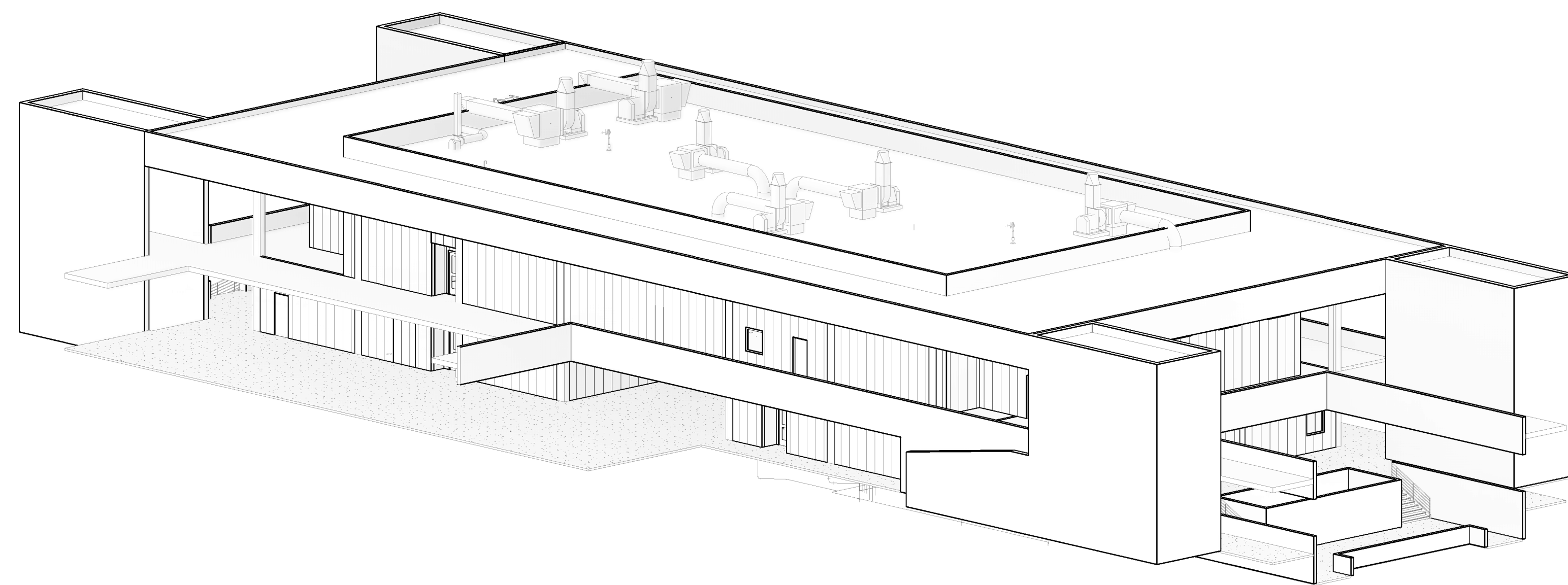


# Pima Community College PCC West Lab Building F Renovation 1931.000

2202 W Anklam Rd, Tucson, AZ 85745

PCC West Lab Building F Renovation  
Pima Community College  
BWS Project No. 1931.000



ADD ALTERNATE #01:  
MICROBIOLOGY, DEMOLITION AND CONSTRUCTION WITH ASSOCIATED  
MECHANICAL UNITS AND EXHAUST, AND SYSTEMS COMPLETE AND IN PLACE

ADD ALTERNATE #02:  
ORGANIC CHEMISTRY, DEMOLITION AND CONSTRUCTION WITH ASSOCIATED  
MECHANICAL UNITS AND EXHAUST, AND SYSTEMS COMPLETE AND IN PLACE

## 100% CONSTRUCTION DOCUMENTS

01/08/2020

100% CONSTRUCTION DOCUMENTS  
01/08/2020

### OWNER

Pima Community College  
Facilities Management  
6680 S. Country Club  
Tucson, Arizona 85709  
Phone: 520.206.4500  
Fax: 520.206.2665

### CONSULTANTS

LABORATORY  
RFD  
3965 Fifth Avenue, #400  
San Diego, CA 92103-3192  
Phone: 619.297.0159

MECHANICAL  
KC Mechanical Engineering  
5447 E Fifth St.  
Tucson Az 85711  
Phone: 520.327.7611

STRUCTURAL  
Turner Structural Engineering  
3026 N. Country Club Rd.  
Tucson Az 85716  
Phone: 520.323.3422

ELECTRICAL  
Monrad Engineering, Inc.  
1926 E Ft. Lowell Rd. #200  
Tucson Az 85719-2391  
Phone: 520.884.0045

bws | ARCHITECTS

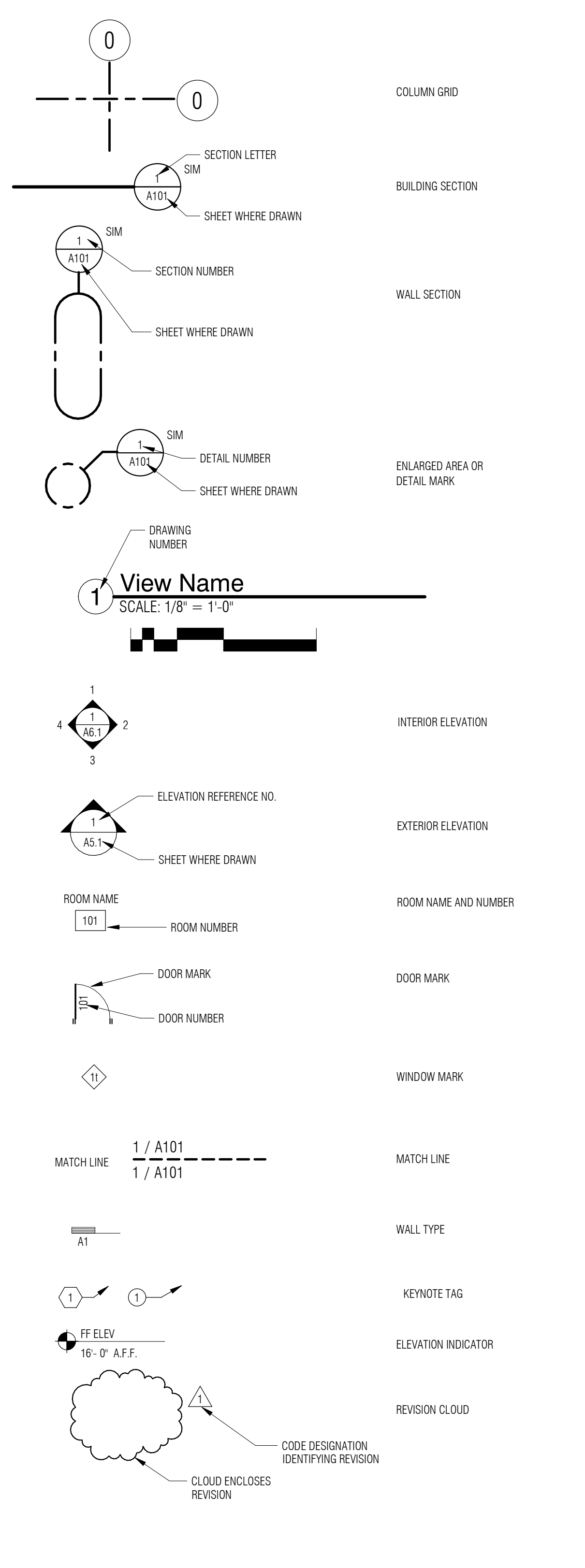
BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
261 North Court Avenue  
Tucson, Arizona 85701  
520.795.2705  
www.bwsarchitects.com



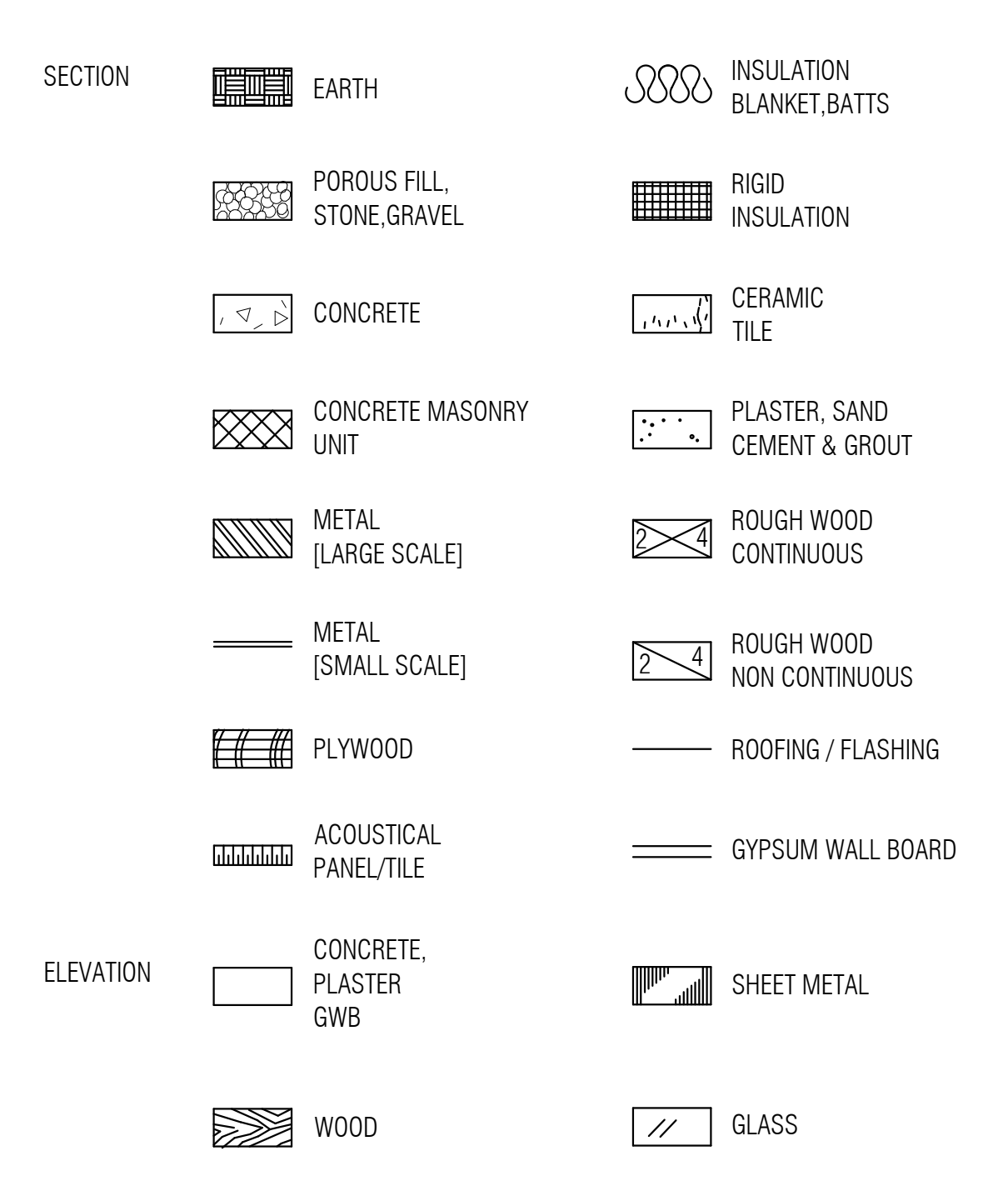
ABBREVIATIONS

Table of abbreviations and their corresponding full names, organized in three columns. Includes terms like AIR CONDITIONING, ANCHOR BOLT, and various construction materials.

SYMBOLS



MATERIALS



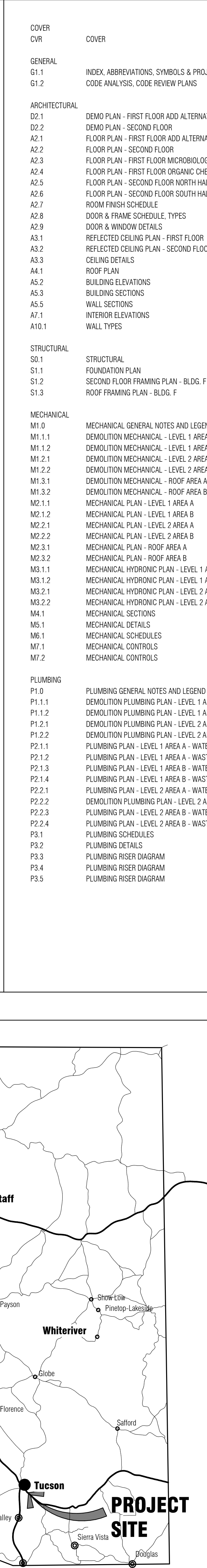
PROJECT DATA

GENERAL NOTES: TO THE BEST OF OUR KNOWLEDGE AND INFORMATION AND IN ACCORDANCE WITH ACCEPTED PROFESSIONAL STANDARDS, WE HAVE COMPLIED WITH APPLICABLE PORTIONS OF THE AMERICAN WITH DISABILITIES ACT PERTAINING TO BUILDING ACCESSIBILITY FOR THE PHYSICALLY HANDICAPPED.

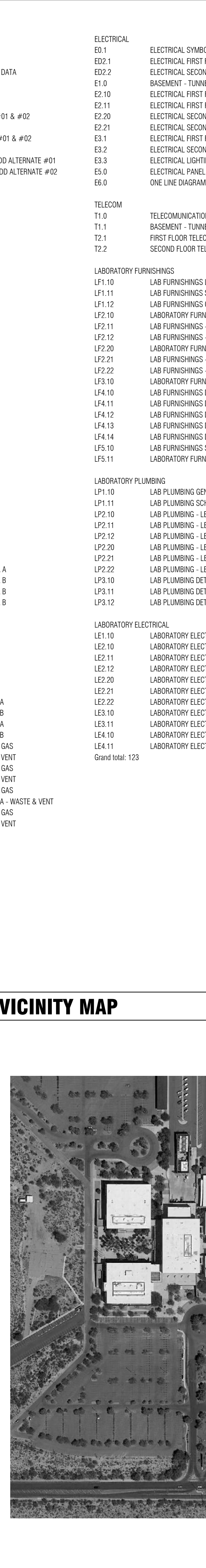
INDEX TO DRAWINGS

Table listing drawing titles and their corresponding sheet numbers, categorized by GENERAL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, and PLUMBING.

LOCATION MAP



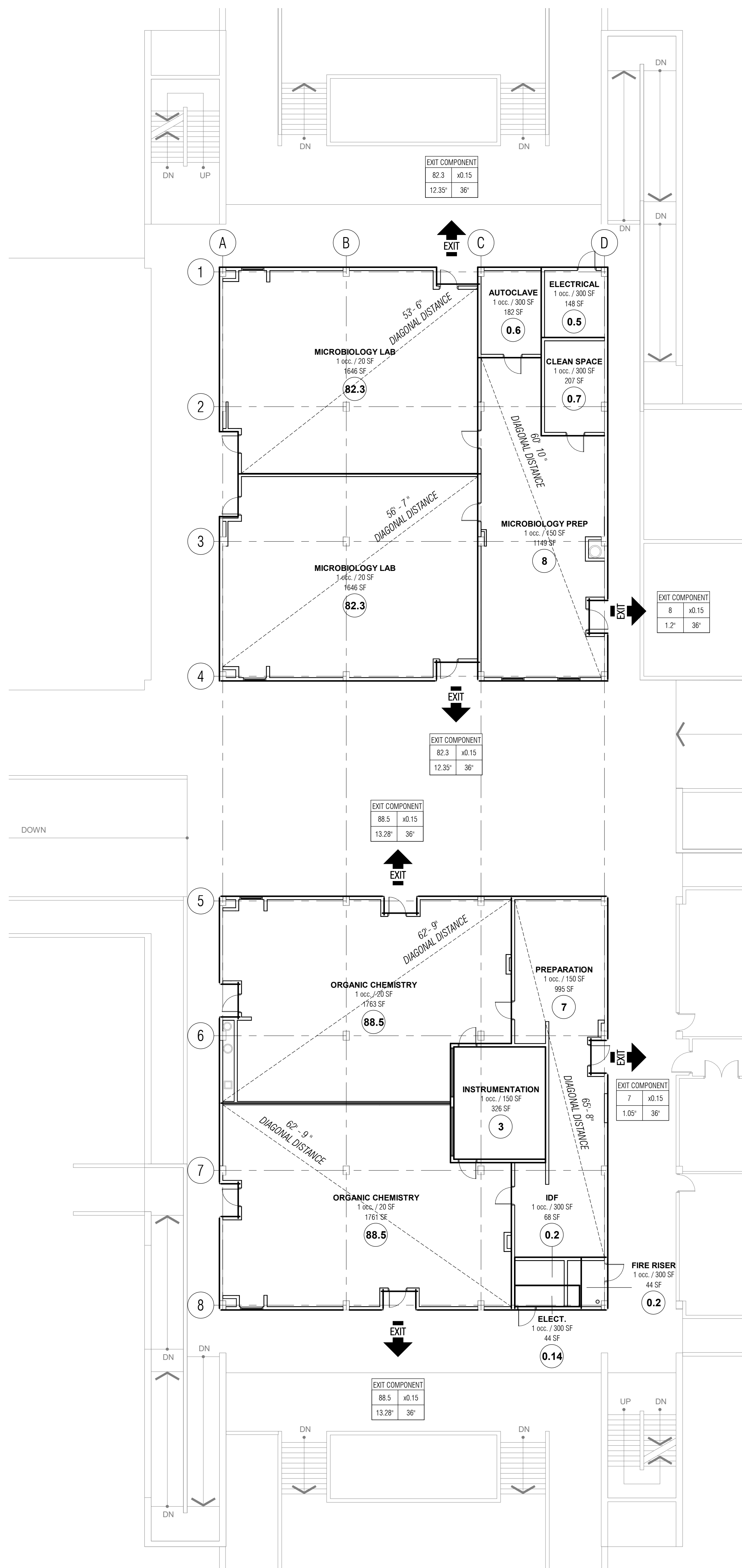
VICINITY MAP



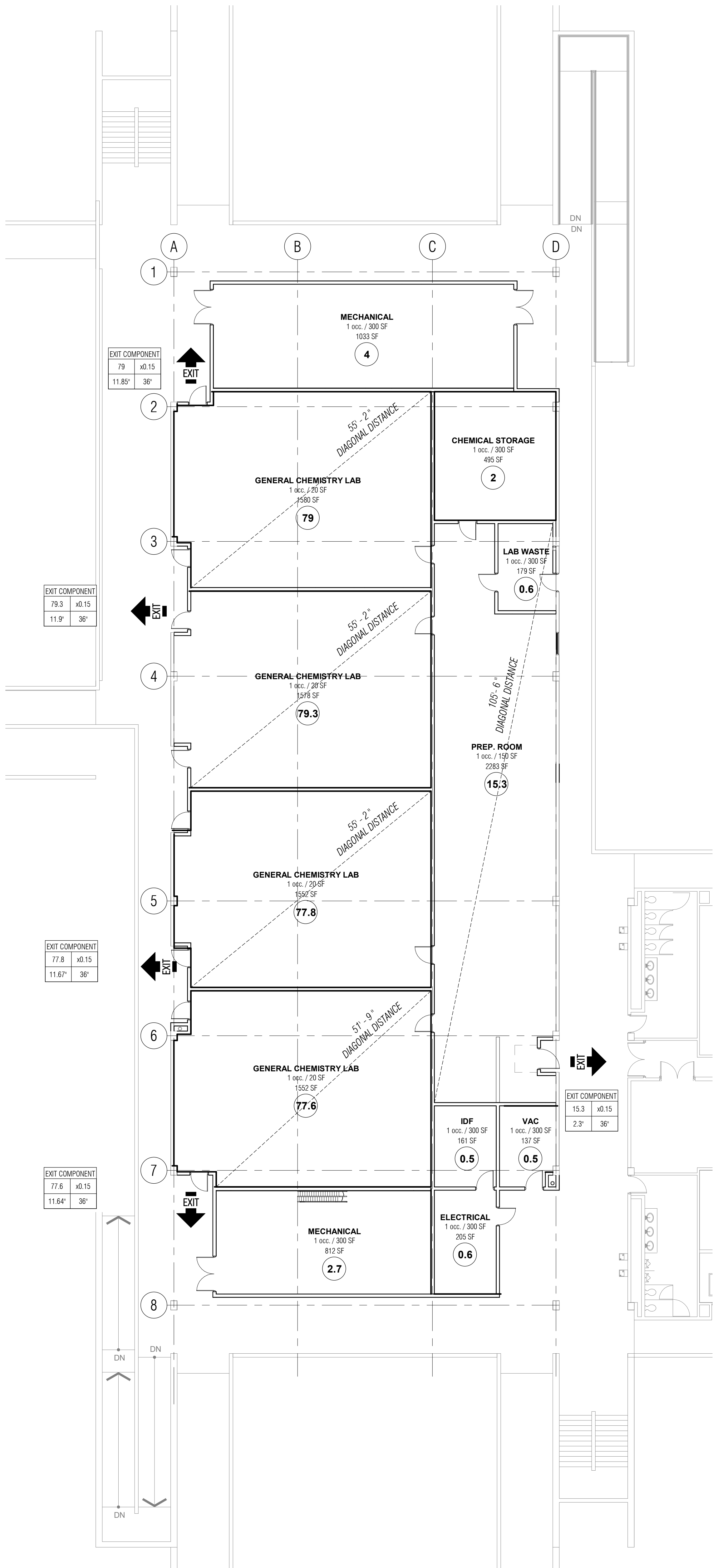
Project information including address (2202 W Anklam Rd, Tucson, AZ 85745), drawing title (PCC West Lab Building F Renovation), author (Robinson Shambach), date (01/08/2020), and revision information.

Vertical sidebar containing logos for ARCHITECTS (bws, Burns Wald-Hopkins Shambach Architects), CONSULTANTS (Structural, Mechanical, Laboratory), and PROJECT INFORMATION (Drawing No: 1931.000, Date: 01/08/2020).





1 CODE PLAN FIRST FLOOR  
SCALE: 3/32" = 1'-0"

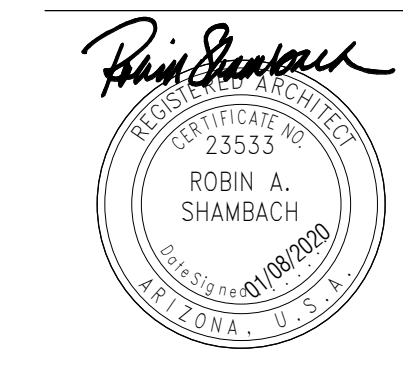


3 CODE PLAN SECOND FLOOR  
3/32" = 1'-0"

**CODE REVIEW - 2018 IBC**

Title, Description of Use :	Educational Occupancies for above the 12th grade Higher Education Laboratories
Occupancy Classification (Section 302) :	GROUP B
Type of Construction (Table 503) : Type IIB, Fully Sprinklered	
<Primary Occupancy>	Allowable Height: 75'-0" Allowable Area: 69,000 S.F.
Automatic Sprinkler System Increase (Table 506.3) :	<Area> sf x (<Multiplier>-%) = <Max> sf
Actual Building Height and Floor Area :	
Height :	2 Stories
Floor Area :	
<Primary Occupancy>	<Primary Occupancy> sf
<Secondary Occupancy>	<Secondary Occupancy> sf
<Tertiary Occupancy>	<Tertiary Occupancy> sf
Total Area :	<Total> sf
Mixed Use and Occupancy (508.3) :	
<Separation Type> (508.3)	<Occupancy Classification>
Fire Resistance Ratings (Table 601 & 602) :	<Construction Type>
Structural Frame	0 hr
Bearing Walls	
Exterior	0 hr
Interior	0 hr
Non-Bearing Walls	
Exterior	1 hr < 10'-0" ; 0 hr > 10'-0"
Interior	0 hr
Floor Construction	0 hr
Roof Construction	0 hr
Exits and Occupant Loads (Table 1004.1.1) :	
First Floor	
Labs (20 net)	6,931 sf / 20 = 341.6
Prep. Room & Instrumentation (150 net)	2,470 sf / 150 = 16.46
Other (300 gross)	693 sf / 300 = 2.31
	Sub Total = 360.37
Second Floor	
Labs (20 net)	6,274 sf / 20 = 313.7
Prep. Room & Instrumentation (150 net)	2,305 sf / 150 = 15.36
Other (300 gross)	3,067 sf / 300 = 10.22
	Sub Total = 339.28
Exits and Occupant Loads (699.6)	
Width of Exits (Table 1005.1) :	699.6 x .15" = 104.9" required

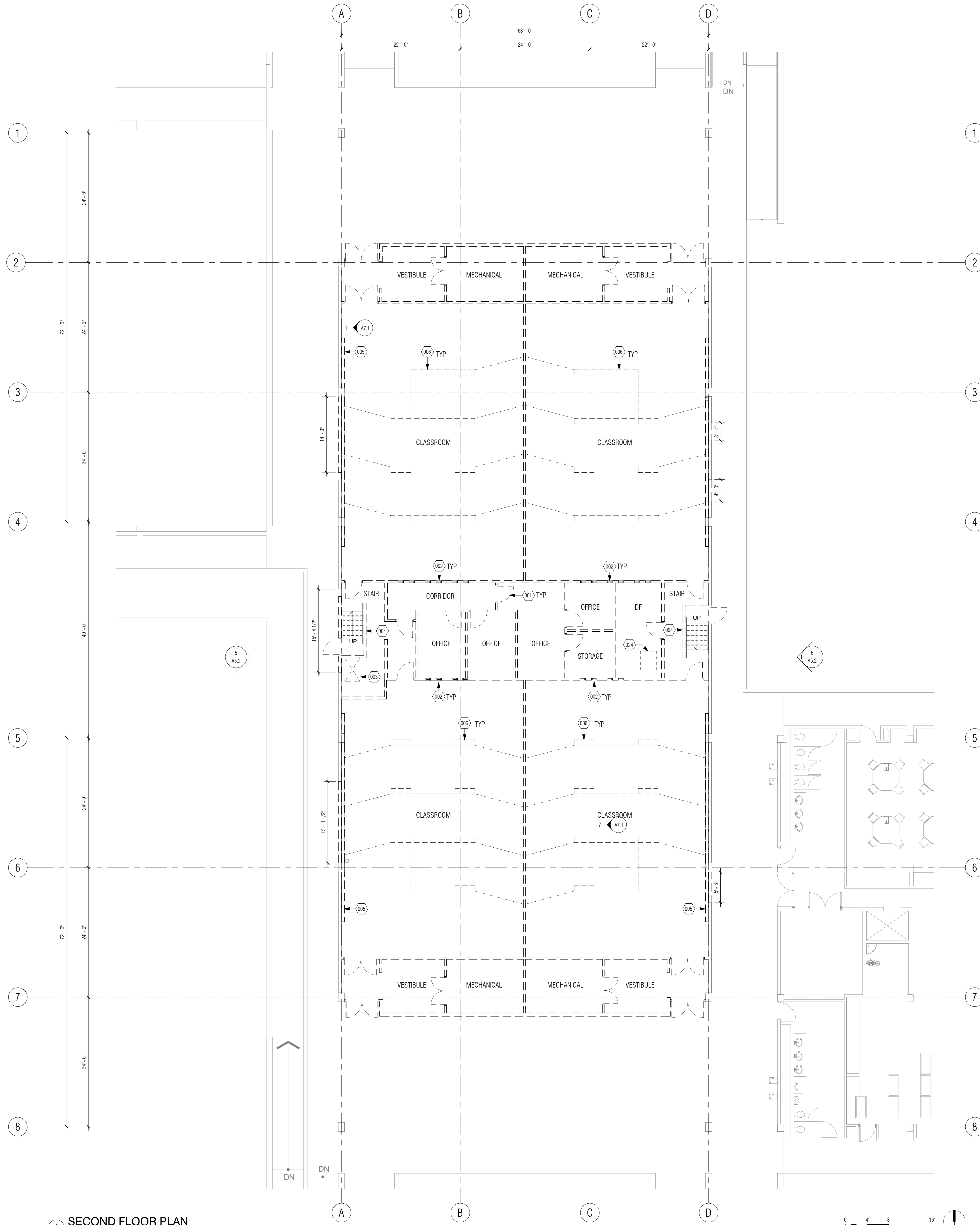
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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS







1 SECOND FLOOR PLAN  
SCALE: 1/8" = 1'-0"

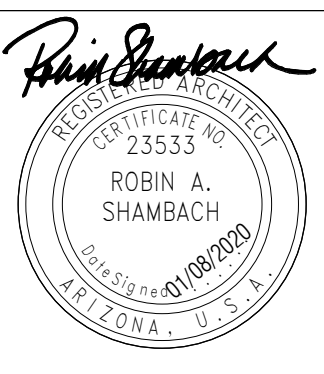


**DEMO PLAN GENERAL NOTES**

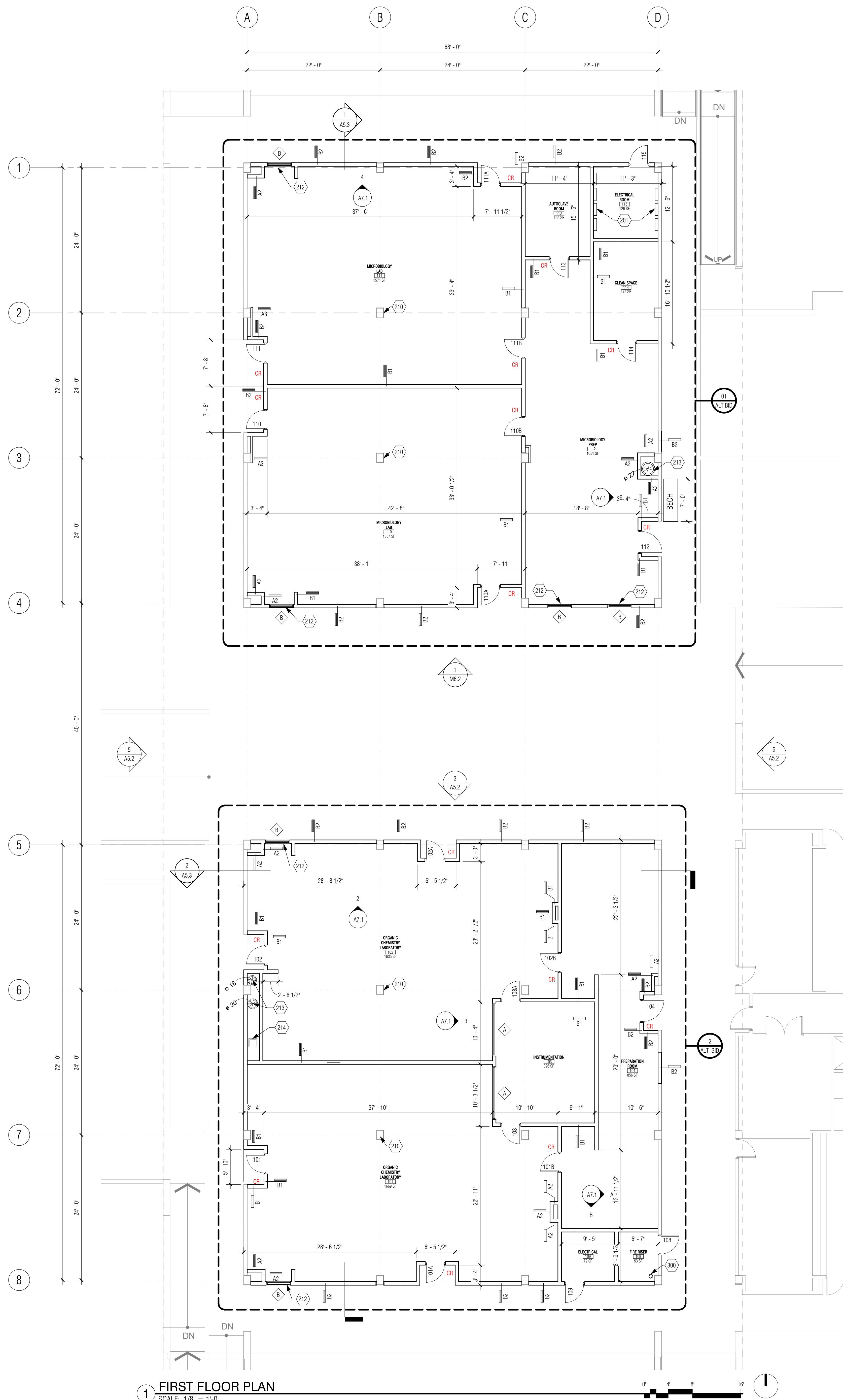
1. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLITION AND REMOVAL WITHIN THE LIMITS OF DEMOLITION U.N.O.
2. THE CONTRACTOR IS RESPONSIBLE FOR ALL BARRICADES AND SAFETY CONCERNS WITHIN AND ADJACENT TO CONSTRUCTION.
3. LIMITS OF DEMOLITION LINES ARE APPROXIMATE AND ARE TO BE ESTABLISHED BY THE FLOOR PLANS. THE ARCHITECT SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO DEMOLITION.
4. EXISTING FINISHES, MILLWORK, ETC. TO REMAIN SHALL BE PROTECTED DURING DEMOLITION. CONTRACTOR SHALL PATCH ALL EXISTING FINISHES TO REMAIN AS REQUIRED BY NEW WORK.
5. SALVAGE MASONRY AS NEEDED FOR INFILL.
6. REMOVE PORTION OF EXTERIOR WALLS TO EXTENTS INDICATED FOR NEW WINDOWS.
7. REFER TO STRUCTURAL, MECHANICAL, PLUMBING ELECTRICAL AND LABORATORY DRAWINGS FOR ADDITIONAL INFORMATION.

**KEYNOTES**

- 001 REMOVE EXISTING DOOR AND FRAME
- 002 REMOVE EXISTING WINDOW
- 003 REMOVE EXISTING LIFT
- 004 REMOVE EXISTING STAIR
- 005 REMOVE EXISTING SOUND INSULATED PANEL
- 006 REMOVE EXISTING PLATFORMS & RISERS
- 024 REMOVE EXISTING LADDER AND HATCH



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**1** FIRST FLOOR PLAN  
SCALE: 1/8" = 1'-0"

**FLOOR PLAN GENERAL NOTES**

1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
2. REFER TO SHEET A2.7 FOR ROOM FINISHES.
3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
4. REFER TO A2.7 FOR WINDOW TYPES.
5. REFER TO SHEET A6.1 FOR ENLARGED RESTROOM FLOOR PLANS.
6. REFER TO SHEET A10.1 FOR WALL TYPES.

**ADD ALTERNATE BID #01:**  
FIRST FLOOR MICROBIOLOGY, DEMOLITION  
AND CONSTRUCTION, COMPLETE AND IN  
PLACE

**ADD ALTERNATE BID #02:**  
FIRST FLOOR ORGANIC CHEMISTRY,  
DEMOLITION AND CONSTRUCTION,  
COMPLETE AND IN PLACE

**KEYNOTES**

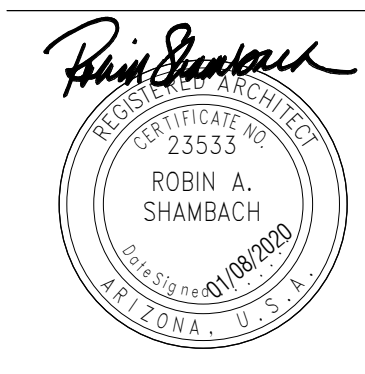
- 201 ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 210 FLOAT SMOOTH AND PAINT
- 212 ROLLING WINDOW SHADE - O.F.O.I
- 213 EXISTING ROOF DRAIN
- 214 EXISTING FLOOR CHASE
- 300 4" PIPE LINE

1/8/2021 1:22:09 PM

**bws ARCHITECTS**  
BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Tucson, AZ 85718  
520.795.2702 Fax 520.795.6171  
www.bwsarch.com

**CONSULTANTS**  
LABORATORY  
ARCIS Facility Services #400  
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Phone: 619.297.0169  
MECHANICAL  
AC Mechanical Engineering  
1647 E. Palm Springs  
Tucson, AZ 85711  
Phone: 520.327.7611  
STRUCTURAL  
Gunter Structural Engineering  
3028 N. W. 10th St.  
Tucson, AZ 85716  
Phone: 520.323.3422  
ELECTRICAL  
Monrad Engineering, Inc.  
1920 E. Palm Springs  
Tucson, AZ 85717  
Phone: 520.884.0045

**Prima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

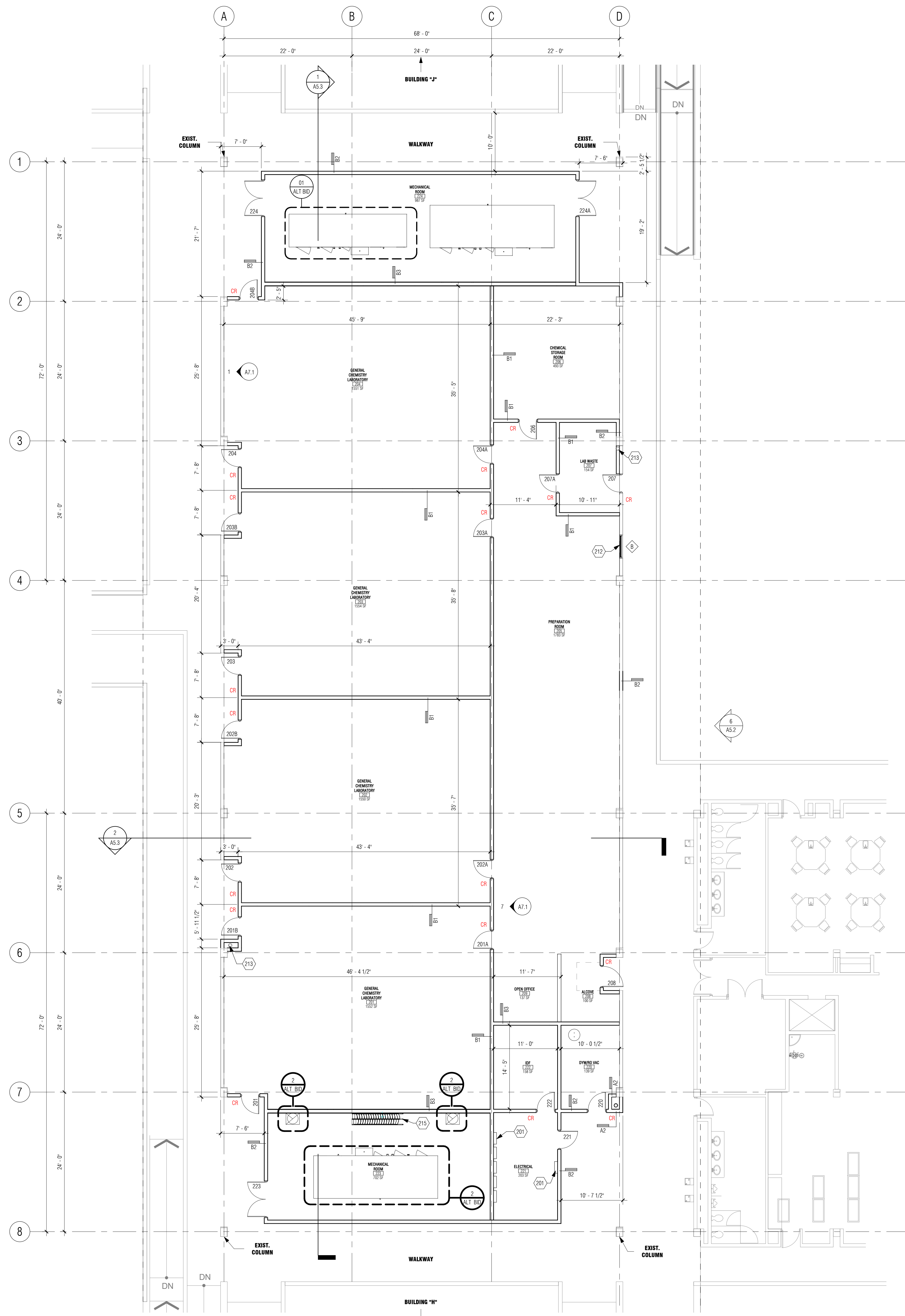


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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS

**FLOOR PLAN - FIRST FLOOR  
ADD ALTERNATE #01 & #02**  
**A2.1**  
100% CONSTRUCTION DOCUMENTS



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1 SECOND FLOOR PLAN  
SCALE: 1/8" = 1'-0"



**FLOOR PLAN GENERAL NOTES**

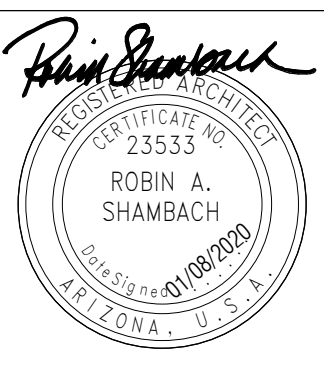
1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
2. REFER TO SHEET A2.7 FOR ROOM FINISHES.
3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
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5. REFER TO SHEET A6.1 FOR ENLARGED RESTROOM FLOOR PLANS.
6. REFER TO SHEET A10.1 FOR WALL TYPES.

**KEYNOTES**

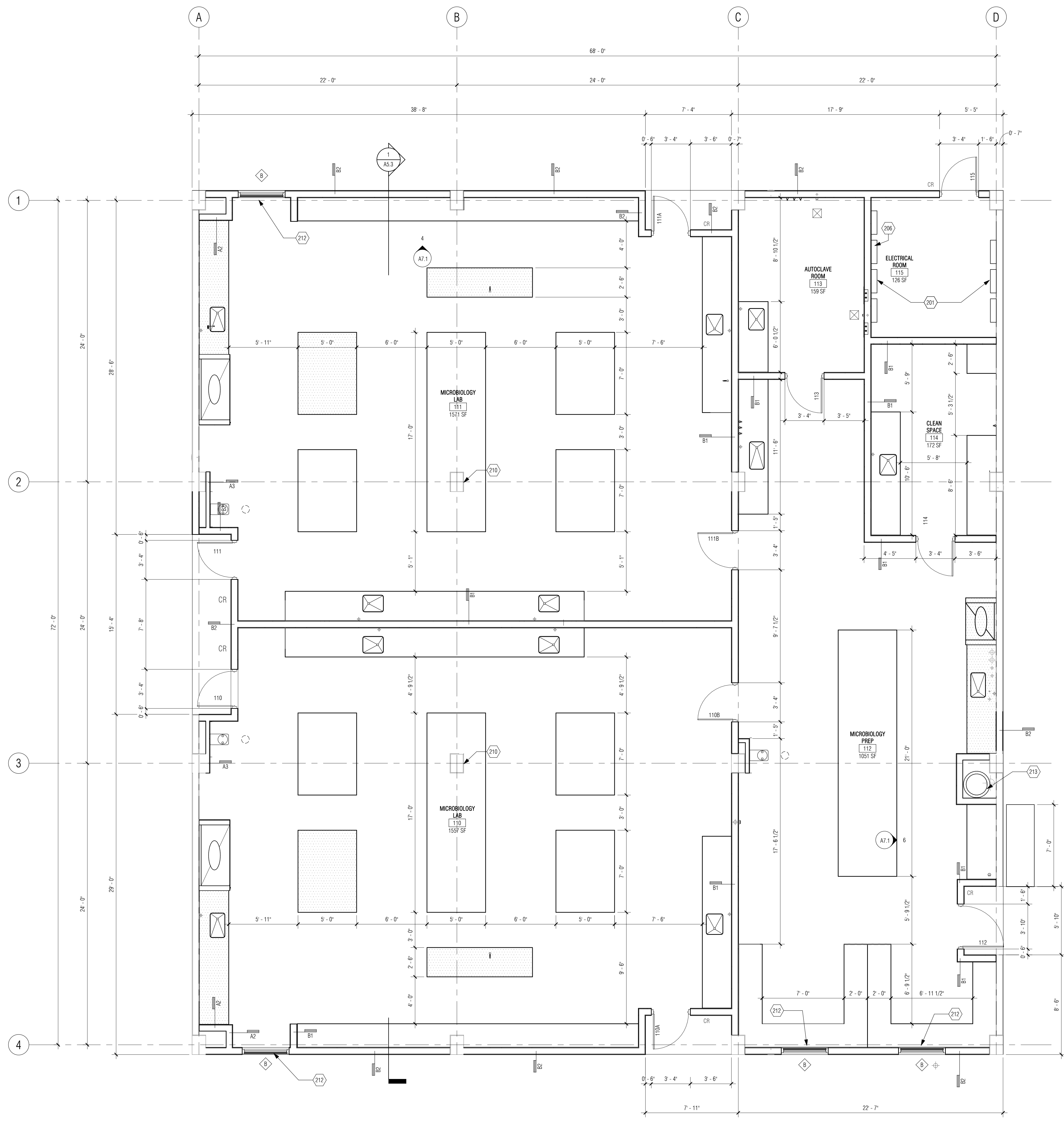
- 201 ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 212 ROLLING WINDOW SHADE - O.F.O.I
- 213 EXISTING ROOF DRAIN
- 215 NEW ALTERNATING TREAD LADDER

ADD ALTERNATE BID #01:  
INDICATED MECHANICAL  
COMPLETE AND IN PLACE

ADD ALTERNATE BID #02:  
INDICATED MECHANICAL UNIT  
COMPLETE AND IN PLACE



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 REVISIONS



**1 FLOOR PLAN - FIRST FLOOR MICROBIOLOGY**  
1/4" = 1'-0"

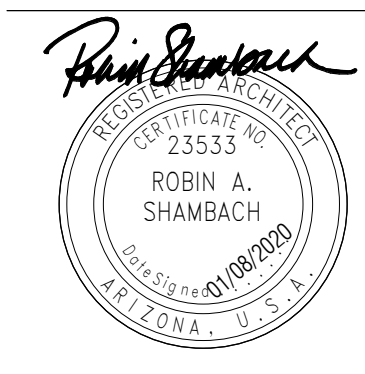
**FLOOR PLAN GENERAL NOTES**

1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
2. REFER TO SHEET A2.7 FOR ROOM FINISHES.
3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
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5. REFER TO SHEET A6.1 FOR ENLARGED RESTROOM FLOOR PLANS.
6. REFER TO SHEET A10.1 FOR WALL TYPES.

**KEYNOTES**

- 201 ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 206 ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 210 FLOAT SMOOTH AND PAINT
- 212 ROLLING WINDOW SHADE - O.F.O.I
- 213 EXISTING ROOF DRAIN

**ADD ALTERNATE BID #01:  
FIRST FLOOR MICROBIOLOGY, DEMOLITION  
AND CONSTRUCTION, COMPLETE AND IN  
PLACE**



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JOB NO: 1931.000  
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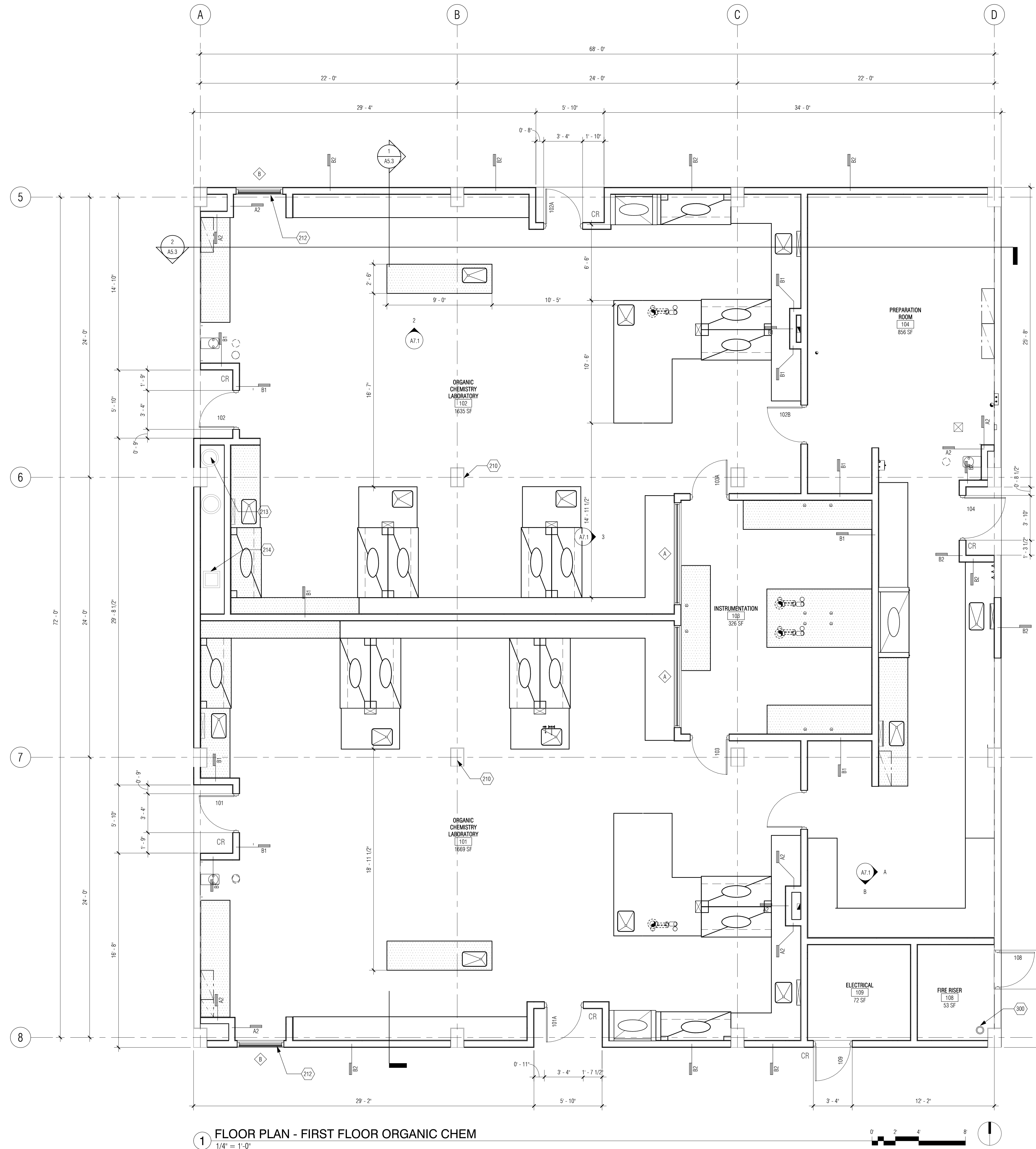
**FLOOR PLAN GENERAL NOTES**

1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
2. REFER TO SHEET A2.7 FOR ROOM FINISHES.
3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
4. REFER TO A2.7 FOR WINDOW TYPES.
5. REFER TO SHEET A6.1 FOR ENLARGED RESTROOM FLOOR PLANS.
6. REFER TO SHEET A10.1 FOR WALL TYPES.

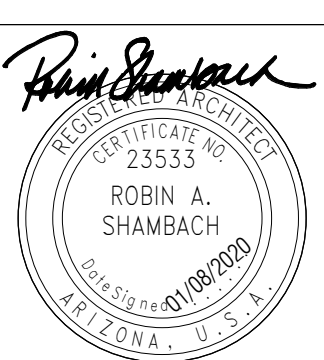
**KEYNOTES**

- 210 FLOAT SMOOTH AND PAINT
- 212 ROLLING WINDOW SHADE - O.F.O.I
- 213 EXISTING ROOF DRAIN
- 214 EXISTING FLOOR CHASE
- 300 4" PIPE LINE

ADD ALTERNATE BID #02:  
FIRST FLOOR ORGANIC CHEMISTRY,  
DEMOLITION AND CONSTRUCTION,  
COMPLETE AND IN PLACE

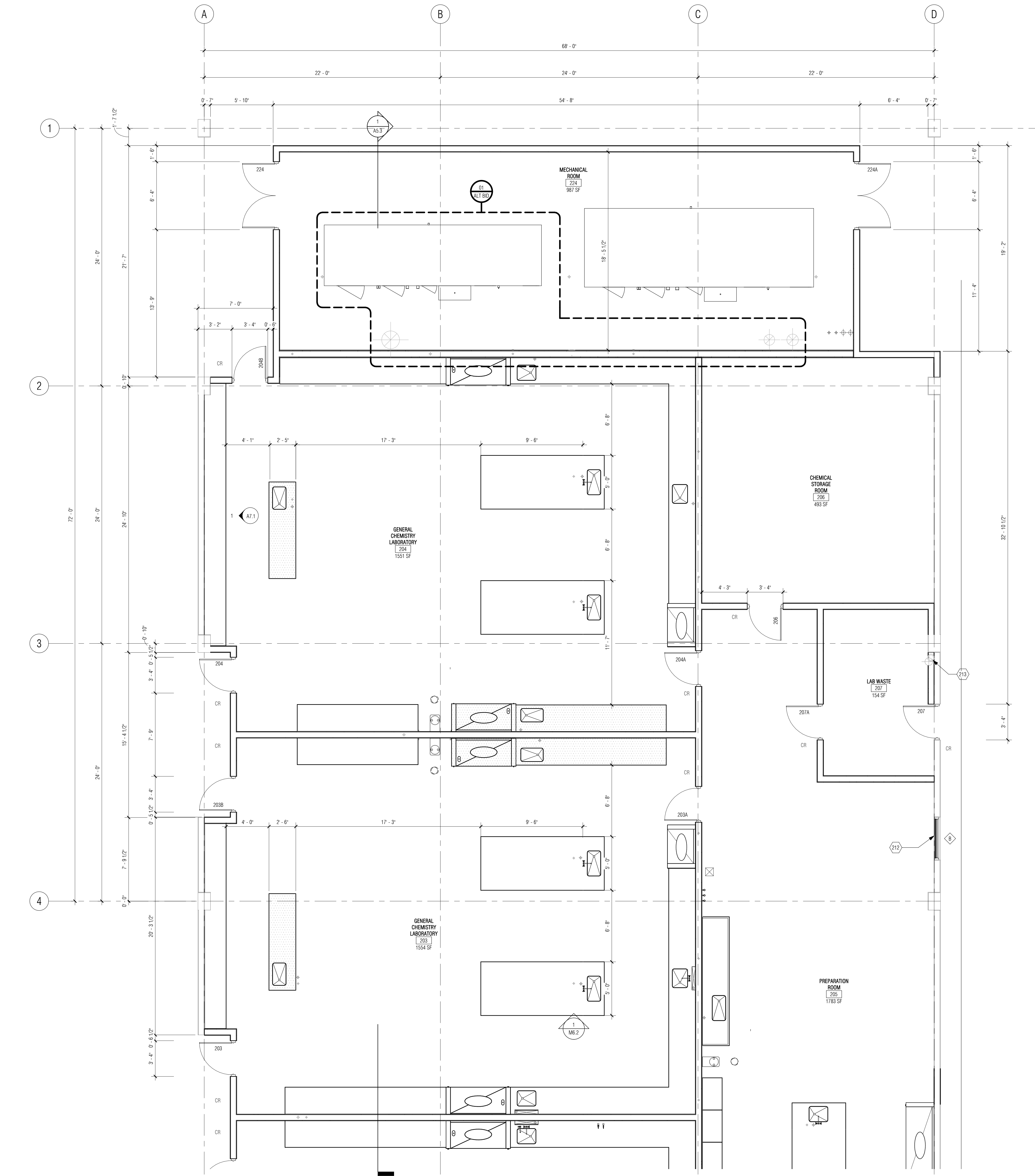


**1 FLOOR PLAN - FIRST FLOOR ORGANIC CHEM**  
1/4" = 1'-0"



EXPIRES 06/30/2022

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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS



1 FLOOR PLAN - SECOND FLOOR NORTH HALF  
1/4" = 1'-0"

**FLOOR PLAN GENERAL NOTES**

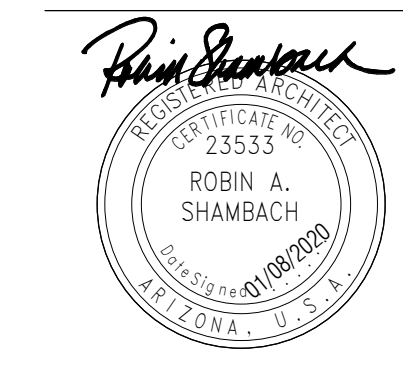
1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
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3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
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5. REFER TO SHEET A6.1 FOR ENLARGED RESTROOM FLOOR PLANS.
6. REFER TO SHEET A10.1 FOR WALL TYPES.

**KEYNOTES**

- 212 ROLLING WINDOW SHADE - O.F.O.I
- 213 EXISTING ROOF DRAIN

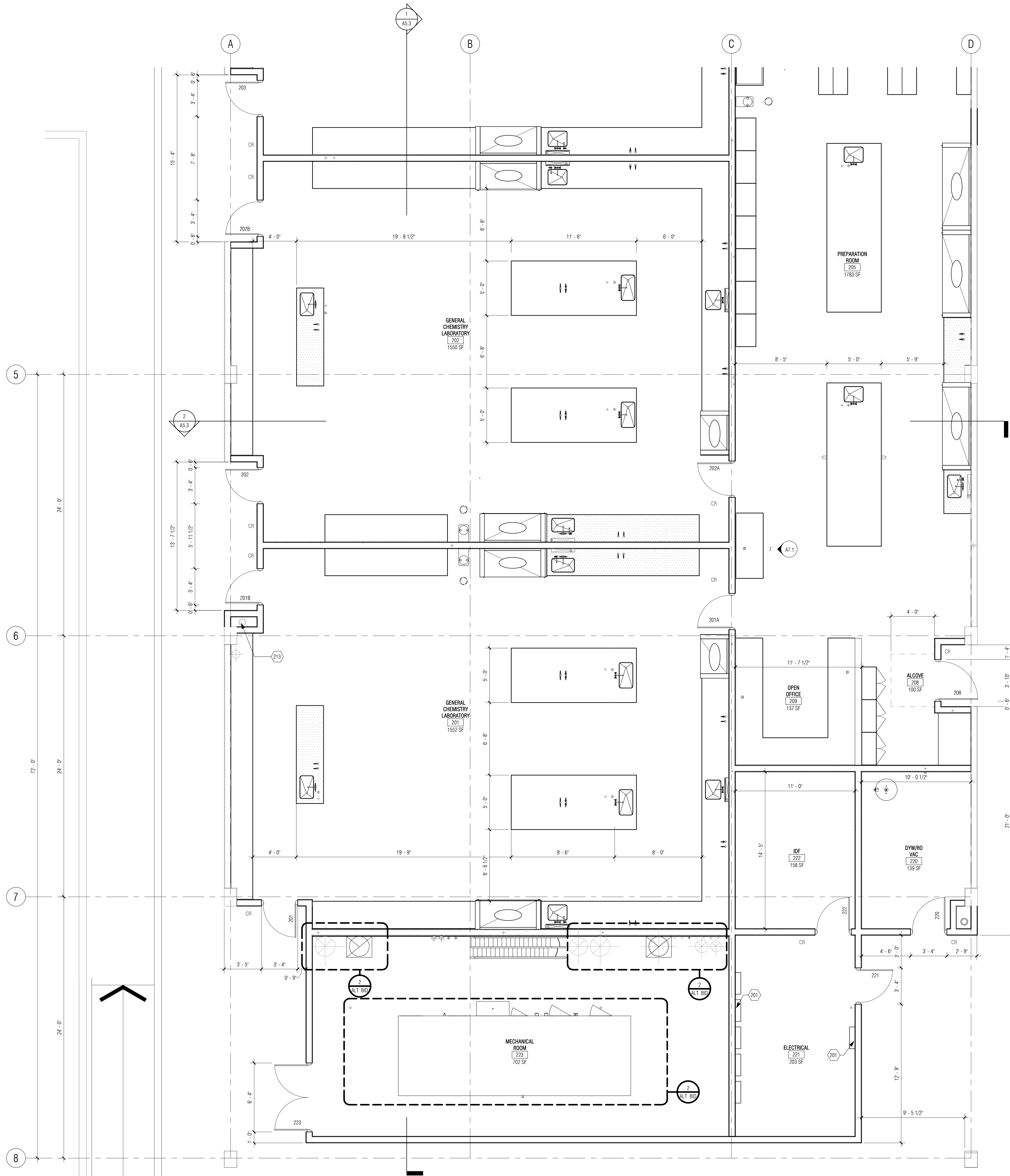
ADD ALTERNATE BID #01:  
INDICATED MECHANICAL UNIT  
COMPLETE AND IN PLACE

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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS





1 FLOOR PLAN - SECOND FLOOR SOUTH HALF  
1/4" = 1'-0"

**FLOOR PLAN GENERAL NOTES**

1. DIMENSIONS ARE TO COLUMN CENTERLINE OR FACE OF WALL, U.N.O.
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3. REFER TO A2.8 FOR DOOR SCHEDULE TYPES.
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6. REFER TO SHEET A10.1 FOR WALL TYPES.

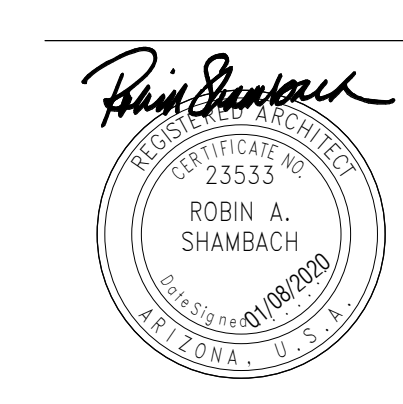
**KEYNOTES**

- 201 ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 213 EXISTING ROOF DRAIN

ADD ALTERNATE BID #02:  
INDICATED MECHANICAL UNIT  
COMPLETE AND IN PLACE

- CONSULTANTS**
- LABORATORY**  
ARC Lab  
1000 N. 1st Ave., Suite 400  
San Diego, CA 92103-3192  
Phone: 619.297.0159
  - MECHANICAL**  
AC Mechanical Engineering  
1047 E. Palm Springs Blvd.  
Tucson, AZ 85711  
Phone: 520.327.1611
  - STRUCTURAL**  
Gunter Structural Engineering  
3028 N. Oracle Rd., Suite 100  
Tucson, AZ 85716  
Phone: 520.323.3422
  - ELECTRICAL**  
Meredith Engineering, Inc.  
1525 E. Palm Springs Blvd., Suite 200  
Tucson, AZ 85711  
Phone: 520.884.0045

**Pima Community College  
PCC West Lab Building F  
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**ROOM FINISH ABBREVIATIONS**

ACP-1	ACOUSTIC CEILING TILE
ACP-2	ACOUSTIC CEILING TILE - TO MATCH EXISTING
AT	ACOUSTIC TREATMENT
CONC	CONCRETE
CPT	CARPET
CT	CERAMIC TILE
ES	EXPOSED STRUCTURE
EXIST	EXISTING
GWB	GYPSUM WALL BOARD
MTL	METAL
P	PAINT
RB	RUBBER BASE
WB	WOOD BASE
WOC	WALK-OFF CARPET
PE	EPOXY PAINT
EPC	EPOXY COUNTERTOP
FH	FUME HOOD
MTC	METAL CASEWORK
LVT	LUXURY VINYL TILE
SC	SEALED CONCRETE

ROOM NUMBER	ROOM NAME	ROOM SCHEDULE														REMARKS
		FLOOR		WALLS						CEILING						
		FINISH	BASE	NORTH		EAST		SOUTH		WEST		SURFACE	FINISH	HEIGHT		
101	ORGANIC CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
102	ORGANIC CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
103	INSTRUMENTATION	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	10' - 0"		
104	PREPARATION ROOM	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	10' - 0"		
108	FIRE RISER	SC-1	RB-1	GWB	P	GWB	P	GWB	P	GWB	P	ES	-	11' - 9"		
109	ELECTRICAL	SC-1	RB-1	GWB	P	GWB	P	GWB	P	GWB	P	ES	-	11' - 9"		
110	MICROBIOLOGY LAB	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
111	MICROBIOLOGY LAB	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
112	MICROBIOLOGY PREP	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
113	AUTOCLAVE ROOM	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
114	CLEAN SPACE	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	9' - 0"		
115	ELECTRICAL ROOM	SC-1	RB-1	GWB	P	GWB	P	GWB	P	GWB	P	ES	-	11' - 9"		
201	GENERAL CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
202	GENERAL CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
203	GENERAL CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
204	GENERAL CHEMISTRY LABORATORY	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
205	PREPARATION ROOM	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
206	CHEMICAL STORAGE ROOM	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
207	LAB WASTE	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	10' - 0"		
208	ALCOVE	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
209	OPEN OFFICE	LVT-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ACP	-	12' - 0"		
220	DIY/WRO VAC	SC-1	RB-1	GWB	P	GWB	P	GWB	P	GWB	P	ES	-	19' - 0"		
221	ELECTRICAL	SC-1	RB-1	GWB	P	GWB	P	GWB	P	GWB	P	ES	-	19' - 0"		
222	IDF	SC-1	RB-1	GWB	PE	GWB	PE	GWB	PE	GWB	PE	ES	-	19' - 0"		
223	MECHANICAL ROOM	SC-1	RB-1	GWB	P	--	P	GWB	P	GWB	P	ES	-	19' - 0"		
224	MECHANICAL ROOM	SC-1	RB-1	GWB	P	--	P	GWB	P	GWB	P	ES	-	19' - 0"		

**MATERIALS & FINISHES LEGEND**

MATERIAL	MANUFACTURER	SIZE / COLOR / NAME	APPLICATION / LOCATION
ACOUSTIC CEILING TILE			
ACP-1	ARMSTRONG	CIRRUS HIGH NRC	CEILING
ACOUSTIC TREATMENT			
AT-1	GULFORD OF MAINE	STUDIO 542966 GLAM 7040	WALLS
AT-2	GULFORD OF MAINE	ANCHORAGE 2335 OPEN HOUSE 2334	WALLS
AT-3	GULFORD OF MAINE	ANCHORAGE 2335 OPEN HOUSE 2335	WALLS
CASEWORK			
WB-1	KEWAJNEE	201 NATURAL MAPLE / PLAIN SLICED VENEER / CLEAR FINISH/ GRADE A	WOOD CASEWORK TEACHING LAB
MTC-1	KEWAJNEE	85 SATIN GREY	METAL CASEWORK PREP ROOMS, ADJUSTABLE SHELVES, BRACKETS, SHEET METAL PIPE DROPS BEHIND SINKS, METAL CHEMICAL STORAGE CABINETS BELOW HOODS, CYLINDER RESTRAINTS AND OTHERS.
EPOXY COUNTERTOPS			
EPC-1	DURCON	GRAPHITE	COUNTERTOPS
PAINT			
PT-1	DUNN EDWARDS	DE6232 / ABSTRACT WHITE	FIELD
PT-2	DUNN EDWARDS	DE6214 / PIGEON GRAY	ACCENT
PT-3	DUNN EDWARDS	DE6263 / PISTACHO SHELL	ACCENT
PT-4	DUNN EDWARDS	DE5877 / LAKEVILLE	ACCENT
PD-1	DUNN EDWARDS	DE1615 / COAL MINER	HM WINDOW AND DOOR FRAME
FUME HOODS			
FH-1	KEWAJNEE	85 SATIN GREY	LABORATORY FUME HOODS
RUBBER BASE			
RB-1	JOHNSONITE	32 FESBLE WG	INTERIOR WALLS
CORNER GUARD			
CG-1		STAINLESS STEEL	WALLS
METAL PANEL			
MP-1	BERRIDGE	STUCCO EMBOSSED PANEL / ROYAL BLUE KYNAR 500 / STANDARD COLOR	EXTERIOR WALLS / HM DOORS / LOUVERS (TO MATCH EXISTING BLUE) & HM DOORS
LUXURY VINYL TILE			
LVT-1	SHAWCONTRACT	23.62X23.62 / THOUGHFUL 4122V WARMTH 22530	FIELD
DOOR & WINDOW FRAME			
DWF-1		NATURAL ALUMINUM	DOOR & WINDOW FRAME
WOOD DOOR			
WOOD-1		MAPLE CLEAR	WOOD DOOR

**NOTE:**  
 FINISHES SHOULD BE CONFIRMED BY  
 OWNER BEFORE CONSTRUCTION

**CONSULTANTS**

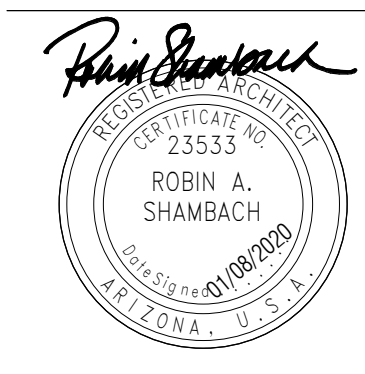
**LABORATORY**  
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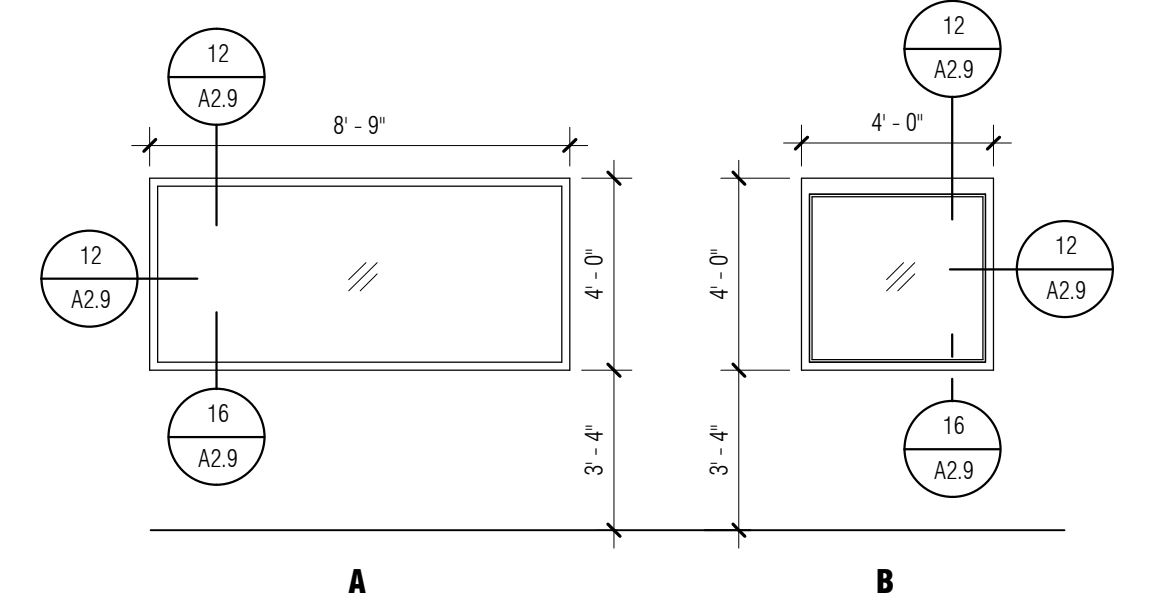
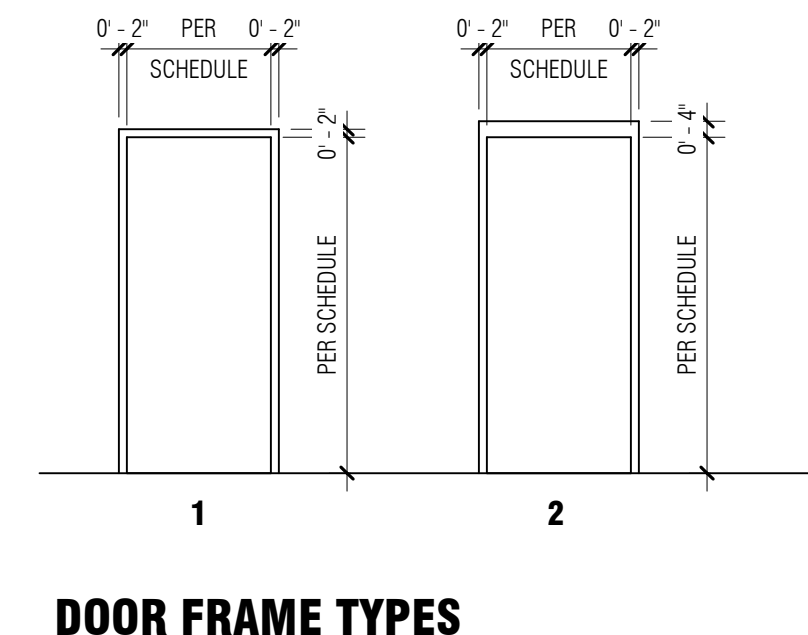
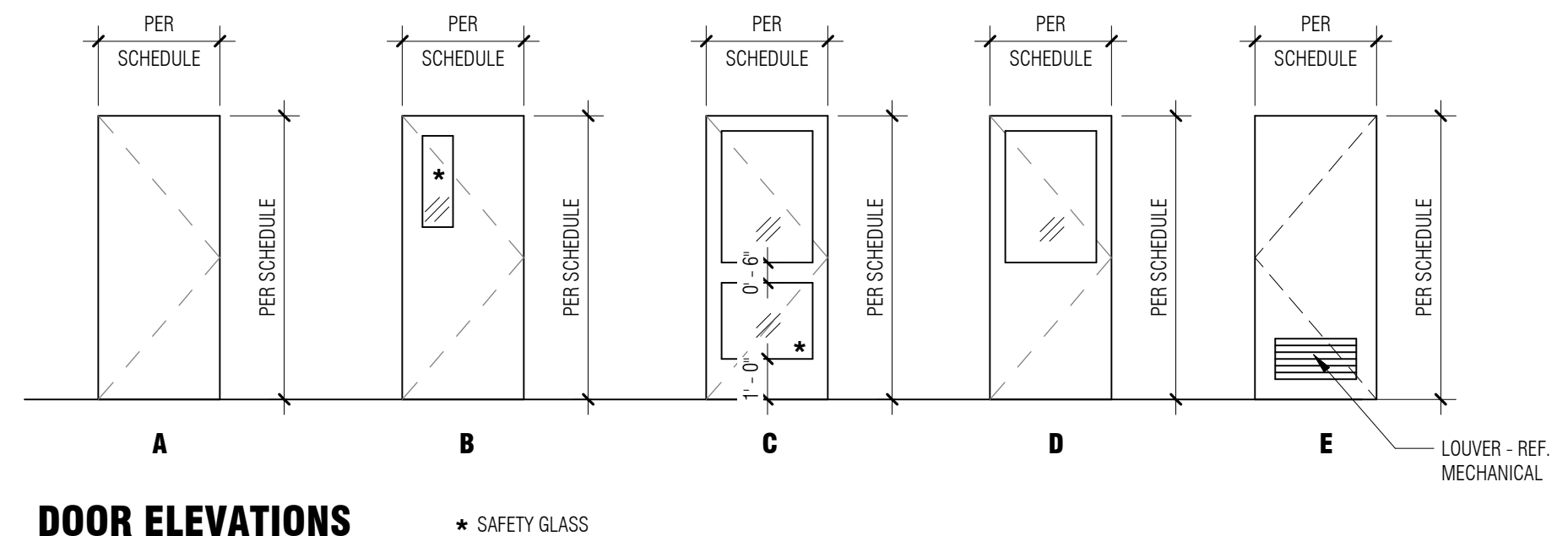
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**DRAWN BY:** Author  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**



**DOOR SCHEDULE ABBREVIATIONS**

AL ALUMINUM  
 ANOD ANODIZED  
 CLR CLEAR  
 HM HOLLOW METAL  
 P PAINT  
 SCW SOLID-CORE WOOD  
 STC SOUND DOOR  
 STL STEEL

OPENING NO.	TYPE	DOOR						FRAME						HARDWARE SET NO.	CARD READER	REMARKS	
		OPENING SIZE		MATERIAL	FINISH	GLASS	TYPE	MATERIAL	FINISH	DETAILS							
		WIDTH	HEIGHT							HEAD	JAMB	LATCH	HINGE				SILL
101	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
101A	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
101B	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
102	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
102A	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
102B	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
103	D		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05		
103A	D		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05		
104	A		3'-6"	7'-0"	HM	P	Yes	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	01	●	
108	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	04		
109	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	04		
110	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
110A	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
110B	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	02	●	
111	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	05	●	
111A	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
111B	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
112	A		3'-6"	7'-0"	HM	P	Yes	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	01	●	
113	D		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	06	●	
114	D		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
115	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	04		
201	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
201A	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
201B	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
202	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
202A	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
202B	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
203	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
203A	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
203B	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
204	C		3'-0"	7'-0"	AL	FP	Yes	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
204A	B		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
204B	C		3'-0"	7'-0"	AL	FP	No	1	AL	FP	9/A2.9	9/A2.9 SIM	10/A2.9	11/A2.9	01	●	
206	D		3'-0"	7'-0"	SCW	CLR	Yes	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
207	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	03	●	
207A	B		3'-0"	7'-0"	SCW	CLR	No	1	AL	FP	5/A2.9	5/A2.9	6/A2.9	7/A2.9	05	●	
208	A		3'-6"	7'-0"	HM	P	Yes	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	01	●	
220	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	03	●	
221	A		3'-0"	7'-0"	HM	P	1	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	01		
222	A		3'-0"	7'-0"	HM	P	No	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	05	●	
223	E	Yes	3'-0"	7'-0"	HM	P	1	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	07		
224	E	Yes	3'-0"	7'-0"	HM	P	1	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	07		
224A	E	Yes	3'-0"	7'-0"	HM	P	1	1	HM	P	3/A2.9	4/A2.9	4/A2.9	17/A2.9	07		



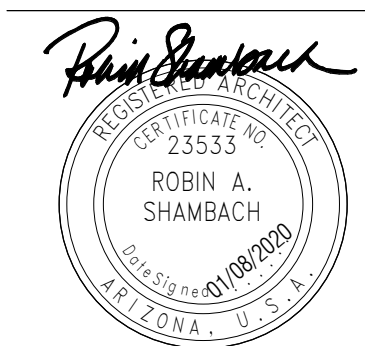
**CONSULTANTS**  
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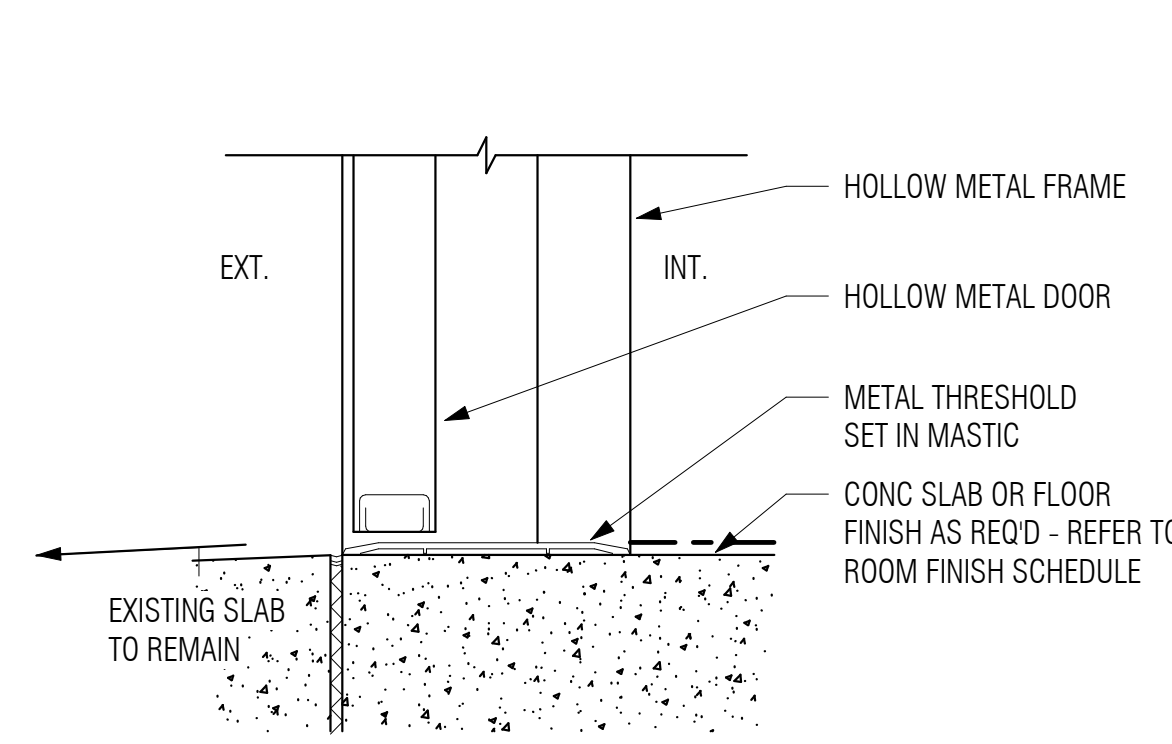
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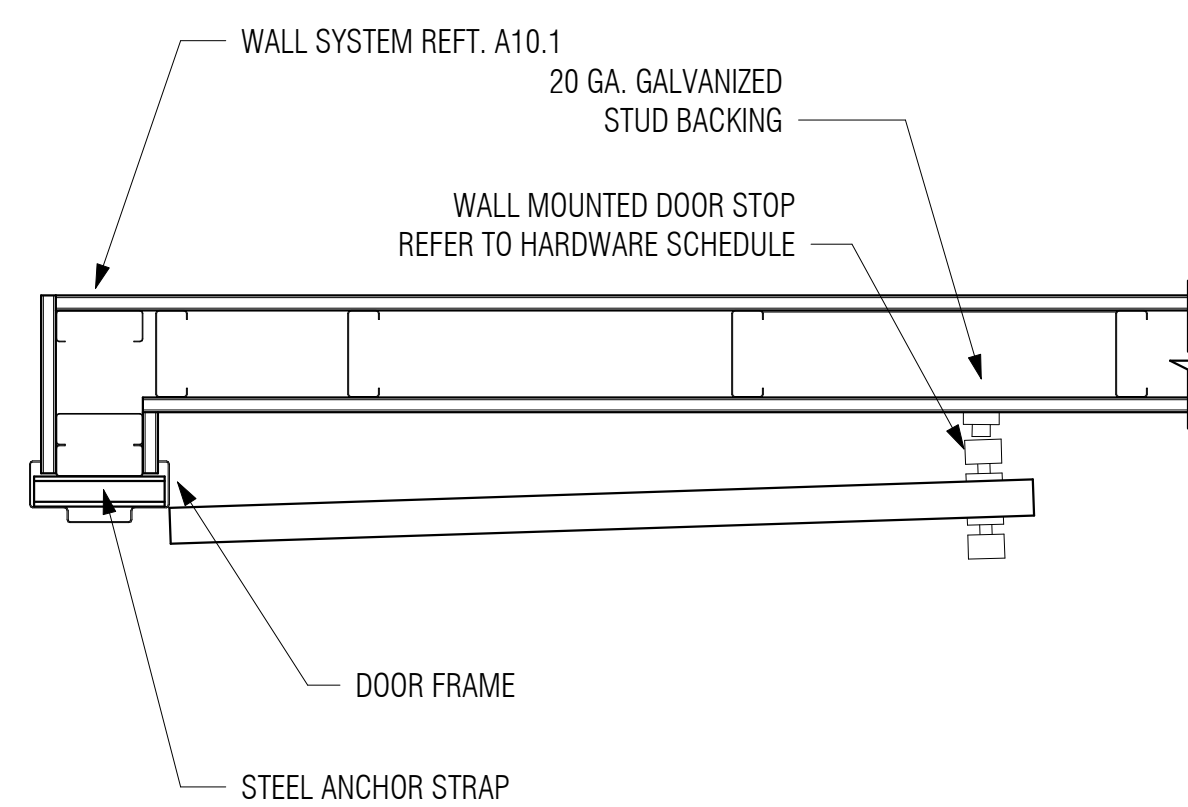
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 2202 W Anklam Rd, Tucson, AZ 85745



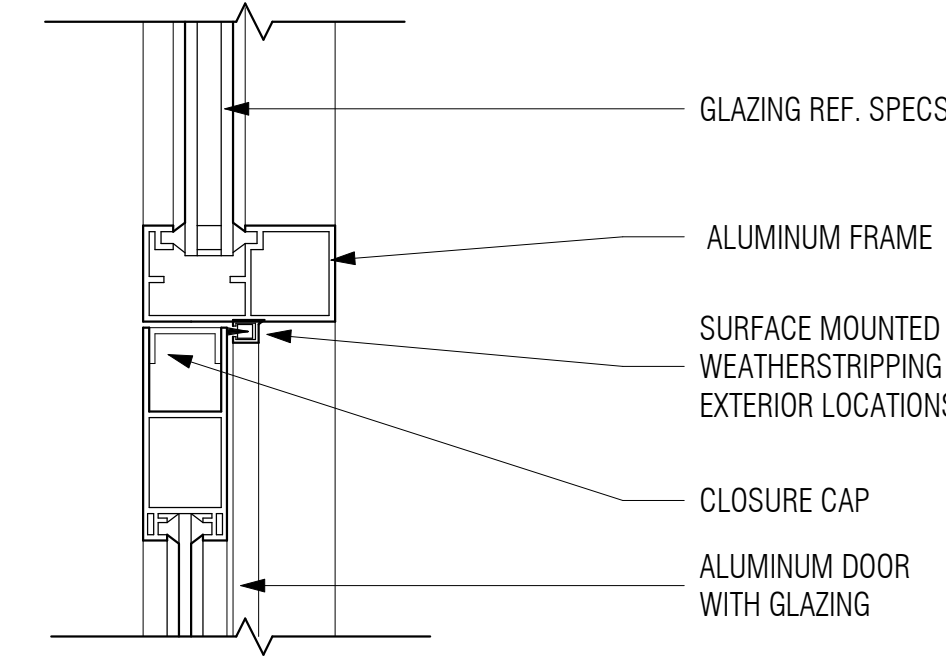
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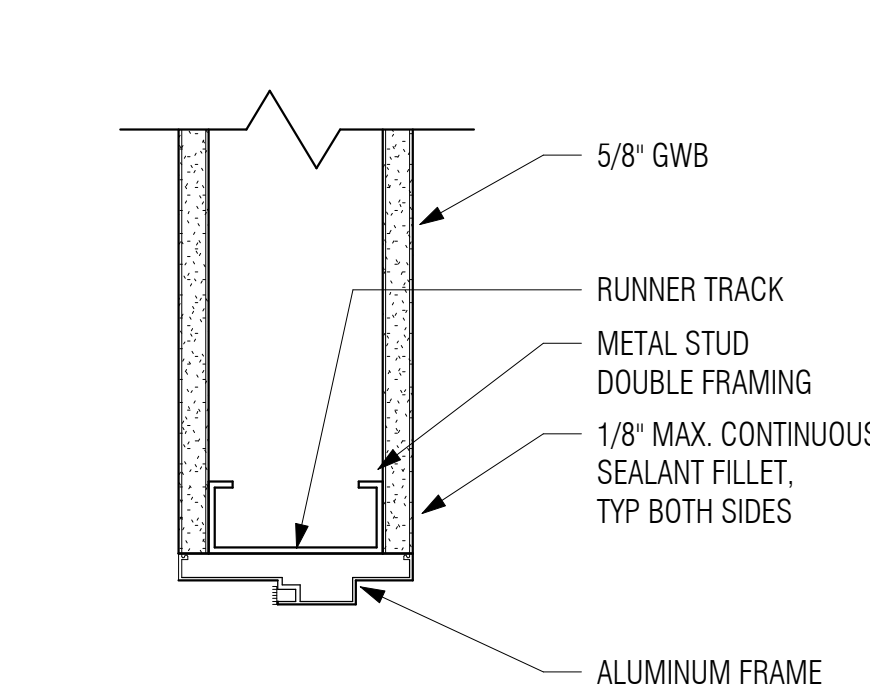
**17 THRESHOLD DETAIL - EXTERIOR HM**  
 3" = 1'-0"



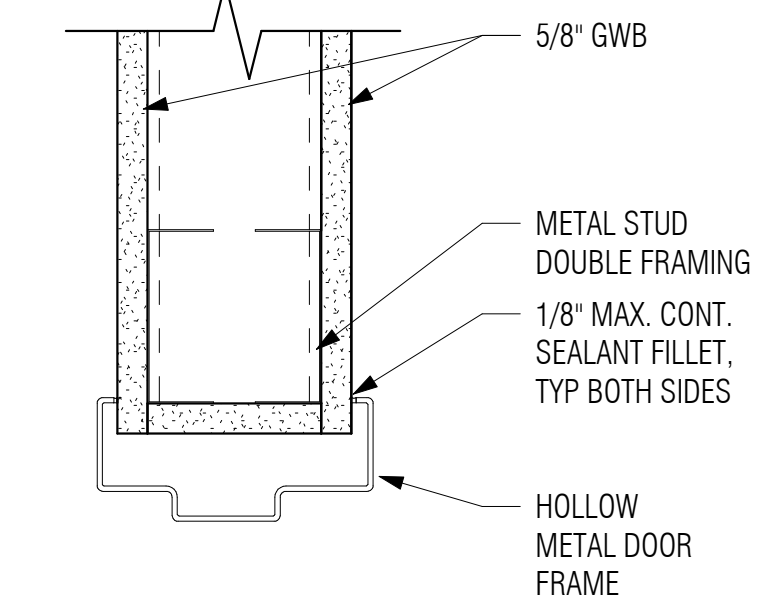
**13 TYPICAL DOOR STOP BACKING**  
 1 1/2" = 1'-0"



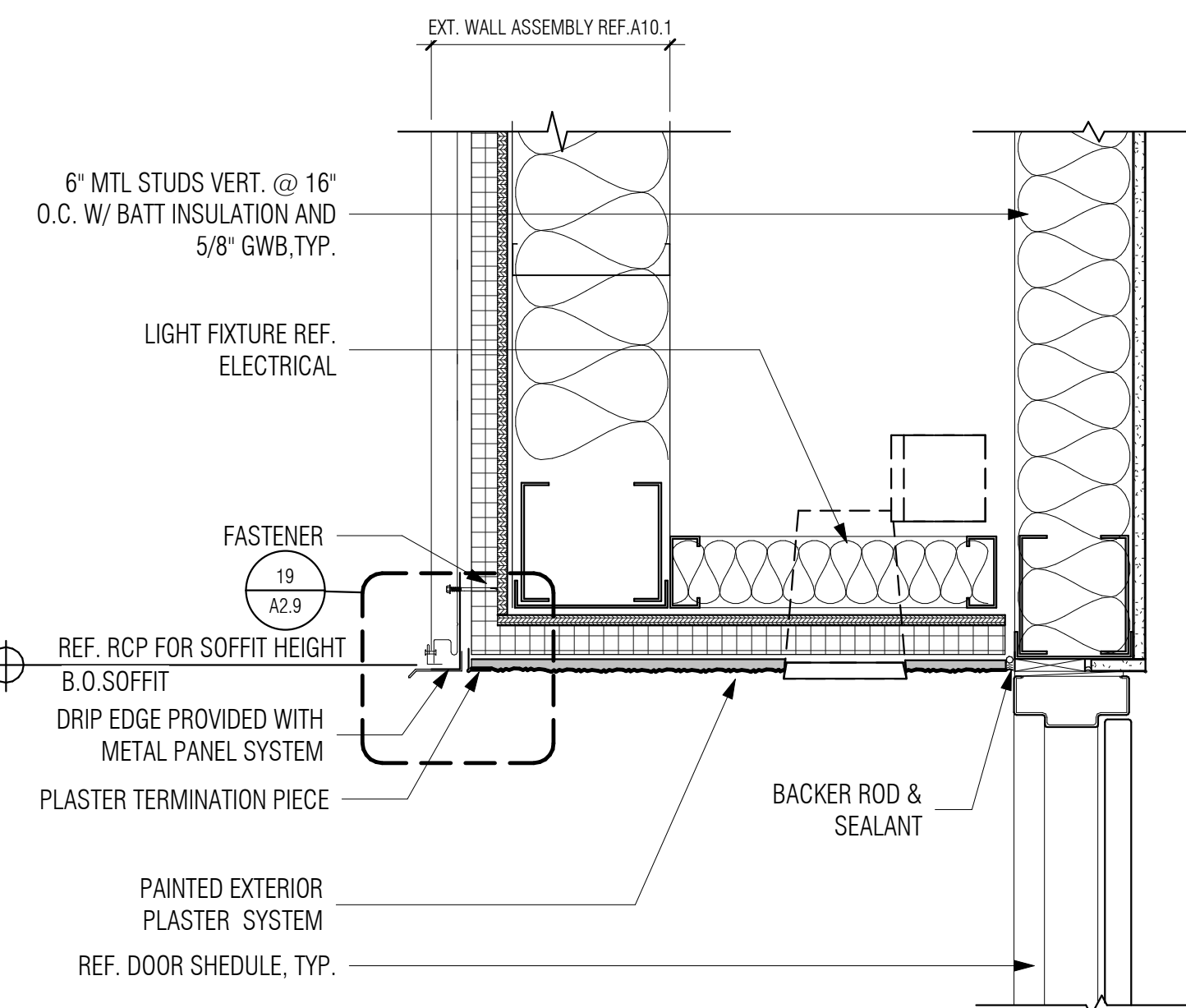
**9 ALUMINUM DOOR HEAD JAMB SIMILAR**  
 3" = 1'-0"



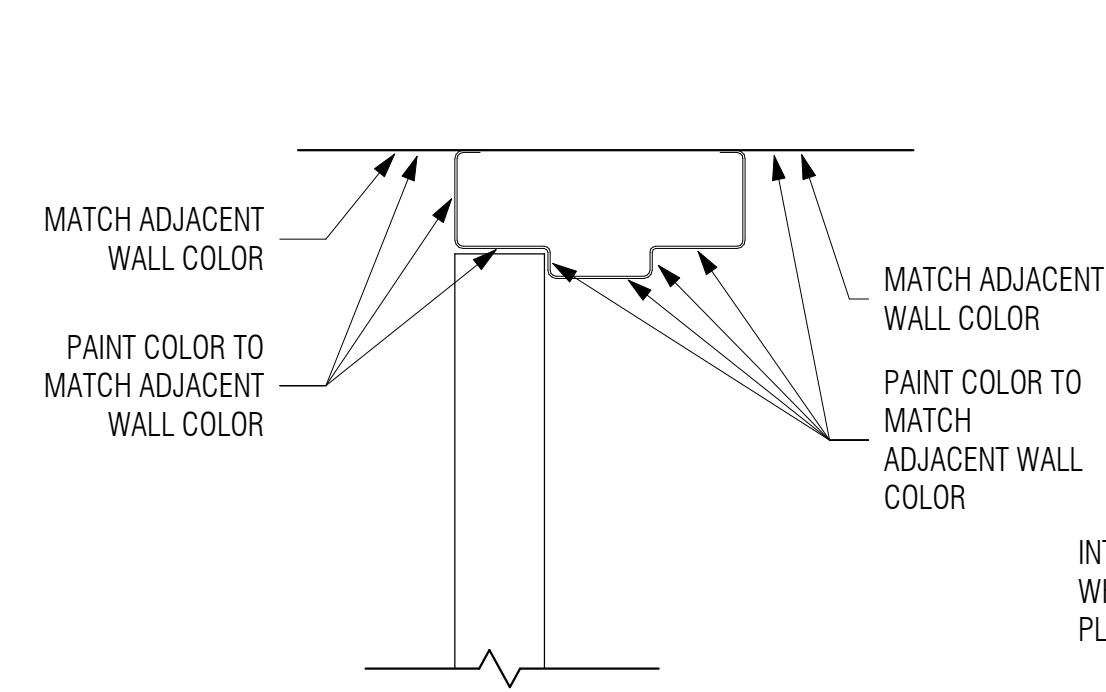
**5 ALUM. DOOR HEAD**  
 3" = 1'-0"



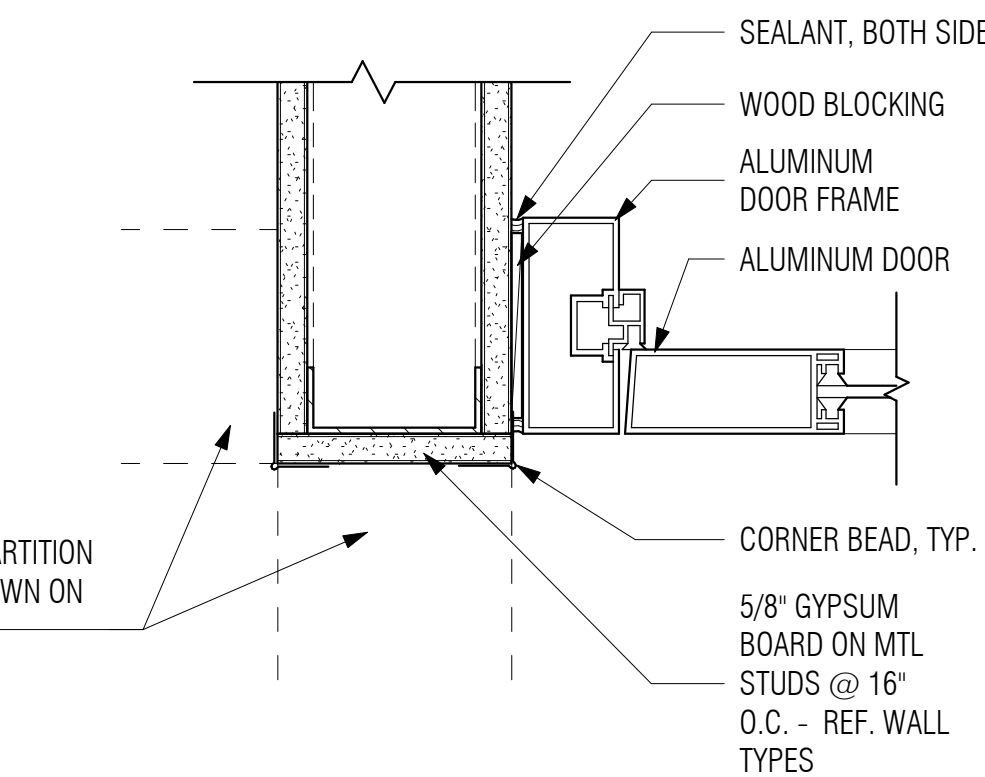
**1 INT - HM DOOR HEAD**  
 3" = 1'-0"



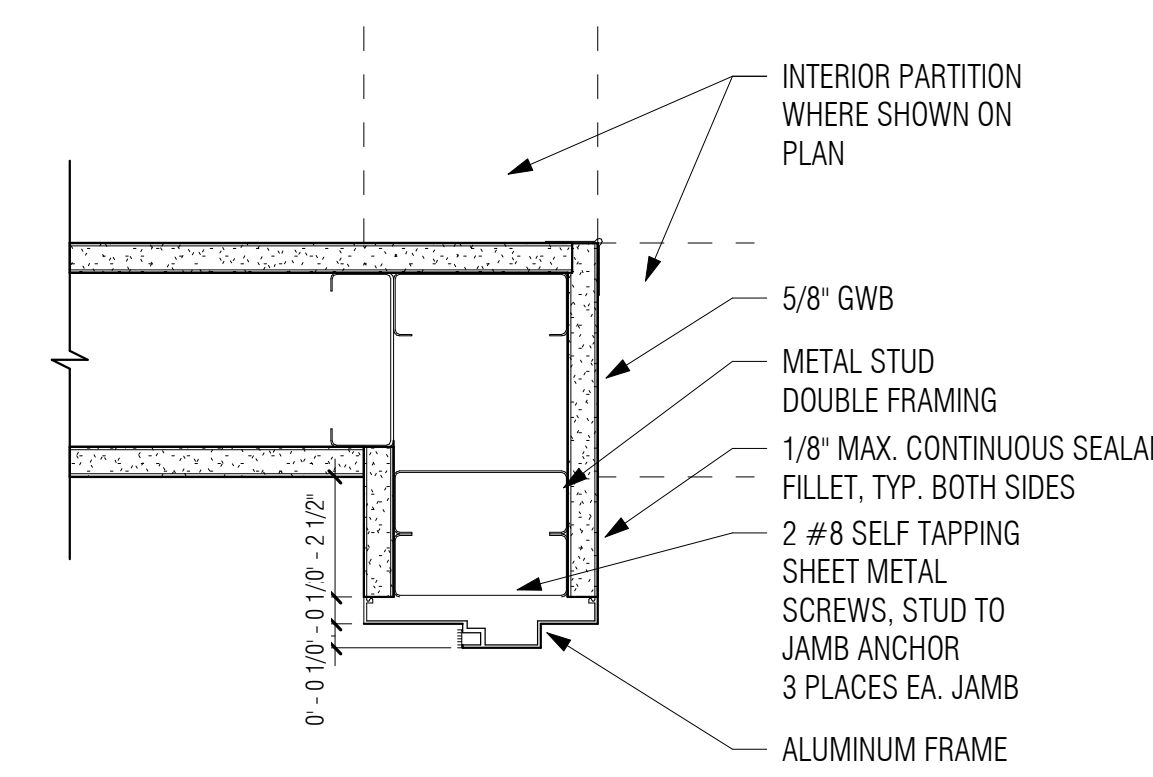
**18 TYPICAL EXTERIOR SOFFIT**  
 1 1/2" = 1'-0"



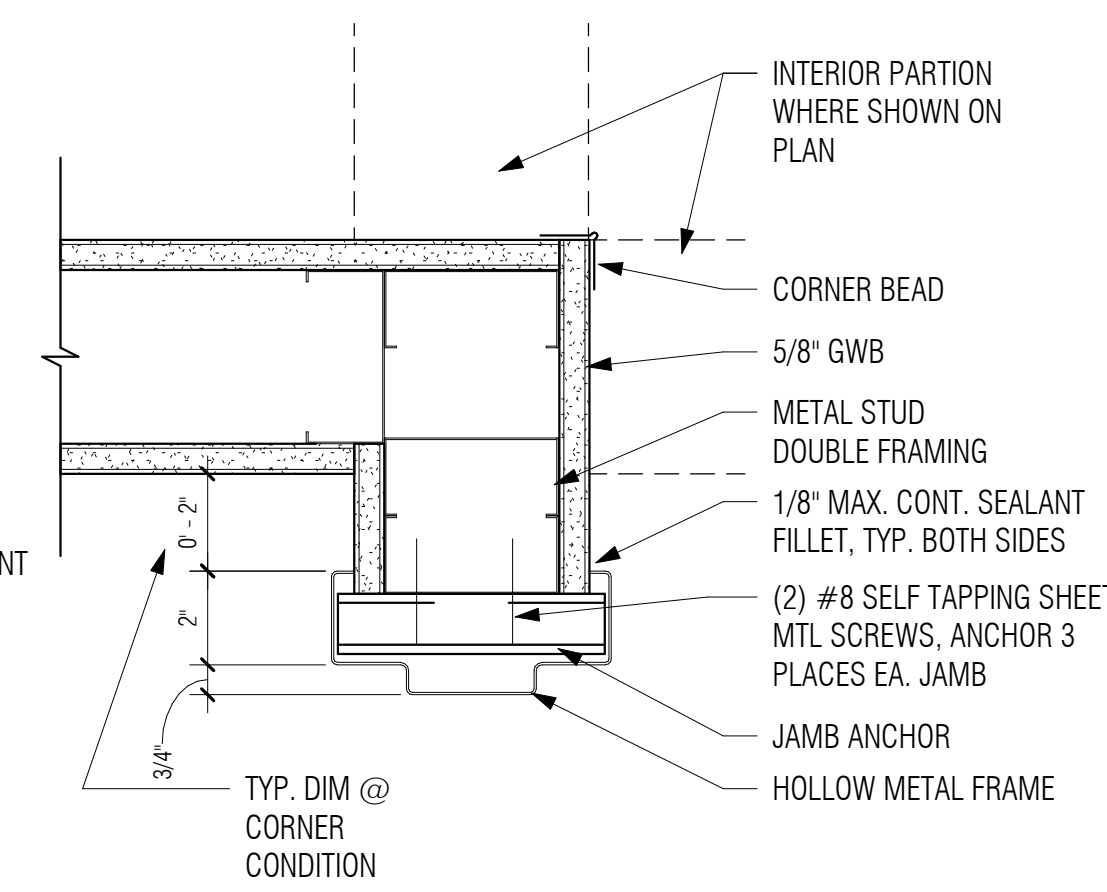
**14 TYPICAL PAINT SPLIT OF DOOR FRAME**  
 3" = 1'-0"



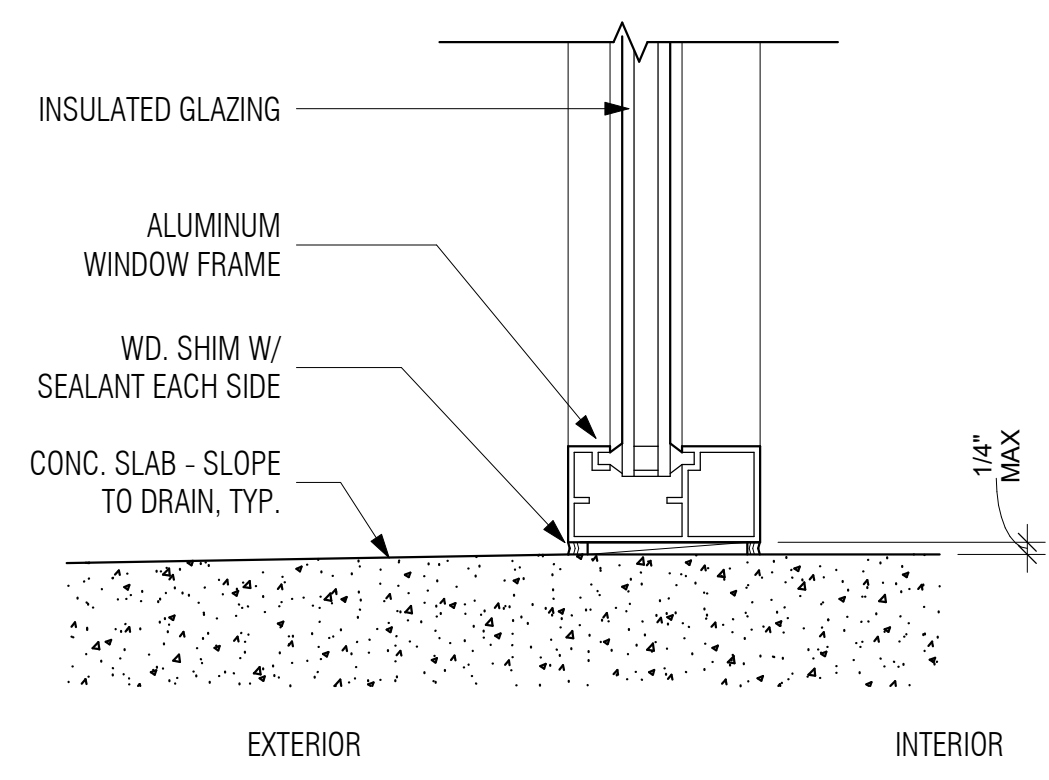
**10 INTERIOR ALUM DOOR JAMB**  
 3" = 1'-0"



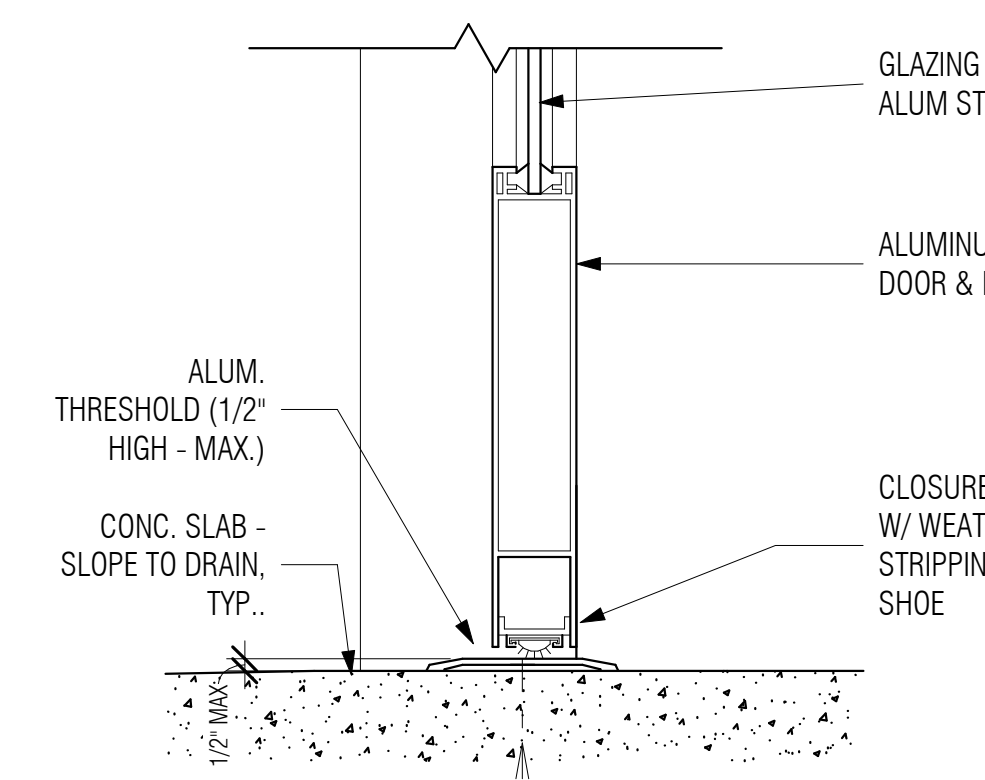
**6 ALUM. DOOR JAMB**  
 3" = 1'-0"



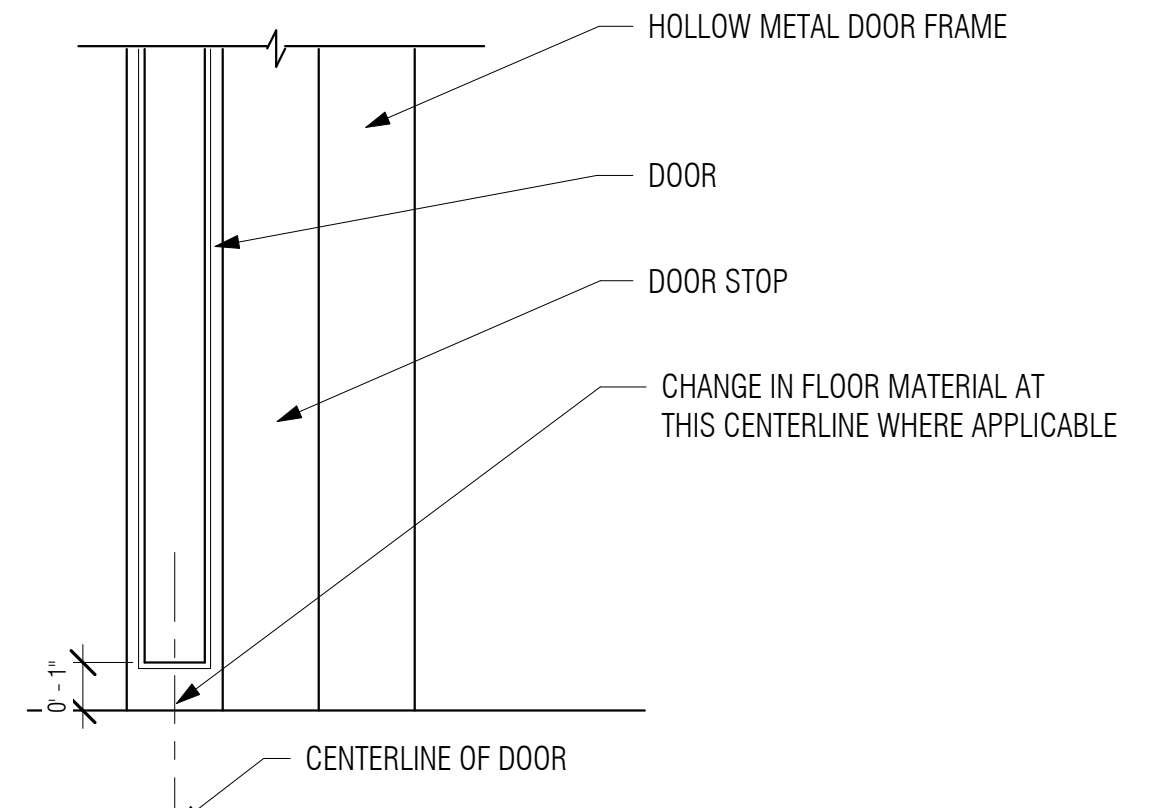
**2 INT - HM DOOR JAMB**  
 3" = 1'-0"



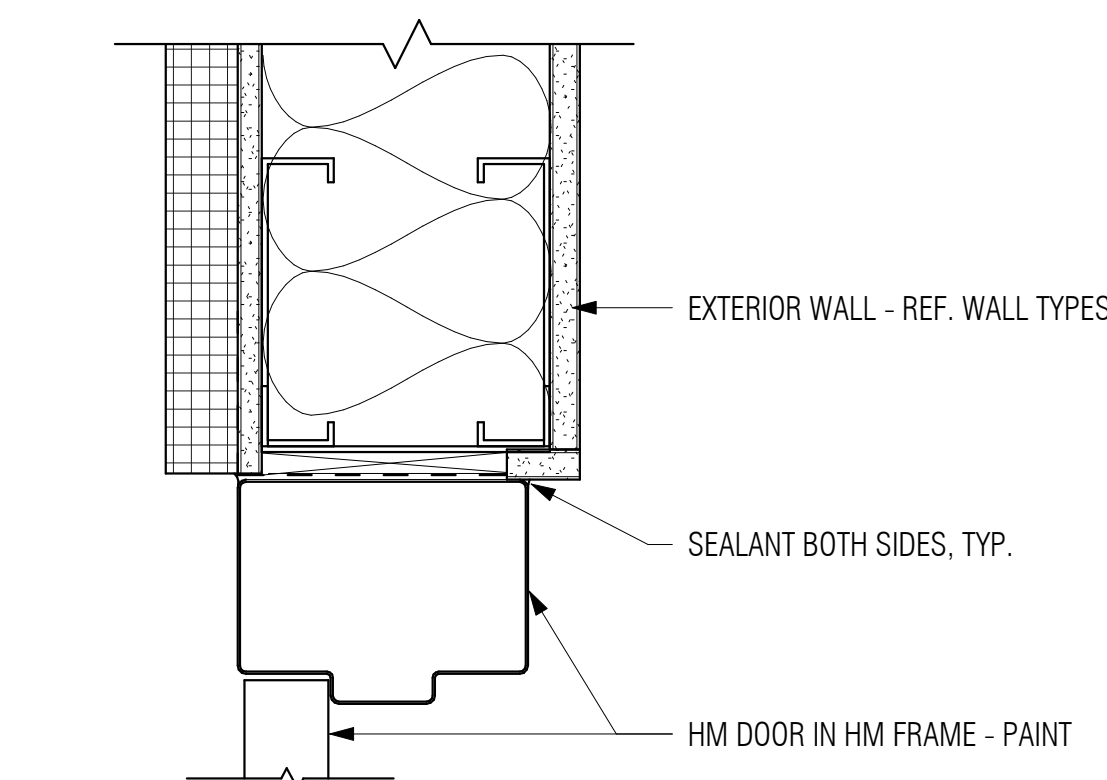
**15 EXTERIOR ALUM STOREFRONT SILL**  
 3" = 1'-0"



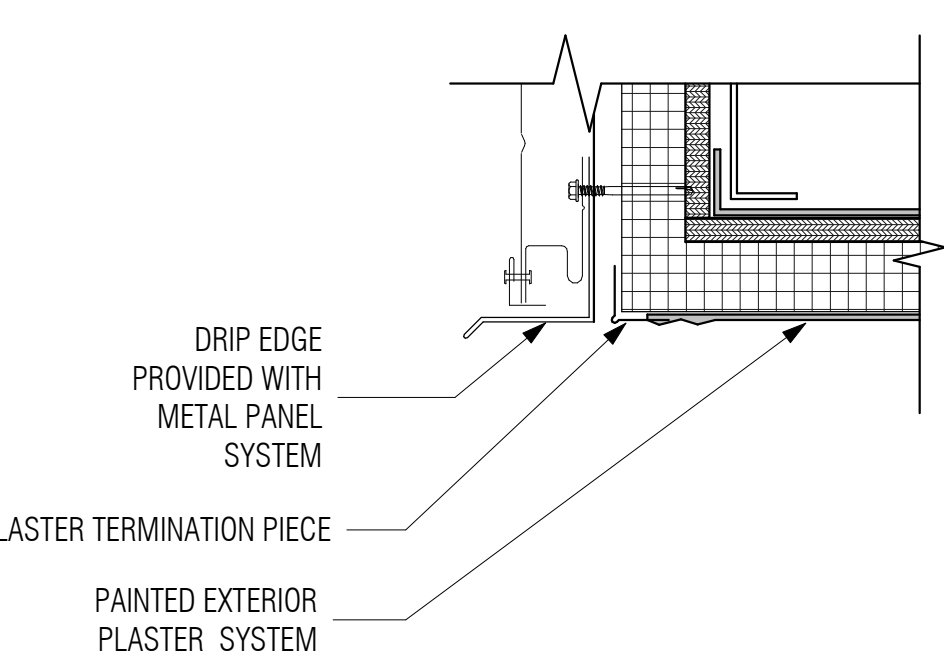
**11 EXTERIOR ALUMINUM DOOR SILL**  
 3" = 1'-0"



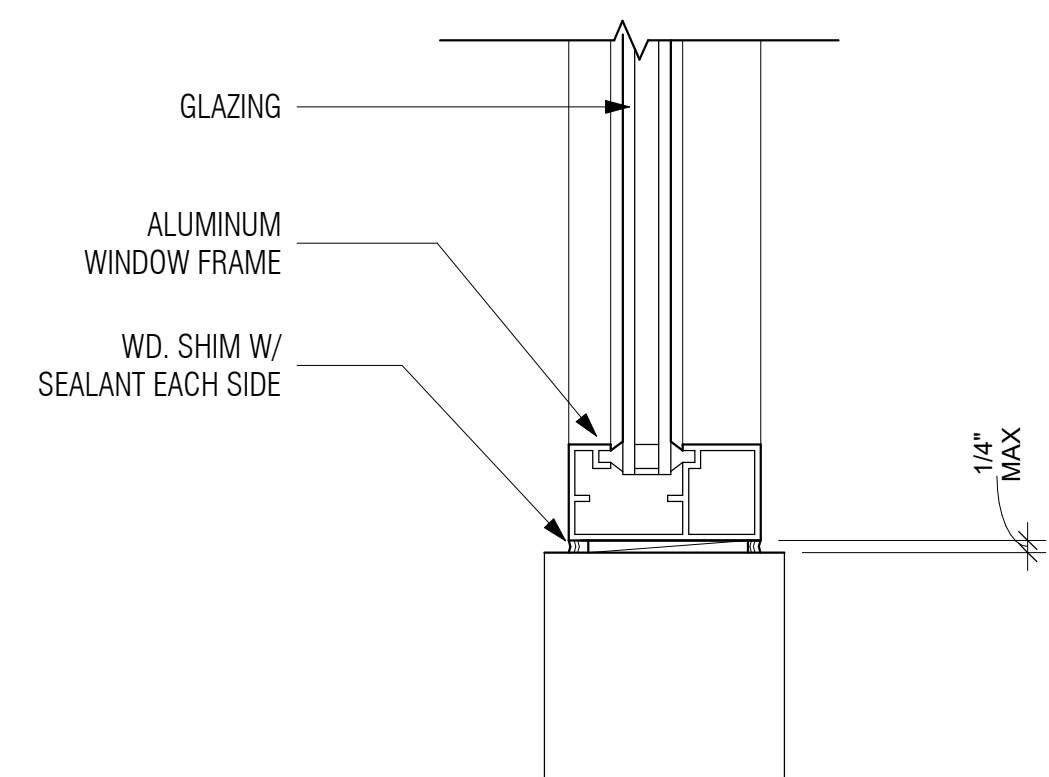
**TYP. INT DOOR THRESHOLD - ALUM. DOOR SIM**  
 SCALE: 3" = 1'-0"



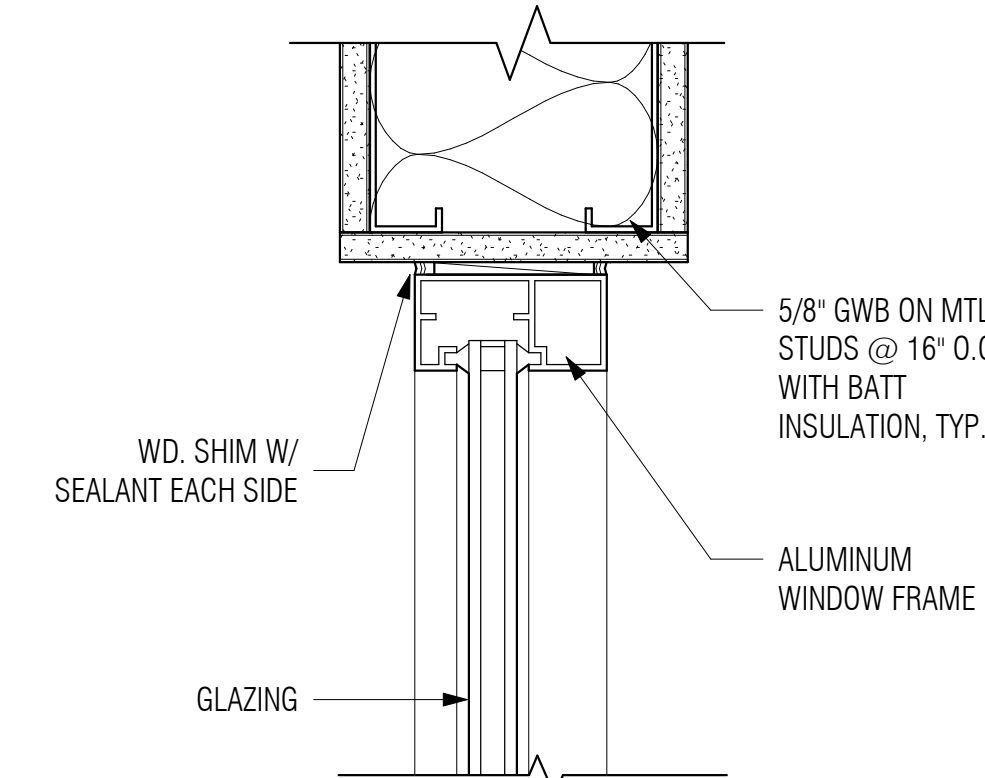
**3 EXTERIOR HM DOOR HEAD**  
 3" = 1'-0"



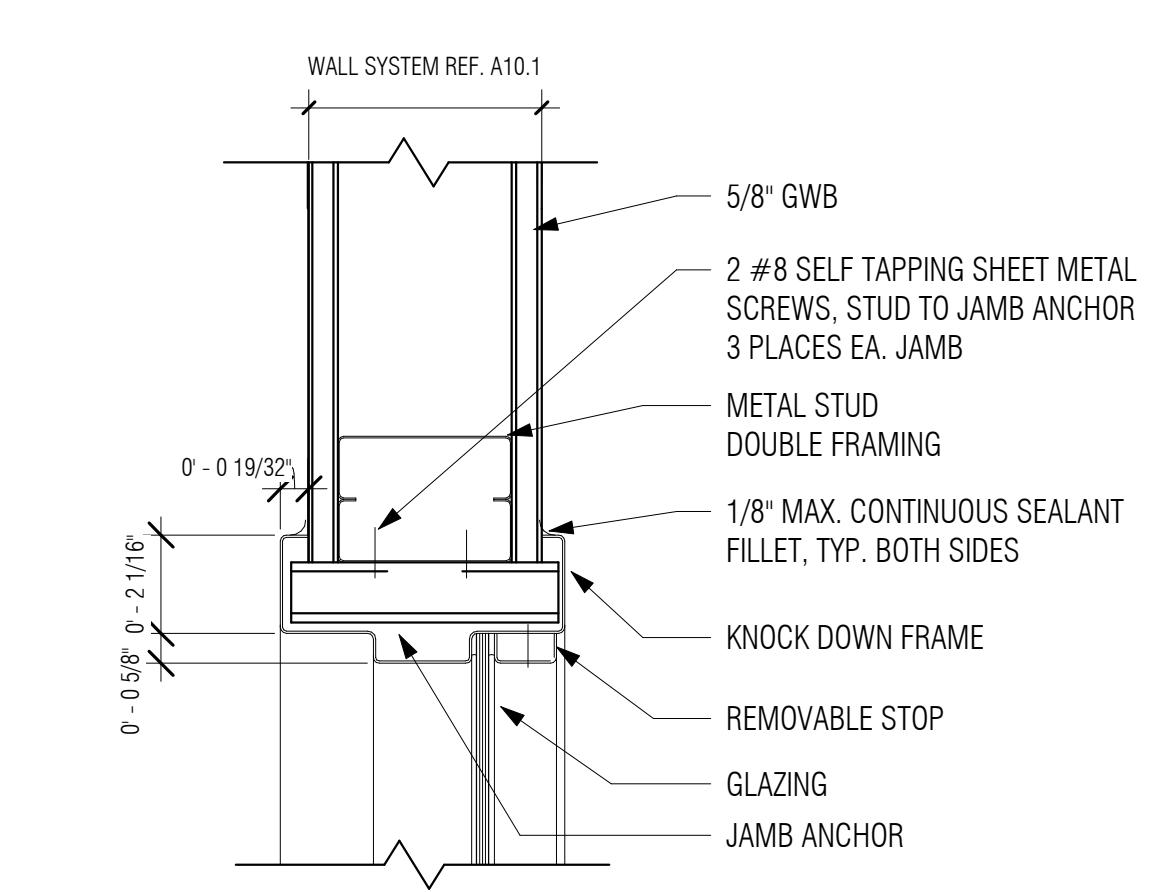
**TYPICAL EXTERIOR SOFFIT-DETAIL**  
 SCALE: 3" = 1'-0"



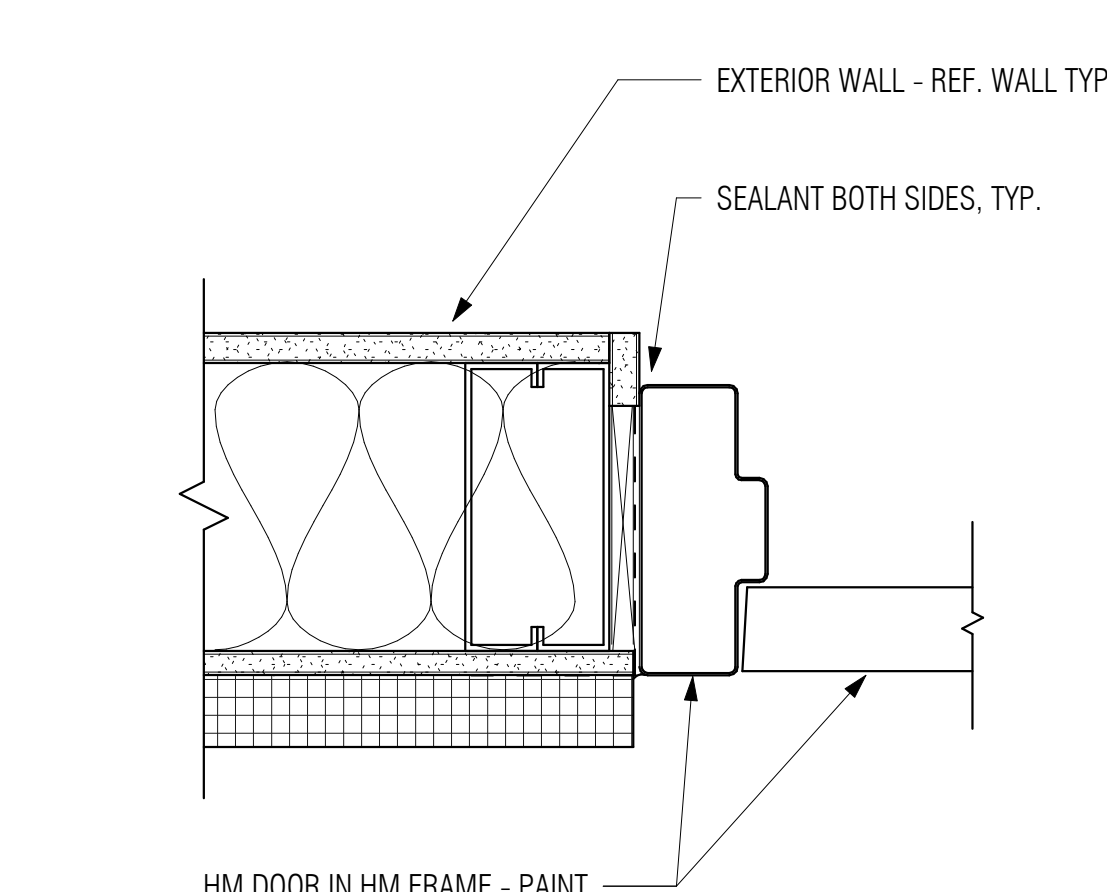
**16 INTERIOR ALUM WINDOW SILL**  
 3" = 1'-0"



**12 INTERIOR ALUM WINDOW HEAD - JAMB SIM.**  
 3" = 1'-0"



**8 HM WINDOW JAMB - HEAD SIM**  
 3" = 1'-0"



**4 EXTERIOR HM DOOR JAMB**  
 3" = 1'-0"

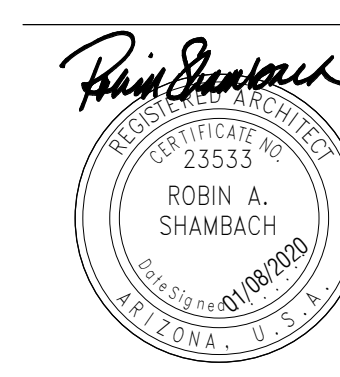
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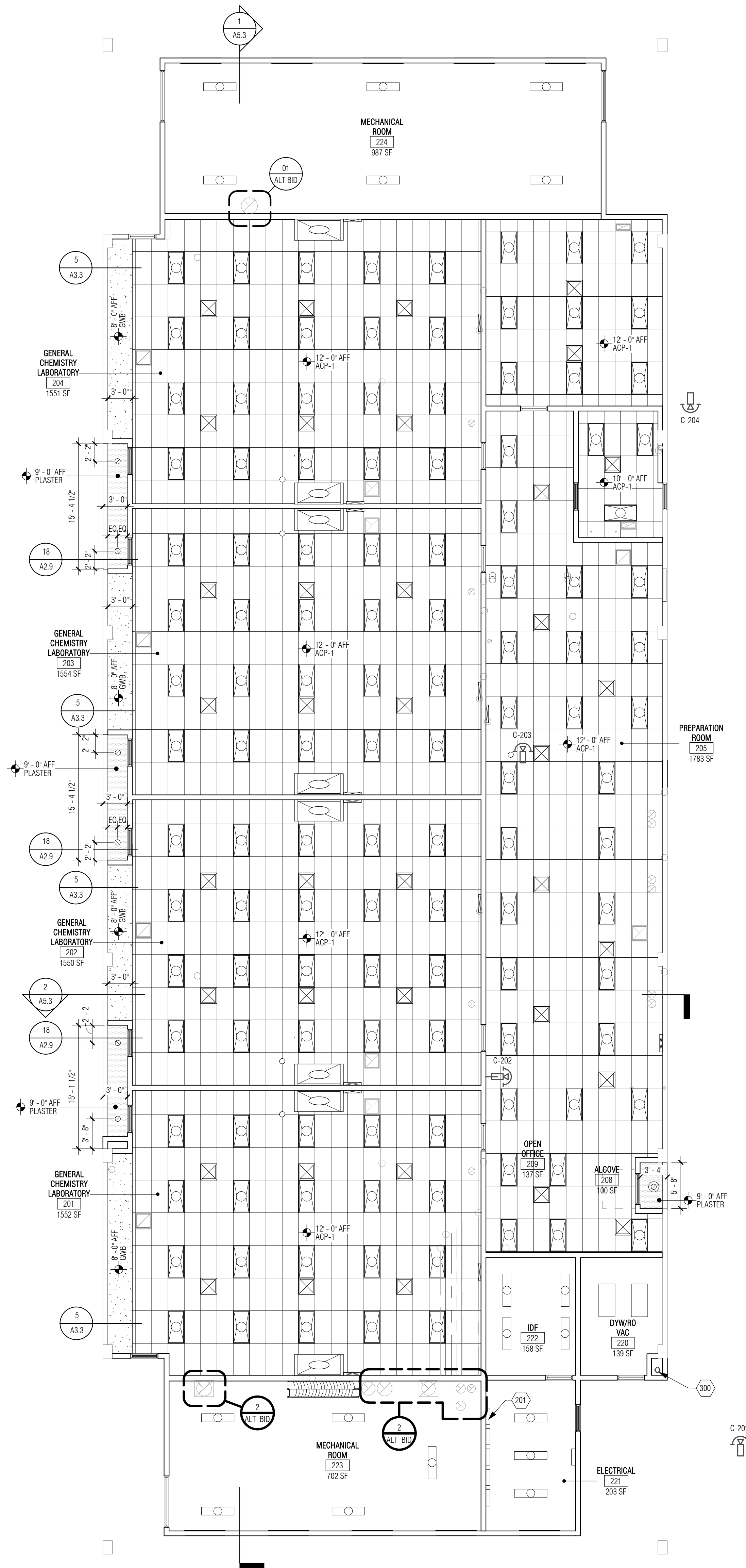


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DOOR & WINDOW DETAILS







1 02 - CEILING PLAN - SECOND FLOOR  
1/8" = 1'-0"

**REFLECTED CEILING PLAN GENERAL NOTES**

- SEE GENERAL NOTES ON SHEET G1.1 FOR SUSPENDED CEILING GRID LAYOUT AND PLACEMENT OF CEILING MOUNTED DEVICES.
- SEE FLOOR PLAN FOR PARTITION TYPES.
- COORDINATE CEILING PLANS WITH MECHANICAL, FIRE PROTECTION AND ELECTRICAL PLANS.
- ALL GWB CEILINGS AND SOFFITS SHALL BE TEXTURED AND PAINTED.
- REFER TO SHEET A3.3 FOR CEILING DETAILS.
- ACCESS PANELS IN FIRE RATED CEILINGS SHALL MATCH THE FIRE RATING OF THE CEILING.
- CENTER LIGHT FIXTURES IN CEILING, U.N.O.
- "CJ" INDICATES A GWB CONTROL JOINT.

**REFLECTED CEILING PLAN LEGEND**

CEILING TYPES:	CEILING EQUIPMENT:
A GWB	□ LIGHT FIXTURE - RECESSED IN CEILING.
B E.T.S. EXPOSED TO STRUCTURE	□ LIGHT FIXTURE - RECESSED IN CEILING.
C 2x4 SUSPENDED ACCOUSTICAL CEILING	□ LIGHT FIXTURE - RECESSED IN CEILING.
D PLASTER SOFFIT	○ LIGHT FIXTURE - CEILING OR PENDENT MOUNT.
	○ LIGHT FIXTURE - RECESSED IN CEILING.
	⊗ EXIT LIGHT
	⊗ MECH - SUPPLY DIFFUSER
	⊗ MECH - RETURN DIFFUSER
	⊗ MECH - EXHAUST
	⊗ CAMERAS OFOI CONTRACTOR TO COORDINATE WITH SECURITY VENDOR

**GENERAL NOTES:**

- CEILING HEIGHTS SHOWN IN PLAN ARE NOMINAL AND SHOULD BE COORDINATED WITH DETAILS AND SECTIONS

**CAMERA LEGEND - SECOND FLOOR**

**NOTE:**

CAMERAS COMPLETE AND IN PLACE TO BE O.F.O.I

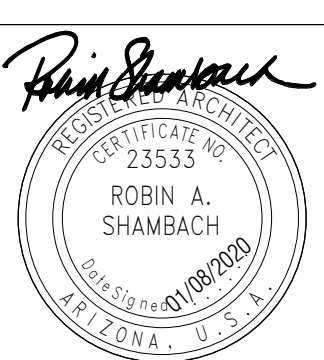
CAMERA SCHEDULE - SECOND FLOOR					
CAMERA No.	NEW/EXIST	TYPE	180	REMARKS	ALT#
C-201	NEW	CEILING MOUNTED	180	NORTH FACING CAMERA	BASE BID
C-202	NEW	WALL MOUNTED	180	FACING DOOR 208	BASE BID
C-203	NEW	WALL MOUNTED	180	CAMERA POINTING CHEM STORAGE/ LAB WASTE	BASE BID
C-204	NEW	CEILING MOUNTED	180	SOUTH FACING CAMERA	BASE BID

**KEYNOTES**

- ELECT. PANEL - PROVIDE CONTINUOUS BACKING AND 1/2" - 4X8 PLYWOOD SHEET AT ALL PANEL LOCATIONS
- 4" PIPE LINE

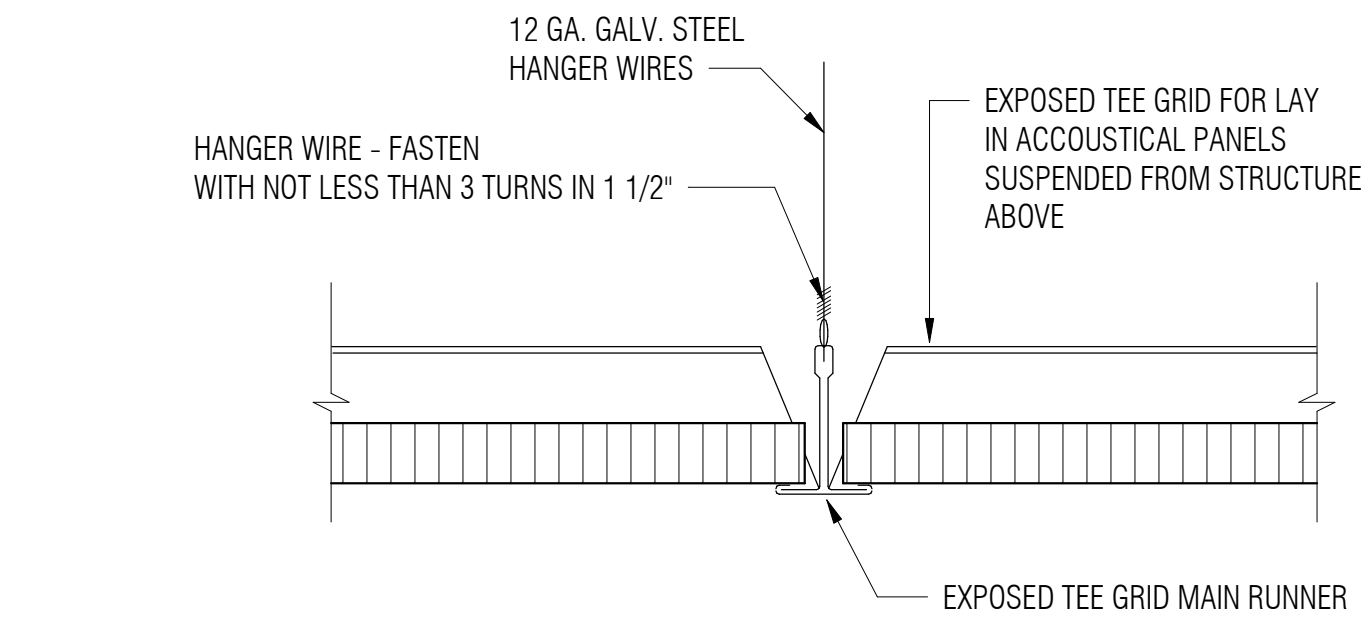
ADD ALTERNATE BID #01:  
INDICATED MECHANICAL  
COMPLETE AND IN PLACE

ADD ALTERNATE BID #02:  
INDICATED MECHANICAL UNIT  
COMPLETE AND IN PLACE

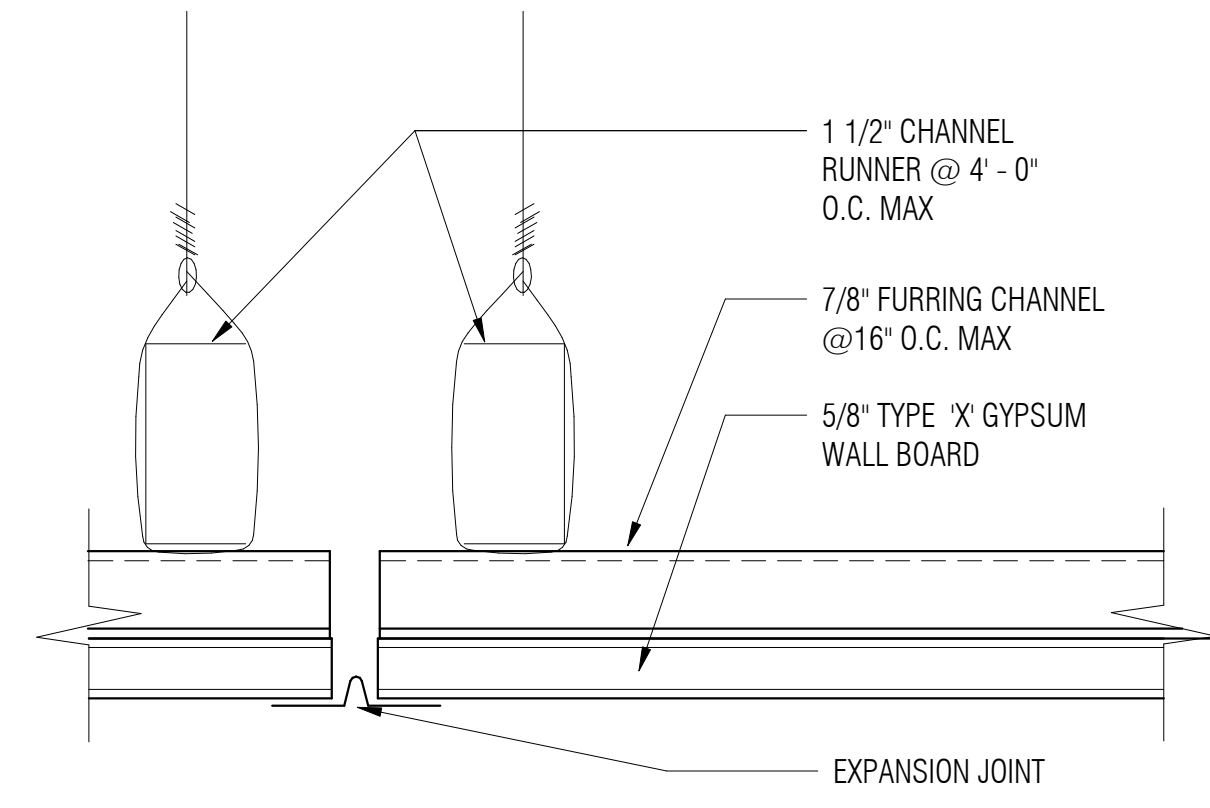


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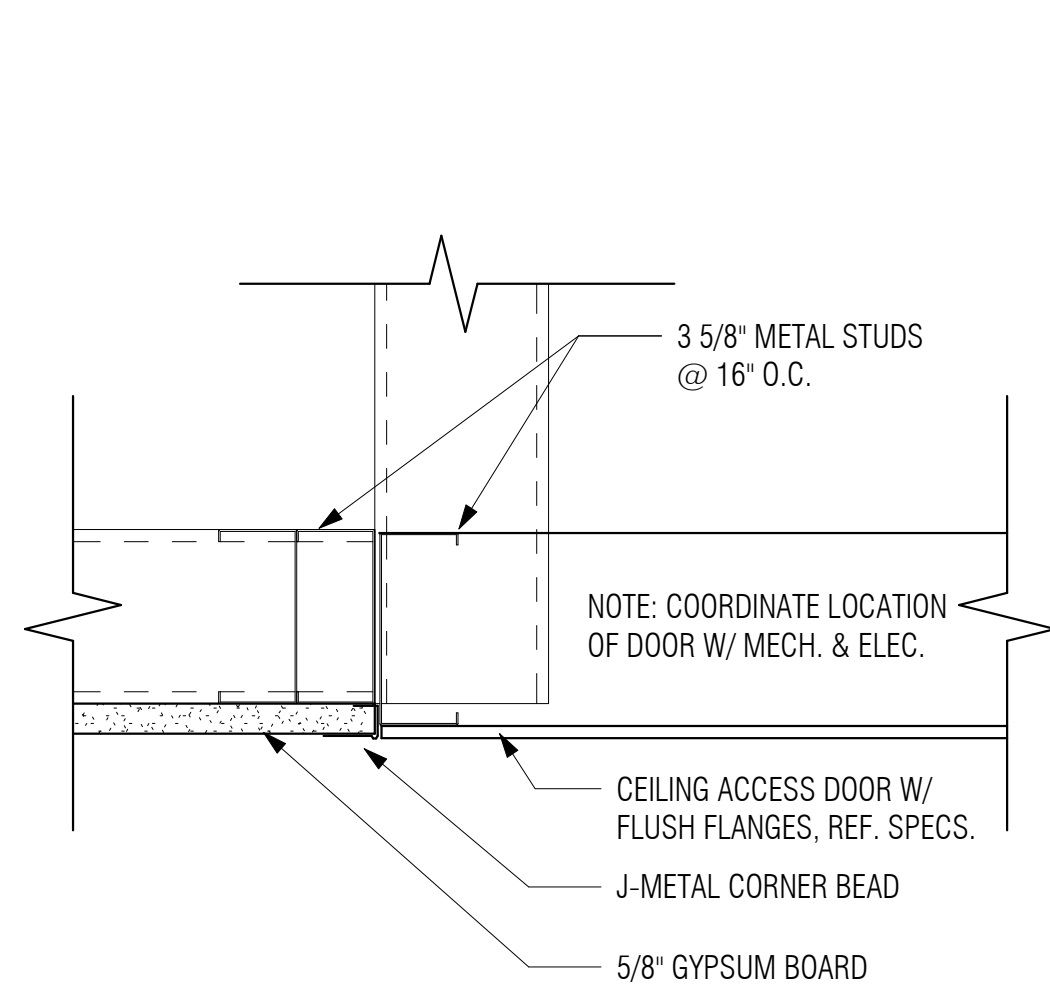
**DRAWN BY:** Author  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**



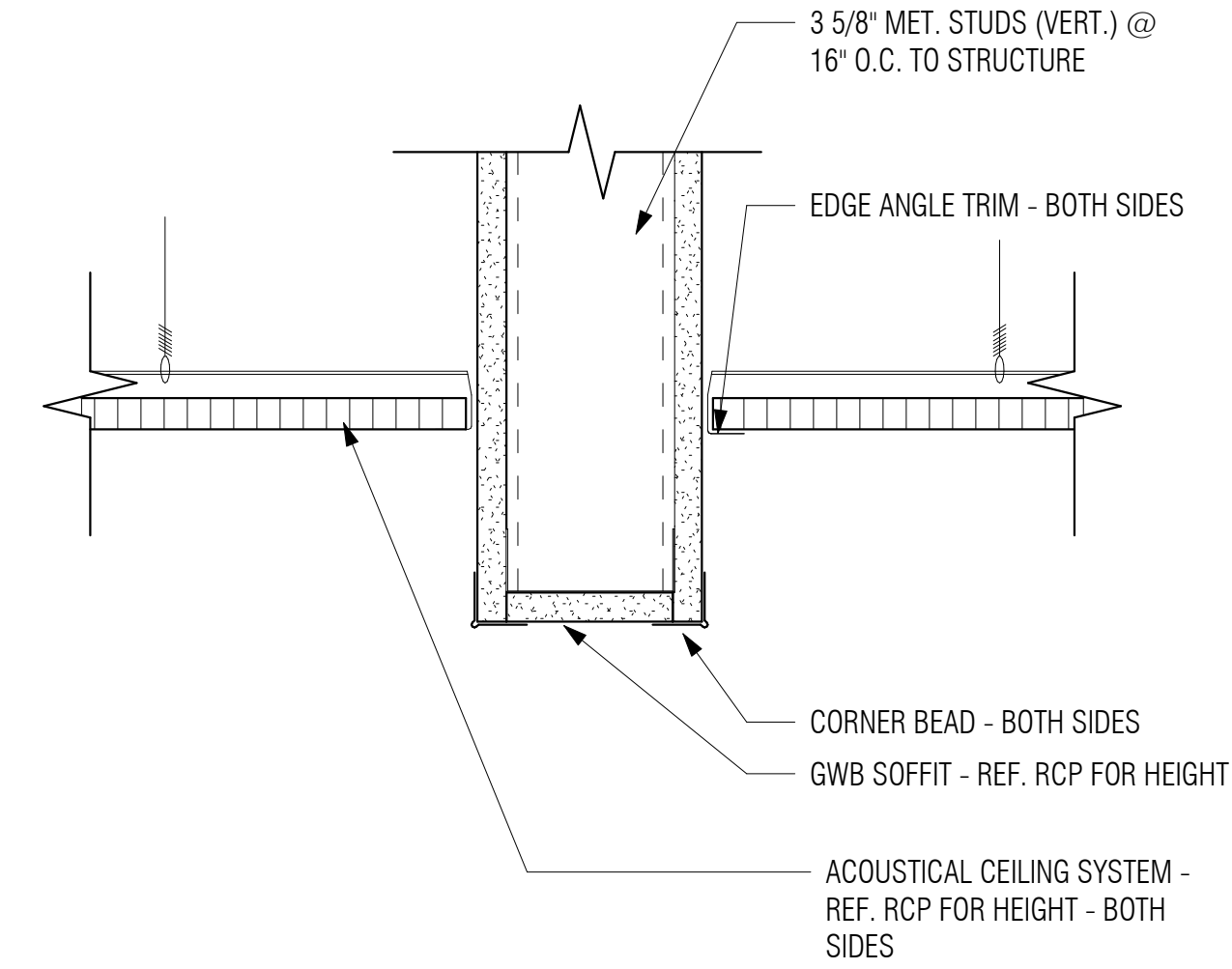
3 SUSPENDED CEILING GRID MAIN RUNNER - TYPICAL  
6" = 1'-0"



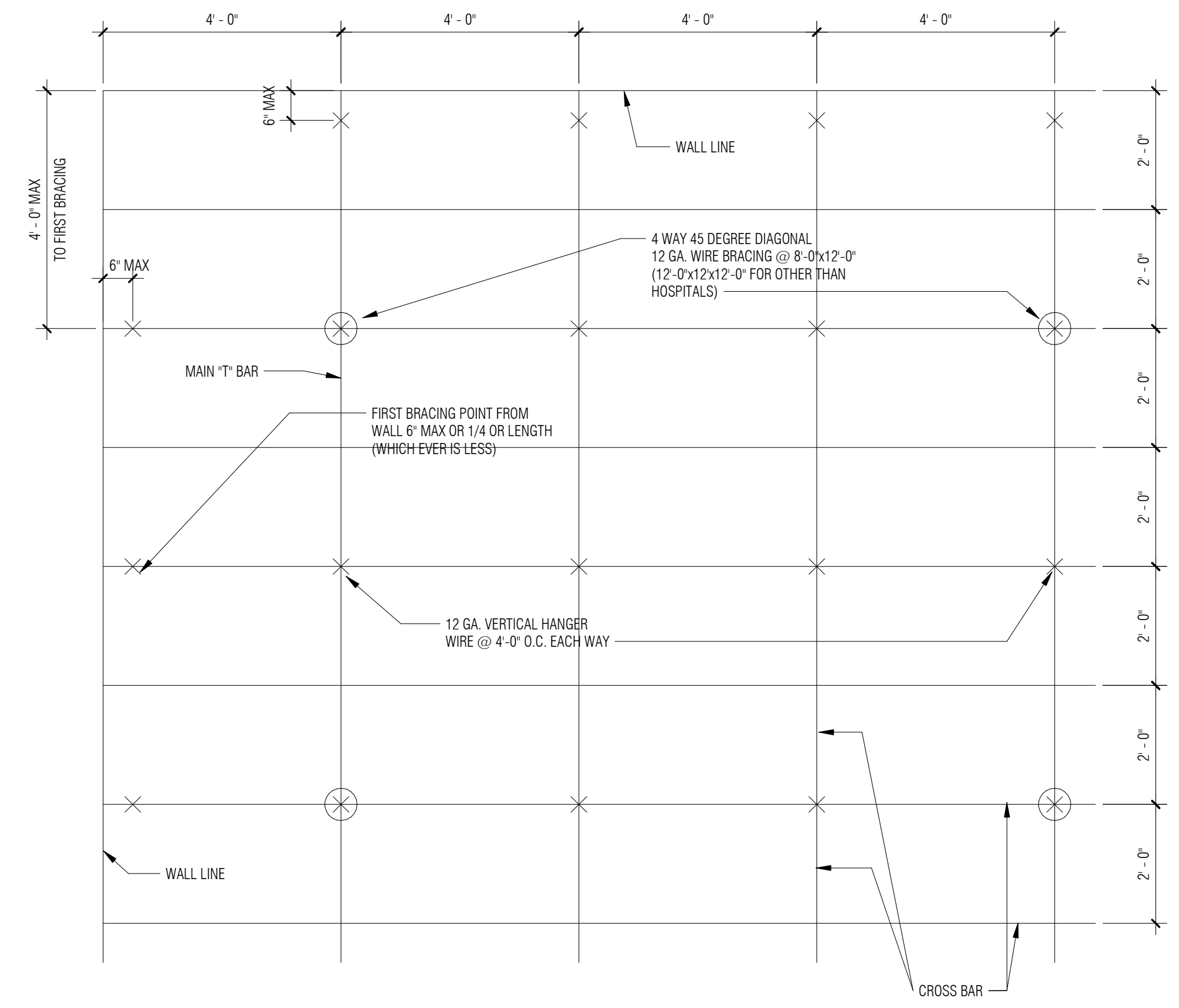
4 SUSPENDED GWB - TYPICAL EXPANSION JOINT  
6" = 1'-0"



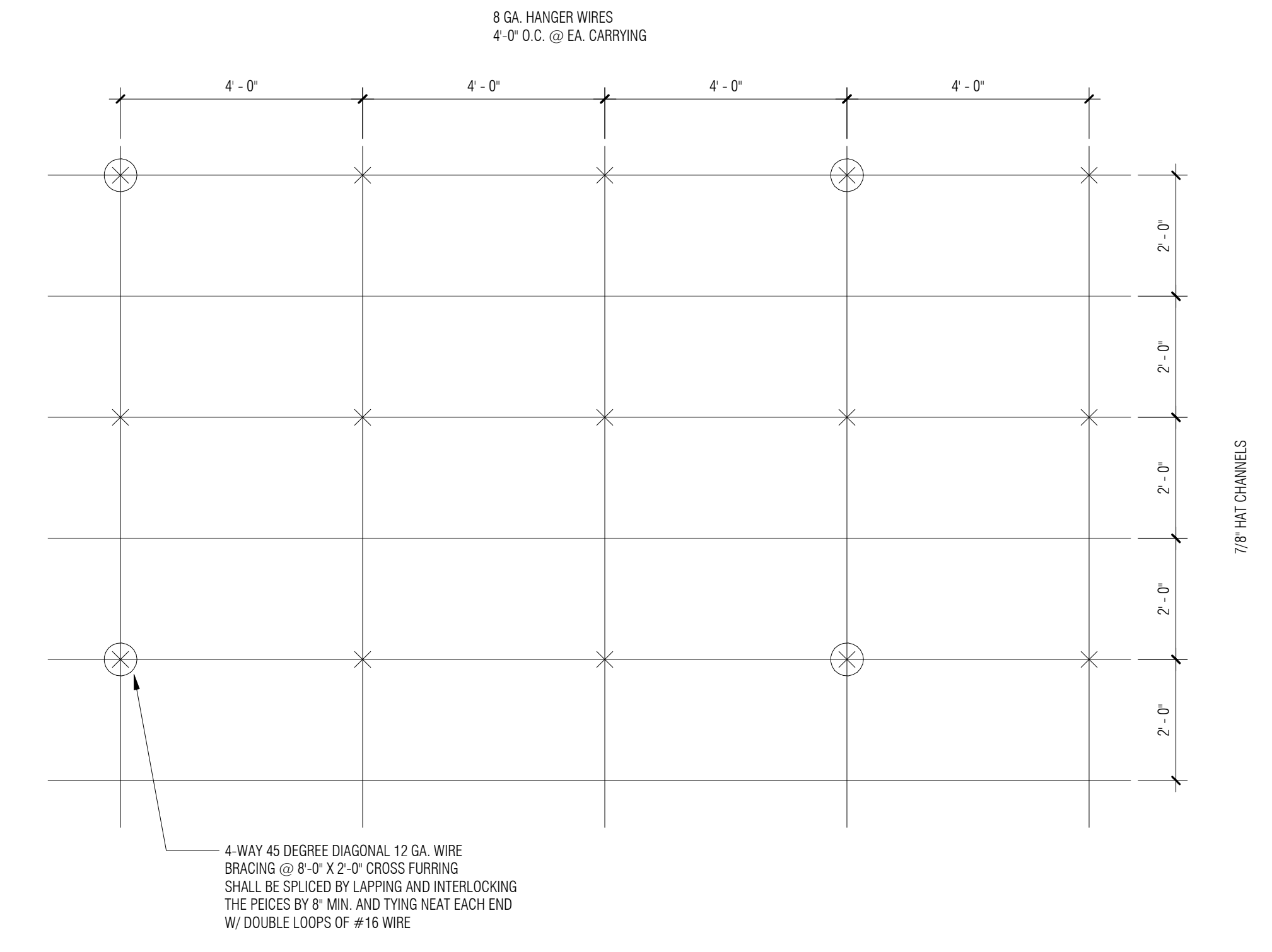
6 CEILING ACCESS PANEL  
SCALE: 3" = 1'-0"



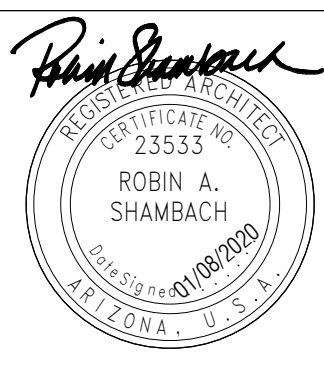
5 ACT CEILING EDGE @ WALL SOFFIT - BOTH SIDES  
3" = 1'-0"



1 DIAGRAMATIC CEILING PLAN - 2X4 SUSPENDED CEILING  
1/2" = 1'-0"

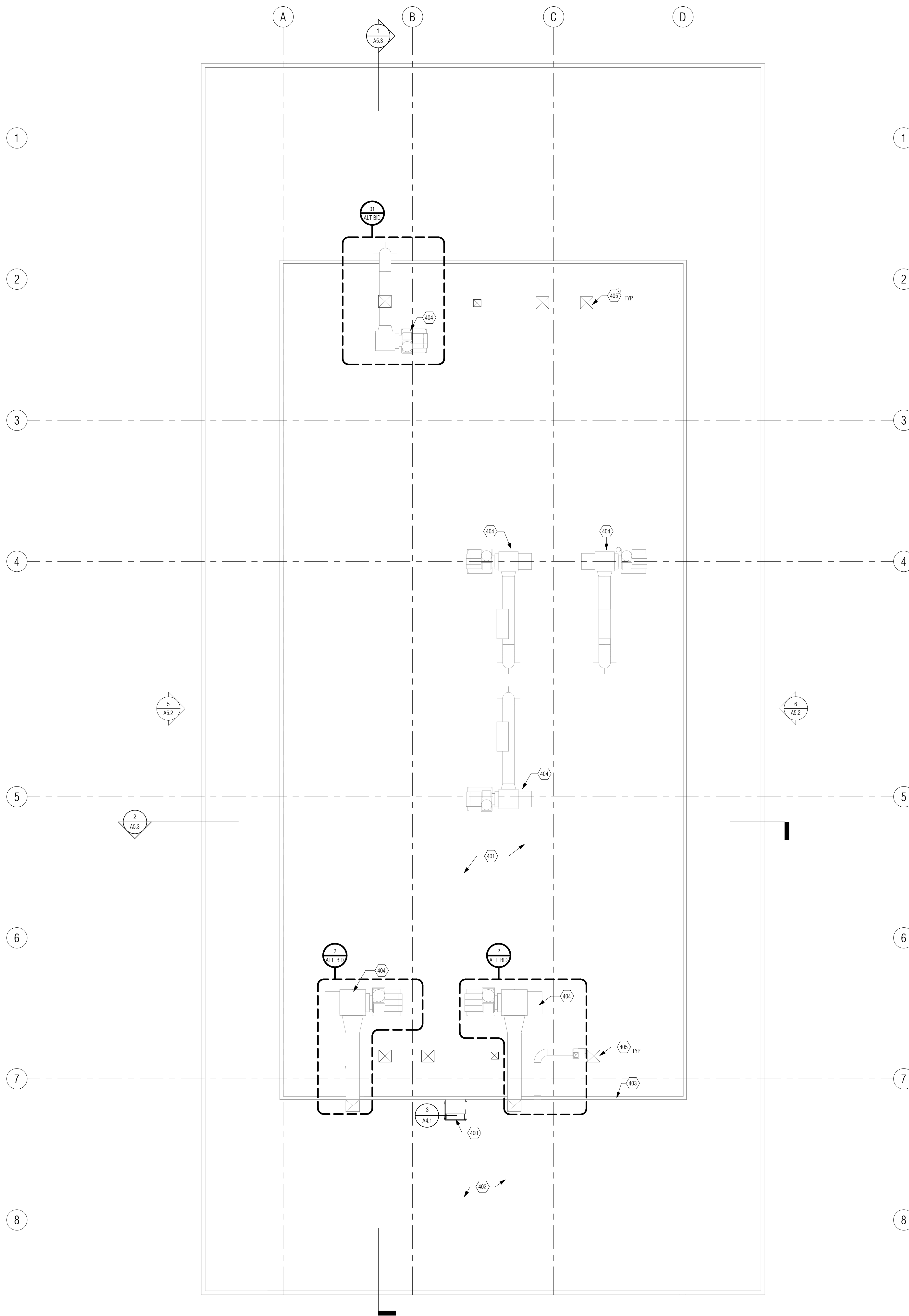


2 DIAGRAMATIC CEILING PLAN - GYPSUM BOARD CEILINGS  
1/2" = 1'-0"



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DATE: 01/08/2020  
REVISIONS

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**1 ROOF PLAN**  
SCALE: 1/8" = 1'-0"

**ROOF PLAN GENERAL NOTES**

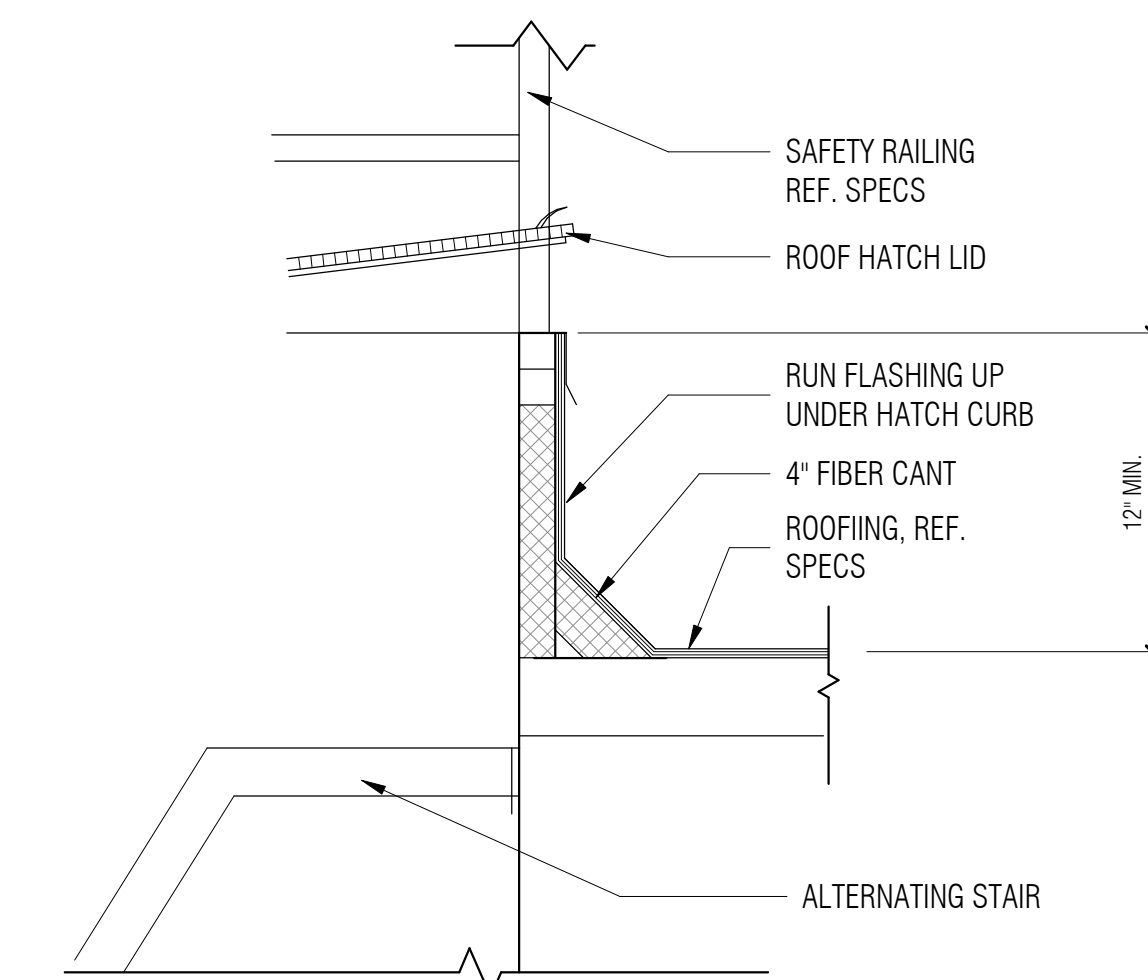
1. ROOF SLOPES SHALL BE A MINIMUM OF 1/2" PER FOOT. U.N.O.
2. VALLEYS AT CRICKETS SHALL BE A MINIMUM OF 1/4" PER FOOT.
3. COORDINATE THE ROOF PLAN WITH PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS.
4. REFER TO PLUMBING DRAWINGS FOR VENT STACK PENETRATIONS AND FLASH PER DETAILS.
5. ROOF DRAINS AND SCUPPERS ARE APPROXIMATE. G.C. TO COORDINATE ALL AREAS.
6. PROVIDE ADDITIONAL CRICKETS AT ROOF DRAINS AND ROOF MOUNTED EQUIPMENT AS REQUIRED TO PROVIDE POSITIVE SLOPE TO DRAIN AT 1/4" PER FOOT MINIMUM.

**KEYNOTES**

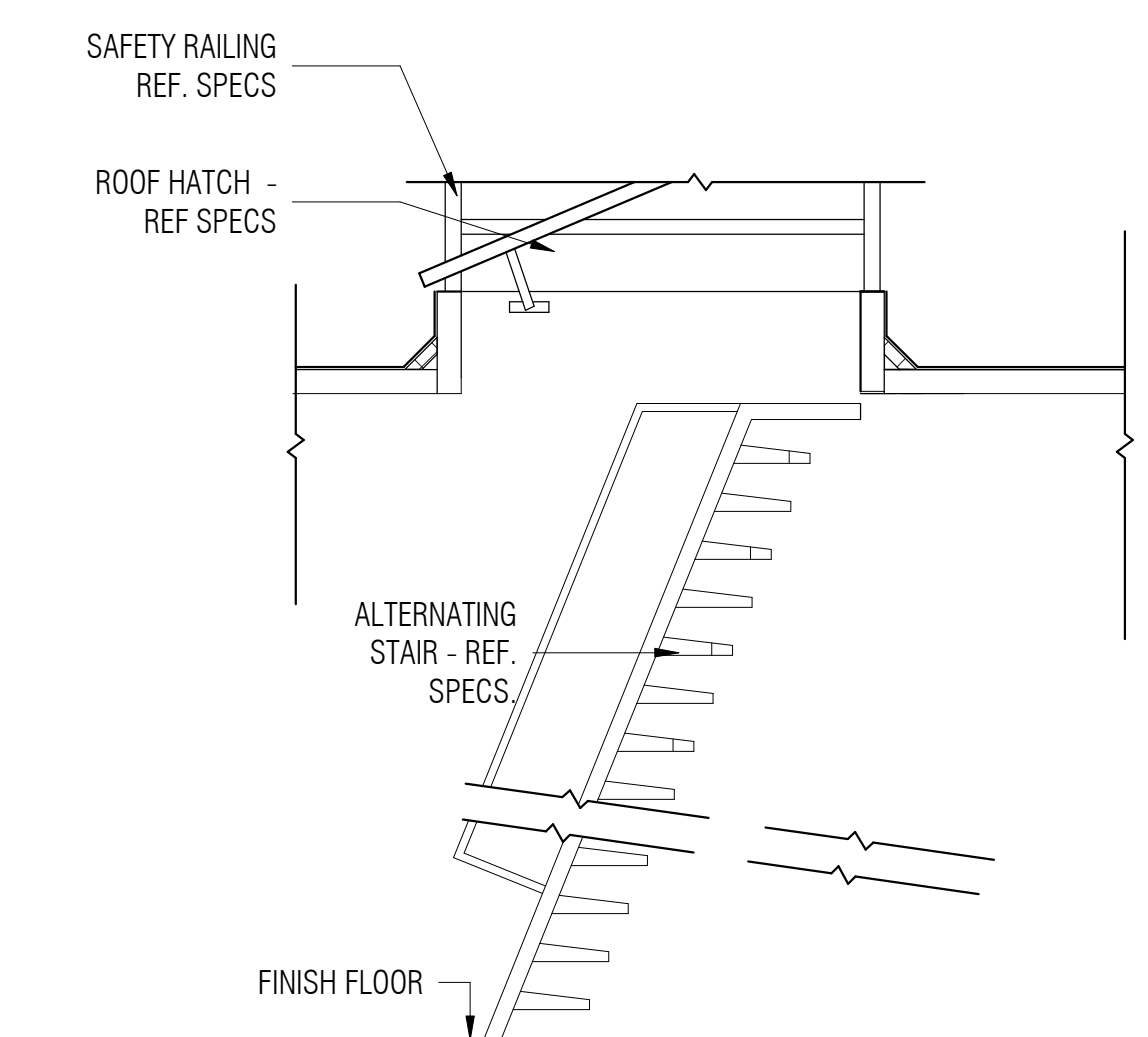
- 400 ROOF HATCH
- 401 BUILDING ROOF
- 402 EXTERIOR WALKWAY ROOF
- 403 LOW PARAPET WALL
- 404 MECHANICAL EQUIPMENT, TYP
- 405 EXISTING OPENINGS IN ROOF SLABS - REF. TO STRUCTURAL

**ADD ALTERNATE BID #01:  
INDICATED MECHANICAL  
COMPLETE AND IN PLACE**

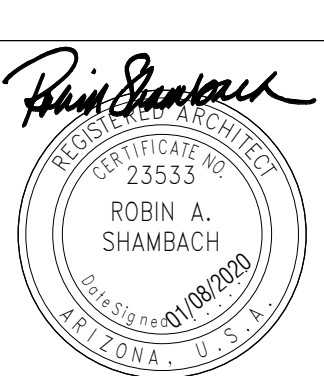
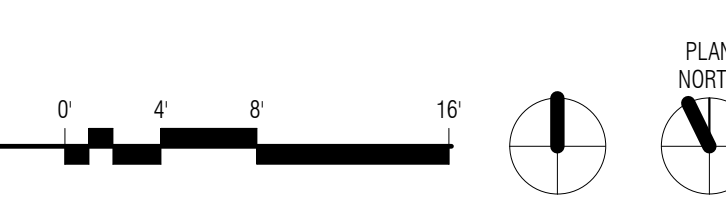
**ADD ALTERNATE BID #02:  
INDICATED MECHANICAL UNIT  
COMPLETE AND IN PLACE**



**2 ROOF HATCH DETAILS**  
SCALE: 1 1/2" = 1'-0"

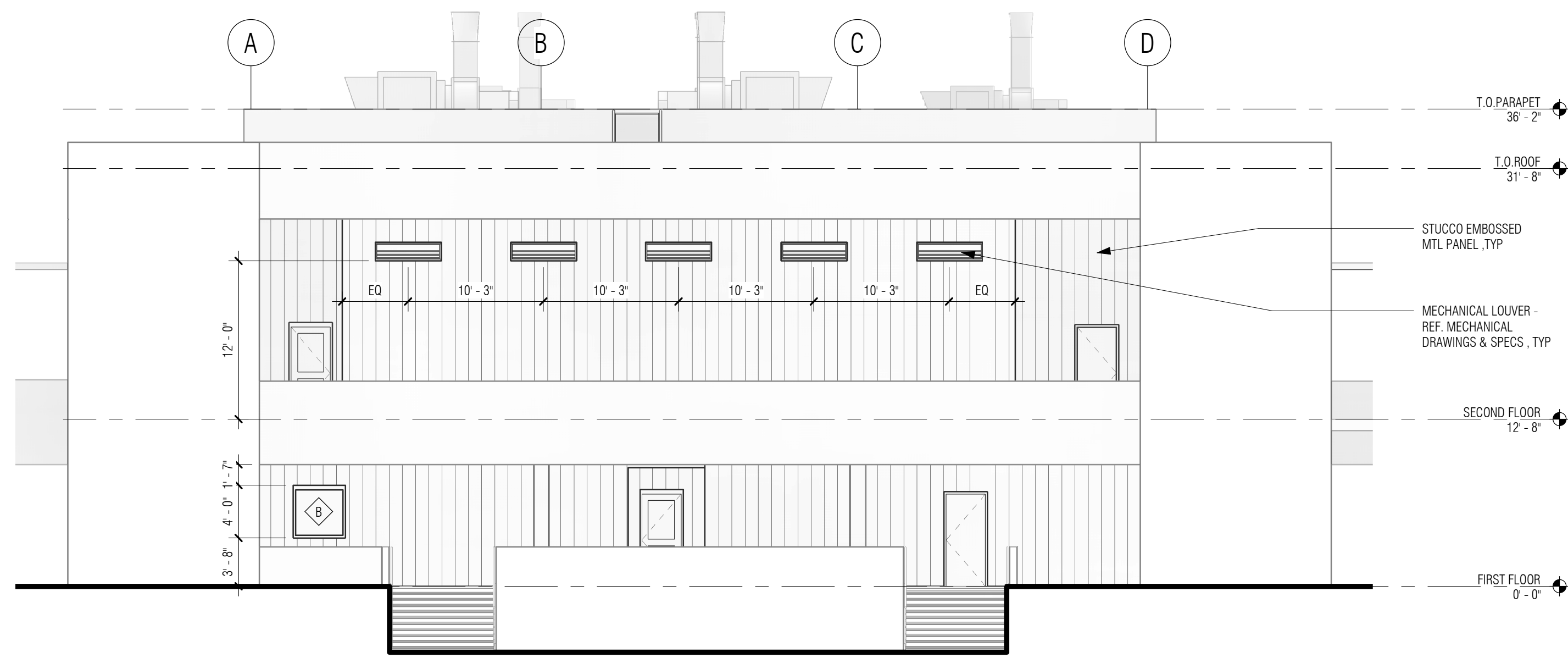


**3 ROOF HATCH ENCLOSURE**  
SCALE: 1/2" = 1'-0"

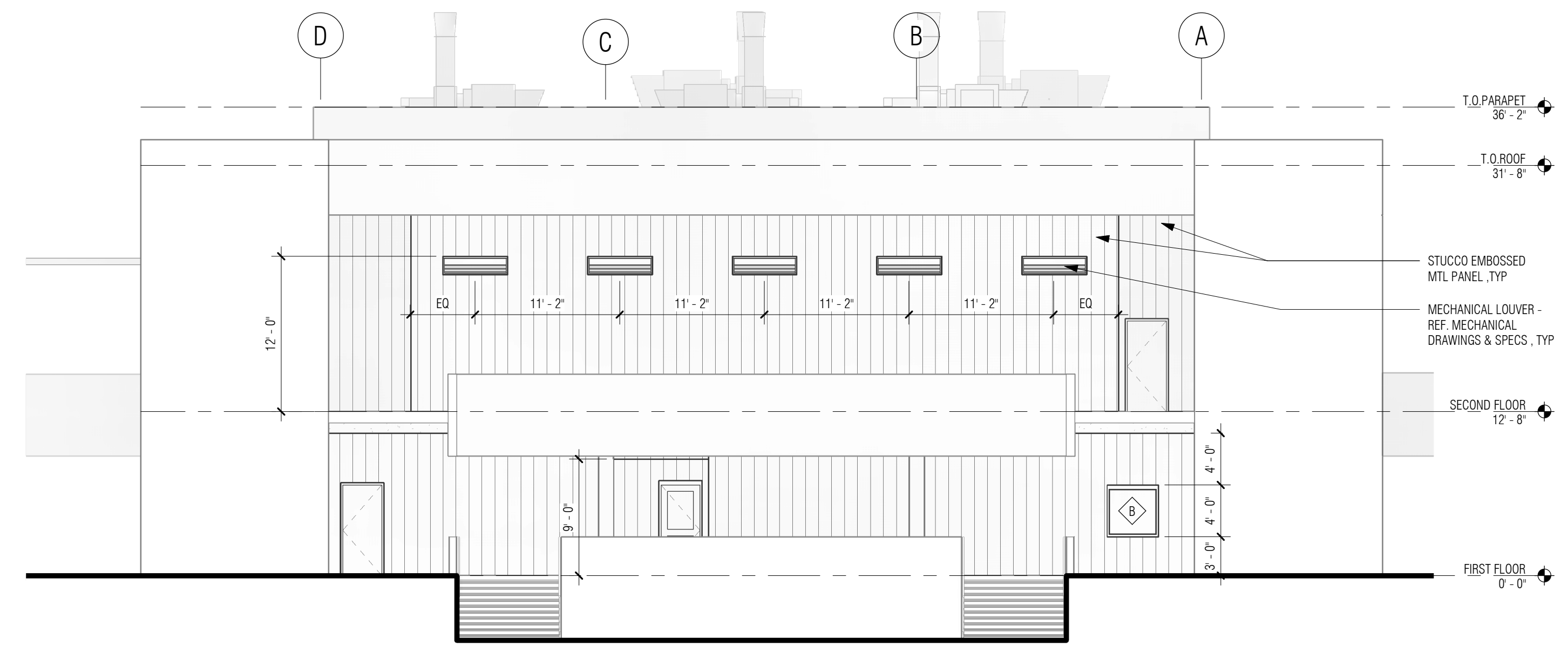


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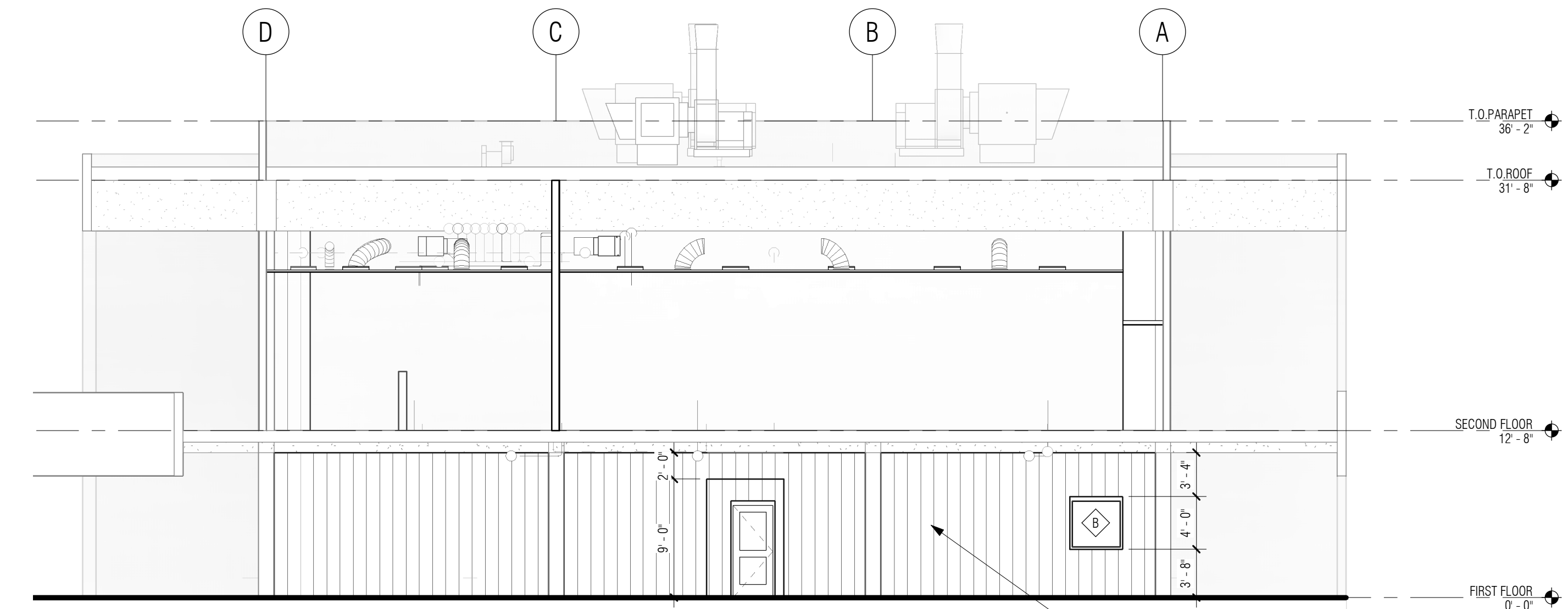




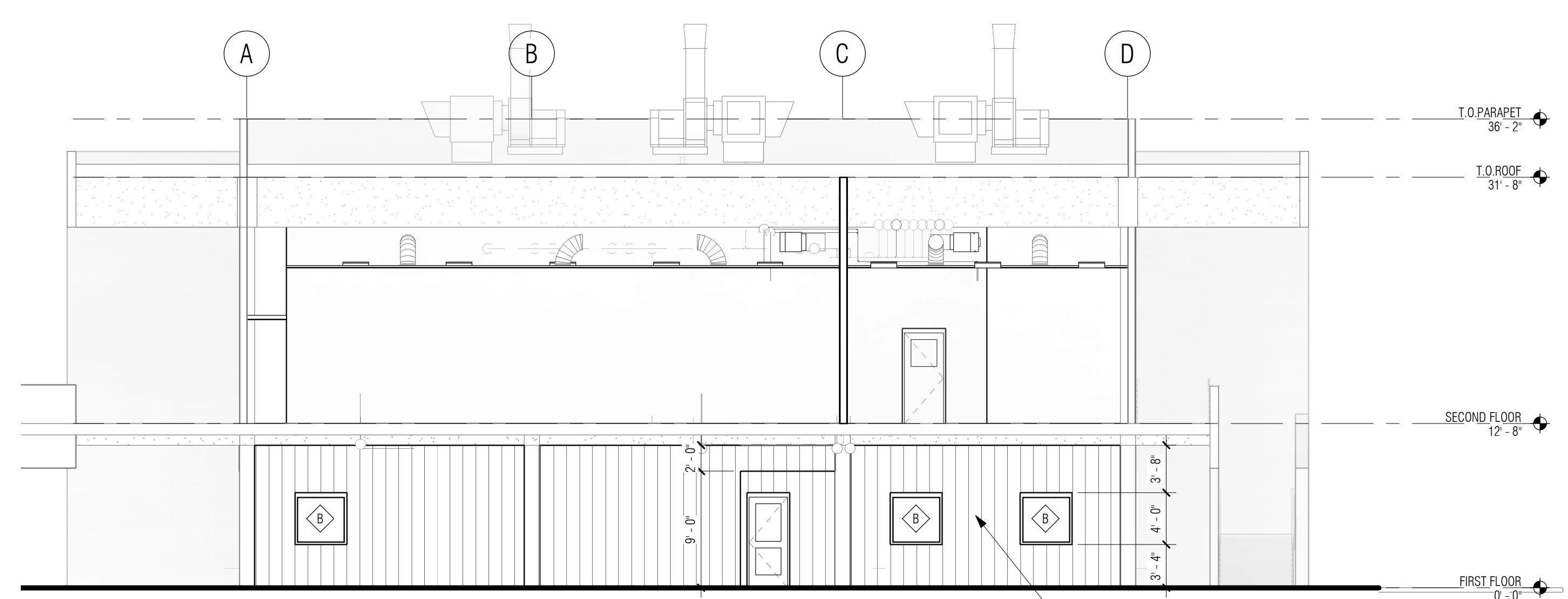
1 BUILDING ELEVATION - SOUTH  
1/8" = 1'-0"



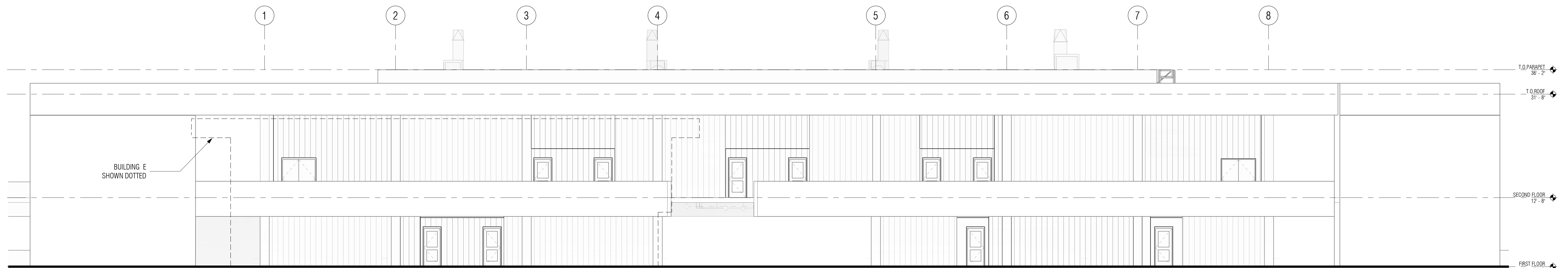
2 BUILDING ELEVATION - NORTH  
1/8" = 1'-0"



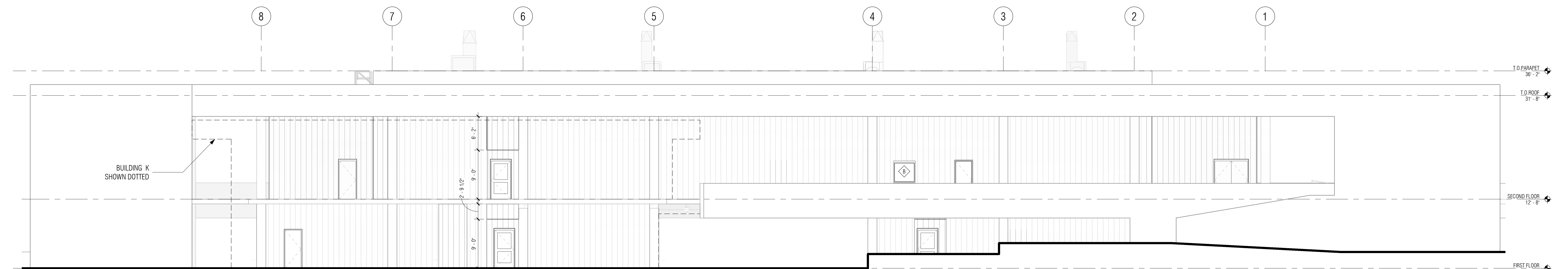
3 BUILDING ELEVATION - BREEZEWAY SOUTH  
1/8" = 1'-0"



4 BUILDING ELEVATION - BREEZEWAY NORTH  
1/8" = 1'-0"

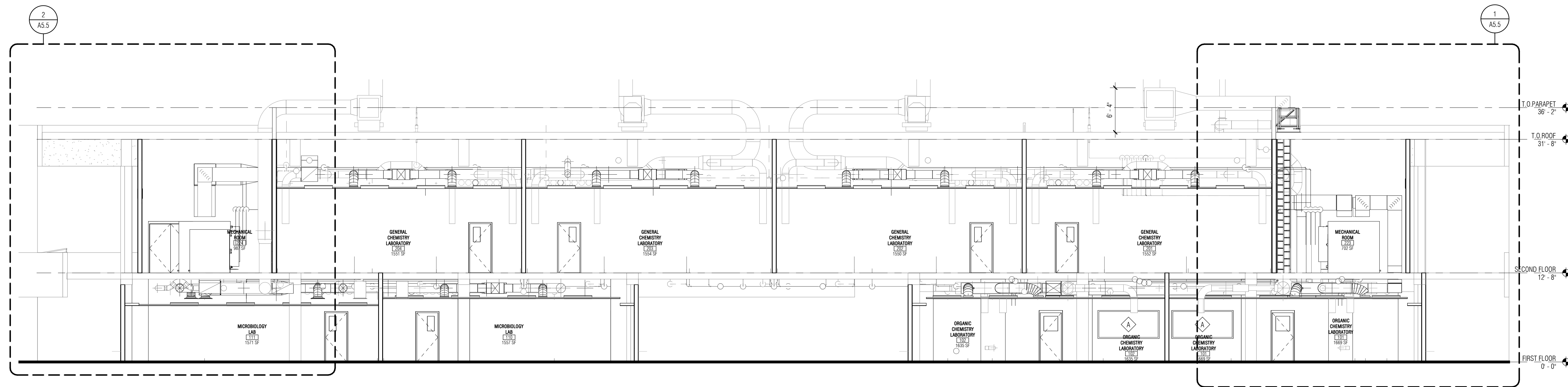


5 BUILDING ELEVATION - WEST  
1/8" = 1'-0"

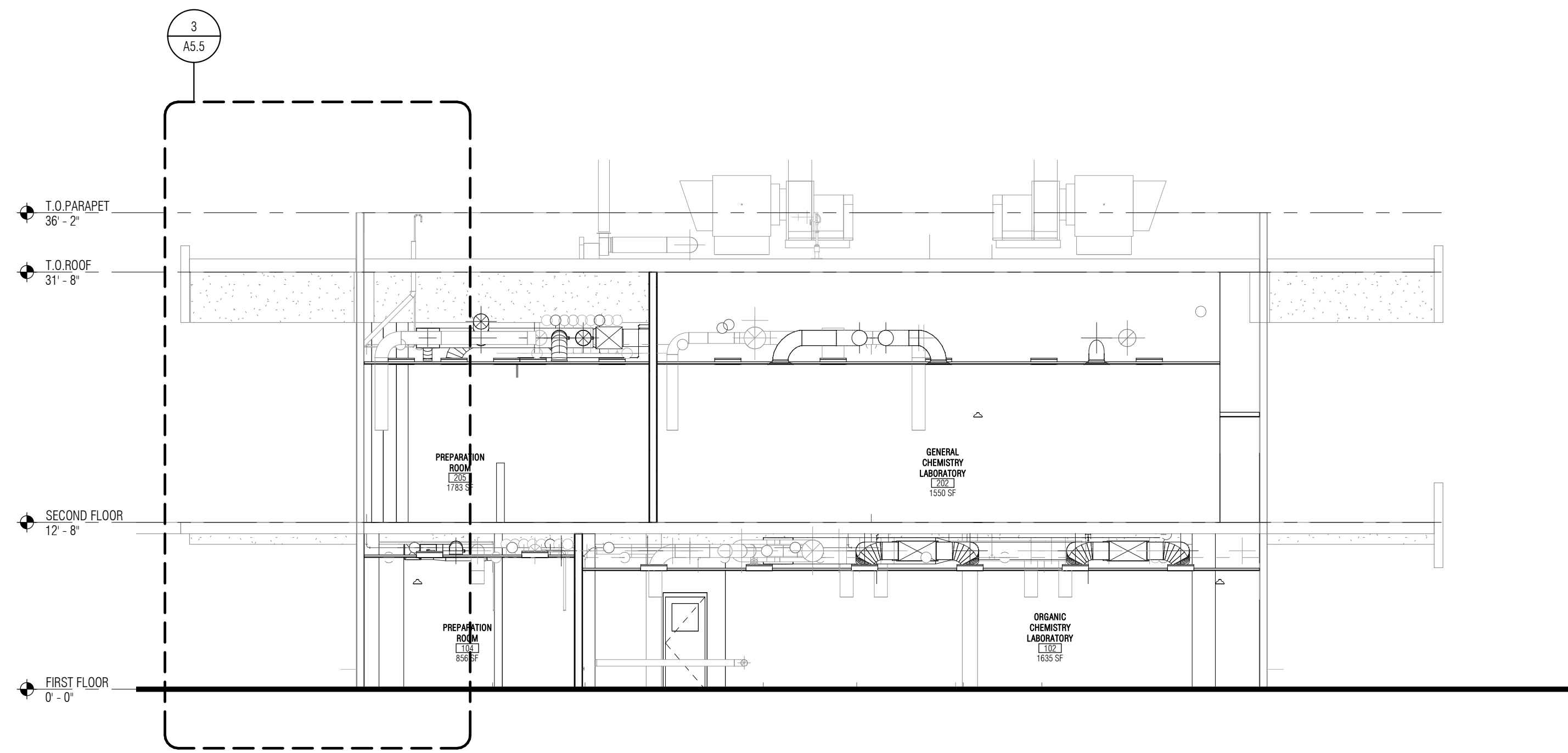


6 BUILDING ELEVATION - EAST  
1/8" = 1'-0"

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**1 BUILDING SECTION A**  
 SCALE: 1/8" = 1'-0"



**2 BUILDING SECTION B**  
 SCALE: 1/8" = 1'-0"

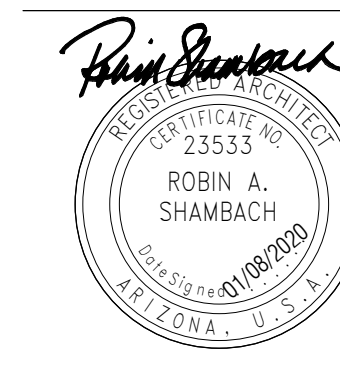
**CONSULTANTS**  
 LABORATORY  
 BPC & FISH, INC.  
 1000 N. Oracle Rd., Suite 100  
 San Diego, CA 92108-3192  
 Phone: 619.297.0159

**MECHANICAL**  
 AC Mechanical Engineering  
 1474 E. Pinal Ave., Suite 100  
 Tucson, AZ 85711  
 Phone: 520.327.7611

**STRUCTURAL**  
 Center Structural Engineering  
 3028 N. Alameda Rd., Suite 200  
 Tucson, AZ 85716  
 Phone: 520.323.3422

**ELECTRICAL**  
 Monrad Engineering, Inc.  
 1520 E. Pinal Ave., Suite 100  
 Tucson, AZ 85711  
 Phone: 520.884.0045

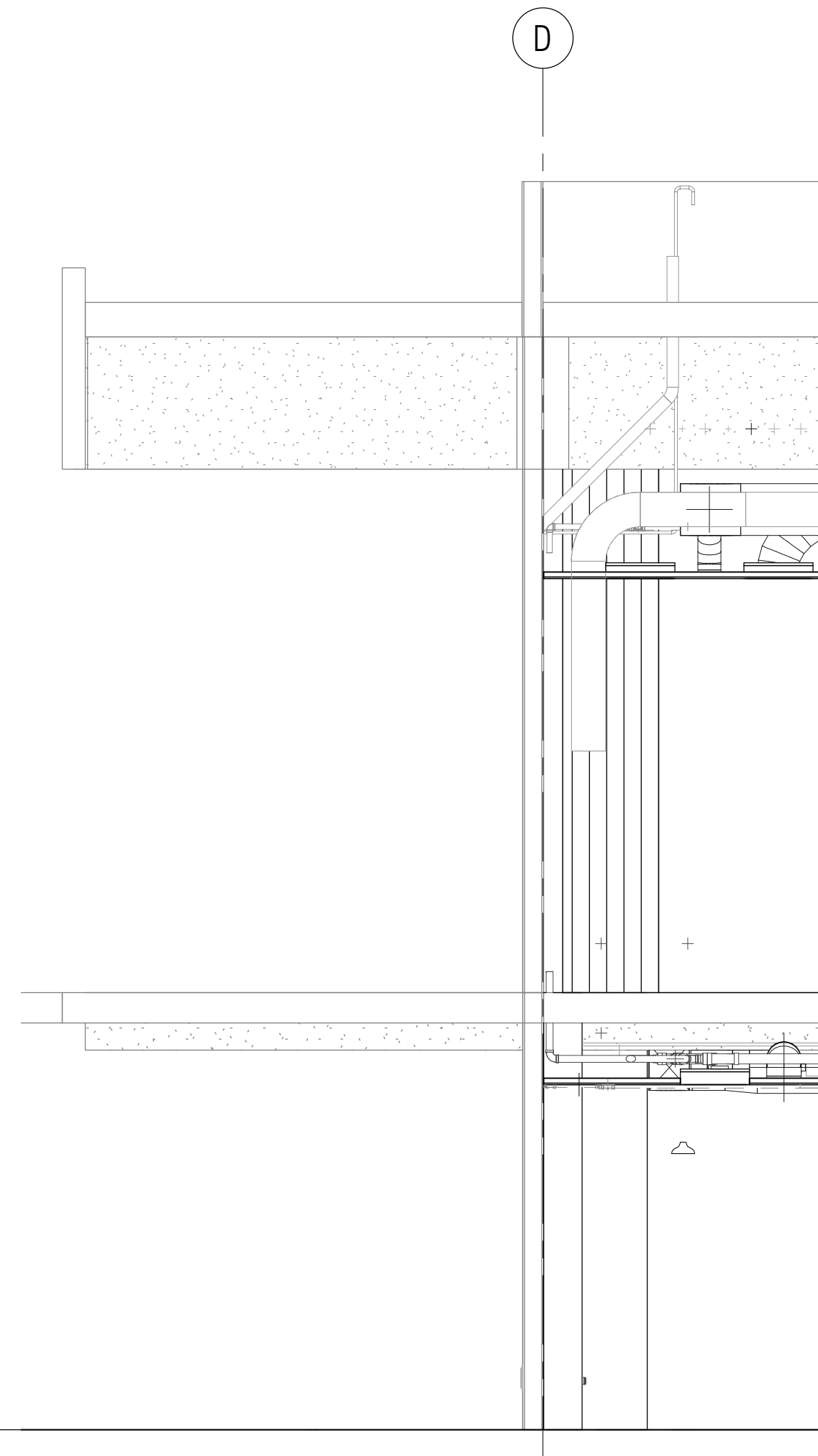
**Pima Community College**  
**PCC West Lab Building F**  
**Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745



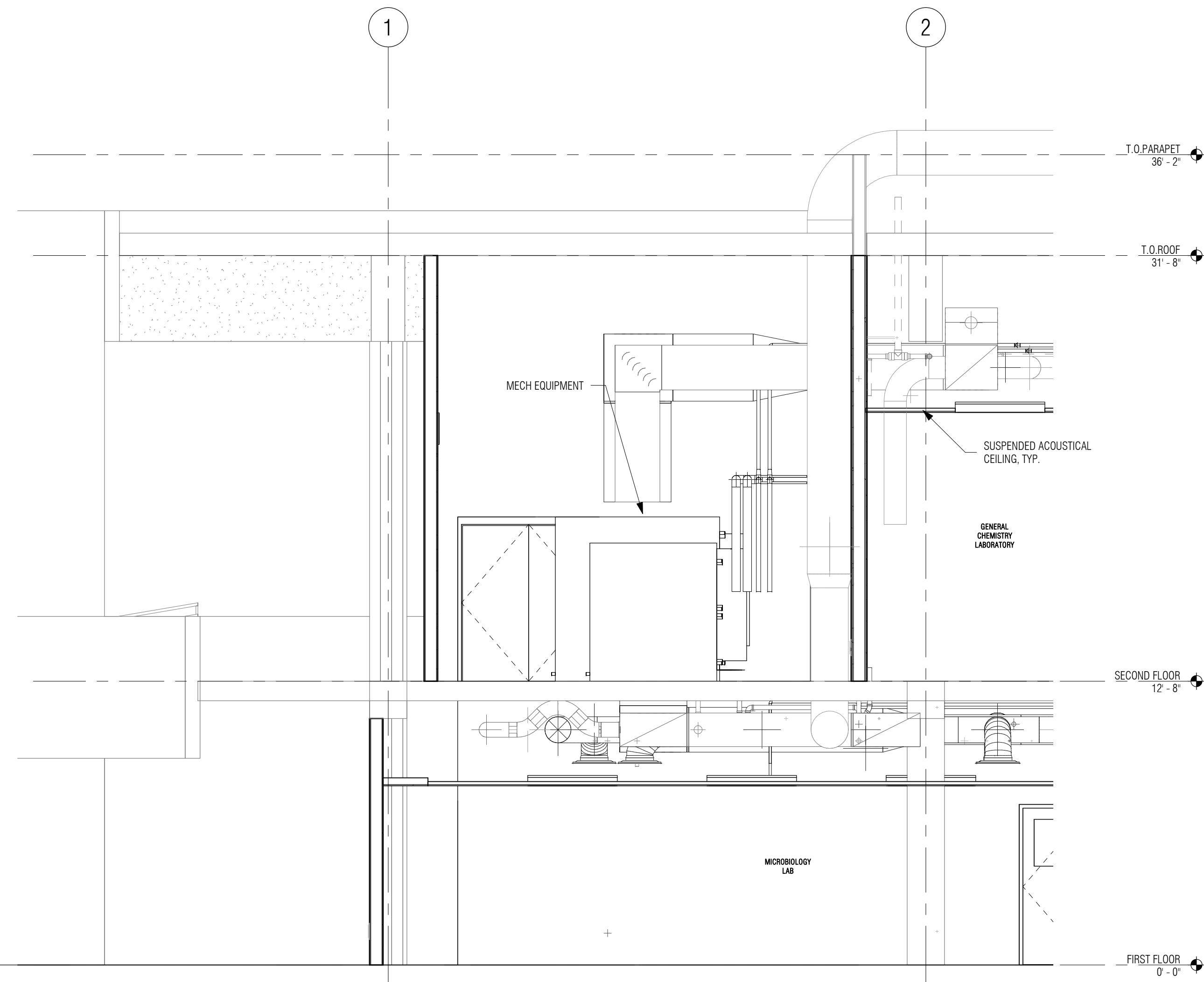
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 DRAWN BY: Author  
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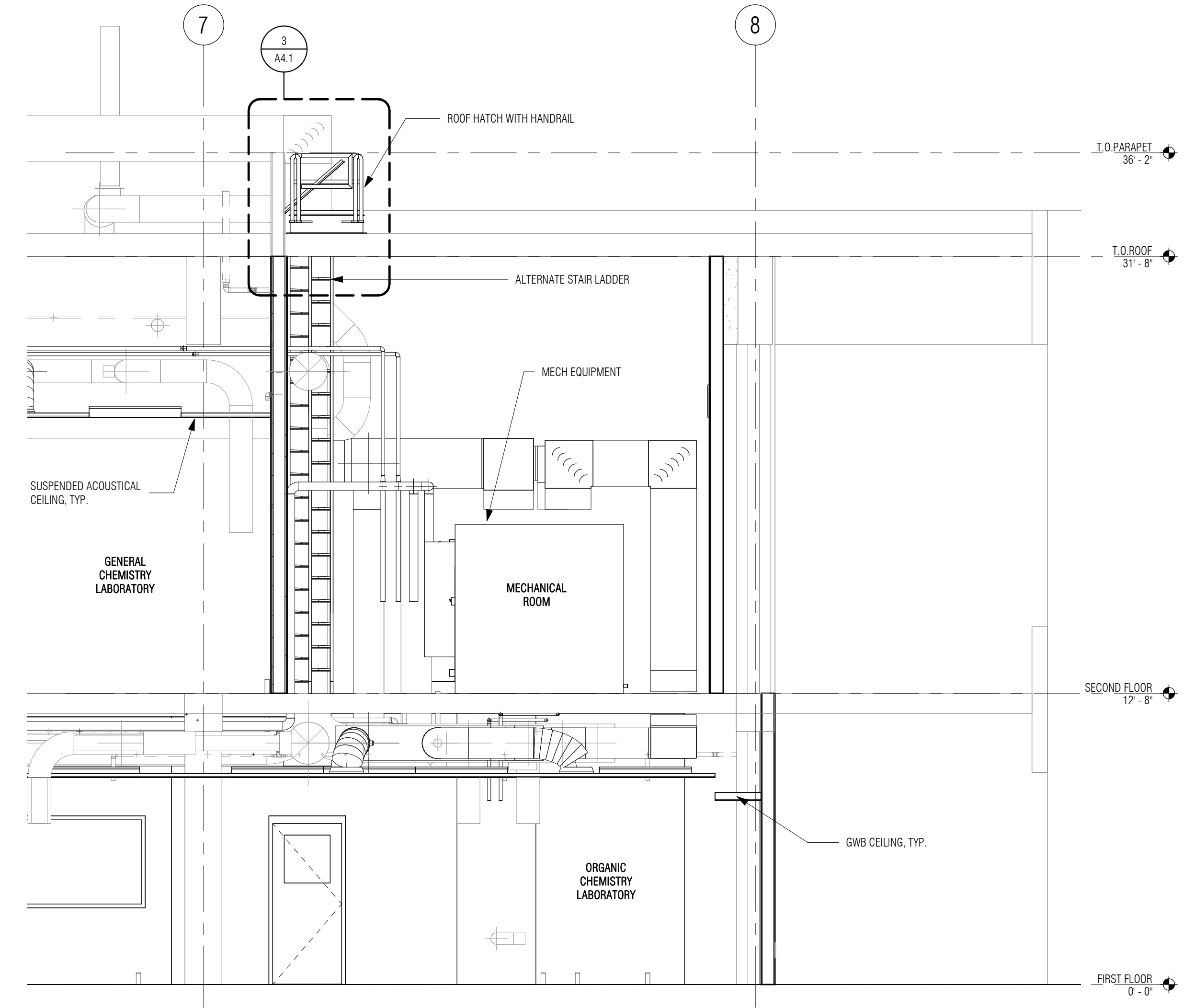
3 WALL SECTION @ GRID "A"  
SCALE: 1/4" = 1'-0"



2 WALL SECTION @ GRID "1-2"  
SCALE: 1/4" = 1'-0"



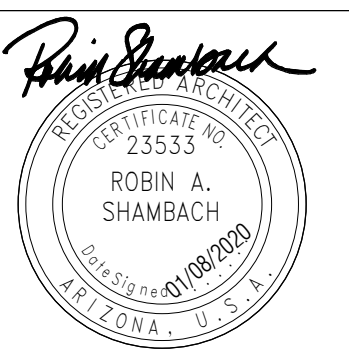
1 WALL SECTION @ GRID "7-8"  
SCALE: 1/4" = 1'-0"



WALL SECTIONS

A5.5  
100% CONSTRUCTION DOCUMENTS

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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS



**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

LABORATORY  
ARCS, 5715 N. Avenue #400  
Scottsdale, AZ 85250  
Phone: 619.297.0159

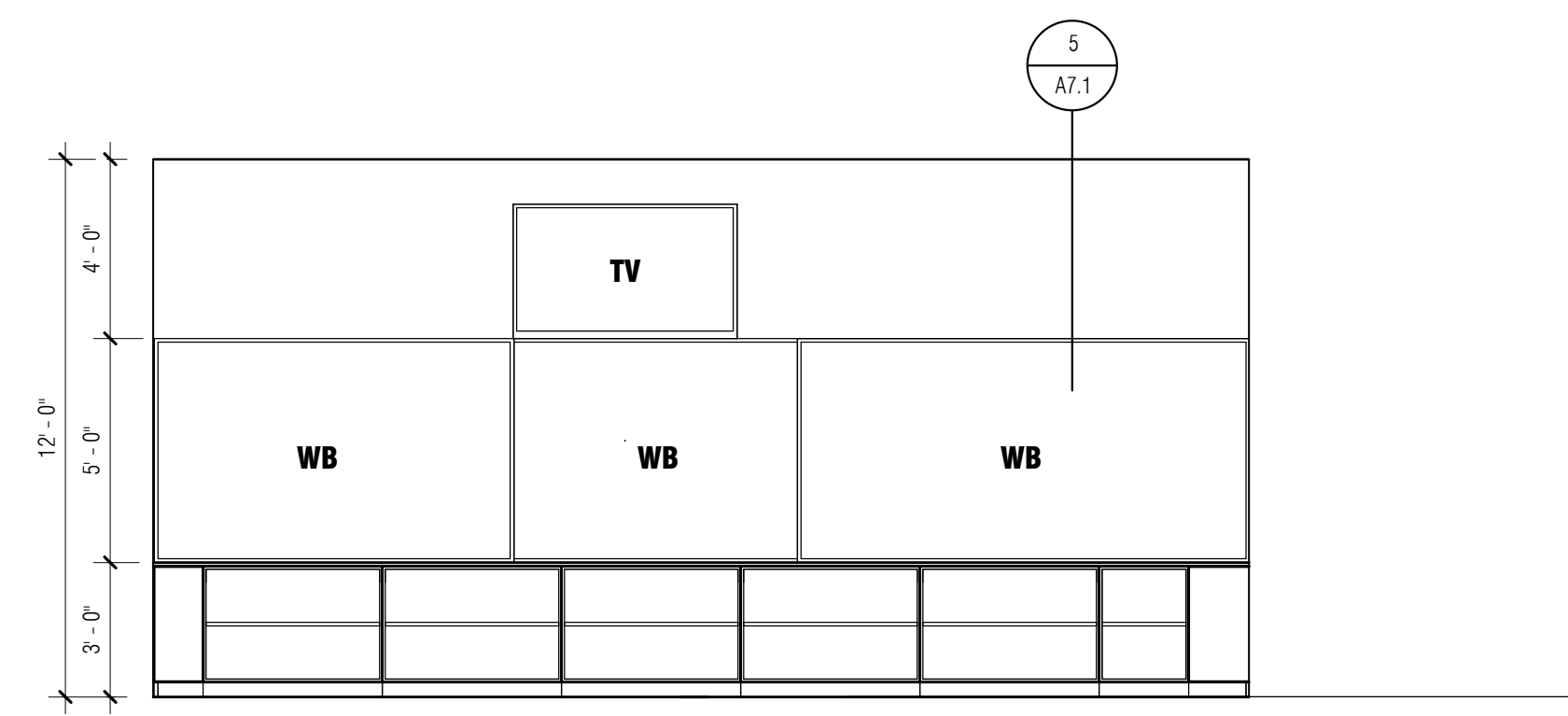
MECHANICAL  
AC Mechanical Engineering  
1647 E. Pinal Avenue #200  
Tucson, AZ 85711  
Phone: 520.327.7611

STRUCTURAL  
Strider Structural Engineering  
3028 N. Oracle Road, Suite 100  
Tucson, AZ 85716  
Phone: 520.323.3422

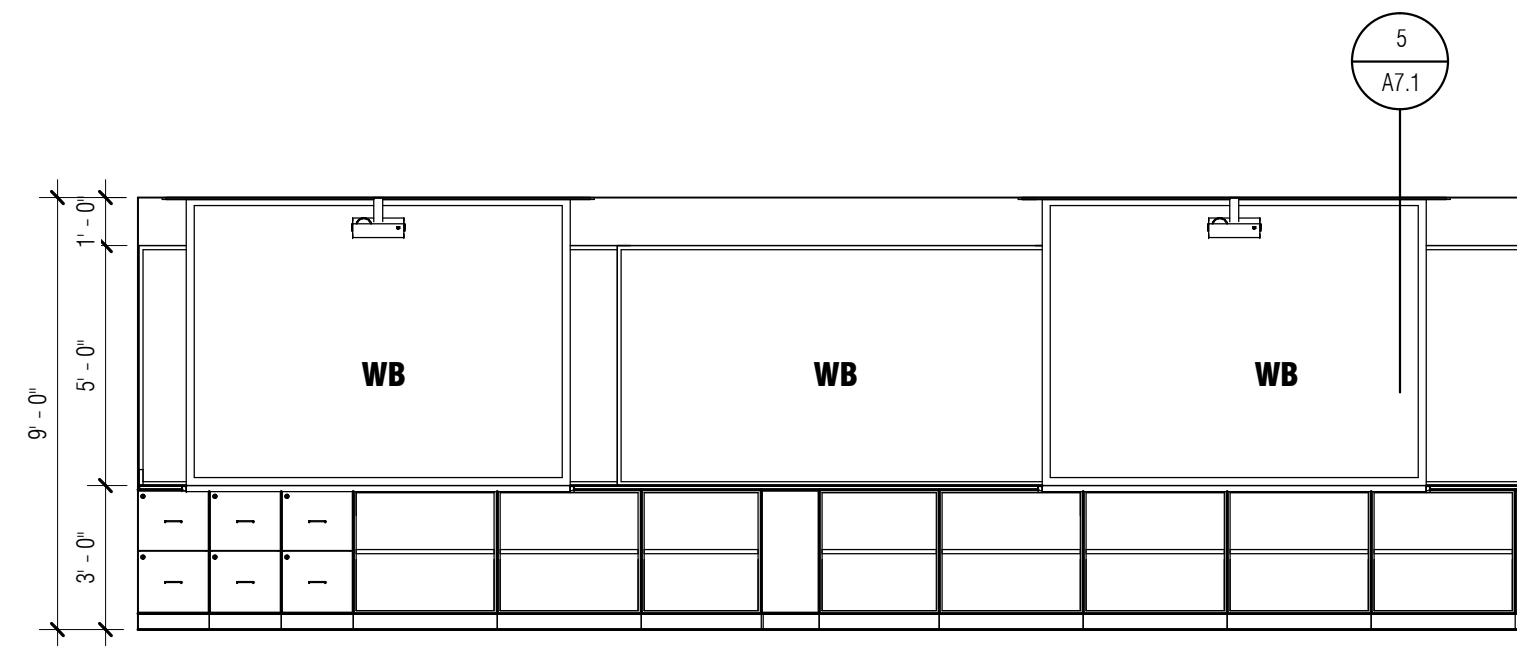
ELECTRICAL  
Morrise Engineering, Inc.  
1520 E. Pinal Avenue #200  
Tucson, AZ 85711  
Phone: 520.884.0045

**bws ARCHITECTS**  
BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Tucson, AZ 85711  
520.395.2702 Fax: 520.395.6171  
www.bwsarch.com

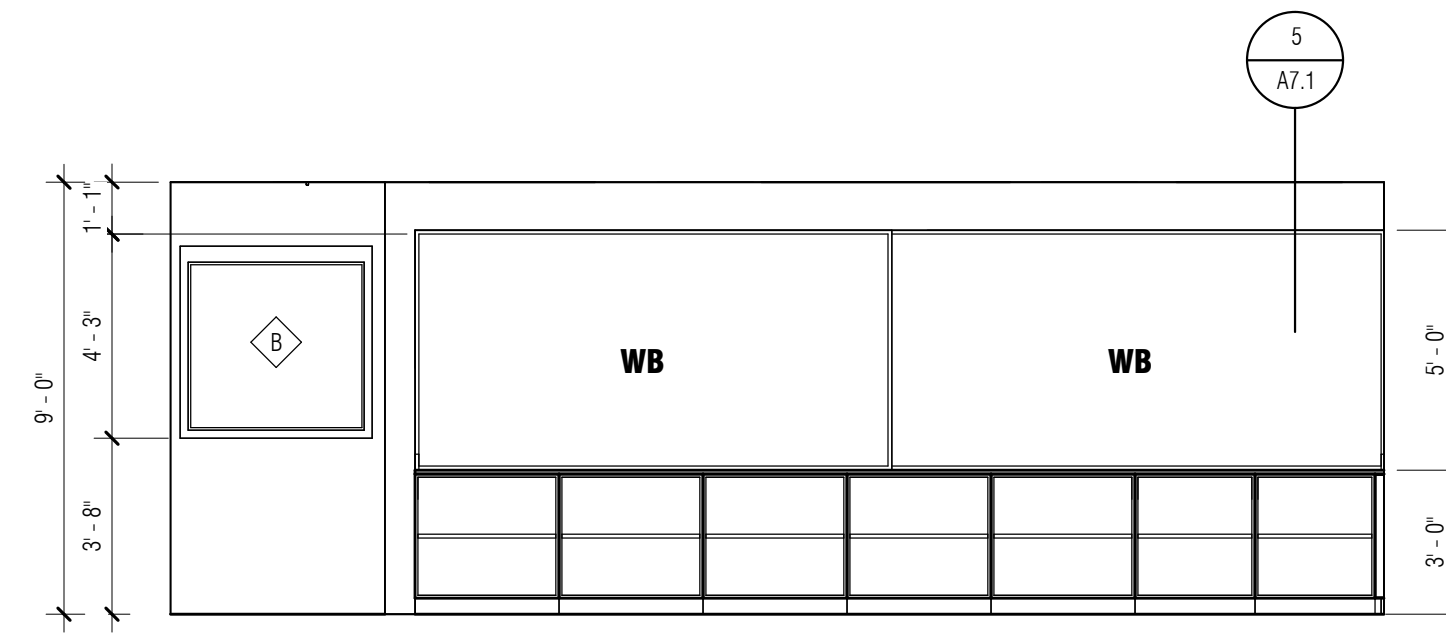




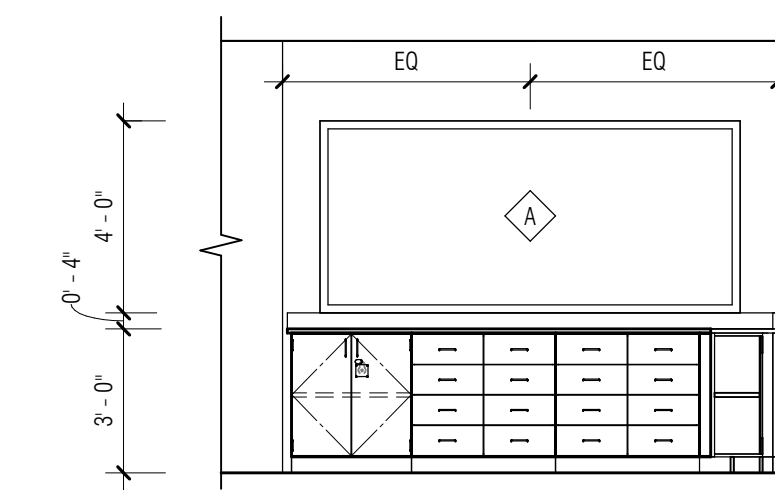
1 TEACHING WALL - GENERAL CHEMISTRY LABORATORY  
1/4" = 1'-0"



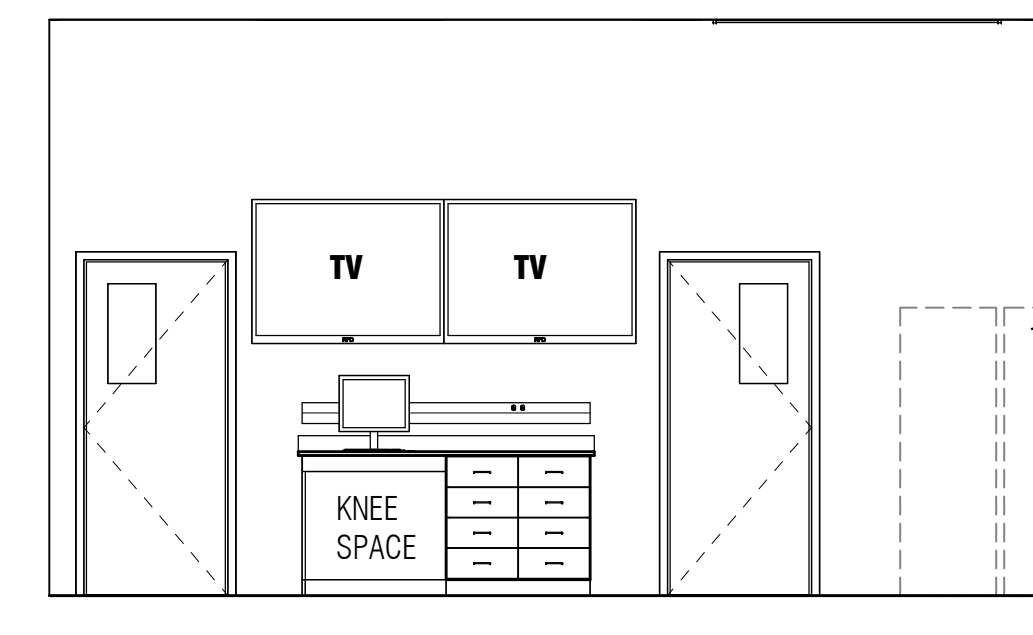
4 TEACHING WALL - MICROBIOLOGY LABORATORY  
1/4" = 1'-0"



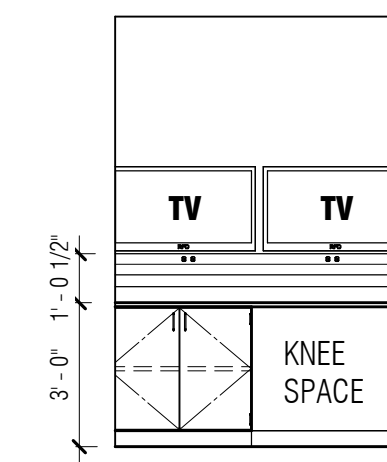
2 TEACHING WALL - ORGANIC CHEMISTRY LABORATORY  
1/4" = 1'-0"



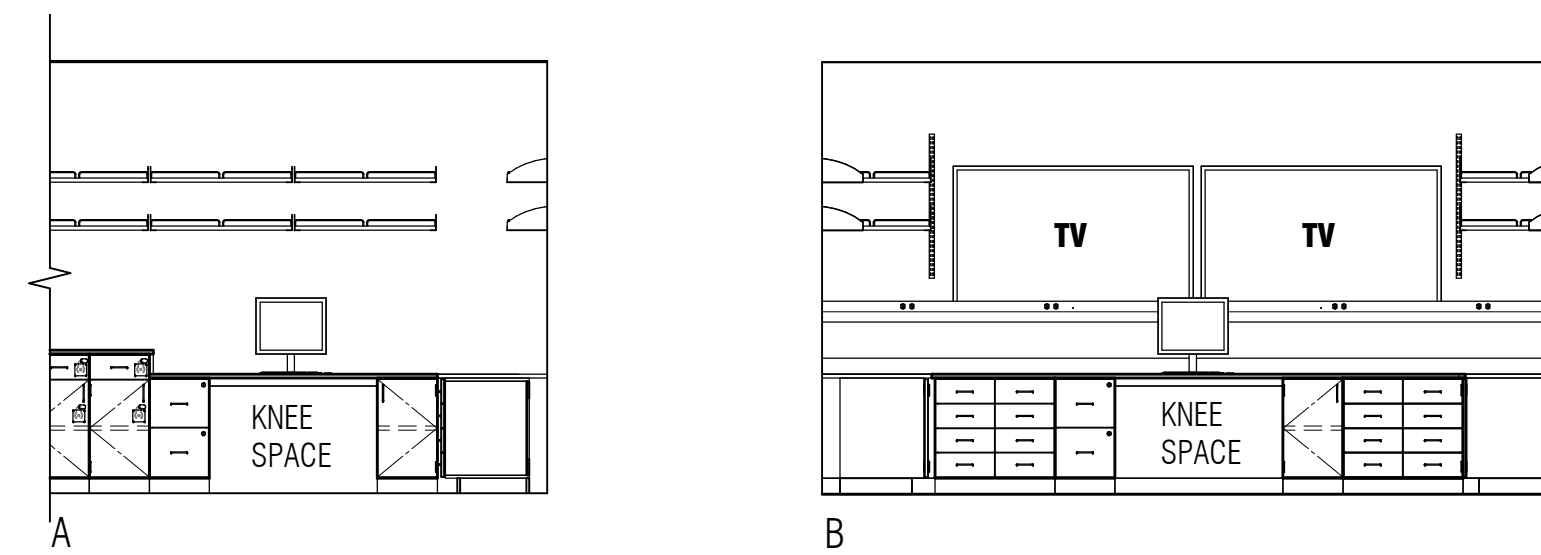
3 INSTRUMENTATION WINDOW  
1/4" = 1'-0"



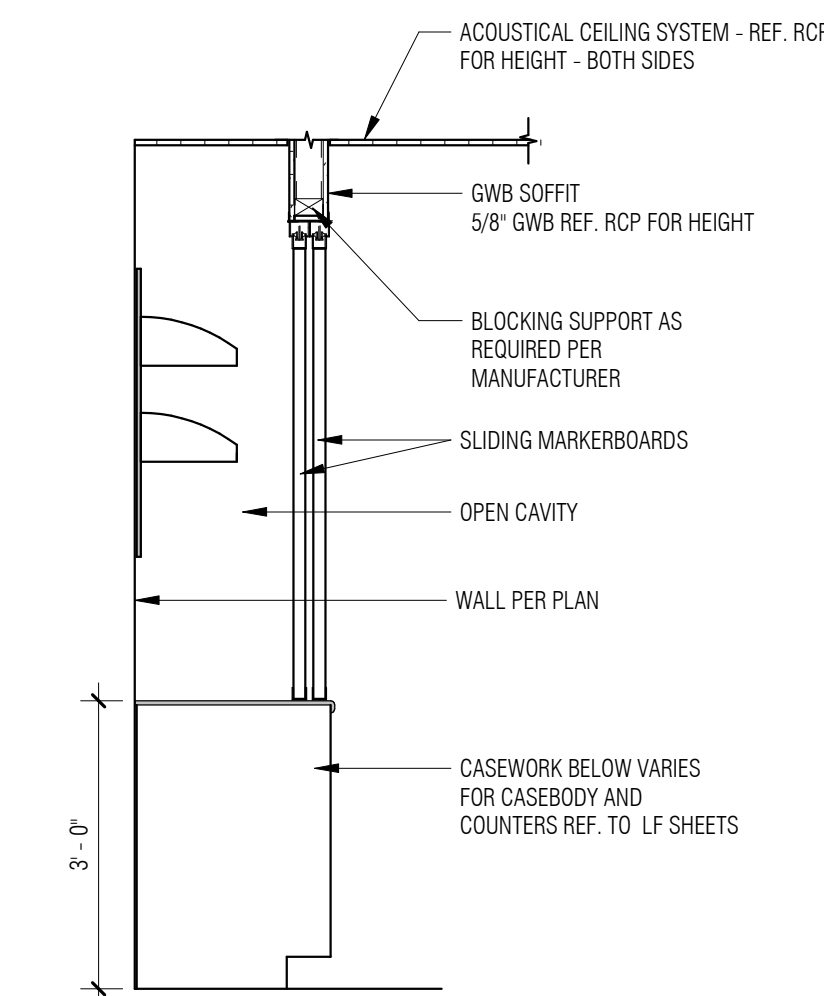
7 COMPUTER STATION @ PREP. ROOM 205  
1/4" = 1'-0"



6 COMPUTER STATION - @ PREP. ROOM 112  
1/4" = 1'-0"



5 COMPUTER STATION @ PREP. ROOM 104  
SCALE: 1/4" = 1'-0"

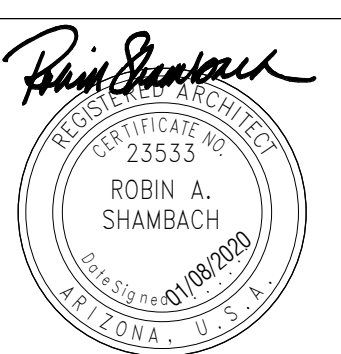


TYPICAL SLIDING MARKER BOARD ON LAB CASEWORK  
5 SCALE: 1/2" = 1'-0"

**LEGEND**

- WB WHITE BOARD
- TV TV MONITOR - 60" WIDE 0.F.O.I

NOTE:  
CASEWORK VARIES FOR CASEBODY AND COUNTERS REF. TO LF SHEETS



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**REVISIONS**

**CONSULTANTS**

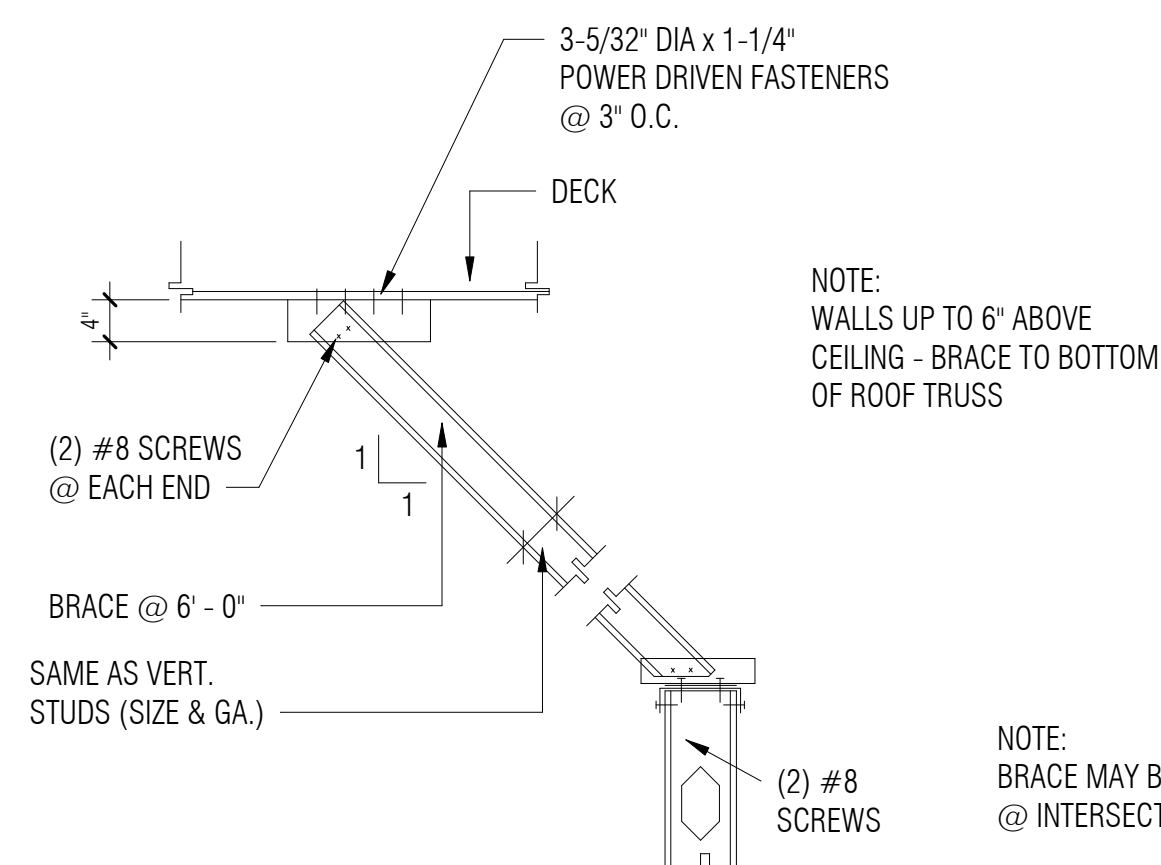
**LABORATORY**  
ARC Lab Systems #400  
1000 N. 17th Ave., Suite 100  
San Diego, CA 92163-3192  
Phone: 619.297.0169

**MECHANICAL**  
AC Mechanical Engineering  
1047 E. Park Ave., Suite 100  
Tucson, AZ 85711  
Phone: 520.327.7611

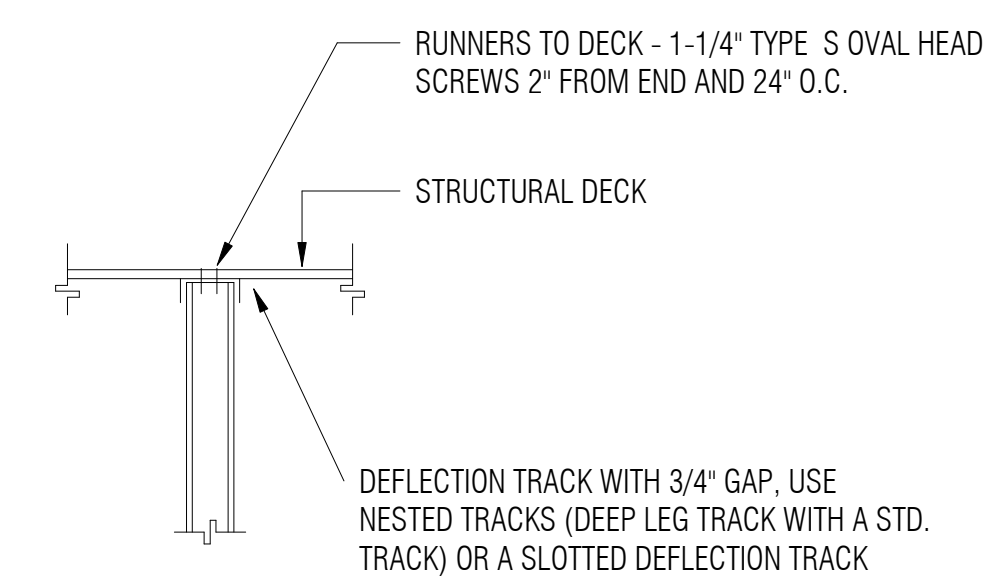
**STRUCTURAL**  
Gunter Structural Engineering  
3028 N. Wilm. Blvd. #100  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
Morrise Engineering, Inc.  
1520 E. Park Ave., Suite 200  
Tucson, AZ 85711  
Phone: 520.884.0045

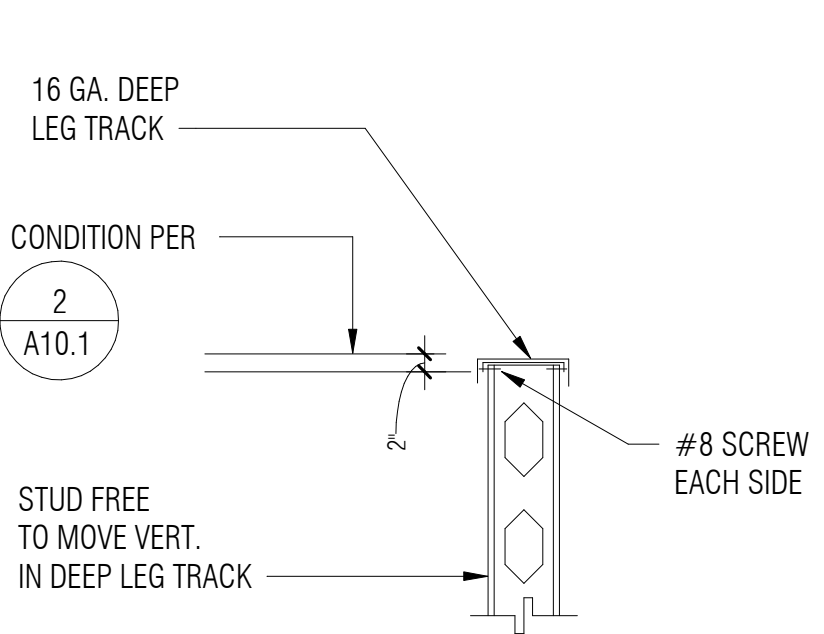
METAL STUD DETAILS - INTERIOR WALLS



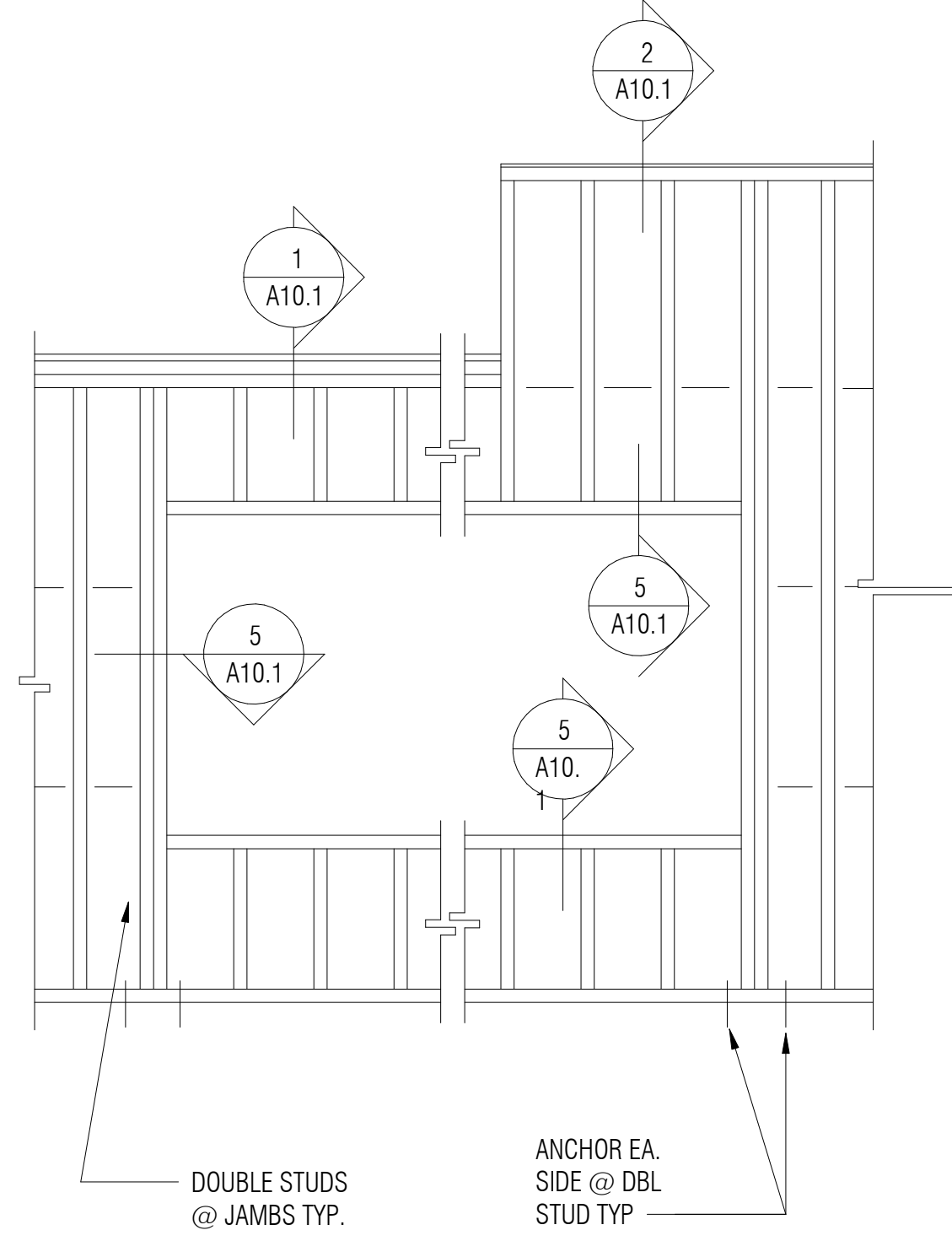
1 BRACING ANCHORAGE



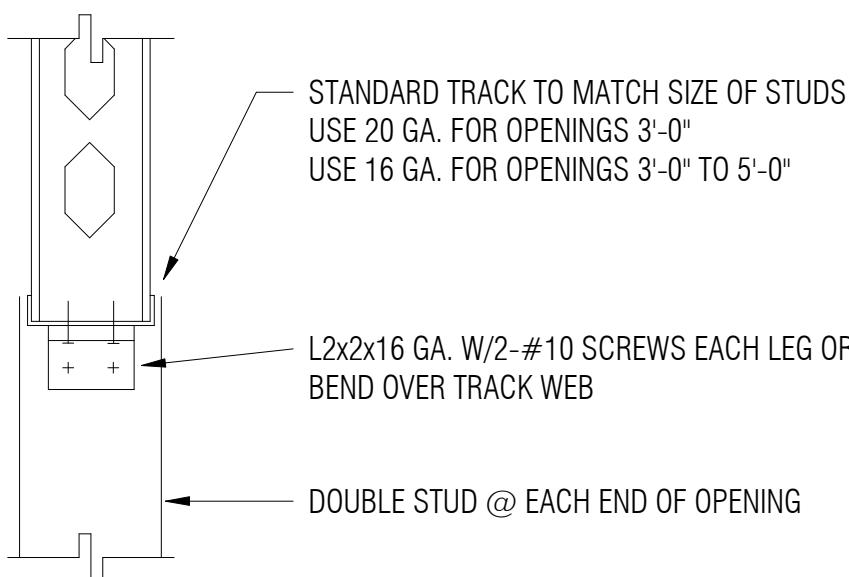
2 INTERIOR HEAD DETAILS



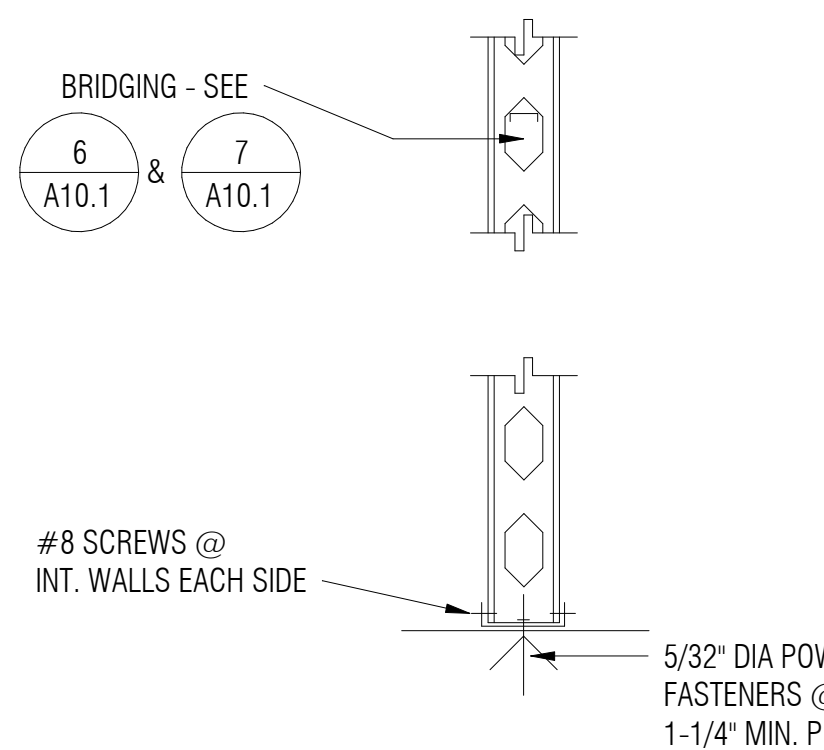
3 METAL STUD WALL SECTION



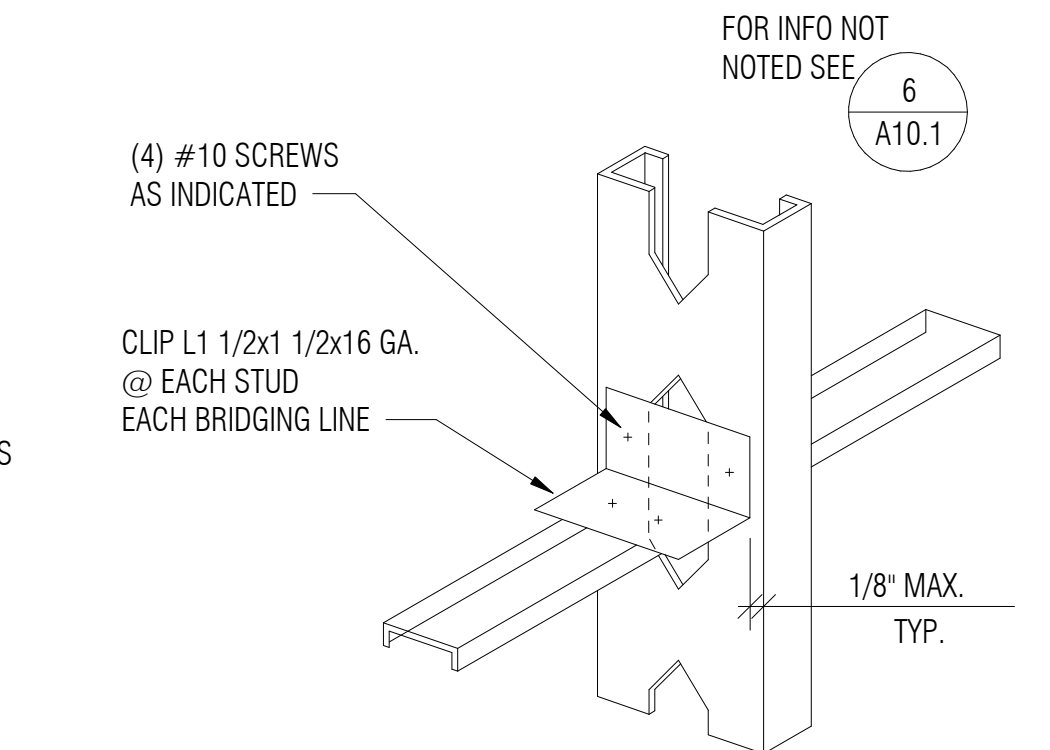
4 TYP. INTERIOR STUD WALL ELEV.



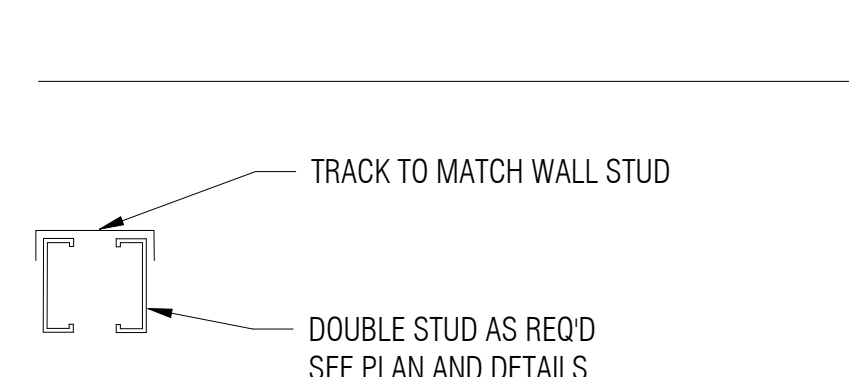
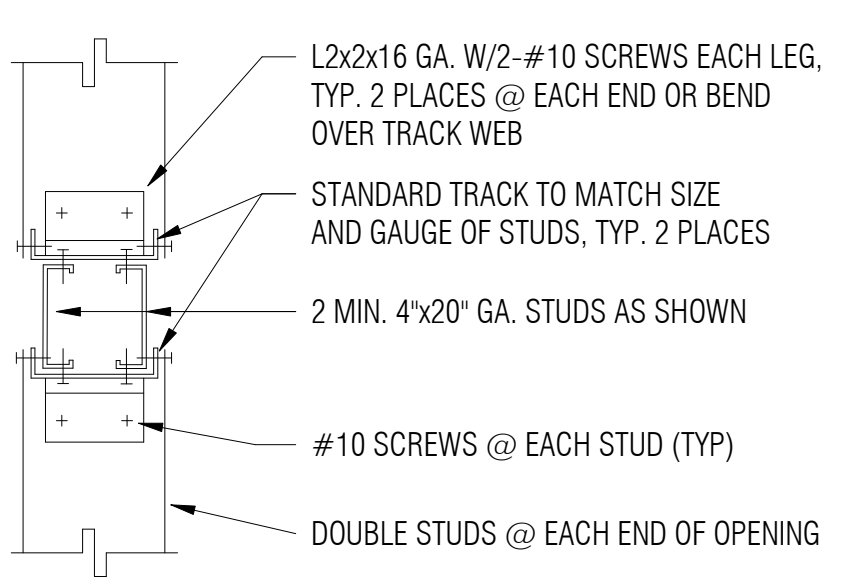
5 DOUBLE STUD DETAIL



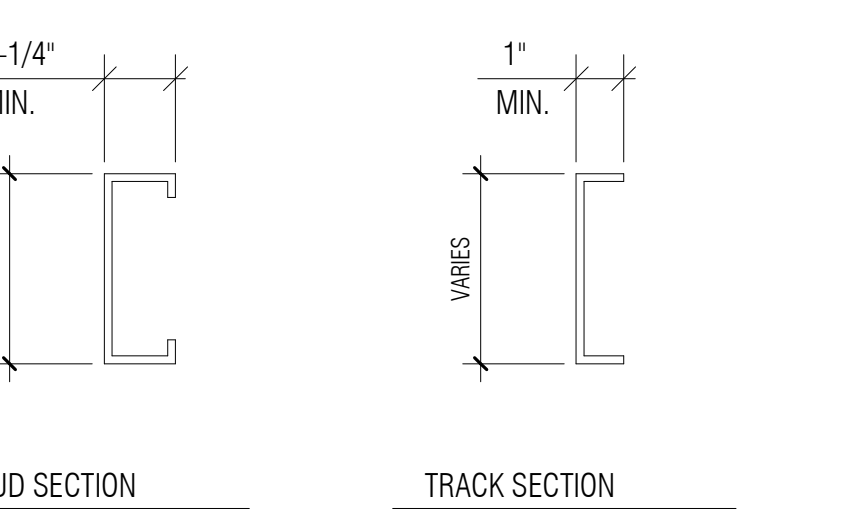
6 BRIDGING FOR WALLS W/ SHEATHING ON BOTH FACES



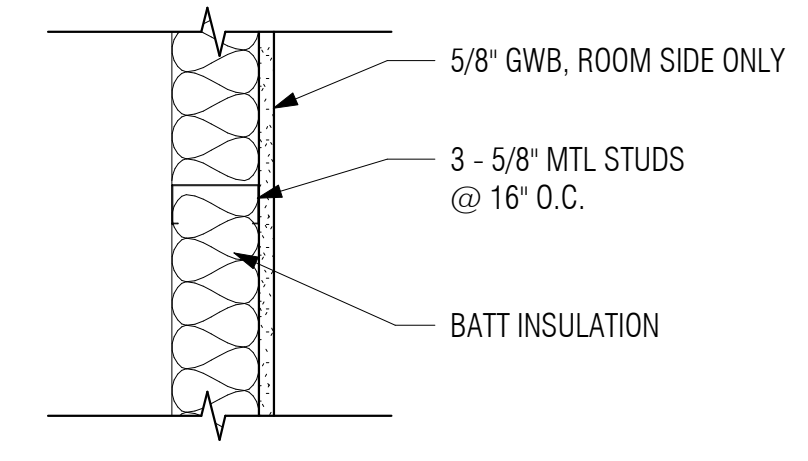
7 BRIDGING FOR WALLS WITH OR WITHOUT SHEATHING



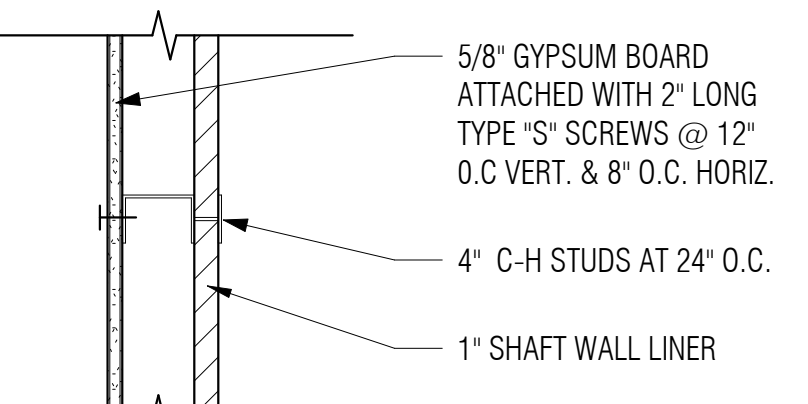
7 CORNER METAL TERMINATION



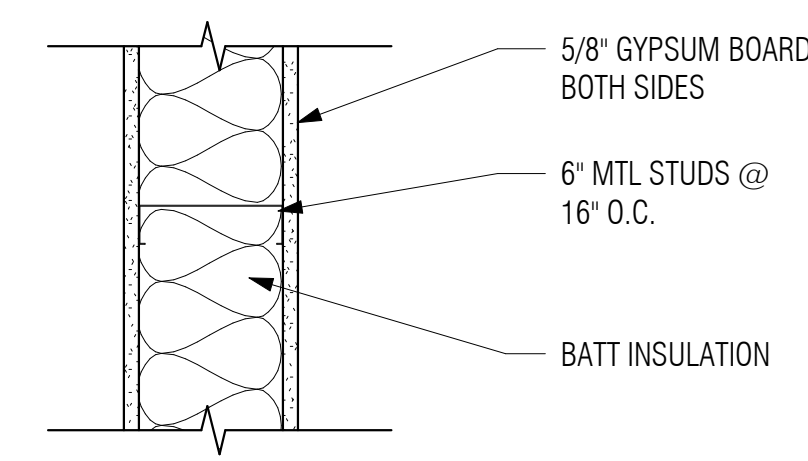
8 CORNER METAL TERMINATION



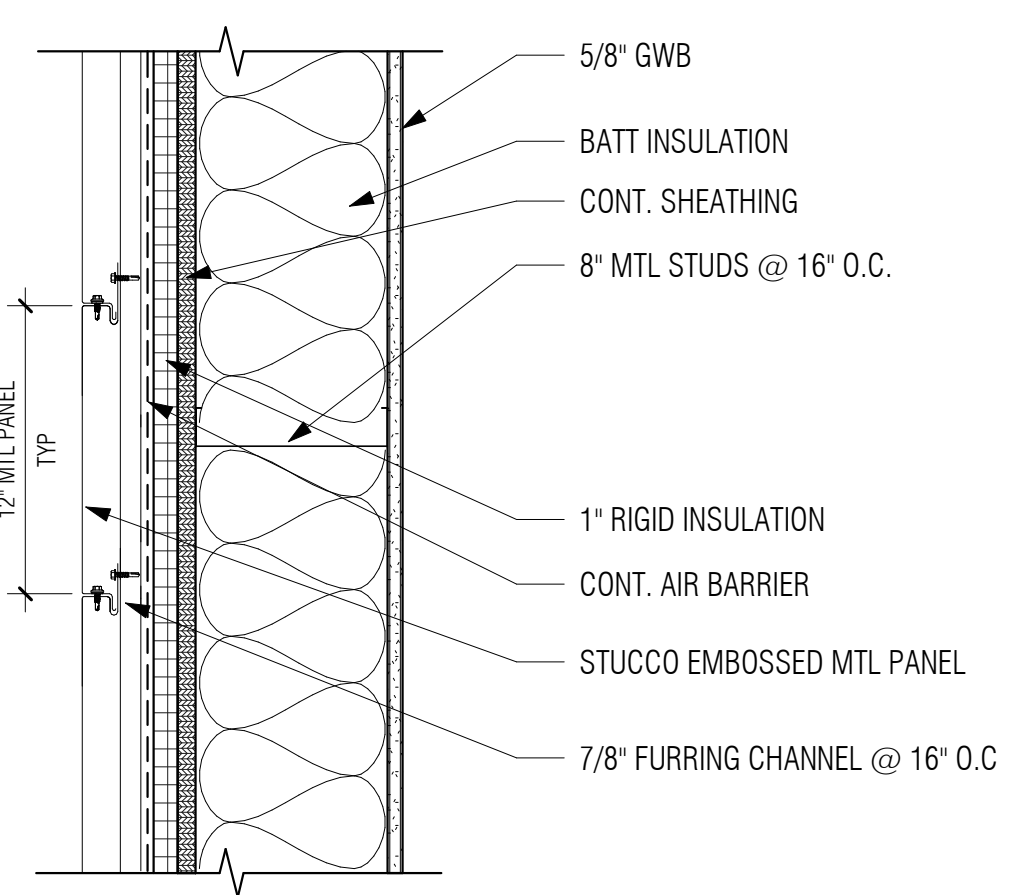
INT - 3 5/8\"/>



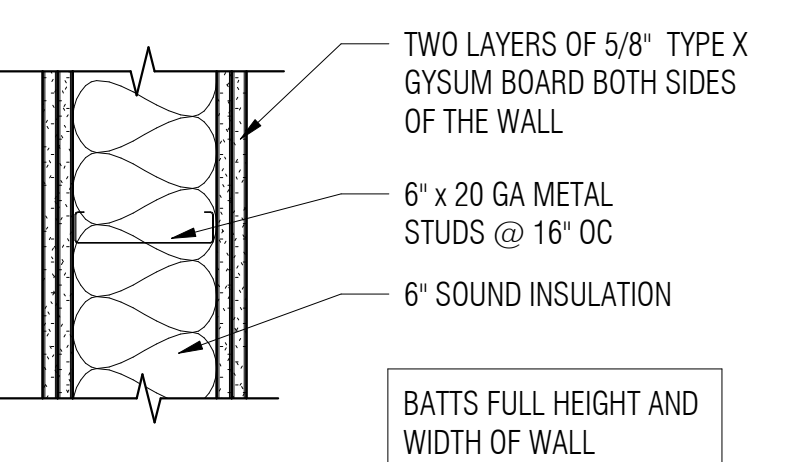
INT - SHAFT WALL (1 HR)



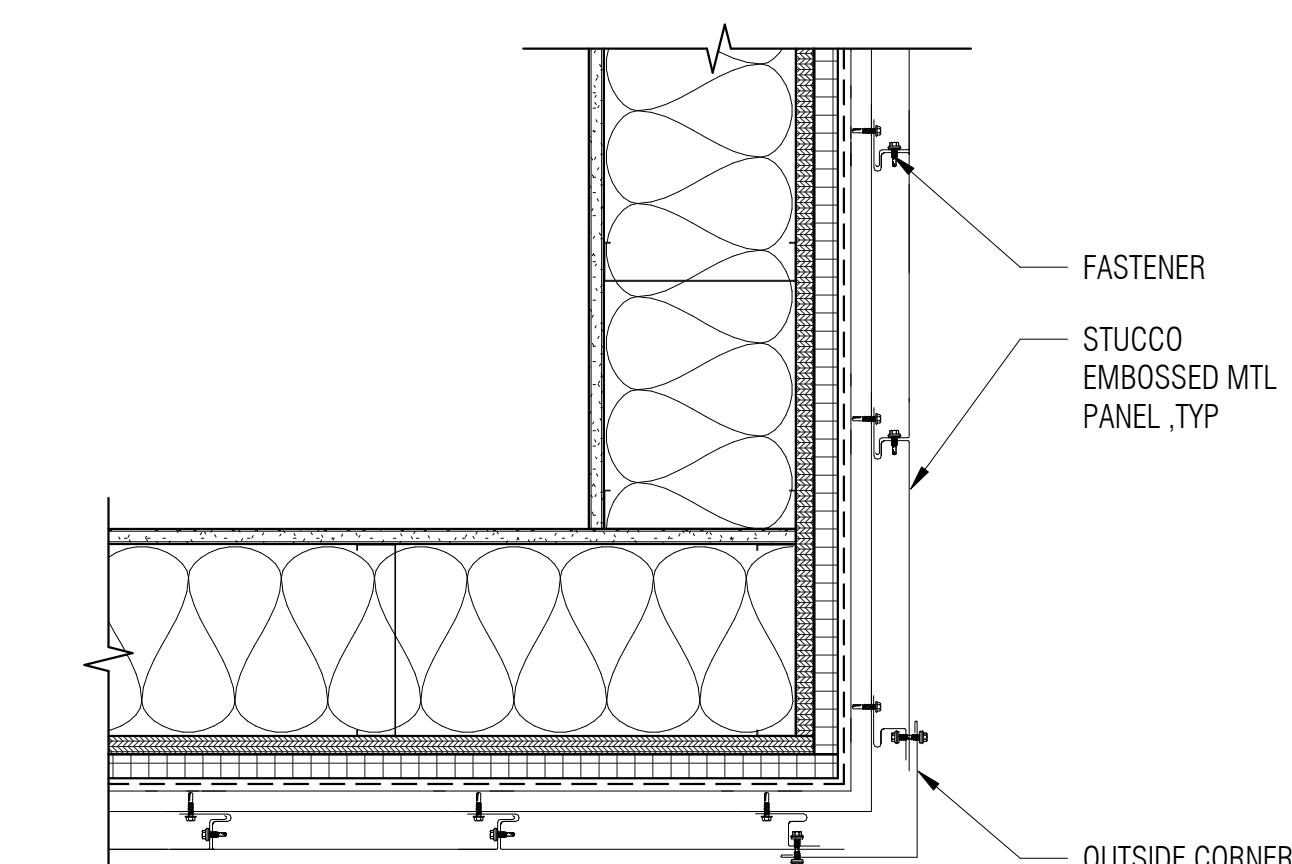
INT - 6\"/>



EXT - 8\"/>



INT - 6\"/>



1 CORNER METAL TERMINATION

ABBREVIATIONS	
A.B.	ANCHOR BOLT
A.C.I.	AMERICAN CONCRETE INSTITUTE
A.E.	ARCHITECT ENGINEER
A.I.A.	AMERICAN INSTITUTE OF ARCHITECTS
ALT.	ALTERNATE
APPROX.	APPROXIMATE
ARCH.	ARCHITECT (URAL)
@	AT
BOT.	BOTTOM
B.B.	BOND BEAM
BD.	BOARD
BTWN.	BETWEEN
BLDG.	BUILDING
BLK.	BLOCK
BLKG.	BLOCKING
BM.	BEAM
B.O.F.	BOTTOM OF FOOTING
BRG.	BEARING
BSMT.	BASEMENT
CHAN.	CHANNEL
CAM.	CAMBER
DEM.	CEMENT
C.I.P.	CAST IN PLACE
C.J.	CONTROL/CONSTRUCTION JOINT
CLR.	CLEAR
C.M.U.	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECT (ION)
CONST.	CONSTRUCT (ION)
CONT.	CONTINUOUS
Q	CENTER LINE
DBL.	DOUBLE
DEMO.	DEMOLITION
DET.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DN.	DOWN
DO.	DITTO
DWG.	DRAWING
EA.	EACH
EL.	ELEVATION
ELEC.	ELECTRICAL
ENG.	ENGINEER
EQ.	EQUAL
EQUIP.	EQUIPMENT
EW.	EACH WAY
EXTG.	EXISTING
EXP.	EXPANSION
EXT.	EXTERIOR
FDN.	FOUNDATION
F.F.	FINISH FLOOR
FIN.	FINISH
FRMG.	FRAMING
FT.	FOOT
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
G.L.	GLU-LAM
GYP.	GYP-SUM
HORIZ.	HORIZONTAL
H.S.A.	HEADED STUD ANCHOR
HT.	HEIGHT
H.V.A.C.	HEATING/VENTILATING
IN.	INCH
INT.	INTERIOR
JST.	JOIST
JT.	JOINT
K	KIP (1000)
KO.	KNOCK OUT
L.L.	LIVE LOAD
L.L.H.	LONG LEG HORIZONTAL
L.L.V.	LONG LEG VERTICAL
MAT.	MATERIAL
MAX.	MAXIMUM
M.B.	MACHINE BOLT
MECH.	MECHANICAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MISC.	MISCELLANEOUS
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OPNG.	OPENING
PL.	PLATE
PT.	POINT
PWD.	PLYWOOD
REINF.	REINFORCE (D)
REQD.	REQUIRED
SCHED.	SCHEDULE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SP.	SPACE
SPEC.	SPECIFICATION
SQ.	SQUARE
ST.	STEEL
SYM.	SYMMETRICAL
T. & B.	TOP AND BOTTOM
THK.	THICKNESS
T.O.B.	TOP OF BEAM
T.O.F.	TOP OF FOOTING
T.O.J.	TOP OF JOIST
T.O.S.	TOP OF STEEL
T.O.W.	TOP OF WALL
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
W/	WITH
W/O	WITHOUT
WT.	WEIGHT
W.W.M.	WELDED WIRE MESH

SYMBOLS and LEGENDS	
	C.M.U.
	STEEL STUDS
	GRANULAR BASE COURSE
	PLYWOOD SHEATHING
	STEEL
	SECTION CUT
	KEYNOTE
	SHEAR WALL
	DETAIL TITLE
	ELEVATION TARGET
	REVISION
	STEP IN FOOTING
	CENTER LINE
	COLUMN MARK
	FOOTING MARK
	SLAB DEPRESSION
	OPENINGS
	COLUMN GRID
	COLUMN GRID
	DECK SPAN
	MOMENT CONNECTION
	CONTROL/CONSTRUCTION JOINT
	*K* SERIES JOIST MARK
	*LH* SERIES JOIST MARK
	STEEL BEAM SIZE
	JOIST GIRDER MARK
	PRE - ENGINEERED WOOD I JOIST

FOR COMPLETE DIMENSIONS SEE ARCHITECTURAL DRAWINGS

**SPECIAL INSPECTION:**  
THE FOLLOWING PORTIONS OF THE WORK REQUIRE SPECIAL INSPECTION TO BE PERFORMED IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE. (NOTE: SPECIAL INSPECTION OF CONCRETE FOOTINGS IS NOT REQUIRED. 3,000 PSI CONCRETE IS SPECIFIED FOR SERVICEABILITY, BUT IS DESIGNED FOR 2,500 PSI.)

- STRUCTURAL WELDING
- EPOXY

THIS NOTE APPLIES TO ALL EXISTING BUILDING AREAS:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CUTTING OF ALL REQUIRED OPENINGS THROUGH BUILDING FLOORS, WALLS, ROOFS, AND FOR THE INSTALLATION OF WALL STRUCTURAL SUPPORT MEMBERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE INSTALLATION OF ALL EQUIPMENT, FIXTURES, PIPING, AND CONDUIT INCLUDING SLEEVES, CONCRETE INSERTS, THREADED RODS AND HANGERS.
2. THIS PROJECT INVOLVES ADDITIONS AND ALTERATIONS TO EXISTING CONSTRUCTION. EVERY EFFORT HAS BEEN MADE TO DETAIL THE DRAWINGS TO CONFORM WITH EXISTING CONSTRUCTION IN ACCORDANCE WITH THE AS-BUILT DRAWINGS. IF CONDITIONS ARE UNCOVERED WHICH DIFFER FROM WHAT IS SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER FOR RECOMMENDATIONS PRIOR TO PROCEEDING WITH THE WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, PLACEMENT, AND MAINTENANCE OF ALL SHORING AND BRACING OF EXISTING CONSTRUCTION THAT MAY BE REQUIRED TO INSURE THAT NO SETTLEMENT OR MOVEMENT OF ANY EXISTING CONSTRUCTION OCCURS.
4. ALL DIMENSIONS OF EXISTING CONSTRUCTION HAVE BEEN TAKEN FROM AS-BUILT DRAWINGS AND SITE SURVEY INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

**STANDARD STRUCTURAL NOTES**

I. GENERAL

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION WITH LOCAL MODIFICATIONS.
2. DESIGN LOADS:
  - A. ROOF LIVE LOAD: . . . . . 20 PSF
  - B. FLOOR LIVE LOAD: . . . . . 50 PSF
  - C. WIND LOAD: . . . . . BASIC WIND SPEED = 105 MPH  
RISK CATEGORY II  
EXPOSURE C  
SDS = 0.282 SD1 = 0.122  
SITE CLASS: D  
LATERAL SYSTEM: ORDINARY CONCRETE MOMENT FRAMES  
LATERAL METHOD: EQUIVALENT LATERAL FORCE PROCEDURE  
D. SOIL PRESSURE: 1,500 P.S.F. (NO SOILS REPORT).
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. THE ARCHITECT/ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.
5. ALL DETAILS SHOWN APPLY WHETHER SPECIFICALLY REFERENCED OR NOT.
6. ALL STRUCTURAL CALCULATIONS SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW, SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER (STRUCTURAL) REGISTERED IN THE STATE OF ARIZONA.

II. CONCRETE

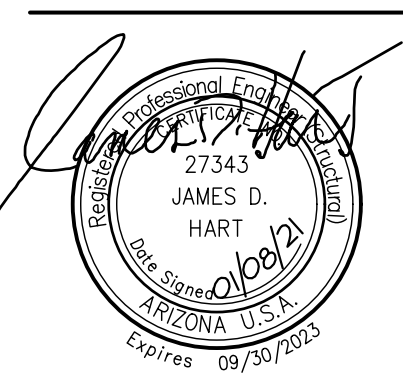
1. ALL CONCRETE SHALL CONFORM WITH ASTM C-94, HAVE A WATER/CEMENTITIOUS MATERIAL RATIO LESS THAN 0.58, AND ATTAIN THE FOLLOWING MINIMUM STRENGTHS AT 28 DAYS:
  - A. FOOTINGS, SLAB ON GRADE . . . . . 3,000 PSI
  - B. CURBS AND SIDE WALKS . . . . . 2,500 PSI
2. ALL CONSTRUCTION SHALL COMPLY WITH APPLICABLE PROVISIONS FOR THE FOLLOWING LATEST ACI STANDARDS:
  - A. ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS
  - B. ACI 318 - BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE
3. CONCRETE FOOTINGS AND PADS MAY BE POURED AGAINST NEAT EXCAVATIONS, PROVIDED PLAN DIMENSIONS ARE ADHERED TO.
4. MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE AS FOLLOWS:
  - A. CONCRETE POURED DIRECTLY AGAINST EARTH . . . . . 3 INCHES
  - B. FORMED CONCRETE . . . . . 1 1/2 INCHES
5. ALL REINFORCING BARS, ANCHOR BOLTS, AND CONCRETE INSERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING CONCRETE.
6. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING CONCRETE. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CONSULT ARCHITECT/ENGINEER OF SUCH CONFLICTS.
7. NO CONSTRUCTION JOINTS (OTHER THAN THOSE SHOWN ON DRAWINGS) SHALL BE INSTALLED WITHOUT APPROVAL OF THE ARCHITECT/ENGINEER. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS.
8. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER TO OBSERVE COMPLETED FOOTING EXCAVATION AND ALL REINFORCING BAR PLACEMENTS BEFORE ANY CONCRETE IS PLACED.
9. REINFORCING STEEL:
  - A. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A-615 GRADE 60.
  - B. ALL REINFORCING IN CONCRETE SHALL BE CONTINUOUS OR LAPPED IN ACCORDANCE WITH ACI 318, AND NOT LESS THAN 48 BAR DIAMETERS.

III. METALS

1. COLD FORMED STEEL FRAMING:
  - A. ALL COLD FORMED STEEL FRAMING WORK, INCLUDING FABRICATION AND ERECTION SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN IRON AND STEEL INSTITUTE SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATIONS.
  - B. ALL 16 GAGE STEEL STUDS AND TRACK SHALL BE FORMED FROM STEEL HAVING A MINIMUM YIELD STRENGTH OF 50,000 P.S.I.
  - C. PROVIDE ALL ACCESSORIES INCLUDING, BUT NOT LIMITED TO, TRACKS, CLIPS WEB STIFFENERS, ANCHORS, FASTENING DEVICES, RESILIENT CLIPS, AND OTHER ACCESSORIES REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, AND AS RECOMMENDED BY THE MANUFACTURER FOR STEEL MEMBERS.
  - D. FASTENING OF COMPONENTS SHALL BE WITH SELF-DRILLING SCREWS OR WELDING. SCREWS OR WELDS SHALL BE OF SUFFICIENT SIZE TO INSURE THE STRENGTH OF THE CONNECTION. ALL WELDS OF GALVANIZED STEEL SHALL BE TOUCHED UP WITH A ZINC-RICH PAINT. ALL WELDS OF CARBON SHEET STEEL SHALL BE TOUCHED UP WITH PAINT. WIRE TYING OF COMPONENTS SHALL NOT BE PERMITTED. POWDER ACTUATED PINS MAY BE USED WHERE NOTED ON THE DETAILS.

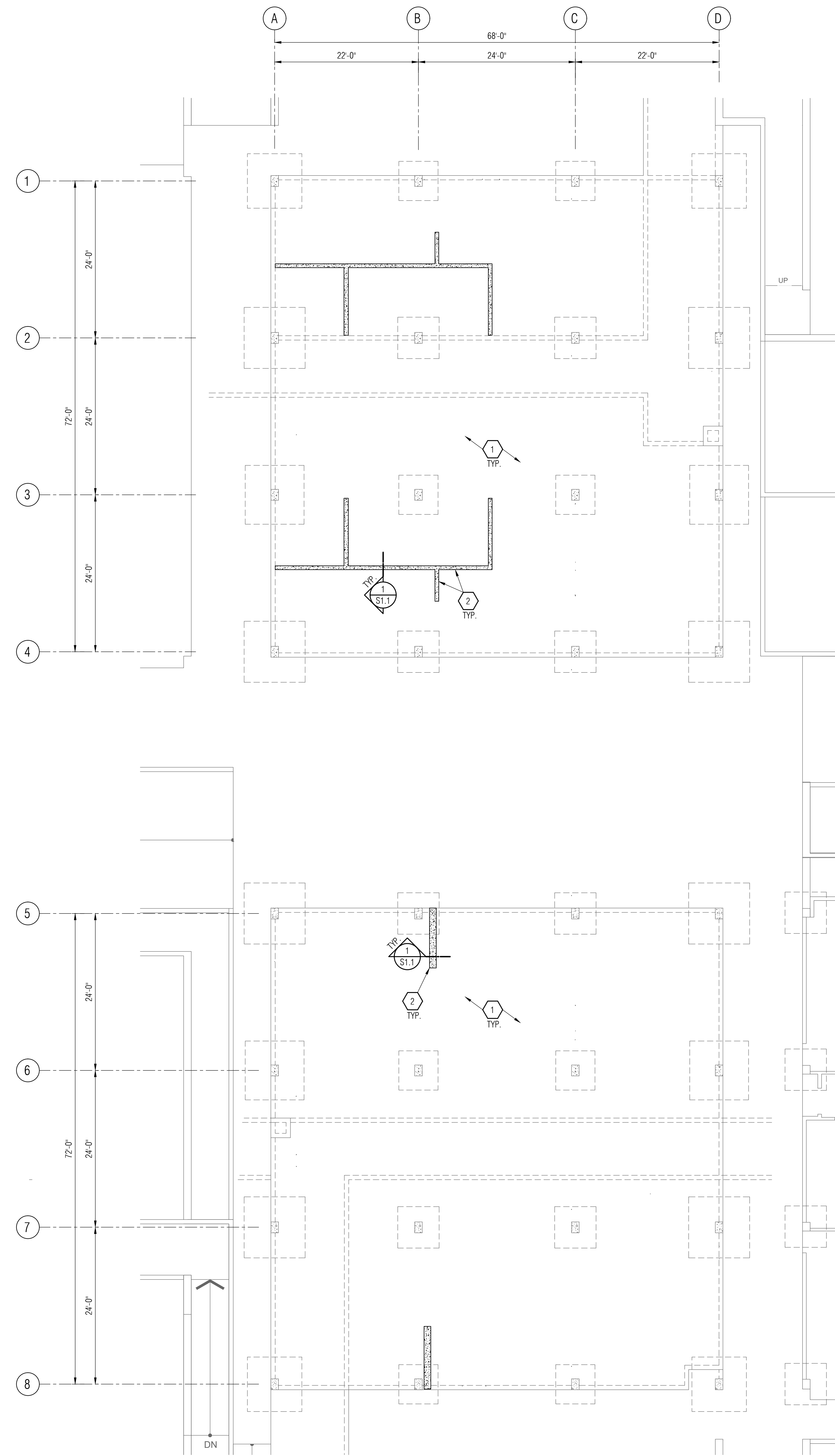
IV. EPOXY:

1. ALL EPOXY ANCHORS INTO CONCRETE SHALL USE SIMPSON "SET-XP" EPOXY.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

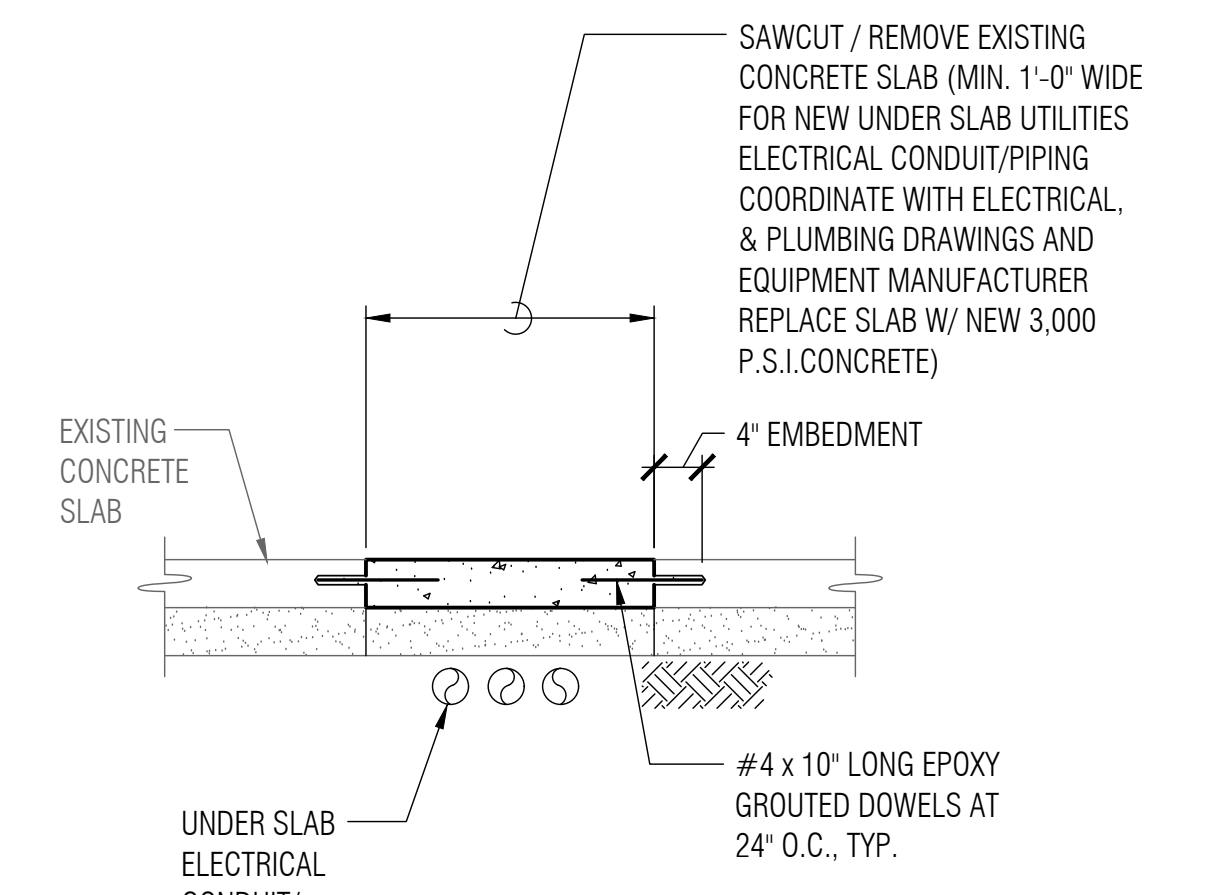


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**DATE:** 01/08/2021  
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- FOUNDATION KEYNOTES:**
- EXISTING 4" CONCRETE SLAB ON GRADE.
  - SAWCUT AND REMOVE EXISTING CONCRETE SLAB FOR NEW PLUMBING. COORDINATE LOCATION WITH ARCHITECTURAL, PLUMBING, AND ELECTRICAL DRAWINGS. REPLACE WITH NEW 3,000 P.S.I. CONCRETE.



**1 CONCRETE SLAB INFILL**  
 3/4" = 1'-0"

**A FOUNDATION PLAN - Building F**  
 SCALE: 1/8" = 1'-0"

**CONSULTANTS**

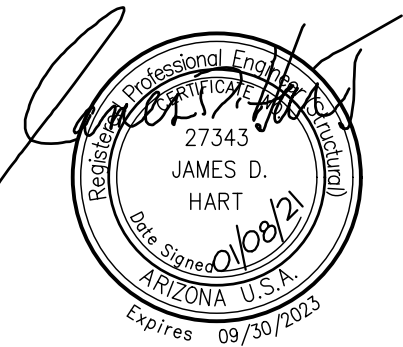
Electrical  
 Electrical Engineering, Inc.  
 1826 E. Lowell Rd. #200  
 Tucson, AZ 85719-2391  
 Phone: 520.884.0045

Structural  
 TSC Structural Engineering  
 3026 N. Country Club Rd.  
 Tucson, AZ 85716  
 Phone: 520.323.3422

Mechanical  
 KC Mechanical Engineering  
 5447 E. Fifth St.  
 Tucson, AZ 85711  
 Phone: 520.327.7611

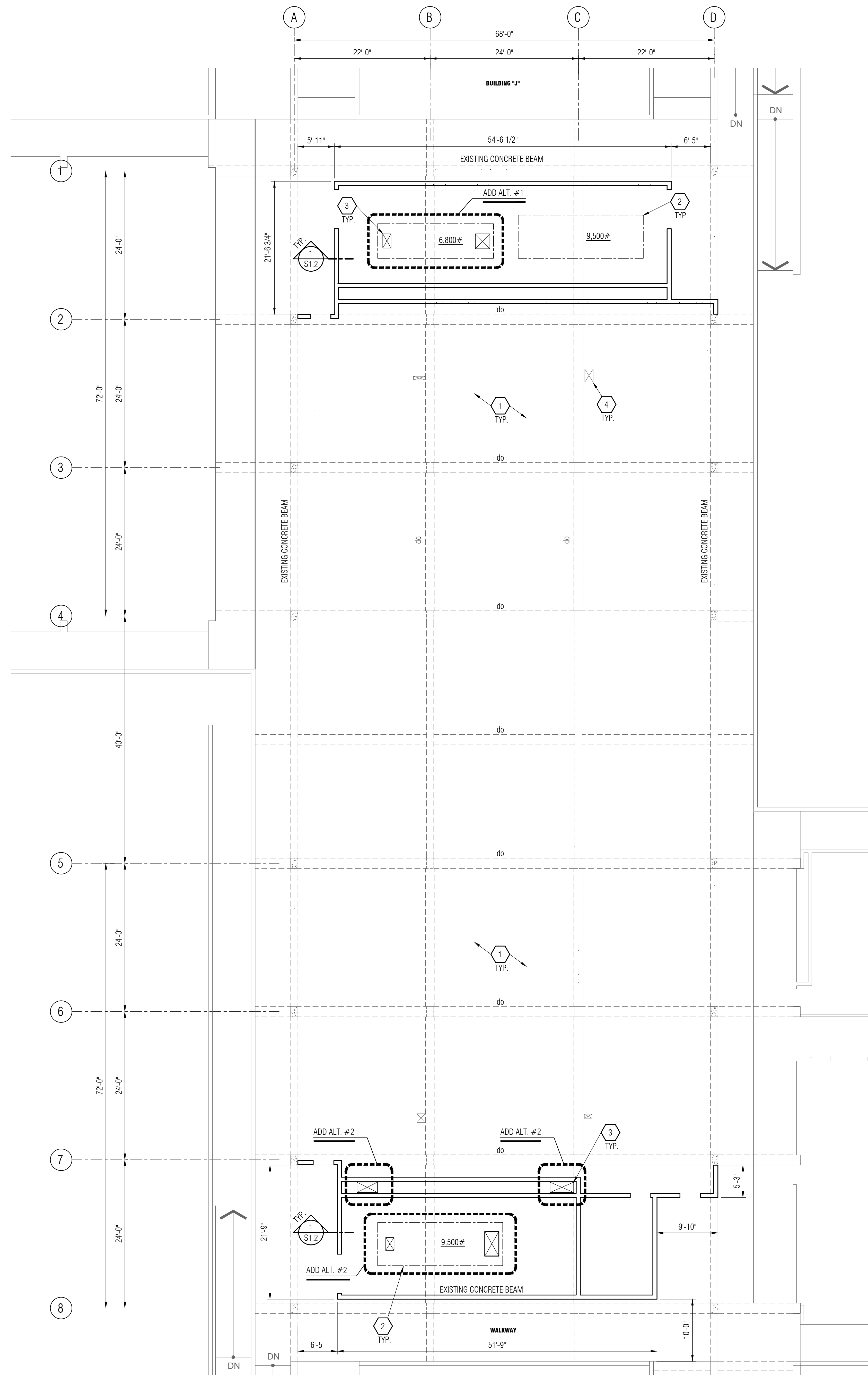
Laboratory  
 REDS  
 2865 Fifth Avenue, #400  
 San Diego, CA 92103-3192  
 Phone: 619.297.0159

**Pima Community College  
 PCC West Lab Building F  
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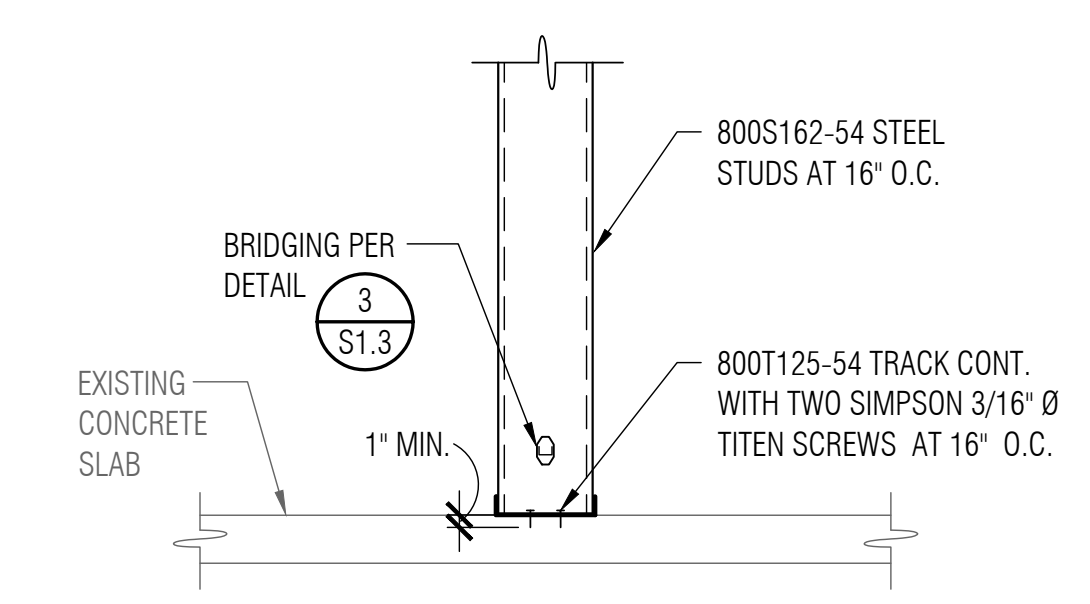
**FOUNDATION PLAN**



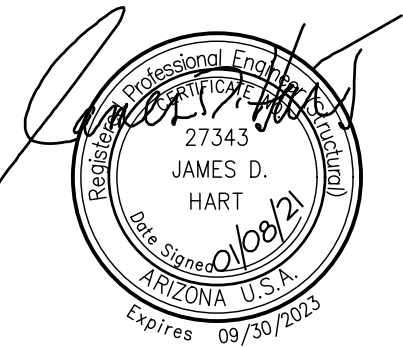
**A SECOND FLOOR FRAMING PLAN - Building F**  
 SCALE: 1/8" = 1'-0"

**SECOND FLOOR FRAMING KEYNOTES:**

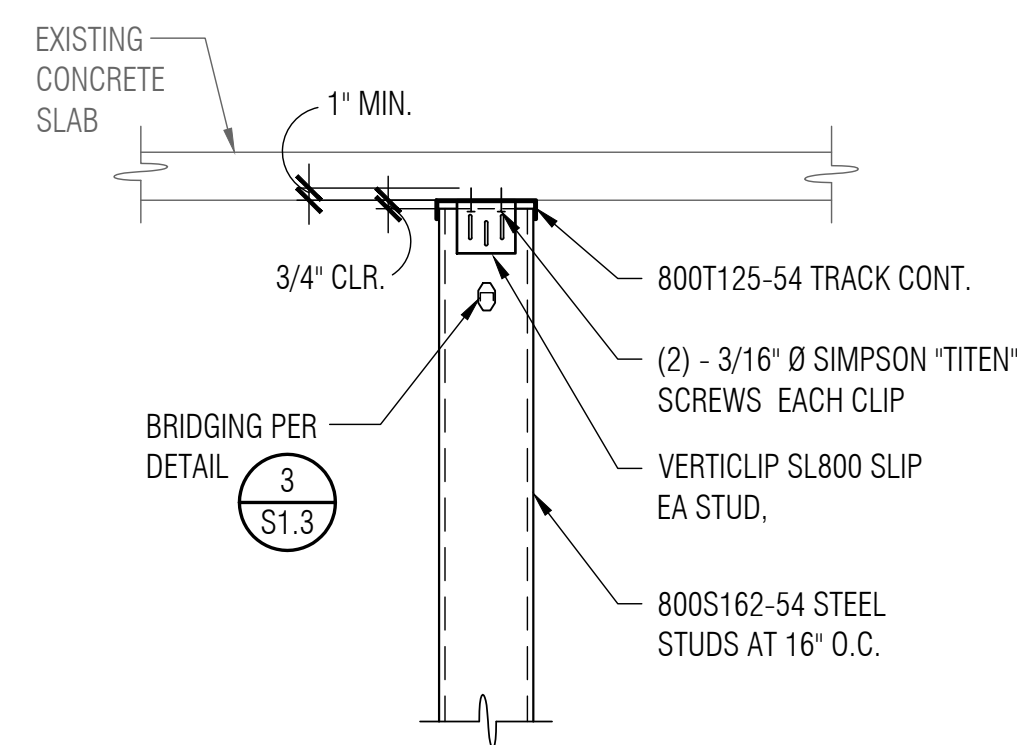
1. EXISTING CONCRETE SLAB.
2. INDICATES NEW MECHANICAL UNIT ON FLOOR. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT SIZE AND LOCATION.
3. INDICATES NEW OPENINGS IN FLOOR SLAB. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT SIZE AND LOCATION. CORE DRILL CORNERS OF OPENINGS. DO NOT OVER CUT.
4. EXISTING OPENING IN FLOOR SLAB.



**1 STUD WALL TO CONCRETE SLAB**  
 3/4" = 1'-0"

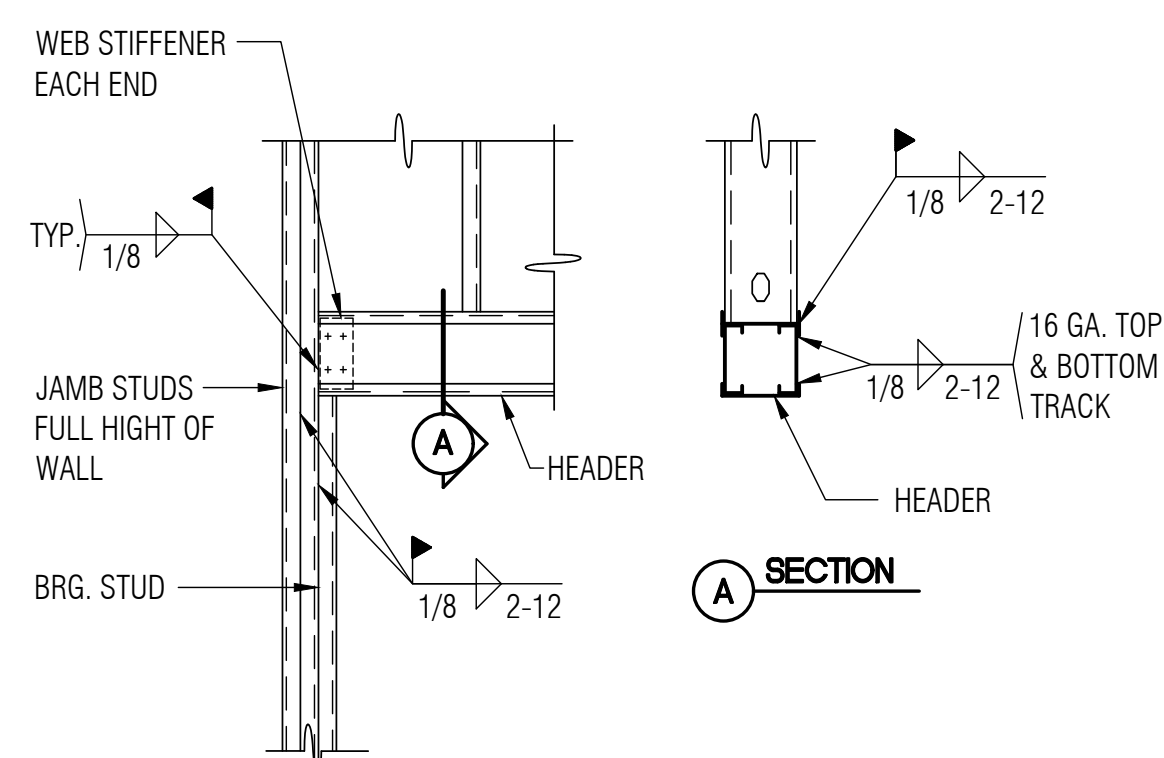


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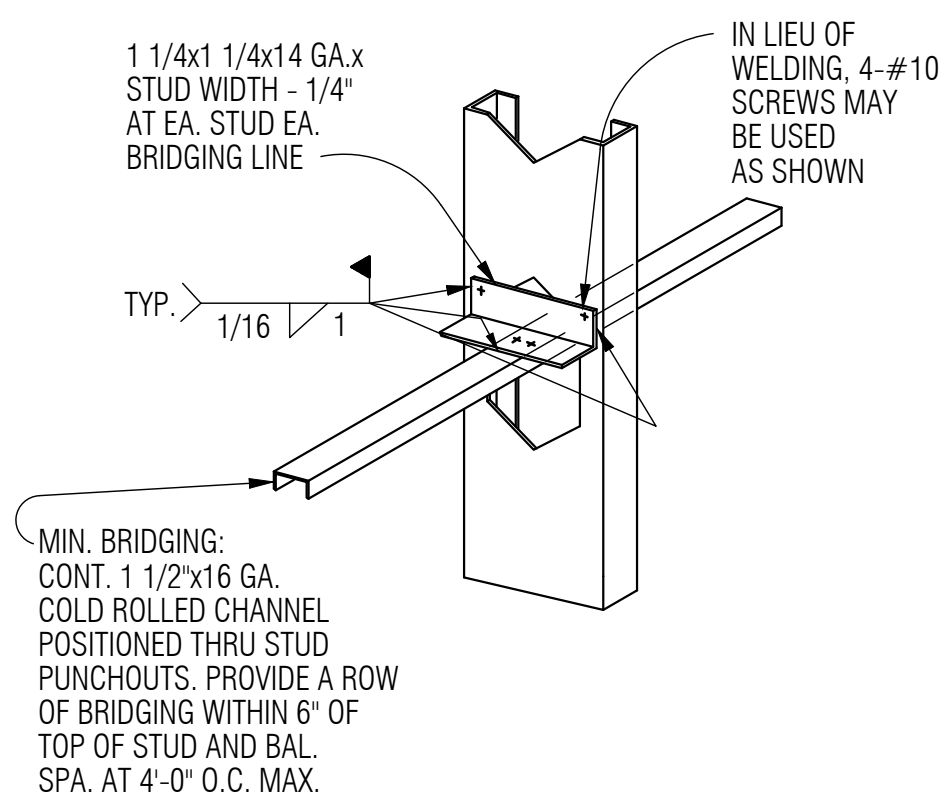


**1 STUD WALL TO CONCRETE SLAB**  
3/4" = 1'-0"

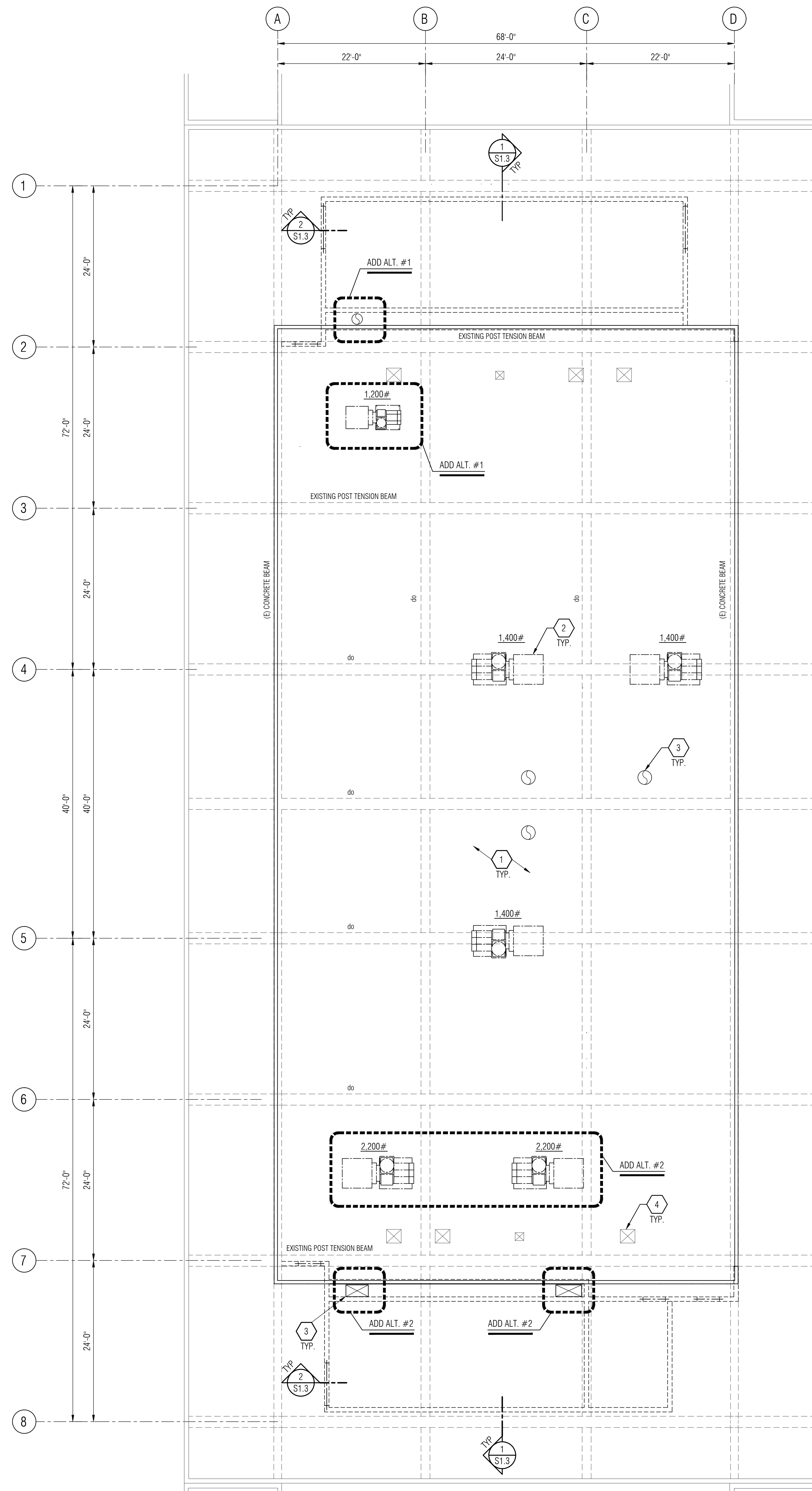
LINTEL SCHEDULE			
OPENING	HEADER	JAMB STUD	BRG. STUD
UP TO 6'-6"	2 - 600S162-54	2 - 800S162-54	1 - 800S162-54



**2 TYP. STEEL STUD LINTEL DETAIL**  
3/4" = 1'-0"

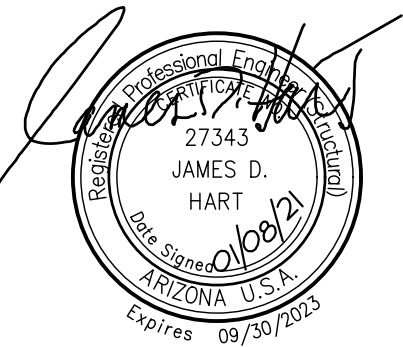


**3 TYP. STUD BRIDGING**  
3/4" = 1'-0"



**A ROOF FRAMING PLAN - Building F**  
SCALE: 1/8" = 1'-0"

- ROOF FRAMING KEYNOTES:**
- EXISTING CONCRETE SLAB.
  - INDICATES NEW MECHANICAL UNIT ON ROOF. SEE MECHANICAL DRAWINGS FOR EXACT SIZE AND LOCATION.
  - INDICATES NEW OPENING IN ROOF SLAB. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT SIZE AND LOCATION.
  - EXISTING OPENING IN ROOF SLAB.



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## MECHANICAL LEGEND

DESCRIPTION	SYMBOL
EXISTING - SHOWN IN LIGHTWEIGHT PEN	
DEMOLISH - SHOWN IN DASHED PEN	
LINED DUCTWORK (UNLESS NOTED OTHERWISE)	
RECTANGULAR BRANCH TAKE-OFF WITH 45° TAP	
RECTANGULAR ELBOW WITH TURNING VANES	
RECTANGULAR 90° ELBOW DOWN / UP - SUPPLY	
RECTANGULAR 90° ELBOW DOWN / UP - RETURN	
RECTANGULAR 90° ELBOW DOWN / UP - EXHAUST	
RECTANGULAR DUCT RISER - SUPPLY / RETURN / EXHAUST	
ROUND BRANCH TAKE-OFF WITH CONICAL TAP	
ROUND ELBOW	
ROUND 90° ELBOW DOWN / UP - SUPPLY	
ROUND 90° ELBOW DOWN / UP - RETURN	
ROUND 90° ELBOW DOWN / UP - EXHAUST	
ROUND DUCT RISER - SUPPLY / RETURN / EXHAUST	
MANUAL BALANCING DAMPER	
FIRE DAMPER	
SMOKE DAMPER	
FIRE SMOKE DAMPER	
DUCT SMOKE DETECTOR	
SPIN IN COLLAR WITH BALANCING DAMPER	
ROUND FLEXIBLE DUCT	
SUPPLY AIR DEVICE	
RETURN AIR DEVICE	
RETURN AIR DEVICE WITH PLENUM BOOT	
EXHAUST AIR DEVICE	
WALL GRILLE - ARROW INDICATES AIRFLOW	
CEILING EXHAUST FAN	
ROOFTOP CURB MOUNTED EXHAUST FAN	
THERMOSTAT	
DUCT SMOKE DETECTOR	

## MECHANICAL PIPING LEGEND

DESCRIPTION	SYMBOL
ELBOW DOWN	
ELBOW UP	
TEE DOWN	
TEE UP	
SHUT OFF VALVE - BALL VALVE	
SHUT OFF VALVE - GATE VALVE	
UNION	
ARROW INDICATES DIRECTION OF FLOW	

## MECHANICAL ABBREVIATIONS

ABV	ABOVE	EA	EXHAUST AIR
AFF	ABOVE FINISH FLOOR	HWS	HEATING WATER SUPPLY
A.D.	ACCESS DOOR	HWR	HEATING WATER RETURN
CD	CONDENSATE	MUW	MAKE-UP WATER
CHWS	CHILLED WATER SUPPLY	OA	OUTSIDE AIR
CHWR	CHILLED WATER RETURN	OH	OVERHEAD
CLG	CEILING	RA	RETURN AIR
CONT	CONTINUATION	SA	SUPPLY AIR
CWS	CONDENSER WATER SUPPLY	SOV	SHUT OFF VALVE
CWR	CONDENSER WATER RETURN	TYP	TYPICAL
DN	DOWN	U.N.O.	UNLESS NOTED OTHERWISE
DTR	DUCT THRU ROOF	UG	UNDERGROUND
E	EXISTING	VTR	VENT THRU ROOF

## MECHANICAL GENERAL NOTES

- COORDINATE ALL MECHANICAL WORK WITH ALL OTHER TRADES. VERIFY ALL EXISTING CONDITIONS BEFORE THE START OF WORK.
- PROVIDE ALL REQUIRED DEMOLITION OF EXISTING MECHANICAL EQUIPMENT, MATERIALS AND OTHER ITEMS WHICH ARE NOT TO BE REUSED IN NEW DESIGN. ALL ITEMS WHICH THE OWNER DOES NOT WISH TO SALVAGE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
- TRANSITION ALL SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTWORK FROM AIR HANDLING UNITS AND EXHAUST FANS TO DUCT THROUGH ROOF (DTR) OR DUCT THROUGH FLOOR SIZE. COORDINATE EXACT LOCATIONS WITH ROOF AND FLOOR STRUCTURAL SYSTEM. VERIFY ADEQUACY OF STRUCTURE TO SUPPORT MECHANICAL EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
- DIMENSIONS ON DRAWINGS ARE SHEET METAL DUCT SIZES. INSULATE DUCTWORK PER SPECIFICATIONS.
- ALL RECTANGULAR DUCT ELBOWS SHALL BE MITERED WITH SINGLE THICKNESS TURNING VANES UNLESS INSTRUCTED OTHERWISE ON DRAWINGS. PROVIDE 45 DEGREE ENTRY FITTINGS AT BRANCH DUCT CONNECTIONS TO DUCT MAINS. FLEXIBLE DUCTS SHALL BE INSTALLED TO MAINTAIN FULL CROSS-SECTIONAL FREE AREA. PROVIDE RIGID SHEET METAL ELBOWS OR LINED PLENUM BOXES AT AIR DEVICES WHEN REQUIRED.
- COORDINATE EXACT LOCATION OF ALL AIR DEVICES WITH ARCHITECTURAL REFLECTED CEILING PLAN.
- OFFSET EXHAUST DISCHARGE AS REQUIRED INSURING A MINIMUM 25'-0" CLEARANCE FROM ALL OUTSIDE AIR INTAKES.
- ALL LOW VOLTAGE CONTROL WIRING AND ITS INSTALLATION TO BE BY MECHANICAL CONTRACTOR INSTALL PER ELECTRICAL SPECIFICATIONS. MOUNTING HEIGHT OF THERMOSTATS SHALL BE PER ADA REQUIREMENTS.
- PROVIDE SMOKE DETECTOR IN RETURN AIR SYSTEM(S) MOVING MORE THAN 2000 CFM AS INDICATED ON DRAWINGS. RETURN AIR PLENUMS MOVING MORE THAN 2000 CFM REQUIRE A RETURN DUCT SMOKE DETECTOR AT EACH UNIT. SMOKE DETECTORS SHALL DISENGAGE FAN(S) WHEN ACTIVATED. SMOKE DETECTORS INSTALLED IN THE RETURN AIR DUCT(S) MUST BE LOCATED AHEAD OF ANY OUTSIDE AIR INLET.
- MECHANICAL CONTRACTOR SHALL REVIEW ALL ELECTRICAL DRAWINGS BEFORE PURCHASING EQUIPMENT TO INSURE THAT PROPER ELECTRICAL SERVICE IS TO BE PROVIDED FOR ALL NEW EQUIPMENT.

## MECHANICAL PIPING GENERAL NOTES

- PROVIDE HIGH CAPACITY AUTOMATIC AIR VENTS AT ALL HIGH POINTS IN PIPING WITHIN MECHANICAL ROOMS OR EXTERIOR TO BUILDING PER PCC MDS5 STANDARD DETAIL. PROVIDE MANUAL AIR VENTS AT ALL OTHER HIGH POINTS IN PIPING.
- PROVIDE MANUAL DRAINS AT ALL LOW POINTS IN PIPING.
- SEAL ALL ROOF OR WALL PIPING PENETRATIONS WEATHER TIGHT.
- INSULATE ALL PIPING PER SPECIFICATIONS. PROVIDE AN ALUMINUM JACKET FOR ALL EXTERIOR PIPING PER SPECIFICATIONS.
- LABEL ALL PIPING PER SPECIFICATIONS. INCLUDE ARROW INDICATING DIRECTION OF FLOW.

## BASE BID & ALTERNATES DESCRIPTION

- BASE BID:
- GENERAL CHEMISTRY AND ASSOCIATED SYSTEMS.
  - SECOND FLOOR ENCLOSURES FOR MECHANICAL ROOMS.

- ADD ALTERNATE #01:
- MICROBIOLOGY AND ASSOCIATED SYSTEMS.

- ADD ALTERNATE #02:
- ORGANIC CHEMISTRY AND ASSOCIATED SYSTEMS.

**Pima Community College**  
**PCC West Lab Building F**  
**Renovation**  
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**DATE:** 01/08/2020  
**REVISIONS**

**MECHANICAL GENERAL**  
**NOTES AND LEGEND**

**M1.0**  
 100% CONSTRUCTION DOCUMENTS

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 520.395.2702 Fax: 520.395.0571  
 www.bwsarch.com

**ELECTRICAL**  
 Monrad Engineering, Inc.  
 1526 E. Fort Lowell Rd.  
 Tucson, AZ 85716  
 Phone: 520.884.0045

**STRUCTURAL**  
 Under Structural Engineering  
 3028 N. Wilmot Rd.  
 Tucson, AZ 85716  
 Phone: 520.323.3422

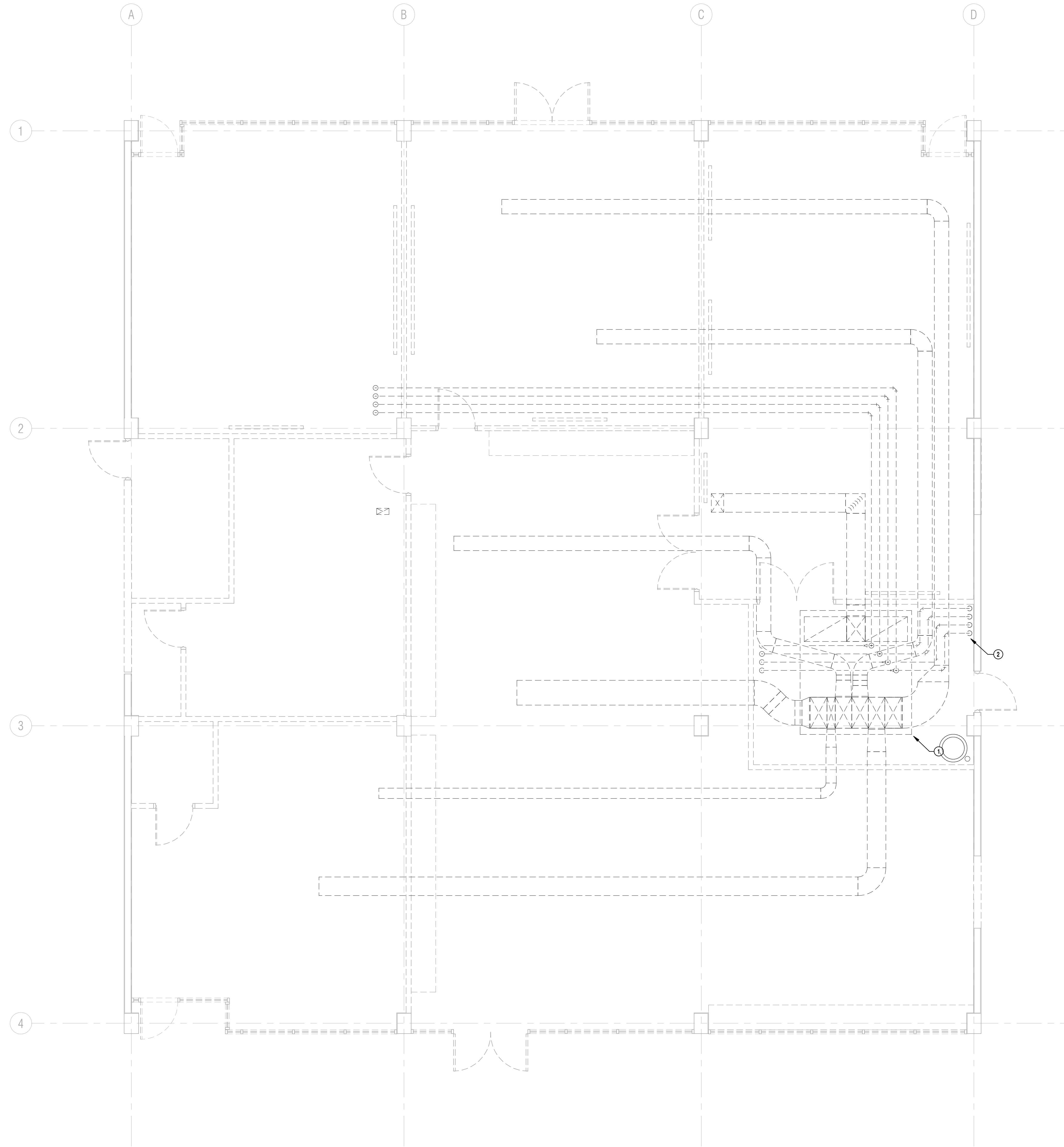
**MECHANICAL**  
 KC Mechanical Engineering  
 1747 E. Fort Lowell Rd.  
 Tucson, AZ 85711  
 Phone: 520.327.1611

**LABORATORY**  
 800 E. Fifth Avenue #400  
 San Diego, CA 92103-3192  
 Phone: 619.297.0169



**MECHANICAL KEYNOTES**

1. REMOVE EXISTING AIR HANDLING UNIT, REMOVE ALL ASSOCIATED DUCT AND AIR DEVICES.
2. REMOVE ALL CHWS/R AND HWS/R PIPING BACK TO MAINS RISING UP FROM UTILITY TUNNEL. EXISTING VALVES IN TUNNEL MAY BE USED TO ISOLATE BUILDING DURING CONSTRUCTION.



① Mechanical Demo Plan 1st Floor - A  
1/4" = 1'-0"

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 Tucson, AZ 85711  
 Phone: 520.327.7611  
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 Phone: 520.323.3422  
 ELECTRICAL  
 Alford Engineering, Inc.  
 1920 E. Fairway  
 Tucson, AZ 85711  
 Phone: 520.884.0045

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 PCC West Lab Building F  
 Renovation**  
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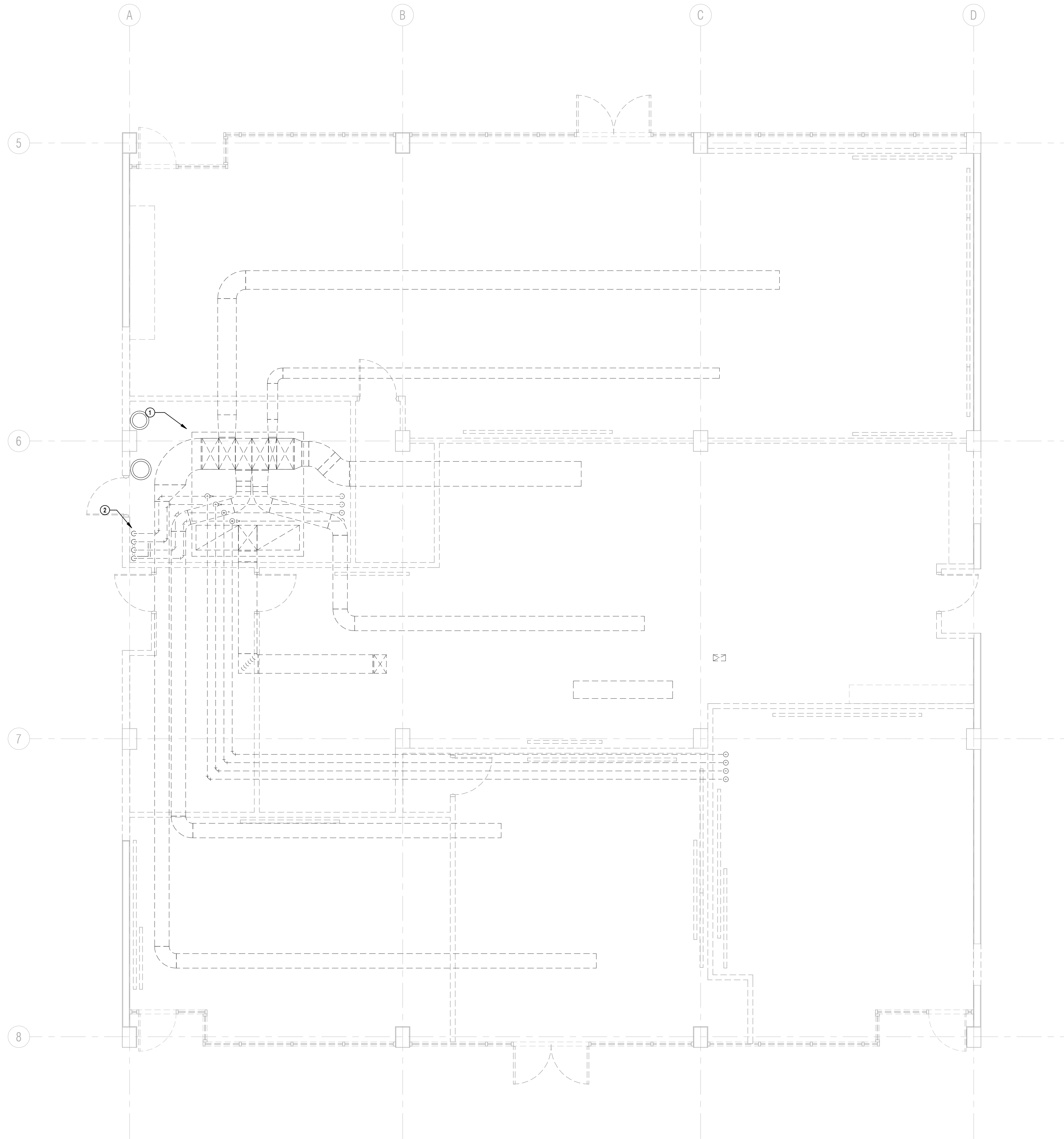
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**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

**KC** MECHANICAL  
 ENGINEERING, L.L.C.  
 5447 East Fifth Street # 112  
 Tucson, Arizona 85711  
 Designers: Mech: TCB Plumb: MT  
 520/327-7611  
 520/327-0432  
 PROJECT# 19-366

**DEMOLITION MECHANICAL  
 PLAN - LEVEL 1 AREA A**  
**M1.1.1**  
 100% CONSTRUCTION DOCUMENTS

**MECHANICAL KEYNOTES**

1. REMOVE EXISTING AIR HANDLING UNIT, REMOVE ALL ASSOCIATED DUCT AND AIR DEVICES.
2. REMOVE ALL CHWS/R AND HWS/R PIPING BACK TO MAINS RISING UP FROM UTILITY TUNNEL. EXISTING VALVES IN TUNNEL MAY BE USED TO ISOLATE BUILDING DURING CONSTRUCTION.



1 Mechanical Demo Plan 1st Floor - B  
1/4" = 1'-0"

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**bws** ARCHITECTS  
BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Tucson, AZ 85710  
520.795.2702 Fax: 520.795.6171  
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**LABORATORY**  
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2503 S. 19th Avenue, Suite 400  
San Diego, CA 92108-3192  
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**MECHANICAL**  
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Tucson, AZ 85711  
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**STRUCTURAL**  
Gunter Structural Engineering  
3028 N. W. 87th Ave.  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
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1920 E. Palmdale Blvd., Suite 200  
Tucson, AZ 85710  
Phone: 520.884.0045

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PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



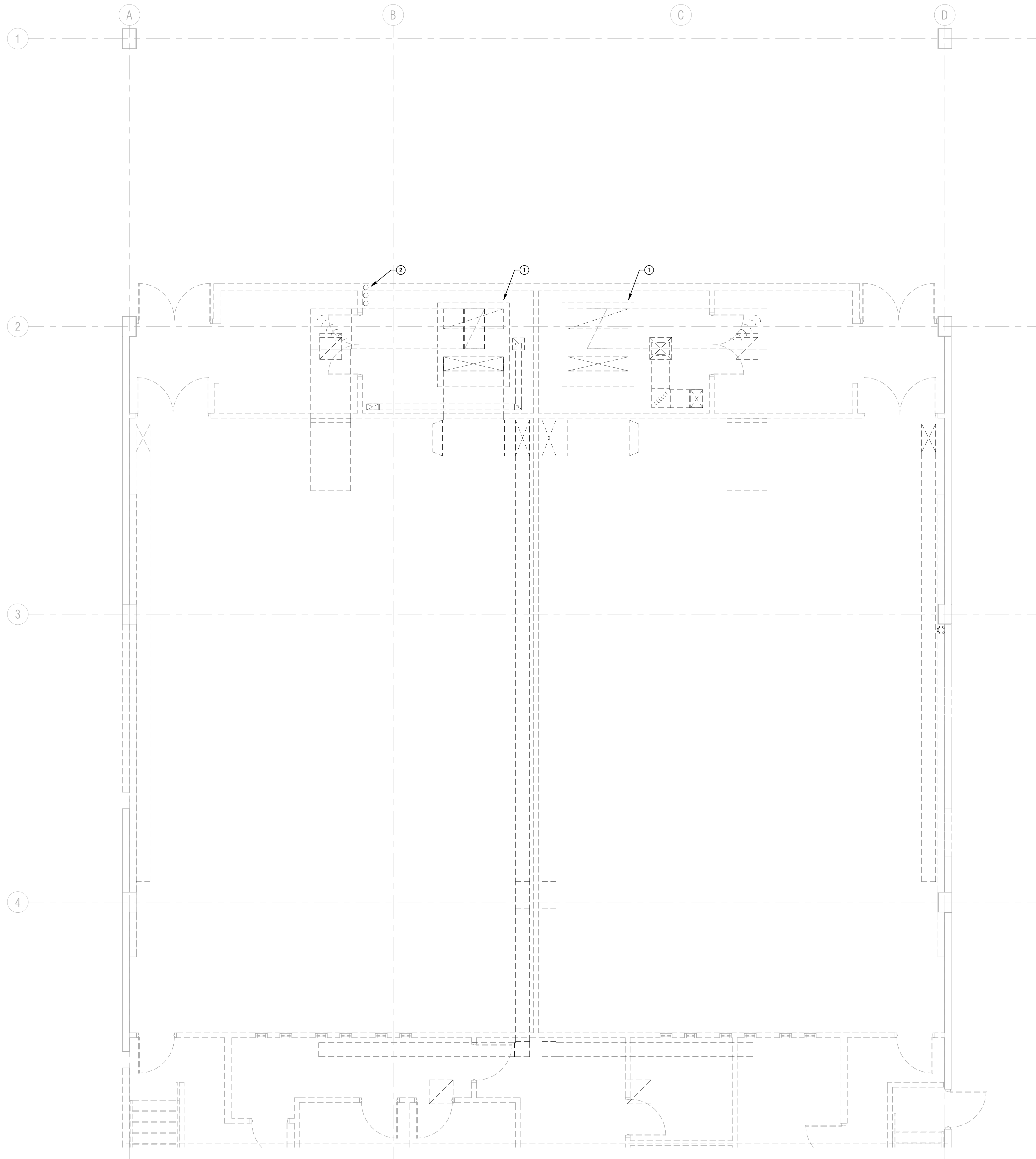
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**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

**KC** MECHANICAL ENGINEERING, L.L.C.  
5447 East Fifth Street # 112 Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT 520/327-7611 520/327-0432 PROJECT# 19-366

**DEMOLITION MECHANICAL PLAN - LEVEL 1 AREA B**  
**M1.1.2**  
100% CONSTRUCTION DOCUMENTS

**MECHANICAL KEYNOTES**

1. REMOVE EXISTING AIR HANDLING UNIT, REMOVE ALL ASSOCIATED DUCT AND AIR DEVICES.
2. REMOVE ALL CHWSR AND HWSR PIPING BACK TO MAINS RISING UP FROM UTILITY TUNNEL. EXISTING VALVES IN TUNNEL MAY BE USED TO ISOLATE BUILDING DURING CONSTRUCTION.



1 Mechanical Demo Plan 2nd Floor - A  
1/4" = 1'-0"

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**bws** ARCHITECTS  
BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
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**CONSULTANTS**  
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KENNETH M.  
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REGISTERED PROFESSIONAL ENGINEER  
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Arizona State Board of Engineers and Architects  
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**MECHANICAL**  
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10747 E. Fairway  
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**REVISIONS**

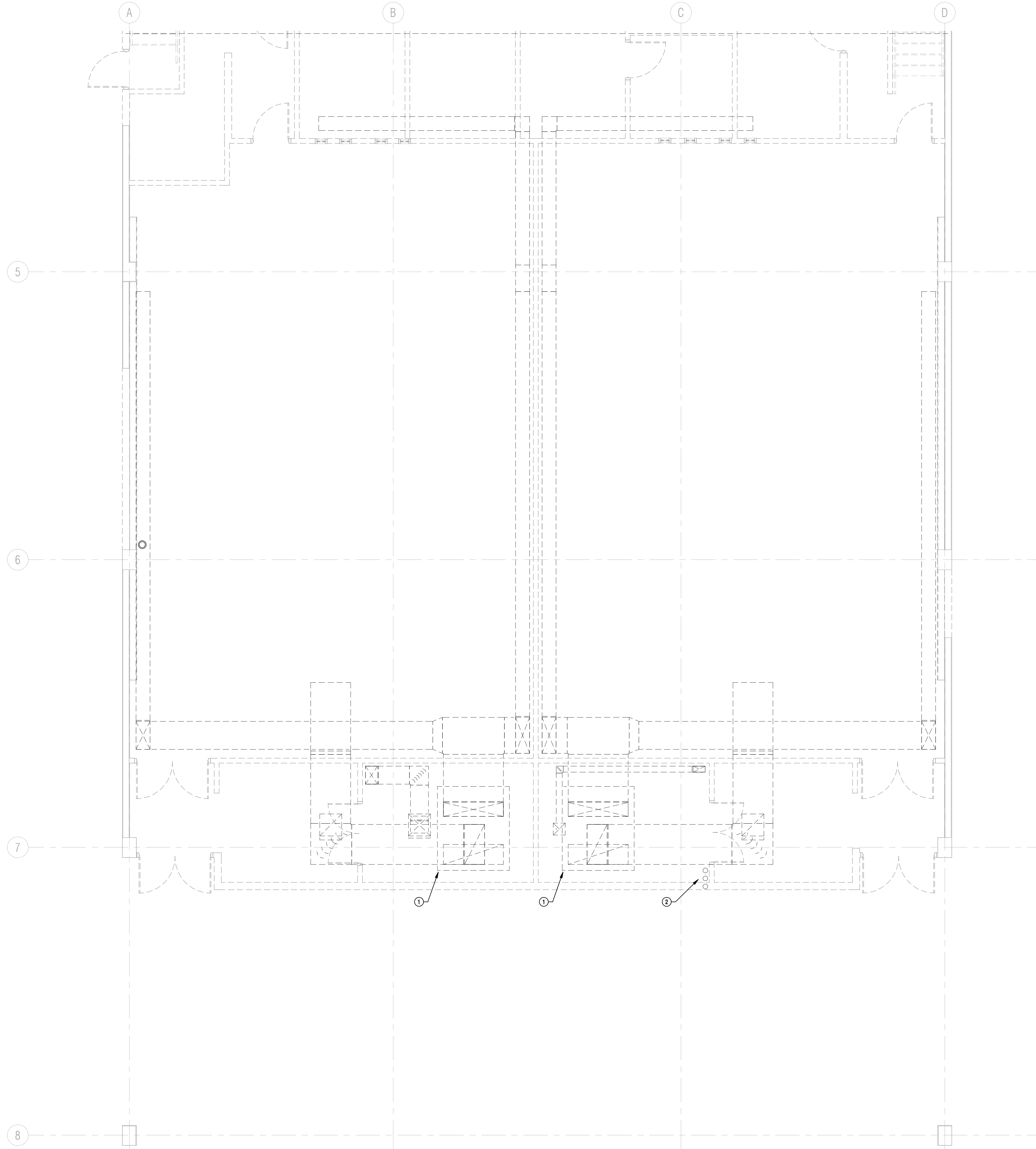
**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT

520/327-7611  
520/327-0432  
PROJECT# 19-366

**DEMOLITION MECHANICAL  
PLAN - LEVEL 2 AREA A**  
**M1.2.1**  
100% CONSTRUCTION DOCUMENTS

**MECHANICAL KEYNOTES**

1. REMOVE EXISTING AIR HANDLING UNIT, REMOVE ALL ASSOCIATED DUCT AND AIR DEVICES.
2. REMOVE ALL CHWSR AND HWSR PIPING BACK TO MAINS RISING UP FROM UTILITY TUNNEL. EXISTING VALVES IN TUNNEL MAY BE USED TO ISOLATE BUILDING DURING CONSTRUCTION.



① Mechanical Demo Plan 2nd Floor - B  
1/4" = 1'-0"

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**bws** ARCHITECTS

BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Tucson, AZ 85711  
520.795.2702 Fax: 520.795.6171  
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**CONSULTANTS**  
**LABORATORY**  
ARC & FORTH ARCHITECTS  
2503 S. 19th Avenue, Suite 400  
San Diego, CA 92108-3192  
Phone: 619.297.0169

**MECHANICAL**  
KC Mechanical Engineering  
1047 E. Fifth Street  
Tucson, AZ 85711  
Phone: 520.327.7611

**STRUCTURAL**  
Tanner Structural Engineering  
3028 N. Oracle Road, Suite 200  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
Morrison Engineering, Inc.  
1520 E. Fifth Street, Suite 200  
Tucson, AZ 85711  
Phone: 520.884.0045

**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



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**DATE:** 01/08/2020

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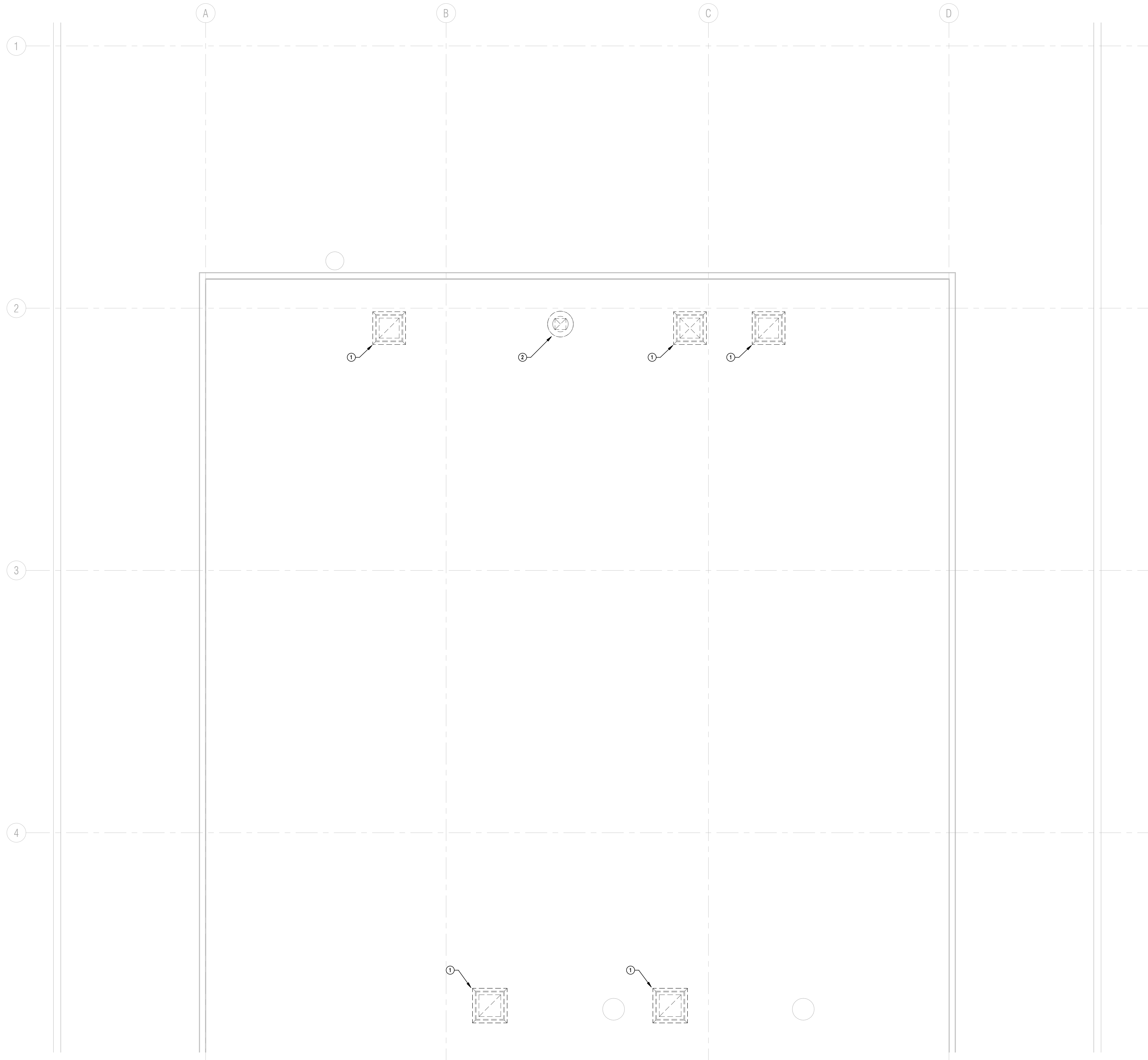
**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112 Tucson, Arizona 85711  
520/327-7611 520/327-0432  
Designers: Mech: TCB Plumb: MT PROJECT# 19-366

**DEMOLITION MECHANICAL PLAN - LEVEL 2 AREA B**  
**M1.2.2**  
100% CONSTRUCTION DOCUMENTS



**MECHANICAL KEYNOTES**

1. REMOVE EXISTING ROOF HOOD AND DUCT THRU ROOF. CAP ROOF CURB. INSULATE TO MATCH EXISTING ROOF INSULATION.
2. REMOVE EXISTING ROOF EXHAUST FAN AND DUCT THRU ROOF. CAP ROOF CURB. INSULATE TO MATCH EXISTING ROOF INSULATION.



1 Mechanical Demo Plan Roof - A  
1/4" = 1'-0"

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Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

**CONSULTANTS**  
**LABORATORY**  
ARC Lab, Inc.  
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**MECHANICAL**  
KC Mechanical Engineering  
1047 E. Park Ave.  
Tucson, AZ 85711  
Phone: 520.327.7611

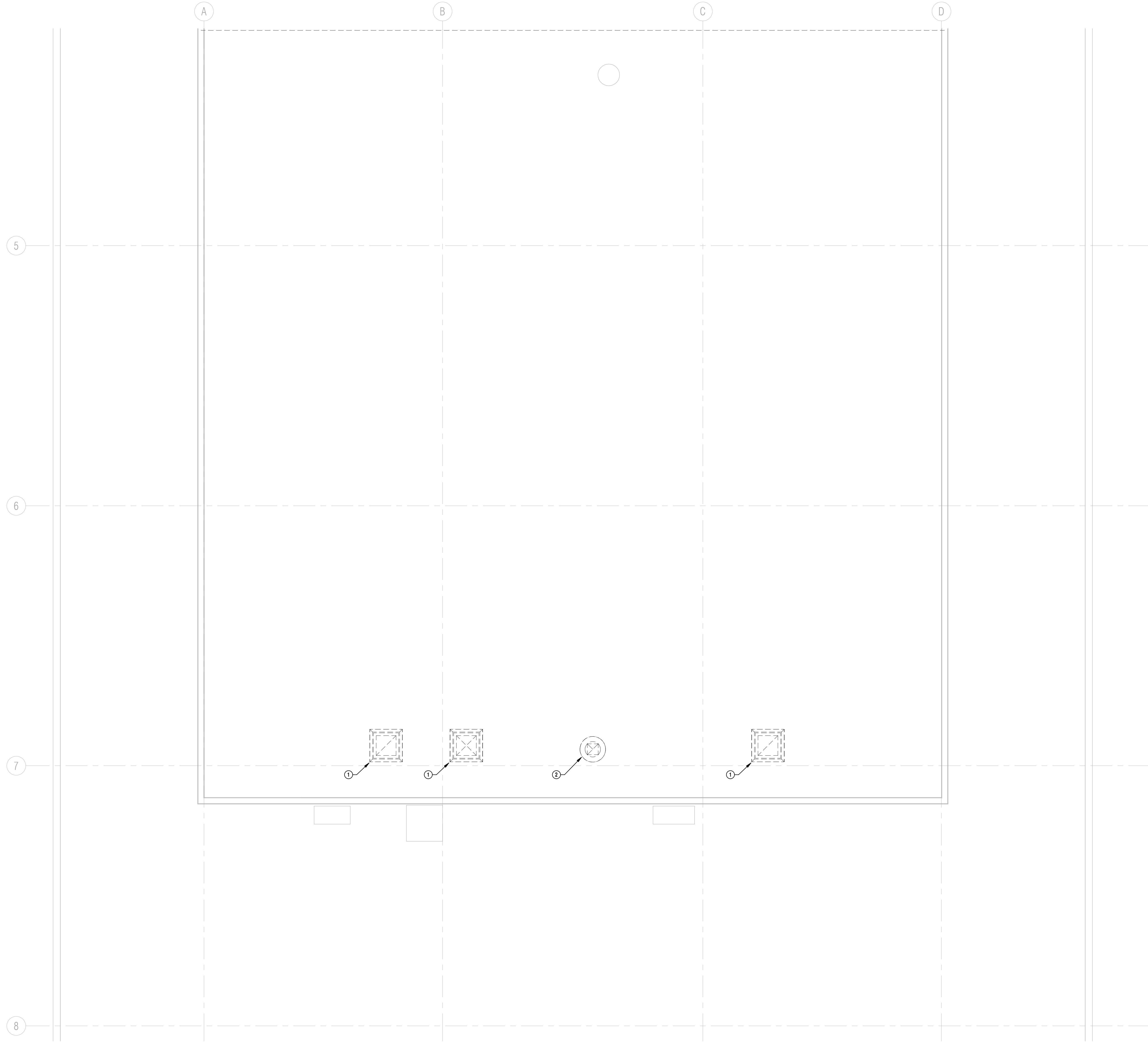
**STRUCTURAL**  
Tanner Structural Engineering  
3028 N. Oracle Rd. #100  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
Morrisey Engineering, Inc.  
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Tucson, AZ 85711  
Phone: 520.884.0045

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**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
26 North Court Avenue  
Tucson, AZ 85711  
520.395.2702 Fax: 520.395.6171  
www.bwsarch.com

**MECHANICAL KEYNOTES**

1. REMOVE EXISTING ROOF HOOD AND DUCT THRU ROOF. CAP ROOF CURB. INSULATE TO MATCH EXISTING ROOF INSULATION.
2. REMOVE EXISTING ROOF EXHAUST FAN AND DUCT THRU ROOF. CAP ROOF CURB. INSULATE TO MATCH EXISTING ROOF INSULATION.



1 Mechanical Demo Plan Roof - B  
1/4" = 1'-0"

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**DEMOLITION MECHANICAL PLAN - ROOF AREA B**

**M1.3.2**  
100% CONSTRUCTION DOCUMENTS

**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

**CONSULTANTS**  
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Phone: 520.323.3422

**ELECTRICAL**  
Meredith Engineering, Inc.  
1520 E. Fifth Street, Suite 200  
Tucson, AZ 85711  
Phone: 520.884.0045

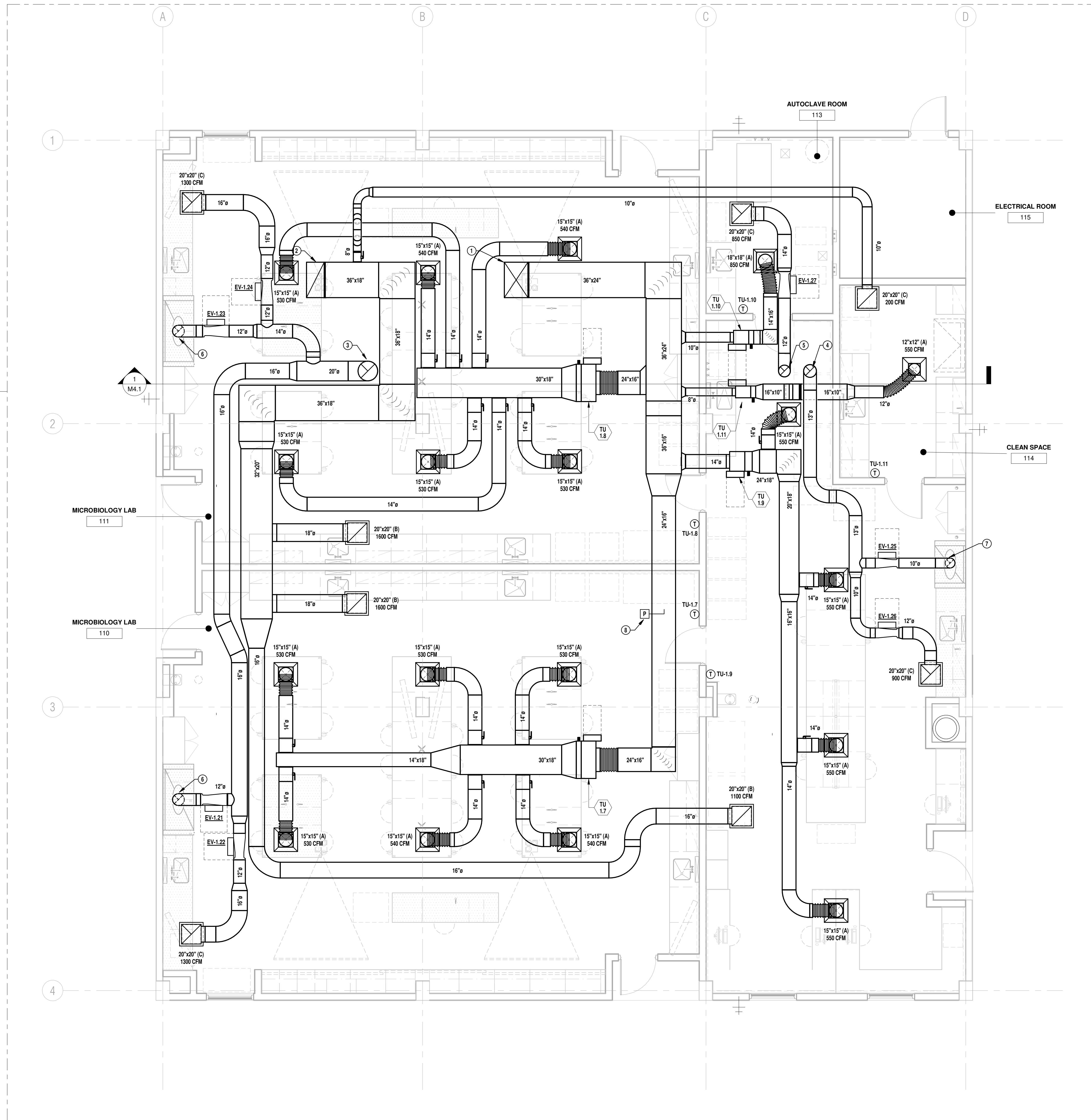
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**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
26 North Court Avenue  
Tucson, AZ 85710  
520.795.2702 Fax: 520.795.6171  
www.bwsarch.com

**MECHANICAL KEYNOTES**

- 36"x24" SUPPLY MAIN UP THRU LEVEL 2 FLOOR TO UNIT INLET. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
- 36"x18" RETURN MAIN UP THRU LEVEL 2 FLOOR TO UNIT INLET. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
- 20" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.1 FOR CONTINUATION.
- 13" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.1 FOR CONTINUATION.
- 10" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.1 FOR CONTINUATION.
- 12" EXHAUST DUCT DOWN TO 6" ACPH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- 10" EXHAUST DUCT DOWN TO 4" ACPH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- SUPPLY DUCT STATIC PRESSURE SENSOR FOR AHU-1.2

NOTE: THE AIRFLOWS SHOWN ON THIS PLAN FOR CEILING EXHAUST AIR DEVICES ARE WITH ALL LAB HOODS AT THEIR MINIMUM AIRFLOW (CLOSED SASH POSITION). REFER TO EXHAUST VALVE SCHEDULE AND CONTROL SEQUENCE OF OPERATION.

ADD ALTERATE #01



1 Mechanical Plan 1st Floor - A  
1/4" = 1'-0"

**bws** ARCHITECTS

**BURNS WILD-HOPKINS SHAMBACH ARCHITECTS**  
26 North Court Avenue  
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**STRUCTURAL**  
Miller Structural Engineering  
3028 N. Oracle Rd. #100  
Tucson, AZ 85718  
Phone: 520.323.3422

**MECHANICAL**  
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1477 E. Fort Lowell Rd.  
Tucson, AZ 85711  
Phone: 520.327.1611

**LABORATORY**  
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San Diego, CA 92103-3192  
Phone: 619.297.0169

**CONSULTANTS**

**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



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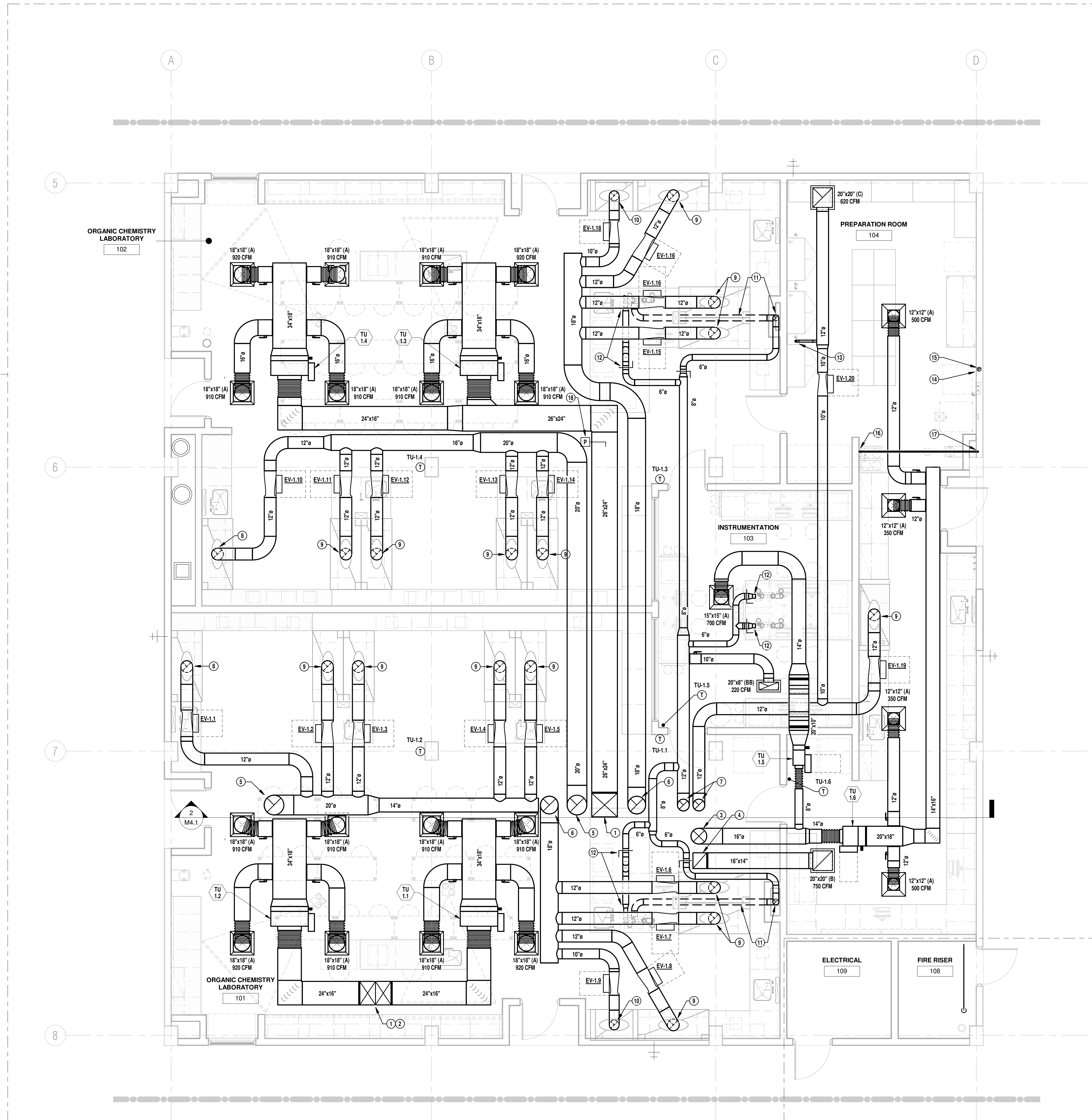
**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT  
520/327-7611  
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PROJECT# 19-366

**MECHANICAL PLAN - LEVEL 1 AREA A**  
**M2.1.1**  
100% CONSTRUCTION DOCUMENTS

**MECHANICAL KEYNOTES**

- 28"x24" SUPPLY UP THRU FLOOR TO LEVEL 2. SEE M2.2.2 FOR CONTINUATION.
- TRANSITION TO 24"x22" WITH (2) 24"x16" MITERED ELBOWS.
- 16" SUPPLY UP THRU FLOOR TO LEVEL 2. SEE M2.2.2 FOR CONTINUATION.
- 16"x14" RETURN WITH 1" LINER UP. TRANSITION TO 16"x16" WITH 2" LINER THRU FLOOR TO LEVEL 2.
- 20" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.2 FOR CONTINUATION.
- 18" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.2 FOR CONTINUATION.
- 12" EXHAUST DUCT UP THRU LEVEL 2 FLOOR. SEE M2.2.2 FOR CONTINUATION.
- 12" EXHAUST DUCT DOWN TO 6" FVH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- 12" EXHAUST DUCT DOWN TO 6" FVH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- 10" EXHAUST DUCT DOWN TO 4" CFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- 6" DOWN IN WALL CHASE TO BASE CABINET CHASE. 6" IN BASE CABINET CHASE TO VACUUM PUMP CABINET EXHAUST CONNECTION. REFER TO LABORATORY FURNISHINGS DETAIL. BALANCE TO 100 CFM.
- 6" MANUAL DAMPER, 6" REDUCE TO 4" EXHAUST SNORKEL CONNECTION. REFER TO LABORATORY FURNISHINGS DETAIL. BALANCE TO 60 CFM.
- 2" SCHEDULE 80 PVC/CPVC EXHAUST DUCT DOWN TO TALL CORROSIVE STORAGE CABINET. REFER TO LABORATORY FURNISHINGS DRAWINGS.
- PROVIDE DRYER WALL BOX WITH 4" DRYER VENT.
- 4" DRYER VENT UP IN WALL AND UP THRU LEVEL 2 FLOOR. SEE M2.2.2 FOR CONTINUATION.
- 1" VENT UP FROM PRESSURE RELIEF VALVE TO ABOVE CEILING.
- 1" VENT UP IN WALL AND UP THRU LEVEL 2 FLOOR. SEE M2.2.2 FOR CONTINUATION.
- SUPPLY DUCT STATIC PRESSURE SENSOR FOR AHU-1.1.

ADD ALTERATE #02



1 Mechanical Plan 1st Floor - B  
1/4" = 1'-0"



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Tucson, AZ 85711  
Phone: 520.327.7611  
STRUCTURAL  
Smith Structural Engineering  
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Tucson, AZ 85716  
Phone: 520.323.3422  
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1926 E. Pinal Avenue  
Tucson, AZ 85716  
Phone: 520.884.0045

**Pima Community College  
PCC West Lab Building F  
Renovation**  
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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS

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5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT  
520/327-7611  
520/327-0432  
PROJECT# 19-366

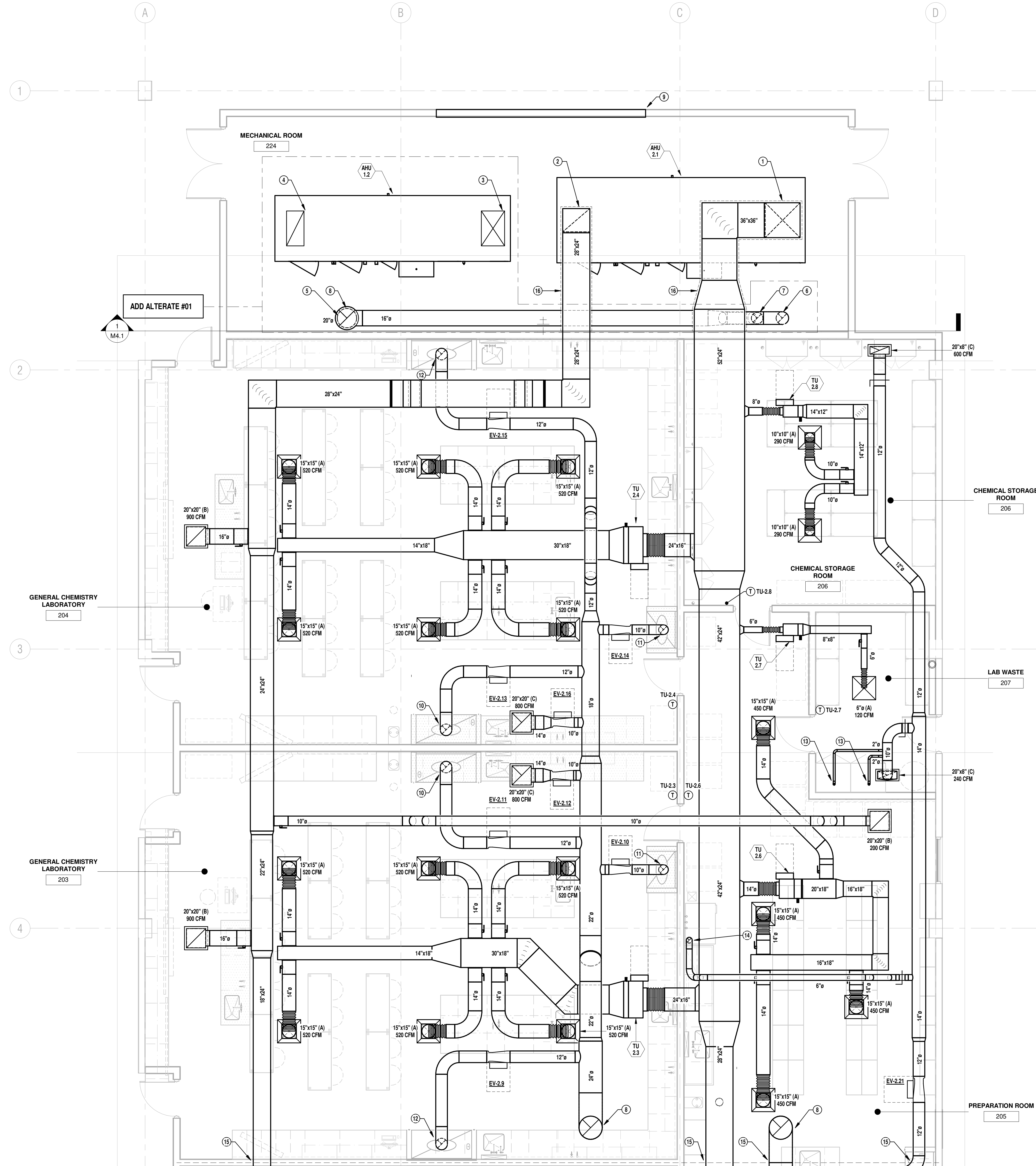
**MECHANICAL PLAN - LEVEL 1 AREA B**  
**M2.1.2**  
100% CONSTRUCTION DOCUMENTS



**MECHANICAL KEYNOTES**

1. 36"x36" SUPPLY UP FROM UNIT. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
2. 28"x24" RETURN UP FROM UNIT. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
3. 36"x24" SUPPLY DOWN FROM UNIT AND THRU FLOOR TO LEVEL 1. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
4. 36"x18" RETURN DOWN FROM UNIT AND THRU FLOOR TO LEVEL 1. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
5. 20"x EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.1 FOR CONTINUATION.
6. 12"x EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.1 FOR CONTINUATION.
7. 12"x EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.1 FOR CONTINUATION.
8. 24"x EXHAUST DUCT THRU ROOF. SEE M2.3.1 FOR CONTINUATION.
9. 6" DEEP ACOUSTIC WALL LOUVERS FOR OUTSIDE AIR INTAKE, MINIMUM 34 SQ.FT. TOTAL FREE AREA. SEE ARCHITECTURAL DRAWINGS.
10. 12"x EXHAUST DUCT DOWN TO 6" ACFH CHEMICAL FUME HOOD, REFER TO LABORATORY FURNISHINGS DRAWINGS.
11. 10"x EXHAUST DUCT DOWN TO 4" ACFH CHEMICAL FUME HOOD, REFER TO LABORATORY FURNISHINGS DRAWINGS.
12. 12"x EXHAUST DUCT DOWN TO 6" CFH CHEMICAL FUME HOOD, REFER TO LABORATORY FURNISHINGS DRAWINGS.
13. 2"x EXHAUST DUCT DOWN TO VENTED STORAGE CABINET, REFER TO LABORATORY FURNISHINGS DRAWINGS.
14. 6"x EXHAUST DUCT DOWN TO TALL GLASSWARE WASHER, REFER TO LABORATORY FURNISHINGS DRAWINGS. BALANCE TO 60 CFM.
15. SEE M2.2.3 FOR CONTINUATION.
16. PROVIDE MINIMUM R8 INSULATION FOR SUPPLY AND RETURN AIR CONDITIONING DUCT IN MECHANICAL ROOM.

NOTE: THE AIRFLOWS SHOWN ON THIS PLAN FOR CEILING EXHAUST AIR DEVICES ARE WITH ALL LAB HOODS AT THEIR MINIMUM AIRFLOW (CLOSED SASH POSITION). REFER TO EXHAUST VALVE SCHEDULE AND CONTROL SEQUENCE OF OPERATION.



1 Mechanical Plan 2nd Floor - A  
1/4" = 1'-0"

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 BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
 26 North Court Avenue  
 Tucson, Arizona 85711  
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 KC Mechanical Engineering  
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 Tucson, AZ 85711  
 Phone: 520.327.7611  
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 3028 N. W. 87th Ave.  
 Tulsa, OK 74107  
 Phone: 520.323.3422  
 ELECTRICAL  
 Electrical Engineering, Inc.  
 1526 E. Pinal Avenue  
 Tucson, AZ 85711  
 Phone: 520.884.0045

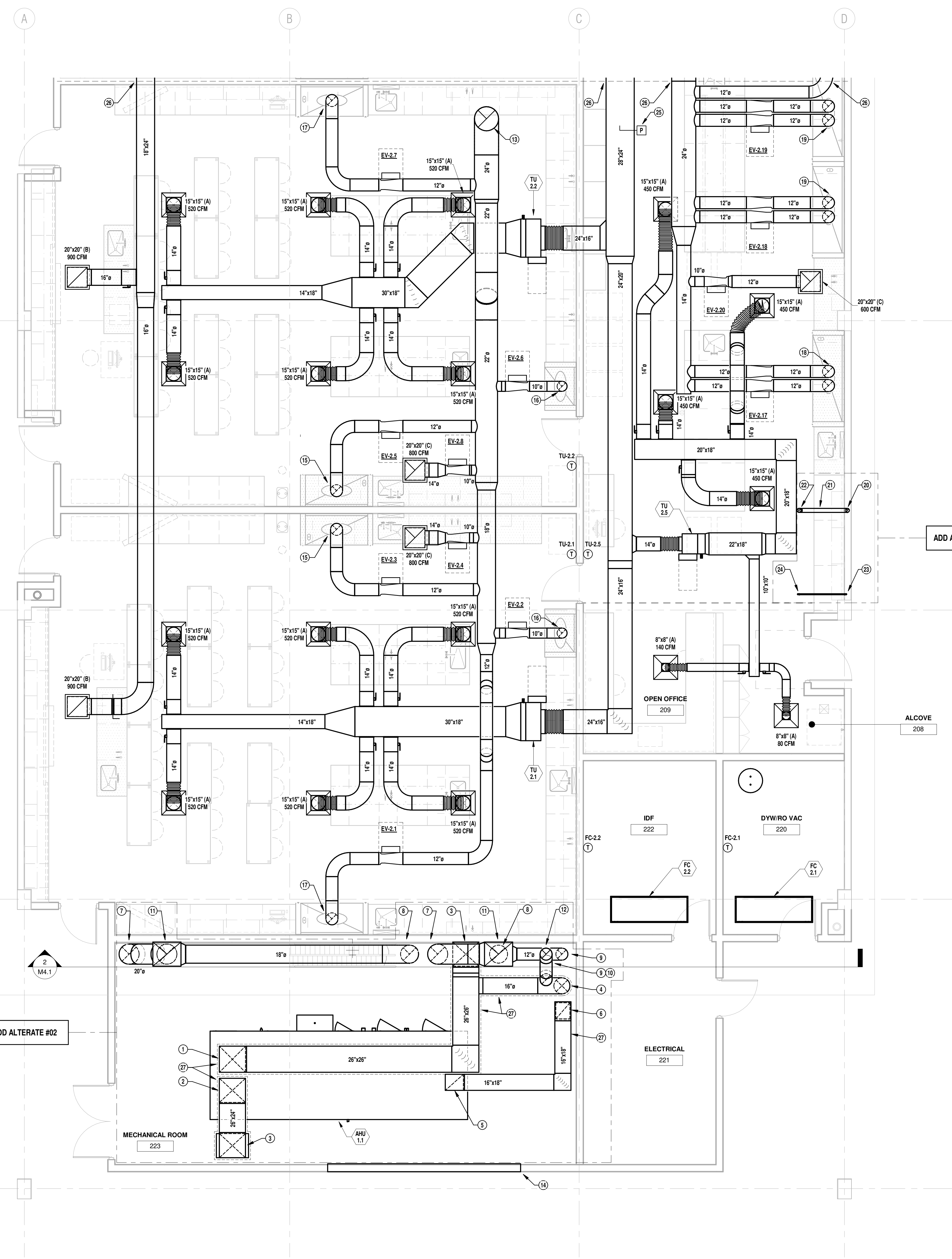
**Pima Community College  
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 2202 W Anklam Rd, Tucson, AZ 85745



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 Designers: Mech: TCB Plumb: MT  
 520/327-7611  
 520/327-0432  
 PROJECT# 19-366

**MECHANICAL PLAN - LEVEL 2 AREA A**  
**M2.2.1**  
 100% CONSTRUCTION DOCUMENTS



**MECHANICAL KEYNOTES**

1. 26"x26" SUPPLY UP FROM UNIT. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
2. 26"x24" SUPPLY UP FROM UNIT. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
3. 26"x24" SUPPLY DOWN THRU FLOOR TO LEVEL 1. SEE M2.2 FOR CONTINUATION.
4. 18"Ø SUPPLY DOWN THRU FLOOR TO LEVEL 1. SEE M2.2 FOR CONTINUATION.
5. 15"x18" RETURN WITH 2" LINER UP FROM UNIT. PROVIDE FLEXIBLE DUCT CONNECTION AT UNIT.
6. 16"x18" RETURN WITH 2" LINER DOWN THRU FLOOR TO LEVEL 1. SEE M2.2 FOR CONTINUATION.
7. 20"Ø EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.2 FOR CONTINUATION.
8. 18"Ø EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.2 FOR CONTINUATION.
9. 12"Ø EXHAUST DUCT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.2 FOR CONTINUATION.
10. 12"Ø EXHAUST DUCT OFFSET AS REQUIRED TO AVOID OTHER DUCTS.
11. 26"x24" EXHAUST DUCT THRU ROOF. SEE M2.3.2 FOR CONTINUATION.
12. 18"Ø EXHAUST DUCT THRU ROOF. SEE M2.3.2 FOR CONTINUATION.
13. 24"Ø EXHAUST DUCT THRU ROOF. SEE M2.3.2 FOR CONTINUATION.
14. 8" DEEP ACOUSTIC WALL LOUVER(S) FOR OUTSIDE AIR INTAKE - MINIMUM 32 SQ. FT. TOTAL FREE AREA. SEE ARCHITECTURAL.
15. 17"Ø EXHAUST DUCT DOWN TO 6' ACFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
16. 10"Ø EXHAUST DUCT DOWN TO 4' ACFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
17. 12"Ø EXHAUST DUCT DOWN TO 6' CFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
18. (2) 12"Ø EXHAUST DUCT DOWN TO 8' ACFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
19. (2) 12"Ø EXHAUST DUCT DOWN TO 8' CFH CHEMICAL FUME HOOD. REFER TO LABORATORY FURNISHINGS DRAWINGS.
20. 4"Ø DRYER VENT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.2. AND UP IN WALL TO ABOVE CEILING.
21. 4"Ø DRYER VENT OFFSET WITH 45° FITTINGS.
22. 4"Ø DRYER VENT UP THRU ROOF. SEE M2.3.2 FOR CONTINUATION.
23. 1"Ø VENT UP THRU FLOOR FROM LEVEL 1. SEE M2.1.2. AND UP IN WALL TO ABOVE CEILING.
24. 1"Ø VENT UP THRU ROOF. SEE M2.3.2 FOR CONTINUATION.
25. SUPPLY DUCT STATIC PRESSURE SENSOR FOR AHU-2.1.
26. SEE M2.2.1 FOR CONTINUATION.
27. PROVIDE MINIMUM R8 INSULATION FOR SUPPLY AND RETURN AIR CONDITIONING DUCT IN MECHANICAL ROOM.

NOTE: THE AIRFLOWS SHOWN ON THIS PLAN FOR CEILING EXHAUST AIR DEVICES ARE WITH ALL LAB HOODS AT THEIR MINIMUM AIRFLOW (CLOSED SASH POSITION). REFER TO EXHAUST VALVE SCHEDULE AND CONTROL SEQUENCE OF OPERATION.

1 Mechanical Plan 2nd Floor - B  
1/4" = 1'-0"

**bws ARCHITECTS**  
**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
 26 North Court Avenue  
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**MECHANICAL**  
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**LABORATORY**  
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 San Diego, CA 92108-3192  
 Phone: 619.297.0159

**CONSULTANTS**

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**Prima Community College  
 PCC West Lab Building F  
 Renovation**

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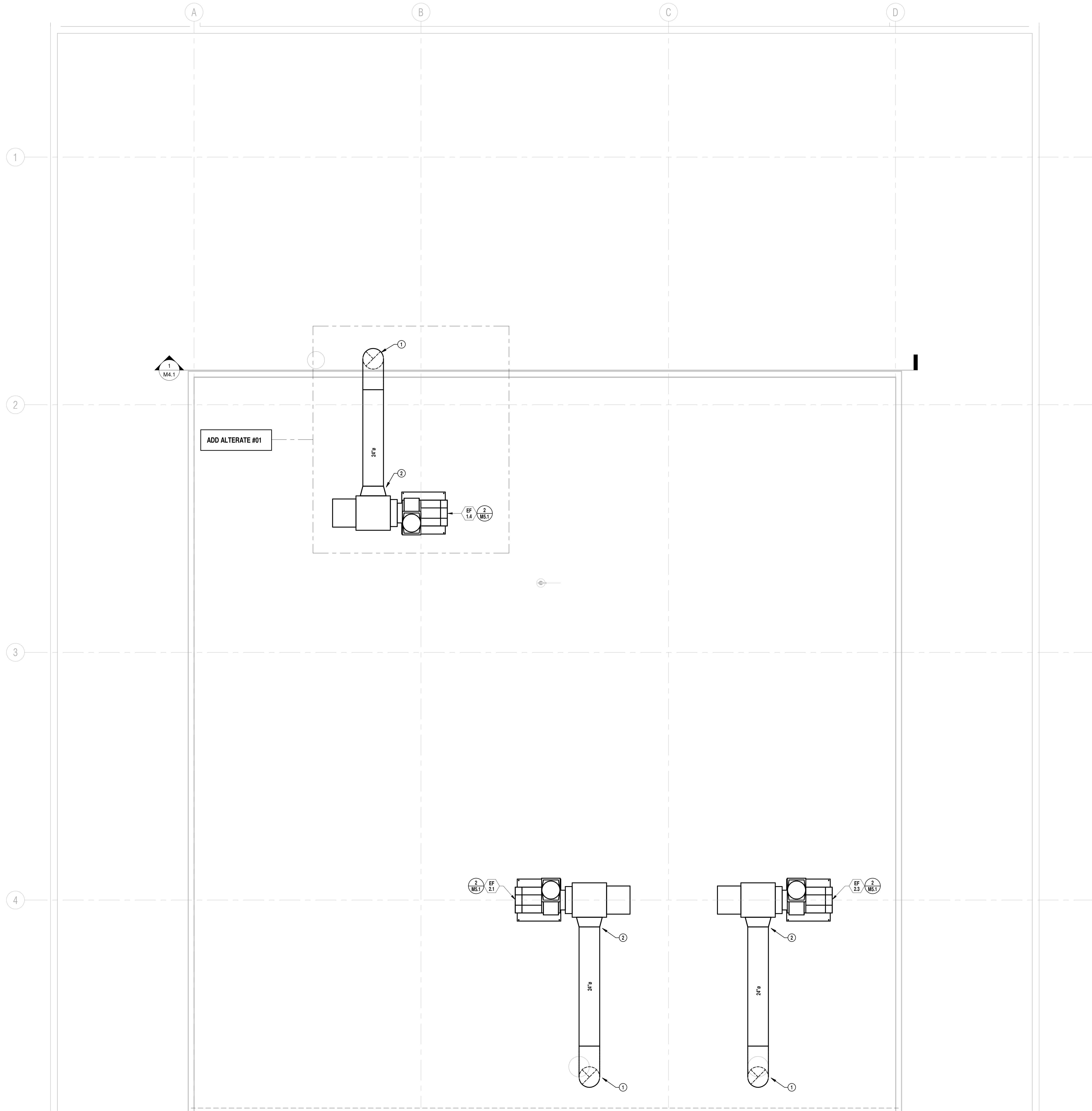
**MECHANICAL PLAN - LEVEL  
 2 AREA B**

**M2.2.2**  
 100% CONSTRUCTION DOCUMENTS

**KC MECHANICAL  
 ENGINEERING, L.L.C.**  
 5447 East Fifth Street # 112  
 Tucson, Arizona 85711  
 Designers: Mech: TCB Plumb: MT  
 520/327-7611  
 520/327-0432  
 PROJECT# 19-366

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1 Mechanical Plan Roof - A  
1/4" = 1'-0"



### MECHANICAL KEYNOTES

- 24" EXHAUST DUCT THRU ROOF
- 24" EXHAUST DUCT TO EXHAUST FAN INLET PLENUM



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**MECHANICAL PLAN - ROOF  
AREA A**

**M2.3.1**  
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 5447 East Fifth Street # 112  
 Tucson, Arizona 85711  
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520/327-7611  
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 PROJECT# 19-366

**Pima Community College  
 PCC West Lab Building F  
 Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

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 Phone: 520.327.7611

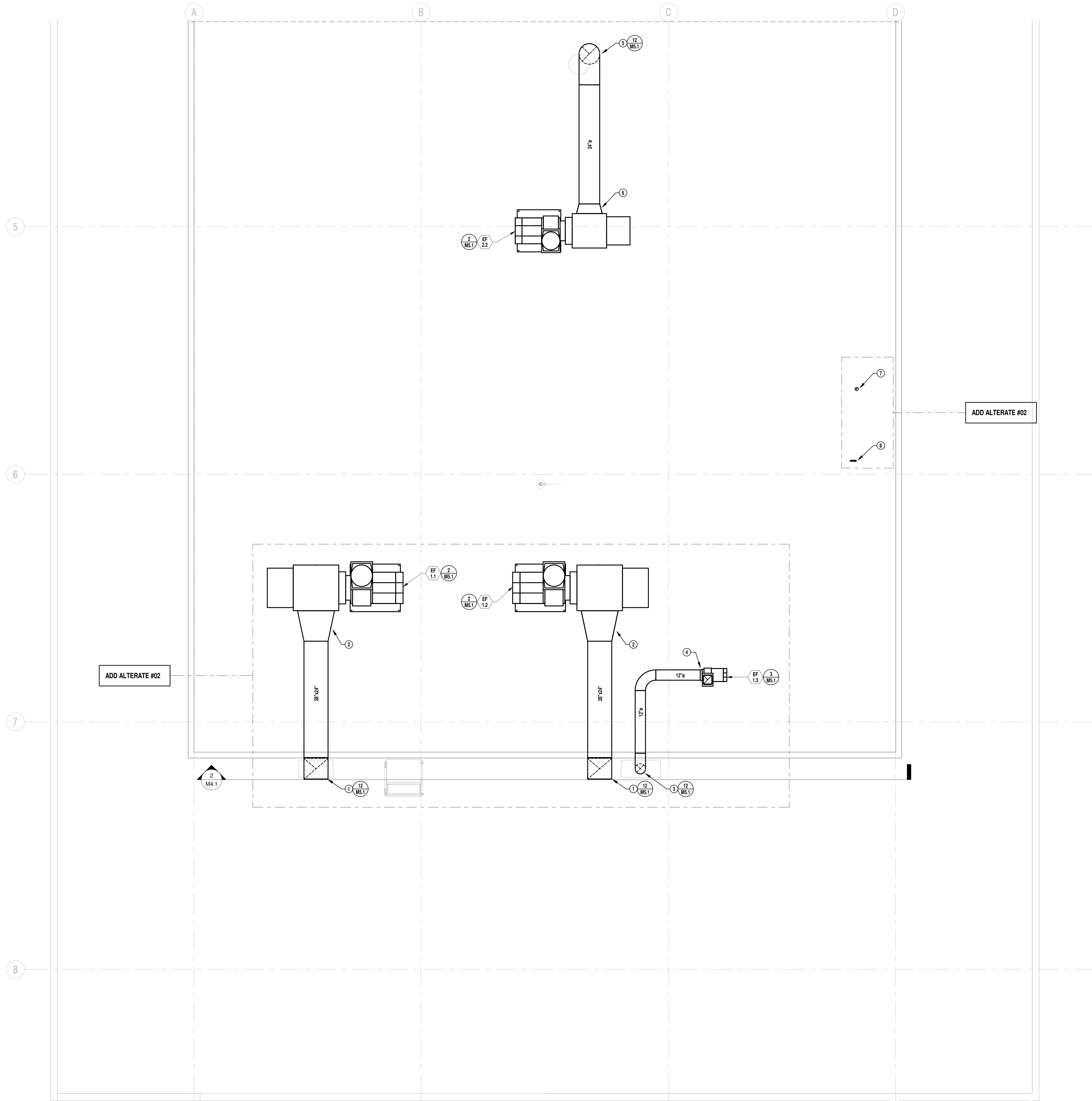
**STRUCTURAL**  
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 3028 N. Oracle Rd. #100  
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 26 North Court Avenue  
 Tucson, AZ 85710  
 520.395.2702 Fax: 520.395.6171  
 www.bwsarch.com

**MECHANICAL KEYNOTES**

1. 28"x24" EXHAUST DUCT THRU ROOF.
2. 28"x24" EXHAUST DUCT TO EXHAUST FAN INLET PLENUM.
3. 12" EXHAUST DUCT THRU ROOF.
4. 12" EXHAUST DUCT TO EXHAUST FAN INLET.
5. 24" EXHAUST DUCT THRU ROOF.
6. 24" EXHAUST DUCT TO EXHAUST FAN INLET PLENUM.
7. 4" DRYER VENT THRU ROOF AND TERMINATE WITH GOOSENECK MINIMUM 36" ABOVE ROOF.
8. 1" VENT THRU ROOF AND TERMINATE WITH GOOSENECK MINIMUM 36" ABOVE ROOF.



1 Mechanical Plan Roof - B  
1/4" = 1'-0"

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**DRAWN BY:** TCB  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**



**MECHANICAL KEYNOTES**

1. CONNECT 6"CHWSR AND 3"HWSR TO EXISTING WITH SOV IN TUNNEL.
2. 6"CHWSR AND 2-1/2"HWSR UP TO LEVEL 2, SEE M3.2.1 FOR CONTINUATION.
3. 1"HWSR DOWN TO COIL.
4. 3/4"HWSR DOWN TO COIL.
5. 1/2"HWSR DOWN TO COIL.

**bws ARCHITECTS**

BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
 26 North Court Avenue  
 Tucson, AZ 85716  
 520.795.2702 Fax: 520.795.6171  
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**CONSULTANTS**  
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 San Diego, CA 92103-3192  
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 1747 E. Park Ave.  
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 Phone: 520.327.7611  
 STRUCTURAL  
 Under Structural Engineering  
 3026 N. W. 10th Pl.  
 Tucson, AZ 85716  
 Phone: 520.323.3422  
 ELECTRICAL  
 Alford Engineering, Inc.  
 1920 E. Park Ave.  
 Tucson, AZ 85711  
 Phone: 520.884.0045

**Pima Community College  
 PCC West Lab Building F  
 Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

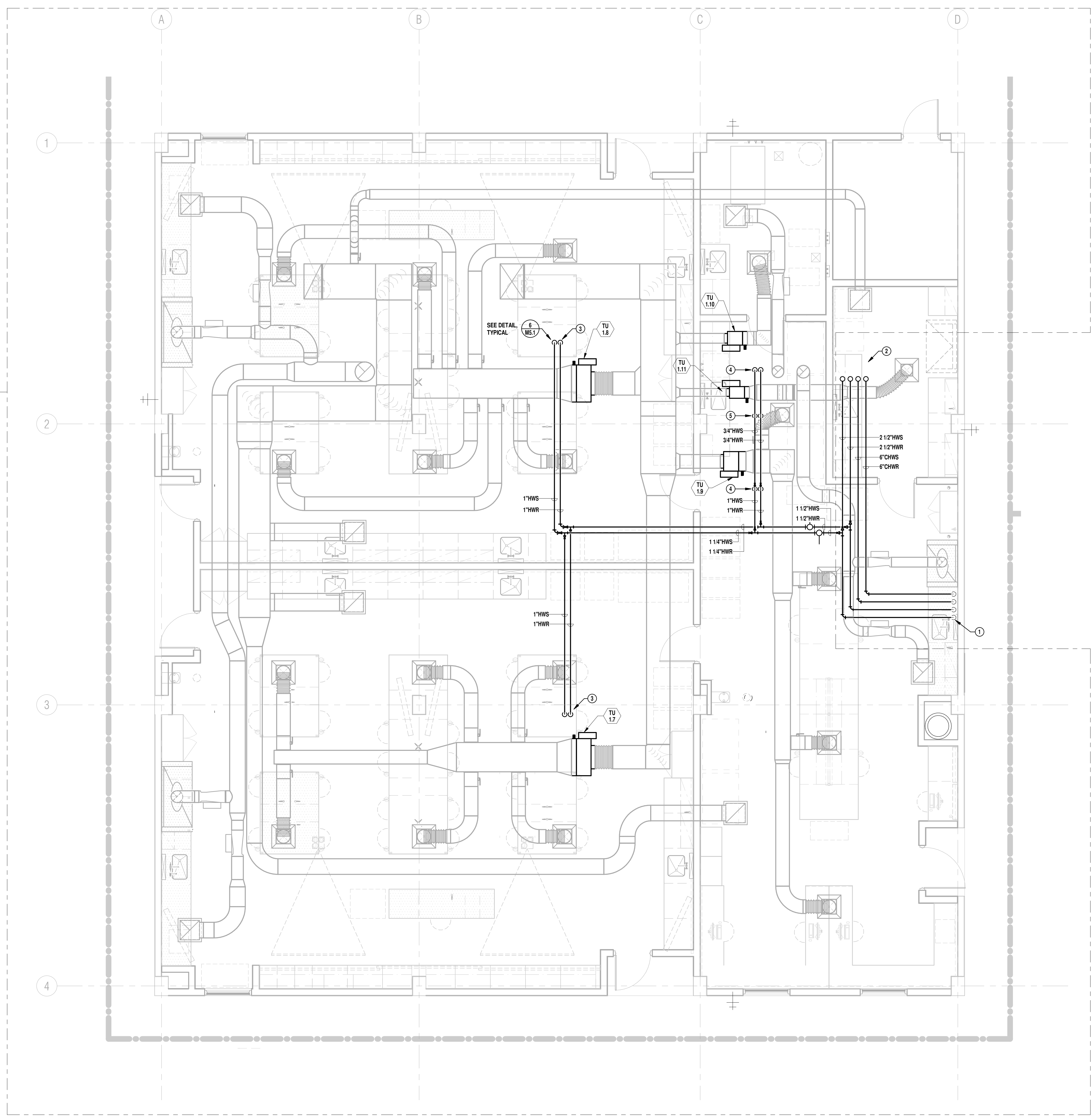


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**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

**MECHANICAL HYDRONIC  
 PLAN - LEVEL 1 AREA A**

**M3.1.1**  
 100% CONSTRUCTION DOCUMENTS

**KC MECHANICAL  
 ENGINEERING, L.L.C.**  
 5447 East Fifth Street # 112 Tucson, Arizona 85711  
 520/327-7611 520/327-0432  
 Designers: Mech: TCB Plumb: MT PROJECT# 19-366



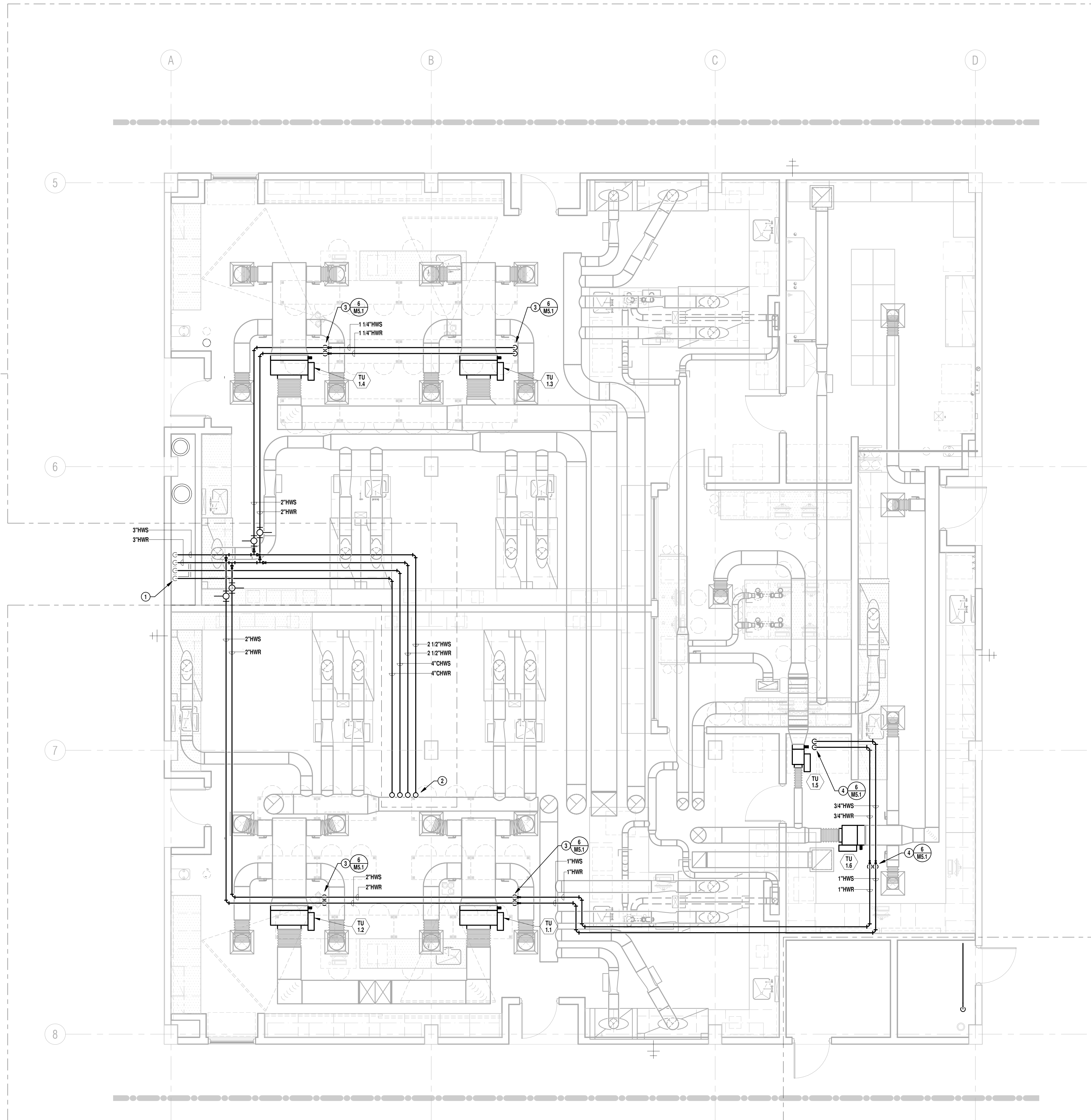
ADD ALTERATE #01

1 Mechanical Hydronic Plan 1st Floor - A  
 1/4" = 1'-0"

**MECHANICAL KEYNOTES**

1. CONNECT 4"CHWS/R AND 3"HWS/R UP TO EXISTING WITH SOV IN TUNNEL.
2. 4"CHWS/R AND 2"HWS/R UP TO LEVEL 2, SEE M3.2.2 FOR CONTINUATION.
3. 1-1/4"HWS/R DOWN TO COIL.
4. 3/4"HWS/R DOWN TO COIL.

ADD ALTERATE #02



1 Mechanical Hydronic Plan 1st Floor - B  
1/4" = 1'-0"

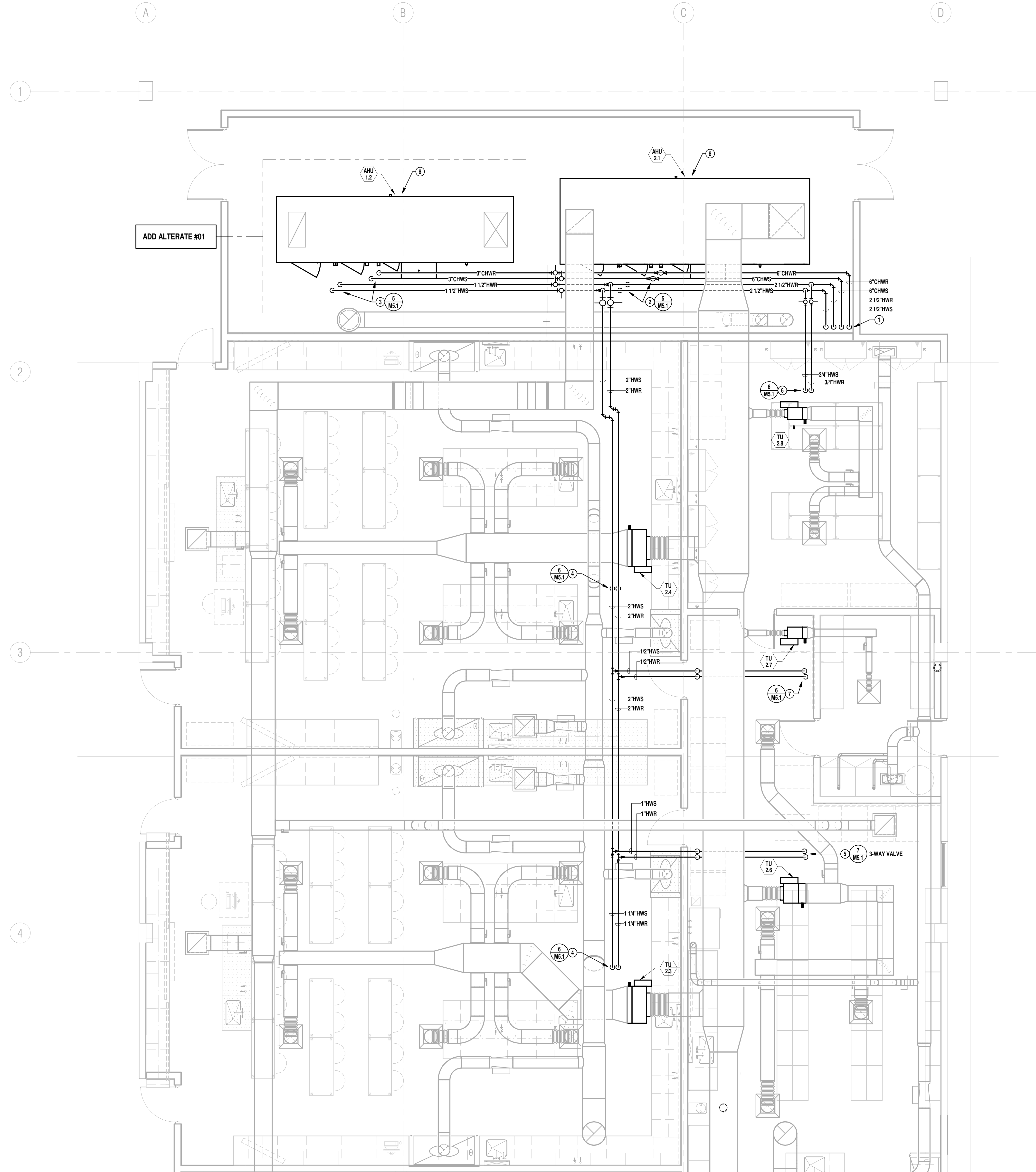
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**DATE:** 01/08/2020  
**REVISIONS**

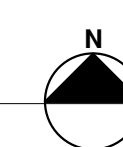
**MECHANICAL KEYNOTES**

1. 6"CHWSR AND 2-1/2"HWSR UP FROM LEVEL 1, SEE M3.1.1 FOR CONTINUATION. PROVIDE SOV IN RISE AT 4 FT AFF.
2. 3"CHWSR AND 1-1/2"HWSR TO AHU-1,2
3. 6"CHWSR AND 2"HWSR TO AHU-2,1
4. 1-1/4"HWSR DOWN TO COIL.
5. 1"HWSR DOWN TO COIL.
6. 3/4"HWSR DOWN TO COIL.
7. 1/2"HWSR DOWN TO COIL.
8. SEE PLUMBING PLAN FOR CONDENSATE DRAIN.



ADD ALTERATE #01

1 Mechanical Hydronic Plan 2nd Floor - A  
1/4" = 1'-0"



1/11/2021 2:40:28 PM

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Designers: Mech: TCB Plumb: MT 520/327-7611 520/327-0432 PROJECT# 19-366

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**DATE:** 01/08/2020  
**REVISIONS**



**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

**LABORATORY**  
25035 KENNETH M. CAWTHORNE  
TUCSON, AZ 85711  
PHONE: 520.327.7611

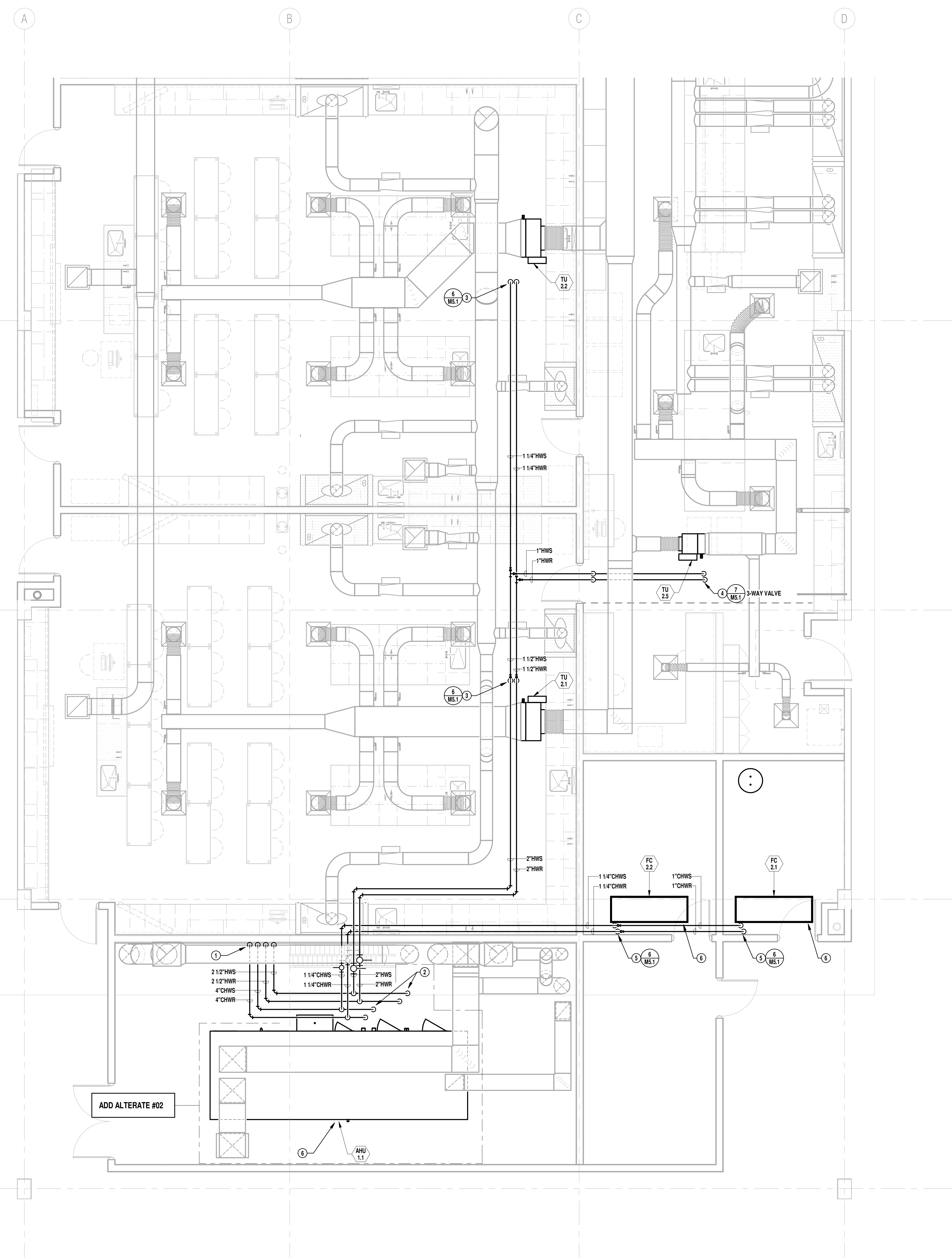
**MECHANICAL**  
AC Mechanical Engineering  
1047 E. Pinal Ave. #5711  
Tucson, AZ 85711  
Phone: 520.327.7611

**STRUCTURAL**  
Civil Structural Engineering  
3028 N. W. 10th St. #200  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
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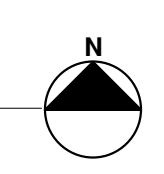
**MECHANICAL HYDRONIC  
PLAN - LEVEL 2 AREA A**  
**M3.2.1**  
100% CONSTRUCTION DOCUMENTS



**MECHANICAL KEYNOTES**

1. 4"CHWSR AND 2-1/2"HWSR UP THRU FLOOR FROM LEVEL 1, SEE M3.1.2 FOR CONTINUATION, PROVIDE SOVS AT 4FT AFF.
2. 4"CHWSR AND 2-1/2"HWSR TO AHU-1.1
3. 1-1/4"HWSR DOWN TO COIL.
4. 1"HWSR DOWN TO COIL.
5. 1"CHWSR DOWN TO COIL.
6. SEE PLUMBING PLANS FOR CONDENSATE DRAIN.

1 Mechanical Hydronic Plan 2nd Floor - B  
1/4" = 1'-0"



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**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT  
520/327-7611  
520/327-0432  
PROJECT# 19-366

**MECHANICAL HYDRONIC PLAN - LEVEL 2 AREA B**  
**M3.2.2**  
100% CONSTRUCTION DOCUMENTS

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**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
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**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

**CONSULTANTS**  
**LABORATORY**  
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Phone: 619.297.0169

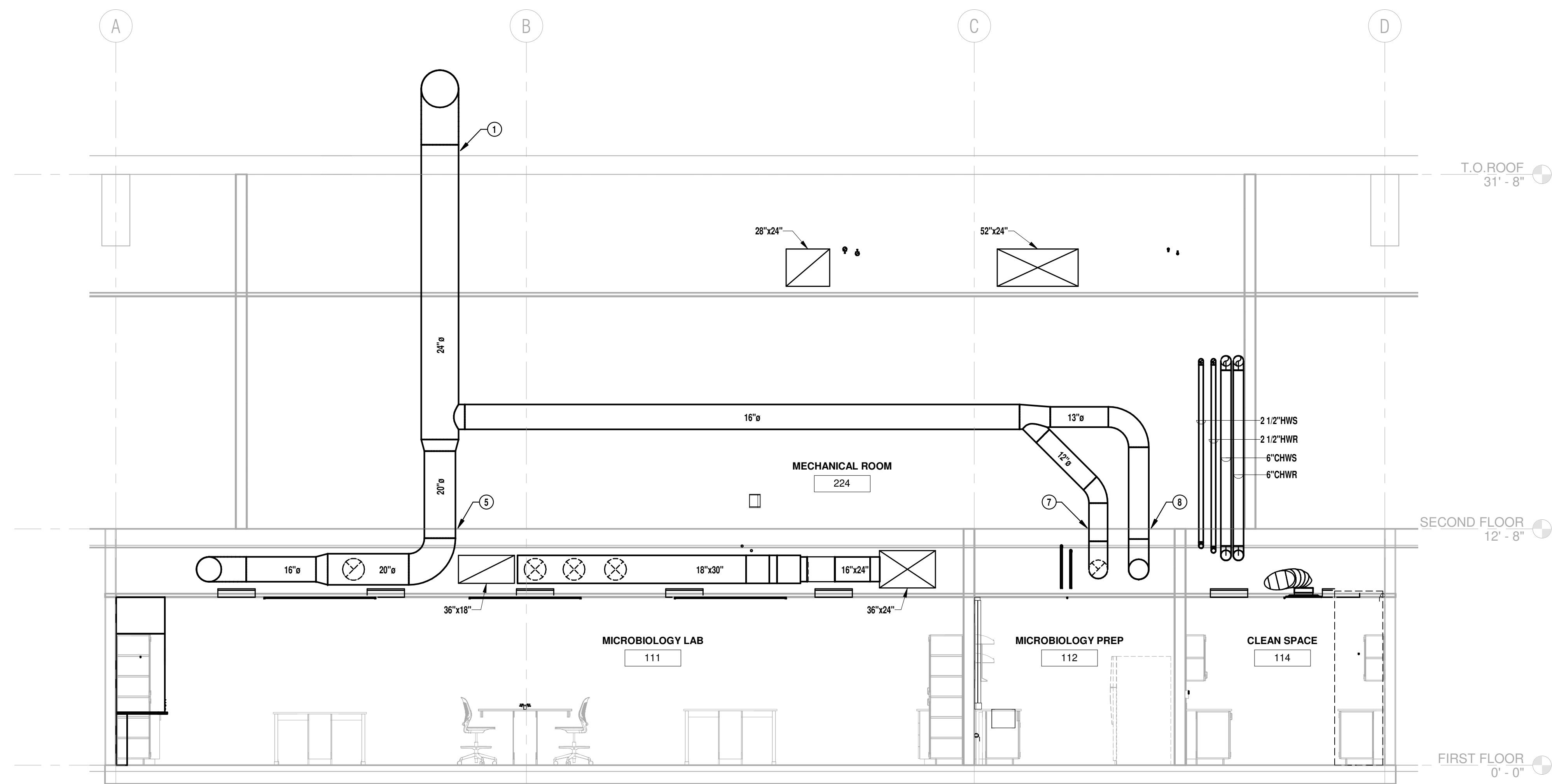
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KC Mechanical Engineering  
147 E. Fifth Street  
Tucson, AZ 85711  
Phone: 520.327.7611

**STRUCTURAL**  
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Tucson, AZ 85716  
Phone: 520.323.3422

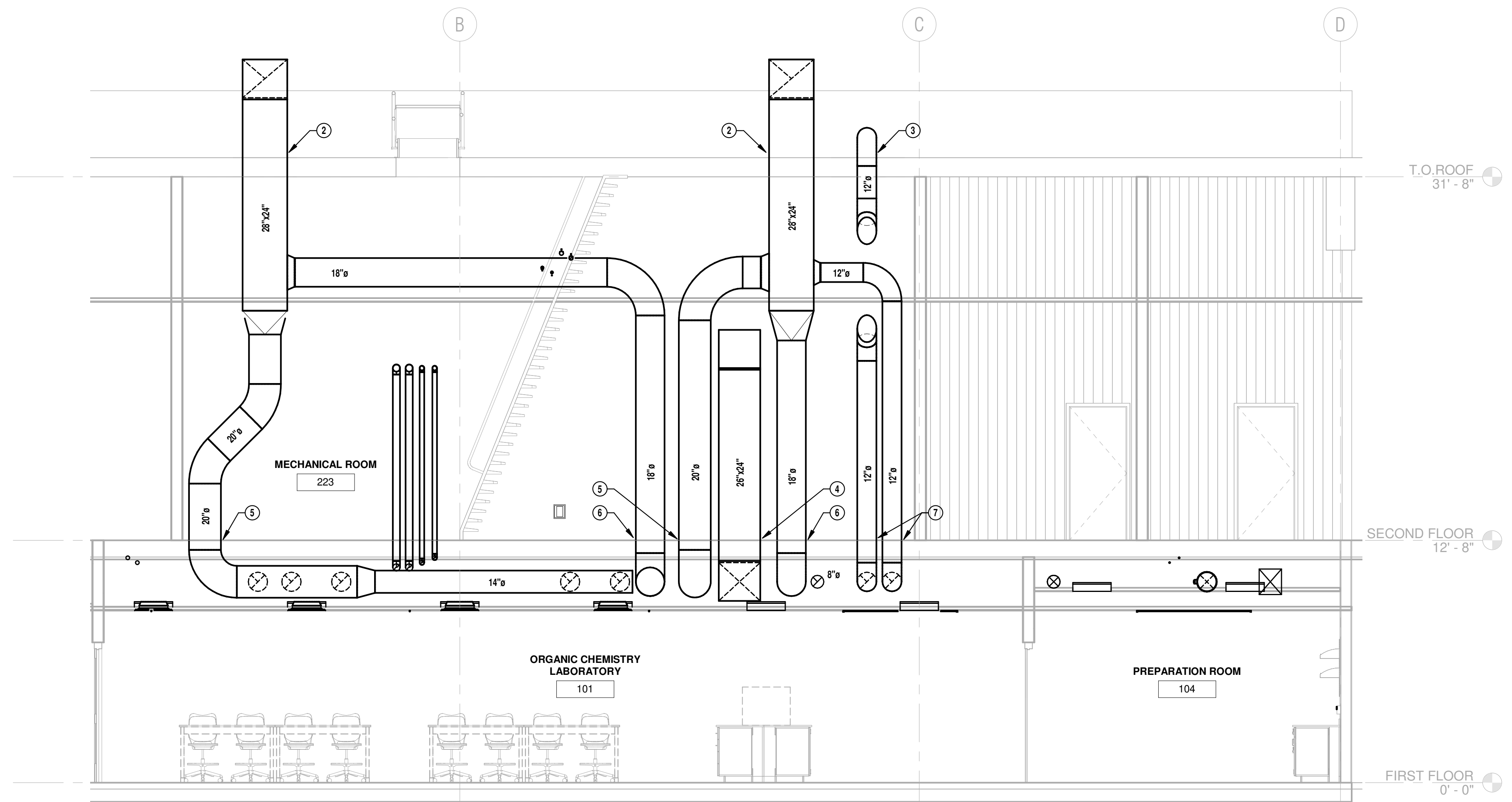
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Morrise Engineering, Inc.  
1920 E. 10th Street  
Tucson, AZ 85714  
Phone: 520.884.0045

**bws ARCHITECTS**  
**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
26 North Court Avenue  
Tucson, AZ 85714  
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1 Section at North Duct Riser  
1/4" = 1'-0"



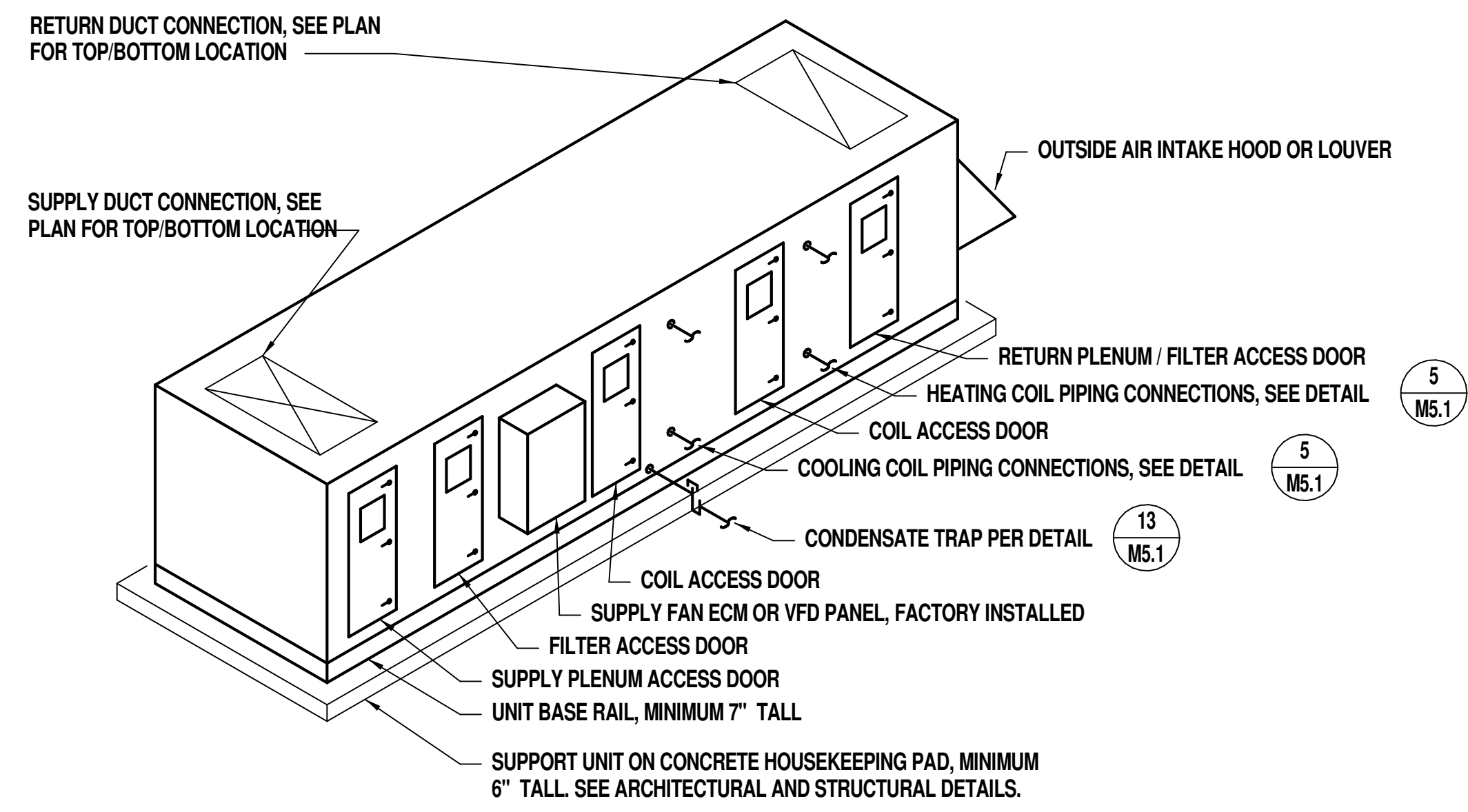
2 Section at South Duct Risers  
1/4" = 1'-0"

**MECHANICAL KEYNOTES**

1. 24" EXHAUST DUCT THRU ROOF.
2. 28" EXHAUST DUCT THRU ROOF.
3. 12" EXHAUST DUCT THRU FLOOR.
4. 24" SUPPLY UP THRU FLOOR.
5. 20" EXHAUST DUCT THRU FLOOR.
6. 18" EXHAUST DUCT THRU FLOOR.
7. 12" EXHAUST DUCT THRU FLOOR.
8. 13" EXHAUST DUCT THRU FLOOR.



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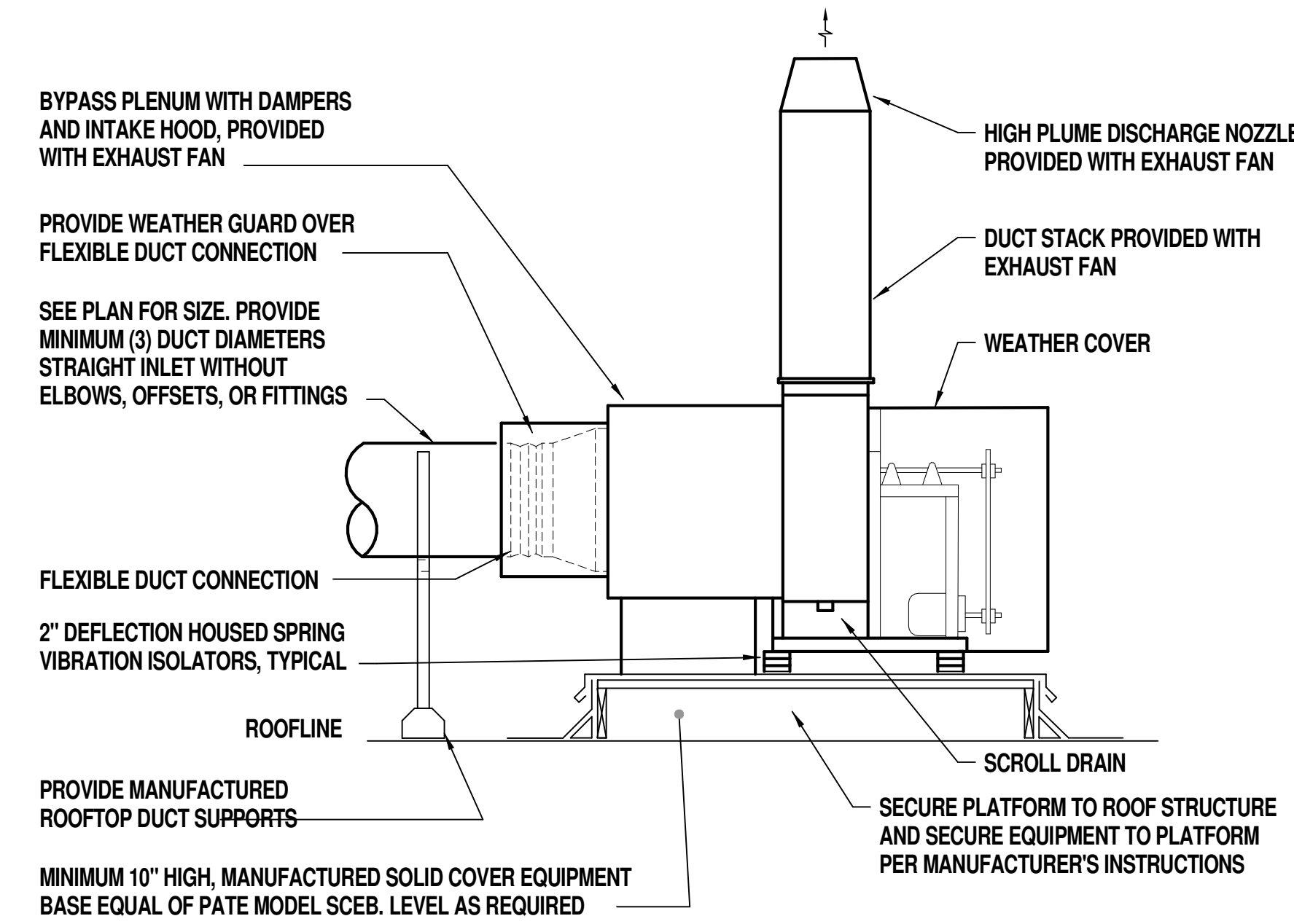


- NOTE:
1. INSULATE ALL CHWS/R & HWS/R PIPING PER SPECIFICATIONS.
  2. PROVIDE AUTOMATIC AIR VENTS AT ALL HIGH POINTS IN PIPING IN MECHANICAL ROOM.
  3. PROVIDE MANUAL DRAINS AT ALL LOW POINTS IN PIPING IN MECHANICAL ROOM.
  4. LABEL ALL PIPING WITH STENCIL PAINTED PIPE MAKERS. INCLUDE ARROW INDICATING DIRECTION OF FLOW.
  5. PROVIDE FLEXIBLE DUCT CONNECTIONS AT UNIT AND TRANSITION TO DUCT SIZES SHOWN ON PLANS.

**INDOOR AIR HANDLING UNIT DETAIL**

NO SCALE

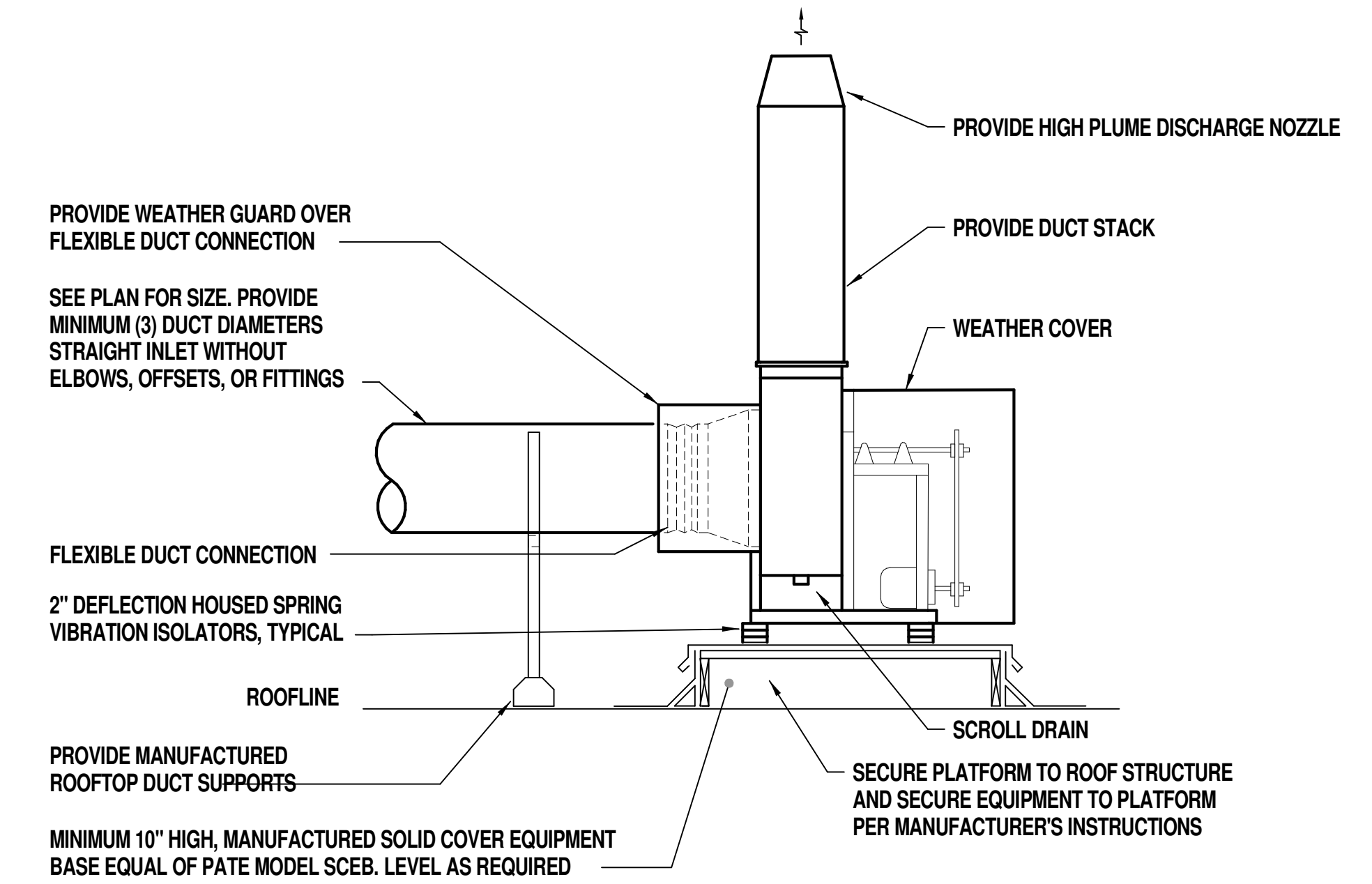
M5.1



**UTILITY SET EXHAUST FAN WITH BYPASS DETAIL**

NO SCALE

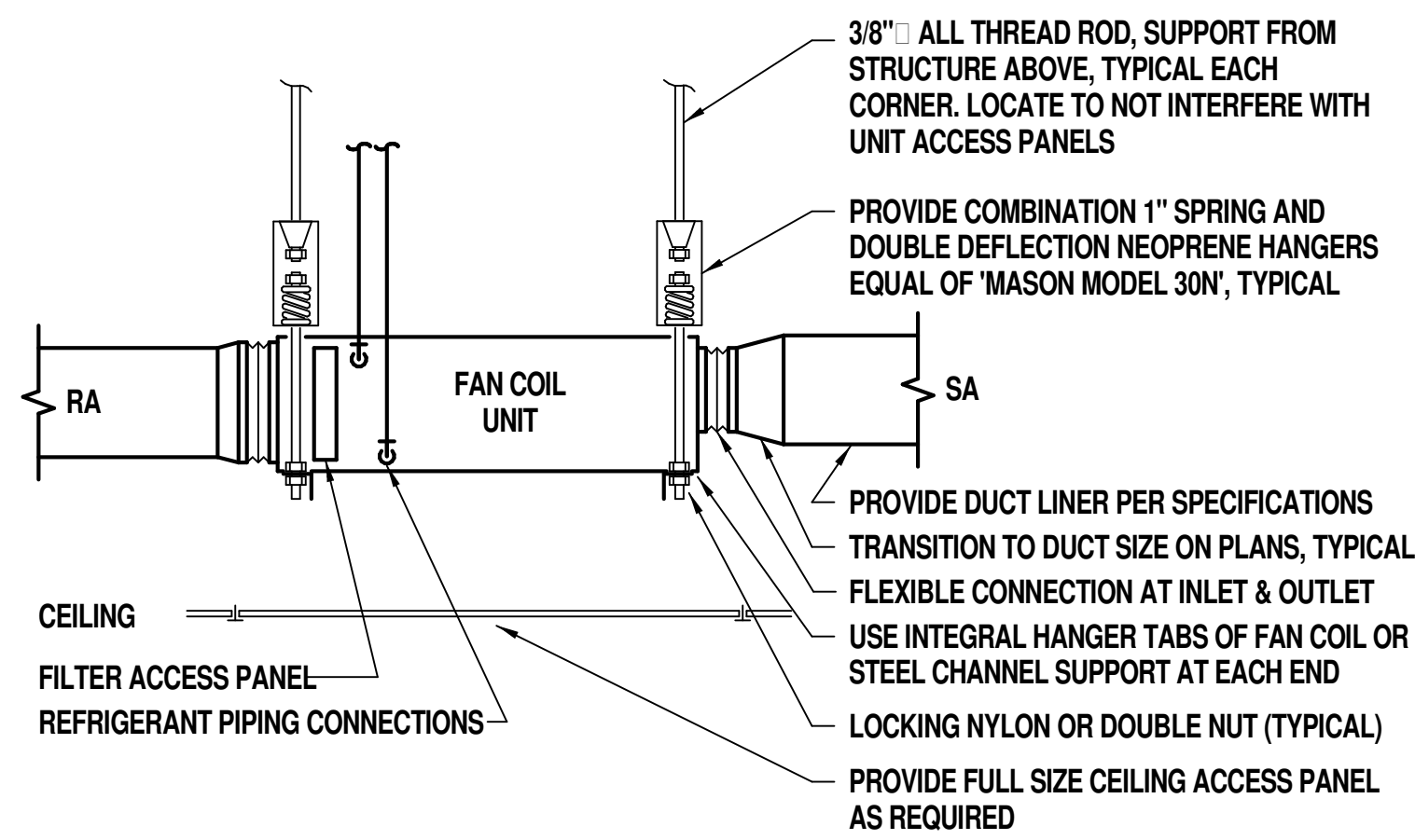
M5.1



**UTILITY SET EXHAUST FAN DETAIL**

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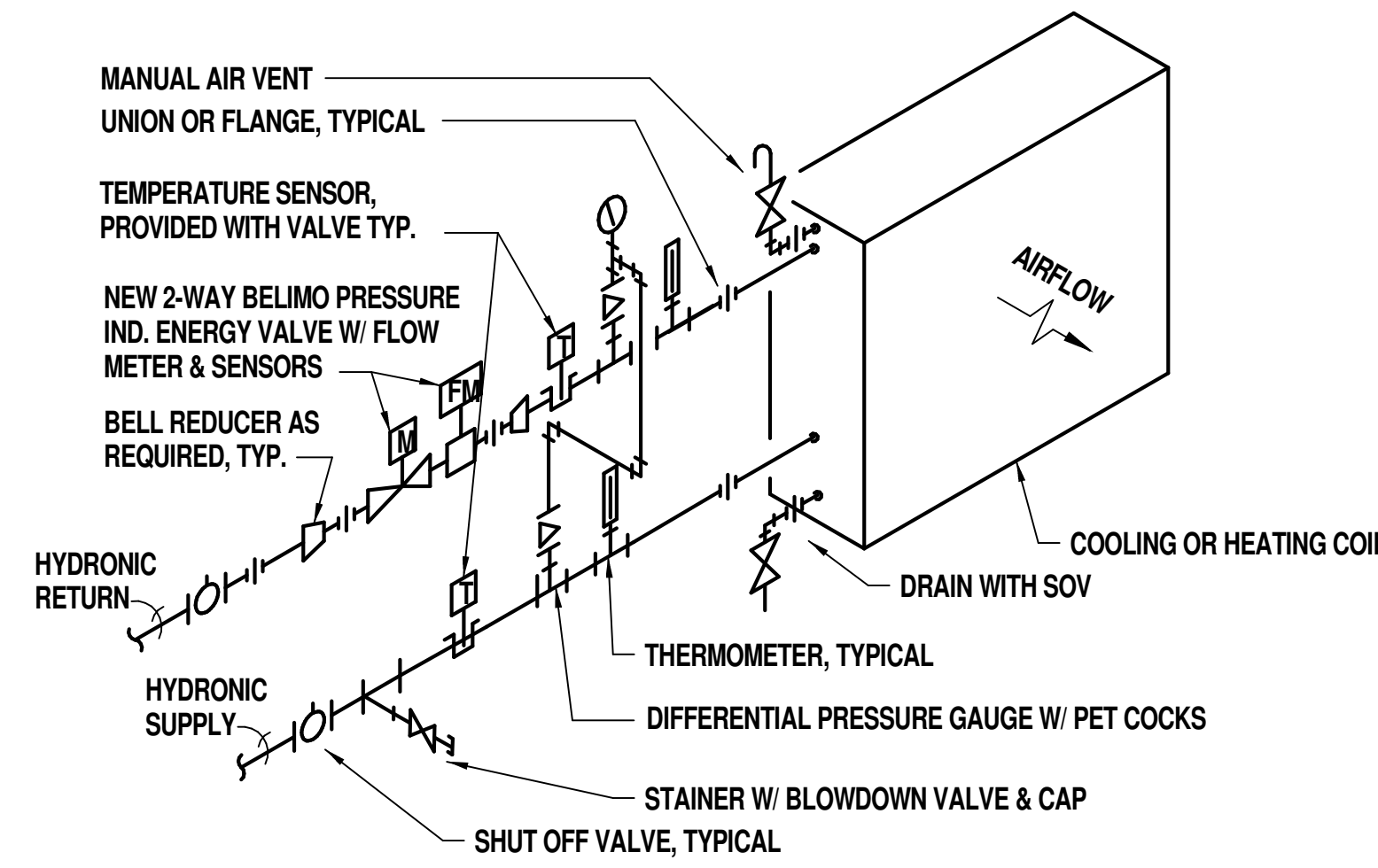
M5.1



**DUCTED FAN COIL DETAIL**

NO SCALE

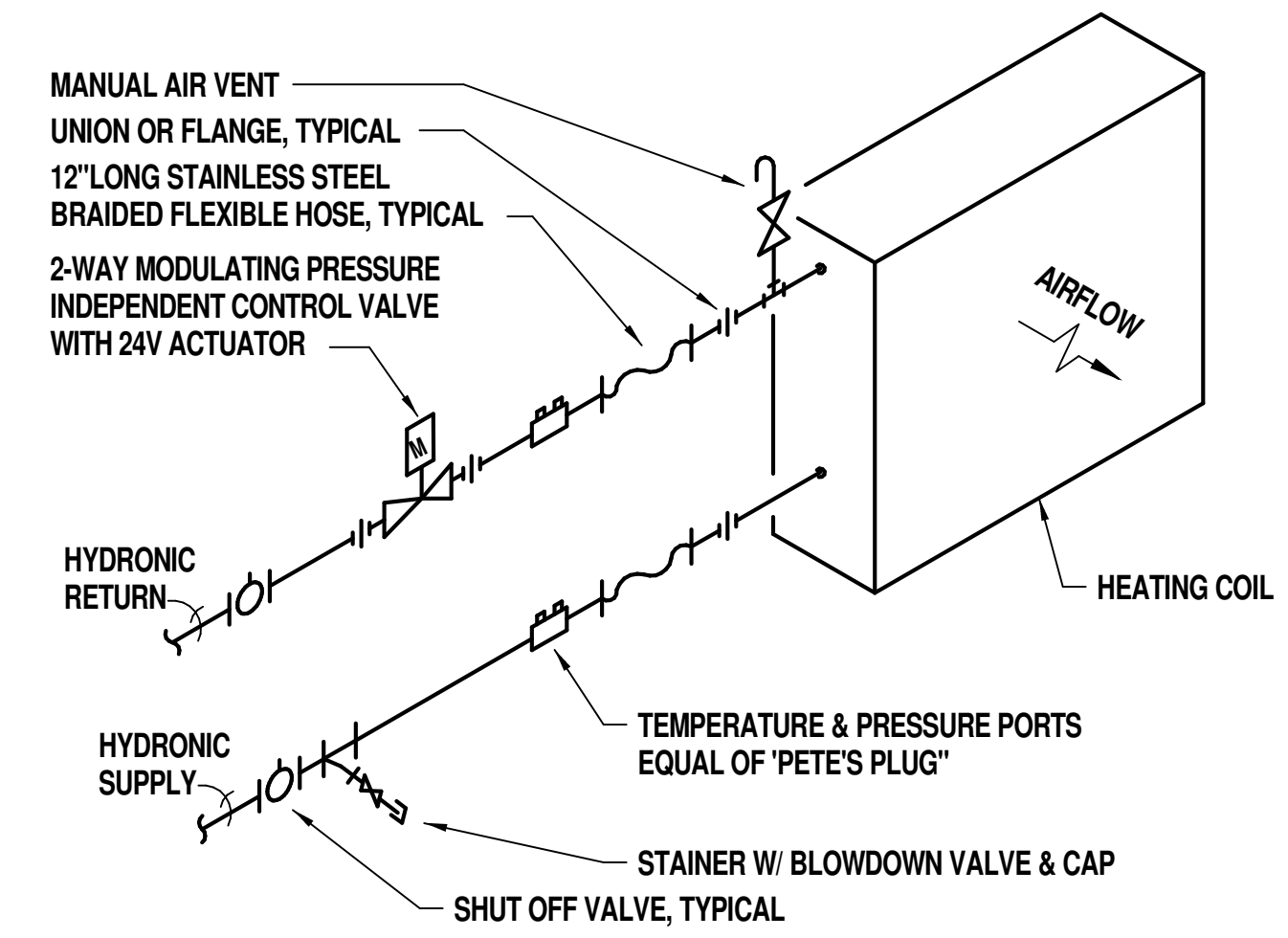
M5.1



**PRESSURE INDEPENDENT 2-WAY VALVE COIL SCHEMATIC (AHU)**

NO SCALE

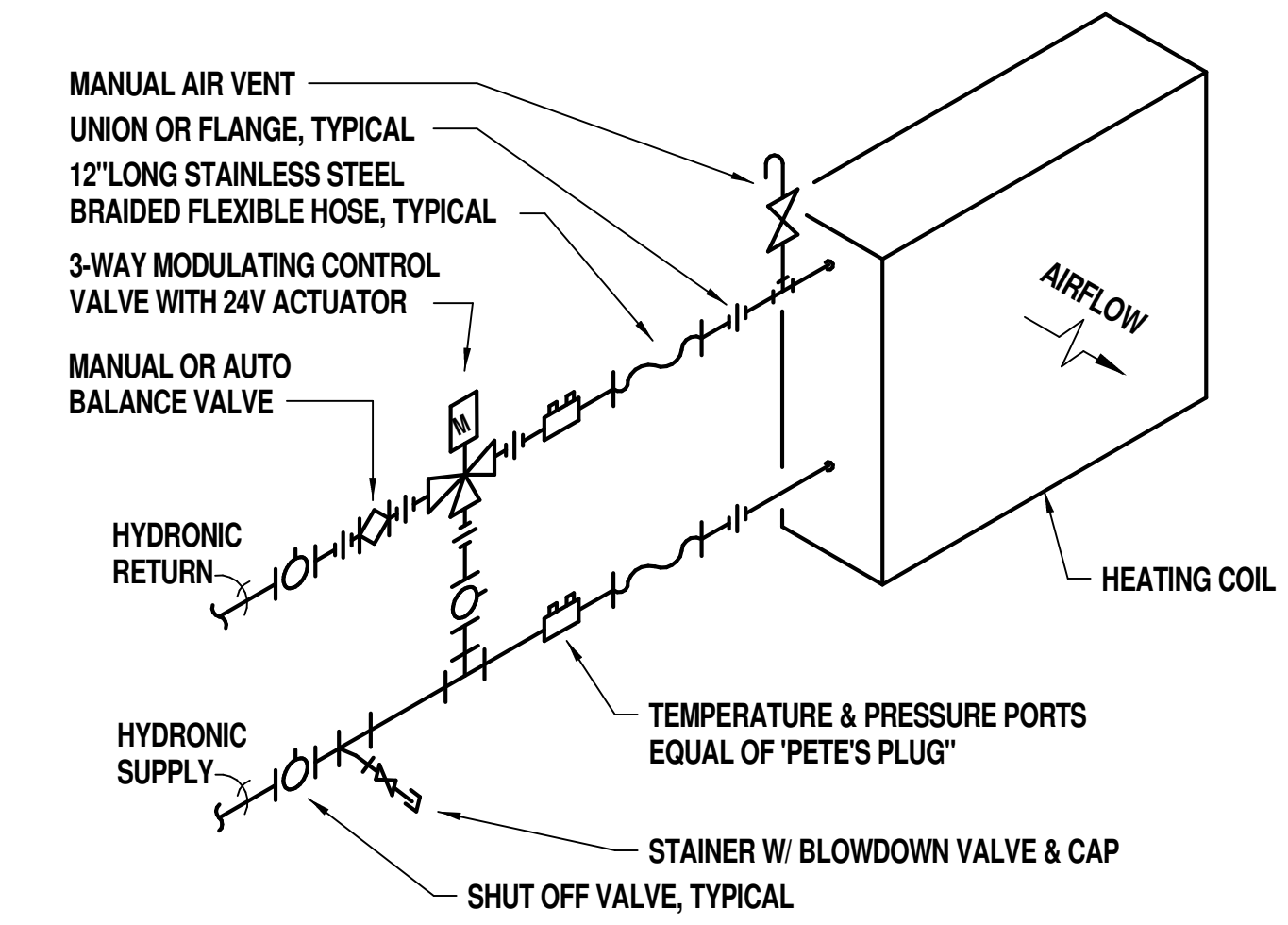
M5.1



**PRESSURE INDEPENDENT 2-WAY VALVE COIL SCHEMATIC (REHEAT COIL)**

NO SCALE

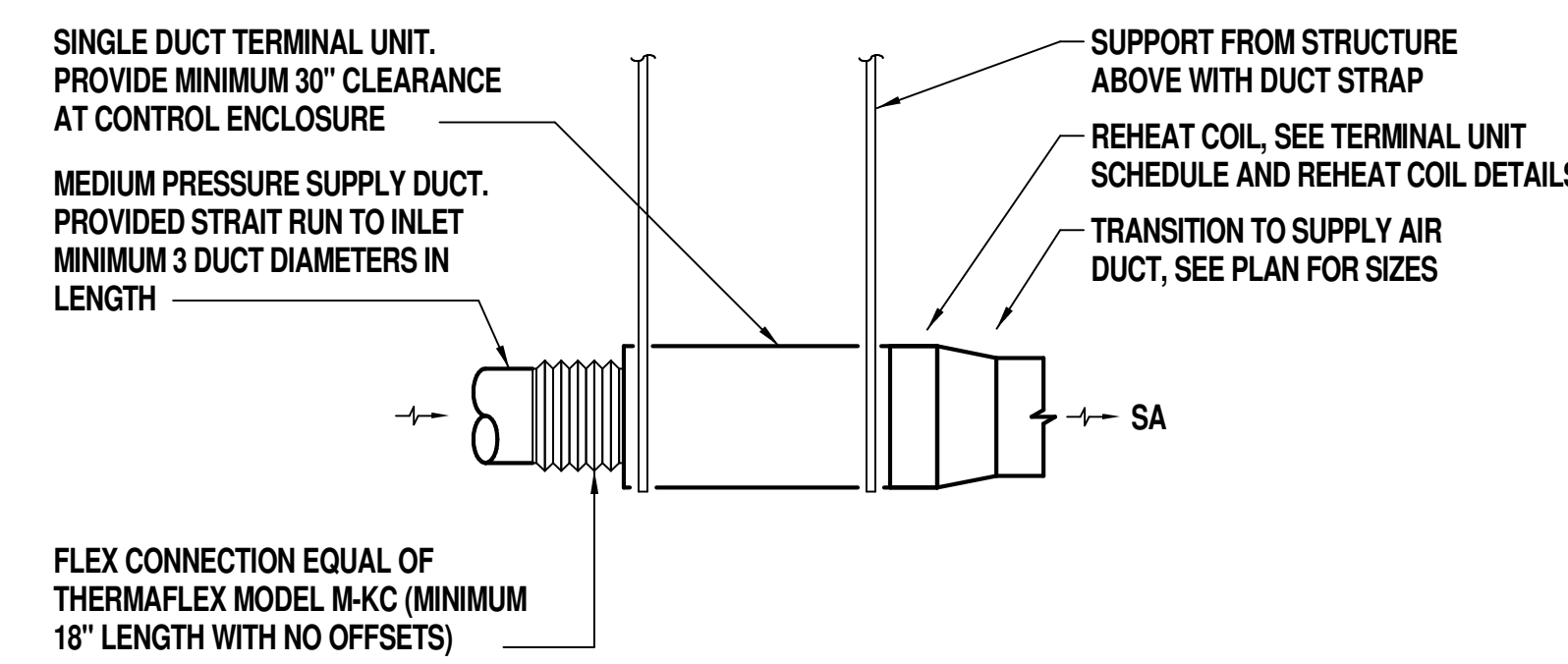
M5.1



**3-WAY VALVE COIL SCHEMATIC (REHEAT COIL)**

NO SCALE

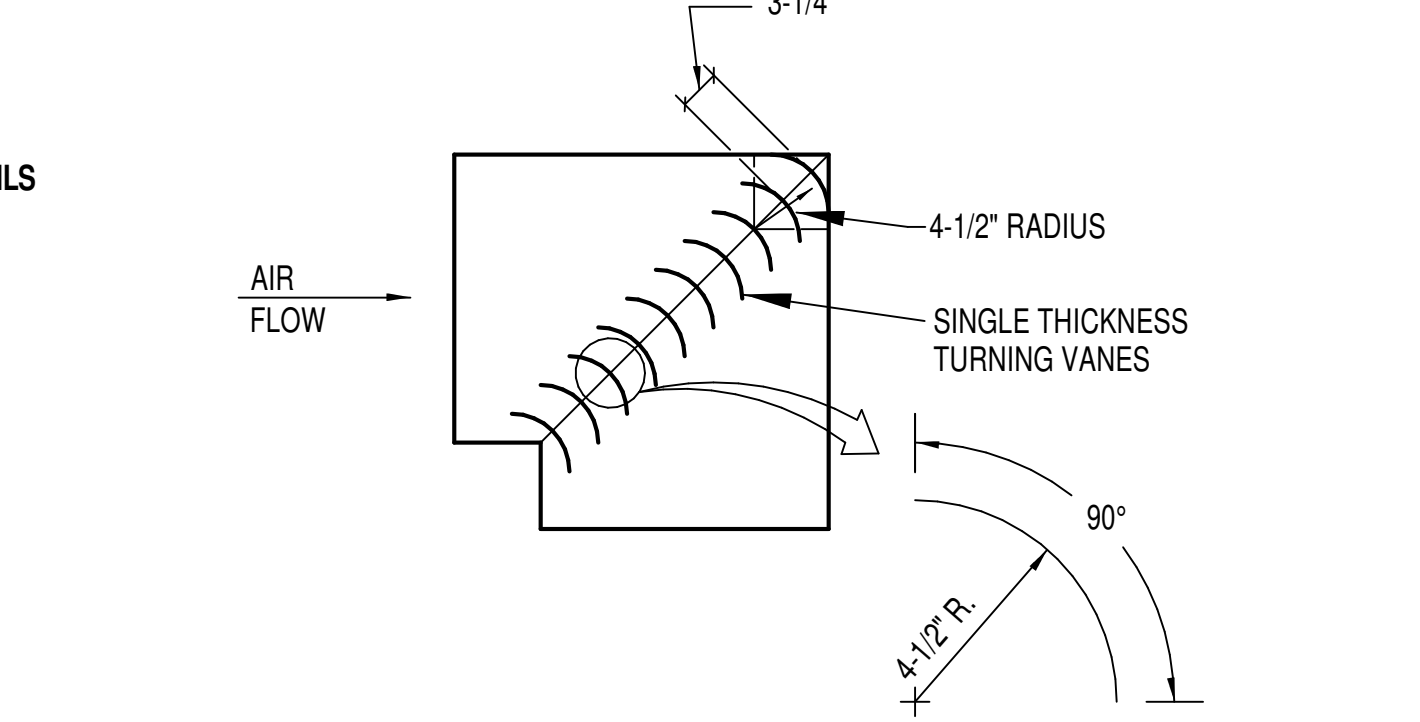
M5.1



**SINGLE DUCT TERMINAL UNIT DETAIL**

NO SCALE

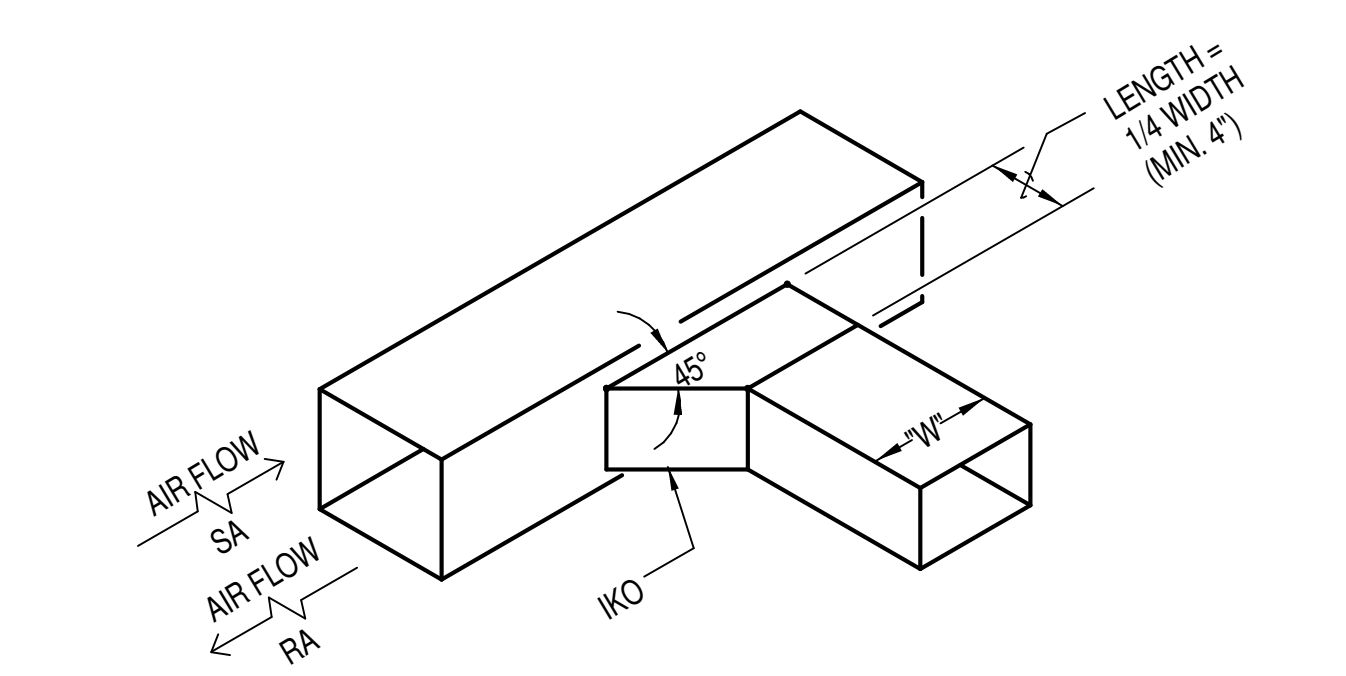
M5.1



**MITER ELBOW WITH TURNING VANES DETAIL**

NO SCALE

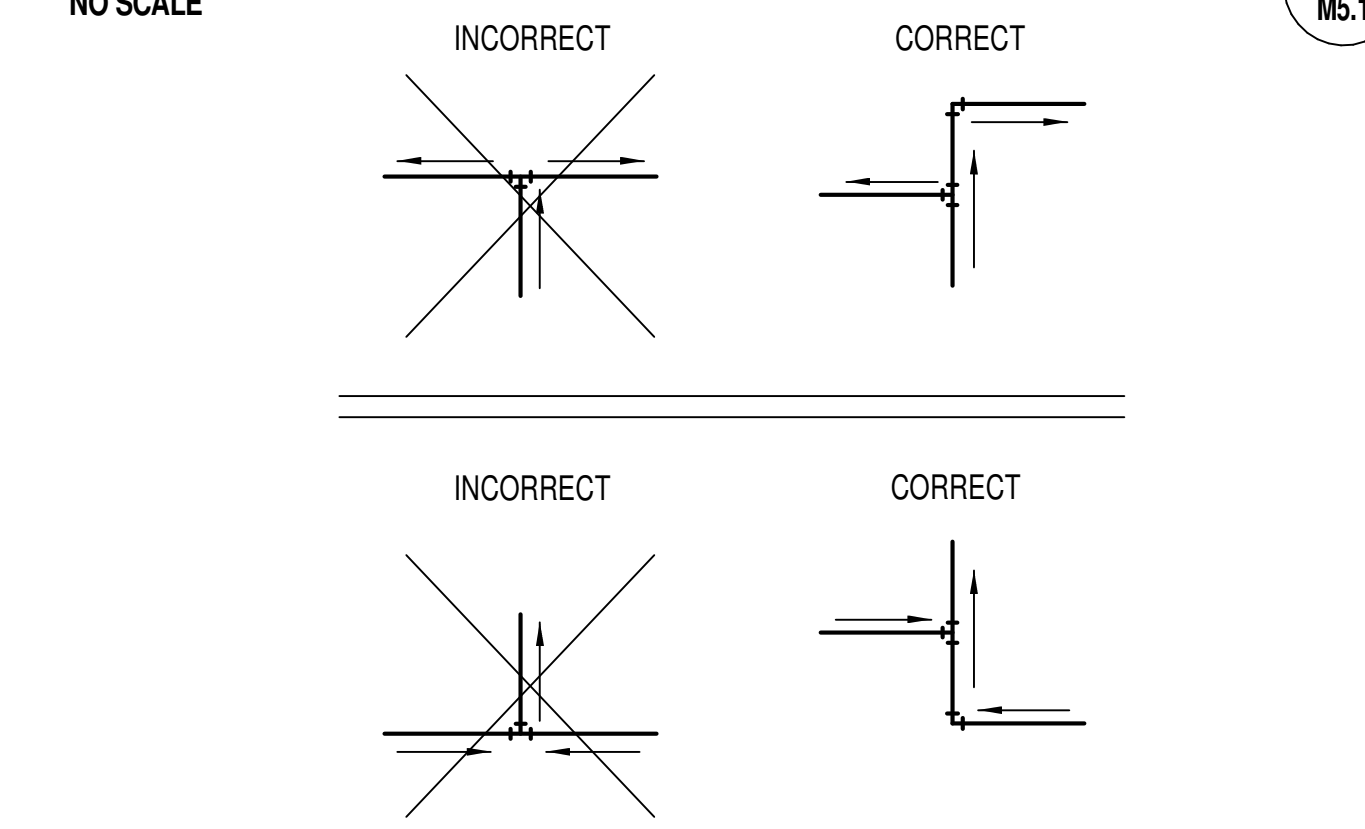
M5.1



**DUCT TAKE-OFF DETAIL**

NO SCALE

M5.1

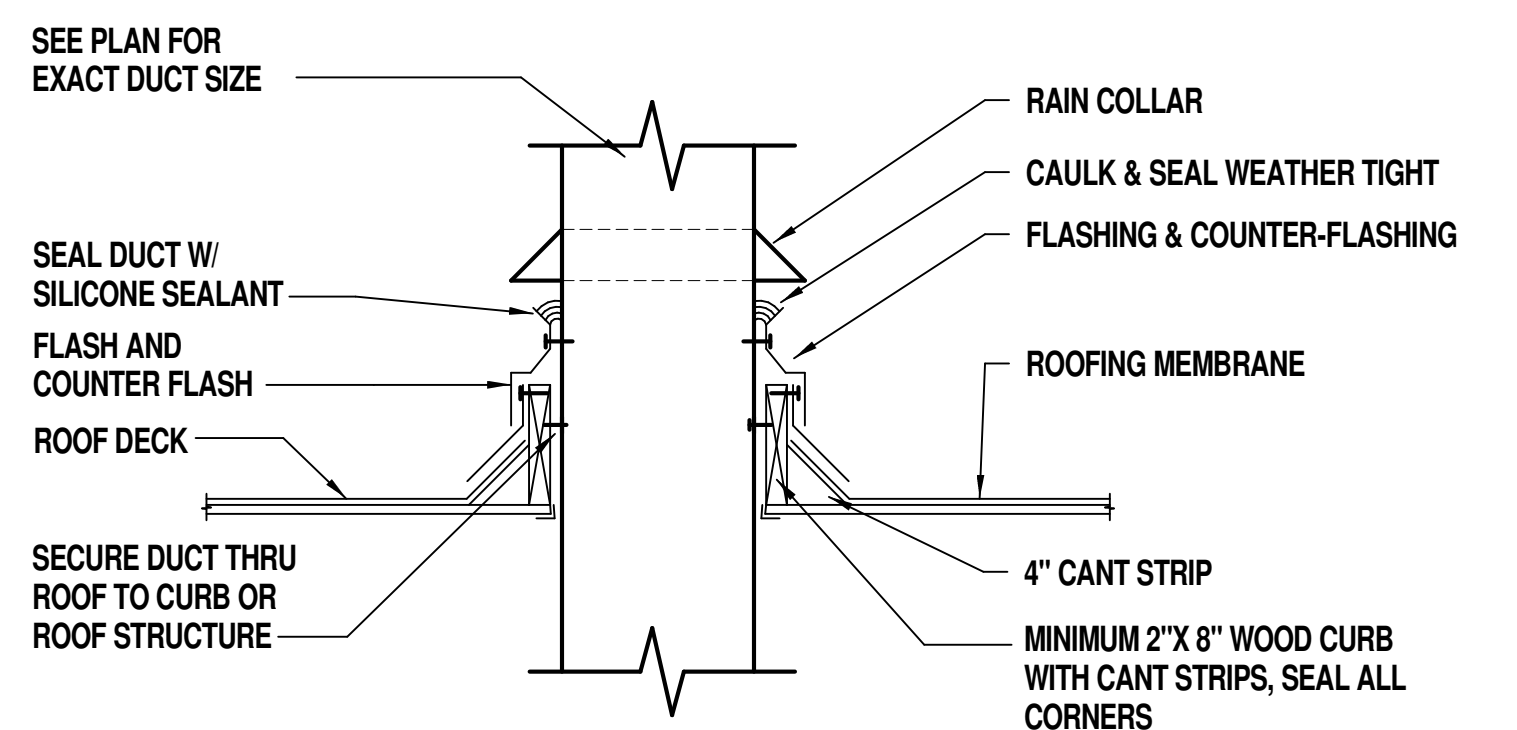


NOTE: BULLHEAD TEES IN PIPING ARE NOT ALLOWED

**BRANCH PIPING SCHEMATIC**

NO SCALE

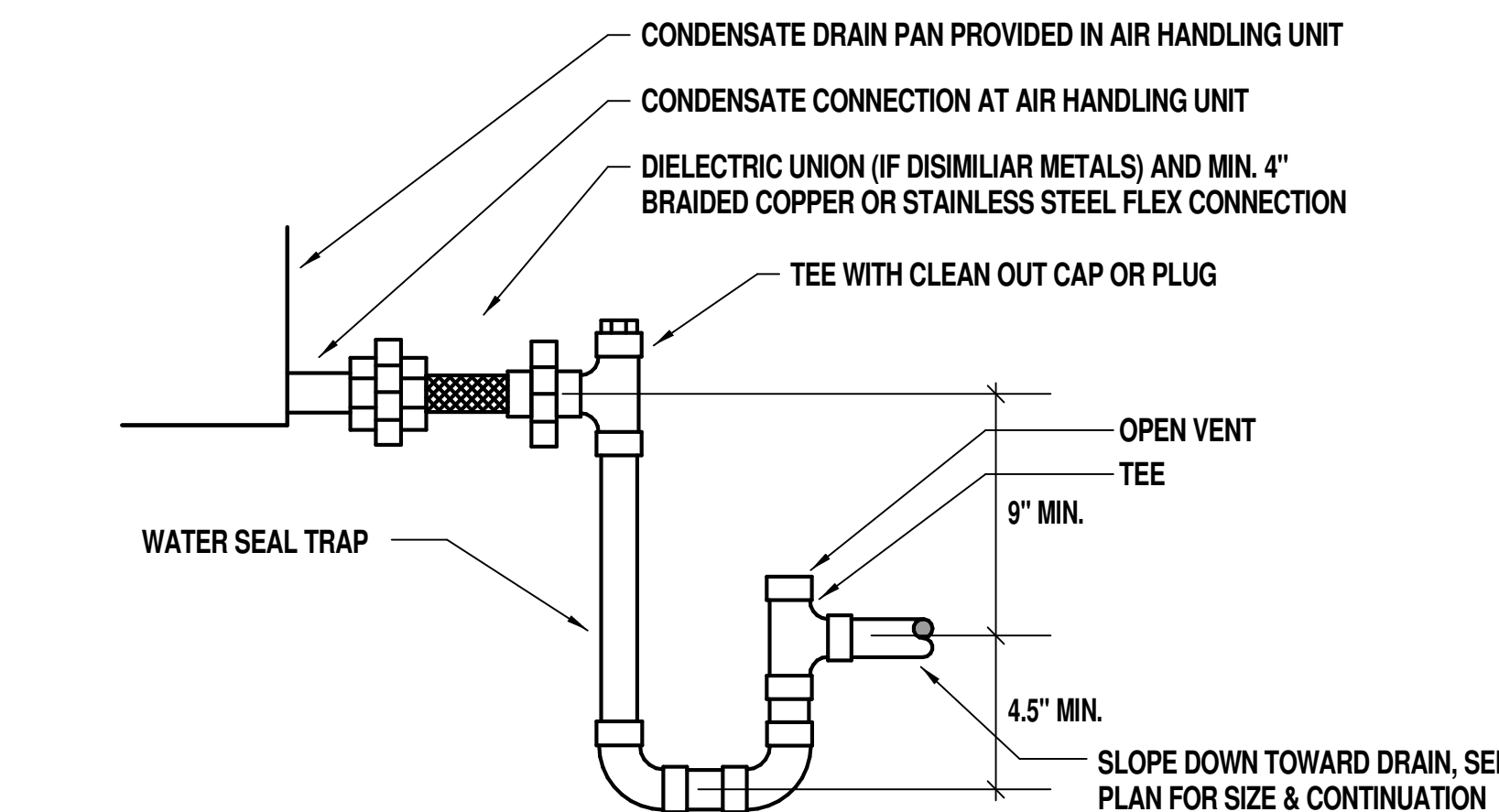
M5.2



**DUCT THRU ROOF DETAIL**

NO SCALE

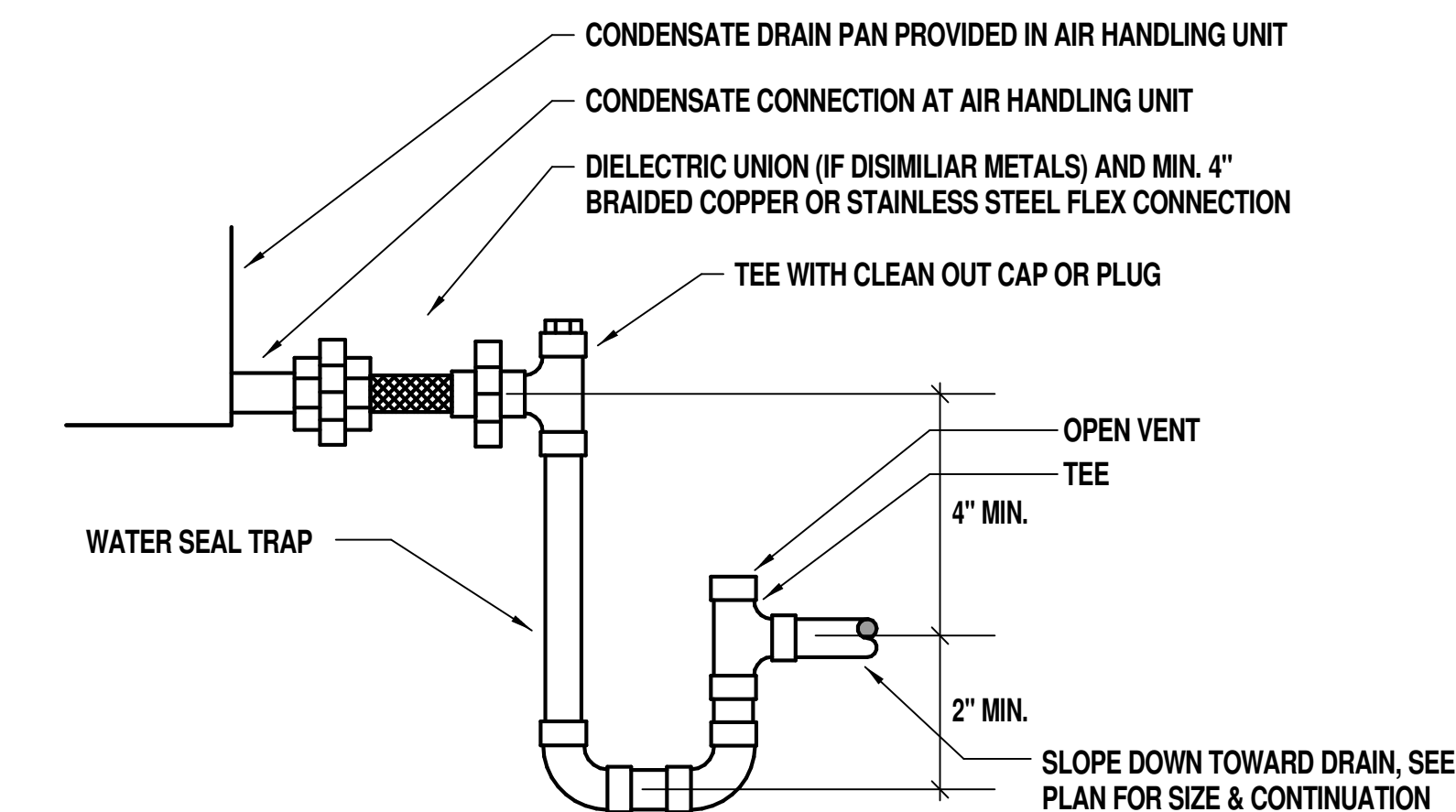
M5.1



**AIR HANDLING UNIT CONDENSATE TRAP DETAIL**

NO SCALE

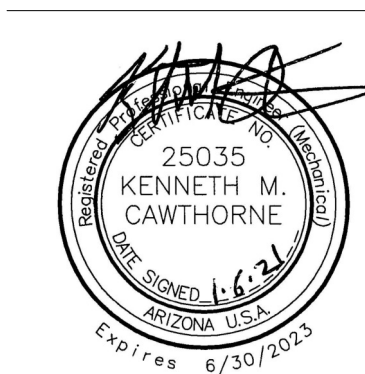
M5.1



**FAN COIL UNIT CONDENSATE TRAP DETAIL**

NO SCALE

M5.1



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**DATE:** 01/08/2020  
**REVISIONS**

AIR HANDLER SCHEDULE			
MARK	AHU-1.1	AHU-1.2	AHU-2.1
TYPE	INDOOR	INDOOR	INDOOR
POSITION	HORIZONTAL	HORIZONTAL	HORIZONTAL
TOTAL SUPPLY AIR (CFM)	17,000	10,000	17,000
SUPPLY FAN EXTERNAL STATIC PRESSURE (IN. W.G.)	3.5	3.5	3.5
MINIMUM SUPPLY FAN TOTAL STATIC PRESSURE (IN. W.G.)	5.6	5.6	5.6
MINIMUM OUTSIDE AIR (CFM)	16,250	5,500	13,200
MINIMUM PREHEAT CAPACITY (MBH)	750	250	690
ENTERING AIR TEMPERATURE (°F)	30	49	40
ENTERING HEATING WATER TEMPERATURE (°F)	160	160	160
HEATING WATER FLOW RATE (GPM)	40	15	40
MAXIMUM COIL PRESSURE DROP (FT. W.C.)	15	15	15
MINIMUM TOTAL COOLING CAPACITY (MBH)	1,300	585	1155
MINIMUM SENSIBLE COOLING CAPACITY (MBH)	650	335	605
ENTERING AIR TEMPERATURE (°F DB/WB)	84 /73.5	80/69	82/71.5
ENTERING CHILLED WATER WATER TEMPERATURE (°F)	45	45	45
CHILLED WATER FLOW RATE (GPM)	290	120	250
MAXIMUM COIL PRESSURE DROP (FT. W.C.)	20	20	20
MAXIMUM COIL VELOCITY (FFM)	500	500	500
MINIMUM FILTER AREA (SQ.FT.)	36	20	36
DRIVE TYPE	DIRECT	DIRECT	DIRECT
SUPPLY FAN MOTOR (QUANTITY / HP)	4 / 6-HP	4 / 3.5-HP	4 / 6-HP
VOLTS/PHASE/HZ (SUPPLY AND RETURN)	460/3/60	460/3/60	460/3/60
POWER POINT 1 (SUPPLY FAN) FLA	28	18	28
POWER POINT 1 (SUPPLY FAN) MCA	29	19	29
VOLTS/PHASE/HZ (LIGHTS)	115/1/60	115/1/60	115/1/60
POWER POINT 2 (LIGHTS) - MOCP	15	15	15
MAXIMUM OPERATING WEIGHT (LBS.)	11,500	8,500	11,500
REFERENCE	NORTEK	NORTEK	NORTEK

- NOTES
- CAPACITY SCHEDULED SHALL BE FOR 2500 FT. ELEVATION.
  - UNIT CONSTRUCTION SHALL BE PER SPECIFICATIONS.
  - PROVIDE STAINLESS STEEL MULTI SLOPED (1A0) DRAIN PAN PER SPECIFICATIONS.
  - PROVIDE 2" THICK, MERV-8, PLEATED TYPE FILTERS. SEE SPECIFICATIONS. PROVIDE FILTER DIFFERENTIAL PRESSURE GAUGE, FACTORY INSTALLED AND WIRED TO CONTROL PANEL.
  - PROVIDE UNIT MOUNTED VFD(S) PANEL WITH DISCONNECT FOR FAN SYSTEM POWER POINT, PROVIDE HIGH LIMIT DIFFERENTIAL PRESSURE SENSOR WIRED TO DISABLE SUPPLY FANS.
  - ALL FAN SYSTEMS SHALL PROVIDE "N+1" REDUNDANCY AND MAINTAIN A MINIMUM OF 90% DESIGN FLOW AND PRESSURE IN THE EVENT OF A SINGLE MOTOR OR VFD FAILURE.
  - PROVIDE AIR FLOW MEASURING SYSTEM FOR SUPPLY FAN SYSTEM.
  - PROVIDE FULL FACE AVERAGING MIXED AIR AND SUPPLY AIR TEMPERATURE SENSORS. PROVIDE COOLING COIL FREEZE-STAT TO DISABLE SUPPLY FANS AT 40 F; FACTORY INSTALLED.
  - PROVIDE 12" THICK, FINAL FILTER SECTION.
  - PROVIDE VAPOR TIGHT LED LIGHTS IN EACH SECTION, FACTORY INSTALLED AND WIRED TO SWITCH AND JUNCTION BOX.
  - DISCONNECT MEANS FOR LIGHTS POWER POINT BY ELECTRICAL. COORDINATE FINAL CONNECTION.
  - EXTERNAL STATIC PRESSURES SCHEDULED INCLUDE A LOADED FILTER ALLOWANCE.
  - PROVIDE AIR FLOW MEASURING SYSTEM FOR OUTSIDE AIR INTAKE.

EXHAUST FAN SCHEDULE						
MARK	EF-1.1	EF-1.2	EF-1.3	EF-1.4	EF-2.1, 2	EF-2.3
SERVICE	O. CHEM	O. CHEM. PREP	O. CHEM. PREP	M. BIO	G. CHEM	PREP
BLOWER TYPE	B.I. SCROLL	B.I. SCROLL	B.I. SCROLL	B.I. SCROLL	B.I. SCROLL	B.I. SCROLL
MAXIMUM AIR FLOW (CFM)	7300	8220	660	5150	4440	4320
MINIMUM AIR FLOW (CFM)	2600	3520	660	4500	3200	2700
E.S.P. ("w.g.)	2	2	1.5	2	1.75	1.75
DRIVE TYPE	BELT	BELT	BELT	BELT	BELT	BELT
MAXIMUM FAN SPEED (RPM)	1200	1200	1200	1400	1400	1400
MAXIMUM SONES - INLET	25	25	12	22	20	20
MOTOR HP	5	7-1/2	1/2	5	3	3
VOLTS/PHASE/HZ	460/3/60	460/3/60	460/3/60	460/3/60	460/3/60	460/3/60
MAXIMUM OPERATING WEIGHT (LBS.)	2200	2200	300	1400	1400	1400
REFERENCE	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK
	VK-CH-24-19	VK-CH-27-21	USF-10-82	VK-CH-22-18	VK-CH-22-16	VK-CH-22-16
NOTES	1 THRU 10	1 THRU 10	1 THRU 6, 9, 10, 11	1 THRU 10	1 THRU 10	1 THRU 10

- NOTES
- SCHEDULE CAPACITY SHALL BE FOR 2500 FT. ELEVATION.
  - FAN PERFORMANCE SHALL BE AMCA CERTIFIED.
  - DISCONNECT MEANS PROVIDED BY ELECTRICAL.
  - PROVIDE FACTORY SUPPLIED ROOFCURB, BIRDSCREEN & BACKDRAFT DAMPER.
  - PROVIDE WEATHERHOOD, SCROLL DRAIN AND BOLTED ACCESS DOOR.
  - PROVIDE 2" DEFLECTION, HOUSED SPRING ISOLATORS UNDER FAN.
  - PROVIDE INLET PLENUM WITH BYPASS DAMPER AND INTAKE HOOD. PROVIDE FAN CONTROLLER WITH AIRFLOW MONITOR, DUCT STATIC PRESSURE SENSOR, BY-PASS DAMPER ACTUATOR AND BACNET COMMUNICATION. SEE CONTROLS.
  - PROVIDE INTEGRAL, HIGH-PLUME DISCHARGE DUCT STACK.
  - PROVIDE PREMIUM EFFICIENCY, VFD RATED FAN MOTOR. PROVIDE VFD RATED FOR MOTOR HP. COORDINATE INSTALL WITH ELECTRICAL
  - SEE CONTROLS FOR FAN CONTROL.
  - PROVIDE HIGH-PLUME DISCHARGE DUCT STACK.

EXHAUST VENTURI VALVE SCHEDULE - LEVEL 1															
MARK	EV-1.1	EV-1.2 TO 1.8	EV-1.9	EV-1.10	EV-1.11 TO 1.17	EV-1.18	EV-1.19	EV-1.20	EV-1.21	EV-1.22	EV-1.23	EV-1.24	EV-1.25	EV-1.26	EV-1.27
SERVICE	6" AFVH	6" FVH	4" CFH	6" AFVH	6" FVH	4" CFH	6" ACFH	CEILING	6" ACFH	CEILING	6" ACFH	CEILING	4" ACFH	CEILING	CEILING
ROOM NO.	101	101	101	102	102	104	104	110	110	111	112	112	112	112	113
DESIGN AIR FLOW (CFM)	850	850	500	850	850	800	620	800	1300	800	1300	500	900	850	
MINIMUM AIR FLOW (CFM)	300	300	200	300	300	200	300	120	300	800	300	200	600	200	
MAXIMUM PRESSURE DROP	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
SIZE (IN Ø)	12	12	10	12	12	10	12	10	12	12	12	10	10	10	
CONTROLS	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	
MANUFACTURER	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	
MODEL NO./INLET SIZE	112	112	110	112	112	110	112	110	112	112	112	110	110	110	
NOTES	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	

EXHAUST VENTURI VALVE SCHEDULE - LEVEL 2																				
MARK	EV-2.1	EV-2.2	EV-2.3	EV-2.4	EV-2.5	EV-2.6	EV-2.7	EV-2.8	EV-2.9	EV-2.10	EV-2.11	EV-2.12	EV-2.13	EV-2.14	EV-2.15	EV-2.16	EV-2.17	EV-2.18, 2.19	EV-2.20	EV-2.21
SERVICE	6" CFH	4" ACFH	6" ACFH	CEILING	6" ACFH	4" ACFH	6" CFH	CEILING	6" CFH	4" ACFH	6" ACFH	CEILING	6" ACFH	4" ACFH	6" CFH	CEILING	8" ACFH	8" CFH	CEILING	CEILING
ROOM NO.	201	201	201	201	202	202	202	202	203	203	203	203	204	204	204	204	205	205	205	206, 207
DESIGN AIR FLOW (CFM)	800	500	800	800	800	500	800	800	800	500	800	800	800	500	800	800	1100	1100	600	900
MINIMUM AIR FLOW (CFM)	300	200	300	120	300	200	300	200	300	200	300	120	300	200	300	120	400	400	120	900
MAXIMUM PRESSURE DROP	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SIZE (IN Ø)	12	10	12	10	12	10	12	10	12	10	12	10	12	10	12	10	12 X 2	12 X 2	10	12
CONTROLS	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC
MANUFACTURER	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC	ANTEC
MODEL NO./INLET SIZE	112	110	112	110	112	110	112	110	112	110	112	112	110	110	112	110	212	212	110	112
NOTES	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3	1 THRU 3

- EXHAUST VENTURI VALVE SCHEDULE NOTES
- VENTURI VALVE & ASSOCIATED CONTROLS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
  - VENTURI VALVE SHALL FAIL IN THE NORMALLY OPEN POSITION.
  - PROVIDE PRESSURE SENSORS, DAMPER, HIGH SPEED ACTUATOR & CONTROL ENCLOSURE.

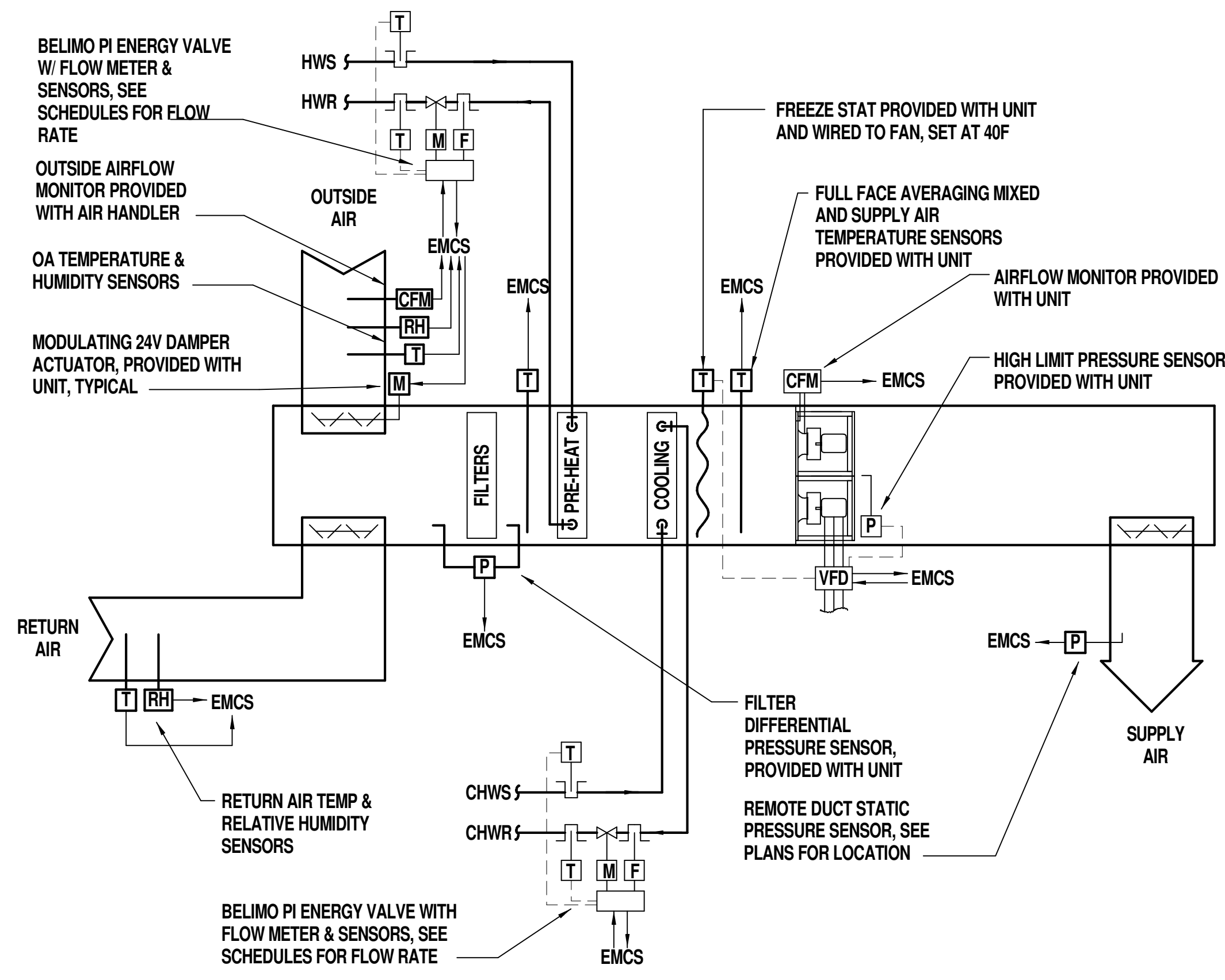
TERMINAL UNIT SCHEDULE - LEVEL 1 - AHU-1.1 AND 1.2										TOTALS
MARK	TU-1.1 - 1.4	TU-1.5	TU-1.6	TU-1.7	TU-1.8	TU-1.9	TU-1.10	TU-1.11		
MAXIMUM AIR FLOW (CFM)	3650	700	1700	3200	3200	2200	850	550		27000
MINIMUM AIR FLOW (CFM)	1300	400	850	1600	1600	1100	200	100		11050
HEATING AIR FLOW (CFM)	3650	400	850	1600	1600	1100	600	200		20950
REHEAT CAPACITY (MBH)	128	14	30	56	56	39	21	8		736
REHEAT WATER FLOW (GPM)	13	1.5	3	6	6	4	2.5	1		76
MINIMUM OPERATING STATIC PRESSURE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
CONTROLS	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC		
MANUFACTURER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER		
MODEL NO./INLET SIZE	LMHS / 22	LMHS / 8	LMHS / 14	LMHS / 22	LMHS / 22	LMHS / 14	LMHS / 10	LMHS / 8		
NOTES	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6		

TERMINAL UNIT SCHEDULE - LEVEL 2 - AHU-2.1										TOTALS
MARK	TU-2.1	TU-2.2	TU-2.3	TU-2.4	TU-2.5	TU-2.6	TU-2.7	TU-2.8		
MAXIMUM AIR FLOW (CFM)	3120	3120	3120	3120	2020	1800	120	580		17000
MINIMUM AIR FLOW (CFM)	1600	1600	1600	1600	900	900	100	400		8700
HEATING AIR FLOW (CFM)	2100	2100	2100	2100	1700	1700	120	580		12500
REHEAT CAPACITY (MBH)	84	84	84	84	68	68	5	24		501
REHEAT WATER FLOW (GPM)	8.5	8.5	8.5	8.5	7	7	0.5	2.5		51
MINIMUM OPERATING STATIC PRESSURE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
CONTROLS	DDC	DDC	DDC	DDC	DDC	DDC	DDC	DDC		
MANUFACTURER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER	KRUEGER		
MODEL NO./INLET SIZE	LMHS / 22	LMHS / 22	LMHS / 22	LMHS / 22	LMHS / 14	LMHS / 14	LMHS / 6	LMHS / 8		
NOTES	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6	1 THRU 6		

- TERMINAL UNIT SCHEDULE NOTES
- TERMINAL UNIT & ASSOCIATED CONTROLS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
  - TERMINAL UNIT PROVIDED SHALL OPERATE PRESSURE INDEPENDENTLY.
  - TERMINAL UNIT SHALL FAIL IN THE NORMALLY OPEN POSITION.
  - PROVIDE INLET SENSOR, DAMPER & CONTROL ENCLOSURE WITH 120V/24V TRANSFORMER. SEE PLAN FOR COIL & ENCLOSURE SIDE.
  - REHEAT AIR COIL PRESSURE DROP SHALL NOT EXCEED 0.25" w.g.
  - COIL PERFORMANCE BASED ON 55 DEG. F. EAT, 160 DEG. F. EWT MAX., 5 FT. W.C. PRESSURE DROP.

OUTDOOR AIR CALCULATION														
BUILDING UNIT	ROOM NUM.	ROOM NAME	ZONE FLOOR AREA, Az (SQ.FT.)	CODE	OCCUPANCY CATEGORY, Ra, Rp	ZONE POPULATION Pz	ZONE AIR DISTRIBUTION EFFECTIVENESS, Ez	ZONE SUPPLY AIR FLOW Vpz (CFM)	SYSTEM POPULATION Ps	OUTDOOR AIR INTAKE Vol (CFM)	REQUIRED EXHAUST VENTILATION (CFM)	ZONE MIN. EXHAUST AIR FLOW (CFM)	ZONE MAX EXHAUST AIR FLOW (CFM)	
AHU-1.1	101	ORGANIC CHEMISTRY LAB	1,668	22	SCIENCE LABORATORIES	41.7		7,300				1,668	2,760	7,460
	102	ORGANIC CHEMISTRY LAB	1,634	22	SCIENCE LABORATORIES	40.9		7,300				1,634	2,760	7,460
	103	INSTRUMENTATION	326	22	SCIENCE LABORATORIES	8.2		700				326	340	340
	104	PREPARATION ROOM	856	22	SCIENCE LABORATORIES	21.4		1,700				856	920	920
			4,484			112.1	CSCR	17,000		112	2,288	4,484	6,780	16,180
AHU-1.2	110	MICROBIOLOGY LAB	1,560	22	SCIENCE LABORATORIES	39.0		3,200				1,560	1,600	1,600
	111	MICROBIOLOGY LAB	1,574	22	SCIENCE LABORATORIES	39.4		3,200				1,574	1,600	1,600
	112	MICROBIOLOGY PREP	1,051	22	SCIENCE LABORATORIES	26.3		2,200				1,051	1,100	1,100
	113	AUTOCLAVE ROOM	159	22	SCIENCE LABORATORIES	4.0		850				159	200	850
	114	CLEAN SPACE	172	50	STORAGE ROOMS	0.3		550				0	0	0
			4,516			108.9	CSCR	10,000		109	2,035	4,344	4,500	5,150
AHU-2.1	201	GENERAL CHEMISTRY	1,550	22	SCIENCE LABORATORIES	38.8								

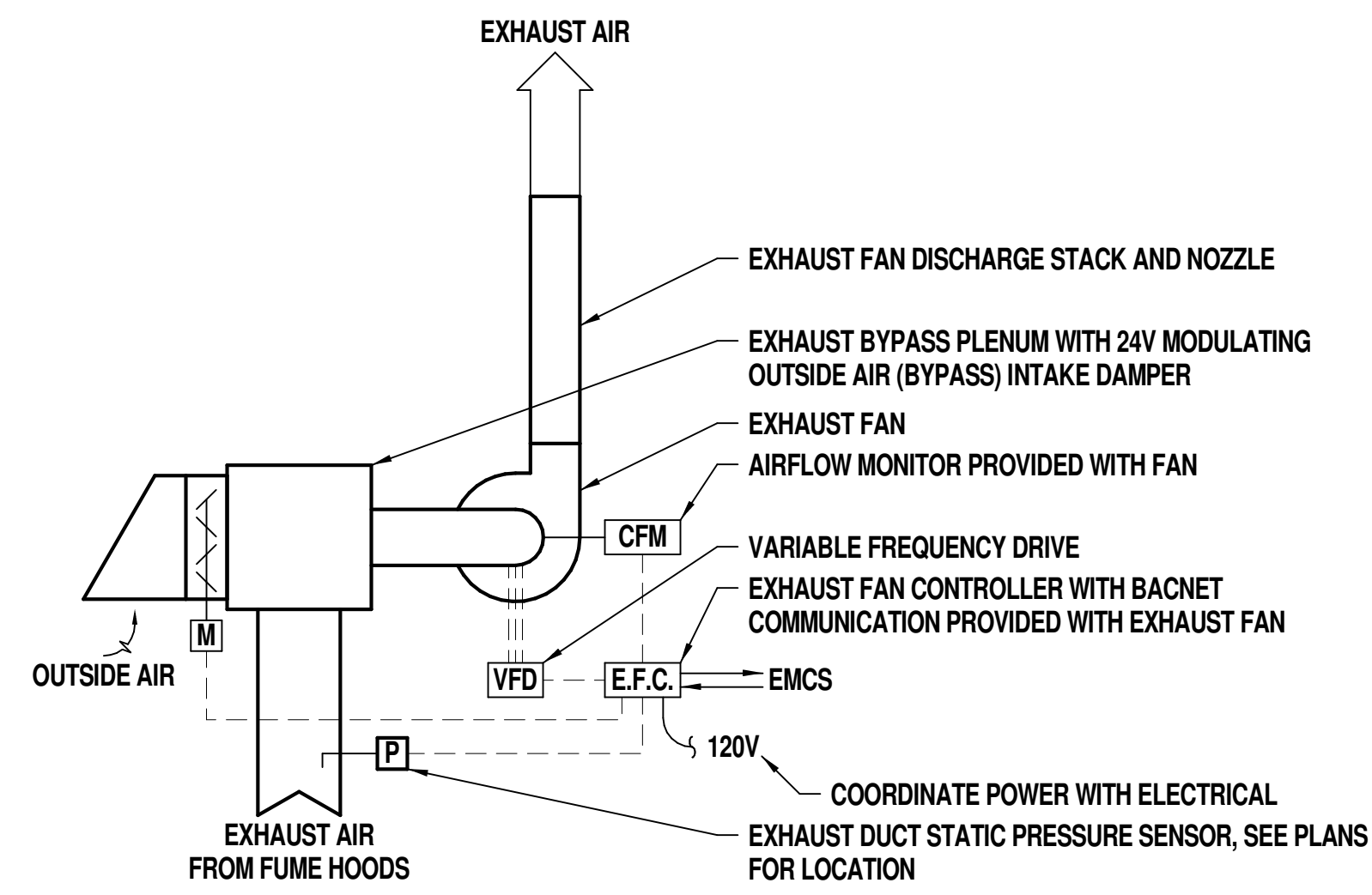




**AIR HANDLER UNIT CONTROL DIAGRAM**

NO SCALE

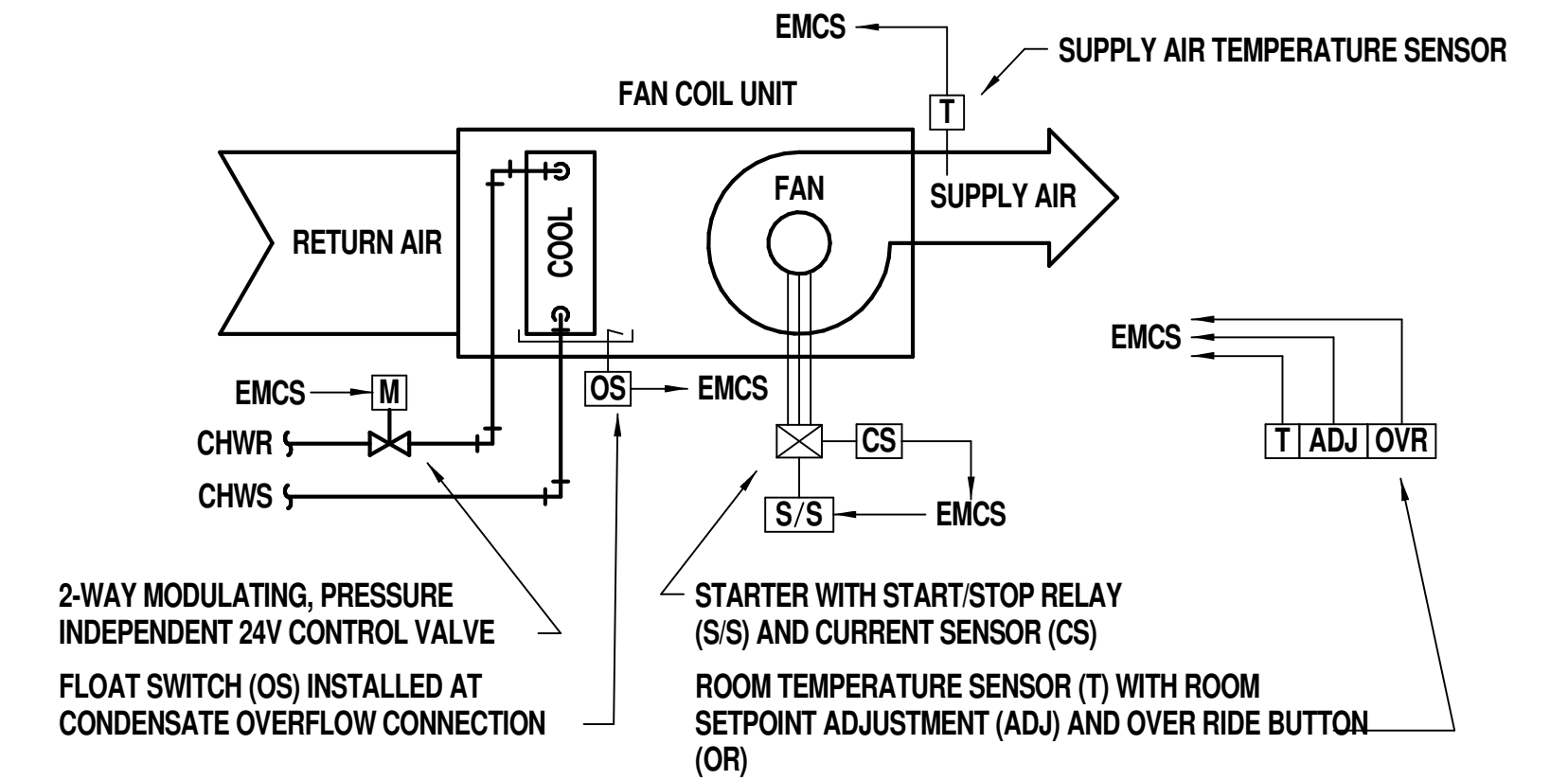
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M6.1



**LAB EXHAUST FAN CONTROL SCHEMATIC**

NO SCALE

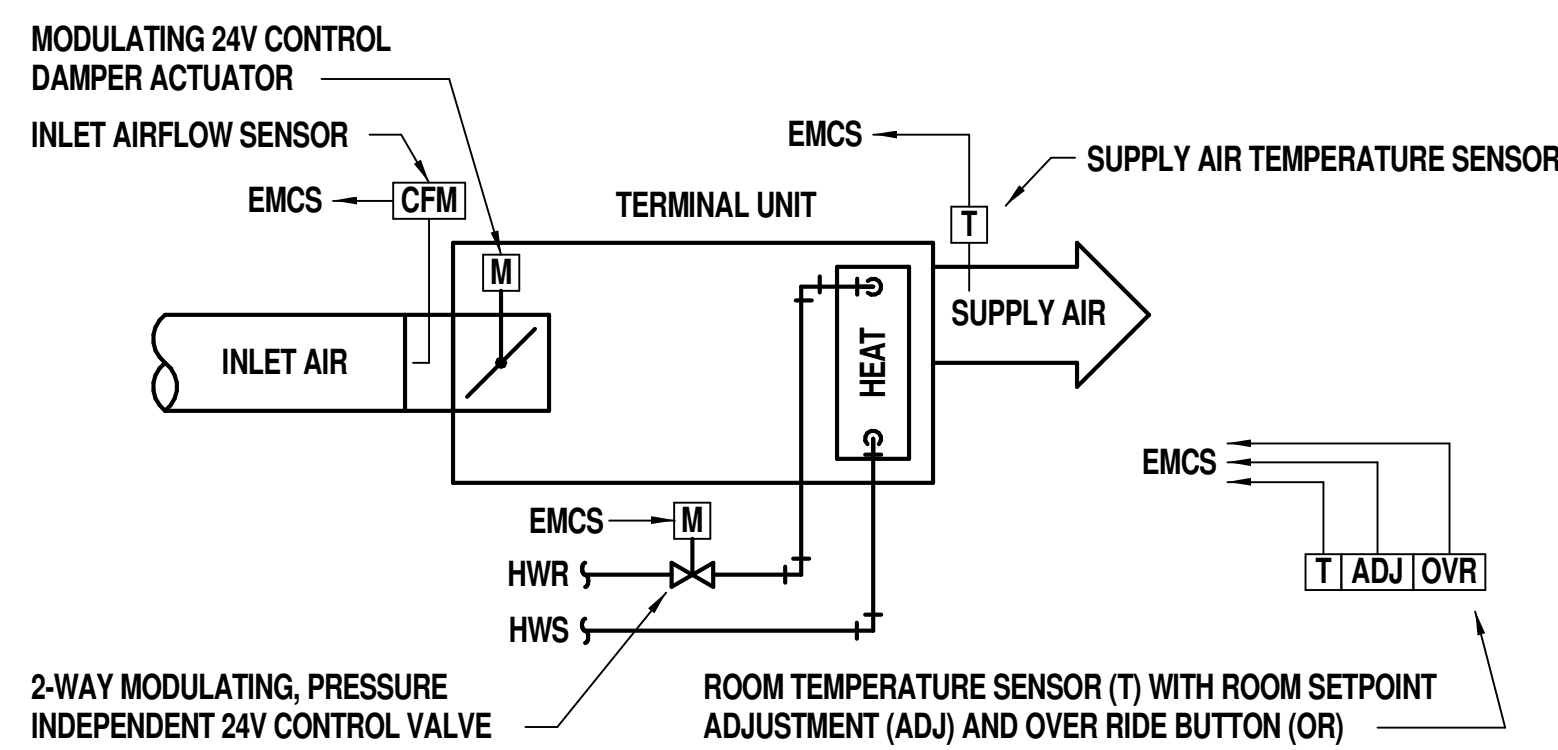
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**FAN COIL UNIT CONTROL SCHEMATIC**

NO SCALE

7  
M6.1

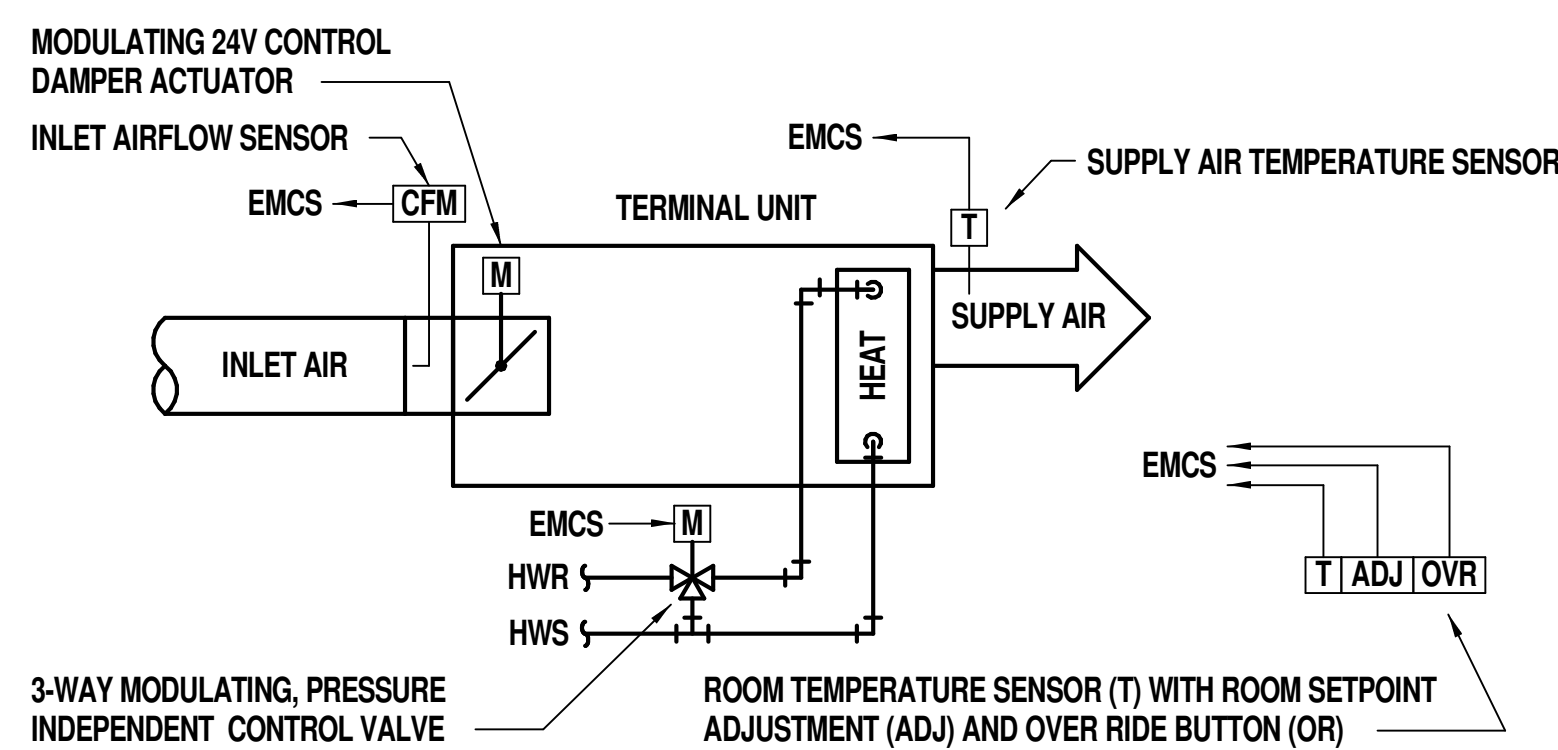


- NOTES:
1. TERMINAL UNITS ARE PROVIDED WITH INLET AIRFLOW SENSOR, INLET DAMPER, CONTROLLER ENCLOSURE AND 24V TRANSFORMER.
  2. PROVIDE CONTROLLER AND DAMPER ACTUATORS FOR FIELD INSTALLATION AND CALIBRATION.
  3. PROVIDE CONTROL VALVE FOR REHEAT COIL, COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR.

**TWO-WAY VALVE TERMINAL UNIT CONTROL SCHEMATIC**

NO SCALE

2  
M6.1

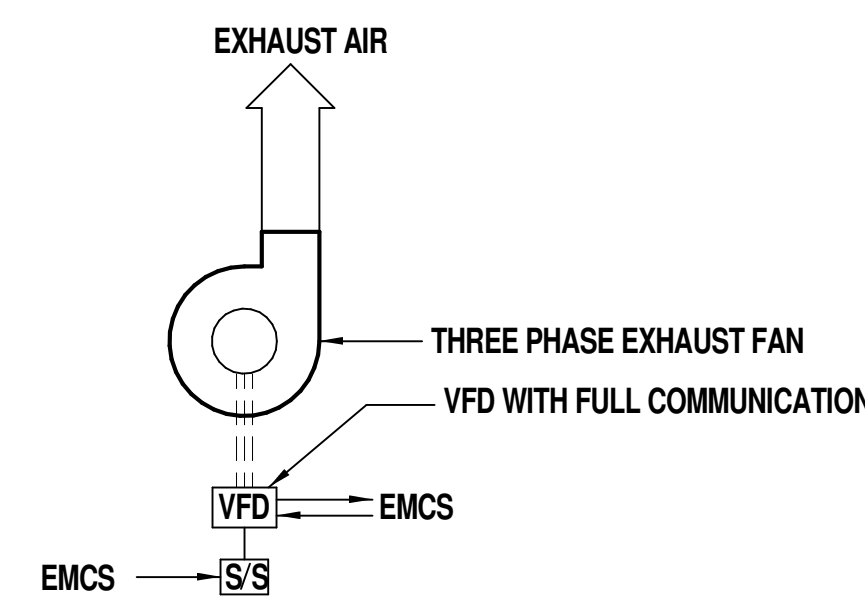


- NOTES:
1. TERMINAL UNITS ARE PROVIDED WITH INLET AIRFLOW SENSOR, INLET DAMPER, CONTROLLER ENCLOSURE AND 24V TRANSFORMER.
  2. PROVIDE CONTROLLER AND DAMPER ACTUATORS FOR FIELD INSTALLATION AND CALIBRATION.
  3. PROVIDE CONTROL VALVE FOR REHEAT COIL, COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR.

**THREE-WAY VALVE TERMINAL UNIT CONTROL SCHEMATIC**

NO SCALE

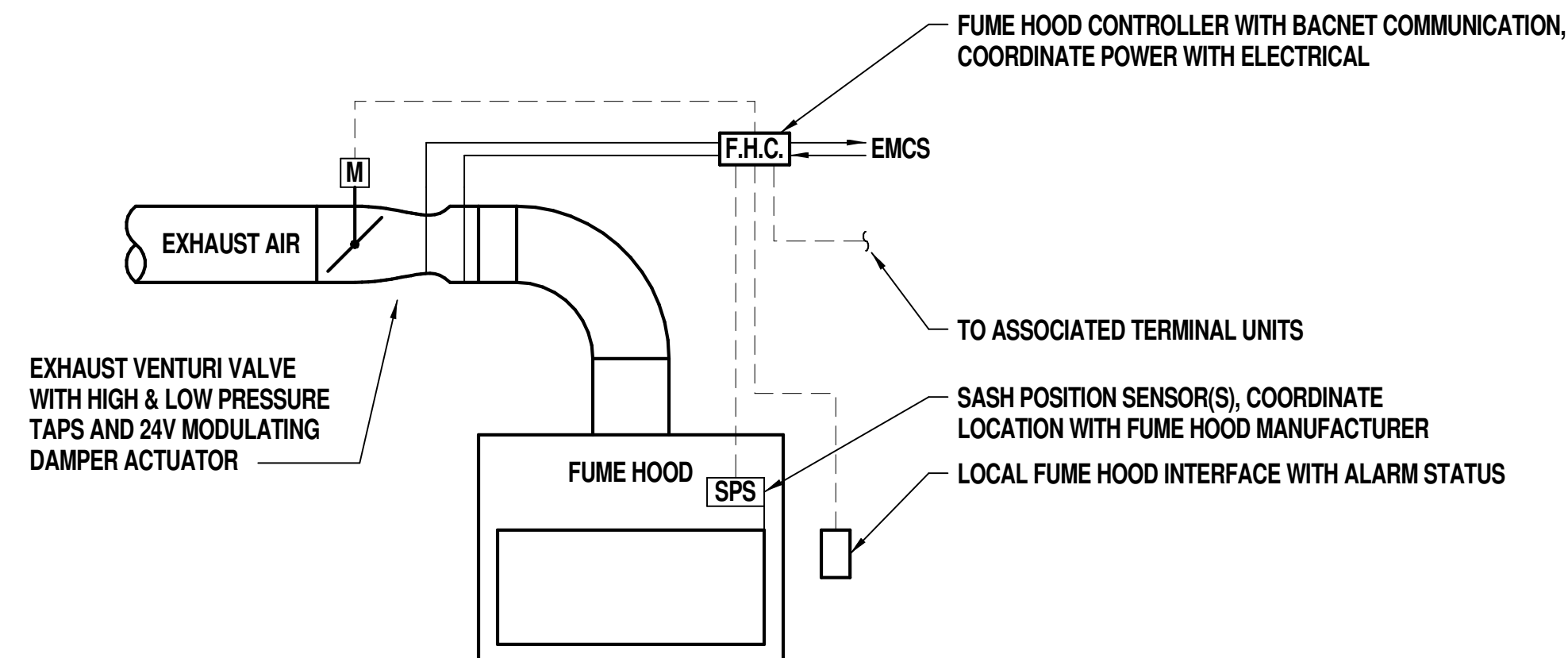
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M6.1



**THREE PHASE VFD EXHAUST FAN CONTROL SCHEMATIC**

NO SCALE

5  
M6.1



**FUME HOOD CONTROL SCHEMATIC**

NO SCALE

6  
M6.1



**DRAWN BY:** TCB  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**



## CONTROL NOTES

1. PROVIDE BACNET CONTROLS WITH NETWORK ACCESS AND FULL COLOR GRAPHICS BY THE FOLLOWING MANUFACTURER:
  - A. DELTA CONTROLS INC. INSTALLED BY ACC
2. THE CONTROL SYSTEM SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 230900 AND THE PCC MANUAL OF DESIGN AND SPECIFICATIONS SECTION 230923 DATED 4/2019 (30 PAGES).
3. ALL CONTROLS SHALL INCLUDE FULL COLOR GRAPHICS WITH BUILDING FLOOR PLANS AND SCHEMATIC DRAWINGS OF EACH PIECE OF EQUIPMENT. ALL GRAPHIC DISPLAYS SHALL BE SUBMITTED FOR OWNER APPROVAL.
4. ALL WIRING EXPOSED TO WEATHER TO BE IN RIGID CONDUIT. ALL WIRING EXPOSED IN THE BUILDING, ABOVE HARD CEILINGS, OR IN WALLS TO BE IN CONDUIT OR EMT. ALL WIRING ABOVE LAY-IN CEILINGS CAN BE PLENUM RATED CABLE ATTACHED TO THE BUILDING STRUCTURE OR DUCTWORK.
5. PROVIDE ALL CONTROL DEVICES REQUIRED TO PERFORM THE FUNCTIONS DESCRIBED IN THE SEQUENCE OF OPERATION AND SHOWN ON THE PLANS AND CONTROL DIAGRAMS.
6. COORDINATE BACNET COMMUNICATION CARD REQUIREMENTS WITH THE VFD AND AC UNIT MANUFACTURERS.
7. COORDINATE ALL ELECTRICAL DEVICES WITH THE ELECTRICAL PLANS AND SPECIFICATIONS.
8. COORDINATE ALL PIPE AND DUCT SENSORS WITH THE MECHANICAL CONTRACTOR.
9. COORDINATE ALL CONTROL DEVICES FOR THE EVAPORATIVE COOLERS WITH THE MANUFACTURER.
10. ALL SET POINTS SHALL BE DISPLAYED AND BE ADJUSTABLE. ALL SET POINTS THAT ARE BEING RESET SHALL HAVE THE MOST CURRENT SET POINT DISPLAYED.
11. ALL TIMED SEQUENCES SHALL BE DISPLAYED AND BE ADJUSTABLE. DURING THE TIMED SEQUENCE, THE REMAINING TIME SHALL BE DISPLAYED.
12. ALL ALARM LIMITS SHALL BE DISPLAYED AND BE ADJUSTABLE.
13. ALL ALARM NOTIFICATIONS SHALL DESCRIBE THE ALARM CONDITION WITH RECOMMENDED ACTIONS FOR CORRECTIONS. THE TYPE OF ALARM SHALL BE SELECTED BY THE OWNER. THE DATE AND TIME ALONG WITH A DESCRIPTION OF THE ALARM SHALL BE LOGGED.
14. TREND LOGS SHALL BE PROVIDED AS SELECTED BY THE OWNER.
15. DISPLAY RUN TIMES ON ALL EQUIPMENT.

## SEQUENCE OF OPERATIONS

### AIR HANDLERS

1. THE AIR HANDLERS SHALL OPERATE ON A SCHEDULED START/STOP BASIS OR AN OVERRIDE OR NIGHT SET-BACK/SET-UP COMMAND.
2. THE OUTSIDE AIR DAMPERS SHALL CLOSE WHEN THE AIR HANDLER IS DISABLED.
3. UPON INITIAL START, THE SUPPLY FAN SHALL RAMP UP ITS SPEED TO MEET THE DUCT STATIC PRESSURE SET POINT.
4. IF A SUPPLY FAN FAILS, AN ALARM MESSAGE SHALL BE PROVIDED.
5. IF ALL THE SUPPLY FANS FAIL, THE AIR HANDLER SHALL BE DISABLED AND A HIGH PRIORITY ALARM MESSAGE SHALL BE PROVIDED.
6. THE SUPPLY DUCT STATIC PRESSURE SET POINT SHALL BE DETERMINED DURING THE AIR FLOW BALANCING AND IS ESTIMATED TO BE 1.0 IN.W.C.
7. IF THE DUCT STATIC PRESSURE IS GREATER THAN 0.5 IN.W.C. FROM SET POINT, AN ALARM MESSAGE SHALL BE PROVIDED.
8. IF THE SUPPLY FAN DIFFERENTIAL PRESSURE IS GREATER THAN 5 IN.W.C., THE SUPPLY FAN SHALL BE DISABLED VIA SAFETY SWITCH AND A HIGH PRIORITY ALARM MESSAGE PROVIDED. IF A SUPPLY OR RETURN FAN FAILS, AN ALARM MESSAGE SHALL BE PROVIDED.
9. THE MINIMUM OUTSIDE AIR AIRFLOW SHALL BE MONITORED AND DISPLAYED. THE MINIMUM OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO MAINTAIN THE SCHEDULED MINIMUM OUTSIDE AIR FLOW CFM. IF THE MINIMUM OUTSIDE AIR FLOW IS GREATER THAN 15% FROM SET POINT, AN ALARM MESSAGE SHALL BE PROVIDED.
10. THE OUTSIDE AIR, RETURN AIR, MIXED AIR, AND SUPPLY AIR TEMPERATURES SHALL BE MONITORED AND DISPLAYED. THE RETURN AIR AND OUTSIDE AIR RELATIVE HUMIDITY SHALL BE MONITORED AND DISPLAYED.
11. IF THE MIXED AIR TEMPERATURE IS LESS 50 F, THE PRE-HEAT COIL ENERGY CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN THE AIR RETURN WATER TEMPERATURES, AND ENERGY USE (CURRENT IN MBTU/HR AND TOTALIZED ON MMBTU) SHALL BE DISPLAYED.
12. THE COOLING COIL ENERGY CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT WHILE MAXIMIZING COIL DELTA T. THE RECORDED FLOW RATE, SUPPLY AND RETURN WATER TEMPERATURES, AND ENERGY USE (CURRENT IN MBTU/HR AND TOTALIZED ON MMBTU) SHALL BE DISPLAYED. THE PRE-HEAT AND CHILLED WATER COILS SHALL NOT OPERATE AT THE SAME TIME.
13. THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE 52 F AND RESET BETWEEN 52 F AND 70 F TO MAINTAIN THE HOTTEST ZONE. AT LEAST ONE TERMINAL UNIT SHALL BE FULLY OPEN AND MAINTAIN ROOM TEMPERATURE. THE CURRENT SUPPLY AIR TEMPERATURE SET POINT SHALL BE DISPLAYED.
14. IF THE SUPPLY AIR TEMPERATURE IS 5 F OR GREATER FROM SET POINT, AN ALARM MESSAGE SHALL BE PROVIDED.
15. IF THE SUPPLY AIR TEMPERATURE AFTER THE COOLING COIL IS LESS THAN 40 F, THE AIR HANDLER SHALL BE DISABLED, THE OUTSIDE AIR DAMPERS CLOSED, THE HEATING AND CHILLED WATER COIL VALVES SHALL FULLY OPEN, AND A HIGH PRIORITY ALARM MESSAGE PROVIDED.
16. THE RETURN AIR RELATIVE HUMIDITY SET POINT SHALL BE 50% RH AND SHALL BE ADJUSTABLE BY THE OPERATOR. IF ANY RETURN AIR RELATIVE HUMIDITY IS GREATER THAN 10% RH ABOVE SET POINT, THE AIR HANDLER THE COOLING COIL CONTROL VALVE SHALL FULLY OPEN FLOW THROUGH THE COIL. THIS SEQUENCE SHALL CONTINUE UNTIL THE RETURN AIR RELATIVE HUMIDITY IS 10% BELOW THE SET POINT OR THE SCHEDULED OFF OR NIGHT SET-BACK/SET-UP.
17. NIGHT SET-BACK/SET-UP OPERATION
  - A. A MANUAL SOFTWARE OR GRAPHIC SWITCH SHALL BE PROVIDED TO ALLOW THE OPERATOR TO ENABLE OR DISABLE THE NIGHT SET-BACK AND/OR SET-UP OPERATION.
  - B. THE DEHUMIDIFICATION SEQUENCE SHALL BE DISABLED.
  - C. THE SUPPLY AIR TEMPERATURE SET POINT SHALL BE RESET BETWEEN 60 F AND 80 F TO MAINTAIN THE HOTTEST ZONE.
  - D. SEE THE TERMINAL UNIT SEQUENCE FOR OPERATION.
18. OVERRIDE OPERATION
  - A. IF THE OVERRIDE IS ACTIVATED, THE AIR HANDLER SHALL BE ENABLED FOR THE OVERRIDE PERIOD
  - B. THE OVERRIDE TIME SHALL BE DISPLAYED AND BE ADJUSTABLE, INITIALLY SET AT 4 HOURS.
  - C. THE DATE, TIME, AND ROOM SENSOR OVERRIDE ACTIVATED SHALL BE LOGGED.
19. FULL COMMUNICATION SHALL BE PROVIDED FOR THE FAN VFDS AND ENERGY VALVES. ALL DATA SHALL BE DISPLAYED AND ACCESSIBLE.
20. THE CURRENT AND MONTHLY PEAK ENERGY USE IN MBH SHALL BE DISPLAYED FOR BOTH THE COOLING AND HEATING COIL. THE TOTALIZED MONTHLY ENERGY USE IN MMBTU SHALL BE DISPLAYED FOR BOTH THE COOLING AND HEATING COIL. AT THE END OF EACH MONTH, THE PEAK AND TOTALIZED COOLING AND HEATING COIL LOADS SHALL BE SENT TO MAINTENANCE PERSONNEL.

### TERMINAL UNITS

1. THE FUME HOODS, EXHAUST, AND TERMINAL UNITS SHALL BE PROVIDED WITH A CONTROLLER TO MAINTAIN NEUTRAL ROOM AIR FLOW. THIS CONTROLLER SHALL FULLY COMMUNICATE AND ALL CONTROL POINTS SHALL BE DISPLAYED AND BE ADJUSTABLE.
2. THE TERMINAL UNITS SHALL OPERATE ON A SCHEDULED START/STOP BASIS TO MATCH THE ASSOCIATED AIR HANDLER SCHEDULE.
3. THE ROOM TEMPERATURE SET POINT SHALL BE 72 F AND BE LOCALLY ADJUSTABLE BETWEEN 68 F AND 75 F AT THE SENSOR. AN ALARM MESSAGE SHALL BE PROVIDED IF THE ROOM TEMPERATURE IS GREATER THAN 3F FROM SET POINT.
4. THE INLET DAMPER SHALL MODULATE BETWEEN ITS SCHEDULED MAXIMUM AND HEATING AIR FLOW TO MAINTAIN THE SUPPLY AIR CFM TO MATCH THE EXHAUST AIR CFM FOR EACH ROOM.
5. IF THE INLET DAMPER IS AT ITS HEATING AIR FLOW AND THE ROOM TEMPERATURE IS BELOW SET POINT, THE REHEAT COIL CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN THE ROOM TEMPERATURE SET POINT.
6. IF THE AIR FLOW IS GREATER THAN 10% ABOVE THE MAXIMUM OR BELOW THE HEATING SCHEDULED AIR FLOW, AN ALARM MESSAGE SHALL BE PROVIDED.
7. THE SUPPLY AIR TEMPERATURE SHALL BE DISPLAYED.
8. NIGHT SET-BACK/SET-UP OPERATION
  - A. A MANUAL SOFTWARE OR GRAPHIC SWITCH SHALL BE PROVIDED TO ALLOW THE OPERATOR TO ENABLE OR DISABLE THE NIGHT SET-BACK AND/OR SET-UP OPERATION.
  - B. THE ROOM TEMPERATURE SET POINT SHALL BE 80F FOR COOLING AND 65F FOR HEATING
  - C. THE INLET DAMPER SHALL MODULATE DOWN TO ITS MINIMUM POSITION OR TO MATCH THE EXHAUST CFM.
  - D. THE REHEAT COIL SHALL MODULATE IF HEATING IS REQUIRED TO MAINTAIN THE HEATING ROOM TEMPERATURE SET POINT.
9. OVERRIDE OPERATION
  - A. IF AN OVERRIDE IS ACTIVATED, THE ROOM TEMPERATURE AND AIR FLOW SHALL RETURN TO THE OCCUPIED SET POINTS AND THE ASSOCIATED AIR HANDLER SHALL RETURN TO THE OCCUPIED SEQUENCE.
  - B. THE OVERRIDE PERIOD SHALL BE 4 HOURS OR AS DEFINED BY THE OPERATOR.
  - C. THE DATE, TIME, AND TERMINAL UNIT THAT INITIATED THE OVERRIDE PERIOD SHALL BE LOGGED.

## SEQUENCE OF OPERATIONS

### EXHAUST FANS

1. THE EXHAUST FAN SHALL BE PROVIDED WITH A CONTROLLER TO MAINTAIN CONSTANT DISCHARGE AIRFLOW. THIS CONTROLLER SHALL FULLY COMMUNICATE AND ALL CONTROL POINTS SHALL BE DISPLAYED AND BE ADJUSTABLE.
2. THE EXHAUST FANS SHALL OPERATE ON A SCHEDULED START/STOP BASIS OR AN OVERRIDE OR NIGHT SET-BACK/SET-UP COMMAND TO MATCH THE ASSOCIATED AIR HANDLER SCHEDULE AND OPERATION.
3. UPON INITIAL START, THE EXHAUST FAN SHALL RAMP UP ITS SPEED TO MEET THE DUCT STATIC PRESSURE SET POINT.
4. IF THE EXHAUST FAN FAILS, THE TERMINAL UNITS SERVING THIS ROOM SHALL FULLY CLOSE AND A HIGH PRIORITY ALARM MESSAGE SHALL BE PROVIDED.
5. THE EXHAUST DUCT STATIC PRESSURE SET POINT SHALL BE DETERMINED DURING THE AIR FLOW BALANCING AND IS ESTIMATED TO BE 0.75 IN.W.C.
6. IF THE DUCT STATIC PRESSURE IS GREATER THAN 0.5 IN.W.C. FROM SET POINT, AN ALARM MESSAGE SHALL BE PROVIDED.
7. THE EXHAUST FAN BYPASS DAMPER SHALL MODULATE AS REQUIRED TO MAINTAIN A CONSTANT DISCHARGE AIRFLOW.
8. THE EXHAUST FAN AIRFLOW SHALL BE DISPLAYED IN CFM.

### FUME HOODS

1. THE FUME HOODS, EXHAUST, AND SUPPLY AIR SHALL BE PROVIDED WITH A CONTROLLER TO MAINTAIN NEUTRAL ROOM AIR FLOW. THIS CONTROLLER SHALL FULLY COMMUNICATE AND ALL CONTROL POINTS SHALL BE DISPLAYED AND BE ADJUSTABLE.
2. A SASH POSITION SENSOR SHALL BE INSTALLED IN EACH FUME HOOD TO MEASURE THE SASH POSITION.
3. THE FUME HOOD EXHAUST AIRFLOW SHALL MODULATE BETWEEN THE MAXIMUM AND MINIMUM SCHEDULED AMOUNT BASED ON THE SASH POSITION. IF THE SASH IS 18" OR HIGHER, THE EXHAUST SHALL BE AT THE MAXIMUM SCHEDULED AIRFLOW. IF THE SASH IS FULLY CLOSED, THE EXHAUST SHALL BE AT THE SCHEDULED MINIMUM AIRFLOW.
4. THE CONTROLLER SHALL MODULATE THE SUPPLY AIR TERMINAL UNIT AIRFLOW TO MAINTAIN THE SAME AIRFLOW AND A NEUTRAL ROOM PRESSURE.
5. NIGHT SET-BACK/SET-UP OPERATION
  - A. DURING UNOCCUPIED TIMES, THE EXHAUST DAMPER SHALL MODULATE DOWN TO MINIMUM SCHEDULED AIRFLOW, REGARDLESS OF SASH POSITION.
  - B. THE CONTROLLER SHALL MODULATE THE SUPPLY AIR TERMINAL UNIT DOWN TO MINIMUM SCHEDULED AIRFLOW TO MATCH THE EXHAUST AND PROVIDE A NEUTRAL ROOM PRESSURE.
6. OVERRIDE OPERATION
  - A. IF AN OVERRIDE IS ACTIVATED DURING UNOCCUPIED TIMES, THE CORRESPONDING HOODS SHALL BE IN OCCUPIED OPERATION FOR THE DURATION OF THE OVERRIDE PERIOD.

### FAN COILS

1. THE FAN COILS SHALL OPERATE CONTINUOUSLY.
2. THE ROOM TEMPERATURE SET POINT SHALL BE 75F AND BE LOCALLY ADJUSTABLE BETWEEN 68F AND 78F
3. THE FAN SHALL CYCLE OFF IF THE ROOM TEMPERATURE IS 3F BELOW SET POINT.
4. IF THE ROOM TEMPERATURE IS 1F ABOVE SET POINT, THE FAN SHALL CYCLE ON.
5. IF THE FAN FAILS, AN ALARM MESSAGE SHALL BE PROVIDED.
6. IF THE ROOM TEMPERATURE IS 1F ABOVE SET POINT, THE COOLING COIL CONTROL VALVE SHALL MODULATE OPEN AS NEEDED TO MAINTAIN THE ROOM TEMPERATURE SET POINT.
7. THE SUPPLY AIR TEMPERATURE SHALL BE DISPLAYED.
8. IF THE OVERFLOW SWITCH IS ACTIVATED, THE FAN SHALL BE DISABLED AND THE COIL CONTROL VALVE FULLY CLOSED.

### CONSULTANTS

LABORATORY  
ARLÉ Fifth Avenue #400  
San Dimas, CA 91763-3192  
Phone: 610.297.0169

MECHANICAL  
KC Mechanical Engineering  
1047 E. Fifth Street  
Tucson, AZ 85711  
Phone: 520.327.1611

STRUCTURAL  
Junker Structural Engineering  
1026 N. La Grange Rd.  
Tucson, AZ 85716  
Phone: 520.323.3422

ELECTRICAL  
Morand Engineering, Inc.  
1590 E. 10th Street  
Tucson, AZ 85710  
Phone: 520.884.0045

**Prima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



**DRAWN BY:** Author  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020

### REVISIONS

### MECHANICAL CONTROLS

**M7.2**  
100% CONSTRUCTION DOCUMENTS

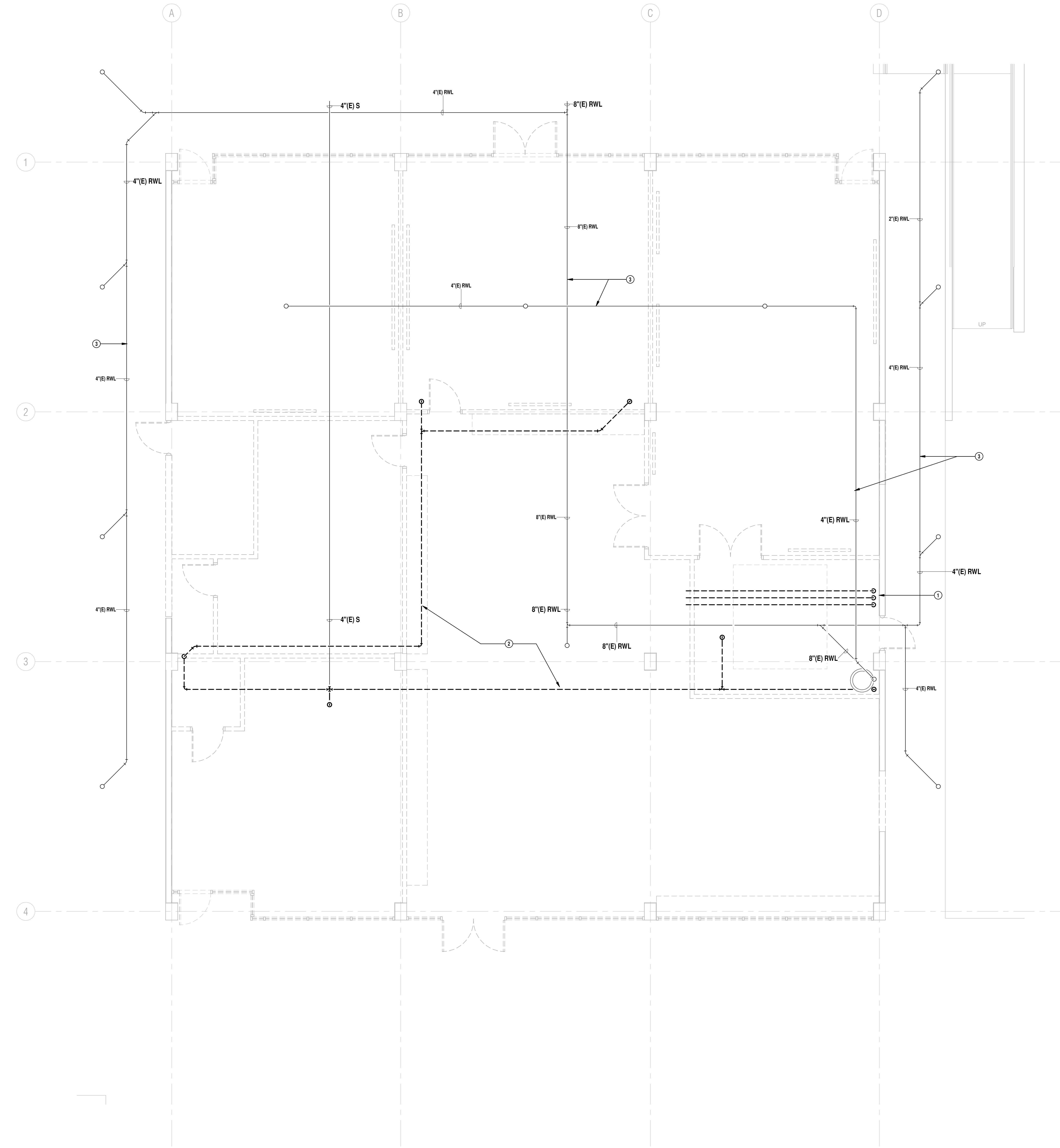
**KC**  
MECHANICAL  
ENGINEERING, L.L.C.

5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers Mech: TCB Plumb: MT

520/327-7611  
520/327-0432  
PROJECT# 19-366



1/11/2021 2:41:49 PM



1 Plumbing Demo Plan 1st Floor - A  
 1/4" = 1'-0"



### PLUMBING KEYNOTES

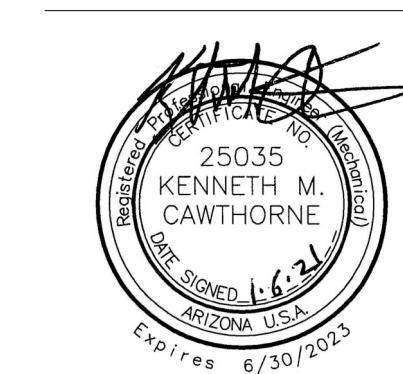
1. REMOVE ALL EXISTING CW, HW AND HWR PIPING BACK TO 2" CW, 1" HW AND 1/2" HWR MAINS RISING UP FROM UTILITY TUNNEL
2. REMOVE ALL EXISTING S BACK TO 4" S MAIN
3. EXISTING RAINWATER LEADERS TO REMAIN, TYPICAL

**DRAWN BY:** MT  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

**DEMOLITION PLUMBING  
 PLAN - LEVEL 1 AREA A**

**P1.1.1**  
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**KC MECHANICAL ENGINEERING, L.L.C.**  
 5447 East Fifth Street # 112  
 Tucson, Arizona 85711  
 Designers: Mech: TCB Plumb: MT  
 520/327-7611  
 520/327-0432  
 PROJECT# 19-366



**Pima Community College  
 PCC West Lab Building F  
 Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

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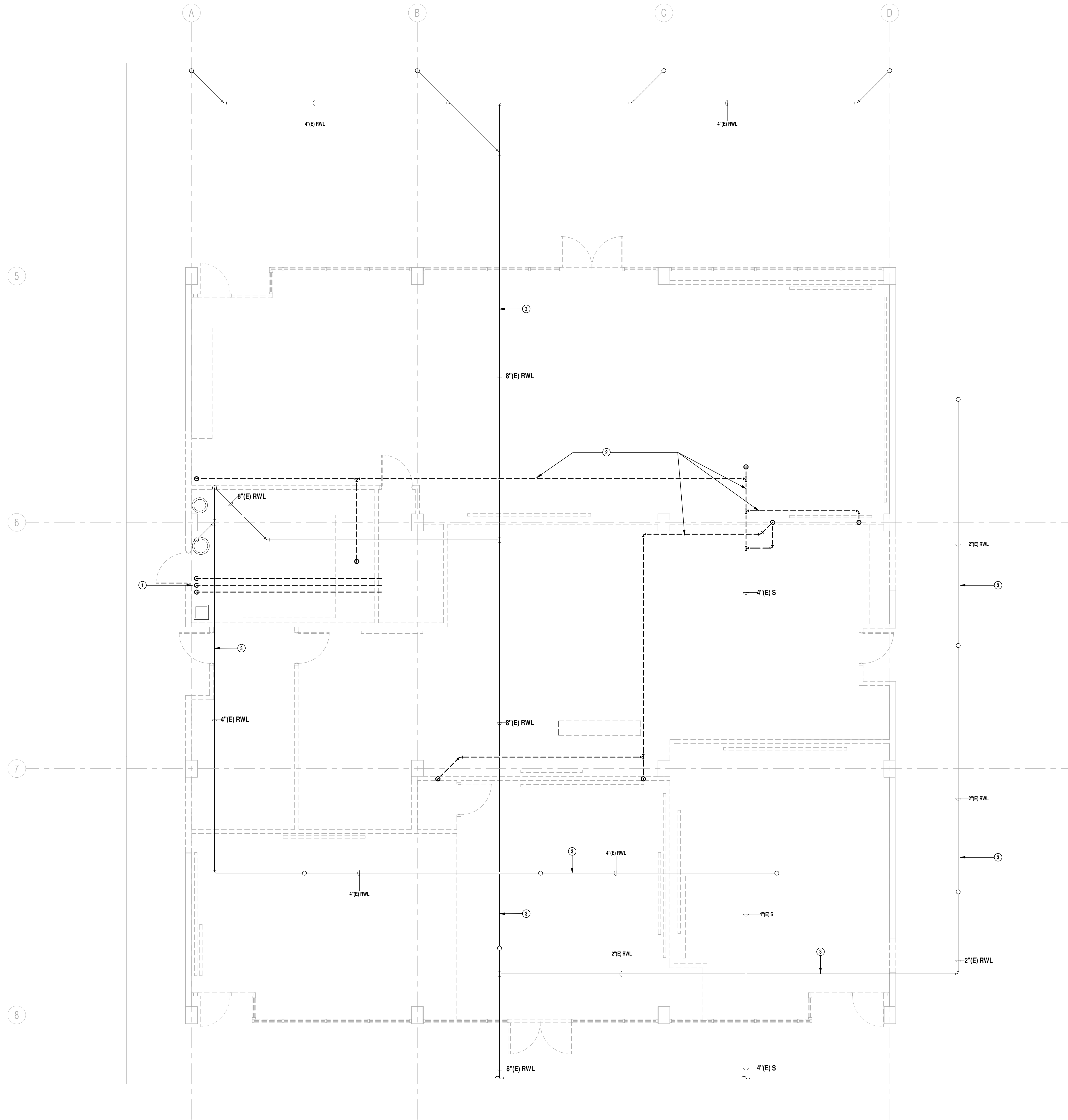
**STRUCTURAL**  
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 3728 N. Oracle Rd. #100  
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**ELECTRICAL**  
 Alford Engineering, Inc.  
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1 Plumbing Demo Plan 1st Floor - B  
1/4" = 1'-0"



### PLUMBING KEYNOTES

1. REMOVE ALL EXISTING CW, HW AND HWR PIPING BACK TO 2" CW, 1" HW AND 1/2" HWR MAINS RISING UP FROM UTILITY TUNNEL.
2. REMOVE ALL EXISTING S BACK TO 4" S MAIN.
3. EXISTING RAINWATER LEADERS TO REMAIN, TYPICAL.



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DEMOLITION PLUMBING  
 PLAN - LEVEL 1 AREA B

**P1.1.2**  
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**STRUCTURAL**  
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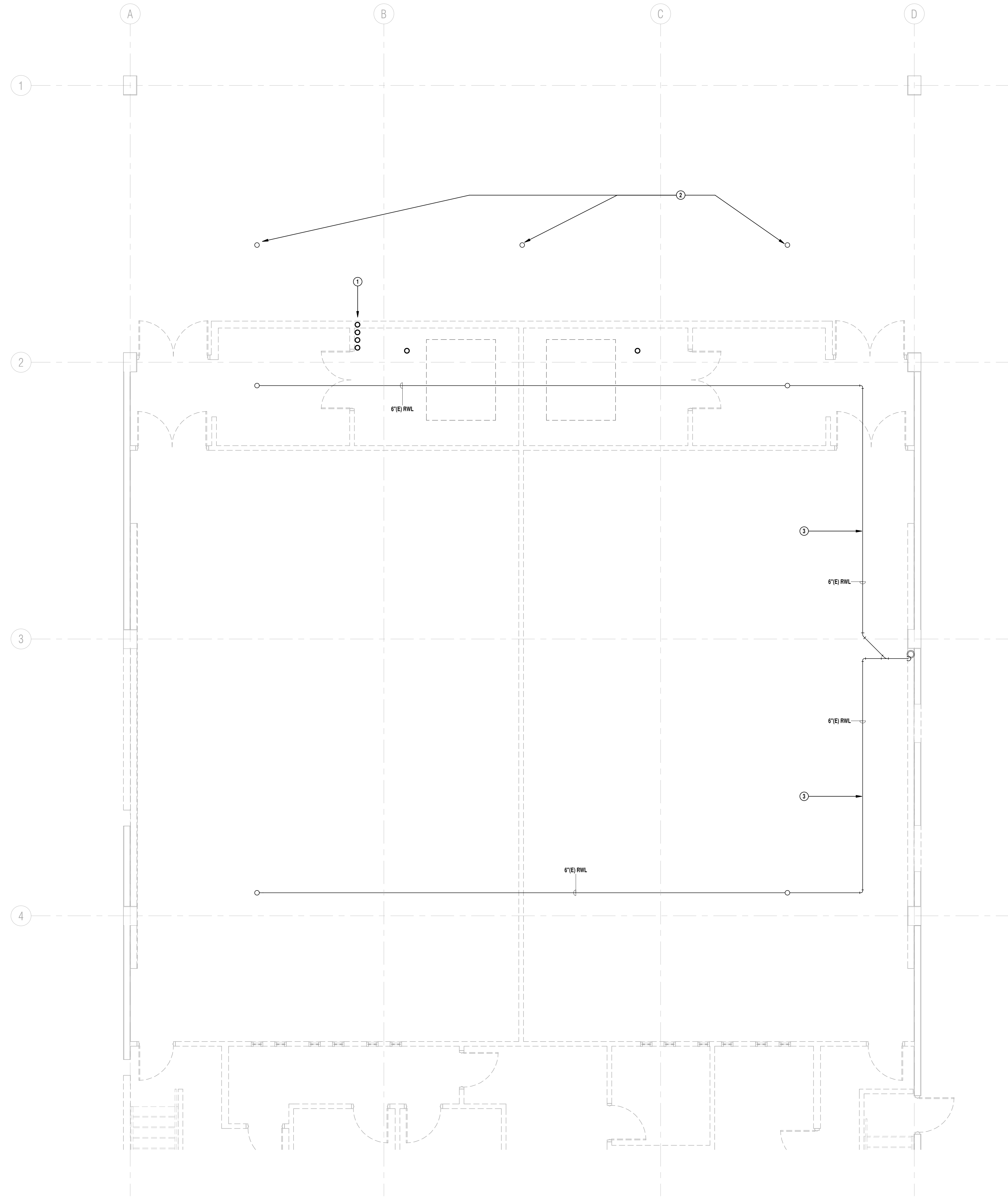
**ELECTRICAL**  
 Monrad Engineering, Inc.  
 1520 E. 17th Avenue #200  
 Tucson, AZ 85714  
 Phone: 520.884.0045

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 Tucson, AZ 85716  
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**PLUMBING KEYNOTES**

1. REMOVE ALL EXISTING CW, HW AND HWR PIPING.
2. REMOVE ALL EXISTING S AND V PIPING. EXISTING VTR TO REMAIN.
3. EXISTING RAINWATER LEADERS TO REMAIN, TYPICAL.



1 Plumbing Demo Plan 2nd Floor - A  
1/4" = 1'-0"

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**KC MECHANICAL ENGINEERING, L.L.C.**  
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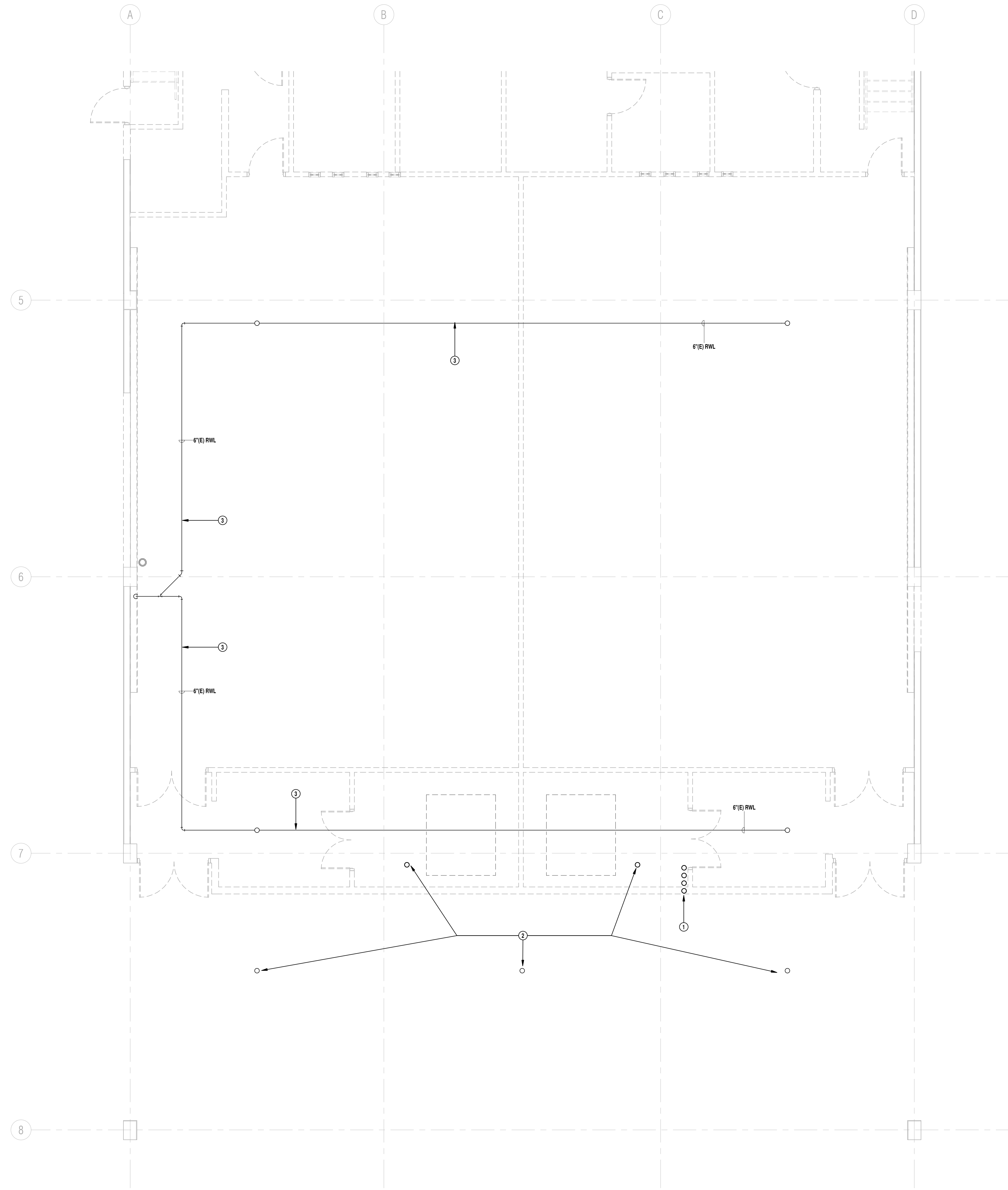
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**DEMOLITION PLUMBING  
PLAN - LEVEL 2 AREA A**  
**P1.2.1**  
100% CONSTRUCTION DOCUMENTS



1 Plumbing Demo Plan 2nd Floor - B  
 1/4" = 1'-0"

### PLUMBING KEYNOTES

1. REMOVE ALL EXISTING CW, HW AND HWR PIPING.
2. REMOVE ALL EXISTING S AND V PIPING. EXISTING VTR TO REMAIN.
3. EXISTING RAINWATER LEADERS TO REMAIN, TYPICAL.

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 PROJECT# 19-366

**DEMOLITION PLUMBING PLAN - LEVEL 2 AREA B**  
**P1.2.2**  
 100% CONSTRUCTION DOCUMENTS

**PLUMBING KEYNOTES**

- 1-1/4" TW, 3/4" ICW, 3/4" IHW, 1/2" IHWR, (2) 3/4" PW, & 1-1/4" LG POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR 1/2" IHWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" # 116151AC, SET TO .5 GPM.
- 2" TW, 1-1/2" ICW, 1-1/4" IHW, 3/4" IHWR, 1" PW, 1-1/4" LG, 3/4" LV, & 1" PWR UP TO LEVEL 2. SEE P2.1 FOR CONT.
- 1" ICW, 1/2" IHW, & (2) 1" PW POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 1-1/4" TW, 3/4" ICW, 3/4" IHW, 1/2" IHWR, (2) 1" PW, 1/2" LG, & 3/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR 1/2" IHWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" # 116151AC, SET TO .5 GPM.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.

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**ELECTRICAL**  
 Monrad Engineering, Inc.  
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 Phone: 520.884.0045

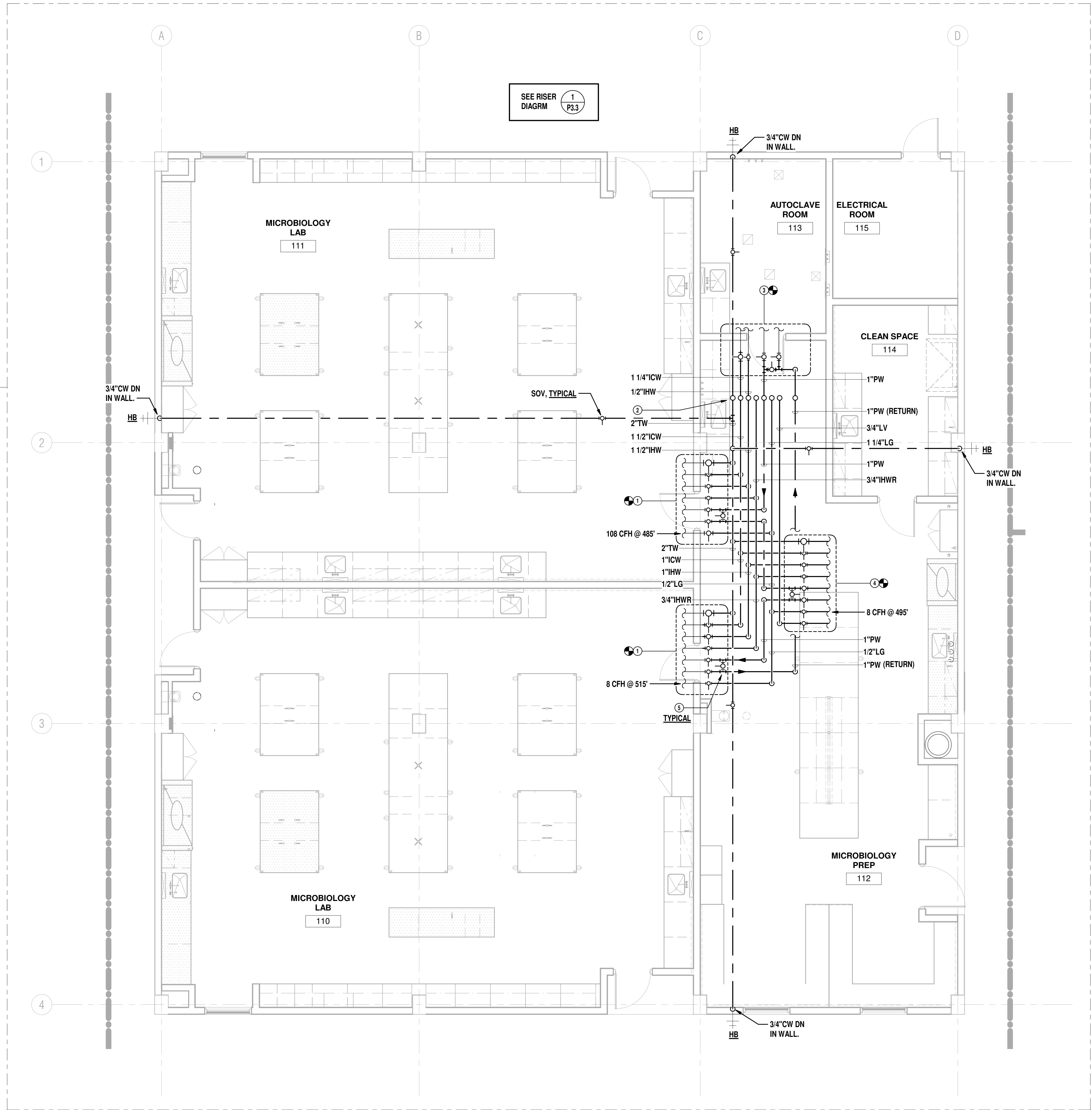
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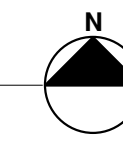
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**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

**PLUMBING PLAN - LEVEL 1  
 AREA A - WATER & GAS -  
 ADD ALT #1**  
**P2.1.1**  
 100% CONSTRUCTION DOCUMENTS

**KC MECHANICAL ENGINEERING, L.L.C.**  
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 Designers: Mech: TCB Plumb: MT  
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 520/327-0432  
 PROJECT# 19-366

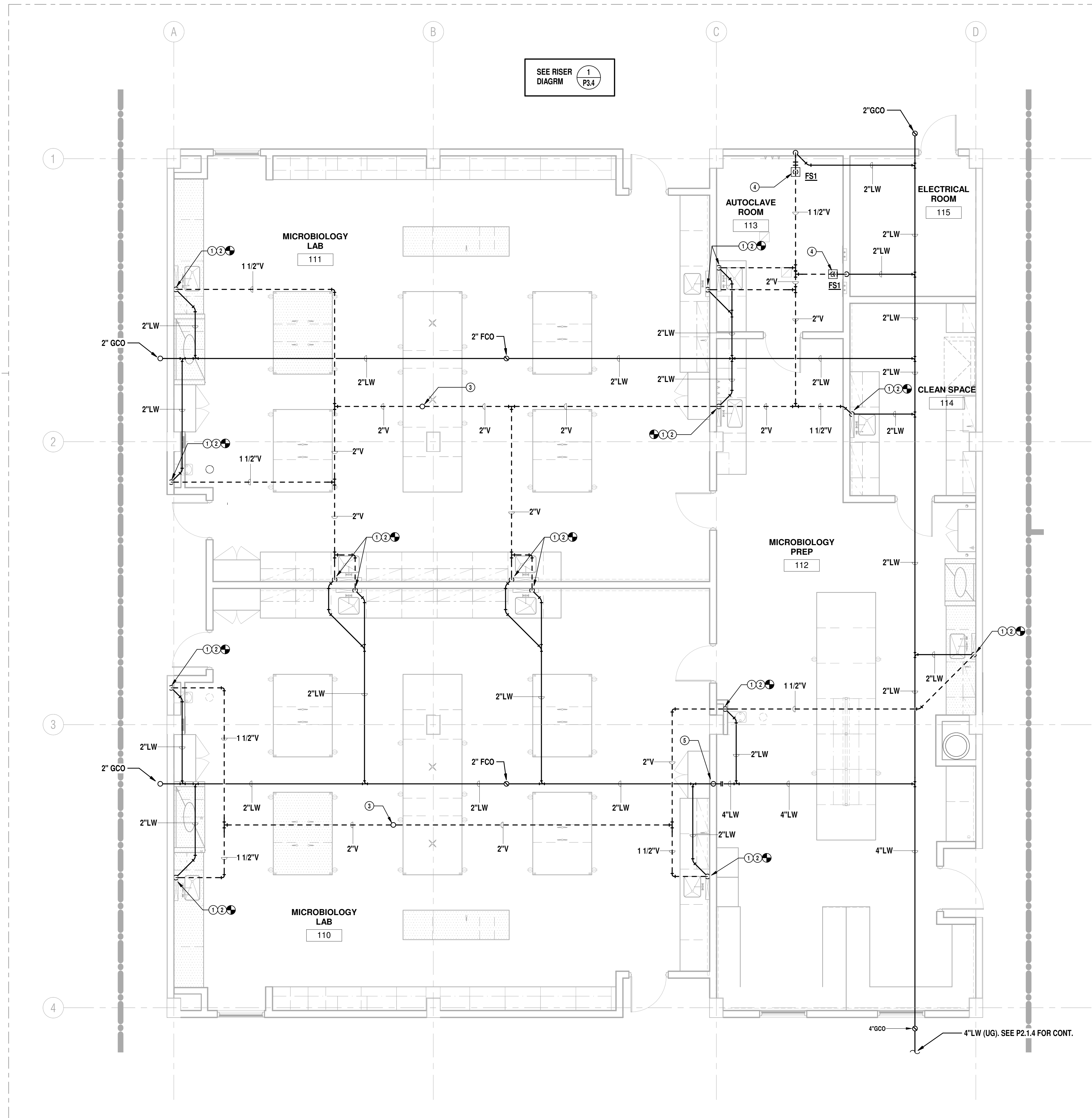


1 Plumbing Plan 1st Floor - A - Water & Gas  
 1/4" = 1'-0"



**PLUMBING KEYNOTES**

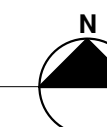
1. POINT OF CONNECTION TO 1-1/2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
2. POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
3. 2" UP TO LEVEL 2. SEE P2.2.2 FOR CONTINUATION.
4. 2" LAB WASTE WITH 2" WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
5. 3" LAB WASTE DOWN FROM LEVEL 2. PROVIDE 4" WCO @ 12" AFF. SEE P2.2.2 FOR CONTINUATION.



ADD ALTERATE #01

SEE RISER DIAGRAM  
1  
P8.4

1 Plumbing Plan 1st Floor - A - Waste & Vent  
1/4" = 1'-0"

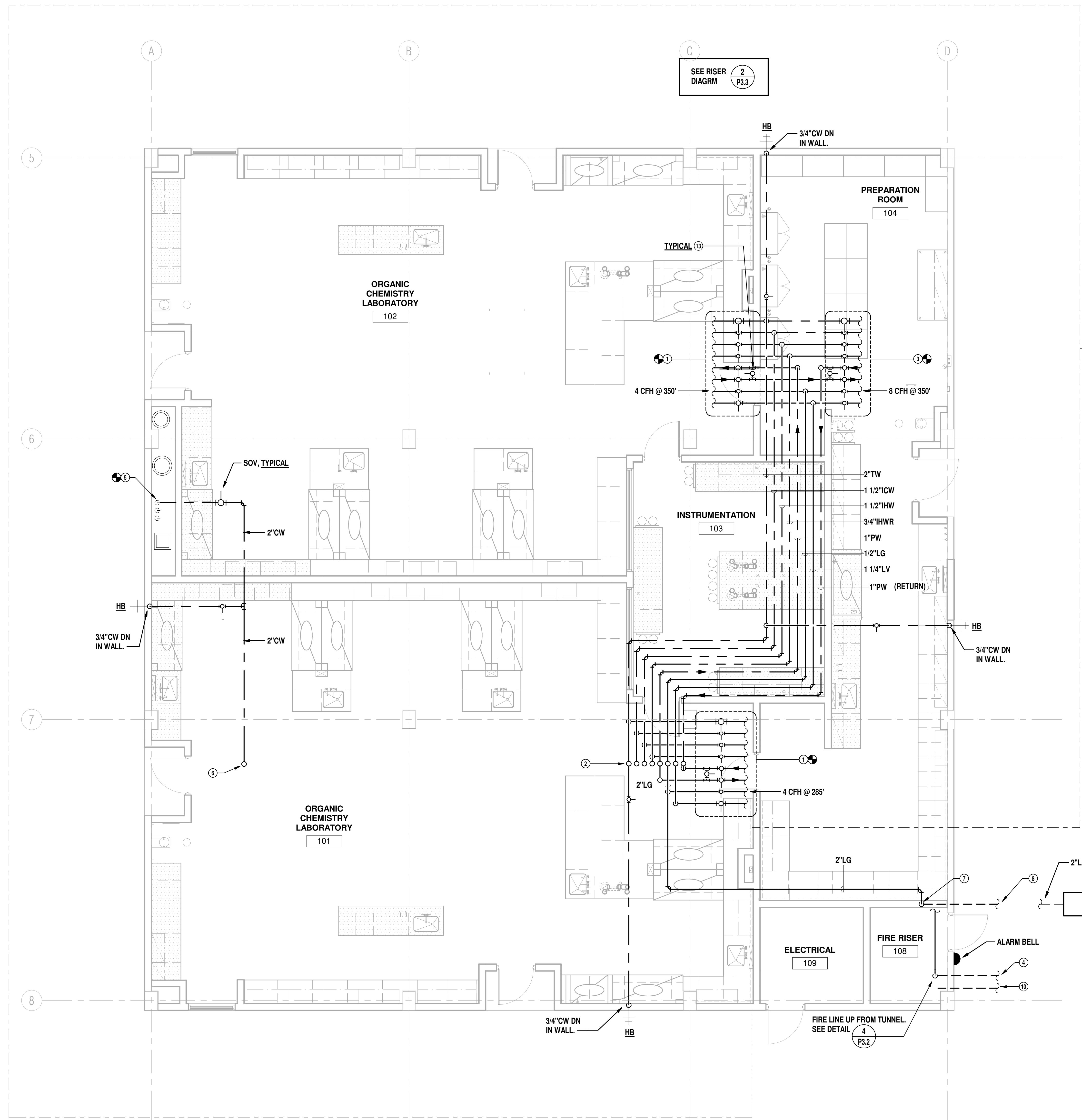


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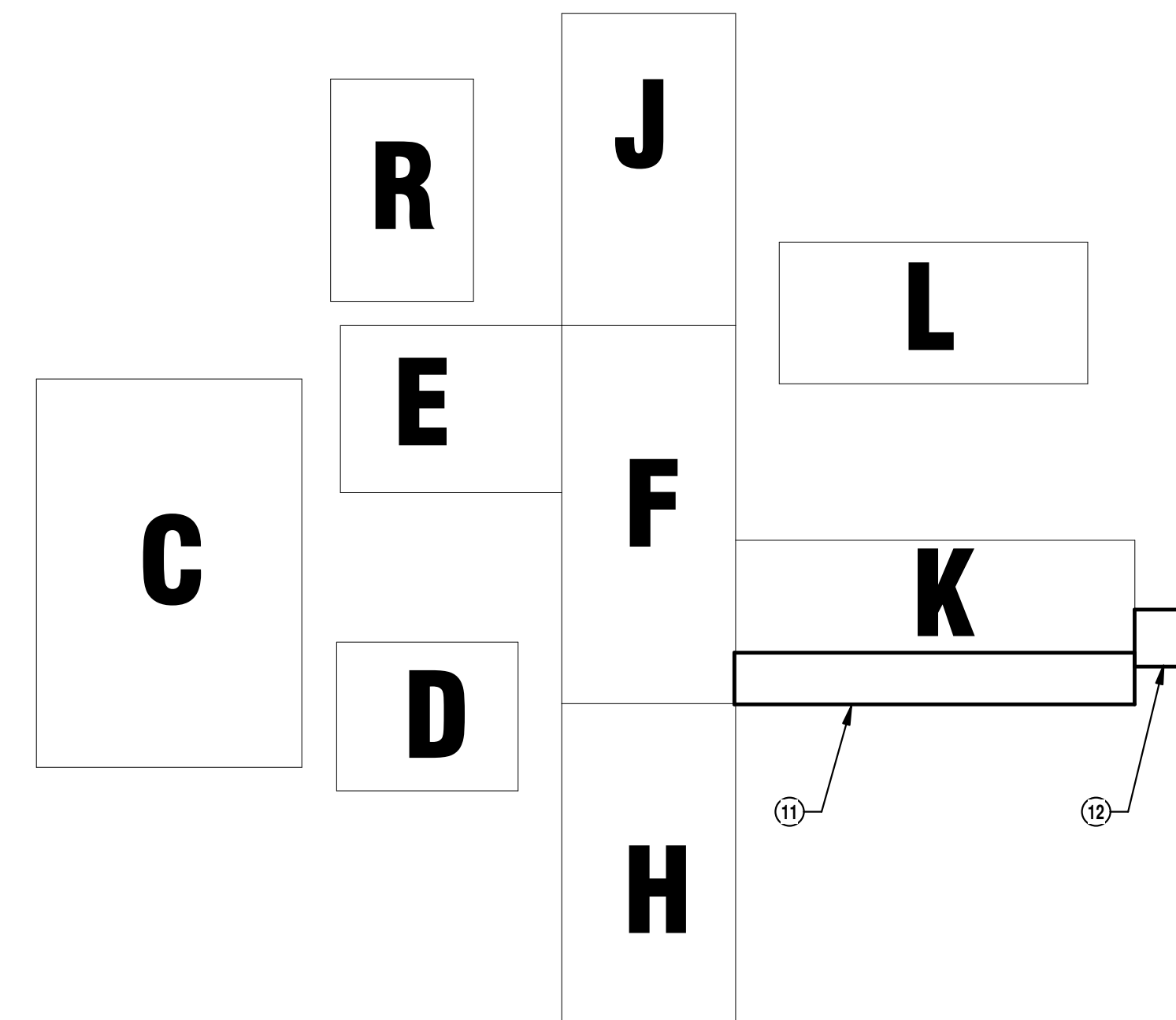


**PLUMBING NOTES**

- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 3/4" PW, 1-1/4" LG, & 1-1/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" #116151AC, SET TO 3 GPM.
- 2" TW, 1-1/2" ICW, 1-1/2" HW, 3/4" HWR, 1" PW, 2" LG, 1-1/4" LV, & 1" PWR UP TO LEVEL 2. SEE P2.2.3 FOR CONT.
- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 3/4" PW, 1-1/4" LG, & 3/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" #116151AC, SET TO 3 GPM.
- CONNECT 6" FIRE LINE TO EXISTING 6" STUB-OUT IN TUNNEL. FIELD VERIFY EXISTING PRIOR TO START OF WORK.
- CONNECT NEW 2" CW TO EXISTING 2" CW & ROUTE ABOVE CEILING. FIELD VERIFY EXISTING PRIOR TO START OF WORK.
- 2" CW UP TO LEVEL 2. SEE P2.2.1 FOR CONTINUATION.
- 2" LG DOWN TO BELOW FLOOR / IN CRAWL SPACE.
- 2" LG BELOW FLOOR / IN TUNNEL UNDER BUILDING K TO GAS METER APPROXIMATELY 230' AWAY. PROVIDE VENTED SLEEVE WHERE BURIED PER DETAIL 6P3.2.
- EXISTING GAS METER FOR BUILDING F LOCATED ON EAST EXTERIOR OF BUILDING K. SEE SITE PLAN FOR APPROXIMATE LOCATION. FIELD VERIFY EXACT LOCATION. 300 CFH @ 515' T.W.G. PRESSURE. REPLACE METER IF REQUIRED. COORDINATE WITH SOUTHWEST GAS. TRENCHING & BACKFILL BY CONTRACTOR. COORDINATE WITH SOUTHWEST GAS.
- CONNECT 4" FDC LINE TO EXISTING 4" STUB-OUT IN TUNNEL. FIELD VERIFY EXISTING PRIOR TO START OF WORK.
- EXISTING TUNNEL UNDER BUILDING K. LOCATION OF EXISTING 4" FDC LINE & 6" FIRE LINE FOR NEW CONNECTION. ROUTE NEW X" G IN TUNNEL TO EAST EXTERIOR OF BUILDING K, APPROXIMATELY 230'. COORDINATE FINAL LOCATION WITH SITE CONDITIONS.
- APPROXIMATE LOCATION OF NEW GAS METER. SEE NOTE #8.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.
- HPG BY SW GAS. TRENCH & BACKFILL BY CONTRACTOR. COORD. WITH SW GAS.

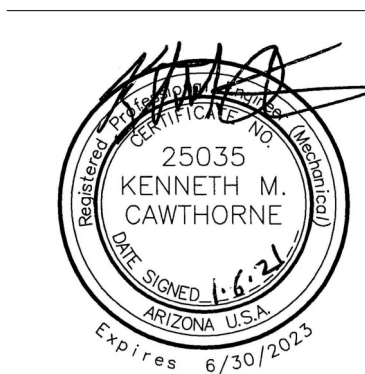


ADD ALTERATE #02  
NOTE: NATURAL GAS PIPING MAINS IN BASE BID. DISTRIBUTION PIPING TO ALTERNATE AREAS NOT IN BASE BID.



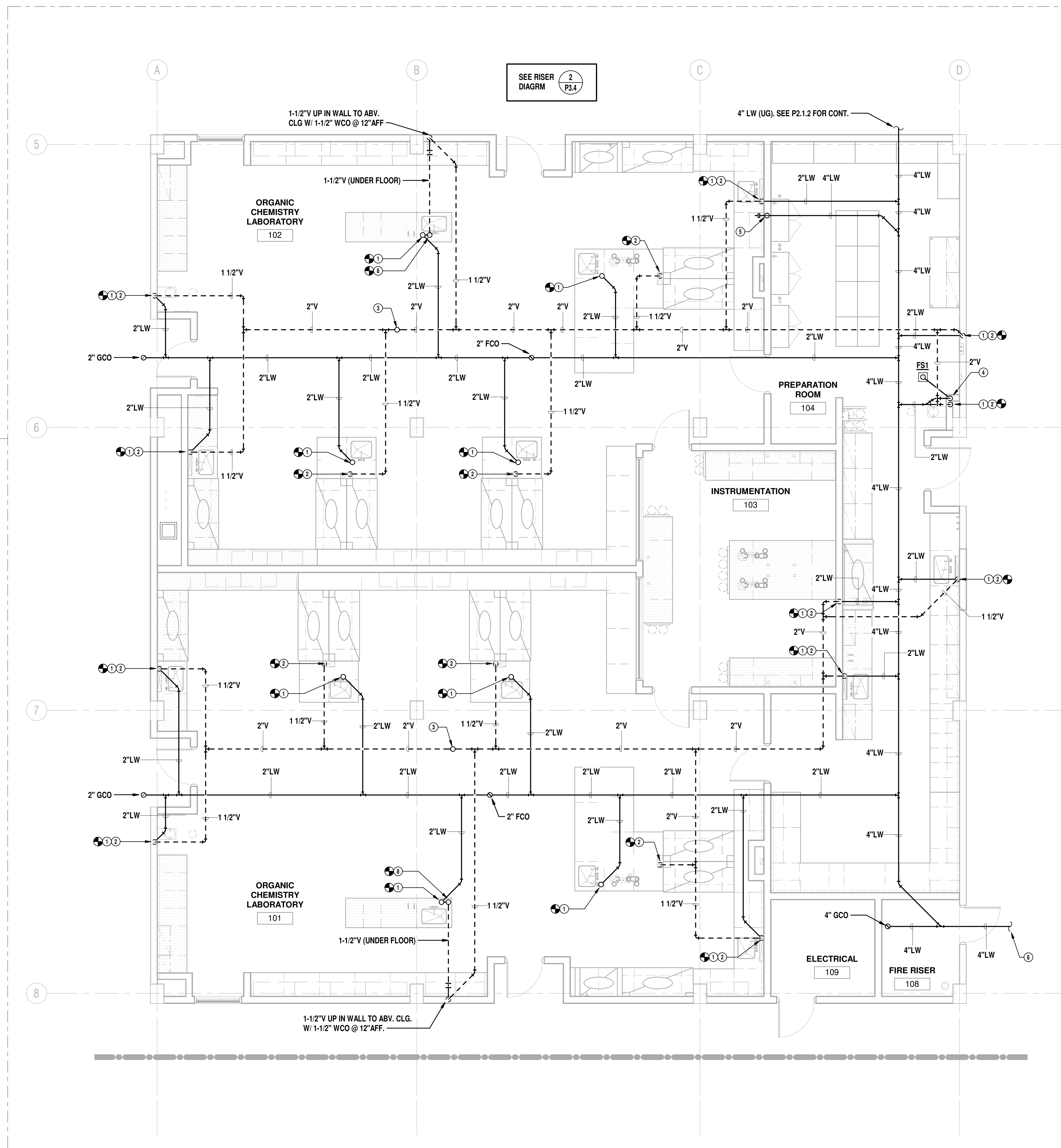
1 Plumbing Plan 1st Floor - B - Water & Gas  
1/4" = 1'-0"

Plumbing - Reference Site Plan  
n.t.s.



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ADD ALTERATE #02

SEE RISER DIAGRAM 2 P3.4

**PLUMBING KEYNOTES**

1. POINT OF CONNECTION TO 1-1/2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
2. POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
3. 2" V UP TO LEVEL 2. SEE P2.2.4 FOR CONTINUATION.
4. 2" LAB WASTE WITH 2"WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
5. 4" LAB WASTE DOWN FROM LEVEL 2. PROVIDE 4"WCO @ 12" AFF. SEE P2.2.2 FOR CONTINUATION.
6. NEW 4" LAB WASTE MAIN UNDERGROUND / IN CRAWL SPACE TO WASTE NEUTRALIZATION TANK.
7. BASE BID - REPLACE EXISTING WASTE NEUTRALIZATION TANK WITH NEW UNIT AT APPROXIMATE LOCATION SHOWN. PROVIDE EQUAL OR "MIFAB" 400 GALLON CAPACITY, 48" DIAMETER X 42-1/4" HEIGHT, WITH 6" INLET & OUTLET CONNECTIONS. RECONNECT EXISTING LAB WASTE FROM BUILDING K. CONNECT NEW 4" LAB WASTE AND ROUTE IN CRAWL SPACE UNDERGROUND TO BUILDING F NEW LAB WASTE. CONNECT TANK OUTLET TO EXISTING SEWER. FIELD VERIFY EXISTING PRIOR TO START OF WORK. SEE SITE PLAN FOR EXACT LOCATION.
8. POINT OF CONNECTION TO 1-1/2" ISLAND VENT BELOW COUNTER AT +/- 6" ABOVE FINISHED FLOOR. ROUTE 1-1/2" UNDER FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
9. 2" VENT UP FROM UG. TERMINATE WITH GOOSENECK +/- 6" ABV. GRADE. UTILIZE EXISTING VENT WHERE APPLICABLE. FIELD VERIFY EXISTING PRIOR TO START OF WORK.

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**DATE:** 01/08/2020  
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**PLUMBING PLAN - LEVEL 1  
 AREA B - WASTE & VENT -  
 ADD ALT #2**  
**P2.1.4**  
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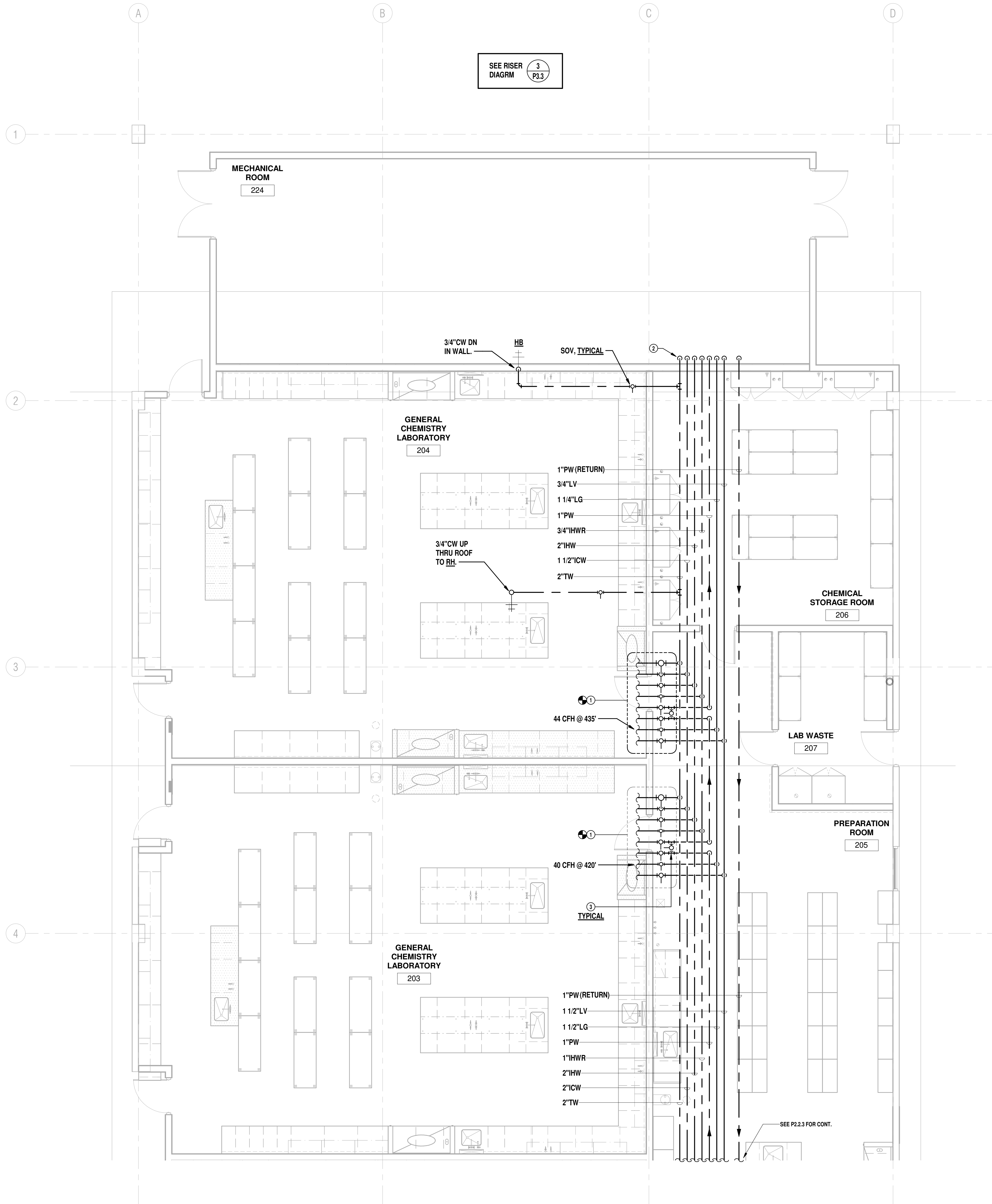
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1 Plumbing Plan 1st Floor - B - Waste & Vent  
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 PROJECT# 19-366

**PLUMBING KEYNOTES**

- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HW, (2) 3/4" PW, 3/4" LG, & 1-1/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" # 116151AC, SET TO .5 GPM.
- 2" TW, 1-1/2" ICW, 2" HW, 3/4" HW, 1" PW, 1-1/4" LG, 3/4" LV, & 1" PWR DN TO LEVEL 1. SEE P2.2.3 FOR CONT.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.



SEE RISER DIAGRAM P2.3

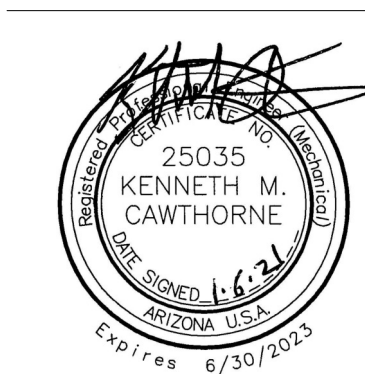
1 Plumbing Plan 2nd Floor - A - Water & Gas  
1/4" = 1'-0"

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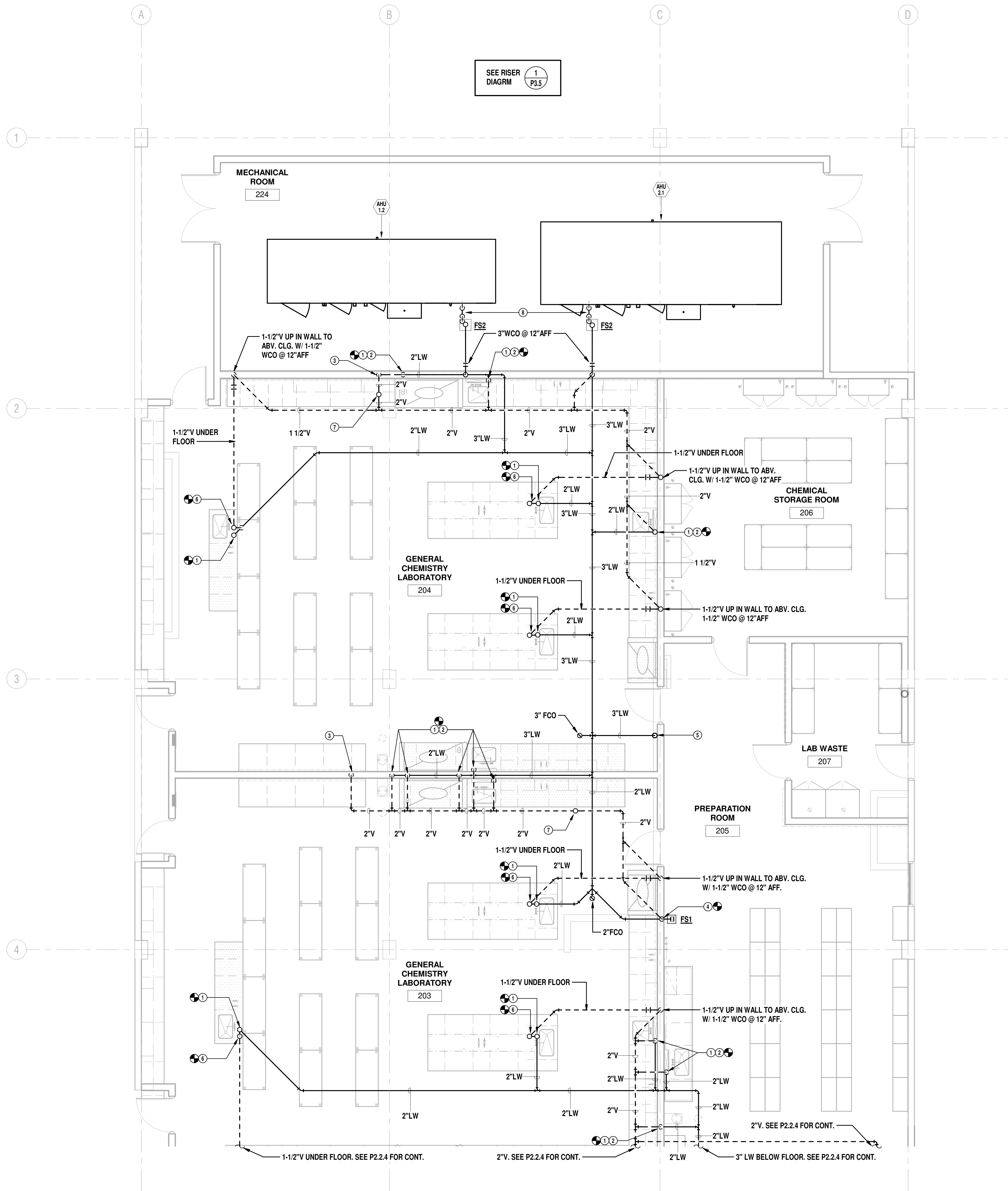
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520/327-0432  
PROJECT# 19-366

**PLUMBING PLAN - LEVEL 2  
AREA A - WATER & GAS -  
BASE BID**  
**P2.2.1**  
100% CONSTRUCTION DOCUMENTS

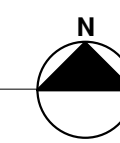


SEE RISER DIAGRAM 1 P3.5

**PLUMBING KEYNOTES**

- POINT OF CONNECTION TO 2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 2" V UP FROM LEVEL 1. SEE P2.1.2 FOR CONTINUATION.
- 2" LAB WASTE WITH 2"WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
- 3" LAB WASTE DOWN TO LEVEL 1. SEE P2.1.2 FOR CONTINUATION.
- POINT OF CONNECTION TO 1-1/2" ISLAND VENT BELOW COUNTER AT +/- 6" ABOVE FINISHED FLOOR. ROUTE 1-1/2" V UNDER FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 3" VTR MIN. 20'-0" FROM ALL FRESH AIR INTAKES, OFFSET AS REQUIRED.
- 1-1/4" C/D WITH OPEN TEE & TRAP. TERMINATE AT FLOOR SINK WITH AIRGAP. SEE MECHANICAL FOR DETAIL.

1 Plumbing Plan 2nd Floor - A - Waste & Vent  
1/4" = 1'-0"



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**ELECTRICAL**  
Morrise Engineering, Inc.  
1520 E. Park Ave., Suite 200  
Tucson, AZ 85711  
Phone: 520.884.0045

**Prima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

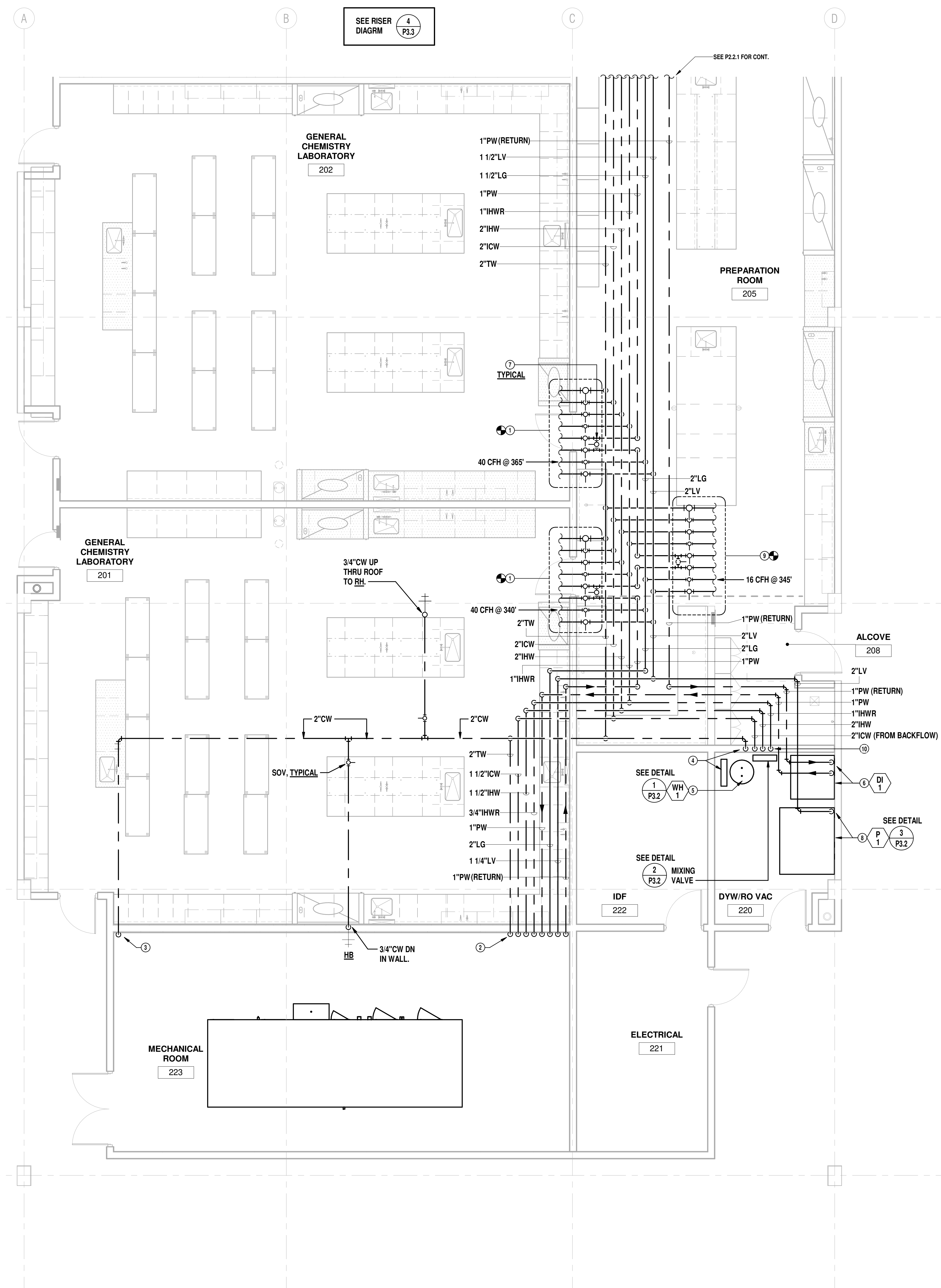


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JOB NO: 1931.000  
DATE: 01/08/2020  
REVISIONS

**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT  
520/327-7611  
520/327-0432  
PROJECT# 19-366

**PLUMBING PLAN - LEVEL 2  
AREA A - WASTE & VENT -  
BASE BID**  
**P2.2.2**  
100% CONSTRUCTION DOCUMENTS





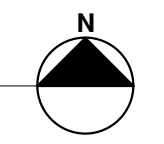
SEE RISER DIAGRAM P3.3 4

SEE P2.2.1 FOR CONT.

**PLUMBING KEYNOTES**

- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 3/4" PW, 3/4" LG, & 1-1/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" #116151AC, SET TO 3 GPM.
- 2" TW, 1-1/2" ICW, 1-1/2" HW, 3/4" HWR, 1" PW, 2" LG, 1-1/4" LV, & 1" PWR UP FROM LEVEL 1. SEE P2.1.3 FOR CONT.
- 2" CW UP FROM LEVEL 1. SEE P2.1.3 FOR CONT.
- 2" CW TO 2" REDUCED PRESSURE BACKFLOW PREVENTER EQUAL OF FERCO #R25V, PROVIDE AIR GAP FITTING AND 3" DRAIN TO EXTERIOR WITH DOWN SPOUT NOZZLE EQUAL OF IR SMITH #171-03. POINT OF SEPARATION TO INDUSTRIAL WATER (ICW), FROM BACKFLOW PROVIDE 2" CW TO BUILDING & 1-1/2" ICW TO WATER HEATER & MIXING VALVE. SEE DETAILS 1P3.2 & 2P3.2 FOR CONT.
- WATER HEATER FOR INDUSTRIAL HOT WATER. SEE SCHEDULE.
- 1" PW & PW RETURN DN TO PURIFIED / DIONIZED WATER SYSTEM WITH FACTORY RECIRCULATION PUMP. INSTALL PER MANUFACTURER'S DETAILS. SEE SCHEDULE.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.
- 2" LV DN TO VACUUM PUMP SYSTEM. SEE SCHEDULE.
- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 1" PW, 1/2" LG, 1" LV, & 1/2" CA. POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFF" #116151AC, SET TO 3 GPM.
- 2" CW FROM BACKFLOW, & 2" HW (120) & 1" HWR FROM MIXING VALVE UP DN IN WALL FROM MECHANICAL ROOM. SEE DETAILS 1P3.2 & 2P3.2 FOR CONT.

1 Plumbing Plan 2nd Floor - B - Water & Gas  
1/4" = 1'-0"



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26 North Court Avenue  
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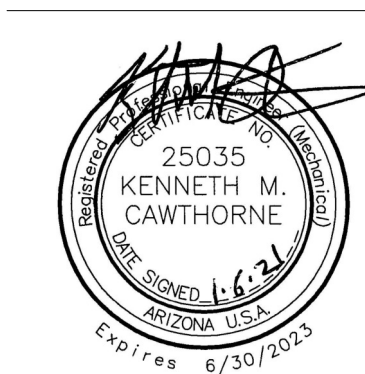
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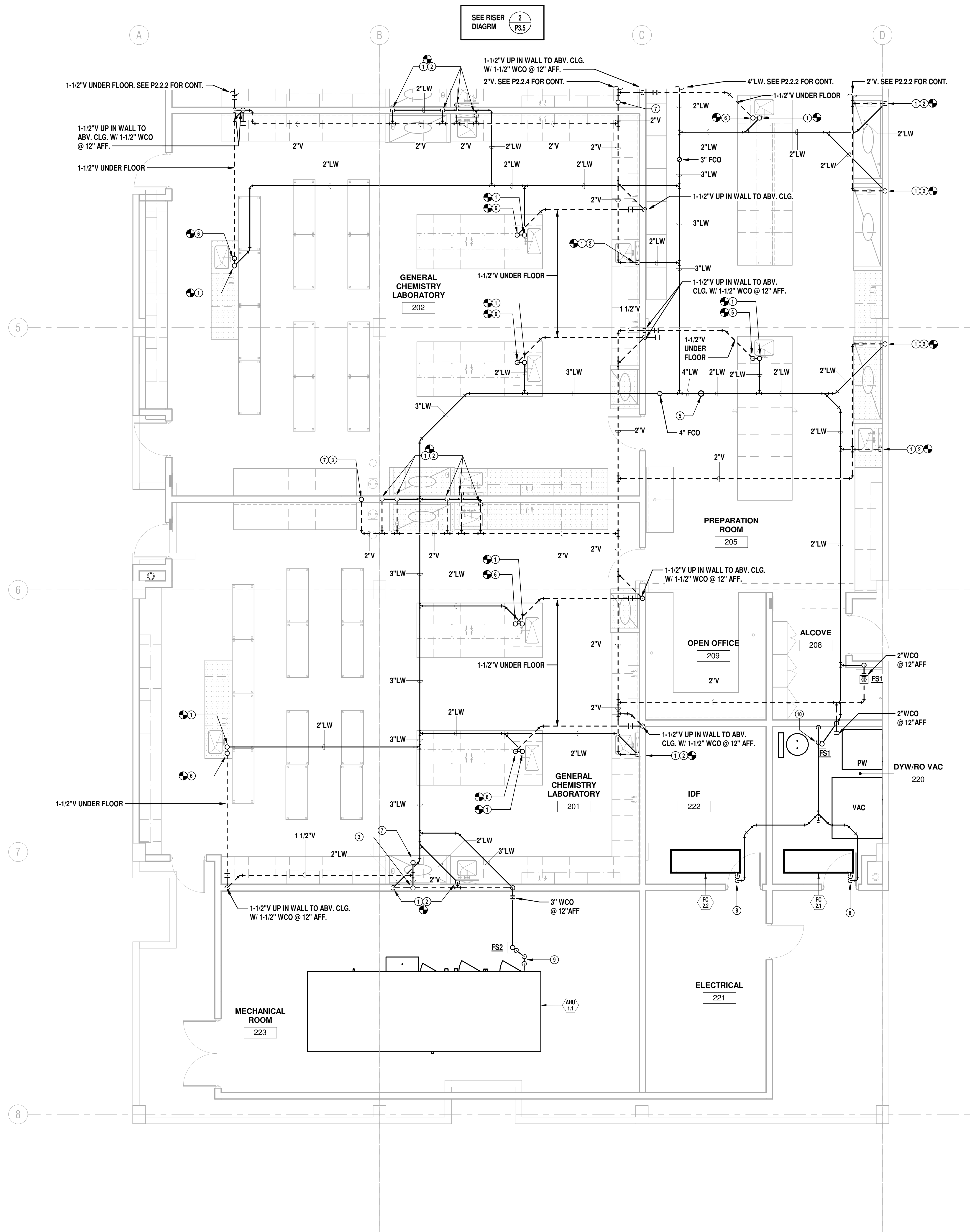
**Pima Community College  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



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JOB NO: 1931.000  
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REVISIONS

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5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT  
520/327-7611  
520/327-0432  
PROJECT# 19-366

**PLUMBING PLAN - LEVEL 2  
AREA B - WATER & GAS -  
BASE BID**  
**P2.2.3**  
100% CONSTRUCTION DOCUMENTS



**PLUMBING KEYNOTES**

- POINT OF CONNECTION TO 2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING, OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 2" UP FROM LEVEL 1. SEE P2.1.4 FOR CONTINUATION.
- 2" LAB WASTE WITH 2" WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
- 4" LAB WASTE DOWN TO LEVEL 1. SEE P2.1.4 FOR CONTINUATION.
- POINT OF CONNECTION TO 1-1/2" ISLAND VENT BELOW COUNTER AT +/- 6" ABOVE FINISHED FLOOR. ROUTE 1-1/2" UNDER FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 3" VTR MIN. 20'-0" FROM ALL FRESH AIR INTAKES, OFFSET AS REQUIRED.
- 3/4" CD FROM FC WITH OPEN TEE & TRAP. PROVIDE CLEANOUTS AT CHANGES OF DIRECTION. SEE MECHANICAL FOR DETAIL.
- 1-1/2" CD WITH OPEN TEE & TRAP. TERMINATE AT FLOOR SINK WITH AIR GAP. SEE MECHANICAL FOR DETAIL.
- 3/4" CD ON WALL & TERMINATE AT FLOOR SINK WITH AIR GAP.

1 Plumbing Plan 2nd Floor - B- Waste & Vent  
1/4" = 1'-0"

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**KC MECHANICAL ENGINEERING, L.L.C.**  
5447 East Fifth Street # 112  
Tucson, Arizona 85711  
520/327-7611  
520/327-0432  
Designers: Mech: TCB Plumb: MT PROJECT# 19-366

**PLUMBING PLAN - LEVEL 2  
AREA B - WASTE & VENT -  
BASE BID**  
**P2.2.4**  
100% CONSTRUCTION DOCUMENTS

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**Pima Community College  
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PRESSURE LOSS CALCULATIONS	
System Type	Flush Tank
Total Fixture Demand	145.0 F.U.
Plumbing GPM Demand	53.8 GPM
Assumed Pressure Available at Property Line (Tucson Waste estimate)	75.0 PSI
Distance from Main to Meter	75.0 FT
Distance from Backflow Preventer to Building	100.0 FT
Pressure Reducing Valve Setting	N/A PSI
<b>SITE PRESSURE LOSS</b>	
A. Pipe Loss (1-1/2" Dia. Pipe From Main to Meter)	9.1 PSI
B. 1-1/2" Meter	7.2 PSI
C. PRV	N/A PSI
D. Backflow Preventer	11.5 PSI
E. Pipe Loss (2" Dia. Pipe From BFP to Building)	3.1 PSI
<b>TOTAL SITE PRESSURE LOSSES</b>	<b>31.0 PSI</b>
<b>BUILDING PRESSURE LOSS</b>	
A. Pressure Required at Last Fixture	25.0 PSI
B. Lift at 20 ft	8.7 PSI
<b>TOTAL BUILDING PRESSURE LOSSES</b>	<b>33.7 PSI</b>
<b>TOTAL PRESSURE LOSSES</b>	<b>64.6 PSI</b>
<b>TOTAL ALLOWABLE PRESSURE DROP</b>	<b>10.4 PSI</b>
<b>EQUIVALENT FEET CALCULATION (BUILDING)</b>	
A. Total Measured Length of Pipe (building entrance to furthest fixture)	160 FT
B. Add 50% for Fittings and Valves	80 FT
<b>TOTAL EQUIVALENT FEET</b>	<b>240 FT</b>
<b>ALLOWABLE AVERAGE *P/100 FT.</b>	
10.4 PSI X 100 =	4.3 PSI / 100 FT. ALLOWABLE WITHIN BUILDING
240.0 EQUIV. FT.	
Therefore, @ 53.8 GPM Use a 2" diameter CW pipe @ 3.1 PSI / 100 FT and 5.6 feet / second	

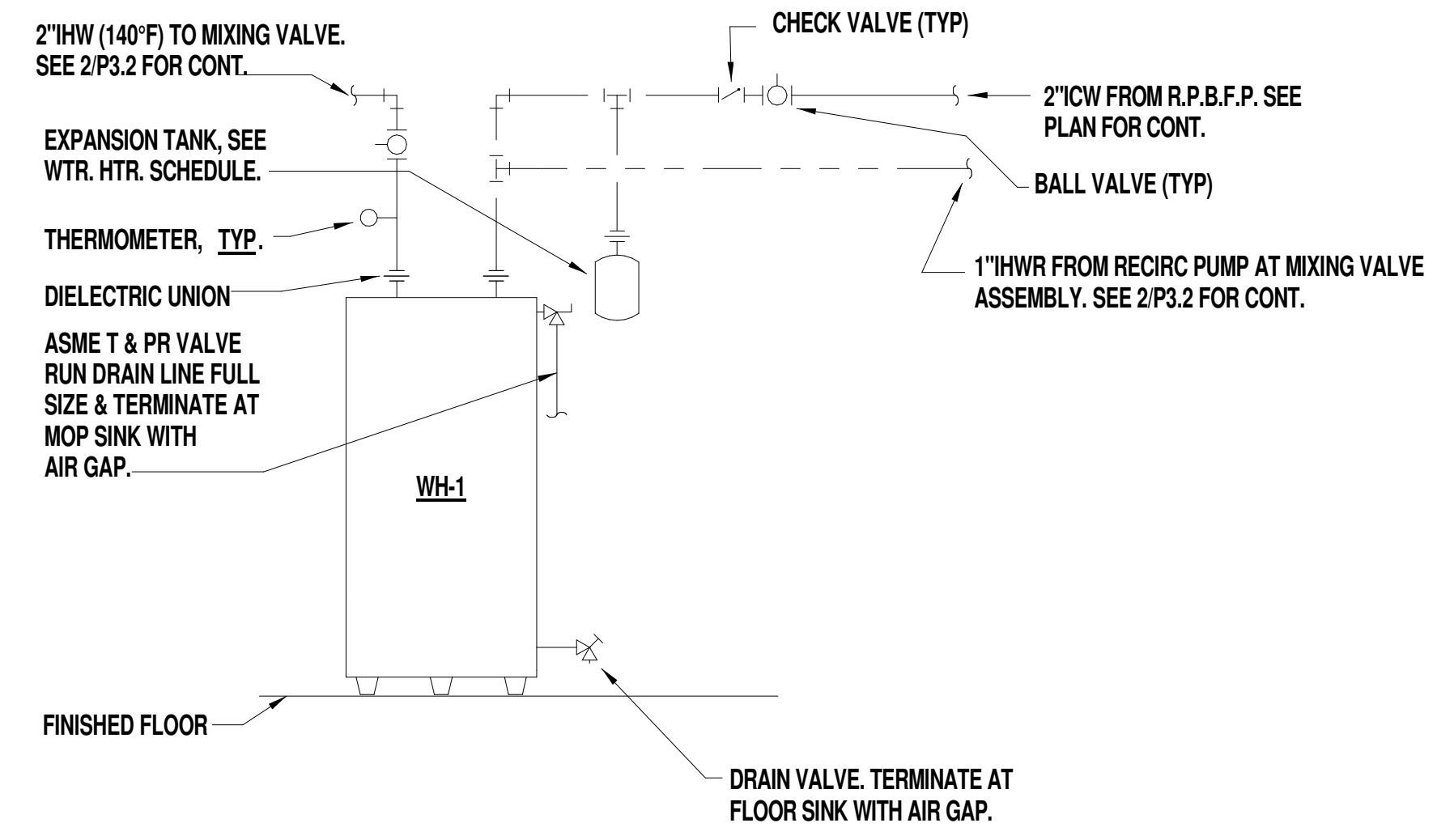
WATER HEATER SCHEDULE	
MARK	WH-1
ENTERING WATER TEMPERATURE (DEG. F)	60
LEAVING WATER TEMPERATURE (DEG. F)	120
RECOVERY RATE (GPH)	31
STORAGE VOLUME (GAL.)	65
ENERGY SOURCE	ELECTRIC (4.5KW)
VOLTS/PHASE/HZ	460/3/60
REFERENCE	BRADFORD WHITE LE265T3-3
EXPANSION TANK	AMTROL
REFERENCE	ST-5
RELIEF VALVE SETTING (PSIG)	150
NOTES	1-6
1. RECOVERY RATE SCHEDULED IS FOR SEA LEVEL.	
2. PROVIDE HEAT TRAP FITTINGS AT COLD & HOT WATER CONNECTIONS EQUAL TO "WATTS".	
3. PROVIDE RECIRCULATION PUMP EQUAL TO GRUNDFOS MODEL MAGNA3 32-60 F, 106 WATTS, 115/1/60. PROGRAMMABLE MULTISPEED W/ INTEGRAL TIME CLOCK & TEMP SENSOR. 6 GPM @ 15 FT. OF HEAD.	
4. WATER HEATER SHALL BE UL LISTED.	
5. PROVIDE (2) NON-SIMULTANEOUS ELEMENTS.	

DEIONIZATION SYSTEM	
MARK	DI-1
TYPE	RECIRCULATING SKID MOUNT
REFERENCE	PURETEC FLEXX DP DI SKID
<b>NOTES</b>	
1. PROVIDE FACTORY VALVES & CONTROLLER.	
2. INSTALL PER MANUFACTURE'S DETAILS.	
3. PROVIDE WITH FACTORY RECIRCULATION PUMP. MIN. 10 GPM @ 85 FT. OF HEAD	
4. PROVIDE WITH UV STERILIZATION & POST FILTRATION RATE AT 0.2 MICRON.	
5. PROVIDE DI EXCHANGE TANKS PER MANUFACTURE'S REQUIREMENTS.	
6. SEE LAB CONSULTANTS DRAWINGS FOR PURIFICATION REQUIREMENTS.	

PLUMBING FIXTURE SCHEDULE												
MARK	FIXTURE	DESCRIPTION	QTY	WASTE			WATER		CONNECTION SIZES (INCHES) **			
				FU	TOTAL		FU	TOTAL	WASTE	VENT	HOT	COLD
L1	LAB SINK	SEE LAB PLANS.	54	2	108		2	108	1 1/2	1 1/2	1/2	1/2
L2	CUP SINK	SEE LAB PLANS.	11	1	11		2	22	1 1/2	1 1/2	1/2	1/2
L3	EYE WASH	SEE LAB PLANS.	11	-	-		-	-	1 1/2	1 1/2	3/4	3/4
FS1	FLOOR SINK	J.R. SMITH #3110-12, 12" X 12" X 6" DEEP W/1/2 GRATE.	6	2	12		-	-	2	1 1/2	-	-
FS2	FLOOR SINK	J.R. SMITH #3110-10, 12" X 12" X 10" DEEP W/1/2 GRATE.	3	2	6		-	-	3	2	-	-
RH	ROOF HYDRANT	WOODFORD #B24P-3/4 BRASS HOSE BIBB W/VACUUM BREAKER & FLUSH MOUNT TAMPER RESISTANT BRASS WALL BOX, CHROME FINISH.	2	-	-		2.5, 1	3.5	-	-	-	3/4
HB	HOSE BIBB	WOODFORD #24P-3/4 BRASS HOSE BIBB W/VACUUM BREAKER & REMOVABLE LOOSE KEY HANDLE ATTACHED TO OPERATING STEM.	10	-	-		2.5, 1	11.5	-	-	-	3/4
TOTAL FIXTURE UNITS					137			145				

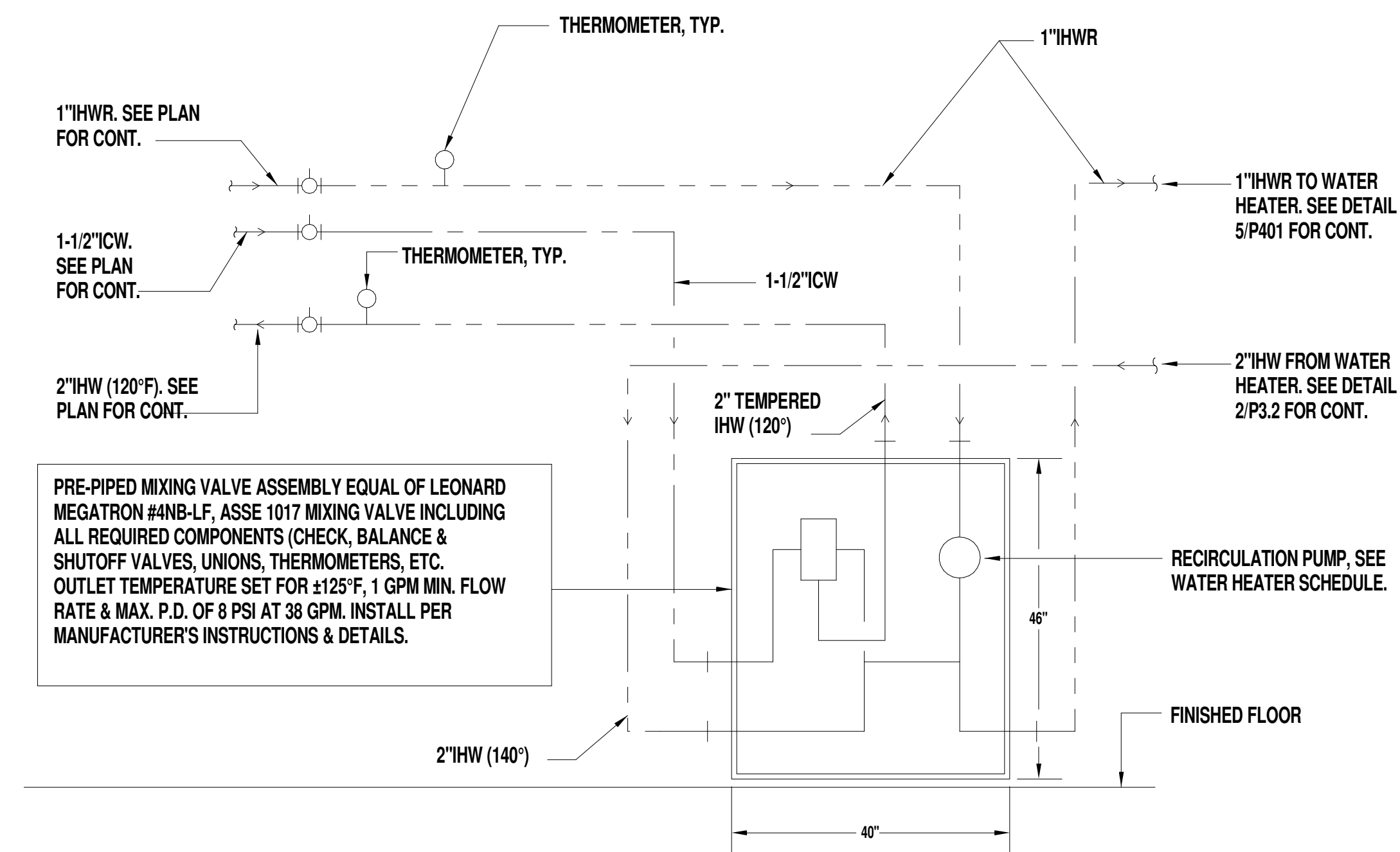
\*\* FIXTURE SERVICE PIPE SIZE SHALL BE THE SIZE INDICATED WITH REDUCER (IF REQ'D) AS CLOSE TO FIXTURE CONNECTION AS POSSIBLE

VACUUM PUMP		
VP-1	MAIN VACUUM PUMP	AMICO MODEL # V-RVD-T-200P-SS-N-056, NFPA & UL/ETL LISTED, ROTARY VANE - DRY, 5.6 HP TRIPLEX TANK MOUNTED VACUUM PUMP SYSTEM W/ ASME 200 GALLON RECIEVER. 208/3/60, 51 FLA (3 PUMPS RUNNING). 67" W x 55" L x 97" H. 56.0 SYSTEM SCFM W/ ONE PUMP IN STAND-BY, MAXIMUM 80 DBA, 28,498 BTU/H. ALL COMPONENTS SHALL COME PRE-PIPED AND PRE-WIRED TO A SINGLE POINT SERVICE CONNECTION. ALL INTERCONNECTING PIPING AND WIRING SHALL BE COMPLETED AND FACTORY OPERATIONALLY TESTED PRIOR TO SHIPMENT. UNIT SHALL COME EQUIPPED WITH A UL LISTED NEMA 12 ENCLOSURE WITH EXTERNALLY OPERABLE CIRCUIT BREAKERS & STARTERS. INSTALLING MECH. CONTRACTOR SHALL BE RESPONSIBLE FOR DISASSEMBLING & RE-ASSEMBLING UNIT IN PLACE TO FACTORY SPECIFICATIONS AS REQUIRED. WEIGHT - 2,400 LBS.



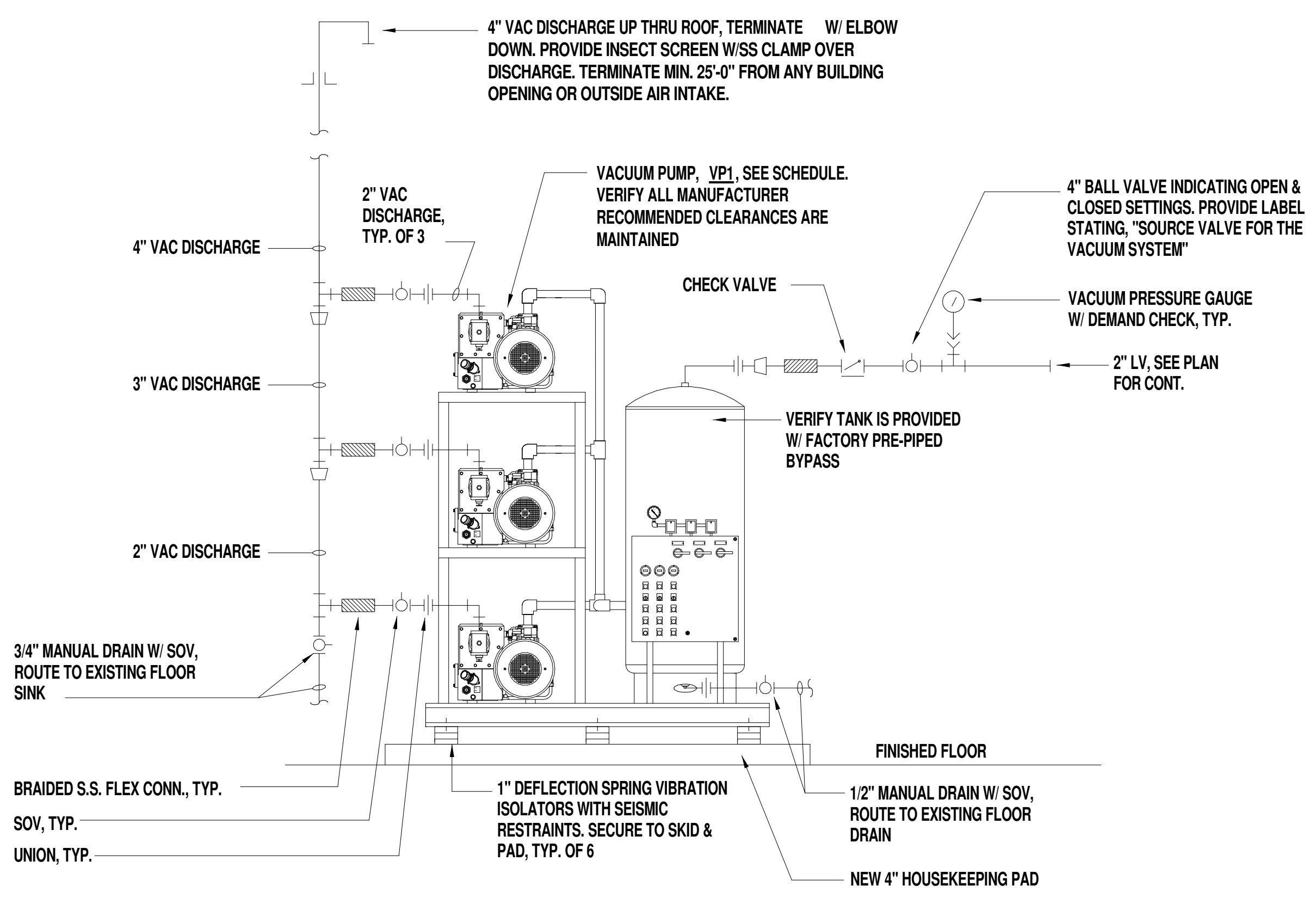
**WATER HEATER DETAIL**  
NO SCALE

1 P3.2



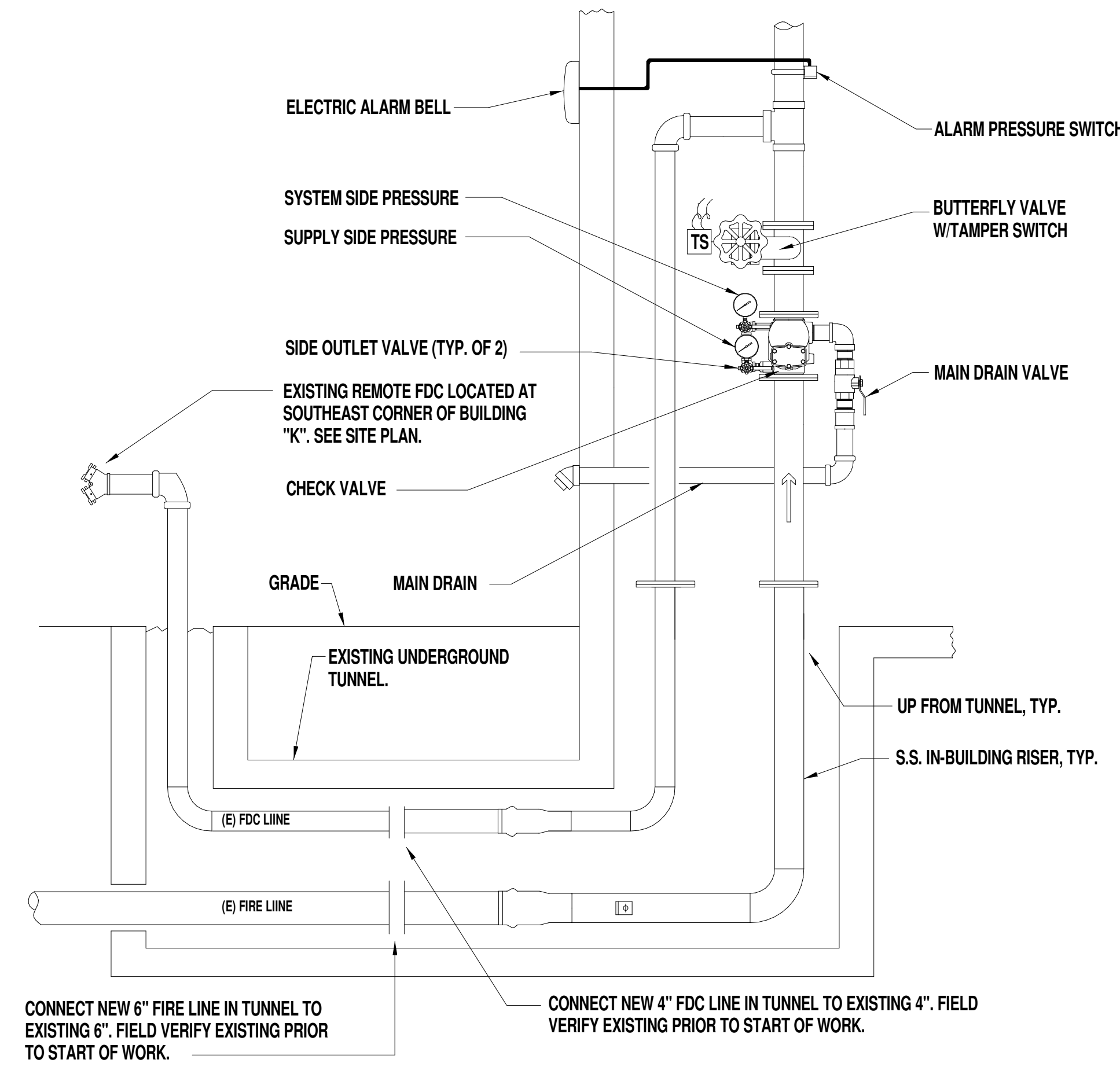
**MIXING VALVE DETAIL**  
NO SCALE

2 P3.2



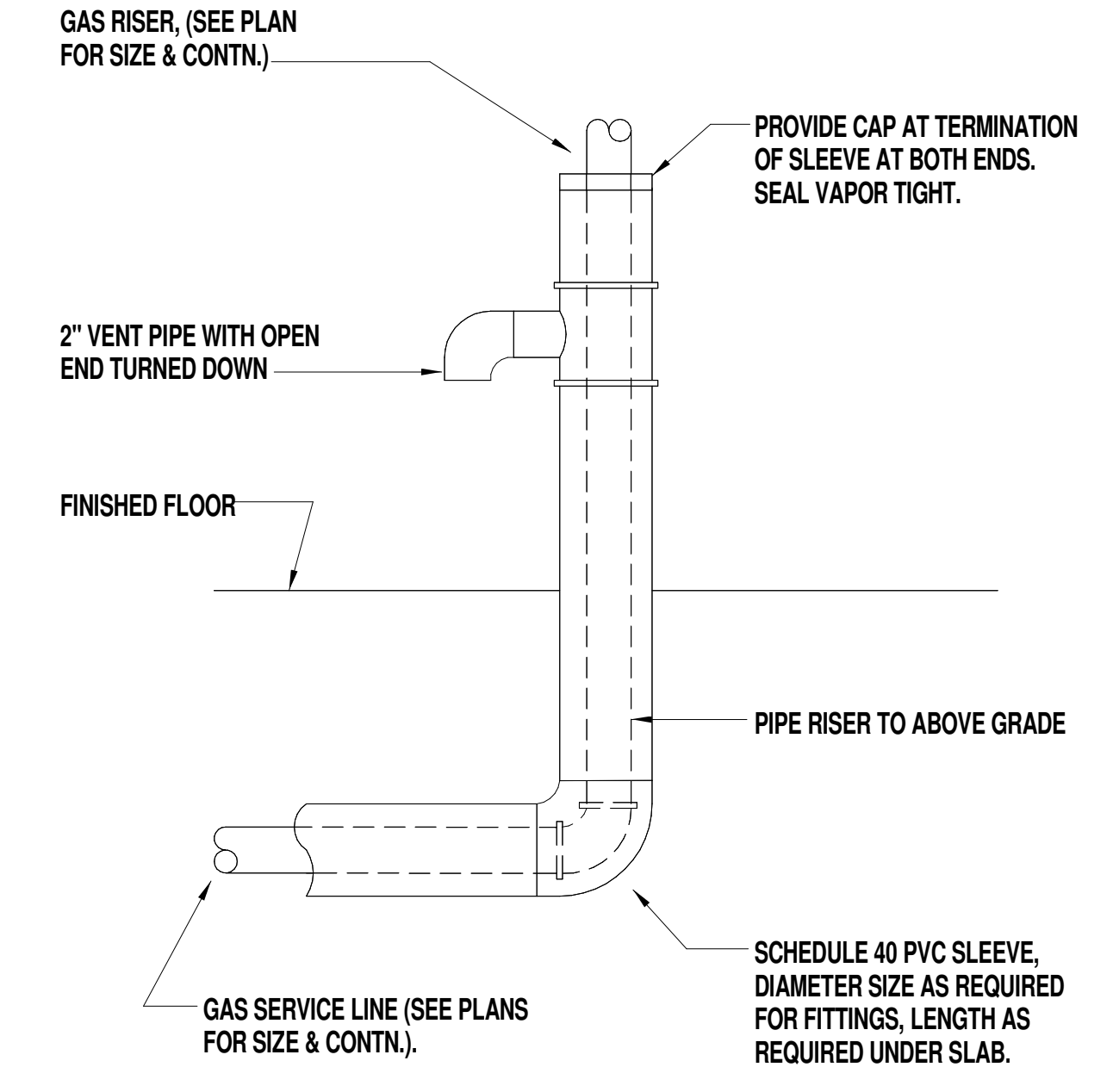
**LAB VACUUM PUMP SYSTEM DETAIL**  
NO SCALE

3 P3.2



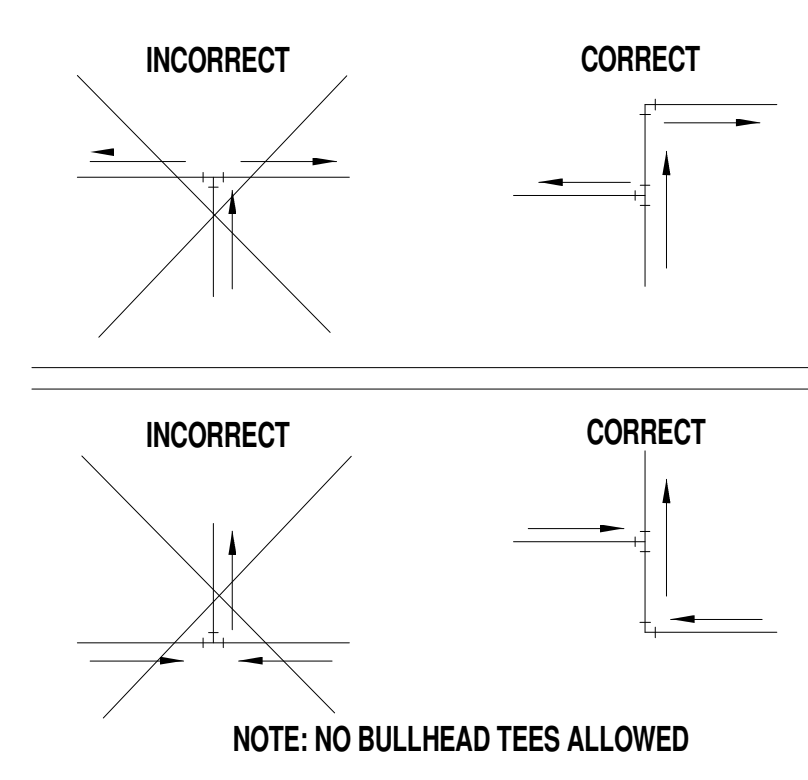
**WET PIPE RISER DETAIL**  
NO SCALE

4 P3.2



**GAS SLEEVE AND VENT DETAIL**  
NO SCALE

5 P3.2



**BRANCH PIPING SCHEMATIC**  
NO SCALE

7 P3.2

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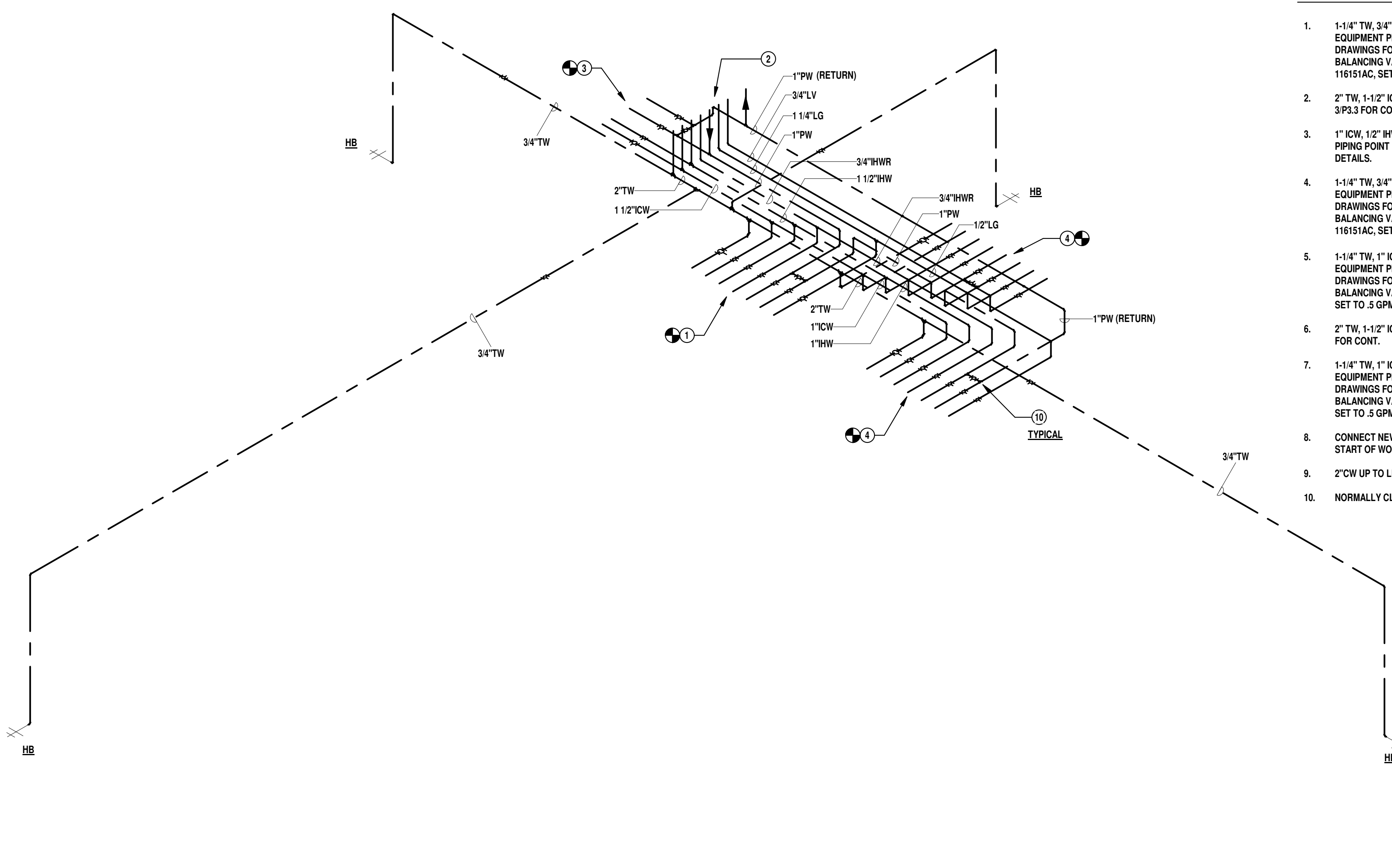


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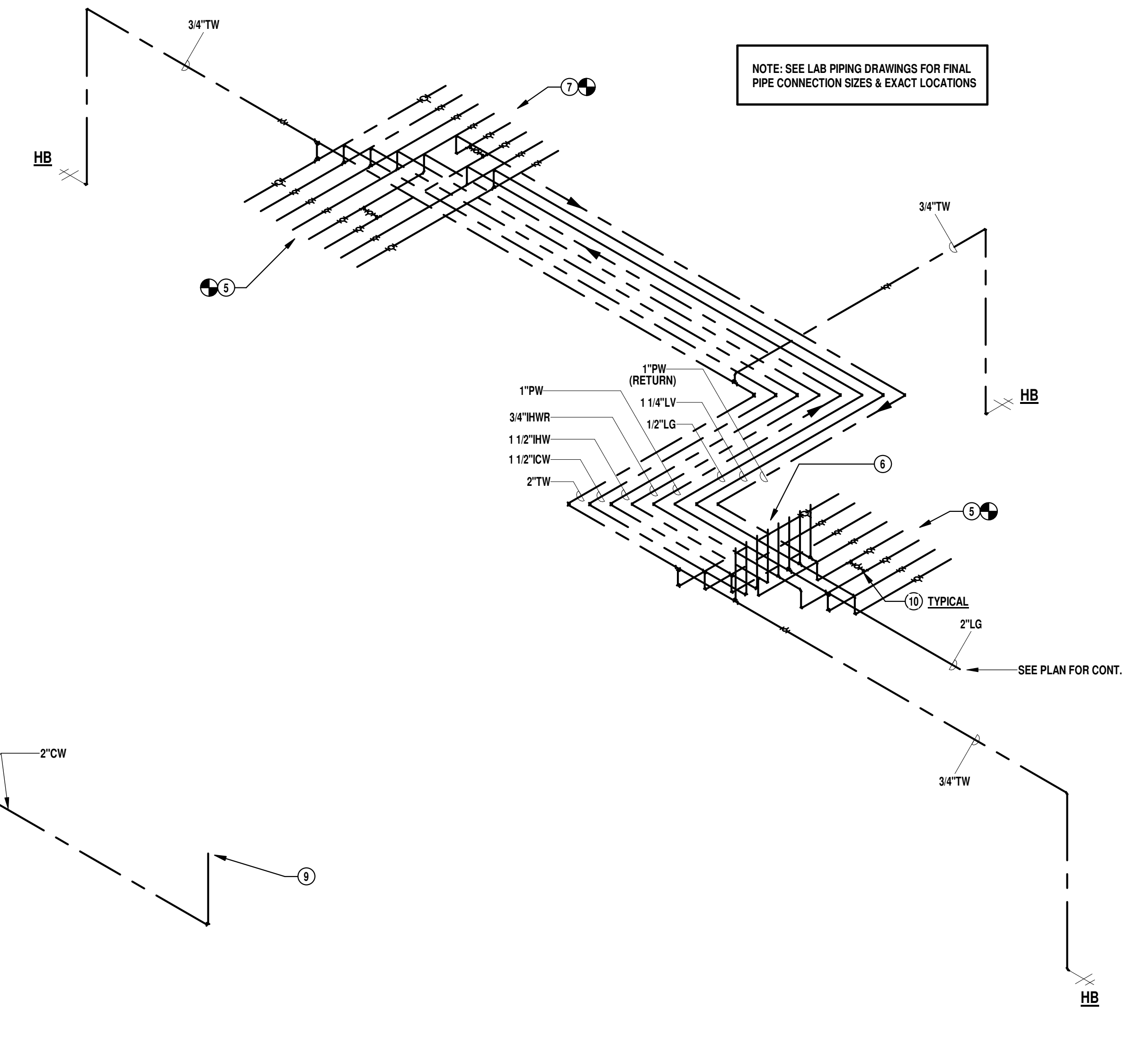


**PLUMBING KEYNOTES - LEVEL 1**

- 1-1/4" TW, 3/4" ICW, 3/4" HW, 1/2" HWR, (2) 1" PW, & 1-1/4" LG POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- 2" TW, 1-1/2" ICW, 2" HW, 3/4" HWR, 1" PW, 1-1/4" LG, 3/4" LV, 1/2" CA, & 1" PWR UP TO LEVEL 2. SEE 3P3.3 FOR CONT.
- 1" ICW, 1/2" HW, & (2) 1" PW POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
- 1-1/4" TW, 3/4" ICW, 3/4" HW, 1/2" HWR, (2) 1" PW, 1/2" LG, & 3/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 1" PW, 1-1/4" LG, & 1-1/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- 2" TW, 1-1/2" ICW, 1-1/2" HW, 3/4" HWR, 1" PW, 2" LG, 1-1/4" LV, & 1" PWR UP TO LEVEL 2. SEE 4P3.3 FOR CONT.
- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 1" PW, 1-1/4" LG, & 3/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- CONNECT NEW 2" CW TO EXISTING 2" CW & ROUTE ABOVE CEILING. FIELD VERIFY EXISTING PRIOR TO START OF WORK.
- 2" CW UP TO LEVEL 2. SEE 4P3.3 FOR CONTINUATION.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.



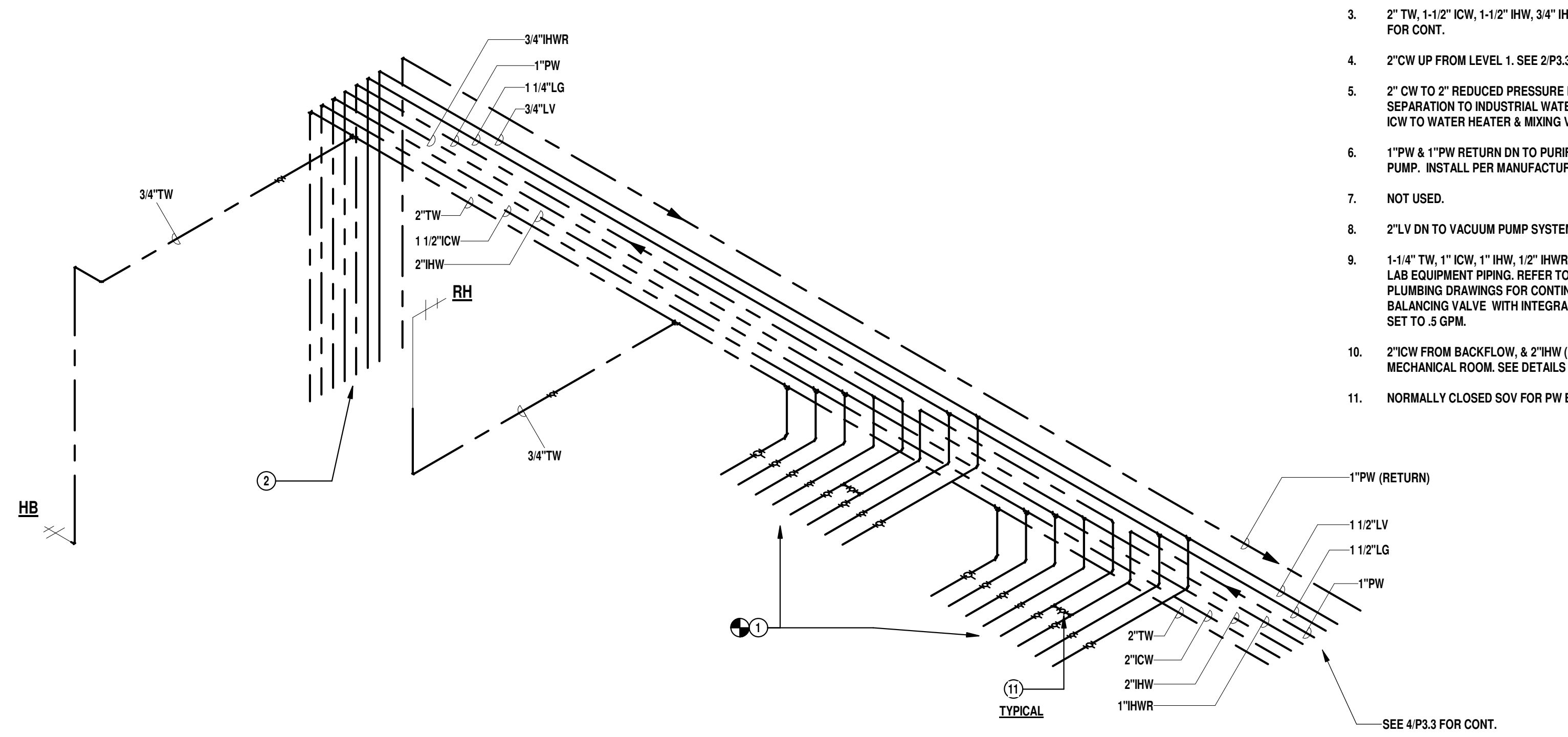
1 PLUMBING RISER DIAGRAM - WATER - LEVEL 1 AREA A - ADD ALT #1



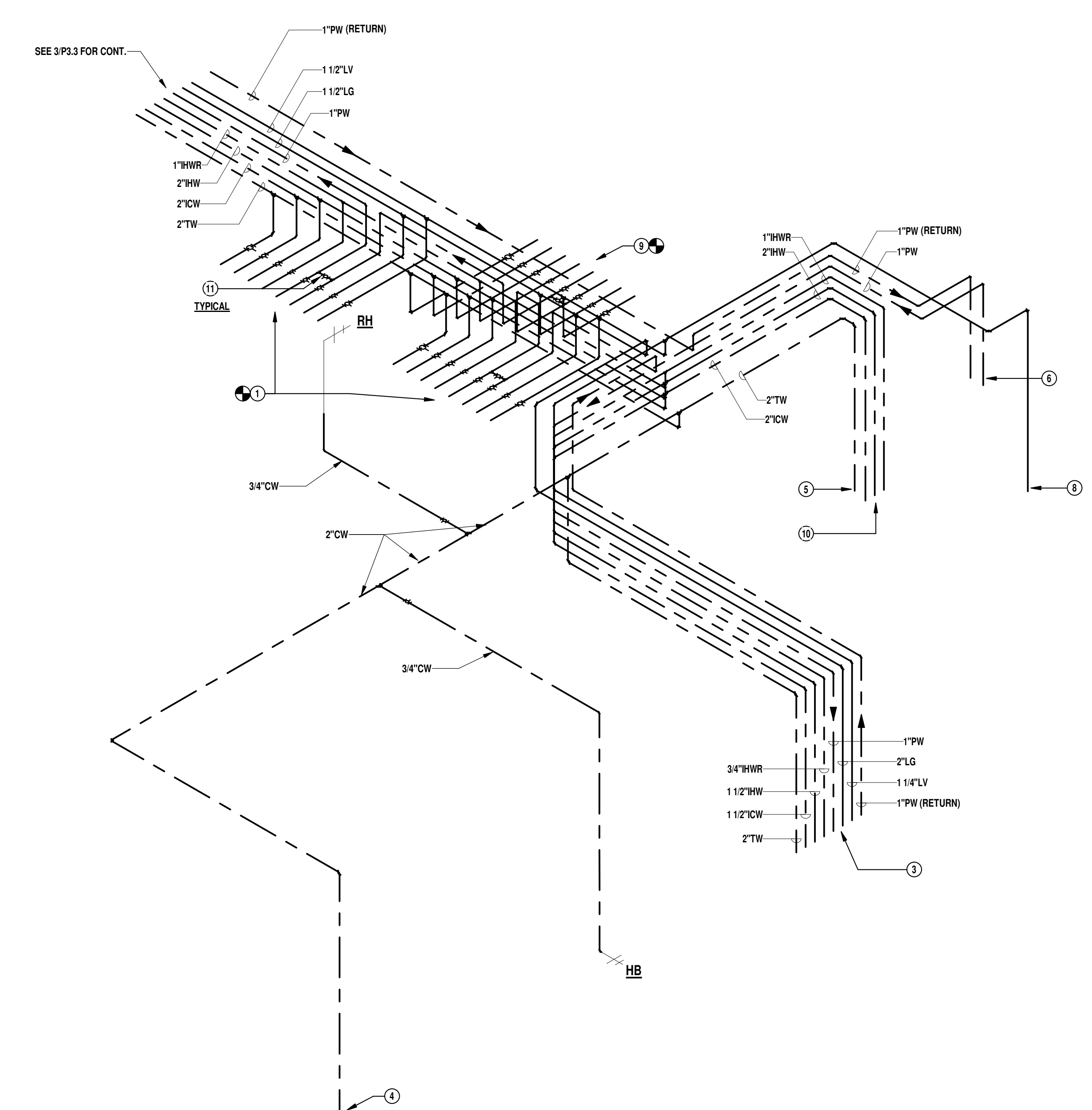
2 PLUMBING RISER DIAGRAM - WATER - LEVEL 1 AREA B - ADD ALT #2

**PLUMBING KEYNOTES - LEVEL 2**

- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 1" PW, 3/4" LG, & 1-1/4" LV POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- 2" TW, 1-1/2" ICW, 2" HW, 3/4" HWR, 1" PW, 1-1/4" LG, 3/4" LV, & 1" PWR DN TO LEVEL 1. SEE 1P3.3 FOR CONT.
- 2" TW, 1-1/2" ICW, 1-1/2" HW, 3/4" HWR, 1" PW, 2" LG, 1-1/4" LV, & 1" PWR UP FROM LEVEL 1. SEE 2P3.3 FOR CONT.
- 2" CW UP FROM LEVEL 1. SEE 2P3.3 FOR CONT.
- 2" CW TO 2" REDUCED PRESSURE BACKFLOW PREVENTER EQUAL OF FERCO #R25Y. POINT OF SEPARATION TO INDUSTRIAL WATER (IW). FROM BACKFLOW PROVIDE 2" ICW TO BUILDING & 1-1/2" ICW TO WATER HEATER & MIXING VALVE. SEE DETAILS 1P3.2 & 2P3.2 FOR CONT.
- 1" PW & 1" PW RETURN DN TO PURIFIED / DIONIZED WATER SYSTEM WITH FACTORY RECIRCULATION PUMP. INSTALL PER MANUFACTURER'S DETAILS. SEE SCHEDULE.
- NOT USED.
- 2" LV DN TO VACUUM PUMP SYSTEM. SEE SCHEDULE.
- 1-1/4" TW, 1" ICW, 1" HW, 1/2" HWR, (2) 1" PW, 1/2" LG, 1" LV, & 1/2" CA POINT OF CONNECTION FOR LAB EQUIPMENT PIPING. REFER TO LAB PIPING POINT OF CONNECTION SCHEDULE AND LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS. FOR HWR PROVIDE ADJUSTABLE THERMAL BALANCING VALVE WITH INTEGRAL OUTLET TEMP GAUGE & CHECK EQUAL OF "CALEFFF" # 116151AC, SET TO .5 GPM.
- 2" ICW FROM BACKFLOW, & 2" HW (120) & 1" HWR FROM MIXING VALVE UP DN IN WALL FROM MECHANICAL ROOM. SEE DETAILS 1P3.2 & 2P3.2 FOR CONT.
- NORMALLY CLOSED SOV FOR PW BY-PASS. TYPICAL. SEE LAB DRAWINGS.

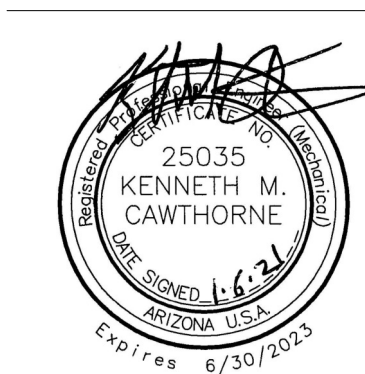


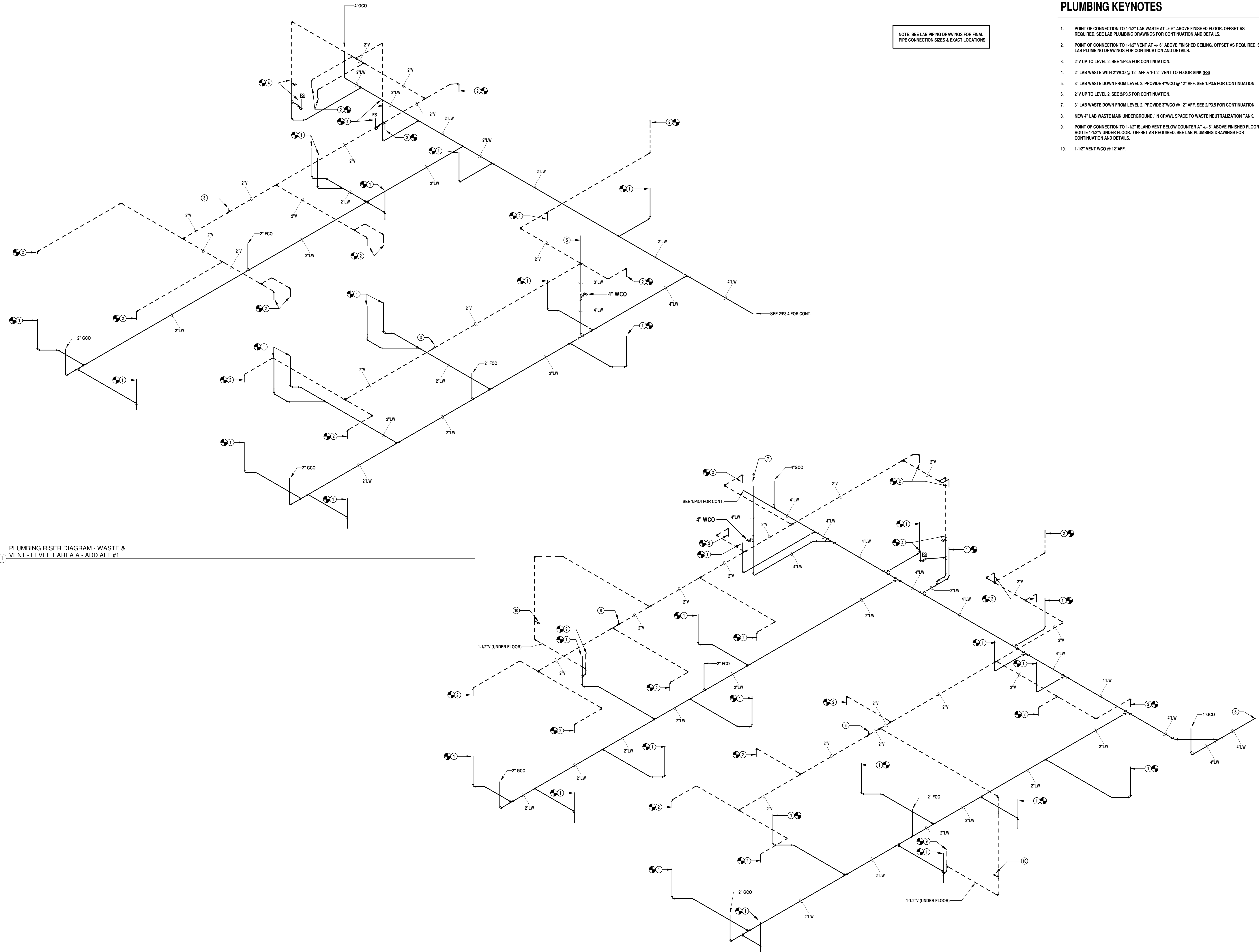
3 PLUMBING RISER DIAGRAM - WATER - LEVEL 2 AREA A - BASE BID



4 PLUMBING RISER DIAGRAM - WATER - LEVEL 2 AREA B - BASE BID

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1 PLUMBING RISER DIAGRAM - WASTE & VENT - LEVEL 1 AREA A - ADD ALT #1

2 PLUMBING RISER DIAGRAM - WASTE & VENT - LEVEL 1 AREA B - ADD ALT #2

NOTE: SEE LAB PIPING DRAWINGS FOR FINAL PIPE CONNECTION SIZES & EXACT LOCATIONS

**PLUMBING KEYNOTES**

1. POINT OF CONNECTION TO 1-1/2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
2. POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
3. 2" V UP TO LEVEL 2. SEE 1/P3.5 FOR CONTINUATION.
4. 2" LAB WASTE WITH 2" WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
5. 3" LAB WASTE DOWN FROM LEVEL 2. PROVIDE 4" WCO @ 12" AFF. SEE 1/P3.5 FOR CONTINUATION.
6. 2" V UP TO LEVEL 2. SEE 2/P3.5 FOR CONTINUATION.
7. 3" LAB WASTE DOWN FROM LEVEL 2. PROVIDE 3" WCO @ 12" AFF. SEE 2/P3.5 FOR CONTINUATION.
8. NEW 4" LAB WASTE MAIN UNDERGROUND / IN CRAWL SPACE TO WASTE NEUTRALIZATION TANK.
9. POINT OF CONNECTION TO 1-1/2" ISLAND VENT BELOW COUNTER AT +/- 6" ABOVE FINISHED FLOOR. ROUTE 1-1/2" V UNDER FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
10. 1-1/2" VENT WCO @ 12" AFF.

1/11/2021 2:42:21 PM

**KC MECHANICAL ENGINEERING, L.L.C.**

5447 East Fifth Street # 112  
Tucson, Arizona 85711  
Designers: Mech: TCB Plumb: MT

520/327-7611  
520/327-0432  
PROJECT# 19-366

PLUMBING RISER DIAGRAMS

**P3.4**  
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JOB NO: 1931.000  
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REVISIONS



**Pima Community College  
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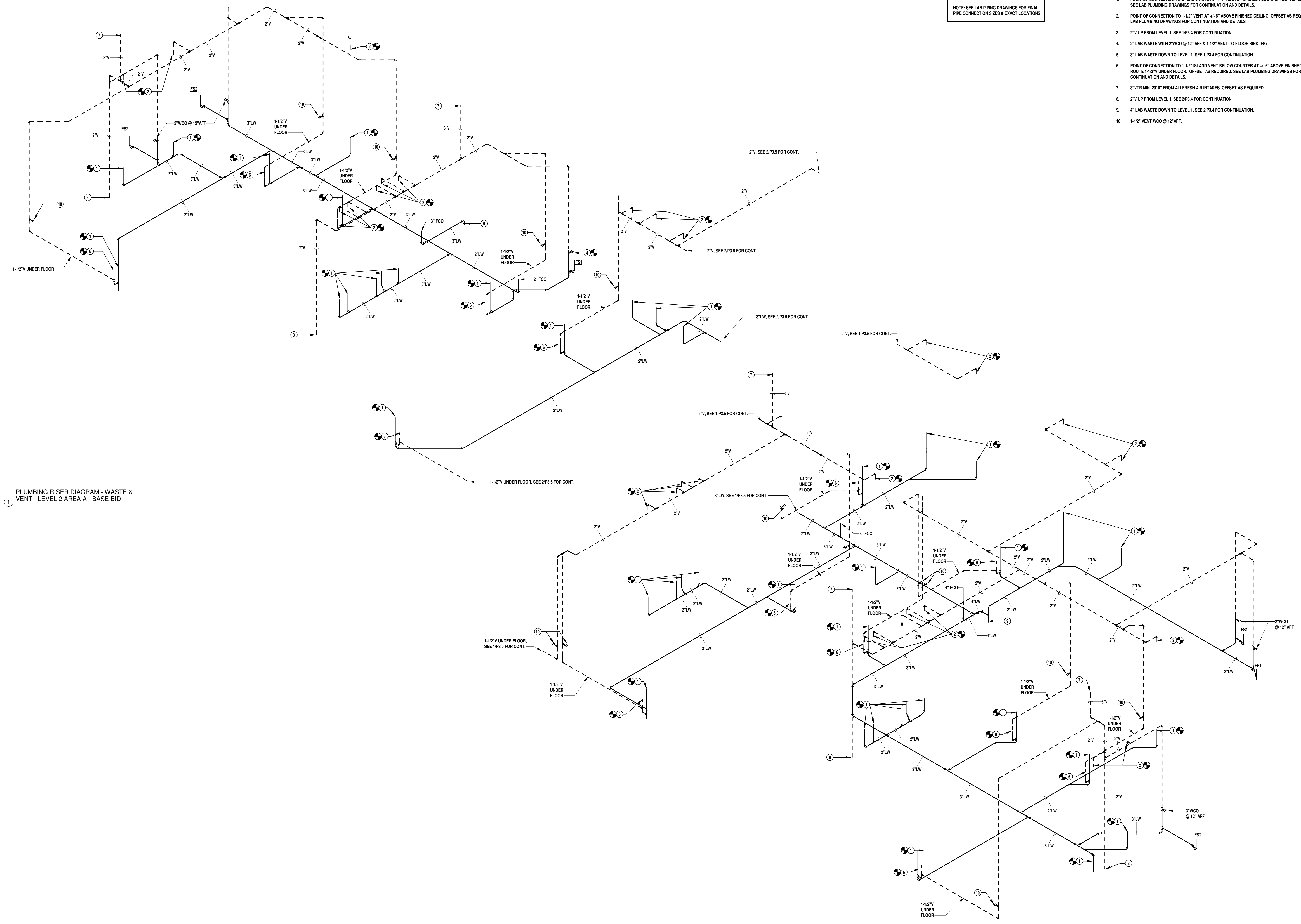
**CONSULTANTS**  
LABORATORY  
ARCS Fifth Avenue #400  
San Diego, CA 92103-3192  
Phone: 619.297.0169

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**ELECTRICAL**  
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NOTE: SEE LAB PIPING DRAWINGS FOR FINAL PIPE CONNECTION SIZES & EXACT LOCATIONS

### PLUMBING KEYNOTES

1. POINT OF CONNECTION TO 2" LAB WASTE AT +/- 6" ABOVE FINISHED FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
2. POINT OF CONNECTION TO 1-1/2" VENT AT +/- 6" ABOVE FINISHED CEILING. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
3. 2" V UP FROM LEVEL 1. SEE 1P3.4 FOR CONTINUATION.
4. 2" LAB WASTE WITH 2"WCO @ 12" AFF & 1-1/2" VENT TO FLOOR SINK (ES)
5. 3" LAB WASTE DOWN TO LEVEL 1. SEE 1P3.4 FOR CONTINUATION.
6. POINT OF CONNECTION TO 1-1/2" ISLAND VENT BELOW COUNTER AT +/- 6" ABOVE FINISHED FLOOR. ROUTE 1-1/2" UNDER FLOOR. OFFSET AS REQUIRED. SEE LAB PLUMBING DRAWINGS FOR CONTINUATION AND DETAILS.
7. 3" VTR MIN. 20'-0" FROM ALL FRESH AIR INTAKES. OFFSET AS REQUIRED.
8. 2" V UP FROM LEVEL 1. SEE 2P3.4 FOR CONTINUATION.
9. 4" LAB WASTE DOWN TO LEVEL 1. SEE 2P3.4 FOR CONTINUATION.
10. 1-1/2" VENT WCO @ 12" AFF.

1 PLUMBING RISER DIAGRAM - WASTE & VENT - LEVEL 2 AREA A - BASE BID

2 PLUMBING RISER DIAGRAM - WASTE & VENT - LEVEL 2 AREA B - BASE BID

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 5447 East Fifth Street # 112 Tucson, Arizona 85711  
 520/327-7611 520/327-0432  
 Designers: Mech: TCB Plumb: MT PROJECT# 19-366

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PLUMBING RISER DIAGRAMS

**P3.5**  
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## ELECTRICAL SYMBOL LEGEND

	LED DIMMER SWITCH AT + 48" A.F.F., U.N.O.
	LED DIMMER SWITCH & OCCUPANCY SENSOR AT + 48" A.F.F., U.N.O.
	THREE WAY LED DIMMER SWITCH AT +48" A.F.F., U.N.O.
	4"Ø APERTURE RECESSED MOUNTED LED LIGHT FIXTURE.
	WALL SURFACE MOUNTED LED LIGHT INTERIOR/EXTERIOR FIXTURE.
	24"X48" GRID LED TROFFER FIXTURE.
	LED LINEAR FIXTURE, LENGTH VARIES ACCORDING TO FIXTURE TYPE.
	RECESSED LED LINEAR WALL WASHER.
	EXIT LIGHT FIXTURE AND OUTLET. PROVIDE FACES AND DIRECTIONAL ARROWS AS REQUIRED.
	CEILING MOUNTED OCCUPANCY SENSOR.
	RACEWAY CONCEALED IN FLOOR, UNDERFLOOR, OR UNDERGROUND. 2 #12, 1 #12 GRD. IN 3/4" C. U.N.O.
	HOMERUN TO PANEL "C1". CIRCUITS 1 AND 3. NUMBER OF HASH-MARKS INDICATE NUMBER OF CONDUCTORS, EXCLUDING GROUND CONDUCTOR IN RACEWAY. REFER TO PANEL SCHEDULES FOR RACEWAY AND CONDUCTOR SIZES.
	FLEXIBLE CONDUIT.
	GROUND, SIZED ACCORDING TO CODE, U.N.O.
	CONDUIT STUBBED OUT AND CAPPED.
	RECEPTACLE FOR EWS REMOTE CONDENSER.
	WALL MOUNTED GROUND FAULT CIRCUIT INTERRUPTER, WEATHERPROOF, DUPLEX CONVENIENCE RECEPTACLE AT +18" A.F.F.
	WALL MOUNTED TELE/DATA OUTLET AT +18" A.F.F., U.N.O. PROVIDE 1-1/4"C. FROM OUTLET TO CABLETRAY.
	CEILING MOUNTED DATA OUTLET. PROVIDE 1-1/4"C. FROM OUTLET TO CABLETRAY.
	PHONE WALL MOUNTED VOICE OUTLET AT +48" A.F.F., U.N.O. PROVIDE 1-1/4"C. FROM OUTLET TO CABLETRAY.
	JUNCTION BOX, SIZED ACCORDING TO CODE.
	WALL MOUNTED DUPLEX CONVENIENCE RECEPTACLE AT +18" A.F.F., U.N.O.
	WALL MOUNTED GROUND FAULT CIRCUIT INTERRUPTER, DUPLEX CONVENIENCE RECEPTACLE AT +48" A.F.F.
	WALL MOUNTED DOUBLE DUPLEX CONVENIENCE RECEPTACLE AT +18" A.F.F., U.N.O.
	TRANSFORMER, AS NOTED.
	DISCONNECT SWITCH, FUSED, SIZE AS NOTED.
	MOTOR OUTLET AND MOTOR CONNECTION.
	ELECTRICAL CONNECTION.
	METER SOCKET.
	FUSED DISCONNECT SWITCH IN SWITCHBOARD.
	PANELBOARD, REFER TO PANEL SCHEDULE.
	ELECTRICAL SERVICE ENTRANCE EQUIPMENT, REFER TO SINGLE LINE DIAGRAM
	FIRE ALARM PULL STATION AT + 48" A.F.F., U.N.O.
	FIRE ALARM SMOKE DETECTOR.
	FIRE ALARM AUDIO-VISUAL DEVICE AT +80" A.F.F., TO BOTTOM, U.N.O.
	FIRE ALARM VISUAL DEVICE AT +80" A.F.F., TO BOTTOM, U.N.O.
	FIRE ALARM FLOW SWITCH CONNECTION.
	FIRE ALARM TAMPER SWITCH CONNECTION
	FIRE ALARM CONTROL PANEL.
	OUTLET BOX FOR FUTURE CAMERA. PROVIDE 3/4"C. FROM OUTLET TO CABLETRAY.
	PROXIMITY CARD READER OUTLET @48" A.F.F.
	DUCT SMOKE DETECTOR.
	DOOR CONTROL PROVISIONS AND DOOR STATUS MONITORING DEVICE. PROVIDE 3/4"C. TO ACCESSIBLE CEILING SPACE FROM HANDY BOX FACING DOWN IN FRAME AT STRIKE SIDE OF DOOR FRAME AND 3/4"C. FROM HANDY BOX FACING DOWN IN FRAME AT HINGE SIDE OF DOOR FRAME.

## ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR
A.F.G.	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
CU.	COPPER
EF	EXHAUST FAN
EWS	ELECTRIC WATER STATION
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD	GROUND
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
WP	WEATHERPROOF

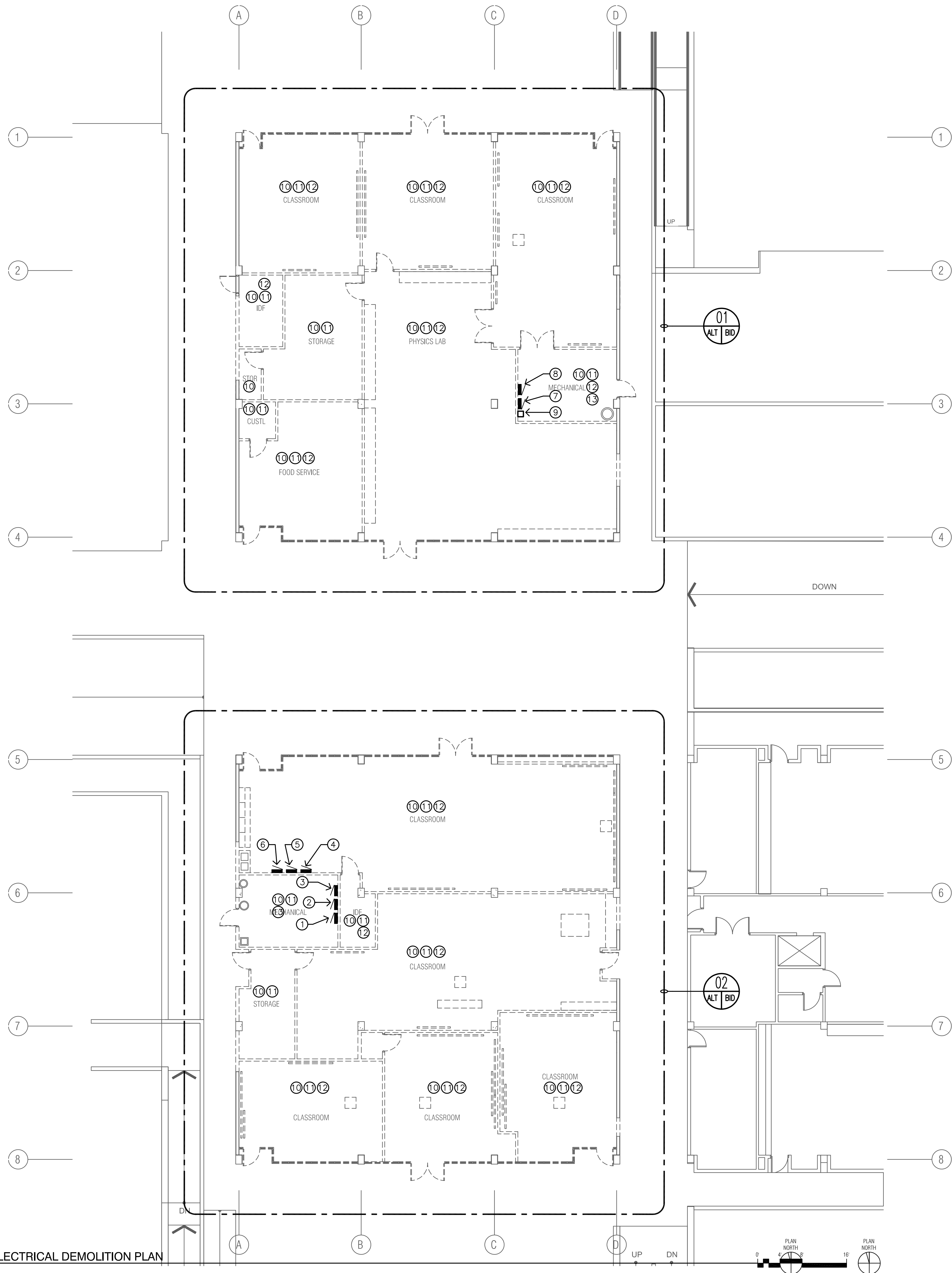


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**ELECTRICAL SYMBOLS LEGEND & ABBREVIATIONS**  
**E0.1**  
**CONSTRUCTION DOCUMENTS**



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1 FIRST FLOOR ELECTRICAL DEMOLITION PLAN  
SCALE: 1/8" = 1'-0"

- KEYNOTES:
- EXISTING PANEL "GP1" TO BE REMOVED.
  - EXISTING PANEL "GLT" TO BE REMOVED.
  - EXISTING PANEL "PAGP1" TO BE REMOVED.
  - EXISTING PANEL "GEM" TO BE REMOVED.
  - EXISTING PANEL "GP" TO BE REMOVED.
  - EXISTING PANEL "GL" TO BE REMOVED.
  - EXISTING PANEL "FP1" TO BE REMOVED.
  - EXISTING PANEL "FL1" TO BE REMOVED.
  - EXISTING IDF CABINET TO BE REMOVED.
  - REMOVE WALL MOUNTED & FLOOR MOUNTED RECEPTACLES IN THIS SPACE. REMOVE ASSOCIATED CONDUIT, BOXES, & WIRE.
  - REMOVE WALL AND CEILING MOUNTED LIGHT FIXTURES IN THIS SPACE. REMOVE ASSOCIATED SWITCHES, CONDUIT, BOXES, & WIRE.
  - REMOVE WALL, FLOOR, FIRE ALARM AND TELECOMMUNICATIONS DEVICES. REMOVE ASSOCIATED CONDUIT, BOXES, & CABLE.
  - DISCONNECT EXISTING AIR HANDLER & REMOVE FEEDER.

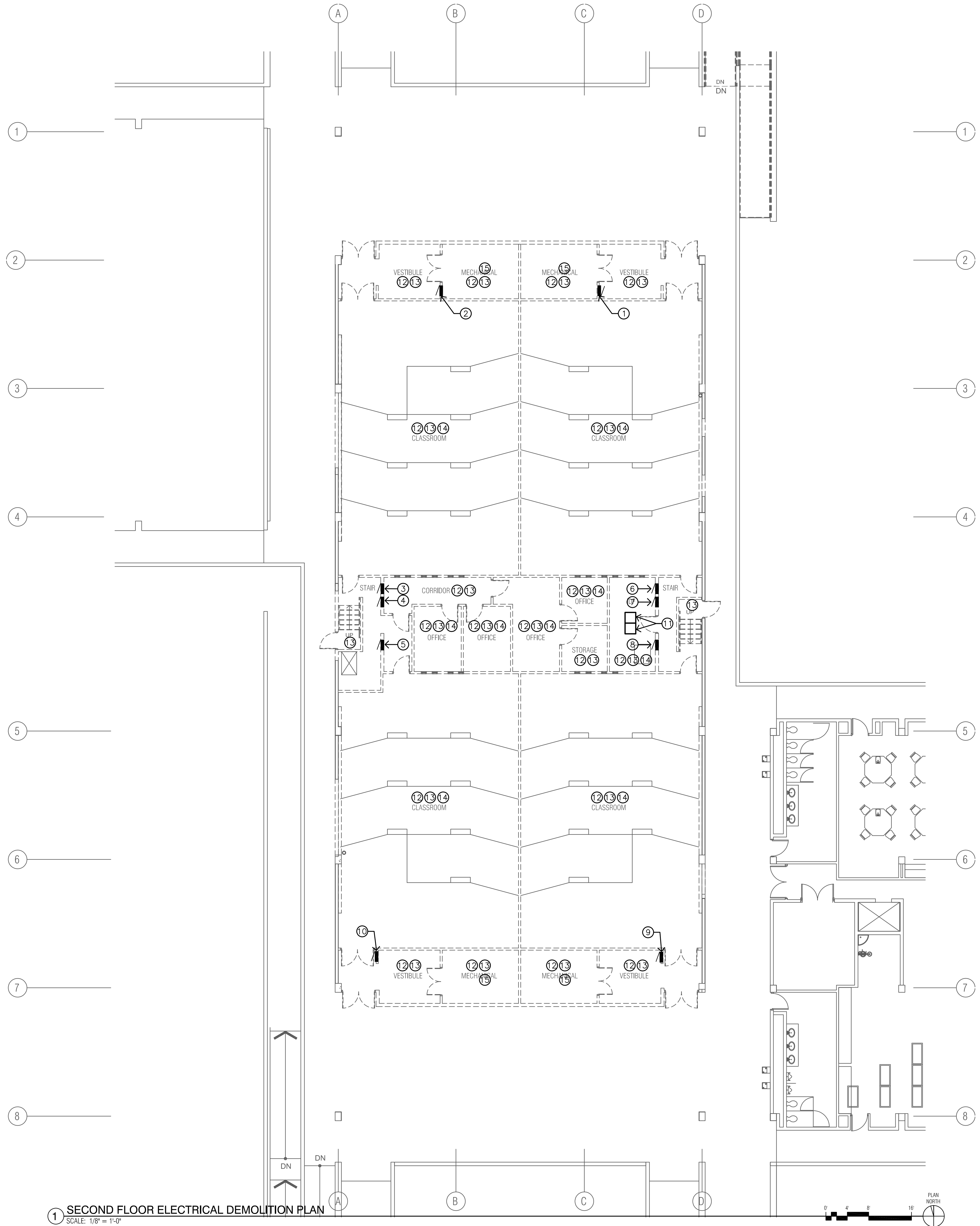
**ADD ALTERNATE BID #01**  
MICROBIOLOGY AND SYSTEMS ASSOCIATED WITH IT. CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
ORGANIC CHEMISTRY AND ASSOCIATED SYSTEMS. CONSTRUCTION COMPLETE AND IN PLACE.



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1 SECOND FLOOR ELECTRICAL DEMOLITION PLAN  
SCALE: 1/8" = 1'-0"

KEYNOTES:

1. EXISTING PANEL "FD1" TO BE REMOVED.
2. EXISTING PANEL "FD2" TO BE REMOVED.
3. EXISTING PANEL "FP3" TO BE REMOVED.
4. EXISTING PANEL "GP3" TO BE REMOVED.
5. EXISTING PANEL "FL2" TO BE REMOVED.
6. EXISTING PANEL "FP2" TO BE REMOVED.
7. EXISTING PANEL "GP2" TO BE REMOVED.
8. EXISTING PANEL "GOL" TO BE REMOVED.
9. EXISTING PANEL "GD1" TO BE REMOVED.
10. EXISTING PANEL "GD2" TO BE REMOVED.
11. EXISTING IDF RACKS TO BE REMOVED.
12. REMOVE WALL MOUNTED & FLOOR MOUNTED RECEPTACLES IN THIS SPACE. REMOVE ASSOCIATED CONDUIT, BOXES, & WIRE.
13. REMOVE WALL AND CEILING MOUNTED LIGHT FIXTURES IN THIS SPACE. REMOVE ASSOCIATED SWITCHES, CONDUIT, BOXES, & WIRE.
14. REMOVE WALL, FLOOR, FIRE ALARM AND TELECOMMUNICATIONS DEVICES. REMOVE ASSOCIATED CONDUIT, BOXES, & CABLE.
15. DISCONNECT EXISTING AIR HANDLER & REMOVE FEEDER.



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ELECTRICAL  
 SECOND FLOOR  
 DEMOLITION PLAN  
**ED2.2**  
 CONSTRUCTION DOCUMENTS

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 (520) 884-0045 M19094

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 PCC West Lab Building F  
 Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

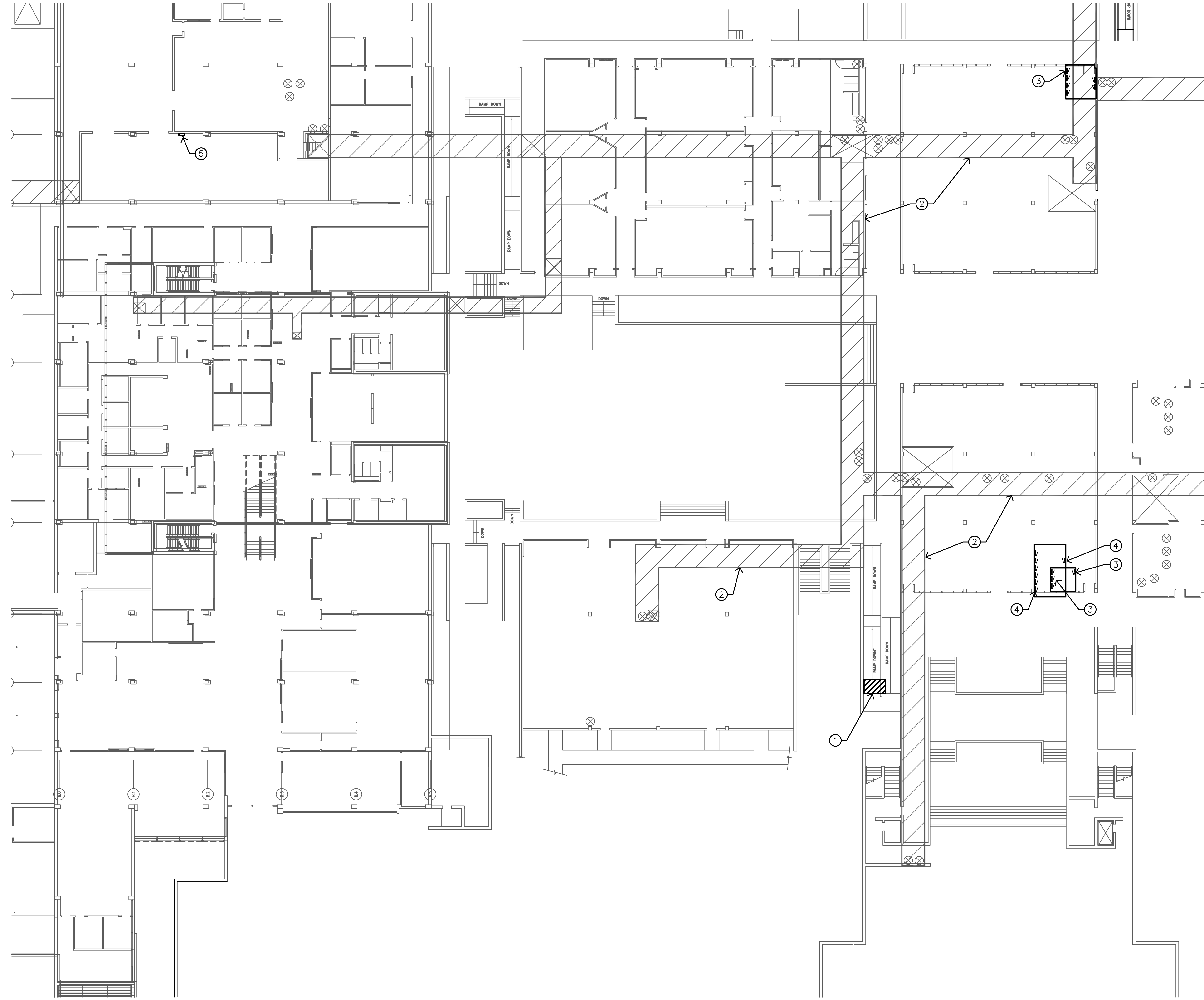
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 2202 W Anklam Rd, Tucson, AZ 85745  
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Mechanical  
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Electrical  
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 1925 East Ft. Lowell Road, Suite 200  
 Tucson, AZ 85719-2391  
 Phone: 520.884.0045

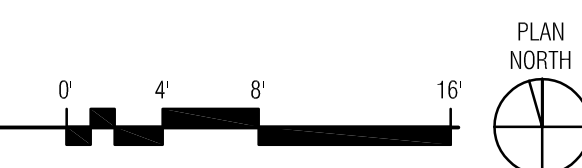
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 Suite 100  
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○ KEYNOTES:

1. EXISTING MAIN SWITCHBOARD "A" & "B" IN BASEMENT ELECTRICAL ROOM.
2. EXISTING TUNNELS IN BASEMENT.
3. NEW PANELS IN NEW ELECTRICAL ROOM ON FIRST FLOOR.
4. NEW PANELS IN NEW ELECTRICAL ROOM ON SECOND FLOOR.
5. EXISTING MAIN FIRE ALARM CONTROL PANEL IN CENTRAL PLANT ELECTRICAL ROOM.

1 BASEMENT-TUNNEL ELECTRICAL PLAN  
SCALE: 1/16" = 1'-0"



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BASEMENT-TUNNEL  
ELECTRICAL &  
TELECOMMUNICATIONS PLAN  
**E1.0**  
CONSTRUCTION DOCUMENTS

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2202 W Anklam Rd, Tucson, AZ 85745

Laboratory  
PCC West Science Labs  
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Tucson, AZ 85745  
Phone: 520.237.0159

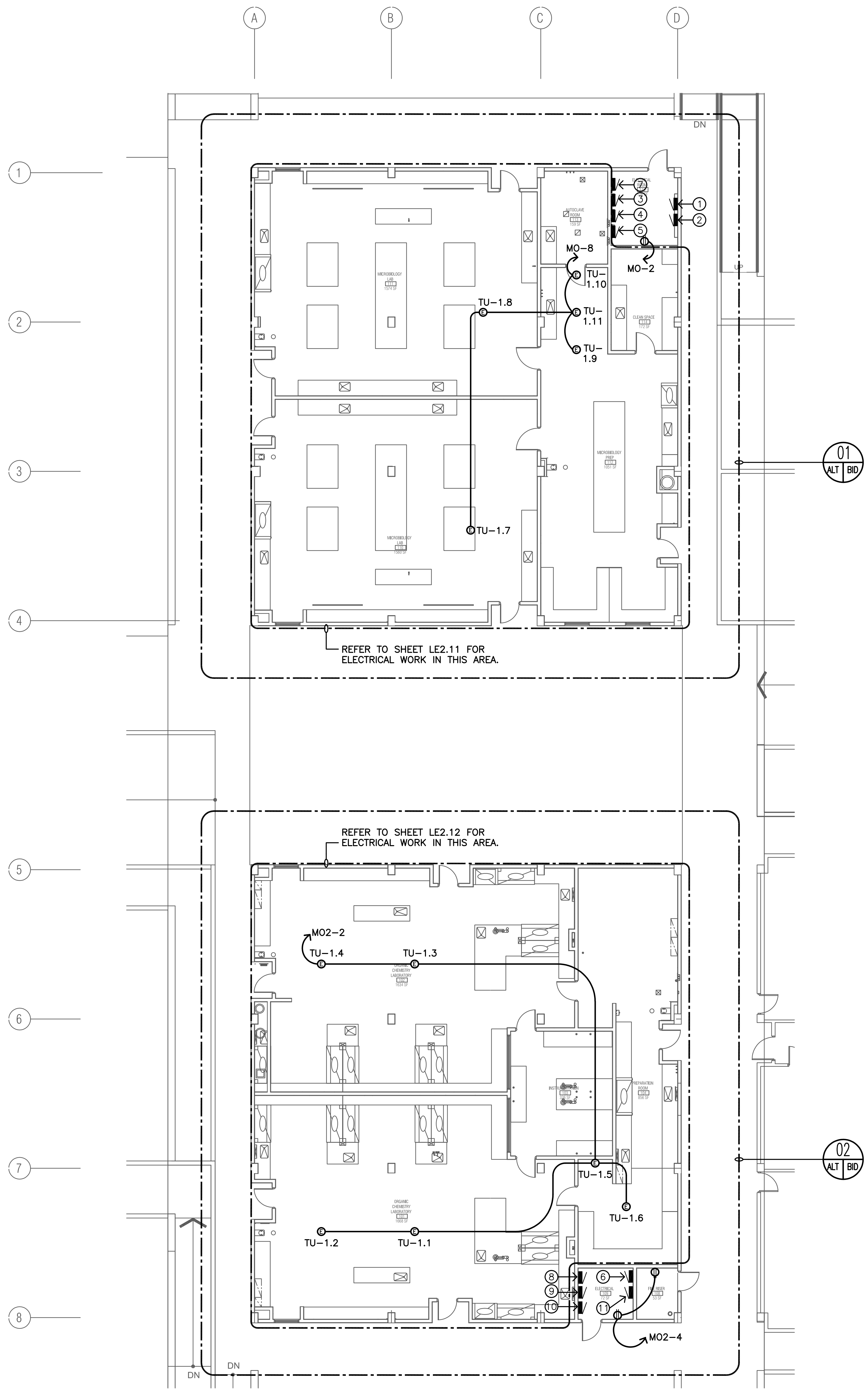
Mechanical  
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Phone: 520.323.3422

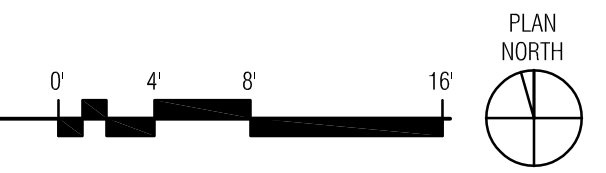
Electrical  
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**1** FIRST FLOOR ELECTRICAL POWER PLAN  
 SCALE: 1/8" = 1'-0"



**KEYNOTES:**

1. NEW PANEL "F1".
2. NEW PANEL "GEM".
3. NEW PANEL "1LP1".
4. NEW PANEL "1LP2".
5. NEW PANEL "1LP3".
6. NEW PANEL "1LP4".
7. NEW PANEL "M0".
8. NEW PANEL "1LP5".
9. NEW PANEL "1LP6".
10. NEW PANEL "1LP7".
11. NEW PANEL "MO2".

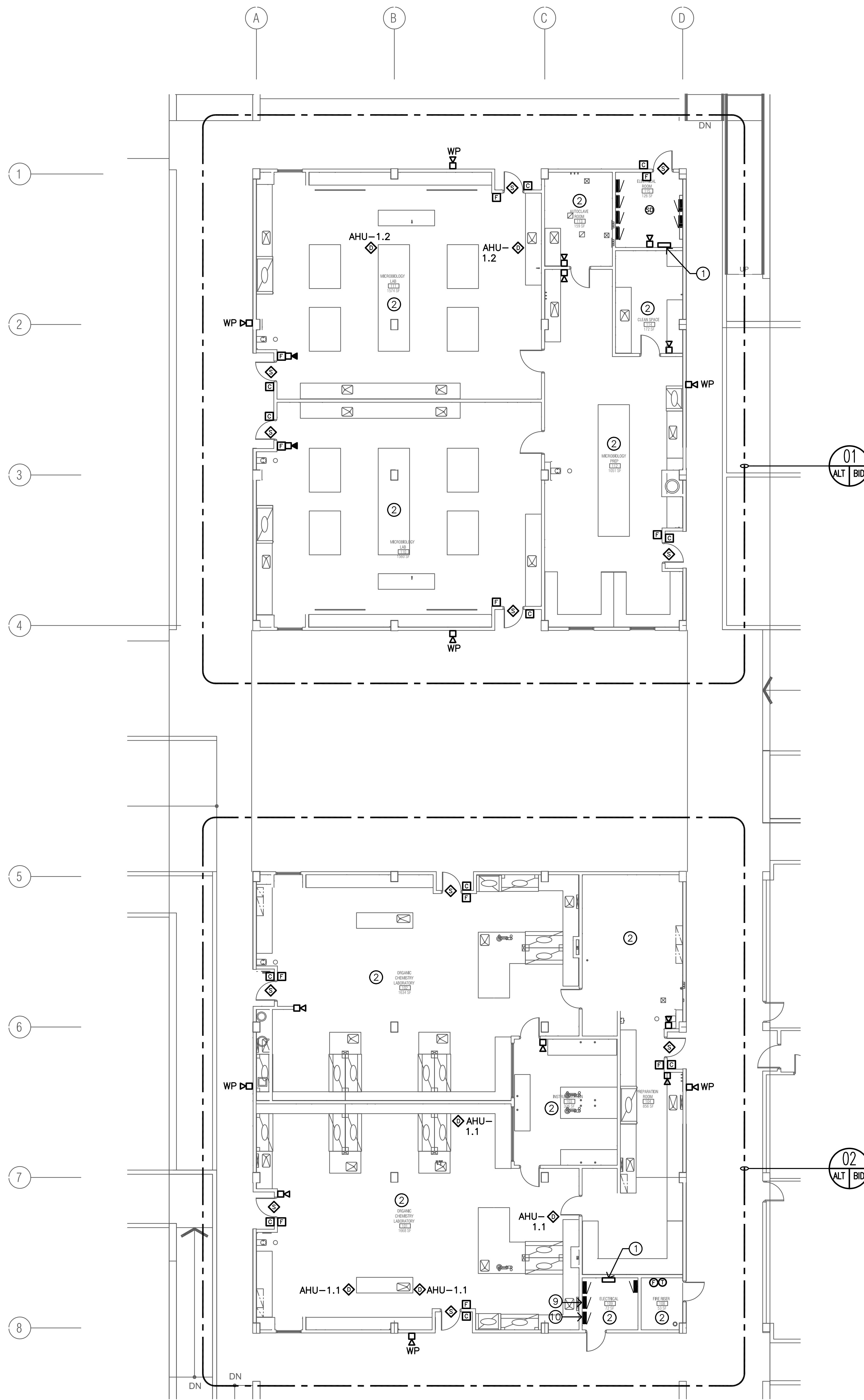
**ADD ALTERNATE BID #01**  
 MICROBIOLOGY AND SYSTEMS  
 ASSOCIATED WITH IT.  
 CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
 ORGANIC CHEMISTRY AND ASSOCIATED  
 SYSTEMS.  
 CONSTRUCTION COMPLETE AND IN PLACE.

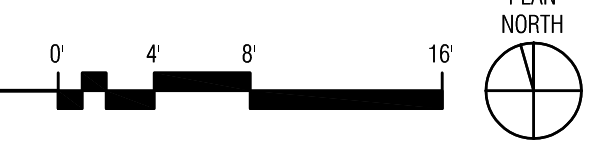


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**1** FIRST FLOOR ELECTRICAL SPECIAL SYSTEMS PLAN  
SCALE: 1/8" = 1'-0"



**ACCESS CONTROL SYSTEM GENERAL NOTES:**

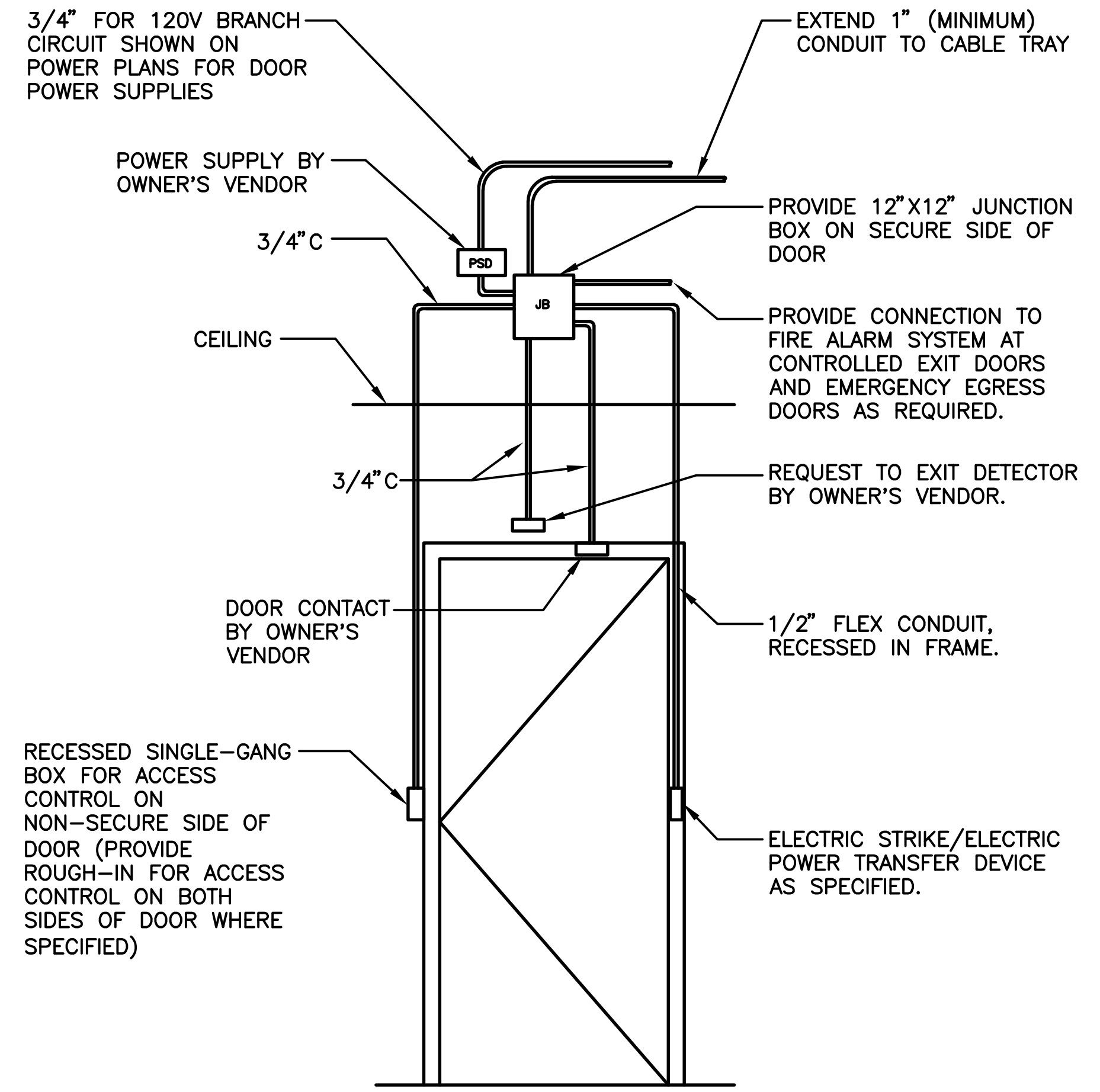
1. CONDUITS AND BOXES INDICATED WITHIN FRAMES APPLY TO HOLLOW METAL DOORS ONLY. ALUMINUM STOREFRONTS WILL ONLY REQUIRE 1-INCH CONDUIT STUBBED INO FRAME.
2. DOOR HARDWARE CONFIGURATIONS WILL VARY. ILLUSTRATION IS A GENERAL REPRESENTATION OF CONDITIONS. REFER TO DIVISION 8 DOOR HARDWARE SETS FOR INDIVIDUAL HARDWARE REQUIREMENTS.
3. DIVISION 26: PROVIDE ALL ROUGH-IN (BOTH LINE AND LOW VOLTAGE) AND LINE VOLTAGE CONNECTIONS AT ALL COMPONENT LOCATIONS FOR A COMPLETE AND OPERATIONAL SYSTEM.
4. INSTALLATION MEANS AND METHODS WILL VARY DEPENDING ON DOOR CONFIGURATIONS. CONCEAL ALL CARD READER ROUGH-IN BOXES, CONDUITS TO BOXES, CONDUITS TO DOOR HARDWARE AND FRAMES, AND CONDUITS TO/FROM POWER SUPPLIES (AND READER CONTROLLERS) IN WALLS AND CEILINGS. EXPOSED RACEWAY IN NEW CONSTRUCTION IS UNACCEPTABLE.
5. PROVIDE BUSHINGS ON ALL CONDUIT STUB-UPS.
6. CONDUIT STUBBED UP INTO INTERIOR ACCESSIBLE SPACES ABOVE FINISHED CEILINGS: IN LOCATIONS WITH HARD CEILINGS OR EXPOSED STRUCTURE, EXTEND CONDUIT TO SPACE ABOVE NEAREST LAY-IN CEILING AND PROVIDE PULLSTRING.
7. POWER SUPPLIES: ARE BY OWNER'S VENDOR.

**KEYNOTES:**

1. NEW FIRE ALARM POWER SUPPLY FOR FIRE ALARM DEVICES.
2. CONNECT ALL INTERIOR & EXTERIOR FIRE ALARM DEVICES ON THIS FLOOR TO EXISTING MAIN FIRE ALARM CONTROL PANEL IN CENTRAL PLANT ELECTRICAL ROOM.

**ADD ALTERNATE BID #01**  
MICROBIOLOGY AND SYSTEMS ASSOCIATED WITH IT.  
CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
ORGANIC CHEMISTRY AND ASSOCIATED SYSTEMS.  
CONSTRUCTION COMPLETE AND IN PLACE.

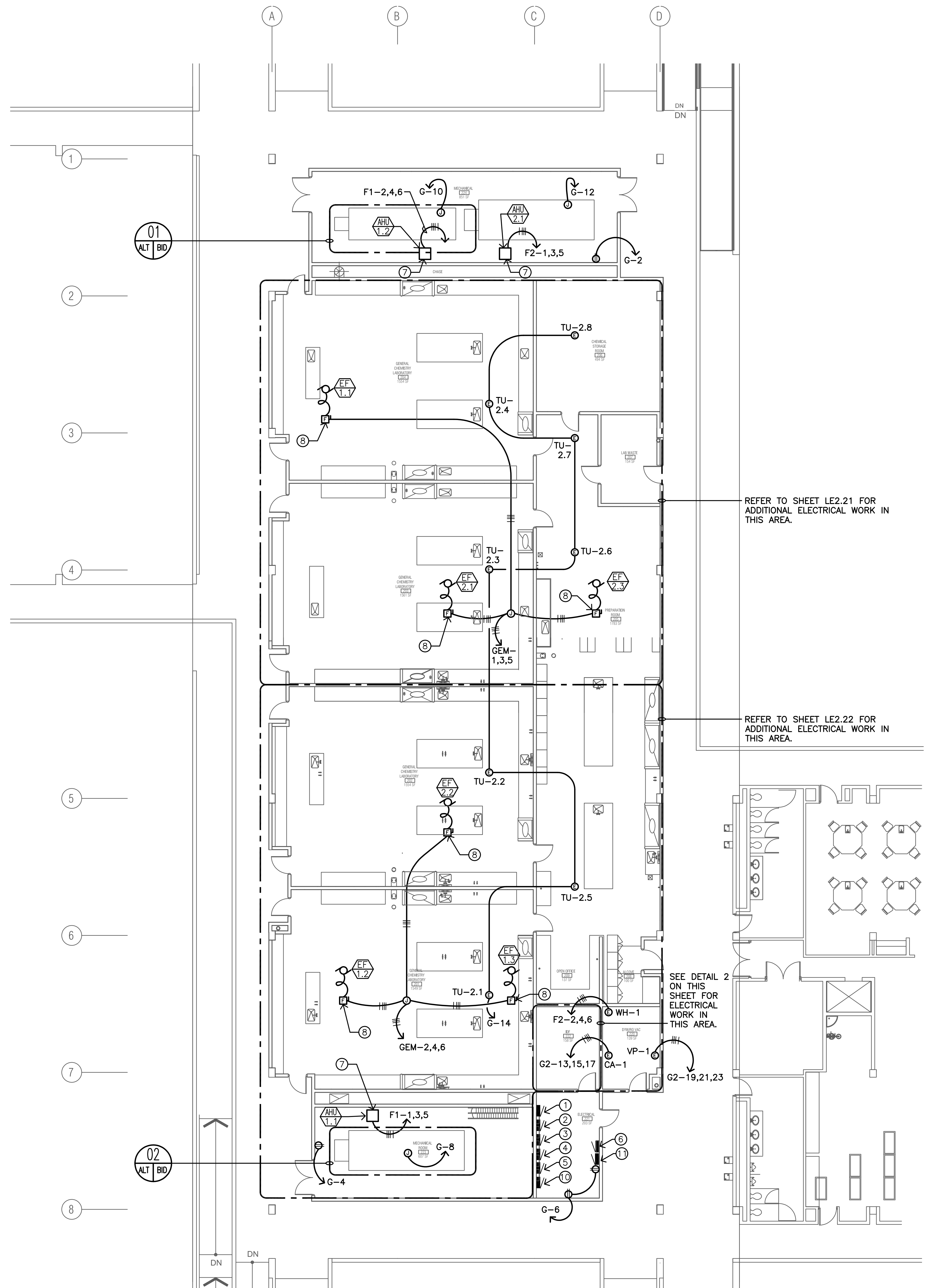


**2** SINGLE DOOR ACCESS CONTROL SYSTEM DIAGRAM  
NOT TO SCALE

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1 SECOND FLOOR ELECTRICAL POWER PLAN  
SCALE: 1/8" = 1'-0"

REFER TO SHEET LE2.21 FOR ADDITIONAL ELECTRICAL WORK IN THIS AREA.

REFER TO SHEET LE2.22 FOR ADDITIONAL ELECTRICAL WORK IN THIS AREA.

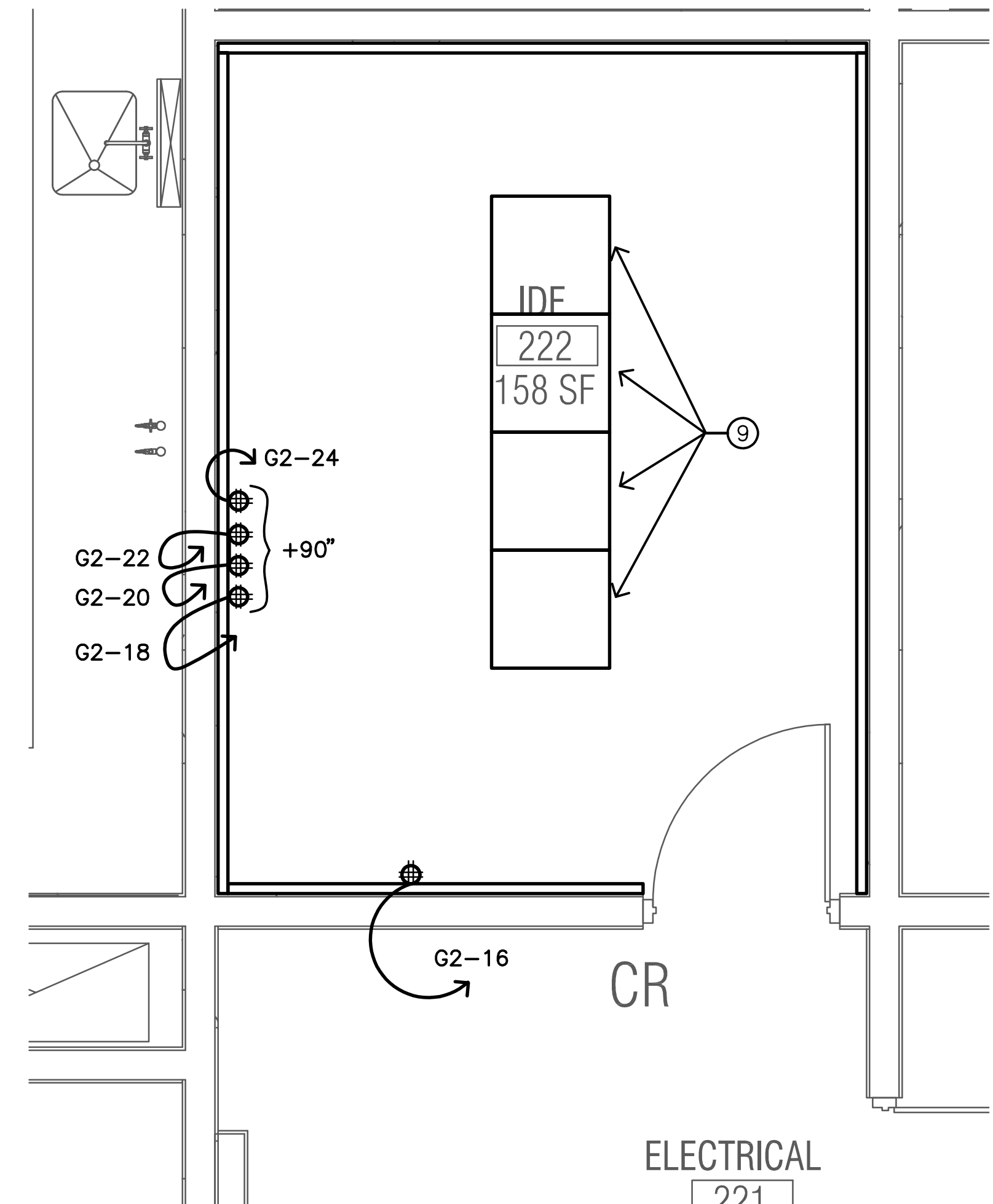
SEE DETAIL 2 ON THIS SHEET FOR ELECTRICAL WORK IN THIS AREA.

KEYNOTES:

1. NEW PANEL "F2".
2. NEW PANEL "2LP1".
3. NEW PANEL "2LP2".
4. NEW PANEL "2LP3".
5. NEW PANEL "2LP4".
6. NEW PANEL "G".
7. REFER TO MECHANICAL DRAWINGS FOR VFD'S.
8. 30A/3P, WP, 480V, ON ROOF.
9. NEW IDF RACKS.
10. NEW PANEL "2LP5".
11. NEW PANEL "G2".

**ADD ALTERNATE BID #01**  
HVAC UNIT FOR MICROBIOLOGY ENCLOSURE AND UNIT FOR GENERAL CHEMISTRY = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
HVAC UNIT FOR ORGANIC CHEMISTRY. ENCLOSURE SHELL SPACE = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.



2 SECOND FLOOR IDF ROOM ELECTRICAL POWER PLAN  
SCALE: 1/2" = 1'-0"

ELECTRICAL

221

PLAN NORTH

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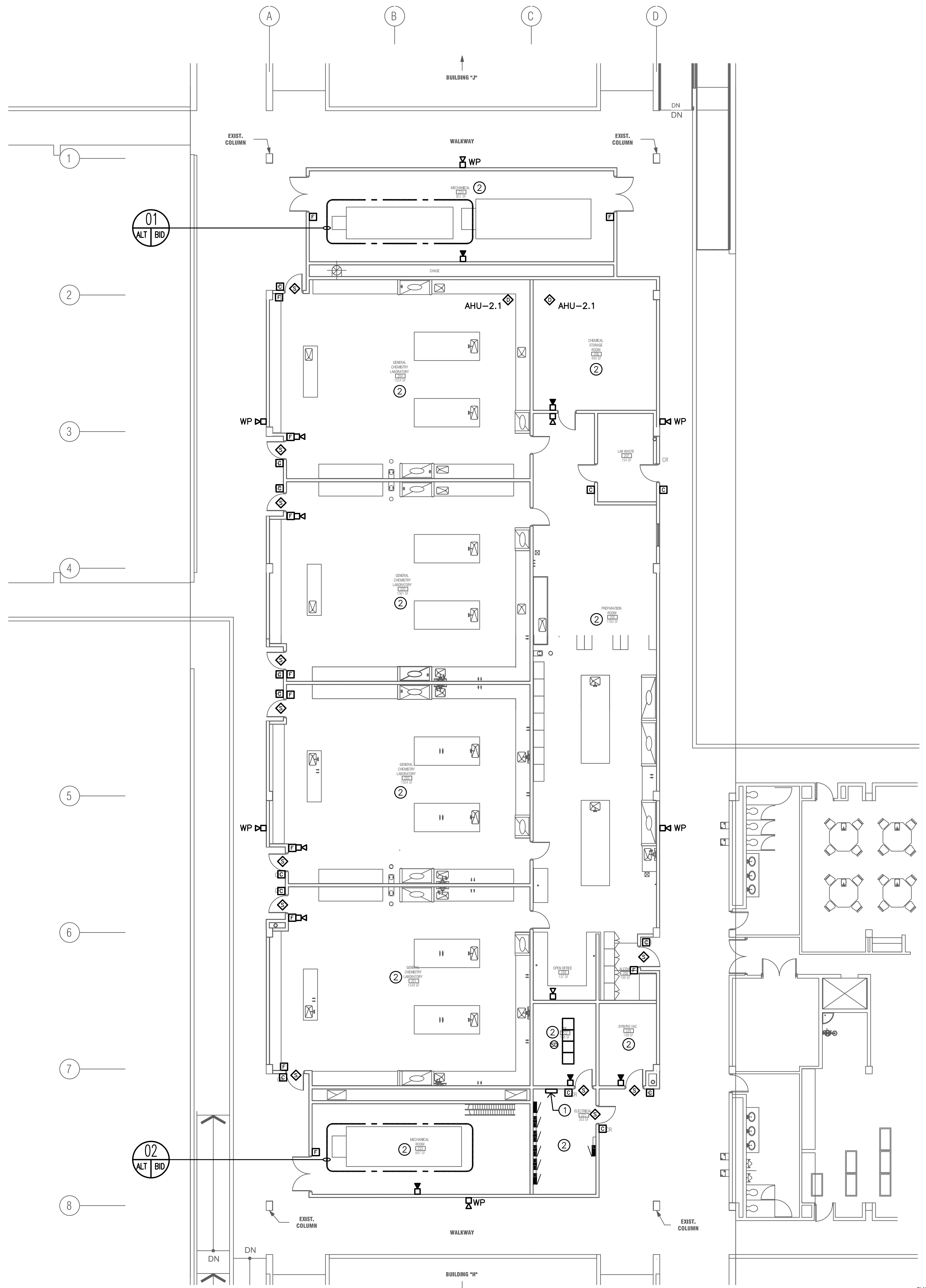
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REVISIONS

ELECTRICAL  
SECOND FLOOR  
POWER PLAN  
**E2.20**  
CONSTRUCTION DOCUMENTS

5/14/2020 9:55:28 AM



1 SECOND FLOOR ELECTRICAL SPECIAL SYSTEMS PLAN  
SCALE: 1/8" = 1'-0"



○ KEYNOTES:

1. NEW FIRE ALARM POWER SUPPLY FOR FIRE ALARM DEVICES.
2. CONNECT ALL INTERIOR & EXTERIOR FIRE ALARM DEVICES ON THIS FLOOR TO EXISTING MAIN FIRE ALARM CONTROL PANEL IN CENTRAL PLANT ELECTRICAL ROOM.

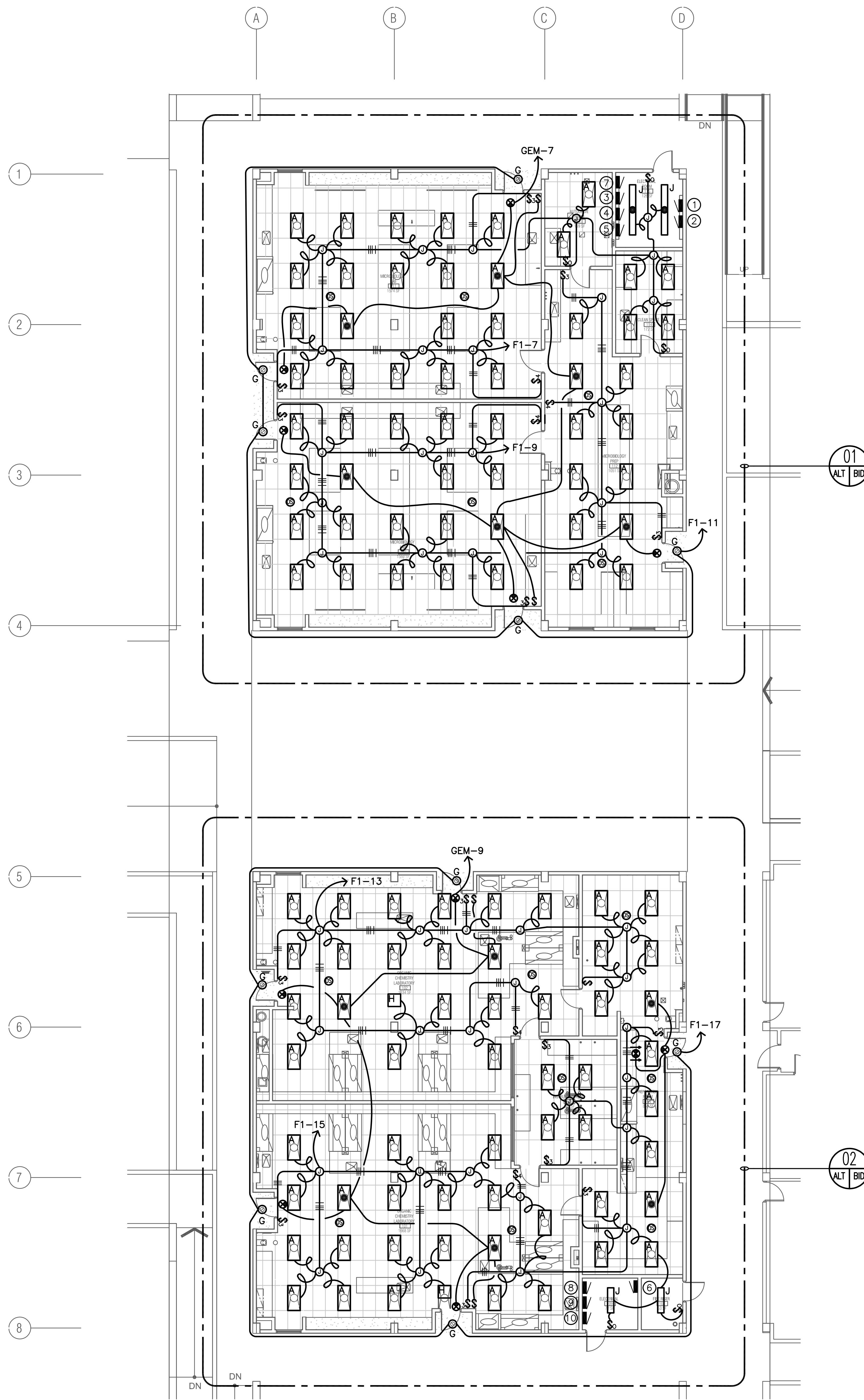
**ADD ALTERNATE BID #01**  
HVAC UNIT FOR MICROBIOLOGY ENCLOSURE AND UNIT FOR GENERAL CHEMISTRY = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
HVAC UNIT FOR ORGANIC CHEMISTRY. ENCLOSURE SHELL SPACE = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.



**DRAWN BY:** ND  
**JOB NO:** 1931.000  
**DATE:** 01/08/2021  
**REVISIONS**

5/14/2020 9:55:28 AM



1 FIRST FLOOR ELECTRICAL LIGHTING PLAN  
SCALE: 1/8" = 1'-0"

○ KEYNOTES:

1. NEW PANEL "F1".
2. NEW PANEL "GEM".
3. NEW PANEL "1LP1".
4. NEW PANEL "1LP2".
5. NEW PANEL "1LP3".
6. NEW PANEL "1LP4".
7. NEW PANEL "M0".
8. NEW PANEL "1LP5".
9. NEW PANEL "1LP6".
10. NEW PANEL "1LP7".

**ADD ALTERNATE BID #01**  
MICROBIOLOGY AND SYSTEMS  
ASSOCIATED WITH IT.  
CONSTRUCTION COMPLETE AND IN PLACE.

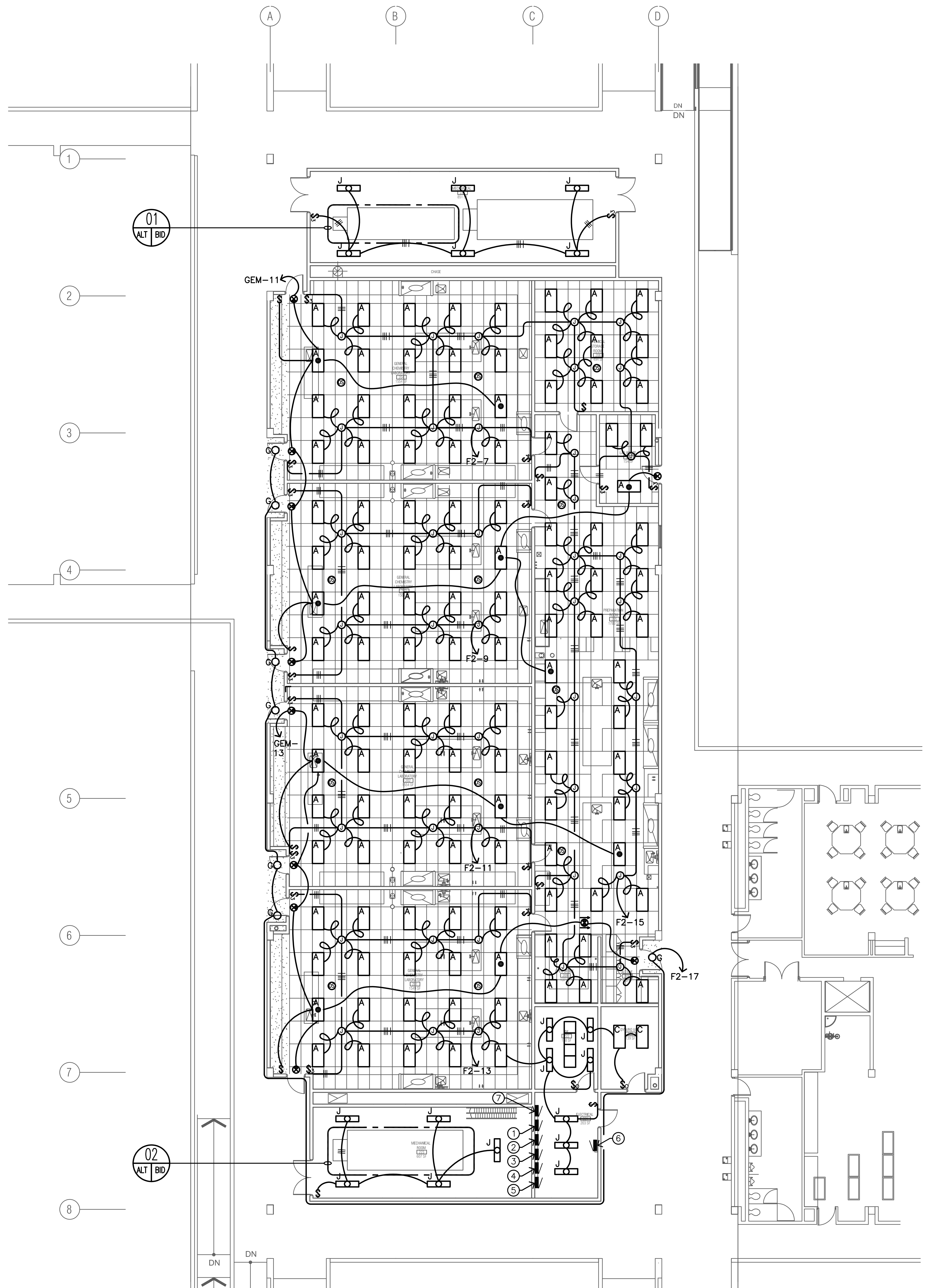
**ADD ALTERNATE BID #02**  
ORGANIC CHEMISTRY AND ASSOCIATED  
SYSTEMS.  
CONSTRUCTION COMPLETE AND IN PLACE.



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REVISIONS



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1 SECOND FLOOR ELECTRICAL LIGHTING PLAN  
SCALE: 1/8" = 1'-0"



○ KEYNOTES:

1. NEW PANEL "F2".
2. NEW PANEL "2LP1".
3. NEW PANEL "2LP2".
4. NEW PANEL "2LP3".
5. NEW PANEL "2LP4".
6. NEW PANEL "GC".
7. NEW PANEL "2LP5".

**ADD ALTERNATE BID #01**  
HVAC UNIT FOR MICROBIOLOGY  
ENCLOSURE AND UNIT FOR GENERAL  
CHEMISTRY = BASE BID.  
CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
HVAC UNIT FOR ORGANIC CHEMISTRY.  
ENCLOSURE SHELL SPACE = BASE BID.  
CONSTRUCTION COMPLETE AND IN PLACE.

CONSULTANTS

Laboratory  
REDL Facility  
2301 E. Fernado Galvez  
Tucson, AZ 85714  
Phone: 619.237.0159

Mechanical  
KCM Mechanical Engineering  
447 E. Pinal  
Tucson, AZ 85711  
Phone: 520.327.7611

Structural  
Turner Structural Engineering  
2226 N. W. 10th Pl.  
Tucson, AZ 85716  
Phone: 520.323.3422

Electrical  
Monrad Engineering, Inc.  
1925 East Fl. Lowell Road, Suite 200  
Tucson, AZ 85719  
Phone: 520.884.0045

**PCC West Science Labs  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745



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DATE: 01/08/2021  
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LOCKOUT - TAGOUT - TESTOUT  
**MONRAD**  
ENGINEERING INC  
CONSULTING ELECTRICAL ENGINEERS  
1925 East Fl. Lowell Road, Suite 200  
Tucson, Arizona 85719-2391  
(520) 884-0045 M19094

ELECTRICAL  
SECOND FLOOR  
LIGHTING PLAN  
**E3.2**  
CONSTRUCTION DOCUMENTS

**bws ARCHITECTS**  
BURNS WALK-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Tucson, Arizona 85714  
320.795.2705 Fax: 320.795.6171  
www.bwsarch.com



KEYNOTES:

1. REFER TO ONE LINE DIAGRAM.

PANEL GEM 277 / 480 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 14,000 MINIMUM A.I.C. RATING																	
100 A. BUS 100 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	EF-1.1, 2.1, 2.3	20	12	3/4"	3	5			3	5			3/4"	10	30	EF-1.2, 1.3, 2.2	2
3																	4
5																	6
7	LTG-EMERGENCY	20/1			0.4	-										SPACE	8
9									0.4	-							10
11									0.4	-							12
13																	14
15	SPARE																16
17																	18
19																	20
21																	22
23																	24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 25.6 KVA																	
DEMAND LOAD = 26 KVA																	

PANEL F1 277 / 480 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 14,000 MINIMUM A.I.C. RATING																	
200 A. BUS 200 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	AHU-1.1	60	4	1"	11	7			11	7			1"	8	40	AHU-1.2	2
3																	4
5																	6
7	LTG	20/1	12	3/4"	1.2	-										SPACE	8
9									1.3	-							10
11	LTG-EXTERIOR								0.2	-							12
13	LTG				1.1	1							3/4"	12	20	STERILIZER	14
15									1.5	1							16
17	LTG-EXTERIOR								0.2	1							18
19	STERILIZER	50	8	1"	9	15							1-1/4"	2	100	PANEL "F2"	20
21									9	14							22
23																	24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 131 KVA																	
DEMAND LOAD = 133 KVA																	

PANEL F2 277 / 480 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 14,000 MINIMUM A.I.C. RATING																	
100 A. BUS 100 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	AHU-2.1	60	4	1"	11	1.5			11	1.5			3/4"	12	20	WH-1	2
3																	4
5																	6
7	LTG	20/1	12	3/4"	1.3	-										SPACE	8
9									0.9	-							10
11									0.9	-							12
13																SPACE	14
15									1.1	-							16
17	LTG-EXTERIOR								1.3	-							18
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 42.3 KVA																	
DEMAND LOAD = 43.5 KVA																	

PANEL MO 120 / 208 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 10,000 MINIMUM A.I.C. RATING																	
225 A. BUS 225 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	SPARE	20/1			0.2								3/4"	10	20/1	RECEPTS	2
3																	4
5																	6
7	PANEL "1LP2"	100	(1)	(1)	7	0.5							3/4"	10		TU'S	8
9									7	-							10
11									8	-							12
13	PANEL "1LP3"	100			7	-											14
15									7	-							16
17									5	-							18
19	PANEL "1LP4"	100			9	-										SPACE	20
21									9	-							22
23									7	-							24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 69 KVA																	
DEMAND LOAD = 69 KVA																	

PANEL MO2 120 / 208 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 10,000 MINIMUM A.I.C. RATING																	
225 A. BUS 225 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	PANEL "1LP5"	100	(1)	(1)	6	0.4							1/2"	12	20/1	TU'S	2
3									5	0.5							4
5																	6
7	PANEL "1LP6"	100			2	-											8
9									2	-							10
11									2	-							12
13	PANEL "1LP7"	100			10	-										SPACE	14
15									9	-							16
17									7	-							18
19	SPACE	20/1															20
21																	22
23																	24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 48 KVA																	
DEMAND LOAD = 48 KVA																	

PANEL G 120 / 208 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 10,000 MINIMUM A.I.C. RATING																	
225 A. BUS 225 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	PANEL "2LP1"	100	(1)	(1)	6	0.2			6	0.2			3/4"	10	20/1	RECEPTS	2
3																	4
5																	6
7	PANEL "2LP2"	100			6	1.2											8
9									4	1.2						AHU-1.1	10
11									6	1.2						AHU-2.1	12
13	PANEL "2LP3"	100			6	0.5										TU'S	14
15									7	-						SPACE	16
17									7	-							18
19	SPARE	20/1															20
21																	22
23																	24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 60 KVA																	
DEMAND LOAD = 60 KVA																	

PANEL G2 120 / 208 VOLTS, 3 PHASE, 4 WIRE																	
TYPE 10,000 MINIMUM A.I.C. RATING																	
225 A. BUS 225 A. MAIN CIRCUIT BREAKER MOUNTING FLUSH <input type="checkbox"/>																	
LOCATION SURFACE <input checked="" type="checkbox"/>																	
ENCLOSURE: NEMA 1																	
LOAD KVA																	
SERVES			BKR WIRE COND			A			B			C					
1	PANEL "2LP4"	100	(1)	(1)	6	-			6	-							2
3																	4
5																	6
7	PANEL "2LP5"	100			6	-											8
9									5	-							10
11									4	-							12
13	CA-1	20	12	3/4"	1.6	-										SPACE	14
15									1.6	1				3/4"	12	RECEPTS	16
17									1.6	1							18
19	VP-1	60	6	1"	6	1											20
21									6	1							22
23																	24
● CONTINUOUS LOAD X 1.25																	
NON-CONTINUOUS LOAD X 1																	
#																	
DEMAND KVA/PHASE																	
DEMAND AMPS/ PHASE																	
REMARKS:																	
TOTAL CONNECTED LOAD = 60 KVA																	
DEMAND LOAD = 60 KVA																	

PANEL SCHEDULE KEY:

GEM	F1	F2
MO	MO2	-
G	G2	-

**bws ARCHITECTS**  
 BURNS WALK-HOPKINS SHAMBACH ARCHITECTS  
 261 North Canal Avenue  
 Tucson, AZ 85716  
 Phone: 520.326.2795 Fax: 520.326.0171  
 www.bwsarch.com

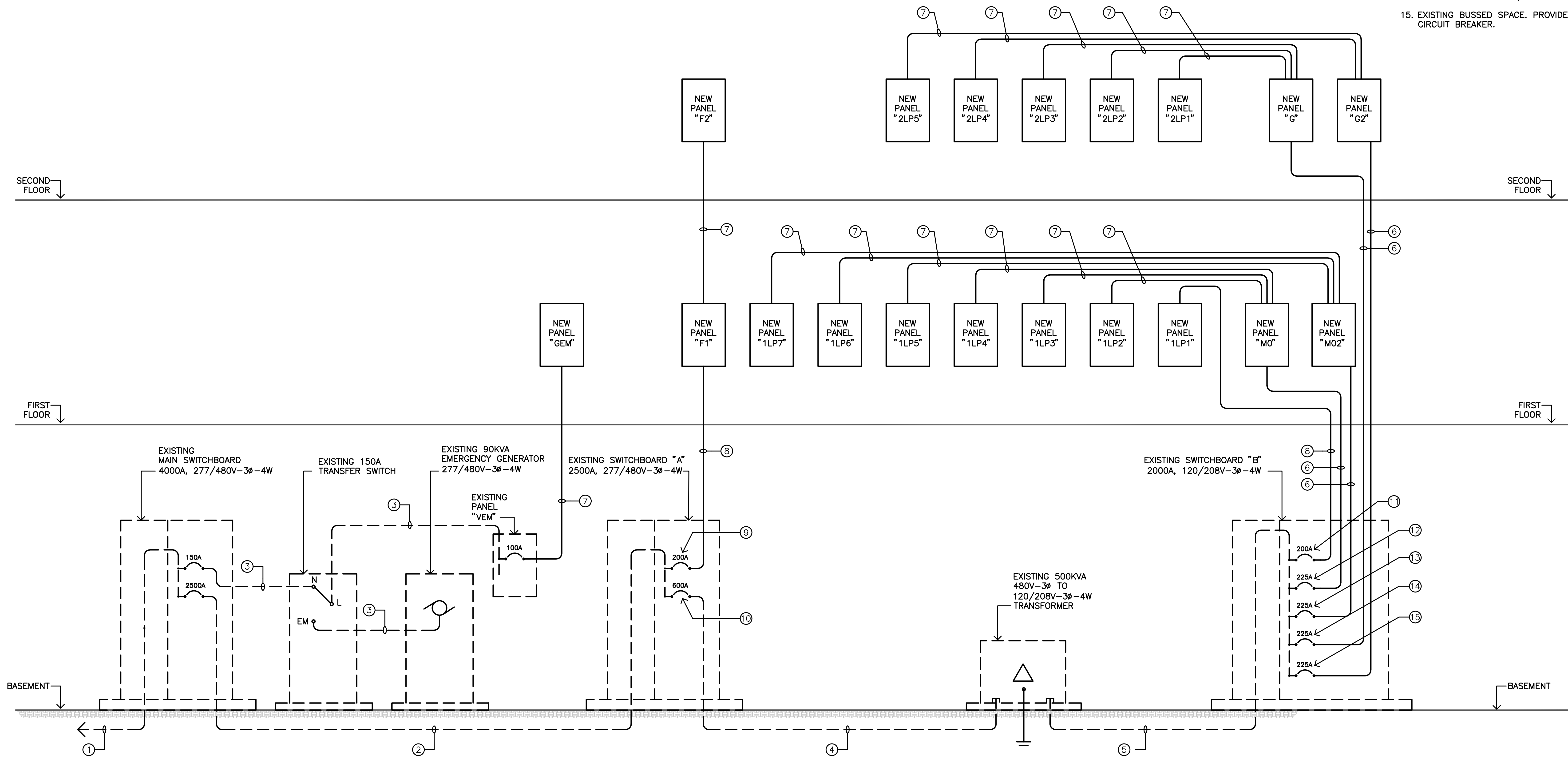
Electrical  
 Structural  
 Mechanical  
 PCC West Science Labs  
 2202 W Anklam Rd, Tucson, AZ 85745  
 Phone: 520.884.0045

Laboratory  
 PCC West Science Labs  
 2202 W Anklam Rd, Tucson, AZ 85745  
 Phone: 520.327.7611

**PCC West Science Labs**  
**PCC West Lab Building F**  
**Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745



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**PARTIAL ONE LINE DIAGRAM**  
NOT TO SCALE

- KEYNOTES:**
- EXISTING 4000A FEEDER TO REMAIN.
  - EXISTING 2500A FEEDER TO REMAIN.
  - EXISTING 150A FEEDER TO REMAIN.
  - EXISTING 600A FEEDER TO REMAIN.
  - EXISTING 2000A FEEDER TO REMAIN.
  - NEW 4#4/0 CU., 1#3 CU. GRD., 2"C.
  - NEW 4#2 CU., 1#8 CU. GRD., 1-1/4"C.
  - NEW 4#3/0 CU., 1#6 CU. GRD., 2"C.
  - EXISTING SPARE CIRCUIT BREAKER WITH PROVISIONS FOR FUSES. PROVIDE NEW 200A FUSES.
  - EXISTING CIRCUIT BREAKER TO REMAIN.
  - EXISTING CIRCUIT BREAKER TO BE RELABELED FROM "FD1/FD2/GD1/GD2" TO "1LP1".
  - EXISTING CIRCUIT BREAKER TO BE RELABELED FROM "FP1/GP1" TO "MO".
  - EXISTING CIRCUIT BREAKER TO BE RELABELED FROM "FP2/GP2" TO "MO2".
  - EXISTING CIRCUIT BREAKER TO BE RELABELED FROM "FP3/GP3" TO "G".
  - EXISTING BUSSED SPACE. PROVIDE NEW CIRCUIT BREAKER.

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**PCC West Science Labs**  
**PCC West Lab Building F**  
**Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

**CONSULTANTS**  
Laboratory  
HDL Film Analysis, #100  
2800 Oldham Canyon Rd, Suite 100  
Tucson, AZ 85718  
Phone: 520.237.0159

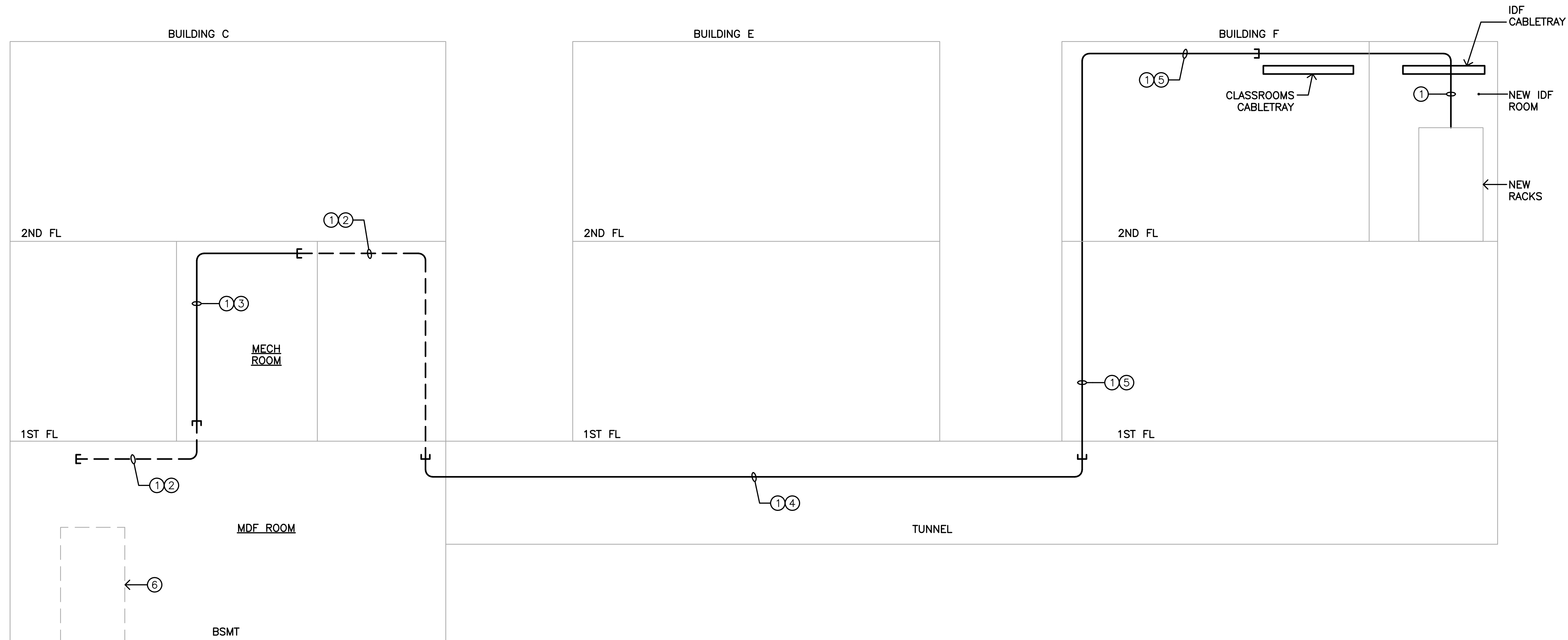
Mechanical  
K/Mechanical Engineering  
447 E. First Street  
Tucson, AZ 85711  
Phone: 520.327.7811

Structural  
Turner Structural Engineering  
1228 N. Country Club Rd.  
Tucson, AZ 85716  
Phone: 520.323.3422

Electrical  
Monrad Engineering, Inc.  
1925 East Ft. Lowell Road, Suite 200  
Tucson, AZ 85716  
Phone: 520.884.0045

**bws ARCHITECTS**  
**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
261 North Court Avenue  
Tucson, AZ 85716  
520.962.2756 Fax: 520.962.6171  
www.bwsarch.com





○ KEYNOTES:

1. NEW FIBER OPTIC BACKBONE CABLE BY OWNER'S VENDOR IN 1-1/4" C INNERDUCT BY CONTRACTOR.
2. EXISTING CONDUIT.
3. MOUNT ON EXISTING MECHANICAL ROOM WALL OR CEILING.
4. MOUNT ON EXISTING TUNNEL WALL OR CEILING.
5. NEW 4" C WITH (3) 1-1/4" C INNERDUCTS BY CONTRACTOR IN CHASES UP THROUGH FIRST FLOOR AND UP TO SECOND FLOOR CEILING. SEE KEYNOTE 6 ON SHEET T1.1 AND KEYNOTE 6 ON SHEET T2.1.
6. EXISTING MDF ROOM CABINETS.

① TELECOMMUNICATIONS RISER DIAGRAM  
NOT TO SCALE



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TELECOMMUNICATIONS  
RISER DIAGRAM

**T1.0**  
CONSTRUCTION DOCUMENTS

**PCC West Science Labs  
PCC West Lab Building F  
Renovation**  
2202 W Anklam Rd, Tucson, AZ 85745

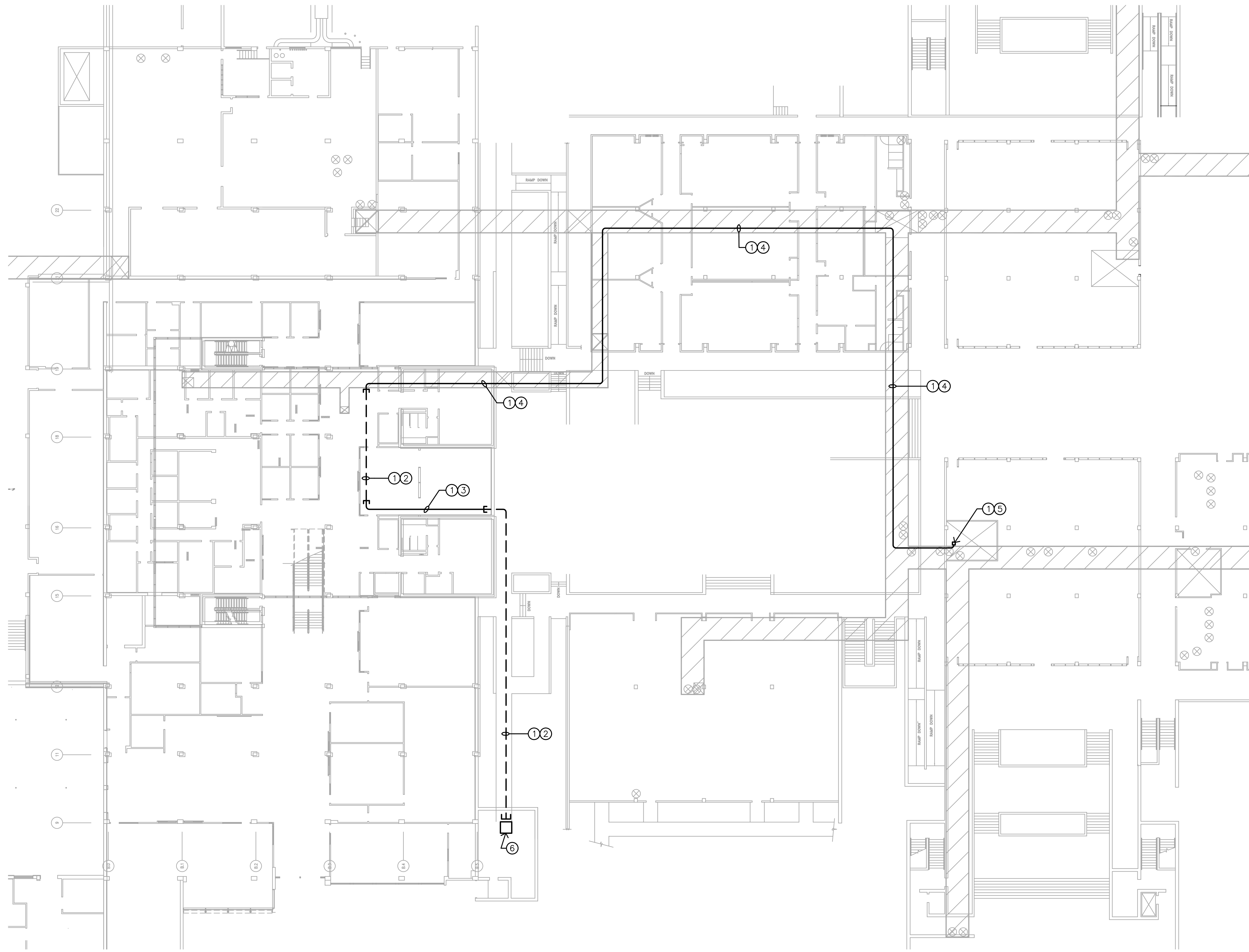
**CONSULTANTS**  
Laboratory  
HDL, Fifth Avenue, #100  
2800 Dow Drive, CA 92103-3192  
Phone: 619.297.0159

Mechanical  
KC Mechanical Engineering  
5477 E. Pinal, #200  
Phoenix, AZ 85031  
Phone: 520.327.7611

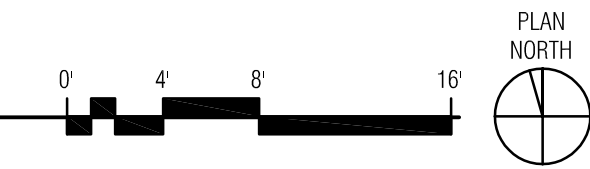
Structural  
Tanner Structural Engineering  
3226 N. W. 48th Pl.  
Tucson, AZ 85718  
Phone: 520.323.3422

Electrical  
Monrad Engineering, Inc.  
1925 E. Lowell Road, Suite 200  
Tucson, AZ 85718  
Phone: 520.884.0045

**bws ARCHITECTS**  
**BURNS WALK-HOPKINS SHAMBACH ARCHITECTS**  
261 Horn Court Avenue  
Tucson, AZ 85718  
520.962.2795 Fax: 520.962.6171  
www.bwsarch.com



1 BASEMENT-TUNNEL TELECOMMUNICATIONS PLAN  
SCALE: 1/16" = 1'-0"



○ KEYNOTES:

1. NEW FIBER OPTIC BACKBONE CABLE BY OWNER'S VENDOR IN 1-1/4" C INNERDUCT BY CONTRACTOR.
2. EXISTING CONDUIT.
3. MOUNT ON EXISTING MECHANICAL ROOM WALL OR CEILING.
4. MOUNT ON EXISTING TUNNEL WALL OR CEILING.
5. NEW 4" C WITH (3) 1-1/4" C INNERDUCTS BY CONTRACTOR IN CHASES UP THROUGH FIRST FLOOR AND UP TO SECOND FLOOR CEILING. SEE KEYNOTE 6 ON SHEET T1.1 AND KEYNOTE 6 ON SHEET T2.1.
6. EXISTING MDF ROOM CABINETS.

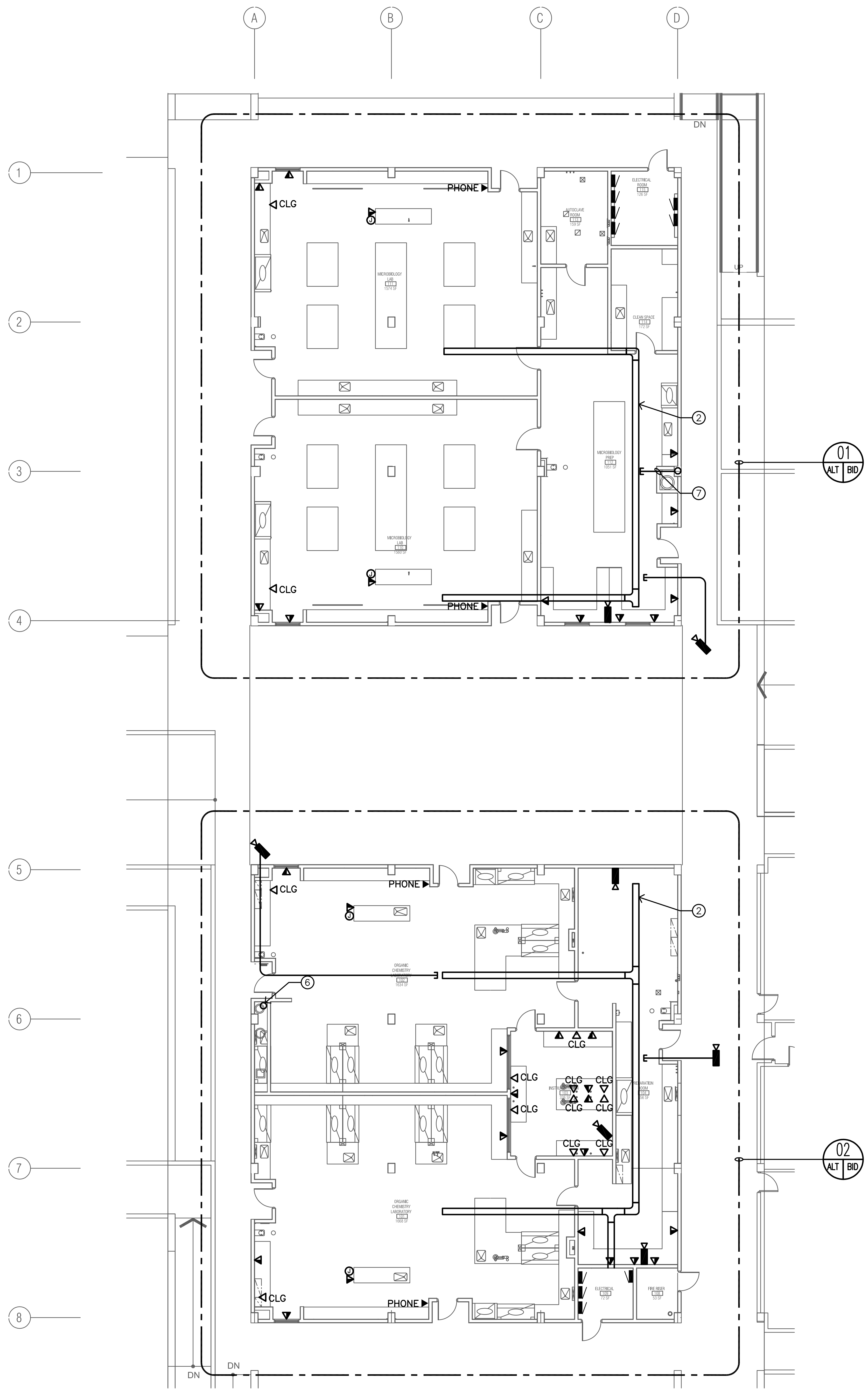


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BASEMENT-TUNNEL  
TELECOMMUNICATIONS PLAN

T1.1  
CONSTRUCTION DOCUMENTS

5/14/2020 9:55:28 AM



1 FIRST FLOOR TELECOMMUNICATIONS PLAN  
SCALE: 1/8" = 1'-0"

○ KEYNOTES:

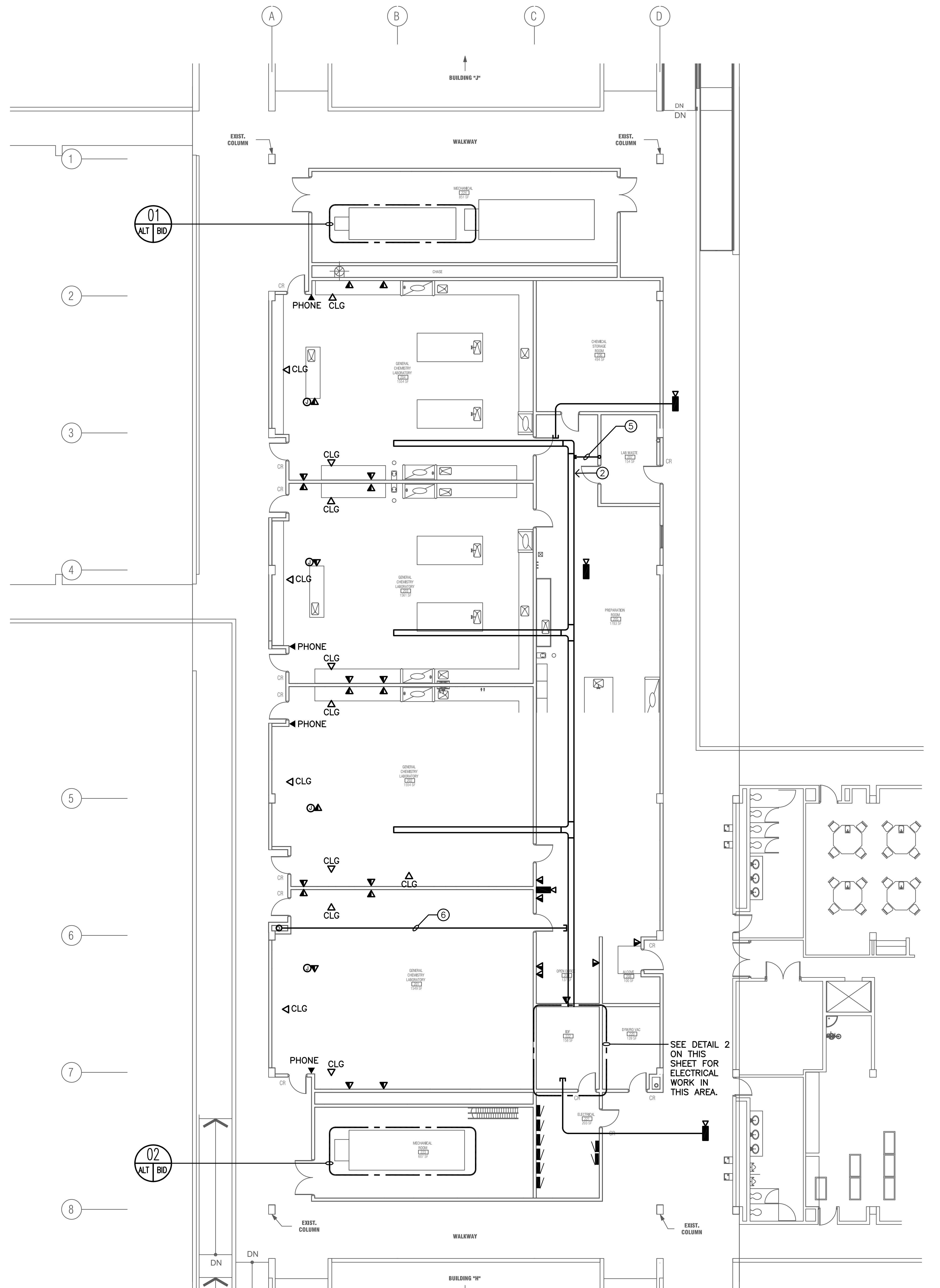
1. IDF RACKS.
2. 12"W X 4"H CABLETRAY.
3. (4) 4"C FROM NORTH CABLETRAY TO SOUTH CABLETRAY.
4. NEW 4'X8'X3/4" PLYWOOD BACKBOARD, PAINTED ON BOTH SIDES WITH WHITE FIRE RETARDANT PAINT.
5. TELECOMMUNICATIONS ROOM GROUND BAR.
6. (1) 4"C UP FROM TUNNEL AND UP TO SECOND FLOOR CEILING. SEE KEYNOTE ⑥ ON SHEET T2.2 FOR CONTINUATION.
7. (2) 4"C FROM CABLETRAY TO EAST WALL CHASE AND UP CHASE TO SECOND FLOOR CEILING. SEE KEYNOTE ⑦ ON SHEET T2.2 FOR CONTINUATION.

**ADD ALTERNATE BID #01**  
MICROBIOLOGY AND SYSTEMS  
ASSOCIATED WITH IT.  
CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
ORGANIC CHEMISTRY AND ASSOCIATED  
SYSTEMS.  
CONSTRUCTION COMPLETE AND IN PLACE.



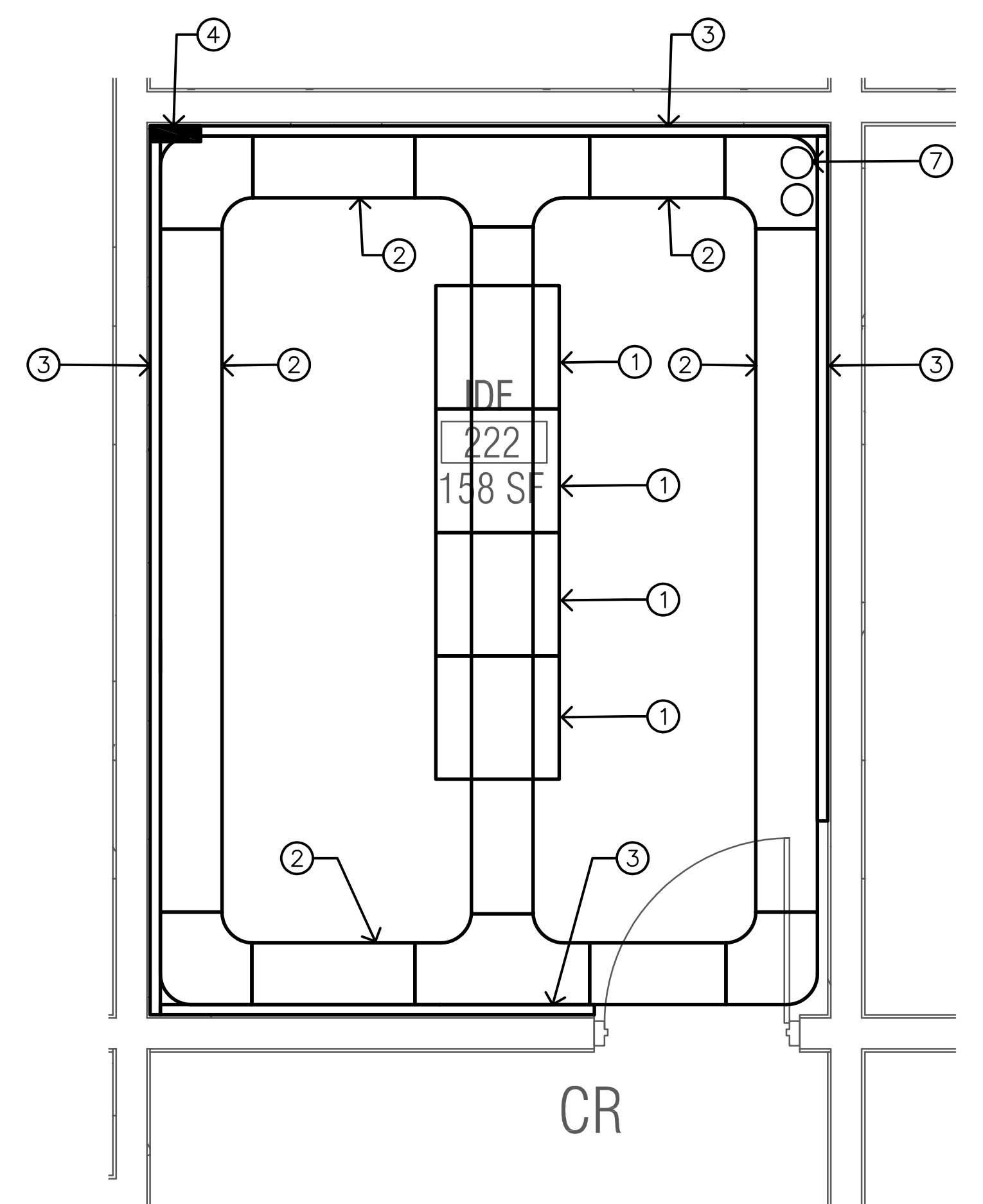
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REVISIONS



01  
ALT  
BID

02  
ALT  
BID

1 SECOND FLOOR TELECOMMUNICATIONS PLAN  
SCALE: 1/8" = 1'-0"



2 SECOND FLOOR IDF ROOM TELECOMMUNICATIONS PLAN  
SCALE: 1/2" = 1'-0"

KEYNOTES:

1. IDF RACKS.
2. 12"W X 4"H CABLETRAY.
3. NEW 4'X8'X3/4" PLYWOOD BACKBOARD, PAINTED ON BOTH SIDES WITH WHITE FIRE RETARDANT PAINT.
4. TELECOMMUNICATIONS ROOM GROUND BAR.
5. (2) 4"C FROM CABLETRAY TO EAST WALL CHASE AND DOWN TO FIRST FLOOR CEILING FOR CABLING FROM FIRST FLOOR DEVICES TO SECOND FLOOR IDF.
6. (1) 4"C FROM CABLETRAY TO WEST WALL CHASE, DOWN TO FIRST FLOOR CHASE, AND DOWN INTO TUNNEL FOR FIBER AND COPPER BACKBONE CABLE.
7. (2) 4"C SLEEVES FROM SECOND FLOOR TO FIRST FLOOR CEILING SPACE.

**ADD ALTERNATE BID #01**  
HVAC UNIT FOR MICROBIOLOGY ENCLOSURE AND UNIT FOR GENERAL CHEMISTRY = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.

**ADD ALTERNATE BID #02**  
HVAC UNIT FOR ORGANIC CHEMISTRY. ENCLOSURE SHELL SPACE = BASE BID. CONSTRUCTION COMPLETE AND IN PLACE.

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**GENERAL NOTES**

- ALL WALL BENCHTOPS AND MOVABLE TABLES SHALL BE 30" DEEP INCLUDING WALL BENCH BACK SPLASH (UNLESS OTHERWISE NOTED).
- ALL ISLAND/PENINSULA BENCHTOPS SHALL BE 60" DEEP (UNLESS OTHERWISE NOTED).
- ALL BENCHES AND TABLES SHALL BE 36" HIGH (UNLESS OTHERWISE NOTED).
- ALL BENCH/TABLE TOPS TO BE 1" THICK EPOXY RESIN (UNLESS OTHERWISE NOTED).
- ALL BACK AND SIDE SPLASHES TO BE 3/4" THICK AND 4" HIGH, PIPEDROP CURBS TO BE 3/4" THICK AND 5" HIGH (UNLESS OTHERWISE NOTED).
- PROVIDE SIDESPLASHES AT ALL BENCH TOPS AGAINST FUME HOODS AND/OR ADJACENT WALLS.
- OVERALL LENGTH OF BENCHTOPS SHALL BE DETERMINED BY CASEWORK SIZES AND DIMENSIONS AS INDICATED ON PLANS. TOPS SHALL OVERHANG 1/2" AT EACH END AND 1" FROM FRONT OF BASE CABINETS AND TABLES. WHEN OVERALL DIMENSIONS ARE GIVEN, 1/2" OVERHANG IS NOT INCLUDED.
- ALL CASEWORK, FUME HOODS AND ANY OTHER FURNISHINGS WITH EXPOSED-TO-VIEW BACKS AND SIDES SHALL BE FINISHED.
- INSTALL CLOSURE PANELS BETWEEN BACK OF HOODS AND WALLS AT EXPOSED ENDS AND BETWEEN BASE CABINETS AND/OR HOODS THAT ARE SET BACK TO BACK. FOR BASE CABINETS, PROVIDE EXTENDED ENDS AT THESE LOCATIONS.
- ALL PENETRATIONS THROUGH BENCHTOP SHALL BE SEALED WITH SEALANT.
- BACKS OF COUNTERTOPS AND SPLASHES AGAINST WALLS SHALL BE SEALED TO THE WALL WITH SEALANT.
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.
- ARCHITECT OR OWNER'S REPRESENTATIVE WILL SELECT COLORS FOR ALL COMPONENTS OF PROJECT INDICATED ON THESE DRAWINGS. COLOR SELECTION WILL BE FROM THE CASEWORK MANUFACTURER'S STANDARD COLOR LINE.
- FREE STANDING SHELVING AND CASEWORK LESS THAN 18" DEEP SHALL BE SECURED TO PREVENT TIPPING. SUBMIT SHOP DRAWINGS OF ATTACHMENT PRIOR TO INSTALLATION.
- SAFETY SHOWER/EYEWASH UNITS SHALL COMPLY WITH ANSI STANDARDS FOR USABILITY BY THE PHYSICALLY DISABLED. SAFETY SHOWER/EYEWASH UNITS SHALL BE FURNISHED UNDER DIVISION 11 FOR INSTALLATION UNDER DIVISION 22.
- FOR LABORATORY SERVICE FITTING TYPES, LOCATIONS AND ORDER, SEE LABORATORY FURNISHINGS PLANS. THESE FITTINGS SHALL BE PROVIDED UNDER DIVISION 11, FOR INSTALLATION UNDER DIVISION 22 U.O.N.
- AT ALL TALL FREESTANDING VENTED, CORROSIVE, OR SOLVENT STORAGE CABINETS, VENT PIPING WILL BE PROVIDED AND INSTALLED FROM THE CABINET POINT OF CONNECTION TO THE EXHAUST DUCT SYSTEM PER DIVISION 23.
- WHERE NO FUME HOOD OCCURS ADJACENT TO UNDER COUNTER CORROSIVE STORAGE CABINETS, ROUTE VENT PIPE (IN PIPE CHASE) UP NEAREST PIPE DROP ENCLOSURE TO EXHAUST DUCT SYSTEM FOR CONNECTION UNDER DIVISION 23.
- WHERE FUME HOOD OCCURS ADJACENT TO UNDER COUNTER CORROSIVE STORAGE CABINETS, ROUTE VENT PIPE (IN PIPE CHASE) TO FUME HOOD AND EXTEND 4" ABOVE FUME HOOD WORK SURFACE BEHIND BAFFLE.
- SNORKEL EXHAUST EQUIPMENT SHOWN ON THESE DRAWINGS SHALL BE PROVIDED UNDER DIVISION 11. DIVISION 23 SHALL PROVIDE DUCTWORK ROUTING AND MAKE FINAL CONNECTION TO SNORKEL EQUIPMENT.
- LOCATION OF EQUIPMENT, SUCH AS FUME HOODS, BRACES OR ANY OTHER ITEMS THAT MAY INTERFERE WITH LIGHTING, STRUCTURAL OR MECHANICAL SYSTEMS, SHALL BE CAREFULLY COORDINATED. NOTIFY OWNER'S REPRESENTATIVE OF DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.
- UNLESS OTHERWISE NOTED, ALL MISCELLANEOUS CHANNELS, BRACKETS AND FITTINGS INDICATED ON ALL LABORATORY FURNISHINGS DRAWINGS SHALL BE SUPPLIED, INSTALLED AND PAINTED UNDER DIVISION 11.
- CONTRACTOR SHALL EXAMINE ALL LABORATORY FURNISHINGS PLANS AND COORDINATE WITH REFLECTED CEILING PLANS FOR PROPER CEILING HEIGHTS & PIPE DROP ENCLOSURE HEIGHTS AND LOCATIONS.
- HEAVY DUTY UNISTRUT AND OTHER STRUCTURALLY ANCHORED AND SUSPENDED DEVICES WHICH REQUIRE COORDINATION WITH OTHER TRADES SHALL BE THE RESPONSIBILITY OF THIS DIVISION (UNLESS OTHERWISE NOTED). ADDITIONAL FRAMING MAY BE REQUIRED TO ACCOMMODATE ANCHORAGE AROUND DUCTWORK OR OTHER OBSTRUCTIONS.
- ALL BULLETIN BOARDS, MARKER BOARDS, CHALKBOARDS, PROJECTION SCREENS, COAT RACKS AND FIRE EXTINGUISHERS ARE INDICATED ON THE "LF" DRAWINGS FOR COORDINATION ONLY.
- SERVICE FITTINGS SHOWN ON THE "LF" PLAN DRAWINGS ARE FOR LOCATION ONLY. REFER TO DETAILS AND SPECIFICATIONS FOR ACTUAL FITTINGS.
- ELECTRICAL DEVICES SHALL BE PROVIDED UNDER DIVISION 26. ELECTRICAL DEVICES SHOWN ON THE "LF" DRAWINGS ARE FOR THE LOCATION OF CASEWORK CUTOUTS. DEVICES SHOWN AT FUME HOODS SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER.
- ALL WALL MOUNTED RACEWAYS SHALL BE MOUNTED 43" A.F.F. TO THE BOTTOM OF THE RACEWAY U.O.N.
- INTEGRAL OR TOP SET BASE BY DIVISION 9. REFER TO ARCHITECTURAL FINISH DRAWINGS & SPECIFICATIONS.

**TYPICAL ABBREVIATIONS**

(NOTE: NOT ALL ABBREVIATIONS SHOWN ARE USED. REFER TO FLOOR PLANS FOR ACTUAL ABBREVIATION TYPES.)

ADA	AMERICAN DISABILITIES ACT
A.F.F.	ABOVE FINISHED FLOOR
ARCH	ARCHITECTURAL DOCUMENTS
CFM	CUBIC FEET/MINUTE
CENT	CENTRIFUGE
CLG.	CEILING
CLR.	CLEARANCE
DIA	DIAMETER
DIV.	DIVISION
EQUIP	EQUIPMENT
FZR	FREEZER
GA.	GAUGE
G.C.	GENERAL CONTRACTOR
G.W.	GLASSWARE WASHER
H.D.	HEAVY DUTY
INC	INCUBATOR
MAX.	MAXIMUM
MIN.	MINIMUM
MTD.	MOUNTED
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OFOI	OWNER FURNISHED, OWNER INSTALLED
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
O.H.	OVERHEAD
REF	REFRIGERATOR
SIM.	SIMILAR
SPEC	SPECIFICATIONS
ST.STL.	STAINLESS STEEL
TEMP	TEMPERATURE
TYP.	TYPICAL
UC	UNDER COUNTER
U.O.N.	UNLESS OTHERWISE NOTED
WP	WEATHERPROOF

**LABORATORY SERVICE ABBREVIATIONS**

CO2	CARBON DIOXIDE
EW	EYEWASH
ICW	INDUSTRIAL COLD WATER
IHW	INDUSTRIAL HOT WATER
LG	LABORATORY GAS
LV	LABORATORY VACUUM
N2	NITROGEN GAS
PW	PURIFIED WATER
SS	SAFETY SHOWER
_(V)	SERVICE VALVE - PROVIDED UNDER DIV. 22
_(VB)	SERVICE VALVE BOX - PROVIDED UNDER DIV. 22

**LABORATORY SYMBOLS LEGEND**

	SYMBOL LEGEND	DESCRIPTION	DETAIL
1		PIPE DROP ENCLOSURE	1 LF4.13
2		DRYING RACK	9 LF4.10
3A		ADJUSTABLE WALL SHELVES (2 TIERS, 12" DEEP)	4 LF4.13
3B		ADJUSTABLE WALL SHELVES (2 TIERS, 14" DEEP)	4 LF4.13
4		ADJUSTABLE ISLAND BENCH SHELVING (2 TIERS U.O.N.)	5 LF4.13
5		FIXED REAGENT SHELF	7 LF4.13
6		CYLINDER RESTRAINT	7 LF4.12
7		CYLINDER RACK ASSEMBLY	8 LF4.12
8		SNORKEL FUME EXHAUST - SEE EXHAUST SCHEDULE	7 LF4.10
9		CHEMICAL RESISTANT SHELVING UNIT	8 LF4.13
10		BENCHTOP SLEEVE AT VACUUM PUMP CABINET	9 LF4.11
11		BENCHTOP GROMMET	8 LF4.11
12		SAFETY SHOWER WITH EYEWASH UNIT, SEE SERVICE FITTING SCHEDULE	
13		PROJECTION SCREEN & CEILING MOUNTED PROJECTOR (SEE ARCHITECTURAL DOCUMENTS, SHOWN FOR COORDINATION ONLY)	
14		MONITOR (SHOWN FOR COORDINATION ONLY)	
15		SLIDING MARKER BOARDS ON BENCHTOP (SEE ARCHITECTURAL DOCUMENTS, SHOWN FOR COORDINATION ONLY)	
16		BENCHTOP PEDESTAL BOX (UNDER DIVISION 26, SHOWN FOR COORDINATION ONLY)	
17		MISCELLANEOUS EXHAUST - SEE EXHAUST SCHEDULE	
		OWNER FURNISHED, OWNER INSTALLED (OFOI) EQUIPMENT	
		ADA COMPLIANT AREA	
		WALL CABINET - SEE CASEWORK MENU	
		TALL STORAGE CABINET - SEE CASEWORK MENU	
		MOVABLE TABLE - SEE CASEWORK MENU	
		CHEMICAL FUME HOOD - SEE EXHAUST SCHEDULE	2 LF4.10
		ADA CHEMICAL FUME HOOD - SEE EXHAUST SCHEDULE	3 LF4.10
		FULL-VIEW CHEMICAL FUME HOOD - SEE EXHAUST SCHEDULE	4 LF4.10
		BIOLOGICAL SAFETY CABINET, OFOI	
		EPOXY RESIN SINK - SEE SINK SCHEDULE	
		STAINLESS STEEL SINK - SEE SINK SCHEDULE	
		CUP SINK - SEE SINK SCHEDULE	
		FLOOR DRAIN (SHOWN FOR COORDINATION ONLY)	
		FLOOR SINK (SHOWN FOR COORDINATION ONLY)	
		CYLINDER MANIFOLD BY DIVISION 22	

**LABORATORY BENCHTOP SCHEDULE**

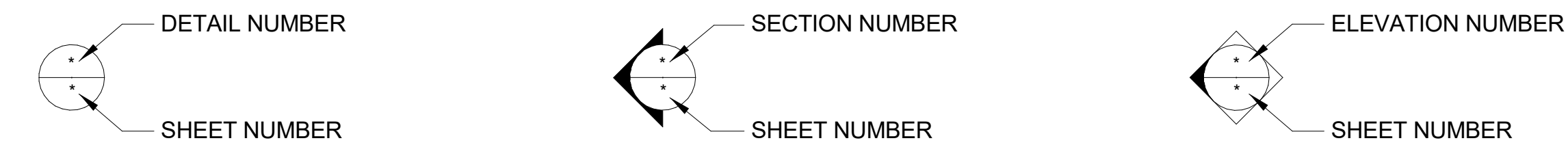
	EPOXY RESIN BENCHTOP		STAINLESS STEEL BENCHTOP
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+30", +34", +36" INDICATES BENCHTOP HEIGHT ABOVE FINISHED FLOOR

FOR BENCHTOP TRANSITION HEIGHT, REFER TO DETAILS:

FOR BENCHTOP DRIP GROOVES, REFER TO DETAIL:

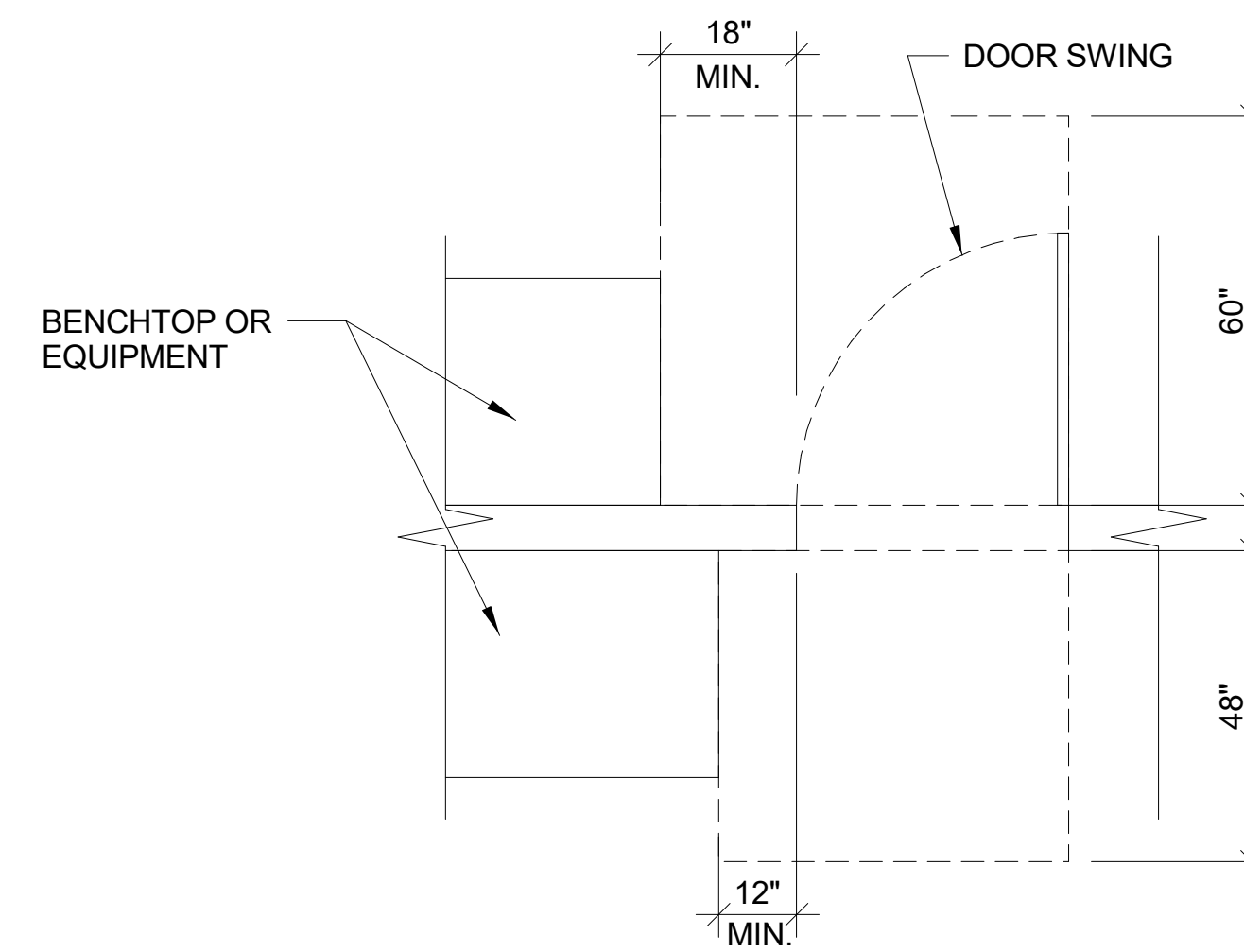
**DETAIL SYMBOLS LEGEND**



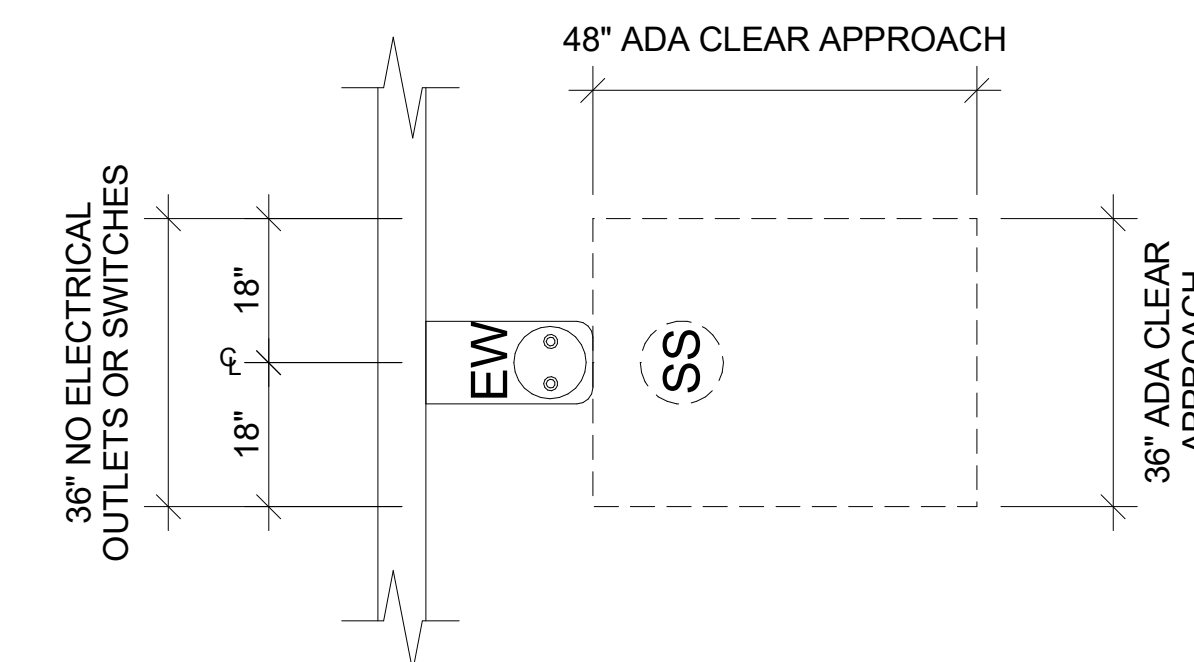
**ELECTRICAL SYMBOLS**

- 
- 
- 
- 
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- 
- 

**INTERIOR DOOR CLEARANCES (ADA COMPLIANT)**



**ADA APPROACH CLEARANCES AT SS/EW**



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# EXHAUST EQUIPMENT SCHEDULES

## CHEMICAL FUME HOODS

DRAWING REFERENCE	HOOD SIZE AND TYPE	TYPE OF SASH	TYPE OF SILL	NUMBER OF VERTICAL SASHES	NOMINAL VERTICAL SASH HEIGHT	HORIZONTAL SASH CONFIGURATION		DESIGN OPERATING CONDITIONS			MAXIMUM OPERATING CONDITIONS			MINIMUM VAV AIR FLOW (NOTE 1)	MAX HOOD STATIC PRESSURE DROP	EXHAUST CONNECTION BY MECHANICAL (NOTE 2)	REMARKS
						NUMBER OF SASHES	NUMBER OF TRACKS	SASH OPENING	FACE VELOCITY	AIRFLOW	SASH OPENING	FACE VELOCITY	AIRFLOW				
4' CFH	4' CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	30	-	-	18	100	500	28.5	100	800	200	0.25	10	
4' ACFH	4' ADA CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	30	-	-	18	100	500	28.5	100	800	200	0.25	10	
6' CFH	6' CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	30	-	-	18	100	800	28.5	100	1,300	300	0.25	12	
6' ACFH	6' ADA CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	30	-	-	18	100	800	28.5	100	1,300	300	0.25	12	
6' FVH	6' FULL VIEW CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	34	-	-	18	100	850	34	100	1,600	300	0.50	12	PROVIDE DEDICATED SEPARATED EXHAUST DESIGN FOR EACH HOOD FOR BACK-TO-BACK WORKSTATIONS.
6' AFVH	6' ADA FULL VIEW CHEMICAL FUME HOOD	VERTICAL	AIRFOIL	1	34	-	-	18	100	850	34	100	1,600	300	0.50	12	PROVIDE DEDICATED SEPARATED EXHAUST DESIGN FOR EACH HOOD FOR BACK-TO-BACK WORKSTATIONS.
8' CFH	8' CHEMICAL FUME HOOD	COMBINATION VERTICAL/HORIZONTAL	AIRFOIL	1	30	5	2	18	100	1,100	28.5	100	1,750	400	0.25	12 (QTY/2)	
8' ACFH	8' ADA CHEMICAL FUME HOOD	COMBINATION VERTICAL/HORIZONTAL	AIRFOIL	1	30	5	2	18	100	1,100	28.5	100	1,750	400	0.25	12 (QTY/2)	

**NOTES:**

- MINIMUM VARIABLE AIR VOLUME (VAV) EXHAUST AIRFLOW CORRESPONDS TO 25" DEEP WORK SURFACE. FOR EXTENDED DEPTHS, APPLY AIRFLOW CORRECTION PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE EXHAUST DUCT TRANSITION PIECE TO TRANSITION FROM FUME HOOD COLLAR SIZE TO SCHEDULED EXHAUST CONNECTION SIZE.

## OTHER EXHAUST EQUIPMENT

DRAWING REFERENCE	EQUIPMENT	EXHAUST AIR FLOW	STATIC PRESSURE	EXHAUST DUCT CONNECTION SIZE	REMARKS
		CFM	INCH OF WATER	INCH	
8	SNORKEL EXHAUST	60	0.5	4	BASED ON MOVEX MODEL MET SNORKEL.
TCS	TALL CORROSIVE STORAGE CABINET	UNREGULATED	-	2	PROVIDE SCHEDULE 80 PVC/CPVC PIPE FOR EXHAUST DUCT PIPE.
TFS	TALL FLAMMABLE STORAGE CABINET	UNREGULATED	-	2	PROVIDE 2"Ø MAKEUP AIR PIPE CONNECTION FROM ROOM SUPPLY AIR SYSTEM. PROVIDE BLACK IRON PIPE FOR SUPPLY & EXHAUST DUCT.
TAV	TALL VENTILATED STORAGE CABINET	UNREGULATED	-	2	
VP	VACUUM PUMP CABINET	100	0.2	6	DEDICATED CABINET EXHAUST DUCT VENT TO ROOM EXHAUST SYSTEM.
17a	GAS REGULATOR/MANIFOLD RELIEF VALVE EXHAUST CONNECTION	UNREGULATED	-	1	RELIEF VALVE PIPING CONNECTION FROM REGULATOR/MANIFOLD RELIEF VALVE TO ROOM EXHAUST DUCT SYSTEM.
17b	TALL GLASSWARE WASHER	60	0.5	3	BASED ON STERIS RELIANCE 500XLS GLASSWASHER.
17c	CLOTHES DRYER	-	-	-	SHOWN FOR COORDINATION ONLY - REFER TO MECHANICAL PLANS

## LABORATORY SERVICE FITTING SCHEDULE

ABBREV.	FITTING TYPE	MOUNTING	NOTES	DETAIL
PW PW-S	PURIFIED WATER PURIFIED WATER (SELF-CLOSING VALVE)	DECK	AT LABORATORY SINK, MANUAL ON-OFF VALVE (ROUND HANDLE)	1 LF5.10
		DECK	AT LABORATORY SINK, SELF CLOSING VALVE (LEVER HANDLE)	2 LF5.10
		HOOD	SIDE POST MOUNTED, MANUAL ON-OFF VALVE (ROUND HANDLE)	1 LF5.11
		HOOD (ADA)	SIDE POST MOUNTED, MANUAL ON-OFF VALVE (LEVER HANDLE)	1 LF5.11
ICW	INDUSTRIAL COLD WATER	DECK	AT LABORATORY SINK (HOODED HANDLE)	3 LF5.10
		HOOD	SIDE POST MOUNTED AT FUME HOOD CUP SINK (HOODED HANDLE)	2 LF5.11
		HOOD (ADA)	SIDE POST MOUNTED AT FUME HOOD CUP SINK (LEVER HANDLE)	2 LF5.11
IHWICW	INDUSTRIAL HOT WATER/ INDUSTRIAL COLD WATER	DECK	AT LABORATORY SINK (HOODED HANDLE)	4 LF5.10
		DECK (ADA)	AT LABORATORY SINK (WRIST BLADE HANDLE)	5 LF5.10
LG LV N2	LABORATORY GAS LABORATORY VACUUM NITROGEN	DECK	AT BENCH (HOODED HANDLE)	6 LF5.10    7 LF5.10
		DECK (ADA)	AT ADA WALL BENCH (LEVER HANDLE)	6 LF5.10    7 LF5.10
		HOOD	SIDE POST MOUNTED (HOODED HANDLE)	3 LF5.11
		HOOD (ADA)	SIDE POST MOUNTED (LEVER HANDLES)	4 LF5.11
SS/EW	SAFETY SHOWER/ EYEWASH UNIT	WALL	BOWL AND SKIRT	9 LF5.10

## LABORATORY SERVICE FITTING SCHEDULE

ABBREV.	FITTING TYPE	MOUNTING	NOTES
LV(V)	LABORATORY VACUUM (VALVE)	WALL	SHUT-OFF VALVE UNDER DIVISION 22
PW(VB)	PURIFIED WATER (VALVE BOX)	WALL	SHUT-OFF VALVE BOX UNDER DIVISION 22
ICW(VB)	INDUSTRIAL COLD WATER (VALVE BOX)	WALL	SHUT-OFF VALVE BOX UNDER DIVISION 22
IHW(VB)	INDUSTRIAL HOT WATER (VALVE BOX)	WALL	SHUT-OFF VALVE BOX UNDER DIVISION 22

**NOTES:**

- FOR INDUSTRIAL WATER 'DO NOT DRINK' SIGN AT FAUCETS, REFER TO DETAIL:
- FOR FIXTURE SPACING REFER TO DETAILS:
- SERVICE ABBREVIATION \_\_ (V) REFERS TO SERVICE VALVE - PROVIDED UNDER DIVISION 22.
- SERVICE ABBREVIATION \_\_ (VB) REFERS TO SERVICE VALVE BOX - PROVIDED UNDER DIVISION 22.

## LABORATORY SINK SCHEDULE

SINK NUMBER	DESCRIPTION	OUTLET	WIDTH x DEPTH x HEIGHT (INSIDE DIMENSIONS)	SINK OUTLET SIZE	REMARKS	DETAIL
SK1	EPOXY RESIN	SIDE	21.5" x 15.5" x 11"	1-1/2"	DROP-IN	1 LF4.14
SK2	EPOXY RESIN	SIDE	28" x 15" x 12"	1-1/2"	DROP-IN	1 LF4.14
SK3	EPOXY RESIN	CORNER	25" x 15" x 4.8"	1-1/2"	DROP-IN; REQUIRES ADA FITTINGS	1 LF4.14
SK4	STAINLESS STEEL	CENTER	22" x 16" x 10"	1-1/2"	INTEGRAL WITH TOP	2 LF4.14
CS1	EPOXY RESIN	CENTER	3" x 6"	1-1/2"	OVAL, TYPICAL @ FUME HOOD W/ RAISED LIP	3 LF4.14

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**bws** ARCHITECTS

BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
26 North Court Avenue  
Scottsdale, AZ 85251  
320.952.0102 Fax: 320.952.6171  
www.bwsarch.com

Electrical  
Mechanical  
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Civil  
Environmental  
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Engineering, Inc.  
1520 E Camelback Rd. #200  
Tucson, AZ 85716  
Phone: 520.884.0045

Mechanical  
AC Mechanical Engineering  
3747 E. Park Ave. #511  
Scottsdale, AZ 85211  
Phone: 520.327.7611

Laboratory  
PCC Science Labs  
Building F Renovation  
2202 W Anklam Rd, Tucson, AZ 85745



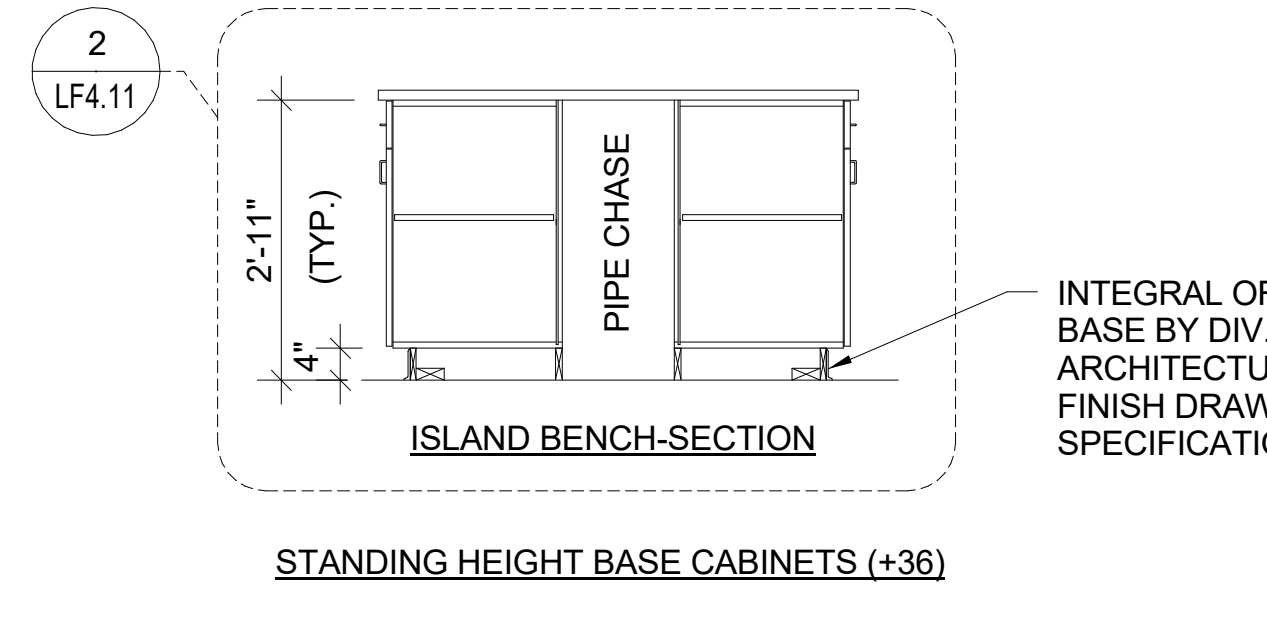
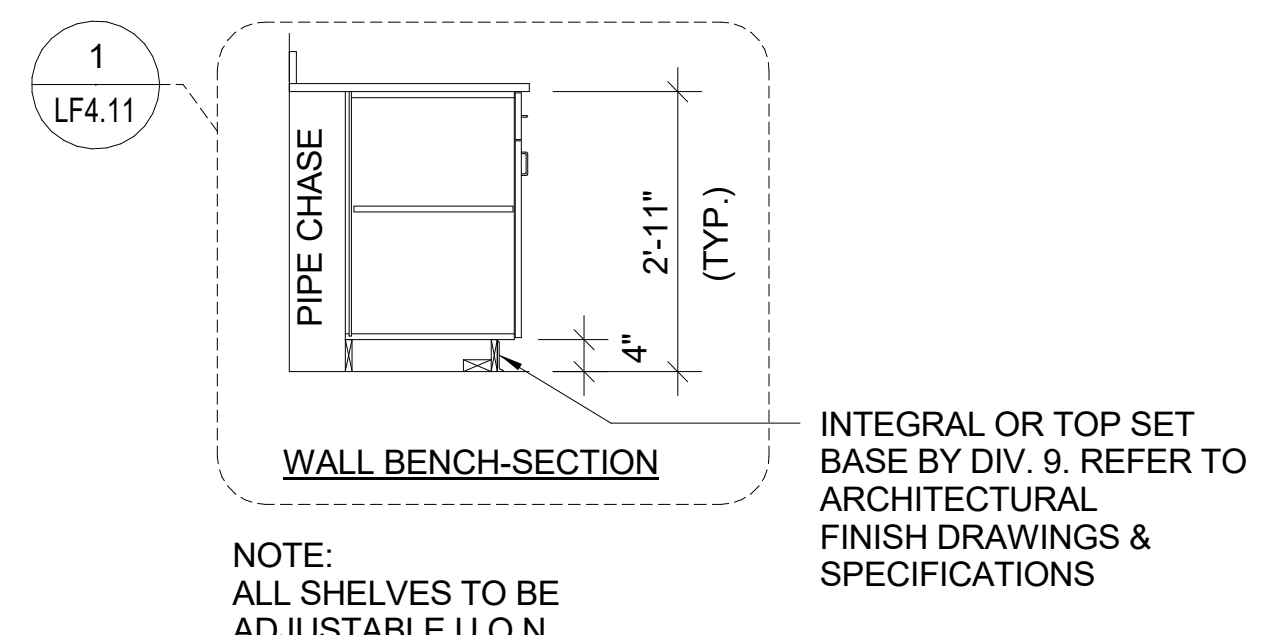
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DATE: 01/08/2020  
REVISIONS

LABORATORY FURNISHINGS SCHEDULES

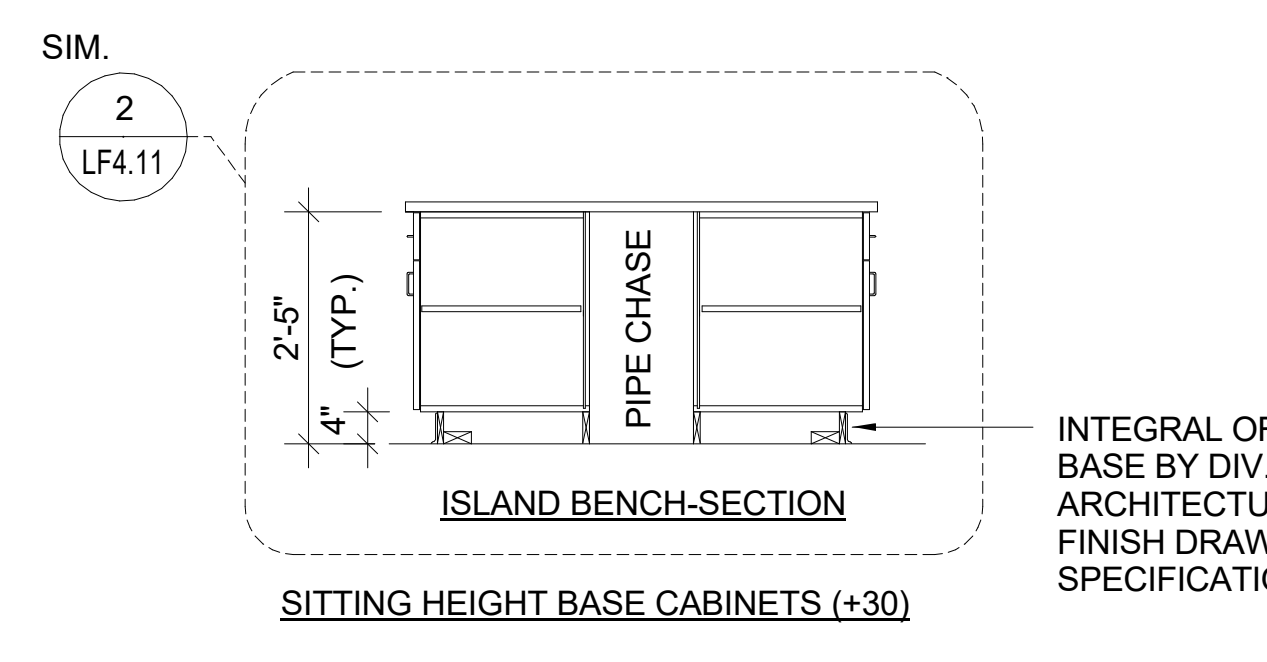
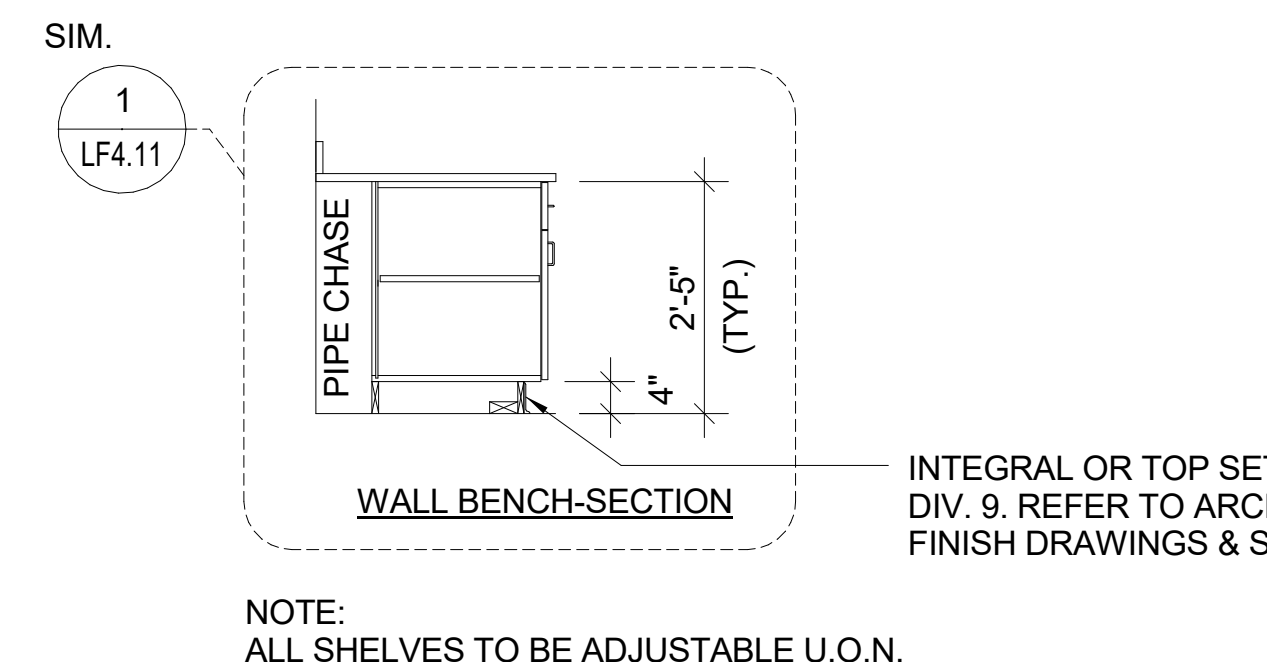
**LF1.11**  
100% CONSTRUCTION DOCUMENTS

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

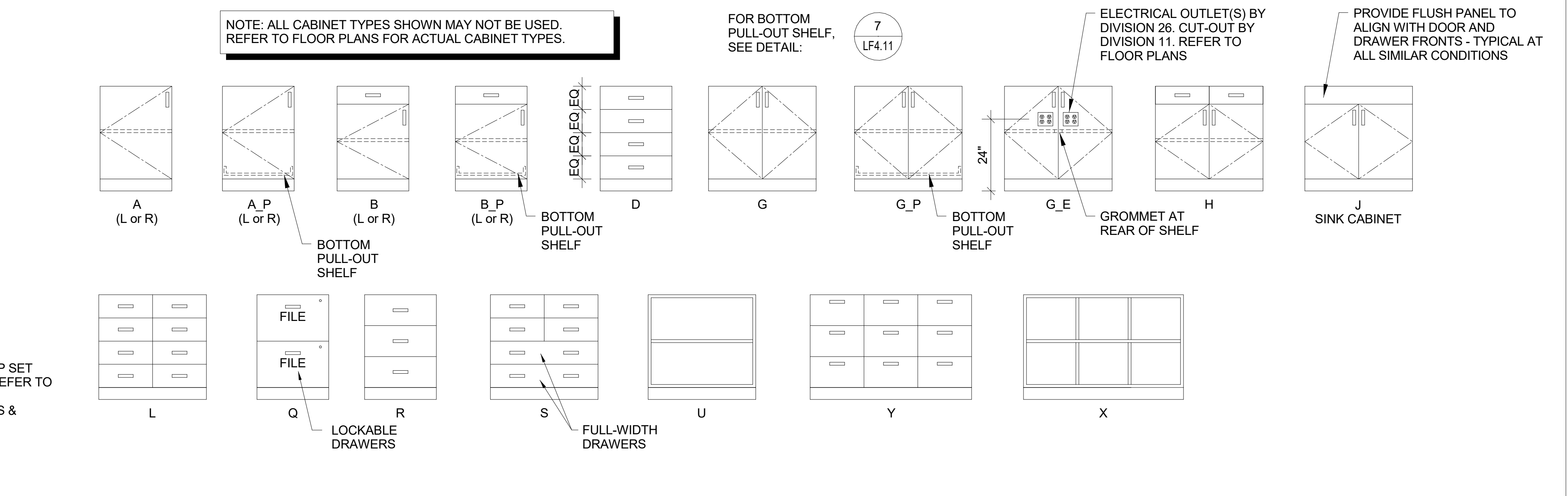
NOTES:  
 1. FOR WALL BACKING HEIGHTS REFER TO:



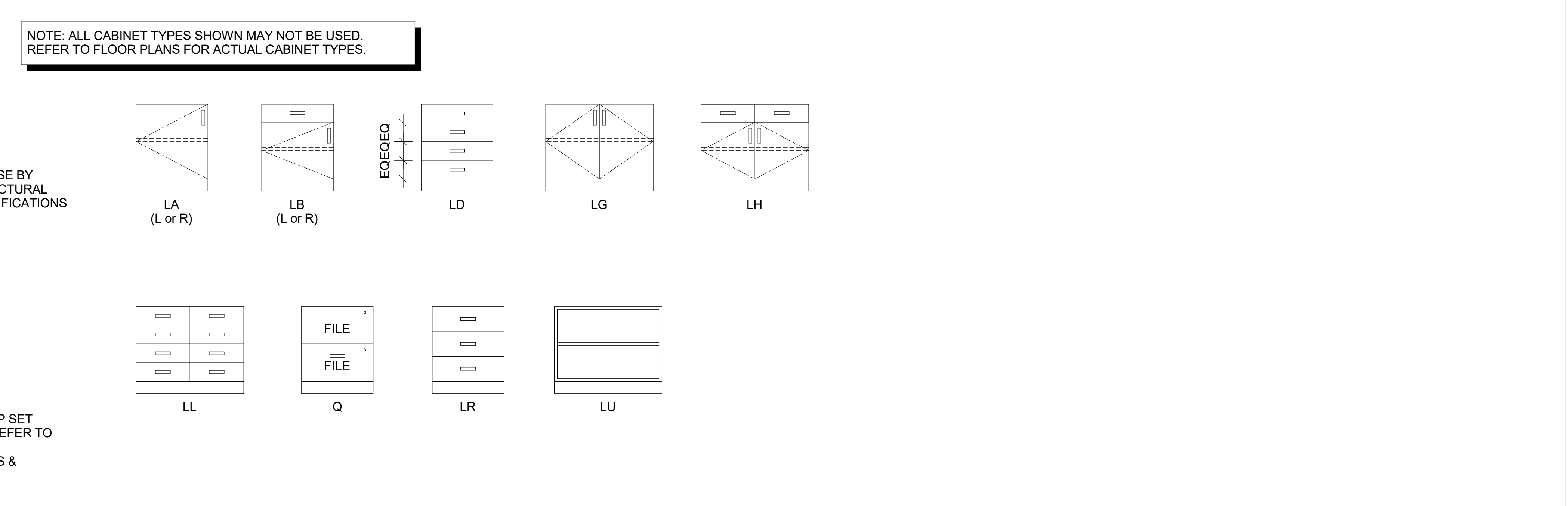
STANDING HEIGHT BASE CABINETS (+36)



SITTING HEIGHT BASE CABINETS (+30)

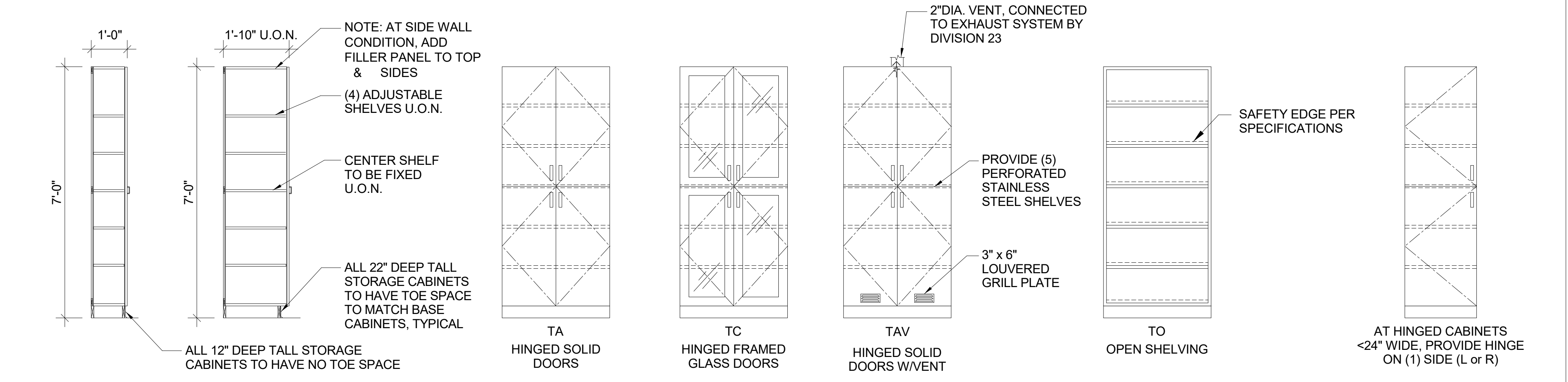
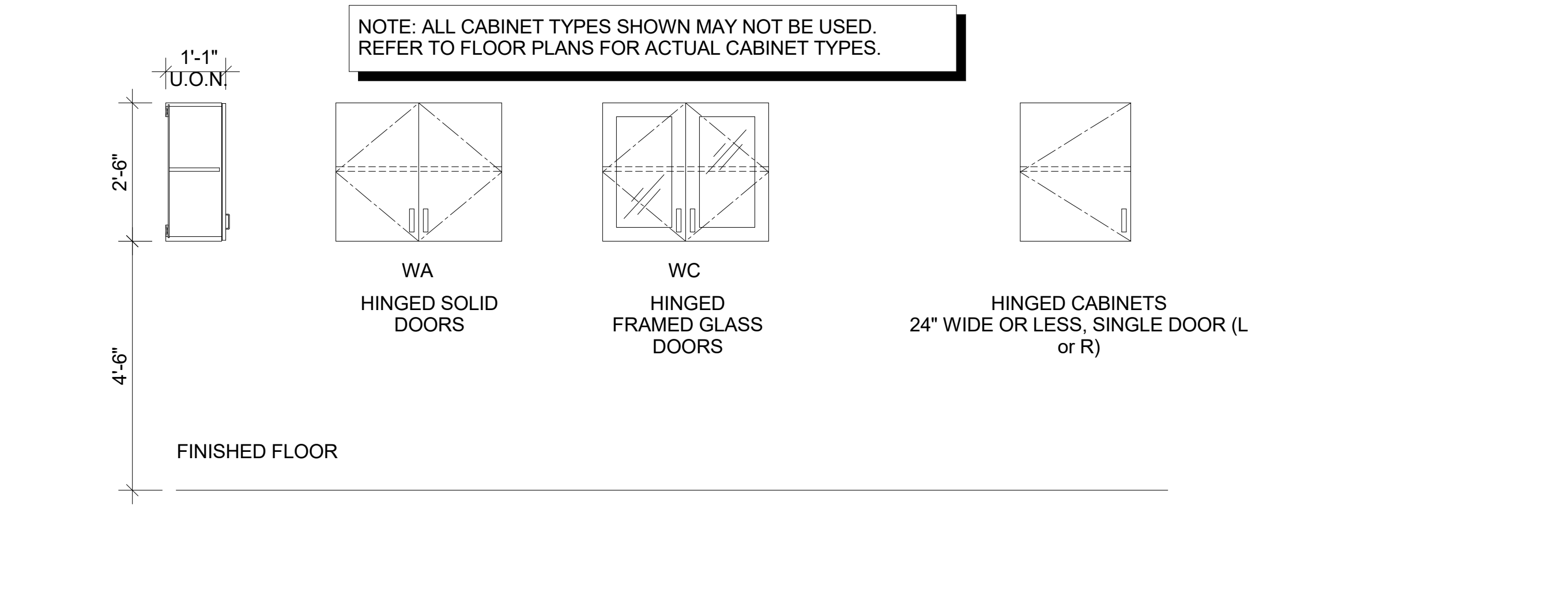


STANDING HEIGHT BASE CABINETS (WOOD - U.O.N.)

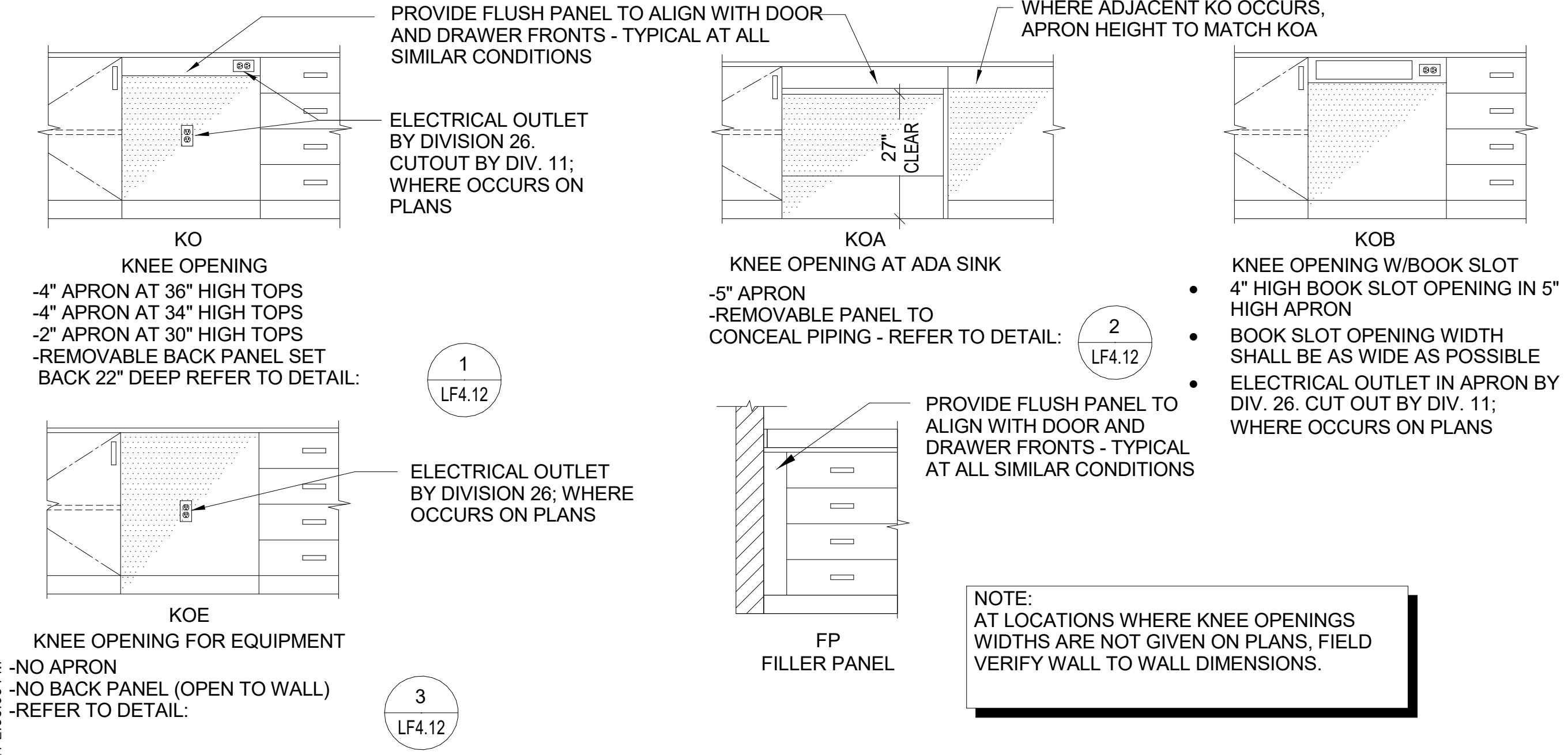


SITTING HEIGHT BASE CABINETS (WOOD - U.O.N.)

CASEWORK LEGEND & NOTES

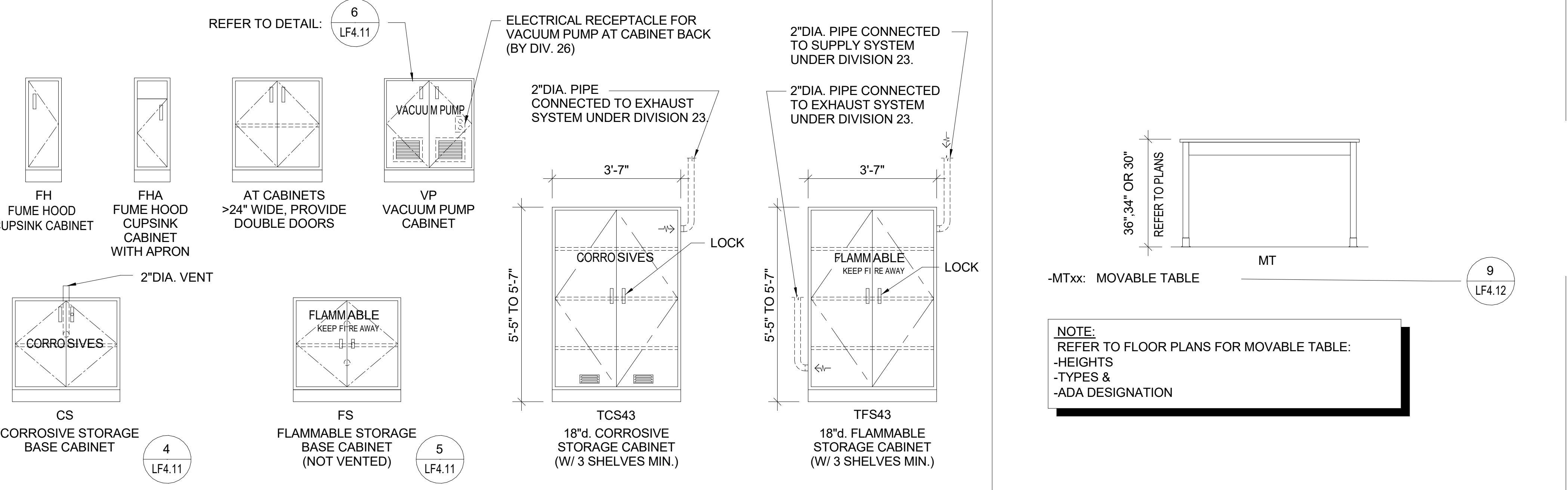


WALL CABINETS (WOOD - U.O.N.)



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

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



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

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

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

11/6/2021 2:58:58 PM  
 -NO APRON  
 -NO BACK PANEL (OPEN TO WALL)  
 -REFER TO DETAIL:

NOTE:  
 -REFER TO FLOOR PLANS FOR MOVABLE TABLE:  
 -HEIGHTS  
 -TYPES &  
 -ADA DESIGNATION

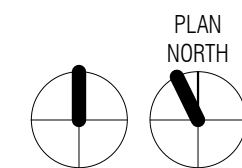
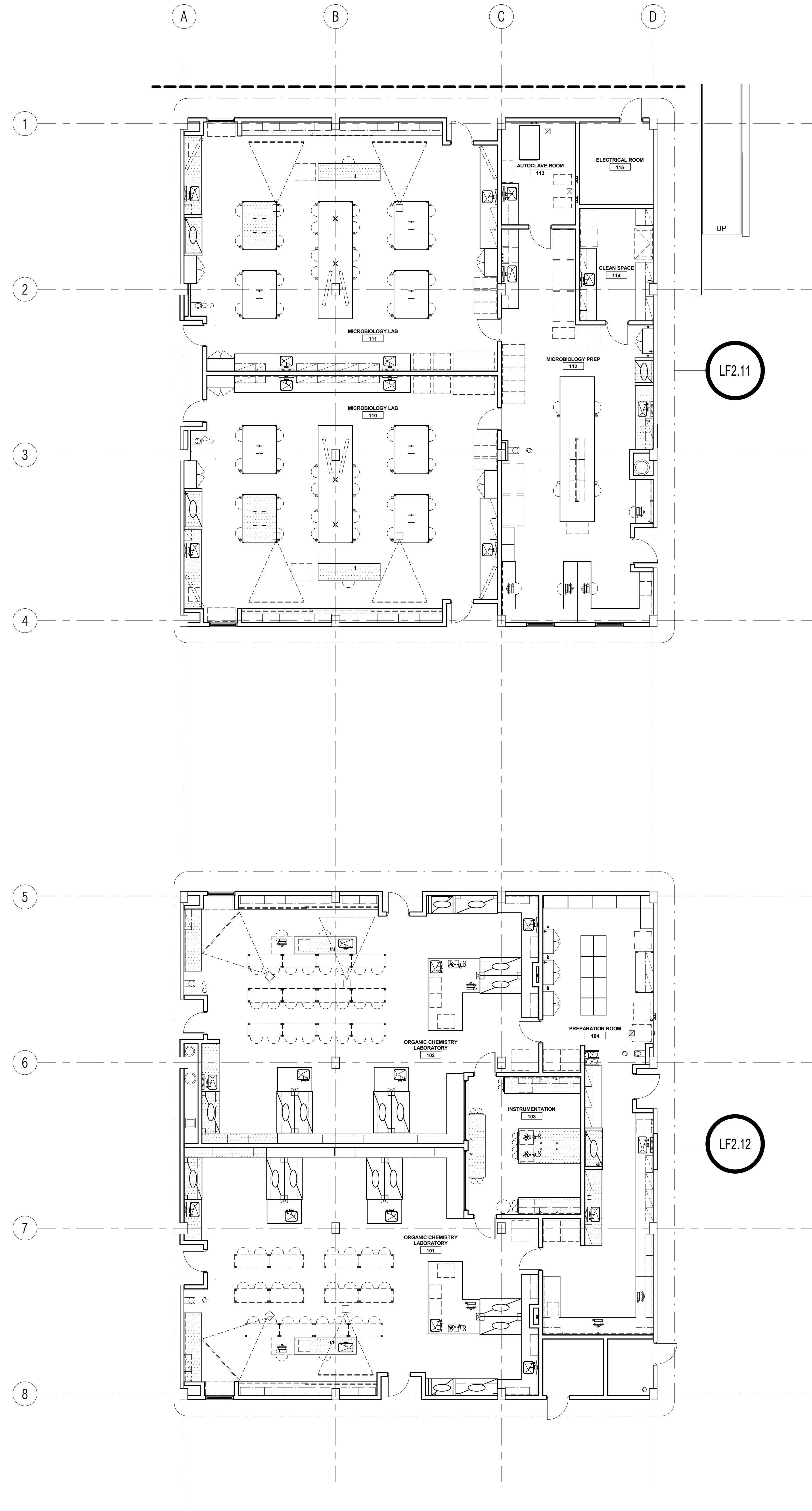


EXPIRES 09/30/22  
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 DATE: 01/08/2020  
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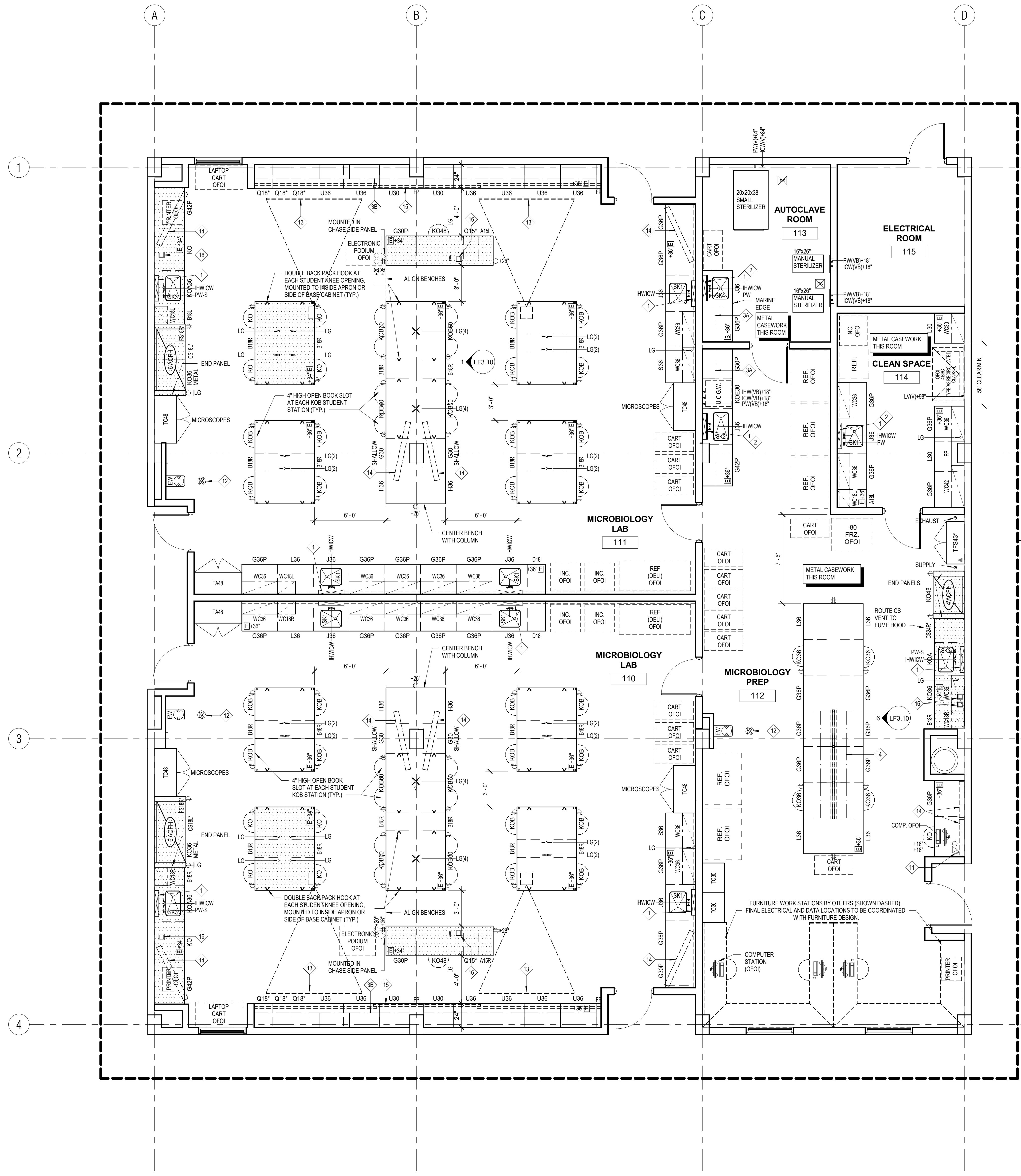
LABORATORY FURNISHINGS  
 CASEWORK MENU



1 LEVEL-1 OVERALL  
1/8" = 1'-0"

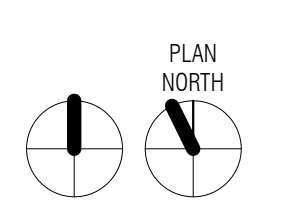


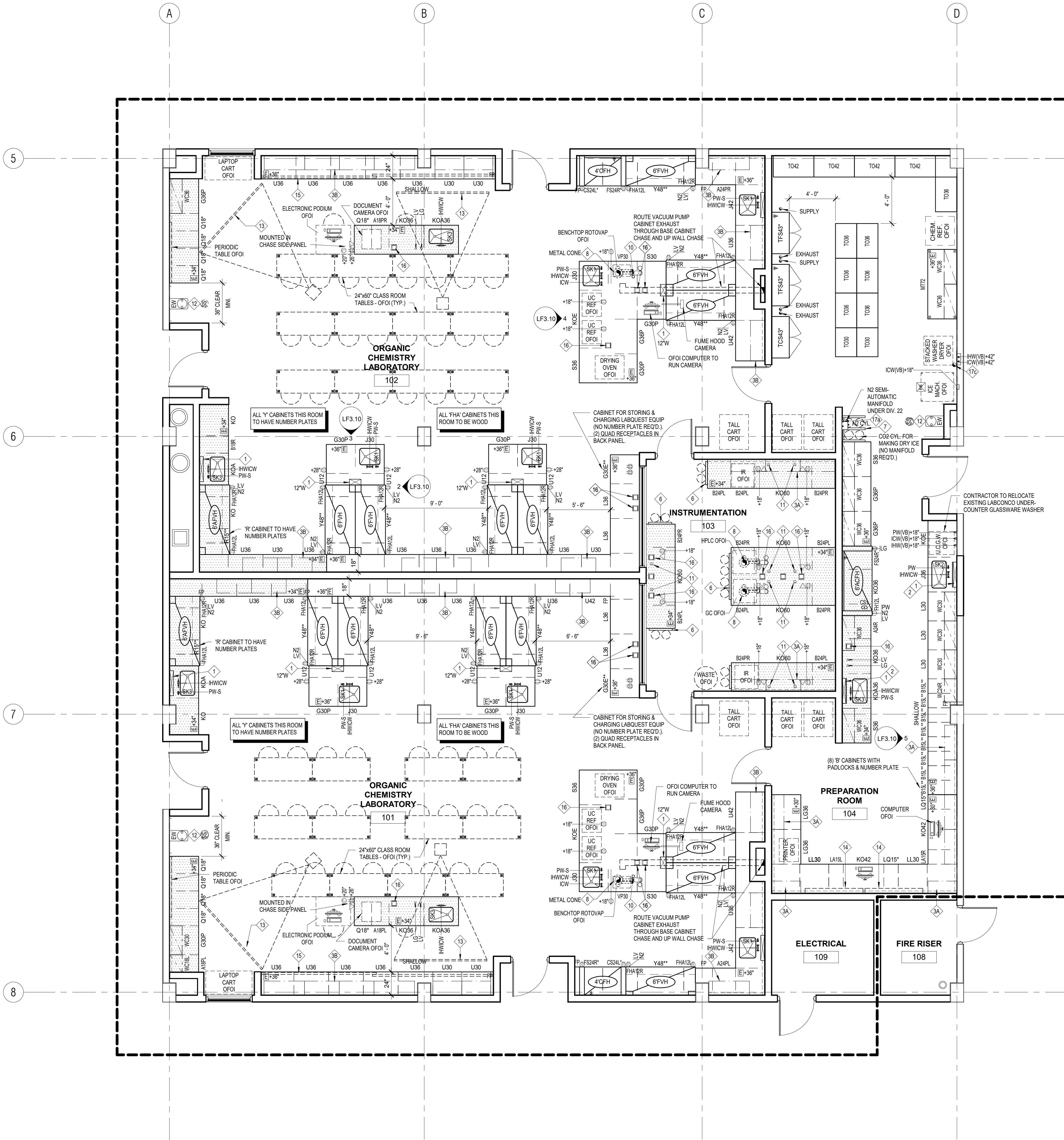




1 LEVEL-1, PLAN 'A'  
1/4" = 1'-0"

ADD ALTERNATE #01  
MICROBIOLOGY AND  
ASSOCIATED SYSTEMS.  
REFER TO SPEC  
SECTION 012300





ADD ALTERNATE #02  
 ORGANIC CHEMISTRY  
 AND ASSOCIATED  
 SYSTEMS. REFER TO  
 SPEC SECTION 012300

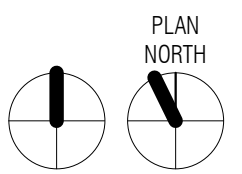
1 LEVEL-1, PLAN 'B'  
 1/4" = 1'-0"

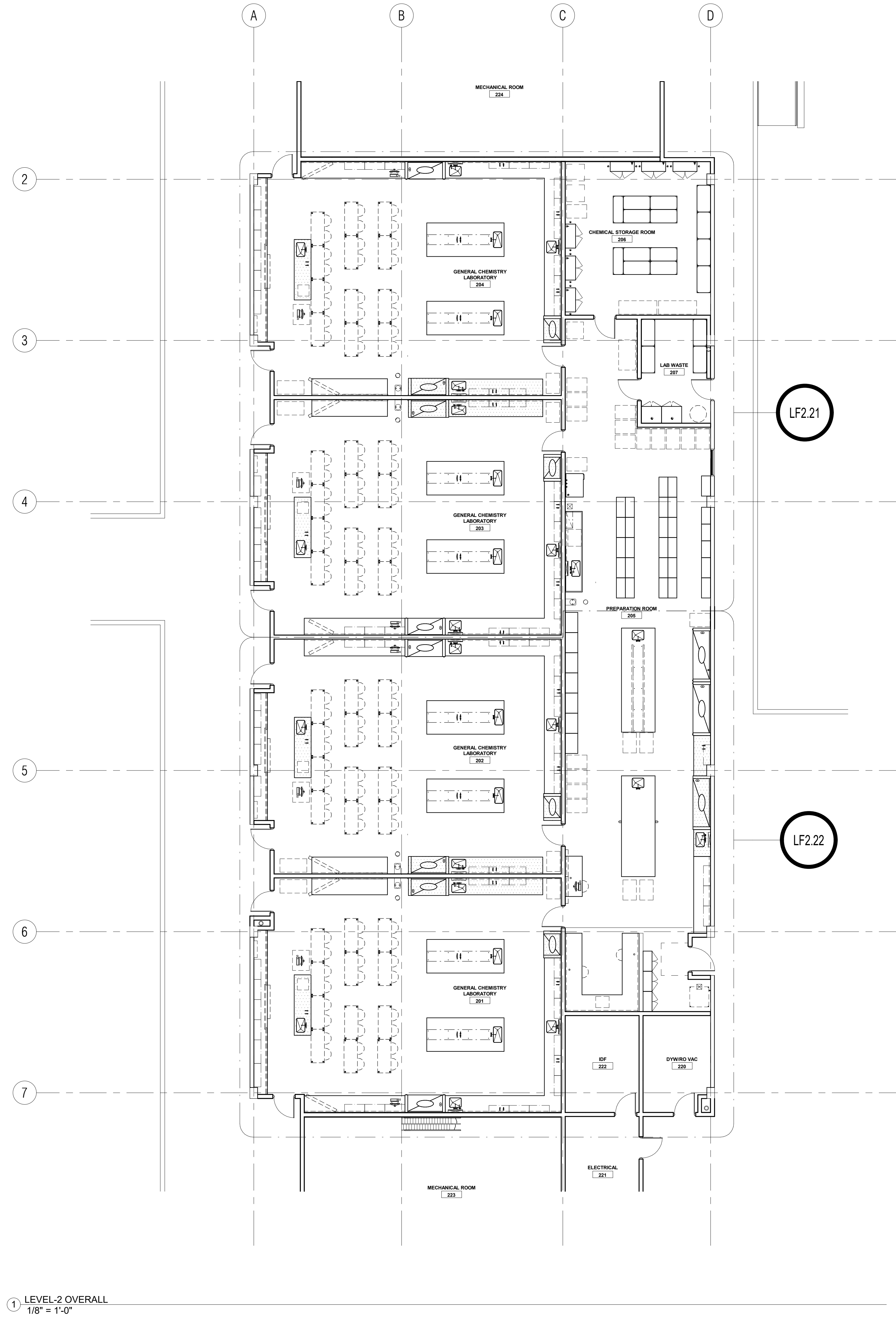
**CONSULTANTS**  
 Laboratory  
 BPC/E/PLH  
 2500 E. McDowell Rd., Suite 100  
 Scottsdale, AZ 85261  
 Phone: 602.997.0169  
 Mechanical  
 KC Mechanical Engineering  
 10747 E. McDowell Rd., Suite 100  
 Scottsdale, AZ 85261  
 Phone: 520.327.1611  
 Structural  
 JRM Structural Engineering  
 3028 N. Central Blvd., Suite 100  
 Tucson, AZ 85711  
 Phone: 520.323.3422  
 Electrical  
 Monrad Engineering, Inc.  
 1290 E. McDowell Rd., Suite 100  
 Scottsdale, AZ 85261  
 Phone: 520.884.0045

**PCC Science Labs**  
**Building F Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745



Expires 09/30/22  
 DRAWN BY: JRF  
 JOB NO: 1931.000  
 DATE: 01/08/2020  
 REVISIONS





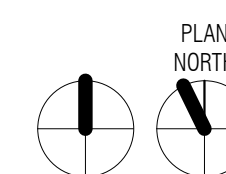
1 LEVEL-2 OVERALL  
1/8" = 1'-0"



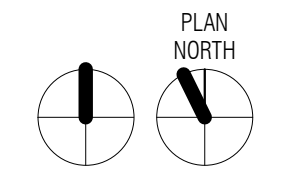
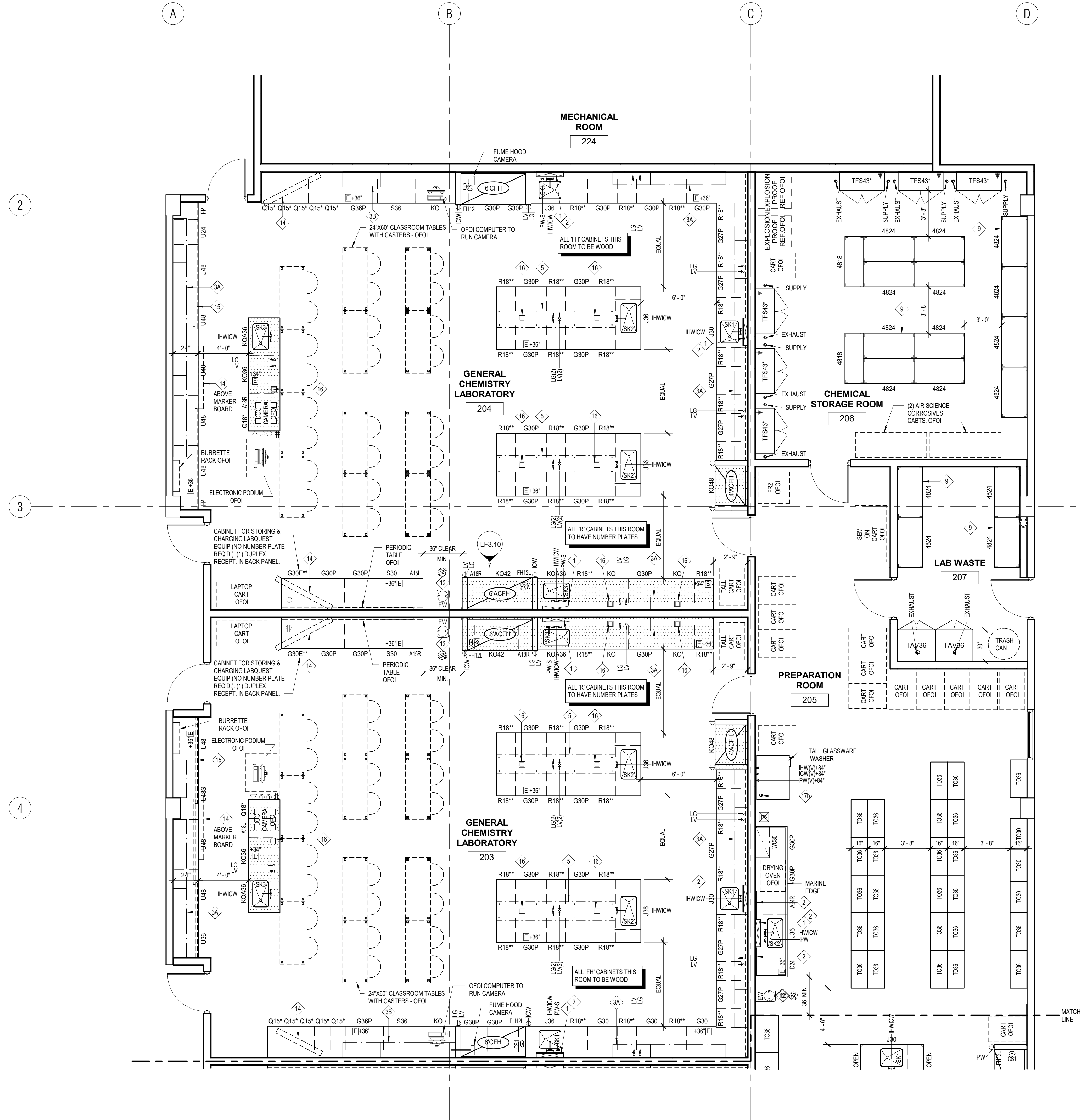
Expires 09/30/22

**DRAWN BY:** JRF  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020

**REVISIONS**

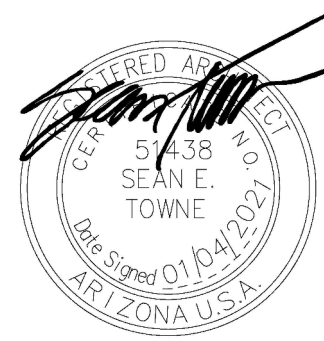
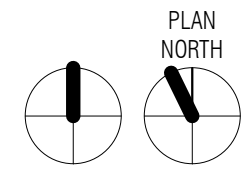
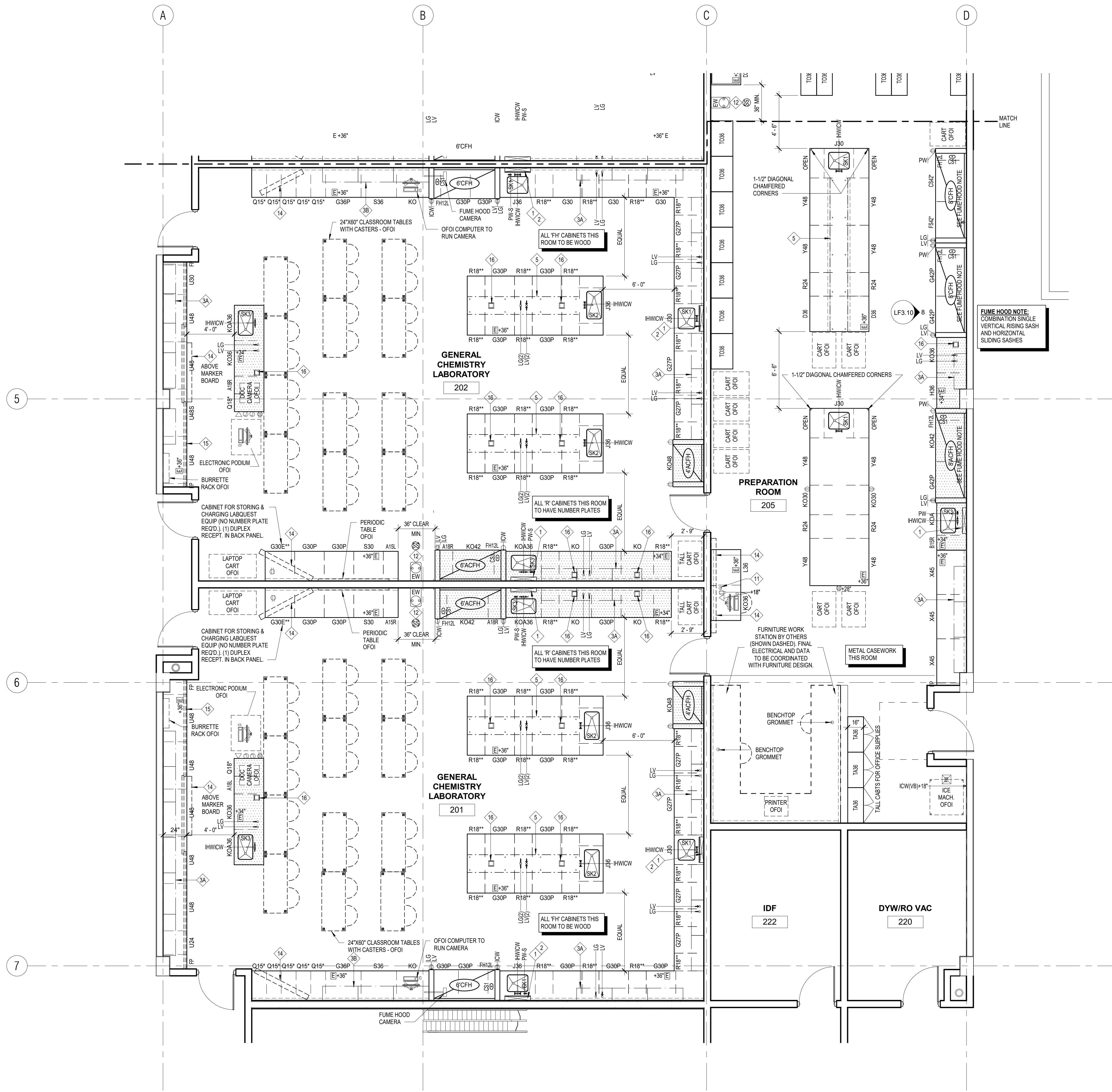


1 LEVEL-2, PLAN 'A'  
1/4" = 1'-0"





1 LEVEL-2, PLAN 'B'  
1/4" = 1'-0"



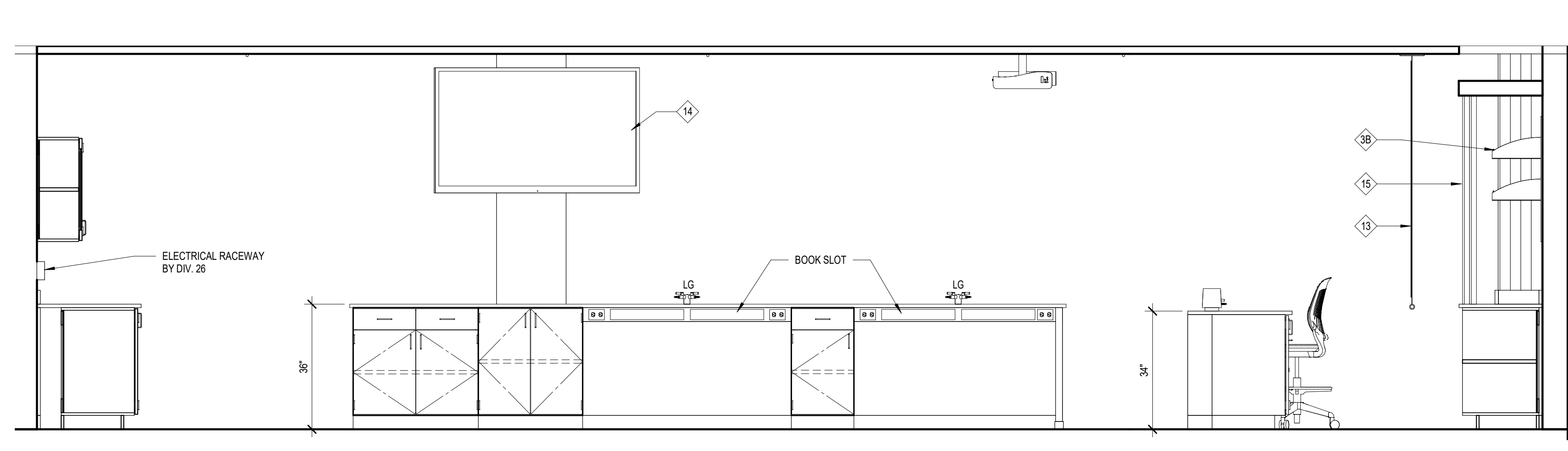
**CONSULTANTS**

Laboratory  
BFLS, 5710 Avenue #400  
San Diego, CA 92121-3192  
Phone: 619.297.0169

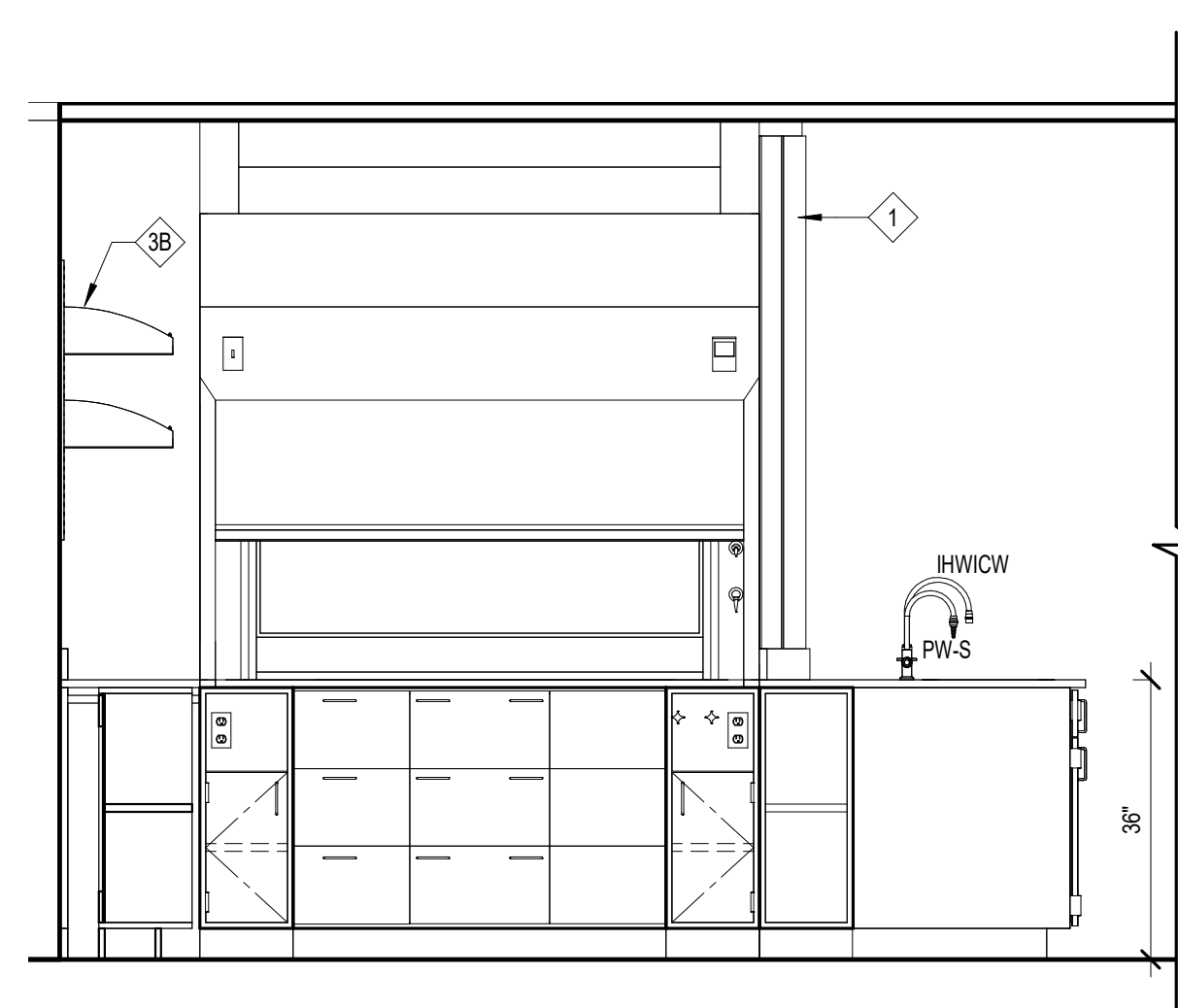
Mechanical  
AC Mechanical Engineering  
10747 E. Palm Court  
Tucson, AZ 85711  
Phone: 520.327.1611

Structural  
Miller Structural Engineering  
3028 N. Alamo Blvd. #100  
Tucson, AZ 85716  
Phone: 520.323.3422

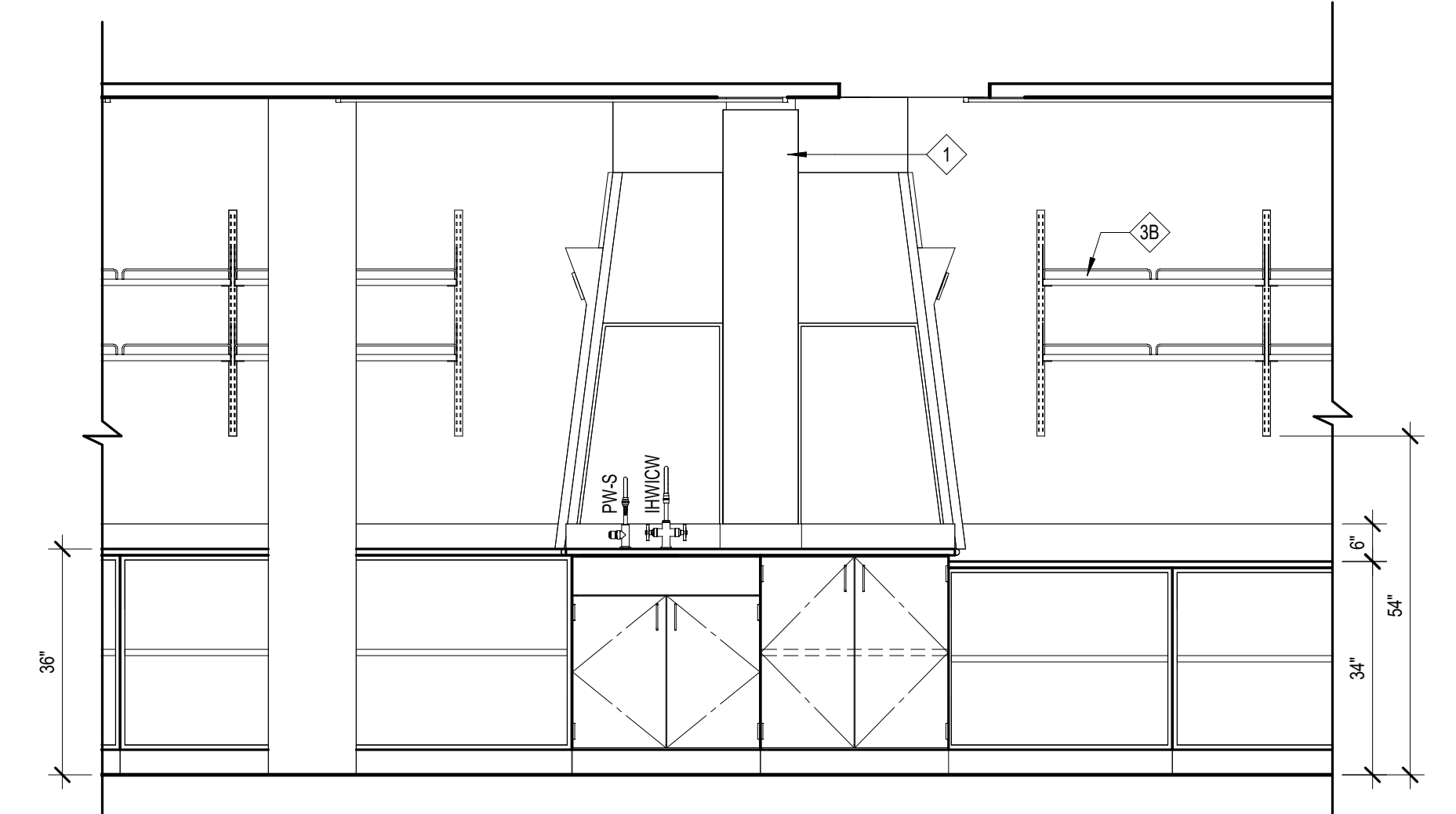
Electrical  
Mored Engineering, Inc.  
1292 E. Palm Court  
Tucson, AZ 85716  
Phone: 520.884.0045



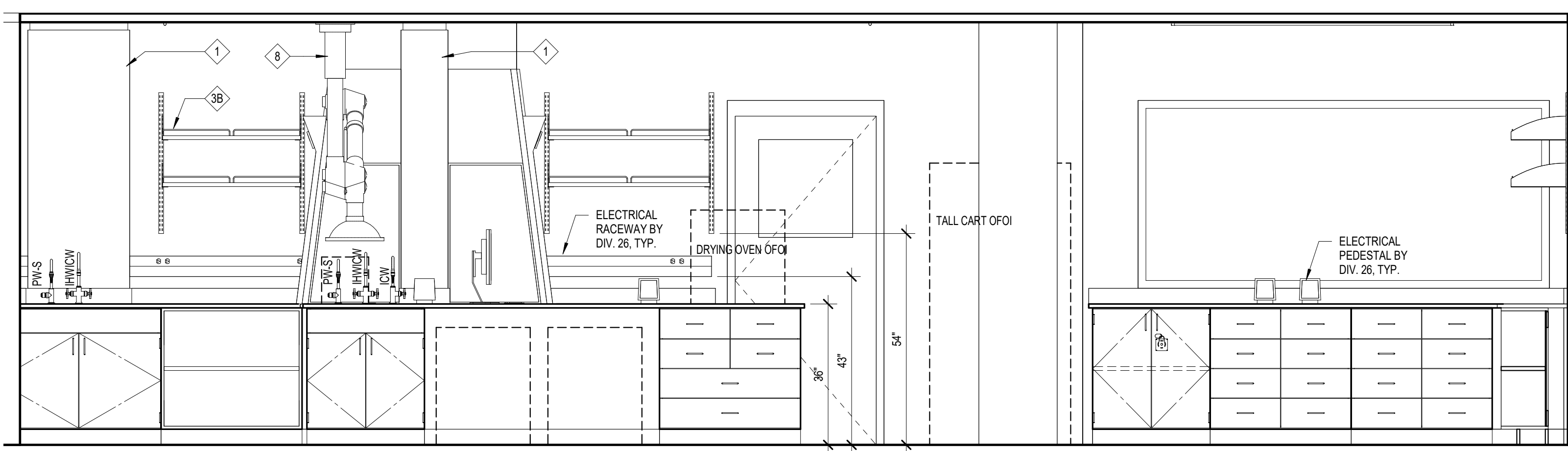
1 MICROBIOLOGY ISLAND BENCH  
1/2" = 1'-0"



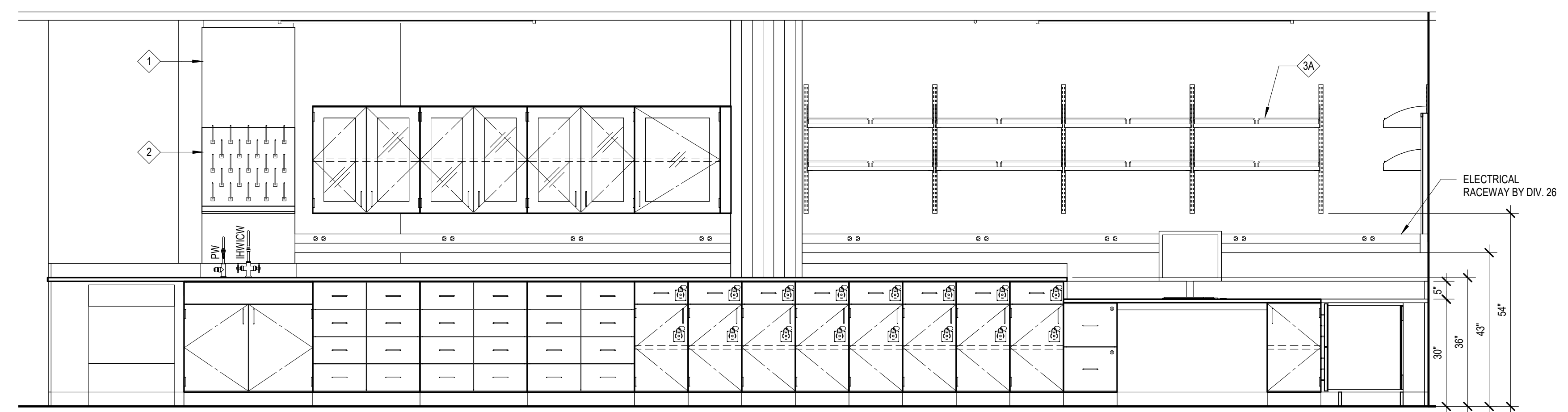
2 102\_ORGANIC CHEMISTRY LABORATORY\_2A  
1/2" = 1'-0"



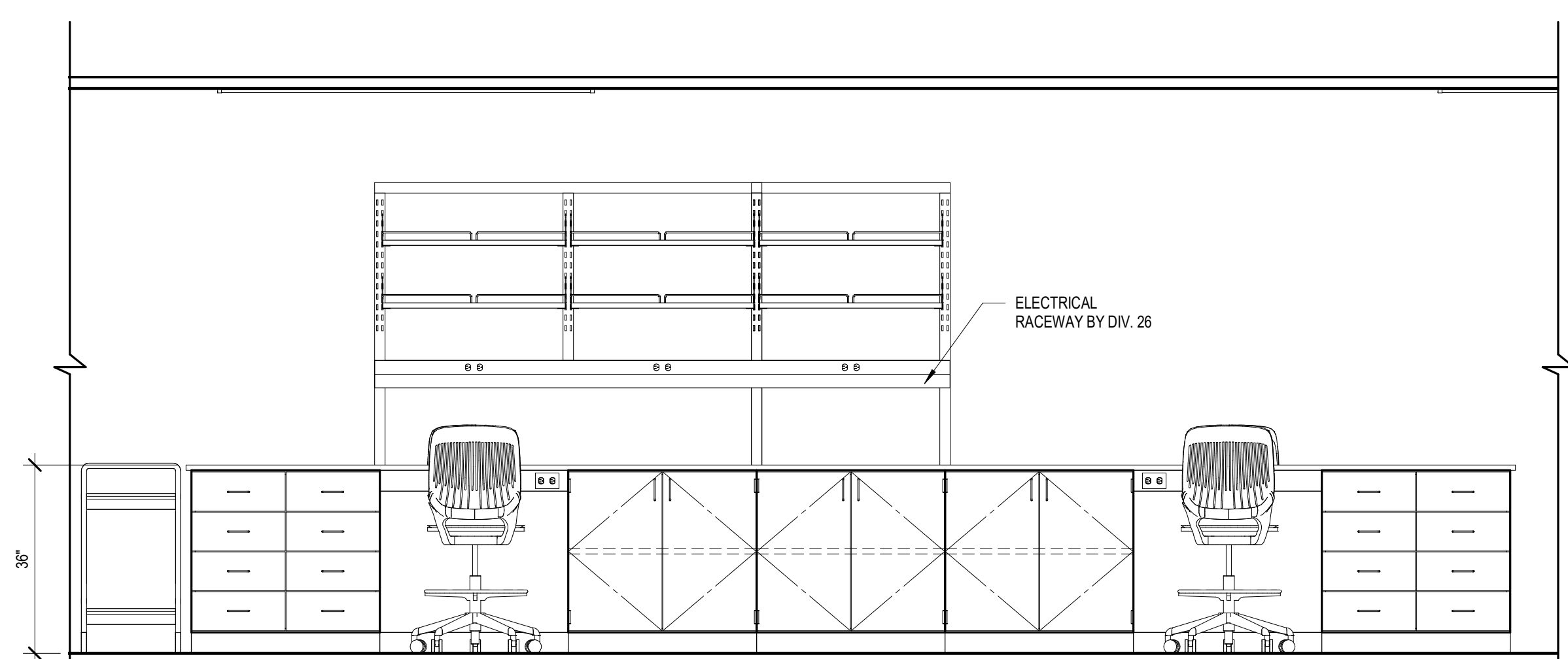
3 102\_ORGANIC CHEMISTRY LABORATORY\_2B  
1/2" = 1'-0"



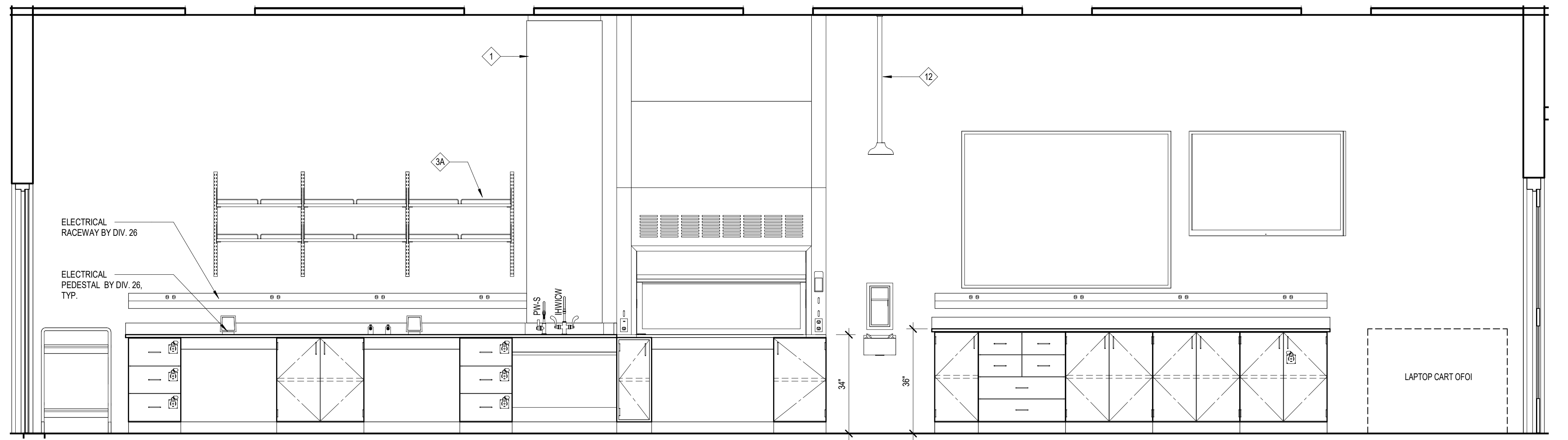
4 102\_ORGANIC CHEMISTRY LABORATORY\_1  
1/2" = 1'-0"



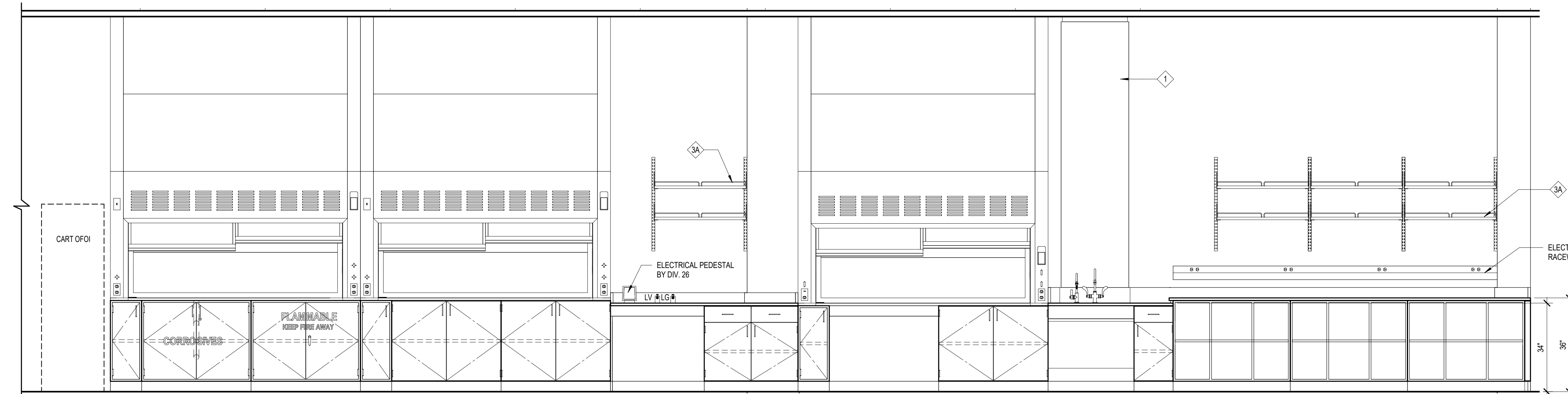
5 104\_PREPARATION ROOM  
1/2" = 1'-0"



6 112\_MICROBIOLOGY PREP  
1/2" = 1'-0"



7 204\_GENERAL CHEMISTRY LABORATORY  
1/2" = 1'-0"



8 205\_PREPARATION ROOM  
1/2" = 1'-0"

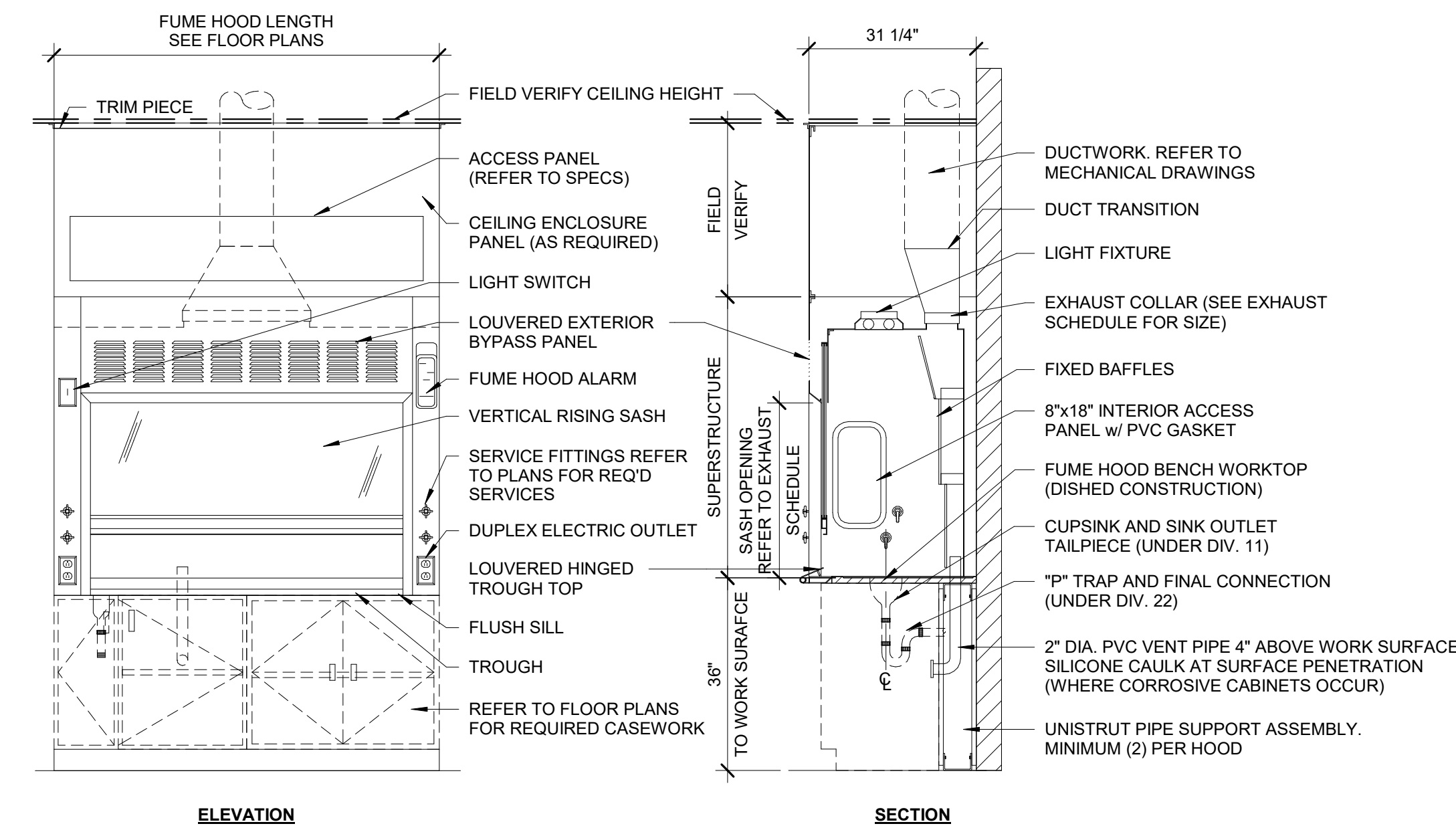
1/6/2021 2:59:27 PM



Drawn by: JRF  
Job No: 1931.000  
Date: 01/08/2020  
REVISIONS

**NOTES:**  
 1. FOR FUME HOOD PRE-PIPING REFER TO DETAIL (LF4.10)  
 2. FOR FUME HOOD SAFETY LABEL REFER TO DETAIL (LF4.10)  
 3. WATER FITTING REQUIRED TO ALIGN WITH CENTER OF CUP SINK. COORDINATE WITH FUME HOOD AND BENCHTOP MANUFACTURER.

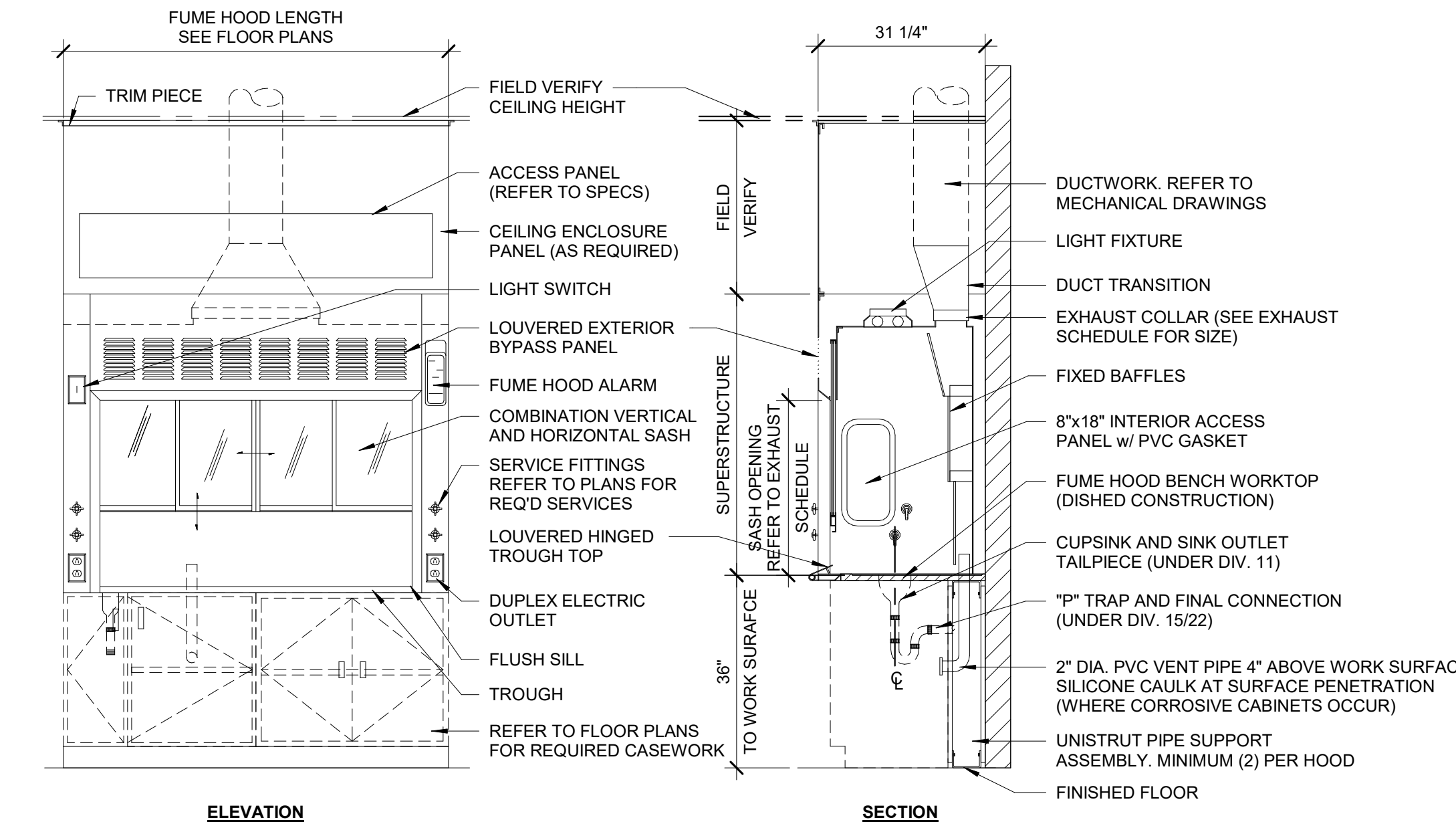
**NOTES:**  
 1. CUPSINK LOCATION VARIES. REFER TO LABORATORY FURNISHINGS PLANS FOR PLACEMENT.  
**NOTES:**  
 1. PROVIDE ALL NECESSARY CUT-OUTS AND PATHWAYS FOR THE CAMERA.



**.FUME HOOD - VERTICAL SASH** 1/2" = 1'-0" ①

**NOTES:**  
 1. FOR FUME HOOD PRE-PIPING REFER TO DETAIL (LF4.10)  
 2. FOR FUME HOOD SAFETY LABEL REFER TO DETAIL (LF4.10)  
 3. WATER FITTING REQUIRED TO ALIGN WITH CENTER OF CUP SINK. COORDINATE WITH FUME HOOD AND BENCHTOP MANUFACTURER.

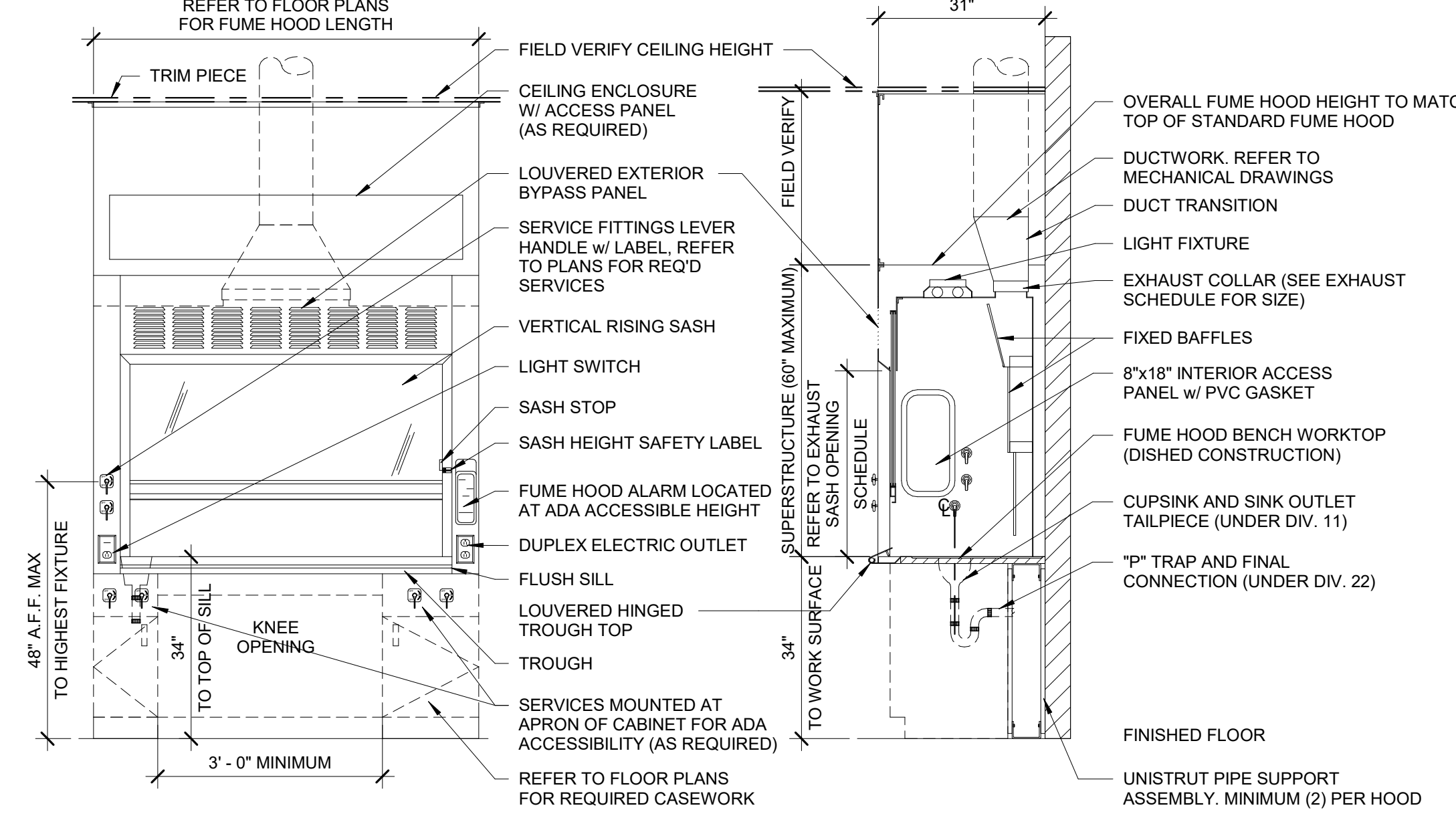
**NOTES:**  
 1. CUPSINK LOCATION VARIES. REFER TO LABORATORY FURNISHINGS PLANS FOR PLACEMENT.



**.FUME HOOD - COMBINATION SASH** 1/2" = 1'-0" ②

**NOTES:**  
 1. FOR FUME HOOD PRE-PIPING REFER TO DETAIL (LF4.10)  
 2. FOR FUME HOOD SAFETY LABEL REFER TO DETAIL (LF4.10)  
 3. WATER FITTING REQUIRED TO ALIGN WITH CENTER OF CUP SINK. COORDINATE WITH FUME HOOD AND BENCHTOP MANUFACTURER.

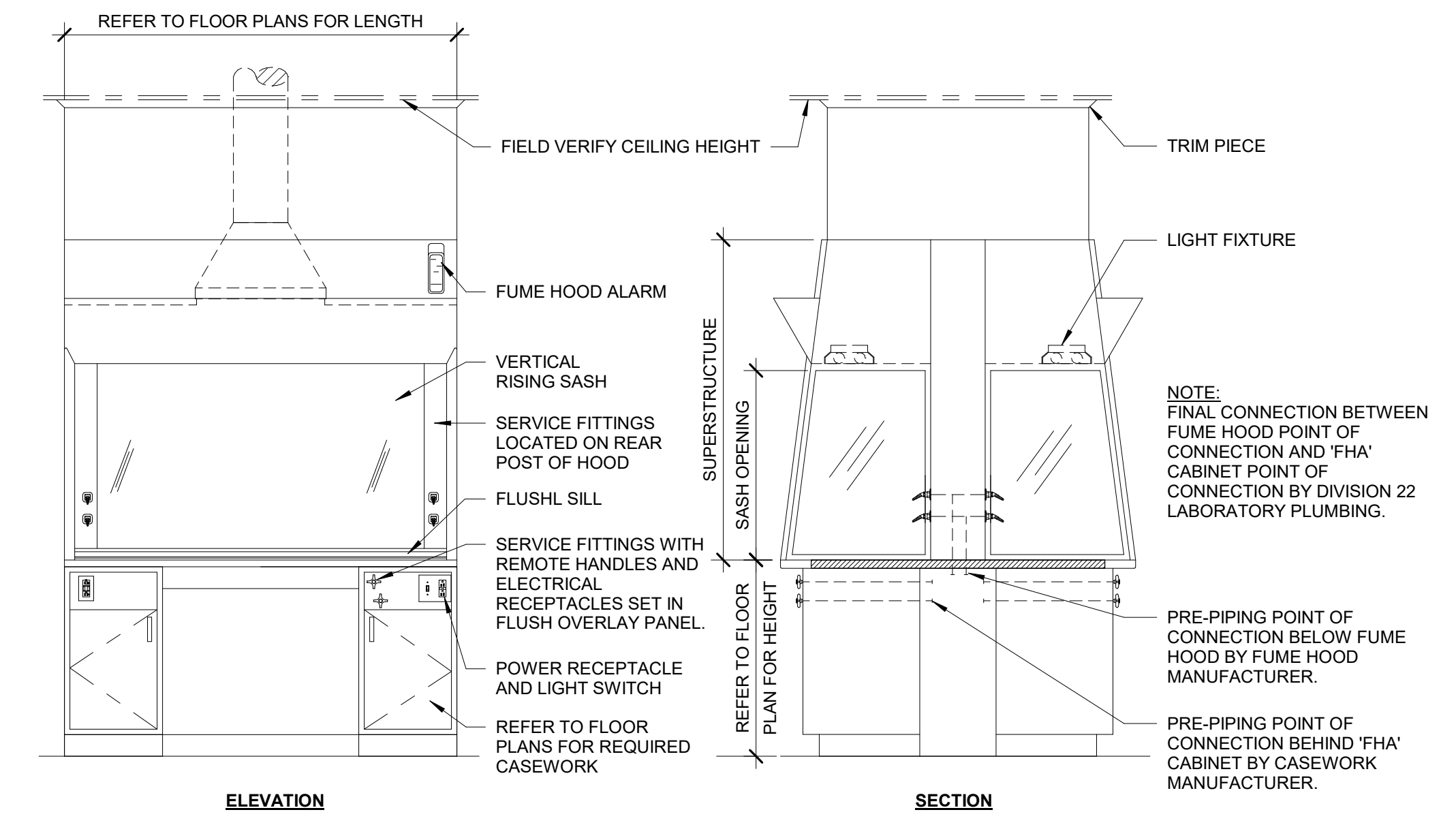
**NOTES:**  
 1. CUPSINK LOCATION VARIES. REFER TO LABORATORY FURNISHINGS PLANS FOR PLACEMENT.



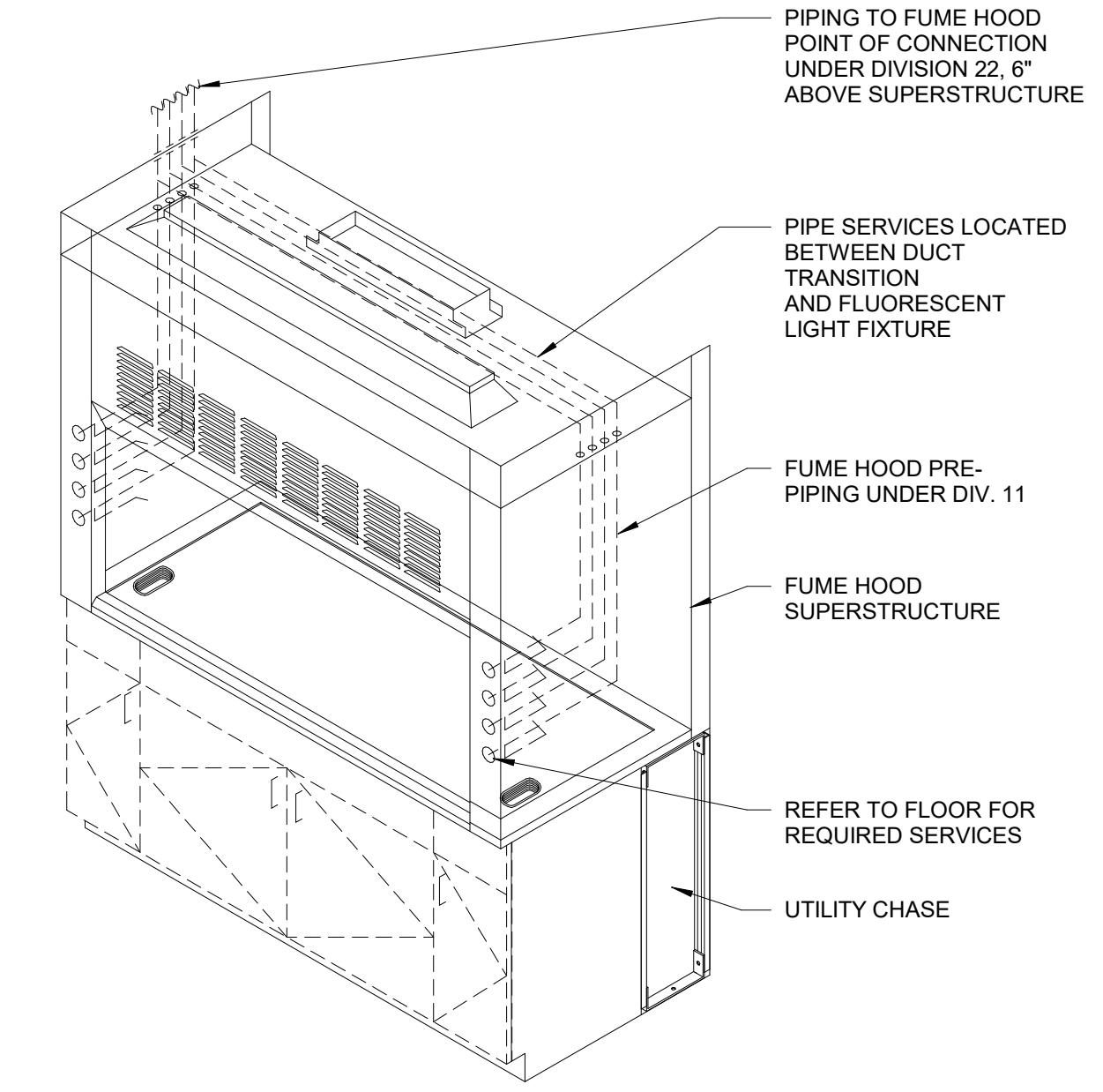
**.FUME HOOD - (ADA)** 1/2" = 1'-0" ③

**NOTES:**  
 1. FOR FUME HOOD SAFETY LABEL REFER TO DETAIL (LF4.10)

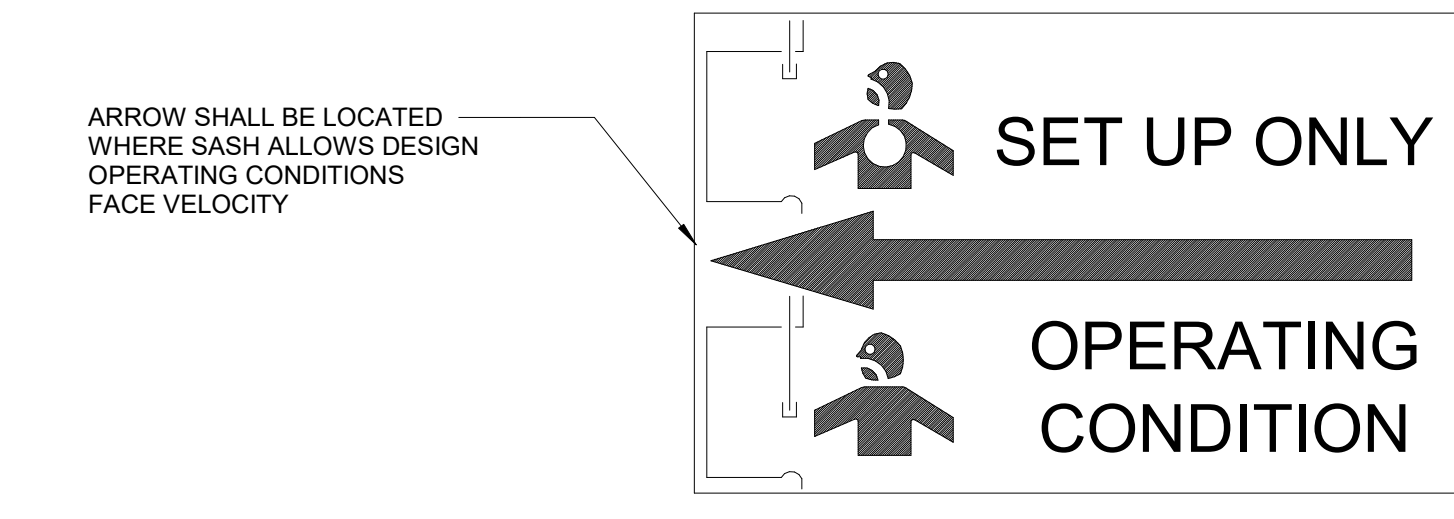
**NOTES:**  
 1. PROVIDE ALL NECESSARY CUT-OUTS AND PATHWAYS FOR THE CAMERA.



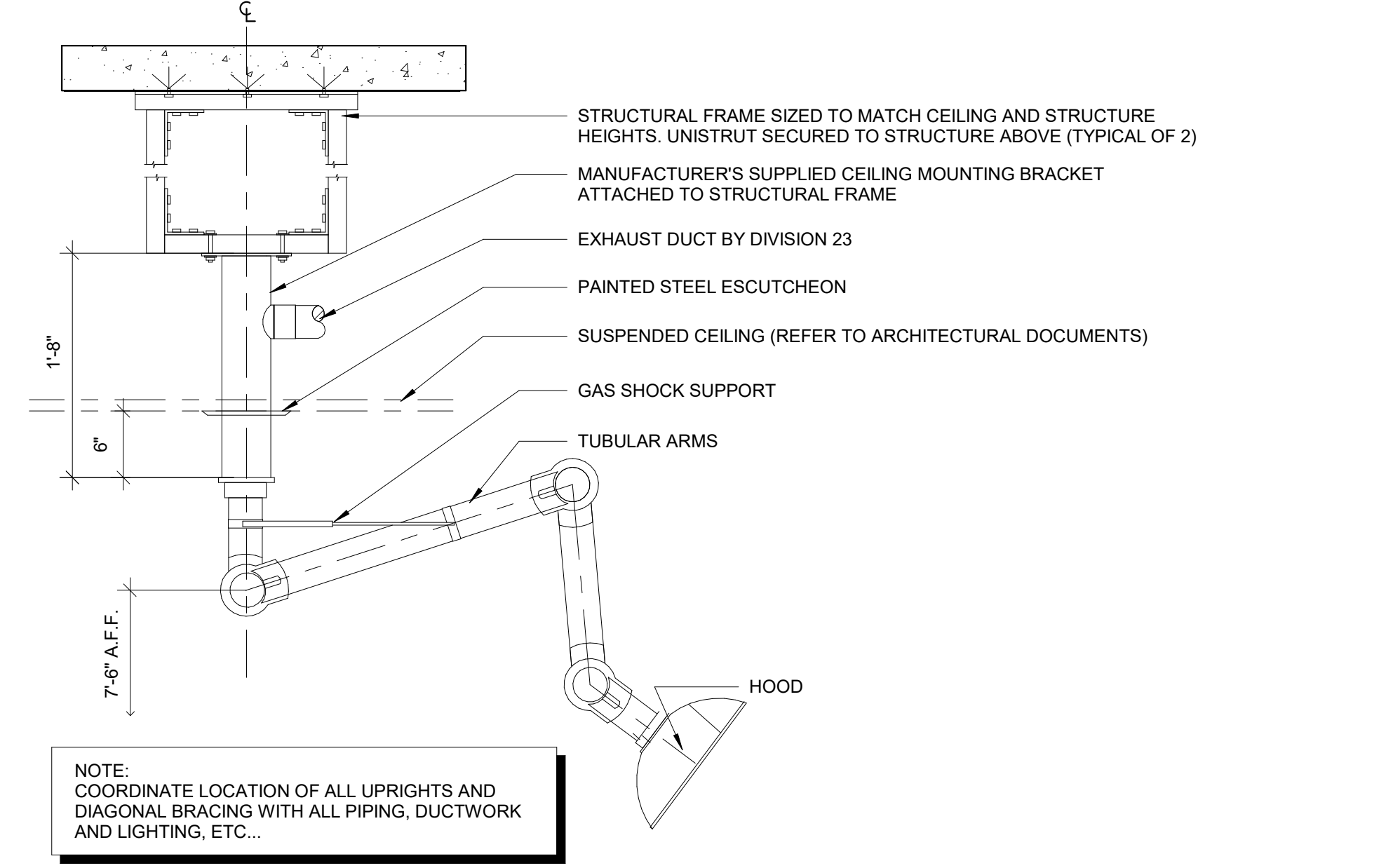
**.FUME HOOD - FULL-VIEW** 1/2" = 1'-0" ④



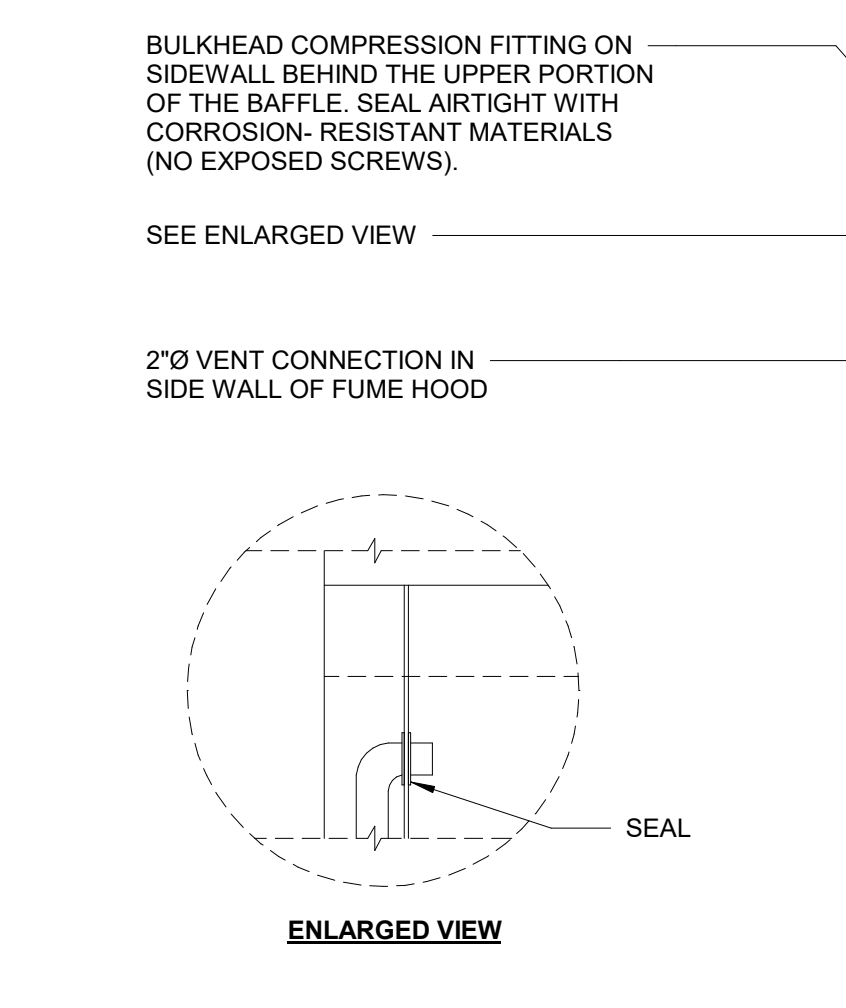
**.FUME HOOD - PRE-PIPING** 1/2" = 1'-0" ⑤



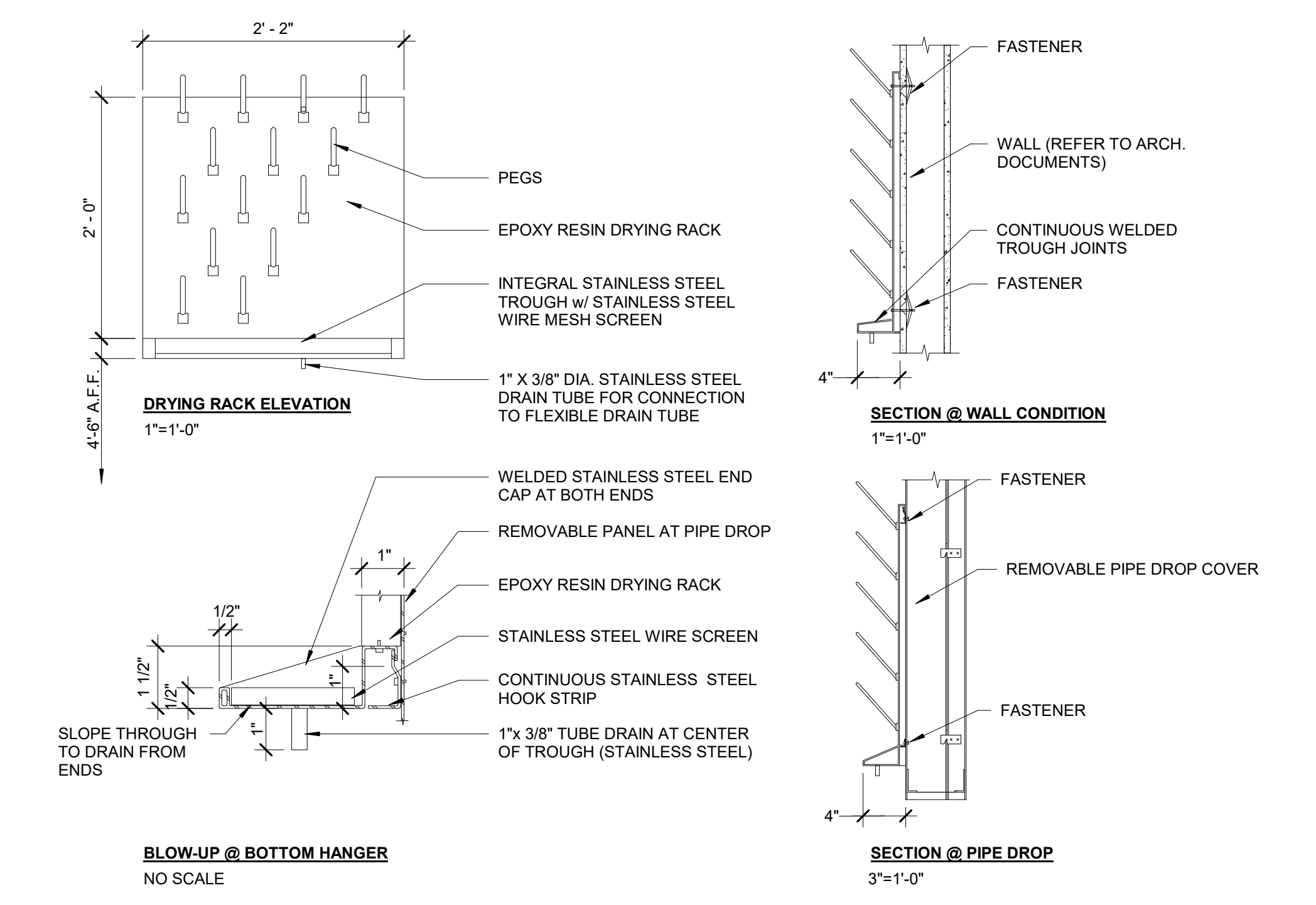
**.FUME HOOD - SAFETY LABEL** 1/2" = 1'-0" ⑥



**.SNORKEL - CEILING MOUNTED** 1" = 1'-0" ⑦



**.CS-CABINET VENTING** 1/2" = 1'-0" ⑧

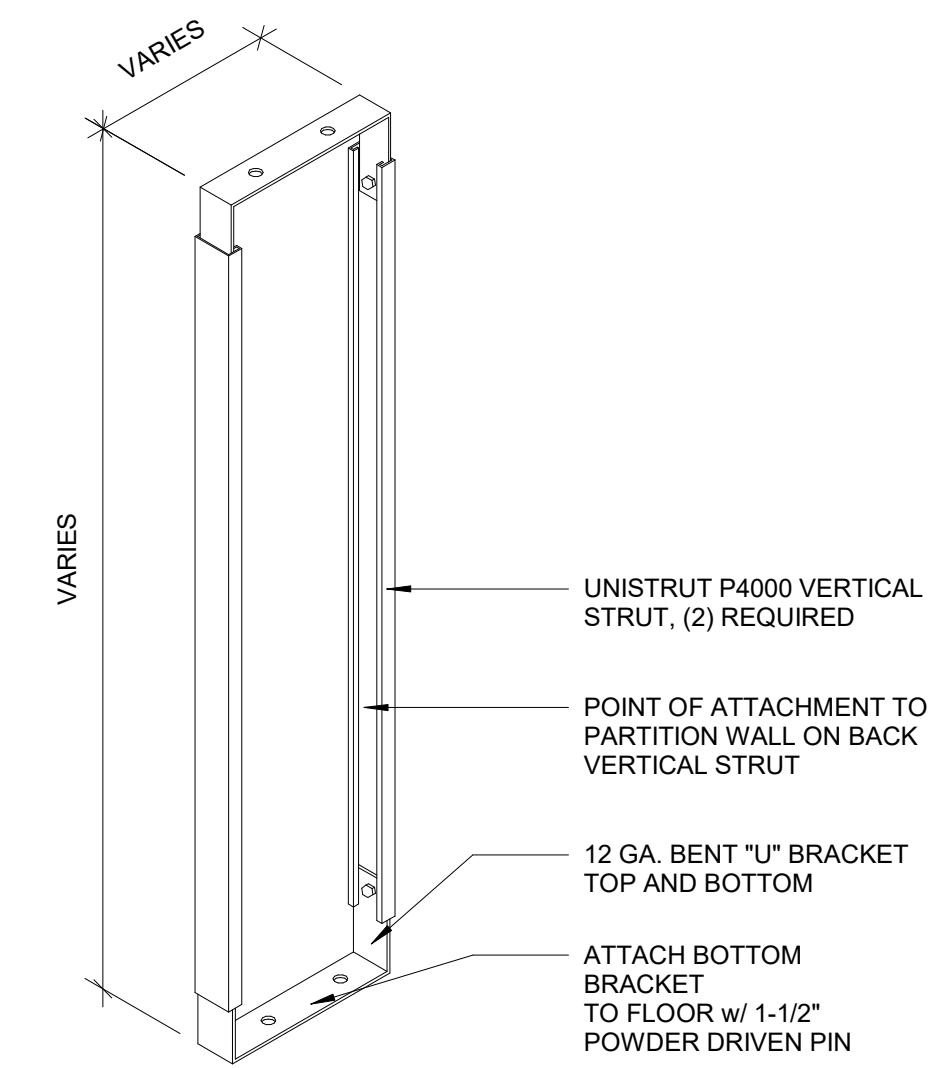
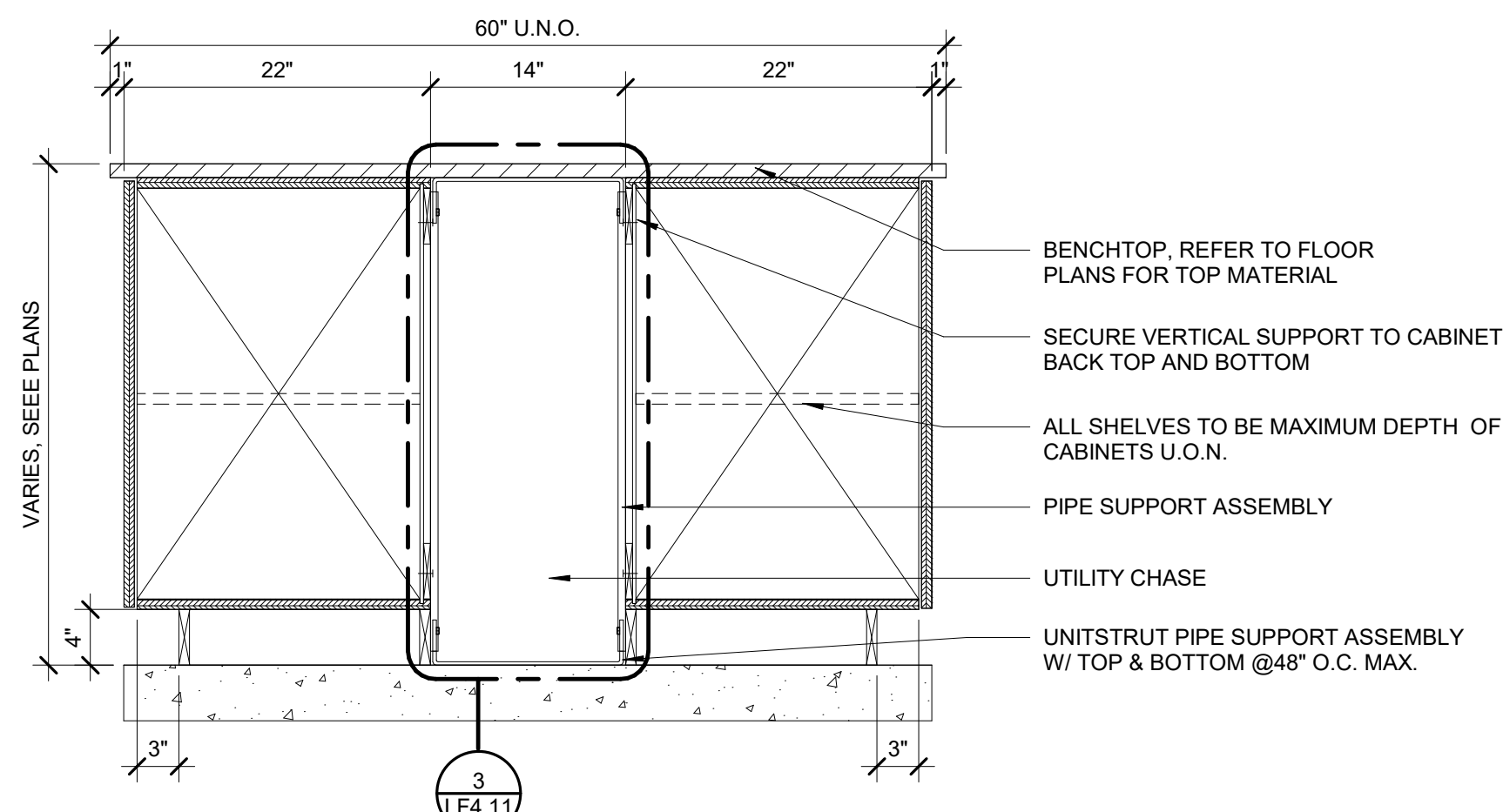
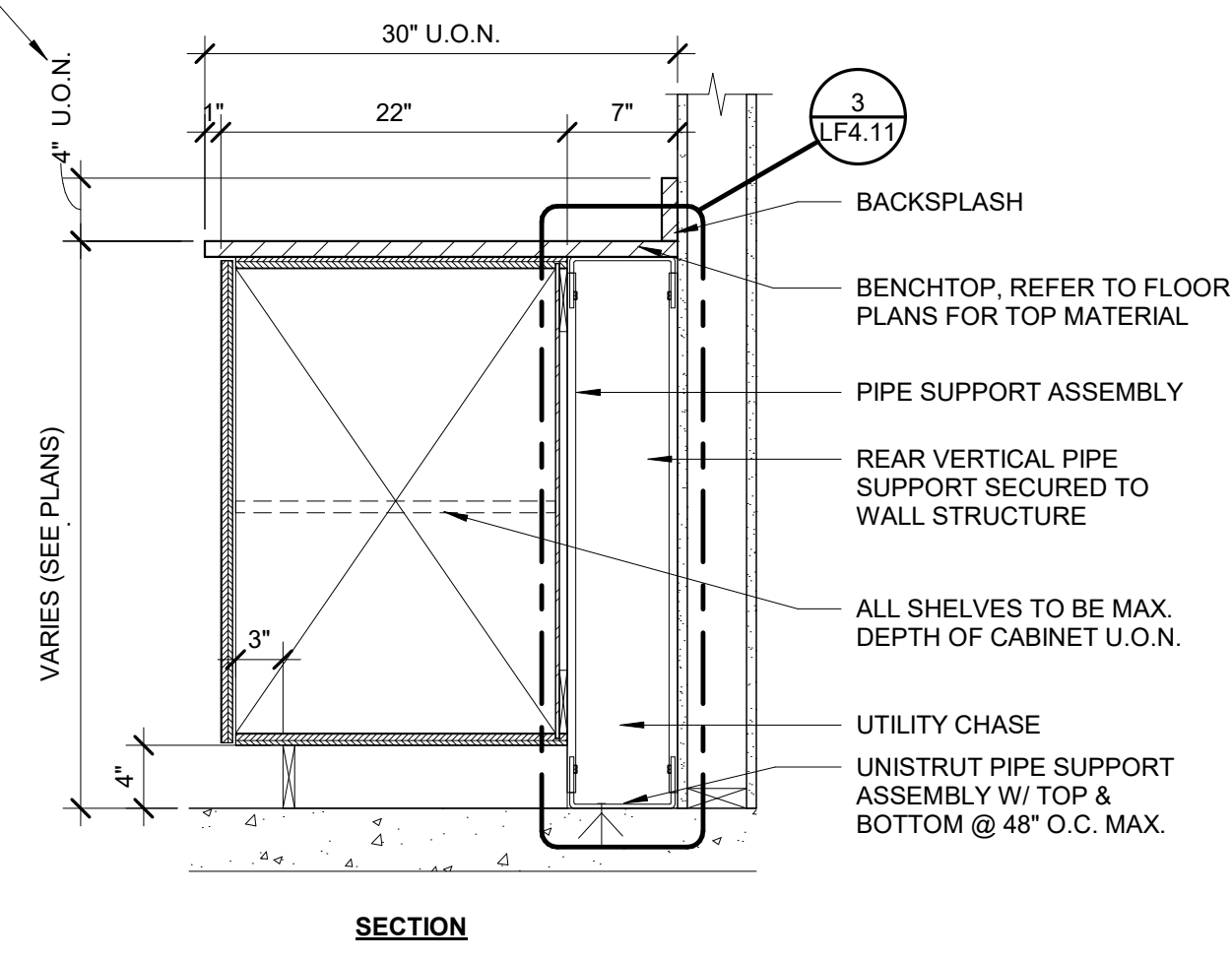


**.DRYING RACK - EPOXY** 1" = 1'-0" ⑨

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NOTE:  
BACKSPLASH HEIGHT VARIES  
AT BENCH TOP TRANSITIONS



.CONVENTIONAL CASEWORK - WALL BENCH

1" = 1'-0"

1

.CONVENTIONAL CASEWORK - ISLAND BENCH

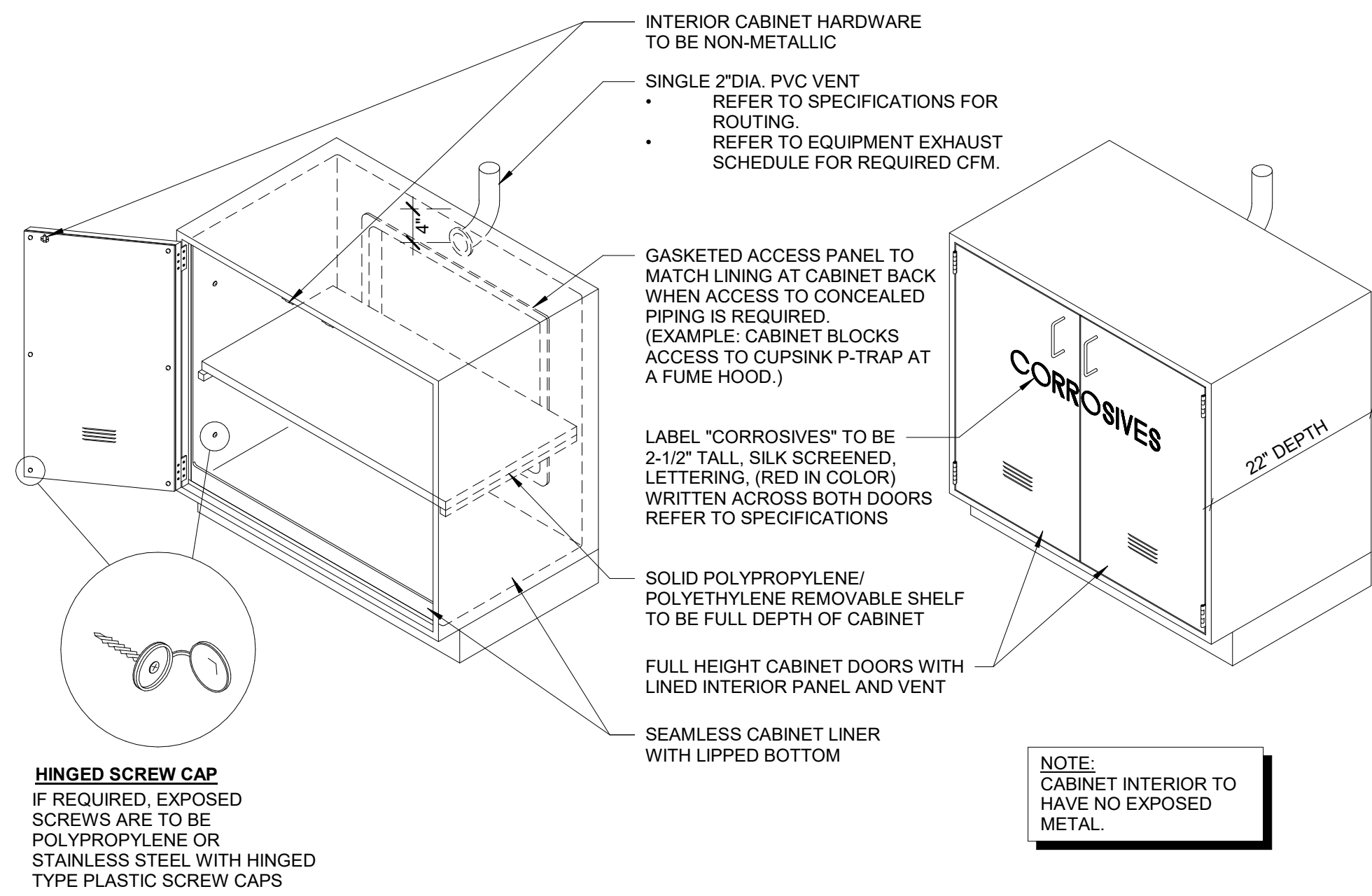
1" = 1'-0"

2

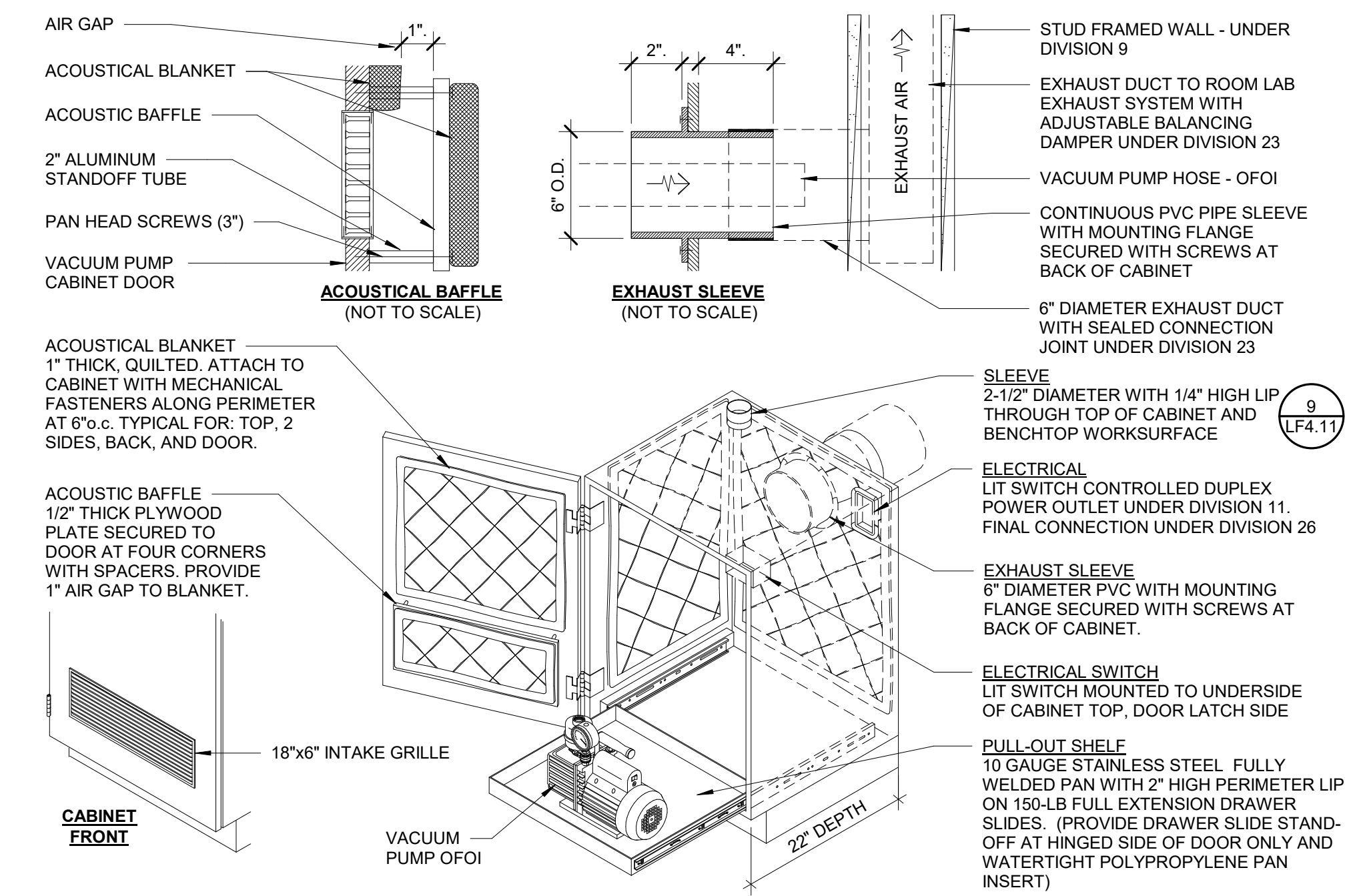
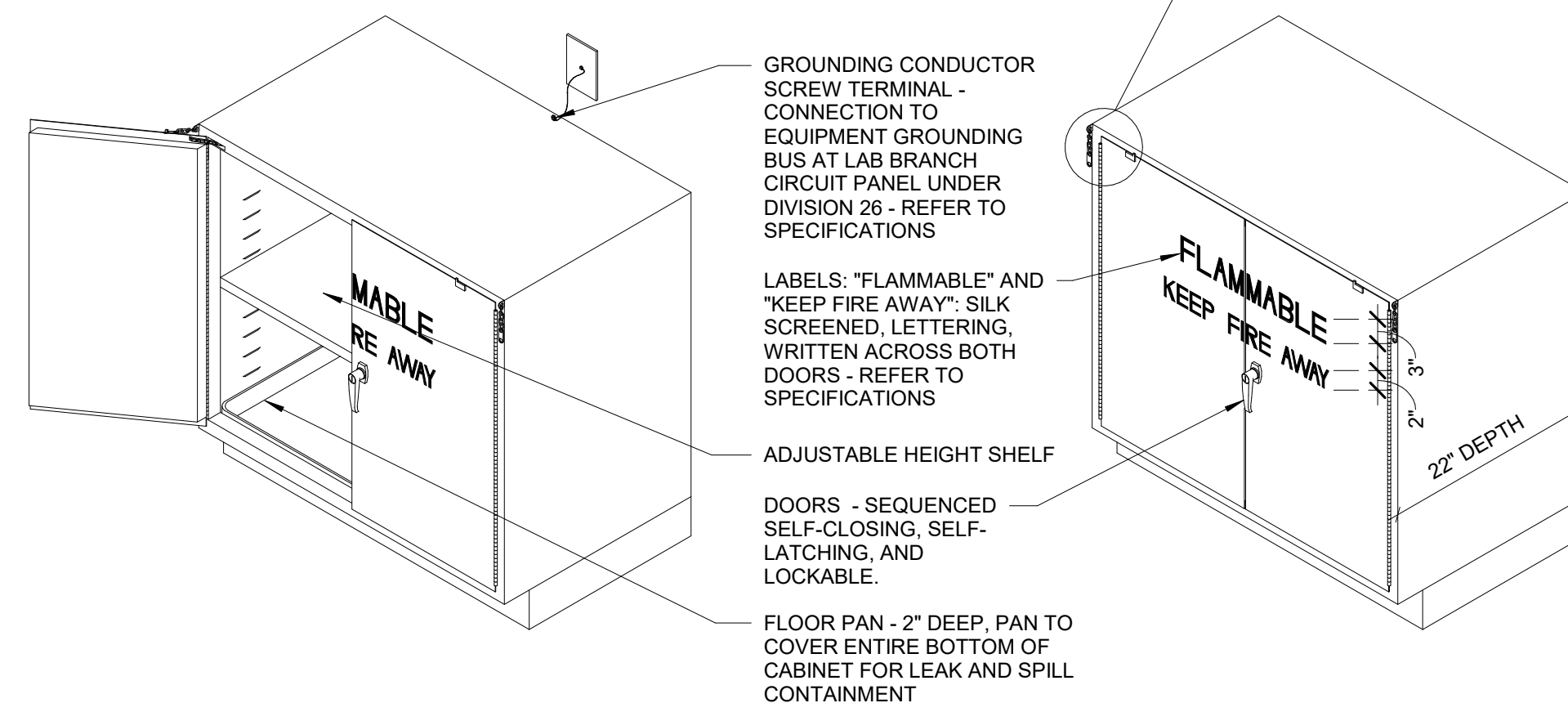
.UNISTRUT PIPE SUPPORT ASSEMBLY

1 1/2" = 1'-0"

3



NOTES:  
CABINET AND DOORS TO BE OF DOUBLE WALLED METAL CONSTRUCTION (U.O.N.)  
CABINET TO BE UL RATED - REFER TO SPECIFICATIONS FOR ADDITIONAL STANDARDS.  
DO NOT VENT CABINET. SEAL ALL VENTS WITH BUNGS AS PROVIDED BY MANUFACTURER.  
AT MOVABLE CABINETS PROVIDE LOCKABLE CASTERS AND SEISMIC ANCHOR - REFER TO SPECIFICATIONS.



.CORROSIVES STORAGE CABINET

3/4" = 1'-0"

4

.SOLVENTS STORAGE CABINET

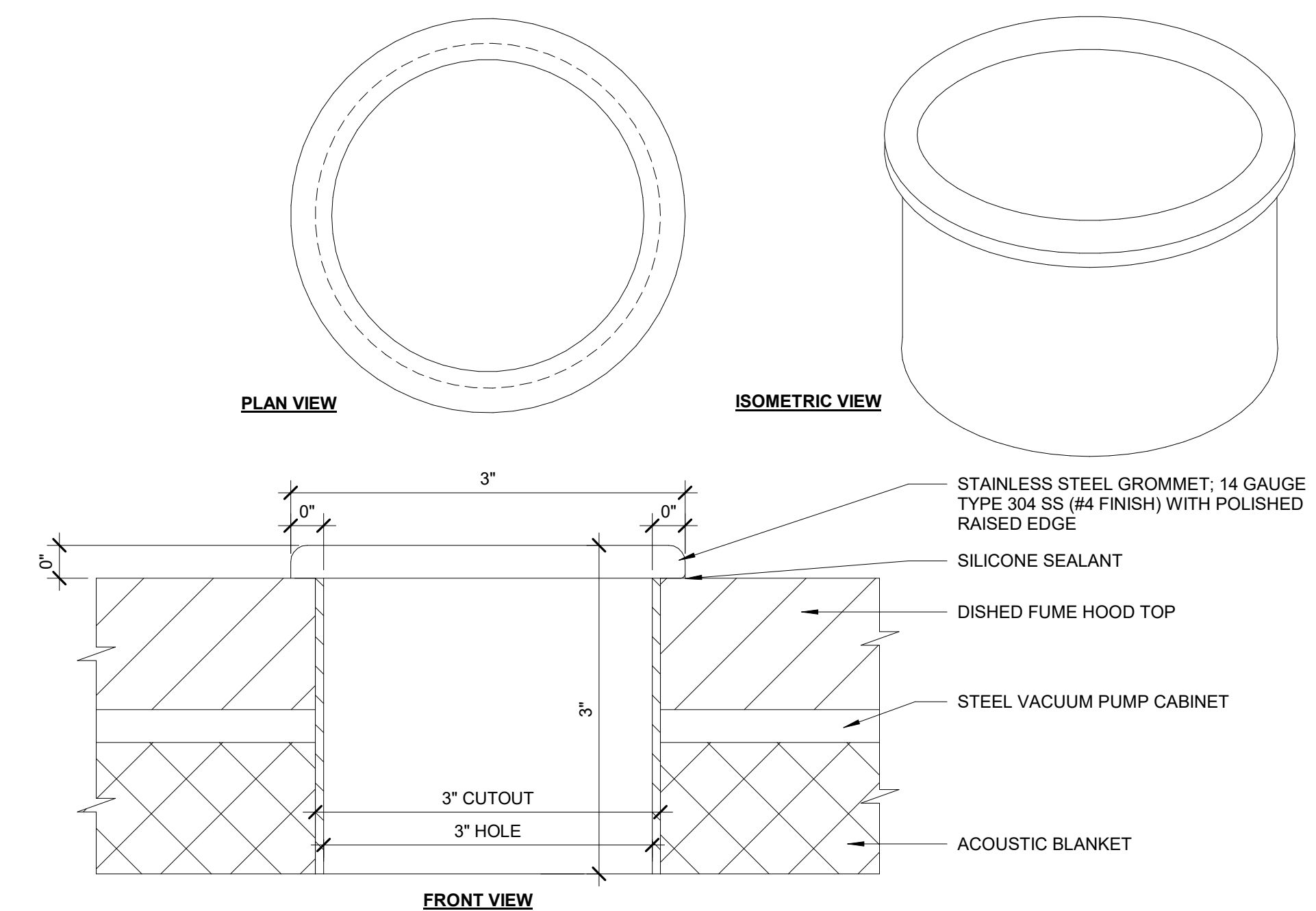
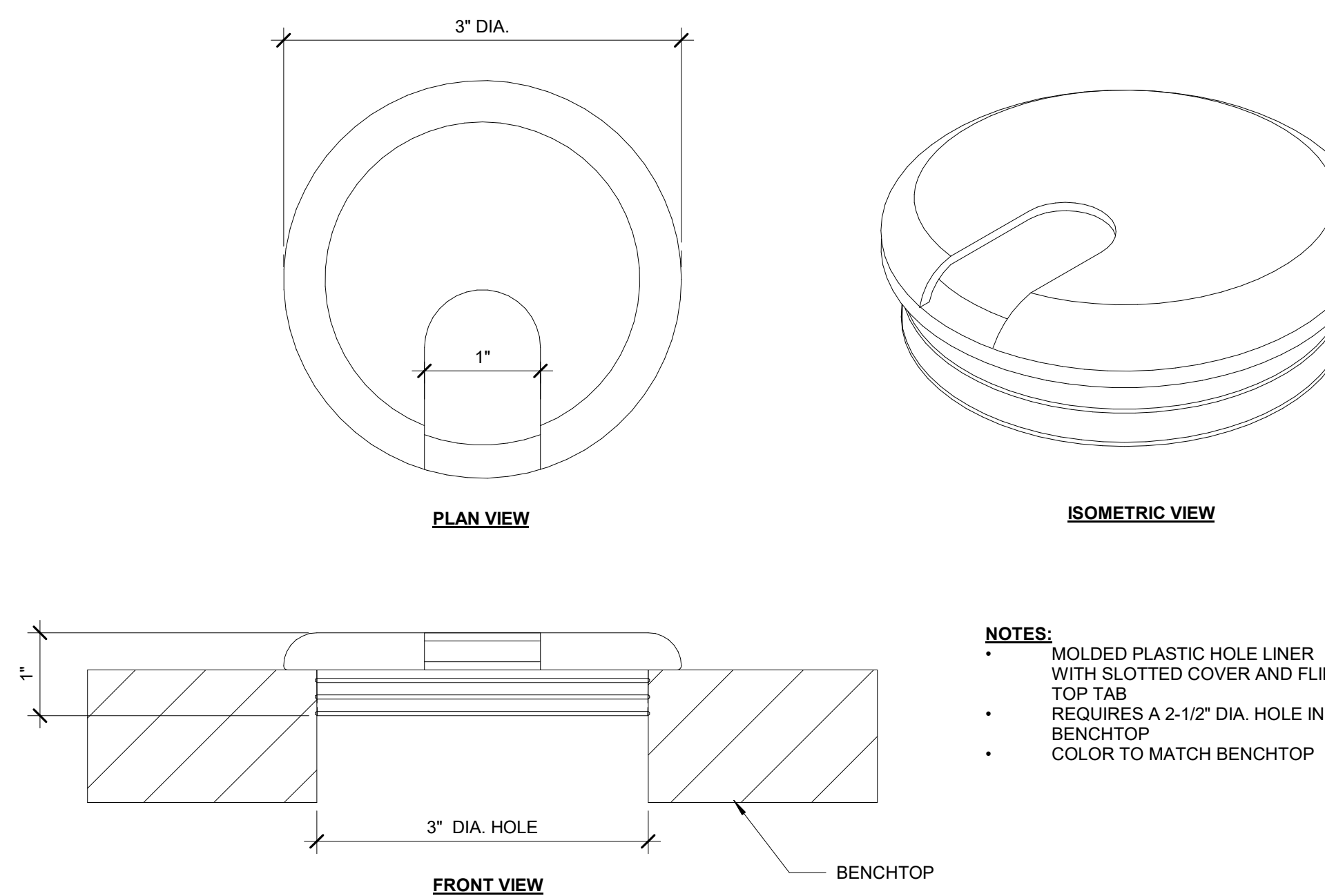
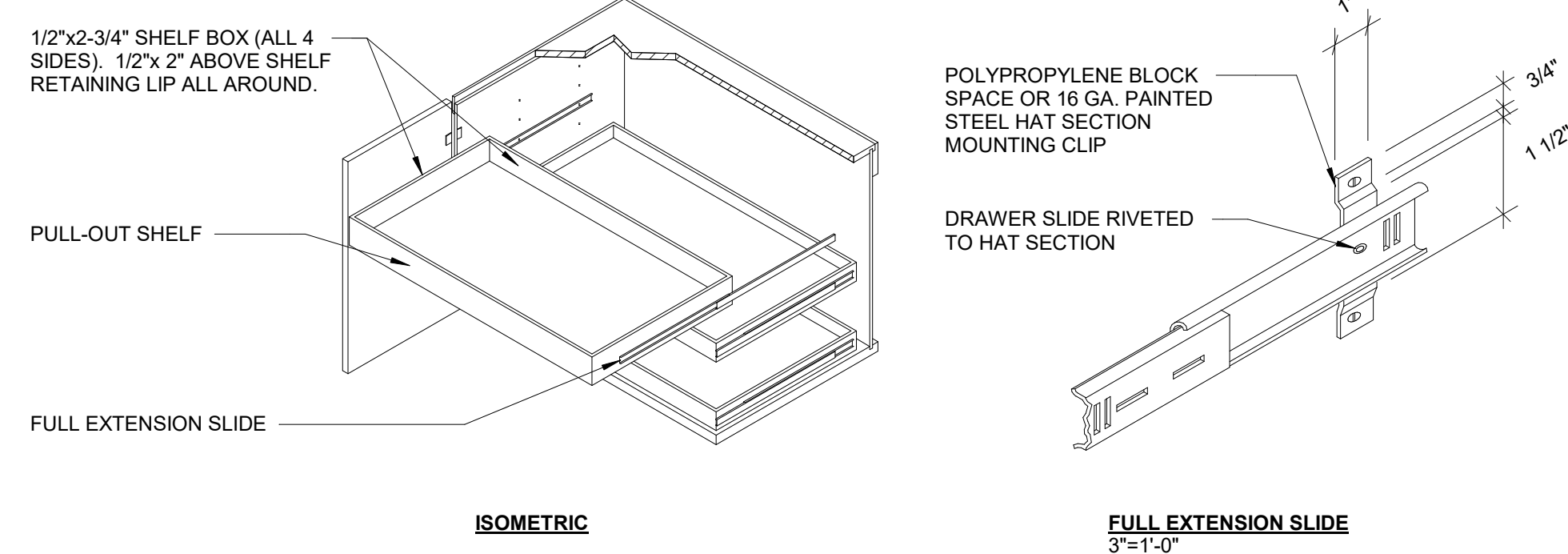
3/4" = 1'-0"

5

.VACUUM PUMP CABINET

3/4" = 1'-0"

6



.PULL-OUT SHELF

1/2" = 1'-0"

7

.BENCHTOP GROMMET

12" = 1'-0"

8

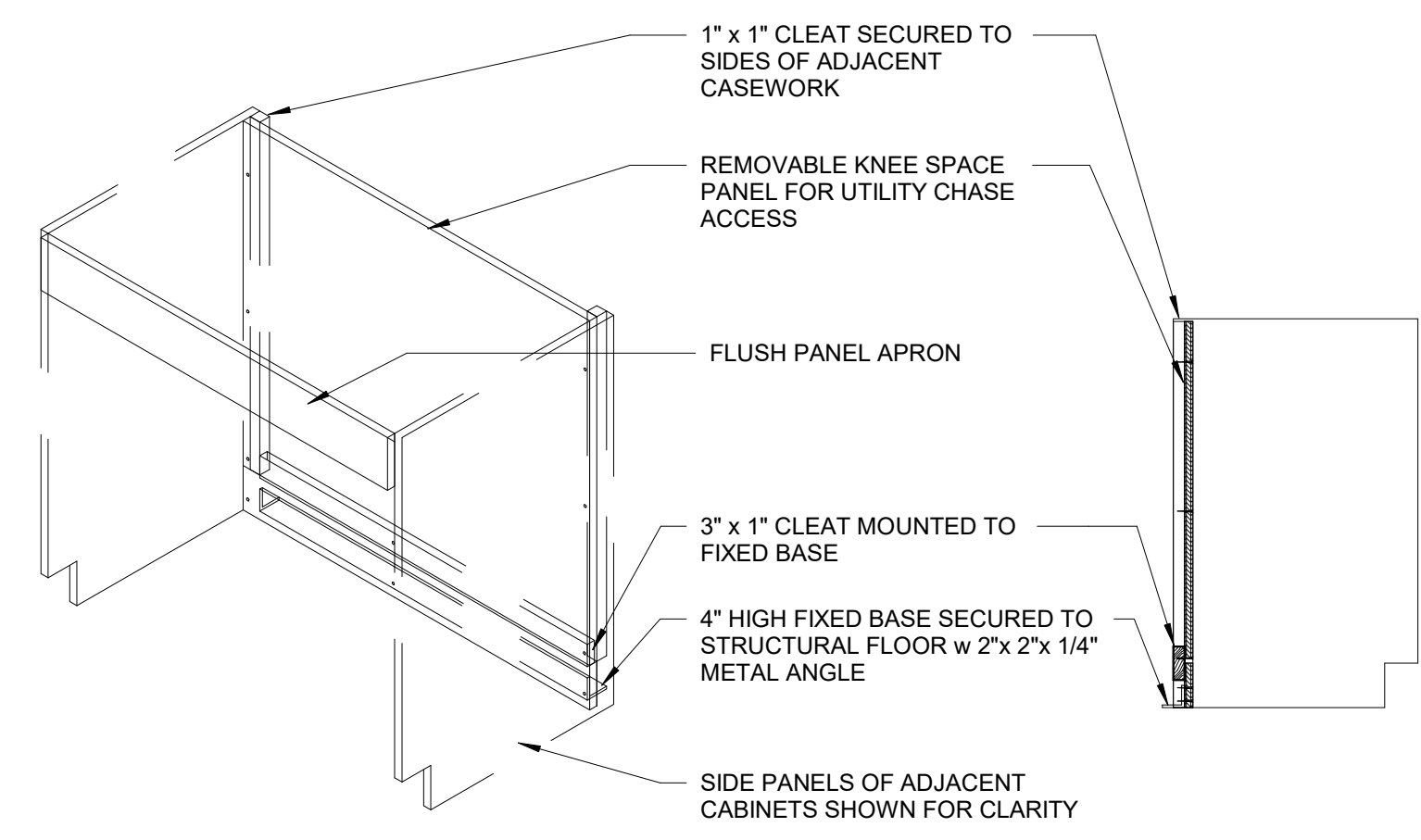
.SLEEVE - AT VACUUM PUMP

12" = 1'-0"

9

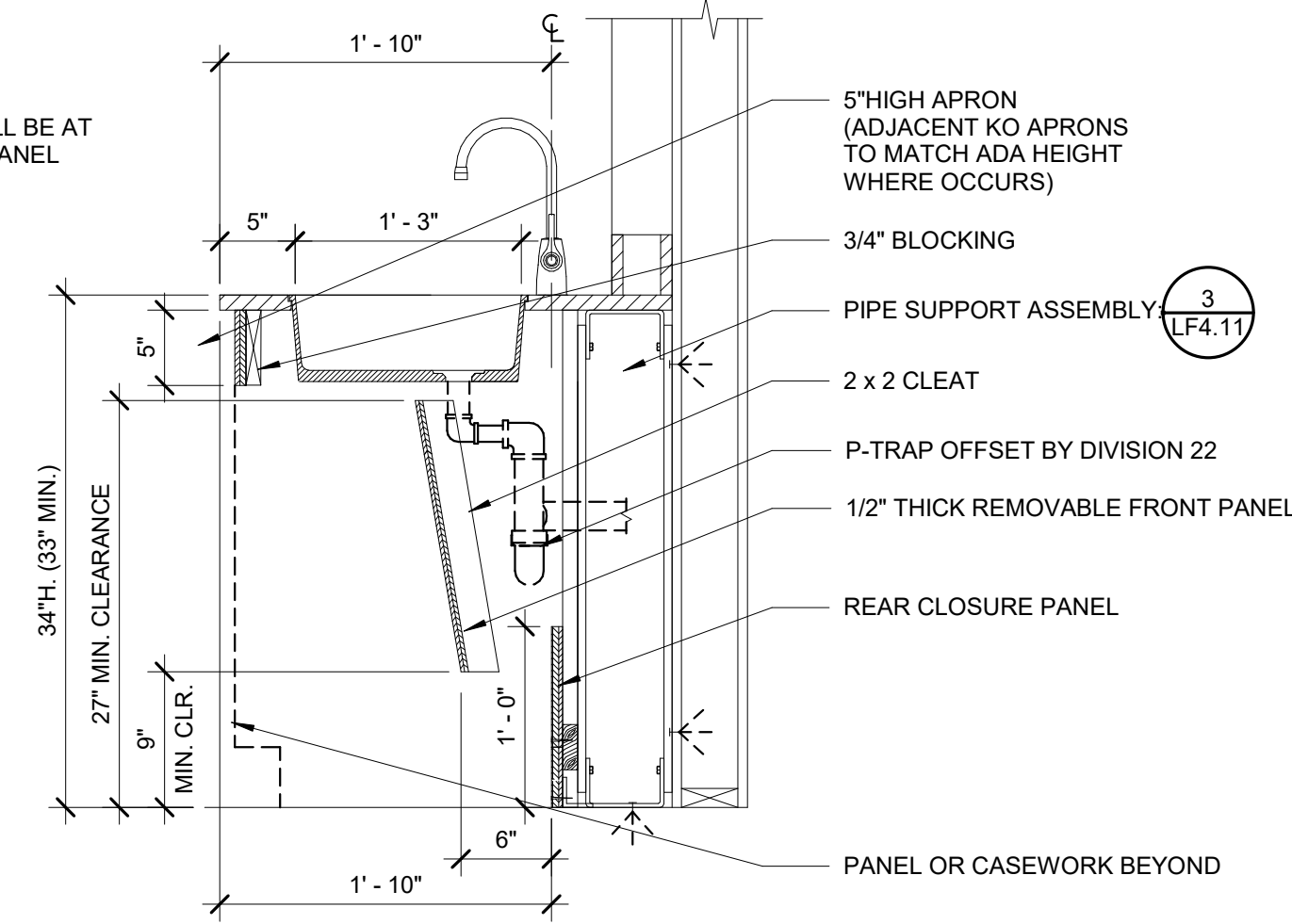
1/6/2021, 2:59:35 PM





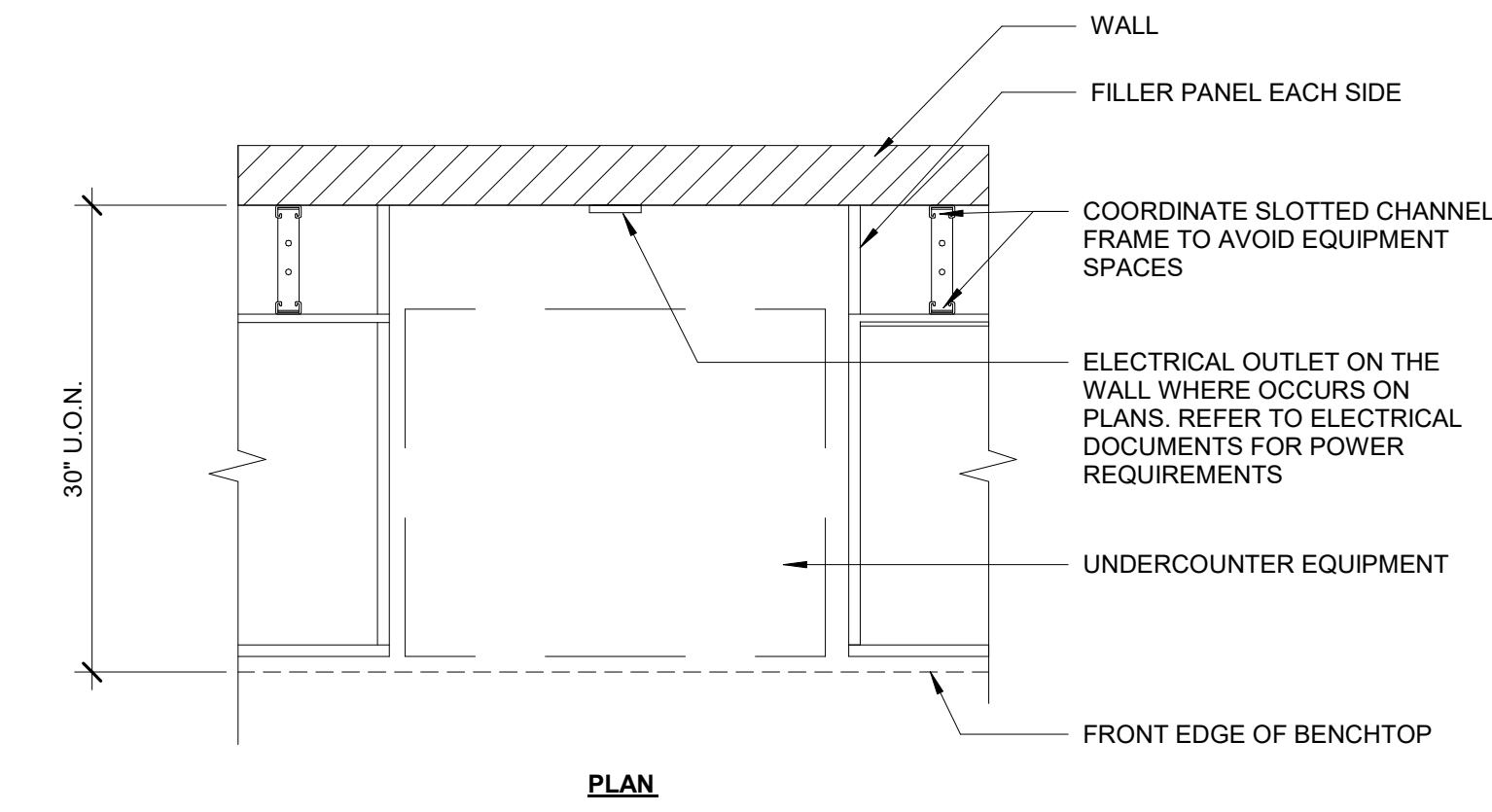
**.KNEE OPENING - REAR PANEL**

3/4" = 1'-0" 1



**.KNEE OPENING - AT ADA SINK**

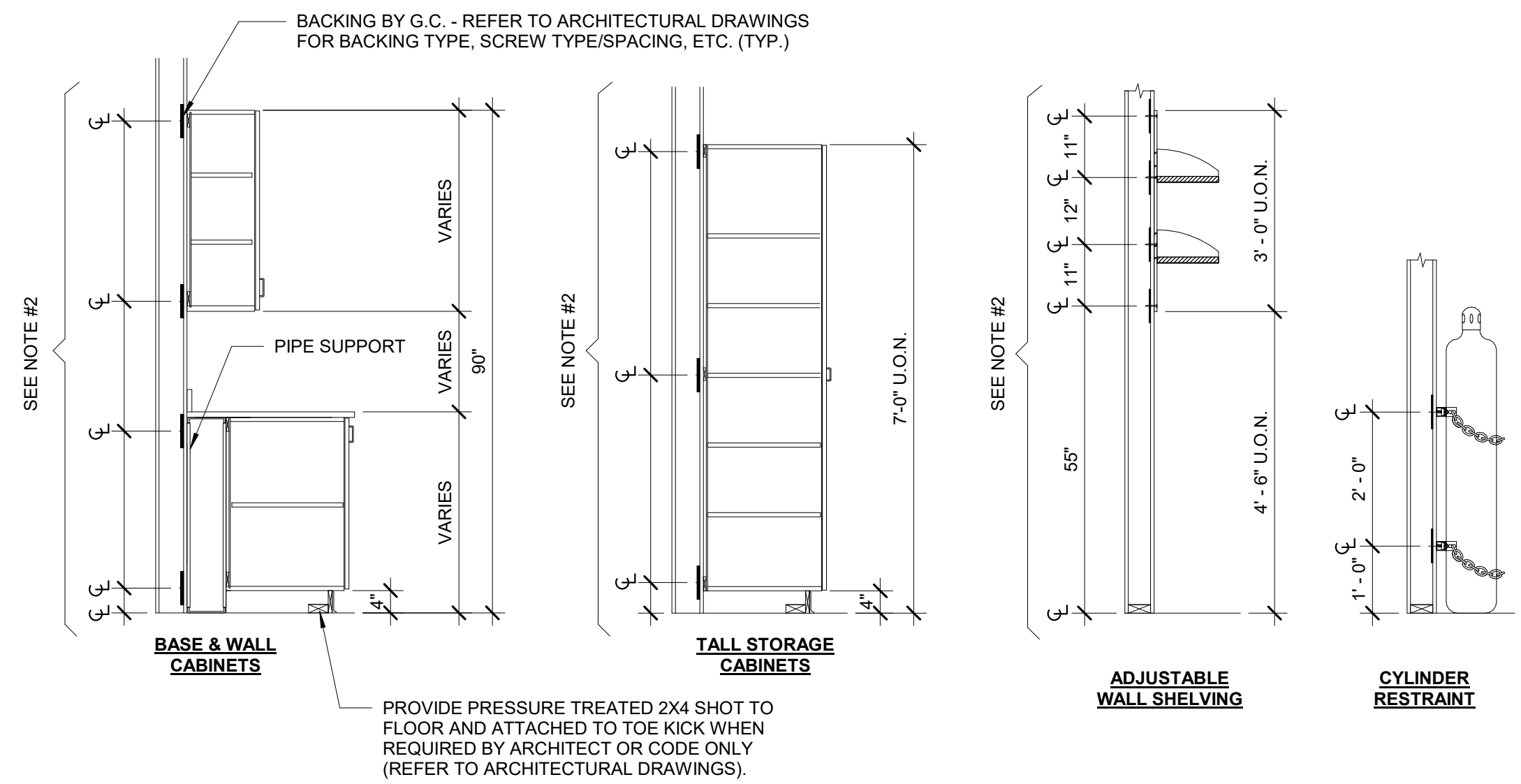
1" = 1'-0" 2



**.KNEE OPENING - AT EQUIPMENT**

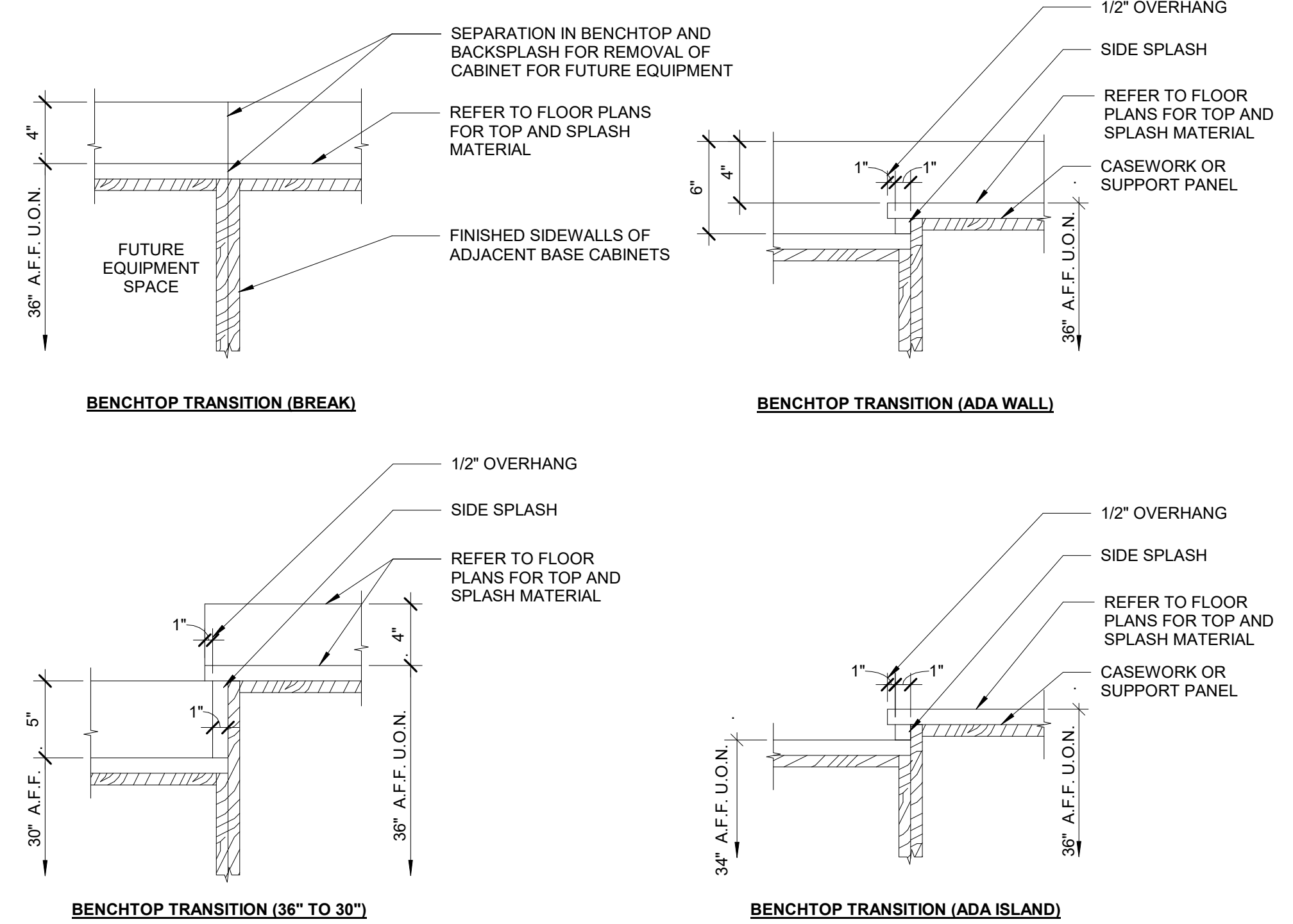
1" = 1'-0" 3

**BACKING / ANCHORAGE NOTES:**  
 1. SEE ARCHITECTURAL DRAWINGS FOR ANCHORAGE REQUIREMENTS.  
 2. BACKING HEIGHTS TO BE SUBMITTED BY CASEWORK SUPPLIER FOR COORDINATION WITH OTHER TRADES.  
 3. REFER TO ARCHITECTURAL DRAWINGS FOR WALL TYPES & SUBMIT ALTERNATE ANCHORAGE METHODS FOR CMU, BLOCK WALL, ETC.



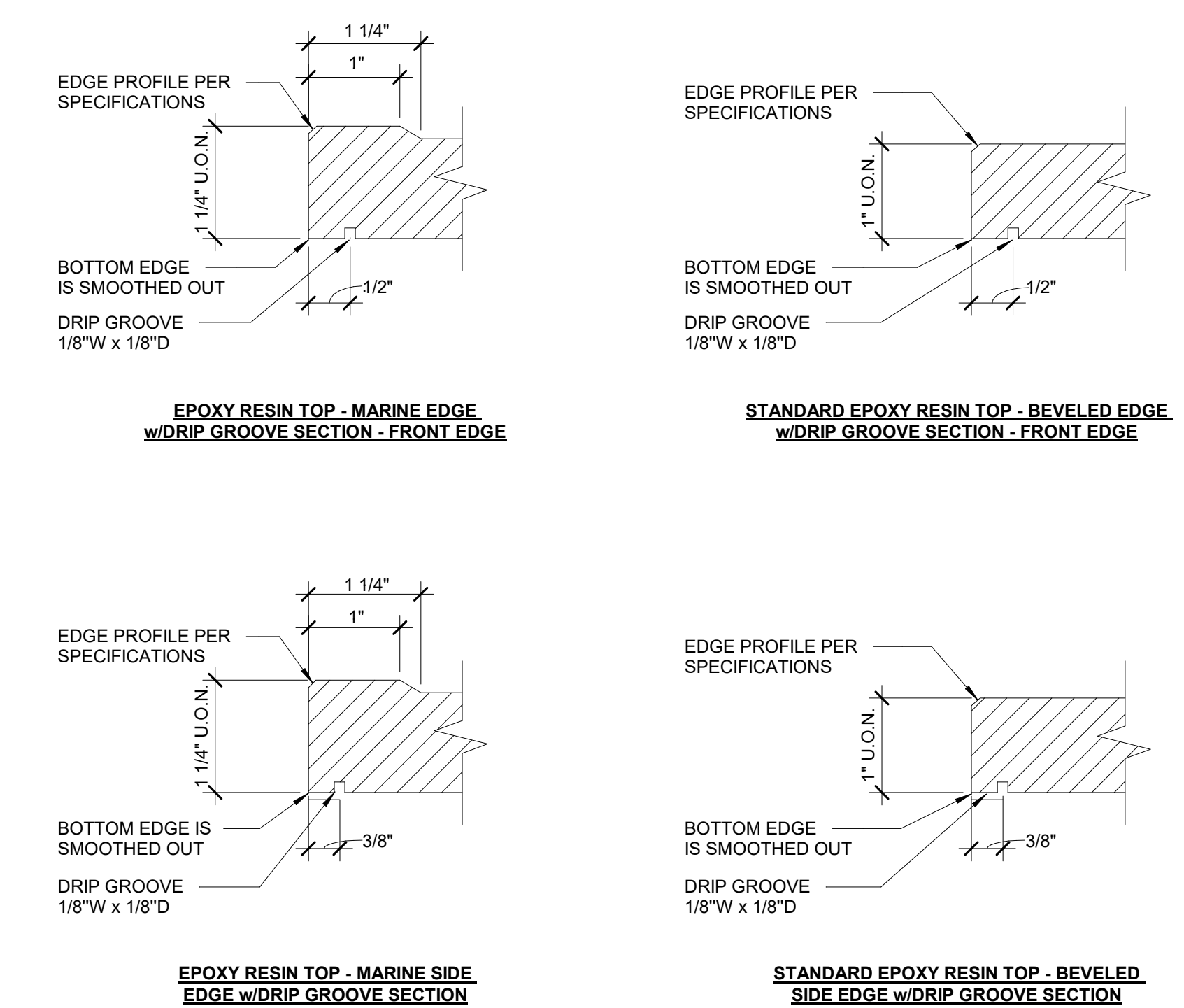
**.BACKING HEIGHTS**

1/2" = 1'-0" 4



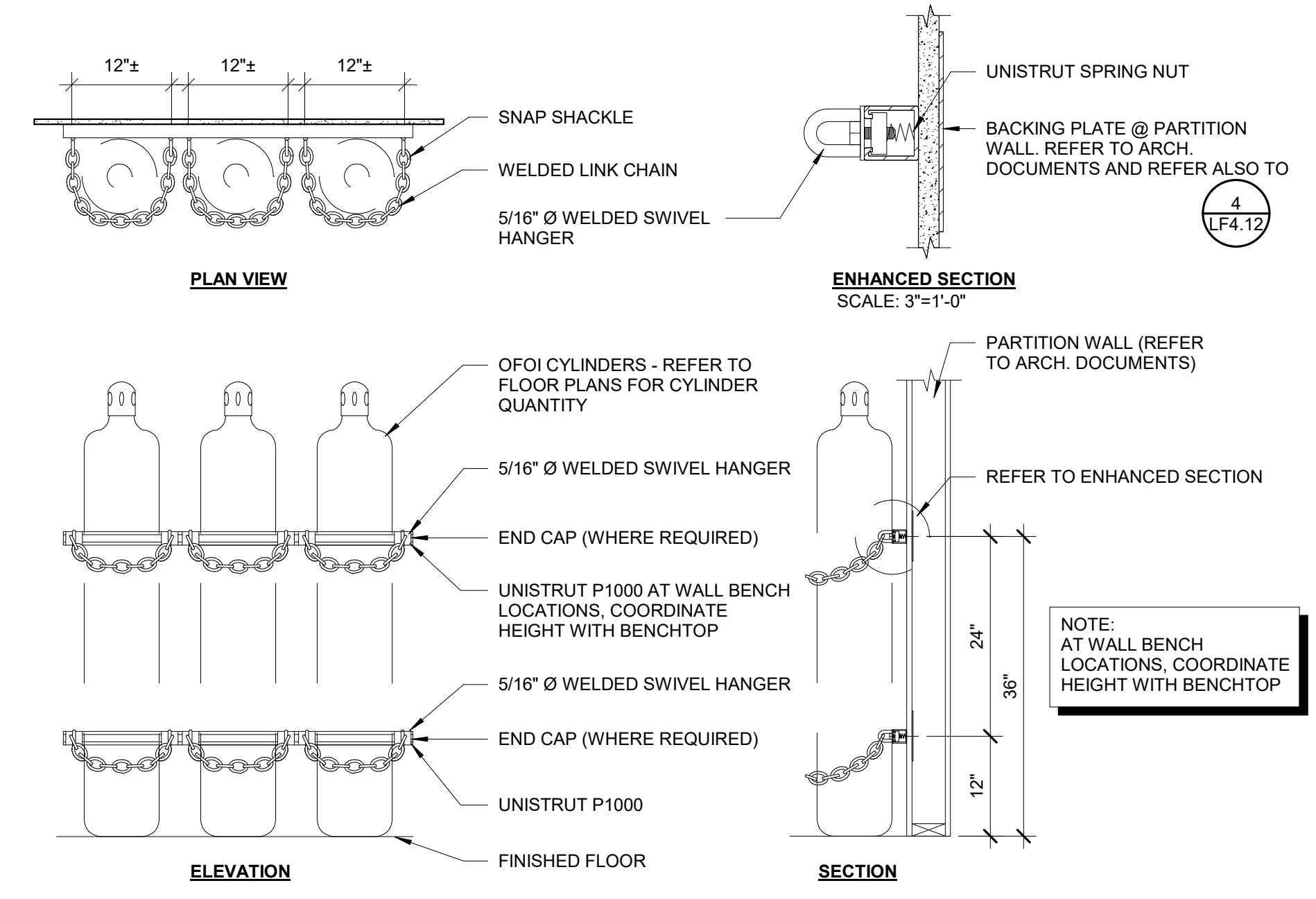
**.BENCHTOP TRANSITIONS**

1 1/2" = 1'-0" 5



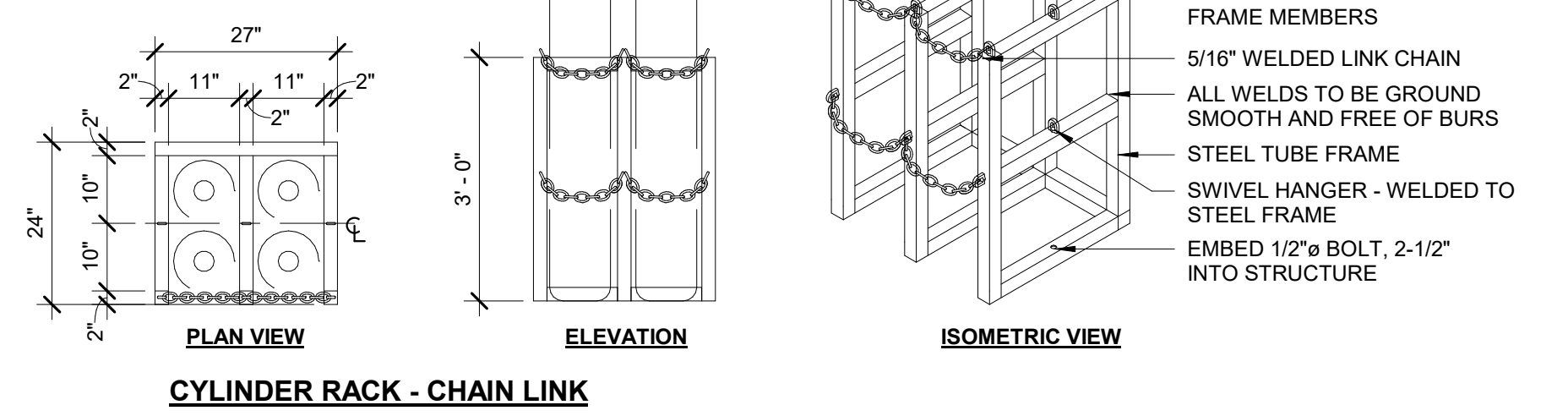
**.BENCHTOP DRIP GROOVES**

1 1/2" = 1'-0" 6



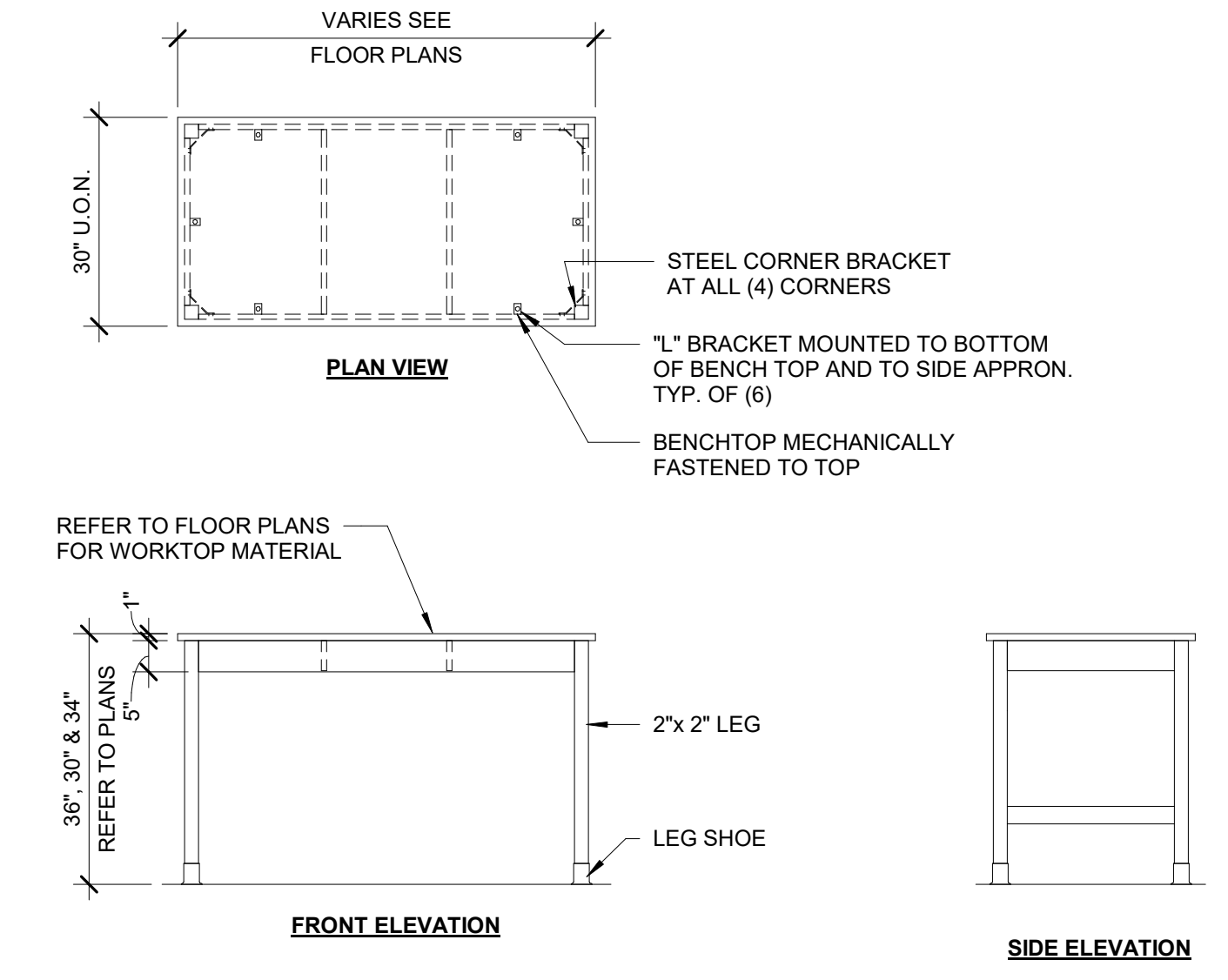
**.CYLINDER RESTRAINT**

3/4" = 1'-0" 7



**.CYLINDER RACK ASSEMBLY**

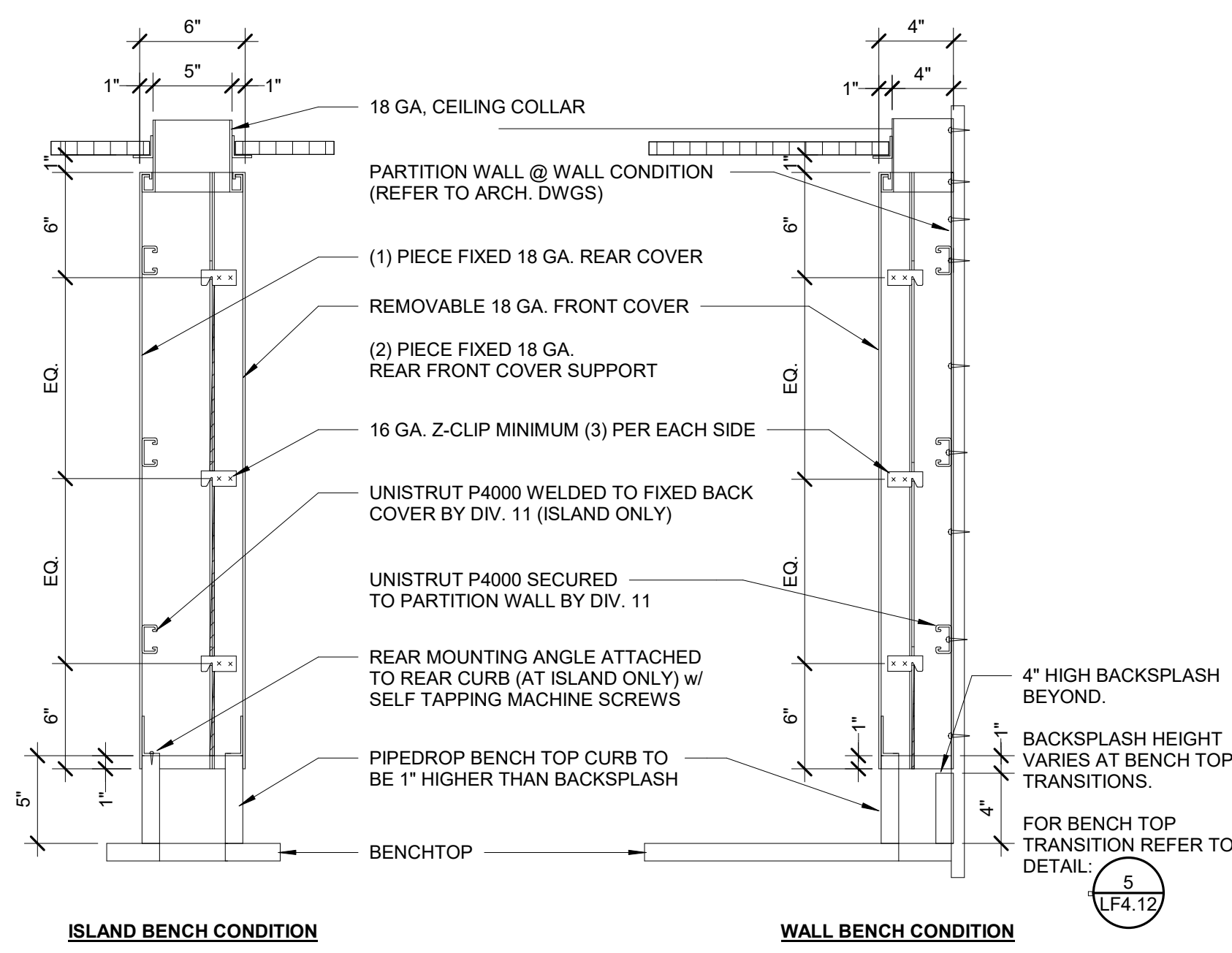
1/2" = 1'-0" 8



**.MOVABLE TABLE**

1/2" = 1'-0" 9

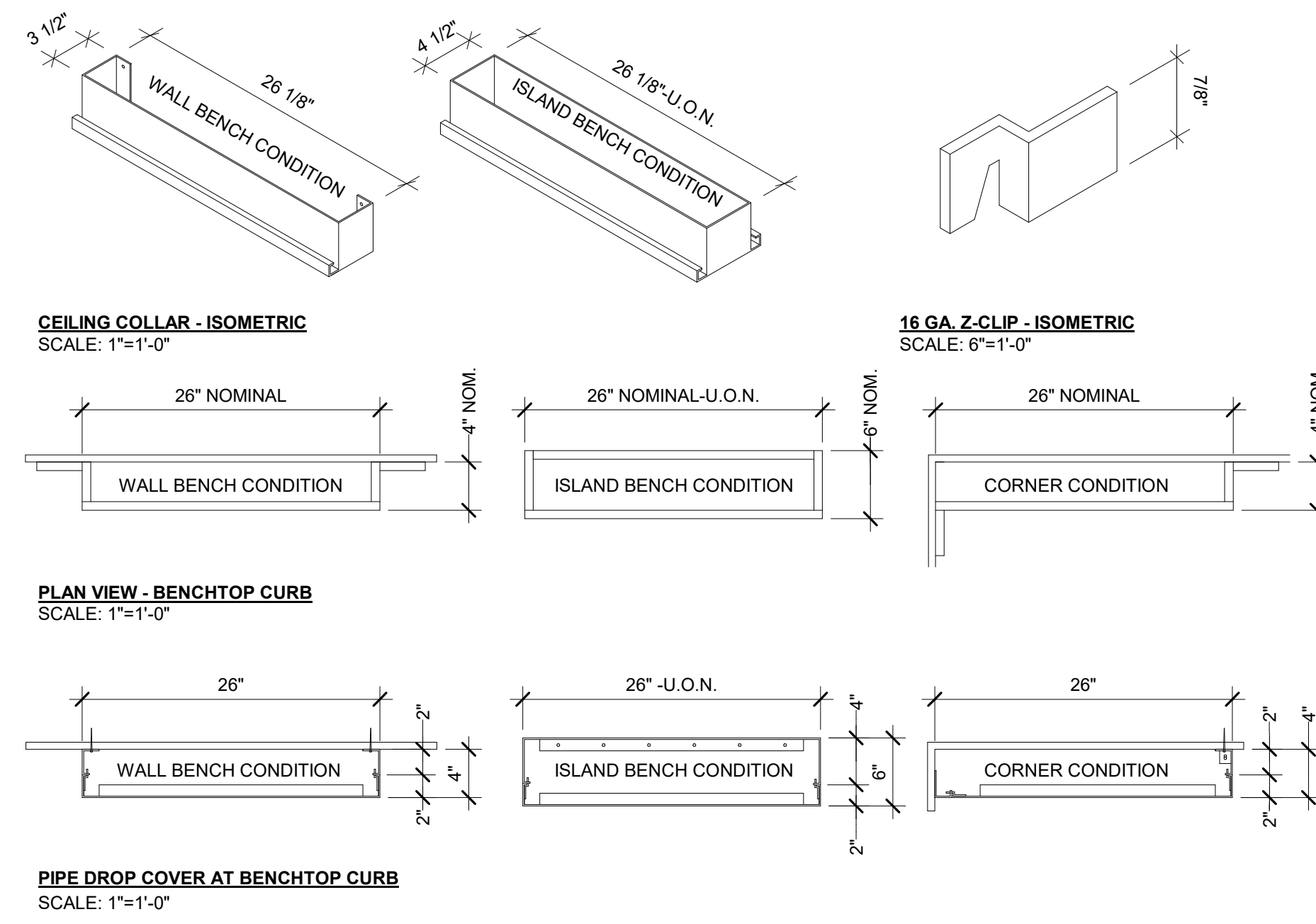
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ISLAND BENCH CONDITION

WALL BENCH CONDITION

1 1/2" = 1'-0" 1

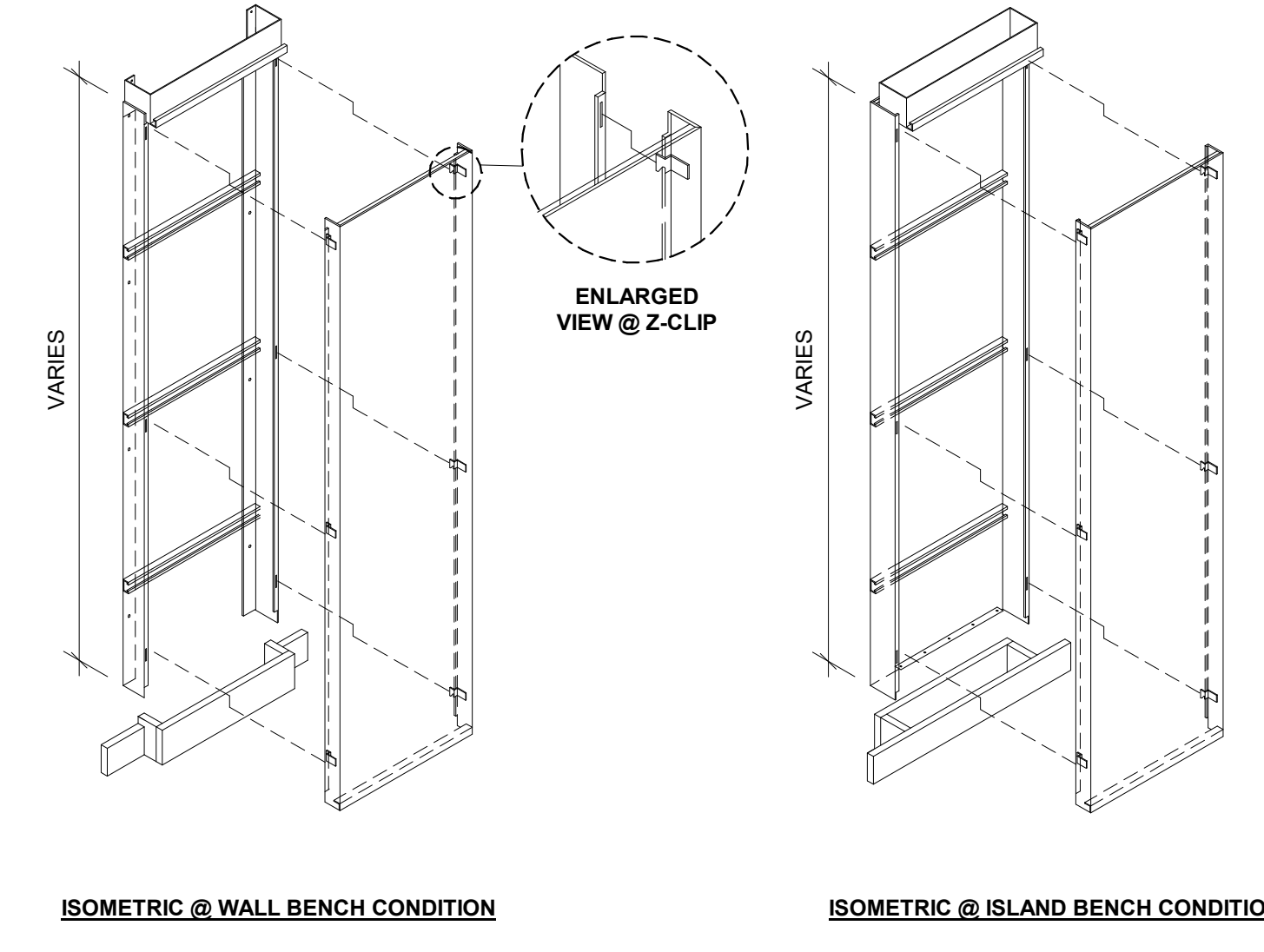


CEILING COLLAR - ISOMETRIC  
SCALE: 1"=1'-0"

16 GA. Z-CLIP - ISOMETRIC  
SCALE: 6"=1'-0"

PLAN VIEW - BENCHTOP CURB  
SCALE: 1"=1'-0"

PIPE DROP COVER AT BENCHTOP CURB  
SCALE: 1"=1'-0"



ISOMETRIC @ WALL BENCH CONDITION

ISOMETRIC @ ISLAND BENCH CONDITION

1/2" = 1'-0" 4

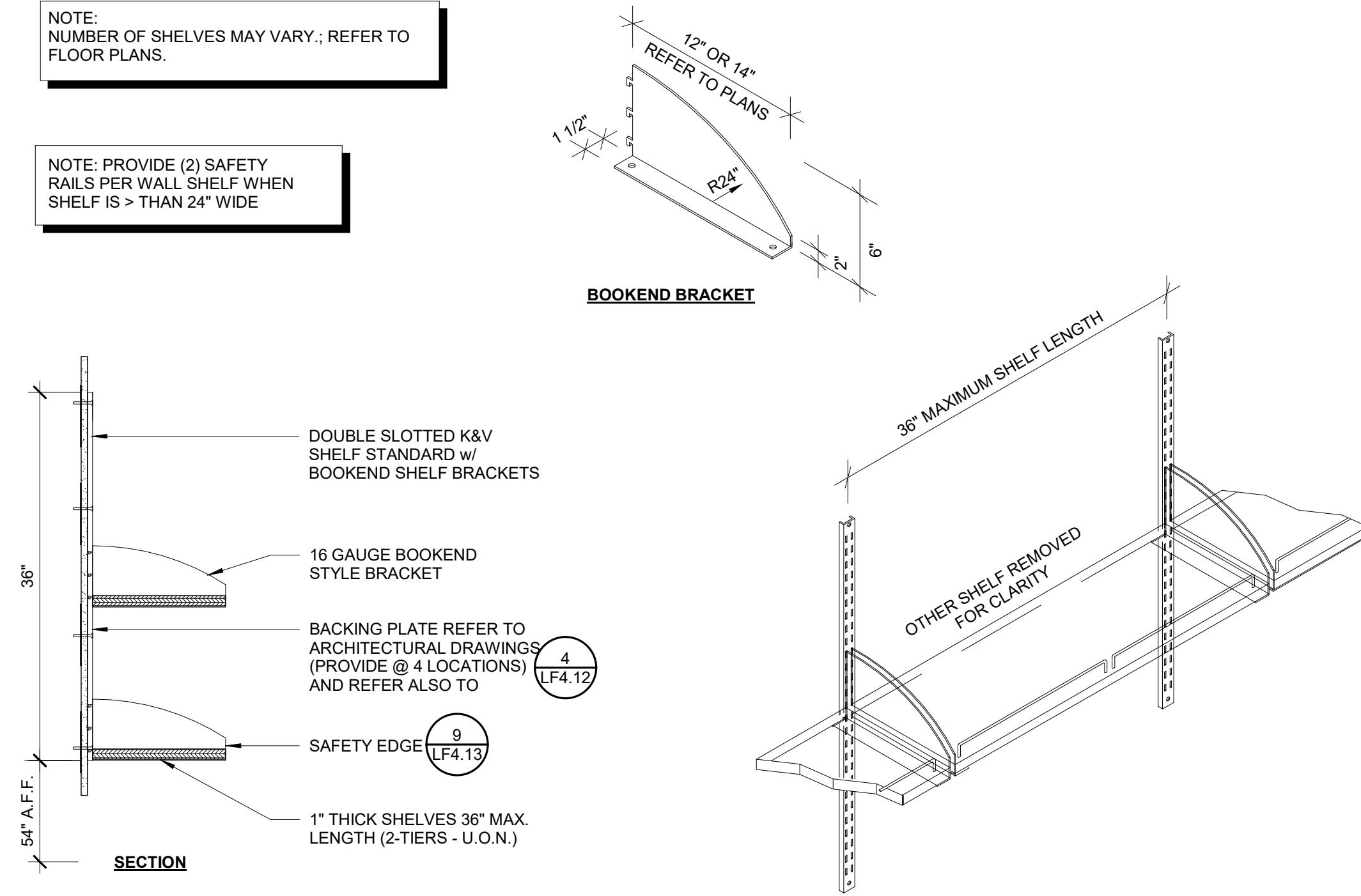
.PIPE DROP - SECTIONS

.PIPE DROP - DETAILS

.PIPE DROP - ENCLOSURE ASSEMBLY

NOTE:  
NUMBER OF SHELVES MAY VARY.; REFER TO  
FLOOR PLANS.

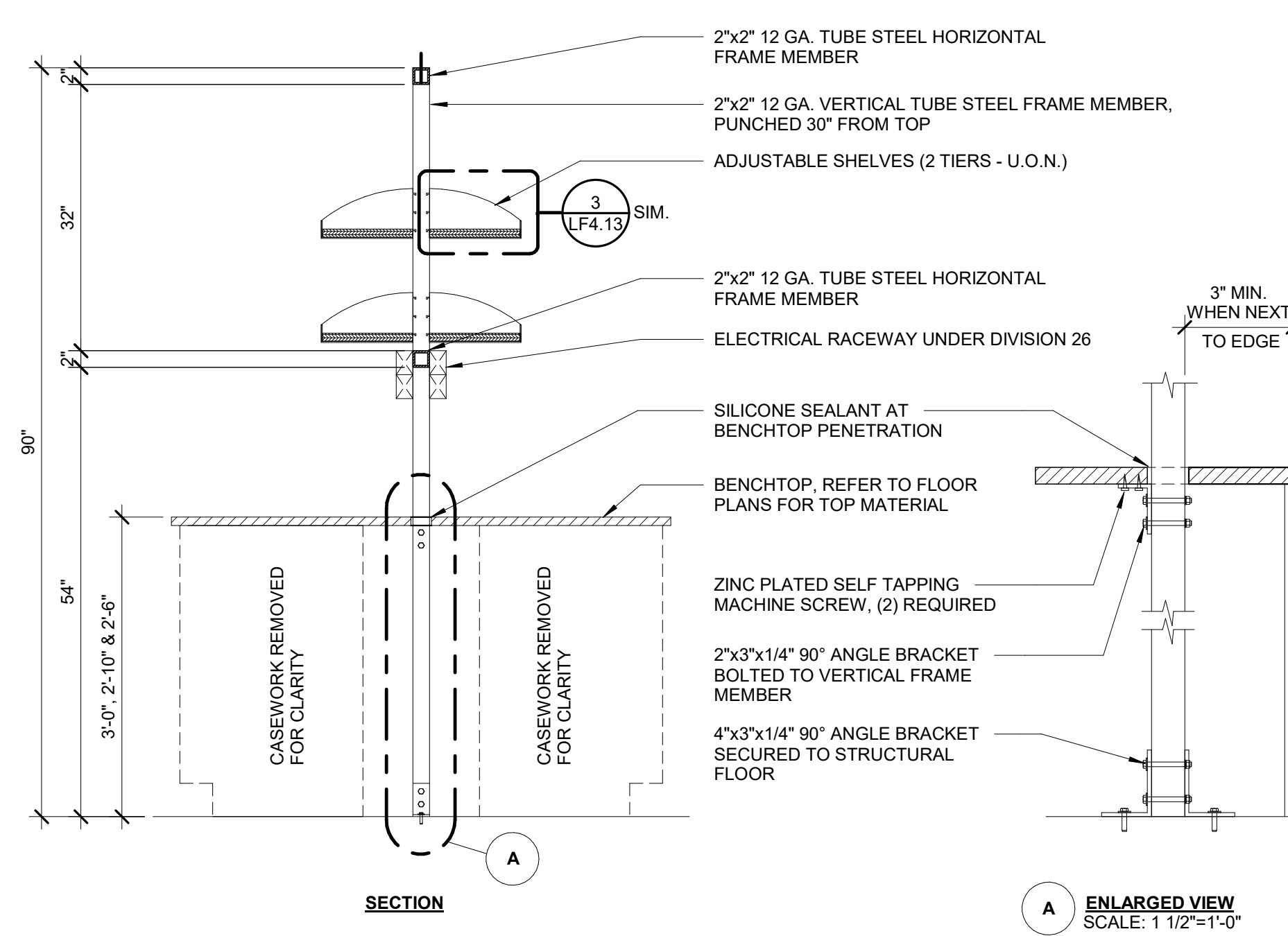
NOTE: PROVIDE (2) SAFETY  
RAILS PER WALL SHELF WHEN  
SHELF IS > THAN 24" WIDE



.ADJUSTABLE WALL SHELVES

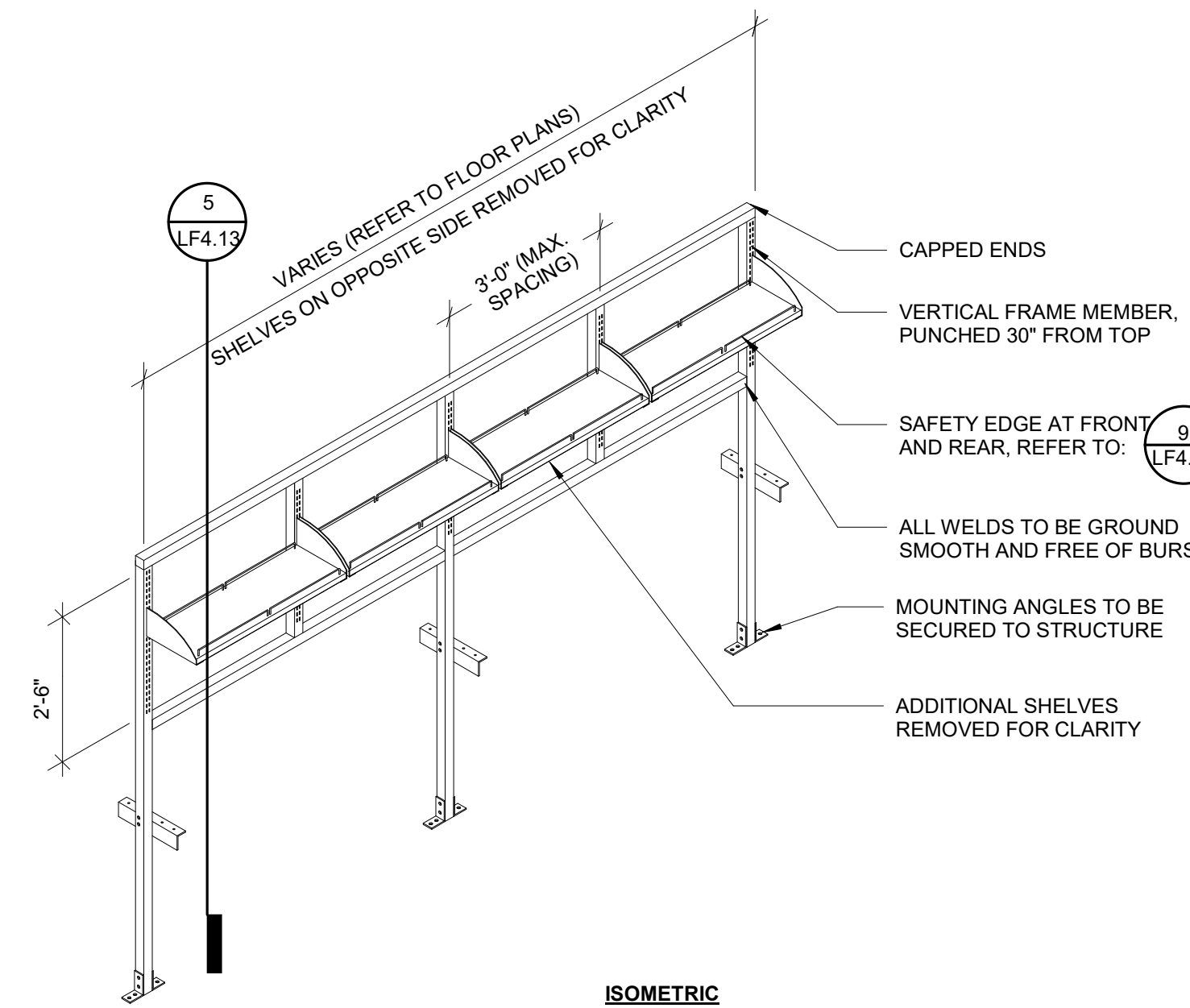
1" = 1'-0" 3

NOTE:  
ALL STEEL TUBING AND ASSOCIATED HARDWARE TO BE  
EPOXY POWDER COATED COLOR SELECTED BY ARCHITECT



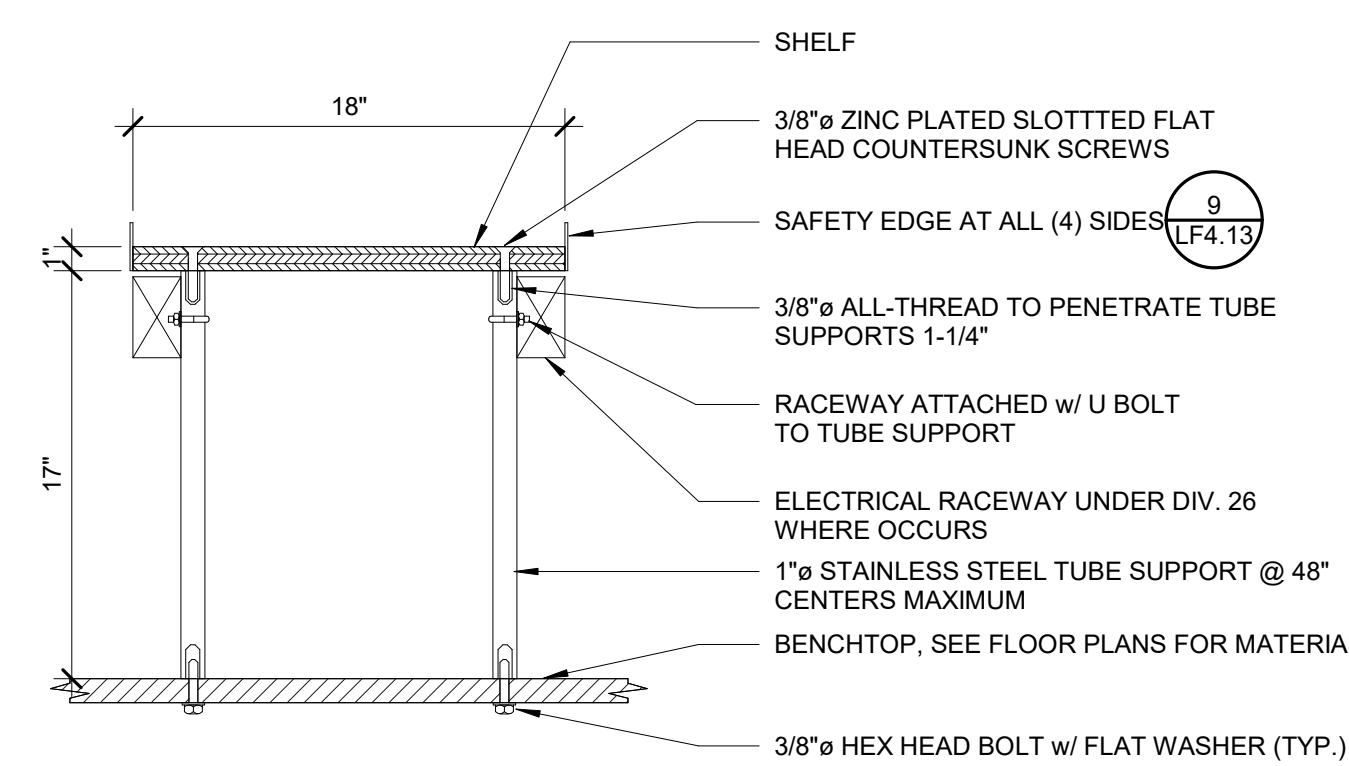
.ADJUSTABLE ISLAND SHELVES - SECTION

3/4" = 1'-0" 5



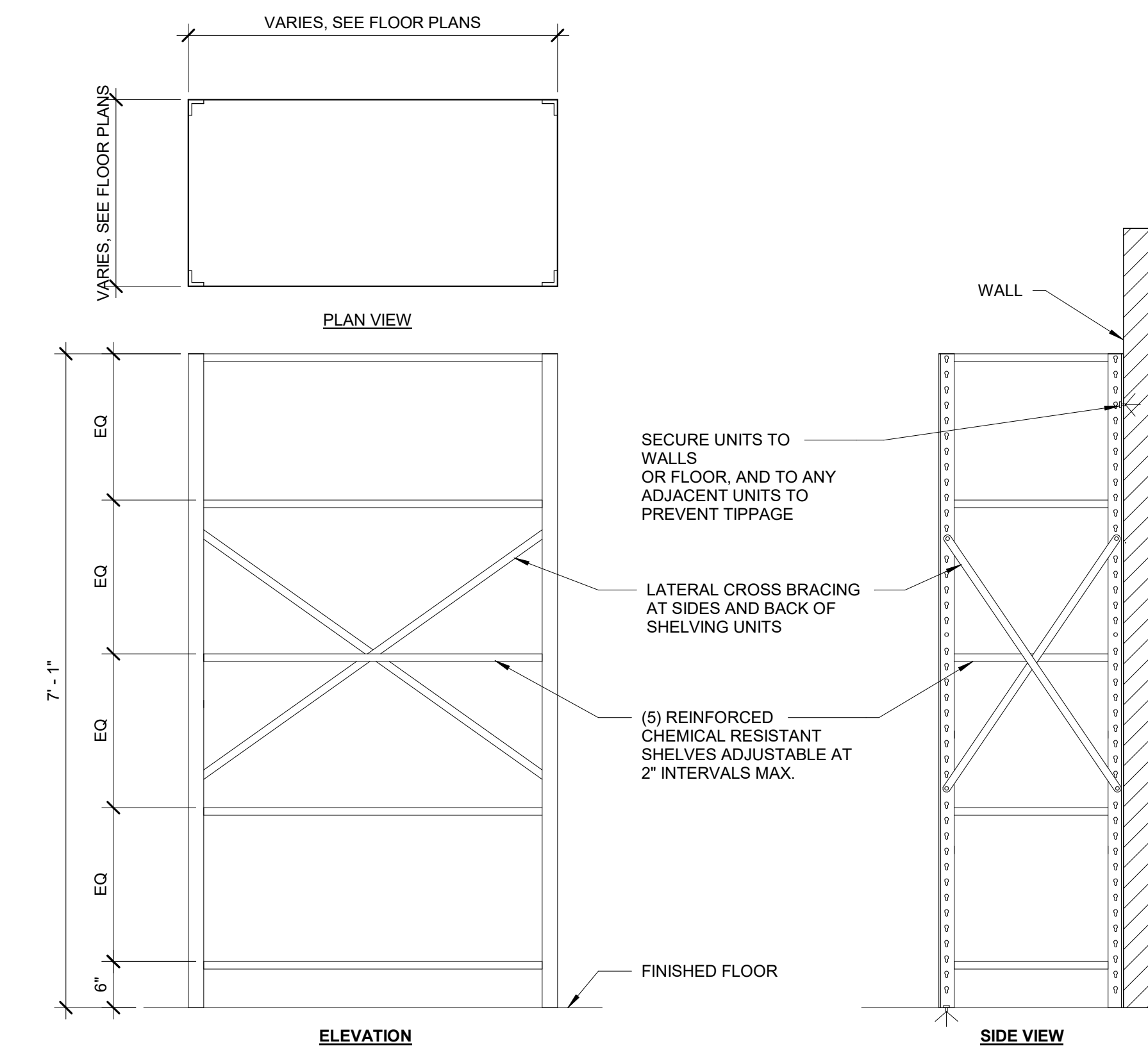
.ADJUSTABLE ISLAND SHELVES - AXONOMETRIC

3/8" = 1'-0" 6



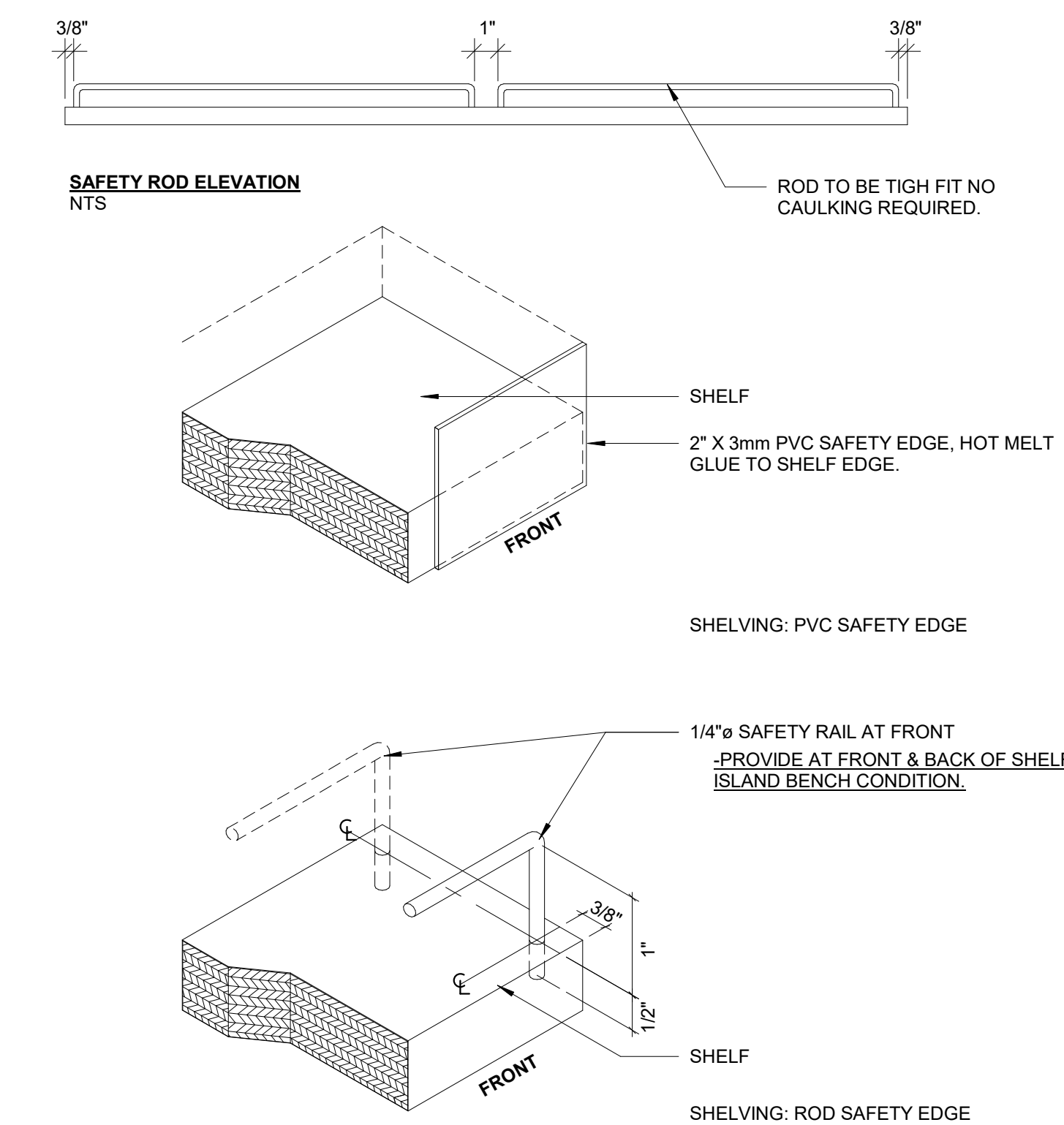
.FIXED REAGENT SHELVES

1 1/2" = 1'-0" 7



.CHEMICAL RESISTANT SHELVING UNIT

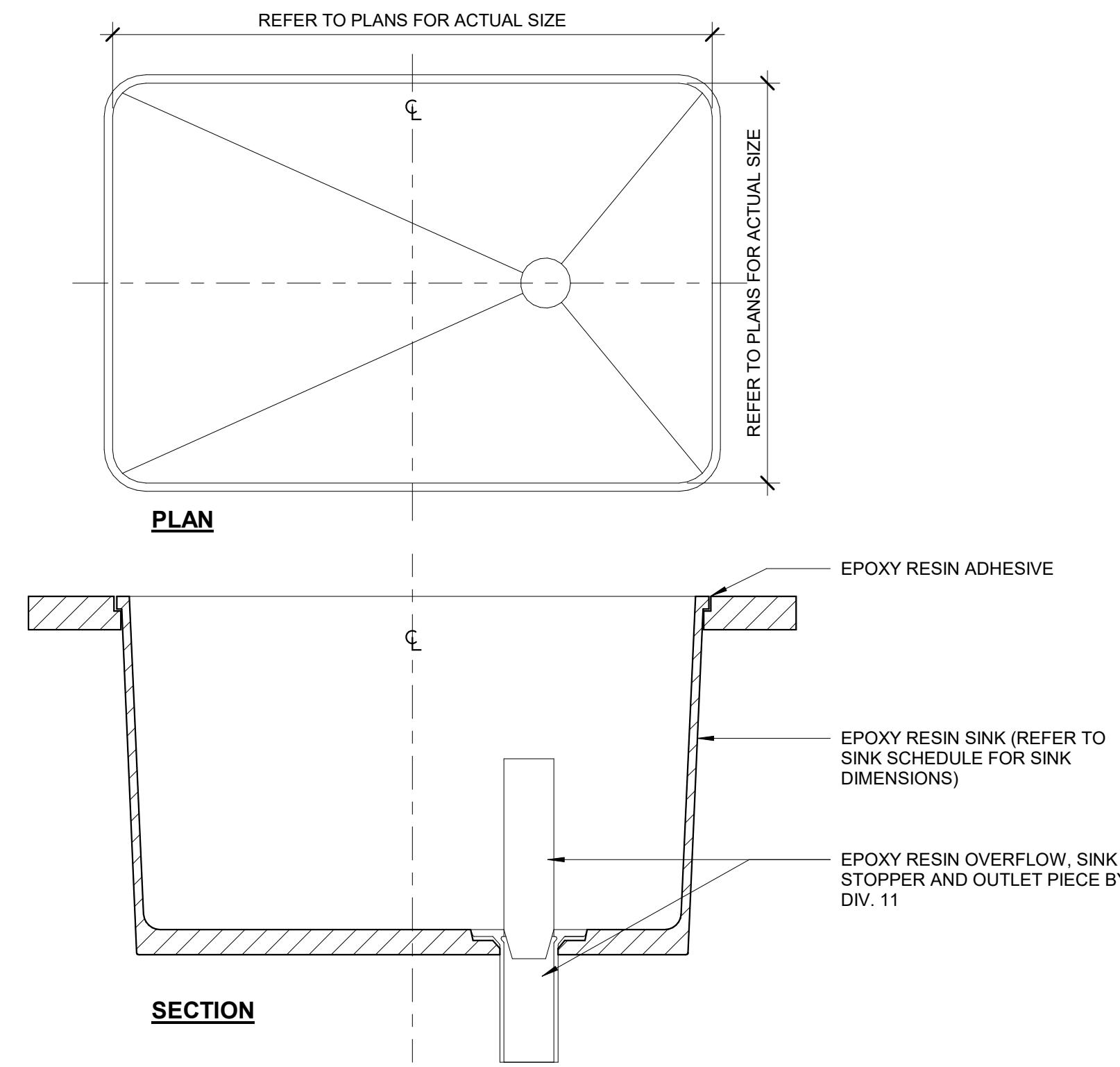
3/4" = 1'-0" 8



.SAFETY EDGES

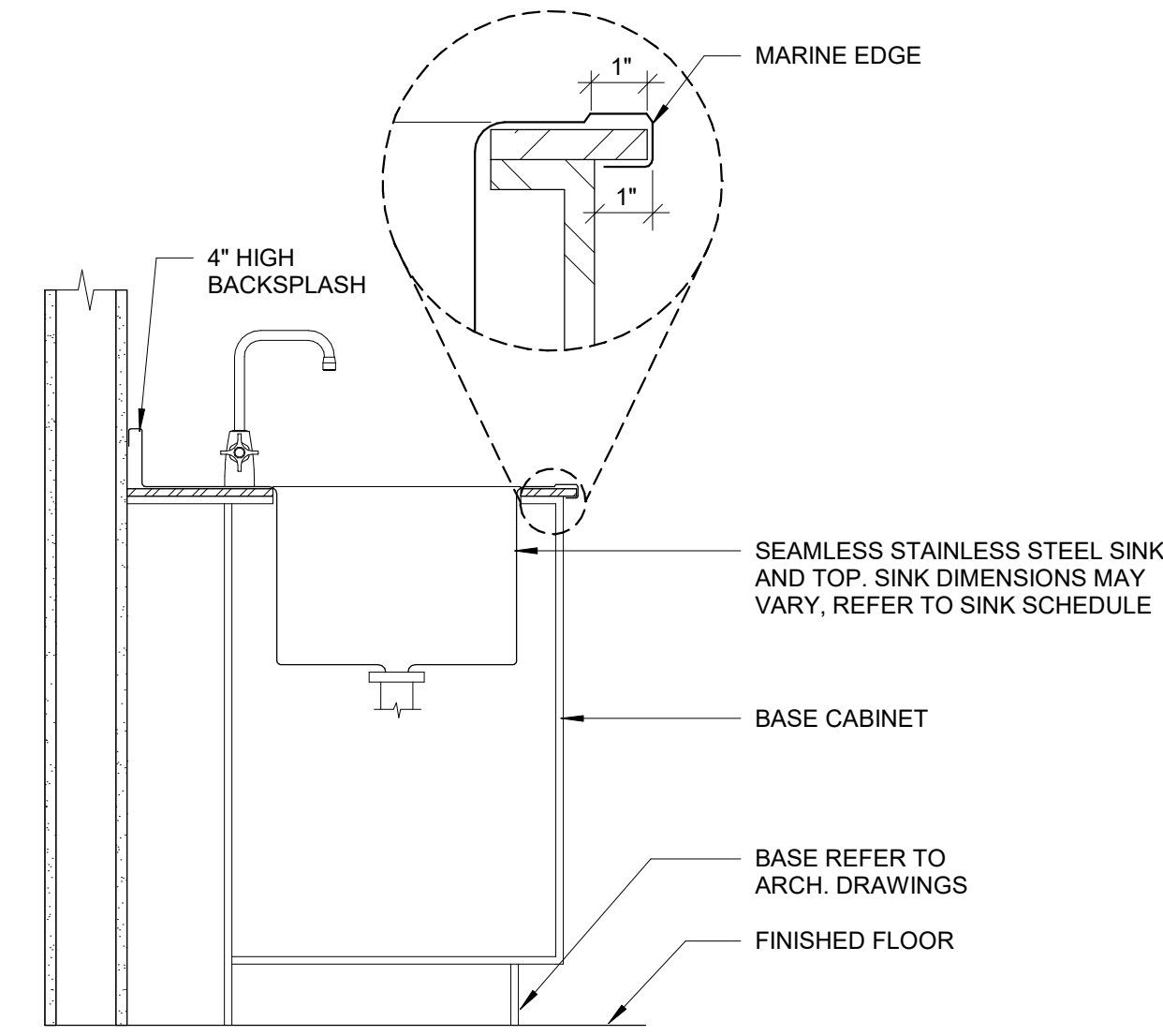
6" = 1'-0" 9

1/6/2021 2:59:41 PM



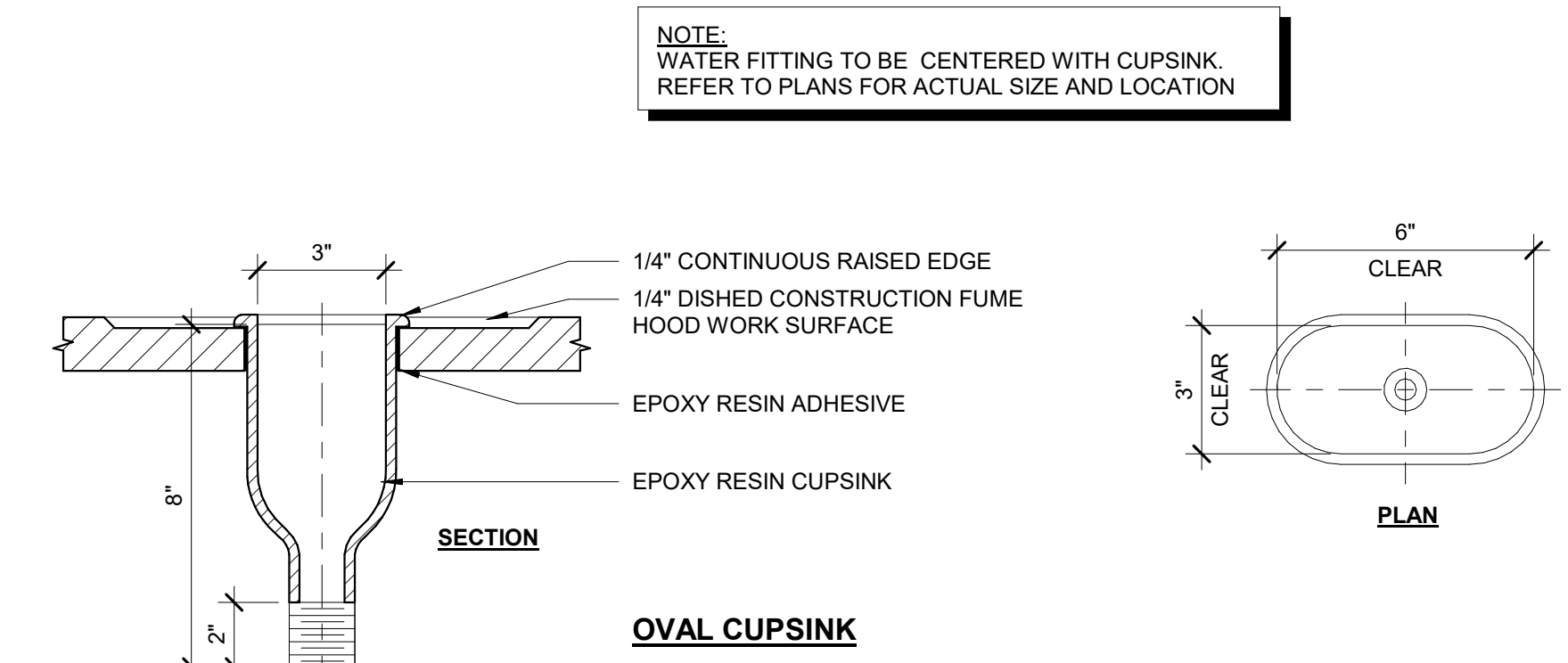
**.SINK - EPOXY DROP-IN**

3" = 1'-0" ①



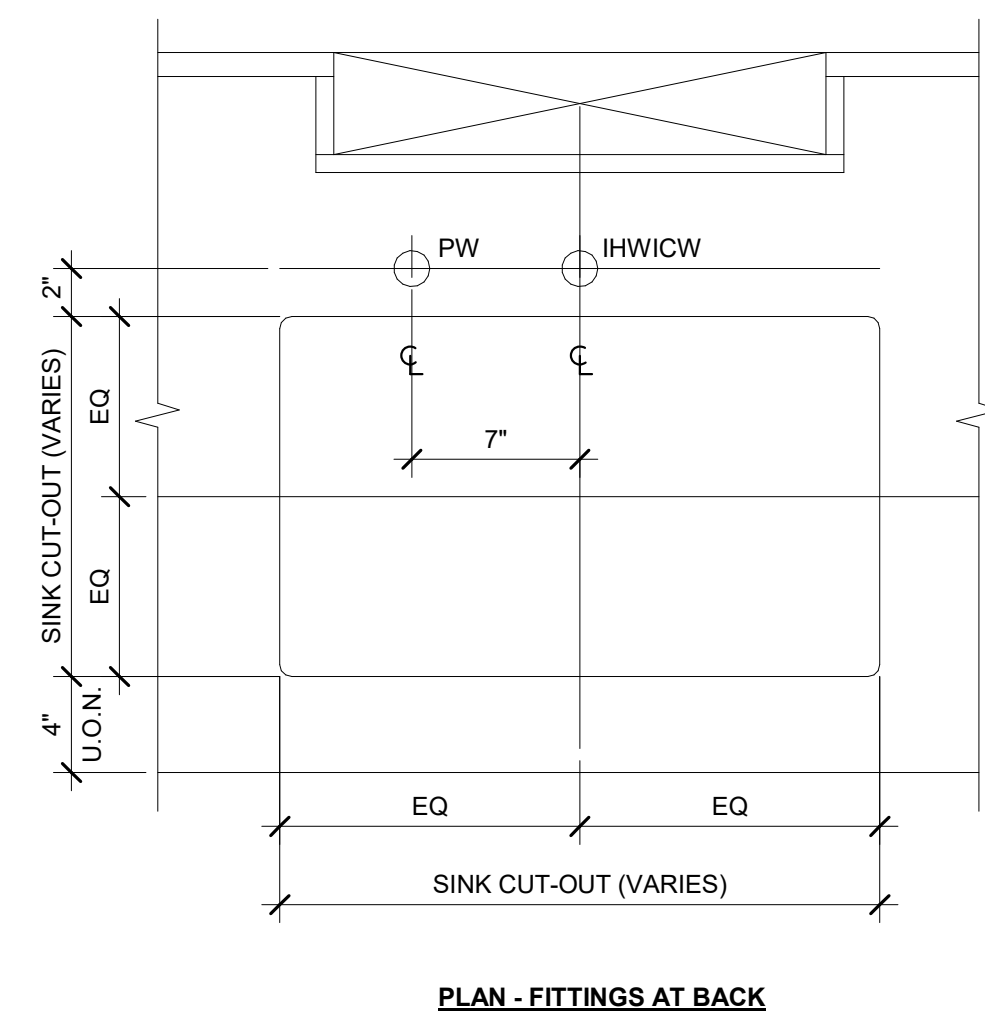
**.SINK - STAINLESS STEEL**

1" = 1'-0" ②



**.SINK - CUPSINK RAISED LIP @ FUME HOOD**

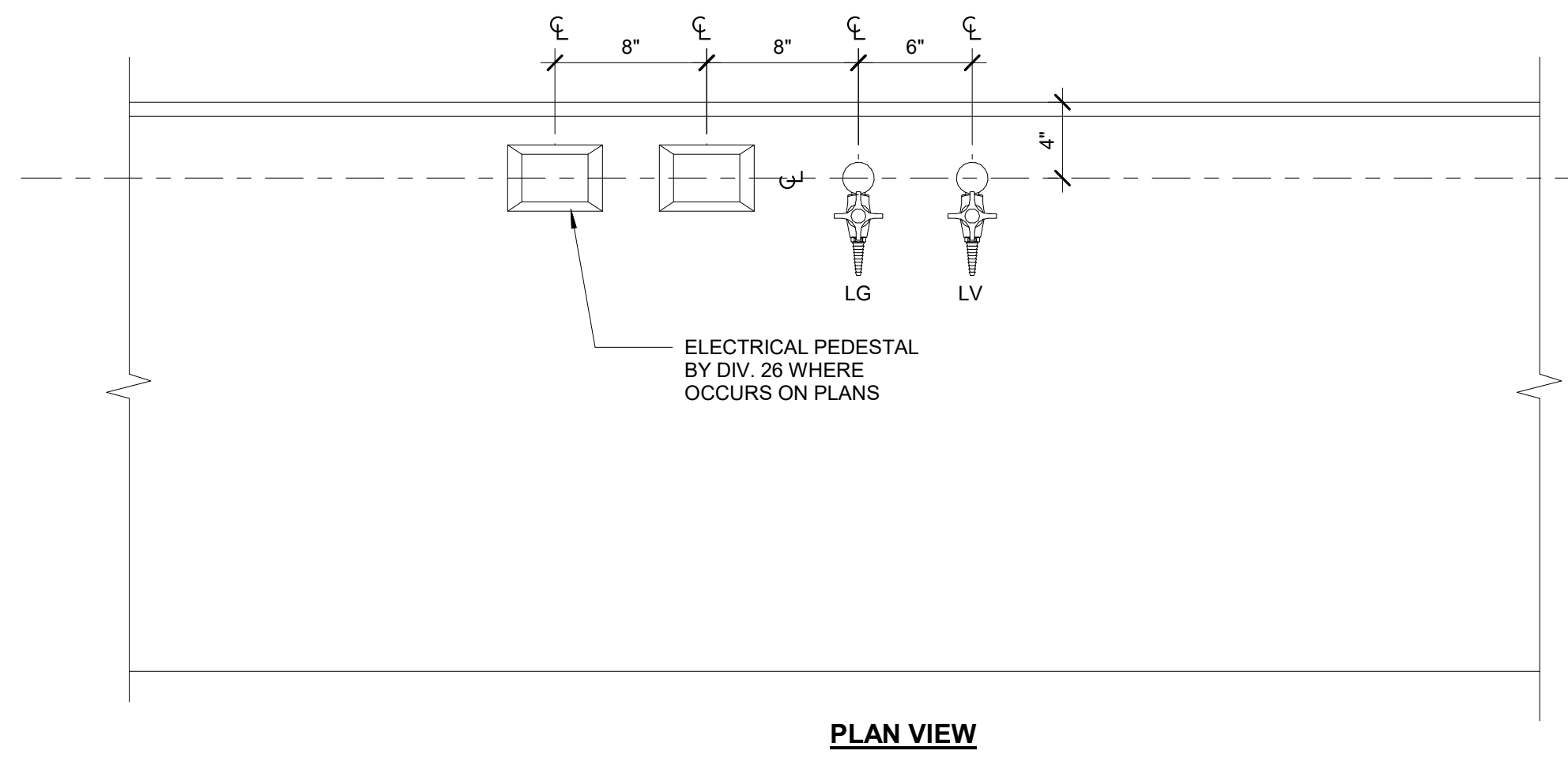
3" = 1'-0" ③



**NOTE:**  
 1. FIXTURE SPACING REPRESENT TYPICAL CONFIGURATIONS. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 2. CONTRACTOR TO VERIFY CLEARANCES FOR ALL SERVICE CUT-OUTS.  
 3. REFER TO PLANS AND SINK SCHEDULE FOR SINK TYPES AND SIZES.  
 4. PIPE DROP CUT-OUTS AS OCCURS ON PLANS.

**.FIXTURE SPACING - SINK AT WALL BENCH**

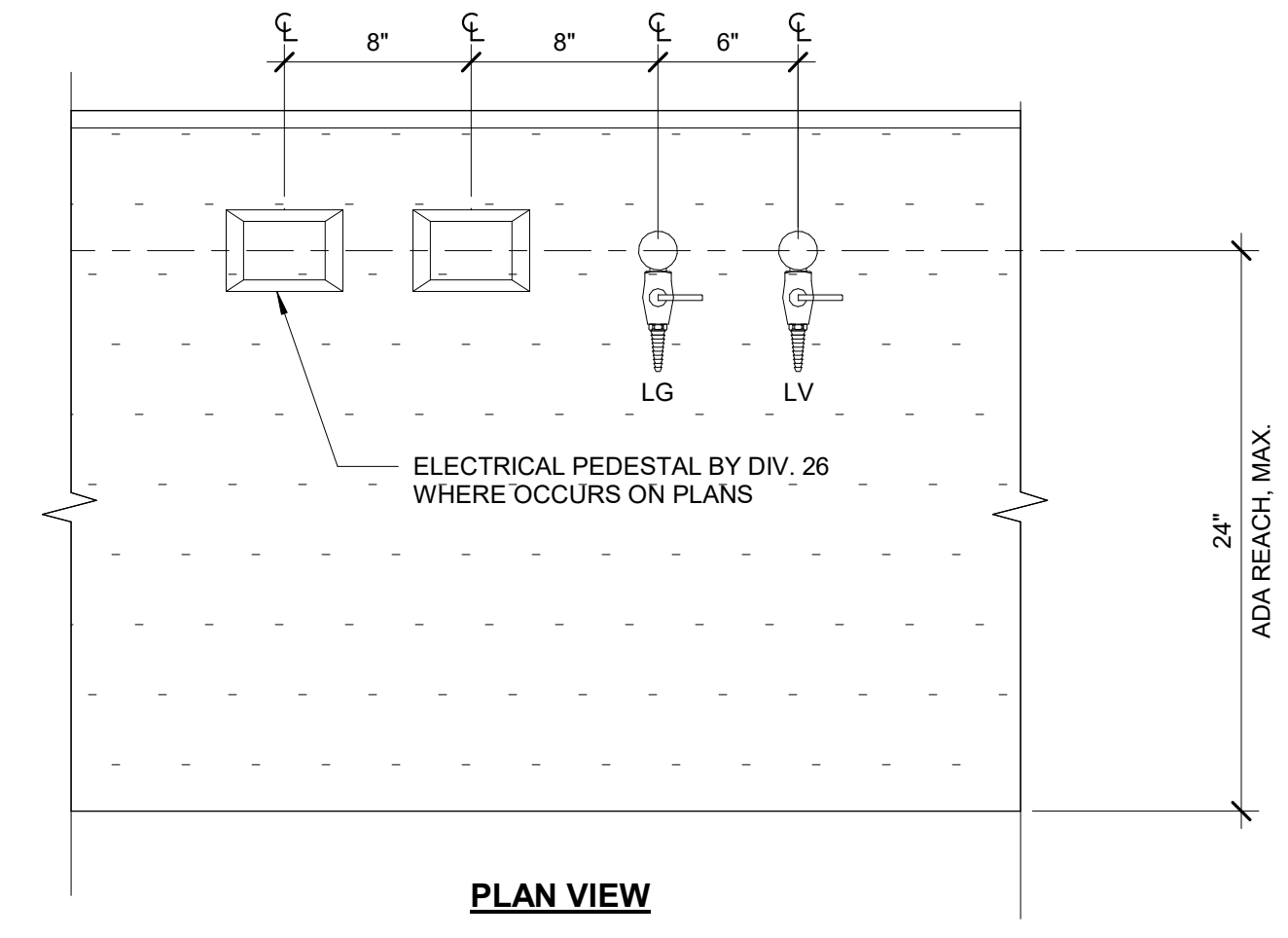
1 1/2" = 1'-0" ④



**NOTE:**  
 1. FIXTURE SPACING REPRESENT TYPICAL CONFIGURATIONS. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 2. CONTRACTOR TO VERIFY CLEARANCES FOR ALL SERVICE CUT-OUTS.  
 3. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 4. REFER TO PLANS AND SINK SCHEDULE FOR SINK TYPES AND SIZES.  
 5. APPLY TYPICAL FIXTURE SPACING @ OHS & WALL CONDITIONS WHERE OCCURS ON LF PLANS.

**.FIXTURE SPACING - BENCH WALL**

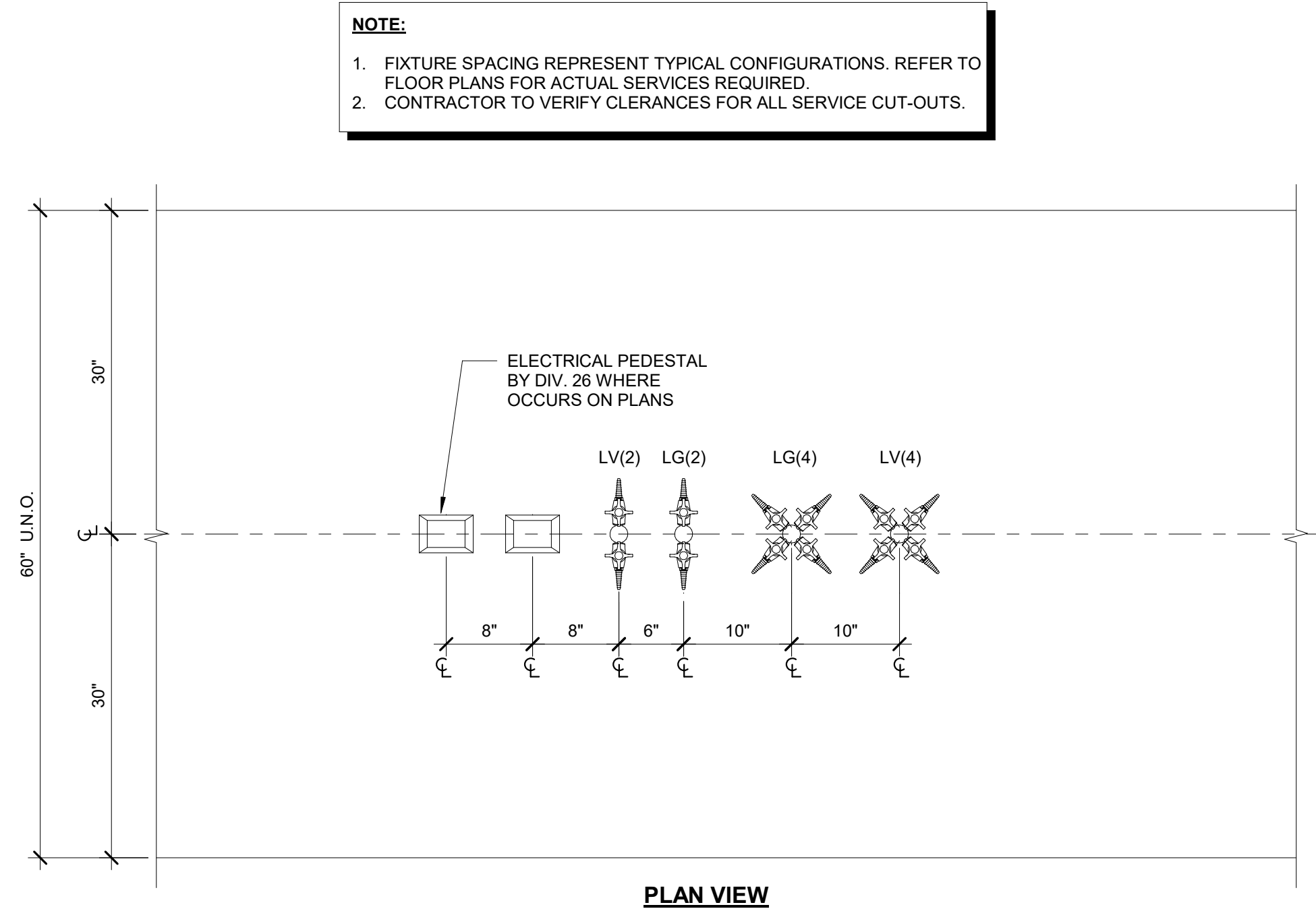
1 1/2" = 1'-0" ⑤



**NOTE:**  
 1. FIXTURE SPACING REPRESENT TYPICAL CONFIGURATIONS. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 2. CONTRACTOR TO VERIFY CLEARANCES FOR ALL SERVICE CUT-OUTS.  
 3. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 4. REFER TO PLANS AND SINK SCHEDULE FOR SINK TYPES AND SIZES.  
 5. PIPE DROP CUT-OUTS AS OCCURS ON PLANS.  
 6. ALL FIXTURES @ ADA CUP SINKS TO HAVE ADA COMPLIANT WRIST BLADE HANDLES.  
 7. TOP OF WORK SURFACE NOT TO EXCEED 34" ABOVE FINISHED FLOOR.

**.FIXTURE SPACING - BENCH WALL (ADA)**

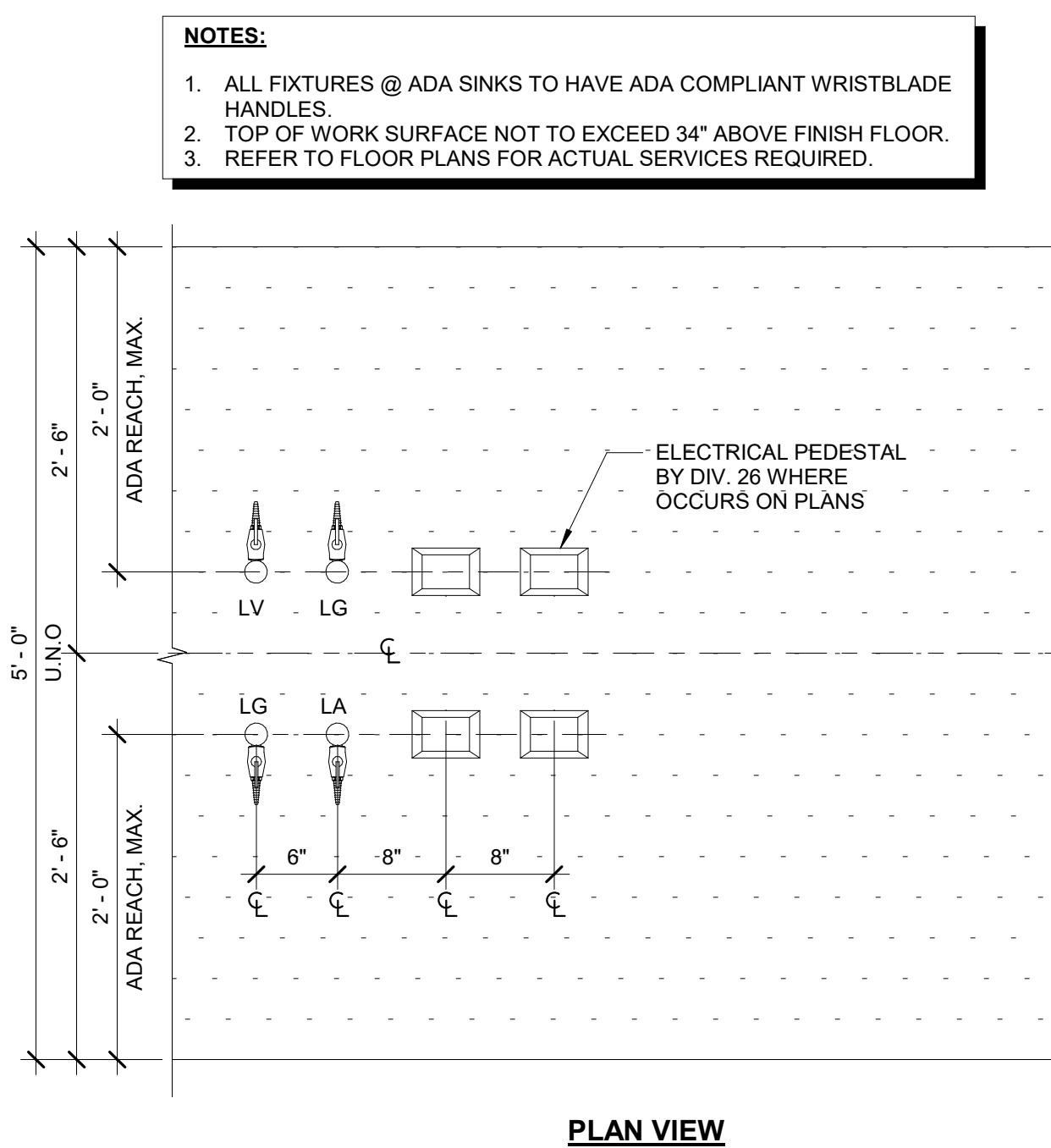
1 1/2" = 1'-0" ⑥



**NOTE:**  
 1. FIXTURE SPACING REPRESENT TYPICAL CONFIGURATIONS. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.  
 2. CONTRACTOR TO VERIFY CLEARANCES FOR ALL SERVICE CUT-OUTS.

**.FIXTURE SPACING - BENCH ISLAND**

1" = 1'-0" ⑦



**NOTES:**  
 1. ALL FIXTURES @ ADA SINKS TO HAVE ADA COMPLIANT WRISTBLADE HANDLES.  
 2. TOP OF WORK SURFACE NOT TO EXCEED 34" ABOVE FINISH FLOOR.  
 3. REFER TO FLOOR PLANS FOR ACTUAL SERVICES REQUIRED.

**.FIXTURE SPACING - BENCH ISLAND (ADA)**

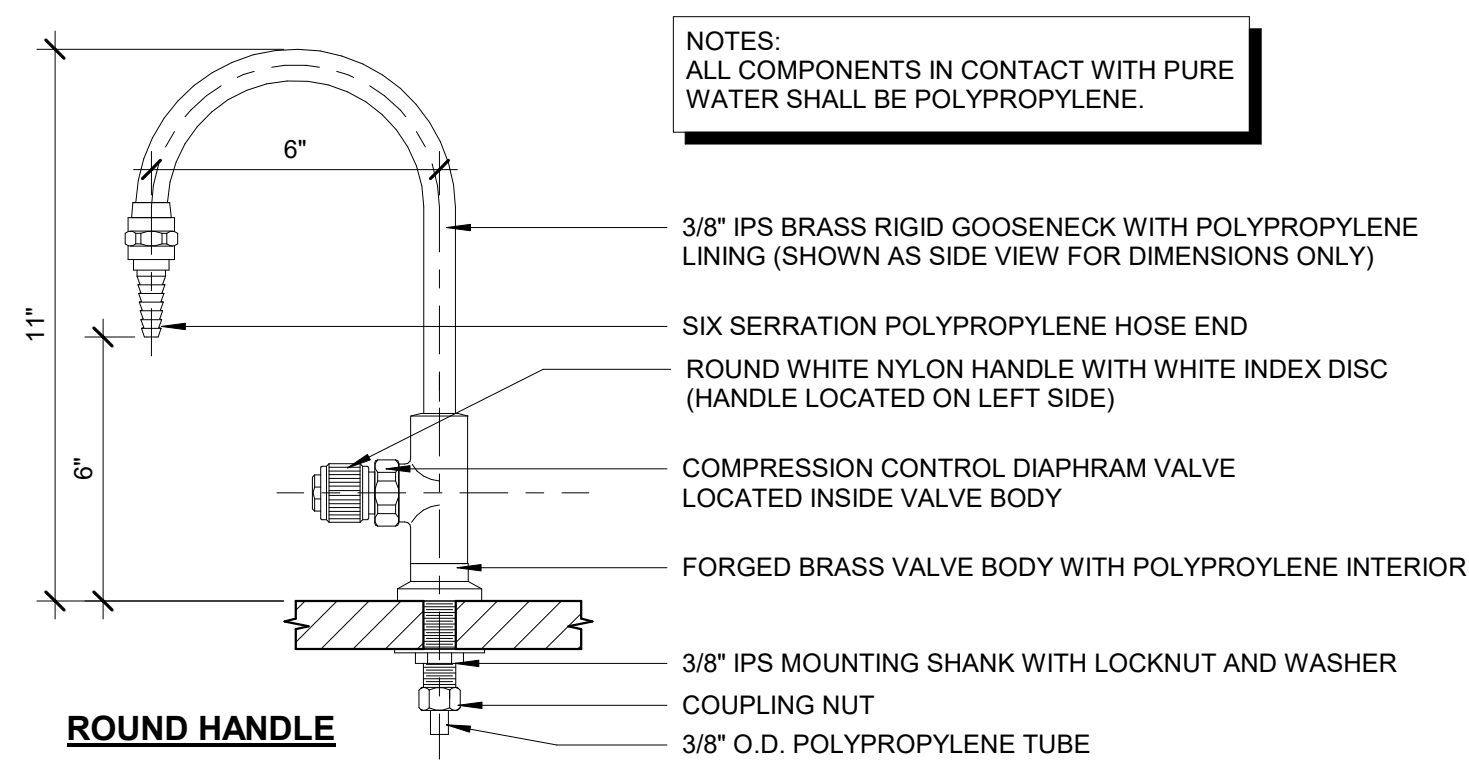
1" = 1'-0" ⑧

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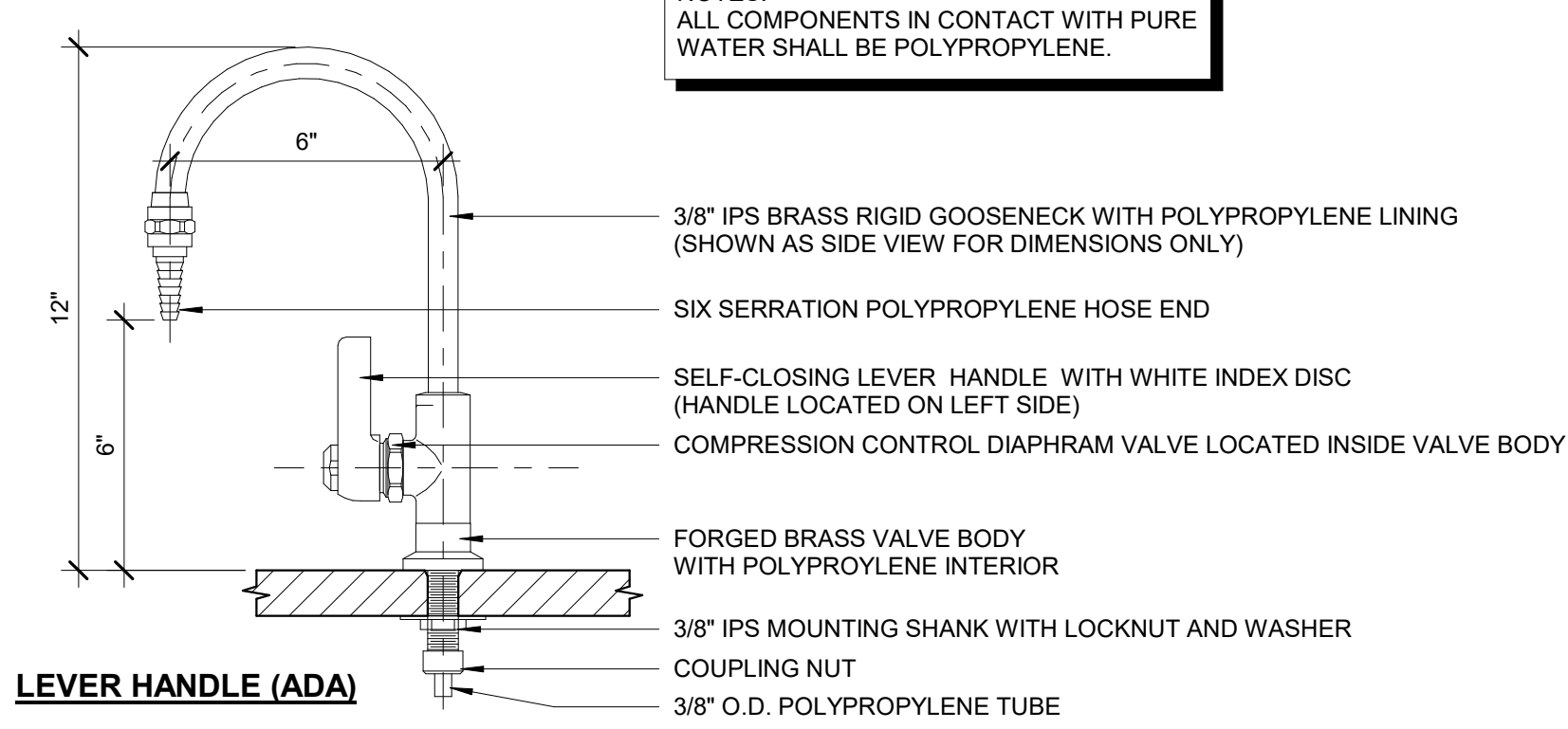
NOTES:  
ALL COMPONENTS IN CONTACT WITH PURE WATER SHALL BE POLYPROPYLENE.

**ROUND HANDLE**

**.PW - DECK**

3" = 1'-0"

1



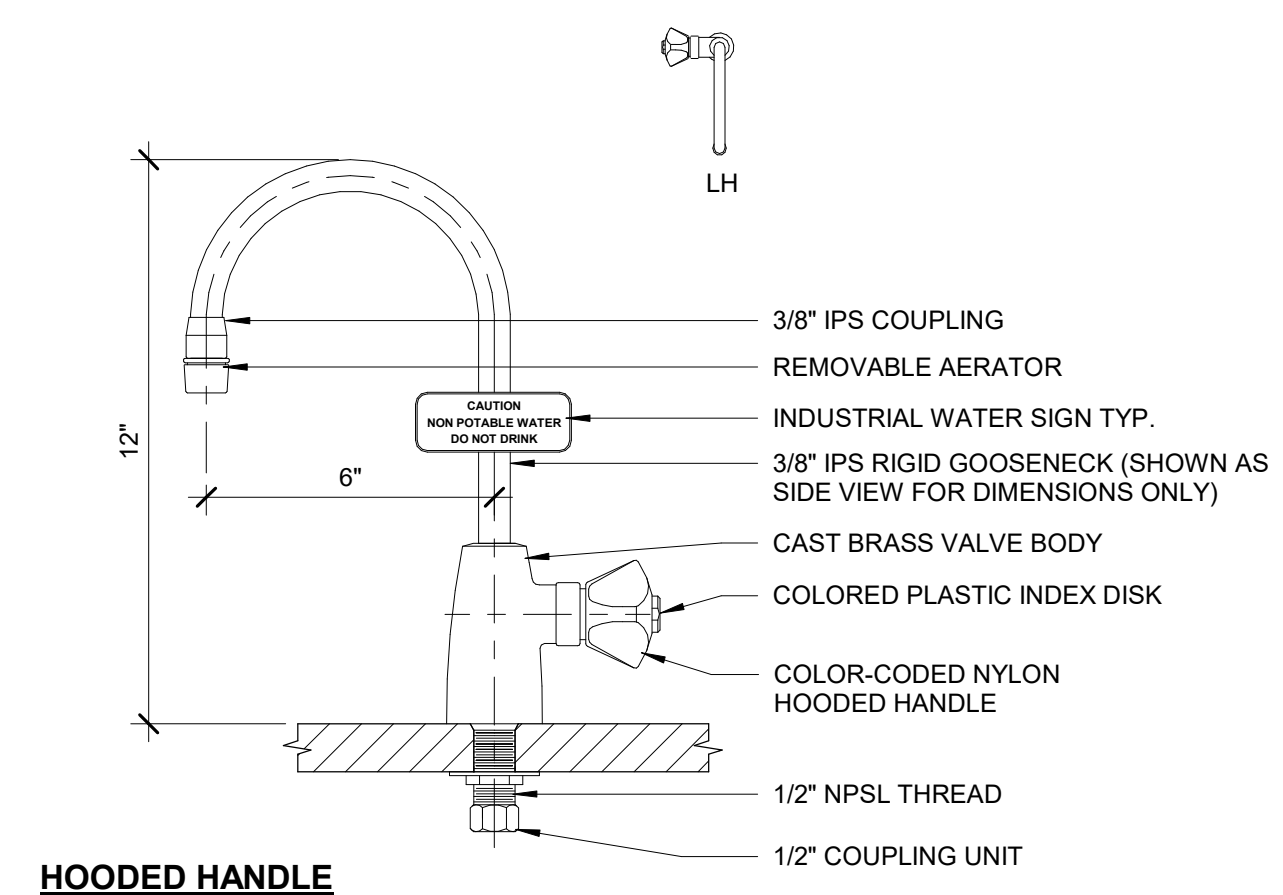
NOTES:  
ALL COMPONENTS IN CONTACT WITH PURE WATER SHALL BE POLYPROPYLENE.

**LEVER HANDLE (ADA)**

**.PW-S - DECK**

3" = 1'-0"

2

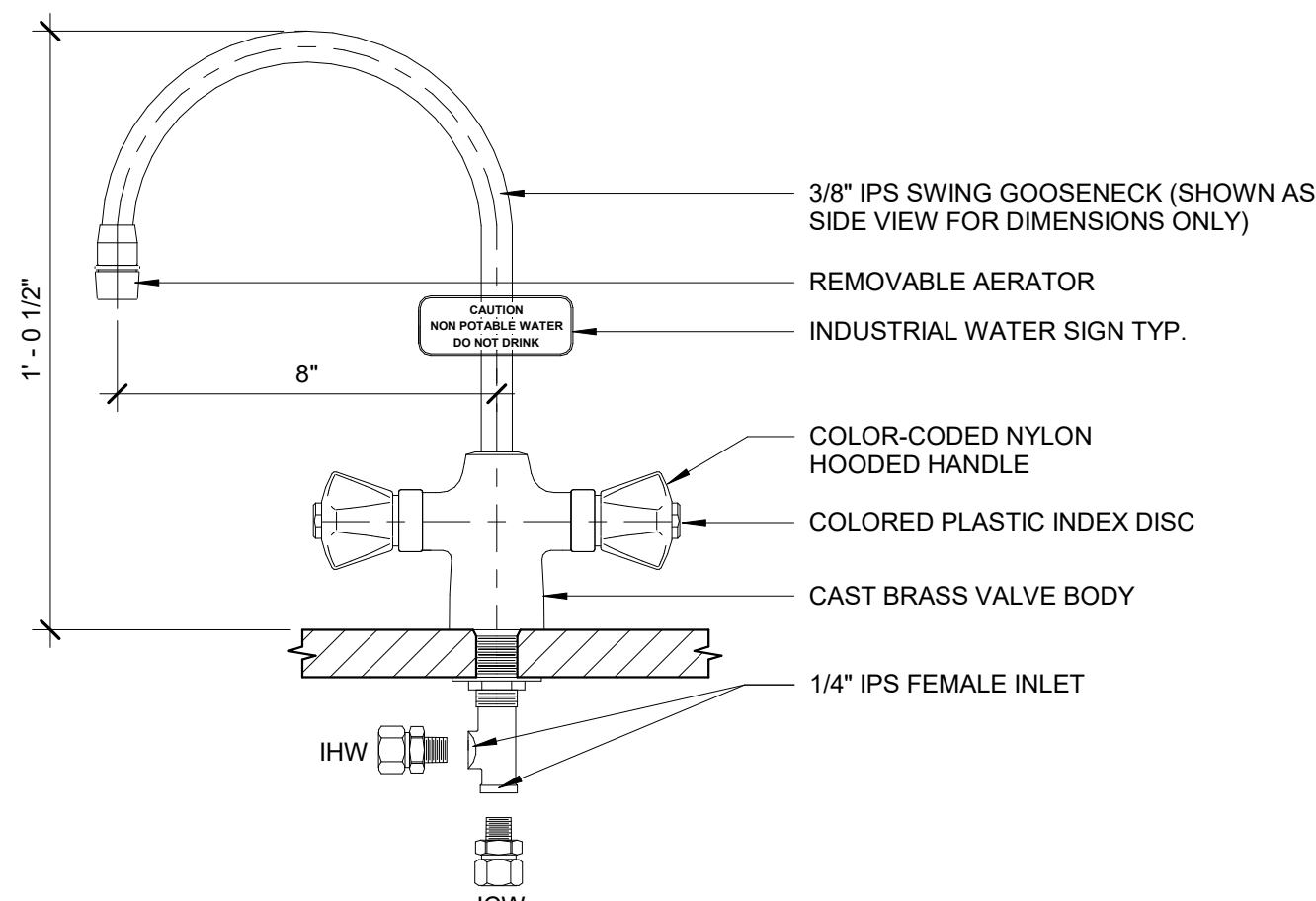


**HOODED HANDLE**

**.ICW - DECK**

3" = 1'-0"

3

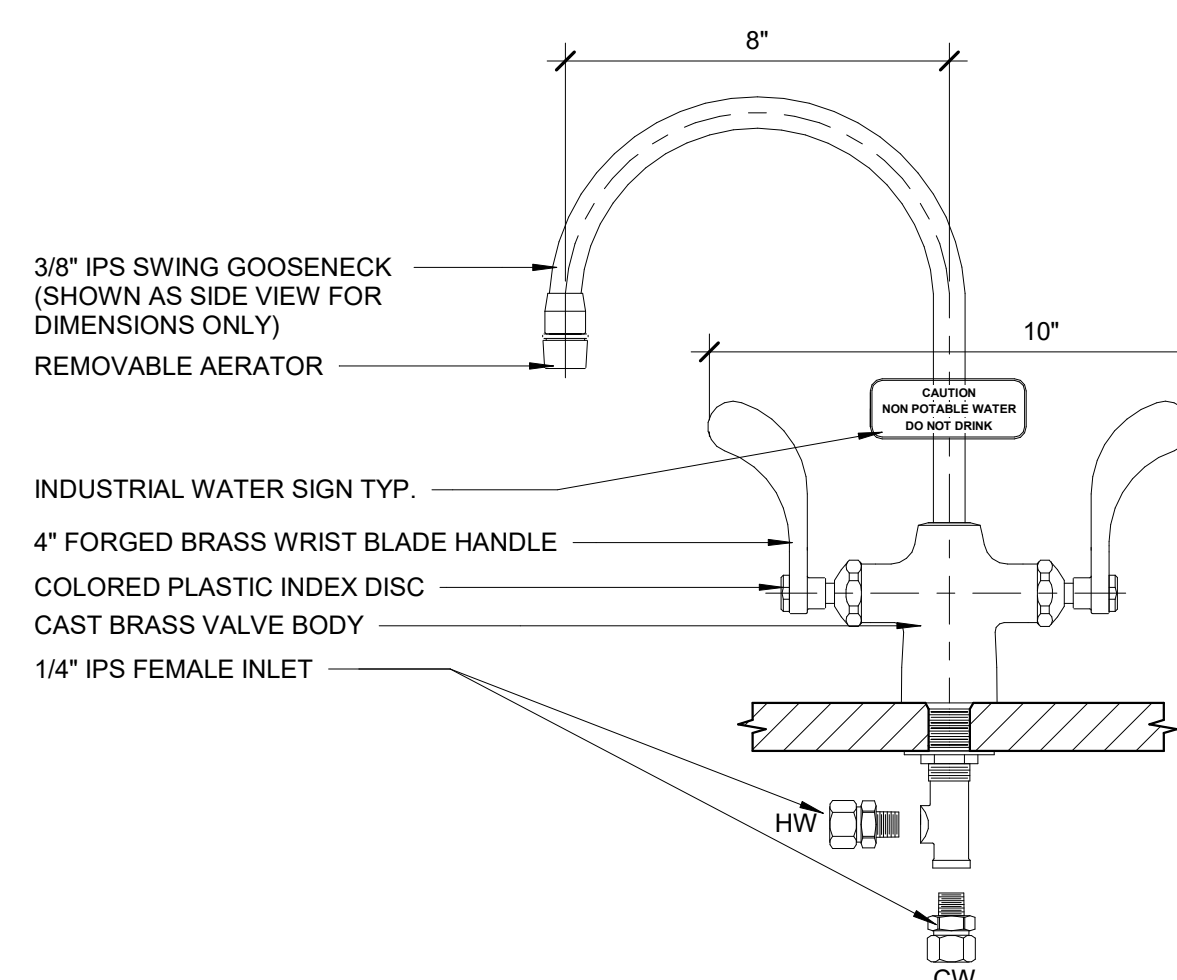


**HOODED HANDLES**

**.IHWICW - DECK**

3" = 1'-0"

4

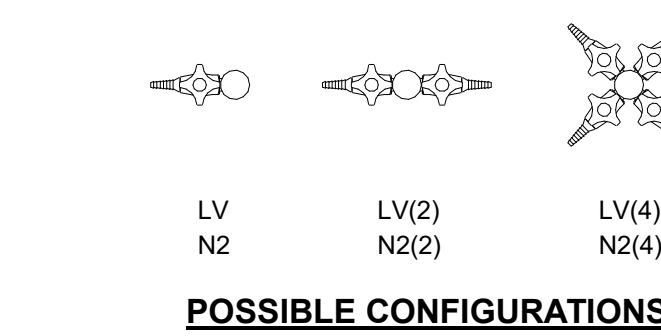


**WRIST BLADE HANDLES (ADA)**

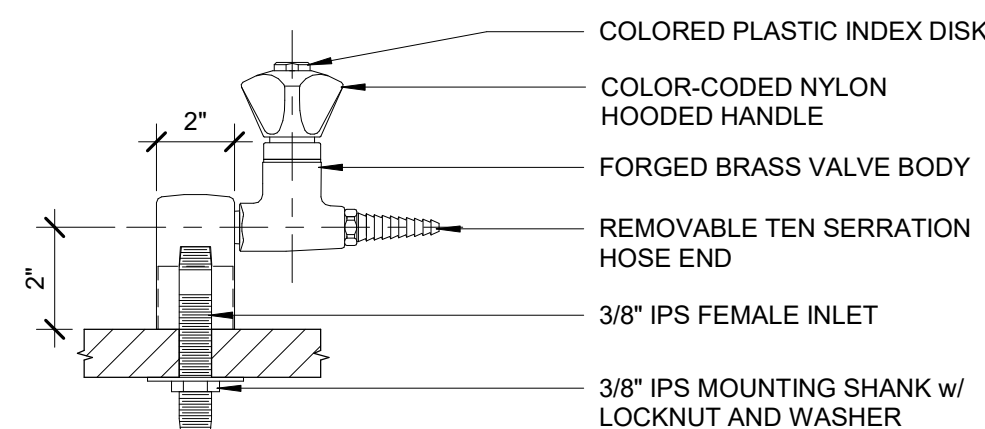
**.IHWICW - DECK (ADA)**

3" = 1'-0"

5



**POSSIBLE CONFIGURATIONS**

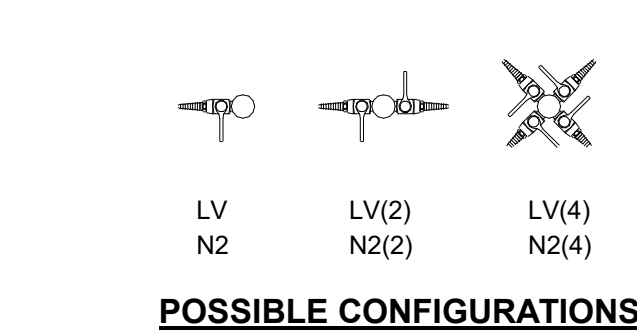


**HOODED HANDLE**

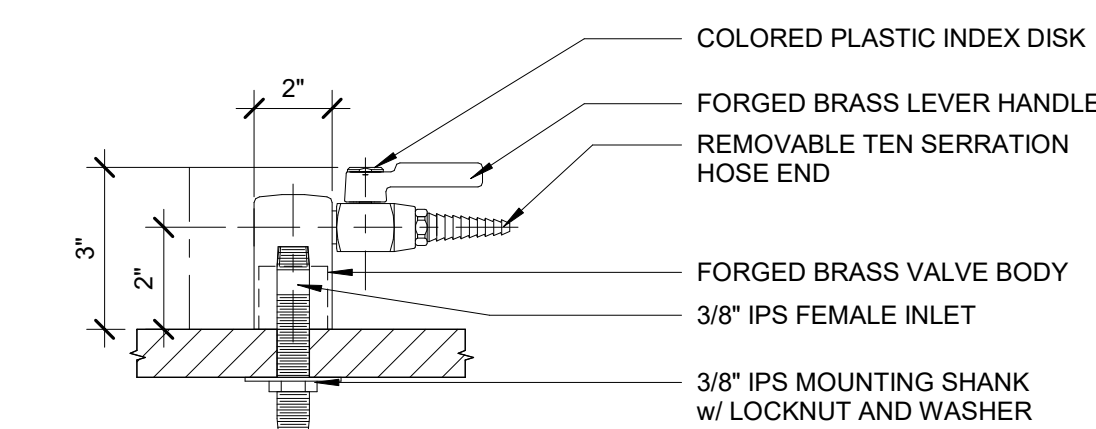
**.LV, N2 - DECK**

3" = 1'-0"

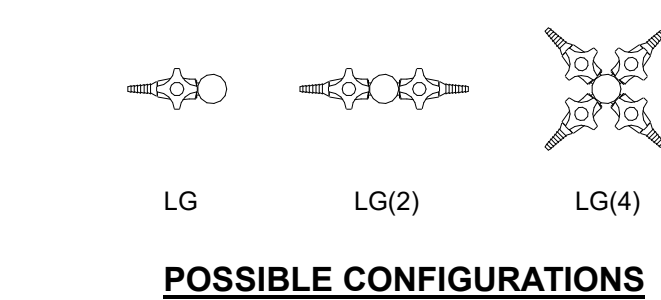
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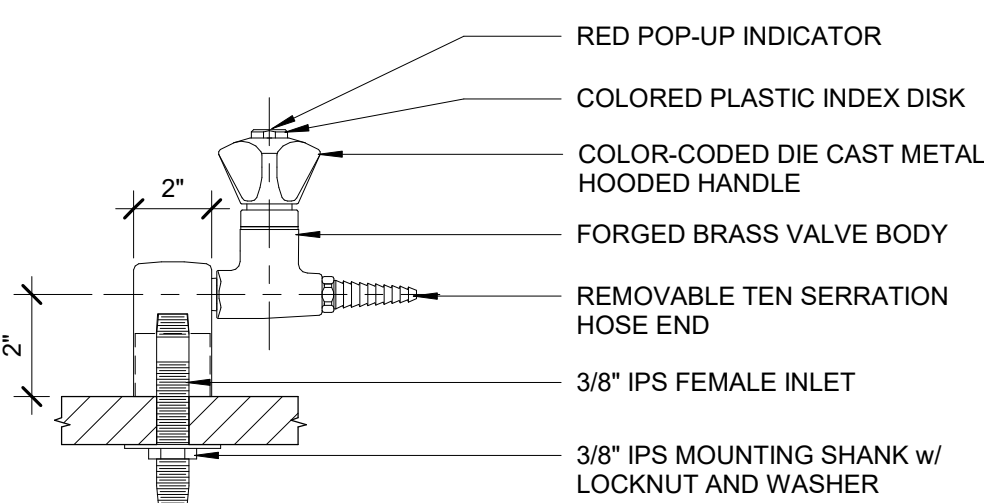
**POSSIBLE CONFIGURATIONS**



**LEVER HANDLE (ADA)**



**POSSIBLE CONFIGURATIONS**

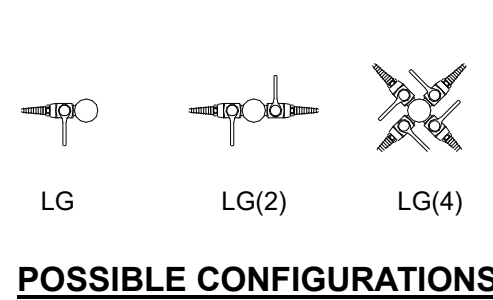


**HOODED HANDLE**

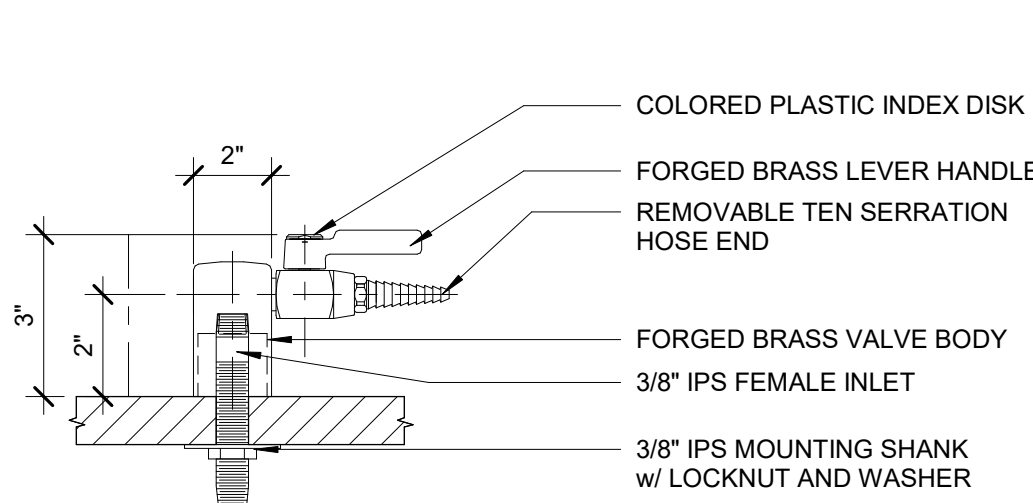
**.LG - DECK**

3" = 1'-0"

7



**POSSIBLE CONFIGURATIONS**

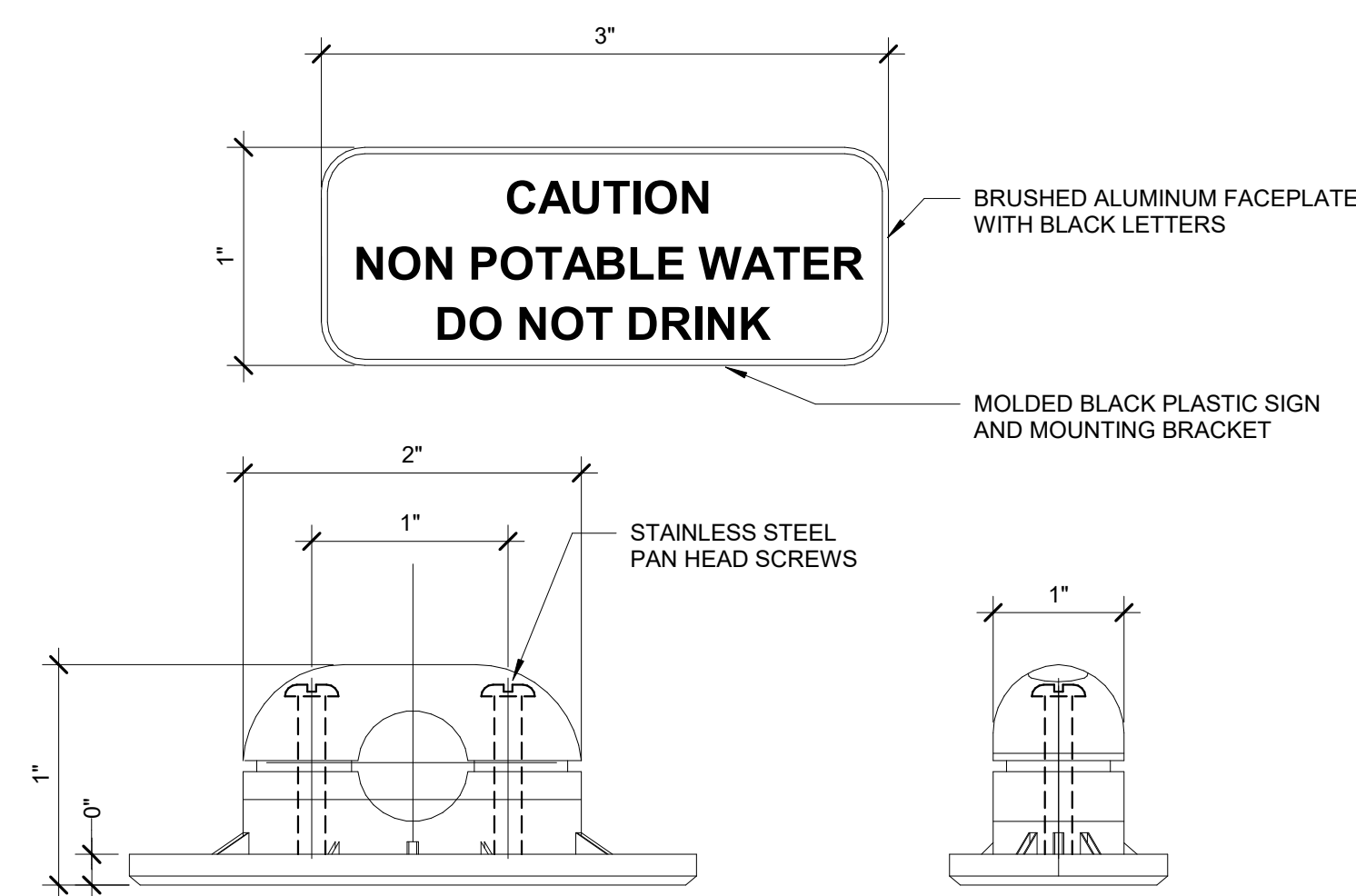


**LEVER HANDLE (ADA)**

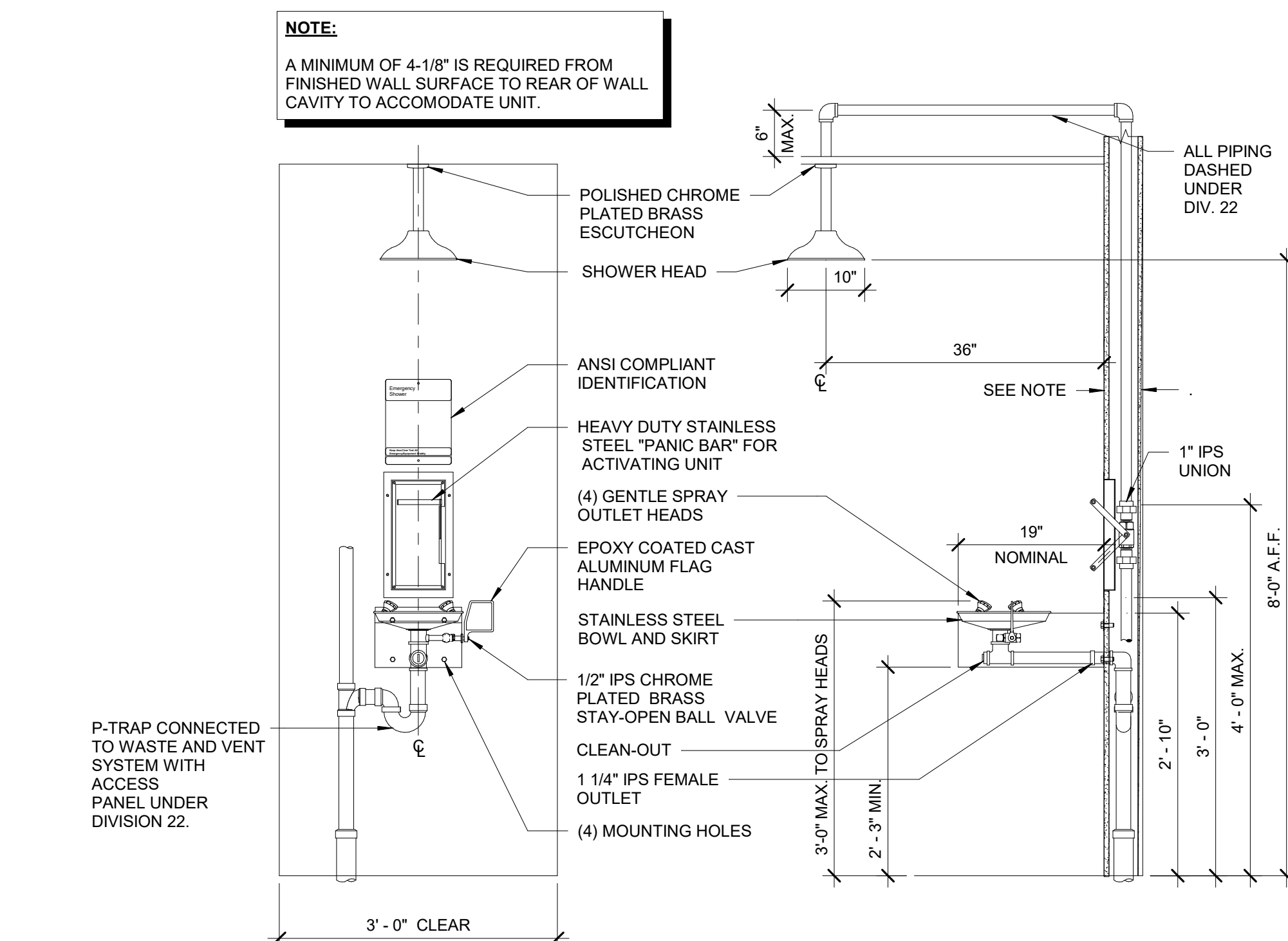
**.INDUSTRIAL WATER SIGN**

12" = 1'-0"

8



**CAUTION  
NON POTABLE WATER  
DO NOT DRINK**



NOTE:  
A MINIMUM OF 4-1/8" IS REQUIRED FROM FINISHED WALL SURFACE TO REAR OF WALL CAVITY TO ACCOMMODATE UNIT.

P-TRAP CONNECTED TO WASTE AND VENT SYSTEM WITH ACCESS PANEL UNDER DIVISION 22.

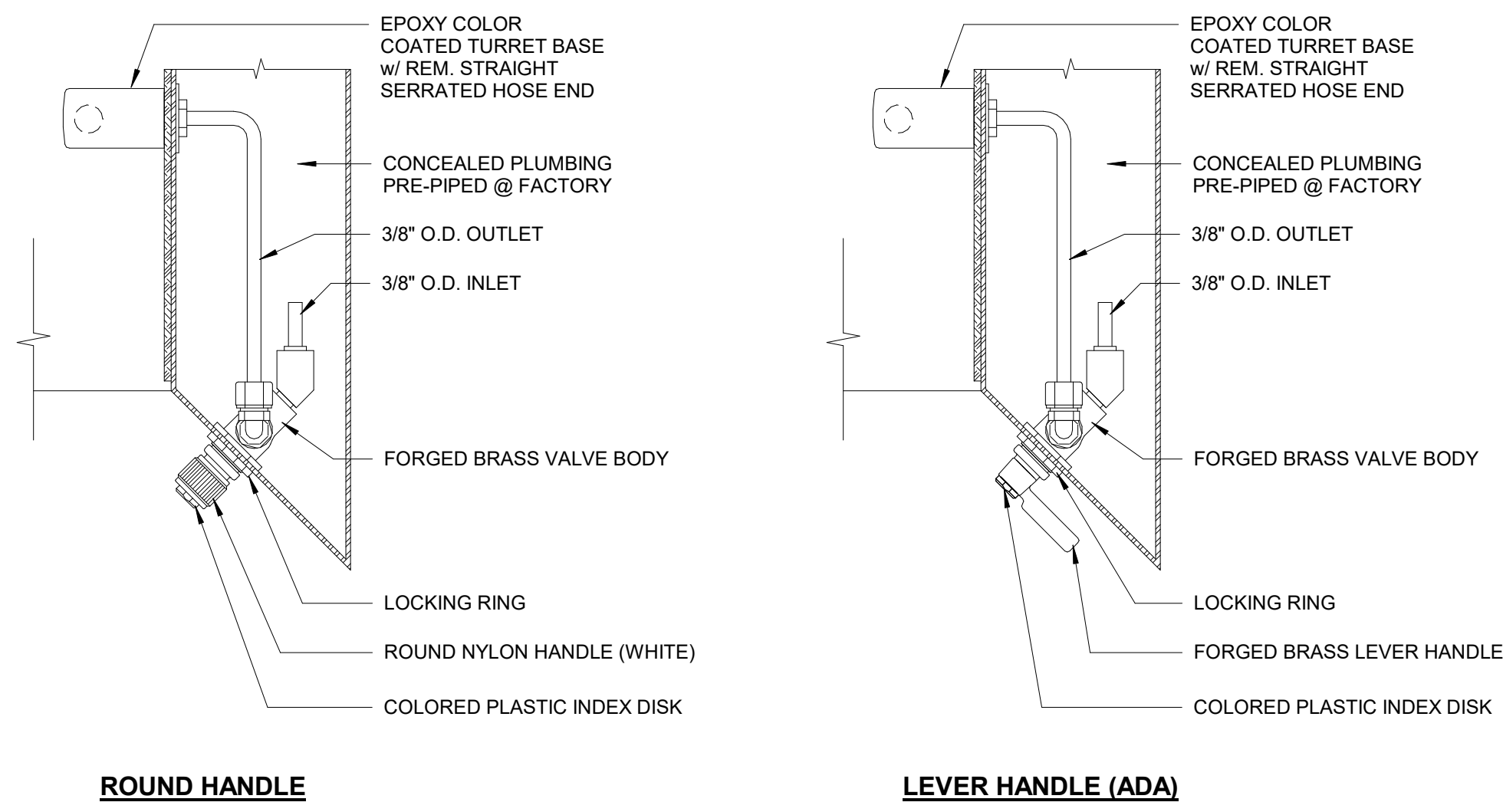
**.SSEW - SHOWER/EYEWASH BOWL AND SKIRT**

3/4" = 1'-0"

9

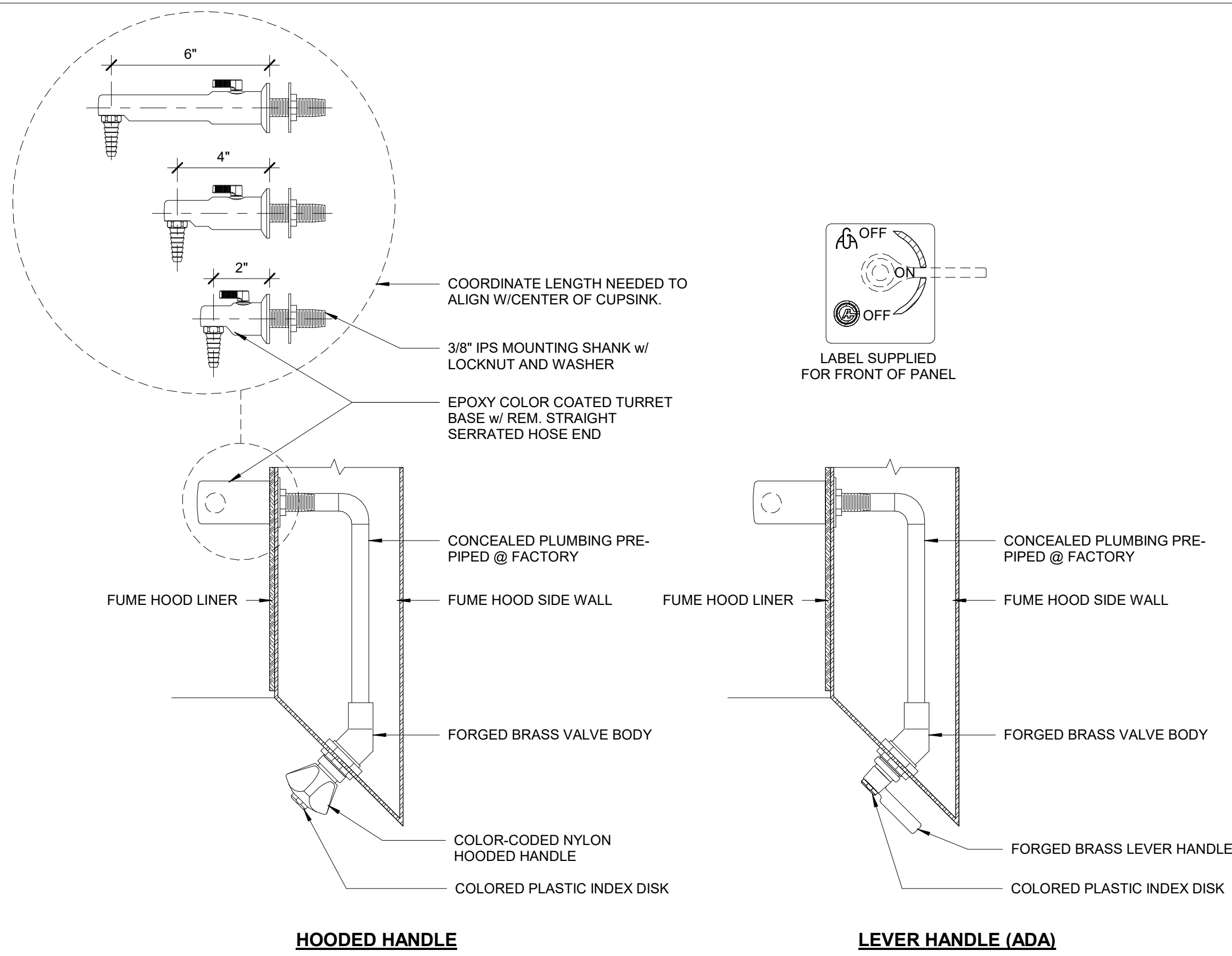


NOTES:  
 1. ALL COMPONENTS IN CONTACT WITH PURE WATER SHALL BE POLYPROPYLENE.  
 2. FITTURE INLET HAS 3/8" O.D. POLYPROPYLENE TUBE. PROVIDE ADAPTOR.  
 3. MAXIMUM WORKING PRESSURE 50 PSI.



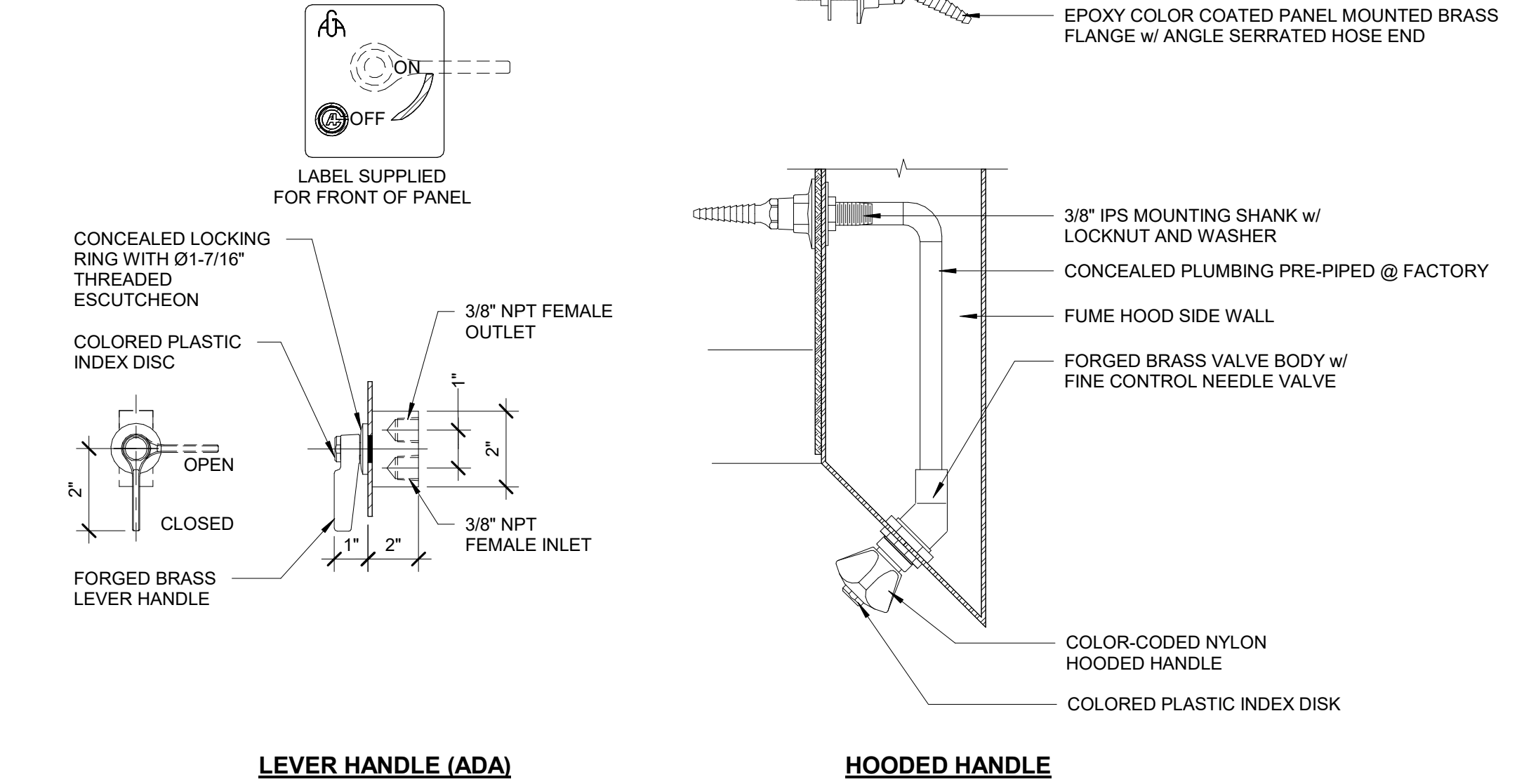
**.PW - HOOD**

3" = 1'-0" 1



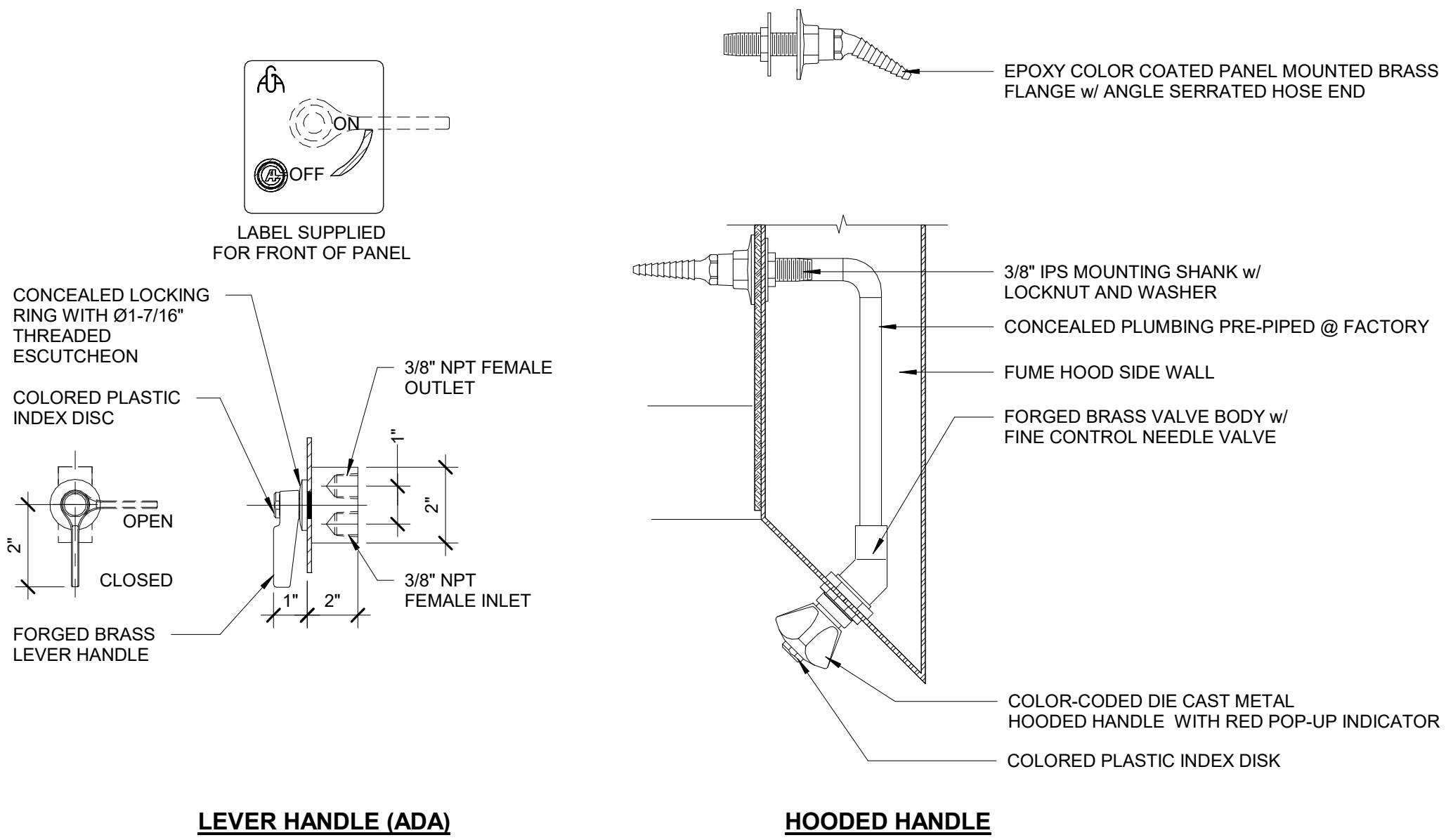
**.ICW - HOOD**

3" = 1'-0" 2



**.LG, LV - HOOD**

3" = 1'-0" 3



**.LG - HOOD**

3" = 1'-0" 4



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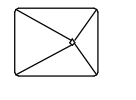
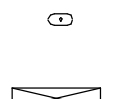
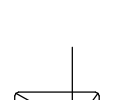
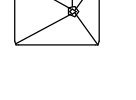

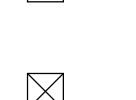

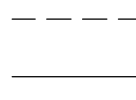
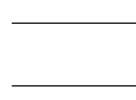
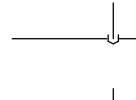

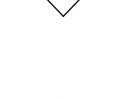
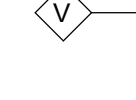
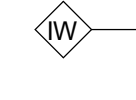
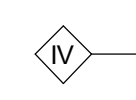
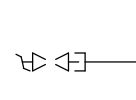
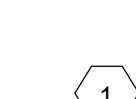



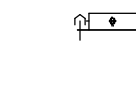
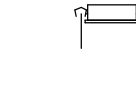
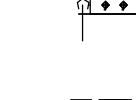












**GENERAL NOTES**

- CONTRACTOR SHALL CAREFULLY EXAMINE ALL DRAWINGS AND SPECIFICATIONS TO PROPERLY DETERMINE SCOPE OF WORK.
- DIVISION 22 SCOPE OF WORK INCLUDES THE INSTALLATION OF ALL SERVICE FITTINGS AND PIPING AS INDICATED ON FIXTURE & EQUIPMENT SCHEDULES AND AS SHOWN ON LF- & LP- DRAWINGS (LABORATORY SERVICE FITTINGS FURNISHED BY DIVISION 11). INSTALL ALL LABORATORY SERVICE FITTINGS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. LABORATORY SERVICE FITTINGS ON LP-SERIES DRAWINGS ARE SYMBOLIC ONLY. REFER TO LP-SERIES DRAWINGS FOR ACTUAL LABORATORY SERVICE FITTINGS, LOCATIONS AND ARRANGEMENTS.
- CONTRACTOR SHALL FIELD VERIFY CONDITIONS AT ALL POINTS OF CONNECTION PRIOR TO INSTALLATION.
- EQUIPMENT AND SYSTEM INSTALLATION SHALL CONFORM WITH ALL APPLICABLE LOCAL, STATE, FEDERAL AND HEALTH AUTHORITY CODES.
- ALL PIPING SHOWN ON DRAWINGS IS DIAGRAMMATIC. ADDITIONAL OFFSETS, WHICH MAY BE REQUIRED, IN WASTE & VENT RISERS OR IN BELOW BENCH SERVICE PIPING SHALL BE PROVIDED UNDER DIVISION 22.
- PIPE LINES ENTERING LABORATORIES ARE SHOWN WITH WIDE SEPARATION FOR CLEAR IDENTIFICATION PURPOSES ONLY. MAINTAIN A TIGHT AND ORDERLY GROUPING OF PIPES WITHIN EACH LABORATORY. LOCATION, ROUTING AND SUPPORT OF LABORATORY PIPING SHALL BE COORDINATED WITH THE INSTALLED EQUIPMENT, OVERHEAD SERVICE CARRIERS, PIPE DROP ENCLOSURES, BUILDING STRUCTURAL ELEMENTS, DUCTWORK, ELECTRICAL CONDUITS, POWER PANELS AND LIGHT FIXTURES.
- ALL EXPOSED TO VIEW PIPING SHALL BE INSTALLED WITH SPECIAL CARE GIVEN TO UNIFORM SPACING, LEVEL AND PLUMB, CLEAN APPEARANCE FREE OF DEBRIS AND HANDLING MARKS, WITHOUT THE NEED FOR OFFSETS BELOW THE CEILING LEVEL.
- VALVES AND CAPS AT POINTS OF CONNECTION ARE SHOWN ON LP-SERIES DRAWINGS FOR COORDINATION ONLY, REFER TO P-SERIES DRAWINGS FOR LOCATION AND SIZES.
- PROVIDE REDUCERS ON POINT OF CONNECTION WHERE SIZES SHOWN ON P-SERIES DRAWINGS ARE LARGER THAN INDICATED ON LP-SERIES DRAWINGS. PROVIDE ADAPTERS/REDUCERS WHERE NECESSARY FOR CONNECTION TO PIPING SERVICES OR WASTE LINES.
- INSTALL WATER HAMMER ARRESTORS ON LINES SERVING FIXTURES OR EQUIPMENT WITH QUICK CLOSING VALVES.
- PROVIDE VALVED AND CAPPED CONNECTIONS WHERE "ROUGH-IN ONLY" OR "FUTURE SERVICES" ARE INDICATED ON DRAWINGS.
- PIPE SIZES ARE INDICATED ON THESE DRAWINGS BY MEANS OF THE POINT OF CONNECTION, SERVICE DROP, FITTING, FIXTURE AND EQUIPMENT CONNECTION SCHEDULES.  
THE FOLLOWING GUIDELINES SHALL GOVERN THE PIPE SIZES:  
A. THE POINT OF CONNECTION SCHEDULE INDICATES PIPE SIZE ENTERING EACH LABORATORY. THE SIZE SHALL EXTEND UNDIMINISHED UP TO THE LAST TEE BRANCH OF THE CEILING DISTRIBUTION PIPING.  
B. WHERE SERVICE DROPS ARE INDICATED, THE SERVICE DROP SCHEDULE SHALL GOVERN THE DROP AS WELL AS EACH ASSOCIATED BRANCH. THESE SERVICES SHALL EXTEND TO BELOW BENCH AND RUN HORIZONTALLY UNDIMINISHED IN SIZE UP TO THE LAST TEE SERVING DIFFERENT FITTINGS.  
C. THE FIXTURE, SERVICE FITTING & EQUIPMENT CONNECTION SCHEDULE SHALL INDICATE THE SIZE FOR THE FINAL SECTION OF PIPING.
- REFER TO THE LABORATORY PLUMBING DETAILS FOR TYPICAL PIPE ROUTING BELOW AND WITHIN THE CASEWORK. THE QUANTITY, SIZE AND MATERIAL OF PIPE WILL VARY IN ACCORDANCE WITH THE TYPE OF SERVICES. INSTALL IN ACCORDANCE WITH THE PIPING ARRANGEMENT AND ORIENTATION SHOWN ON PLANS.
- FITTING/FIXTURE INLET SIZE MAY VARY. PROVIDE APPROPRIATE CONNECTORS.
- FLOOR DRAINS AND FLOOR SINKS ARE SHOWN ON LABORATORY PLUMBING PLANS FOR GENERAL LOCATION AND REFERENCE ONLY. REFER TO PLUMBING DRAWINGS FOR ACTUAL LOCATION, SIZE AND TYPE OF DEVICE.
- TEST ALL VALVES, SERVICE FITTINGS, EMERGENCY SHOWERS, EYEWASHES AND DRENCH HOSES AS SPECIFIED TO ENSURE SYSTEM INTEGRITY AND PROPER OPERATION.
- INSULATE PIPING IN ACCORDANCE WITH DIVISION 22 SPECIFICATIONS. INSULATION TO INCORPORATE ENTIRE LENGTH OF PIPE FROM POINT OF CONNECTION TO POINT OF USE.
- PROVIDE STAINLESS STEEL ESCUTCHEON PLATES FOR ALL EXPOSED PIPE PENETRATIONS IN WALLS AND CEILINGS.
- PROVIDE MINIMUM SIZE OF 2" LABORATORY WASTE & 1-1/2" VENT RISER WHERE  LABORATORY WASTE POINTS OF CONNECTION SYMBOL IS INDICATED ON DRAWINGS. WASTE PENETRATIONS AT LABORATORY SINKS & CUPSINKS MAY REQUIRE OFFSET TO AVOID STRUCTURAL BEAMS AND JOISTS. REFER TO DETAIL #5/LP3.10.
- ALL PLUMBING VENTS SHALL EXTEND SIX INCHES ABOVE FLOOD LEVEL RIM OF FIXTURE SERVED BEFORE CHANGING FROM VERTICAL TO A HORIZONTAL POSITION UNLESS OTHERWISE NOTED FOR SPECIAL VENTING ARRANGEMENTS.
- REFERENCES TO LP DETAILS ARE SHOWN FOR SPECIFIC CONDITIONS ON THE LP FLOOR PLAN DRAWINGS. IN ADDITION, REFER TO GENERAL NOTES AND PLAN SYMBOL LEGEND FOR MISCELLANEOUS DETAILS.
- PROVIDE CLEANOUTS IN ACCORDANCE WITH PLUMBING CODE OR LOCAL, STATE, FEDERAL AND HEALTH AUTHORITY REQUIREMENTS. COORDINATE CLEANOUT ACCESS LOCATIONS WITH LABORATORY CASEWORK INSTALLATION.
- CONNECTIONS TO HOSE EYEWASHES AND/OR DRENCH HOSES TO BE PROTECTED BY BACK FLOW PREVENTERS INSTALLED ACCORDING WITH PLUMBING CODE AND ACCEPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- EMERGENCY SHOWERS, EYEWASHES AND DRENCH HOSES ARE FURNISHED UNDER DIVISION 11. INSTALL THESE DEVICES AS DETAILED AND SHOWN ON PLANS. CONNECT TO COLD WATER SUPPLY AS INDICATED WITHOUT FIXTURE ISOLATION VALVES.
- PROVIDE BACKFLOW PREVENTERS ON EQUIPMENT CONNECTIONS TO POTABLE WATER AS REQUIRED BY LOCAL CODE AND ACCEPTED BY LOCAL AUTHORITY HAVING JURISDICTION.
- SEAL ALL PIPING PENETRATIONS THROUGH RATED WALLS WITH UL APPROVED SYSTEM. SEE ARCHITECTURAL & PLUMBING DETAILS.
- PROVIDE IDENTIFICATION FOR PIPING AND EQUIPMENT PER ASME A13.1 AND PROJECT SPECIFICATIONS.


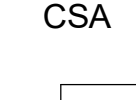
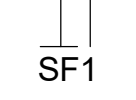

**PIPING LEGEND**

PIPING/ABBREVIATION	DESCRIPTION
CA	COMPRESSED AIR (100 psig)
CW	COLD WATER (POTABLE )
ICW	INDUSTRIAL COLD WATER
IHW	INDUSTRIAL HOT WATER
IHW R	INDUSTRIAL HOT WATER RETURN
LG	LABORATORY GAS
LV	LABORATORY VACUUM
LW	LABORATORY WASTE
LWV	LABORATORY WASTE VENT
PW	PURIFIED WATER
N2	NITROGEN

**PLAN SYMBOL LEGEND**

SYMBOL	ABBREVIATION	DESCRIPTION
	SK*	LABORATORY SINK (PROVIDED UNDER DIVISION 11)
	CS*	CUP SINK (PROVIDED UNDER DIVISION 11)
		PIPE DROP ENCLOSURE (PROVIDED UNDER DIVISION 11). FOR PIPING LAYOUT WITHIN PIPE DROP REFER TO DETAILS #9/LP3.10.
		P-TRAP & TRAP ARM
		SAFETY SHOWER/EYEWASH UNIT (PROVIDED UNDER DIVISION 11)
	FD	FLOOR DRAIN (SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO P-SERIES DRAWINGS.)
	FS	FLOOR SINK (SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO P-SERIES DRAWINGS.)
		PIPING BELOW BENCH
		PIPING BELOW FLOOR
		PIPE CAPPED
		PIPE ELBOW UP (OR) TEE UP & DOWN
		PIPE ELBOW DOWN
		PIPE TEE & ELBOW UP
		PIPE TEE & ELBOW DOWN
		POINT OF CONNECTION TO 2" LABORATORY WASTE @ 6" A.F.F. & 1-1/2" LABORATORY WASTE VENT RISE @ 6" A.F.C. - U.O.N. (REFER TO P-SERIES DRAWINGS FOR CONTINUATION)
		POINT OF CONNECTION TO 1-1/2" LABORATORY WASTE VENT RISE @ 6" A.F.C. (U.O.N.) (REFER TO P-SERIES DRAWINGS FOR CONTINUATION)
		POINT OF CONNECTION TO 2" LABORATORY WASTE VERTICAL FIXTURE DRAIN @ 6" A.F.F. (ISLAND FIXTURE WASTE) (REFER TO P-SERIES DRAWINGS FOR CONTINUATION)
		POINT OF CONNECTION TO 1-1/2" LABORATORY WASTE VERTICAL FIXTURE VENT @ 6" A.F.F. (ISLAND FIXTURE VENT) (REFER TO P-SERIES DRAWINGS FOR CONTINUATION)
		POINT OF CONNECTION TO VALVED AND CAPPED SERVICES (VALVES AND CAP PROVIDED UNDER DIVISION 22 P-SERIES DRAWINGS)
		POINT OF CONNECTION NUMBER - COORDINATES PLAN WITH POINT OF CONNECTION SCHEDULE
		SERVICE DROP NUMBER - COORDINATES PLAN WITH SERVICE DROP SCHEDULE
	DETAIL NUMBER DRAWING NUMBER	DETAIL REFERENCE BUBBLE COORDINATES PLAN WITH DETAIL SHEETS
		EQUIPMENT VALVE BOX
	GSB	LABORATORY GAS SHUT-OFF VALVE BOX
		ICW & IHW VALVE BOX
		CYLINDER MANIFOLD
	A.F.F.	ABOVE FINISHED FLOOR
	A.F.C.	ABOVE FINISHED CEILING
	BV	BALL VALVE
	DN	DOWN
	N.T.S.	NOT TO SCALE
	P.O.C.	POINT OF CONNECTION
	SIM.	SIMILAR
	TYP.	TYPICAL
	U.O.N.	UNLESS OTHERWISE NOTED

**FIXTURE, SERVICE FITTING AND EQUIPMENT LEGEND**

	DESIGNATES LABORATORY SINK(FURNISHED UNDER DIVISION 11 - U.O.N. REFER TO PLANS)
	DESIGNATES CUP SINK(FURNISHED UNDER DIVISION 11 - U.O.N. REFER TO PLANS)
	DESIGNATES SERVICE FITTING STATION (LABORATORY SERVICE FITTINGS FURNISHED UNDER DIVISION 11 - ALL OTHERS FURNISHED UNDER DIVISION 22)
	DESIGNATES EQUIPMENT STATION (FURNISHED UNDER DIVISION 11 AND/OR OFOI. REFER TO PLANS)

**FIXTURE CONNECTION SCHEDULE**

PIPE SIZE IN INCHES							
FIXTURE/FITTING NO.	CW	ICW	IHW	PW	LG	LV	LW(P-TRAP)
SKA		1/2	1/2				1 1/2
SKB		1/2	1/2	1/2			1 1/2
CSA							1 1/2

- NOTES:  
 1. BUILDING PW WATER LOOP TO EACH FIXTURE PER LP-SERIES DRAWINGS.  
 2. CONNECTION TO SERVICE PER LP-SERIES DRAWINGS.  
 3. ALL SERVICES TO FUME HOOD TO BE PRE-PIPED TO SINGLE POINT OF CONNECTION BY DIV. 11. FUME HOOD SERVICE FITTING LOCATION MAY VARY, REFER TO LF PLANS.

**SERVICE FITTING SCHEDULE**

PIPE SIZE IN INCHES							
SERVICE FITTING NO.	CW	ICW	IHW	PW	LG	LV	N2
SF1	1 1/4						
SF2					1/2		
SF3						3/4	
SF4						3/4	1/2
SF5					1/2	3/4	
SF6				1/2			

**EQUIPMENT CONNECTION SCHEDULE**

PIPE SIZE IN INCHES							
EQUIPMENT NO.	ICW	IHW	PW	LV	CA	LW(P-TRAP)	
EQ1 (MANUAL STERILIZER, 16x26)		1/2					
EQ2 (PREVACUUM STERILIZER, 20x20x38)	3/4		1/2		1/2*		
EQ3 (U.C. GLASS WASHER)	3/4	3/4	1/2				
EQ4 (STACKED WASHER/DRYER)	3/4	3/4				2	
EQ5 (ICE MACHINE)	1/2						
EQ6 (TALL GLASS WASHER)	1	1	1				

- \* COMPRESSED AIR TO BE SUPPLIED FROM DEDICATED AIR COMPRESSOR IF REQUIRED. REFER TO SECTION 115350.

- NOTES:  
 1. BUILDING PW WATER LOOP TO EACH EQUIPMENT PER LP-SERIES DRAWINGS.  
 2. CONNECTION TO SERVICE PER LP-SERIES DRAWINGS.

**SERVICE DROP SCHEDULE**

PIPE SIZE IN INCHES							
DROP NUMBER NO.	CW	ICW	IHW	PW	LG	LV	N2
1					1/2		
2					1 1/4		
3		1/2	1/2	*	1 1/4		
4		1/2	1/2		1/2		
5		1/2	1/2	*	1/2		
6						3/4	1/2
7		1/2	1/2	*			
8		1/2	1/2		1/2	3/4	
9		1/2	1/2	*		3/4	1/2
10		1/2	1/2	*	1/2	3/4	
11				1/2	1/2	3/4	1/2
12		3/4	3/4	*			
13		3/4	3/4	*	3/4	1 1/4	
14		3/4	3/4		3/4	1 1/4	
15		1/2			1/2	3/4	
16				1/2	1/2	3/4	
17		3/4	3/4				
18		1/2	1/2				
19					1/2	3/4	
20					3/4		

- \* BUILDING PW PIPING SIZE

- NOTES:  
 1. BUILDING PW WATER LOOP TO EACH SERVICE DROP PER LP-SERIES DRAWINGS.

PIPING POINT OF CONNECTION SCHEDULE

ROOM NAME	ROOM NO.	POC NO.		CW	ICW	IHW	IHWR	PW	LG	LV
				GPM	GPM	GPM	GPM	GPM	sCFH	sCFM
LEVEL 1										
MICROBIOLOGY LAB	111	1.01	DESIGN FLOW	23	5	5		1	108	
			PIPE SIZE (IN)	1 1/4	3/4	3/4	1/2	*	1 1/4	
AUTOCLAVE ROOM	113	1.02	DESIGN FLOW		7	1.5		4		
			PIPE SIZE (IN)		1	1/2		*		
MICROBIOLOGY PREP / CLEAN SPACE	112 / 114	1.03	DESIGN FLOW	23	6	6		3	8	1
			PIPE SIZE (IN)	1 1/4	3/4	3/4	1/2	*	1/2	3/4
MICROBIOLOGY LAB	110	1.04	DESIGN FLOW	23	5	5		1	108	
			PIPE SIZE (IN)	1 1/4	3/4	3/4	1/2	*	1 1/4	
ORGANIC CHEMISTRY LABORATORY	102	1.05	DESIGN FLOW	23	7	7		5	4	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	1/2	1 1/4
PREPARATION ROOM	104	1.06	DESIGN FLOW	23	7	7		4	8	2
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	1/2	3/4
ORGANIC CHEMISTRY LABORATORY	101	1.07	DESIGN FLOW	23	7	7		5	4	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	1/2	1 1/4
LEVEL 2										
GENERAL CHEMISTRY LABORATORY	204	2.01	DESIGN FLOW	23	9	8		2	44	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	3/4	1 1/4
GENERAL CHEMISTRY LABORATORY	203	2.02	DESIGN FLOW	23	9	8		2	40	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	3/4	1 1/4
GENERAL CHEMISTRY LABORATORY	202	2.03	DESIGN FLOW	23	9	8		2	40	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	3/4	1 1/4
GENERAL CHEMISTRY LABORATORY	201	2.04	DESIGN FLOW	23	9	8		2	40	9
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	3/4	1 1/4
PREPARATION ROOM / ALCOVE	205 / 208	2.05	DESIGN FLOW	23	11	9		12	16	3
			PIPE SIZE (IN)	1 1/4	1	1	1/2	*	1/2	1

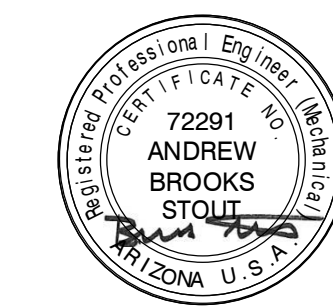
NOTES:

1. FLOW RATES REPRESENT DESIGN PEAK LABORATORY LOADS USED FOR PIPE SIZING AT POC.
2. CW - COLD WATER FOR SAFETY SHOWER/EYEWASH SIZED FOR INSTANTANEOUS/INCIDENTAL USE.
3. \* REFER TO P-SERIES PLANS FOR PURIFIED WATER PIPING SIZING. PROVIDE MINIMUM 3 fps CIRCULATION VELOCITY IN LABORATORY PW LOOP. SYSTEM STATIC PRESSURE SHOULD NOT EXCEED 60 psig. VALVED SERVICE CONNECTION PER LP SCHEDULES AND DETAILS.
4. IHWR CIRCULATED INSIDE LABORATORY AS SHOWN ON PLANS. DESIGN FLOW PER P-SERIES DRAWINGS.
5. IHW HARDNESS SHOULD NOT TO EXCEED 120 MG/L (PPM) TO LABORATORY EQUIPMENT.
6. SG GASES PIPING ROUTE BY LP-SERIES DRAWINGS

ESTIMATED PW WATER CONSUMPTION AND PEAK LOAD		
	GAL	GPM
PW WATER HOURLY CONSUMPTION	40	
PW WATER 4-HOUR CONSUMPTION	160	
PW WATER PEAK FLOW RATE		10

**Pima Community College**  
**PCC West Lab Building F**  
**Renovation**

2202 W Anklam Rd, Tucson, AZ 85745



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**DATE:** 01/08/2020

**REVISIONS**

**LABORATORY PLUMBING SCHEDULES**

**LP1.11**  
 100% CONSTRUCTION DOCUMENTS

CONSULTANTS

LABORATORY  
 APCL, 4715 N. Avenue #400  
 San Diego, CA 92108-3192  
 Phone: 619.297.0169

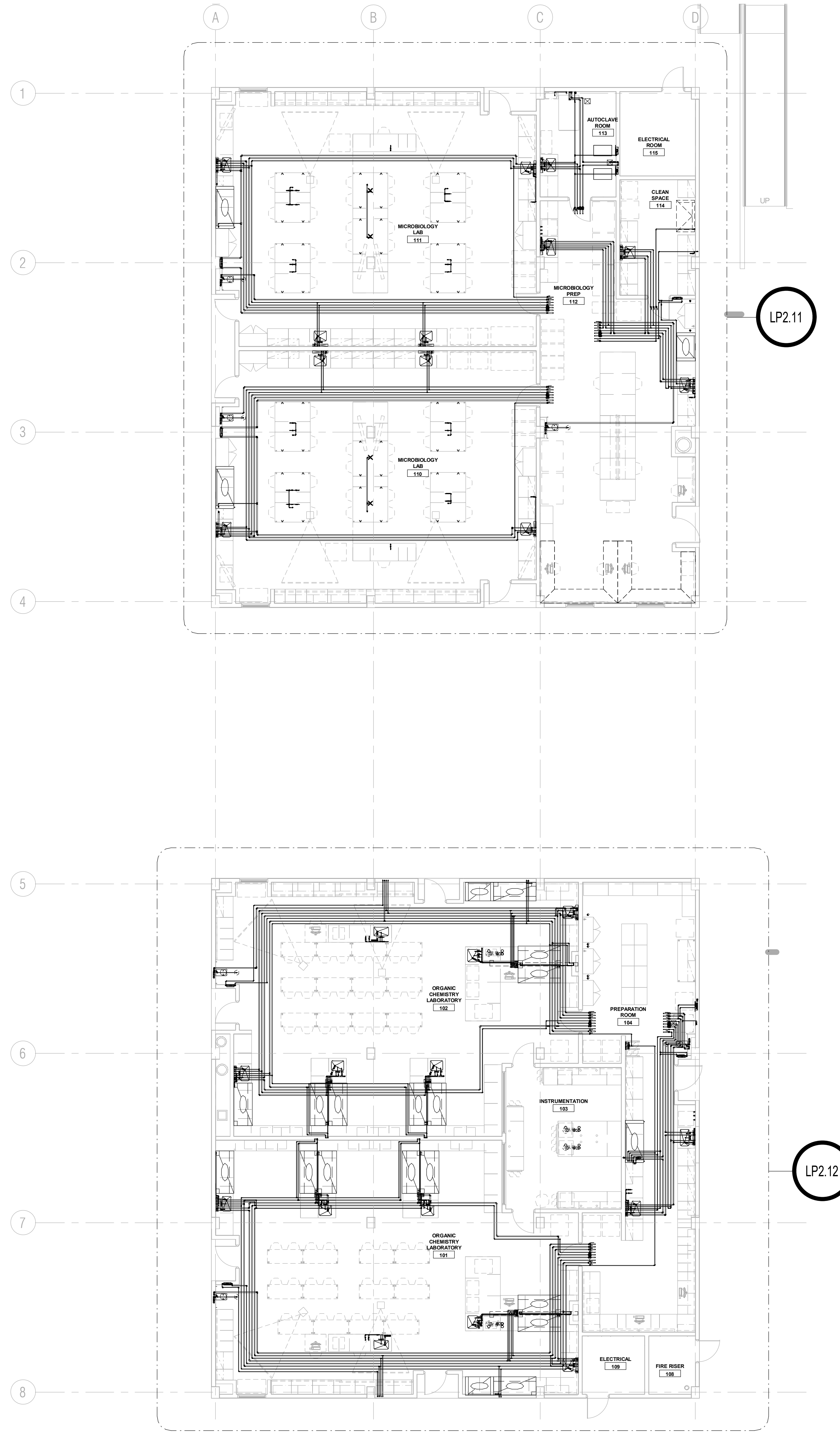
MECHANICAL  
 KC Mechanical Engineering  
 1400 E. University Ave.  
 Tucson, AZ 85711  
 Phone: 520.327.7611

STRUCTURAL  
 Sinter Structural Engineering  
 3020 N. Oracle Rd. #200  
 Tucson, AZ 85718  
 Phone: 520.323.3422

ELECTRICAL  
 Montreal Engineering, Inc.  
 1250 E. University Ave.  
 Tucson, AZ 85711  
 Phone: 520.884.0045

**bws** ARCHITECTS

**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
 76 North Court Avenue  
 Suite 200  
 520.795.2702 Fax: 520.795.6171  
 www.bwsarch.com



1 LEVEL-1 OVERALL - ALTERNATE BID  
 1/8" = 1'-0"

**CONSULTANTS**

**LABORATORY**  
 BPC, Fifth Avenue #400  
 San Diego, CA 92103-3192  
 Phone: 619.297.0169

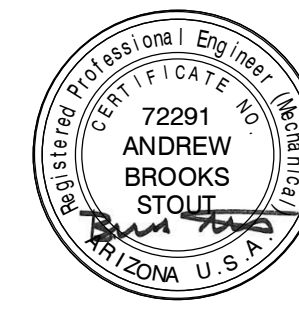
**MECHANICAL**  
 AC Mechanical Engineering  
 1000 North Oracle Road  
 Tucson, AZ 85711  
 Phone: 520.327.7611

**STRUCTURAL**  
 Miller Structural Engineering  
 3026 East Chino Pk.  
 Tucson, AZ 85716  
 Phone: 520.323.3422

**ELECTRICAL**  
 Morrell Engineering, Inc.  
 1230 E. Broadway  
 Tucson, AZ 85719  
 Phone: 520.884.0045

**Pima Community College  
 PCC West Lab Building F  
 Renovation**

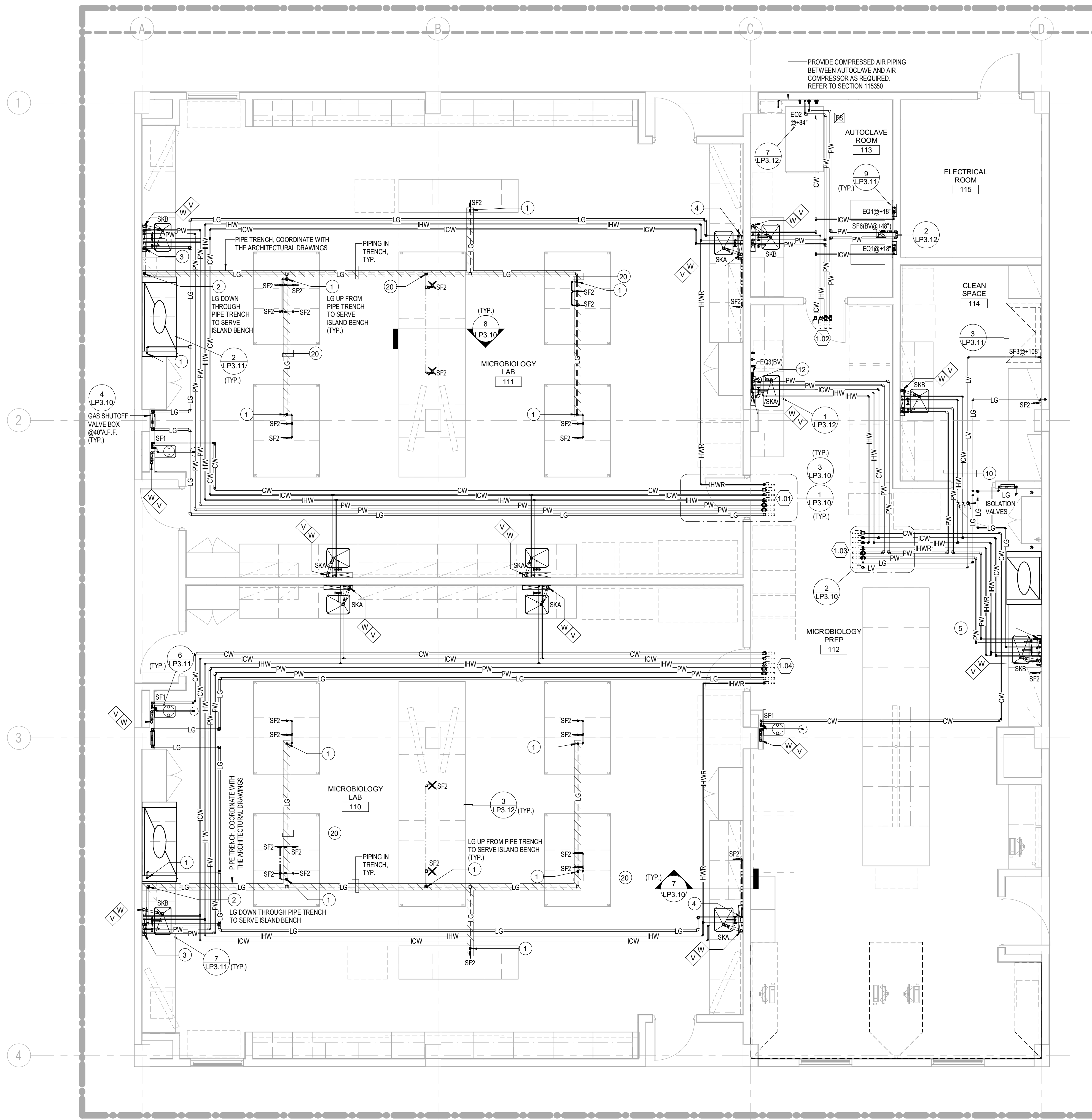
2202 W Anklam Rd, Tucson, AZ 85745



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**DATE:** 01/08/2020

**REVISIONS**





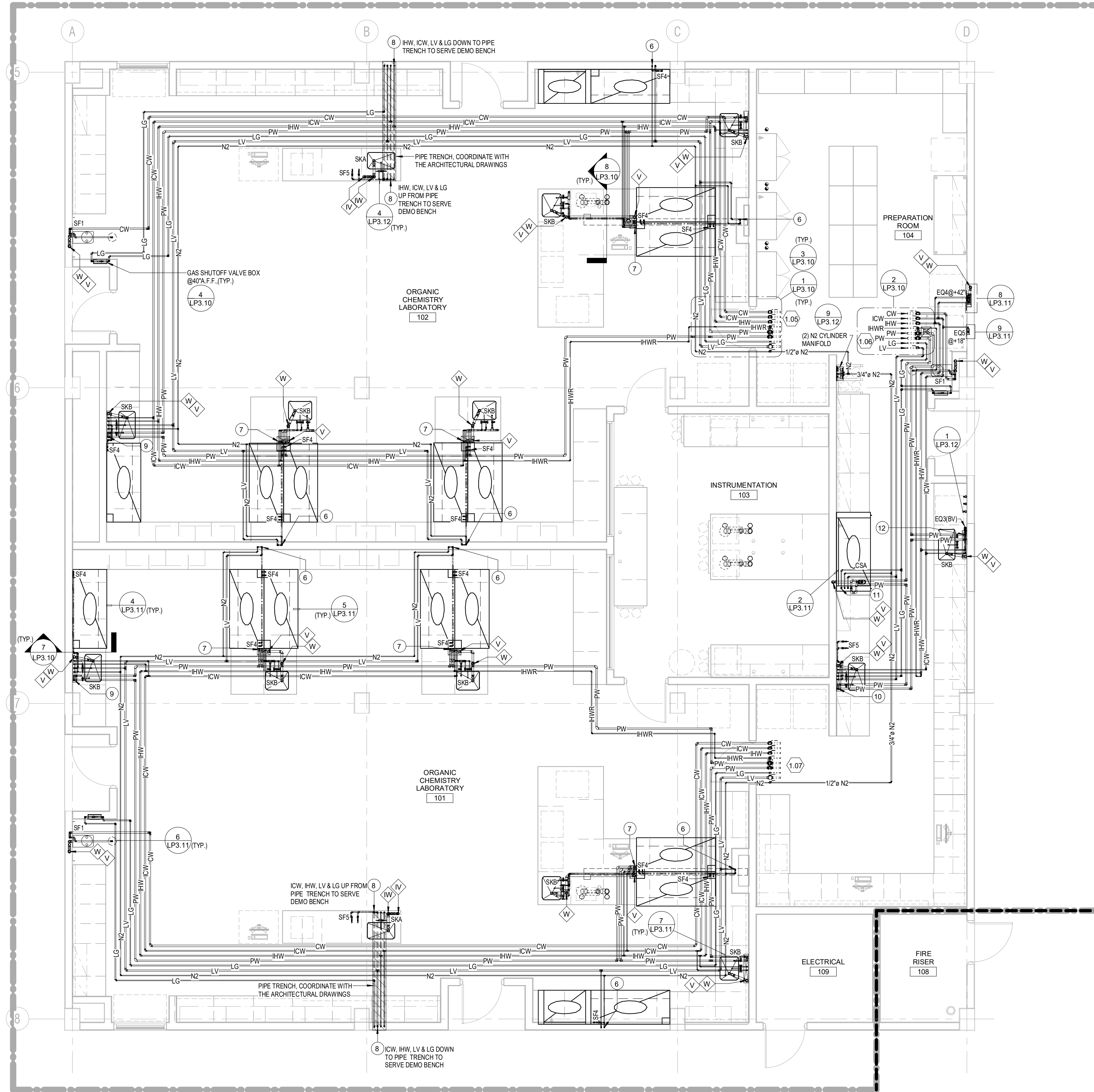
ADD ALTERNATE #01  
MICROBIOLOGY AND  
ASSOCIATED SYSTEMS.  
REFER TO SPEC  
SECTION 012300

1 LEVEL-1, PLAN 'A'  
1/4" = 1'-0"



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1 LEVEL-1, PLAN 'B'  
1/4" = 1'-0"



ADD ALTERNATE #02  
ORGANIC CHEMISTRY  
AND ASSOCIATED  
SYSTEMS. REFER TO  
SPEC SECTION 012300



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LABORATORY PLUMBING  
LEVEL 1 PLAN B

**LP.12**  
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PCC West Lab Building F  
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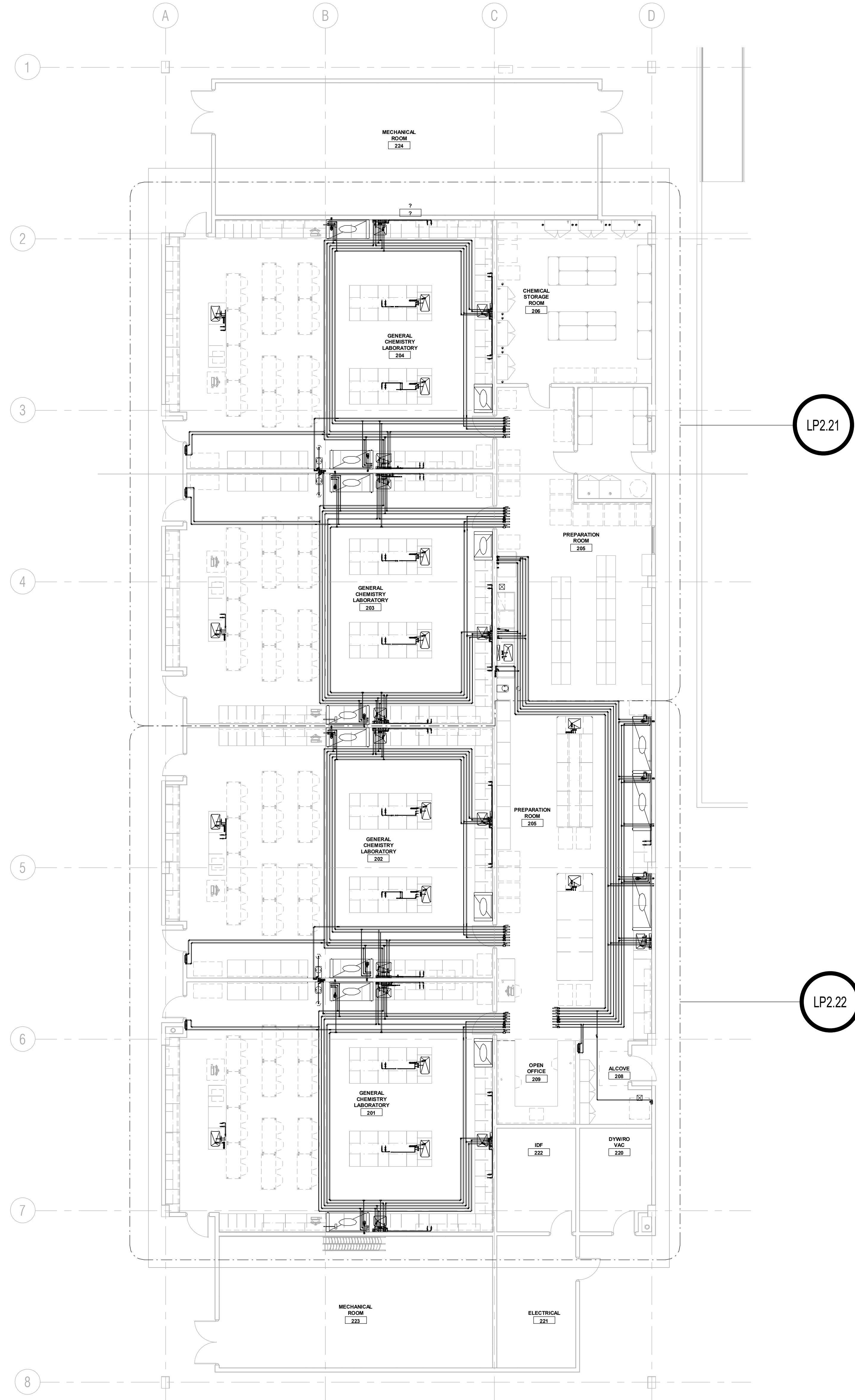
**CONSULTANTS**  
LABORATORY  
BROOKS ANDERSON  
72291  
ANDREW  
BROOKS  
STATE OF ARIZONA  
ENGINEER  
LICENSE NO. 72291  
TUCSON, AZ 85711  
PHONE: 619.297.0169

**MECHANICAL**  
AC Mechanical Engineering  
1000 N. Oracle Rd.  
Tucson, AZ 85711  
Phone: 520.327.7611

**STRUCTURAL**  
Giner Structural Engineering  
3025 E. Chino Rd.  
Tucson, AZ 85716  
Phone: 520.323.3422

**ELECTRICAL**  
Moraal Engineering, Inc.  
1230 E. Chino Rd.  
Tucson, AZ 85716  
Phone: 520.884.0045

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BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
76 North Court Avenue  
Tucson, AZ 85716  
520.795.2105 Fax: 520.795.6171  
www.bwsarch.com

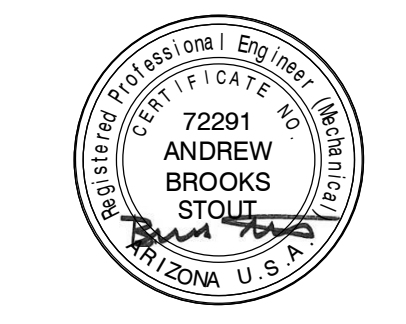


**1 LEVEL-2 OVERALL**  
 1/8" = 1'-0"



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**LAB PLUMBING - LEVEL 2 OVERALL**  
**LP2.20**  
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**PCC West Lab Building F**  
**Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

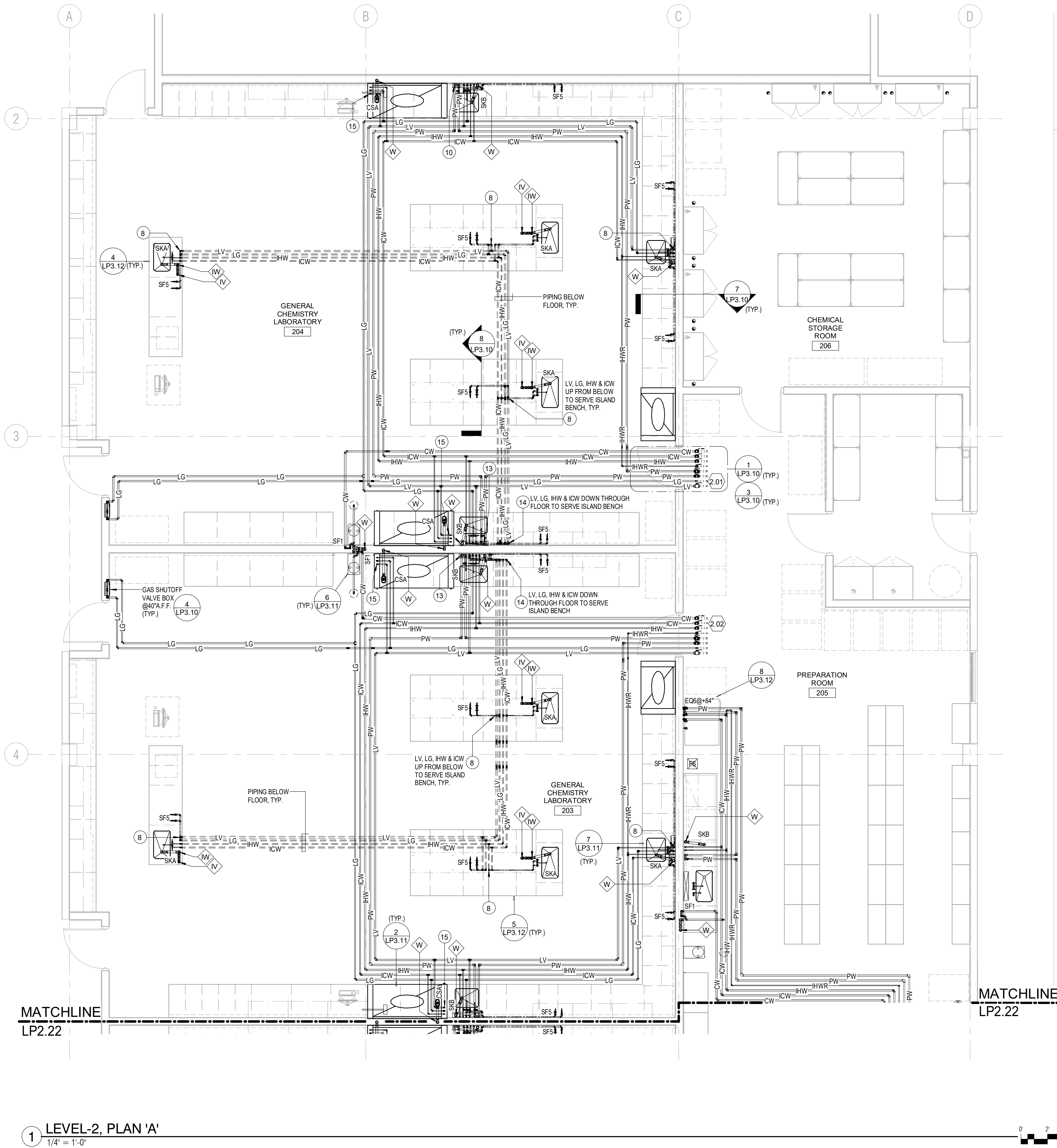
**CONSULTANTS**  
**LABORATORY**  
 BRCS, Fifth Avenue #400  
 San Diego, CA 92103-3192  
 Phone: 619.297.0169

**MECHANICAL**  
 AC Mechanical Engineering  
 1000 W. Broadway  
 Tucson, AZ 85711  
 Phone: 520.327.7611

**STRUCTURAL**  
 Strider Structural Engineering  
 3026 E. Chino Pk.  
 Tucson, AZ 85716  
 Phone: 520.323.3422

**ELECTRICAL**  
 Morford Engineering, Inc.  
 1232 E. 1st St.  
 Tucson, AZ 85719  
 Phone: 520.884.0045

**bws ARCHITECTS**  
**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
 76 North Court Avenue  
 Tucson, AZ 85710  
 520.795.2102 Fax: 520.795.6171  
 www.bwsarch.com

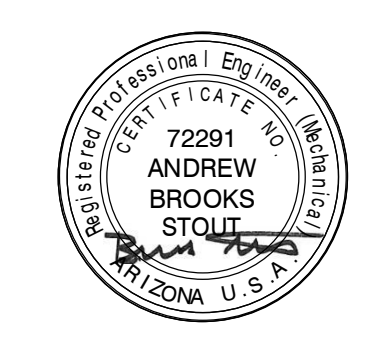


1 LEVEL-2, PLAN 'A'  
1/4" = 1'-0"



- CONSULTANTS**
- LABORATORY**  
BPCS, Fifth Avenue #400  
San Diego, CA 92103-3192  
Phone: 619.297.0169
  - MECHANICAL**  
AC Mechanical Engineering  
1000 E. McDowell Rd.  
Tucson, AZ 85711  
Phone: 520.327.1611
  - STRUCTURAL**  
Miller Structural Engineering  
3026 N. Oracle Blvd. #100  
Tucson, AZ 85716  
Phone: 520.323.3422
  - ELECTRICAL**  
Moraal Engineering, Inc.  
1235 E. Chino Rd.  
Tucson, AZ 85716  
Phone: 520.884.0045

**Pima Community College  
PCC West Lab Building F  
Renovation**  
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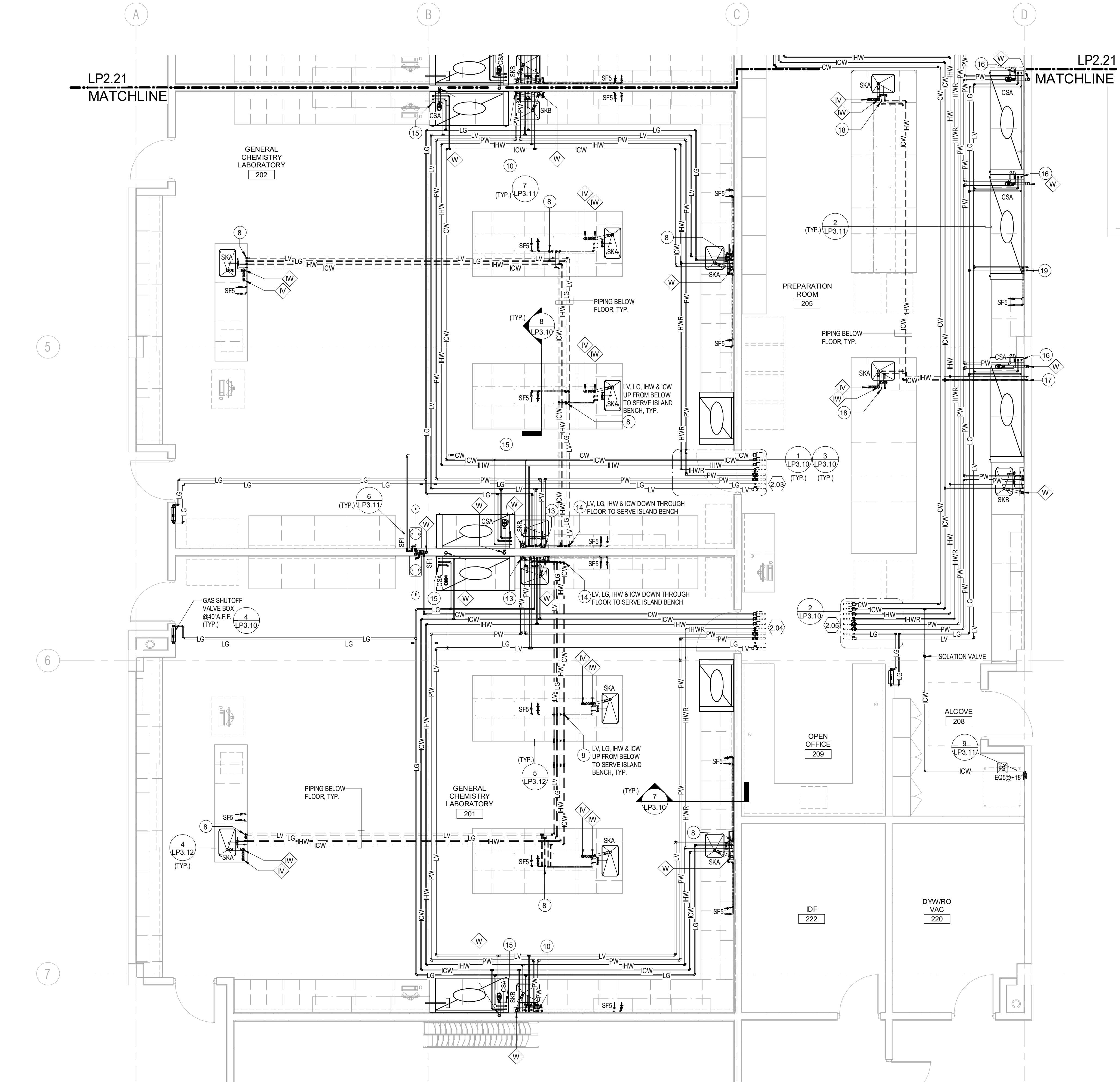


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**DATE:** 01/08/2020  
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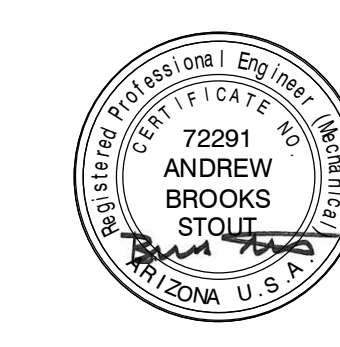
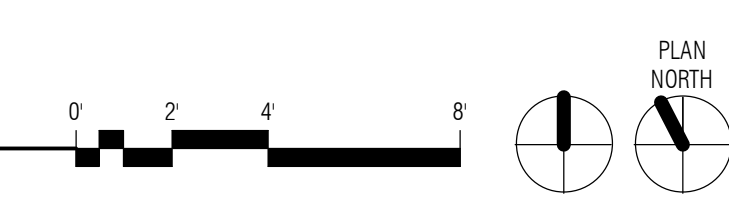
**LAB PLUMBING - LEVEL 2  
PLAN A**

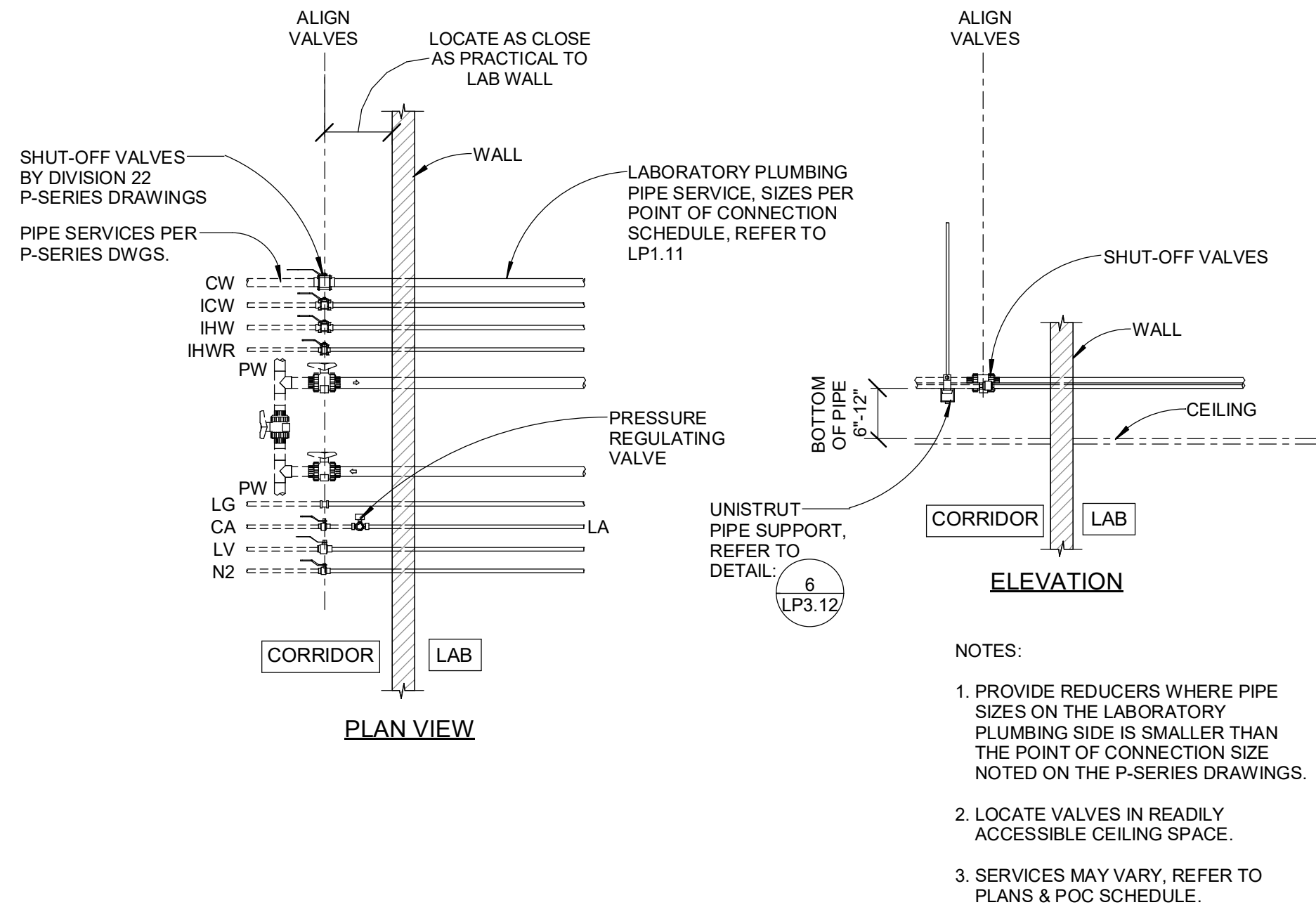
**LP2.21**  
100% CONSTRUCTION DOCUMENTS



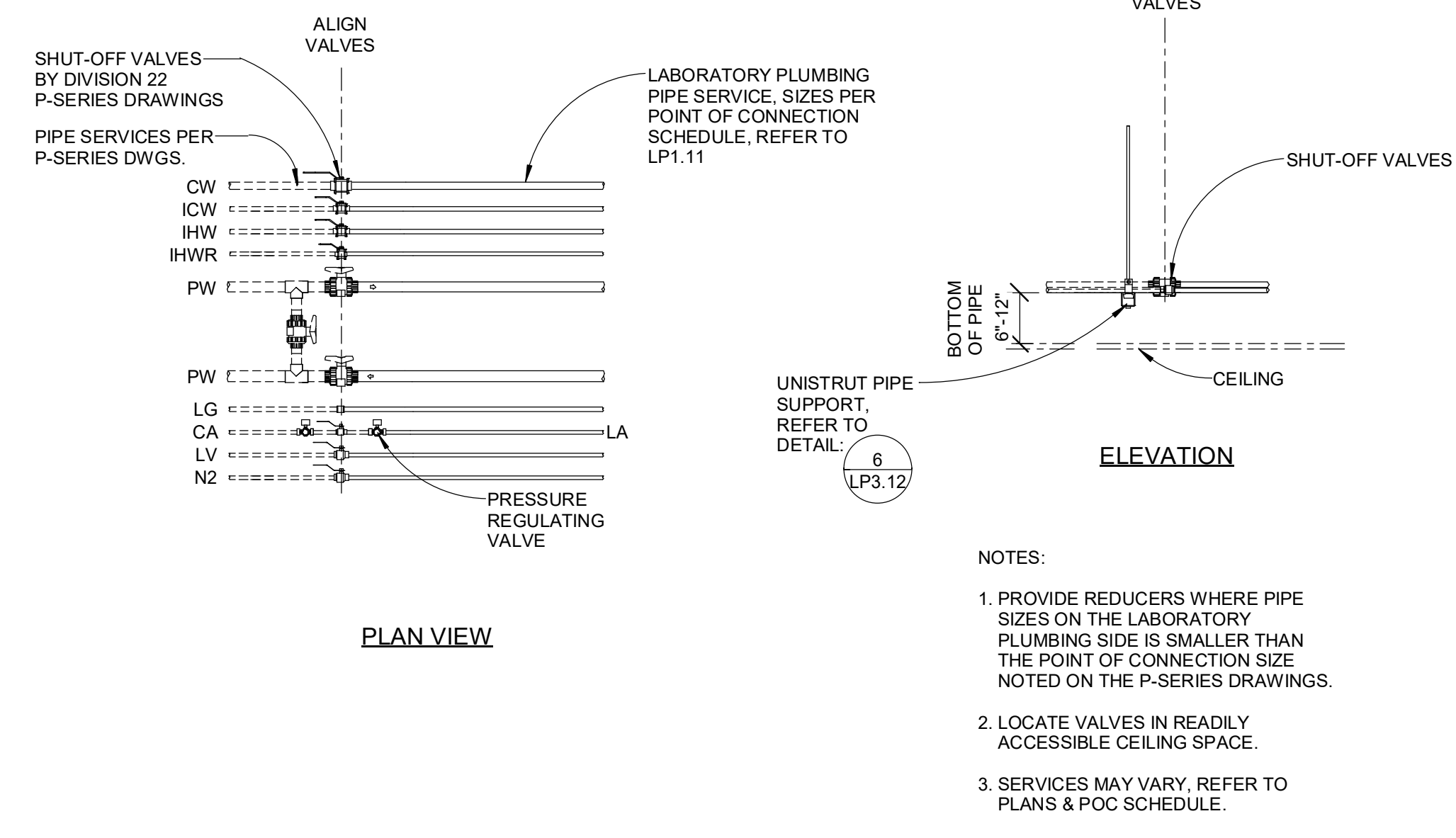


1 LEVEL-2, PLAN 'B'  
1/4" = 1'-0"

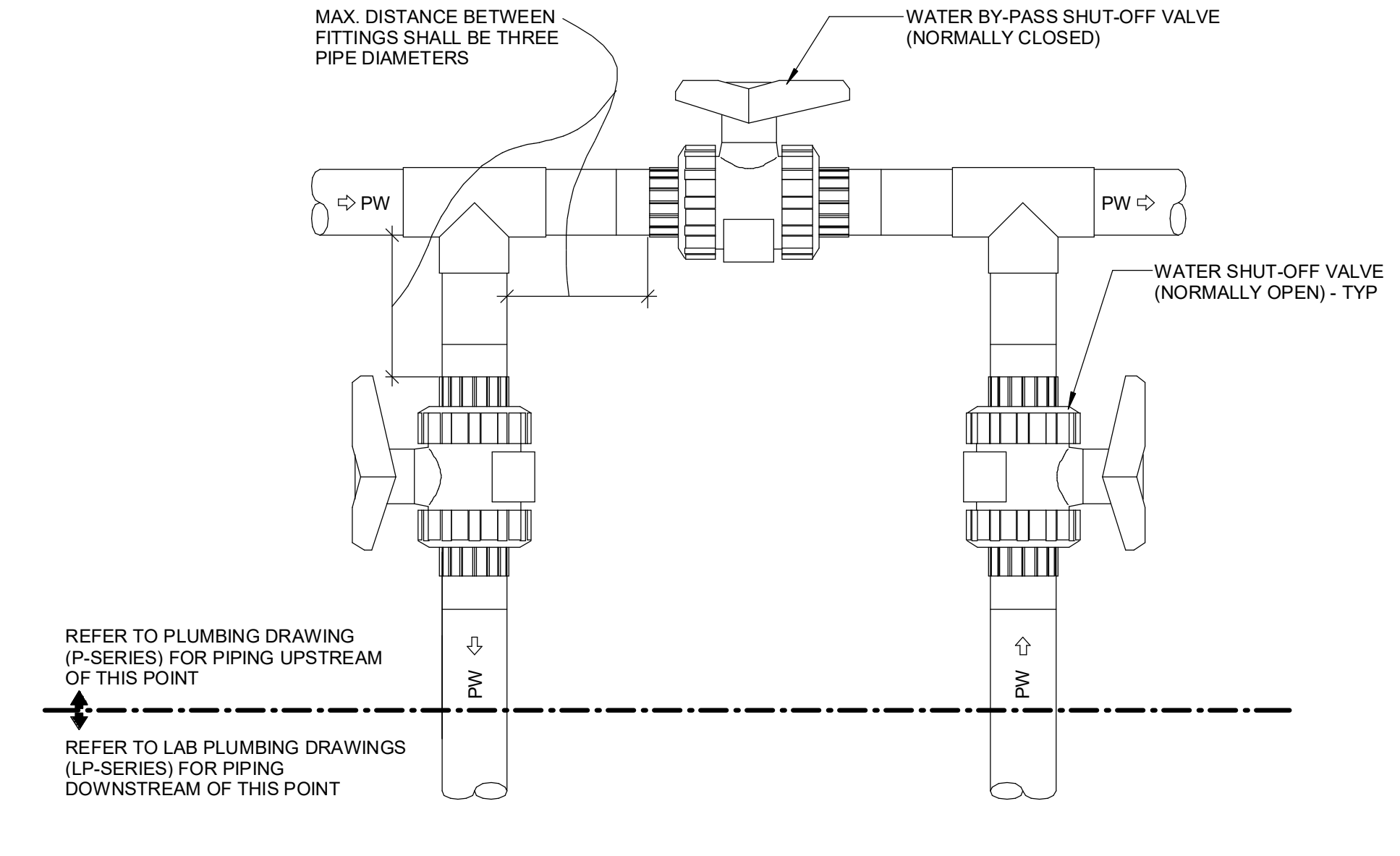




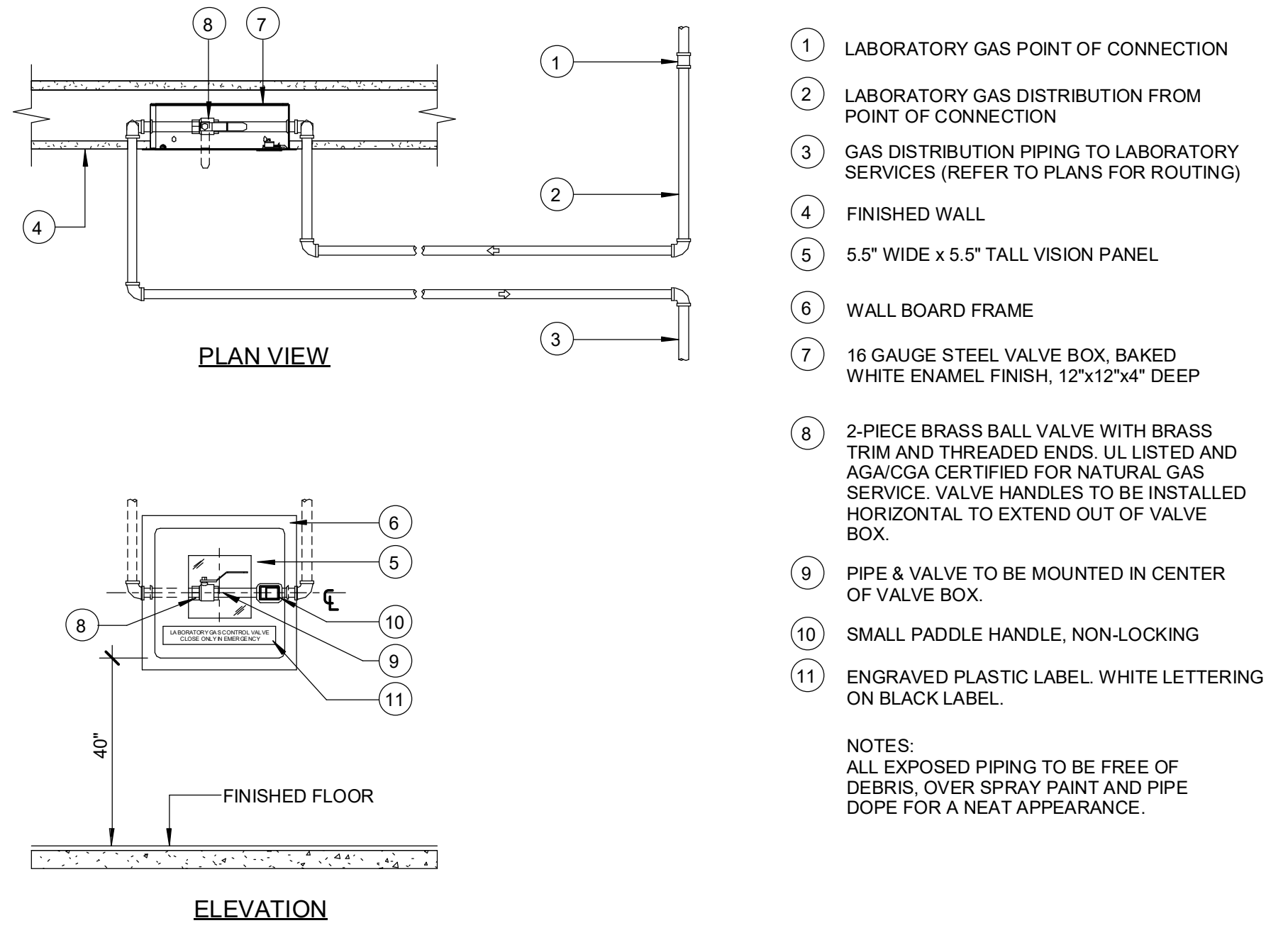
TYPICAL POINT OF CONNECTION PIPING AT LAB ENTRY DOORS 1/2" = 1'-0" 1



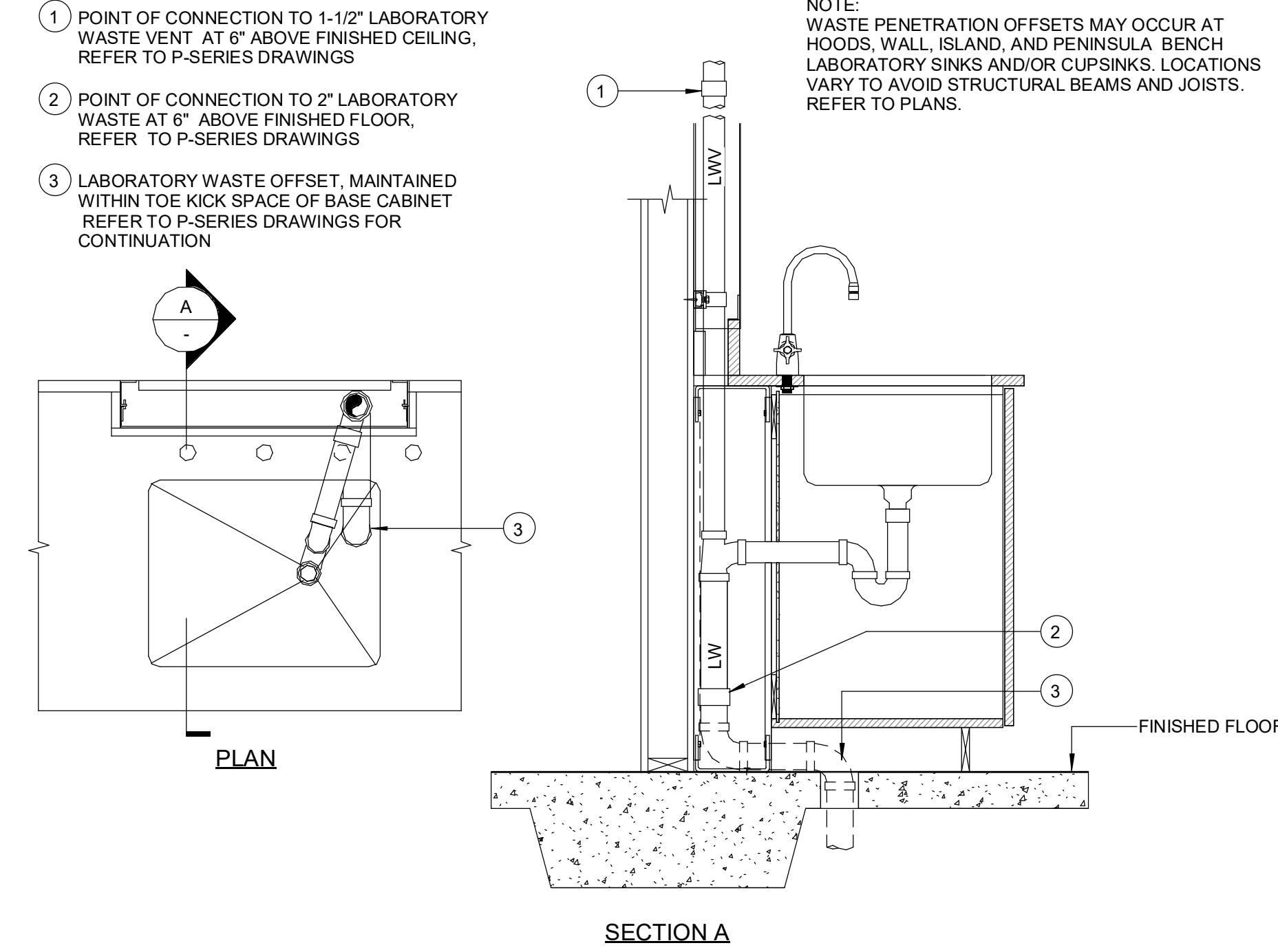
TYPICAL POINT OF CONNECTION PIPING AT INSIDE LAB ENTRY DOORS 1/2" = 1'-0" 2



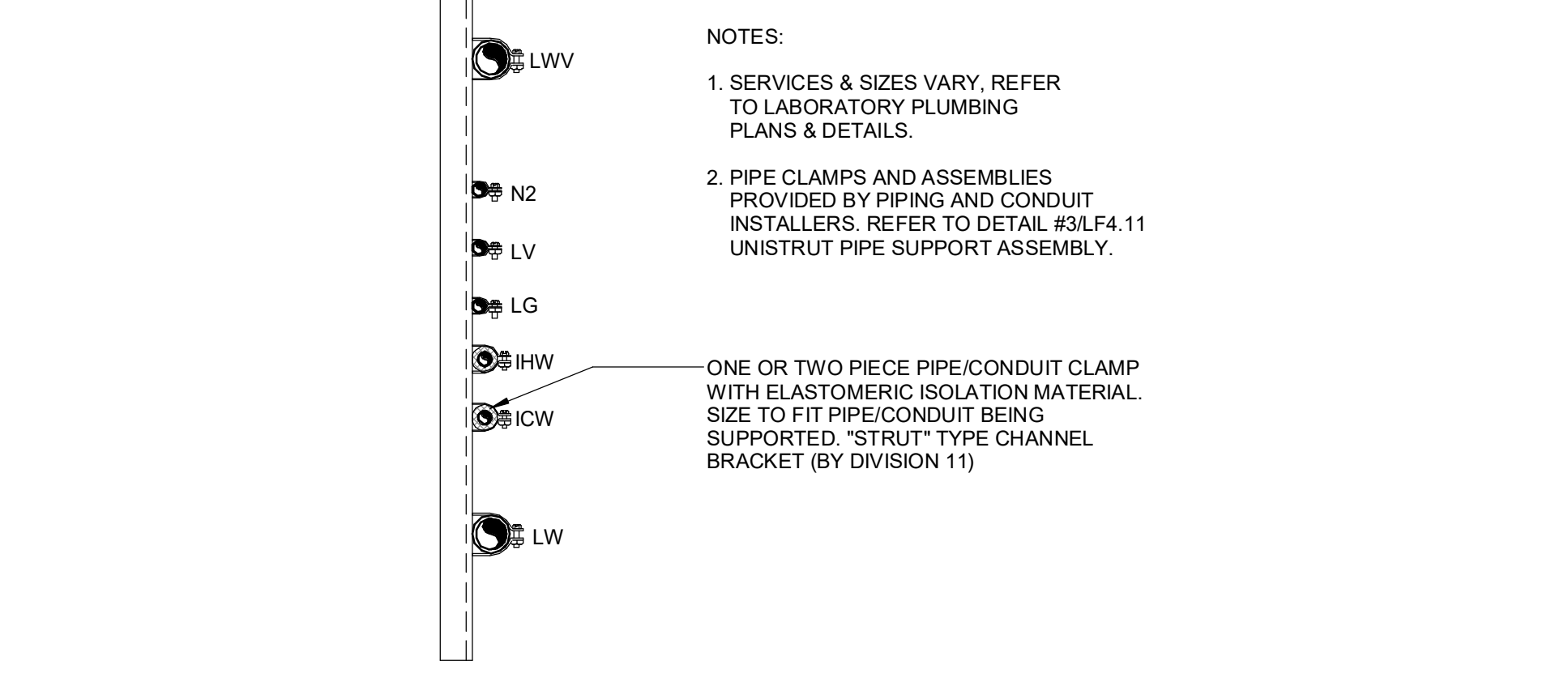
PW WATER SUPPLY VALVES AT POC 3" = 1'-0" 3



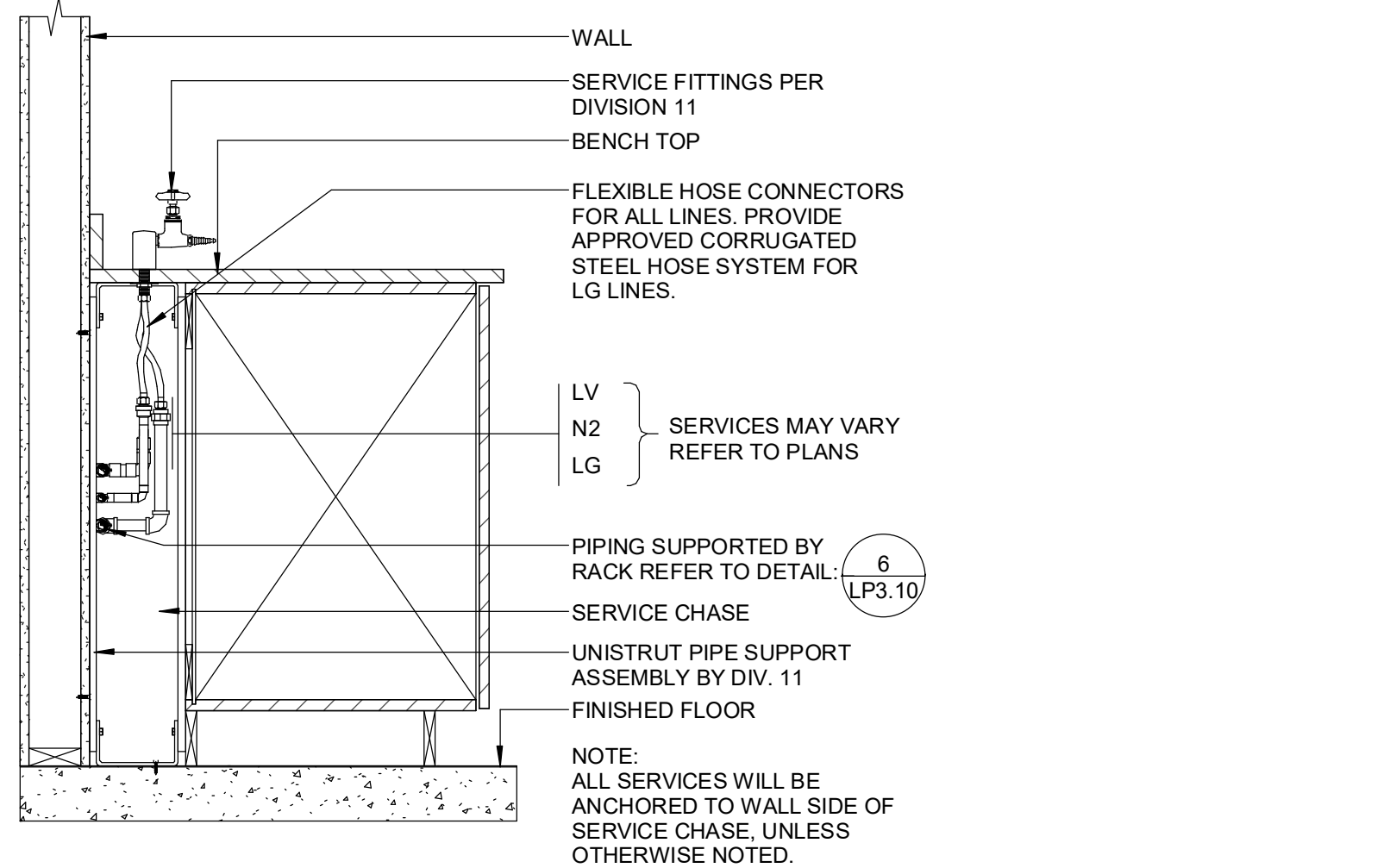
PIPING AT GAS SHUTOFF VALVE 1" = 1'-0" 4



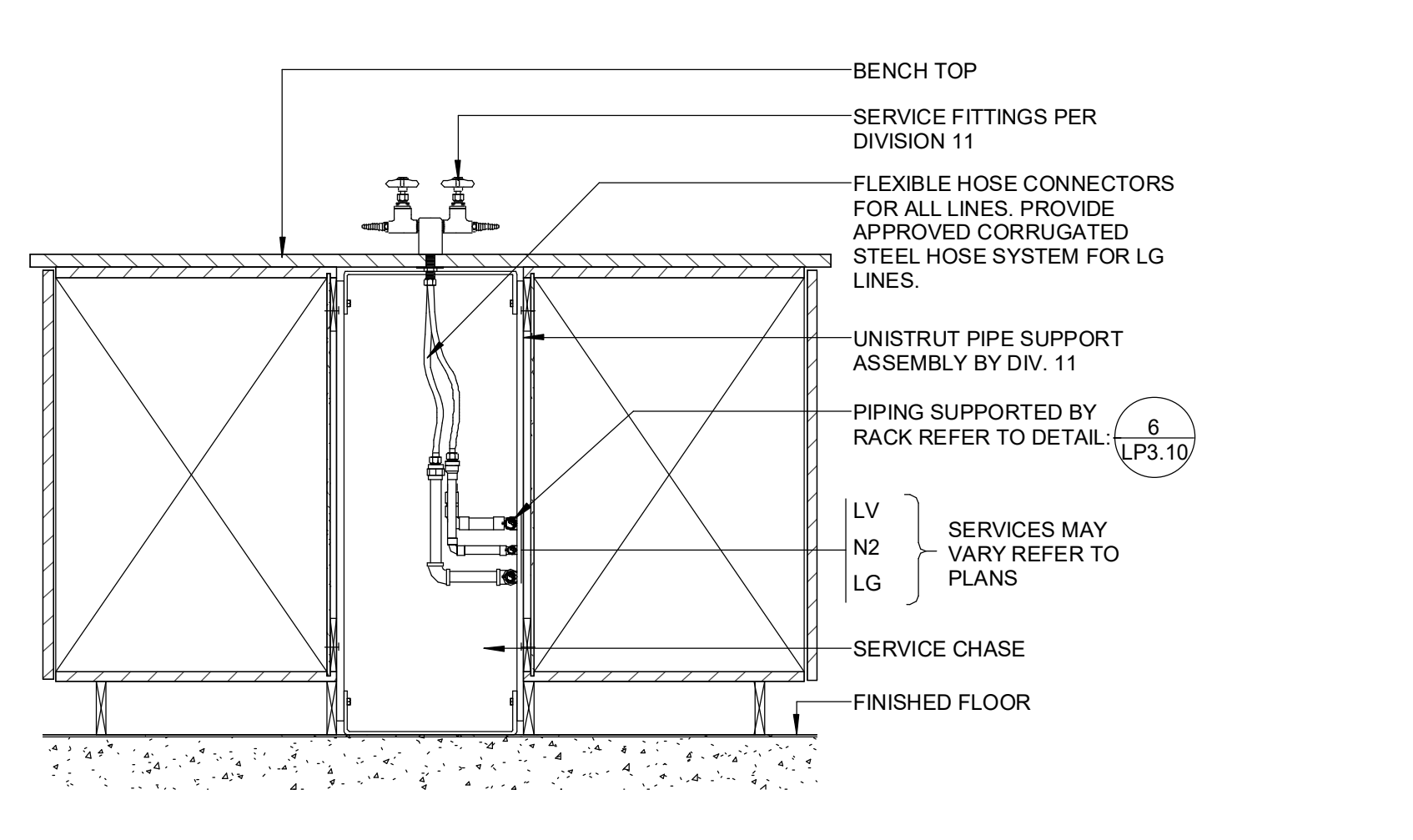
WASTE OFFSET AT SINK LOCATION 1" = 1'-0" 5



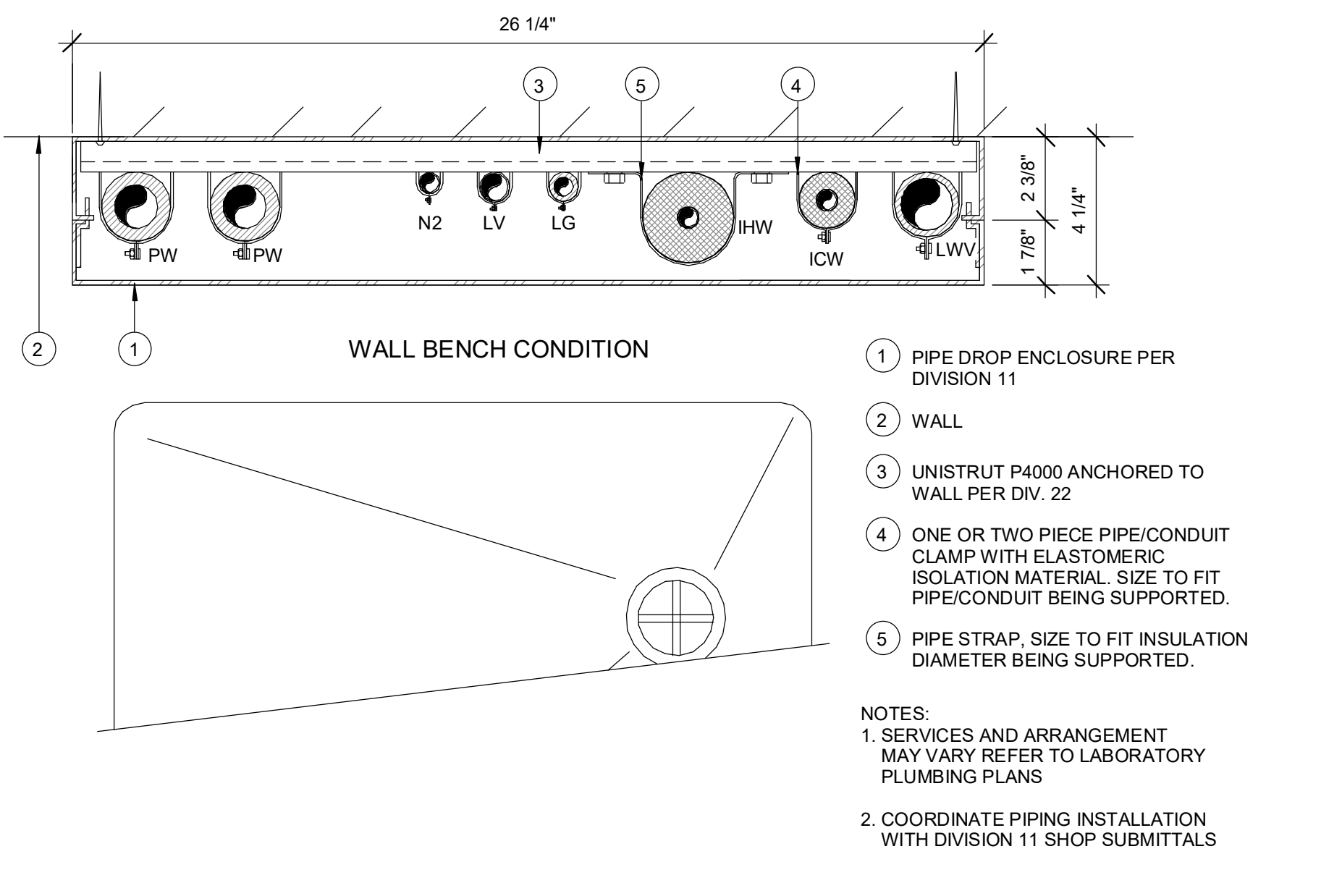
BELOW BENCH SUPPORT RACK 1 1/2" = 1'-0" 6



TYPICAL WALL BENCH SECTION 1" = 1'-0" 7



TYPICAL ISLAND BENCH SECTION 1" = 1'-0" 8



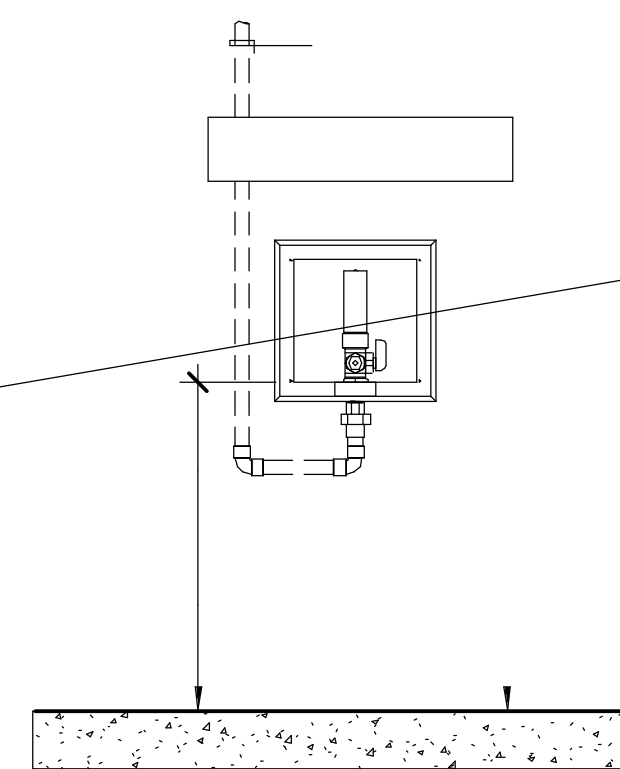
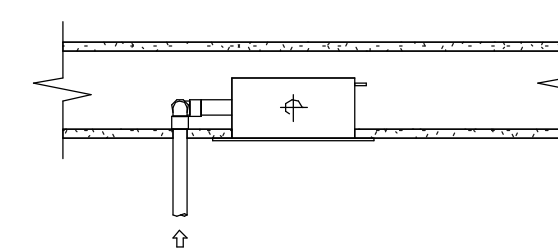
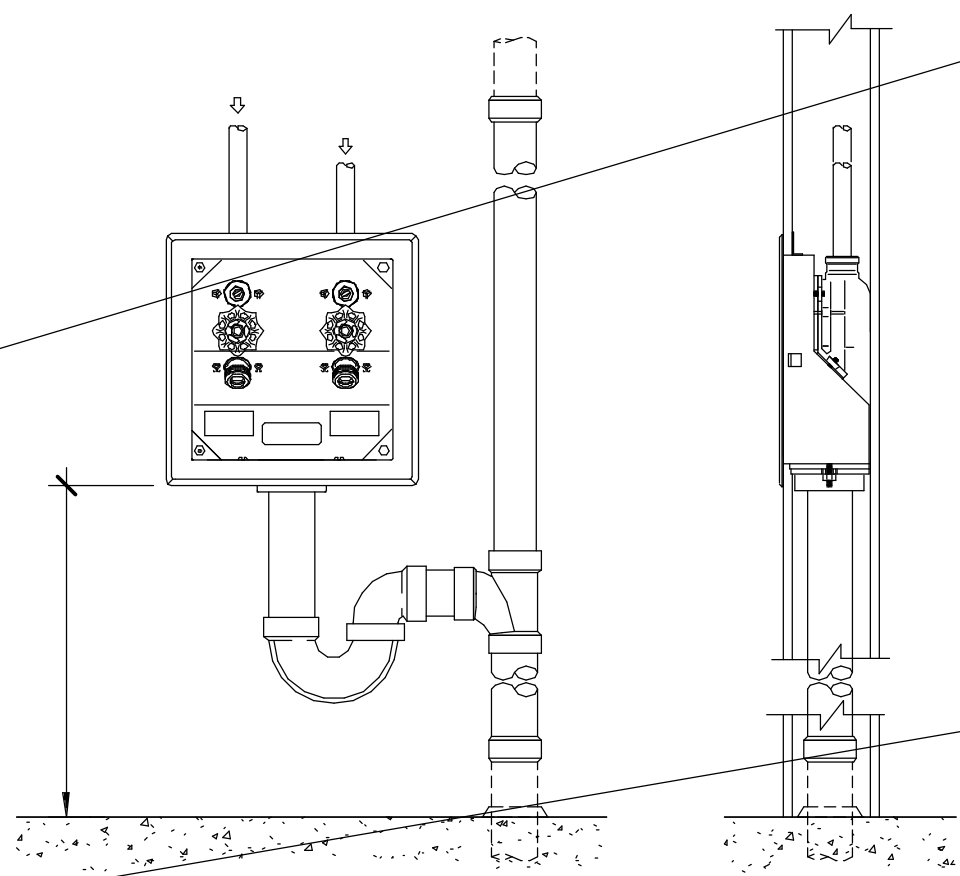
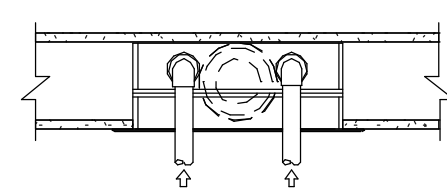
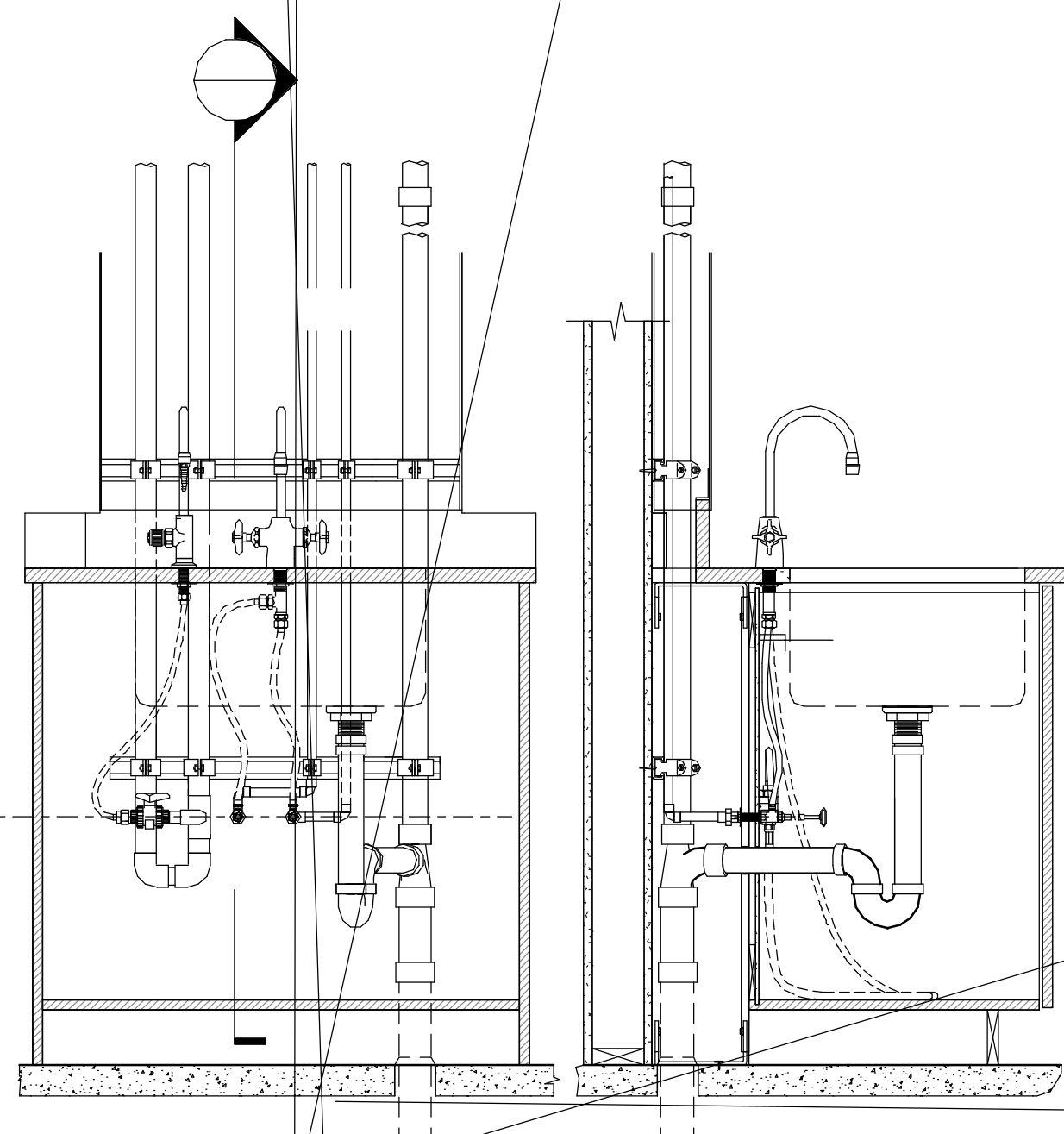
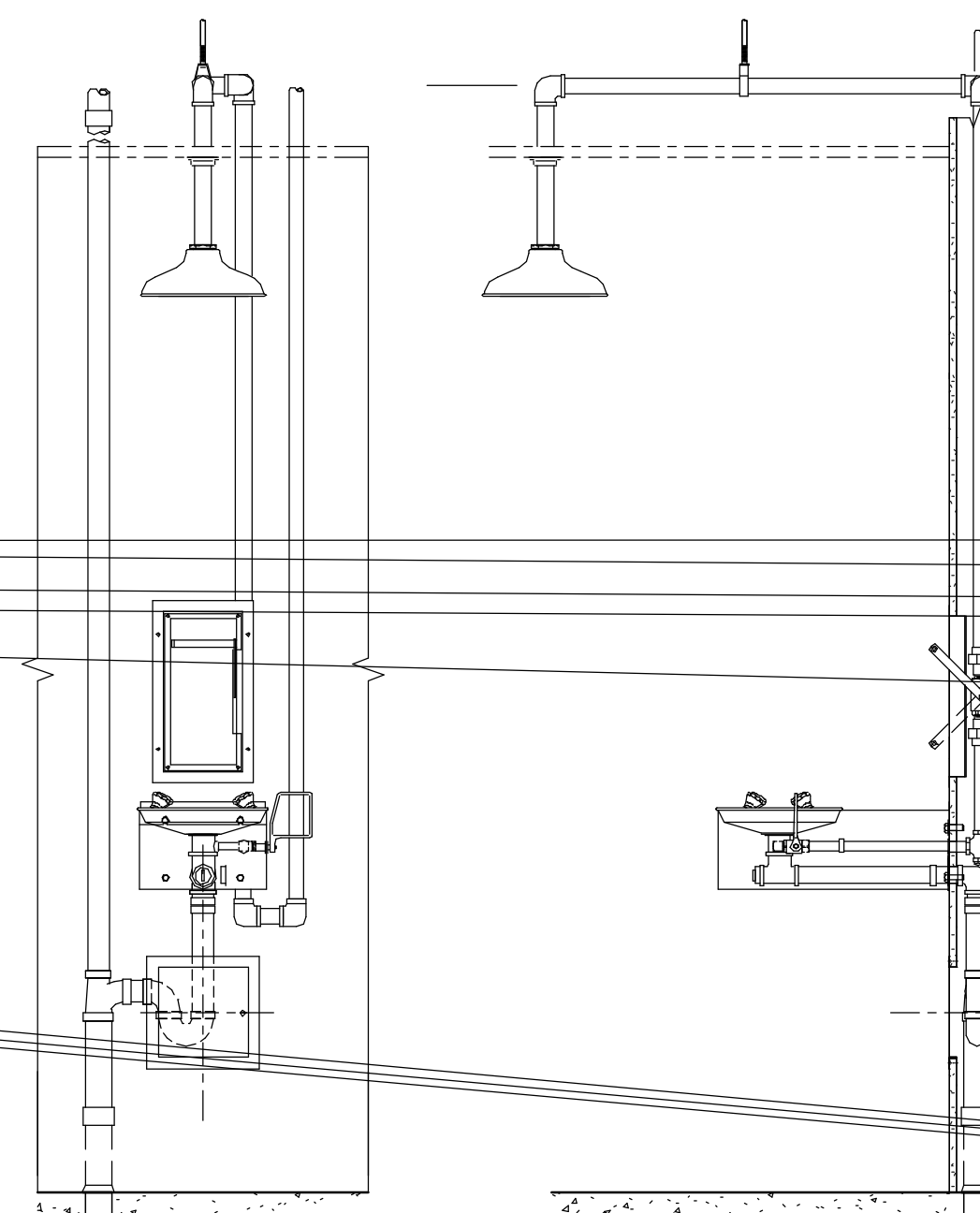
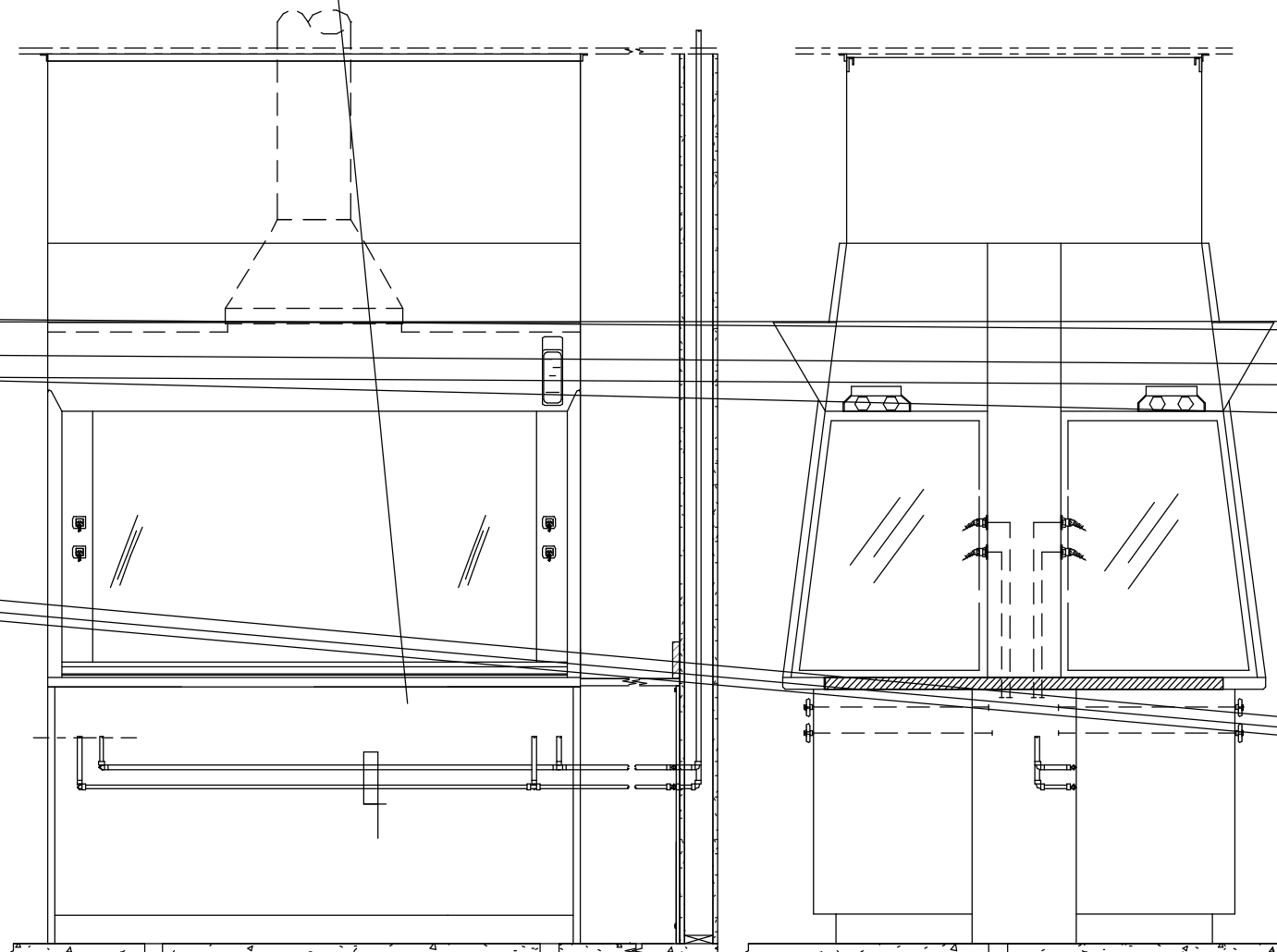
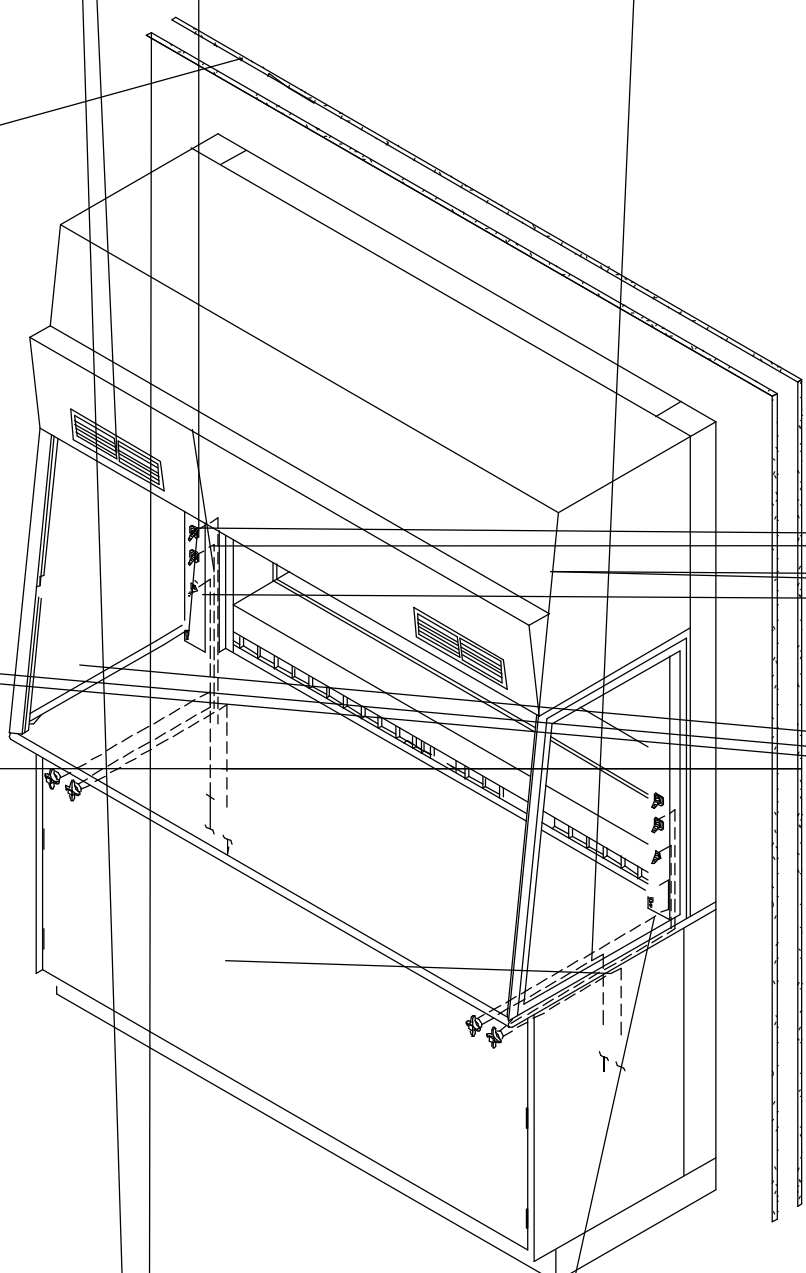
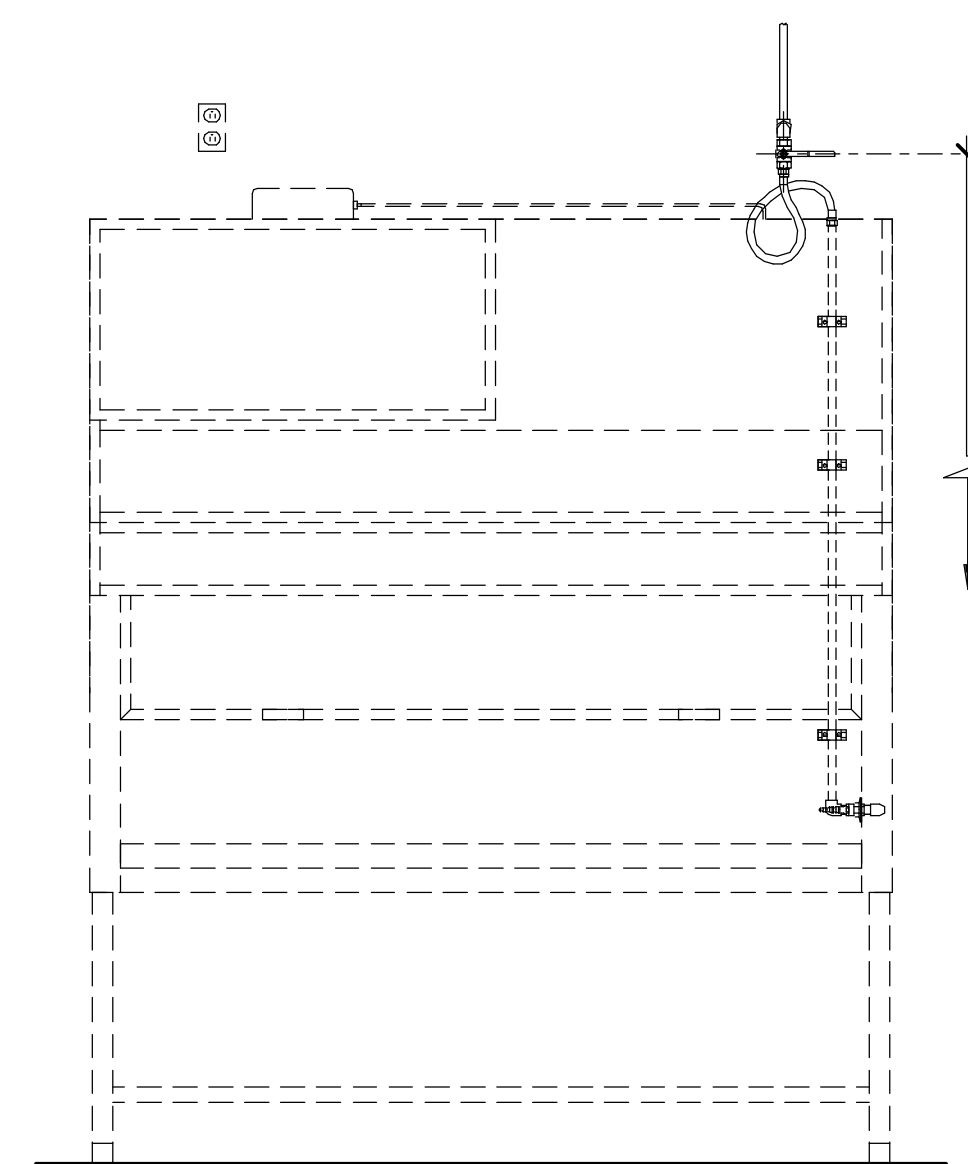
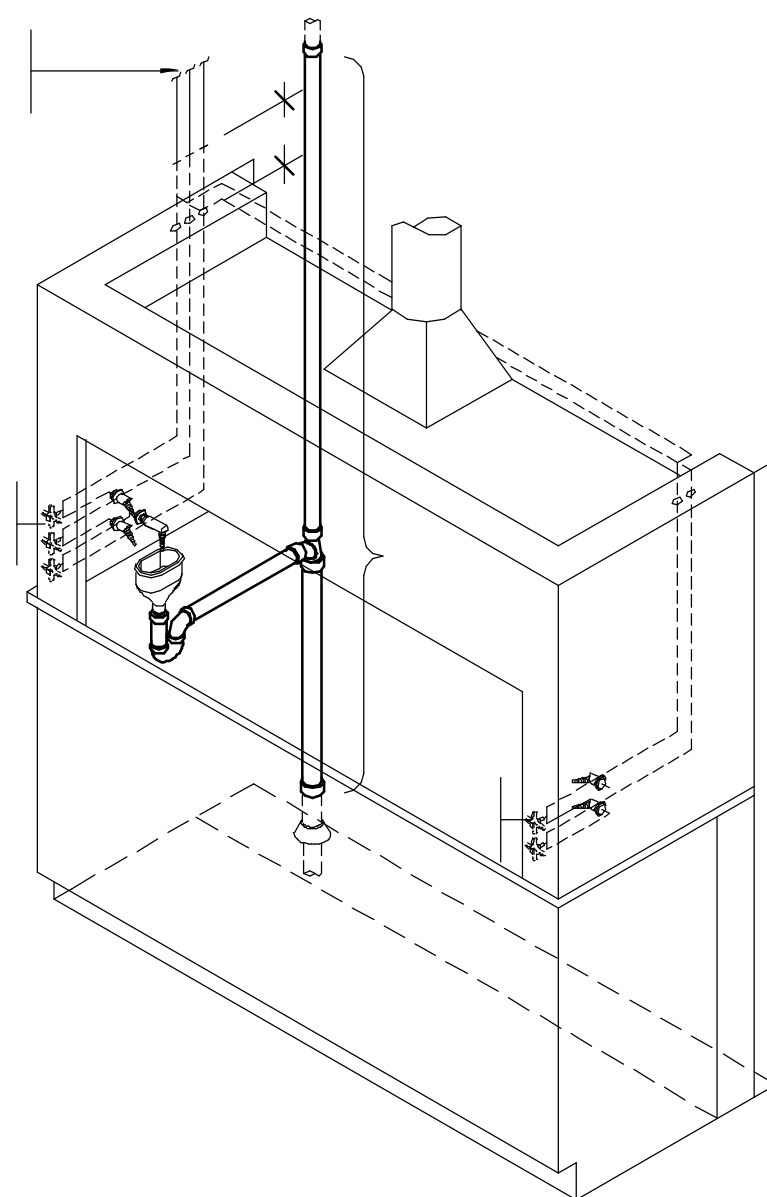
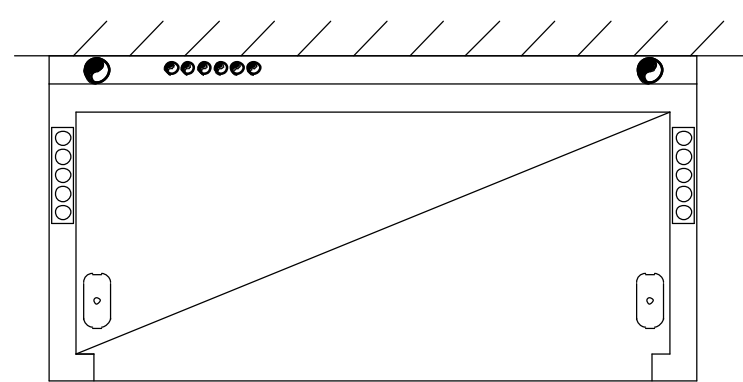
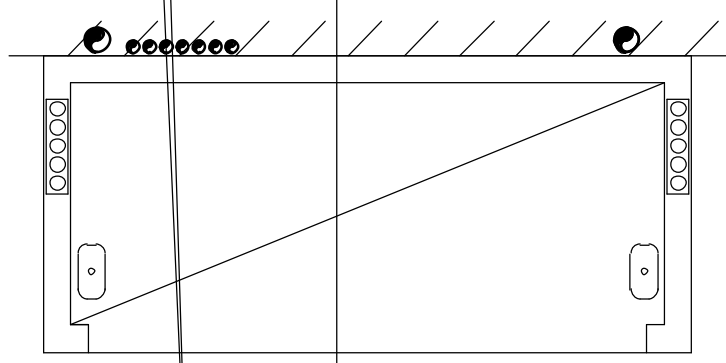
TYPICAL WALL PIPE DROP ENCLOSURE 3" = 1'-0" 9

1/6/2021, 2:31:00 PM



**DRAWN BY:** RI  
**JOB NO:** 1931.000  
**DATE:** 01/08/2020  
**REVISIONS**

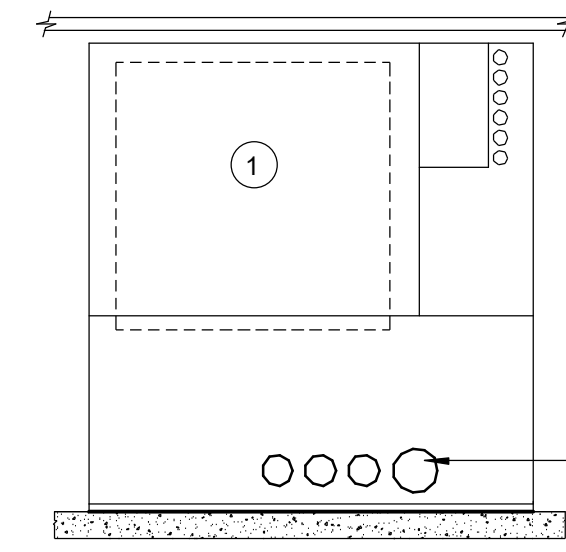
**LAB PLUMBING DETAILS**



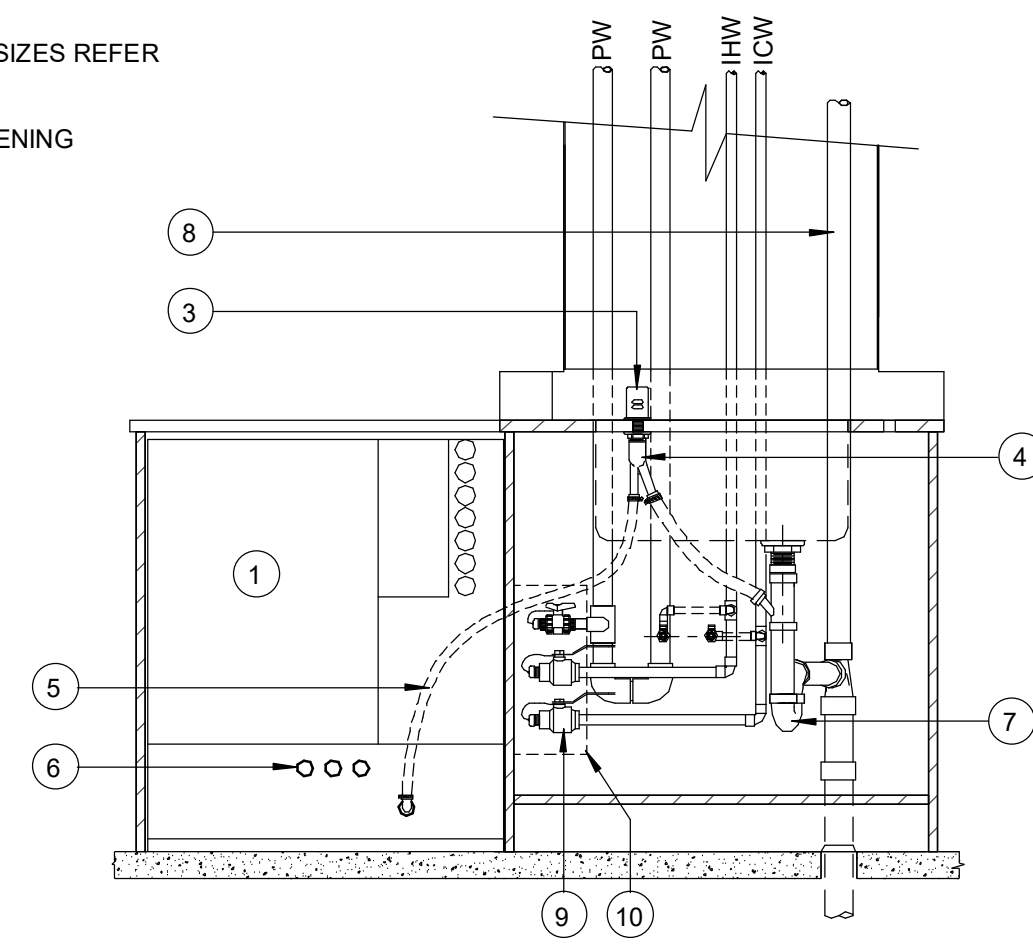


- 1 UNDERCOUNTER GLASSWARE WASHER
- 2 WASTE.
- 3 AIR GAP IF REQUIRED (COORDINATE INSTALLATION W/ DIVISION 11 SHOP SUBMITTALS)
- 4 WYE TAILPIECE
- 5 FLEX HOSE BY MANUFACTURER
- 6 SUPPLIES TO WASHER
- 7 1 1/2" P-TRAP
- 8 LABORATORY WASTE VENT
- 9 SERVICE BALL VALVE (TYP.) FOR SIZES REFER TO SCHEDULE DRAWING LP1.10
- 10 SERVICE BALL VALVE ACCESS OPENING

NOTES:  
 1. REFER TO LABORATORY PLUMBING PLANS FOR ADDITIONAL SINK RELATED PIPING  
 2. COORDINATE W/ EQUIPMENT SUBMITTAL



ELEVATION - SUPPLY PIPING



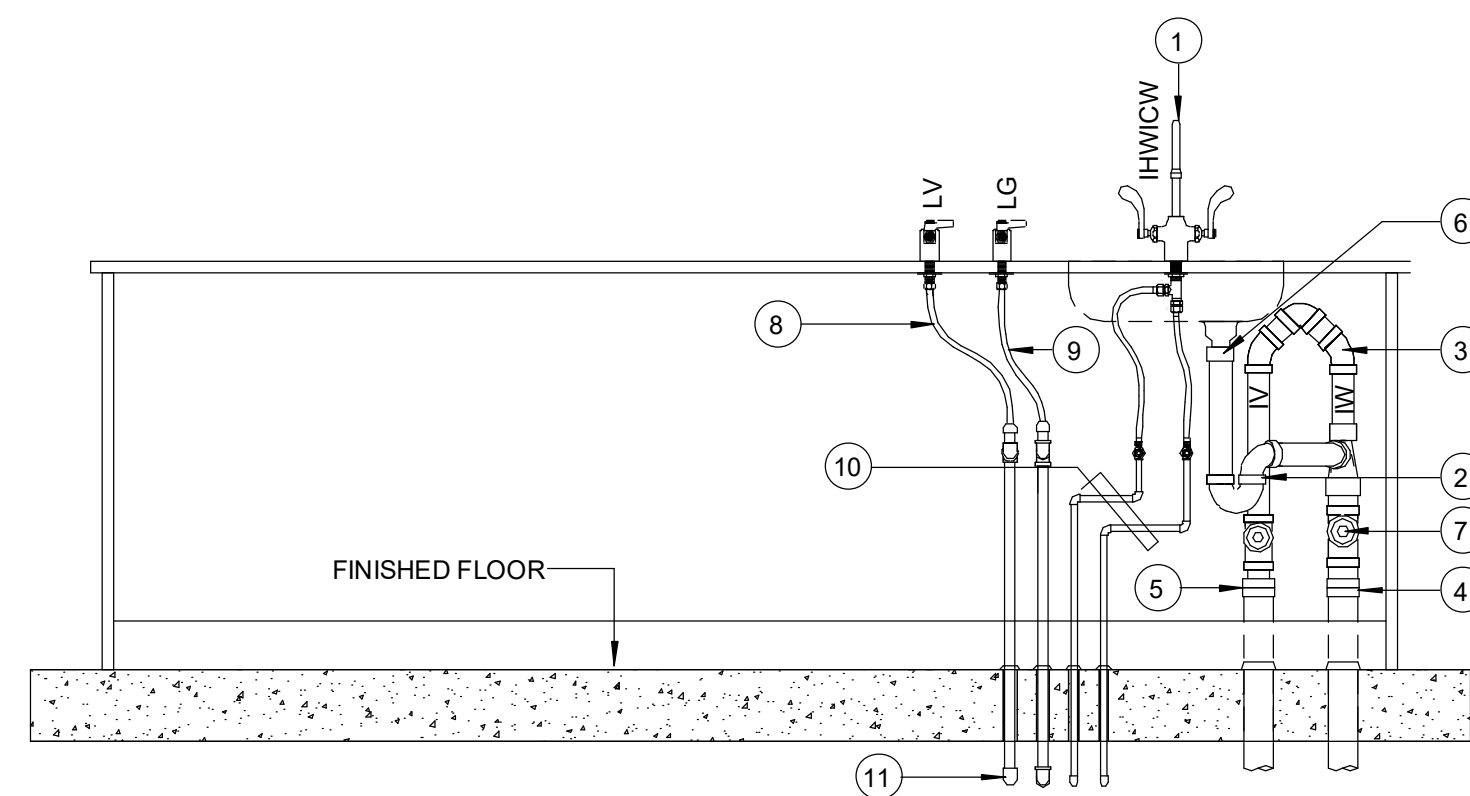
ELEVATION - WASTE PIPING

U.C. WASHER PIPING SUPPLY & WASTE CONNECTION FROM ADJACENT SINK 3/4" = 1'-0" 1

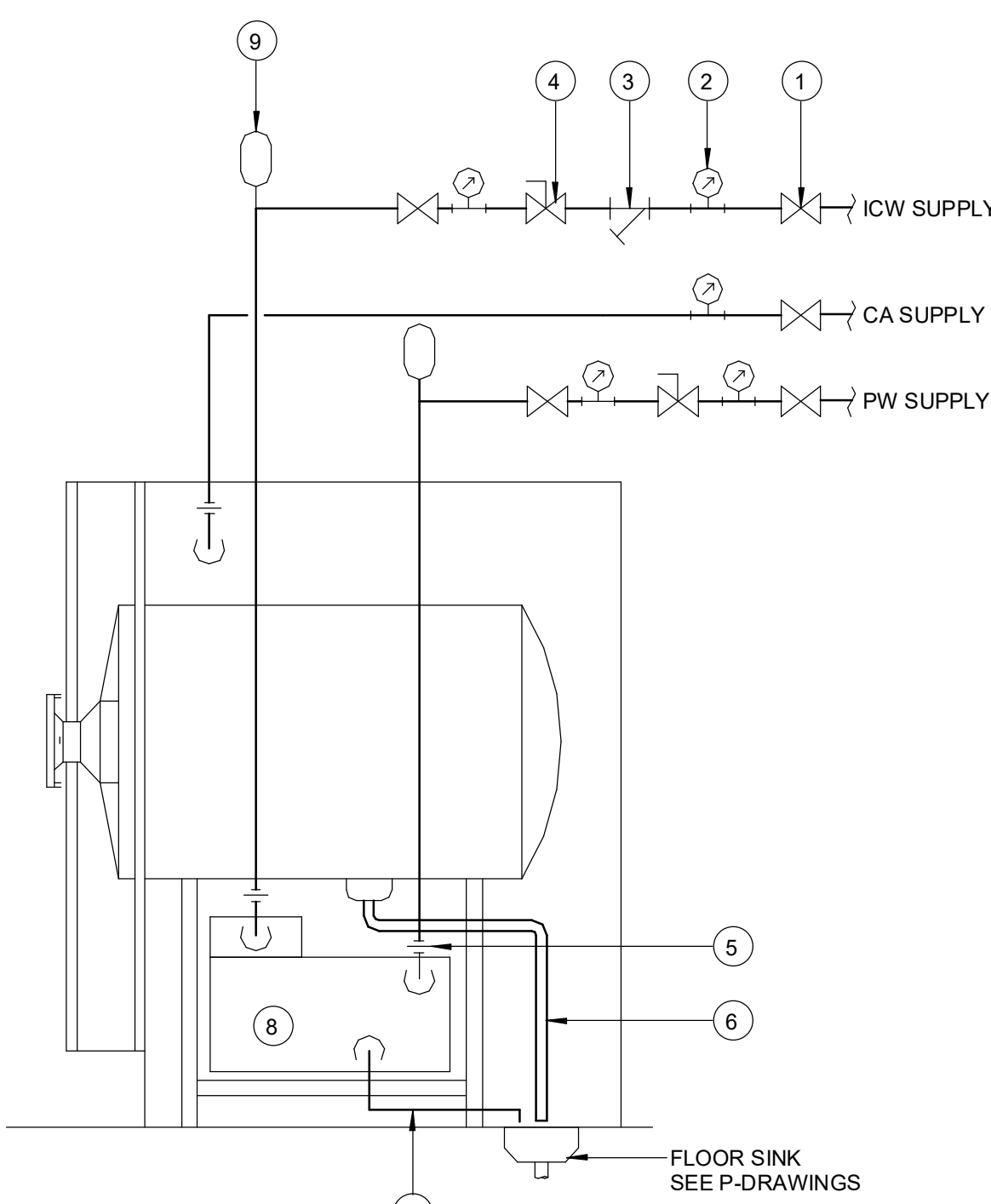
- 1 SERVICE FITTINGS AS SHOWN ON LF-SERIES DRAWINGS.
- 2 1-1/2" P-TRAP
- 3 RETURN BEND COMPOSED OF A 45°(0.79 rad), A 90°(1.6rad), AND A 45°(0.79 rad) FITTING.
- 4 POINT OF CONNECTION TO 2" VERTICAL FIXTURE DRAIN @ 6" A.F.F. REFER TO P-SERIES DRAWINGS FOR CONTINUATION.
- 5 POINT OF CONNECTION TO 1-1/2" VERTICAL FIXTURE VENT @ 6" A.F.F. REFER TO P-SERIES DRAWINGS FOR CONTINUATION.

- 6 LABORATORY WASTE POINT OF CONNECTION TO SINK TAILPIECE
- 7 CLEANOUT
- 8 1/2" DIAMETER FLEXIBLE CONNECTORS
- 9 APPROVED CORRUGATED STEEL HOSE SYSTEM FOR LG LINES.
- 10 PIPING SUPPORTED BY RACK, SEE DETAIL: 6 LP3.10
- 11 PIPING BELOW FLOOR

NOTE: SERVICES MAY VARY. REFER TO PLANS & SCHEDULES.



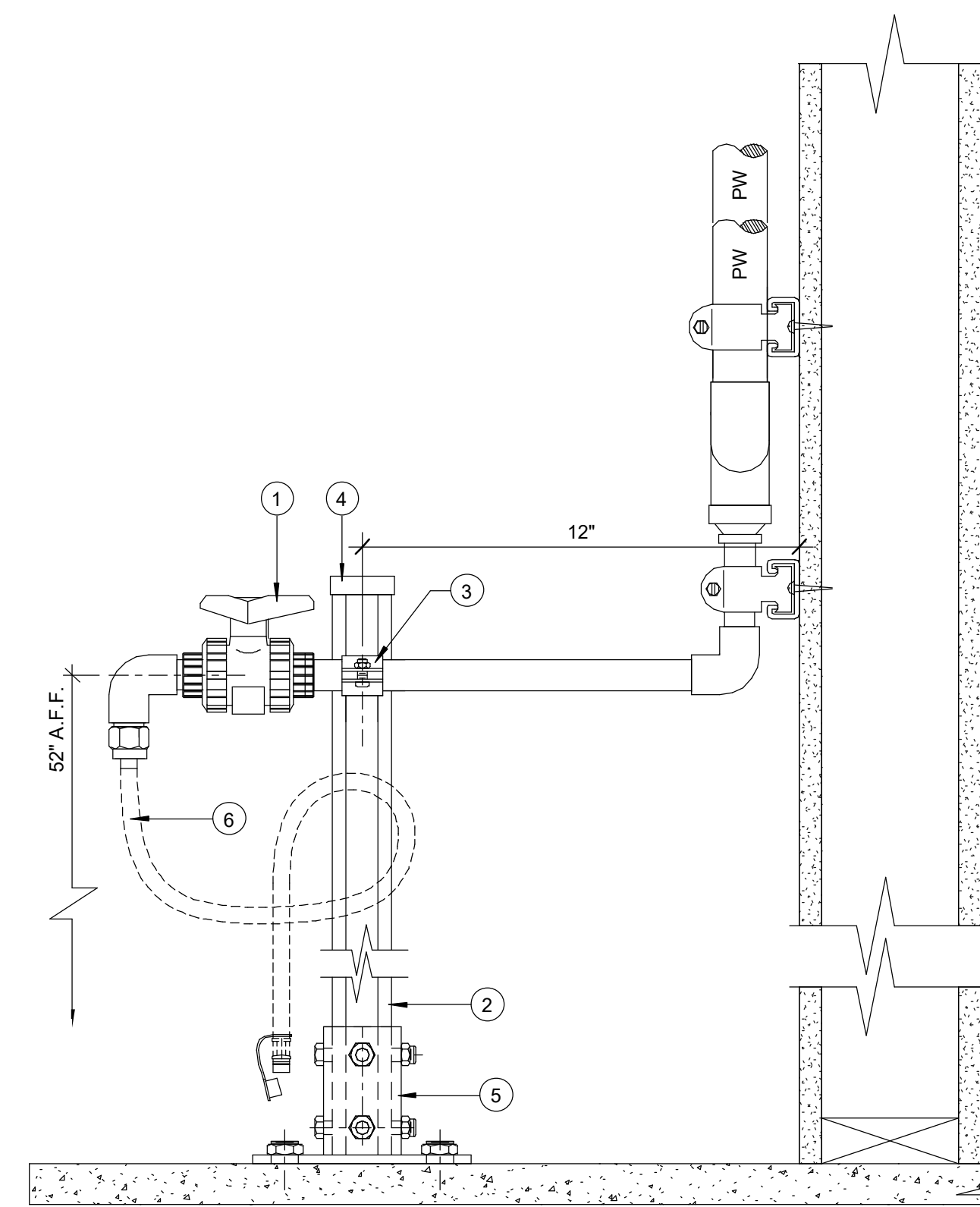
ISLAND DEMO BENCH WASTE AND VENT PIPING 3/4" = 1'-0" 4



- 1 SHUT-OFF VALVE (TYPICAL)
- 2 PRESSURE GAUGE (TYPICAL)
- 3 STRAINER (TYPICAL)
- 4 PRESSURE REGULATOR (TYPICAL)
- 5 UNION (TYPICAL)
- 6 CHAMBER DRAIN, ROUTE TO FLOOR SINK
- 7 STEAM GENERATOR DRAIN, ROUTE TO FLOOR SINK
- 8 INTEGRAL STEAM GENERATOR
- 9 WATER HAMMER ARRESTER

NOTES:  
 1. ICW SOURCE SUPPLY PROVIDED FROM BACK FLOW PROTECTED WATER SYSTEM.  
 2. PIPE SIZES, SERVICES AND LOCATIONS OF CONNECTIONS MAY VARY. REFER TO PLANS, SCHEDULES AND MANUFACTURER'S REQUIREMENTS.  
 3. ROUTE STEAM RELIEF VALVE TO FLOOR SINK.  
 4. COMPRESSED AIR PIPING TO AUTOCLAVE FROM DEDICATED AIR COMPRESSOR OR AS REQUIRED BY AUTOCLAVE MANUFACTURER. REFER TO SECTION 115350.

PIPING AT AUTOCLAVE SCALE: NTS 7

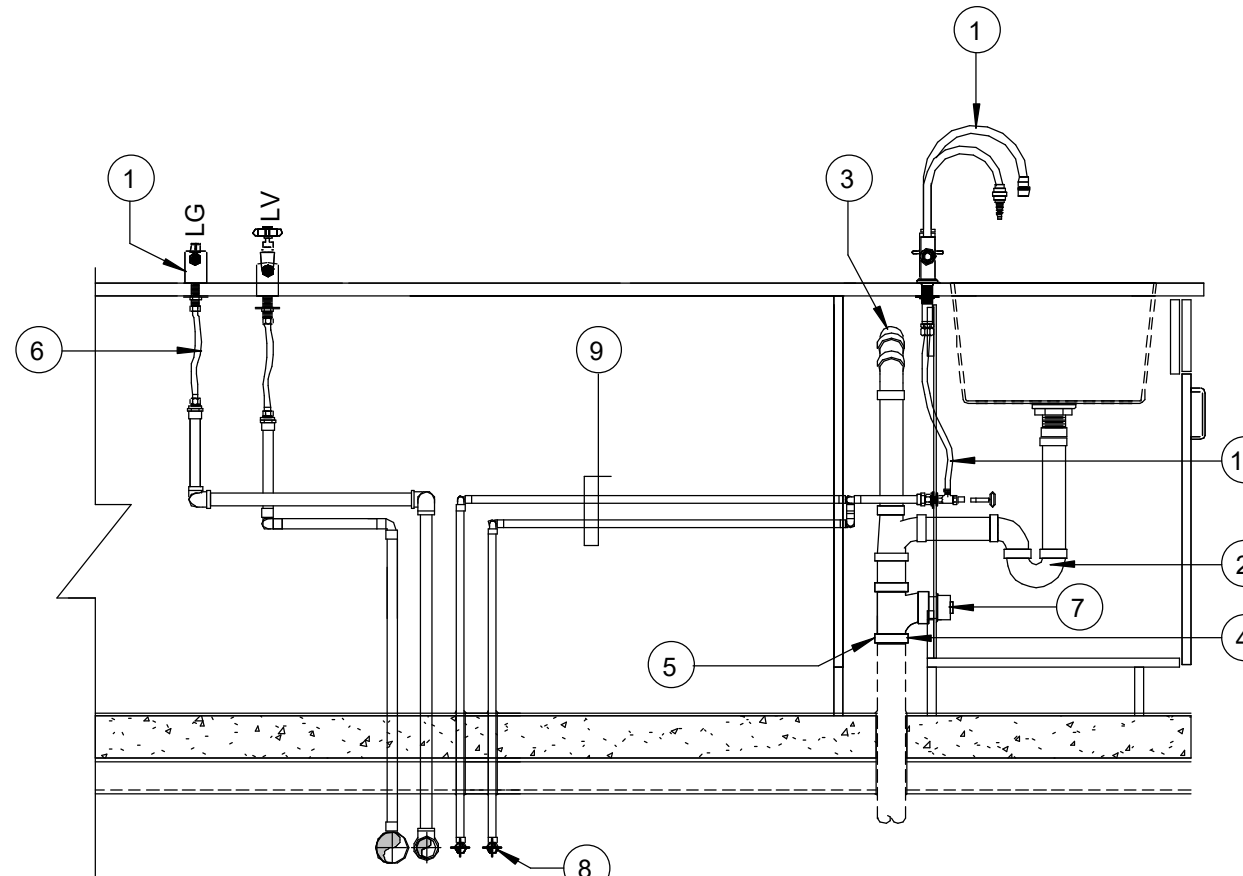


- 1 1/2" PW BALL VALVE
- 2 PIPE SUPPORT, VERTICAL FLOOR ANCHORED UNISTRUT
- 3 PIPES SUPPORT CLAMP
- 4 STRUT END CAPS
- 5 STRUT POST BASE
- 6 1/2" FLEXIBLE CONNECTION WITH PLUG END

PW VERTICAL PIPE FLOOR SUPPORT 3" = 1'-0" 2

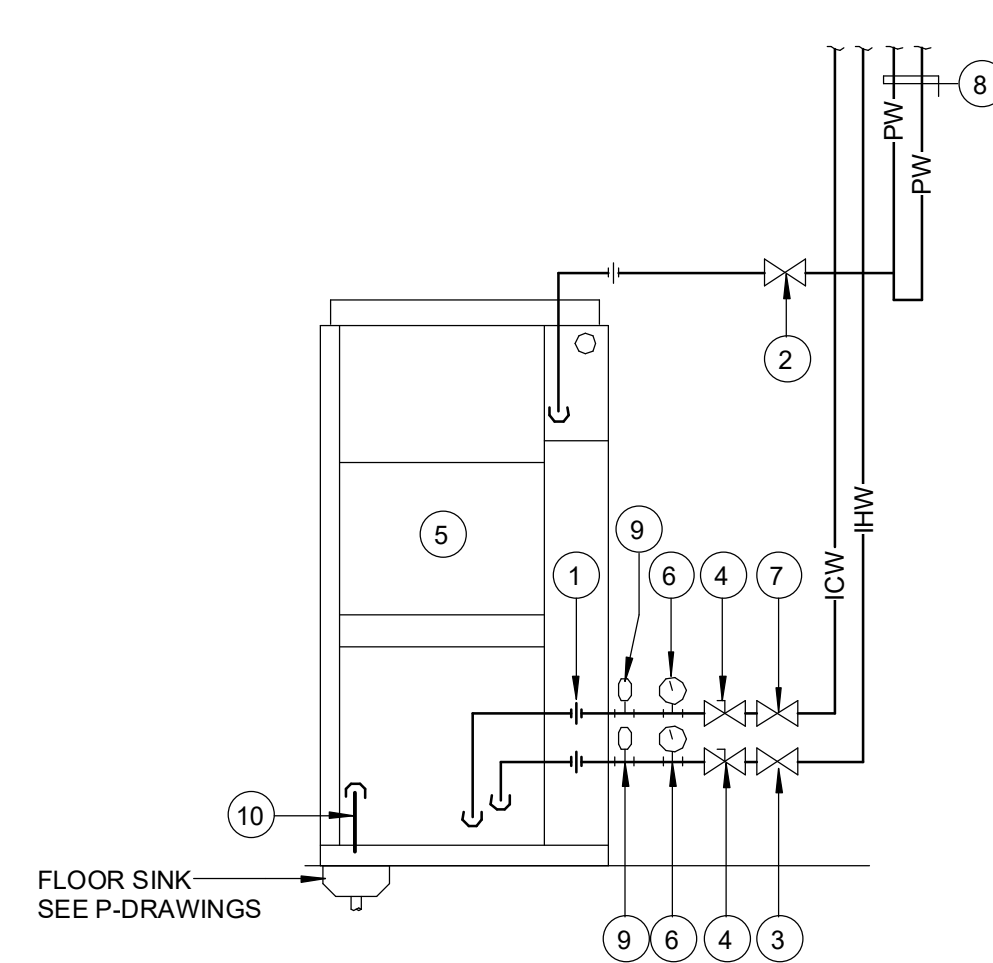
- 1 SERVICE FITTINGS AS SHOWN ON LF-SERIES DRAWINGS.
- 2 1-1/2" P-TRAP
- 3 RETURN BEND COMPOSED OF A 45°(0.79 rad), A 90°(1.6rad), AND A 45°(0.79 rad) FITTING.
- 4 POINT OF CONNECTION TO 2" VERTICAL FIXTURE DRAIN @ 6" A.F.F. REFER TO P-SERIES DRAWINGS FOR CONTINUATION.
- 5 POINT OF CONNECTION TO 1-1/2" VERTICAL FIXTURE VENT @ 6" A.F.F. REFER TO P-SERIES DRAWINGS FOR CONTINUATION.
- 6 APPROVED CORRUGATED STEEL HOSE SYSTEM FOR LG LINES, TYP.
- 7 CLEANOUT
- 8 PIPING BELOW FLOOR
- 9 PIPING SUPPORTED BY RACK, SEE DETAIL: 6 LP3.10
- 10 1/2" DIAMETER FLEXIBLE CONNECTORS

NOTE: SERVICES MAY VARY. REFER TO PLANS & SCHEDULES.



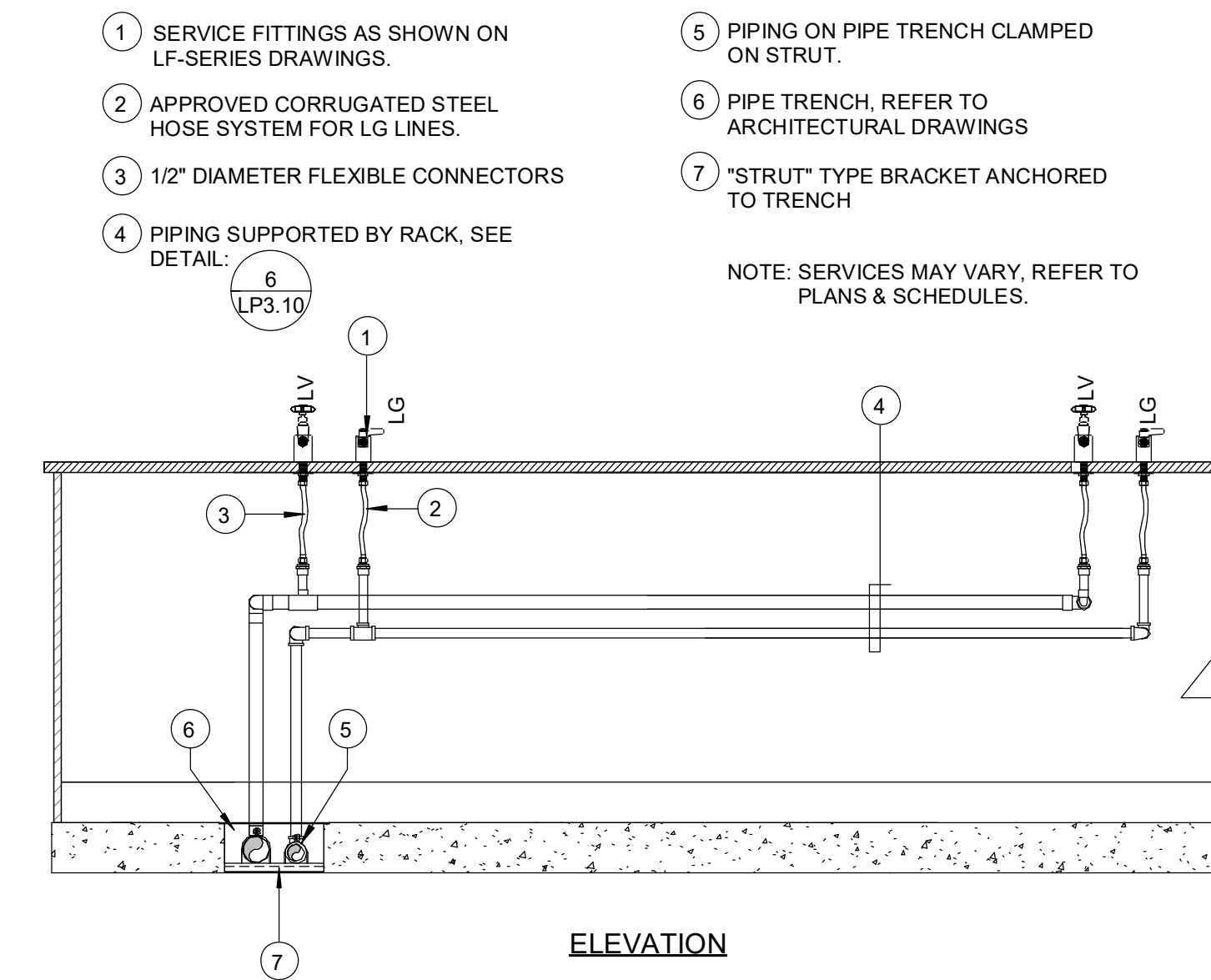
ELEVATION

TYPICAL ISLAND BENCH PIPING 3/4" = 1'-0" 5



- 1 PIPE UNION (TYPICAL)
- 2 PW SUPPLY W/ ISOLATION VALVE
- 3 IHW ISOLATION VALVE
- 4 WATER PRESSURE REGULATOR
- 5 GLASSWARE WASHER
- 6 WATER GAUGE
- 7 ICW ISOLATION VALVE
- 8 PW PIPING LOOP BY DIV. 22. REFER TO LP-SERIES DWG FOR CONTINUATION
- 9 WATER HAMMER ARRESTER
- 10 DRAIN TO FLOOR SINK. REFER TO LP AND PLUMBING PLANS

PIPING AT GLASSWARE WASHER SCALE: NTS 8

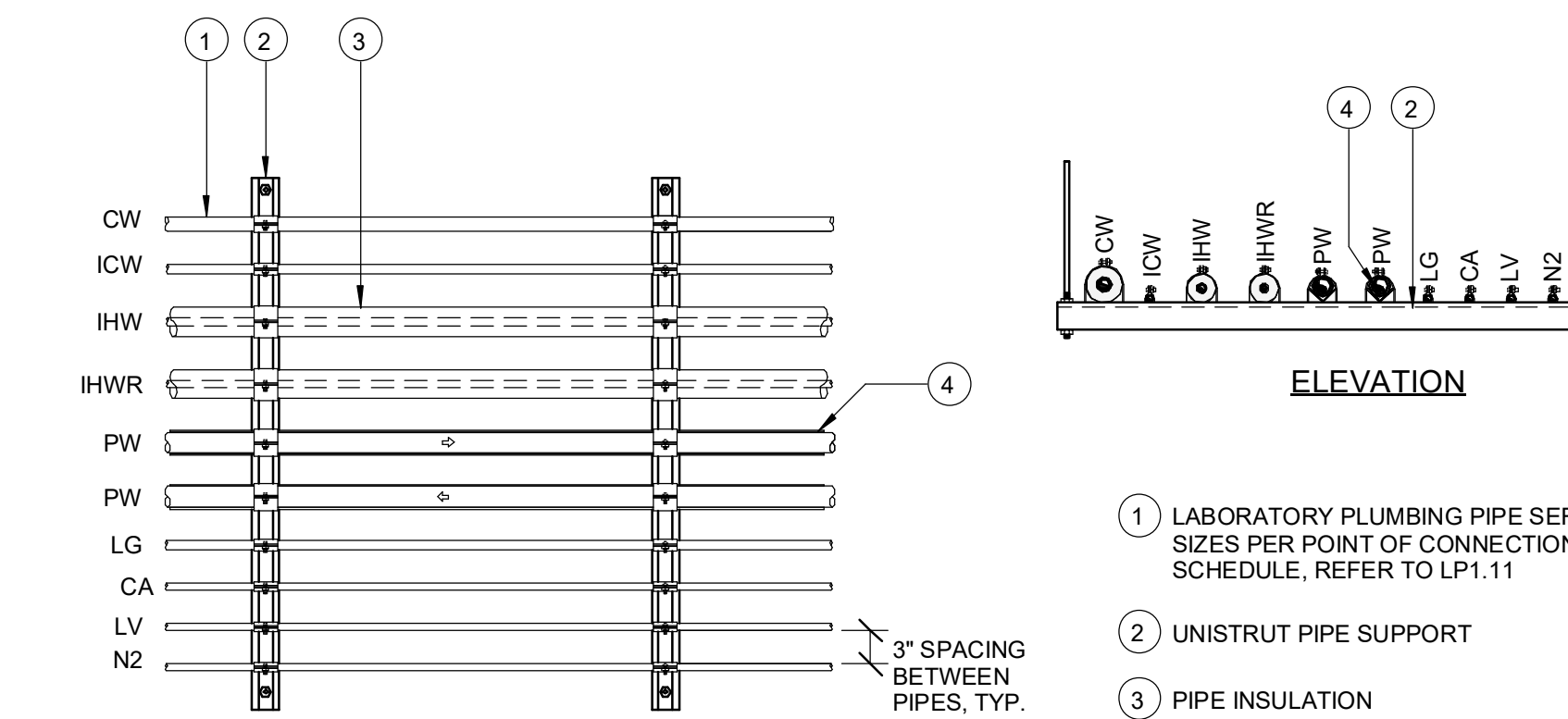


- 1 SERVICE FITTINGS AS SHOWN ON LF-SERIES DRAWINGS.
- 2 APPROVED CORRUGATED STEEL HOSE SYSTEM FOR LG LINES
- 3 1/2" DIAMETER FLEXIBLE CONNECTORS
- 4 PIPING SUPPORTED BY RACK, SEE DETAIL.
- 5 PIPING ON PIPE TRENCH CLAMPED ON STRUT.
- 6 PIPE TRENCH. REFER TO ARCHITECTURAL DRAWINGS
- 7 "STRUT" TYPE BRACKET ANCHORED TO TRENCH

NOTE: SERVICES MAY VARY. REFER TO PLANS & SCHEDULES.

ELEVATION

ISLAND BENCH PIPING 3/4" = 1'-0" 3



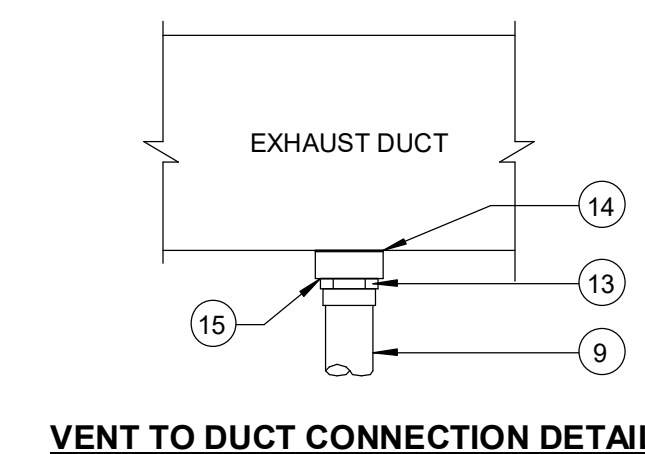
ELEVATION

- 1 LABORATORY PLUMBING PIPE SERVICE. SIZES PER POINT OF CONNECTION SCHEDULE, REFER TO LP1.11
- 2 UNISTRUT PIPE SUPPORT
- 3 PIPE INSULATION
- 4 PURIFIED WATER PIPING LINEAR SUPPORT

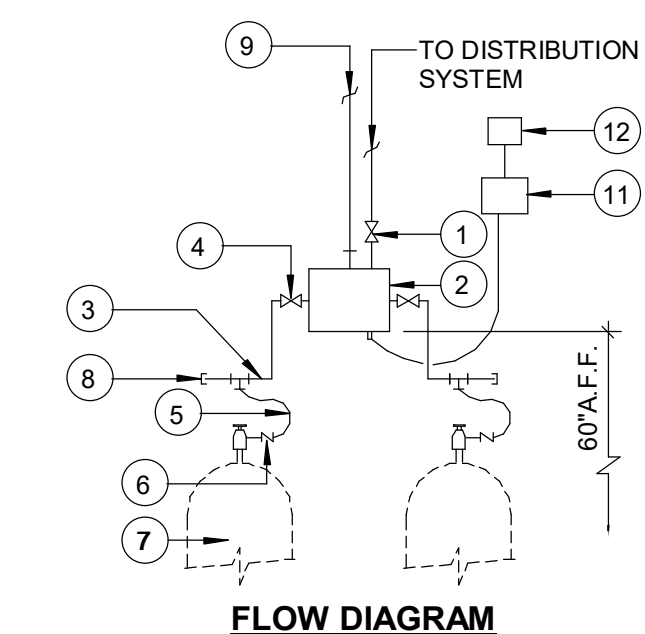
NOTE: SERVICES MAY VARY. REFER TO PLANS & POC SCHEDULE.

PLAN VIEW

POC PIPING SUPPORT DETAIL 3/4" = 1'-0" 6



VENT TO DUCT CONNECTION DETAIL



FLOW DIAGRAM

PLAN

- 1 SYSTEM SHUT-OFF VALVE
- 2 PRESSURE REDUCING/CHANGE-OVER REGULATOR SYSTEM
- 3 HIGH PRESSURE HEADER
- 4 BANK SHUT-OFF VALVE
- 5 PIGTAIL
- 6 CHECK VALVE
- 7 GAS CYLINDERS OFOI
- 8 GAS TIGHT SEALED PLUG
- 9 1" MANIFOLD RELIEF EXHAUST PIPE, CONNECTED TO LABORATORY EXHAUST DUCTWORK
- 10 CYLINDER RESTRAINT BY DIV. 11
- 11 POWER SOURCE (IF REQUIRED)
- 12 ANNUNCIATOR
- 13 THREADED CONNECTOR ON END OF RELIEF EXHAUST PIPE
- 14 THREAD-O-LET FITTING WELDED TO EXHAUST DUCT
- 15 RELIEF EXHAUST PIPE CONNECTOR SCREWED INTO THREAD-O-LET. PROVIDE TEFLON TAPE ON CONNECTOR THREADS

NOTES:  
 1. NOT ALL MANIFOLD COMPONENTS ARE SHOWN. REFER TO DIVISION 22 SPECIFICATIONS.  
 2. PROVIDE MOUNTING/BRACKETING HARDWARE FOR AFFIXING UNIT TO WALL.  
 3. NUMBER OF CYLINDERS MAY VARY. REFER TO PLANS.

CYLINDER MANIFOLD AT (2) CYLINDER RACK SCALE: NTS 9

1/6/2021 2:31:06 PM



DRAWN BY: RI  
 JOB NO: 1931.000  
 DATE: 01/08/2020  
 REVISIONS



ABBREVIATIONS AND DESCRIPTIONS			
A	AMPERES	KCM	KILO-CIRCULAR-MIL
AC	ALTERNATING CURRENT	KS	KNEE SPACE
AC	AIR CONDITIONING	KVA	KILO-VOLTAMPERE
AC	AMPERES INTERRUPTING CAPACITY	KW	KILO-WATT
AFC	AVAILABLE FAULT CURRENT	KWH	KILO-WATT-HOUR
AF	ABOVE FINISHED FLOOR		
AFG	ABOVE FINISHED GRADE	LBS	POUNDS
AF	AMP FRAME/AMP FUSE	LF	LINEAL FEET
ABV	ABOVE	LOC	LOCATION
AL	ALUMINUM	LT	LIGHT
ARCH	ARCHITECT OR ARCHITECTURAL	LTG	LIGHTING
AS	AMP SWITCH	LV	LOW VOLTAGE
AT	AMP TRIP		
ATS	AUTOMATIC TRANSFER SWITCH	MH	MOUNTING HEIGHT
AWG	AMERICAN WIRE GAUGE	MANUF	MANUFACTURER
		MAX	MAXIMUM
BIG	BELOW GRADE	MC	MECHANICAL CONTRACTOR
BKBD	BACKBOARD	MCC	MOTOR CONTROL CENTER
BEL	BELOW	MCP	MOTOR CIRCUIT PROTECTION
		MECH	MECHANICAL
C	CONDUIT WITH WIRE	MIN	MINIMUM
CATV	CABLE TELEVISION	M.L.O.	MAIN LUGS ONLY
CCTV	CLOSED CIRCUIT TELEVISION	MTD	MOUNTED
CB	CIRCUIT BREAKER	MTG	MOUNTING
CLG	CEILING		
CLF	CURRENT LIMITING FUSE	N	NEUTRAL
CLR	CLEAR	NC	NORMALLY CLOSED
CO	CONDUIT ONLY WITH NYLON PULLCORD	NEC	NATIONAL ELECTRICAL CODE
COAX	COAXIAL CABLE	NIC	NOT IN CONTRACT
CONC	CONCRETE	NL	NIGHT LIGHT
CONN	CONNECT OR CONNECTION	NTS	NOT TO SCALE
CONT	CONTINUATION	NO	NORMALLY OPEN
CONTR	CONTRACTOR		
CPT	CONTROL POWER TRANSFORMER	OC	ON CENTER
CP	COPPER	OFD	OWNER FURNISHED CONTRACTOR INSTALLED
CT	CURRENT TRANSFORMER	OFD	OWNER FURNISHED OWNER INSTALLED
CW	COLD WATER		
		PB	PULLBOX
D	DEDICATED OUTLET	PC	PHOTOCELL CONTROL
DC	DIRECT CURRENT	PCTC	PHOTOCELL/TIMECLOCK CONTROL
DIA	DIAMETER	PE	PNEUMATIC-ELECTRIC
DISC	DISCONNECT	PH	PHASE
DIST	DISTRIBUTION	PV	POST INDICATING VALVE
DL	DAMP LOCATION	PL	PILOT LIGHT
DB	DISTRIBUTION SWITCHBOARD	PLBG	PLUMBING
DWGS	DRAWINGS	PNL	PANEL
		PVC	POLYVINYL CHLORIDE
EA	EACH	PWR	POWER
EB	SEMINUTE BATTERY CONNECTED TO UNIT	PP	POWER POLE
EC	ELECTRICAL CONTRACTOR	PS	POWER SENTRY EMERGENCY BATTERY UNIT
EDF	ELECTRICAL DRINKING FOUNTAIN		
EG	CONNECTED TO EMERGENCY GENERATOR	Q	FIXTURE WITH QUARTZ RESTRIKE
EF	EXHAUST FAN	QTY	QUANTITY
EI	CONNECTED TO EMERGENCY INVERTER		
ELECT	ELECTRICAL	REC	RECESSED
ELEV	ELEVATION/ELEVATOR	RECEPT	RECEPTACLE
EMER, EM	EMERGENCY	REF	REFRIGERATOR
EMT	ELECTRO-METALLIC TUBING	REQ	REQUIREMENTS
EQUIP	EQUIPMENT	RGS	RIGID GALVANIZED STEEL
EXIST, EX	EXISTING	RM	ROOM
		SB	STANDBY
F	DEGREES FAHRENHEIT	SD	SMOKE DETECTOR
FA	FIRE ALARM	SPEC	SPECIFICATION
FF	FURNITURE FEED, FINISHED FLOOR	SQ FT	SQUARE FEET OR SQUARE FOOT
FFE	FINISH FLOOR ELEVATION	STRUCT	STRUCTURAL
FIN	FINISH OR FINISHED	SW	SWITCH
FIXT	FIXTURE	SWBD	SWITCHBOARD
FLUOR	FLUORESCENT	SWGR	SWITCHGEAR
FT	FEET OR FOOT		
FTG	FOOTING		
FVNR	FULL VOLTAGE NON-REVERSING	TEMP	TEMPERATURE OR TEMPORARY
		TEL, TELE	TELEVISION
G	GROUND BUS OR WIRE	TC	TIMECLOCK
GA	GAUGE	TRANSF	TRANSFORMER
GALV	GALVANIZED	TYP	TYPICAL
GC	GENERAL CONTRACTOR		
GD	GARBAGE DISPOSAL	UGPS	UNDERGROUND PULL SECTION
GFI	GROUND FAULT INTERRUPTER	UL	UNDERWRITERS LABORATORIES
GFR	GROUND FAULT RELAY	UNO	UNLESS NOTED OTHERWISE
GG	GREEN GROUND		
GND	GROUND	V	VOLTS
		VA	VOLTAMPERE
H	HORIZONTAL	VFD	VARIABLE FREQUENCY DRIVE
HAZMAT	HAZARDOUS MATERIAL		
HR	HOUR	W	WITH
HP	HORSEPOWER	WH	WATER HEATER
HOA	HAND-OFF-AUTOMATIC	WP	WEATHER PROOF
HT	HEIGHT	WT	WEIGHT
HTR	HEATER		
HZ	HERTZ	X	EXISTING
		XFMR	TRANSFORMER
IG	ISOLATED GROUND	XL	EXISTING TO BE RELOCATED
IMC	INTERMEDIATE METAL CONDUIT	XN	NEW LOCATION OF RELOCATED FIXTURE
INCAND	INCANDESCENT	XR	EXISTING TO BE REMOVED
J-BOX	JUNCTION BOX		

LIGHTING SYMBOLS AND DESCRIPTIONS	
	SEE LUMINAIRE SCHEDULE FOR ADDITIONAL FIXTURE SYMBOLS.
S	SWITCH, SINGLE POLE 20A, MTD 48" AFF TO TOP DEVICE: WHITE COVERPLATE: WHITE PROVIDE 3-1/2" DEEP SINGLE GANG BOX
S <sup>DIM</sup>	DIMMER SWITCH, MTD. +48" AFF
S	SPECIALTY SWITCH AS DENOTED ON PLANS. DEVICE: WHITE COVERPLATE: WHITE
(FIE)	LUMINAIRE CALLOUT:
Xa	

LUMINAIRE TYPE UNIQUE LUMINAIRE SYMBOL

(FIE) LIGHTING BRANCH CIRCUIT AND SWITCH LEGS

SIGNAL SYMBOLS AND DESCRIPTIONS	
HER	CARD READER
HTV	CATV OUTLET PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE. +15" AFF UNO.
S	SPEAKER BACK BOX LOCATION

TELECOMMUNICATIONS SYSTEM STANDARDS	
• ALL CABLING AND ASSOCIATED COMPONENTS SHALL COMPLY WITH ANSITIA/EIA-568-A.	
• ALL CONDUIT AND PATHWAYS SHALL COMPLY WITH ANSITIA/EIA-569-A.	
• ALL GROUNDING AND BONDING SHALL COMPLY WITH ANSITIA/EIA-607.	

GENERAL NOTES:	
1.	ALL CURRENT CARRYING CONDUCTORS SHALL BE COPPER. INSULATION SHALL BE TYPE THHN/THWN FOR ALL BRANCH CIRCUITS UP TO AND INCLUDING SIZE # 2AWG. INSULATION FOR CONDUCTORS OVER SIZE # 2AWG SHALL BE XHHW.
2.	ALL GROUND CONDUCTORS SHALL BE INSULATED COPPER.
3.	ALL CONDUIT SHALL BE EMT (INSTALLED IN INTERIOR CONCEALED SPACES) OR SCHEDULE-40 PVC (INSTALLED UNDERGROUND) UNLESS OTHERWISE NOTED.
4.	ALL AMPACITIES ARE BASED UPON TABLE 310.16 OF THE 2017 N.E.C.

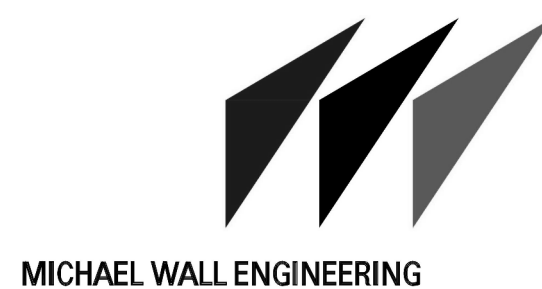
ELECTROMAGNETIC FIELDS (EMF)			
ALL ELECTRIC DEVICES GENERATE AND ARE SUSCEPTIBLE TO EMF. SENSITIVE DEVICES (CRT'S, COMPUTERS, MAGNETIC MEDIA, ETC.) SHOULD BE PLACED TO MINIMIZE EXPOSURE FROM STRONG EMF SOURCES (TRANSFORMERS, SWITCHGEAR, FEEDERS, ETC.).			
THE FOLLOWING TABLE SHOULD BE USED AS A GUIDE AND SHALL BE SUPERSEDED BY ACTUAL FIELD MEASUREMENTS.			
SOURCE	RECOMMENDED RADIAL DISTANCE		
AMPACITY	10 mGauss	5 mGauss	1 mGauss
100	1.25'	1.75'	4'
225	2'	2.75'	6'
400	2.5'	4'	8'
800	4'	6'	12'
1200	5'	7'	16'
1600	6'	8'	20'
2000	7'	10'	22'
3000	9'	13'	28'
4000	11'	15'	35'

ELECTRICAL CONSTRUCTION DOCUMENTS GENERAL INFORMATION	
1.	THE INFORMATION CONTAINED WITHIN THESE CONSTRUCTION DOCUMENTS IS DIAGRAMMATIC. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK AND SHALL INCLUDE ALL COSTS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
2.	THE CONTRACTOR SHALL COORDINATE ALL INSTALLATIONS WITH ALL OTHER TRADES.
3.	FINAL LOCATIONS OF ALL DEVICES, EQUIPMENT, ETC. SHALL BE AS INDICATED ON THE LABORATORY FURNISHINGS DRAWINGS. ALL DIMENSIONAL INFORMATION SHALL BE OBTAINED FROM THE LABORATORY FURNISHINGS DRAWINGS. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED FROM THE LABORATORY ELECTRICAL DRAWINGS.
4.	THESE DRAWINGS ARE SUPPLEMENTED BY PRINTED DIVISION 26 ELECTRICAL SPECIFICATIONS. THE COMPLETE ELECTRICAL CONSTRUCTION DOCUMENT PACKAGE CONTAINS BOTH SPECIFICATIONS AND DRAWINGS. THE CONTRACTOR SHALL OBTAIN AND REVIEW THE COMPLETE ELECTRICAL CONSTRUCTION DOCUMENT PACKAGE PRIOR TO THE COMMENCEMENT OF ANY WORK. OF NOTE, SPECIFICATION SECTION 266000 LABORATORY ELECTRICAL REQUIREMENTS APPLIES ONLY TO WORK PERFORMED TO INSTALL ELECTRICAL WIRING, EQUIPMENT, DEVICES, AND SUPPORTING INFRASTRUCTURE FOR ITEMS SHOWN ON THE LABORATORY FURNISHINGS, LABORATORY PLUMBING, AND LABORATORY ELECTRICAL PLANS. ENSURE THIS SPECIFICATION IS REFERENCED TO IDENTIFY ELECTRICAL REQUIREMENTS SPECIFIC TO THIS INSTALLATION.

SYMBOLS AND DESCRIPTIONS			
	DUPLX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: WHITE. COVERPLATE: STAINLESS STEEL		JUNCTION BOX, WALL MOUNTED.
	DUPLX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. CONNECTED TO STANDBY POWER SYSTEM. DEVICE: RED. COVERPLATE: STAINLESS STEEL		JUNCTION BOX, SURFACE MOUNTED, CONCEALED.
	DEDICATED 20A RATED DUPLX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: WHITE. COVERPLATE: STAINLESS STEEL		JUNCTION BOX, FLUSH FLOOR MOUNTED.
	GROUND FAULT INTERRUPTER DUPLX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: WHITE. COVERPLATE: STAINLESS STEEL		CLOCK OUTLET, MOUNTED 96" A.F.F., U.O.N.
	DUPLX RECEPTACLE WITH (1) USB-A CHARGING PORT AND (1) USB-C CHARGING PORT, MOUNTED AS SHOWN ON PLAN SHEET.		WIREWAY, WIREMOLD AL4520 SERIES OR EQUAL, 43" A.F.F. TO BOTTOM OF THE RACEWAY, UNO.
	DUPLX RECEPTACLE WITH (1) USB-A CHARGING PORT AND (1) USB-C CHARGING PORT, MOUNTED AS SHOWN ON PLAN SHEET.		PANELBOARD FLUSH MOUNTED
	WEATHER PROOF DUPLX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: WHITE. COVERPLATE: GASKETED STAINLESS STEEL		PANELBOARD SURFACE MOUNTED
	DUPLX RECEPTACLE PEDESTAL MOUNTED.		FUSED DISCONNECT SWITCH
	BACK TO BACK DUPLX RECEPTACLES PEDESTAL MOUNTED.		FVNR COMBINATION MOTOR STARTER, H.O.-A, AUXILIARY CONTACTS, CPT, PILOT LIGHTS, NEMA ENCLOSURE AS REQUIRED, WITH FUSED DISCONNECT SWITCH.
	CEILING MOUNTED RECEPTACLE		VARIABLE FREQUENCY DRIVE
	SPECIALTY OUTLET, VERIFY NEMA CONFIGURATION AS NOTED ON PLANS MOUNTED AS SHOWN ON PLAN SHEET.		MOTOR HORSEPOWER RATED SWITCH.
	FOURPLEX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: WHITE. COVERPLATE: STAINLESS STEEL		CONCEALED EMT CONDUIT WITH THHN/THWN WIRE #12AWG CONDUCTORS WITH (1) #12AWG GREEN GROUND, 3/4" MINIMUM.
	DEDICATED 20A RATED FOURPLEX RECEPTACLE MOUNTED AS SHOWN ON PLAN SHEET. DEVICE: GREY. COVERPLATE: STAINLESS STEEL		CONCEALED EMT CONDUIT WITH THHN/THWN WIRE #10AWG CONDUCTORS WITH (1) #10AWG GREEN GROUND, 3/4" MINIMUM.
	FOURPLEX RECEPTACLE WITH (1) USB-A CHARGING PORT AND (1) USB-C CHARGING PORT, MOUNTED AS SHOWN ON PLAN SHEET.		INDICATES (1) #10AWG NEUTRAL
	FOURPLEX RECEPTACLE PEDESTAL MOUNTED.		UNDERGROUND CONDUIT AND WIRE, 3/4" PVC MIN. UNO.
	BACK TO BACK FOURPLEX RECEPTACLES PEDESTAL MOUNTED.		TELECOMMUNICATIONS CONDUIT ONLY, 1-1/4" O. U.N.O.
	CEILING MOUNTED DATA OUTLET BOX LOCATION SHOWN FOR REFERENCE ONLY. COORDINATE WITH DATA WORK.		HOMERUN
	TELECOMMUNICATIONS OUTLET LOCATION, PEDESTAL MOUNTED. COORDINATE WITH DATA WORK.		RECESSED FIRE RATED FLOOR BOX WITH FOUR AVAILABLE POSITIONS. DEVICES TO BE MOUNTED IN FLOOR BOX AS SHOWN AT EACH SYMBOL ON PLANS.
	WIRELESS ACCESS POINT BOX LOCATION ABOVE CEILING FOR WIRELESS LAN. COORDINATE WITH DATA WORK.		CEILING MOUNTED PROJECTOR PANEL. DEVICES TO BE MOUNTED IN CEILING PANEL AS SHOWN ON PLANS. LOCATIONS SHOWN FOR REFERENCE ONLY. COORDINATE WITH ARCHITECTURAL.
	BACK TO BACK TELECOMMUNICATIONS OUTLET LOCATION, PEDESTAL MOUNTED. COORDINATE WITH DATA WORK.		TELEPHONE OUTLET BOX LOCATION SHOWN FOR REFERENCE ONLY. COORDINATE EXACT LOCATIONS, DEVICE QUANTITIES AND TYPES WITH DATA WORK. PROVIDE AND INSTALL BLANK LOW VOLTAGE COVER PLATES AT ALL OUTLET BOX LOCATIONS.

MULTI-POLE RECEPTACLE WIRING

NEMA CODE	WIRE DESIGNATION
	(2)#12 AWG, 34°C +(1)#12 AWG, G, G.
	(2)#10 AWG, 34°C +(1)#10 AWG, G, G.
	(3)#10 AWG, 34°C +(1)#10 AWG, G, G.

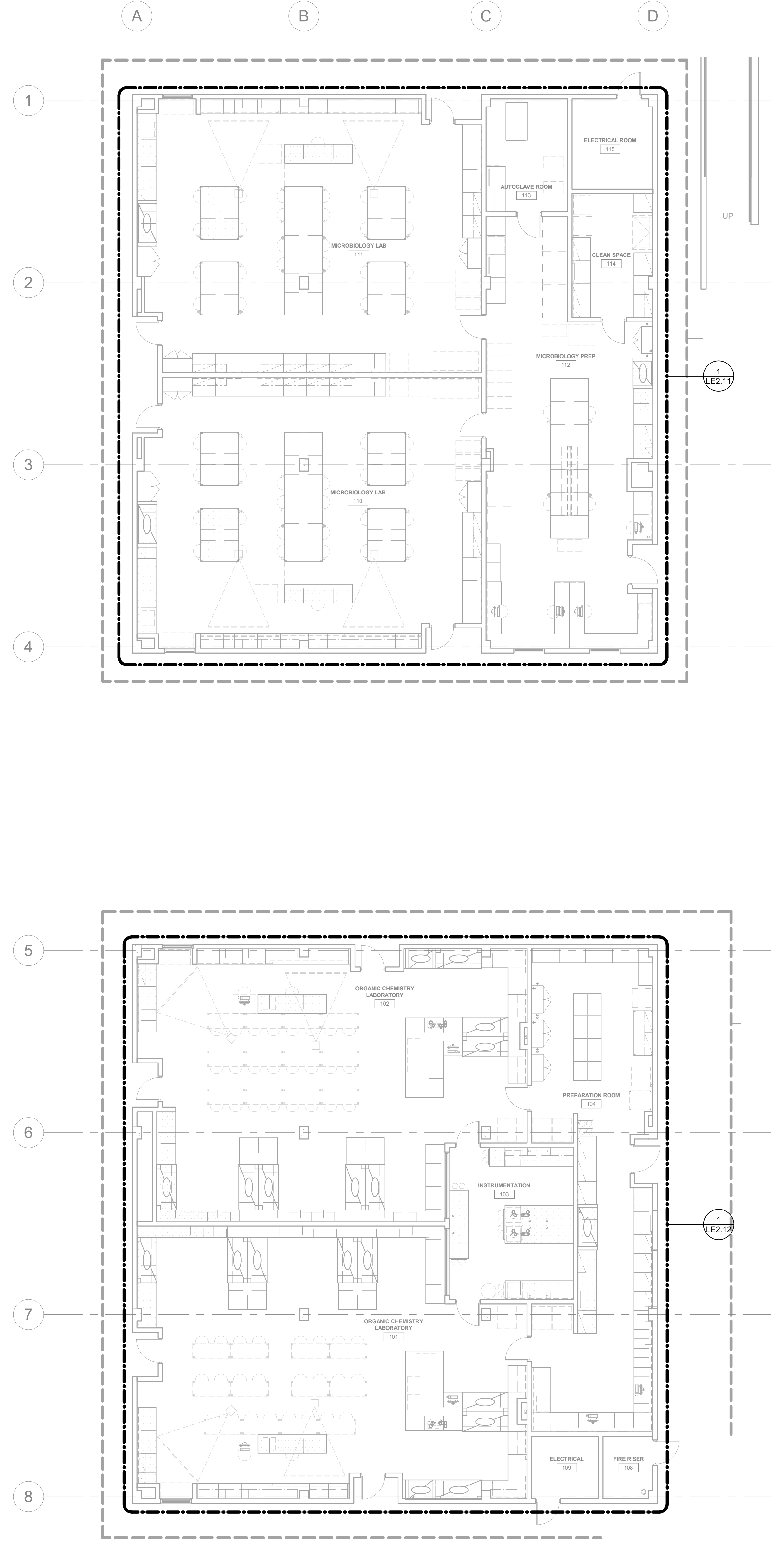


MICHAEL WALL ENGINEERING

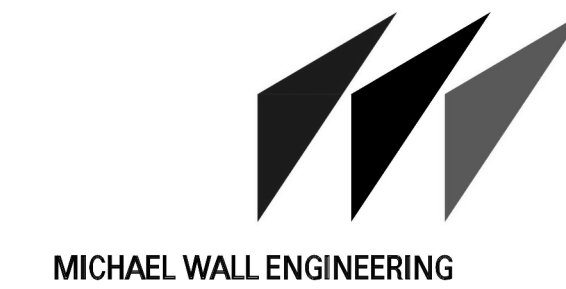
858-638-0600  
 858-638-0640 (fax)  
 www.mwalleng.com  
 4115 Sorrento Valley Blvd.  
 San Diego, CA 92121  
 REGISTERED ELECTRICAL ENGINEERS

**DRAWN BY:** LF  
**JOB NO:** 1931.000  
**DATE:** 01/08/2021  
**REVISIONS**

**REVISIONS**



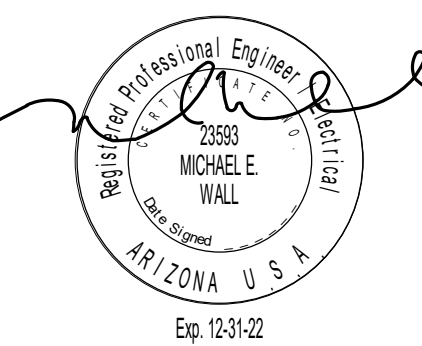
1 OVERALL LEVEL-1  
1/8" = 1'-0"



MICHAEL WALL ENGINEERING  
 858-638-0600  
 858-638-0640 (fax)  
 www.mwalleng.com  
 4115 Sorrento Valley Blvd.  
 San Diego, CA 92121  
 REGISTERED ELECTRICAL ENGINEERS

DRAWN BY: LF  
 JOB NO: 1931.000  
 DATE: 01/08/2021  
 REVISIONS

LABORATORY ELECTRICAL -  
 LEVEL 1 OVERALL  
**LE2.10**  
 100% CONSTRUCTION DOCUMENTS



2202 W Anklam Rd, Tucson, AZ 85745

**PCC Science Labs  
 Building F Renovation**

Laboratory  
 PCC Science Labs  
 2202 W Anklam Rd  
 Tucson, AZ 85745  
 Phone: 520.327.0159

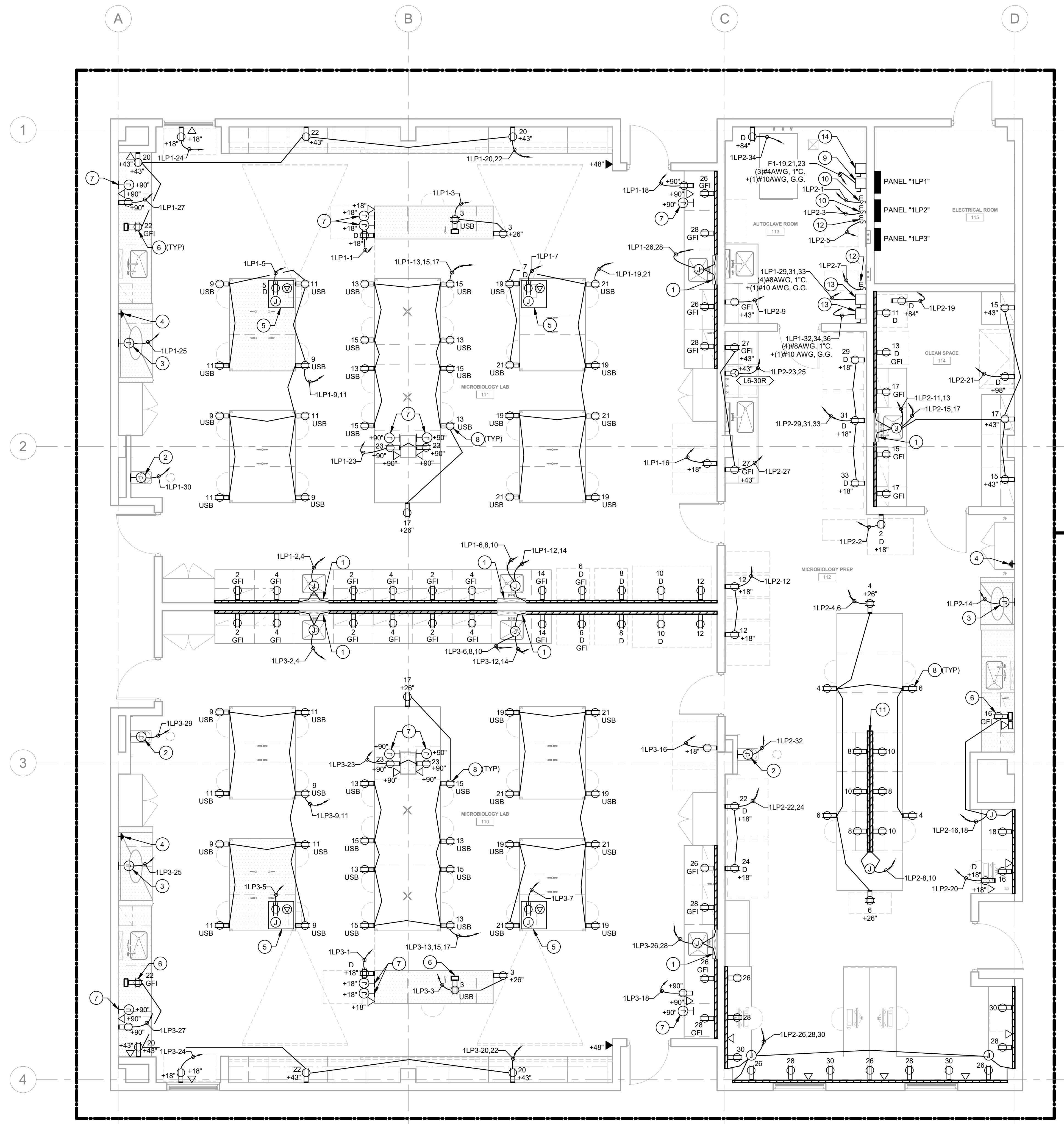
Mechanical  
 KC Mechanical Engineering  
 1047 E Palm Canyon  
 Tucson, AZ 85711  
 Phone: 520.327.7611

Structural  
 Junder Structural Engineering  
 3028 N. Oracle Blvd. #100  
 Tucson, AZ 85716  
 Phone: 520.323.3422

Electrical  
 Monrad Engineering, Inc.  
 1520 E. Palm Canyon  
 Tucson, AZ 85711  
 Phone: 520.884.0045

**bws ARCHITECTS**

BURNS WALD-HOPKINS SHAMBACH ARCHITECTS  
 26 North Court Avenue  
 Tucson, AZ 85711  
 520.795.2702 Fax: 520.795.6171  
 www.bwsarch.com

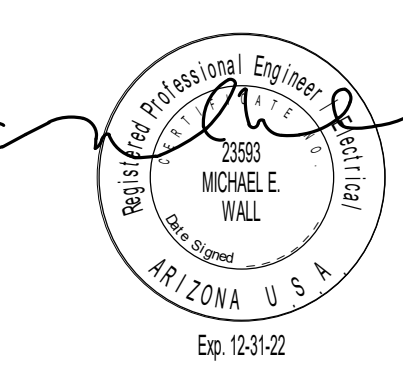
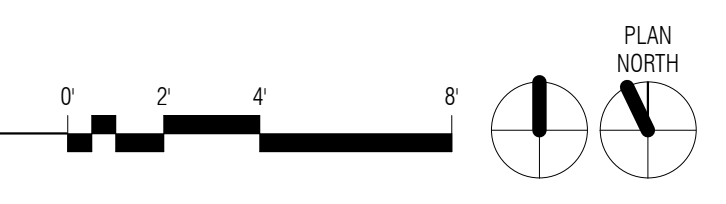


ADD ALTERNATE #01  
MICROBIOLOGY AND  
ASSOCIATED SYSTEMS.  
REFER TO SPEC  
SECTION 012300

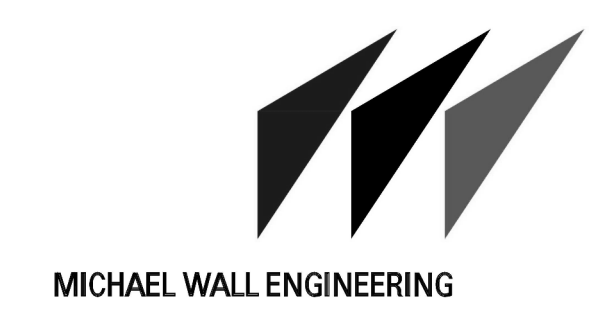
- KEY NOTES:**
- 1 PIPEDROP, UTILIZE FOR CONCEALMENT OF CONDUIT. SEE DETAIL 6LE4.10.
  - 2 PROVIDE AND INSTALL J-BOX AND REQUIRED CONNECTIONS TO SAFETY SHOWER ALARM.
  - 3 PROVIDE J-BOX AND CONNECTION AT TOP OF CHEMICAL FUME HOOD AT +96".
  - 4 PROVIDE GROUNDING OF CABINET AT LOCATION SHOWN ON PLAN. SEE DETAIL 1LE4.11.
  - 5 CEILING MOUNT PROJECTOR. PROVIDE RECEPTACLE. VERIFY LOCATION AND MOUNTING WITH ARCHITECTURAL.
  - 6 ELECTRICAL PEDESTAL. SEE DETAIL 1LE4.10.
  - 7 PROVIDE J-BOX AND 1-1/4" C. TO ACCESSIBLE CEILING FOR AV USE. SEE PROJECT ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
  - 8 RECEPTACLE TO BE MOUNTED IN TABLE APRON. VERIFY LOCATION AND MOUNTING WITH LABORATORY FURNISHING DRAWINGS.
  - 9 PROVIDE AND INSTALL NEMA 4X 60A 3P FUSED DISCONNECT FOR STERILIZER ELECTRIC STEAM GENERATOR. CIRCUITS TO BE PROVIDED FROM BUILDING ELECTRICAL PANEL.
  - 10 PROVIDE AND INSTALL 20A 1P MOTOR RATED SNAP SWITCH FOR CONTROLS.
  - 11 SHELF MOUNTED RACEWAY AT THIS LOCATION.
  - 12 PROVIDE AND INSTALL 20A 1P MOTOR RATED SNAP SWITCH FOR STERILIZER EXHAUST CONDENSER.
  - 13 PROVIDE AND INSTALL NEMA 4X 60A 3P FUSED DISCONNECT FOR MANUAL STERILIZER.
  - 14 PROVIDE AND INSTALL NEMA 4X 30A 3P FUSED DISCONNECT FOR STERILIZER VACUUM PUMP. CIRCUITS TO BE PROVIDED FROM BUILDING ELECTRICAL PANEL.

- GENERAL NOTES:**
1. COORDINATE ALL DEVICE MOUNTING HEIGHTS AND LOCATIONS WITH LABORATORY FURNISHING DESIGN PRIOR TO ROUGH-IN.
  2. ALL OUTLETS WITHIN 6'-0" OF SINK OR EYE WASH STATION TO BE GFI.
  3. PROVIDE (1) 1-1/4" C.O. STUBBED FROM EACH WALL, FLOOR, OR WIREWAY MOUNTED TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  4. PROVIDE A MINIMUM OF (1) 1-1/4" C.O. STUBBED FROM EACH TELE/DATA SECTION OF DUAL CHANNEL WIREWAY TO ACCESSIBLE CEILING. THIS IS REQUIRED FOR ALL DUAL CHANNEL WIREWAY LOCATIONS, EVEN WHERE NO DATA IS SHOWN.
  5. FOR WIREWAY DETAILS SEE 2 THRU 5LE4.10.
  6. PROVIDE (1) 1" C.O. STUBBED FROM EACH PEDESTAL TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  7. PROVIDE INDEPENDENT HOT AND NEUTRAL CONDUCTORS FOR EACH RECEPTACLE CIRCUIT IN A HOMERUN.
  8. SEE MULTIPOLE RECEPTACLE WIRING TABLE ON PROJECT PLAN SHEET LE1.10 FOR INFORMATION ON CONDUCTOR QUANTITIES AND SIZES REQUIRED TO PROVIDE POWER TO MULTIPOLE OUTLETS BY NEMA CODE.
  9. BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED AS FOLLOWS:
    - A. CIRCUIT LENGTH OF UP TO 50 FEET SHALL UTILIZE #12 CONDUCTORS.
    - B. CIRCUIT LENGTH GREATER THAN 50 FEET AND UP TO 90 FEET SHALL UTILIZE #10 CONDUCTORS.
    - C. CIRCUIT LENGTH GREATER THAN 90 FEET AND UP TO 140 FEET SHALL UTILIZE #8 CONDUCTORS.

1 LEVEL-1, PLAN 'A'  
1/4" = 1'-0"

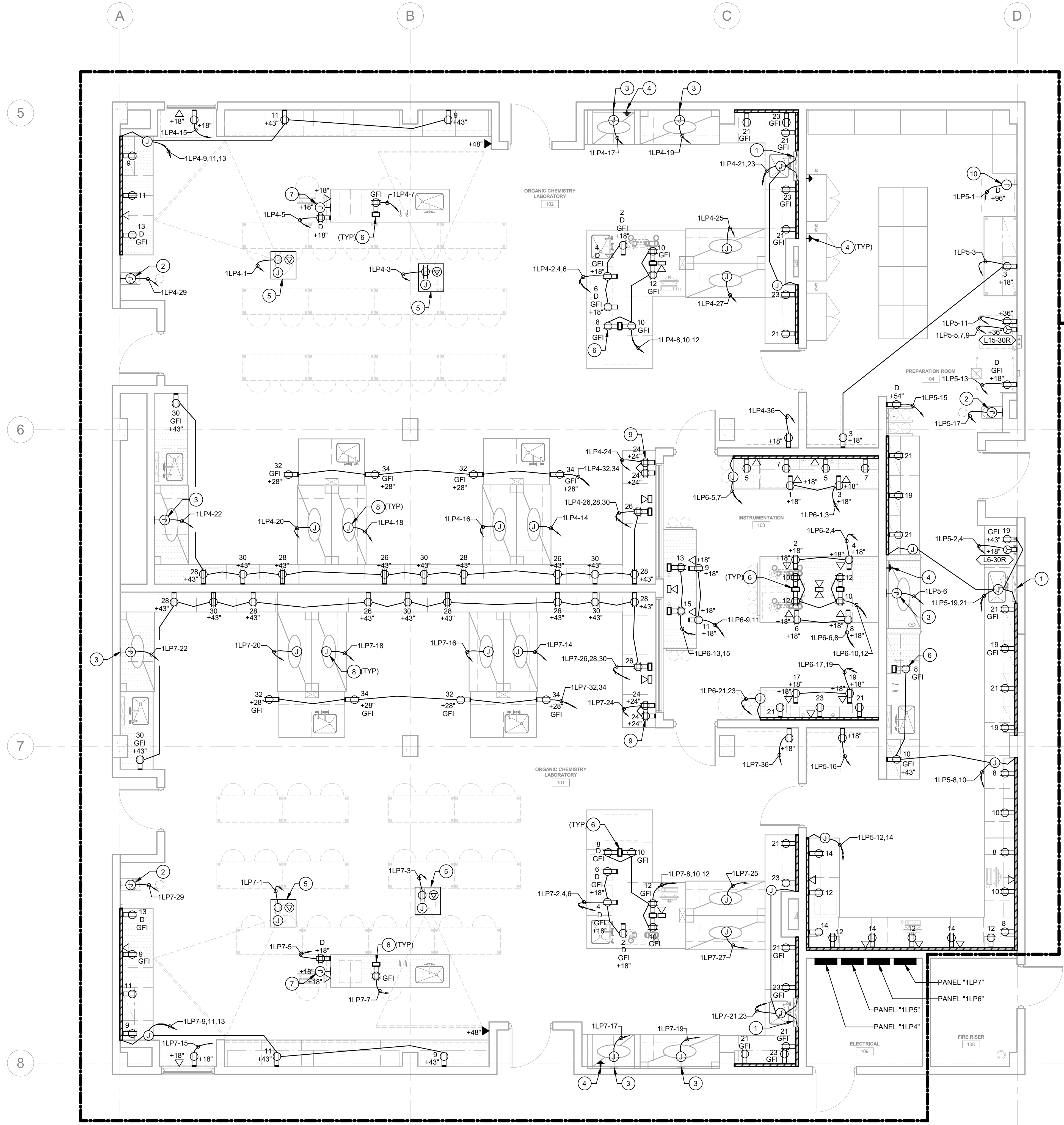


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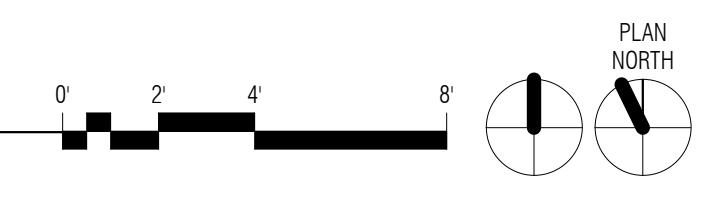


**ADD ALTERNATE #02  
 ORGANIC CHEMISTRY  
 AND ASSOCIATED  
 SYSTEMS. REFER TO  
 SPEC SECTION 012300.**

- KEY NOTES:**
- 1 PIPEDROP, UTILIZE FOR CONCEALMENT OF CONDUIT. SEE DETAIL 6LE4.10.
  - 2 PROVIDE AND INSTALL J-BOX AND REQUIRED CONNECTIONS TO SAFETY SHOWER ALARM.
  - 3 PROVIDE J-BOX AND CONNECTION AT TOP OF CHEMICAL FUME HOOD AT +96".
  - 4 PROVIDE GROUNDING OF CABINET AT LOCATION SHOWN ON PLAN. SEE DETAIL 1LE4.11.
  - 5 CEILING MOUNT PROJECTOR. PROVIDE RECEPTACLE, VERIFY LOCATION AND MOUNTING WITH ARCHITECTURAL.
  - 6 ELECTRICAL PEDESTAL. SEE DETAIL 1LE4.10.
  - 7 PROVIDE J-BOX AND 1-1/4" C.O. TO ACCESSIBLE CEILING FOR AV USE. SEE PROJECT ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
  - 8 PROVIDE CEILING MOUNTED J-BOX AND CONNECTION AT TOP OF CHEMICAL FUME HOOD.
  - 9 PROVIDE (2) 2x2" RECEPTACLES MOUNTED IN BACK OF CABINET PANEL.
  - 10 PROVIDE AND INSTALL J-BOX FOR HARD WIRED CONNECTION TO EXPLOSION PROOF REFRIGERATOR. COORDINATE REQUIREMENTS WITH OWNER'S EQUIPMENT.

- GENERAL NOTES:**
1. COORDINATE ALL DEVICE MOUNTING HEIGHTS AND LOCATIONS WITH LABORATORY FURNISHING DESIGN PRIOR TO ROUGH-IN.
  2. ALL OUTLETS WITHIN 6'-0" OF SINK OR EYE WASH STATION TO BE GFI.
  3. PROVIDE (1) 1-1/4" C.O. STUBBED FROM EACH WALL, FLOOR, OR WIREWAY MOUNTED TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  4. PROVIDE A MINIMUM OF (1) 1-1/4" C.O. STUBBED FROM EACH TELE/DATA SECTION OF DUAL CHANNEL WIREWAY TO ACCESSIBLE CEILING. THIS IS REQUIRED FOR ALL DUAL CHANNEL WIREWAY LOCATIONS, EVEN WHERE NO DATA IS SHOWN.
  5. FOR WIREWAY DETAILS SEE 2 THRU 5LE4.10.
  6. PROVIDE (1) 1" C.O. STUBBED FROM EACH PEDESTAL TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  7. PROVIDE INDEPENDENT HOT AND NEUTRAL CONDUCTORS FOR EACH RECEPTACLE CIRCUIT IN A HOMERUN.
  8. SEE MULTIPOLAR RECEPTACLE WIRING TABLE ON PROJECT PLAN SHEET LE1-10 FOR INFORMATION ON CONDUCTOR QUANTITIES AND SIZES REQUIRED TO PROVIDE POWER TO MULTIPOLAR OUTLETS BY NEMA CODE.
  9. BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED AS FOLLOWS:
    - A. CIRCUIT LENGTH OF UP TO 50 FEET SHALL UTILIZE #12 CONDUCTORS.
    - B. CIRCUIT LENGTH GREATER THAN 50 FEET AND UP TO 90 FEET SHALL UTILIZE #10 CONDUCTORS.
    - C. CIRCUIT LENGTH GREATER THAN 90 FEET AND UP TO 140 FEET SHALL UTILIZE #8 CONDUCTORS.

**1 LEVEL-1, PLAN 'B'**  
 1/4" = 1'-0"



**CONSULTANTS**

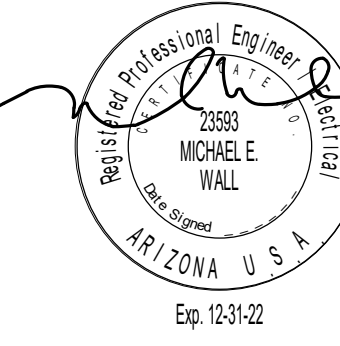
**Electrical**  
 Monrad Engineering, Inc.  
 1520 E. Foothill Parkway, Suite 200  
 San Diego, CA 92108  
 Phone: 619.587.9381

**Structural**  
 Under Structural Engineering  
 10261 La Jolla Village Drive, Suite 100  
 San Diego, CA 92037  
 Phone: 619.520.3276

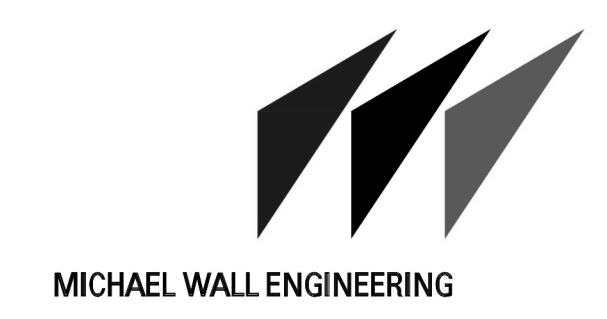
**Mechanical**  
 PCC Mechanical Engineering  
 4800 La Jolla Village Drive, Suite 100  
 San Diego, CA 92037  
 Phone: 619.297.0169

**PCC Science Labs  
 Building F Renovation**

2202 W Anklam Rd, Tucson, AZ 85745



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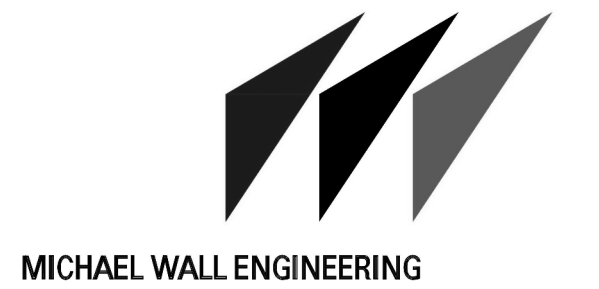
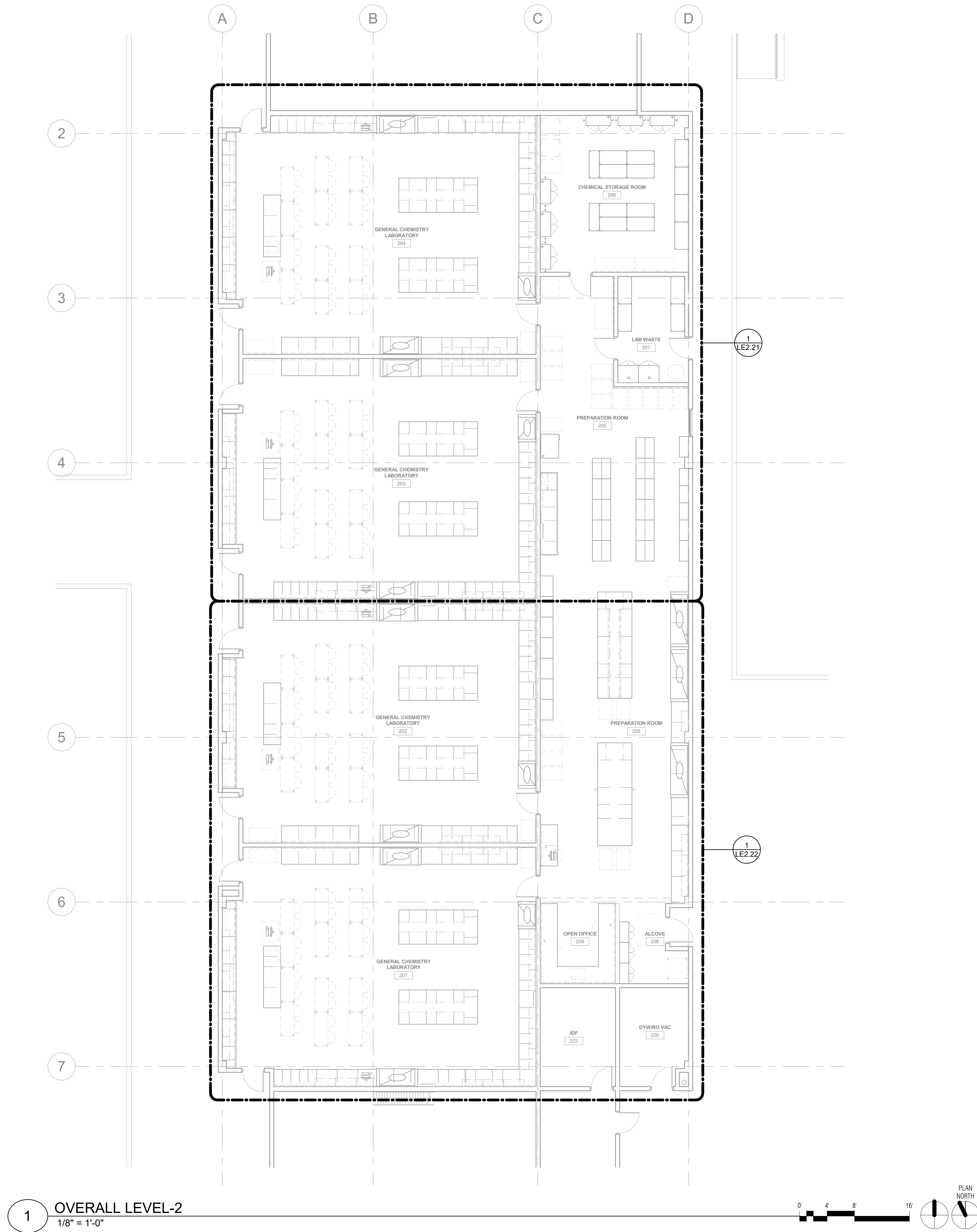


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**LABORATORY ELECTRICAL -  
 LEVEL 1 PLAN B**

**LE2.12**  
 100% CONSTRUCTION DOCUMENTS

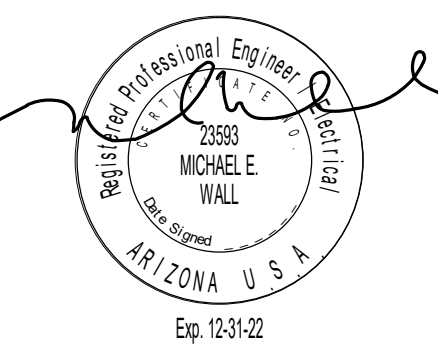




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**LABORATORY ELECTRICAL -  
 LEVEL 2 OVERALL**  
**LE2.20**  
 100% CONSTRUCTION DOCUMENTS



**PCC Science Labs  
 Building F Renovation**  
 2202 W Anklam Rd, Tucson, AZ 85745

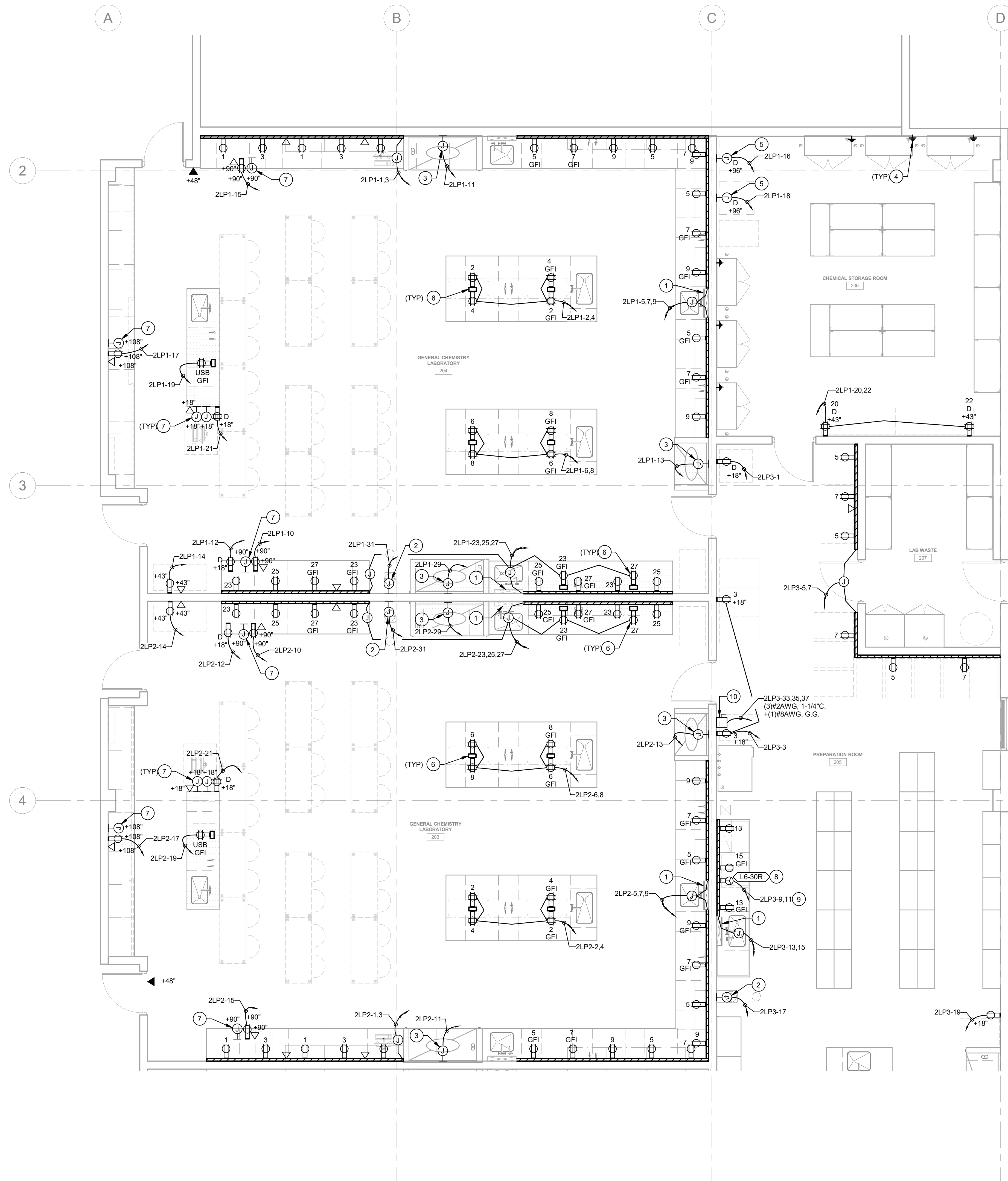
**CONSULTANTS**  
 Laboratory  
 PCC Science Labs  
 2202 W Anklam Rd  
 Tucson, AZ 85745  
 Phone: 520.327.0159

**Mechanical**  
 KC Mechanical Engineering  
 1047 E Palm Springs  
 Tucson, AZ 85711  
 Phone: 520.327.7611

**Structural**  
 Miller Structural Engineering  
 3028 N. Oracle Rd. #100  
 Tucson, AZ 85716  
 Phone: 520.323.3422

**Electrical**  
 Monrad Engineering, Inc.  
 1520 E. Palm Springs  
 Tucson, AZ 85711  
 Phone: 520.884.0045

**bws ARCHITECTS**  
**BURNS WALD-HOPKINS SHAMBACH ARCHITECTS**  
 26 North Court Avenue  
 Tucson, AZ 85711  
 Phone: 520.795.2702 Fax: 520.795.6171  
 www.bwsarch.com



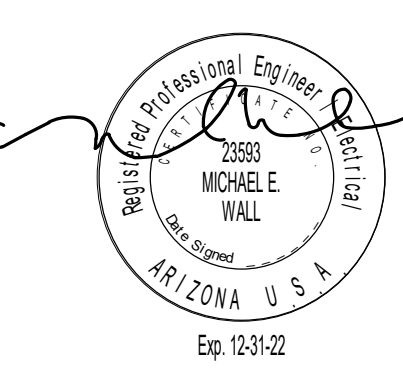
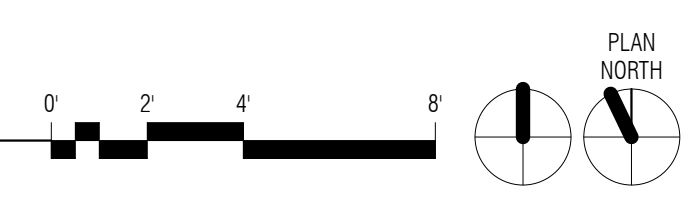
**KEY NOTES:**

- 1 PIPEDROP, UTILIZE FOR CONCEALMENT OF CONDUIT. SEE DETAIL 6LE4.10.
- 2 PROVIDE AND INSTALL J-BOX AND REQUIRED CONNECTIONS TO SAFETY SHOWER ALARM.
- 3 PROVIDE J-BOX AND CONNECTION AT TOP OF CHEMICAL FUME HOOD AT +96".
- 4 PROVIDE GROUNDING OF CABINET AT LOCATION SHOWN ON PLAN. SEE DETAIL 1/LE4.11.
- 5 PROVIDE AND INSTALL J-BOX FOR HARD WIRED CONNECTION TO EXPLOSION PROOF REFRIGERATOR. COORDINATE REQUIREMENTS WITH OWNER'S EQUIPMENT.
- 6 ELECTRICAL PEDESTAL. SEE DETAIL 1/LE4.10.
- 7 PROVIDE J-BOX AND 1-1/4" C.O. TO ACCESSIBLE CEILING FOR ANY USE. SEE PROJECT ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- 8 MOUNT RECEPTACLE IN WIREWAY.
- 9 ROUTE HOMERUN THROUGH WIREWAY.
- 10 PROVIDE AND INSTALL NEMA 1 100A 3P FUSED DISCONNECT FOR GLASSWARE WASHER.

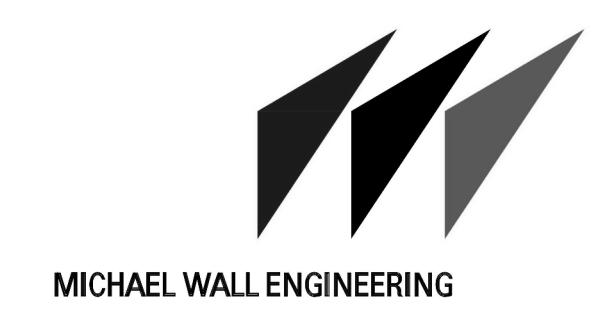
**GENERAL NOTES:**

1. COORDINATE ALL DEVICE MOUNTING HEIGHTS AND LOCATIONS WITH LABORATORY FURNISHING DESIGN PRIOR TO ROUGH-IN.
2. ALL OUTLETS WITHIN 6'-0" OF SINK OR EYE WASH STATION TO BE GFI.
3. PROVIDE (1) 1-1/4" C.O. STUBBED FROM EACH WALL, FLOOR, OR WIREWAY MOUNTED TELE/DATA OUTLET TO ACCESSIBLE CEILING.
4. PROVIDE A MINIMUM OF (1) 1-1/4" C.O. STUBBED FROM EACH TELE/DATA SECTION OF DUAL CHANNEL WIREWAY TO ACCESSIBLE CEILING. THIS IS REQUIRED FOR ALL DUAL CHANNEL WIREWAY LOCATIONS, EVEN WHERE NO DATA IS SHOWN.
5. FOR WIREWAY DETAILS SEE 2 THRU 5/LE4.10.
6. PROVIDE (1) 1" C.O. STUBBED FROM EACH PEDESTAL TELE/DATA OUTLET TO ACCESSIBLE CEILING.
7. PROVIDE INDEPENDENT HOT AND NEUTRAL CONDUCTORS FOR EACH RECEPTACLE CIRCUIT IN A HOMERUN.
8. SEE MULTI-POLE RECEPTACLE WIRING TABLE ON PROJECT PLAN SHEET LE1.10 FOR INFORMATION ON CONDUCTOR QUANTITIES AND SIZES REQUIRED TO PROVIDE POWER TO MULTI-POLE OUTLETS BY NEMA CODE.
9. BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED AS FOLLOWS:
  - A. CIRCUIT LENGTH OF UP TO 50 FEET SHALL UTILIZE #12 CONDUCTORS.
  - B. CIRCUIT LENGTH GREATER THAN 50 FEET AND UP TO 90 FEET SHALL UTILIZE #10 CONDUCTORS.
  - C. CIRCUIT LENGTH GREATER THAN 90 FEET AND UP TO 140 FEET SHALL UTILIZE #8 CONDUCTORS.

1 LEVEL-2, PLAN 'A'  
1/4" = 1'-0"

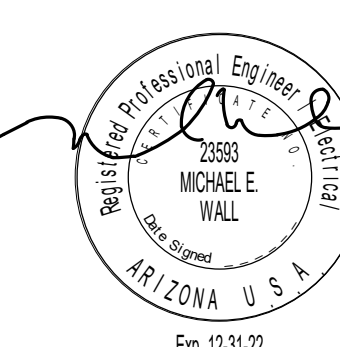


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**LABORATORY ELECTRICAL -  
 LEVEL 2 PLAN A**  
**LE2.21**  
 100% CONSTRUCTION DOCUMENTS

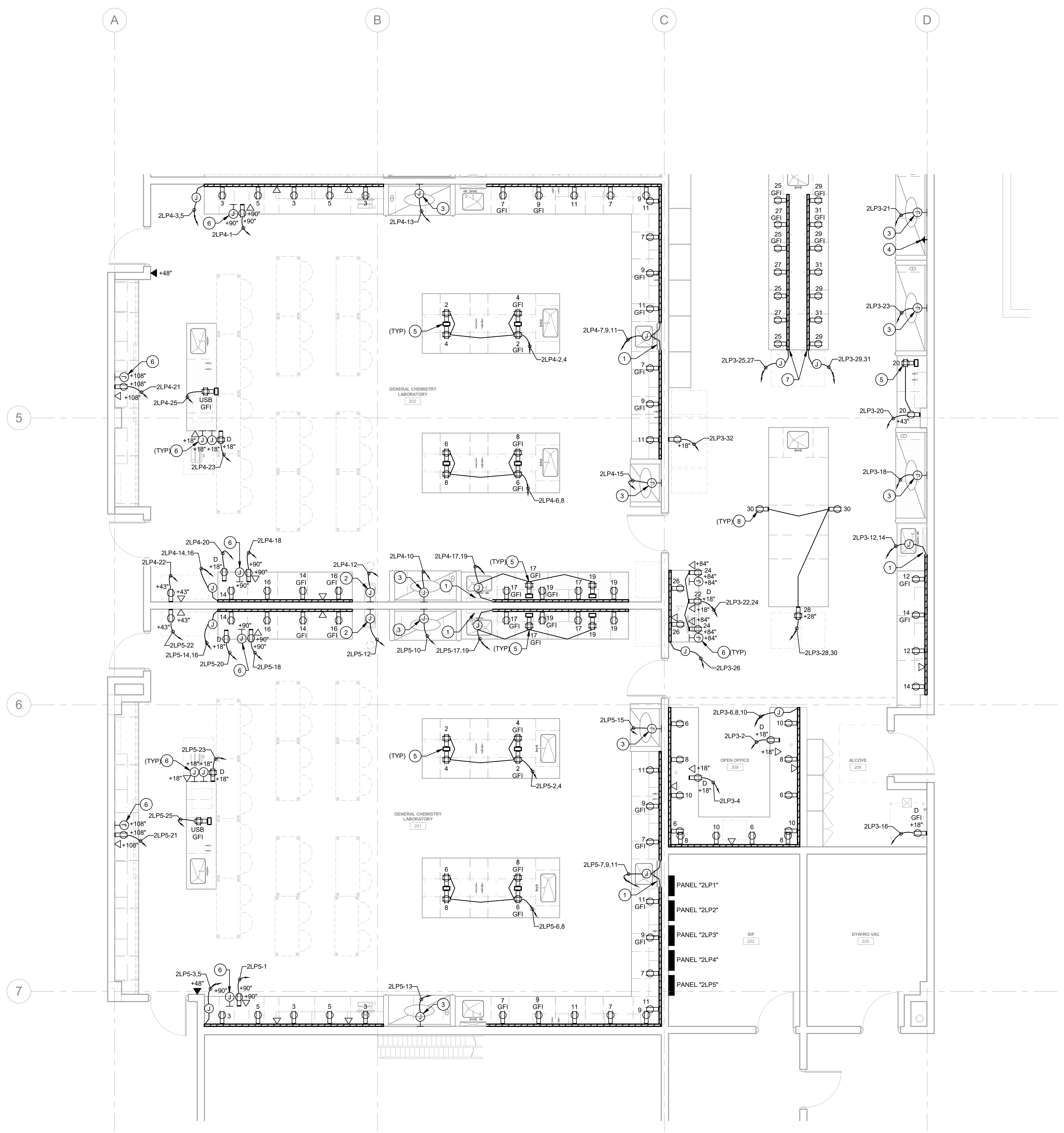


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**DATE:** 01/08/2021  
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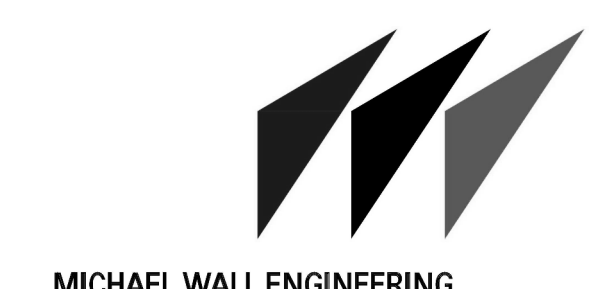
**LABORATORY ELECTRICAL -  
 LEVEL 2 PLAN B**  
**LE2.22**  
 100% CONSTRUCTION DOCUMENTS

- KEY NOTES:**
- 1 PIPEDROP, UTILIZE FOR CONCEALMENT OF CONDUIT. SEE DETAIL 6LE4.10.
  - 2 PROVIDE AND INSTALL J-BOX AND REQUIRED CONNECTIONS TO SAFETY SHOWER ALARM.
  - 3 PROVIDE J-BOX AND CONNECTION AT TOP OF CHEMICAL FUME HOOD AT +96".
  - 4 PROVIDE GROUNDING OF CABINET AT LOCATION SHOWN ON PLAN. SEE DETAIL 1LE4.11.
  - 5 ELECTRICAL PEDESTAL. SEE DETAIL 1LE4.10.
  - 6 PROVIDE J-BOX AND 1-1/4" C. TO ACCESSIBLE CEILING FOR AN USE. SEE PROJECT ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
  - 7 SHELF MOUNTED RACEWAY AT THIS LOCATION.
  - 8 RECEPTACLE TO BE MOUNTED IN TABLE APRON. VERIFY LOCATION AND MOUNTING WITH LF DRAWINGS.

- GENERAL NOTES:**
1. COORDINATE ALL DEVICE MOUNTING HEIGHTS AND LOCATIONS WITH LABORATORY FURNISHING DESIGN PRIOR TO ROUGH-IN.
  2. ALL OUTLETS WITHIN 6'-0" OF SINK OR EYE WASH STATION TO BE GFI.
  3. PROVIDE (1) 1-1/4" C.O. STUBBED FROM EACH WALL, FLOOR, OR WIREWAY MOUNTED TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  4. PROVIDE A MINIMUM OF (1) 1-1/4" C.O. STUBBED FROM EACH TELE/DATA SECTION OF DUAL CHANNEL WIREWAY TO ACCESSIBLE CEILING. THIS IS REQUIRED FOR ALL DUAL CHANNEL WIREWAY LOCATIONS, EVEN WHERE NO DATA IS SHOWN.
  5. FOR WIREWAY DETAILS SEE 2 THRU 5LE4.10.
  6. PROVIDE (1) 1" C.O. STUBBED FROM EACH PEDESTAL TELE/DATA OUTLET TO ACCESSIBLE CEILING.
  7. PROVIDE INDEPENDENT HOT AND NEUTRAL CONDUCTORS FOR EACH RECEPTACLE CIRCUIT IN A HOMERUN.
  8. SEE MULTIPOLE RECEPTACLE WIRING TABLE ON PROJECT PLAN SHEET LE1.10 FOR INFORMATION ON CONDUCTOR QUANTITIES AND SIZES REQUIRED TO PROVIDE POWER TO MULTIPOLE OUTLETS BY NEMA CODE.
  9. BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED AS FOLLOWS:
    - A. CIRCUIT LENGTH OF UP TO 50 FEET SHALL UTILIZE #12 CONDUCTORS.
    - B. CIRCUIT LENGTH GREATER THAN 50 FEET AND UP TO 90 FEET SHALL UTILIZE #10 CONDUCTORS.
    - C. CIRCUIT LENGTH GREATER THAN 90 FEET AND UP TO 140 FEET SHALL UTILIZE #8 CONDUCTORS.



**1 LEVEL-2, PLAN 'B'**  
 1/4" = 1'-0"



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Panel: 1LP6											
Location: ELECTRICAL ROOM 109				Volts: 208Y/120V				Bus Rating: 225A			
Mounting: Surface				Phases: 3				MCB Rating: 150A 3P			
NEMA: Type 1				Wires: 4							
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	Lab Power INSTRUMENTATION 103	20 A	1	360 VA	360 VA		1	20 A	Lab Power INSTRUMENTATION 103	2	
3	Lab Power INSTRUMENTATION 103	20 A	1		360 VA	360 VA	1	20 A	Lab Power INSTRUMENTATION 103	4	
5	Lab Power INSTRUMENTATION 103	20 A	1			360 VA	1	20 A	Lab Power INSTRUMENTATION 103	6	
7	Lab Power INSTRUMENTATION 103	20 A	1	360 VA	360 VA		1	20 A	Lab Power INSTRUMENTATION 103	8	
9	Lab Power INSTRUMENTATION 103	20 A	1		360 VA	360 VA	1	20 A	Lab Power INSTRUMENTATION 103	10	
11	Lab Power INSTRUMENTATION 103	20 A	1	180 VA	0 VA	360 VA	1	20 A	Lab Power INSTRUMENTATION 103	12	
13	Lab Power INSTRUMENTATION 103	20 A	1		0 VA		1	20 A	Spare	14	
15	Lab Power INSTRUMENTATION 103	20 A	1		180 VA	0 VA	1	20 A	Spare	16	
17	Lab Power INSTRUMENTATION 103	20 A	1			360 VA	1	20 A	Spare	18	
19	Lab Power INSTRUMENTATION 103	20 A	1	360 VA	0 VA		1	20 A	Spare	20	
21	Lab Power INSTRUMENTATION 103	20 A	1		360 VA	0 VA	1	20 A	Spare	22	
23	Lab Power INSTRUMENTATION 103	20 A	1			180 VA	1	20 A	Spare	24	
25	Spare	20 A	1	0 VA	0 VA		1	20 A	Spare	26	
27	Spare	20 A	1		0 VA	0 VA	1	20 A	Spare	28	
29	Spare	20 A	1			0 VA	1	20 A	Spare	30	
31	Spare	20 A	1	0 VA	0 VA	0 VA	1	20 A	Spare	32	
33	Spare	20 A	1		0 VA	0 VA	1	20 A	Spare	34	
35	Spare	20 A	1			0 VA	1	20 A	Spare	36	
37	Spare	20 A	1	0 VA	0 VA		1	20 A	Spare	38	
39	Spare	20 A	1		0 VA	0 VA	1	20 A	Spare	40	
41	Spare	20 A	1			0 VA	1	20 A	Spare	42	
<b>Total Load:</b>				1980 VA	1980 VA	1980 VA					
<b>Total Amps:</b>				17 A	17 A	17 A					
Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals							
Lab Power	5940 VA	100.00%	5940 VA	Total Conn. Load: 5940 VA							
				Total Est. Demand: 5940 VA							
				Total Conn.: 16 A							
				Total Est. Demand: 16 A							
<b>Notes:</b>											

Panel: 1LP3											
Location: ELECTRICAL ROOM 115				Volts: 208Y/120V				Bus Rating: 225A			
Mounting: Surface				Phases: 3				MCB Rating: 150A 3P			
NEMA: Type 1				Wires: 4							
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	Lab Power MICROBIOLOGY LAB 110	20 A	1	360 VA	540 VA		1	20 A	Lab Power MICROBIOLOGY LAB 110	2	
3	Lab Power MICROBIOLOGY LAB 110	20 A	1		720 VA	540 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	4	
5	Lab Power MICROBIOLOGY LAB 110	20 A	1			1000 VA	1000 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	6
7	Lab Power MICROBIOLOGY LAB 110	20 A	1	1000 VA	1000 VA		1	20 A	Lab Power MICROBIOLOGY LAB 110	8	
9	Lab Power MICROBIOLOGY LAB 110	20 A	1		720 VA	1000 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	10	
11	Lab Power MICROBIOLOGY LAB 110	20 A	1			720 VA	180 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	12
13	Lab Power MICROBIOLOGY LAB 110	20 A	1	720 VA	180 VA		1	20 A	Lab Power MICROBIOLOGY LAB 110	14	
15	Lab Power MICROBIOLOGY LAB 110	20 A	1		720 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	16	
17	Lab Power MICROBIOLOGY LAB 110	20 A	1			360 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	18
19	Lab Power MICROBIOLOGY LAB 110	20 A	1	720 VA	720 VA		1	20 A	Lab Power MICROBIOLOGY LAB 110	20	
21	Lab Power MICROBIOLOGY LAB 110	20 A	1		720 VA	720 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	22	
23	Lab Power MICROBIOLOGY LAB 110	20 A	1			720 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	24
25	Lab Power MICROBIOLOGY LAB 110	20 A	1	1000 VA	360 VA		1	20 A	Lab Power MICROBIOLOGY LAB 110	26	
27	Lab Power MICROBIOLOGY LAB 110	20 A	1		360 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 110	28	
29	Lab Power MICROBIOLOGY LAB 110	20 A	1			200 VA	0 VA	1	20 A	Spare	30
31	Spare	20 A	1	0 VA	0 VA		1	20 A	Spare	32	
33	Spare	20 A	1		0 VA	0 VA	1	20 A	Spare	34	
35	Spare	20 A	1			0 VA	1	20 A	Spare	36	
37	Spare	20 A	1	0 VA	0 VA		1	20 A	Spare	38	
39	Spare	20 A	1			0 VA	1	20 A	Spare	40	
41	Spare	20 A	1			0 VA	1	20 A	Spare	42	
<b>Total Load:</b>				6600 VA	6220 VA	4900 VA					
<b>Total Amps:</b>				57 A	54 A	41 A					
Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals							
Lab Power	17720 VA	100.00%	17720 VA	Total Conn. Load: 17720 VA							
				Total Est. Demand: 17720 VA							
				Total Conn.: 49 A							
				Total Est. Demand: 49 A							
<b>Notes:</b>											

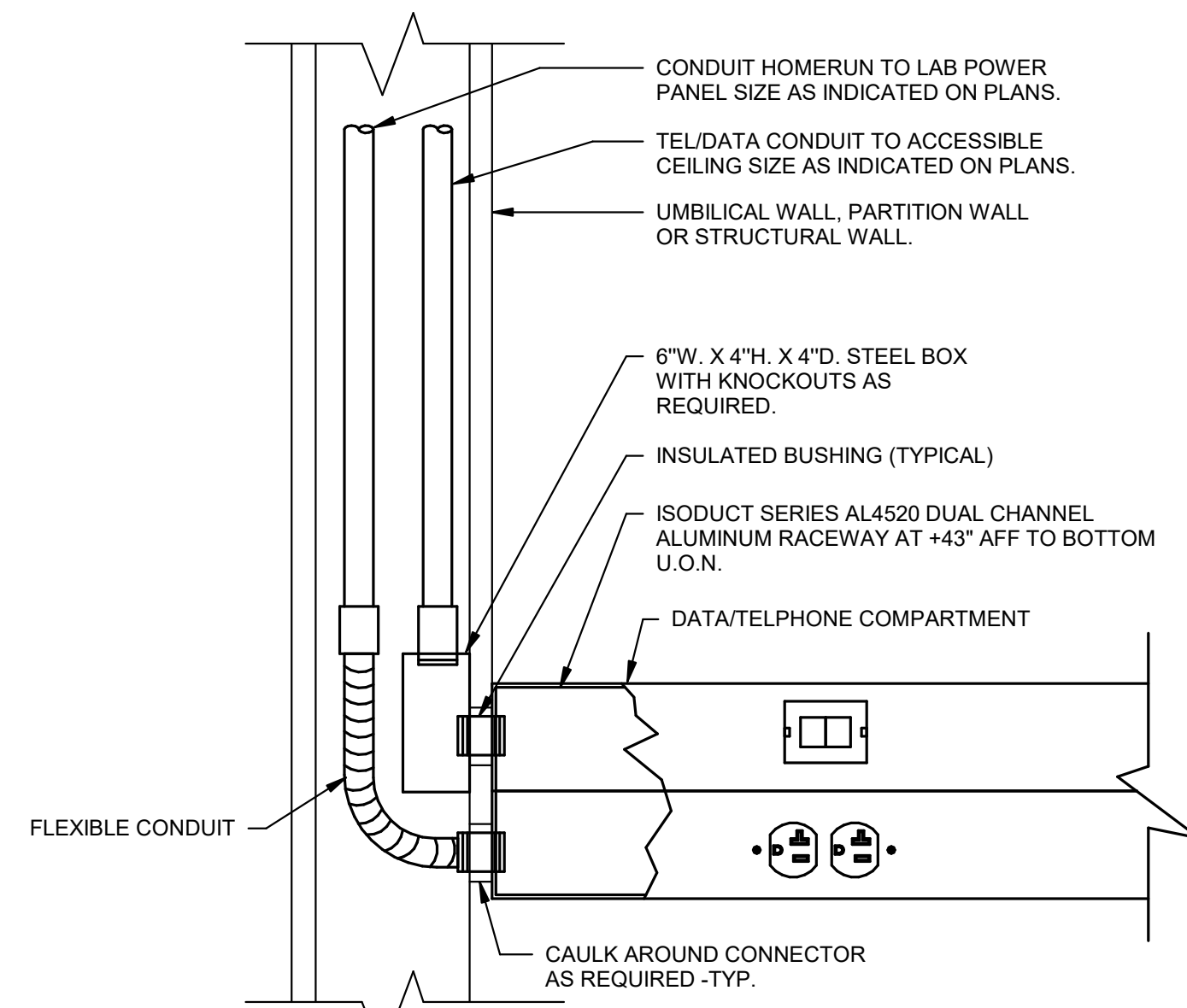
Panel: 1LP1											
Location: ELECTRICAL ROOM 115				Volts: 208Y/120V				Bus Rating: 225A			
Mounting: Surface				Phases: 3				MCB Rating: 150A 3P			
NEMA: Type 1				Wires: 4							
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	Lab Power MICROBIOLOGY LAB 111	20 A	1	360 VA	540 VA		1	20 A	Lab Power MICROBIOLOGY LAB 111	2	
3	Lab Power MICROBIOLOGY LAB 111	20 A	1		720 VA	540 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	4	
5	Lab Power MICROBIOLOGY LAB 111	20 A	1			1000 VA	1000 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	6
7	Lab Power MICROBIOLOGY LAB 111	20 A	1	1000 VA	1000 VA		1	20 A	Lab Power MICROBIOLOGY LAB 111	8	
9	Lab Power MICROBIOLOGY LAB 111	20 A	1		720 VA	1000 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	10	
11	Lab Power MICROBIOLOGY LAB 111	20 A	1			720 VA	180 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	12
13	Lab Power MICROBIOLOGY LAB 111	20 A	1	720 VA	180 VA		1	20 A	Lab Power MICROBIOLOGY LAB 111	14	
15	Lab Power MICROBIOLOGY LAB 111	20 A	1		720 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	16	
17	Lab Power MICROBIOLOGY LAB 111	20 A	1			360 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	18
19	Lab Power MICROBIOLOGY LAB 111	20 A	1	720 VA	720 VA		1	20 A	Lab Power MICROBIOLOGY LAB 111	20	
21	Lab Power MICROBIOLOGY LAB 111	20 A	1		720 VA	720 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	22	
23	Lab Power MICROBIOLOGY LAB 111	20 A	1			720 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	24
25	Lab Power MICROBIOLOGY LAB 111	20 A	1	1000 VA	360 VA		1	20 A	Lab Power MICROBIOLOGY LAB 111	26	
27	Lab Power MICROBIOLOGY LAB 111	20 A	1		360 VA	360 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	28	
29	Lab Power AUTOCLAVE ROOM 113	40 A	3			3120 VA	200 VA	1	20 A	Lab Power MICROBIOLOGY LAB 111	30
31	--	--	--	3120 VA	3120 VA						32
33	--	--	--		3120 VA	3120 VA					34
35	Spare	20 A	1	0 VA	0 VA	0 VA	3120 VA				36
37	Spare	20 A	1	0 VA	0 VA			1	20 A	Spare	38
39	Spare	20 A	1		0 VA	0 VA	0 VA	1	20 A	Spare	40
41	Spare	20 A	1			0 VA	0 VA	1	20 A	Spare	42
<b>Total Load:</b>				12840 VA	12460 VA	11140 VA					
<b>Total Amps:</b>				109 A	106 A	93 A					
Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals							
Lab Power	36440 VA	100.00%	36440 VA	Total Conn. Load: 36440 VA							
				Total Est. Demand: 36440 VA							
				Total Conn.: 101 A							
				Total Est. Demand: 101 A							
<b>Notes:</b>											

Panel: 1LP7											
Location: ELECTRICAL ROOM 109				Volts: 208Y/120V				Bus Rating: 225A			
Mounting: Surface				Phases: 3				MCB Rating: 150A 3P			
NEMA: Type 1				Wires: 4							
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	Lab Power ORGANIC CHEMISTRY...	20 A	1	1000 VA	360 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	2	
3	Lab Power ORGANIC CHEMISTRY...	20 A	1		1000 VA	360 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	4	
5	Lab Power ORGANIC CHEMISTRY...	20 A	1			360 VA	360 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	6
7	Lab Power ORGANIC CHEMISTRY...	20 A	1	360 VA	1000 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	8	
9	Lab Power ORGANIC CHEMISTRY...	20 A	1		720 VA	540 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	10	
11	Lab Power ORGANIC CHEMISTRY...	20 A	1			540 VA	360 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	12
13	Lab Power ORGANIC CHEMISTRY...	20 A	1	1000 VA	1000 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	14	
15	Lab Power ORGANIC CHEMISTRY...	20 A	1		360 VA	1000 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	16	
17	Lab Power ORGANIC CHEMISTRY...	20 A	1			1000 VA	1000 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	18
19	Lab Power ORGANIC CHEMISTRY...	20 A	1	1000 VA	1000 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	20	
21	Lab Power ORGANIC CHEMISTRY...	20 A	1		720 VA	1000 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	22	
23	Lab Power ORGANIC CHEMISTRY...	20 A	1			540 VA	720 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	24
25	Lab Power ORGANIC CHEMISTRY...	20 A	1	1000 VA	900 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	26	
27	Lab Power ORGANIC CHEMISTRY...	20 A	1		1000 VA	1440 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	28	
29	Lab Power ORGANIC CHEMISTRY...	20 A	1			200 VA	1440 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	30
31	Spare	20 A	1	0 VA	720 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	32	
33	Spare	20 A	1		0 VA	720 VA		1	20 A	Spare	34
35	Spare	20 A	1			0 VA	360 VA	1	20 A	Spare	36
37	Spare	20 A	1	0 VA	0 VA		1	20 A	Spare	38	
39	Spare	20 A	1		0 VA	0 VA	1	20 A	Spare	40	
41	Spare	20 A	1			0 VA	0 VA	1	20 A	Spare	42
<b>Total Load:</b>				9340 VA	8860 VA	6880 VA					
<b>Total Amps:</b>				80 A	76 A	57 A					
Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals							
Lab Power	25080 VA	100.00%	25080 VA	Total Conn. Load: 25080 VA							
				Total Est. Demand: 25080 VA							
				Total Conn.: 70 A							
				Total Est. Demand: 70 A							
<b>Notes:</b>											

Panel: 1LP4											
Location: ELECTRICAL ROOM 109				Volts: 208Y/120V				Bus Rating: 225A			
Mounting: Surface				Phases: 3				MCB Rating: 150A 3P			
NEMA: Type 1				Wires: 4							
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	Lab Power ORGANIC CHEMISTRY...	20 A	1	1000 VA	360 VA		1	20 A	Lab Power ORGANIC CHEMISTRY...	2	
3	Lab Power ORGANIC CHEMISTRY...	20 A	1		1000 VA	360 VA	1	20 A	Lab Power ORGANIC CHEMISTRY...	4	
5	Lab Power ORGANIC CHEMISTRY...	20 A	1			360 VA	360 VA	1	20 A		



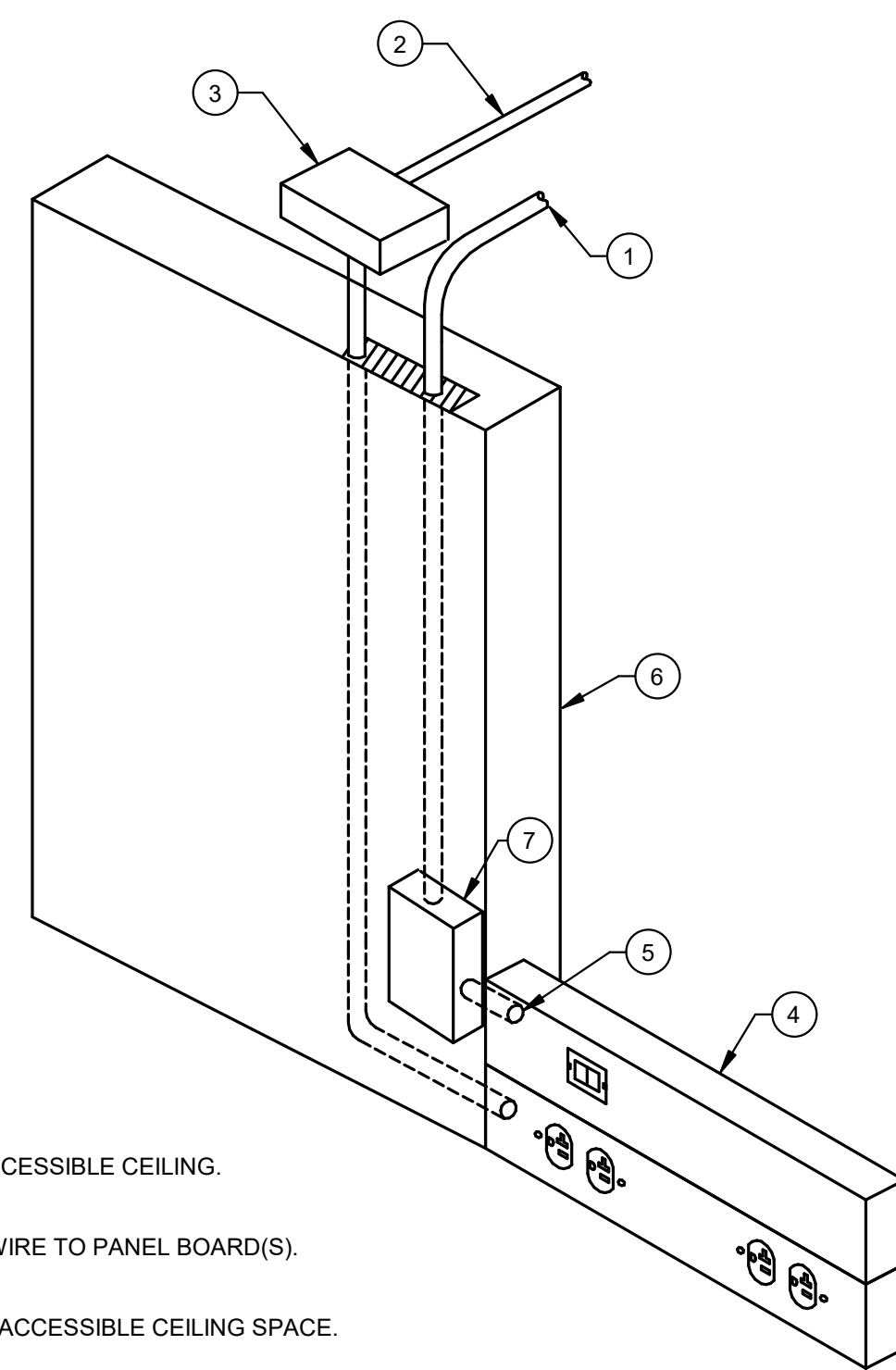




- GENERAL NOTES:**
- SEE 'T' DRAWINGS FOR ADDITIONAL TEL/DATA REQUIREMENTS.

**5 WALL MTD. RACEWAY WITH END FEED ENTRY**

NO SCALE



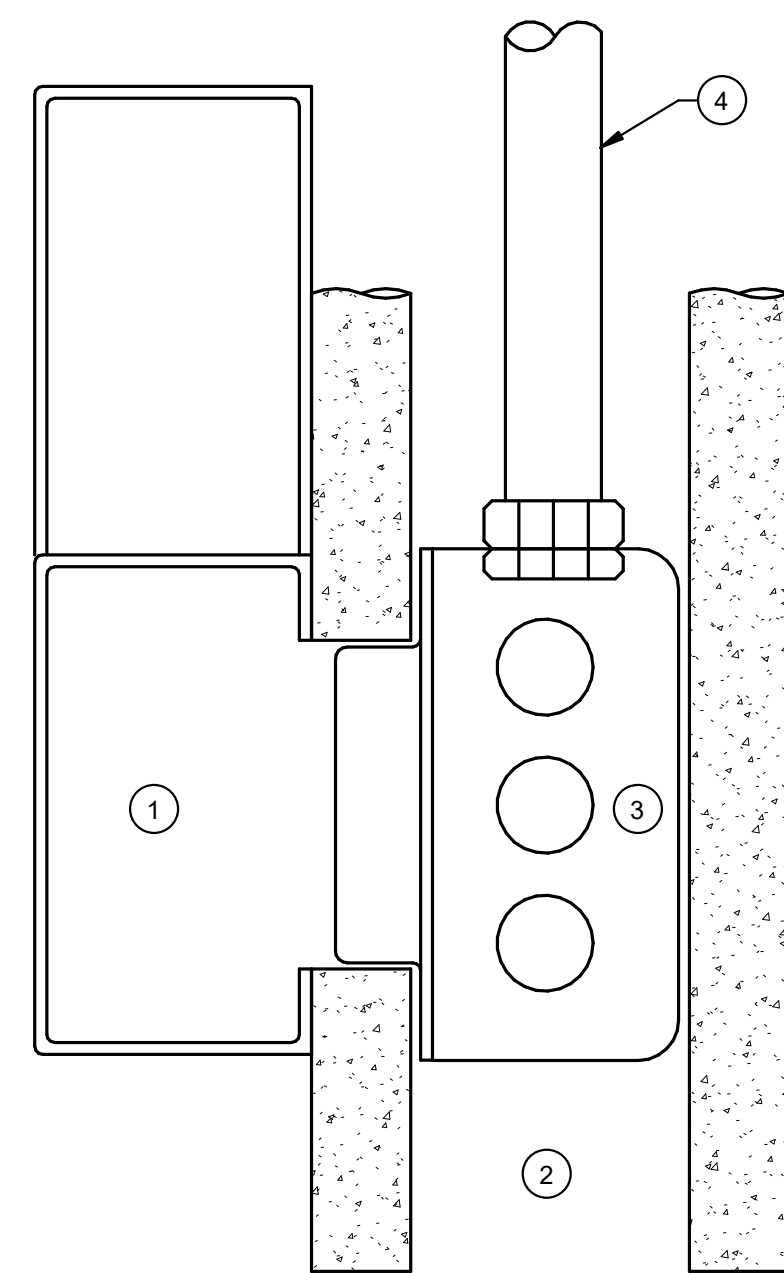
- KEY NOTES:**
- EMT CONDUIT TO ACCESSIBLE CEILING.
  - EMT CONDUIT AND WIRE TO PANEL BOARD(S).
  - 4" SQUARE J-BOX IN ACCESSIBLE CEILING SPACE.
  - MULTI-OUTLET WIREWAY ISODUCT AL4520 SERIES MOUNTED ON BENCH PER ARCHITECTURAL REQUIREMENTS. WIREWAY SECTIONS SHALL BE INDIVIDUAL PIECES PER WORKSTATION AND SHALL FIT TIGHT AT EACH END PER ARCHITECTURAL REQUIREMENTS. SEE ARCHITECTURAL DRAWINGS FOR FURTHER INFORMATION.
  - 1-1/4" CONDUIT CONNECTION BETWEEN WIREWAY SECTIONS THROUGH CASEWORK RISER.
  - PIPE DROP UTILITY CHASE WITH REMOVABLE COVER.
  - CODE SIZE J-BOX INSIDE ACCESSIBLE PIPE DROP (EIA/TIA STANDARDS FOR TELE/DATA BOX).

- GENERAL NOTES:**
- SEE 'T' DRAWINGS FOR ADDITIONAL TEL/DATA REQUIREMENTS.

**6 SCHEMATIC ELECTRICAL SERVICE FROM WALL MOUNTED PIPE DROP**

NO SCALE

10/00-08



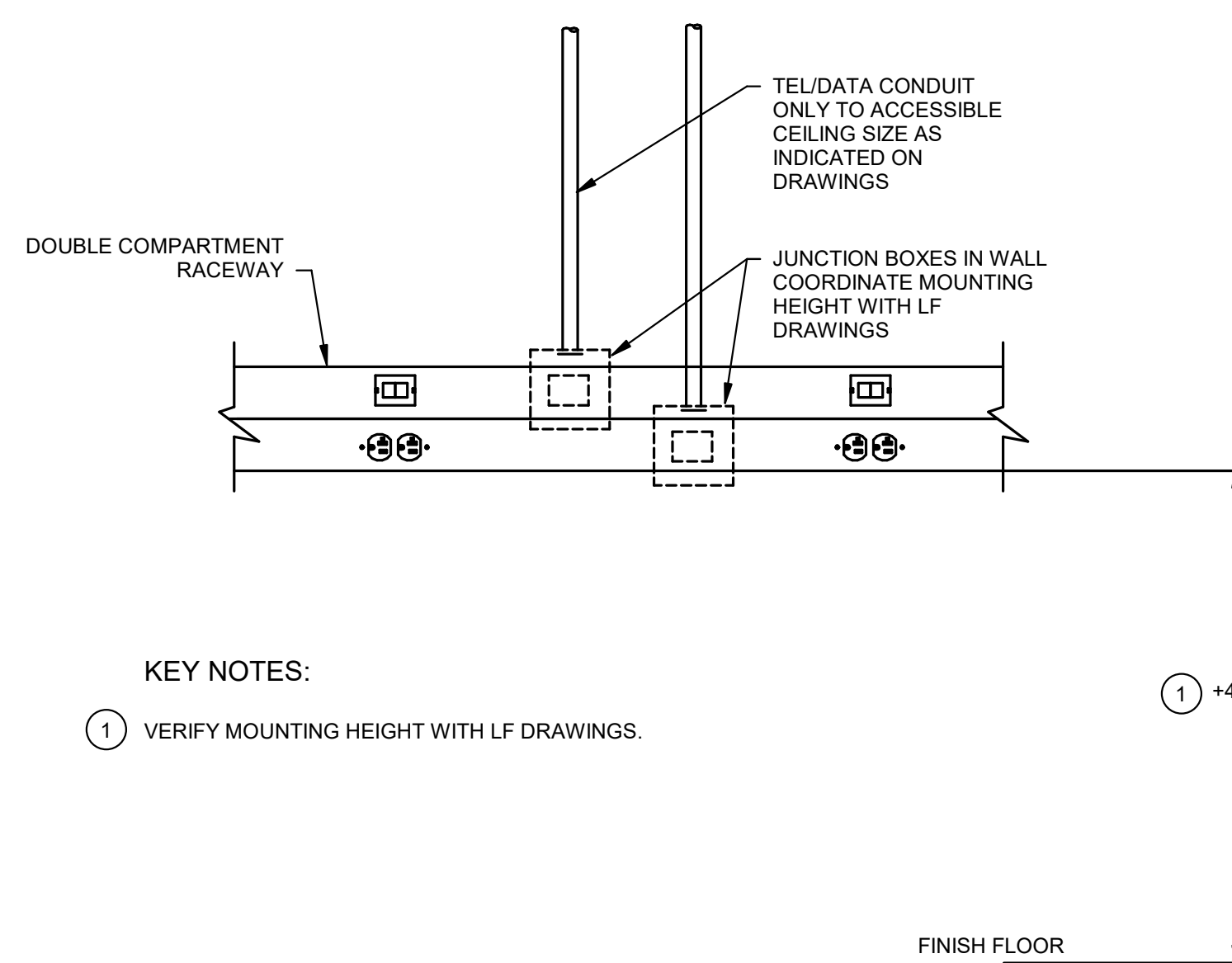
- KEY NOTES:**
- TYPICAL WALL-MOUNTED WIREWAY. WIREMOLD ISODUCT AL4520 SERIES CUT OUT IN RACEWAY TO BE DEBURRED AND SMOOTH (POWER BELOW, TEL/DATA ABOVE).
  - INTERSTITIAL SPACE IN WALL.
  - J-BOX MOUNTED TO STRUCTURE WITH WALL. (4S DEEP FOR POWER, 4 11/16 FOR TEL/DATA).
  - CONDUIT TO POWER PANEL (TO ACCESSIBLE CEILING FOR TEL/DATA LOCATION SIZE FOR CAT 5).

- GENERAL NOTES:**
- SIMILAR CONFIGURATION FOR TEL/DATA COMPARTMENT.
  - SEE 'T' DRAWINGS FOR ADDITIONAL TEL/DATA REQUIREMENTS.

**3 WALL ENTRY TO RACEWAY**

NO SCALE

16110-17

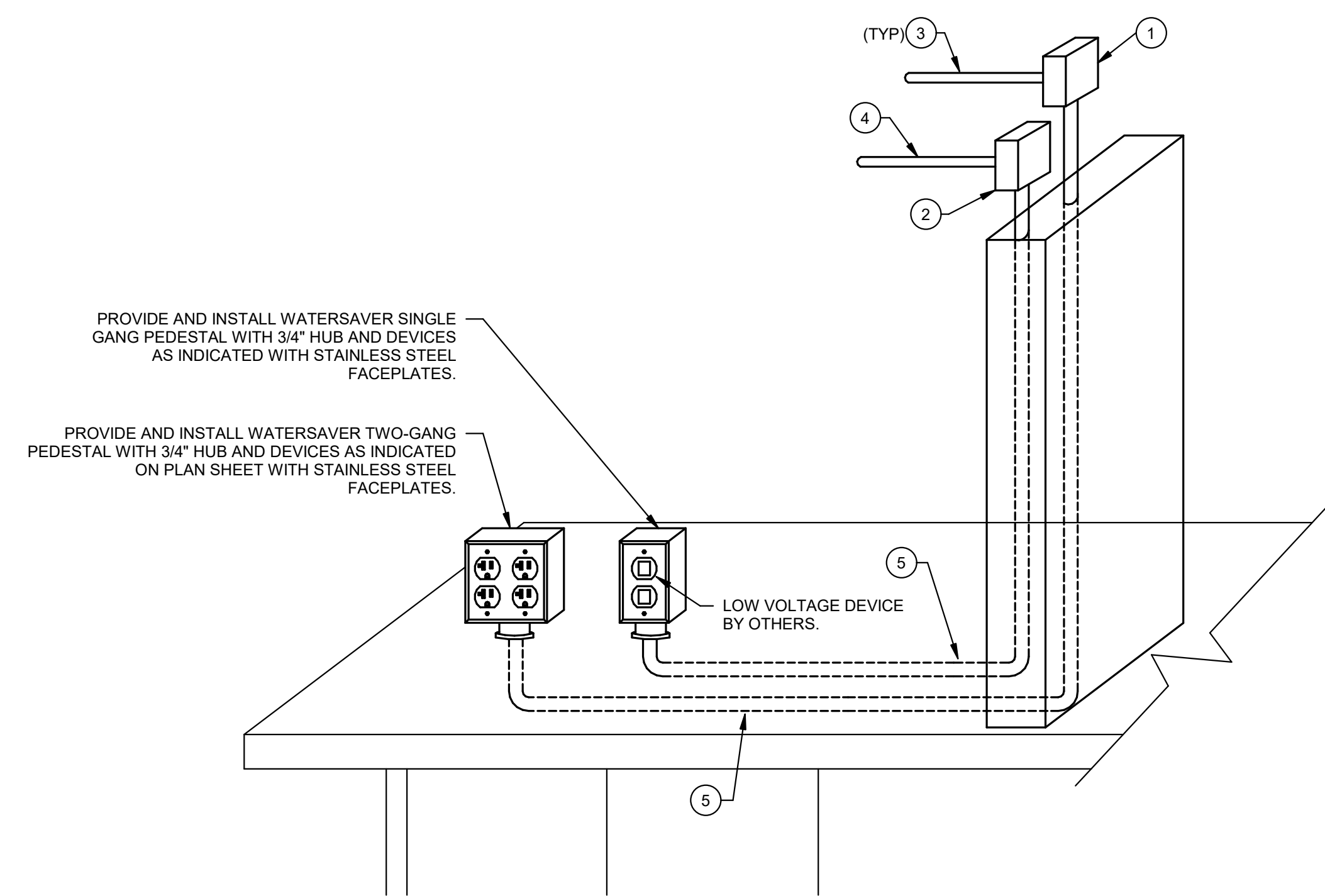


- KEY NOTES:**
- VERIFY MOUNTING HEIGHT WITH LF DRAWINGS.

- GENERAL NOTES:**
- SEE 'T' DRAWINGS FOR ADDITIONAL TEL/DATA REQUIREMENTS.

**4 DOUBLE COMPARTMENT RACEWAY FEED**

NO SCALE



PROVIDE AND INSTALL WATERSAVER SINGLE GANG PEDESTAL WITH 3/4" HUB AND DEVICES AS INDICATED WITH STAINLESS STEEL FACEPLATES.

PROVIDE AND INSTALL WATERSAVER TWO-GANG PEDESTAL WITH 3/4" HUB AND DEVICES AS INDICATED ON PLAN SHEET WITH STAINLESS STEEL FACEPLATES.

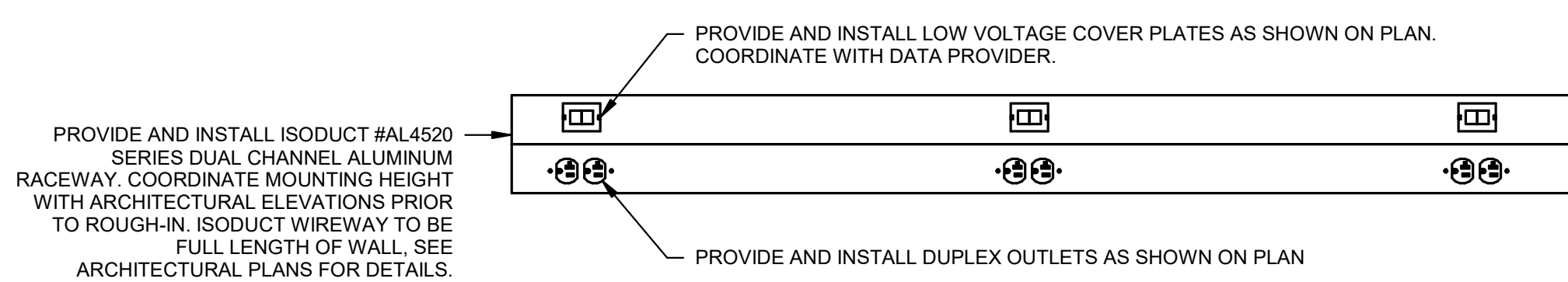
NOTE THAT SOME ISLAND BENCH LOCATIONS DO NOT HAVE PIPE DROPS OR ABOVE-BENCH STRUCTURE FOR CONDUIT FEEDS, AND MUST BE FED FROM BELOW. VERIFY ISLAND BENCH CONFIGURATION WITH LF SERIES PLANS AND SPECIFICATIONS TO IDENTIFY CONDUIT PATH REQUIREMENTS.

- KEY NOTES:**
- 4" SQUARE J-BOX IN ACCESSIBLE CEILING SPACE.
  - 5" SQUARE J-BOX IN ACCESSIBLE CEILING SPACE.
  - EMT CONDUIT AND WIRE TO PANEL BOARD AS PER PLANS.
  - 1-1/4" EMT CONDUIT PER TELE/DATA LOCATION TO CABLE TRAY IN CORRIDOR.
  - ROUTE CONDUIT THROUGH CHASE IN MILLWORK.

- GENERAL NOTES:**
- SEE 'T' DRAWINGS FOR ADDITIONAL TEL/DATA REQUIREMENTS.

**1 LAB BENCH PEDESTAL DETAIL**

NO SCALE



PROVIDE AND INSTALL ISODUCT #AL4520 SERIES DUAL CHANNEL ALUMINUM RACEWAY. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN. ISODUCT WIREWAY TO BE FULL LENGTH OF WALL. SEE ARCHITECTURAL PLANS FOR DETAILS.

PROVIDE AND INSTALL LOW VOLTAGE COVER PLATES AS SHOWN ON PLAN. COORDINATE WITH DATA PROVIDER.

PROVIDE AND INSTALL DUPLEX OUTLETS AS SHOWN ON PLAN.

GRAPHICAL REPRESENTATION

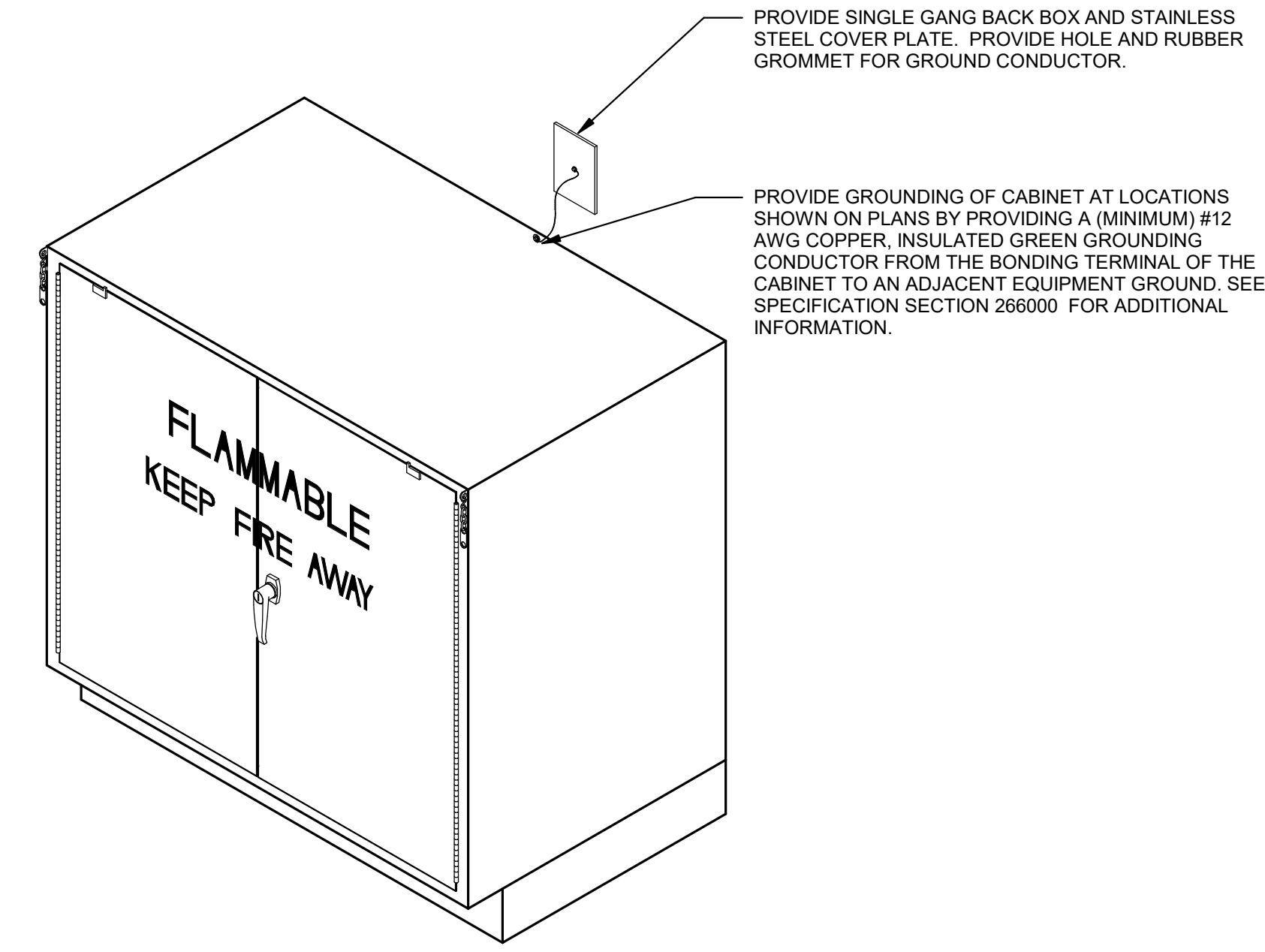
**2 SCHEMATIC WIREWAY DETAIL AT SHELF LOCATIONS**

NO SCALE

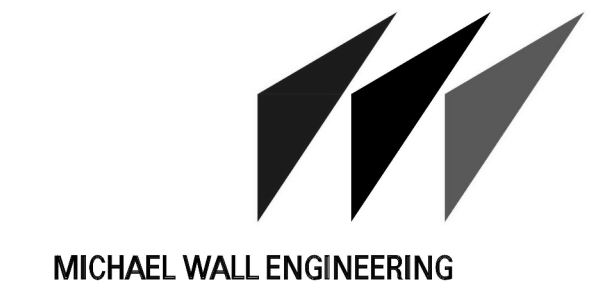
16110-20

LABORATORY ELECTRICAL - DETAIL SHEET

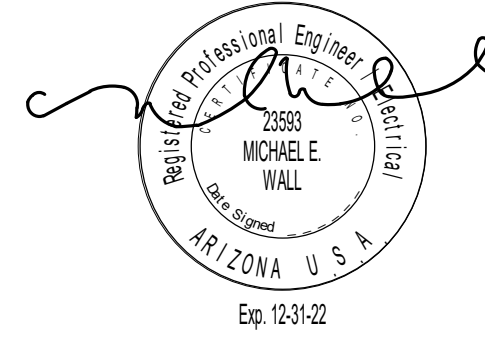
LABORATORY ELECTRICAL - DETAIL SHEET



1 FLAMMABLE CABINET BONDING DETAIL  
NO SCALE



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DATE: 01/08/2021  
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