Sheets:
 - 1. General Sheet G-008 FOURTH FLOOR LIFE SAFTEY PLAN, dated February 2, 2021, (reissued).
 - 2. Architectural Sheet A-101 FOURTH FLOOR PLAN – BASE BID, dated February 2, 2021, (reissued).
 - 3. Architectural Sheet A-601 DOOR SCHEDULE, DOOR TYPE LEGEND & FRAME TYPES, dated February 2, 2021, (reissued).

4. Laboratory Sheet LF-003 CASEWORK, dated February 2, 2021, (reissued).
5. Laboratory Sheet LF-206 AUTOCLAVE ROOM, dated February 2, 2021, (reissued).
6. Plumbing Sheet P-002 PLUMBING DETAILS, dated February 2, 2021, (reissued).
7. Plumbing Sheet P-003 PLUMBING DETAILS, dated February 2, 2021, (reissued).
8. Plumbing Sheet P-100 PLUMBING THIRD FLOOR PLAN – NEW WORK, dated February 2, 2021, (reissued).
9. Plumbing Sheet P-101 PLUMBING FOURTH FLOOR OVERALL PLAN, dated February 2, 2021, (reissued).
10. Mechanical Sheet M-501 TEMPERATURE CONTROL SEQUENCES, CONTROL DIAGRAMS AND POINT LIST, dated February 2, 2021, (reissued).
11. Electrical Sheet E-001 ELECTRICAL SYMBOLS AND NOTES, dated February 2, 2021, (reissued).
12. Electrical Sheet E-101 FOURTH FLOOR PLAN – POWER AND SPECIAL SYSTEMS, dated February 2, 2021, (reissued).
13. Telecommunications Sheet TC-001 TELECOM SYMBOL SCHEDULE, GENERAL NOTES, AND DETAILS, dated February 2, 2021, (reissued).

REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS

- A. Specification Section 012300 ALTERNATES, (not reissued).
 1. SECTION 3.2 – SCHEDULE OF PROPRIETARY ALTERNATES
 - a. Article B.1: Revise to read as follows: “1. Provide Johnson Controls Facility Explorer (FX) Niagara BACNet system, no exceptions. The installing controls contractor shall be JCI authorized building controls specialist (ABCS) and shall hold gold level status or higher with Johnson Controls.
 - b. Add Article D as follows:
“D. Proprietary Alternate No. 4: Door Hardware
 1. Provide Schlage locksets (no substitutions) as described in specification section 087100 Door Hardware.”
- B. Specification Section 081416 FLUSH WOOD DOORS
 1. Delete subsection 3.3/A in it’s entirety.
 2. Delete subsection 3.3/B in it’s entirety.
- C. Specification Section 115310 LABORATORY CASEWORK AND OTHER FURNISHINGS
 1. Delete subsection 1.9/B in it’s entirety.
 2. Delete subsection 2.3/A/4/c in it’s entirety.
- D. Specification Section 230593 TESTING AND BALANCING
 1. Article 1.3.A: Delete all reference to (7) sound level measuring and (8) indoor air quality measuring.
- E. Specification Section 260574 OVERCURRENT PROTECTIVE DEVICE COORDINATION
 1. Article 1.2.F: Revise to read as follows “The electrical gear shown on this project may not be coordinated with the devices of certain manufacturers. The contractor shall be

responsible for any changes in feeder size or type of circuit breakers required. Coordinate the system selectively.”

- F. Specification Section 262416 PANELBOARDS
1. Article 3.5.A: Revise to read as follows “Provide for each flush-mounted panelboard size (6) spare ¾ inch conduits from panel to above accessible ceiling of area served (normally a lab) for future extension. Cap and label spare conduits.”

REVISIONS TO DRAWING SHEETS

- A. Replace SHEET G-008 FOURTH FLOOR LIFE SAFETY PLAN with revised G-008, included in Attachments.
- B. Replace SHEET A-101 FOURTH FLOOR PLAN – BASE BID with revised A-101, included in Attachments.
- C. Replace SHEET A-601 DOOR SCHEDULE, DOOR TYPE LEGEND & FRAME TYPES with revised A-601. Included in Attachments.
- D. Replace SHEET LF-003 CASEWORK with revised LF-003, included in Attachments.
- E. Replace SHEET LF-206 AUTOCLAVE ROOM with revised LF-206, included in Attachments.
- F. Replace SHEET P-002 PLUMBING DETAILS with revised P-002, included in Attachments.
- G. Replace SHEET P-003 PLUMBING DETAILS with revised P-003, included in Attachments.
- H. Replace SHEET P-100 PLUMBING THIRD FLOOR PLAN – NEW WORK with revised P-100, included in Attachments.
- I. Replace SHEET P-101 PLUMBING FOURTH FLOOR OVERALL PLAN with revised P-101, included in Attachments.
- J. SHEET M-001 add the following General Notes:

“50. As a part of the base bid for each of the ten (10) rooms listed below, provide a space air pressure monitor and visualization panel with ± 0.10 ” w.c pressure range and audible/visual alarms. The location shall be on a wall common to the room and the interior corridor. The exact location will be indicated by the EOR during the shop drawing process. The system shall consist of a pressure port on the room side, a pressure port on the corridor side, 24 volt power provided by the Division 23 contacts from the nearest emergency panel, the pressure monitor panel shall be provided with white face plate/English, all associated tubing in EMT conduit, wiring and BACnet tie-in to the BAS system with (1) a DI alarm, (2) a DO alarm, (3) an AO pressure signal and (4) switchable positive and negative room offset with audible alarm set points. The system shall be Phoenix APM2 or approved equivalent installed per the manufacturer’s recommendations.

467 Wet Lab 1	460 Autoclave
455 Wet Lab 2	462 Instrument
463 Wet Lab 3	464 Microscope

461 Wet Lab 4	486 Equipment
469 Wet Lab 5	468 Wet Lab 6

51. Provide one (1) new JACE panel for this project and wire same into the existing JCI BAS system.
52. All costs associated with manufacturer's requirements for inlet and discharge straight duct lengths upstream and downstream of variable air volume, constant air volume and/or lab module supply and exhaust valves shall be included as a part of bid. Phoenix (the basis of design for the lab module supply and exhaust valves) has stated that no straight lengths are required to meet their air valve accuracy requirements.
53. For this project and included in the bid, the control subcontractor to the Division 23 contractor shall provide a full building as-built (in regard to sequences) and shall update and make current the building graphs.
54. A differential pressure sensor shall be provided for the project and shall be integrated into the hot water pumping control system. This diffuser shall be located between variable volume terminal units SV-4-B and SV-4-C.
55. The four (4) existing unit heaters removed as a part of this project shall be returned to the University to a location determined by the University on the campus.
56. Provide two (2) emergency stop switches for existing coupled air handling units AHU-2/AHU-3. Locate one (1) in laboratory corridor 400F and one (1) in laboratory corridor 400G and wire into the existing temperature/control/BAS system. From those fan systems, the function shall be as sequenced on Sheet M-502.
57. The entire emergency smoke control system sequences for AHU-2 and 3 and for AHU 4 and 5 shall be tested and approved during the system commissioning process."

K. SHEET M-202

1. The 16" diameter lab exhaust air duct rising up through the roof is indicated incorrectly. The correct location is nominally 6'-0" to the plan north of the indicated location. All ductwork shall be revised accordingly.
2. To the plan southwest of column 8/D, provide a 36" x 18" return air opening with volume damper on the bottom of the 28" x 16" return air duct.

L. SHEET M-203

1. In Autoclave Service Room 460A, revise CD-9 supply air quantity from 400CFM to 800 CFM.

M. SHEET M-204

1. There is an existing 48"x18" return air duct riser in the chase near column 7/A.7. Remove the existing fire damper, cap/seal duct in chase and patch chase wall to comply with 2 hour fire rating.

N. SHEET M-301

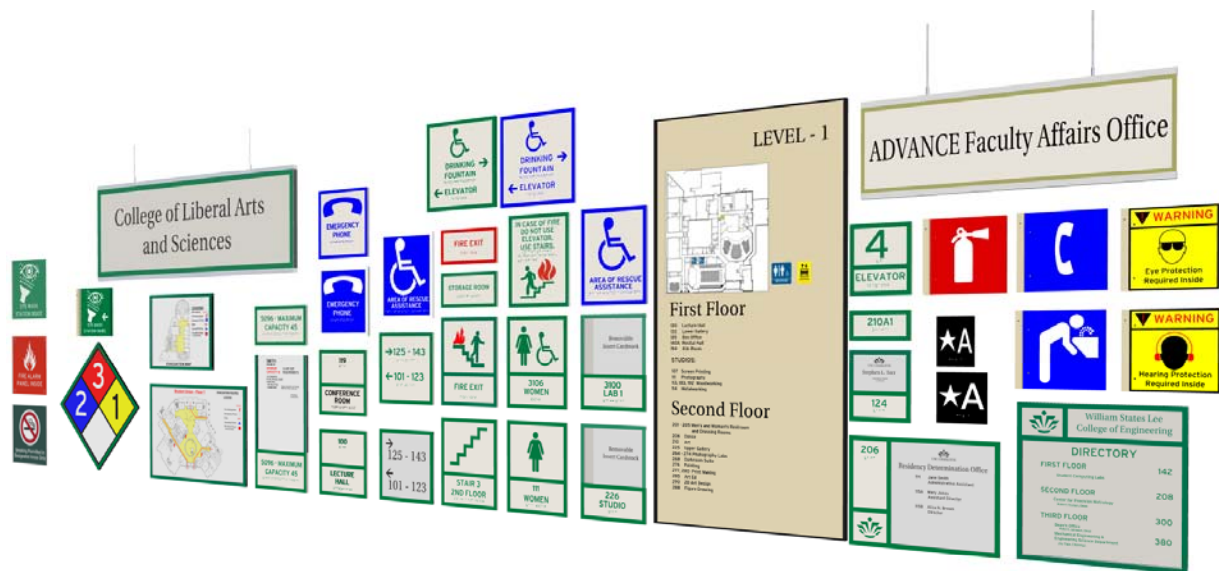
1. All chilled water supply and return piping to FCU-7 and FCU-8 shall be 1".
2. All hot water supply and return piping to FCU-7 and FCU-8 shall be ¾"
3. Hot water supply and return piping from existing mains to and from VAV 4-13 shall be 1".

O. SHEET M-504

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1. On the typical laboratory control schematic diagram, revise the wall mounted photo sensitive occupied/unoccupied sensor to be fume hood mounted rather than wall mounted.
- P. Replace SHEET M-501 TEMPERATURE CONTROL SEQUENCES, CONTROL DIAGRAMS AND POINT LIST with revised M-501, included in Attachments.
- Q. Replace SHEET E-001 ELECTRICAL SYMBOLS AND NOTES with revised E-001, included in Attachments.
- R. Replace SHEET E-101 FOURTH FLOOR PLAN – POWER AND SPECIAL SYSTEMS with revised E-101, included in Attachments.
- S. SHEET E-403
1. Delete the following: “Note: all new fire alarm devices, notification appliances and wiring shall be furnished and installed by UNCC fire alarm/sprinkler shop. Electrical contractor shall provide empty raceways and boxes, and all necessary 120-volt power circuits.
- T. Replace SHEET TC-001 TELECOM SYMBOL SCHEDULE, GENERAL NOTES, AND DETAILS with revised TC-001, included in Attachments.

END OF DOCUMENT

SECTION 3, ANNEX D.1
CAMPUS INTERIOR SIGNAGE STANDARDS



2010 Campuswide Interior Signage and Graphics Systems

A comprehensive system of signs for building navigation and interior space designation.

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Introduction



PREFACE

In an effort to present a consistent image and visual harmony throughout The University of North Carolina at Charlotte campus, an overall signage program has been developed. This way-finding system will help guide students, faculty, staff and visitors to their destinations throughout the campus.

The purpose of these signage standards is to establish basic guidelines for the fabrication and installation of all exterior identification, informational and directional signage. These standards establish certain policies for the execution of signage as well as providing a description of various sign types, graphic uses, materials, Specifications, fabrication and installation procedures, etc.

All signage must be in conformance with these standards and approved by the UNC Charlotte Department of Facilities Management prior to fabrication and installation. The sign types herein identified for UNC Charlotte adhere to the codes and regulations for the City of Charlotte, North Carolina.

Specific signs on public roadways may require sign permits prior to fabrication. The fabricator shall be responsible for obtaining any required permits from the City. A construction drawing has been completed for each sign type and may be obtained at the UNC Charlotte Department of Facilities Management.

These drawings must be complied with, though fabrication methods and materials may be altered in attempt to produce a better product with approval of Facilities Management Design Services.

The fabricator shall submit in writing for approval any suggested revisions to these drawings to the UNC Charlotte Department of Facilities Management prior to making the revision. Sign shapes, sizes, colors, finishes, graphics, etc. may not be changed. It is required that the fabricator produce shop drawings of all signs to be fabricated, and submit them to the Project Manager for approval.

Type Style



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage. Use of Sub-Brand Logos must be pre-approved by Marketing before including in sign fabrication if other than the Crown or the Crown and University name as depicted above in standard black or PMS 349 Campus Green.

<http://www.publicrelations.uncc.edu/logo/main-logo.html>

<http://www.publicrelations.uncc.edu/logo/sub-brand.html>



TYPE STYLE AND COPY

To maintain consistency, the typeface used on all Logos is to be UTOPIA. The Tactile or Raised Relief sign copy will be Interstate upper case. Utopia and Interstate are the new 2009 standard fonts created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary, the letter spacing condensed characters and letter kerning must be followed. All copy should be 85% condensed and have -.15 letter spacing.

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

ARROW AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.



ROTC
BURSON
SMITH
KENNEDY
COLVARD NORTH & SOUTH

TYPE A

2

FIXED ROOM
IDENTIFICATION

CURRENT BUILDING SAMPLE LIST WITH NEW DESIGN MANUAL SIGNAGE

WINNINGHAM



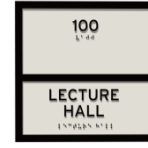
DENNY



FRETWELL
CONE CENTER



STUDENT HEALTH
CENTER



ROWE ARTS



BIOINFORMATICS
CAMERON



KING BUILDING



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

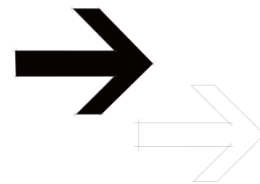
One piece etched sign construction.



TYPE B

3

ADA
RESTROOM ID



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

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FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

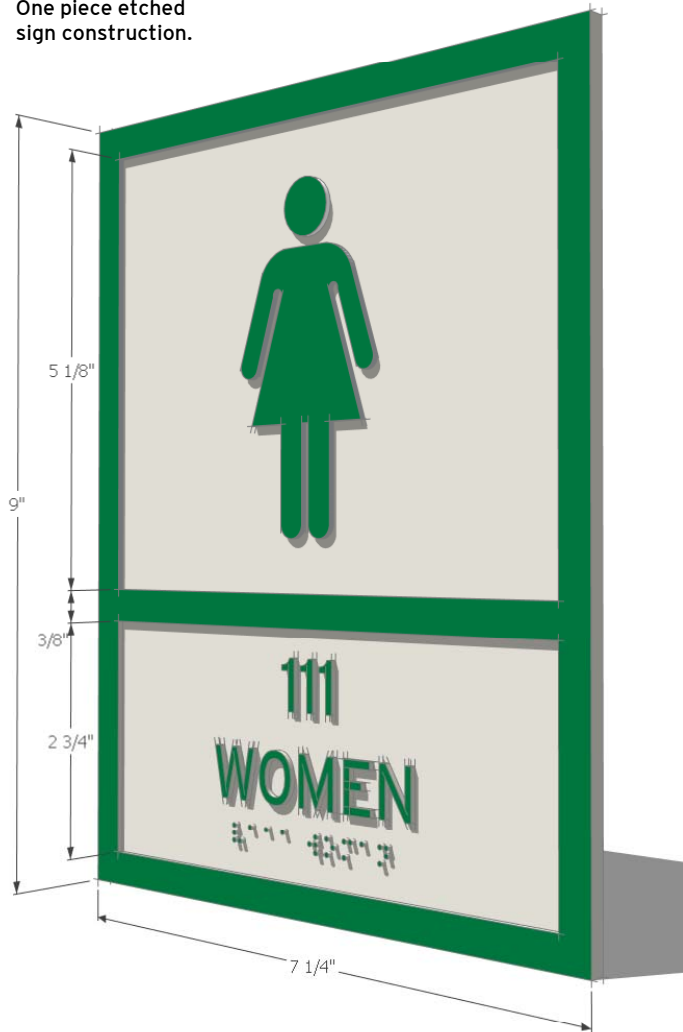
Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

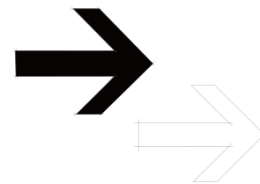
One piece etched sign construction.



TYPE B.0

4

STD. RESTROOM IDENTIFICATION



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

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FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

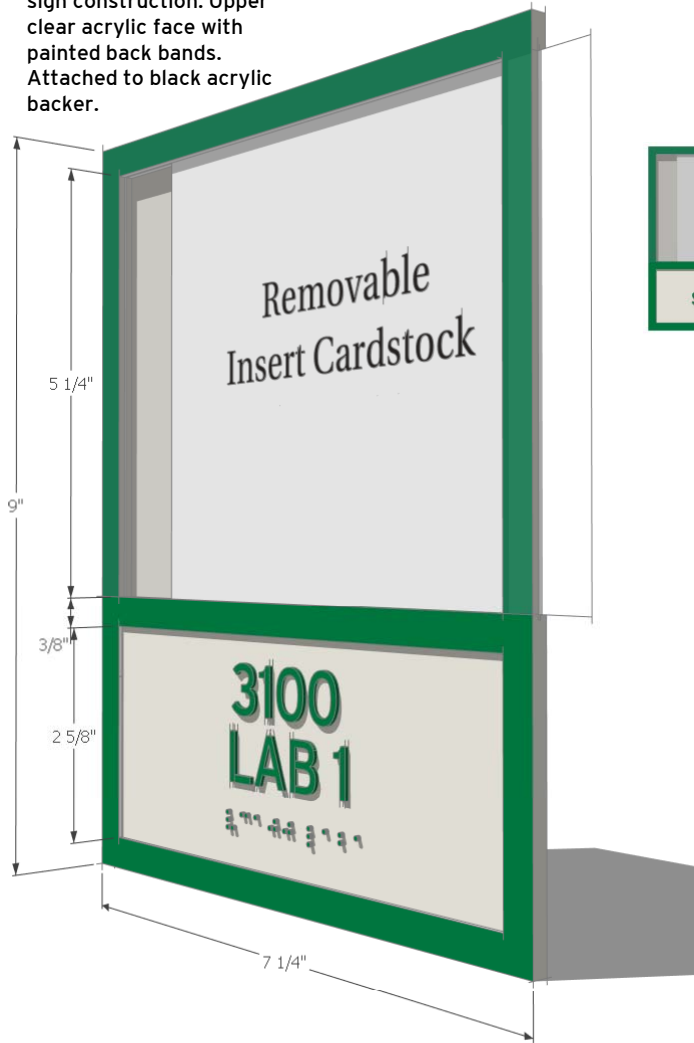
Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

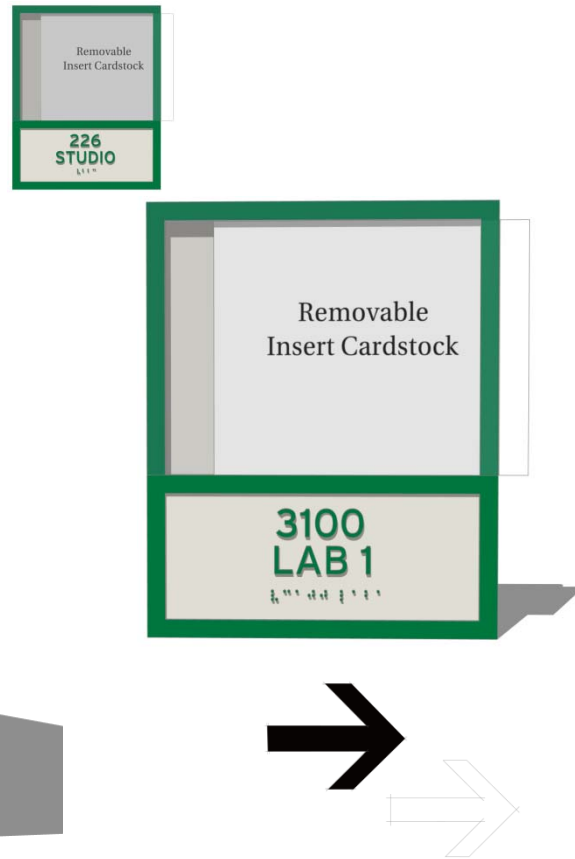
Lower section etched sign construction. Upper clear acrylic face with painted back bands. Attached to black acrylic backer.



TYPE B.1

5

UPDATEABLE ROOM IDENTIFICATION



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

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While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

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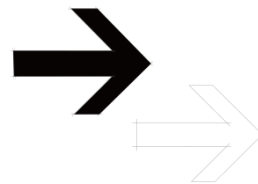
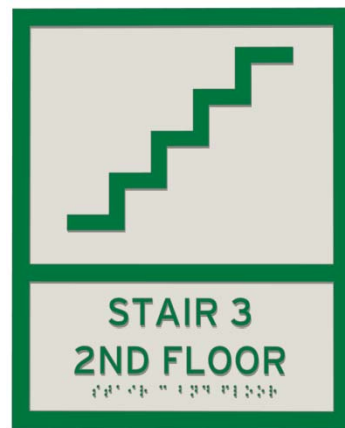
One piece etched sign construction.



TYPE B.2

6

STAIRWELL EXIT IDENTIFICATION



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

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FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

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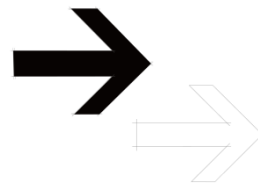
One piece etched sign construction.



TYPE B.3

7

STAIRWELL LEVEL
AND NUMBER
IDENTIFICATION



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TYPE STYLE AND COPY

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FABRICATION AND MOUNTING

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Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

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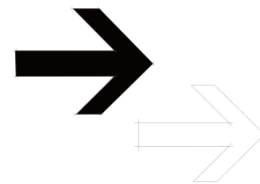
One piece etched sign construction.



TYPE B.4

8

ELEVATOR IN CASE OF FIRE DO NOT USE - REDIRECTION



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FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

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One piece etched sign construction.

TYPE B.5

9

AREA OF RESCUE



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

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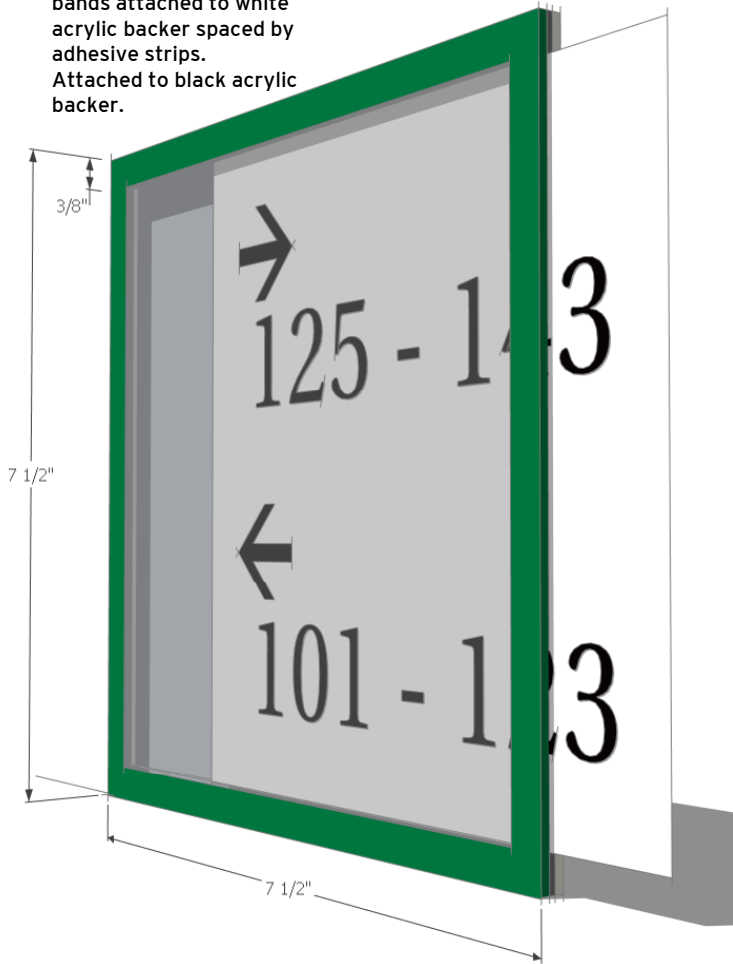
FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

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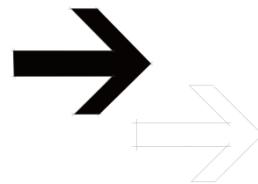
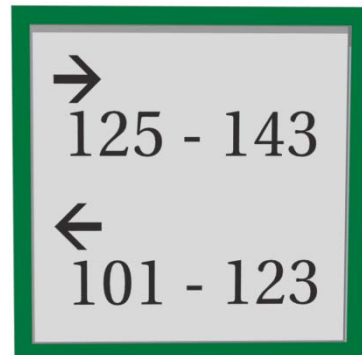
Full Face clear acrylic face with painted back bands attached to white acrylic backer spaced by adhesive strips. Attached to black acrylic backer.



TYPE C

10

VARIABLE USE -
INSERT FOR CORRIDORS AND
INTERSECTION HALLWAYS



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program.

While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

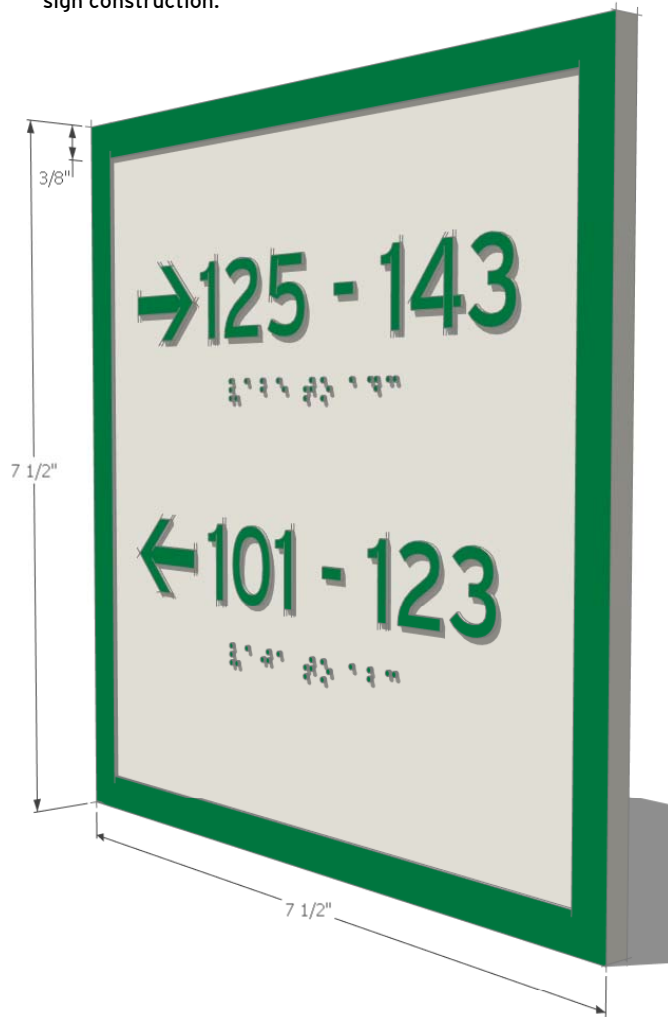
Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

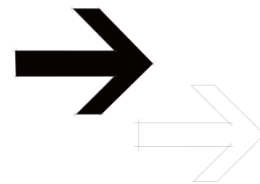
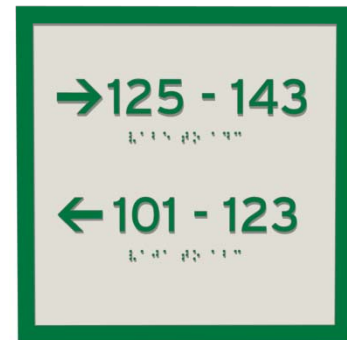
One piece etched sign construction.



TYPE C.1

11

ADA WAYFINDING IDENTIFICATION



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

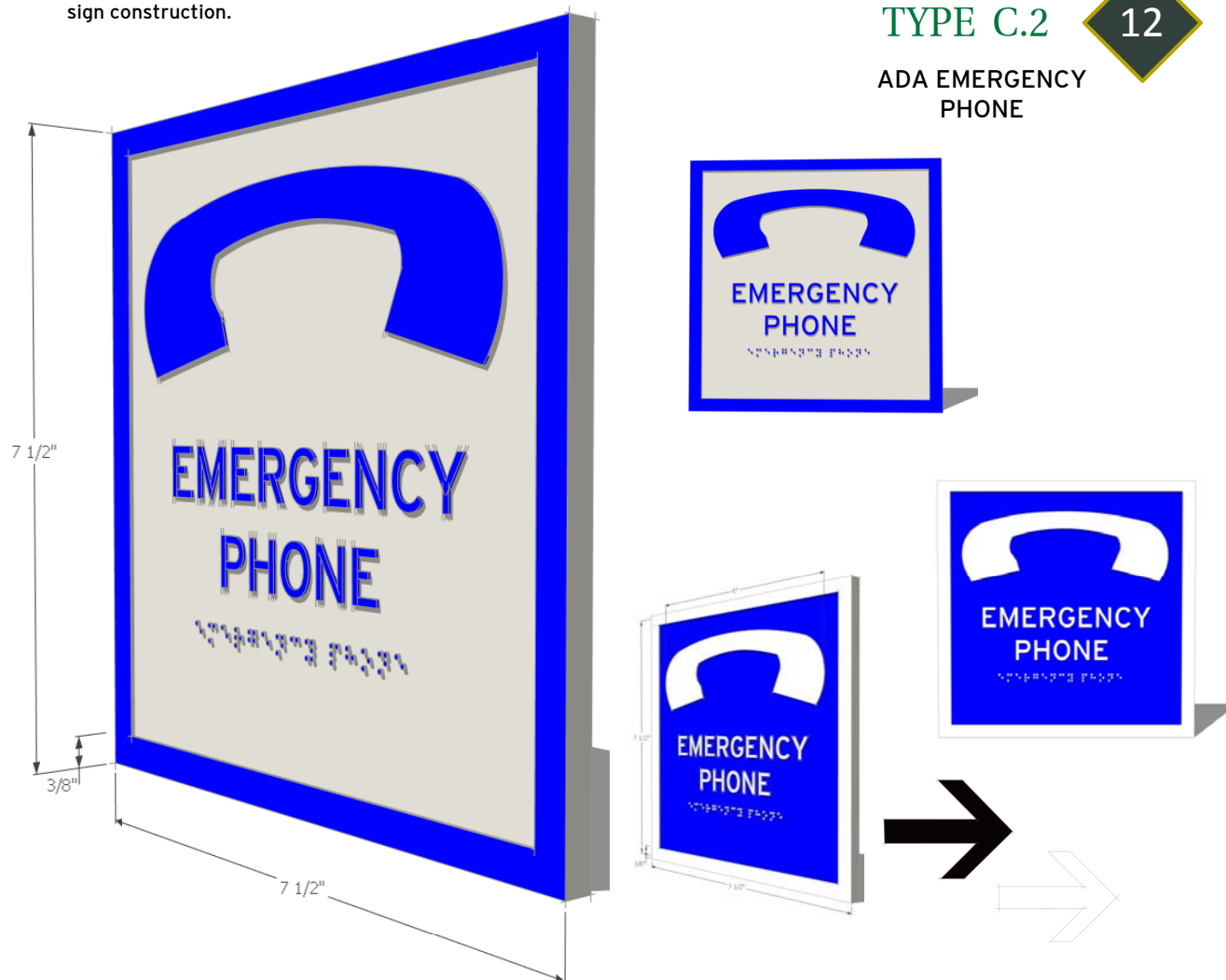
There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE C.2

12

ADA EMERGENCY PHONE



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE C.3

13

ADA SERVICES
DIRECTIONAL



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

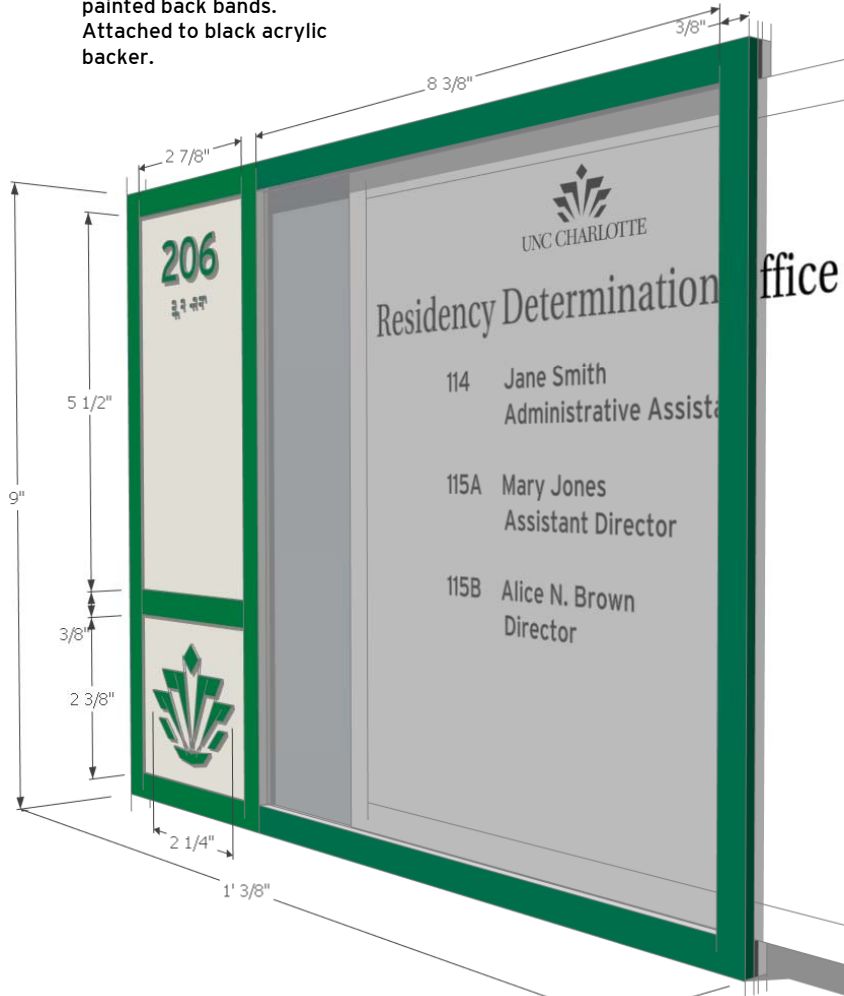
Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

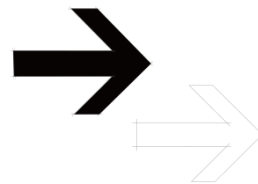
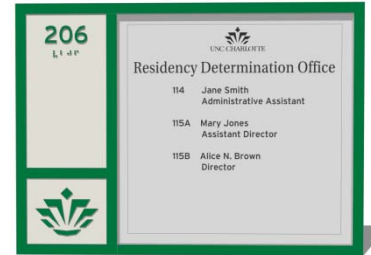
Left side section etched sign construction. Right clear acrylic face with painted back bands. Attached to black acrylic backer.



TYPE D

14

LARGE ROOM IDENTIFICATION DIRECTORY
Use when area has Master Entry to Suite of Offices or Groups



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program.

While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

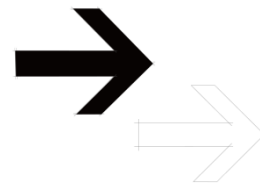
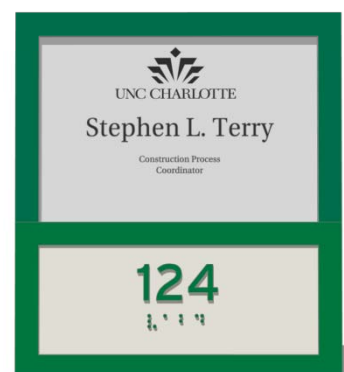
Lower section etched sign construction. Upper clear acrylic face with painted back bands. Attached to black acrylic backer.



TYPE E

15

UPDATEABLE
OFFICE ID



The vendor must provide Submittal Drawings with layout and character sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program.

While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

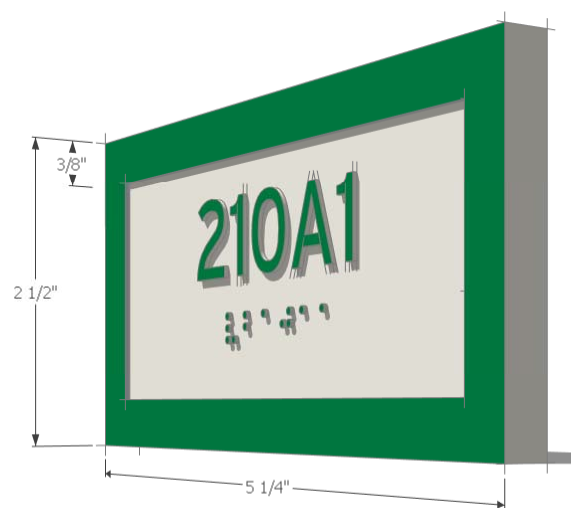
ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

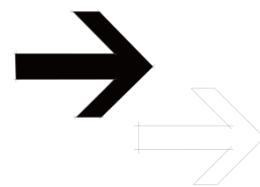
There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE E.1
CUBICLE ID



CONE CENTER



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

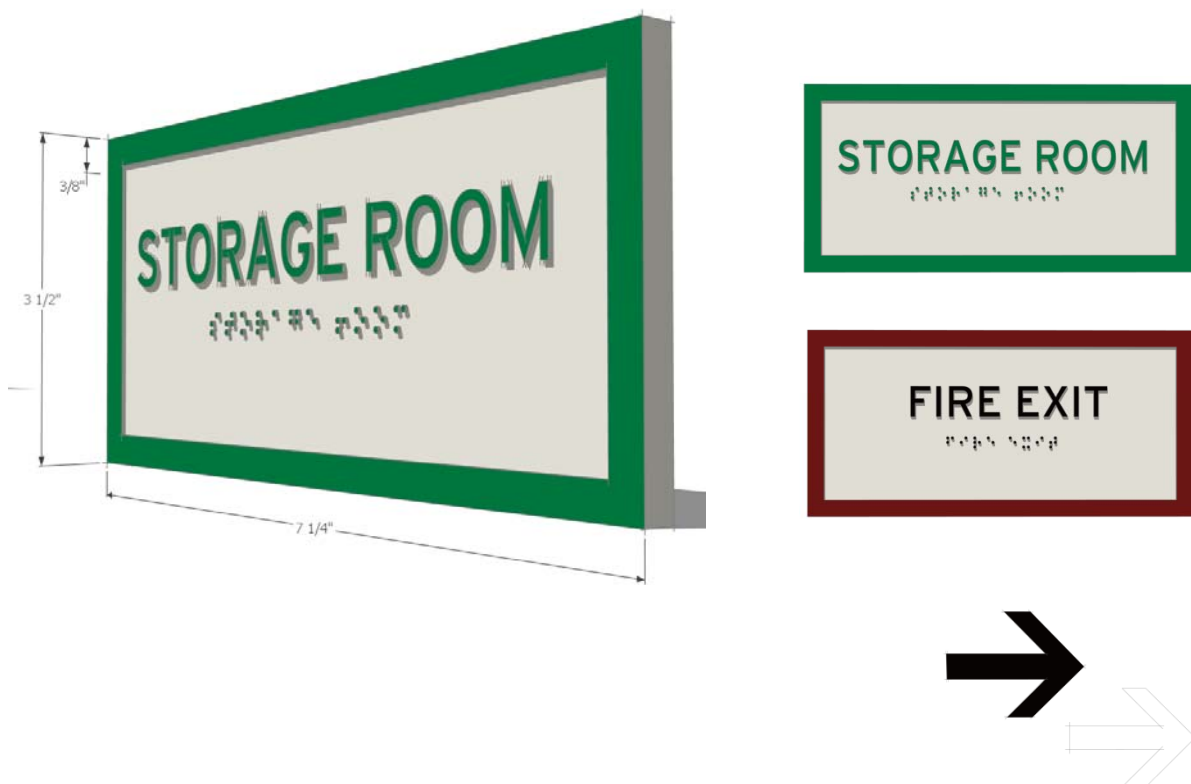
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE F

17

SPECIFIC ID or WAYFIND



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

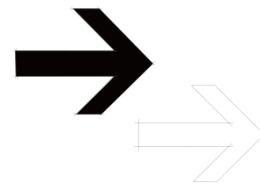
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE F.1

18

CLASSROOM
CAPACITY



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



19

TYPE F.2

INSERTABLE CLASSROOM CAPACITY WITH SEATING PLAN

Full Face clear acrylic with painted back bands attached to white black backer spaced by adhesive strips.

The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

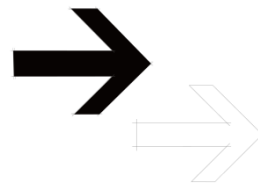
ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



Full Face clear acrylic with painted back bands attached to black acrylic backer spaced by adhesive strips.

TYPE G
**INSERTABLE
 LARGE DIRECTORY**



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

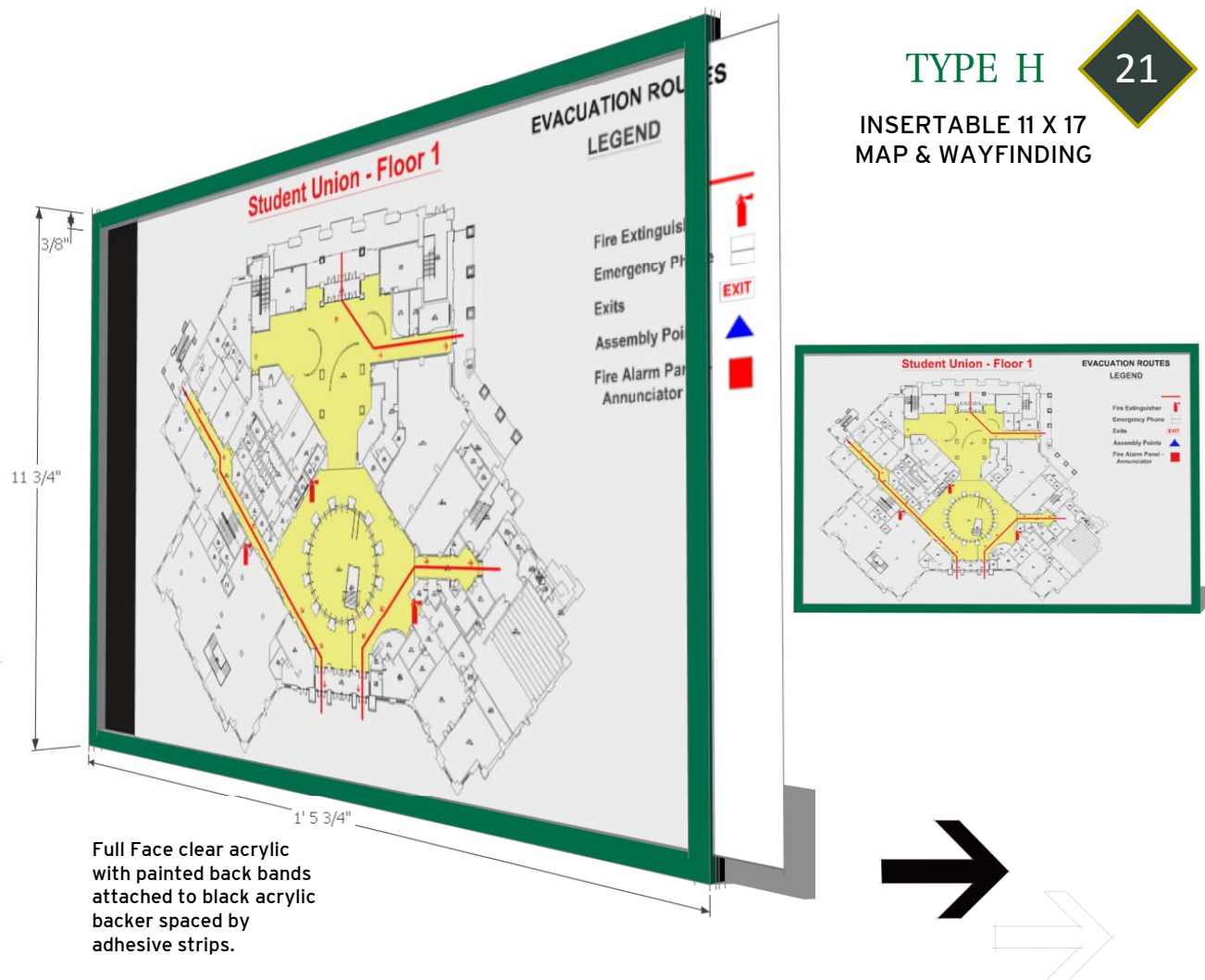
To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

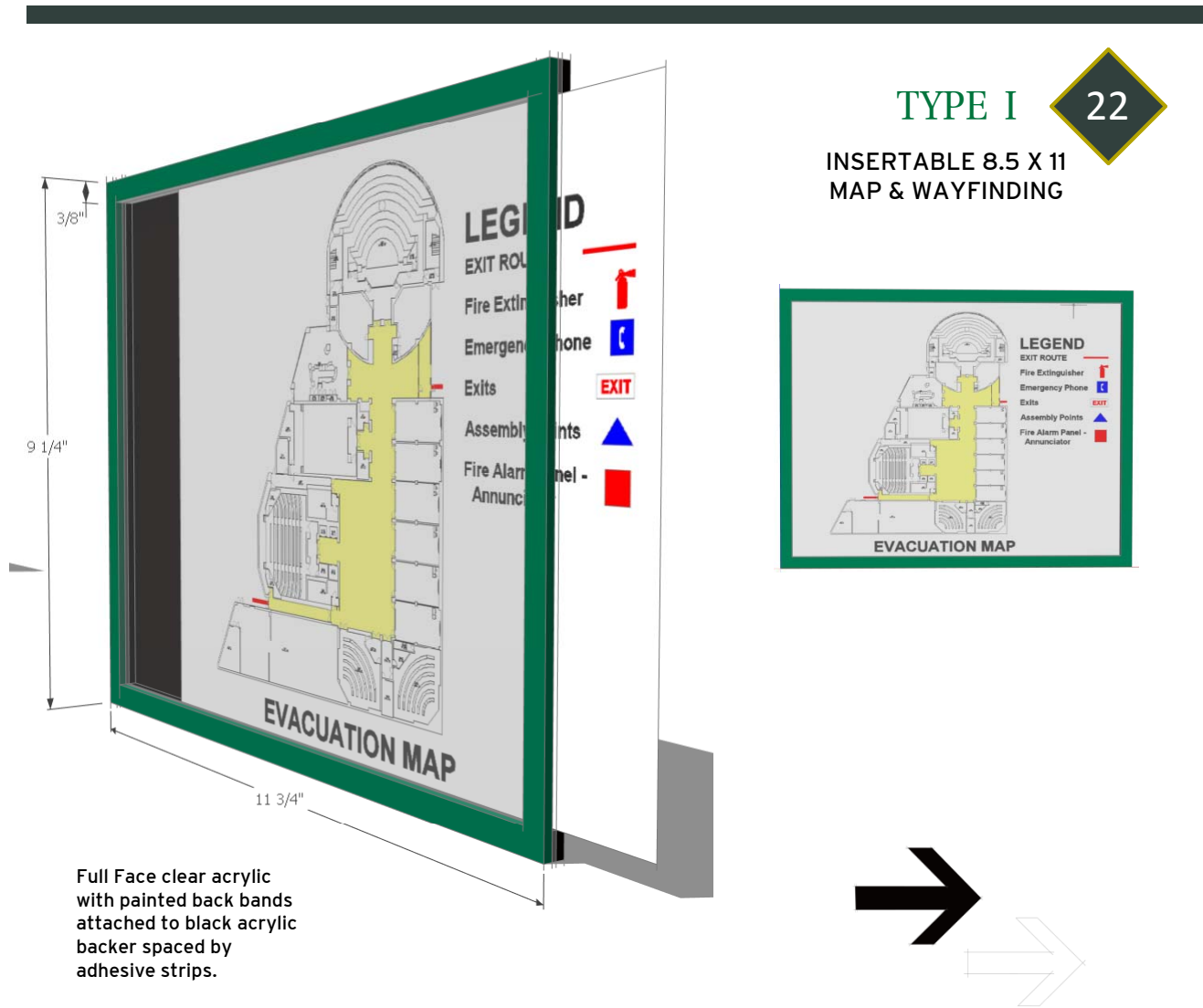
To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



TYPE I **22**

INSERTABLE 8.5 X 11
MAP & WAYFINDING

Full Face clear acrylic with painted back bands attached to black acrylic backer spaced by adhesive strips.

The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

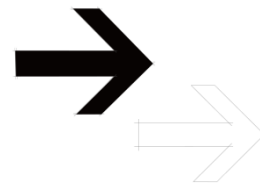
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

One piece etched sign construction.

TYPE J

23

ELEVATOR
LOCATION
IDENTIFICATION



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

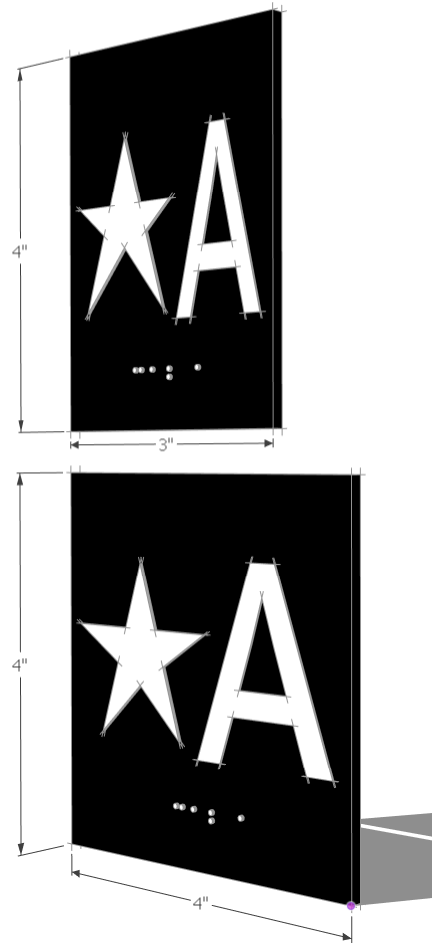
Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

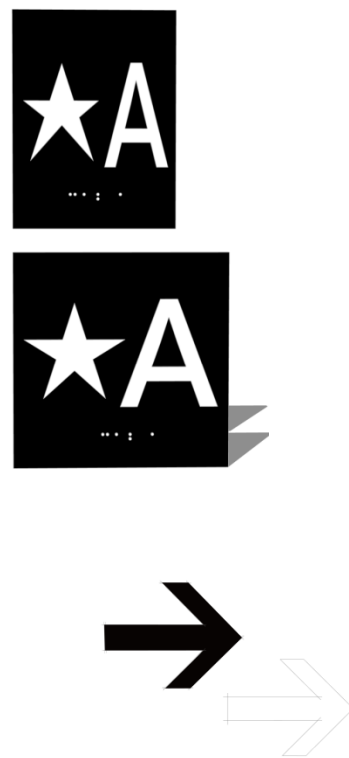
One piece etched -
raised relief sign
construction.



TYPE J.1

24

ELEVATOR CAB
IDENTIFICATION



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

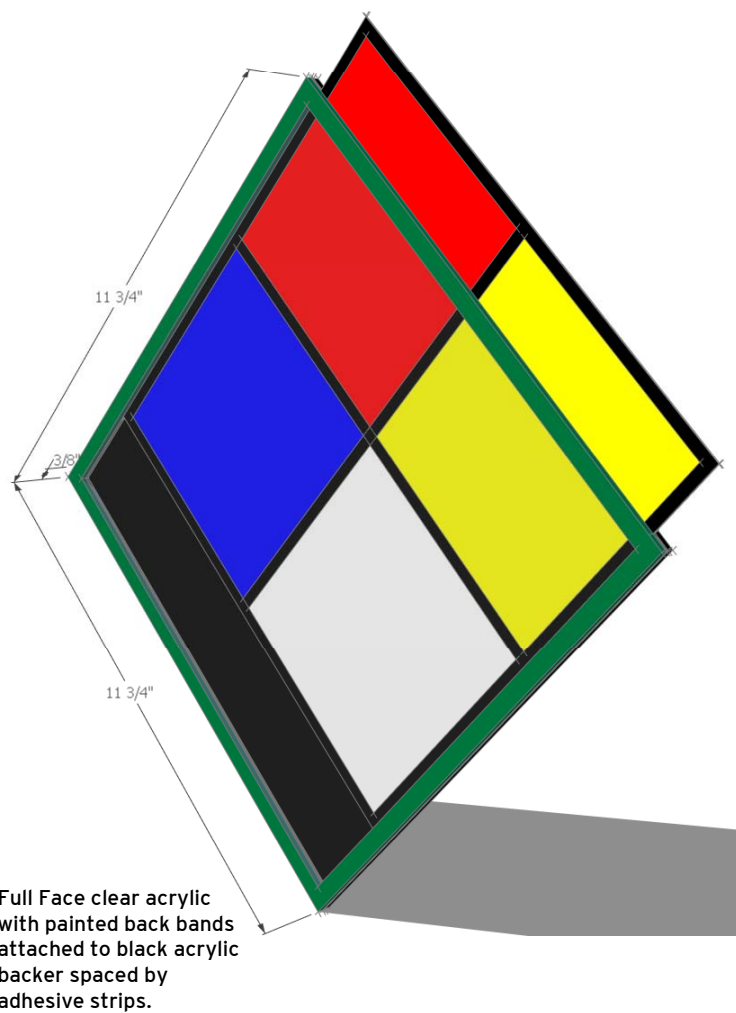
Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

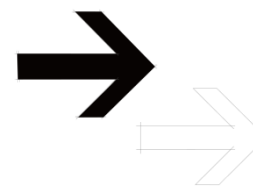
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



Full Face clear acrylic with painted back bands attached to black acrylic backer spaced by adhesive strips.

TYPE K  **25**
 INSERTABLE 11 X 11
 HAZMAT PLACARD HOLDER



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

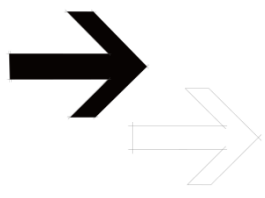
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.



TYPE L.1 **26**

**INSERTABLE 18 X 36
WAYFINDING DIRECTORY**

Fullview Directory with clear acrylic face. Black aluminum frame attached wall by adhesive strips and mechanical fasteners.



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications. Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief. Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

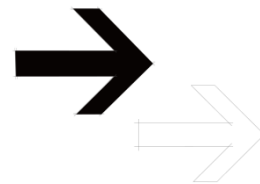
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained. There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

TYPE L.2

27

INSERTABLE 8 X 24 CEILING MOUNTED SUITE DIRECTORY

Horizontal Configurations Ceiling Modules



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

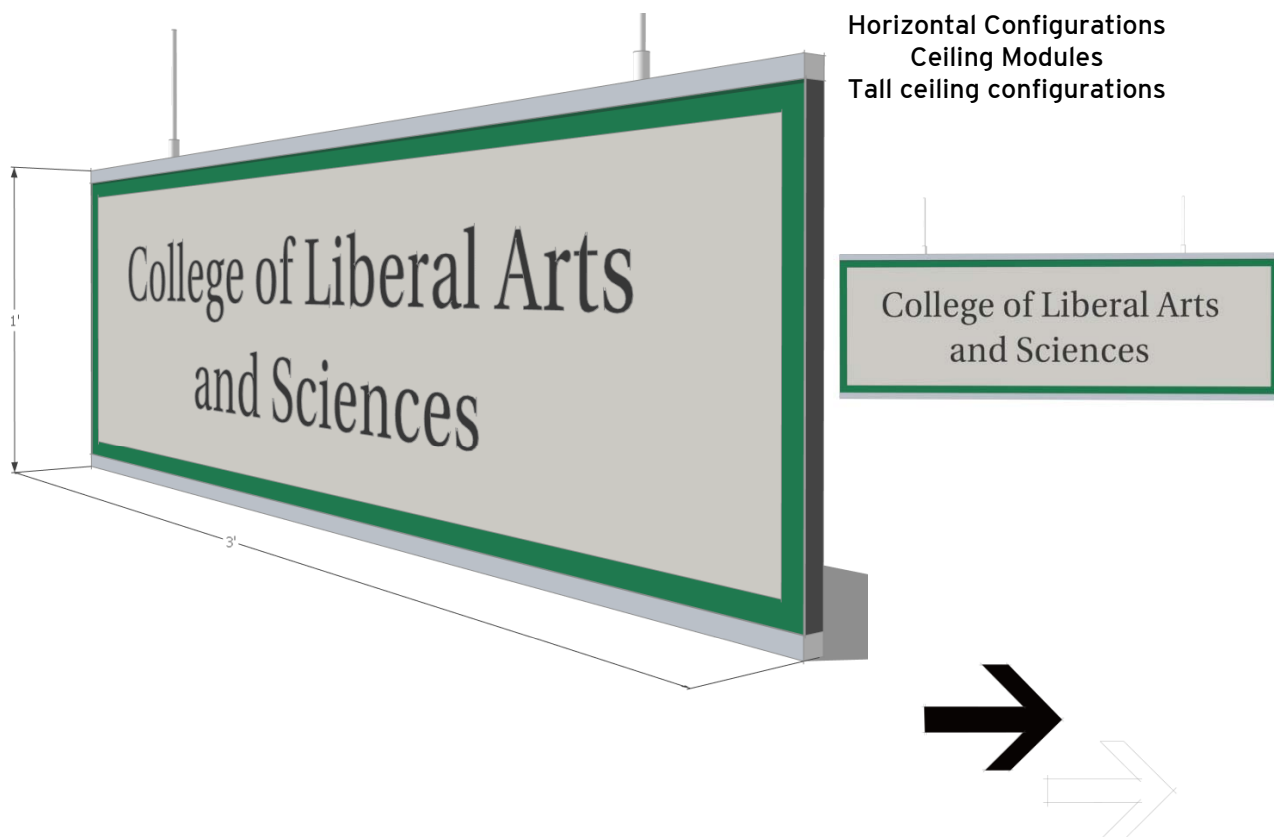
There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

TYPE L.3

28

INSERTABLE 12 X 36 CEILING MOUNTED SUITE DIRECTORY

Horizontal Configurations
Ceiling Modules
Tall ceiling configurations



The vendor must provide Submittal Drawings with layout, character and pictogram sizing, including compression and spacing sizes used to create readable and functional signage.

TYPE STYLE AND COPY

To maintain consistency, the typeface used on all sign copy will be Interstate in upper case. Interstate is the new 2009 standard font created for the University and compatible for PC based vinyl cutting devices and is required for this program. While the point sizes of text will vary (Std. is 3/4"), the letter spacing condensing or spacing of characters and kerning balance must be followed.

FABRICATION AND MOUNTING

The Fabricator is to provide scaled text layouts of all signs to the University for approval prior to fabrication. Refer to construction drawings for detailed specifications.

Chemically etched inset 1/32" to meet 2010 ADA Standards for Tactile relief.

Signs to be mounted with secure 2-way tape for variable surfaces, and be located 60" to center of the sign (see NCBC 18.4 for mounting heights and wall and doorway placement requirements).

ARROWS AND COPY

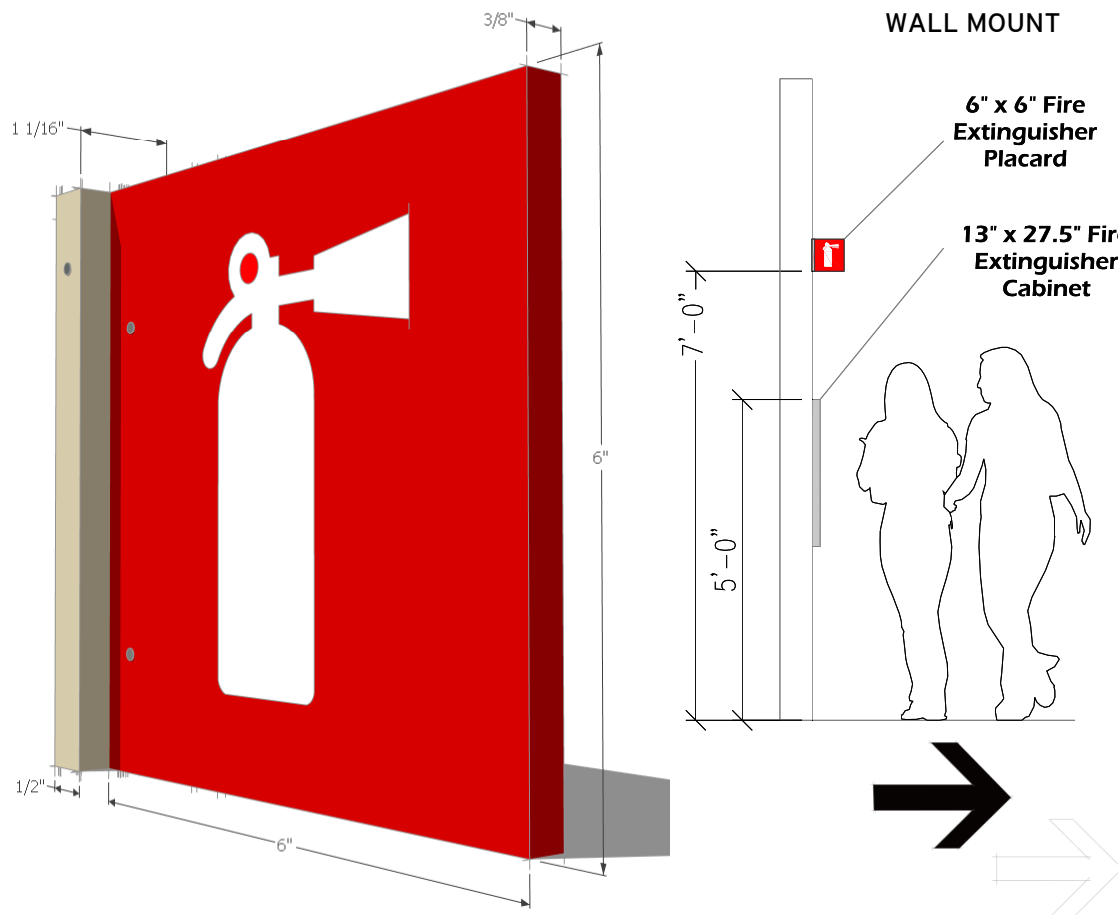
The arrow as shown should be used for all directional needs. The arrow should be used in an orientation which will make the directional information most obvious. The relationship between the arrow and the type as shown should always be maintained.

There are instances where a curved arrow or turned arrow is required to convey correct directions. The vendor must provide drawings for approval prior to fabrication.

TYPE PM.01

29

**6 X 6 PROJECTION
WALL MOUNT**



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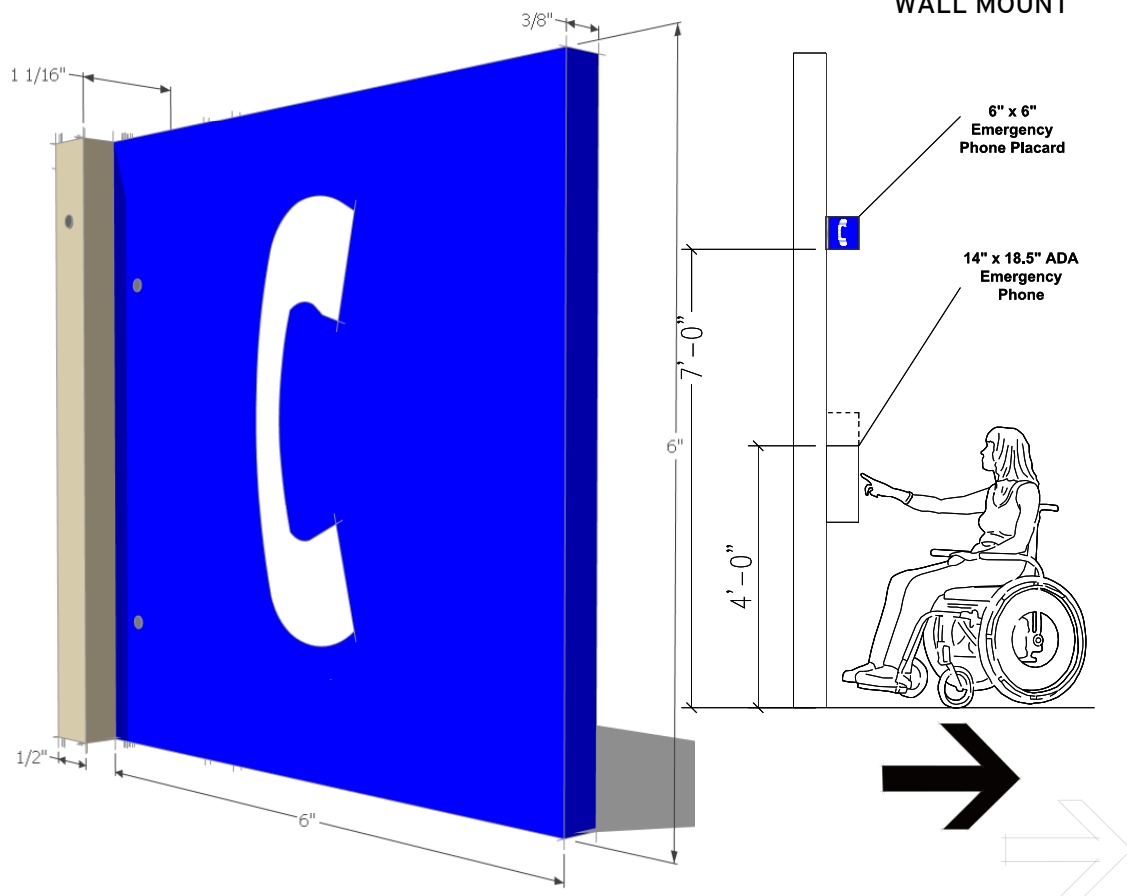
ARROWS AND COPY

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TYPE PM.02

30

6 X 6 PROJECTION WALL MOUNT



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ARROWS AND COPY

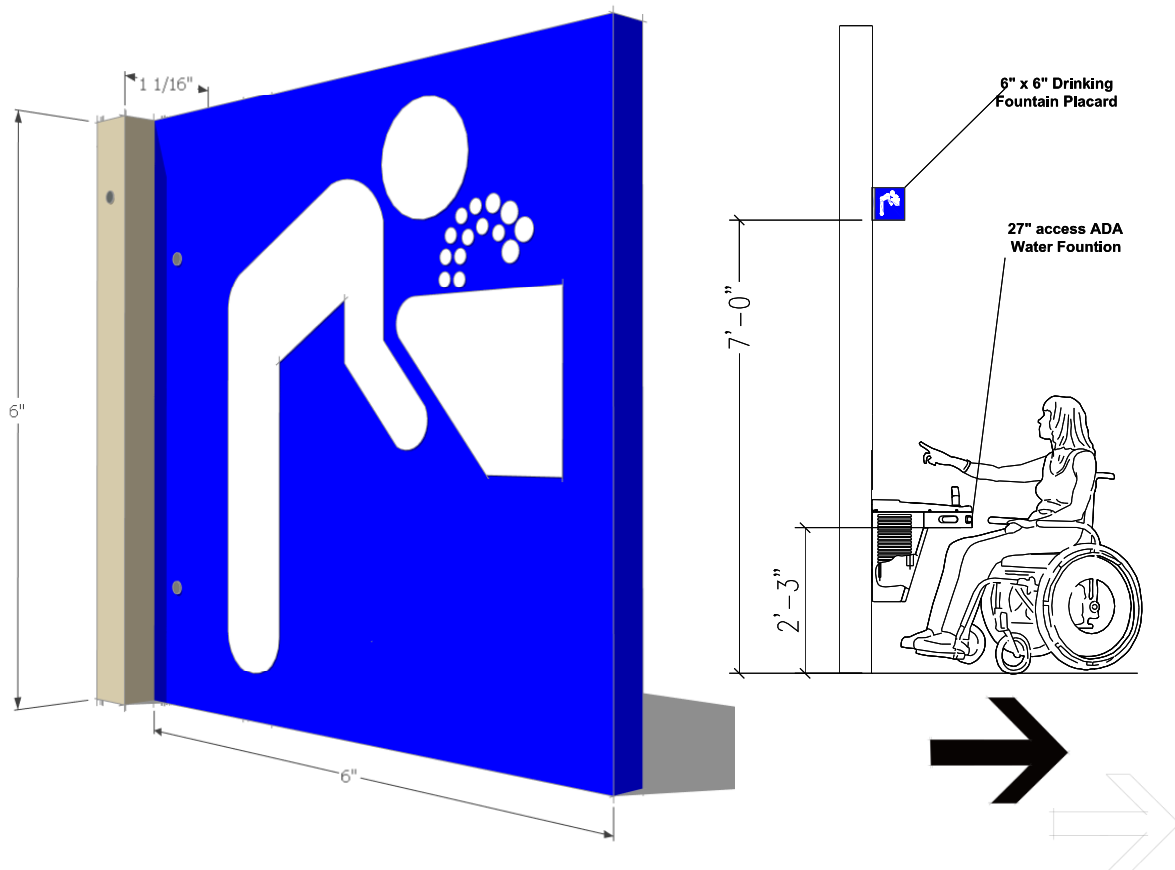
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TYPE PM.03

31

6 X 6 PROJECTION
WALL MOUNT



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ARROWS AND COPY

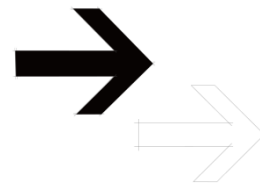
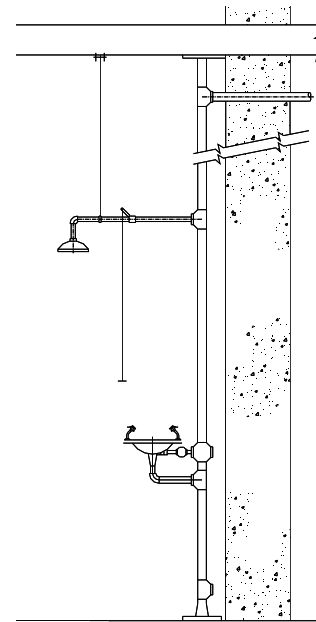
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TYPE PM.04

32

6 X 6 PROJECTION WALL MOUNT



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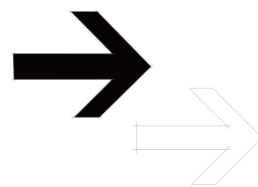
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TYPE PM.05

33

6 X 6 PROJECTION
WALL MOUNT



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TYPE PM.06

34

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WALL MOUNT



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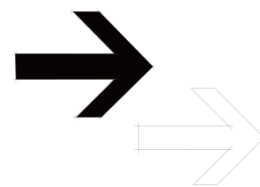
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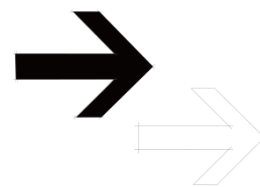
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INTRODUCTION

All components and finished units within this program shall be manufactured by professional fabricators. An example of the fabricator's previous work shall be reviewed by UNC Charlotte prior to production.

PERMITS (As Applicable)

The Vendor shall secure all required sign permits and licenses prior to the purchase of materials or the beginning of fabrication of any signs as required by local code. The Vendor shall notify the Owner immediately of any problems that arise during the permitting process if applicable. It is the responsibility of the Vendor to allow time in his work schedule for any permitting and process, securing such permits and inspections in a timely fashion so as to allow subsequent fabrication and installation to be completed on schedule.

SHOP DRAWINGS

Shop drawings must be furnished for UNC Charlotte Design Services review prior to fabrication showing specified materials, construction details, installation details or steps, dimensions, grade etc.

Note: Designer's Working Drawings are for fabricators' and suppliers' reference and do not limit fabricators and suppliers from responsibility to ensure appropriate engineering for fabrication and installation. Shop drawings for all items furnished under this Contract shall include a complete sign schedule, scaled message patterns of all Sign Text Layouts, complete fabrication details of all signs, and timeline to completion.

Attachment details including all mechanical fasteners, steel support framing, hinges and removable panels, location, size, dimensions, and finishes or any other related items necessary to fabricate and install finished signs, exact identification of all paint colors and paint formulas, vinyl, and other product used in fabricating the sign(s).

TEXT/ARROWS/SYMBOLS

Approved text, directional arrows, and symbols are to be reviewed by Facilities Management Design Services for use. The sign fabricator is to submit scaled copy layouts for approval.

For typical typographic layouts and type style per sign type, see 2010 Campuswide Exterior Signage pages; S1-3. All symbols or forms used for final sign application or final finishing shall be computer cut. Hand Cut letters or symbols are not acceptable.

SUBMITTALS

Submit two (2) complete sets of shop drawings (including text layouts for each sign) at an agreed upon scale, for review prior to fabrication of all items. Owner's review does not relieve the Vendor from responsibility for errors in dimensions nor for inadequate or improper use of materials for construction.

SUBSTITUTIONS

Any request for substitutions which does not clearly show equality to the Owner's satisfaction will be rejected. The burden of proof that the proposed substitution is equal to and meets the requirements specified and shown in the project documents including type, design, quality, operation, function, use, size, appearance, capability and manufacturer shall be solely the responsibility of the bidding Vendor.

(Specifications Cont.)

PAINT AND VINYL SYSTEM

Specifications

39

Paint colors are specified in the drawings using the Matthews Paint Company System, specifically formulated for the UNC Charlotte sign system.

The recommended vinyl film system to be Arlon Vinyl Film by Arlon or 3M. Vinyl sheeting for sign text messages shall be computer cut, High Performance or Reflective Grade vinyl films 3.5 to 6.7 mils thick with continuous pressure sensitive adhesive backing.

AS-BUILT DRAWINGS

Upon completion, the vendor shall provide the owner with two (2) complete sets of as-built drawings on CD in AutoCAD and PDF. As-Built drawings shall include Location Plans and Sign Schedules.

FABRICATION/MATERIALS

Aluminum plates, extrusions and supports shall conform to the requirements of the design intent details, ASTM standards and all applicable building codes, and shall be as submitted and approved on the shop drawings. All screws, bolts and fasteners where used with aluminum shall be stainless steel. All fasteners are to be painted. All fastenings shall be as indicated on the drawings and shall be compatible to the materials fastened. Isolation materials shall be provided between unlike metals.

Before fabrication the Vendor shall make on-site measurements and verify that site conditions and/or current architectural drawings conform to the signage and graphics drawings and shall be responsible therefore. All work shall be fabricated to approved shop drawings and shall be first class workmanship in accordance with the best trade practices.

All joints, corners, miters, splices, or signage shall be accurately machined, filled, fitted and rigidly framed together at joints and contact points.

All materials are to be as specified on working drawings unless written approval has been obtained for material substitution by The office of Design Services at UNC Charlotte.

ALUMINUM

All aluminum sheet for signage is to be .125" thickness unless specified otherwise. All welding is to be seamless welded. All depressions or raised areas, due to welding, must be filled and ground smooth prior to priming and painting. All screws, brackets and fasteners in contact with aluminum are to be stainless steel or aluminum. Non-corrosive and non-staining.

PLASTICS

All plastics are to be PVC, Polycarbonate, or acrylic sheet unless specified otherwise. Other plastics may be substituted as long as a test sample is submitted, prior to fabrication, for owner's approval.

FINISHES

All fabrication materials are to be smooth and free of all defects. Cut lines, welds, slag, dust, dirt, grease and other surface defects are to be removed prior to finishing.

(Specifications Cont.)

PRIMING AND PAINTING

Specifications

40

All materials are to be applied properly according to manufacturer's recommendations and specifications. All paints, primers, solvents, top Coats, etc., are to be chemically compatible. Step A - Use Aluminum specific cleaner on all aluminum parts to receive paint, followed by using bare metal sealer coating and then Acrylic Primer Sealer.

Paints for aluminum shall be Matthews Paint Company polyurethane opaque satin paint, with satin clear finish seal coat applied. Application shall consist of 1 coat of Metal primer @ .25mil minimum and 2 coats of opaque satin Acrylic Polyurethane paint of specified color. 1 mil DFT minimum each coat for a total dry film thickness of two (2) mils DFT.

Paints for spraying acrylics shall be matte Acrylic Polyurethane with an ultraviolet Inhibitor engineered for extreme heat and finish retention. Clear Satin finish shall be applied to a total dry film thickness of two (2) mils OFT. Acrylic material shall be 1/16", 1/8", and 1/4" Acrylic Plexiglass, Matte Clear with a P95 finish. or approved equal as shown on Drawings.

Order or mix paint for each color in quantity to assure consistent application for all signs in a given color. Vendor shall allow paint surfaces to thoroughly air dry for a minimum of forty eight (48) hours prior to the application of masking film which shall be applied to protect all sign surfaces during shipping and installation.

All products below may have an "or equal", but product submittals must be provided and approved prior to manufacturing and application of finishes, and must meet or exceed current product below.

Paint must cure for a minimum of forty eight (48) hours or longer based on Manufacturer guidelines prior to the application of masking film which shall be applied to protect all sign surfaces during shipping and installation.

Matthews Paint PPG Ind.
LakeView Corporate Park • 8201 100th St. • Pleasant Prairie, WI 53158 • 1.800.323.6593 •
www.matthewspaint.com

Arlon Adhesives & Films Division
281 I South Harbor Blvd.
Santa Ana, CA 92704-5805 – (714) 540-2811 - (800) 854-0361

Rohm and Haas Plastic
Technology Center
PO Building 117.
Route 13 &.413
Bristol, PA 19007 - (215) 785-8000

SAMPLES

Vendor shall submit to the owner 6" x 6" samples of all materials and paint finishes of specified finishes unless vendor has previously installed approved product and code. All submittals shall bear the exact material identification and/or paint formula marked on the back surface.

(Specifications Cont.)

Specifications

41

INSTALLATION

All freestanding signs are to be mounted in concrete, except where specified otherwise. Footing size and depth to be determined by fabricator. Installer to verify final locations based on vicinity map provided by University Project Manager. All concrete footings are to be 3000 psi and should be sufficient to ensure the structural stability of the sign unit in high wind conditions.

All free standing signs are to have a concealed sleeve underground to allow for the removal of signs for maintenance and painting. The sleeve system will be set in concrete footings and contain a removable, tamperproof pin for access.

All signs are to be level and plumb. Use current Campus signage for template of installation.

All signage locations are to be approved by client and meet all local zoning codes for setback and height restrictions.

Sign locations are to be staked and identified with the Dept. of Facilities Management unless otherwise instructed.

The fabricator is to verify underground utilities with the Office of Facilities Planning prior to installation of footings.

The fabricator will get approval by a UNC Charlotte representative prior to driving a vehicle off designated streets or driveways in order to reach a sign location.

Where special job conditions occur or where there is uncertainty as to interpretation, before execution of the work.

Vendor shall inform the Department of Facilities Management Design Services Project Manager.

UTILITY LOCATES

Installer is responsible for calling in public utility locates where property of University meets the City of Charlotte or County line. Project Manager will coordinate campus locates with internal departments in conjunction with calling One Call regarding on campus locate work.

CLEANING/PROTECTION REQUIREMENTS

Vendor shall not only protect his work at all times, but shall also protect all adjacent work and materials by suitable

covering or other methods during progress of his work. They shall remove all rubbish, excess soil and rock, and

accumulated materials and shall leave the work in a clean, orderly and acceptable condition.

Any existing landscape

material that is removed or disturbed during the installation of signs shall be replaced or

restored to its original

condition.

STORAGE

All signs, extrusions, graphic or signage material shall not be exposed to damaging conditions or abrasion during storage, fabrication, delivery or installation. All signs shall be stored in a weather protected space and not be subject to natural elements as determined in conjunction with the Owner.

Health Hazard	
	4 Very short exposure could cause death or serious residual injury even though prompt medical attention was given.
	3 Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
	2 Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
	1 Exposure could cause irritation but only minor residual injury even if no treatment is given.
	0 Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

Flammability	
	4 Will rapidly or completely vaporize at normal pressure and temperature , or is readily dispersed in air and will burn readily.
	3 Liquids and solids that can be ignited under almost all ambient conditions.
	2 Must be moderately heated or exposed to relatively high temperature before ignition can occur.
	1 Must be preheated before ignition can occur.
	0 Materials that will not burn.

Instability ¹	
	4 Readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures .
	3 Capable of detonation or explosive reaction, but requires a strong initiating source or must be heated under confinement before initiation, or reacts explosively with water .
	2 Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.
	1 Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy , but not violently.
	0 Normally stable, even under fire exposure conditions, and are not reactive with water.

Special Hazards	
	This section is used to denote special hazards. There are only three NFPA 704 approved symbols:
	OX This denotes an oxidizer , a chemical which can greatly increase the rate of combustion /fire.
	SA This denotes gases which are simple asphyxiants . The only gases for which this symbol is permitted are nitrogen, helium, neon, argon, krypton, and xenon . The use of this hazard symbol is optional.
	W Unusual reactivity with water . This indicates a potential hazard using water to fight a fire involving this material. When a compound is both water-reactive and an oxidizer , the W/bar symbol should go in this quadrant and the OX warning is placed immediately below the NFPA diamond.

Regulations 49 CFR Part 172.502 (prohibited placarding) and Part 172.504 (general placarding) and 2009 *NFPA 101: Life Safety Code*.

(Specifications Cont.)

SAFETY CONDITIONS

Specifications

23

The Vendor or Bidder shall maintain safety standards for persons employed in accordance with the standards set by the Occupational Safety and Health Act (latest adoption).

The University of North Carolina at Charlotte and Facilities Management Design Services Group shall be held harmless for any accident, injury or any other incident resulting from noncompliance with these standards.

GUARANTEE

Vendor shall furnish a written guarantee stating that all materials and workmanship are guaranteed against defects for a period of one (1) year after completion and final acceptance of the installed or received work (based on Purchase requisition outlines), and that all materials and installation are in complete accordance with these and manufacturer's written specifications and/or recommendations.

This guarantee shall be in addition to and not in lieu of other guarantees available to the University by North Carolina State Law.

Defects due to faulty material, workmanship or damage to existing surfaces prepared by other trades during the installation of signs and during the guarantee period shall be repaired to the original condition or replaced by the Vendor at their expense, to the satisfaction of the University representative, Design Services.

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
- C. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.2 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include [**taxes**,]freight[,] and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Lump-Sum Allowance: Include the sum of \$15,000 allowance to the Division 22 contract to be applied to costs associated with the upgrade to the deionization equipment located in the basement of the building. This work shall be provided by the existing equipment manufacturer who also provides the servicing of the equipment.

END OF SECTION 012100

SECTION 08 71 00 – DOOR HARDWARE

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. Section 013100 " Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.

1.02 SUMMARY

- A. Section includes:
 - 1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
 - 2. Electronic access control system components, including:
 - a. Electronic access control devices.
 - 3. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:
 - 1. Windows
 - 2. Cabinets (casework), including locks in cabinets
 - 3. Signage
 - 4. Toilet accessories
- C. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
 - 3. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
 - 4. Division 26 sections for connections to electrical power system and for low-voltage wiring.

5. Division 28 sections for coordination with other components of electronic access control system.

1.03 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.

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3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
 4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Quantity, type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components).
Operational description should include operational descriptions for: egress, ingress (access), and fire/smoke alarm connections.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
 5. Key Schedule:
 - a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

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- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.
- C. Informational Submittals:
1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
 2. Product data for electrified door hardware:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 3. Certificates of Compliance:
 - a. UL listings for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
 - c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
 4. Warranty: Special warranty specified in this Section.
- D. Closeout Submittals:
1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Factory order acknowledgement numbers (for warranty and service)
 - d. Name, address, and phone number of local representative for each manufacturer.
 - e. Parts list for each product.
 - f. Final approved hardware schedule, edited to reflect conditions as-installed.
 - g. Final keying schedule
 - h. Copies of floor plans with keying nomenclature
 - i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
 - k. Door Pull Survey – Index of door opening force measurements and adjustments at openings receiving door closers in compliance with Americans with Disabilities Act Accessibility Guidelines (ADAAG) and ICC/ANSI A117.1 Standard on Accessible and Usable Buildings and Facilities.

1.05 QUALITY ASSURANCE

- A. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 2. Can provide installation and technical data to Architect and other related subcontractors.
 3. Can inspect and verify components are in working order upon completion of installation.
 4. Capable of producing wiring diagrams.
 5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.
- C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
- E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
- G. Keying Conference
1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.

- b. Preliminary key system schematic diagram.
- c. Requirements for key control system.
- d. Requirements for access control.
- e. Address for delivery of keys.

H. Pre-installation Conference

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.
6. Use web-based door opening and hardware information software package to review and coordinate all door opening and hardware information. See Section 013100 " Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.

I. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
3. Use web-based door opening and hardware information software package to review and coordinate all door opening and hardware information. See Section 013100 " Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 2. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:

1. Promptly replace products damaged during shipping.
 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.07 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
1. Use web-based door opening and hardware information software package to review and coordinate all door opening and hardware information. See Section 013100 " Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
1. Use web-based door opening and hardware information software package to review and coordinate all door opening and hardware information. See Section 013100 " Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.
- E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

1.08 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Beginning from date of Substantial Completion, for durations indicated.
 - a. Closers:
 - 1) Mechanical: 30 years.
 - b. Exit Devices:
 - 1) Mechanical: 3 years.
 - c. Locksets:

- 1) Mechanical: 10 years.
 - 2) Electrified: 1 year.
- d. Key Blanks: Lifetime
2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

- A. Maintenance Tools: Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

- A. Fasteners
 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not

use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.

4. Install hardware with fasteners provided by hardware manufacturer.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series.
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series.

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Interior: Heavy weight, steel, 4-1/2 inches (114 mm) high
4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
5. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
6. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

2.04 PIVOT SETS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Dorma, Rixson.

B. Requirements:

1. Provide pivot sets complete with oil-impregnated top pivot, unless indicated otherwise.

2. Where offset pivots are specified, Provide one intermediate pivot for doors less than 91 inches (2311 mm) high and one additional intermediate pivot per leaf for each additional 30 inches (762 mm) in height or fraction thereof. Intermediate pivots spaced equally not less than 25 inches (635 mm) or not more than 35 inches (889 mm) on center, for doors over 121 inches (3073 mm) high.
3. Provide appropriate model where pivot sets are scheduled at fire rated openings.

2.05 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.06 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.07 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage ND series (Owner Preferred Alternate).
2. Acceptable Manufacturers and Products: Corbin-Russwin CL3100 series, Best 9K.

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
2. Cylinders: Refer to “KEYING” article, herein.

3. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
 - b. Cycle life - tested to minimum 10 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.
9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
 - a. Lever Design: Schlage Rhodes.

2.08 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 98 series (Owner Preferred Alternate).
2. Acceptable Manufacturers and Products: Detex Advantex series, Precision APEX 2000 series.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide flush end caps for exit devices.
7. Provide exit devices with manufacturer's approved strikes.
8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
11. OPTION: Provide dogging indicators (CDSI/HDSI) for visible indication of dogging status.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.

15. Top latch mounting: double or single tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.09 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers and Products: No Substitute.

B. Requirements:

1. Provide full-size interchangeable cylinders/cores to match Owner's existing Schlage Everest and Primus key systems, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Replaceable Construction Cores.
 - a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) 3 construction control keys.
 - 2) 12 construction change (day) keys.
 - b. Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2.10 KEYING

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers and Products: No Substitute.

B. Provide cylinders/cores keyed into Owner's existing factory registered Schlage keying system.

C. Characteristics:

1. All building key systems shall conform to the Campus Keying structure.
 - a. Schlage Everest D for Interior Keys
 - b. Schlage Everest D for Campus Mechanical Keys
 - c. Schlage Primus C for Campus Entry (exterior) Keys
2. All keys shall be Blank Bow both sides.
3. Provide one change key for each key symbol used.
4. Provide no keys with cylinders.
5. Provide key blanks equal to three (3) blanks per cylinder.

- D. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

2.11 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4040XP series (Owner Preferred Alternate)
2. Acceptable Manufacturers and Products: Corbin-Russwin DC8000 series, Sargent 281/281P10/281TJ series, factory assembled (without PRV).

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 3/4 inch (19 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.12 CONCEALED DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 2030 series.
2. Acceptable Manufacturers and Products: Dorma ITS96 series, Model 91 series.

B. Requirements:

1. Provide concealed door closers at doors conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide heavy duty, single-acting closers with single lever arm and roller assembly.
3. Provide closers capable of being mounted in a minimum 1-3/4 inch header.
4. Provide concealed door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.

5. Cylinder Body: 1-1/8 inch (29 mm) piston diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
6. Provide all-weather hydraulic fluid, fireproof, passing requirements of UL10C.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special template, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.13 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Hiawatha.

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
3. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.

2.14 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Hiawatha.

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.15 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson.
2. Acceptable Manufacturers: Rixson, Sargent.

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.16 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.17 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International.
2. Acceptable Manufacturers: National Guard, Reese.

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

3. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
4. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.18 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.19 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide coat hooks as specified.

2.20 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Continuous Hinges: BHMA 628 (US28)
4. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
5. Protection Plates: BHMA 630 (US32D)
6. Overhead Stops and Holders: BHMA 630 (US32D)
7. Door Closers: Powder Coat to Match
8. Wall Stops: BHMA 630 (US32D)
9. Latch Protectors: BHMA 630 (US32D)
10. Weatherstripping: Clear Anodized Aluminum
11. Thresholds: Mill Finish Aluminum

EXECUTION**3.01 EXAMINATION**

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as pivots, are provided.
- H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Furnish permanent cores to Owner for installation.

-
- I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Testing and labeling wires with Architect's opening number.
 - J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
 - K. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
 - L. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
 - M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - N. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
 - O. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 FIELD QUALITY CONTROL

- A. Engage qualified manufacturer trained representative to perform inspections and to prepare inspection reports.
 - 1. Representative will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.
 - 2. Use web-based door opening and hardware information software package to set Installation status and Installation Verification. See Section 013100 "Project Management and Coordination" for a description of the specific web-based door opening and hardware information software package for use on Project.

3.04 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.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.06 DOOR HARDWARE SCHEDULE

- A. Hardware items are referenced in the following hardware. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- B. Hardware Sets:

HARDWARE GROUP NO. 01

Provide each SL door(s) with the following:

<u>QTY</u>	<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
	NOTE	HARDWARE BY DOOR SUPPLIER		

HARDWARE GROUP NO. 02

Provide each SGL door(s) with the following:

<u>QTY</u>	<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PASSAGE SET	ND10S RHO	626	SCH
1	EA WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 03

Provide each SGL door(s) with the following:

<u>QTY</u>	<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PASSAGE SET	ND10S RHO	626	SCH
1	EA OH STOP	90S	630	GLY
1	EA GASKETING	488SBK PSA	BK	ZER
1	EA DOOR BOTTOM	369AA	AA	ZER

HARDWARE GROUP NO. 04

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HARDWARE GROUP NO. 05

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	COAT AND HAT HOOK	507	626	IVE

HARDWARE GROUP NO. 06

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	OH STOP	450S	630	GLY
1	EA	COAT AND HAT HOOK	507	626	IVE

HARDWARE GROUP NO. 07

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 08

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	OH STOP	450S	630	GLY

HARDWARE GROUP NO. 09

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 10

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	OH STOP	450S	630	GLY

HARDWARE GROUP NO. 11

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 12

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 13

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
6	EA	HINGE	5BB1SC 4.5	652	IVE
2	EA	MANUAL FLUSH BOLT	FB457 12"	626	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	ELECTRONIC LOCKSET (BY SECURITY CONTRACTOR)	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	FSIC CORE	23-030 ICX	622	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS	630	IVE
1	EA	MEETING STILE	383AA	AA	ZER

HARDWARE GROUP NO. 14

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SINGLE HOOK	507B	626	IVE

HARDWARE GROUP NO. 15

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRONIC LOCKSET (BY SECURITY CONTRACTOR)	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	FSIC CORE	23-030 ICX	622	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

HARDWARE GROUP NO. 15.1

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRONIC LOCKSET (BY SECURITY CONTRACTOR)	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	FSIC CORE	23-030 ICX	622	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE

HARDWARE GROUP NO. 16

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 17

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

Operational Description: Door normally closed and locked. Access by key from outside. Inside lever always free for egress.

HARDWARE GROUP NO. 19

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 20

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	COORDINATOR	COR X FL	US26D	IVE
2	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MEETING STILE	383AA	AA	ZER

HARDWARE GROUP NO. 21

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	COORDINATOR	COR X FL	US26D	IVE
2	EA	OH STOP	450S	630	GLY
2	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MEETING STILE	383AA	AA	ZER

APPLY OH STOP TO INACTIVE LEAF.

HARDWARE GROUP NO. 22

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-NL-F	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 23

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	GASKETING	339AA	AA	ZER
			ASTRAGAL		

CONNECTION TO FIRE ALARM BY ELECTRICAL.

HARDWARE GROUP NO. 24

Provide each SGL door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP DEL REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

Operational Description: Doors normally closed and unlocked. Push/pull operation.

HARDWARE GROUP NO. 25

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
2	EA	PIVOT SET	7215 SET	626	IVE
2	EA	LONG DOOR PULL	PR 9266F 48" N	630-316	IVE
2	EA	CONCEALED CLOSER	2030 BUMP WMS	689	LCN
2	EA	KICK DOWN HOLDER	FS452-4	626	IVE
1			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

HARDWARE GROUP NO. 26

Provide each PR door(s) with the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	ELECTRONIC LOCKSET (BY SECURITY CONTRACTOR)	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	FSIC CORE	23-030 ICX	622	SCH
1	EA	COORDINATOR	COR X FL	US26D	IVE
2	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MEETING STILE	383AA	AA	ZER

END OF SECTION

LIFE SAFETY AREA OCCUPANCY SCHEDULE			
SCHEDULE	AREA	AREA PER OCCUPANT	OCC LOAD
STORAGE	37 SF	300 SF	1
1/100 GROSS			
BUSINESS	9814 SF	100 SF	99
Assembly-Unconcentrated			
COLLAB SPACE	114 SF	15 SF	8
COLLAB SPACE	114 SF	15 SF	8
COLLAB SPACE	114 SF	15 SF	8
COLLAB SPACE	54 SF	15 SF	4
TERRACE	946 SF	15 SF	49
Business			
OFFICE SUITE	1105 SF	100 SF	12
Educational-Classroom			
SEMINAR CLASSROOM	802 SF	20 SF	54
Educational-Vocational			
AUTOCLAVE	312 SF	50 SF	7
COMPUTATIONAL LAB	304 SF	50 SF	7
COMPUTATIONAL LAB	317 SF	50 SF	7
COMPUTATIONAL LAB	300 SF	50 SF	6
COMPUTATIONAL LAB	289 SF	50 SF	6
COMPUTATIONAL LAB	303 SF	50 SF	7
COMPUTATIONAL LAB	318 SF	50 SF	7
COMPUTATIONAL LAB	317 SF	50 SF	7
COMPUTATIONAL LAB	317 SF	50 SF	7
COMPUTATIONAL LAB	310 SF	50 SF	7
COMPUTATIONAL LAB	308 SF	50 SF	7
COMPUTATIONAL LAB	301 SF	50 SF	6
COMPUTATIONAL LAB	306 SF	50 SF	7
GRAD WORKSTATIONS	417 SF	50 SF	9
GRAD WORKSTATIONS	216 SF	50 SF	5
GRAD WORKSTATIONS	355 SF	50 SF	8
INSTRUMENT ROOM	425 SF	50 SF	9
MICROSCOPE ROOM	417 SF	50 SF	9
WET LAB 1	361 SF	50 SF	8
WET LAB 2	503 SF	50 SF	11
WET LAB 3	499 SF	50 SF	10
WET LAB 4	343 SF	50 SF	7
WET LAB 5	330 SF	50 SF	7
WET LAB 6	354 SF	50 SF	8
Mechanical Room			
MECH/ ELEC	279 SF	300 SF	1
STORAGE AREA			
EQUIPMENT ROOM	293 SF	300 SF	1
Storage Area			
STORAGE	220 SF	300 SF	1

PARTITION LEGEND

1. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE AN3X U.N.O.

- NON-RATED PARTITION TO CEILING
- NON-RATED PARTITION TO DECK
- EXISTING 1 HR. RATED PARTITION TO DECK
- EXISTING 2 HR. RATED PARTITION TO DECK
- 2 HR. RATED BARRIER TO DECK

NOTE: SEE SHEET A-001 FOR CONSTRUCTION OF PARTITION TYPES.

LIFE SAFETY PLAN LEGEND

EGRESS TRAVEL PATH: DISTANCE NOTED IS ACTUAL. ALLOWABLE DISTANCE IS 300'-0"

Room name
1 OCC → OCCUPANCY LOAD
150 SF → ROOM AREA
OCC Type → OCCUPANCY TYPE

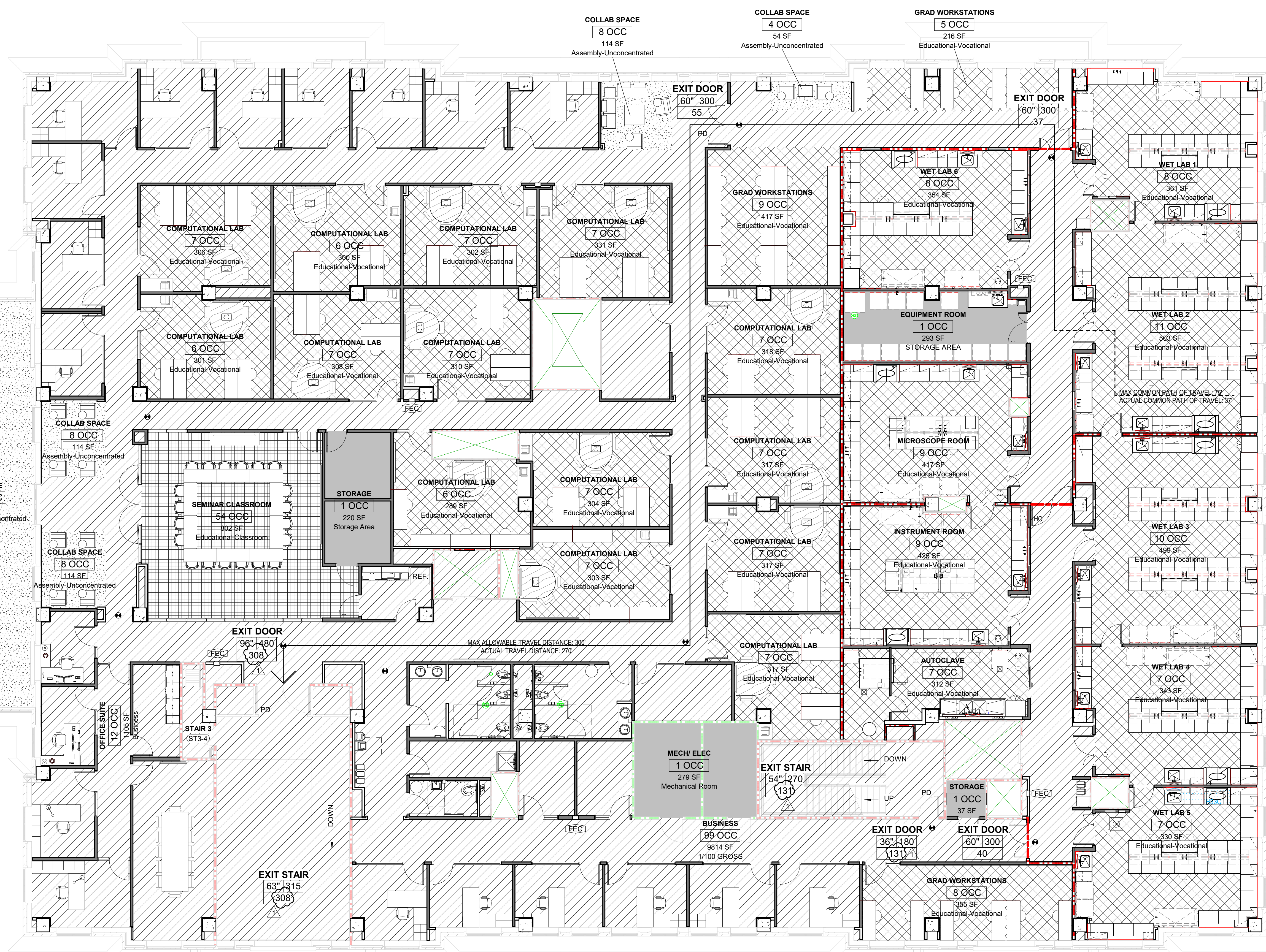
EXIT DOOR
34" 170 → EXIT CAPACITY (DOOR EGRESS WIDTH / 2)
111 → ANTICIPATED LOAD
→ EGRESS WIDTH

EXIT STAIR
48" 160 → EXIT CAPACITY (STAIR EGRESS WIDTH / 3)
137 → ANTICIPATED LOAD
→ EGRESS WIDTH

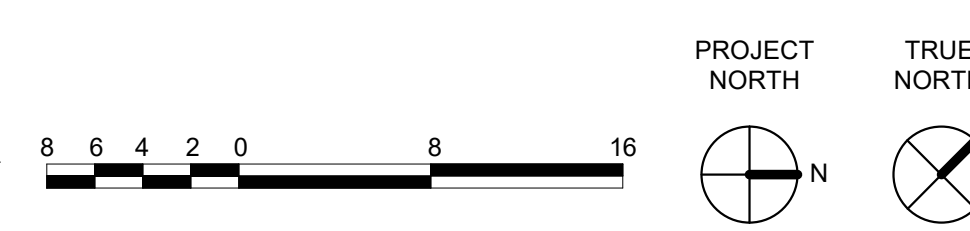
HO → HOLD OPEN
PD → PANIC DEVICE
FEC → FIRE EXTINGUISHER CABINET WITH FIRE EXTINGUISHER
EXIT SIGN

LIFE SAFETY AREA OCCUPANCY KEY

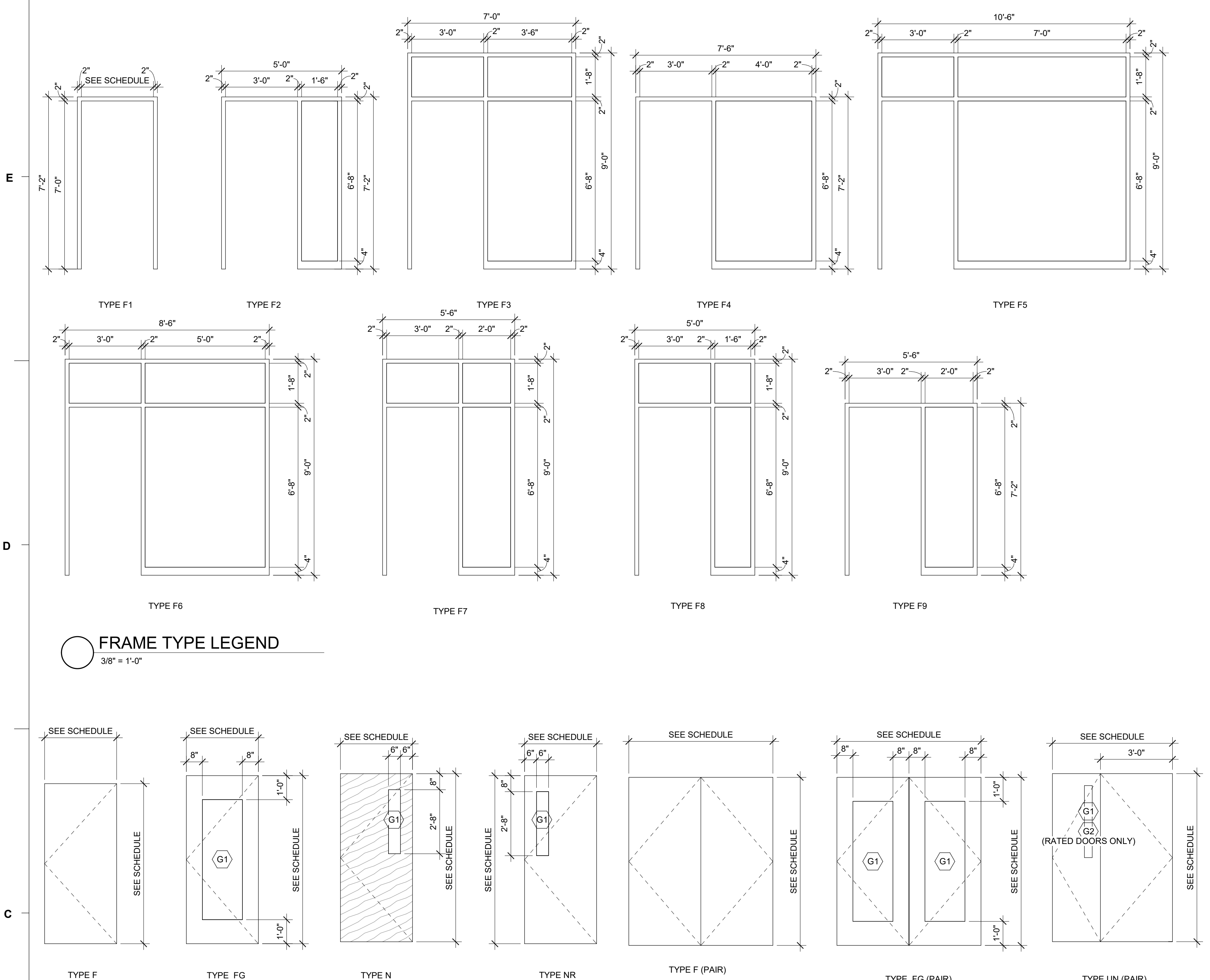
Occupancy Type	Area per Occupant
Assembly - Concentrated	7 SF
Assembly - Standing Space	5 SF
Assembly - Unconcentrated	15 SF
Business	100 SF
Courtrooms	40 SF
Dormitories	50 SF
Educational - Classroom	20 SF
Educational - Vocational	50 SF
Exercise Rooms	50 SF
Institutional - Inpatient	240 SF
Institutional - Outpatient	100 SF
Institutional - Sleeping Areas	120 SF
Kitchens - Commercial	200 SF
Library - Reading	50 SF
Library - Stack	100 SF
Locker Rooms	50 SF
Mechanical Room	300 SF
Parking Garages	200 SF
Residential	200 SF
Stages and Platforms	15 SF
Storage Areas	300 SF



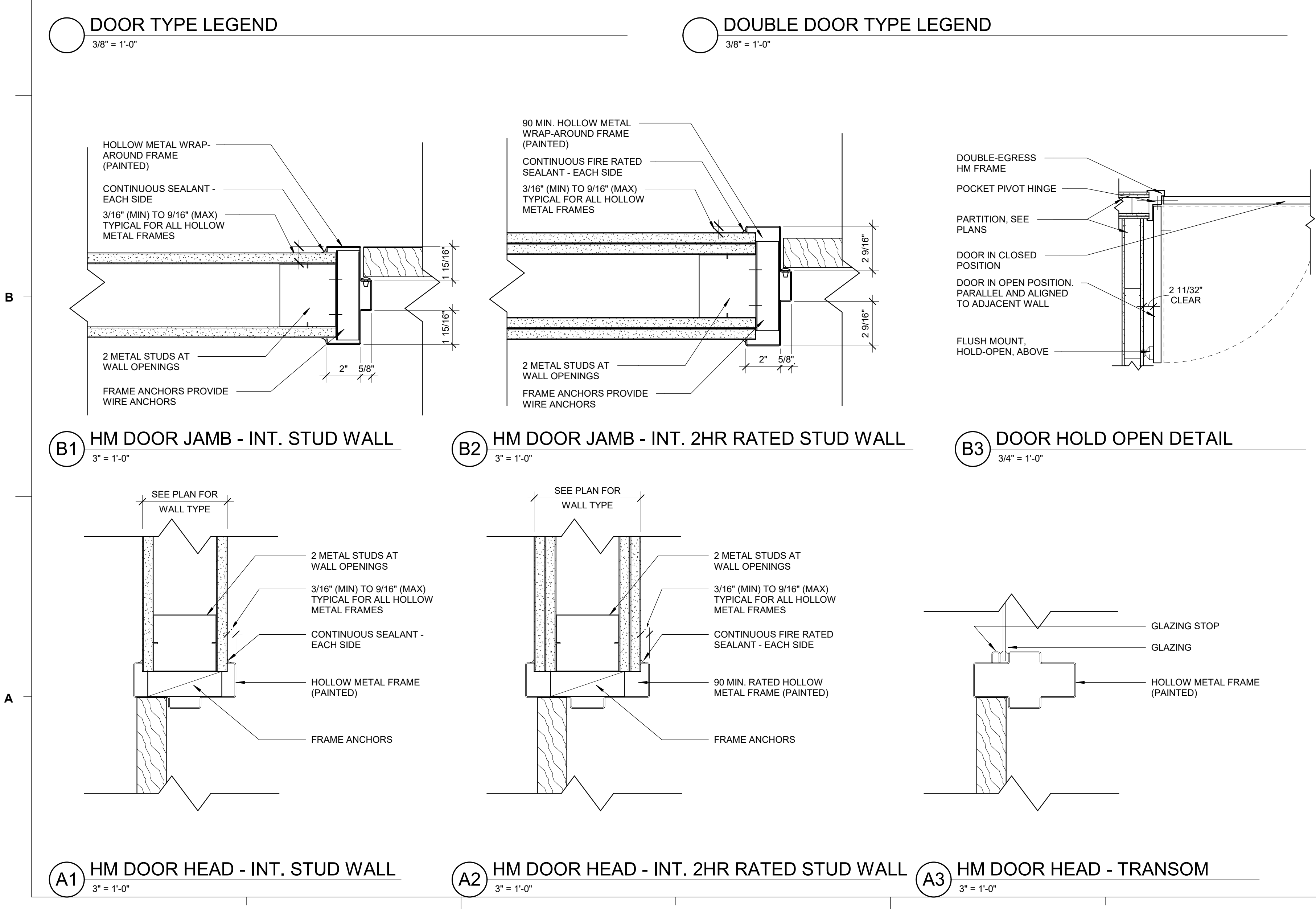
(A1) 4TH FLOOR LIFE SAFETY PLAN
1/8" = 1'-0"



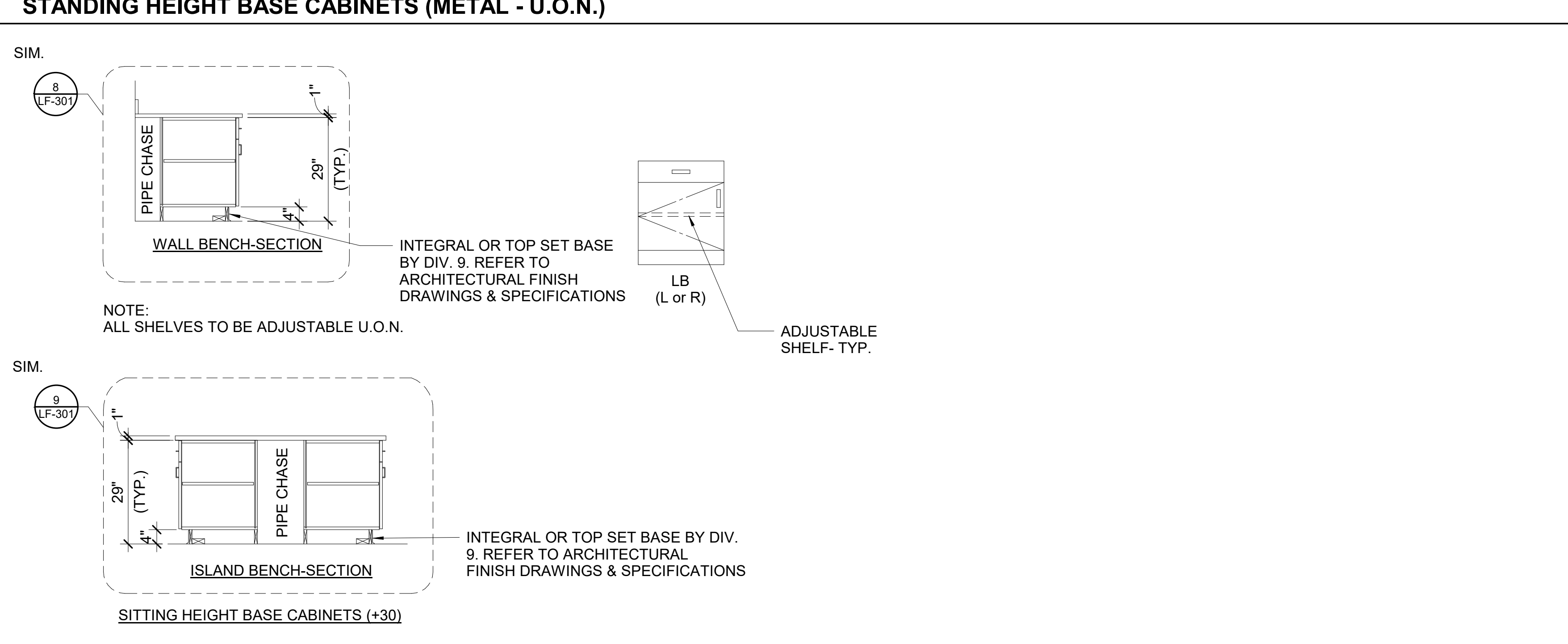
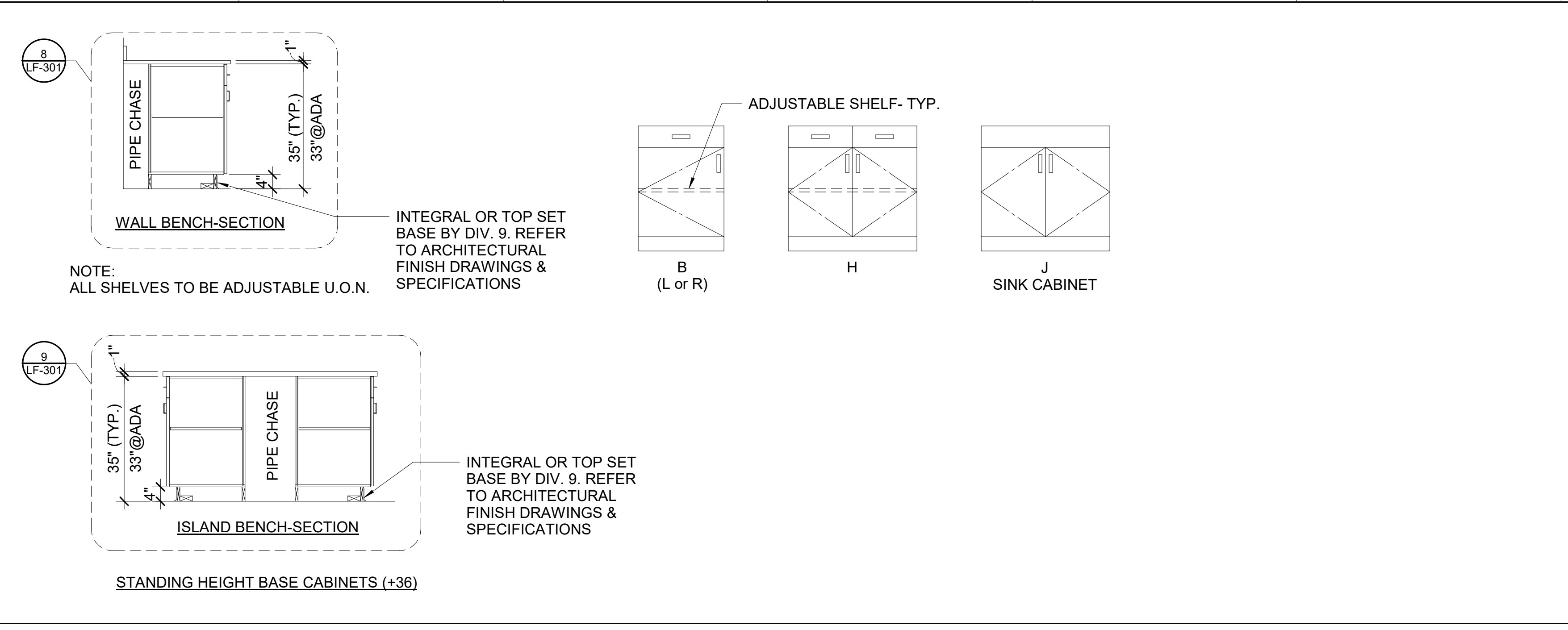
BIM 360://UNCC Bioinformatics 4th Floor Upfit/UNCC Bioinformatics_2018.rvt
 2/1/2021 10:04:34 PM



DOOR		DOOR SCHEDULE										FRAME			REMARKS				
DOOR NUMBER	TYPE	HEIGHT	WIDTH	MATL	FINISH	RATING	STC	Hardware	CLOSER	HOLD OPEN	CARD READER	DOOR PROTECTION	TYPE	MATL	FINISH	HEAD	JAMB	SILL	
400EA	N	7'-0"	3'-0"	WD	ST			15					F2	HM	PNT	A1/A-601	B1/A-601	A6/A-601	
400FA	UN (PAIR)	7'-0"	5'-0"	WD	ST	90 MIN		26	Yes		Yes		F1	HM	PNT	A2/A-601	B2/A-601	B5/A-601	
400FB	F (PAIR)	7'-0"	6'-0"	WD	ST	90 MIN		23		Yes		ARMOR PLATE	F1	HM	PNT	A2/A-601	B2/A-601	B6/A-601	
400GA	UN (PAIR)	7'-0"	4'-6"	WD	ST	90 MIN		26	Yes		Yes		F1	HM	PNT	A2/A-601	B2/A-601	B5/A-601	
401A	N	7'-0"	3'-0"	WD	ST			05					F8	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
402A	N	7'-0"	3'-0"	WD	ST			02					F1	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
403A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
404A	N	7'-0"	3'-0"	WD	ST			07					F1	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
405A	N	7'-0"	3'-0"	WD	ST			05					F3	HM	PNT	A3/A-601	B1/A-601	A4/A-601	
406A	N	7'-0"	3'-0"	WD	ST			06					F2	HM	PNT	A1/A-601	B1/A-601	A6/A-601	
407A	N	7'-0"	3'-0"	WD	ST			08	Yes				F1	HM	PNT	A1/A-601	B1/A-601	A5/A-601	
407B	N	7'-0"	3'-0"	WD	ST			09					F1	HM	PNT	A1/A-601	B1/A-601	A6/A-601	
408AA	F	7'-0"	3'-0"	WD	ST			12	No				F1	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
409A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
410A	N	7'-0"	3'-0"	WD	ST			17	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B4/A-601	
411A	N	7'-0"	3'-0"	WD	ST			07			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A6/A-601
412A	N	7'-0"	3'-0"	WD	ST			08					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F2	A1/A-601	B1/A-601	A4/A-601
413A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A6/A-601
414A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
418A	F	7'-0"	3'-0"	WD	ST			08	Yes			KICK PLATE	F1	HM	PNT	A1/A-601	B1/A-601	A6/A-601	
417A	N	7'-0"	3'-0"	WD	ST			15			Yes		F4	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
418A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F2	A1/A-601	B1/A-601	A4/A-601
419A	N	7'-0"	3'-0"	WD	ST			06			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
420A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
421A	N	7'-0"	3'-0"	WD	ST			15			Yes		F4	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
422A	N	7'-0"	3'-0"	WD	ST			05			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
423A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
423B	F	7'-0"	3'-0"	WD	ST			11					F1	HM	PNT	A1/A-601	B1/A-601	A5/A-601	
423G	FG (PAIR)	7'-0"	6'-0"	AL	ANOD			25	Yes	No			2/A-251	SF	ANO				
423I	F	7'-0"	3'-0"	WD	ST			02					F7	HM	PNT	A3/A-601	B1/A-601	A6/A-601	
423J	F	7'-0"	3'-0"	WD	ST			24	Yes				F1	HM	PNT	A1/A-601	B1/A-601	A5/A-601	
424A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
425A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
426A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
427A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
428A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F6	A3/A-601	B1/A-601	A4/A-601
429A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
430A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F8	A3/A-601	B1/A-601	A4/A-601
431A	N	7'-0"	3'-0"	WD	ST			08			Yes		F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F4	A1/A-601	B1/A-601	A4/A-601
432A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F6	A3/A-601	B1/A-601	A4/A-601
433A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F6	A3/A-601	B1/A-601	A4/A-601
436A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F8	A3/A-601	B1/A-601	A4/A-601
438A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F8	A3/A-601	B1/A-601	A4/A-601
440A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
442A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
444A	F	7'-0"	3'-0"	WD	ST			14	No				F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A5/A-601
445A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
446A	N	7'-0"	3'-0"	WD	ST			05			Yes		F9	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
447A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
448A	N	7'-0"	3'-0"	WD	ST			15			Yes		F9	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
449A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
450A	F	7'-0"	3'-6"	WD	ST	60 MIN		22	Yes				F1	HM	--	EXISTING	A1/A-601	B1/A-601	CE/A-601
451A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
452A	F	7'-0"	3'-6"	WD	ST	60 MIN		19	Yes				F1	HM	--	EXISTING	A1/A-601	B1/A-601	CE/A-601
453A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
454A	F	7'-0"	3'-0"	WD	ST			15	Yes				F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	CE/A-601
455A	N	7'-0"	3'-0"	WD	ST			05					F1	HM	PNT	ALT 3A: PROVIDE FRAME TYPE F5	A3/A-601	B1/A-601	A4/A-601
457A	FG	7'-0"	3'-0"	WD	ST			15			Yes		F9	HM	PNT	A1/A-601	B1/A-601	A4/A-601	
459A	UN (PAIR)	7'-0"	4'-6"	WD	ST			20	Yes			ARMOR PLATE	F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
459B	NR	7'-0"	3'-0"	WD	ST			04					F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
460A	SLIDE	9'-0"	7'-6"	--	--			01					--	--	--			B6/A-602	
460AA	X	7'-0"	2'-6"	--	--			10					--	--	--			B6/A-601	
461A	UN (PAIR)	7'-0"	4'-6"	WD	ST			26	Yes			ARMOR PLATE	F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
462A	UN (PAIR)	7'-0"	4'-6"	WD	ST			26	Yes		Yes		F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
462B	F	7'-0"	4'-6"	WD	ST	90 MIN		16	Yes				F1	HM	PNT	A2/A-601	B2/A-601	B6/A-601	
463A	UN (PAIR)	7'-0"	4'-6"	WD	ST			20	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
463B	NR	7'-0"	3'-0"	WD	ST			04	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
464A	UN (PAIR)	7'-0"	4'-6"	WD	ST			26	Yes		Yes		F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
465A	UN (PAIR)	7'-0"	4'-6"	WD	ST			20	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
465B	NR	7'-0"	3'-0"	WD	ST			04	Yes				F1	HM	PNT	A2/A-601	B2/A-601	B6/A-601	
466A	UN (PAIR)	7'-0"	4'-6"	WD	ST			13	Yes		Yes		F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
467A	UN (PAIR)	7'-0"	4'-6"	WD	ST			21	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
467B	F	7'-0"	3'-0"	WD	ST			04	Yes				F1	HM	PNT	A1/A-601	B1/A-601	B6/A-601	
468A	UN (PAIR)	7'-0"	4'-6"	WD	ST			20	Yes				F1	HM	PNT	B1/A-601	B6/A-601	B6/A-601	
469A	FG (PAIR)	7'-0"	6'-0"	WD	ST			26	Yes		Yes		F1	HM	PNT	A1/A-601	B1/A-601	A4/A-601	



D24	BASE CABINET TYPE WIDTH (INCHES - TYPICAL)
D24C/G	BASE CABINET TYPE WIDTH ON CASTERS OR GLIDES IN LIEU OF INTEGRAL TOE BASE
A24L	BASE CABINET TYPE WIDTH DOOR HINGE ON LEFT SIDE
A24R	BASE CABINET TYPE WIDTH DOOR HINGE ON RIGHT SIDE
LD24	SITTING HEIGHT AT BASE CABINET & KO BASE CABINET TYPE WIDTH
KO24	KNEE OPENING WIDTH
KOX24	KNEE OPENING KNEE OPENING TYPE (SEE KNEE OPENINGS SECTION) WIDTH (X = A, D, OR E)
MT60X	MOVABLE TABLE WIDTH (NOTE: 30"/33" DEPTH ASSUMED PER GENERAL NOTES) MOVABLE TABLE TYPE (C) ON CASTERS & (D) W/ DRAWER (X = C AND/ OR D)
MT6024	MOVABLE TABLE WIDTH DEPTH
WA36	WALL-HUNG CABINET WALL CABINET DOOR TYPE WIDTH
TC48	TALL STORAGE CABINET TALL CABINET DOOR TYPE WIDTH
TAV48	DESIGNATES VENTED CABINET WITH 2"Ø CONNECTION
FP	FILLER PANEL
*	DESIGNATES KEY LOCKABLE CASEWORK
**	DESIGNATES PADLOCK HASP

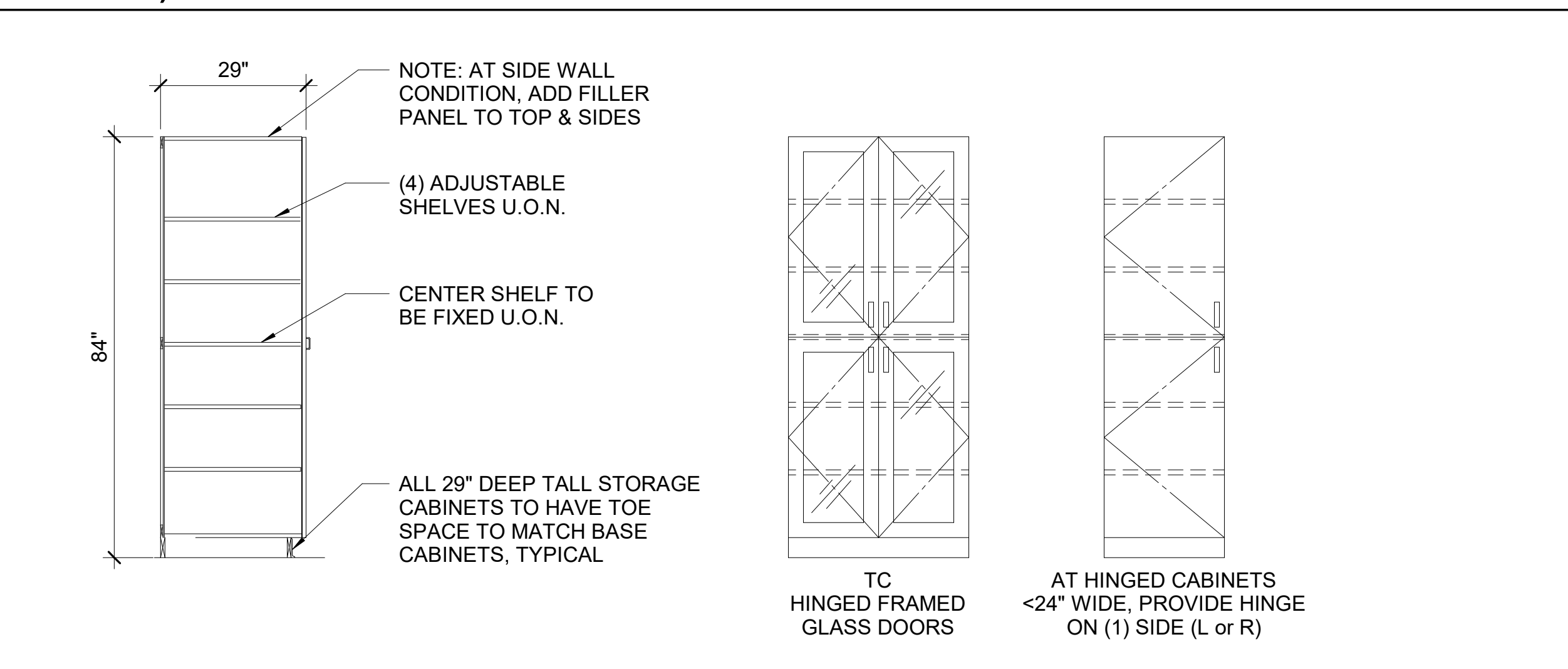
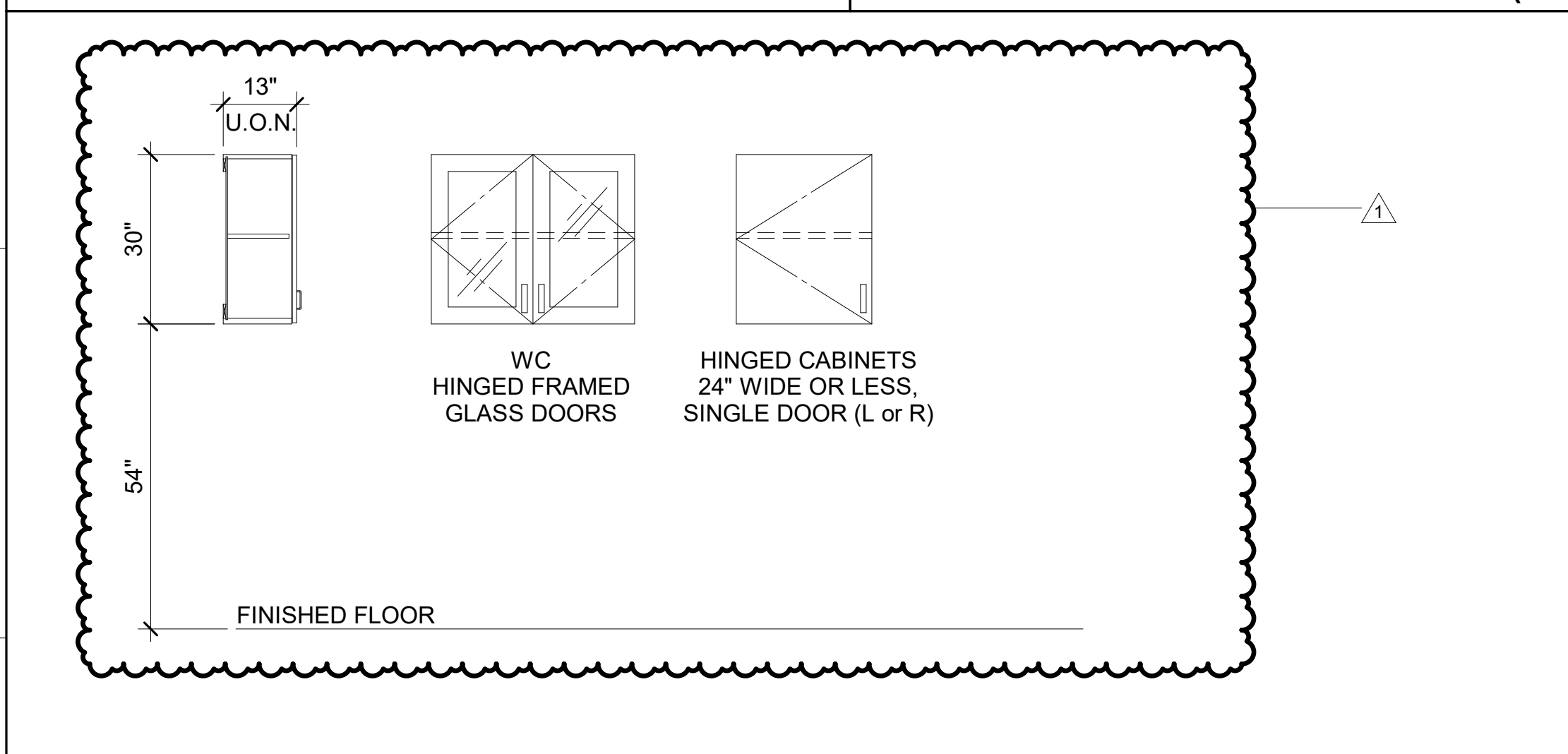


NOTES:

1. FOR CABINET BACKING HEIGHTS REFER TO: 7 (LF-301)

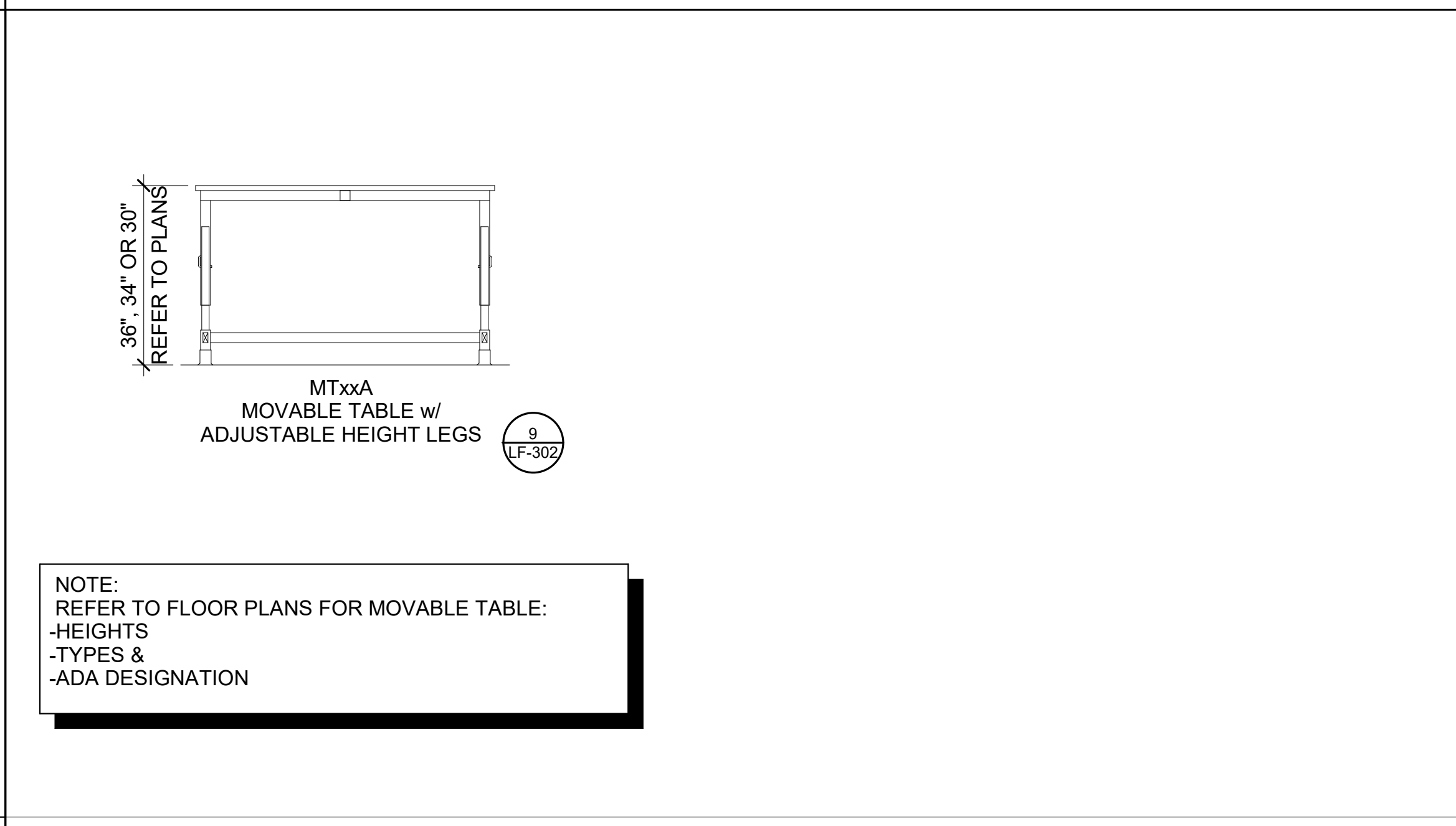
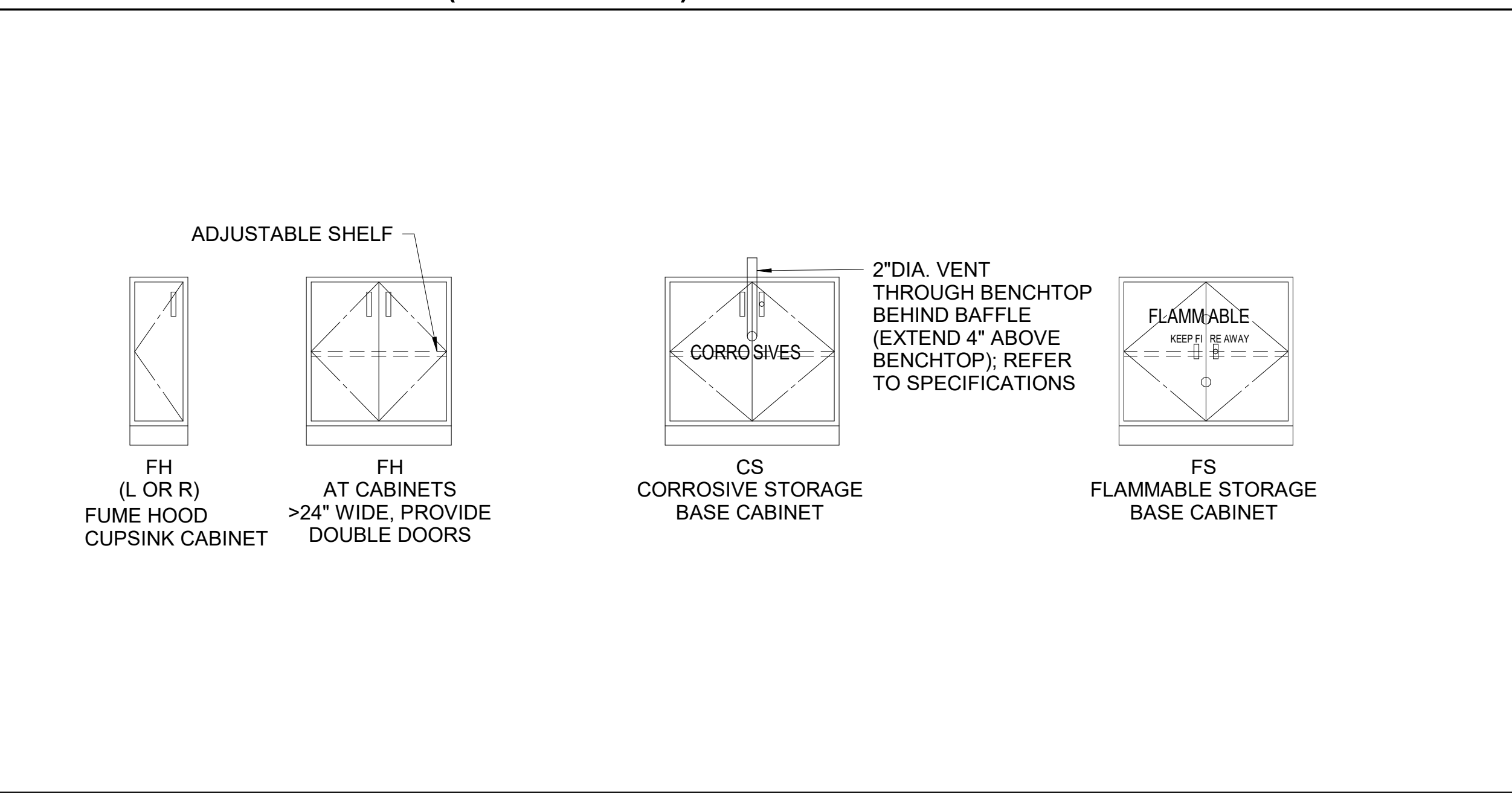
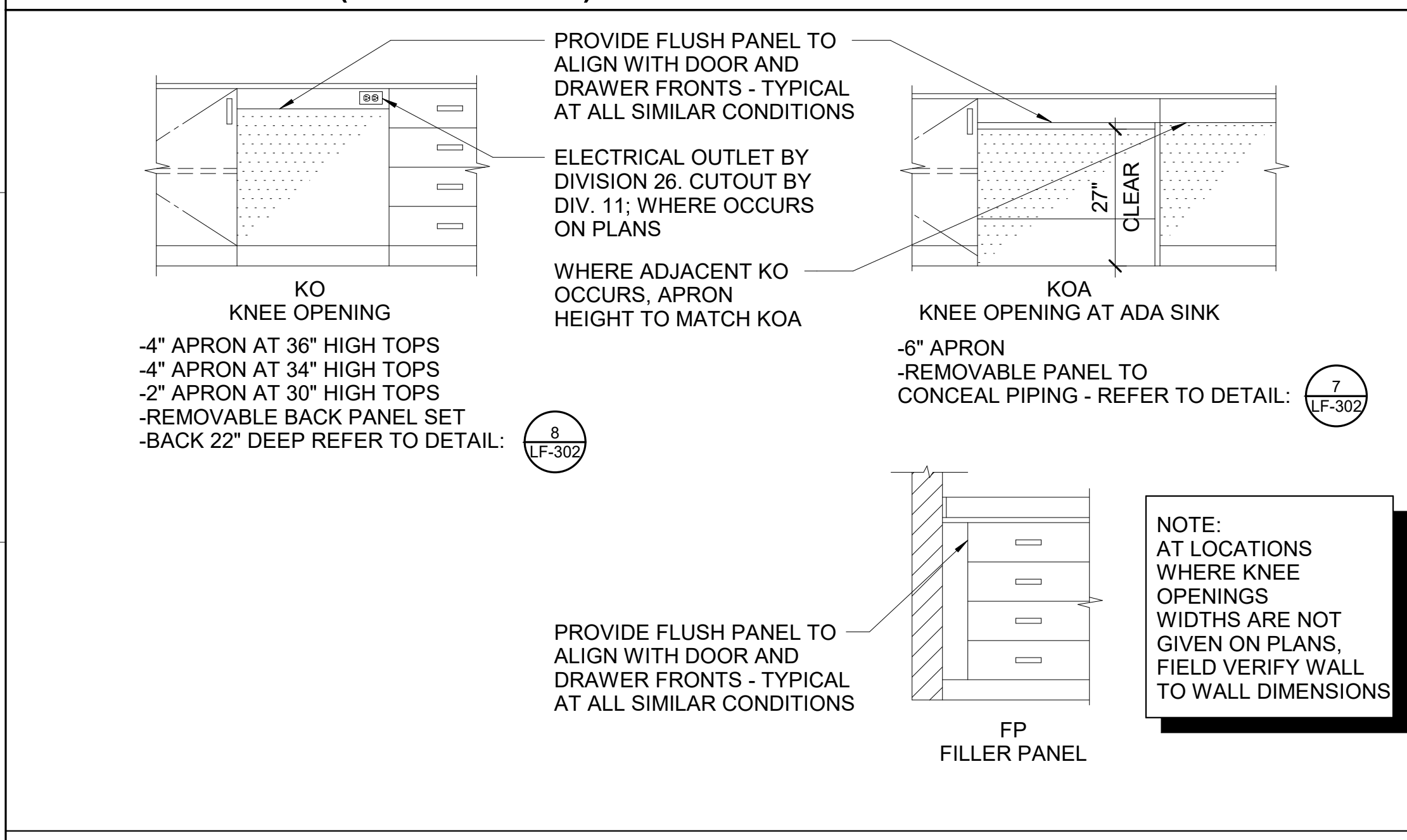
CASEWORK LEGEND & NOTES

SITTING HEIGHT BASE CABINETS (METAL - U.O.N.)



WALL CABINETS (METAL - U.O.N.)

TALL STORAGE CABINETS (METAL - U.O.N.)



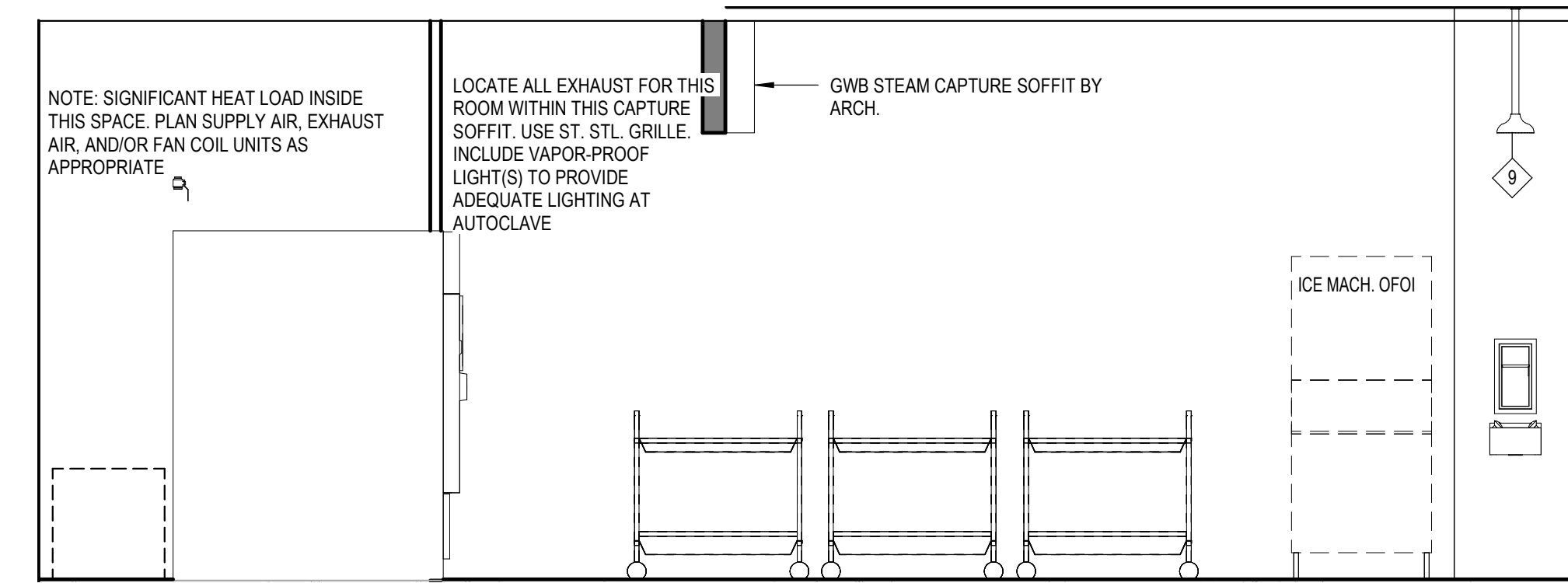
KNEE OPENINGS (METAL - U.O.N.)

SPECIAL CABINETS (METAL - U.O.N.)

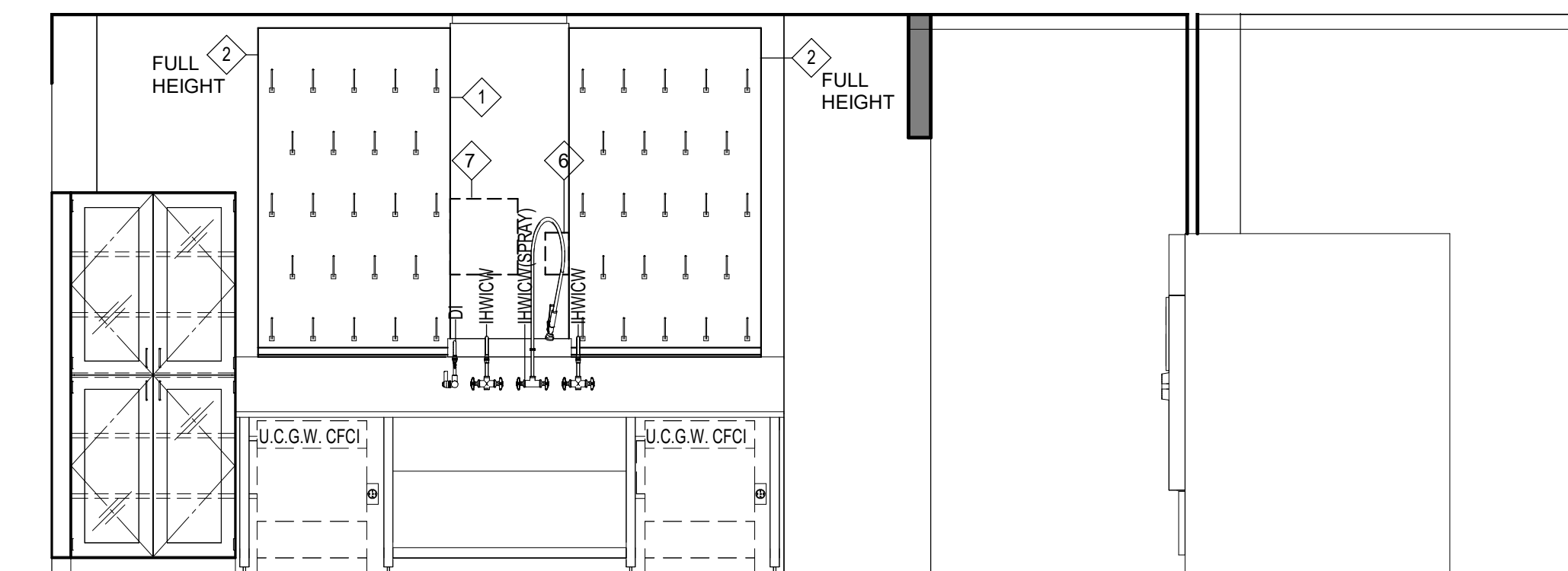
MOVABLE TABLES (METAL - U.O.N.)

N:\2019\1-201902\REV\MTLF-UNC BIOINFORMATICS-2019-FRONT SHEETS AND DETAILS.rvt 2/1/2021 8:59:08 AM

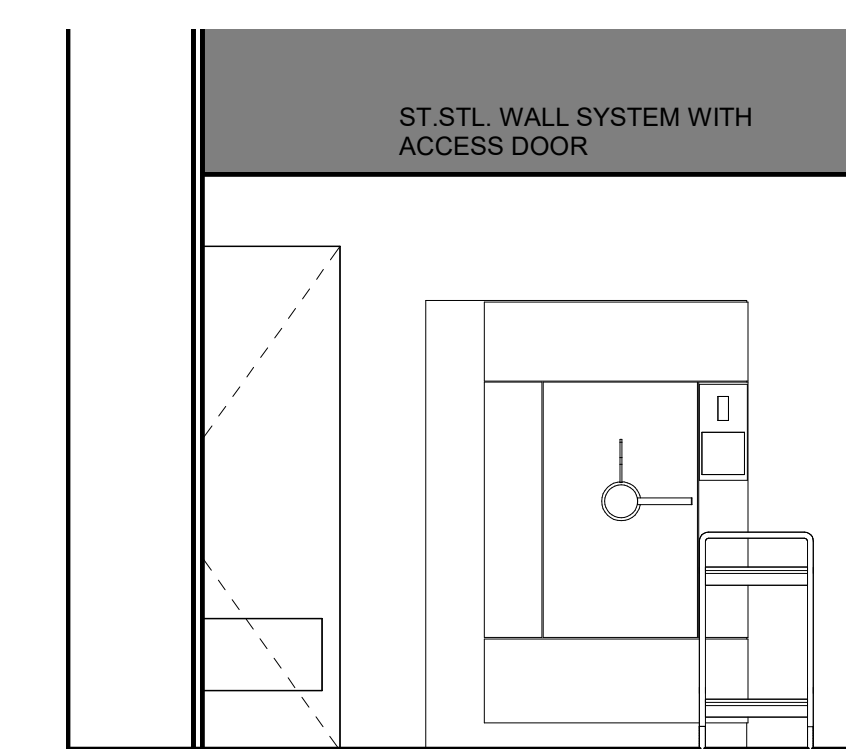
No.	Description	Date
1	Addendum #1	02/02/2021



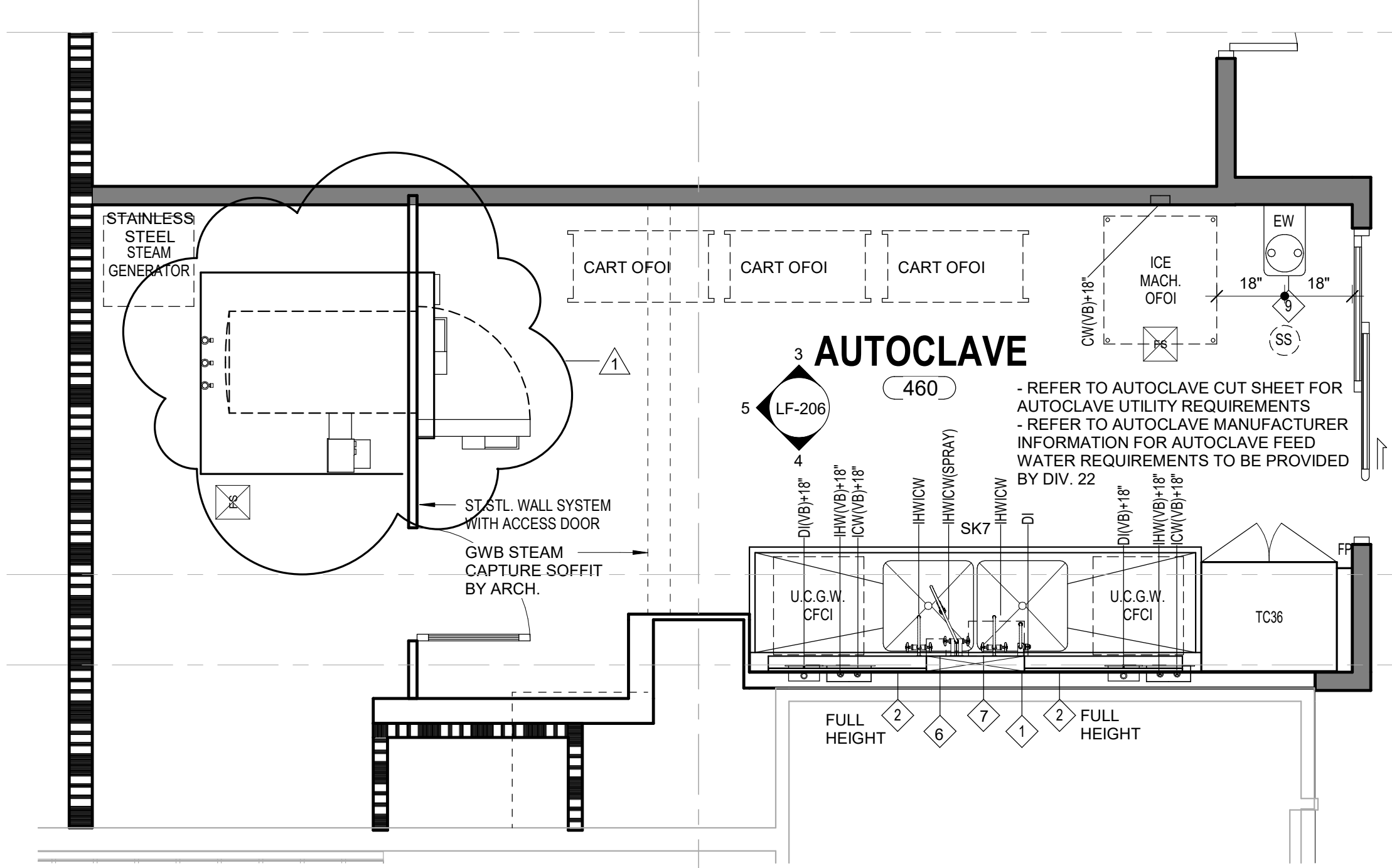
3 AUTOCLAVE NORTH VIEW
3/8" = 1'-0"



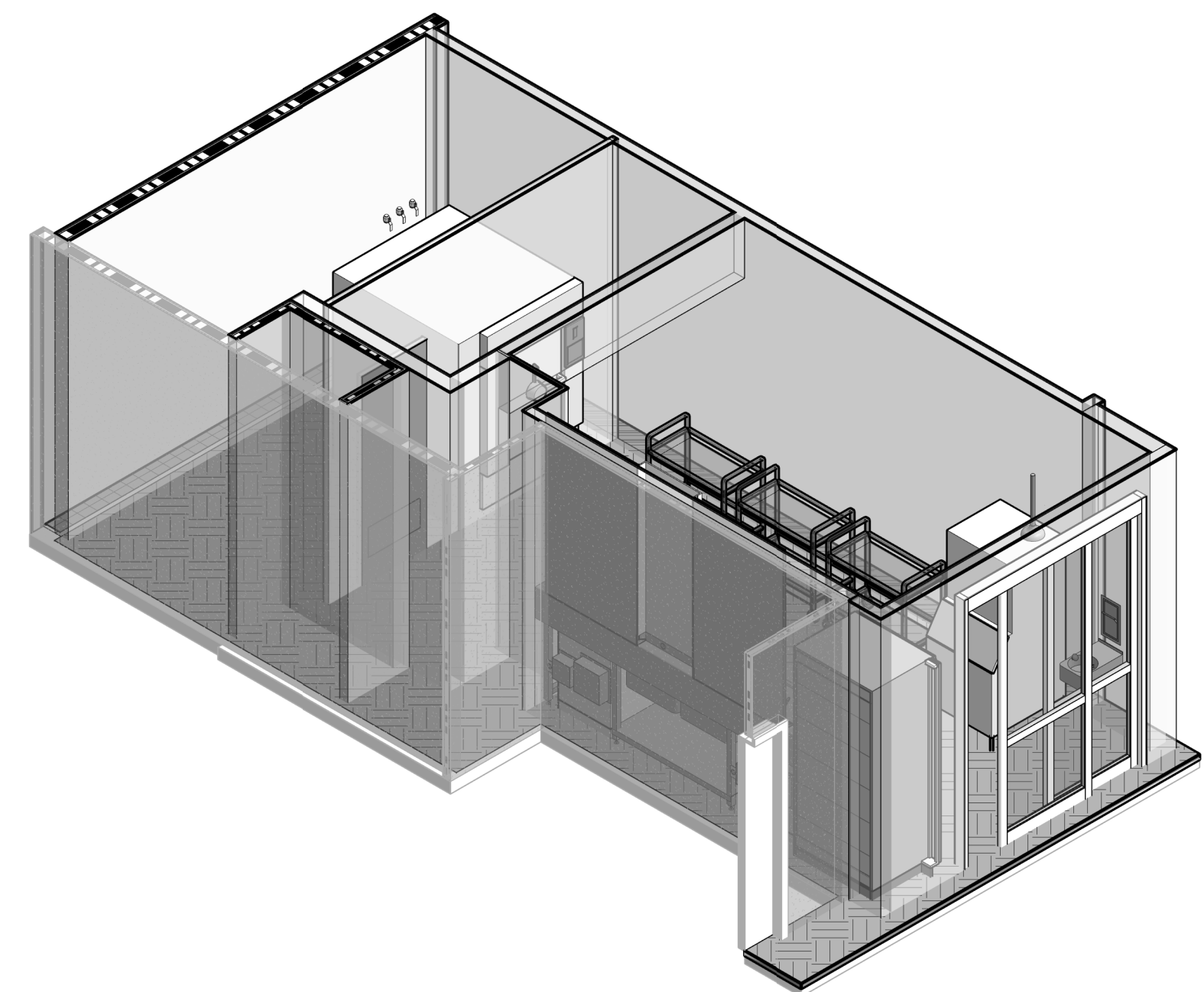
4 AUTOCLAVE ROOM - SOUTH VIEW
3/8" = 1'-0"



5 AUTOCLAVE ROOM - WEST VIEW
3/8" = 1'-0"



1 AUTOCLAVE
3/8" = 1'-0"

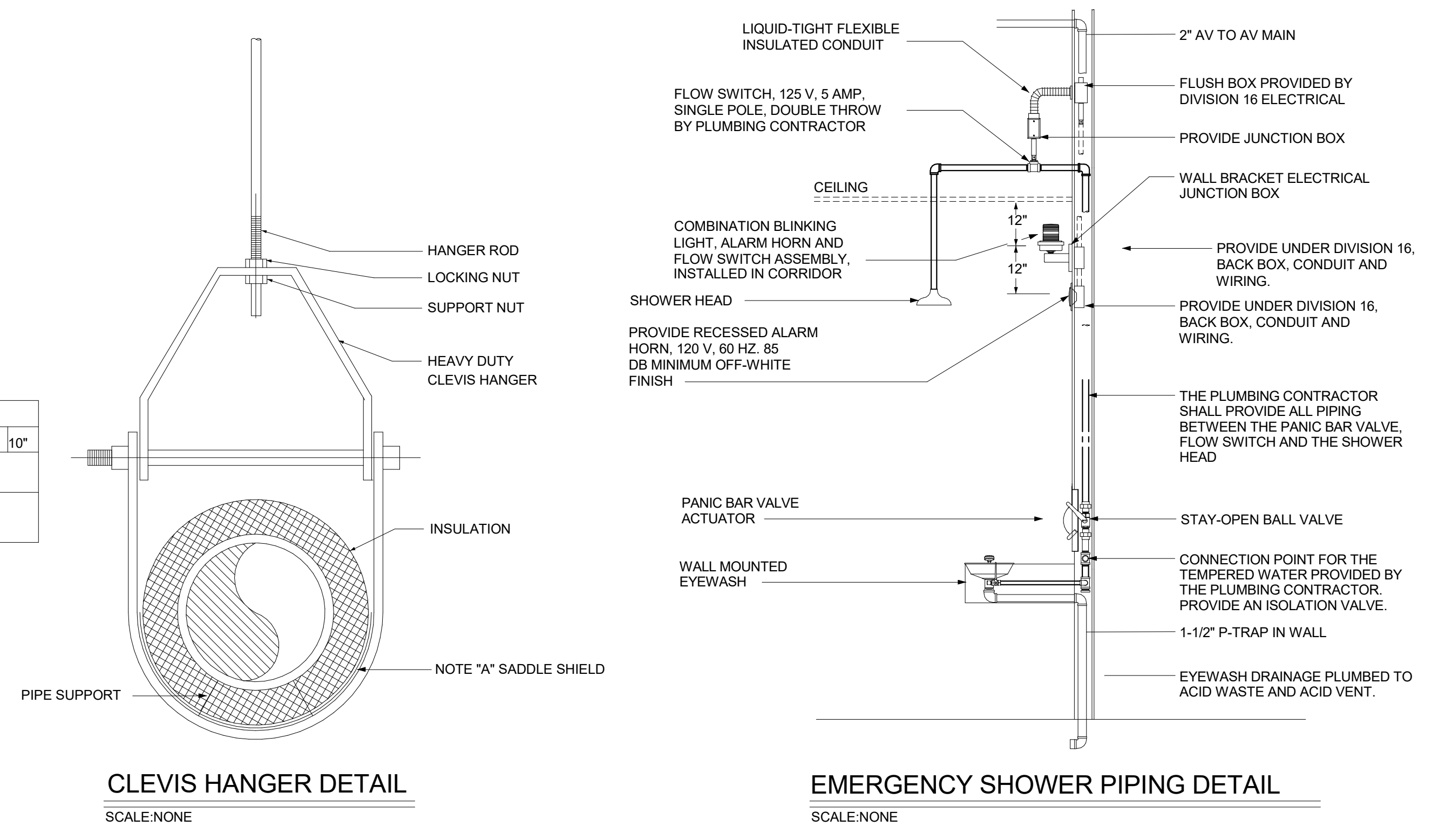


2 AUTOCLAVE ROOM

REVISIONS:

No.	Description	Date
1	Addendum 1	02.02.2021

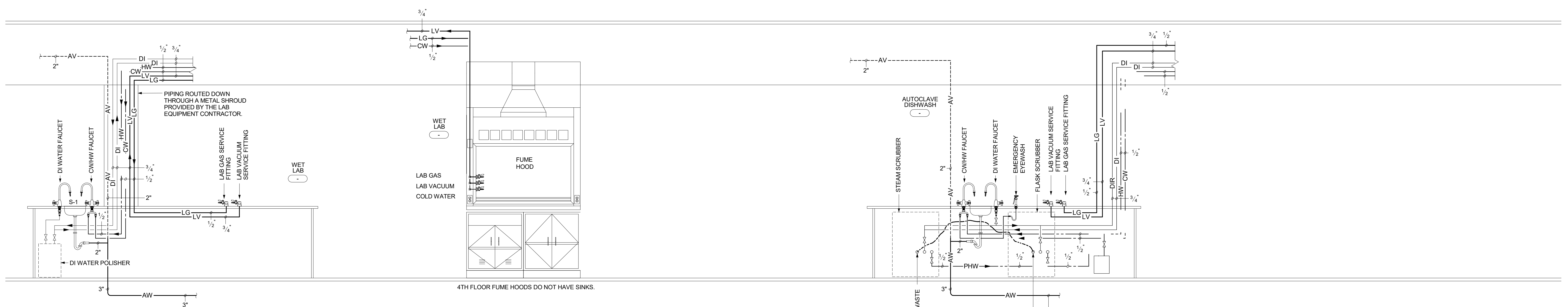
PROJECT: 9202-194610
 DATE: 01/04/2021
 DRAWN BY: JF
 CHECKED BY: RAM



NOTE "A" PROVIDE INSULATION PROTECTION-SEE SPECIFICATIONS

HANGER ROD SPACING						
PIPE SIZE	1"	1-1/4"	1-1/2"	2"	2-1/2"	3" 4" 6" 8" 10"
MAX. ALLOWABLE SPACING	8 FT	10 FT				12 FT

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST PIPE ON TRAPEZE.

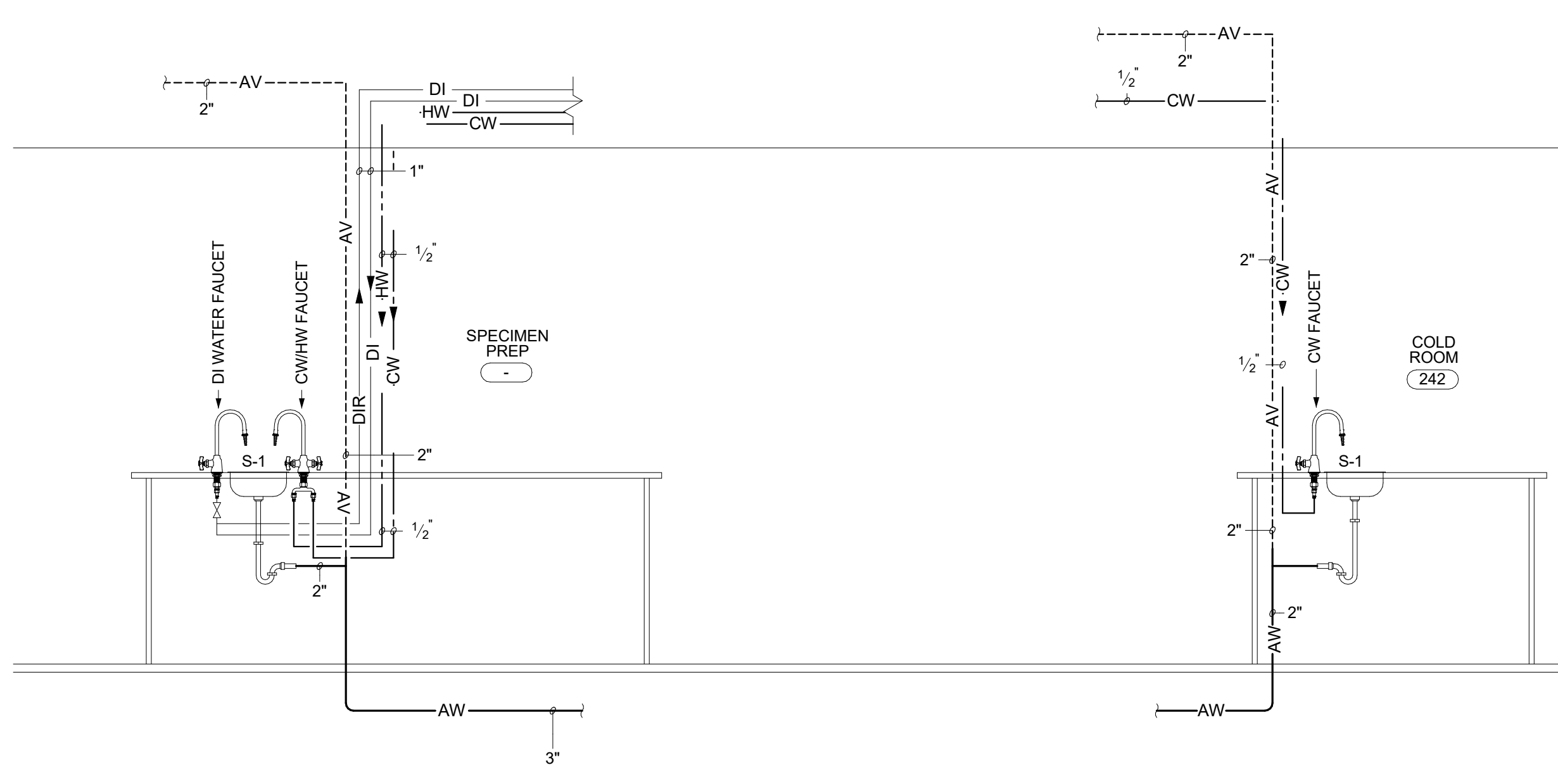


LABORATORY CASEWORK ELEVATION
 SCALE: NONE

LABORATORY CASEWORK ELEVATION
 SCALE: NONE

LABORATORY CASEWORK ELEVATION
 SCALE: NONE

NOTE: COORDINATE THE SANITARY UNDERFLOOR PIPE SIZES WITH THE FLOOR PLANS.



LABORATORY CASEWORK ELEVATION
 SCALE: NONE

LABORATORY CASEWORK ELEVATION
 SCALE: NONE

LABORATORY CASEWORK NOTES

THE LAB SINKS ARE FURNISHED WITH TAILPIECE, LAB WATER FAUCETS, EMERGENCY EYEWASH AND/OR LAB GAS SERVICE FITTINGS. THESE SINKS ARE FURNISHED BY THE LAB CASEWORK SUPPLIER AND INSTALLED BY THE PLUMBING SUB-CONTRACTOR. DIVISION 22 CONTRACTOR SHALL PROVIDE TAILPIECE, TRAP AND SUPPLIES.

THE PLUMBING SUB-CONTRACTOR SHALL PIPE UP TO THE LAB SINKS AND PROVIDE THE FINAL CONNECTION INCLUDING THE P-TRAP, UTILITY SUPPLY, GAS AND WATER IN-LINE SHUT-OFF VALVES.

THE DI WATER FAUCET SHALL BE FURNISHED WITH THE CASEWORK. THE DI FAUCET SHALL BE INSTALLED BY THE PLUMBING SUB-CONTRACTOR.

COORDINATE WITH THE ARCHITECTURAL DRAWINGS AND LABORATORY CASEWORK SPECIFICATIONS FOR THE ACTUAL PLACEMENT OF SINKS, FAUCETS AND SERVICE FITTINGS.

LABORATORY PIPING SHALL BE SHOWN AS FOLLOWS. REFER TO THE PLANS FOR THE ACTUAL PIPING. ALL SYSTEMS INDICATED BELOW ARE NOT REQUIRED AT ALL LOCATIONS. THE DEIONIZED WATER PIPING IS A CONTINUOUSLY LOOPED SYSTEM AT THIS LOCATION. THE PIPE SIZE IS TYPICAL FOR THE LOOP.

1/2" LG LAB GAS
 3/4" LV LAB VACUUM
 1/2" CW DOMESTIC COLD WATER
 1/2" HW DOMESTIC HOT WATER
 3/4" DI DEIONIZED WATER

ALL HORIZONTAL PIPING SHALL BE ROUTED IN THE LAB STATION PLUMBING CHASE.

ALL REQUIRED HORIZONTAL PIPING SUPPORTS SHALL BE PROVIDED WITH THE LAB STATION PLUMBING CHASE.

THESE NOTES APPLY TO ALL LABORATORY CASEWORK PLUMBING DRAWINGS AND THE PLUMBING FLOOR PLANS.

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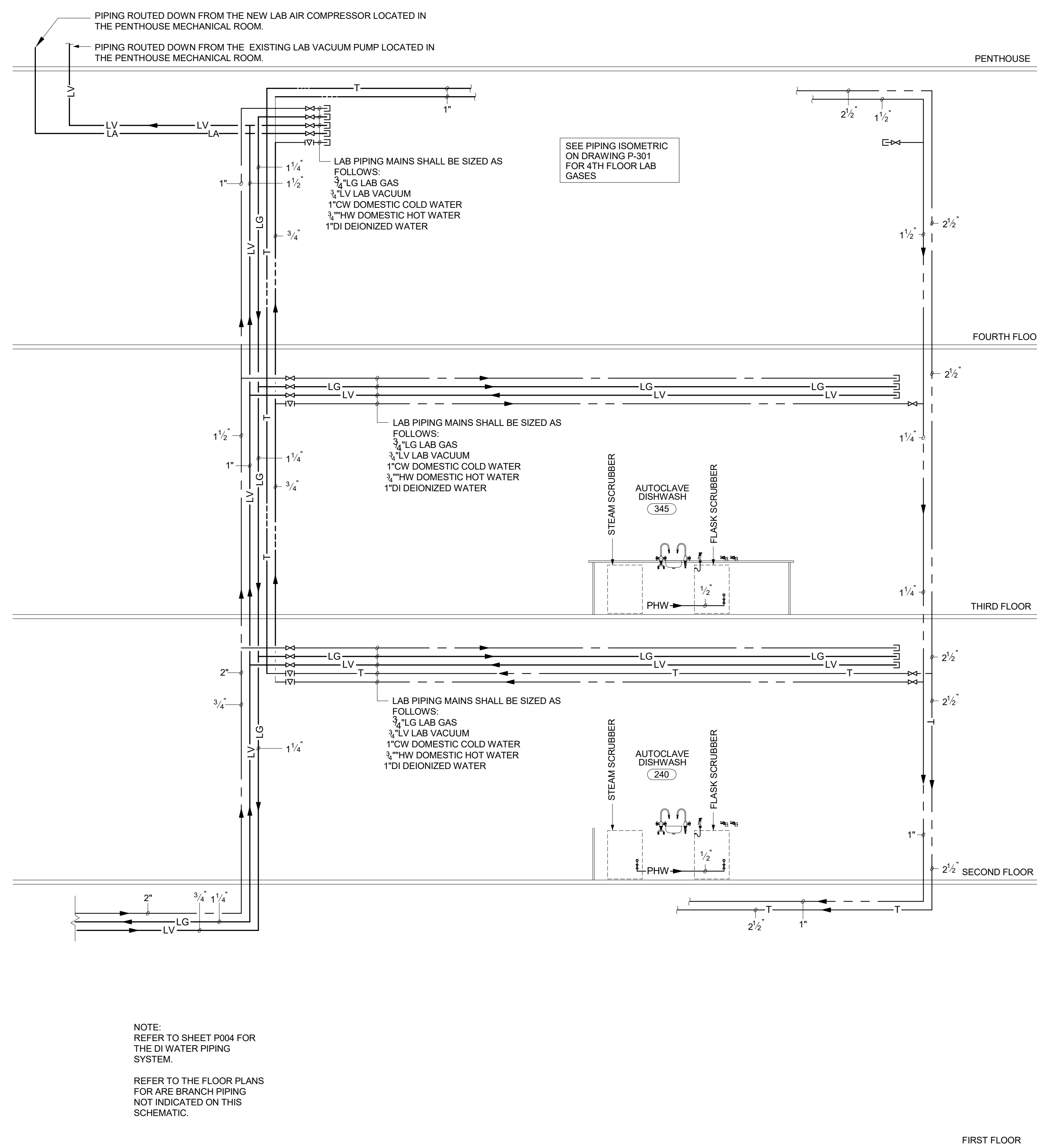
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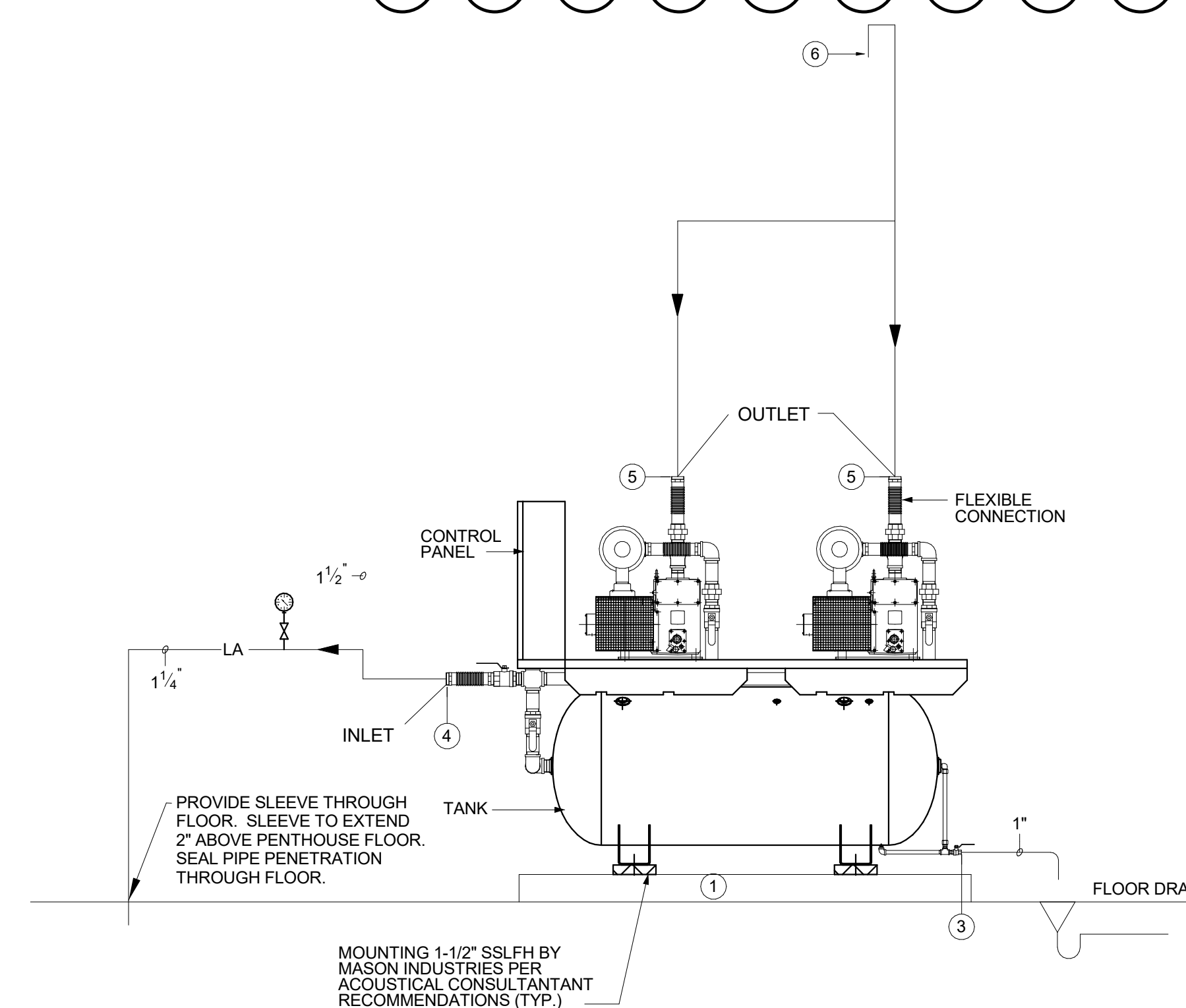
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DATE: 01/04/2021
DRAWN BY: JF
CHECKED BY: RAM

PLUMBING DETAILS

P-003



WET LAB RISER SCHEMATIC



KEYED NOTES: LAB AIR COMPRESSOR SYSTEM

- ① 4" HIGH CONCRETE PAD
- ② DELETED
- ③ PROVIDE 1" DRAIN WITH DRAIN VALVE.
- ④ CONNECT 1-1/4" LAB AIR PIPING TO 2"x18" FLEX CONNECTION FURNISHED WITH AIR COMPRESSOR SYSTEM.
- ⑤ CONNECT 2" LAB AIR INLET TO 2" FLEXIBLE DISCHARGE CONNECTION FURNISHED WITH AIR COMPRESSOR SYSTEM.
- ⑥ FRESH AIR INLET. TURN PIPING DOWN AND PROVIDE BUG SCREEN ON END OF PIPING. CONTRACTOR HAS OPTION TO RUN PIPE OUT WALL.

OIL FREE DUPLEX LAB AIR COMPRESSOR SYSTEM PIPING SCHEMATIC

SCALE: NONE

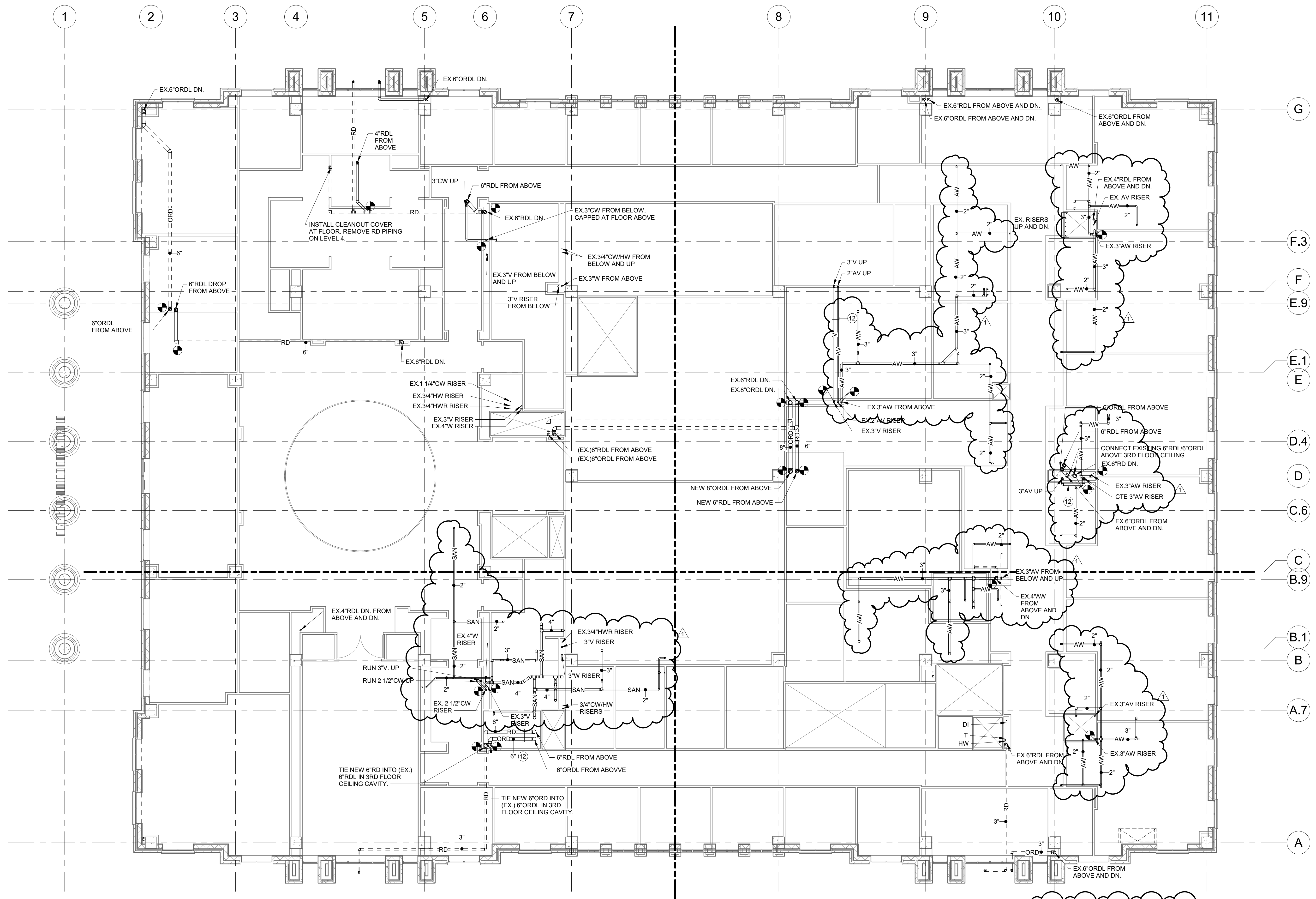
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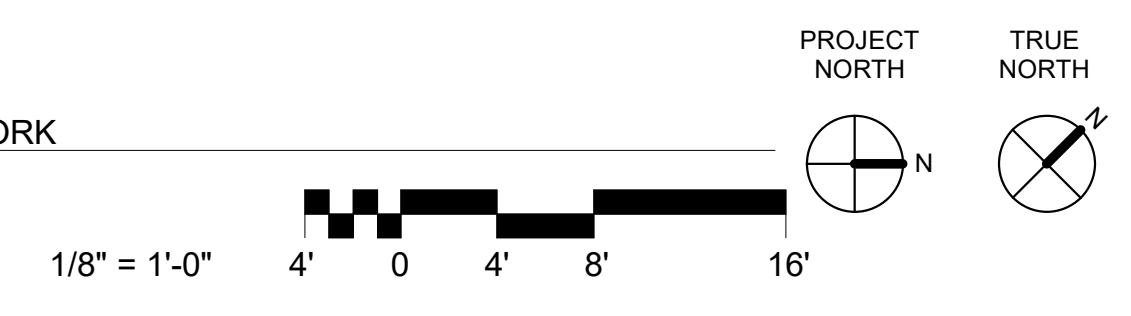
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PLUMBING
 THIRD FLOOR
 PLAN - NEW
 WORK

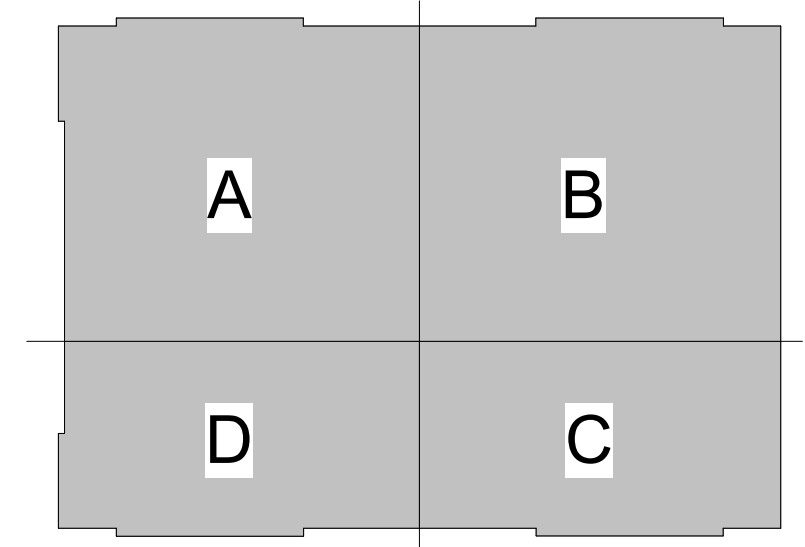
P-100



1 3RD FLOOR PLAN - PLUMBING - NEW WORK
 P-100 1/8" = 1'-0"



NOTE:
 WASTE PIPING SHOWN ABOVE 3RD FLOOR CEILING
 IS ALSO SHOWN ON THE 4TH FLOOR PLANS AND
 SHOWN HERE FOR REFERENCE ONLY.



WALL RATING LEGEND

	NON-RATED PARTITION TO CEILING
	NON-RATED PARTITION TO DECK
	1 HR. RATED PARTITION TO DECK
	2 HR. RATED PARTITION TO DECK

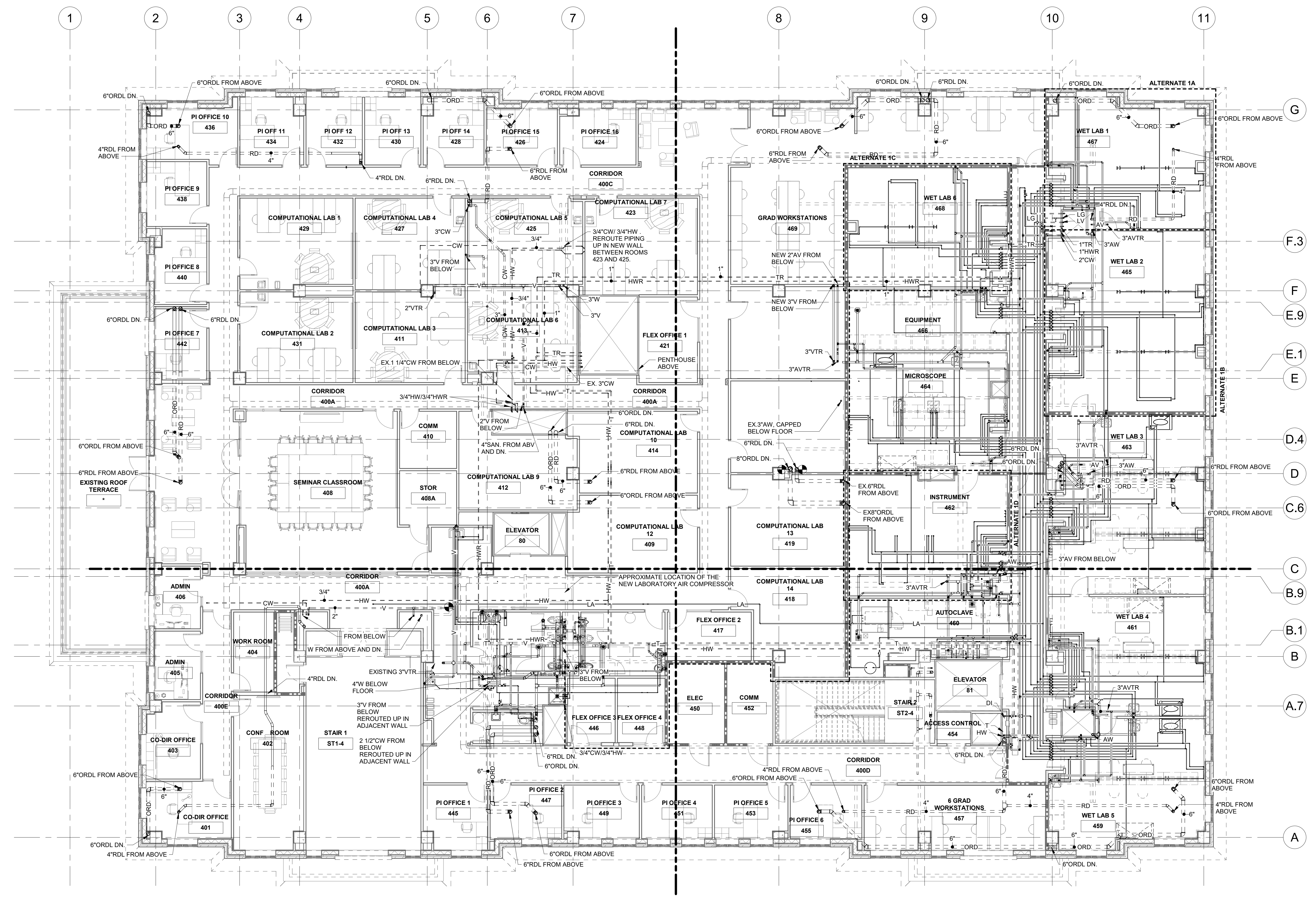
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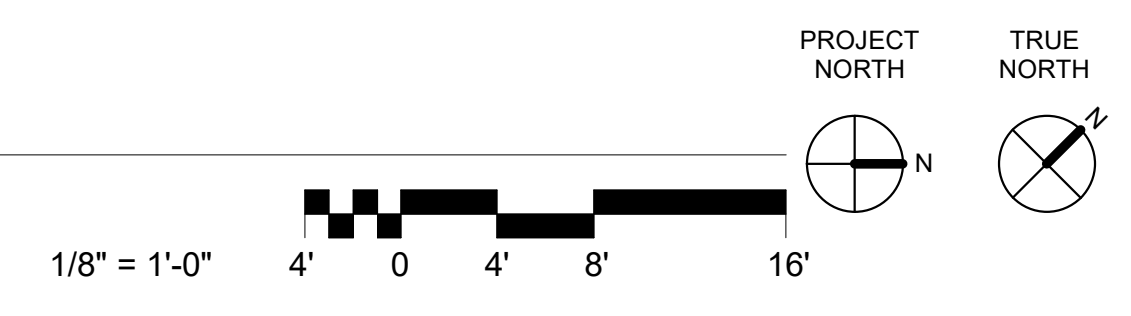
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PLUMBING
 FOURTH FLOOR
 OVERALL PLAN -
 BASE BID

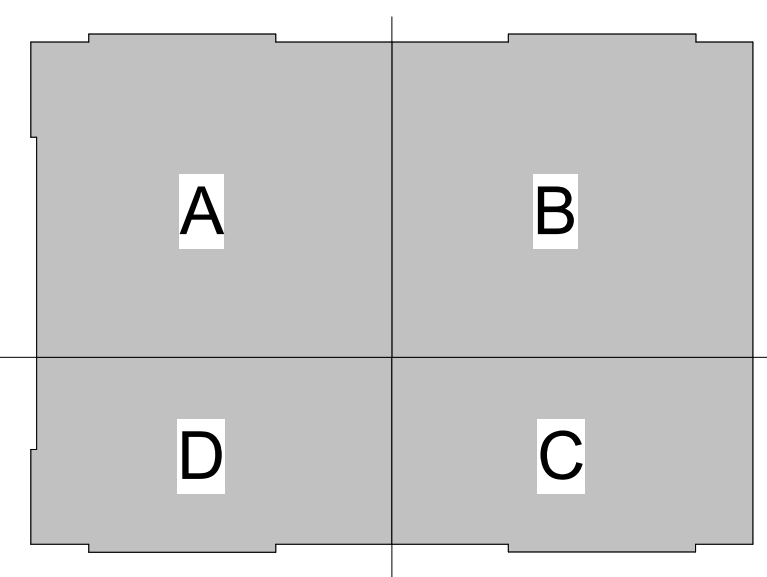
P-101



1 OVERALL 4TH FLOOR PLAN - PLUMBING - BASE BID
 P-101 1/8" = 1'-0"

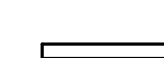





NOTE:
 WASTE PIPING SHOWN ABOVE 3RD FLOOR CEILING
 IS ALSO SHOWN ON THE 4TH FLOOR PLANS AND
 SHOWN HERE FOR REFERENCE ONLY.



KEY PLAN

WALL RATING LEGEND

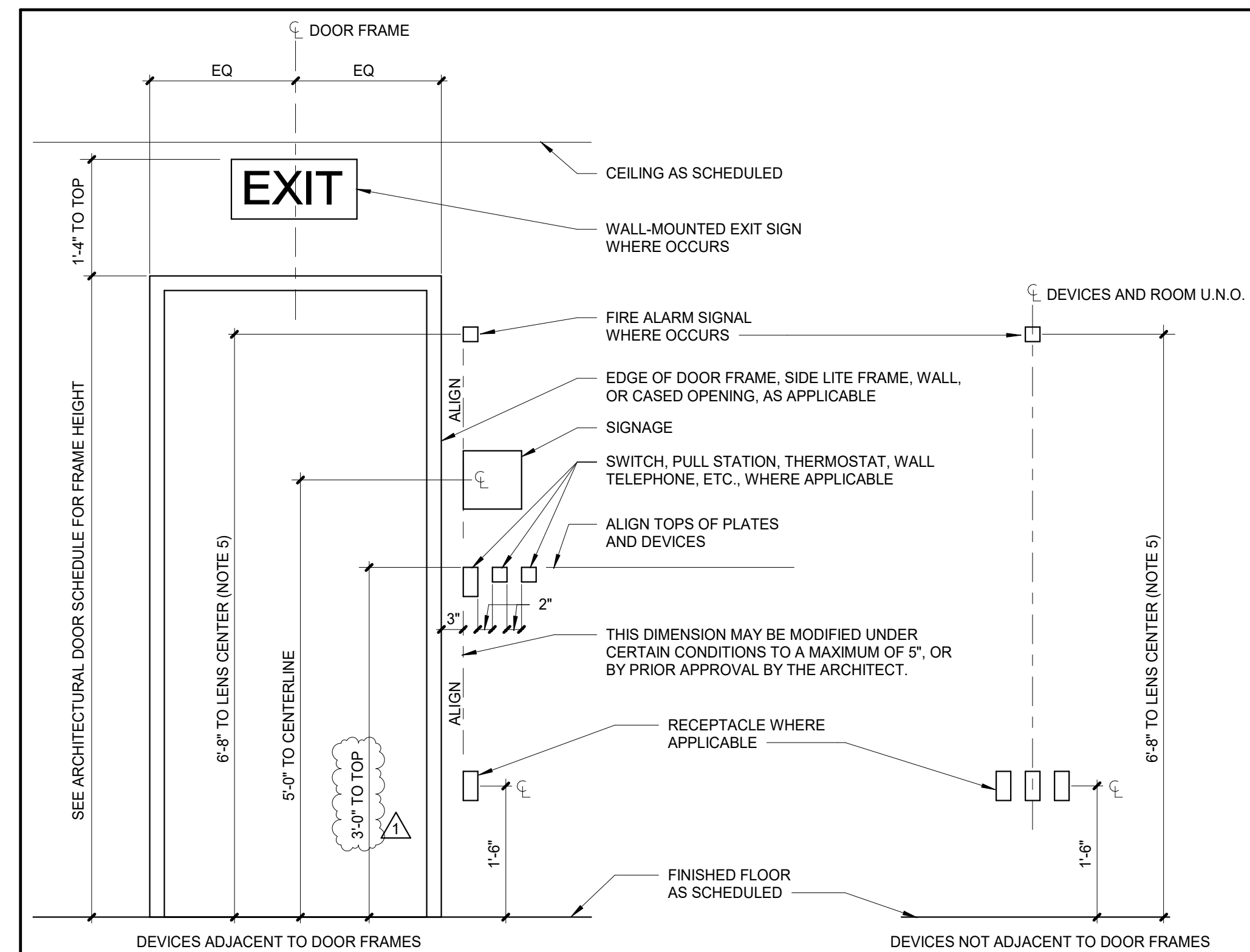
	NON-RATED PARTITION TO CEILING
	NON-RATED PARTITION TO DECK
	1 HR. RATED PARTITION TO DECK
	2 HR. RATED PARTITION TO DECK

ELECTRICAL SYMBOL SCHEDULE

NOTE: THIS SCHEDULE IS FOR REFERENCE ONLY. SOME SYMBOLS SHOWN HERE DO NOT APPEAR ELSEWHERE IN THE DRAWINGS. ADDITIONAL SYMBOLS MAY BE SHOWN ADJACENT TO RELATED PLAN.

SYMBOL	DESCRIPTION
	CONDUIT, RUN IN WALL, ABOVE CEILING, OR UNDER FLOOR. (DO NOT INSTALL CONDUITS EMBEDDED IN OVERHEAD CONCRETE SLABS ON DECK.) RUN CONDUIT CONCEALED WITH WALLS, INCLUDING MASONRY WALLS. TO MAXIMUM EXTENT FEASIBLE, CONDUITS SHALL BE PARALLEL AND PERPENDICULAR TO WALL OR STRUCTURE. EXTERIOR CONDUITS SHALL BE CONCEALED UNDERGROUND AND UNDER SLAB ON GRADE. RUN CONDUITS EXPOSED IN UNFINISHED UTILITY SPACES.
	CIRCUIT HOMERUN TO PANEL - WITH PANEL AND CIRCUIT DESIGNATION
	CONDUIT RUN BELOW GRADE OR BELOW SLAB ON GRADE
	CONDUIT STUB-OUT TERMINATED WITH INSULATED-THROAT BUSHING
	CONDUIT STUB-OUT BELOW GRADE AND CAP. MARK EXACT LOCATION ON RECORD DRAWINGS.
	TYPICAL REPRESENTATION OF 4-WIRE + GROUND FEEDER.
	TYPICAL REPRESENTATION OF 3-WIRE + GROUND FEEDER.
	TYPICAL REPRESENTATION OF GROUNDING ELECTRODE CONDUCTOR.
	THROUGH-THE-WALL METAL CONDUIT SLEEVE OR OTHER EMPTY CONDUIT RUN WITH BOTH ENDS TERMINATED WITH INSULATED-THROAT BUSHINGS. PROVIDE QUANTITY AND SIZE OF CONDUITS AS NOTED.
	JUNCTION OR PULL BOX. SIZE PER N.E.C.
	POWER OUTLET BOX FOR MOTORIZED PROJECTION SCREEN. PROVIDE DISCONNECTING MEANS ABOVE CEILING. INSTALL AND CONNECT TO MOTOR AND CONTROL SWITCH ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
	CONTROL SWITCH FOR MOTORIZED PROJECTION SCREEN. INSTALL AND CONNECT TO SCREEN ACCORDING TO MANUFACTURER'S INSTRUCTIONS. SWITCH IS FURNISHED WITH SCREEN.
	POWER OUTLET BOX AND CONNECTIONS TO MOTORIZED WINDOW SHADES. PROVIDE DISCONNECTING MEANS AND FINAL CONNECTIONS PER MANUFACTURER'S INSTRUCTIONS.
	CONTROL SWITCH FOR MOTORIZED WINDOW SHADES. INSTALL AND CONNECT TO SHADES ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
	POWER OUTLET BOX FOR OVERHEAD PROJECTOR. PROVIDE DISCONNECTING MEANS ABOVE CEILING. INSTALL AND MAKE FINAL CONNECTIONS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
	POWER WALL OUTLET BOX FOR AUTOMATIC PAPER TOWEL DISPENSER. COORDINATE LOCATION AND MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATION AND MANUFACTURER'S INSTRUCTIONS.
	POWER WALL OUTLET BOX FOR ELECTRIC HAND DRYER. COORDINATE LOCATION AND MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATION AND MANUFACTURER'S INSTRUCTIONS.
	LIGHTING FIXTURE, LINEAR TYPE. DRAWN APPROXIMATELY TO SCALE - CEILING OR WALL-MOUNT, SUSPENDED, SURFACE MOUNTED, OR RECESSED AS SCHEDULED. PROVIDE OUTLET BOX TO SUIT CONDITIONS. FIXTURE TYPE AND CIRCUIT NUMBER AS NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION.
	LIGHTING FIXTURE, CEILING-MOUNTED POINT TYPE - SUSPENDED, SURFACE MOUNTED, OR RECESSED AS SCHEDULED. PROVIDE OUTLET BOX TO SUIT CONDITIONS. FIXTURE TYPE AND CIRCUIT NUMBER AS NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION.
	LIGHTING FIXTURE, WALL-MOUNTED POINT TYPE - SURFACE MOUNTED OR RECESSED AS SCHEDULED. PROVIDE OUTLET BOX TO SUIT CONDITIONS. FIXTURE TYPE AND CIRCUIT NUMBER AS NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION.
	LIGHTING FIXTURES ON EMERGENCY POWER SYSTEM (NEC ART. 700)
	LIGHTING FIXTURES ON STANDBY POWER SYSTEM (NEC ART. 701 & 702)
	BOLLARD LIGHT OR POST-TOP AREA LIGHTING FIXTURE WITH CONCRETE BASE.
	DIRECTIONAL LIGHTING FIXTURE AS SCHEDULED. CHEVRON INDICATES DIRECTION OF MAIN BEAM.
	EXIT SIGN - ELECTRIC, INTERNALLY ILLUMINATED. SEE LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION. PROVIDE SIGNS WITH FACES AND DIRECTIONAL ARROWS AS INDICATED ON LIGHTING PLANS. MOUNTED AS NOTED BELOW. SHADOWN QUADRANTS INDICATE FACES.
	CEILING-MOUNTED, SINGLE FACE
	CEILING-MOUNTED, DOUBLE FACE
	WALL-MOUNTED, SINGLE FACE
	END WALL-MOUNTED, SINGLE FACE
	END WALL-MOUNTED, DOUBLE FACE
	THIS SYMBOL INDICATES A REQUIREMENT FOR OCCUPANCY SENSING AUTOMATIC LIGHTING CONTROL DEVICES IN THE ROOM. IT IS NOT INTENDED TO SHOW THE LOCATION OF ANY DEVICE. PROVIDE CEILING-MOUNTED SENSORS IN QUANTITY AND LOCATIONS AS REQUIRED TO DETECT SMALL HAND MOTION THROUGHOUT THE ROOM. NOTE: LIGHTING FIXTURES ON EMERGENCY AND/OR NIGHT LIGHT CIRCUITS SHALL NOT BE CONTROLLED BY OCCUPANCY SENSORS. SEE SECTION 260923.
	PHOTOELECTRIC SWITCH FOR LIGHTING CONTROL SYSTEM
	S SINGLE POLE SWITCH - 20A, 120-277V. REFER TO SECTIONS 262726 AND 262727.
	S2 DOUBLE POLE SWITCH - 20A, 120-277V. REFER TO SECTIONS 262726 AND 262727.
	S3 THREE WAY SWITCH - 20A, 120-277V. REFER TO SECTIONS 262726 AND 262727.
	S4 FOUR WAY SWITCH - 20A, 120-277V. REFER TO SECTIONS 262726 AND 262727.
	SW SWITCH WITH PILOT LIGHT - 20A. REFER TO SECTIONS 262726 AND 262727.
	SW LV LOW VOLTAGE SWITCH - MOVEMENT CONTACT, TWO-BUTTON OR TOGGLE TYPE, SINGLE-POLE, DOUBLE-THROW, WITH NORMALLY OPEN CONTACTS.
	SW D DIMMER SWITCH - SUITABLE FOR TYPE AND QUANTITY OF LIGHTING LOAD. COORDINATE WITH LIGHTING FIXTURE TYPE BEING CONTROLLED (0-10V, ELV, MLV, DMX, ETC.).
	SW V WALL BOX MOUNTED OCCUPANCY SENSORS/SWITCHES. SET FOR MANUAL "ON" AND AUTOMATIC "OFF" (VACANCY SENSOR). SEE TIME DELAY AS SPECIFIED.
	AGTD AUTOMATIC GENERATOR TRANSFER DEVICE (EMERGENCY LIGHTING TRANSFER RELAY). TO PROVIDE FULL LIGHT FIXTURE OUTPUT FROM EMERGENCY SOURCE UPON LOSS OF NORMAL POWER, WHILE ALLOWING FULL DIMMING CAPABILITY TO REMAIN.
	RECEPTACLE 120V, NEMA 5-20R DUPLEX, MOUNT 18" AFF TO CENTER UNLESS NOTED OTHERWISE. REFER TO SECTIONS 262726 AND 262727.
	RECEPTACLE 120V, NEMA 5-20R DUPLEX, MOUNT 36" AFF TO TOP OR 2" ABOVE BACKSPASH TO BOTTOM UNLESS NOTED OTHERWISE. REFER TO SECTIONS 262726 AND 262727.
	RECEPTACLE 120V, TWO NEMA 5-20R DUPLEX RECEPTACLES IN OUTLET BOX WITH 2-DEVICE PLATE. REFER TO SECTIONS 262726 AND 262727.
	NEMA 5-20R DUPLEX RECEPTACLE ON EMERGENCY CIRCUIT. USE RED COLOR RECEPTACLE AND PLATE.
	"GFI" INDICATES OUTLET PROTECTED BY GROUND FAULT CIRCUIT INTERRUPTER (GFCI). USUALLY THE GFCI IS INCLUDED WITH THE BRANCH CIRCUIT BREAKER. PROVIDE GFCI TYPE RECEPTACLE OR SEPARATE GFCI DEVICE, INSTALLED IN A READILY ACCESSIBLE LOCATION, IN ANY CASE WHERE GFCI IS REQUIRED AND THE CIRCUIT BREAKER DOES NOT INCLUDE INTEGRAL GFCI PROTECTION.
	TYPICAL NEMA 5-20R DOUBLE DUPLEX (QUAD) RECEPTACLE FOR ELECTRIC WATER COOLER (ELECTRIC DRINKING FOUNTAIN). LOCATE AS REQUIRED BY WATER COOLER MANUFACTURER'S INSTRUCTIONS. COORDINATE WITH PLUMBING CONTRACTOR. BRANCH CIRCUIT SHALL HAVE GFCI PROTECTION INTEGRAL WITH THE CIRCUIT BREAKER.
	WEATHER-RESISTANT, GFCI-PROTECTED, NEMA 5-20R DUPLEX RECEPTACLE. PROVIDE WEATHERPROOF, WHILE IN USE GASKETED METAL COVER. PROVIDE GFCI TYPE RECEPTACLE IF THE CIRCUIT BREAKER DOES NOT INCLUDE INTEGRAL GFCI PROTECTION.
	CONVENIENCE RECEPTACLE, 120V, NEMA 5-20R DUPLEX, MOUNT FLUSH IN CEILING.
	NEMA 5-20R DUPLEX RECEPTACLE FOR WALL MOUNTED TELEVISION OR VIDEO DISPLAY SCREEN. INSTALL DEVICE CONCEALED BEHIND DISPLAY SCREEN, IN ACCORDANCE WITH TV MOUNTING BRACKET INSTALLATION INSTRUCTIONS. COORDINATE MOUNTING HEIGHT WITH ARCHITECT.
	"USB" INDICATES NEMA 5-20R DUPLEX CONVENIENCE OUTLET WITH TWO 3.1A, 5-VOLT DC USB PORTS (ONE TYPE A AND ONE TYPE C), COMPATIBLE WITH USB 2.0 AND 3.0 DEVICES.
	"SW" INDICATES SPLIT-WIRED NEMA 5-20R DUPLEX RECEPTACLE, WITH CONTROLLED OUTLET ON TOP, AND UNCONTROLLED OUTLET ON BOTTOM. TOP OUTLET SHALL BE CONTROLLED BY OCCUPANCY SENSOR IN ROOM. PROVIDE OUTLET WITH FACTORY MARKING INDICATING CONTROLLED OUTLET PER NEC 408.36.
	SPECIAL CONFIGURATION OUTLET - TYPE AS SCHEDULED OR NOTED BY NEMA CONFIGURATION. MOUNTING HEIGHT AS SCHEDULED OR NOTED.
	COMBINATION DATA/TELEPHONE (TELECOM) OUTLET - 18" AFF TO CENTER. PROVIDE EMPTY CONDUIT WITH NYLON PULL CORD FROM OUTLET TO STUB-OUT AS NOTED BELOW. PROVIDE INSULATED-THROAT BUSHING ON EACH END OF CONDUIT.
	1. TYPICAL TELECOM OUTLET SHALL BE PROVIDED WITH 5-INCH SQUARE, 2 7/8" DEEP OUTLET BOX WITH TWO-GANG PLASTER RING, READY FOR THE INSTALLATION OF TWO-GANG PLATE. PROVIDE ONE 1 1/4" FROM OUTLET, TERMINATING WITH BUSHING ABOVE AND WITHIN 12" OF CABLE TRAY ABOVE ACCESSIBLE CEILING, OR TO TELECOM CLOSET ON SAME FLOOR. 2. ALL DATA/TELEPHONE OUTLETS SHALL HAVE THEIR CONDUIT ROUTED TO TERMINATION POINTS ON THE SAME FLOOR WHERE THE OUTLET IS LOCATED WITH A MAXIMUM OF TWO 90 DEGREE BENDS PLUS A 22 DEGREE KICKOUT IF REQUIRED WHERE CONDUITS ARE ROUTED THROUGH A NON-RATED WALL THAT EXTENDS TO STRUCTURE ABOVE. 3. FOR ELEVATOR SERVICE AND WALL TELEPHONE OUTLETS, PROVIDE ONE DOUBLE GANG BACK BOX WITH A SINGLE GANG PLASTER RING, AND PROVIDE CONDUIT AS SPECIFIED IN NOTE 1 ABOVE. ELEVATOR SERVICE SHALL HAVE 1" TO THE ELEVATOR CONTROL EQUIPMENT CABINET.
	TYPICAL TELECOM OUTLET - 36" AFF TO TOP OR 2" ABOVE BACKSPASH TO BOTTOM UNLESS NOTED OTHERWISE.
	WALL-MOUNTED TELECOM OUTLET FOR OPTICAL FIBER CONNECTION. COORDINATE OUTLET LOCATION AND MOUNTING HEIGHT WITH UNCC'S ITS DEPARTMENT. PROVIDE FLUSH WALL OUTLET BOX AND CONDUIT AS DESCRIBED IN TELECOM NOTE 1 ABOVE.
	INDICATE APPROXIMATE LOCATION OF CEILING-MOUNTED WIRELESS ACCESS POINT. PROVIDE CONDUIT FROM ACCESSIBLE CEILING SPACE TO CABLE TRAY AS INDICATED ON FLOOR PLANS
	DATA OUTLET FOR WALL MOUNTED TELEVISION OR VIDEO DISPLAY SCREEN. PROVIDE OUTLET AND CONDUIT AS DESCRIBED FOR TYPICAL TELECOM OUTLET. INSTALL OUTLET CONCEALED BEHIND DISPLAY SCREEN, IN ACCORDANCE WITH TV MOUNTING BRACKET INSTALLATION INSTRUCTIONS. COORDINATE MOUNTING HEIGHT WITH ARCHITECT.
	WALL OUTLET BOX AND POWER CONNECTION VIA LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT TO ELECTRIFIED MODULAR OFFICE CUBICLE. PROVIDE ONE 120V, 20A CIRCUIT FOR EVERY TWO CUBICLES. FINAL LOCATION OF ROUGH-IN CONNECTIONS SHALL BE AS DIRECTED BY OFFICE CUBICLE SYSTEM SUPPLIER AND THE ARCHITECT.
	WALL OUTLET BOX AND CONNECTION VIA 1 1/2" LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT TO TELECOMMUNICATION CABLE PATHWAY IN MODULAR OFFICE CUBICLE. PROVIDE 1 1/2" CONDUIT WITH NYLON PULL CORD AND BUSHED ENDS TO ABOVE ACCESSIBLE CEILING. FINAL LOCATION OF ROUGH-IN CONNECTIONS SHALL BE AS DIRECTED BY OFFICE CUBICLE SYSTEM SUPPLIER AND THE ARCHITECT.
	JUNCTION BOX ABOVE CEILING, PROVIDED BY DIV 26, FOR DIV 23 CONTRACTOR TO MAKE 120V POWER CONNECTIONS AS REQUIRED TO HVAC EQUIPMENT, COORDINATE LOCATIONS WITH DIV 23 CONTRACTOR. LEAVE CONDUCTORS COILED IN BOX.

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT OR DISTRIBUTION PANELBOARD, AS SCHEDULED.
	SPD SURGE PROTECTOR (TVSS), TYPE 1 UNLESS OTHERWISE NOTED. SEE SPECS.
	A-Y DRY TYPE TRANSFORMER - THREE PHASE, 480-120/208 VOLTS, NEMA TP-1.
	A-A DRY TYPE TRANSFORMER - THREE PHASE, 480-120/240 VOLTS.
	DRY TYPE TRANSFORMER - SINGLE PHASE, 480-120/240 VOLTS.
	115 OR 230 VOLT, 1 PHASE MOTOR.
	208 OR 230 VOLT, 3 PHASE MOTOR - NUMERAL INDICATES HORSEPOWER.
	480 VOLT, 3 PHASE MOTOR - NUMERAL INDICATES HORSEPOWER.
	NONFUSIBLE DISCONNECT SWITCH, SIZE IN AMPERES AS SHOWN, OTHERWISE HORSEPOWER RATED TO MATCH OR EXCEED MOTOR.
	FUSIBLE DISCONNECT SWITCH, FUSE SIZE IN AMPERES AS SHOWN.
	ENCLOSED CIRCUIT BREAKER.
	MAGNETIC STARTER - FVNR, UNLESS NOTED OTHERWISE.
	VFD TYPE MOTOR CONTROLLER FURNISHED WITH DISCONNECT SWITCH AS PART OF DIVISION 23.
	COMBINATION MAGNETIC STARTER WITH NONFUSIBLE DISCONNECT.
	MANUAL MOTOR STARTER.
	GROUND ROD - 10x 3/4"
	GROUNDING ELECTRODE SYSTEM AS REQUIRED BY ARTICLE 250 OF NEC AND DIVISION 26 SPECS. THE ELECTRODES THAT MAKE UP THE SYSTEM ARE: • MAIN METALLIC WATER PIPE • STEEL STRUCTURE • MADE GROUNDING ELECTRODE • REBAR STEEL
	MPGB MAIN POWER GROUND BAR.
	TMGB TELECOMMUNICATIONS MAIN GROUND BAR.
	TGB TELECOMMUNICATIONS GROUND BAR.
	MORU MOTOR OPERATED ROLL-UP DOOR OR GATE.
	RAI RESCUE ASSISTANCE INTERCOM. SEE SECTION 285501.
	RAMI RESCUE ASSISTANCE MASTER. SEE SECTION 285501.
	GRA GENERATOR REMOTE ANNUNCIATOR.
	IWH INSTANTANEOUS ELECTRIC WATER HEATER - PROVIDE 30A, 2P SWITCH AND CONNECT TO ASSIGNED 30A, 208 VOLT, 1-PHASE CIRCUIT.
	CMV CEILING MOUNTED SURVEILLANCE TV CAMERA. PROVIDE 1" FROM CAMERA LOCATION TO ACCESSIBLE CEILING CAVITY, CABLE TRAY, OR TO SECURITY EQUIPMENT RACK, AS APPLICABLE. NO 120 VOLT POWER REQUIRED.
	CMV CEILING MOUNTED SURVEILLANCE TV CAMERA. PROVIDE FLUSH IN WALL OUTLET BOX 36" AFF AND 1" FROM CAMERA LOCATION TO ACCESSIBLE CEILING CAVITY, CABLE TRAY, OR TO SECURITY EQUIPMENT RACK, AS APPLICABLE. NO 120 VOLT POWER REQUIRED.
	ACS SECURITY EQUIPMENT RACK. PROVIDE DATA OUTLET AND DOUBLE DUPLEX NEMA 5-20R RECEPTACLE 15" AFF ON BACK SIDE OF EQUIPMENT RACK AND DEDICATED 20A, 120V CIRCUIT.
	RRR DOOR RELEASE STATION. PROVIDE RACEWAY AND OUTLET BOXES AT RECEPTION DESK AS DIRECTED BY SECURITY SYSTEM INSTALLER. SEE SECURITY SYSTEM DRAWINGS FOR ADDITIONAL REQUIREMENTS.
	IC INTERCOM STATION.
	DAB DURESS ALARM BUTTON PROVIDED AS PART OF SECURITY SYSTEM. PROVIDE BACK BOX AND CONDUIT TO ABOVE ACCESSIBLE CEILING.
	CR INDICATES PROVISIONS FOR CARD READER.
	SD# SECURITY DOOR DETAIL CALLOUT.
	FACP FIRE ALARM CONTROL PANEL.
	FAA FIRE ALARM ANNUNCIATOR PANEL-FLUSH MOUNTED IN WALL.
	FAT DIGITAL FIRE ALARM TRANSMITTER.
	FATC FIRE ALARM TERMINAL WIRING CABINET.
	FMS FIRE ALARM MANUAL STATION MOUNT 36" AFF TO TOP OF DEVICE.
	CD CEILING MOUNTED SMOKE DETECTOR
	DD DUCT SMOKE DETECTOR ASSEMBLY CONSISTING OF SMOKE DETECTORS, SAMPLING TUBES, AND REMOTE ALARM AND KEY-TEST SWITCH STATIONS, IN QUANTITY AS REQUIRED TO SATISFY NFPA 72 REQUIREMENTS. PROVIDE AUXILIARY RELAY MODULE TO ACCOMPLISH EQUIPMENT SHUT-DOWN REQUIREMENTS.
	SD# BEAM FIRE ALARM BEAM TYPE SMOKE DETECTOR (TRANSMITTER & RECEIVER UNITS). INSTALL AT HIGHEST ACCESSIBLE LOCATION IN CENTRAL CIRCULATION SPACE.
	SFS SPRINKLER ALARM-FLOW SWITCH
	SFT SPRINKLER ALARM-TAMPER SWITCH
	CDR CEILING MOUNTED COMBINATION RATE-OF-RISE/FIXED TEMPERATURE FIRE DETECTOR, EXCEPT AS NOTED OTHERWISE.
	WMA WALL-MOUNTED FIRE ALARM COMBINATION ADA SPEAKER/STROBE APPLIANCE. UNIT SHALL BE RATED 75cd UNLESS HIGHER cd RATING IS REQUIRED BY NFPA 72.
	CEM CEILING-MOUNTED FIRE ALARM COMBINATION ADA SPEAKER/STROBE APPLIANCE. UNIT SHALL BE RATED 75cd UNLESS HIGHER cd RATING IS REQUIRED BY NFPA 72.
	IG ISOLATED GROUNDING
	MCB MAIN CIRCUIT BREAKER
	MLO MAIN LUGS ONLY
	MTS MANUAL TRANSFER SWITCH
	N NEUTRAL
	NC NORMALLY CLOSED
	NEC NATIONAL ELECTRICAL CODE
	NO NORMALLY OPEN
	P POLE
	PH PHASE
	RVMN REDUCED VOLTAGE MAGNETIC STARTER
	RVNSR SOFT-START STARTER
	S.C. RATING BUS BRACE RATING AND SHORT CIRCUIT INTERRUPTING RATINGS OF BREAKERS WITHIN EQUIPMENT. SPACE ONLY (WITH PROVISIONS FOR FUTURE OVERCURRENT PROTECTIVE DEVICE)
	UN UNLESS OTHERWISE NOTED
	VFD OR VSD VARIABLE SPEED DRIVE TYPE MOTOR CONTROLLER
	WP INDICATES DEVICE TO HAVE WEATHERPROOF COVER
	WT INDICATES OUTLET OR DEVICE TO HAVE WATERTIGHT GASKETED COVER.



- NOTES:
- SEE ELECTRICAL SYMBOLS FOR SPECIAL CONDITIONS (I.E. RECEPTACLES ABOVE COUNTERS, ETC.)
 - ALL THERMOSTATS, SWITCHES, STROBES, HORNS AND OTHER DEVICES SHALL BE INSTALLED IN A NEAT AND ORDERLY FASHION, WITH EACH ITEM BEING PLUMB AND SQUARE.
 - FOR STROBES, HORNS, ETC. NOT ADJACENT TO DOORS, ALIGN VERTICALLY AS DIRECTED BY ARCHITECT.
 - DIMENSIONS SHOWN ARE TO FACE PLATES UNLESS NOTED OTHERWISE.
 - THE MAXIMUM MOUNTING HEIGHT FOR FIRE ALARM STROBE AND HORN/STROBE UNITS IS 8'-0" AFF TO THE CENTER OF THE LENS.

DETAIL - TYPICAL ELECTRICAL DEVICE AND SIGNAGE LOCATIONS

ABBREVIATIONS

A	AMPERE
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINAL GRADE
ADA	AMERICANS WITH DISABILITIES ACT
AHU	AIR HANDLING UNIT
ATS	AUTOMATIC TRANSFER SWITCH
AR	AS REQUIRED
BAS	BUILDING AUTOMATION SYSTEM
BFG	BELOW FINAL GRADE
C	CONDUIT
C.B.	CIRCUIT BREAKER
C.L.B.	CURRENT LIMITING CIRCUIT BREAKER
C-FVNR	COMBINATION FUSE AND FUSED SWITCH
C-RVNR	COMBINATION RVNR AND FUSED SWITCH OR CIRCUIT BREAKER, AS INDICATED
CT12	12-INCH WIDE CABLE TRAY ABOVE CEILING. REFER TO SECTION 260636.
EC	EMPTY CONDUIT WITH PULL STRING AND INSULATING BUSHINGS.
F	FUSE
FCU	FAN COIL UNIT
FFM	FUSE PER NAMEPLATE REQUIREMENTS
FVNR	FUSE PER MANUFACTURERS RECOMMENDATION
G	FULL VOLTAGE NON-REVERSIBLE MAGNETIC MOTOR STARTER
GF	GROUND
IG	INDICATES OUTLET OR CIRCUIT TO HAVE GROUND FAULT PROTECTION. GENERALLY PROTECTION IS PROVIDED BY GFCI TYPE BREAKER (REQUIRES SEPARATE NEUTRAL PER 120V CIRCUIT)
IS	ISOLATED GROUNDING
MCB	MAIN CIRCUIT BREAKER
MCM	MAIN (THOUSAND CIRCULAR MILS)
MLO	MAIN LUGS ONLY
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NO	NORMALLY OPEN
P	POLE
PH	PHASE
RVNR	REDUCED VOLTAGE MAGNETIC STARTER
RVNSR	SOFT-START STARTER
S.C. RATING	BUS BRACE RATING AND SHORT CIRCUIT INTERRUPTING RATINGS OF BREAKERS WITHIN EQUIPMENT. SPACE ONLY (WITH PROVISIONS FOR FUTURE OVERCURRENT PROTECTIVE DEVICE)
UN	UNLESS OTHERWISE NOTED
VFD OR VSD	VARIABLE SPEED DRIVE TYPE MOTOR CONTROLLER
WP	INDICATES DEVICE TO HAVE WEATHERPROOF COVER
WT	INDICATES OUTLET OR DEVICE TO HAVE WATERTIGHT GASKETED COVER.

GENERAL NOTES

- ELECTRICAL DEVICES AND EQUIPMENT SHALL BE U.L. APPROVED FOR USE WITH CONDUCTORS THAT HAVE INSULATION RATED FOR 75°C OR HIGHER. DERATING OF CONDUCTORS IS NOT ALLOWED.
- ELECTRICAL CONDUCTORS SHALL BE COPPER, TWENTYTHREE, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
- MINIMUM BRANCH CIRCUIT CONDUCTOR SIZE SHALL BE #12 AWG. REFER TO SPECIFICATIONS FOR MINIMUM ACCEPTABLE CONDUIT SIZE.
- AN INDIVIDUAL GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED WITH EACH 120-VOLT OR HIGHER VOLTAGE CIRCUIT. SIZE CONDUCTOR AS SHOWN, OR, IF SIZE IS NOT GIVEN, PER NEC TABLES 250.122 AND 250.66, AS APPLICABLE. GROUNDING CONDUCTOR SHALL BE BONDED TO EACH METALLIC CONDUIT, EACH OUTLET BOX, AND TO TERMINATION EQUIPMENT.
- PROVIDE CONDUITS AS SPECIFIED FOR ALL POWER CIRCUITS, SIZED PER NEC, NOT TO EXCEED 40% FILL.
- RUN CONDUITS AS HIGH AS POSSIBLE, CONCEALED IN WALLS, ABOVE CEILING, BELOW GRADE OR UNDER SLAB BELOW VAPOR BARRIER, OR HIDDEN IN OVERHEAD STRUCTURE TO MAXIMUM EXTENT FEASIBLE. COORDINATE ROUTING OF CONDUITS WITH OTHER TRADES TO AVOID CONFLICTS.
- ALL WALL OUTLETS SHALL BE LOCATED CAREFULLY TO ASSURE CORRECT MOUNTING HEIGHT AND ALIGNMENT. DEVICE PLATES SHALL BE INSTALLED LEVEL, PLUMB, AND FLUSH AGAINST WALL, WITH EDGES ALIGNED WITH NEIGHBORING DEVICE PLATES. OUTLETS INSTALLED IN A CARELESS OR HAPHAZARD MANNER SHALL BE REMOVED AND REINSTALLED PROPERLY TO THE SATISFACTION OF THE A.E., AND AT THE CONTRACTOR'S EXPENSE. MOUNTING HEIGHTS OF OUTLETS IN MASONRY MAY BE ADJUSTED SLIGHTLY TO CORRESPOND WITH COURSING. COORDINATE WITH ARCHITECTURAL WALL PANELS AND TRIMS.
- ALL WORK SHALL COMPLY WITH 2017 NEC.
- ALL EQUIPMENT, FIXTURES AND MATERIALS USED IN THIS PROJECT SHALL BE LISTED BY AN INDEPENDENT TESTING LABORATORY ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- ALL NON-ENERGIZED CONDUCTIVE SURFACES OF MATERIALS THAT ARE PART OF THE ELECTRICAL SYSTEM SHALL BE BONDED TO INSULATED LEVEL, PLUMB, AND FLUSH AGAINST WALL WITH PHASE CONDUCTORS.
- EACH 120 VOLT AND 277 VOLT BRANCH CIRCUIT SHALL BE PROVIDED WITH A SEPARATE, DEDICATED NEUTRAL CONDUCTOR WHETHER CIRCUIT IS RUN SINGLY OR GROUPED IN CONDUIT WITH OTHER CIRCUITS. NO MORE THAN THREE 120 VOLT OR 277 VOLT CIRCUITS MAY BE RUN TOGETHER IN A SINGLE CONDUIT.
- PRIOR TO STARTING ANY ELECTRICAL WORK ASSOCIATED WITH AUDIO-VISUAL SYSTEMS THE INSTALLERS SHALL COORDINATE FINAL LOCATION OF ALL AUDIO-VISUAL ROUGH-IN.
- PROVIDE CONDUIT PENETRATION OF RATED WALLS AND FLOOR IN ACCORDANCE WITH DETAILS AND SECTION 260539.
- ELECTRICAL CIRCUITING SHOWN ON THESE DRAWINGS IS DIAGRAMMATIC AND IS NOT INTENDED TO DEPICT ACTUAL CONDUIT ROUTES. RUN CONDUITS PER SPECIFICATIONS, AND IN ACCORDANCE WITH N.E.C. REQUIREMENTS. CIRCUIT RUNS OTHER THAN THOSE NECESSARY FOR THE OPERATION OF EGRESS STAIRS AND PASSAGES ARE NOT PERMITTED TO PENETRATE THE RATED STAIR ENCLOSURE OR THE ASSOCIATED EXIT PASSAGEWAY.
- DO NOT RUN ANY UN-RELATED POWER CONDUCTORS THROUGH TELECOM ROOM.
- THE LOCATION OF ABOVE CEILING LIGHTING CONTROLS INCLUDING OCCUPANCY SENSOR POWER TRANSFERS AND EMERGENCY TRANSFER RELAYS SHALL HAVE THEIR LOCATION IDENTIFIED ON THE CEILING WITH PHENOLIC LABELS PER SPECIFICATION SECTION 260553.

LIGHTING FIXTURE SCHEDULE

FIXTURE TYPE	DESCRIPTION	LAMP		BALLAST/DRIVER		TOTAL WATTS		
		QTY	WATTS	QTY	WATTS			
EXC	LED EXIT SIGN, CEILING-MOUNTED, STENCIL-FACE, WITH WHITE THERMOPLASTIC HOUSING, RED LETTERS. B.O.D. = DUAL-LITE EYE SERIES. OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED	AR	1	ELECTRONIC	0.69	69
LA	2'X2' LED LAY-IN GRID VOLUMETRIC TROFFER, WITH RECTANGULAR, FROSTED, PRISMATIC ACRYLIC DIFFUSER, NOMINAL 2750 LUMEN OUTPUT. B.O.D. = COLUMBIA (CAT72-35LWGR-RED1), OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED 3500K 90CRI	AR	1	ELECTRONIC DIMMING DRIVER, 1%, 0-10V	23	23
LB	SAME AS TYPE LA, EXCEPT NOMINAL 4500 LUMEN OUTPUT. B.O.D. = COLUMBIA (CAT72-35VLR-RED1), OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED 3500K 90CRI	AR	1	ELECTRONIC DIMMING DRIVER, 1%, 0-10V	40	40
LC-4'	SUSPENDED LED CONTINUOUS ROW-MOUNT LINEAR DIRECT/INDIRECT LUMINAIRE, NOMINAL 0.5" X 2.5" X 4" LENGTH, WITH MINIMUM 24" LONG ADJUSTABLE AIRCRAFT CABLE SUSPENSION, CURVED HOUSING, WHITE FINISH, OPEN TOP, CURVED WHITE ACRYLIC DIFFUSER ON BOTTOM, NOMINAL 80% UP AND 40% DOWN LIGHT DISTRIBUTION. B.O.D. = LITECONTROL. SAE106-LPA-04-SOF-C1-39K-155-4D-D01-1C-UNV-FA1, OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED 3500K 90CRI	AR	AR	ELECTRONIC DIMMING DRIVER, 1%, 0-10V	13W/FT	208
LC-20'	SAME AS TYPE LC-4', EXCEPT ROW LENGTH IS 20', MADE UP OF 4 SECTIONS. B.O.D. = LITECONTROL. SAE106-LPA-20-SOF-C1-39K-155-4D-D01-1C-UNV-FA1, OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED 3500K 90CRI	AR	AR	ELECTRONIC DIMMING DRIVER, 1%, 0-10V	13W/FT	260
LD	LED RECESSED 4" DIAMETER DOWNLIGHT WITH SEMI-SPECULAR CLEAR ANODIZED ALUMINUM REFLECTOR CONE, SELF-FLANGED, WIDE BEAM ANGLE, NOMINAL 3000 LUMENS OUTPUT. B.O.D. = PRESOLITE LTR-4RD-HL30L-D0M1-LTR-4RD-1ML39K6WDS, OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, COOPER, PHILIPS.	AR	LED 3500K	AR	1	ELECTRONIC DIMMING DRIVER, 1%, 0-10V	35	35
LE	LED STRIP LIGHT WITH ROUNDED WHITE ACRYLIC LENS, 4 FEET LONG, WHITE PAINTED STEEL HOUSING, NOMINAL 3200 LUMEN OUTPUT, WITH V-HANGERS AND CHAIN SUSPENSION UNLESS NOTED OTHERWISE. B.O.D. = WILLIAMS FR-4L30B5-DV-UNV, OTHER ACCEPTABLE MANUFACTURERS INCLUDE ACUTY, PHILIPS, COOPER.</							



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REVISIONS:

No.	Description	Date
1	Addendum 1	02.02.2021

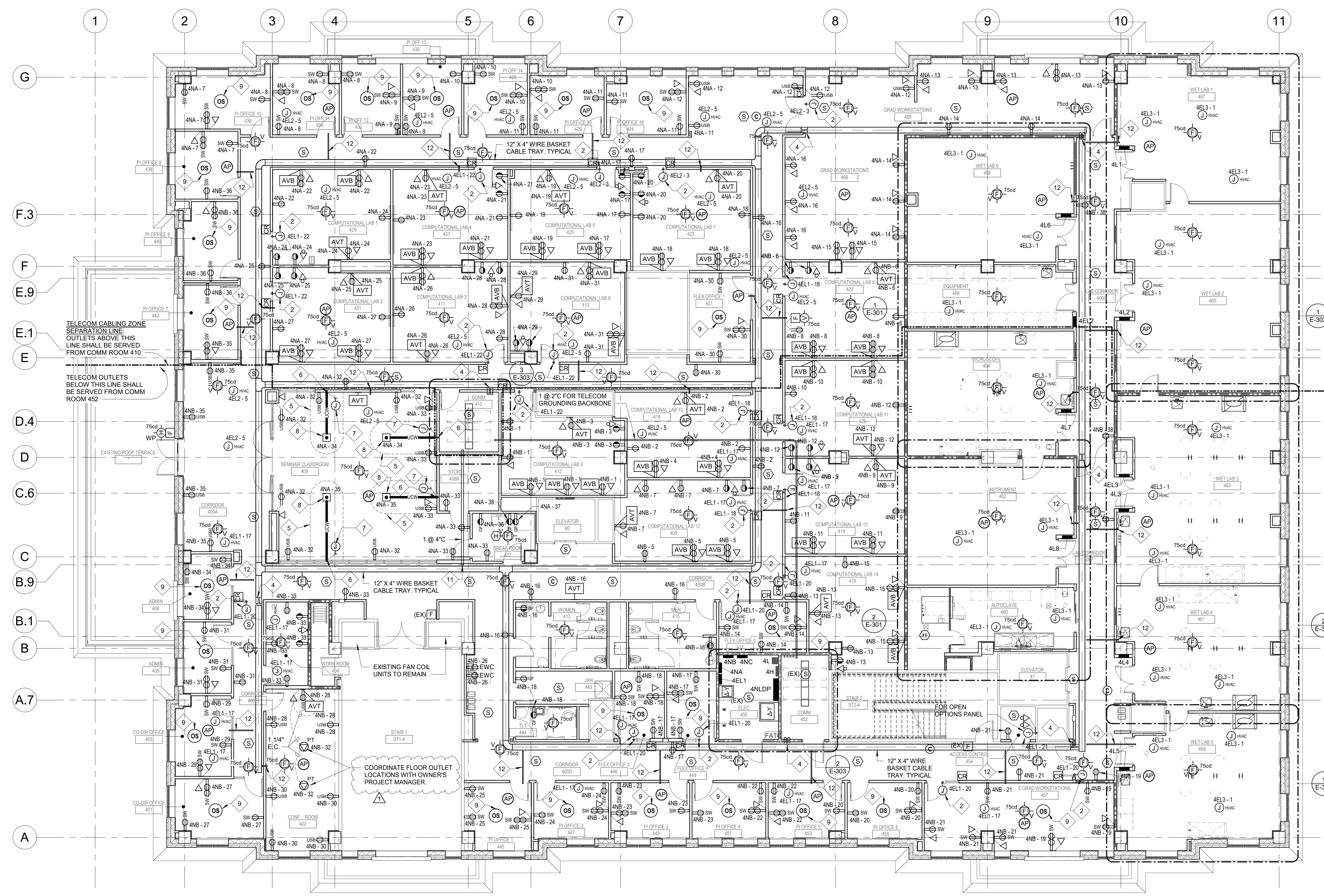
PROJECT: 9202-194610
DATE: 01/04/2021
DRAWN BY: JCT
CHECKED BY: RAM

FOURTH FLOOR PLAN - POWER AND SPECIAL SYSTEMS

E-101

KEYNOTES
APPLIES TO THIS DRAWING ONLY
REPRESENTED BY

NO.	DESCRIPTION
2	4" X 4" JUNCTION BOX WITH BLANK COVER ABOVE CEILING. FOR 120V POWER TO LOW VOLTAGE POWER SUPPLY SERVING CARD READER AND ELECTRIC LOCK OR STRIKE. LEAVE 12" SLACK CONDUITS. ELECTRICAL AND MECHANICALLY SECURED. COILED IN BOX. FOR USE BY ACCESS CONTROLS INSTALLER.
4	FOR PENETRATION THROUGH RATED PARTITION. USE 4-PORT FIRE-RATED ASSEMBLY: STI E2-PATH SERIES 33 OR EQUIVALENT. ABOVE CABLE TRAY. FOR PENETRATION THROUGH NON-RATED PARTITION. USE 4" X 4" CONDUITS THROUGH WALL ABOVE CABLE TRAY. BUSH BOTH ENDS.
5	DASHED OUTLINE INDICATES APPROXIMATE EXTENTS OF RAMPING FOR UNDERCARPET WIREWAY SYSTEM. B.O.D = CONNECTRAC 2.7
6	PROVIDE ROUGH-IN BOX AND WALL BASE TRIM FOR CONNECTION TO UNDERCARPET WIREWAY. INSTALL PER MANUFACTURER'S INSTALLATION GUIDE.
7	SINGLE-GANG JUNCTION BOX WITH BLANK COVER. AFF TO BOTTOM. FOR 120V CONNECTION TO UNDERCARPET WIREWAY SYSTEM.
8	SURFACE-MOUNTED FLOOR OUTLET ASSEMBLY - LISTED COMPONENT OF UNDERCARPET WIREWAY SYSTEM - WITH TWO NEMA 5-20R SINGLE RECEPTACLES. INSTALL PER MANUFACTURER'S INSTALLATION GUIDE.
9	OCCUPANCY SENSOR FOR AUTOMATIC CONTROL OF RECEPTACLE OUTLETS INDICATED TO BE CONTROLLED. POWER TO CONTROLLED OUTLETS SHALL TURN ON IMMEDIATELY WHEN SENSOR DETECTS OCCUPANT AND TURN OFF 20 MINUTES AFTER SENSOR DETECTS VACANCY. PROVIDE SLAVE POWER PACKS AS NEEDED FOR CONTROL OF MORE THAN ONE CIRCUIT IN ROOM.
11	1 @ 4" THROUGH WALL, ABOVE CEILING. BUSH BOTH ENDS. STUB OUT CONDUIT WITHIN 12" AND ABOVE CABLE TRAY.
12	1 @ 1 1/4" THROUGH WALL, ABOVE CEILING. BUSH BOTH ENDS. STUB OUT CONDUIT WITHIN 12" AND ABOVE CABLE TRAY.



1 4TH FLOOR PLAN - POWER & SPECIAL SYSTEMS
E-101 1/8" = 1'-0"

ALTERNATES:

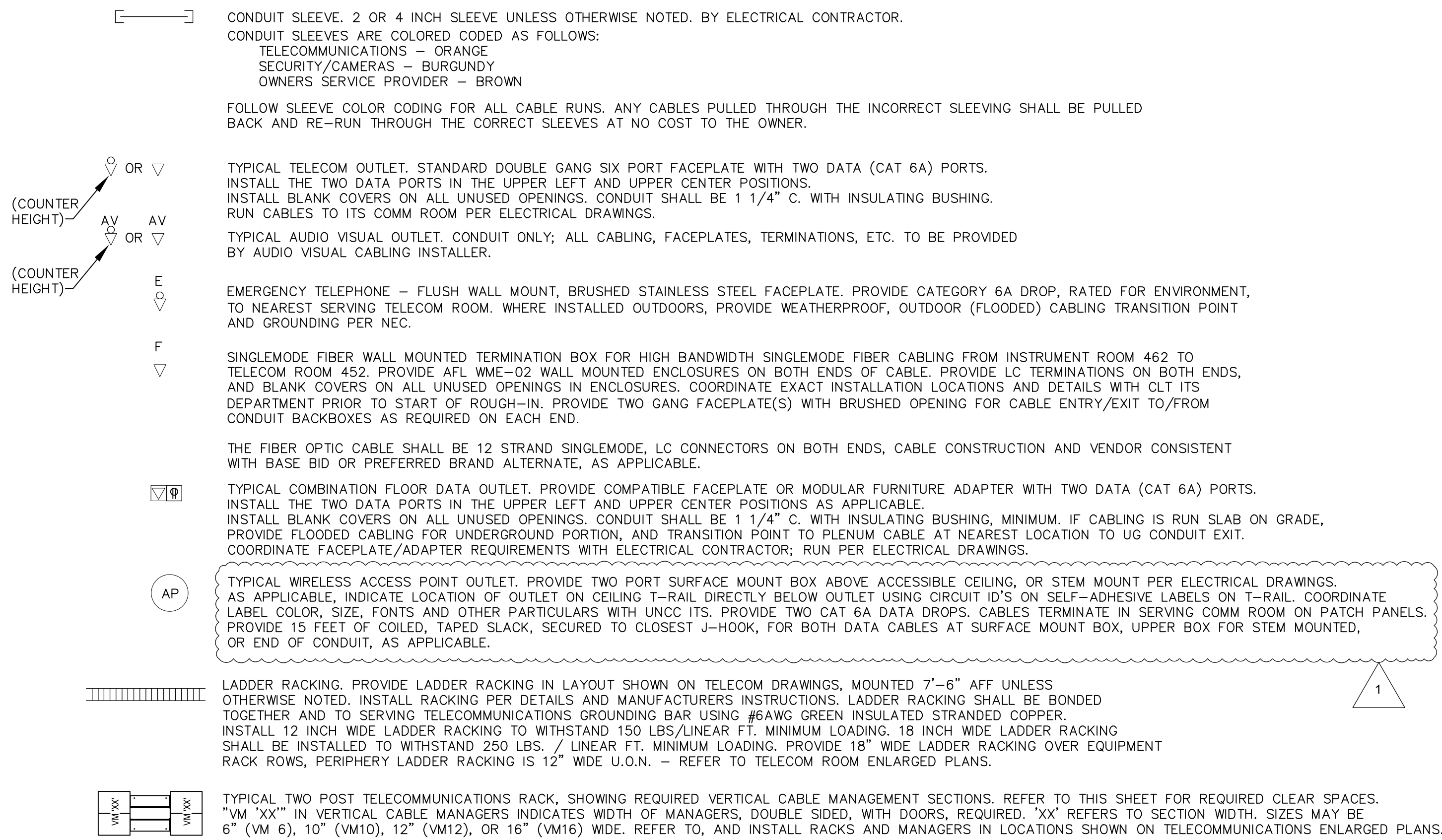
1. SHELL AREAS: BASE BID SHALL INCLUDE ALL WALLS, DOORS, CEILING, MECHANICAL DUCTING, FIRE PROTECTION, LIGHT FIXTURES, AND ELECTRICAL & PLUMBING ROUGH-INS. PROVIDE TEMPORARY PLASTIC BLANK COVERPLATES ON WALL AND CEILING ROUGH-IN OUTLETS IN SHELL AREAS. ALTERNATE IS TO CONSTRUCT SPACES AS INDICATED. ALTERNATE ITEMS INCLUDE LABORATORY CASEWORK, FUME HOODS, FLOOR & WALL FINISHES, WIRING DEVICES AND PLUMBING FIXTURES.

- A. ADD WET LAB 1
- B. ADD WET LAB 2
- C. ADD WET LAB 6
- D. ADD INSTRUMENT ROOM
- E. ADD 4 COMPUTATIONAL LABS (8, 11, 13, & 14) AND 3 FLEX OFFICES (2, 3, & 4)
- F. ADD 3 COMPUTATIONAL LABS (9, 10, & 12)

REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE LIST OF ALTERNATES AND ADDITIONAL INFORMATION.

TELECOM LEGEND

NOTE: LABEL ALL OUTLETS AND CABLING PER OWNER TELECOM DEPARTMENT DIRECTIONS AND PROJECT SPECIFICATIONS. REFER TO ELECTRICAL PLANS FOR OUTLET LOCATIONS, TYPES AND QUANTITIES.



THE INTENT OF THE TELECOM CONSTRUCTION DOCUMENTS IS TO ESTABLISH THE TYPE OF SYSTEM AND FUNCTIONS, BUT NOT TO SET FORTH EACH ITEM ESSENTIAL TO THE FUNCTIONING OF THE SYSTEM. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND SHOW APPROXIMATE LOCATION AND EXTENT OF THE WORK, IN CASE OF ANY DOUBT OF WORK INTENDED, OR CONFLICT WITH ANY ASPECT OF THE PROJECT CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE COMMUNICATIONS CABLING CONTRACTOR TO REQUEST INSTRUCTIONS FROM THE A/E. IF THE CONTRACTOR FAILS TO NOTIFY AND OBTAIN CLARIFICATION FROM THE A/E, WHERE ANY DOUBT OF THE INTENT OR CONFLICT EXISTS, THE CONTRACTOR SHALL REMEDIATE THE WORK AS DIRECTED BY THE A/E WITHOUT COST TO THE OWNER.

THE COMMUNICATIONS CABLING CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE FUNCTIONING SYSTEM, INCLUDING FURNISHING AND INSTALLING ALL REQUIRED BRACKETS, SUPPORTS, FRAMES, BONDING, GROUNDING FRAMES, AND HARDWARE REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL COMMUNICATIONS INFRASTRUCTURE.

NOTE: THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY PROVIDE THE BETTER QUALITY, QUANTITY, OR MORE EXPENSIVE OPTION, UNLESS SPECIFICALLY DIRECTED OTHERWISE BY THE A/E.

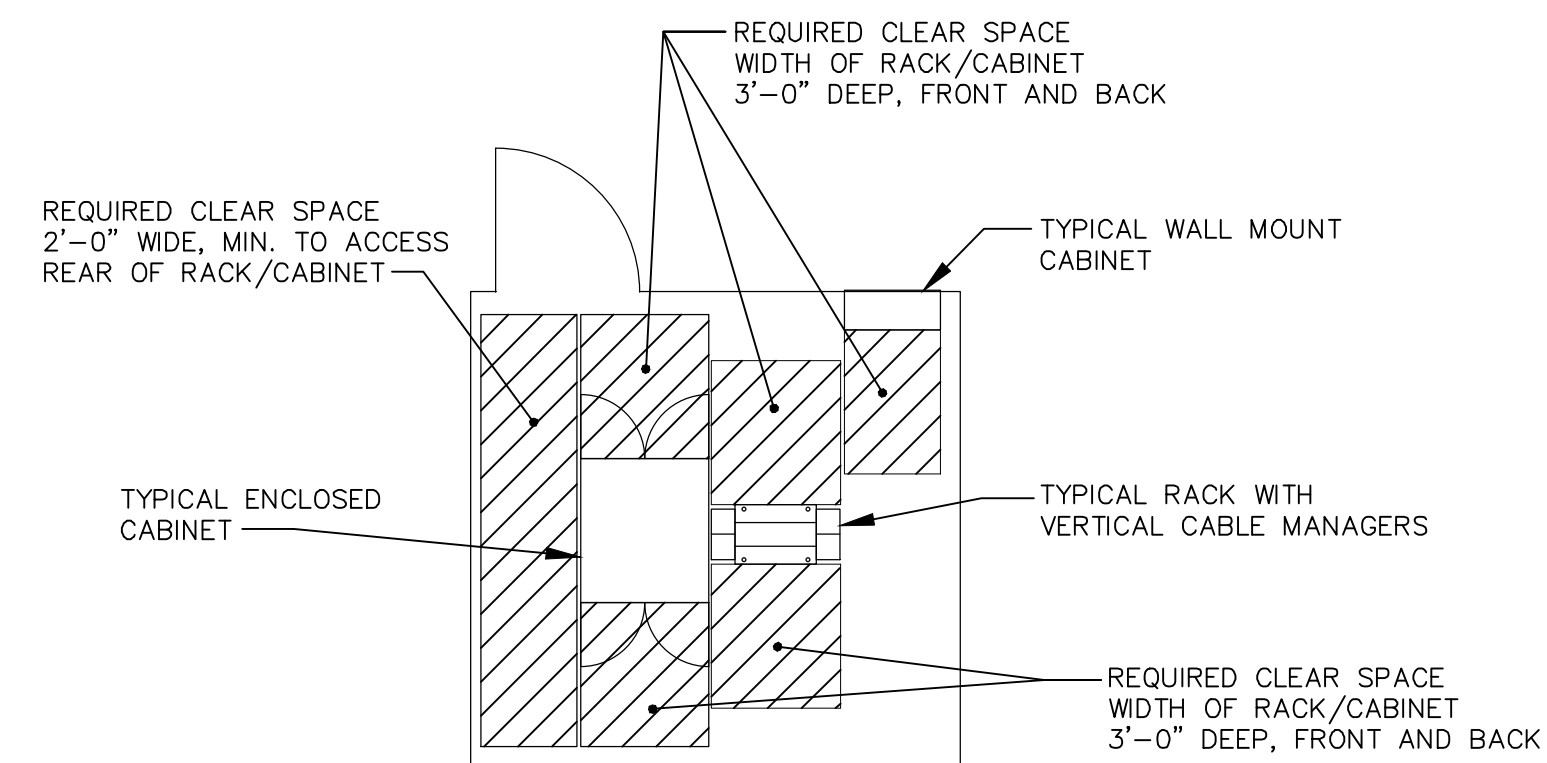
NOTE: The mechanical system in this project employs above ceiling space as the return air plenum. To satisfy NC Mechanical Code 602.2.1, all materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84E. Insure compliance with the NC Mechanical Code Section 602.

INDEX OF DRAWINGS

- TC-100 - TELECOM SYMBOL SCHEDULE AND DIAGRAMS
- TC-101 - TELECOM RISER DIAGRAMS
- TC-102 - TELECOM DETAILS
- TC-103 - TELECOM ROOMS ENLARGED PLANS

TELECOMMUNICATIONS GENERAL NOTES

- COORDINATE WITH ARCHITECTURAL AND ELECTRICAL PLANS FOR TELECOM DEVICE OUTLET LOCATIONS. IN THE EVENT OF ANY CONFLICTS, BETWEEN TELECOM AND ELECTRICAL SHEETS, THE MORE COSTLY OR CAPABLE OPTION SHALL BE ASSUMED.
- COORDINATE OUTLET REQUIREMENTS WITH OTHER TRADES. PROVIDE ANY MISCELLANEOUS HARDWARE REQUIRED TO INSTALL A COMPLETE, WORKING CABLE PLANT.
- REFER TO ARCHITECTURAL AND ELECTRICAL PLANS FOR TELECOM OUTLET LOCATIONS AND CONFIGURATIONS.
- PROVIDE 3/4" VOID-FREE FIRE-RATED PLYWOOD BACKBOARD ON ALL WALLS OF ALL TELECOM ROOMS, LAG BOLTED TO WALLS, FROM 0'-6" AFF TO 8'-6" AFF UNLESS OTHERWISE SPECIFICALLY NOTED.
- AT ALL CONDUIT STUB-UP LOCATIONS SHOWN ON PLANS, PROVIDE LADDER RACKING MOUNTED VERTICALLY TO BACKBOARD FROM STUB-UPS BELOW, TO STUB-UPS OR LADDER RACKING ABOVE (WHICHEVER IS HIGHER) TO PROVIDE SUPPORT STRUCTURE FOR VERTICAL CABLING. THIS LADDER RACKING SHALL BE 12" WIDE, MINIMUM.
- COORDINATE ALL TELECOM CONDUIT, BACKBOX AND PLASTER RING SIZES REQUIRED FOR ALL OUTLETS OR OTHER PATHWAYS REQUIRED WITH ELECTRICAL CONTRACTOR PRIOR TO COMPLETION OF ELECTRICAL ROUGH-IN.
- ALL CABLING SHALL BE RATED FOR ITS INSTALLED ENVIRONMENT. ALL CABLING IN OCCUPIED SPACES SHALL BE PLENUM RATED UNLESS INDICATED OTHERWISE.
- PROVIDE INSULATING THROAT BUSHINGS AND PULL STRINGS IN ALL TELECOMMUNICATIONS CONDUIT.
- USE CHART ON SHEET TC-101 TO DETERMINE THE MAXIMUM ALLOWABLE CONDUIT CABLE FILL, WHICH IS MORE RESTRICTIVE THAN THE NEC SUGGESTED FILLS, TO ALLOW FOR FUTURE GROWTH. ALL CABLING PENETRATIONS THROUGH WALLS, AND THROUGH INACCESSIBLE AREAS SHALL BE IN CONDUIT OR SIMILAR PENETRATION ASSEMBLIES. MAINTAIN WALL RATINGS FOR ALL TELECOM CABLING WALL PENETRATIONS.
- COORDINATE CLOSELY WITH THE ELECTRICAL CONTRACTOR TO PROVIDE ALL CONDUIT, BACKBOXES, PLASTER RINGS, SLEEVING, AND CABLE TRAY NOT IN TELECOMMUNICATIONS ROOMS, REQUIRED TO INSTALL A COMPLETE CABLING SYSTEM. PERFORM THIS COORDINATION BEFORE CABLING INSTALLATION ACTIVITIES BEGIN.



1 TYPICAL REQUIRED CLEARANCES - TELECOMMUNICATIONS EQUIPMENT SPACES

SCALE: NONE

- NOTES:
- THIS DETAIL IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO SHOW REQUIRED WORKING CLEARANCES AROUND RACKS, CABINETS, AND/OR EQUIPMENT ENCLOSURES.
 - CONDUIT STUB-UPS, AND/OR ANY OTHER HINDRANCES ARE NOT ALLOWED WITHIN THE CLEAR SPACE AREAS.
 - PROVIDE A 2'-0", MINIMUM, CLEAR "WALK-AROUND" PATH ON AT LEAST ONE SIDE OF RACKS, CABINETS, AND/OR ENCLOSURES REQUIRING REAR ACCESS. WALK PATH SHALL BE "CLEAR" AS PER NOTE 2.

TELECOMMUNICATIONS CABLING CONDUIT/SLEEVING SIZING CHART

EMT CONDUIT TRADE SIZE	TELECOMMUNICATIONS CABLING OUTSIDE DIAMETER 0.31"	NOTES
1 1/4"	5	
1 1/2"	7	
2"	12	USE THIS VALUE FOR 2" J-HOOKS MAX. FILL
2 1/2"	21	
3"	32	
3 1/2"	42	
4"	54	USE THIS VALUE FOR 4" J-HOOKS MAX. FILL

ALL TELECOMMUNICATIONS CONDUITS SHALL BE 1 1/4" MINIMUM, UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS, AND SHALL BE BLUE IN COLOR.

- NOTES:
- THIS INFORMATION IS PRESENTED AS SUPPLEMENTARY TO THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE, AND IS INTENDED AS AN AID TO DETERMINING CONDUIT SIZES FOR TELECOMMUNICATIONS CABLING. THE MAXIMUM FILLS SHOWN HERE ARE BASED ON A 40 PERCENT INITIAL FILL FACTOR IN STRAIGHT CONDUIT RUNS WITH NO BENDS, AND WITH 30% OF TOTAL CONDUIT CAPACITY RESERVED FOR FUTURE GROWTH, AS DIRECTED BY OWNER. DERATE FILLS SHOWN HERE BY 10% MINIMUM, ROUNDING DOWN, FOR EVERY 90° OF BENDS IN AGGREGATE. A 45° OFFSET BEND SHALL DERATE CONDUIT CAPACITY BY 15% FIRE AND SMOKESTOP ASSEMBLIES OR OTHER CIRCUMSTANCES MAY REQUIRE DIFFERENT MAXIMUM FILLS. IN THE EVENT OF ANY DISAGREEMENT BETWEEN THIS CHART AND THE NATIONAL ELECTRICAL CODE, THE MORE RESTRICTIVE (LESS CAPACITY) SHALL APPLY.
 - J-HOOKS: USE 2" J-HOOKS WITHIN ROOMS AND SIMILAR SPACES. USE 4" WHEN IN HALLWAYS, OR WHEN CABLE COUNT EXCEEDS 24 (TWO 2" J-HOOK CAPACITY). USE MULTIPLE J-HOOK ROWS TO SUPPORT CABLES, BUNDLED WITHIN THE CAPACITY LIMITS STATED HERE.

2 TYPICAL TELECOMMUNICATIONS GROUND BAR CONNECTIONS



- NOTES:
- RUN ALL GROUND CONDUCTORS IN THIS SYSTEM IN TELECOM PRIMARY AND SECONDARY PATHWAYS TO EXTENT FEASIBLE.
 - REFER TO ELECTRICAL DRAWINGS, "TELECOMMUNICATIONS GROUNDING DIAGRAM" FOR ADDITIONAL INFORMATION.

SCALE: NONE

TELECOMMUNICATIONS GROUNDING SYSTEM LEGEND AND DIAGRAM

TELECOMMUNICATIONS GROUNDING LEGEND

ALL CONDUCTORS SHALL BE GREEN INSULATED, OR BARE STRANDED ALL-COPPER CONDUCTORS.

- TBC TELECOMMUNICATIONS BONDING CONDUCTOR #6 AWG GREEN INSULATED, BY DIVISION 27 CONTRACTOR. CONNECTION TO ELECTRICAL PANELBOARDS BY ELECTRICAL CONTRACTOR.
- TBCB TELECOMMUNICATIONS MAIN BONDING CONDUCTOR #3/0 AWG BARE STRANDED COPPER, BY ELECTRICAL CONTRACTOR.
- TBCR TELECOMMUNICATIONS BONDING BACKBONE #3/0 AWG BARE STRANDED COPPER, BY ELECTRICAL CONTRACTOR.
- TBCS TELECOMMUNICATIONS MAIN GROUND BAR MOUNTED ON BACKBOARD. SEE DETAIL, BY ELECTRICAL CONTRACTOR.
- TBCF TELECOMMUNICATIONS GROUND BAR MOUNTED ON BACKBOARD. SEE DETAIL, BY ELECTRICAL CONTRACTOR.
- TBCR TELECOMMUNICATIONS GROUND BAR MOUNTED ON BACKBOARD. SEE DETAIL, BY ELECTRICAL CONTRACTOR.
- ERB EQUIPMENT RACK BUSBAR MOUNTED IN EACH RACK AND/OR CABINET. SEE DETAIL, BY DIVISION 27 CONTRACTOR