

# NEW MIKVAH FOR THE CHABAD AT VIRGINIA TECH

301 WALL ST.  
BLACKSBURG, VA 24060

5 DESIGN COMM No. 23-09

NOVEMBER 25, 2025

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SQ# = DRAWING SEQUENCE NUMBER

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18	S301	TYPICAL SHEAR WALL DETAILS			

**100% FINAL FOR  
OWNER REVIEW**

STRUCTURAL

**GEMINI STRUCTURAL**

1320 SOUTHSIDE DR.  
SALEM, VA 24153  
540-354-7003

PLUMBING & MECHANICAL

**MANN & ASSOCIATES, INC.**

306 MARKET ST SE  
ROANOKE, VA 24011  
540-344-5513

ELECTRICAL

**GIBSON  
ENGINEERING**

2100 LUBNA DRIVE  
CHRISTIANSBURG, VA 24073  
540-998-6069

ARCHITECTURE

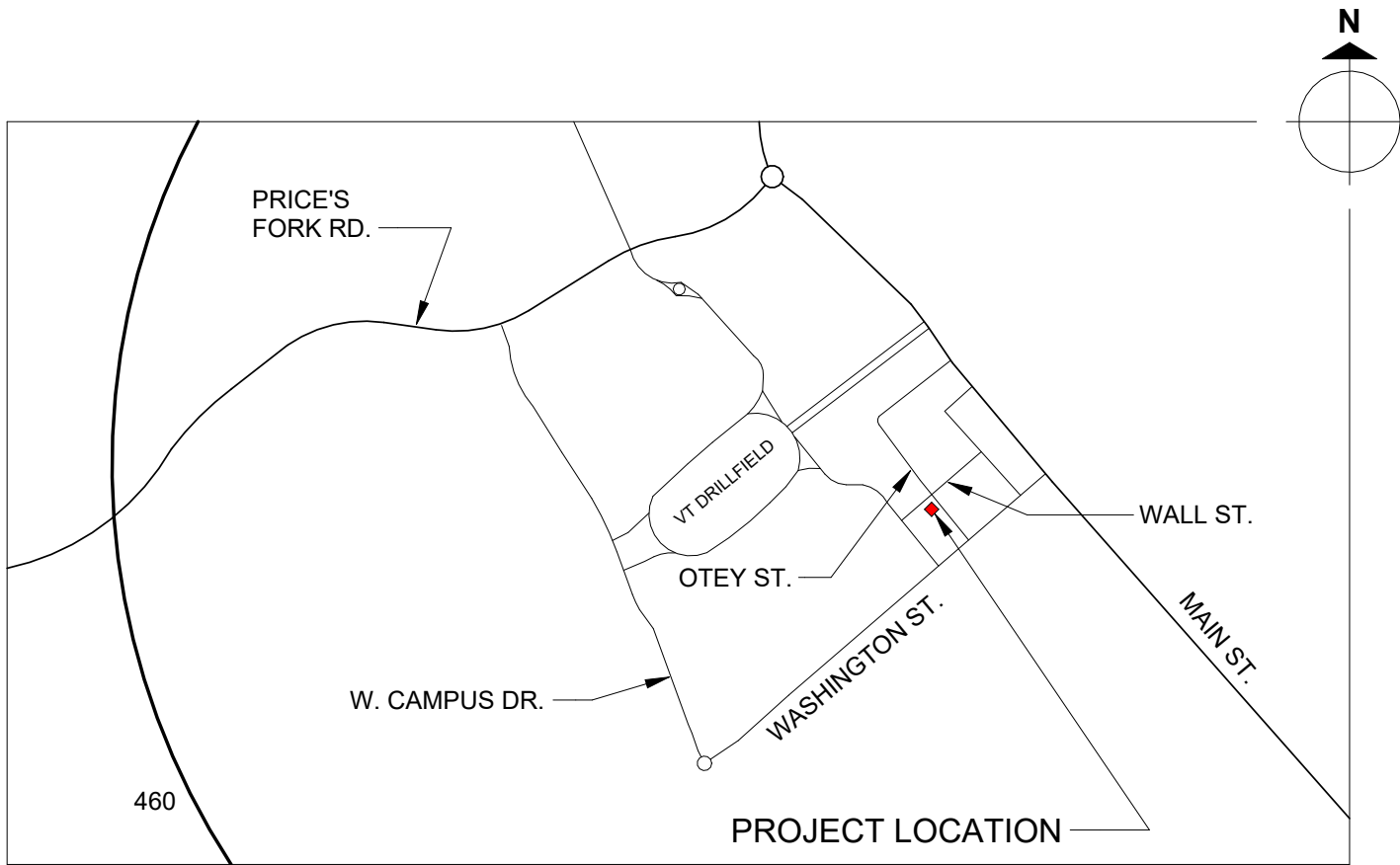


5 DESIGN, LLC  
20 MIDWAY PLAZA DR, SUITE 300  
CHRISTIANSBURG, VA 24073  
540-230-2619  
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### ABBREVIATIONS

ABV	ABOVE	GA	GAUGE, GAGE	PLUMB	PLUMBING
ALUM	ALUMINUM	GWB	GYPSUM WALL BOARD	PT	PRESERVATIVE TREATED
APPROX	APPROXIMATELY	HM	HOLLOW METAL	REINF	REINFORCED
BLDG	BUILDING	HORIZ	HORIZONTAL	RES	RESITANT
BOT	BOTTOM	ICE	ICE MACHINE	REQD	REQUIRED
CIV	CIVIL	INSUL	INSULATION	SATC	SUSPENDED ACCOUSTIC TILE CEILING
CMU	CONCRETE MASONRY UNIT	LAV	LAVATORY	SH	SHEET
CONC	CONCRETE	M.O.	MASONRY OPENING	SIM	SIMILAR
CONT	CONTINUOUS	MAS	MASONRY	STL	STEEL
C.O.	CLEANOUT	MAX	MAXIMUM	STOR	STORAGE
CJ	CONTROL JOINT	MECH	MECHANICAL	STRUC	STRUCTURAL
DIA	DIAMETER	MIN	MINIMUM	TYP	TYPICAL (ANTICIPATE IN ALL SIMILAR LOCATIONS)
DS	DOWNSPOUT	NIC	NOT IN CONTRACT	VERT	VERTICAL
EA	EACH	OC	ON CENTER	W/	WITH
EJC	EXPANSION JOINT COVER	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED	WC	WATER CLOSET
ELEC	ELECTRIC OR ELECTRICAL	OH	OVERHEAD	WD	WOOD
EXIST	EXISTING	OPNG	OPENING	WRB	WEATHER RESISTIVE BARRIER
FIN FLR	FINISHED FLOOR	OPP HND	OPPOSITE HAND (MIRRORED)	WWF	WELDED WIRE FABRIC
FRTW	FIRE RETARDANT TREATED WOOD				

### VICINITY MAP



**OWNER:**  
CHABAD AT VT

**PROPERTY ADDRESS:**  
301 Wall St.

**APPLICABLE CODE:**  
2021 VIRGINIA RESIDENTIAL CODE

**AREA OF NEW CONSTRUCTION**  
1100 SF

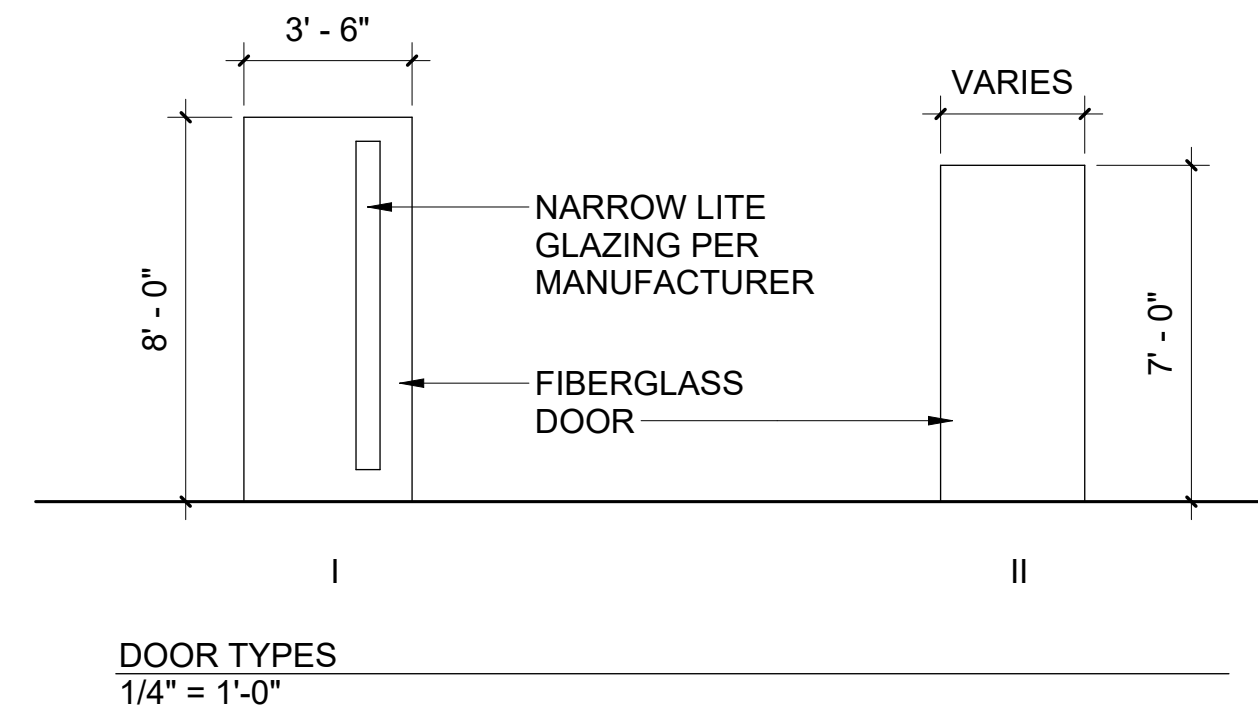
PROJECT INFORMATION

REVISIONS  
DATE  
DESCRIPTION  
No.

T000

SHEET

DOOR AND FRAME SCHEDULE								
No.	DOOR				SIZE			NOTES
	MATERIAL	TYPE	CORE	FINISH	W	H	THK	
01	FIBERGLASS	I	INSUL.	PAINT	3'-6"	8'-0"	1 3/4"	
02	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
03a	FIBERGLASS	II	INSUL.	PAINT	2'-8"	7'-0"	1 3/4"	NOTE D
03b	FIBERGLASS	II	INSUL.	PAINT	2'-8"	7'-0"	1 3/4"	NOTE D
04a	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
04b	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
05	FIBERGLASS	II	INSUL.	PAINT	2'-8"	7'-0"	1 3/4"	
06a	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
06b	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
07a	FIBERGLASS	II	INSUL.	PAINT	2'-8"	7'-0"	1 3/4"	NOTE D
07b	FIBERGLASS	II	INSUL.	PAINT	2'-8"	7'-0"	1 3/4"	NOTE D
08	FIBERGLASS	II	INSUL.	PAINT	3'-0"	7'-0"	1 3/4"	
09	WOOD	II	INSUL.	PAINT	(2) 1'-9"	7'-0"	1 3/4"	CAVITY SLIDER POCKET DOOR (BI-PART)



**DOOR, FRAME, AND DOOR HARDWARE NOTES**

- A. AT ALL INTERIOR DOORS (AND INTERIOR SIDE OF EXTERIOR DOORS), PROVIDE 3/4" x 3" PVC TRIM/CASING.
  - a. FIELD PAINT
- B. AT EXTERIOR OF ALL EXTERIOR DOORS, PROVIDE 1" x 3 1/2" FIBER CEMENT TRIM (HARDIE TRIM).
  - a. FIELD PAINT
- C. COORDINATE HANDING OF FRAMES WITH PLAN AND DOOR SWINGS.
- D. PROVIDE MIRROR PER INTERIOR DESIGN DRAWINGS.

**ARCHITECTURAL SPECIFICATIONS**

**GYPSUM BOARD (GWB)**

Gypsum panels, accessories, and finishing shall conform to ASTM C475, ASTM C645, ASTM C754, ASTM C840, ASTM C1396, and GA-216. Gypsum products shall not be manufactured in China. Provide regular core boards sized to minimize joints. Provide galvanized steel or rolled zinc accessories, including corner beads, control joints, and edge beads. Provide self-tapping, corrosion resistant screws to attach panels to metal framing and wood. Provide 2" wide coated fiberglass tape for joints and corners. Provide ready-mixed vinyl-based joint compound. Provide Level 4 finish on all surfaces exposed to view. Provide Level 2 finish on all surfaces not exposed to view. Maximum variation of finished gypsum surfaces shall be 1/8 inch over 10 feet in any direction. Provide water and mold resistant GWB in all locations subject to moisture, and as noted on the drawings.

**JOINT SEALANT**

- At all building joints, provide a mildew resistant sealant. Tool all joints to achieve a concave face. Provide foam backer rod at larger joints. Clean all excess sealant from surrounding construction. Install all sealant prior to painting.
  - a. Acoustic sealant shall be equal to Tremco Acoustical Sealant
  - b. Sealant in wet areas other than tile joints shall be equal to Mapei Mapefil AC
  - c. Sealant at tile joints shall be equal to Mapei Mapefil T Plus (color-matched to adjacent grout)
  - d. Sealant at all other interior joints, wall corners, window and door frames, etc. shall be equal to Tremco Tremflex 834
  - e. Sealant at all exterior joints shall be equal to Tremco Dymonic 100
  - f. Seal all penetrations and joints in fire-rated construction. Provide UL classified designs or sealed engineered judgments for all sealant systems used in fire-rated construction. Submit systems to AHJ.

**ROOFING SYSTEM**

**Rigid Insulation**

- a. Polyisocyanurate boards (closed-cell) with max 2" board thickness
  - 2" base layer
- b. R-value = 12 min. (per 2" board thickness)
- c. Provide crickets of tapered insulation to achieve slopes as shown on Roof Plan

**Membrane**

- a. Fully adhered, EPDM single-ply membrane
- b. Thickness = 60 mil
- c. EcoWhite
- d. UL Class A fire hazard classification
- e. Full system warranty: 20-year limited warranty covering membrane, roof insulation, and membrane accessories

**ADHERED MANUFACTURED STONE VENEER**

Stone veneer shall be equal to LIMESTONE FROM ELDORADO STONE. Install as required by the manufacturer's written installation instructions. Obtain all accessories from the stone manufacturer. Provide the manufacturer's standard 50 year warranty.

**FIBER CEMENT SIDING**

Architectural Wall Panels by NICHIIA USA  
 Panel type: Vintagewood  
 Color: Cedar (to be confirmed by Owner)

Install per manufacturers written installation instructions.

**FIBERGLASS DOORS**

**Exterior Door 01:**

- Fiberglass with polyurethane core equal to Oslo by ETO doors.
  - Narrow slim vertical lite - flush glazed and insulated
  - Pre-hung in composite jambs
  - Field paint, Color as selected by owner
  - Hardware as selected by owner

<https://www.etodoors.com/oslo.html/>

**All other Exterior Doors:**

- Flush Fiberglass with polyurethane core equal to Austin by ETO doors.
  - Pre-hung in composite jambs
  - Field paint, Color as selected by owner
  - Hardware as selected by owner

<https://www.etodoors.com/austin.html/>

**Interior Doors:**

- Flush Fiberglass with polyurethane core equal to Austin by ETO doors.
  - Pre-hung in composite jambs
  - Field paint, Color as selected by owner
  - Hardware as selected by owner

<https://www.etodoors.com/austin.html/>

**DOOR HARDWARE**

Provide door hardware as requested by owner. Coordinate with owner requirements.

**POCKET DOOR**

Bi-part pocket door by Cavity Slider

**FLOOR ACCESS DOORS**

- For installation in finished floor at Rain Pool 1 and Rain Pool 2:**  
 Provide (30" x 30") Recessed Floor Door (R-TPS) by USF Fabrication, Inc.
  - Aluminum cover and frame with 316 stainless steel hardware
  - Recessed cover receives floor tile and to be flush with adjacent finished floor
 Installation shall be in accordance with the manufacturer's instructions.

- For installation in intermediate platforms at Immersion Pool and Keilim:**  
 Provide (24" x 24") Recessed Floor Door (W-APS) by USF Fabrication, Inc.
  - All 316 stainless steel construction - cover, frame, and hardware
  - Cover to be flush with adjacent concrete floor
 Installation shall be in accordance with the manufacturer's instructions.

**PAINTING**

Paint all surfaces that are not factory finished and will be exposed to view.

- At all GWB surfaces, provide one (1) coat of Sherwin Williams Pro Mar 200 Zero VOC Primer and two (2) coats of Sherwin Williams Pro Mar 200 Zero VOC Interior Latex in semi-gloss
- PAINT AT PVC TRIM AND FIBERGLASS DOORS?

Equal products from other manufacturers may be used. Provide per-coat thickness recommended by manufacturer. Prepare all surfaces as recommended by the manufacturer. Provide an adhesion test on all metal surfaces prior to painting. Inform the architect of any failed adhesion test in writing and do not paint the surface until further instruction from the architect is received.

**PVC WALL & CEILING PANELS**

ACRE SHEETS BY MODERN MILL

**FLOOR TILE**

- Provide porcelain floor tile equal to Daltile Keystones Colorbody Porcelain Mosaics (2" x 2") in 12x12 sheets. Color as selected by the owner
- Install all floor tile per TCNA detail F115A-25 with a crack isolation membrane equal to Schluter Ditra
- All grout shall be equal to Mapei Kerapoxy CQ low VAC epoxy grout. All sealant at tile shall be equal to Mapei Mapefil LM. Color matched to grout color. All sealant joints shall match grout width.
- Provide Schluter satin anodized aluminum transition - Reno-U at doors

**TILE JOINTS AT CHANGE OF PLANE SHALL BE SEALED, NOT GROUTED**

**WALL TILE**

- Provide porcelain wall tile on 1/2" cement backer board. Seal all joints of backer board, including joint at floor slab
- Wall tile shall be 12"x24". Tile shall be equal to Daltile Haut Monde. Color as selected by the owner. Install stack bond pattern with joint widths to match floor tile
- Install all wall tile per TCNA detail W244C-25 (without waterproof membrane)
- All grout shall be equal to Mapei Kerapoxy CQ low VAC epoxy grout. All sealant at tile shall be equal to Mapei Mapefil LM. Color matched to grout color

**TILE JOINTS AT CHANGE OF PLANE SHALL BE SEALED, NOT GROUTED**

Provide Aluminum profile Jolly by Schluter Systems, at all outside wall corners and tile edges.

DO WE WANT TO USE ANY OTHER CORNER PROFILES? (MAYBE RONDEC OR QUADDEC?)

**HANDRAIL AT MIKVAH IMMERSION POOL**

- Deck-mounted Model DMS-102 from S.R. Smith
- 316 Stainless steel - 1.90" OD tubing
- Custom powder coated color

**GUARD RAIL AT MIKVAH IMMERSION POOL**

- Recessed Base Rail frameless glass railing system from Viewrail
- 1/2" tempered safety glazing - 42" height above finished floor

DATE:	11-25-25
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**DOOR SCHEDULE & ARCHITECTURAL SPECIFICATIONS**

**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
Blacksburg, VA

**100% FINAL FOR OWNER REVIEW**



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REVISIONS	DESCRIPTION	DATE
No.		

A001

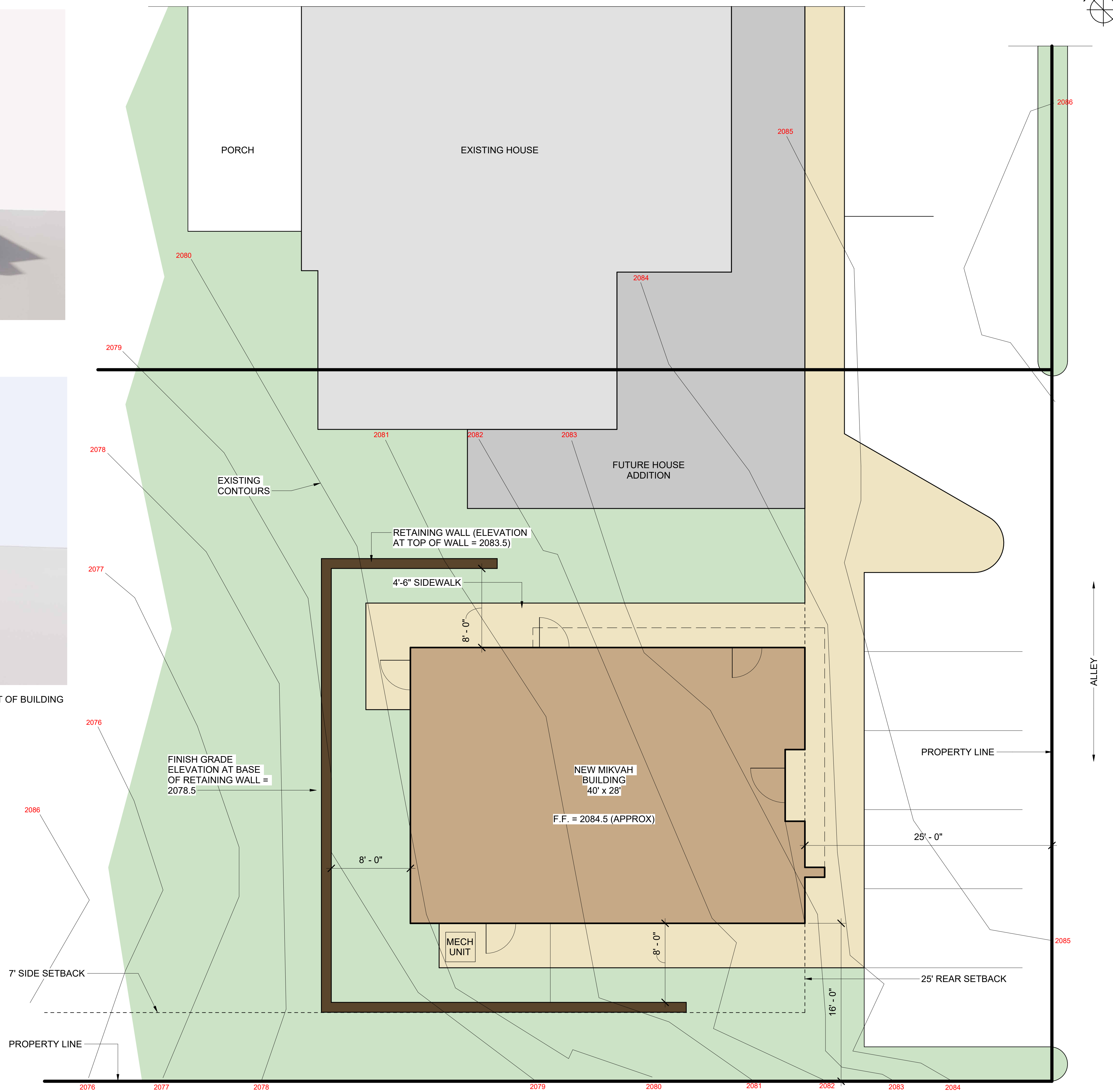
SHEET



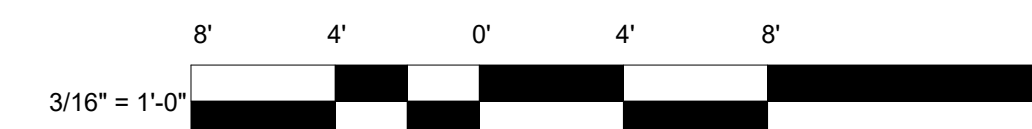
3D RENDERING - FRONT OF BUILDING



3D RENDERING - FRONT OF BUILDING



① SCHEMATIC SITE PLAN  
3/16" = 1'-0"



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SCHEMATIC SITE PLAN

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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FOR OWNER  
REVIEW



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REVISIONS	DATE
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DESCRIPTION	

A002

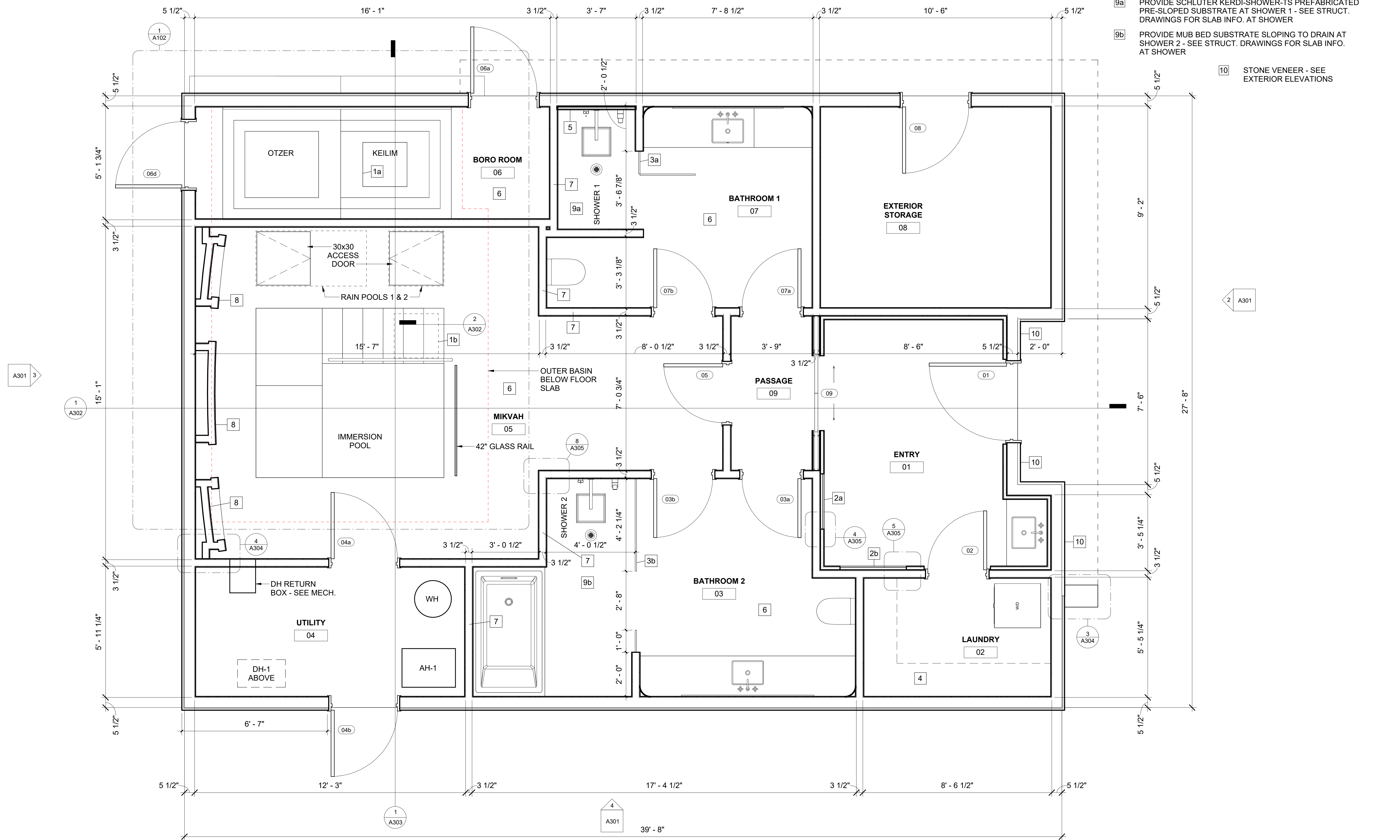
SHEET

**GENERAL PLAN NOTES**

1. INSTALL ALL PRODUCTS IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
2. PROVIDE 2" POLY-ISO UNDER-SLAB PERIMETER INSULATION - EXTEND FROM TOP OF FOOTING TO 2'-0" INSIDE EXT. WALL AROUND ENTIRE PERIMETER OF BUILDING. INSTALL INSULATION UNDER THE VAPOR BARRIER.
3. PROVIDE A LEVEL 4 FINISH ON ALL GWB EXPOSED TO VIEW.
4. ALL INTERIOR WALLS TO BE 2x4 WOOD STUD FRAMING AT 16" O.C. WITH 1/2" M.R. GWB ON BOTH SIDES. EXTEND FROM FLOOR TO TRUSS BEARING ELEVATION. PROVIDE 3 1/2" UNFACED SOUND-BATT INSULATION IN ALL CAVITIES. OMIT GWB IN SPACES WITH NO ACCESS. SEE TILE NOTE FOR ADDITIONAL INFORMATION.
5. **TILE NOTE:** PROVIDE PORCELAIN WALL TILE THROUGHOUT EACH OF THE FOLLOWING ROOMS - BATHROOM 2 [03], MIKVAH [05], BORO ROOM [06], AND BATHROOM 1 [07]. WALL TILE TO EXTEND FROM FLOOR TO CEILING. AT ALL TILE LOCATIONS, PROVIDE 1/2" CEMENT BACKER BOARD IN LIEU OF 1/2" GWB.

**FLOOR PLAN KEYNOTES**

- |    |   |    |   |    |   |
|----|---|----|---|----|---|
| 1a | 24" x 24" ACCESS DOOR AT INTERMEDIATE KEILIM PLATFORM   | 2b | 3/8" GLASS PANEL DONOR WALL. 36" x 24" WITH BOTTOM AT 36" A.F.F. SEE DETAIL | 5  | PROVIDE 1 1/2" FURRING WALL AT SHOWER FOR PLUMBING PIPING   |
| 1b | 24" x 24" ACCESS DOOR UNDER STEPS   | 3a | GLASS SHOWER PARTITION - WITH 2'-6" DOOR                                    | 6  | PROVIDE ELECTRIC FLOOR HEAT SYSTEM - SEE ELEC. DRAWINGS   |
| 2a | 3/8" GLASS SIGNAGE PANEL. 30" WIDE AND EXTENDING FROM FLOOR TO CEILING AT 9'-0". PROVIDE EDGE-LIT LED EXTRUSION AT VERTICAL EDGES. SEE DETAIL | 3b | GLASS SHOWER PARTITION - NO DOOR  | 7  | ALCOVE SHELF WITHIN WALL - SEE INTERIOR DESIGN DRAWINGS   |
|    |   | 4  | PROVIDE BUILT-IN PAINTED WOOD SHELVING - COORDINATE WITH OWNER              | 8  | MIKVAH FEATURE WALL - SEE ID DRAWINGS   |
|    |   |    |   | 9a | PROVIDE SCHLUTER KERDI-SHOWER-TS PREFABRICATED PRE-SLOPED SUBSTRATE AT SHOWER 1 - SEE STRUCT. DRAWINGS FOR SLAB INFO. AT SHOWER |
|    |   |    |   | 9b | PROVIDE MUB BED SUBSTRATE SLOPING TO DRAIN AT SHOWER 2 - SEE STRUCT. DRAWINGS FOR SLAB INFO. AT SHOWER                          |
|    |   |    |   | 10 | STONE VENEER - SEE EXTERIOR ELEVATIONS  |



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



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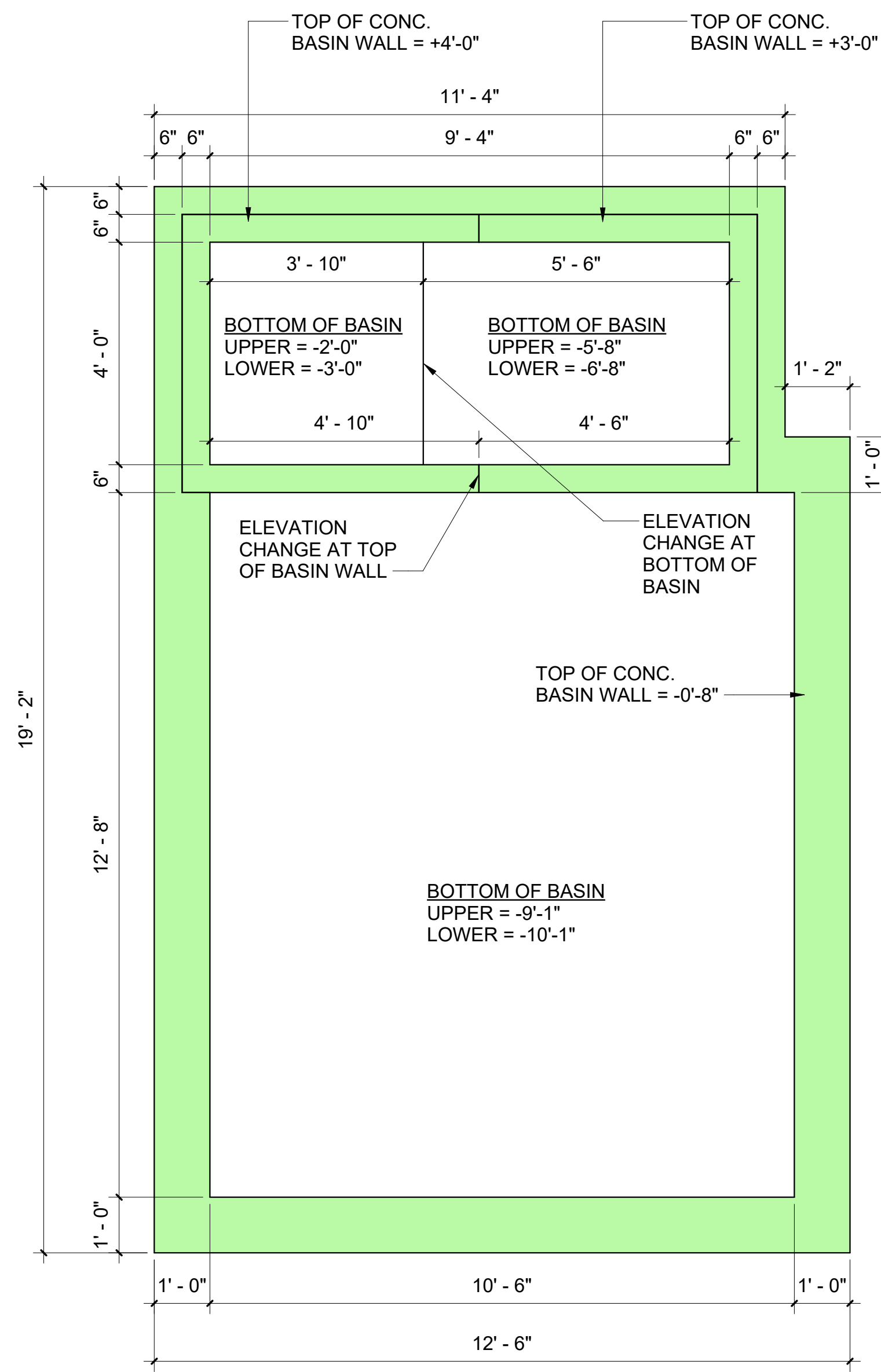
**FLOOR PLAN**  
**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
 Blacksburg, VA

100% FINAL FOR OWNER REVIEW

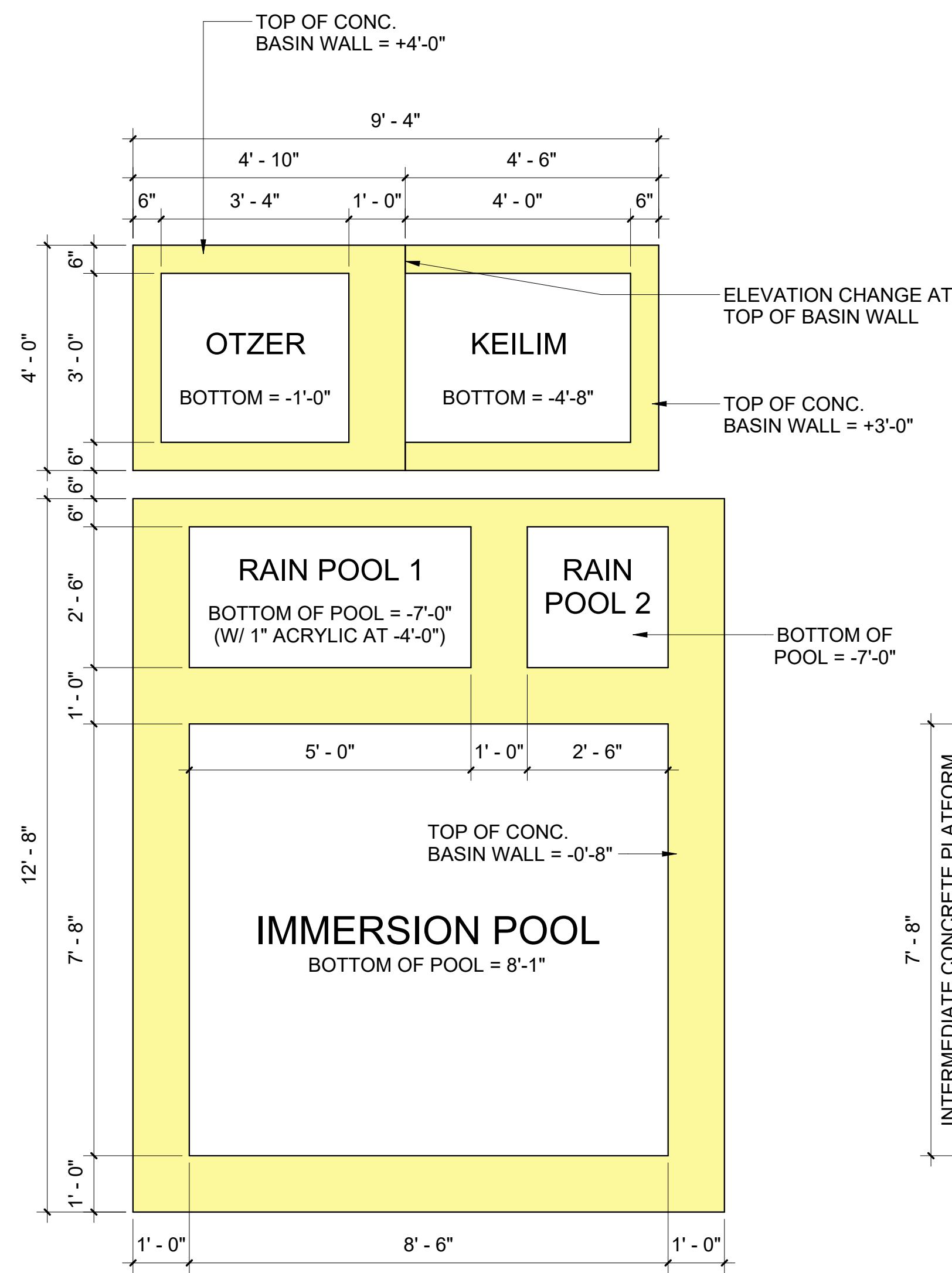


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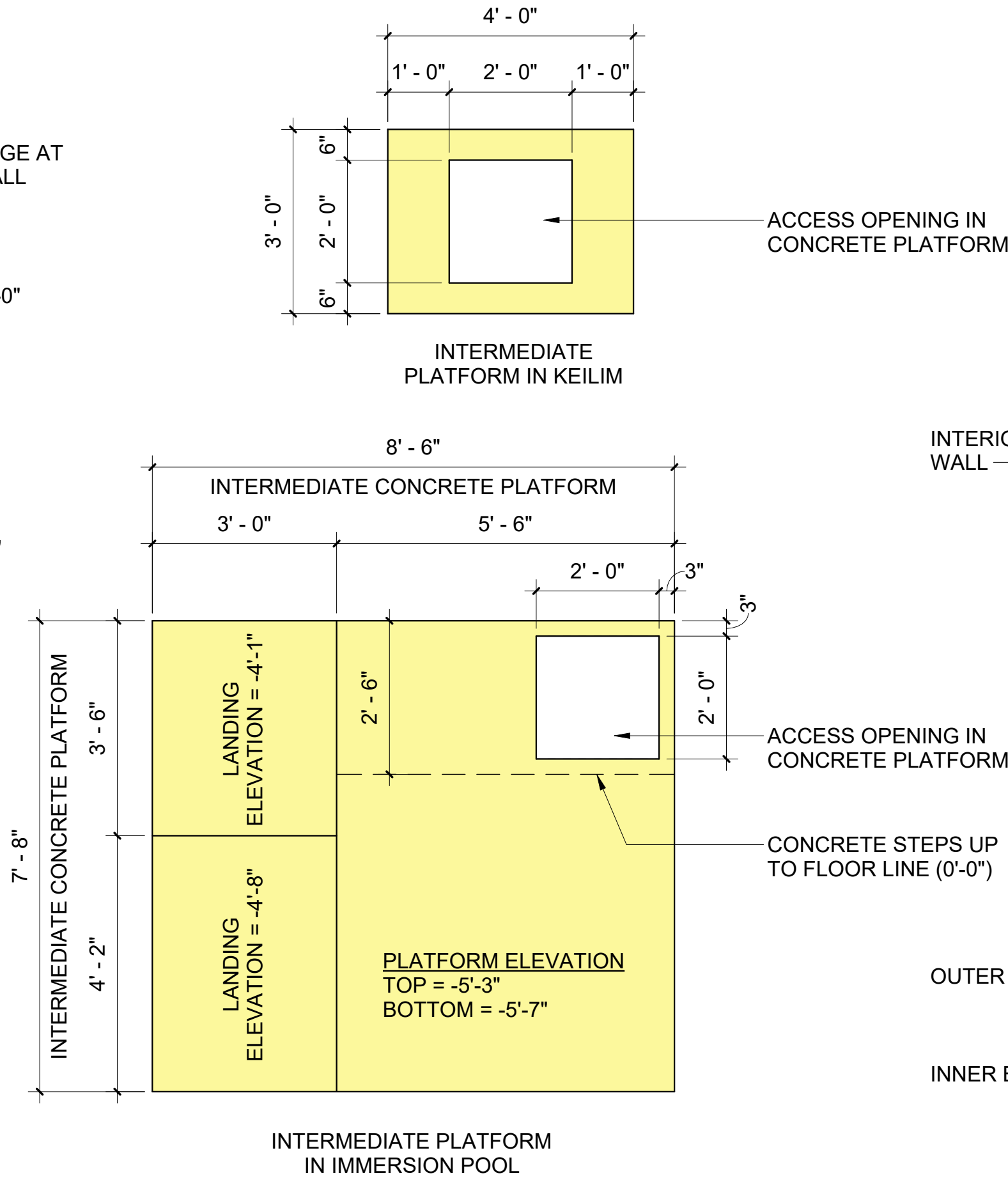
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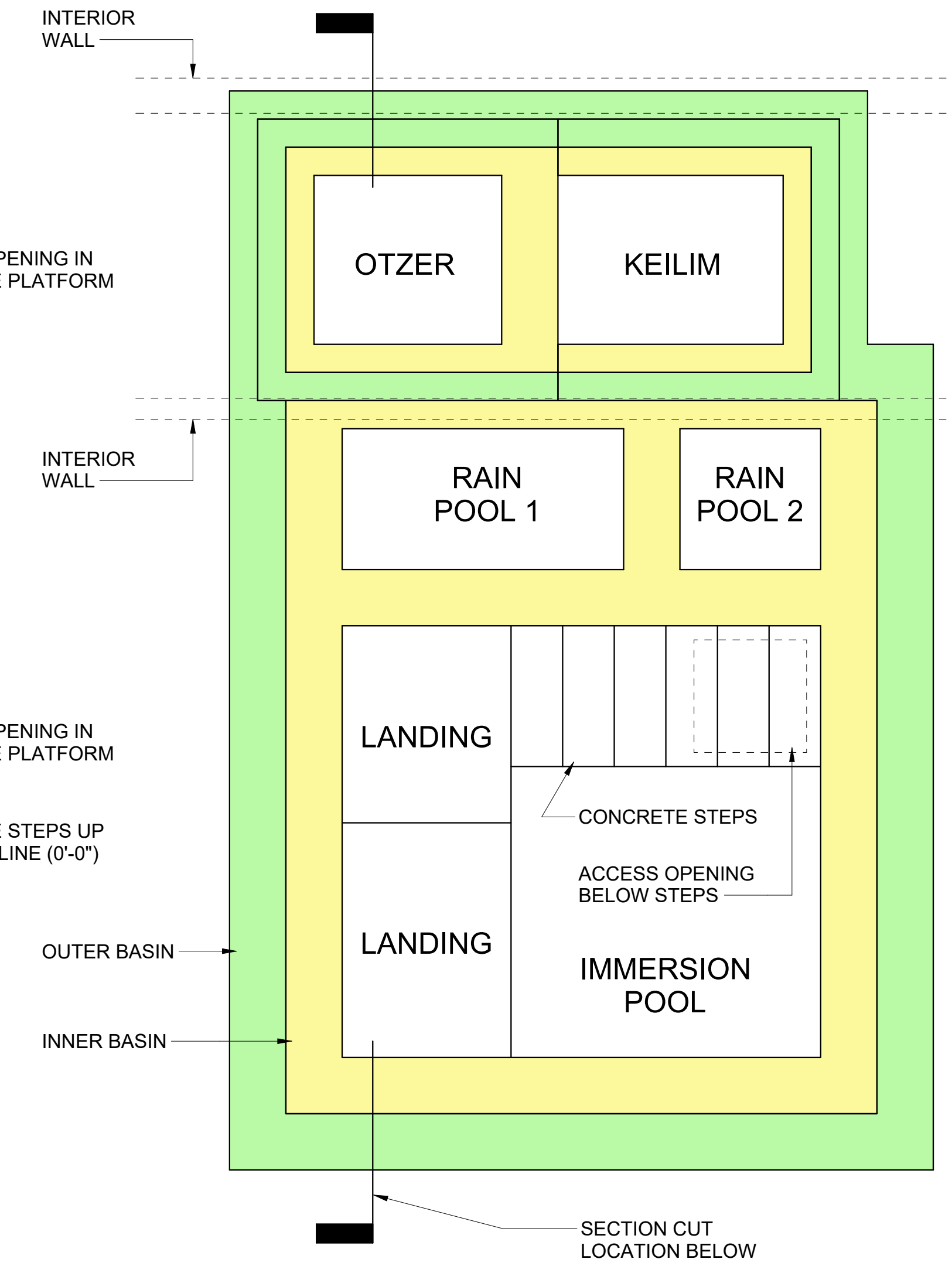
**OUTER BASIN**



**INNER BASINS**

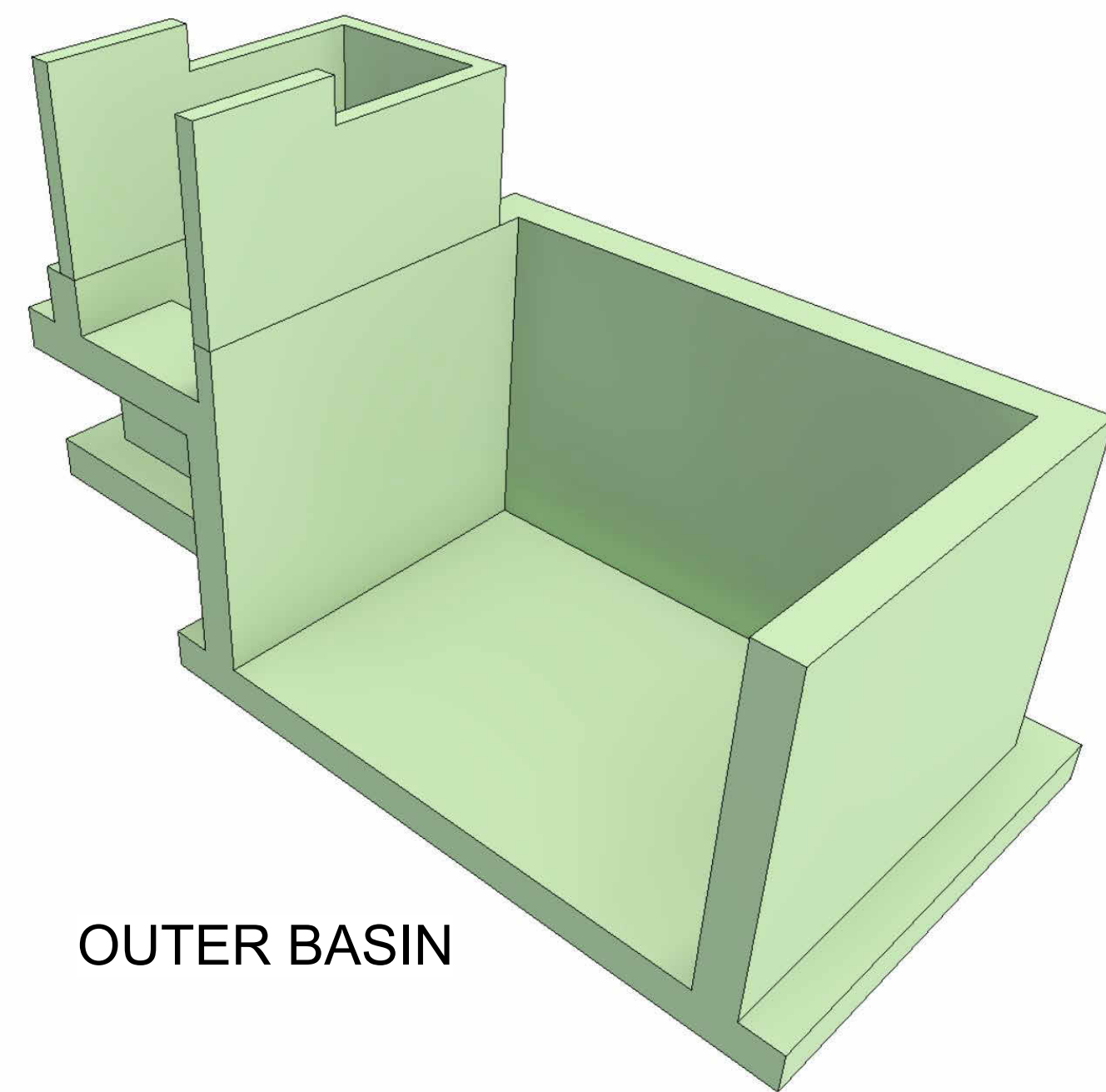


**INTERMEDIATE PLATFORMS**

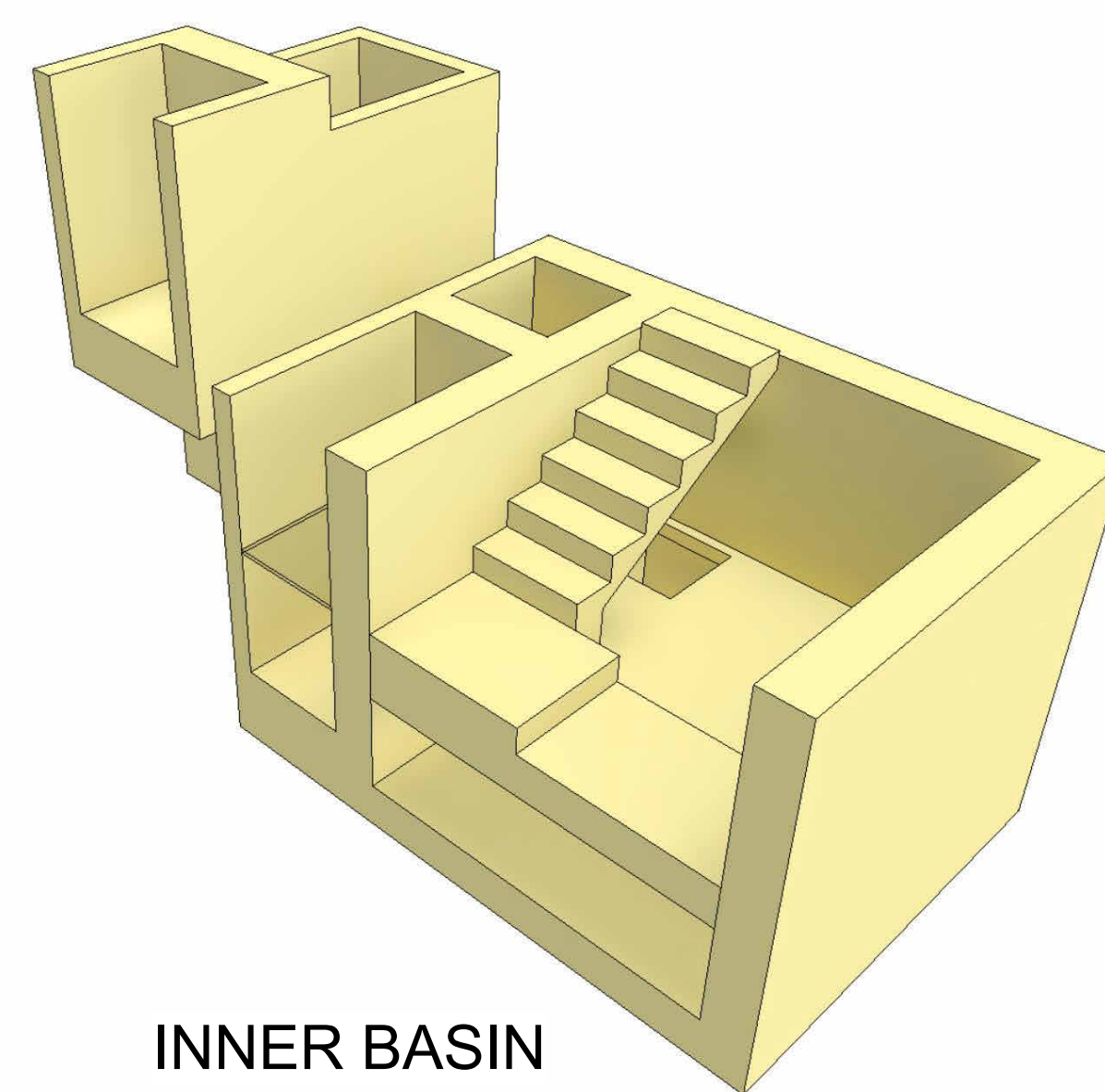


**BASIN ASSEMBLY**

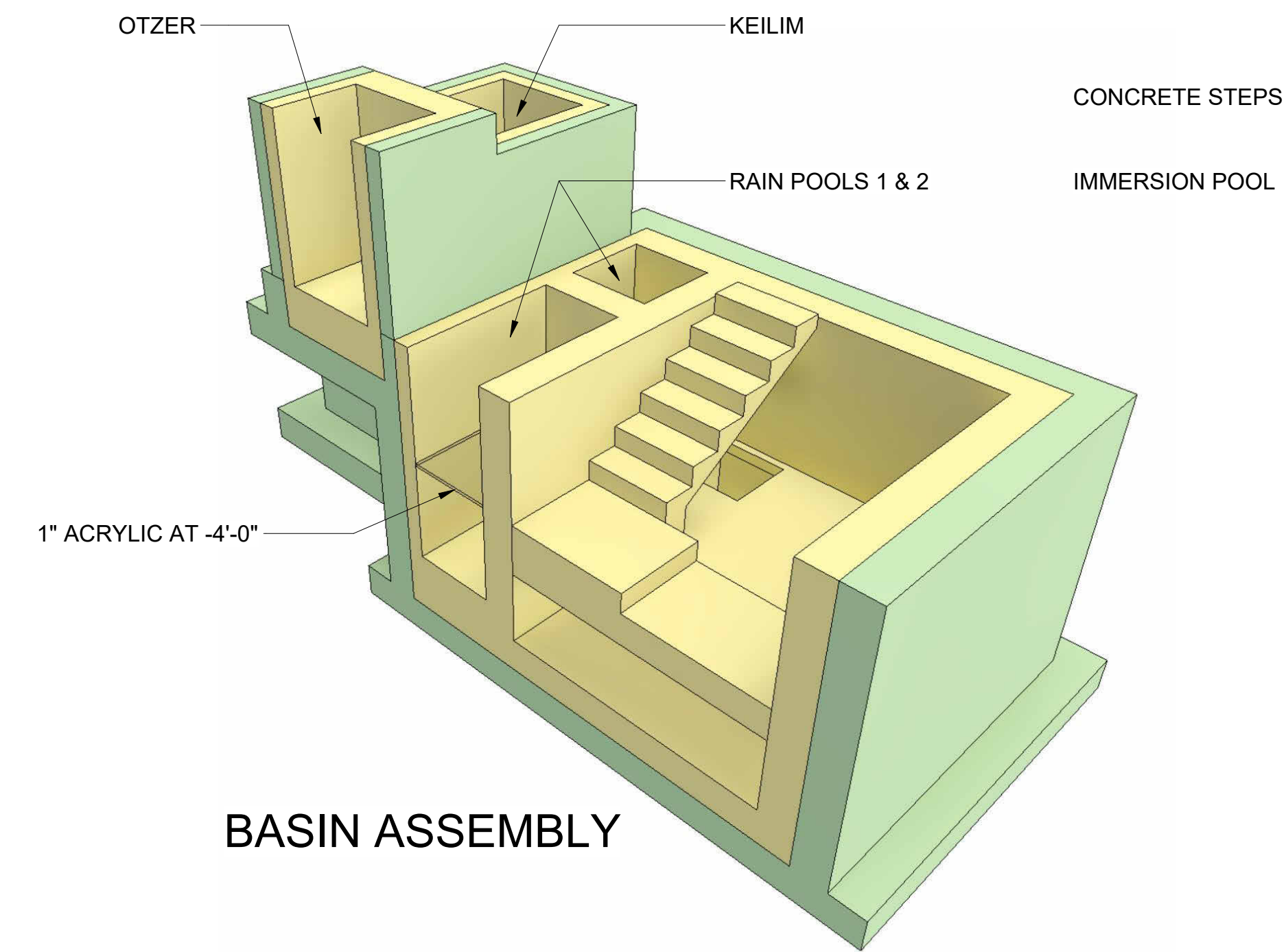
1 ENLARGED MIKVAH BASIN PLANS  
1/2" = 1'-0"



**OUTER BASIN**



**INNER BASIN**



**BASIN ASSEMBLY**

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**MIKVAH BASIN PLANS**

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Blacksburg, VA

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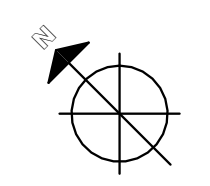
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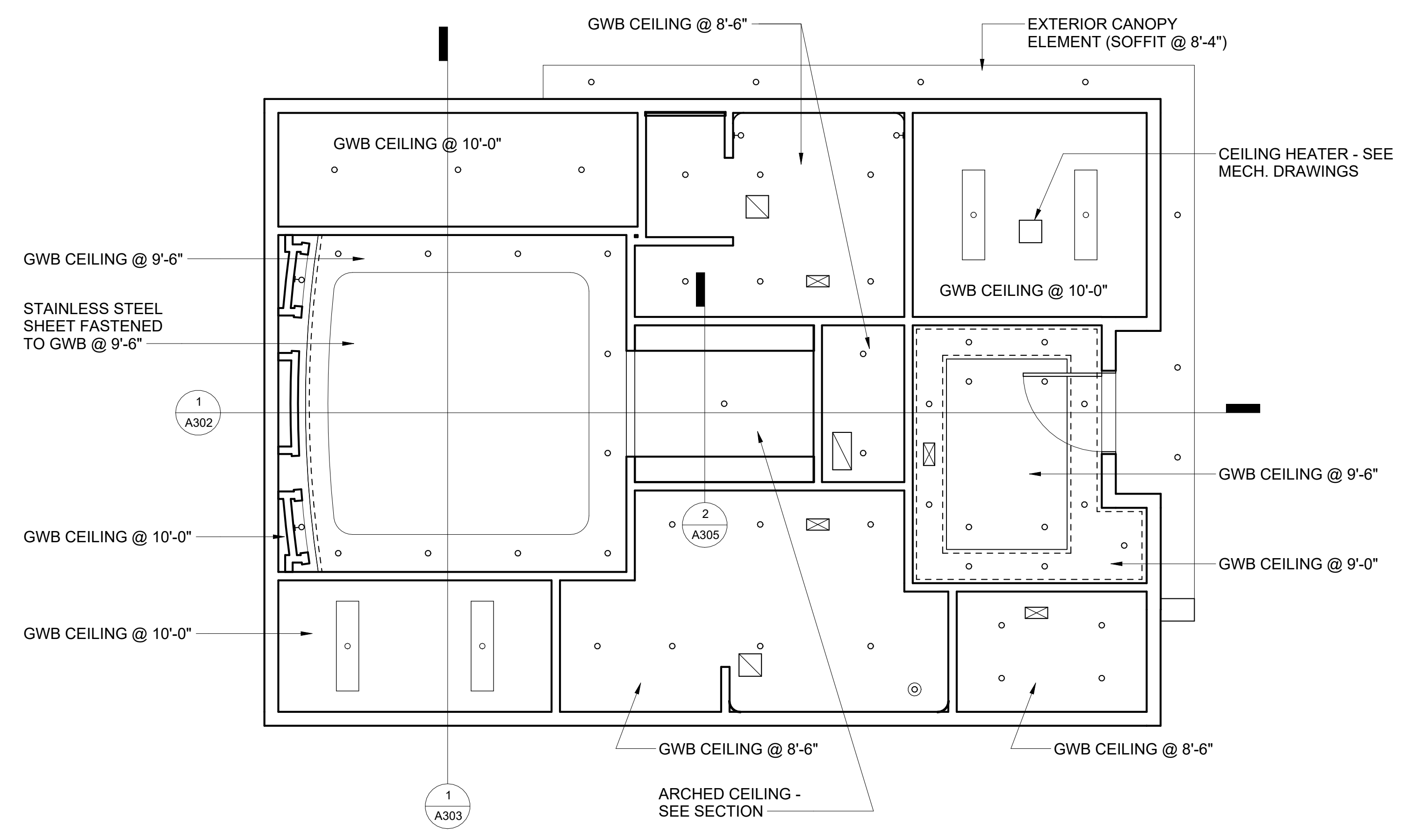


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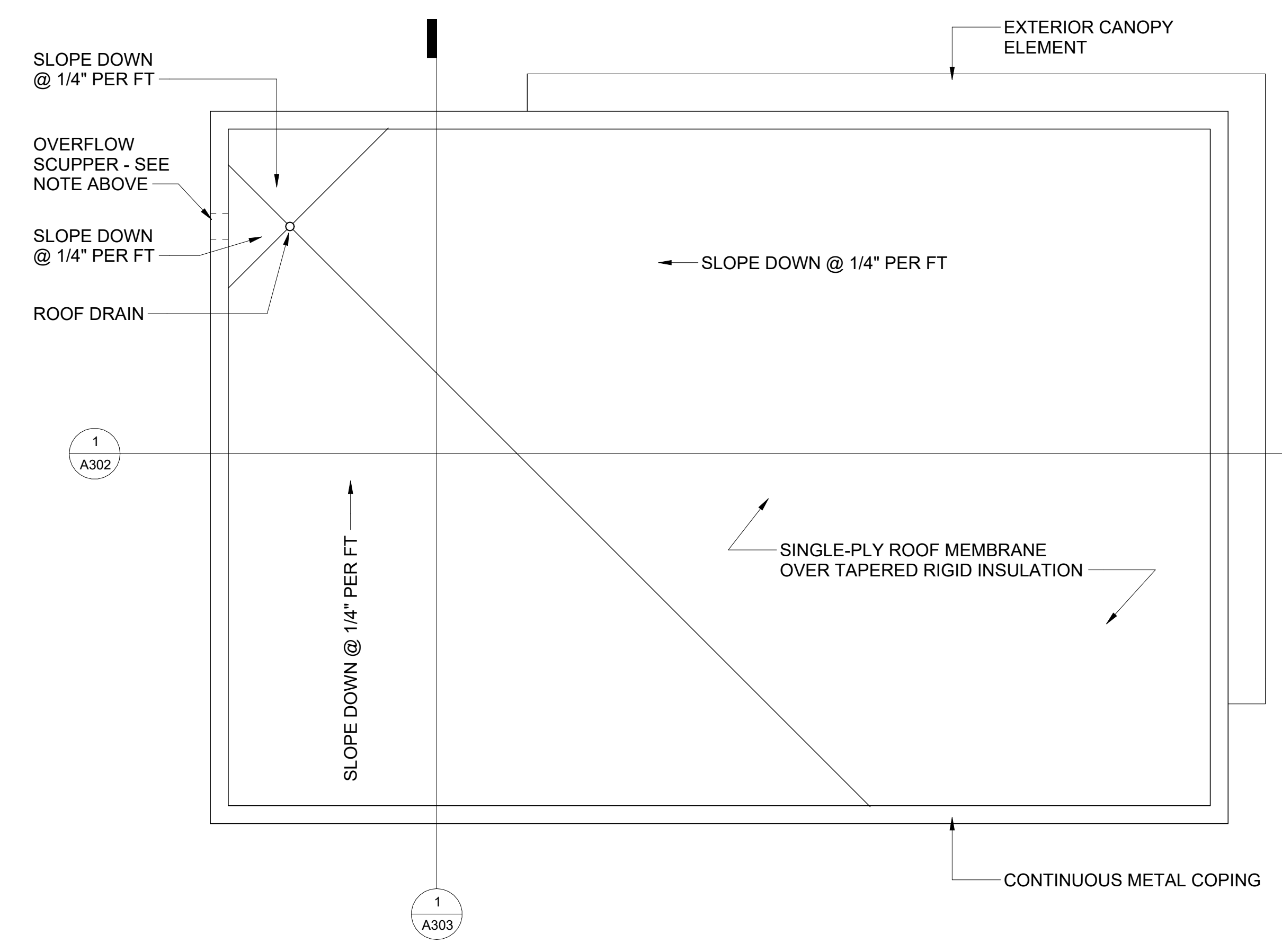
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**OVERFLOW SCUPPER NOTE**  
 PROVIDE 12" x 6" SHEET METAL THRU-WALL SCUPPER.  
 FABRICATE AND INSTALL PER PLATE 30 IN THE  
 ARCHITECTURAL SHEET METAL MANUAL (SMACNA)



1 REFLECTED CEILING PLAN  
 1/4" = 1'-0"



2 ROOF PLAN  
 1/4" = 1'-0"

**REFLECTED CEILING PLAN NOTES**

- COORDINATE MECHANICAL, ELECTRICAL, AND PLUMBING INSTALLATIONS IN ORDER TO ACHIEVE AND MAINTAIN INDICATED CEILING HEIGHTS

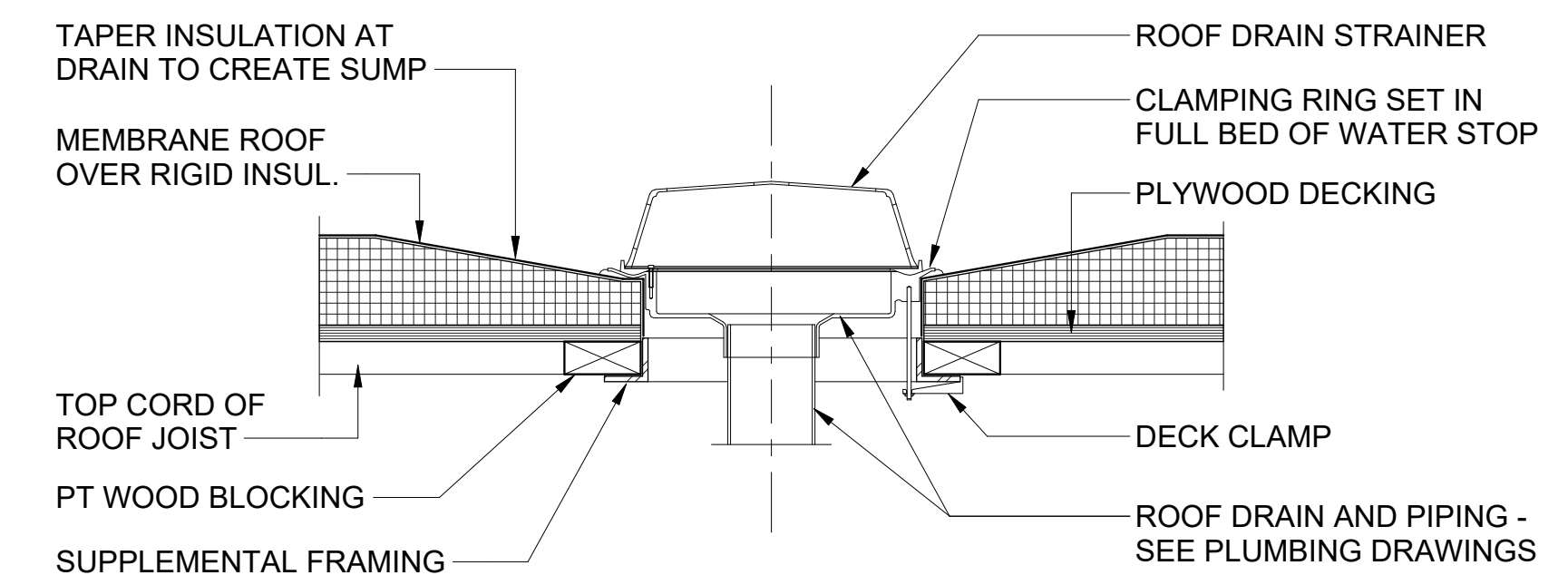
**CEILING LEGEND**

- ⊙ PENDANT LIGHTING FIXTURE
- CONCEALED LED LIGHT STRIP
- RECESSED LED DOWNLIGHT
- ◻ SURFACE MOUNTED LINEAR LED FIXTURE
- ⊠ MECHANICAL SUPPLY DIFFUSERS
- ◻ MECHANICAL RETURN GRILLE
- ⊠ MECHANICAL EXHAUST GRILLE

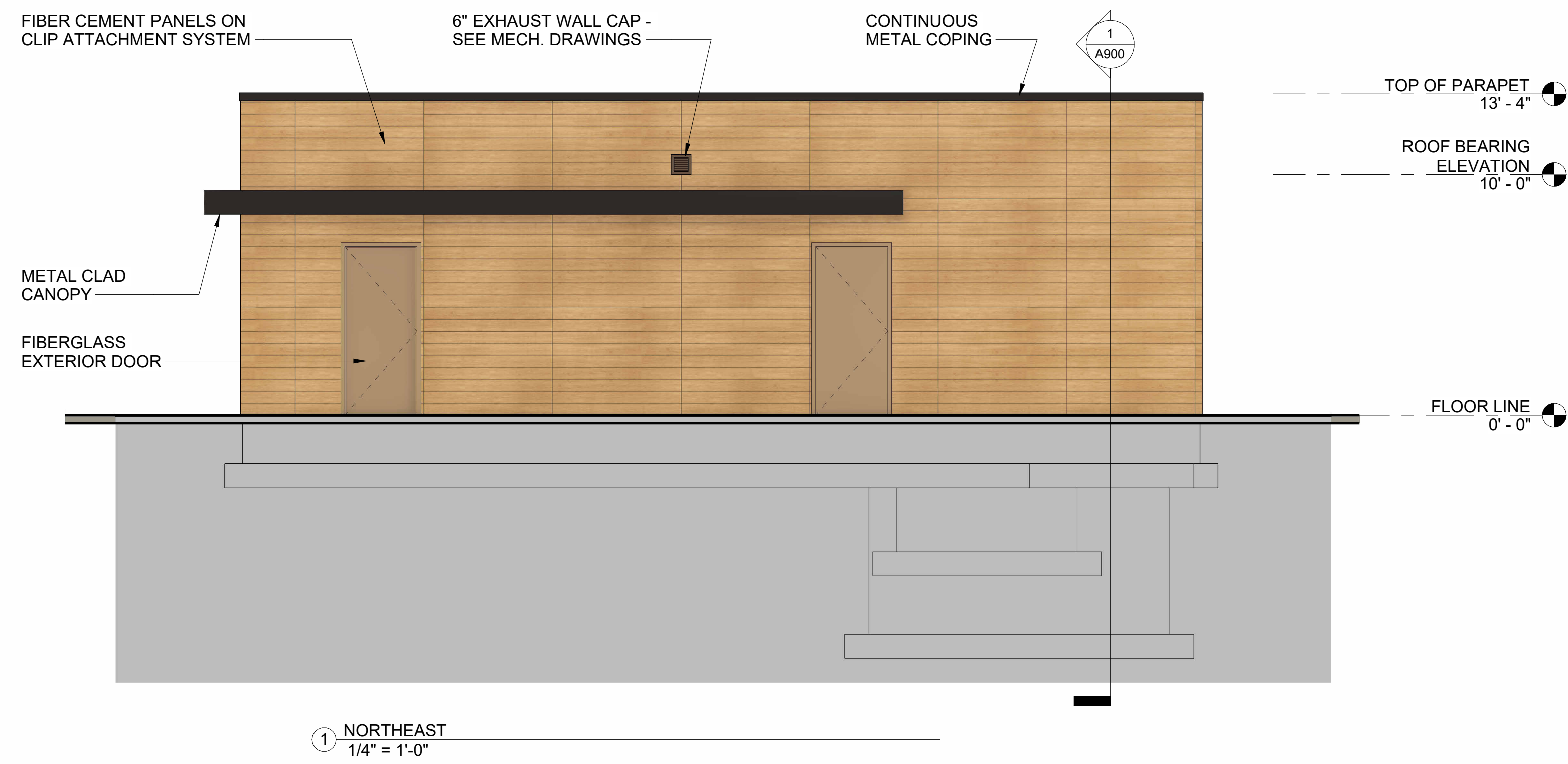
SEE INTERIOR DESIGN AND ELEC. DRAWINGS FOR ADDITIONAL LIGHTING FIXTURE INFORMATION. SEE MECHANICAL DRAWINGS FOR MECHANICAL RELATED ITEMS

**ROOFING NOTES**

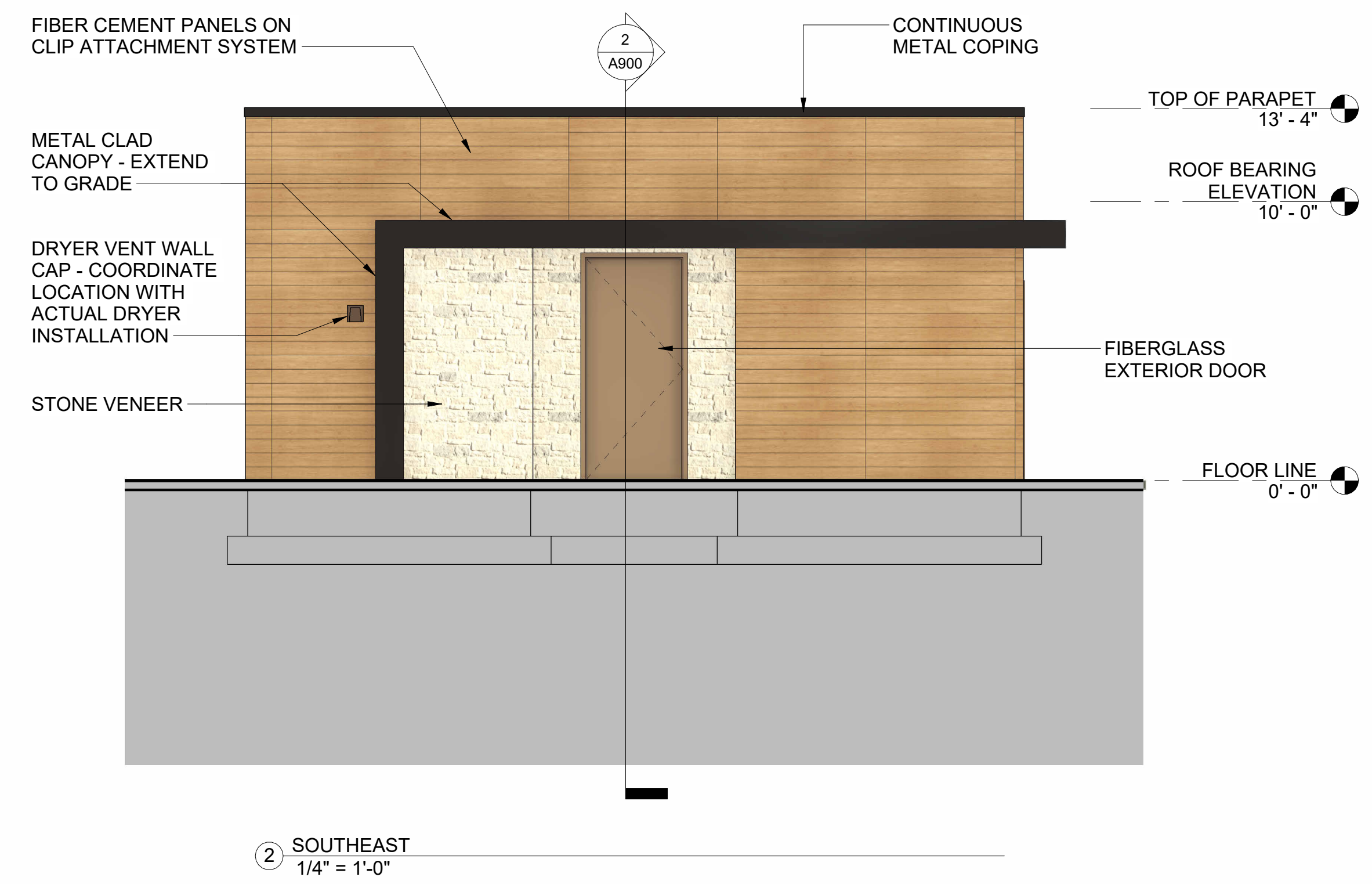
- INSTALLATION OF ROOFING AND ALL ROOF-RELATED CONSTRUCTION, INCLUDING FLASHING, COPING, ETC. SHALL BE MANUFACTURED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND THE LATEST ADDITION OF THE NATIONAL ROOFING CONTRACTOR'S ASSOCIATION MANUAL (THE MORE STRINGENT OF THE TWO).
- ALL FLASHINGS AND COPINGS SHALL BE 0.040" ALUMINUM, PREFINISHED IN A MANUFACTURER'S STANDARD COLOR. COUNTERFLASHINGS ARE 0.032" ALUMINUM AND WILL MATCH FLASHING.



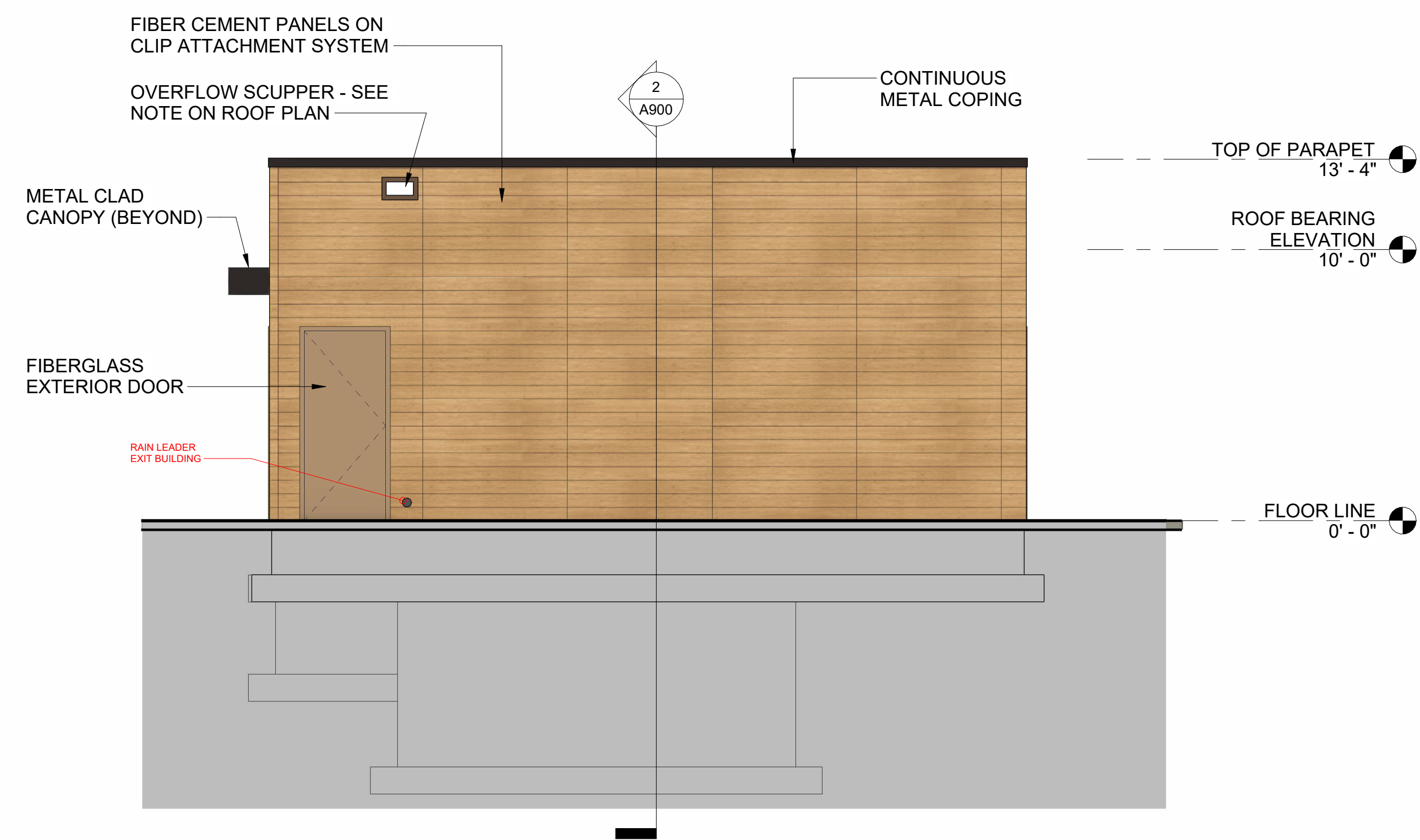
3 ROOF DRAIN DETAIL  
 1 1/2" = 1'-0"



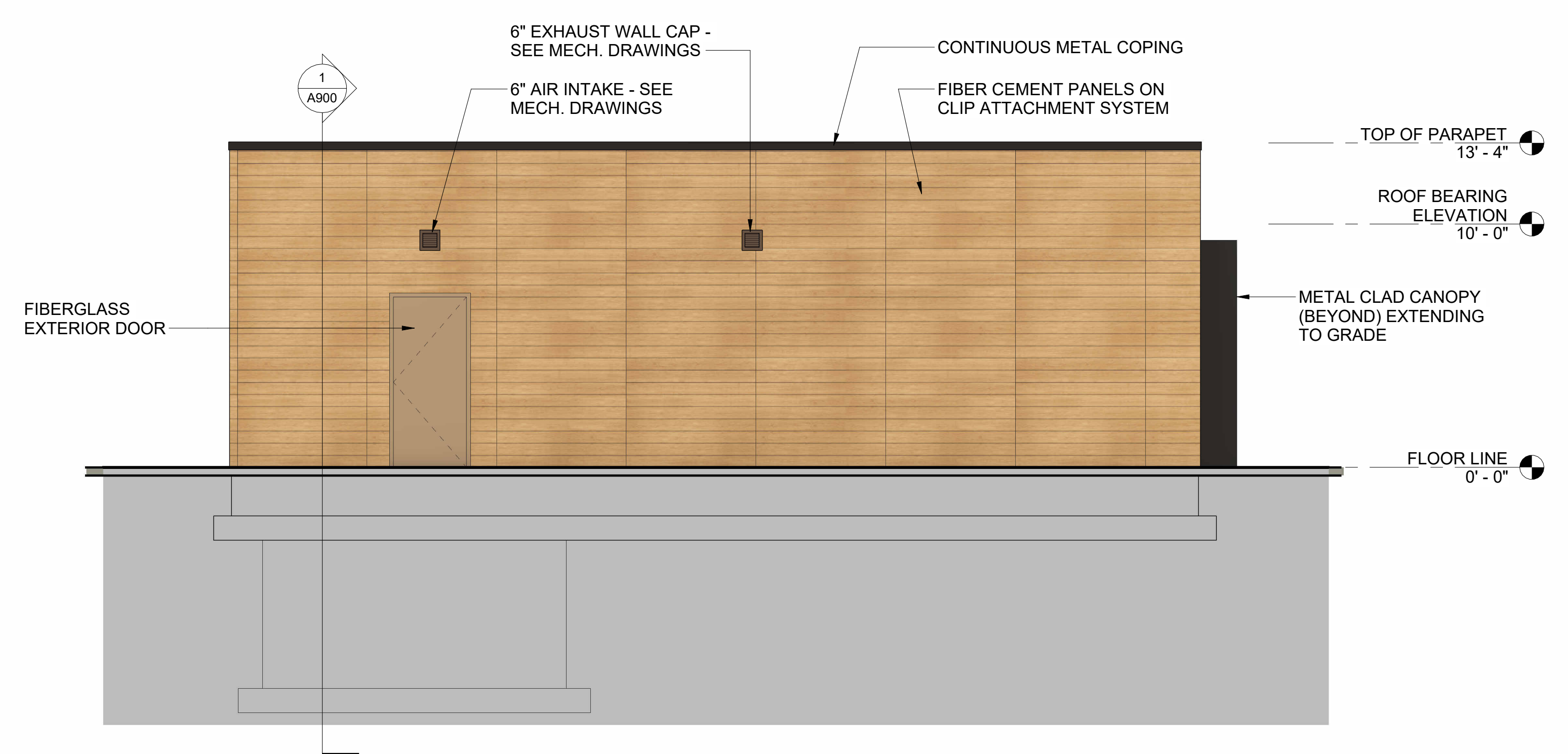
① NORTHEAST  
1/4" = 1'-0"



② SOUTHEAST  
1/4" = 1'-0"



③ NORTHWEST  
1/4" = 1'-0"



④ SOUTHWEST  
1/4" = 1'-0"

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EXTERIOR ELEVATIONS

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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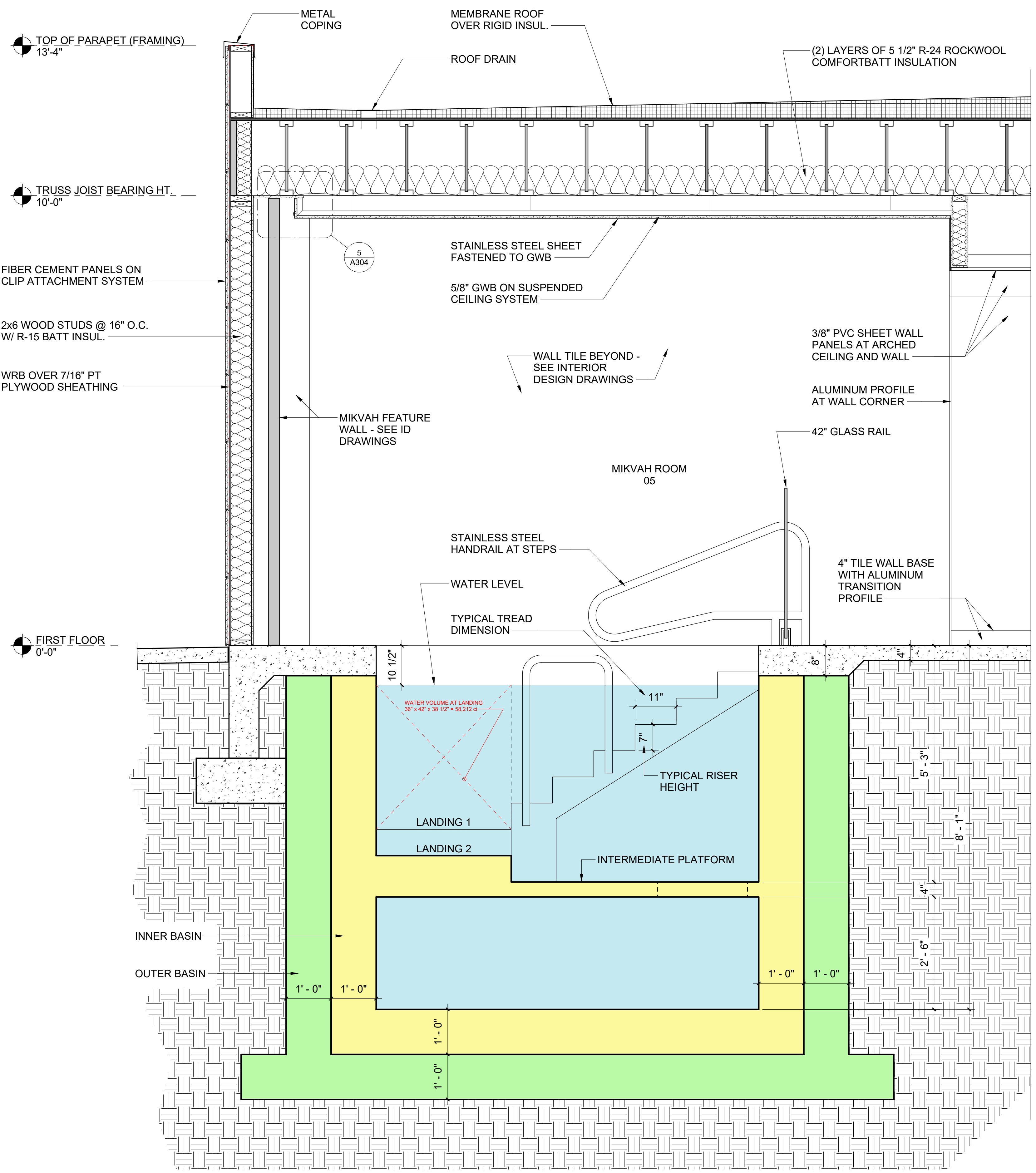


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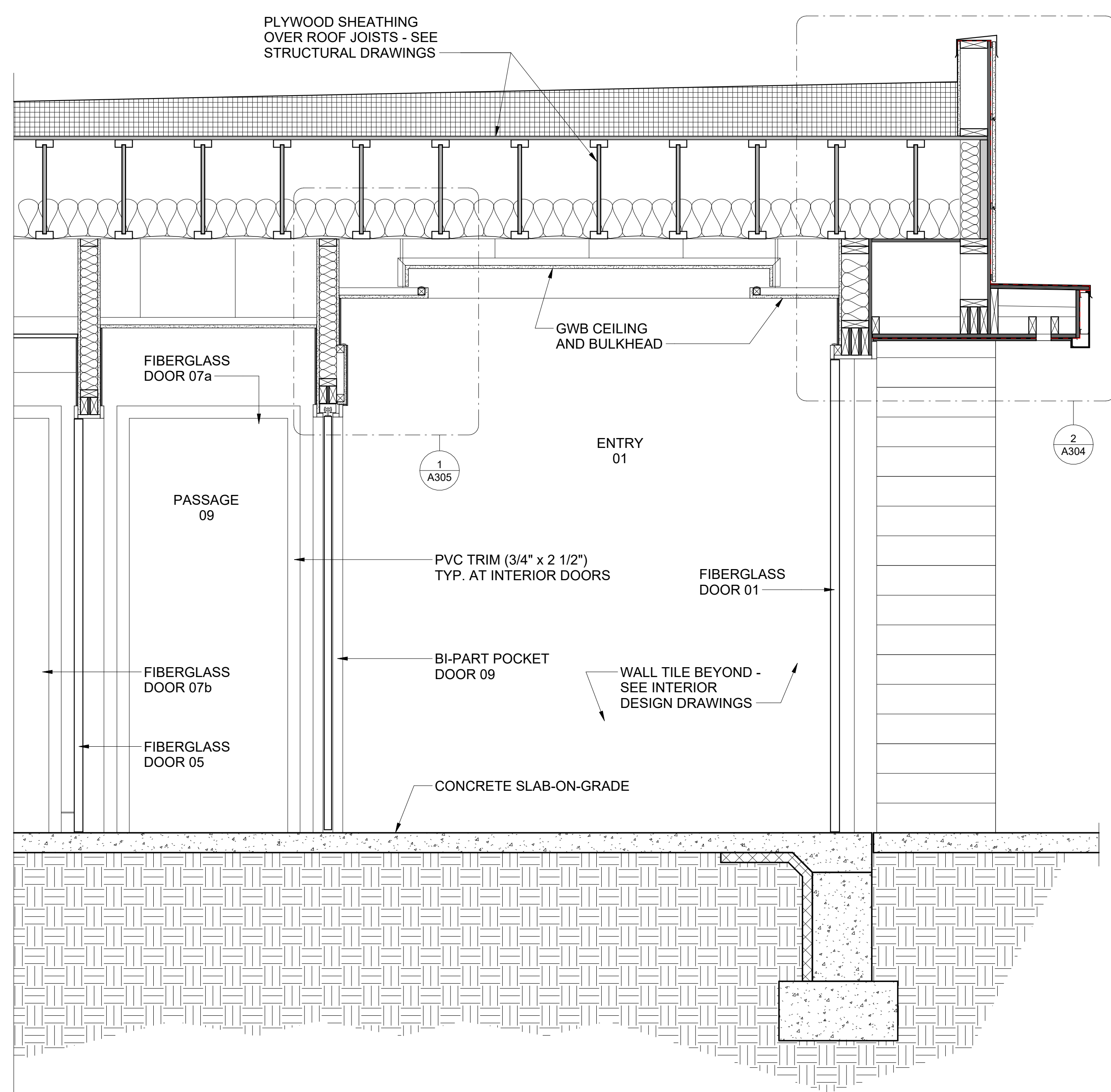
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A301

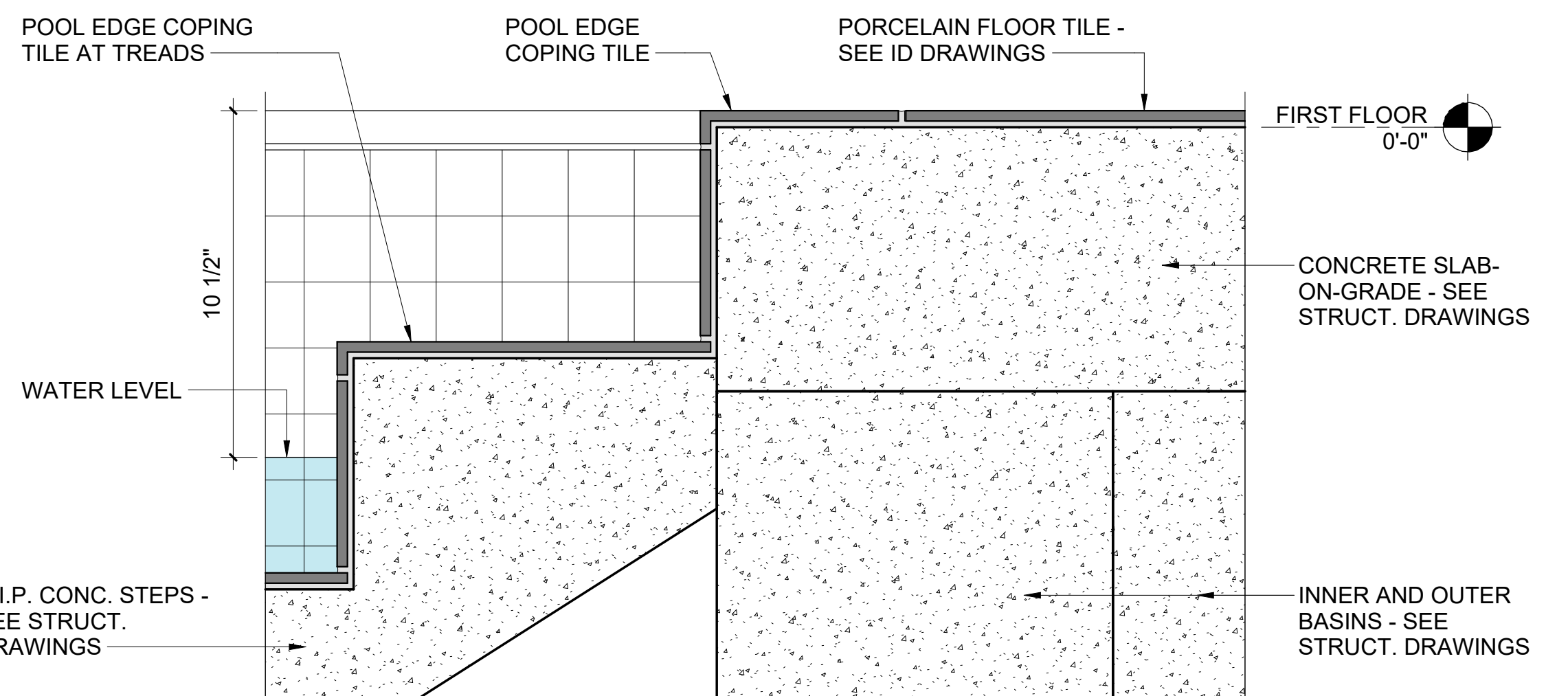
SHEET



1 LONGITUDINAL BUILDING SECTION  
3/4" = 1'-0"



2 POOL EDGE DETAIL  
3" = 1'-0"



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BUILDING SECTION

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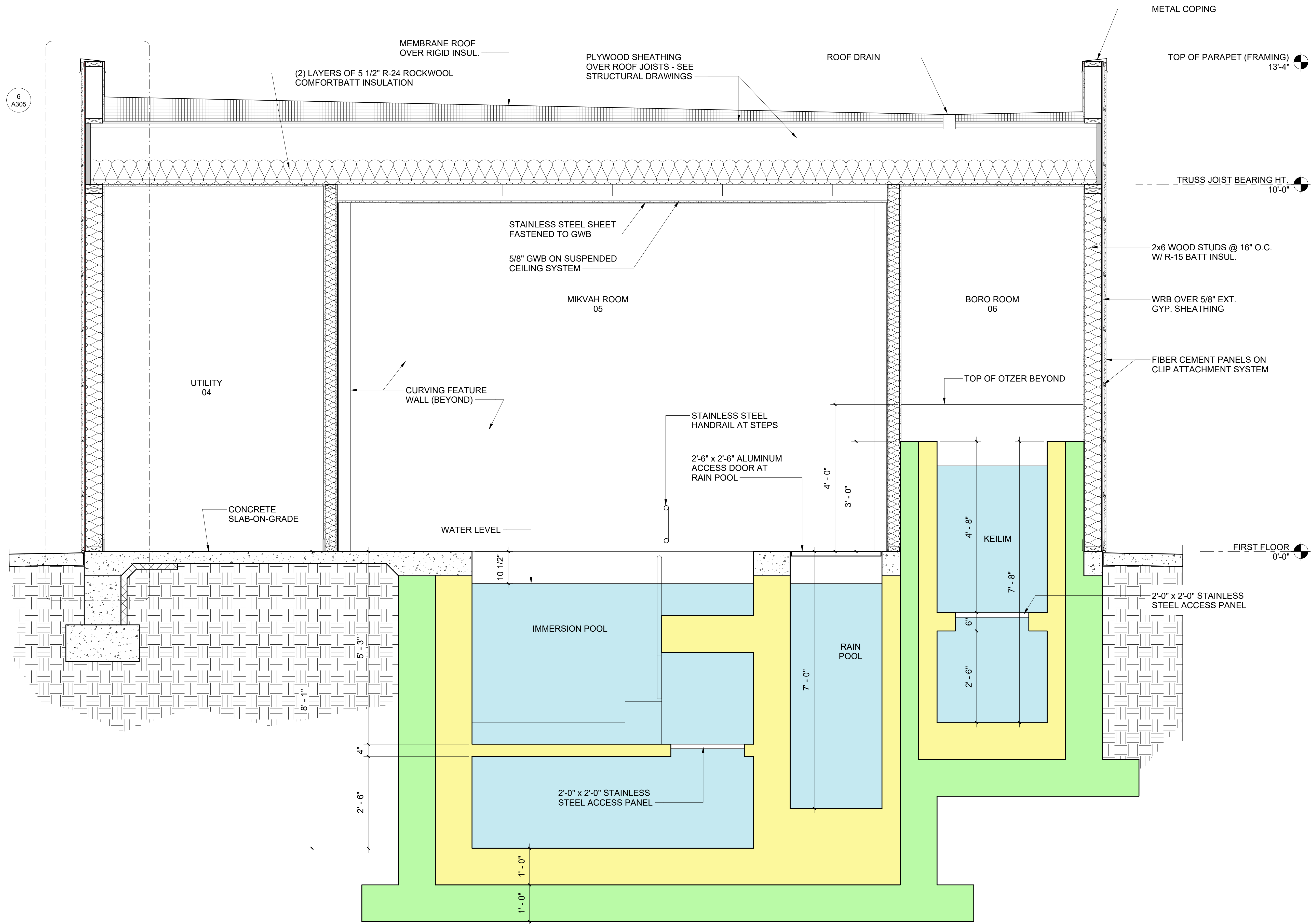


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1 BUILDING CROSS-SECTION  
3/4" = 1'-0"

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BUILDING SECTION

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SHEET

DETAILS

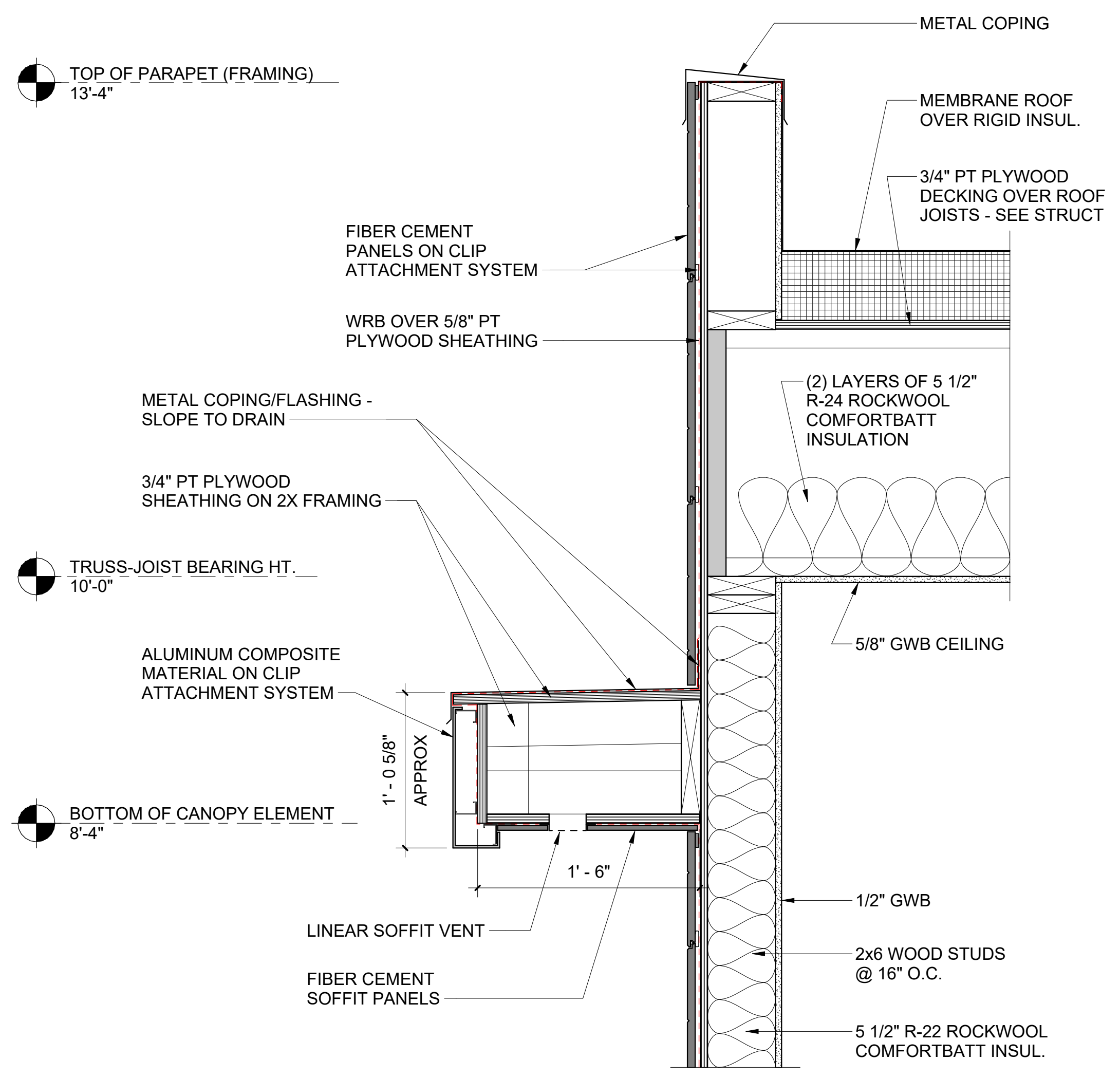
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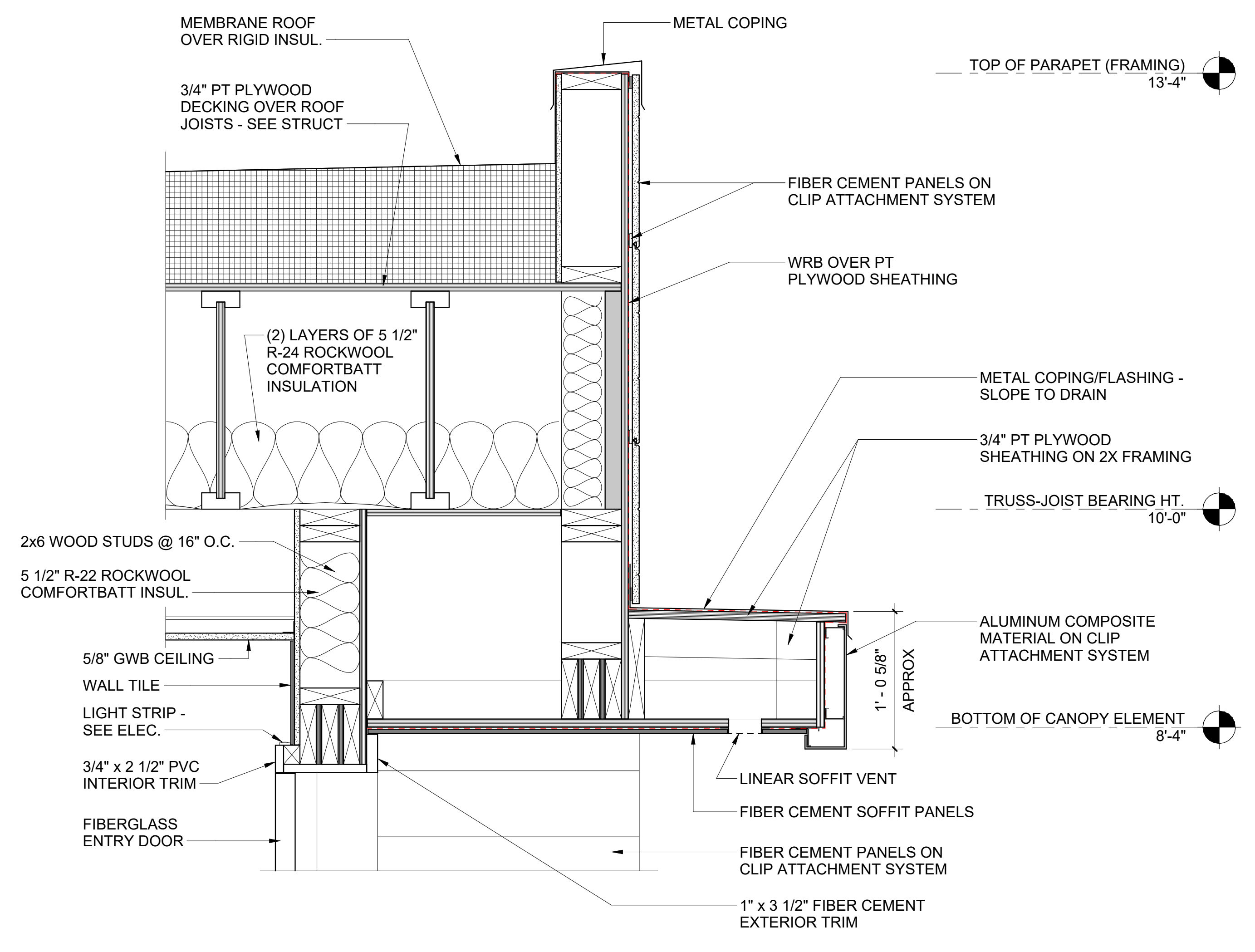


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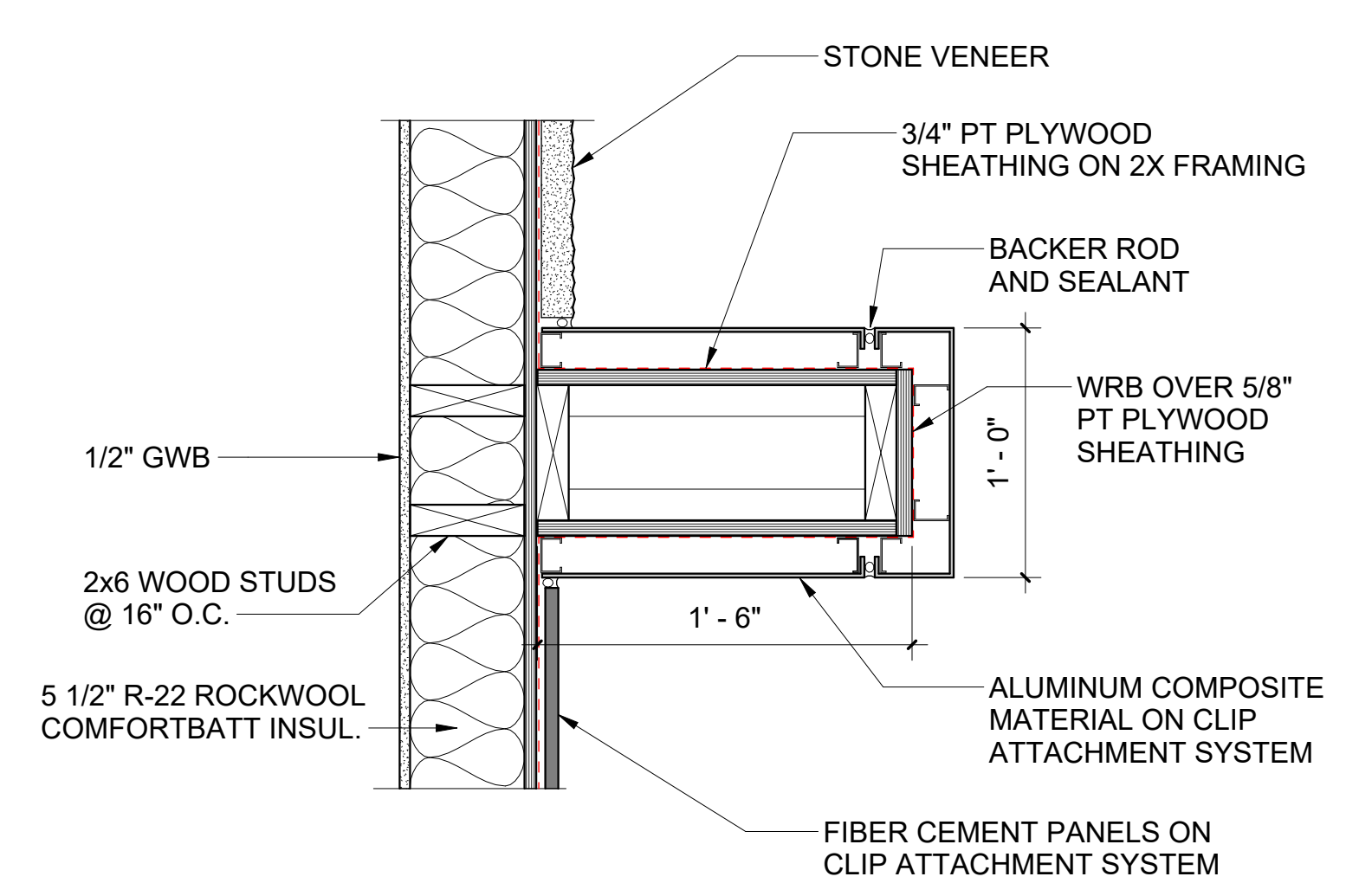
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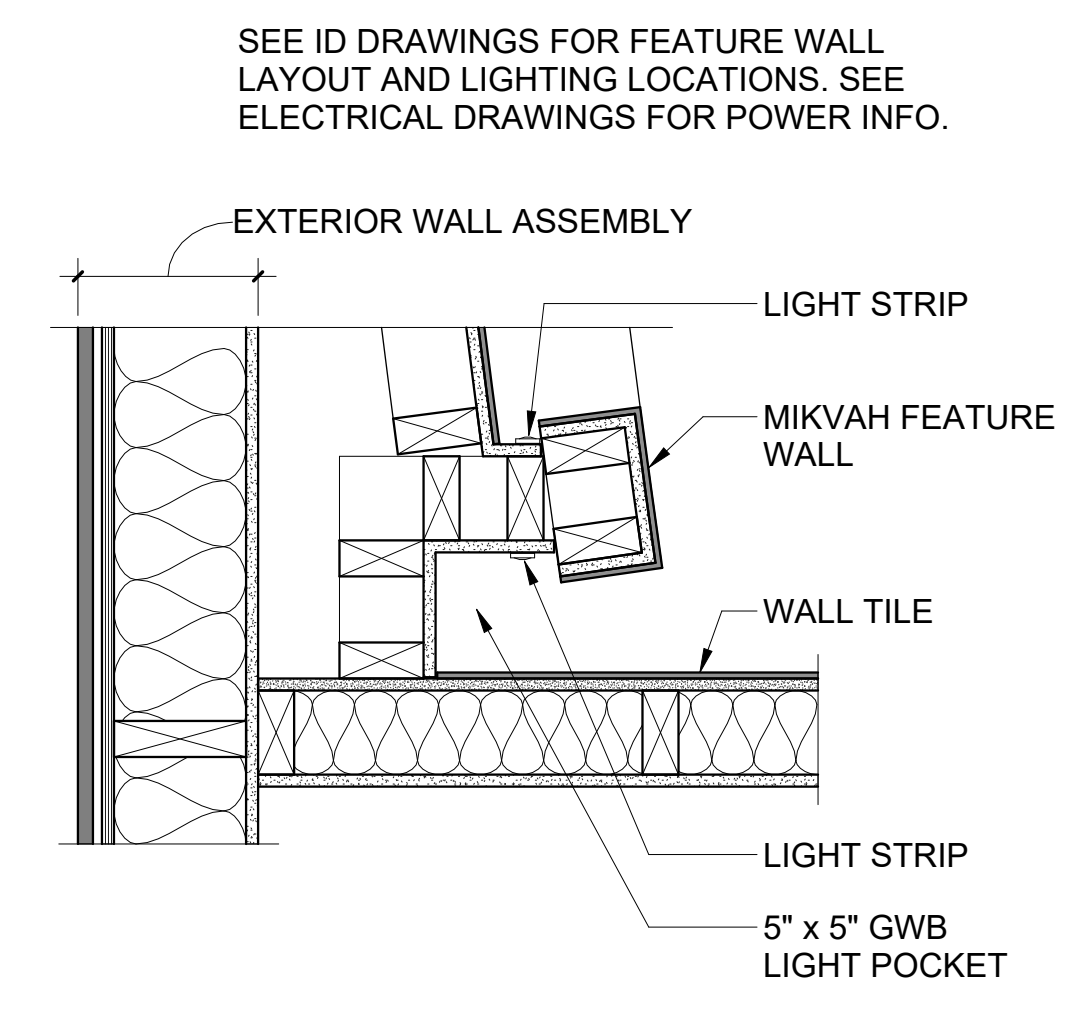
SECTION DETAIL AT EXT. CANOPY ELEMENT  
 1 1 1/2" = 1'-0"



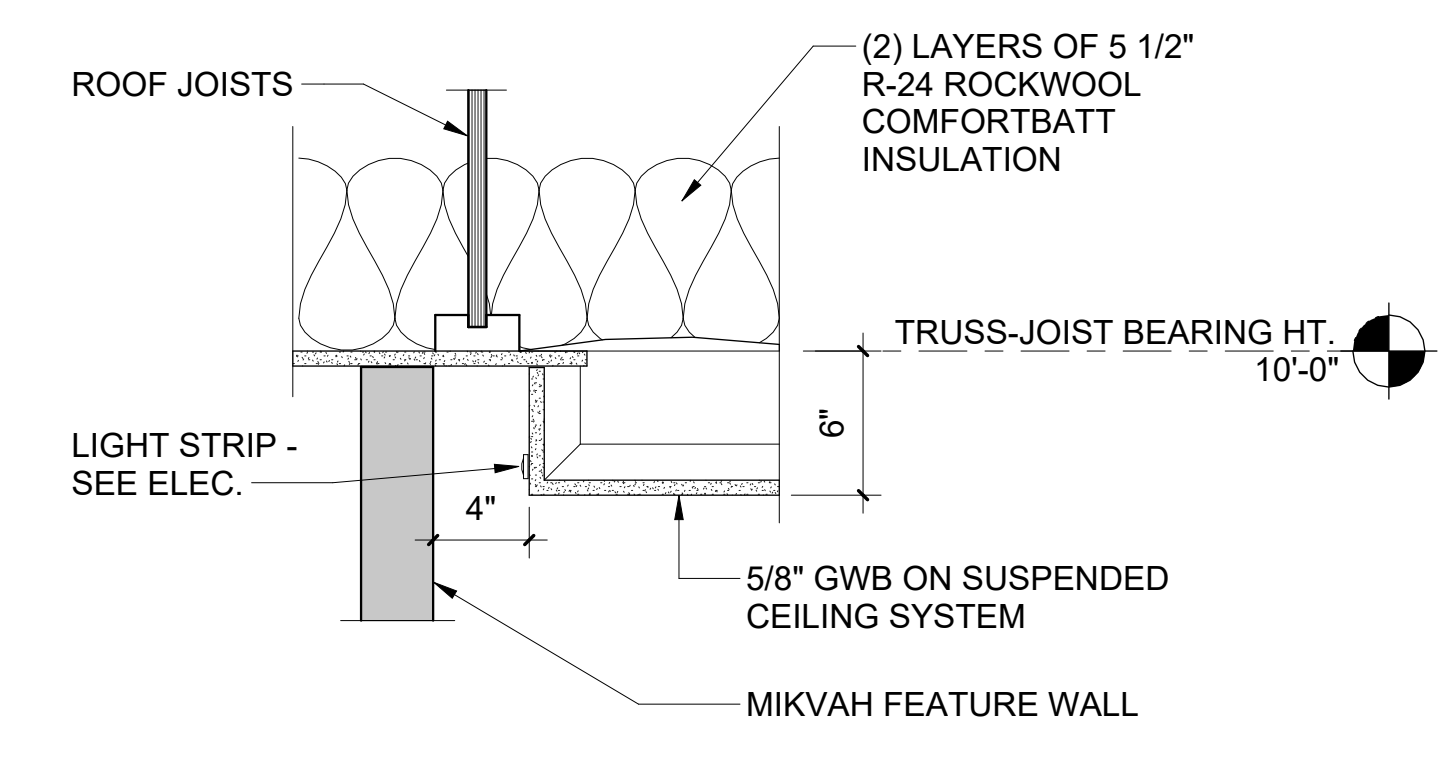
SECTION DETAIL AT ENTRANCE  
 1 1 1/2" = 1'-0"



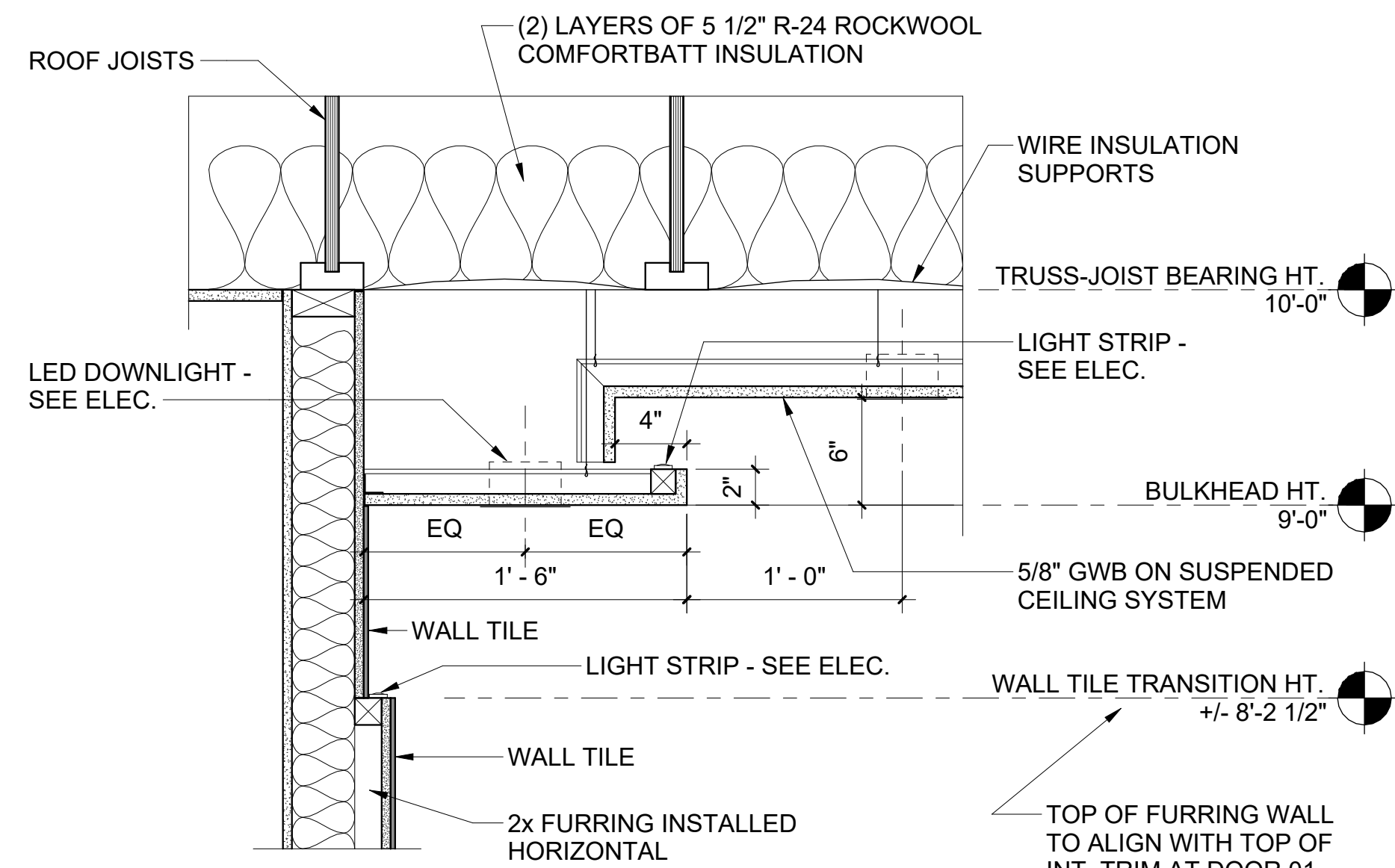
PLAN DETAIL  
 1 1 1/2" = 1'-0"



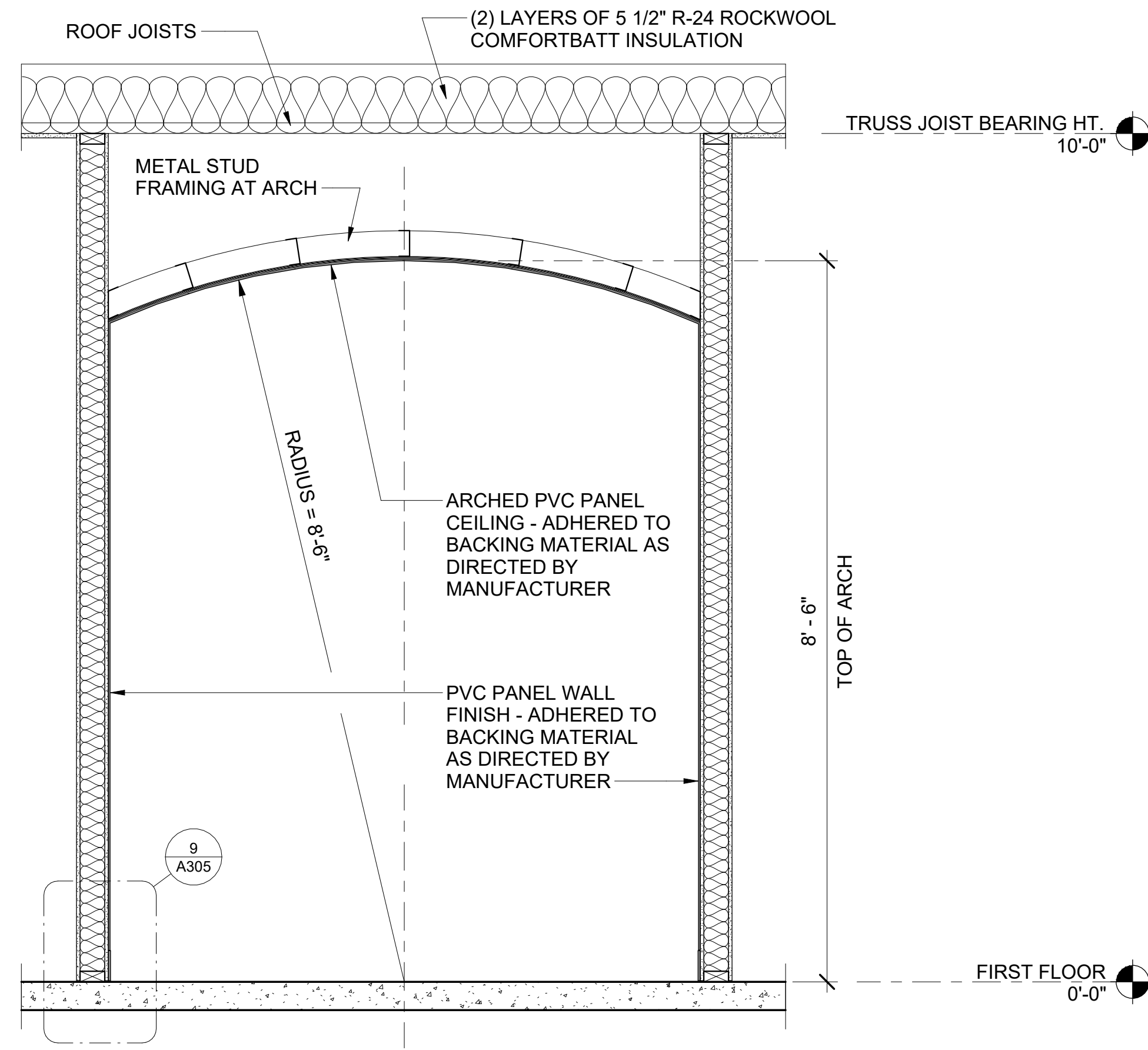
PLAN DETAIL  
 1 1 1/2" = 1'-0"



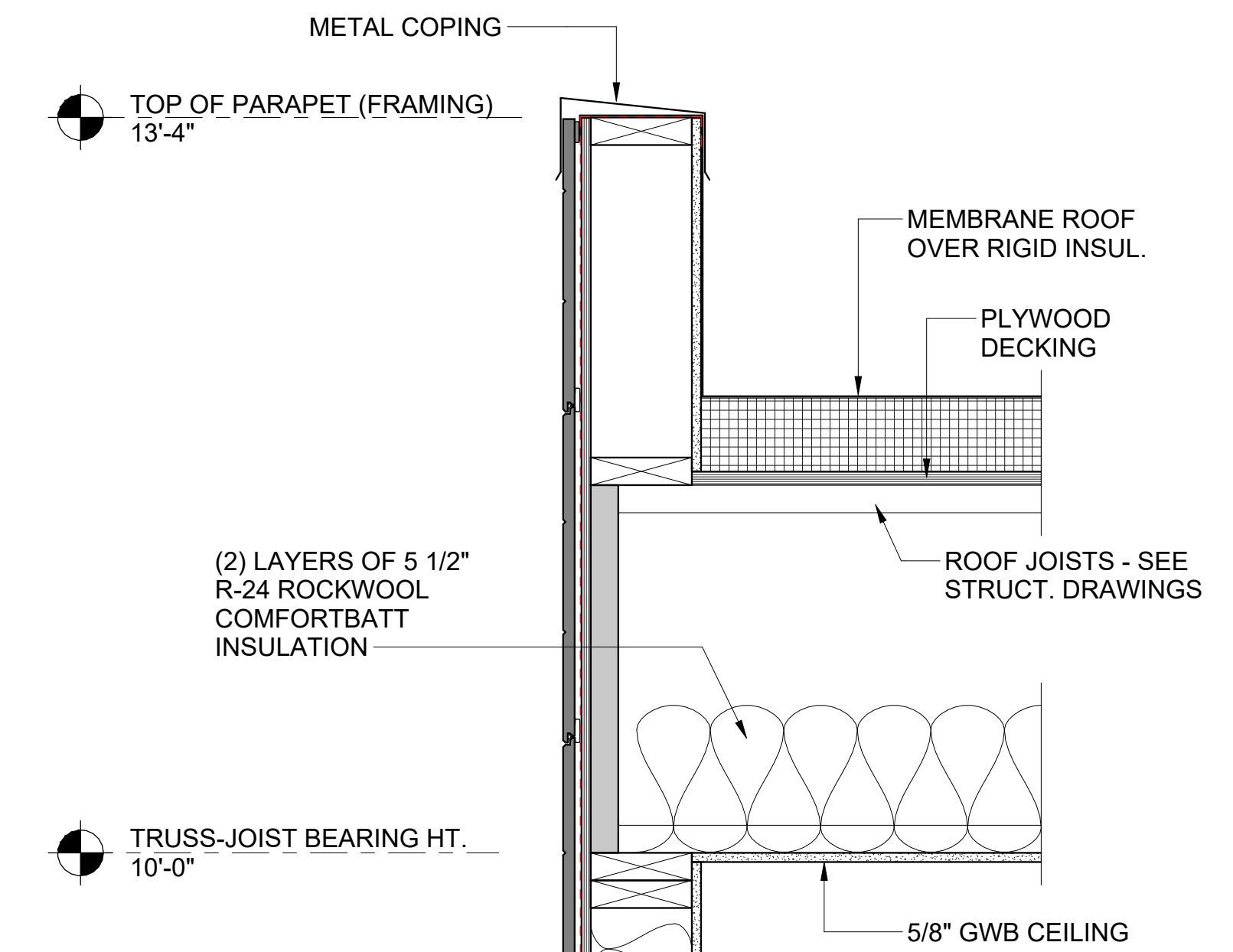
CEILING DETAIL  
 1 1 1/2" = 1'-0"



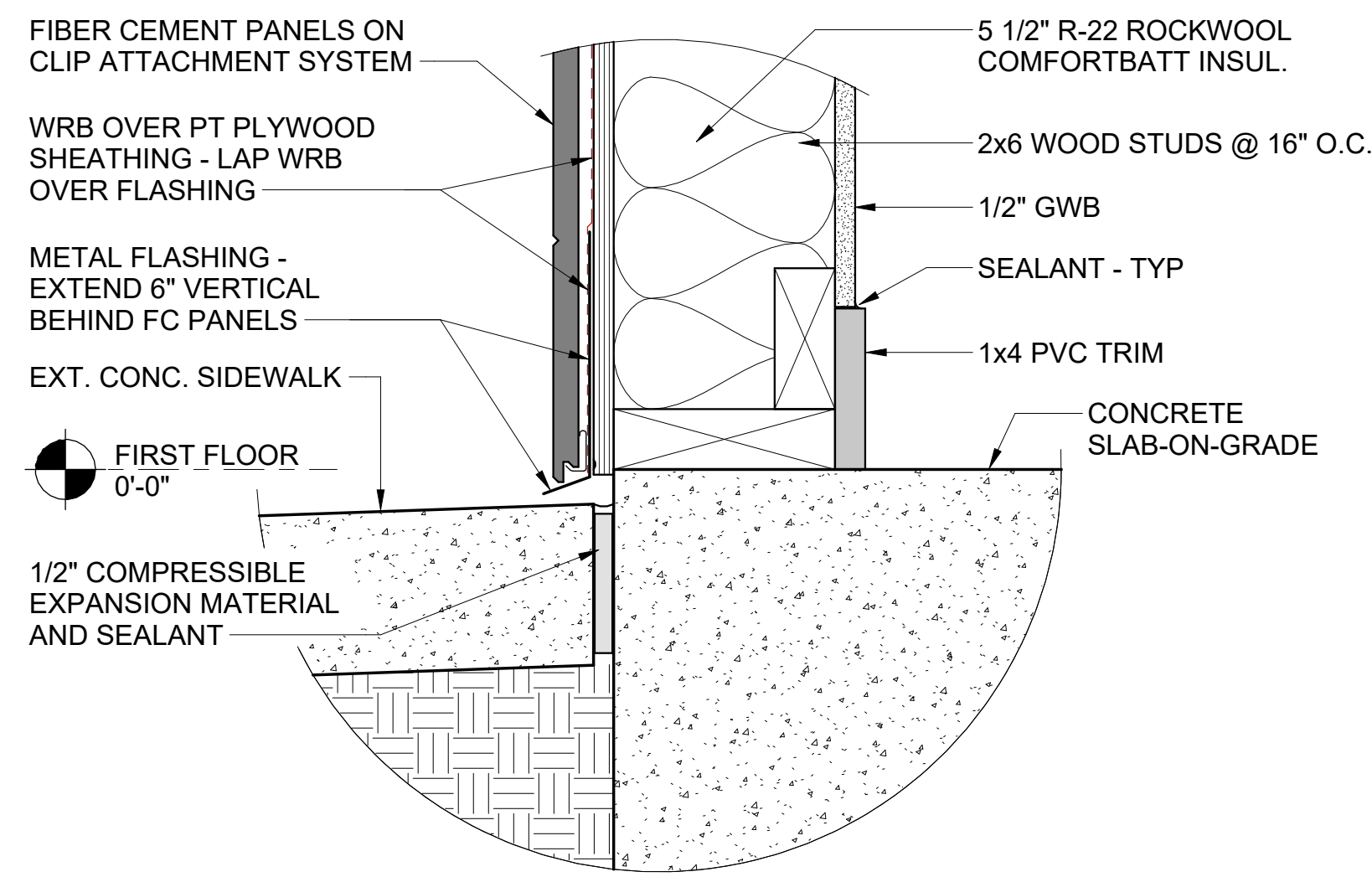
1 CEILING DETAIL  
1 1/2" = 1'-0"



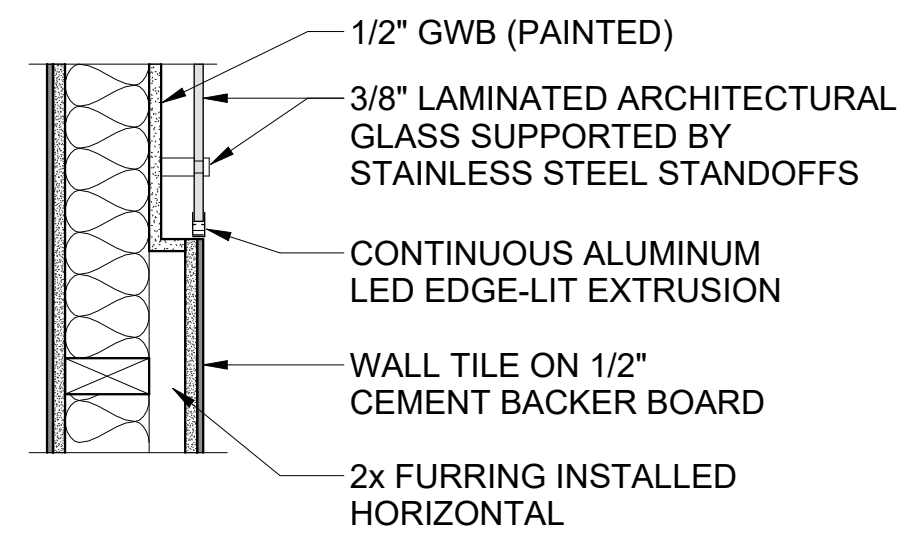
2 SECTION AT ARCHED CEILING  
3/4" = 1'-0"



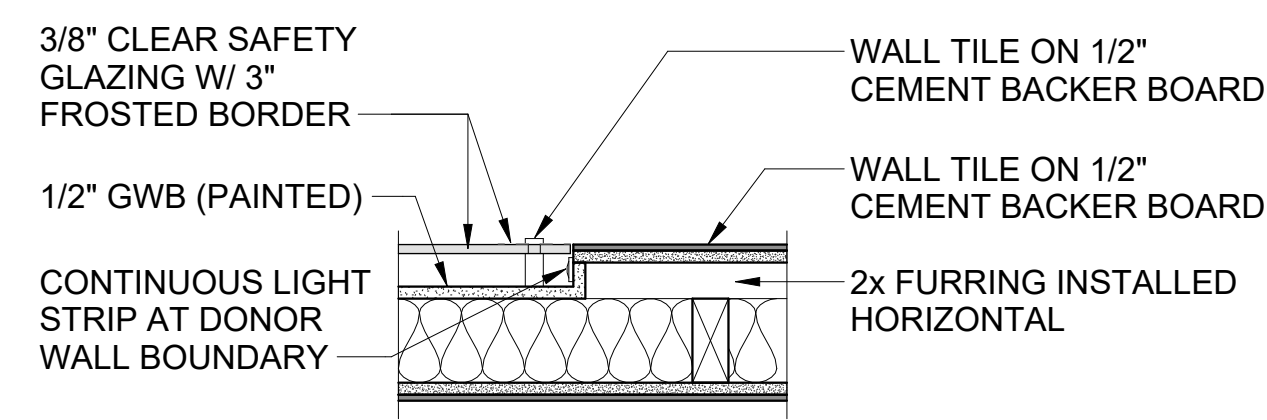
3 TYPICAL WALL DETAIL  
1 1/2" = 1'-0"



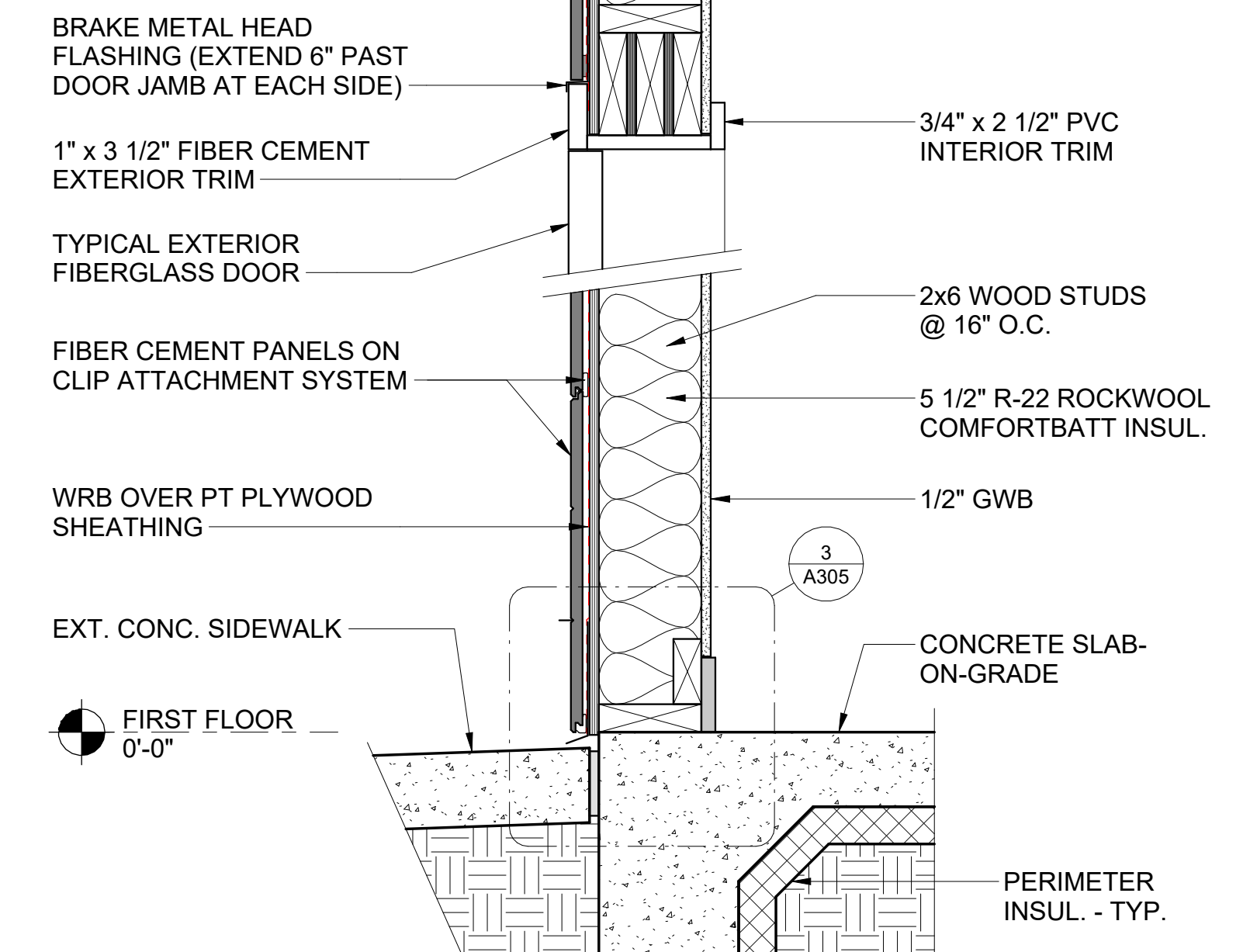
4 TYPICAL BASE OF WALL - EXTERIOR  
3" = 1'-0"



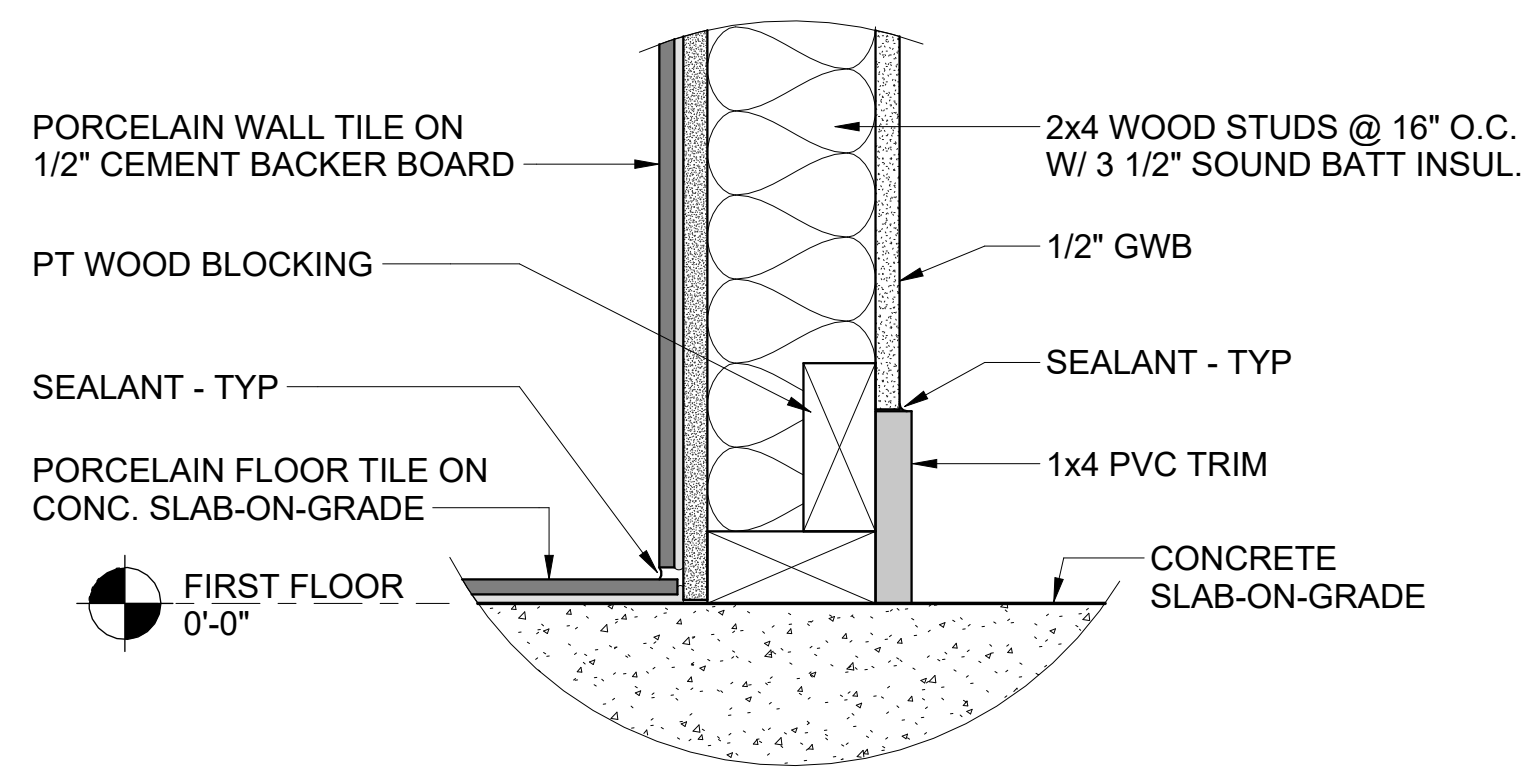
5 PLAN DETAIL  
1 1/2" = 1'-0"



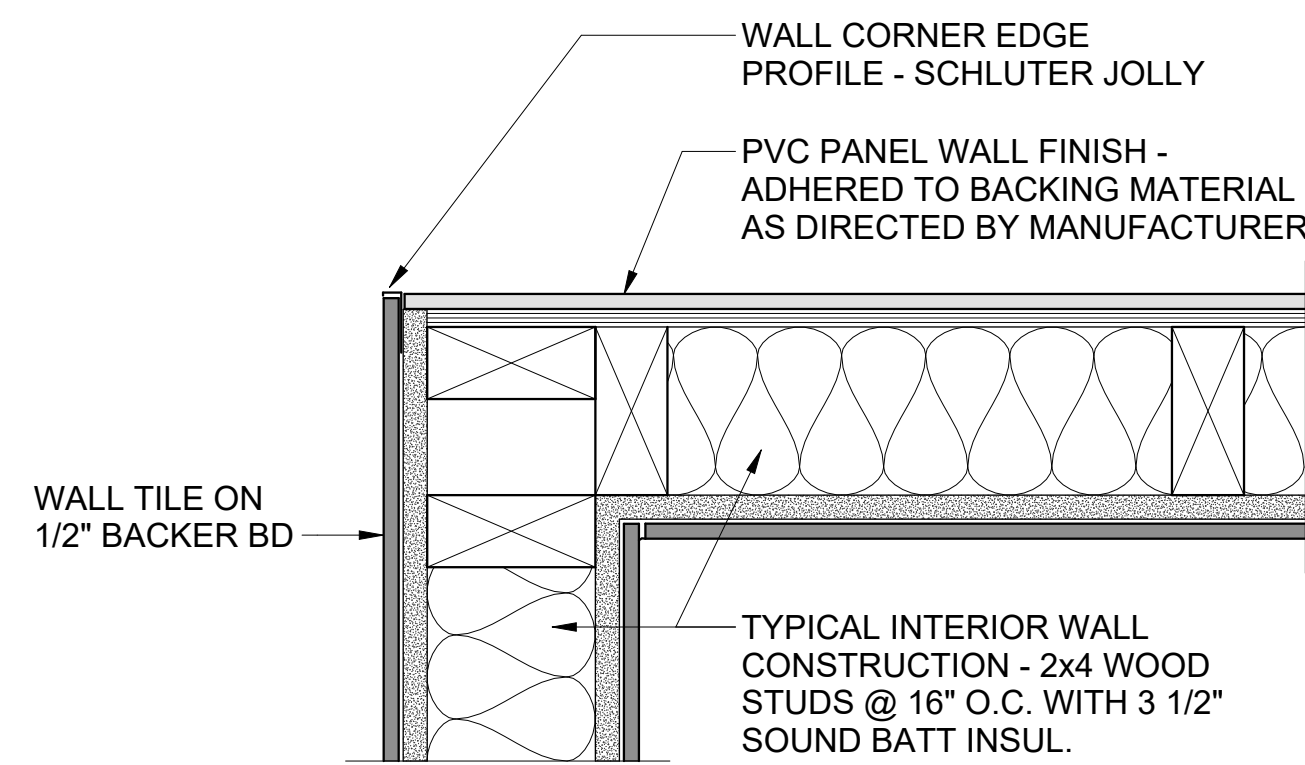
6 PLAN DETAIL  
1 1/2" = 1'-0"



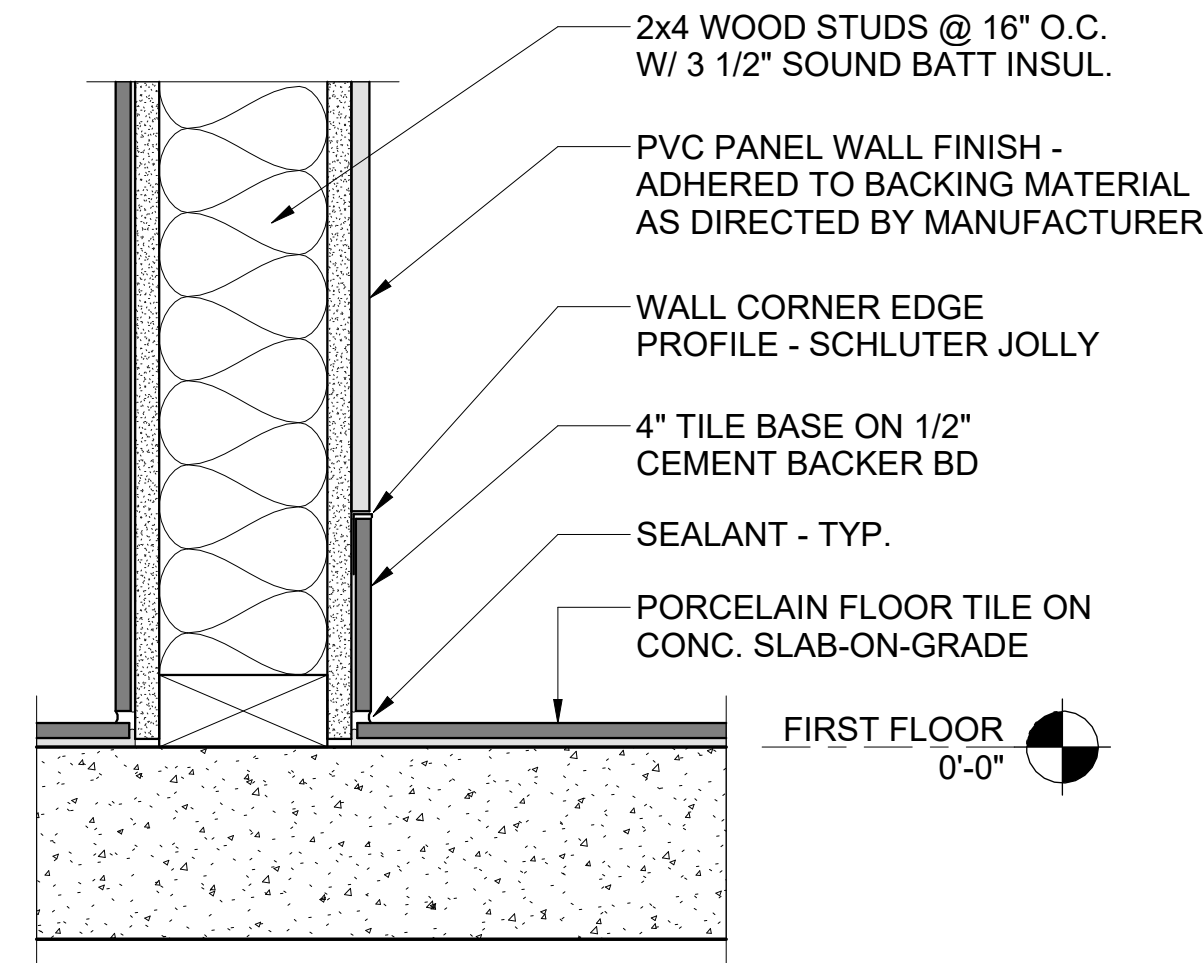
7 TYPICAL WALL DETAIL  
1 1/2" = 1'-0"



8 TYPICAL BASE OF WALL INTERIOR  
3" = 1'-0"



9 PLAN DETAIL  
3" = 1'-0"



10 BASE OF WALL AT PVC PANELS  
3" = 1'-0"

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DETAILS

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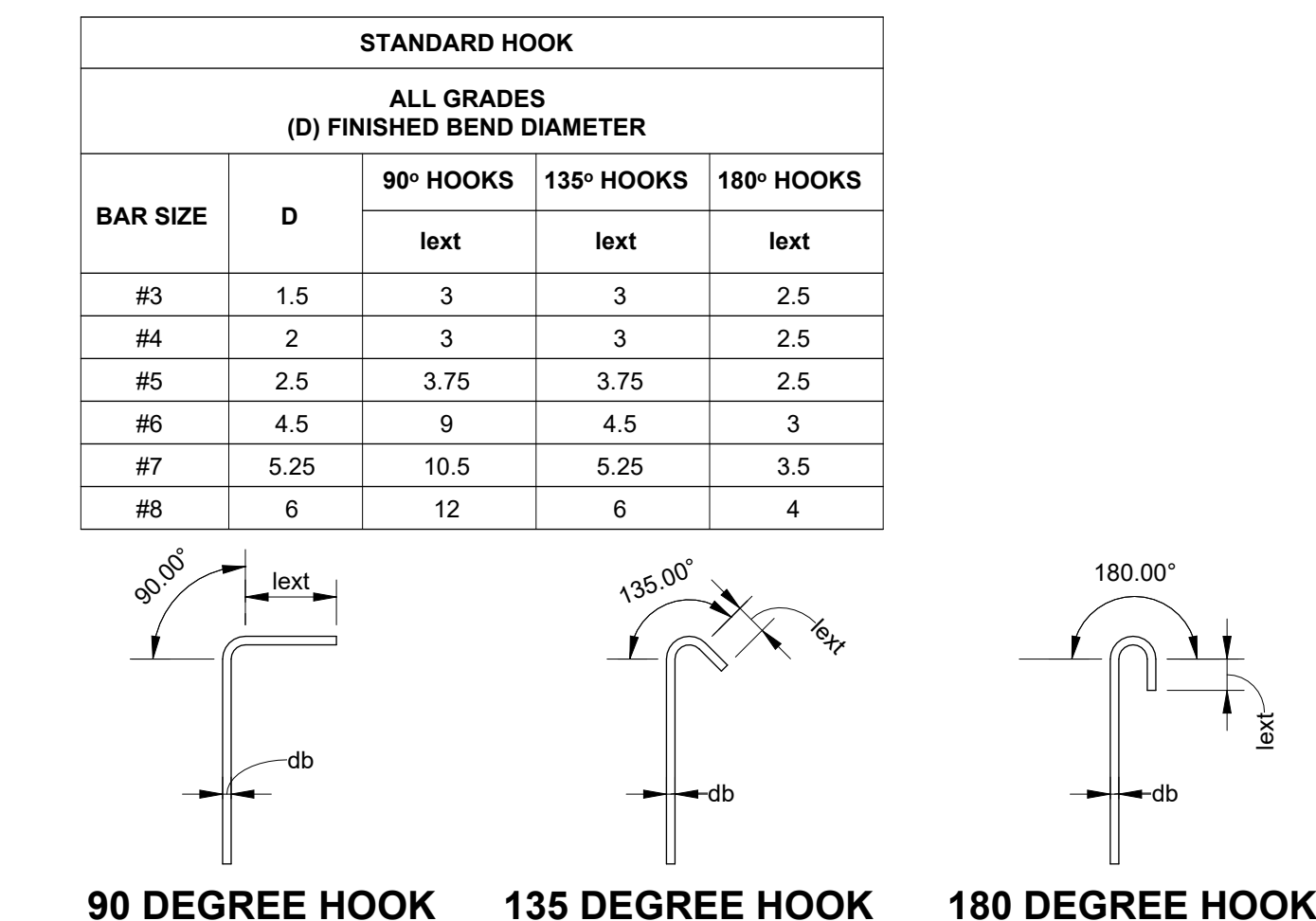
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A305

SHEET

&	AND	(E)	EXISTING
@	AT	E	EAST
	DEG	E-W	EAST-WEST
Ø	DIAMETER	EA	EACH
#	NUMBER, POUND	EF	EACH FACE
		EJ	EXPANSION JOINT
AB	ANCHOR BOLT	ELEV	ELEVATION
ACI	AMERICAN CONCRETE INSTITUTE	ELEC	ELECTRICAL
ADDL	ADDITIONAL	ELEV	ELEVATOR
ADJ	ADJACENT	EMBED	EMBEDDED
AESS	ARCHITECTURAL EXPOSED	ENGR	ENGINEER
	STRUCTURAL STEEL	EQ	EQUAL; EARTHQUAKE
AGGR	EQUIPMENT	EQUIP	EQUIPMENT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	ES	EACH SIDE
		ET	ET CETERA
ALT	ALTERNATE	EW	EACH WAY
ALUM	ALUMINUM	EXIST	EXISTING
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	EXP	EXPANSION
		EXT	EXTERIOR
APA	AMERICAN PLYWOOD ASSOCIATION	EXTD	EXTEND; EXTENDED
APPD	APPROVED		
APPROX	APPROXIMATE	F	DEGREES FAHRENHEIT
AR	ANCHOR ROD	FD	FLOOR DRAIN
ARCH	ARCHITECTURAL; ARCHITECT	FDN	FOUNDATION
ASSY	ASSEMBLY	FF	FAR FACE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	FG	FRICITION GRIP BOLT
	AMERICAN WELDING SOCIETY	FIN	FINISH
AWS		FL	FLOOR; FLOOR LINE
		FLG	FLANGE
BAL	BALANCE	FOS	FACE OF STUD
BD	BOARD	FP	FIREPROOF; FULL PENETRATION
BF	BRACED FRAME	FRMG	FRAMING
BLDG	BUILDING	FS	FULL SIZE; FAR SIDE
BLK	BLOCK; BLOCKING	FT	FOOT; FEET
BM	BEAM	FTG	FOOTING
BMU	BRICK MASONRY UNIT	FV	FIELD VERIFY
BOS	BOTTOM OF STEEL; BOSOM (WELD)		
BOT	BOTTOM	GA	GAGE GAUGE
BRCG	BRACING	GALV	GALVANIZED
BRG	BEARING	GB	GRADE BEAM
BRKT	BRACKET	GFRC	GLASS FIBER REINFORCED CONCRETE
BSMT	BASEMENT	GL	GLUED LAMINATED (BEAM)
BTWN	BETWEEN	GR	GRADE
BU	BUILT-UP	GRND	GROUND
		H	HORIZONTAL
c	CAMBER	HEF	HORIZONTAL EACH FACE
C	STANDARD CHANNEL	HGR	HANGER
CANT	CANTILEVER	HIF	HORIZONTAL INSIDE FACE
CC	CENTER TO CENTER	HOF	HORIZONTAL OUTSIDE FACE
CG	CENTER OF GRAVITY	HORIZ	HORIZONTAL
CIP	CAST-IN-PLACE	HP	HP SHAPES; HIGH POINT
CJ	CONSTRUCTION JOINT	HS	HIGH STRENGTH
CJP	COMPLET JOINT PENETRATION WELD	HSS	HOLLOW STRUCTURAL SECTION
CL	CENTERLINE	HT	HEIGHT
CLR	CLEARANCE; CLEAR		
CMU	CONCRETE MASONRY UNIT	ICC	INTERNATIONAL CODE COUNCIL
COL	COLUMN	ID	INSIDE DIAMETER
COMP	COMPRESSION	IN	INCH
CONC	CONCRETE	INCL	INCLUDE
CONFIG	CONFIGURATION	INFO	INFORMATION
CONN	CONNECTION; CONNECT	INSUL	INSULATION
CONST	CONSTRUCTION	INT	INTERIOR
CONT	CONTINUE; CONTINUOUS		
CONTR	CONTRACTOR	JST	JOIST
COORD	COORDINATE; COORDINATION	JT	JOINT
CORR	CORRUGATED		
CTR	CENTER	K	KIP (1,000 POUNDS)
CTSK	COUNTERSINK; COUNTERSUNK	KO	KNOCK-OUT
CU	CUBIC	KSI	KIPS PER SQUARE INCH
		L	ANGLE
d	PENNY (NAIL)	LAB	LABORATORY
db	NOMINAL BAR DIAMETER (INCHES)	LB	POUND
DBA	DEFORMED BAR ANCHOR	LF	LINEAL FOOT
DBL	DOUBLE	LN	LINEAL; LINEAR
DC	DEMAND CRITICAL WELD	LL	LIVE LOAD
DEG	DEGREE	LLB	LONG LEGS BACK-TO-BACK
DEMO	DEMOLISH; DEMOLITION	LLH	LONG LEG HORIZONTAL
DEPT	DEPARTMENT	LLV	LONG LEG VERTICAL
DET	DETAIL	LOC	LOCATION; LOCATE
DIA	DIAMETER	LONGIT	LONGITUDINAL
DIAG	DIAGONAL	LP	LOW POINT
DIAPH	DIAPHRAGM	LSL	LONG SLOTTED (HOLES)
DICA	DRILLED-IN CONCRETE ANCHOR	LSW	LIGHT GAGE SHEAR WALL
DIM	DIMENSION	LTWT	LIGHTWEIGHT
DISC	DISCONTINUED; DISCONTINUOUS	LVL	LEVEL
DISC	DISCONTINUED; DISCONTINUOUS	LWC	LIGHT WEIGHT CONCRETE
DL	DEAD LOAD		
DN	DOWN		
DO	DITTO		
DWG	DRAWING		
DWL	DOWEL		

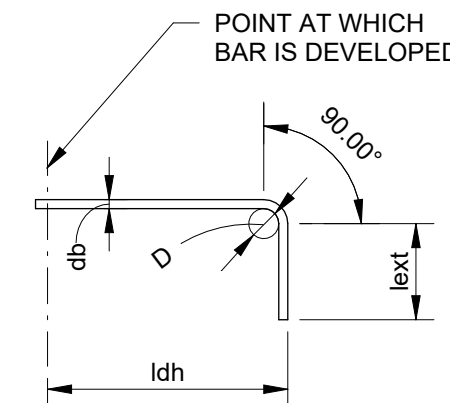
5 ABBREVIATIONS



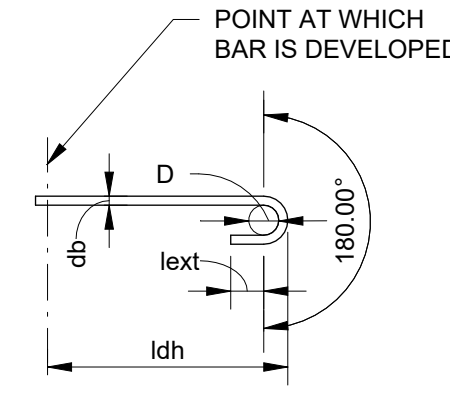
STANDARD HOOK GEOMETRY FOR STIRRUPS, TIES, AND HOOPS

MAS	MASONRY	S1S	SURFACED ONE SIDE
MATL	MATERIAL	S2S	SURFACED TWO SIDES
MAX	MAXIMUM	S4S	SURFACED FOUR SIDES
MB	MACHINE BOLT	S	AMERICAN STANDARD SHAPE; SOUTH
MC	MISCELLANEOUS CHANNEL	SB	SPACER BAR; SUPPORT BAR
MECH	MECHANICAL	SC	SLIP CRITICAL
MEMB	MEMBRANE	SCC	STRUCTURAL CONSULTANT TO THE CONTRACTOR
MEP	MECHANICAL/ELECTRICAL/PLUMBING	SCHED	SCHEDULE, SCHEDULED
MEZZ	MEZZANINE	SDQ	SPECIAL DUCTILE QUALITY SECTION
MF	MOMENT FRAME	SECT	SECTION
MFP	MOMENT FRAME BEAM	SEOR	STRUCTURAL ENGINEER OF RECORD SHEET
MFC	MOMENT FRAME COLUMN	SHT	SHEET
MFR	MANUFACTURE; MANUFACTURER	SHTG	SHEATHING
MFRG	MANUFACTURING	SIM	SIMILAR
MIN	MINIMUM, MINUTE	SLBB	SHORT LEGS BACK-TO-BACK
MISC	MISCELLANEOUS	SOB	SLAB ON GRADE
ML	MATCH LINE	SP	SPIRAL
MO	MASONRY OPENING	SPC	SPACE
MS	MECHANICAL SPLICE	SPCG	SPACING
		SPEC	SPECIFICATION
N	NORTH	SQ	SQUARE
N-S	NORTH-SOUTH	SSL	SHORT SLOTTED (HOLES)
NF	NEAR FACE	STD	STANDARD
NIC	NOT IN CONTRACT	STIFF	STIFFENER
NS	NEAR SIDE	STIRR	STIRRUP
NTS	NOT TO SCALE	STR	STRAIGHT
NWC	NORMAL WEIGHT CONCRETE	STRUC	STRUCTURAL
		SUPT	SUPPORT
OC	ON CENTER	SW	SHEAR WALL
OD	OUTSIDE DIAMETER	SYM	SYMMETRICAL
OPNG	OPENING		
OPP	OPPOSITE (HAND)	T&B	TOP AND BOTTOM
OPT	OPTION; OPTIONAL	T&G	TONGUE AND GROOVE
OVS	OVERSIZED (HOLES)	TBD	TO BE DETERMINED
OWJ	OPEN WEB JOIST	TEMP	TEMPERATURE; TEMPORARY
		THK	THICK; THICKNESS
P	PIPE	TOC	TOP OF CURB; TOP OF CONCRETE
PC	PRECAST	TOF	TOP OF FOOTING
PCF	POUNDS PER CUBIC FOOT	TOS	TOP OF STEEL
PCP	PRECAST CONCRETE PANEL	TOW	TOP OF WALL
PCP	PRECAST CONCRETE PANEL	TOW	TOP OF WALL
GL	GLUED LAMINATED (BEAM)	TRANS	TRANSVERSE
PERP	PERPENDICULAR	PH	PENTHOUSE
PH	PARTIAL JOINT PENETRATION WELD	PJP.PP	PARTIAL JOINT PENETRATION WELD
PL	PLATE	PLC	PLACE
PLC	PLACE	PLF	POUNDS PER LINEAL FOOT
PLF	POUNDS PER LINEAL FOOT	PLYWD	PLYWOOD
PLYWD	PLYWOOD	PREFAB	PREFABRICATED
PS	PRESTRESSED	PS	PRESTRESSED
PSF	POUNDS PER SQUARE FOOT	PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH	PT	POST-TENSIONED
PT	POST-TENSIONED	PVC	POLYVINYL CHLORIDE
PVC	POLYVINYL CHLORIDE		
R	RADIUS		
RB	RISER BAR		
ID	INSIDE DIAMETER		
RC	REINFORCED CONCRETE		
RCMD	RECOMMEND	W	WIDE FLANGE; WIDE; WEST
REF	REFERENCE	W/O	WITHOUT
REINF	REINFORCE; REINFORCING; REINFORCEMENT	WD	WOOD
		WF	WIDE FLANGE
REQD	REQUIRED	WH	WEEP HOLE
REQT	REQUIREMENT	WL	WORK LINE
		WP	WORK POINT
		WPJ	WEAKENED PLANE JOINT
		WT	WEIGHT; STRUCTURAL TEE CUT FROM W SHAPE
		WWF	WELDED WIRE FABRIC
		WWR	WELDED WIRE REINFORCING
		YD	YARD

STANDARD HOOK			
ALL GRADES (D) FINISHED BEND DIAMETER			
BAR SIZE	D	HOOKS	
		90° HOOKS	180° HOOKS
#3	2.25	4.5	2.5
#4	3	6	2.5
#5	3.75	7.5	2.5
#6	4.5	9	3
#7	5.25	10.5	3.5
#8	6	12	4
#9	9	13.5	4.5
#10	10.25	15.25	5
#11	11.25	17	5.75
#14	17	20.25	6.75
#18	22.5	27	9



90 DEGREE HOOK



180 DEGREE HOOK

10 TYP STANDARD HOOK GEOMETRY

3 REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH NOTES

- NOTES:
- NOTATIONS:  
db: NOMINAL BAR DIAMETER (INCHES)  
Ld: TENSION DEVELOPMENT LENGTH (INCHES) FOR REINFORCEMENT SATISFYING THE FOLLOWING REQUIREMENTS:  
SLABS AND WALLS: CLEAR SPACING > 2db, AND CONCRETE CLEAR COVER > db  
BEAMS AND COLUMNS: CLEAR SPACING > db, AND CONCRETE CLEAR COVER > db  
L: DEVELOPMENT LENGTH OF BARS IN THICK CONCRETE = 1.3 x Ld (INCHES)  
Lb: DEVELOPMENT LENGTH OF BARS OR DOWELS IN COMPRESSION = 19 x db (INCHES)  
Lc: SPIRAL COLUMN LAP SPLICE IN COMPRESSION = 30 x db (INCHES)  
Lcs: SPIRAL COLUMN LAP SPLICE IN COMPRESSION = 22.5 x db (INCHES)  
Lsb: TYPICAL LAP SPLICE LENGTH = 1.3 x Ld (INCHES)  
Lsbt: LAP SPLICE LENGTH OF HORIZONTAL BARS IN THICK CONCRETE = 1.69 x Ld (INCHES)  
Ldh: DEVELOPMENT LENGTH OF TENSION OF STANDARD HOOK, WITH SIDE COVER ≥ 2 1/2"  
Ldt: DEVELOPMENT LENGTH IN TENSION OF HEADER BAR (INCHES)  
D: FINISHED BEND DIAMETER (INCHES)  
lext: STRAIGHT EXTENSION AT THE END OF A HOOK (INCHES)
  - MULTIPLY VALUES IN THE TABLE BY 1.5 IF CLEAR SPACING OR CONCRETE COVER DO NOT MEET THE REQUIREMENTS FOR Ld IN NOTE 1.
  - "HORIZONTAL BARS IN THICK CONCRETE" REFERS TO BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST BELOW. THIS INCLUDES BEAMS, SLABS, FOUNDATIONS, AND WALLS.
  - #14 AND #18 BARS SHALL NOT BE LAP SPLICED. SEE "GENERAL NOTES"

f'c = 3,000 PSI / GRADE 60						
BAR SIZE	Ld	Lt	Lsb	Lsbt	Ldt	Ldh
#3	17	22	22	28	6	6
#4	22	29	29	38	7	6
#5	28	36	36	47	10	8
#6	33	43	43	56	13	11
#7	48	63	63	81	16	14
#8	55	72	72	93	19	16
#9	62	81	81	105	23	20
#10	70	91	91	118	27	23
#11	78	101	101	131	32	27
#14	93	121	-	-	-	71
#18	124	161	-	-	-	109

f'c = 4,000 PSI / GRADE 60						
BAR SIZE	Ld	Lt	Lsb	Lsbt	Ldt	Ldh
#3	15	19	19	25	6	6
#4	19	25	25	33	7	6
#5	24	31	31	41	9	8
#6	29	37	37	49	12	10
#7	42	54	54	71	15	13
#8	48	62	62	81	18	15
#9	54	70	70	91	22	18
#10	61	79	79	102	26	22
#11	67	87	87	114	30	26
#14	81	105	-	-	-	66
#18	108	140	-	-	-	102

ALL CONCRETE STRENGTHS / GRADE 60			
BAR SIZE	Lb	Lc	Lcs
#3	8	12	9
#4	9	15	12
#5	12	19	15
#6	14	23	17
#7	16	27	20
#8	18	30	23
#9	21	34	26
#10	23	39	29
#11	26	43	32
#14	31	-	-
#18	41	-	-

7 REINFORCING BAR DEVELOPMENT LENGTHS AND LAP SPLICES - GRADE 60

**SPECIAL INSPECTION**

THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION AND TESTING PER IBC SECTION 1705. THIS WORK SHALL BE PERFORMED BY A SPECIAL INSPECTOR CERTIFIED BY THE COMMONWEALTH OF VIRGINIA TO PERFORM THE TYPES OF INSPECTIONS AND TESTS SPECIFIED. THE FREQUENCY OF INSPECTIONS AND TESTING SHALL BE AS OUTLINED IN THE IBC TABLE ITEMS LISTED BELOW. DEFICIENCIES SHALL BE REPORTED DAILY TO THE CONTRACTOR. SUMMARY REPORTS SHALL BE DISTRIBUTED WEEKLY TO THE OWNER, ARCHITECT, CONTRACTOR, BUILDING OFFICIAL, AND STRUCTURAL ENGINEER. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING.

ITEM	DESCRIPTION (REFER TO IBC SECTION 1705)	IBC TABLE REQUIREMENTS
CONCRETE	CONCRETE THAT IS PART OF THE STRUCTURE.	SECTION 1705.2, TABLE 1705.3 ITEMS 5, 6, 7, 8, 11, 12
ACHORS CAST IN CONCRETE		TABLE 1705.3, ITEM 3
ANCHORS POST-INSTALLED IN HARDENED CONCRETE	INSTALLATION OF MECHANICAL AND ADHESIVE ANCHORS	TABLE 1705.3, TABLE 4
REINFORCING STEEL	PLACEMENT OF REINFORCING STEEL	TABLE 1705.3, ITEM 1
STRUCTURAL WOOD		SECTION 1705.5
SOILS		SECTION 1705.6, TABLE 1705.6

SHEET LIST	
SHEET NUMBER	SHEET NAME
S001	ABBREVIATIONS, REINFORCING, SHEET LIST
S002	GENERAL NOTES
S101	FOUNDATION PLAN
S102	ROOF FRAMING PLAN
S201	TYPICAL FOUNDATION DETAILS AND SCHEDULES
S202	TYPICAL WOOD DETAILS
S301	TYPICAL SHEAR WALL DETAILS
S401	SECTIONS AND DETAILS

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ABBREVIATIONS, REINFORCING, SHEET LIST

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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No.		

**GENERAL**

ALL TYPICAL DETAILS AND NOTES SHOWN ON DRAWINGS SHALL APPLY UNLESS NOTED OTHERWISE. TYPICAL DETAILS MAY NOT NECESSARILY BE INDICATED ON THE PLANS, BUT SHALL STILL APPLY AS SHOWN OR DESCRIBED IN THE DETAILS. WHERE TYPICAL DETAILS ARE NOTED ON THE DRAWINGS, THE SPECIFIED TYPICAL DETAIL SHALL BE USED. WHERE NO DETAIL IS NOTED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CHOOSE THE APPROPRIATE TYPICAL DETAIL FROM THOSE PROVIDED. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ALTERNATE TYPICAL DETAILS TO THOSE PROVIDED WITH THE RELATED CALCULATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO SHOP DRAWING PRODUCTION AND FIELD USE.

3D VIEWS (INCLUDING AXONOMETRICS, ISOMETRICS, PERSPECTIVES, ETC.) ARE PROVIDED FOR REFERENCE PURPOSES ONLY. IN THE EVENT OF ANY DISCREPANCIES BETWEEN INFORMATION REPRESENTED BY BOTH A 3D VIEW AND BY A NON-3D VIEW WITHIN THE CONSTRUCTION DOCUMENTS, THE NON-3D VIEW SHALL GOVERN IN ALL CASES. INFORMATION REPRESENTED BY 3D VIEWS BUT NOT REPRESENTED ELSEWHERE IN THE CONSTRUCTION DOCUMENTS IS NOT INTENDED TO BE PART OF THE CONSTRUCTION DOCUMENTS.

**BUILDING CODE**

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING CODE. THE PUBLICATIONS LISTED BELOW ARE THE GOVERNING CODES AND STANDARDS AND ARE REFERENCED BY THEIR BASIC DESIGNATION. IN THE CASE OF CONFLICTING REQUIREMENTS, THE BUILDING CODE SHALL GOVERN.

**APPLICABLE CODES AND STANDARDS**

BUILDING CODE	INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION
ACI 318	AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE," 2019 EDITION
RCSC	RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS, "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS," 2014 EDITION
ANSI/AWC NDS	AMERICAN WOOD COUNCIL, "NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION WITH NDS SUPPLEMENT," 2018 EDITION
ASCE 7	AMERICAN SOCIETY OF CIVIL ENGINEERS, "MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES," 2022 EDITION
ICC	INTERNATIONAL CODE COUNCIL, INTERNATIONAL CODE COUNCIL - EVALUATION SERVICES (ICC-ES)
IAPMO	INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS - UNIFORM EVALUATION SERVICE (IAPMO-UES)

**STRUCTURAL DESIGN DATA**

**LOAD COMBINATIONS:** LOAD COMBINATIONS ARE IN ACCORDANCE WITH SECTION 1605 OF THE BUILDING CODE.

**LIVE LOADS:** FIRST FLOOR: 100PSF  
ROOF: 20PSF

**SNOW LOADS:** SNOW LOADING AND SNOW DRIFT LOADING SHALL BE IN ACCORDANCE WITH THE BUILDING CODE (SECTION 1608).

GROUND SNOW LOAD:  $P_g = 46$  PSF

IMPORTANCE FACTOR:  $I_s = 1.0$

SNOW EXPOSURE FACTOR:  $C_e = 1.15$

THERMAL FACTOR:  $C_t = 1.15$

FLAT-ROOF SNOW LOAD:  $P_f = 37.0$  PSF

**WIND LOADS:** WIND PRESSURE SHALL BE IN ACCORDANCE WITH THE BUILDING CODE (SECTION 1609).

BASIC WIND SPEED (3-SECOND GUST):  $V_{ult} = 108$  MPH  
BASIC WIND SPEED (3-SECOND GUST):  $V_{asd} = 83.7$  MPH

RISK CATEGORY: II

EXPOSURE CATEGORY: B

INTERNAL PRESSURE COEFFICIENT:  $GC_{pi} = +/- 0.18$

**SEISMIC LOADS:** SEISMIC LOADING SHALL BE IN ACCORDANCE WITH THE BUILDING CODE.

BUILDING LOCATION: LATITUDE: 37.2271° N  
LONGITUDE: 80.4159° W

RISK CATEGORY: II

IMPORTANCE FACTOR:  $I_e = 1.0$

SITE CLASS: D

SPECTRAL RESPONSE COEFFICIENTS:  $S_{ds} = 0.22$ ,  $S_{d1} = 0.11$

SEISMIC DESIGN CATEGORY: B

LATERAL SYSTEM: LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE

RESPONSE MODIFICATION COEFFICIENT:  $R = 6/12$

SEISMIC RESPONSE COEFFICIENT:  $C_s = 0.03$

DESIGN BASE SHEAR:  $V = 0.68$  KIPS

ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE

**STORY DRIFT**

THE PRIMARY STRUCTURE WILL EXPERIENCE LATERAL MOVEMENTS BETWEEN ADJACENT FLOORS. THE STORY DRIFTS PERPENDICULAR AND/OR PARALLEL TO THE PRIMARY STRUCTURE ARE AS FOLLOWS:

**SEISMIC DRIFT**

LEVELS	SERVICE LEVEL STORY DRIFT	DESIGN STORY DRIFT, $I_e D_p$
1	H/400	H/200

**WIND DRIFT**

LEVELS	SERVICE LEVEL STORY DRIFT	DESIGN STORY DRIFT
1	H/400	H/100

WHERE REQUIRED BY THE BUILDING CODE, NON-STRUCTURAL COMPONENTS INCLUDING EXTERIOR CLADDING, STAIRS, ELEVATORS, AND MISCELLANEOUS METALS; MECHANICAL/ELECTRICAL/PLUMBING SYSTEM SUPPORTS; INTERIOR METAL STUD FRAMING; AND ANY OTHER ELEMENTS REQUIRED BY THE BUILDING CODE SHALL BE DESIGNED TO ACCOMMODATE THE PRIMARY STRUCTURE STORY DRIFTS WITH ANY APPLICABLE ELEMENT-SPECIFIC MODIFICATIONS PER CHAPTER 13 OF ASCE 7.

**FOUNDATIONS**

**SPREAD FOOTINGS:** DESIGN SOIL BEARING PRESSURE = 1,500 PSF. ALL FOOTINGS SHALL BEAR ON SUITABLE UNDISTURBED SOIL AND/OR PREPARED BASE MATERIALS APPROVED BY A GEOTECHNICAL ENGINEER LICENSED IN THE JURISDICTION WHERE THE PROJECT IS LOCATED. WHERE SUITABLE UNDISTURBED SOILS ARE NOT FOUND AT THE SPECIFIED FOOTING ELEVATION, OVER-EXCAVATE TO THE DEPTHS REQUIRED BY THE GEOTECHNICAL ENGINEER AND REPLACE MATERIALS WITH STRUCTURAL FILL, LEAN CONCRETE, OR PROVIDE OTHER PREPARATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER TO ACHIEVE THE REQUIRED BEARING CAPACITY.

**CONCRETE**

MIXING, BATCHING, TRANSPORTING, PLACING, AND CURING OF ALL CONCRETE, AND SELECTION OF CONCRETE MATERIALS, SHALL CONFORM TO ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE," EXCEPT AS NOTED BELOW. PROPORTIONS OF AGGREGATE TO CEMENTITIOUS PASTE SHALL BE SUCH AS TO PRODUCE A DENSE, WORKABLE MIX THAT CAN BE PLACED WITHOUT SEGREGATION OR EXCESS FREE SURFACE WATER.

MIX DESIGNS LISTED BELOW SHALL BE SUBMITTED TO THE ARCHITECT AND APPROVED PRIOR TO USE. SELECTION OF CONCRETE MIX PROPORTIONS SHALL BE IN ACCORDANCE WITH ACI 301. MIX PROPORTIONS SHALL MEET OR EXCEED THE REQUIREMENTS LISTED BELOW FOR THE LOCATIONS NOTED. THE MORE STRINGENT OF THE REQUIREMENTS LISTED SHALL GOVERN.

PROVIDE ASTM C150 (TYPE I OR II) OR ASTM C595 (TYPE II, IS, IP, OR IT) CEMENT UNLESS NOTED OTHERWISE. THE CEMENTITIOUS MATERIAL CONTENT SHALL BE ADEQUATE FOR THE SPECIFIED REQUIREMENTS FOR STRENGTH, WATER-CEMENT RATIO, DURABILITY, AND FINISH ABILITY.

MAXIMUM COMPLEMENTARY CEMENTING MATERIALS (EX. FLY ASH, SLAG, SILICA FUME) AS A PERCENTAGE OF TOTAL WEIGHT OF CEMENTITIOUS MATERIAL SHALL BE 60 PERCENT. FLY ASH SHALL MEET ASTM C618 REQUIREMENTS, AND SHALL NOT EXCEED 30 PERCENT OF TOTAL CEMENTITIOUS MATERIAL. WATER/CEMENT RATIO SHALL BE BASED ON TOTAL CEMENTITIOUS MATERIAL, INCLUDING COMPLEMENTARY CEMENTING MATERIALS. NOMINAL MAXIMUM SIZE OF AGGREGATE SHALL BE AS LISTED BELOW.

ALL CONCRETE USED IN HORIZONTAL SURFACES EXPOSED TO THE WEATHER SHALL CONTAIN AN ACCEPTABLE ADMIXTURE TO PRODUCE AIR-ENTRAINED CONCRETE WITH TOTAL AIR CONTENT AS NOTED IN THE CONCRETE MIX SPECIFICATION TABLE. TOLERANCE FOR AIR CONTENT SHALL BE +/-1.5 PERCENT. AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK. IF CONCRETE IS PUMPED, AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP LINE. TESTS FOR AIR CONTENT SHALL MEET ASTM C172 REQUIREMENTS.

THE CONTRACTOR SHALL DETERMINE SLUMP. EACH CONCRETE MIX SUBMITTED SHALL HAVE THE SLUMP SPECIFIED. SLUMP SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK. IF CONCRETE IS PUMPED, SLUMP SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP. SLUMPS SHALL BE WITHIN +1 INCH AND -2 INCHES OF THE SPECIFIED SLUMP.

THE USE OF SUPER PLASTICIZERS AND WATER REDUCERS IS ALLOWED, BUT NOT REQUIRED. ALL ADMIXTURES SHALL BE CHLORIDE-FREE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

**CONCRETE MIX SPECIFICATION TABLE**

LOCATION	F <sub>c</sub> MIN (PSI)	TEST AGE (DAYS)	MAX W/C RATIO	NOMINAL MAX AGG SIZE	AIR CONTENT PERCENT
MISCELLANEOUS CONCRETE, CURBS, SIDEWALKS	3,000	28	0.50	1"	4.5
EXTERIOR EXPOSED SLABS ON GRADE	4,000	28	0.45	1"	4.5
INTERIOR SLABS ON GRADE	4,000	28	0.50	1"	-
CONCRETE WALLS, SPREAD FOOTINGS	4,000	28	0.44	1"	-

**REINFORCING STEEL**

ALL REINFORCING SHALL BE NEW BILLET STOCK ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE. BARS SHALL BE SECURELY TIED IN PLACE WITH #16 GAGE MINIMUM ANNEALED BLACK WIRE. BARS SHALL BE SUPPORTED ON CHAIRS IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE. THE CONTRACTOR SHALL COORDINATE REINFORCING STEEL IN CONGESTED AREAS AS NECESSARY. SHOP DRAWINGS (INCLUDING LACING PLANS AND ELEVATIONS) SHALL BE SUBMITTED TO, AND REVIEWED BY, THE ARCHITECT/ENGINEER BEFORE STARTING FABRICATION.

REINFORCING BARS SHALL BE LAP SPLICED FOR TENSION UNLESS NOTED OTHERWISE ON THE DRAWINGS. NO REINFORCING BARS SHALL BE SPLICED BY WELDING.

WELDING OR TACK WELDING OF REINFORCING BARS TO OTHER BARS OR TO PLATES, ANGLES, ETC. IS PROHIBITED, EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER. WHERE WELDING IS APPROVED, IT SHALL BE DONE BY AWS CERTIFIED WELDERS USING E9018 OR APPROVED ELECTRODES. WELDING PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.4.

CAST-IN-PLACE CONCRETE COVER OVER REINFORCING STEEL, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:

- CONCRETE CAST AGAINST EARTH
  - ALL BAR SIZES: 3 INCHES
- CONCRETE EXPOSED TO EARTH OR WEATHER:
  - #6 BAR OR LARGER: 2 INCHES
  - #5 BAR OR SMALLER: 1-1/2 INCHES
- OTHER CONCRETE
  - SLABS:
    - TOP BARS: 3/4 INCH
    - BOTTOM BARS: 1 INCH
  - WALLS:
    - BARS AND SMALLER: 1 INCH

SPECIFIED CONCRETE COVER SHALL BE MAINTAINED TO ALL REINFORCEMENT AT CONCRETE REVEALS AND INSETS. SHOP DRAWINGS SHOWING CONCRETE REVEALS AND OTHER INSETS SHALL BE SUBMITTED FOR REVIEW.

**WELDED WIRE REINFORCEMENT**

WELDED WIRE REINFORCEMENT (WWR) SHALL BE ELECTRICALLY WELDED AND CONFORM TO ASTM A1064. LAP EDGES AND ENDS OF REINFORCEMENT A MINIMUM OF ONE MESH SPACING PLUS 2 INCHES, BUT NOT LESS THAN 6 INCHES. WELDED WIRE REINFORCEMENT SHALL BE SUPPORTED ON CHAIRS IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.

**MISCELLANEOUS METALS**

THE CONTRACTOR SHALL DESIGN AND SUPPLY ALL ADDITIONAL MISCELLANEOUS METALS THAT ARE INDICATED IN THE ARCHITECTURAL DRAWINGS OR THOSE METALS WHICH ARE FOUND TO BE NECESSARY TO SUPPORT THE ARCHITECTURAL FINISHES OR OTHER BUILDING SYSTEMS WHERE REQUIRED BY THE BUILDING CODE. THE MISCELLANEOUS METALS SHALL ACCOMMODATE LATERAL MOVEMENTS BETWEEN ADJACENT FLOORS AS DEFINED IN THE STORY DRIFT SECTION OF THESE NOTES.

ALL FRAMING AND CONNECTIONS DESIGNED BY THE CONTRACTOR SHALL NOT RESULT IN ECCENTRIC LOADS BEING APPLIED TO THE PRIMARY STRUCTURE NOR LATERAL LOADS BEING APPLIED TO THE BOTTOM FLANGE OF STEEL BEAMS. THE CONTRACTOR'S DESIGN SHALL VERIFY THAT THE CONNECTIONS DO NOT RESULT IN ADVERSE LOCAL CONNECTION STRESSES OCCURRING WITHIN THE PRIMARY STRUCTURE. SUBMIT CALCULATIONS STAMPED BY AN ENGINEER LICENSED TO PERFORM THE WORK IN THE JURISDICTION WHERE THE PROJECT IS LOCATED AND SHOP DRAWINGS INDICATING IMPOSED LOADS ON THE PRIMARY STRUCTURE.

**ANCHORAGE TO HARDENED CONCRETE**

ANCHORAGE TO HARDENED CONCRETE SHALL INCLUDE MECHANICAL AND ADHESIVE ANCHORS OF SIZE, NUMBER, AND SPACING AS SHOWN ON THE DRAWINGS. HOLES SHALL BE DRILLED AND CLEANED AND ANCHORS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS AND AN APPROVED ICC-ES (OR IAPMO-UES EQUIVALENT) REPORT. INSPECTION AND TESTING SHALL BE PROVIDED IN ACCORDANCE WITH THE GENERAL NOTES AND THE APPROVED ICC-ES (OR IAPMO-UES EQUIVALENT) REPORT.

WHERE THE ANCHOR TYPE IS SPECIFIED ON THE DRAWINGS, SUBSTITUTION FOR A DIFFERENT TYPE OF ANCHORAGE (INCLUDING SUBSTITUTING FOR A CAST-IN-PLACE ANCHORAGE) SHALL NOT BE PERMITTED WITHOUT PRIOR CONSENT OF THE ENGINEER.

ACCEPTABLE ANCHORS SHALL HAVE A CURRENT ICC-ES (OR IAPMO-UES EQUIVALENT) REPORT INDICATING THAT THE ANCHOR IS PERMITTED FOR RESISTING APPLIED LOADS IN CRACKED CONCRETE. UNLESS NOTED OTHERWISE, ANCHORS SHALL BE ASTM A36 THREADED ROD OR ASTM A615, GRADE 60 REINFORCING STEEL DOWELS.

WHEN EMBEDMENT IS NOTED ON THE DRAWINGS, THE ANCHOR EFFECTIVE EMBEDMENT DEPTH SHALL EQUAL OR EXCEED THE NOTED EMBEDMENT DEPTH. WHERE NO EMBEDMENT IS NOTED ON THE DRAWINGS, THE MINIMUM EFFECTIVE ANCHOR EMBEDMENT DEPTH SHALL BE 6.5 ANCHOR DIAMETERS. MINIMUM DISTANCE TO THE NEAREST CONCRETE EDGE SHALL BE 12 ANCHOR DIAMETERS, AND MINIMUM ANCHOR SPACING SHALL BE 8 ANCHOR DIAMETERS.

HOLES SHALL BE DRILLED WITH ROTARY IMPACT HAMMER OR EQUIVALENT METHOD TO PRODUCE A HOLE WITH A ROUGH INSIDE SURFACE. CORE DRILLING IS NOT PERMITTED. NO STEEL REINFORCEMENT SHALL BE CUT TO INSTALL ANCHORS. THE ADHESIVE SHALL BE MIXED, APPLIED, AND CURED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS IN THE ICC-ES (OR IAPMO-UES EQUIVALENT) REPORT. ALL PLACEMENT AND CURING SHALL BE CONDUCTED WITH CONCRETE AND AIR TEMPERATURES ABOVE 50 DEGREES FAHRENHEIT. ADHESIVE SHALL BE APPLIED ONLY TO CLEAN, DRY CONCRETE. POSITIVE PROTECTION SHALL BE PROVIDED SO THAT ANCHORS ARE NOT DISTURBED DURING THE CURING PERIOD. STAINLESS STEEL ANCHORS SHALL BE USED AT ALL EXTERIOR LOCATIONS AND WHERE SPECIFICALLY INDICATED ON THE DRAWINGS. DEFECTIVE OR ABANDONED HOLES SHALL BE FILLED WITH NON-SHRINK GROUT OR AN INJECTABLE ADHESIVE MATCHING THE ADJACENT CONCRETE COMPRESSIVE STRENGTH. NOTIFY THE STRUCTURAL ENGINEER OF DEFECTIVE OR ABANDONED HOLES IN WALLS AND COLUMNS. THESE ELEMENTS MAY REQUIRE NON-SHRINK GROUT WITH A COMPRESSIVE MODULUS OF ELASTICITY MATCHING THAT OF THE ADJACENT CONCRETE.

**FRAMING LUMBER**

ALL FRAMING LUMBER SHALL BE A MINIMUM OF SOUTHERN PINE NO. 2 AND SHALL BE KILN DRIED OR MC-19, AND GRADED AND MARKED IN CONFORMANCE WITH THE SOUTHERN PINE INSPECTION BUREAU STANDARD GRADING RULES FOR SOUTHERN PINE LUMBER. FURNISH TO THE FOLLOWING MINIMUM STANDARDS:

**TIMBERSTRAND RIM BOARD (PSL)**

TIMBERSTRAND RIM BOARD (TSL) SHALL BE MANUFACTURED UNDER A PROCESS APPROVED BY THE NATIONAL RESEARCH BOARD. EACH PIECE SHALL BEAR A STAMP OR STAMPS NOTING THE NAME AND PLANT NUMBER OF THE MANUFACTURER, THE GRADE, THE NATIONAL RESEARCH BOARD NUMBER, AND THE QUALITY CONTROL AGENCY. ALL TIMBERSTRAND RIM BOARD SHALL BE MANUFACTURED IN ACCORDANCE WITH ICC-ES ESR-1387 (OR IAPMO-UES EQUIVALENT) USING SOUTHERN PINE VENEER GLED WITH A WATERPROOF ADHESIVE MEETING THE REQUIREMENTS OF ASTM D2559 WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER.

ALL MEMBERS SHALL BE SOUTHERN PINE, GRADE 1.55E, F<sub>b</sub> = 2,325 PSI, F<sub>v</sub> = 400 PSI.

DESIGN SHOWN ON PLANS IS BASED ON LSL MEMBERS MANUFACTURED BY TRUS JOIST. A WEYERHAEUSER BUSINESS. ALTERNATE MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER. ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE THE CURRENT ICC-ES (OR IAPMO-UES EQUIVALENT) EVALUATION REPORTS DEMONSTRATING THAT THE PRODUCTS HAVE EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH THE MEMBERS PROVIDED.

**ENGINEERED WOOD I-JOISTS AND OPEN WEB TRUSSES**

THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF PREFABRICATED PLYWOOD I-JOISTS OR PREFABRICATED OPEN WEB WOOD TRUSSES (OR COMBINATION OF WOOD AND METAL). THESE MEMBERS SHALL BE DESIGNED FOR THE SPANS AND CONDITIONS SHOWN ON THE PLANS AND SHALL BE FURNISHED AND INSTALLED IN CONFORMANCE WITH THE MANUFACTURER'S PUBLISHED SPECIFICATIONS. ALL NECESSARY BRACING, BRIDGING, BLOCKING, PRE-NOTCHED PLATES, ETC. SHALL BE DETAILED AND FURNISHED BY THE CONTRACTOR.

ALL JOISTS AND TRUSSES THIS SPECIFIED SHALL BE TRUS JOIST PRODUCTS BY WEYERHAEUSER OR REDBUILT LLC RED-I SERIES WOOD CHORD/ WOOD WEB I-JOISTS OR OPEN WEB WOOD CHORD/ METAL WEB TRUSSES. OTHER PRODUCT MANUFACTURERS SHALL SUBMIT A REQUEST FOR SUBSTITUTION A MINIMUM OF TWO WEEKS PRIOR TO BIDDING. THE SUBSTITUTION REQUEST SHALL BEAR A STATEMENT FROM THE MANUFACTURER INDICATING THAT THEY ACKNOWLEDGE THE REQUIREMENT OF THESE NOTES FOR FULLY ENGINEERED SHOP DRAWINGS AND CALCULATIONS BEARING THE SEAL OF AN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED. THE REQUIREMENT FOR REVIEW OF THE INSTALLED PRODUCT, AND THEIR AGREEMENT TO MEET THESE REQUIREMENTS.

JOIST MANUFACTURERS SHALL PROVIDE LEVEL CHORDS AT ALL JOISTS WHICH HAVE DIAPHRAGM OR STRAP NAILING WHICH EXCEEDS THE MANUFACTURER'S RECOMMENDED NAIL SPACING FOR SAWN CHORDS.

ALL BRIDGING, BEARING CLIPS, BLOCKING, HANGERS, ETC. THAT CONNECT TO THE JOISTS SHALL BE PER THE MANUFACTURER'S STANDARDS. PROVIDE LOAD-SHARING BRIDGING AT ALL OPEN WEB JOISTS.

JOIST ERECTOR SHALL EXERCISE THE UTMOST CARE DURING THE ERECTION OF JOISTS TO PREVENT THE JOISTS FROM BUCKLING, LATERALLY, STOCKPILE, LIFT, AND LATERALLY BRACE THE JOISTS AS DIRECTED ON THE ERECTION DRAWINGS AND IN THE DESIGN MANUAL. REMOVE ANY DAMAGED JOIST FROM THE JOB SITE. DO NOT ATTEMPT TO REINFORCE ANY DAMAGED JOIST EXCEPT AS APPROVED IN WRITING BY THE ENGINEER AND THE MANUFACTURER.

SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED AND STAMPED BY AN ENGINEER LICENSED TO PERFORM THE WORK IN THE JURISDICTION WHERE THE PROJECT IS LOCATED. IT IS THE INTENT OF THESE NOTES THAT THE PRODUCT ENGINEER REVIEW THE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL CONSTRUCTION DOCUMENTS AND DETERMINE THAT THE PRODUCT IS ADEQUATE FOR THE INTENDED USE AND CAPABLE OF SUPPORTING ALL EQUIPMENT, PIPING, SOFFITS, ETC. WHICH ARE INDICATED. THE SHOP DRAWINGS SHALL CARRY A STATEMENT BY THE PRODUCT ENGINEER STATING THAT HE/SHE HAS REVIEWED THESE DOCUMENTS AND LISTING THE REVIEWED DOCUMENTS BY SHEET NUMBER. THE PROJECT ENGINEER WILL SPECIFY ANY SPECIAL LOADS TO BE DESIGNED FOR.

**ROOF SHEATHING**

PROVIDE 7/16-INCH APA RATED OSB, INDEX 32/16, UNBLOCKED, LAID UP WITH FACE GRAIN PERPENDICULAR TO FRAMING BELOW, UNLESS NOTED OTHERWISE ON PLAN. STAGGER PANEL END JOINTS. PROVIDE 1/8-INCH GAP BETWEEN ALL ADJUTING PANEL EDGES. PROVIDE THE FOLLOWING MINIMUM NAILING UNLESS NOTED OTHERWISE ON PLANS:

8d AT 6 INCHES ON CENTER	ALL SUPPORTED PANEL EDGES, DIAPHRAGM BOUNDARIES AND OVER EXTERIOR WALLS AND SHEAR WALLS
8d AT 12 INCHES ON CENTER	FIELD NAILING

**TREATED WOOD**

ALL WOOD PLATES, LEDGERS, AND BLOCKING IN DIRECT CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED WITH AN AMERICAN WOOD PRESERVERS ASSOCIATION (AWPA) APPROVED PRESERVATIVE. ALTERNATIVELY PER IBC SECTION 2304.12. FOR SOME EXCEPTIONS, IMPERVIOUS MOISTURE BARRIERS MAY BE PROVIDED BETWEEN UNTREATED MEMBERS AND CONCRETE OR MASONRY.

ALL METAL FASTENERS IN CONTACT WITH TREATED WOOD SHALL BE GALVANIZED OR STAINLESS STEEL. WHEN USING GALVANIZED FASTENERS, THE CONTRACTOR SHALL COORDINATE THE GALVANIZATION PROCESS WITH THE CHEMICAL COMPOSITION OF THE WOOD TREATMENT.

**TIMBER CONNECTORS**

TIMBER CONNECTORS CALLED OUT BY LETTERS AND NUMBERS SHALL BE BY SIMPSON STRONG-TIE COMPANY, INC. AS SPECIFIED IN THE LATEST EDITION OF THEIR CATALOG. EQUIVALENT DEVICES BY OTHER MANUFACTURERS MAY BE SUBSTITUTED, PROVIDED THEY HAVE CURRENT ICC-ES (OR IAPMO-UES EQUIVALENT) EVALUATION REPORTS DEMONSTRATING THAT THE PRODUCTS HAVE EQUAL OR GREATER LOAD CAPACITIES. PROVIDE NUMBER AND SIZE OF FASTENERS AS SPECIFIED BY MANUFACTURER. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED SPECIFICATIONS. WHERE CONNECTOR STRAPS CONNECT TWO MEMBERS, PLACE ONE-HALF OF THE NAILS OR BOLTS IN EACH MEMBER. ALL BOLTS IN WOOD MEMBERS SHALL CONFORM TO ASTM A307. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD, UNLESS NOTED OTHERWISE. ALL NAILS SHALL BE COMMON. ALL SHIMS SHALL BE SEASONED AND DRIED AND THE SAME GRADE (MINIMUM) AS MEMBERS CONNECTED. ALL SINGLE JOISTS, DOUBLE JOISTS, AND TRIPLE JOISTS SHALL BE CONNECTED TO FLUSH BEAMS WITH "U" SERIES JOIST HANGERS.

IF MORE THAN 20 PERCENT OF FASTENERS AROUND THE PERIMETER OF PLYWOOD SHEATHING ARE OVERDRIVEN BY OVER 1/16-INCH AND UP TO 1/8-INCH, THEN NAILING MUST BE ADDED TO REPLACE EVERY TWO NAILS OVERDRIVEN BY MORE THAN 1/16-INCH. IF THE PANEL IS WETTED DURING CONSTRUCTION AND ALL NAILS APPEAR TO BE OVERDRIVEN, THE ENGINEER SHALL BE CONSULTED TO COMPARE PANEL THICKNESS TO DRY CONDITIONS TO VERIFY WHETHER SWELLING HAS OCCURRED.

**WOOD FRAMING DETAILS**

THE FOLLOWING APPLY UNLESS NOTED OTHERWISE SHOWN ON THE PLANS.

- PROVIDE TWO 2x10 HEADERS OVER ALL AND DOUBLE STUDS EACH SIDE OF ALL OPENINGS IN STUD BEARING WALLS UNLESS NOTED OTHERWISE.
- PROVIDE CONTINUOUS SOLID BLOCKING AT MID-HEIGHT OF ALL STUD WALLS OVER 10'-0" IN HEIGHT.
- ALL STUD WALLS SHALL BE 2x4 AT 16 INCHES ON CENTER AT INTERIOR WALLS AND 2x6 AT 16 INCHES ON CENTER AT EXTERIOR WALLS, UNLESS NOTED OTHERWISE.
- PLYWOOD WALL SHEATHING SHALL HAVE SOLID BLOCKING AT ALL EDGES. PROVIDE THE FOLLOWING MINIMUM NAILING UNLESS NOTED OTHERWISE ON PLANS.
 

8d AT 6 INCHES ON CENTER	AT SHEET EDGES
8d AT 12 INCHES ON CENTER	AT INTERMEDIATE BEARING POINTS
- ALL WOOD STUD WALLS SHALL HAVE LOWER WOOD PLATE ATTACHED TO WOOD FRAMING BELOW WITH 16d NAILS AT 6 INCHES ON CENTER STAGGERED OR BORED TO CONCRETE WITH 5/8-INCH-DIAMETER ANCHOR BOLTS AT 6'-0" ON CENTER UNLESS NOTED OTHERWISE ON THE PLANS. ALL ANCHOR BOLTS SHALL HAVE A SIMPSON STRONG-TIE BPS-TYPE BEARING PLATE OR EQUIVALENT AND A MINIMUM EMBEDMENT OF 7 INCHES IN CONCRETE, MEASURED TO THE TOP SIDE OF THE DOUBLE HEAVY HEX NUT.

**MECHANICAL/ELECTRICAL/PLUMBING SYSTEM SUPPORTS**

THE CONTRACTOR SHALL DESIGN AND SUPPLY ALL ADDITIONAL MISCELLANEOUS METALS AND SYSTEM SUPPORT COMPONENTS THAT ARE NECESSARY TO SUPPORT ALL MECHANICAL, ELECTRICAL (TELECOM, AUDIO VISUAL, ETC.), AND PLUMBING FIRE-PROTECTION SYSTEMS. SUCH METALS AND SUPPORT COMPONENTS AND THEIR CONNECTIONS SHALL BE PROVIDED AS NECESSARY TO DIRECTLY AND CONCENTRICALLY IMPOSE LOADS ON THE PRIMARY STRUCTURE. THE CONNECTIONS TO THE PRIMARY STRUCTURE ARE SUBJECT TO THE REQUIREMENTS OF THE MISCELLANEOUS METALS SECTION ABOVE. LOADS SHALL BE LOCATED NO CLOSER THAN 5 FEET FROM ANY ADJACENT HANGING LOAD, AND THE CONTRACTOR SHALL COORDINATE THE SUPPORT AND HANGING LOADS WITH ALL BUILDING SYSTEMS. WHERE REQUIRED BY THE BUILDING CODE, THE MECHANICAL/ELECTRICAL/PLUMBING SYSTEM SUPPORTS SHALL ACCOMMODATE LATERAL MOVEMENTS BETWEEN ADJACENT FLOORS AS DEFINED IN THE STORY DRIFT SECTION OF THESE NOTES.

**STRENGTH AND STABILITY DURING CONSTRUCTION**

DURING CONSTRUCTION, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE STRUCTURE.

A COMPLETED STRUCTURE IS REQUIRED TO PROVIDE GLOBAL STABILITY. TO PROVIDE LOCAL STABILITY OF INDIVIDUAL STRUCTURAL COMPONENTS (SLABS, DECKS, BEAMS, COLUMNS, WALLS, ETC.), AND TO RESIST IMPOSED LOADS.

THE STRUCTURE WAS ANALYZED AND DESIGNED BY GEMINI STRUCTURAL CONSIDERING ITS COMPLETED STATE ONLY. THE DESIGN DID NOT EVALUATE PARTIALLY COMPLETED CONSTRUCTION STAGES.

THE CONTRACTOR SHALL CONSIDER ALL ASPECTS OF CONSTRUCTION SEQUENCING. CONSIDERATIONS SHALL INCLUDE BUT NOT BE LIMITED TO STEEL ERECTION AND CONCRETE PLACEMENT, CRANE REQUIREMENTS, TEMPORARY SHORING, BRACING/STRENGTHENING, BACKFILLING, DE-STRESSING TIEBACKS, TEMPORARY CONSTRUCTION LOADS, SAFETY PROCEDURES, TEMPERATURE CHANGE, AND MOISTURE EFFECTS.

THE CONTRACTOR SHALL EVALUATE THE NEED FOR AND RETAIN, AS NECESSARY, AN ENGINEER LICENSED TO PERFORM THE WORK IN THE JURISDICTION WHERE THE PROJECT IS LOCATED TO REVIEW ALL STAGES OF CONSTRUCTION SEQUENCING, VALIDATE ALL TEMPORARY CONSTRUCTION LOADS, AND PREPARE A COMPREHENSIVE CONSTRUCTION/ERECTION PLAN TO ADDRESS BOTH STABILITY AND RESISTANCE TO IMPOSED LOADS UNTIL THE STRUCTURE IS COMPLETE.

TEMPORARY SUPPORTS, TEMPORARY CONNECTIONS, AND/OR CONSTRUCTION/ERECTION AIDS SHALL BE REMOVED BY THE CONTRACTOR AFTER THEY ARE NO LONGER REQUIRED.

**MISCELLANEOUS**

REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, CIVIL, ELEVATOR, OR OTHER SPECIALTY ENGINEERING DRAWINGS FOR DIMENSIONS NOT SHOWN, INCLUDING, BUT NOT LIMITED TO: SIZE AND LOCATION OF CURBS, EQUIPMENT HOUSEKEEPING PADS, WALL AND FLOOR OPENINGS, BLOCKOUTS, FLOOR DEPRESSIONS, SUMPS, DRAINS, ANCHOR BOLTS, EMBEDDED ITEMS, ARCHITECTURAL TREATMENT, ETC. THE CONTRACTOR SHALL VERIFY DIMENSIONS AND RESOLVE DISCREPANCIES OR CONFLICTS PRIOR TO CONSTRUCTION.

WHERE SECTIONS ARE INDICATED ON THE PLAN BY A NUMBER AND A DRAWING NUMBER THUS, 1/S5.01, THE INDICATED SECTION (1) IS SHOWN ON STRUCTURAL DRAWING S5.01.

**DEFERRED STRUCTURAL SUBMITTALS**

SOME STRUCTURAL SYSTEMS ARE DEFINED AS VENDOR-DESIGNED COMPONENTS PER THE STRUCTURAL DOCUMENTS. THESE ELEMENTS OF THE DESIGN ARE DEFERRED SUBMITTAL COMPONENTS AND HAVE NOT BEEN PERMITTED UNDER THE BASE BUILDING APPLICATION. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT THE STAMPED COMPONENT SYSTEM DOCUMENTS TO THE BUILDING OFFICIAL FOR APPROVAL.

DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT, WHO SHALL REVIEW THEM FOR GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING. THE CONTRACTOR SHALL SUBMIT THESE REVIEWED DEFERRED SUBMITTAL DOCUMENTS TO THE BUILDING OFFICIAL. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.

THE FOLLOWING LIST INCLUDES THE ITEMS THAT ARE DEFINED AS DEFERRED STRUCTURAL SUBMITTAL COMPONENTS. REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS FOR ADDITIONAL DEFERRED SUBMITTAL COMPONENTS.

- DEFERRED STRUCTURAL SUBMITTAL COMPONENTS:
- ANCHORAGE FOR MECHANICAL/ELECTRICAL/PLUMBING SYSTEMS
  - METAL STAIRS AND LANDINGS
  - WOOD TRUSSES

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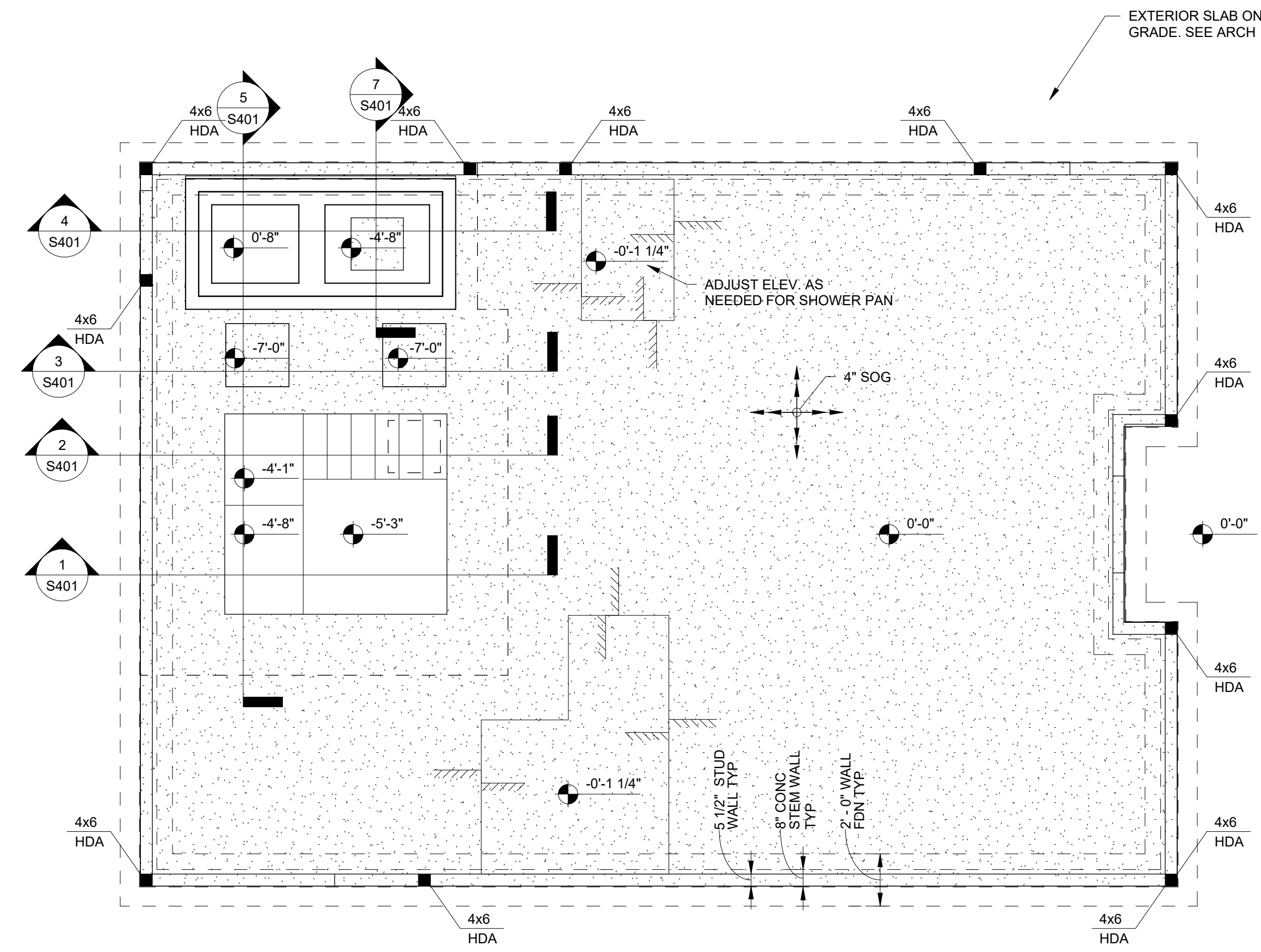
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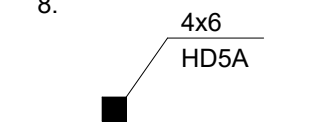
**GENERAL NOTES**

NEW MIKVAH FOR THE CHABAD AT VA TECH Blacksburg, VA



NOTES:

1. REFERENCE FLOOR ELEVATION IS 0'-0". TOP OF SLAB ON GRADE IS AT THE REFERENCE ELEVATION UNLESS NOTED OTHERWISE. SEE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL SLAB EDGES, OPENINGS, SLOPES, AND DEPRESSIONS NOT DEFINED ON THE STRUCTURAL PLANS.
2. ALL FOOTINGS SHALL BEAR ON UNDISTURBED SUBGRADE, UNLESS NOTED OTHERWISE.
3. SLAB ON GRADE IS 4 INCHES THICK, UNLESS NOTED OTHERWISE.
4. TOP OF WALL FOOTING IS AT EL. -2'-0", UNLESS NOTED OTHERWISE.
5. EXTERIOR WALLS SHALL BE CONSIDERED BEARING WALLS AND SHEAR WALLS, UNLESS NOTED OTHERWISE. REFER TO THE SHEAR WALL SCHEDULE AND DETAILS. SEE THE ARCHITECTURAL DRAWINGS FOR ALL WALL LOCATIONS AND MINIMUM SIZES.
6. NON-SCHEDULED WALLS SHALL BE CONSTRUCTED PER THE TYPICAL WOOD DETAILS AND GENERAL NOTES. SEE THE ARCHITECTURAL DRAWINGS FOR NON-BEARING WALL LOCATIONS AND MINIMUM SIZES.
7. "HD#\"/>



1 FOUNDATION FRAMING PLAN  
1/4" = 1'-0"

DATE:	11-25-25
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FOUNDATION PLAN

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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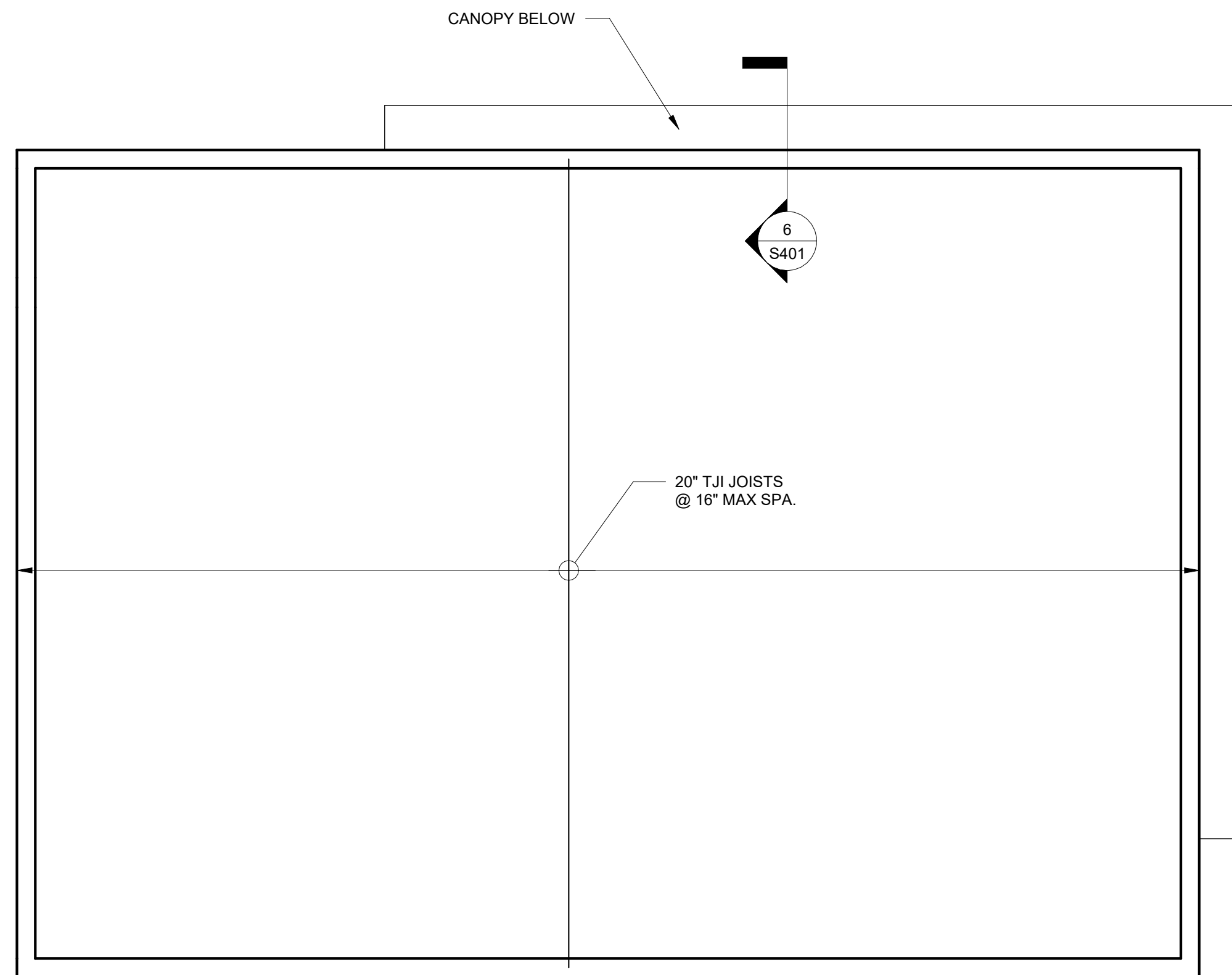


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NOTES:

1. THE REFERENCE ROOF ELEVATION IS 11'-8". THE TOP OF THE ROOF FRAMING IS LOCATED AT THE REFERENCE ROOF ELEVATION, UNLESS NOTED OTHERWISE. THE STRUCTURAL ROOF IS 7/16 INCH APA RATED SHEATHING. SEE GENERAL NOTES FOR MORE DETAILS.
2. SEE TYPICAL WOOD DETAILS FOR SHEATHING LAYOUT AND NAILING REQUIREMENTS, UNLESS NOTED OTHERWISE ON PLANS.
3. FRAMING LOCATIONS ARE SCHEMATICALLY SHOWN ON THE PLANS. IT IS NOT THE INTENT OF THE STRUCTURAL PLANS TO GRAPHICALLY LOCATE ALL FRAMING MEMBERS EXCEPT WHERE SPECIFICALLY CALLED OUT. THE CONTRACTOR IS RESPONSIBLE FOR SPACING FRAMING MEMBERS AS NOTED ON THE PLANS AND GENERATING MEMBER LAYOUT FOR SHOP DRAWINGS AND QUANTITY TAKEOFFS.
4. EXTERIOR WALLS SHALL BE CONSIDERED BEARING WALLS AND SHEAR WALLS. UNLESS NOTED OTHERWISE, REFER TO THE SHEAR WALL SCHEDULE AND DETAILS. SEE THE ARCHITECTURAL DRAWINGS FOR ALL WALL LOCATIONS AND MINIMUM SIZES.
5. NON-SCHEDULED WALLS SHALL BE CONSTRUCTED PER THE TYPICAL WOOD DETAILS AND GENERAL NOTES. SEE THE ARCHITECTURAL DRAWINGS FOR NON-BEARING WALL LOCATIONS AND MINIMUM SIZES.
6. COORDINATE LOCATION OF ALL EMBEDS WITH MECHANICAL, ELECTRICAL, PLUMBING, AND EXTERIOR WALL SYSTEMS PRIOR TO CASTING SLABS AND WALLS.
7. SEE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, AND OTHER DISCIPLINES DRAWINGS FOR OPENING SIZES AND LOCATIONS NOT SHOWN ON PLAN.
8. REFERENCE ALL CONSTRUCTION DOCUMENTS FOR SIZE, EXTENT, AND LOCATION OF CONCRETE CURBS, HOUSEKEEPING PADS, CMU WALLS, PLANTER WALLS, BOLLARDS, EDGE ANGLES, AND SLAB PENETRATIONS.

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ROOF FRAMING PLAN

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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1 ROOF FRAMING PLAN  
1/4" = 1'-0"

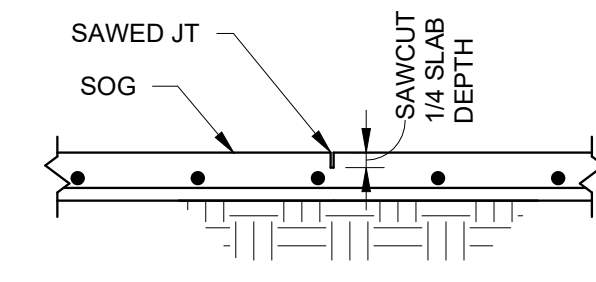
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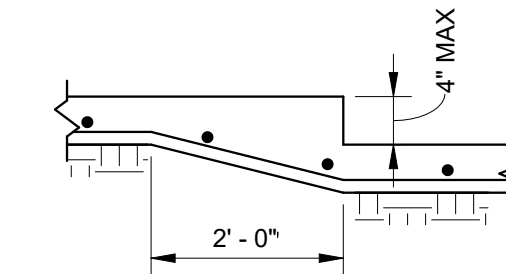
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NOTES:

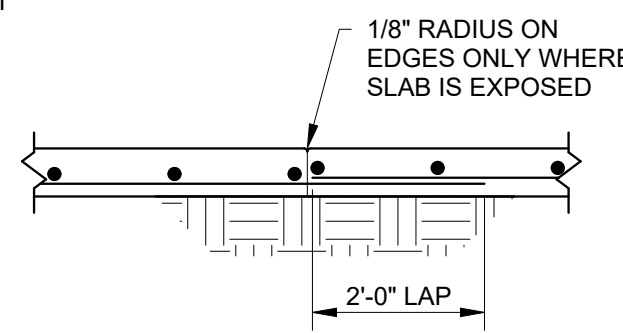
1. SLAB ON GRADE IS 4 INCHES THICK UNLESS NOTED OTHERWISE.
2. LOCATE CONSTRUCTION JOINTS UNDER PARTITIONS OR ON COLUMN LINES. PROVIDE CONTROL JOINTS ON ALL COLUMN LINES AND AT A MAXIMUM SPACING OF 30 x SLAB THICKNESS EACH WAY IN BETWEEN. PROVIDE CONTROL JOINTS AT ALL RE-ENTRANT CORNERS. CONTRACTOR SHALL SUBMIT A JOINTING PLAN TO ARCHITECT FOR REVIEW.
3. SAWED JOINTS SHALL BE MADE AS SOON AS THE CONTROL JOINT CAN BE CUT WITHOUT EDGES RAVELING AND WITHIN 24 HOURS OF SLAB PLACEMENT. SAWED JOINTS SHALL BE FILLED WITH SEALANT AS COORDINATED WITH THE ARCHITECT.
4. LOCATE REINFORCING AT MID-DEPTH OF SLAB UNO.
5. TYPICAL SLAB REINFORCING:  
 4" - 6" SLAB: #4 @ 18" EACH WAY  
 GREATER THAN 6" SLAB: #5 @ 18" EACH WAY BOT  
 #4 @ 18" EACH WAY TOP



CONTROL JOINT

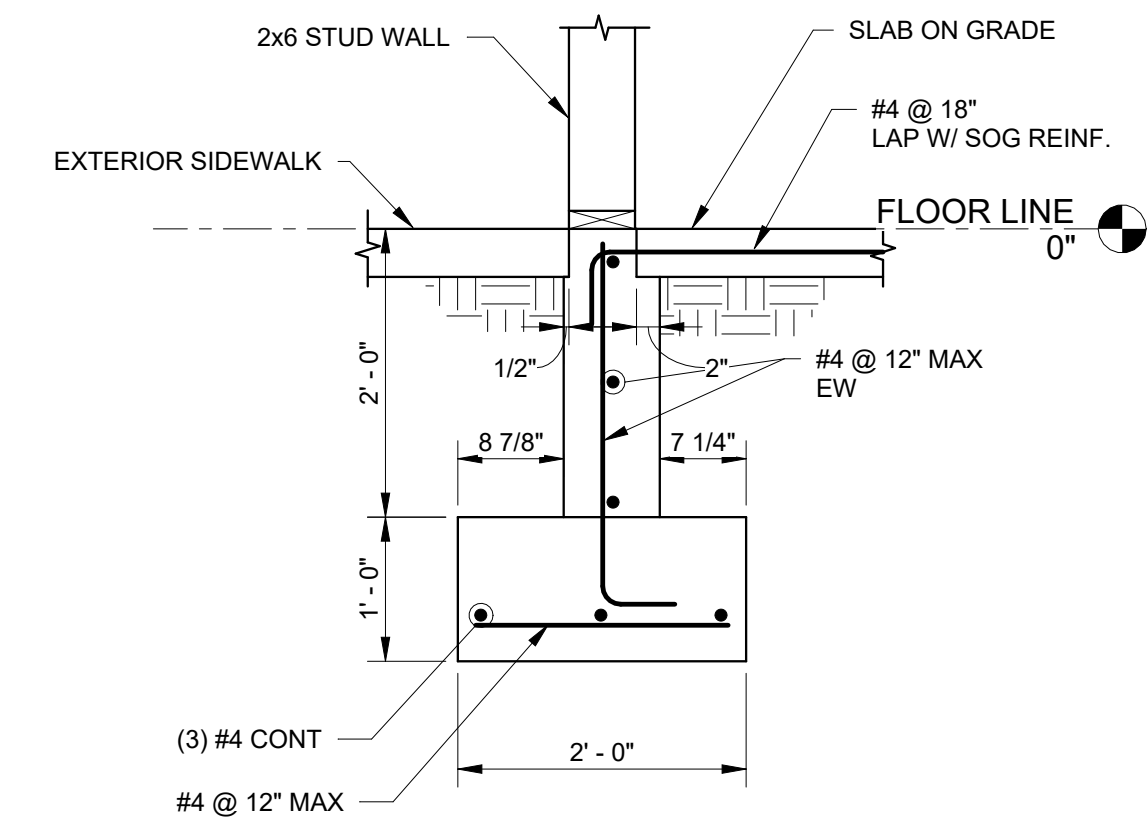


MINOR STEP

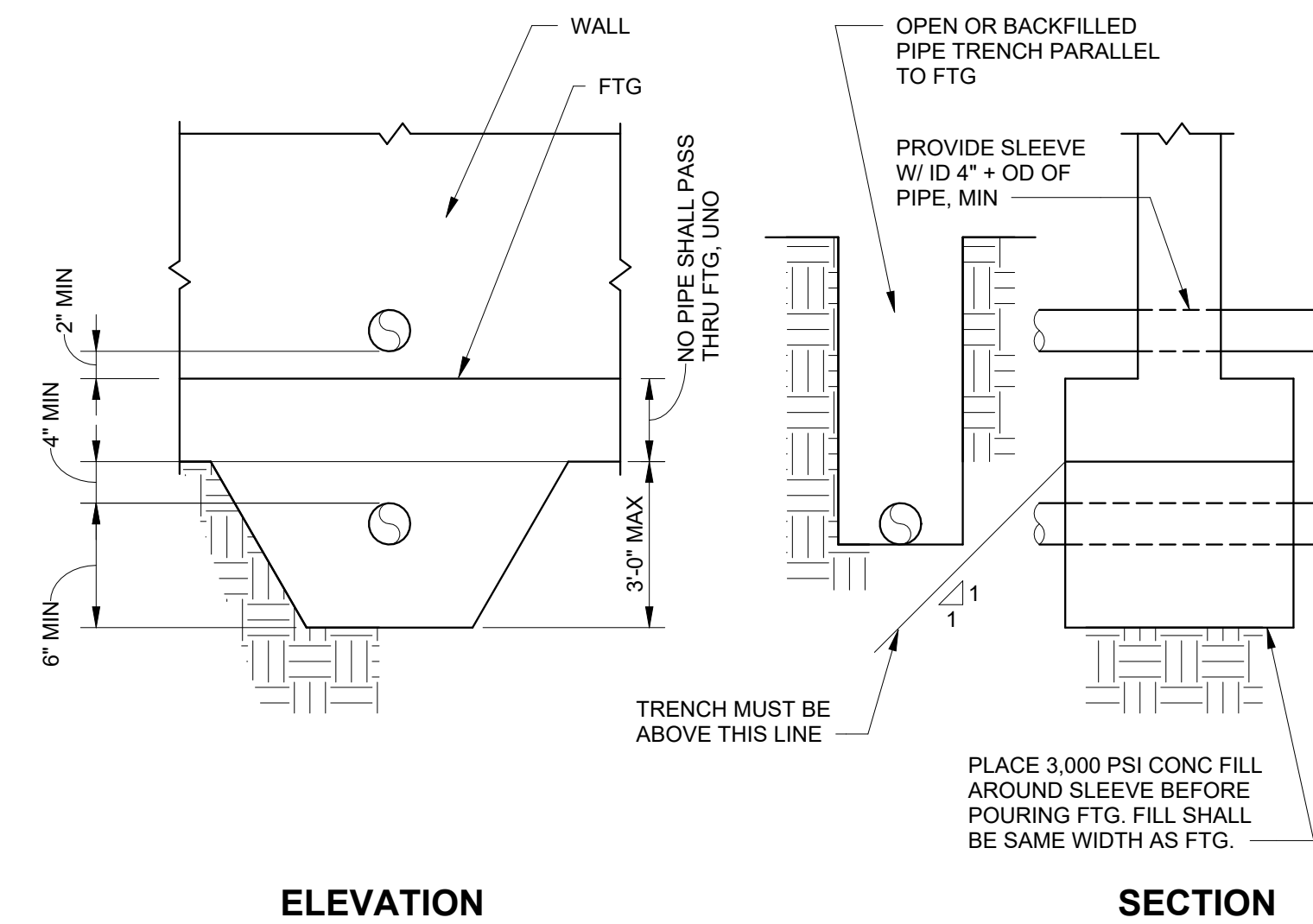


CONSTRUCTION JOINT

4 TYPICAL SLAB ON GRADE



3 TYPICAL WALL FOOTING

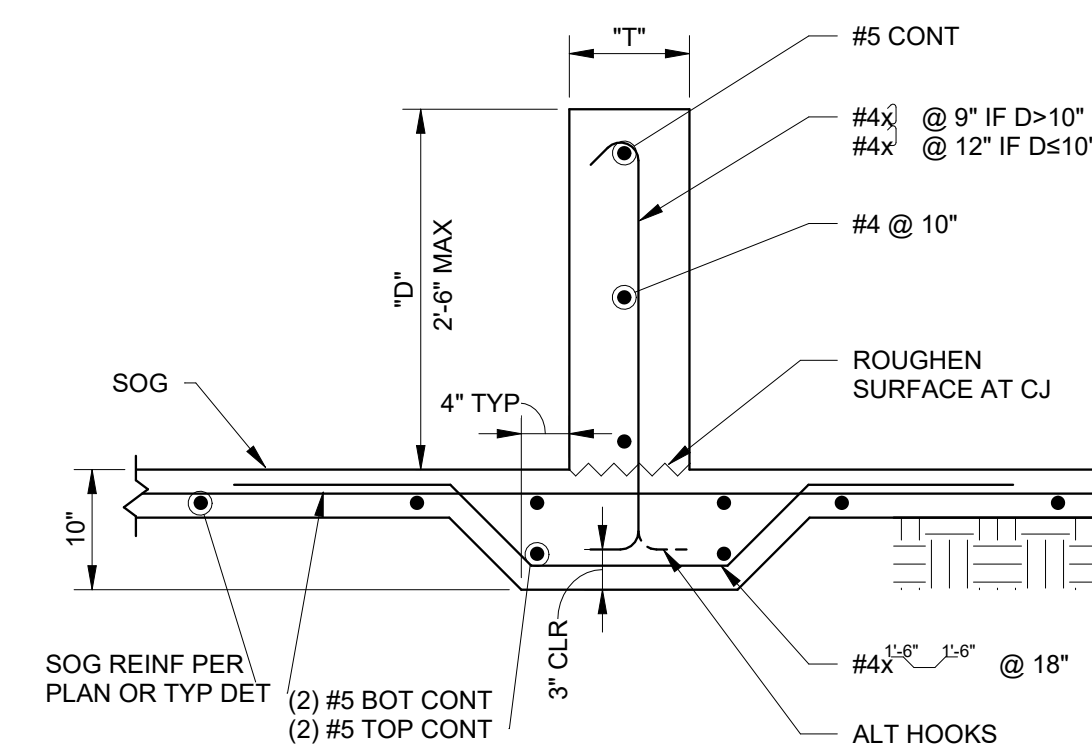


7 TYP PIPE ENCASEMENT UNDER FTG

NOTE:

1. OPENINGS IN SLAB AND FOUNDATION WALLS SHALL HAVE (1) VERTICAL AND (1) HORIZONTAL #4 BAR WITHIN 3" OF OPENING ON EACH SIDE OF OPENING. REINFORCING SHALL EXTEND 2'-6" BEYOND END OF OPENING OR SHALL BE HOOKED INTO FOOTING OR SLAB.  
 (1) ADDITIONAL 4'-0" #4 DIAGONAL BAR SHALL BE LOCATED AT EACH CORNER OF OPENING. CONTACT STRUCTURAL ENGINEER FOR OPENINGS GREATER THAN 2'-0" IN EITHER DIRECTION LOCATED IN STEM WALL. THESE MAY NEED ADDITIONAL REINFORCING.

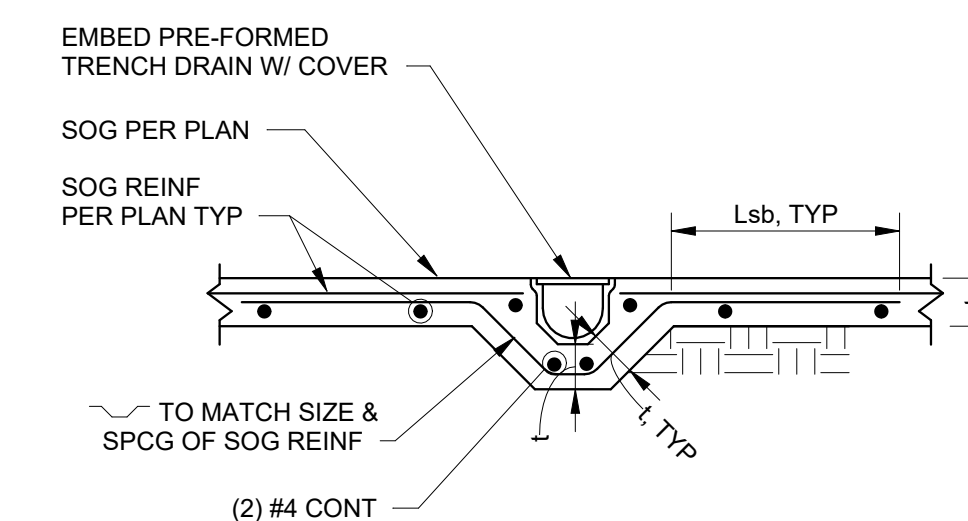
8 FOUNDATION REINFORCING NOTES



NOTES:

1. T = 6" MINIMUM OR 10" MAXIMUM. IF T > 10", CURB REINFORCEMENT SHALL BE PER "TYPICAL HOUSEKEEPING PAD" DETAIL.
2. SEE ARCHITECTURAL FOR T AND D DIMENSIONS AND CURB LOCATIONS.

11 TYP CONC CURB AT SLAB ON GRADE



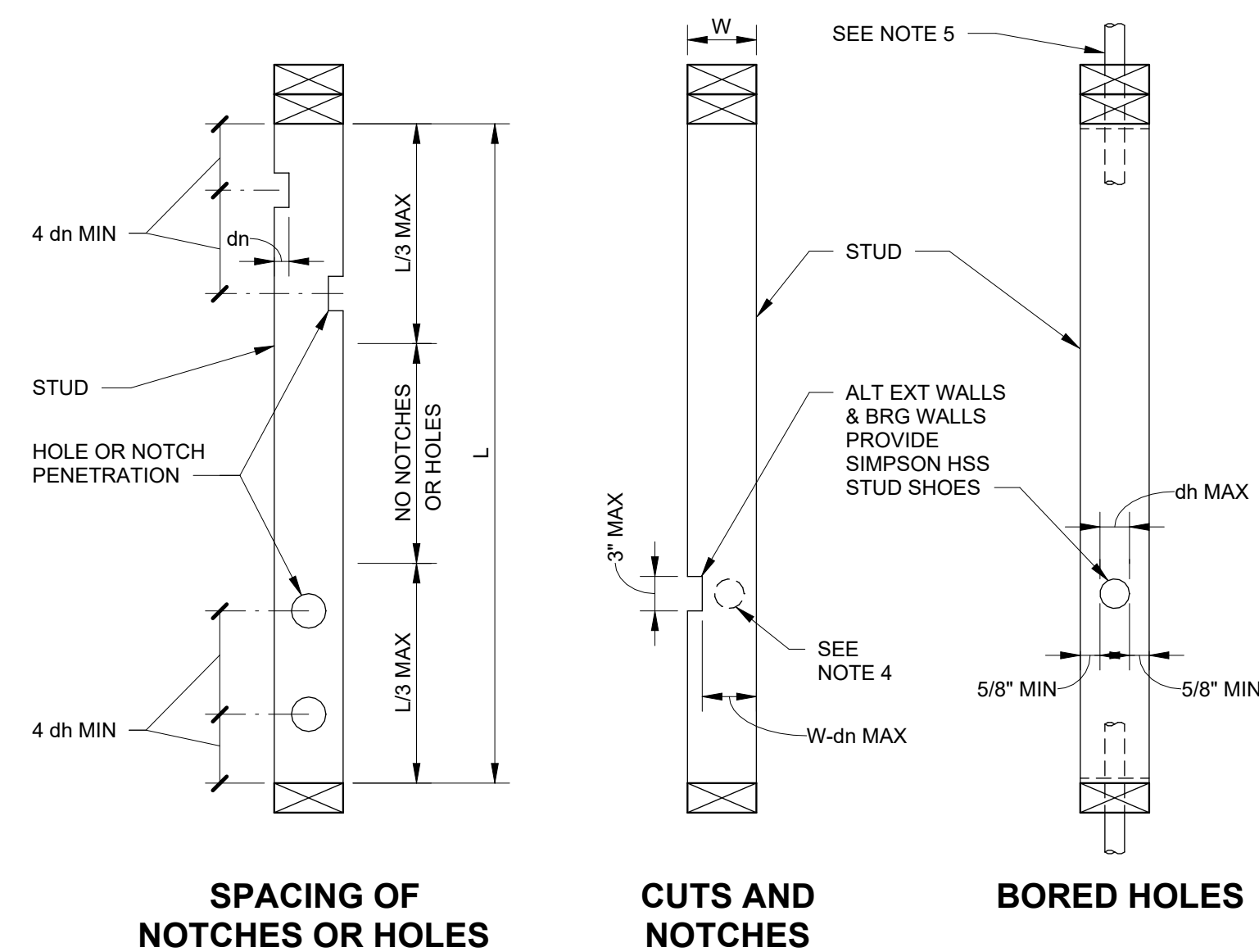
12 TYP TRENCH DRAIN AT SOG

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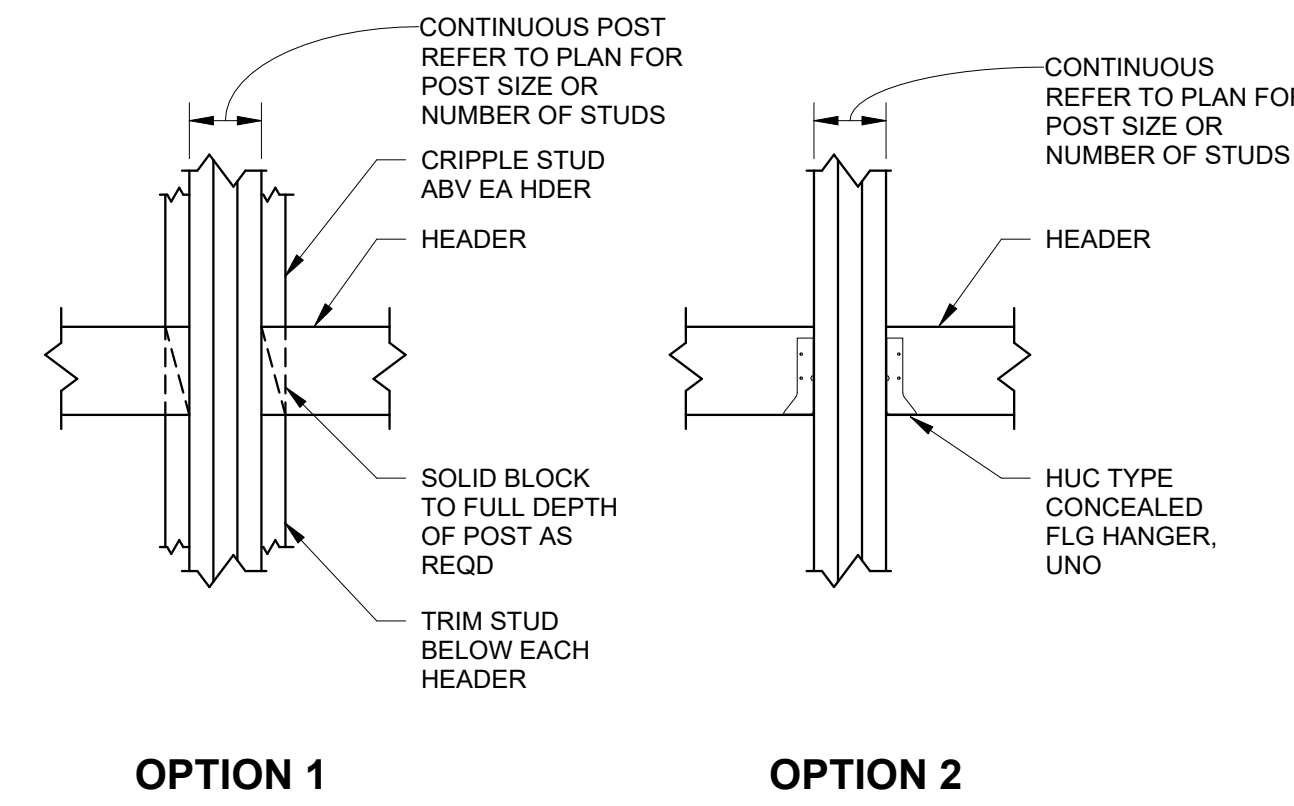
REVISIONS	DATE
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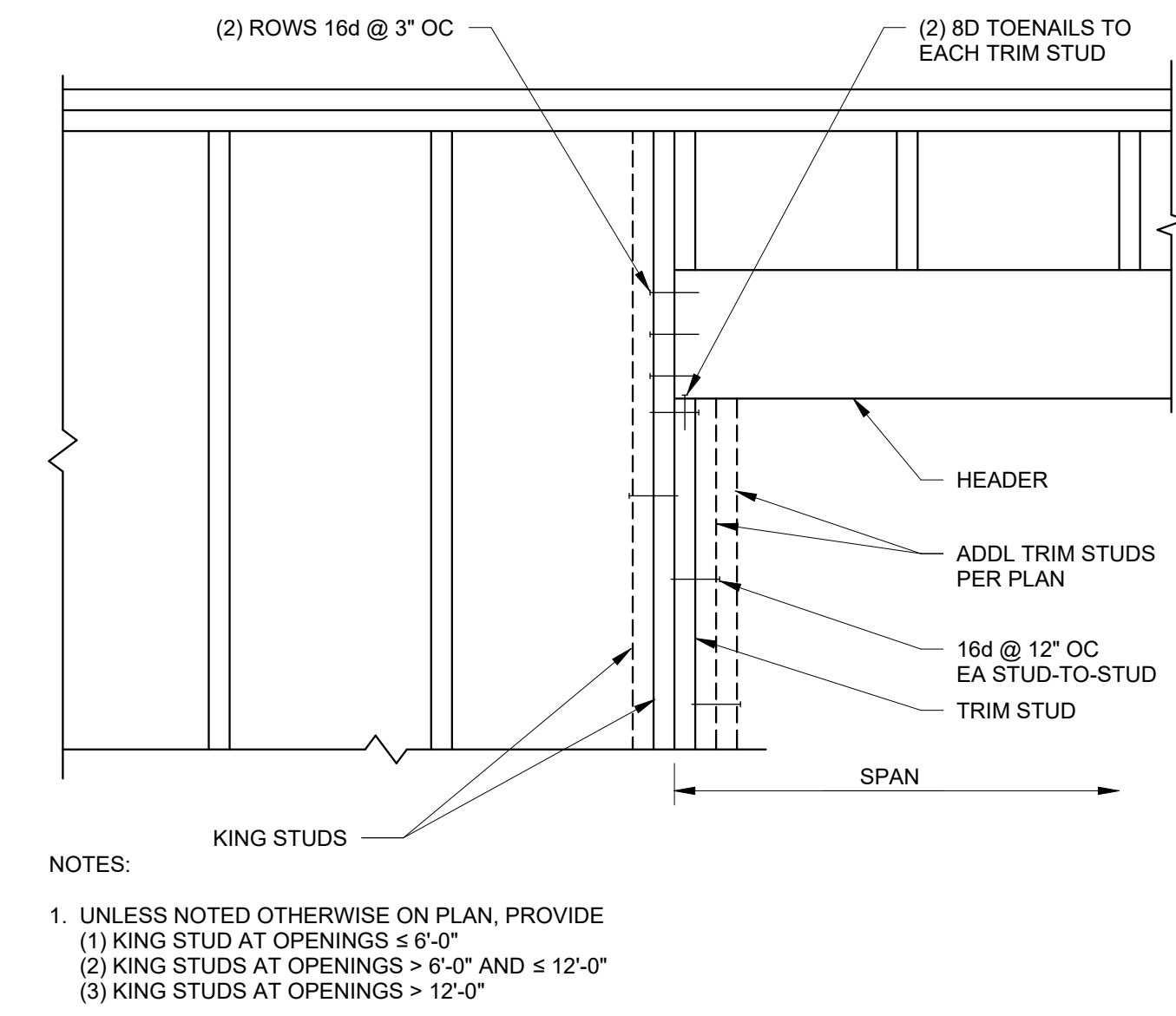
	PENETRATION SCHEDULE			
	EXTERIOR WALLS BEARING WALLS		INTERIOR NON-LOAD BEARING WALLS	
	dn MAX	dh MAX	dn MAX	dh MAX
2x4	7/8"	1 3/8"	1 3/8"	2"
2x6	1 3/8"	2 1/8"	2 1/8"	3 1/4"
2x8	1 1/2"	2 1/2"	2 7/8"	4 1/4"

- NOTES:
- MAXIMUM OF (2) PENETRATIONS PER STUD. NO MORE THAN (5) CONSECUTIVE STUDS WITH PENETRATIONS.
  - SEE PENETRATION SCHEDULE FOR MAXIMUM PENETRATION SIZE.
  - STUD PACKS OR POSTS SHALL NOT BE PENETRATED BY A CUT, NOTCH, OR HOLE WITHOUT VERIFYING WITH ENGINEER.
  - BORED HOLES SHALL NOT BE LOCATED IN THE SAME SECTION ON THE FACE OF A STUD AS A CUT OR NOTCH.
  - WHERE PLUMBING, HEATING, OR OTHER PIPES ARE PLACED IN OR PARTLY IN A PARTITION, NECESSITATING THE CUTTING OF SOLES OR PLATES, A METAL TIE NOT LESS THAN 16 GAGE GALVANIZED AND 1 1/2" WIDE SHALL BE FASTENED TO EACH PLATE ACROSS AND TO EACH SIDE OF THE OPENING WITH NOT LESS THAN (6) 16d NAILS INTO TOP FACE OF EACH PLATE. (24) 16d NAILS TOTAL.

1 TYPICAL STUD AND PLATE PENETRATION

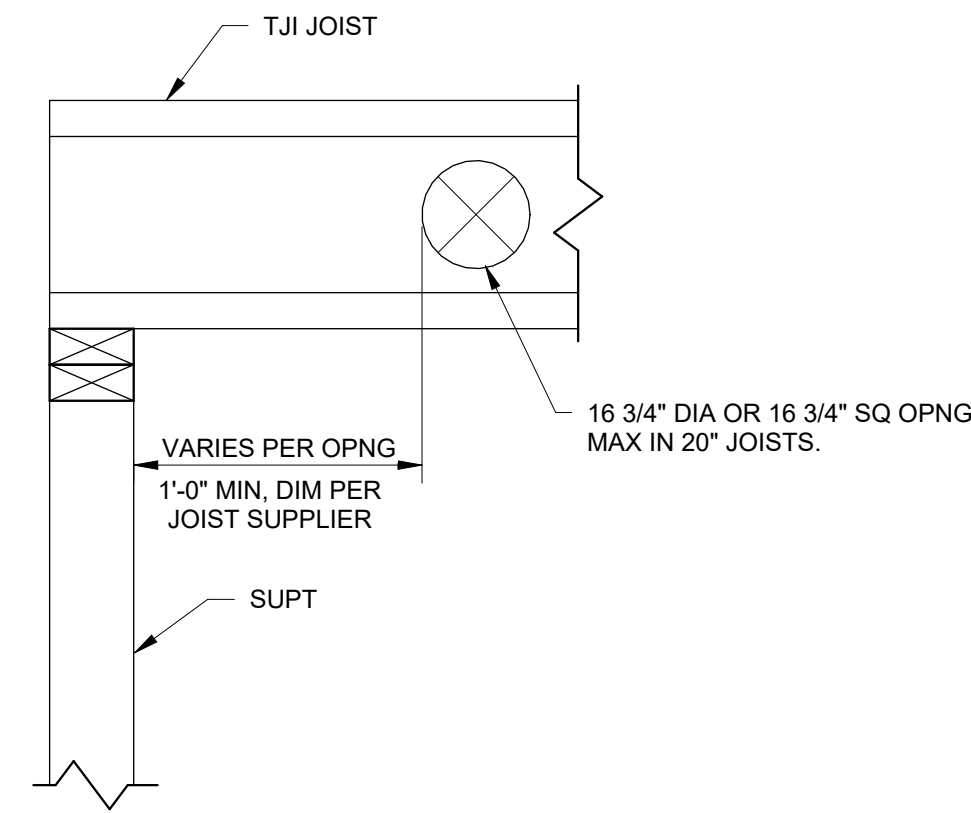


3 TYP HEADER TO CONT FULL HT POST



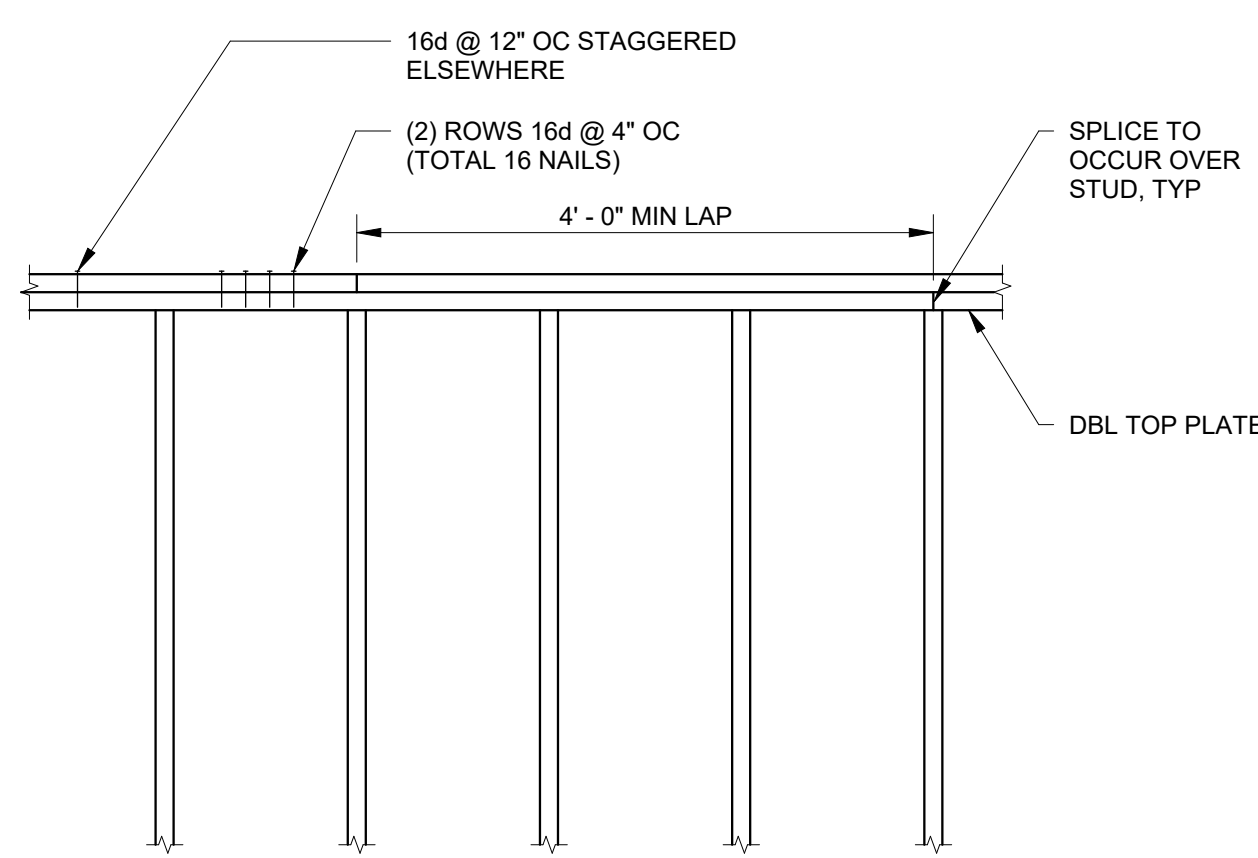
4 TYPICAL HEADER

- NOTES:
- UNLESS NOTED OTHERWISE ON PLAN, PROVIDE (1) KING STUD AT OPENINGS  $\leq 6'-0"$  (2) KING STUDS AT OPENINGS  $> 6'-0"$  AND  $\leq 12'-0"$  (3) KING STUDS AT OPENINGS  $> 12'-0"$

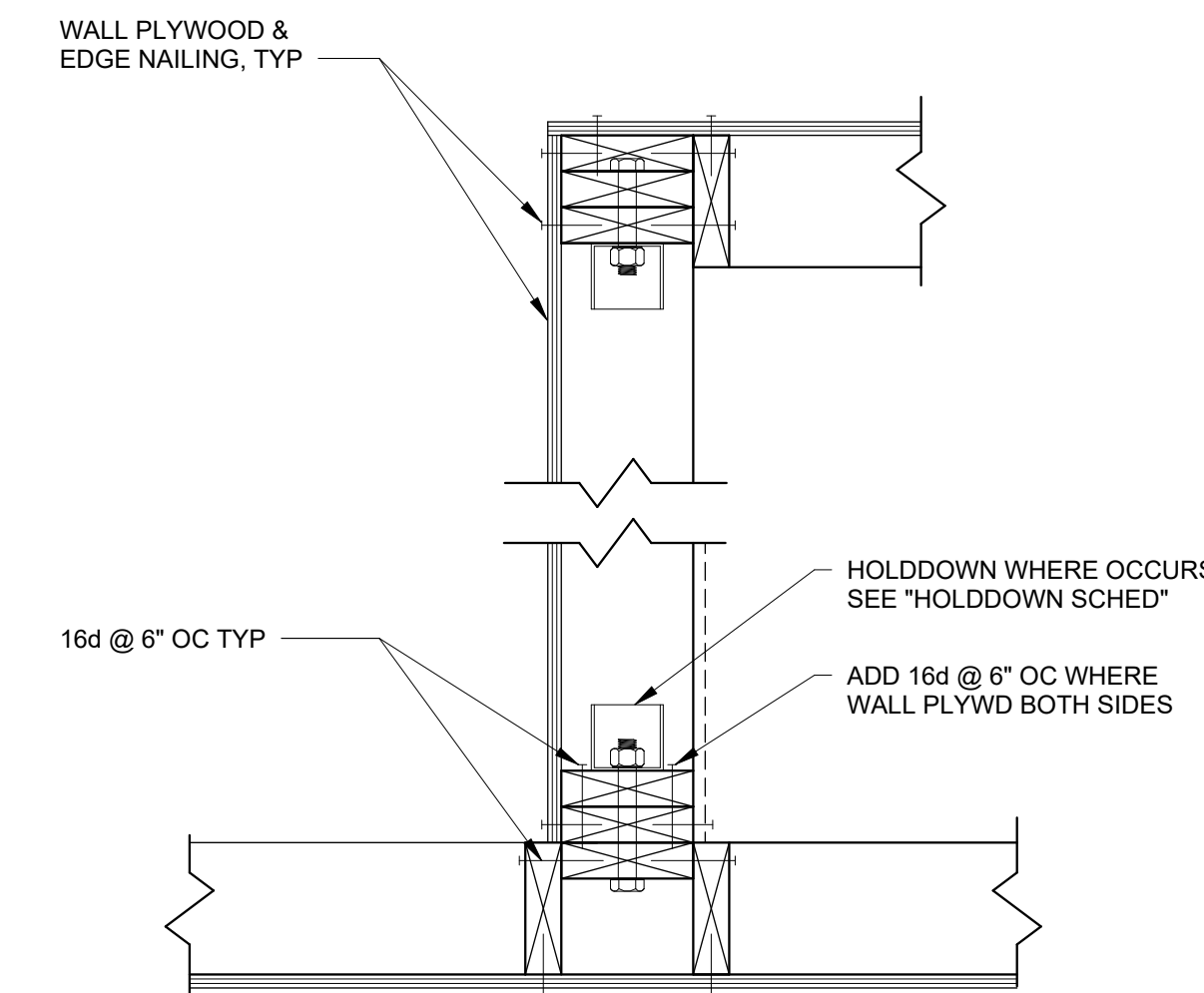


5 TYPICAL OPENINGS IN TJI JOISTS

- NOTES:
- ALL OPENINGS IN JOISTS TO BE APPROVED BY JOIST SUPPLIER/ DESIGNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION.



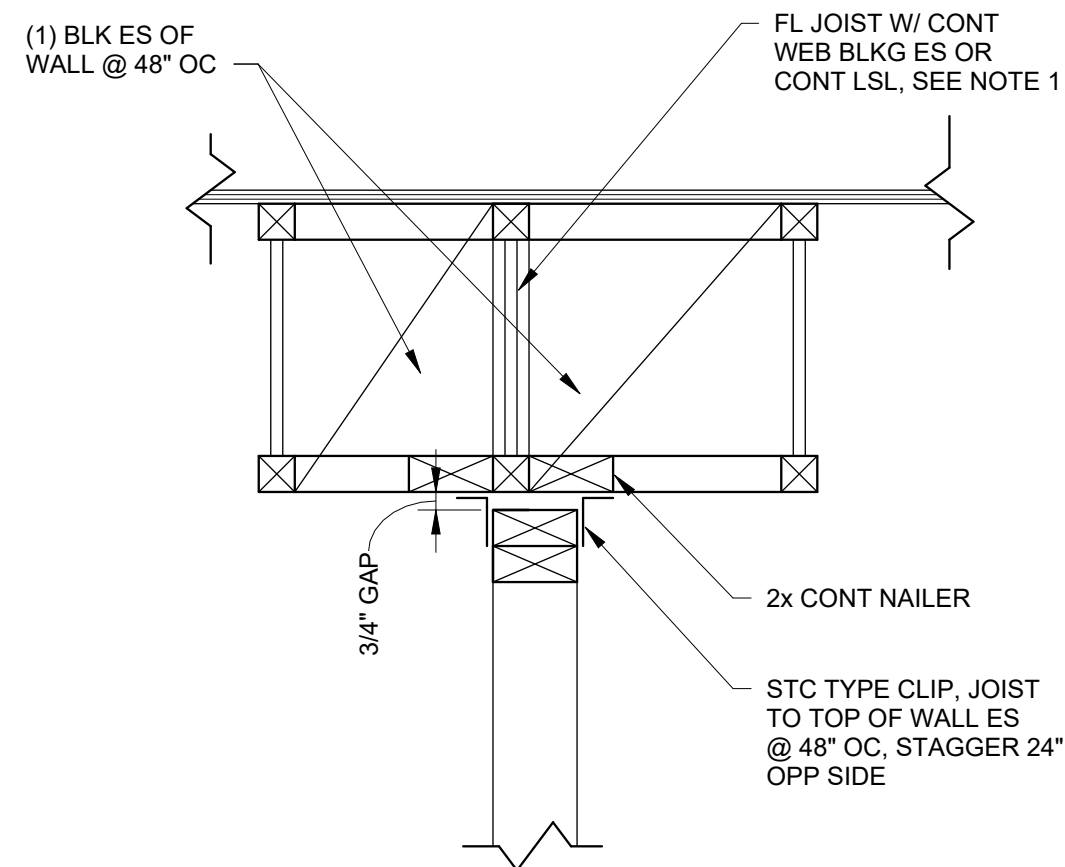
6 TYPICAL TOP PLATE LAP



7 TYPICAL WALL INTERSECTION

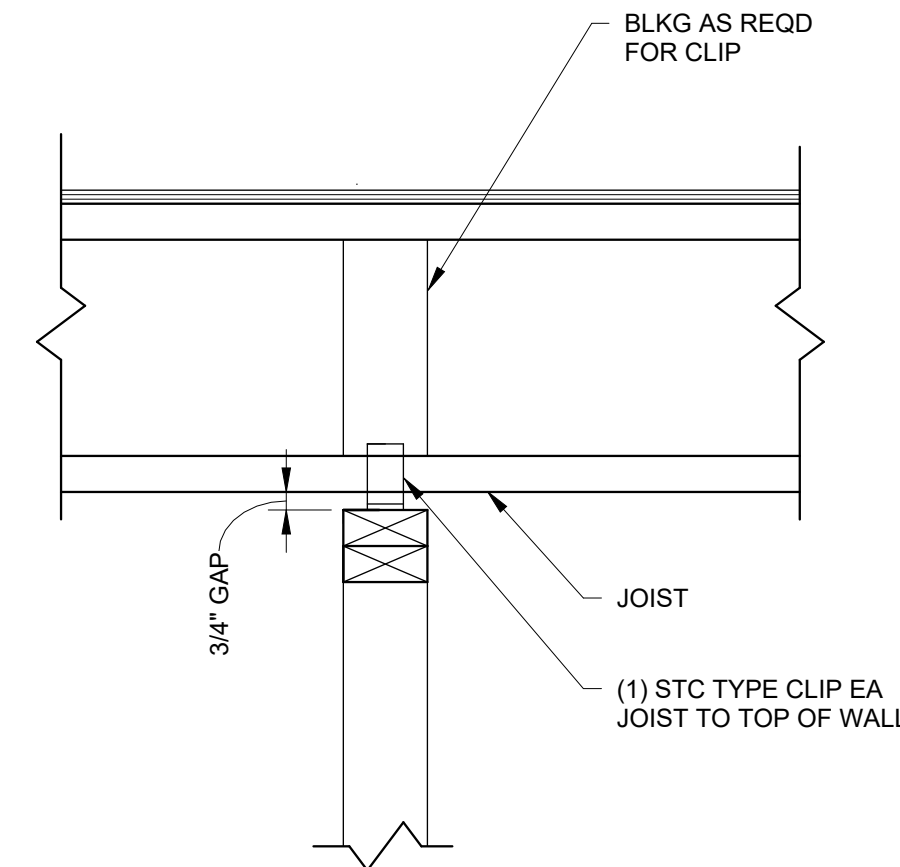
NAILING SCHEDULE	
CONNECTION	NAILING
JOIST TO SILL OR GIRDER, TOENAIL	(3) 8d
BRIDGING TO JOIST, TOENAIL EA END	(2) 8d
SOLE PLATE TO JOIST OR BLOCKING, FACE NAIL	16d @ 16" OC
TOP PLATE TO STUD, END NAIL	(2) 16d
STUD TO SOLE PLATE	(4) 8d TOENAIL, OR (2) 16d END NAIL
DOUBLE STUDS, FACE NAIL	16d @ 12" OC
DOUBLE TOP PLATES, FACE NAIL	16d @ 12" OC
TOP PLATE INTERSECTIONS, FACE NAIL	(2) 16d
CONTINUOUS HEADER, TWO PIECES	16d @ 12" OC ALONG EACH EDGE
CEILING JOIST TO PLATE, TOENAIL	(3) 8d
RAFTER OR TUSS TO PLATE, TOENAIL	(3) 8d
BUILT-UP CORNER STUDS	16d @ 12" OC EACH LAYER STAGGERED
BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOENAIL	(3) 8d
RIM JOIST TOP PLATE, TOENAIL	8d @ 6" OC
POST AND BEAM OR GIRDER CONSTRUCTION	PROVIDE POSITIVE CONNECTION AGAINST UPLIFT AND LATERAL DISPLACEMENT
BUILT-UP RIM JOIST	(2) ROWS OF 16d @ 12" OC

- NOTES:
- NAILS ARE COMMON UNLESS NOTED OTHERWISE. SEE "TIMBER CONNECTORS" SECTION OF THE GENERAL NOTES FOR ADDITIONAL INFORMATION.
  - REFER TO 2021 IBC TABLE 2304.10.2 FOR ADDITIONAL NAILING REQUIREMENTS.

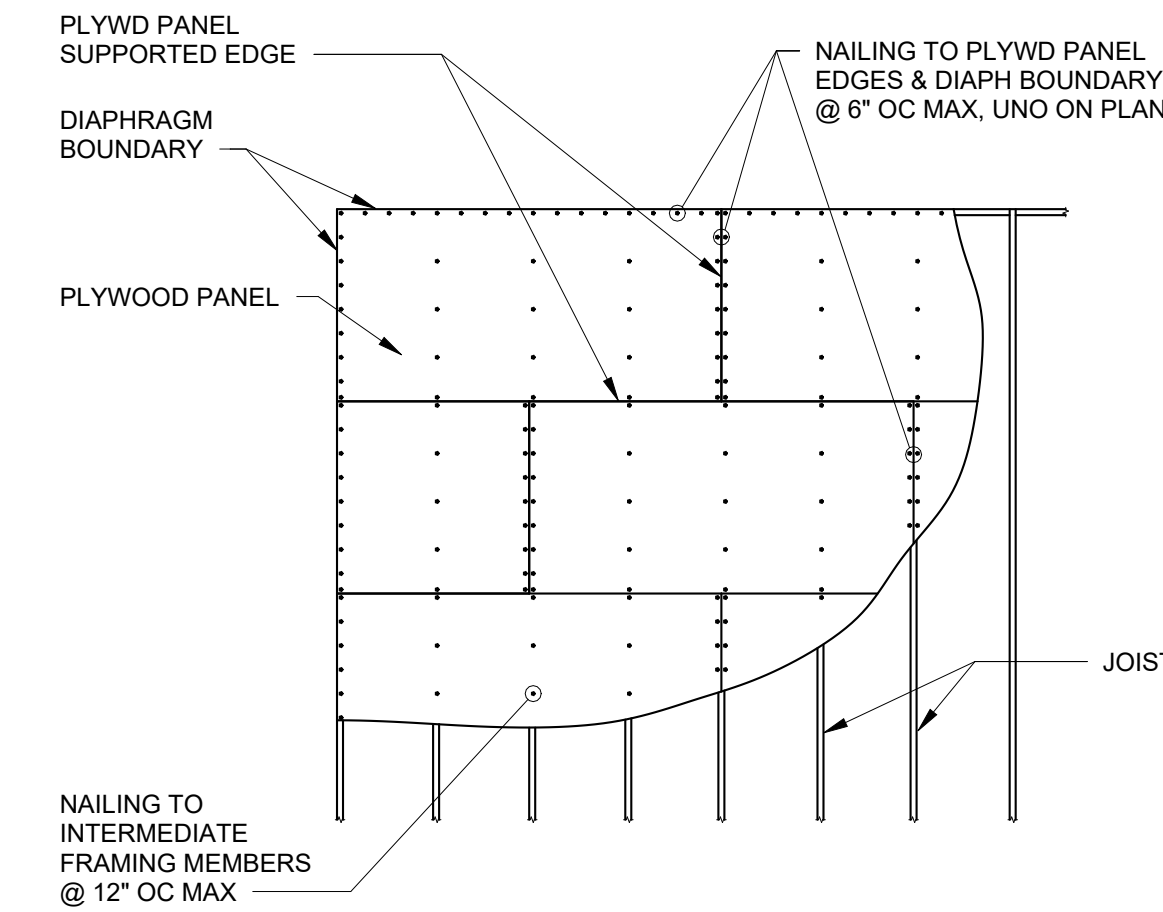


9 TYPICAL NON-BEARING STUD WALL

- NOTES:
- PROVIDE DOUBLE JOIST UNDER ALL PARALLEL PARTITIONS THAT EXTEND OVER MORE THAN HALF THE JOIST LENGTH.



WALL PERPENDICULAR TO JOIST



11 TYPICAL UNBLOCKED PLYWOOD ROOF/FLOOR

- NOTES:
- DRAG STRUTS, BEARING WALL, AND SHEAR WALL INTERSECTIONS SHALL BE CONSIDERED DIAPHRAGM BOUNDARIES, TYPICAL

12 NAILING SCHEDULE

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TYPICAL SHEAR WALL DETAILS

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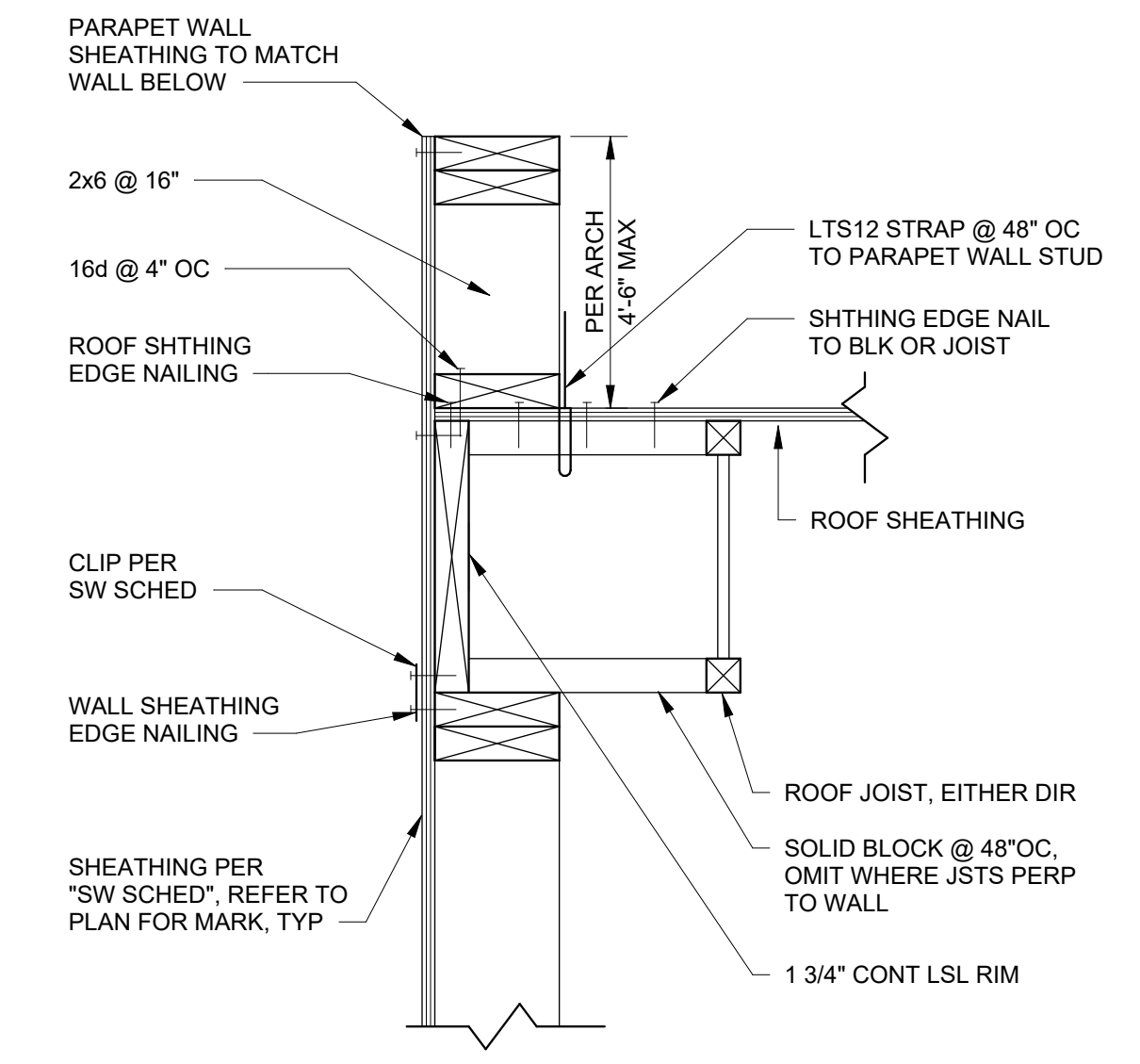


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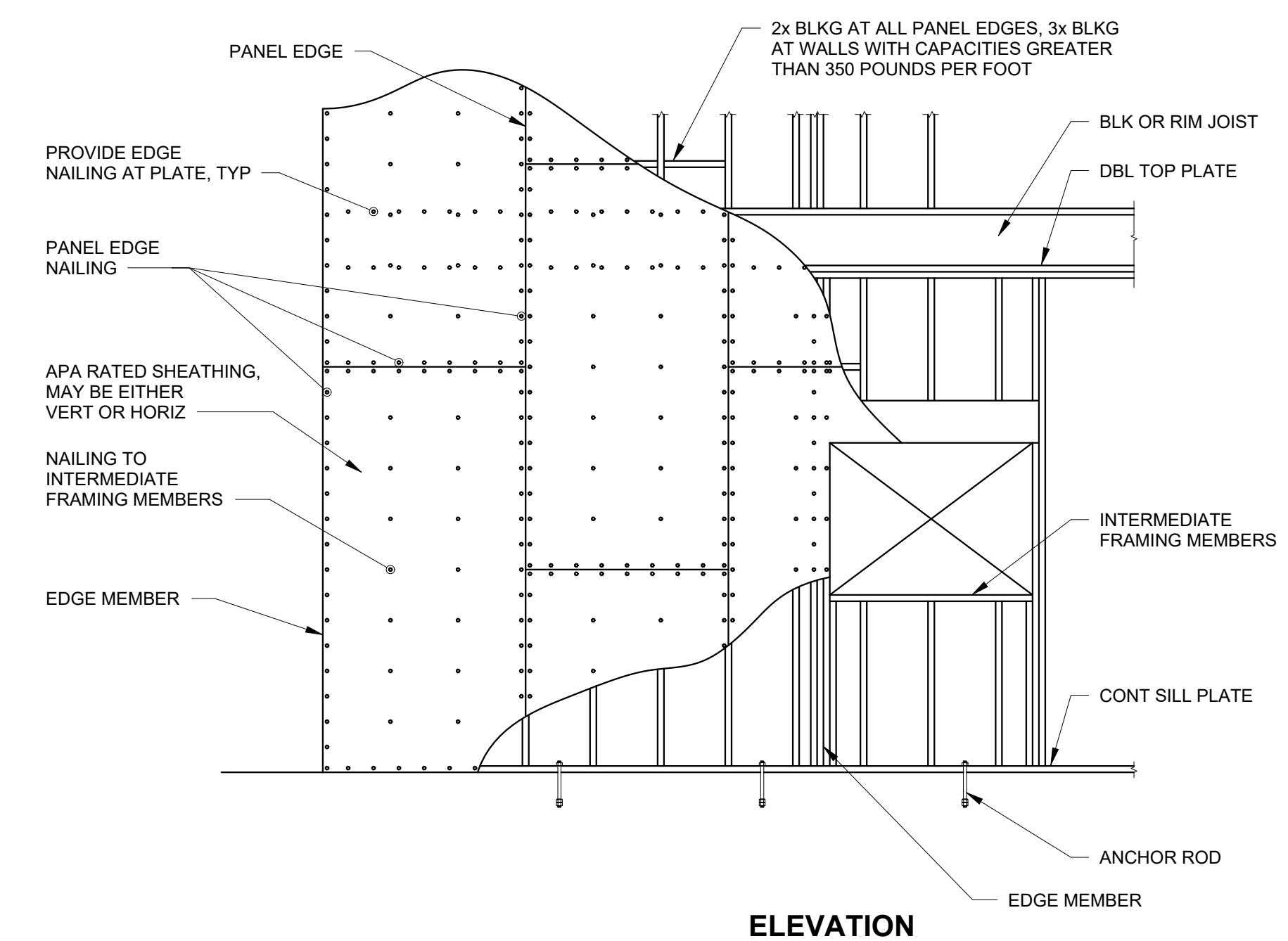
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5 TYPICAL ROOF TO EXTERIOR WALL

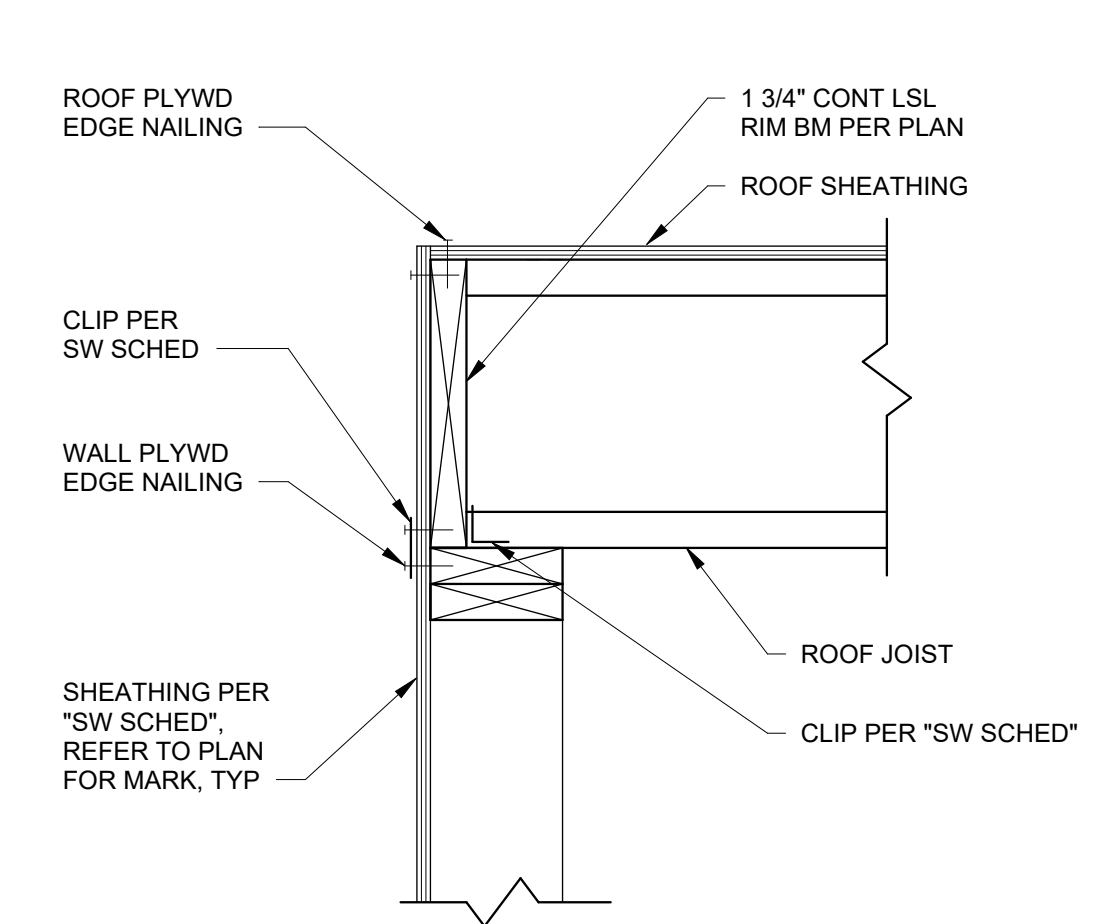


ELEVATION

SHEAR WALL SCHEDULE											
TYPE	SHEATHING	STUD SIZE	STUD SPACING	EDGE MEMBER	STUD & BLOCKING SIZE AT ADJOINING PANEL EDGES	PANEL EDGE NAILING	TOP PLATE TO FRAMING ABOVE	BOTTOM PLATE TO FRAMING BELOW	BOTTOM PLATE TO CONCRETE BELOW	CAPACITY (PLF)	HOLDDOWN
SW	7/16" APA RATED ONE SIDE	2x6	16"	(2) 2x6	2x	8d @ 6"	CLIPS @ 24"	-	5/8" DIA AR @ 48"	241	HD1

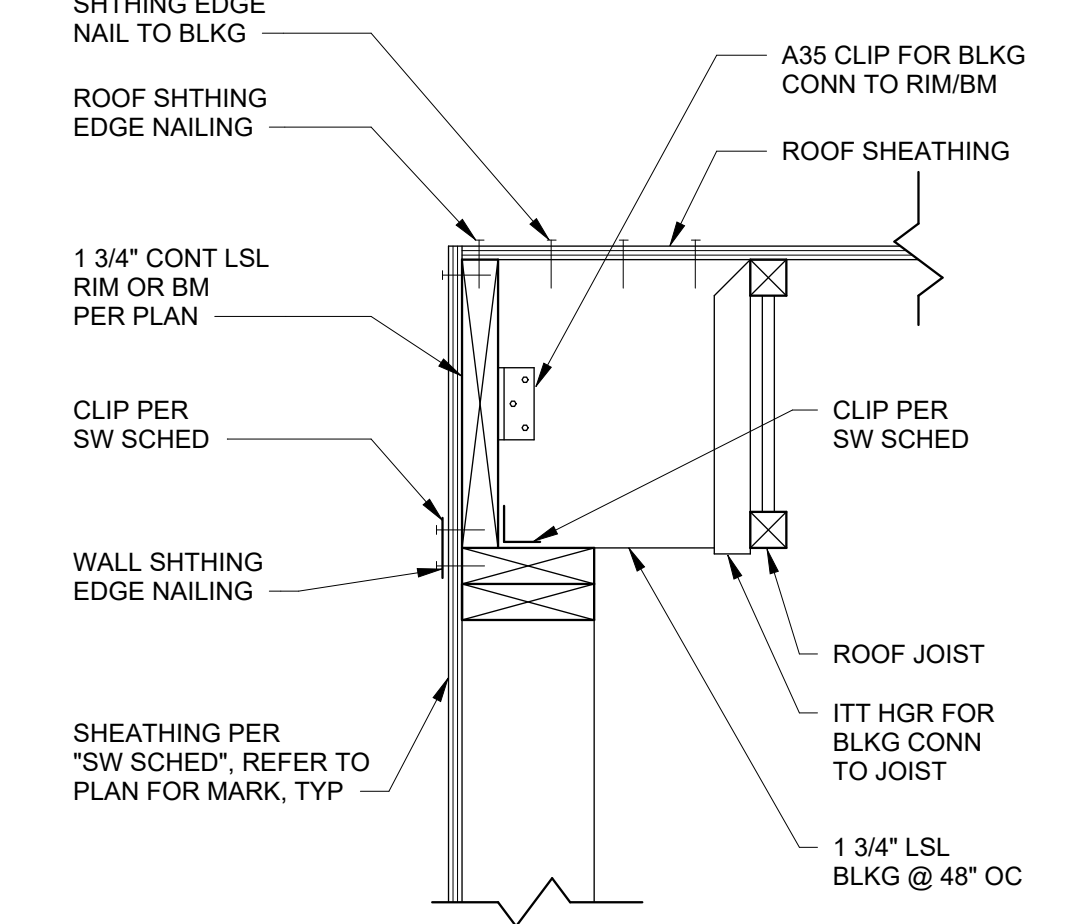
- NOTES:
- NAILING TO INTERMEDIATE MEMBERS SHALL BE AT 12" ON CENTER.
  - FRAMING CLIPS SHALL BE A35, LTP5, OR APPROVED EQUAL.
  - PROVIDE SIMPSON BPS TYPE BEARING PLATES OR EQUIVALENT ON ALL ANCHOR RODS TO CONCRETE. ANCHOR RODS SHALL HAVE A 6" EMBEDMENT UNLESS NOTED OTHERWISE, MEASURED TO THE TOP OF THE HOOK. LOCATE ANCHOR RODS WITHIN 8" OF ENDS OF WALLS.
  - PROVIDE 3x SILL PLATES TO CONCRETE AT SHEAR WALLS WITH CAPACITIES GREATER THAN 350 POUNDS PER FOOT. PROVIDE (2) 20# END NAILS BETWEEN SILL PLATE AND EACH STUD.
  - DO NOT OVERDRIVE NAILS.

1 TYPICAL WOOD SHEAR WALL SCHEDULE



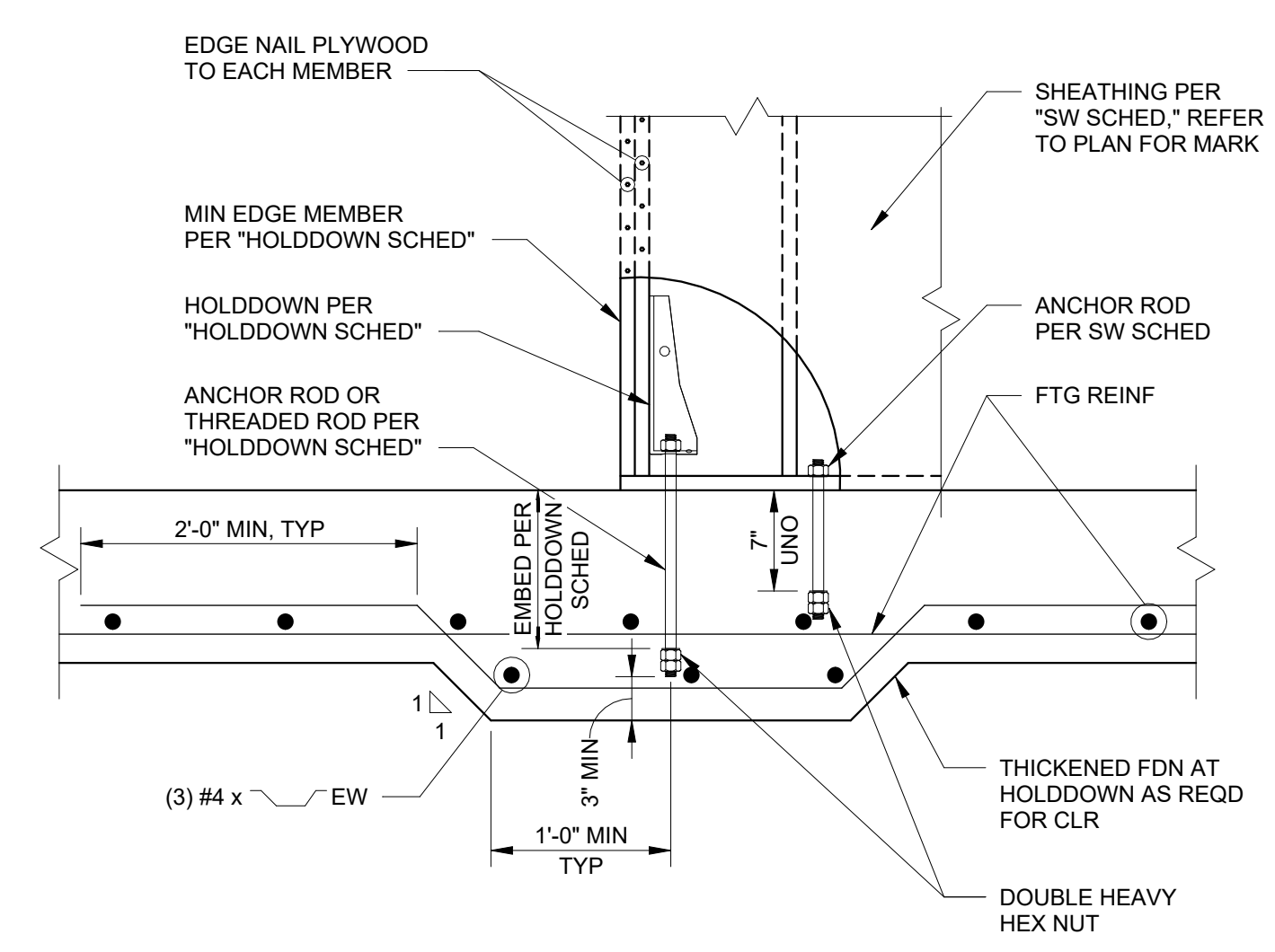
WALL PERPENDICULAR TO JOIST

4 TYPICAL ROOF TO EXTERIOR WALL



WALL PARALLEL TO JOIST

4 TYPICAL ROOF TO EXTERIOR WALL

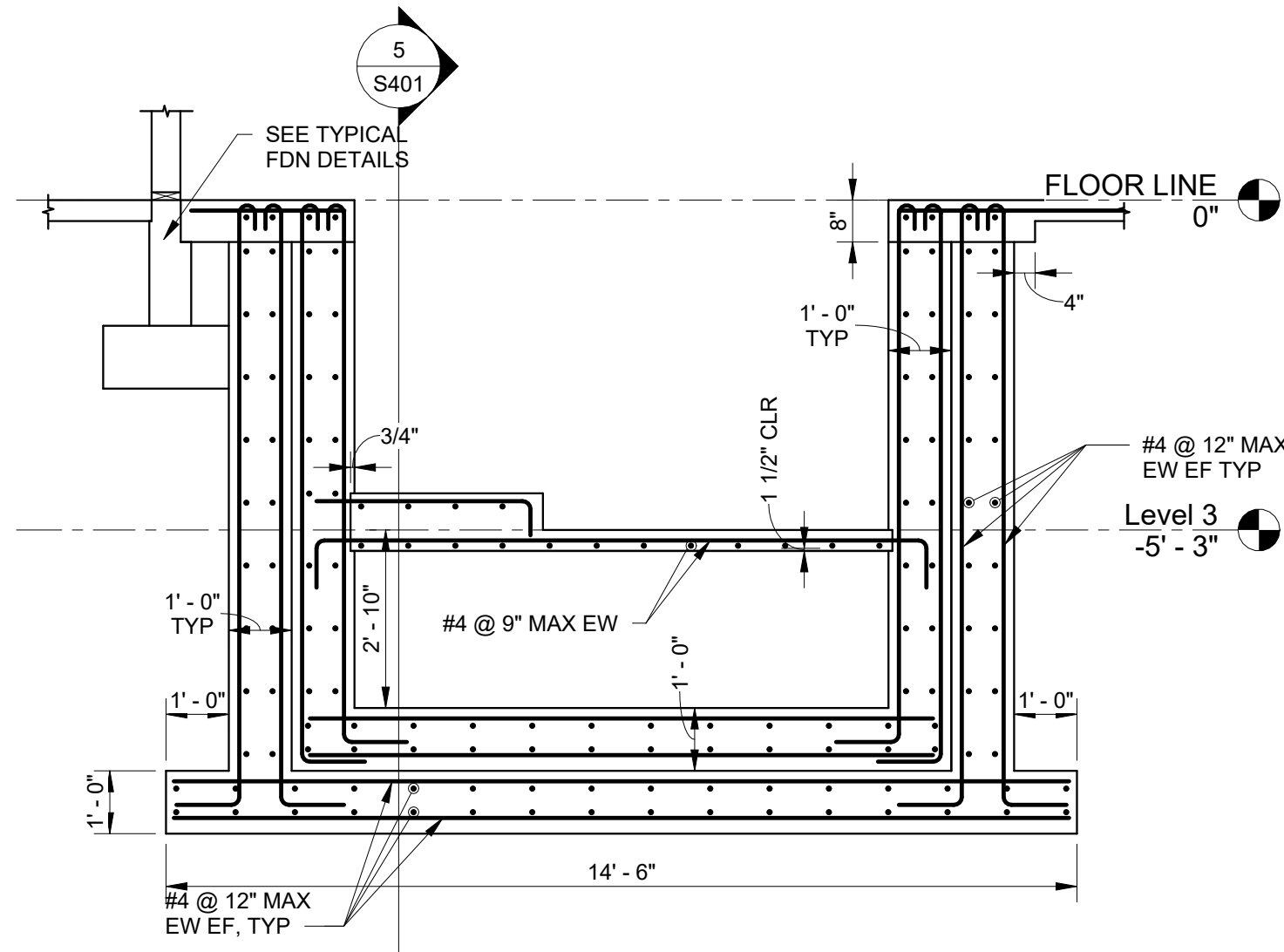


2 TYPICAL HOLDDOWN AT FOUNDATION

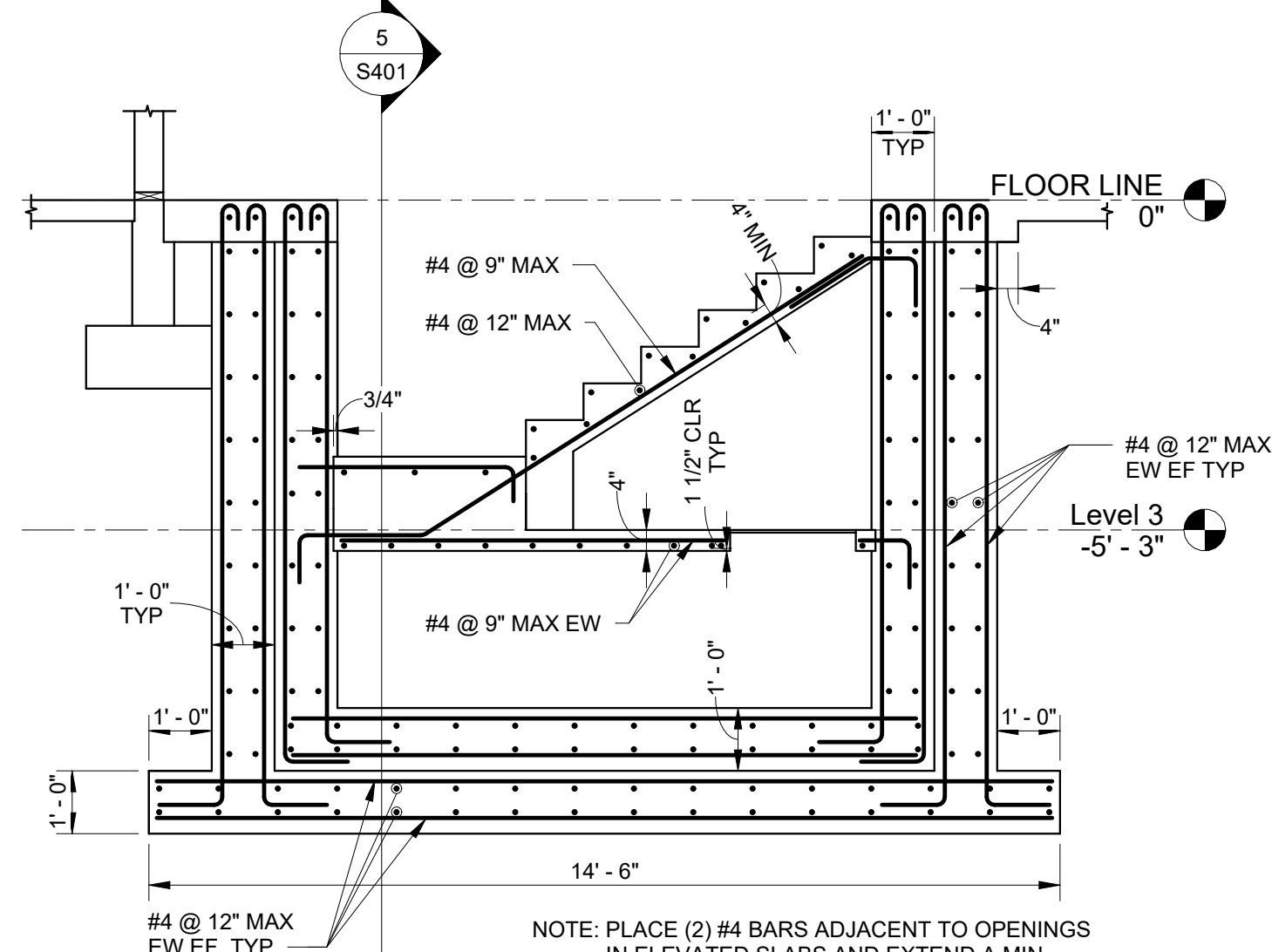
HOLDDOWN SCHEDULE						
MARK	HOLDDOWN	MINIMUM EDGE MEMBER	ANCHOR BOLT	EMBED LENGTH	DETAIL REF	CAPACITY (LBS)
HD1	HDU2-SDS2.5	4x6	5/8"	8"	FOUNDATION	3075

- NOTES:
- EDGE NAIL WALL SHEATHING TO EACH STUD AT BUILT-UP MEMBERS.
  - USE THE MINIMUM EDGE MEMBER IN 'HOLDDOWN SCHEDULE' UNLESS A LARGER POST IS NOTED ON PLAN.
  - SEE THE TYPICAL SHEAR WALL SCHEDULE FOR REQUIRED LOCATIONS.

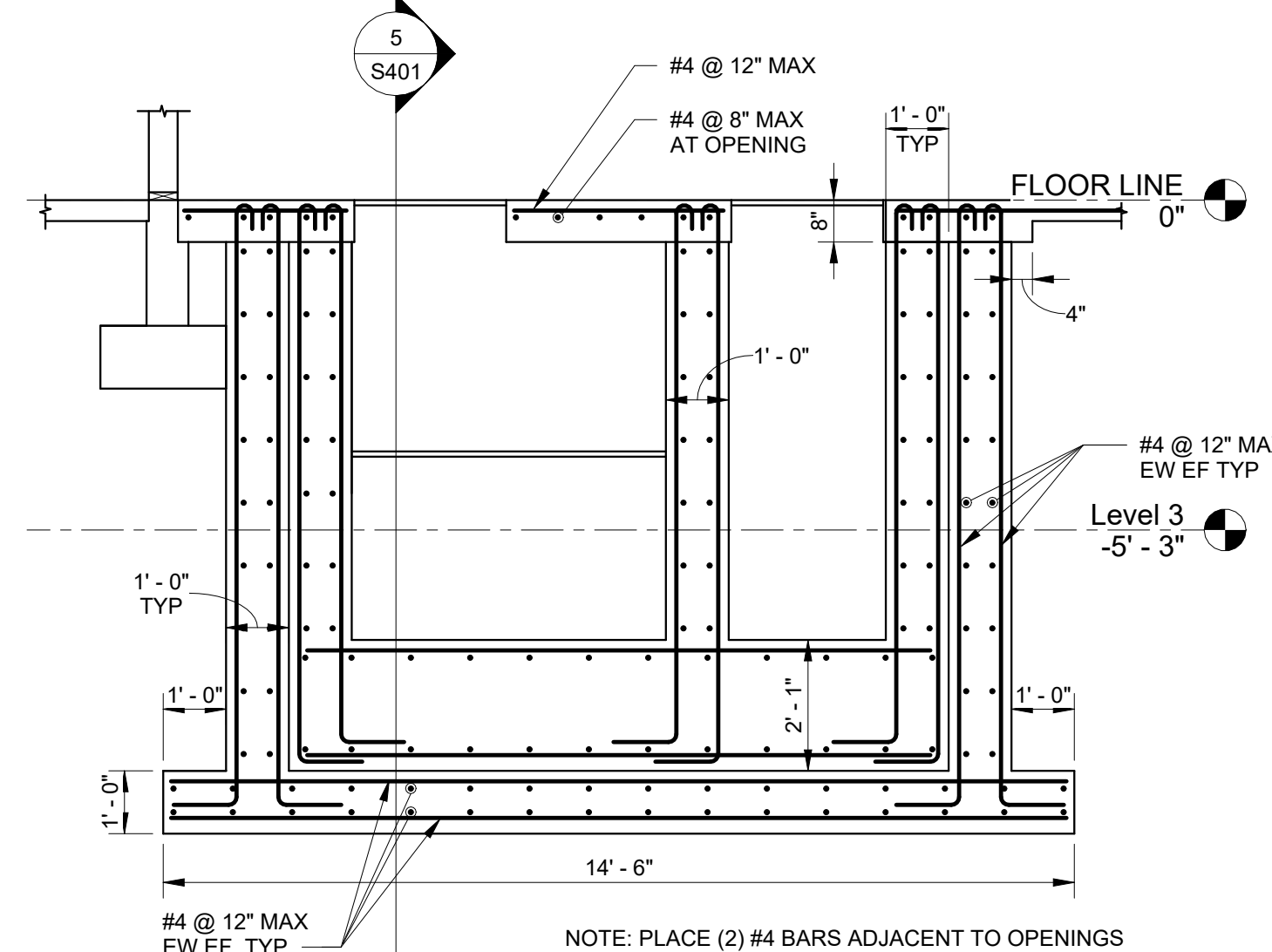
3 HOLDDOWN SCHEDULE



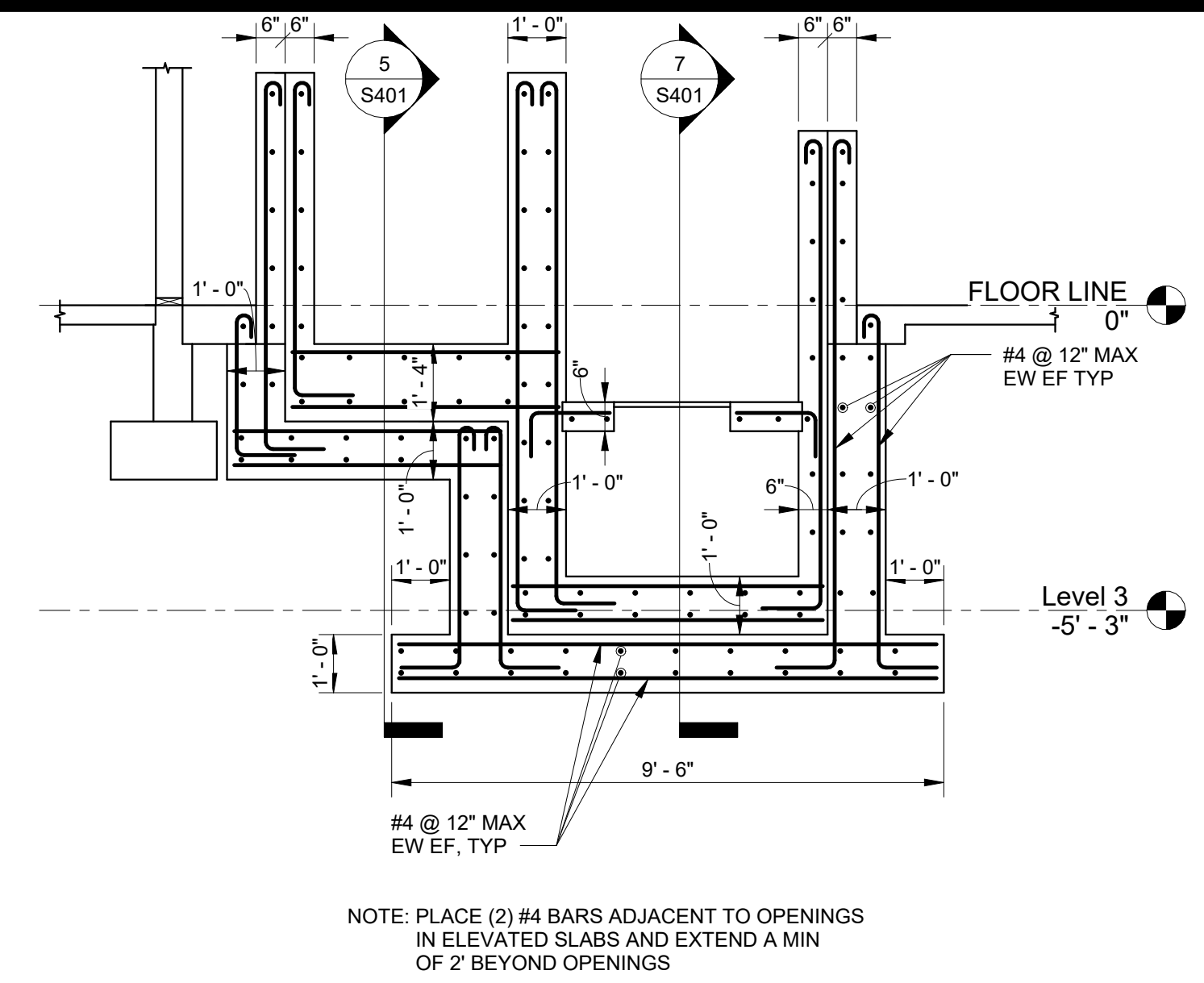
1 SECTION  
3/8" = 1'-0"



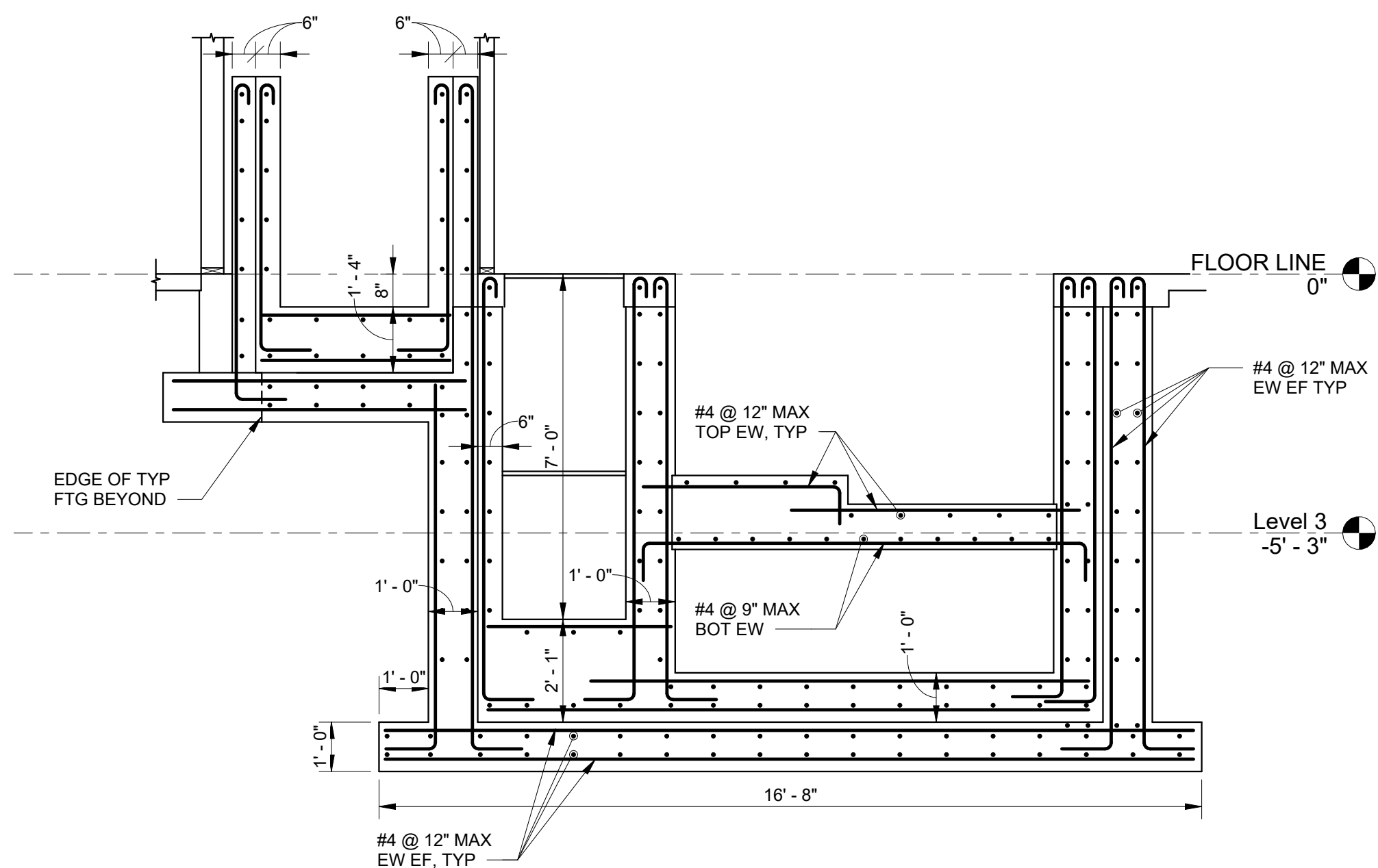
2 SECTION  
3/8" = 1'-0"



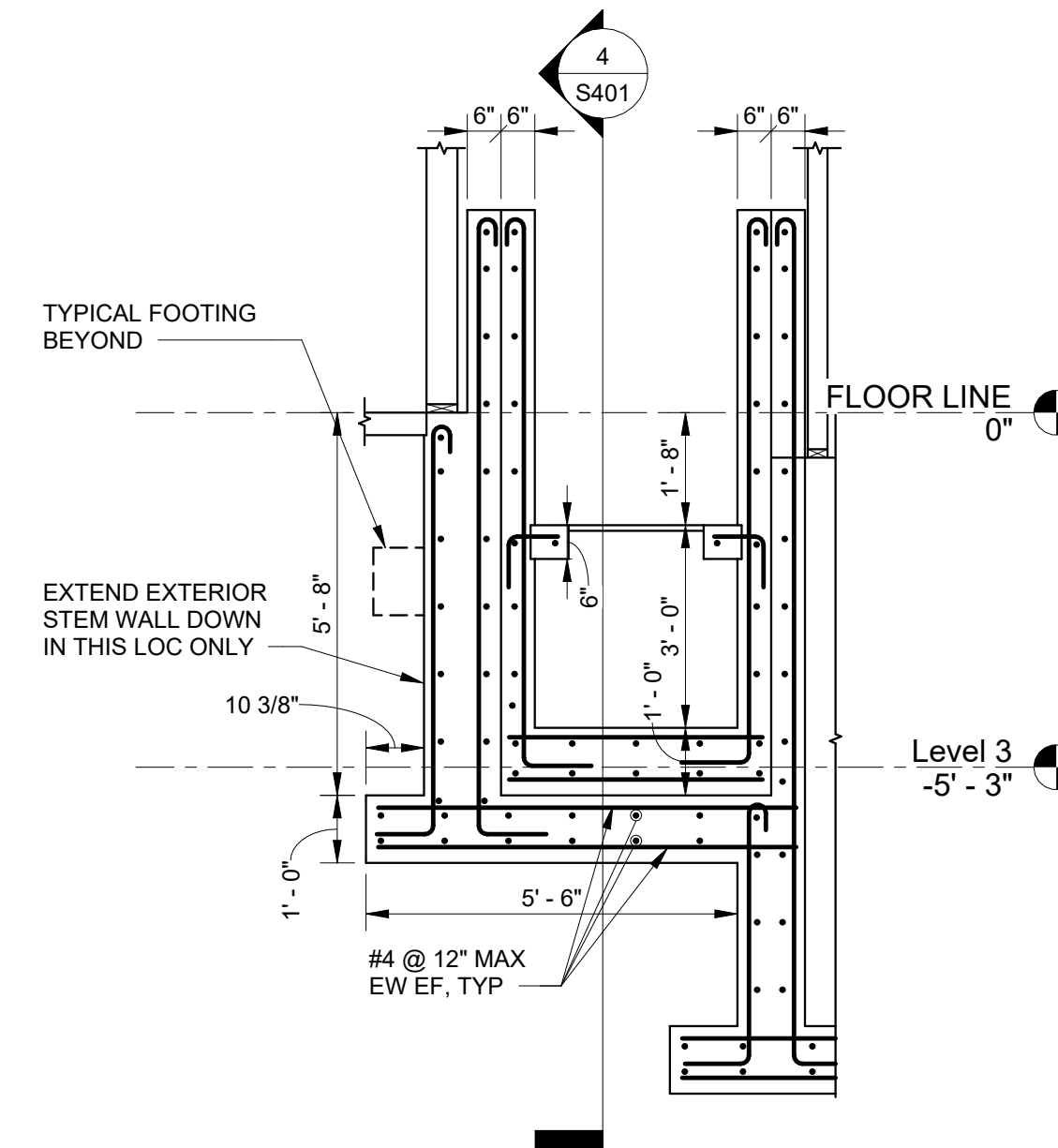
3 SECTION  
3/8" = 1'-0"



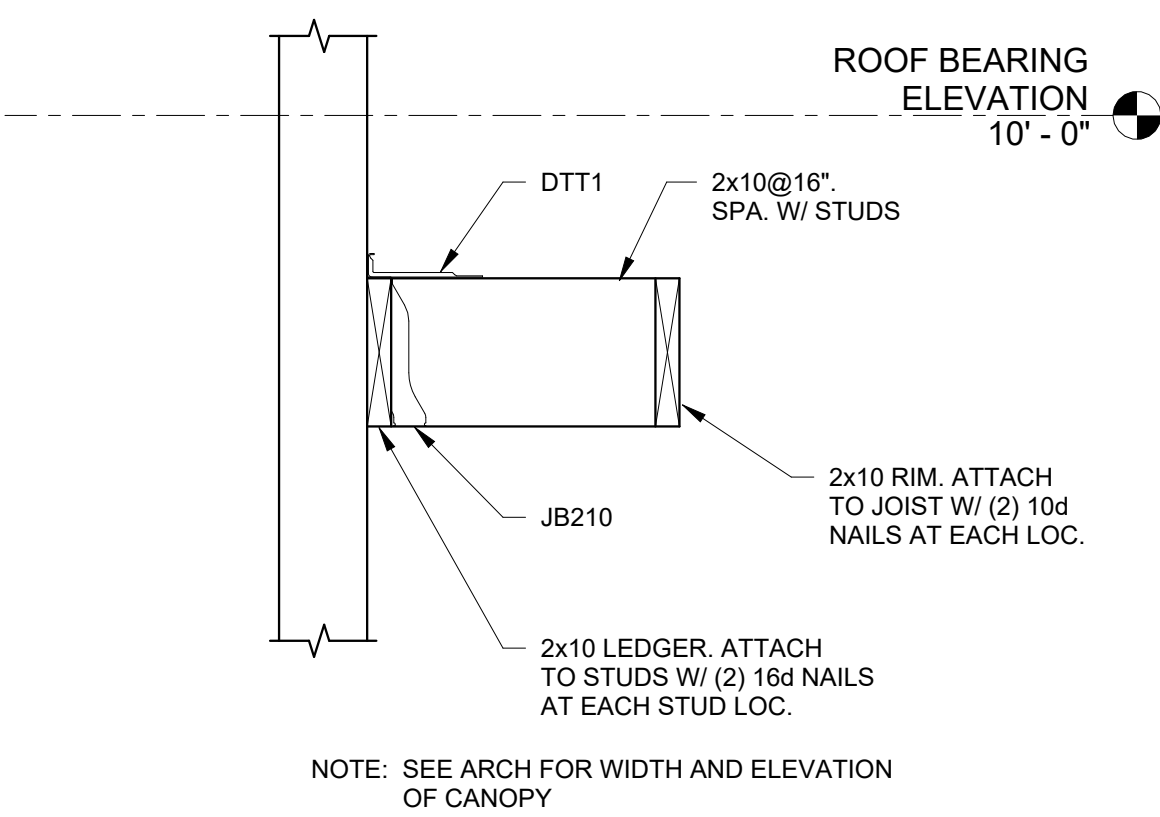
4 SECTION  
3/8" = 1'-0"



5 SECTION  
3/8" = 1'-0"



7 SECTION  
3/8" = 1'-0"



6 SECTION  
1" = 1'-0"

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**SECTIONS AND DETAILS**  
  
**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
 Blacksburg, VA

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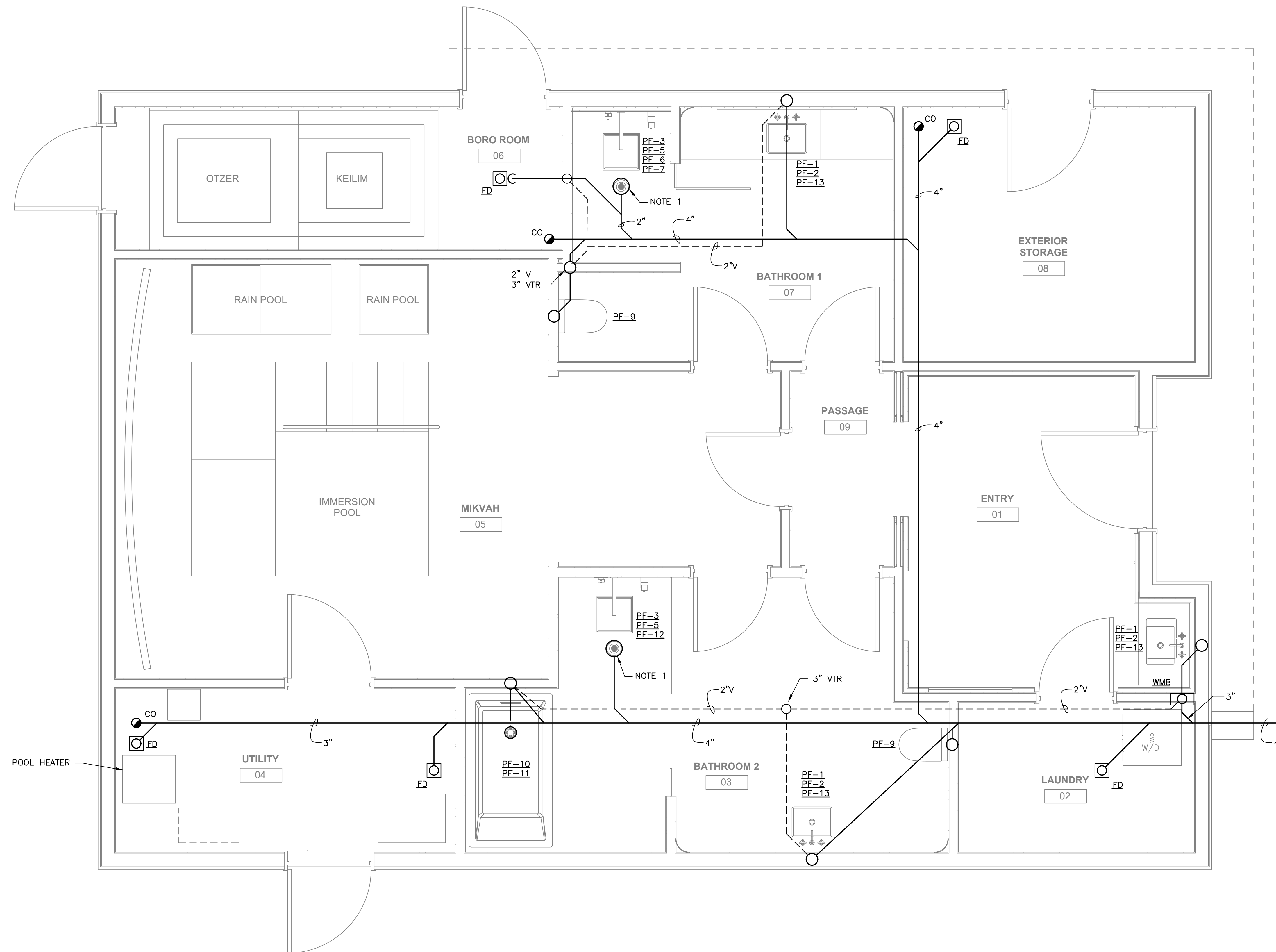
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S401

**NOTES THIS SHEET**

1. COORDINATE SHOWER DRAIN TYPE AND OUTLET LOCATION WITH OWNER AND INTERIOR DESIGN DRAWINGS.



**FLOOR PLAN - SANITARY**  
SCALE: 1/2" = 1'-0"

DATE:	11/25/25
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**FLOOR PLAN - SANITARY**

**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
Blacksburg, VA

**100% FINAL FOR OWNER REVIEW**



5 Design, LLC  
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Christiansburg, VA 24073  
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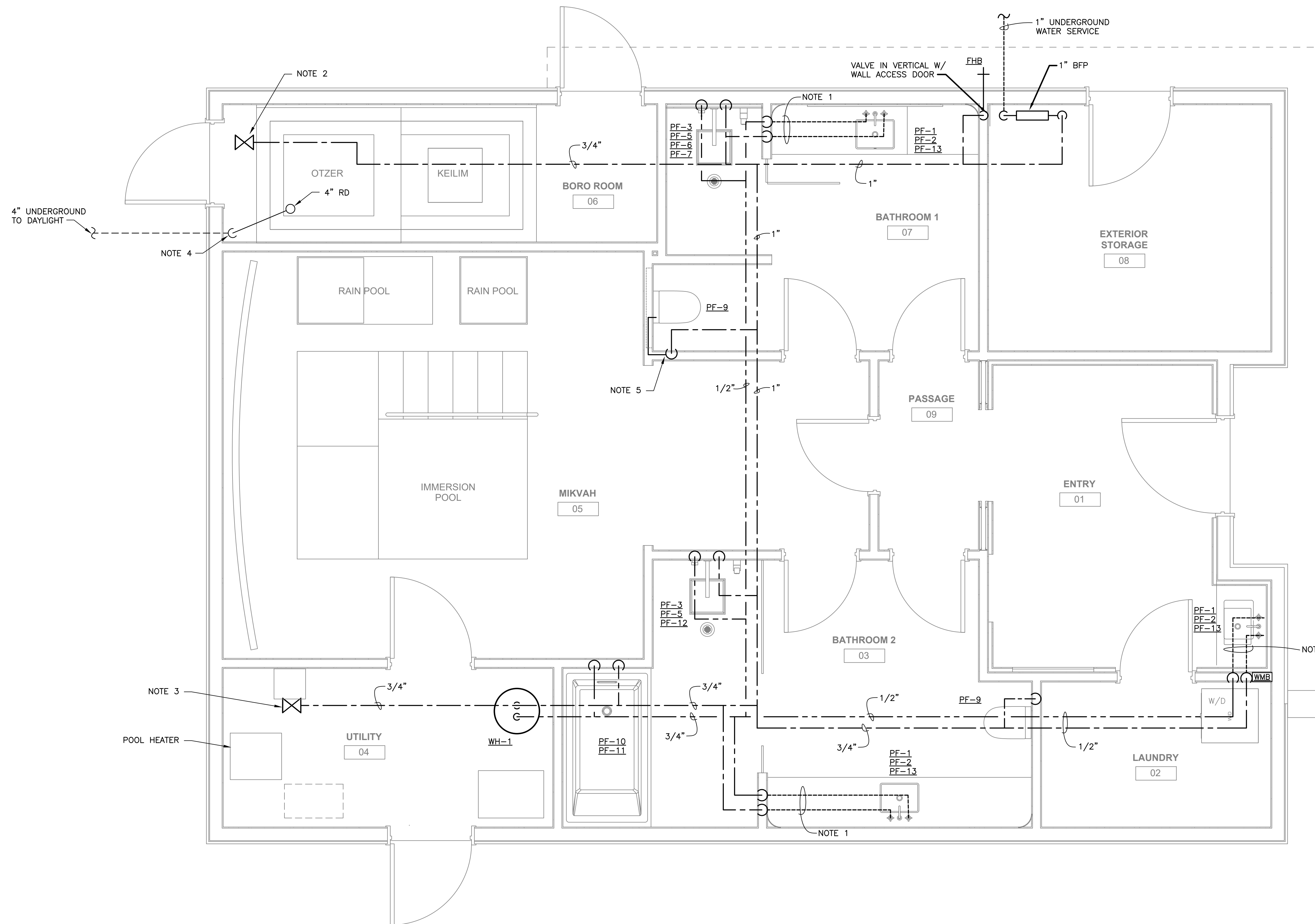
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**P101**

SHEET

### NOTES THIS SHEET

1. ROUTE 1/2" CW AND HW INSULATED PIPES CONCEALED BELOW COUNTER.
2. PROVIDE 3/4" CW VALVE FOR CONNECTION TO OTZER. COORDINATE WITH OWNER.
3. PROVIDE 3/4" CW VALVE FOR CONNECTION TO POOL HEATER. COORDINATE WITH OWNER.
4. PROVIDE 4" ROOF LEADER WITH TEE AND VALVES TO DIVERT RAIN WATER TO OTZER. COORDINATE WITH OWNER.
5. ROUTE WATER PIPE DOWN WALL AND BELOW RECESSED SHELF THAT IS BEHIND THE WATER CLOSET.



**FLOOR PLAN - WATER**  
SCALE: 1/2" = 1'-0"

DATE:	11/25/25
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## FLOOR PLAN - WATER

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

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**PLUMBING FIXTURE SCHEDULE** SEE FIXTURE SCHEDULE NOTE 2

MARK	DESCRIPTION	FIXTURE WASTE	VENT	C.W.	H.W.	MANUFACTURER	MODEL	CATALOG NO.	REMARKS	MTG HGT
PF-1 PF-2 PF-13	SINK	2"	1-1/2"	1/2"	1/2"	NOTE 1	NOTE 1	NOTE 1	SINK, FAUCET, AND BOTTLE TRAP.	
PF-9	WATER CLOSET	4"	2"	1/2"	---	NOTE 1	NOTE 1	NOTE 1	WALL-HUNG TOILET, CARRIER, AND ACTUATOR PLATE.	
PF-3 PF-5 PF-6 PF-7	SHOWER - BATHROOM 1	2"	1-1/2"	1/2"	1/2"	NOTE 1	NOTE 1	NOTE 1	SHOWER VALVE, HAND SHOWER, RAIN HEAD, RAIN HEAD ARM, FLOOR/TRENCH DRAIN.	
PF-3 PF-5 PF-12	SHOWER - BATHROOM 2	2"	1-1/2"	1/2"	1/2"	NOTE 1	NOTE 1	NOTE 1	SHOWER VALVE, HAND SHOWER, RAIN HEAD, RAIN HEAD ARM, FLOOR/TRENCH DRAIN.	
PF-10 PF-11	BATHTUB - BATHROOM 2	2"	1-1/2"	1/2"	1/2"	NOTE 1	NOTE 1	NOTE 1	BATHTUB AND BATH VALVE.	
WMB	WASHING MACHINE BOX	3"	2"	1/2"	1/2"	WATTS	INTELLIFLOW	A2C-WB-M1	AUTOMATIC WASHING MACHINE WATER SHUTOFF VALVE SYSTEM WITH LEAK SENSOR, RECESSED FLANGED BOX WITH 1/2" WATER CONNECTIONS AND 2" DRAIN, 120 VOLT VALVES WITH RECEPTACLE AND 5-FOOT CORD. INSTALL LEAK SENSOR IN WATER-TITE HEAVY DUTY PLASTIC PAN.	40"
FHB	FREEZEPROOF HOSE BIBB	---	---	3/4"	---	WOODFORD	---	MODEL 65	ANTI-SIPHON, AUTOMATIC DRAINING FREEZELESS WALL HYDRANT, BRASS FINISH WITH VACUUM BREAKER. SIZE EXTENSION TO WALL THICKNESS.	24"
FD	FLOOR DRAIN	2"	---	---	---	JAY R. SMITH	---	2005	PROVIDE WITH ROUND BRONZE TOP. PROVIDE SURE SEAL TRAP SEAL.	---

**FIXTURE SCHEDULE NOTES:**  
 1. SEE INTERIOR DESIGN DRAWINGS FOR FIXTURE MODEL NUMBERS AND ADDITIONAL INFORMATION.  
 2. SUBMIT PLUMBING FIXTURE SHOP DRAWINGS FOR OWNER REVIEW AND APPROVAL. SEE ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS FOR INSTALLATION DETAILS, DIMENSIONS, AND CLEARANCES.

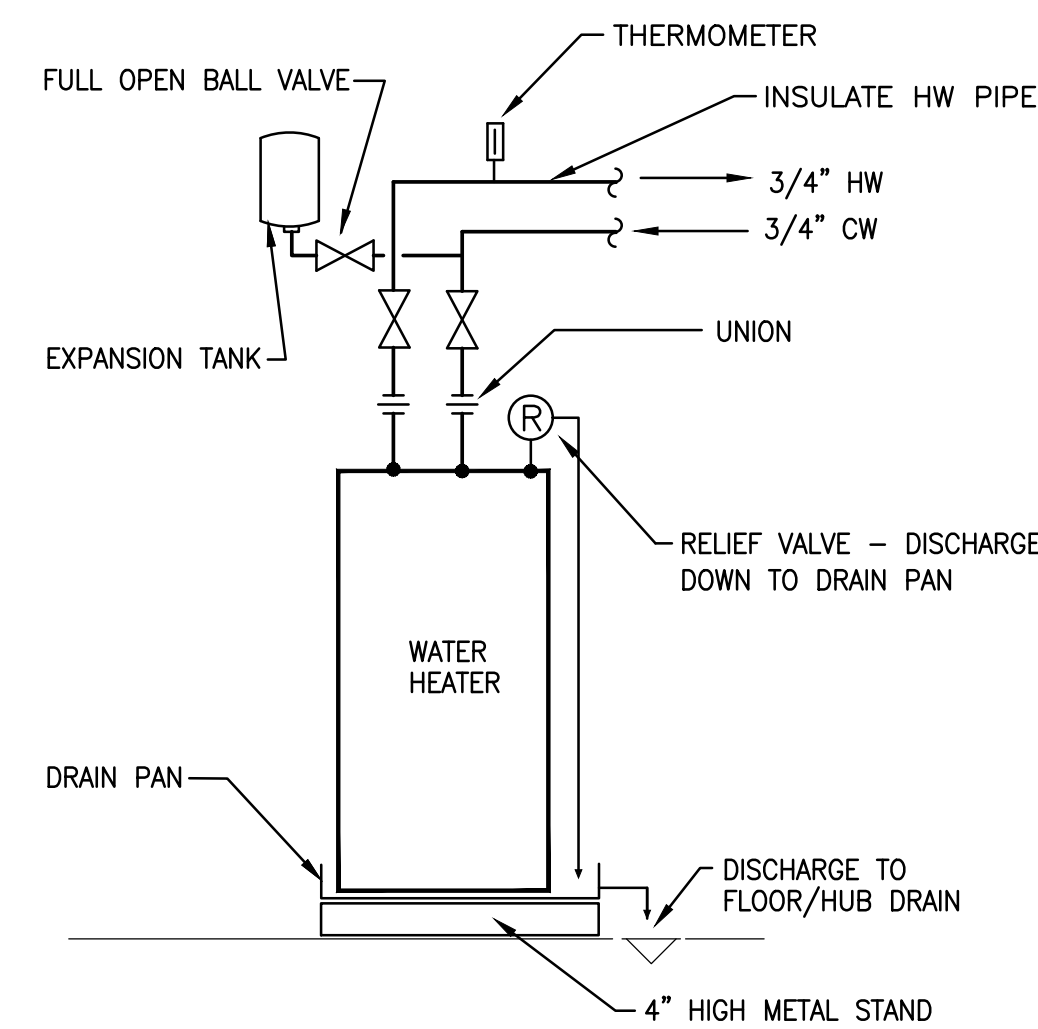
**PLUMBING OUTLINE SPECIFICATIONS**

- ALL WORK SHALL COMPLY WITH THE 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
- PROVIDE COMPLETE SUBMITTAL INFORMATION FOR FIXTURES, EQUIPMENT AND DEVICES.
- RECORD ALL CHANGES IN THE WORK ON THE PROJECT RECORD DRAWINGS.
- PROVIDE DETAILED OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT.
- PLUMBING EQUIPMENT, MATERIALS AND LABOR SHALL INCLUDE A ONE YEAR WARRANTY.
- DRAWINGS INDICATE GENERAL LAYOUT OF PIPING AND EQUIPMENT. COORDINATE INSTALLATION WITH OTHER TRADES AND PROVIDE ADDITIONAL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED. SEE ARCHITECTURAL DRAWINGS FOR CRITICAL INSTALLATION DIMENSIONS.
- VERIFY SITE CONDITIONS INCLUDING LOCATION FOR CONNECTIONS OF WATER AND SANITARY WASTE PIPING.
- CONFIRM LOCATION ELECTRICAL PANELBOARDS. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELBOARDS.
- SEAL AIRTIGHT ALL PIPE AND DUCT WALL PENETRATIONS.
- COORDINATE INSTALLATION OF EQUIPMENT AND OTHER DEVICES TO PROVIDE ACCESS FOR SERVICING.
- PROVIDE ALL MISCELLANEOUS COMPONENTS REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, WHETHER OR NOT THESE COMPONENTS ARE SPECIFIED HEREIN.
- MOUNT ALL EQUIPMENT PLUMB AND LEVEL WITH SUBSTANTIAL FASTENERS SUITABLE FOR THE LOAD. ALL COMPONENTS SHALL BE RIGIDLY ANCHORED FOR LONG LIFE UNDER HARD USE.
- PROVIDE SLEEVES FOR ALL PIPE PENETRATIONS IN MASONRY WALLS AND CONCRETE. ANCHOR SLEEVES TO ADJACENT STRUCTURE. SLEEVE ALL PIPES AT FOOTINGS AND FOUNDATION WALLS.
- INSTALL PIPING AND PIPE HANGERS PER ASME B31.9. SUPPORT PIPING AND SPACE HANGERS IN ACCORDANCE WITH VIRGINIA PLUMBING CODE, TABLE 308.5.
- WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING: COPPER, TYPE L, HARD DRAWN, ASTM B42, SOLDER FITTINGS, ASME B16.18 OR B16.22. FLUSH CLEAN AND DISINFECT.
- WATER PIPING, ABOVE GROUND: COPPER, TYPE L, ASTM B 88M, SOLDER FITTINGS. FLUSH CLEAN AND DISINFECT. LABEL WATER PIPES PER ASME A13.1.
- SANITARY WASTE AND VENT PIPING, BURIED WITHIN 5 FEET OF BUILDING: SCHEDULE 40 DWV PVC. ASTM D2665 OR ASTM D3034 WITH SOLVENT WELDED JOINTS WITH ASTM D2564 SOLVENT CEMENT.
- SANITARY WASTE AND VENT PIPING, ABOVE GROUND: SCHEDULE 40 DWV, ASTM D2665. FITTINGS SHALL BE PVC WITH SOLVENT WELD JOINTS WITH ASTM D 2564 SOLVENT CEMENT.
- INSTALL CLEANOUTS IN ACCORDANCE WITH VIRGINIA PLUMBING CODE. CLEANOUTS SHALL BE SAME MATERIAL AS DRAIN PIPING. LOCATE AT CHANGES OF DIRECTION GREATER THAN 45 DEGREES IN HORIZONTAL RUNS, AT BASE OF STACKS, AND NEAR THE JUNCTION OF THE BUILDING DRAIN AND THE BUILDING SEWER.
- ISOLATION VALVES FOR WATER PIPING SHALL BE QUARTER TURN BALL VALVES, MSS SP-110, CLASS 150 WITH LEVER HANDLE AND THREADED ENDS.
- PROVIDE ASSE 1072 SURESEAL TRAP SEALER IN ALL FLOOR/HUB DRAINS.
- WATER HAMMER ARRESTERS: ASSE 1010, INSTALLED WHERE INDICATED AND IN LOCATION CONCEALED FROM PUBLIC VIEW. PROVIDE ACCESS TO WATER HAMMER ARRESTER.
- BACKFLOW PREVENTER SHALL BE TESTED BY CERTIFIED TESTER AND RESULTS OF TEST SHALL BE PROVIDED TO THE OWNER AND THE BUILDING OFFICIAL.
- AIR ADMITTANCE VALVES PER ASSE 1051 AND INSTALLED IN AN ACCESSIBLE AND VENTILATED LOCATION FOR PROPER OPERATION. LOCATE A MINIMUM OF 4" ABOVE FIXTURE DRAIN. AAV TO BE UL LISTED WHEN INSTALLED IN A RETURN AIR PLENUM.
- INSULATE WATER PIPING WITH FIBERGLASS PIPE WRAP WITH ALL SERVICE VAPOR BARRIER JACKET. FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/50 MAXIMUM. K-VALUE OF 0.24. MINIMUM THICKNESS OF 1" THICKNESS FOR HOT WATER AND 3/4" FOR COLD WATER. SEAL COLD WATER PIPE INSULATION WITH VAPOR BARRIER MASTIC. INSULATION SHALL BE CONTINUOUS AT HANGERS.
- PLUMBING FIXTURES SHALL BE AS SPECIFIED ON THE INTERIOR DESIGN DRAWINGS AND SHALL BE IN COMPLIANCE WITH ASME 112.18, ASME A112.19.2 AND ANSI A117.1. INSTALL PER MANUFACTURER'S INSTRUCTIONS. FURNISH AND INSTALL FIXTURES COMPLETE WITH ALL TRIM INCLUDING SUPPLIES, CHROME ESCUTCHEONS, WASTE AND VENT CONNECTIONS, FITTINGS, CARRIERS, HANGERS AND SUPPORTS, BOLT CAPS, FAUCETS, VALVES AND TRAPS. TRIM FINISH SHALL BE AS SPECIFIED ON INTERIOR DESIGN DRAWINGS.
- WATER SUPPLY TO FIXTURES TO INCLUDE CHROME ESCUTCHEONS, ANGLE SUPPLY VALVE WITH QUARTER TURN HANDLE. FLEXIBLE SUPPLIES TO BE CHROME PLATED COPPER TUBE RISERS OR BRAIDED STAINLESS STEEL.
- PROVIDE CHROME ESCUTCHEONS AT PIPE PENETRATIONS OF WALLS AND FLOORS.
- VERIFY AND DEMONSTRATE TO OWNER THE OPERATION OF ALL EQUIPMENT AND CONTROLS.
- PERFORM TESTING OF WATER, SANITARY AND VENT PIPES PER VIRGINIA PLUMBING CODE. DISINFECT WATER PIPING PER LOCAL HEALTH DEPARTMENT REQUIREMENTS. PROVIDE ALL NECESSARY TESTS AND COORDINATE INSPECTIONS AND APPROVAL PER LOCAL REQUIREMENTS.

PLUMBING LEGEND	
SYMBOL	DESCRIPTION
----	DOMESTIC COLD WATER PIPING
----	DOMESTIC HOT WATER PIPING
----	SANITARY PIPING
----	VENT PIPING
G	PIPE TURN DOWN
O	PIPE TURN UP
⊘	ISOLATION VALVE
FD OC	FLOOR DRAIN
VTR	VENT THRU ROOF
CW	COLD WATER
HW	HOT WATER
W	SANITARY WASTE
V	SANITARY VENT
CO	CLEANOUT

**PLUMBING EQUIPMENT NOTES**

**WH-1:** ELECTRIC WATER HEATER, 50 GALLONS, 4.5 KW, 240 VOLTS, SINGLE PHASE. EQUAL TO STATE PATRIOT MODEL PCE-52-20RT, 0.95 EF, WITH HEAT TRAP FITTINGS. PROVIDE T&P RELIEF, THERMAL EXPANSION TANK, HOT & COLD SHUTOFF VALVES. PROVIDE DRAIN PAN WITH DRAIN OUTLET TO FLOOR DRAIN.



**WATER HEATER DETAIL**  
NO SCALE

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**SCHEDULES AND SPECS - PLUMBING**  
**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
 Blacksburg, VA

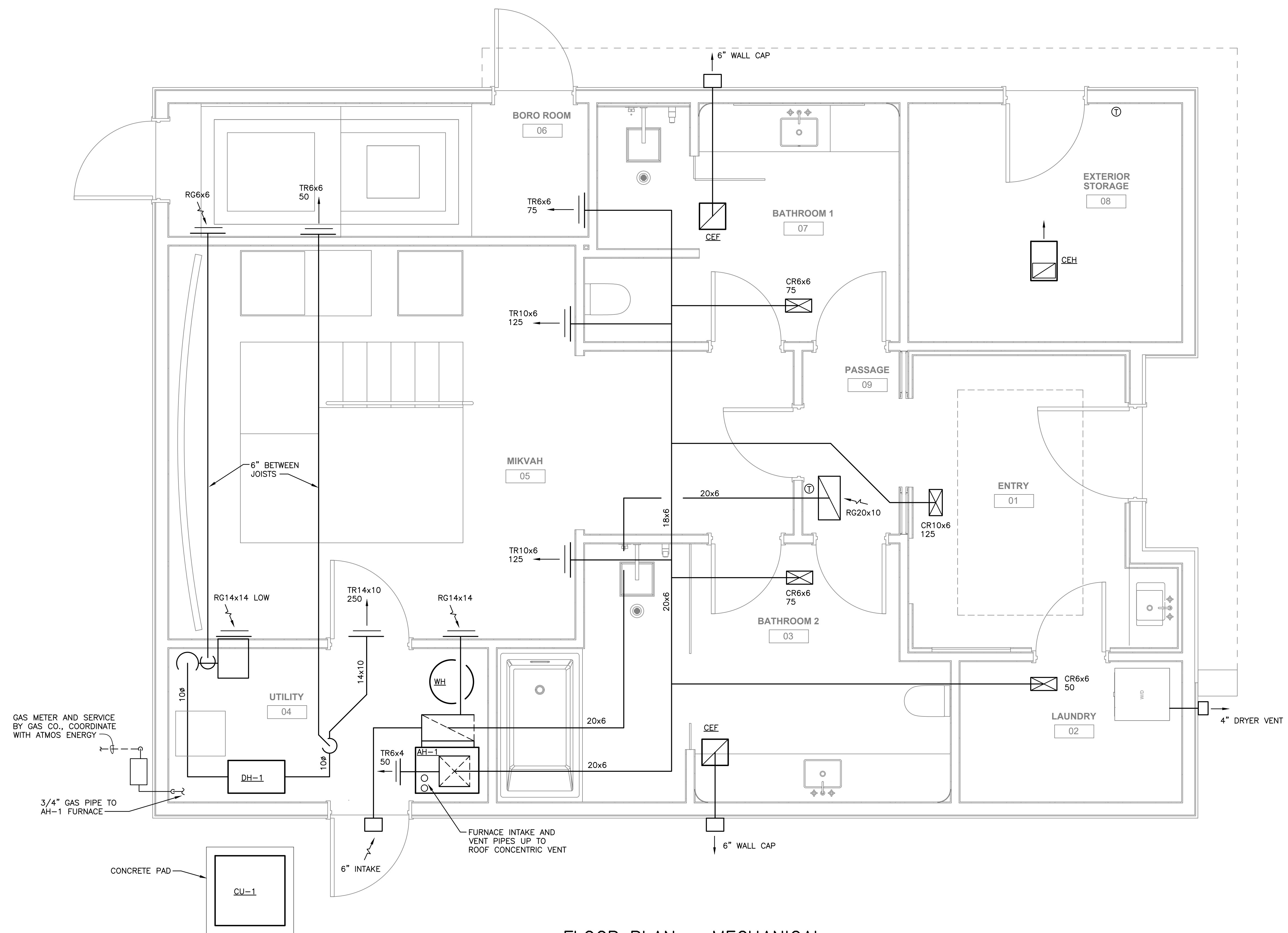
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**MANN & ASSOCIATES, INC.**  
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 Roanoke, VA 24011  
 540-344-5513



GAS METER AND SERVICE BY GAS CO., COORDINATE WITH ATMOS ENERGY

3/4" GAS PIPE TO AH-1 FURNACE

CONCRETE PAD

FURNACE INTAKE AND VENT PIPES UP TO ROOF CONCENTRIC VENT

**FLOOR PLAN - MECHANICAL**  
SCALE: 1/2" = 1'-0"

DATE:	11/25/25
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**FLOOR PLAN - MECHANICAL**

**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
Blacksburg, VA

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**M101**

SHEET

# GAS FURNACE AIR HANDLER (AH) & CONDENSING UNIT (CU) SCHEDULE

UNIT	SUPPLY FAN				FAN ELECTRICAL		GAS HEAT		COOLING		CONDENSING UNIT ELEC.			SELECTION BASED ON CARRIER	AREA SERVED	NOTES
	SUPPLY CFM	OUTSIDE AIR (CFM)	ESP (IN. WATER)	MOTOR HP	VOLTAGE	MCA/MOP	INPUT (MBH)	OUTPUT (MBH)	TOTAL (MBH)	SENSIBLE (MBH)	VOLTAGE	PHASE	MCA/MOP			
AH-1/CU-1	700	90	0.7	1/2	120	9.8/15	40/26	39/25	24	18	240	1	19.4/25	59TN6C-040C14-10 / 26VNA124	MIKVAH BUILDING	1 THRU 11

**SCHEDULE NOTES:**

1. CARRIER INFINITY COMMUNICATING SYSTEM WITH VARIABLE CAPACITY AND DEHUMIDIFICATION CAPABILITY.
2. FURNACE-95% EFFICIENCY, DIRECT VENT, NATURAL GAS FURNACE, ECM MOTOR, AGA CERTIFIED, ENERGY STAR. PROVIDE PVC COMBUSTION AIR CONCENTRIC VENT.
3. MULTI-POSITION CASED COIL, COPPER TUBES, ALUMINUM FINS. TXV REFRIGERANT METERING DEVICE, SLOPED CONDENSATE PAN.
4. AIR CONDITIONING UNIT: VARIABLE SPEED COMPRESSOR, MATCHED WITH INDOOR COIL, R-454B REFRIGERANT, MINIMUM 20 SEER2.
5. RATED AT ENTERING AIR TEMPERATURES OF 80F/67F COOLING AND 70F HEATING.
6. PROGRAMMABLE THERMOSTAT.
7. PROVIDE MANUFACTURER'S PREFABRICATED BOTTOM FILTER FRAME KIT FOR 1" PLEATED FILTER.
8. PROVIDE CONDENSATE OVERFLOW DETECTION SWITCH IN SECONDARY DRAIN CONNECTION TO DE-ENERGIZE AIR HANDLER.
9. AIR HANDLER TO BE VERTICAL CONFIGURATION.
10. PROVIDE FOUR 6" HIGH RISER LEGS TO MOUNT CONDENSING UNIT ON CONCRETE PAD.
11. MOTOR OPERATED DAMPERS FOR OUTSIDE AIR SHALL BE TWO POSITION (OPEN/CLOSE). MINIMUM OUTSIDE AIR DAMPER INTERLOCKED TO OPEN IN OCCUPIED MODE.

## FAN SCHEDULE

UNIT	CFM	E.S.P.	DRIVE	RPM	MOTOR			MAX SONES	SELECTION BASED ON GREENHECK	WEIGHT LBS.	AREA SERVED	CONTROL	NOTES
					HP/AMPS	VOLTS	PH						
CEF	125	0.25	DIRECT	910	1.5 FLA	120	1	2.0	SP-A390-VG	24	BATHROOMS	LIGHT SW.	1,2

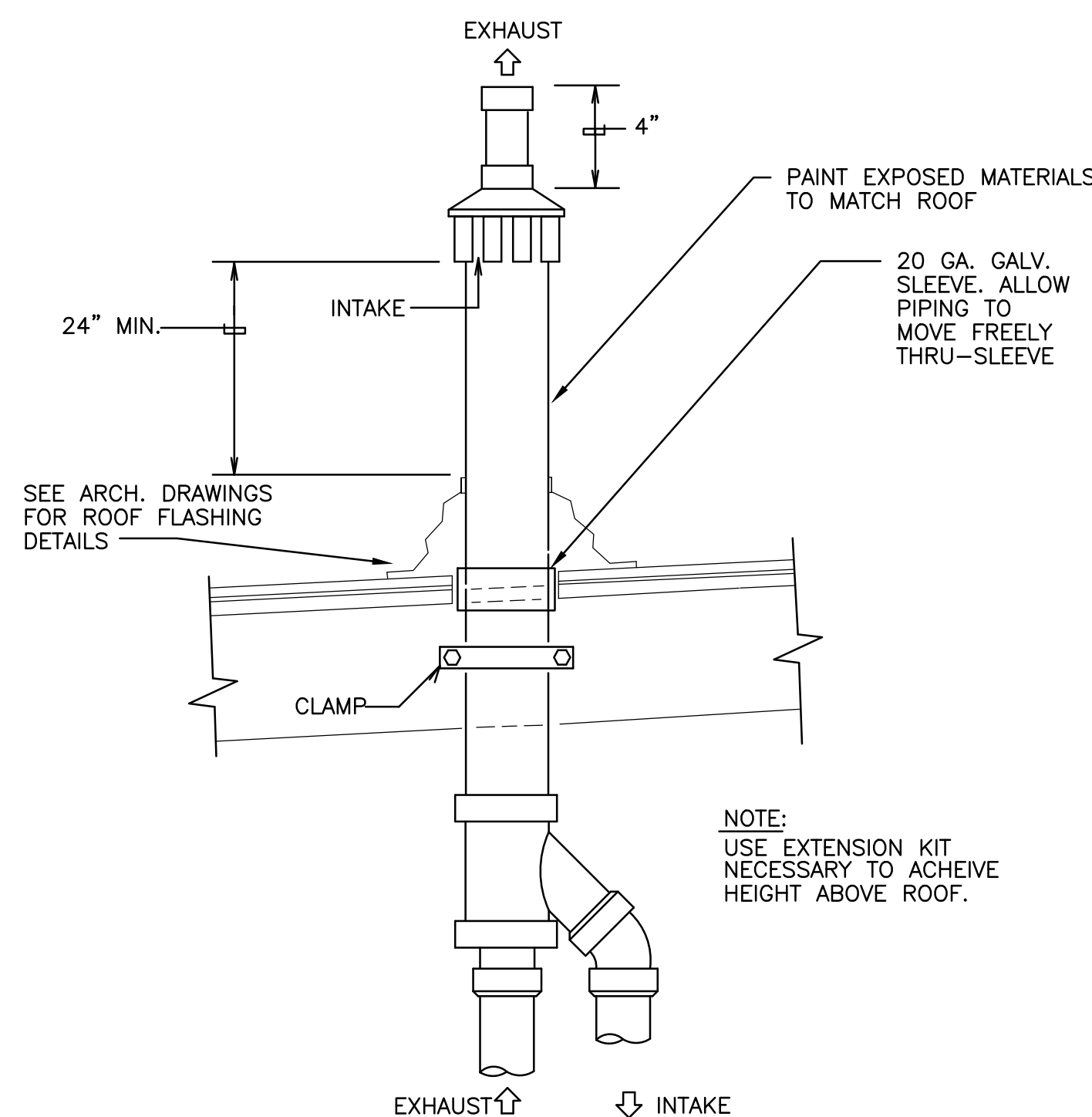
**SCHEDULE NOTES:**

1. CENTRIFUGAL CEILING EXHAUST FAN, BACKDRAFT DAMPER, CEILING GRILLE, ELECTRICAL PLUG TYPE DISCONNECT. EXHAUST FAN TO BE ENERGIZED BY ROOM LIGHT SWITCH.
2. ROUTE EXHAUST DUCT TO WALL CAP.

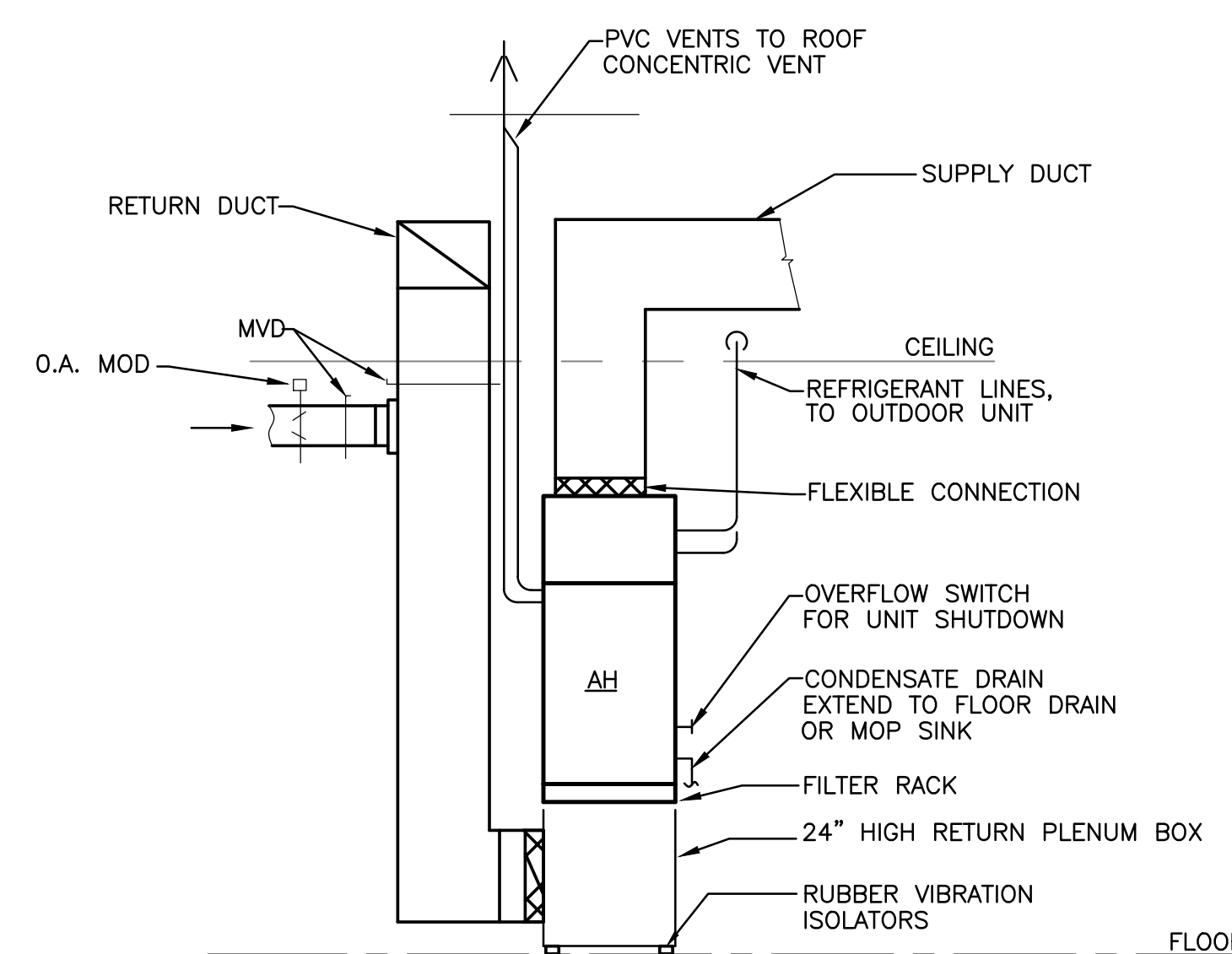
## MECHANICAL EQUIPMENT

**DEHUMIDIFIER (DH-1):** HONEYWELL TRUDRY DR120 DEHUMIDIFIER, 120 PINTS, 300 CFM, 7.3 AMPS, 120 VOLTS WITH CORD AND PLUG, INLINE AIRFLOW CONFIGURATION WITH 10" INLET AND OUTLET, MERV 11 FILTER, WALL MOUNTED DEHUMIDISTAT CONTROLLER, ENERGY STAR RATED, CONDENSATE OVERFLOW SWITCH, PROVIDE SPRING VIBRATION ISOLATOR HANGARS AND FLEX DUCT CONNECTORS.

**CEILING ELECTRIC HEATER (CEH):** RECESSED CEILING MOUNTED, 2000 WATTS, 8.3 AMPS, 240 VOLTS, SINGLE PHASE, DISCONNECT MEANS, CONTROL TRANSFORMER AND WALL MOUNTED THERMOSTAT, MARKEL COMMERCIAL DUTY 3380 SERIES, 14"x19"x4". CONFIRM CABINET SIZE WILL FULLY RECESS IN CEILING.



**GAS FURNACE CONCENTRIC  
ROOF VENT DETAIL**  
NOT TO SCALE



**VERTICAL AIR HANDLER  
INSTALLATION DETAIL**  
NOT TO SCALE

## MECHANICAL LEGEND

SYMBOL	DESCRIPTION
	9" CEILING DIFFUSER SUPPLYING 200 CFM
	RETURN OR EXHAUST REGISTER OR GRILLE
	THERMOSTAT OR SENSOR
	HUMIDITY SENSOR
	MANUAL VOLUME DAMPER
	MOTOR OPERATED DAMPER
	SIDEWALL SUPPLY REGISTER
	CEILING REGISTER
	RETURN GRILLE
	AIR HANDLER (GAS FURNACE + DX COIL)
	CONDENSING UNIT
	CEILING EXHAUST FAN FOR BATHROOMS
	DEHUMIDIFIER
	CEILING ELECTRIC HEATER

## MECHANICAL OUTLINE SPECIFICATIONS

1. ALL WORK SHALL COMPLY WITH THE 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
2. PROVIDE COMPLETE SUBMITTAL INFORMATION FOR EQUIPMENT AND DEVICES.
3. RECORD ALL CHANGES IN THE WORK ON THE PROJECT RECORD DRAWINGS.
4. PROVIDE DETAILED OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT.
5. MECHANICAL EQUIPMENT, MATERIALS AND LABOR SHALL INCLUDE A ONE YEAR WARRANTY AND FIVE YEAR COMPRESSOR WARRANTY.
6. DRAWINGS INDICATE GENERAL LAYOUT OF PIPING, DUCTWORK AND EQUIPMENT. THE CONTRACTOR SHALL INVESTIGATE ALL STRUCTURAL, ELECTRICAL AND FINISH CONDITIONS AFFECTING THE WORK AND SHALL ARRANGE THE MECHANICAL WORK ACCORDINGLY. PROVIDE ADDITIONAL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED TO PROPERLY COMPLETE THE WORK, WHETHER OR NOT SUCH COMPONENTS ARE INDICATED ON THE DRAWINGS.
7. CONFIRM LOCATION OF ELECTRICAL PANELBOARDS. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELBOARDS.
8. SEAL AIRTIGHT ALL PIPE AND DUCT WALL PENETRATIONS.
9. COORDINATE INSTALLATION OF EQUIPMENT AND OTHER DEVICES TO PROVIDE ACCESS FOR SERVICING.
10. PROVIDE ALL MISCELLANEOUS COMPONENTS REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, WHETHER OR NOT THESE COMPONENTS ARE SPECIFIED HEREIN.
11. METAL ACCESS DOORS SHALL BE PROVIDED AS REQUIRED FOR ALL COMPONENTS REQUIRING ACCESS. COORDINATE LOCATIONS WHERE ACCESS DOORS WILL BE REQUIRED FOR VALVES, DAMPERS, SENSORS OR OTHER DEVICES.
12. DUCTWORK SHALL BE INSTALLED TO PERMIT THE INSTALLATION OF CEILINGS AND LIGHT FIXTURES AT THE INDICATED HEIGHTS. REFER TO ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR COORDINATION.
13. GALVANIZED SHEET METAL DUCTWORK CONSTRUCTION SHALL COMPLY WITH SMACNA STANDARDS WITH TURNING VANES OR LONG RADIUS ELBOWS AND MANUAL DAMPERS FOR BALANCING. INDICATED DUCT SIZES ARE INTERIOR AIRFLOW DIMENSIONS. AT EACH TAKEOFF TO A SUPPLY DIFFUSER, PROVIDE LOW-LOSS CONICAL OR TAPERED 45 DEGREE RECTANGULAR BRANCH TAKEOFF WITH MANUAL DAMPER. MANUAL VOLUME DAMPER TO HAVE LOCKING HANDLE WITH EXTENDED SHAFT AND STANDOFF FOR INSULATION THICKNESS. DUCTS SHALL BE FASTENED AND SEALED PER MECHANICAL CODE AND ENERGY CODE FOR 2.0 INCHES STATIC PRESSURE AND SMACNA SEAL CLASS A.
14. INSULATE ALL SUPPLY, RETURN, AND OUTSIDE AIR DUCTWORK. INSULATE EXHAUST DUCT FROM LOUVER TO BACKDRAFT DAMPER. INSULATE TOP OF SUPPLY AIR CEILING DIFFUSERS. SEAL ALL INSULATION JOINTS VAPOR TIGHT. INSULATE WITH FIBERGLASS DUCT WRAP WITH ALL SERVICE VAPOR BARRIER JACKET. FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/50 MAXIMUM, MINIMUM INSTALLED R6. PROVIDE 1" ACOUSTIC LINER WITH FUNGUS/BACTERIA RESISTANT COATING PER ASTM G21 WHERE INDICATED.
15. FLEXIBLE DUCTS SHALL HAVE STEEL WIRE HELIX REINFORCEMENT, CONTINUOUS INNER LINER, R6 FIBERGLASS INSULATION AND OUTER JACKET TO COMPLY WITH UL 181, CLASS 1. DIAMETER OF FLEX DUCT SHALL MATCH DIFFUSER INLET SIZE. SUPPORT EVERY FOUR FEET WITH MAXIMUM OF 1" SAG. MAXIMUM LENGTH IS EIGHT FEET.
16. GRILLES, REGISTERS AND ASSOCIATED ACCESSORIES TO BE ALUMINUM CONSTRUCTION. RETURN GRILLES (RG) BY PRICE INDUSTRIES TO BE ALUMINUM 630 SERIES WITH VANES ON 3/4" CENTERS FOR SURFACE MOUNT IN CEILING OR WALL. SIDEWALL SUPPLY REGISTERS (TR) AND CEILING REGISTERS (CR) TO BE SERIES 6200, DOUBLE DEFLECTION, EXTRUDED ALUMINUM WITH ALUMINUM OBD.
17. LOUVERS SHALL BE 4 INCH DEEP, EXTRUDED ALUMINUM, BIRD SCREEN, KYNAR FINISH SELECTED BY ARCHITECT, RUSKIN MODEL EME420DDE FOR WIND DRIVEN RAIN. COORDINATE FRAME AND INSTALLATION WITH WALL CONSTRUCTION. DUCT CONNECTION TO LOUVER SHALL BE WATERTIGHT AND DUCT SHALL SLOPE DOWN TOWARD LOUVER TO DRAIN.
18. PROVIDE IDENTIFICATION MARKINGS FOR EQUIPMENT, PIPING AND CONTROLS. NAMEPLATES SHALL BE PLASTIC LAMINATE WITH 1/4" LETTERS.
19. PROVIDE FLEXIBLE CONNECTORS AT CONNECTION OF DUCTWORK TO AIR HANDLING EQUIPMENT.
20. CONDENSATE LINES TO BE PVC WITH TRAP AND CLEANOUT TEE AT COOLING COIL. INSULATE WITH 3/4" PIPE WRAP. SUPPORT ON WALL AND ROUTE TO NEAREST FLOOR DRAIN AND TERMINATE WITH AIR GAP FOR AN INDIRECT CONNECTION.
21. REFRIGERANT LINES SHALL BE COPPER TUBING SIZED PER MANUFACTURER'S INSTRUCTIONS. SUPPORT EXTERIOR LINES WITH GALVANIZED UNISTRUCT MOUNTED TO SIDE OF BUILDING OR ON CONCRETE PAD. INSULATE REFRIGERANT LINES PER ENERGY CODE WITH THICKNESS BASED ON LINE SIZE AND MAXIMUM LINE TEMPERATURE, 1" MINIMUM THICKNESS. INSULATE WITH FLEXIBLE ELASTOMERIC CELLULAR INSULATION. SEAL JOINTS WITH VAPOR BARRIER MASTIC. INSULATION SHALL BE CONTINUOUS AT HANGERS. APPLY TWO COATS OF UV RESISTANT PROTECTIVE FINISH ON EXTERIOR LINES. PROVIDE LOCKING CAPS ON ALL REFRIGERANT SERVICE VALVES.
22. COMBUSTION AIR AND VENT PIPES SHALL BE SIZED BY FURNACE AND RADIANT HEAT MANUFACTURER. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
23. INSTALL PIPING AND PIPE HANGERS PER ASME B31.9. SUPPORT PIPING AND SPACE HANGERS IN ACCORDANCE WITH VIRGINIA MECHANICAL CODE, TABLE 305.4.
24. TEST AND BALANCE ALL EQUIPMENT FOR PROPER OPERATION, AIRFLOW, CAPACITY, ACCEPTABLE SPACE TEMPERATURES AND NOISE LEVELS. PERFORM TAB AND RECORD RESULTS PER AABC OR NEBB STANDARDS AND SUBMIT REPORT FOR REVIEW.
25. START-UP EQUIPMENT AND PERFORM FUNCTIONAL TEST IN HEATING AND COOLING MODES. PROGRAM THERMOSTATS AND INSTRUCT OWNER'S MAINTENANCE PERSONNEL ON THE OPERATION OF EQUIPMENT AND CONTROLS. PROVIDE FINAL FILTER CHANGE.

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**NEW MIKVAH FOR THE CHABAD AT VA TECH**  
 Blacksburg, VA

100% FINAL  
FOR OWNER  
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## ELECTRICAL LEGEND

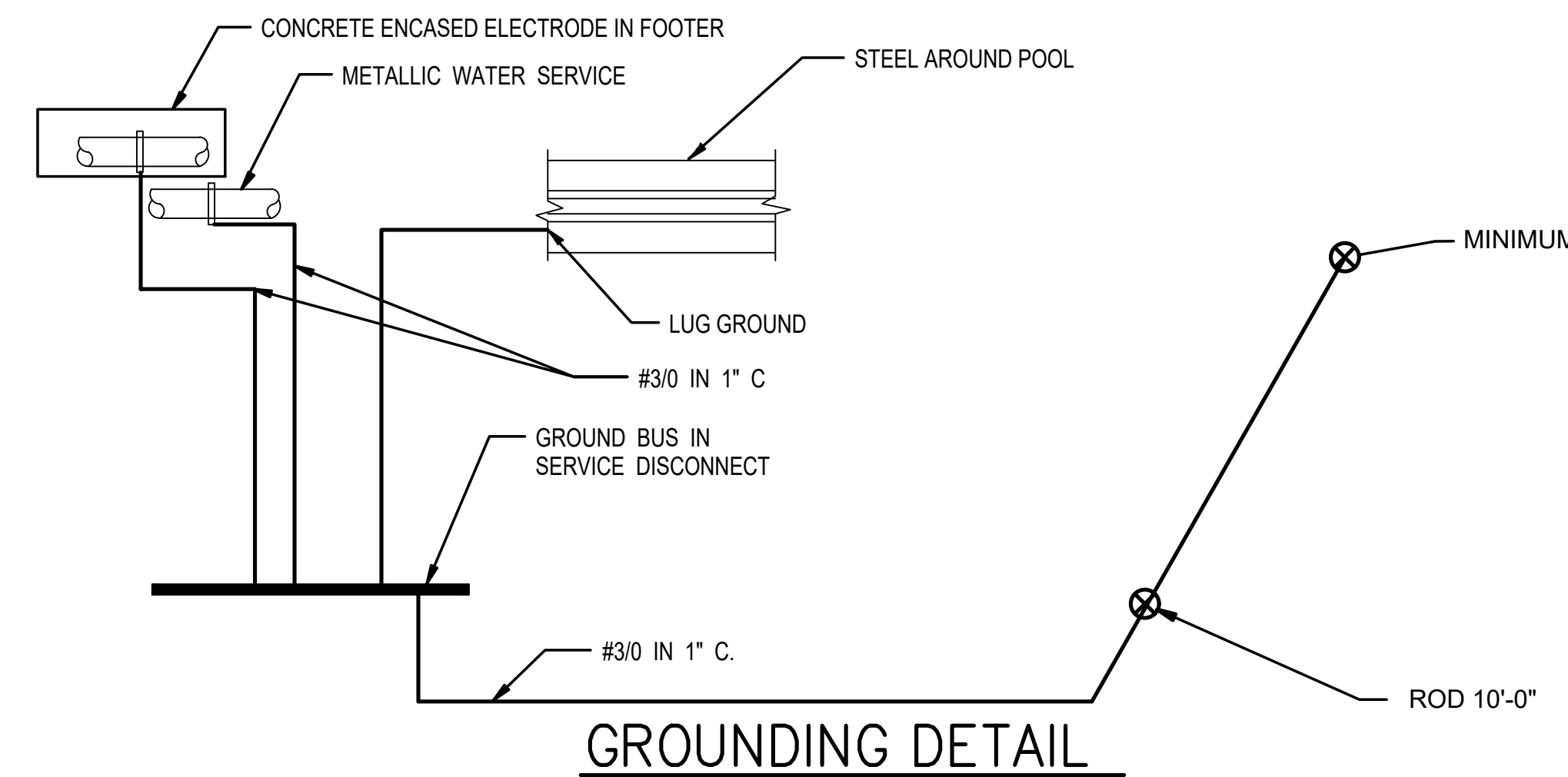
## GENERAL NOTES

	LIGHTING FIXTURE, RECESSED, SURFACE OR PENDANT CEILING MOUNTED. N INDICATES NIGHT LIGHT (TYP). COORDINATE WITH OWNER FOR DESIRED NIGHT LIGHT LOCATIONS.
	EXIT LIGHTING FIXTURE, SURFACE CEILING MOUNTED, DIRECTIONAL ARROWS AS INDICATED. VR SUBSCRIPT INDICATES VANDAL RESISTANT.
	EXIT LIGHTING FIXTURE, SURFACE WALL MOUNTED, DIRECTIONAL ARROWS AS INDICATED.
	FURNITURE WHIPS UNLESS INDICATED OTHERWISE, FOR FURNITURE WHIPS PROVIDE DATA AND POWER
	QUAD-PLEX WALL RECEPTACLE
	DUPLEX WALL RECEPTACLE, MOUNTING HEIGHT = 2'-0", EXCEPT 'C' SUBSCRIPT INDICATES MOUNTING IN CASEWORK(TYP). 'GF' SUBSCRIPT INDICATES GROUND FAULT, 'WP' SUBSCRIPT INDICATES WEATHERPROOF, 'EWC' SUBSCRIPT INDICATES GROUND FAULT BEHIND ELECTRIC WATER COOLER. '*' INDICATES MOUNTED HEIGHT = 8" ABOVE COUNTER(TYP). 'TV' INDICATES COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL PLANS FOR TV LOCATIONS.
	OCCUPANCY SENSOR, DUAL TECHNOLOGY
	EMERGENCY BATTERY UNIT
	CONDUCTORS IN CONDUIT CONCEALED IN CEILING OR WALL.
	BRANCH CIRCUIT HOME RUN TO PANELBOARD. NOTATION INDICATES PANELBOARD & BRANCH CIRCUIT CONNECTION.
	CONDUCTORS IN CONDUIT CONCEALED IN SLAB OR BELOW GRADE.
	CONDUCTORS IN CONDUIT TURNED UP.
	CONDUCTORS IN CONDUIT TURNED DOWN.
	EXISTING FLOOR BOX
	INTEGRAL OCCUPANCY SENSOR SWITCH, MOUNTING HEIGHT = 4'-0" TO TOP.
	COMBINATION PHONE OUTLET AND DATA OUTLET. DATA SYSTEM OUTLET, MOUNTING HEIGHT = 1'-6" UNLESS INDICATED OTHERWISE. PROVIDE 1' CONDUIT FROM BOX TO ABOVE ACCESSIBLE CEILING. WHERE MOUNTED BESIDE COUNTER RECEPTACLE: MOUNT SAME HEIGHT AS RECEPTACLE, PROVIDE PULL CABLE IN 1" CONDUIT.

- MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. VERIFY LOCATION WITH MECHANICAL AND PROVIDE ALL CONDUIT AND WIRING TO OUTDOOR EQUIPMENT.
- WHERE LIGHT SWITCHES ARE INDICATED TO BE MOUNTED BEHIND DOOR, MOUNT SUCH SWITCHES A MINIMUM OF 3'-9" FROM HINGED SIDE.
- REVISE PANELBOARD SCHEDULES ON PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.
- LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.
- PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES WITH THE DEVICE ID, RATING, POWER SOURCE AND INSTALLATION DATE AND BY WHICH SWITCH OR STARTER.
- COUNTER AND TOILET RECEPTACLES TO BE GFI AND COUNTER HEIGHT EXCEPT WHERE NOTED. REFRIGERATOR RECEPTACLE TO BE 36" AFF.
- LIGHT FIXTURE TYPE IS SHOWN ONLY ONCE AS TYPICAL FOR THE ENTIRE ROOM UNLESS SPECIFICALLY INDICATED OTHERWISE.
- UNLESS INDICATED OTHERWISE, SIZE CONDUITS IN ACCORDANCE WITH NFPA 70.
- COORDINATE WITH THE MECHANICAL CONTRACTOR TO ENSURE ALL WORKING CLEARANCE AND DEDICATED WORKING SPACE OF PANELBOARDS.
- COORDINATE ELECTRICAL INSTALLATION WITH ALL CASEWORK TO BE INSTALLED. PROVIDE THE NECESSARY JUNCTION BOXES FOR ALL POWER AND DATA CONNECTIONS INDICATED.
- GROUNDING CONDUCTORS ARE NOT INDICATED IN BRANCH CIRCUIT RACEWAYS. PROVIDE GROUND CONDUCTORS AS REQUIRED BY NEC.
- PROVIDE DIMMER SWITCHES AT ALL DIMMABLE FIXTURES.
- PROVIDE LABELS ON ALL RECEPTACLE INDICATING PANEL AND CIRCUIT FEEDING EACH DEVICE.

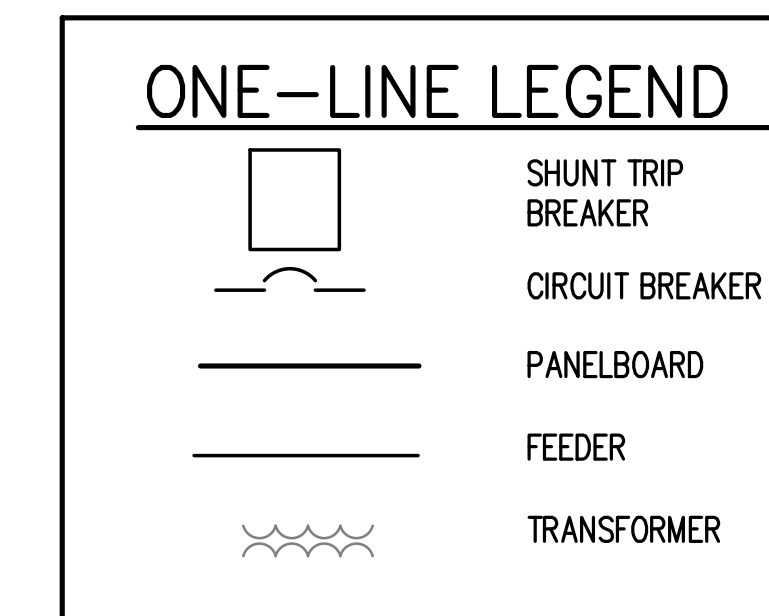
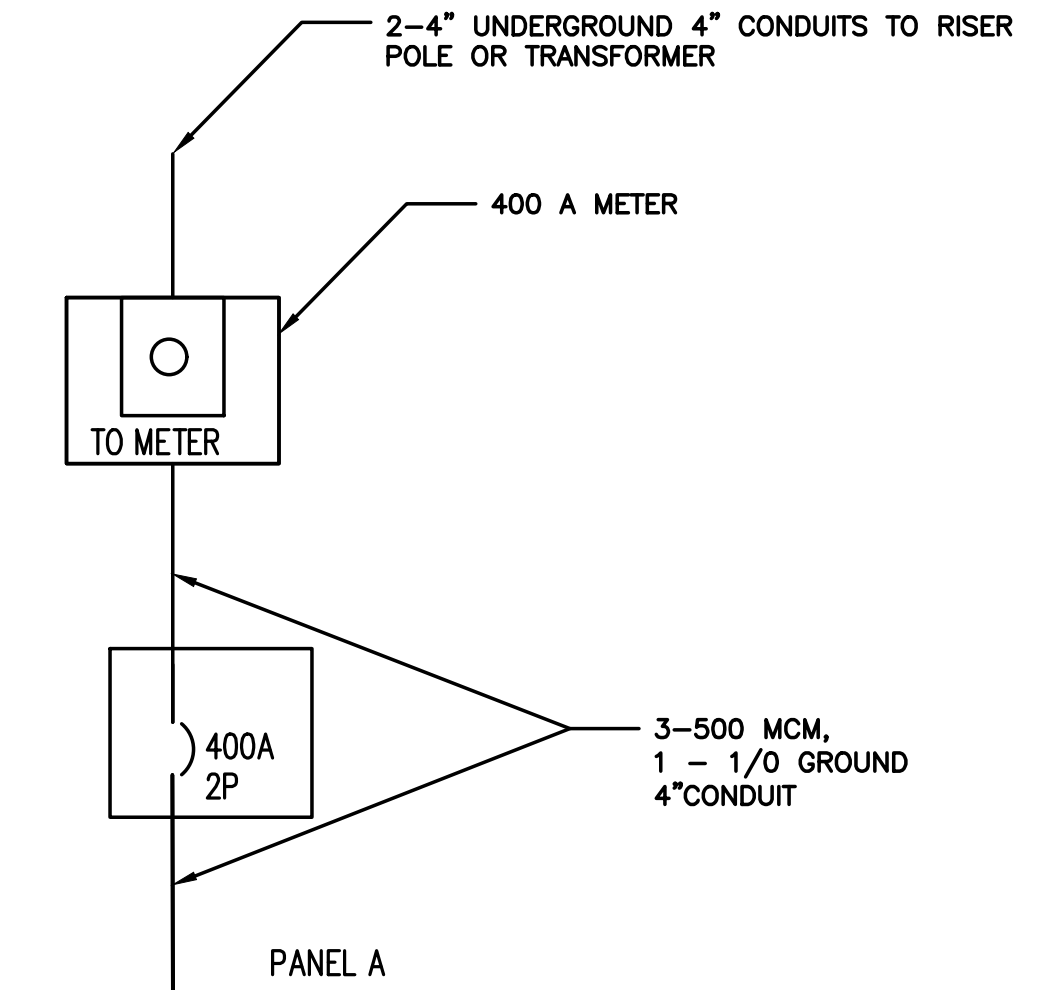
### LEGEND NOTES:

- ALL MOUNTING HEIGHTS ARE TO TOP OF DEVICE UNLESS INDICATED OTHERWISE.



**GROUNDING DETAIL**

**ONE-LINE DIAGRAM**



DATE:	11-25-2025
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CHECKED BY:	DG
STATE PROJECT No:	

## ELECTRICAL LEGEND AND GENERAL NOTES

NEW MIKVAH FOR THE CHABAD AT VA TECH  
Blacksburg, VA

**100% FINAL FOR OWNER REVIEW**



5 Design, LLC  
20 Midway Plaza Dr, Suite 300  
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REVISIONS	DESCRIPTION	DATE
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E101

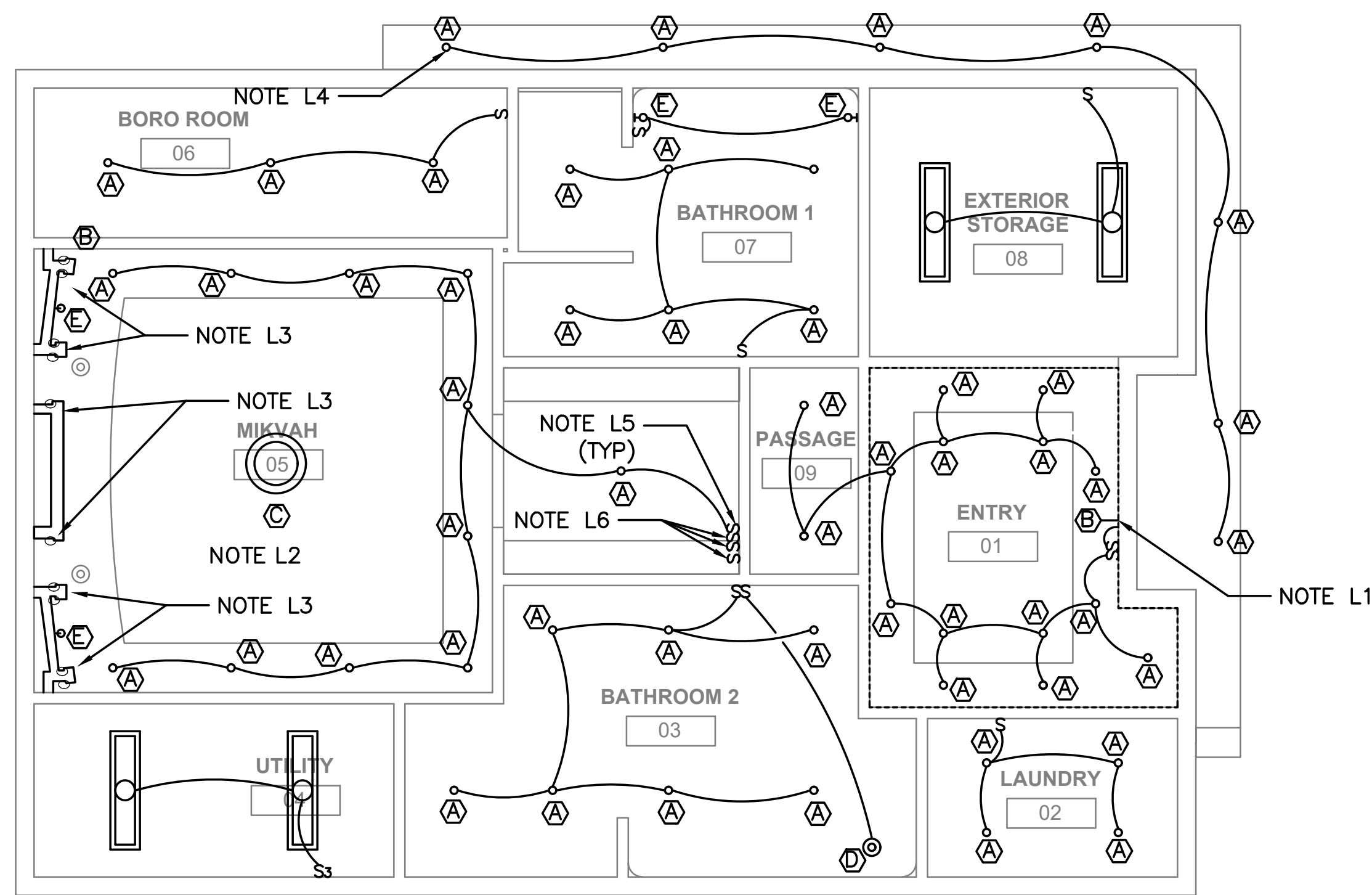
SHEET

LIGHTING NOTES THIS SHEET

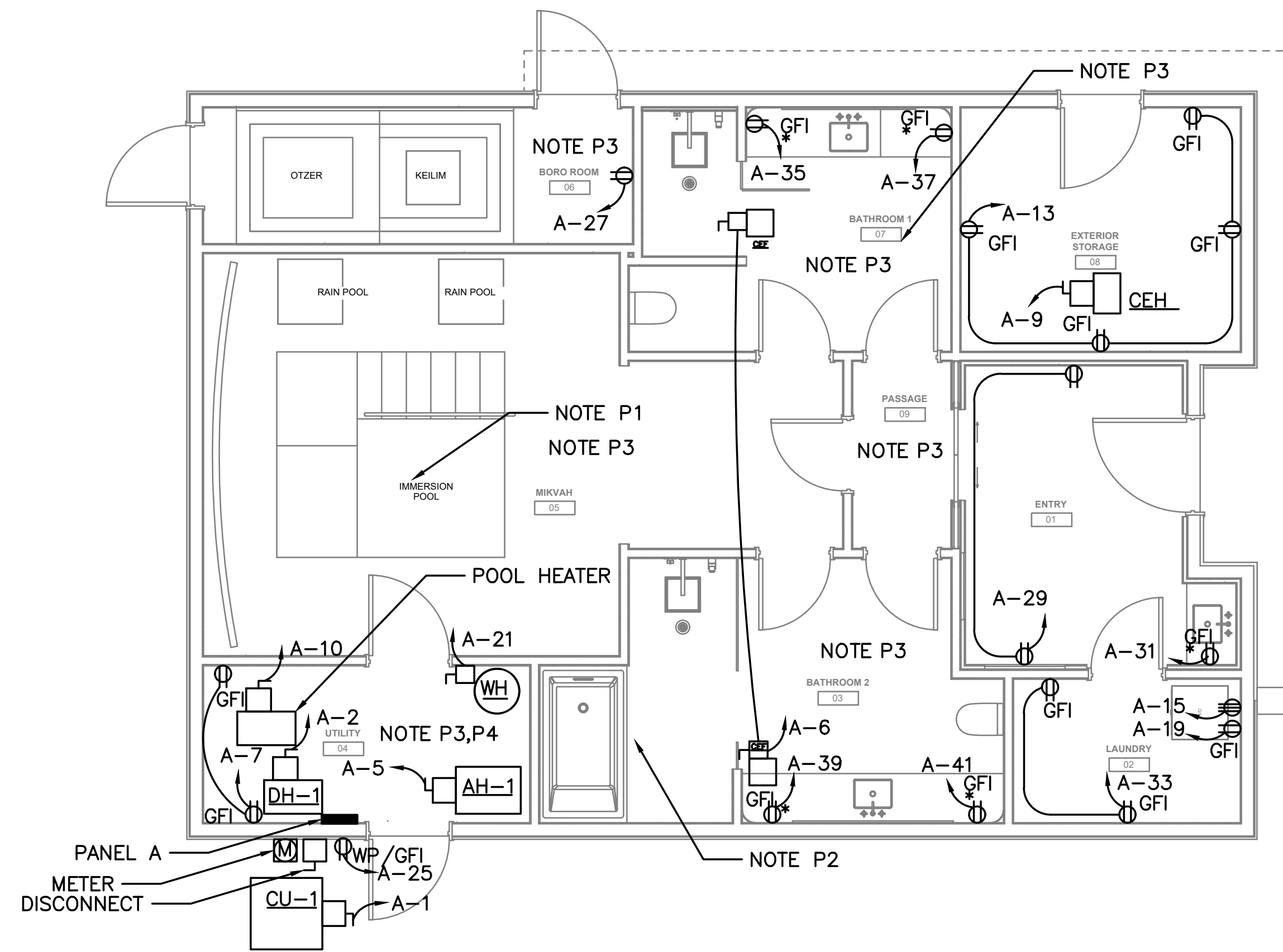
- L1. PROVIDE POWER FOR LIGHTING STRIP AT TOP OF FURRING. COORDINATE WITH ARCHITECTURAL PLANS FOR EXACT LOCATION OF CONNECTION FOR LIGHTING. SEE INTERIOR LIGHTING DRAWING FOR FOR INTERIOR LIGHTING LAYOUT AND A103 FOR REFLECTED CEILING PLAN.
- L2. PROVIDE POWER IN POOL FOR POOL LIGHTING.
- L3. PROVIDE POWER FOR LIGHTING STRIPS. COORDINATE LOCATIONS WITH ARCHITECTURAL AND ID DRAWINGS.
- L4. PROVIDE TIMER AND CONTACTOR IN UTILITY 04 TO CONTROL EXTERIOR LIGHTS.
- L5. COORDINATE LIGHT SWITCH LOCATIONS AT ROUGH-IN. PROVIDE DIMMER SWITCHES AT ALL DIMMABLE FIXTURES.
- L6. LIGHT SWITCHES TO CONTROL CHANDELIER, SCONCES, AND STRIP LIGHTING IN MIKVAH 05.

POWER NOTES THIS SHEET

- P1. PROVIDE POWER FOR POOL COVER. COORDINATE EXACT LOCATION WITH OWNER.
- P2. PROVIDE POWER FOR SPA TUB.
- P3. COORDINATE WITH MECHANICAL AND OWNER TO PROVIDE POWER AND CONTROLS FOR FLOOR HEAT. FLOOR HEAT TO BE IN ROOMS 06, 05, 03, 09, 07.
- P4. PROVIDE POWER FOR POOL SYSTEM.



ELECTRICAL NEW WORK - LIGHTING PLAN  
1/4" = 1'-0"



ELECTRICAL NEW WORK - POWER PLAN  
1/4" = 1'-0"

LIGHTING FIXTURE SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	INPUT VOLTAGE	LAMPS TYPE	TOTAL WATTS	MNTG.	DESCRIPTION
Ⓐ	LUXRITE	-					3" SMART MINI PANEL RGB + TUNABLE WHITE - ROUND
Ⓑ	LIGHTOLOGY	EDG395811					TWIST STRIP 3.3W COMMERCIAL GRADE 24V
Ⓒ	TBD	TBD					CHANDELIER
Ⓓ	FERGUSONHOME	E11023-95GLD					ET2 DIAPHANE 3 LIGHT 10" WIDE LED MULTI LIGHT PENDANT WITH ROCK CRYSTAL ACCENTS
Ⓔ	VISUALS COMFORT & CO.	-					COVET DOUBLE BOX SCONCE
Ⓕ	A/S SELECTION	-					FLOOR LIGHT - COORDINATE EXACT LOCATION WITH CLIENT
Ⓖ	LITHONIA	ELM2LF		LED	2.4	SURF	EMERGENCY EGRESS LIGHT FIXTURE
Ⓕ	LITHONIA	ELM2LF		LED	2.4	SURF	REMOTE HEAD

NOTE: PROVIDE DIMMER SWITCHES AT ALL DIMMABLE FIXTURES

PANEL A													
VOLTAGE:		120/240		PHASE: 1		BUS AMPS: 400A		MAIN BREAKER AMPS: MLO		<input checked="" type="checkbox"/> SURFACE MOUNTED <input type="checkbox"/> FLUSH MOUNTED		KAIC RATING: 22,000	
CKT NO.	BRKR	WIRE NO.	WIRE SZ.	CIRCUIT DESCRIPTION	LOAD - KVA	CKT NO.	BRKR	WIRE NO.	WIRE SZ.	CIRCUIT DESCRIPTION	LOAD - KVA		
					PHASE						PHASE		
1	2	25	2 10	CU-1	1.9	2	2	20	2 12	DEH-1	1.0		
3					1.9	4					1.0		
5	1	20	2 12	AH-1	0.9	6	1	20	2 12	CEF-1	1.0		
7	1	20	2 12	RCPT UTILITY 04	0.9	8	1	20	2 12	POOL HEATER	1.0		
9	2	20	2 10	CEH	1.0	10	1	20		SPARE			
11					1.0	12	1	20		SPARE			
13	1	20	2 12	RCPT EXT STOR 08	1.0	14	1	20		SPARE			
15	2	30	2 10	DRYER RM 02	2.0	16	1	20		SPARE			
17					2.0	18	1	20		SPARE			
19	1	20	2 12	WASHER RM 02	1.0	20	1	20		SPARE			
21	2	30	3 10	WH-1	2.3	22	1	20		SPARE			
23					2.3	24	1	20		SPARE			
25	1	20	2 12	EXTERIOR RCPT	0.4	26	1	20		SPARE			
27	1	20	2 12	BORO RM RCPT 06	0.2	28	1	20		SPARE			
29	1	20	2 12	ENTRY 01 RCPT	0.4	30	1	20		SPARE			
31	1	20	2 12	ENTRY 01 RCPT	0.4	32	1	20		SPARE			
33	1	20	2 12	LAUNDRY RCPT	0.4	34	1	20		SPARE			
35	1	20	2 12	BATH 1 RM 07	0.2	36	1	20		SPARE			
37	1	20	2 12	BATH 1 RM 07	0.2	38	1	20		SPARE			
39	1	20	2 12	BATH 2 RM 03	0.2	40	1	20		SPARE			
41	1	20	2 12	BATH 2 RM 03	0.2	42	1	20		SPARE			
TOTAL LEFT SIDE					20.6	TOTAL RIGHT SIDE					4.0		
TOTAL RIGHT SIDE					4.0	TOTAL CONNECTED LOAD					24.6		
TOTAL					24.6								

\* NOTES

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ELECTRICAL PLANS

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E201

SHEET

## ELECTRICAL SPECIFICATIONS

## PART 1 - GENERAL

## 1.1 DESCRIPTION OF WORK

Provide new lighting, power, data and low voltage systems as indicated on the plans.

## 1.2 QUALITY ASSURANCE

## A. General

- Comply with IEEE C2, "National Electrical Safety Code".
- IEEE Compliance: Comply with applicable Institute of Electrical and Electronics Engineers, Inc. standards pertaining to generator construction.
- NEC Compliance: Comply with NFPA 70, "National Electrical Code" as applicable to construction and installation of products required in this specification.
- UL and NEMA Compliance and Labeling: Provide products which have been labeled by Underwriters Laboratories and have been certified to comply with UL requirements.
- IEEE Compliance: Comply with STD 241, "IEEE Recommended Practice for Electrical Power Systems in Commercial Buildings" pertaining to communication systems.

## 1.3 COORDINATION OF ELECTRICAL WORK

- C. General: Refer to the division sections for general coordination requirements applicable to the entire work. It is recognized that the contract documents are diagrammatic in showing certain physical relationships which must be established within the electrical work and in its interface with other work including utilities and mechanical work and that such establishment is the exclusive responsibility of the Contractor.

## 1.4 ELECTRICAL SYSTEM IDENTIFICATION

- A. Conduit Systems: Provide adequate marking of primary conduits which are exposed or concealed in accessible spaces, to distinguish each run as either a power or signal/communication conduit. Except as otherwise indicated, use orange banding with black lettering. Provide self adhesive or snap on type plastic markers. Indicate voltage ratings of conductors where above 240 V. Locate markers at ends of conduit runs, near switches and other control devices and near items of equipment served by the conductors. Switch, leg conduit and short branches for power connections need not be marked, except where conduit is larger than 1 inch. Label all junction boxes with branch circuit numbers terminated within.
- B. Identification Labels and Warning Signs: Provide engraved plastic laminate or baked enamel labels on major units of electrical equipment including switchboards, panelboards, motor controllers, disconnect switches, signal and similar systems. Label shall include equipment identification mark and voltage characteristics and shall be melamine plastic, 0.125 inch thick, white with black center core. Provide warning signs where there is hazardous exposure or danger associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size, minimum 0.25 inch nominal block style, to convey adequate information at each location; mount permanently in an appropriate and effective location.

## 1.5 ELECTRICAL SYSTEM PERFORMANCE

- A. General: The overall system performances of electrical work are of even greater importance than the specified individual unit\_of\_work performances. Each unit of electrical work has been designed and specified to perform at minimum levels of output and efficiency and is intended to contribute to and be compatible with the entire system. Compatibility of actual performances by electrical system performances is the Contractor's responsibility.

## 1.6 SUBMITTALS

## A. LIGHTING

- Product Data: Submit manufacturer's product data and installation instructions on each type building lighting fixture photocell, contactor and component.

## PART 2 - PRODUCTS

## 2.1 CABLE AND WIRE

- A. Provide factory-fabricated wire or cable of the size, rating, material and type as indicated for each service in compliance with NECA - Standard of Installation. Where not indicated, provide proper selection as determined by the work requiring the installation to comply with NEC standards. Conductors shall be rated 600 volt of insulation type THW, THWN, THHN, or USE installed in compliance with National Electrical Code requirements.
- B. Provide bonding conductors for sizes No. 8 AWG and smaller of solid bare copper per ASTM B 1, and for sizes No. 6 AWG and larger stranded bare copper per ASTM B 8.
- C. No. 10 AWG and smaller diameter shall be solid copper; No. 8 AWG and larger diameter shall be stranded copper.
- E. Provide the following types of cables in NEC approved locations and applications where indicated. Provide cable UL listed for its intended use.
- Metal clad cable: Type MC.
- F. Provide UL 486A, factory-fabricated, solderless, metal connectors of the size, ampacity, rating, material, type and class as indicated for each service. Where not indicated, provide proper selection as determined by the work requiring the installation to comply with NEC standards. Provide insulating tape in compliance with UL 510.

## 2.2 ELECTRICAL OUTLET BOXES AND FITTINGS

- A. Interior Outlet Boxes: UL 514A, provide galvanized flat rolled sheet steel interior outlet wiring boxes, flush mounted of type, shapes and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices. Provide feraloy cast outlet boxes where surface mounted with threaded conduit hubs to suit each respective location and installation.
- B. Weatherproof Outlet Boxes: Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of types, shapes and sizes, with threaded conduit ends, cast metal face plates with spring-hinged waterproof caps suitably configured for each application, including faceplate gaskets and corrosion-resistant fasteners. Weatherproof while in operation.

## 2.4 WIRING DEVICES

- A. General: Provide factory-fabricated wiring devices, in types, colors and electrical ratings for applications indicated and complying with NEMA Standards Publication No. WD 1. Where types and grades are not indicated, provide proper selection as determined by installer to fulfill wiring requirements, and comply with NEC and NEMA standards for wiring devices. Provide receptacles with isolated ground and/or surge protection where indicated.
- B. Switches:
- Snap: UL 20, provide general duty flush single-pole toggle switches, 20-amperes.
- D. Wiring Device Accessories:
- Wall Plates: Provide UL listed, one-piece device plates for outlets and fittings to fit the device installed. For flush-mounted outlets on finished walls, provide white switch and outlet plates of types, sizes and with ganging and cutouts as indicated. Install with metal screws for securing plates to devices; screw heads colored to match finish of plate.
  - For surface mounted boxes, provide feraloy cast outlet plates on all outlet boxes, type suitable for wiring device installed in box.
  - Provide plate with engraved legend where indicated.

## 2.5 SAFETY AND DISCONNECT SWITCHES

- A. Provide General Duty Type: 240 volts AC, Type GD. Heavy Duty Type: 600 volts AC.
- B. Switches used as motor disconnect means shall be horsepower rated. Fused switches shall utilize Class R fuseholder and fuses unless indicated otherwise or recommended by equipment manufacturer.

## 2.6 ELECTRICAL GROUNDING AND BONDING EQUIPMENT

- A. General: UL 467. Provide grounding products of types indicated and of sizes and ratings as required by NEC. Provide all material required including but not necessarily limited to, cable/wire, connectors, terminals (solderless lugs), grounding rods/electrodes, bonding jumper braid and other items and accessories needed for a complete installation. Where more than one type meets indicated requirements, selection is installer's option. Where materials or components are not otherwise indicated, provide products complying with NEC, and established industry standards.
- B. Electrical Grounding Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials except bare or green insulation and sized according to NEC. Equipment grounding conductors shall have green insulation. Solid conductors shall comply with ASTM B-3, stranded conductors with ASTM B-8.
- C. Grounding Connectors: Provide listed and labeled grounding connectors for the required materials. Provide high-conductivity plated pressure connector units or exothermic welded connections.

## 2.7 LIGHTING FIXTURES

- A. Provide lighting fixtures of sizes, types, and ratings indicated in lighting fixture schedule

## 2.8 TIME CONTROLLED SWITCHES

- A. Provide electrically operated time controlled maintained contact switches with 24\_hour dials capable of periodically and automatically switching mechanically held or electrically held contactors ON and OFF. Select switches which permit selection of from 1 to 7 ON\_OFF operations each day; with coil ratings of 120 volts, 60 Hz, and with DPDT switch. Provide flush mount enclosure, NEMA Type 1, with side hinged door and lock, mounting holes and knockouts. Provide timing switch with manual circuit by\_pass switch, 10 hour reserve power, and separate grounding terminal. Finish enclosure with manufacturer's standard gray finish.

INSTALLATION  
PART 3 - INSTALLATION

## 3.1 General

- A. Verify final locations for rough\_in with field measurements and with the requirements of the actual equipment to be connected.
- B. Rough\_in for owner furnished equipment to make equipment operate as intended, including providing miscellaneous wiring items.

## 3.2 CABLE, WIRE AND CONNECTORS

- A. Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NEC to be installed otherwise. Provide insulated equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor.
- B. Coordinate cable and wire installation with electrical raceway and equipment installation. Conductor sizes indicated are copper. Pull conductors together where more than one is being installed. Use pulling means and lubricant that will not damage conductor or raceway. Use splice and tap connectors which are compatible with conductor material, and only in accessible junction, pull or outlet boxes.
- C. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

## 3.2 ELECTRICAL BOXES AND FITTINGS

- D. Fasten boxes rigidly to substrate or structural surfaces to which they are to be mounted, or solidly embed electrical boxes in concrete or masonry.

## 3.3 WIRING DEVICES

- A. Install wiring devices in clean outlets after wiring has been installed. Do not install plates and cover installed wiring devices until painting is complete.
- B. Ground all wiring devices unless indicated otherwise. Test wiring devices for correct polarity, proper ground and electrical continuity.
- C. Install covers and device plates with edges in continuous contact with finished wall surfaces without use of mats or similar devices. Plaster or caulking used as a filling to repair openings around outlets shall not be applied without removing the cover or device plate. Plates installed in wet areas shall be gasketed.

## 3.4 SAFETY AND DISCONNECT SWITCHES

- A. Install disconnect switches used for motor-driven equipment within sight of the controller and motor and not more than 50 feet from the controller and motor unless indicated otherwise.
- B. Provide an electrical ground for all disconnect switches.
- C. Test all switches for proper operation by operating them energized, but without load for six opening/closing cycles. Inspect switch and correct deficiencies, then retest to demonstrate compliance.

## 3.5 ELECTRICAL GROUNDING EQUIPMENT

- A. Install electrical grounding systems where shown, in accordance with applicable portions of National Electrical Code, **NECA 331-2014 "Standard for Building and Service Entrance Grounding and Bonding,"** and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.
- B. Provide separate grounding conductor with wiring in all raceways.
- C. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing where indicated.
- D. Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.

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