

UTAH STATE UNIVERSITY
ENGINEERING LAB RESTROOM REMODEL

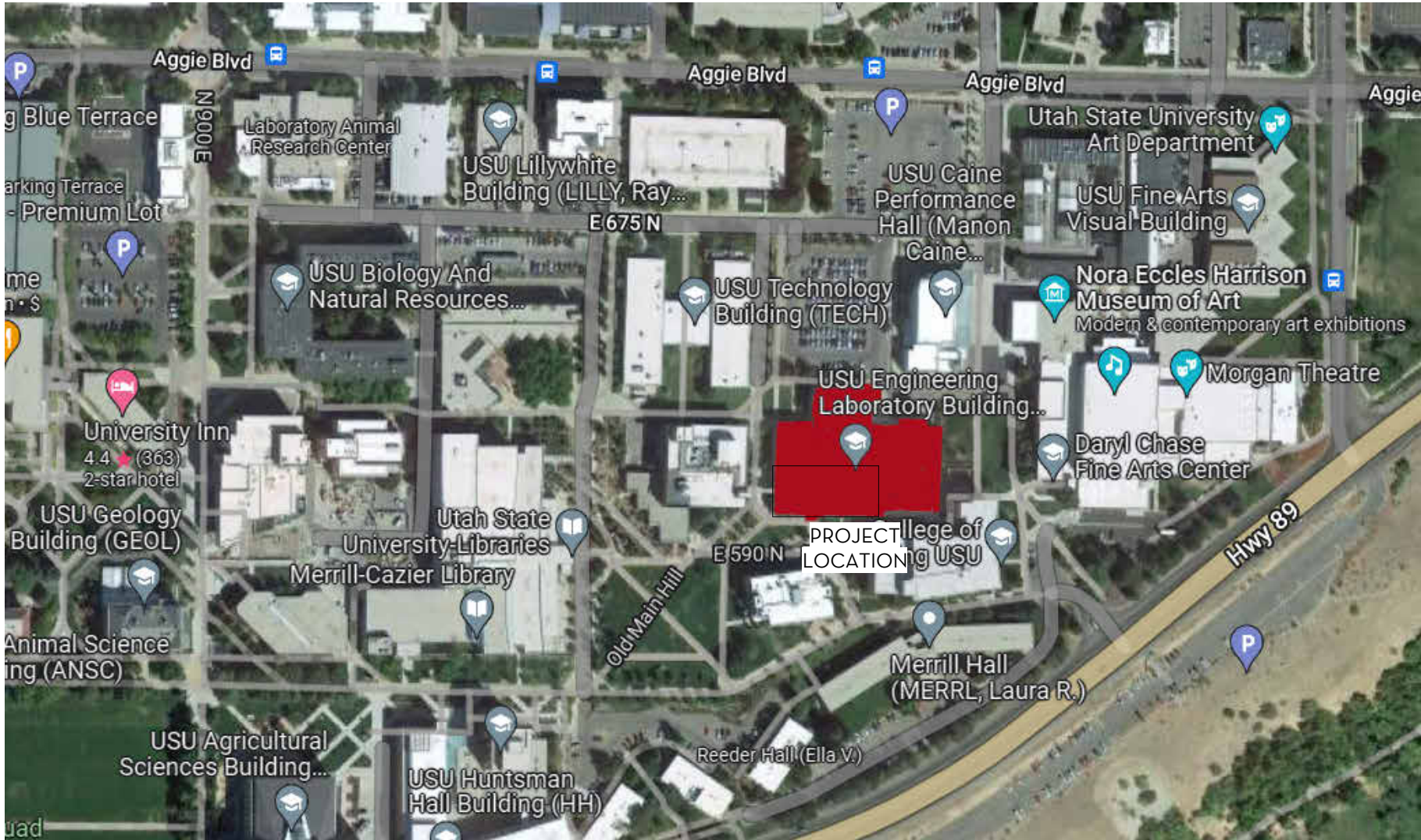


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1 GENERAL	G002	ADA COMPLIANCE SHEET
1 GENERAL	G003	ADA SIGNAGE

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2 ARCHITECTURAL	D100	DEMOLITION PLANS & EXISTING PICTURES
2 ARCHITECTURAL	A100	REMODELED FLOOR PLAN
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5 ELECTRICAL	E002	ELECTRICAL SPECIFICATIONS
5 ELECTRICAL	E101	ELECTRICAL PLANS
5 ELECTRICAL	E501	ELECTRICAL DETAILS & SCHEDULES

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LOGAN CITY CURRENT CODES
INTERNATIONAL BUILDING CODE (IBC) 2021
INTERNATIONAL PLUMBING CODE (IPC) 2021
INTERNATIONAL MECHANICAL CODE (IMC) 2021
NATIONAL ELECTRICAL CODE (NEC) 2020
INTERNATIONAL ENERGY CON. CODE (IECC) 2021
INTERNATIONAL FIRE CODE (IFC) 2021

CLASSIFICATION (SECTION 304)
OCCUPANCY CLASSIFICATION = B (EDUCATIONAL INSTITUTION)
CONSTRUCTION TYPE = II-B

OCCUPANT LOAD CALCULATION (TABLE 1004.1.1)
BUSINESS AREAS = 100 GROSS SQ. FT./PERSON

PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)
WATER CLOSETS - 1 PER 25 FOR THE FIRST 50 AND 1 PER 50 FOR THE
REMAINDER EXCEEDING 50.
LAVATORIES - 1 PER 40 FOR THE FIRST 80 AND 1 PER 80 FOR THE
REMAINDER EXCEEDING 80.

WATER CLOSETS REQUIREMENTS
3 PROVIDED

LAVATORIES REQUIREMENTS
3 PROVIDED

A2 VICINITY MAP
A001 LOGAN, UTAH

A5 SHEET INDEX
A001 NO SCALE

TITLE	COVER SHEET
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS		
NO.	DATE	DESCRIPTION

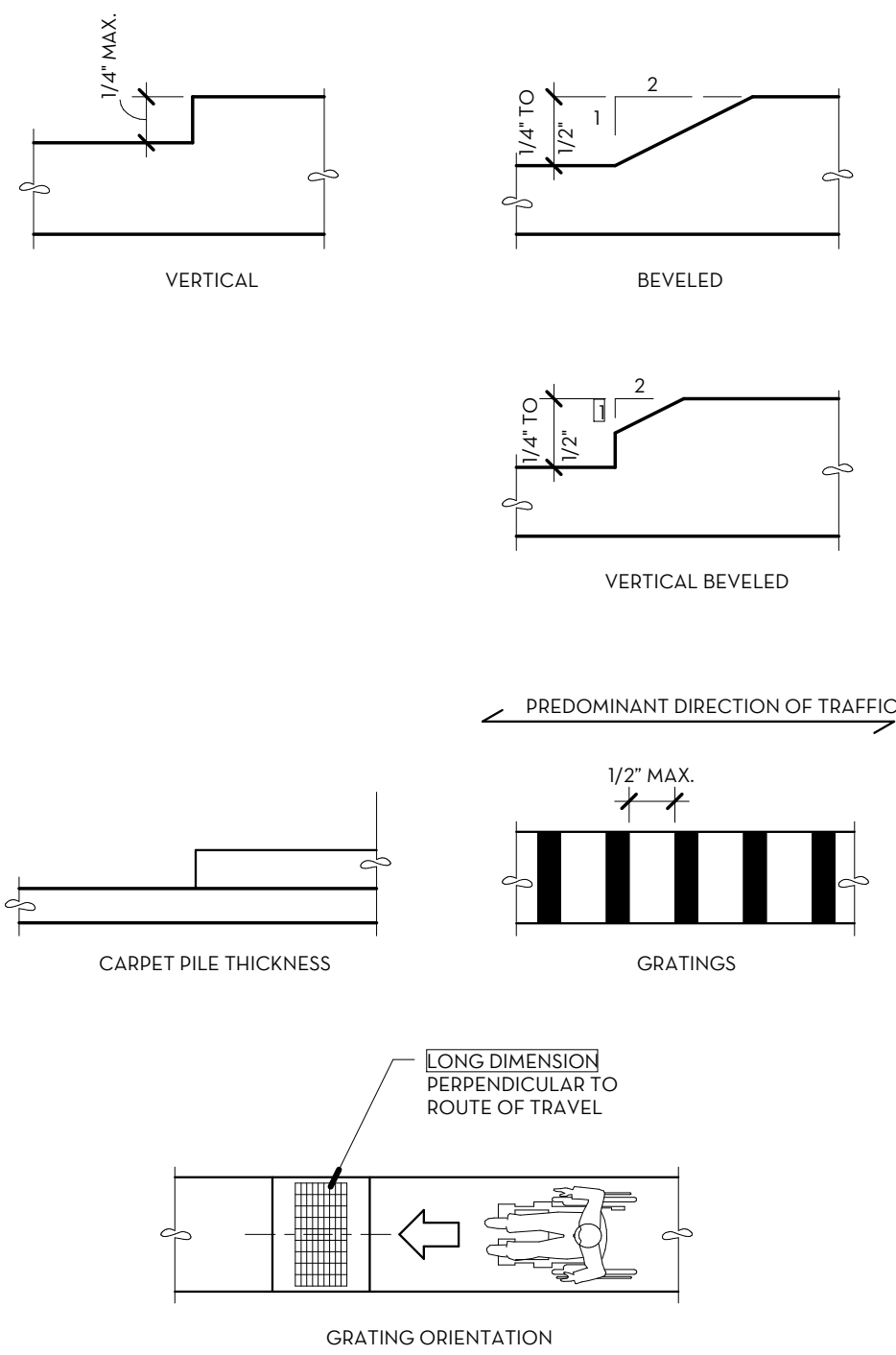
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JOB NO: 24103 - USU ENG BLDG
SCALE:

DRAWN:

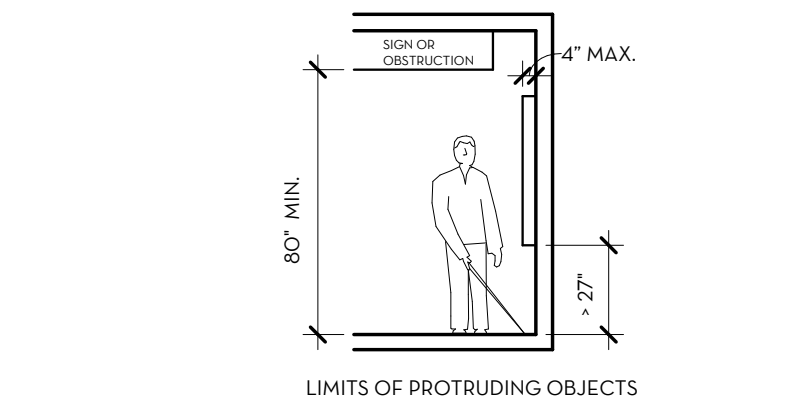
SHEET

G001

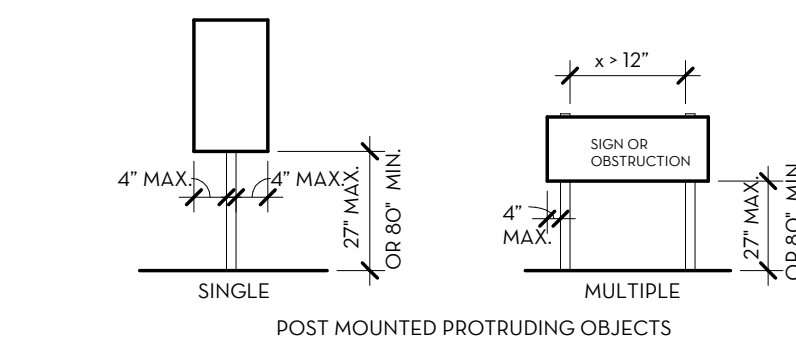
GENERAL NOTE:
THIS SHEET IS FOR REFERENCE.
DETAILS ON THIS SHEET MAY OR MAY
NOT PERTAIN TO THIS PROJECT.



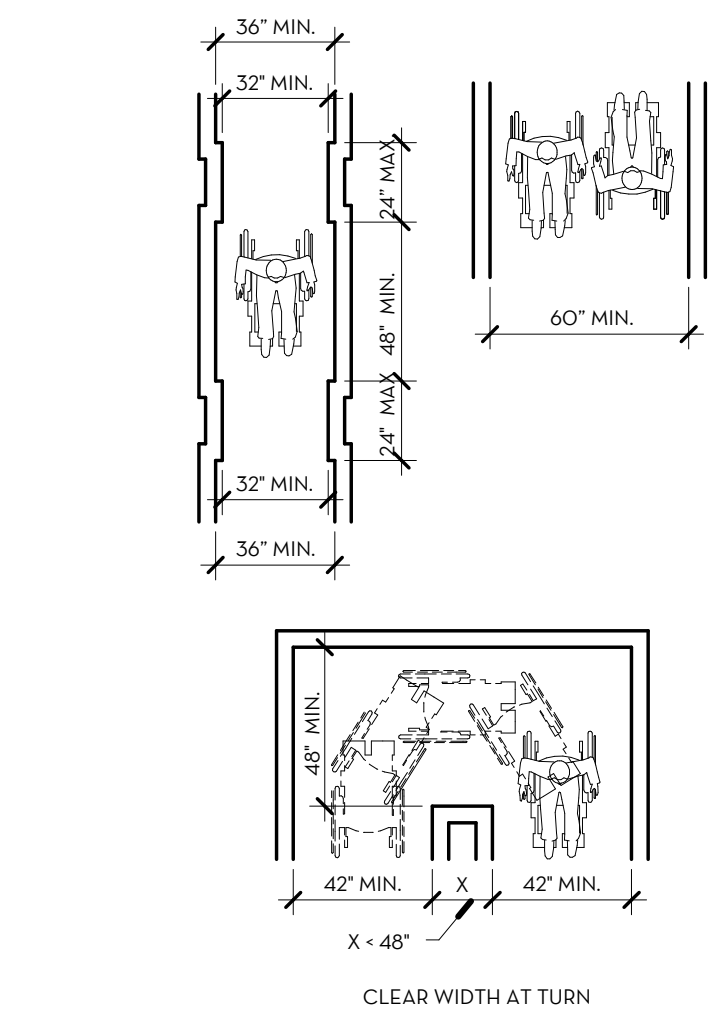
303. CHANGES IN LEVEL



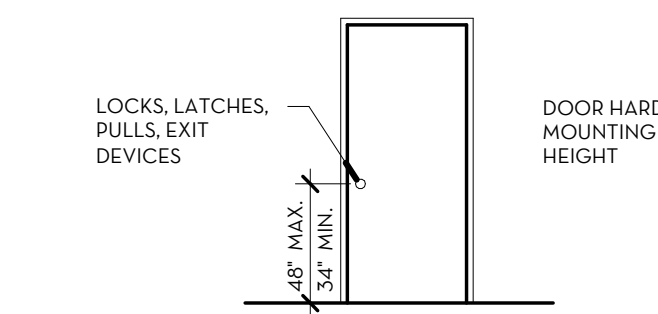
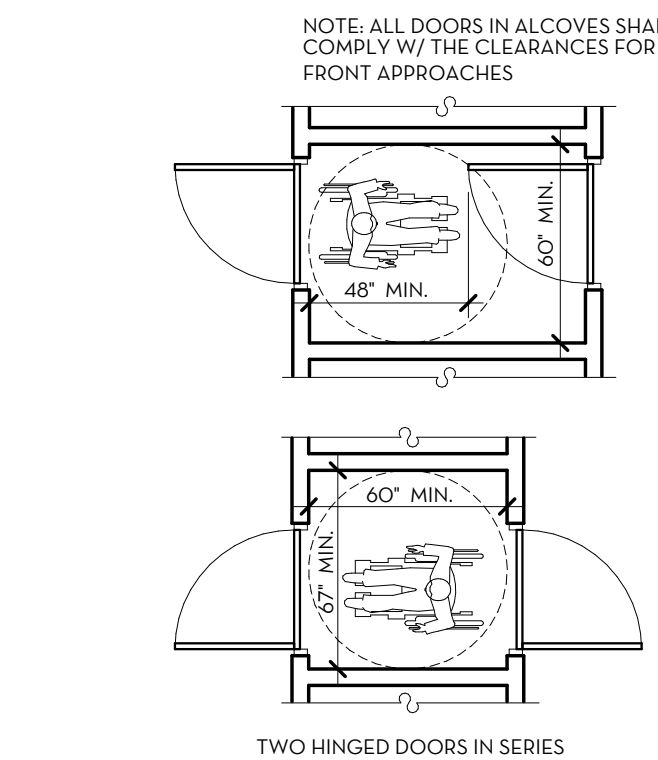
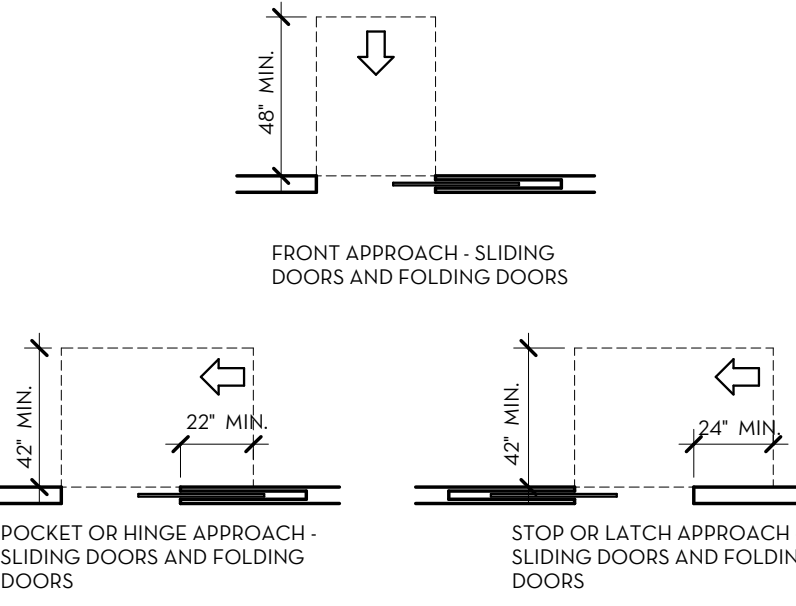
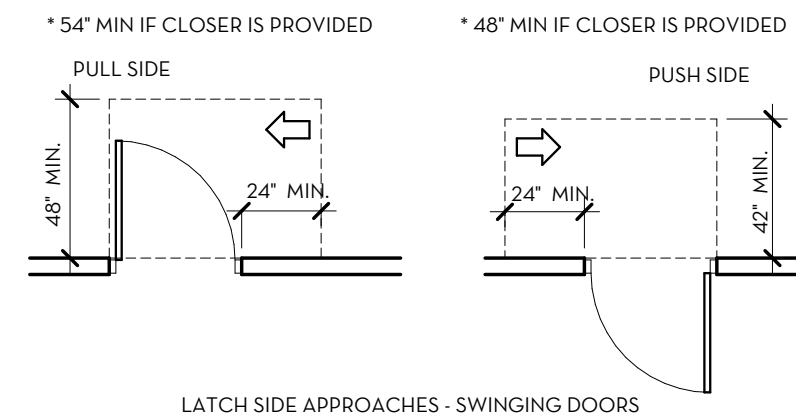
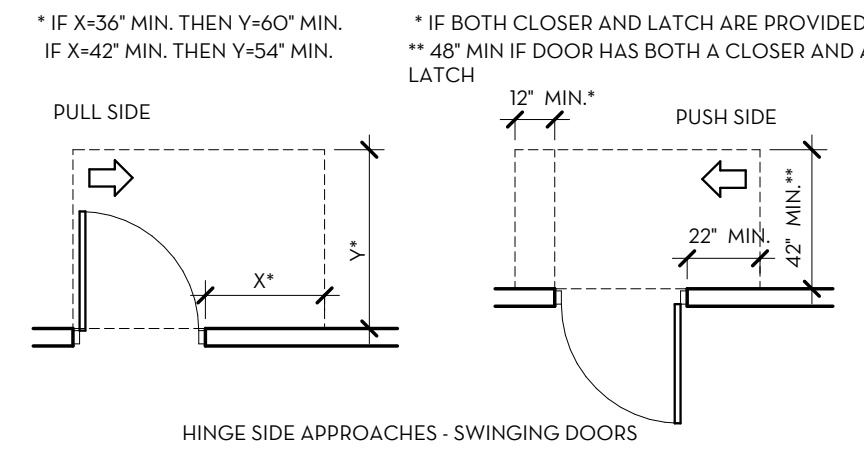
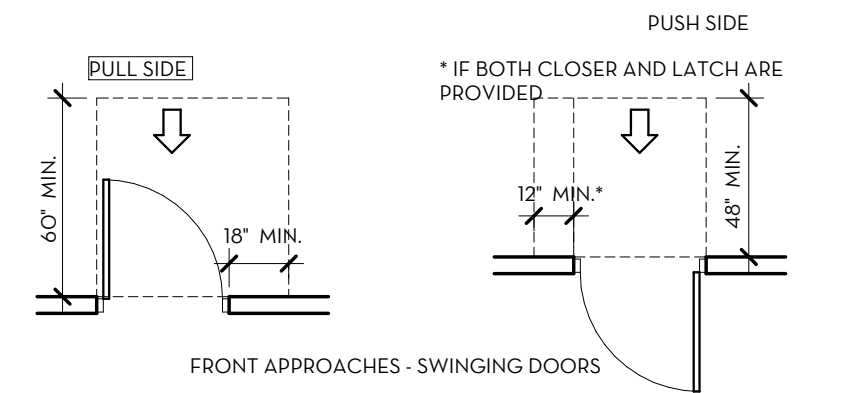
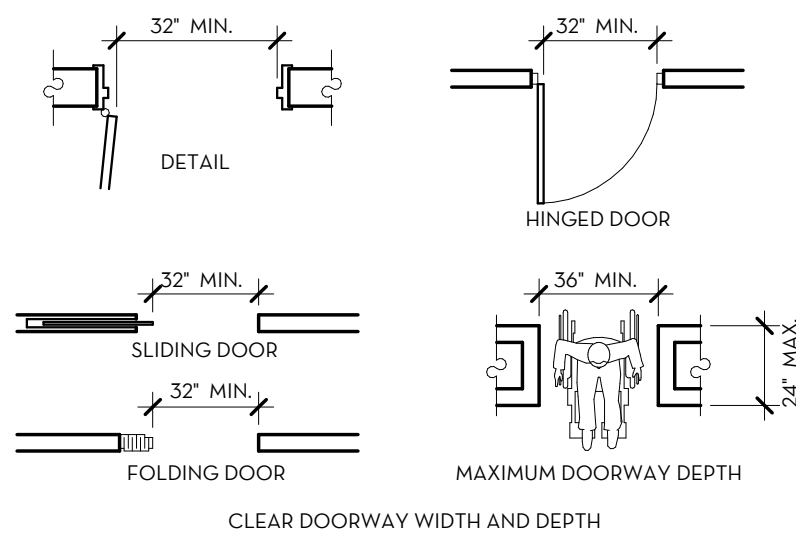
303.3 POST-MOUNTED OBJECTS.
OBJECTS ON POSTS OR PYLONS SHALL BE PERMITTED TO OVERHANG 4
INCHES MAXIMUM WHERE MORE THAN 27 INCHES AND NOT MORE THAN 80
INCHES ABOVE THE FLOOR. OBJECTS ON MULTIPLE POSTS OR PYLONS
WHERE THE CLEAR DISTANCE BETWEEN THE POSTS OR PYLONS IS GREATER
THAN 12 INCHES SHALL HAVE THE LOWEST EDGE OF SUCH OBJECT EITHER
27 INCHES MAXIMUM OR 80 INCHES MIN ABOVE THE FLOOR.



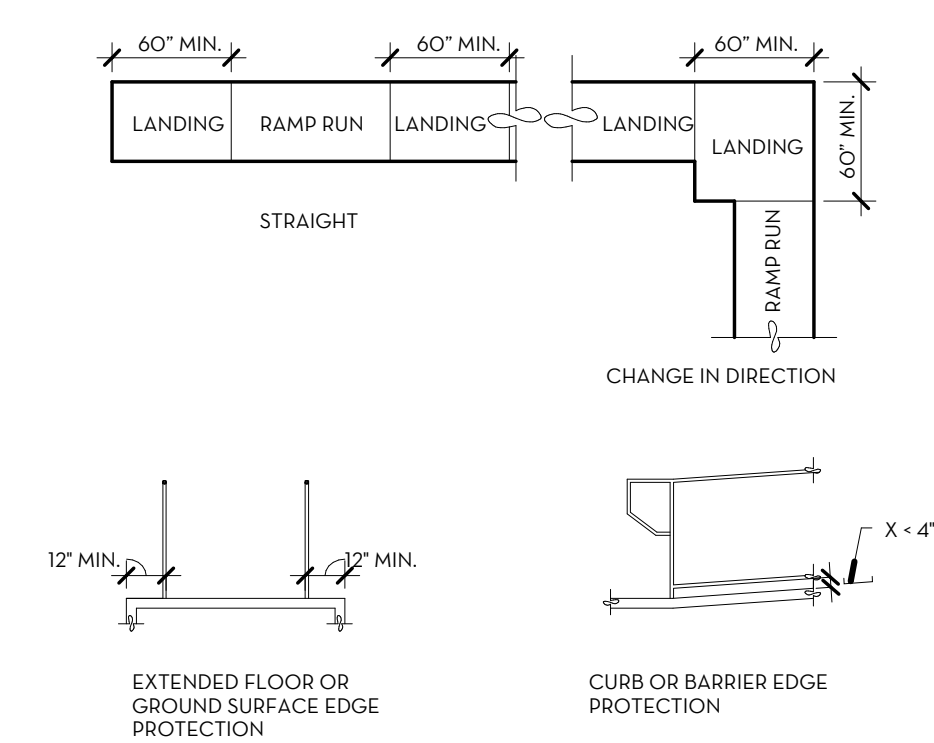
307. PROTRUDING OBJECTS



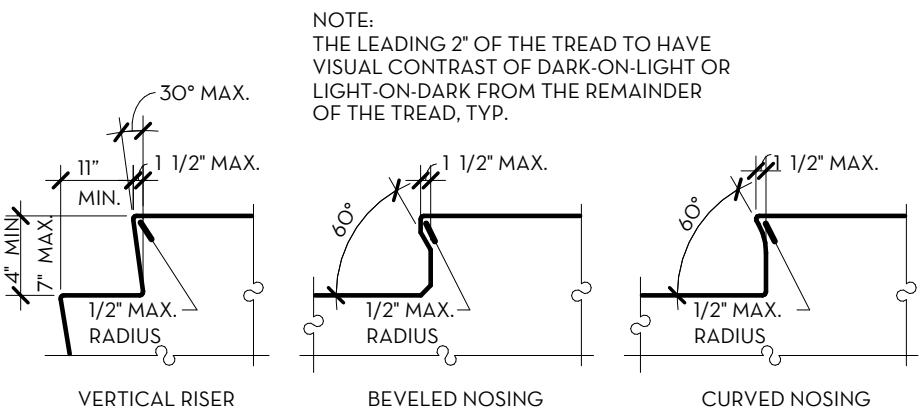
403. ACCESSIBLE ROUTES



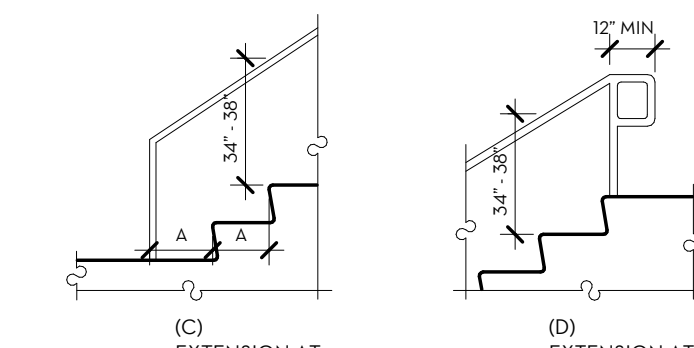
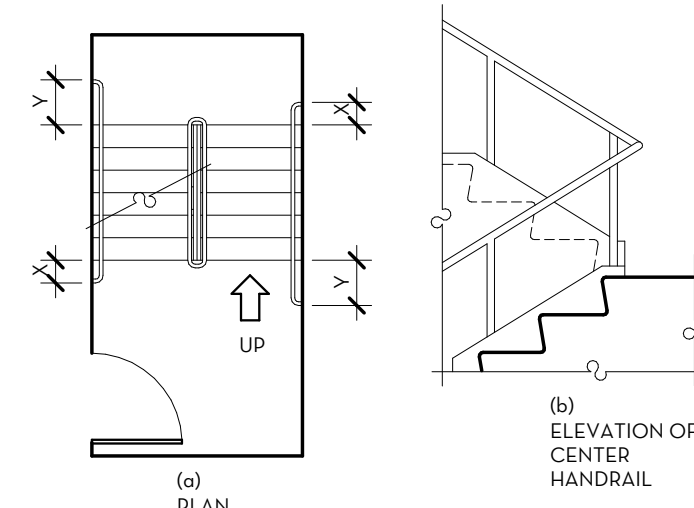
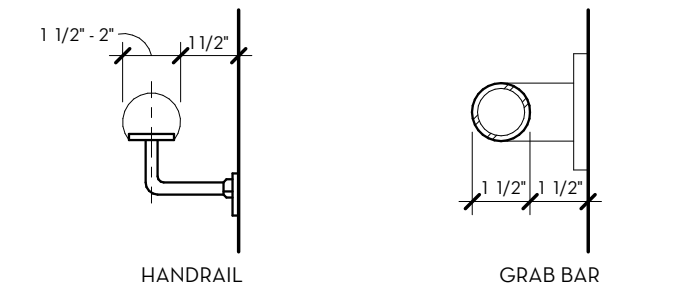
404. DOORS AND DOORWAYS



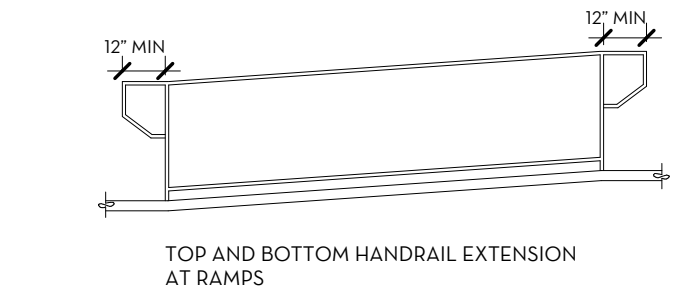
405. RAMP LANDINGS



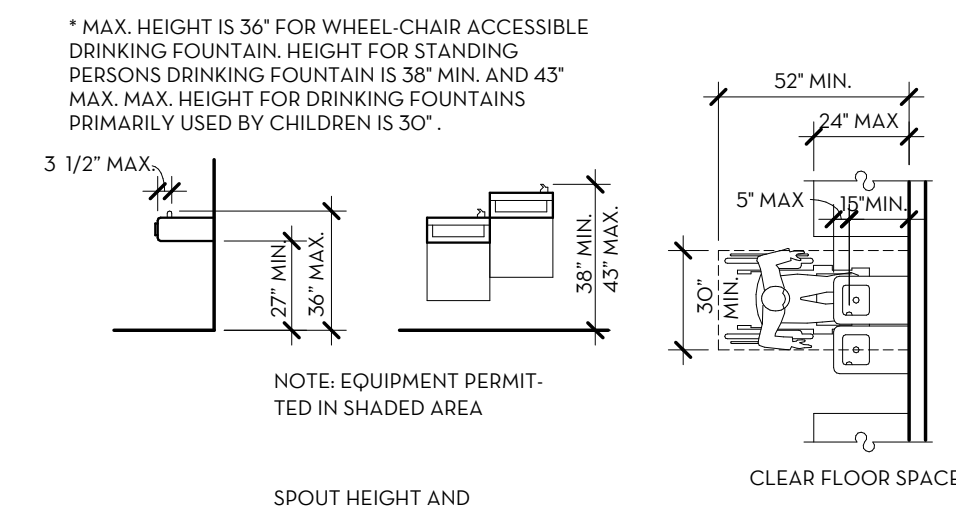
504.5 STAIR NOSINGS



NOTE: X IS THE 12" MINIMUM HANDRAIL EXTENSION
REQUIRED AT EACH TOP RISER IN THE DIRECTION OF
TRAVEL. AT THE BOTTOM OF A STAIR FLIGHT THE HANDRAIL
SHALL EXTEND AT THE SLOPE OF THE STAIR FLIGHT
FOR ONE HORIZONTAL TREAD DEPTH BEYOND THE
TREAD NOSING (A).

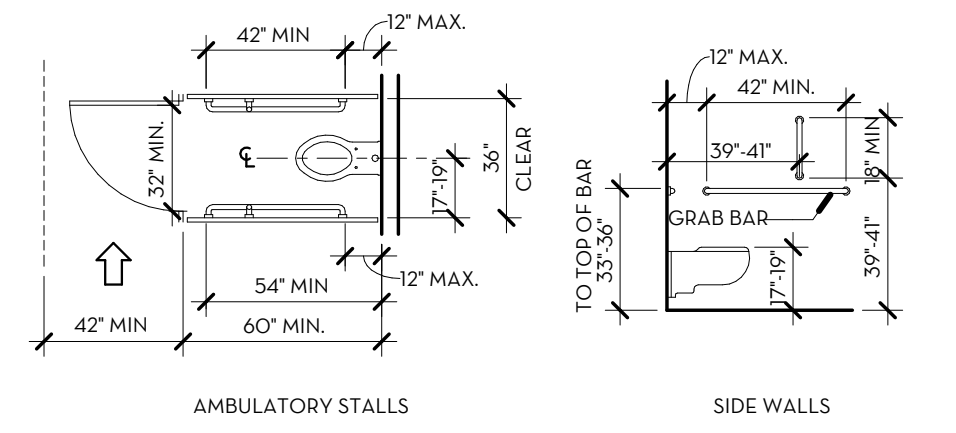
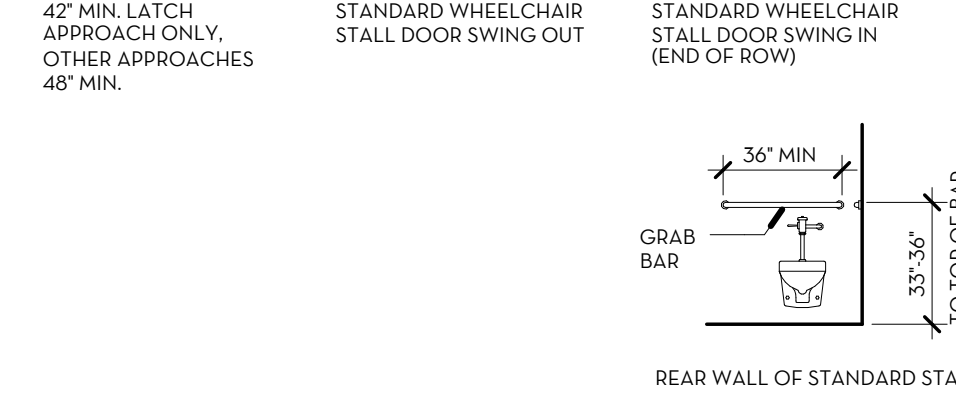
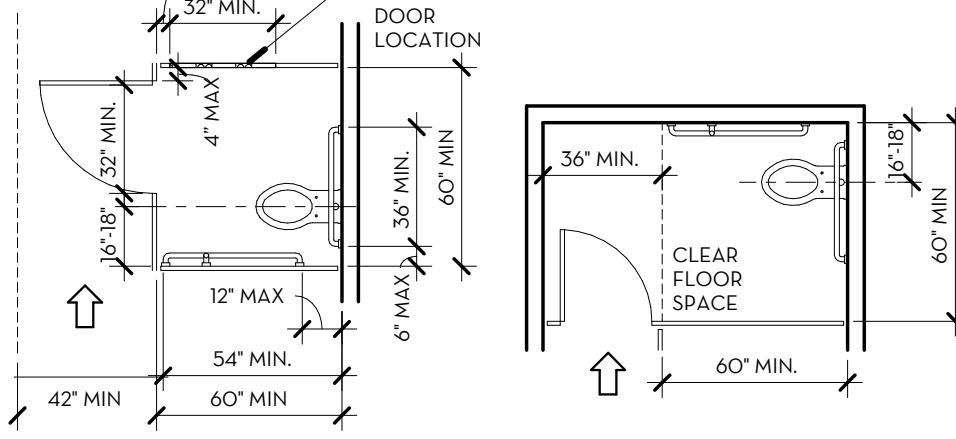
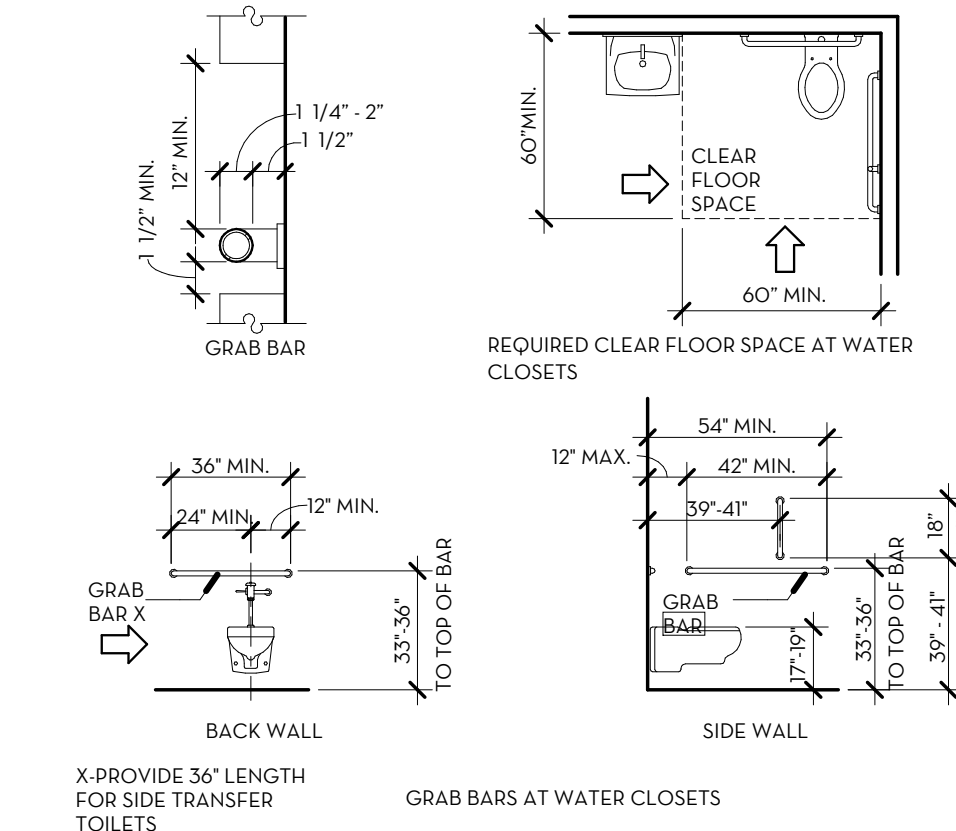


505. HANDRAILS

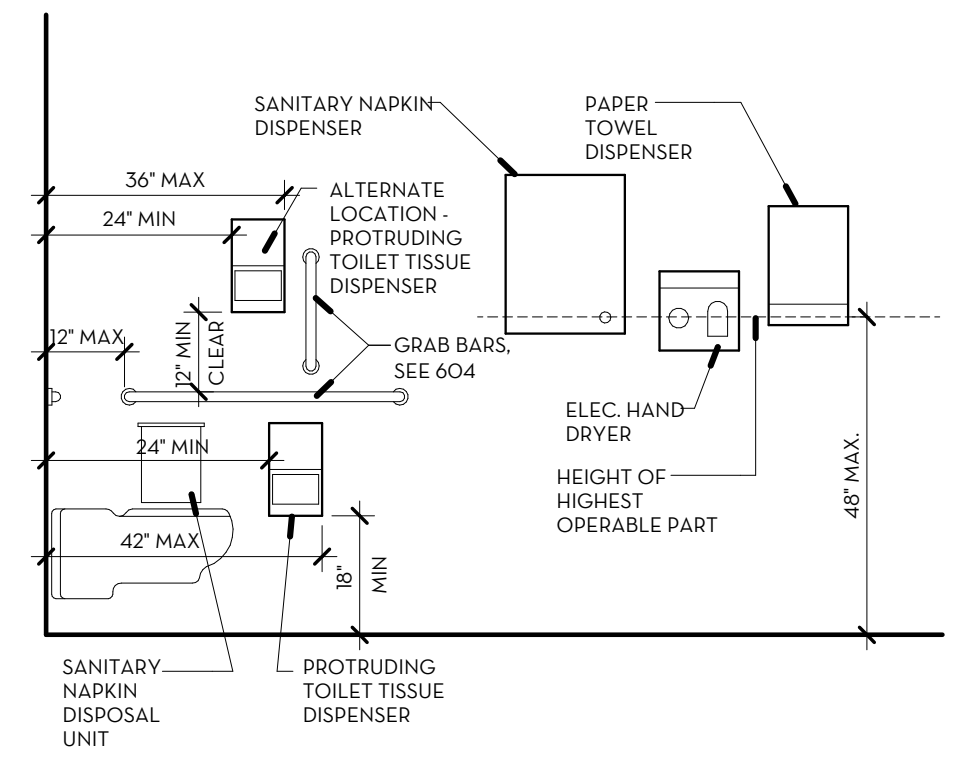


602. DRINKING FOUNTAINS

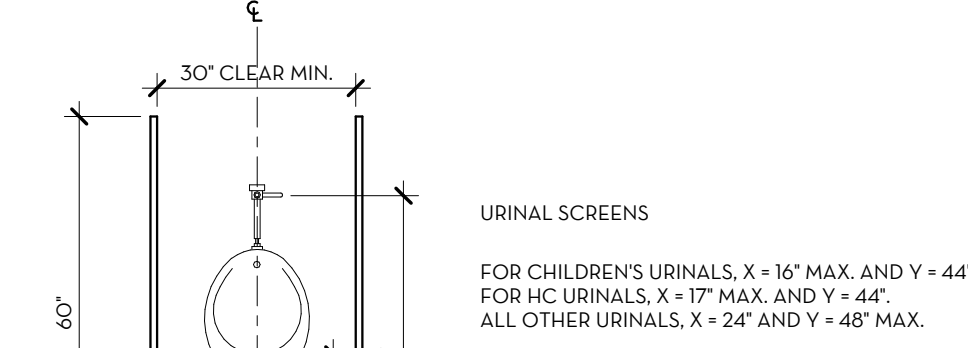
* THE SPACE BETWEEN THE GRAB BARS AND SHOWER CONTROLS, SHOWER
FITTINGS, AND OTHER GRAB BARS ABOVE THE GRAB BAR TO BE 1 1/2" MIN.



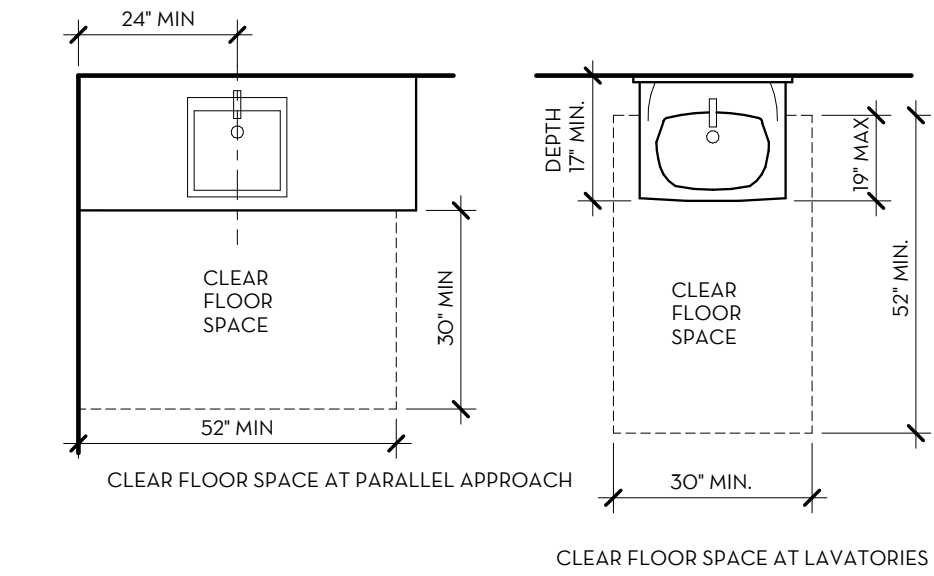
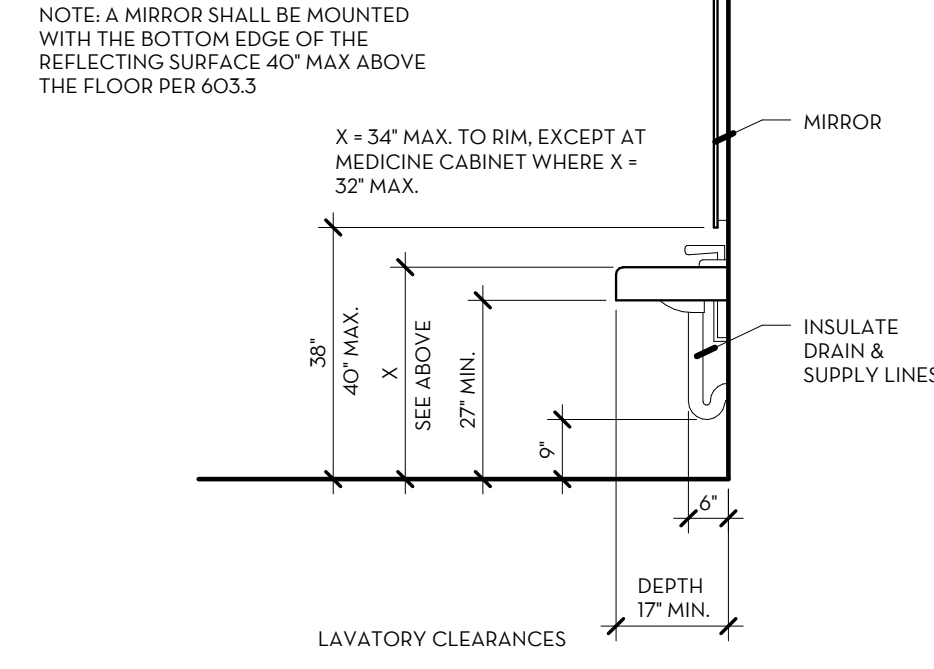
604. TOILETS AND TOILET
COMPARTMENTS



604.7 ACCESSORIES AND EQUIPMENT



605 URINALS



NOTE:
WHERE ENHANCED REACH RANGE IS REQUIRED AT LAVATORIES, FAUCETS AND SOAP
DISPENSER CONTROLS TO HAVE A REACH DEPTH OF 11" MAX. OR IF AUTOMATIC TO BE
ACTIVATED WITH IN A REACH OF 11" MAX. WATER AND SOAP FLOW TO BE PROVIDED W/ A
REACH DEPTH OF 11" MAX.

606. LAVATORIES AND SINKS



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TITLE	ADA COMPLIANCE SHEET
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODL
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REVISIONS		
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DATE: 4/17/2025 10:17:30 AM
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SCALE: 1/2" = 1'-0"
DRAWN: Author

SHEET

Goo2



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TITLE	ADA SIGNAGE
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REVISIONS		
NO.	DATE	DESCRIPTION

DATE: 4/17/2025 10:17:31 AM
JOB NO: 24103 - USU ENG BLDG
SCALE: 1/2" = 1'-0"
DRAWN: Author

SHEET

G003

703.5 VISUAL CHARACTERS. VISUAL CHARACTERS SHALL COMPLY WITH 703.5.

703.5.1 FINISH AND CONTRAST. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.

703.5.2 CASE. CHARACTERS SHALL BE UPPERCASE OR LOWERCASE OR A COMBINATION OF BOTH.

703.5.3 STYLE. CHARACTERS SHALL BE CONVENTIONAL IN FORM. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.

703.5.4 CHARACTER PROPORTIONS. CHARACTERS SHALL BE SELECTED FROM FONTS WHERE THE WIDTH OF THE UPPERCASE LETTER "O" IS 55 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I".

703.5.5 CHARACTER HEIGHT. MINIMUM CHARACTER HEIGHT SHALL COMPLY WITH TABLE 703.5.5. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND AN OBSTRUCTION PREVENTING FURTHER APPROACH TOWARDS THE SIGN. CHARACTER HEIGHT SHALL BE BASED ON THE UPPERCASE LETTER "I".

703.5.6 HEIGHT FROM FINISH FLOOR OR GROUND. VISUAL CHARACTERS SHALL BE 40 INCHES (1015 MM) MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

703.5.7 STROKE THICKNESS. STROKE THICKNESS OF THE UPPERCASE LETTER "I" SHALL BE 10 PERCENT MINIMUM AND 30 PERCENT MAXIMUM OF THE HEIGHT OF THE CHARACTER.

703.5.8 CHARACTER SPACING. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT CHARACTERS, EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 10 PERCENT MINIMUM AND 35 PERCENT MAXIMUM OF CHARACTER HEIGHT.

703.5.9 LINE SPACING. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE 135 PERCENT MINIMUM AND 170 PERCENT MAXIMUM OF THE CHARACTER HEIGHT.

703.6 PICTOGRAMS. PICTOGRAMS SHALL COMPLY WITH 703.6.

703.6.1 PICTOGRAM FIELD. PICTOGRAMS SHALL HAVE A FIELD HEIGHT OF 6 INCHES (150 MM) MINIMUM. CHARACTERS AND BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD.

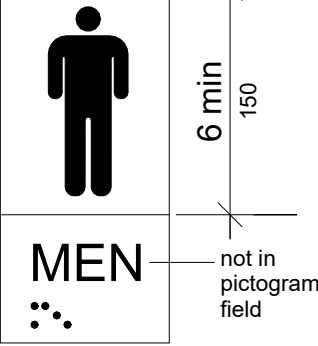


FIGURE 703.6.1 PICTOGRAM FIELD DARK-ON-LIGHT.

703.6.2 FINISH AND CONTRAST. PICTOGRAMS AND THEIR FIELD SHALL HAVE A NON-GLARE FINISH. PICTOGRAMS SHALL CONTRAST WITH THEIR FIELD WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD.

703.6.3 TEXT DESCRIPTORS. PICTOGRAMS SHALL HAVE TEXT DESCRIPTORS LOCATED DIRECTLY BELOW THE PICTOGRAM FIELD. TEXT DESCRIPTORS SHALL COMPLY WITH 703.2, 703.3 AND 703.4.

703.7 SYMBOLS OF ACCESSIBILITY. SYMBOLS OF ACCESSIBILITY SHALL COMPLY WITH 703.7.

703.7.1 FINISH AND CONTRAST. SYMBOLS OF ACCESSIBILITY AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. SYMBOLS OF ACCESSIBILITY SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER A LIGHT SYMBOL ON A DARK BACKGROUND OR A DARK SYMBOL ON A LIGHT BACKGROUND.

703.3.2 POSITION. BRAILLE SHALL BE POSITIONED BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTI-LINED, BRAILLE SHALL BE PLACED BELOW THE ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8 INCH (9.5 MM) MINIMUM FROM ANY OTHER TACTILE CHARACTERS AND 3/8 INCH (9.5 MM) MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS.

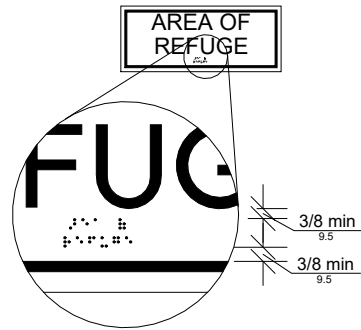


FIGURE 703.3.2 POSITION OF BRAILLE

703.4 INSTALLATION HEIGHT AND LOCATION. SIGNS WITH TACTILE CHARACTERS SHALL COMPLY WITH 703.4.

703.4.1 HEIGHT ABOVE FINISH FLOOR OR GROUND. TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48 INCHES (1220 MM) MINIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60 INCHES (1525 MM) MAXIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER.

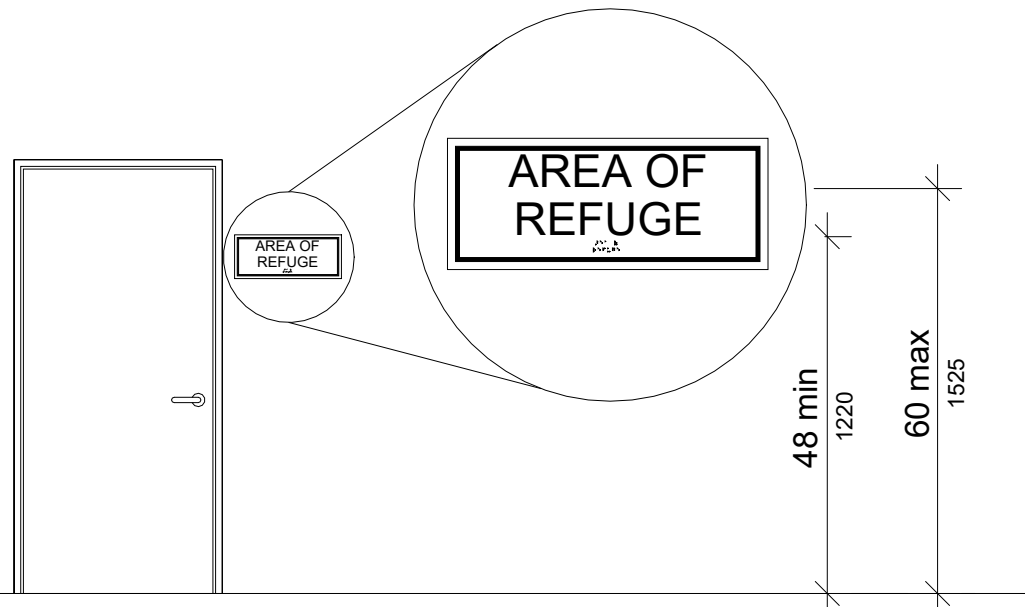


FIGURE 703.4.1 HEIGHT OF TACTILE CHARACTERS ABOVE FINISH FLOOR OR GROUND

703.4.2 LOCATION. WHERE A TACTILE SIGN IS PROVIDED AT A DOOR, THE SIGN SHALL BE LOCATED ALONGSIDE THE DOOR. AT THE LATCH SIDE, WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAFS, THE SIGN SHALL BE LOCATED TO THE RIGHT OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE AT THE LATCH SIDE OF ASINGLE DOOR OR AT THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE LOCATED ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18 INCHES (455 MM) MINIMUM BY 18 INCHES (455 MM) MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION.

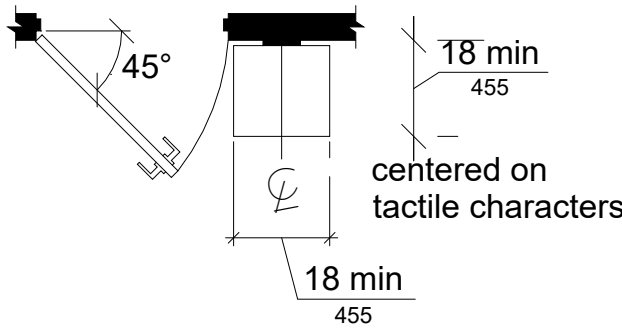


FIGURE 703.4.2 LOCATION OF TACTILE SIGNS AT DOORS

703 SIGN

703.1 GENERAL. SIGNS SHALL COMPLY WITH 703. WHERE BOTH VISUAL AND TACTILE CHARACTERS ARE REQUIRED, EITHER ONE SIGN WITH BOTH VISUAL AND TACTILE CHARACTERS, OR TWO SEPARATE SIGNS, ONE WITH VISUAL, AND ONE WITH TACTILE CHARACTERS, SHALL BE PROVIDED.

703.2 RAISED CHARACTERS. RAISED CHARACTERS SHALL COMPLY WITH 703.2 AND SHALL BE DUPLICATED IN BRAILLE. COMPLYING WITH 703.3, RAISED CHARACTERS SHALL BE INSTALLED IN ACCORDANCE WITH 703.4.

703.2.1 DEPTH. RAISED CHARACTERS SHALL BE 1/32 INCH (0.8 MM) MINIMUM ABOVE THEIR BACKGROUND.

703.2.2 CASE. CHARACTERS SHALL BE UPPERCASE.

703.2.3 STYLE. CHARACTERS SHALL BE SANS SERIF. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.

703.2.4 CHARACTER PROPORTIONS. CHARACTERS SHALL BE SELECTED FROM FONTS WHERE THE WIDTH OF THE UPPERCASE LETTER "O" IS 55 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I".

703.2.5 CHARACTER HEIGHT. CHARACTER HEIGHT MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8 INCH (16 MM) MINIMUM AND 2 INCHES (51 MM) MAXIMUM BASED ON THE HEIGHT OF THE UPPERCASE LETTER "I".

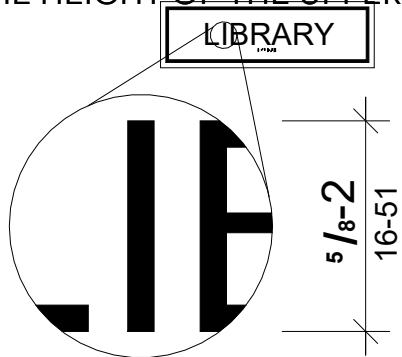


FIGURE 703.2.5 HEIGHT OF RAISED CHARACTERS

703.2.6 STROKE THICKNESS. STROKE THICKNESS OF THE UPPERCASE LETTER "I" SHALL BE 15 PERCENT MAXIMUM OF THE HEIGHT OF THE CHARACTER.

703.2.7 CHARACTER SPACING. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS WITHIN A MESSAGE, EXCLUDING WORD SPACES. WHERE CHARACTERS HAVE RECTANGULAR CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8 INCH (3.2 MM) MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. WHERE CHARACTERS HAVE OTHER CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/16 INCH (1.6 MM) MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE BASE OF THE CROSS SECTIONS, AND 1/8 INCH (3.2 MM) MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE TOP OF THE CROSS SECTIONS. CHARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE ELEMENTS 3/8 INCH (9.5 MM) MINIMUM.

703.2.8 LINE SPACING. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135 PERCENT MINIMUM AND 170 PERCENT MAXIMUM OF THE RAISED CHARACTER HEIGHT.

703.3 BRAILLE. BRAILLE SHALL BE CONTRACTED (GRADE 2) AND SHALL COMPLY WITH 703.3 AND 703.4.

703.3.1 DIMENSIONS AND CAPITALIZATION. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE AND SHALL COMPLY WITH TABLE 703.3.1. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS, AND ACRONYMS.

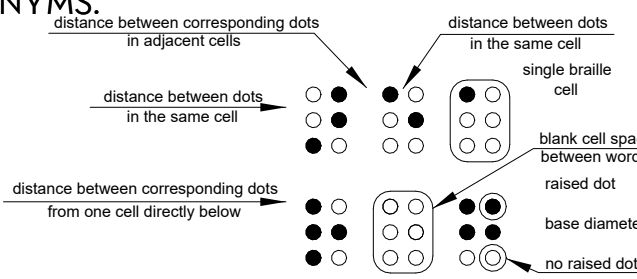


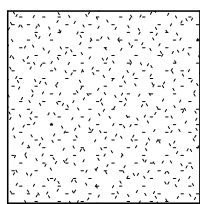
FIGURE 703.3.1 BRAILLE MEASUREMENT

D

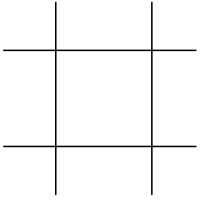
C

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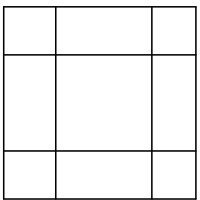
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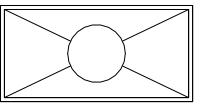
DEMOLITION SUSPENDED PAINTED GYPSUM BOARD



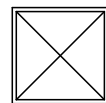
EXISTING 2'X2' ACOUSTICAL CEILING TILE



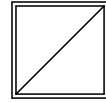
DEMO 2'X2' ACOUSTICAL CEILING TILE



2'X4' LED LIGHT DIRECT/INDIRECT



2'X2' AIR SUPPLY



2'X2' AIR RETURN



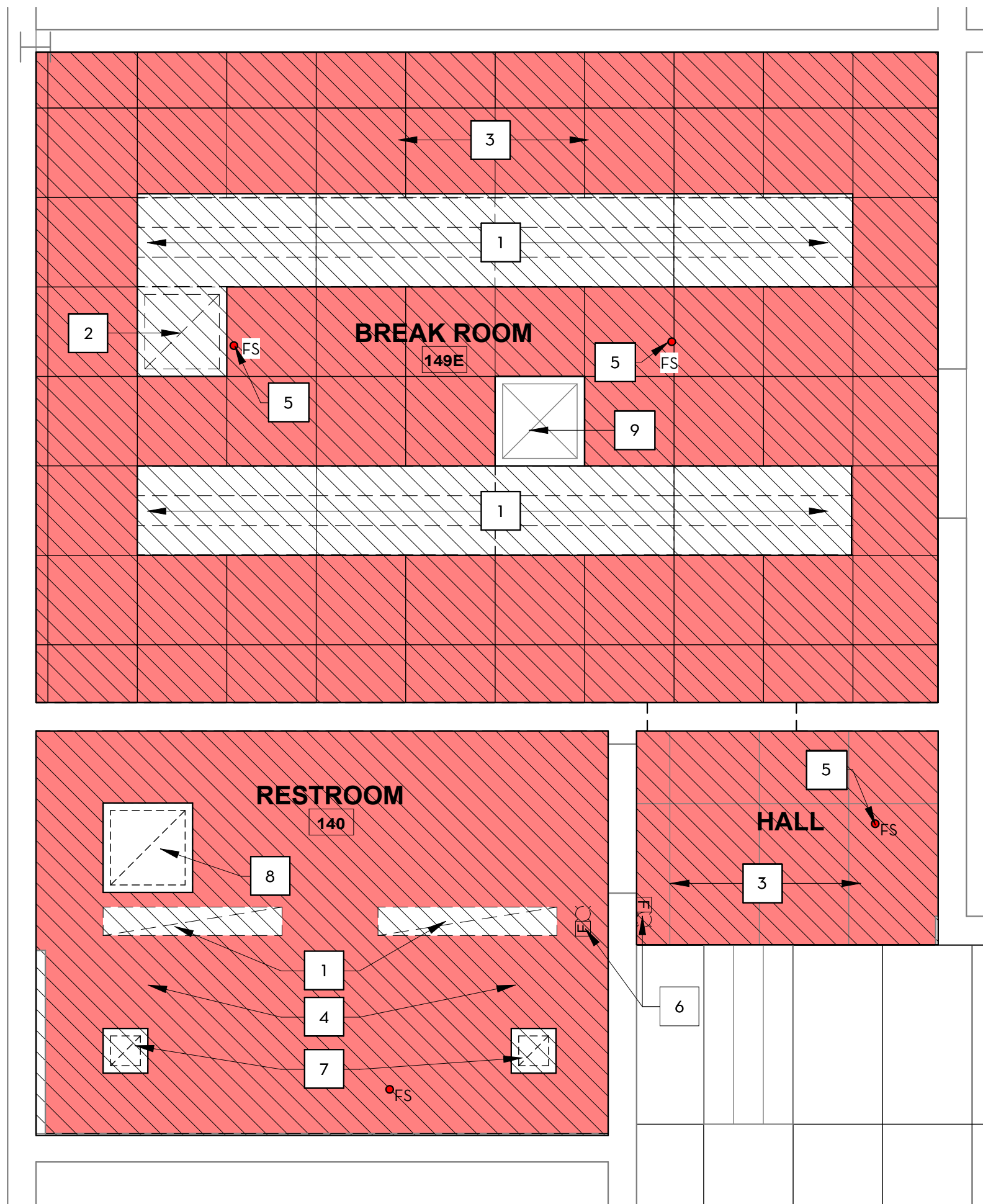
FIRE ALARM & STROBE

KEYED NOTES - REMODELED REFLECTED CEILING PLAN

- REMOVE AND SALVAGE EXISTING LIGHT FIXTURE.
- REMOVE AND RELOCATE EXISTING RETURN GRILL, COORD. NEW LOCATION W/ MECHANICAL ENGINEER.
- REMOVE & REPLACE EXISTING ACOUSTIC TILE GRID AND TILES.
- REMOVE EXISTING GYP.BD. CEILING.
- EXISTING FIRE SPRINKLER HEAD, VERIFY IN FIELD IF LOCATION IS TO BE RELOCATED. COORD. ALL MODIFICATIONS W/ USU FACILITIES. CONTRACTOR TO COORD. WITH FIRE SPRINKLER CONTRACTOR.
- EXISTING FIRE ALARM STROBE TO BE RELOCATED, SEE ELECTRICAL DRAWINGS FOR LOCATION. COORD. W/ USU FACILITIES.
- REMOVE EXISTING EXHAUST GRILLES, COORD. NEW LOCATION W/ MECHANICAL DRAWINGS.
- REMOVE EXISTING MECHANICAL SUPPLY-COORD. NEW LOCATION W/ MECHANICAL DRAWINGS.
- EXISTING MECHANICAL SUPPLY TO REMAIN.

C2
D100
DEMOLITION PLAN REFLECTED CEILING PLAN LEGEND
1/4" = 1'-0"

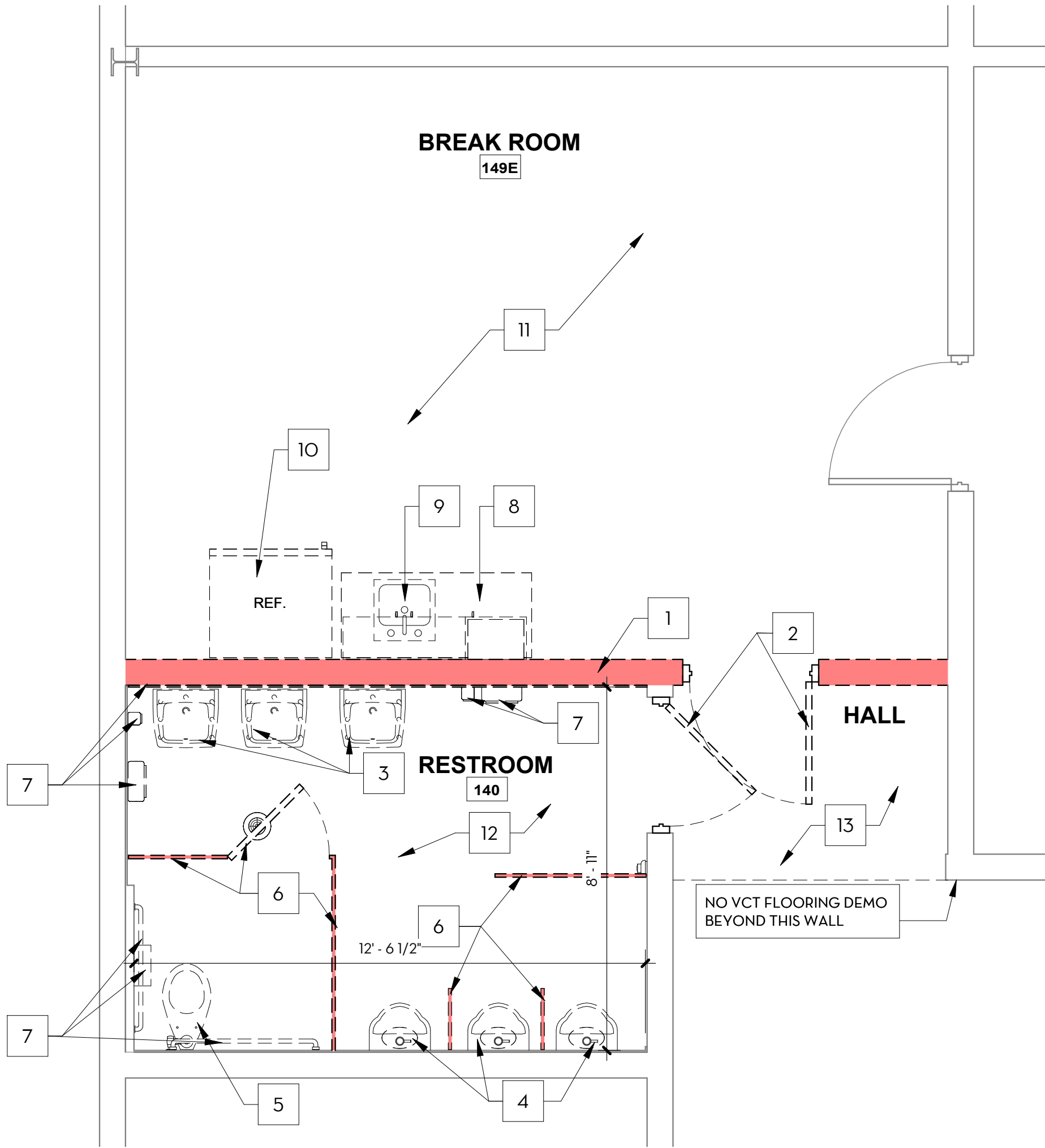
C3
D100
KEYED NOTES- DEMOLITION REFLECTED CEILING PLAN
1 1/2" = 1'-0"



A2
D100
DEMOLITION REFLECTED CEILING PLAN
3/8" = 1'-0"



A4
D100
DEMOLITION PLAN
3/8" = 1'-0"



GENERAL DEMOLITON NOTES:

- CONTRACTOR TO CONSTRUCT AND MAINTAIN APPROPRIATE BARRICADES TO PROTECT BUILDING OCCUPANTS FROM ANY AND ALL HAZARDS OCCURRING DURING DEMOLITION AND CONSTRUCTION.
- CARE SHALL BE TAKEN DURING DEMOLITION TO LIMIT CONSTRUCTION REPAIRS. PATCH AND REPAIR AS REQUIRED ANY DAMAGE INCURRED DUE TO CONSTRUCTION OPERATIONS.
- OWNER SHALL REMOVE ALL FURNITURE AND EQUIPMENT.
- ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION PRIOR TO COMMENCING CONSTRUCTION.
- REFERENCE ALL DISCIPLINES AND REVIEW ALL SHEETS IN THE CONSTRUCTION SET PRIOR TO STARTING DEMOLITION.
- CONTRACTOR SHOULD EXERCISE CAUTION DURING ALL STAGES OF DEMOLITION. IF AT ANY TIME CONCERNS ARISE ABOUT SAFETY OR STRUCTURAL STABILITY, THE CONTRACTOR SHOULD CEASE WORK AND CONTACT THE ARCHITECT/ ENGINEER IMMEDIATELY.

D5
D100
DEMOLITION GENERAL NOTES
1 1/2" = 1'-0"

KEYED NOTES - DEMOLITION FLOOR PLAN

- REMOVE EXISTING WALL.
- REMOVE EXISTING DOOR, FRAME, AND HARDWARE. SALVAGE TO OWNER.
- REMOVE EXISTING WALL MOUNTED SINKS.
- REMOVE EXISTING WALL MOUNTED URINALS.
- REMOVE EXISTING WALL MOUNTED TOILET.
- REMOVE EXISTING BATHROOM PARTITIONS, & PARTITION DOOR.
- REMOVE EXISTING BATHROOM ACCESSORIES (GRAB BARS, SOAP DISPENSERS, PAPER TOWEL DISPENSERS, HAND DRYERS, MIRROR, TOILET PAPER DISPENSER)
- REMOVE EXISTING CABINETRY, SALVAGE FOR REUSE.
- REMOVE EXISTING SINK.
- REMOVE AND RELOCATE EXISTING REFRIGERATOR.
- REMOVE EXISTING CARPET, PREP/REPAIR SUB FLOOR FOR NEW FLOORING, SEE FINISH SCHEDULE.
- REMOVE EXISTING WALL TILE & FLOOR TILE, PREP/REPAIR SUB FLOOR FOR NEW FLOORING, SEE FINISH SCHEDULE.
- REMOVE EXISTING VCT, PREP/REPAIR SUB FLOOR FOR NEW FLOORING, SEE FINISH SCHEDULE.

C5
D100
DEMOLITION PLAN KEYED NOTES
1 1/2" = 1'-0"

36X24



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MELLE DETTENMAIER 435.890.2009
CHRISTIAN WILSON 435.232.8662

TITLE DEMOLITION PLANS & EXISTING PICTURES

PROJECT ENGINEERING LAB ROOM 140- RESTROOM REMODL

CLIENT UTAH STATE UNIVERSITY

ADDRESS 4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS

NO.	DATE	DESCRIPTION

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SHEET

D100



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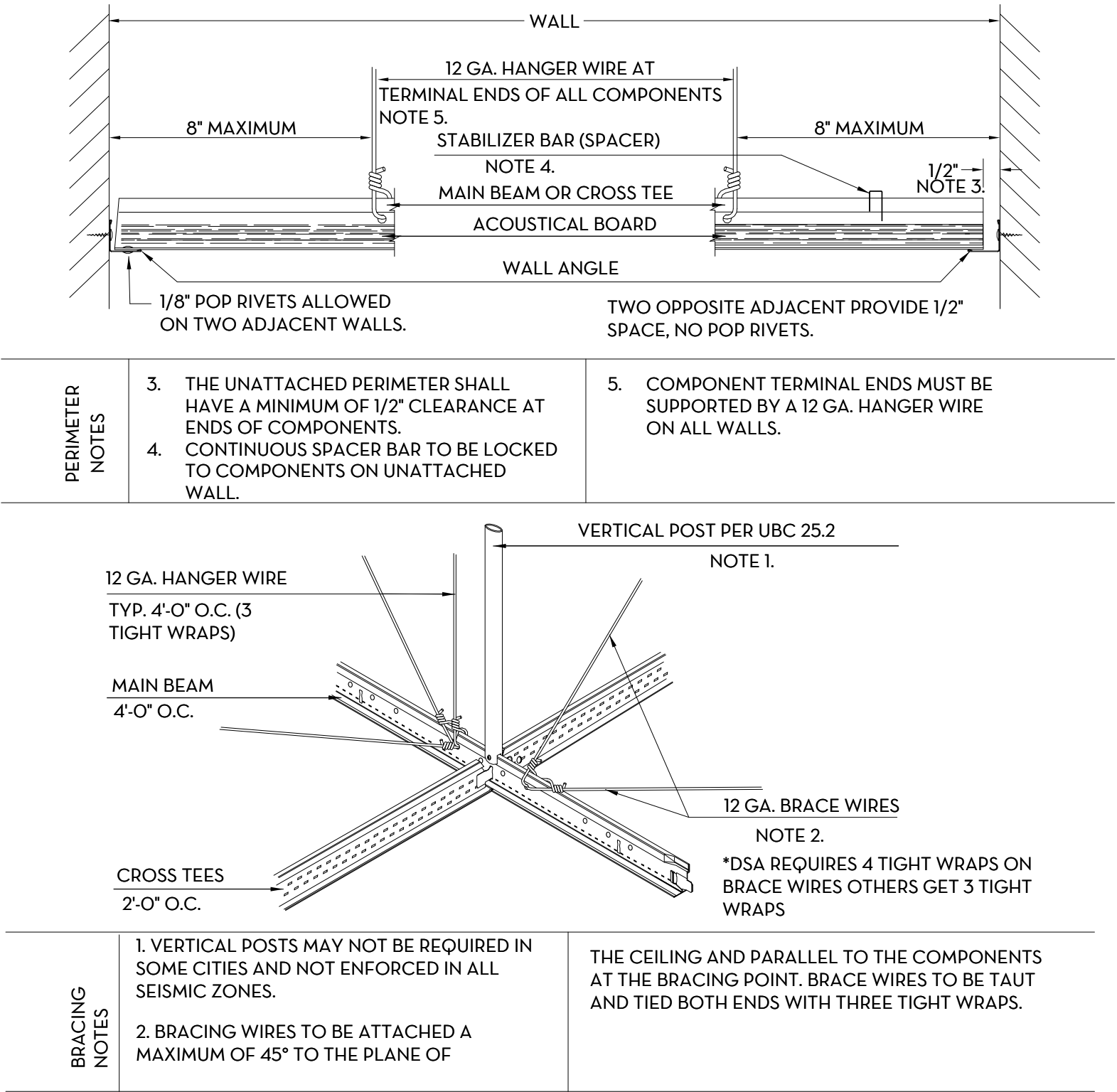
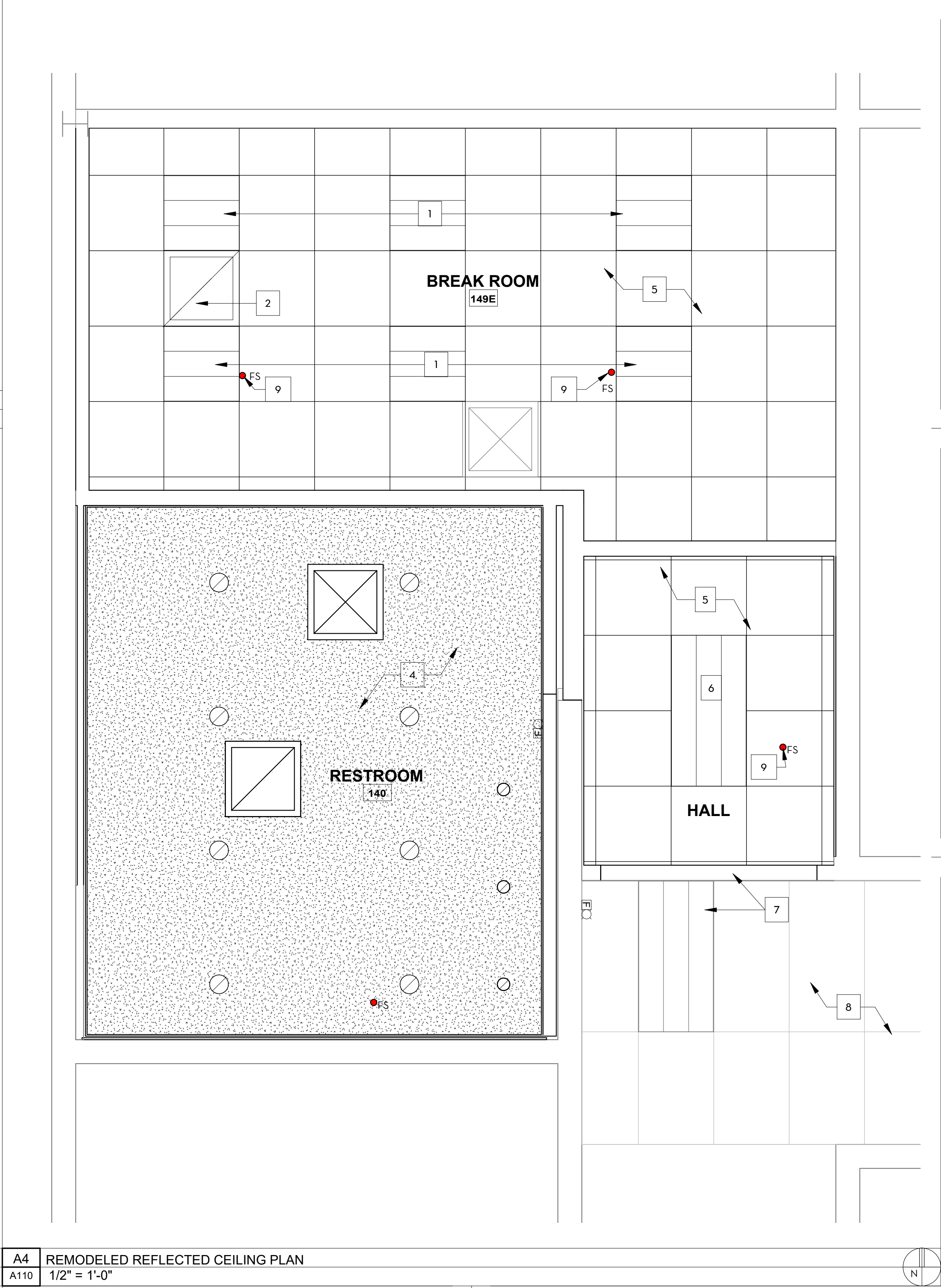
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PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS		
NO.	DATE	DESCRIPTION

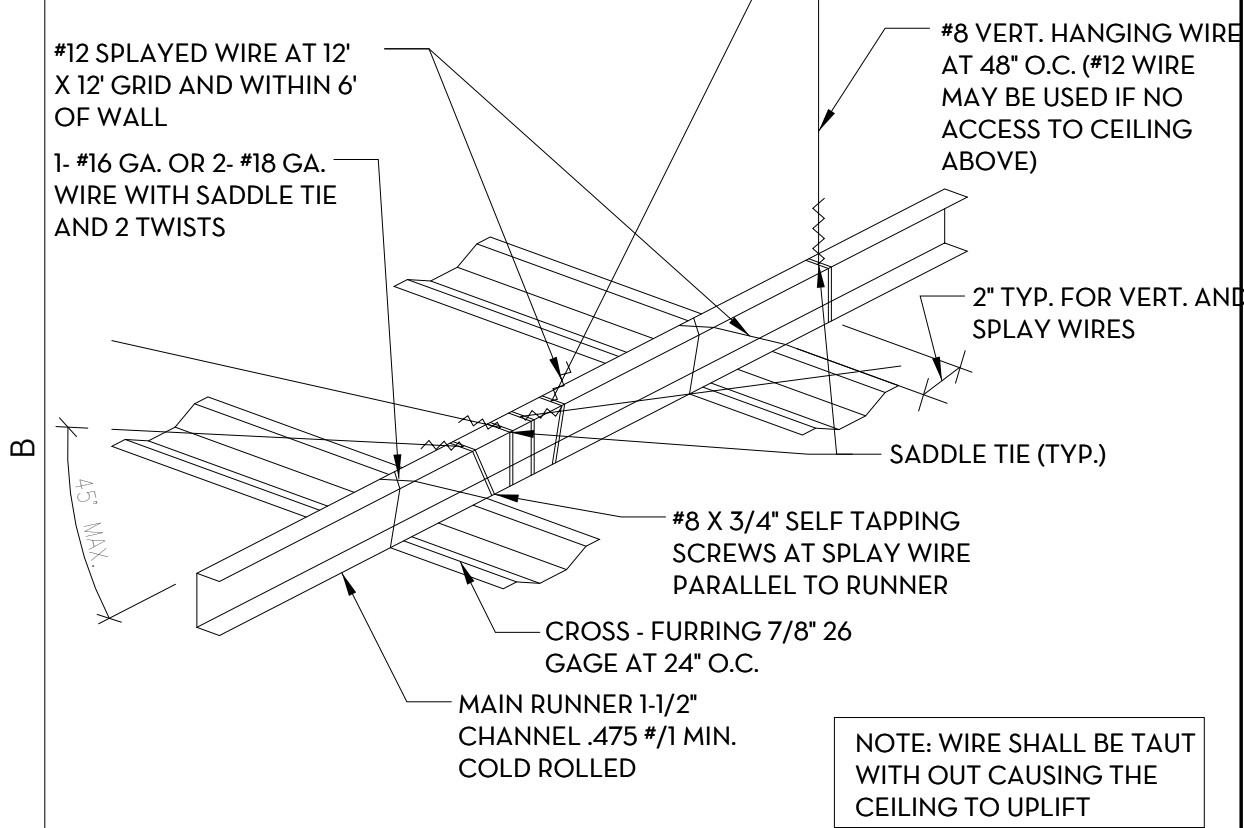
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SHEET

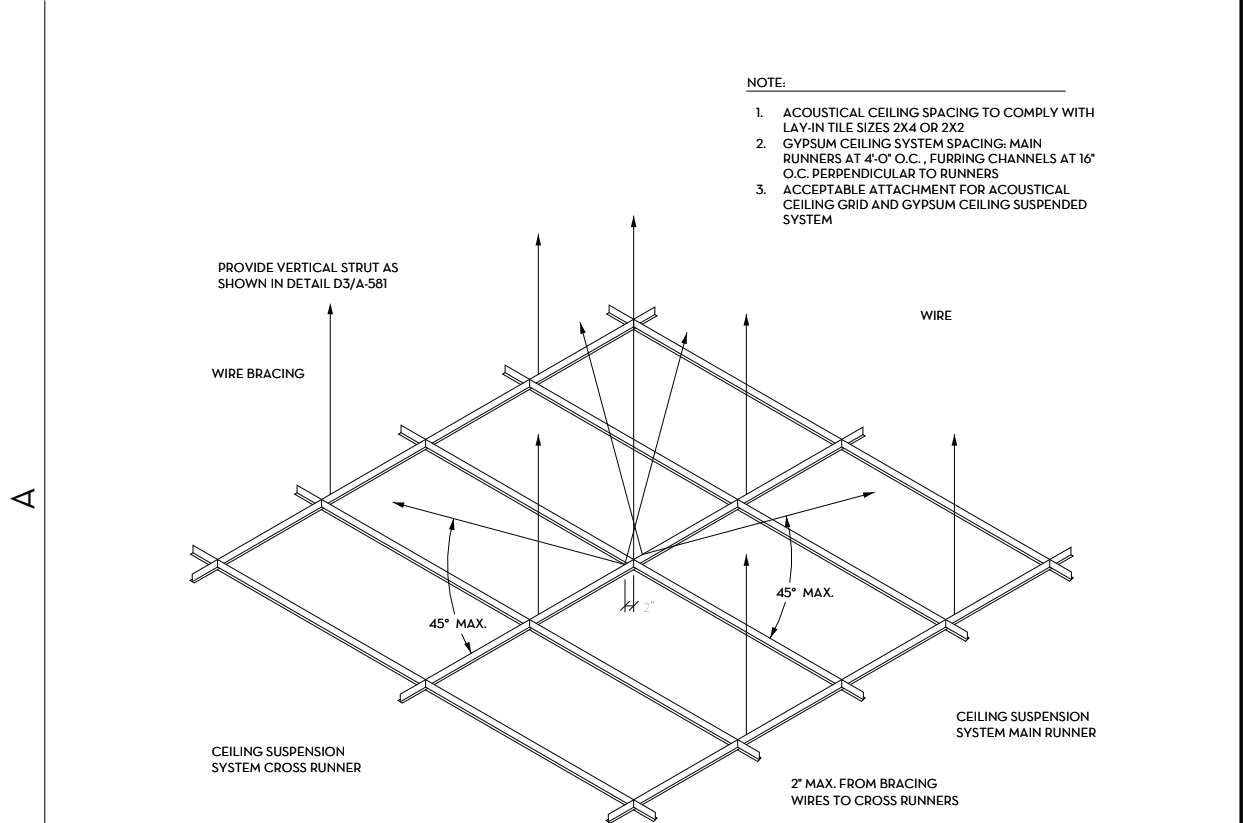
A110



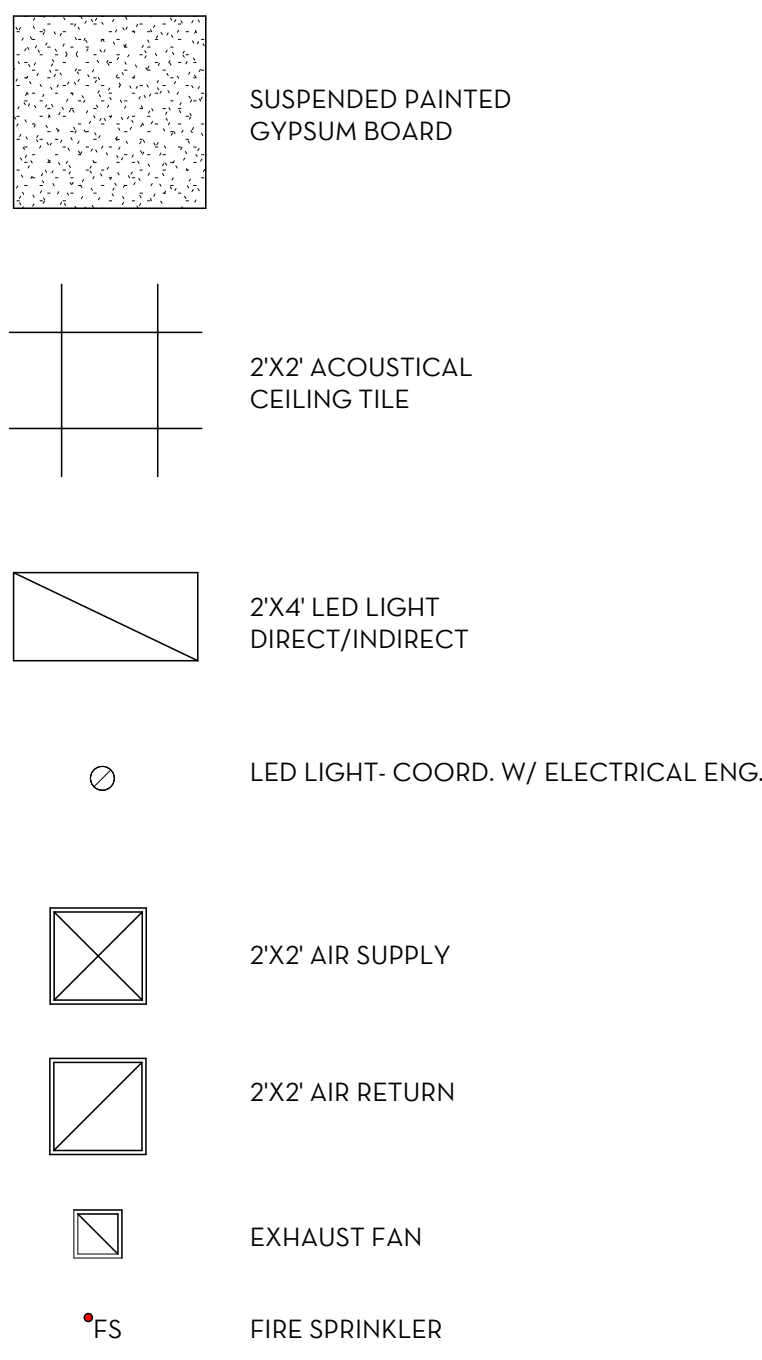
C2
A110
CEILING DETAIL - SEISMIC BRACING
3" = 1'-0"



B1
A110
CEILING DETAILS - GYPSUM BOARD CEILING
1 1/2" = 1'-0"



A1
A110
ACT CEILING DETAIL
1/4" = 1'-0"



NOTE: TENANT IMPROVEMENT TO BE FIRE SPRINKLERED. SUPPRESSION SYSTEM TO BE DESIGN BUILD. COORDINATE SPRINKLER HEAD LOCATIONS AROUND LIGHTING AND MECHANICAL VENTILATION.

A2
A110
CEILING LEGEND
1/4" = 1'-0"

KEYED NOTES - DEMOLITION REFLECTED CEILING PLAN

- NEW 2X2 LIGHT FIXTURES.
- RELOCATED MECHANICAL DIFFUSER, COORD. W/ MECHANICAL ENGINEER.
- NOT USED.
- NEW GYP.BD. CEILING
- NEW ACOUSTIC TILE GRID & TILES.
- NEW 2X4 LED LIGHT.
- WALL CONSTRUCTED NEXT TO EXISTING LIGHT.
- EXISTING CEILING TO REMAIN.
- FIRE SPRINKLER- VERIFY IN FIELD IF RELOCATION IS NECESSARY. CONTRACTOR TO COORDINATE W/ FIRE SPRINKLER COMPANY, AND COORD. W/ USU PRIOR TO RELOCATION WORK.
-

A3
A110
KEYED NOTES- REMODELED REFLECTED CEILING PLAN
1 1/2" = 1'-0"

A4
A110
REMODELED REFLECTED CEILING PLAN
1/2" = 1'-0"



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CHRISTIAN WILSON 435.232.8662

TITLE	FINISH PLAN
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS		
NO.	DATE	DESCRIPTION

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SCALE: As indicated
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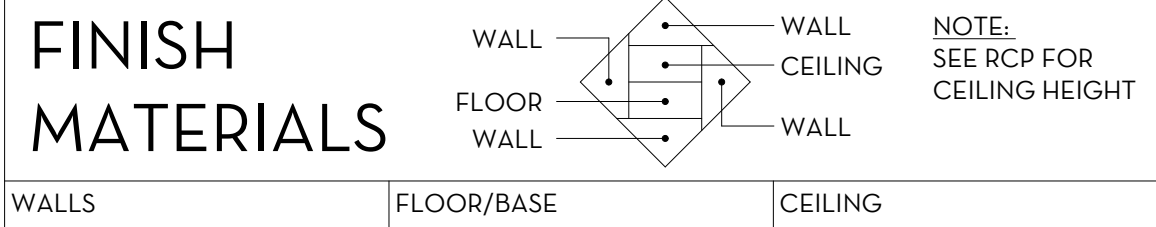
A130

GENERAL FINISH PLAN NOTES:

1. NO FINISH SUBSTITUTIONS MAY BE MADE WITHOUT PRIOR WRITTEN AUTHORIZATION BY OWNER.
2. ALL FINISHES SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
3. GENERAL CONTRACTOR TO PROVIDE TEMPORARY PROTECTION FOR ALL INSTALLED FINISHES AS WORK PROGRESSES.
4. THE CONTRACTOR SHALL SUBMIT SAMPLES OF FINISH MATERIALS TO DESIGNER.
5. PAINT AND WALL COVERING SUBCONTRACTOR SHALL EXAMINE WALLS TO ENSURE PROPER PREPARATION BEFORE APPLICATION. BEGINNING WORK IMPLIES ACCEPTANCE OF THEIR CONDITION.
6. ALL EXISTING WALLS TO BE PAINTED, U.N.O. AS PER INDICATED ON PLAN.
7. ALL CARPET INSTALLATION SHALL BE ACCOMPLISHED BY A FLOOR COVERING FIRM OR CERTIFIED INSTALLER AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MFRS. INSTALLATION INSTRUCTIONS.
8. ALL CERAMIC AND VINYL COMP. TILES TO BE INSTALLED WITH FULL TILE FROM TRANSITION AT DOOR AND FULL TILE FROM WALL PERPENDICULAR TO DOOR, U.N.O.
9. NO PAINTING OR INTERIOR FINISHING SHALL BE DONE UNDER CONDITIONS WHICH WILL JEOPARDIZED THE QUALITY OR APPEARANCE OF SUCH WORK. ALL WORKMANSHIP WHICH IS JUDGED LESS THAN FIRST QUALITY BY THE DESIGNER WILL BE REJECTED.
10. ALL SURFACES SHALL BE PREPARED TO RECEIVE THE SPECIFIED FINISH. ALL GYPSUM BOARD WALLS SHALL BE TAPED, SPACKLED AND SANDED SMOOTH AND PREPARED TO RECEIVE THE SPECIFIED FINISH. PAINT GRADE WOODWORK SHALL BE HAND SANDED BETWEEN COATS AND DUSTED CLEAN. ALL HOLES, PITCH POCKETS OR SAPPY PORTIONS SHALL BE SCRAPED AND SHELLACKED, OR SEALED WITH KNOT SEALER. NAIL HOLES, CRACKS OR DEFECTS SHALL BE PUTTIED AFTER FIRST COAT, WITH PUTTY MATCHING COLOR OF STAIN OR PAINT FINISH. REMOVE OIL OR GREASE WITH MINERAL SPIRITS.
11. ALL CRACKS, HOLES, IMPERFECTIONS IN EXISTING WALLS SHALL BE FILLED WITH PATCHING PLASTER AND SMOOTHED OFF TO MATCH ADJOINING SURFACES.
12. INTERIOR GYPSUM BOARD SURFACES SHALL BE WIPED WITH A DAMP CLOTH JUST PRIOR TO APPLICATION OF THE FIRST COAT, IN ORDER TO LAY FLAT ANY NAP WHICH MAY HAVE FORMED IN SANDING PROCESS.
13. UPON COMPLETION, REMOVE ALL PAINT FROM WHERE IT HAS SPILLED, SPLASHED OR SPLATTERED ON EXPOSED SURFACES.
14. ALL VENEER STAINS SHALL HAVE UNIFORM COLOR.
15. EXAMINE ALL FINISH SURFACES AFTER COMPLETION OF WORK AND PROCEED WITH "TOUCH-UP" AS REQUIRED.
16. PROVIDE DESIGNER WITH A MINIMUM OF (3) 8" X 10" BRUSH-OUTS OF EACH COLOR & FINISH FOR DESIGNER'S APPROVAL. DESIGNER RESERVES THE RIGHT TO ADJUST ANY COLOR/FINISH ONCE THE WALL TEST HAS BEEN MADE.
17. UNDERSIDE OF SOFFITS (WHERE OCCURS) TO RECEIVE A FINISH TO MATCH CEILING FINISH, UNO.
18. ALL GYP. BD. CEILINGS AND SOFFITS TO RECEIVE TWO (2) COATS FLAT PAINT, U.N.O. WHERE INDICATED ON PLANS.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR ALLOWING FOR DELIVERY LEAD TIMES FOR ALL FINISHES, FIXTURES, FABRICS AND OTHER CUSTOM FINISHES WITHIN THE CONSTRUCTION SCHEDULE. ALL DELIVERY TIMES MUST BE CONFIRMED, AND ANY EXCESSIVE LEAD TIME MUST BE BROUGHT TO THE DESIGNER'S ATTENTION IMMEDIATELY TO ALLOW FOR RESPECIFICATION IF NECESSARY.
20. SEE FINISH PLAN, ELEVATIONS AND DETAILS FOR CLARIFICATION OF EXTENT OF FINISH MATERIALS.
21. PAINT IS DEFINED AS ONE PRIMER COAT AND 2 FINISH COATS.
22. STAINED AND PAINTED SURFACES SHALL BE FINISHED SUCH THAT JOINTS ARE NOT VISIBLE WHEN VIEWED FROM ANY ANGLE AS DETERMINED BY THE DESIGNER.
23. ALL INTERSECTIONS OF FLOOR FINISH MATERIALS SHALL BE LOCATED DIRECTLY UNDER CENTER OF DOOR, WHERE OCCURS, UNO.
24. ALL WALLS TO RECEIVE W1 UNO.
25. ALL COVER PLATES, SWITCHES, OUTLETS, RECEPCTACLES AND DEVICES TO BE WHITE UNO.
26. PROVIDE EPOXY PAINT AT ALL RESTROOMS, SHOWERS, LOCKER ROOMS AND JANITOR CLOSETS.
27. ALL PAINTED STEEL BRACING AND COLUMNS TO BE PAINTED W1, UNLESS NOTED OTHERWISE.
28. ALL GROUT JOINTS TO BE NO LARGER THAN 1/8".
29. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF MILLWORK.
30. AT SOFFITS RECEIVING COLOR. PAINT ALL SIDES OF SOFFIT.
31. ALL WOOD TRIM TO BE STAINED TO MATCH DOOR STAIN.
32. ALL COUNTERTOP, BACKSPLASHES, AND EDGE BANDING TO HAVE COORDINATING FINISHES.
33. PROVIDE FLOOR FINISH "RT. RUBBER STAIR TREAD" AT STAIR TREADS AND LANDING.
34. PROVIDE A SMOOTH TRANSITION AT ALL FLOOR MATERIALS - CONTRACTOR TO INSTALL ALL FLOOR FINISHES AT SAME LEVEL, DESPITE DIFFERENT THICKNESS. PROVIDE FLOOR TRANSITION WHERE OCCURS.
35. ALL HM DOOR FRAMES TO BE PAINTED W1 U.N.O.

C2	FINISH PLAN NOTES
A130	1 1/2" = 1'-0"

FINISH MATERIALS



MATERIAL FINISH LEGEND

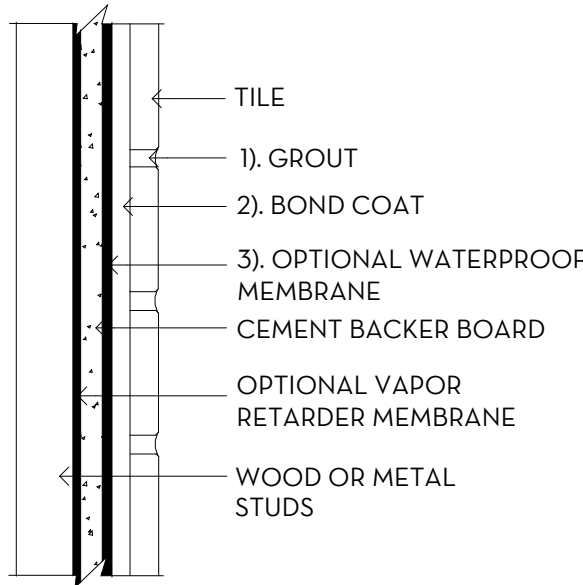
WALLS								
CALL OUT	TYPE	MANUF.	SERIES	COLOR	SIZE	INSTALL	FINISH	NOTES
W1	WALL PAINT		--	USU MORNING MIST	--		SEMI GLOSS	--
W2	WALL TILE (TCNA #W244C)	DALTILE	LINEAR	MATTE SUEDE GRAY 0782	8"X24"	RUNNING BOND	MATTE CERAMIC	ONE ROW OF GREY TILE AS BASE THEN START ARCTIC WHITE
	WALL TILE (TCNA #W244C)	DALTILE	LINEAR	SEMI-GLOSS ARCTIC WHITE 0790	8"X24"	RUNNING BOND	GLAZED CERAMIC	GROUT COLOR: MAPEI 93-WARM GRAY
	WALL PAINT ABOVE TILE	SHERWIN WILLIAMS		SNOWBOUND SW7004			EPOXY	T.O. TILE TRIM: JOLLY SCHLUTER A60BW BRIGHT WHITE
W3	BATHROOM PARTITIONS	ONE POINT	SOLID PLASTIC	METALLIC SILVER 9511				
FLOORING								
F1	TILE FLOOR (TCNA #F122)	DALTILE	COLOR WHEEL MOSAICS GLAZED CERAMIC	MATTE SUEDE GRAY LATTICE WEAVE-0782	1"X3" (12"X12" SHEET)	LATTICE WEAVE	MATTE	GROUT COLOR: MAPEI-19 PEARL GRAY
F2	CARPET TILE	SHAW CONTRACT	TURN TILE 5T205	ADAPT 04761	12"X48"	RUNNING BOND ASHLAR	-	MATCH EXISTING COLOR IN BUILDING- VERIFY COLOR PRIOR TO ORDERING
F3	LVT	INTERFACE	BRUSHED LINES -A016	SANDALWOOD- A01608	25CMX1M	ASHLAR	-	
F4	VCT	MATCH EXISTING	MATCHE EXISTING	WHITE W/ GRAY BORDER				
BASE								
B1	RUBBER BASE	ROPPE	PINNACLE	BLACK BROWN - 193	4" COVED	-	-	
CEILINGS								
C1	PAINTED GYP BD	SHERWIN WILLIAMS	-	SNOWBOUND SW7004	-	-	FLAT	
C2	ACOUSTIC CEILING	ARMSTRONG	ULTIMA TEGULAR	WHITE	2'X2'	SEE RCP	-	
MILLWORK								
M1	LAMINATE CABINETS	STEVENS WOOD	ARTIKA & RAIN	NATURAL ELM 574	-	-	-	BREAKROOM
M2	ENGINEERED STONE COUNTERTOPS	MSI	GROUP 1	ICED WHITE	3CM	-	-	BREAKROOM

A2	FINISH MATERIALS DETAILS
A130	NO SCALE

A4	FINISH PLAN
A130	1/2" = 1'-0"

INTERIOR WALLS OVER WOOD OR METAL STUDS
WOOD OR METAL STUDS
CEMENT BACKER BOARD
CERAMIC OR PORCELAIN TILE

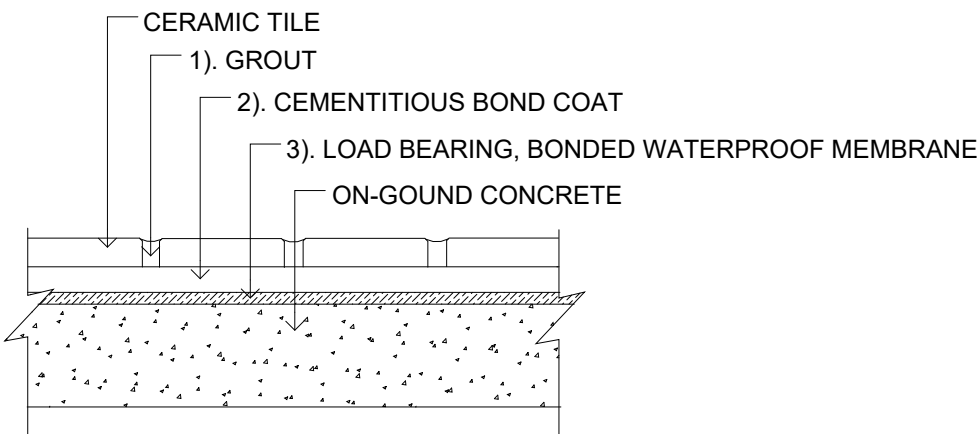
TCNA #W244C



D1	WALL TILE - TCNA #W244C
A130	3" = 1'-0"

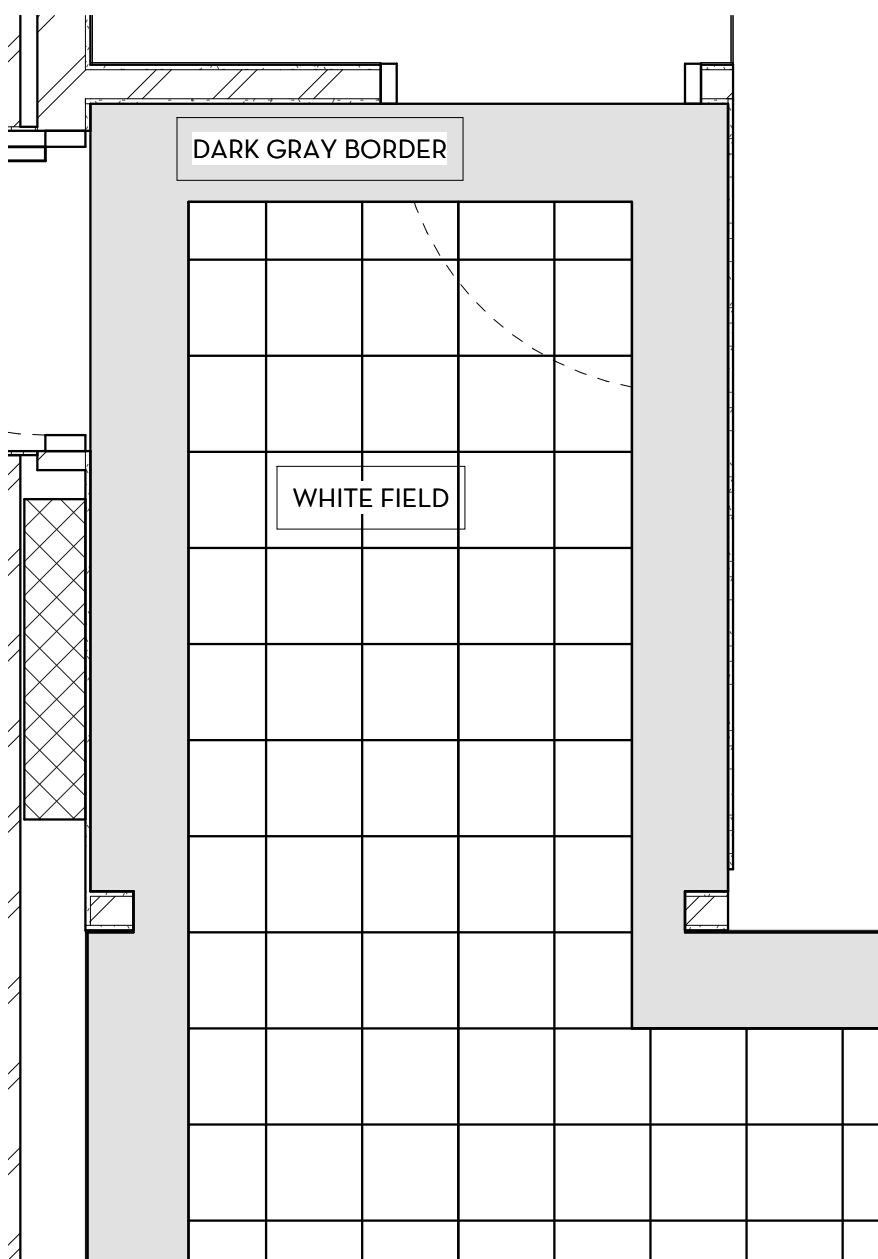
INTERIOR FLOORS OVER CONCRETE
ON GROUND CONCRETE
WATERPROOF MEMBRANE
CERAMIC OR PORCELAIN TILE

TCNA #F122

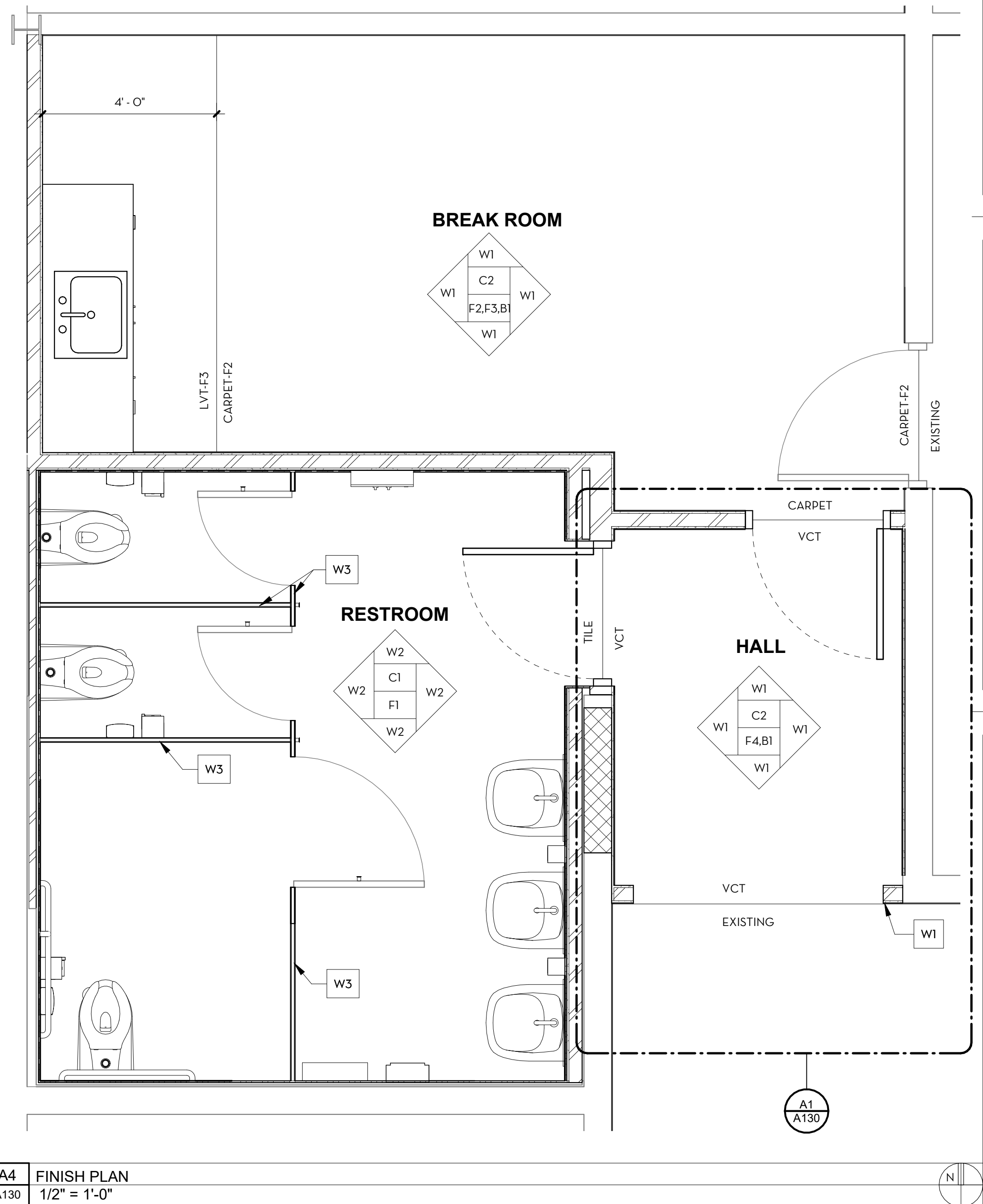


C1	FLOOR TILE - TCNA #F122
A130	3" = 1'-0"

NOTE:
HALL VCT - MATCH EXISTING. CARRY BORDER INTO MODIFIED HALL



A1	HALL VCT PATTERN
A130	1/2" = 1'-0"

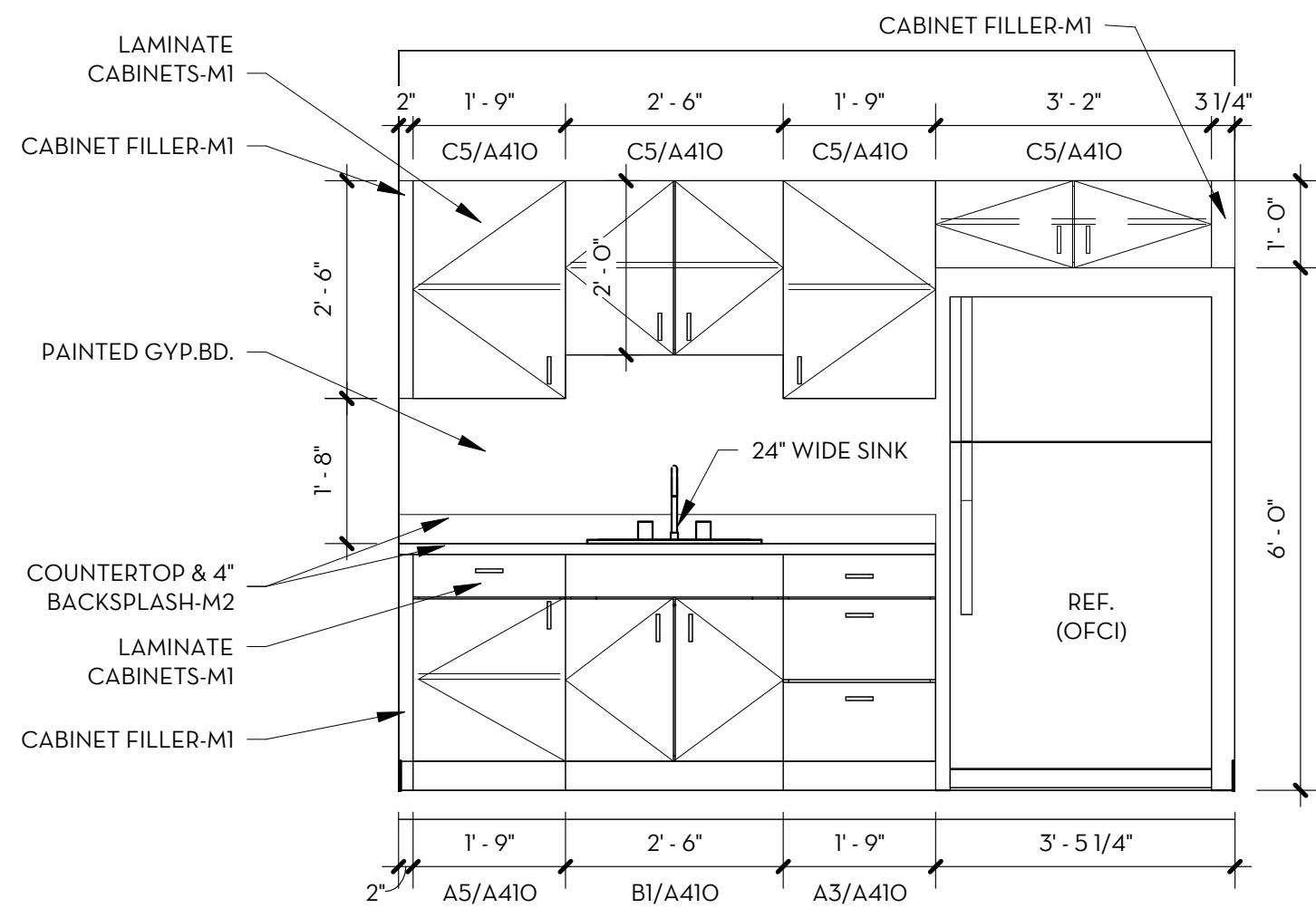


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A4	BREAK ROOM- WEST ELEVATION
A400	1/2" = 1'-0"



TITLE	INTERIOR ELEVATIONS
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

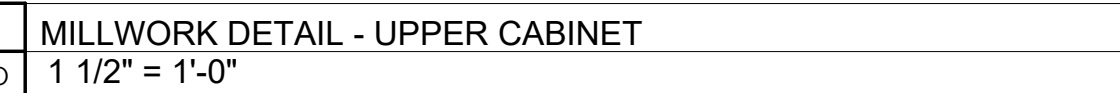
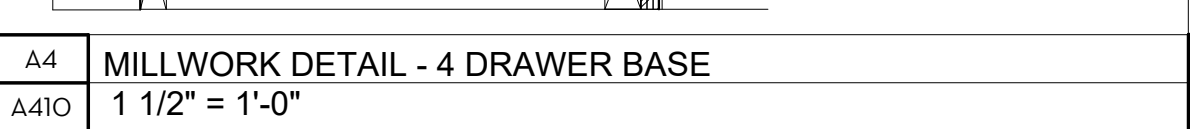
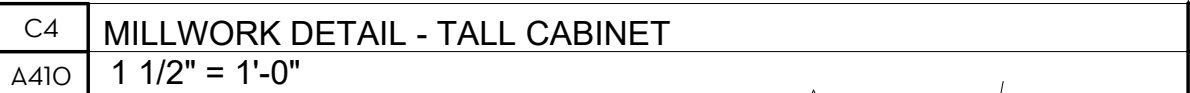
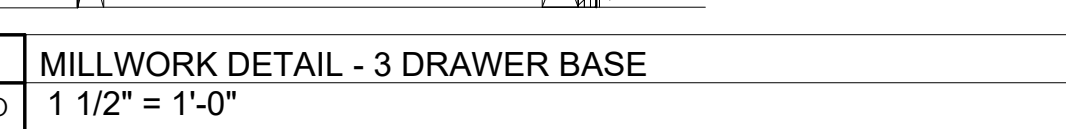
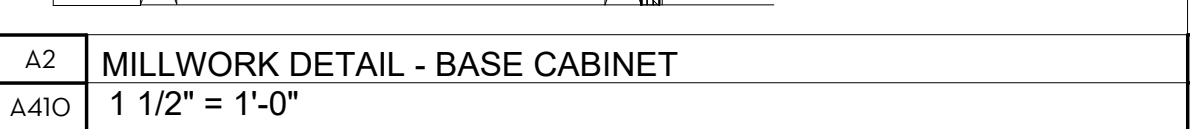
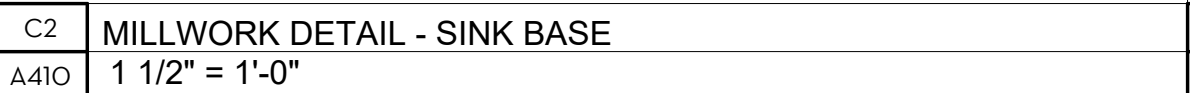
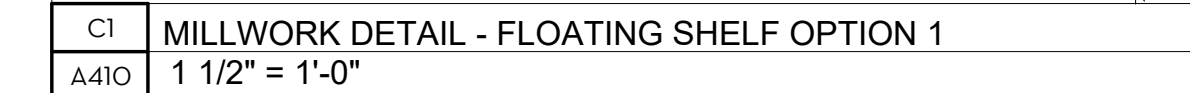
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NO.	DATE	DESCRIPTION

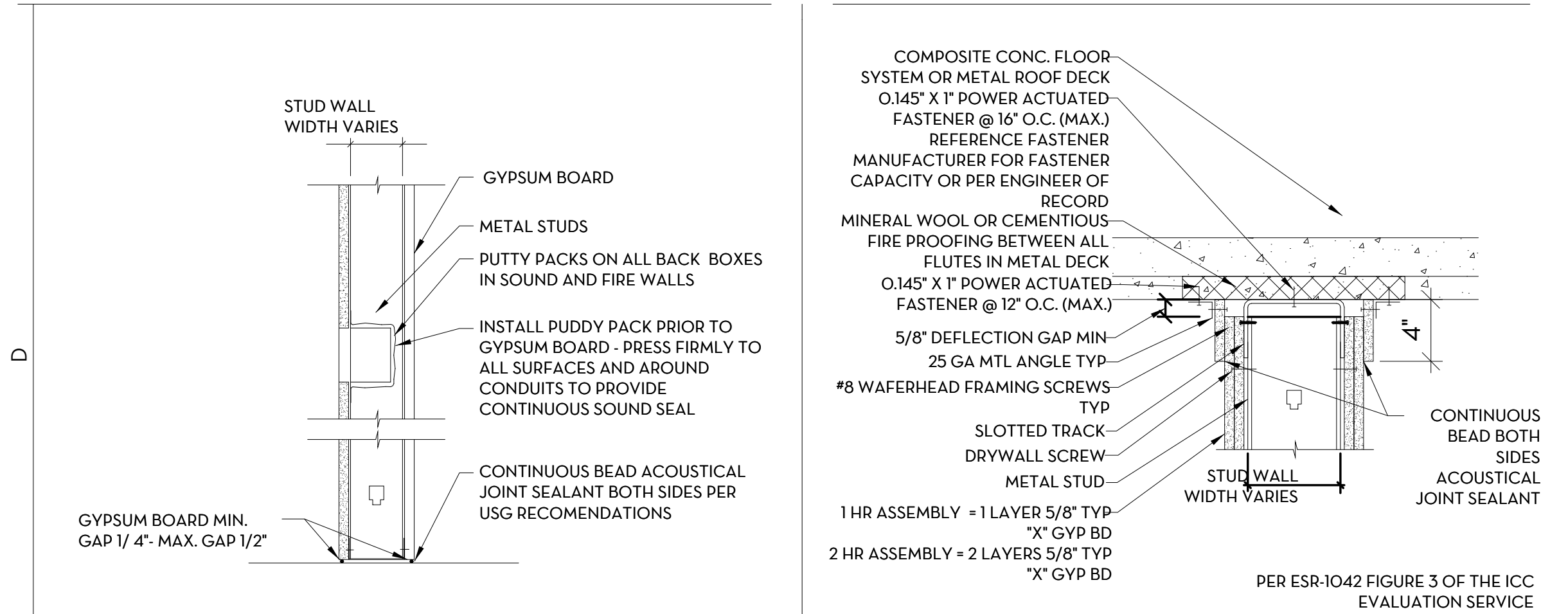
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SHEET

A400

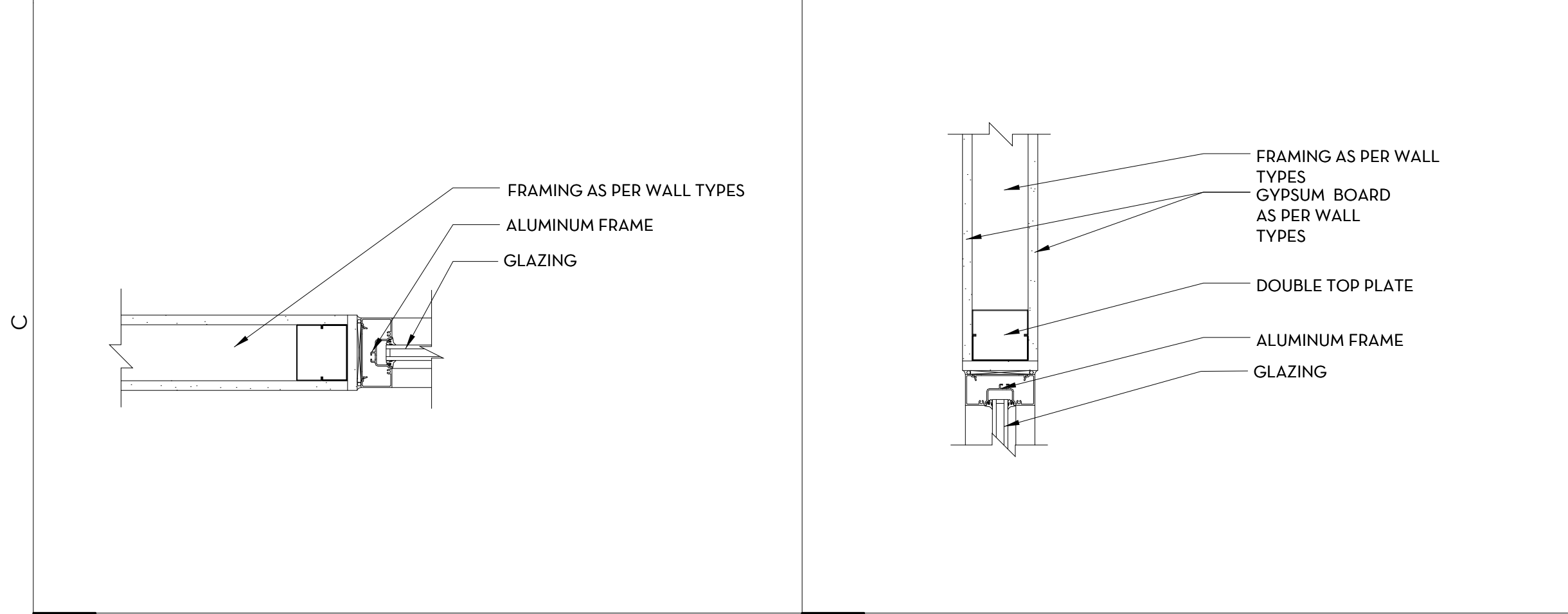
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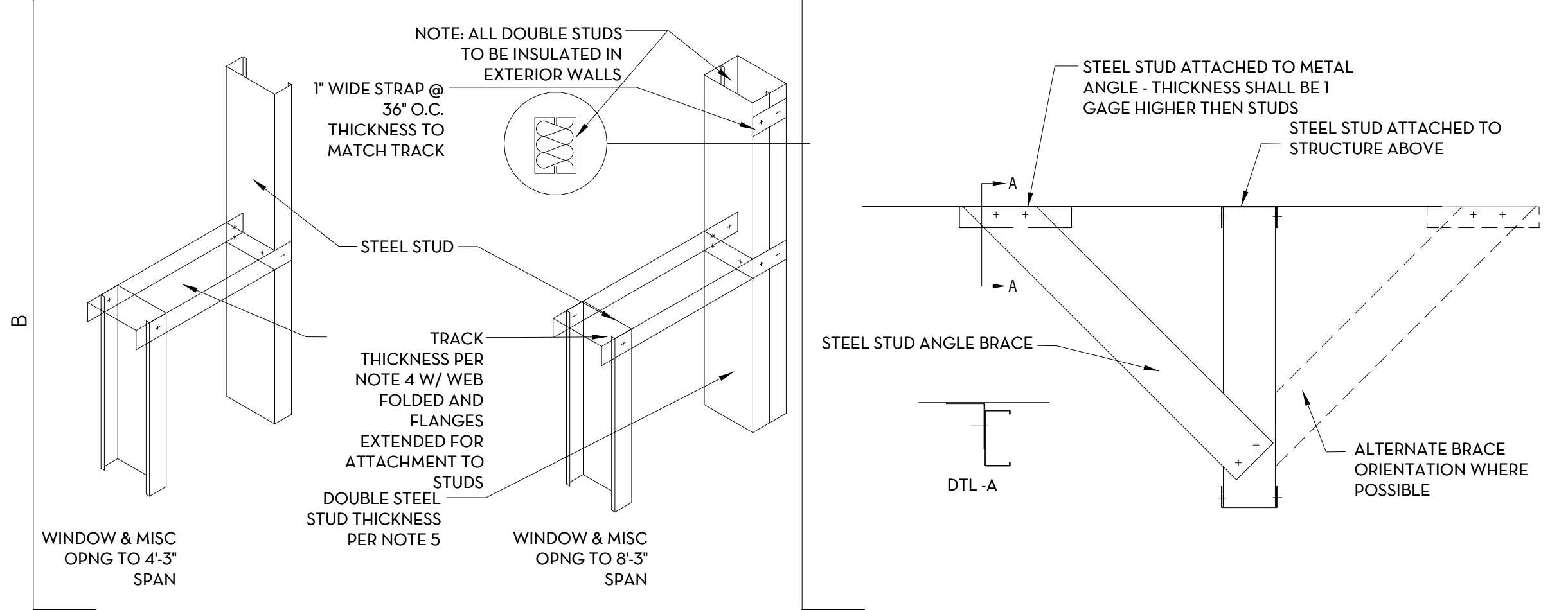
D1 METAL FRAMING - SOUND-FIRE WALL DETAIL
1 1/2" = 1'-0"

D2 METAL FRAMING - FIRE-SOUND TOP TRACK
1 1/2" = 1'-0"

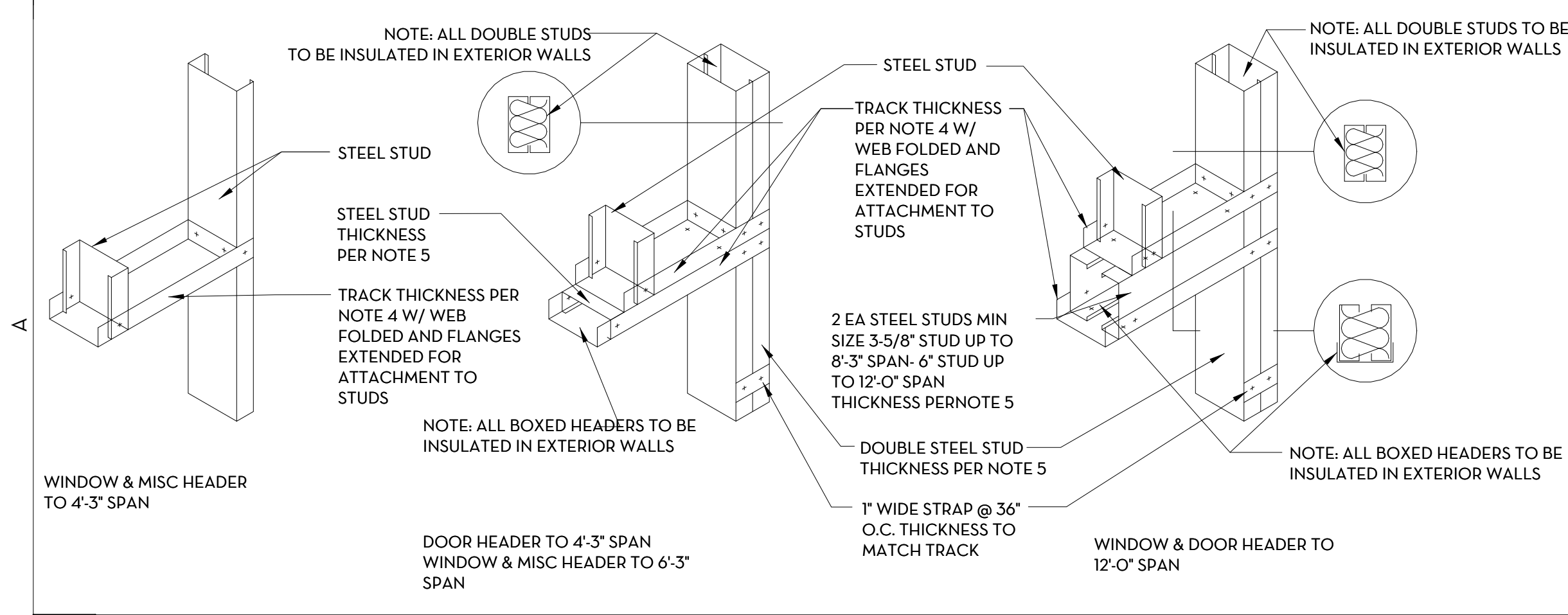


C1 METAL FRAMING - INTERIOR WALL - WINDOW DETAIL
1 1/2" = 1'-0"

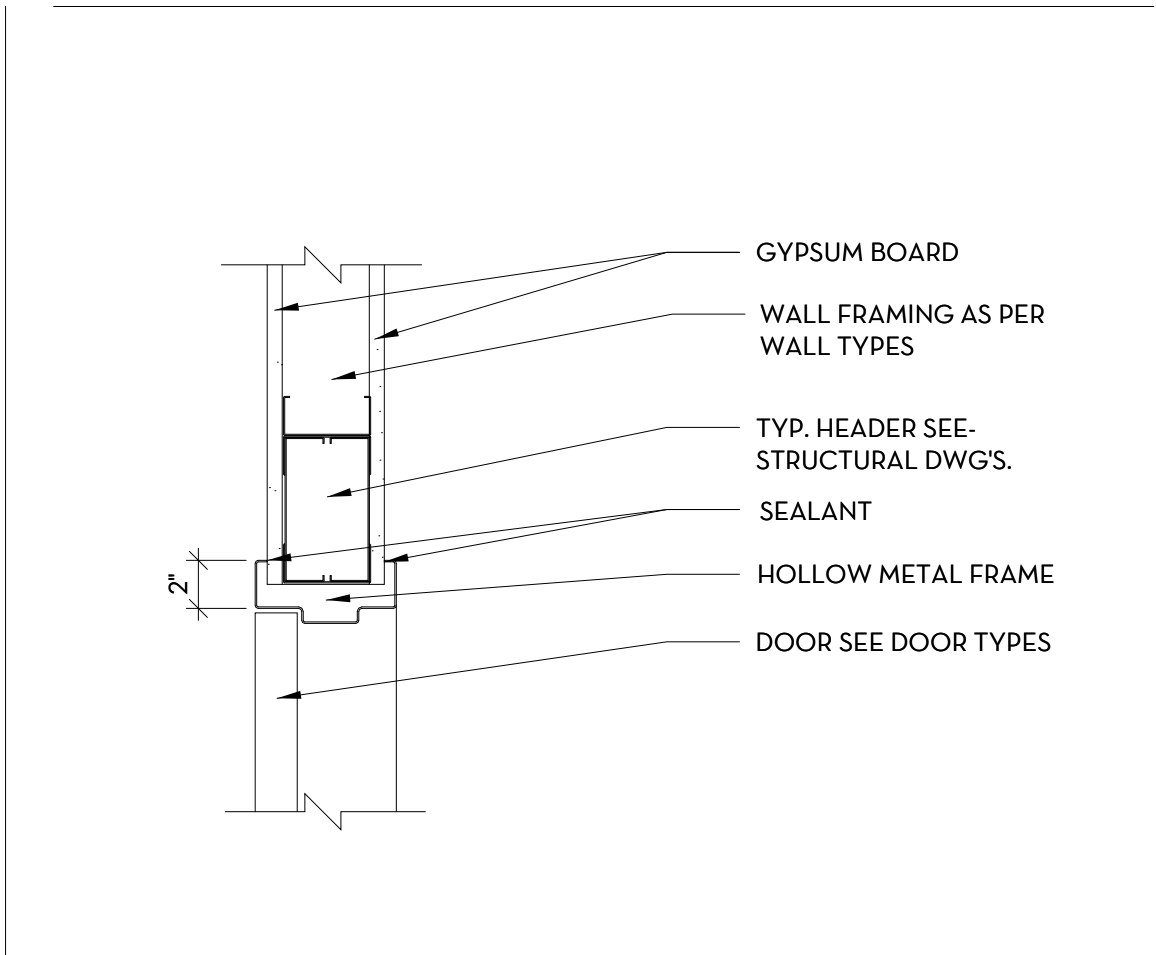
C2 METAL FRAMING - INTERIOR WINDOW HEADER DETAIL
1 1/2" = 1'-0"



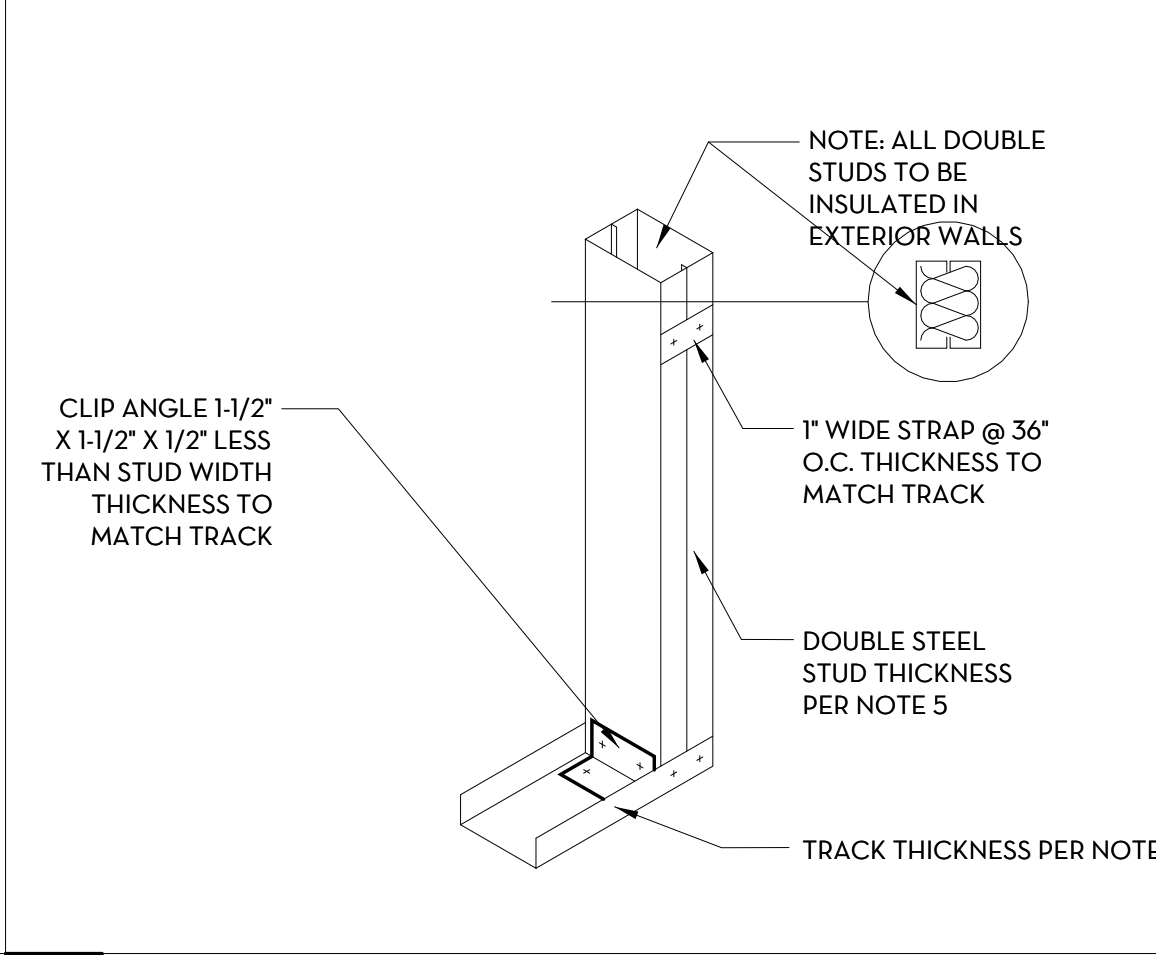
B1 METAL FRAMING - OPENING DETAILS
1 1/2" = 1'-0"



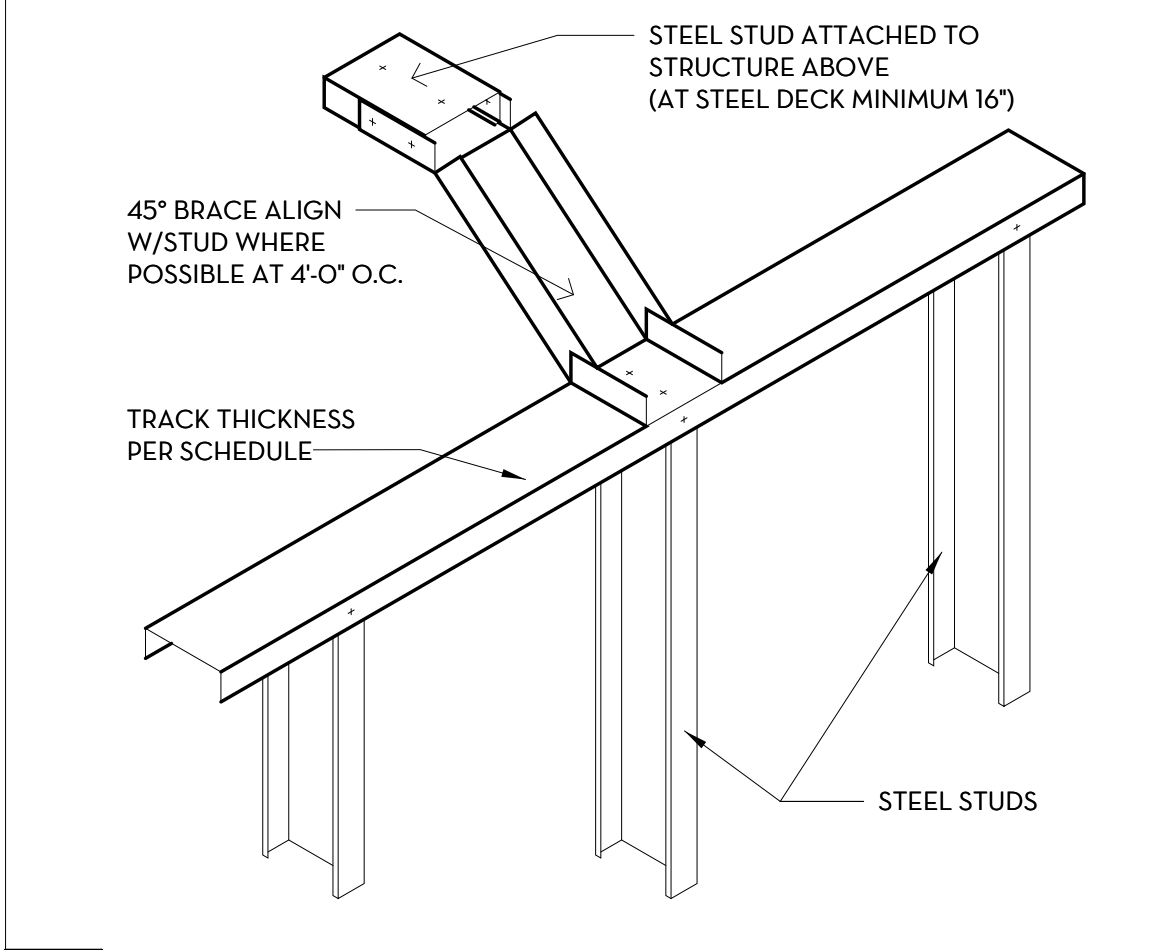
A1 METAL FRAMING - OPENING HEADERS
1 1/2" = 1'-0"



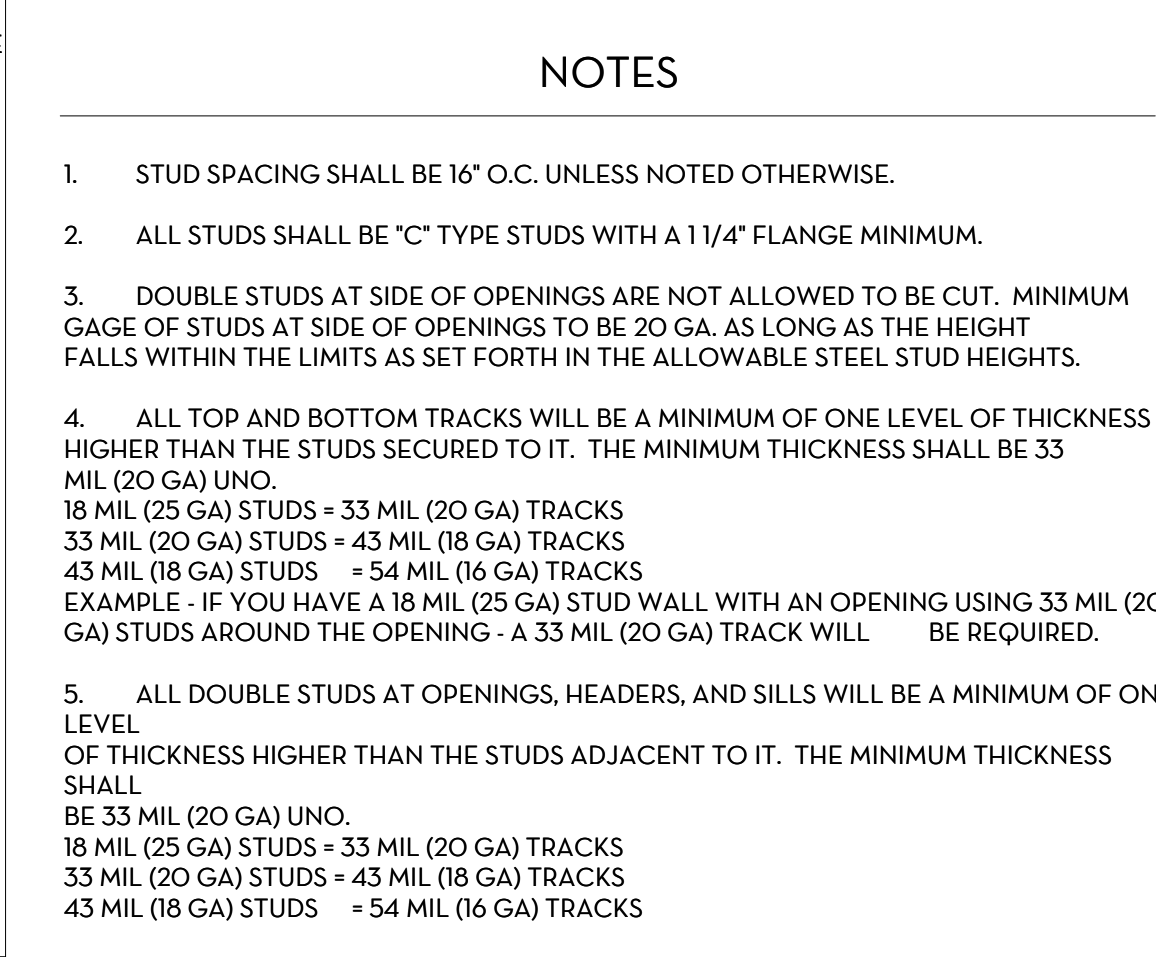
D3 METAL FRAMING - INTERIOR DOOR HEADER DETAIL
1 1/2" = 1'-0"



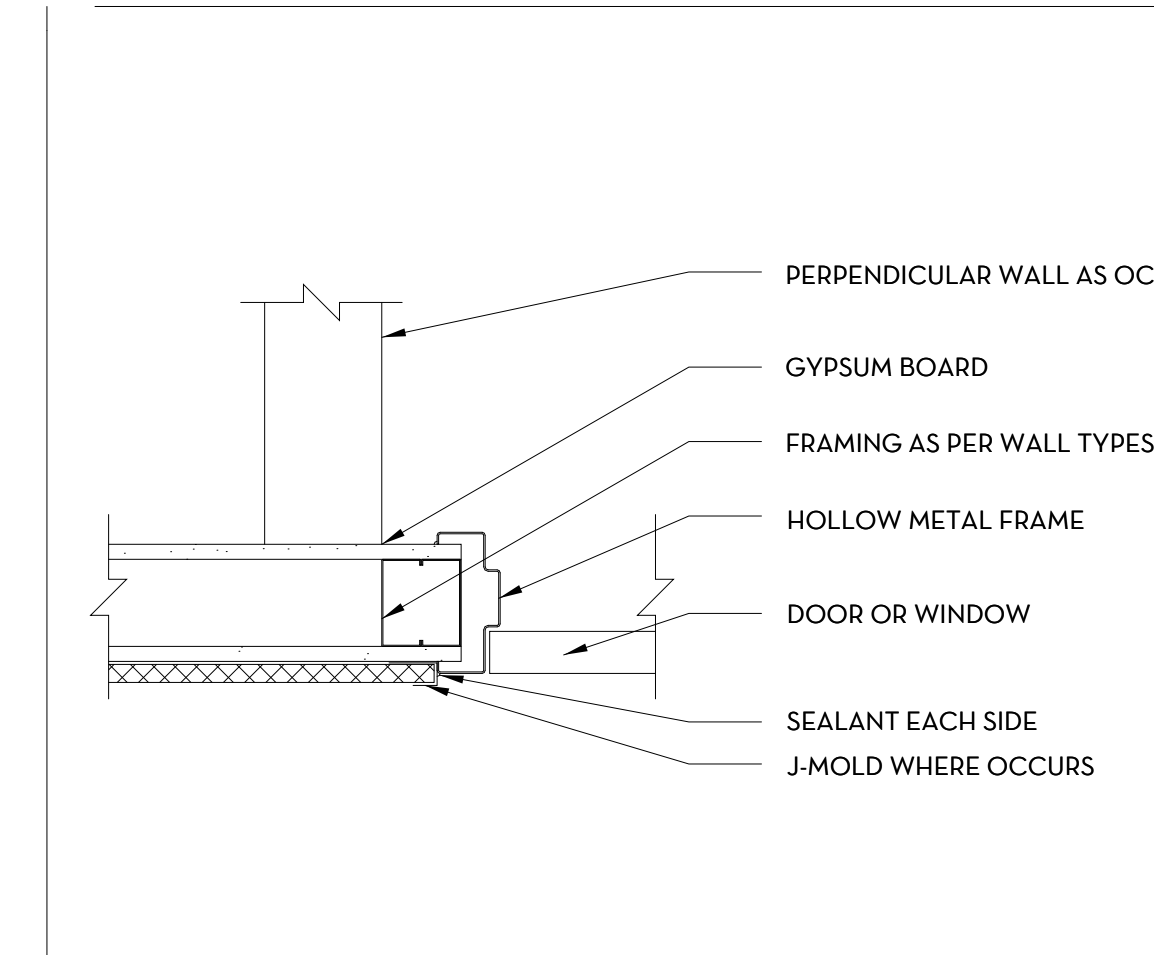
C3 METAL FRAMING - END OF DOOR JAMB
1 1/2" = 1'-0"



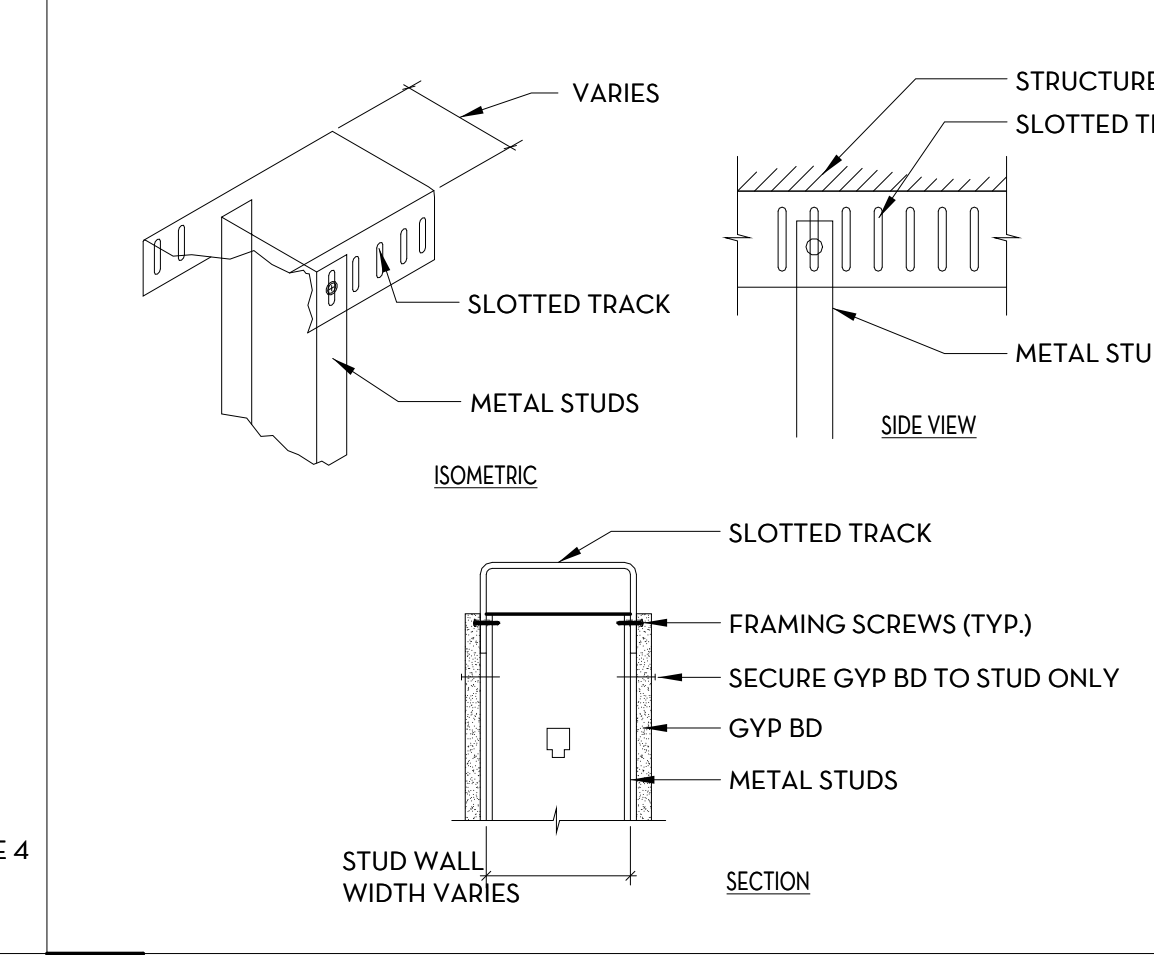
B3 METAL FRAMING - DIAGONAL BRACE DETAIL
1 1/2" = 1'-0"



A3 METAL FRAMING - OPENING HEADERS
1 1/2" = 1'-0"



D4 METAL FRAMING - INTERIOR DOOR JAMB DETAIL
1 1/2" = 1'-0"

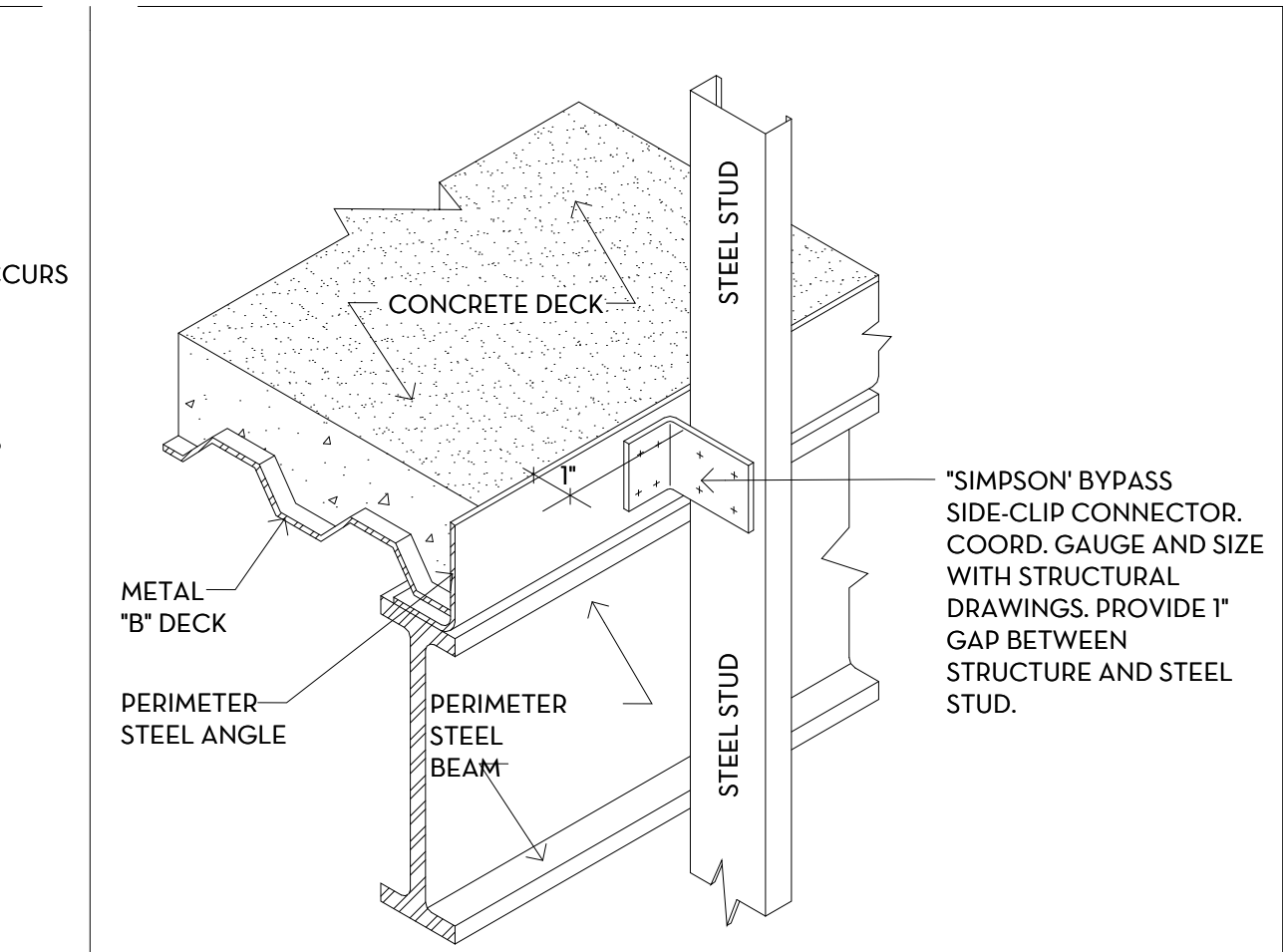


C4 METAL FRAMING - SLOTTED TOP TRACK THREE SIDES
1 1/2" = 1'-0"

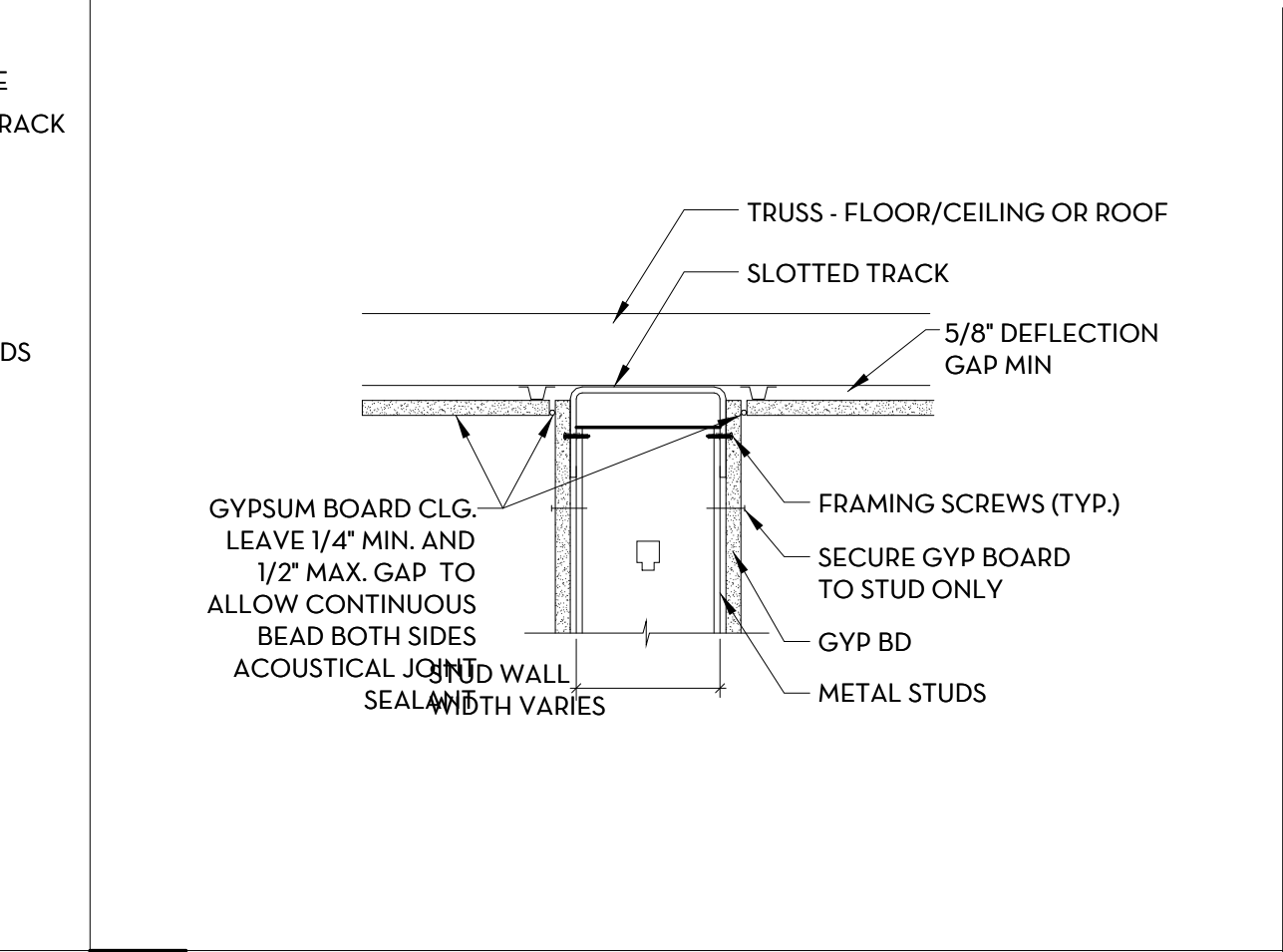
ALLOWABLE STEEL STUD HEIGHTS									
STUD MEMBER SEE NOTE 1	SPACING	GYP BD 1 SIDE SEE NOTE 2	GYP BD 1 SIDE SEE NOTE 2	CERAMIC TILE ON CEMENT BOARD 1 SIDE	CERAMIC TILE ON CEMENT BOARD 2 SIDES	TILE & CMNT BD 1 SIDE	2 LAYER GYP BD 2 SIDES		
		TYP	TYP	1 SIDE	2 SIDES	1 SIDE			
162S125-18	24" O.C.	6'-0"	7'-11"	NP	NP	NP	NP	7'-5"	6'-6"
	16" O.C.	6'-11"	8'-4"	NP	NP	NP	NP	8'-4"	7'-5"
162S125-33	12" O.C.	7'-7"	8'-10"	NP	NP	NP	NP	8'-2"	8'-2"
	24" O.C.	7'-3"	8'-9"	NP	NP	NP	NP	8'-11"	8'-11"
25OS125-18	16" O.C.	8'-7"	9'-8"	NP	NP	NP	NP	10'-10"	10'-10"
	12" O.C.	9'-6"	10'-4"	NP	NP	NP	NP	11'-11"	11'-11"
25OS125-33	24" O.C.	8'-4"	10'-7"	NP	NP	NP	NP	8'-5"	8'-5"
	16" O.C.	9'-6"	11'-3"	NP	NP	NP	NP	8'-11"	8'-11"
25OS125-43	12" O.C.	10'-6"	11-11"	NP	NP	NP	NP	9'-6"	9'-6"
	24" O.C.	10'-5"	11'-7"	NP	NP	NP	NP	8'-11"	8'-11"
362S125-18	16" O.C.	11'-11"	12'-10"	NP	NP	NP	NP	10'-0"	10'-0"
	12" O.C.	13'-2"	13'-11"	NP	NP	NP	NP	10'-11"	10'-11"
362S125-33	24" O.C.	11'-4"	13'-6"	NP	NP	NP	NP	9'-6"	9'-6"
	16" O.C.	13'-0"	14'-9"	NP	NP	NP	NP	10'-10"	10'-10"
362S125-43	12" O.C.	14'-4"	15'-9"	NP	NP	NP	NP	11'-9"	11'-9"
	24" O.C.	14'-0"	15'-5"	NP	NP	NP	NP	10'-5"	10'-5"
40OS125-18	16" O.C.	12'-5"	14'-4"	NP	NP	NP	NP	10'-9"	10'-9"
	12" O.C.	13'-8"	15'-4"	NP	NP	NP	NP	12'-0"	12'-0"
40OS125-33	24" O.C.	13'-6"	14'-9"	NP	NP	NP	NP	11'-7"	11'-7"
	16" O.C.	15'-6"	16'-5"	NP	NP	NP	NP	12'-11"	12'-11"
40OS125-43	12" O.C.	17'-1"	17'-10"	NP	NP	NP	NP	14'-1"	14'-1"
	24" O.C.	16'-3"	16'-3"	NP	NP	NP	NP	12'-3"	12'-3"
60OS125-18	16" O.C.	16'-11"	18'-0"	NP	NP	NP	NP	13'-10"	13'-10"
	12" O.C.	18'-7"	19'-7"	NP	NP	NP	NP	15'-2"	15'-2"
60OS125-33	24" O.C.	12'-0"	14'-2"	NP	NP	NP	NP	10'-5"	10'-5"
	16" O.C.	13'-9"	15'-4"	NP	NP	NP	NP	11'-11"	11'-11"
60OS125-43	12" O.C.	15'-1"	16'-5"	NP	NP	NP	NP	13'-0"	13'-0"
	24" O.C.	15'-0"	16'-5"	NP	NP	NP	NP	12'-10"	12'-10"
80OS125-18	16" O.C.	17'-5"	18'-4"	NP	NP	NP	NP	14'-5"	14'-5"
	12" O.C.	18'-11"	19'-11"	NP	NP	NP	NP	15'-0"	15'-0"
80OS125-33	24" O.C.	16'-5"	17'-2"	NP	NP	NP	NP	13'-4"	13'-4"
	16" O.C.	18'-9"	19'-5"	NP	NP	NP	NP	15'-2"	15'-2"
80OS125-43	12" O.C.	20'-8"	21'-2"	NP	NP	NP	NP	16'-8"	16'-8"
	24" O.C.	19'-9"	19'-9"	NP	NP	NP	NP	14'-0"	14'-0"
80OS125-43	16" O.C.	20'-10"	21'-7"	NP	NP	NP	NP	16'-2"	16'-2"
	12" O.C.	23'-11"	24'-6"	NP	NP	NP	NP	19'-5"	19'-5"
80OS125-43	16" O.C.	26'-3"	26'-9"	NP	NP	NP	NP	20'-6"	20'-6"
	12" O.C.	22'-9"	23'-7"	NP	NP	NP	NP	19'-10"	19'-10"
80OS125-43	16" O.C.	26'-0"	28'-3"	NP	NP	NP	NP	21'-3"	21'-3"
	12" O.C.	28'-8"	30'-7"	NP	NP	NP	NP	23'-0"	23'-0"
80OS125-43	24" O.C.	28'-11"	30'-6"	NP	NP	NP	NP	24'-2"	24'-2"
	16" O.C.	33'-1"	34'-4"	NP	NP	NP	NP	27'-2"	27'-2"
80OS125-43	12" O.C.	36'-5"	37'-6"	NP	NP	NP	NP	29'-8"	29'-8"

- NOTES
- STUD SPACING SHALL BE 16" O.C. UNLESS NOTED OTHERWISE.
 - ALL STUDS SHALL BE "C" TYPE STUDS WITH A 1 1/4" FLANGE MINIMUM.
 - DOUBLE STUDS AT SIDE OF OPENINGS ARE NOT ALLOWED TO BE CUT. MINIMUM GAGE OF STUDS AT SIDE OF OPENINGS TO BE 20 GA. AS LONG AS THE HEIGHT FALLS WITHIN THE LIMITS AS SET FORTH IN THE ALLOWABLE STEEL STUD HEIGHTS.
 - ALL TOP AND BOTTOM TRACKS WILL BE A MINIMUM OF ONE LEVEL OF THICKNESS HIGHER THAN THE STUDS SECURED TO IT. THE MINIMUM THICKNESS SHALL BE 33 MIL (20 GA) UNO.
18 MIL (25 GA) STUDS = 33 MIL (20 GA) TRACKS
43 MIL (18 GA) STUDS = 43 MIL (18 GA) TRACKS
54 MIL (16 GA) STUDS = 54 MIL (16 GA) TRACKS
EXAMPLE - IF YOU HAVE A 18 MIL (25 GA) STUD WALL WITH AN OPENING USING 33 MIL (20 GA) STUDS AROUND THE OPENING - A 33 MIL (20 GA) TRACK WILL BE REQUIRED.
 - ALL DOUBLE STUDS AT OPENINGS, HEADERS, AND SILLS WILL BE A MINIMUM OF ONE LEVEL OF THICKNESS HIGHER THAN THE STUDS ADJACENT TO IT. THE MINIMUM THICKNESS SHALL BE 33 MIL (20 GA) UNO.
18 MIL (25 GA) STUDS = 33 MIL (20 GA) TRACKS
33 MIL (20 GA) STUDS = 43 MIL (18 GA) TRACKS
43 MIL (18 GA) STUDS = 54 MIL (16 GA) TRACKS

- ALLOWABLE STEEL STUD CELING SPANS L/360
- | STUD MEMBER
SEE NOTE 1 | SPACING | 1 LAYER OF GYP BD
SEE NOTE 2 | 2 LAYERS OF GYP BD
SEE NOTE 2 |
|---------------------------|----------|---|---|
| | | LATERAL SUPPORT OF COMPRESSION FLANGE
UNINSUPPORTED MID SPAN | LATERAL SUPPORT OF COMPRESSION FLANGE
UNINSUPPORTED MID SPAN |
| 162S137-33 | 24" O.C. | 7'-5" | 6'-6" |
| | 16" O.C. | 8'-6" | 7'-5" |
| 25OS162-33 | 12" O.C. | 9'-4" | 8'-2" |
| | 24" O.C. | 10'-10" | 9'-5" |
| 25OS162-43 | 16" O.C. | 12'-5" | 10'-10" |
| | 12" O.C. | 13'-5" | 11'-11" |
| 362S162-33 | 24" O.C. | 11'-9" | 10'-3" |
| | 16" O.C. | 13'-6" | 11'-9" |
| 362S162-43 | 12" O.C. | 14'-10" | 13'-2" |
| | 24" O.C. | 12'-2" | 10'-11" |
| 40OS162-33 | 16" O.C. | 13'-7" | 12'-2" |
| | 12" O.C. | 14'-8" | 13'-2" |
| 40OS162-43 | 24" O.C. | 13'-4" | 11'-11" |
| | 16" O.C. | 14'-11" | 13'-4" |
| 60OS162-33 | 12" O.C. | 16'-2" | 14'-5" |
| | 24" O.C. | 12'-6" | 10'-3" |
| 60OS162-43 | 16" O.C. | 13'-11" | 12'-6" |
| | 12" O.C. | 15'-1" | 13'-6" |
| 80OS162-43 | 24" O.C. | 15'-1" | 12'-2" |
| | 16" O.C. | 16'-11" | 13'-8" |
| 80OS162-43 | 12" O.C. | 18'-4" | 16'-5" |
| | 24" O.C. | 15'-2" | 12'-10" |
| 80OS162-43 | 16" O.C. | 16'-11" | 13'-8" |
| | 12" O.C. | 18'-4" | 16'-5" |
- NOTES
- STUD IDENTIFICATION
CHARACTERS 1-3 = MEMBER DEPTH (362 = 3 5/8")
CHARACTER 4 = STYLE (S = C-STUD/JOIST)
CHARACTERS 5-7 = FLANGE WIDTH (025 = 1 1/4")
CHARACTERS 8-9 = MATERIAL THICKNESS IN MILS
FOR REFERENCE ONLY GAUGE NO = 33 MILS = 20 G 43 MILS = 18 GA
2. GYPSUM BOARD USED FOR THIS TABLE TO BE 5/8" ON 1 SIDE OF THE STEEL STUDS.
3. MINIMUM THICKNESS OF STUDS FOR SUPPORT OF CERAMIC TILE SHALL BE 33 MILS (20 GAUGE) - ACTUAL THICKNESS WILL BE DETERMINED BY THE HEIGHT OF THE STUD.
4. NOT ALL POSSIBLE OPTIONS OF STEEL STUDS ARE SHOWN IN THIS TABLE. ALL OTHER VARIATIONS ARE TO BE REVIEWED AND APPROVED BY THE ARCHITECT OR STRUCTURAL ENGINEER.
5. 25 GAUGE STUDS ARE NOT PERMITTED
 - STUD SPACING SHALL BE 16" O.C. UNLESS NOTED OTHERWISE.
 - ALL STUDS SHALL BE "C" TYPE STUDS WITH A 1 1/4" FLANGE MIN.
 - DOUBLE STUDS AT SIDE OF OPENINGS ARE NOT ALLOWED TO BE CUT. MIN. GAUGE OF STUDS AT SIDE OF OPENINGS TO BE 20 GA. AS LONG AS THE HEIGHT FALLS WITHIN THE LIMITS AS SET FORTH IN THE ALLOWABLE STEEL STUD HEIGHTS.
 - ALL TOP AND BOTTOM TRACKS WILL BE A MINIMUM OF ONE LEVEL OF THICKNESS HIGHER THAN THE STUDS SECURED TO IT. THE MIN. THICKNESS SHALL BE 33 MIL (20 GAUGE) UNLESS NOTED OTHERWISE.
18 MIL (25 GAUGE) STUDS = 33 MIL (20 GAUGE) TRACKS
33 MIL (20 GAUGE) STUDS = 43 MIL (18 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS



D5 METAL FRAMING - BYPASS SIDE CLIP
1 1/2" = 1'-0"



C5 METAL FRAMING - SLOTTED TOP TRACK
1 1/2" = 1'-0"

ALLOWABLE STEEL STUD CELING SPANS L/360									
STUD MEMBER SEE NOTE 1	SPACING	1 LAYER OF GYP BD SEE NOTE 2	2 LAYERS OF GYP BD SEE NOTE 2						
		LATERAL SUPPORT OF COMPRESSION FLANGE UNINSUPPORTED MID SPAN	LATERAL SUPPORT OF COMPRESSION FLANGE UNINSUPPORTED MID SPAN						
162S137-33	24" O.C.	7'-5"	6'-6"						
	16" O.C.	8'-6"	7'-5"						
25OS162-33	12" O.C.	9'-4"	8'-2"						
	24" O.C.	10'-10"	9'-5"						
25OS162-43	16" O.C.	12'-5"	10'-10"						
	12" O.C.	13'-5"	11'-11"						
362S162-33	24" O.C.	11'-9"	10'-3"						
	16" O.C.	13'-6"	11'-9"						
362S162-43	12" O.C.	14'-10"	13'-2"						
	24" O.C.	12'-2"	10'-11"						
40OS162-33	16" O.C.	13'-7"	12'-2"						
	12" O.C.	14'-8"	13'-2"						
40OS162-43	24" O.C.	13'-4"	11'-11"						
	16" O.C.	14'-11"	13'-4"						
60OS162-33	12" O.C.	16'-2"	14'-5"						
	24" O.C.	12'-6"	10'-3"						
60OS162-43	16" O.C.	13'-11"	12'-6"						
	12" O.C.	15'-1"	13'-6"						
80OS162-43	24" O.C.	15'-1"	12'-2"						
	16" O.C.	16'-11"	13'-8"						
80OS162-43	12" O.C.	18'-4"	16'-5"						
	24" O.C.	15'-2"	12'-10"						
80OS162-43	16" O.C.	16'-11"	13'-8"						
	12" O.C.	18'-4"	16'-5"						

NOTES

- STUD IDENTIFICATION
CHARACTERS 1-3 = MEMBER DEPTH (362 = 3 5/8")
CHARACTER 4 = STYLE (S = C-STUD/JOIST)
CHARACTERS 5-7 = FLANGE WIDTH (025 = 1 1/4")
CHARACTERS 8-9 = MATERIAL THICKNESS IN MILS
FOR REFERENCE ONLY GAUGE NO = 33 MILS = 20 G 43 MILS = 18 GA
2. GYPSUM BOARD USED FOR THIS TABLE TO BE 5/8" ON 1 SIDE OF THE STEEL STUDS.
3. MINIMUM THICKNESS OF STUDS FOR SUPPORT OF CERAMIC TILE SHALL BE 33 MILS (20 GAUGE) - ACTUAL THICKNESS WILL BE DETERMINED BY THE HEIGHT OF THE STUD.
4. NOT ALL POSSIBLE OPTIONS OF STEEL STUDS ARE SHOWN IN THIS TABLE. ALL OTHER VARIATIONS ARE TO BE REVIEWED AND APPROVED BY THE ARCHITECT OR STRUCTURAL ENGINEER.
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18 MIL (25 GAUGE) STUDS = 33 MIL (20 GAUGE) TRACKS
33 MIL (20 GAUGE) STUDS = 43 MIL (18 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS
43 MIL (18 GAUGE) STUDS = 54 MIL (16 GAUGE) TRACKS

CENTER STREET ARCHITECTS
170 E. CENTER STREET
LOGAN, UTAH 84321
CENTERSTREETARCH.COM

STATE OF UTAH
J. CHRISTIAN WILSON
#5050453
09/09/2024
LICENSED ARCHITECT

MELLE DETTENMAIER 435.890.2009
CHRISTIAN WILSON 435.232.8662

FRAMING DETAILS			
TITLE	PROJECT	CLIENT	ADDRESS
	ENGINEERING LAB ROOM 140- RESTROOM REMODL	UTAH STATE UNIVERSITY	4110 OLD MAIN HILL, LOGAN, UT 84321

170 E, CENTER STREET
LOGAN, UTAH 84321
CENTERSTREETARCH.COM



MELLE DETTENMAIER 435.890.2009
CHRISTIAN WILSON 435.232.8662

<p>B2 METAL FRAMING - TYPICAL PUTTY SEAL</p> <p>A501 1 1/2" ≈ 1'-0"</p>	<p>B3 METAL FRAMING - STEEL STUDS EXTENDED TO CEILING HEIGHT</p> <p>A501 3/8" ≈ 1'-0"</p>

Technical drawing of a wall section showing various door and window openings, structural details, and annotations.

Annotations:

- D2 A501 OR D2 A500 @ NON-FIRE RATED & NON-SOUND WALLS
- ABOVE CEILING OPENING
- LARGE ABOVE CEILING OPENING
- A1 A500
- OPENING ABOVE CEILING WHICH INTERRUPTS LOWER OPENINGS JAMB STUDS
- UNDERSIDE OF SLAB, FLOOR OR ROOF DECK CEILING LINE
- 2" WIDE METAL STRAP THICKNESS TO MATCH TRACK
- 3" DEEP TOP TRACK SEE NOTE 4
- DOOR OPENING
- A1 A500
- DOUBLE DOOR OPENING
- D4 A500
- DOUBLE STUDS
- PUTTY PACK AROUND ELECTRICAL BOXES TYP. @ FIRE RATED & SOUND WALLS
- B1 A500
- A1 A500
- BELOW CEILING OPENING
- LARGE B1 BELOW A500 CEILING OPENING
- DOUBLE STUDS
- DOUBLE STUDS
- DOUBLE STUDS
- DOOR OPENING
- A1 A500
- D4 A500
- BOTTOM TRACK SEE NOTE 4
- FLOOR LINE
- DOUBLE STUDS

Dimensions:

- 4'-3" MAX.
- 8'-3" MAX.
- 4'-3" MAX.
- 4'-3" MAX.
- 8'-3" MAX.
- 8'-3" MAX.
- 8'-3" MAX.
- 4'-3" MAX.

Other Labels:

- L MIN.
- DOUBLE STUDS
- D3 A501

2	3	4	5
---	---	---	---

TITLE	FRAMING DETAILS
PROJECT	ENGINEERING LAB
CLIENT	UTAH STATE UNIVER
ADDRESS	4110 OLD MAIN HIL

REVISIONS		
NO.	DATE	DESCRIPTION

DATE: 4/17/2025 10:17:36 AM
JOB NO: 24103 - USU ENG BLDG
SCALE: As indicated
DRAWN: Author

SHEET

A501

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SPECIFICATIONS ARCHITECTURAL ONLY	PROJECT LOCATION: UTAH STATE UNIVERSITY CAMPUS PROJECT DESCRIPTION: ENGINEERING LAB ROOM 140 RESTROOM REMODEL		
	ARCHITECT: CENTER STREET ARCHITECTS, LLC 170 EAST CENTER STREET LOGAN, UTAH 84321 mello@centerstreetarch.com 435.232.8662		
	INSTRUCTIONS TO BIDDERS: CAREFULLY EXAMINE SPECIFICATIONS, AND DRAWINGS, AS WELL AS ALL OF THE CONDITIONS AFFECTING THE WORK. THE GENERAL CONTRACTOR AND ALL SUB CONTRACTORS SHALL FULLY UNDERSTAND AND ALL PROVISIONS CONTAINED IN THESE DOCUMENTS AND AGREE TO DO ALL THAT IS CALLED FOR BY THEM, INCLUDING FURNISHING ALL NECESSARY LABOR AND MATERIALS TO SUPPLY AND INSTALL WORK OF EACH DIVISION OF THE WORK, OR ITEM FOR WHICH A COST IS GIVEN TO PROVIDE A COMPLETE INSTALLATION.		
	I. GENERAL CONDITIONS A. PERMITS: THE GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL OBTAIN AND APPLY FOR ALL , LICENSES, CERTIFICATES, INSPECTIONS REQUIRED BY LAW, BOTH PERMANENT AND TEMPORARY, AND MAINTAIN COPIES OF ALL PERMITS ON THE JOB SITE AT ALL TIMES. B. CHANGES FROM ORIGINAL PLANS: 1. THE OWNER RESERVES THE RIGHT TO MAKE ANY DESIRED CHANGE IN PLANS AND SPECIFICATIONS WHILE UNDER CONTRACT. HOWEVER, THE CHANGES MADE, MAY ADJUST THE PRICE (ADDED OR DEDUCTED) TO THE ORIGINAL CONTRACT PRICE. THE ADJUSTED PRICE SHALL BE AGREED UPON BETWEEN THE OWNER AND THE CONTRACTOR AND ENDORSED UPON ORIGINAL CONTRACT. WHEN BOTH PARTIES AGREE THERETO, IT SHALL IN NO WAY INVALIDATE OR MAKE VOID THE ORIGINAL TERMS. 2. THE OWNER, WITHOUT INVALIDATING THE CONTRACT, MAY REQUEST EXTRA WORK OR MAKE CHANGES BY ALTERING, ADDING TO OR DEDUCTING FROM THE WORK. THE CONTRACT SUM WILL THEN BE ADJUSTED ACCORDINGLY. ALL SUCH WORK SHALL BE EXECUTED UNDER THE CONDITIONS OF THE ORIGINAL CONTRACT. ANY CLAIM FOR EXTENSION OF TIME CAUSED THEREBY, SHALL BE ADJUSTED IN ONE OR MORE OF THE FOLLOWING WAYS: CHANGE ORDER, & COSTS FOR EXTENSIONS INCLUDED IN PROPOSAL. A. BY ESTIMATE AND ACCEPTANCE IN A LUMP SUM. B. BY COST AND PERCENTAGE, OR BY COST AND FIXED FEE. 3. IF THE CONTRACTOR CLAIMS THAT ANY INSTRUCTIONS BY DRAWINGS OR OTHERWISE INVOLVE EXTRA COST UNDER THIS CONTRACT, THE CONTRACTOR SHALL GIVE THE OWNER WRITTEN NOTICE THEREOF WITHIN A REASONABLE TIME AFTER THE RECEIPT OF SUCH INSTRUCTIONS. C. BROOM CLEAN, CONTRACTOR SHALL REMOVE STAINS, SPOTS, MARKS, AND DIRT FROM COMPLETED WORK. WASH CONCRETE FLOORS, CLEAN AND WAX ALL RESILIENT FLOORS, CLEAN ALL GLASS. CONTRACTOR SHALL COMPLY WITH ALL SPECIAL CLEANING INSTRUCTIONS IN THE SPECIFICATIONS AND/OR MANUFACTURERS INSTRUCTIONS. D. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE COMPLEMENTARY. SPECIFIC INFORMATION MAY BE FOUND IN EITHER OR BOTH. E. WHEN A CONTRACTOR IS ALLOWED A SUBSTITUTION, HE/SHE WILL COVER THE ENTIRE EXPENSE OF THE SUBSTITUTION, INCLUDING WORK AND EXPENSES OF OTHER CONTRACTORS CAUSED BY THE SUBSTITUTION.		
	DIVISION - 01 00 00 - GENERAL REQUIREMENTS		
	SECTION - 01 01 00 - GENERAL CONDITIONS		
	1.1 LAY OUT WORK: A. LOCATE ALL EXISTING UTILITY SERVICE LINES AND PROTECT THROUGHOUT CONSTRUCTION PERIOD. B. CONTRACTOR TO LAY OUT WORK AND BE RESPONSIBLE FOR ALL LINES, MEASUREMENTS OF THE BUILDING, UTILITIES, AND OTHER WORK EXECUTED UNDER THE CONTRACT. 1.2 EXAMINATION: A. ANY DISCREPANCIES, ERRORS, OR OMISSIONS DISCOVERED IN THE CONTRACT DOCUMENTS BY THE CONTRACTOR SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER BEFORE PROCEEDING WITH RELATED WORK, OTHERWISE THE CORRECTION OF SUCH ITEMS IS THE RESPONSIBILITY OF THE CONTRACTOR. 1.3. CODES AND STANDARDS A. ALL WORK, MATERIALS, AND INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH ALL CODIFIED ORDINANCES, THE APPLICABLE STATE CODE, AND THE CITY/COUNTY'S BUILDING CODE, LATEST EDITIONS. 1.4 TEMPORARY FACILITIES: A. TEMPORARY OFFICE: AS REQUIRED BY REQUIRED BY CONTRACTOR. SAFETY AND FIRE PROTECTION IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR; PROVIDE THE FOLLOWING: 1. SCHEDULE MEANS OF SAFETY AND FIRE PROTECTION FOR BUILDING, ALL MATERIALS, AND PERSONNEL PRIOR TO START OF WORK. METHODS AND EQUIPMENT SUBJECT TO THE APPROVAL OF THE BUILDING OFFICIAL. 2. COMPLY WITH ALL APPLICABLE PROVISION OF MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION, ISSUED BY THE ASSOCIATION OF GENERAL CONTRACTORS OF AMERICA, INC. 3. ALLOW NO WELDING TO BE PERFORMED BY ANY CONTRACTOR OR SUBCONTRACTOR UNLESS AN APPROVED FIRE EXTINGUISHER IS IMMEDIATELY ADJACENT TO THE WORK. END OF SECTION - 01 01 00		
	SECTION - 01 18 00 PROJECT UTILITY SOURCES TEMPORARY UTILITIES: THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH AVAILABLE UTILITY(S) FOR TEMPORARY CONNECTIONS AND BEAR ALL COSTS FOR THESE UTILITIES. ON THE CAMPUS PROPER AND SOME PERIPHERAL AREAS THE UTILITIES ARE UNIVERSITY UTILITIES AND THE CONTRACTOR SHALL MAKE ARRANGEMENTS THROUGH FD&C FOR CONNECTIONS. THE CONTRACTOR SHALL PROVIDE AND INSTALL METERS FOR MEASURING USE OF UTILITIES PURCHASED FROM UTAH STATE UNIVERSITY. FD&C SHALL READ OR HAVE THE METERS READ AT THE BEGINNING OF THE PROJECT, MONTHLY, AND AT THE END OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITY COSTS INCLUDING THOSE FROM THE UNIVERSITY. END OF SECTION - 01 18 00		
	SECTION - 01 31 00 PROJECT MANAGEMENT AND COORDINATION GENERAL: THE FOLLOWING REQUIREMENTS SHALL BE INCORPORATED IN THE CONTRACT DOCUMENTS. A. A. SCHEDULES: FOR USU DELEGATED AND CAPITAL IMPROVEMENT PROJECTS, THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION SCHEDULE WITH EACH PAY REQUEST. PAY REQUESTS W/O SCHEDULES WILL NOT BE PROCESSED. THE CONTRACTOR SHALL DELIVER THIS SCHEDULE AND PAY REQUEST TO THE CONSULTANT FIRST. THE CONSULTANT SHALL REVIEW THE PAY REQUEST TO VERIFY ACCURACY AND AMOUNT COMPLETED. CONSULTANT WILL THEN TRANSMIT TO THE USU FD&C CONSTRUCTION COORDINATOR FOR APPROVAL AND PAYMENT. B. PROGRESS MEETINGS: THE CONTRACTOR SHALL BE IN CHARGE OF THE CONSTRUCTION PROGRESS MEETINGS, SET THE AGENDA AND TAKE MINUTES OF THE MEETING. THE MEETING OR SHALL DISTRIBUTE COPIES OF THE AGENDA AND MINUTES TO FACILITIES DESIGN & CONSTRUCTION, AND THE CONSULTANT PRIOR TO EACH MEETING. THE AGENDA FOR WEEKLY SCHEDULED PROGRESS MEETINGS SHALL COVER THE FOLLOWING: 1. PROBLEMS AND POTENTIAL FIELD ORDERS OR CHANGE ORDERS, PROPOSAL REQUESTS, AND RFIS. 2. UPDATE OF THE CONSTRUCTION SCHEDULE. 3. WORK COMPLETED DURING THE LAST WEEK. 4. ITEMS TO BE COMPLETED DURING THE NEXT WEEK WITH ASSIGNMENTS END OF SECTION - 01 31 00		
	SECTION - 01 35 00 SPECIAL PROCEDURES		
	A. GENERAL: THE FOLLOWING REQUIREMENTS SHALL BE INCORPORATED IN THE CONTRACT DOCUMENTS. 1. UTILITIES MAPPING: THE CONTRACTOR SHALL NOTIFY FD&C FORTY-EIGHT (48) HOURS BEFORE BACK FILLING ANY SITE UTILITY EXCAVATIONS TO ALLOW FOR THE MAPPING OF NEW AND EXISTING UTILITIES BY THE		

DIVISION - 01 00 00 - GENERAL REQUIREMENTS		
SECTION - 01 35 00 SPECIAL PROCEDURES (CONT.)		
UNIVERSITY. THIS APPLIES TO ALL SITE EXCAVATIONS IN WHICH UTILITY LINES ARE ENCOUNTERED. UTILITY MAPPING BY THE UNIVERSITY DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF PREPARING AS-BUILT DRAWINGS OF UTILITY WORK PERFORMED UNDER CONTRACT. 1. UTILITY AS-BUILT SYSTEMS: CONSTRUCTION DOCUMENTS SHALL REQUIRE CONTRACTOR TO GIVE 7 DAYS ADVANCED NOTICE OF REQUIRED SHUT DOWNS IN WRITING. 2. SITE DUST CONTROL: PROVIDE EFFECTIVE DUST CONTROL MEASURES IN ALL REMODELING AREAS. SITE DUST CONTROL IS REQUIRED PER EPA REGULATIONS. 3. CONTRACT LIMITS: THE LIMITS OF RESPONSIBILITY FOR THE CONTRACTOR AND THE CONSULTANT SHALL INCLUDE ALL IMPACTED ADJACENT UNIVERSITY PROPERTY INCLUDING LANDSCAPE AREAS, SIDEWALKS, ROADWAYS, PARKING LOTS, AND UTILITIES. SUCH EXTENDED AREAS WILL BE SHOWN ON THE DRAWINGS AND INDICATE THAT THE CONTRACTOR HAS RESPONSIBILITY TO MAINTAIN AND RESTORE AFFECTED AREAS. CONTRACTOR'S USE OF BUILDING EQUIPMENT: THE CONTRACTOR MAY HAVE LIMITED USE OF BUILDING EQUIPMENT SUCH AS ELECTRIC MOTORS, BLOWERS, HEAT EXCHANGERS, FILTERS, LIGHTING FIXTURES, RESTROOM FACILITIES, ETC., WITH THE PERMISSION OF FD&C. ELEVATORS MAY BE USED DURING CONSTRUCTION ONLY WITH PERMISSION. END OF SECTION - 01 35 00		
SECTION - 01 41 00 REGULATORY REQUIREMENTS		
A. GENERAL: THE FOLLOWING REQUIREMENTS SHALL BE INCORPORATED IN THE CONTRACT DOCUMENTS. 1. PERMITS: a. BUILDING PERMITS ARE NOT REQUIRED ON THE UNIVERSITY CAMPUS OR FOR CONNECTION TO UNIVERSITY UTILITIES. SEE DESIGN CRITERIA FOR SPECIFIC REVIEW AND APPROVAL PROCESS. DIGGING PERMITS ARE REQUIRED FOR ANY EXCAVATION, INCLUDING UTILITY INSTALLATION, INTERRUPTION, SHUT-OFF OR OUTAGE, ETC. THEY ARE OBTAINED THROUGH FD&C AND REQUIRE A MINIMUM OF FORTY-EIGHT (48) HOURS NOTICE DURING USU WORKING HOURS. b. CAMPUS RESTRICTIONS: THE FOLLOWING SHALL APPLY DURING CONSTRUCTION: 1. ABIDE BY ALL POSTED CAMPUS REGULATIONS IN REGARD TO TRAFFIC, PARKING, SMOKING, NOISE, ETC. 2. ALL TRASH AND RECYCLING IS TO BE HAULED FROM CAMPUS TO A LEGAL DISPOSAL SITE. AT NO TIME SHALL ON-SITE BURNING BE ALLOWED. DO NOT USE UNIVERSITY DUMPSTERS FOR TRASH DISPOSAL. 3. CLASS SCHEDULES SHOULD BE OBSERVED TO AVOID UNDUE DISTURBANCES. 4. PARKING PERMITS ARE REQUIRED FOR ANY PARKING OUTSIDE THE CONTRACT LIMIT LINES. 5. CONSULTANTS AND CONTRACTORS PERFORMING WORK FOR USU ARE SUBJECT TO FEDERAL AND STATE LAWS REGARDING AFFIRMATIVE ACTION, EQUAL EMPLOYMENT OPPORTUNITY, AND SEXUAL HARASSMENT. DURING CONSTRUCTION OF THE PROJECT THE CONTRACTOR SHALL LIMIT NOISE FROM THE SITE AS MUCH AS POSSIBLE. LOCAL SOUND ORDINANCES ARE IN EFFECT. COORDINATE WITH FACILITIES DESIGN AND CONSTRUCTION FOR APPROPRIATE TIMES TO USE LOUD EQUIPMENT SUCH AS JACKHAMMERS OR SHOT-NAILERS. RADIOS AND OTHER DEVICES WILL NOT BE PERMITTED ON-SITE. C. TEMPORARY UTILITIES: 1. 1. ELECTRICAL: a. WHERE COMMERCIAL POWER IS NOT READILY AVAILABLE, UTAH STATE UNIVERSITY MAY AT THEIR OPTION PROVIDE ELECTRIC POWER TO A TEMPORARY SERVICE. THE CONTRACTOR SHALL PROVIDE HIS OWN SERVICES FROM THE SERVICE DROP. DISCONNECT, METER READINGS AT THE TIME OF METER INSTALLATION SHALL BE OBSERVED BY THE CONTRACTOR'S REPRESENTATIVE. WHEN PERMANENT ELECTRIC POWER IS INSTALLED IN THE BUILDING AND THE BUILDING SYSTEM HAS BEEN INSPECTED AND APPROVED AS OPERATIONAL, THE TEMPORARY SERVICE MAY BE REMOVED AT THE CONTRACTOR'S REQUEST. POWER SYSTEM SHALL NOT BE ENERGIZED BEFORE THE MAIN SWITCHBOARD IS INSPECTED BY USU AND THE METERING SYSTEM IS CORRECTLY INSTALLED. b. THE CONTRACTOR SHALL BE BILLED FOR ELECTRICAL POWER CONSUMED ON BOTH THE TEMPORARY AND PERMANENT POWER SYSTEMS UNTIL FINAL ACCEPTANCE OF THE COMPLETE CONTRACT. D. CULINARY WATER: 1. THE CONTRACTOR SHALL PROVIDE A SOURCE OF CULINARY WATER ON THE SITE. 2. THE SITE OR BUILDING PERMANENT CULINARY WATER MAY BE USED ON THE PROJECT AFTER PERMANENT CONNECTION AND METER(S) ARE INSTALLED AND THE LINES ARE TESTED, INSPECTED AND FLUSHED. FIRE SERVICE CONNECTIONS AND LINES SHALL NOT BE USED FOR SITE WATER. THE CONTRACTOR WILL BE BILLED FOR ALL CULINARY WATER USED ON SITE UNLESS OTHER ARRANGEMENTS ARE MADE AT THE BEGINNING OF THE WORK BY USU FD&C. E. STEAM AND CONDENSATE: 1. THE CONTRACTOR SHALL PROVIDE A SOURCE OF HEAT FOR THE SITE DURING CONSTRUCTION THAT WILL NOT ADD UNNECESSARY MOISTURE TO THE INTERIOR. 2. THE SITE OR BUILDING PERMANENT STEAM AND CONDENSATE MAY BE USED ON THE PROJECT AFTER PERMANENT CONNECTION AND METER(S) IS INSTALLED AND THE LINES ARE TESTED, INSPECTED AND FLUSHED. 3. THE CONTRACTOR WILL BE BILLED FOR ALL STEAM (CONDENSATE) USED ON SITE UNLESS OTHER ARRANGEMENTS ARE MADE AT THE BEGINNING OF THE WORK BY FD&C. F. NATURAL GAS 1. THE CONTRACTOR MAY PROVIDE A SOURCE OF NATURAL GAS FOR THE SITE. 2. THE SITE OR BUILDING PERMANENT NATURAL GAS MAY BE USED ON THE PROJECT AFTER PERMANENT CONNECTION AND METER(S) IS INSTALLED AND THE LINES ARE TESTED, INSPECTED. 3. THE CONTRACTOR WILL BE BILLED FOR ALL NATURAL GAS USED ON SITE UNLESS OTHER ARRANGEMENTS ARE MADE AT THE BEGINNING OF THE WORK BY FD&C. G. TELEPHONE AND DATA 1. 1. WITHIN THE UNIVERSITY SERVICE AREA, HARD LINE AND/OR DATA SERVICE IS TO BE ORDERED THROUGH THE LOCAL TELEPHONE COMPANY AND THEN ARRANGED FOR SERVICE TO THE CONSTRUCTION SITE THROUGH ON CAMPUS CABLES THROUGH THE USU IT DEPARTMENT. END OF SECTION - 01 41 00		
SECTION - 01 52 00 CONSTRUCTION FACILITIES		
A. CONSTRUCTION OFFICE: CONSTRUCTION OFFICE FOR THE USE OF THE CONSULTANT AND USU SHALL BE PROVIDED BY CONTRACTOR. CONSTRUCTION OFFICE SHALL INCLUDE A TABLE WITH 12 CHAIRS, A PLAN RACK, A PLAN TABLE, AND A TWO DRAWER FILE. THIS OFFICE SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL HAVE DATA, HEAT AND AIR CONDITIONING; IT SHALL BE MAINTAINED IN CLEAN CONDITION. B. SANITARY FACILITIES: THE CONTRACTOR SHALL PROVIDE TEMPORARY SANITATION FACILITIES FOR THE PROJECT. SECTION - 01 53 00 TEMPORARY CONSTRUCTION A. A. WHEN ROUTING PEDESTRIANS AROUND AN AREA OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TEMPORARY WALKING SURFACES ACROSS EXISTING LANDSCAPED AREAS. THESE SURFACES SHALL BE CONSTRUCTED OF A DURABLE MATERIAL WITH A SLIP-RESISTANT SURFACE. THE USE AND PLACEMENT OF TEMPORARY WALKING SURFACES SHALL BE APPROVED IN ADVANCE BY FD&C. THE CONTRACTOR SHALL RESTORE ALL LANDSCAPED AREAS DAMAGED BY THE PLACEMENT AND USE OF THE WALKWAYS. THE CONTRACTOR SHALL ALSO RESTORE LANDSCAPE DAMAGED BY PEDESTRIANS ROUTED OVER EXISTING LANDSCAPE TO AVOID CONSTRUCTION.		

DIVISION - 01 00 00 - GENERAL REQUIREMENTS		
SECTION - 01 55 00 VEHICULAR ACCESS AND PARKING		
A. INDICATE ON THE CONSTRUCTION DRAWINGS ACCESS ROUTES TO JOB SITE THROUGH THE CAMPUS FOR CONCRETE TRUCKS, DELIVERY TRUCKS AND OTHER VEHICLES CONCERNED WITH THE PROJECT. DETERMINE THESE ROUTES WITH FD&C. ANY DAMAGE TO THESE AREAS SHALL BE REPAIRED BY THE CONTRACTOR UPON COMPLETION OF THE PROJECT. END OF SECTION - 01 55 00		
SECTION - 01 56 00 TEMPORARY BARRIERS AND ENCLOSURES		
A. OPEN EXCAVATIONS OUTSIDE OF CONSTRUCTION FENCES SHALL BE PROTECTED BY 6 FOOT HIGH SCREENED LINK FENCING IN GOOD REPAIR. INSTALL FENCING IN STRAIGHT, TRUE LINES. FENCING SHALL NOT EXTEND INTO PEDESTRIAN WALKWAY, AND SHALL NOT CREATE A SAFETY HAZARD. GATES SHALL BE LOCKED WITH THE CONTRACTOR'S LOCK AND APPROPRIATE UNIVERSITY LOCKS IN A MANNER TO ALLOW THE UNIVERSITY EMERGENCY VEHICLE ACCESS AT ANY TIME. UNIVERSITY LOCKS ARE OBTAINABLE FROM THE UNIVERSITY POLICE OR FIRE MARSHAL. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL DISMANTLE THE FENCE AND REMOVE IT FROM SITE. WHEN PEDESTRIANS ARE ROUTED AROUND CONSTRUCTION AREAS ADDITIONAL BARRICADES WILL BE REQUIRED TO PREVENT DAMAGE TO ADJACENT LANDSCAPED AREAS. BARRICADES SHALL BE PLACED TO ROUTE PEDESTRIANS AROUND AFFECTED AREAS USING EXISTING PAVED SURFACES. THESE BARRICADES SHALL BE CONSTRUCTED AS DESCRIBED ABOVE. END OF SECTION -01 55 00		
SECTION - 01 67 00 TRANSFERRING ITEMS		
A. THE CONTRACTOR SHALL TRANSFER ALL DELIVERABLES THROUGH THE CONSULTANT TO THE UNIVERSITY. ALL CONTRACTOR SUPPLIED ITEMS TRANSFERRED TO THE UNIVERSITY SHALL BE ACCOMPANIED BY A LETTER OF TRANSMITTAL SIGNED BY AN AUTHORIZED AGENT AND DELIVERED TO FD&C AS A RECORD COPY BY THE CONSULTANT. AS-BUILTS, OPERATIONS AND MAINTENANCE MANUALS, GUARANTEES, SALVAGED EQUIPMENT, EXTRA OR SERVICE PARTS OR OTHER SIMILAR TYPE ITEMS SHOULD BE HANDLED IN THIS WAY TO AVOID MISUNDERSTANDINGS OF WHAT HAS BEEN TRANSFERRED AND WHEN IT WAS TRANSFERRED. THE CONSULTANT SHALL VERIFY THAT THE CORRECT QUANTITIES OF ALL MAINTENANCE STOCK ITEMS ARE TRANSFERRED. END OF SECTION - 01 67 00		
SECTION - 01 77 00 CLOSEOUT PROCEDURES		
A. A. GENERAL: THE FOLLOWING REQUIREMENTS SHALL BE INCORPORATED IN THE CONTRACT DOCUMENTS. B. DOCUMENTS: 1. SUBSTANTIAL COMPLETION: A SUBSTANTIAL COMPLETION CERTIFICATE SHALL NOT BE ISSUED UNTIL THE UNIVERSITY MAY OCCUPY THE BUILDING. THE ATTORNEY GENERAL HAS CLARIFIED THIS AS FOLLOWS: a. THAT ALL FIRE MARSHAL ITEMS ARE CLEARED AND A "CERTIFICATE OF FIRE CLEARANCE" IS ISSUED. b. THAT THE CONSULTANT HAS RECEIVED BALANCE REPORTS FROM THE CONTRACTOR. c. THAT ALL CORRECTION ITEMS HAVE BEEN SUBSTANTIALLY COMPLETED. 2. PRE-SUBSTANTIAL COMPLETION INSPECTION: THE CONSULTANT WILL SCHEDULE A PRE-SUBSTANTIAL COMPLETION INSPECTION. THE INSPECTION SHALL INCLUDE ALL CONSULTANTS, FD&C, BUILDING CODE OFFICIAL OR REPRESENTATIVE, AND OTHER INVITED UNIVERSITY REPRESENTATIVES. a. ALL INSPECTION REPORTS BY UNIVERSITY REPRESENTATIVES SHALL BE SUBMITTED TO FD&C WHO WILL PROVIDE THE CONSULTANT WITH COPIES OF THE REPORTS. THE CONSULTANT SHALL CHECK FOR CONFORMANCE TO THE CONTRACT DOCUMENTS. b. THE CONSULTANT SHALL ASSEMBLE ALL REPORTS FROM HIS CONSULTANTS AND THE UNIVERSITY REPRESENTATIVES AND DISTRIBUTE COPIES TO THE CONTRACTOR AND FD&C. 3. SUBSTANTIAL COMPLETION INSPECTION: THE SUBSTANTIAL COMPLETION INSPECTION WILL BE HELD AFTER COMPLETION OF THE ITEMS NOTED IN THE PRE-SUBSTANTIAL COMPLETION INSPECTION REPORT AND WHEN THE BUILDING IS READY FOR OCCUPANCY. THE SUBSTANTIAL COMPLETION INSPECTION WILL BE MADE WITH THE STATE FIRE MARSHAL, STATE AND UNIVERSITY OFFICIALS, THE CONSULTANT, AND THE CONTRACTOR. 4. FINAL METER READINGS: NOTIFY FACILITIES OPERATIONS TO MAKE FINAL METER READINGS FOR USU TEMPORARY AND PERMANENT UTILITIES. 5. UTILITY BILLINGS: PROVIDE PROOF OF CLEARANCE FROM USU FACILITIES OPERATIONS THAT ALL UTILITY BILLS HAVE BEEN PAID. 6. INSURANCE TERMINATION: ADVISE USU OF PENDING INSURANCE TERMINATION DATE. 7. TRAINING SESSION: THE CONTRACTOR SHALL PROVIDE A TRAINING SESSION TO UNIVERSITY PERSONNEL ON ALL MECHANICAL, ELECTRICAL, COMMUNICATION, ETC SYSTEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUBMIT TO FD&C AN ATTENDANCE LOG. THIS ATTENDANCE LOG SHALL INCLUDE ALL UNIVERSITY PERSONNEL PRESENT AT THE ABOVE TRAINING SESSION AND THEIR SIGNATURES. THE CONTRACTOR SHALL PROVIDE A VIDEO OF THE TRAINING SESSION TO FD&C. 8. DELIVERABLES: PRIOR TO FINAL PAYMENT, PROVIDE ONE COMPLETE ELECTRONIC SET OF OPERATION AND MAINTENANCE MANUALS AND WARRANTIES AS OUTLINED IN SECTION 01 78 23. THE CONTRACTOR SHALL ALSO PROVIDE ACCURATE AS-BUILT DRAWINGS FOR THE PURPOSE OF GENERATING A RECORD DRAWING SET AS OUTLINED IN SECTION 01 78 39. CONSULTANTS SHALL REVIEW THE SUBMITTALS FOR COMPLETENESS AND, WHERE APPLICABLE, INCORPORATE CHANGES IN THE RECORD DRAWINGS. THE CONSULTANT SHALL DELIVER COMPLETED O&M MANUALS, ORIGINAL AS-BUILT DOCUMENTS, AND RECORD DRAWINGS TO FD&C AT ONE TIME. THE CONSULTANT SHALL NOT RECEIVE FINAL PAYMENT UNTIL THE O&M DOCUMENTS, AS-BUILT AND RECORD DRAWINGS ARE RECEIVED AND APPROVED BY FD&C. END OF SECTION - 01 77 00		
SECTION - 01 78 23 OPERATION AND MAINTENANCE DATA		
A. ASSEMBLE A COMPLETE SET OF OPERATION AND MAINTENANCE MANUALS. O&M MANUALS SHALL BE COMPRISED OF THE FOLLOWING: 1. GENERAL CONTRACTOR AND SUBCONTRACTOR CONTACT INFORMATION. 2. WARRANTY INFORMATION. 3. MANUFACTURERS' INFORMATION SUBMITTED AS PART OF THE SHOP DRAWING REVIEW PROCESS. INCLUDE O&M DATA REQUIRED IN PROJECT SPECIFICATION SECTIONS. 4. INSTRUCTION FOR CARE AND MAINTENANCE SPECIFIC TO EACH PROVIDED SYSTEM OR COMPONENT. 5. PRODUCT DATA WITH CATALOG NUMBER, SIZE, COLOR AND OTHER INFORMATION NECESSARY TO IDENTIFY EACH SYSTEM OR COMPONENT PROVIDED. 6. TRANSMITTALS SHOWING FD&C'S ACCEPTANCE OF ALL EXTRA MATERIAL SPECIFIED. 7. ELECTRONIC FILES SHALL BE SUBMITTED IN PDF FORMAT: a. SEPARATE IN TO 3 MAJOR GROUPS AS FOLLOWS: - CONTRACTOR INFORMATION AND ARCHITECTURAL - SECTION - MECHANICAL - ELECTRICAL B. EACH PDF MUST INCLUDE BOOKMARK LINKED TO EACH SECTION WITH SUB BOOKMARKS FOR EACH SUBCATEGORY, PRODUCT MANUAL, AND PIECE OF EQUIPMENT. C. PDFS MUST HAVE TEXT RECOGNITION / OPTICAL CHARACTER RECOGNITION (OCR) ENABLE SO PDFS ARE SEARCHABLE. D. PDFS SHALL BE EDITABLE TO THE EXTENT THAT FILES AND PAGES CAN BE ADDED AND COMBINED, AND TEXT CAN BE COPIED. E. ALL PASSWORDS MUST BE REMOVED FROM FILES. END OF SECTION - 01 78 23		
SECTION - 01 78 39 PROJECT RECORD DOCUMENTS		
A. PHOTO RECORD OF PROJECT: THE CONTRACTOR SHALL PHOTOGRAPH ALL ABOVE CEILING DUCTWORK AND CONDUITS BEFORE THE INSTALLATION OF THE		

DIVISION - 01 00 00 - GENERAL REQUIREMENTS		
SECTION - 01 78 39 PROJECT RECORD DOCUMENTS (CONT.) CEILING SYSTEM, PHOTOGRAPH INFORMATION SHALL INCLUDE THE ROOM NUMBER, IDENTIFICATION OF THE DUCT OR CONDUIT, AND ITS LOCATION IN THE ROOM. THE PHOTO DOCUMENTATION SHALL BE DELIVERED TO USU FD&C AFTER COMPLETION OF ALL DUCT AND CONDUIT WORK. A. RECORD CALCULATIONS REQUIREMENTS: CONSULTANTS SHALL SUBMIT ONE (ONE) COMPLETE COPY OF ALL RECORD STRUCTURAL CALCULATIONS WHICH INCLUDE THE FOLLOWING: 1. ENGINEER'S STAMP W/ SIGNATURE AND DATE (NO ELECTRONIC REPRODUCTION OF ENGINEER'S SIGNATURE ACCEPTED) 2. A VALID/CURRENT UTAP STAMP 3. ENGINEERING FIRM'S PROJECT NO. 1. DESIGN CRITERIA: a. SEISMIC b. WIND c. SOILS d. GOVERNING CODE 2. DESIGN LOADS: a. ROOF DEAD AND SNOW LOADS - FLOOR DEAD AND LIVE LOADS - ALL OTHER MISC. DEAD AND LIVE LOADS b. CALCS SHALL BE INDEXED AND PAGES NUMBERED. c. ALL ENGINEERING ASSUMPTIONS TO BE CLEARLY NOTED. d. CALCS SHALL BE LEGIBLE. e. INCLUDE NAMES OF MANUFACTURER/SUPPLIERS OF ALL PROPRIETARY STRUCTURAL PRODUCTS AND COPIES OF THE PRODUCT TECHNICAL INFORMATION IN CALCS SUCH AS DECKING, HANGERS, JOISTS, ANCHORS, ETC. CALCS TO INCLUDE LABELED PICTURES, DIAGRAMS, PHOTOS, ETC. WHICH CLARIFY CALCULATIONS. g. CALCS TO BE PROFESSIONALLY BOUND AND SHALL HAVE PLASTIC COVERS ON FRONT AND BACK. 3. ONE COMPLETE COPY OF THE ENERGY MODEL IN ELECTRONIC FORMAT. 4. ONE COMPLETE COPY OF LEED DOCUMENTATION IN ELECTRONIC FORMAT. A. RECORD DRAWINGS: CONSULTANTS SHALL PROVIDE AN ACCURATE, COMPLETE B. RECORD SET OF THE PROJECT. 1. CADD INFORMATION SHALL BE PROVIDED IN THE FOLLOWING FORMATS): a. A. ADD A DWG FILE (RECORD DRAWING, NOT CONSTRUCTION) - NON STANDARD FONTS USED IN THE DRAWINGS (AUTOCAD, SHX) AND (TTF) - COMPILED SHAPE FILES - PLOT STYLE TABLES (CTB) - PLOTTER CONFIGURATION FILES - IMAGES (LOGOS, MAPS, ETC) - XREF FILES (ATTACHED OR BOUND) b. REVIT (IF EXISTS) - REVIT FILE - NAVISWORKS FILE 2. PDF: a. EACH SHEET SHALL BE A SEPARATE PDF FILE WITH THE FILE NAME BEING THE SHEET NAME (I.E.: A100.PDF) b. CONTRACTOR SUBMITTED AS-BUILT DOCUMENTS. c. ONCE COMPLETE SET OF PROJECT SHOP DRAWINGS.		
DIVISION - 02 00 00 - EXIST. CONDITIONS SITE WORK (NOT APPLICABLE)		
DIVISION - 03 00 00 - CONCRETE (NOT APPLICABLE)		
DIVISION - 04 00 00 - MASONRY (NOT APPLICABLE)		
DIVISION - 05 00 00 - METALS		
SECTION 05 00 00 - METAL FABRICATIONS PART 1: GENERAL 1.1 SUMMARY, THIS SECTION INCLUDES THE FOLLOWING: 1. SHELF ANGLES. 2. STEEL FRAMING AND SUPPORTS FOR MECHANICAL AND ELECTRICAL EQUIPMENT. 1.2 SUBMITTALS A. A. SHOP DRAWINGS: DETAIL FABRICATION AND ERECTION OF EACH METAL FABRICATION INDICATED. INCLUDE PLANS, ELEVATIONS, SECTIONS, AND DETAILS OF METAL FABRICATIONS AND THEIR CONNECTIONS. SHOW ANCHORAGE AND ACCESSORY ITEMS. 1.3 QUALITY ASSURANCE A. QUALIFICATIONS: FABRICATOR EXPERIENCED IN PRODUCING METAL FABRICATIONS SIMILAR TO THOSE INDICATED FOR THIS PROJECT. SERVICE PERFORMANCE, AS WELL AS SUFFICIENT PRODUCTION CAPACITY TO PRODUCE REQUIRED UNITS. B. WELDING: QUALIFY PROCEDURES AND PERSONNEL ACCORDING TO THE FOLLOWING: AWS D11, "STRUCTURAL WELDING CODE- STEEL" 2. AWS D13, "STRUCTURAL WELDING CODE- SHEET STEEL" 3. CERTIFY THAT EACH WELDER HAS SATISFACTORILY PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND, IF PERTINENT, HAS UNDERGONE RECERTIFICATION. 1.4 PROJECT CONDITIONS A. FIELD MEASUREMENTS: WHERE METAL FABRICATIONS ARE INDICATED TO FIT WALLS AND OTHER CONSTRUCTION, VERIFY DIMENSIONS BY FIELD MEASUREMENTS BEFORE FABRICATION AND INDICATE MEASUREMENTS ON SHOP DRAWINGS. COORDINATE FABRICATION SCHEDULE WITH CONSTRUCTION PROGRESS TO AVOID DELAYING THE WORK PART 2 - PRODUCTS 2.1 METALS, GENERAL A. METAL SURFACES, GENERAL: FOR METAL FABRICATIONS EXPOSED TO VIEW IN THE COMPLETED WORK, PROVIDE MATERIALS WITH SMOOTH, FLAT SURFACES WITHOUT BLEMISHES. DO NOT USE MATERIALS WITH EXPOSED PITTING, SEAM MARKS, ROLLER MARKS, ROLLED TRADE NAMES, OR ROUGHNESS 2.2 FERROUS METALS A. STEEL PLATES, SHAPES, AND BARS: ASTM A 36/A 36M. B. ROLLED-STEEL FLOOR PLATE: ASTM A 786/A 786M, ROLLED FROM PLATE COMPLYING WITH ASTM A 36/A 36M OR ASTM A 283/A 283M, GRADE C OR D. C. STEEL TUBING: COLD-FORMED STEEL TUBING COMPLYING WITH ASTM A 500. 2.3 PAINT A. SHOP PRIMERS: PROVIDE PRIMERS THAT COMPLY WITH DIVISION 9 SECTION "PAINTING." B. SHOP PRIMER FOR FERROUS METAL: ORGANIC ZINC-RICH PRIMER, COMPLYING WITH SSPC-PAINT 20 AND COMPATIBLE WITH TOPCOAT. 2.4 FASTENERS A. GENERAL: PROVIDE TYPE 304 OR 316 STAINLESS-STEEL FASTENERS FOR EXTERIOR USE AND ZINC-PLATED FASTENERS WITH COATING COMPLYING WITH ASTM B 633, CLASS FE/ZN 5, WHERE BUILT INTO EXTERIOR WALLS. SELECT FASTENERS FOR TYPE, GRADE, AND CLASS REQUIRED. B. BOLTS AND NUTS: REGULAR HEXAGON-HEAD BOLTS, ASTM A 307, GRADE A (ASTM F 568M, PROPERTY CLASS 540); WITH HEX NUTS, ASTM A 563 (ASTM A 563M), AND, WHERE INDICATED, FLAT WASHERS. C. ANCHOR BOLTS: ASTM F 1554, GRADE 36. D. LAG BOLTS: ASME B18.21 (ASME B18.2.3.8M). 2.5 FABRICATION, GENERAL A. SHOP ASSEMBLY: PREASSEMBLE ITEMS IN SHOP TO GREATEST EXTENT POSSIBLE TO MINIMIZE FIELD SPLICING AND ASSEMBLY.		
DIVISION - 05 00 00 - METALS		
SECTION 05 00 00 - METAL FABRICATIONS (CONT.) B. EASE EXPOSED EDGES TO A RADIUS OF APPROXIMATELY 1/32 INCH (1 MM), UNLESS OTHERWISE INDICATED. C. WELD CORNERS AND SEAMS CONTINUOUSLY TO COMPLY WITH THE FOLLOWING: D. PROVIDE FOR ANCHORAGE OF TYPE INDICATED, COORDINATE WITH SUPPORTING STRUCTURE. E. FORM EXPOSED WORK TRUE TO LINE AND LEVEL WITH ACCURATE ANGLES AND SURFACES. AND STRAIGHT SHARP EDGES. F. REMOVE SHARP OR ROUGH AREAS ON EXPOSED TRAFFIC SURFACES. 2.6 MISCELLANEOUS FRAMING AND SUPPORTS A. GENERAL: PROVIDE STEEL FRAMING AND SUPPORTS THAT ARE NOT A PART OF STRUCTURAL-STEEL FRAMEWORK AS NECESSARY TO COMPLETE THE WORK. B. GENERAL: PROVIDE STEEL FRAMING AND SUPPORTS INDICATED AND AS NECESSARY TO COMPLETE THE WORK. C. FABRICATION: UNLESS OTHERWISE INDICATED, FABRICATE TO SIZES, SHAPES, AND PROFILES INDICATED AND AS NECESSARY TO RECEIVE ADJACENT CONSTRUCTION RETAINED BY FRAMING AND SUPPORTS. CUT, DRILL, AND TAP UNITS TO RECEIVE HARDWARE, HANGERS, AND SIMILAR ITEMS. 2.8 FINISHES, GENERAL A. COMPLY WITH NAAMMS "METAL FINISHES MANUAL FOR ARCHITECTURAL AND METAL PRODUCTS" FOR RECOMMENDATIONS FOR APPLYING AND DESIGNATING FINISHES. PART 3 - EXECUTION 3.1 INSTALLATION, GENERAL A. FASTENING TO IN-PLACE CONSTRUCTION: PROVIDE ANCHORAGE DEVICES AND FASTENERS WHERE NECESSARY FOR SECURING METAL FABRICATIONS TO IN-PLACE CONSTRUCTION. INCLUDE THREADED FASTENERS FOR CONCRETE AND MASONRY INSERTS, TOGGLE BOLTS, THROUGH-BOLTS, LAG BOLTS, WOOD SCREWS, AND OTHER CONNECTORS. B. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING METAL FABRICATIONS. SET METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; WITH EDGES AND SURFACES LEVEL, PLUMB, TRUE, AND FREE OF RACK; AND MEASURED FROM ESTABLISHED LINES AND LEVELS. C. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS. WELD CONNECTIONS THAT ARE NOT TO BE LEFT AS EXPOSED JOINTS BUT CANNOT BE SHOP WELDED BECAUSE OF SHIPPING SIZE LIMITATIONS. DO NOT WELD, CUT, OR ABRASIVE SURFACES OF EXTERIOR UNITS THAT HAVE BEEN HOT-DIP GALVANIZED AFTER FABRICATION AND ARE FOR BOLTED OR SCREWED FIELD CONNECTIONS. 3.2 ADJUSTING AND CLEANING TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRASION AREAS OF SHOP PAINT, AND PAINT EXPOSED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING. END OF SECTION 05 00 00		
DIVISION - 06 00 00 - WOOD & PLASTICS		
SECTION - 06 01 00 MAINTENANCE OF WOOD, PLASTICS, AND COMPOSITES A. TREATMENT: ANY WOOD COMING IN CONTACT WITH CONCRETE OR MASONRY SHALL BE TREATED WITH A WOOD PRESERVATIVE. WOOD CURBS AND NAILERS IN CONNECTION WITH ROOFING SHALL ALSO BE TREATED WITH A WOOD PRESERVATIVE. FIRE RETARDANT TREATMENT IS NOT REQUIRED FOR CURBS, NAILERS, GROUND, AND MISCELLANEOUS BACKINGS. FULL SHEETS OF FIRE-RETARDANT PLYWOOD ARE REQUIRED AT ALL IT ROOMS FOR GEAR INSTALLATION. (SEE IT REQUIREMENTS) B. ENVIRONMENTAL CONDITIONS: ALL WOOD SHALL BE PROTECTED FROM THE ELEMENTS DURING STORAGE ON SITE. WOOD SHALL BE KILN DRIED AND ARRIVE ON SITE WITH THE MOISTURE CONTENT NOT TO EXCEED 19%. PROPER VENTILATION TO CONTROL WARPING SHALL BE PROVIDED. END OF SECTION - 06 01 00		
SECTION - 06 10 50 - MISCELLANEOUS CARPENTRY PART 1: GENERAL THE GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS AND ALL CODES AND STANDARDS REFERENCED, APPLY TO THE WORK SPECIFIED IN THIS SECTION. 1.2 SCOPE OF WORK A. ROUGH FRAMING B. FIRE TREATED PLYWOOD BACKER PANELS FIRE TREATED BLOCKING INCLUDING TO ACCOMMODATE FOR RAILINGS, AND ADA BATHROOM GRABBARS. 1.3 SECTION REQUIREMENTS SUBMITTALS: SUBMIT THE FOLLOWING: WOOD TREATMENT DATA INCLUDING TREATMENT PLANTS' CERTIFICATION OF COMPLIANCE WITH INDICATED FOR COMPLIANCE OF ENGINEERED WOOD PRODUCTS. PART 2 - PRODUCTS: 2.3 PANEL PRODUCTS: 1. PLYWOOD BACKER PANELS FOR TELEPHONE, IT, & ELECTRICAL EQUIPMENT. PROVIDE FIRE RETARDANT TREATED PANELS. END OF SECTION - 06 10 50		
SECTION - 06 20 00 FINISH CARPENTRY A. A. ENVIRONMENTAL CONDITIONS: FINISH CARPENTRY SHALL BE MAINTAINED AT A CONSTANT INTERIOR RELATIVE HUMIDITY LEVEL WITHIN THE RANGES SHOWN IN THE AWI STANDARDS, APPROXIMATING THE FINAL BUILDING HUMIDITY LEVEL. CONTRACTOR SHALL USE AN APPROPRIATE TEMPORARY HEATING SOURCE TO ACHIEVE THE HUMIDITY LEVELS RECOMMENDED BY AWI. END OF SECTION - 06 20 00		
SECTION - 06 40 00 ARCHITECTURAL WOODWORK A. ARCHITECTURAL WOOD WORK: ALL ARCHITECTURAL WOOD WORK SHALL BE AT LEAST "CUSTOM GRADE" IN ACCORDANCE WITH AWI STANDARDS FOR CASEWORK. B. FINISH WOODWORK SHOULD BE SENSITIVE TO THE USE OF THE INTENDED SPACE AND BE APPROPRIATE TO ANY RELEVANT ADJACENT INTERIOR FINISHES. C. COMPOSITES WITH THE INTENTION OF WEATHER EXPOSURE, STRENGTH, AND AESTHETIC APPEAL ARE ENCOURAGED AS BEING INTEGRAL TO THE PROJECT DESIGN. D. SOLID WOOD BLOCKING / BACKING SHALL BE PROVIDED AT ALL DOORSTOPS AND WALL HUNG EQUIPMENT. END OF SECTION - 06 40 00		
SECTION 06 40 20 - INTERIOR ARCHITECTURAL WOODWORK 1.1 SUMMARY A. THIS SECTION INCLUDES THE FOLLOWING: 1. INTERIOR WOOD TRIM. 2. INTERIOR WOOD CABINETRY. 1.2 SUBMITTALS A. SHOP DRAWINGS: SHOW LOCATION OF EACH ITEM, DIMENSIONED PLANS AND ELEVATIONS, LARGE-SCALE DETAILS, ATTACHMENT DEVICES. B. SAMPLES: 1. TRIM AND PANELING FOR EACH TYPE, COLOR, PATTERN, AND SURFACE FINISH. 2. WOODWORK QUALITY STANDARD: AWS - PREMIUM GRADE 1.3 QUALITY ASSURANCE INSTALLER QUALIFICATIONS: FABRICATOR OF WOODWORK. QUALITY STANDARD: UNLESS OTHERWISE INDICATED, COMPLY WITH AWS "ARCHITECTURAL WOODWORK STANDARDS" 2.1 MATERIALS WOOD PRODUCTS: HARDBOARD: AHA A135.4. MEDIUM-DENSITY OVERLAY: ANSI A208.2, GRADE MDO. HIGH-PRESSURE DECORATIVE LAMINATE: NEMA LD 3, GRADES AS INDICATED OR, IF NOT INDICATED, AS REQUIRED BY WOODWORK QUALITY STANDARD. 2.2 MISCELLANEOUS MATERIALS ADHESIVES, GENERAL: DO NOT USE ADHESIVES THAT CONTAIN UREA FORMALDEHYDE. 2.4 FABRICATION, GENERAL A. GENERAL: COMPLETE FABRICATION TO MAXIMUM EXTENT POSSIBLE BEFORE SHIPMENT TO PROJECT SITE. WHERE NECESSARY FOR FITTING AT SITE, PROVIDE ALLOWANCE FOR SCRIBING, TRIMMING, AND FITTING. 1. 1. INTERIOR WOODWORK GRADE: PREMIUM. 2. SHOP CUT OPENINGS TO MAXIMUM EXTENT POSSIBLE. SAND EDGES OF CUTOUTS TO REMOVE SPLINTERS AND BURRS. SEAL EDGES OF WITH A COAT OF POLYURETHANE.		

DIVISION - 05 00 00 - METALS

SECTION 05 00 00 - METAL FABRICATIONS (CONT.)

B. EASE EXPOSED EDGES TO A RADIUS OF APPROXIMATELY 1/32 INCH (1 MM), UNLESS OTHERWISE INDICATED.

C. WELD CORNERS AND SEAMS CONTINUOUSLY TO COMPLY WITH THE FOLLOWING:

D. PROVIDE FOR ANCHORAGE OF TYPE INDICATED; COORDINATE WITH SUPPORTING STRUCTURE.

E. FORM EXPOSED WORK TRUE TO LINE AND LEVEL WITH ACCURATE ANGLES AND SURFACES.

AND STRAIGHT SHARP EDGES.

F. REMOVE SHARP OR ROUGH AREAS ON EXPOSED TRAFFIC SURFACES.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. GENERAL: PROVIDE STEEL FRAMING AND SUPPORTS THAT ARE NOT A PART OF STRUCTURAL-STEEL FRAMEWORK AS NECESSARY TO COMPLETE THE WORK.

B. GENERAL: PROVIDE STEEL FRAMING AND SUPPORTS INDICATED AND AS NECESSARY TO COMPLETE THE WORK.

C. FABRICATE UNLESS OTHERWISE INDICATED. FABRICATE TO SIZES, SHAPES, AND PROFILES INDICATED AND AS NECESSARY TO RECEIVE ADJACENT CONSTRUCTION RETAINED BY FRAMING AND SUPPORTS. CUT, DRILL, AND TAP UNITS TO RECEIVE HARDWARE, HANGERS, AND SIMILAR ITEMS.

2.8 FINISHES, GENERAL

A. COMPLY WITH NAAMMS "METAL FINISHES MANUAL FOR ARCHITECTURAL AND METAL PRODUCTS" FOR RECOMMENDATIONS FOR APPLYING AND DESIGNATING FINISHES.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. FASTENING TO IN-PLACE CONSTRUCTION: PROVIDE ANCHORAGE DEVICES AND FASTENERS WHERE NECESSARY FOR SECURING METAL FABRICATIONS TO IN-PLACE CONSTRUCTION. INCLUDE THREADED FASTENERS FOR CONCRETE AND MASONRY INSERTS, TOGGLE BOLTS, THROUGH-BOLTS, LAG BOLTS, WOOD SCREWS, AND OTHER CONNECTORS.

B. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING METAL FABRICATIONS. SET METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; WITH EDGES AND SURFACES LEVEL, PLUMB, TRUE, AND FREE OF RACK; AND MEASURED FROM ESTABLISHED LINES AND LEVELS.

C. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS. WELD CONNECTIONS THAT ARE NOT TO BE LEFT AS EXPOSED JOINTS BUT CANNOT BE SHOP WELDED BECAUSE OF SHIPPING SIZE LIMITATIONS. DO NOT WELD, CUT, OR ABRASIVE SURFACES OF EXTERIOR UNITS THAT HAVE BEEN HOT-DIP GALVANIZED AFTER FABRICATION AND ARE FOR BOLTED OR SCREWED FIELD CONNECTIONS.

3.2 ADJUSTING AND CLEANING

TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRASION AREAS OF SHOP PAINT, AND PAINT EXPOSED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING.

END OF SECTION 05 00 00

DIVISION - 06 00 00 - WOOD & PLASTICS

SECTION - 06 01 00 MAINTENANCE OF WOOD, PLASTICS, AND COMPOSITES

A. TREATMENT: ANY WOOD COMING IN CONTACT WITH CONCRETE OR MASONRY SHALL BE TREATED WITH A WOOD PRESERVATIVE. WOOD CURBS AND NAILERS IN CONNECTION WITH ROOFING SHALL ALSO BE TREATED WITH A WOOD PRESERVATIVE. FIRE RETARDANT TREATMENT IS NOT REQUIRED FOR CURBS, NAILERS, GROUND, AND MISCELLANEOUS BACKINGS. FULL SHEETS OF FIRE-RETARDANT PLYWOOD ARE REQUIRED AT ALL IT ROOMS FOR GEAR INSTALLATION. (SEE IT REQUIREMENTS)

B. ENVIRONMENTAL CONDITIONS: ALL WOOD SHALL BE PROTECTED FROM THE ELEMENTS DURING STORAGE ON SITE. WOOD SHALL BE KILN DRIED AND ARRIVE ON SITE WITH THE MOISTURE CONTENT NOT TO EXCEED 19%. PROPER VENTILATION TO CONTROL WARPING SHALL BE PROVIDED.

END OF SECTION - 06 01 00

SECTION - 06 10 50 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

A. THE GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS AND ALL CODES AND STANDARDS REFERENCED, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.2 SCOPE OF WORK

A. ROUGH FRAMING

B. FIRE TREATED PLYWOOD BACKER PANELS FIRE TREATED BLOCKING INCLUDING TO ACCOMMODATE FOR RAILINGS, AND ADA BATHROOM GRABBARRS.

1.3 SECTION REQUIREMENTS

A. SUBMITTALS TO ACCOMPANY THE FOLLOWING:

WOOD TREATMENT DATA INCLUDING TREATMENT PLANT'S CERTIFICATION OF COMPLIANCE WITH INDICATED FOR COMPLIANCE OF ENGINEERED WOOD PRODUCTS.

2.2 PRODUCTS:

2.3 PANEL PRODUCTS:

A. PLYWOOD BACKER PANELS FOR TELEPHONE, IT & ELECTRICAL EQUIPMENT, PROVIDE FIRE RETARDANT TREATED PANELS.

END OF SECTION - 06 10 50

SECTION - 06 20 00 FINISH CARPENTRY

A. ENVIRONMENTAL CONDITIONS: FINISH CARPENTRY SHALL BE MAINTAINED AT A CONSTANT INTERIOR RELATIVE HUMIDITY LEVEL WITHIN THE RANGES SHOWN IN THE AWI STANDARDS, APPROXIMATING THE FINAL BUILDING HUMIDITY LEVEL. CONTRACTOR SHALL USE AN APPROPRIATE TEMPORARY HEATING SOURCE TO ACHIEVE THE HUMIDITY LEVELS RECOMMENDED BY AWI.

END OF SECTION - 06 20 00

SECTION - 06 40 00 ARCHITECTURAL WOODWORK

A. ARCHITECTURAL WOOD WORK: ALL ARCHITECTURAL WOOD WORK SHALL BE AT LEAST "CUSTOM GRADE" IN ACCORDANCE WITH AWI STANDARDS FOR CASEWORK.

B. FINISH WOODWORK SHOULD BE SENSITIVE TO THE USE OF THE INTENDED SPACE AND BE APPROPRIATE TO ANY RELEVANT ADJACENT INTERIOR FINISHES.

C. COMPOSITES WITH THE INTENTION OF WEATHER EXPOSURE, STRENGTH, AND AESTHETIC APPEAL ARE ENCOURAGED AS BEING INTEGRAL TO THE PROJECT DESIGN.

D. SOLID WOOD BLOCKING / BACKING SHALL BE PROVIDED AT ALL DOORSTOPS AND WALL HUNG EQUIPMENT.

END OF SECTION - 06 40 00

SECTION 06 40 20 - INTERIOR ARCHITECTURAL WOODWORK

1.1 SUMMARY

A. THIS SECTION INCLUDES THE FOLLOWING:

1. INTERIOR WOOD TRIM.

2. INTERIOR WOOD CABINetry.

1.2 SUBMITTALS

A. SHOP DRAWINGS: SHOW LOCATION OF EACH ITEM, DIMENSIONED PLANS AND ELEVATIONS, LARGE-SCALE DETAILS, ATTACHMENT DEVICES.

B. SAMPLES:

1. TRIM AND PANELING FOR EACH TYPE, COLOR, PATTERN, AND SURFACE FINISH.

2. WOODWORK QUALITY STANDARD: AWS - PREMIUM GRADE

1.3 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: FABRICATOR OF WOODWORK.

QUALITY STANDARD: UNLESS OTHERWISE INDICATED, COMPLY WITH AWS "ARCHITECTURAL WOODWORK STANDARDS"

2.1 MATERIALS

A. WOOD PRODUCTS:

HARDBOARD, ADA A135.4.

MEDIUM-DENSITY OVERLAY: ANSI A208.2, GRADE MDO.

HIGH-PRESSURE DECORATIVE LAMINATE: NEMA LD 3, GRADES AS INDICATED OR, IF NOT INDICATED, AS REQUIRED BY WOODWORK QUALITY STANDARD.

2.2 MISCELLANEOUS MATERIALS ADHESIVES, GENERAL: DO NOT USE ADHESIVES THAT CONTAIN UREA FORMALDEHYDE.

2.4 FABRICATION

A. GENERAL: COMPLETE FABRICATION TO MAXIMUM EXTENT POSSIBLE BEFORE SHIPPING TO PROJECT SITE. WHERE NECESSARY FOR FITTING AT SITE, PROVIDE ALLOWANCE FOR SCRIBING, TRIMMING, AND FITTING.

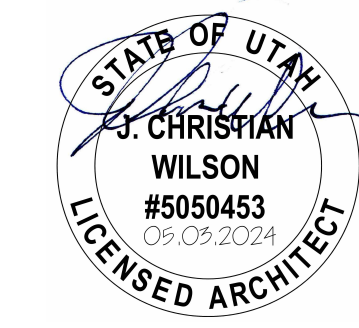
1. INTERIOR WOODWORK GRADE, PREMIUM.

2. SHOP CUT OPENINGS TO MAXIMUM EXTENT POSSIBLE. SAND EDGES OF CUTOUTS TO REMOVE SPLINTERS AND BURRS. SEAL EDGES OF WITH A



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TITLE	PROJECT	CLIENT	ADDRESS
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REVISIONS	
NO.	DESCRIPTION

DATE: 4/17/2025 10:17:37 AM
JOB NO. 24103 - USU ENG BLDG
SCALE:
DRAWN:
SHEET
A601

DIVISION 08 00 00 - DOORS AND FRAMES

SECTION - 08 71 00 DOOR HARDWARE (CONT.)

6.10.12 MAXIMUM USAGE FOR CONDUIT WILL BE 40% OF TOTAL SQUARE INCH INTERNAL CAPACITY. MINIMUM CONDUIT SIZE IS - INCH.
6.10.13 THE CARD ACCESS-CONDUIT SYSTEM AND CABLING INSTALLED MUST BE DISTINCT AND SEPARATE FROM THE WIRE WAY/CONDUIT SYSTEM HOUSING VOICE/DATA CABLES IN CAMPUS BUILDINGS. EXCEPTION TO THIS IS POE CABLING MAY BE RUN CONCURRENTLY.
6.10.14 CONNECTIONS TO DEVICES MUST BE SECURED. SO THAT NO CORDS MAY BE EASILY DISCONNECTED FROM THE DEVICES AND NO CORDS ARE LEFT EXPOSED TO UNAUTHORIZED TAMPERING.
6.10.15 WIRING WILL BE DONE IN STRICT ACCORDANCE WITH MANUFACTURERS' GUIDELINES. EXCEPTIONS MUST BE APPROVED BY THE USU ELECTRICAL SHOP OR IT PHYSICAL INFRASTRUCTURE.
6.10.16 LOW VOLTAGE SHIELDS WILL BE TERMINATED IN ACCORDANCE WITH MANUFACTURERS' GUIDELINES. SHOULD "NOISE" IN THE BUILDING GROUND REFERENCE INTERFERE WITH OR PREVENT THE DEVICE FROM OPERATING PROPERLY, THE CONTRACTOR WILL INSTALL A DEDICATED GROUND FOR THE CARD ACCESS SYSTEM IN THAT PARTICULAR BUILDING. FLOATING SHIELDS WILL NOT BE ALLOWED.
6.10.17 ELECTRICAL RELAYS WILL BE USED FOR ALL OUTPUTS TO FIELD DEVICES.
6.10.18 FIELD WIRING MUST BE ONE PIECE FROM SOURCE TERMINAL TO DESTINATION TERMINAL. SPLICES IN FIELD WIRING WILL NOT BE ALLOWED.
6.10.19 THE CONSTRUCTION PROCEDURE FOR WIRING ROUTED THRU DOOR MULLION WILL BE SUBMITTED TO USU FOR APPROVAL. ALL WIRING IN AND AROUND DOOR MOLD WILL BE DONE IN A GOOD WORKMANSHIP TYPE MANNER TO MINIMIZE THE VISUAL IMPACT ON THE APPEARANCE OF THE DOOR. ALL HOLES DRILLED IN THE DOOR MULLION WILL BE CONCEALED USING PLASTIC MANUFACTURED HOLE CAPS. THE COLOR OF THE HOLE CAPS WILL BE SUITABLE FOR THE APPLICATION.
6.10.20 THE HOLES FOR FLUSH MOUNTED DOOR SWITCHES MUST BE DRILLED IN A MANNER CONSISTENT WITH GOOD WORKMANSHIP AND MATCH THE EXISTING COLOR AND MATERIAL WHENEVER POSSIBLE.
6.11 DOOR SWITCHES
6.11.1 DOOR SWITCHES WILL BE SURFACE MOUNTED OR FLUSH MOUNTED ON THE OPPOSING SIDE OF THE DOOR FROM THE HINGES. THE SWITCH WILL BE MOUNTED ON THE TOP OF THE DOOR AND WILL BE NO FURTHER THAN THREE INCHES FROM THE INTERIOR PORTION OF THE DOORFRAME.
6.11.2 SURFACE MOUNT SWITCHES WILL HAVE ARMORED CABLE BETWEEN THE SWITCH AND THE DOOR. THE CABLE ENTRANCE HOLE IN THE DOOR AFFIX ARMORED CABLING FIRMLY WITHIN THE CONDUIT OR ELECTRICAL BOX I.E. (CABLE CLAMP) AS TO PREVENT TAMPERING OF DPS WIRES.
6.11.3 SURFACE MOUNT SWITCHES WILL HAVE TAMPER RESISTANT SCREWS TO ATTACH SWITCH TO DOOR AND DOORFRAME.
6.11.4 A SCREW-LOCKING ADHESIVE SUCH AS 'LOCTITE' THREAD LOCKER WILL BE USED TO SECURE ALL SCREWS. 'LOCTITE' THREAD LOCKER #222MS OR #242 ONLY
6.11.5 FLUSH MOUNT SWITCHES ARE TO BE MOUNTED IN THE TOP PORTION (HEADER) OF THE DOORFRAME AND IN THE ADJOINING PORTION OF THE DOOR.
6.11.6 THE HOLES FOR FLUSH MOUNTED DOOR SWITCHES MUST BE DRILLED THE EXACT SIZE FOR THE SWITCH BEING USED. A TIGHT FRICTION FIT MUST BE ACHIEVED.
6.11.7 NO HINGE MOUNTED DOOR CONTACTS ARE TO BE USED.
6.12 DOOR HARDWARE
6.12.1 DOOR HARDWARE WILL BE FAIL-SECURE WITH MECHANICAL MANUAL EGRESS FROM THE SECURED SIDE. HARDWARE SHALL ALSO MATCH USU STANDARD SERGEANT OR SCHLAGE FORMAT WITHIN ELECTRONIC LOCKING SYSTEMS.
6.12.2 ALL ELECTRONIC HARDWARE WILL BE 24V AND POWERED VIA INDEPENDENT 24V POWER SUPPLY FOR DOOR HARDWARE.
6.12.3 DOOR SWITCHING AND POWER WILL RESIDE IN THE ACCESS CONTROL PANEL LOCATION.
6.12.4 NOT USED
6.12.5 POWER SUPPLY WILL BE CONNECTED TO BUILDING EMERGENCY CIRCUITS WHEN POSSIBLE.
6.12.6 POWER SUPPLIES WILL HAVE A 7AMP HOUR BATTERY BACKUP OR HIGHER.
6.12.7 THE LOCATION OF POWER SUPPLIES WHEN LOCATED AWAY FROM ACCESS CONTROL PANEL WILL BE FULLY DOCUMENTED VIA AS-BUILT DRAWINGS.
6.12.8 NO MORE THAN 2 DOORS WITH EXIT DEVICES PER INDEPENDENT 24V POWER SUPPLY.
6.12.9 THE REX SIGNALS EGRESS FROM THE SECURED SIDE. UNLOCKING WILL BE A MANUAL MECHANICAL FUNCTION FOLLOWING VALID REQUEST TO EXIT. THE REX WILL ELECTRONICALLY UNLOCK HARDWARE ONLY WHEN USED IN CONJUNCTION WITH A HANDICAP PUSHBUTTON/OPENER OR MAGNETIC LOCKING HARDWARE. WHERE POSSIBLE A REX WILL BE USED WITH ELECTRIFIED HANDLES AND CRASH BARS.
6.12.10 DOOR HARDWARE IS TO BE SET SO THAT 'DOGGING' FUNCTIONALITY IS NOT POSSIBLE.
6.12.11 DOOR HARDWARE WILL HAVE BLANK CYLINDER OR KEY OVERRIDE AND CARDS. CARDS WILL BE USED TO MAINTAIN THE SHLAGE, OR SARGENT (WHERE APPROPRIATE) LOCK FULL SIZE INTERCHANGEABLE CORE.
6.12.12 DOOR HARDWARE POWER SUPPLIES WILL HAVE A LOCKING JUNCTION BOX 7.0 PLANS
7.01 DRAWINGS AND SPECIFICATIONS FOR THE ACCESS CONTROL SYSTEM SHALL HAVE DEDICATED DETAIL DRAWINGS IN THE CONSTRUCTION PLANS. THE DETAIL DRAWINGS SHALL BE PROVIDED ELECTRONICALLY IN A VERSION OF AUTOCAD ACCEPTABLE TO THE UNIVERSITY ON CD AND SHALL INCLUDE:
A) A FLOOR PLAN WITH A SEPARATE SECURITY LAYER (FOR EACH LEVEL) INDICATING THE LOCATION AND DOOR LABEL FOR ALL FIELD DEVICES.
B) A DETAILED WIRING PLAN SHOWING TERMINATION TO TERMINATION WIRING.
C) A COMPLETE SET OF MANUALS FOR ALL MANUFACTURED ITEMS PROVIDED AS PART OF THIS PROJECT.
D) CONTROL PANEL ELEVATION.
E) POWER WIRING AND CONDUIT ELEVATIONS.
F) SECURITY DOOR MATRIX WHICH INCLUDES DOOR NUMBER, DOOR SIZE, HARDWARE SET/SCHEDULE, LOCATION, AND DRAWING NO.
G) DOOR DETAIL AND ELEVATION FOR EACH SECURITY DOOR.
H) DETAILED CONTROL WIRING DIAGRAMS FOR ALL READERS AND DEVICES
I) USU WILL REVIEW THE PLANS FOR COMPLIANCE TO STANDARDS AND FUNCTIONAL REQUIREMENTS. WHEN APPROVED, USU WILL RETURN A SIGNED COPY OF THE PLANS TO THE CONTRACTOR FOR CONSTRUCTION.
END OF SECTION 08 71 00.

DIVISION 09 00 00 - FINISHES

SECTION 09 22 00 - NON-STRUCTURAL METAL FRAMING PART I GENERAL

11 SECTION INCLUDES
A. NON-STRUCTURAL METAL FRAMING, COLD-FORMED METAL FRAMING FOR WALLS, COLD-FORMED METAL FRAMING FOR CEILINGS AND ACCESSORIES.
1.2 REFERENCES
A. ASTM INTERNATIONAL (ASTM):
1. ASTM A 653 - STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALD) BY THE HOT-DIP PROCESS.
2. ASTM C 645 - STANDARD SPECIFICATION FOR NON-STRUCTURAL STEEL FRAMING MEMBERS.
3. ASTM C 754 - STANDARD SPECIFICATION FOR INSTALLATION OF STEEL FRAMING MEMBERS TO RECEIVE SCREW-ATTACHED GYPSUM PANEL PRODUCTS.
B. AMERICAN IRON AND STEEL INSTITUTE (AISI) - STANDARD FOR COLD-FORMED STEEL FRAMING GENERAL PROVISIONS.
C. AMERICAN IRON AND STEEL INSTITUTE (AISI) - NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.
1.3 SUBMITTALS
INCLUDING: DATA: MANUFACTURER'S DATA SHEETS ON EACH PRODUCT TO BE USED.
1. MANUFACTURER'S CERTIFICATION OF PRODUCT COMPLIANCE WITH CODES AND STANDARDS.
2. PREPARATION INSTRUCTIONS AND RECOMMENDATIONS.
3. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
4. INSTALLATION METHODS.
1.4 QUALITY ASSURANCE
A. CONTRACTOR SHALL PROVIDE EFFECTIVE, FULL TIME QUALITY CONTROL OVER ALL FABRICATION AND ERECTION COMPLYING WITH THE PERTINENT CODES AND REGULATIONS OF GOVERNMENT AGENCIES HAVING JURISDICTION.
B. INSTALLER QUALIFICATIONS: INSTALLER EXPERIENCED IN PERFORMING WORK OF THIS SECTION WHO HAS SPECIALIZED IN INSTALLATION OF WORK SIMILAR TO THAT REQUIRED FOR THIS PROJECT.

DIVISION 08 00 00 - DOORS AND FRAMES

SECTION - 08 71 00 DOOR HARDWARE (CONT.)

DETECTOR, SOUNDERS, ETC.) DEPENDING ON SPACE REQUIREMENTS PREFERENCE IS GIVEN TO FP0250 - 2C8308PE6M-16 DOOR POWER DISTRIBUTION ENCLOSURE WITH AUX POWER OUTPUT FOR AUXILIARY DOOR COMPONENTS (REX MOTION DETECTOR, SOUNDERS, ETC.)
4.07 RELAYS
ALTRONIX RELAY/ ALTRONIX 6062 - TIME DELAY RELAY (FOR ADA DOORS.)
IDEC / IDEC RHUBI AND RHUBZ RELAYS (IN BASE POWER DISTRIBUTION ENCLOSURES)
4.09 REQUEST TO TO EXIT (REX) REQUEST TO EXIT DETECTION SYSTEMS: BOSCH DS 150I REQUEST TO EXIT MOTION DETECTOR OR SIMILAR
(NOTE: MOTION DETECTOR REX WILL ONLY BE USED WHERE APPROVED BY USU)
PUSH TO EXIT REX: PUSH TO EXIT WILL ONLY BE USED WHERE REQUIRED AS A PHYSICAL INTERRUPT TO MAG LOCK TYPE LOCKING DEVICES.
4.10 CABLING: COMPOSITE CABLING
4.11 DEVICE SERVERS
4.12 PERSONALITY MODULE AND HOUSING RM4 READER MODULE
4.13 DOOR SWITCHES
CENTROL (GE) / SENTROL 1078C - FLUSH MOUNTED DOOR POSITION SWITCH (COLOR MATCH)
CENTROL AL2505 - SURFACE MOUNTED SWITCH WITH ARMORED CABLE
4.14 INPUT/OUTPUT MODULE
S2 - MERCURY BOARD / S2 MERCURY BOARD - MR51 / S2 MERCURY BOARD - MR50
4.15 HORNS/ALARMS: DETECT SYSTEMS DS-4200H - DOOR PROP ALARM
4.16 EMERGENCY PUSH BUTTON COVERS W/HORN:
SDC 491 - BREAK GLASS STATION WITH HORN
5.0 NETWORK TOPOGRAPHY
5.01 USU USES A STAR CONFIGURATION WITH EACH ACCESS/ALARM POINT BEING A 'HOME RUN' BACK TO THE ACCESS CONTROL PANEL FROM THE PERSONALITY MODULE LOCATED ABOVE THE DOOR OR THE CARD READER. THE CABLING BETWEEN THE PERSONALITY MODULE (RM READER) AND THE ACCESS CONTROL PANEL WILL BE THE COMPOSITE CABLING OUTLINED IN THE SECTION 4.10. ALL COMMUNICATION AND POWER TO THE INDIVIDUAL DOORS WILL COME FROM THE ACCESS CONTROL PANEL LOCATION. EXCEPTIONS TO THIS WILL BE MADE WHEN SPECIFIC HARDWARE REQUIRES A LOCALIZED POWER SUPPLY OR POWER OVER ETHERNET (POE) CONNECTED TO A NETWORK SERVER, WHEN POSSIBLE A TRUNK CABLE AND RACK RAIL SYSTEM ESTABLISHED IN COMMON HALLWAYS TO ACCOMMODATE MULTIPLE 'HOME RUN' COMPOSITE CABLES.
6.01 INSTALLATION REQUIREMENTS
6.01 POWER SUPPLY INSTALLATION SHALL ALSO INCLUDE WIRING A/C FAIL FAULT RELAY TO INPUT 8 ON 1502 OR FIRST ADDRESSED MR52 AND LABELED/PROGRAMED AS A/C FAIL NOTIFICATION. EACH POWER SUPPLY IN CONSECUTIVE PANELS SHALL ALSO BE WIRED, LABELED AND PROGRAMED FOR A/C FAIL NOTIFICATION.
6.02 PANEL AND ANY NETWORK DEVICE SERVER WILL BE WIRED THROUGH A DEDICATED POWER SUPPLY WITH BATTERY BACKUP. BATTERIES MUST BE INSTALLED UNDER THE DOOR. BATTERIES MUST BE INSTALLED IN THE FIELD.
6.03 POWER TO ACCESS CONTROL PANELS IS TO BE HARDWIRED UTILIZING EMT OR RIGID CONDUIT IN ACCORDANCE WITH SECTION 6.10 OF THIS SPECIFICATION.
6.04 CARD READERS WILL BE MOUNTED WITHIN A TWO FOOT (24") RADIUS OF THE DOOR TO WHICH IT IS ASSIGNED, ANY DEVIATION MUST BE SPECIFICALLY REQUESTED IN WRITING WITH AN EXPLANATION OF THE NECESSITY TO PLACE THE CARD READER FARTHER AWAY THAN TWO FEET (24").
6.05 A CIRCUIT FROM FIRE ALARM PANEL MUST BE INSTALLED TO EACH LOCK POWER DISTRIBUTION PANEL. IN APPLICATIONS THAT INCLUDE MAG-LOCKS, CONTRACTOR MUST CONNECT TO A FIRE ALARM CIRCUIT PROVIDED AT THE CONTROLLER BACKBOARD
BY THE FIRE ALARM CONTRACTOR.
6.06 ACCESS CONTROL PANELS ARE TO BE INSTALLED IN NETWORK OR ELECTRICAL CLOSETS AS APPROVED BY THE USU ACCESS CONTROL SHOP OR PLANNING AND DESIGN. ALL PANELS AND BOARDS MUST BE INSTALLED IN NEMA 4 ENCLOSURES(Y) (WITHIN THE ELECTRICAL CLOSET) THAT ARE OF SUFFICIENT SIZE AND ORIENTATION TO INCLUDE ALL CARD ACCESS SYSTEM COMPONENTS. ALL ENCLOSURES MUST BE LOCKABLE AND LOCATED IN A MANNER THAT THE ENCLOSURES ARE NOT ACCESSIBLE BY OTHER PERSONNEL.
6.07 EACH PANEL WILL BE LABELED ACCORDANCE WITH USU STANDARDS. THE LABEL FOR EACH PANEL WILL BE POSTED ON THE INTERIOR OF THE PANEL DOOR.
6.08 EACH PANEL WILL HAVE A LIST OF READERS (UNIVERSITY DOOR NUMBERS) CONNECTED TO IT LOCATED ON THE INSIDE COVER, OR CLEARLY LABELED ON THE WIRING FOR EACH DOOR.
6.09 INSTALLATION OF NETWORK CONNECTION DROP IS TO BE COORDINATED THROUGH USU IT OFFICE. DROP TERMINATION IS TO BE INSIDE OF ACCESS CONTROL PANEL TO PREVENT TAMPERING. THE MAC ADDRESS AND IP ADDRESS FOR EACH PANEL MUST BE LABELED AND MAINTAINING THE OVERALL DATABASE, WHILE ALLOWING NUMEROUS SECURED USUS TO GRANT OR DENY ACCESS FOR INDIVIDUALS FROM MULTIPLE WORKSTATIONS AROUND THE CAMPUS.
3.11 ALLOW FOR UNATTENDED SCHEDULED UNLOCKING OF INDIVIDUAL DOORS FOR A SUSTAINED PERIOD OF PUBLIC ACCESS.
3.12 ALL HARDWARE MOUNTED IN EXTERIOR LOCATIONS MUST BE WEATHER RESISTANT AND DESIGNED TO MAINTAIN THE AESTHETIC BEAUTY OF THE CAMPUS. THE FINISH OF THE ACCESS CONTROL HARDWARE SHOULD MATCH THE FINISH OF THE OTHER DOOR HARDWARE.
3.13 HARDWARE MUST BE DURABLE ENOUGH TO WITHSTAND HIGH TRAFFIC LOCATIONS WITHOUT FREQUENT FAILURE.
3.14 HARDWARE MUST CONTINUE TO FULLY FUNCTION IN THE EVENT THAT COMMUNICATION TO THE CENTRAL DATABASE IS LOST.
3.15 ALL ACCESS CONTROL SYSTEM EQUIPMENT (CONTROLLERS AND READERS) MUST BE FULLY WARRANTED AGAINST DEFECTS IN WORKMANSHIP FOR A MINIMUM OF ONE YEAR FROM DATE OF INSTALLATION, WITH AN OPTIONAL FOUR-YEAR EXTENDED WARRANTY QUOTE. ALL HARDWARE MUST BE FULLY SUPPORTED FOR A MINIMUM OF FIVE YEARS FROM DATE OF INSTALLATION (NON-OBSOLESCENT), OR REPLACED AT NO COST TO USU WITH LIKE HARDWARE.
SECTION - 08 70 00 HARDWARE, LOCKS & KEYS (CONT.)
3.16 REQUEST TO EXIT DEVICES WILL BE INCLUDED ON ALL EXTERNAL DOORS WITH ELECTRONIC LOCKING DEVICES, WHERE POSSIBLE THEY WILL BE INTEGRATED INTO THE DOOR HARDWARE. MOTION REQUEST TO EXIT DEVICES WILL ONLY BE USED WHERE NO OTHER DEVICE IS POSSIBLE.
4.0 STANDARDIZED HARDWARE
4.00 THE FOLLOWING HARDWARE IS SPECIFIED HARDWARE FOR ACCESS CONTROL INTEGRATIONS. COMPATIBLE SUBSTITUTIONS ARE ALLOWED WITH APPROVAL.
4.01 CONTROLLERS: MERCURY INTELLIGENT NETWORK CONTROLLERS: S2 MERCURY EPI502 INTELLIGENT CONTROLLER, 16M, 2 READERS, 8 INPUTS, 4 OUTPUTS S2 MERCURY MR52 READER INTERFACE MODULE 2 READERS, 8 INPUTS, 6 OUTPUTS
4.02 READERS
ICLASS SE RP40E (ELITE KEY REQUIRED), WALL SWITCH, CONTACTLESS, BLACK, WITH SIO ICLASS SE RK40E (ELITE KEY REQUIRED), WALL SWITCH, KEYPAD, CONTACTLESS, BLACK, WITH SIO ICLASS SE RISE (ELITE KEY REQUIRED), MULLION (LG), CONTACTLESS, BLACK, WITH SIO ICLASS SE RIOE (ELITE KEY REQUIRED), MULLION (RG), CONTACTLESS, BLACK, WITH SIO
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4.04 ELECTRIC STRIKES
VON DUPRIN 98/99 SERIES
4.04 ELECTRIC STRIKES
VON DUPRIN SERIES 6000 24 VOLT
HES 1006 STRIKE
HES 9600, OR 9400 RIM STRIKE OR HES 9500 RIM FOR FIRE-RATED APPLICATIONS
ADAMS RITE STRIKE
SLP-UL-M-KIT - SARGENT ELR WITH REX BUILT IN (EXIT DEVICE)
VLP-UL-M-KIT - VON DUPRIN ELR WITH REX (EXIT DEVICE)
4.05 ELECTRIC POWER TRANSFER
VON DUPRIN EPT-10 EPT-5
POWER TRANSFER HINGE - ELECTRIFIED HINGE, MINIMUM 6 WIRES, MAX OF 12 WIRES. MUST BE FROM APPROVED, REPUTABLE, MANUFACTURE. ASSA ABLOY OR ALLEGIAN.
ARMORED CABLE DOOR LOOPS - USED ON PIVOT HINGE DOORS IN PLACE OF GVUX POWER TRANSFER.
ALARM LOCK ALZ71
KEDEX K-DLA12
4.06 AND/OR POWER SUPPLIES AND BATTERIES
ACCESS POWER SUPPLY/CHARGER FOR MERCURY
BATTERIES 12V, 7AH LIFE SAFETY POWER WILL BE USED FOR ALL ELECTRONIC ACCESS CONTROL. POWER OUTPUT (DB) FOR AUXILIARY DOOR COMPONENTS (REX MOTION

DIVISION 08 00 00 - DOORS AND FRAMES

SECTION - 08 71 00 DOOR HARDWARE (CONT.)

A) ACHIEVED THE STATUS OF INTEGRATOR OR HIGHER CERTIFICATION FROM S2 SECURITY APPROVED TRAINING VENUES, PHOTOCOPIES OF CERTIFICATION SHOULD BE SUBMITTED WITH PACKAGE RESPONSE. CERTIFICATION MUST BE CURRENT.
B) PROVIDE DETAILED CUSTOMER REFERENCES FOR PROJECTS PERFORMED WITHIN 2 YEARS OF PURCHASE ORDER DATE THAT REFLECT SIMILAR SCOPE AND SIZE OF USU PROJECT.
2.0 GENERAL REQUIREMENTS AND NOTES
2.00 USU REQUIRES THAT ALL EXTERIOR DOORS (INCLUDING EACH OPERABLE LEAF) HAVE ACTIVE ELECTRONIC CARD ACCESS. THE ONLY EXCEPTION TO THIS IS EMERGENCY EXITS OR EXIT ONLY DOORS, WHICH WILL HAVE, AT A MINIMUM, A DOOR POSITION SWITCH FOR MONITORING. ONE LEAF IN A SET OF DOORS CONNECTED TO A READER IS ACCEPTABLE WHEN THE REMAINING DOORS HAVE ELECTRONIC LOCKS THAT ARE INTEGRATED WITH S2.
2.01 USU HAS PURCHASED AND INSTALLED THE S2 SECURITY MANAGEMENT SOFTWARE, DATABASE AND LICENSING. THE UNIVERSITY HAS COMPLETED INSTALLATION OF DOOR ACCESS HARDWARE COMPONENTS AT EXISTING CAMPUS LOCATIONS.
2.02 IT IS THE INTENT OF USU TO MAINTAIN CONSISTENT AND STANDARDIZE ACCESS CONTROL INSTALLATIONS THROUGHOUT ALL USU CAMPUS BY DICTATING DESIGN, DOOR HARDWARE, WIRING, AND ELECTRONIC DEVICES/CONTROLLERS USED IN CONSTRUCTION. USU WILL HAVE FINAL APPROVAL OF THE FORE MENTIONED COMPONENTS IN CONSTRUCTION WHERE WORK HAS BEEN SUBCONTRACTED TO 3RD PARTIES.
2.03 IT IS THE RESPONSIBILITY OF THE ACCESS CONTROL INTEGRATOR OR COMPANY TO GENERATE AN EXCEPTIONS LIST PRIOR TO BIDDING OR INSTALLATION THAT ITEMIZES EACH EXCEPTED AREA AND HARDWARE SCHEDULED. COMPONENTS OR DESIGNS BEING USED WHICH MAY HAMPER THEIR ABILITY TO PROVIDE A SECURE AND COMPLIANT ACCESS CONTROL PRODUCT.
2.04 THE USU PHYSICAL SECURITY SHOP IN THE UNIVERSITY RISK MANAGEMENT DEPARTMENT AND OR THE LOCKSMITH SHOP RESERVES THE RIGHT TO APPROVE OR REJECT FINAL DESIGN AND/OR SCOPE OF WORK FOR ACCESS CONTROL ON NEW CONSTRUCTION AND EXISTING STRUCTURES.
2.05 WHEN ANY PROJECT OR WORK IS DECLARED FULLY COMPLETE, A FINAL WALKTHROUGH WILL TAKE PLACE WITH THE INTEGRATOR (AND GENERAL CONTRACTOR WHEN APPLICABLE). A USU REPRESENTATIVE, PROJECT MANAGER(S) AND CUSTOMER MUST PARTICIPATE IN A FINAL WALK THRU PRIOR TO ACCEPTANCE OF ANY ACCESS CONTROL WORK. ALL DOORS MUST BE FUNCTIONING PROPERLY IN THE FIELD AS WELL AS WITHIN THE ACCESS CONTROL SOFTWARE.
2.06 COORDINATION AND HARDWARE REVIEW MEETINGS WILL BE HELD WITH THE INTEGRATOR AND THE USU PHYSICAL SECURITY OR LOCKSMITH PERSONNEL PRIOR TO START-UP OF ANY ACCESS CONTROL PROJECT.
2.07 USU HAS A NAMING CONVENTION TO USE IN IDENTIFYING DOORS AND BUILDINGS. THE NAMING CONVENTION WILL BE ADHERED TO WHEN PROJECTS ARE BEING APPROVED.
A) BUILDINGS ALL HAVE A NUMBER DESIGNATION AND AN OFFICIAL NAME. FOR EXAMPLE, OLD MAIN IS THE OFFICIAL NAME AND THE NUMBER DESIGNATION IS 001.
3.0 BASE SPECIFICATIONS
3.01 THE SYSTEM MUST FULLY AND COMPLETELY INTEGRATE WITH THE MOST CURRENT VERSION OF S2 DOOR ACCESS SYSTEM PURCHASED FROM STONE SECURITY.
3.02 ALLOW OR DENY THE UNLOCKING OF A LOCKED ENTRANCE BASED ON CRITERIA ESTABLISHED IN THE SOFTWARE FOR INDIVIDUAL CARPOHOLDERS.
3.03 RECORD A LOG FILE OF ALL SYSTEM ACTIVITY, INCLUDING DOOR ACCESS GRANTED, ACCESS DENIED, PORTAL FORCED, PORTAL HELD, ALARMS, SYSTEM MESSAGES, AND DATA MAINTENANCE.
3.04 ALLOW MONITORING OF THE OVERALL SYSTEM FOR FUNCTIONALITY AND ALARMS FROM MULTIPLE POINTS. SYSTEM WILL REQUIRE AND RECORD ALARM ACKNOWLEDGMENTS BY OPERATOR.
3.05 UTILIZE THE CAMPUS TCP/IP NETWORK FOR COMMUNICATIONS BETWEEN CONTROLLERS AND THE CENTRAL DATABASE.
3.06 PROVIDE INTERFACES WITH OTHER SYSTEMS, INCLUDING INTRUSION ALARM, PANIC ALARM, FIRE ALARM, AND CCTV SYSTEMS.
3.07 PROVIDE SECURITY OF THE DOOR, EVEN IN THE EVENT COMMUNICATION IS LOST TO THE MAIN DATABASE, ALLOWING THE DOOR TO CONTINUE TO RECOGNIZE WHICH CARDS TO GRANT ACCESS TO, AND CONTINUING TO RECORD ACCESS TRANSACTIONS.
3.08 ALLOW PROPER EGRESS IN EMERGENCY SITUATIONS SUCH THAT NO SPECIAL KNOWLEDGE OR CARD IS REQUIRED TO EXIT A SPACE.
3.09 MUST COMPLY WITH ADA STANDARDS.
3.10 ALLOW FOR CENTRAL ADMINISTRATION OF THE ACCESS CONTROL DATABASE FOR THE PURPOSES OF POPULATING AND MAINTAINING THE OVERALL DATABASE, WHILE ALLOWING NUMEROUS SECURED USUS TO GRANT OR DENY ACCESS FOR INDIVIDUALS FROM MULTIPLE WORKSTATIONS AROUND THE CAMPUS.
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VON DUPRIN 98/99 SERIES
4.04 ELECTRIC STRIKES
VON DUPRIN SERIES 6000 24 VOLT
HES 1006 STRIKE
HES 9600, OR 9400 RIM STRIKE OR HES 9500 RIM FOR FIRE-RATED APPLICATIONS
ADAMS RITE STRIKE
SLP-UL-M-KIT - SARGENT ELR WITH REX BUILT IN (EXIT DEVICE)
VLP-UL-M-KIT - VON DUPRIN ELR WITH REX (EXIT DEVICE)
4.05 ELECTRIC POWER TRANSFER
VON DUPRIN EPT-10 EPT-5
POWER TRANSFER HINGE - ELECTRIFIED HINGE, MINIMUM 6 WIRES, MAX OF 12 WIRES. MUST BE FROM APPROVED, REPUTABLE, MANUFACTURE. ASSA ABLOY OR ALLEGIAN.
ARMORED CABLE DOOR LOOPS - USED ON PIVOT HINGE DOORS IN PLACE OF GVUX POWER TRANSFER.
ALARM LOCK ALZ71
KEDEX K-DLA12
4.06 AND/OR POWER SUPPLIES AND BATTERIES
ACCESS POWER SUPPLY/CHARGER FOR MERCURY
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DIVISION 08 00 00 - DOORS AND FRAMES

SECTION - 08 71 00 DOOR HARDWARE

SPECIFIC REQUIREMENTS
IN AN EFFORT TO REDUCE LONG-TERM MAINTENANCE COSTS AND TO PROMOTE MORE CONSISTENT PERFORMANCE OF OUR FACILITIES, UTAH STATE UNIVERSITY STANDARDIZED ON THE FOLLOWING DOOR HARDWARE PRODUCTS AND APPLICATIONS TO BE USED ON ANY NEW CONSTRUCTION OR FACILITY RENOVATION PROJECT.
IN ADDITION, ANY SPECIFICATION SECTIONS AND/OR HARDWARE SETS FOR SUCH PROJECTS SHALL BE WRITTEN AND/OR REVIEWED BY OUR LOCAL ALLEGIAN SPECIFICATION TEAM PRIOR TO FINAL BIDDING TO ENSURE COMPLIANCE WITH OUR STANDARDS. OUR LOCAL ALLEGIAN SPECIFICATION TEAM MAY BE CONTACTED VIA GEORGE STROMQUIST AIA, LEED AP BD+C, CSI, CDT (801-389-7905) OR JASON GASSAWAY (385-315-5134)
KEY SYSTEMS (PROVIDED BY OWNER)
CYLINDER TYPES: (NO SUBSTITUTION)
• ASSA KEY IN LEVER (KIL) TYPE WHERE INSTALLED IN LEVERS
• ASSA RIM AND MORTISE CYLINDERS
CYLINDER PROVISION & INSTALLATION:
• OWNER WILL FURNISH AND INSTALL PERMANENT CYLINDERS.
• CONTRACTOR SHALL PROVIDE AND INSTALL TEMPORARY CYLINDERS.
• OWNER WILL REMOVE TEMPORARY CYLINDERS AND INSTALL FINAL KEYED
• CYLINDERS UPON SUBSTANTIAL COMPLETION.
NOTE: SPECIFICATION TO CALL OUT APPROPRIATE CYLINDER QUANTITIES, MODELS, SIZES, KEYWAYS, TAILPIECES, ETC. FOR OWNER'S REFERENCE WHEN PROCURING.
MECHANICAL LOCKSETS
GRADE I CYLINDRICAL LOCKS: (NO SUBSTITUTIONS)
• SCHLAGE NO SERIES WITH LEVER
• SARGENT 10 X LINE SERIES WITH LEVER
LOCK FUNCTIONS:
• STOREROOM FUNCTION AT UTILITY, MAINTENANCE, STORAGE & ACCESS CONTROL DOORS
• ENTRANCE FUNCTION AT OFFICE DOORS
• CLASSROOM FUNCTION AT CLASSROOM DOORS
• PRIVACY FUNCTION AT RESTROOMS (WHERE INDICATORS ARE NEEDED) USE MORTISE LOCKS)
NOTE: CALL OUT FULL LOCK DETAILS (MODEL, TRIM, CYLINDER TYPE, FUNCTION, ETC) EXIT DEVICES
PANIC / FIRE EXIT HARDWARE: (NO SUBSTITUTIONS)
• VON DUPRIN 98 SERIES
• SARGENT 80 SERIES
• REFER TO OWNER ON DOGGING REQUIREMENTS (HEX, CYLINDER, THUMBTURN)
• ONLY RIM TYPE - ANY APPLICATIONS USING VERTICAL RODS, VERTICAL CABLES, OR MORTISE TYPE DEVICES REQUIRE SPECIFIC UNIVERSITY APPROVAL.
MULLIONS:
• REFER TO OWNER ON TYPE OF MULLION TO BE USED ON PAIRS (REMOVABLE OR FIXED)
• PROVIDE EACH BANK OF DOORS WITH ONLY ONE KEYED REMOVABLE MULLION
• STABILIZERS AND MOUNTING KITS ARE DESIRED ON ANY MULLIONS.
NOTE: CALL OUT FULL EXIT DEVICE DETAILS (MODEL, TRIM, FUNCTION, FIRE RATING, ETC.)
DOOR CLOSERS
MECHANICAL DOOR CLOSERS: (NO SUBSTITUTIONS)
• LCN 4040XP SERIES,
• SARGENT 281 SERIES
• THROUGH BOLT FASTENERS REQUIRED ON ALL WOOD DOORS. SELF REAMING AND TAPPING FASTENERS ARE ACCEPTABLE ON HM AND ALUMINUM.
• WHERE REQUIRED FOR CLOSER INSTALLATION, CALL OUT SPECIFIC MOUNTING BRACKETS NEEDED.
NOTE: CALL OUT FULL CLOSER DETAILS (MODEL, ARM, BRACKETS, FASTENERS, ETC.)
AUTOMATIC OPERATORS
AUTOMATIC OPERATOR: (NO SUBSTITUTIONS)
• GYROTECH 710 SERIES
• LCN 4600 SERIES
NOTE: CALL OUT FULL OPERATOR AND ACTUATOR DETAILS (MODEL, ACTUATOR KITS, SWITCHES, ETC.)
DOOR RELEASE DEVICES
MAGNETIC HOLDERS:
• LCN EMT850, SIMILAR BY ABH AND RIXSON ARE ACCEPTABLE.
• WALL MOUNT, 35LB HOLD FORCE.
• TRI-VOLTAGE (24VDC, 12VDC, AND 120VAC) COMPATIBLE.
DOOR PROTECTION
KICK PLATES:
• .050" THICK STAINLESS STEEL, BEVELED 4 EDGES.
• 10" IN HEIGHT.
• 2" LESS DOOR WIDTH (LDW)
• OMIT AT ALUMINUM STOREFRONT DOORS
STOPS
WALL STOPS:
• WROUGHT STAINLESS STEEL WITH RUBBER BUMPER.
• CONCAVE WHERE REQUIRED BY LOCK FUNCTION, OTHERWISE CONVEX.
OVERHEAD STOPS:
• HEAVY DUTY, CONCEALED OVERHEAD STOPS WITH ADJUSTABLE BRACKET AT EXTERIOR STOREFRONT DOORS.
• HEAVY DUTY, SURFACE MOUNTED STOPS WHERE WALL STOP IS NOT POSSIBLE.
• CUTBACK AND DOOR HAS NO CLOSER.
THRESHOLDS & GASKETING
NO REFERENCES.
NOTE: SPECIFICATION TO NOTE THAT GASKET SHALL BE INSTALLED SUCH THAT DOOR IS ABLE TO CLOSE AND LATCH WITHOUT BINDING ON GASKET.
FLUSH BOLTS / ASTRAGALS
FLUSH BOLTS:
• MANUAL FLUSH BOLTS PREFERRED ON INACTIVE DOORS
• AUTO FLUSH BOLTS / CONSTANT LATCHING BOLTS:
• PROVIDE ONLY WHERE SPECIFICALLY REQUIRED BY EGRESS OR FIRE CODE.
• PROVIDE JUST PROOF STRIKE ANYWHERE BOTTOM BOLT IS SPECIFIED.
CLOSERS @ PAIRS WITH INACTIVE LEAF:
• IT IS PREFERRED TO HAVE CLOSERS ON BOTH LEAVES OF PAIRS, EVEN WHEN ONE IS INACTIVE.
ASTRAGALS @ PAIRS WITH INACTIVE LEAF
• ALL LOCKSET PAIRS TO HAVE OVERLAPPING ASTRAGAL MOUNTED TO THE KEYED
SIDE OF DOOR (ACTIVE LEAF PULL SIDE MOUNT @ RHRA OR LHRA DOORS AND INACTIVE LEAF PUSH SIDE MOUNT @ RHRA / LHRA DOORS).
• PROVIDE FLAT STEEL ASTRAGAL TO BE THROUGH-BOLTED. LOCK STRIKES TO BE FLAT SO THAT ASTRAGAL IS NOT NOTCHED DURING STRIKE.
• ACCEPTABLE PRODUCTS: ZERO 44ST, NGP 139SP, PEMKO 357SP
COORDINATORS:
• PROVIDE ONLY WHERE REQUIRED BY FIRE AND/OR EGRESS CODE.
• PROVIDE FLAT BAR TYPE WITH FILLER STRIPS WITH ANY NECESSARY MOUNTING BRACKETS
THESE STANDARDS ARE TO BE PROVIDED "NO SUBSTITUTION", EXCEPT WHERE SPECIFIC WRITTEN APPROVAL IS GIVEN BY THE UNIVERSITY FACILITIES LOCK DEPARTMENT. REPLACEMENT OF ANY HARDWARE PROVIDED THAT DOES NOT ADHERE TO THESE STANDARDS MAY BE REQUIRED AT NO ADDITIONAL COST TO THE UNIVERSITY.
08 74 00 CARD ACCESS CONTROL SPECIFICATIONS
1.0 QUALIFICATIONS
1.01 PRE-QUALIFIED VENDORS FOR CARD ACCESS ON THE USU CAMPUS ARE: STONE SECURITY, AVTEC (DIVISION OF CYE) ADDITIONAL VENDORS MAY BE QUALIFIED UPON APPROVAL.
1.02 ALL INTEGRATORS AND THEIR EMPLOYEES WORKING ON THE UTAH STATE UNIVERSITY (USU) CAMPUS SHALL MEET THE FOLLOWING QUALIFICATIONS AND MUST SUBMIT EVIDENCE ACCORDINGLY.

DIVISION - 06 00 00 - WOOD & PLASTICS

SECTION 06 40 20 - INTERIOR ARCHITECTURAL WOODWORK (CONT.)
2.5 SHOP FINISHING

A. FINISH - SATIN SHEEN. COORDINATE TO MATCH BUILDING DOORS.
B. FINISH ARCHITECTURAL WOODWORK AT FABRICATION SHOP. DEFER ONLY FINAL TOUCHUP, CLEANING, AND POLISHING UNTIL AFTER INSTALLATION.
3.1 INSTALLATION
BEFORE INSTALLATION, CONDITION WOODWORK TO AVERAGE PREVAILING HUMIDITY CONDITIONS IN INSTALLATION AREAS. EXAMINE SHOP-FABRICATED WORK FOR COMPLETION AND COMPLETE WORK AS REQUIRED.
GRADE: INSTALL WOODWORK TO COMPLY WITH REQUIREMENTS FOR THE SAME GRADE SPECIFIED FOR FABRICATION OF TYPE OF WOODWORK. INSTALL WOODWORK LEVEL, PLUMB, TRUE, AND STRAIGHT TO A TOLERANCE OF 1/8 INCH IN 96 INCHES. SHIM AS REQUIRED WITH CONCEALED SHIMS. SCRIBE AND CUT WOODWORK TO FIT ADJOINING WORK, REFINISH CUT SURFACES, AND REPAIR DAMAGED FINISH AT CUTS. ANCHOR WOODWORK TO ANCHORS OR BLOCKING BUILT IN OR DIRECTLY ATTACHED TO SUBSTRATES. SECURE WITH COUNTERSUNK, CONCEALED FASTENERS AND BLIND NAILING AS REQUIRED FOR COMPLETE INSTALLATION. USE FINE FINISHING NAILS OR FINISHING SCREWS FOR EXPOSED FASTENING. COUNTERSUNK AND FILLED FLUSH WITH WOOD GRAIN. MATCH AND MATCHING FINAL FINISH IF TRANSPARENT FINISH IS INDICATED.
END OF SECTION 06 40 20

DIVISION - 07 00 00 - THERMAL MOISTURE PROTECTION

SECTION - 07 05 00 STANDARDS FOR THERMAL & MOISTURE PROTECTION
A. STANDARDS: THE DESIGN SHALL CONFORM TO THE CURRENT NATIONAL ROOFING CONTRACTORS ASSOCIATION ROOFING AND WATERPROOFING MANUAL.
B. TESTING FOR ALL NEW BUILDINGS AND SIGNIFICANT REMODELS: AN INDEPENDENT ENVELOPE CONSULTANT WILL BE USED TO ENSURE COMPLIANCE WITH STATE BUILDING REQUIREMENTS FOR ENERGY EFFICIENCY.
C. DRAINAGE: POSITIVE DRAINAGE OF AT LEAST 2% (1/4"/FOOT) SHALL BE PROVIDED ON ALL ROOFS. USE INTERIOR DRAIN PIPES WHENEVER POSSIBLE AND PENETRATE THROUGH THE BUILDING ON INTERIOR WALLS. IF EXTERIOR DRAINAGE IS NECESSARY, STEPS TO ENSURE EFFECTIVE DRAINAGE MUST BE TAKEN SUCH AS: HEAT CABLE, ICE AND WATER SHIELD, GUTTERS, ICE AND SNOW GUARDS, ETC. A QUALITY CAST METAL ROOF DRAIN, TURN OR EQUAL, SHALL BE SPECIFIED. SCURPERS SHALL NOT BE APPROVED. ROOF DRAIN PIPES SHALL BE LOCATED TO ALLOW ANTICIPATED ROOF DEFLECTION. CAP ALL PARAPET WALLS WITH METAL COPINGS USING STANDING SEAM JOINTS. LIMIT CAULKING AS A WATER-PROOFING TO A MINIMUM.
D. AIR TIGHT CONSTRUCTION: ALL DESIGNS REQUIRE DETAILS ENSURING TOTAL BUILDING ENVELOPE AIR-TIGHT CONSTRUCTION.
E. ACCESS: ALL ROOF SURFACES SHALL BE ACCESSIBLE. MOUNT LOW HVAC, WALKING DECKS AND PATIOS, ETC., HIGH ENOUGH FOR ROOF MEMBRANE TO BE ACCESSIBLE (8" MINIMUM). PROVIDE A MINIMUM OF THIRTY BY FORTY-EIGHT INCH (30X48") ROOF HATCH. ACCESS DOORS AND LADDERS TO ALL LEVELS OF THE ROOF. PROVIDE GRAB BARS ABOVE ROOF HATCHES WITH TELESOPING SAFETY RAILS. PROVIDE ELEVATOR ACCESS TO ANY ROOF THAT CONTAINS A MECHANICAL ROOM OR PENTHOUSE.
F. THERMAL AND MOISTURE BARRIER PRE-CONSTRUCTION CONFERENCE: HOLD A PRECONSTRUCTION CONFERENCE WITH ALL CONCERNED PARTIES IN ATTENDANCE.
END OF SECTION 07 05 00

SECTION - 07 51 00 INSULATION
A. MATERIALS: INSULATION MAY BE FROM WHATEVER MATERIALS, DESIGNED FOR THE SPECIFIC APPLICATION WHICH MEET PROJECT REQUIREMENTS TO ACHIEVE ANY ENERGY EFFICIENT BUILDING ENVELOPE. ALL MATERIALS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
B. CAVITY INSULATION: WHERE POSSIBLE FOR A CONCEALED LOCATION, (EX. BETWEEN FLOORS IN CURTAIN WALLS) CAVITIES SHALL BE FILLED WITH EXPANDING FOAM CAVITY INSULATION (ICYNENE OR EQUIVALENT).
END OF SECTION 07 51 00

SECTION 07 90 10 - JOINT SEALERS.

A. PROVIDE SEALANTS FOR INTERIOR NON SAGING, NON-BLEEDING, NON-STAINING TYPES.
B. PROVIDE MINIMUM ONE YEAR WARRANTY ON ALL SEALANTS.
1. COUNTERTOPS: ACRYLIC EMULSION LATEX ASTM C834 TO MATCH LAMINATE COLOR.
2. DOOR FRAME WALLS (INTERIOR): ACRYLIC EMULSION LATEX ASTM C834 TO MATCH FRAME COLOR.
END OF SECTION 07 90 10

DIVISION 08 00 00 - DOORS AND FRAMES

SECTION 08 11 00 - STEEL DOOR FRAMES (INTERIOR)
A. STEEL FRAMES: FABRICATE STEEL FRAMES TO BE RIGID, NEAT IN APPEARANCE, AND FREE FROM DEFECTS, WARP, OR BUCKLE.
1. PROVIDE UNITS WITH MITERED OR COPED AND CONTINUOUSLY WELDED CORNERS, FORMED FROM 0.0635 INCH (1.6 MM) THICK, GALV. STEEL SHEET.
B. PREPARE FRAMES TO RECEIVE HARDWARE ACCORDING TO SDI 107.
C. COMPLY WITH MANUFACTURER'S METAL FINISHES MANUAL FOR ARCHITECTURAL AND METAL PRODUCTS FOR RECOMMENDATIONS RELATIVE TO FINISHES.
1. SHOP APPLY PRIMER THAT COMPLIES WITH ANSI A224.1
END OF SECTION 08 11 00

SECTION 08 21 10 - FLUSH WOOD DOORS WITH HARDWOOD-VENEER FACES AND FACTORY FIT AND FINISHING.

A. PREMIUM GRADE: FACES OF PLAIN SLICED SEVEN PLIES.
(WOOD SPECIES TO MATCH EXISTING)
B. FINISH CATALYZED POLYURETHANE WITH OPEN GRAIN FINISH AND SATIN SHEEN.
C. WARRANTY TO BE LIFE TIME OF DOOR
D. LIGHT OPENINGS TO BE TRIMMED WITH MOLDINGS OF MATERIAL MATCHING DOOR VENEERS.
END OF SECTION 08 21 10

SECTION - 08 70 00 HARDWARE, LOCKS & KEYS

GENERAL REQUIREMENTS
A. GENERAL: THE UNIVERSITY HAS A MASTER KEY SYSTEM ON CAMPUS. ALL LOCKS SHALL BE GRADE ONE, ANY LOCKSET, PASSAGE SET, OR EXIT DEVICE SHALL MEET ADA SPECIFICATIONS, ANY LEVER IS TO HAVE A FULL RETURN AT THE END OF THE HANDLE. THE STYLE SHALL MATCH SCHLAGE SPARTA OR RHODAS.
B. LOCKS: ALL LOCKS SHALL BE PROVIDED WITH CONSTRUCTION CYLINDERS THAT ARE SCHLAGE EVEREST CYLINDERS, ZERO BITTED.
1. FOR ANY PROJECT, THERE SHALL BE SIX PERCENT (6%) EXTRA LOCKS LEFT ON THE JOB FOR MAINTENANCE. THESE LOCKS SHALL BE AS FOLLOWS WITH ONE MINIMUM OF EACH TYPE:
A. TWO PERCENT (2%) - CLASSROOM FUNCTION TYPE (KEY TO LOCK AND UNLOCK)
B. FOUR PERCENT (4%) - ENTRY FUNCTION.
2. REMODELS REQUIRE HARDWARE TO MATCH EXISTING FINISH.
C. EXTRA LOCKS: EXTRA LOCKS AND KEYS SHALL BE DELIVERED TO THE FD&COFFICE UPON COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL VERIFY QUANTITIES BEFORE DELIVERY.
D. ADDITIONS: WHERE ADDITIONS ARE BUILT TO EXISTING BUILDINGS, THE LOCKS SHALL BE OF A MATCHING TYPE TO BE CONSISTENT WITH BUILDING MASTER KEY.
E. EXIT DEVICES: EXIT DEVICES MUST HAVE DEAD LATCHING FEATURE. INSTALL WITH SEX BOLTS OR THROUGH BOLTS AS REQUIRED. THESE DEVICES SHALL MEET ADA SPECIFICATIONS. IN ADDITION PROVIDE OVERHEAD DOOR RESTRICTORS INCLUDED. FIRE EXIT DEVICES SHALL BE USED ON FIRE-RATED DOORS AS REQUIRED.
F. KEYS: DOOR KEYS AND CYLINDERS SHALL BE PART OF THE CONTRACT.
1. WHERE EXIT DEVICES ARE INSTALLED, THE CONTRACTOR SHALL SUPPLY AT LEAST ONE (1) DOGGING OR LOCKDOWN KEY WITH EACH EXIT DEVICE THAT IS NOT FIRE RATED.
2. ALL OTHER KEYS FOR CABINETS, LOCKERS, PANELS, DOGGING, ELECTRICAL OPERATOR, WATER VALVE AND SPECIAL PURPOSE KEYS SHALL BE IDENTIFIED AND TAGGED. THESE KEYS SHALL BE DELIVERED TO THE CONSTRUCTION COORDINATOR AT THE TIME OF FINAL ACCEPTANCE.
3. END OF SECTION -08 70 00



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TITLE	MECHANICAL GENERAL NOTES
PROJECT	USU ENGINEER LAB 140
CLIENT	UTAH STATE UNIVERSITY
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REVISIONS		
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ME002

ALL DRAWINGS, SPECIFICATIONS, DESIGNS, AND IDEAS REPRESENTED HEREIN ARE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER. NO PART THEREOF SHALL BE COPIED AND/OR DISCLOSED TO OTHERS OR USED IN CONJUNCTION WITH ANY OTHER PROJECT OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY HAVE BEEN PREPARED WITHOUT THE WRITTEN CONSENT OF THE DESIGNER. WRITTEN DIMENSIONS OF THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB. NOTIFY DESIGNER OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THE DRAWINGS.

PROVIDENT 20A CENTER STREET, ARCHITECTS P.L.L.C.

<h2>230050 - HVAC DESIGN CRITERIA</h2>	
A.	WORK INCLUDED: FURNISH ALL LABOR, MATERIALS, EQUIPMENT, APPLIANCES AND NECESSARY INCIDENTALS FOR THE COMPLETE INSTALLATION OF ALL HEATING, VENTILATION AND AIR CONDITIONING AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.
B.	1. AIR CONDITIONING AND HEATING TO EXISTING A/C UNITS AS INDICATED ON PLANS COMPLETE WITH DUCTWORK, AND CONTROLS. 2. RELATED WORK INCLUDED IN THIS SECTION: 1. FURNISHING ELECTRICAL DEVICES NECESSARY FOR MECHANICAL WORK, EXCEPT DISCONNECTS UNLESS INDICATED OTHERWISE. 2. LINE AND LOW VOLTAGE WIRING FOR MECHANICAL CONTROLS INCLUDING FINAL CONNECTIONS AS INDICATED ON WIRING DIAGRAMS. 3. CONDUIT FOR LINE AND LOW VOLTAGE WIRING FOR MECHANICAL CONTROLS AS INDICATED ON WIRING DIAGRAMS. 4. RESPONSIBILITY FOR OBTAINING CLARIFICATION OF DISCREPANCIES BETWEEN MECHANICAL AND ELECTRICAL WORK FROM ARCHITECT PRIOR TO PROCEEDING WITH THE WORK. 5. RESPONSIBILITY FOR PROPER OPERATION OF AUTOMATIC ELECTRICAL CONTROLS AND EQUIPMENT, AND OF ELECTRIC POWER DRIVEN EQUIPMENT FURNISHED UNDER THIS SECTION.
C.	RELATED WORK IN OTHER SECTIONS: 1. ELECTRICAL WORK AS FOLLOWS WILL BE PROVIDED UNDER ELECTRICAL DIVISION:
D.	CONDUIT FOR LINE VOLTAGE WIRING FOR EQUIPMENT AND DEVICES AS INDICATED IS SPECIFIED EXCEPT CONDUIT FOR LINE AND LOW VOLTAGE WIRING FOR MECHANICAL CONTROLS AS SPECIFIED UNDER DIVISION 23.
E.	LINE VOLTAGE WIRING FOR EQUIPMENT AND DEVICES AS INDICATED OR SPECIFIED HEREIN EXCEPT LINE AND LOW VOLTAGE WIRING FOR MECHANICAL CONTROLS AS SPECIFIED UNDER DIVISION 23.
F.	PROVIDING DISCONNECT SWITCHES.
G.	INSTALLING ELECTRICAL DEVICES SUCH AS STARTERS AND DISCONNECTS, AND WHEN INDICATED, FURNISHING ALL SUCH DEVICES.
H.	CODES AND STANDARDS: 1. IN ADDITION TO THE REQUIREMENTS OF ALL GOVERNING CODES, ORDINANCES AND AGENCIES, CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS: 2. 2021 INTERNATIONAL MECHANICAL CODE. 3. 2021 INTERNATIONAL BUILDING CODE. 4. 2021 INTERNATIONAL PLUMBING CODE. 5. 2021 INTERNATIONAL ENERGY CONSERVATION CODE. 6. 2021 INTERNATIONAL FUEL AND GAS CODE. 7. ASHRAE 90.1-2016. 8. 2020 INTERNATIONAL ELECTRICAL CODE.
I.	DESIGN CONDITIONS 1. OUTSIDE DESIGN CONDITIONS: USE THE FOLLOWING CLIMATE DATE FROM ASHRAE 2020 FUNDAMENTALS HANDBOOK 24.14 FOR LOGAN, UTAH a. ELEVATION, 4785 FT. b. SUMMER DESIGN DRY BULB TEMP. (ASHRAE 1%), 93°F c. SUMMER MEAN COINCIDENT WEB BULB, (ASHRAE 1%), 63°F d. COOLING TOWER WET BULB TEMP. (ASHRAE 1%), 53°F e. WINTER DESIGN DRY BULB TEMP. (ASHRAE 99%), -3°F f. WINTER DESIGN DRY BULB TEMP. (BEST ENG. PRACTICE, LOGAN UT), -20°F
J.	ALL GAS FIRED EQUIPMENT SHALL INCLUDE A LABEL INDICATING THAT THE APPLIANCE HAS BEEN ADJUSTED, MODIFIED OR RE-CALIBRATED FOR THE ALTITUDE WHEREIN THE PROJECT IS TO BE LOCATED. THE APPLIANCE SHALL ALSO INCLUDE A COMPLIANCE STATEMENT INDICATING THAT THE APPLIANCE HAS BEEN ADJUSTED, MODIFIED OR RE-CALIBRATED FOR THE PROPER OPERATION AT THE ALTITUDE OF THE PROJECT AND SHALL BE LISTED CAPABLE FOR USE WITH NATURAL GAS OR PROPANE GAS IF PROPANE IS LISTED ON THE DRAWINGS.
<h2>230051 - PRODUCT HANDLING</h2>	
A.	PROTECTION: TAKE ALL PRECAUTIONS NECESSARY TO PROTECT THE MATERIALS OF THIS SECTION BEFORE, DURING AND AFTER INSTALLATION.
B.	REPLACEMENTS: IN THE EVENT OF DAMAGE, IMMEDIATELY REPAIR ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.
<h2>230052 - JOB CONDITIONS</h2>	
A.	EXAMINATION OF SITE: EXAMINE THE SITE AND INCLUDE IN BID PROPOSAL ALL CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED.
<h2>230053 - INSTALLATION REQUIREMENTS</h2>	
A.	PROVIDE A MINIMUM CLEARANCE OF 30" OR MORE AT ALL EQUIPMENT AND CONNECTED PIPING. CODE REQUIRED CLEARANCE SHALL TAKE PRECEDENCE.
B.	INSTALL ALL VALVES, PIPING, AND EQUIPMENT WITH CLEARANCES TO PERMIT DISASSEMBLY FOR MAINTENANCE PURPOSES.
C.	PROVIDE AMPLE SPACE IN EQUIPMENT ROOMS FOR REMOVAL OF COILS, COOLER TUBE, IMPELLERS AND MOTOR ROTORS, HEAT EXCHANGER TUBES, ETC. OFFSET PIPING DROPS TO ALLOW REMOVAL AND PROVIDE UNIONS IN PIPING WHERE PIPING IS TO BE DISCONNECTED. SHOW AND LABEL ACCESS SPACE ON CONSTRUCTION DRAWINGS.
D.	PROVIDE ACCESS DOORS FOR ALL EQUIPMENT LOCATED ABOVE INACCESSIBLE CEILINGS.
E.	INSTALL ALL SYSTEMS SUCH THAT NO EQUIPMENT, DUCTWORK, PIPING, CONDUIT, ETC. IS REQUIRED TO BE REMOVED TO SERVICE, REPAIR OR REPLACE EQUIPMENT.
F.	LOCATE LARGER DUCTWORK, PIPING, AND VAV BOXES IN THE CEILING SPACE ABOVE CORRIDORS. LOCATE SMALLER PIPING AND CONDUIT IN ADJACENT SPACES WHERE CEILING SPACE IN CORRIDORS IS LIMITED. AVOID USING PIPING TRAPEZES WHERE ACCESS TO PIPING AND CONDUIT IS LIMITED.
G.	SCHEDULE ALL UTILITY SHUTDOWNS 7 DAYS IN ADVANCE.
<h2>230053.1 - MISCELLANEOUS</h2>	
A.	PERMIT AND FEES: ARRANGE, APPLY AND PAY FOR ALL NECESSARY PERMITS, INSPECTIONS, EXAMINATIONS AND FEES OR CHARGES REQUIRED BY PUBLIC AUTHORITIES HAVING JURISDICTION.
B.	LOCATIONS AND ACCESSIBILITY: CONTRACTOR SHALL FULLY INFORM HIMSELF REGARDING PECULIARITIES AND LIMITATIONS OF SPACE AVAILABLE FOR INSTALLATION OF WORK UNDER THIS SECTION. VALVES, MOTORS, CONTROLS AND OTHER DEVICES REQUIRING SERVICE, MAINTENANCE AND ADJUSTMENT SHALL BE PLACED IN FULLY ACCESSIBLE POSITIONS AND LOCATIONS. PROVIDE ACCESS DOORS WHERE REQUIRED IN DUCTWORK AND/OR CONSTRUCTION WHETHER SPECIALLY DETAILED OR NOT, AND RENDER ALL SUCH DEVICES ACCESSIBLE.
C.	SCAFFOLDING: FURNISH ALL SCAFFOLDING, RIGGING AND HOISTING AS REQUIRED FOR THE PROPER EXECUTION OF THE WORK.
D.	DRAWINGS: DRAWINGS INDICATE DESIRED LOCATION AND ARRANGEMENT OF DUCTWORK, EQUIPMENT, AND OTHER ITEMS, AND ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE. ALL OFFSETS AND INTERFERENCES MAY NOT BE SHOWN BECAUSE OF THE SCALE OF DRAWINGS. ASSUME THE RESPONSIBILITY FOR COORDINATING THE WORK WITH ALL OTHER TRADES. WORK SPECIFIED AND NOT CLEARLY DEFINED BY THE DRAWINGS SHALL BE INSTALLED AND ARRANGED IN A MANNER SATISFACTORY TO THE ENGINEER. IN THE EVENT CHANGES IN INDICATED LOCATIONS AND ARRANGEMENTS ARE DEEMED NECESSARY BY ENGINEER, THEY SHALL BE MADE BY THIS CONTRACTOR WITHOUT ADDITIONAL CHARGES.
E.	ALL HVAC EQUIPMENT SHALL BE LABELED. INFORMATION ON LABELS SHALL INCLUDE: IDENTIFICATION NUMBER AND NAME, SAME AS THE DRAWINGS, FLOW AND STATIC PRESSURE AND THE AREA TO WHICH THE UNIT SERVES. LABELS SHALL BE BLACK FACED FORMICA WITH WHITE ENGRAVED LETTERING AT LEAST 3/16 INCH HIGH.

230054 - DISCREPANCIES	
A.	IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE OWNER.
B.	DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED. SEE SECTION 230050.
230055 - EQUIPMENT IDENTIFICATION	
A.	ALL MAJOR EQUIPMENT SHALL BEAR FIRMLY ATTACHED METAL NAMEPLATES WHICH STATE NAME OF MANUFACTURER, MODEL NUMBER AND ELECTRICAL DATA.
230056 - INITIAL LUBRICATION, ADJUSTING, AND FILLING STATIONS	
A.	BEFORE OPERATING ANY MECHANICAL SYSTEMS, EQUIPMENT BEARINGS SHALL BE LUBRICATED AND BOLTS, PULLEYS, AND OTHER MOVING PARTS CHECKED FOR ALIGNMENT AND TOLERANCES IN ACCORDANCE WITH MANUFACTURER'S OPERATING INSTRUCTIONS. VIBRATIONS AND NOISE SHALL BE SUPPRESSED.
230057 - CLEANING OF EQUIPMENT, MATERIALS, AND PREMISES	
A.	ALL MAJOR EQUIPMENT SHALL BEAR FIRMLY ATTACHED METAL NAMEPLATES WHICH STATE NAME OF MANUFACTURER, MODEL NUMBER AND ELECTRICAL DATA.
230058 - EQUIPMENT AND MATERIALS	
A.	INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND LITERATURE.
230059 - ACCESSIBILITY	
A.	INSTALL WORK READILY ACCESSIBLE FOR NORMAL OPERATION, READING OF INSTRUMENTS, ADJUSTMENT, SERVICE, INSPECTION AND REPAIR, PROVIDE ACCESS PANELS WHERE INDICATED AND REQUIRED. ACCESS PANELS SHALL BE THE RESPONSIBILITY OF RESPECTIVE SUBCONTRACTORS.

PLUMBING GENERAL NOTES

1. SLOPE PIPE AS FOLLOWS: WASTE BRANCHES: 1/4" PER FOOT; WASTE MAINS: 1/4" PER FOOT; ROOF DRAIN/ROOF DRAIN OVERFLOW: 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
2. CONTRACTOR SHALL PERFORM ALL WORK DONE WITH WATER CONTROL IN MIND TO PREVENT WATER FROM DAMAGING AREAS ON FLOORS BELOW.
3. PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE. CONTRACTOR SHALL FIELD VERIFY EXACT PIPE ROUTING AND COORDINATE WITH ALL OTHER TRADES FOR COMPLETE INSTALLATION OF CODE COMPLIANT PLUMBING SYSTEM.
4. ALL PIPING IN PLUMBING CHASES SHALL BE ARRANGED TO ALLOW MAINTENANCE ACCESS. PROVIDE MANUFACTURER REQUIRED CLEARANCES AROUND ALL EQUIPMENT.
5. NO PIPING SHALL RUN OVER ELECTRICAL PANELS, VFD'S OR MCC'S. PROTECT EQUIPMENT WITH A 42" DEEP ZONE IN FRONT OF PANELS, VFD'S, AND MCC'S.
6. COORDINATE FAN ROOM FLOOR DRAIN AND FLOOR SINK LOCATIONS WITH COOLING COIL, EVAPORATIVE SECTION, AND HEATING COIL LOCATIONS.
7. CONTRACTOR TO PROVIDE VALVE IDENTIFICATION AND LOCATION ON ALL CEILING TILES WHERE VALVES ARE LOCATED.
8. PIPING AND ROUTING SHOWN, INCLUDING ALL BELOW FLOOR DECK PIPING, IS APPROXIMATE. EXACT LOCATION AND SIZE OF ALL PIPING SHALL BE DETERMINED BY THE CONTRACTOR AND FIELD VERIFIED.
9. REFER TO ARCHITECTURAL DRAWINGS FOR FIXTURE MOUNTING HEIGHTS, DIMENSIONS, AND OTHER REQUIREMENTS.
10. CONTRACTOR TO VERIFY CONNECTION SIDE OF ADA FIXTURES AND ADJUST ACCORDINGLY. INSTALL FLUSH VALVES HANDLES ON WIDE SIDE OF ALL FIXTURES.
11. LOCATE ALL VENTS MINIMUM 25' AWAY FROM AIR INTAKES.
12. INSTALL ALL DOMESTIC WATER LINES BELOW DUCTWORK.
13. WHERE ISOLATION VALVES, BALANCING VALVES AND WATER HAMMER ARRESTORS ARE MOUNTED ABOVE HARD CEILINGS, CONTRACTOR SHALL INSTALL 24" X 24" ACCESS DOOR IN CEILING.
14. MOUNT ALL ISOLATION VALVES, CONTROL VALVES, BALANCING VALVES, ETC. NEAR CEILING HEIGHT FOR EASE OF ACCESS & MAINTENANCE.
15. INSTALL ALL EQUIPMENT WITH SUFFICIENT CLEARANCE FOR MAINTENANCE PER MANUFACTURERS RECOMMENDATION.
16. COORDINATE ALL FLOOR PENETRATIONS WITH STRUCTURAL AND OTHER TRADES. PROVIDE SLEEVES AS NECESSARY.
17. COORDINATE EXACT LOCATION OF PLUMBING WITH STRUCTURAL MEMBERS, LIGHTS, REFLECTED CEILING, CABLE TRAY, DUCTWORK, MECHANICAL PIPING, MEDICAL GASES, FIRE PROTECTION AND OTHER TRADES, TYPICAL.
18. COORDINATE THE LOCATION OF THE FLOOR DRAIN, SHOWER DRAIN, OR FLOOR SINK WITH ARCHITECTURAL AND STRUCTURAL, TYPICAL AT ALL LOCATIONS.
19. SEE PLUMBING FIXTURE SCHEDULE FOR PIPE SIZES OF WASTE, VENT AND DOMESTIC WATER TO/FROM SINGLE FIXTURE.
20. HOSE BIBBS SHOWN AT LAVATORIES ARE TO BE MOUNTED AT AN ACCESSIBLE LOCATION UNDER THE LAVATORY.
21. COORDINATE EXACT LOCATION OF PLUMBING PIPING WITH STRUCTURAL MEMBERS, LIGHTS, REFLECTED CEILING PLANS, CABLE TRAY, ELECTRICAL CONDUITS, DUCTWORK, MECHANICAL AND FIRE PROTECTION PIPING, AND ALL OTHER TRADES AND ALL EXISTING CONDITIONS.
22. LOCATE CIRCUIT SETTERS, VALVES, WATER HAMMER ARRESTORS, ETC. IN ACCESSIBLE LOCATIONS. PROVIDE 24"x24" ACCESS PANEL WHERE ITEM IS LOCATED ABOVE A HARD CEILING.
23. INSTALL CLEANOUTS IN DRAIN PIPING AS INDICATED, AND WHERE NOT INDICATED, ACCORDING TO THE FOLLOWING.
 - a) SHALL BE SIZE SAME AS DRAINAGE PIPING UP TO 4" NPS. USE 4" NPS FOR LARGER. DRAINAGE PIPING UNLESS LARGER CLEANOUT IS INDICATED.
 - b) SHALL BE LOCATED AT MINIMUM INTERVALS OF 50 FT FOR PIPING 4" NPS AND SMALLER AND 100 FT FOR LARGER PIPING PER CODE REQUIREMENTS.
 - c) SHALL BE LOCATED AT THE BASE OF EACH VERTICAL STACK.
24. ALL PIPE AND DUCT SIZES SHALL REMAIN THE SAME SIZE SHOWN, IN THE DIRECTION OF FLOW, UNTIL INDICATED OTHERWISE.

MECHANICAL PIPING GENERAL NOTES	
1.	CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND MATERIALS AND PERFORM ALL REQUIRED LABOR TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2.	UNLESS OTHERWISE NOTED: ALL MECHANICAL PIPING IS OVERHEAD TO RUN ABOVE DUCTWORK AND TIGHT TO UNDERSIDE OF STRUCTURE.
3.	WHERE VALVING OR EQUIPMENT IS LOCATED ABOVE HARD CEILINGS PROVIDE AN ACCESS DOOR IN CEILING. ACCESS DOORS SHALL HAVE A MINIMUM SIZE OF 24"x24".
4.	NO PIPING TO RUN OVER ELECTRICAL PANELS, VFD'S OR MCC'S. PROTECT EQUIPMENT WITH A 42" DEEP ZONE IN FRONT OF PANELS, VFD'S, AND MCC'S.
5.	SLEEVE PIPING THRU WALLS/FOUNDATIONS WHERE REQUIRED. COORDINATE PIPING SLEEVES WITH OTHER TRADES AND STRUCTURAL APPURTENANCES.
6.	INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
7.	ALL VALVES SHALL BE INSTALLED SO THAT VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
8.	PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN THE HEATING AND CHILLED WATER PIPING SYSTEM.
9.	INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.
10.	ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
11.	PROVIDE ISOLATION VALVES AT EACH EXIT/ENTRANCE INTO SHAFT WHETHER OR NOT SHOWN.
12.	ALL PIPE AND DUCT SIZES SHALL REMAIN THE SAME SIZE SHOWN, IN THE DIRECTION OF FLOW, UNLESS SHOWN OTHERWISE.
13.	COORDINATE LOCATION OF THERMOSTAT WITH ARCHITECTURAL FURNISHING PLANS. MOUNT THERMOSTAT AT HEIGHT AS SPECIFIED ON ARCHITECTURAL.
14.	CONTRACTOR TO PROVIDE VALVE IDENTIFICATION AND LOCATION ON ALL CEILING TILES WHERE VALVES ARE LOCATED ABOVE CEILING.

MECHANICAL GENERAL NOTES

1. ALL SUPPLY GRILLES ARE CD-1. CFM AS NOTED, UNLESS OTHERWISE NOTED. REFER TO DETAIL FOR GRILLE & DIFFUSER CONNECTION.
2. ALL RETURN GRILLES SHOWN AS SUCH ARE RG-1 UNLESS OTHERWISE NOTED. RETURN GRILLES LOCATED IN ACCOUSTICAL CEILING TILE SHALL BE INSTALLED WITH RETURN AIR SOUND BOOT UNLESS OTHERWISE INDICATED.
3. BRANCH DUCTWORK SHALL BE SIZED TO MATCH NECK INLET SIZE OF DIFFUSER, GRILLE, OR REGISTER SERVED UNLESS NOTED OTHERWISE.
4. COORDINATE EXACT LOCATION OF THERMOSTAT WITH OWNER.
5. DO NOT ROUTE DUCTS AND PIPES ABOVE ELECTRICAL PANELS. ALL ELECTRICAL PANELS MUST HAVE CLEAR ACCESS SPACE IN FRONT OF PANEL 4'-0" DEEP AND 6'-6" HIGH. DO NOT ROUTE DUCTS AND PIPES IN ELECTRICAL ROOMS, EXCEPT DUCTS AND PIPES SERVING THE ROOM.
6. COORDINATE EXACT LOCATIONS OF GRILLES WITH ARCHITECTURAL PLANS.
7. ALL DUCT DIMENSIONS ARE INSIDE FREE AREA DIMENSIONS. ADJUST SHEET METAL DIMENSION FOR LINED DUCT.
8. PROVIDE CEILING ACCESS PANELS AS REQUIRED WHERE MECHANICAL EQUIPMENT, VALVES, FIRE DAMPERS, ETC. ARE LOCATED ABOVE INACCESSIBLE CEILINGS.
9. ROOF DECK SHALL NOT BE USED TO SUPPORT LOADS FROM PIPING, DUCTWORK OR EQUIPMENT, UNLESS NOTED OTHERWISE. HANGER LOADS LESS THAN 50 LBS. MAY BE HUNG FROM THE STEEL ROOF DECK IN CASES WHEN HANGING FROM THE STEEL ROOF DECK CANNOT BE AVOIDED; THE ATTACHMENT METHOD MUST DISTRIBUTE THE LOAD ACROSS THE DECK AS APPROVED BY THE STRUCTURAL ENGINEER.
10. COORDINATE INSTALLATION OF NEW MECHANICAL EQUIPMENT WITH EXISTING CONDITIONS.
11. ALL SURFACES DAMAGED AS A RESULT OF NEW CONSTRUCTION SHALL BE PATCHED AND REPAIRED AS REQUIRED TO MATCH EXISTING SURFACES.
12. PROVIDE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND ALL SIDES OF MECHANICAL EQUIPMENT.
13. THERMOSTATS SHALL NOT BE LOCATED ON EXTERIOR WALLS. COORDINATE EXACT MOUNTING LOCATION OF ALL THERMOSTATS WITH LATEST REVISION OF ARCHITECTURAL ELEVATION AND FURNISHINGS PLANS, TYPICAL.
14. LOCATE ALL EXHAUST VENTS AND PLUMBING VENTS MINIMUM 10 FT. FROM ALL BUILDING INTAKES.
15. INSTALL WATER, GAS, AND VENT PIPING SHOWN ABOVE THE CEILING UNLESS NOTED OTHERWISE.
16. INSTALL WASTE PIPING SHOWN BELOW THE FLOOR UNLESS NOTED OTHERWISE.
17. PROVIDE 2" MINIMUM WASTE PIPING BELOW GRADE.
18. COORDINATE EXACT LOCATION OF FIXTURES AND DRAINS WITH ARCHITECTURAL DRAWINGS.
19. PROVIDE 3" MINIMUM VENT THROUGH ROOF. INCREASE VENT LINE 12" BELOW BUILDING INSULATION.
20. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CAULKING AND SEALING ALL PENETRATIONS IN FIRE AND SMOKE RATED PARTITIONS TO MAINTAIN RATINGS. SEE SPECIFICATION, TYPICAL.
21. THE MECHANICAL CONTRACTOR SHALL PROVIDE FIRE, SMOKE OR COMBINATION FIRE/SMOKE DAMPERS AT ALL LOCATIONS SHOWN ON THE CONTRACT DOCUMENTS AND AS REQUIRED TO MEET THE INTEGRITY OF ALL SMOKE AND FIRE PARTITIONS. THE CONTRACTOR SHALL REFER TO THE LATEST ARCHITECTURAL LIFE SAFETY PLANS FOR ALL FIRE AND SMOKE PARTITION LOCATIONS. DAMPERS ARE TO BE PROVIDED WITH SHUTOFF/TEST SWITCH AT EACH LOCATION.
22. PROVIDE AND INSTALL TURNING VANES IN ALL SQUARE LOW PRESSURE DUCTWORK AT ELBOWS OR TEES, TYPICAL.
23. INSTALL ALL TERMINAL BOXES IN EASILY ACCESSIBLE AND SERVICEABLE LOCATIONS, MEETING ALL MANUFACTURERS REQUIRED CLEARANCES ON EACH SIDE. SEE DETAILS, TYPICAL.
24. CONTRACTOR SHALL OFF-SET, TRANSITION AND PROVIDE CHANGES AS REQUIRED FOR COORDINATION WITH OTHER TRADES, TYPICAL.
25. DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS. REFER TO MECHANICAL SPECIFICATIONS FOR EXTENT OF DUCT INSULATION AND LINER.
26. PROVIDE AND INSTALL REMOTE DAMPER OPERATORS FOR ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS. SEE MECHANICAL SPECIFICATIONS FOR EQUIPMENT REQUIREMENTS, TYPICAL.
27. PROVIDE AND INSTALL HIGH EFFICIENCY TAKE-OFF FITTINGS AND BALANCING DAMPER AT ALL BRANCH CONNECTIONS TO LOW PRESSURE DUCTWORK.
28. PROVIDE AND INSTALL HIGH EFFICIENCY OR CONICAL TAKE-OFFS AT ALL BRANCH CONNECTIONS TO MEDIUM PRESSURE DUCTWORK.
29. WHERE DUCTWORK CROSSES, SUPPLY DUCTWORK IS USUALLY BELOW RETURN AND EXHAUST DUCT. RETURN DUCTWORK IS USUALLY BELOW EXHAUST DUCTS.
30. EXCEPT WHERE DIRECTED TO PLACE ITEMS OF WORK AT THE APPROXIMATE LOCATION SHOWN; DO NOT SCALE DRAWINGS FOR DIMENSIONAL INFORMATION. ALL ELEMENTS OF THE DRAWINGS MAY NOT BE DRAWN TO EXACT SCALE. ALL DIMENSIONS REQUIRED ARE SHOWN OR MAY BE DERIVED FROM THOSE SHOWN ON THE FLOOR PLANS, DETAIL PLANS, ELEVATIONS, SECTION, DETAILS, SCHEDULES, AND SPECIFICATIONS; IF CONCERNS ARISE, THE CONTRACTOR SHALL NOTIFY THE DESIGNER SO THAT A CLARIFICATION CAN BE ISSUED.
31. THESE DOCUMENTS SHOW THE DESIGN INTENT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE EVERYTHING INDICATED ON THE DRAWINGS OR SPECIFIED REGARDLESS OF WHERE IT IS SHOWN ON THE DRAWINGS OR IN THE SPECIFICATIONS.
32. THE CONTRACTOR SHALL INFORM THE DESIGNER OF ANY PROPOSED DEVIATIONS FROM THE CONTRACT DOCUMENTS.



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230500 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL
 1.1 SECTION REQUIREMENTS
 A. SUMMARY: GENERAL REQUIREMENTS FOR MOTORS, HANGERS AND SUPPORTS, VIBRATION ISOLATION AND SEISMIC RESTRAINTS, VALVES, AND METERS AND GAGES.
 B. SUBMITTALS: PRODUCT DATA FOR MATERIALS AND EQUIPMENT SPECIFIED IN THIS SECTION.
 PART 2 - PRODUCTS
 2.1 MOTORS
 A. MOTOR CHARACTERISTICS:
 1. MOTORS 34 HP AND LARGER: THREE PHASE.
 2. MOTORS SMALLER THAN 34 HP: SINGLE PHASE.
 3. FREQUENCY RATING: 60 HZ.
 4. VOLTAGE RATING: NEMA STANDARD VOLTAGE SELECTED TO OPERATE ON NOMINAL CIRCUIT VOLTAGE TO WHICH MOTOR IS CONNECTED.
 5. SERVICE FACTOR: 1.15 FOR OPEN DRIPPROOF MOTORS; 1.0 FOR TOTALLY ENCLOSED MOTORS.
 6. DUTY: CONTINUOUS DUTY AT AMBIENT TEMPERATURE OF 105°F AND AT ALTITUDE OF 4500 FEET ABOVE SEA LEVEL.
 7. CAPACITY AND TORQUE CHARACTERISTICS: SUFFICIENT TO START, ACCELERATE, AND OPERATE CONNECTED LOADS AT DESIGNATED SPEEDS, AT INSTALLED ALTITUDE AND ENVIRONMENT, WITH INDICATED OPERATING SEQUENCE, AND WITHOUT EXCEEDING NAMEPLATE RATINGS OR CONSIDERING SERVICE FACTOR.
 8. ENCLOSURE: UNLESS OTHERWISE INDICATED, OPEN DRIPPROOF.
 9. MOTORS USED WITH VARIABLE FREQUENCY CONTROLLERS: RATINGS, CHARACTERISTICS, AND FEATURES COORDINATED WITH AND APPROVED BY CONTROLLER MANUFACTURER.
 2.2 HANGERS AND SUPPORTS
 A. HANGER AND PIPE ATTACHMENTS: FACTORY FABRICATED WITH GALVANIZED COATINGS; NONMETALLIC COATED FOR HANGERS IN DIRECT CONTACT WITH COPPER TUBING.
 B. BUILDING ATTACHMENTS: POWDER-ACTUATED-TYPE, DRIVE-PIN SUPPORTS WITH BUILDING MATERIAL SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
 C. MECHANICAL-EXPANSION ANCHORS: INSERT WEDGE-TYPE ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
 2.3 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICES
 A. VIBRATION SUPPORTS:
 1. RESTRAINED ELASTOMERIC MOUNTS: DOUBLE-DEFLECTION TYPE, WITH MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS WITH FACTORY-DRILLED, ENCAPSULATED TOP PLATE FOR BOLTING TO EQUIPMENT AND BASEPLATE FOR BOLTING TO STRUCTURE. PROVIDE ISOLATOR WITH MINIMUM 0.5-INCH STATIC DEFLECTION.
 2. SPRING ISOLATORS: FREESTANDING, LATEROALLY STABLE, OPEN-SPRING ISOLATORS. PROVIDE ISOLATOR WITH MINIMUM 1-INCH STATIC DEFLECTION.
 B. VIBRATION HANGERS:
 1. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE, WITH MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS BONDED TO STEEL HOUSINGS WITH THREADED CONNECTIONS FOR HANGER RODS. PROVIDE ISOLATOR WITH MINIMUM 0.5-INCH STATIC DEFLECTION.
 2. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGER WITH SPRING AND INSERT IN COMPRESSION. PROVIDE ISOLATOR WITH MINIMUM 1-INCH STATIC DEFLECTION.
 C. SEISMIC RESTRAINTS:
 1. RESILIENT ISOLATION WASHERS AND BUSHINGS: 1-PIECE, MOLDED, BRIDGE-BEARING NEOPRENE COMPLYING WITH AASHTO M 251 AND HAVING A DUROMETER HARDNESS OF 50, PLUS OR MINUS 5, WITH A FLAT WASHER FACE.
 2. RESTRAINING CABLES: GALVANIZED STEEL CABLES WITH END CONNECTIONS MADE OF STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT.
 3. ANCHOR BOLTS: SEISMIC-RATED, DRILL-IN, AND STUD-WEDGE OR FEMALE-WEDGE TYPE. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488/E 488M.
 2.4 PRESSURE GAGES AND TEST PLUGS
 A. PRESSURE GAGES: DIRECT-MOUNTING, INDICATING-DIAL TYPE COMPLYING WITH ASME B40.100. DRY METAL CASE, MINIMUM 2-1/2 INCH DIAMETER WITH RED POINTER ON WHITE FACE, AND PLASTIC WINDOW. MINIMUM ACCURACY 3 PERCENT OF MIDDLE HALF OF RANGE. RANGE TWO TIMES OPERATING PRESSURE.
 B. TEST PLUG: CORROSION-RESISTANT BRASS OR STAINLESS-STEEL BODY WITH TWO SELF-SEALING RUBBER CORE INSERTS AND GASKETED AND THREADED CAP, WITH EXTENDED STEM FOR UNITS TO BE INSTALLED IN INSULATED PIPING. MINIMUM PRESSURE AND TEMPERATURE RATING 500 PSIG AT 200°F.
 PART 3 - EXECUTION
 3.1 MOTOR INSTALLATION
 A. ANCHOR MOTOR ASSEMBLY TO BASE, ADJUSTABLE RAILS, OR OTHER SUPPORT, ARRANGED AND SIZED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
 3.2 GENERAL PIPING INSTALLATIONS
 A. INSTALL PIPING FREE OF SAGS AND BENDS.
 B. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
 C. INSTALL SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS AND CONCRETE FLOOR AND ROOF SLABS.
 D. EXTERIOR WALL, PIPE PENETRATIONS: MECHANICAL SLEEVE SEALS INSTALLED IN STEEL OR CAST-IRON PIPES FOR WALL SLEEVES.
 E. FIRE-BARRIER PENETRATIONS: SEAL PIPE PENETRATIONS WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
 F. INSTALL UNIONS AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT.
 G. INSTALL DIELECTRIC UNIONS AND FLANGES TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN GAS PIPING.
 H. INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN WATER PIPING.
 3.3 GENERAL EQUIPMENT INSTALLATIONS
 A. INSTALL EQUIPMENT TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS ARE NOT INDICATED.
 B. INSTALL EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.
 C. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS. EXTEND GROUND FITTINGS TO ACCESSIBLE LOCATIONS.
 D. INSTALL EQUIPMENT TO ALLOW RIGHT OF WAY FOR PIPING INSTALLED AT REQUIRED SLOPE.
 3.4 CONCRETE BASES
 A. ANCHOR EQUIPMENT TO CONCRETE BASE ACCORDING TO EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS AND ACCORDING TO SEISMIC CODES AT PROJECT.
 B. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4 INCHES LARGER IN BOTH DIRECTIONS THAN SUPPORTED UNIT.
 C. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 18-INCH CENTERS AROUND THE FULL PERIMETER OF THE BASE TO CONNECT CONCRETE BASE TO CONCRETE FLOOR.
 D. INSTALL EPOXY-COATED ANCHOR BOLTS FOR SUPPORTED EQUIPMENT THAT EXTEND THROUGH CONCRETE BASE, AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
 E. PLACE AND SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURER'S SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS.
 F. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.

- I. USE 3000-PSI, 28-DAY COMPRESSIVE-STRENGTH CONCRETE AND REINFORCEMENT AS SPECIFIED IN DIVISION 3 SECTION "CAST-IN-PLACE CONCRETE." 3.5 HANGERS AND SUPPORTS
- A. COMPLY WITH MSS SP-69 AND MSS SP-89. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE OR TO STRUCTURAL STEEL.
- B. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS.
- C. INSTALL POWDER-ACTUATED DRIVE-PIN FASTENERS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
- D. INSTALL MECHANICAL-EXPANSION ANCHORS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
- E. SEE DIVISION 13 SECTION "FIRE SUPPRESSION PIPING" FOR SUPPORT OF FIRE-PROTECTION SYSTEM PIPING.
- F. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
- G. HORIZONTAL-PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
 - 1. ADJUSTABLE STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED STATIONARY PIPES.
 - 2. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4, TO ALLOW OFF-CENTER CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION.
 - 3. ADJUSTABLE STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
 - 4. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
 - 5. ADJUSTABLE SWIVEL-RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
- H. VERTICAL-PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
 - 1. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20.
 - 2. CARBON- OR ALLOY-STEEL RISER CLAMPS (MSS TYPE 42): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20, IF LONGER ENDS ARE REQUIRED FOR RISER CLAMPS.

3.6 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICE INSTALLATION

- A. ADJUST VIBRATION ISOLATORS TO ALLOW FREE MOVEMENT OF EQUIPMENT LIMITED BY RESTRAINTS.
- B. INSTALL RESILIENT BOLT ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS.
- C. INSTALL CABLES SO THEY DO NOT BEND ACROSS SHARP EDGES OF ADJACENT EQUIPMENT OR BUILDING STRUCTURE.

3.7 PRESSURE GAGES AND TEST PLUGS

- A. INSTALL PRESSURE GAGES AT SUCTION AND DISCHARGE OF EACH PUMP.
- B. INSTALL TEST PLUGS AT SUPPLY AND RETURN FOR HYDRONIC TERMINALS, AND BOILERS.

END OF SECTION 230500

230523 - VALVES

PART 1 - GENERAL (NOT APPLICABLE)
PART 2 - PRODUCTS
2.1 GENERAL-DUTY VALVES

- A. END CONNECTIONS: THREADS SHALL COMPLY WITH ANSI B1.20.1. FLANGES SHALL COMPLY WITH ANSI B16.1 FOR CAST-IRON VALVES AND ANSI B16.24 FOR BRONZE VALVES. SOLDER-JOINT CONNECTIONS SHALL COMPLY WITH ANSI B16.18.
- B. ONE-PIECE, COPPER-ALLOY BALL VALVES: BRASS OR BRONZE BODY WITH CHROME-PLATED BRONZE BALL, PTFE OR TFE SEATS, AND 400-PSIG MINIMUM CWP RATING.
- C. TWO-PIECE, COPPER-ALLOY BALL VALVES: BRONZE BODY WITH REGULAR-PORT, CHROME-PLATED BRONZE BALL; PTFE OR TFE SEATS; AND 600-PSIG MINIMUM CWP RATING AND BLOWOUT-PROOF STEM.
- D. BRONZE, SWING CHECK VALVES: CLASS 125, BRONZE BODY WITH NONMETALLIC DISC AND SEAT.
- E. BRONZE GATE VALVES: CLASS 125, BRONZE BODY WITH NONRISING STEM AND BRONZE SOLID WEDGE.
- F. CAST-IRON GATE VALVES: CLASS 125, NONRISING CAST-IRON BODY AND SOLID-WEDGE DISC.
- G. BRONZE GLOBE VALVES: CLASS 125, BRONZE BODY WITH BRONZE DISC.

PART 3 - EXECUTION
3.1 INSTALLATION

- A. USE GATE AND BALL VALVES FOR SHUTOFF DUTY; GLOBE AND BALL FOR THROTTLING DUTY.
- B. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.
- C. INSTALL VALVES FOR EACH FIXTURE AND ITEM OF EQUIPMENT.
- D. INSTALL THREE-WAY BYPASS AROUND EACH PRESSURE-REDUCING VALVE USING THROTTLING-TYPE VALVES.
- E. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE.
- F. INSTALL VALVES IN A POSITION TO ALLOW FULL STEM MOVEMENT.
- G. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW IN HORIZONTAL POSITION WITH HINGE PIN LEVEL.

END OF SECTION 230523

230548 - MECHANICAL VIBRATION AND SEISMIC CONTROLS

PART 1 - GENERAL

1.1 SEISMIC AND VIBRATION CONTROL

A. GENERAL: DIVISION 15 SHALL BE RESPONSIBLE FOR PURCHASING AND INSTALLING VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, RIGID STEEL FRAMES, ANCHORS, INSERTS, HANGERS AND ATTACHMENTS AND SEISMIC BRACING AND SNUBBERS AS REQUIRED FOR SEISMIC CONTROL AND PREVENTION OF THE TRANSMISSION OF VIBRATION FOR BOTH ISOLATED AND NON-ISOLATED SYSTEMS.

B. ALL MECHANICAL EQUIPMENT SHALL BE DESIGNED FOR THE SITE SPECIFIC SEISMIC ZONE AS SET BY THE INTERNATIONAL BUILDING CODE.

C. REFERENCE STANDARDS: THE WORK SHALL COMPLY TO THE FOLLOWING STANDARDS:

1. INTERNATIONAL BUILDING CODE, CURRENT EDITION
2. NFPA BULLETIN 90A, CURRENT EDITION
3. BRIDGE BEARING SPECIFICATIONS

D. DESIGN PARAMETERS: REFER TO SECTION 1621 OF THE 2003 INTERNATIONAL BUILDING CODE AND ASCE 7-02.

E. APPROVED MANUFACTURERS:

1. IN ORDER TO INSURE THAT THE REQUIREMENTS OF THE PROJECT ARE ACHIEVED, THE CONTRACTOR MUST SECURE THE SERVICES OF A MANUFACTURER OR SUPPLIER WHO HAS PROVEN CAPABILITIES OF DEALING EFFECTIVELY WITH VIBRATION CHARACTERISTICS, EFFECTS AND CRITERIA AND CAN PROVIDE FACILITIES AND CAPABILITIES FOR MEASURING, EVALUATING AND DESIGNING FOR SEISMIC DISTURBANCES.
2. MANUFACTURERS APPROVED FOR USE ARE:
 - A. MASON INDUSTRIES, INC.
 - B. AMBER/BOOTH COMPANY.
 - C. VIBRATION ELIMINATOR CO.
3. KINETICS NOISE CONTROL.

3. THE MANUFACTURER'S RESPONSIBILITIES SHALL INCLUDE DESIGNING AND PROVIDING VIBRATION ISOLATORS AND SEISMIC RESTRAINTS. HE SHALL ALSO BE RESPONSIBLE FOR THE PROPER INSTALLATION OF THESE COMPONENTS. PERIODIC INSPECTIONS TO THE JOB SITE WILL BE MADE AS REQUIRED. HE SHALL MAKE A FINAL INSPECTION AND SUBMIT A REPORT TO THE ARCHITECT CERTIFYING COMPLIANCE TO THESE SPECIFICATIONS, DRAWINGS AND RELATED STANDARDS. PROVIDE SUBMITTALS AS SPECIFIED.

SUBMITTALS: SUBMITTAL DATA PRIOR TO FABRICATION, SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

1. COMPLETE ENGINEERING CALCULATIONS AND SHOP DRAWINGS FOR ALL VIBRATION AND SEISMIC REQUIREMENTS FOR ALL EQUIPMENT, PIPING AND DUCTWORK.
2. THE UTAH STATE PROFESSIONAL STAMP OF THE ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN AND OPERATION OF THE VIBRATION AND SEISMIC SYSTEM.
3. THE TYPE, SIZE, AND DEFLECTION OF EACH ISOLATOR PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
4. DETAILS FOR ALL THE ISOLATORS AND SEISMIC BRACING WITH SNUBBERS PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
5. THE SIZE, LOADING AND LOCATION OF PIPE AND DUCT SUPPORTS WITH AN AS-BUILT PLAN OR COMPLETE DESCRIPTION OF THE SYSTEM.

G. VIBRATION ISOLATION:

1. ALL MECHANICAL EQUIPMENT 1 HP. AND OVER UNLESS OTHERWISE NOTED, SHALL BE ISOLATED FROM THE STRUCTURE BY MEANS OF RESILIENT VIBRATION AND NOISE ISOLATORS DESIGNED AND SUPPLIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER. PIPING AND DUCTWORK CONNECTED TO VIBRATING EQUIPMENT SHALL BE ISOLATED FROM THE STRUCTURE AS REQUIRED TO PREVENT VIBRATION TRANSMISSION. ISOLATOR EQUIPMENT, HANGERS, CONNECTIONS, AND OTHER ISOLATING DEVICES SHALL BE DESIGNED AND INSTALLED TO PREVENT TRANSMISSION OF VIBRATION TO THE STRUCTURE FROM THE MECHANICAL EQUIPMENT OR ANY OF THE ASSOCIATED PIPING AND DUCTWORK.

H. VIBRATION ISOLATORS SHALL BE PROVIDED AS FOLLOWS AND AS OTHERWISE INDICATED:

1. ISOLATE ALL WATER PIPING THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS.
2. ISOLATE ALL DUCTWORK THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS WITH NEOPRENE ELEMENTS.

I. VIBRATION ISOLATORS SHALL BE AS FOLLOWS:

1. TYPE D SPRING HANGERS: VIBRATION HANGERS SHALL CONTAIN A STEEL SPRING AND 0.3" DEFLECTION NEOPRENE ELEMENT IN SERIES. THE NEOPRENE ELEMENT SHALL BE MOLDED WITH A ROD ISOLATION BUSHING THAT PASSES THROUGH THE HANGER BOX. SPRING DIAMETERS AND HANGER BOX LOWER HOLE SIZES SHALL BE LARGE ENOUGH TO PERMIT THE HANGER ROD TO SWING THROUGH A 30 DEGREE ARC BEFORE CONTACTING THE HOLE AND SHORT CIRCUITING THE SPRING. SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL TO JOIN EQUAL TO 50% OF THE RATED DEFLECTION. HANGERS SHALL BE TYPE 30D AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER-BOOOTH.
2. TYPE P NEOPRENE PAD: A PAD TYPE MOUNTING CONSISTING OF TWO LAYERS OF 3/8" THICK RIBBED OR WAFFLED BRIDGE BEARING NEOPRENE PADS BOND TO A 16 GAGE GALVANIZED STEEL SEPARATOR PLATE. ANCHOR BOLT WITH NEOPRENE WASHER AND SLEEVE.

J. SEISMIC RESTRAINTS:

1. GENERAL: THE INTENT OF THE SEISMIC RESTRAINTS IS TO RESTRAIN THE MECHANICAL EQUIPMENT, PIPES AND DUCTS DURING AN EARTHQUAKE FOR LIFE SAFETY PURPOSES, TO PREVENT EQUIPMENT FROM OVERTURNING, TO PREVENT SUSPENDED EQUIPMENT, PIPES AND DUCTS FROM SWAYING OR FALLING AND CREATING A POTENTIAL LIFE SAFETY HAZARD. FOR "ESSENTIAL" AND "HAZARDOUS" FACILITIES (AS DEFINED IN THE INTERNATIONAL BUILDING CODE), THE INTENT OF THE SEISMIC RESTRAINT SYSTEM ALSO INCLUDES PREVENTING THE MECHANICAL SYSTEMS OPERATIONAL DURING AND FOLLOWING AN EARTHQUAKE. SEE SECTION 05500 "METAL FABRICATION" FOR STANDARDS FOR MISCELLANEOUS METAL FABRICATION.
2. THE FOLLOWING MECHANICAL ITEMS SHALL BE SEISMIC ALLY BRACED AS SPECIFIED, DETAILED ON THE DRAWINGS, OR AS RECOMMENDED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER:

A. ROOF HOODS - ANCHOR BOLTS

B. PACKAGED ROOFTOP AIR HANDLERS - ANCHOR BOLTS

C. WATER HEATER - ANCHOR BOLTS

D. INLINE EXHAUST FANS - CABLES

E. ALL DUCT WORK AND PIPING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL BUILDING CODE. INSULATED PIPING LONGITUDINAL RESTRAINTS SHALL BE ATTACHED DIRECTLY TO PIPING.

3. CONNECTIONS OF THE SEISMIC BRACING TO THE STRUCTURE SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND ACCEPTABLE TO THE STRUCTURAL ENGINEERS. IN GENERAL, CONNECT TO BEAMS, CONCRETE SLABS, OR TO THE TOP MEMBER OF THE JOISTS AT THE PANEL POINTS. DIVISION 15 SHALL PROVIDE SPANNER BEAMS WHERE REQUIRED FOR SEISMIC BRACING. SEISMIC ANCHORAGE SHALL EXTEND THROUGH CONCRETE HOUSE KEEPING PADS AND ANCHOR TO THE BUILDING FLOOR SLABS.
4. THE SEISMIC AND VIBRATION CONTROL MANUFACTURER SHALL DETERMINE THE NUMBER, SIZE, AND TYPE OF ANCHOR BOLTS, CABLE RESTRAINTS, SEISMIC SNUBBERS, ETC. FOR EACH TYPE OF EQUIPMENT AND GROUPS OF PIPES AND DUCTS. INDIVIDUAL PIPES AND DUCTS SHALL BE BRACED AS PER THE SMACNA DETAILS AND APPROVED AND VERIFIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER.

K. SEISMIC SNUBBERS:

1. THE CAPACITY OF THE SEISMIC SNUBBER AT 3/8" DEFLECTION SHALL BE 3 TO 4 TIMES THE LOAD ASSIGNED TO THE MOUNT GROUPING IN ITS IMMEDIATE AREA. SUBMITTALS SHALL INCLUDE LOAD DEFLECTION CURVES UP TO 1/2" DEFLECTION IN THE Y AND Z PLANES. TEST SHALL BE CONDUCTED IN AN INDEPENDENT LABORATORY OR UNDER THE SIGNED SUPERVISION OF AN INDEPENDENT REGISTERED ENGINEER. THE SNUBBER ASSEMBLIES SHALL BE BOLTED TO THE TEST MACHINE AS THE SNUBBER IS NORMALLY INSTALLED. TEST REPORTS SHALL CERTIFY THAT NEITHER THE NEOPRENE ELEMENTS NOR THE SNUBBER BODY SUSTAINED ANY OBVIOUS DEFORMATION AFTER RELEASE OF LOAD. SNUBBERS SHALL BE SERIES Z-1011 AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER-BOOOTH.

END OF SECTION 230548

230594 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. THIS SECTION INCLUDES TESTING AND BALANCING TO PRODUCE DESIGN OBJECTIVES FOR AIR SYSTEMS.

B. CERTIFIED REPORTS: SUBMIT TWO COPIES OF REPORTS PREPARED, AS SPECIFIED IN THIS SECTION, ON APPROVED FORMS CERTIFIED BY TEST AND BALANCE FIRM.

C. TAB FIRM QUALIFICATIONS: ENGAGE A TAB FIRM CERTIFIED BY EITHER ABC OR NEBB TO CONDUCT TESTING, USE STANDARD FORMS FROM ABC'S NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS* OR NEBB'S PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS.*

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS, INCLUDING DESIGN CONDITIONS, SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TEST AND BALANCE OF SYSTEMS AND EQUIPMENT.

B. EXAMINE APPROVED SUBMITTAL DATA OF HVAC SYSTEMS AND EQUIPMENT.

C. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT THEY ARE COMPLETE AND THAT TESTING, CLEANING, ADJUSTING, AND COMMISSIONING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.

D. EXAMINE HVAC SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT INDICATED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW CONTROL VALVES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS, ARE PROPERLY INSTALLED, AND THAT THEIR LOCATIONS ARE ACCESSIBLE AND APPROPRIATE FOR EFFECTIVE BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION.

EXAMINE SYSTEMS FOR FUNCTIONAL DEFICIENCIES THAT CANNOT BE CORRECTED BY ADJUSTING AND BALANCING.

F. EXAMINE HVAC EQUIPMENT TO ENSURE THAT CLEAN FILTERS HAVE BEEN INSTALLED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.

G. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:

1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
3. INTEGRITY OF DAMPERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
4. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
5. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
6. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE CONTRACT DOCUMENTS.
7. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
8. INTERLOCKED SYSTEMS ARE OPERATING.
9. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.

H. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TEST AND BALANCE PROCEDURES.

3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS."

B. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES. AFTER TESTING AND BALANCING, CLOSE PROBE HOLES AND PATCH INSULATION WITH NEW MATERIALS IDENTICAL TO THOSE REMOVED. RESTORE VAPOR BARRIER AND FINISH ACCORDING TO INSULATION SPECIFICATIONS FOR THIS PROJECT.

C. MARK EQUIPMENT AND IDENTIFICATION DEVICE SETTINGS WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER/CONTROLLER POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS.

D. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP) UNITS.

3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS "AS-BUILT" DUCT LAYOUTS.

B. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS.

C. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.

D. CHECK FOR AIRFLOW BLOCKAGES.

E. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.

F. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.

G. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.

3.4 TOLERANCES

A. SET HVAC SYSTEM AIRFLOW RATES WITHIN THE FOLLOWING TOLERANCES:

1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS 5 TO PLUS 10 PERCENT.
2. AIR OUTLETS AND INLETS: 0 TO MINUS 10 PERCENT.

END OF SECTION 230594

230700 - MECHANICAL INSULATION

- 1. GENERAL
- 1.1 SECTION REQUIREMENTS
- A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF MECHANICAL INSULATION.
- B. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE-DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.
- 2. PRODUCTS
- 2.1 PIPE INSULATION
- A. PERFORMED, GLASS-FIBER PIPE INSULATION: ASTM C 547, CLASS 1, WITH FACTORY-APPLIED, ALUMINUM, VAPOR-BARRIER JACKET.
- B. FLEXIBLE ELASTOMERIC-CELLULAR PIPE INSULATION: CLOSED-CELL, SPONGE-OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I.
- C. POLYOLEFIN PIPE INSULATION: UNICELLULAR POLYETHYLENE, PERFORMED PIPE INSULATION. COMPLY WITH ASTM C 534, TYPE I, EXCEPT FOR DENSITY.
- 2.2 DUCT AND EQUIPMENT INSULATION
- A. GLASS-FIBER-BOARD INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 612, TYPE IB, WITHOUT FACING AND WITH ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM.
- B. GLASS-FIBER-BLANKET INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II, WITHOUT FACING AND WITH ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM.
- C. FLEXIBLE ELASTOMERIC-CELLULAR SHEET INSULATION: CLOSED-CELL, SPONGE-OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE II.
- 3. EXECUTION
- 3.1 PIPE INSULATION INSTALLATION
- A. INSTALL VAPOR BARRIERS ON INSULATED PIPES WITH SURFACE OPERATING TEMPERATURES BELOW 60°F.
- B. INSULATE PIPE, FITTINGS, VALVES, AND SPECIALTIES, EXCEPT IN HOT WATER SYSTEMS WHERE VALVES AND SPECIALTIES DO NOT REQUIRE INSULATION.
- C. SEAL VAPOR-BARRIER PENETRATIONS FOR HANGERS, SUPPORTS, ANCHORS, AND OTHER PROJECTIONS.
- D. COAT GLASS-FIBER PIPE INSULATION ENDS WITH VAPOR-BARRIER COATING.
- E. ROOF PENETRATIONS: APPLY INSULATION FOR INTERIOR APPLICATIONS TO THE ROOF FLASHING.
- F. EXTERIOR WALL PENETRATIONS: FOR PENETRATIONS BELOW GRADE, TERMINATE INSULATION FLUSH WITH MECHANICAL SLEEVE SEAL. FOR PENETRATIONS ABOVE GRADE, TERMINATE AT INSIDE SURFACE OF EXTERIOR CLADDING.
- G. INTERIOR WALLS AND PARTITIONS PENETRATIONS: APPLY INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS. EXCEPT FIRE-RATED WALLS AND PARTITIONS.
- H. FIRE-RATED WALLS AND PARTITIONS PENETRATIONS: TERMINATE INSULATION AT PENETRATIONS THROUGH FIRE-RATED WALLS AND PARTITIONS. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
- I. FLOOR PENETRATIONS: TERMINATE INSULATION AT THE UNDERSIDE OF THE FLOOR ASSEMBLY AND AT THE FLOOR SUPPORT AT TOP OF FLOOR. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
- J. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION: SEAL JOINTS WITH ADHESIVE.
- K. INTERIOR PIPING SYSTEM APPLICATIONS: INSULATE THE FOLLOWING PIPING SYSTEMS:
 - 1. DOMESTIC HOT WATER
 - 2. RECIRCULATED DOMESTIC HOT WATER
 - 3. ROOF DRAIN BODIES AND HORIZONTAL RAINWATER LEADERS OF STORM WATER PIPING.
 - 4. EXPOSED WATER SUPPLIES AND SANITARY DRAINS OF FIXTURES FOR PEOPLE WITH DISABILITIES.
 - 5. VENT PIPING 5 FT. INSIDE BUILDING.
- L. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:
 - 1. FLEXIBLE CONNECTORS.
 - 2. FIRE-PROTECTION PIPING SYSTEMS.
 - 3. SANITARY DRAINAGE AND VENT PIPING.
 - 4. DRAINAGE PIPING LOCATED IN CRAWLSPACES, UNLESS OTHERWISE INDICATED.
 - 5. CHROME-PLATED PIPES AND FITTINGS, EXCEPT FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
 - 6. PIPING SPECIALTIES, INCLUDING AIR CHAMBERS, UNIONS, STRAINERS, CHECK VALVES, PLUG VALVES, AND FLOW REGULATORS.

PIPE INSULATION THICKNESS APPLICABLE SCHEDULE: INSULATE PIPING WITH THE FOLLOWING MATERIALS AND THICKNESSES:

1. DOMESTIC HOT WATER AND RECIRCULATED HOT WATER: 1-INCH THICK, PERFORMED, GLASS- FIBER PIPE INSULATION.
2. HYDRONIC COOLING PIPING, 40 TO 60°F: PERFORMED, GLASS- FIBER PIPE INSULATION.

A. PIPE DIAMETER LESS THAN NPS 1-1/2: 1 INCH THICK.

B. PIPE DIAMETER NPS 1-1/2 AND LARGER: 1 INCH THICK.

3. HYDRONIC HEATING PIPING, 140 TO 220°F: 1-INCH THICK, PERFORMED, GLASS- FIBER PIPE INSULATION.
4. REFRIGERANT SUCTION PIPING: 1/2-INCH THICK, FLEXIBLE, ELASTOMERIC- CELLULAR PIPE INSULATION.
5. SANITARY DRAINS AND STORM WATER PIPING: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.

3.2 DUCT INSULATION INSTALLATION

A. INSTALL INSULATION CONTINUOUSLY ON DUCTS THAT PENETRATE WALLS AND FLOORS, EXCEPT WHERE FIRE-RATED ASSEMBLIES TERMINATE INSULATION AT THE ASSEMBLY. MAINTAIN INSULATION VAPOR RETARDERS ON COLD DUCTS.

B. INSTALL REMOVABLE OR SEGMENTED INSULATION ON ACCESS PANELS AND DOORS.

C. INSTALL VAPOR BARRIERS ON INSULATED DUCTS AND PLENUMS WITH SURFACE OPERATING TEMPERATURES BELOW 60 °F. SEAL JOINTS AND SEAMS TO MAINTAIN VAPOR BARRIER ON INSULATION REQUIRING A VAPOR BARRIER.

D. TAPER GLASS-FIBER INSULATION ENDS AT A 45-DEGREE ANGLE AND SEAL WITH ADHESIVE. CUT ENDS OF FLEXIBLE ELASTOMERIC CELLULAR INSULATION SQUARE AND SEAL WITH ADHESIVE.

E. SPEED INSULATION INSTALLATION: SECURE INSULATION TIGHT AND SMOOTH WITH BOARD WASHERS AND ANCHOR PINS. SPACE ANCHOR PINS 18 INCHES APART EACH WAY AND 3 INCHES FROM INSULATION JOINTS. APPLY VAPOR-BARRIER COATING COMPOUND TO INSULATION AT OPEN JOINTS, BREAKS, PUNCTURES, AND VOIDS IN VAPOR BARRIER.

F. BLANKET INSULATION INSTALLATION: BOND DUCTS HAVING LONG SIDES OR DIAMETERS SMALLER THAN 24 INCHES WITH BONDING ADHESIVE APPLIED IN 6-INCH- WIDE TRANSVERSE STRIPS ON 12-INCH CENTERS. BOND DUCTS HAVING LONG SIDES OR DIAMETERS 24 INCHES AND LARGER WITH ANCHOR PINS SPACED 12 INCHES APART EACH WAY. APPLY BONDING ADHESIVE TO PREVENT SAGGING OF INSULATION. OVERLAP JOINTS 3 INCHES. SEAL JOINTS, BREAKS, AND PUNCTURES WITH VAPOR- BARRIER COMPOUND.

G. DUCT SYSTEM APPLICATIONS: INSULATE INDOOR CONCEALED SUPPLY-, RETURN-, AND OUTSIDE-AIR DUCTS.

H. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:

1. METAL DUCTS WITH DUCT LINER.
2. FACTORY-INSULATED FLEXIBLE DUCTS.
3. FACTORY-INSULATED PLENUMS, CASINGS, TERMINAL BOXES, AND FILTER BOXES AND SECTIONS.
4. FLEXIBLE CONNECTORS.
5. VIBRATION-CONTROL DEVICES.
6. TESTING LABORATORY LABELS AND STAMPS.
7. NAMEPLATES AND DATA PLATES.

I. DUCT INSULATION THICKNESS APPLICABLE SCHEDULE: INSULATE DUCTS WITH THE FOLLOWING MATERIALS AND THICKNESSES:

1. CONCEALED APPLICATIONS: GLASS-FIBER BLANKET, 1-1/2 INCHES THICK.
2. EXPOSED APPLICATIONS: GLASS-FIBER BOARD, 2 INCHES THICK.

END OF SECTION 230700

233113 - DUCT AND ACCESSORIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. SUMMARY: METAL AND NONMETAL DUCTS AND ACCESSORIES IN PRESSURE CLASSES 2-INCH WG OR LESS AND A MAXIMUM VELOCITY OF 2400 FPM.

B. COMPLY WITH NFPA 90A FOR SYSTEMS SERVING SPACES MORE THAN 25,000 CU. FT. IN VOLUME OR BUILDING TYPES II, IV, AND V CONSTRUCTION MORE THAN 3 STORIES IN HEIGHT.

C. COMPLY WITH NFPA 90B FOR SYSTEMS SERVING SPACES IN 1-OR 2-FAMILY DWELLINGS OR SERVING SPACES LESS THAN 25,000 CU. FT.

D. COMPLY WITH UL 181 AND UL 181A FOR DUCTS AND CLOSURES.

PART 2 - PRODUCTS

2.1 DUCTS

A. GALVANIZED STEEL SHEET: FORMING STEEL WITH MINIMUM 60 HOT-DIP GALVANIZED COATING.

B. DUCT LINER: ASTM C 1071, TYPE II, 1 INCH THICK, WITH AN AIRSTREAM SURFACE COATED WITH A HIGH-TEMPERATURE-RESISTANT COATING.

1. ADHESIVE: ASTM C 916, TYPE I.

2. MECHANICAL FASTENERS: GALVANIZED STEEL PIN, LENGTH REQUIRED TO PENETRATE LINER PLUS A MAXIMUM 1/8-INCH PROJECTION INTO THE AIRSTREAM.

C. JOINT AND SEAM TAP, AND SEALANT: COMPLY WITH UL 181A.

D. RECTANGULAR METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD" FOR METAL, THICKNESS, REINFORCING TYPES AND INTERVALS, TIE-ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.

E. FIBROUS-GLASS LINER: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH NAIMA AH124.

1. THICKNESS: 1 INCH.

2. LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916.

3. MECHANICAL FASTENERS: GALVANIZED STEEL SUITABLE FOR ADHESIVE ATTACHMENT, MECHANICAL ATTACHMENT, OR WELDING ATTACHMENT.

2.2 ACCESSORIES

A. VOLUME-CONTROL DAMPERS: FACTORY-FABRICATED VOLUME-CONTROL DAMPERS, COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES. SINGLE BLADE AND MULTIPLE OPPOSED BLADE, STANDARD LEAKAGE RATING, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.

B. FLEXIBLE CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1.

C. FLEXIBLE DUCTS: FACTORY-FABRICATED, INSULATED, ROUNDED DUCT, WITH AN OUTER JACKET ENCLOSING 1-INCH THICK, GLASS-FIBER INSULATION AROUND A CONTINUOUS INNER LINER.

PART 3 - EXECUTION

3.1 INSTALLATION

A. DUCT SYSTEM PRESSURE CLASS: CONSTRUCT AND INSTALL EACH DUCT SYSTEM FOR THE SPECIFIC DUCT PRESSURE CLASSIFICATION INDICATED.

B. CONCEAL DUCTS FROM VIEW IN FINISHED AND OCCUPIED SPACES.

C. AVOID PASSING THROUGH ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.

D. SUPPORT AND CONNECT METAL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD."

E. INSTALL DUCT ACCESSORIES ACCORDING TO DETAILS OF CONSTRUCTION AS SHOWN IN SMACNA STANDARDS.

F. INSTALL VOLUME-CONTROL DAMPERS IN LINED DUCT WITH METHODS TO AVOID DAMAGE TO LINER AND TO AVOID EROSION OF DUCT LINER.

3.2 TESTING, ADJUSTING, AND BALANCING

A. BALANCE AIRFLOW WITHIN DISTRIBUTION SYSTEMS, INCLUDING SUBMANS, BRANCHES, AND TERMINALS TO INDICATED QUANTITIES.

END OF SECTION 233113

MECHANICAL AND PLUMBING SPECIFICATIONS

PROJECT USU ENGINEER LAB 140

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233713 - DIFFUSERS, REGISTERS , GRILLES

PART 1 - GENERAL	1.1 SECTION REQUIREMENTS
	A. SUBMIT PRODUCT DATA, INCLUDING COLOR CHARTS FOR FACTORY FINISHES.
PART 2 - PRODUCTS	2.1 APPROVED MANUFACTURERS:
	1. E.H. PRICE
	2. KRUEGER
	3. TITUS
	4. NAILOR
	5. TUTTLE & BAILEY
2.2 OUTLETS AND INLETS	A. DIFFUSERS:
	1. MATERIAL: STEEL
	2. FINISH: BAKED ENAMEL, COLOR SELECTED BY ARCHITECT.
	4. MOUNTING: FLUSH OR LAY IN AS REQUIRED FOR CEILING TYPE.
B. WALL AND CEILING GRILLES:	1. MATERIAL: STEEL
	3. FINISH: BAKED ENAMEL, COLOR SELECTED BY ARCHITECT.
	4. MOUNTING: COUNTERSUNK SCREW.
C. FLOOR REGISTERS:SEE EQUIPMENT SCHEDULE	1. MATERIAL: STEEL, COMPLETE WITH OBD ADJUSTABLE THROUGH FACE
	3. FINISH: COLOR SELECTED BY ARCHITECT.
	4. MOUNTING: SECURE TO FLOOR PER MANUFACTURER REQUIREMENTS.
PART 3 - EXECUTION	3.1 INSTALLATION
	A. COORDINATE LOCATION AND INSTALLATION WITH DUCT INSTALLATION AND INSTALLATION OF OTHER CEILING, FLOOR, AND WALL-MOUNTED ITEMS.
	B. LOCATE CEILING DIFFUSERS, REGISTERS, AND GRILLES, AS INDICATED ON DRAWINGS. UNLESS OTHERWISE INDICATED, LOCATE UNITS ON CENTER LINE OF ACOUSTICAL CEILING PANELS.
	C. PROVIDE 6 FEET MINIMUM OF ACOUSTICALLY LINED DUCT DOWNSTREAM OF THE AIR TERMINAL UNIT PRIOR TO ANY BRANCH TAKE OFF.
END OF SECTION 233713	
220500 - COMMON WORK RESULTS FOR PLUMBING	
PART 1 - GENERAL	1.1 SECTION REQUIREMENTS
	A. SUMMARY: GENERAL REQUIREMENTS FOR MOTORS, HANGERS AND SUPPORTS, VIBRATION ISOLATION AND SEISMIC RESTRAINTS, VALVES, AND METERS AND GAGES.
	B. SUBMITTALS: PRODUCT DATA FOR MATERIALS AND EQUIPMENT SPECIFIED IN THIS SECTION.
	C. TEST AND INSPECT ALL PLUMBING INSTALLATIONS WITH A REPRESENTATIVE OF THE UNIVERSITY PRESENT PRIOR TO BACKFILL OR ENCLOSING PLUMBING PIPING. SCHEDULE ALL UTILITY SHUTDOWNS 7 DAYS IN ADVANCE. SUBMIT WRITTEN REQUEST TO USU PROJECT MANAGER.
	E. UPON COMPLETION OF WORK AND AFTER CLEANING OF SYSTEM, FIXTURES AND EQUIPMENT, AND AUTOMATIC PARTS OF PLUMBING SYSTEM SHALL BE CAREFULLY ADJUSTED NORMAL OPERATION. ALL FLUSH VALVES AND FIXTURE STOPS SHALL BE CHECKED FOR PROPER OPERATION AND FINAL ADJUSTMENT.
PART 2 - PRODUCTS	2.1 HANGERS AND SUPPORTS
	A. HANGER AND PIPE ATTACHMENTS: FACTORY FABRICATED WITH GALVANIZED COATINGS; NONMETALLIC COATED FOR HANGERS IN DIRECT CONTACT WITH COPPER TUBING.
	B. BUILDING ATTACHMENTS: POWDER-ACTUATED-TYPE, DRIVE-PIN ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
	C. MECHANICAL-EXPANSION ANCHORS: INSERT WEDGE-TYPE ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
2.2 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICES	A. VIBRATION SUPPORTS:
	1. RESTRAINED ELASTOMERIC MOUNTS: DOUBLE-DEFLECTION TYPE, WITH MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS BONDED TO FACTORY-DRILLED, ENCAPSULATED TOP PLATE FOR BOLTING TO EQUIPMENT AND BASEPLATE FOR BOLTING TO STRUCTURE. PROVIDE ISOLATOR WITH MINIMUM 0.5-INCH STATIC DEFLECTION.
	2. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING ISOLATORS. PROVIDE ISOLATOR WITH MINIMUM 1-INCH STATIC DEFLECTION.
B. VIBRATION HANGERS:	1. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE, WITH MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS BONDED TO STEEL HOUSINGS WITH THREADED CONNECTIONS FOR HANGER RODS. PROVIDE ISOLATOR WITH MINIMUM 0.5-INCH STATIC DEFLECTION.
	2. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGER WITH SPRING AND INSERT IN COMPRESSION. PROVIDE ISOLATOR WITH MINIMUM 1-INCH STATIC DEFLECTION.
C. SEISMIC RESTRAINTS:	1. RESILIENT ISOLATION WASHERS AND BUSHINGS: 1-PIECE, MOLDED, BRIDGE-BEARING NEOPRENE COMPLYING WITH AASHTO M 251 AND HAVING A DUROMETER HARDNESS OF 50, PLUS OR MINUS 5, WITH A FLAT WASHER FACE.
	2. RESTRAINING CABLES: GALVANIZED STEEL CABLES WITH END CONNECTIONS MADE OF STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT.
	3. ANCHOR BOLTS: SEISMIC-RATED, DRILL-IN, AND STUD-WEDGE OR FEMALE-WEDGE TYPE. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488/E 488M.
PART 3 - EXECUTION	3.1 GENERAL PIPING INSTALLATIONS
	A. INSTALL PIPING FREE OF SAGS AND BENDS.
	B. MAKE PIPE RUNS STRAIGHT AND TRUE. SPRINGING OR FORCING PIPING INTO PLACE IS NOT PERMITTED. INSTALL IN MANNER TO PREVENT ANY UNDUE STRAIN ON EQUIPMENT. MAKE JOINTS SMOOTH AND UNOBSTRUCTED INSIDE AND OUT, AND REAM PIPE ENDS THOROUGHLY TO REMOVE BURRS. CONCEAL PIPING IN FINISHED PORTIONS OF THE BUILDINGS EXCEPT AS OTHERWISE DIRECTED OR INDICATED. CAP OR PLUG ENDS AND OPENINGS IN PIPE AND FITTINGS IMMEDIATELY TO EXCLUDE DIRT UNTIL EQUIPMENT IS INSTALLED OR FINAL CONNECTIONS ARE MADE.
	C. INSTALL PIPING TO CLEAR BEAMS UNLESS SLEEVEING IS INDICATED. CONSTANTLY CHECK WORK OF OTHER TRADES TO PREVENT INTERFERENCE WITH THIS INSTALLATION. OBTAIN APPROVAL FROM ARCHITECT IF CORING OR CUTTING OF CONCRETE WORK IS NECESSARY. DUE TO FAILURE TO INSTALL REQUIRED SLEEVES PRIOR TO THE TIME OF CONCRETE POUR, COST OF CORING AND CUTTING WORK SHALL BE BORNE BY THE SUBCONTRACTOR.
	D. EXPOSED PLATED OR ENAMELED PIPE: MAKE CONNECTIONS TO EQUIPMENT WITH SPECIAL CARE. SHOW NO TOOL MARKS OR THREADS.
	E. UNIONS: PROVIDE A UNION ON ONE SIDE OF EACH SHUTOFF VALVE, AT BOTH SIDES OF AUTOMATIC VALVES, AT EQUIPMENT CONNECTIONS AND ELSEWHERE INDICATED OR REQUIRED, UNLESS FLANGES ARE INDICATED.
	F. FLOOR, WALL AND CEILING PLATES: PROVIDE WHERE PIPES PIERCE FINISHED SURFACES.
	G. NOISE: INSTALL SOIL, WASTE, AND WATER PIPING IN MANNER THAT PREVENTS ANY UNUSUAL NOISE FROM FLOW OF WATER UNDER NORMAL CONDITIONS.
	H. SHUTOFF VALVES: PROVIDE WHERE INDICATED AND REQUIRED FOR ADEQUATE CONTROL OF SYSTEMS AND FOR ISOLATION OF FIXTURE GROUPS AND EQUIPMENT.
	I. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
	J. INSTALL SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSOM-BOARD PARTITIONS AND CONCRETE FLOOR AND ROOF SLABS.

K. EXTERIOR WALL, PIPE PENETRATIONS: MECHANICAL SLEEVE SEALS INSTALLED IN STEEL OR CAST-IRON PIPES FOR WALL SLEEVES.	
	L. FIRE-BARRIER PENETRATIONS: SEAL PIPE PENETRATIONS WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
	M. INSTALL UNIONS AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT.
	N. INSTALL DIELECTRIC UNIONS AND FLANGES TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN GAS PIPING.
	O. INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN WATER PIPING.
3.2 HANGERS AND SUPPORTS	A. COMPLY WITH MSS SP-89 AND MSS SP-89. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE OR TO STRUCTURAL STEEL.
	B. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS.
	C. INSTALL POWDER-ACTUATED DRIVE-PIN FASTENERS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
	D. INSTALL MECHANICAL-EXPANSION ANCHORS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
	E. SEE DIVISION 13 SECTION "FIRE SUPPRESSION PIPING" FOR SUPPORT OF FIRE-PROTECTION SYSTEM PIPING.
	F. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
	G. HORIZONTAL PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
	1. ADJUSTABLE STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED STATIONARY PIPES.
	2. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4, TO ALLOW OFF-CENTER CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION.
	3. ADJUSTABLE STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
	4. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
	5. ADJUSTABLE SWIVEL-RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
	H. VERTICAL-PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
	1. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20.
	2. CARBON-OR ALLOY-STEEL RISER CLAMPS (MSS TYPE 42): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20, IF LONGER ENDS ARE REQUIRED FOR RISER CLAMPS.
	I. EQUIPMENT AND MATERIALS: INSTALL PER MANUFACTURER'S RECOMMENDATIONS. ACCESSIBILITY: INSTALL WORK READILY ACCESSIBLE FOR NORMAL OPERATION, READING OF INSTRUMENTS, ADJUSTMENT, SERVICE, INSPECTION AND REPAIR. PROVIDE ACCESS PANELS WHERE INDICATED AND REQUIRED.
	K. PIPE JOINTS: MAKE SCREWED JOINTS WITH A MINIMUM AMOUNT OF COMPOUND APPLIED TO THE MALE THREAD ONLY. ALL JOINTS SHALL BE MADE PER CODE REQUIREMENTS.
	L. PROVIDE PIPE ISOLATION AT ALL HANGERS FOR NON-INSULATED MATERIALS.
	M. PIPING ROUGH-IN FOR FIXTURES: SUPPORT OR SECURE TO BUILDING CONSTRUCTION OF FIRMLY ANCHORED WASTE PIPING SO THAT PIPES CANNOT BE DISPLACED. DO NOT SECURE TO WALLS. USE OF MAKESHIFT DEVICES, SUCH AS ROPE, WIRE, TAPE, ETC. IS PROHIBITED.
	N. HORIZONTAL DRAINAGE PIPING SHALL BE INSTALLED IN UNIFORM ALIGNMENT AT UNIFORM SLOPES. THE MINIMUM SLOPE OF HORIZONTAL PIPE 4" OR LARGER IN DIAMETER MAY HAVE A SLOPE OF NOT LESS THAN 1% (1/8 INCH PER FOOT). THE MINIMUM SLOPE OF HORIZONTAL PIPE LESS THAN 4" MAY HAVE A SLOPE OF NOT LESS THAN 2% (1/4 INCH PER FOOT).
3.3 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICE INSTALLATION	
A. ADJUST VIBRATION ISOLATORS TO ALLOW FREE MOVEMENT OF EQUIPMENT LIMITED BY RESTRAINTS.	
B. INSTALL RESILIENT BOLT ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS.	
C. INSTALL CABLES SO THEY DO NOT BEND ACROSS SHARP EDGES OF ADJACENT EQUIPMENT OR BUILDING STRUCTURE.	
END OF SECTION 220500	
220700 - PLUMBING INSULATION	
1.1 SECTION REQUIREMENTS	A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF PLUMBING INSULATION.
	B. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE- DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.
PART 2 - PRODUCTS	2.1 PIPE INSULATION
	A. PREFORMED, GLASS-FIBER PIPE INSULATION: ASTM C 547, CLASS 1, WITH FACTORY-APPLIED, ALL-PURPOSE, VAPOR-RETARDER JACKET.
	B. FLEXIBLE, ELASTOMERIC-CELLULAR PIPE INSULATION: CLOSED-CELL, SPONGE-OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I.
	C. POLYOLEFIN PIPE INSULATION: UNICELLULAR POLYETHYLENE, PREFORMED PIPE INSULATION. COMPLY WITH ASTM C 534, TYPE I, EXCEPT FOR DENSITY.
PART 3 - EXECUTION	3.1 INSULATION MATERIALS AND THICKNESS ARE IDENTIFIED BELOW. IF MORE THAN ONE MATERIAL IS LISTED FOR A TYPE OF EQUIPMENT, SELECTION FROM MATERIALS LISTED IN CONTRACTOR'S OPTION.
	2. INSULATE INDOOR AND OUTDOOR EQUIPMENT IN PARAGRAPHS BELOW THAT IS NOT FACTORY INSULATED.
	3. STEAM-TO-HOT-WATER CONVERTER INSULATION SHALL BE ONE OF THE FOLLOWING:
	a. MINERAL-FIBER BOARD: 2 INCHES THICK AND 2 LB/CU FT NOMINAL DENSITY.
	b. MINERAL-FIBER PIPE AND TANK: 2 INCHES THICK.
	F. PIPING INSULATION SCHEDULE, GENERAL
	1. ACCEPTABLE PREFORMED PIPE AND TUBULAR INSULATION MATERIALS AND THICKNESS ARE IDENTIFIED FOR EACH PIPING SYSTEM AND PIPE SIZE RANGE. IF MORE THAN ONE MATERIALS IS LISTED FOR A PIPING SYSTEM, SELECTION FROM MATERIALS LISTED IS CONTRACTOR'S OPTION.
	2. ITEMS NOT INSULATED: UNLESS OTHERWISE INDICATED, DO NOT INSTALL INSULATION ON THE FOLLOWING:
	a. DRAINAGE PIPING LOCATED IN CRAWL SPACES.
	b. UNDERGROUND PIPING.
	c. CHROME-PLATED PIPES AND FITTINGS UNLESS THERE IS A POTENTIAL FOR PERSONNEL INJURY.
	G. INDOOR PIPING INSULATION SCHEDULE
	1. DOMESTIC COLD WATER:
	a. NPS 1 - 1/2 AND SMALLER: INSULATION SHALL BE THE FOLLOWING:
	a1. MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH.
	2. DOMESTIC HOT AND RE-CIRCULATED HOT WATER:
	a. NPS 1 - 1/2 AND SMALLER: INSULATION SHALL BE THE FOLLOWING:
	a1. MINERAL-FIBER, PREFORMED PIPE INSULATION TYPE I: 1 INCH.
	3. STORMWATER AND OVERFLOW:
	a. ALL PIPE SIZES: INSULATION SHALL BE THE FOLLOWING:
	a1. MINERAL-FIBER, PREFORMED PIPE INSULATION TYPE I: 1 INCH.
	a1. INSULATE WITH AN IMPERVIOUS VAPOR BARRIER.

4. ROOF DRAIN AND OVERFLOW DRAIN BODIES	a. ALL PIPES SIZES: INSULATION SHALL BE THE FOLLOWING:
	a1. MINERAL-FIBER, PREFORMED PIPE INSULATION TYPE I: 1 INCH.
	b1. INSULATE WITH AN IMPERVIOUS VAPOR BARRIER.
5. CONDENSATE AND EQUIPMENT DRAIN WATER BELOW 60 DEG F:	a. ALL PIPE SIZES: INSULATION SHALL BE THE FOLLOWING:
	a1. MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH.
H. INDOOR, FIELD-APPLIED JACKET SCHEDULE	1. INSTALL JACKET OVER INSULATION MATERIAL FOR INSULATION WITH FACTORY-APPLIED JACKET. INSTALL THE FIELD-APPLIED JACKET OVER THE FACTORY-APPLIED JACKET.
	2. IF MORE THAN ONE MATERIAL IS LISTED, SELECTION FROM MATERIALS LISTED IS CONTRACTOR'S OPTION.
	3. PIPING CONCEALED:
	a. NONE
	4. PIPING, EXPOSED
	a. PVC: 20 MILS THICK
	b. COLORAGGIE BLUE (DARK NAVY BLUE) SUBMIT COLOR CHART TO ARCHITECT FOR VERIFICATION.
	c. PIPING MARKERS: PROVIDE MINIMUM ONE PIPE TAG ON EXPOSED PIPING AND BRANCH PIPING. MARKERS SHALL BE SPACED AT MAXIMUM 20FT.
	a1. DOMESTIC WATER (HOT AND COLD AND HOT RET): COMPLY WITH ASME A13.1
	d1. ALL OTHER EXPOSED PIPING NOT IN MECHANICAL ROOMS: COMPLY WITH ASME A13.1
END OF SECTION 220700	
220523 - PLUMBING VALVES	
PART 1 - GENERAL (NOT APPLICABLE)	
	PART 2 - PRODUCTS
2.1 GENERAL-DUTY VALVES	A. END CONNECTIONS: THREADS SHALL COMPLY WITH ANSI B1.20.1. FLANGES SHALL COMPLY WITH ANSI B16.1 FOR CAST-IRON VALVES AND ANSI B16.24 FOR BRONZE VALVES. SOLDER-JOINT CONNECTIONS SHALL COMPLY WITH ANSI B16.18.
	B. ONE-PIECE, COPPER-ALLOY BALL VALVES: BRASS OR BRONZE BODY WITH CHROME-PLATED BRONZE BALL, PTFE OR TFE SEATS, AND 400-PSIG MINIMUM CWP RATING.
	C. TWO-PIECE, COPPER-ALLOY BALL VALVES: BRONZE BODY WITH REGULAR-PORT, CHROME-PLATED BRONZE BALL; PTFE OR TFE SEATS; AND 600-PSIG MINIMUM CWP RATING AND BLOWOUT-PROOF STEM.
	D. BRONZE, SWING CHECK VALVES: CLASS 125, BRONZE BODY WITH NONMETALLIC DISC AND SEAT.
	E. BRONZE GATE VALVES: CLASS 125, BRONZE BODY WITH NONRISING STEM AND BRONZE SOLID WEDGE.
	F. CAST-IRON GATE VALVES: CLASS 125, NONRISING CAST-IRON BODY AND SOLID-WEDGE DISC.
	G. BRONZE GLOBE VALVES: CLASS 125, BRONZE BODY WITH BRONZE DISC.
PART 3 - EXECUTION	3.1 INSTALLATION
	A. USE GATE AND BALL VALVES FOR SHUTOFF DUTY; GLOBE AND BALL FOR THROTTLING DUTY.
	B. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.
	C. INSTALL VALVES FOR EACH FIXTURE AND ITEM OF EQUIPMENT.
	D. INSTALL THREE-VALVE BYPASS AROUND EACH PRESSURE-REDUCING VALVE USING THROTTLING-TYPE VALVES.
	E. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE.
	F. INSTALL VALVES IN A POSITION TO ALLOW FULL STEM MOVEMENT.
	G. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW IN HORIZONTAL POSITION WITH HINGE PIN LEVEL.
END OF SECTION 220523	
221116 - DOMESTIC WATER PIPING	
PART 1 - GENERAL	1.1 SECTION REQUIREMENTS
	A. PERFORMANCE REQUIREMENTS: UNLESS OTHERWISE INDICATED, MINIMUM PRESSURE REQUIREMENTS FOR WATER PIPING ARE AS FOLLOWS:
	1. SERVICE ENTRANCE PIPING: 160 PSIG.
	2. DOMESTIC WATER PIPING: 125 PSIG.
	B. COMPLY WITH NSF 14, "PLASTIC PIPING COMPONENTS AND MATERIALS."
	C. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS."
PART 2 - PRODUCTS	2.1 PIPE AND FITTINGS
	A. NO PIPE OF A FOREIGN MANUFACTURER WILL BE ACCEPTABLE.
	B. ALL PIPING, FITTINGS, FLANGES, ETC. SHALL BE FREE FROM DEFECTS AND SHALL COMPLY WITH THE APPROPRIATE ASTM SPECIFICATIONS.
	C. STEEL PIPING: ASTM A 53/A 53M, SCHEDULE 40, GALVANIZED STEEL PIPE, WITH CLASS 125, GALVANIZED, STANDARD PATTERN GRAY-IRON, THREADED FITTINGS.
	D. SOFT COPPER TUBING: ASTM B 88, TYPE L, WATER TUBE, ANNEALED TEMPER WITH COPPER PRESSURE FITTINGS, CAST-COPPER-ALLOY OR WROUGHT-COPPER, SOLDER-JOINT FITTINGS. FURNISH WROUGHT-COPPER FITTINGS IF INDICATED.
	E. HARD COPPER TUBING: ASTM B 88, TYPE L ASTM B 88M, TYPES B AND C, WATER TUBE, DRAIN TEMPER WITH WROUGHT-COPPER, SOLDER-JOINT FITTINGS. FURNISH WROUGHT-COPPER FITTINGS IF INDICATED.
	1. COPPER UNIONS: CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES AND SOLDER-JOINT OR THREADED ENDS.
	D. CPVC PIPING: SCHEDULE 40 PIPE COMPLYING WITH CPVC SCHEDULE 40 SOCKET-TYPE FITTINGS.
	E. PE PIPING: SDR NOS. 5.3, 7, OR 9; WITH PE PIPE, COMPOUND NUMBER REQUIRED TO GIVE PRESSURE RATING NOT LESS THAN 200 PSIG AND INSERT FITTINGS MADE OF PA, PP, OR PVC, WITH SERRATED, MALE INSERT ENDS MATCHING INSIDE OF PIPE. INCLUDE BANDS OR CRIMP RINGS.
	SCHEDULE 40 PVC PIPING: PVC PIPE AND PVC SCHEDULE 40 SOCKET-TYPE FITTINGS. PEX TUBING: NOT ALLOWED.
	H. SPECIAL-DUTY VALVES:
	1. CPVC UNION BALL VALVES: FULL-PORT BALL, SOCKET OR THREADED DETACHABLE END CONNECTORS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	2. CPVC NON-UNION BALL VALVES: FULL- OR REDUCED-PORT BALL, SOCKET OR THREADED ENDS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	3. CPVC CHECK VALVES: SWING OR BALL-CHECK DESIGN AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	4. PVC UNION BALL VALVES: FULL-PORT BALL, SOCKET OR THREADED DETACHABLE END CONNECTORS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	5. PVC NON-UNION BALL VALVES: FULL- OR REDUCED-PORT BALL, SOCKET OR THREADED ENDS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	6. PVC BUTTERFLY VALVES: WITH LEVER HANDLE AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
	7. PVC CHECK VALVES: SWING OR BALL-CHECK DESIGN AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
PART 3 - EXECUTION	3.1 PIPING APPLICATIONS
	A. INSTALL LISTED PIPE MATERIALS AND JOINING METHODS BELOW IN THE FOLLOWING APPLICATIONS:
	1. UNDERGROUND, SERVICE ENTRANCE PIPING:
	1.1. NPS 3 AND SMALLER SHALL BE ONE OF THE FOLLOWING:
	1.1.1. SOFT COPPER TUBING TYPE K, ASTM B 88, SOLDER-JOINT FITTINGS
	1.1.2. PP SDR 7.4 SOCKET FITTINGS AND FUSION-WELDED JOINTS.
	1.1.1. NPS 3 AND LARGER SHALL BE ONE OF THE FOLLOWING:
	1.1.1.1. SOFT COPPER TUBING TYPE K, ASTM B 88, SOLDER-JOINT FITTINGS
	1.1.2. MECHANICAL-JOINT, DUCTILE-IRON PIPE; STANDARD MECH. JOINT FITTINGS & JOINTS
	1.1.3. PP SDR 7.4 SOCKET FITTINGS AND FUSION-WELDED JOINTS.

2. ABOVEGROUND DISTRIBUTION PIPING:	2.1. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2 AND SMALLER:
	2.1.1. HARD COPPER TUBE, ASTM B 88, TYPE L CAST-COPPER, SOLDER-JOINT FITTINGS; AND SOLDERED JOINTS.
	2.1. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2-1/2 AND LARGER:
	2.1.1. HARD COPPER TUBE, ASTM B 88, TYPE L CAST-COPPER, SOLDER-JOINT FITTINGS; AND SOLDERED JOINTS.
	3.2 VALVE APPLICATIONS
	A. INSTALL GATE VALVES CLOSE TO MAIN ON EACH BRANCH AND RISER SERVING TWO OR MORE PLUMBING FIXTURES OR EQUIPMENT CONNECTIONS AND WHERE INDICATED.
	B. INSTALL GATE OR BALL VALVES ON INLET TO EACH PLUMBING EQUIPMENT ITEM, ON EACH SUPPLY TO EACH PLUMBING FIXTURE NOT HAVING STOPS ON SUPPLIES, AND ELSEWHERE AS INDICATED.
	C. INSTALL DRAIN VALVE AT BASE OF EACH RISER, AT LOW POINTS OF HORIZONTAL RUNS, AND WHERE REQUIRED TO DRAIN WATER DISTRIBUTION PIPING SYSTEM.
	D. INSTALL SWING CHECK VALVE ON DISCHARGE SIDE OF EACH PUMP AND ELSEWHERE AS INDICATED.
	E. INSTALL BALL VALVES IN EACH HOT-WATER CIRCULATING LOOP AND DISCHARGE SIDE OF EACH PUMP.
3.3 PIPING INSTALLATIONS	A. INSTALL HANGERS AND SUPPORTS AT INTERVALS INDICATED IN THE APPLICABLE PLUMBING CODE AND AS RECOMMENDED BY PIPE MANUFACTURER.
	B. SUPPORT VERTICAL PIPING AT EACH FLOOR.
3.4 INSPECTION AND CLEANING	A. INSPECT AND TEST PIPING SYSTEMS FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
	B. CLEAN AND DISINFECT WATER DISTRIBUTION PIPING FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
END OF SECTION 220116	
221316 - SANITARY WASTE AND VENT PIPING	
PART 1 - GENERAL	1.1 SECTION REQUIREMENTS
	A. MINIMUM PRESSURE REQUIREMENT FOR SOIL, WASTE, AND VENT: 10 FEET HEAD.
	B. COMPLY WITH NSF 14, "PLASTIC PIPING COMPONENTS AND RELATED MATERIALS."
PART 2 - PRODUCTS	2.1 PIPES AND FITTINGS
	A. HUB-AND-ANVIL SOIL PIPE: ASTM A 74, SERVICE CLASS CAST IRON; ASTM C 564 RUBBER GASKETS.
	B. HUBLESS SOIL PIPE: ASTM A 888 OR CISPI 301 CAST-IRON PIPE AND HUBLESS, CAST-IRON FITTINGS WITH NEOPRENE SEALING SLEEVE AND STAINLESS-STEEL CORRUGATED SHIELD AND CLAMP ASSEMBLY.
	C. PVC PLASTIC, DWV PIPE: ASTM D 2665, SCHEDULE 40, PLAIN ENDS WITH PVC SOCKET-TYPE, DWV PIPE FITTINGS.
PART 3 - EXECUTION	3.1 PIPE APPLICATIONS
	A. ABOVEGROUND APPLICATIONS: HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS, PVC PLASTIC, DWV PIPE AND FITTINGS WITH SOLVENT-CEMENTED JOINTS AND FIRE/SMOKE RATED WRAP FOR INSTALLATION IN RETURN AIR PLENUM.
	B. BELOWGROUND APPLICATIONS: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS, PVC PLASTIC, DWV PIPE AND DRAINAGE-PATTERN FITTINGS WITH CEMENTED JOINTS.
3.2 PIPING INSTALLATION	A. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK," CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS."
	B. INSTALL CAST-IRON SLEEVE WITH WATER STOP AND MECHANICAL SLEEVE SEAL AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE INSTALLATION WATERTIGHT.
3.3 INSPECTION	A. INSPECT AND TEST PIPING SYSTEMS FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
	END OF SECTION 221316
221319 - PLUMBING SPECIALTIES	
PART 1 - GENERAL	1.1 SECTION REQUIREMENTS
	A. SUBMITTALS: PRODUCT DATA.
PART 2 - PRODUCTS	2.1 MANUFACTURED UNITS
	1. APPLICATION: FLOOR CLEANOUT, WALL CLEANOUT.
	2. BODY OR FERRULE MATERIAL: CAST IRON, PLASTIC.
	3. CLAMPING DEVICE: REQUIRED.
	4. OUTLET CONNECTION: THREADED.
	5. CLOSURE: BRASS PLUG WITH STRAIGHT THREADS AND GASKET, PLASTIC PLUG.
	6. ADJUSTABLE HOUSING MATERIAL: CAST IRON, PLASTIC WITH THREADS SET-SCREWS OR OTHER DEVICE.
	7. FRAME AND COVER MATERIAL AND FINISH: NICKEL-BRONZE, COPPER ALLOY.
	8. FRAME AND COVER SHAPE: ROUND.
	9. DELETE SUBPARAGRAPH BELOW IF NOT APPLICABLE
	10. TOP LOADING CLASSIFICATION: MEDIUM DUTY.
	B. FLOOR DRAINS:
	1. APPLICATION: FLOOR DRAIN.
	2. BODY MATERIAL: GRAY IRON.
	3. SEEPAGE FLANGE: REQUIRED.
	4. CLAMPING DEVICE: REQUIRED.
	5. OUTLET: BOTTOM.
	6. SEDIMENT BUCKET: SEE MODEL NUMBER.
	8. TOP OR STRAINER MATERIAL: GRAY IRON.
	9. TOP OF BODY AND STRAINER FINISH: NICKEL BRONZE.
	10. TOP SHAPE: ROUND.
	11. TOP LOADING CLASSIFICATION: MEDIUM DUTY.
	12. INLET FITTING: GRAY IRON, WITH THREADED INLET AND THREADED OR SPIGOT OUTLET, AND TRAP SEAL PRIMER VALVE CONNECTION.
	13. TRAP MATERIAL: CAST IRON.
	14. TRAP PATTERN: DEEP-SEAL P-TRAP.
	15. TRAP FEATURES: TRAP SEAL PRIMER VALVE DRAIN CONNECTION.
	C. PIPE-APPLIED, ATMOSPHERIC VACUUM BREAKERS: ASSE 1001, WITH FLOATING DISC AND ATMOSPHERIC VENT.
	D. HOSE CONNECTION VACUUM BREAKERS: NICKEL-PLATED BRONZE, WITH NONREMOVABLE AND MANUAL DRAIN FEATURES AND GARDEN-HOSE THREADED CONNECTION.
	E. HOSE BIBBS: BRONZE BODY IN CHROME-PLATED FINISH, WITH REMOVABLE COMPOSITION DISC, THREADED OR SOLDERED INLET, GARDEN-HOSE THREADED OUTLET, AND (WHEEL) [LOOSE-KEY] HANDLE.
	F. WALL HYDRANT: ASME A112.21.3M, ASSE 1019, PROJECTING, NONFREEZE, AUTOMATIC DRAINING, ANTIBACKFLOW TYPE, WITH KEY OPERATOR AND THREADED OR SOLDERED INLET, GARDEN-HOSE THREADED OUTLET, AND ROUGH-BRONZE FINISH.
END OF SECTION 221319	

224000 - PLUMBING FIXTURES

1.1 SECTION REQUIREMENTS	A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF PLUMBING FIXTURE.
	B. COMPLY WITH REQUIREMENTS OF PUBLIC LAW 102-486, "ENERGY POLICY ACT," REGARDING WATER FLOW RATE AND WATER CONSUMPTION OF PLUMBING FIXTURES.
C. COMPLY WITH APPLICABLE STANDARDS BELOW:	1. NATIONAL SANITATION FOUNDATION CONSTRUCTION: NSF 61.
	2. PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT."
	3. PUBLIC LAW 102-486, "ENERGY POLICY ACT."
	4. ANSI STANDARD A117.1, "BUILDINGS AND FACILITIES -- PROVIDING ACCESSIBILITY AND USEABILITY FOR PHYSICALLY HANDICAPPED PEOPLE," LISTING AND LABELING: PROVIDE ELECTRICALLY OPERATED FIXTURES SPECIFIED IN THIS SECTION THAT ARE LISTED AND LABELED.
1.2 DEFINITIONS	A. FIXTURE: INSTALLED RECEPTOR CONNECTED TO THE WATER DISTRIBUTION SYSTEM, THAT RECEIVES AND MAKES AVAILABLE POTABLE WATER AND DISCHARGES THE USED LIQUID OR LIQUID-BORNE WASTES DIRECTLY OR INDIRECTLY INTO THE DRAINAGE SYSTEM. THE TERM "FIXTURE" MEANS THE ACTUAL RECEPTOR, EXCEPT WHEN USED IN A GENERAL APPLICATION WHERE TERMS "FIXTURE" AND "PLUMBING FIXTURE" INCLUDE ASSOCIATED TRIM, FITTINGS, ACCESSORIES, APPLIANCES, APPURTENANCES, SUPPORT, AND EQUIPMENT.
	C. ROUGHING-IN: INSTALLATION OF PIPING AND SUPPORT FOR THE FIXTURE PRIOR TO THE ACTUAL INSTALLATION OF THE FIXTURE.
	D. TRIM: HARDWARE AND MISCELLANEOUS PARTS, SPECIFIC TO A FIXTURE AND NORMALLY SUPPLIED WITH IT REQUIRED TO COMPLETE FIXTURE ASSEMBLY AND INSTALLATION.
PART 2 - PRODUCTS	2.1 PLUMBING FIXTURES, GENERAL
	A. PROVIDE PLUMBING FIXTURES AND TRIM, FITTINGS, OTHER COMPONENTS, AND SUPPORTS AS SPECIFIED IN "FIXTURE SCHEDULE."
	B. PLUMBING FIXTURES SHALL BE THE MANUFACTURER'S STANDARD COLOR UNLESS SPECIFIC COLORS ARE NOTED.
2.2 FITTINGS, EXCEPT FAUCETS	A. FITTINGS GENERAL: UNLESS OTHERWISE SPECIFIED, PROVIDE FITTINGS FABRICATED OF BRASS, WITH A POLISHED CHROME PLATED FINISH.
	B. ESCUTCHEONS: POLISHED CHROME-PLATED, SHEET STEEL WALL FLANGE WITH FRICTION CLIPS.
PART 3 - EXECUTION	3.1 EXAMINATION
	A. EXAMINE ROUGHING-IN FOR POTABLE COLD WATER AND HOT WATER SUPPLIES AND SOIL, WASTE, AND VENT PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS PRIOR TO INSTALLING FIXTURES.
	B. EXAMINE WALLS, FLOORS, AND CABINETS FOR SUITABLE CONDITIONS WHERE FIXTURES ARE TO BE INSTALLED.
	C. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
3.2 APPLICATION	A. INSTALL PLUMBING FIXTURES AND SPECIFIED COMPONENTS, IN ACCORDANCE WITH DESIGNATIONS AND LOCATIONS

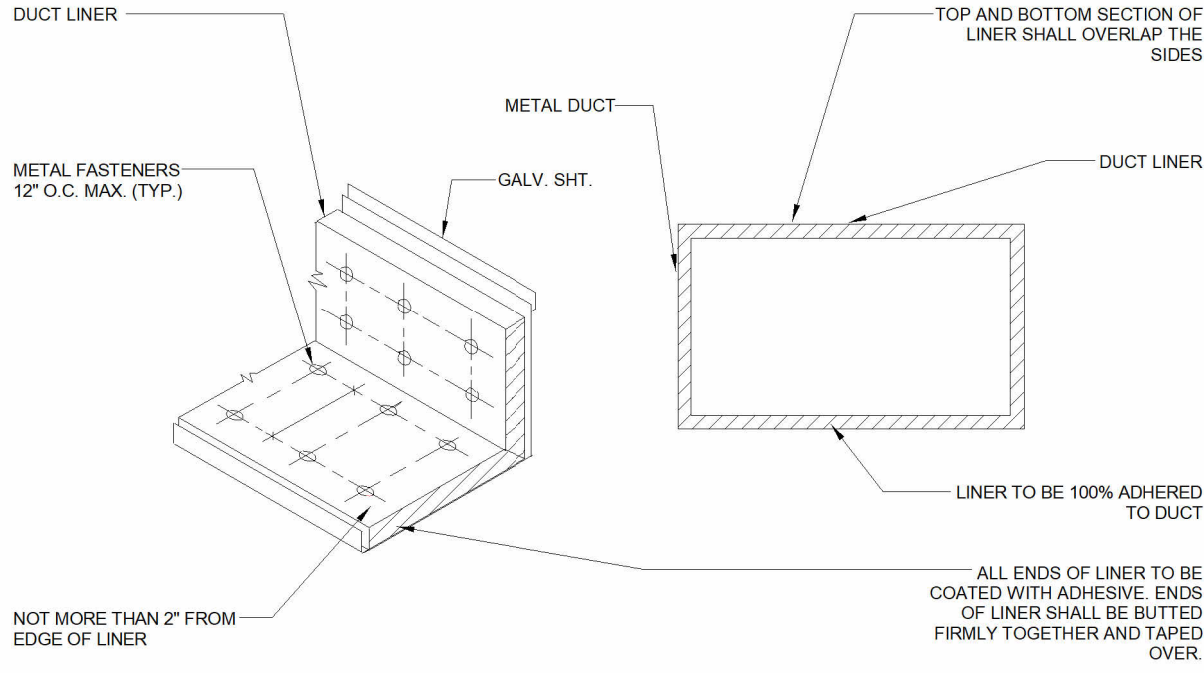
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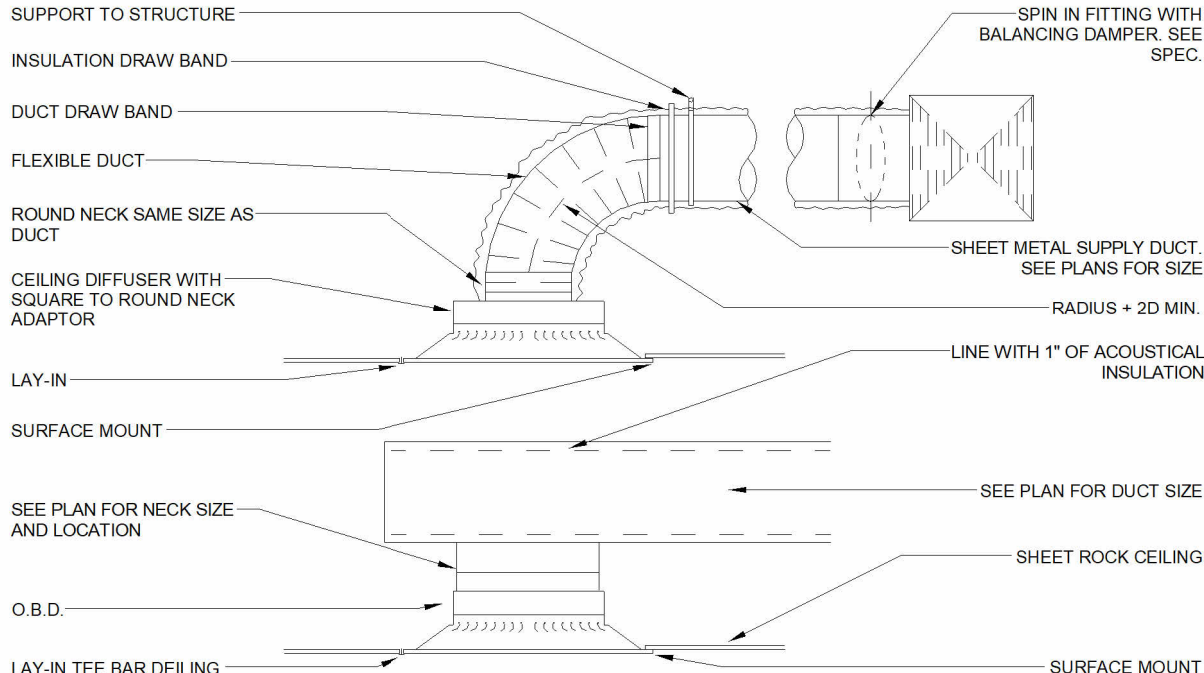
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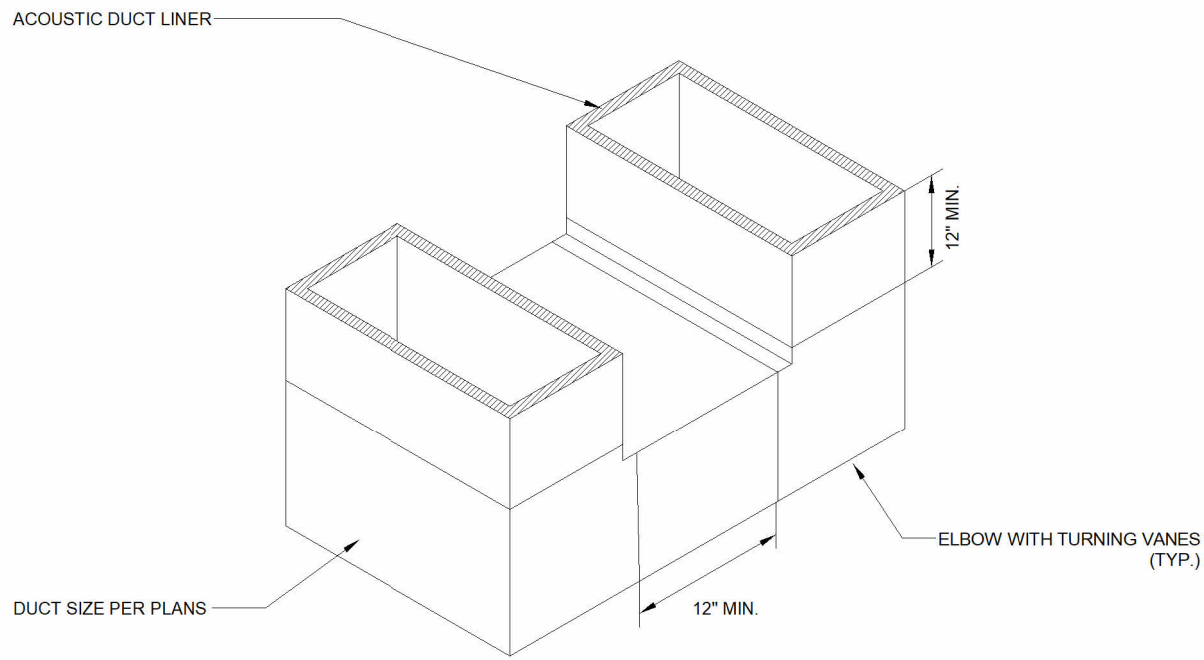
GRILLE, REGISTER & DIFFUSER SCHEDULE							
MARK	MANUFACTURER	MODEL	DESCRIPTION	SIZE	MAX CFM	MAX NC	NOTES
CD-1	E.H. PRICE	SPD	SQUARE PLAQUE CEILING DIFFUSERS WITH FIXED 4-WAY PATTERN, REMOVABLE FACE & CORE. FRAME SHALL FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. FRAMES SHALL BE SIZED TO HANDLE AIR FLOW AND FIT CEILING SPACE AVAILABLE. PROVIDE ROUND NECK ADAPTER WHERE APPLICABLE.	6 8 10 12 14 15	190 320 490 620 850 980	30	COLOR: BY ARCHITECT, SUBMIT FOR APPROVAL
EG-1	E.H. PRICE	PDDR	PERFORATED FACE EXHAUST GRILLE, REMOVABLE FACE & CORE. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24"x24", 24"x12", OR 12"x12" AS REQ'D TO FIT CEILING TILE SPACE AVAILABLE. PROVIDE OBD ADJUSTABLE THROUGH GRILLE FACE WHERE REQUIRED.	24/24	N/A	30	COLOR: BY ARCHITECT, SUBMIT FOR APPROVAL



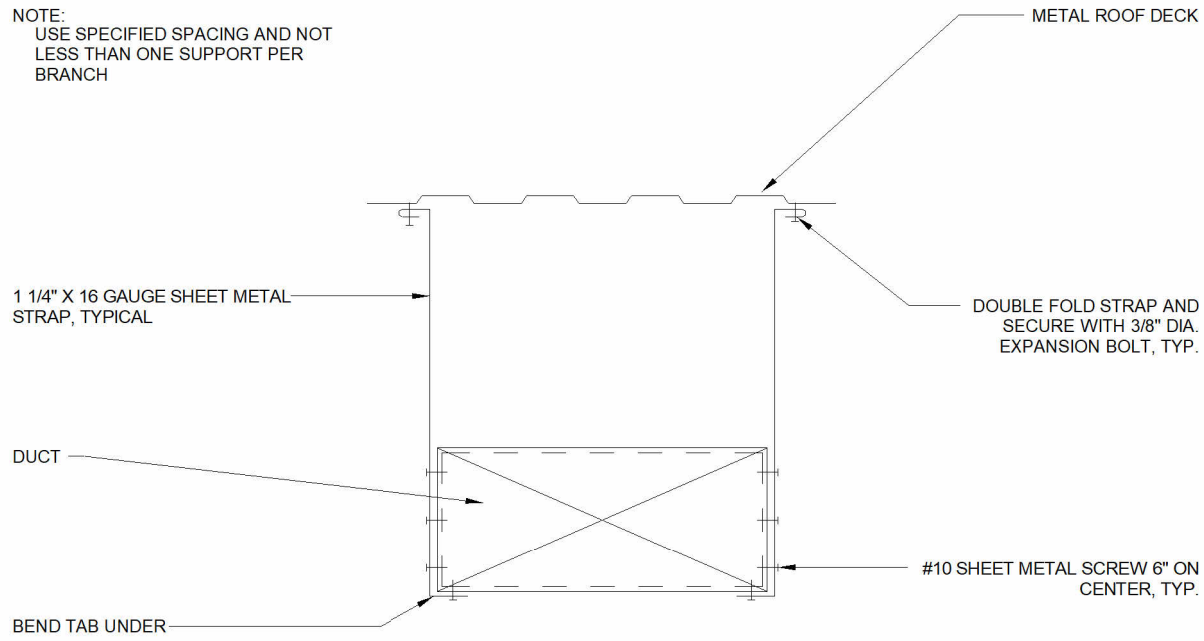
5 DUCT LINER DETAIL
SCALE: NTS



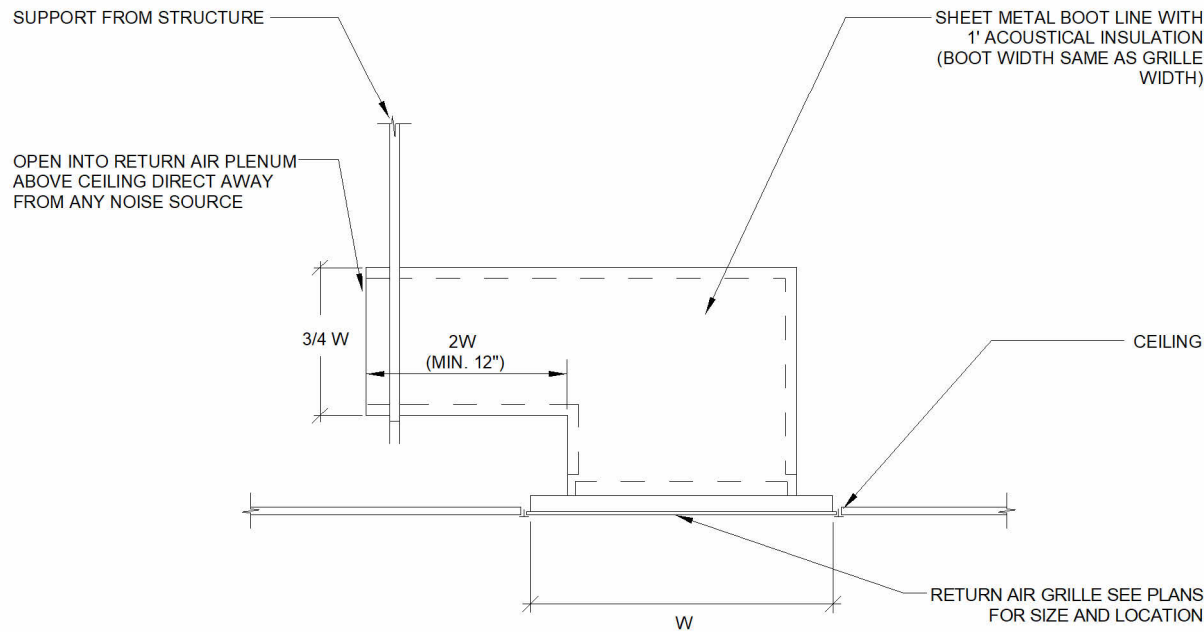
1 CEILING DIFFUSER DETAIL
SCALE: NTS



2 RETURN AIR TRANSFER DUCT DETAIL
SCALE: NTS



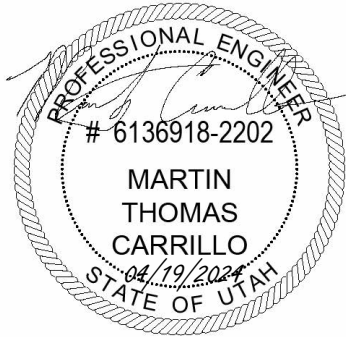
3 RECTANGULAR DUCT SUPPORT
SCALE: NTS



4 RETURN AIR WITH SOUND BOOT
SCALE: NTS



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CHRISTIAN WILSON 435.232.8662

TITLE	MECHANICAL DETAILS			
	PROJECT	USU ENGINEER LAB 140		
	CLIENT	UTAH STATE UNIVERSITY		
	ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321		

REVISIONS		
NO.	DATE	DESCRIPTION

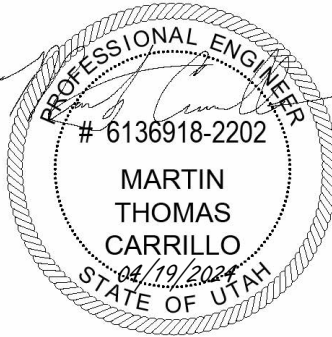
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GENERAL NOTES

- EXISTING EQUIPMENT INFORMATION GATHERED FROM AS-BUILT CONSTRUCTION DOCUMENTS. ACTUAL CONDITIONS MAY VARY AND SHALL BE VERIFIED PRIOR TO BEGINNING WORK.

KEYED NOTES

- DEMOLISH AND REMOVE EXISTING EXHAUST GRILLES. SEAL ALL EXHAUST DUCT. SEE MH111 FOR NEW EXHAUST CONFIGURATION.
- DEMOLISH AND REMOVE EXISTING CEILING MOUNTED SUPPLY DIFFUSER. PREPARE EXISTING DUCT FOR NEW CONNECTION. SEE MH111.
- EXISTING CEILING RETURN GRILLE SHALL BE RELOCATED TO NEW POSITION AT MODIFIED CEILING GRID. SEE MH111 AND ARCH RCP.
- DEMOLISH AND REMOVE EXISTING TRANSFER AIR DUCT ABOVE CEILING.

TITLE	LEVEL 1 MECHANICAL DEMO PLAN
PROJECT	USU ENGINEER LAB 140
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

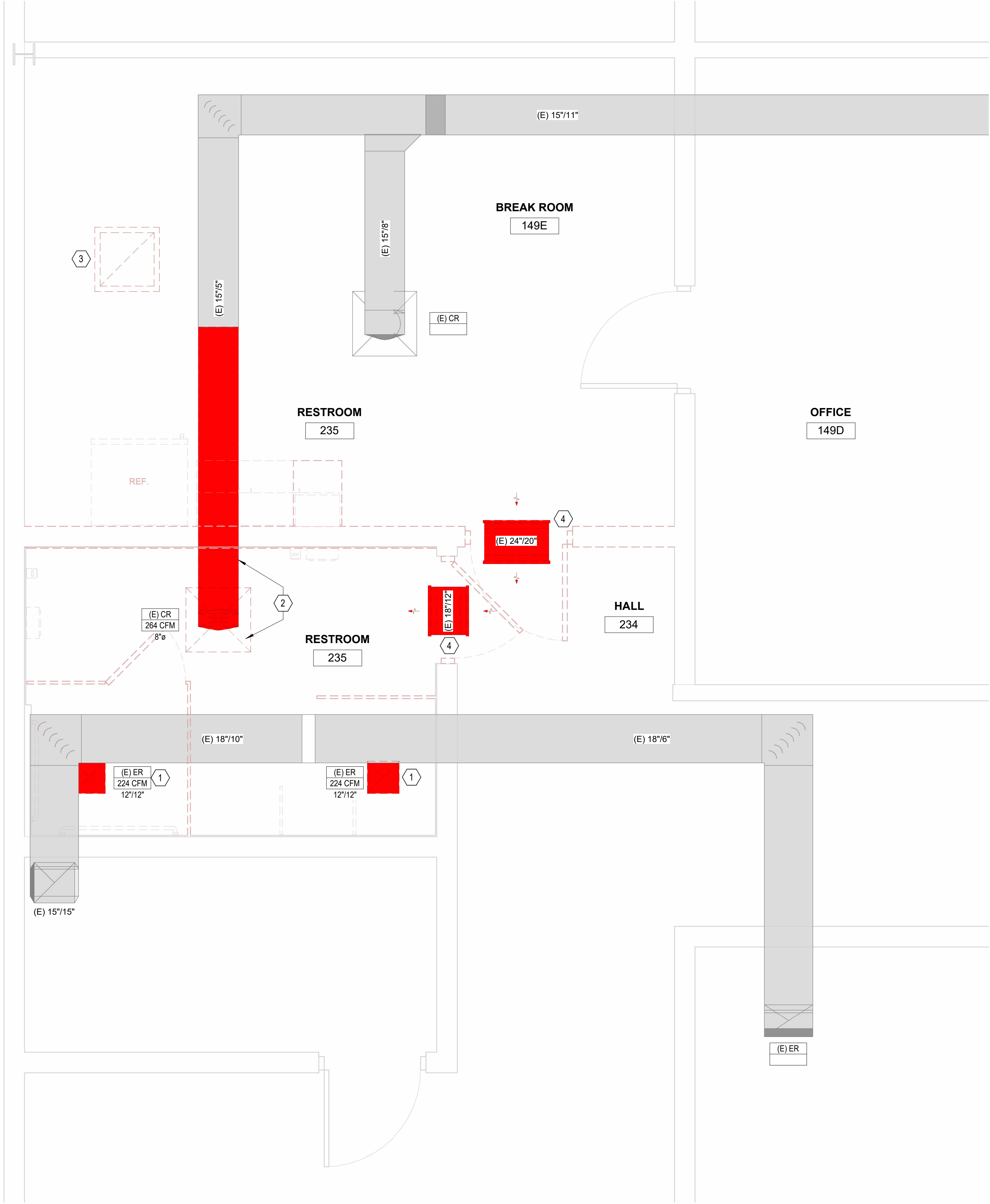
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MD111

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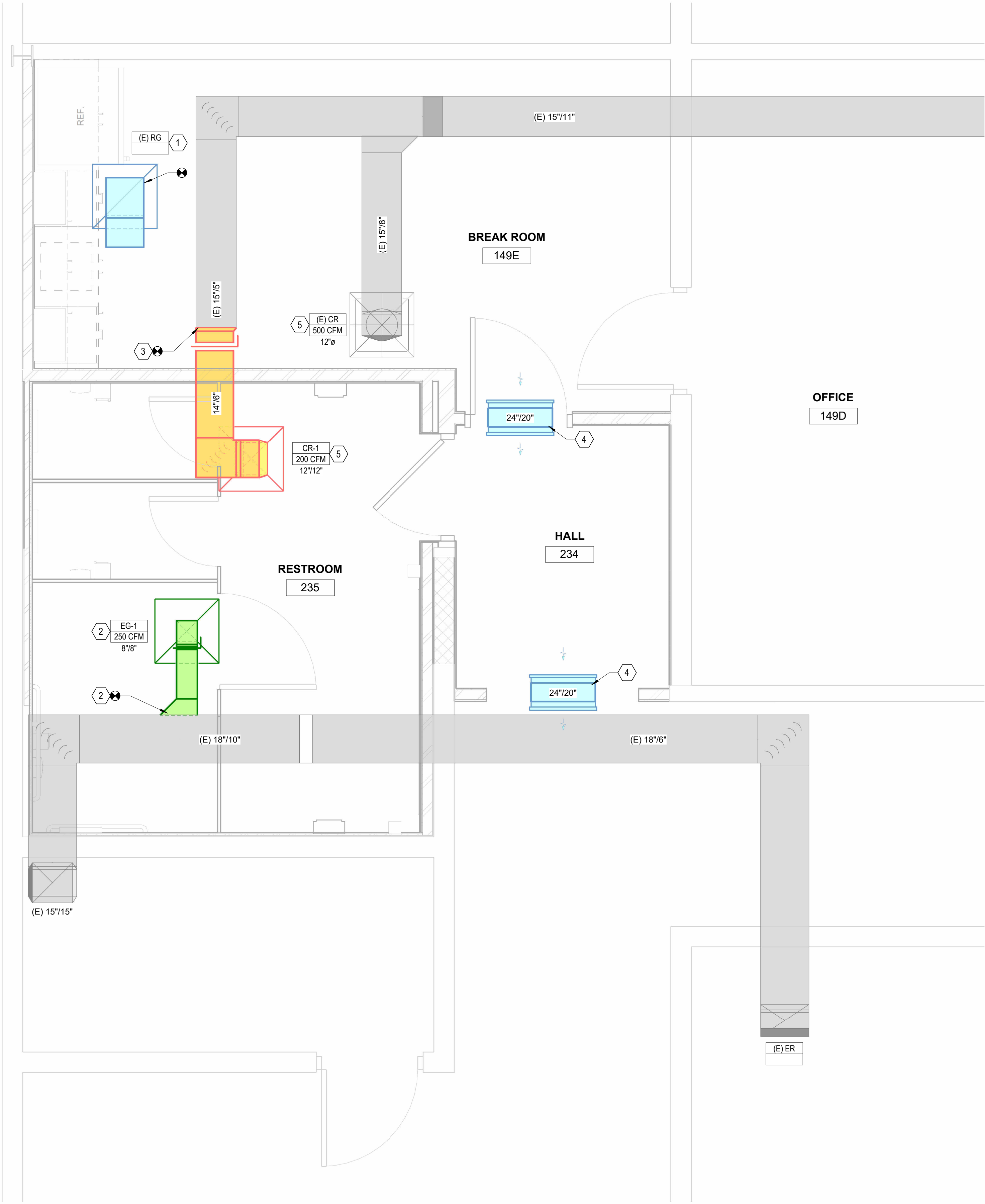
1 LEVEL 1 MECHANICAL DEMOLITION PLAN
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B
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1 LEVEL 1 MECHANICAL PLAN
1/2" = 1'-0"



GENERAL NOTES

- EXISTING EQUIPMENT INFORMATION GATHERED FROM AS-BUILT CONSTRUCTION DOCUMENTS. ACTUAL CONDITIONS MAY VARY AND SHALL BE VERIFIED PRIOR TO BEGINNING WORK.

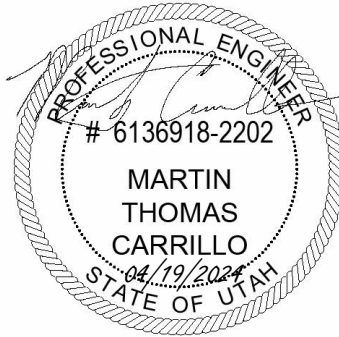
KEYED NOTES

- RELOCATE EXISTING CEILING RETURN GRILLE TO NEW LOCATION. VERIFY EXACT LOCATION WITH ARCHITECTURAL REFLECTED CEILING PLAN. MODIFY/ADD 14/14 RETURN AIR SOUND BOOT (OR BAFFLE) AT EXISTING GRILLE.
- EXTEND NEW EXHAUST DUCT FROM EXISTING TO NEW EXHAUST GRILLE. TRANSITION AND OFFSET AS REQUIRED.
- EXTEND NEW SUPPLY DUCT FROM EXISTING TO NEW CEILING REGISTER. TRANSITION AND OFFSET AS REQUIRED. PROVIDE BALANCING DAMPER ABOVE LAY-IN CEILING.
- PROVIDE AND INSTALL NEW TRANSFER AIR OPENING TO MINIMUM FREE AREA SIZE INDICATED.
- BALANCE EXISTING DIFFUSER TO AIRFLOW NOTED.



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TITLE	LEVEL 1 MECHANICAL PLAN
PROJECT	USU ENGINEER LAB 140
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

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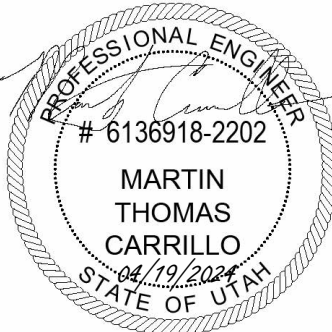
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MH111

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TITLE	PLUMBING DETAILS
PROJECT	USU ENGINEER LAB 140
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS

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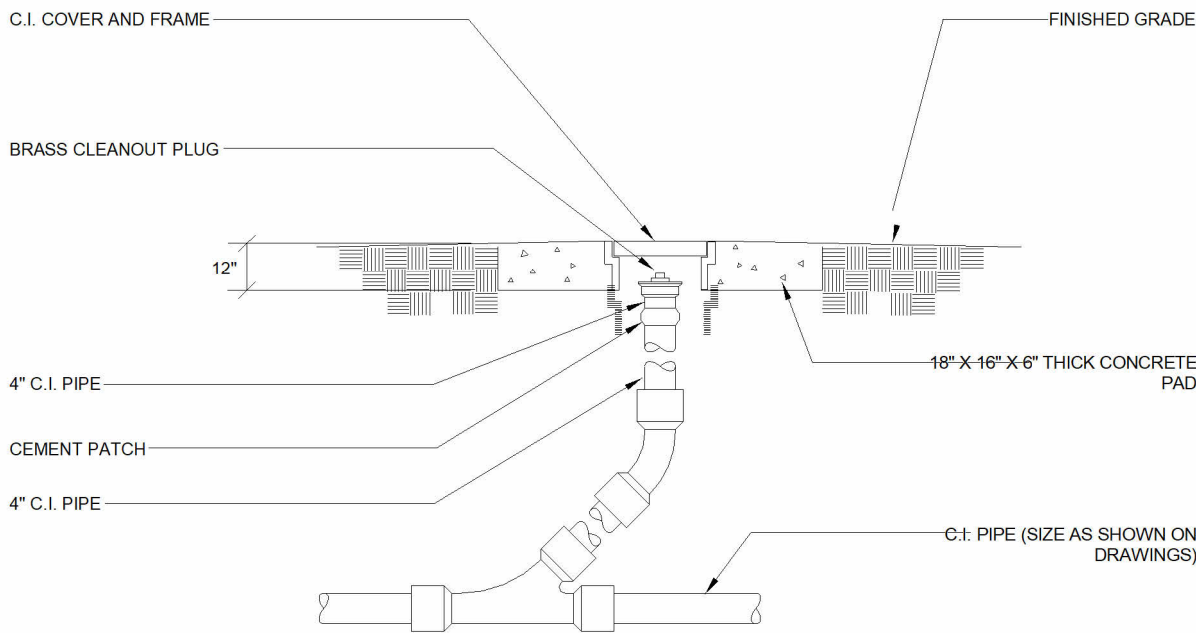
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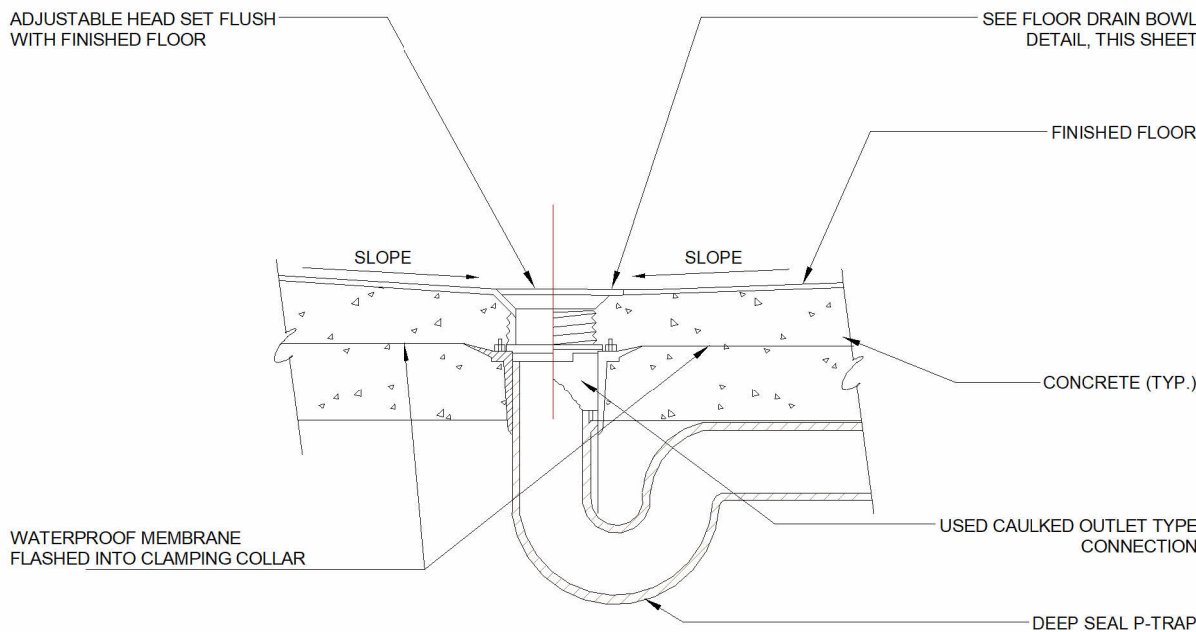
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PLUMBING FIXTURE SCHEDULE								
MARK	FIXTURE	MANUFACTURER & MODEL	COLD WATER	HOT WATER	TRAP	WASTE	VENT	FIXTURE
L-1	LAVATORY, WALL-HUNG	KOHLER K-2032 (OR APPROVED EQUAL)	1/2"	1/2"	1-1/2"	1-1/2"	1-1/2"	KOHLER K-2032 GREENWICH 20"x18", "D" SHAPED BOWL, BITREOUS CHINA, WALL MOUNT LAVATORY WITH DUAL FRONT OVERFLOW, 4" FAUCET CENTERS; K-7715 OPEN GRID STRAINER; TECHNICAL CIONCEPT 500484 MILANO BATTERY POWERED SENSOR FAUCET. FACET TO BE PROVIDED WITH FACTORY MIXING VALVE WITH 3/8 COMPRESSION CONNECTIONS AND IN-LINE CHECKS. PROVIDE WATTS NO. 7 DUAL CHECKS IN HOT AND COLD SUPPLIES. PROVIDE VANDAL RESISTANT BUBBLE AERATOR. PROVIDE LOOSE KEY ANGLES STOPS AND CHROME PLATED COPPER SUPPLIES AND 17 GA. CAST BRASS, CHROME PLATED P-TRAP. COVER ALL EXPOSED PIPING WITH "HANDI-LAV GAURD" PROTECTOR TO MEET ADA REQUIREMENTS. (1)
WC-1	WATER CLOSET (WALL HUNG)	KOHLER K-4325 (OR APPROVED EQUAL)	1"	-	-	4"	2"	KOHLER K-4325 "KINGSTON" VITREOUS CHINA TOP SPUD WALL HUNG ELONGATED TOILET, SIPHON JET, 1-1/2" TOP SPUD. SLOAN ROYAL-111 1.6 GPF, BEMIS 195SSSCT WHITE, OPEN FRONT, LESS COVER, WITH SELF-ADJUSTING CHECK HINGE. INSTALL ACTUATOR ON WIDE SIDE OF FIXTURE. PIPE ACCORDINGLY.
WC-2	WATER CLOSET (ACCESSIBLE, WALL HUNG)	KOHLER K-4325 (OR APPROVED EQUAL)	1"	-	-	4"	2"	KOHLER K-4325 "KINGSTON" VITREOUS CHINA TOP SPUD WALL HUNG ELONGATED TOILET, SIPHON JET, 1-1/2" TOP SPUD. SLOAN ROYAL-111 1.6 GPF, BEMIS 195SSSCT WHITE, OPEN FRONT, LESS COVER, WITH SELF-ADJUSTING CHECK HINGE. INSTALL ACTUATOR ON WIDE SIDE OF FIXTURE. PIPE ACCORDINGLY.
S-1	SINK (SINGLE COMPARTMENT, COUNTER MOUNTED)	ELKAY LR1716	1/2"	1/2"	1-1/4"	1-1/2"	1-1/2"	ELKAY LR1716 18 GAUGE TYPE 304 STAINLESS STEEL COUNTERTOP SELF RIMMING SINK. DIMENSIONS: 17"x 16"x 7 1/2" WITH (2) FAUCET HOLES ON 8" CENTERS; LK-35 DUO-STRAINER; CHICAGO 786 FAUCET HOLES ON 8" CENTERS; LK-35 DUO-STRAINER; CHICAGO 786-GN-1A-ES SPOUT. (1)
FD-1	FLOOR DRAIN TOILET ROOMS	JR SMITH 2010 (OR APPROVED EQUAL)	-	-	2"	2"	1-1/2"	SMITH FIGURE 2010 CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND ROUND NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE OR ROUND HOLE GRATE. DEEP SEAL TRAP COMPLETE WITH PROSET TRAP GUARD INSERT.

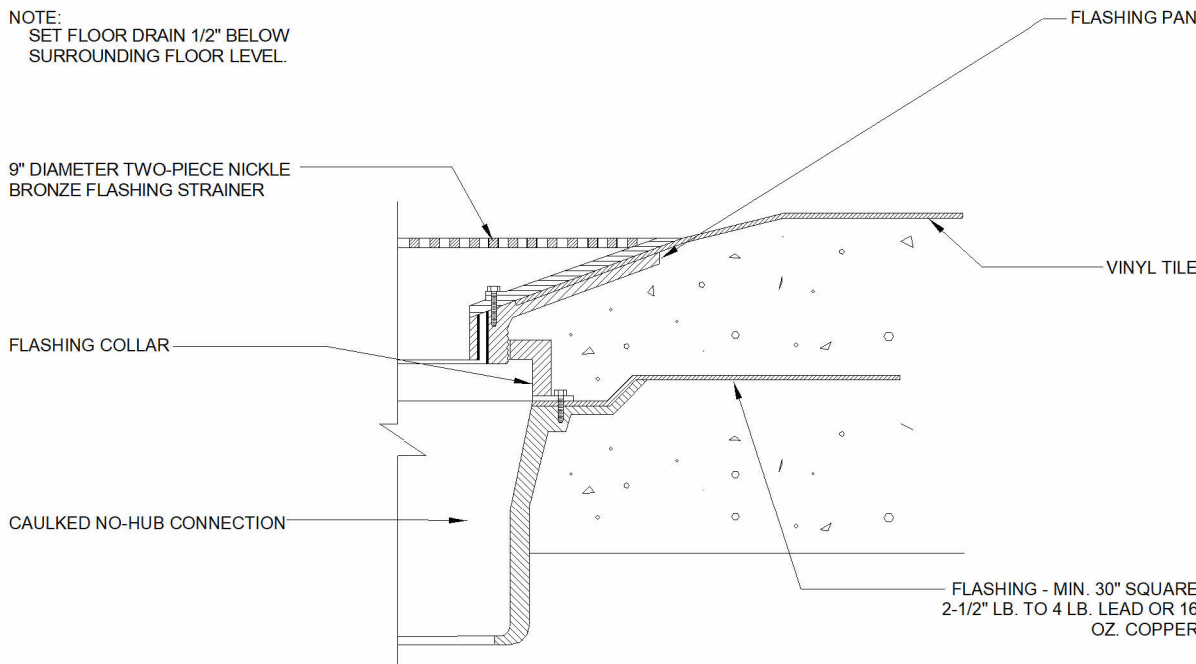
(1) PROVIDE SYMMONS THERMIXER MODEL 5-120 THERMOSTATIC MIXING VALVE BELOW LAVATORIE AND SINK. SET OUTLET AT 110° F. CONNECT TO HOT WATER INLET OF FAUCET.



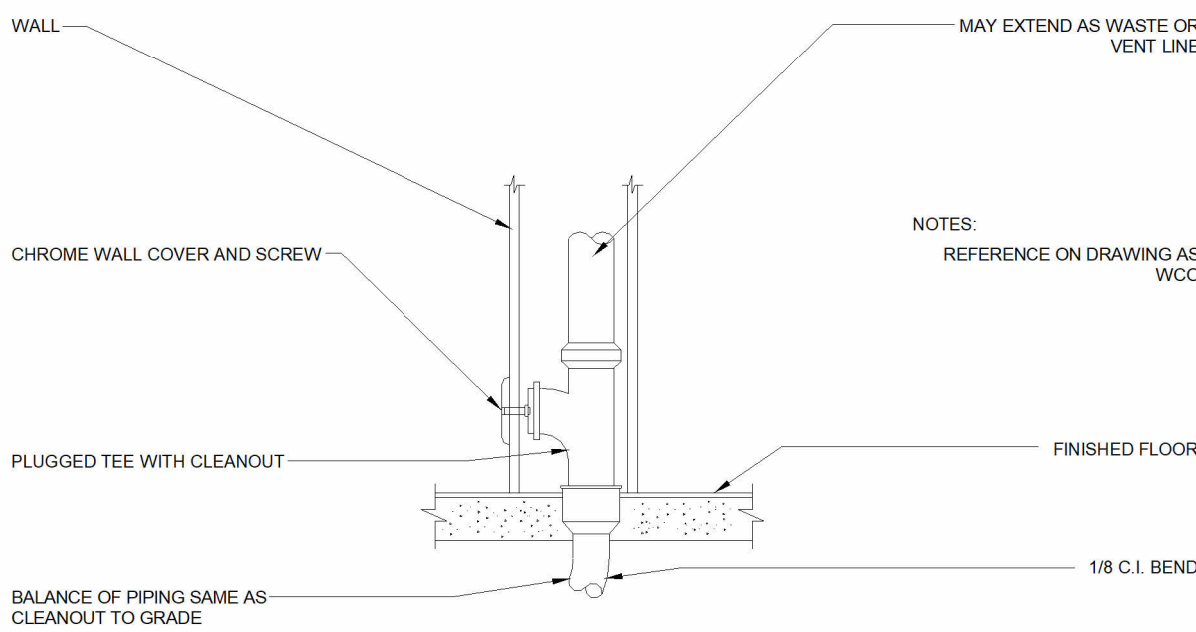
1 CLEANOUT TO GRADE (COTG)
SCALE: NTS



2 FLOOR DRAIN DETAIL
SCALE: NTS



3 FLOOR DRAIN DETAIL
SCALE: NTS

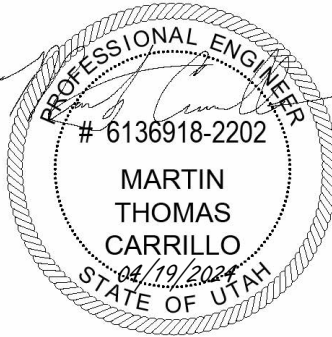


4 WALL CLEANOUT
SCALE: NTS

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GENERAL NOTES

1. EXISTING EQUIPMENT INFORMATION GATHERED FROM AS-BUILT CONSTRUCTION DOCUMENTS. ACTUAL CONDITIONS MAY VARY AND SHALL BE VERIFIED PRIOR TO BEGINNING WORK.

#

KEYED NOTES

1. DEMOLISH AND REMOVE EXISTING FIXTURE. DEMOLISH WATER PIPING BACK TO MAIN AND PREPARE FOR NEW CONNECTIONS. CAP ALL PIPING IN PLACE DURING CONSTRUCTION.

TITLE	LEVEL 1 PLUMBING DEMO PLAN
PROJECT	USU ENGINEER LAB 140
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

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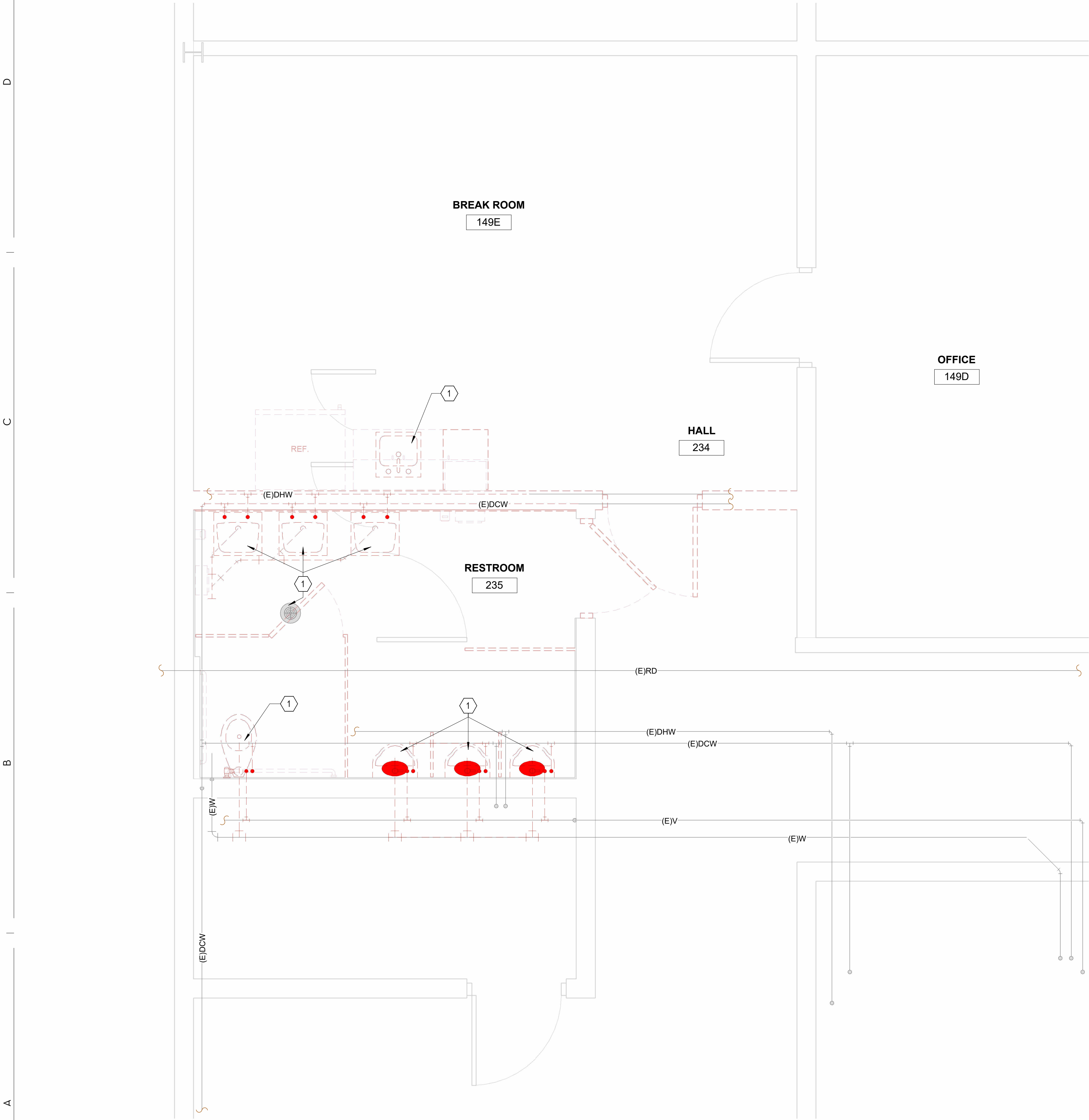
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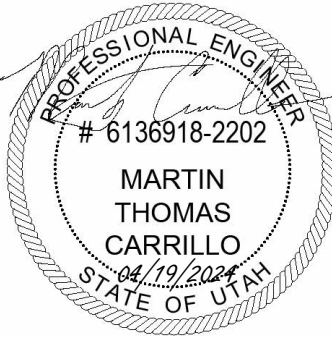
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1 LEVEL 1 PLUMBING DEMOLITION PLAN
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GENERAL NOTES

1. EXISTING EQUIPMENT INFORMATION GATHERED FROM AS-BUILT CONSTRUCTION DOCUMENTS. ACTUAL CONDITIONS MAY VARY AND SHALL BE VERIFIED PRIOR TO BEGINNING WORK.

KEYED NOTES

1. CONNECT INTO EXISTING DOMESTIC WATER DISTRIBUTION PIPING. FIELD VERIFY EXISTING SIZE AND LOCATIONS.
2. EXTEND NEW WASTE/VENT PIPING TO EXISTING FIELD. VERIFY EXISTING CONDITIONS, SIZES, AND LOCATIONS.

TITLE	LEVEL 1 PLUMBING PLAN
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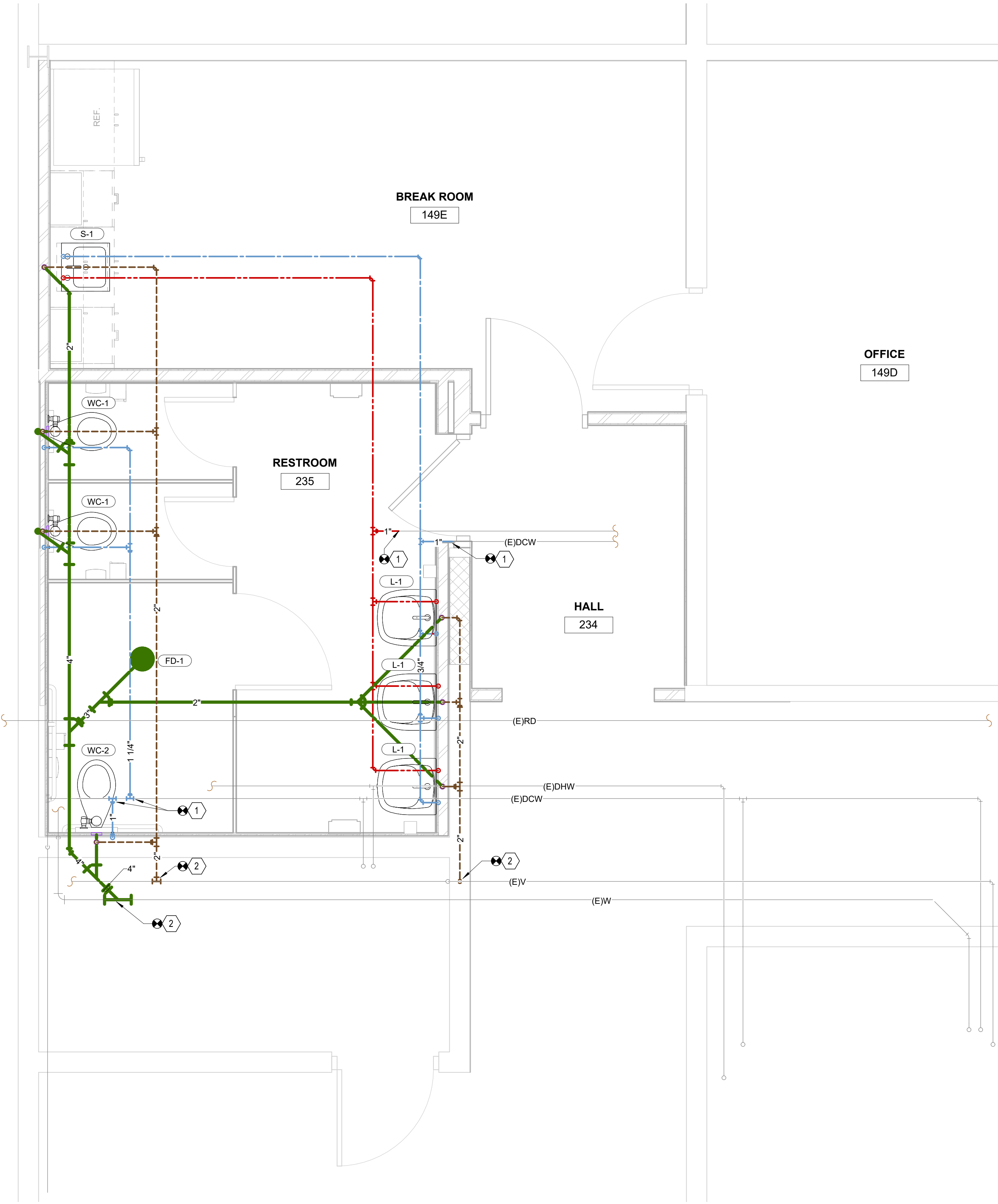
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LAST SAVED: 17 Apr 25

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A

GENERAL PROJECT NOTES

- ALL ELECTRICAL INSTALLATIONS TO CONFORM TO THE LATEST NEC AND LOCAL CODES.
- THE ELECTRICAL CONTRACTOR SHALL HAVE A COORDINATION MEETING WITH THE MECHANICAL CONTRACTOR, CONSTRUCTION SUPERINTENDANT AND ANY OTHER TRADES AS REQUIRED WITHIN SEVEN DAYS OF THE START OF THE JOB TO REVIEW CODE CLEARANCE REQUIREMENTS FOR PANELS, SWITCHES, AND OTHER ELECTRICAL GEAR SPECIFICALLY FOR THIS JOB. RECORD THE MEETING IN THE SUPERINTENDENT'S LOG. REPORT UNRESOLVED CONFLICTS TO THE ARCHITECT IMMEDIATELY.
- ELECTRICAL CONTRACTOR'S PROJECT MANAGER AND ON-SITE PROJECT FOREMAN SHALL REVIEW VENDOR SUBMITTALS FOR ACCURACY PRIOR TO SUBMITTING TO ENGINEER. INACCURACIES SHALL BE CORRECTED PRIOR TO ENGINEER SUBMITTAL.
- THE CLARITY OF RECORD DRAWING CHANGES MADE BY THE CONTRACTOR SHALL BE EQUAL TO THE ORIGINAL DRAWINGS AS JUDGED BY THE ARCHITECT OR THE RECORD SET WILL BE RETURNED TO THE CONTRACTOR FOR CLARIFICATION.
- WHEN THE GENERAL CONTRACT CALLS FOR "RECORD" OR "AS-BUILT" DRAWINGS TO BE FURNISHED BY THE CONTRACTOR AT JOB COMPLETION, THE ELECTRICAL CONTRACTOR SHALL BE REQUIRED TO FURNISH A COMPLETE SET OF "BLUE-PRINT READY" AUTOCAD ELECTRICAL DRAWINGS FOR ALL CONTRACTOR GENERATED CHANGES FROM THE DRAWINGS OF A CLARITY EQUAL TO THE ORIGINAL DRAWINGS AS JUDGED BY THE ENGINEER. CONTACT ARCHITECT FOR DISKS OR REPRODUCIBLE ORIGINAL MEDIA. PROVIDE DRAWINGS ON CD IN AUTOCAD FORMAT.
- DO NOT SCALE ELECTRICAL FLOOR PLANS. SEE ARCHITECTURAL DRAWINGS FOR ACCURATE DIMENSIONS AND FLOOR PLANS.
- ELECTRICAL DEVICES CANNOT BE SHOWN TO SCALE AND SOMETIMES OVERLAP BUILDING ELEMENTS. REFER TO ARCHITECTURAL ELEVATIONS FOR ACCURATE MOUNTING LOCATIONS.
- PANEL INDEXES SHALL INCLUDE ALL PERTINENT INFORMATION ON THE PANEL SCHEDULES INCLUDING DISTINCT NAMES FOR EACH CIRCUIT AND INFORMATION ON LIGHTS, OUTLETS, EQUIPMENT, ETC. DO NOT SIMPLY COPY THE CIRCUIT DESCRIPTION COLUMN. INDEXES TO BE TYPEWRITTEN. INCLUDE UPGRADES MADE AS PART OF THIS PROJECT.
- MOUNTING HEIGHT OF GENERAL PURPOSE OUTLETS AND SWITCHES SHALL BE 16" TO BOTTOM AND 48" TO TOP RESPECTIVELY UNLESS OTHERWISE NOTED.
- ALL ELECTRICAL EQUIPMENT SHALL BE LOCATED SO AS NOT TO INTERFERE WITH WOOD TRIM AND MOLDINGS. THE ELECTRICAL CONTRACTOR SHALL REVIEW FINISH SCHEDULES AND ARCHITECTURAL DETAILS BEFORE ROUGH-IN OF OUTLET OR SWITCH BOXES TO PREVENT BOXES AND PLATES FROM BEING PLACED BEHIND OR IN TRIMS AND MOLDINGS. REFER SPECIAL CONDITIONS TO ARCHITECT PRIOR TO ROUGH-IN.
- CIRCUIT WIRE SIZES MUST, AT MINIMUM, MATCH NEC REQUIRED CONDUCTOR SIZES FOR CORRESPONDING OVERCURRENT PROTECTIVE DEVICES. VERIFY WITH PANEL SCHEDULES BEFORE PULLING WIRE.
- THE ELECTRICAL CONTRACTOR SHALL RUN BRANCH CIRCUIT CONDUITS IN ATTIC SPACES IN A NEAT AND WORKMANLIKE MANNER SO AS TO CONSERVE OPEN SPACES AS MUCH AS POSSIBLE. HVAC DUCTWORK AND PLUMBING SHALL HAVE LOCATION PRIORITY OVER BRANCH CIRCUIT CONDUIT RUNS.
- PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR, PULLED INTO THE CONDUIT WITH THE PHASE CONDUCTOR, IN ALL SERVICE, FEEDER, AND BRANCH CIRCUITS.
- PROVIDE A NEUTRAL CONDUCTOR FOR EACH BREAKER TRIP HANDLE. NEUTRALS SHALL NOT BE SHARED BETWEEN BRANCH CIRCUITS.
- ALL CIRCUITS TO BE MINIMUM #12 CU IN MINIMUM 3/4" CONDUIT UNLESS OTHERWISE NOTED.
- MC CABLE IS NOT AN APPROVED ALTERNATE TO CONDUCTORS IN CONDUIT.
- DO NOT INSTALL MORE THAN THREE PHASE CONDUCTORS IN ANY HOME-RUN CONDUITS UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
- IDENTIFY ALL OUTLET COVER PLATES WITH THE PANEL AND CIRCUIT NUMBER.
- A GFI OUTLET SHALL BE INSTALLED AT EACH LOCATION DESIGNATED BY "GF" ON THE DRAWINGS. DOWNSTREAM PROTECTION BY A GFI OUTLET UPSTREAM IS NOT ALLOWED.
- OUTLETS, SWITCHES, AND COVER PLATES TO BE COLOR CODED (BROWN, WHITE, IVORY, OR GRAY) TO THE WALL THEY ARE MOUNTED ON AS DIRECTED BY THE ARCHITECT.
- ALL CONVENIENCE OUTLETS MUST BE MOUNTED FLUSH WITH THE COVER PLATE AND SECURED FIRMLY TO THE OUTLET BOX.
- REMOVE ALL OLD AND/OR UNUSED EXISTING CONDUIT AND ELECTRICAL APPARATUS FROM EXTERIOR OR INTERIOR EXPOSED SURFACES.
- WHERE EXISTING ELECTRICAL EQUIPMENT IS TO REMAIN BUT THE SURFACE THAT IT IS MOUNTED ON IS TO BE REWORKED UNDER OTHER CONTRACTS, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND INSTALL OR MODIFY THE EXISTING EQUIPMENT AS REQUIRED TO MEET THE DESIGN INTENT. SEE ARCHITECTURAL DRAWINGS FOR ROOF, CEILINGS, WALLS, SOFFITS, FLOORS, ETC.
- REMOVE ALL UNUSED CONDUITS AND CIRCUITS IN THE DEMOLITIONED AREA AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
- REMOVE ALL EXISTING ELECTRICAL DEVICES, EQUIPMENT, AND APPARATUS AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
- RELOCATE EXISTING CONDUITS AND CIRCUITS AS REQUIRED THAT ARE PRESENTLY SERVING EQUIPMENT THAT IS INTENDED TO REMAIN IN SERVICE BUT SAID CONDUITS ARE CURRENTLY RUNNING THROUGH AREAS TO BE DEMOLITIONED.
- WHERE EXISTING CONDUIT RUNS ARE RE-USED BY SPECIAL PERMISSION FROM THE ARCHITECT, A SEPARATE GREEN, INSULATED GROUND WIRE SHALL BE PULLED IN THE CONDUIT AND BONDED AT EACH END AS REQUIRED.
- RE-ROUTE EXISTING CIRCUIT CONDUITS AS REQUIRED AT ALL AREAS WHERE EXISTING WALLS ARE TO BE DEMOLITIONED OR HAVE DOORWAYS CUT IN THEM. PLAN ON AN AVERAGE OF ONE, 3/4" CONDUIT RELOCATION FOR EACH PENETRATION OR WALL REMOVAL.
- FIELD VERIFY CONDITIONS FOR NEW WIRING. SURFACE RACEWAYS MUST RECEIVE PRIOR APPROVAL FROM THE ARCHITECT AND OWNER AND WILL BE EVALUATED ON A CASE BY CASE BASIS DURING CONSTRUCTION. APPROVED RACEWAYS MUST BE PAINTED TO MATCH THE SURFACE ON WHICH THEY ARE MOUNTED.
- ALL PATCH, REPAIR, REPAINT AND COVER UP REQUIRED AS A RESULT OF ELECTRICAL REMODEL IS TO BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, BUT ACTUAL WORK IS TO BE PERFORMED BY QUALIFIED PERSONNEL.
- FIXTURE COUNTS SHOWN ON DRAWINGS ARE FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY FIXTURE COUNTS AS PART OF BIDDING PROCESS.
- SUPPORT RECESSED T-BAR MOUNT FIXTURES WITH FOUR EXTRA GALVANIZED WIRE SUPPORTS ON OPPOSITE CORNERS PER IBC. CONNECT WIRES TO BUILDING STRUCTURE.
- WHERE LIGHT FIXTURES AS SPECIFIED AS COLOR PER ARCHITECT, THIS SHALL BE INTERPRETED AS A NON-STANDARD COLOR.
- OVER-MIRROR WALL LIGHTS ARE TO BE MOUNTED SO THE LENS FACES DOWNWARD.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW ALL SWITCH LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-IN TO PREVENT ANY SWITCHES FROM BEING LOCATED ON THE WRONG SIDE OF THE DOOR.
- VERIFY FIXTURE COUNT WITH REFLECTED CEILING PLAN.
- INSTALL CEILING SMOKE AND HEAT DETECTORS A MINIMUM OF THREE FEET AWAY FROM ANY SUPPLY AIR DUCT.
- BID TO RUN FIRE ALARM RACEWAYS CONCEALED. ANY SURFACE RACEWAYS (WIREMOLD #700 ONLY) MUST BE PRIOR APPROVED BY THE ARCHITECT/OWNER AND PAINTED TO MATCH THE SURFACE IT IS MOUNTED ON.
- COORDINATE LOCATION OF ALL FIRE ALARM DEVICES WITH NFPA AND ADA REQUIREMENTS. COORDINATE LOCATIONS WITH MILLWORK AS REQUIRED.
- REVIEW THE STATE DESIGN REQUIREMENTS MANUAL PRIOR TO BID.
- REVIEW THE USU A&E DESIGN MANUAL PRIOR TO BID.
- WHERE THERE ARE CONFLICTS IN THE DRAWINGS AND/OR SPECIFICATIONS THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO BID. WHERE NO NOTIFICATION IS GIVEN THE MORE STRINGENT INTERPRETATION (GENERALLY INTERPRETED TO BE THE MORE COSTLY) WILL BE ENFORCED.

ELECTRICAL LEGEND

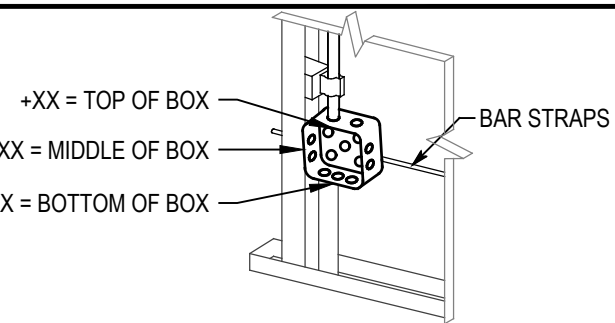
ANNOTATIONS			
	DETAIL CALL-OUT: TOP "X" REFERS TO DETAIL NUMBER & BOTTOM "XXX" REFERS TO SHEET NUMBER		DOUBLE DUPLEX OUTLET: GROUND FAULT INTERRUPTER
	KEYED NOTE CALLOUT		DOUBLE DUPLEX OUTLET: EMERGENCY GROUND FAULT INTERRUPTER - RED DEVICE AND PLATE UNLESS OTHERWISE SPECIFIED
	EQUIPMENT CALLOUT		SPECIAL OUTLET: SEE PANEL SCHEDULE
	COMMUNICATIONS RACEWAY: "x" CONDUITS OF "y" DIAMETER		JUNCTION BOX
			DISCONNECT; NO OVER-CURRENT PROTECTION
			DISCONNECT WITH OVER-CURRENT PROTECTION (CIRCUIT BREAKER STYLE OR AS SPECIFIED)
			MOTOR PROTECTIVE THERMAL SWITCH
			MOTOR PROTECTIVE FUSED THERMAL SWITCH
			QUANTITY OF CONDUCTORS: SHORT LINES = PHASE /SWITCH, LONG LINES = NEUTRAL
			HOME-RUN
			CIRCUITING: CONTROL
			CIRCUITING: LINE VOLTAGE + DIMMING CONTROL
LIGHTING FIXTURES		POWER AND DISTRIBUTION	
	EMERGENCY LIGHT		PANELBOARD
	BATTERY PACK		
	EXIT LIGHT: CEILING - FACE(S) AS SHOWN		
	EXIT LIGHT: WALL - FACE(S) AS SHOWN		
	EXIT LIGHT: FACE SIDE		
	EXIT LIGHT: DIRECTIONAL ARROWS, DOUBLE FACE		
	RECESSED FIXTURE		
	STRIP LIGHT		
	LINEAR FIXTURE		
	EMERGENCY FIXTURE		
	WALL MOUNT FIXTURE		
	CEILING FIXTURE		
	SUSPENDED FIXTURE		
LIGHTING CONTROL		COMMUNICATIONS	
	SINGLE POLE SWITCH; "x" INDICATES SWITCH GROUP		COMMUNICATIONS RACK
	THREE WAY SWITCH		COMMUNICATIONS RACEWAY; OPEN D-RINGS OR J-HOOKS. SEE DETAILS AND SPECIFICATIONS
	FOUR WAY SWITCH		PHONE BACKBOARD
	DIGITAL LIGHTING CONTROL SWITCH; SX = SWITCH CONTROL TYPE #1; SY = SWITCH CONTROL TYPE #2, ETC.		COMMUNICATIONS ENCLASURE
	PILOT LIGHT SWITCH		TELEVISION OUTLET (COMM OUTLET BOX; 1.25" CONDUIT, 1-RG-6 COAX), BY OWNER
	DIMMER SWITCH: LED; 600 W MINIMUM		COMMUNICATIONS OUTLET (COMM OUTLET BOX; 1.25" CONDUIT, (1)CAT 6 CABLE), BY OWNER
	WALL MOUNT OCCUPANCY SENSOR: ADAPTIVE TECHNOLOGY		COMMUNICATIONS OUTLET (COMM OUTLET BOX; 1.25" CONDUIT, (2)CAT 6 CABLES), BY OWNER
	DIMMER SWITCH WITH WALL MOUNT OCCUPANCY SENSOR: ADAPTIVE TECHNOLOGY		COMMUNICATIONS OUTLET (COMM OUTLET BOX; 1.25" CONDUIT, (4)CAT 6 CABLES), BY OWNER
	WALL MOUNT OCCUPANCY SENSOR: VACANCY SENSOR FUNCTION		COMMUNICATIONS OUTLET: WIRELESS ACCESS POINT (COMM OUTLET BOX; 1.25" CONDUIT, (1)CAT 6 CABLE), BY OWNER
	WALL MOUNT OCCUPANCY SENSOR: OCCUPANCY SENSOR FUNCTION		
	OCCUPANCY SENSOR: DUAL TECHNOLOGY		
	OCCUPANCY SENSOR: VACANCY SENSOR FUNCTION		
BRANCH CIRCUITING		FIRE ALARM	
	SIMPLEX OUTLET		SMOKE DETECTOR
	SIMPLEX OUTLET: GROUND FAULT INTERRUPTER		DUCT DETECTOR
	DUPLEX OUTLET		HEAT DETECTOR
	DUPLEX RECEPTACLE WITH (2)USB; LEVITON T5832 SERIES OR EQUIVALENT		FIRE ALARM FLOW SWITCH
	FACELESS GFCI PROTECTION DEVICE		FIRE ALARM TAMPER SWITCH
	DUPLEX OUTLET: GROUND FAULT INTERRUPTER		FIRE ALARM STROBE; "X" = MINIMUM CANDELA RATING
	ELECTRIC WATER COOLER OUTLET: GFCI UNLESS NOTED		CEILING MOUNTED FIRE ALARM STROBE; "X" = MINIMUM CANDELA RATING
	DUPLEX OUTLET: EMERGENCY SOURCE - RED DEVICE AND PLATE UNLESS OTHERWISE SPECIFIED		FIRE ALARM HORN AND STROBE; "X" = MINIMUM CANDELA RATING
	DUPLEX OUTLET: WEATHERPROOF		CEILING MOUNTED FIRE ALARM HORN AND STROBE; "X" = MINIMUM CANDELA RATING
	DUPLEX OUTLET: WEATHERPROOF-IN-USE COVER		FIRE ALARM PULL STATION
	DOUBLE DUPLEX OUTLET		ELECTRIC STRIKE (4SD J-BOX ABOVE CEILING; 1/2" CONDUIT STUB INTO DOOR FRAME)
	DOUBLE DUPLEX OUTLET: EMERGENCY SOURCE - RED DEVICE AND PLATE UNLESS OTHERWISE SPECIFIED		CARD READER (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)
	DOUBLE DUPLEX OUTLET: ISOLATED GROUND - ORANGE DEVICE AND PLATE UNLESS OTHERWISE SPECIFIED		KEYPAD (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)
SECURITY			ELECTRIC STRIKE (4SD J-BOX ABOVE CEILING; 1/2" CONDUIT STUB INTO DOOR FRAME)
	CARD READER (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)		KEYPAD (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)
	KEYPAD (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)		ELECTRIC STRIKE (4SD J-BOX ABOVE CEILING; 1/2" CONDUIT STUB INTO DOOR FRAME)
	ELECTRIC STRIKE (4SD J-BOX ABOVE CEILING; 1/2" CONDUIT STUB INTO DOOR FRAME)		CARD READER (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)
	KEYPAD (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)		KEYPAD (4SD J-BOX WALL; 4SD J-BOX ABOVE CEILING; 1/2" CONDUIT BETWEEN BOXES)

SHEET INDEX

#	Sheet Title
E-001	ABBREVIATIONS G.P.N. LEGEND & SHEET INDEX
E-002	ELECTRICAL SPECIFICATIONS
E-101	ELECTRICAL PLANS
E-501	ELECTRICAL DETAILS & SCHEDULES

SITE ELECTRICAL	
---(E)3ØUP---	3-PHASE UNDERGROUND PRIMARY POWER : EXISTING
---(E)3ØUS---	3-PHASE UNDERGROUND SECONDARY POWER : EXISTING
---(D)3ØUP---	3-PHASE UNDERGROUND PRIMARY POWER: DEMO
---(D)3ØUS---	3-PHASE UNDERGROUND SECONDARY POWER: DEMO
---3ØUP---	3-PHASE UNDERGROUND PRIMARY POWER
---3ØUS---	3-PHASE UNDERGROUND SECONDARY POWER
---(E)UT---	UNDERGROUND TELEPHONE : EXISTING
---(E)UTV---	UNDERGROUND TV : EXISTING
---(D)UT---	UNDERGROUND TELEPHONE : DEMO
---(D)UTV---	UNDERGROUND TV : DEMO
---UT---	UNDERGROUND TELEPHONE
---UTV---	UNDERGROUND TV
	POINT OF DISCONNECTION
	POINT OF CONNECTION
	UTILITY POLE

GENERAL WALL-MOUNTED BOX HEIGHT DETAIL



REFER TO POWER, LIGHTING AND COMMUNICATIONS PLANS FOR SPECIFIC DIMENSIONS. SEE GENERAL NOTES AND SPECIFICATIONS WHERE NO HEIGHTS ARE INDICATED.

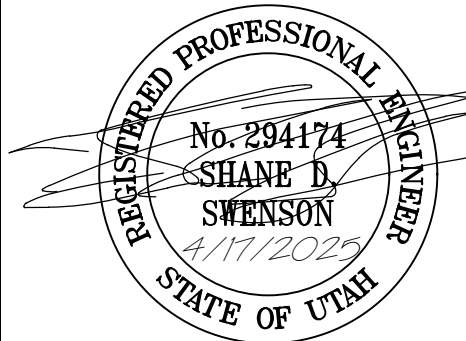
ELECTRICAL ABBREVIATIONS

A	AMPERE	CAB	CABINET	ELEC	ELECTRICAL	FT	FEET OR FOOT	MAX	MAXIMUM	NIC	NOT IN CONTRACT	SCHED	SCHEDULE	XFMR	TRANSFORMER
AF	AMP FUSE	CAT	CATALOG/CATEGORY	ELEV	ELEVATOR	GFI	GROUND FAULT INTERRUPTER	MCB	MAIN CIRCUIT BREAKER	NL	NIGHT LITE	SECT	SECTION	T-STAT	THERMOSTAT
AFF	ABOVE FINISHED FLOOR	CIB	CIRCUIT BREAKER	EMER, EM	EMERGENCY	G, GND	GROUND	MECH	MECHANICAL	NO	NORMALLY OPEN	SP	SINGLE POLE	TYP	TYPICAL
AFG	ABOVE FINISHED GRADE	CKT	CIRCUIT	EMT	ELECTRICAL METALLIC TUBING	HP	HORSEPOWER	MFR	MANUFACTURER	NTS	NOT TO SCALE	SN	SOLID NEUTRAL	UBC	UNIFORM BUILDING CODE
AFI	ARC-FAULT CIRCUIT-INTERRUPTER	CLG	CEILING	EOLR	END OF LINE RESISTOR	HVAC	HEATING, VENTILATING & AIR CONDITIONING	MIN	MINIMUM	OC	OVERCURRENT PROTECTION	SPEC	SPECIFICATION	UL	UNDERWRITERS LABORATORY
AIC	AMPERE INTERRUPTING CAPACITY	CO	CONDUIT ONLY	EQUIP	EQUIPMENT	IG	ISOLATED GROUND	MLO	MAIN LUGS ONLY	P	POLE	SW	SWITCH	UMC	UNIFORM MECHANICAL CODE
AL	ALUMINUM	COMM	COMMUNICATION	EX, EXIST	EXISTING	IMC	INTERMEDIATE METAL CONDUIT	MTD	MOUNTED	PH	PHASE	SWBD	SWITCHBOARD	UNO	UNLESS NOTED OTHERWISE
ARCH	ARCHITECT(URAL)	CONN	CONNECTION	FBO	FURNISHED BY OTHERS	IN	INCH(ES)	NEC	NATIONAL ELECTRICAL CODE	PNL	PANEL	SWGR	SWITCH GEAR	V	VOLT OR VOLTAGE
AS	AMP SWITCH	CU	COPPER	FOU	FAN COIL UNIT	ISC	SHORT CIRCUIT AMPERES, KA	NECA	NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION	PWR	POWER	SYS	SYSTEM	VA	VOLT AMPERE
AWG	AMERICAN WIRE GAUGE	DEMO	DEMOLITION/DEMOLISH	FF	FINISHED FLOOR	JB, J-BOX	JUNCTION BOX	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION	QTY	QUANTITY	TEMP	TEMPORARY	W	WATT
BLDG	BUILDING	DISC	DISCONNECT	FIXT	FIXTURE	KCMIL	THOUSAND CIRCULAR MILS	N, NEUT	NEUTRAL	RECEP	RECEPTACLE	TELE	TELEPHONE	W/	WITH
BKBD	BACKBOARD	DN	DOWN	FLEX	FLEXIBLE METALLIC CONDUIT (STEEL)	KVA	KILOVOLT AMPERE	NFC	NATIONAL FIRE CODE	REQD	REQUIRED	TWP	TWISTED PAIR	WG	WIRE GUARD
C	CONDUIT	DWG	DRAWING	FLUOR	FLUORESCENT	KW	KILOWATT	NC	NORMALLY CLOSED	RGSC	RIGID GALVANIZED STEEL CONDUIT	TWSP	TWISTED SHIELDED PAIR	WP	ULLISTED WEATHERPROOF, NEMA 3R or 4

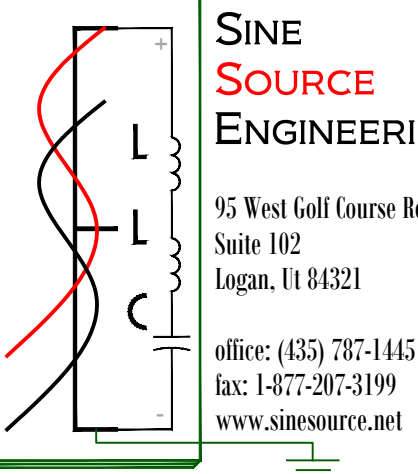


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TITLE	ABBREVIATIONS G.P.N. LEGEND & SHEET INDEX
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODEL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS

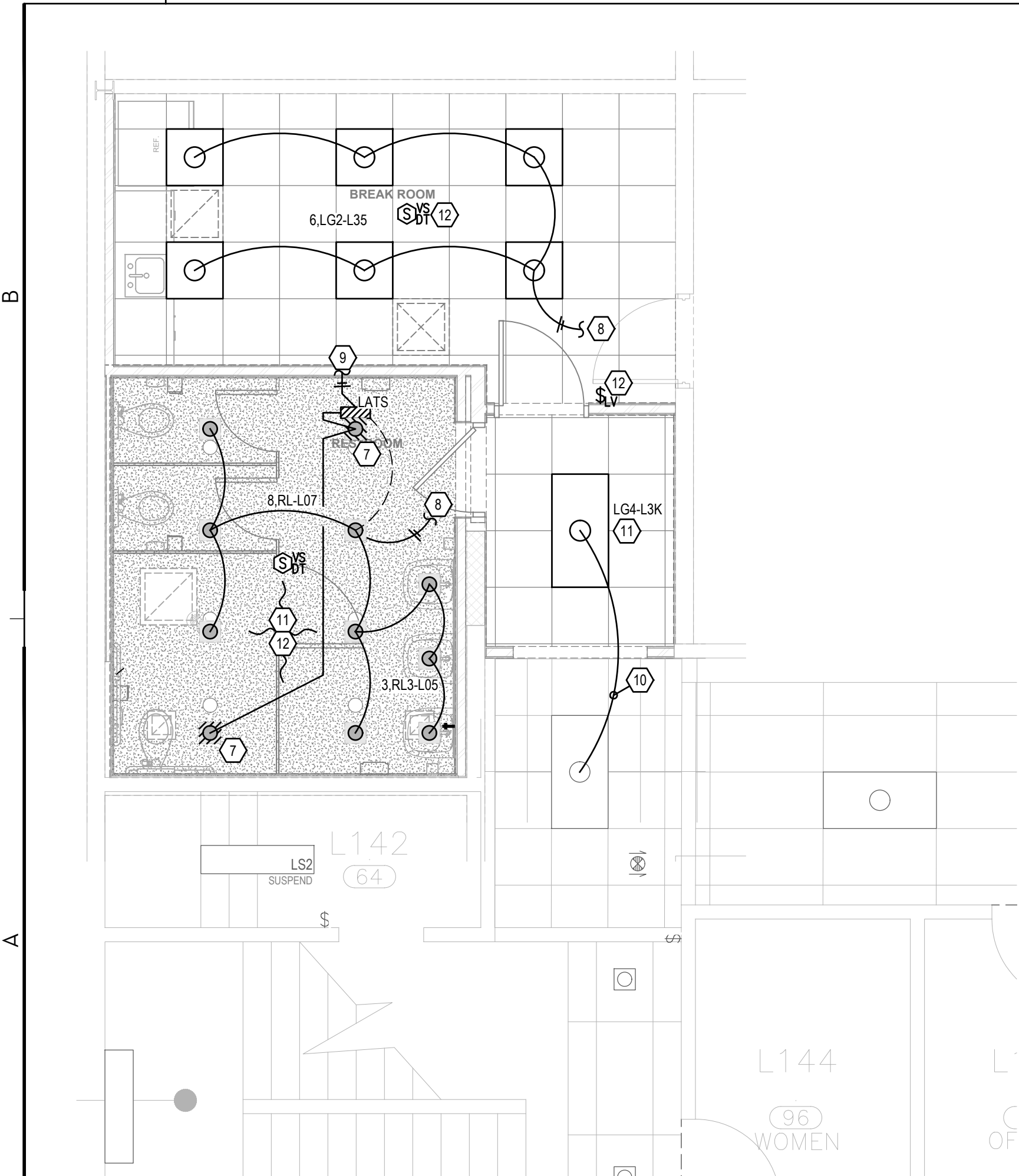
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DATE: 04/17/25
JOB NO: SSE# - 2024029
SCALE: AS NOTED
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SHEET
E-001

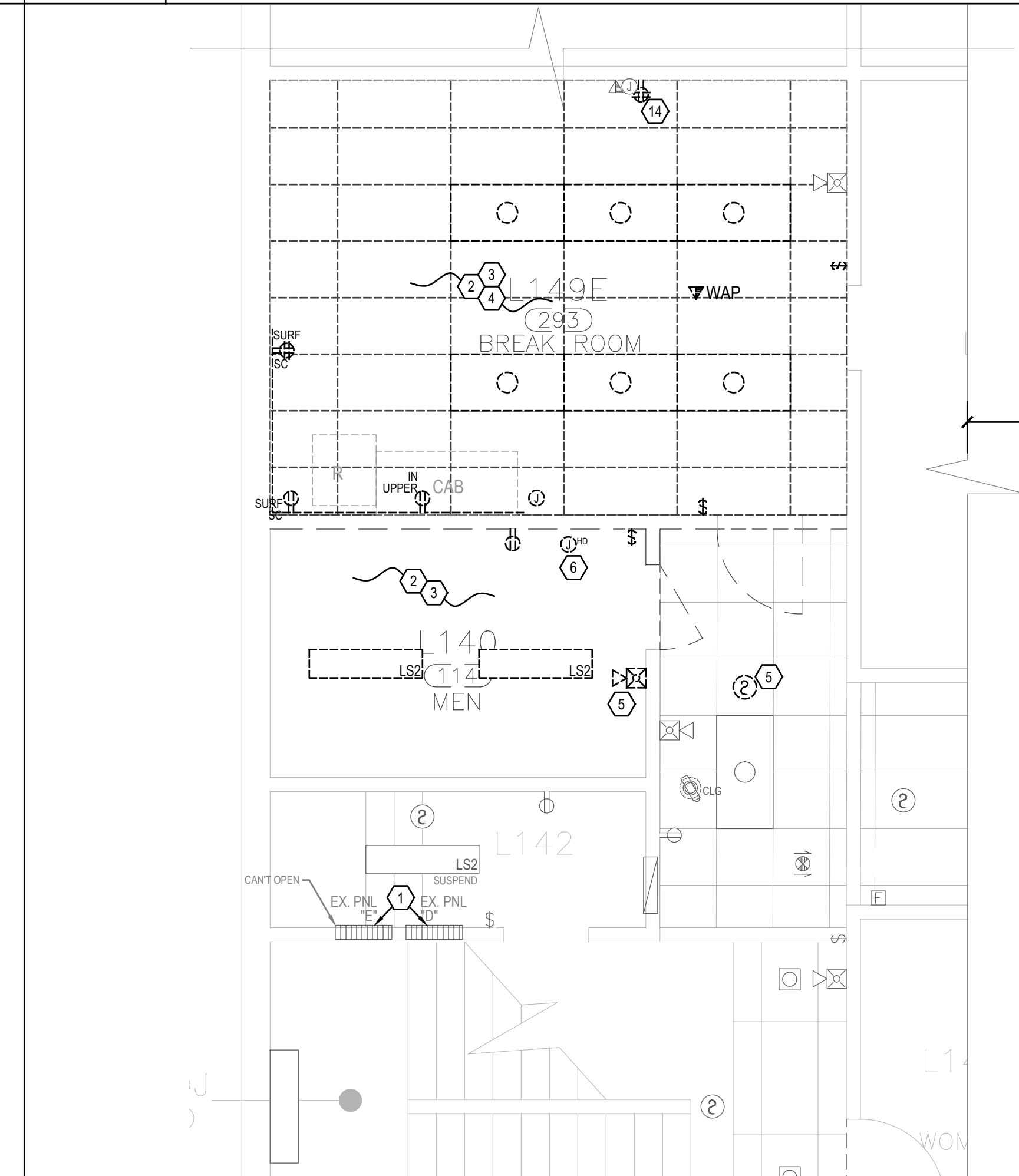
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LAST SAVE 4/16/2025 T:\JOBS\2024029 USU ENG. BLOG RESTROOM01 DRAWINGS\05 ELECTRICAL\SINE SOURCE PROJECT\SHEETSE-101.1 ELECTRICAL PLANS.DWG
LAST SAVED: 16 Apr 25



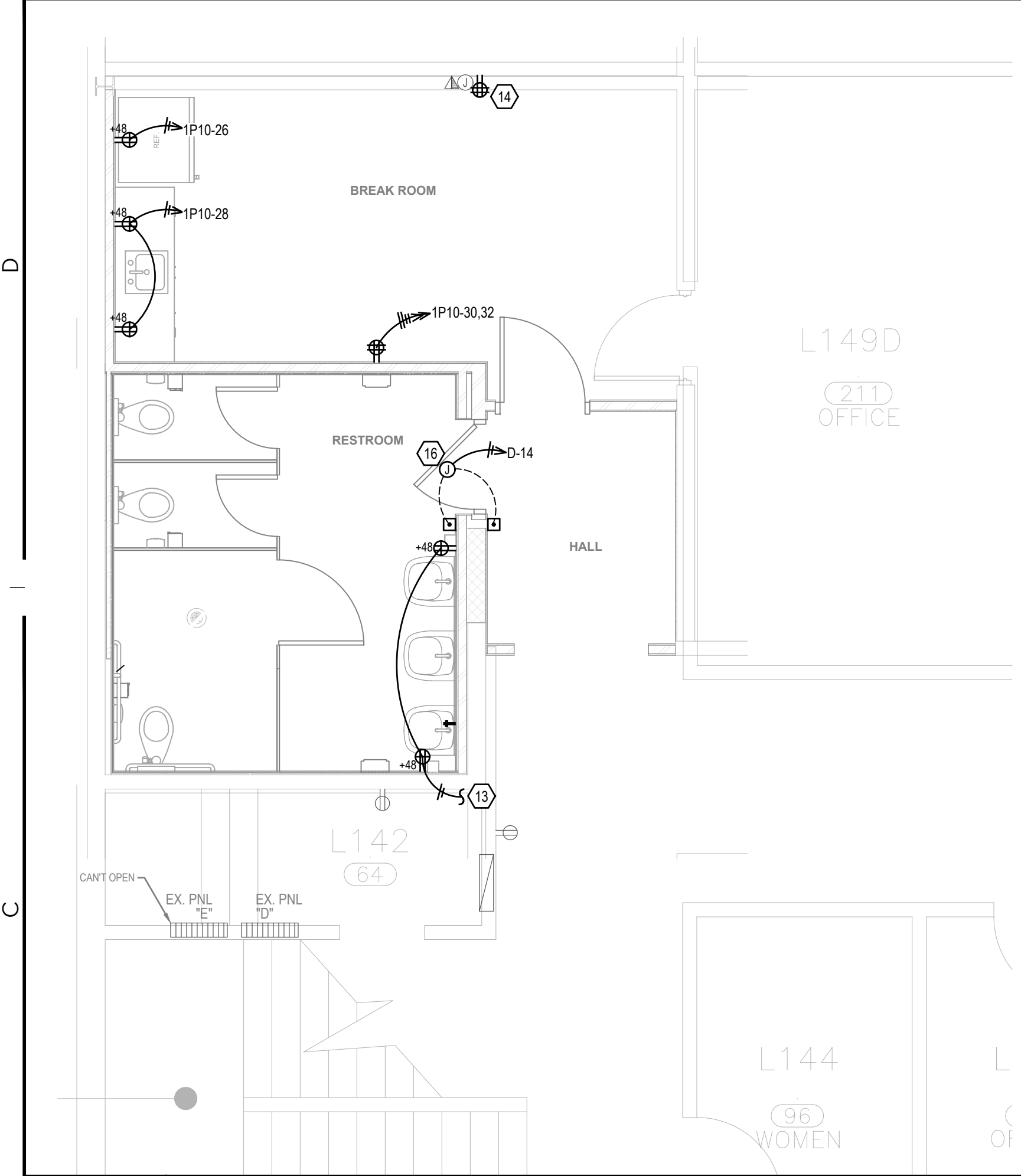
A1 LIGHTING PLAN

SCALE: 1/4" = 1'-0"



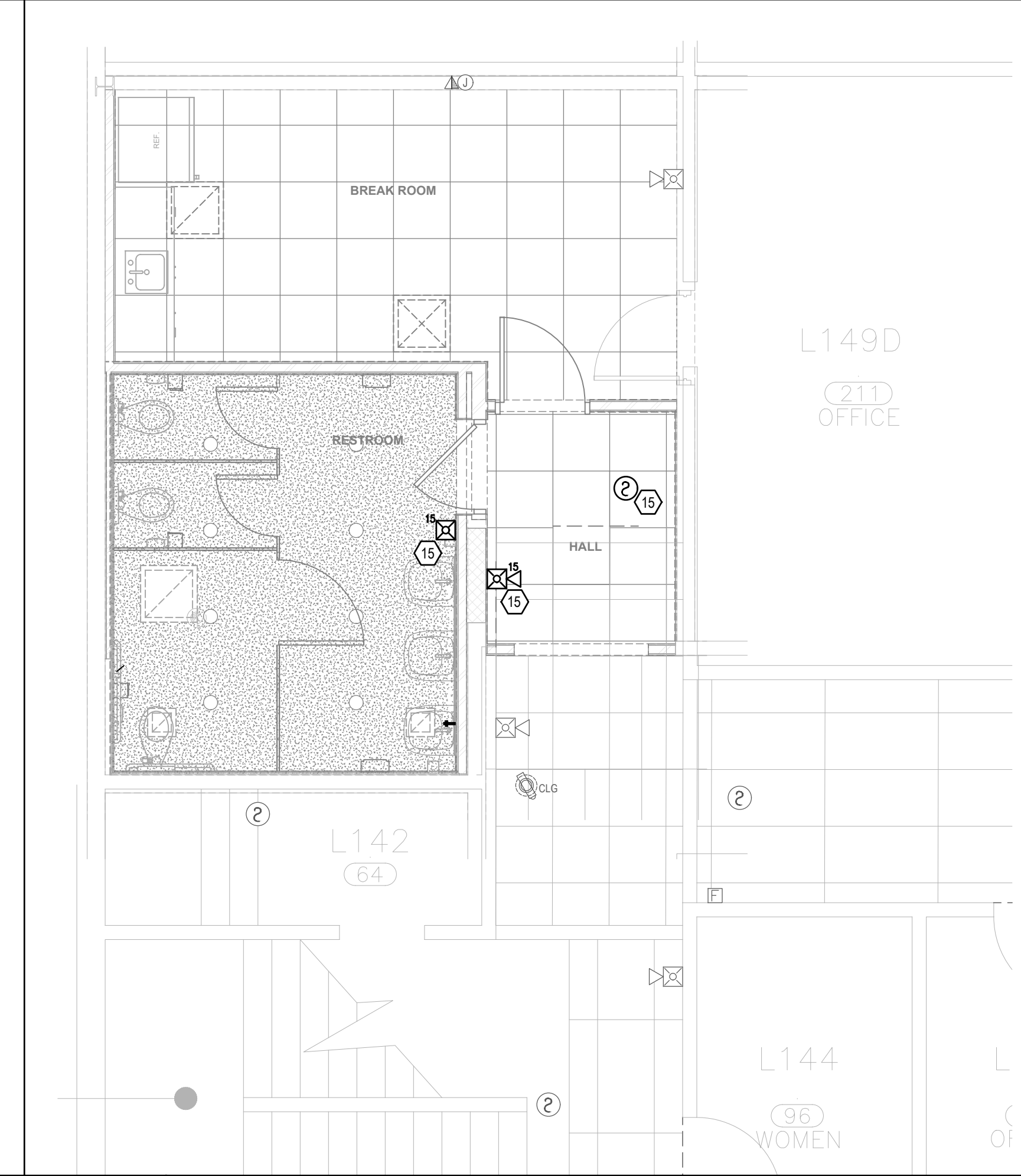
A2 ELECTRICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



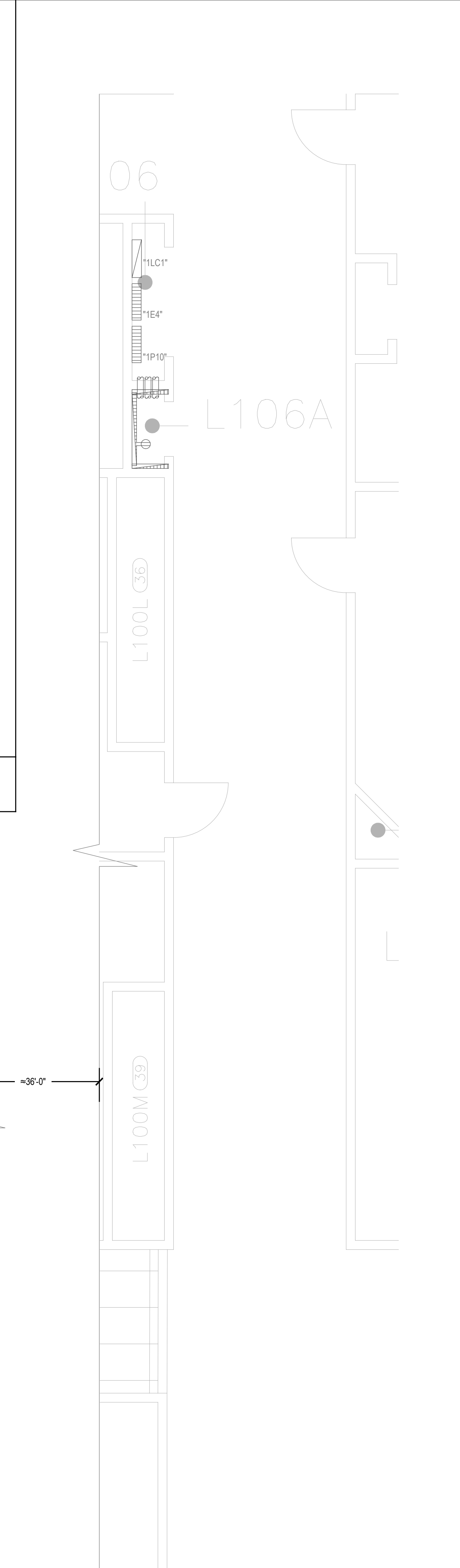
C1 POWER PLAN

SCALE: 1/4" = 1'-0"



C2 ELECTRONIC SYSTEMS & FIRE ALARM PLAN

SCALE: 1/4" = 1'-0"

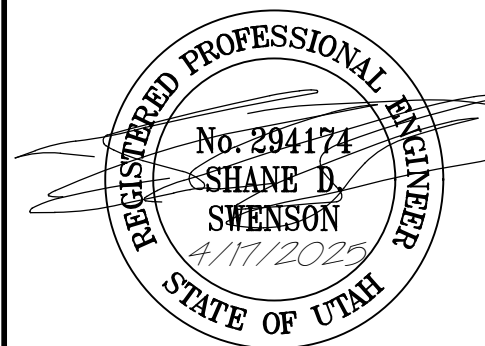


- SHEET KEYED NOTES**
- EXISTING PANELS TO REMAIN.
 - REMOVE EXISTING FIXTURES AND/OR LIGHTING CONTROL AS INDICATED.
 - REMOVE EXISTING OUTLETS AS INDICATED.
 - REMOVE EXISTING COMMUNICATIONS DEVICES AS INDICATED.
 - REMOVE EXISTING FIRE ALARM DEVICES AS INDICATED.
 - DISCONNECT EXISTING EQUIPMENT FOR REMOVAL.
 - CONNECT FIXTURE TO EM CIRCUIT INDICATED. CONNECT FIXTURE TO OPERATE WITH SWITCHES IN NORMAL MODE. PROVIDE AUTOMATIC SWITCHING DEVICE (LATS) FOR FIXTURE AS REQUIRED. FIXTURES ON A COMMON SWITCH SHALL BE CONNECTED TO A SINGLE SWITCHING DEVICE WITH APPROPRIATE RATINGS. LATS SHOWN FOR INTENT ONLY. LOCATE DEVICES IN ACCESSIBLE LOCATION ON OR NEAR FIRST CONTROLLED FIXTURE. PROVIDE ACCESS DOORS WHERE REQUIRED.
 - CONNECT TO EXISTING NORMAL SOURCE LIGHTING CIRCUIT PREVIOUSLY SERVING SPACE.
 - CONNECT TO EXISTING EM LIGHTING CIRCUIT PREVIOUSLY SERVING SPACE.
 - CONNECT TO EXISTING CIRCUIT INDICATED.
 - PROVIDE NEW LIGHTING AS INDICATED.
 - PROVIDE NEW LIGHTING CONTROL AS SHOWN.
 - CIRCUIT TO EXISTING OUTLET CIRCUIT PREVIOUSLY SERVING SPACE.
 - REPLACE EXISTING DEVICES IN SAME LOCATION WITH NEW COMPLYING WITH THIS PROJECT'S SPECIFICATIONS.
 - RE-INSTALL FIRE ALARM DEVICE REMOVED DURING DEMOLITION.
 - PROVIDE POWER TO AUTOMATIC DOOR CONTROLLER PER EQUIPMENT REQUIREMENTS. PROVIDE 3/4" CONDUIT WITH CONTROL WIRING PER MANUFACTURER'S REQUIREMENTS TO CONTROL BUTTON. REFER TO ARCHITECTURAL DETAILS FOR EXACT BUTTON LOCATIONS. INTERLOCK DOOR WITH ACCESS CONTROL SYSTEM TO RELEASE ON APPROVED CARD READ. EXTEND POWER TO DOOR RELEASE POWER SUPPLY AS REQUIRED.

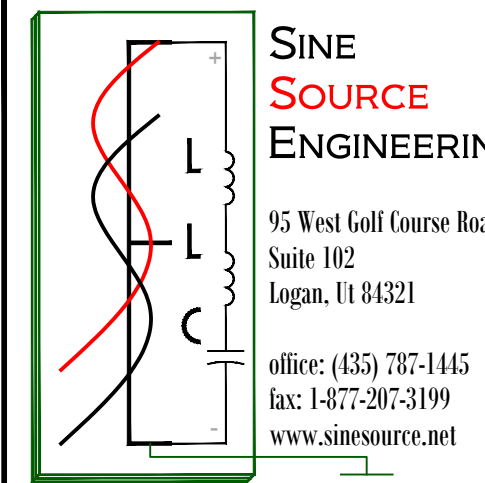
- GENERAL SHEET NOTES**
- DEMOLITION PLAN IS ENGINEER'S ATTEMPT TO ASSIST BIDDERS IN ESTIMATING REMOVAL COSTS OF EXISTING EQUIPMENT. PLAN IS NOT INTENDED TO BE ALL-INCLUSIVE, AND IT IS THE BIDDERS RESPONSIBILITY TO VERIFY ALL EXISTING EQUIPMENT AND DEVICES TO BE REMOVED PRIOR TO BIDDING.
 - EXISTING ITEMS TO BE REMOVED ARE INDICATED AS BOLD/DASHED. ITEMS TO REMAIN ARE SHOWN AS LIGHT/SOLID.
 - MAINTAIN CIRCUIT CONTINUITY FOR DEVICES DOWNSTREAM OF ITEMS TO BE REMOVED.
 - COORDINATE ALL SWITCH, OUTLET, LIGHT AND OTHER DEVICE LOCATIONS WITH ARCHITECTURAL ELEMENTS (CABINETS, WINDOWS ETC.) PRIOR TO ROUGH IN. REVIEW ARCHITECTURAL INTERIOR ELEVATIONS PRIOR TO ROUGH-IN OF EACH AREA FOR ADDITIONAL INFORMATION.
 - PROVIDE 4SD J-BOX WITH 1 GANG MUD RING AND 1" CONDUIT TO ACCESSIBLE CEILING SPACE FOR ALL VOICE/DATA/COMBO OUTLETS SHOWN ON FLOOR PLANS. PROVIDE INSULATED THROAT CONNECTORS ON BOTH ENDS OF CONDUIT. COMMUNICATIONS CABLING PROVIDED BY OWNER.
 - ALL CONDUIT SHALL BE RAN OVERHEAD UNLESS OTHERWISE NOTED.
 - EXISTING LIGHTING, ELECTRICAL AND ELECTRONIC DEVICES SHOWN LIGHT. NEW DEVICES SHOWN DARK.
 - NEW DEVICES SHOWN ON EXISTING WALLS SHALL FINISH FLUSH WITH WALL UNLESS OTHERWISE NOTED. CUT, PATCH AND REPAIR SURFACES AS REQUIRED.



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TITLE	ELECTRICAL PLANS
PROJECT	ENGINEERING LAB ROOM 140- RESTROOM REMODEL
CLIENT	UTAH STATE UNIVERSITY
ADDRESS	4110 OLD MAIN HILL, LOGAN, UT 84321

REVISIONS		
NO.	DATE	DESCRIPTION

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E-101

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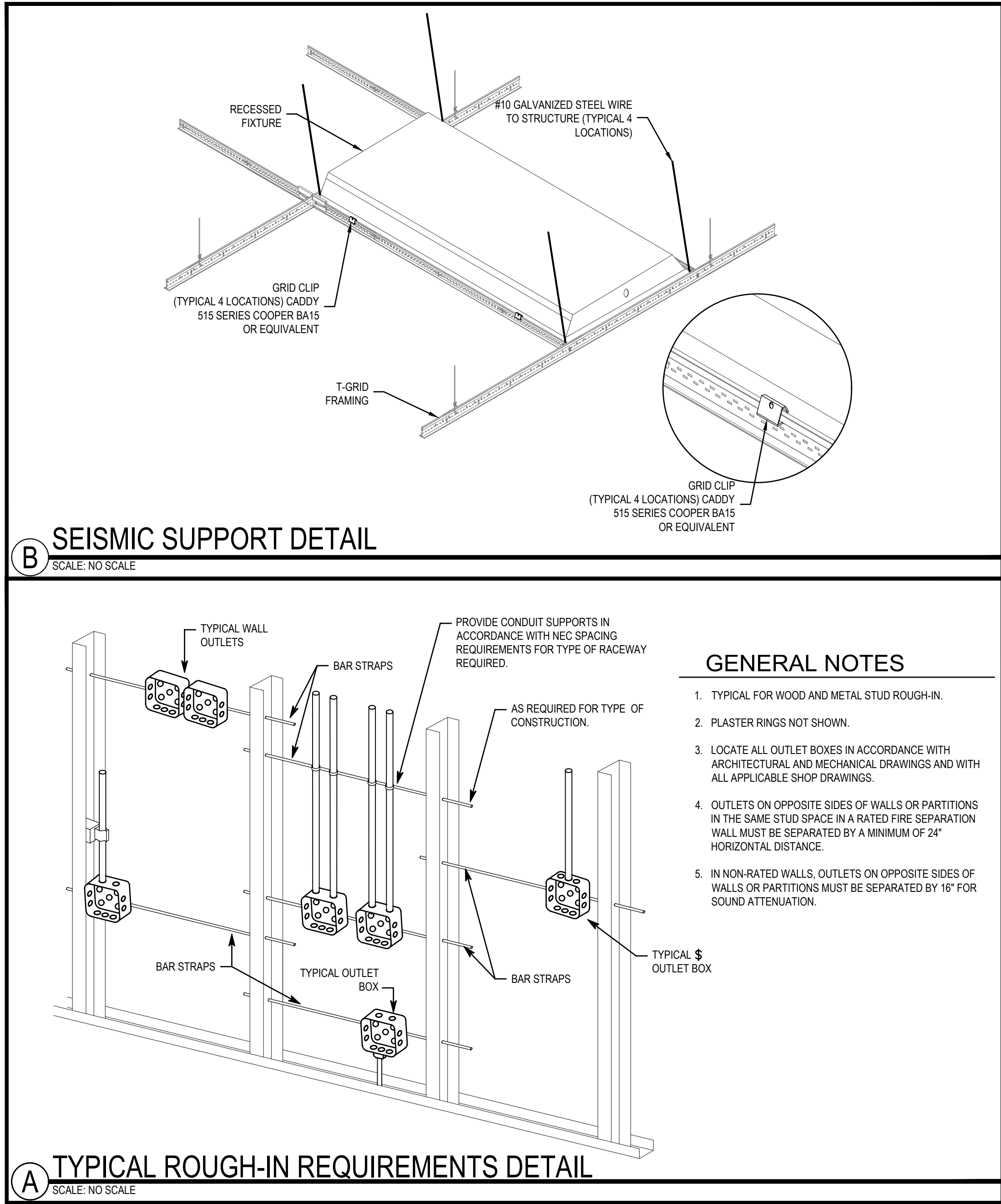
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C

B

A

LIGHT FIXTURE SCHEDULE						
	TYPE	MANUFACTURER/CATALOG NO.	DESCRIPTION	MOUNTING	POWER	LAMPS
	L ATS	DUAL LITE ATSD SERIES OR EQUIVALENT	LIGHTING TRANSFER SWITCH TO TRANSFER FROM SWITCHED POWER TO GENERATOR POWER ON NORMAL POWER FAILURE; RATINGS PER LOAD CONTROLLED; DIMMER COMPATIBLE	CEILING/FIXTURE	N/A	N/A
	LG2- L35	LITHONIA SPX-2X2-3400LM-80CRI-40K-BFR-MPL-MIN10-ZT-MVOLT(-E10WLCP)-MW OR EQUIVALENT WITH PRIOR APPROVAL	RECESSED, FLAT PANEL; MULTI-VOLT, ELECTRONIC, DIMMING, DRIVER; EM BATTTRY PACK WHERE NOTED ON DRAWINGS;	RECESSED	23 W	3500 LUMEN NOMINAL LED 4000K
	LG4- L3K	LITHONIA SPX-2X4-3000LM-80CRI-40K-BFR-MPL-MIN10-ZT-MVOLT(-E10WLCP)-MW OR EQUIVALENT WITH PRIOR APPROVAL	RECESSED, FLAT PANEL; MULTI-VOLT, ELECTRONIC, DIMMING, DRIVER; SMOOTH WHITE LENS; EM BATTTRY PACK WHERE NOTED ON DRAWINGS;	RECESSED	20 W	3000 LUMEN NOMINAL LED 4000K
	RL3- L05	LITHONIA LDN3-40-05-L03-AR-LD-MVOLT-UGZ OR EQUIVALENT	RECESSED CAN; LED LAMPING; CLEAR, OPEN, SEMI-SPECULAR CONE; 2" NOMINAL OPENING; SELF-FLANGED CONE; DIMMABLE; EM BATTERY WHERE NOTED ON DRAWINGS; TRIM EXTENDER WHERE REQUIRED	RECESS	6.3 W	500 LUMEN NOMINAL LED 4000K
	RL- L07	LITHONIA LDN6-40-07-L06-AR-LD-MVOLT-GZ1(-ELSD) OR EQUIVALENT	RECESSED CAN; LED LAMPING; CLEAR, OPEN, SEMI-SPECULAR CONE; 6" NOMINAL OPENING; SELF-FLANGED CONE; DIMMABLE; EM BATTERY WHERE NOTED ON DRAWINGS; TRIM EXTENDER WHERE REQUIRED	RECESS	8.9 W	700 LUMEN NOMINAL LED 4000K
NOTES						



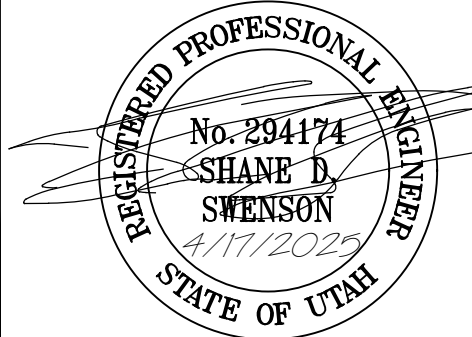
PANEL	68A-L142-D	TYPE	GE NLAB			3			Ø	4			WIRE	120/208			VOLTS			LOCATION		MOUNTING			
		REMARKS	-ALL CIRCUITS CONSIDERED EXISTING UNLESS OTHERWISE INDICATED IN THESE DRAWINGS --EXISTING CIRCUIT ANTICIPATED TO BE MADE SPARE BY THIS PROJECT --PROVIDE NEW BREAKER IN EXISTING PANEL															JANITOR	L142		X	FLUSH			
																						SURFACE			
																								225	AMP MAIN
																								X	LUGS

PANEL	68A-L106A-1P10	TYPE	SQ D NQOD							3	Ø	4	WIRE	120/208	VOLTS	LOCATION	MOUNTING																	
		REMARKS	-ALL CIRCUITS CONSIDERED EXISTING UNLESS OTHERWISE INDICATED IN THESE DRAWINGS --EXISTING CIRCUIT ANTICIPATED TO BE MADE SPARE BY THIS PROJECT --PROVIDE NEW BREAKER IN EXISTING PANEL															HALL CLOSET	FLUSH															
																		106A	SURFACE															
																	225 AMP MAIN																	
																		LUGS																
																		BREAKER																
No.	BRKR	CIRCUIT DESCRIPTION					L	O	M	WIRE/CND			CIRC. LOAD	WIRE/CND			L	O	M	CIRCUIT DESCRIPTION			BRKR	No.										
	A	P																																
1	20	1	PLUGS: OFF 149,149D																															
			P	N	G	C																												
			EX	EX	EX	EX																												
3	20	1	PLUGS: STG 149C, 149E WALL																															
			EX	EX	EX	EX																												
5	20	1	PLUGS: WORK 149A,149B																															
			EX	EX	EX	EX																												
7	20	1	PLUGS: LAB 110																															
			EX	EX	EX	EX																												
9	20	1	PLUGS: STUDENT 108																															
			EX	EX	EX	EX																												
11	20	1	PLUGS: STUDENT OFF 108A																															
			EX	EX	EX	EX																												
13	20	1	PLUGS: LAB 112																															
			EX	EX	EX	EX																												
15	20	1	PLUGS: LAB 112																															
			EX	EX	EX	EX																												
17	20	1	PLUGS: LAB 112																															
			EX	EX	EX	EX																												
19	20	3	RM 149A 3-PHASE																															
			EX	EX	EX	EX																												
21	-	-	-																															
			EX																															
23	-	-	-																															
			EX																															
25	20	1	DEPT HEAD LAB 112, 149E																															
			EX	EX	EX	EX																												
27	20	1	FIRE DAMPER EXIT & EXT LTG																															
			EX	EX	EX	EX																												
29	20	1	SPARE																															
31	20	1	SPACE																															
33	20	1	SPACE																															
35	20	1	SPACE																															
37	20	1	SPACE																															
39	20	1	SPACE																															
41	20	1	SPACE																															
										TOTALS	2400	1500	1200																					
FEEDER										EXISTING					AMPS/PHASE					20	13	10	AIC EX 10K											
																									SCCR EX 10K									
																									PARALLEL RUNS					SEE ONE-LINE				
BREAKER CODES																																		
A=ARC-FAULT; G=GROUND FAULT; H=HACR; L=LOCKING HANDLE; S=SHUNT TRIP; R=RED PAINTED HANDLE																																		
WIRE CODES																																		
I=ADD'L ISO GROUND TO MATCH SAFETY GROUND; S=UNLESS OTHERWISE SPECIFIED																																		
GENERAL CODES																																		
1LIN=SEE ONE-LINE DIAGRAM																																		

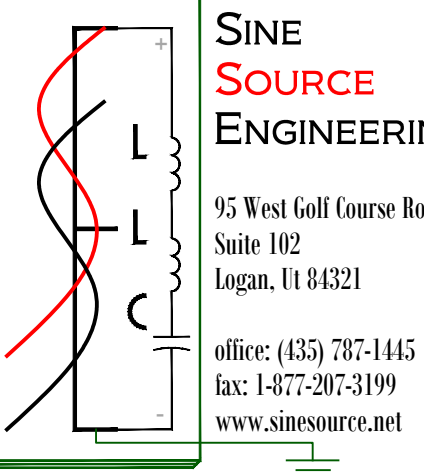


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TITLE	ELECTRICAL DETAILS & SCHEDULES		
	ENGINEERING LAB ROOM 140- RESTROOM REMODEL		
	UTAH STATE UNIVERSITY		
	4110 OLD MAIN HILL, LOGAN, UT 84321		
PROJECT			
CLIENT			
ADDRESS			

REVISIONS		
NO.	DATE	DESCRIPTION

DATE: 04.17.25
JOB NO: SSE# - 2024029
SCALE: AS NOTED
DRAWN: -

SHEET

E-501