

STRUCTURAL NOTES

- ALL CONSTRUCTION SHALL CONFORM TO THE LATEST REQUIREMENTS OF "NORTH CAROLINA STATE 2012 RESIDENTIAL BUILDING CODE", IN ADDITION TO ALL LOCAL CODES AND REGULATIONS.
- DESIGN LOADS:

	LIVE LOAD (PSF)	DEAD LOAD (PSF)	DEFLECTION	
			DL	LL
ALL FLOORS	40	10	L/360	L/240
ATTIC (w/ walk up stairs)	30	10	L/240	L/240
ATTIC (no walk up access)	20	10	L/240	L/180
ATTIC (no access)	10	5	L/240	L/180
EXTERNAL BALCONY	60	10	L/360	L/240
ROOF	20	10	L/180	L/180
ROOF TRUSS	20	20	L/240	L/180
WIND LOAD	BASED ON 100 MPH (EXPOSURE B)			
SEISMIC	SEISMIC ZONES A, B & C			
- MINIMUM ALLOWABLE SOIL BEARING PRESSURE = 2000 PSF
- CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI AND A MAXIMUM SLUMP OF FIVE INCHES UNLESS NOTED OTHERWISE. (U.N.O.)
- MAXIMUM DEPTH OF UNBALANCED FILL AGAINST FOUNDATION WALLS TO BE LESS THAN 4'-0" WITHOUT USING SUFFICIENT WALL BRACING. REFER TO SECTION R404 OF 2012 NC BUILDING CODE FOR BACKFILL LIMITATIONS BASED ON WALL HEIGHT, WALL THICKNESS, SOIL TYPE, AND UNBALANCED BACKFILL HEIGHT.
- ALL FRAMING LUMBER SHALL BE SPF #2 (Fb = 1000 PSI) UNO. ALL FRAMING LUMBER EXPOSED TO THE ELEMENTS SHALL BE TREATED MATERIAL. ALL LVL LUMBER TO BE 1.75" WIDE NOMINAL EACH SINGLE MEMBER AND Fb = 2600 PSI, E = 1.9M PSI (U.N.O.) ALL LVL LUMBER TO BE 3.5" WIDE NOMINAL EACH SINGLE MEMBER AND Fb = 2325 PSI, E = 1.6M PSI (U.N.O.) ALL PSL LUMBER TO BE 3.5" WIDE NOMINAL EACH SINGLE MEMBER AND Fb = 2400 PSI, E = 1.8M PSI (U.N.O.)
- ALL LOAD BEARING EXTERIOR HEADERS SHALL BE AT (2) 2x10. (U.N.O.) REFER TO TABLE R502.5(1) & (2) FOR JACK STUD REQUIREMENTS FOR HEADER SPANS FOR INTERIOR AND EXTERIOR LOAD CONDITIONS UNLESS SPECIFICALLY NOTED ON PLANS.
- ALL STRUCTURAL STEEL W-SHAPES (I-BEAMS) SHALL BE ASTM A992 GRADE 50. ALL STEEL ANGLES, PLATES, AND C-CHANNELS SHALL BE ASTM A36. ALL STEEL PIPE SHALL BE ASTM A53 GRADE B.
- STEEL BEAMS SHALL BE SUPPORTED AT EACH END WITH A MINIMUM BEARING LENGTH OF 3-1/2" AND FULL FLANGE WIDTH. PROVIDE SOLID BEARING FROM BEAM SUPPORT TO FOUNDATION. BEAMS SHALL BE ATTACHED TO EACH SUPPORT WITH TWO (2) LAG SCREWS (1/2" x 4" LONG) LATERAL SUPPORT IS CONSIDERED ADEQUATE PROVIDED THE JOISTS ARE TOE NAILED TO THE SOLE PLATES, AND THE SOLE PLATES ARE NAILED OR BOLTED TO THE BEAM FLANGES @ 48" O.C.
- PROVIDE ANCHOR BOLT PLACEMENT PER SECTION 403.1.6: 1/2" ANCHOR BOLTS SPACED AT 6'-0" O.C. AND PLACED 12" FROM THE END OF EACH PLATE SECTION. ANCHOR BOLTS SHALL BE SPACED AT 3'-0" O.C. FOR BASEMENTS. ANCHOR BOLT SHALL EXTEND 7" INTO CONCRETE OR MASONRY. THERE SHALL BE A MINIMUM TWO ANCHOR BOLTS PER PLATE SECTION.
- FOUNDATION DRAINAGE--DAMP PROOFING OR WATERPROOFING PER SECTION 405 AND 406 OF NC BUILDING CODE.
- WALL AND ROOF CLADDING VALUES:
WALL CLADDING SHALL BE DESIGNED FOR 24.1 POUNDS PER SQUARE FOOT (LBS/SQFT) OR GREATER POSITIVE AND NEGATIVE PRESSURE. ROOF VALUES BOTH POSITIVE AND NEGATIVE SHALL BE AS FOLLOWS:
45.5 LBS/SQFT FOR ROOF PITCHES 0/12 TO 2.25/12
34.8 LBS/SQFT FOR ROOF PITCHES 2.25/12 TO 7/12
21.0 LBS/SQFT FOR ROOF PITCHES 7/12 TO 12/12
**MEAN ROOF HEIGHT 30'-0" OR LESS
- FOR ROOF SLOPES FROM 2/12 THROUGH 4/12, BUILDER TO INSTALL 2 LAYERS OF 15# FELT PAPER.
- REFER TO SECTION R602.3 FOR FRAMING OF ALL WALLS OVER 10'-0" IN HEIGHT.
- PROVIDE CONTINUOUS SHEATHING PER SECTION 602.10.4
- REFER TO TABLE N1102.1 FOR PRESCRIPTIVE BUILDING ENVELOPE THERMAL COMPONENT CRITERIA.
- PSL COLUMNS DESIGNED WITH MAXIMUM HEIGHT OF 9'-0" (U.N.O.)
- PROVIDE A MINIMUM OF 500# UPLIFT AT TOP AND BOTTOM OF PORCH COLUMNS. (U.N.O.)
- MAXIMUM MASONRY PEIR HEIGHT SHALL NOT EXCEED FOUR TIMES ITS LEAST HORIZONTAL DIMENSION.
- IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND SQUARE FOOTAGE PRIOR TO CONSTRUCTION. TYNDALL ENGINEERING & DESIGN, PA IS NOT RESPONSIBLE FOR DIMENSION OR SQUARE FOOTAGE ERRORS ONCE CONSTRUCTION BEGINS.

DEFINITIONS FOR COMMON ABBREVIATIONS

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|-----------------------------|------------------------------|
| ALT = ALTERNATE | MAX = MAXIMUM |
| CANT = CANTILEVER | MIN = MINIMUM |
| CJ = CEILING JOIST | NOM = NOMINAL |
| CMU = CONCRETE MASONRY UNIT | O.C. = ON CENTER |
| COL = COLUMN | PL = PLATE |
| CONC = CONCRETE | PT = PRESSURE TREATED |
| CONT = CONTINUOUS | REIN = REINFORCED |
| CT = COLLAR TIE | REQD = REQUIRED |
| DBL = DOUBLE | RJ = ROOF JOIST |
| DIA = DIAMETER | RS = ROOF SUPPORT |
| DJ = DOUBLE JOIST | SC = STUD COLUMN |
| DR = DOUBLE RAFTER | SOH = SCHEDULE |
| EA = EACH | SPEC = SPECIFIED |
| EE = EACH END | THK = THICK |
| FJ = FLOOR JOIST | TJ = TRIPLE JOIST |
| FND = FOUNDATION | TRTD = TREATED |
| FTG = FOOTING | TYP = TYPICAL |
| GALV = GALVANIZED | UNO = UNLESS NOTED OTHERWISE |
| HORIZ = HORIZONTAL | W = WIDE FLANGE BEAM |
| HT = HEIGHT | WWF = WELDED WIRE FABRIC |
| MANUF = MANUFACTURER | XJ = EXTRA JOIST |

1) MAXIMUM HEIGHT OF DECK SUPPORT POSTS AS FOLLOWS:

POST SIZE	MAX. POST HEIGHT**
4 x 4	8'-0"
6 x 6	20'-0"
***	OVER 20'-0"

- * THIS TABLE IS BASED ON NO. 2 TREATED SOUTHERN PINE POSTS. MAXIMUM TRIBUTARY AREA IS BASED ON 128 TOTAL SQUARE FEET WHICH MAY BE LOCATED AT DIFFERENT LEVELS.
- ** FROM TOP OF FOOTING TO BOTTOM OF GIRDER
- *** DECKS WITH POST HEIGHTS OVER 20'-0" SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT.

2) DECKS SHALL BE BRACED TO PROVIDE LATERAL STABILITY BY ONE OF THESE METHODS:

- THE DECK FLOOR HEIGHT IS LESS THAN 4'-0" AND THE DECK IS ATTACHED TO THE STRUCTURE IN ACCORDANCE WITH SECTION (4) ABOVE. LATERAL BRACING IS NOT REQUIRED.
- 4 x 4 WOOD KNEE BRACES MAY BE PROVIDED ON EACH COLUMN IN BOTH DIRECTIONS. THE KNEE BRACES SHALL ATTACH TO EACH POST AT A POINT NOT LESS THAN 1/3 OF THE POST LENGTH FROM THE TOP OF THE POST, AND THE BRACES SHALL BE ANGLED BETWEEN 45° AND 60° FROM THE HORIZONTAL. KNEE BRACES SHALL BE BOLTED TO THE POST AND GIRDER WITH ONE 5/8" HOT DIPPED GALVANIZED BOLT AT EACH END OF THE BRACE.
- FOR FREESTANDING DECKS WITHOUT KNEE BRACES OR DIAGONAL BRACING, LATERAL STABILITY MAY BE PROVIDED BY EMBEDDING THE POSTS IN ACCORDANCE WITH THE FOLLOWING:

POST SIZE	MAX. TRIBUTARY AREA	MAX. POST HEIGHT	EMBEDMENT DEPTH	CONCRETE DIAMETER
4 x 4	48 SQ. FT.	4'-0"	2'-6"	1'-0"
6 x 6	120 SQ. FT.	6'-0"	3'-6"	1'-8"
- 2 x 6 DIAGONAL VERTICAL CROSS BRACING MAY BE PROVIDED IN TWO (2) PERPENDICULAR DIRECTIONS FOR FREESTANDING DECKS OR PARALLEL TO THE STRUCTURE AT THE EXTERIOR COLUMN LINE FOR ATTACHED DECKS. THE 2 x 6s SHALL BE ATTACHED TO THE POSTS WITH ONE 5/8" HOT DIPPED GALVANIZED BOLT AT EACH END OF EACH BRACING MEMBER.
- FOR EMBEDMENT OF PILES IN COASTAL REGIONS, SEE CHAPTER 46.

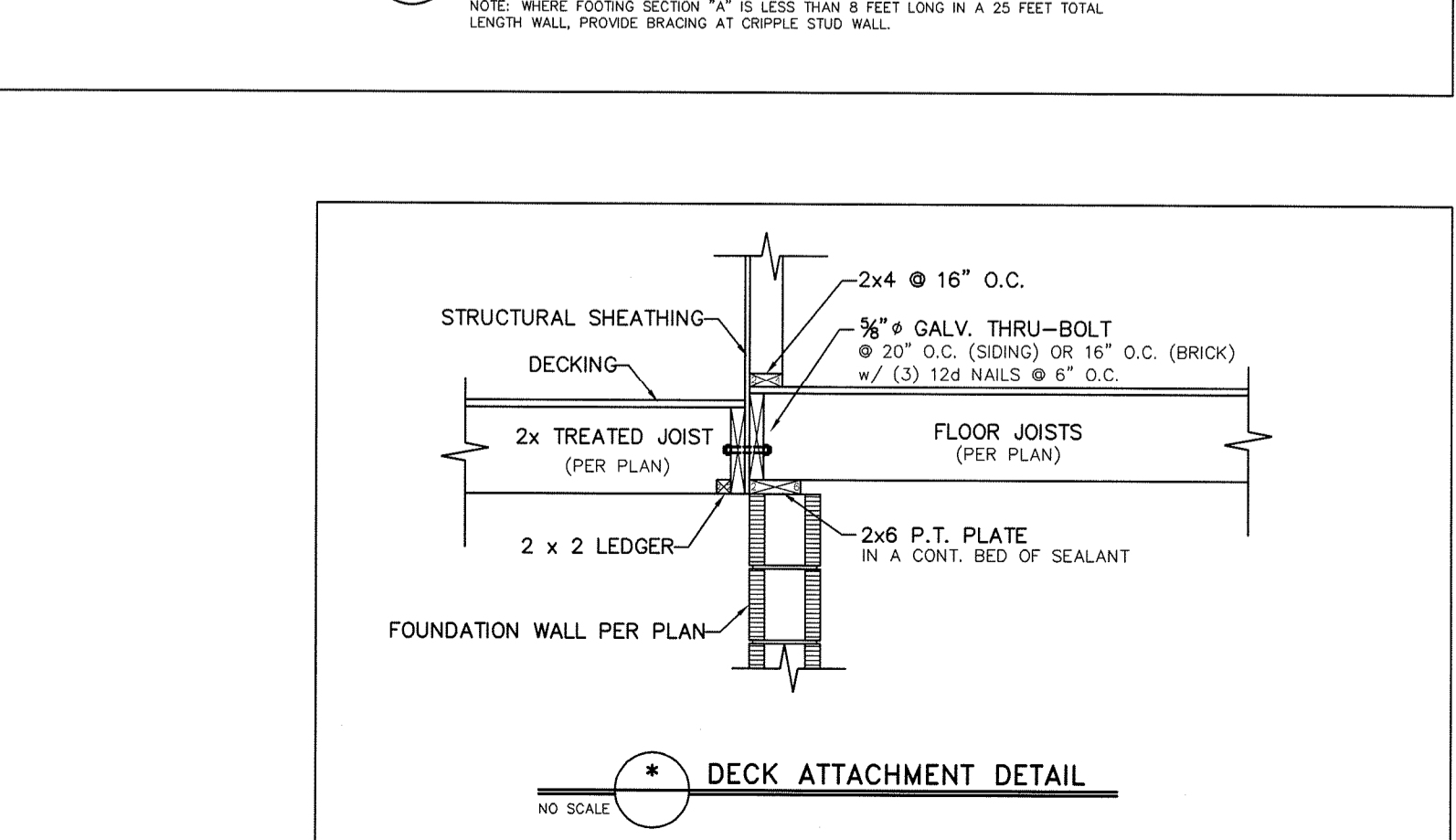
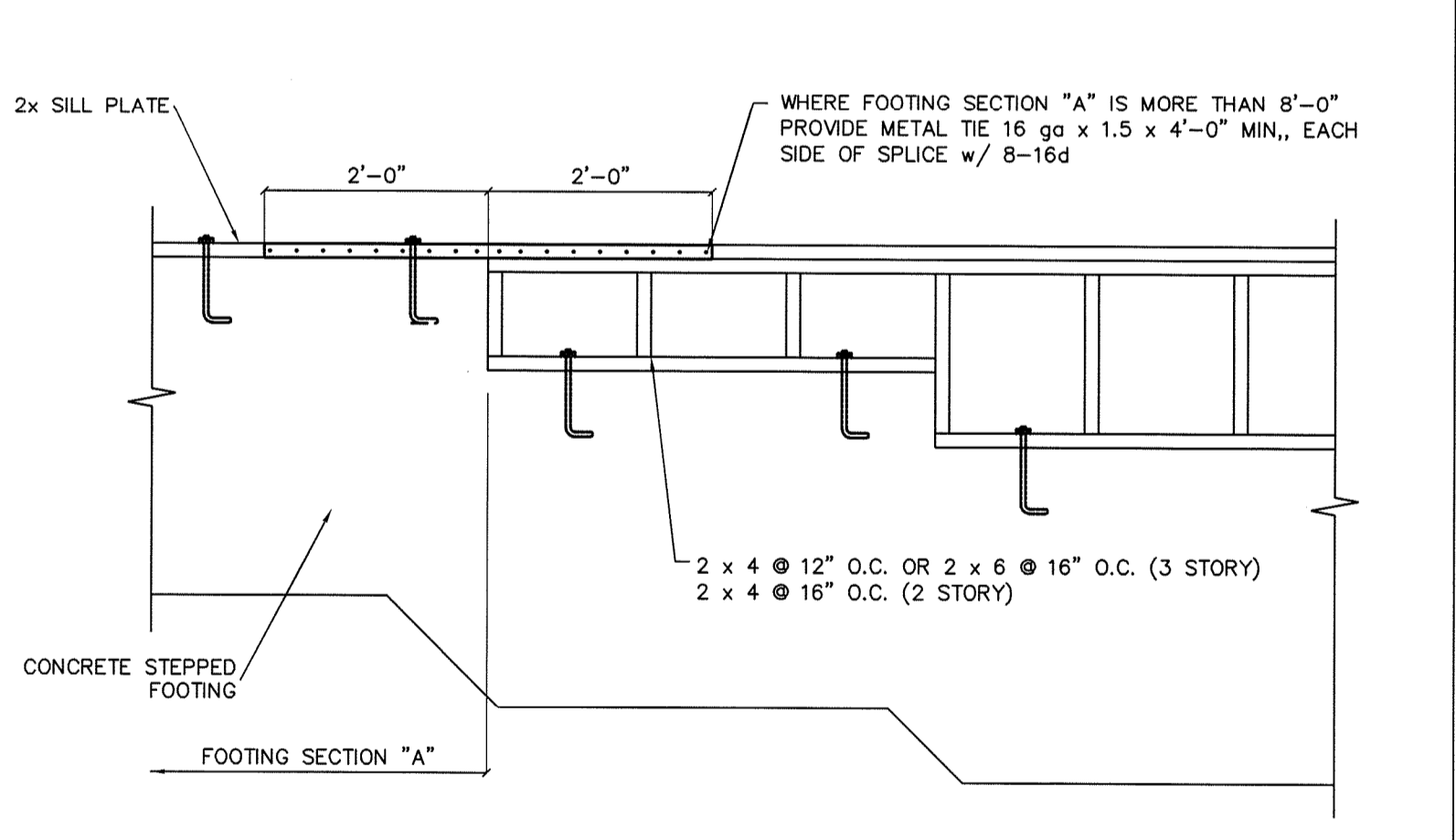
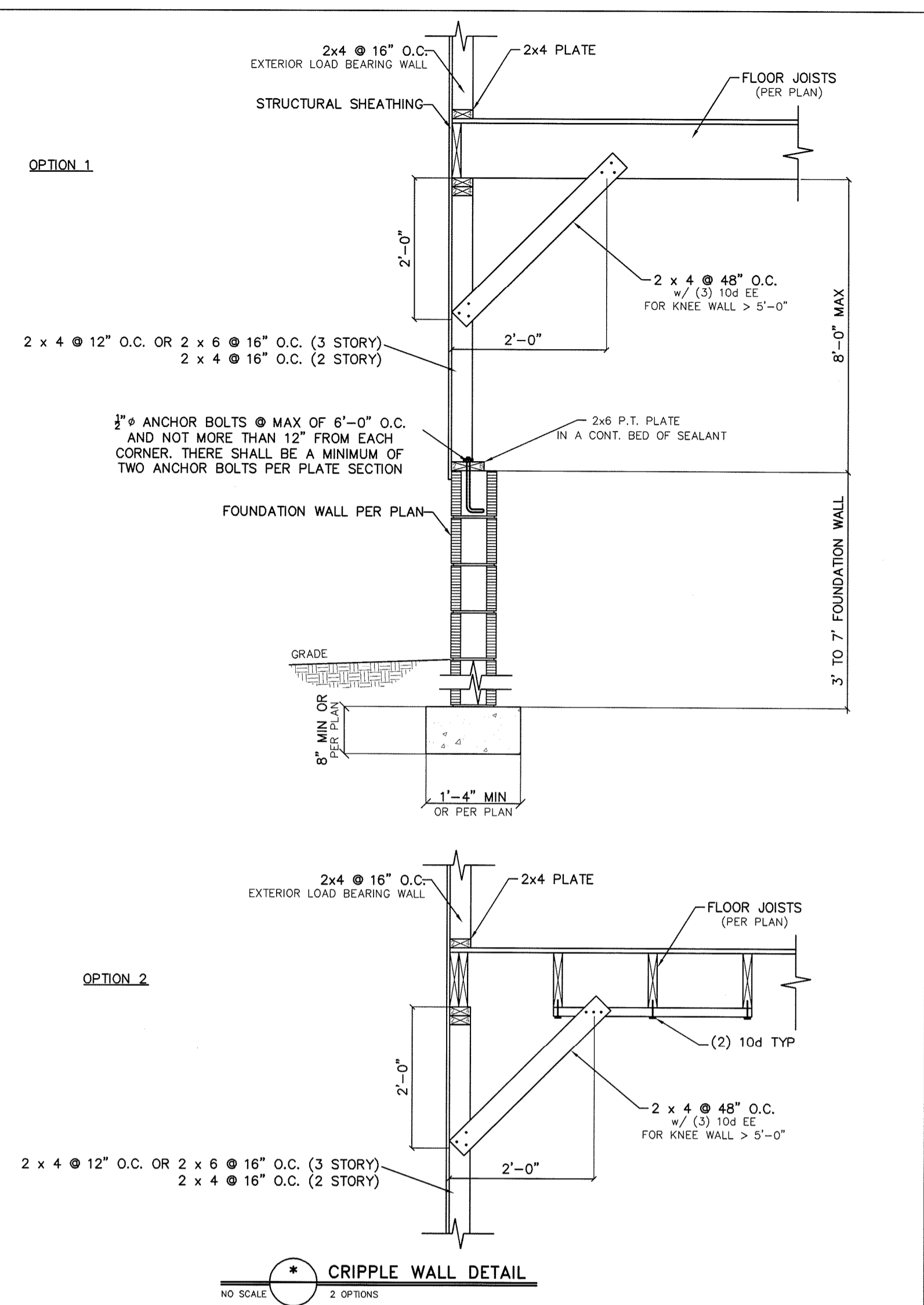
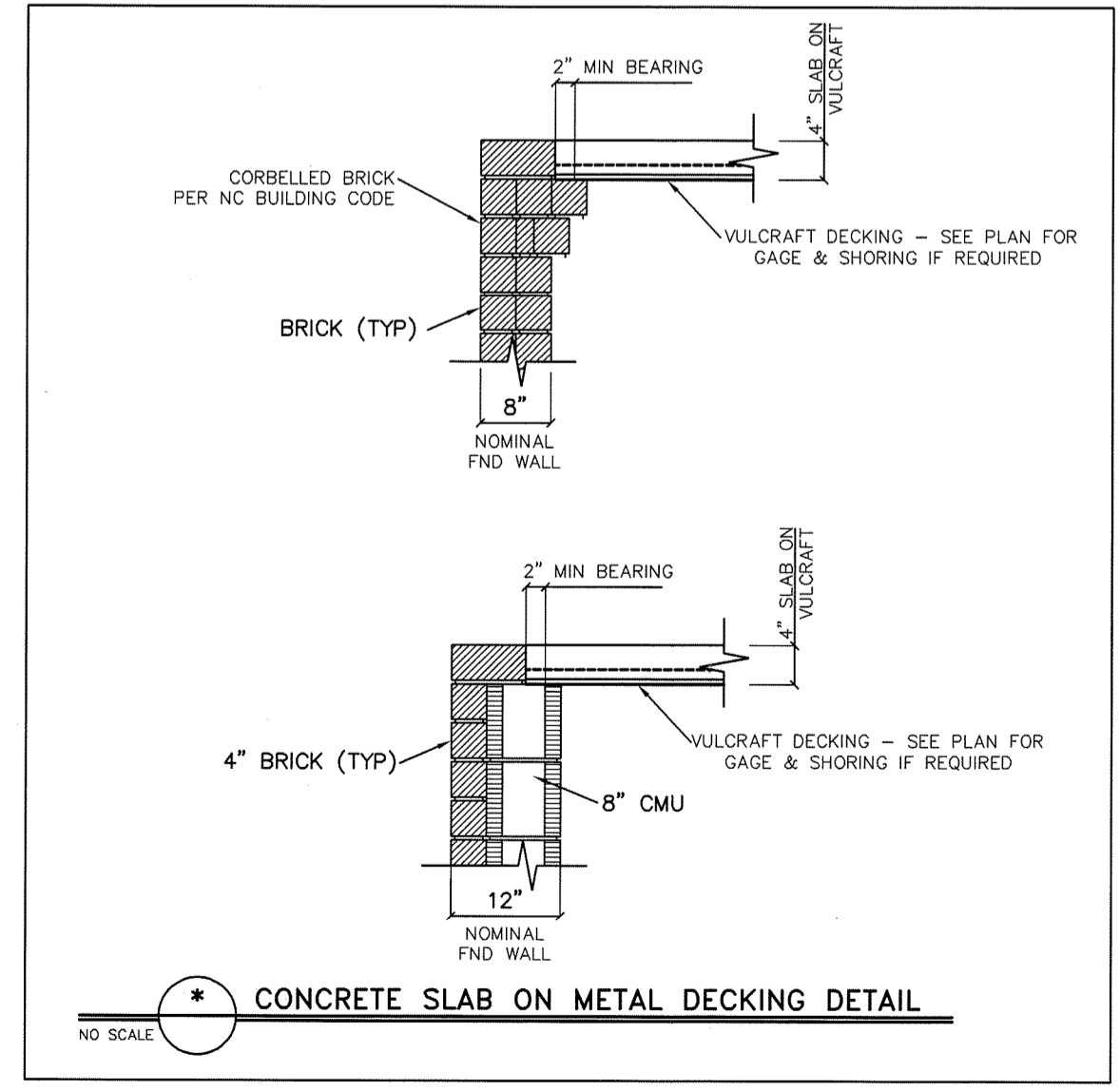
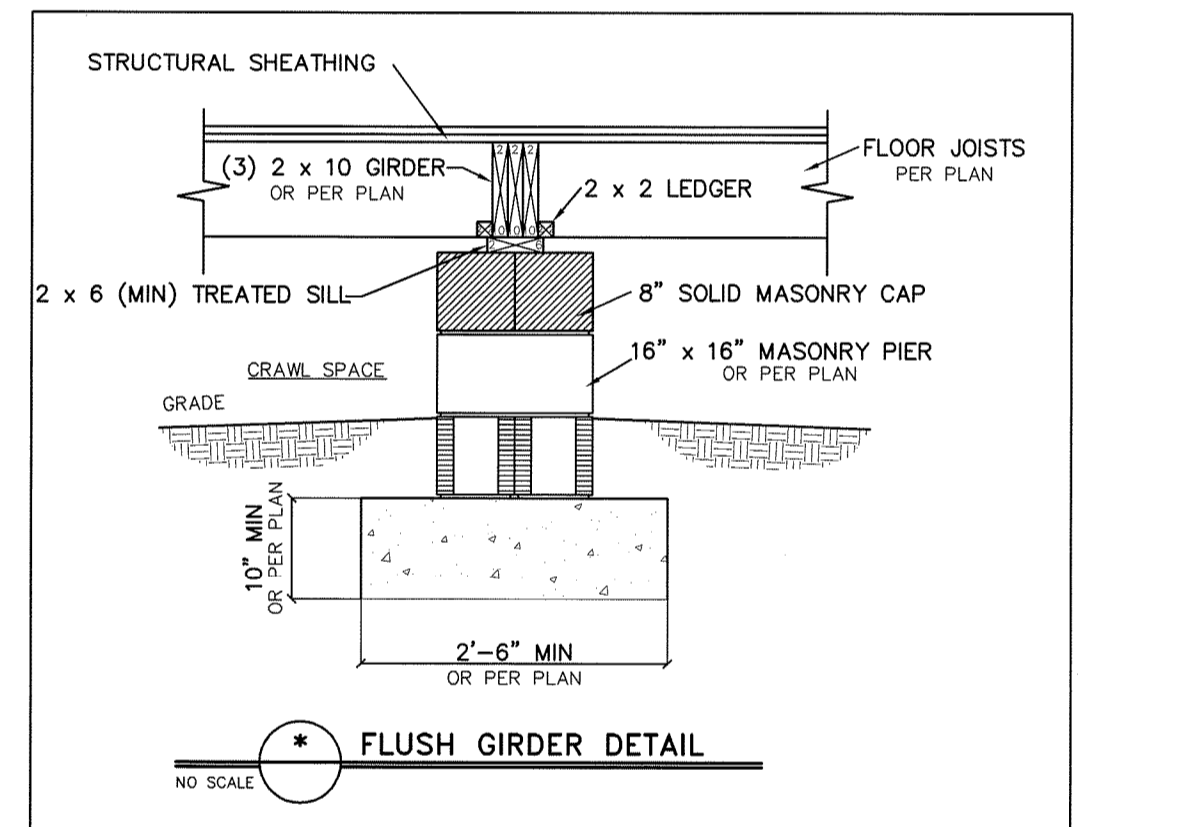
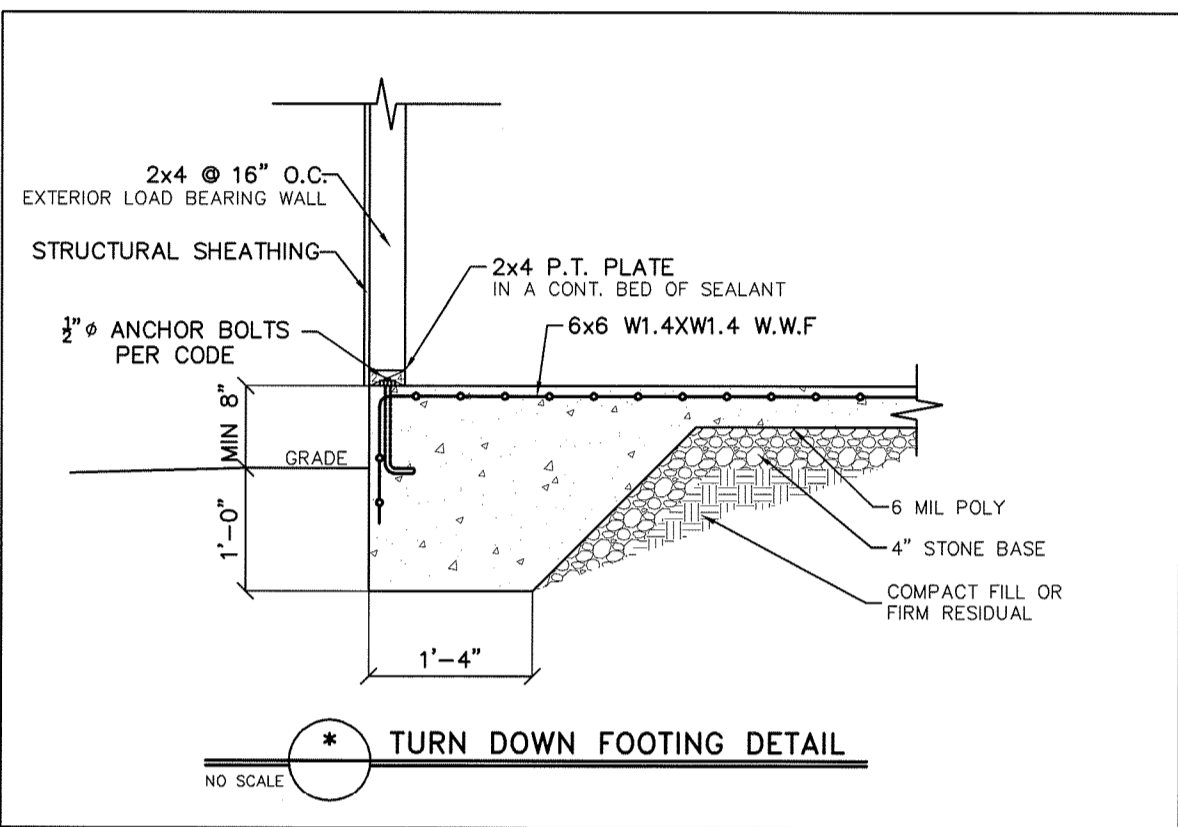
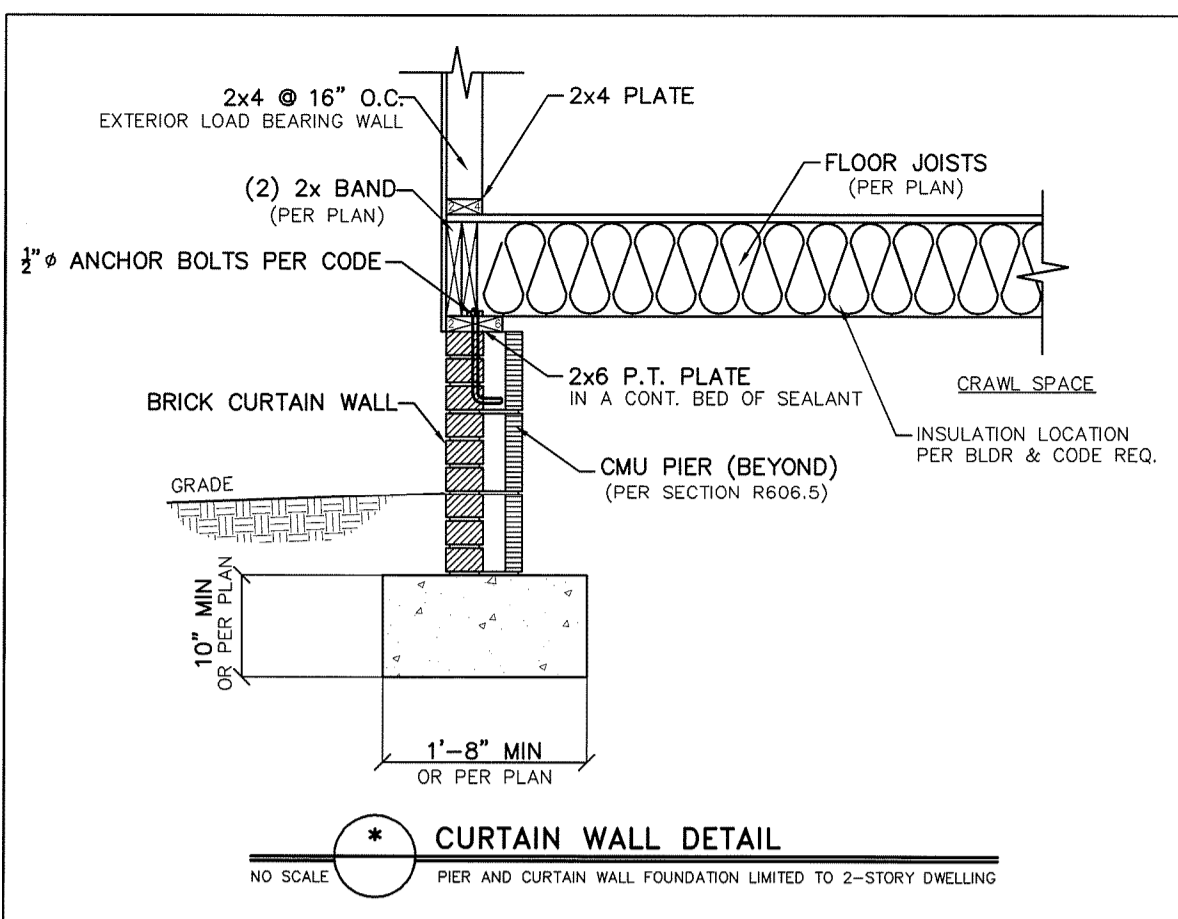


TABLE N1102.1 CLIMATE ZONES 3-5

CLIMATE ZONES	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC**	CEILING R-VALUE*	WOOD FRAMED WALL R-VALUE*	MASS WALL R-VALUE*	FLOOR R-VALUE*	BASEMENT WALL R-VALUE*	SLAB R-VALUE AND DEPTH	CRAWL SPACE WALL R-VALUE*
3	0.35	0.65	0.30	30	13	5/10	19	10/13	0	5/13
4	0.35	0.60	0.30	38 or 30 cont ¹	15 13 + 2.5 ^b	5/10	19	10/13	10 ^d	10/13
5	0.35	0.60	NR	38 or 30 cont ¹	15, 13 + 2.5 ^b 15 + 3 ^b	13/17	30 ^g	10/13	10 ^d	10/13

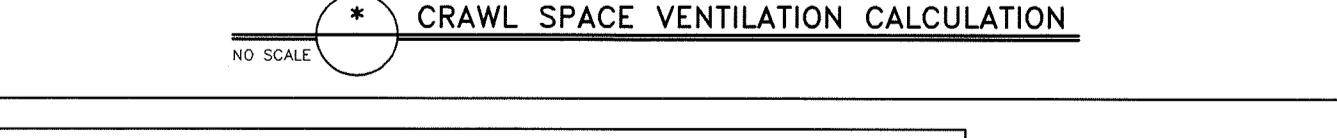
- a. R-VALUES ARE MINIMUM. U-FACTORS AND SHGC ARE MAXIMUMS.
- b. THE FENESTRATION U-FACTOR COLUMN EXCLUDES SKYLIGHTS. THE SOLAR HEAT GAIN COEFFICIENT (SHGC) COLUMN APPLIES TO ALL GLAZED FENESTRATION.
- c. "10/13" MEANS R-10 CONTINUOUS INSULATED SHEATHING ON THE INTERIOR OR EXTERIOR OF THE HOME OR R-13 CAVITY INSULATION AT THE INTERIOR OF THE BASEMENT WALL OR CRAWL SPACE WALL.
- d. FOR MONOLITHIC SLABS, INSULATION SHALL BE APPLIED FROM THE INSPECTION GAP DOWNWARD TO THE BOTTOM OF THE FOOTING OR A MAXIMUM OF 18" BELOW GRADE WHICHEVER IS LESS. FOR FLOATING SLABS, INSULATION SHALL EXTEND TO THE BOTTOM OF THE FOUNDATION WALL OR 24", WHICHEVER IS LESS. R-5 SHALL BE ADDED TO THE REQUIRED SLAB EDGE R-VALUES FOR FLOATING SLABS.
- e. R-19 FIBERGLASS BATTIS COMPRESSED AND INSTALLED IN A 2x4 CAVITY IS DEEMED TO COMPLY. FIBERGLASS BATTIS RATED R-19 OR HIGHER COMPRESSED AND INSTALLED IN A 2x4 CAVITY IS NOT DEEMED TO COMPLY.
- f. BASEMENT WALL INSULATION IS NOT REQUIRED IN WARM-HUMID LOCATIONS AS DEFINED BY FIGURE 41101.2(1) AND TABLE N1101.2. g. OR INSULATION SUFFICIENT TO FILL THE FRAMING CAVITY. R-19 MINIMUM.
- h. "13+2" MEANS R-13 CAVITY INSULATION PLUS R-2 INSULATED SHEATHING. "15+2" MEANS R-15 CAVITY INSULATION PLUS R-2 INSULATED SHEATHING. IF STRUCTURAL SHEATHING COVERS MORE THAN 25 PERCENT OF THE EXTERIOR, SHALL BE SUPPLEMENTED WITH INSULATED SHEATHING OF AT LEAST R-2. "13 + 2.5" MEANS R-13 CAVITY INSULATION PLUS R-2.5 SHEATHING.
- i. FOR MASS WALLS, THE SECOND R-VALUE APPLIES WHEN MORE THAN HALF THE INSULATION IS ON THE INTERIOR MASS WALL.
- j. R-30 SHALL BE DEEMED TO SATISFY THE CEILING INSULATION REQUIREMENT WHEREVER THE FULL HEIGHT OF UNCOMPRESSED R-30 INSULATION EXTENDS OVER THE WALL TOP PLATE AT THE LEVEL. OTHERWISE R-30 INSULATION IS REQUIRED WHERE ADEQUATE CLEARANCE EXISTS OR INSULATION MUST EXTEND TO EITHER THE INSULATION Baffle OR WITHIN 1" OF THE ATTIC ROOF DECK.
- k. TABLE VALUE REQUIRED EXCEPT FOR ROOF EDGE WHERE THE SPACE IS LIMITED BY THE PITCH OF THE ROOF, THERE THE INSULATION MUST FILL THE SPACE UP TO THE AIR Baffle.

SQ. FT. OF CRAWL SPACE / 150 = SQ. FT. OF REQ'D VENTILATION WITHOUT CROSS VENTILATION
SQ. FT. OF VENTILATION REQ'D / 0.45 SQ.FT. PER VENT = # OF VENTS REQ'D

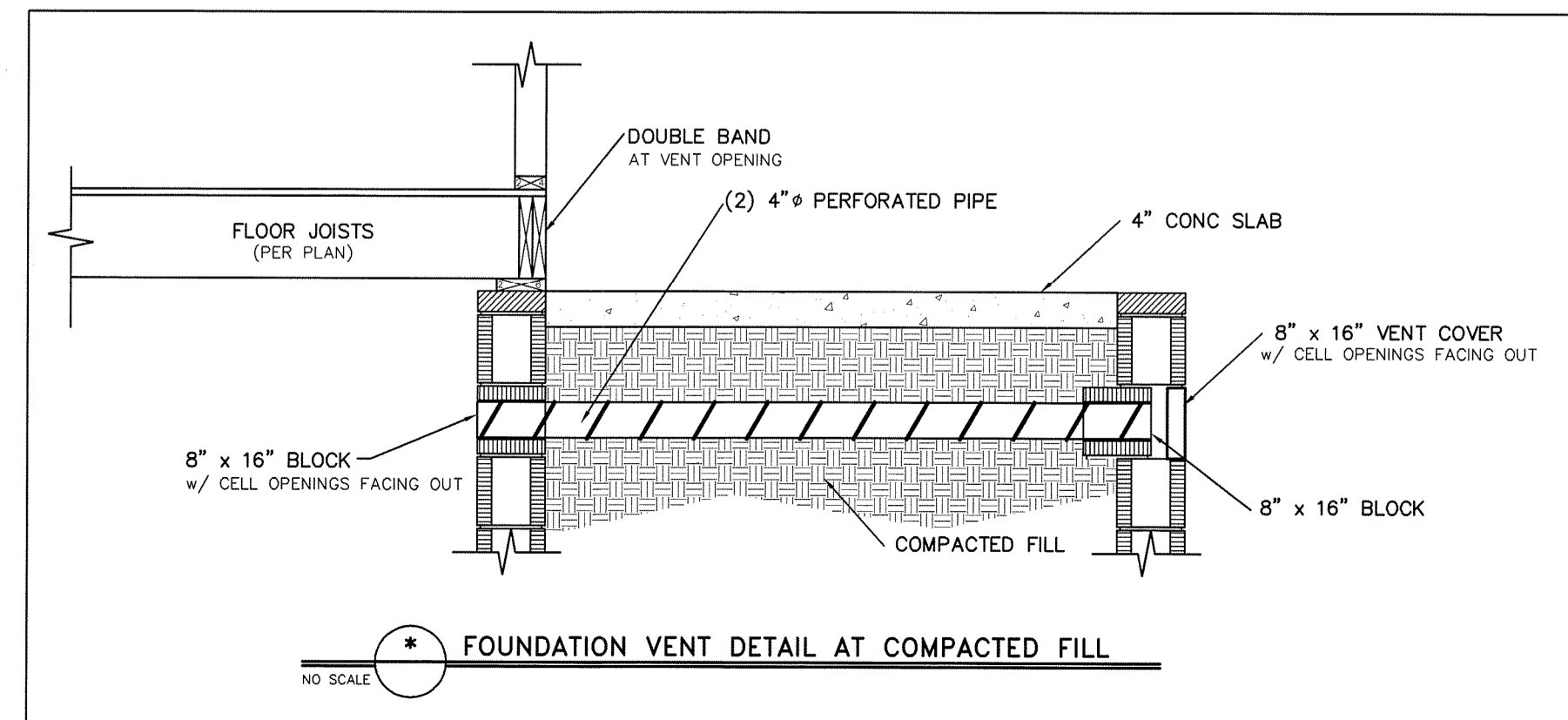
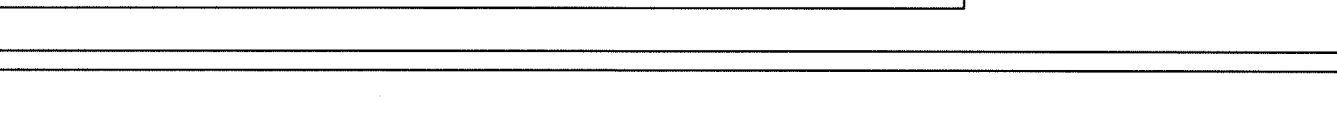
-OR-

SQ. FT. OF CRAWL SPACE / 1500 = SQ. FT. OF REQ'D VENTILATION WITH CROSS VENTILATION
SQ. FT. OF VENTILATION REQ'D / 0.45 SQ.FT. PER VENT = # OF VENTS REQ'D

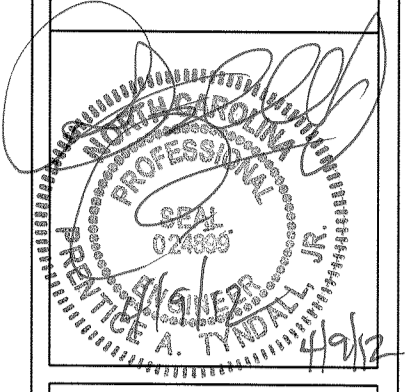
- VENT LOCATIONS MAY VARY FROM THOSE SHOWN ON PLAN, HOWEVER VENTS SHALL BE PLACED TO PROVIDE ADEQUATE VENTILATION AT ALL POINTS AND TO PREVENT DEAD AIR POCKETS.
- THE TOTAL AREA OF VENTILATION OPENINGS MAY BE REDUCED TO 1/1500 OF THE CRAWL SPACE GROUND AREA WHERE THE REQUIRED OPENINGS ARE PLACED SO AS TO PROVIDE CROSS VENTILATION OF THE CRAWL SPACE. THE INSTALLATION OF OPERABLE LUMBER SHALL NOT BE PROVIDED. ONE FOUNDATION VENT SHALL BE WITHIN 3 FEET OF EACH CORNER OF THE BUILDING. TO PREVENT HAZARDOUS ENTRY WHEN THE CRAWL SPACE IS BUILT ON A SLOPED SITE, THE UPRIGHT FOUNDATION WALLS MAY BE CONSTRUCTED WITHOUT WALL VENT OPENINGS. VENT DAMS SHALL BE PROVIDED WHEN THE BOTTOM OF THE FOUNDATION VENT OPENING IS LESS THAN 4 INCHES ABOVE THE FINISHED EXTERIOR GRADE.
WALL VENTED CRAWL SPACES REQUIRE FULL COVERAGE GROUND VAPOR RETARDERS.



- SQ. FT. OF ATTIC / 300 = # OF INLETS/OUTLETS REQUIRED
- CALCULATION BASED ON VENTILATORS USED AT LEAST 3'-0" ABOVE THE COMB VENTS WITH THE BALANCE OF VENTILATION PROVIDED BY CASE VENTS.
 - CATHEDRAL CEILING SHALL HAVE A 1" MINIMUM CLEARANCE BETWEEN THE BOTTOM OF THE ROOF DECK AND THE INSULATION.



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VUNCANNON DESIGNS

STANDARD DETAILS

Project #: 1201-010129
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Scale: NOT TO SCALE

No.	Date	Remarks

Sheet Number
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