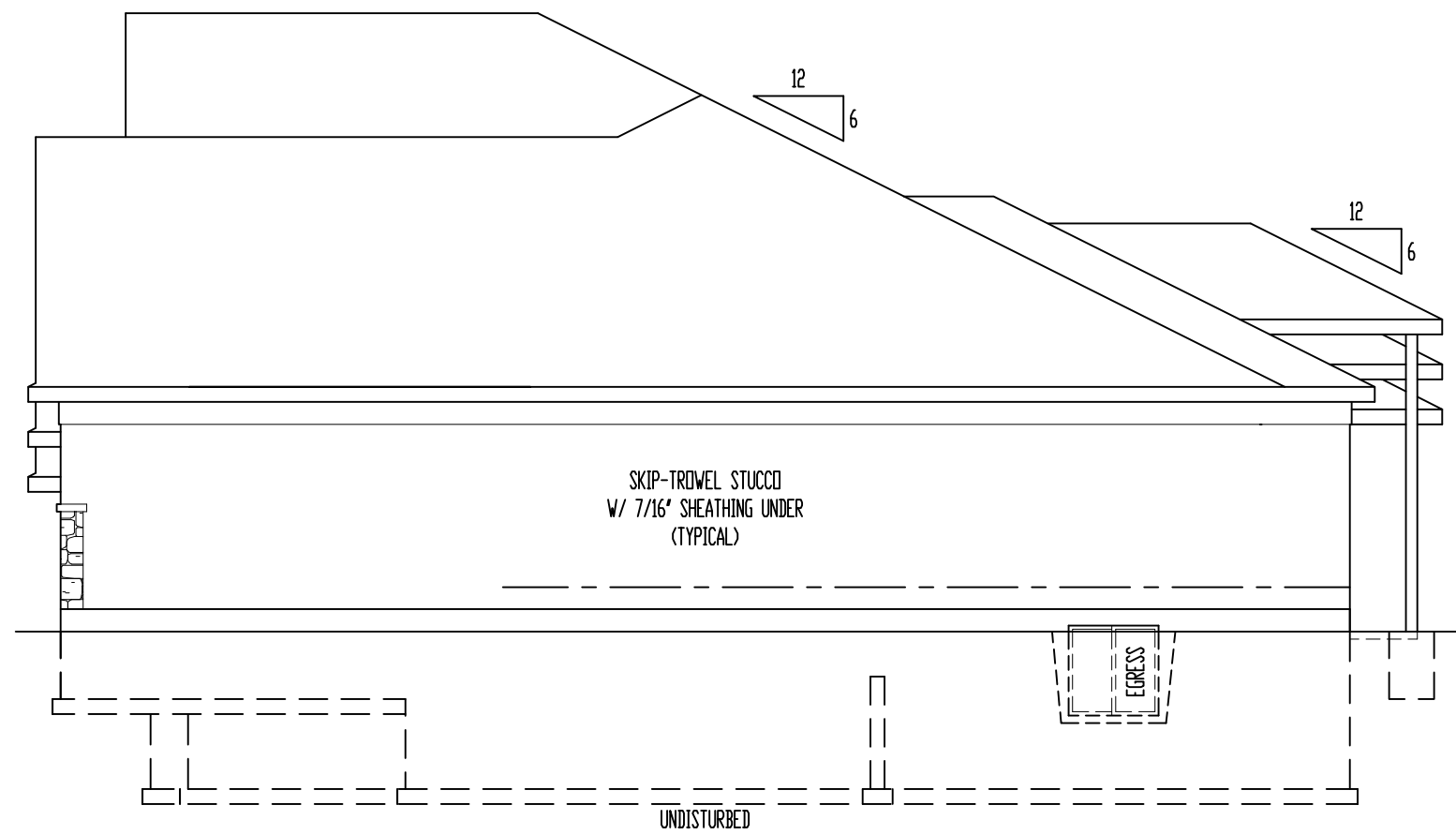


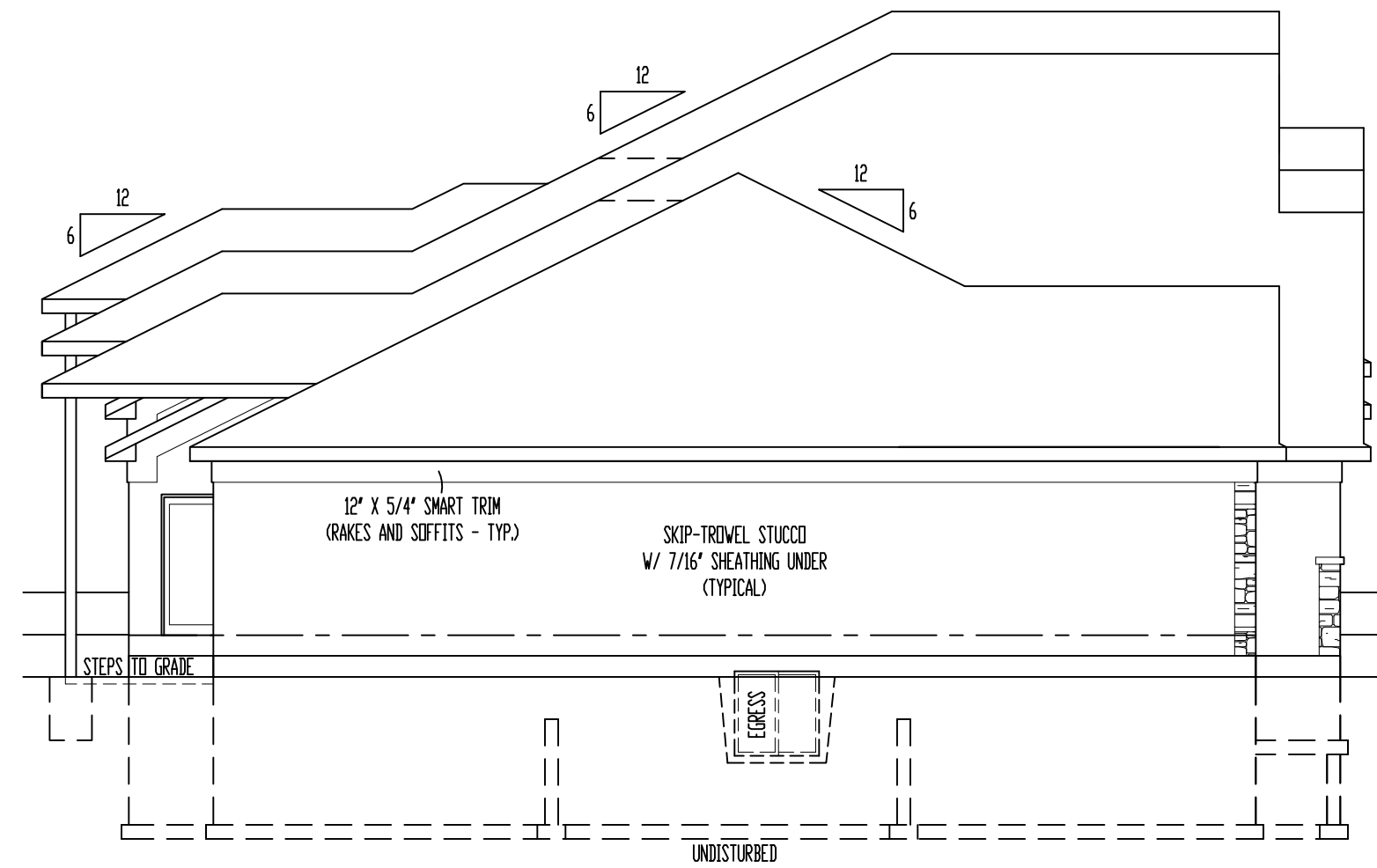
FRONT ELEVATION

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



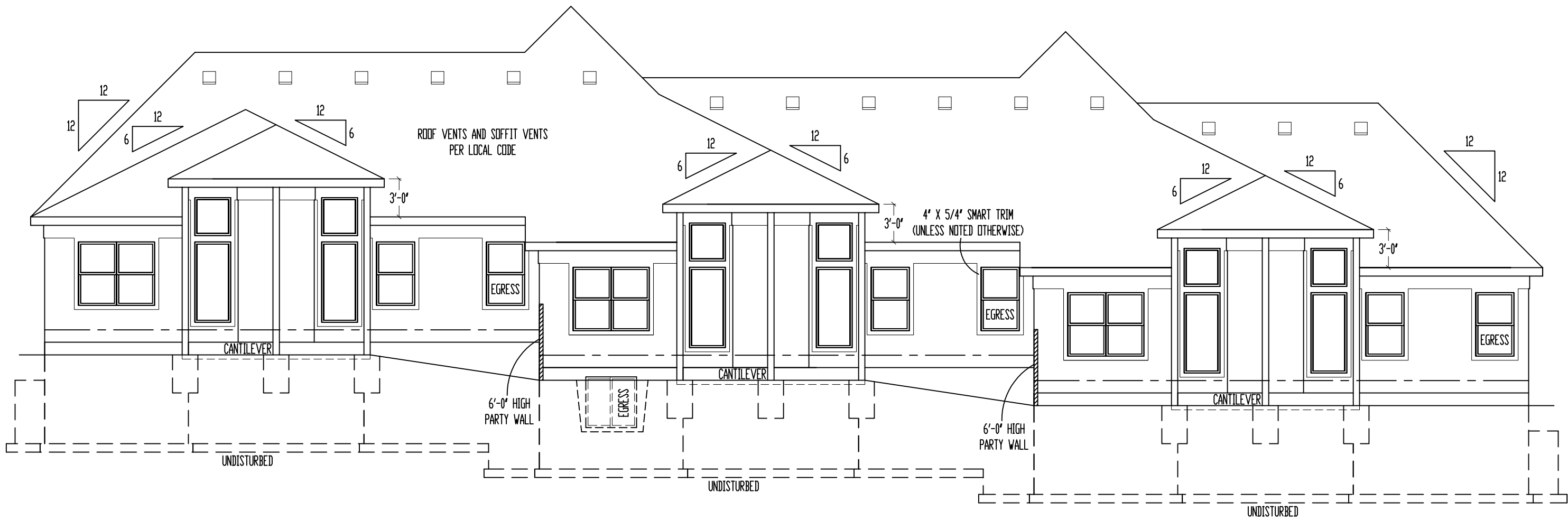
RIGHT ELEVATION

SCALE: 1/8" = 1'-0"



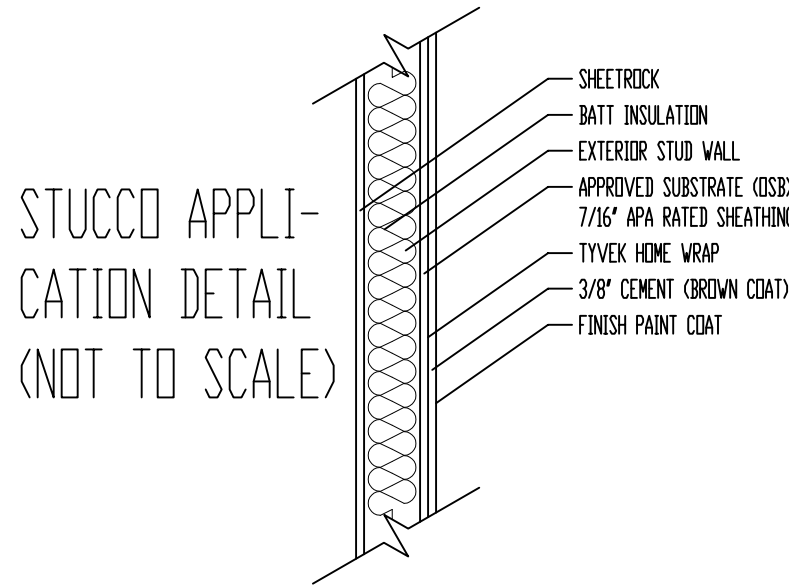
LEFT ELEVATION

SCALE: 1/8" = 1'-0"



REAR ELEVATION

SCALE: 1/8" = 1'-0"



- ELEVATIONS:
- SKIP-TROWEL STUCCO ON ALL ELEVATIONS
  - TILE ROOF SHINGLES
  - LOCATE ROOF AND SOFFIT VENTS PER CODE
  - ADJUST FOUNDATION TO GRADE
- OPTIONAL DECK:
- DECK CONSTRUCTION TO COMPLY WITH MUNICIPALITY'S RESIDENTIAL DECK STANDARDS
  - 2" X 10" #2 RTD @ 16" OC FLOOR JOISTS (MAX. SPAN 14'-0")
  - 2" X 6" CEDAR BECKING
  - 6" X 6" CEDAR/PTBL POSTS
  - 2" X 2" CEDAR SPINDLES
  - 2" X 6" CEDAR TOP RAIL
  - DETERMINE OPTIONAL STAIRS ON SITE

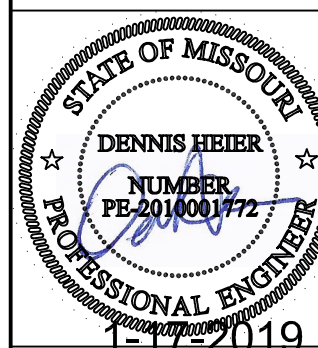
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"For God so loved the world, that he gave his only begotten Son, that whosoever should not perish, but have everlasting life" (John 3:16)

**VIEWPOINT**  
RESIDENTIAL DESIGN LLC  
M/T: (816) 547-4437  
E: Plans@ViewpointDesign.net

Description: **Lot 7, Townhomes of Chapel Ridge**  
Property Address: **509 Ashurst Pl., Lee's Summit, MO 64081**

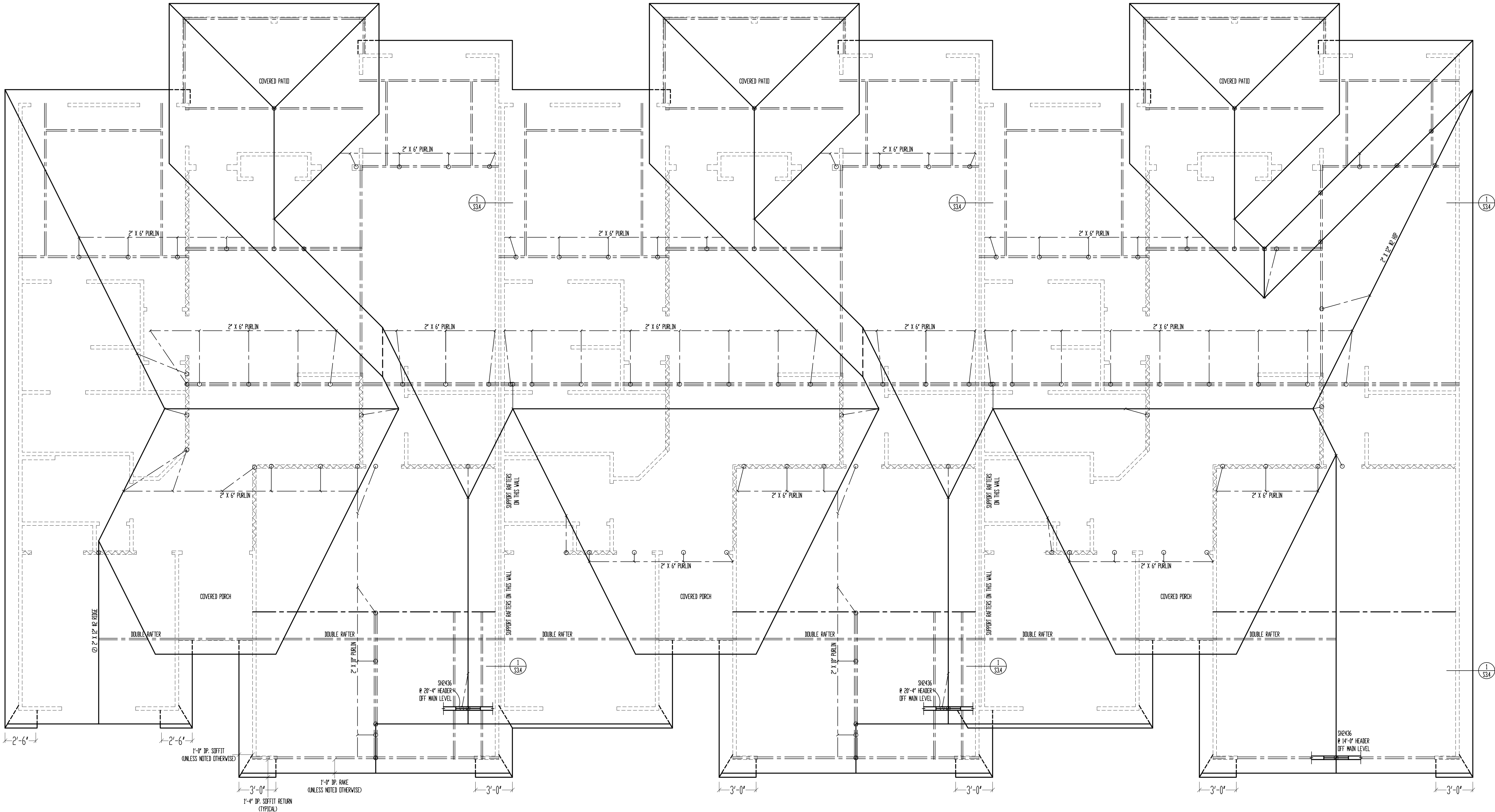
Project Title: **TCR007**  
General Contractor: **Kevin Higdon Construction, LLC**



Date: 1-7-AD 2019  
Rev. 1:  
Rev. 2:  
Rev. 3:

Sheet Title:  
**ELEVATIONS**

Sheet No.:  
**A-1**



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

WALL RAFTERS SHALL BE 2" X 6" #2 @ 16" O.C., UNLESS NOTED OTHERWISE.

FLASHING NOTE:  
DRIP EDGE, VALLEYS AND FLASHINGS TO BE METAL CLAD.

ROOF NOTES:  
ROOF DESIGNED FOR HEAVY ROOF COVERING  
40psf TOTAL LOAD (20psf DL, 20psf LL (SL))

\* RAFTERS (HEM-FIR, DOUG-FIR, OR EQUAL)  
SEE SPAN CHARTS BELOW

CODE MINIMUM	RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
11	#2-2x6	#2x6 O.C.	12'-0"
12	#2-2x6	#2x6 O.C.	12'-0"
13	#2-2x6	#2x6 O.C.	12'-0"
14	#2-2x6	#2x6 O.C.	12'-0"
15	#2-2x6	#2x6 O.C.	12'-0"
16	#2-2x6	#2x6 O.C.	12'-0"
17	#2-2x6	#2x6 O.C.	12'-0"
18	#2-2x6	#2x6 O.C.	12'-0"
19	#2-2x6	#2x6 O.C.	12'-0"
20	#2-2x6	#2x6 O.C.	12'-0"

NOTE: CODE MINIMUM ALLOWS FOR A RAFTER DEFLECTION OF L/360 TOTAL LOAD

HIGHER PERFORMANCE (RECOMMENDED)	RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
21	#2-2x6	#2x6 O.C.	12'-0"
22	#2-2x6	#2x6 O.C.	12'-0"
23	#2-2x6	#2x6 O.C.	12'-0"
24	#2-2x6	#2x6 O.C.	12'-0"
25	#2-2x6	#2x6 O.C.	12'-0"
26	#2-2x6	#2x6 O.C.	12'-0"
27	#2-2x6	#2x6 O.C.	12'-0"
28	#2-2x6	#2x6 O.C.	12'-0"
29	#2-2x6	#2x6 O.C.	12'-0"
30	#2-2x6	#2x6 O.C.	12'-0"

DEFLECTION = L/360 LIVE LOAD, L/240 TOTAL LOAD


- \* VALUITS TO BE 2x10 DEPTH
- \* RIDGE BRACES ARE: UNLESS OTHERWISE NOTED:
  - R2- 2x10 UP TO 10/12 PITCH
  - R2- 2x10 OVER 10/12 PITCH
- \* ALL HIPS & VALLEYS ARE: UNLESS OTHERWISE NOTED:
  - R2- 2x10 UP TO 10/12 PITCH
  - R2- 2x10 OVER 10/12 PITCH
- \* PURLINS ARE 2x6 MIN.
  - PURLIN STRUTS ARE AT 4'-0" O.C.
  - PURLIN STRUTS SHALL BE INSTALLED AT NOT LESS THAN A 45 DEGREE ANGLE WITH THE HORIZONTAL
  - ALL PURLIN STRUTS SHALL HAVE A MAXIMUM UNBRACED LENGTH OF 8'-0"
  - PURLIN STRUTS SHALL BE CONSTRUCTED IN A "Y" CONFIGURATION AND PER THE FOLLOWING CHART:

PURLIN STRUT	MAX PURLIN STRUT LENGTH
(1) 2x4	8'-0"
(1) 2x4 & (1) 2x6	12'-0"
(1) 2x6 & (1) 2x6	20'-0"
(2) 2x6 & (1) 2x6	30'-0"
CONSULT ARCH/ENGR. >	30'-0"

- \* RIDGE BRACES ARE SAME AS PURLIN BRACES-  
SPACING, SIZE, CONFIGURATION & INSTALLATION  
(SEE PURLIN BRACE NOTES ABOVE)
- \* HIP & VALLEY BRACES ARE SAME AS PURLIN  
SIZE, CONFIGURATION, & INSTALLATION  
(SEE PURLIN BRACE NOTES ABOVE)
- \* VERTICAL BRACE IF DOT IS UNDER HIP OR VALLEY  
SLASH IS TOP END OF BRACE ( / ),  
DOT IS BOTTOM OF BRACE ( o ).
- \* --- DENOTES BEARING WALL
- \* --- DENOTES ROOF BRACE
- \* --- DENOTES PURLIN
- \* --- DENOTES BEARING STRUCTURE

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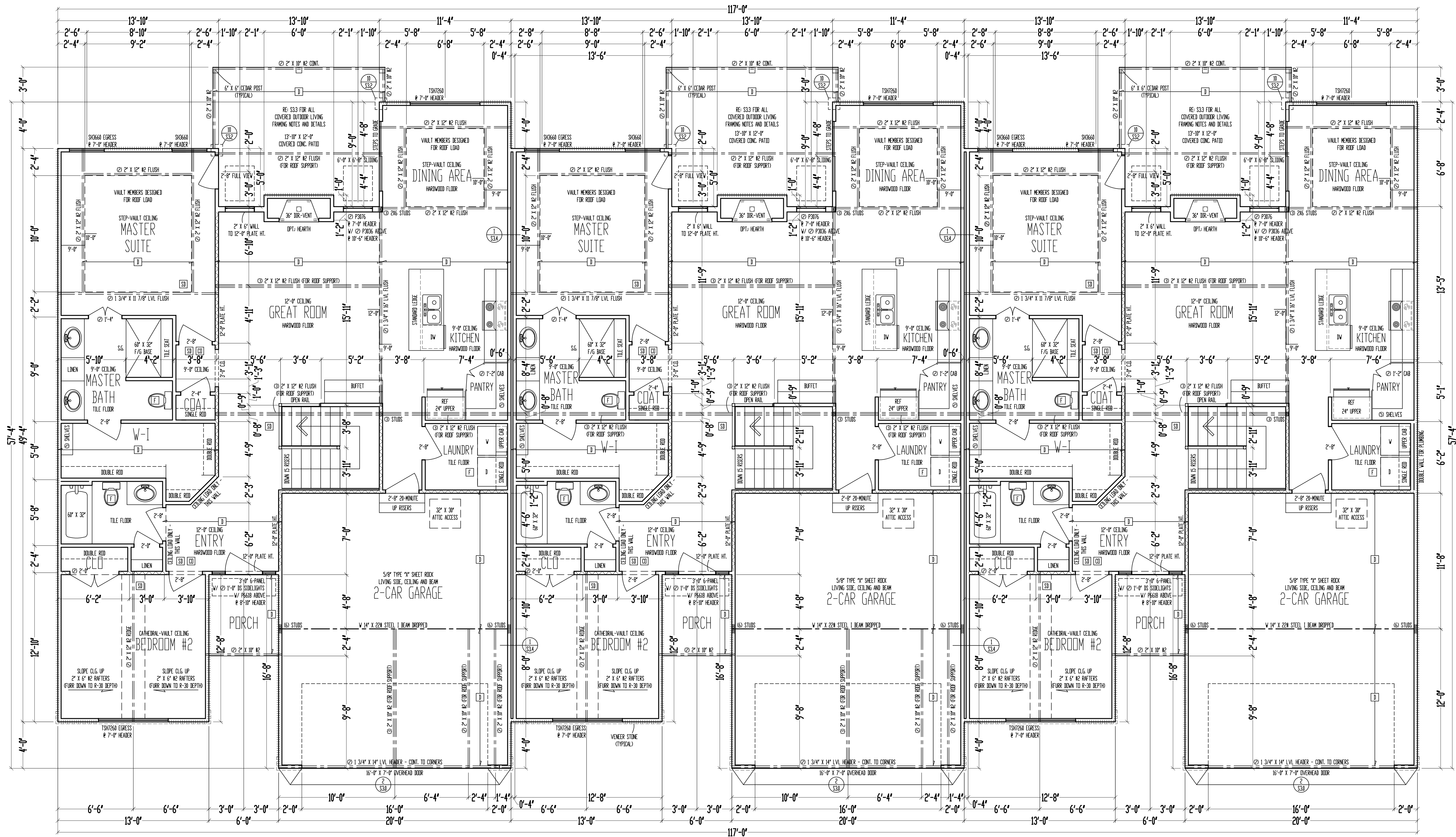


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Rev. 3:

Sheet Title:  
**ROOF PLAN**

Sheet No.:  
**A-2**





9'-0" CEILING  
**MAIN LEVEL**  
 SCALE: 1/4" = 1'-0"

JOIST SCHEDULE	
C	2" X 6" #3 CEILING JOIST @ 16" O.C.
D	2" X 6" #2 CEILING JOIST @ 16" O.C.

UNIT A: 1451 SQ. FT.  
 UNIT B: 1451 SQ. FT.  
 UNIT C: 1451 SQ. FT.  
**TOTAL: 4353 SQ. FT.**

GARAGE A: 472 SQ. FT.  
 GARAGE B: 472 SQ. FT.  
 GARAGE C: 472 SQ. FT.

- \*\*\*\*\* = WALL BRACING PER FRAMING NOTE H1 AND PER CALCULATIONS ON SHEET S31.
- FRAMING NOTES**
1. MAIN LEVEL EXTERIOR WALLS SHALL BE SHEATHED W/ 7/16" OSB APA PANELS W/ 8d COMMON NAILS @ 6" O.C. AT EDGES & @ 12" O.C. IN THE FIELD. SMART PANEL, OR EQUAL, INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
  2. VENTILATION = 6B-1/2" MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED W/ NO. 6 - 1 1/4" TYPE W OR S DRILLWALL SCREWS @ 7" O.C. EDGES & FIELD. MIN. 8'-0" SECTIONS ONE SIDE OF WALL (OR) MIN. 4'-0" SECTION FOR BOTH SIDES.
  3. VENTILATION = LOAD BEARING INTERIOR WALL.
  4. @ 2" X 10" #2 HEADER AT ALL EXTERIOR AND LOAD BEARING WALLS, UNLESS NOTED OTHERWISE.
  5. LOW TIES @ 4'-0" O.C. (TYPICAL).
  6. NON STUDS THE FULL HEIGHT OF BASED PLATE WALLS.
  7. BLOCK JOISTS ABOVE BEAMS, CANTILEVERS AND LOAD BEARING WALLS WITH JOIST MATERIAL ONT REQUIRED WITH I-JOISTS.
  8. PROVIDE MULTIPLE STUDS FOR SOLID BEARING BELOW ALL BEAMS.
  9. ALL DESIGNATED 2" X 6" WALLS SHALL HAVE DOUBLE KING STUDS AT DOOR AND WINDOW OPENINGS.
  10. ALL INSURANCE WALLS SHALL BE 45' UNLESS NOTED OTHERWISE.
  11. ALL WALLS TO BE FRAMED W/ MIN. STUD GRADE 2" X 4" S @ 16" O.C. UNLESS NOTED OTHERWISE.
  12. EXTERIOR WALL BOTTOM PLATES SHALL BE NAIL TO FRAMING BELOW WITH 16d COMMON NAILS @ 8" O.C. MAX. (WHERE APPLICABLE).

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MIT: (816) 547-4437  
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**TCR007**  
 General Contractor:  
**Kevin Higdon**  
**Construction, LLC**

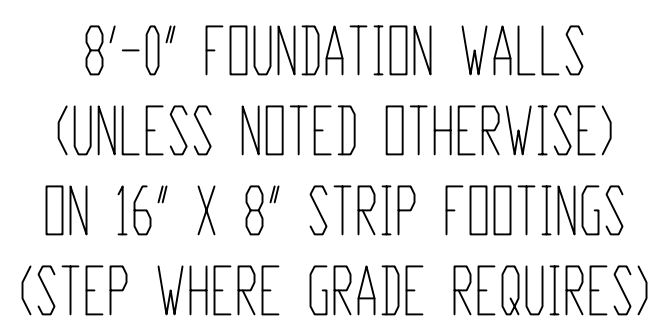
**STATE OF MISSOURI**  
 DENNIS HEBER  
 NUMBER  
 PE-2010001772  
 1-17-2019  
 PROFESSIONAL ENGINEER

Date: 1-7-AD 2019  
 Rev. 1:  
 Rev. 2:  
 Rev. 3:

Sheet Title:  
**MAIN LEVEL PLAN**

Sheet No.:  
**A-3**





UNFINISHED A: 1333 SQ. FT.  
UNFINISHED B: 1333 SQ. FT.  
UNFINISHED C: 1329 SQ. FT.

JOIST SCHEDULE	
A	2" X 10" #3 FLOOR JOIST @ 16' O.C.
B	2" X 10" #2 FLOOR JOIST @ 16' O.C.
C	2" X 10" #2 FLOOR JOIST @ 16' O.C. DOUBLE EVERY OTHER
D	2" X 10" #2 FLOOR JOIST @ 16' O.C. DOUBLED

**FOUNDING NOTES**

1. BASEMENT LEVEL EXTERIOR WOOD-FRAMED WALLS SHALL BE SHEATHED W/ 7/16" OSB. AIR PANELS W/ 86 COMPOUND 6" X 6" AT 4' O.C. AT 8" & 12" O.C. IN THE FIELD. SPAN PANEL, OR EQUIV., INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

2. 1" MINIMUM THICKNESS = 65-125% MIN. OPTIMUM OVER STOPS SPACED 3" MAX FASTENED W/ N6-1 1/4" TYPE 1 OR 3 DOWEL STUDS @ 7" O.C. ENDS & FIELDS ONLY @ 8" O.C. SECTIONS ONE SIDE OF WALL OR GROUND 4" O.C. SECTION FOR BOTH SIDES.

3. 1/4" MINIMUM THICKNESS FOR EXTERIOR INTERIOR WALL.

4. 12" O.C. W/ 4" ENDER AT ALL EXTERIOR AND LOAD BEARING WALLS, UNLESS NOTED OTHERWISE.

5. 1/2" MIN. THICK 4" O.C. TYPE (A) WALL.

6. ROW STUDS THE FULL HEIGHT OF RAISED PASEL WALLS.

7. BLOCK JOISTS ABOVE BEAMS, CONTINUE WALLS AND LOAD BEARING WALLS WITH JOIST MATERIAL OBT REQUIRED WITH 1-JOIST.

8. PROVIDE MULTIPLE STUDS FOR SOLID BEARING BEARING BEAD ALL BEAMS.

9. ALL RESEGMENT 2" X 6" WALLS SHALL HAVE DOUBLE KING STUDS AT DOOR AND WINDOW OPENINGS.

10. ALL INSIDE WALLS SHALL BE 4" MIN. THICKNESS UNLESS NOTED OTHERWISE.

11. ALL WALLS TO BE FRAMED W/ 11/16" STD. STUDS @ 2" X 4'S @ 8" O.C. UNLESS NOTED OTHERWISE.

12. PROVIDE BOLT'S W/ 4" MIN. 2" CEMENTOR 4" MIN. X 4" MIN. X 4" MIN. AT 12" O.C. OF EACH PASEL LENGTH.

13. NEW FOUNDATION SHALL BEAR ON ORIGINAL SOIL, WITH MINIMUM BEARING CAPACITY OF 150 PSF. A GEOTECHNICAL ENGINEER IS RECOMMENDED FOR VERIFICATION OF THESE CONDITIONS DURING THE EXCAVATION PHASE. ENGINEER OF RECORD ASSUMES NO RESPONSIBILITY FOR CONSTRUCTION NOT VERIFIED TO BE FOUND ON ANYTHING SHORT OF THE ABOVE INFORMATION.



FASTENER SCHEDULE FOR STRUCTURAL MEMBERS							
DESCRIPTION OF BUILDING ELEMENTS		NUMBER AND TYPE OF FASTENER		SPACING OF FASTENERS			
ROOF <sup>1</sup>							
BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOE NAIL		3-8d (2½" x 0.113")		-			
CEILING JOISTS TO PLATE, TOE NAIL		3-8d (2½" x 0.113")		-			
CEILING JOISTS NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS, FACE NAIL		3-10d		-			
COLLAR TIE TO RAFTER, FACE NAIL OR 1½" x 20 GAGE RIDGE STRAP		3-10d (3" x 0.128")		-			
RAFTER OR ROOF TRUSS TO PLATE, TOE NAIL		3-16d BOX NAILS (3½" x 0.135") OR 3-10d COMMON NAILS (3" x 0.148")		2 TOE NAILS ON ONE SIDE AND 1 TOE NAIL ON OPPOSITE SIDE OF EACH RAFTER OR TRUSS			
ROOF RAFTERS TO RIDGE, VALLEY, OR HIP RAFTERS; TOE NAIL FACE NAIL		4-16d (3½" x 0.135"), 3-16d (3½" x 0.135")		-			
WALL <sup>1</sup>							
BUILT-UP STUDS - FACE NAIL		10d (3" x 0.128")		24" O.C.			
ABUTTING STUDS AT INTERSECTING WALL CORNERS, FACE NAIL		16d (3½" x 0.135")		12" O.C.			
BUILT-UP HEADER, TWO PIECES WITH ½" SPACER		16d (3½" x 0.135")		16" O.C. ALONG EACH EDGE			
CONTINUED HEADER, TWO PIECES		16d (3½" x 0.135")		16" O.C. ALONG EACH EDGE			
CONTINUOUS HEADER TO STUD, TOE NAIL		4-8d (2½" x 0.113")		-			
DOUBLE STUDS, FACE NAIL		10d (3" x 0.128")		24" O.C.			
DOUBLE TOP PLATES, FACE NAIL		10d (3" x 0.128")		24" O.C.			
DOUBLE TOP PLATES, MINIMUM 24-INCH OFFSET OF END JOINTS, FACE NAIL IN LAPPED AREA		8-16d (3½" x 0.135")		-			
SOLE PLATE TO JOIST OR BLOCKING, FACE NAIL		16d (3½" x 0.135")		16" O.C.			
SOLE PLATE TO JOIST OR BLOCKING AT BRACED WALL PANELS		3-16d (3½" x 0.135")		16" O.C.			
STUD TO SOLE PLATE, TOE NAIL		3-8d (2½" x 0.113") OR 2-16d (3½" x 0.135")		-			
TOP OR SOLE PLATE TO STUD, END NAIL		2-16d (3½" x 0.135")		-			
TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS, FACE NAIL		2-10d (3" x 0.128")		-			
1" BRACE TO EACH STUD AND PLATE, FACE NAIL		2-8d (2½" x 0.113")		-			
1"x6" SHEATHING TO EACH BEARING, FACE NAIL		2-8d (2½" x 0.113")		-			
1"x8" SHEATHING TO EACH BEARING, FACE NAIL		2-8d (2½" x 0.113")		-			
WIDER THAN 1"x8" SHEATHING TO EACH BEARING, FACE NAIL		3-8d (2½" x 0.113")		-			
FLOOR <sup>1</sup>							
JOIST TO SILL OR GIRDER, TOE NAIL		3-8d (2½" x 0.113")		-			
RIM JOIST TO TOP PLATE, TOE NAIL (ROOF APPLICATIONS ALSO)		8d (2½" x 0.113")		6" O.C.			
RIM JOIST OR BLOCKING TO SILL PLATE, TOE NAIL		8d (2½" x 0.113")		6" O.C.			
1"x6" SUBFLOOR OR LESS TO EACH JOIST, FACE NAIL		2-8d (2½" x 0.113")		-			
2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL		2-16d (3½" x 0.135")		-			
2" PLANKS (PLANK AND BEAM - FLOOR AND ROOF)		2-16d (3½" x 0.135")		AT EACH BEARING			
BUILT-UP GIRDERS AND BEAMS, 2-INCH LUMBER LAYERS		10d (3" x 0.128")		NAIL EACH LAYER AS FOLLOWS: 32" O.C. AT TOP AND BOTTOM AND STAGGERED. TWO NAILS AT ENDS AND AT EACH SPLICE			
LEDGER STRIP SUPPORTING JOISTS OR RAFTERS		3-16d (3½" x 0.135")		AT EACH JOIST OR RAFTER			
FASTNER SCHEDULE FOR STRUCTURAL MEMBERS							
DESCRIPTION OF BUILDING MATERIALS		DESCRIPTION OF FASTENER		EDGE SPACING (INCHES)		INTERMEDIATE SUPPORTS (INCHES)	
WOOD STRUCTURAL PANELS, SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING <sup>1</sup>							
⅜" - ½"		6d COMMON (2" x 0.113") NAIL (SUBFLOOR, WALL) 8d COMMON NAIL (ROOF)		6		12	
⅝"- 1"		8d COMMON NAIL (2½" x 0.131")		6		12	
1⅝" - 1½"		10d COMMON (3" x 0.148") NAIL OR 8d (2½" x 0.131") DEFORMED NAIL		6		12	
OTHER WALL SHEATHING <sup>1</sup>							
½" GYPSUM SHEATHING		1½" GALVANIZED ROOFING NAIL; STAPLE GALVANIZED, 1½" LONG; 1½" SCREWS, TYPE W OR S		7		7	
⅝" GYPSUM SHEATHING		1¾" GALVANIZED ROOFING NAIL; STAPLE GALVANIZED, 1½" LONG; 1½" SCREWS, TYPE W OR S		7		7	
WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING <sup>1</sup>							
¾" AND LESS		6d DEFORMED (2" x 0.120") NAIL OR 8d COMMON (2½" x 0.131") NAIL		6		12	
⅞" - 1"		8d COMMON (2½" x 0.131") NAIL OR 8d DEFORMED (2½" x 0.120") NAIL		6		12	
1⅞" - 1½"		10d COMMON (3" x 0.148") NAIL OR 8d DEFORMED (2½" x 0.120") NAIL		6		12	

1. IF INFORMATION LISTED ON PLAN SHEETS CONTRADICTS INFORMATION IN THIS TABLE, INFORMATION ON PLANS TAKES PRECEDENCE OVER INFORMATION LISTED IN THIS TABLE

FOUNDATION NOTES

- CONCRETE SHALL BE AIR-ENTRAINED BETWEEN 5%-7% WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2500 PSI FOR BASEMENT AND INTERIOR FLOOR SLABS-ON-GRADE, 3000 PSI FOR FOUNDATION WALLS, AND 3500 PSI FOR PORCHES AND GARAGE FLOOR SLABS
- THE FOUNDATION DESIGN SHALL COMPLY WITH THE ENFORCING JURISDICTION'S RESIDENTIAL FOUNDATION STANDARDS
- PROVIDE A MINIMUM 4"-DIAMETER PERFORATED DRAIN PIPE ALONG PERIMETER OF USABLE SPACE AT FOOTING LEVEL OR OTHER EQUIVALENT MATERIALS PER IRC SECTION R405.1. THE PIPE SHALL BE COVERED WITH A MINIMUM OF 6" OF GRAVEL OR CRUSHED ROCK. THE DRAIN SHALL DAYLIGHT BELOW FOOTING LEVEL OR TERMINATE IN A MINIMUM 20 GALLON SUMP PIT.
- FOUNDATION SHALL BE DESIGNED FOR A BEARING CAPACITY OF 1500 PSF AND FOUNDED ON COMPETENT ORIGINAL SOIL AS DETERMINED AND CONFIRMED BY A LICENSED GEOTECHNICAL ENGINEER OR ENGINEERING GEOLOGIST. ENGINEER OF RECORD ASSUMES NO RESPONSIBILITY FOR CONSTRUCTION NOT VERIFIED TO BE FOUNDED ON ANY SOIL WITH THE AFOREMENTIONED MINIMUM PROPERTIES.
- FOOTINGS SHALL BE A MINIMUM OF 16" WIDE x 8" DEEP AND SHALL HAVE A MINIMUM OF (2) CONTINUOUS GRADE 40 #4 BARS WITH 3" BOTTOM CLEARANCE. BOTTOM OF FOOTING SHALL BE LOCATED A MINIMUM OF 3'-0" BELOW GRADE FOR FROST PROTECTION.
- CONCRETE PADS SUPPORTING COLUMN LOADS SHALL BE NO SMALLER THAN 2'-0" x 2'-0" x 1'-0" DEEP WITH A MINIMUM OF (4) GRADE 40 #4 BARS EACH WAY WITH 3" BOTTOM CLEARANCE
- FOUNDATION WALLS SHALL BE A MINIMUM OF 8" NOMINAL WIDTH AND SHALL HAVE HORIZONTAL GRADE 40 #4 BARS AT 2'-0" O.C. MAX. WITH VERTICAL #4 BARS AS REQUIRED ON FOUNDATION CROSS SECTION ON SHEET S2.0
- REINFORCEMENT SHALL LAP A MINIMUM OF 2'-0" (CLASS B SPLICE)
- INTERIOR BEARING WALLS AND COLUMNS SHALL BE ISOLATED FROM THE BASEMENT FLOOR SLAB
- BASEMENT FLOOR SLAB SHALL BE A MINIMUM OF 4" THICK ON A MINIMUM BASE COURSE OF 4" TO 6" OF SAND, GRAVEL OR CRUSHED ROCK. BETWEEN THE BASE COURSE AND FLOOR SLAB SHALL BE PLACED A 6-MIL. POLY VAPOR RETARDER WITH MINIMUM OVERLAP OF 6" AT DISCONTINUITIES
- IF A FLOOR IS TO BE SUPPORTED BY A MINIMUM OF 2'-0" OF GRANULAR FILL OR 8" OF EARTH, BASEMENT SLAB SHALL BE DESIGNED BY A LICENSED ENGINEER
- SILL PLATES SHALL BE ANCHORED TO THE FOUNDATION WALL WITH ½" Ø ANCHOR BOLTS EMBEDDED A MINIMUM OF 7" INTO CENTER OF WALL STEM AND SHALL BE INSTALLED AT A MAXIMUM OF 6'-0" O.C. (OR AS NOTED ON PLANS) AND SHALL BE INSTALLED WITHIN 6" TO 12" OF EACH END OF EACH SILL PLATE LENGTH, PER IRC SECTION R403.1.6
- FOUNDATION WINDOW WELLS SHALL BE PROVIDED WITH MINIMUM DIMENSIONS AS SHOWN IN DETAIL ON SHEET S2.0
- THE GARAGE FLOOR SHALL SLOPE TOWARD THE VEHICLE DOORS OR TO A TRENCH OR UNTRAPPED DRAIN THAT DISCHARGES TO THE EXTERIOR, ABOVE GRADE

FRAMING NOTES

- ALL DIMENSIONAL LUMBER SHALL BE DOUGLAS-FIR-LARCH GRADE #2, UNLESS NOTED OTHERWISE ON PLANS
- ALL INTERIOR LOAD-BEARING AND EXTERIOR WALL HEADERS SHALL BE (2) #2 - 2x10's, UNLESS NOTED OTHERWISE ON PLANS
- BLOCK OVER BEAMS AND AT CANTILEVERS AND DOOR JAMBS
- INTERIOR NON-BEARING WALLS RESTING ON BASEMENT SLAB SHALL BE ISOLATED FROM ABOVE FRAMING BY A MINIMUM OF ½"
- ALL HEADERS/BEAMS SHALL BEAR ON A MINIMUM OF (2) 2x4 POSTS (KING AND JACK STUDS), UNLESS NOTED OTHERWISE
- WHERE JOISTS SPAN PARALLEL TO FOUNDATION, BLOCKING SHALL BE PROVIDED IN THE TWO SPACES MOST ADJACENT TO THE FOUNDATION WALL AT 4'-0" O.C. FOR THE PURPOSE OF TRANSFERRING LATERAL FOUNDATION WALL LOAD TO THE FLOOR DIAPHRAGM. FASTEN JOISTS AND BLOCKING TO SILL PLATE WITH (4) 10d NAILS. IF MECHANICAL DUCTWORK IS INSTALLED IN ONE OF THESE FIRST TWO BAYS, FASTEN 2x4's FLAT AT 4'-0" O.C. BETWEEN JOIST(S) AND/OR SILL AND PROVIDE BLOCKING AS PRESCRIBED ABOVE IN THE NEXT TWO JOIST BAYS. SECURE 2x4's TO JOIST(S)SILL PLATE WITH (4) 10d NAILS.
- ALL WOOD MATERIAL SUPPORTED ON CONCRETE OR MASONRY SHALL BE TREATED OR OF DECAY-RESISTANT MATERIAL
- JOISTS UNDER BEARING PARTITIONS ON PLANS HAVE BEEN SIZED TO SUPPORT THE DESIGN LOAD.
- JOISTS FRAMING INTO THE FACE OF A STEEL OR WOOD BEAM SHALL BE SUPPORTED WITH APPROPRIATE COLD-FORMED STEEL JOIST HANGERS
- JOISTS FRAMED ON TOP OF STRUCTURAL MEMBER SHALL BE SUPPORTED AT EN DS BY FULL-DEPTH SOLID BLOCKING MIN. 1½" IN THICKNESS OR BY FASTENING RIM TO JOISTS PER FASTENING TABLE TO LEFT
- ALL WALL COVERINGS SHALL COMPLY WITH IRC SECTION R702.3
- ALL RAFTERS AND COLLAR TIES SHALL COMPLY WITH IRC SECTION R802.3.
- ALL RAFTERS SHALL HAVE 2x4 COLLAR TIES @ 4'-0" O.C. IN UPPER ½ OF VERTICAL DISTANCE BETWEEN CEILING AND ROOF
- BLOCKING BETWEEN JOISTS UNDER A LOAD-BEARING WALL IS NOT REQUIRED
- PER IRC SECTION 501.3, BOTTOM OF ALL FLOOR ASSEMBLIES ABOVE UNFINISHED AREAS SHALL BE PROVIDED WITH A ½" GYPSUM BOARD MEMBRANE OR RESIDENTIAL FIRE SPRINKLER SYSTEM WHEN FLOOR SYSTEM IS CONSTRUCTED OF OTHER THAN DIMENSION LUMBER OR STRUCTURAL COMPOSITE LUMBER EQUAL TO OR GREATER THAN 2x10 NOMINAL DIMENSION(WHERE REQUIRED BY ENFORCING JURISDICTION)
- ENGINEERED LVL's SHALL HAVE MINIMUM PROPERTIES OF Fb = 2600 psi, E=1900 ksi, AND Fv=285 psi
- ENGINEERED PARALLAMS SHALL HAVE MINIMUM PROPERTIES OF Fb = 2600 psi, E = 2000 ksi, AND Fv = 290 psi
- COLUMN CONNECTION TO STEEL BEAMS SHALL BE WITH A CLIP POST CAP WITH ALL FOUR TAB EARS BENT AROUND THE BOTTOM FLANGE OF THE BEAM. FOR A BEARING PLATE, FOUR HOLES SHALL BE DRILLED IN THE BOTTOM FLANGE OF THE STEEL BEAM TO MATCH THE HOLE PATTERN OF THE PLATE. ½" x 2" BOLTS SHALL THEN BE INSTALLED WITH A FLAT WASHER, LOCK WASHER, AND A NUT IN EACH OF THE HOLES. THE POST CAP MAY BE WELDED TO THE STEEL BEAM IN ACCORDANCE WITH AWS D1.1-92 AS AN ALTERNATIVE, AND WOULD NEED TO BE INSPECTED BY AN AWS-CERTIFIED INSPECTOR.
- WHEN MECHANICAL EQUIPMENT IS LOCATED IN AN ENCLOSED ROOM, THERE SHALL BE (2) 14"x12" VENTS LOCATED IN A WALL COMMON WITH ADDITIONAL LIVING AREA. ONE VENT SHALL BE LOCATED SUCH THAT THE BOTTOM OF THE VENT BEGINS 12" FROM THE FLOOR AND THE OTHER VENT SHALL BE LOCATED SUCH THAT THE TOP OF THE VENT BEGINS 12" FROM THE CEILING.
- ALL ROOF SHEATHING SHALL BE ⅝" OSB WITH 8d COMMON NAILS @ 6" O.C. AT PANEL EDGES AND @ 12" O.C. IN FIELD

GLAZING NOTES

- GLAZING IN HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC SECTION R308.4 SHALL BE OF APPROVED SAFETY GLAZING MATERIALS. GLASS IN STORM DOORS, INDIVIDUAL FIXED OR OPENABLE PANELS ADJACENT TO A DOOR WHERE THE NEAREST VERTICAL EDGE IS WITHIN A 2'-0" ARC OF THE DOOR IN A CLOSED POSITION AND FOR WHICH THE BOTTOM EDGE IS WITHIN 5'-0" OF THE FLOOR, WALLS ENCLOSEING STAIRWAYS AND LANDINGS WHERE THE GLAZING IS WITHIN 5'-0" OF THE TOP OR BOTTOM OF THE STAIR, ENCLOSURES FOR SPAS, TUBS, SHOWERS, AND WHIRLPOLS, GLAZING IN FIXED OR OPENABLE PANELS EXCEEDING NINE SQUARE FEET AND FOR WHICH THE BOTTOM EDGE IS LESS THAN 1'-6" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 3'-0"
- ALL OPERABLE WINDOWS SHALL HAVE FALL PROTECTION PER IRC SECTION R612.2

ATTIC VENTILATION

- ENCLOSED ATTICS SHALL HAVE CROSS VENTILATION FOR EACH SEPARATE SPACE BY VENTILATING OPENINGS PROTECTED AGAINST THE ENTRANCE OF RAIN OR SNOW. VENTILATING OPENINGS SHALL BE PROVIDED WITH CORROSION-RESISTANT WIRE MESH, WITH ½" TO ½" OPENINGS. THE TOTAL FREE VENTILATING AREA SHALL NOT BE LESS THAN ⅓<sup>rd</sup> OF THE AREA OF SPACE VENTILATED, EXCEPT WHERE THE VENTILATORS ARE LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED - THE REQUIRED AREA MAY BE REDUCED TO 1/300.

EMERGENCY EGRESS

- PROVIDE A MINIMUM OF ONE WINDOW FOR EACH BEDROOM THAT HAS A MINIMUM OPENABLE AREA OF 5.7 SQUARE FEET WITH A MINIMUM OPENABLE HEIGHT OF 2'-0" AND A MINIMUM WIDTH OF 1'-9". IN ADDITION, THE OPENABLE PORTION OF EGRESS WINDOWS SHALL NOT EXCEED 3'-8" ABOVE THE ADJOINING FLOOR OR PERMANENT STEP.
- PROVIDE SMOKE ALARMS IN EACH SLEEPING ROOM, OUTSIDE OF EACH SLEEPING AREA AND ON EACH FLOOR, INCLUDING BASEMENT (IF APPLICABLE). ALARMS SHALL BE HARDWIRED TOGETHER SO THAT THE ACTIVATION OF ONE SMOKE ALARM WILL ACTIVATE ALL SMOKE ALARMS IN THE DWELLING. PROVIDE CARBON MONOXIDE DETECTORS OUTSIDE EACH SLEEPING AREA.

MASONRY VENEER

- MASONRY VENEER SHALL BE ANCHORED TO THE SUPPORTING WALL STUDS WITH CORROSION-RESISTANT METAL TIES EMBEDDED IN MORTAR OR GROUT AND EXTENDING INTO THE VENEER A MINIMUM OF 1½", WITH NOT LESS THAN ⅝" MORTAR OR GROUT COVER TO OUTSIDE FACE.
- VENEER TIES, IF STRAND WIRE, SHALL NOT BE LESS IN THICKNESS THAN NO. 9 U.S. GAGE WIRE AND SHALL HAVE A HOOK EMBEDDED IN THE MORTAR JOINT, OR IF SHEET METAL, SHALL BE NOT LESS THAN NO. 22 U.S. GAGE BY ⅞" CORRUGATED.
- EACH TIE SHALL SUPPORT NOT MORE THAN 2.67 SQUARE FEET OF WALL AREA AND SHALL BE SPACED NOT MORE THAN 32 INCHES ON CENTER HORIZONTALLY AND 24 INCHES ON CENTER VERTICALLY.
- VENEER TIES AROUND WALL OPENINGS: ADDITIONAL METAL TIES SHALL BE PROVIDED AROUND ALL WALL OPENINGS GREATER THAN 16 INCHES IN EITHER DIMENSION. METAL TIES AROUND THE PERIMETER OF OPENINGS SHALL BE SPACED NOT MORE THAN 3 FEET ON CENTER AND PLACED WITHIN 12 INCHES OF THE WALL OPENING.

GARAGE NOTES

- DOOR(S) BETWEEN THE GARAGE AND DWELLING SHALL BE MINIMUM 1½" SOLID CORE OR HONEY-COMBED STEEL DOOR WITH 20-MINUTE FIRE RATING EQUIPPED WITH A SELF-CLOSING DEVICE
- VEHICLE DOORS AND FRAMES SHALL BE DESIGNED AND INSTALLED TO MEET THE 90-MPH 3-SECOND GUST LOADING PER DASMA 108 AND ASTM E 330-96 PER IRC SECTION R301.2.1

GARAGE NOTES (CONTINUED)

- THE GARAGE SHALL BE SEPARATED FROM THE DWELLING AND ITS ATTIC AREAS BY MINIMUM ⅝" GYP. BOARD APPLIED TO THE GARAGE SIDE OF FRAMING. WHERE HABITABLE SPACE OCCURS ABOVE THE GARAGE, THE GARAGE CEILING ASSEMBLY SHALL BE PROTECTED WITH A MINIMUM ⅝" TYPE X GYP. BOARD. WHERE A FLOOR/CEILING SPACE IS PROVIDED ABOVE THE GARAGE COLUMNS AND BEAMS SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED WITH ⅝" GYP. BOARD.
- GARAGE DOOR FRAME FOR THE ATTACHMENT OF THE TRACK AND COUNTER BALANCE SHALL CONSIST OF THE FOLLOWING: 2x6 VERTICAL JAMBS RUNNING FROM FLOOR TO CEILING AND SHALL BE FASTENED WITH 2½" x 0.120" NAILS AT 7" O.C. STAGGERED WITH (7) ¾" x 0.120" NAILS THROUGH THE JAMB INTO THE HEADER. MINIMUM 2x8 HEADER FOR ATTACHMENT OF COUNTER BALANCE SYSTEM.

DESIGN LOADING (PER TABLE R301.5)

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS (PSF)		
USE	LIVE LOAD	DEAD LOAD
UNINHABITABLE ATTICS WITHOUT STORAGE	10	10
UNINHABITABLE ATTICS WITH LIMITED STORAGE	20	10
HABITABLE ATTICS AND ATTICS SERVED WITH FIXED STAIRS	30	10
BALCONIES (EXTERIOR) AND DECKS	40	10 <sup>d</sup>
FIRE ESCAPES	40	10
GUARDRAILS AND HANDRAILS <sup>a</sup>	200 <sup>c</sup>	-
GUARDRAIL IN-FILL COMPONENTS <sup>b</sup>	50 <sup>c</sup>	-
PASSENGER VEHICLE GARAGES	50	DEPENDENT UPON SLAB CONSTRUCTION
ROOMS OTHER THAN SLEEPING ROOM	40	10 <sup>d</sup>
SLEEPING ROOM	30	10 <sup>d</sup>
STAIRS	40	10 <sup>d</sup>

- a. A single concentrated load applied in any direction at any point along the top.
- b. Guard in-fill components (all those except the handrail), ballusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to one square foot. This load need not be assumed to act concurrently with any other live load requirement.
- c. Glazing used in handrail assemblies and guards shall be designed with a safety factor of 4. The safety factor shall be applied to each of the concentrated loads applied to the top of the rail, and to the load on the in-fill components. These loads shall be determined independently of one another, and loads are assumed not to occur with any other live load.
- d. An additional dead loading of 10 psf shall be applied where thinset tile floor is to be installed. An additional dead loading of 50 psf shall be applied where mudset tile floor is to be installed.

INSULATION/EFFICIENCY

- BUILDING ENVELOPE INSULATION SHALL COMPLY WITH IRC TABLE N1102.1.1 OR THE 2012 IECC (SEE SHEET S3.1 FOR FRAMING DETAILS AND TABLES ON THIS SHEET FOR MORE INFORMATION)
- CATHEDRAL -VAULTED CEILING FRAMING SHALL BE FRAMED WITH A MINIMUM INSULATION VALUE OF R-38. IF VAULTED RAFTERS DO NOT PROVIDE REQUIRED DEPTH TO ACHIEVE R-38 INSULATION BUILDER SHALL FUR DOWN RAFTERS PER DETAILS PROVIDED ON SHEET S3.1.

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT (TABLE N1102.1.1)	
CLIMATE ZONE	4-A
FENESTRATION U-FACTOR	0.35
SKYLIGHT U-FACTOR	0.55
GLAZED FENSTRATION SHGC	0.40
CEILING R-VALUE	49
WOOD FRAME WALL R-VALUE	13
MASS WALL R-VALUE	8 / 13
FLOOR R-VALUE	19
BASEMENT WALL R-VALUE	10-CONTINUOUS OR 13-CAVITY
SLAB R-VALUE AND DEPTH	10 AT 2'-0"
CRAWL SPACE WALL R-VALUE	10-CONTINUOUS OR 13-CAVITY
DUCTWORK EXPOSED TO OUTSIDE AIR R-VALUE	8
DUCTWORK NOT EXPOSED TO OUTSIDE AIR R-VALUE	6
CATHEDRAL VAULTED CEILING R-VALUE	38

DUCT SEALING

**N1103.2.2 (R403.2.2) SEALING (MANDATORY).** DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH SECTION M1601.4.1 OF 2012 IRC.

**EXCEPTIONS:**

- AIR-IMPERMEABLE SPRAY FOAM PRODUCTS SHALL BE PERMITTED TO BE APPLIED WITHOUT ADDITIONAL JOINT SEALS.
- WHERE A DUCT CONNECTION IS MADE THAT IS PARTIALLY INACCESSIBLE, THREE SCREWS OR RIVETS SHALL BE EQUALLY SPACED ON THE EXPOSED PORTION OF THE JOINT SO AS TO PREVENT A HINGE EFFECT.
- CONTINUOUSLY WELDED AND LOCKING-TYPE LONGITUDINAL JOINTS AND SEAMS IN DUCTS OPERATING AT STATIC PRESSURES LESS THAN 2 INCHES OF WATER COLUMN PRESSURE CLASSIFICATION SHALL NOT REQUIRE ADDITIONAL CLOSURE SYSTEMS.

DUCT TIGHTNESS SHALL BE VERIFIED BY EITHER OF THE FOLLOWING:

- POST-CONSTRUCTION TEST: TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CFM PER 100 SQUARE FEET OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. ACROSS THE ENTIRE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTER BOOTS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST.
- ROUGH-IN TEST: TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CFM PER 100 SQUARE FEET OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. ACROSS THE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTERS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST. IF THE AIR HANDLER IS NOT INSTALLED AT THE TIME OF THE TEST, TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 3 CFM PER 100 SQUARE FEET OF CONDITIONED FLOOR AREA.

**EXCEPTION:** THE TOTAL LEAKAGE TEST IS NOT REQUIRED FOR DUCTS AND AIR HANDLERS LOCATED ENTIRELY WITHIN THE BUILDING THERMAL ENVELOPE.

MECHANICAL VENTILATION SYSTEM FAN EFFICACY			
FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
RANGE HOODS	ANY	2.8	ANY
IN-LINE FAN	ANY	2.8	ANY
BATHROOM, UTILITY ROOM	10	1.4	90
BATHROOM, UTILITY ROOM	90	2.8	ANY

VISTA

STRUCTURAL

ENGINEERING, LLC

14718 NW DELIA STREET  
PORTLAND, OREGON 97229  
OFFICE: 971.645.0901 \*  
MOBILE: 971.645.0901 \*  
DENNIS@VISTASTRUCTURAL.COM \*  
VISTASTRUCTURAL.COM \*

CLIENT: KEVIN HIGDON CONSTRUCTION

JOB TITLE: TCR007 TRIPLEX  
509 ASHURST PLACE

LOCATION: LEE'S SUMMIT, MISSOURI

DENNIS HEIER  
NUMBER  
FE-2010011772  
12-18-2018  
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY

DRAWING TITLE

STRUCTURAL

NOTES

ENGINEER: DMH	CHECKED BY: DMH
JOB NO.: 1992	DRAWN BY: DMH
DATE: 12-18-18	
SHEET NUMBER	

S1.0



RESIDENTIAL SEISMIC & WIND ANALYSIS

DETERMINE WEIGHT OF HOUSE:				INPUT
				CALCULATED VALUE
LOCATION		DEAD LOAD (psf)	AREA (ft²)	WEIGHT (lbs.)
ROOF		10	6349	63490
CEILING		10	6349	63490
FIRST FLOOR		10	6349	63490
		WALL LENGTH (ft)	WALL HEIGHT (ft)	WALL UNIT WT. (psf)
FIRST FLOOR EXT. WALL DL		354.66	10	35466
		DEAD LOAD (psf)	AREA (ft²)	WEIGHT (lbs)
FIRST FLOOR INT. PARTITION WALL DL		6	6349	38094

PROJECTED AREAS (WIND DESIGN PER 115 MPH 3-SECOND GUST, EXPOSURE C AND MEAN ROOF HEIGHT <= 30 FT ASSUMED)							
FRONT-TO-BACK				SIDE-TO-SIDE			
	AREA	LOAD			AREA	LOAD	
SLOPED ROOF	555	4515		SLOPED ROOF	708	6024	
VERT. ROOF	853	10129	CUMULATIVE	VERT. ROOF	30	373	CUMULATIVE
1ST	1287	15282	30007	1ST	663.63	8250	14728
				PRESSURE (PSF) - PER ASCE CH. 6			
	SLOPED ROOF	ZONE B	9.7		ZONE C	11.3	2a (FIG. 28.6-1, ASCE7)
	WALL/VERT. ROOF	ZONE A	14.2		ZONE D	7.7	12.068
	MEAN ROOF HT., h		24				

a) If there is a walkout wall to be sheathed, determine tributary wind area and enter here. If no walkout, enter 0 for area.  
 $q_{z10}=0.00256K_zK_{xt}K_dV^2$  (ASCE7-10 Velocity Pressure)  $q_{z10\_ASD}=0.6q_{z10}$  (Design Velocity Pressure for ASD analysis under ASCE7-10 and IRC/IBC 2012)

1ST FLOOR TRIBUTARY WEIGHT  
S<sub>g</sub> (SITE GROUND MOTION - %g - FROM ASCE7 SEISMIC MAP)  
F<sub>a</sub> (from ASCE7 Table 11.4-1)  
S<sub>0g</sub> (= 2/3 \* S<sub>g</sub> \* F<sub>a</sub>)  
R (from ASCE7 Table 12.2-1)

144713  
12.0%  
1.6  
0.128  
6.5

SEISMIC SHEAR		
LOCATION	From ASCE7 (Eq. 12.8-1):	V (= 1.2 * S <sub>0g</sub> * W / R) (lbs.)
1ST FLOOR		3420

Sheathing Location	Min. Sheathing Schedule	Fastening Schedule	Allowable Shear (#/LF)	Code Reference
Exterior ( <a href="#">Option #1</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 18ga. Staples w/ 1" penetration @ 8" O.C. Edges, 8" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	155	per IBC, Table 2306.3.(1)
Exterior ( <a href="#">Option #2</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 18ga. Staples w/ 1" penetration @ 4" O.C. Edges, 8" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	230	per IBC, Table 2306.3.(1)
Exterior ( <a href="#">Option #3</a> )	7/16" APA Rated Plywood/OSB	1-1/2" 18ga. Staples w/ 1" penetration @ 3" O.C. Edges, 8" O.C. Field For 24" stud spacing, 12" O.C. Field For 16" stud spacing	310	per IBC, Table 2306.3.(1)
Exterior ( <a href="#">Option #4</a> )	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing	8d Common Nails w/ 1-3/8" penetration @ 6" O.C. Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 4" O.C. Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	220	AF&PA SDPWS Table 4.3A
Exterior ( <a href="#">Option #5</a> )	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing	8d Common Nails w/ 1-3/8" penetration @ 4" O.C. Edges, 12" O.C. Field for 7/16" APA-rated plywood/OSB or shiplap panel sheathing OR @ 3" O.C. Edges, 12" O.C. Field for 3/8" shiplap panel sheathing	320	AF&PA SDPWS Table 4.3A
Exterior ( <a href="#">Option #6</a> )	7/16" APA Rated Plywood/OSB or shiplap panel sheathing, or 3/8" shiplap panel sheathing with tighter nail spacing and double studs at each panel edge	8d Common Nails w/ 1-3/8" penetration @ 3" O.C. Edges, 12" O.C. Field	410	AF&PA SDPWS Table 4.3A
Interior	1/2" Gypsum Board	No. 6- 1 1/4" Type W or S Screws @ 8" O.C. Edges, 12" O.C. Field	60	per IBC, Table 2306.4.4
Interior	16 Ga. Simpson/USP Type WB Steel X-Brace (or equal)	(3) 16d @ end studs & (1) 8d @ intermediate studs (per manufacturer specifications - see detail on sheet S3)	325	

EXTERIOR SHEATHING OPTION FOR FIRST FLOOR	4
EXTERIOR SHEATHING OPTION FOR BASEMENT WALLS	4

WIDTH OF 1ST STORY (FT.)	117
DEPTH OF 1ST STORY (FT.)	60.33
BACK WALL OF GARAGE (FT.)	0
GAR. WALL: 1=F-B, 2=S-S	2

WIDTH OF 2ND STORY (FT.) 1  
DEPTH OF 2ND STORY (FT.) 1

	SEISMIC				WIND			
	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)	FRONT-TO-BACK	RESISTANCE (lbs.)	SIDE-TO-SIDE	RESISTANCE (lbs.)
1ST FLOOR	114	31920	49.5	13860	114	44688	49.5	19404

1ST FLOOR FRONT-TO-BACK 1ST FLOOR SIDE-TO-SIDE BASEMENT FRONT-TO-BACK BASEMENT SIDE-TO-SIDE	ADDITIONAL RESISTANCE REQUIRED		Anchor Bolt Spacing (in.)		16d Nail Spacing req'd at bottom plate (in.)	
	SEISMIC	WIND	diameter (in.)	0.5	1st Floor F-B	11
	0	0	Shear value (per NDS)	944	1st Floor S-S	43
	0	0	Spacing F-B (inches)	72.9		
			spacing S-S (inches)	288.0		

RESISTANCE REQUIRED IN ADDITION TO RESISTANCE PROVIDED BY EXTERIOR WALLS**						
	ADDITIONAL RESISTANCE REQUIRED (POUNDS)	PORTAL FRAMES OR PERF. SHEAR WALL RESISTANCE	INTERIOR X-BRACES (325#/BRACE)	INTERIOR WALL LENGTH W/ 1/2" GYPSUM BOARD PER TABLE (FT.)	INT. WALL LENGTH SHEATHED W/ OSB (TOTAL LENGTH, ONE SIDE, FT.)	RESISTANCE PROVIDED BY ADDITIONAL METHODS (POUNDS)
1ST FLOOR FRONT-TO-BACK	0					0
1ST FLOOR SIDE-TO-SIDE	0					0

\*\*NOTES: 1) SEE ATTACHED CALCULATIONS FOR PORTAL FRAME OR PERFORATED SHEAR WALL RESISTANCE CAPACITIES (IF APPLICABLE).  
2) SEE SHEET S1 FOR INTERIOR STEEL X-BRACE INSTALLATION. 3) INTERIOR WALLS SHEATHED WITH OSB SHALL BE ATTACHED WITH SAME STAPLE/NAILING PATTERN AS EXTERIOR OSB ON SAME FLOOR (SEE TABLE ABOVE) AND ARE ONLY APPLICABLE FOR FULL-HEIGHT SECTIONS OF 2'-8" OR LONGER  
**ALL LATERAL BRACING ACHIEVED AT EXTERIOR WALLS AND WALLS DIRECTLY ON FOUNDATIONS; THEREFORE, NO INTERIOR BRACING PER 2012 IRC SECTION R502.2.1 IS REQUIRE!**

WIND UPLIFT ANALYSIS						
	X/12	DEGREES				
ROOF PITCH (MAX)	12	45.0	PITCH OF 6 OR LESS: EOH -13.3, E -7.2, G -5.2			
		ASCE 7				
	LENGTH (FT.)	PRESSURE (PSF)	LINEAL FT. OF OH	UPLIFT PER FT* (LBS)		
OVERHANG	1	-1.08	356.66	-1.08		
	TOTAL AREA (FT²)	ZONE E AREA (FT²)	ZONE G AREA (FT²)	PRESSURE ZN. E (PSF)	PRESSURE ZN. G (PSF)	TOTAL FORCE (LBS)
MAIN ROOF**	7058.61	-534.089424	7592.699424	-1.08	-0.36	-2157
						FORCE PER LINEAL FT @ PERIMETER (LBS)
						-6.1
*ALONG PERIMETER	TOTAL UPLIFT PER LINEAL FOOT ALONG EXTERIOR (POUNDS)			-7.2	UPLIFT OK	
**INSIDE EXTERIOR WALLS	RESISTANCE DUE TO DEAD WEIGHT & (3) 10d TOENAILS			251.6		

**NOTE FOR CONSTRUCTION:**  
THE CONTINUOUS STRUCTURAL PANEL SHEATHING BRACING METHOD REQUIRES USE OF THE ABOVE TABLE FOR SHEATHING OF THE ENTIRE STRUCTURE. IN ADDITION, FRAMING MEMBERS SHALL BE @ 16" O.C. MAX., UNBLOCKED, AND W/ SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS

**NOTE FOR DESIGN:**  
ALL WALLS USED IN THE CALCULATION OF THE RESISTANCE FOR THIS STRUCTURE SHALL HAVE A MINIMUM UNINTERRUPTED HEIGHT OF 8'-0" AND LENGTH OF 2'-8". ALLOWABLE RESISTANCES HAVE BEEN #/FT AND INCREASED BY 40% FOR WIND LOADS, PER VALUES IN 2012 IBC SECTION 2306 AND AF&PA SDPWS TABLE 4.3A. FOR EXAMPLE, 7/16" APA-RATED SHEATHING WITH 8d @ 6" & 12" HAS A SEISMIC SHEAR VALUE OF 240 A WIND SHEAR VALUE OF 335#/FT - 40% GREATER THAN THAT OF SEISMIC)

**NOTE: SOIL SITE CLASS ASSUMED TO BE CLASS D. IF SITE CONDITIONS ARE DETERMINED TO BE CLASS E OR F, CONSULT ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION**



14718 NW DELIA STREET \* PORTLAND, OREGON 97229  
OFFICE: 971.645.0901 \* MOBILE: 971.645.0901 \*  
\* DENNIS@VISTASTRUCTURAL.COM \* VISTASTRUCTURAL.COM

CLIENT: KEVIN HIGDON CONSTRUCTION

JOB TITLE: TCR007 TRIPLEX  
509 ASHURST PLACE

LOCATION: LEE'S SUMMIT, MISSOURI



NO.	DATE	REVISION	BY

DRAWING TITLE

STRUCTURAL  
CALCULATIONS

ENGINEER: DMH	CHECKED BY: DMH
JOB NO.: 1992	DRAWN BY: DMH
DATE: 12-18-18	
SHEET NUMBER	

S1.1



GENERAL NOTES

- PLANS ARE DESIGNED AND REVIEWED IN ACCORDANCE WITH THE 2012 IRC AS ADOPTED BY THE CITY OF OVERLAND PARK
- RESIDENTIAL CONCRETE AND ASPHALT DRIVEWAY SLABS SHALL BE A MIN. 4" THICK. THE DRIVEWAY SHALL HAVE A CONSTANT SLOPE SO AS TO AVOID PONDING OF WATER. THE SLOPE SHALL BE AWAY FRO THE HOUSE OR BUILDING OR DRAIN BY MEANS APPROVED BY THE BUILDING OFFICIAL
- APPROVED NUMBERS OR ADDRESSES SHALL BE PROVIDED FOR ALL NEW BUILDING IN SUCH A POSITION AS TO BE PLAINLY VISIBLE AND LEGIBLE FRO THE STREET OR ROAD FRONTING THE PROPERTY AND LOCATED NOT MORE THAN 50 FEET FROM THE PROPERTY LINE. ADDRESS CHARACTERS SHALL HAVE A CONTRASTING BACKGROUND AND HAVE A MIN. HEIGHT OF 4"
- SINGLE FAMILY DWELLINGS SHALL HAVE THE ABILITY TO ILLUMINATE THE ADDRESS AND NUMBERS DURING THE HOURS OF DARKNESS WITH A POWER SOURCE CONNECTED TO THE HOUSE ELECTRICAL SYSTEM OR OTHER APPROVED SOURCE OF ILLUMINATION.
- EXCEPT FOR VEHICULAR ACCESS DOORS, ALL EXTERIOR SWINGING DOORS OF RESIDENTIAL BUILDINGS AND ATTACHED GARAGES, INCLUDING THE DOORS LEADING FROM THE GARAGE AREA INTO THE DWELLING UNIT SHALL COMPLY WITH SECTIONS R328.2.1 THROUGH R328.2.5 FOR THE TYPE OF DOOR INSTALLED.
- WHERE INSTALLED, EXTERIOR WOOD DOORS SHALL BE OF SOLID CORE CONSTRUCTION SUCH AS HIGH-DENSITY PARTICLE BOARD, SOLID WOOD, OR WOOD BLOCK CORE WITH A MINIMUM THICKNESS OF 1½" AT ANY POINT. DOORS WITH PANEL INSERTS SHALL BE SOLID WOOD. THE PANELS SHALL BE A MINIMUM OF 1" THICK. THE TAPERED PORTION OF THE PANEL THAT INSERTS INTO THE GROOVE OF THE DOOR SHALL BE A MINIMUM OF ¼" THICK. THE GROOVE SHALL BE A DADO GROOVE OR APPLIED MOLDING CONSTRUCTION. THE GROOVE SHALL BE A MINIMUM OF ½" IN DEPTH.
- WHERE INSTALLED, EXTERIOR STEEL DOORS SHALL BE A MINIMUM THICKNESS OF 24 GAUGE
- FIBERGLASS DOORS SHALL HAVE A MINIMUM SKIN THICKNESS OF ⅝" AND HAVE REINFORRCEMENT MATERIAL AT THE LOCATION OF THE DEADBOLT
- WHERE INSTALLED, THE INACTIVE LEAF OF AN EXTERIOR DOUBLE DOOR SHALL BE PROVIDED WITH FLUSH BOLTS HAVING AN ENGAGEMENT OF NOT LESS THAN 1" INTO THE HEAD AND THRESHOLD OF THE DOOR FRAME
- WHERE INSTALLED, EXTERIOR SLIDING DOORS SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS: A) SLIDING DOOR ASSEMBLIES SHALL BE INSTALLED TO PREVENT THE REMOVAL OF THE PANELS AND THE GLAZING FROM THE EXTERIOR WITH THE INSTALLATION OF SHIMS OR SCREWS IN THE UPPER TRACK AND B) ALL SLIDING GLASS DOORS SHALL BE EQUIPPED WITH A SECONDARY LOCKING DEVICE CONSISTING OF A METAL PIN OR A SURFACE MOUNTED BOLT ASSEMBLY. METAL PINS SHALL BE INSTALLED AT THE INTERSECTION OF THE INNER AND OUTER PANELS OF THE INSIDE DOOR AND SHALL NOT PENETRATE THE FRAME'S EXTERIOR SURFACE. THE SURFACE MOUNTED BOLT ASSEMBLY SHALL BE INSTALLED A THE BASE OF THE DOOR.
- WOOD DOOR FRAMES SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS: A) ALL EXTERIOR DOOR FRAMES SHALL BE SET IN FRAME OPENINGS CONSTRUCTED OF DOUBLE STUDDING OR EQUIVALENT CONSTRUCTION, INCLUDING GARAGE DOOR, BUT EXCLUDING OVERHEAD DOORS. DOOR FRAMES, INCLUDING THOSE WITH SIDELIGHTS SHALL BE REINFORCED IN ACCORDANCE WITH ASTM F476-84 GRADE 40, AND B) IN WOOD FRAMING, HORIZONTAL BLOCKING SHALL BE PLACED BETWEEN STUDS AT THE DOOR LOCK HEIGHT FOR THREE STUDS SPACES OR EQUIVALENT BRACING ON EACH SIDE OF THE DOOR OPENING.
- ALL EXTERIOR DOOR FRAMES (INCLUDING THE DOOR LEADING FROM THE GARAGE TO THE DWELLING UNIT) SHALL BE CONSTRUCTED OF 18 GAUGE OR HEAVIER STEEL AND REINFORCED AT THE HINGES AND STRIKES. ALL STEEL FRAMES SHALL BE ANCHORED TO THE WALL IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. SUPPORTING WALL STRUCTURES SHALL CONSIST OF DOUBLE STUDDING OR FRAMING OF EQUIVALENT STRENGTH. FRAMES SHALL BE INSTALLED TO ELIMINATE TOLERANCES INSIDE THE ROUGH OPENING.
- DOOR JAMBS SHALL BE INSTALLED WITH SOLID BACKING IN A MANNER SO NO VOID EXITS BETWEEN THE STRIKE SIDE OF THE JAMB AND THE FRAME OPENING FOR A VERTICAL DISTANCE OF 12" EACH SIDE OF THE STRIKE. FILLER MATERIAL SHALL CONSIST OF A SOLID WOOD BLOCK.
- DOOR STOPS ON WOODEN JAMBS FOR IN-SWITCHING DOORS SHALL BE OF ONE-PIECE CONSTRUCTION. JAMBS FOR ALL DOORS SHALL BE CONSTRUCTED OR PROTECTED SO AS TO PREVENT VIOLATION OF THE STRIKE.
- HINGES FOR EXTERIOR SWINGING DOORS SHALL COMPLY WITH THE FOLLOWING: A) AT LEAST TWO SCREWS 3" IN LENGTH PENETRATING AT LEAST 1" INTO WALL STRUCTURE SHALL BE USED. SOLID WOOD FILLERS OR SHIMS SHALL BE USED TO ELIMINATE ANY SPACE BETWEEN THE WALL STRUCTURE AND DOOR FRAME BEHIND EACH HINGE, AND B) HINGES FOR OUT-SWINGING DOORS SHALL BE EQUIPPED WITH MECHANICAL INTERLOCK TO PRECLUDE THE REMOVAL OF THE DOOR FROM THE EXTERIOR.
- EXTERIOR DOOR STRIKE PLATES SHALL BE A MINIMUM OF 18 GAUGE METAL WITH FOUR OFFSET SCREW HOLES. STRIKE PLATES SHALL BE ATTACHED TO WOOD WITH NOT LESS THAN 3" SCREWS, WHICH SHALL HAVE A MINIMUM OF 1" PENETRATION INTO THE NEAREST STUD. NOTE: FOR SIDE LIGHTED UNITS, REFER TO SECTION R328.4.6
- ALL EXTERIOR DOORS SHALL HAVE ESCUTCHEON PLATES OR WRAP-AROUND DOOR CHANNELS INSTALLED AROUND THE LOCK PROTECTING THE DOOR'S EDGE
- EXTERIOR DOORS SHALL BE PROVIDED WITH A LOCKING DEVICE COMPLYING WITH ONE OF THE FOLLOWING: SINGLE CYLINDER DEADBOLT SHALL HAVE A MINIMUM PROJECTION OF 1". THE DEADBOLT SHALL PENETRATE AT LEAST ¾" INTO THE STRIKE RECEIVING THE PROJECTED BOLT. THE CYLINDER SHALL HAVE A TWIST-RESISTANT TAPERED HARDENED STEEL CYLINDER GUARD. THE CYLINDER SHALL HAVE A MINIMUM OF FIVE PIN TUMBLERS. SHALL BE CONNECTED TO THE INNER PORTION OF THE LOCK BY SOLID METAL CONNECTING SCREWS AT LEAST ½" IN DIAMETER AND 2½" IN LENGTH. BOLT ASSEMBLY (BOLT HOUSING) UNIT SHALL BE OF SINGLE PIECE CONSTRUCTION. ALL DEADBOLTS SHALL MEET ANSI GRADE 2 SPECIFICATIONS.
- ALL MAIN OR FRONT ENTRY DOORS TO DWELLING UNITS SHALL BE ARRANGED SO THAT THE OCCUPANT HAS A VIEW OF THE AREA IMMEDIATELY OUTSIDE THE DOOR WITHOUT OPENING THE DOOR. THE VIEW MAY BE PROVIDED BY A DOOR VIEWER HAVING A FIELD OF VIEW OF NOT LESS THAN 180 DEGREES THROUGH WINDOWS OR THROUGH VIEW PORTS.
- SIDE LIGHT DOOR UNITS SHALL HAVE FRAMING OF DOUBLE STUD CONSTRUCTION OR EQUIVALENT CONSTRUCTION COMPLYING WITH SECTIONS R328.3.1, R328.3.2 AND R3828.3.3. THE DOOR FRAME THAT SEPARATES THE DOOR OPENING FROM THE SIDE LIGHT, WHETHER ON THE LATCH SIDE OR THE HINGE SIDE, SHALL BE DOUBLE STUD CONSTRUCTION OR EQUIVALENT CONSTRUCTION COMPLYING WITH SECTIONS R328.3.1 AND R328.3.2. DOUBLE STUD CONSTRUCTION OR CONSTRUCTION OF EQUIVALENT STRENGTH SHALL EXIST BETWEEN THE GLAZING UNIT OF THE SIDE LIGHT AND WALL STRUCTURE OF THE DWELLING.
- ALL FRONT AND STREET SIDE DOOR ENTRANCES SHOULD BE PROTECTED WITH A MINIMUM OF ONE LIGHT OUTLET HAVING A MINIMUM OF SIXTY WATTS OF LIGHTING (OR ENERGY EFFICIENT EQUIVALENT), INSTALLED SO THAT THE LIGHT SOURCE IS NOT READILY ACCESSIBLE.
- HOUSES WITH WINDOWS OR DOORS NEAR GROUND LEVEL BELOW EIGHT FEET ON THE REAR SIDE OF THE HOUSE SHALL BE EQUIPPED WITH A MINIMUM OF ONE LIGHT OUTLET HAVING 100 WATT LIGHTING (OR ENERGY EFFICIENT EQUIVALENT) AND SHALL BE OF THE FLOOD LIGHT TYPE. THOSE FIXTURES PLACED BELOW EIGHT FEET SHALL BE FIXTURES MANUFACTURED SUCH THAT THE LIGHT SOURCE IS NOT READILY ACCESSIBLE.
- BASEMENT FLOOR SLABS SHALL BE ISOLATED FROM COLUMN PADS, INTERIOR COLUMNS AND INTERIOR BEARING WALLS TO FACILITATE DIFFERENTIAL MOVEMENT. NONBEARING WALLS SUPPORTED ON BASEMENT FLOOR SLABS SHALL BE PROVIDED WITH A MINIMUM ONE-INCH EXPANSION JOINT TO FACILITATE DIFFERENTIAL MOVEMENT BETWEEN THE FLOOR SLAB AND THE FLOOR FRAMING ABOVE. ISOLATION AND/ORR AN EXPANSION JOINT IS NOT REQUIRED WITHIN SIX INCHES OF THE EXTERIOR WALLS
- ONE LAYER OF NO. 15 ASPHALT FELT, FREE FROM HOLES AND BREAKS, COMPLYING WITH ASTM D226 FOR TYPE 1 FELT OR OTHER APPROVED WATER-RESISTIVE BARRIER WHERE APPLIED OVER STUDS OR SHEATHING OF ALL EXTERIOR WALLS. SUCH FELT OR MATERIAL SHALL BE APPLIED HORIZONTALLY, WITH THE UPPER LAYER LAPPED OVER THE LOWER LAYER NOT LESS THAN 2 INCHES. WHERE JOINTS OCCUR, FELT SHALL BE LAPPED NOT LESS THAN 6 INCHES. THE FELT OR OTHER APPROVED MATERIAL SHALL BE CONTINUOUS TO THE TOP OF WALLS AND TERMINATED AT PENETRATIONS AND BUILDING APPENDAGES IN A MANNER TO MEET THE REQUIREMENTS OF THE EXTERIOR WALL ENVELOPE AS DESCRIBED IN SECTION R703.1. EXOEPTIONS: OMISSION OF THE WATER-RESISTIVE BARRIER IS PERMITTED IN THE FOLLOWING SITUATIONS - A) IN DETACHED ACCESSORY BUILDINGS, AND B) UNDER EXTERIOR WALL FINISH MATERIALS AS PERMITTED IN TABLE R703.4
- IN AREAS WHERE EXPANSIVE OR COLLAPSIBLE SOILS ARE KNOWN TO EXIST, ALL DWELLINGS SHALL HAVE A CONTROLLED METHOD OF WATER DISPOSAL FROM ROOFS THAT WILL COLLECT AND DISCHARGE ALL ROOF DRAINAGE TO THE GROUND SURFACE AT LEAST 3 FEET FROM FOUNDATION WALLS OR TO AN APPROVED DRAINAGE SYSTEM.
- EXTERIOR WALLS ASSOCIATED WITH CONDITIONED BASEMENTS SHALL BE INSULATED FROM THE TOP OF THE BASEMENT WALLS DOWN TO 10'-0" BELOW GRADE OR TO THE BASEMENT FLOOR, WHICHEVER IS LESS. WALLS ASSOCIATED WITH UNCONDITIONED BASEMENTS SHALL MEET THIS REQUIREMENT UNLESS THE FLOOR OVERHEAD IS INSULATED IN ACCORDANCE WITH SECTIONS N1102.1 AND N1102.2.5. EXCEPTION: EXTERIOR BASEMENT WALLS MADE OF CONCRETE OR MASONRY ARE NOT REQUIRED TO BE INSULATED WHEN SUCH WALLS ARE NOT ADJACENT TO FINISHED SPACE AND ARE MORE THAN 50% BELOW GRADE. EXTERIOR BASEMENT WALLS MADE OF CONCRETE AND MASONRY SHALL BE INSULATED WHENEVER THE ADJACENT INTERIOR SPACE IS FINISHED

ALLOWABLE LOAD FOR PNEUMATIC OR MECHANICALLY DRIVEN NAILS AND STAPLES							
FASTENER DESCRIPTION	NAIL GUN NAILS/WIRE DIA.	WIRE GA.	PENETRATION REQUIRED INTO MAIN MEMBER FOR LATERAL STRENGTH (IN.)	ALLOWABLE LOADS (LBS.)			
				LATERAL STRENGTH		WITHDRAWL STRENGTH	
				SP	DFL	SP	DFL
16 GA. STAPLE	0.0630	16	1	51	-	36	32
15 GA. STAPLE	0.0720	15	1	64	-	42	37
14 GA. STAPLE	0.0800	14	1	75	-	46	41
6d COOLER NAIL	0.0920	13	1	46	-	27	23
6d SINKER NAIL							
6d BOX NAIL	0.0990	12 1/2	1 1/8	61	55	31	24
6d CASING NAIL							
7d COOLER NAIL							
6d COMMON NAIL							
8d COOLER NAIL	0.1130	11.5000	1 1/4	79	72	35	28
8d SINKER NAIL							
8d BOX NAIL							
8d CASING NAIL							
6d RING SHANK NAIL	0.1200	11	1.3750	89	81	41	32
6d SCREW SHANK NAIL							
8d RING SHANK NAIL							
8d SCREW SHANK NAIL							
10d COOLER NAIL	0.1280	10.5000	1.5000	89	81	36	31
10d SINKER NAIL							
12d SHORT							
10d BOX NAILS	0.1280	10.5000	1.5000	101	93	40	31
12d BOX NAILS							
10d CASING NAILS							
8d COMMON NAILS	0.1310	10.2500	1.5000	106	97	41	32
16d SHORT NAILS							
12d SINKER NAILS	0.1350	10	1.5000	113	103	42	33
16d BOX NAILS							
10d RING SHANK NAILS	0.1350	10	1.6250	113	103	46	36
10d SCREW SHANK NAILS							
12d RING SHANK NAILS							
12d SCREW SHANK NAILS							
10d COMMON NAILS	0.1480	9	1.6250	128	118	46	36
12d COMMON NAILS							
16d SINKER NAILS							
20d BOX NAILS							
30d BOX NAILS	0.1480	9	1.7500	128	118	50	40
16d RING SHANK NAILS							
16d SCREW SHANK NAILS	0.1620	8	1.7500	154	141	50	40
16d COMMON NAILS							
40d BOX NAILS	0.1770	7	2.1250	178	163	59	47
20d RING SHANK NAILS							
20d SCREW SHANK NAILS	0.1770	7	2.1250	178	163	54	43
20d SINKER NAILS							
20d COMMON NAILS							
30d SINKER NAILS	0.1480	9	2.1250	170	166	59	47

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-STRUCTURAL-  
ENGINEERING, LLC



14718 NW DELIA STREET \* PORTLAND, OREGON 97229  
OFFICE: 971.645.0901 \* MOBILE: 971.645.0901 \*  
\* DENNIS@VISTASTRUCTURAL.COM \* VISTASTRUCTURAL.COM

CLIENT: KEVIN HIGDON CONSTRUCTION

JOB TITLE: TCR007 TRIPLEX  
509 ASHURST PLACE

LOCATION: LEE'S SUMMIT, MISSOURI



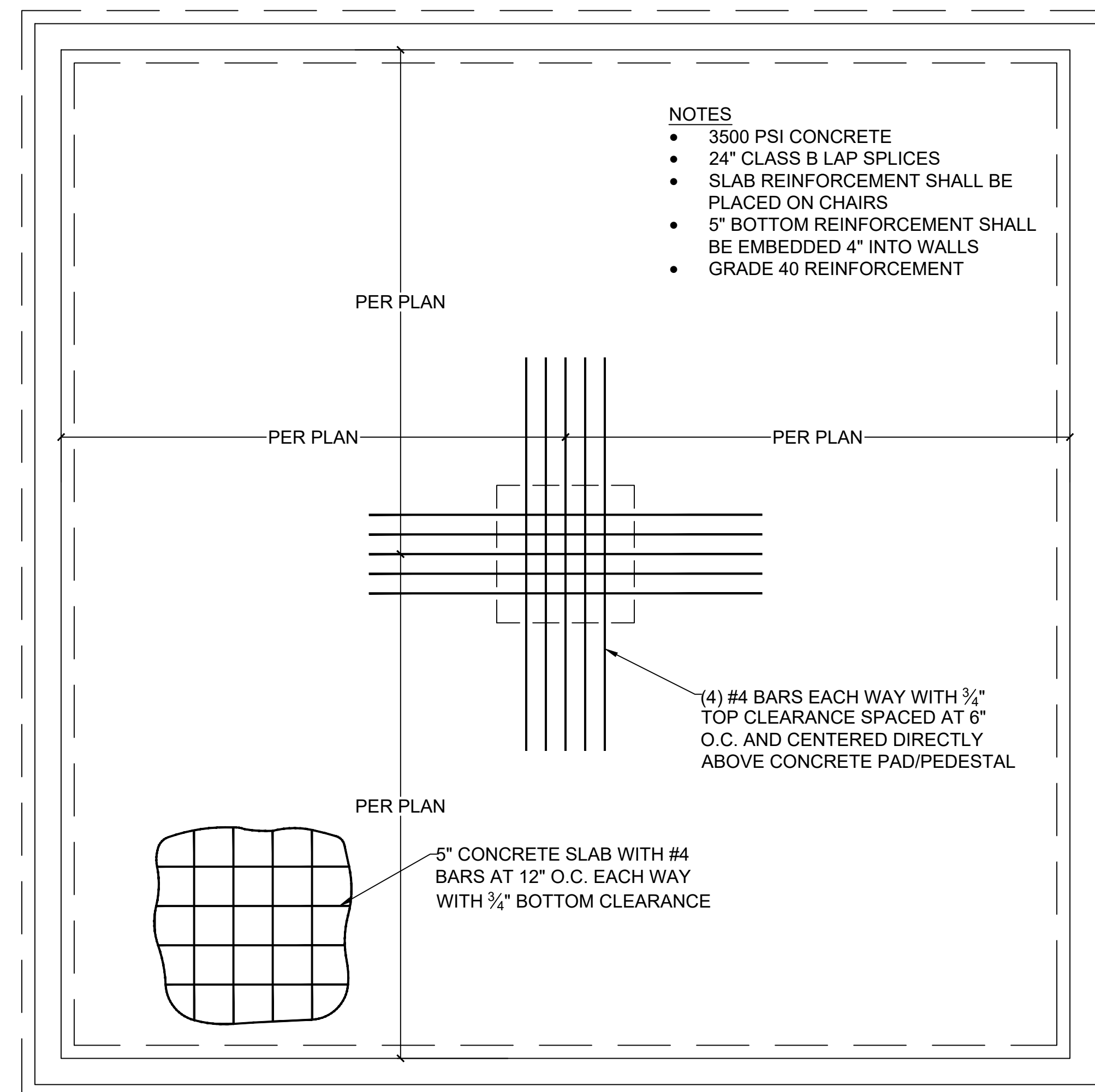
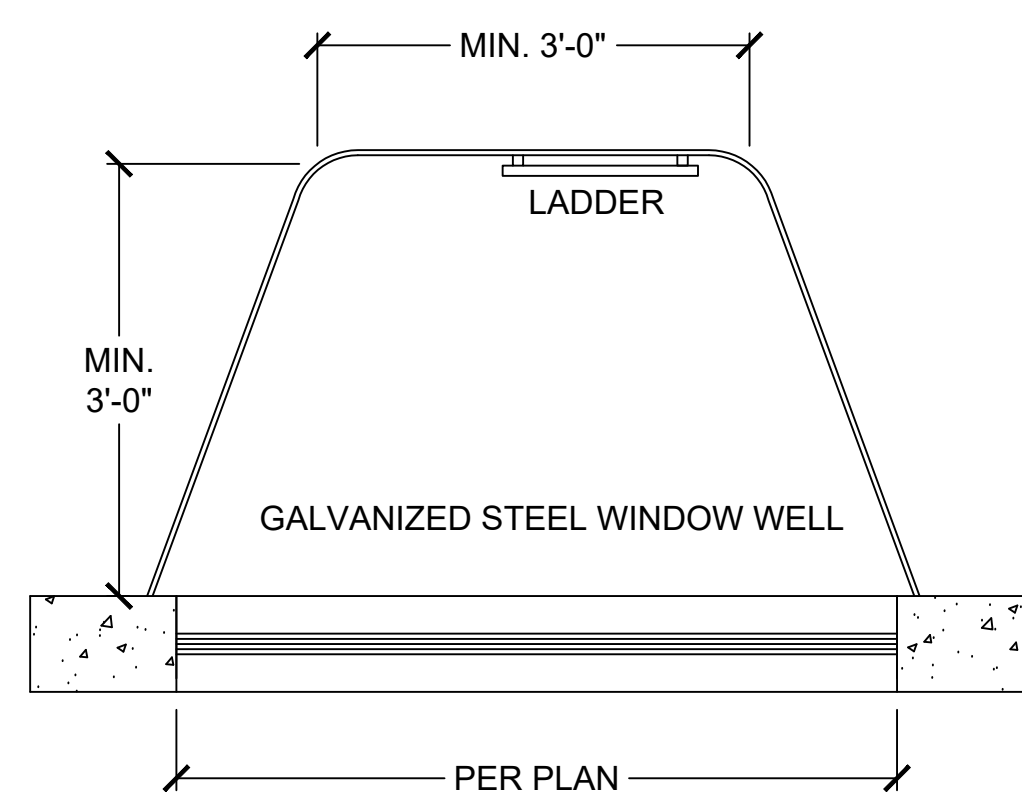
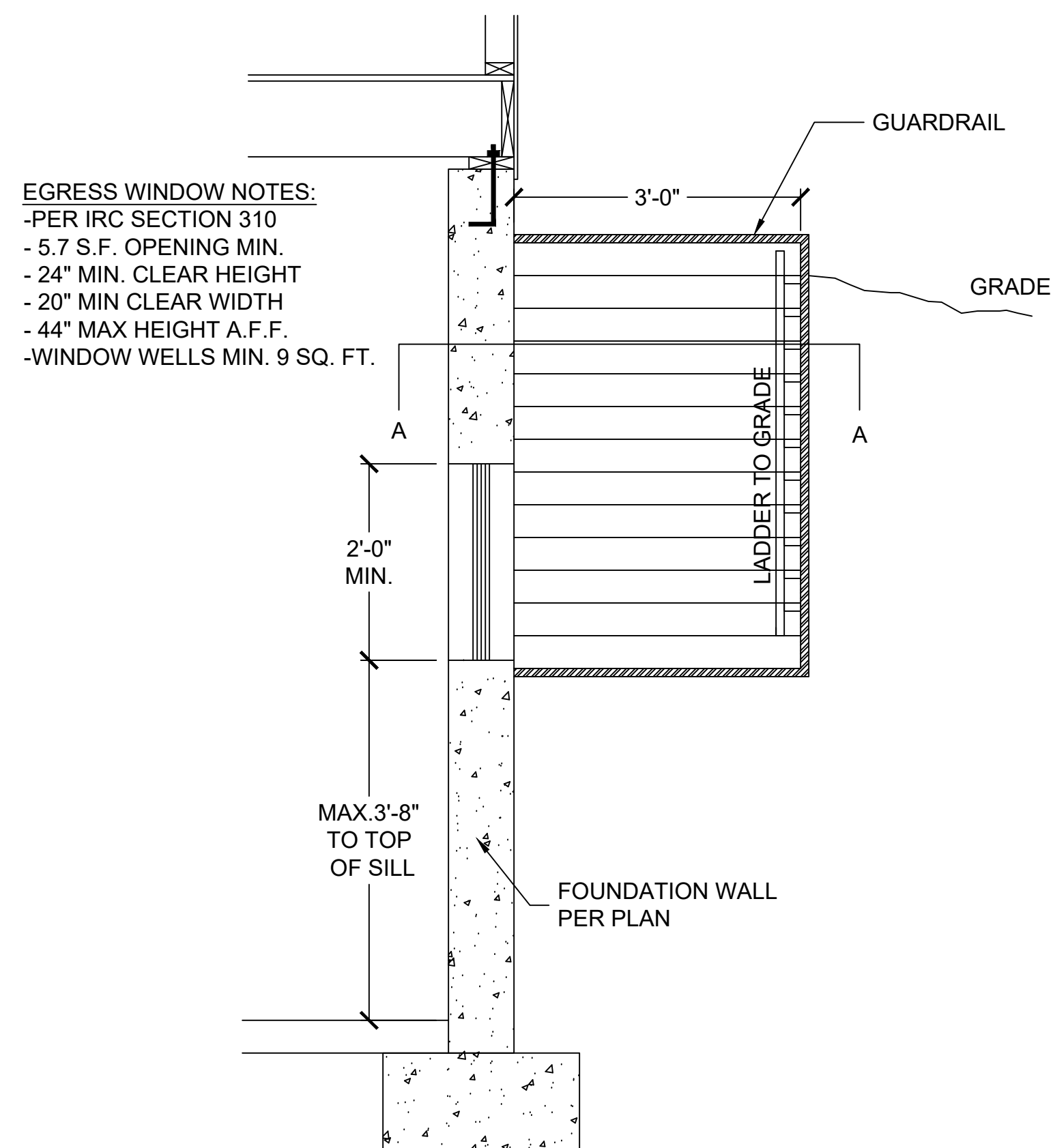
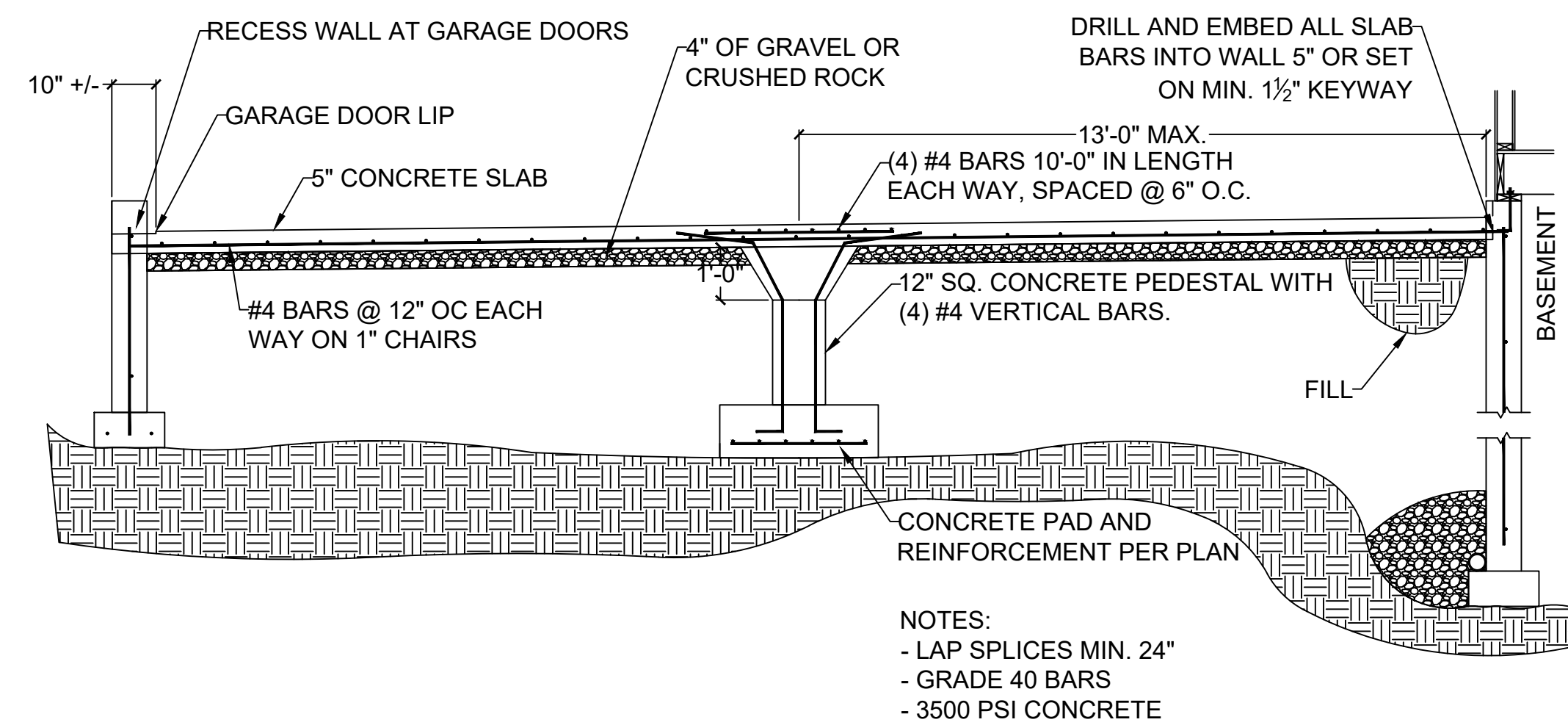
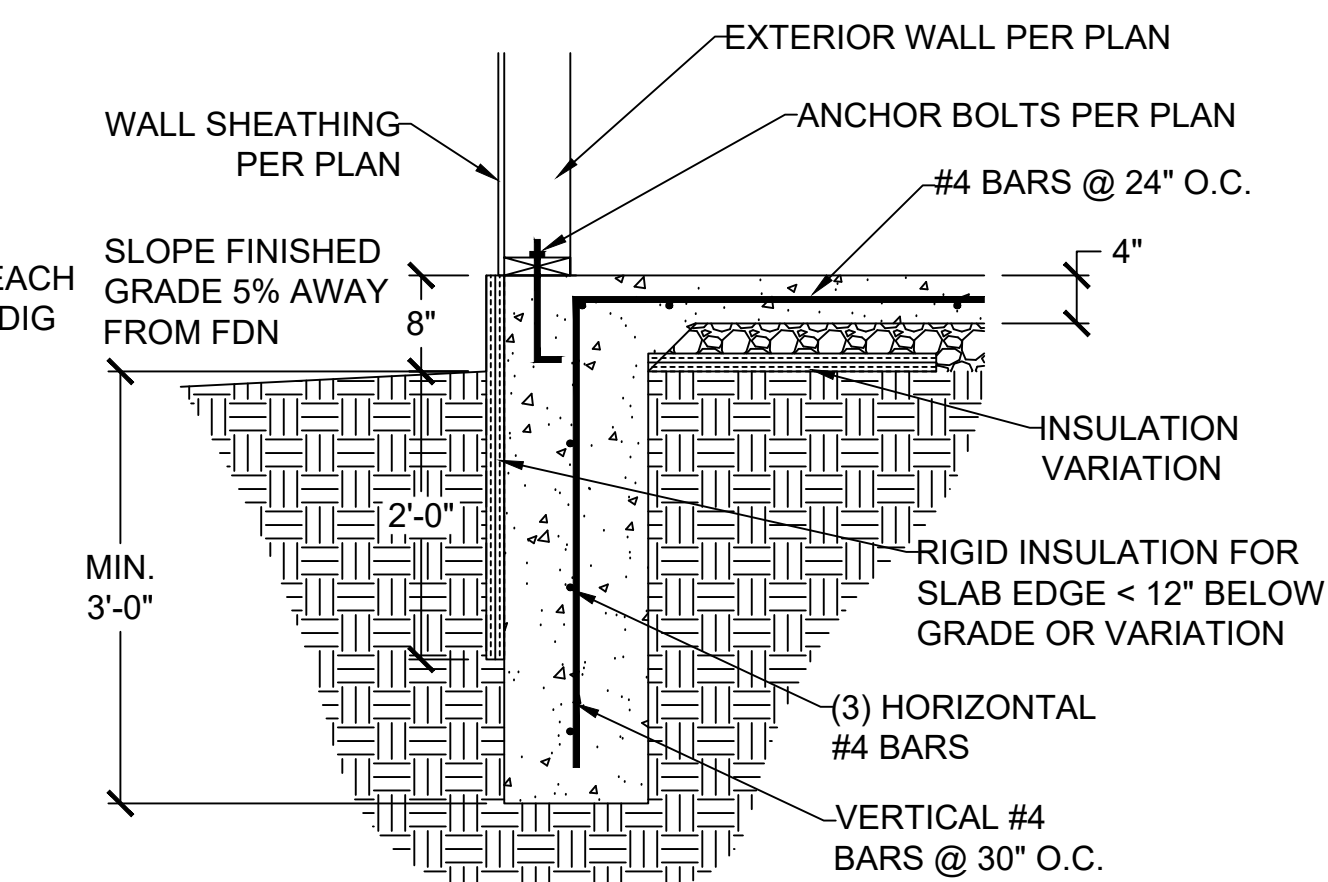
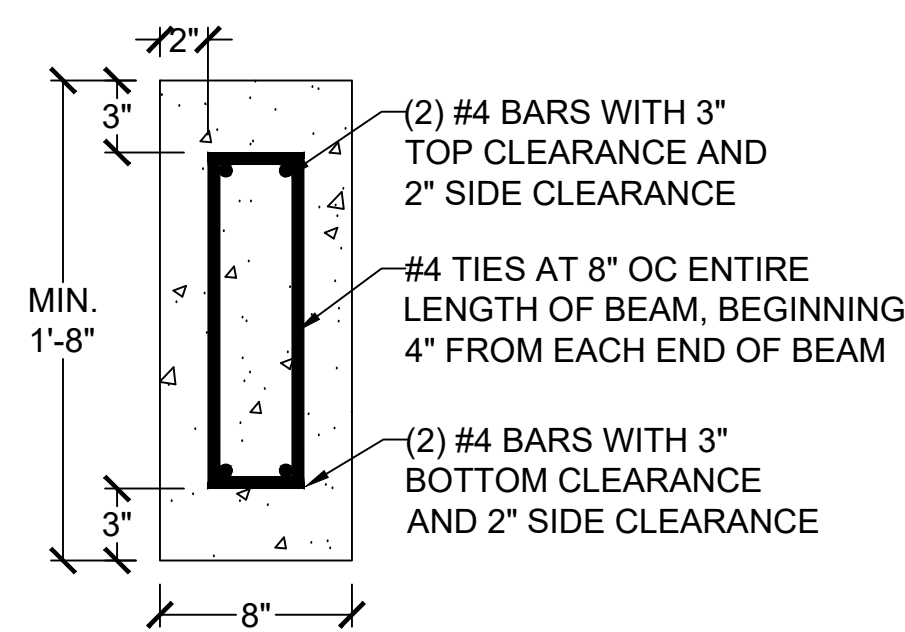
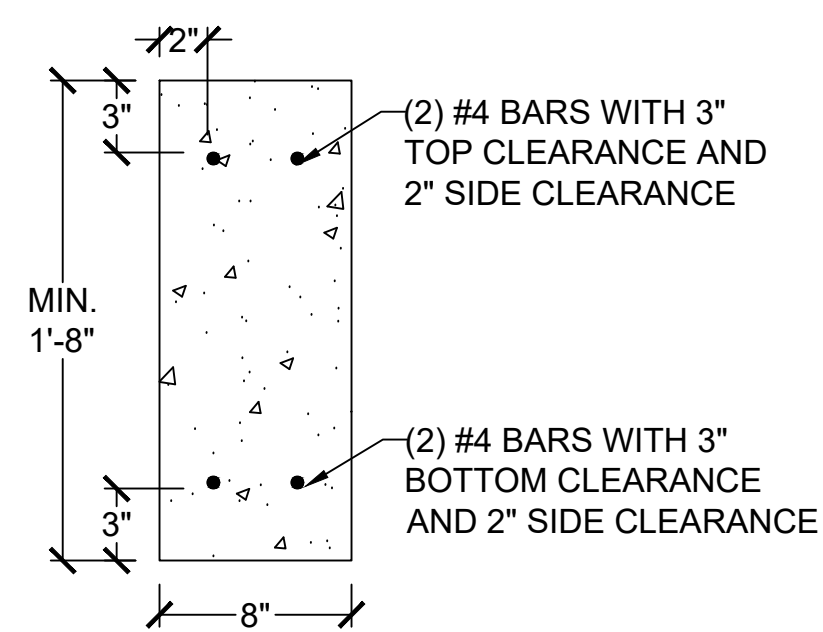
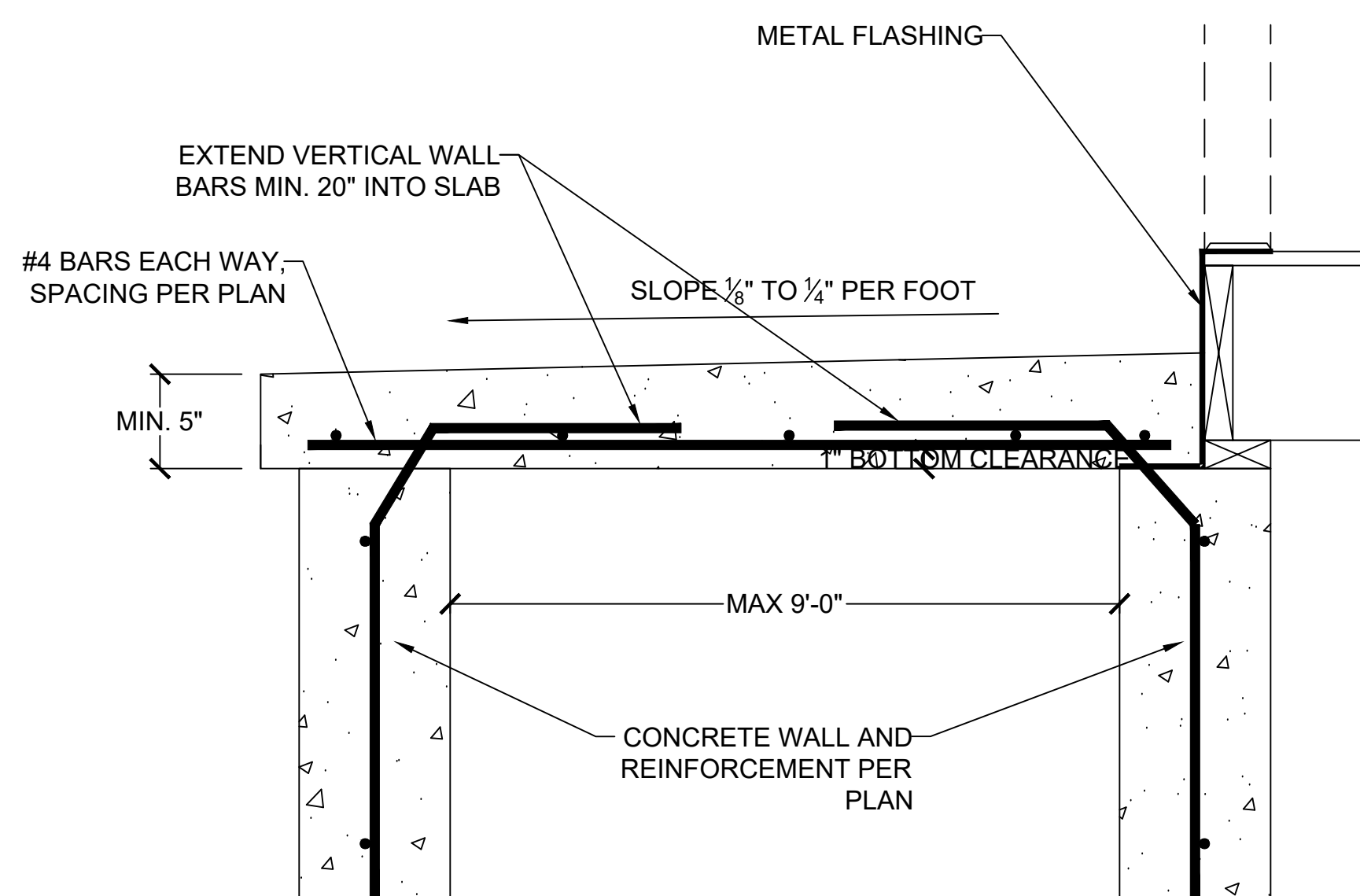
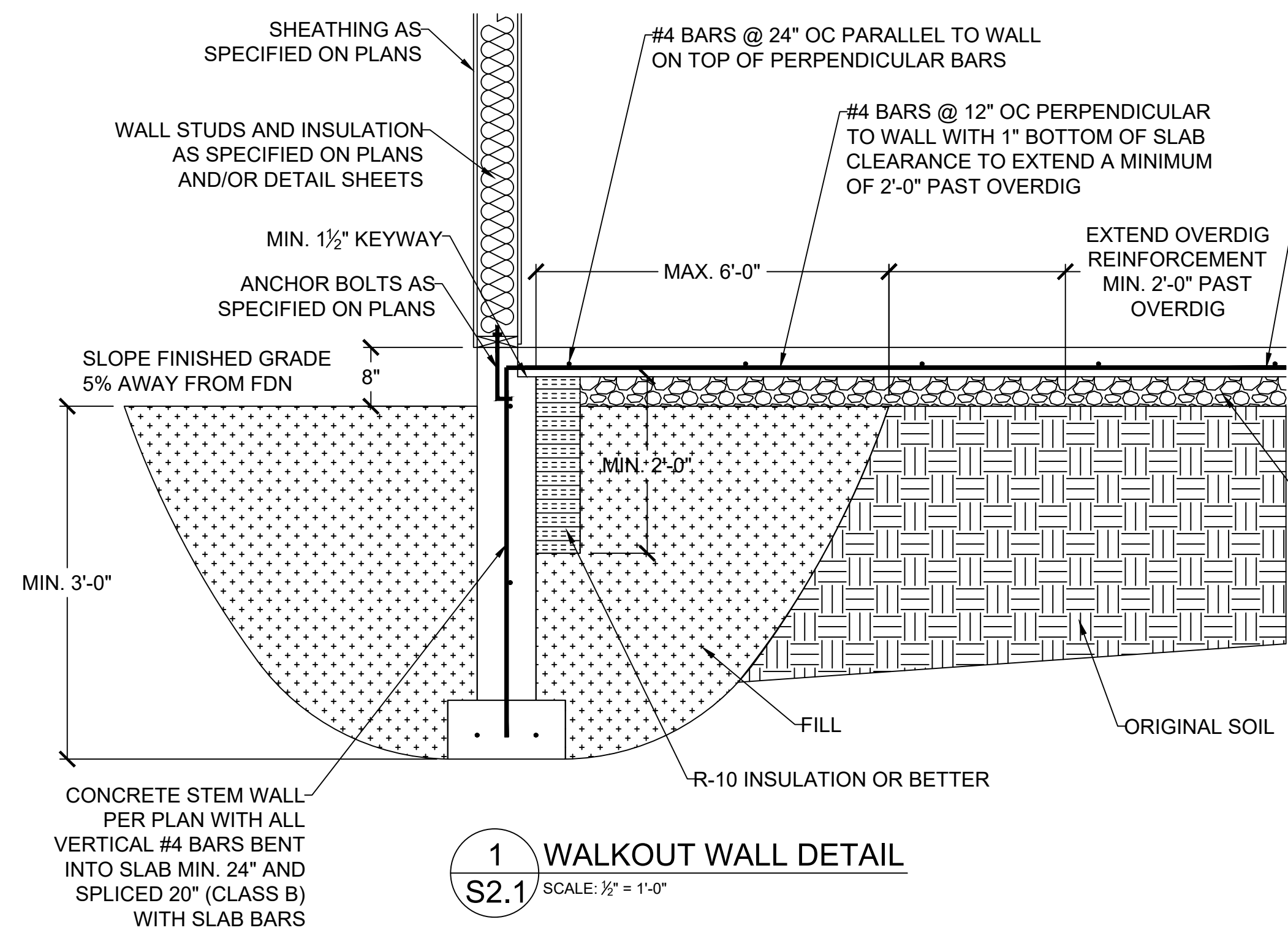
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STRUCTURAL NOTES			
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S1.2









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14718 NW DELIA STREET \* PORTLAND, OREGON 97229  
OFFICE: 971.645.0901 \* MOBILE: 971.645.0901 \*  
\* PENNIS@VISTASTRUCTURAL.COM \* VISTASTRUCTURAL.COM

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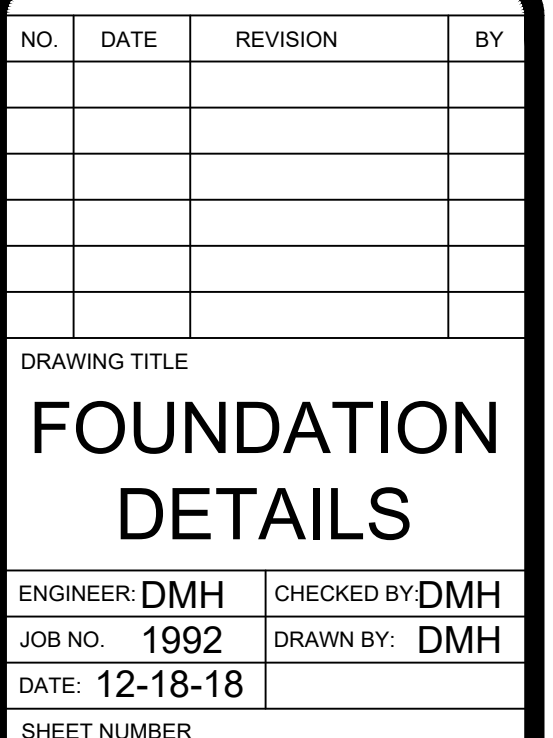
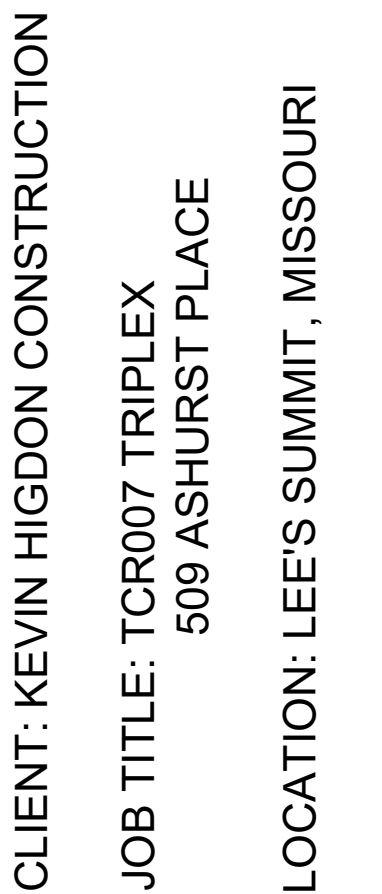
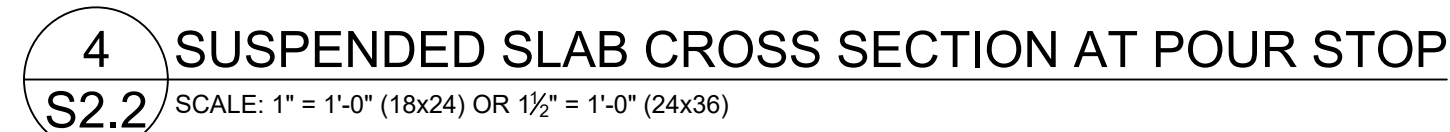
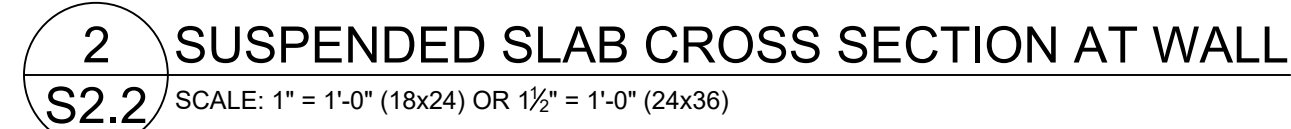
LOCATION: LEE'S SUMMIT, MISSOURI



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<b>FOUNDATION DETAILS</b>			
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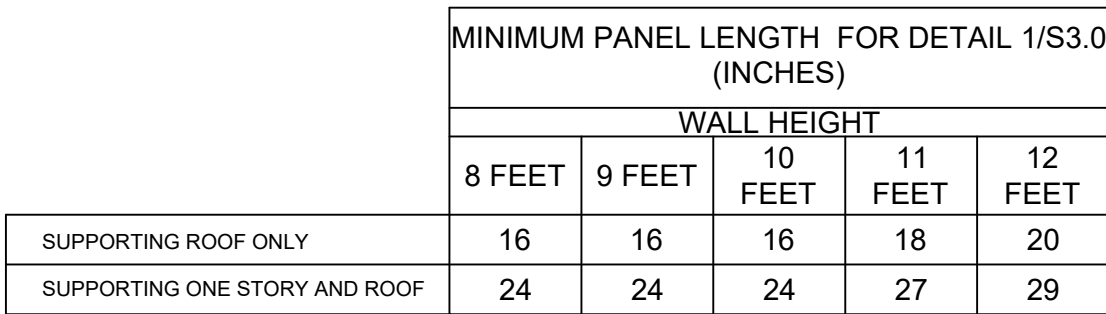
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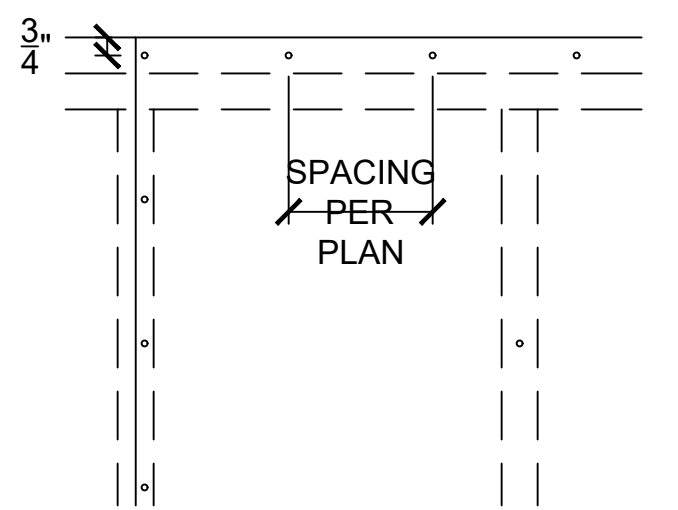


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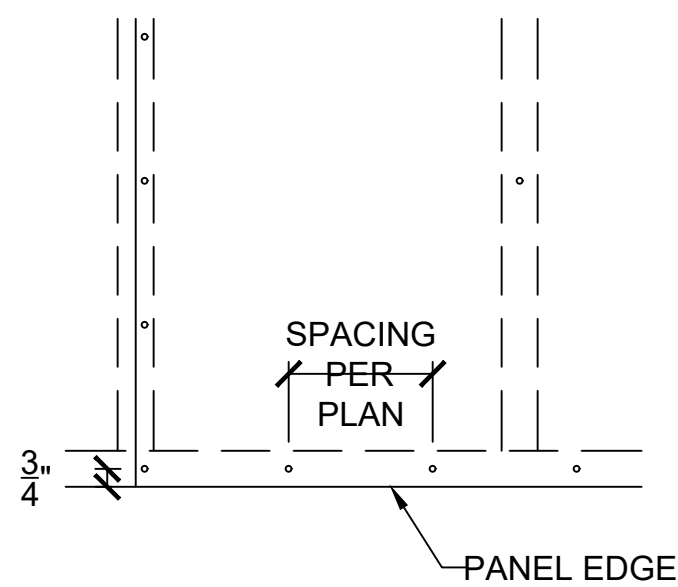




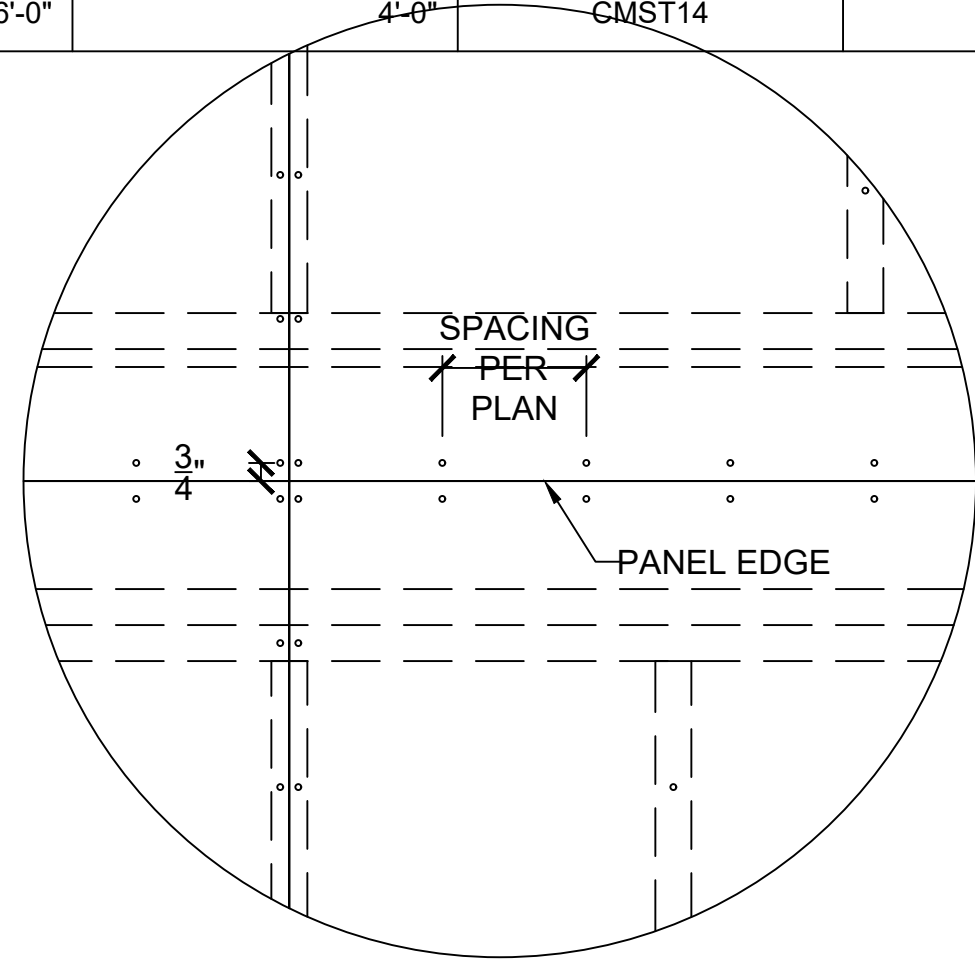
MINIMUM PANEL LENGTH FOR DETAIL 2/S3.0 (INCHES)				
WALL HEIGHT				
8 FEET	9 FEET	10 FEET	11 FEET	12 FEET
24	27	30	33 <sup>a</sup>	36 <sup>a</sup>



SHEATHING EDGE AT TOP PLATE  
(SINGLE ROW OF FASTENERS)

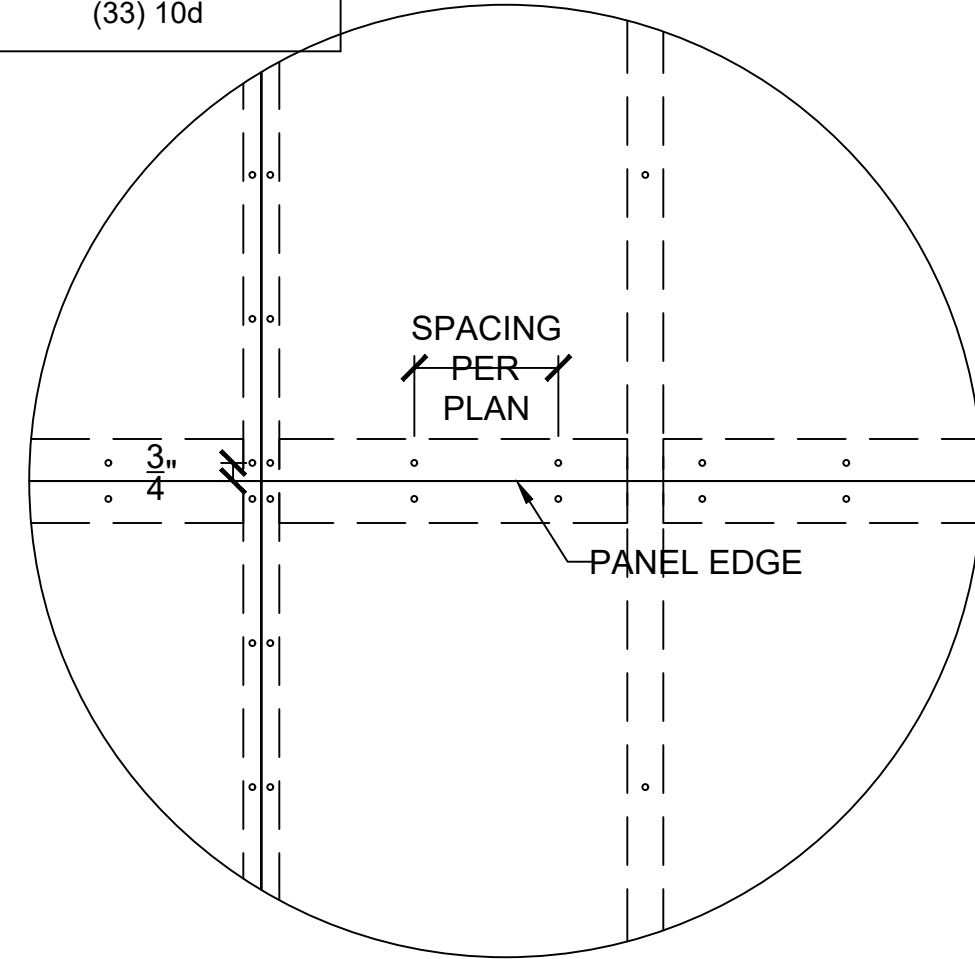


SHEATHING EDGE AT BOTTOM PLATE  
(SINGLE ROW OF FASTENERS)



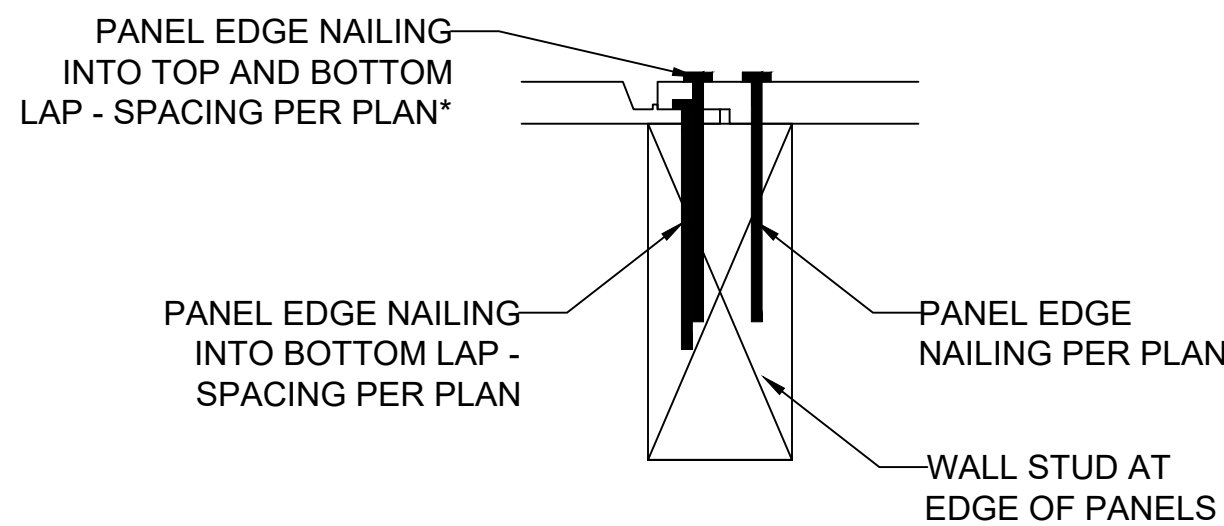
5	SHEATHING EDGE AT HORIZONTAL
S3.0	FRAMING MEMBER

SCALE: 1" = 1'-0" (18x24) OR 1½" = 1'-0" (24x36)

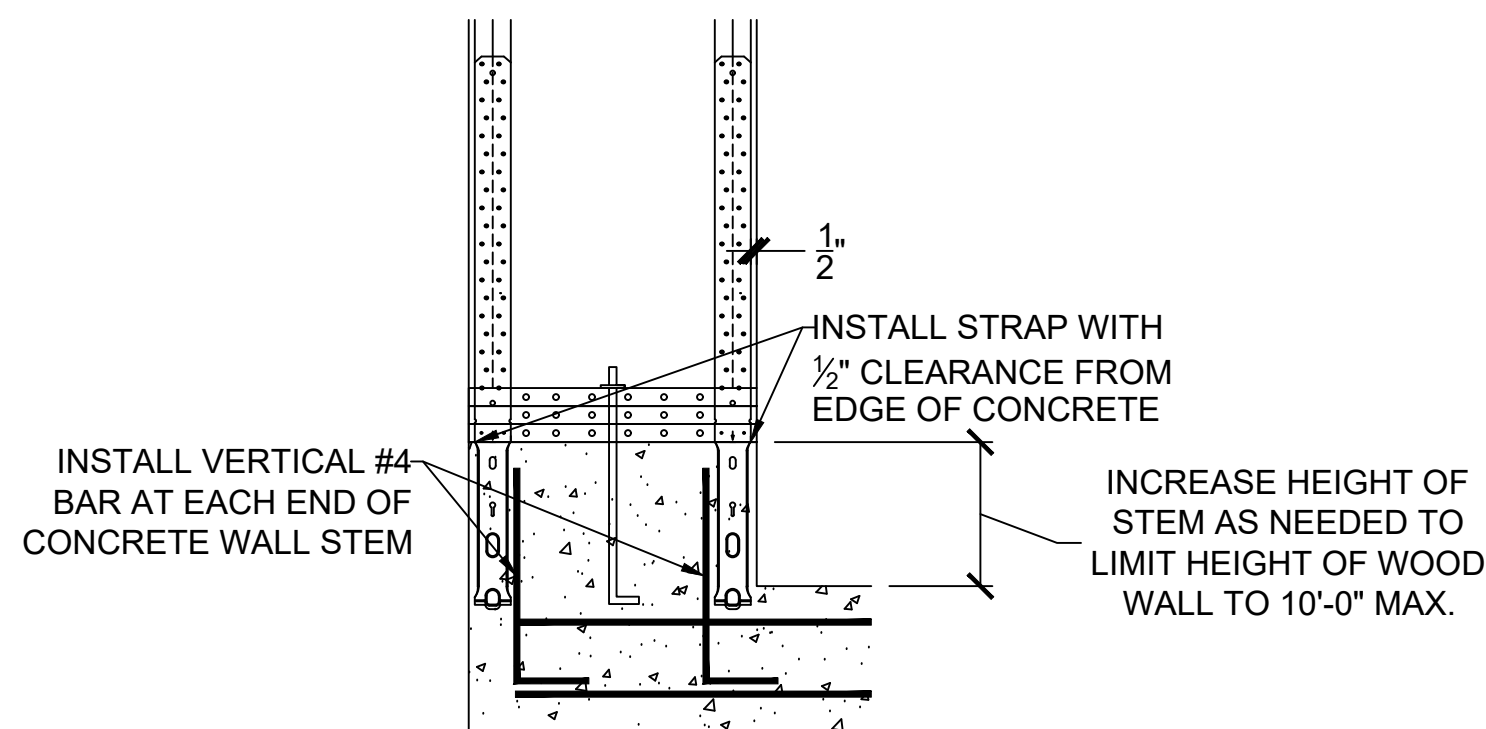


## 6 SHEATHING EDGE AT PANEL S3.0 SPLICE ACROSS STUDS

SCALE: 1" = 1'-0" (18x24) OR 1½" = 1'-0" (24x36)



\*NOTE: NAILING INTO TOP AND BOTTOM LAP IS IN ADDITION TO NAILING REQUIRED INTO BOTTOM LAP. FOR EXAMPLE, IF PLAN CALLS FOR NAILS @ 6" O.C. AT EDGES, BOTTOM LAP SHALL BE FASTENED AT 6" O.C AND, IN ADDITION, NAILING SHALL ALSO BE INSTALLED THROUGH TOP AND BOTTOM LAP @ 6" O.C. STAGGERED 3" FROM BOTTOM LAP NAILING



INCREASE HEIGHT OF  
STEM AS NEEDED TO  
LIMIT HEIGHT OF WOOD  
WALL TO 10'-0" MAX.



SCALE: 4" = 1'-0" (18x24) OR 6" = 1'-0" (24x36)

## 8 GARAGE HOLD-DOWN S3.0 STRAP INSTALLATION

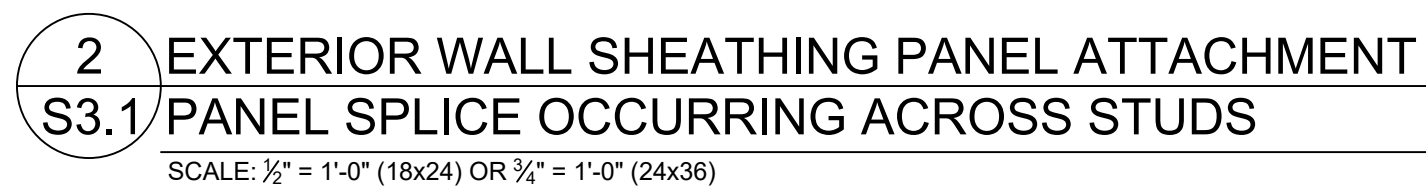
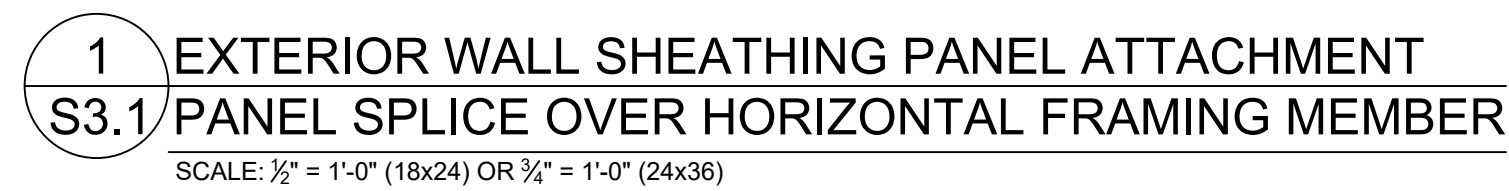
SCALE:  $\frac{1}{2}" = 1'-0"$  (18x24) OR  $\frac{3}{4}" = 1'-0"$  (24x36)

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JOB TITLE: TCR007 TRIPLEX  
509 ASHURST PLACE  
LOCATION: LEE'S SUMMIT, MISSOURI



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S3.0			





NO.	DATE	REVISION	BY

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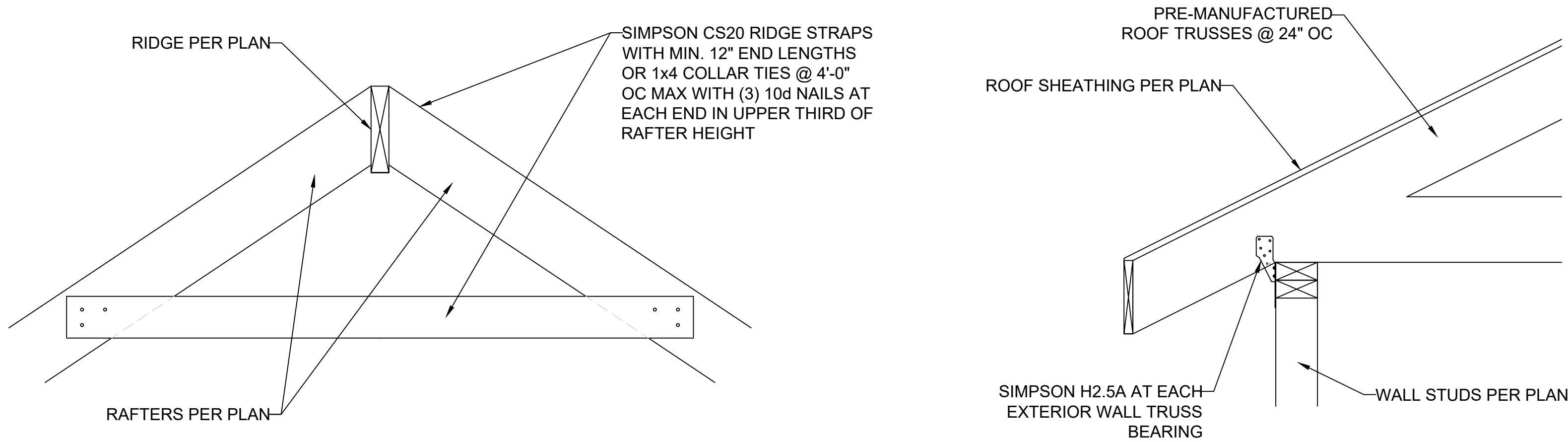
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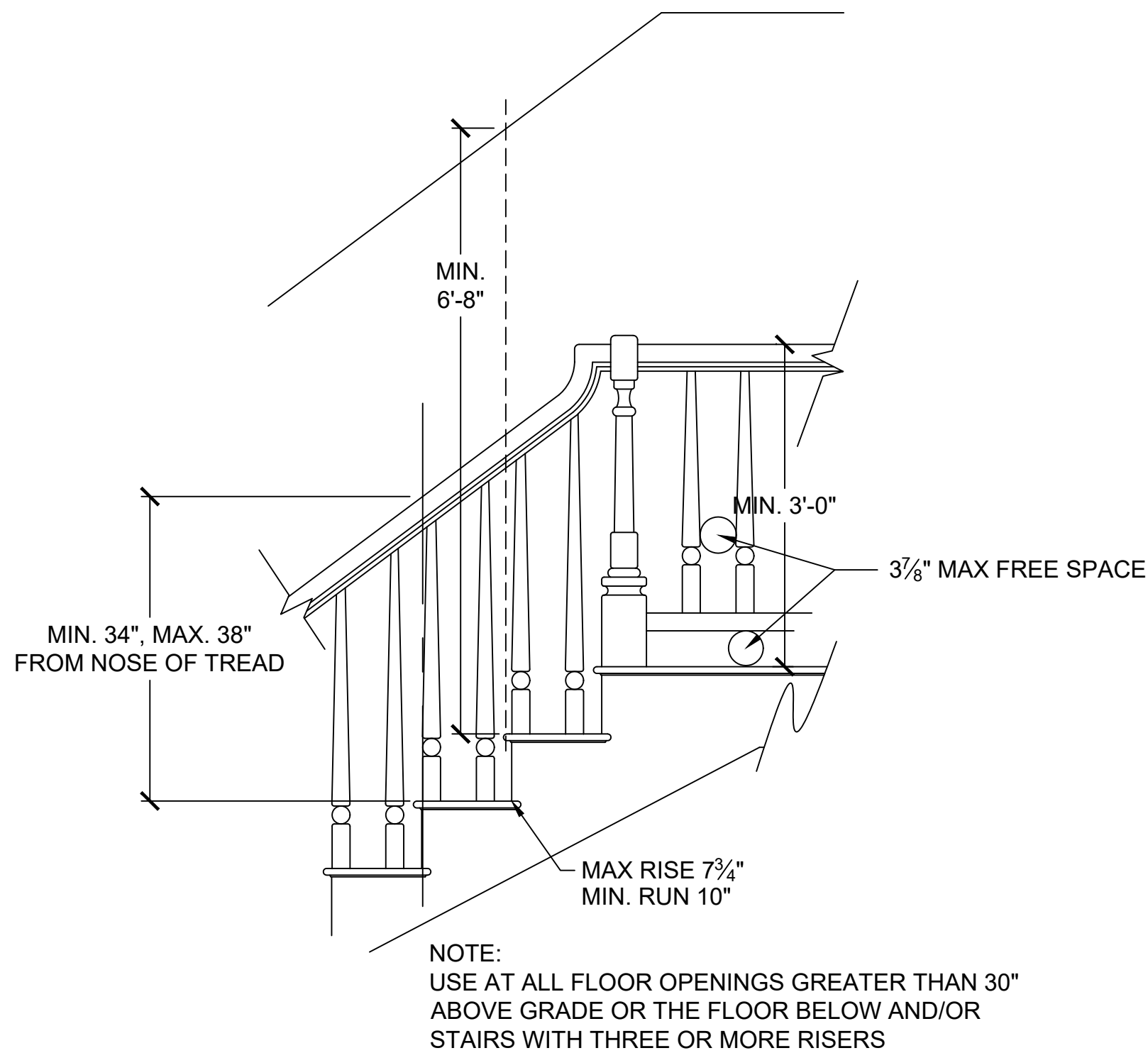
# S3.1



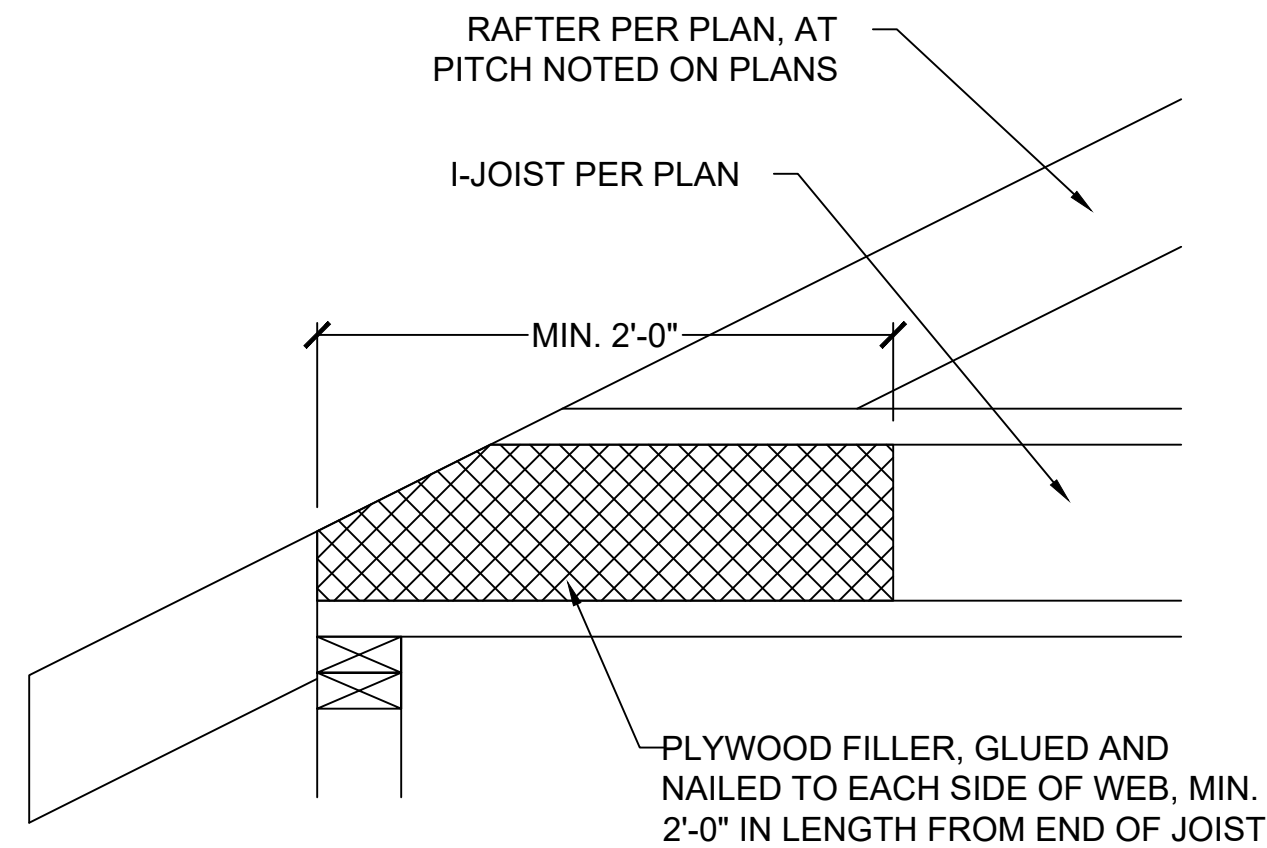


1 RIDGE FRAMING DETAIL  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)

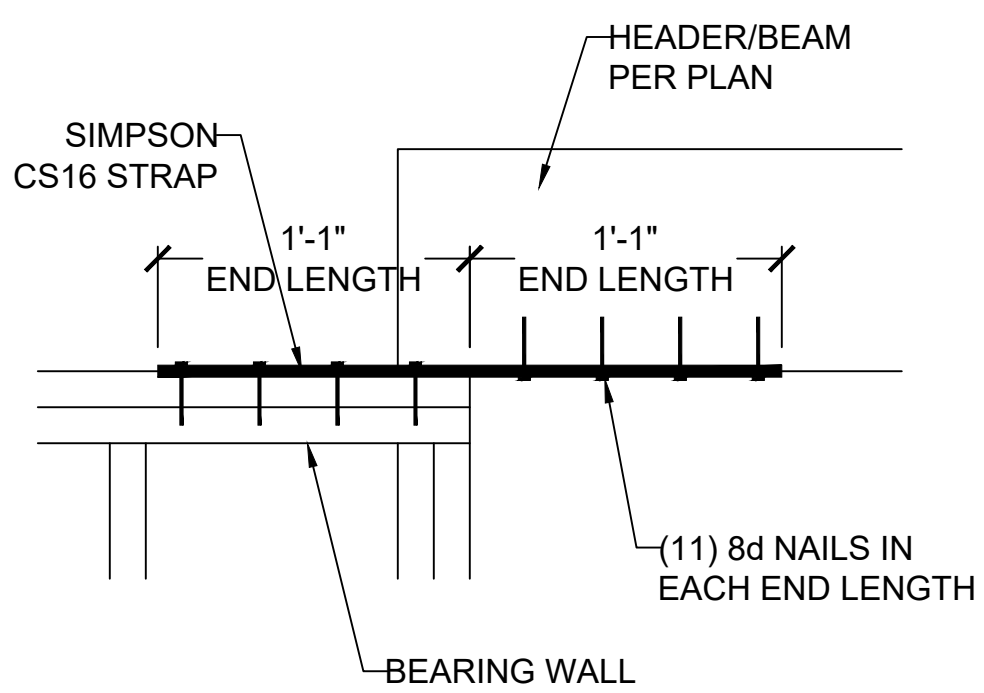
2 TRUSS CONNECTION TO EXT. WALL BEARING  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)



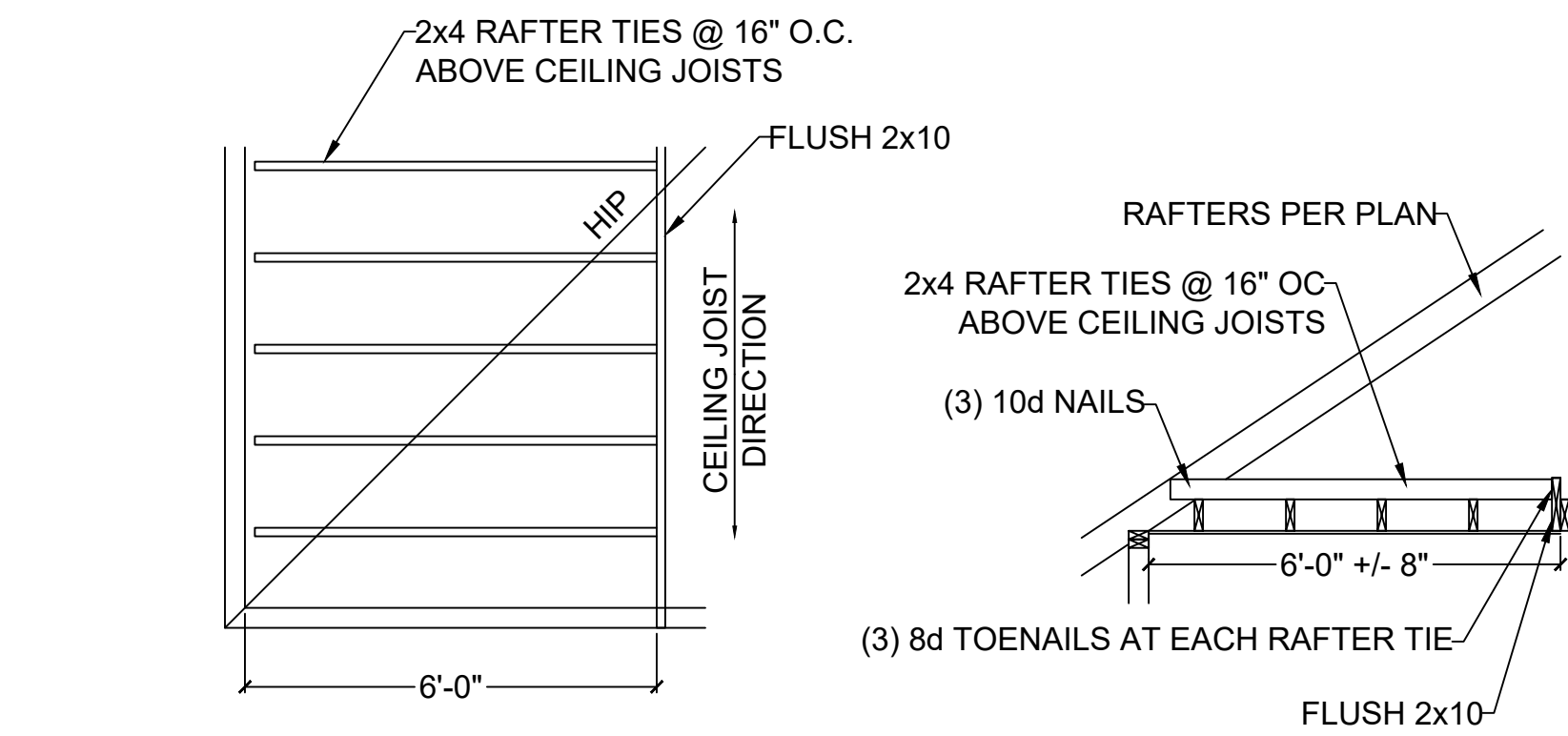
4 STAIR AND HANDRAIL/GUARDRAIL DETAIL  
S3.2 SCALE: 1/2" = 1'-0" (18x24) OR 3/4" = 1'-0" (24x36)



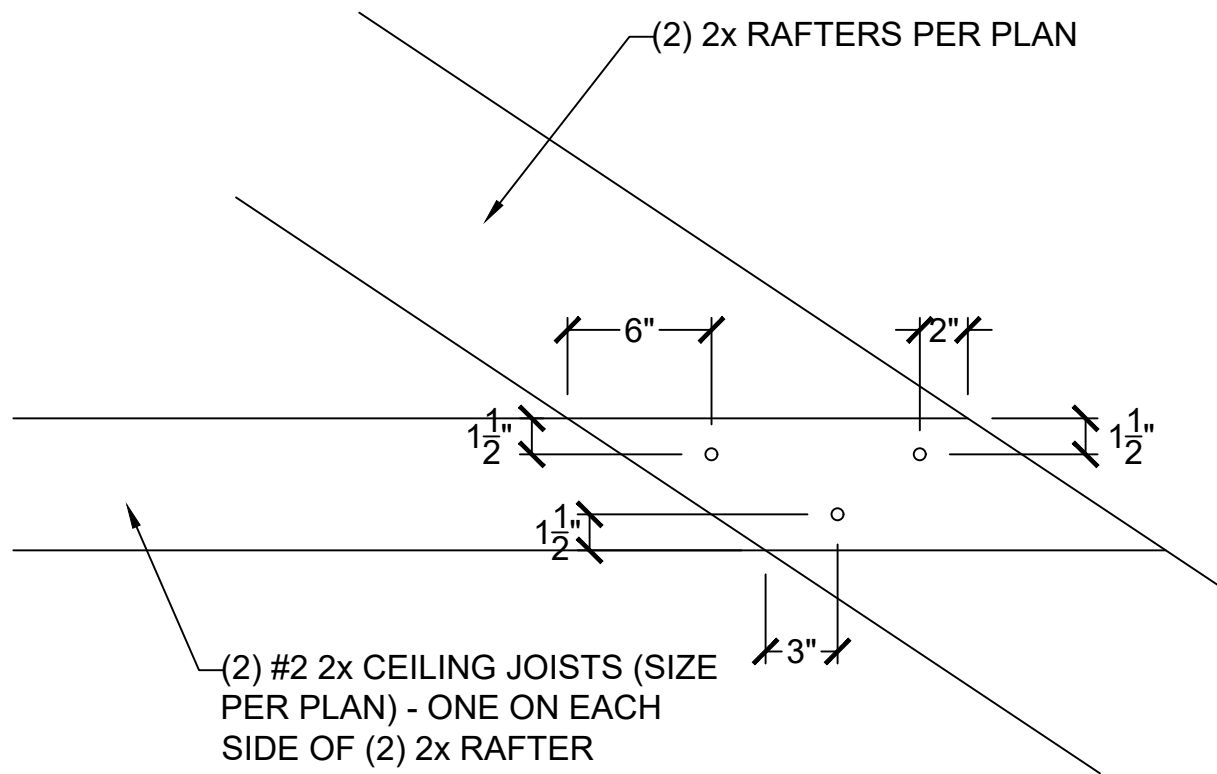
9 COPED I-JOIST REINFORCEMENT  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)



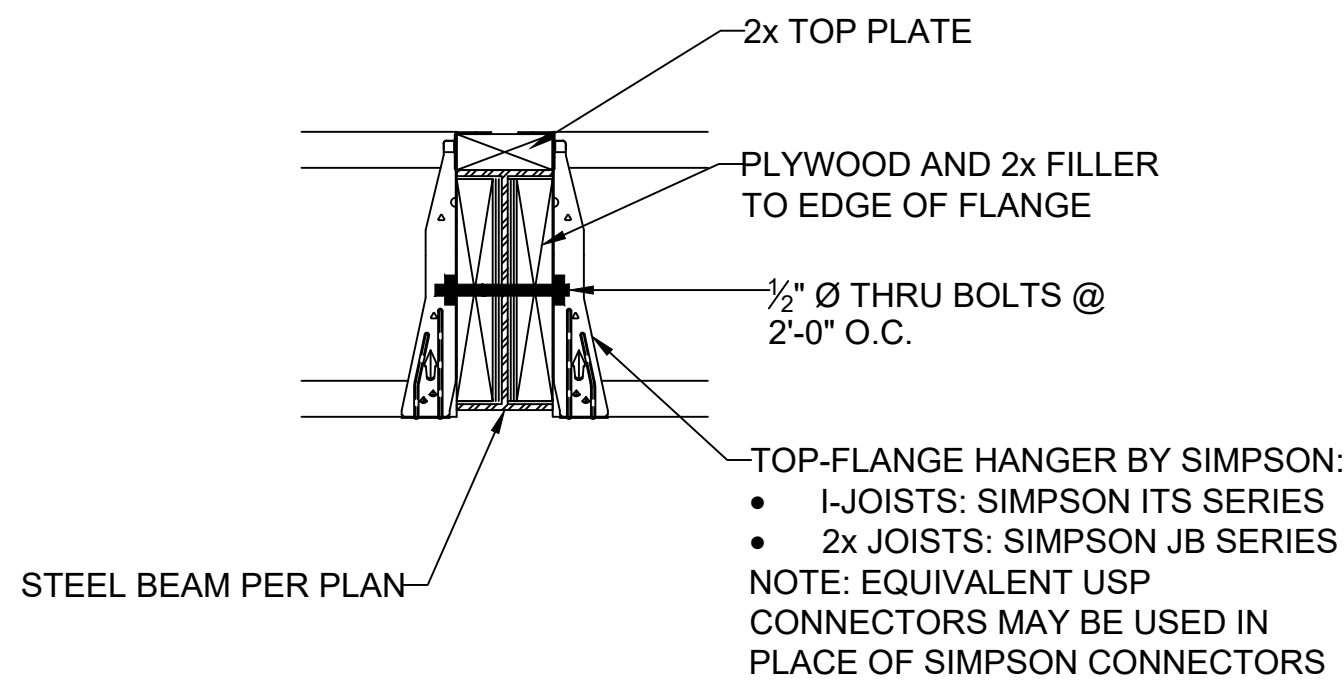
10 HEADER/BEAM CONNECTION OPTIONS AT OUTDOOR/OPEN SPACE  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)



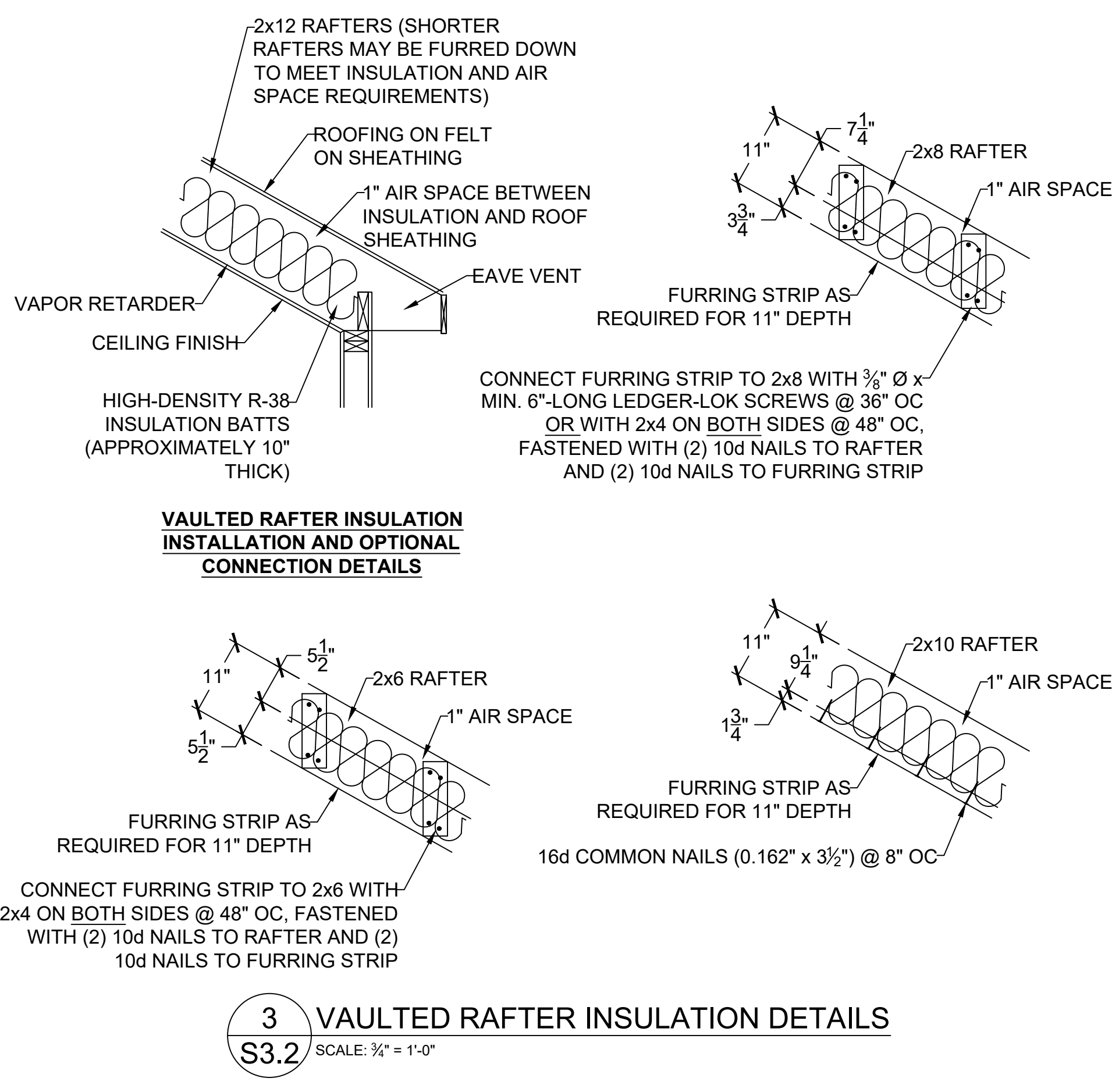
5 RAFTER TIES AT CEILING JOISTS PERP. TO RAFTERS  
S3.2 SCALE: 3/4" = 1'-0" (18x24) OR 5/8" = 1'-0" (24x36)



6 FIELD-CONSTRUCTED A-FRAME DETAIL  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)



7 FLOOR JOIST TO FLUSH STEEL BEAM DETAIL  
S3.2 SCALE: 1" = 1'-0" (18x24) OR 1/2" = 1'-0" (24x36)



3 VAULTED RAFTER INSULATION DETAILS  
S3.2 SCALE: 3/4" = 1'-0"

HEIGHT (FT.)	SPACING (INCHES O.C.)			
	24	16	12	8
SUPPORTING A ROOF ONLY				
10 OR LESS	2x4	2x4	2x4	2x4
12	2x6	2x4	2x4	2x4
14	2x6	2x6	2x6	2x4
16	2x6	2x6	2x6	2x4
18	DR	2x6	2x6	2x6
20	DR	DR	2x6	2x6
SUPPORTING ONE FLOOR AND A ROOF				
10 OR LESS	2x6	2x4	2x4	2x4
12	2x6	2x6	2x6	2x4
14	2x6	2x6	2x6	2x6
16	DR	2x6	2x6	2x6
18	DR	2x6	2x6	2x6
20	DR	DR	2x6	2x6
SUPPORTING TWO FLOORS AND A ROOF				
10 OR LESS	2x6	2x6	2x4	2x4
12	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6
16	DR	2x6	2x6	2x6
18	DR	DR	2x6	2x6
20	DR	DR	DR	2x6

NOTES:  
1) DR = DESIGN REQUIRED  
2) UTILITY, STANDARD, STUD AND #3 GRADE LUMBER OF ANY SPECIES ARE NOT PERMITTED  
3) THIS TABLE DOES NOT APPLY FOR STUDS SUPPORTING MEMBERS WITH A TRIB. LENGTH GREATER THAN 6'-0"

8 MAXIMUM ALLOWABLE LENGTH OF WOOD WALL STUDS (IRC TABLE 602.3.1)  
S3.2

**VISTA**  
STRUCTURAL  
ENGINEERING, LLC

1418 NW DELIA STREET \* PORTLAND, OREGON 97229  
OFFICE: 971.645.0901 \* MOBILE: 971.645.0901 \*  
DENNIS@VISTASTRUCTURAL.COM \* VISTASTRUCTURAL.COM

CLIENT: KEVIN HIGDON CONSTRUCTION  
JOB TITLE: TCR007 TRIPLEX  
509 ASHURST PLACE  
LOCATION: LEE'S SUMMIT, MISSOURI

STATE OF MISSOURI  
DENNIS HEIER  
NUMBER  
FE-2018001772  
PROFESSIONAL ENGINEER  
12-18-2018

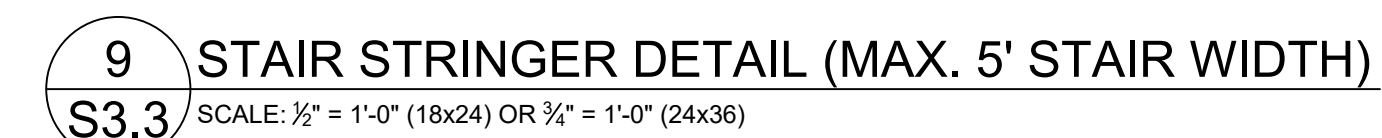
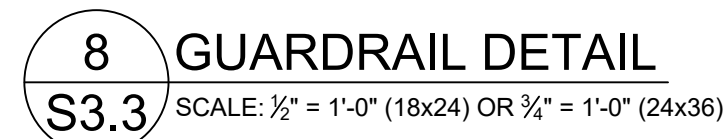
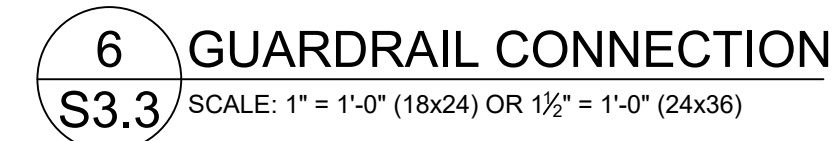
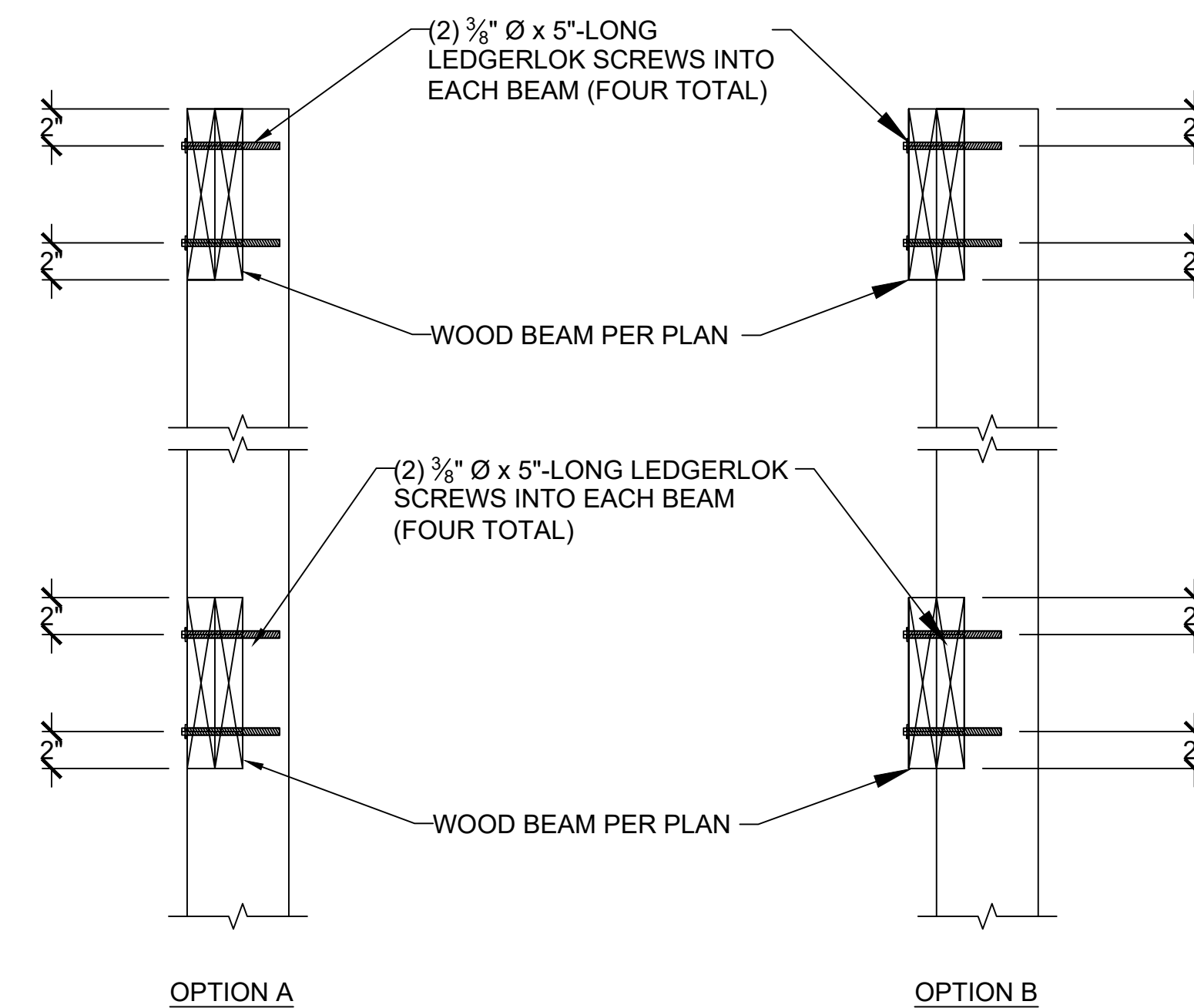
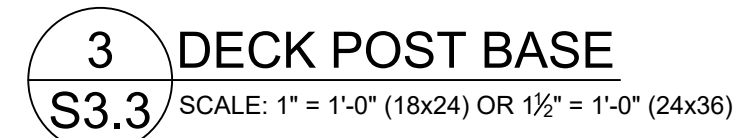
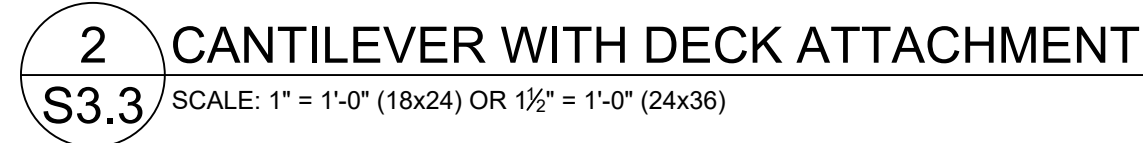
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**FRAMING DETAILS**

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**S3.2**





DECK JOIST SPAN	½" Ø GALV. LAG OR ¾" Ø LEDGER-LOK SPACING
10'-0" OR LESS	16" OC
10'-0" - 13'-11"	12" OC OR @ 16" OC DOUBLED EVERY OTHER
14'-0" - 18'-0"	8" OC OR @ 16" OC DOUBLED



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## S3.3



## NON-BEARING WALL RATING - 2HR

### FINISH RATING - 120 MIN

NTS



CONFIGURATION B  
EXPOSED TO FIRE FROM EITHER SIDE  
NTS

#	COMPONENT
1	2" WIDE CHANNEL AT FLOOR, INTERMEDIATE OR OF TOP WALL
2	2" DEEP x 1 $\frac{3}{8}$ " H-SHAPED STEEL STUDS @ 24" OC
3	(2) LAYERS OF 1" THICK GYPSUM BOARD LINER PANELS IN 24" WIDTHS
4	2x4 WOOD STUDS @24" OC MAX, MIN 3" SEPARATION BETWEEN WOOD FRAMING & AREA SEPARATION WALL
5	MIN 1 $\frac{1}{2}$ " THICK x 4' WIDE GYPSUM BOARD APPLIED HORIZONTAL OR VERTICAL
6	ALUMINUM ANGLE ATTACHMENT CLIPS- MIN 2" WIDE WITH MIN 2" AND 2 $\frac{1}{2}$ " LEGS

1. FLOOR, INTERMEDIATE OR TOP OF WALL - 2 IN. WIDE CHANNEL SHAPED WITH 1-1N LONG LEGS FORMED FROM NO. 25 MSG GALV STEEL, SECURED WITH SUITABLE FASTENERS SPACED @ 24 IN OC
2. STEEL STUDS - STEEL MEMBERS FORMED FROM NO. 25 MSG GALV STEEL HAVING "H" SHAPED FLANGE SPACED @ 24 IN OC; OVERALL DEPTH 2 IN AND FLANGE WIDTH 1-3/8 IN.
3. GYPSUM BOARD - 2 LAYERS OF 1 IN THICK GYPSUM WALLBOARD LINER PANELS, SUPPLIED IN NOM 24 IN WIDTHS. VERTICAL EDGES OF PANELS FRICTION FITTED INTO "H" SHAPED STUDS.

(JAMES HARDIE GYPSUM INC-TYPE HARDILINER)

4. WOOD STUDS - NOM 2 BY 4 IN. MAX SPACING @ 24 IN. OC. STUDS CROSS-BRACED AT MIDHEIGHT WHERE NECESSARY FOR CLIP ATTACHMENT. MIN.  $\frac{3}{4}$ " SEPARATION BETWEEN WOOD FRAMING AND AREA SEPARATION WALL.
5. GYPSUM BOARD - CLASSIFIED OR UNCLASSIFIED - MIN.  $\frac{1}{2}$ " IN. THICK, 4FT WIDE, APPLIED EITHER HORIZONTALLY OR VERTICALLY. WALLBOARD ATTACHED TO STUDS WITH  $1\frac{1}{2}$ " IN. LONG STEEL DRYWALL NAILS SPACED @ 8 IN. OC. VERTICAL JOINTS LOCATED OVER STUDS. (OPTIONAL) JOINTS COVERED WITH PAPER TAPE AND JOINT COMPOUND. NAIL HEADS COVERED WITH JOINT COMPOUND.
6. ATTACHMENT CLIPS - ALUMINUM ANGLE, 0.063 IN. THICK, MIN 2 IN. WIDE WITH MIN 2 IN. AND  $2\frac{1}{2}$ " IN. LEGS. CLIPS SECURED WITH TYPE S SCREWS  $\frac{3}{8}$ " IN. LONG TO "H" STUDS AND WITH TYPE W SCREWS  $1\frac{1}{2}$ " IN. LONG TO WOOD FRAMING THROUGH HOLES PROVIDED IN CLIP. CLIPS SPACED A MAX OF 10 FT OC VERTICALLY BETWEEN WOOD FRAMING AND "H" STUDS FOR SEPARATION WALLS UP TO 23 FT HIGH. FOR SEPARATION WALLS UP TO 44FT HIGH, CLIPS SPACED AS DESCRIBED ABOVE FOR THE UPPER 24 FT AND THE REMAINING WALL AREA BELOW REQUIRES CLIPS A MAX 5 FT OC VERTICALLY BETWEEN WOOD FRAMING AND "H" STUDS.

\*BEARING THE UL CLASSIFICATION MARK

- A. TWO HOUR FIRE WALL PER UL DESIGN # U366 SHOWN IN THE UL FIRE RESISTANCE DIRECTORY.
- B. INSULATE STUD CAVITIES WITH 3½" BATT INSULATION
- C. PLUMBING OR ELECTRICAL ALLOWED IN ADJOINING WALLS
- D. A SEPARATE FIRE SEPARATION WALL INSPECTION WILL BE REQUIRED
- E. ANY SHAFT WALL PENETRATIONS IN EXCESS OF 1½" BUT LESS THAN 2½" TO BE FILLED WITH APPROVED FIRE CAULK OR FIRE FOAM. PENETRATIONS IN EXCESS OF 2½" TO BE FIRE PROOFED WITH OVERLAPPING LAYER OF ½" TYPE X SHEET ROCK, PROPERLY NAILED AND GLUED. SEAL ADDITIONAL DRYWALL PATCH COMPLETELY WITH FIRE CAULK
- F. ATTIC FIRE SEPARATION WALL: (1)-2 HOUR SHAFT WALL FIRE TEST U366



## SECOND FLOOR LEVEL

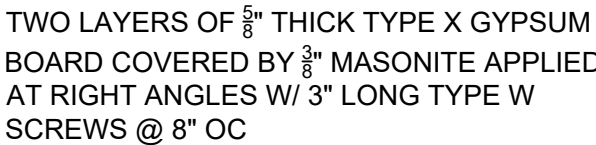
ON ONLY TWO STORY DESIGNS

## FIRST FLOOR LEVEL

## BASEMENT LEVEL

## BASEMENT LEVEL

## FIRE WALL SECTION



## 1 HOUR SOFFIT DETAIL



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## S3.4