

# NEW 32' x 48' x 20' POLE BARN FOR

OWNER: WALTER & CHELSEA CIUCEVICH  
(910) 644-4801

SITE: 1099 LLOYD STEWART RD.  
BROADWAY, NC 27505

## BUILDING CODES & ZONING ORDINANCES

- EXECUTE ALL WORK IN ACCORDANCE WITH LOCAL AND FEDERAL CODES, MANUFACTURERS RECOMMENDATIONS, TRADE AND REFERENCE STANDARDS
- THIS PLAN IS TO COMPLY WITH THE FOLLOWING GOVERNING AUTHORITIES
  - A. NORTH CAROLINA RESIDENTIAL CODE 2017 EDITION
  - B. BUILDING OWNERS REQUIREMENTS

## SCOPE OF WORK:

NEW 32' x 48' x 20' POLE BARN DRAWING SET

TOTAL AREA ~ 1,536 SF

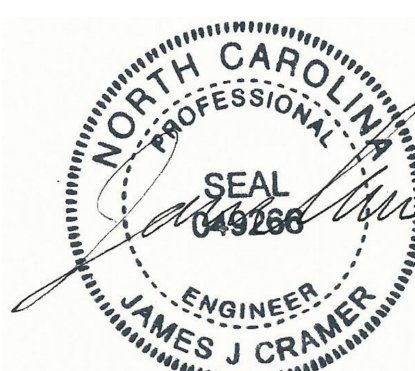
SNOW = 20PSF  
DEAD LOAD = 5PSF  
SOIL = 1500PSF  
ROOF DEFLECTION = L/240  
FROST DEPTH = 10"

## SHEET LIST TABLE:

SHEET NUMBER	SHEET TITLE
C1.0	COVER SHEET/DETAILS
C2.0	SITE PLAN
A1.0	ELEVATION VIEWS
A2.0	ELEVATION VIEWS
A3.0	FIRST & SECOND FLOOR PLANS
A4.0	TWO FLOOR SECTION VIEW
S1.0	POST HOLE LAYOUT & SLAB CONTROL JOINT PLAN
S2.0	ROOF FRAMING PLAN
S3.0	SECOND FLOOR JOIST PLAN
E1.0	FIRST & SECOND FLOOR ELECTRICAL PLAN
E2.0	ELECTRICAL PANEL DIAGRAM AND NOTES
M1.0	HVAC PLAN
P1.0	PLUMBING ISOMETRIC

ELEVATION, FOUNDATION, FRAMING AND SPECS IN FOLLOWING STAMPED QUOTE

**CRAMER**  
ENGINEERING, LLC  
STRUCTURAL ENGINEERING  
PO BOX 5419  
FAIRLAWN, OH 44334  
Phone (440) 655-1348  
email: james@cramerengineering.com  
www.cramerengineering.com

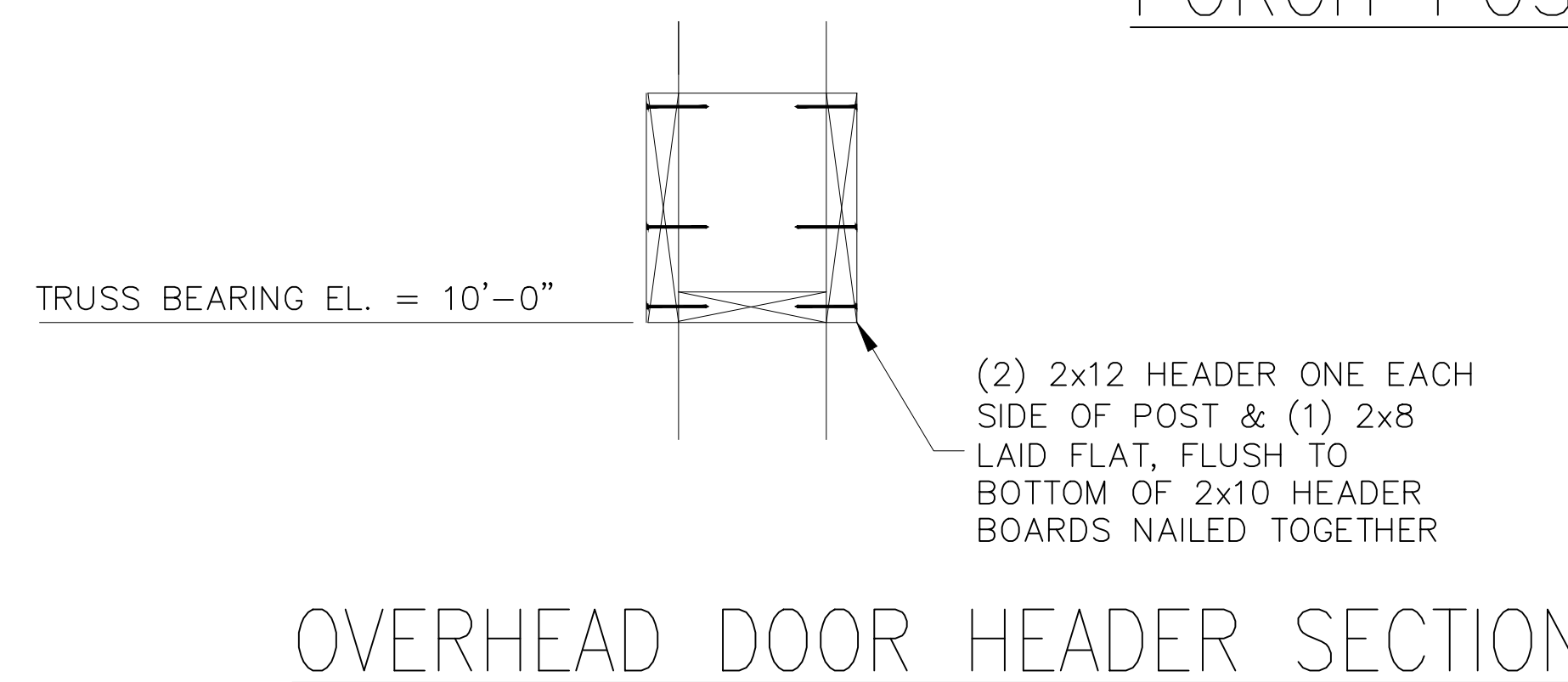
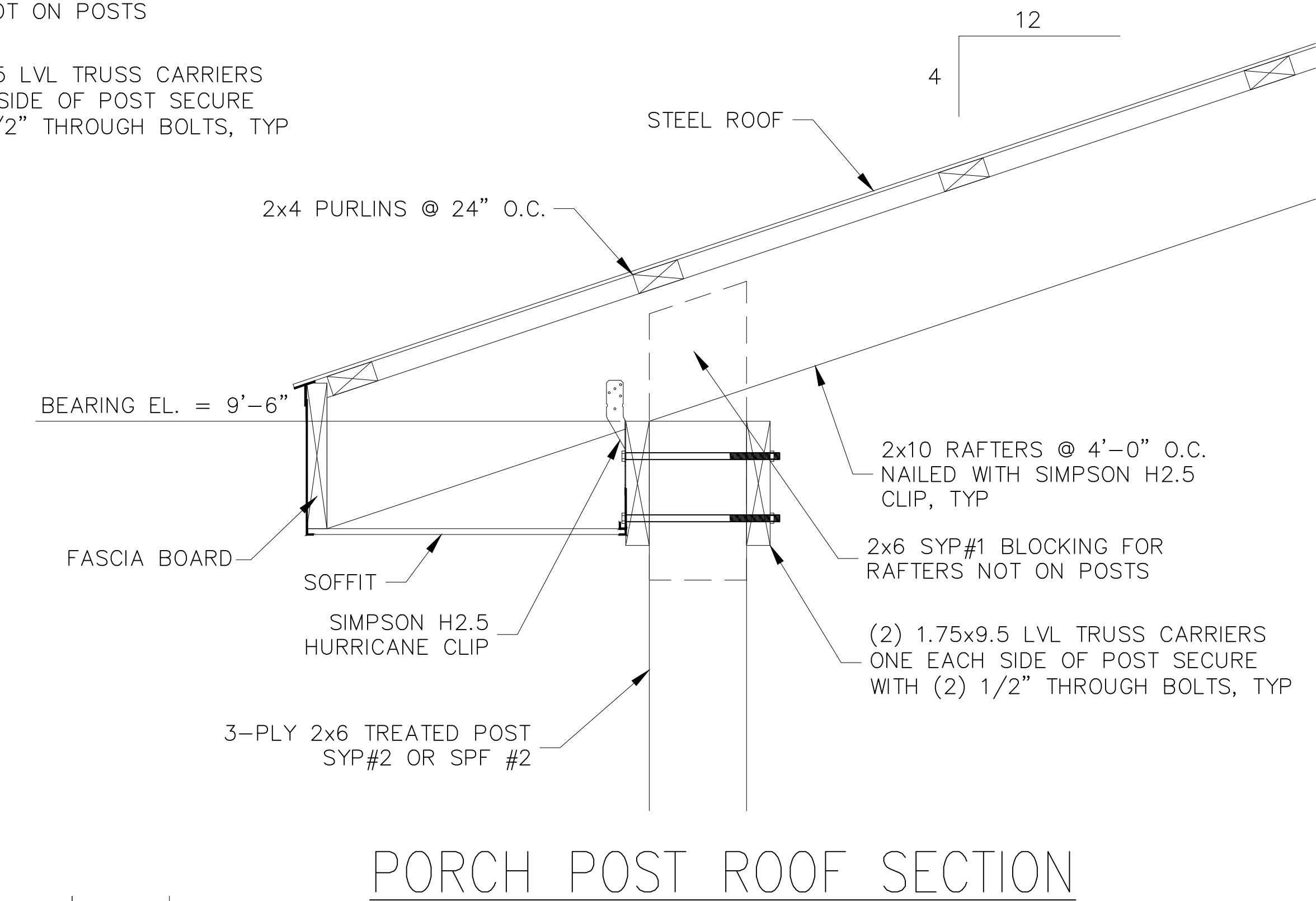
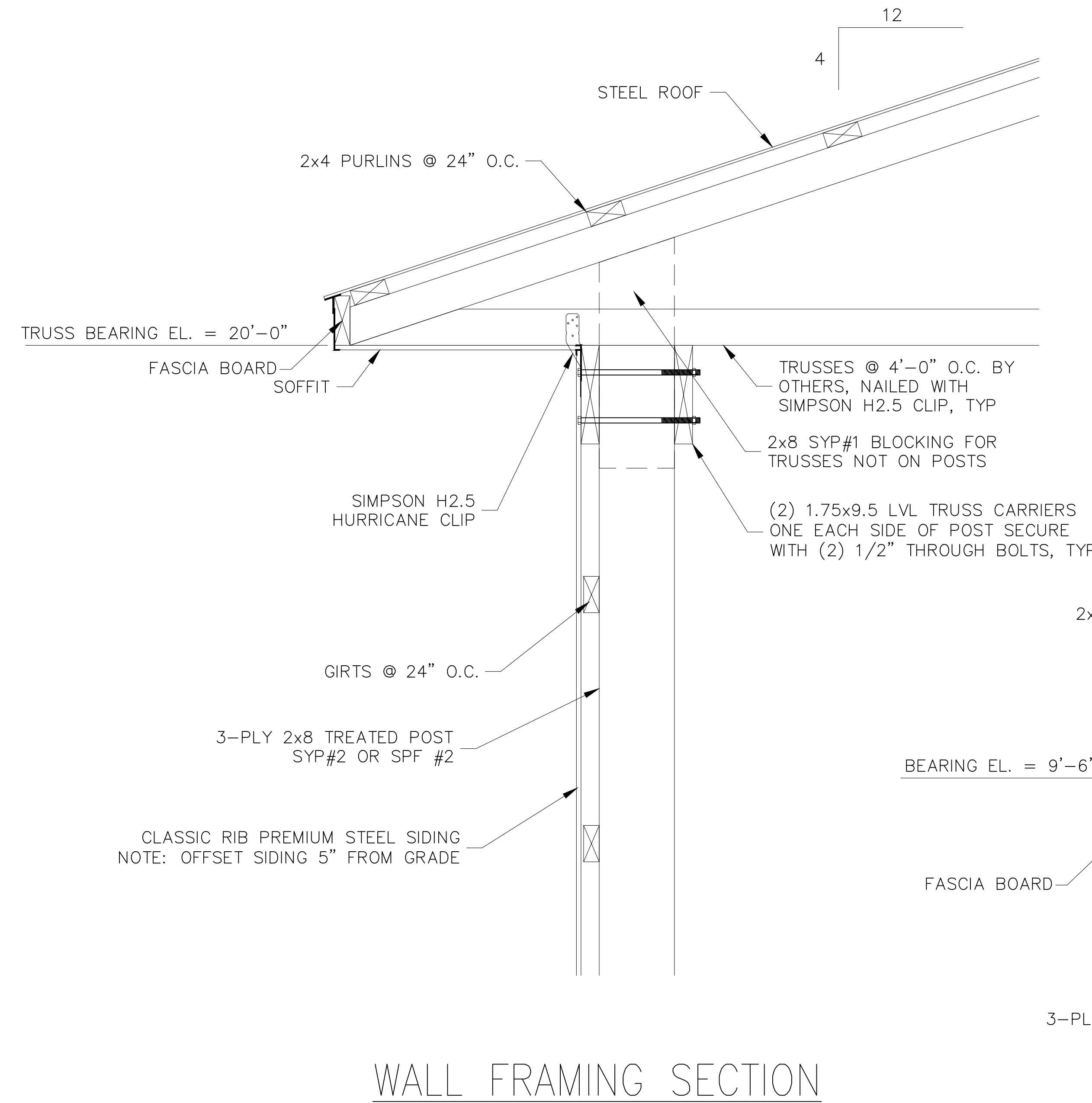
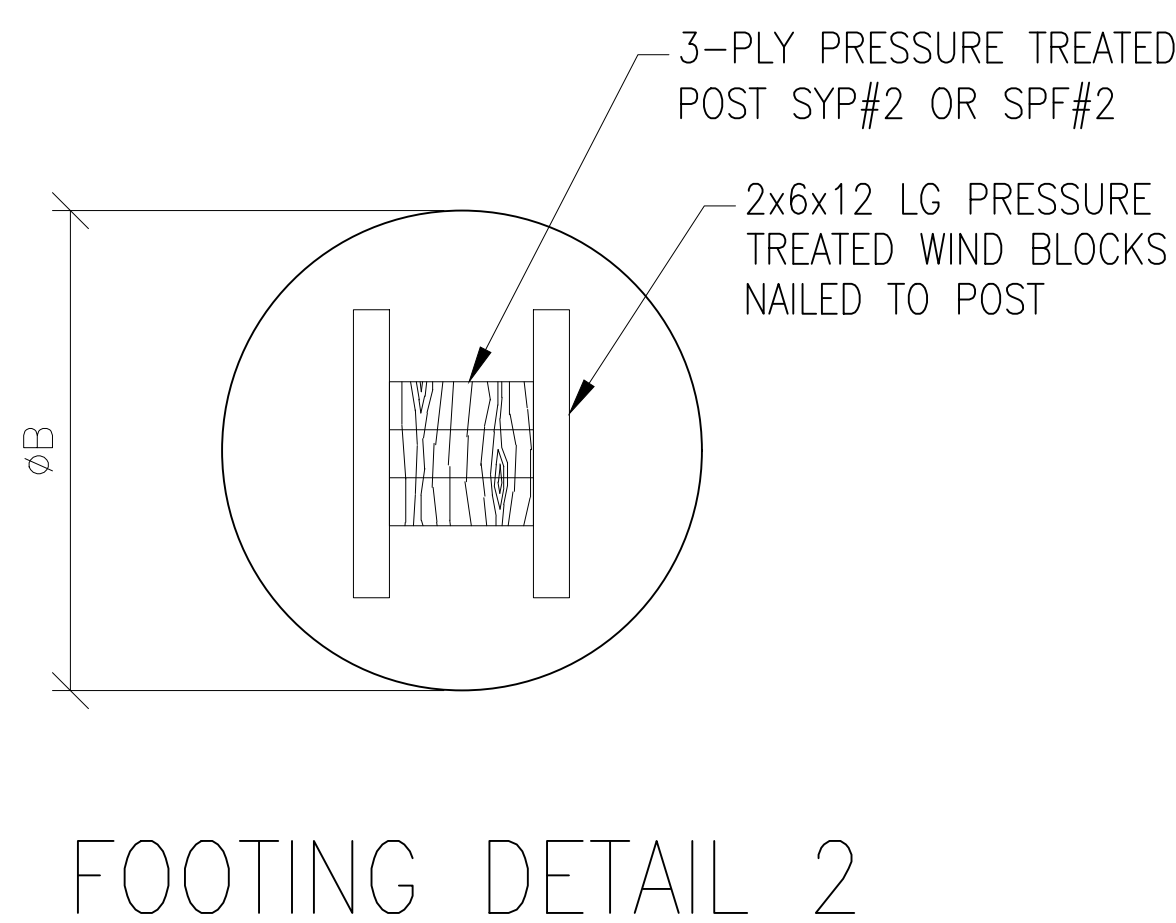
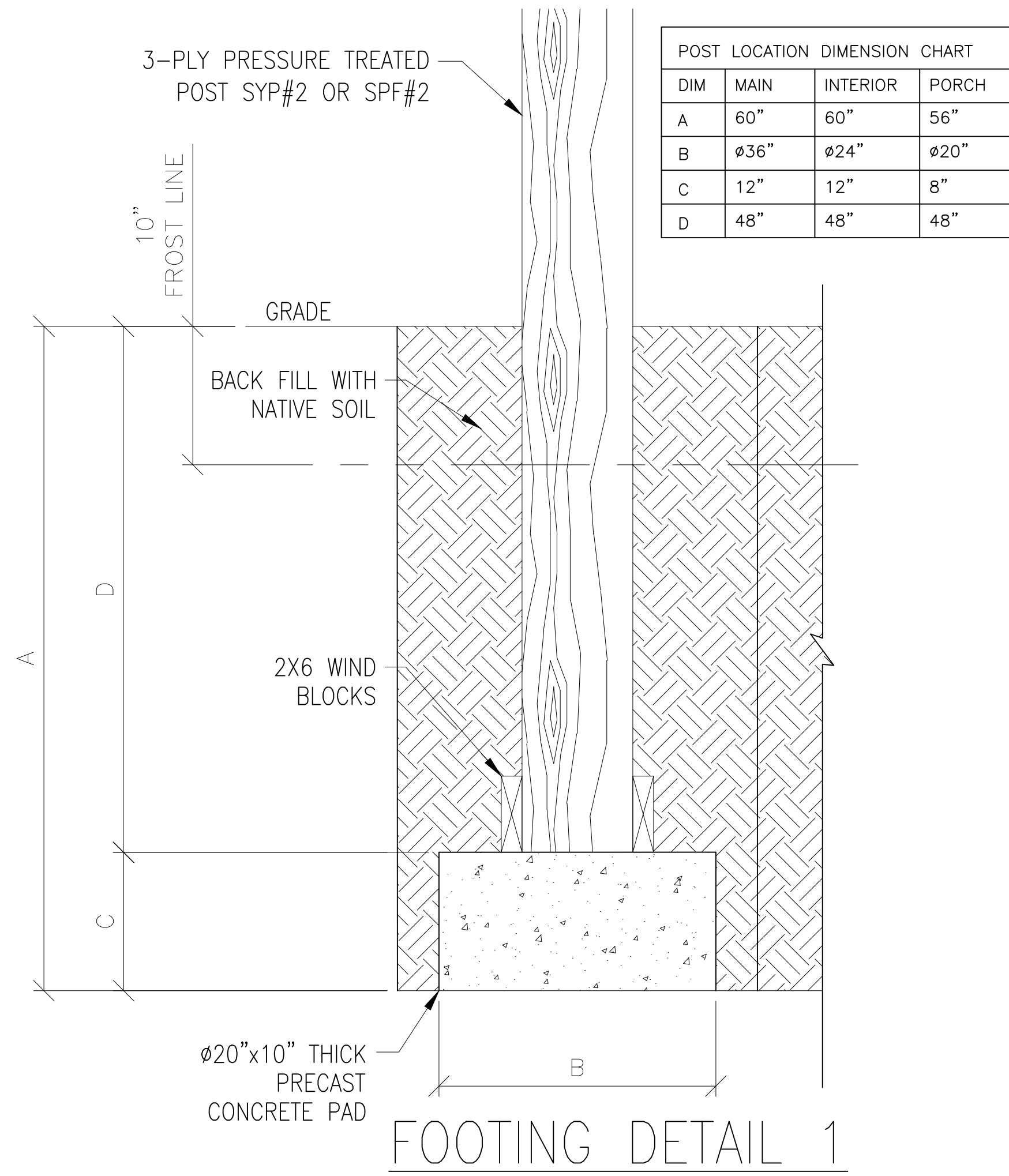


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COVER SHEET & DETAILS

C1.0



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NO.	REVISION

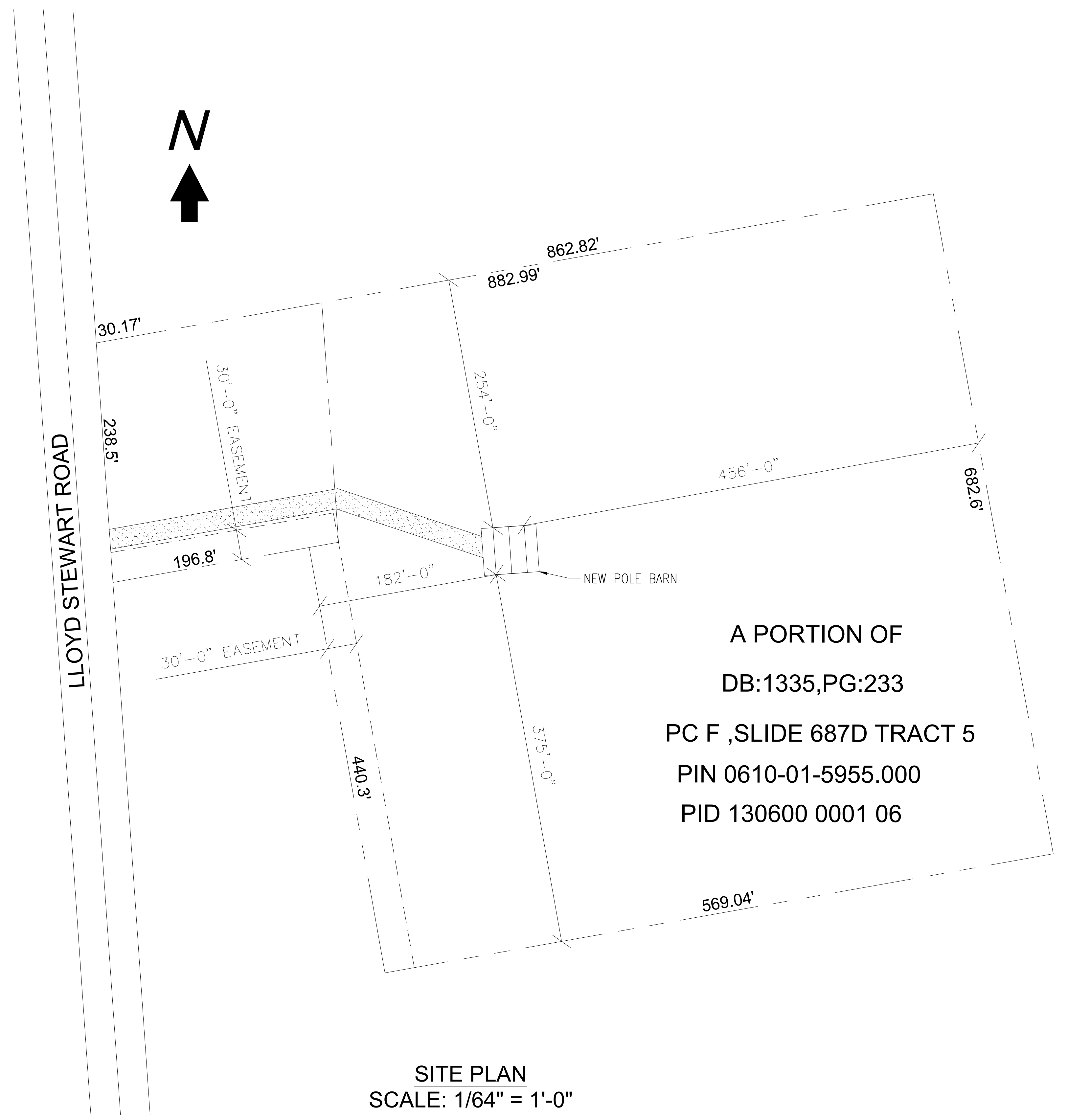
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STARTED: 09.27.2022	DRAWN BY: DJB
REVIEWED: 10.03.2022	REVIEWED BY: JB
APPROVED: 10.03.2022	APPROVED BY: JJC

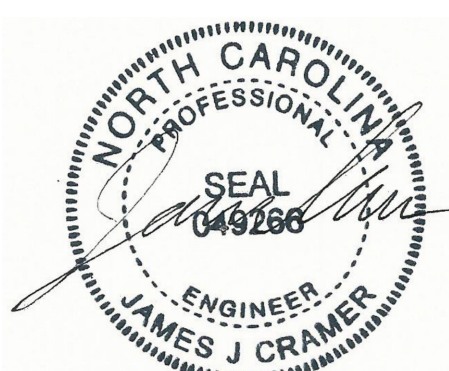
VERIFY ALL DIMENSIONS IN FIELD

SITE PLAN

C2.0



SITE PLAN  
SCALE: 1/64" = 1'-0"



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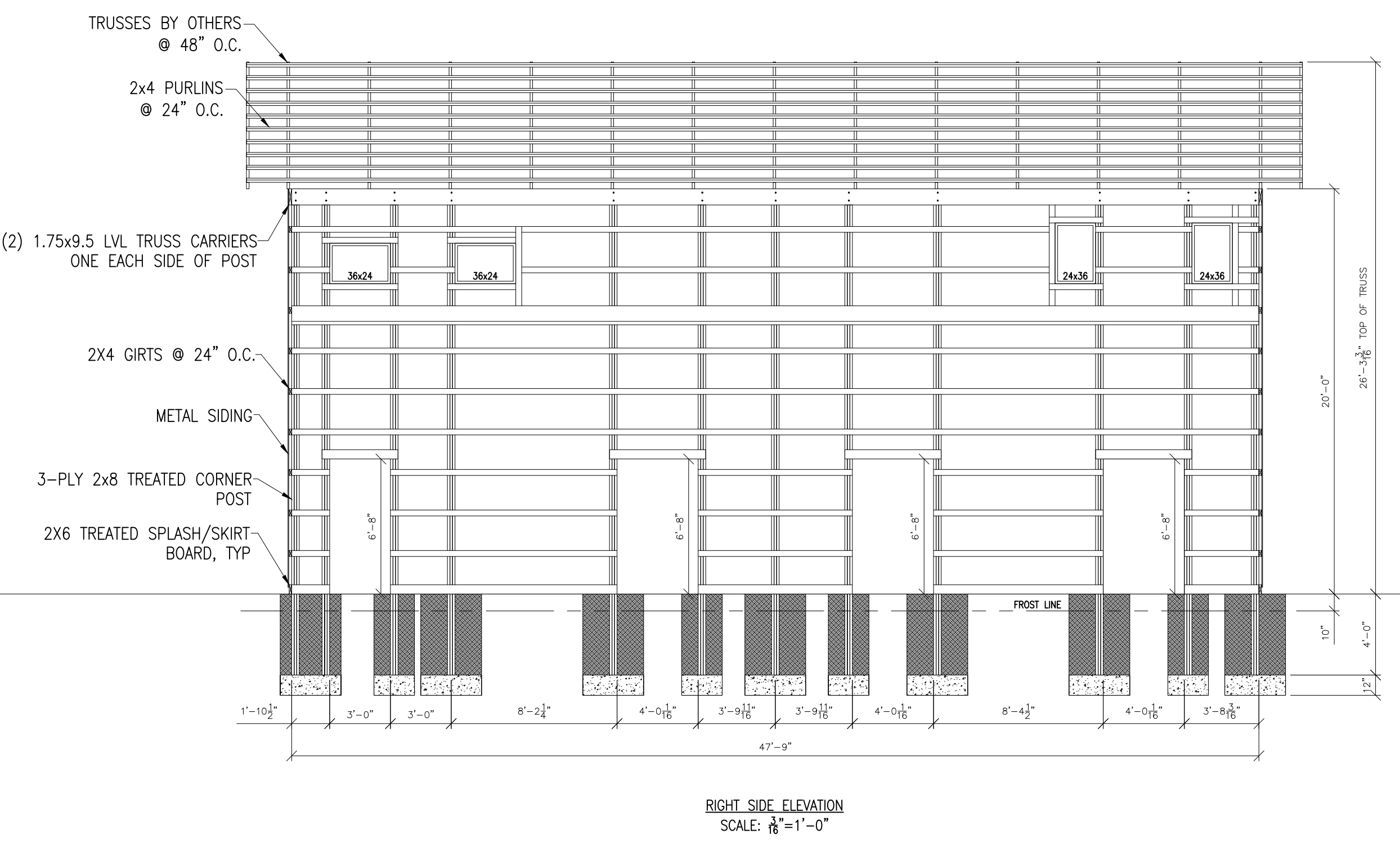
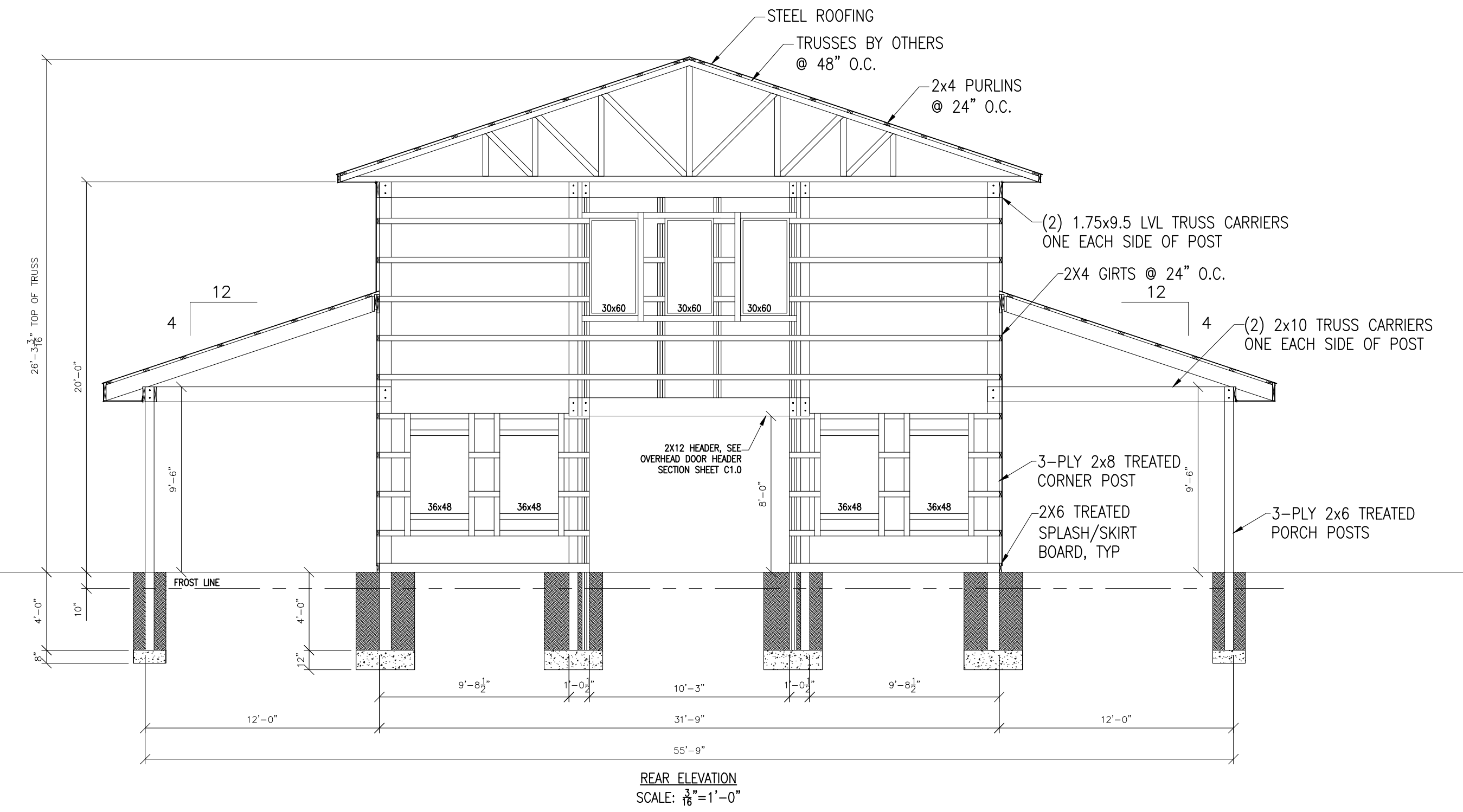
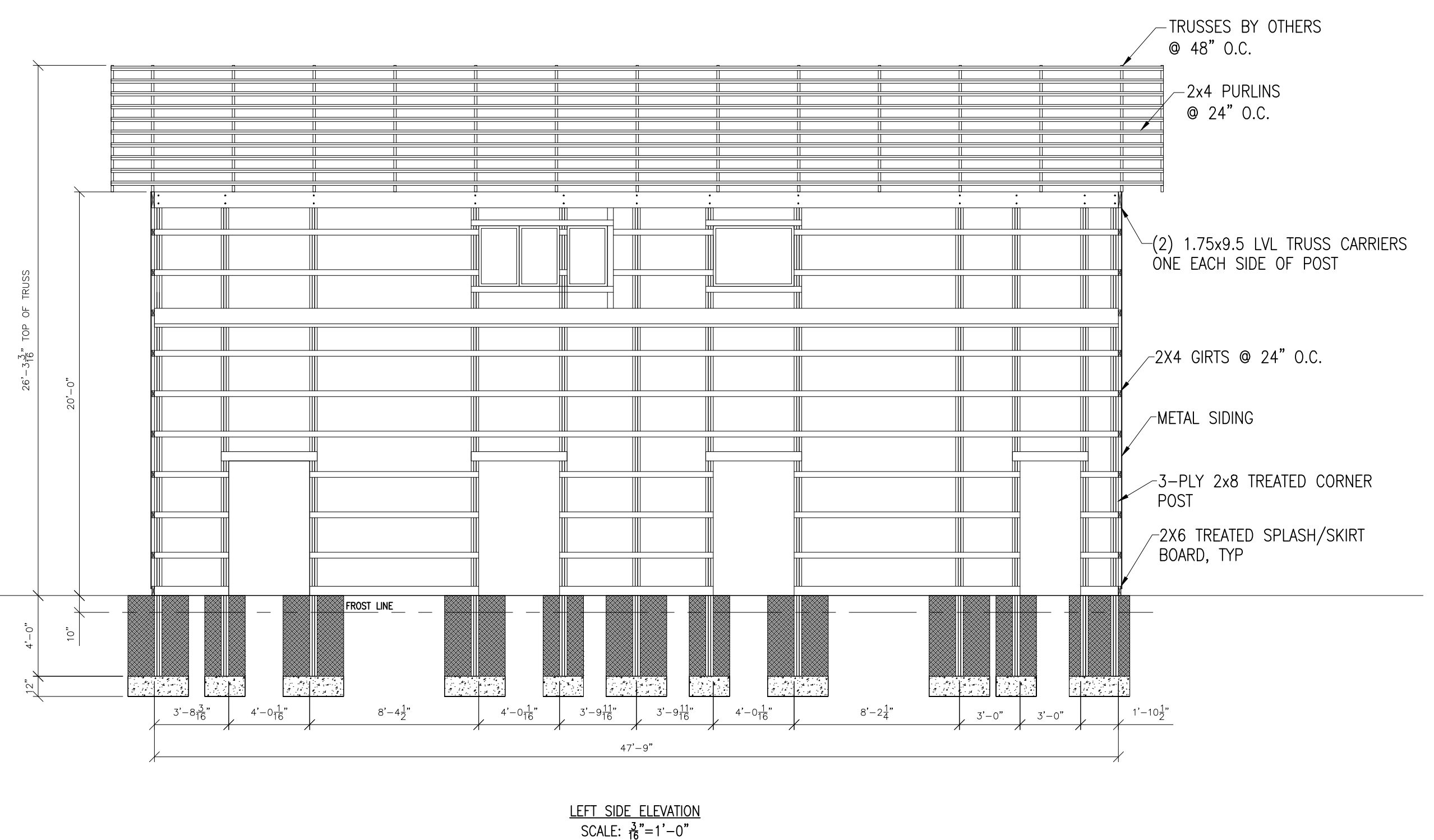
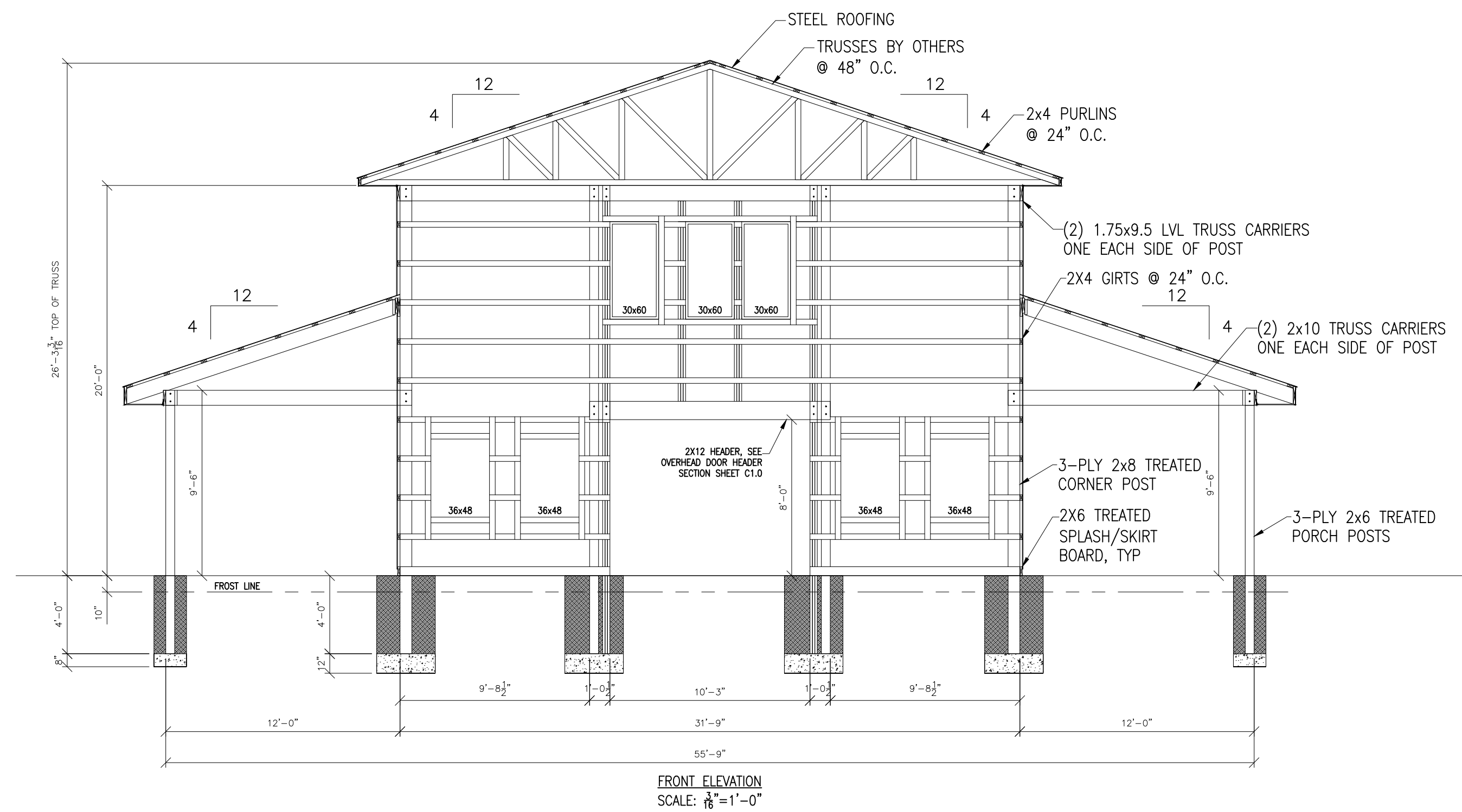
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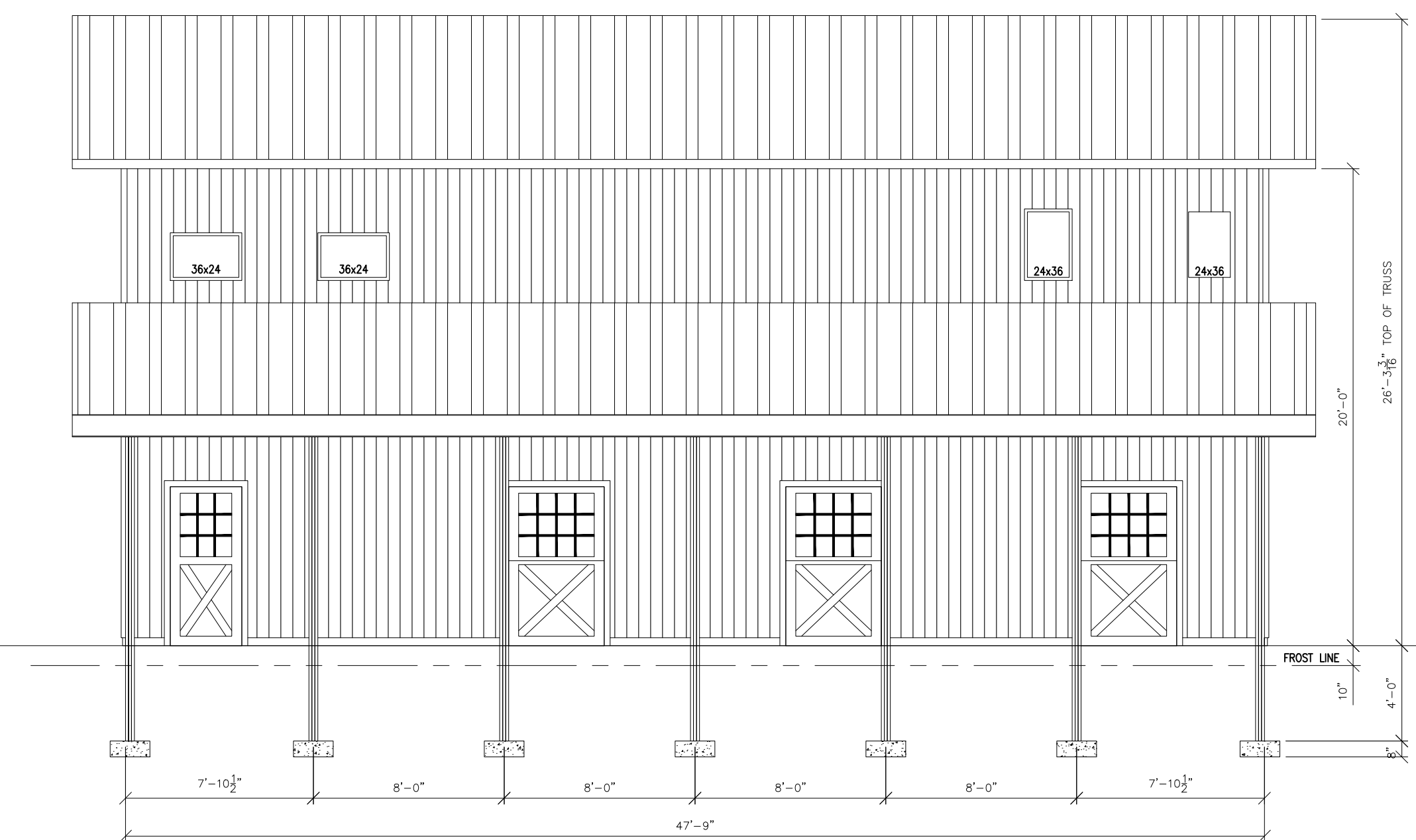
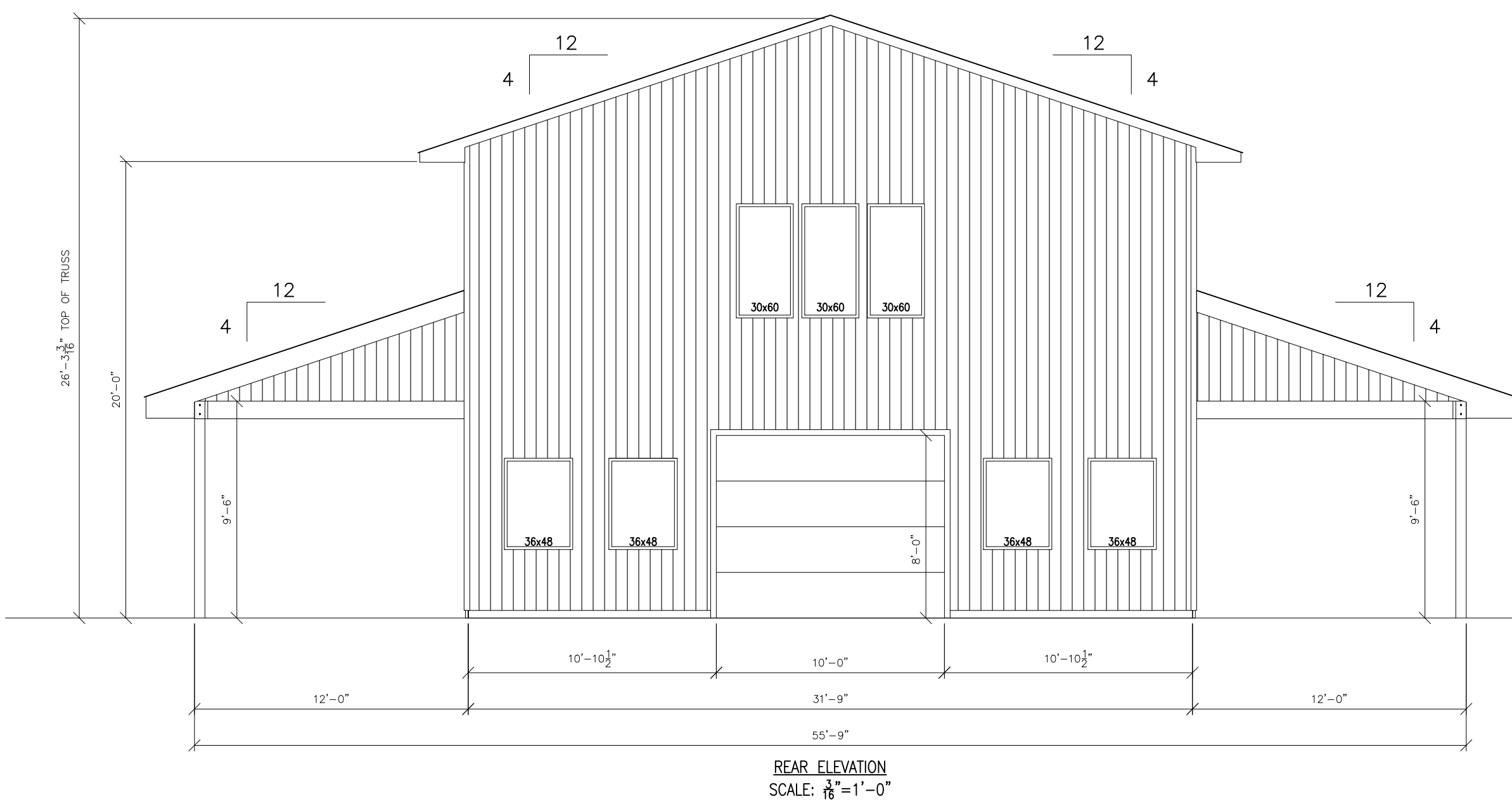
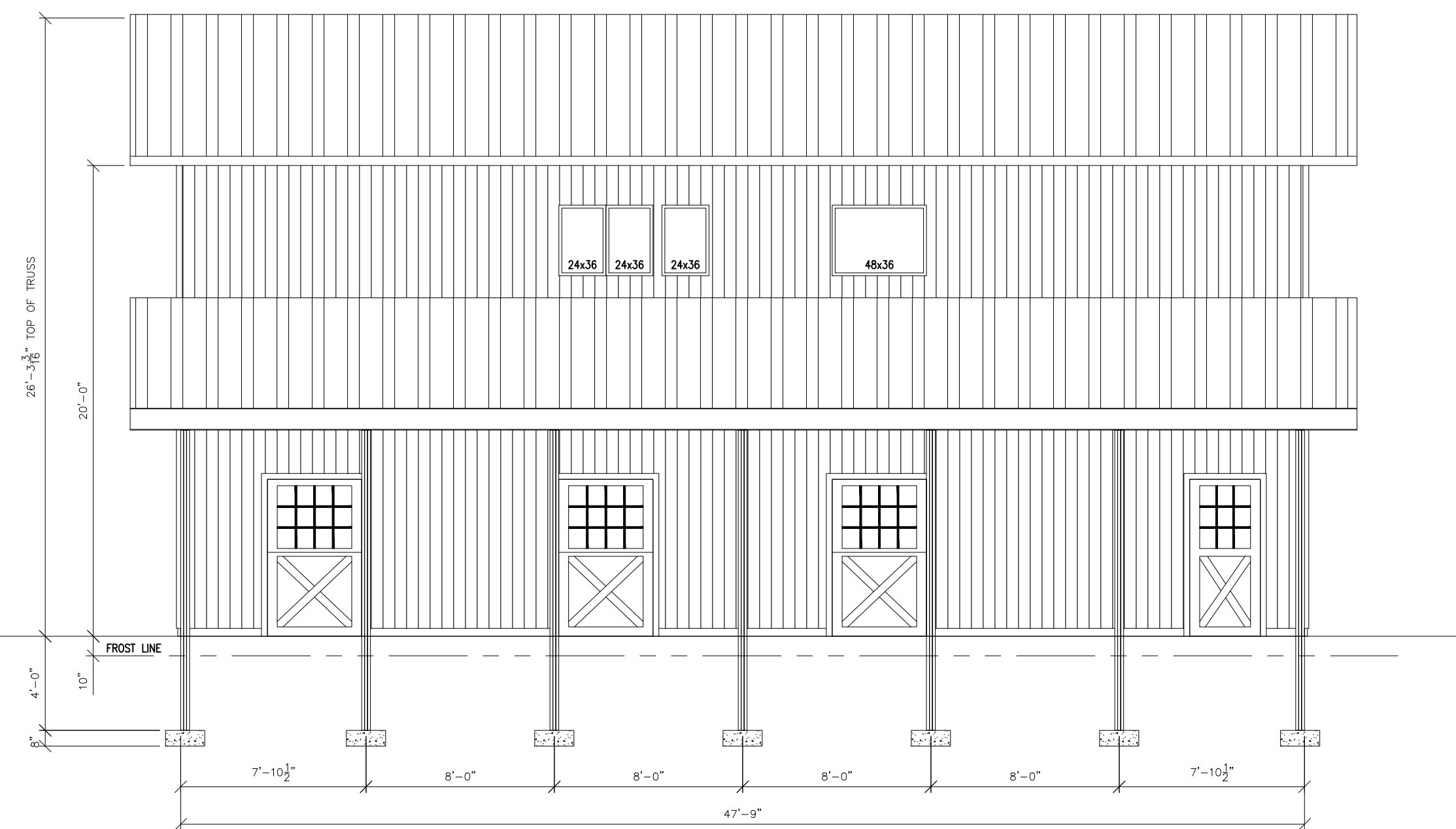
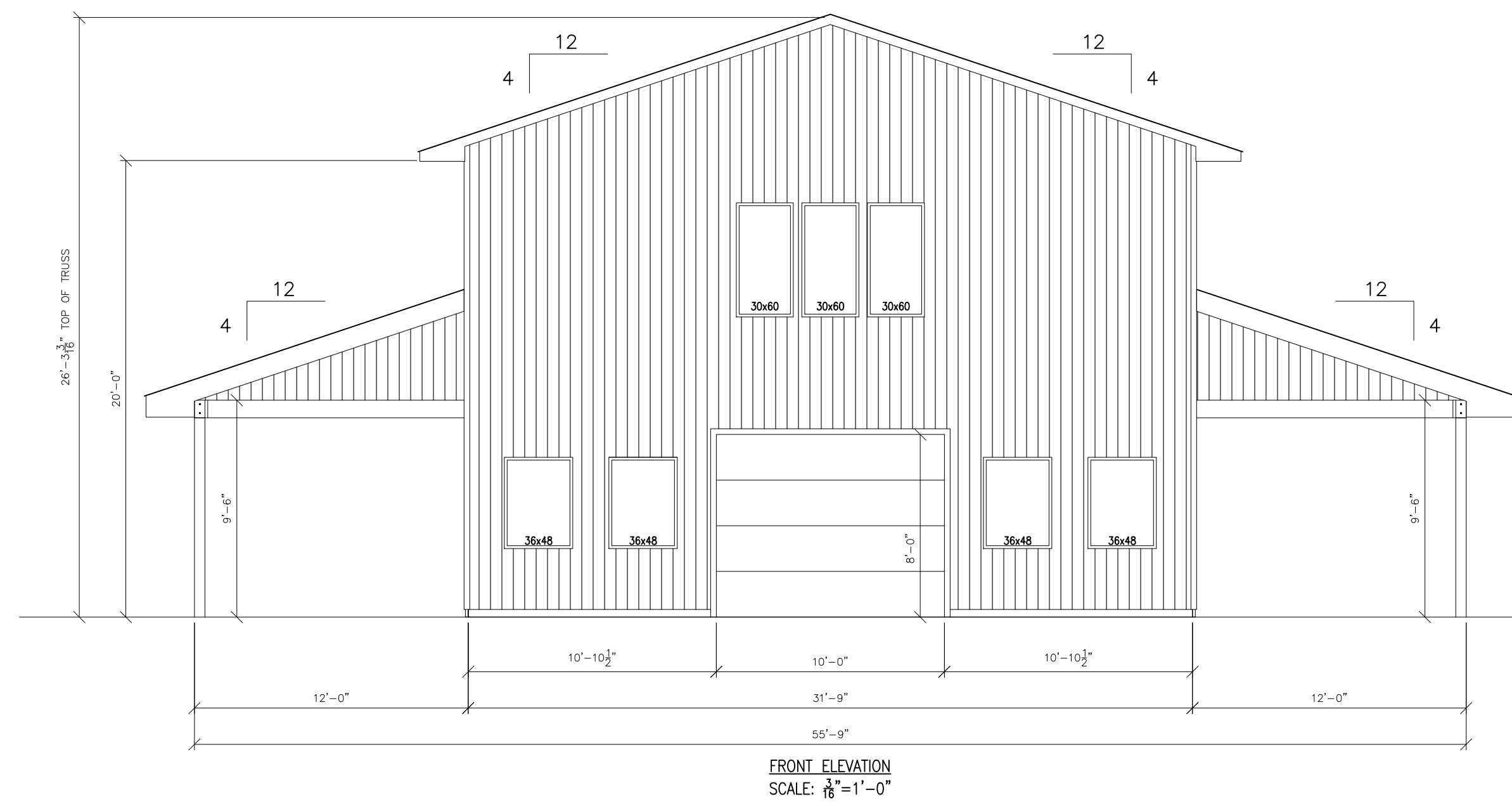
APPROVED: 10.03.2022 APPROVED BY: JBC

VERIFY ALL DIMENSIONS IN FIELD

ELEVATION VIEWS

**A1.0**





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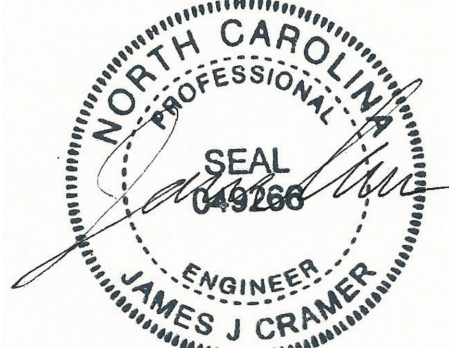
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ELEVATION VIEWS



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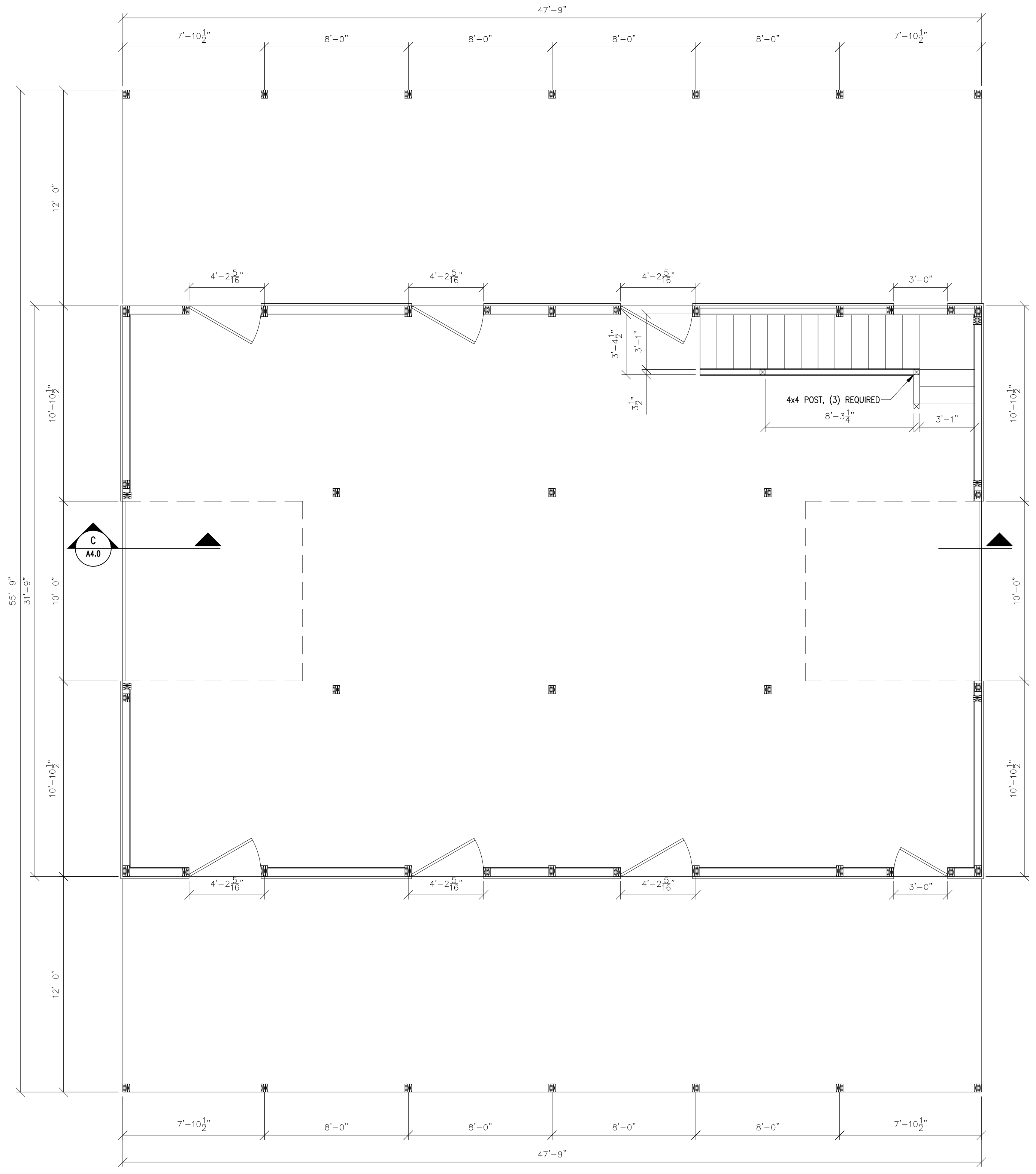
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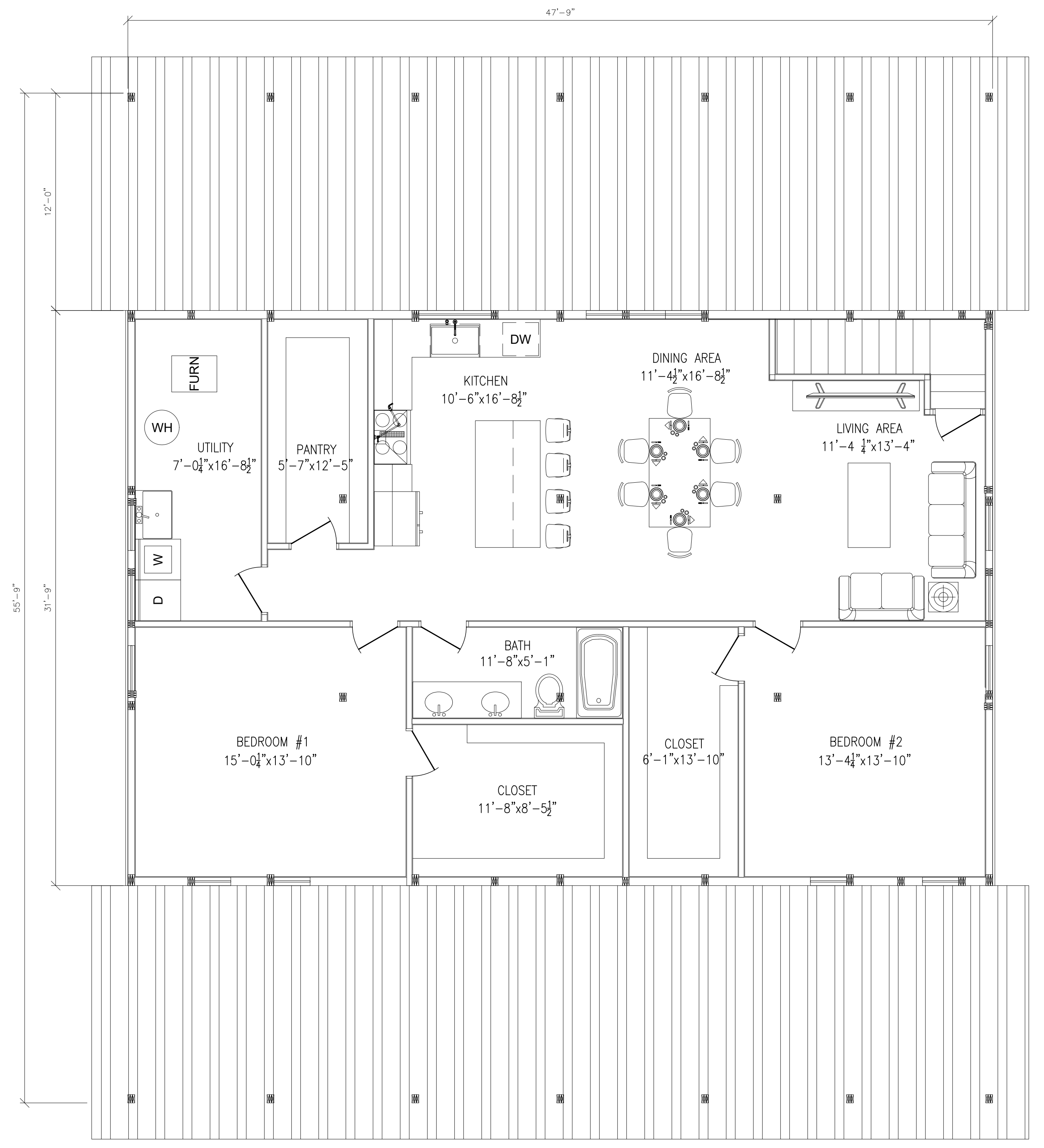
VERIFY ALL DIMENSIONS IN FIELD

FIRST & SECOND FLOOR PLANS

**A3.0**



FIRST FLOOR PLAN  
SCALE: 1/4"=1'-0"



SECOND FLOOR PLAN  
SCALE: 1/4"=1'-0"

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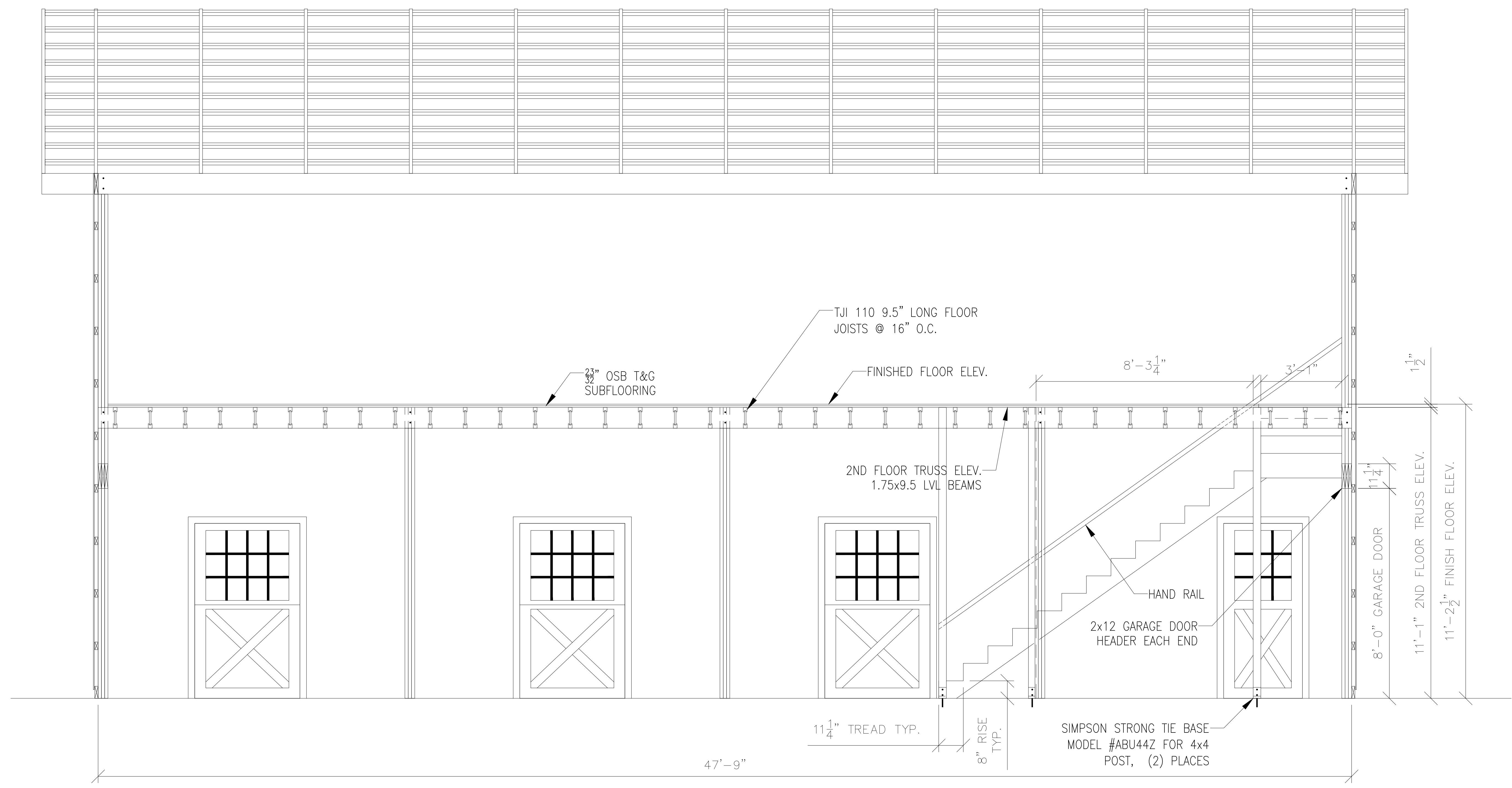
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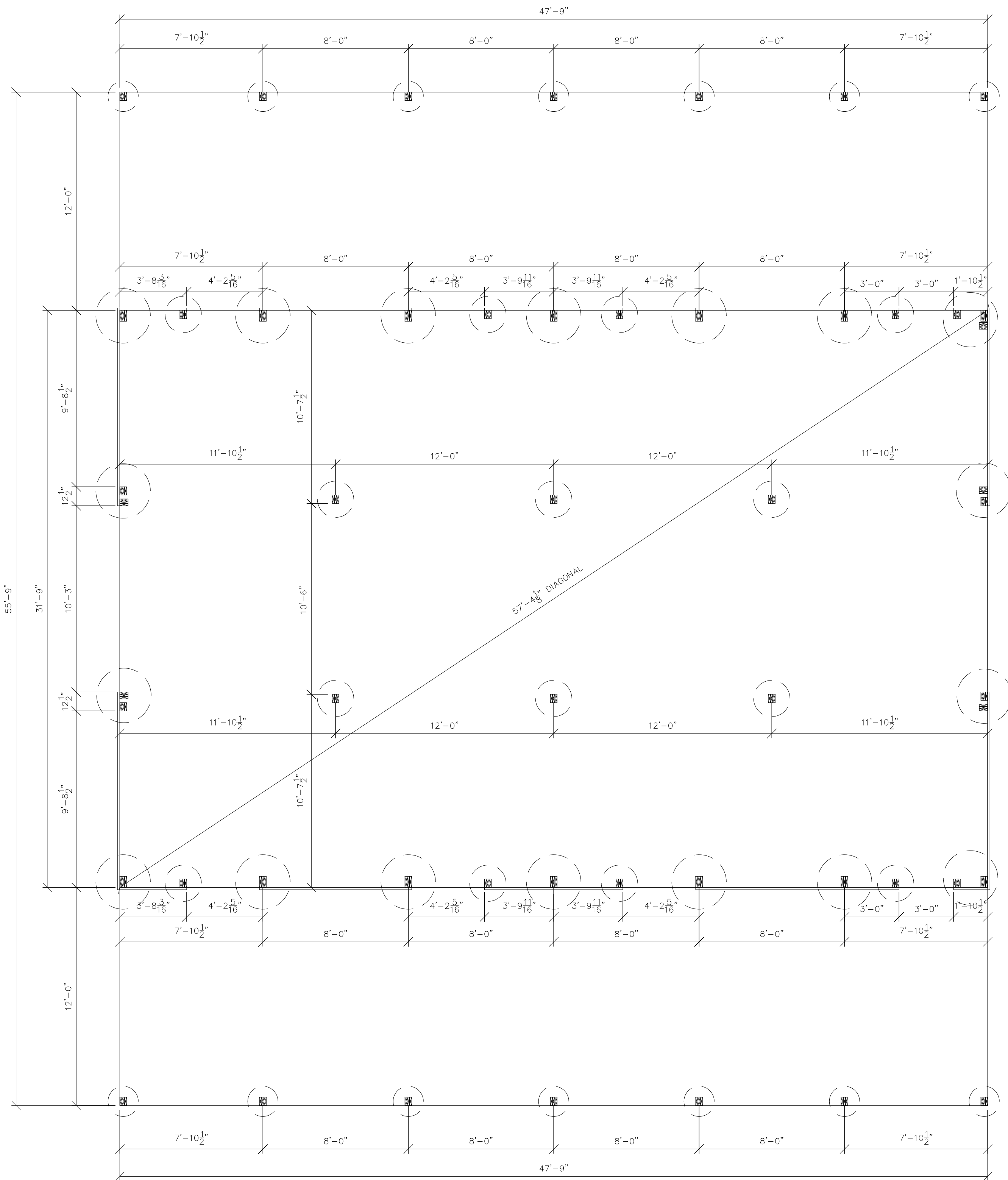
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TWO FLOOR SECTION VIEW

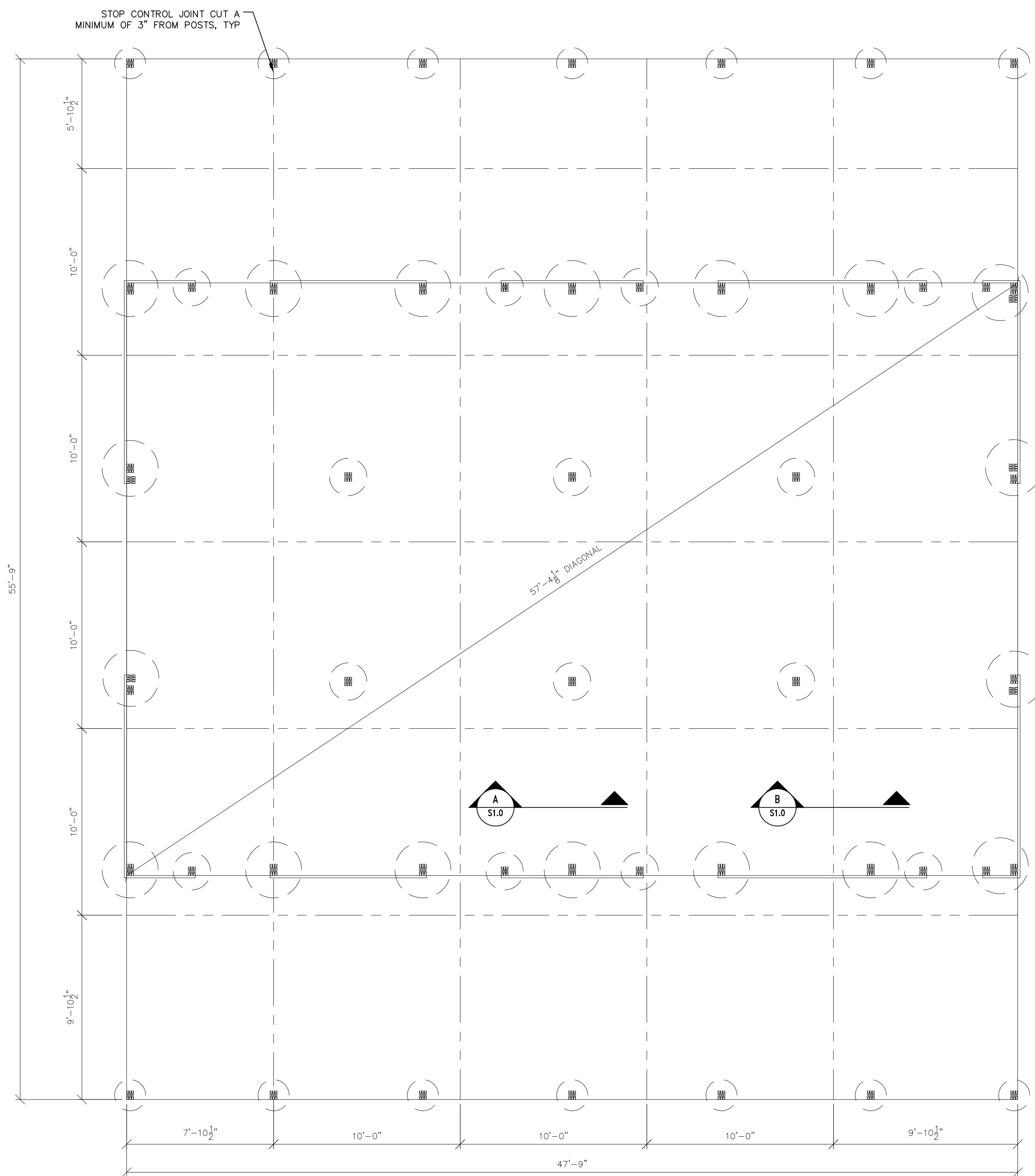
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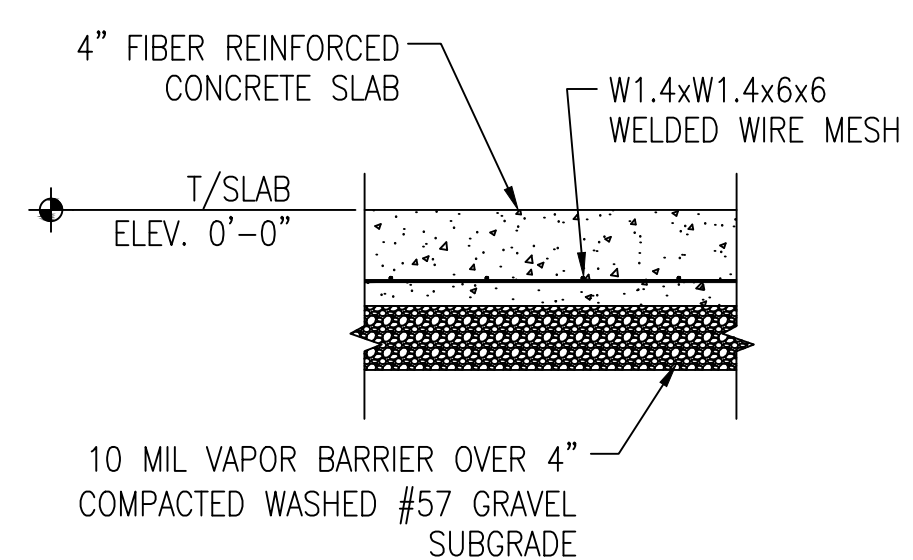
TWO FLOOR  
 SECTION VIEW  
 SCALE: 1/2" = 1'-0"  
 C  
 A4.0



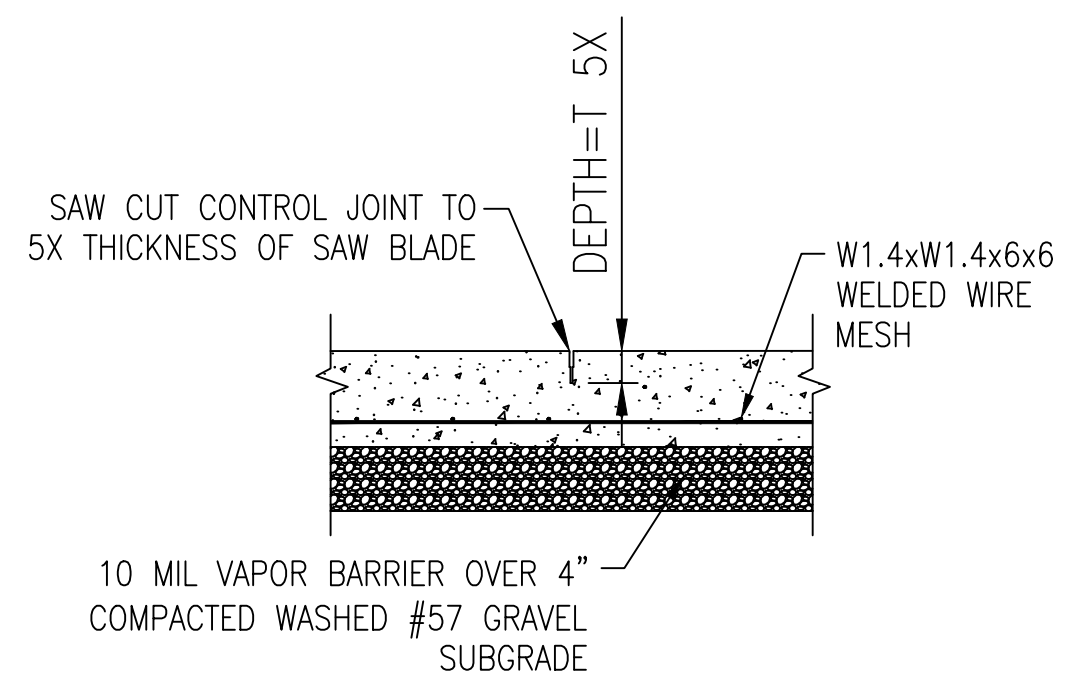
POST HOLE LAYOUT  
SCALE: 1/4" = 1'-0"



SLAB CONTROL JOINT PLAN  
SCALE: 1/4" = 1'-0"



TYPICAL SLAB SECTION  
SCALE: 1" = 1'-0" A  
S1.0



SLAB CONSTRUCTION JOINT DETAIL  
SCALE: 1" = 1'-0" B  
S1.0

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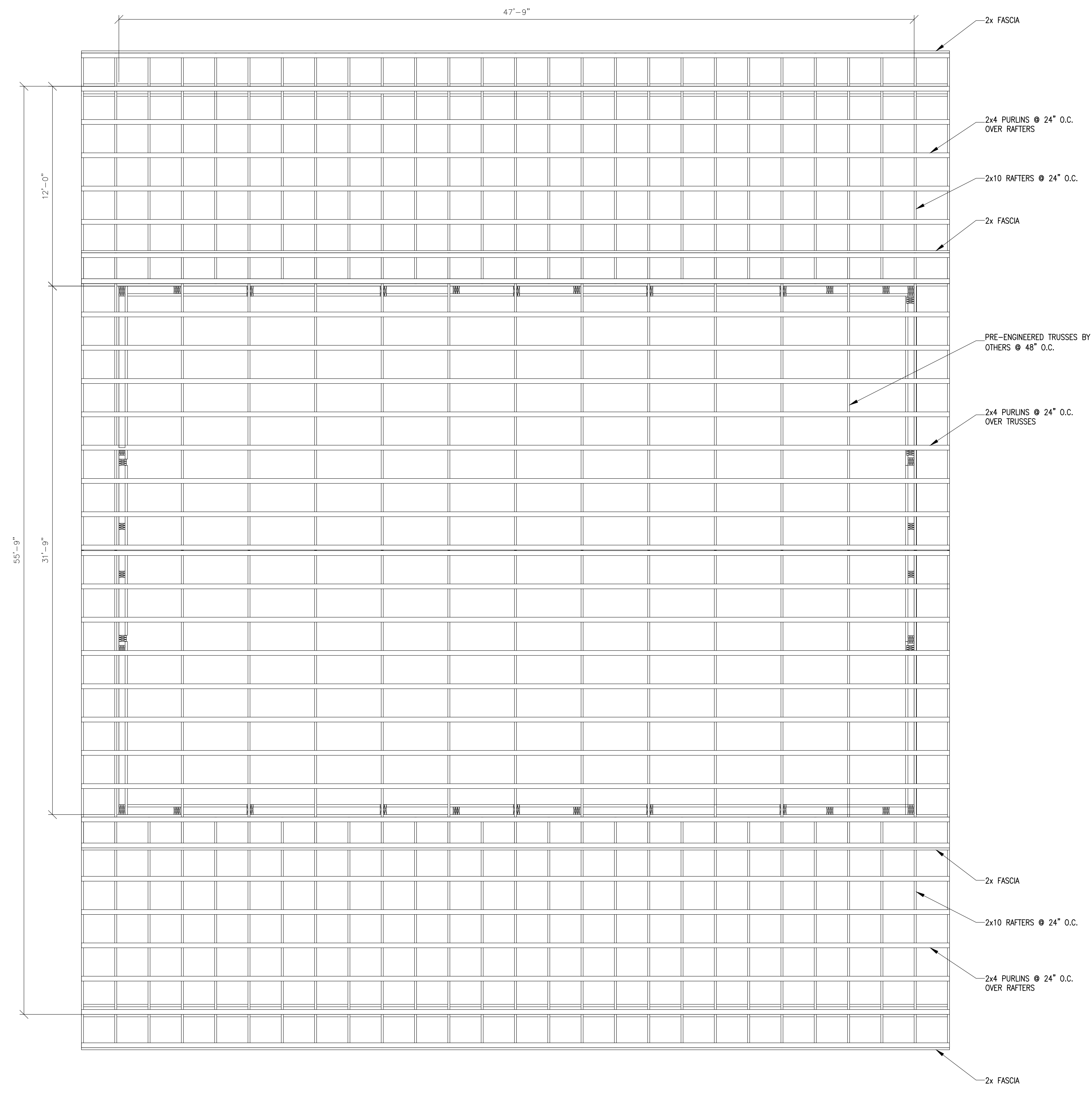
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ROOF FRAMING PLAN

**S2.0**



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





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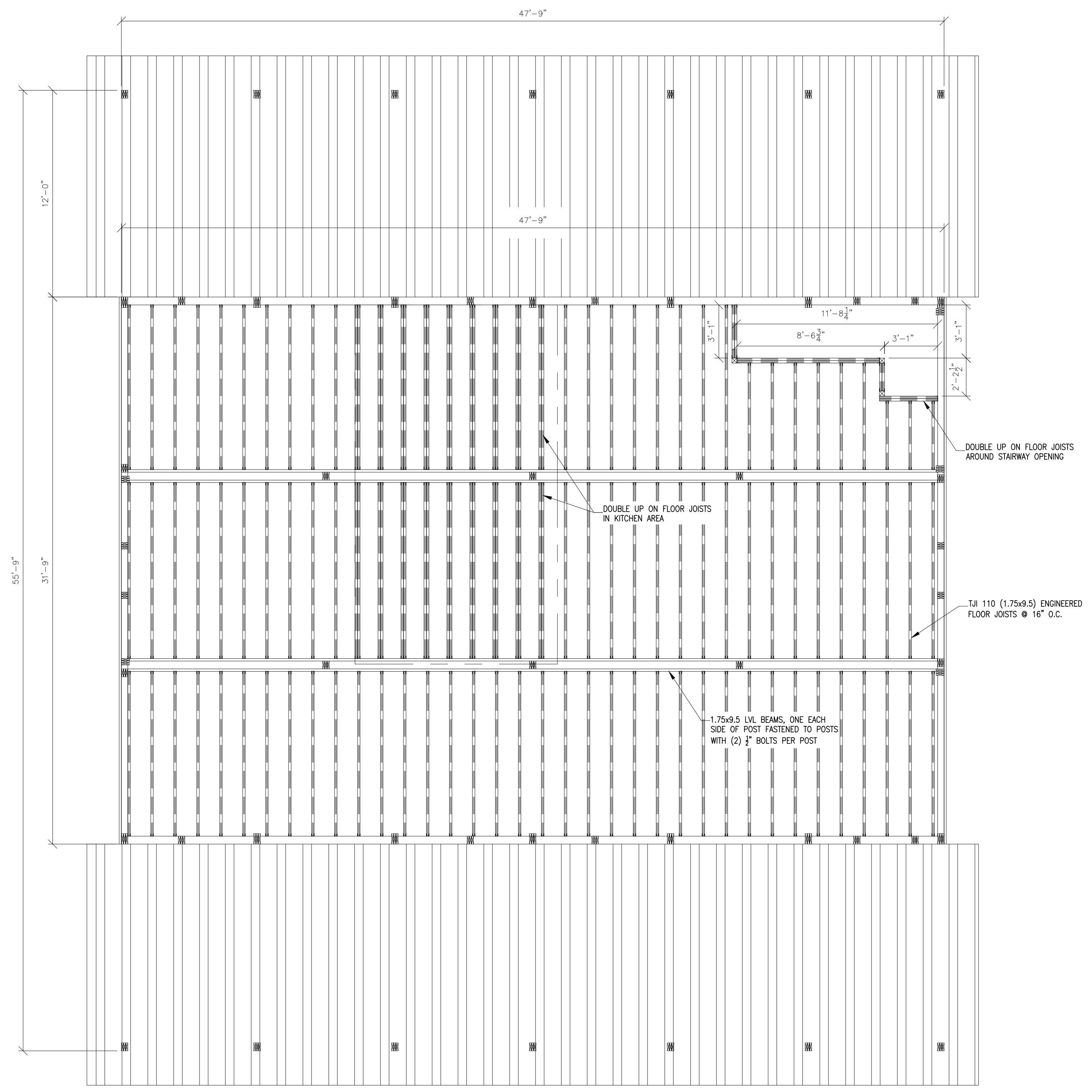
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SECOND FLOOR JOIST PLAN

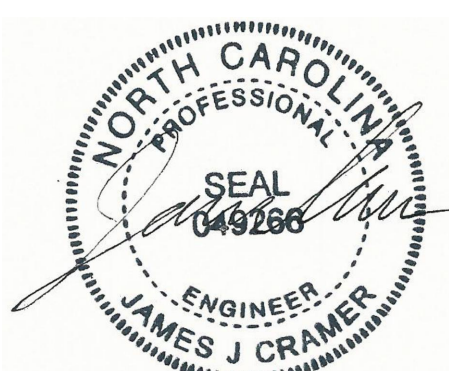
**S3.0**



SECOND FLOOR JOIST PLAN  
SCALE: 1/4" = 1'-0"



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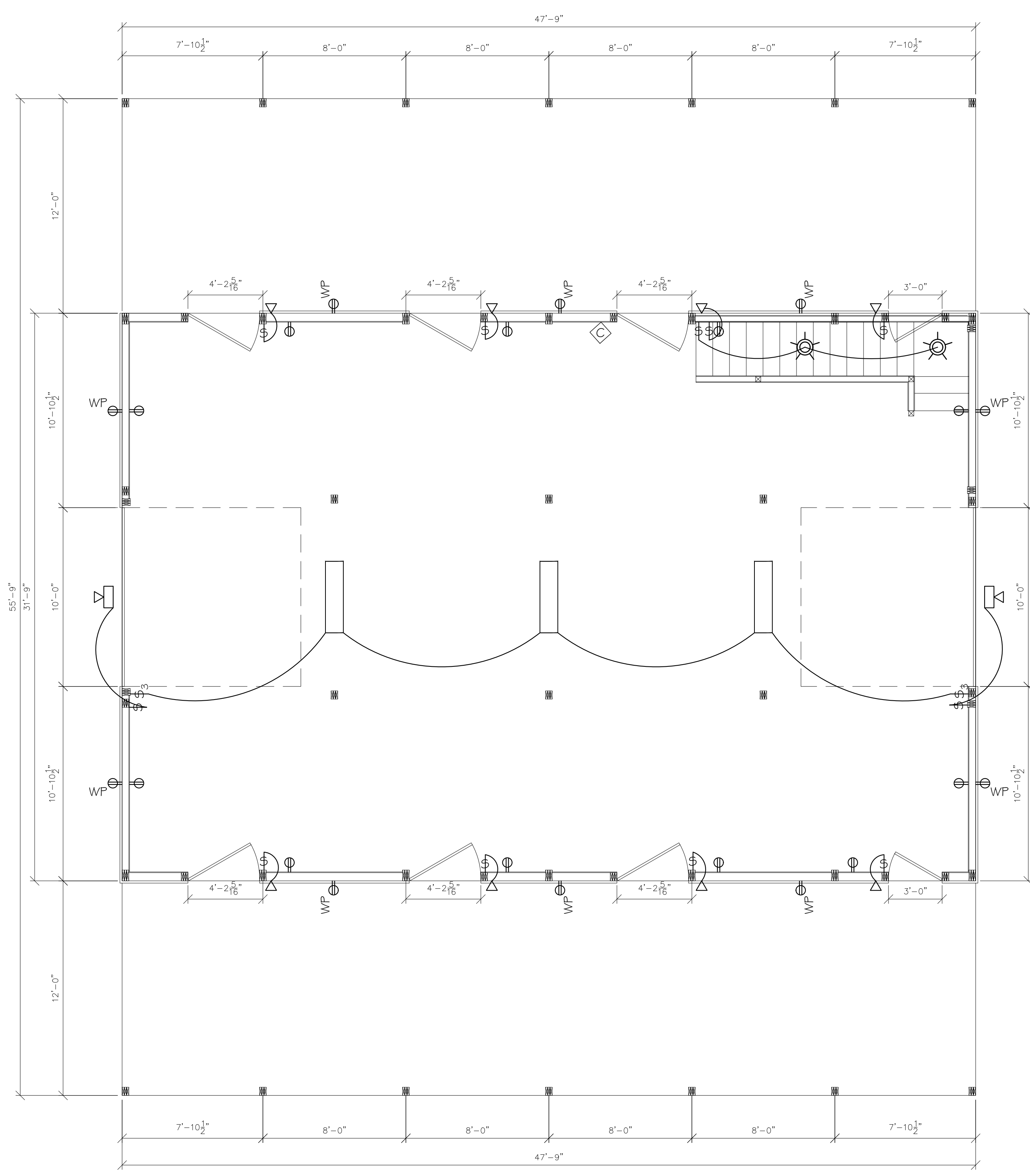
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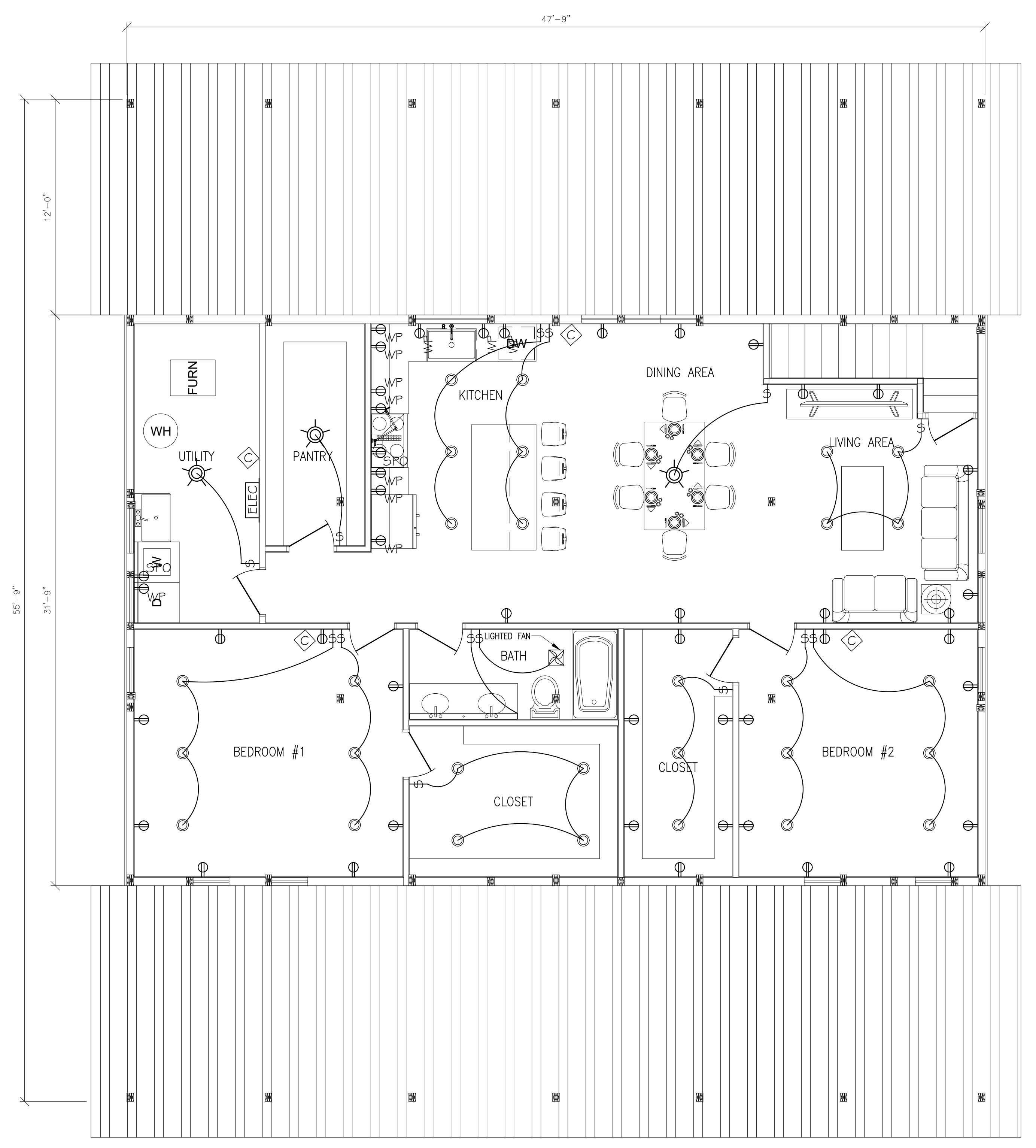
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**FIRST & SECOND FLOOR ELECTRICAL PLAN**

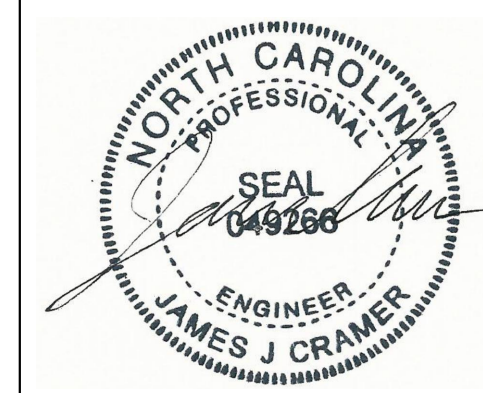
**E1.0**



FIRST FLOOR ELECTRICAL PLAN  
SCALE: 1/4" = 1'-0"



SECOND FLOOR ELECTRICAL PLAN  
SCALE: 1/4" = 1'-0"



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**ELECTRICAL PANEL DIAGRAM AND NOTES**

**E1.0**

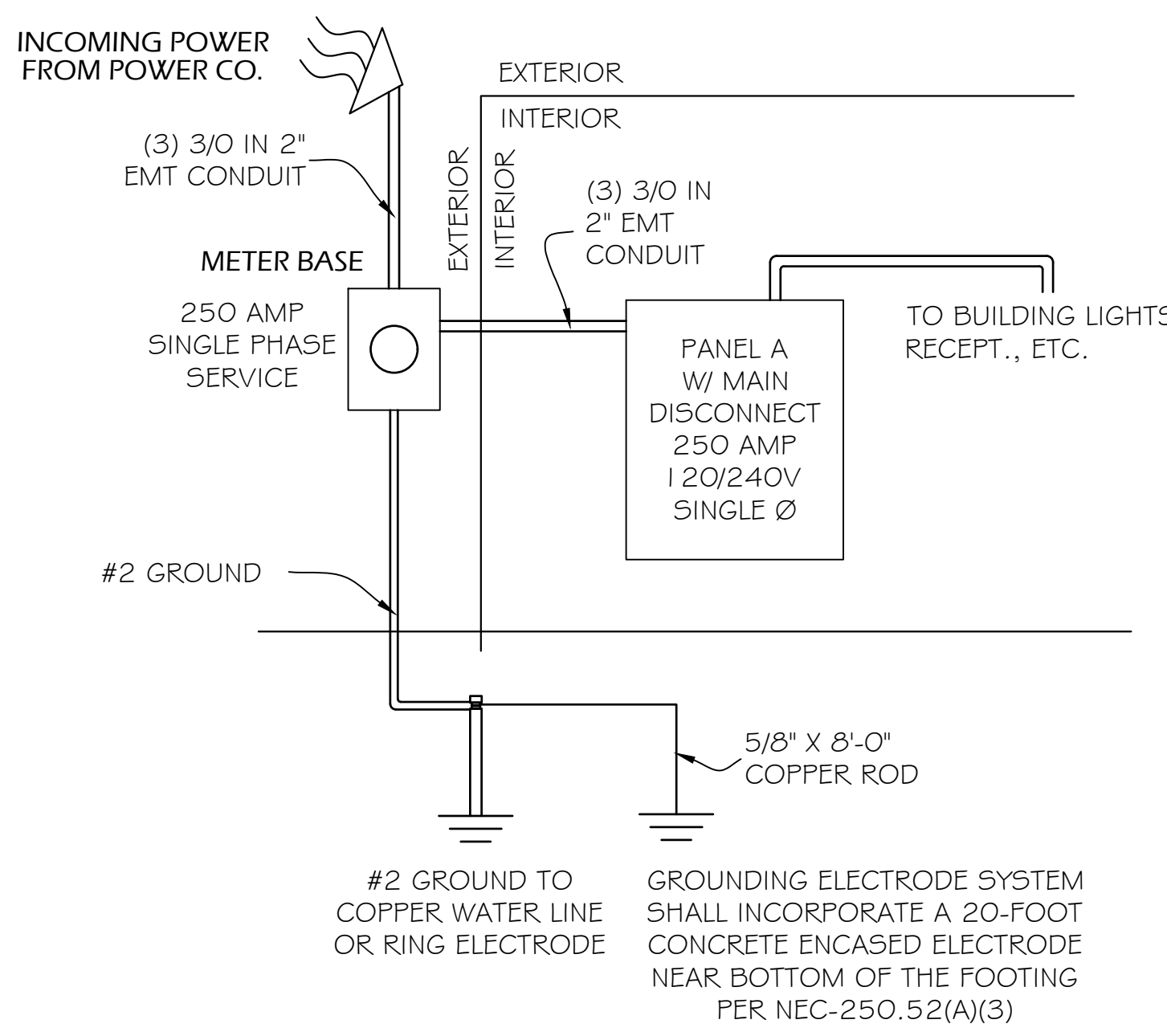
**NEW PANEL A - POWER & LIGHTS**  
**200 AMP 120/240 V 1 Ø PANEL**

**MAIN DISCONNECT IN PANEL**

DESCRIPTION	GA.	WATTS	CIR. NO.	AMP	AMP	CIR. NO.	WATTS	GA.	DESCRIPTION
BEDROOM #1 CIRCUIT	12	500	1	20	20	14	500	12	KITCHEN CIRCUIT
BATHROOM CIRCUIT	12	500	2	20	20	15	500	12	LIVING ROOM/DINING ROOM CIRCUIT
BEDROOM #2 CIRCUIT	12	500	3	20	20	16	500	12	UTILITY / LAUNDRY CIRCUIT CIRCUIT
AIR CONDITIONING (HVAC) CIRCUIT	8	2500	4	50	20	17	500	12	PANTRY CIRCUIT
WASHER & DRYER	8	2500	5	40	20	18	500	12	BEDROOM #1 CLOSET CIRCUIT
HOT WATER TANK	8	4500	6	40	20	19	500	12	BEDROOM #2 CLOSET CIRCUIT
ELECTRIC STOVE	8	4500	7	40	20	20	500	12	FIRST FLOOR CIRCUIT
SMOKE/CO ALARM CIRCUIT	12	500	8	20	20	21	500	12	EXTERIOR OUTLETS/LIGHTING CIRCUIT
			9			22			
			10			23			
			11			24			
			12			25			
			13			26			

42-CIRCUIT PANEL SHOWN; INSTALL PANEL W/ 30 CIRCUITS MIN.  
 WATTS: 16,000  
 WATTS: 4,000  
**TOTAL WATTS: 16,000 + 4,000 = 20,000**  
**TOTAL AMPS: 166.67**

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
$\phi$	* SINGLE POLE SWITCH - 48" A.F.F.
$\phi_3$	* THREE WAY SWITCH - 48" A.F.F.
$\phi$ with circle	* ROTARY DIMMER SWITCH-MULTIPLE UNIT CONTROL
$\square$ with diagonal lines	2X4 SURFACE MOUNT (3)-18W LED BULBS
$\circ$ with center dot	RECESSED DOWNLIGHT - DIMMER SWITCH - DIMMABLE 12W LED
$\odot$	RECESSED LIGHT (SPOT) - ROTATES 358 DEGREES - DIMMABLE 12W LED
$\odot$ with radiating lines	CEILING MOUNT SUSPENDED CHANDELIER - (5) 32W FLUORESCENT LAMPS (EACH FIXTURE)
$\parallel$	TASK LIGHT - UNDER CABINET/ AUDIO DESK BACK - MAX. 42 W FLUOR.
$\square$ with horizontal lines	WALL VANITY SURFACE MOUNT - 12W LED
$\square$ with cross-hatch	RESTRM. EXHAUST FAN 110 CFM - INTERLOCK TO LIGHT SWITCHES; VENT DIRECT THROUGH TO OUTSIDE; SEAL ALL ROOF OR WALL PENETRATIONS
$\square$ with X	RESTROOM EXHAUST FAN VENT; VENTS DUCTED TO ONE EXHAUST FAN SIZED FOR TOTAL FIXTURE COUNT
$\square$ with triangle	EXTERIOR FLOOD LIGHT/SURFACE MOUNTED
$\triangle$	EXTERIOR GOW LED WALL MOUNTED LIGHT
$\oplus$	DUPLEX RECEPTACLE - 110/120 V 19" MIN. - 48" MAX. A.F.F., U.N.O.; VERIFY HGT. IN RANGE SPECIFIED W/ OWNER PRIOR TO INSTALLATION
$\oplus$ GFCI	GROUND FAULT CIRCUIT INTERRUPTER; INSTALL NOTES AS DUPLEX REC.
$\oplus$ C	CLG. DUPLEX RECEPTACLE - 110/120 V
$\oplus$ F	SUB-FLOOR MOUNTED DUPLEX RECEPTACLE - 110/120 V WITH COVER
$\oplus$ WP	WATERPROOF RECEPTACLE; INSTALL NOTES SAME AS DUPLEX REC.
$\oplus$ SPO	SPECIAL PURPOSE RECEPTACLE; 208/120V UTILITY (STOVE, WASHER) INSTALL NOTES SAME AS DUPLEX REC.
$\square$ with meter symbol	ELECTRIC METER - NEW 200 AMP SERVICE
$\square$ with ELEC	NEW 200AMP ELEC. FEED PANEL - FOR BUILDING CIRCUITS & CAPACITY FOR POSSIBLE FUTURE ADDITION
$\square$ with horizontal lines	CEILING MOUNTED FLUORESCENT OVERHEAD
$\diamond$ with C	HARD WIRED COMBINED CO & CO2 DETECTOR WITH BATTERY BACKUP



**RISER DIAGRAM**  
250 AMP 120/240 SINGLE PHASE PANEL  
COORDINATE ELECTRICAL WORK WITH THE LOCAL POWER COMPANY

**ELECTRICAL NOTES**

- ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE NATIONAL, STATE AND LOCAL REQUIREMENTS.
  - ELECTRICAL AND HVAC WORK SHALL BE COMPLETED BY AN INDIVIDUAL OR BUSINESS THAT IS LICENSED BY THE OHIO CONSTRUCTION INDUSTRY LICENSING BOARD AS REQUIRED BY ORC-4740 AND OAC-4141:16.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN WORKING ORDER BEARING THE "UL" OR EQUIVALENT LABEL WHENEVER SUCH STANDARDS HAVE BEEN ESTABLISHED.
- CONDUIT, MC CABLE OR OTHER APPROVED MATERIAL TO BE USED WHERE WIRING IS EXPOSED. TYPE NM WIRING MAY BE USED WHERE WIRING IS NOT EXPOSED AND IS PROTECTED WITH A THERMAL BARRIER HAVING A MINIMUM 15 MINUTE FINISH RATING. ALL UNDERGROUND CONDUCTORS SHALL BE IDENTIFIED FOR SUCH USE. ALL MATERIALS IN OPEN SPACE ABOVE CEILINGS TO BE PLENUM RATED WHERE SPACE IS USED AS A PLENUM.
- ALL WIRING OR CONDUIT AND PANEL CIRCUIT PROTECTION SHALL BE SIZED FOR THE CONNECTING LOADS PER THE NATIONAL ELECTRICAL CODE, TABLE 310-16.
- 200 AMP PANEL, 120/240V, SINGLE PHASE, 3-WIRE; NEW SERVICE.
- LIGHTING IS REQUIRED IN ALL MEANS OF EGRESS, INCLUDING EXIT DISCHARGE, DURING ALL TIMES THE BUILDING SPACE SERVED BY THE MEANS OF EGRESS IS OCCUPIED. ILLUMINATION LEVEL AND POWER SOURCE REQUIREMENTS SHALL COMPLY WITH OBC 2017 SECTION 1006.
- THE POWER SUPPLY FOR MEANS OF EGRESS ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES ELECTRICAL SUPPLY. IN THE EVENT OF POWER SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE EGRESS AREAS PER SECTION 1006.3 OBC 2017. THE EMERGENCY SYSTEM SHALL PROVIDE POWER FOR NOT LESS THAN 90 MINUTES AND CONSIST OF STORAGE BATTERIES, UNIT EQUIPMENT OR ON-SITE GENERATOR IN ACCORDANCE WITH SECTION 2702 (OBC 2017).
- EXIT SIGNS ARE REQUIRED FOR TWO OR MORE EXITS AND SHALL COMPLY WITH THE LOCATION, SIZE, COLOR ILLUMINATION AND POWER SOURCE REQUIREMENTS OF OBC 2017, SECTION 1011.

**INSTALLATION NOTES:**

COORDINATE ALL WORK WITH THE PLUMBING AND HEATING CONTRACTOR(S). COORDINATE PLACEMENT OF LIGHT FIXTURES WITH HVAC DUCTWORK; FIELD ADJUST LOCATIONS OF LIGHTS & OTHER ELECTRICAL COMPONENTS AS NEEDED.  
 WHERE UNDERGROUND, ALL PVC TO BE SCHED. 80  
 PROVIDE WARNING TAPE FOR ANY DIRECT-BURIED CONDUCTORS AND CABLES PER NEC 300.5 (D) (3); SPECIFICALLY, UNDERGROUND SERVICE CONDUCTORS NOT ENCASED IN CONCRETE, BURIED 450mm (18") OR MORE BELOW GRADE ARE REQUIRED TO HAVE THEIR LOCATION IDENTIFIED BY A WARNING RIBBON PLACED IN THE TRENCH A MIN. OF 300mm (12") ABOVE THE UNDERGROUND INSTALLATION

**GROUNDING:**

- PROVIDE WATER BONDING TO COPPER PIPE OUT OF MAIN SWITCH PER ARTICLE 250, NEC; ATTACH TO CLOSEST ACCESSIBLE WATER PIPE; LOCATION TO BE FIELD DETERMINED
- AUXILIARY GROUNDING ELECTRODES PERMITTED IN ACCORDANCE WITH NEC 250.54

PROVIDE WARNING TAPE FOR ANY DIRECT-BURIED CONDUCTORS AND CABLES PER NEC 300.5 (D) (3); SPECIFICALLY, UNDERGROUND SERVICE CONDUCTORS NOT ENCASED IN CONCRETE, BURIED 450mm (18") OR MORE BELOW GRADE ARE REQUIRED TO HAVE THEIR LOCATION IDENTIFIED BY A WARNING RIBBON PLACED IN THE TRENCH A MIN. OF 300mm (12") ABOVE THE UNDERGROUND INSTALLATION



EXPIRES 12-31-2023

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2022

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No. 22-330

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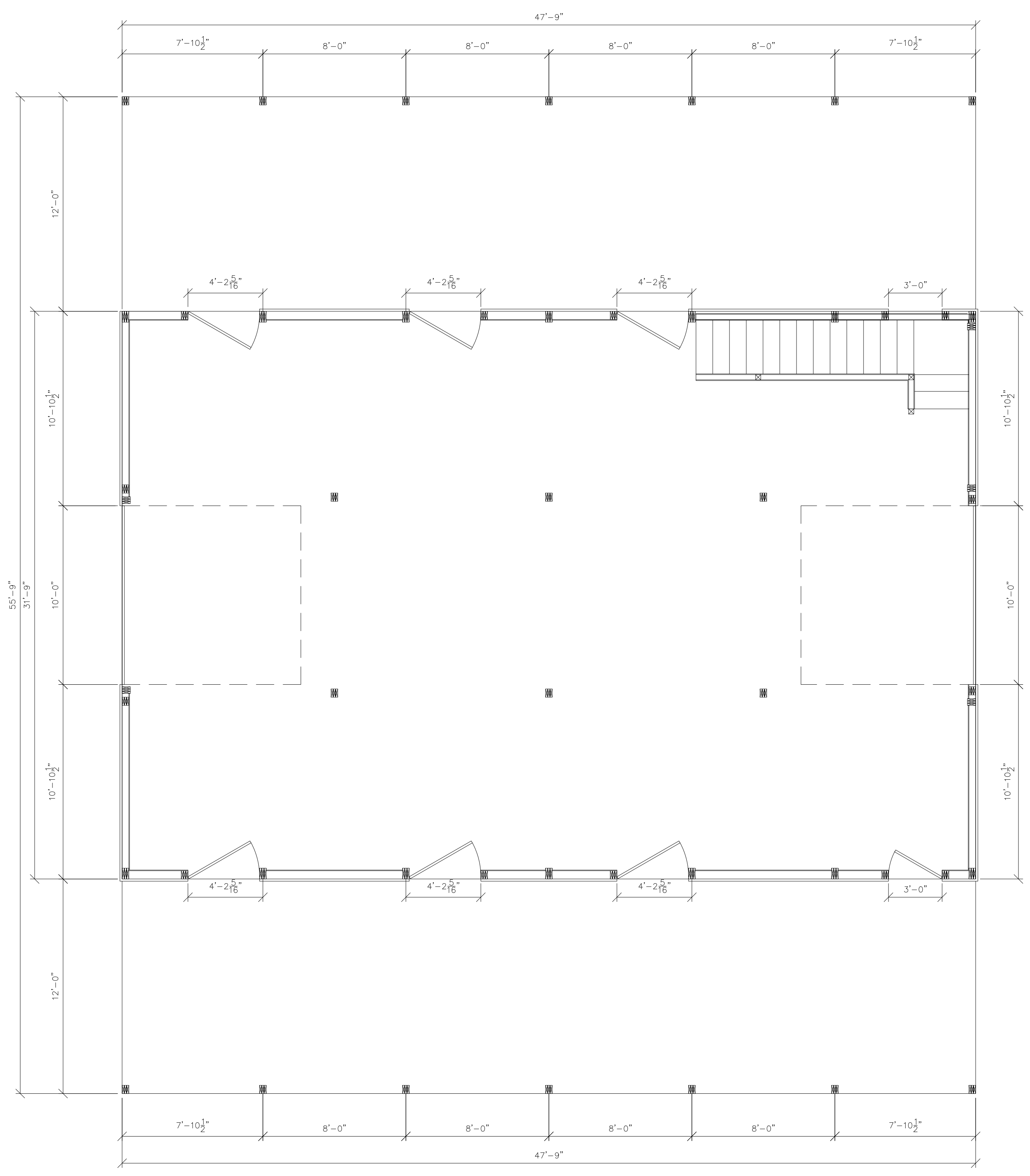
REVISIONS	DATE	DESCRIPTION

STARTED: 09.27.2022	DRAWN BY: DJB
REVIEWED: 10.03.2022	REVIEWED BY: JB
APPROVED: 10.03.2022	APPROVED BY: JJC

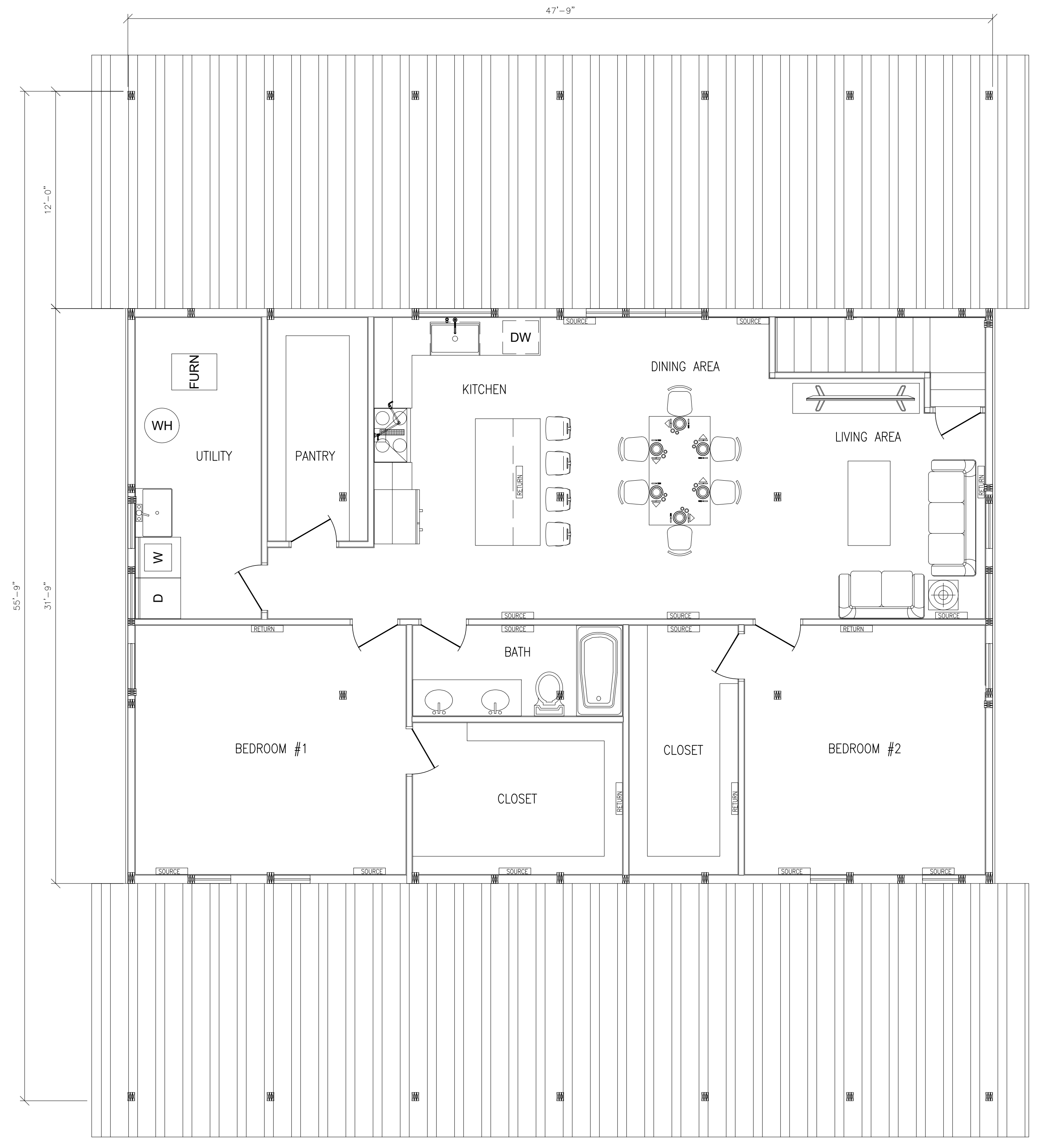
VERIFY ALL DIMENSIONS IN FIELD

FIRST & SECOND FLOOR ELECTRICAL  
PLAN VIEWS

**E1.0**



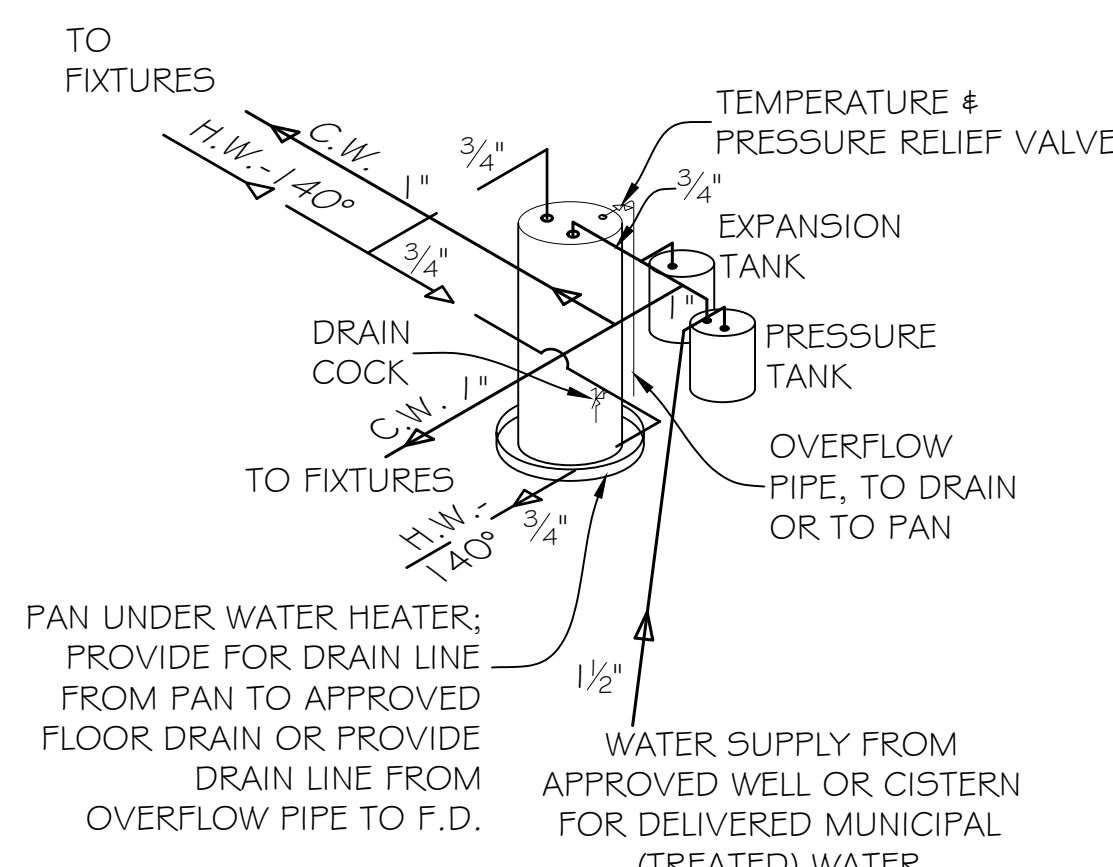
FIRST FLOOR HVAC PLAN  
SCALE: 1/4"=1'-0"



SECOND FLOOR HVAC PLAN  
SCALE: 1/4"=1'-0"

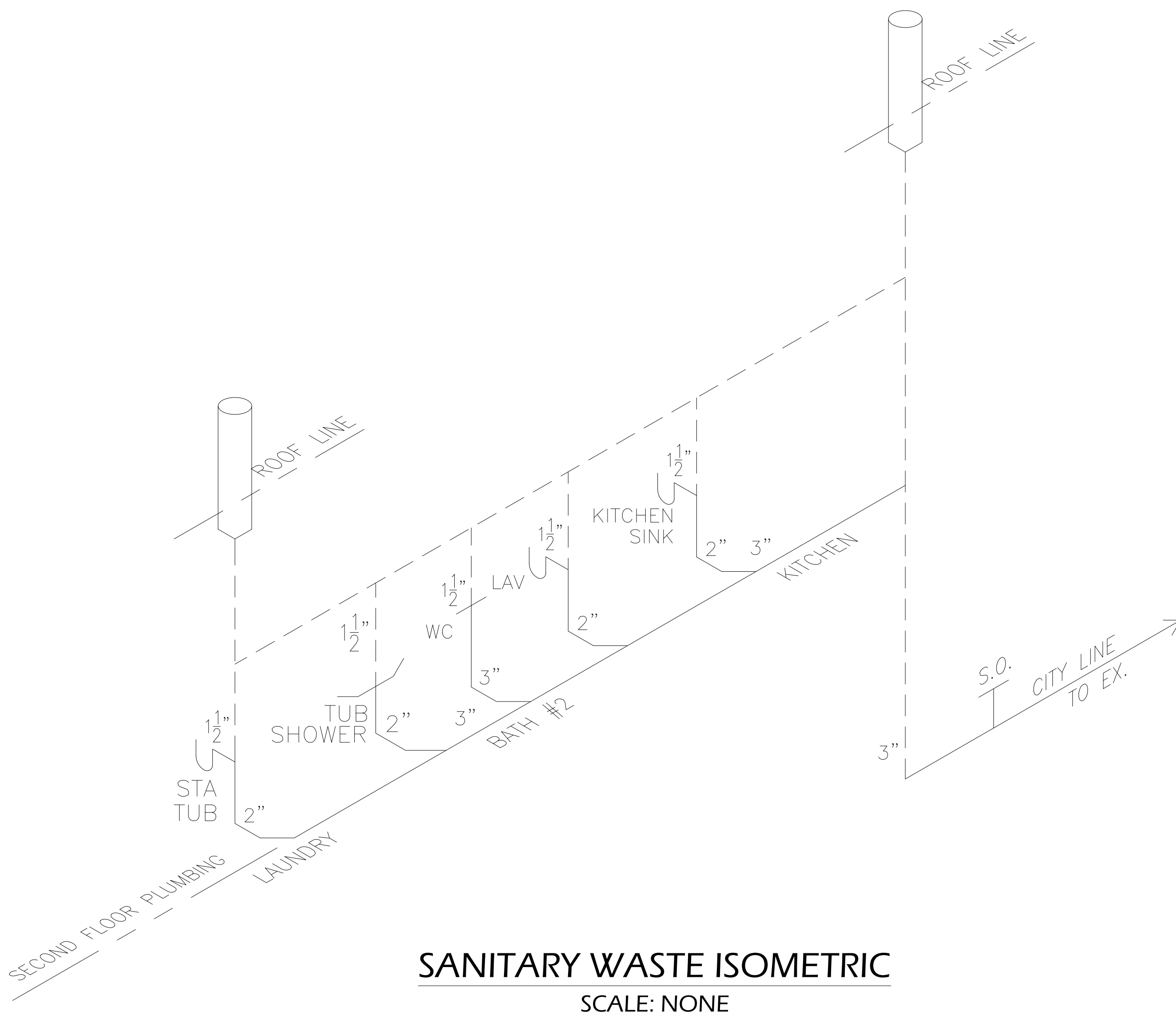
# PLUMBING NOTES

- PLUMBING EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH ITS UNDERWRITERS APPROVAL, THE MANUFACTURERS' RECOMMENDATIONS AND SPECIFICATIONS, GOOD ENGINEERING PRACTICES, AND LOCAL AND STATE CODES (REFER TO CHAPTER 29 OBC).
- WATER SERVICE PIPE AND FITTINGS SHALL CONFORM TO NSF 61 AND SHALL CONFORM TO ONE OF THE MATERIAL STANDARDS LISTED IN TABLES 605.3 AND 605.5 OF THE OPC, LATEST EDITION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - COPPER OR COPPER-ALLOY PIPE, TUBING AND FITTINGS,
  - CROSS-LINKED POLYETHYLENE (PEX) PLASTIC TUBING AND FITTINGS FOR PEX PLASTIC TUBING,
  - ACRYLONITRILE BUTADIENE STYRENE (ABS) PLASTIC PIPE AND ABS PLASTIC FITTINGS,
  - POLYVINYL CHLORIDE (PVC) PLASTIC SCHEDULE 40 PIPE AND PVC PLASTIC FITTINGS,
  - OTHER APPROVED MATERIALS AS LISTED IN THE TABLES NOTED ABOVE MAY BE SUBSTITUTED UPON REVIEW AND APPROVAL BY THE BUILDING DESIGNER.
- WATER DISTRIBUTION PIPE SHALL CONFORM TO NSF 61 AND SHALL CONFORM TO ONE OF THE STANDARDS LISTED IN TABLE 605.4, OPC, 2017 EDITION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - COPPER OR COPPER-ALLOY PIPE OR TUBING,
  - CROSS-LINKED POLYETHYLENE (PEX) PLASTIC TUBING,
  - CHLORONATED POLYVINYL CHLORIDE (CPVC) PLASTIC PIPE AND TUBING,
  - OTHER APPROVED MATERIALS AS LISTED IN THE TABLES NOTED ABOVE MAY BE SUBSTITUTED UPON REVIEW AND APPROVAL BY THE BUILDING DESIGNER.
- DOMESTIC WATER INSULATION: 1" THICK OWENS-CORNING 25 ASJ/SSL HEAVY DENSITY PIPE INSULATION.
- ALL GAS PIPING TO BE BLACK STEEL PIPE THREADED AND COUPLED; COMPLY WITH OMC, 2017 EDITION.
- ALL PLUMBING FIXTURES SHALL BE INSTALLED WITH SUPPLY SHUTOFF VALVES. EACH GAS APPLIANCE SHALL BE INSTALLED WITH A SHUTOFF VALVE.
- VALVES IN WATER PIPING SHALL BE BALL VALVES WITH BRONZE BODY SOLDERED ENDS, MINIMUM 150 POUNDS SWP. VALVES IN GAS PIPING SHALL BE AGA APPROVED SQUARE HEAD PLUG TYPE WITH LEVER HANDLE ADAPTER FOR GAS SERVICE.
- SOIL, WASTE, VENT AND DRAIN PIPING (UNDERGROUND AND ABOVE GROUND INTERIOR) AND FITTINGS SHALL CONFORM TO ONE OF THE MATERIAL STANDARDS LISTED IN TABLES 702.1, 702.2 AND 702.4 OF THE OPC, 2017 EDITION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - POLYVINYL CHLORIDE (PVC) PIPES AND PVC PIPE FITTINGS,
  - ACRYLONITRILE BUTADIENE STYRENE (ABS) PLASTIC PIPE AND ABS PIPE FITTINGS,
  - OTHER APPROVED MATERIALS AS LISTED IN THE TABLES NOTED ABOVE MAY BE SUBSTITUTED UPON REVIEW AND APPROVAL BY THE BUILDING DESIGNER.
  - ABS OR PVC MATERIALS MAY NOT BE USED IN PLENUM SPACE.
- WHERE PLUMBING PASSES THROUGH CONCRETE, PROVIDE MACHINE CUT STEEL PIPE SLEEVE 1" LARGER THAN OUTLINE DIAMETER OF PIPE. WHERE FLOORS ARE CORED DRILLED, STEEL SLEEVES ARE NOT REQUIRED. SEAL OPENINGS TO MAINTAIN THE INTEGRITY.
- WHERE ANY MATERIALS ARE INSTALLED THROUGH A FIRE BARRIER OR FIRE SEPARATION WALL OR FLOOR/CEILING ASSEMBLY, FIRE CAULK AROUND PENETRATION TO MAINTAIN FIRE RATING.
- PROVIDE ALL INSERTS AND SUPPORTS TO PROPERLY SUPPORT AND RETAIN PIPING TO CONTROL EXPANSION, ANCHORAGE, DRAINAGE, AND PREVENT SWAY AND VIBRATION.
- RUN ALL PIPING AS DIRECTLY AS POSSIBLE. ACTUAL LOCATION OF DRAIN, SOIL AND WASTE PIPING SHALL MEET THE VARIOUS BUILDING CONDITIONS. PERFORM ANY WORK NECESSARY TO CONCEAL PIPING OR CLEAN PIPING AND DUCTWORK OF OTHER TRADES.
- PROVIDE ALL STOPS, TRAPS, ESCUTCHEONS, BACKFLOW PREVENTERS, CARRIER, ETC. REQUIRED FOR A COMPLETE SYSTEM.
  - EACH FIXTURE TRAP SHALL HAVE LIQUID SEAL OF NOT LESS THAN 2 INCHES (51 MM) AND NOT MORE THAN 4 INCHES (102 MM) PER SECTION 1002.4 OPC.
  - A TRAP SEAL PRIMER VALVE IS NOT REQUIRED WHERE A FIXTURE TRAP IS SUPPLIED WITH WATER ON A REGULAR BASIS PER EXCEPTION, SECTION 1002.4 OPC. ROOM FLOORS WHERE FLOOR DRAINS ARE LOCATED ARE TO BE MOPPED REGULARLY.
- HORIZONTAL PLUMBING WASTE LINES TO SLOPE 1/4 INCH PER FOOT: WASTE LINES 3 TO 6 INCHES IN DIAMETER MAY SLOPE 1/8 INCH PER FOOT PER TABLE 704.1, OPC, 2017 EDITION.
- PLUMBING CONTRACTOR TO VERIFY SEWER/SEPTIC LOCATION, SITE ELEVATIONS AND LOCAL CODES AND REVISE AS REQUIRED FOR THE PLUMBING PERMIT AND CERTIFICATES OF INSPECTION.
- GUTTERS/DOWNSPOUTS MUST BE PROPERLY TIED INTO STORM DRAINAGE LINES TO PREVENT LEAKAGE INTO BASEMENT.

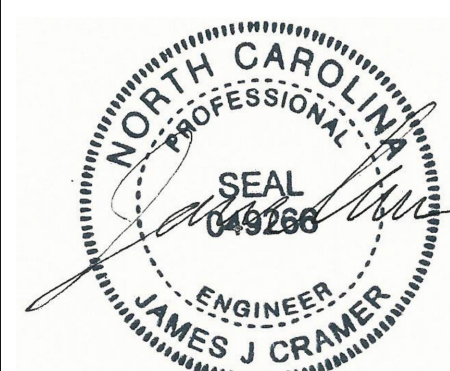


**WATER HEATER DIAGRAM**  
N.T.S.

PLUMBING FIXTURES SCHEDULE: MFR/MODEL	
FIXTURE / SYMBOL	DESCRIPTION
LAV	DROP-IN LAVATORY, W/LEVER HANDLES MOUNTED IN ACCESSIBLE COUNTER, ACCESSIBLE REACH FAUCET; 1 1/4" GRID DRAIN, 1 1/4" 20 GA. P-TRAP, STOPS & SUPPLIES; TRAP & SUPPLY INSULATION (PROTECT HOT WATER AND DRAIN LINES FROM CONTACT).
W.C.	AMERICAN STANDARD VITREOUS CHINA FLOOR MOUNTED 1.6 GPF ELONGATED, SmartHeight TOILET OR EQUAL, STD ROUGH-IN; GLAZED TRAPWAY; COLOR: WHITE. EQUAL OR BETTER MAY BE SUBSTITUTED.
WATER HEATER  EXP TK	GAS WATER HEATER W/EXPANSION & PRESSURE TANK
	STANDARD BATH TUB SHOWER COMBO 60x30



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PLUMBING ISOMETRIC