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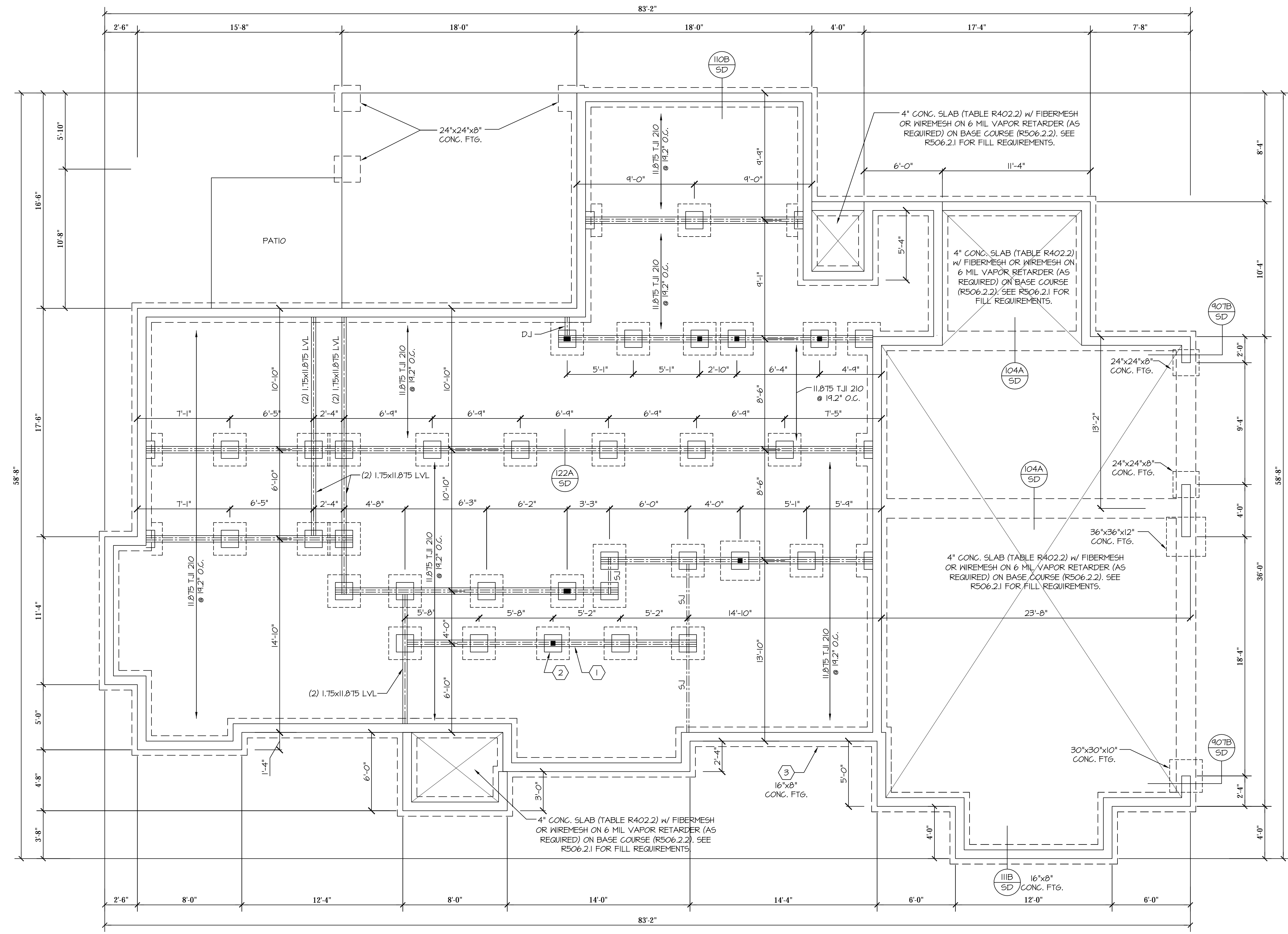
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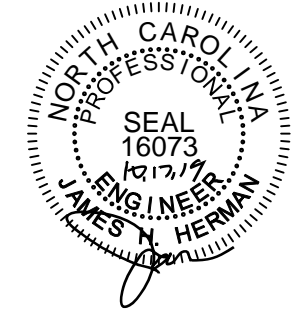
**FOUNDATION STRUCTURAL NOTES**

NC (2010 NCRS): Wind: 115-120 mph - CRAWL

- ① (3)2x10 SYP#2 OR SFP#2 GIRDER, TYPICAL UNO.
- ② CONCRETE BLOCK PIER SIZE SHALL BE:
  - SIZE HOLLOW SOLID
  - 8x16 UP TO 32" UP TO 5'-0"
  - 12x16 UP TO 48" UP TO 9'-0"
  - 16x16 UP TO 64" UP TO 12'-0"
  - 24x24 UP TO 96"
  - WITH 30" x 30" x 10" CONCRETE FOOTINGS, UNO.
- ③ WALL FOOTING AS FOLLOWS
  - DEPTH: 8" - UP TO 2 STORY
  - 10" - 3 STORY
  - WIDTH:
  - SIDING: 16" - UP TO 2 STORY
  - 20" - 3 STORY
  - BRICK: 16" - 1 STORY
  - 20" - 2 STORY
  - 24" - 3 STORY
- FOR FOUNDATION WALL HEIGHT AND BACKFILL REQUIREMENTS, REFER TO CODE TABLE R404.11 (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.
- ④ (4) 2x10 SFP #2 OR SYP #2 GIRDER
- ⑤ (2) 1.75x9.25 LVL OR LSL GIRDER
- ⑥ (3) 1.75x9.25 LVL OR LSL GIRDER
- 7. ■■ 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.
- 8. ABBREVIATIONS:
  - "S,J" = SINGLE JOIST
  - "D,J" = DOUBLE JOIST
  - "T,J" = TRIPLE JOIST
- 9. ADJUST SUBFLOOR THICKNESS OR JOIST SPACING AS REQ'D FOR FLOOR FINISH MATERIALS.



FOUNDATION STRUCTURAL PLAN  
SCALE: 1/4" = 1'-0"  
REFER TO "SD" SHEET(S) FOR STANDARD DETAILS AND STRUCTURAL NOTES



**FRAMING NOTES**

NC (2018 NCRS): Wind: 115-120 mph

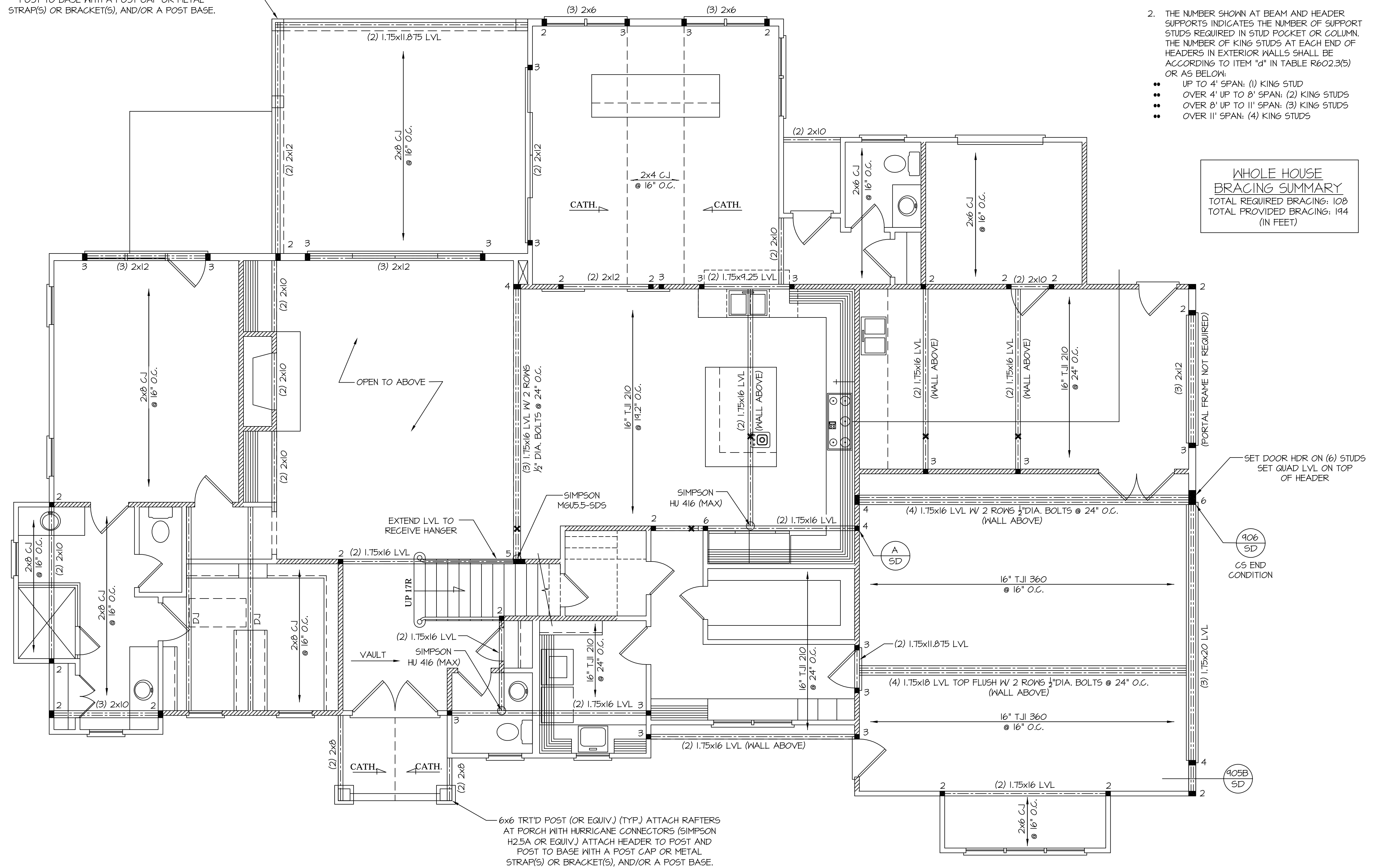
- BRACING METHOD AND TYPE: CONTINUOUSLY SHEATHED WSP. C5-WSP. NOTE THAT THE WALL BRACING AMOUNT PROVIDED ON THE PLANS (DETAILS AND SPECIFICATIONS) IS GREATER THAN THE AMOUNT OF WALL BRACING REQUIRED BY SECTION R602.10 OF THE CODE. SEE NOTES BELOW FOR DETAILS AND SPECIFICATIONS FOR WALL BRACING AND WALL FRAMING.
- EXTERIOR WALL SHEATHING: WALLS SHALL BE BRACED BY SHEATHING WALLS ON ALL STORIES WITH WOOD STRUCTURAL PANEL SHEATHING (WSP) (EXPOSURE B: 7/16", EXPOSURE C: 15/32"). SHEATHING SHALL BE ATTACHED WITH 8d NAILS AT A 6"X12" NAILING PATTERN (6" OC AT PANEL EDGES AND 12" OC AT INTERMEDIATE SUPPORTS). INSTALL BLOCKING AT ALL PANEL EDGES.
- WSP SHEATHING SHALL EXTEND TO THE UPPERMOST DOUBLE BEARING PLATE. BLOCK AT ROOF PER SECTION R602.10.4.5 AND ATTACH BRACED WALLS PER CODE. WSP SHEATHING BETWEEN FLOORS SHALL BE SPLICED ALONG CONTINUOUS BAND OR THE WSP SHEATHING MAY BE SPLICED ACROSS STUDS (CONTINUOUS ACROSS FLOOR SYSTEM) WITH BLOCKING AT PANEL EDGES. (MINIMUM 12" BEYOND FLOOR BREAK) OR OTHER APPROVED METHOD.
- "HD" = HOLD-DOWN: HOLD-DOWN DEVICE (NOTED AS "HD" ON PLANS) SHALL BE AN 800 POUND CAPACITY ASSEMBLY AS NOTED ON PLANS. SEE DETAILS FOR HD ASSEMBLY.  
 • GROUND/FIRST FLOOR: USE "HD HOLD-DOWN DETAIL" ON 5D SHEET (OR EQUIV.)  
 • UPPER FLOORS: ATTACH BASE OF KING STUD WITH A SIMPSON C522 STRAP DOWN ACROSS THE BAND AND DOWN TO A STUD BELOW OR HEADER BELOW. EXTEND STRAP 1" MIN ALONG EACH STUD (OR HEADER) AND ATTACH EACH END W/ (1) 8d NAILS.
- INTERIOR BRACED WALL: (NOTED AS "IBW" ON PLANS) ATTACH 1/2" GYPSUM BOARD (GB) ON EACH SIDE OF WALL WITH A MIN. OF 5d COOLER NAILS OR #6 SCREWS @ 7" O.C. ALONG THE EDGES AND AT INTERMEDIATE SUPPORTS.
- INTERIOR BRACED WALL-WOOD STRUCTURAL PANEL: (NOTED AS "IBW-WSP" ON PLANS). ATTACH ONE SIDE WITH 1/8" WSP SHEATHING WITH 8d NAILS AT A 6"X12" NAILING PATTERN (6" OC AT PANEL EDGES AND 12" OC AT INTERMEDIATE SUPPORTS). INSTALL BLOCKING AT ALL PANEL EDGES. ATTACH GB OVER WSP AS REQUIRED. ATTACH OPPOSITE SIDE WITH 1/2" GB WITH A MIN. OF 5d COOLER NAILS OR #6 SCREWS @ 7" OC ALONG THE EDGES AND AT INTERMEDIATE SUPPORTS.

**WOOD "I" JOISTS**

(SHALL BE ONE OF THE FOLLOWING):

- TJI 210 BY I-LEVEL
  - LFI 20 PLUS BY LP
  - BCI 5000s 12 BY BC
- ALL WOOD "I" JOISTS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- INSTALL SQUASH BLOCKS, WEB STIFFENERS, ETC. AS REQUIRED BY AND ACCORDING TO THE I-JOIST MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.
  - HANGERS FOR I-JOISTS ARE THE RESPONSIBILITY OF THE I-JOIST SUPPLIER.

6x6 TRTD POST (OR EQUIV.) (TYP.) ATTACH RAFTERS AT PORCH WITH HURRICANE CONNECTORS (SIMPSON H2.5A OR EQUIV.) ATTACH HEADER TO POST AND POST TO BASE WITH A POST CAP OR METAL STRAP(S) OR BRACKET(S), AND/OR A POST BASE.



**HEADER/BEAM & COLUMN NOTES**

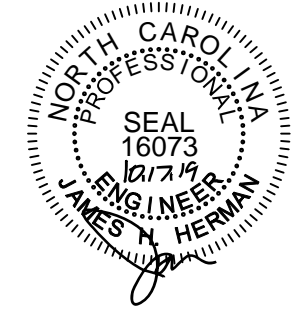
- ALL EXTERIOR AND LOAD BEARING HEADERS SHALL BE MIN. (2)2x10 (4" WALL) OR (3)2x10 (6" WALL) WITH (1) SUPPORT STUD, UNLESS NOTED OTHERWISE.
- THE NUMBER SHOWN AT BEAM AND HEADER SUPPORTS INDICATES THE NUMBER OF SUPPORT STUDS REQUIRED IN STUD POCKET OR COLUMN. THE NUMBER OF KING STUDS AT EACH END OF HEADERS IN EXTERIOR WALLS SHALL BE ACCORDING TO ITEM "d" IN TABLE R602.3(5) OR AS BELOW:
  - UP TO 4' SPAN: (1) KING STUD
  - OVER 4' UP TO 8' SPAN: (2) KING STUDS
  - OVER 8' UP TO 11' SPAN: (3) KING STUDS
  - OVER 11' SPAN: (4) KING STUDS

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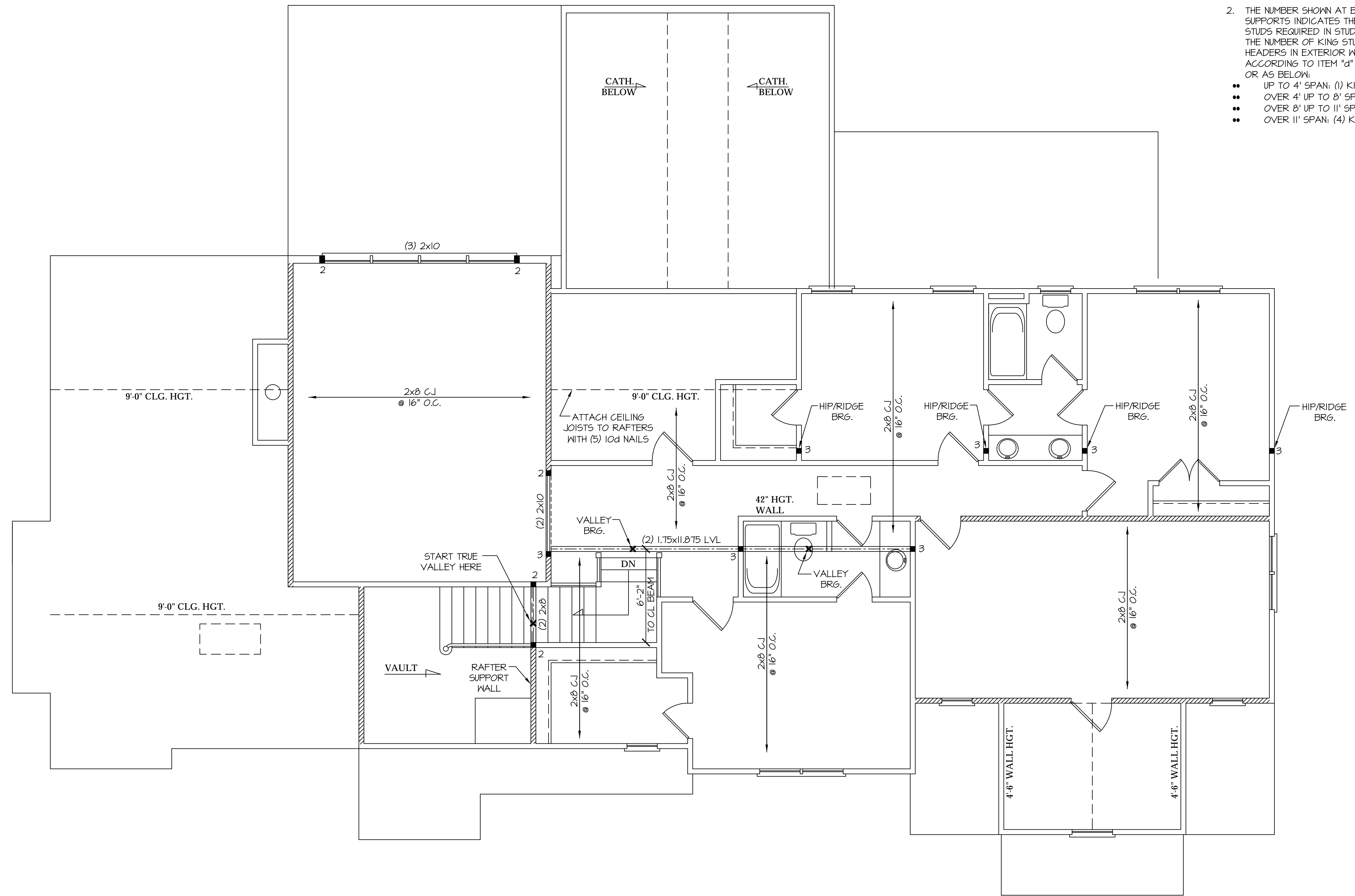
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**HEADER/BEAM & COLUMN NOTES**

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- 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:
  - UP TO 4' SPAN: (1) KING STUD
  - OVER 4' UP TO 8' SPAN: (2) KING STUDS
  - OVER 8' UP TO 11' SPAN: (3) KING STUDS
  - OVER 11' SPAN: (4) KING STUDS



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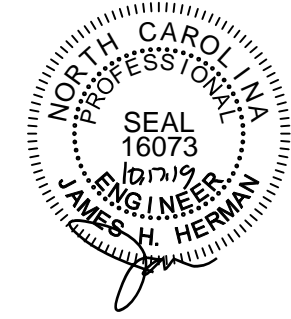
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**SECOND FLOOR STRUCTURAL PLAN**

SCALE: 1/4" = 1'-0"  
REFER TO "SD" SHEET(S) FOR STANDARD DETAILS AND STRUCTURAL NOTES

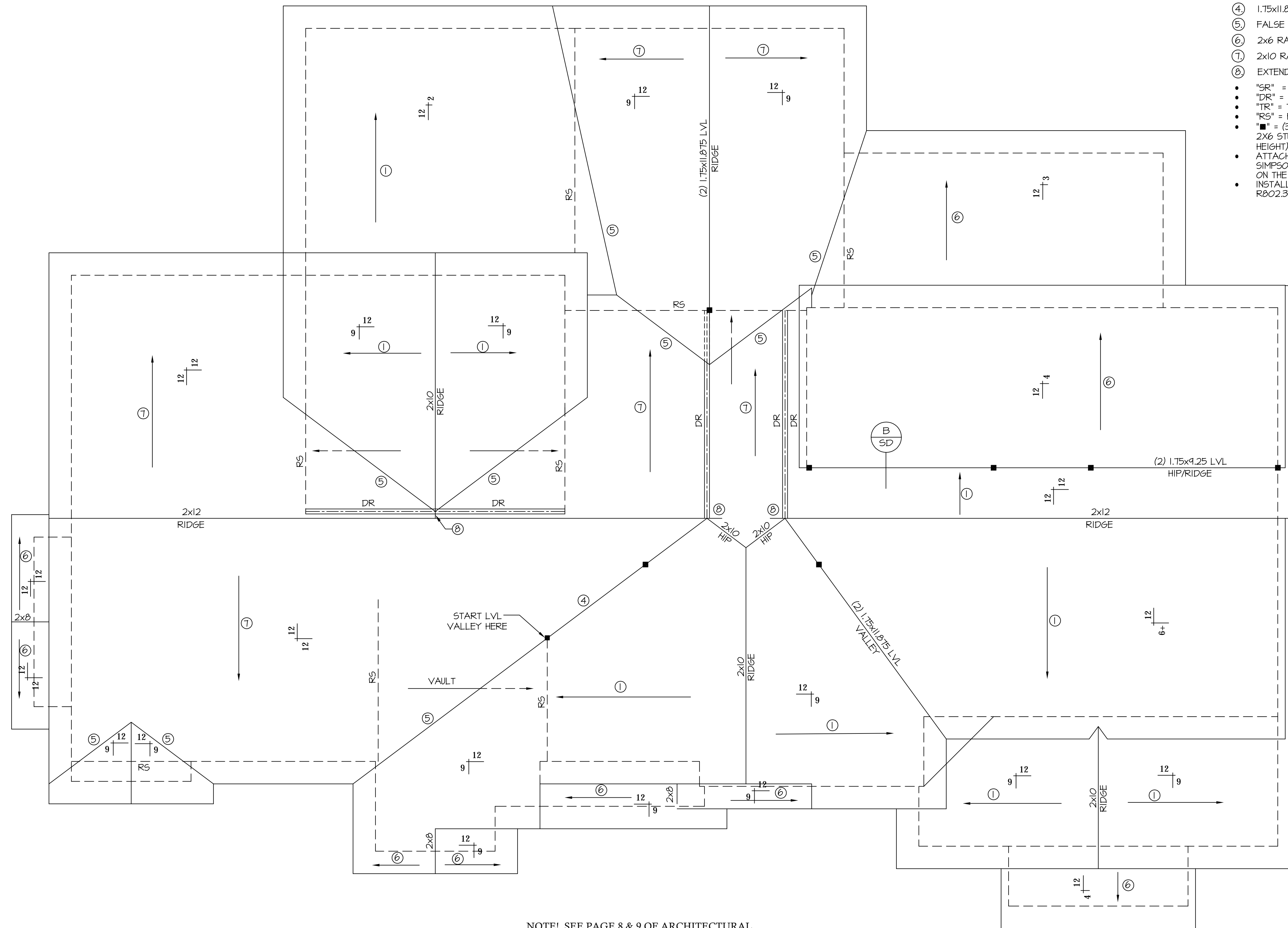
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**ROOF FRAMING NOTES:**

NC (2018 NCRG): Wind: 115-120 mph

- ① 2x8 RAFTERS @ 16" O.C. WITH 2x10 RIDGE, UNO.
  - ② (2) 2x10 OR 1.75x11.875 LVL HIP, (2) 2x10 HIPs MAY BE SPLICED WITH A MIN. 6'-0" OVERLAP AT CENTER
  - ③ (2) 2x10 OR 1.75x9.25 LVL VALLEY, DO NOT SPLICE VALLEYS
  - ④ 1.75x11.875 LVL OR (2)1.75x9.25 LVL VALLEY
  - ⑤ FALSE FRAME VALLEY ON 2x10 FLAT PLATE
  - ⑥ 2x6 RAFTERS @ 16" O.C. W/ 2x8 RIDGE, UNO.
  - ⑦ 2x10 RAFTERS @ 16" O.C. W/ 2x12 RIDGE, UNO.
  - ⑧ EXTEND RIDGE 12" BEYOND INTERSECTION
- "SR" = SINGLE RAFTER
  - "DR" = DOUBLE RAFTER
  - "TR" = TRIFLE RAFTER
  - "RS" = ROOF SUPPORT
  - "■" = (3) STUD OR 4x4 POST FOR ROOF SUPPORT (USE 2x6 STUDS OR 6x6 POST FOR SUPPORT OVER 10'-0" IN HEIGHT)
  - ATTACH VAULTED RAFTERS WITH HURRICANE CLIPS: SIMPSON "H-25A" OR EQUIVALENT. TIES TO BE INSTALLED ON THE OUTSIDE FACE OF FRAMING.
  - INSTALL RAFTER TIES AND COLLAR TIES PER SECTION R802.3.1 OF THE 2018 NC RESIDENTIAL CODE.



NOTE! SEE PAGE 8 & 9 OF ARCHITECTURAL PLANS FOR KNEE WALLS AND FRAMING SECTIONS

**ROOF STRUCTURAL PLAN**

SCALE: 1/4" = 1'-0"

REFER TO "SD" SHEET(S) FOR STANDARD DETAILS AND STRUCTURAL NOTES

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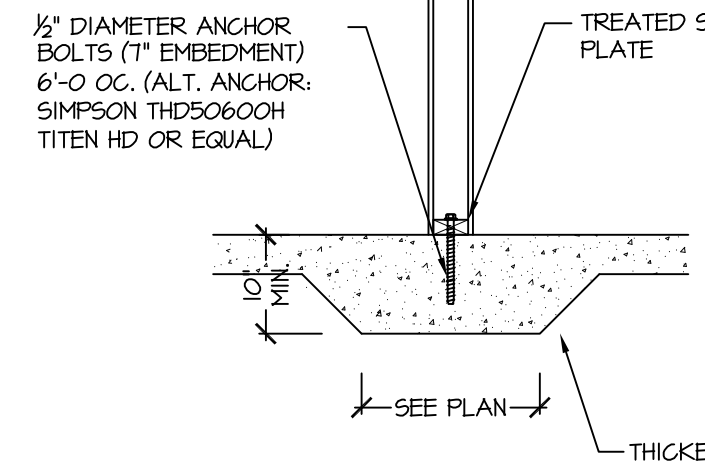
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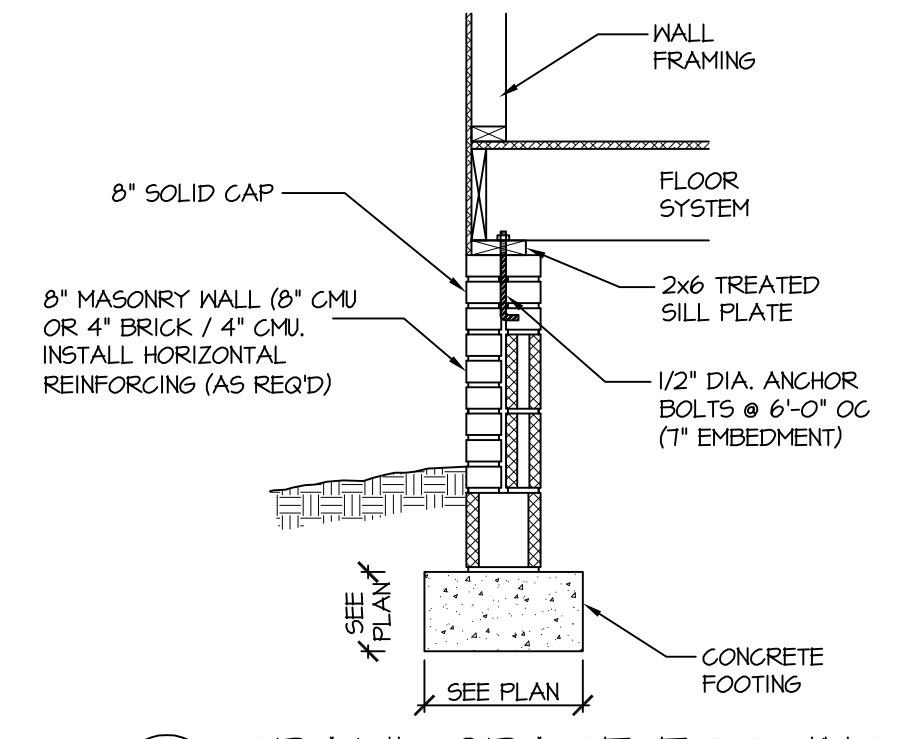
**STRUCTURAL NOTES**

NC (2018) NCR.C; Wind: 115-120 mph

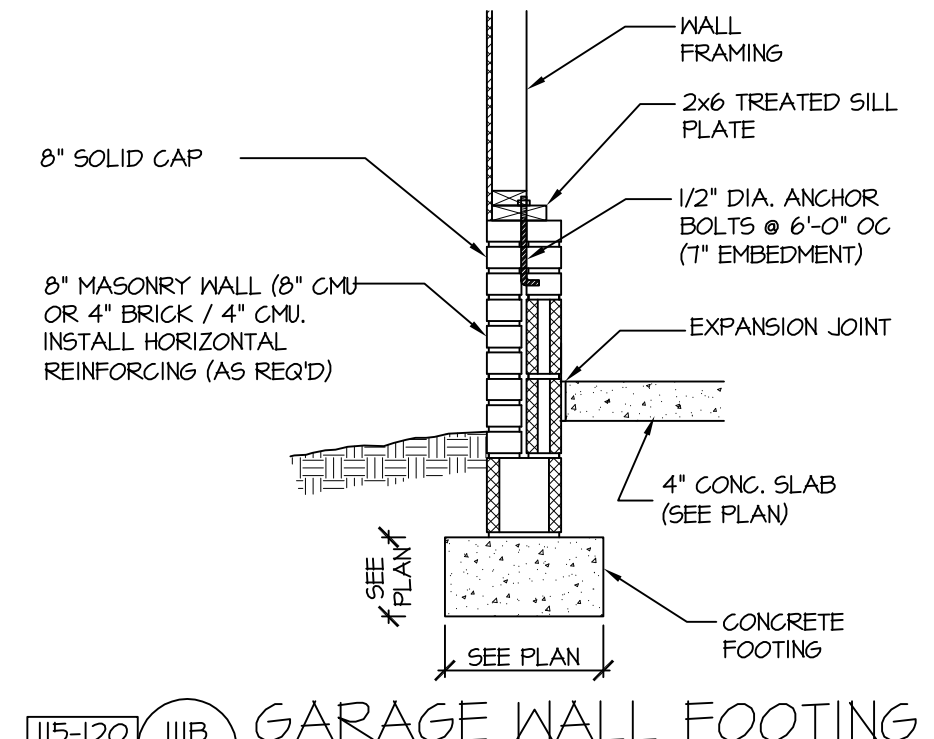
- ENGINEER'S SEAL APPLIES ONLY TO STRUCTURAL COMPONENTS INCLUDING ROOF RAFTERS, HIPS, VALLEYS, RIDGES, FLOORS, WALLS, BEAMS AND HEADERS, COLUMNS, CANTILEVERS, OFFSET LOAD BEARING WALLS, PIER & GIRDER SYSTEM, FOOTING, AND PILING SYSTEM. ENGINEER'S SEAL DOES NOT CERTIFY DIMENSIONAL ACCURACY OR ARCHITECTURAL LAYOUT INCLUDING ROOF SYSTEM. ALL REQUIREMENTS FOR PROFESSIONAL CERTIFICATION SHALL BE PROVIDED BY THE APPROPRIATE PROFESSIONAL. SOUTHERN ENGINEERS, P.A. CERTIFIES ONLY THE STRUCTURAL COMPONENTS AS SPECIFICALLY STATED.
- ALL CONSTRUCTION SHALL CONFORM TO THE LATEST REQUIREMENTS OF RESIDENTIAL CODE, PLUS ALL LOCAL CODES AND REGULATIONS. THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR, AND WILL NOT HAVE CONTROL OF, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION WORK, NOR WILL THE ENGINEER BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE CONSTRUCTION WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. "CONSTRUCTION REVIEW" SERVICES ARE NOT PART OF OUR CONTRACT. ALL MEMBERS SHALL BE FRAMED ANCHORED, TIED AND BRACED IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND THE BUILDING CODE.
- DESIGN LOADS (LISTED AS: LIVE LOAD, DEAD LOAD, DEFLECTION)
  - ROOMS OTHER THAN SLEEPING ROOMS: (40 PSF, 10 PSF, L/360)
  - SLEEPING ROOMS: (30 PSF, 10 PSF, L/360)
  - ATTIC WITH PERMANENT STAIR: (40 PSF, 10 PSF, L/360)
  - ATTIC WITHOUT PERMANENT STAIR: (20 PSF, 10 PSF, L/360)
  - ATTIC WITHOUT STORAGE: (10 PSF, 10 PSF, L/240)
  - STAIRS: (40 PSF, 10 PSF, L/360)
  - EXTERIOR BALCONIES: (60 PSF, 10 PSF, L/360)
  - DECKS: (40 PSF, 10 PSF, L/360)
  - GUARDRAILS AND HANDRAILS: (200 LBS)
  - PASSENGER VEHICLE GARAGES: (50 PSF, 10 PSF, L/360)
  - FIRE ESCAPES: (40 PSF, 10 PSF, L/360)
  - SNOW: (20 PSF)
- WALLS SHALL BE BRACED BY SHEATHING WALLS ON ALL STORIES WITH WOOD STRUCTURAL PANELS. SEE FRAMING NOTES FOR THICKNESS AND NAILING REQUIREMENTS.
- SEE APPENDIX M (DCA6) FOR EXTERIOR DECK REQUIREMENTS INCLUDING ATTACHMENTS FOR LATERAL LOADS.
- CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 3000 PSI AND A MAXIMUM SLUMP OF 5 INCHES UNLESS NOTED OTHERWISE (N.O.). 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. CONTROL JOINTS IN SLABS SHALL BE SPACED ON A GRID OF +30 TIMES THE DEPTH (D). CONTROL JOINTS SHALL BE SAWCUT TO A DEPTH OF 1/3. (I.E. 4" CONCRETE SLABS SHALL HAVE 1/4" DEEP CONTROL JOINTS SAWCUT IN SLAB ON A +10'-0" x +10'-0" GRID).
- 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.
- ALL FRAMING LUMBER SHALL BE SFF #2 (F<sub>b</sub> = 875 PSI) UNLESS NOTED OTHERWISE (N.O.). ALL TREATED LUMBER SHALL BE SYP # 2. PLATE MATERIAL MAY BE SFF # 3 OR SYP #3 (F<sub>c(perp)</sub> = 425 PSI - MIN).
- L.V.L. SHALL BE LAMINATED VENEER LUMBER; F<sub>b</sub>=2600 PSI, F<sub>v</sub>=295 PSI, E=1.4x10<sup>6</sup> PSI.
  - P.S.L. SHALL BE PARALLEL STRAND LUMBER; F<sub>b</sub>=2400 PSI, F<sub>v</sub>=240 PSI, E=2.0x10<sup>6</sup> PSI.
  - L.S.L. SHALL BE LAMINATED STRAND LUMBER; F<sub>b</sub>=2250 PSI, F<sub>v</sub>=400 PSI, E=1.55x10<sup>6</sup> PSI.
 INSTALL ALL CONNECTIONS PER MANUFACTURERS INSTRUCTIONS.
- 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. ANY CHANGE IN TRUSS OR I-JOIST LAYOUT SHALL BE COORDINATED WITH SOUTHERN ENGINEERS.
- 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 PROVIDING 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. LAP ALL REBAR SPLICES 30 BAR DIAMETERS.
- REBAR SHALL BE DEFORMED STEEL, ASTM615, GRADE 60.
- FLITCH BEAMS SHALL BE BOLTED TOGETHER USING (2) ROWS OF 1/2" DIAMETER BOLTS (ASTM A325) 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.
- BRICK LINTELS (WHEN REQUIRED) 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". SEE PLANS FOR SPANS OVER 9'-0". SEE ALSO SECTION RT03.T3 LINTELS.



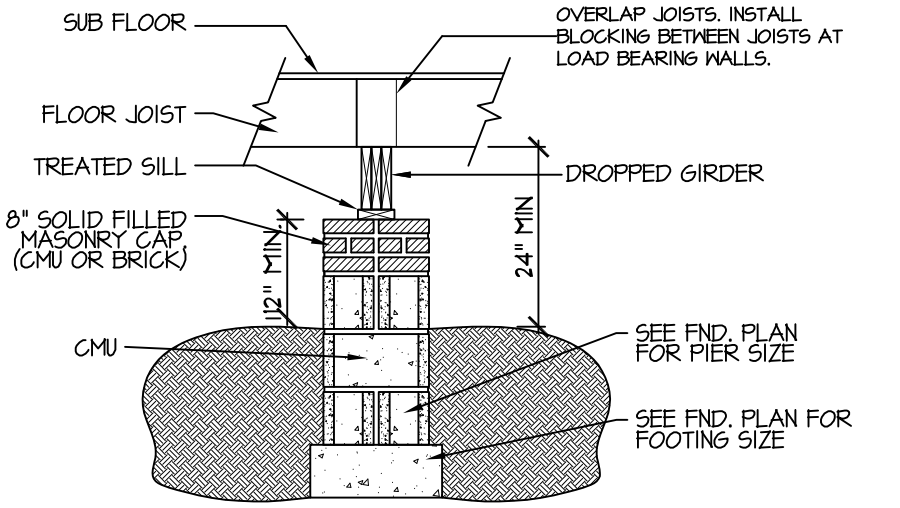
115-120 MPH 104A SD THICKENED SLAB (INTERIOR BEARING WALL)



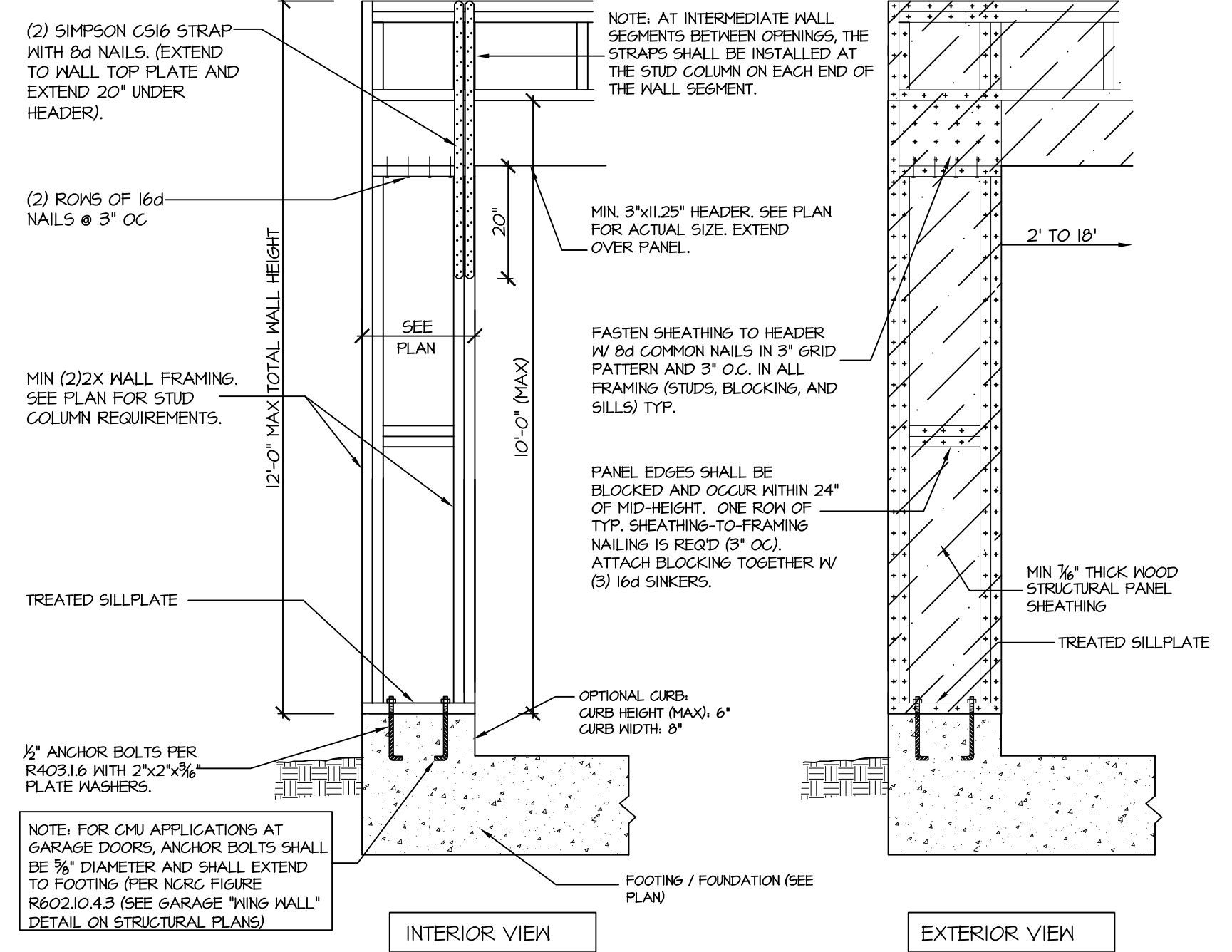
115-120 MPH 110B SD CRAWL SPACE FOOTING (SIDING W/ BRICK SKIRT)



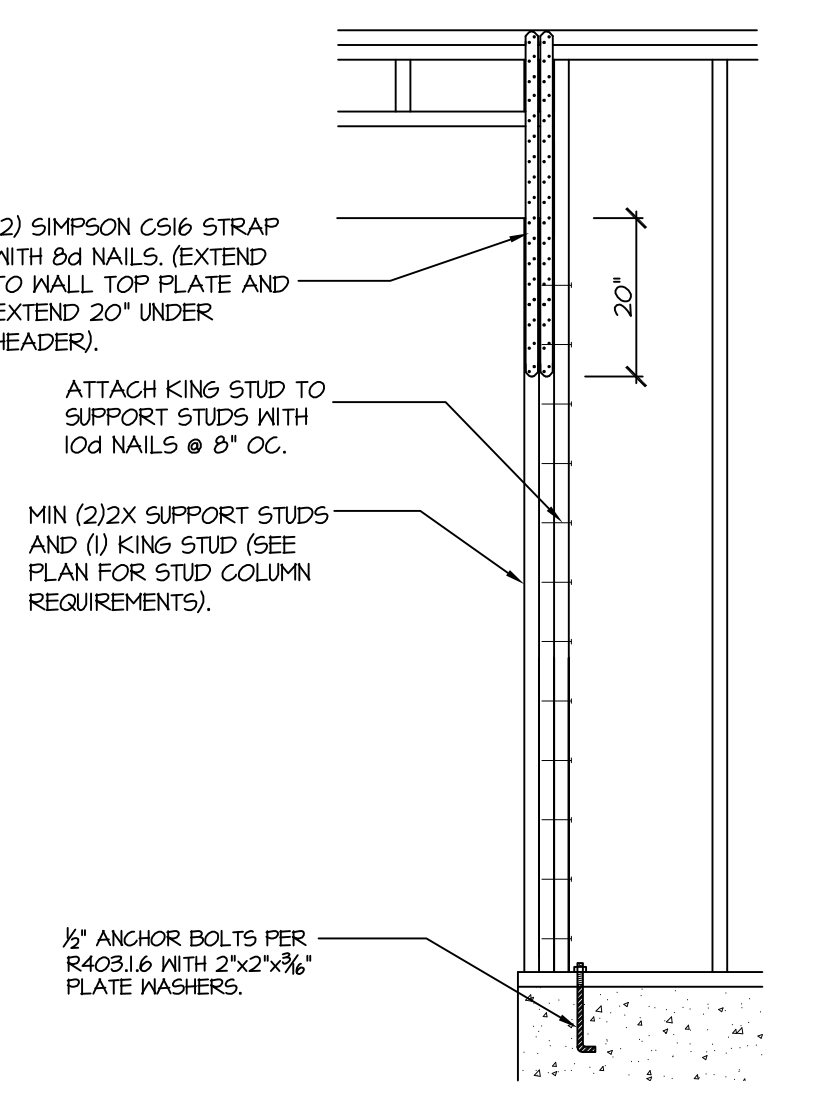
115-120 MPH 111B SD GARAGE WALL FOOTING (SIDING W/ BRICK SKIRT)



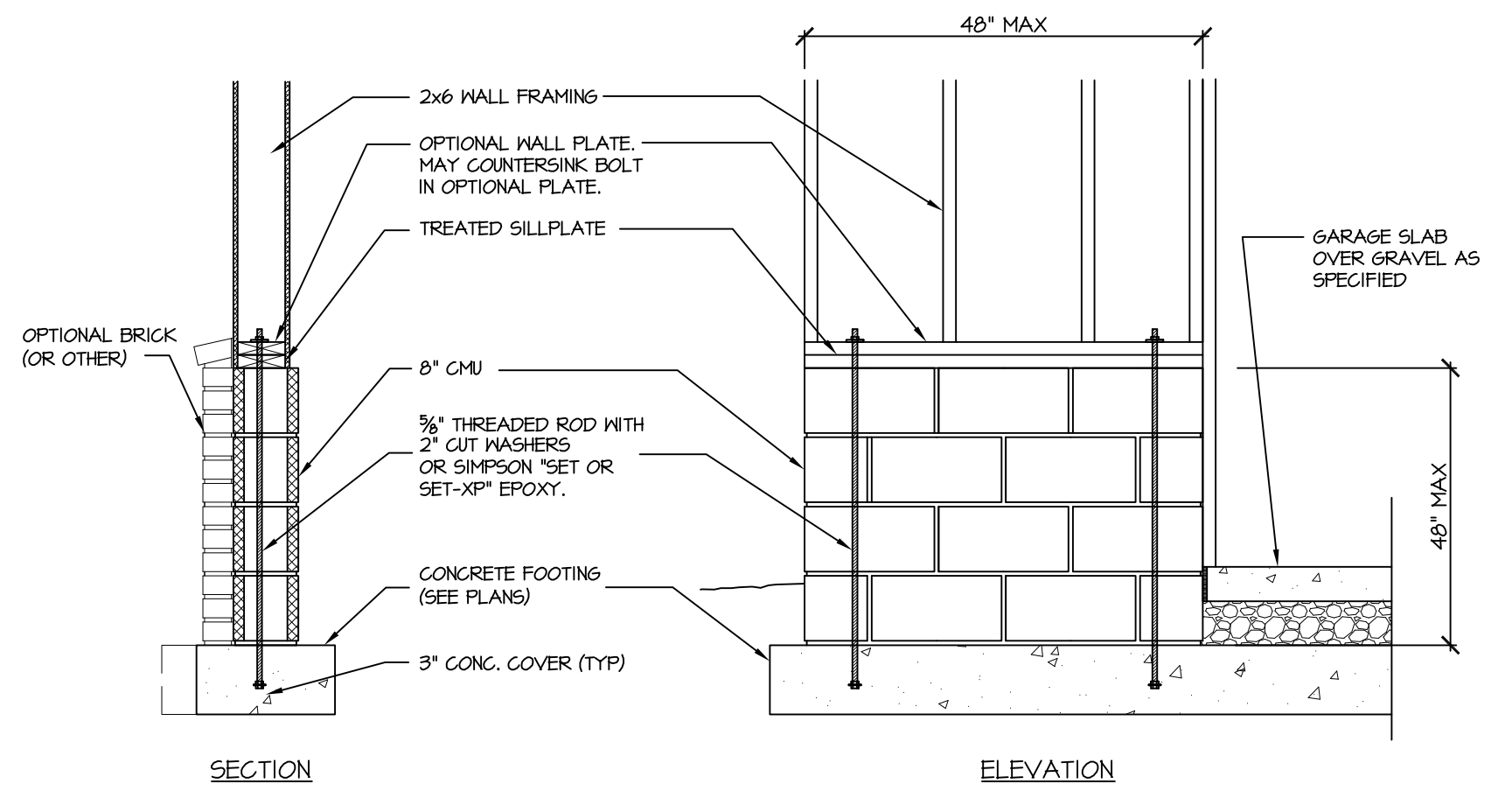
122A SD DROPPED GIRDER



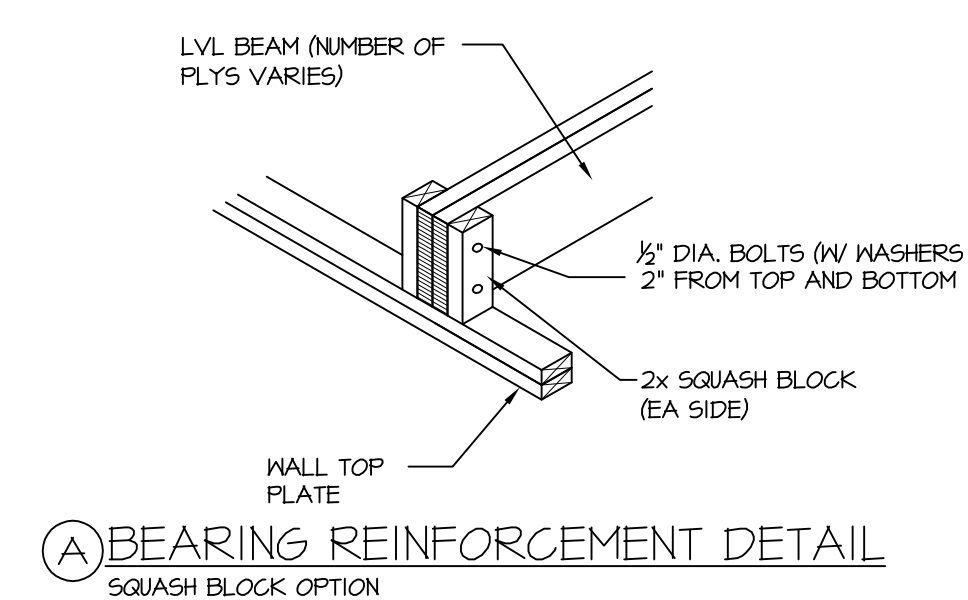
105B SD CS-PF: CONTINUOUS PORTAL FRAME CONSTRUCTION (DETAIL AND APPLICATION BASED ON NCR.C FIGURE R602.10.1 - PORTAL FRAME CONSTRUCTION)



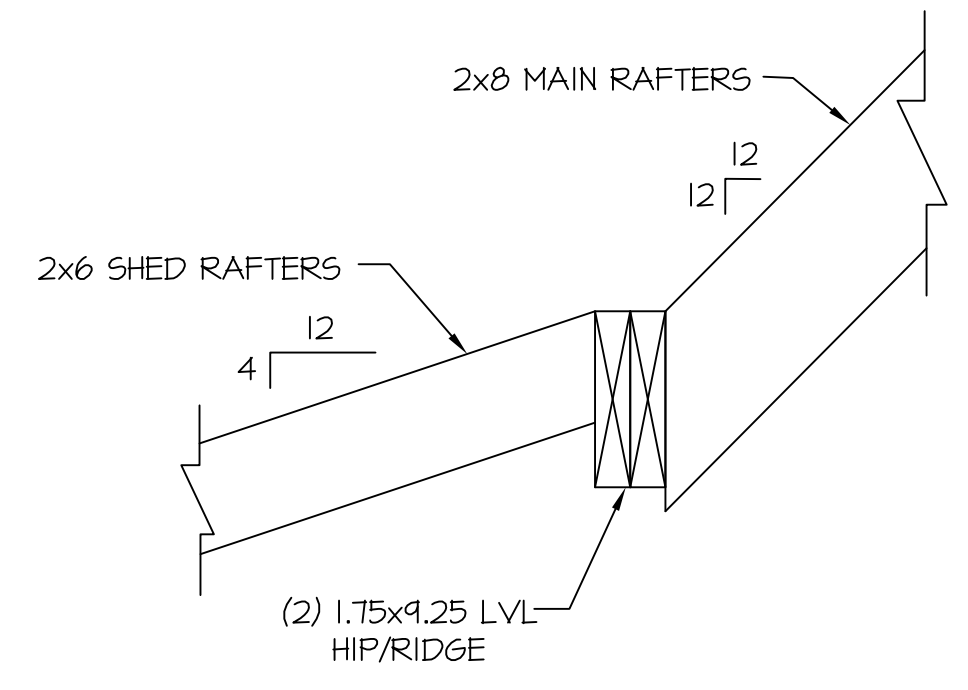
106 SD CS-PF: END CONDITION DETAIL (FOR USE WITH SINGLE CS-PF CONDITION) (DETAIL AND APPLICATION BASED ON NCR.C FIGURE R602.10.1 - PORTAL FRAME CONSTRUCTION)



107 SD GARAGE 'WING WALL' REINFORCING (PER IRC FIGURE R602.10.4.3)



108 SD BEARING REINFORCEMENT DETAIL (SQUASH BLOCK OPTION)



109 SD RAFTER DETAIL



**PROJECT # 19-1621**

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**Rachford**

**SD**