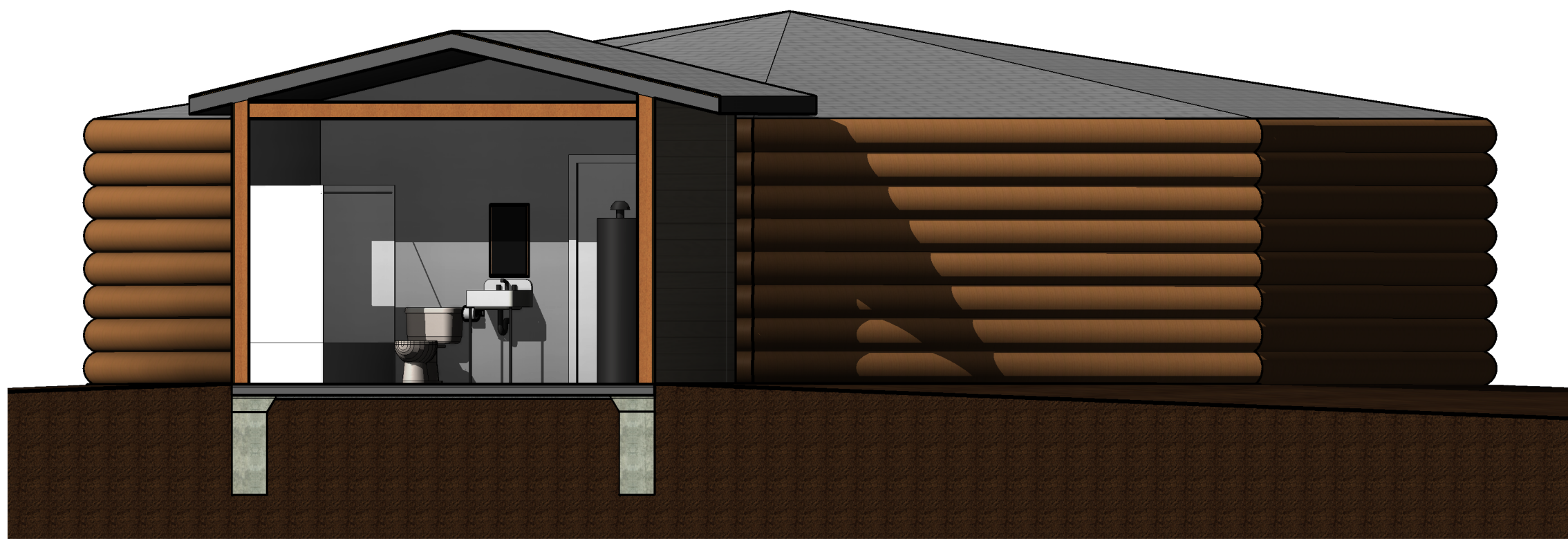
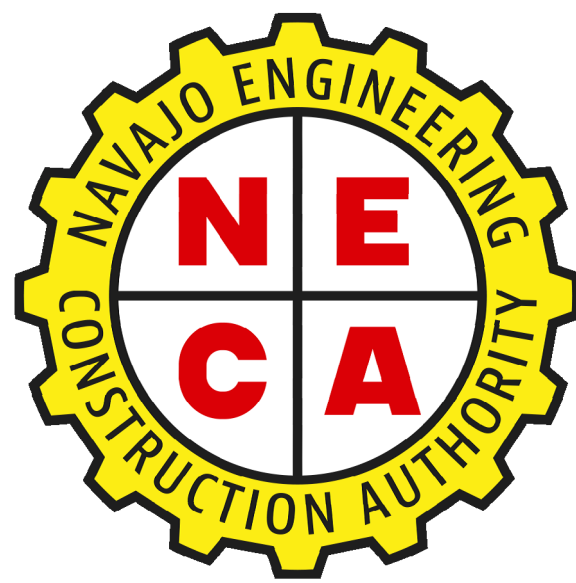


# NAVAJO NATION BATHROOM ADDITIONS

NAVAJO ENGINEERING AND CONSTRUCTION AUTHORITY  
CONSTRUCTION DOCUMENTS  
NAVAJO NATION



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S102 - ROOF FRAMING  
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S301 - FRAMING DETAILS

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A103 - SECTIONS AND ELEVATIONS  
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**MECHANICAL, ELECTRICAL & PLUMBING**  
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NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS  
DECEMBER 9, 2022

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# STRUCTURAL OUTLINE SPECIFICATIONS FOR NECA 150 ADA BATHROOM ADDITIONS, SANTA FE, NM

## I. DESIGN CRITERIA & GENERAL NOTES

- A. Design Codes and Manuals:
- 2015 International Building Code (IBC)
  - ASCE 7-10, Minimum Design Loads for Buildings and Other Structures
  - ACI 318-14, Building Code Requirements for Reinforced Concrete
  - American Wood Council, National Design Specification for Wood Construction 2015

### B. VERTICAL DESIGN LOADS:

- Live Loads
  - Floor.....40 PSF
- Live Roof Loads
  - Roof.....20 PSF
    - Unreduced Live Load,  $L_o$ .....20 PSF
- Snow Loads
  - Roof Snow Load.....20 PSF
    - Ground Snow Load,  $p_g$ .....20 PSF
    - Risk Category.....II
- Dead Loads
  - Roof.....25 PSF
  - Floor.....25 PSF

### C. HORIZONTAL DESIGN LOADS:

- Wind Loads
  - Risk Category II
  - Exposure "C"
  - Ultimate Design Wind Speed (V) - (3 SECOND GUST) - 115 MPH
  - Design Wind Pressures for Components and Cladding:
    - Roof:
      - Zone 1.  $p = -28.6$  psf / na
      - Zone 2.  $p = -60.6$  psf / na
      - Zone 3.  $p = -82.6$  psf / na
    - Roof Overhang:
      - Zone 2.  $p = -41.5$  psf
      - Zone 3.  $p = -68.3$  psf
    - Walls:
      - Zone 4.  $p = -26.4$  psf / +26.4 psf
      - Zone 5.  $p = -48.4$  psf / +26.4 psf
    - Effective Wind Area = 10 sf

### D. GENERAL NOTES

- Drawings
  - Do not scale drawings.
  - See architectural, mechanical, electrical and plumbing drawings for exact location and arrangement of any pads, support frames, etc., required for mechanical and electrical equipment and not with other trades concerning plates, anchors, notches, etc., to be placed in concrete.
  - Any conflict between the structural drawings and specifications, and/or other discipline plans and/or specifications shall be brought to the attention of the architect prior to proceeding with the work affected.
  - Contractor shall verify all edge form setting dimensions as well as the location of elevation changes, off-sets, brick ledges, and block-outs with other disciplines and notify this office of any discrepancies that may exist prior to commencing construction.

### E. Foundation Notes

- Geotechnical engineering study and recommendations for this project have not been performed. Design is based on the assumed values below. A geotechnical study is advised to be completed for each site prior to construction for the verification of all soil design values and for verification of the applicability of the foundation system shown. If there is concern with existing soils and differential movement is unacceptable, a soil study shall be completed.
  - Design is based on typical assumptions below.
    - Allowable soil Bearing Pressure = 1500 psf
    - Frost Depth / Minimum Exterior Footing Embedment = 24"
    - Building pad shall be over-excavated a minimum of 2'-0" below bottom of footing and replaced with engineered fill. Excavation should extend laterally 2'-0" beyond building perimeter
  - Contractor shall be responsible for providing positive water drainage away from structures, during and after construction.
  - It is important to understand that the performance of the foundation is linked directly to the consistency of the moisture content in the soil. The geotechnical engineering study provides recommendations for natural ground preparation, remedial earthwork, drainage, grading, and landscaping.
- When a geotechnical engineering study is not obtained the owner must either obtain a geotechnical study or concede that even with proper compaction of native soils listed in steps below, will not ensure differential settlement is mitigated. Suggested site preparation on the structural drawings does not ensure differential settlement is mitigated. Typical geotechnical studies contain specific requirements concerning clearing and grubbing, site, subfloor and bearing surface preparation, structural fill requirements, compaction requirements, and drainage and sloping requirements not necessarily shown on these drawings. Refer to structural recommendations for suggested site prep and consult a geotechnical engineer as required.

## II. STRUCTURAL CONCRETE

- A. All concrete edges shall be chamfered 3/4" on exposed corners unless otherwise noted.
- B. Basis for design, strength at 28 days:
- Unless indicated otherwise, all concrete shall be ready- mixed concrete with standard stone aggregate (144 PCF), and Type III cement- high early strength when desired.
  - Air entrainment shall conform to the requirements of ACI 318-14 Table 19.3.3.1
  - Structural design is based upon ACI 318-14 and construction shall conform to ACI 301 and ACI 302, latest edition(s).
    - $F'_c = 4000$  psi (normal weight)
      - All slabs on grade and sonotube footings
  - Unless otherwise indicated, concrete cover shall be:
    - Foundations.....3"
    - Slabs (Not exposed to weather) .....3/4"

### C. REINFORCING STEEL

- Deformed Bars.....ASTM A615 / Grade 60
- Placing of reinforcing shall conform to CRSI, latest edition.
- All reinforcing shall be held securely in position with standard accessories during placing of concrete.
- Slab and beam bolsters and hi-chairs shall have vinyl-tipped turned-up legs where soffits/underside of slab is exposed.
- All field bending of reinforcing shall be done cold. Heating of bars will not be permitted.
- Unless otherwise indicated, splice reinforcing as follows:
  - Reinforcing Bars.....48 Bar Diameters
  - Welded Wire Fabric.....6"

### D. WALLS

- Exposed site walls, retaining walls, and stem walls greater than 30 feet in length shall have control joints installed and spaced no greater than 25 feet on center. Install joints within 10 feet of all wall corners.
- Contractor shall submit to architect, final locations of all control joints for approval, prior to construction.

### E. SLAB-ON-GROUND CRITERIA

- Strict adherence to the specified water-to-cement ratio of 0.45 is required. Water shall not be added to the mix at the time of placement.
- Shrinkage shall not exceed 0.02% per ASTM C 157 at 28 days. Shrinkage-compensating concrete shall conform to the recommendations of ACI 223.
- Moist curing of slabs-on-ground is required.
- Care shall be taken to prevent water intrusion into the subgrade both prior to and after slab pours.
- Contraction joints (control joints) shall be installed on all concrete slabs on grade. Verify locations of all joints with Architect prior to placing concrete. The joints shall be spaced no further than 36 times the slab thickness or 15 ft. L or T shapes be avoided when placing crack control joints. If the shape of the area contained by the crack control joints is not square, the aspect ratio of this area should not exceed 1.5 to 1. The control joints should be placed such that they are continuous and not staggered or offset. Placement shall be in accordance to ACI 302.1.
  - Timing of early entry slab saw cuts is critical to slab curing performance. Saw cuts for control joints (contraction joints) shall be made at the earliest possible time that the concrete will support the weight of saw cutting equipment and operations. Timing of early entry saw cuts shall vary between 1 hour in hot weather and 4 hours in cold weather. Early entry dry cut saws shall use a skid plate to prevent spalling.
  - Early entry dry cut saw should be 1 inch into the depth of the slab. The slab shall be cut to ¾ of the slab depth to deepen the 1 inch nominal early entry saw cut within 24 hours.
  - A construction or smooth doweled saw cut contraction joint shall be placed at a maximum of 125 ft.
  - All joints shall be filled to the full joint depth with semi-rigid joint filler in areas exposed to vehicular traffic. Overfill joint and trim joint filler flush with top of joint after hardening.
- Concrete containing air-entraining admixture shall not be trowel finished.

### F. CONCRETE PLACEMENT & TESTING

- Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- Maintain ALL reinforcement in position on chairs during concrete placement.

### G. COLD WEATHER CONCRETING

- All cold weather concrete work shall meet the requirements of ACI Committee 306, latest edition for cold weather concreting, if, for 3 consecutive days the average daily temperature drops below 40°F and stays below 50°F for more than one-half of any 24 hour period.
- Do not use frozen materials containing ice or snow.
- Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- The use of calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators is not permitted; contractor shall utilize a high early strength mix design.

### H. HOT WEATHER CONCRETING

- All hot weather concrete work shall be in accordance with ACI 301. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
- Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

## III. CARPENTRY

- A. Dimensional lumber shall conform to the grading standard of the Western Wood Products Association (WWPA), surface dry, seasoned 90 days, and 19 percent maximum moisture content.
- Wood-Preservative-Treated Lumber shall be utilized as follows:
    - Items in contact with concrete or masonry.
    - Framing less than 18" above ground in crawlspaces.
    - Floor plates installed over concrete slabs-on-grade.
  - Preservative Treatment: AWPAC2 with chemicals containing no arsenic or chromium.
    - AWPAC31 inorganic boron may be used in protected locations.
- B. Wood Design Values
- Hem Fir #2 (studs, floor framing and roof framing)
    - $F_b = 850$  psi,  $F_t = 525$  psi,  $F_v = 150$  psi,  $F_c = 1,300$  psi,  $E = 1,300,000$  psi
  - Roof sheathing shall be 19/32" O.S.B., Structural 1, unblocked. Nailing pattern = 10d common nails @ 6" o.c. edges and 12" o.c. field w/ edge supporting clips, UON. Fire rated O.S.B. shall be provided to 4'-0" on each side of party walls at the roof level.
  - Wall sheathing shall be 7/16" O.S.B., Structural 1, blocked. Nailing pattern = 8d common nails @ 6" o.c. edges and 12" o.c. field, UON.
  - Plywood backing panels for telephone and electrical equipment.
  - All pre-fab connectors (Simpson, etc.) shall be fully fastened using type, size and quantity specified by the manufacturer. All exterior connectors shall be galvanized. General contractor to submit connection schedule to architect/engineer prior to installation.

### C. FASTENING

- All fastening to be in accordance with IBC Fastening Schedule Table 2304.10.1, UON.

## IV. POST-INSTALLED ANCHORS

- A. Except where indicated on the drawings, post-installed anchors shall consist of the following anchor types as provided by Simpson Strong-Tie Company, Inc.
- Anchorage to concrete
    - Adhesive anchors for cracked and uncracked concrete with Set-3G™ technology:*
      - Simpson Set-3G/Set-XP/Set-X adhesive anchoring system installed using the Simpson carbide-drill bit meeting the diameter requirements of ANSI B212.15.
      - Adhesive anchors for cracked and uncracked concrete with standard cleaning procedures use:*
        - Simpson Set-XP Adhesive anchoring system with HAS-E threaded rod or deformed rebar per ICC-ES ESR-2508 for fast cure applications.
        - Simpson Set-XP Adhesive anchoring system with HAS-E threaded rod or deformed rebar per ICC-ES ESR-2508 for slow cure applications.
    - Anchorage to solid grouted masonry
      - Adhesive anchors use:*
        - Simpson Set-3G/Set-XP/Set-X adhesive anchoring system installed using the Simpson carbide-drill bit meeting the diameter requirements of ANSI B212.15.
        - Steel anchor element shall be Simpson HAS-E continuously threaded rod or continuously deformed steel rebar
        - Mechanical anchors use:
          - Simpson Titen HD® per ICC-ES ESR 1056
          - Simpson Wedge-All® per ICC-ES ESR 1396
      - Anchor capacity used in design shall be based on the technical data published by Simpson Strong-Tie or such other method as approved by the structural engineer of record. Substitution requests for alternate products must be approved in writing by the structural engineer of record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an ICC ESR showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in-service temperature and installation temperature.
  - Install anchors per the manufacturer instructions, as included in the anchor packaging.
- D. Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings.
- E. Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the contractor shall review the existing structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, GPR, X-ray, chipping or other means.

NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS

DECEMBER 9, 2022

OWNER:  
NAVAJO ENG & CONSTRUCTION AUTHORITY

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OUTLINE  
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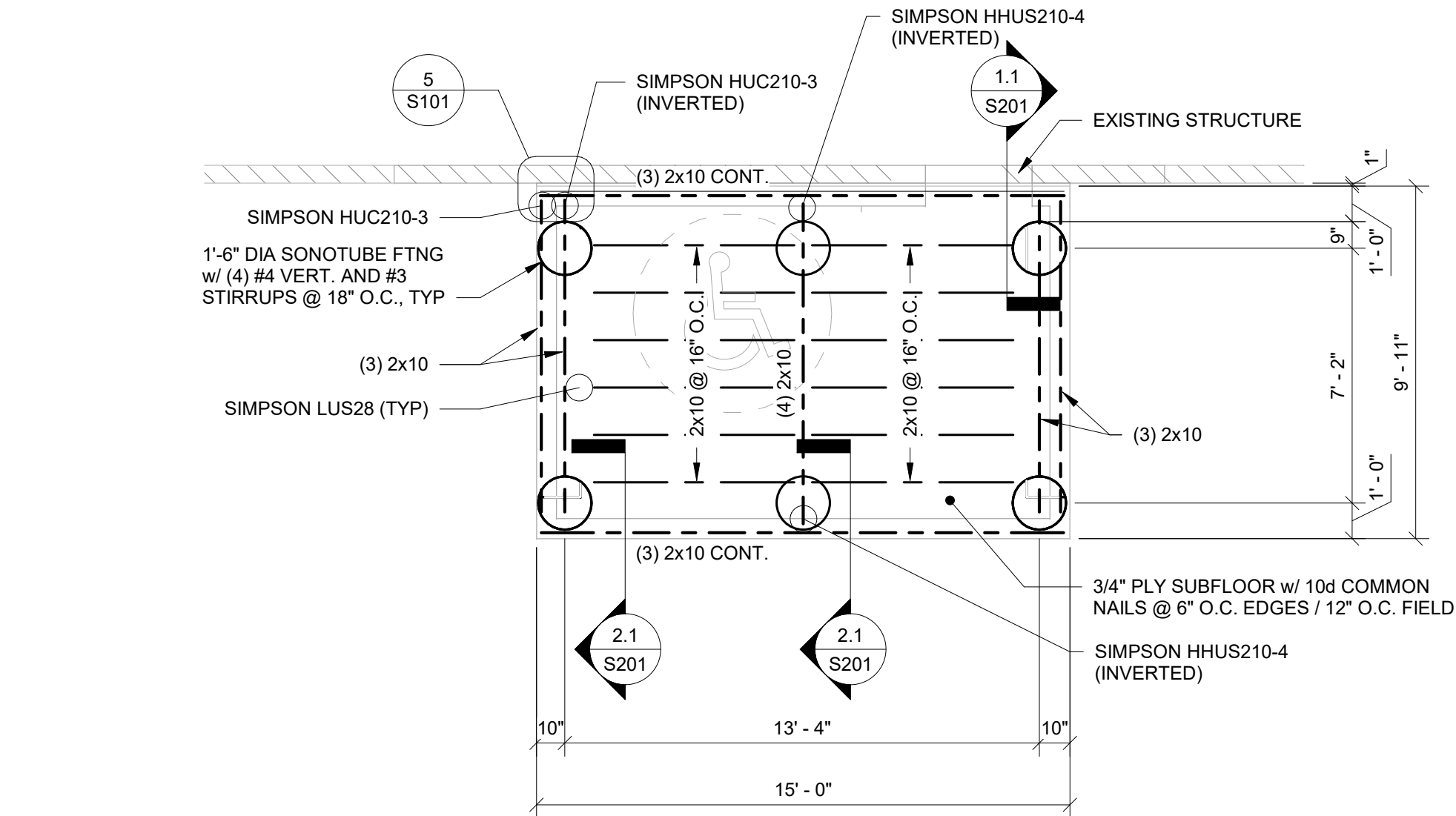
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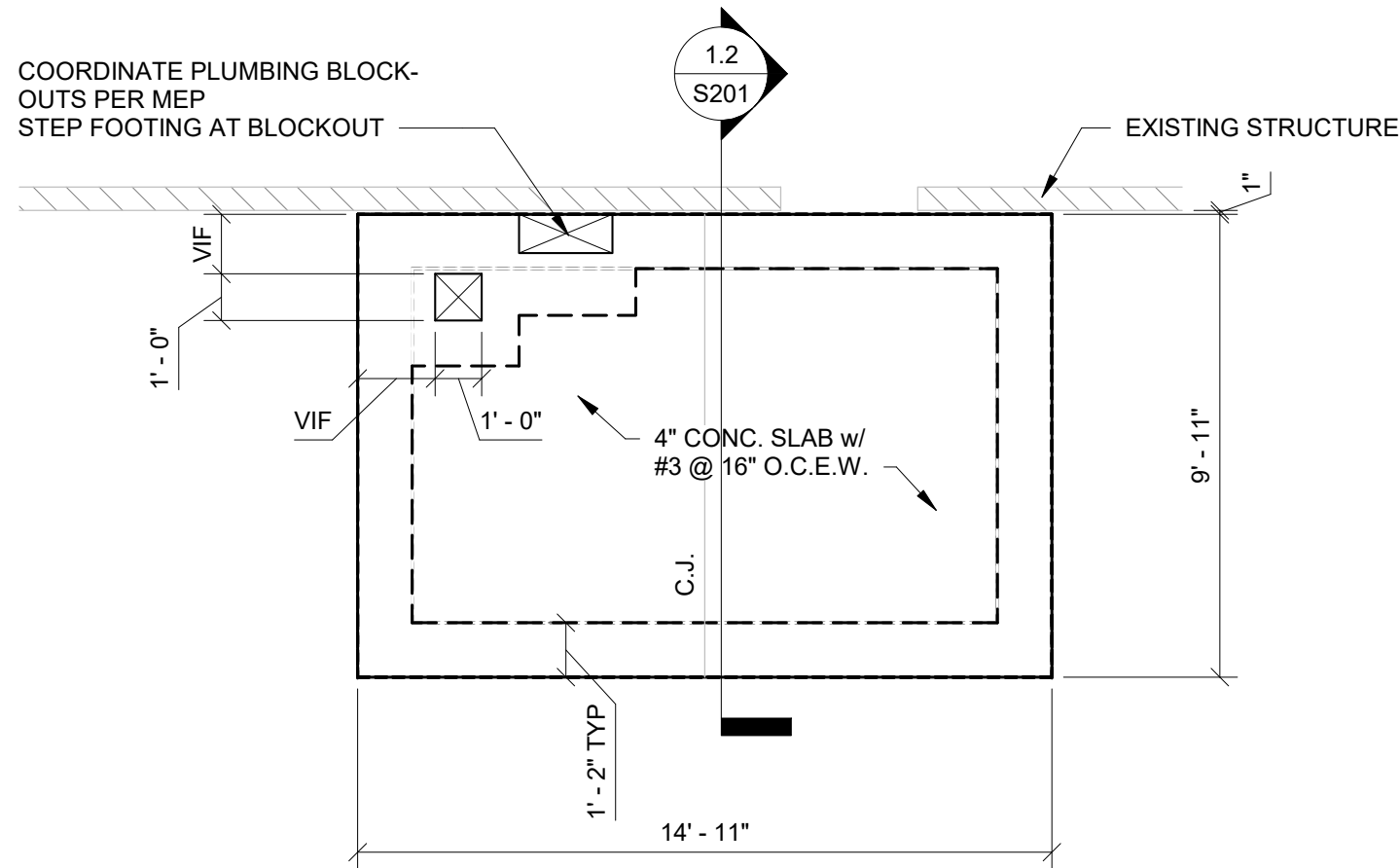
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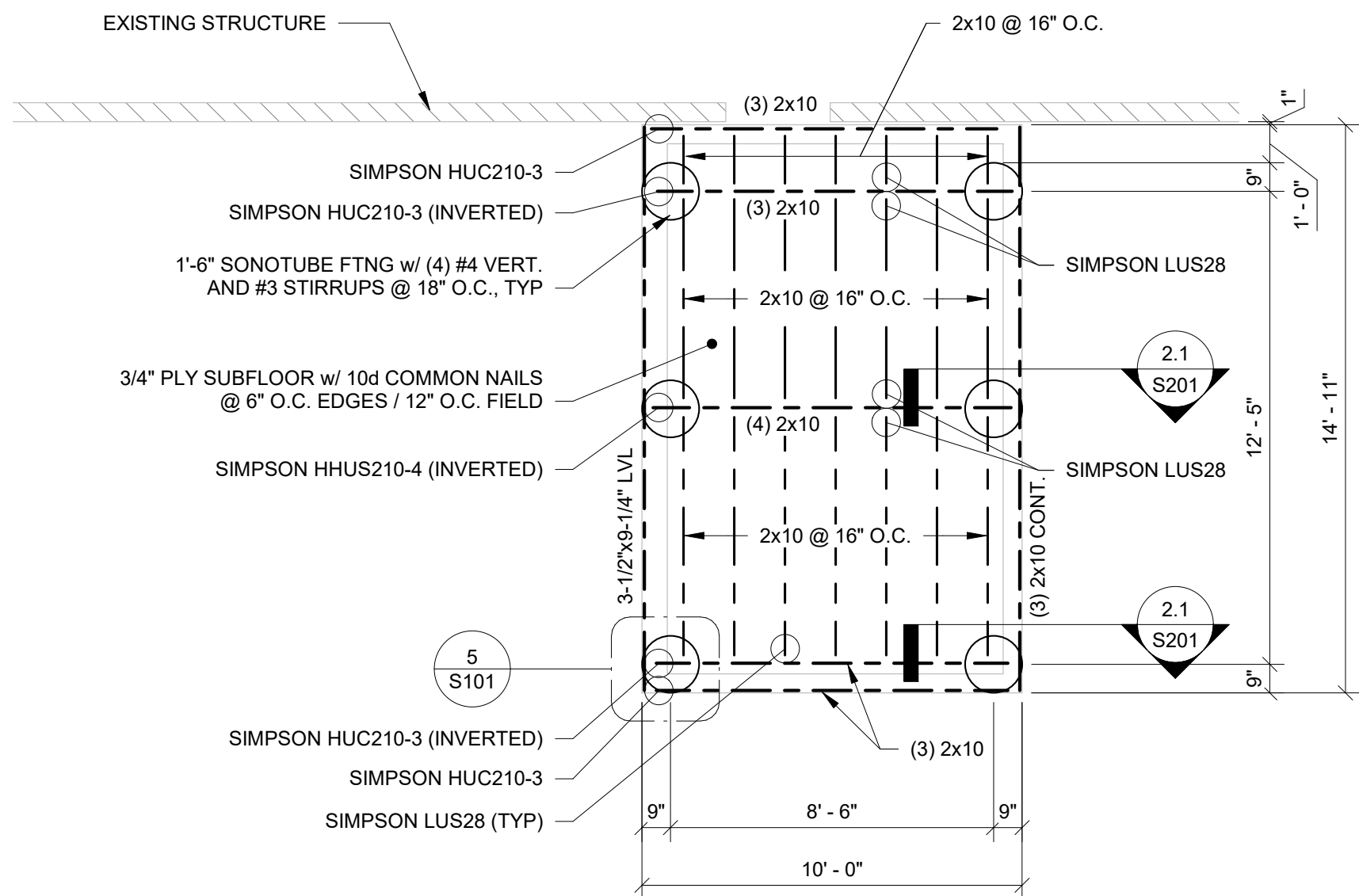
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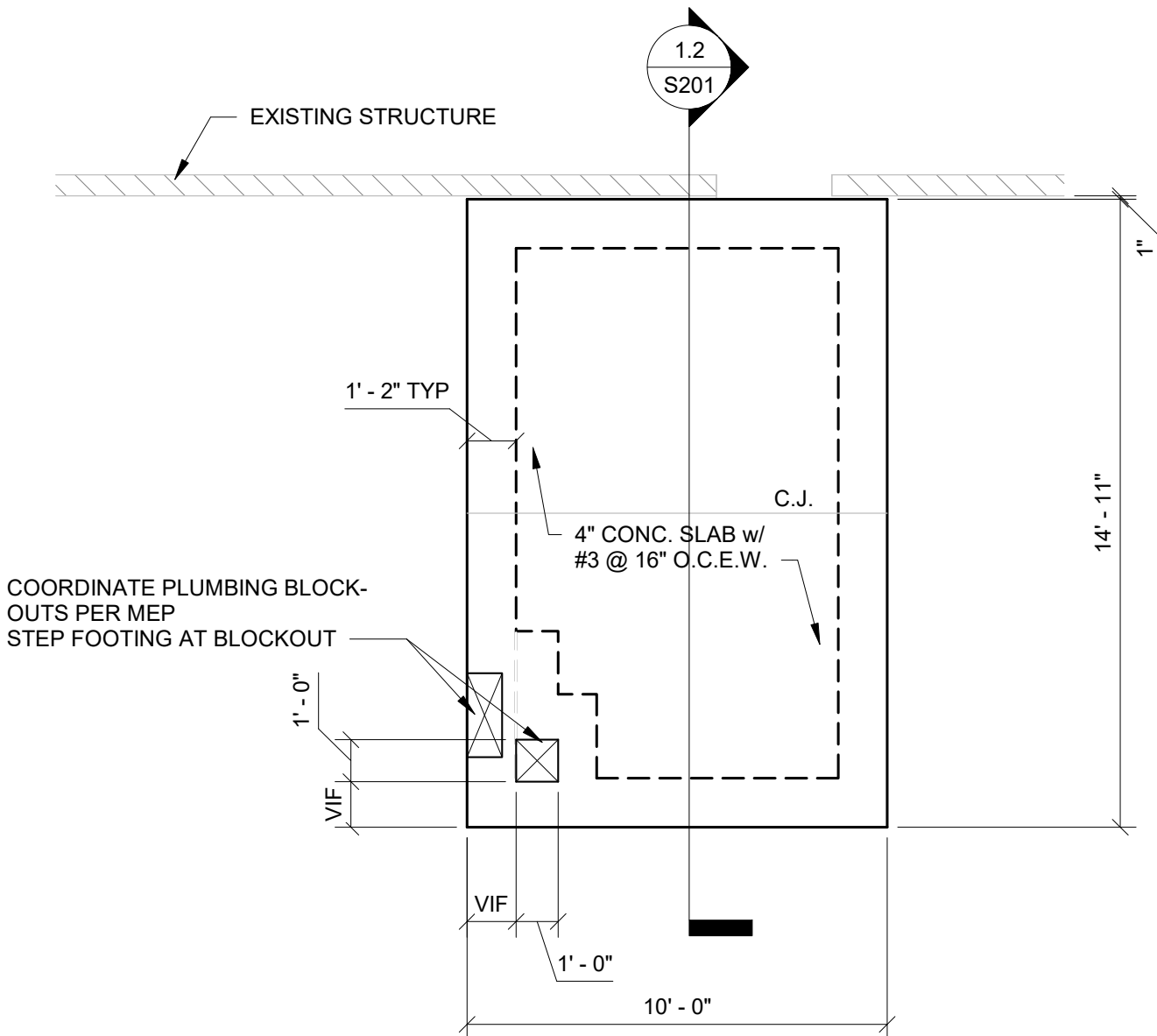
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1/4" = 1'-0"



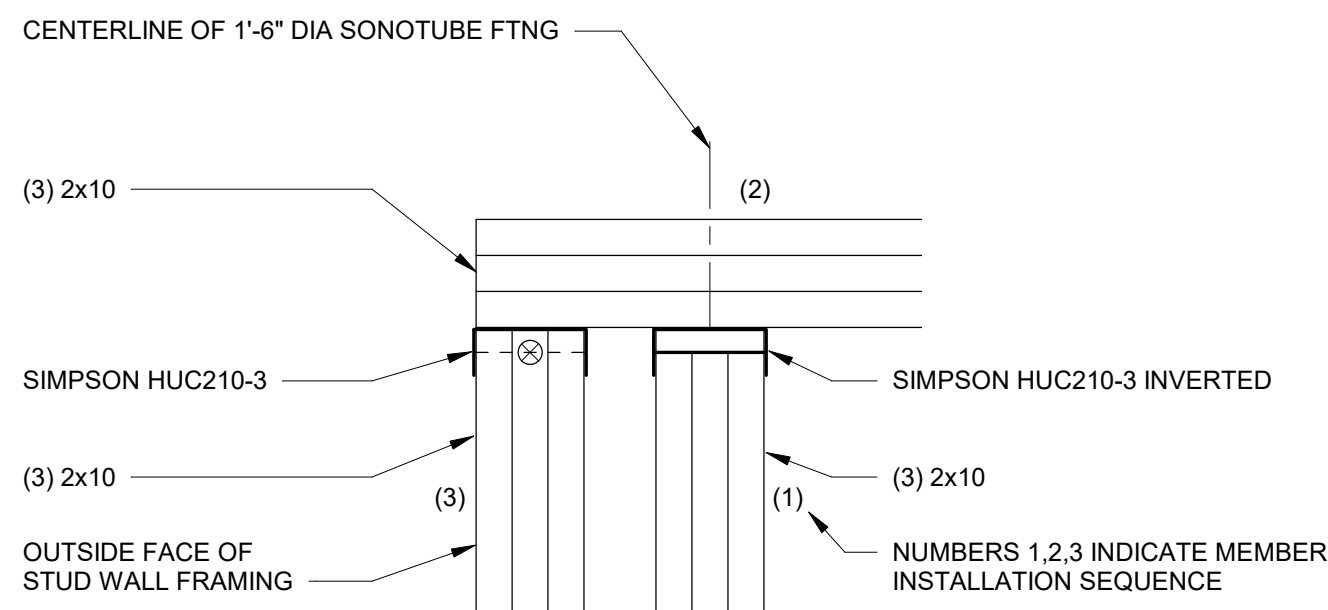
2 Foundation - Turndown Option A  
1/4" = 1'-0"



3 Foundation - Sonotube Option B  
1/4" = 1'-0"



4 Foundation - Turndown Option B  
1/4" = 1'-0"



5 Floor Beam Intersection  
1 1/2" = 1'-0"

#### GENERAL NOTES:

FOUNDATION DESIGN HAS BEEN PERFORMED WITH ASSUMED SOIL PROPERTIES. ASSUMED VALUES MAY NOT CHARACTERIZE ALL POSSIBLE CONSTRUCTION LOCATIONS. VARYING SOIL PROPERTIES MAY RESULT IN DIFFERENTIAL FOUNDATION MOVEMENT RESULTING IN UNEVEN FLOORS AND/OR CRACKING OF FINISHES. WHERE THIS IS NOT ACCEPTABLE TO THE OWNER, A SITE-SPECIFIC SOIL INVESTIGATION SHOULD BE PERFORMED PRIOR TO CONSTRUCTION, FOR THE VERIFICATION OF SOIL DESIGN VALUES AND CHARACTERISTICS.

#### NAVAJO NATION ADA BATHROOM ADDITIONS

#### NAVAJO NATION CONSTRUCTION DOCUMENTS

DECEMBER 9, 2022

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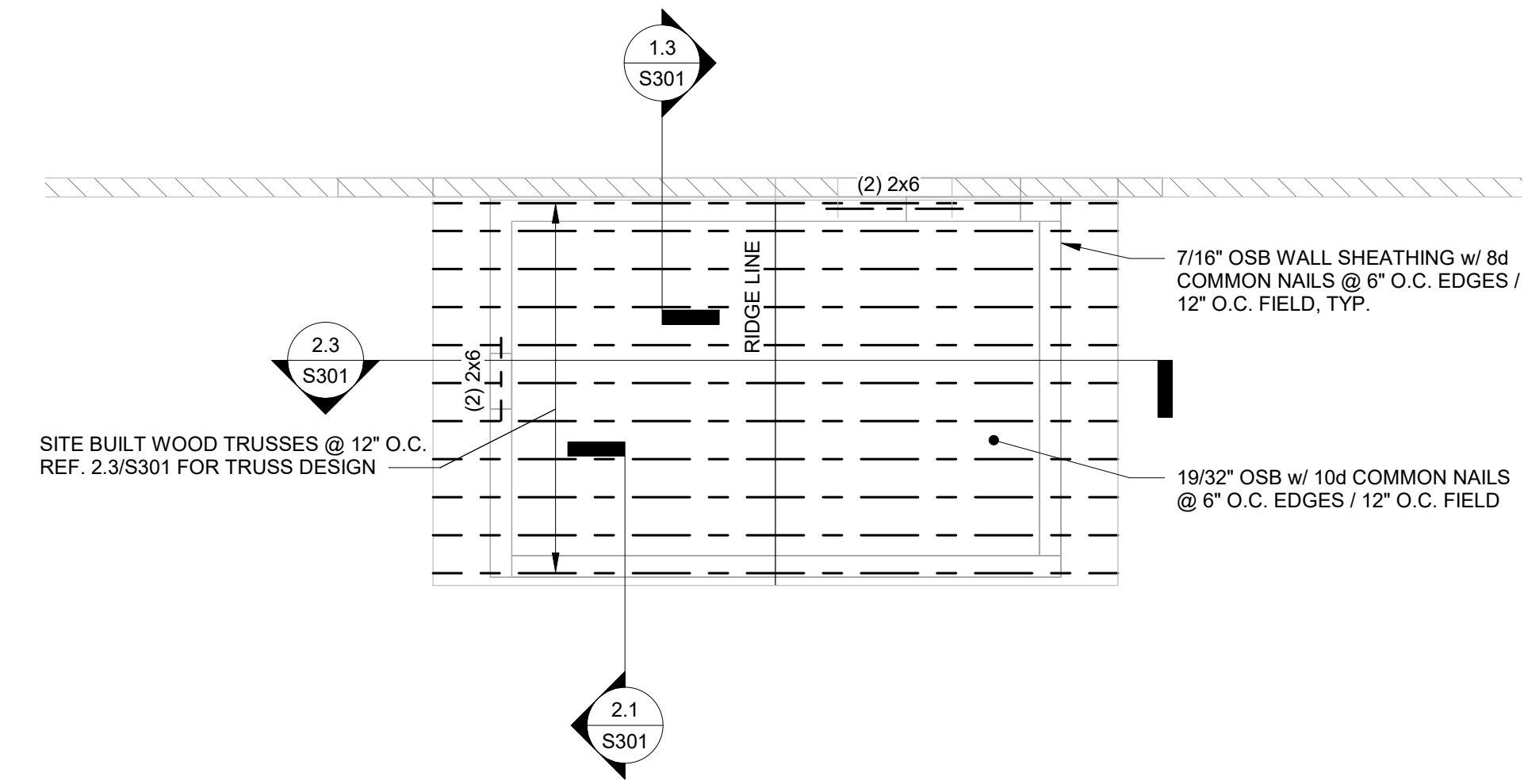
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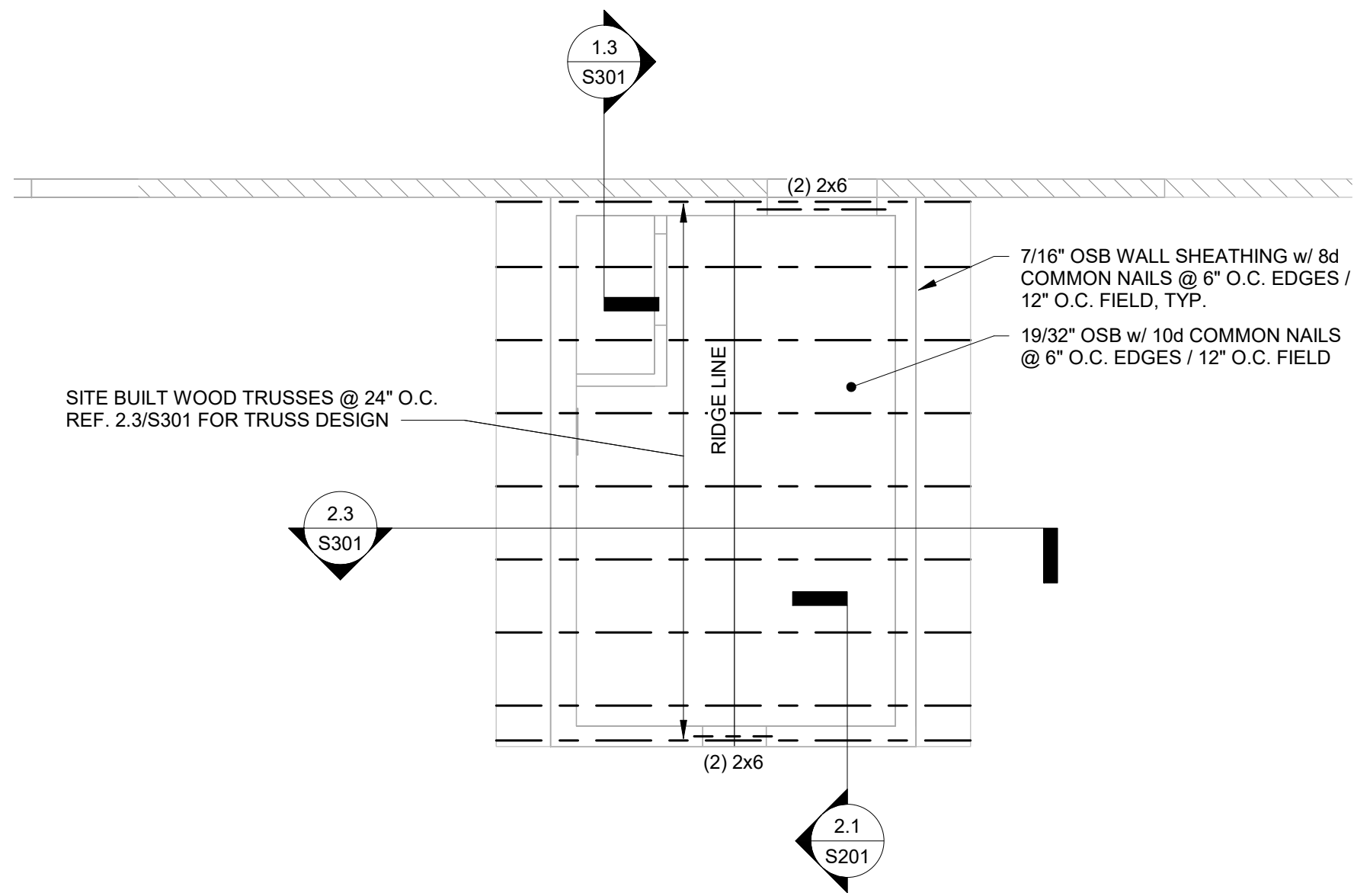
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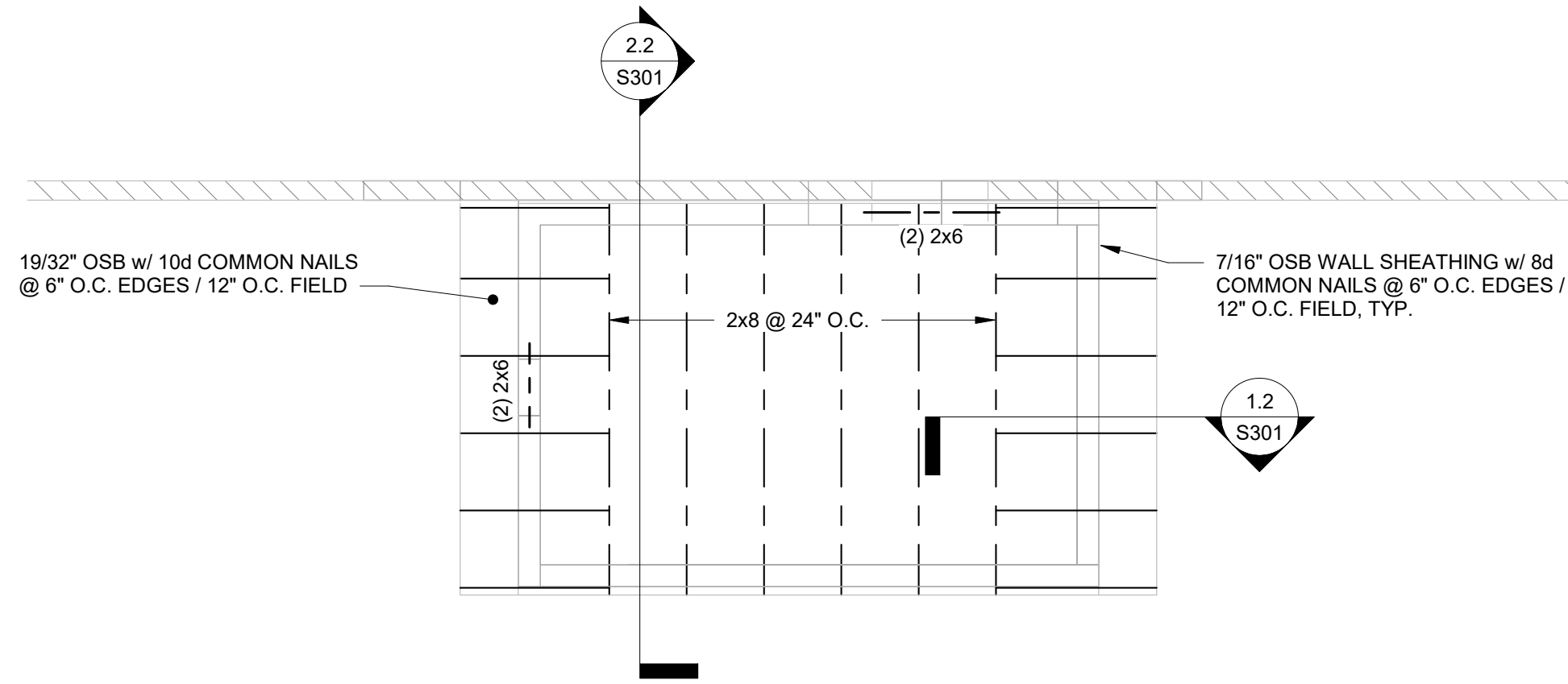
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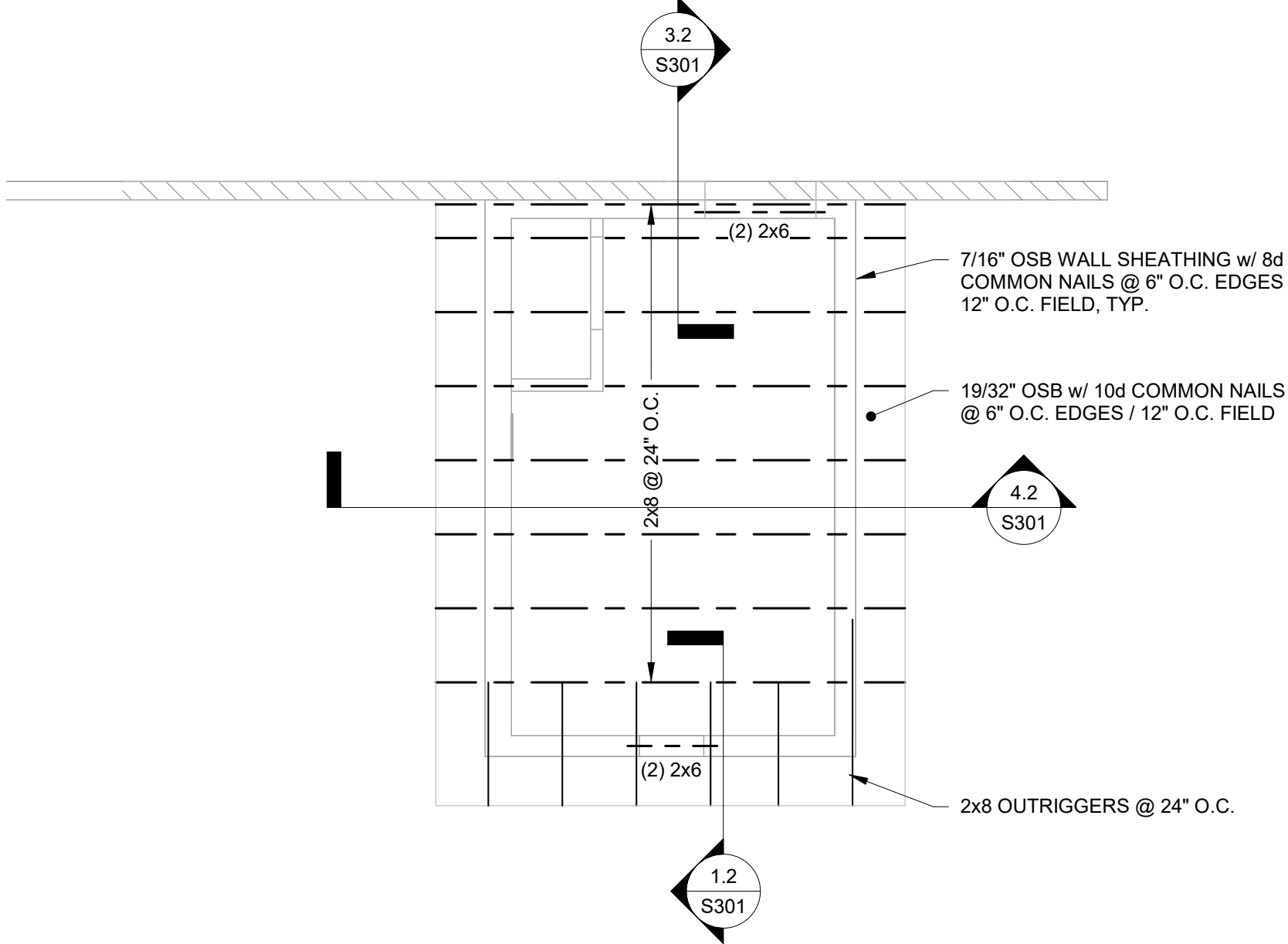
1 Roof Framing A GABLE TRUSS ROOF  
1/4" = 1'-0"



3 Roof Framing C GABLE TRUSS ROOF  
1/4" = 1'-0"



2 Roof Framing B MONOSLOPE ROOF  
1/4" = 1'-0"



4 Roof Framing D MONOSLOPE ROOF  
1/4" = 1'-0"

NAVAJO NATION ADA BATHROOM ADDITIONS

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ROOF FRAMING

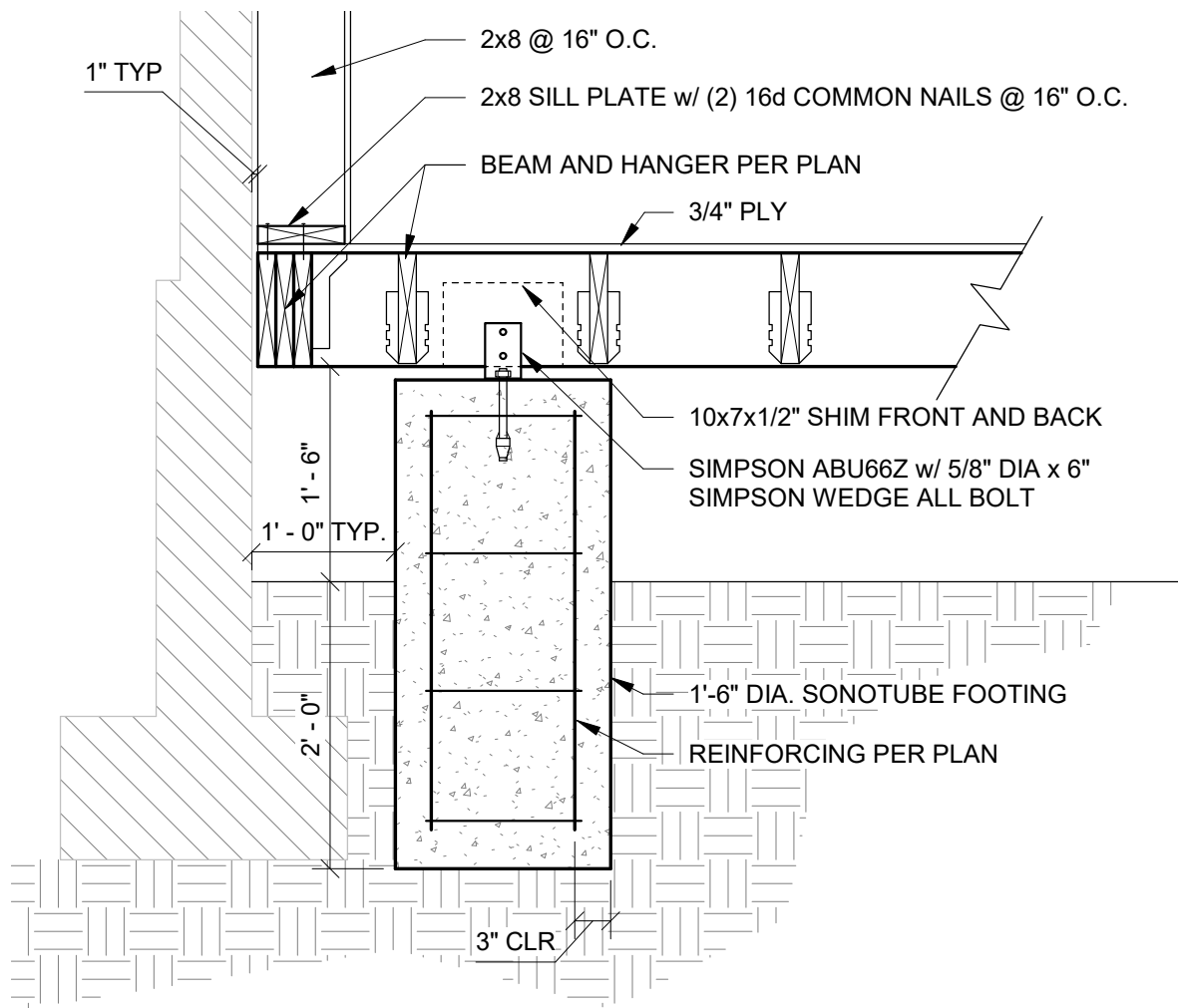
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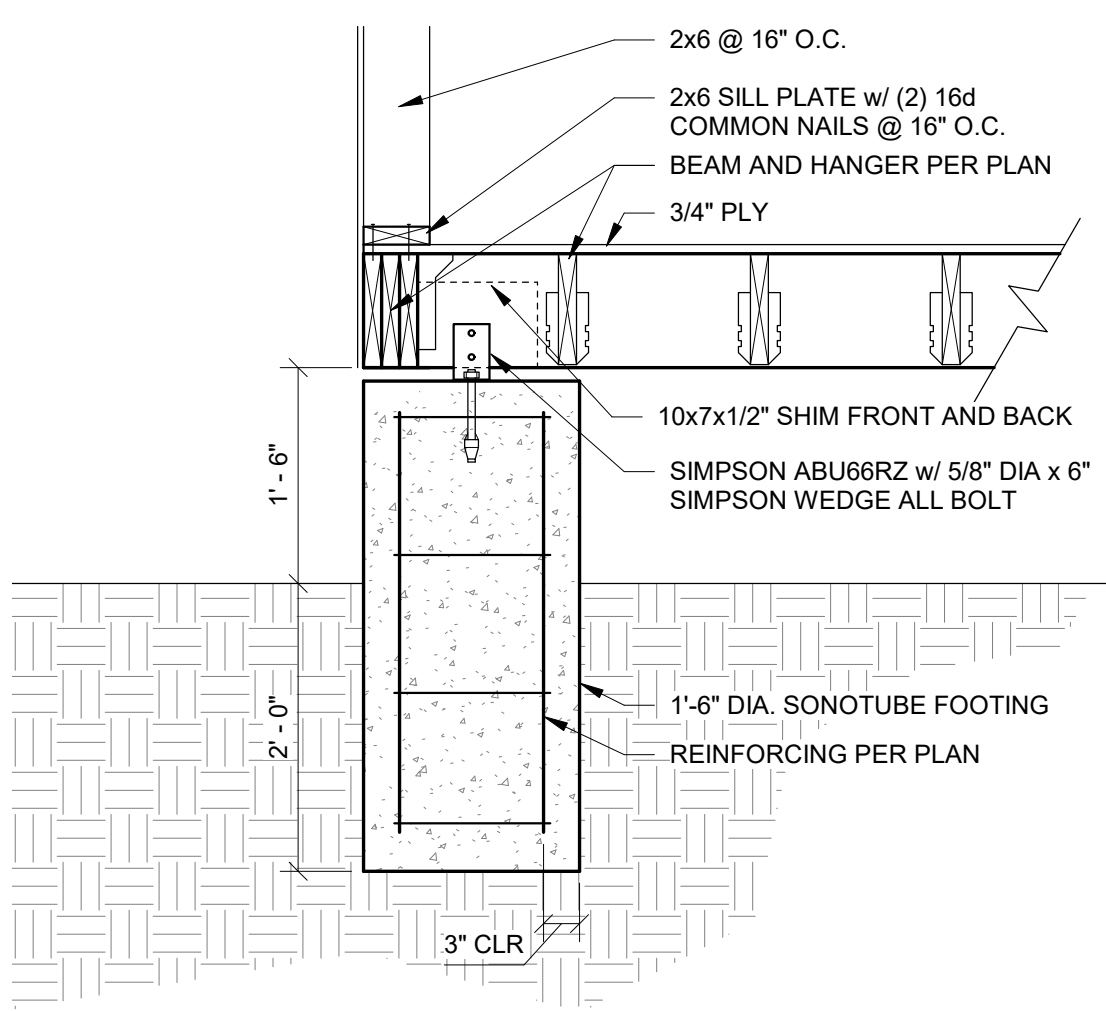
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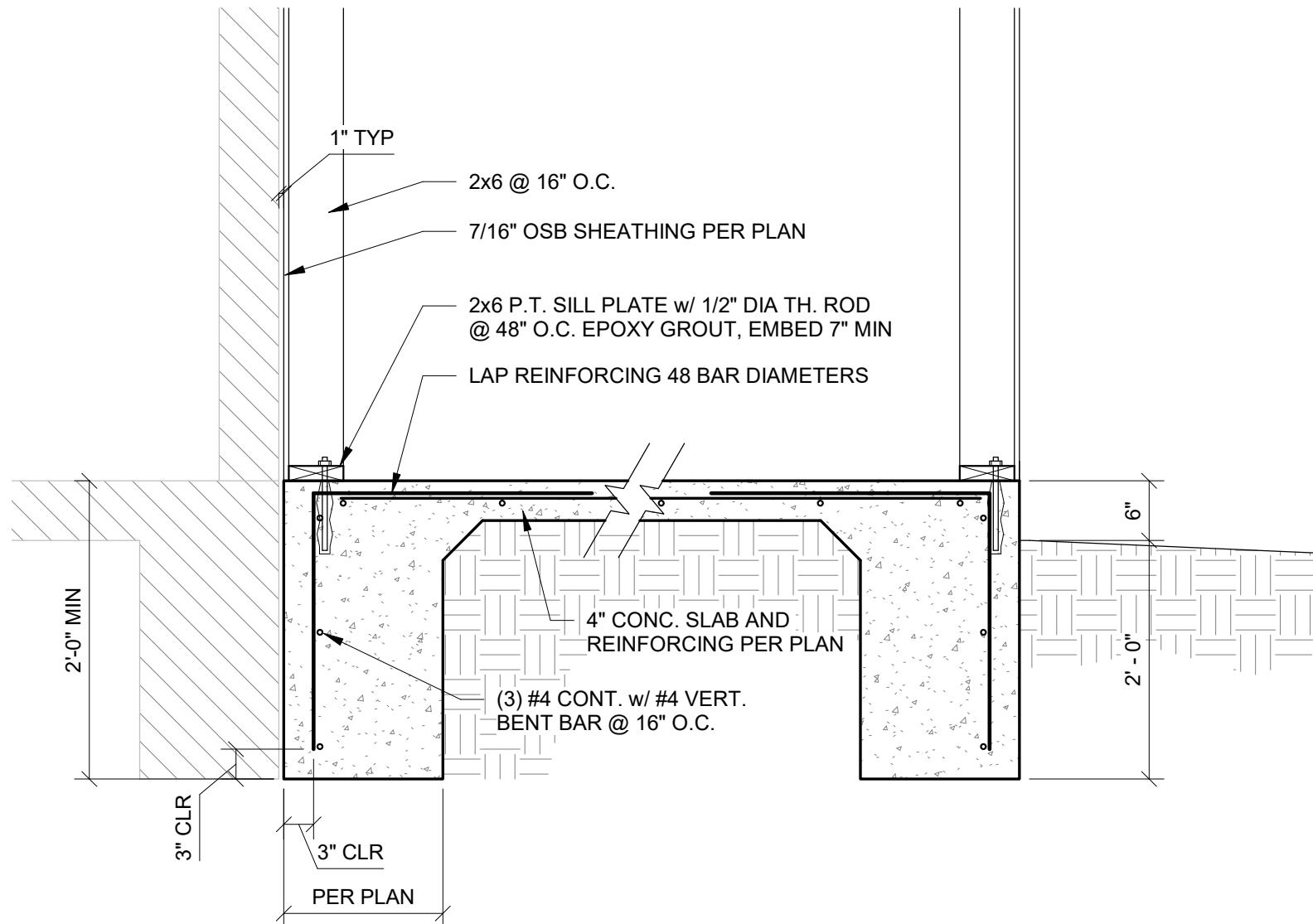
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1.1 TYPICAL SONOTUBE PIER  
3/4" = 1'-0"



2.1 FLOOR FRAMING TO SONOTUBE FOOTING  
3/4" = 1'-0"



1.2 TYPICAL MONOLITHIC TURN DOWN  
3/4" = 1'-0"

NAVAJO NATION ADA BATHROOM ADDITIONS

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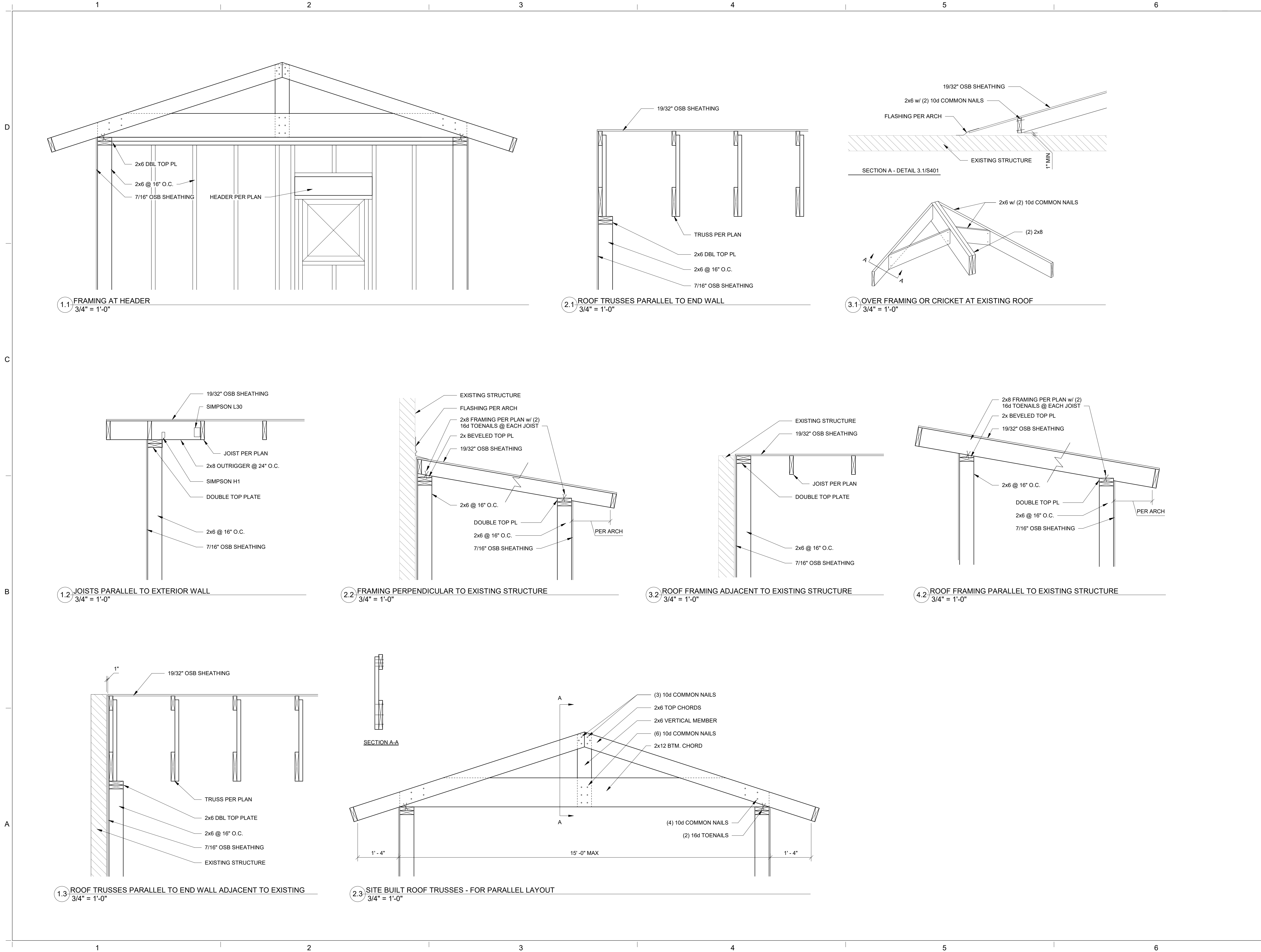
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DETAILS**

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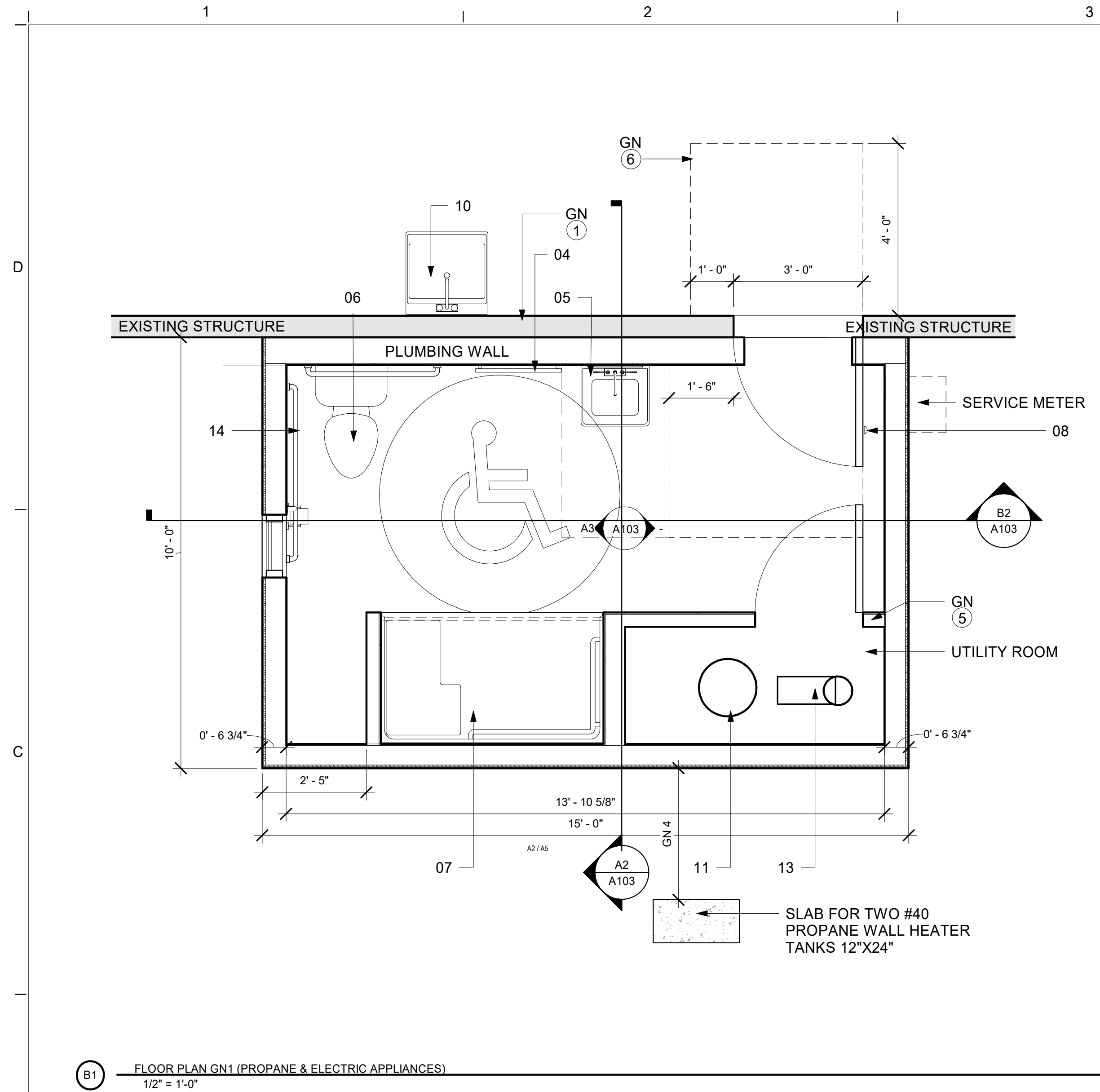
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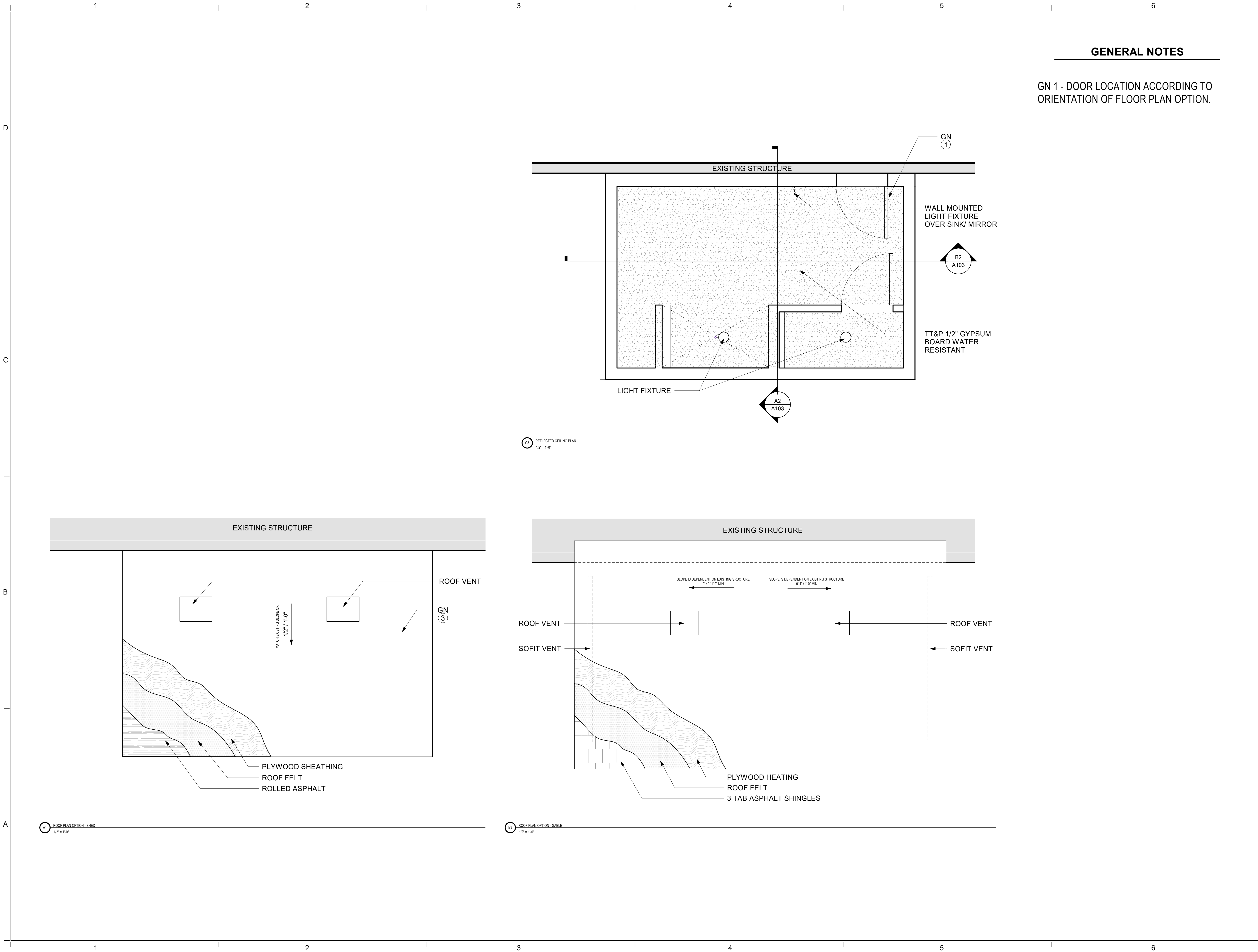
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SHEET TITLE

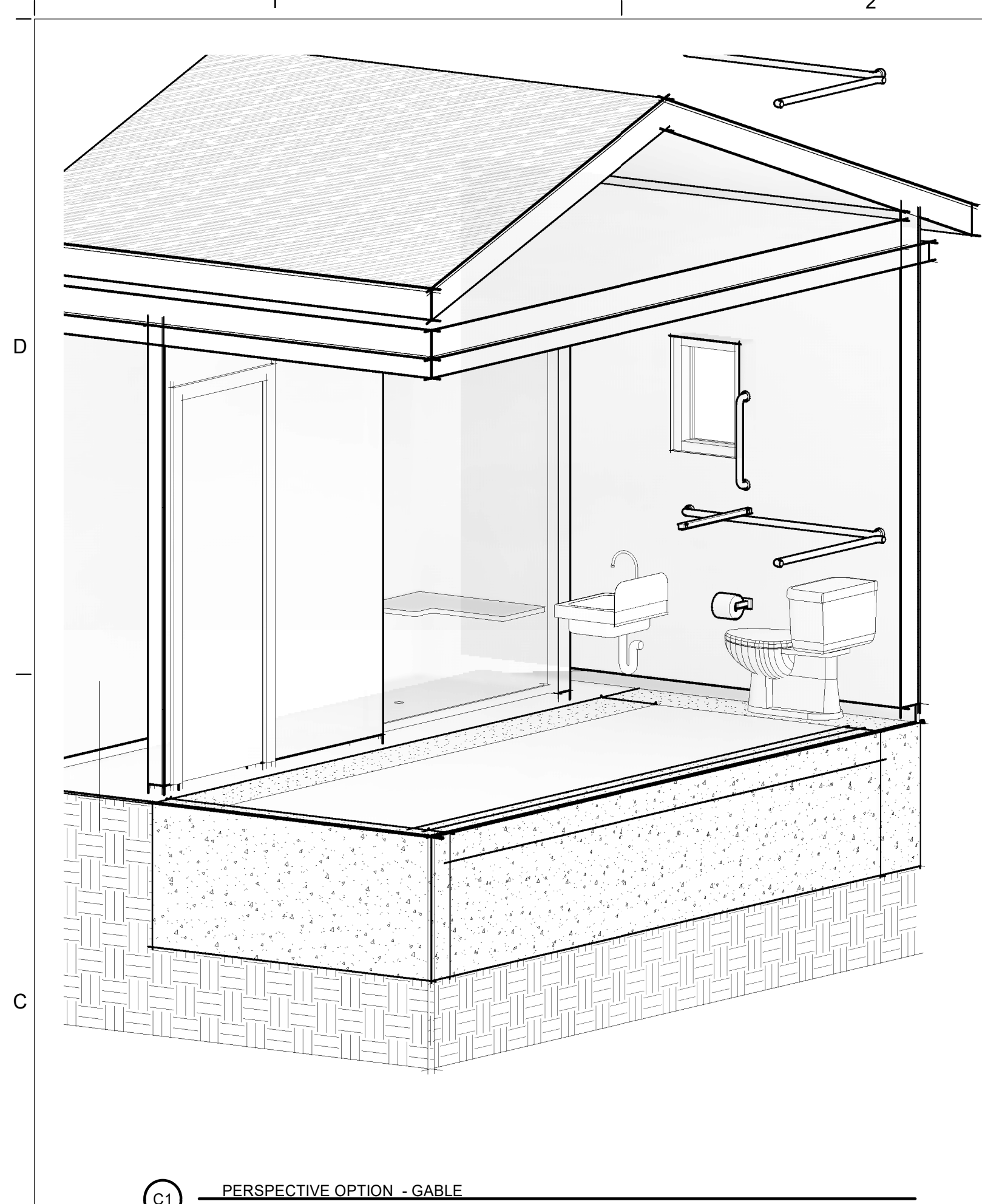
CEILING AND  
ROOF PLANS

SHEET NUMBER

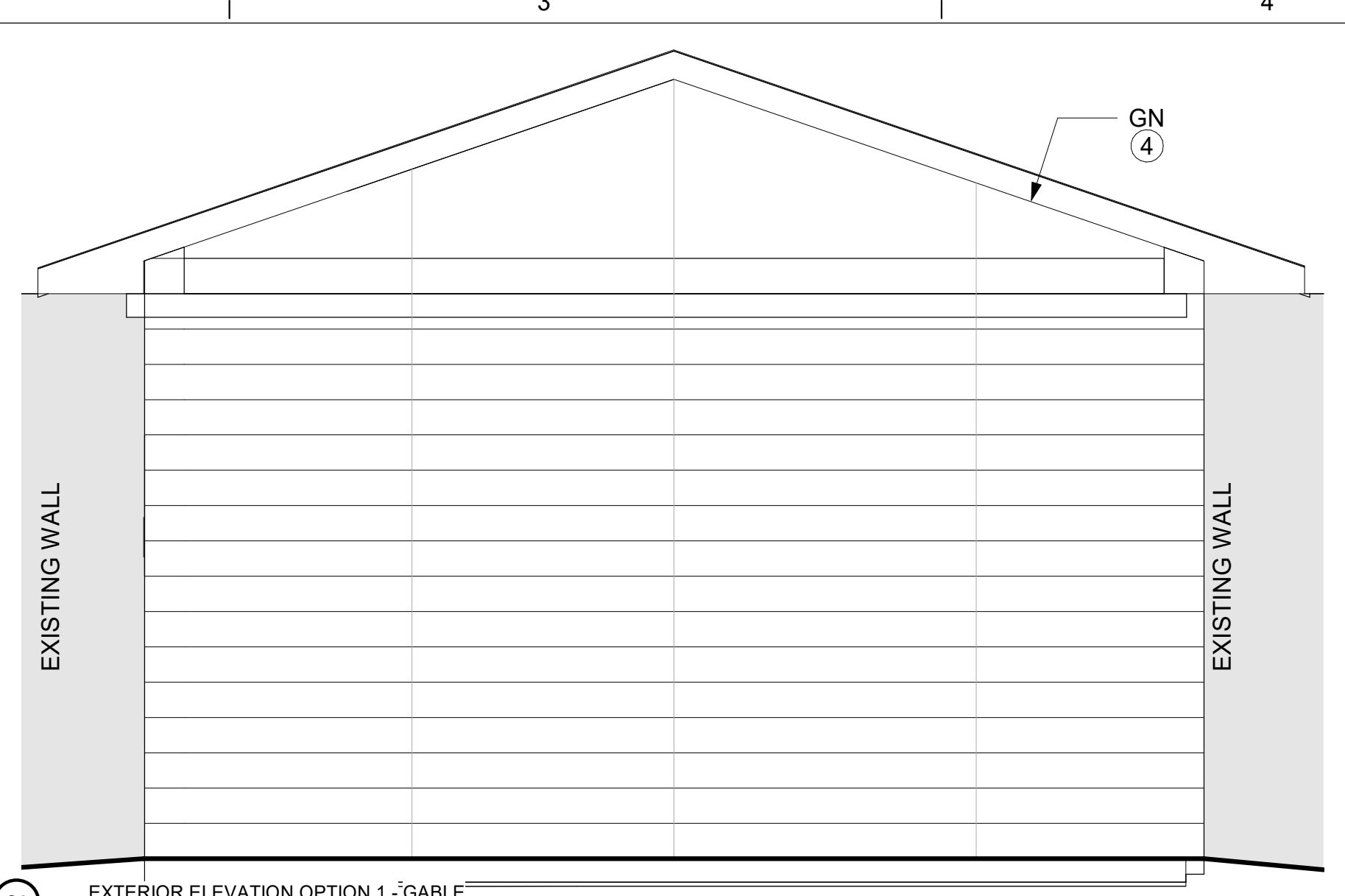
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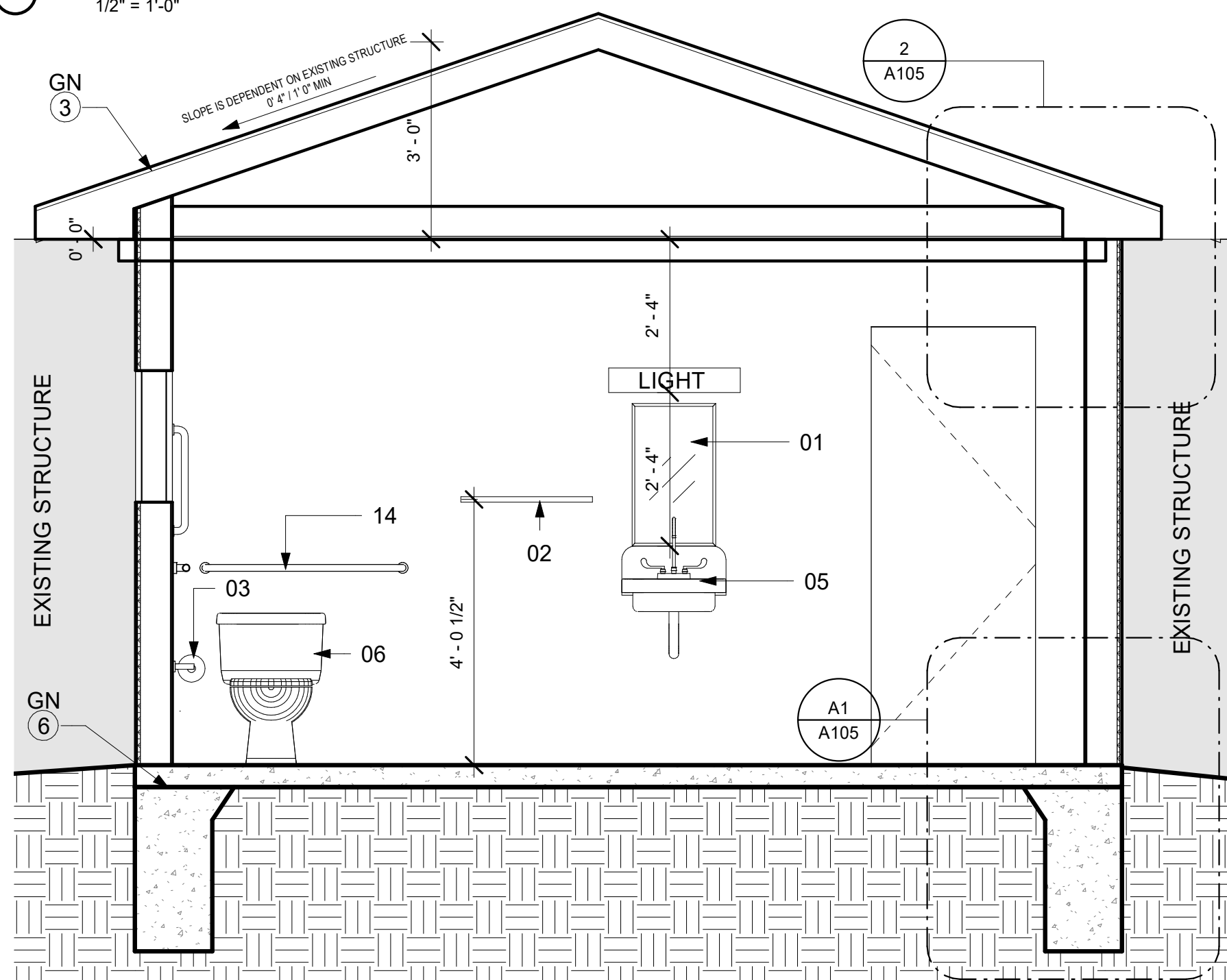




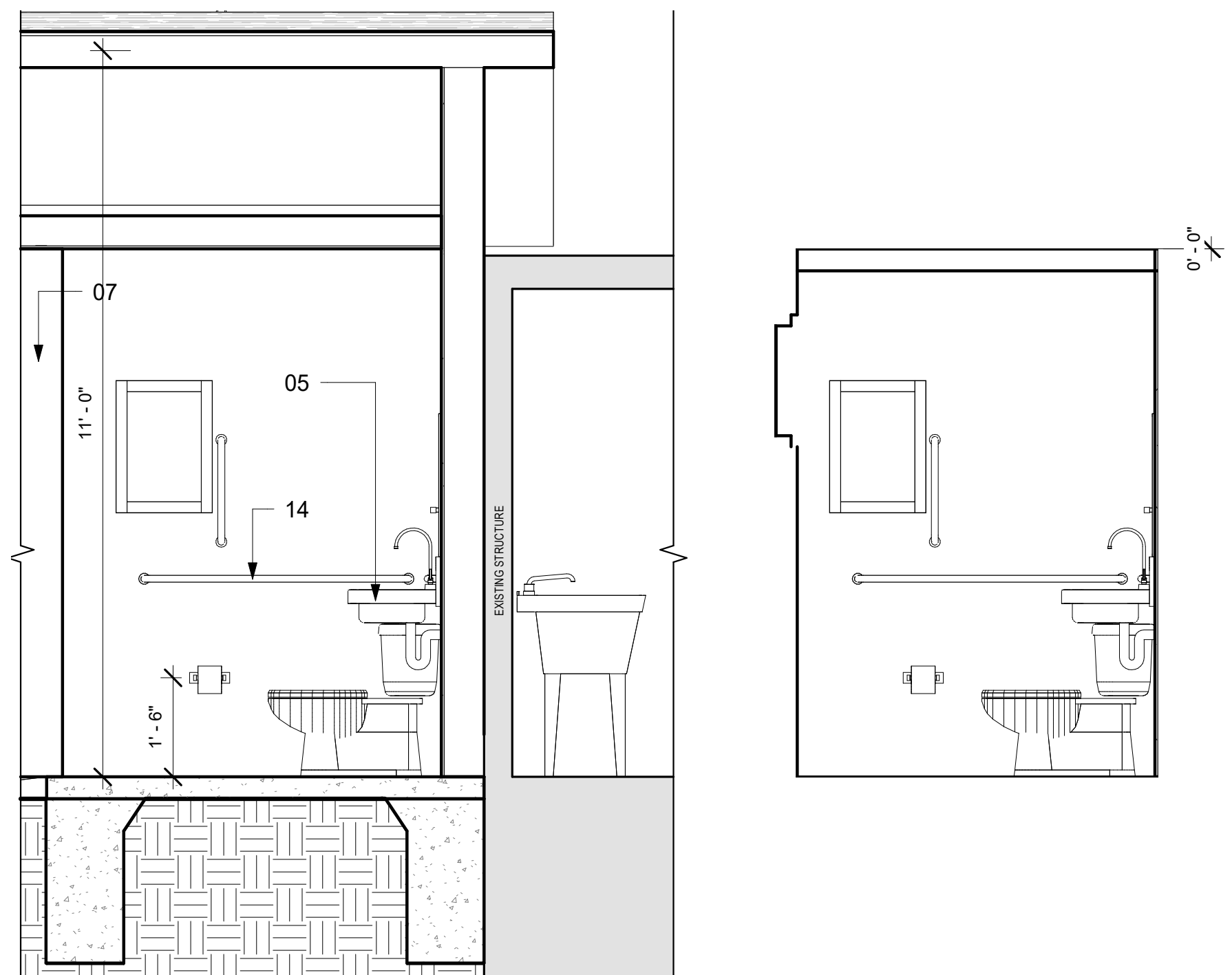
C1 PERSPECTIVE OPTION - GABLE



C2 EXTERIOR ELEVATION OPTION 1 - GABLE  
1/2" = 1'-0"



B2 SECTION OPTION 1 - GABLE  
1/2" = 1'-0"



A2 SECTION OPTION 1 - GABLE  
1/2" = 1'-0"

A3 INTERIOR ELEVATION  
1/2" = 1'-0"

## GENERAL NOTES

GN 3 - ROLL ROOFING IS TO BE INSTALLED ON ROOFS WHOSE SLOPE NO LESS THAN 0' 2" / 1' 0" AND NO MORE THAN 0' 4" / 1' 0". ASPHALT SHINGLES ARE TO BE INSTALLED ON ROOFS WHOSE SLOPE IS NO LESS THAN 0' 4" / 1' 0"

GN 4 - GABLE ROOF OPTION TO BE USED WHERE ADJOINING EXISTING WALL IS A AT LOWER HEIGHT THAN TOP OF THE PITCH GABLE PITCH

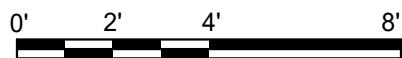
GN 4.5 - GABLE ROOF OPTION TO BE USED WITH CORRESPONDING VIEWS; DISREGARD VIEWS REGARDING SHED ROOF OPTION.

GN 5 - SHED ROOF OPTION TO BE USED WHERE EXISTING ADJOINING WALL IS HIGHER THAN HIGHEST POINT OF PITCH.

GN 5.5 - SHED ROOF OPTION TO BE USED WITH CORRESPONDING VIEWS ; DISREGARD VIEWS REGARDING GABLE ROOF OPTION

GN 6 - GABLE ROOF OPTION SHOWN WITH SLAB-ON-GRADE FOUNDATION TYPE DEPENDING ON ASSESSMENT OR BUILDER FOR STABILITY OF STRUCTURAL FOUNDATION OPTION, GABLE ROOF MAY BE COMBINED WITH PIER FOUNDATION OPTION.

Fixture Schedule				
Key Number	Type	Manufacturer	Model Number	Finish
01	Medicine Cabinet With Mirror	Glacier Bay or Sim.	45399	White
02	24" Towel Bar	Franklin Brass or Sim.	D2424SN	Brushed Nickel
03	Toilet Roll Holder	Franklin Brass or Sim.	127772	Brushed Nickel
04	Shower Curtain Bar	Franklin Brass or Sim.	185-5SN	Brushed Nickel
05	Wall Mounted Bathroom Sink	Ref. Plumbing Sched.		
06	Water Closet	Ref. Plumbing Sched.		
07	Shower Insert - ADA Compliant with integrated seat and grab bars - 4-piece	Ref. Plumbing Sched.		
08	Door Stop	Design House or Sim.	204735	Satin Nickel
09	Door Hardware	Schlage or Sim.	F40 GEO 619	Satin Nickel
10	Kitchen Sink	Ref. Plumbing Sched.		
11	Water Heater	Ref. Plumbing Sched.		
12	Wall Heater	Ref. Plumbing Sched.		
13	Cistern Pump	Ref. Plumbing Sched.		
14	Grab Bars	Glacier Bay or Sim.		



## NAVAJO NATION BATHROOM ADDITIONS

### NAVAJO NATION CONSTRUCTION DOCUMENTS

DECEMBER 9, 2022

OWNER: NAVAJO ENG & CONSTRUCTION AUTHORITY

INDIGENOUS DESIGN STUDIO + ARCHITECTURE, LLC



8008 Pennsylvania Cir NE  
Albuquerque, NM 87110  
Tel 505.226.2565  
Fax 505.226.2566

ARCHITECT

MARK	DATE	DESCRIPTION
	DECEMBER 9, 2022	
	7/16/2021	REV1

PROJECT NUMBER: 2022.005  
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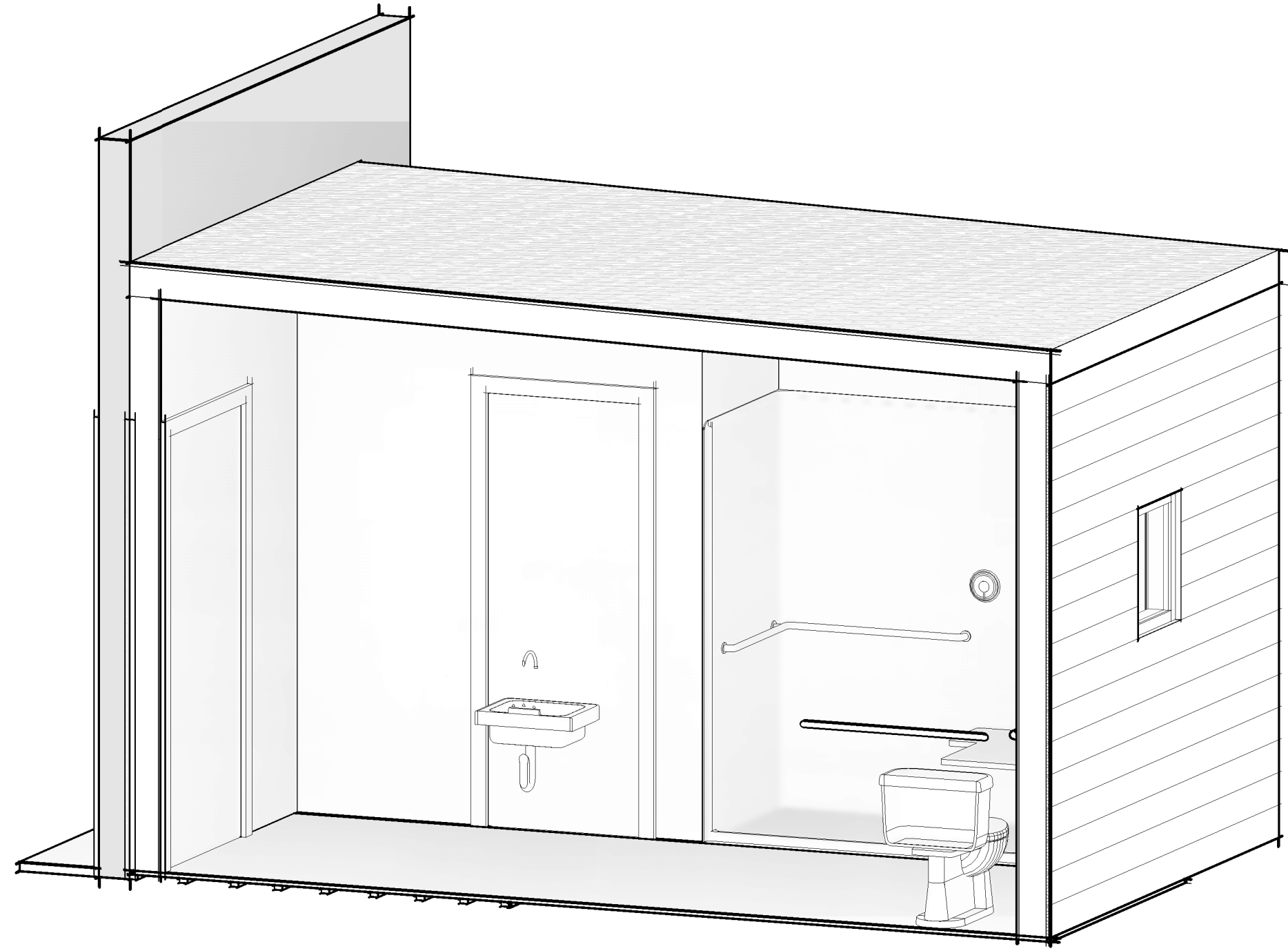
## SECTIONS AND ELEVATIONS

SHEET NUMBER

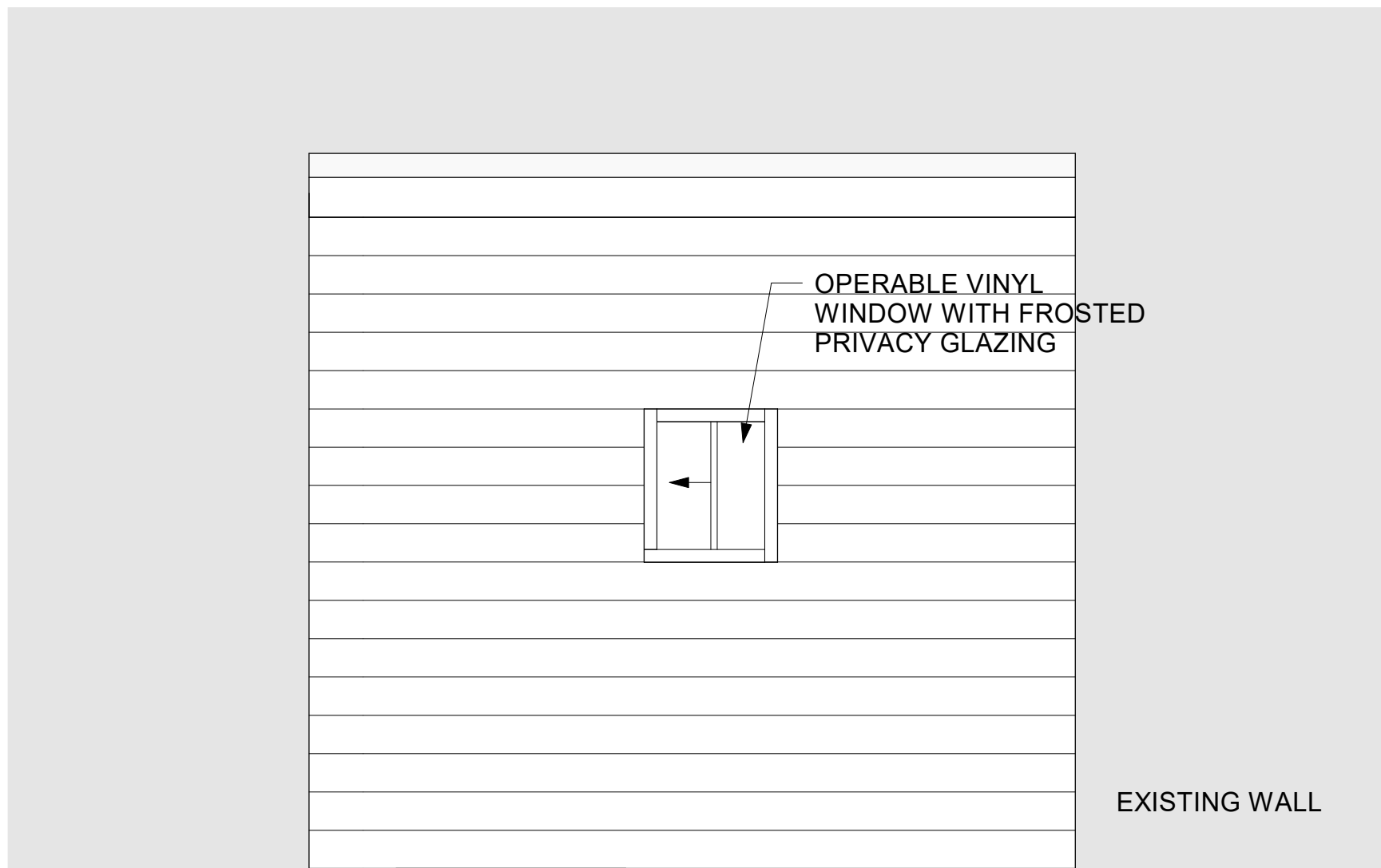
A103

Sequence of

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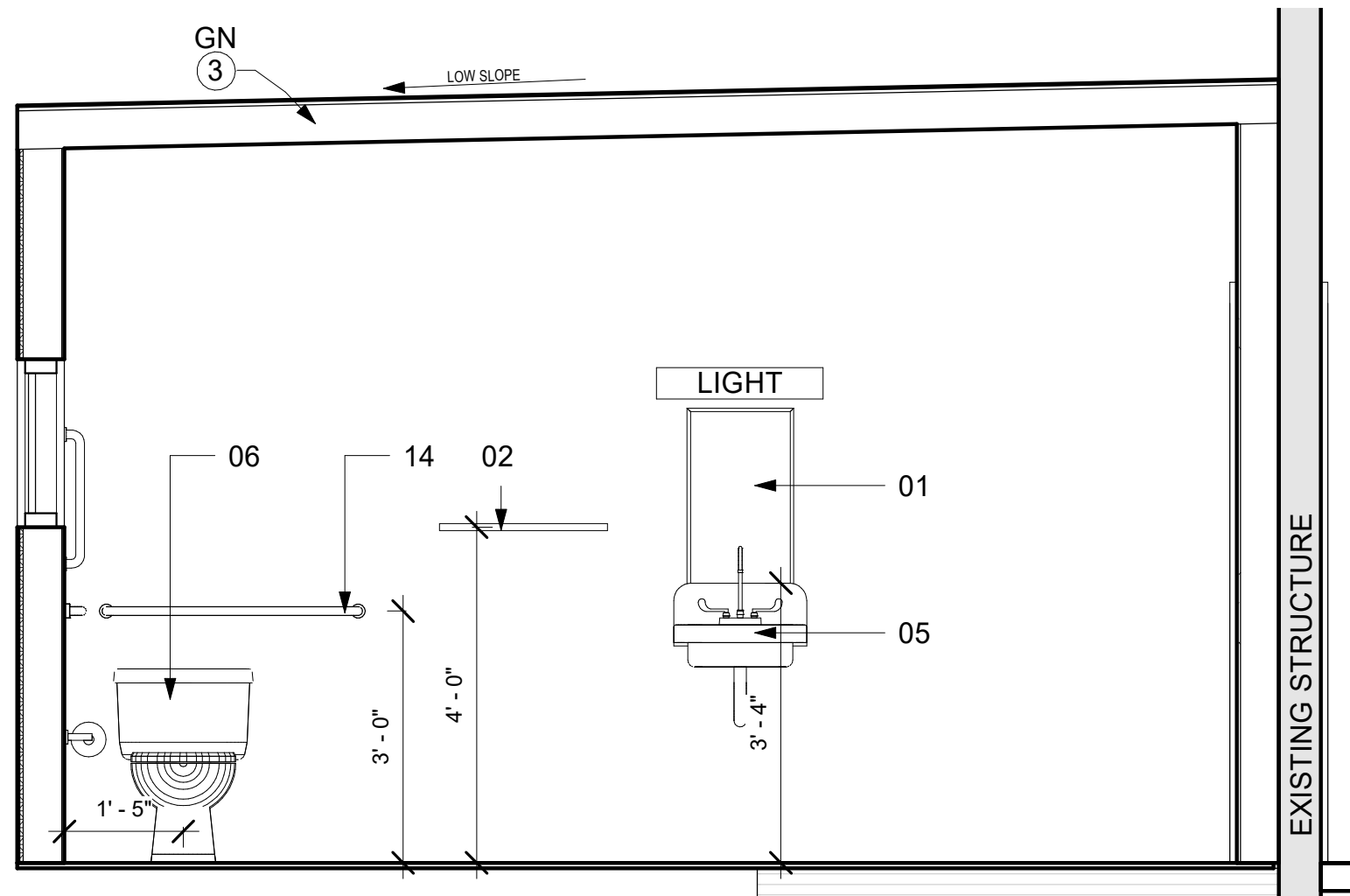
B1 PERSPECTIVE - SHED OPTION



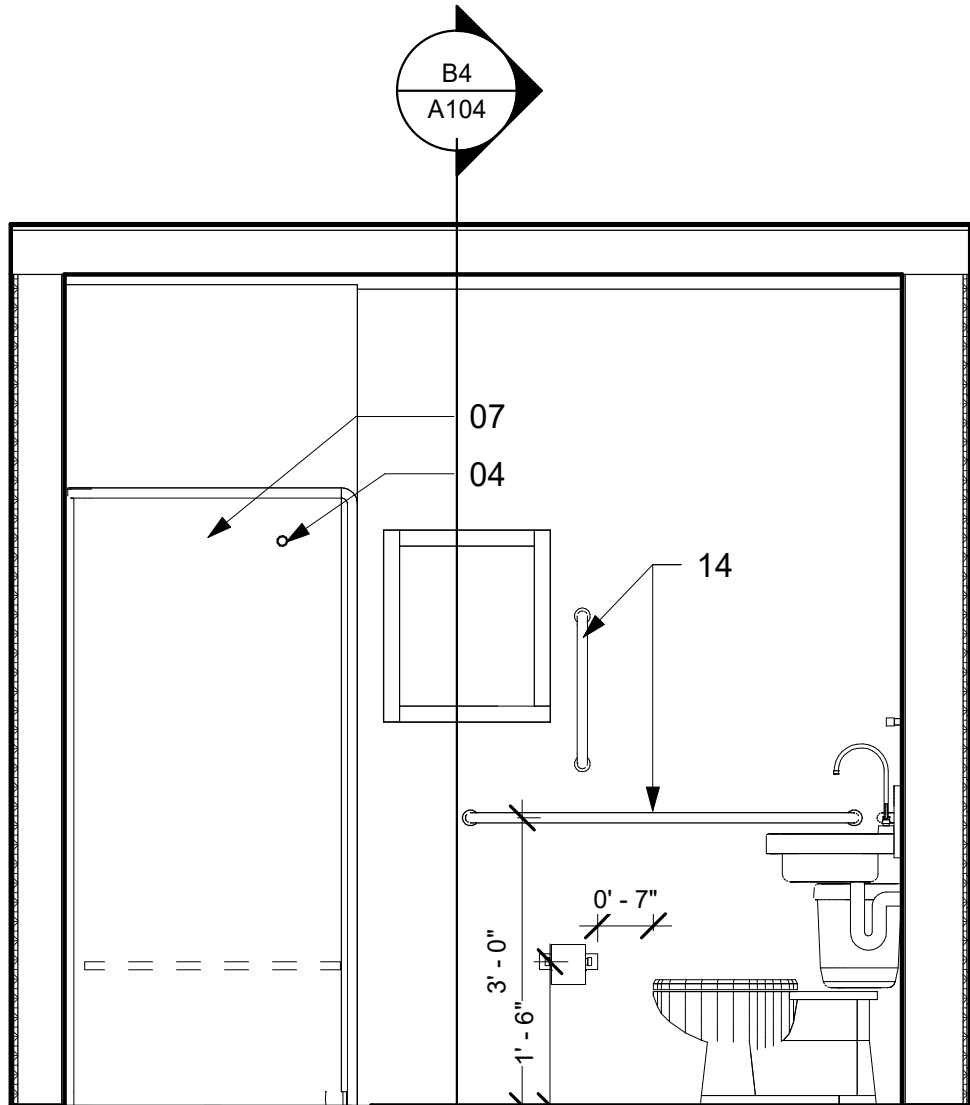
A2 EXTERIOR ELEVATION - SHED ROOF  
1/2" = 1'-0"



G1 EXTERIOR ELEVATION - SHED ROOF  
1/2" = 1'-0"



B4 SECTION - SHED ROOF  
1/2" = 1'-0"



M1 SECTION - SHED ROOF  
1/2" = 1'-0"

## GENERAL NOTES

GN 3 - ROLL ROOFING IS TO BE INSTALLED ON ROOFS WHOSE SLOPE NO LESS THAN 0' 2" / 1' 0" AND NO MORE THAN 0' 4" / 1' 0". ASPHALT SHINGLES ARE TO BE INSTALLED ON ROOFS WHOSE SLOPE IS NO LESS THAN 0' 4" / 1' 0"

GN 5 - SHED ROOF OPTION TO BE USED WHERE EXISTING ADJOINING WALL IS HIGHER THAN HIGHEST POINT OF PITCH.

GN 5.5 - SHED ROOF OPTION TO BE USED WITH CORRESPONDING VIEWS ; DISREGARD VIEWS REGARDING GABLE ROOF OPTION

## NAVAJO NATION BATHROOM ADDITIONS

### NAVAJO NATION CONSTRUCTION DOCUMENTS

DECEMBER 9, 2022

OWNER: NAVAJO ENG & CONSTRUCTION AUTHORITY

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	DECEMBER 9, 2022	

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#### SHEET TITLE

## SECTIONS AND ELEVATIONS

#### SHEET NUMBER

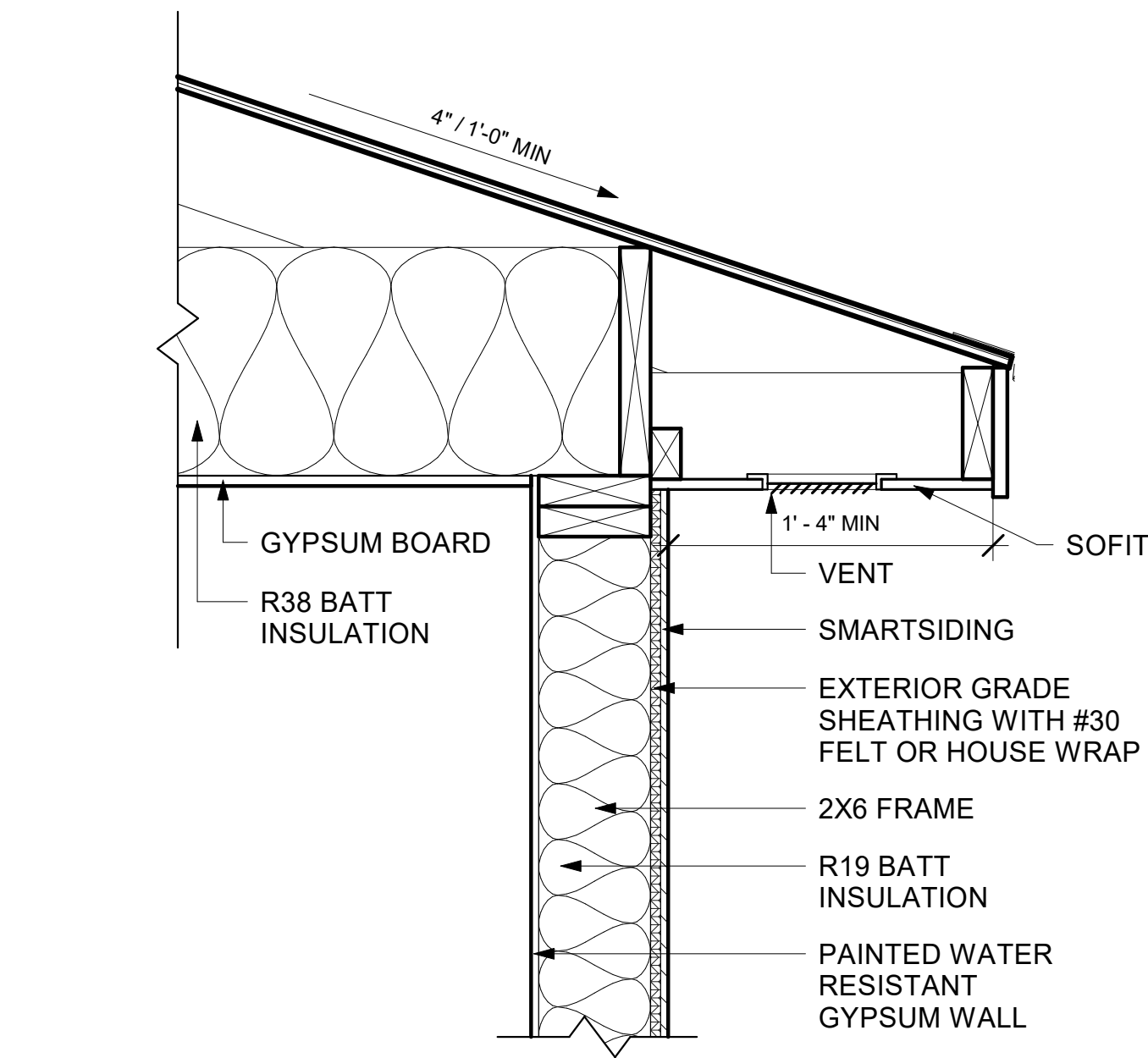
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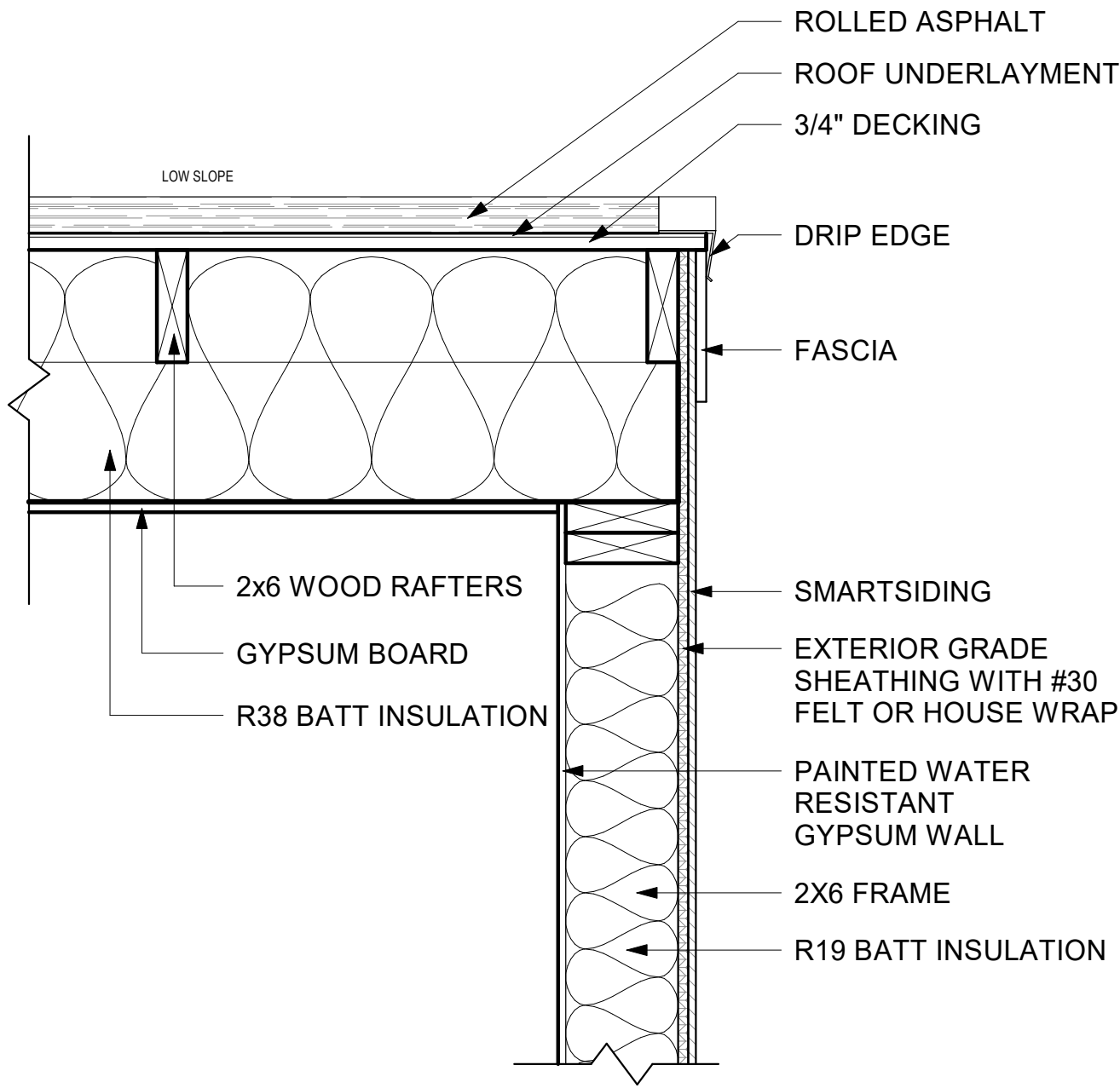


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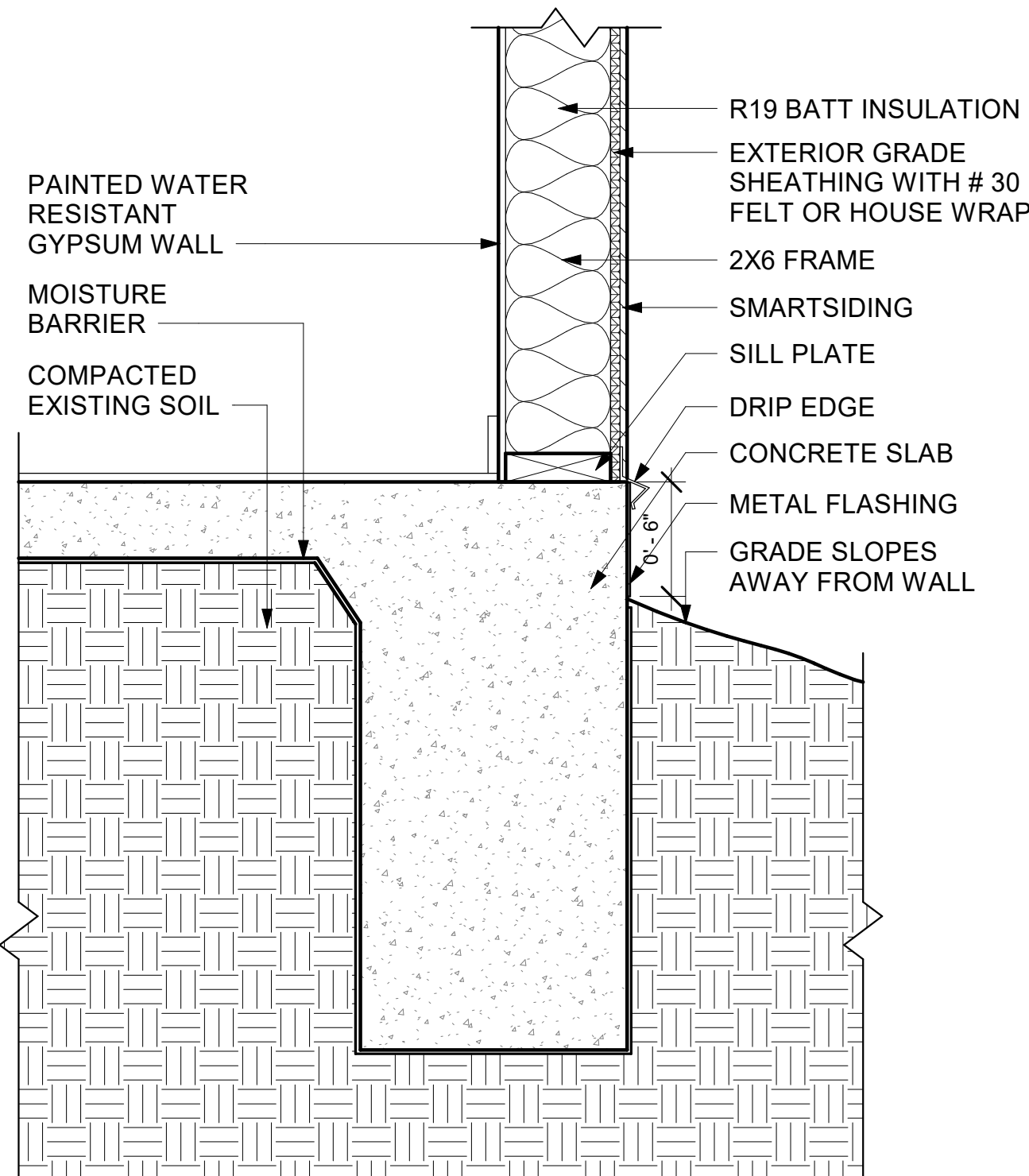
GENERAL NOTES



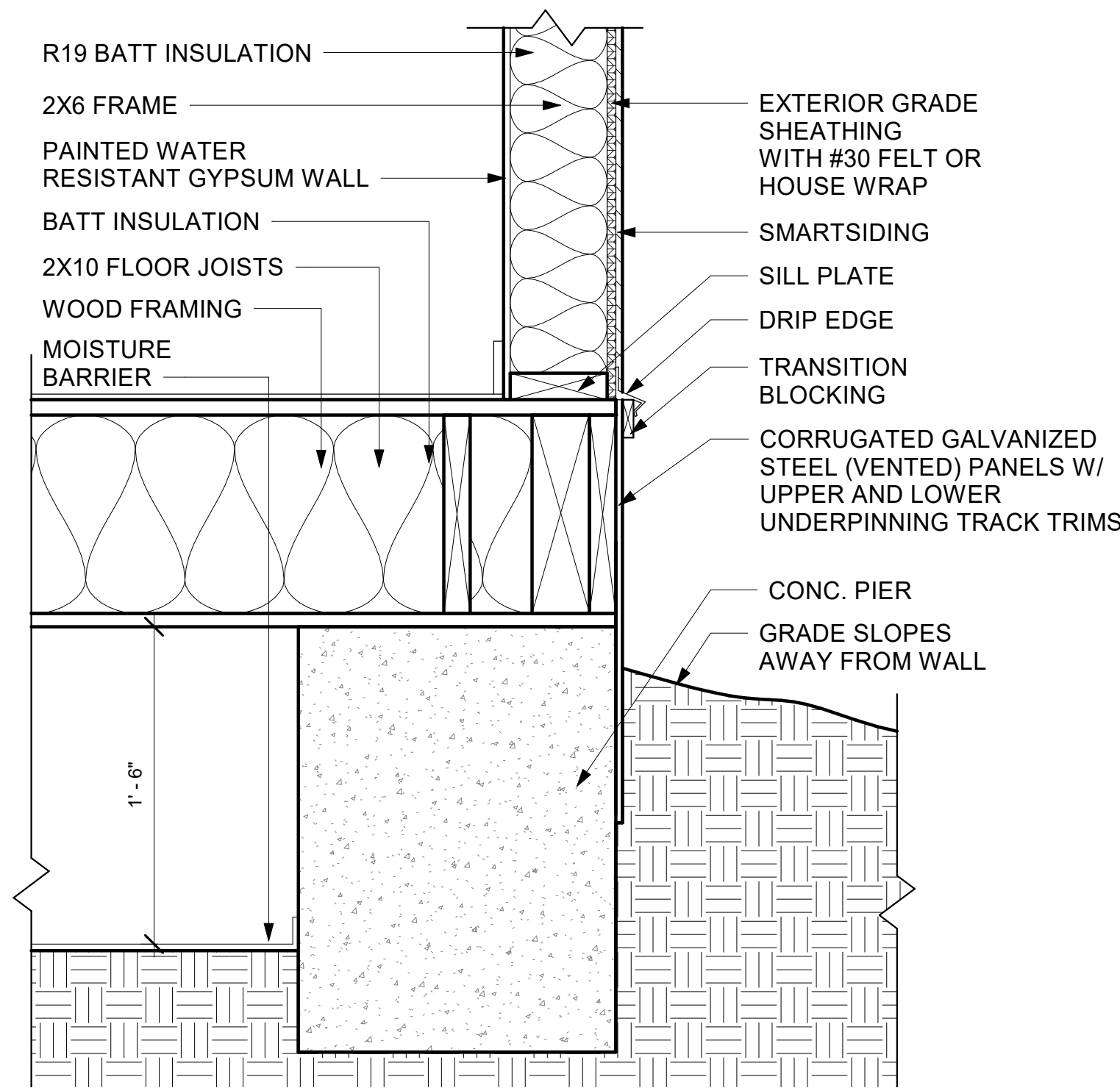
2 OPTION 1 DETAIL - GABLE  
1 1/2" = 1'-0"



C3 OPTION 2 DETAIL - SHED  
1 1/2" = 1'-0"



A1 OPTION 1 DETAIL - SLAB ON GRADE  
1 1/2" = 1'-0"



A3 OPTION 2 DETAIL - PIER FOUNDATION  
1 1/2" = 1'-0"

0" 6" 12" 24"

NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS

DECEMBER 9, 2022

OWNER: NAVAJO ENG & CONSTRUCTION AUTHORITY

INDIGENOUS DESIGN STUDIO + ARCHITECTURE, LLC



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ARCHITECT

MARK	DATE	DESCRIPTION
	DECEMBER 9, 2022	
	7/16/2021	REV1

PROJECT NUMBER: 2022.005  
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SHEET TITLE  
ROOF AND  
FOUNDATION  
DETAILS

SHEET NUMBER

A105

Sequence of

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## ABBREVIATIONS

A, AMP	AMPERE	QTY	QUANTITY
A.C.	AIR CONDITIONING UNIT	RA	RETURN AIR
AC	ALTERNATING CURRENT	RCPT	RECEPTACLE
		RGS	RIGID GALVANIZED STEEL
A.F.F.	ABOVE FINISH FLOOR	RM	ROOM
A.F.G.	ABOVE FINISH GRADE	RMC	RIGID METAL CONDUIT
AFU	AMP FUSE RATING	RMS	ROOT MEAN SQUARE
AFR	AMP FRAME RATING	RTU	ROOFTOP UNIT
AIC	AMPERES INTERRUPTING CURRENT		
APPROX.	APPROXIMATELY	SA	SUPPLY AIR
ATS	AUTOMATIC TRANSFER SWITCH	SCR	SHORT CIRCUIT RATING
AWG	AMERICAN WIRE GAUGE	SHLD	SHIELDED
		SQ	SQUARE
BC	BARE COPPER	SP	STATIC PRESSURE
BD	BALANCING DAMPER	SPD	SURGE PROTECTION DEVICE
BOD	BOTTOM OF DUCT	SS	SANITARY SEWER
BOP	BOTTOM OF PIPE	SK	SINK
BFG	BELOW FINISHED GRADE	SW	SWITCH
BTU	BRITISH THERMAL UNIT	SWB	SWITCHBOARD
BTUH	BRITISH THERMAL UNIT PER HOUR	SWGR	SWITCHGEAR
		SYM	SYMMETRICAL
C	CONDUIT	T	TRANSFORMER
CB	CIRCUIT BREAKER	TC	TERMINAL CABINET
CCTV	CLOSED CIRCUIT TELEVISION	TEB	TELEPHONE EQUIPMENT BOARD
CFM	CUBIC FEET PER MINUTE	TELE	TELEPHONE
CKT	CIRCUIT	TS	TEMPERATURE SENSOR
CLG	CEILING	TSTAT	THERMOSTAT
COMM	COMMUNICATIONS	TTB	TELEPHONE TERMINAL BOARD
CONC	CONCRETE	TV	TELEVISION
C.U.	CONDENSING UNIT	TYP.	TYPICAL
	COPPER		
DB	DRY BULB	UH	UNIT HEATER
DC	DIRECT CURRENT, DOOR CONTACT	UG	UNDERGROUND
DIFF	DIFFUSER	UL	UNDERWRITER'S LABORATORIES
DISC.	DISCONNECT	UON	UNLESS OTHERWISE NOTED
DN	DOWN		
DWG	DRAWING	V	VOLT
DX	DIRECT EXPANSION	VA	VOLT AMPERE
		VTR	VENT THRU ROOF
EA	EACH	W	WATT OR WIRE
EAT	ENTERING AIR TEMPERATURE	WH	WALL HYDRANT
(E),(EX)	EXISTING	WC	WATER CLOSET
EF	EXHAUST FAN	WCO	WALL CLEANOUT
EMH	ELECTRICAL MANHOLE	W/	WITH
ELEC	ELECTRICAL	W/O	WITHOUT
EMT	ELECTRICAL METALLIC TUBING	WP	WEATHERPROOF
EOLD	END OF LINE DEVICE		
EOP	EQUIPMENT		
ESP	EXTERNAL STATIC PRESSURE	XFMR	TRANSFORMER
ET	EXPANSION TANK		
EW/C	ELECTRIC WATER COOLER		
EXH	EXHAUST		
"F	DEGREES IN FAHRENHEIT		
FA	FIRE ALARM		
FACP	FIRE ALARM CONTROL PANEL		
FD	FLOOR DRAIN		
FLA	FULL LOAD AMPERES		
FLEX	FLEXIBLE METAL CONDUIT		
FLR	FLOOR		
FO	FIBER OPTICS		
FPM	FEET PER MINUTE		
FS	FLOOR SINK		
FT	FEET		
G.GND.	GROUND		
GFCI	GROUND FAULT CIRCUIT INTERRUPTER		
HB	HOSE BIBB		
HH	HAND HOLE		
HID	HIGH INTENSITY DISCHARGE		
HOA	HAND-OFF-AUTOMATIC		
HP	HORSEPOWER		
HPS	HIGH PRESSURE SODIUM		
IG	ISOLATED GROUND		
IMC	INTERMEDIATE METAL CONDUIT		
IN	INCHES		
INC	INCANDESCENT		
JB	JUNCTION BOX		
KCMIL	THOUSAND CIRCULAR MILS		
KV	KILOVOLT		
KVA	KILOVOLT-AMPERE		
KW	KILOWATT		
KWH	KILOWATT HOUR		
LAN	LOCAL AREA NETWORK		
LAT	LEAVING AIR TEMPERATURE		
LAV	LAVATORY		
LP	LIQUIFIED PETROLEUM		
LT	LIQUID TIGHT		
LTG	LIGHTING		
MAX	MAXIMUM		
MBH	1,000 BTU PER HOUR		
MCC	MOTOR CONTROL CENTER		
MDP	MAIN DISTRIBUTION PANELBOARD		
M	METER		
MFGR	MANUFACTURER		
MH	MANHOLE OR METAL HALIDE		
MIN	MINIMUM		
MLO	MAIN LUGS ONLY		
MTD	MOUNTED		
MTG	MOUNTING		
N/A	NOT APPLICABLE		
NC	NORMALLY CLOSED		
NIC	NOT IN CONTRACT		
NEC	NATIONAL ELECTRICAL CODE		
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION		
NO	NORMALLY OPEN		
NTS	NOT TO SCALE		
OA	OUTSIDE AIR		
OBD	OPPOSED BLADE DAMPER		
OC	ON CENTER		
OHP	OVERHEAD POWER		
O/P	OUTPUT		
PA	PUBLIC ADDRESS		
PB	PULL BOX		
PNL	PANELBOARD		
PP	POWER POLE		
PSI	POUNDS PER SQUARE INCH		
PT	POTENTIAL TRANSFORMER		
PV	PHOTOVOLTAIC		
PVC	POLYVINYL CHLORIDE		
PWR	POWER		

## PROJECT NOTES & OUTLINE SPECIFICATIONS

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE THEMSELVES WITH THE ENTIRE PROJECT PRIOR TO BID. THIS IS TO ALLOW FOR A COMPLETE AND ACCURATE BID PERTAINING TO SCOPE INDICATED ON THE DESIGN DRAWINGS & SPECIFICATIONS. ANY QUESTIONS THAT MAY ARISE IN REGARDS TO THE SCOPE OF WORK INDICATED, WHAT THE CONTRACTOR'S FUNCTIONS ARE OR ANY OTHER ISSUE RELATED TO THE PROJECT ITSELF SHALL BE IDENTIFIED DURING THE BID PERIOD AND COMMUNICATED TO THE ENGINEER OR CLARIFICATION PRIOR TO AWARD OF CONTRACT.

### MECHANICAL

- DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- ALL SUBCONTRACTORS SHALL BE LICENSED, EXPERIENCED, AND THOROUGHLY KNOWLEDGEABLE IN THEIR RESPECTIVE AREAS OF THE CONSTRUCTION INDUSTRY AND SHALL PERFORM IN A RESPONSIBLE MANNER WITH ESTABLISHED CONSTRUCTION SEQUENCE. SHALL RECOGNIZE THE PRIORITY OF THE CONSTRUCTION DOCUMENTS, AND SHALL INFORM THE PRIME CONTRACTOR OF POTENTIAL PROBLEMS WHEN THE CONSTRUCTION DOCUMENTS ARE UNCLEAR OR INCONSISTENT.
- EXAMINATION OF BIDDING DOCUMENTS:
  - EACH BIDDER SHALL EXAMINE THE BIDDING DOCUMENTS CAREFULLY, AND SHALL MAKE WRITTEN REQUEST TO THE ARCHITECT FOR INTERPRETATION OR CORRECTION OF ANY DISCREPANCIES, AMBIGUITIES, INCONSISTENCIES, OR ERRORS THEREIN WHICH THEY MAY DISCOVER. THE ARCHITECT WILL ISSUE ANY INTERPRETATION OR CORRECTION AS AN ADDENDUM. ONLY A WRITTEN INTERPRETATION OR CORRECTION BY ADDENDUM SHALL BE BINDING. NO BIDDER SHALL RELY UPON INTERPRETATIONS OR CORRECTIONS GIVEN BY ANY OTHER METHOD.
  - FAILURE TO REQUEST CLARIFICATION DURING THE BID PERIOD OF ANY INADEQUACY, OMISSION, OR CONFLICT WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES.
- PROVIDE A BASE BID WHICH SHALL INCLUDE ONLY SPECIFIED EQUIPMENT OR EQUIPMENT LISTED AS EQUIVALENT. NO SUBSTITUTIONS FOR THE LISTED EQUIPMENT SHALL BE ALLOWED IN THE BASE BID.
  - THE MANUFACTURER OF EQUIPMENT OR MATERIALS FIRST NAMED ON THE DRAWINGS AS THE BASIS OF DESIGN. OTHER MANUFACTURERS LISTED ARE CONSIDERED GENERAL EQUIVALENTS ONLY.
  - PROVIDE NECESSARY ADDITIONAL ITEMS SO THAT SELECTED OR SUBSTITUTED ITEM OPERATES EQUIVALENT TO THE BASIS OF DESIGN AND PROPERLY FITS IN THE AVAILABLE SPACE ALLOCATED FOR THE BASIS OF DESIGN.
- OFFSET PIPING, DUCTWORK, ETC. AS NECESSARY TO ACCOMMODATE STRUCTURE, BEAMS, AND COLUMNS, AND EQUIPMENT.
- WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT, OWNER, AND ENGINEER.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM HIS/HER WORK IN CONFORMANCE WITH ALL APPLICABLE CODES, ORDINANCES AND LIFE SAFETY FEATURES AS REQUIRED BY LOCAL, STATE, OR NATIONAL AUTHORITIES. THE CONTRACTOR SHALL VERIFY WITH THE ARCHITECT IF MODIFICATION OF HIS/HER WORK IS REQUIRED FOR COMPLIANCE.
- SUBMIT RECORD DOCUMENTS TO GENERAL CONTRACTOR. DOCUMENTS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, RE-ROUTINGS, ETC.
- SYSTEMS SHALL BE COMPLETE, OPERABLE, AND READY FOR CONTINUOUS OPERATION PRIOR TO ACCEPTANCE BY THE OWNER.
- SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. PERFORM AT A MINIMUM ALL CODE REQUIRED TESTS OR SYSTEMS. IF TESTS OF WORK ARE DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO ADDITIONAL COST TO OWNER.
- ALL MATERIALS AND/OR EQUIPMENT SHALL BE HANDLED AND INSTALLED AS PER MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
- PROVIDE NECESSARY TRENCHING, BACKFILL, EXCAVATION, SUPPORTS, SAW-CUTTING AND PATCHING. CONCRETE/PAVING, ETC., AS REQUIRED. BACKFILL TRENCHES IN 6" LAYERS AND TO 90% COMPACTION AND PATCH TO MATCH EXISTING GRADE.
- DUCTWORK: (LOW VELOCITY)
  - FLEXIBLE DUCTWORK SHALL HAVE AN OUTER JACKET OF FIRE RETARDANT POLYETHYLENE VAPOR BARRIER MATERIAL, UNIFORM LAYER OF FIBERGLASS INSULATION, HIGH-STRENGTH GALVANIZED STEEL HELIX ENCAPSULATED IN REINFORCED "RIP STOP" ALUMINUM LAMINATE INTERIOR CORE, UL LISTED AND LABELED, CLASS 1 AIR DUCT. FLEXIBLE CONNECTION: EQUIVALENT TO VENTFAB, FIREPROOF GLASS CLOTH, 10" W.C. RATED.
  - ROUND DUCT: SPIRAL SEAM, GALVANIZED STEEL. DIE STAMPED OR 5 GORE ELBOWS. "SNAP-LOCK", LONGITUDINAL SEAM DUCT, OR ADJUSTABLE FITTINGS ARE ACCEPTABLE ON INDIVIDUAL GRILLE/DIFFUSER RUNOUTS ONLY.
  - DUCTWORK: G60 GALVANIZED SHEET STEEL; LOCK FORMING QUALITY; CONSTRUCTED TO THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS"; +/- 1" W.C. PRESSURE CLASSIFICATION. SEAL CLASS "C"; WITH GALVANIZED STEEL FASTENERS, ANCHORS, ANGLES, STRAPS, ETC.
  - SEAL ALL SEAMS (LONGITUDINAL AND TRANSVERSE) AIRTIGHT WITH UNITED MCGILL "UNI-GRIP" UL LISTED, WATER BASED, NON-HARDENING, ELASTIC SEALANT OR EQUIVALENT. TAPE NOT ALLOWED.
- PROVIDE 1/4" GALVANIZED MESH SCREEN ON ALL COMBUSTION AIR DUCTS OR OPENINGS, AND ALL OPEN-END RETURN AND EXHAUST DUCTS.
- ALL DUCTWORK DIMENSIONS ARE INSIDE FREE AREA DIMENSIONS.
- SUPPORT PIPE WITH ROD AND CLEVIS, RING HANGERS, TRAPEZE, OR CLAMPS. NO PIPE TAPE OR STRAPPING ALLOWED. ALL HANGERS SHALL BE SIZED FOR OUTSIDE OF INSULATION, IF ANY. PROTECT INSULATED LINES WITH 20 GA SHEET METAL SHIELDS FOR PIPING 1-1/2" AND LESS. PROVIDE CALCIUM SILICATE INSULATION INSERTS FOR ALL INSULATED PIPING 2" AND LARGER. MAINTAIN VAPOR BARRIER ON ALL COLD LINES. ISOLATE BARE COPPER LINES FROM HANGERS WITH VIBRASORB OR EQUIVALENT. COPPER COATED HANGERS ARE NOT SUFFICIENT, WRAPPING PIPE WITH TAPE NOT ACCEPTABLE.

### PLUMBING

- PIPE VALVES AND SPECIALTIES:
  - GATE VALVES - BRONZE, CLASS 125, 200 LB. W.O.G.
  - BALL VALVES - BRONZE, CLASS 125, 600 LB. W.O.G.
  - CHECK VALVES - BRONZE, CLASS 125, 200 LB. W.O.G.
  - BALANCING VALVES - 125 PSI W.P. FOR 250 DEGREE FAHRENHEIT SERVICE TIGHT SHUTOFF, TOUR AND ANDERSON STA. ARMSTRONG CBV, GERAND, OR FLOWSET, BELL AND GOSSETT CIRCUIT SETTER.
- DIRECT UNIONS: FURNISH AND INSTALL A DIELECTRIC UNION AT EACH CONNECTION BETWEEN DISSIMILAR METALS.
- MATERIALS: SOIL, WASTE, AND VENT PIPING (INSIDE BUILDING)
  - THE NEW SEWER LINE SHALL BE SCHEDULE 40 PVC OR SDR 35. NO JOINTS IN THE NEW SEWER LINE CONSTRUCTION SHALL BE PERMITTED WITHIN 9- FEET OF CROSSING WATER LINE.
  - DRAIN FITTINGS, OR DWV COPPER TUBE WITH DWV FITTINGS AND 95-5 NO LEAD SOLDER.
  - CONDENSATE DRAIN LINES INSIDE BUILDING TO BE COPPER TUBE WITH 95-5 NO LEAD SOLDER.
  - CONDENSATE DRAIN LINES OUTSIDE BUILDING TO BE PVC WITH UV- PROTECTIVE COATING, LATEX PAINT OR EQUAL.
- GAS PIPING--SCHEDULE 40 BLACK STEEL PIPE, WELDED FITTINGS WITH ALL PIPING COATED AND WRAPPED ON BURIED PIPE.
- GAS VALVES--NON-LUBRICATED BALL STYLE VALVE WITH RESILIANT SEATS, AND ADJUSTABLE GLAND PACKING NUT, AGA AND UL LISTED FOR NATURAL GAS SERVICE.
- DRAIN PAN PIPING--NOT BURIED--TYPE "M" COPPER, WROUGHT COPPER FITTINGS, AND 95-5 SOLDER.
- SUPPORT BASE MOUNTED CISTERN PUMP BY MASON INDUSTRIES OR EQUIVALENT SPRING TYPE SEISMICALLY RESTRAINED VIBRATION ISOLATORS.

- WATER SUPPLY LINES SHALL BE PEX TUBING. INSULATE ALL DOMESTIC HOT AND COLD WATER PIPING WITH UL APPROVED, WHITE, ALL SERVICE, GLASS FIBER, SNAP-ON, PIPE INSULATION. INSULATE FITTINGS WITH GLASS FIBER BLANKET INSULATION AND PREMOLED P.V.C. COVERS. ALL MATERIALS SHALL HAVE A SMOKE DEVELOPED RATING OF 50 OR LESS AND A FLAME SPREAD RATING OF 25 OR LESS. INSULATION SHALL PASS UNINTERRUPTED THROUGH HANGERS. VAPOR BARRIERS SHALL BE CONTINUOUS AND SEALED WITH "NON-BREATHING" MASTIC ON COLD PIPING. ALL RAW EDGES OF INSULATION SHALL BE NEATLY TRIMMED AND SEALED WITH MASTIC.
  - INSULATION THICKNESS:
    - DOMESTIC COLD WATER: 1/2" THICK ABOVE FLOOR; 1" THICK FROM BOTTOM OF FLOOR DECK TO GRADE.
    - DOMESTIC HOT WATER: 1/2" THICK ABOVE FLOOR; 1" THICK FROM BOTTOM OF FLOOR DECK TO GRADE.
    - REFRIGERANT PIPING: 1" THICK FLEXIBLE ELASTOMERIC
- EQUIPMENT LABELS: LABEL ALL PIPING AND EQUIPMENT. PROVIDE FULL BAND OR STRIP TYPE MARKERS AND FLOW ARROWS ON PIPING. PROVIDE ENGRAVED PLASTIC VALVE TAGS WITH VALVE NUMBER AND ATTACH WITH STANDARD CHAIN OR S-HOOKS. PROVIDE ENGRAVED PLASTIC SIGN ON OR NEAR SPECIFIED EQUIPMENT.

### ELECTRICAL

- IT WILL BE THE CONTRACTOR'S OBLIGATION TO INCLUDE IN THEIR BID THE COSTS FOR INSTALLATION OF JUNCTION BOXES, CONDUIT SUPPORTS, OUTLET COVER PLATES, COORDINATION WITH OTHER TRADES, AND OTHER MISCELLANEOUS ITEMS THAT PERTAIN TO THE SCOPE OF WORK INDICATED.
- ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC).
- SEAL ALL CONDUIT PENETRATIONS WITH APPROVED FIRE RATED MATERIALS AS TO MAINTAIN FIREWALL RATING. REFER TO ARCHITECTURAL DRAWINGS FOR THE LOCATIONS OF ALL FIRE RATED WALLS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR ANY WALLS, CEILINGS, ETC. THAT HAS BEEN DAMAGED DURING THE CONSTRUCTION. REPAIR UTILIZING MATCHING MATERIALS, AND WORK SHALL BE DONE IN A PROFESSIONAL MANNER.
- LOCATIONS OF ELECTRICAL EQUIPMENT AND ALL OTHER DEVICES SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH ALL TRADES FOR EXACT LOCATION OF OTHER EQUIPMENT THAT REQUIRE ELECTRICAL CONNECTIONS.
- ALL CONDUIT ROUTINGS SHOWN ON THE PLAN DRAWINGS ARE APPROXIMATE. EXACT ROUTINGS AND LOCATION OF CONDUITS SHALL BE COORDINATED IN THE FIELD AND INSTALLED AS FIELD CONDITIONS ALLOW.
- ALL CONDUIT SHALL BE CONCEALED WITHIN NEW WALLS OR ABOVE THE NEW CEILING WHEN POSSIBLE.
- ALL HOME RUN CIRCUITING SHALL BE 3/4" EMT CONDUIT, WITH #12 THHN COPPER WIRING (MINIMUM), UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL INSTALL NEW PULL BOXES AND JUNCTION BOXES AS NEEDED OR WHEREVER IT IS REQUIRED BY N.E.C. ALL NEW WIRING SHALL BE IDENTIFIED AND TAGGED AT ALL PULL BOXES, JUNCTION BOXES, EQUIPMENT BOXES AND CABINETS.
- THE MOUNTING HEIGHTS INDICATED ON THE DRAWINGS ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE OTHER TRADES AND REFERENCE THE ARCHITECTURAL INFORMATION FOR EXACT HEIGHTS OF DEVICES PRIOR TO ELECTRICAL ROUGH-IN, UNLESS OTHERWISE NOTED. THIS ALSO PERTAINS TO LOCATIONS OF WALL BOXES, SENSORS, T-STATS, SWITCHES, ETC.
- SHOULD CONTRACTOR AT ANY TIME NOTICE THAT THE ACTUAL FIELD CONDITIONS DO NOT CORRESPOND TO THE INFORMATION INDICATED ON THE DRAWINGS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER FOR CLARIFICATION AND DIRECTION PRIOR TO COMMENCING WORK.
- WHEREVER REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL UNISTRUT CHANNELS, ANGLE IRON, THREADED ROD OR ANY ADDITIONAL SUPPORTS REQUIRED TO ACCOMMODATE THE INSTALLATION OF ALL ELECTRICAL EQUIPMENT AND MATERIALS.
- UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS DOCUMENTING ANY AND ALL CHANGES THAT HAVE BEEN MADE AS PART OF THIS CONTRACT. PROVIDE UPDATED TYPEWRITTEN SCHEDULES FOR ALL PANELS AND LABEL ALL PANELS AND EQUIPMENT AS REQUIRED.
- THE WORD "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL. EXCEPTIONS SHALL BE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER DISCIPLINES PRIOR TO COMMENCEMENT OF WORK AND INSTALLATION OF EQUIPMENT.
- PROVIDE PULLWIRE IN ALL EMPTY CONDUITS.
- PROVIDE FOUR (4) SPARE 3/4"C FROM EACH NEW RECESSED PANELBOARD AND STUB-OUT ABOVE ACCESSIBLE CEILINGS BELOW FLOOR OR ROOF DECKS FOR FUTURE USE.
- CAREFULLY VERIFY ELECTRICAL SERVICE VOLTAGE AND PHASE AVAILABLE.

## SITE UTILITY NOTES

FULL COORDINATION WITH NTUA, NAVAJO TRIBAL UTILITY AUTHORITY AND LOCAL ELECTRICAL UTILITY SHALL BE FOLLOWED THROUGHOUT THIS PROJECT. CODE COMPLIANCE WITH NTUA'S DESIGN AND CONSTRUCTION STANDARDS AND UTILITY REQUIREMENTS ARE MET. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH THE LATEST EDITION OF NEC, NATIONAL ELECTRIC CODE. ANY UNDERGROUND SYSTEM(S) AND METHODS OF INSTALLATION AND INSPECTION(S) SHALL COMPLY WITH SPECIFICATIONS AS NOTED IN THE NTUA OR UTILITIES COMMERCIAL DRAWINGS MANUAL.

- ALL EXISTING MAINLINE UTILITIES ARE TO REMAIN IN PLACE AND ARE TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION UNLESS OTHERWISE NOTED.
- IF ANY UTILITY LINES, PIPELINES, OR ANY UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. IF ANY SUCH EXISTING LINES ARE SHOWN, THE LOCATION IS BASED UPON INFORMATION PROVIDED TO THE ENGINEER BY OTHERS, AND THE INFORMATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY UTILITY LINE, PIPELINE OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK.
- CONTRACTOR SHALL COORDINATE ELECTRICAL, WATER, AND COMMUNICATION SERVICES AND EXTENSIONS WITH LOCAL UTILITY SERVICE PROVIDERS.
- THE CONTRACTOR SHALL NOTIFY ALL APPLICABLE UTILITY COMPANIES AT LEAST TWO (2) DAYS PRIOR TO ANY DIGGING OR EXCAVATION.
- ALL UTILITY WORK SHALL FOLLOW NTUA, NAVAJO TRIBAL UTILITY AUTHORITY OR LOCAL UTILITY REQUIREMENTS.
- VERTICAL SEPARATION OF WATER AND SEWER LINES (INCLUDES SERVICE LINES):
  - WATER ABOVE SEWER: WHEN WATER LINES CROSS SEWER LINES, THE WATER LINE SHALL CROSS ABOVE THE SEWER LINE WITH A MINIMUM VERTICAL SEPARATION OF 12 INCHES (O.D. TO O.D.). IF NECESSARY, THE DEPTH OF BURY FOR THE WATER LINE MAY BE REDUCED TO 36 INCHES (NORMALLY 42 INCHES) AT THE CROSSING TO MAINTAIN THE 12 INCH VERTICAL SEPARATION. WHEN THE MINIMUM 12 INCH VERTICAL SEPARATION IS NOT POSSIBLE, THE WATER LINE IS NOT POSSIBLE, THE WATER LINES SHALL BE PERMITTED WITHIN 10 FEET OF CROSSING A SEWER LINE.
  - SEWER ABOVE WATER: WHEN A WATER LINE MUST CROSS BELOW A SEWER LINE, THE MINIMUM VERTICAL SEPARATION BETWEEN THE LINES IS 12-INCHES BACKFILL OF THE TRENCHES SHALL BE COMPACTED TO PROVIDE ADEQUATE SUPPORT TO PREVENT SETTLING OF THE SEWER LINE AND DAMAGING THE WATER LINE.
  - ALL NEW WATER LINES SHALL BE NORMAL PVC OR PE WATER DISTRIBUTION PIPE WITH A 20-FOOT (MINIMUM) PIPE SECTION CENTERED ON THE SEWER CROSSING. NO JOINTS OF NEW WATER LINE CONSTRUCTION SHALL BE PERMITTED WITHIN 9- FEET OF CROSSING A SEWER LINE. WHILE IT IS DESIRABLE TO HAVE CROSSINGS PERPENDICULAR, NEW WATER LINE (CENTERED ON THE CROSSING) MAY CROSS UNDER A SEWER LINE AT A MAXIMUM OF 25 DEGREES FROM PERPENDICULAR.

## NAVAJO NATION BATHROOM ADDITIONS

## NAVAJO NATION CONSTRUCTION DOCUMENTS

APR - 2023

OWNER:  
NAVAJO ENG & CONSTRUCTION AUTHORITY

### INDIGENOUS DESIGN STUDIO + ARCHITECTURE, LLC



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## PROJECT NOTES, SPECIFICATIONS & ABBREVIATIONS

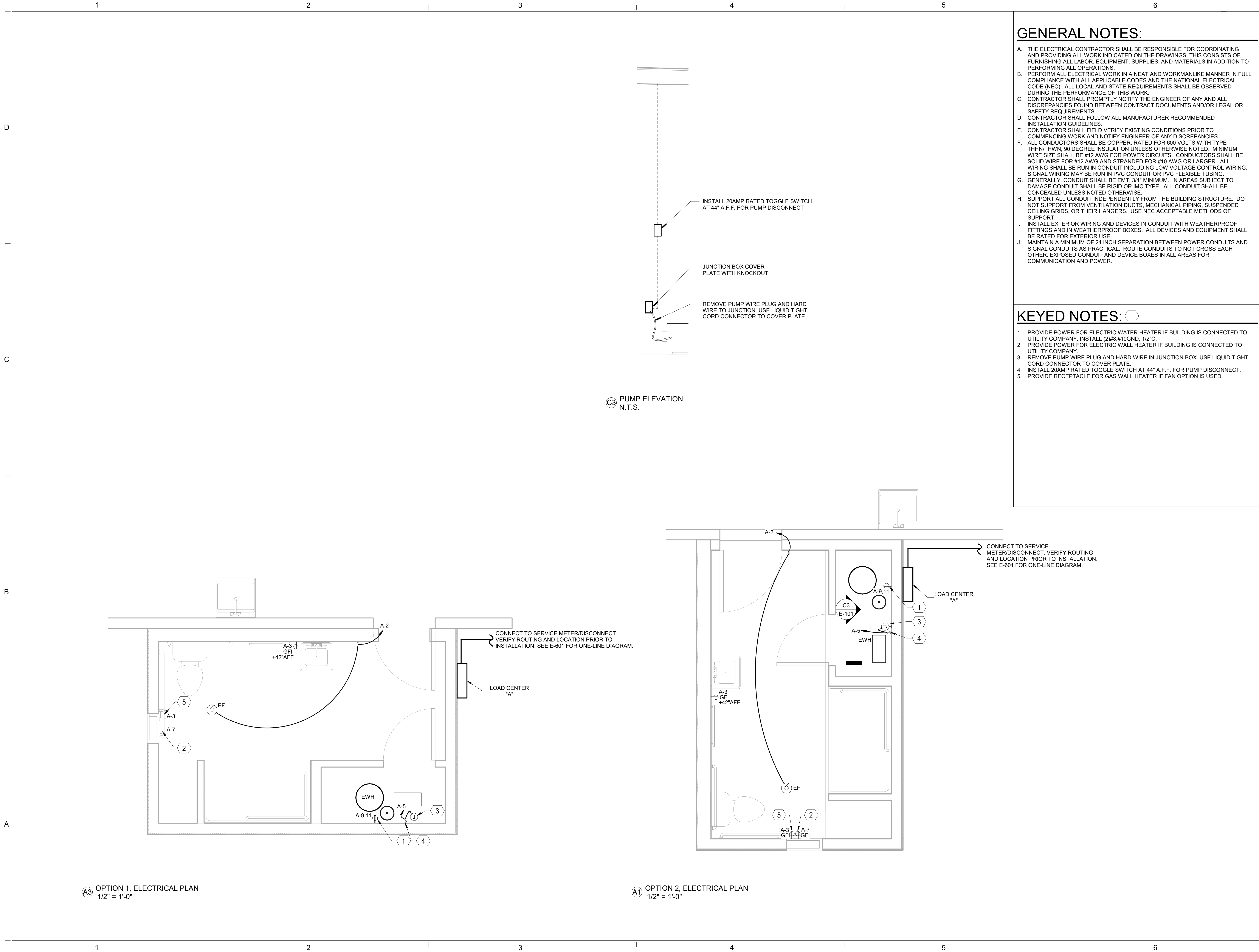
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# MEP-001

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NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
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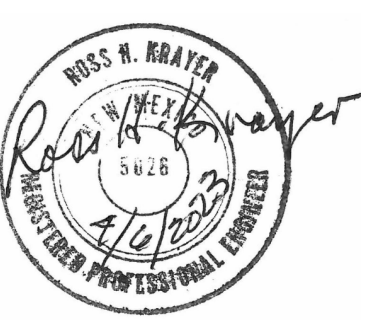
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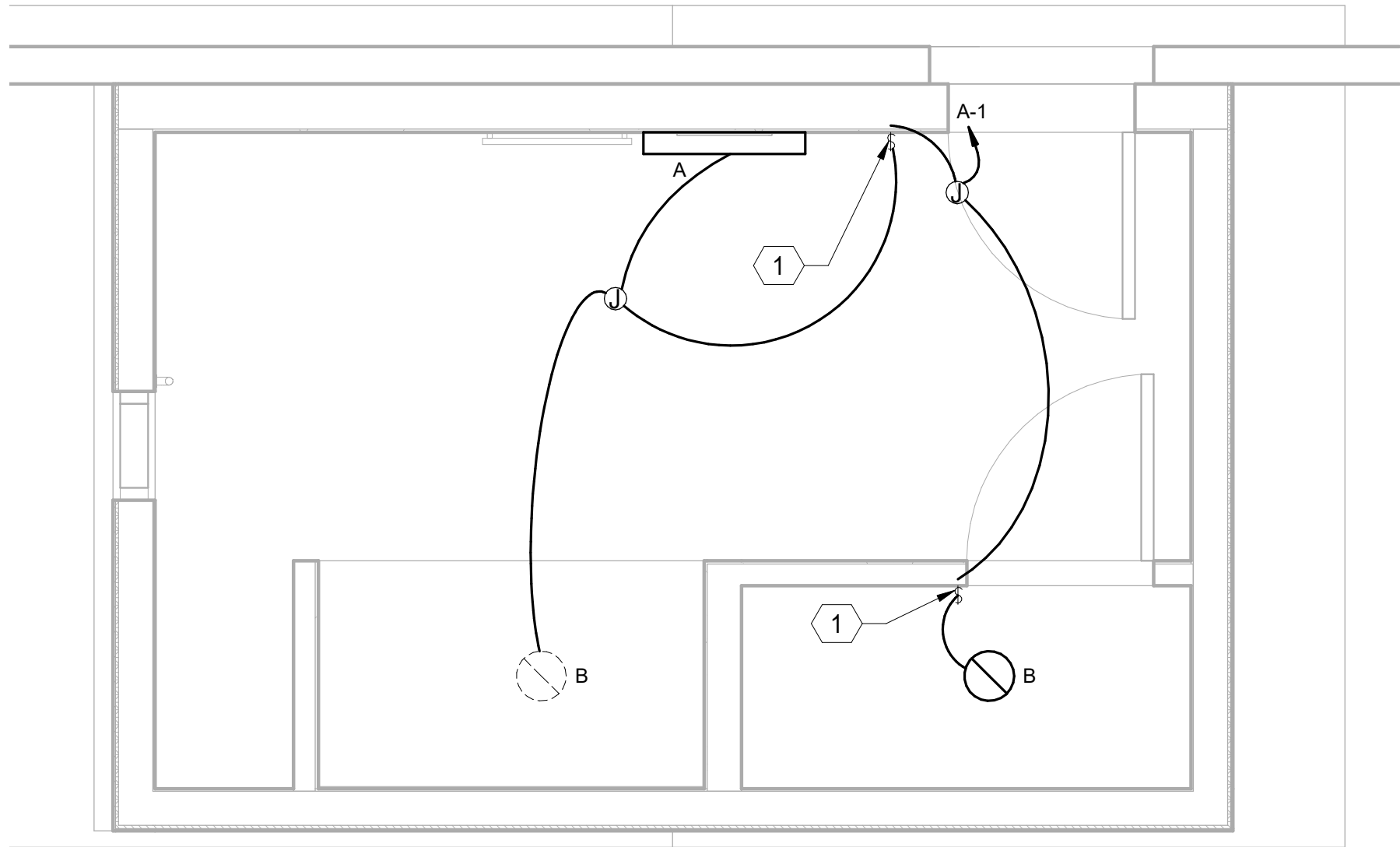
A  
ELECTRICAL PLAN

SHEET NUMBER

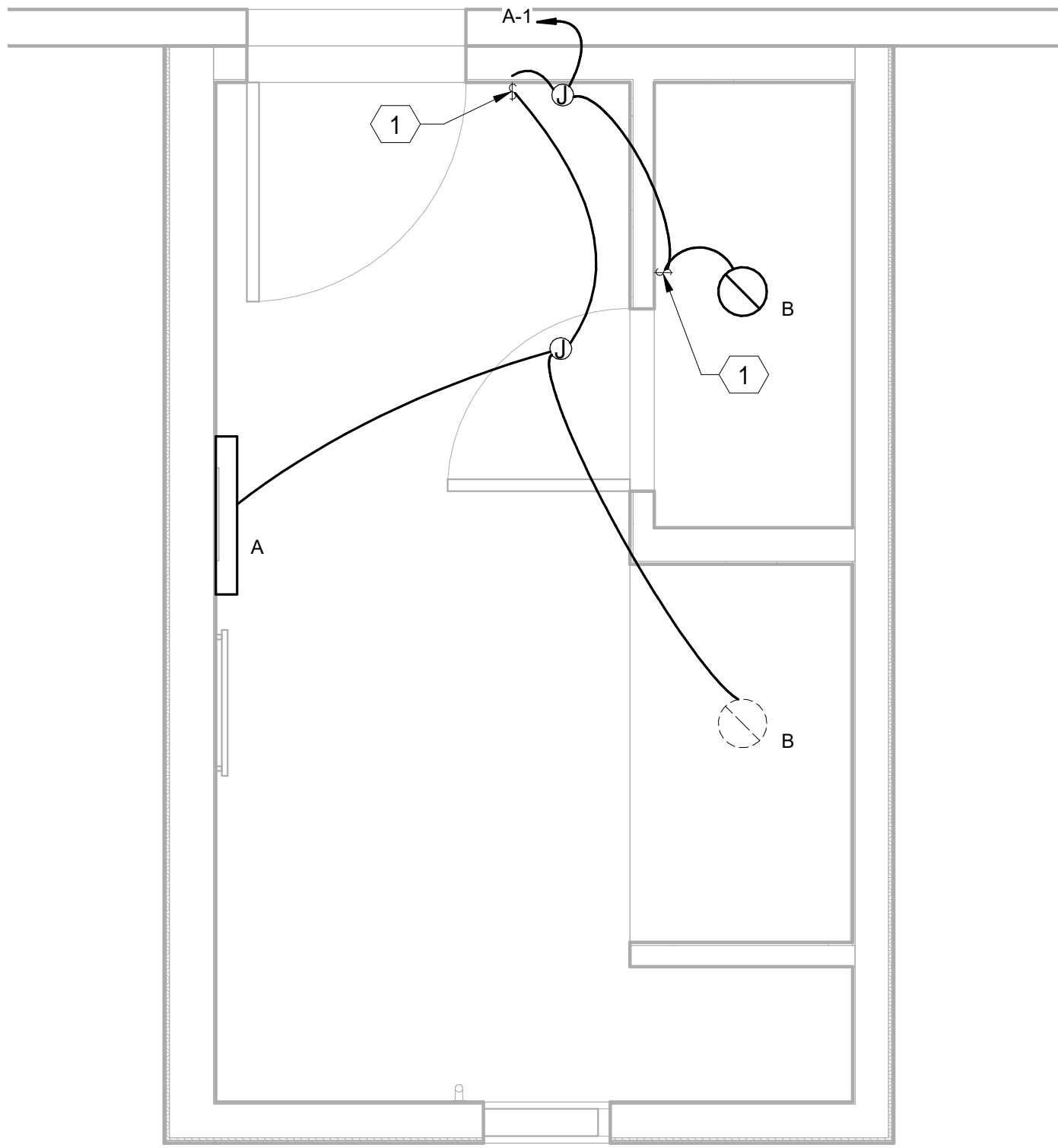
E-101

Sequence of

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**A1** OPTION 1, LIGHTING PLAN  
1/2" = 1'-0"



**A3** OPTION 2, LIGHTING PLAN  
1/2" = 1'-0"

### GENERAL NOTES:

- A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING ALL WORK INDICATED ON THE DRAWINGS. THIS CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, SUPPLIES, AND MATERIALS IN ADDITION TO PERFORMING ALL OPERATIONS.
- B. PERFORM ALL ELECTRICAL WORK IN A NEAT AND WORKMANLIKE MANNER IN FULL COMPLIANCE WITH ALL APPLICABLE CODES AND THE NATIONAL ELECTRICAL CODE (NEC). ALL LOCAL AND STATE REQUIREMENTS SHALL BE OBSERVED DURING THE PERFORMANCE OF THIS WORK.
- C. CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY AND ALL DISCREPANCIES FOUND BETWEEN CONTRACT DOCUMENTS AND/OR LEGAL OR SAFETY REQUIREMENTS.
- D. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER RECOMMENDED INSTALLATION GUIDELINES.
- E. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
- F. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS WITH TYPE THHN/THWN, 90 DEGREE INSULATION UNLESS OTHERWISE NOTED. MINIMUM WIRE SIZE SHALL BE #12 AWG FOR POWER CIRCUITS. CONDUCTORS SHALL BE SOLID WIRE FOR #12 AWG AND STRANDED FOR #10 AWG OR LARGER. ALL WIRING SHALL BE RUN IN CONDUIT INCLUDING LOW VOLTAGE CONTROL WIRING. SIGNAL WIRING MAY BE RUN IN PVC CONDUIT OR PVC FLEXIBLE TUBING.
- G. GENERALLY, CONDUIT SHALL BE EMT, 3/4" MINIMUM. IN AREAS SUBJECT TO DAMAGE CONDUIT SHALL BE RIGID OR IMC TYPE. ALL CONDUIT SHALL BE CONCEALED UNLESS NOTED OTHERWISE.
- H. SUPPORT ALL CONDUIT INDEPENDENTLY FROM THE BUILDING STRUCTURE. DO NOT SUPPORT FROM VENTILATION DUCTS, MECHANICAL PIPING, SUSPENDED CEILING GRIDS, OR THEIR HANGERS. USE NEC ACCEPTABLE METHODS OF SUPPORT.
- I. INSTALL EXTERIOR WIRING AND DEVICES IN CONDUIT WITH WEATHERPROOF FITTINGS AND IN WEATHERPROOF BOXES. ALL DEVICES AND EQUIPMENT SHALL BE RATED FOR EXTERIOR USE.
- J. MAINTAIN A MINIMUM OF 24 INCH SEPARATION BETWEEN POWER CONDUITS AND SIGNAL CONDUITS AS PRACTICAL. ROUTE CONDUITS TO NOT CROSS EACH OTHER. EXPOSED CONDUIT AND DEVICE BOXES IN ALL AREAS FOR COMMUNICATION AND POWER.

### KEYED NOTES:

- 1. MOUNT TOGGLE SWITCH WITH MAXIMUM HEIGHT OF 48-INCHES TO TOP.

NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS

APR - 2023

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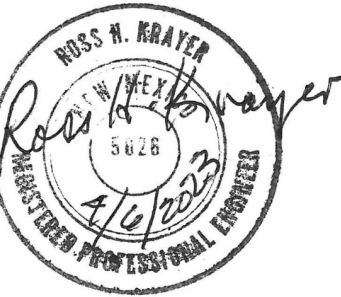
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**LIGHTING PLAN**

SHEET NUMBER

**E-102**

Sequence of



D

C

D

## NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
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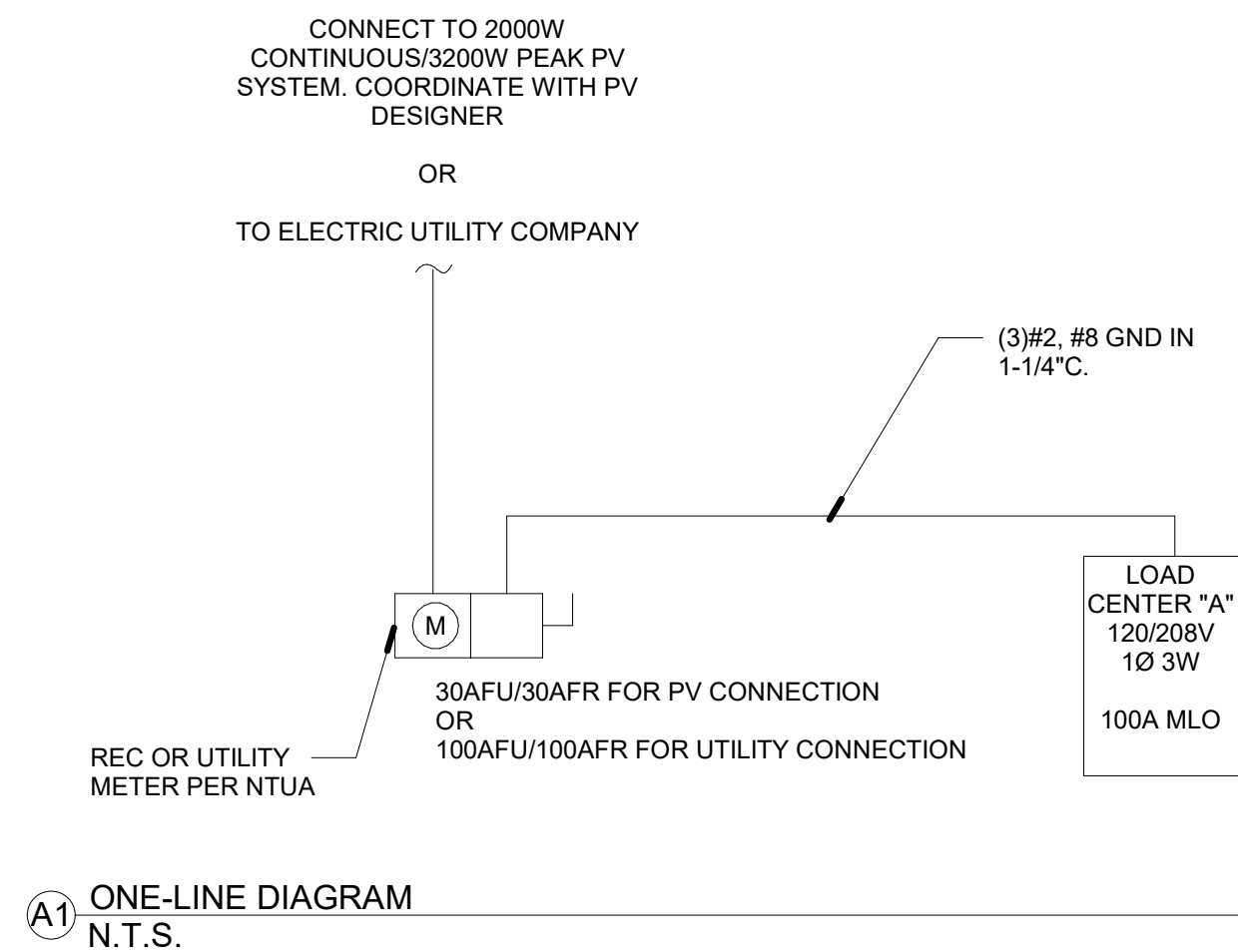
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## ELECTRICAL SCHEDULE

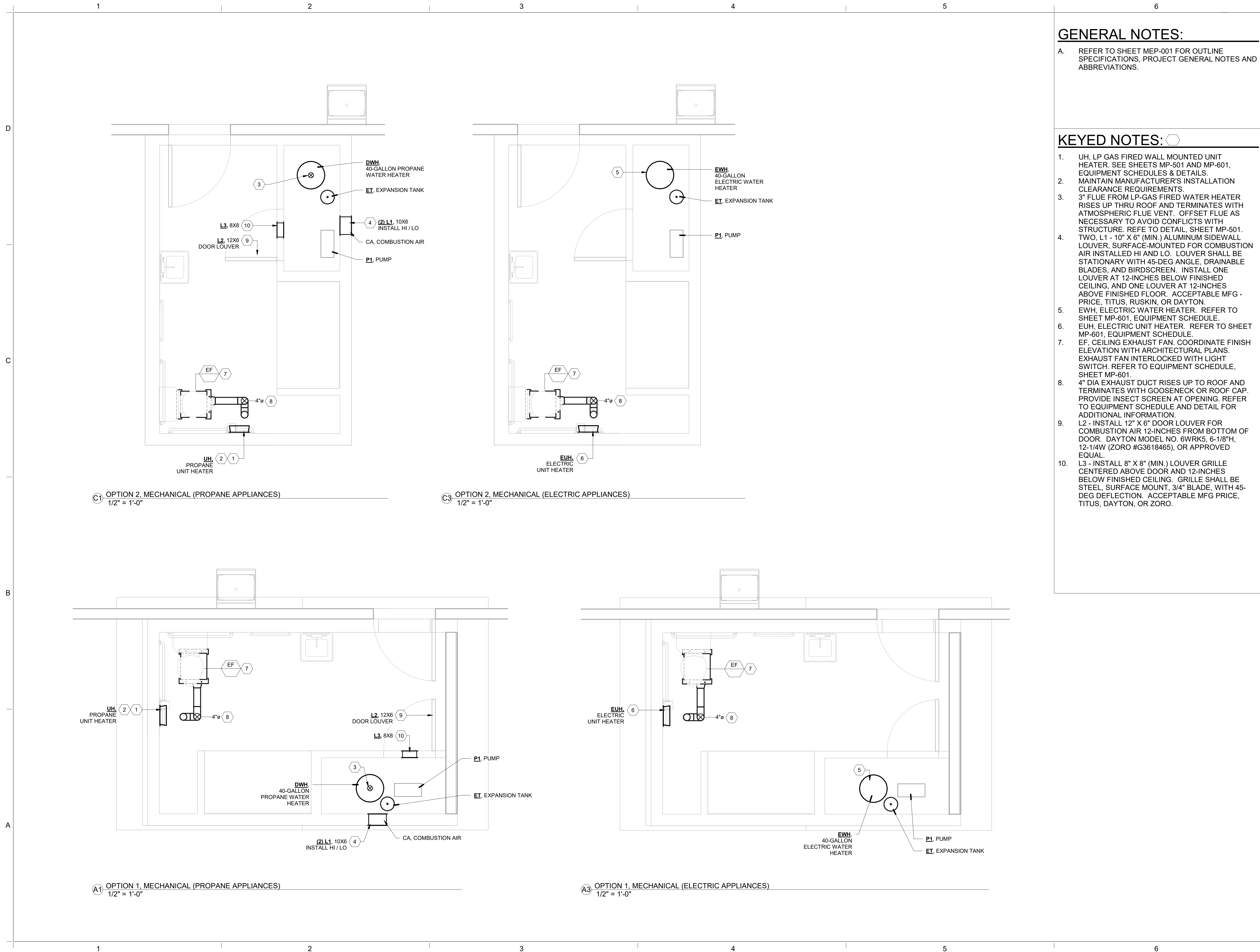
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E-601

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GENERAL NOTES:

- A. REFER TO SHEET MEP-001 FOR OUTLINE SPECIFICATIONS, PROJECT GENERAL NOTES AND ABBREVIATIONS.

KEYED NOTES:

1. UH, LP GAS FIRED WALL MOUNTED UNIT HEATER. SEE SHEETS MP-501 AND MP-601, EQUIPMENT SCHEDULES & DETAILS. MAINTAIN MANUFACTURER'S INSTALLATION CLEARANCE REQUIREMENTS.
2. 3" FLUE FROM LP-GAS FIRED WATER HEATER RISES UP THRU ROOF AND TERMINATES WITH ATMOSPHERIC FLUE VENT. OFFSET FLUE AS NECESSARY TO AVOID CONFLICTS WITH STRUCTURE. REFE TO DETAIL, SHEET MP-501.
3. TWO, L1 - 10" X 6" (MIN.) ALUMINUM SIDEWALL LOUVER, SURFACE-MOUNTED FOR COMBUSTION AIR INSTALLED HI AND LO. LOUVER SHALL BE STATIONARY WITH 45-DEG ANGLE, DRAINABLE BLADES, AND BIRDSCREEN. INSTALL ONE LOUVER AT 12-INCHES BELOW FINISHED CEILING, AND ONE LOUVER AT 12-INCHES ABOVE FINISHED FLOOR. ACCEPTABLE MFG - PRICE, TITUS, RUSKIN, OR DAYTON.
4. EWH, ELECTRIC WATER HEATER. REFER TO SHEET MP-601, EQUIPMENT SCHEDULE.
5. EUH, ELECTRIC UNIT HEATER. REFER TO SHEET MP-601, EQUIPMENT SCHEDULE.
6. EF, CEILING EXHAUST FAN, COORDINATE FINISH ELEVATION WITH ARCHITECTURAL PLANS. EXHAUST FAN INTERLOCKED WITH LIGHT SWITCH. REFER TO EQUIPMENT SCHEDULE, SHEET MP-601.
7. 4" DIA EXHAUST DUCT RISES UP TO ROOF AND TERMINATES WITH GOOSENECK OR ROOF CAP. PROVIDE INSECT SCREEN AT OPENING. REFER TO EQUIPMENT SCHEDULE AND DETAIL FOR ADDITIONAL INFORMATION.
8. L2 - INSTALL 12" X 6" DOOR LOUVER FOR COMBUSTION AIR 12-INCHES FROM BOTTOM OF DOOR. DAYTON MODEL NO. 6WRK5, 6-1/8"H, 12-1/4"W (ZORO #G3618465), OR APPROVED EQUAL.
9. L3 - INSTALL 8" X 8" (MIN.) LOUVER GRILLE CENTERED ABOVE DOOR AND 12-INCHES BELOW FINISHED CEILING. GRILLE SHALL BE STEEL, SURFACE MOUNT, 3/4" BLADE, WITH 45-DEG DEFLECTION. ACCEPTABLE MFG PRICE, TITUS, DAYTON, OR ZORO.

NAVAJO NATION BATHROOM ADDITIONS

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CONSTRUCTION DOCUMENTS

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SHEET TITLE  
**MECHANICAL  
PLAN**

SHEET NUMBER

**M-101**

Sequence of





- A. REFER TO SHEET MEP-001 FOR OUTLINE SPECIFICATIONS, PROJECT GENERAL NOTES AND ABBREVIATIONS.
- B. ALL WATER SUPPLY PIPING SHALL BE PEX TUBING.
- C. PROVIDE ALL PEX LINE FROM FLOOR UP WITH 1/2" JACKETED INSULATION.
- D. PROVIDE WATER SUPPLY LINE RUNNING FROM BOTTOM OF FLOOR TO GROUND WITH 1" JACKETED INSULATION.
- E. INSTALL ALL FITTINGS IN WALL TO A MINIMUM.

1. WATER SUPPLY PIPING AT -42" BELOW GRADE. COORDINATE INSTALLATION WITH NTUA AND NECA SUPERINTENDENT. PLUMBING CONTRACTOR SHALL FOLLOW NTUA UTILITY INSTALLATION REQUIREMENTS.
2. SELF-PRIMING CISTERN PUMP. SECURE PUMP TO FINISH FLOOR AS RECOMMENDED BY MFG. INSTALL WITH RUBBER PAD TO DAMPEN VIBRATION. REFER TO MANUFACTURER'S INSTALLATION MANUAL.
3. 3/4" WATER RISES UP THRU SLAB OR GRADE IN MECHANICAL CLOSET TO SHUT-OFF VALVE, CHECK-VALVE, PRE-FILTER THEN TO PUMP INLET. THIS ASSEMBLY SHOWN ON SCHEMATIC FOR CLARITY PURPOSES. REFER TO SCHEMATIC, THIS SHEET.
4. 3/4" CW FROM PUMP DISCHARGE WITH SHUT-OFF VALVE AT RISE. 3/4" CW CONTINUES UP AND ROUTES TO WATER HEATER. REFER TO SCHEMATIC FOR CLARIFICATION.
5. WATER SUPPLY TEES OFF TO PLUMBING WALL, RISES AND ROUTES IN CEILING SPACE. ROUTING IS DIAGRAMMATICAL. COORDINATE WITH STRUCTURE. REFER TO SCHEMATIC FOR CLARIFICATION.
6. CW AND HW SUPPLY DROPS AND EXTENDS TO PLUMBING FIXTURE(S).
7. PROVIDE 1/2" CW AND 1/2" HW TO SHWR, ADA SHOWER.
8. PROVIDE 1/2" CW AND 1/2" HW TO KS, KITCHEN SINK.
9. PROVIDE 1/2" CW AND 1/2" HW TO LAV.
10. PROVIDE 1/2" CW TO WC, WATER CLOSET.
11. 1/2" LP GAS PIPING RISES UP BELOW SLAB OR GRADE. COORDINATE ROUTING TO AVOID PENETRATING THRU STRUCTURAL STEM WALL.
12. ROUTE 1/2" LP GAS TO WATER HEATER. PROVIDE SHUT-OFF VALVE, TYPICAL. REFER TO SHEET MP501 FOR DETAILS.
13. ROUTE 1/2" LP GAS TO UH, UNIT HEATER. REFER TO MANUFACTURER'S INSTALLATION MANUAL AND RECOMMENDED CLEARANCES FROM COMBUSTIBLES. SEE SHEET MP-601, EQUIPMENT SCHEDULE. COORDINATE INSTALLATION WITH HVAC CONTRACTOR.
14. REFER TO SHEET MP501 FOR WASTE AND VENT PIPE SIZE CONNECTIONS. PROVIDE WCO, WALL CLEANOUT TYPICAL.
15. TIE INTO MAIN WASTE PIPING FROM WC, WATER CLOSET.
16. 2" VTR, VENT THRU ROOF. OFFSET AS NECESSARY TO AVOID CONFLICT WITH STRUCTURE. EXTEND 24" MINIMUM FROM END OF EAVE.
17. ROUTE 3" WASTE PIPING (NTUA STD.) TO SEPTIC TANK. FIELD VERIFY INVERT ELEVATION OF EXISTING SEPTIC TANK OR LEECH FIELD FOR POSITIVE FLOW.
18. 1/2" GAS FLEX SUPPLY LINE RISES UP AND TEES TO PROPANE TANKS. PROVIDE AND CONNECT SHUT-OFF VALVES AT TEE. SUPPORT GAS PIPE RISER WITH T-POST AND SECURE WITH U-CHANNEL AND NUTS/WASHER/BOLTS.
19. 40-GALLON PROPANE TANK PROVIDED BY PLUMBING CONTRACTOR. PROVIDE CHAIN, STAINLESS STEEL SPRING LINK 'CARIBINER' AND T-POST. WRAP CHAIN AROUND PROPANE TANK AND SECURE TANK TO T-POST. TYPICAL FOR EACH TANK.
20. ET, 2-GALLON EXPANSION TANK, EVERBILT MODEL EF-TET-4T. SECURE AND SUPPORT EXPANSION TANK WITH STRAPPING.
21. SEE OPTIONAL 'SS' - SANITARY SEWER ROUTING.

DWH = GAS-FIRED / PROPANE WATER HEATER  
EWH = ELECTRIC WATER HEATER

## NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS

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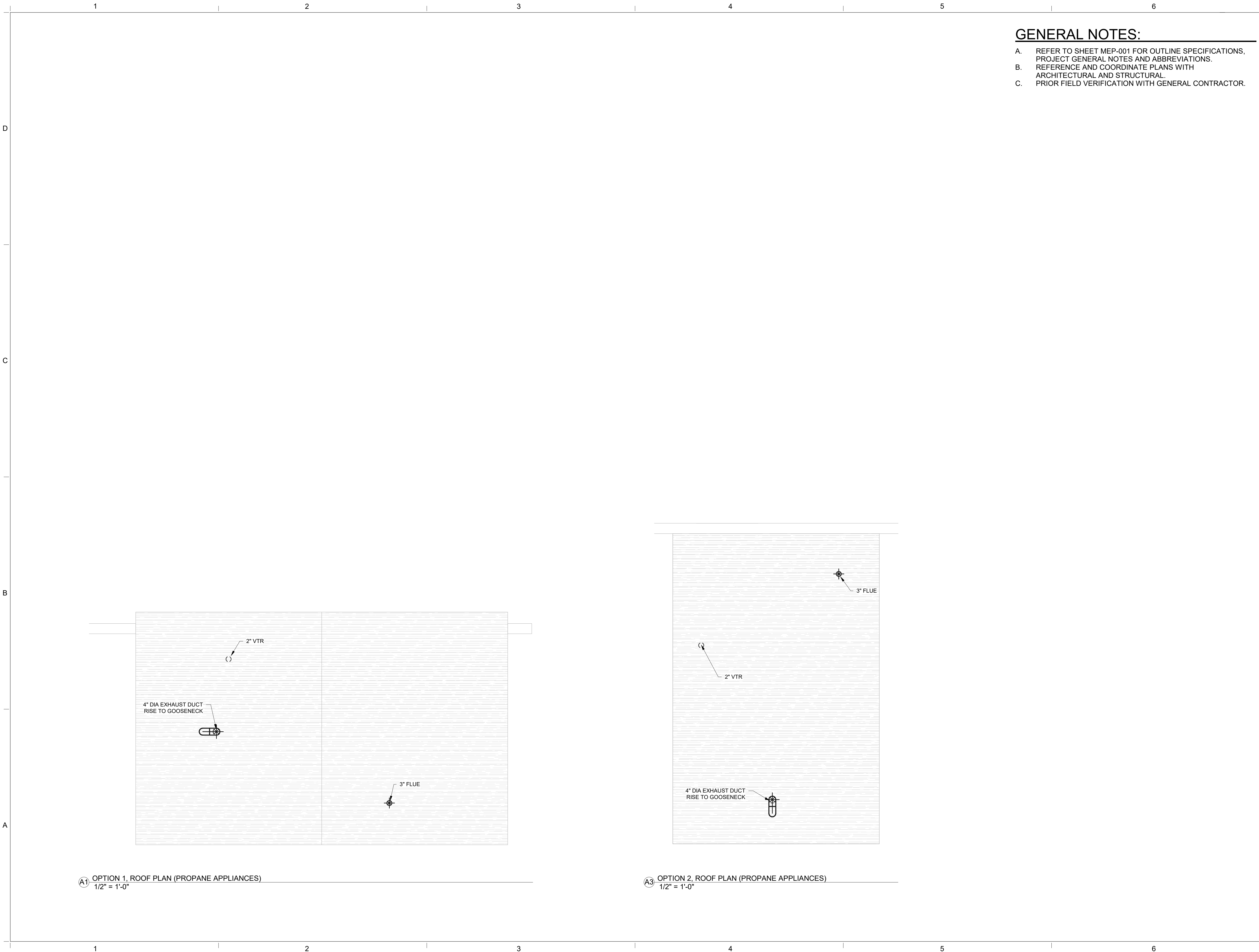
**PLUMBING PLAN**

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P-101

Sequence of

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GENERAL NOTES:

- A. REFER TO SHEET MEP-001 FOR OUTLINE SPECIFICATIONS, PROJECT GENERAL NOTES AND ABBREVIATIONS.
- B. REFERENCE AND COORDINATE PLANS WITH ARCHITECTURAL AND STRUCTURAL.
- C. PRIOR FIELD VERIFICATION WITH GENERAL CONTRACTOR.

NAVAJO NATION BATHROOM ADDITIONS

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PLAN

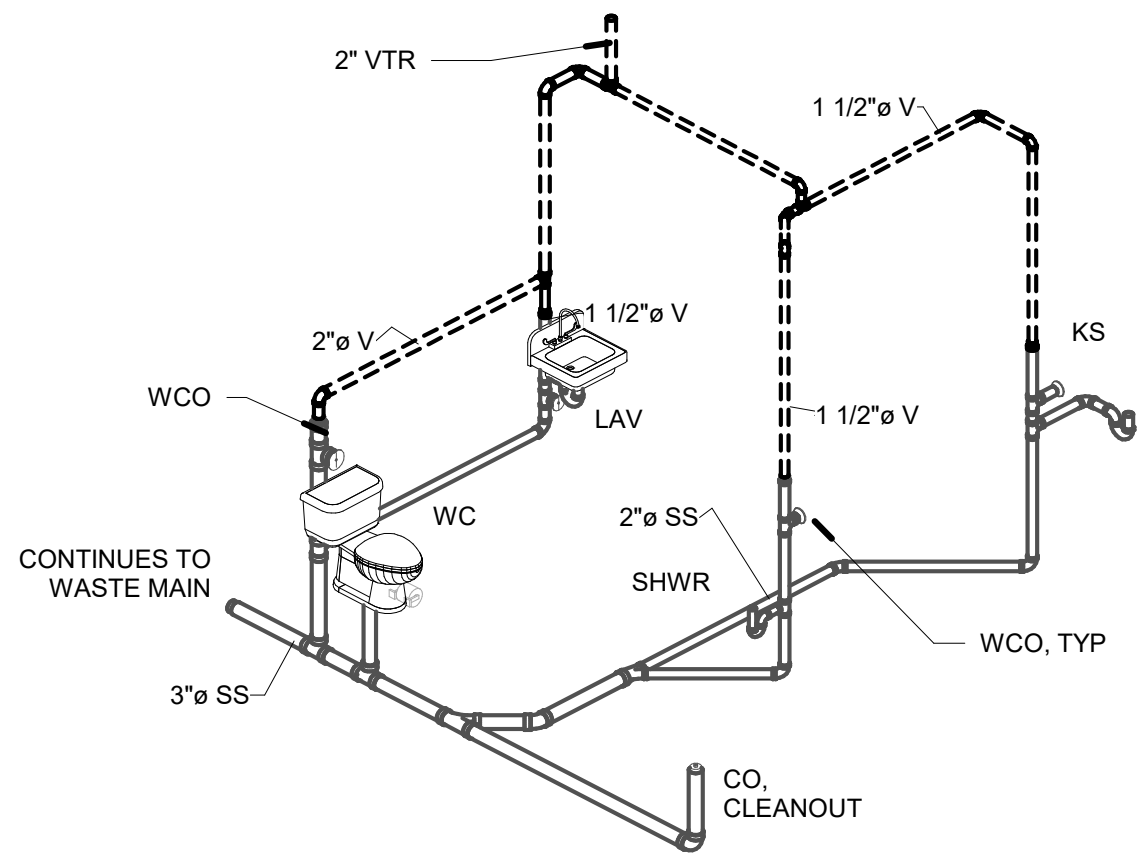
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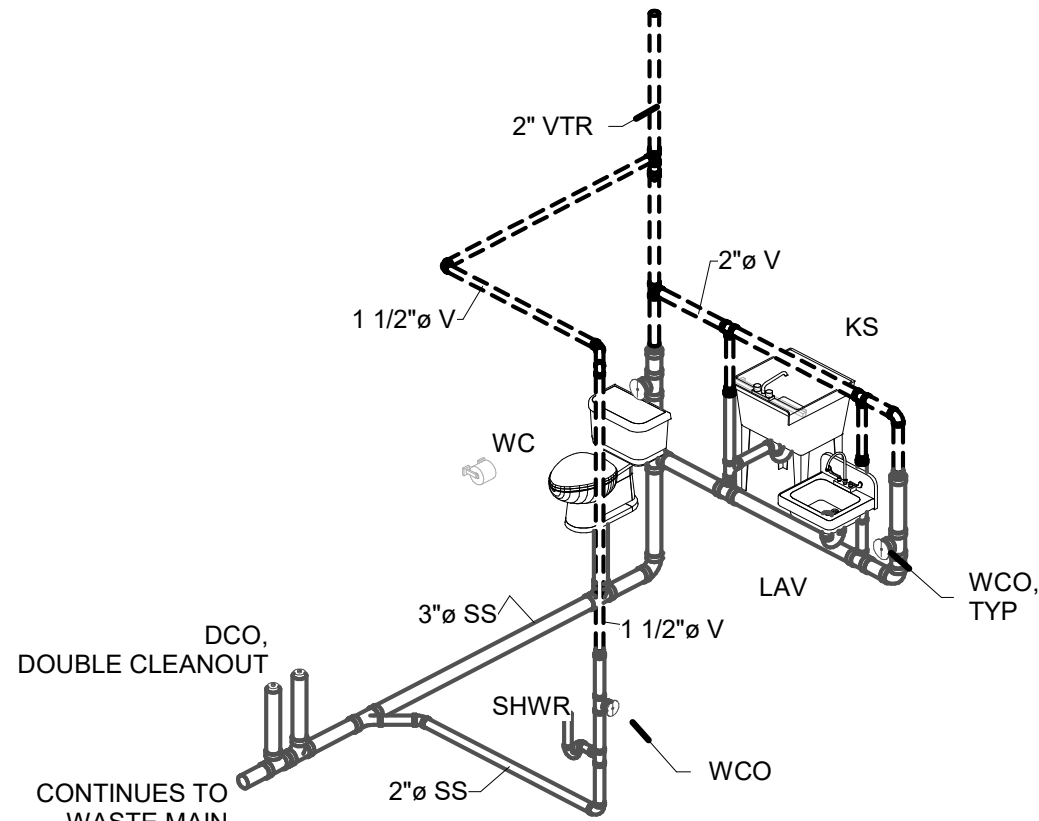
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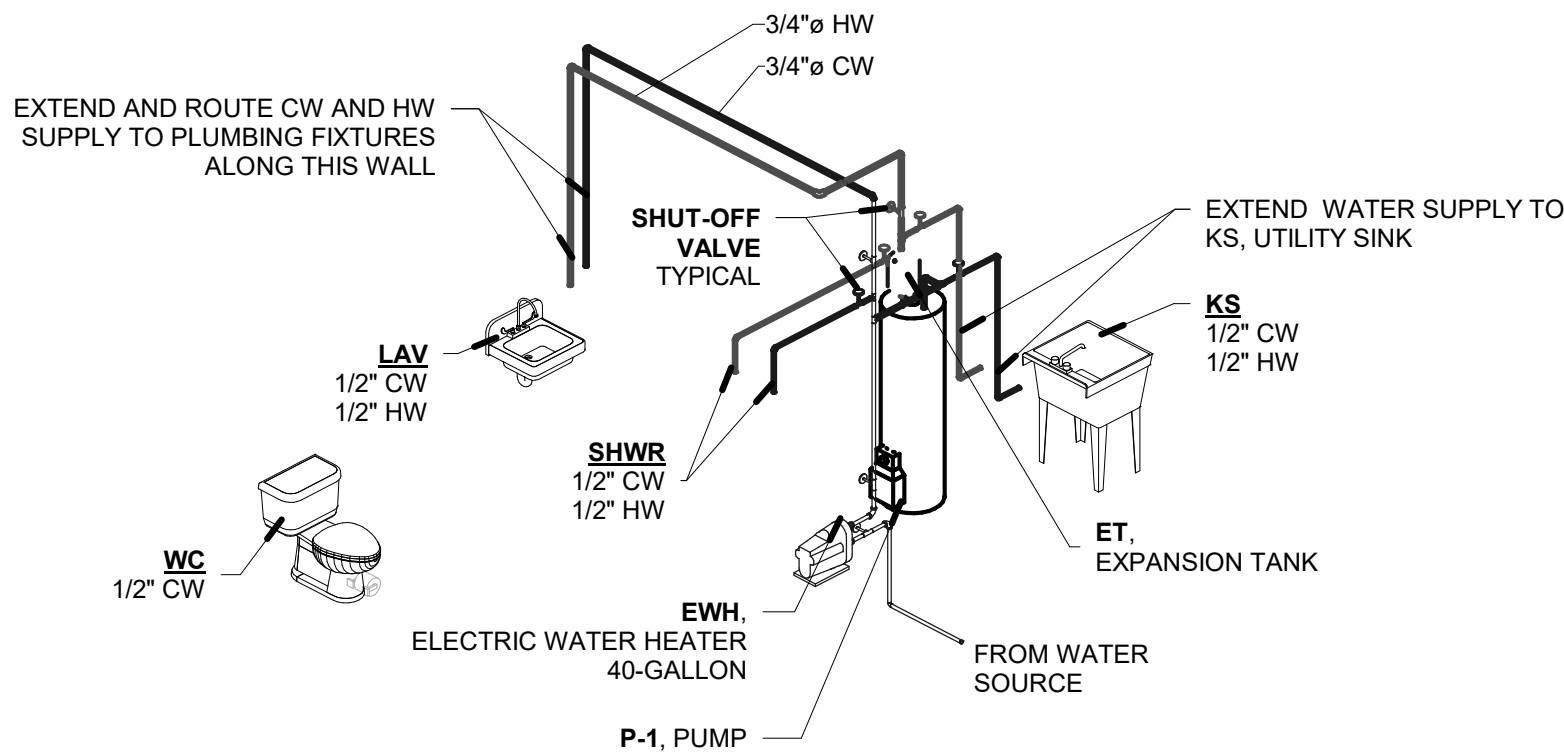
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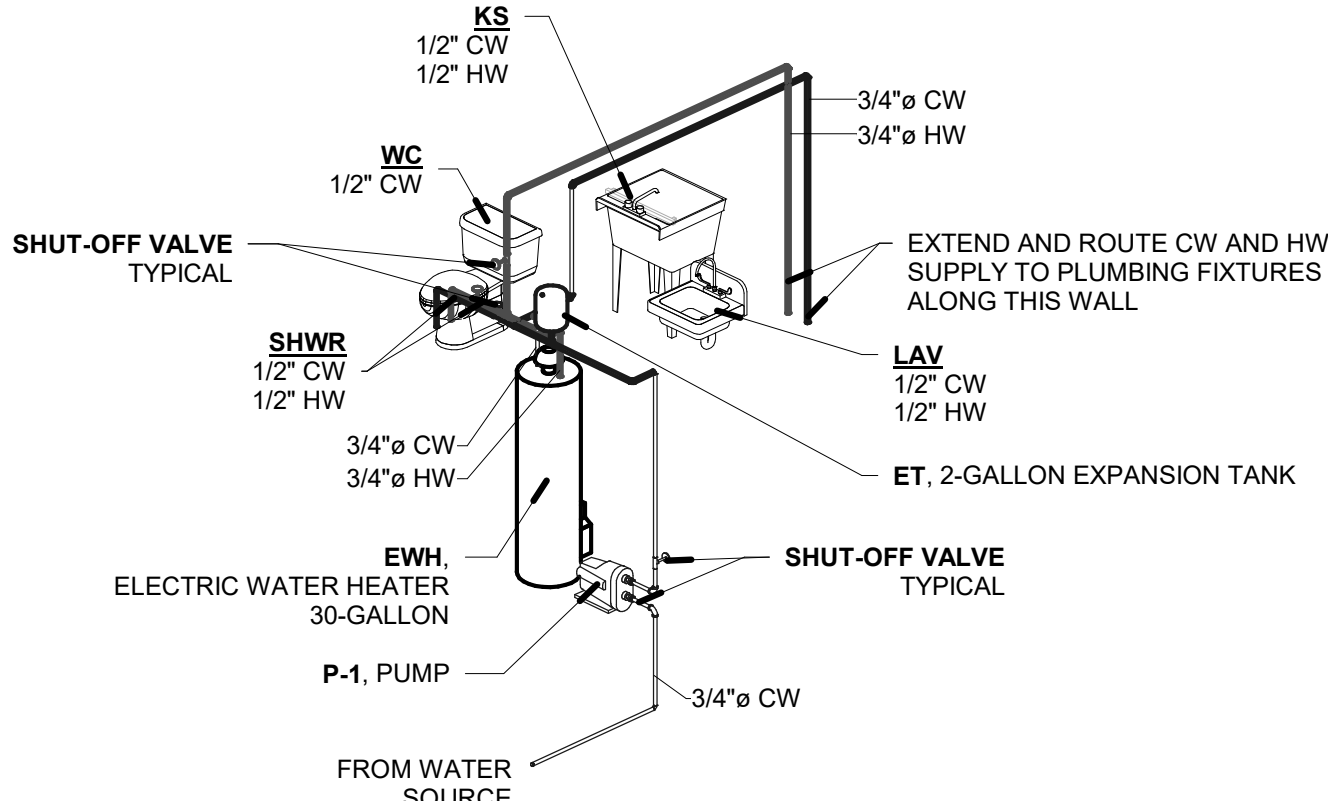
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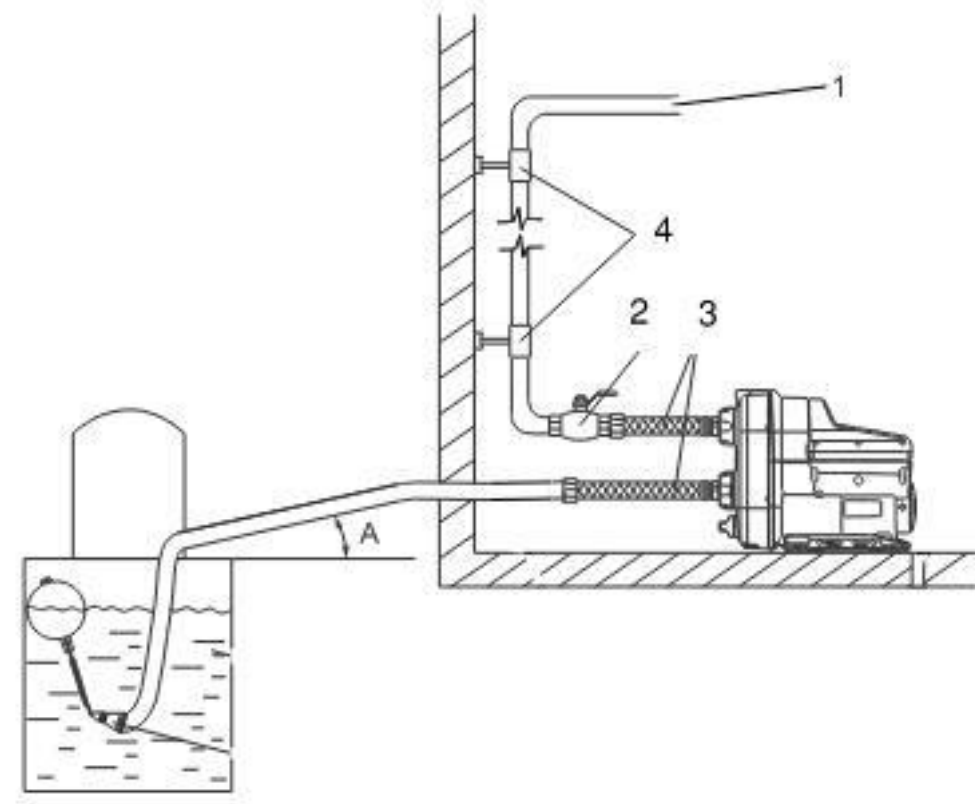
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5 OPTION 2, PLUMBING WATER (ELECTRIC)



2 OPTION 1, PLUMBING WATER (ELECTRIC)

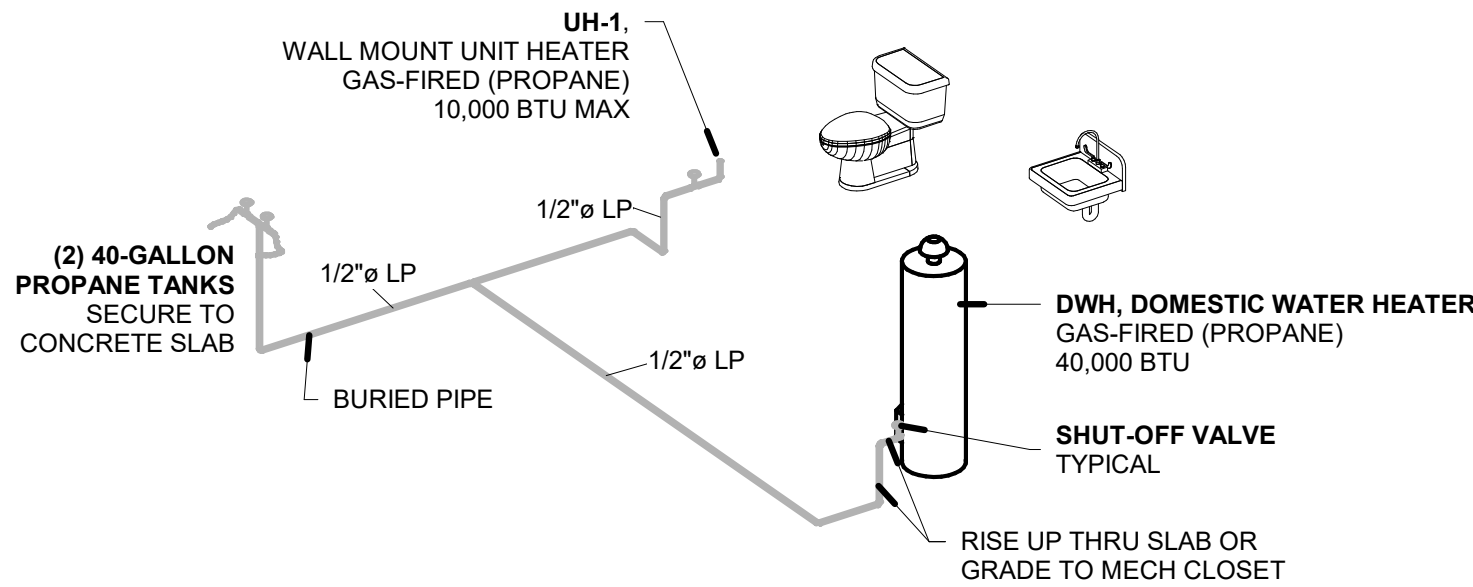


Pos. Description

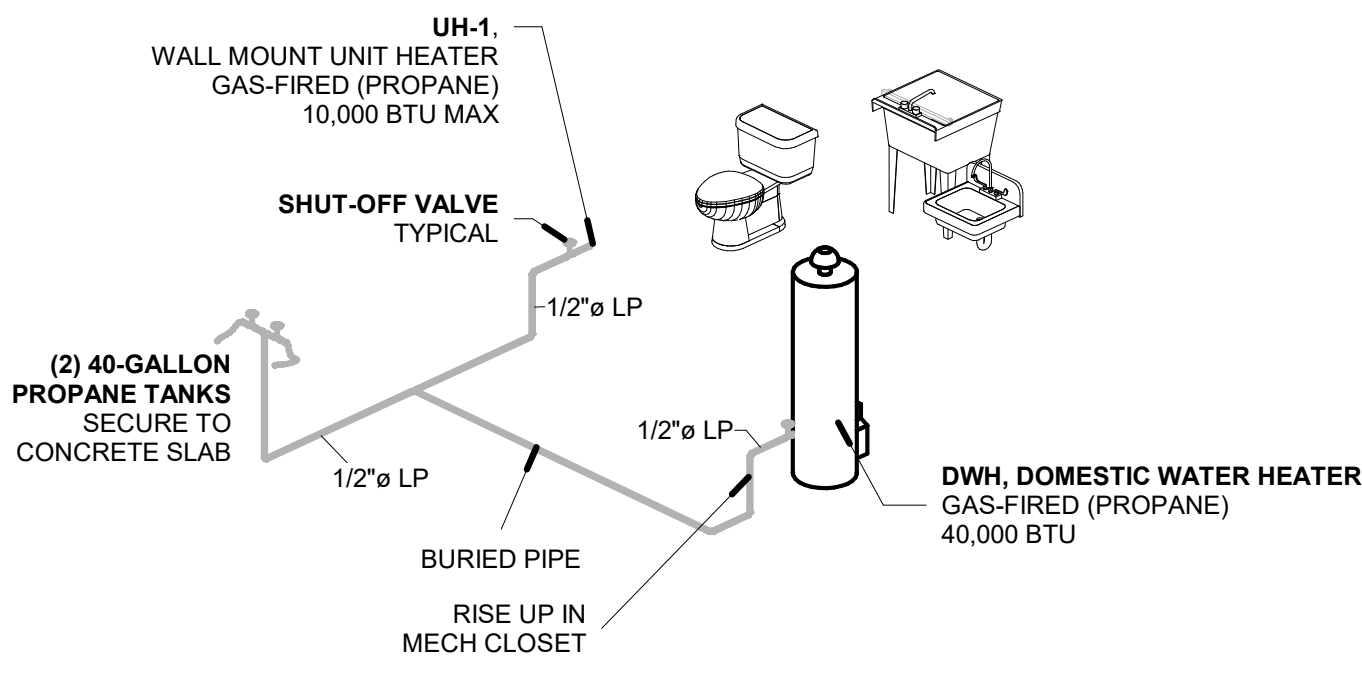
- 1 TO WATER HEATER  
2 ISOLATING VALVE  
3 FLEXIBLE HOSES  
4 PIPE SUPPORT  
H1 MAXIMUM SUCTION LIFT IS 26-FEET

ADDITIONAL NOTE: PROVIDE ET, EXPANSION TANK AT OUTLET OF PUMP.  
REFER TO PLUMBING FIXTURE SCHEDULE FOR EXPANSION TANK.

9 CISTERN PUMP - SUCTION FROM FRESH WATER  
1/8" = 1'-0"



6 OPTION 2, PLUMBING PROPANE



3 OPTION 1, PLUMBING PROPANE

## NAVAJO NATION BATHROOM ADDITIONS

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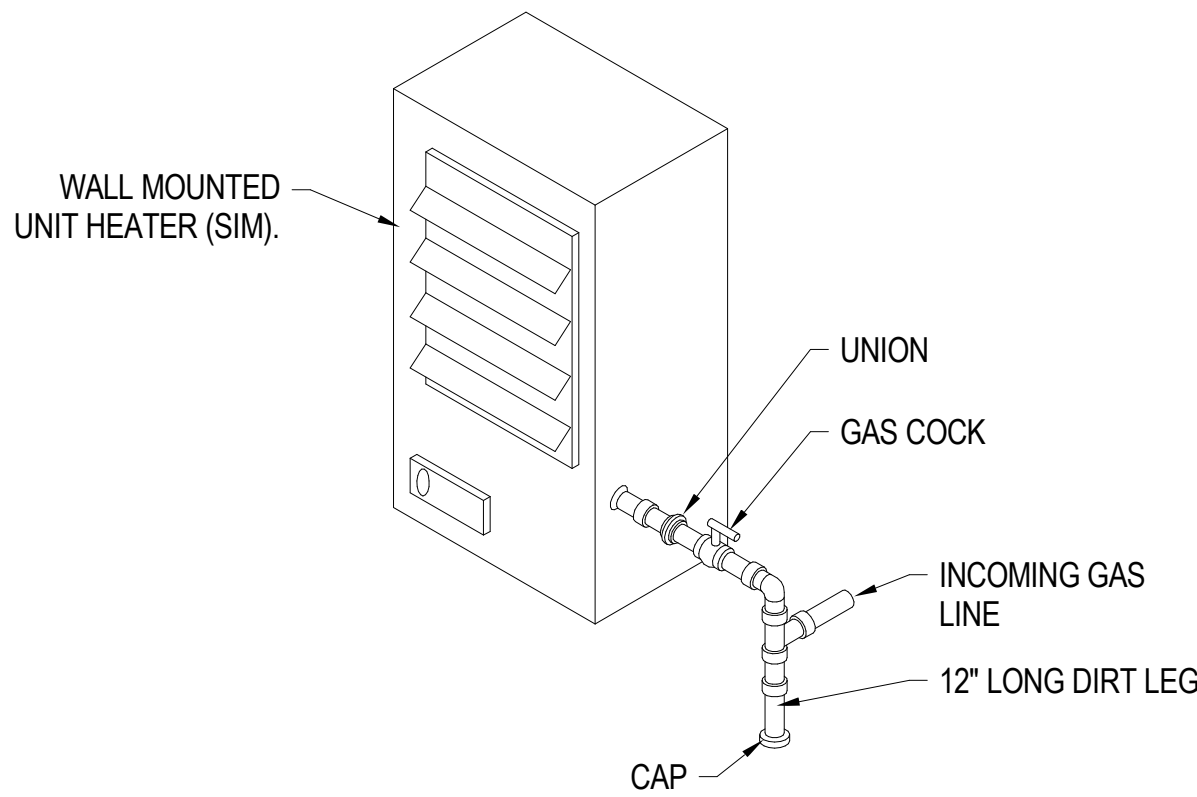
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#### SHEET TITLE ISOMETRIC VIEW & CISTERN PUMP

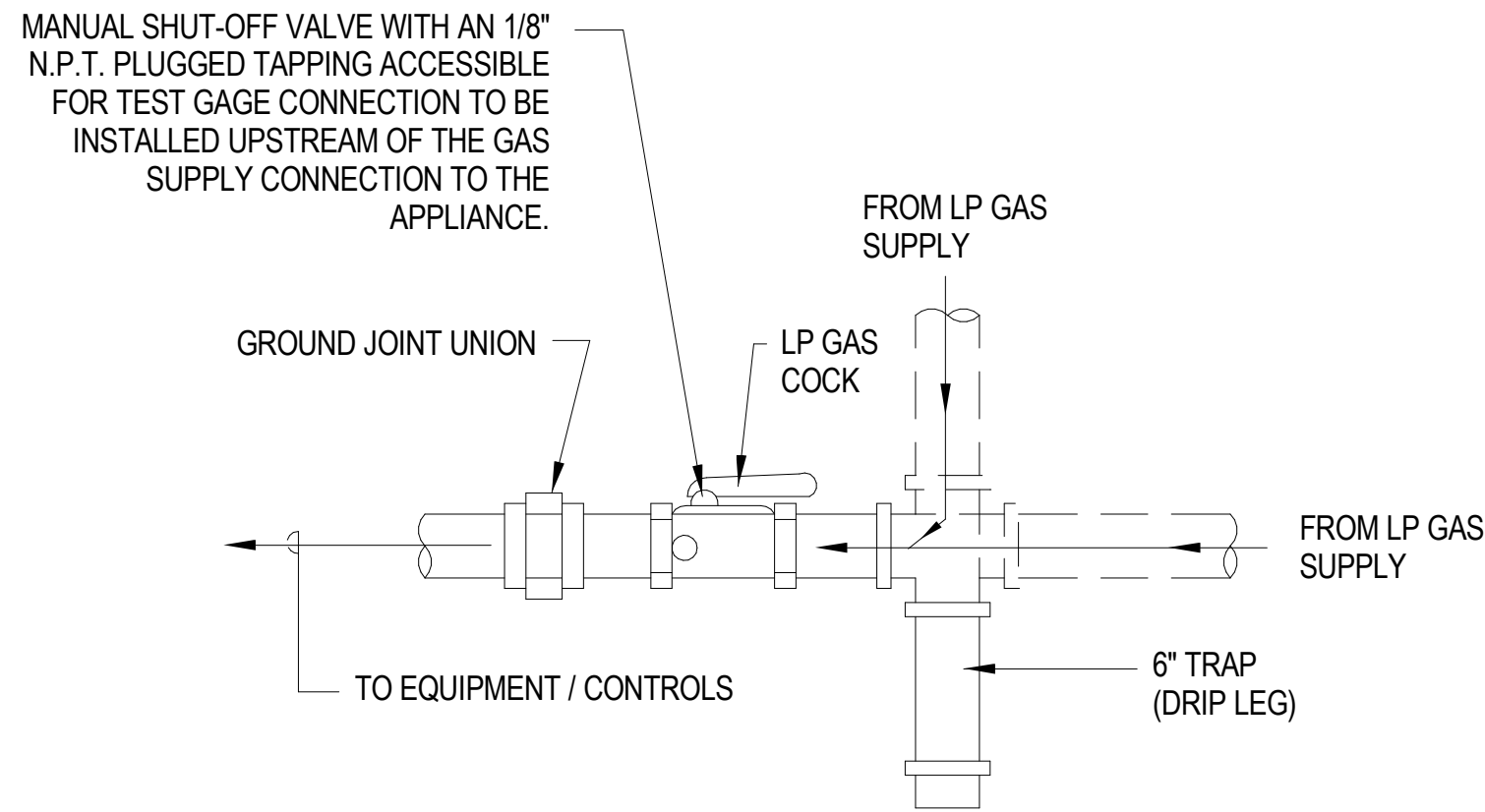
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P-701

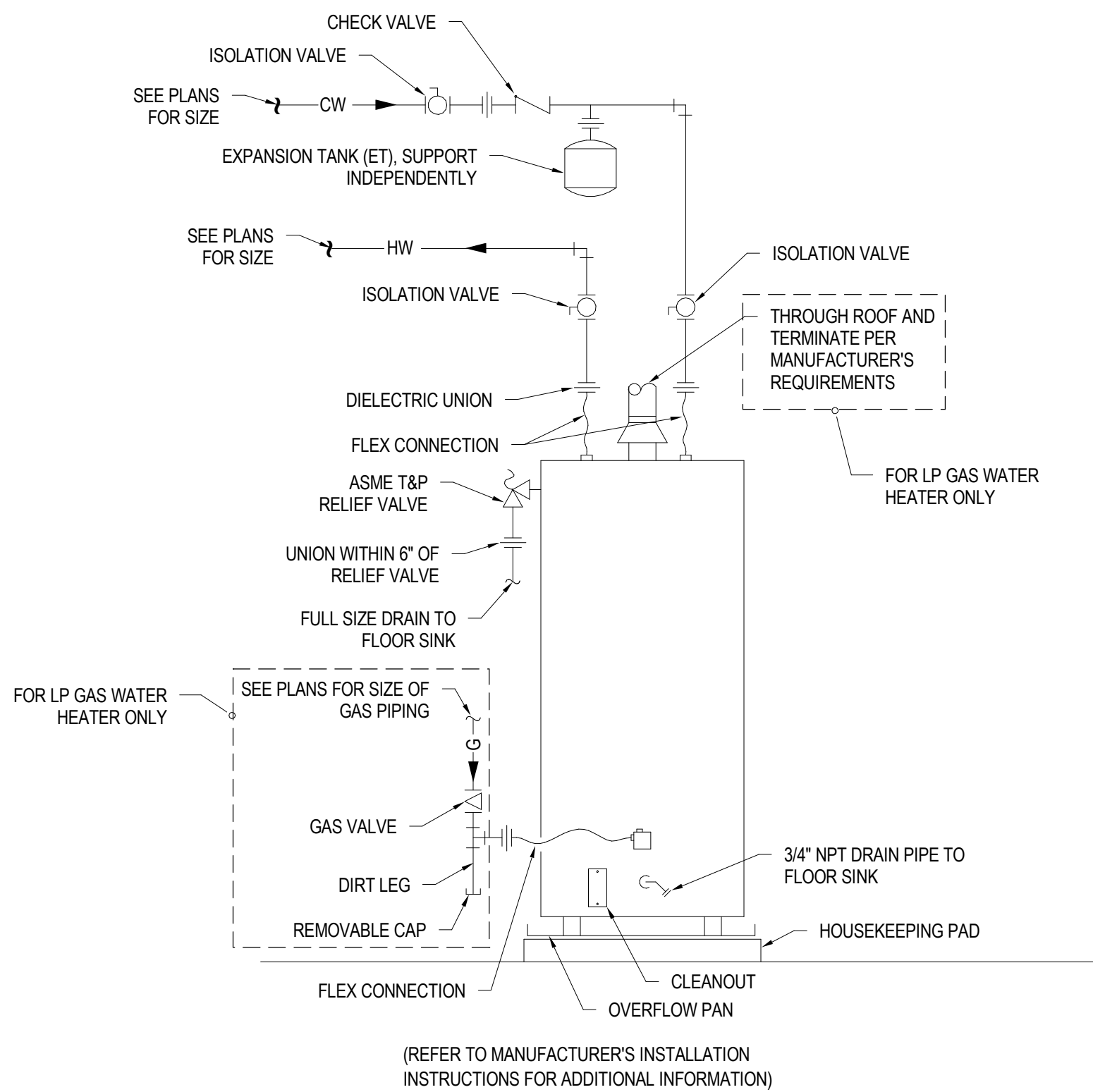
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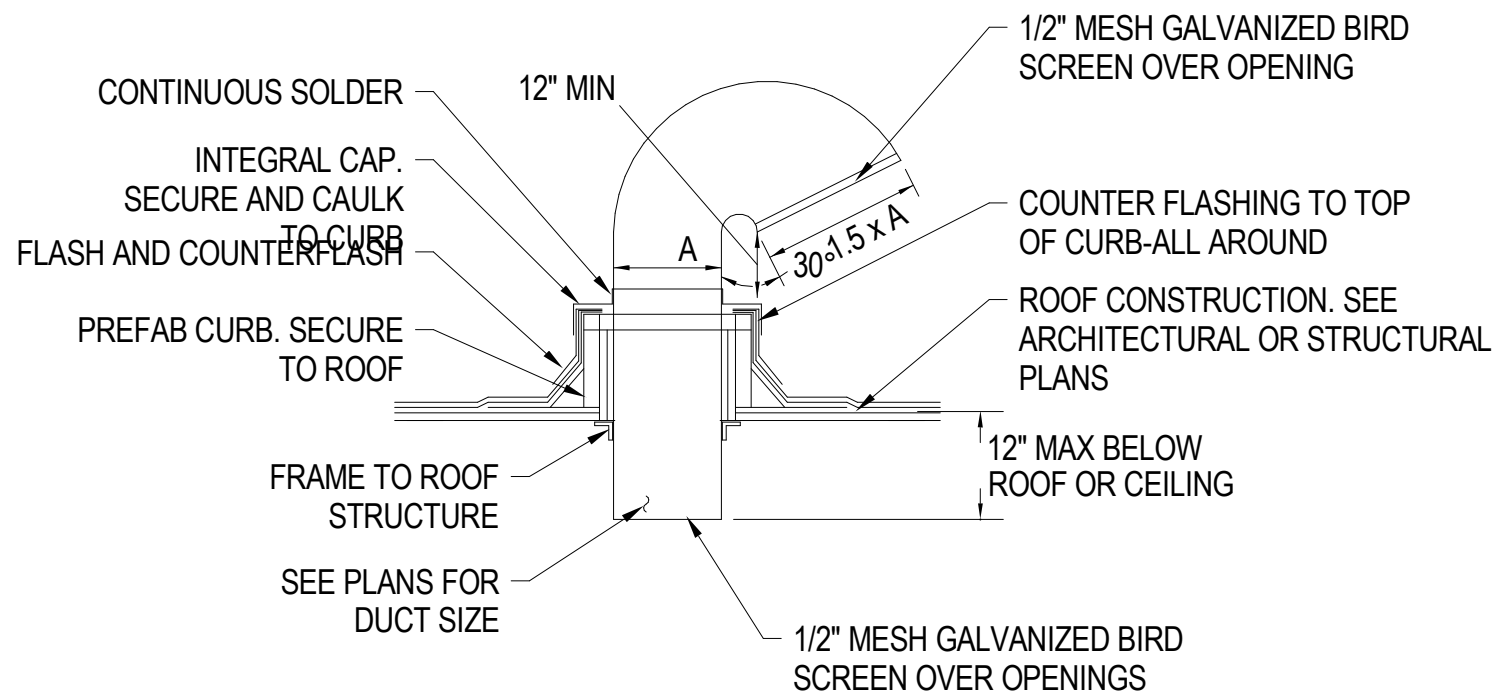
3 LP GAS FIRED UNIT HEATER DETAIL (SIMILAR)  
NO SCALE



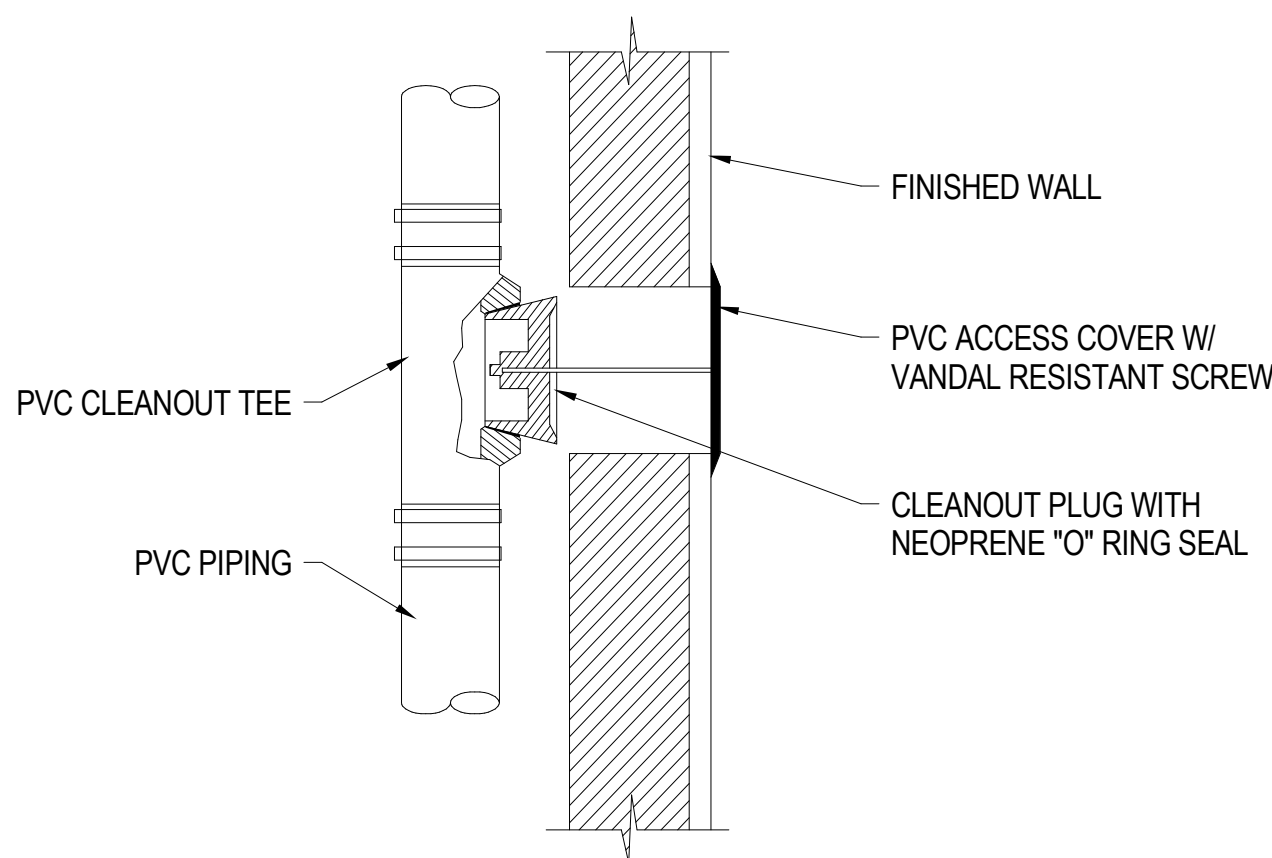
2 GAS CONNECTION TO EQUIPMENT DETAIL  
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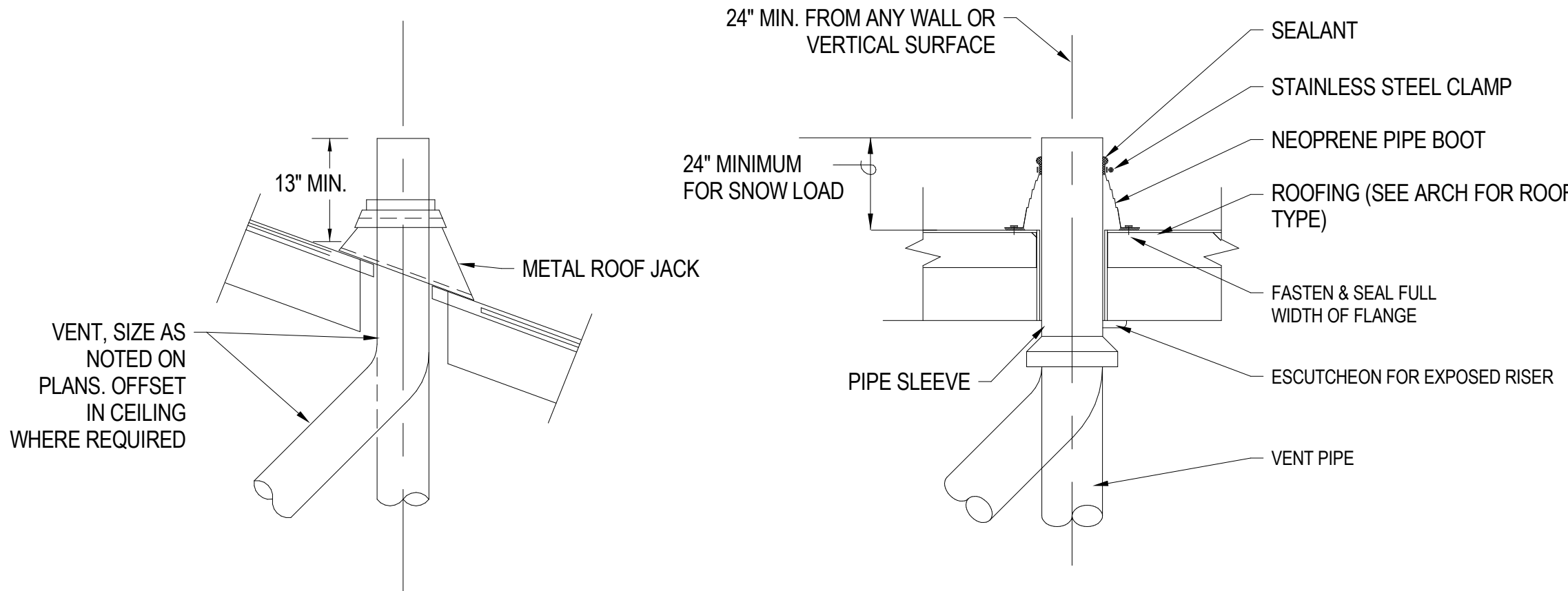
1 WATER HEATER PIPING DIAGRAM (LP GAS)  
NO SCALE



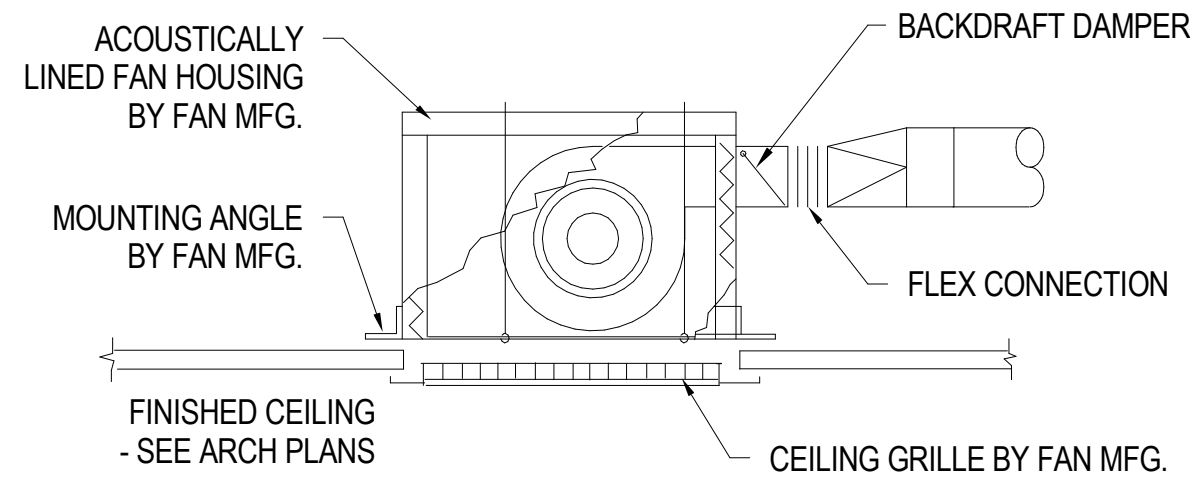
4 GOOSENECK DETAIL  
NO SCALE



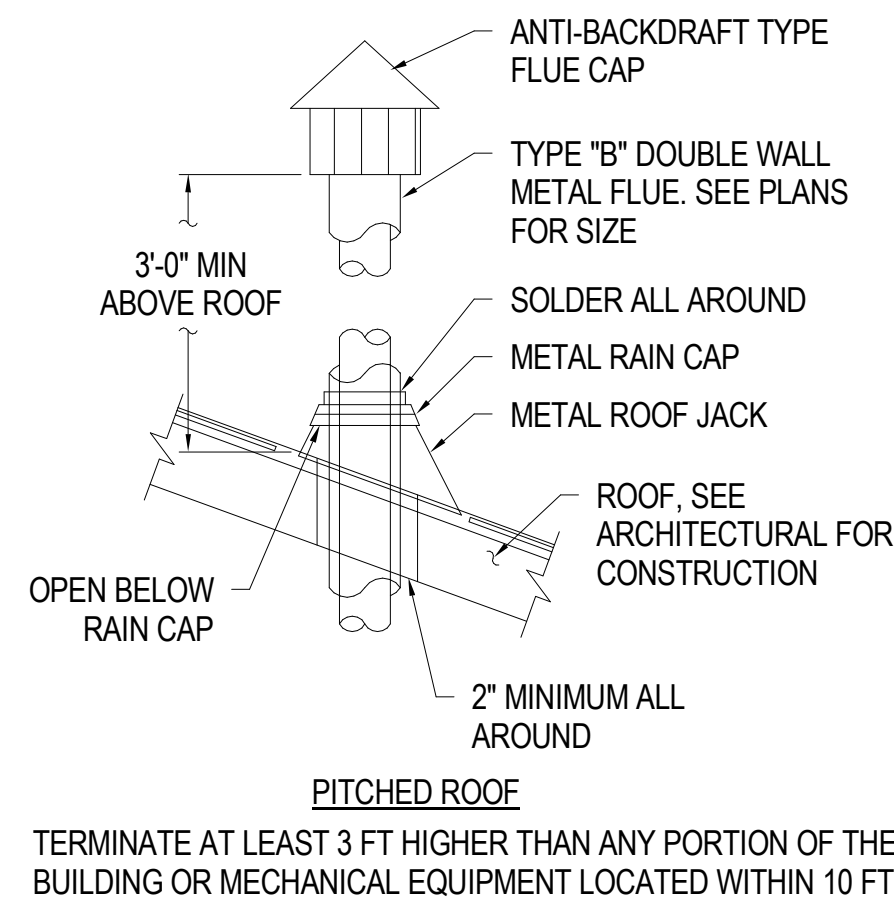
5 CLEANOUT THRU WALL DETAIL  
NO SCALE



6 VTR, VENT THROUGH ROOF DETAIL  
NO SCALE



7 CEILING FAN DETAIL  
NO SCALE



8 ATMOSPHERIC FLUE VENT  
NO SCALE

NAVAJO NATION BATHROOM ADDITIONS

NAVAJO NATION  
CONSTRUCTION DOCUMENTS

APR - 2023

OWNER:  
NAVAJO ENG & CONSTRUCTION AUTHORITY

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DOMESTIC WATER HEATER SCHEDULE (LP GAS)									
SYMBOL	MANUFACTURER AND MODEL	TYPE	SERVICE	OUTLET TEMP (°F)	TANK VOLUME (GALLON)	BTU INPUT (MBH)	RECOVERY @ 90°F	RECOVERY EFFICIENCY	APPROX. WEIGHT (LBS.)
DWH	RHEEM 40-GALLON MODEL NO. XP40T06HE36U0 ( A.O. SMITH - OR EQUAL )	LP GAS	DOMESTIC HOT WATER	110	40	36	42	0.65	125
NOTES: 1. CONTRACTOR SHALL PROVIDE A COMPLETE OPERATING SYSTEM. PROVIDE WATER HEATER WITH INSULATION BLANKET. 2. WATER HEATER WITH PUSH BUTTON IGNITION SYSTEM. 6-YR WARRANTY. DIMENSIONS: 16.5" DIAMETER AT 60" TALL. 3. LP GAS-FIRED WATER HEATER LISTED OR EQUAL. ENSURE CAPACITY SPECIFICATIONS ARE MET.									

DOMESTIC WATER HEATER SCHEDULE (ELECTRIC)									
SYMBOL	MANUFACTURER AND MODEL	TYPE	SERVICE	ELECTRIC			RECOVERY @ 90°F	RECOVERY EFFICIENCY	APPROX. WEIGHT (LBS.)
EWH	RHEEM PERFORMANCE MODEL NO. XE40M09EL45UI ( OR EQUAL )	ELECTRIC	DOMESTIC HOT WATER	DUAL 4500-WATT	240V	1φ	21	0.93	106
NOTES: 1. CONTRACTOR SHALL PROVIDE A COMPLETE OPERATING SYSTEM. PROVIDE WATER HEATER WITH INSULATION BLANKET. 2. WATER HEATER WITH 6-YR WARRANTY. DIMENSIONS: 19.25" DIAMETER AT 51" TALL. 3. ELECTRIC WATER HEATER LISTED OR EQUAL. ENSURE CAPACITY AND ELECTRICAL SPECIFICATIONS ARE MET.									

UNIT WALL HEATER SCHEDULE (LP GAS)						
SYMBOL	MANUFACTURER AND MODEL	TYPE	MAXIMUM BTU	MANIFOLD PRESSURE	DIMENSIONS	NOTES
UH	DYNA-GLO MODEL NO. BFSS10LPT-4P	LP GAS	10,000	10" W.C.	20"H X 17"W X 9.5"D	1. CONTRACTOR SHALL PROVIDE A COMPLETE OPERATING SYSTEM. 2. MAINTAIN REQUIRED CLEARANCES FROM COMBUSTIBLES AND WINDOWS. 3. UNIT WALL HEATER WITH ELECTRONIC PUSH BUTTON IGNITION SYSTEM. 6-YR WARRANTY.

UNIT WALL HEATER SCHEDULE (ELECTRIC)						
SYMBOL	MANUFACTURER AND MODEL	ELECTRICAL			DIMENSIONS	REMARKS
EUH	BROAN MODEL NO. 9815WH WALL HEATER	120V / 1φ	1,500 W	13 AMPS	15"H X 12"W X 4"D	FAN-FORCED AIR WALL HEATER. MOTOR THERMALLY PROTECTED. ON/OFF SWITCH
NOTES: 1. CONTRACTOR SHALL PROVIDE A COMPLETE OPERATING SYSTEM.						

CEILING EXHAUST FAN SCHEDULE										
SYMBOL	SERVICE	MANUFACTURER AND MODEL	INTERLOCK WITH	CFM	ELECTRICAL			SONES	APPROX. WEIGHT (LBS.)	ACCESSORY
					VOLT / PH	AMPS	WATTS			
EF	BATHROOM EXHAUST	BROAN NU-TONE ROOMSIDE SERIES OR APPROVED EQUAL	LIGHT / SWITCH	80	120/1ϕ	0.3	26	0.8	9.2	ROOF CAP W/ BUILT-IN DAMPER
NOTE: 1. ENERGY STAR. 2. EXHAUST FAN INTERLOCKED WITH LIGHT SWITCH.										

CISTERN PUMP SCHEDULE														
MARK	MANUFACTURER AND MODEL	SERVING	FLOW RATE (GPM)	MAXIMUM HEAD (FEET)	MAXIMUM INLET PRESSURE	TYPE	ELECTRICAL				DIMENSIONS			WEIGHT (LBS)
							VOLT / PH	AMPS	WATTS	HP	L	W	H	
P-1	GRUNDFOS SCALA2 98562818	NON-POTABLE WATER	17	147	87 PSI	IEC TYPE B, NEMA 5-15P	115/1Ⓛ	5.7	560	1/3	15.9	7.6	11.9	10
ALTERNATE PRODUCT OPTION														
P-2 (OPTION 2)	TALLAS D-BOOST 650/40	NON-POTABLE WATER	11.8	121.4	53.7 PSI	IPX4 / NEMA-1	115/1Ⓛ	7.3	780	1/3	19.7	10.2	21.81	30.8
P-3 (OPTION 3)	EVERBILT SHALLOW WELL JET PUMP MODEL #J200A3	NON-POTABLE WATER	6	148	65 PSI	-	115/1Ⓛ	8	-	3/4	15.16	7.87	8.5	16.8
<u>NOTES:</u>  1. SELECTED PUMP SHALL BE SELF-PRIMING. 2. CONTRACTOR SHALL PROVIDE A COMPLETE OPERATING SYSTEM. SELECTED PUMP SHALL HAVE THERMAL MOTOR PROTECTION. 3. FURNISH CHECK VALVE OR FOOT VALVE, PRIMING TEE, NPT PLUG, COUPLINGS, THREADED ADAPTER, WELL SEAL, FLEXIBLE PVC COUPLING, AND INLET FILTER.														

PLUMBING FIXTURE SCHEDULE						
SYMBOL	DESCRIPTION	CONNECTIONS				REMARKS
		CW	HW	WASTE	VENT	
WC	AMERICAN STANDARD CADET OVATION, OR GLACIER BAY MODEL #N2428E - OR EQUAL -	1/2"	-	3"	2"	PORCELAIN ELONGATED 12" ROUGH-IN; PROVIDE COMPLETE TOILET, 1.28 GPF, ADA COMPLIANT. 16" FROM FLOOR TO RIM. OVERSIZED 3" FLUSH VALVE WITH CHEMICAL RESISTANT FLAPPER AND SIPHON ACTION JETTED BOWL. COMPLETE TOILET INCLUDES TANK, BOWL, SEAT, BOLTS AND BOLT CAPS; WAX RING. COLOR: WHITE.
LAV	WALL MOUNTED BATHROOM SINK. AMERICAN STANDARD DECLYN 0321.026 020, OR GLACIER BAY MODEL 13-0010 - OR EQUAL -	1/2"	1/2"	2"	1-1/2"	WALL MOUNTED LAVATORY. PROVIDE COMPLETE WITH POP-UP WASTE DRAIN, SUPPLY STOPS. LAVATORY COLOR: WHITE. COLONY TWO-HANDLE DECK MOUNT FAUCET AND AERATOR.
SHWR	FREEDOM 5-PIECE ADA ROLL-IN SHOWER. LEFT DRAIN Model #APF6232BF5PLR. RIGHT DRAIN Model #APF6232BF5SPR.	1/2"	1/2"	2"	1-1/2"	32" x 62" ACRYLIC SHOWER KIT (62 7/16" x 32 1/4" x 79") WITH 1-INCH BARRIER FREE THRESHOLD AND PRE-LEVELLED, REINFORCED SHOWER BASE.
SHWR (OPTION)	MANSFIELD MODEL #LOW-5100-00.					ADA SHOWER WALLS. PROVIDE WITH TRIM AND COMPONENTS FOR A COMPLETE INSTALLATION.
SHWR (OPTION)	MUSTEE DURABASE MODEL 360					ADA SHOWER FLOOR. PROVIDE WITH TRIM AND COMPONENTS FOR A COMPLETE INSTALLATION.
ACCESSORIES					VERIFY TRIM AND COMPONENTS ARE COMPATIBLE WITH FINISHES	
					1.	18" X 15" FOLDING BENCH WITH LEGS MODEL APFSSB2-180150PW
					2.	FREEDOM PRESSURE BALANCED MIXING VALVE MODEL APFMVLS
					3.	FREEDOM HAND-HELD SHOWER & GLIDE BAR MODEL APFHGGBLS
					4.	(2) 36-INCH GRAB BARS AND (1) SHOWER ROD
					5.	2" CAULK-LESS BRASS DRAIN AND STRAINER MODEL APFDR
KS	KITCHEN SINK MUSTEE UTILITUB COMBO UNIT	1/2"	1/2"	2"	1-1/2"	19 CUBIC FT UTILATUB INCLUDES 6" SWING SPOUT FAUCET, FLEXIBLE SUPPLY LINES, P-TRAP WITH 12" TAILPIECE, TOP COVER AND DRAIN STOPPER.
ET	EXPANSION TANK (2-GALLON CAPACITY)	3/4"	-	-	-	AMTROL ST-5 THERM-X-TROL - OR EQUAL. TOTAL VOLUME 2.0 GALLON, MAXIMUM ACCEPTANCE 0.9 GALLON, 3/4" NPT SYSTEM CONNECTION.
CO DCO WCO	CLEANOUT	-	-	-	-	J.R. SMITH-EXTERIOR 4233L-MU J.R. SMITH-INTERIOR 4033L-PBU J.R. SMITH-TILE FLOOR 4033L-PBU J.R. SMITH-FINISH WALL 4472T-PBU CONNECTION - SPEEDI - SET. SIZE SAME AS WASTE LINE SERVED BY CLEANOUT.

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