

MAPLE HILL - LOT 1  
 4238 DARROCH ROAD  
 LILLINGTON, NC 27546



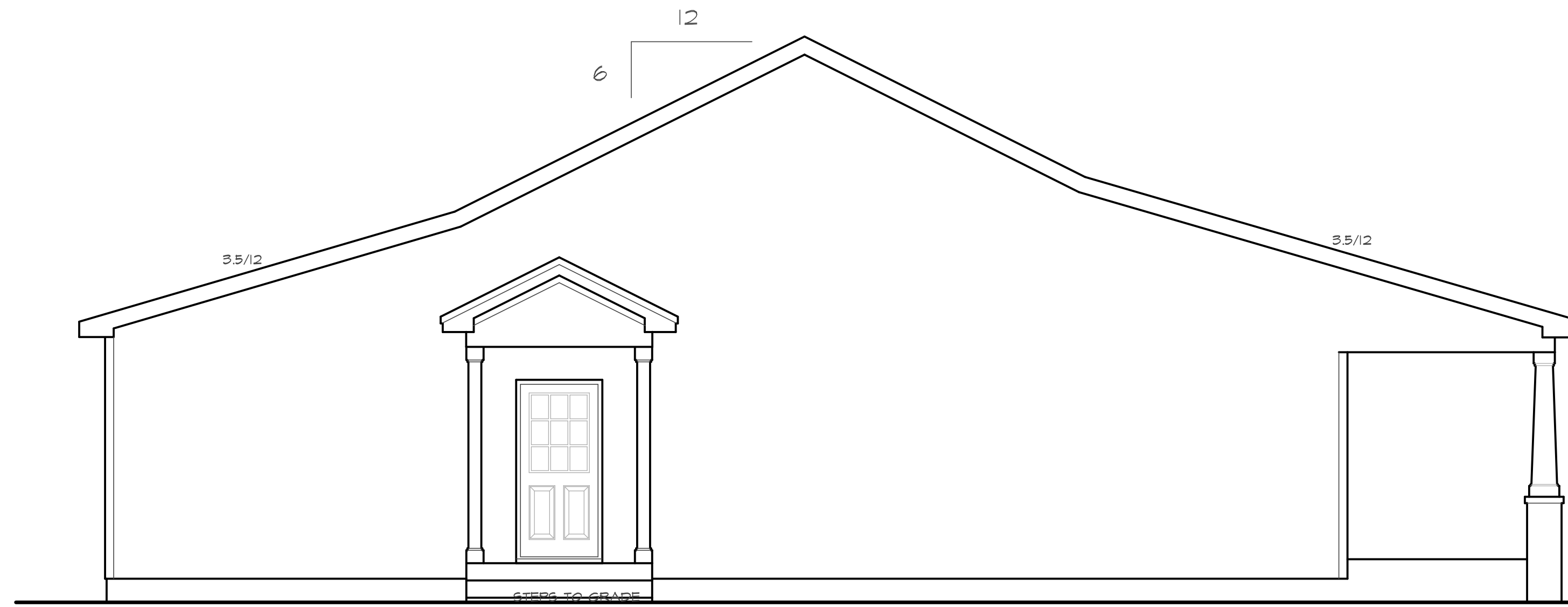
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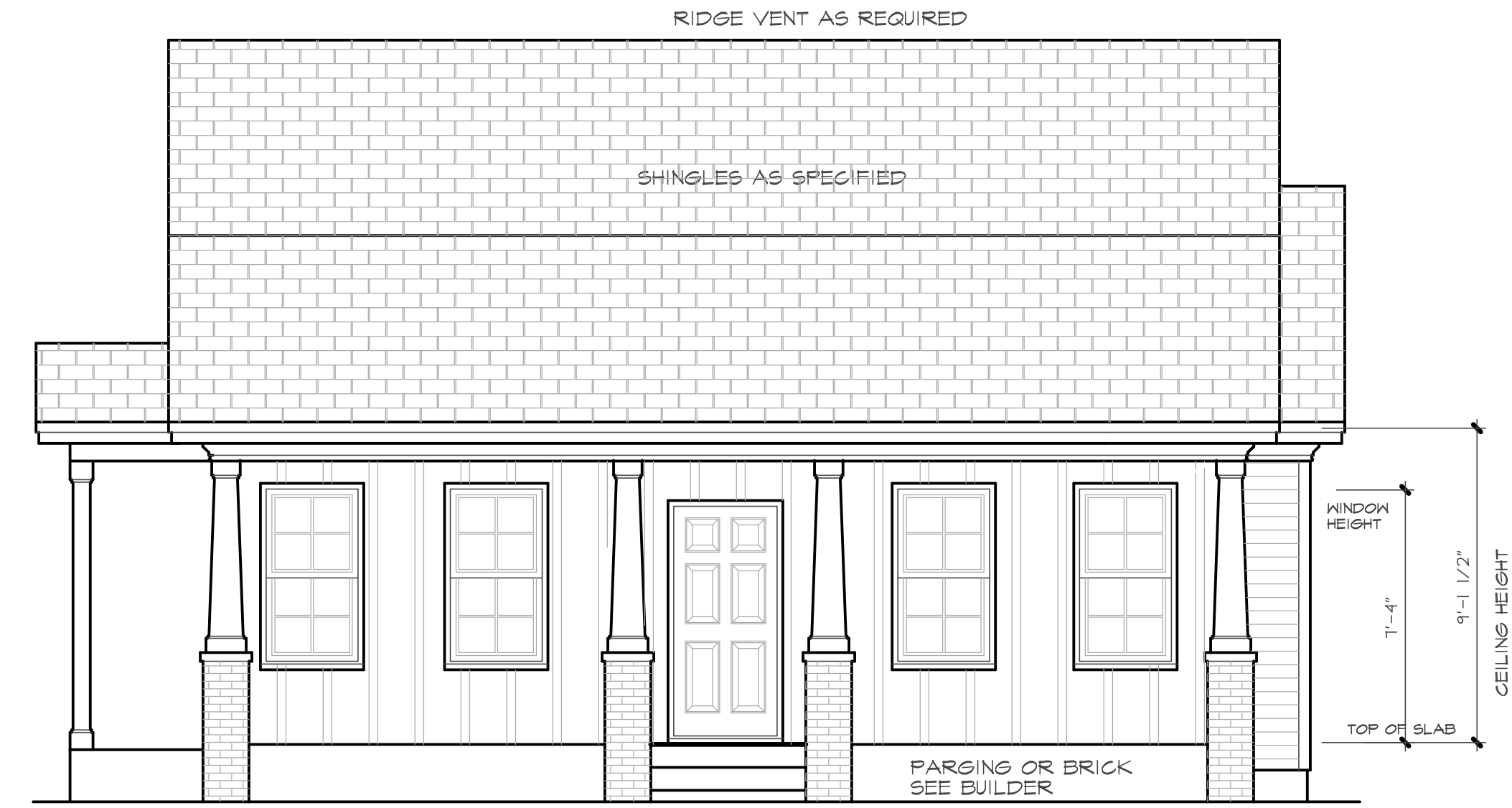
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LEFT SIDE ELEVATION  
 SCALE 1/8" = 1'0"



FRONT ELEVATION  
 SCALE 1/4" = 1'0"

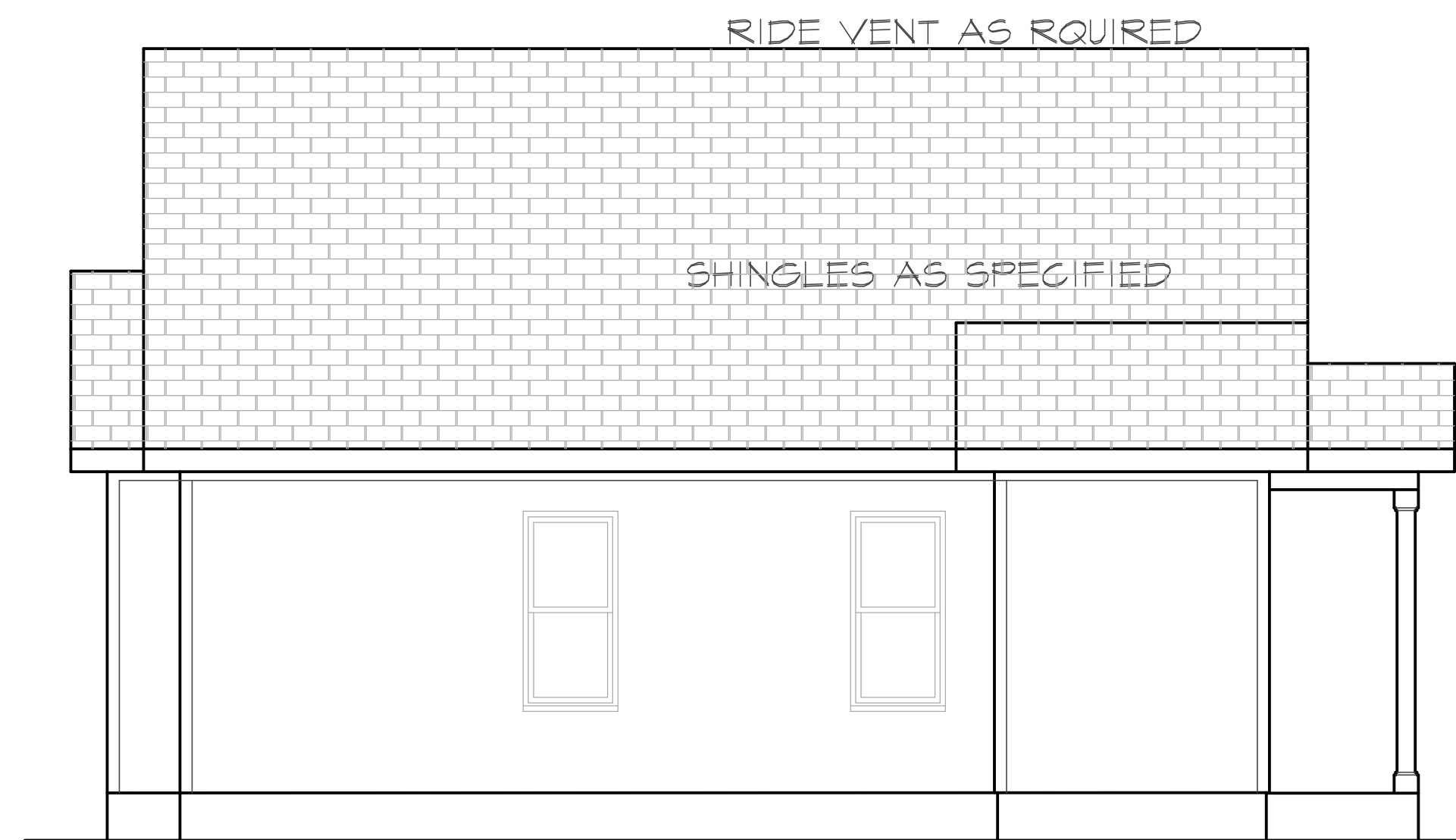
**ATTIC VENTILATION:**

THE NET FREE VENTILATING AREA SHALL BE NOT LESS THAN 1 TO 150 OF THE AREA OF THE SPACE VENTILATED EXCEPT THAT THE AREA MAY BE 1 TO 300, PROVIDED AT LEAST 50 PERCENT OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATORS LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED AT LEAST 5 FEET ABOVE EAVE OR CORNICE VENTS WITH THE BALANCE OF THE REQUIRED VENTILATION TO BE PROVIDED BY EAVE OR CORNICE VENTS.

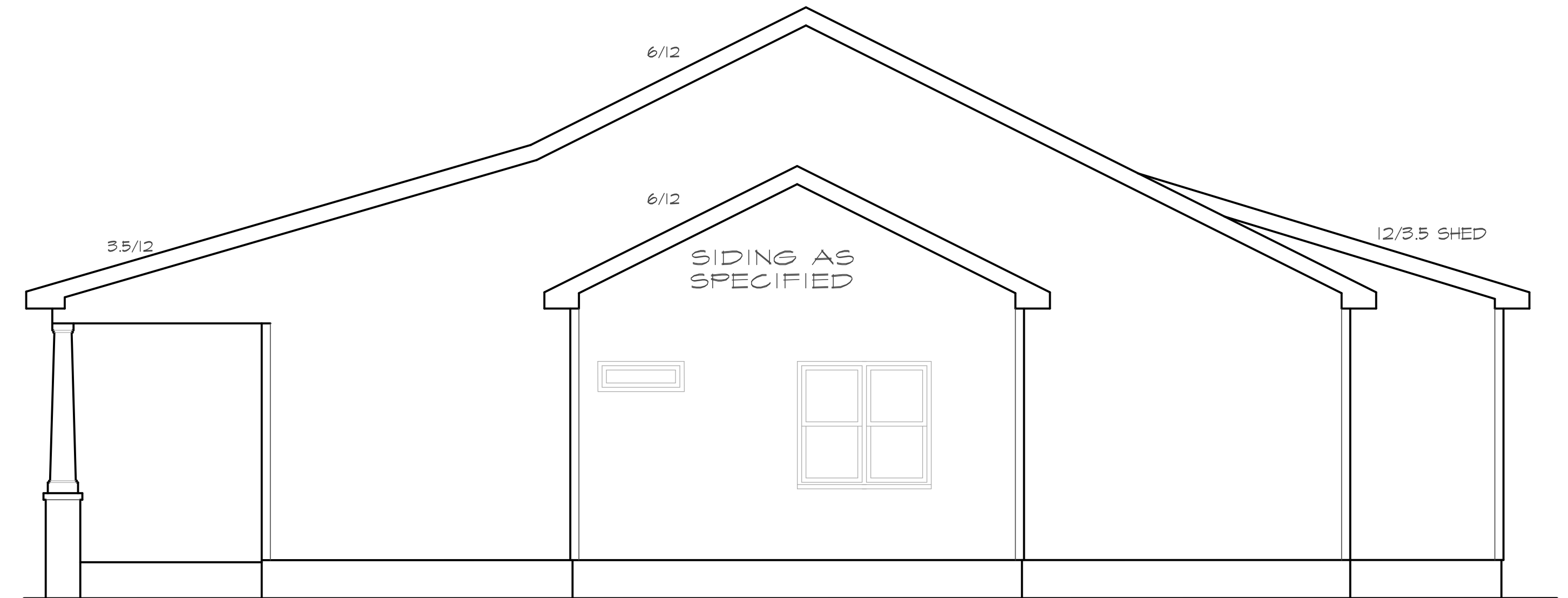
GROSS ATTIC AREA TO BE VENTILATED 1255 SQ.FT.

1255/300 = 4.2 SQ.FT. NET FREE AREA

50% OF VENTING MUST BE 3FT. ABOVE EAVE OR SOFFIT VENTS.



REAR ELEVATION  
 SCALE 1/8" = 1'0"



RIGHT SIDE ELEVATION  
 SCALE 1/8" = 1'0"

Plan # **BELLA IV**

THIS PLAN DESIGNED UNDER NORTH CAROLINA RESIDENTIAL CODE 2018 EDITION (2018 IRC)

DATE 10/19/2023

PROJECT # 231005

**FOUNDATION NOTES:**

1. Duct code min. 4'-0" above grade to be listed or approved based per Appendix M relating to hose end by its sales with 50# galvanized tube @ 20' o.c. and 12" hot dipped galv. @ 42'.
2. Concrete shall be tested with one of the approved methods as outlined in R602.10.3.
3. Structure members fastening to concrete to Table R602.3(1) and (2).
4. Grades and plans shall bear on center 1/3 of pier and footing, respectively.
5. 2018 NC State Residential Building Code apply to the construction of footings.
6. Typical lag bolts to be 1/2" x 6" deep, (LNC).
7. Pressure treated wood shall be installed for exterior use.
8. Hanger Schedule (Simpson hangers) for beam to beam connections (LNC)
  - a. (2018) LUS2-D-2
  - b. (2018) LUS2-D-3
  - c. (2018) LUS3-H2S4-D
9. Concrete shall have min. 28 day strength of 3000 psi and max. slump of 8" unless noted otherwise (LNC). All concrete shall be proportioned, mixed, handled, sampled, tested, and placed in accordance with AC current standards. All samples for curing shall be taken from the unit pump.
10. Allowable soil bearing pressure assumed to be 2000 psf. The contractor must consult Geotechnical Engineer & the Structural Engineer if unsatisfactory subsurface conditions are encountered. The surface area adjacent to the foundation wall shall be provided adequate drainage and shall be graded so as to drain surface water away from foundation walls.

**FOUNDATION VENTING**

**SECTION R408 UNDER FLOOR SPACE**

R408.1 Ventilation. The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement or cellar) shall be provided with ventilation openings through foundation walls or exterior walls. The minimum net area of ventilation openings shall not be less than 1 square foot for each 150 square feet (13.7 m squared) for each 100 m squared of under-floor space area. One such ventilating opening shall be within 3 feet (914 mm) of each corner of said building.

CRAWL AREA TO BE VENTED: 1211 SQ.FT.  
1211/1500 = .807 NET FREE VENTING AREA REQUIRED

**R408.2 Ground Vapor Retarder**

A minimum 6 mil. polyethylene vapor retarder shall be installed to cover all earth in the crawl space with joints lapped not less than 12"

**FOUNDATION STRUCTURAL NOTES:**

1. (B) 2 x 10 SFF #2 GIRDER DROPPED TYPICAL LNO.
2. CONCRETE BLOCK PIER SIZE SHALL BE:
 

SIZE	HOLLOW MASONRY	SOLID MASONRY
8 x 16	UP TO 32" HIGH	UP TO 5'-0" HIGH
12 x 16	UP TO 48" HIGH	UP TO 8'-0" HIGH
16 x 16	UP TO 64" HIGH	UP TO 12'-0" HIGH
24 x 24	UP TO 96" HIGH	

 WITH 30" x 30" x 10" CONCRETE FOOTING, LNO.
3. WALL FOOTING AS FOLLOWS:
 

DEPTH	8" - UP TO 2-1/2 STORY
	10" - 3 STORY

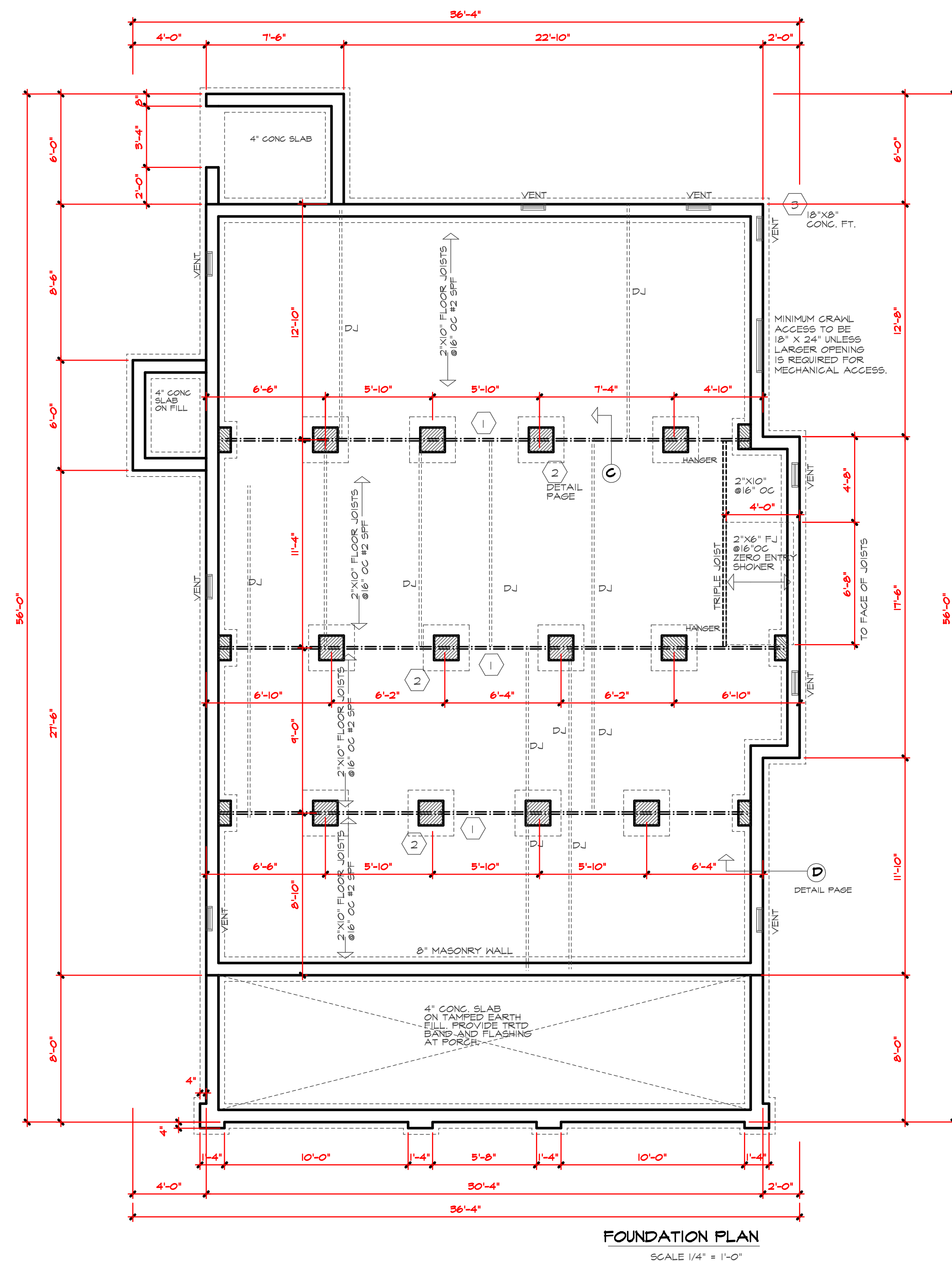
 WIDTH: SIDING (OR EQUAL)
 

8" - UP TO 2-1/2 STORY
16" - 3 STORY

 BRICK VENEER
 

16" - 1 STORY
20" - 2 STORY
24" - 3 STORY
4. ■ DESIGNATES A SIGNIFICANT POINT LEAD TO HAVE SOLID BLOCKING TO PIER. SOLID BLOCK ALL BEAM BEARING POINTS NOTED TO HAVE THREE OR MORE SIDES TO FIN, TYPICAL.
5. ABBREVIATIONS:
  - SJ = SINGLE JOIST
  - DJ = DOUBLE JOIST
  - TJ = TRIPLE JOIST
6. (A) 2 x 10 SFF #2 GIRDER, TYPICAL LNO.

FOR FOUNDATION WALL HEIGHT AND BACKFILL REQUIREMENTS, REFER TO NORTH CAROLINA RESIDENTIAL CODE TABLE R404.1 (1 THRU 4). NOTE: ASSUMED SOIL BEARING CAPACITY = 2000 PSF. CONTRACTOR MUST VERIFY SITE CONDITIONS AND CONTACT SOILS ENGINEER IF MARGINAL OR UNSTABLE SOILS ARE ENCOUNTERED. ATTACH SILL PLATE WITH 1/2" DIA. ANCHOR BOLTS AT 6'-0" CENTERS (1" EMBEDMENT) AND 12" FROM EACH PLATE END, (SECTION R 408.1.6)



**FOUNDATION PLAN**  
SCALE 1/4" = 1'-0"

Plan # **BELLA IV**

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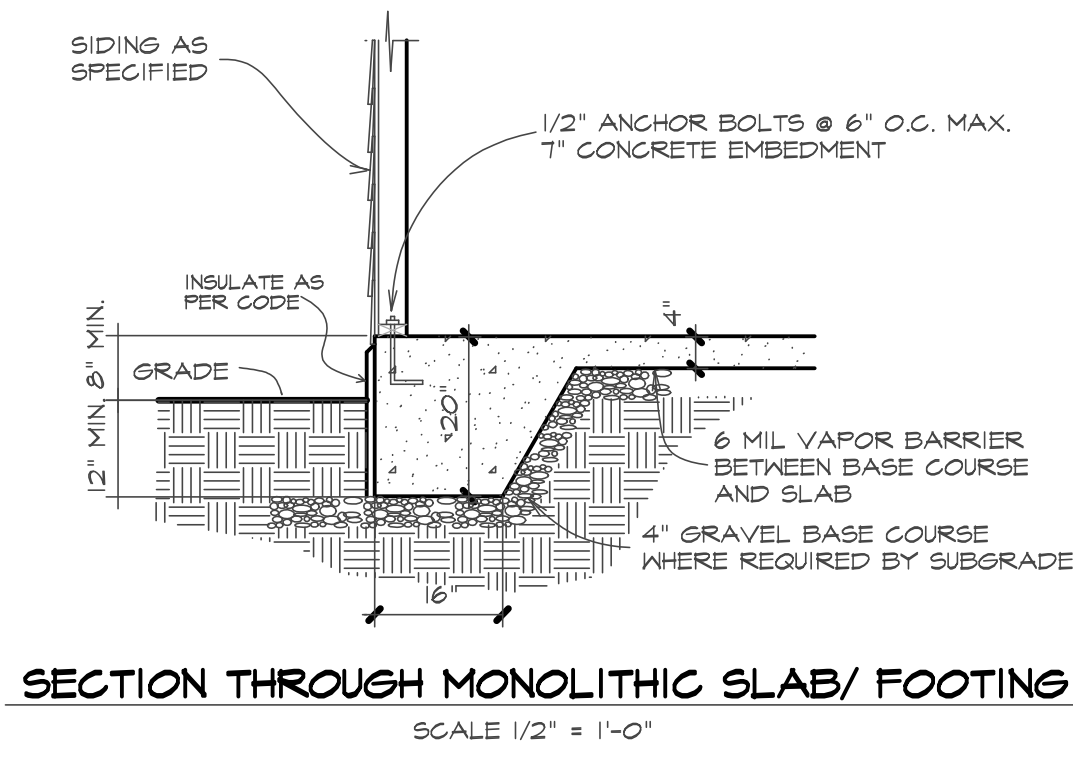
DATE 10/19/2023

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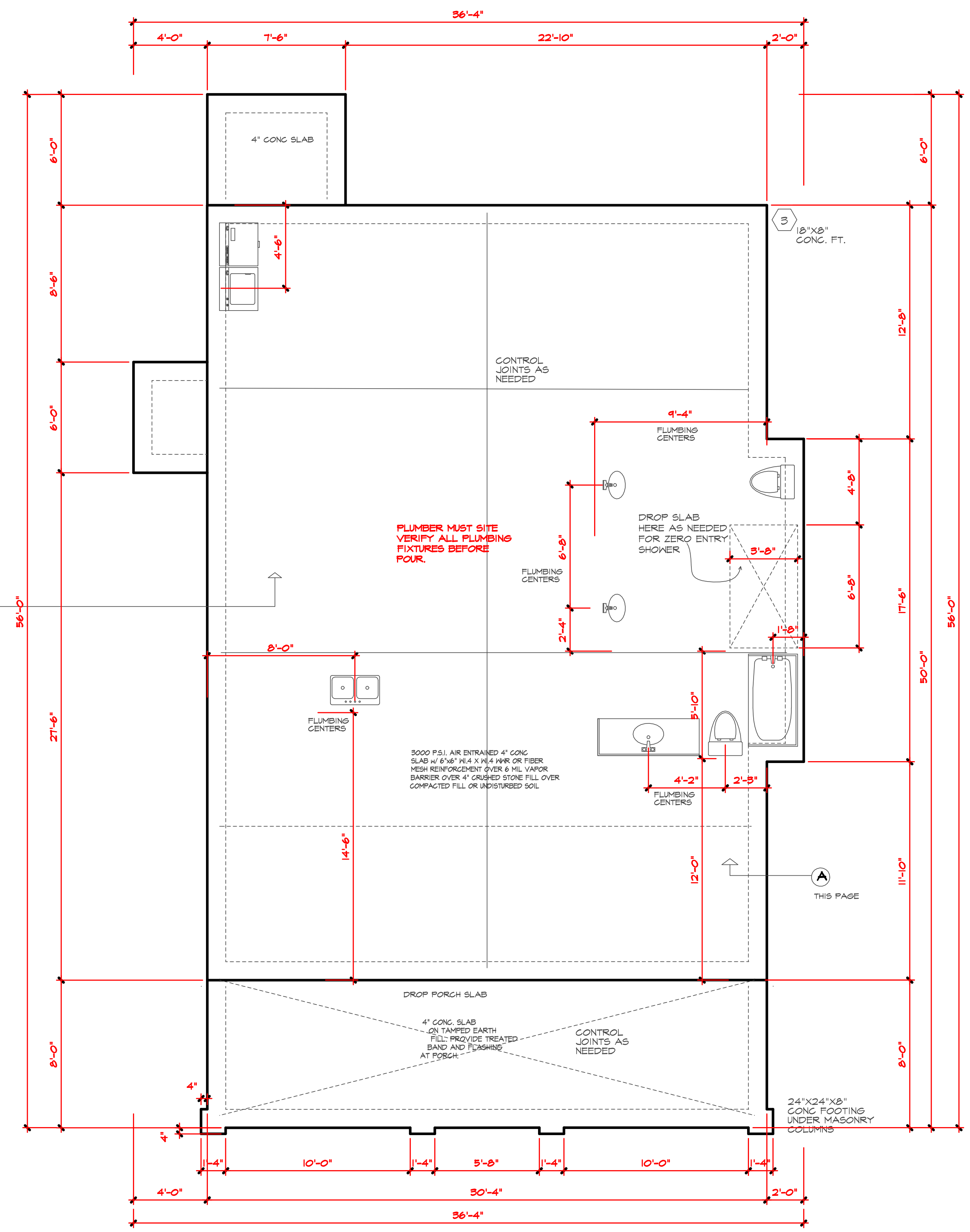
**FOUNDATION STRUCTURAL NOTES:**

1. (B) 2 x 10 SFF #2 GIRDER DROPPED TYPICAL UND.
2. CONCRETE BLOCK PIER SIZE SHALL BE:  

SIZE	HOLLOW MASONRY	SOLID MASONRY
8 x 16	UP TO 32' HIGH	UP TO 5'-0" HIGH
12 x 16	UP TO 48' HIGH	UP TO 9'-0" HIGH
16 x 16	UP TO 64' HIGH	UP TO 12'-0" HIGH
24 x 24	UP TO 96' HIGH	
3. WALL FOOTING AS FOLLOWS:  
 DEPTH: 3'-1" UP TO 2-1/2 STORY  
 10' - 3 STORY  
 WIDTH: SIDING (OR EQUAL)  
 - 16" UP TO 2-1/2 STORY  
 - 18" - 3 STORY  
 BRICK VENEER  
 - 16" - 1 STORY  
 - 20" - 2 STORY  
 - 24" - 3 STORY  
 FOR FOUNDATION WALL HEIGHT AND BACKFILL REQUIREMENTS REFER TO NORTH CAROLINA RESIDENTIAL CODE TABLE R401.1 (1) THRU (4).  
 NOTE: ASSUMED SOIL BEARING CAPACITY = 2000 PSF. CONTRACTOR MUST VERIFY SITE CONDITIONS AND CONTACT SOILS ENGINEER IF MARGINAL OR UNSTABLE SOILS ARE ENCOUNTERED. ATTACH SILL PLATE WITH 1/2" DIA. ANCHOR BOLTS AT 6'-0" CENTERS (1" EMBEDMENT) AND 12" FROM EACH PLATE END. (SECTION R 405.1.6)  
 4. ■ DESIGNATES A SIGNIFICANT POINT LOAD TO HAVE SOLID BLOCKING TO PIER. SOLID BLOCK ALL BEAM BEARING POINTS NOTED TO HAVE THREE OR MORE STUDS TO FND, TYPICAL.  
 5. ABBREVIATIONS:  
 "S" = SINGLE JOIST  
 "D" = DOUBLE JOIST  
 "T" = TRIPLE JOIST  
 6. (A) 2 x 10 SFF #2 GIRDER, TYPICAL UND.



- FOUNDATION NOTES:**
1. Dredge spoils min. 4' above grade are to be hauled or disposed tracked per Appendix M. Retaining to house will be by owner with 5/8" galvanized bolts @ 20' o.c. and 1/2" hot dipped galv. @ 42' o.c.
  2. Concrete shall be braced with one of the approved methods as outlined in R402.10.3.
  3. Structure members fastening to: conform to Table R602.3(1) and (2).
  4. Girders and steel shall bear on center 1/3 of pier and footing, respectively.
  5. 2018 NC State Residential Building Code apply to the construction of footing.
  6. Typical lag bolting to be 1/2"x3" deep. (UNC)
  7. Pressure treated wood shall be installed for exterior use.
  8. Hinge Schedule (Girspace hangers) for beam to beam connections (UNC)  
 a. (D2)19 x LUS2 0-2  
 b. (D2)19 x LUS2 0-3  
 c. (D2)14 x LUS1 HUS4 10
  9. Concrete of all have min. 28 day strength of 3000 psi, and max. slump of 6 inches unless noted otherwise (UNC) Air entrained per Table R602.3(1) and (2). All concrete shall be proportioned, mixed, handled, sampled, tested, and placed in accordance with A.C.I. current standards. All samples for sampling shall be taken from the exit pump.
  10. Allowable soil bearing pressure assumed to be 2000 psf. The contractor must contact Geotechnical Engineer & the Structural Engineer if unsatisfactory subsurface conditions are encountered. The surface area adjacent to the foundation wall shall be provided adequate drainage, and shall be graded so as to drain surface water away from foundation walls.



Plan #

**BELLA IV**

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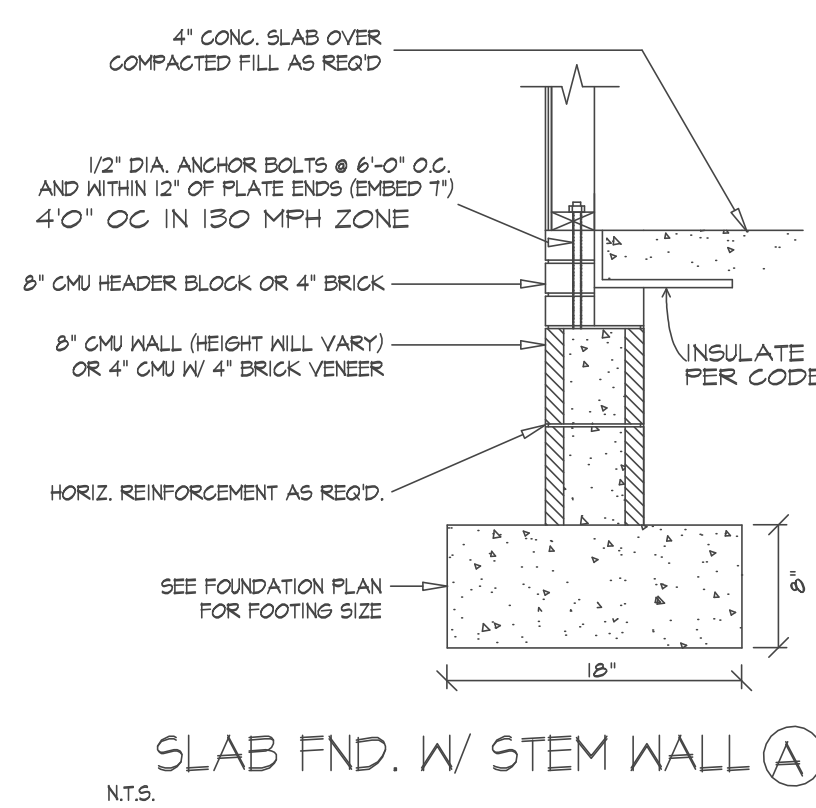
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PROJECT # 231005

**FOUNDATION STRUCTURAL NOTES:**

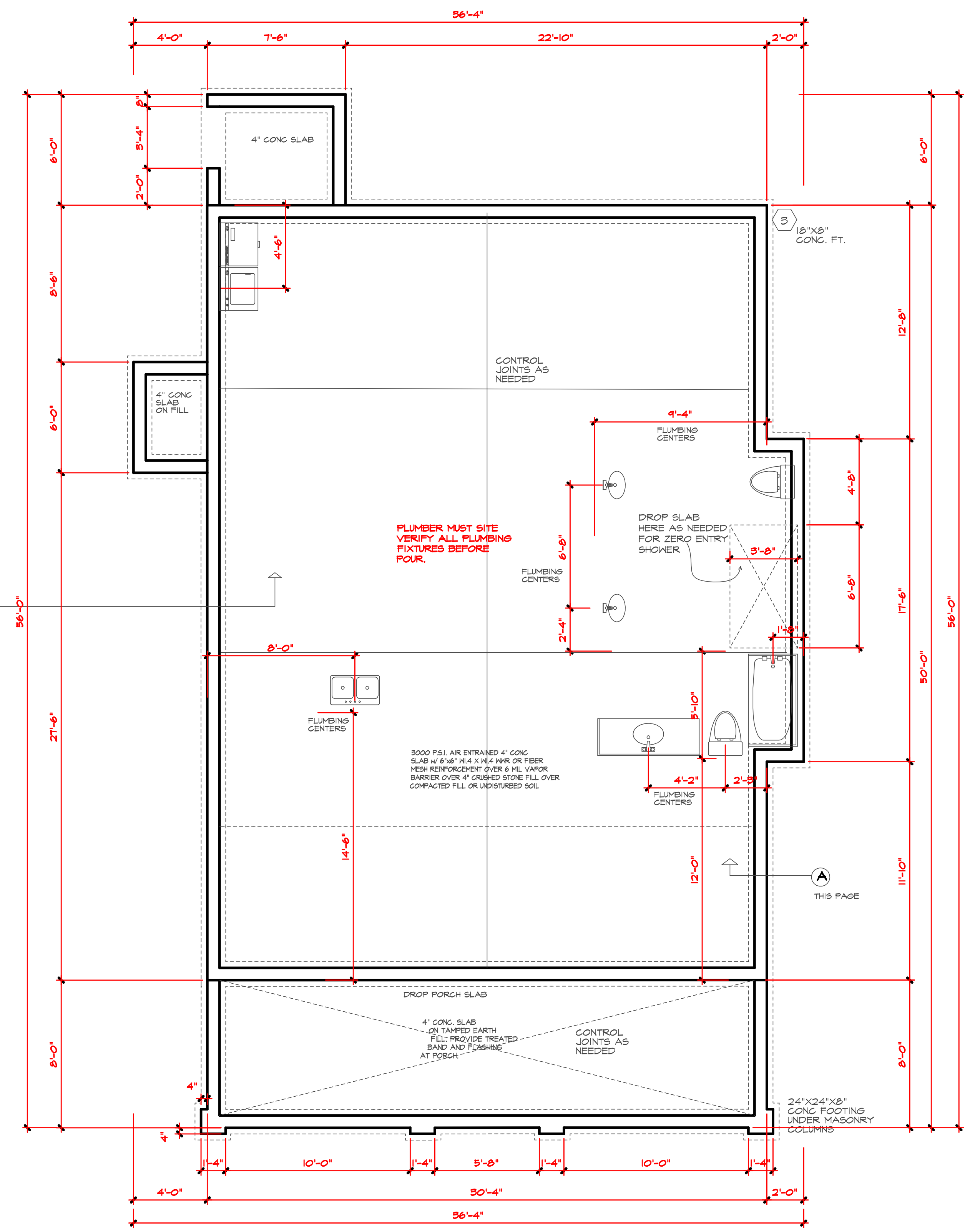
- 1 (B) 2 x 10 SFF #2 GIRDER DROPPED TYPICAL UND.
- 2 CONCRETE BLOCK PIER SIZE SHALL BE:  

SIZE	HOLLOW MASONRY	SOLID MASONRY
8 x 16	UP TO 33" HIGH	UP TO 3'-0" HIGH
12 x 16	UP TO 48" HIGH	UP TO 4'-0" HIGH
16 x 16	UP TO 64" HIGH	UP TO 12'-0" HIGH
24 x 24	UP TO 96" HIGH	
- 3 WALL FOOTING AS FOLLOWS:  
 DEPTH: 8" - UP TO 2-1/2 STORY  
           10" - 3 STORY  
 WIDTH: SIDING (OR EQUAL)  
           - 16" - UP TO 2-1/2 STORY  
           - 18" - 3 STORY  
       BRICK VENEER  
           - 16" - 1 STORY  
           - 20" - 2 STORY  
           - 24" - 3 STORY  
 FOR FOUNDATION WALL HEIGHT AND BACKFILL REQUIREMENTS REFER TO NORTH CAROLINA RESIDENTIAL CODE TABLE R401.1 (1) THRU (4).  
 NOTE: ASSUMED SOIL BEARING CAPACITY = 2000 PSF. CONTRACTOR MUST VERIFY SITE CONDITIONS AND CONTACT SOILS ENGINEER IF MARGINAL OR UNSTABLE SOILS ARE ENCOUNTERED. ATTACH SILL PLATE WITH 1/2" DIA. ANCHOR BOLTS AT 6'-0" CENTERS (1" EMBEDMENT) AND 12" FROM EACH PLATE END. (SECTION R 405.1.6)  
 4 ■ DESIGNATES A SIGNIFICANT POINT LOAD TO HAVE SOLID BLOCKING TO PIER. SOLID BLOCK ALL BEAM BEARING POINTS NOTED TO HAVE THREE OR MORE STUDS TO FND, TYPICAL.  
 5 ABBREVIATIONS:  
   "SL" = SINGLE JOIST  
   "DL" = DOUBLE JOIST  
   "TL" = TRIPLE JOIST  
 6 (A) 2 x 10 SFF #2 GIRDER, TYPICAL UND.



**FOUNDATION NOTES:**

1. Deck posts min. 4' above grade are to be knee or diagonally braced per Appendix M. Bracing to house will be by valer with 5/8" galvanized bolts @ 20' o.c. and 1x2 hot dipped galv @ 42" o.c.
2. Concrete shall be braced with one of the approved methods as outlined in R1002.10.3.
3. Structure members fastening to: conform to Table R1002.3(1) and (2).
4. Girders and steel wall bear on center 1/3 of pier and footing, respectively.
5. 2018 NC State Residential Building Code apply to the construction of footing.
6. Typical lag bolting to be 1/2"x3" deep (UNC).
7. Pressure treated wood shall be installed for exterior use.
8. Hinge Schedule (Girder hangers) for beam to beam connections (UNC)  
 a. (2)2x10 LUS2-D-2  
 b. (2)2x10 LUS2-D-3  
 c. (2)2-1x LUS1-HUS4-10
9. Concrete of all have min. 28 day strength of 4000 psi, and max. slump of 4 inches unless noted otherwise (JNO) Air entrained per Table R1002.3(1) and (2). All concrete shall be proportioned, mixed, handled, sampled, tested, and placed in accordance with AIA cement standards. All samples for sampling shall be taken from the exit pipe.
10. Allowable soil bearing pressure assumed to be 2000 psf. The contractor must contact Geotechnical Engineer & the Structural Engineer if unsatisfactory subsurface conditions are encountered. The surface area adjacent to the foundation wall shall be provided adequate drainage, and shall be graded so as to drain surface water away from foundation walls.



**FOUNDATION PLAN (STEM WALL)**

SCALE 1/4" = 1'-0"

Plan #  
**BELLA IV**

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**STRUCTURAL NOTES:**

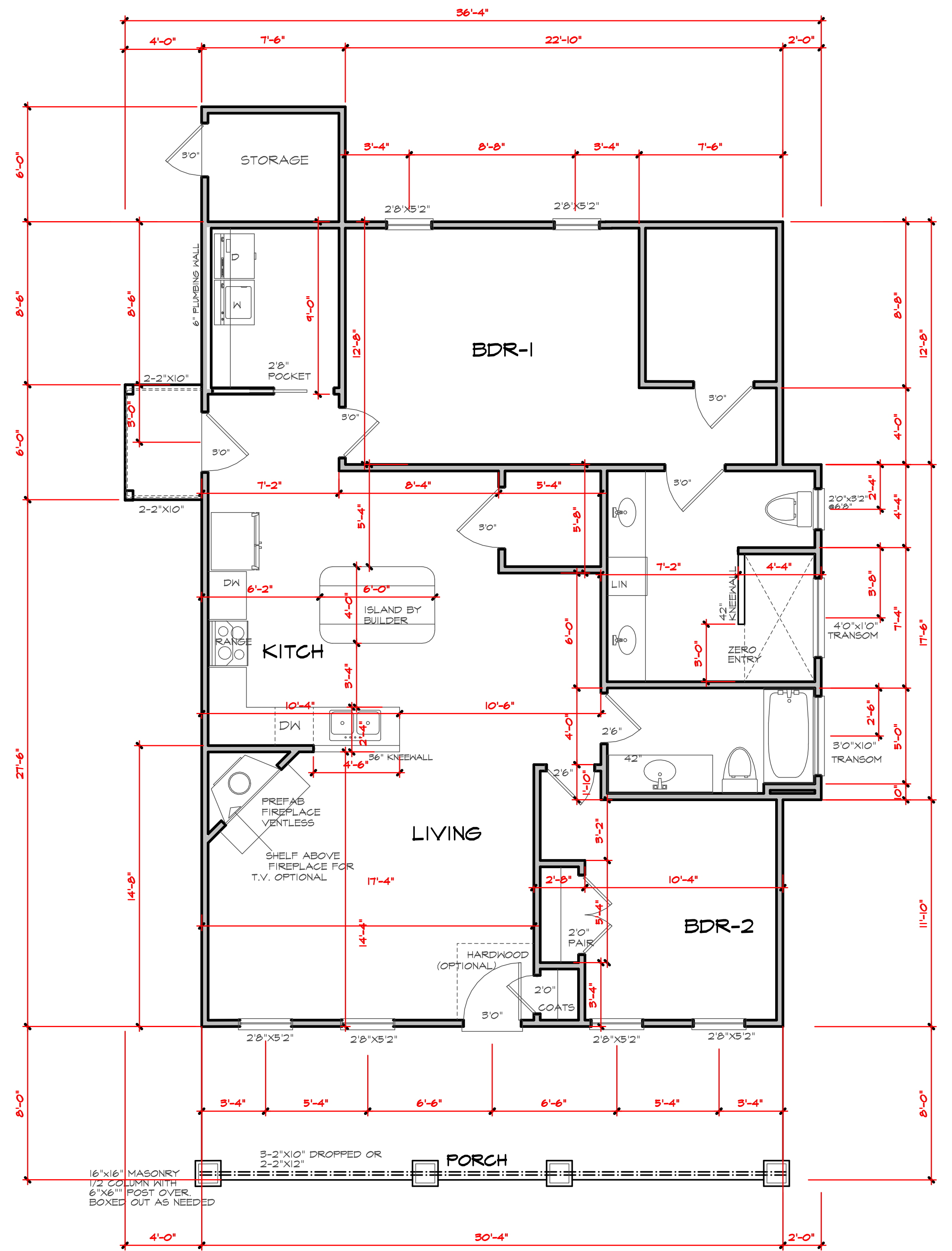
- Framing lumber shall be #2 SPF (modulus of elasticity 1,100,000 psi, E=550). All beams & truss lumber to be #2 SYP, E=1,600,000, fb=1100 min. Studs min #2 or stud grade.
- Use hangers for all beam to beam connections. Structural fastening as per R602.3(1). Adequate connections is the sole responsibility of the general contractor and his subs.
- Structural members fastening to conform to Table R602.3(1) and (2).
- Roof Framing Notes:
  - DBRHips may be splice with a min. 6'-0" one-lap at center. No valley splices.
  - Use 2x10 or fit down rafters for vaulted areas.
  - Attach vaulted rafters with hurricane connectors: Simpson H-2.5, H-5 or approved equal.
- All construction shall conform to the latest requirements of the NC State Residential Building Code - 2018 Edition, plus all local codes & regulations or 2015 IBC.
- Structural Engineer is not responsible for and will not control of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the construction work.
- Structural Engineer is not responsible for the contractor's failure to carry out the proposed construction work in accordance with the contract document.

**FRAMING NOTES:**

- | Design Loads (R301.5)                | Live Loads (PSF) | Dead (PSF) |
|--------------------------------------|------------------|------------|
| Rooms not for Sleeping               | 40               | 10         |
| Sleeping Rooms                       | 30               | 10         |
| Attic w/Permanent Stairs             | 40               | 10         |
| Attic w/o Permanent Stairs           | 20               | 10         |
| Attic w/o Storage                    | 10               | 10         |
| Stairs                               | 40               | -          |
| Exterior Balconies                   | 60               | 10         |
| Decks                                | 40               | 10         |
| Guardrails & Handrails               | 200              | -          |
| Passenger Vehicle Garages            | 50               | 10         |
| Fire Escapes                         | 40               | 10         |
| Snow                                 | 20               | -          |
| Wind Load: (Refer to Table R301.2.4) | -                | -          |
- Verify Zones before Construction.
  - Wale County 115 mph.
  - Wall Shear: Broad wall panels shall be constructed according to section R602.103. The wall structural sheathing shall comply with Table R602.103. The length of broad panels shall be determined by section R602.10.4. Lateral bracing shall be satisfied per method 3 by continuously sheathing walls with structural sheathing per Table R601.3. Note that any specific brace wall detail shall be installed as specified.
  - All framing lumber shall be SPF#2 (Fb=975 psi). Flat material may be SPF#3 or SPF#5 (Fb (psf) = 425 psf min.). All exterior headers to be (2)2x10 spf. u.o.n.o. w/dbt. Jacks for all openings >5'-0".
  - All interior bearing headers to be (2)2x10 u.o.n.o. w/dbt. Jacks for all openings >4'-6". use (2)2x8 flat u.o.n.o.
  - All interior non-bearing headers to be min. (2)2x4 flat u.o.n.o.
  - Fireblock to conform with R602.8

**HEADER/BEAM & COLUMN NOTES**

- ALL EXTERIOR AND LOAD BEARING HEADERS SHALL BE MIN. (2) 2x10 14" WALL OR (3) 2x10 6" WALL WITH (1) SUPPORT STUD, UNLESS NOTED OTHERWISE.
- THE NUMBER SHOWN AT BEAM AND HEADER SUPPORTS INDICATES THE NUMBER OF SUPPORT STUDS REQUIRED IN STUD POCKET OR COLUMN. THE NUMBER OF KING STUDS AT EACH END OF HEADERS IN EXTERIOR WALLS SHALL BE ACCORDING TO ITEM "d" IN TABLE R602.3(5) OR AS BELOW PER NCDOL COMMENTARY "KING STUDS AT WALL OPENINGS" REVISED 1-9-2020:
  - UP TO 3' SPAN: (1) KING STUD
  - OVER 3' UP TO 6' SPAN: (2) KING STUDS
  - OVER 6' UP TO 9' SPAN: (3) KING STUDS
  - OVER 9' UP TO 12' SPAN: (4) KING STUDS
  - OVER 12' UP TO 15' SPAN: (5) KING STUDS



SCALE 1/4" = 1'-0" **FLOOR PLAN**

NOTE!  
TRUSS MANUFACTURER TO  
SIZE ALL STRUCTURAL MEMBERS.

SQUARE FOOTAGE	
FIRST FLOOR	1306 SQ.FT.
STORAGE	45 SQ.FT.
FRT. PORCH	242 SQ.FT.

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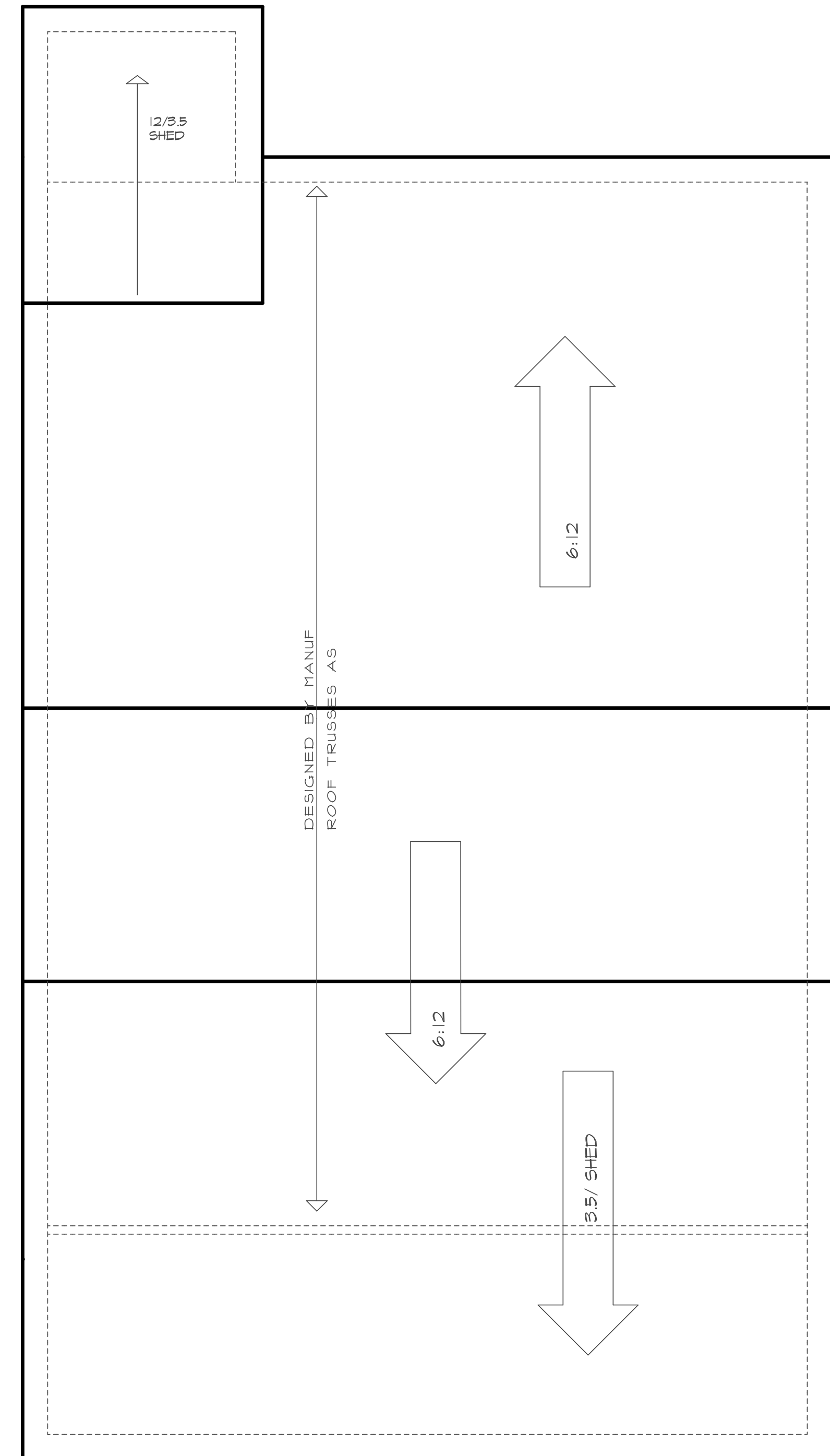
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**TRUSS SYSTEM REQUIREMENTS**

NC (2018 NRC), Wind: 115-120 mph

1. TRUSS SYSTEM LAYOUTS (PLACEMENT PLANS) SHALL BE DESIGNED IN ACCORDANCE WITH SEALED STRUCTURAL PLANS. ANY NEED TO CHANGE TRUSSES SHALL BE COORDINATED WITH ENGINEER OF RECORD.

2. TRUSS SCHEMATICS (PROFILES) SHALL BE PREPARED AND SEALED BY TRUSS MANUFACTURER.

3. ALL TRUSSES SHALL BE DESIGNED FOR BEARING ON SFF #2 OR #3 PLATES OR LEDGERS (ANG).

4. ALL REQUIRED ANCHORS FOR TRUSSES DUE TO UPLIFT OR BEARING SHALL MEET THE REQUIREMENTS AS SPECIFIED ON THE TRUSS SCHEMATICS.

**ROOF PLAN**

NOTE! ROOF TRUSSES BY OTHERS

Plan # **BELLA IV**

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DATE 10/19/2023

PROJECT # 231005

**STRUCTURAL NOTES**

1) ALL CONSTRUCTION SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE NORTH CAROLINA STATE RESIDENTIAL CODE - 2018 EDITION (2018 IRC), PLUS ALL LOCAL CODES AND REGULATIONS.  
ALL MEMBERS SHALL BE FRAMED, ANCHORED, TIED AND BRACED IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND THE BUILDING CODE.

2) DESIGN LOADS SEE TABLE R301.5

WIND SPEED: (REFER TO TABLE R301.2.4)  
VERIFY ZONE BEFORE CONSTRUCTION.

3) WALL BRACING: WALLS SHALL BE BRACED ALONG BRACED WALL LINES ACCORDING TO SECTION R602.10. THE AMOUNT, LOCATION AND CONSTRUCTION OF BRACING SHALL COMPLY WITH R602.10. NOTE THAT THE BRACING SHOWN ON THE PLANS IS BASED ON THE PRESCRIPTIVE BRACING REQUIREMENTS OF THE CODE AND SHALL BE VERIFIED AND/OR APPROVED BY THE CODE OFFICIAL.

4) CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 3000 PSI AND A MAXIMUM SLUMP OF 5 INCHES UNLESS NOTED OTHERWISE (NO). AIR ENTRAINMENT PER TABLE 402.2. ALL CONCRETE SHALL BE PROPORTIONED, MIXED, HANDLED, SAMPLED, TESTED AND PLACED IN ACCORDANCE WITH ACI STANDARDS. ALL SAMPLES FOR PUMPING SHALL BE TAKEN FROM THE EXIT END OF THE PUMP.

5) ALLOWABLE SOIL BEARING PRESSURE ASSUMED TO BE 2000 PSF. THE CONTRACTOR MUST CONTACT A GEOTECHNICAL ENGINEER AND THE STRUCTURAL ENGINEER IF UNSATISFACTORY SUBSURFACE CONDITIONS ARE ENCOUNTERED. THE SURFACE AREA ADJACENT TO THE FOUNDATION WALL SHALL BE PROVIDED WITH ADEQUATE DRAINAGE, AND SHALL BE GRADED SO AS TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS.

6) ALL FRAMING LUMBER SHALL BE SPF #2 (FB = 875 PSI) UNLESS NOTED OTHERWISE (NO). ALL TREATED LUMBER SHALL BE SYP #2 (FB=475 PSI). PLATE MATERIAL MAY BE SPF #3 OR SYP #3 (FC/PERP) = 425 PSI - MIN.

7) ALL WOODEN BEAMS AND HEADERS SHALL HAVE THE FOLLOWING END SUPPORTS: (1) 2X4 STUD COLUMN FOR 6'-0" MAX. BEAM SPAN (NO), (2) 2X4 STUDS FOR BEAM SPAN GREATER THAN 6'-0" (NO).

8) L.V.L. SHALL BE LAMINATED VENEER LUMBER, FB=2600 PSI, FV=285 PSI, E=1,900,000 PSI. P.S.L. SHALL BE PARALLEL STRAND LUMBER, FB=2400 PSI, FV=280 PSI, E=2,000,000 PSI. L.S.L. SHALL BE LAMINATED STRAND LUMBER, FB=2250 PSI, FV=400 PSI, E=1,950,000 PSI. INSTALL ALL CONNECTIONS PER MANUFACTURER'S INSTRUCTIONS.

9) ALL ROOF TRUSS AND I-JOIST LAYOUTS SHALL BE PREPARED IN ACCORDANCE WITH THE SEALED STRUCTURAL DRAWINGS. TRUSSES AND I-JOISTS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

10) ALL STRUCTURAL STEEL SHALL BE ASTM A-36. STEEL BEAMS SHALL BE SUPPORTED AT EACH END WITH A MINIMUM BEARING LENGTH OF 3 1/2 INCHES AND FULL FLANGE WIDTH. PROVIDE SOLID BEARING FROM BEAM SUPPORT TO FOUNDATION. BEAMS SHALL BE ATTACHED TO EACH SUPPORT WITH TWO LAG SCREWS (1/2" DIAMETER X 4" LONG). LATERAL SUPPORT IS CONSIDERED ADEQUATE PROVIDED THE JOIST ARE TOE NAILED TO THE SOLE PLATE, AND SOLE PLATE IS NAILED OR BOLTED TO THE BEAM FLANGE @ 48" O.C. ALL STEEL TUBING SHALL BE ASTM A500.

11) REBAR SHALL BE DEFORMED STEEL, ASTM615, GRADE 60.

12) FLITCH BEAMS SHALL BE BOLTED TOGETHER USING (2) ROWS OF 1/2" DIAMETER BOLTS (ASTM A307) WITH WASHERS PLACED UNDER THE THREADED END OF BOLT. BOLTS SHALL BE SPACED AT 24" O.C. (MAX.) AND STAGGERED AT THE TOP AND BOTTOM OF BEAM (2" EDGE DISTANCE), WITH 2 BOLTS LOCATED AT 6" FROM EACH END.

13) BRICK LINTELS SHALL BE 3 1/2"x3 1/2"x1/4" STEEL ANGLE FOR UP TO 6'-0" SPAN AND 6"x4"x5/16" STEEL ANGLE WITH 6" LEG VERTICAL FOR SPANS UP TO 9'-0" (NO).

14) THE POSITIVE AND NEGATIVE DESIGN PRESSURE FOR DOORS AND WINDOWS SEE R301.2(6).

**DWELLING / GARAGE SEPARATION**

REFER TO SECTIONS R302.3, R302.6, AND R302.7

**WALLS.** A minimum 1/2" gypsum board must be installed on all walls supporting floor/ceiling assemblies used for separation required by this section.

**CEILINGS.** A minimum of 1/2" gypsum must be installed on the underside and exposed sides of all stairways.

**OPENING PENETRATIONS.** Openings between the garage and residence shall be equipped with solid wood doors not less than 1 3/8 inches (35 mm) in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches (35 mm) thick, or 20-minute fire-rated doors.

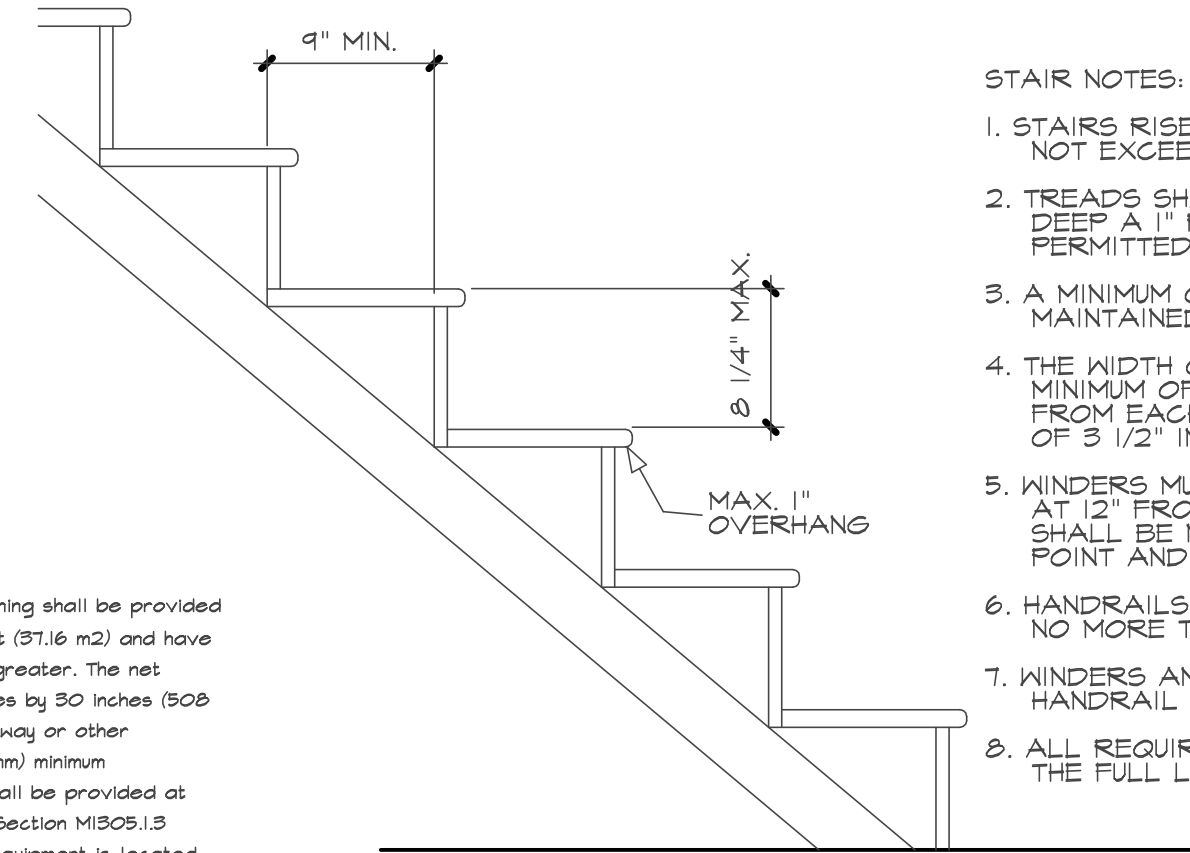
**DUCT PENETRATIONS.** Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other approved material and shall have no openings into the garage.

**OTHER PENETRATIONS.** Penetrations through the separation required in Section R302.6 shall be protected as required by Section R302.11, Item 4.

**ATTIC ACCESS**

SECTION R301.1  
R301.1 Attic access. An attic access opening shall be provided to attic areas that exceed 400 square feet (37.16 m<sup>2</sup>) and have a vertical height of 60 inches (1524 mm) or greater. The net clear opening shall not be less than 20 inches by 30 inches (508 mm by 762 mm) and shall be located in a hallway or other readily accessible location. A 30-inch (762 mm) minimum unobstructed headroom in the attic space shall be provided at some point above the access opening. See Section M305.1.3 for access requirements where mechanical equipment is located in attics.

- Exceptions:
1. Concealed areas not located over the main structure including porches, areas behind knee walls, dormers, bay windows, etc., are not required to have access.
  2. Pull down stair treads, stringers, handrails, and hardware may protrude into the net clear opening.

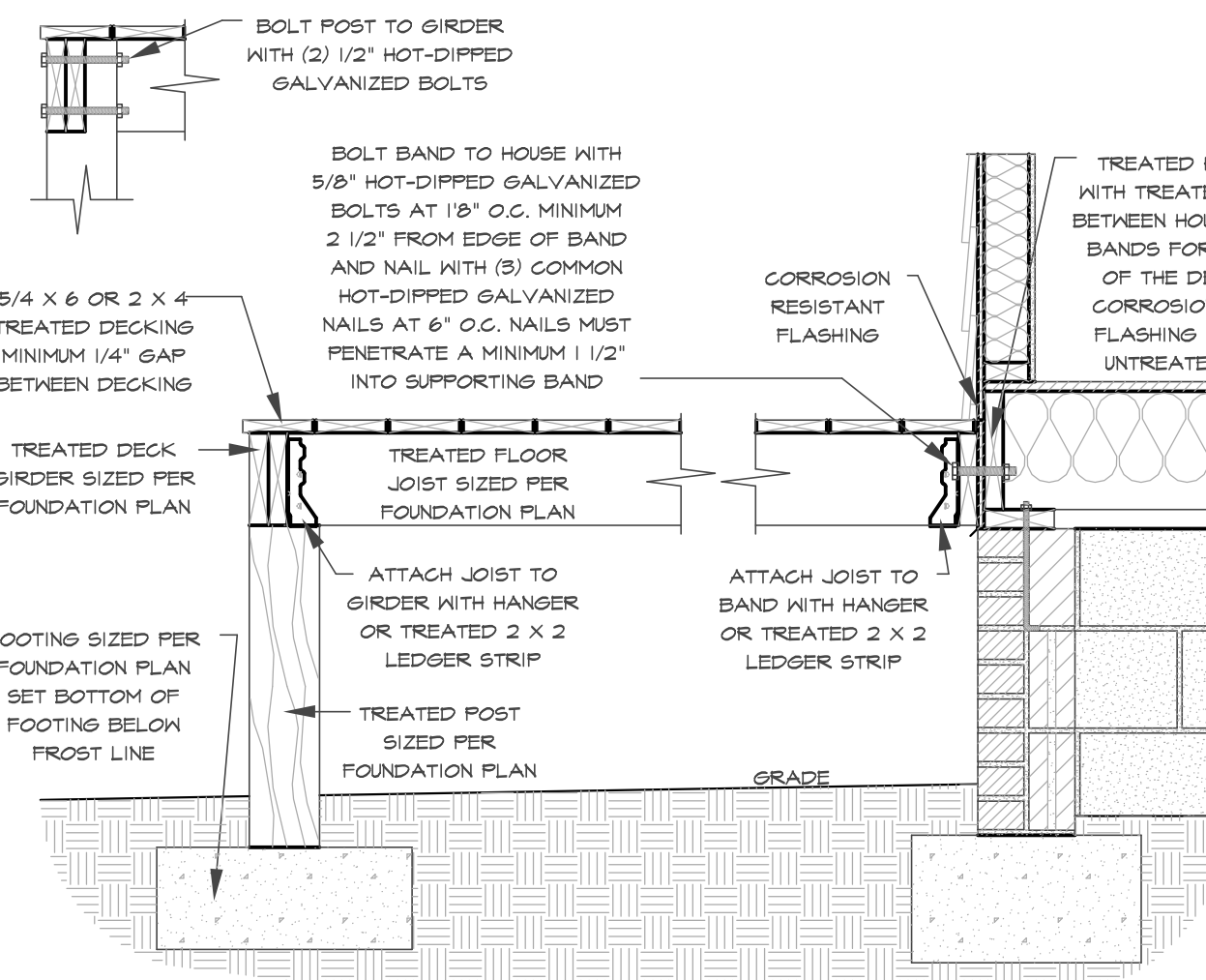


**STAIR NOTES:**

1. STAIRS RISERS MUST BE UNIFORM AND NOT EXCEED 8 1/4".
2. TREADS SHALL NOT BE LESS THAN 10" DEEP A 1" PROJECTION OVER RISER IS PERMITTED.
3. A MINIMUM OF 6'8" HEADROOM MUST BE MAINTAINED AT ALL PLACES ON STAIR.
4. THE WIDTH OF THE STAIR SHALL BE A MINIMUM OF 3'0". HANDRAIL MAY PROJECT FROM EACH SIDE OF STAIR A DISTANCE OF 3 1/2" INTO THE REQUIRED WIDTH.
5. WINDERS MUST BE A MINIMUM OF 4" IN WIDTH AT 12" FROM THE NARROWEST SIDE. TREAD SHALL BE NO NARROWER THAN 4" AT ANY POINT AND AVERAGE NO LESS THAN 9 INCHES.
6. HANDRAILS SHALL BE NO LESS THAN 34" AND NO MORE THAN 38" ABOVE TREAD NOSING.
7. WINDERS AND SPIRAL STAIRS SHALL HAVE THE HANDRAIL LOCATED ON THE OUTSIDE RADIUS.
8. ALL REQUIRED HANDRAILS SHALL BE CONTINUOUS THE FULL LENGTH OF THE STAIRS.

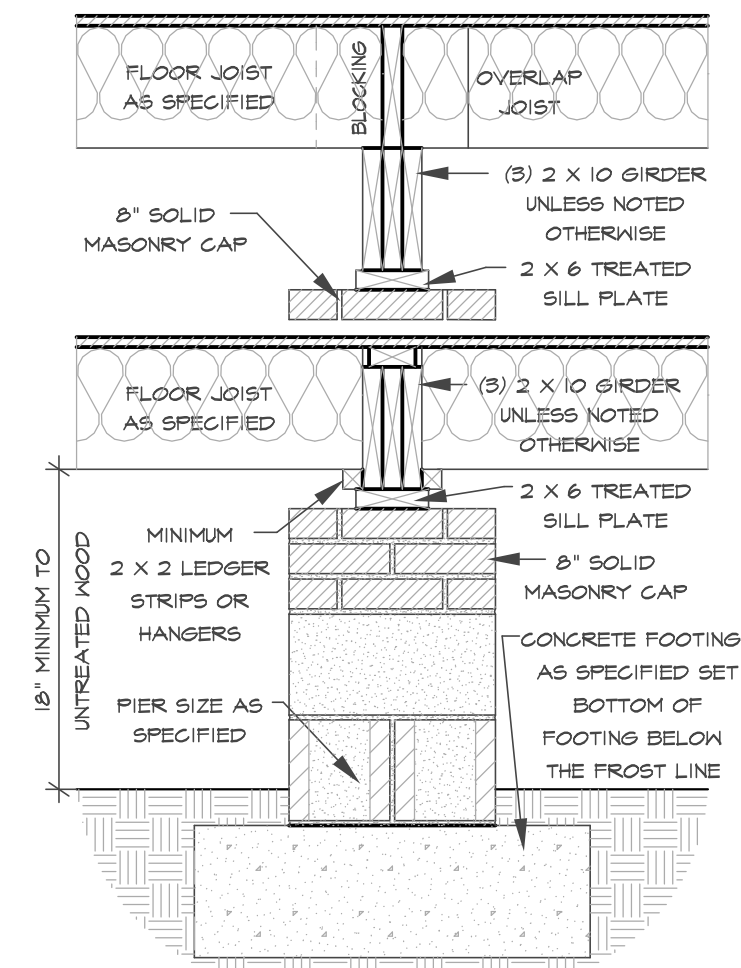
**STAIR DETAIL**

NO SCALE



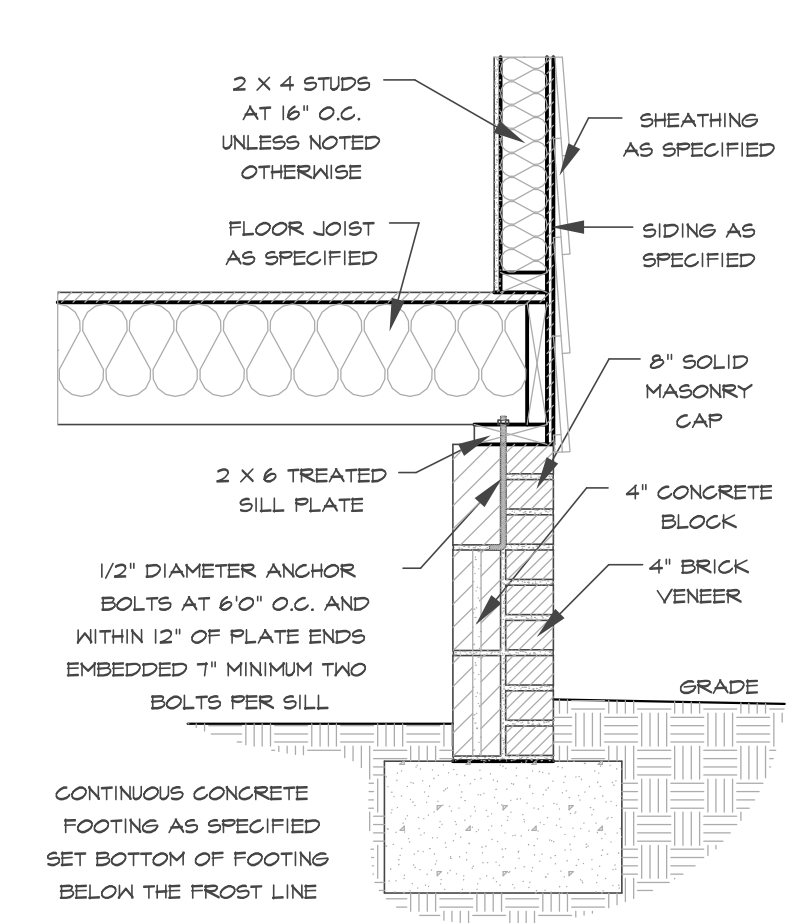
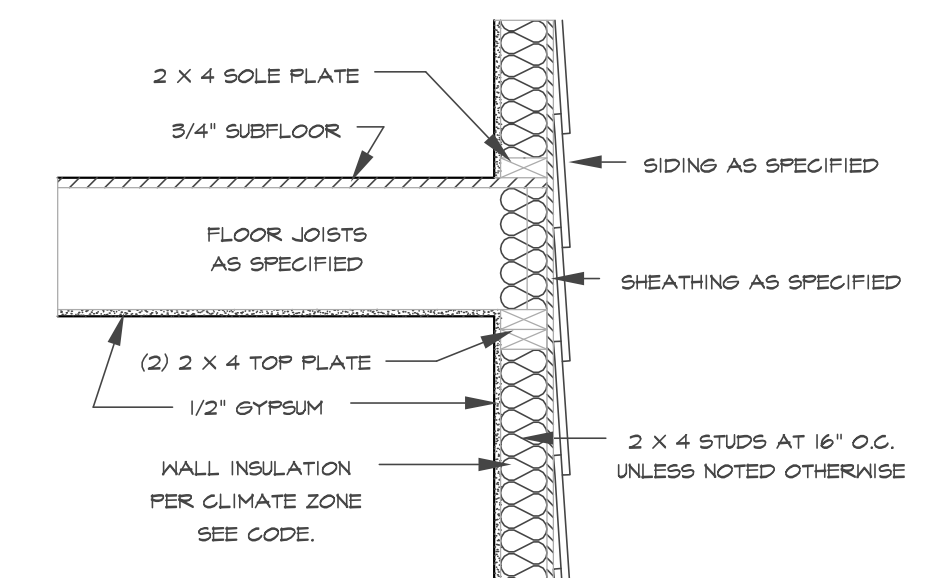
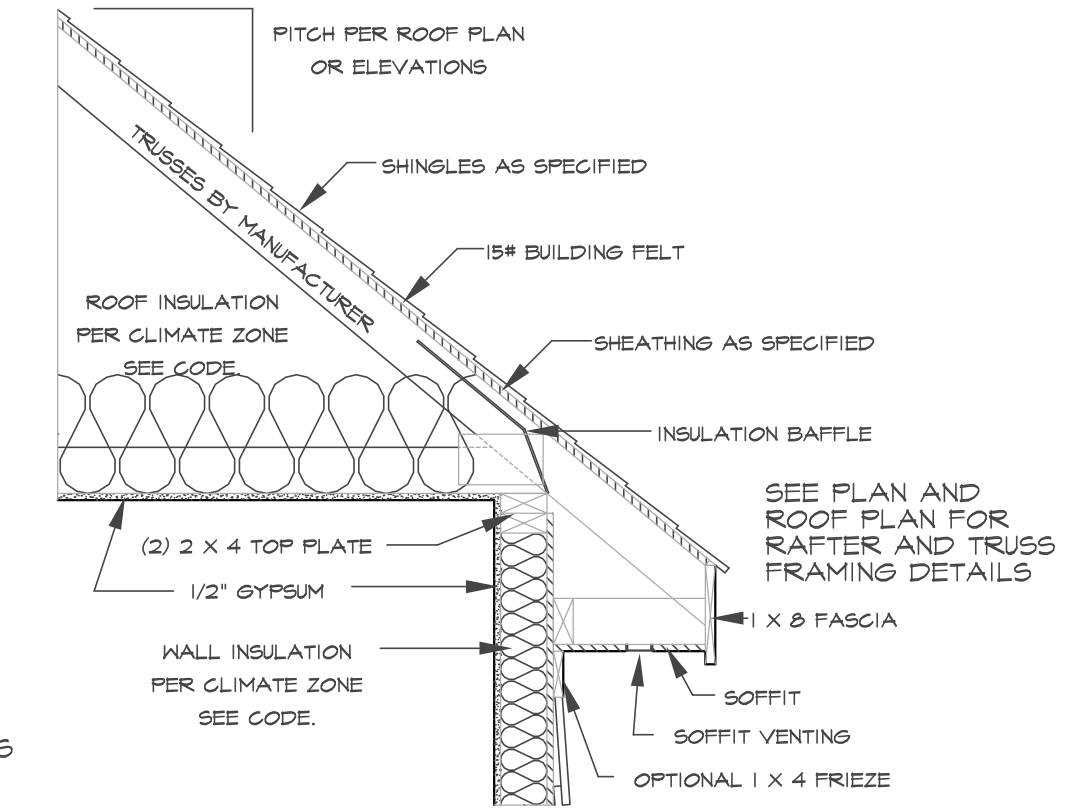
**DECK ATTACHMENT DETAIL TO FRAMED WALL**

SCALE 3/4" = 1'-0"



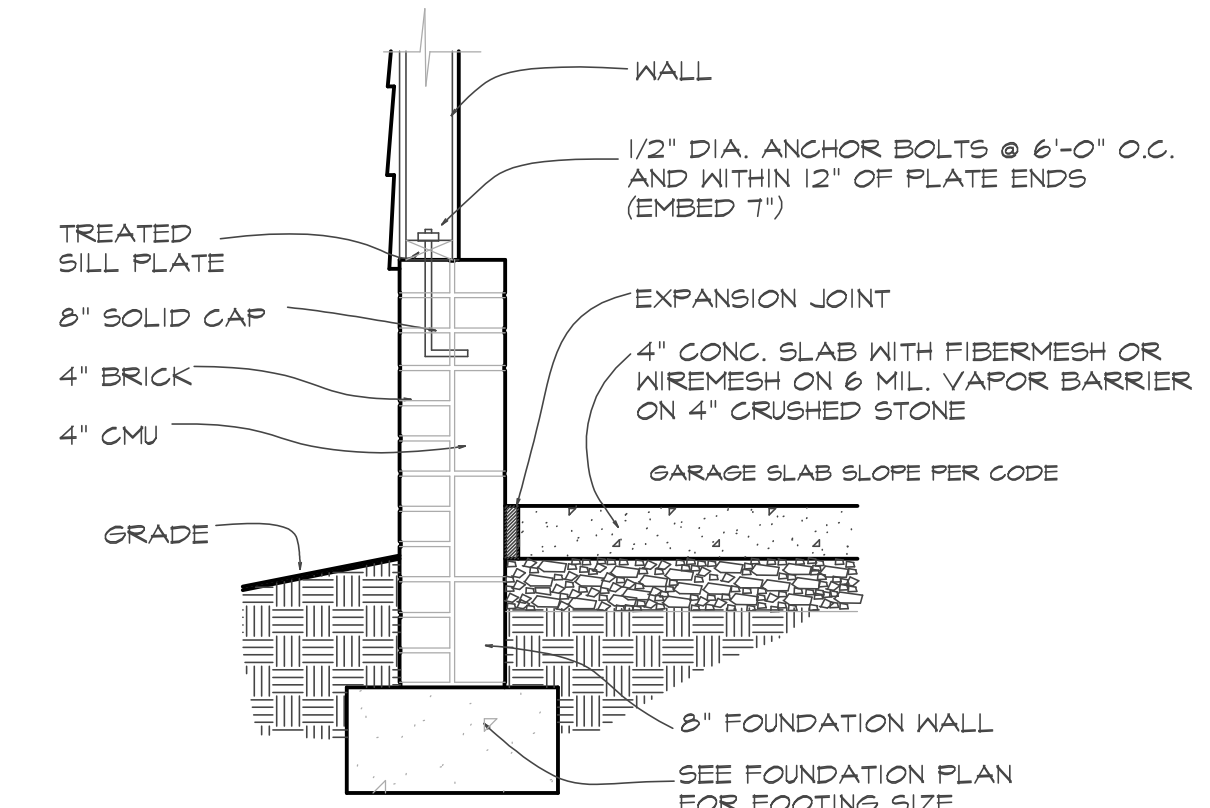
**DROPPED/ FLUSH PIER**

SCALE 3/4" = 1'-0"

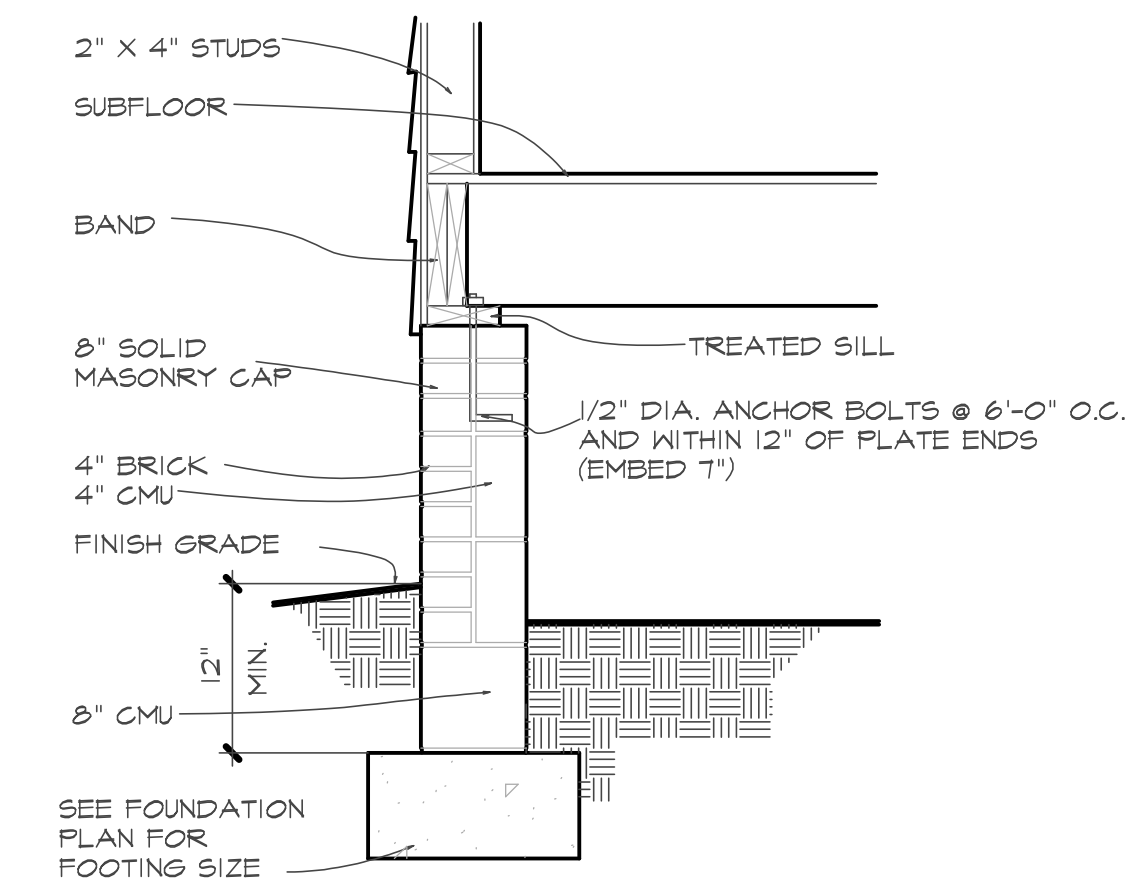


**TYPICAL WALL SECTION**

SCALE 3/4" = 1'-0"



**SECTION AT GARAGE SLAB**



**SECTION AT CRAWL**

**TABLE R602.1.2 INSULATION AND PENETRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b</sup>	SKYLIGHT U-FACTOR <sup>b</sup>	CEILING U-FACTOR <sup>b</sup>	CEILING PENETRATION U-FACTOR <sup>b</sup>	FRAME WALL R-VALUE	WALL R-VALUE	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB R-VALUE & DETAIL	CRAWL SPACE WALL U-FACTOR
3	0.35	0.55	0.30	38 or 30 <sup>c</sup>	15 or 15-25 <sup>d</sup>	5/13 or 5/10 <sup>e</sup>	19	5/19	0	5/13
4	0.35	0.55	0.30	38 or 30 <sup>c</sup>	15 or 15-25 <sup>d</sup>	5/13 or 5/10 <sup>e</sup>	19	10/15	10	10/12
5	0.35	0.55	NR	38 or 30 <sup>c</sup>	12 <sup>f</sup> or 13-15 <sup>d</sup>	13/17 or 13/12.5 <sup>e</sup>	30 <sup>g</sup>	10/12	10	10/19

**TABLE R602.1.4 EQUIVALENT U-FACTORS<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b</sup>	SKYLIGHT U-FACTOR <sup>b</sup>	CEILING U-FACTOR <sup>b</sup>	FRAME WALL U-FACTOR <sup>b</sup>	WALL U-FACTOR	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
3	0.35	0.55	0.030	0.027	0.141	0.047	0.099 <sup>f</sup>	0.136
4	0.35	0.55	0.030	0.027	0.141	0.047	0.055	0.085
5	0.35	0.55	0.030	0.061	0.482	0.033	0.055	0.085

<sup>a</sup> Nonresidential U-factors shall be obtained from measurement, calculation or an approved source.  
<sup>b</sup> Where more than half the fenestration is on the interior, the mean wall U-factor shall be a maximum of 0.027 in Climate Zone 3, 0.021 in Climate Zone 4 and 0.028 in Climate Zone 5.  
<sup>c</sup> Basement wall U-factor of 0.040 in warm humid locations as defined by Figures R301.1 and Table R301.1.  
<sup>d</sup> A maximum of 2% glass fenestration product assemblies, having a U-factor no greater than 0.25 and a SHGC no greater than 0.20 shall be permitted to be substituted for minimum code comparison fenestration product assemblies without penalty. When applying this rule, use the REScheck "3A Trade-off" conditions instead of the alternative conditions of the software. The applicable fenestration product shall be modeled as meeting the U-factor of 0.25 and the SHGC of 0.20, as applicable, per the fenestration product actual U-factor and actual SHGC shall be noted in the comment section of the software for documentation of application of this rule to the applicable product. Compliance for these substitution products shall be verified compared to the above substantial maximum U-value requirement and maximum SHGC requirement, as applicable.