

Building Materials List for Behm Design Plan #600-1  
 www.behmdesign.net 1-800-210-6776  
 ~ Local building code approved substitutions may be made to this list ~  
 Variations in construction methods and materials can require modification  
 of this list. Every attempt is made for greatest accuracy, but typographical  
 or human error is possible. Quantities verification by the materials supplier  
 is recommended before materials package is finalized and/or shipped.

**Rough Framing**  
 2 x 4 x 92-1/2" HF/DF exterior "stud" wall framing ----- 93 pcs.  
 2 x 4 HF/DF No. 2 wall top plate material ----- 200 lf  
 2 x 4 HF/DF No. 2 lookouts material ----- 12' lengths 4 pcs.  
 2 x 4 HF/DF No. 2 pressure-treated bottom plate ----- 100 lf  
 3-1/2 x 11-1/4 LVL Header 2950Fb 2.OE ----- 19'-9" length --- 1 pc.  
 2 x 6 DF No. 1 Header ----- 8' length --- 1 pc.  
 2 x 6 DF No. 1 Header ----- 10' length--- 2 pcs.  
 2 x 3 HF/DF No. 2 Soffit Framing Material ----- 120 lf  
 Trusses : 6 in 12 slope, 20' span (incl. 2 end trusses)----- 16 trusses

**Sheathing Materials**  
 7/16" o.s.b. wall sheathing -----4 x 8 sheet----31 sheets  
 1/2" Roof C-D APA Plywood, ext. glue P.I. 24/0 --4 x 8 sheet---30 sheets

**Vapor Barrier**  
 Roof 15# bituminous felt paper in 36" wide roll----- 338 lf  
 Wall 7# bituminous felt paper in 40" wide roll ----- 350 lf  
 Floor .006" black polyethylene membrane----- 600 sf

**Siding Materials**  
 8" textured o.s.b.siding boards with 1" lap ----- 770 sf siding area  
 Trim: 5/4 x 3 ----- 8' length--- 4 pcs.  
 Trim: 5/4 x 4 ----- 8' length --- 13 pcs.  
 Trim: 5/4 x 4 ----- 17' length --- 1 pc.  
 Fascia: 1 x 6 ----- 64 lf  
 3/8" thk. soffit material -----4 x 8 sheet---6 sheets  
 Rakeboard: 2 x 6 ----- 14' length --- 4 pcs.

**Roofing Materials**  
 Composition Roofing Shingles----- 846 sf roof area  
 Ridgevent material----- 30 lf

**Window and Door Assemblies**  
 3030 sliding window(s)----- 2 ea.  
 16'-0" x 7'-0" sectional garage door----- 1 ea.  
 3068 exterior door----- 1 ea.

**Metal Parts & Misc.**  
 Anchor bolts: 1/2" dia. x 10" ASTM A-307 w/ hex nuts--- 16 pcs.  
 Flat washer for 1/2" dia: 2" square x 3/16" thick stl. pl.----- 16 pcs.  
 Anchor bolts: 5/8" dia. x 14" ASTM A-307 w/ hex nuts--- 2 pcs.  
 Flat washer for 5/8" dia: 2" square x 3/16" thick stl. pl.----- 2 pcs.  
 Simpson H10 connectors ----- 28 pcs.  
 Simpson STHD14 hold-down straps ----- 4 pcs.  
 Simpson MST24 nailing strap ----- 2 pcs.  
 16d sinker nails ----- 50 lbs.  
 8d common nails @ 145 nails / lb. ----- 25 lbs.  
 Drip flashing for window/door heads----- 25 lf  
 2" Vent screen strip ----- 64 lf

~ To advise corrections, call 1-800-210-6776 Thank you.~  
 (note: electrical components and finishing materials not included in this list)



## GARAGE PLAN #600-1

20' x 30'

### Building Code Compliance

This planset was prepared to comply  
 with the prescriptive requirements  
 of the 2015  
 International Residential Code (IRC)

### Parameters For Design

Wind Speed: 120 mph ultimate

Wind Exposure: C

Seismic Category:  
 A, B and C

Snow Load: 30# / sq.ft.

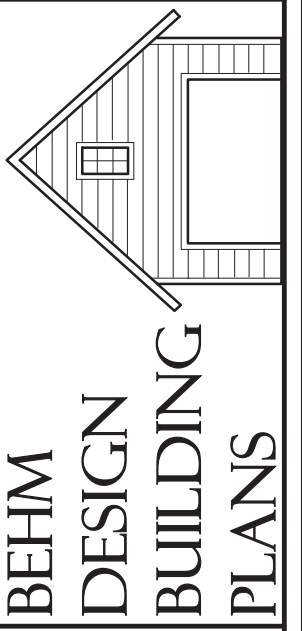
### Building Categories and Data

Occupancy Classification: "U"

Construction Type: "V"

Grade-To-Ridge Height: 14'-2"

Gross Building Area: 600 sf



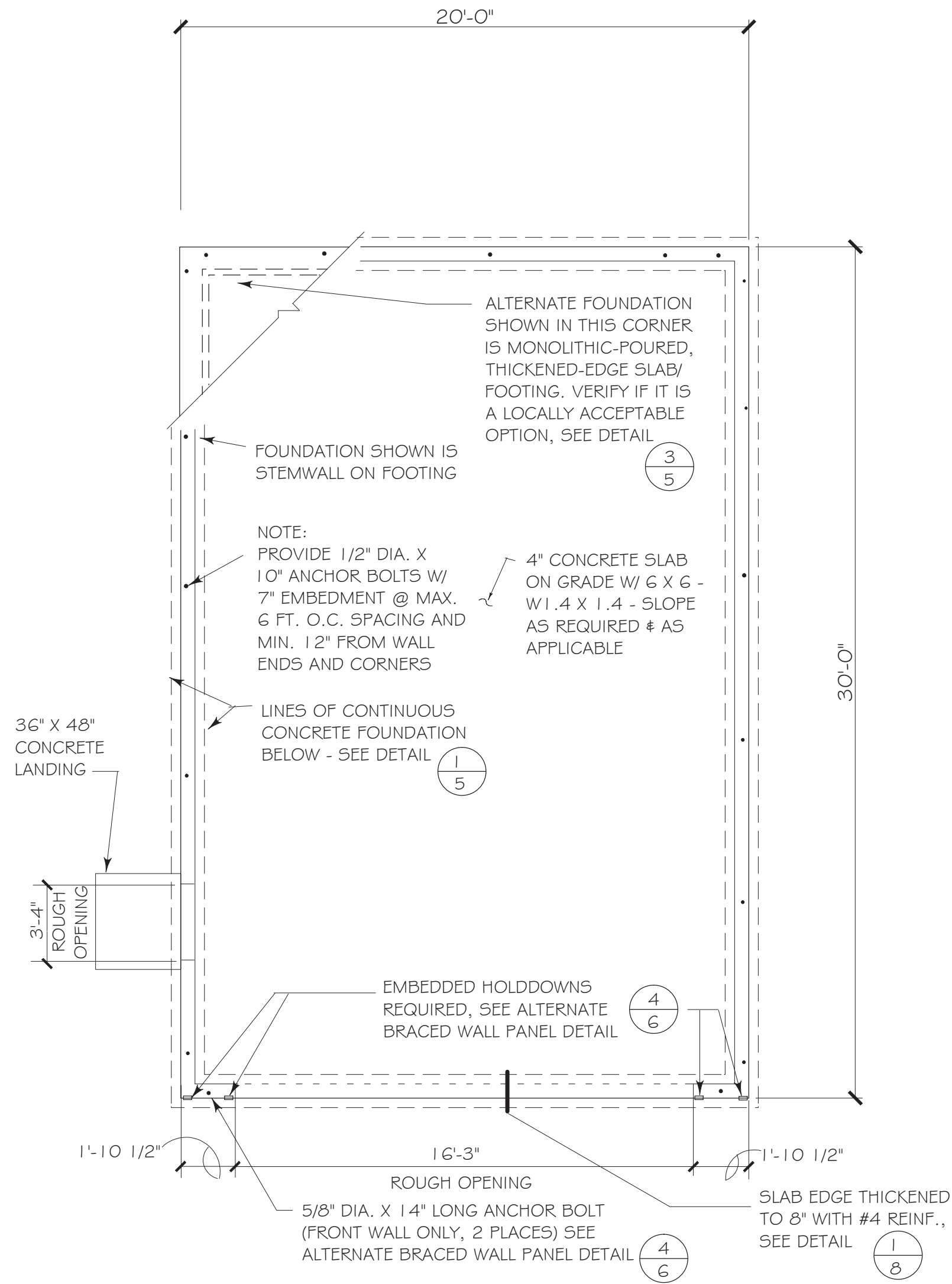
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PLAN NO.  
**600-1**

DESIGN BY:  
 JJB  
 DATE: Revised  
 01/19

SHEET CONTENTS:  
 Pictorial View Of Design  
 Project Data  
 Building Materials List

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

BRACED WALLS AS PER IRC R602.10, AS APPLICABLE FOR LOCAL CODES  
( SHOWN: - - - - - )  
**METHOD: CS-WSP**  
EXTERIOR BRACED WALLS (MIN. 48") NAIL SIDING PANELS OR SHEATHING W/ 8d @ 6" o.c., EDGES AND @ 12" O.C., FIELD AND BLOCK AT HORIZ. PANEL JOINTS. PROVIDE ALTERNATE BRACED WALL PANELS AS INDICATED.

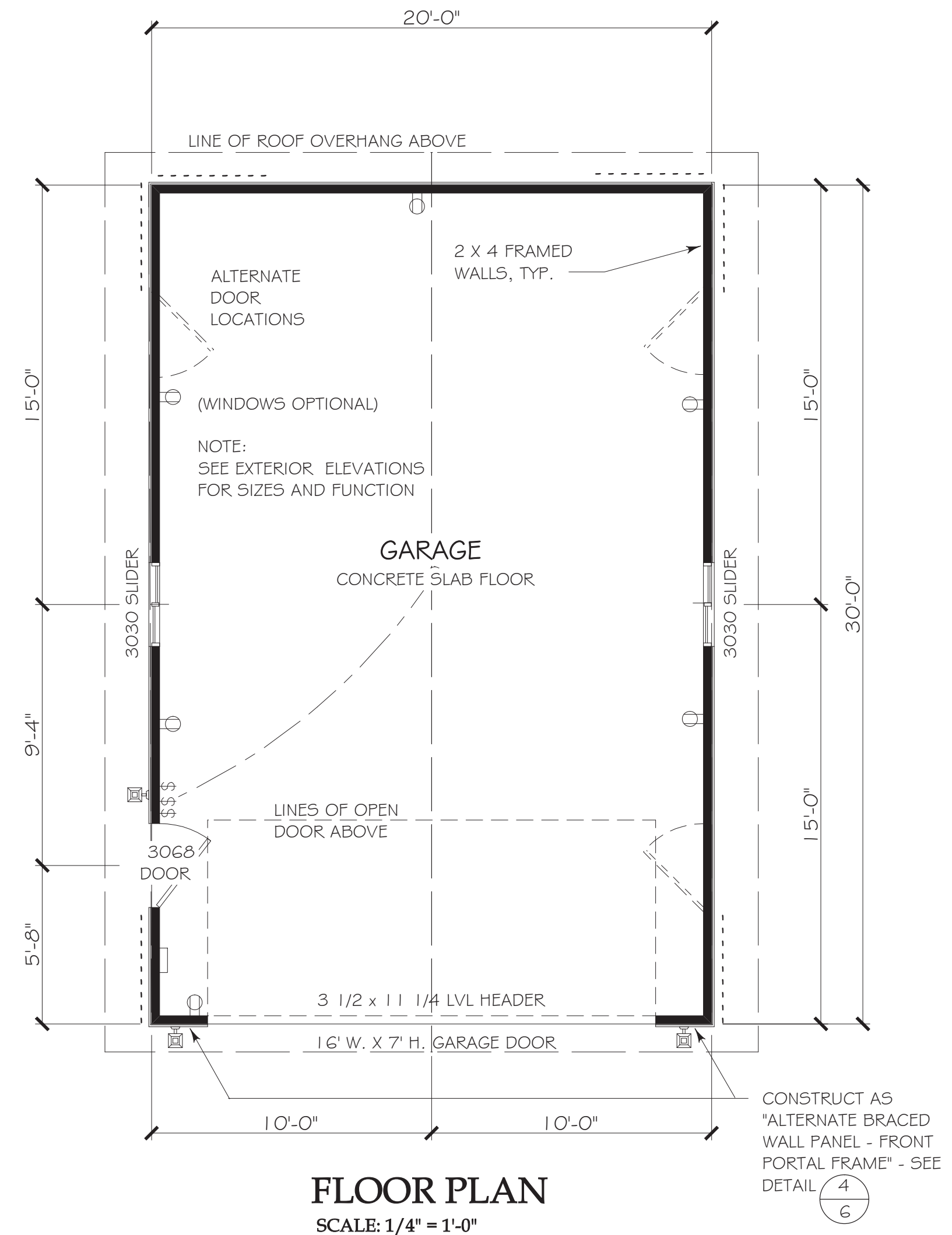
NOTE: FLOOR PLAN DIMENSIONS ARE TO FACE OF FRAMING OR CENTERLINE OF BEARING, TYP. AS SHOWN

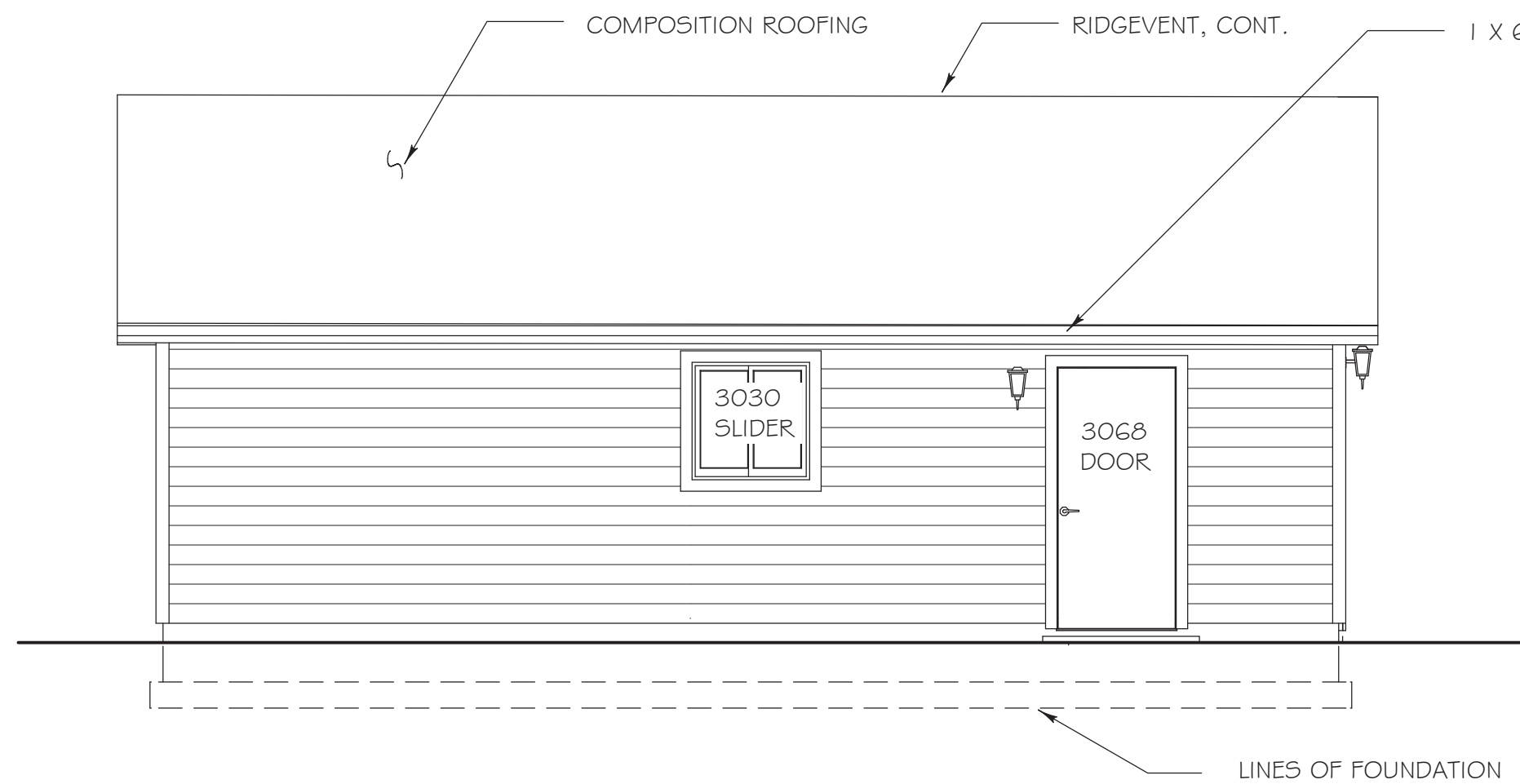
NOTE: DOOR AND WINDOW HEADERS SHALL BE 2- 2 X 6 UNLESS OTHERWISE NOTED

NOTE: FOUNDATION PLAN DIMENSIONS ARE TO FACE OF CONCRETE OR CENTERLINE OF BEARING, AS SHOWN

**LEGEND**

- Ⓢ SWITCH LOCATION
- ⊙ CEILING MOUNTED LIGHT FIXTURE
- ⊕ 110 VOLT DUPLEX OUTLET
- ⊗ EXTERIOR WALL-MTD. LIGHT FIXTURE
- ELECTRIC PANEL OR SUB-PANEL LOCATION, INSTALL PER LOCAL CODES





**LEFT SIDE WALL ELEVATION**

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

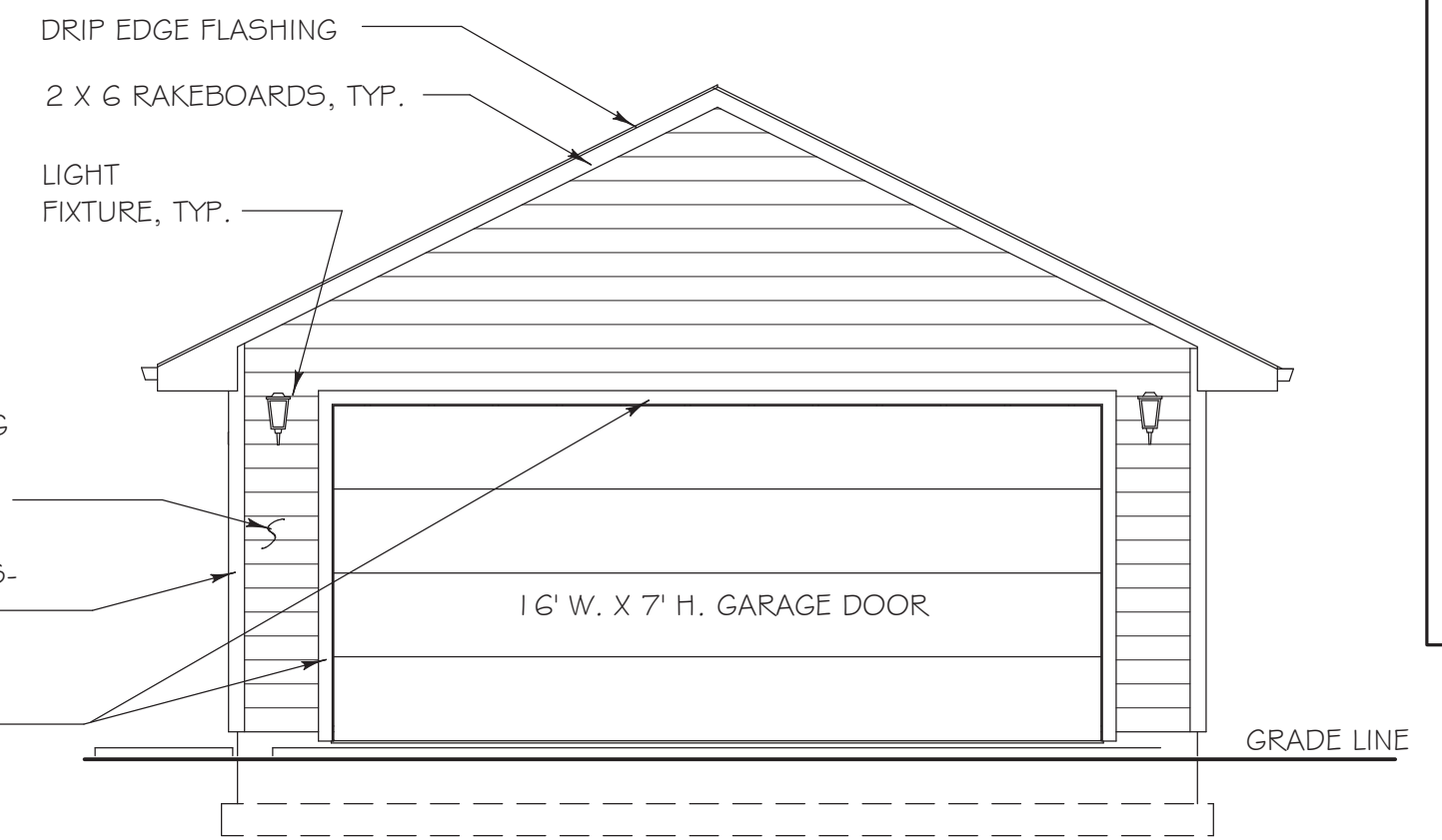
ALTERNATE SIDING:  
7/16" TEXTURED O.S.B SIDING  
(OR 1/2" PLYWOOD) PANELS  
OVER 7# FELT VAPOR BARRIER

SIDING:  
8" X 7/16" TEXTURED O.S.B.  
SIDING BOARDS, OVER 7# FELT  
VAPOR BARRIER, OVER SHEATHING  
(APPROVED ALTERNATE SIDING  
MATERIALS MAY BE SUBSTITUTED)

5/4 X 4 / 5/4 X 3 CORNER BOARDS-  
BUTT SIDING

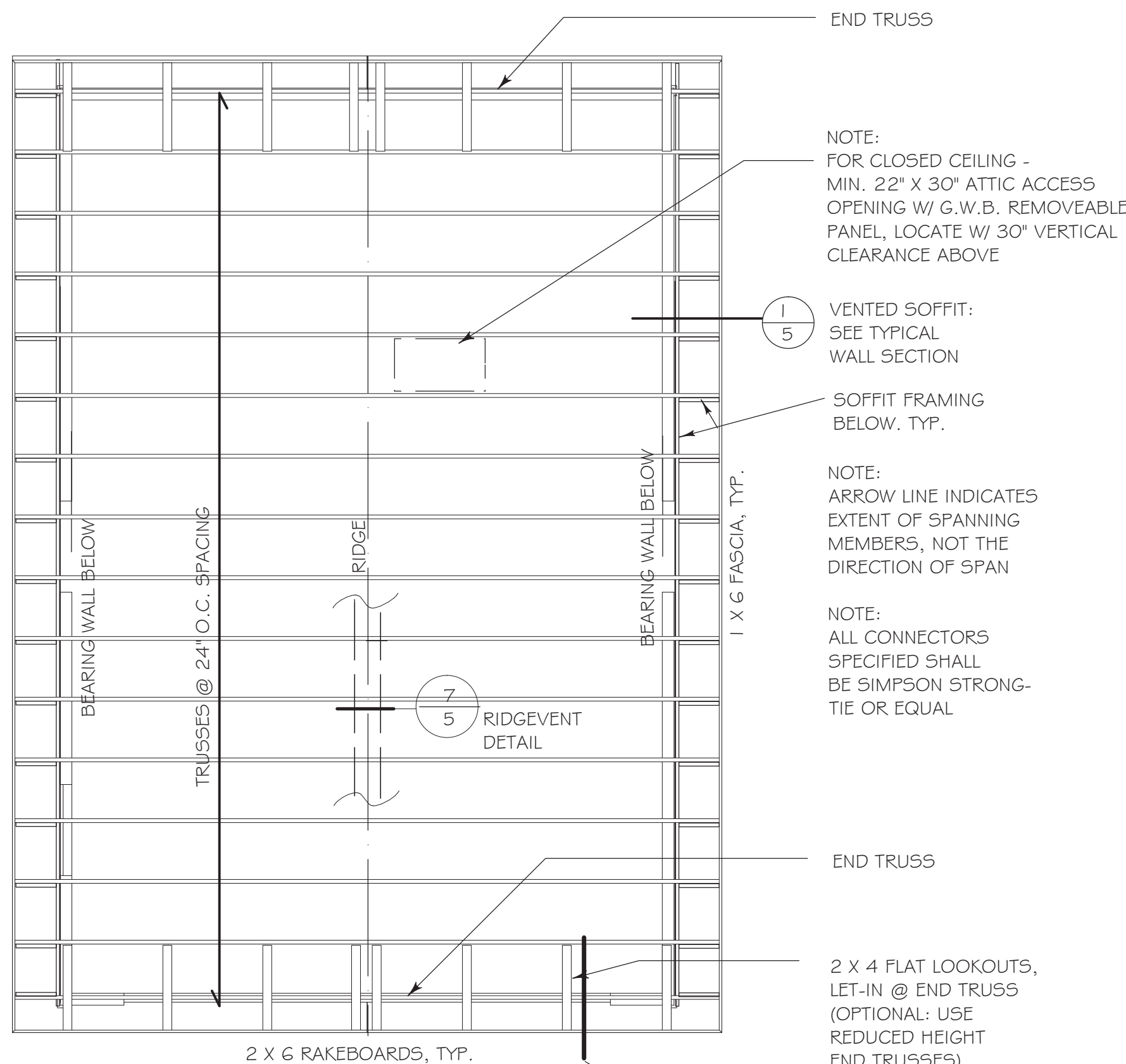
5/4 X 4 WRAP TRIM - BUTT SIDE  
MEMBERS TO TOP AND BOTTOM

NOTE:  
FOR ALTERNATIVE SIDING BOARDS  
USE 1X TRIM BOARDS AND NAIL OVER  
SIDING PANELS



**FRONT ELEVATION**

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



**ROOF FRAMING PLAN**

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

NOTE:  
FOR CLOSED CEILING -  
MIN. 22" X 30" ATTIC ACCESS  
OPENING W/ G.W.B. REMOVEABLE  
PANEL, LOCATE W/ 30" VERTICAL  
CLEARANCE ABOVE

1  
5 VENTED SOFFIT:  
SEE TYPICAL  
WALL SECTION

SOFFIT FRAMING  
BELOW. TYP.

NOTE:  
ARROW LINE INDICATES  
EXTENT OF SPANNING  
MEMBERS, NOT THE  
DIRECTION OF SPAN

NOTE:  
ALL CONNECTORS  
SPECIFIED SHALL  
BE SIMPSON STRONG-  
TIE OR EQUAL

END TRUSS

2 X 4 FLAT LOOKOUTS,  
LET-IN @ END TRUSS  
(OPTIONAL: USE  
REDUCED HEIGHT  
END TRUSSES)

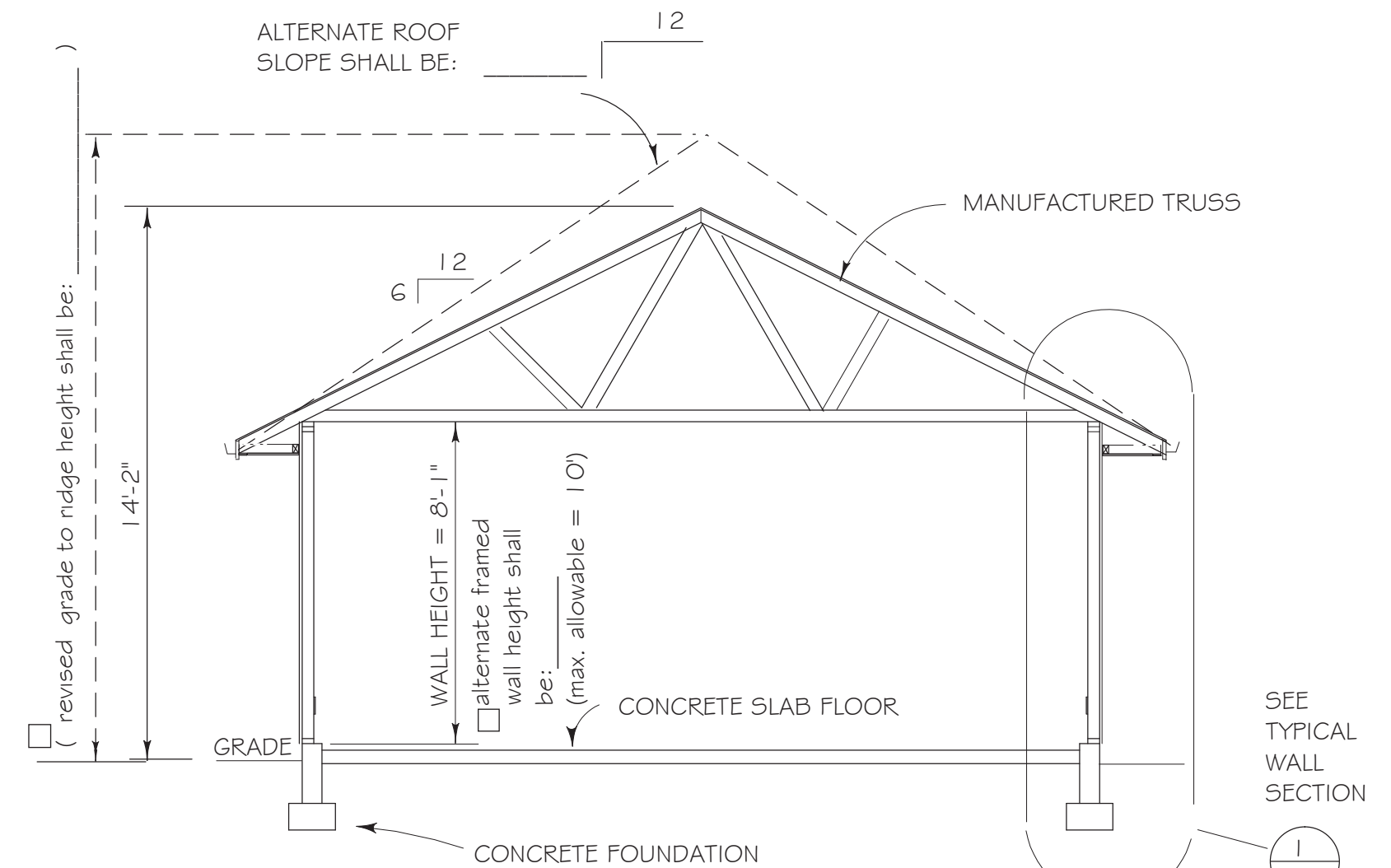
**TRUSS NOTES:**

1. ALL TRUSSES SHALL CARRY MANUFACTURERS STAMP.
2. ALL TRUSSES SHALL BE INSTALLED & BRACED TO MANUFACTURERS SPECIFICATIONS.
3. ALL TRUSSES WILL NOT BE FIELD ALTERED WITHOUT PRIOR BUILDING DEPT. APPROVAL OF ENGINEERING CALCULATIONS.
4. ALL TRUSSES SHALL HAVE DESIGN DETAILS & DRAWINGS ON SITE FOR FRAMING INSPECTION.
5. NON BEARING WALLS SHOULD BE HELD DOWN FROM THE TRUSS BOTTOM CHORD W/ SIMPSON STC TO INSURE THAT THE TRUSS BOTTOM CHORD WILL NOT BEAR ON THE WALL.
6. ALL CONNECTIONS OF RAFTERS, JACK OR HIP TRUSSES TO MAIN GIRDER TO BE PROVIDED BY TRUSS MANUFACTURE.

NOTE:  
NOMINAL WINDOW SIZES ARE  
SHOWN: FEET/INCHES WIDE  
X FEET/INCHES HIGH, TYP. -  
VERIFY FRAMED OPENING  
REQUIRED BY PRODUCT MFR.

NOTE:  
FLASH OPENINGS AND PROVIDE  
WEATHERSTRIPPING AS REQUIRED  
BY LOCAL CODES

NOTE:  
NOTES AND MATERIALS INDICATED  
IN THIS ELEVATION ARE TYPICAL  
FOR ENTIRE BUILDING AS APPLIC.

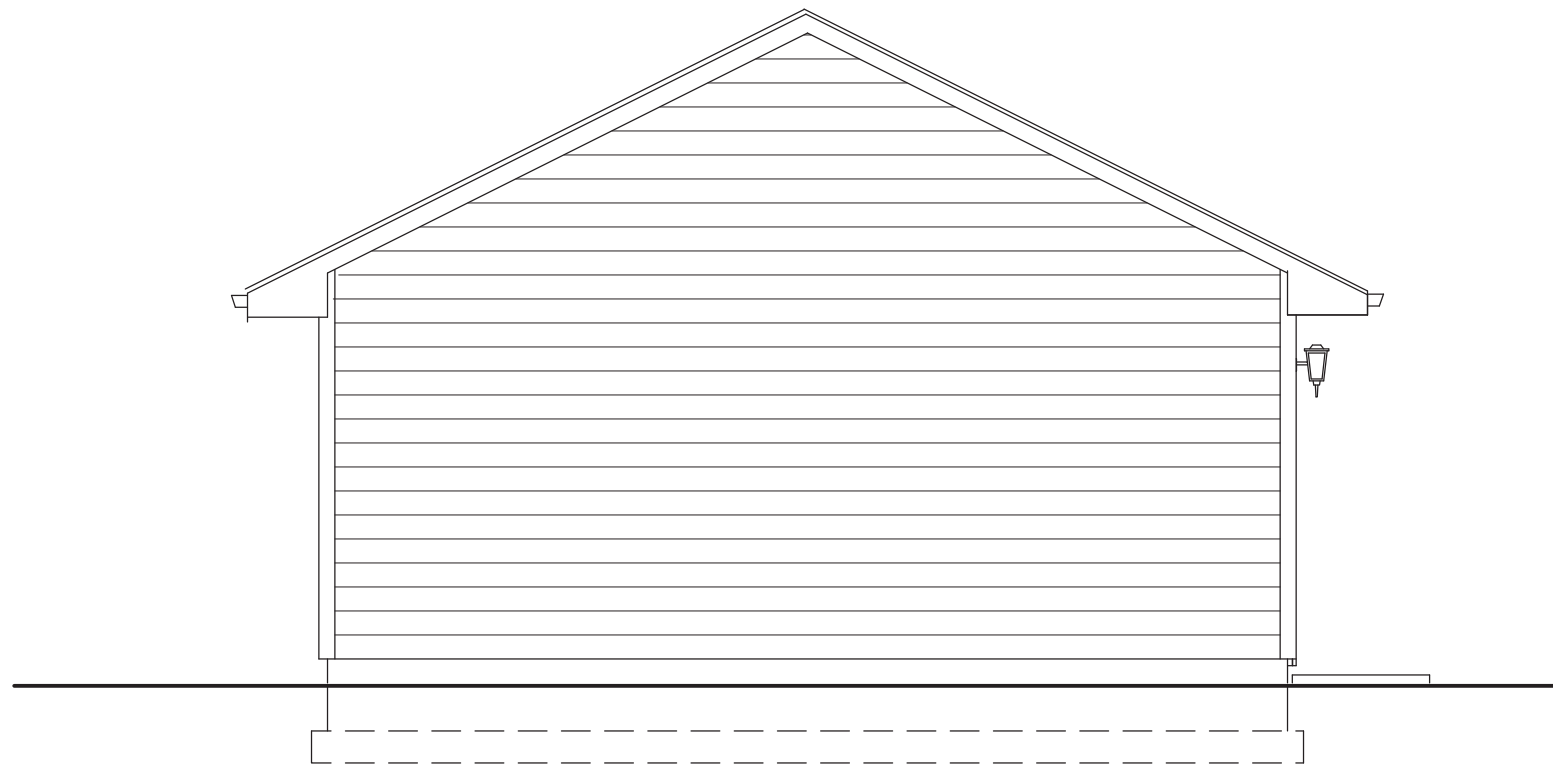


**CROSS-SECTION**

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

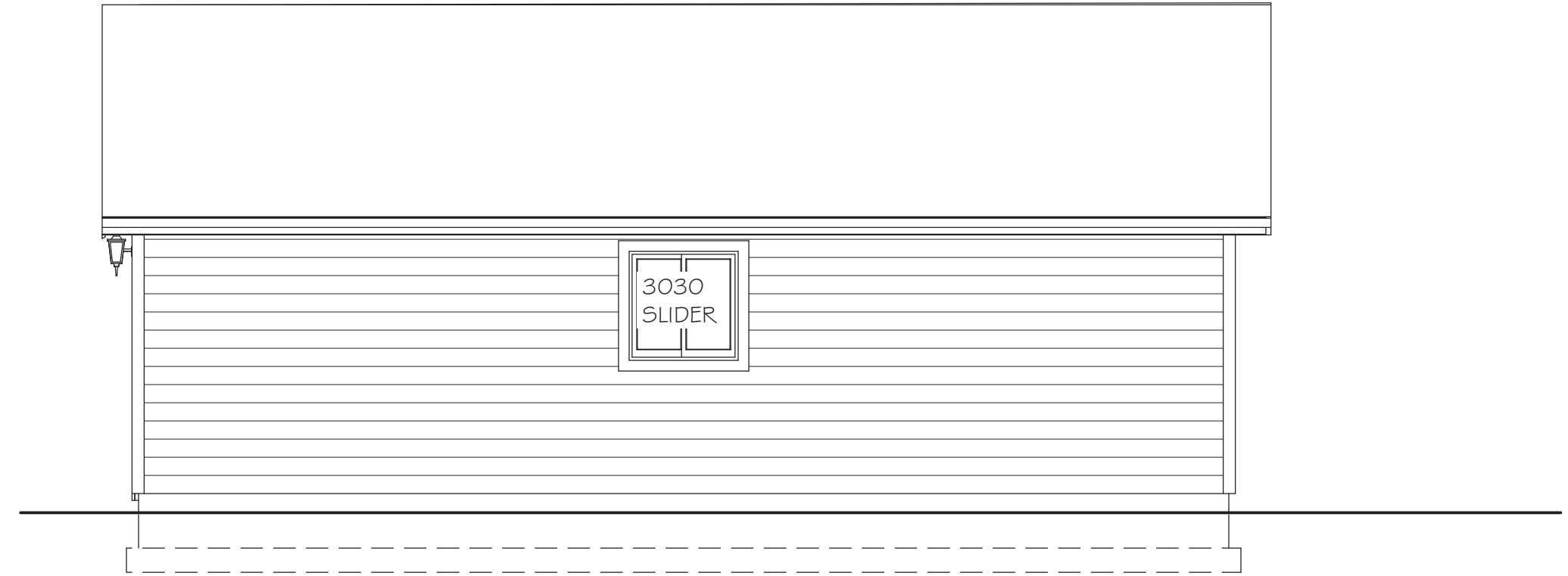
NOTE:  
FOOTING/STEMWALL FOUNDATION  
SHOWN. FOR ALTERNATIVE  
THICKENED-EDGE FOUNDATION  
SEE DETAIL

3  
5



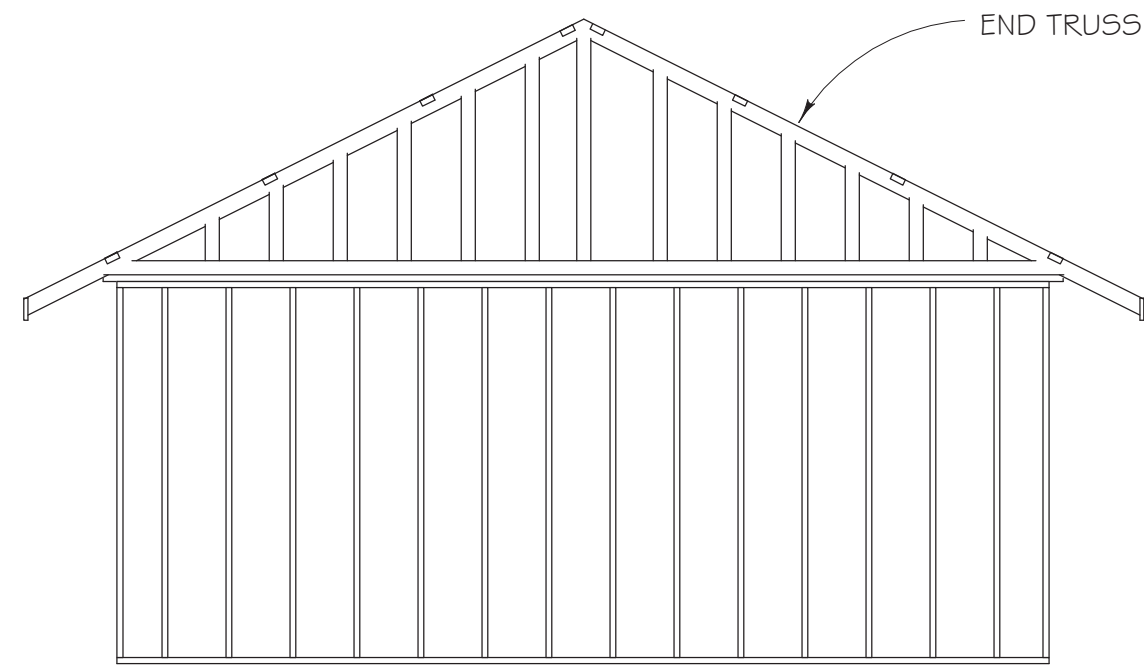
**REAR ELEVATION**

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



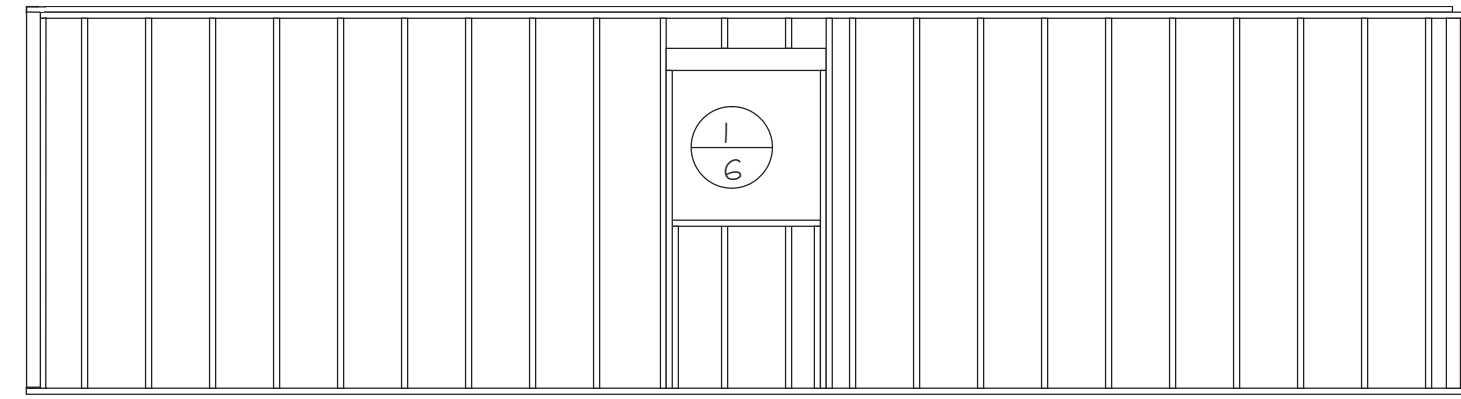
**RIGHT SIDE ELEVATION**

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



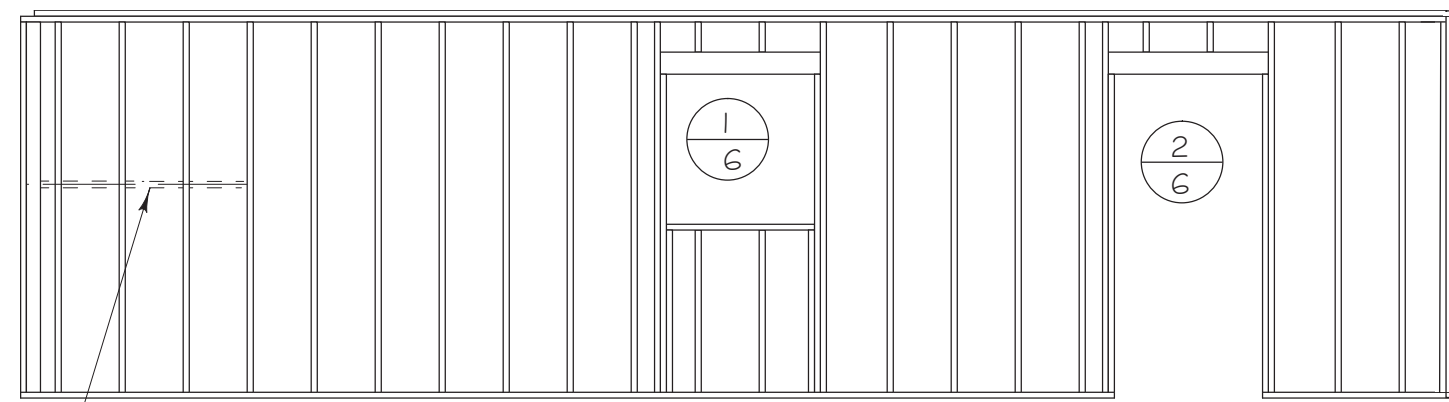
**REAR WALL FRAMING ELEVATION**

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



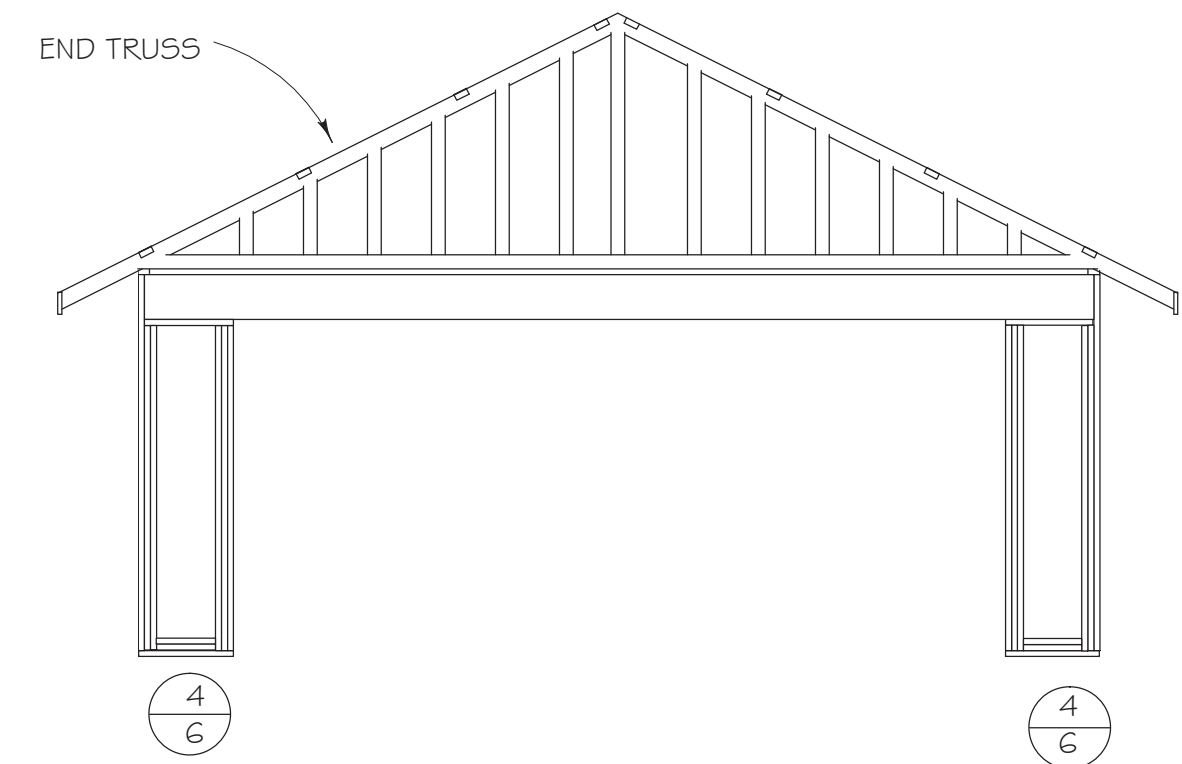
**RIGHT SIDE WALL FRAMING ELEVATION**

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



**LEFT SIDE WALL FRAMING ELEVATION**

NOTE:  
FOR HORIZONTALLY APPLIED WALL SHEATHING PROVIDE 2 X 4 HORIZONTAL BLOCKING BETWEEN STUDS FOR PANEL EDGE NAILING AT BRACED WALLS



**FRONT WALL FRAMING ELEVATION**



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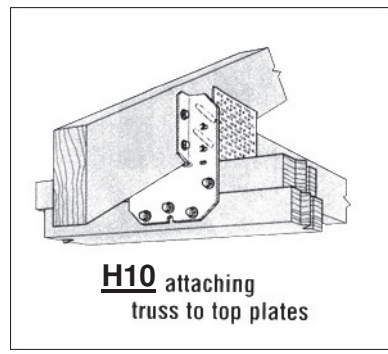
PLAN NO.  
**600-1**

DESIGN BY: JJB  
DATE: Revised 6/8/15

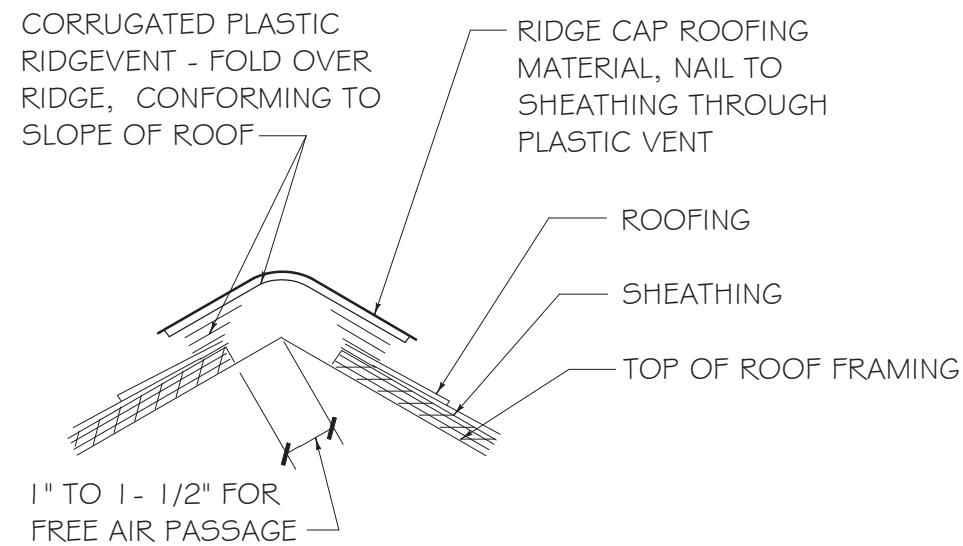
SHEET CONTENTS:  
RIGHT SIDE ELEVATION  
LEFT SIDE ELEVATION  
WALL FRAMING ELEVATIONS

SHEET  
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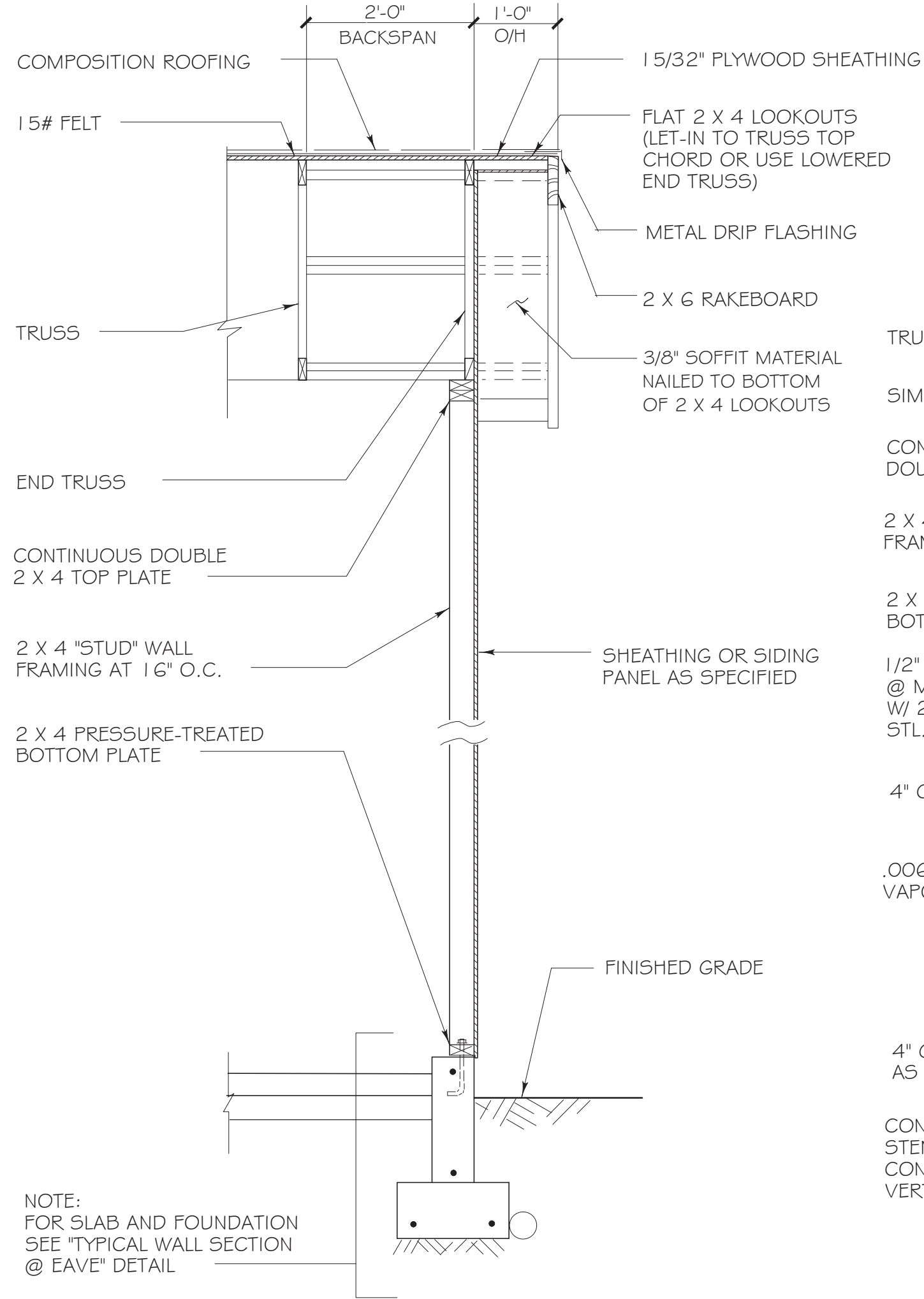
COPYRIGHT BEHM DESIGN



## SIMPSON CONNECTORS

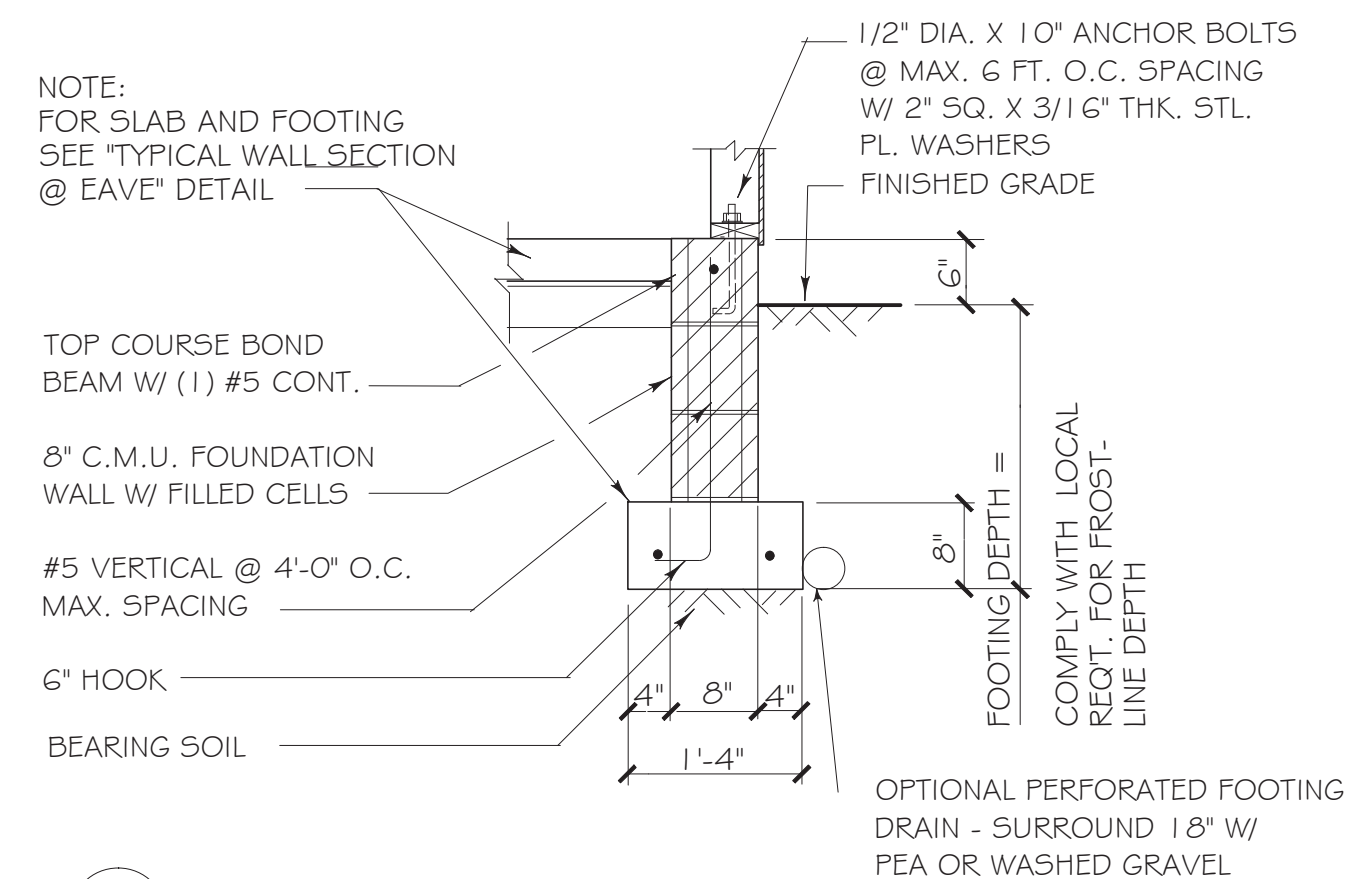


### 7 RIDGEVENT DETAIL



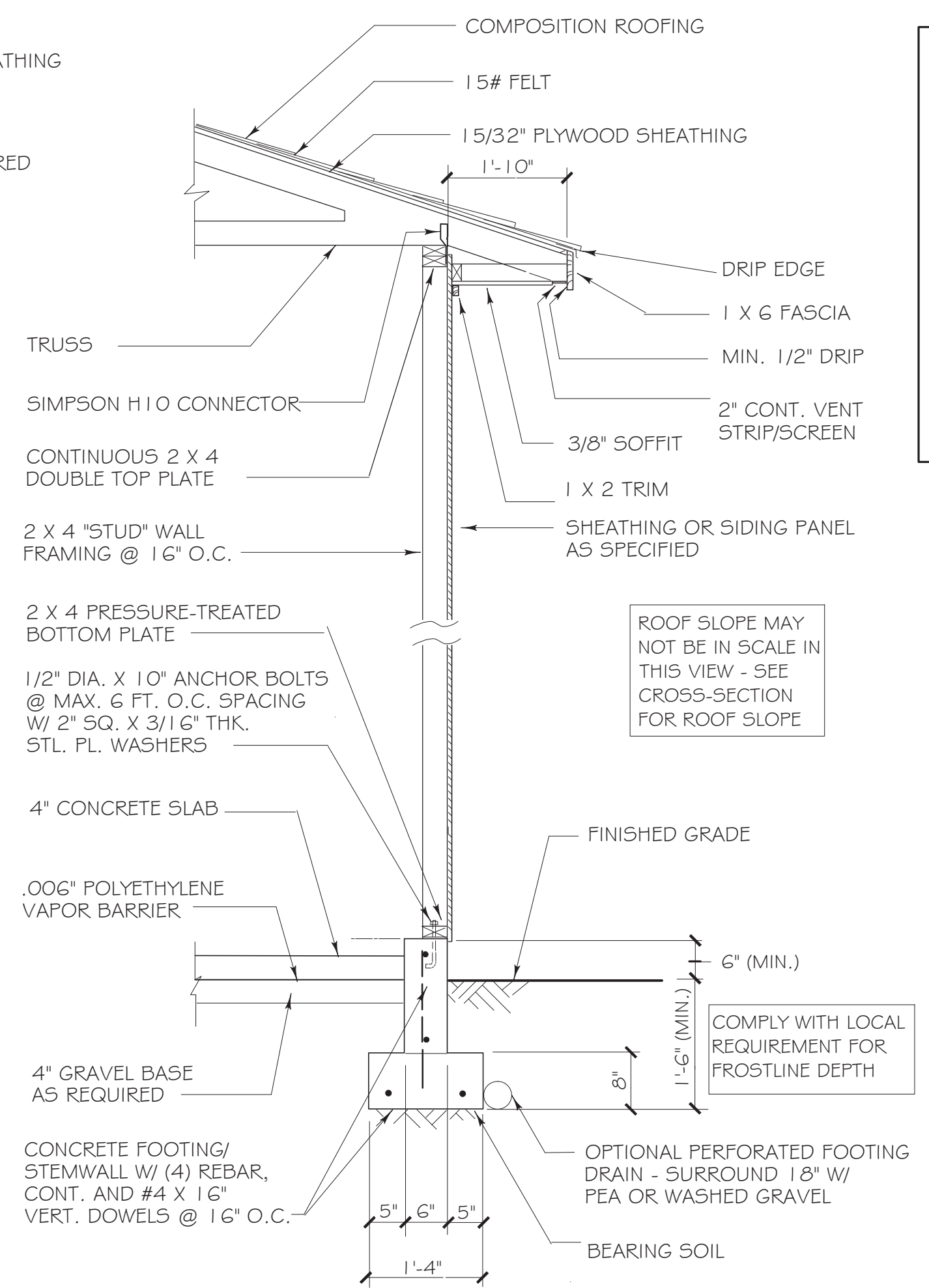
### 2 TYPICAL WALL SECTION @ GABLE

SCALE: 3/4" = 1'-0"



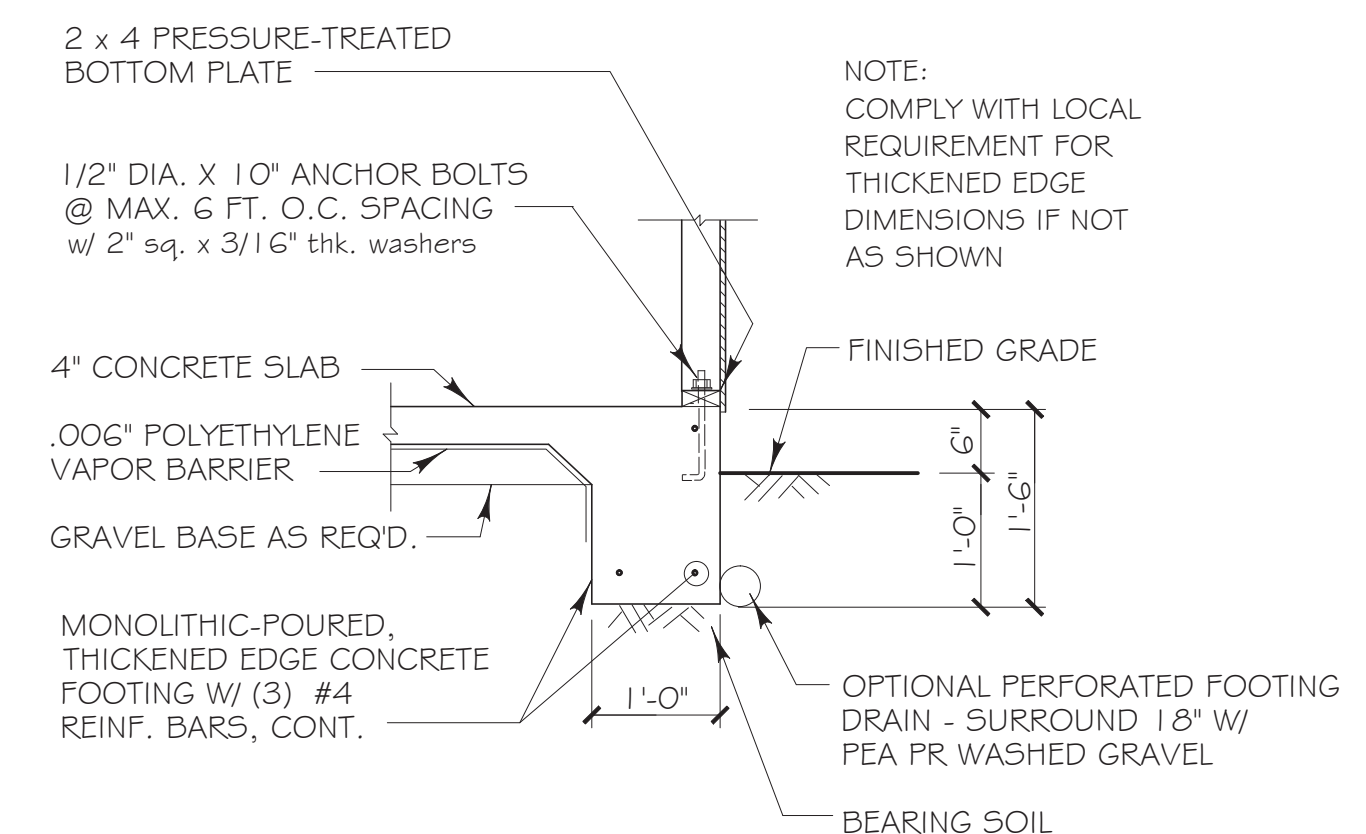
### 4 BLOCK FOUNDATION WALL DETAIL

SCALE: 3/4" = 1'-0"



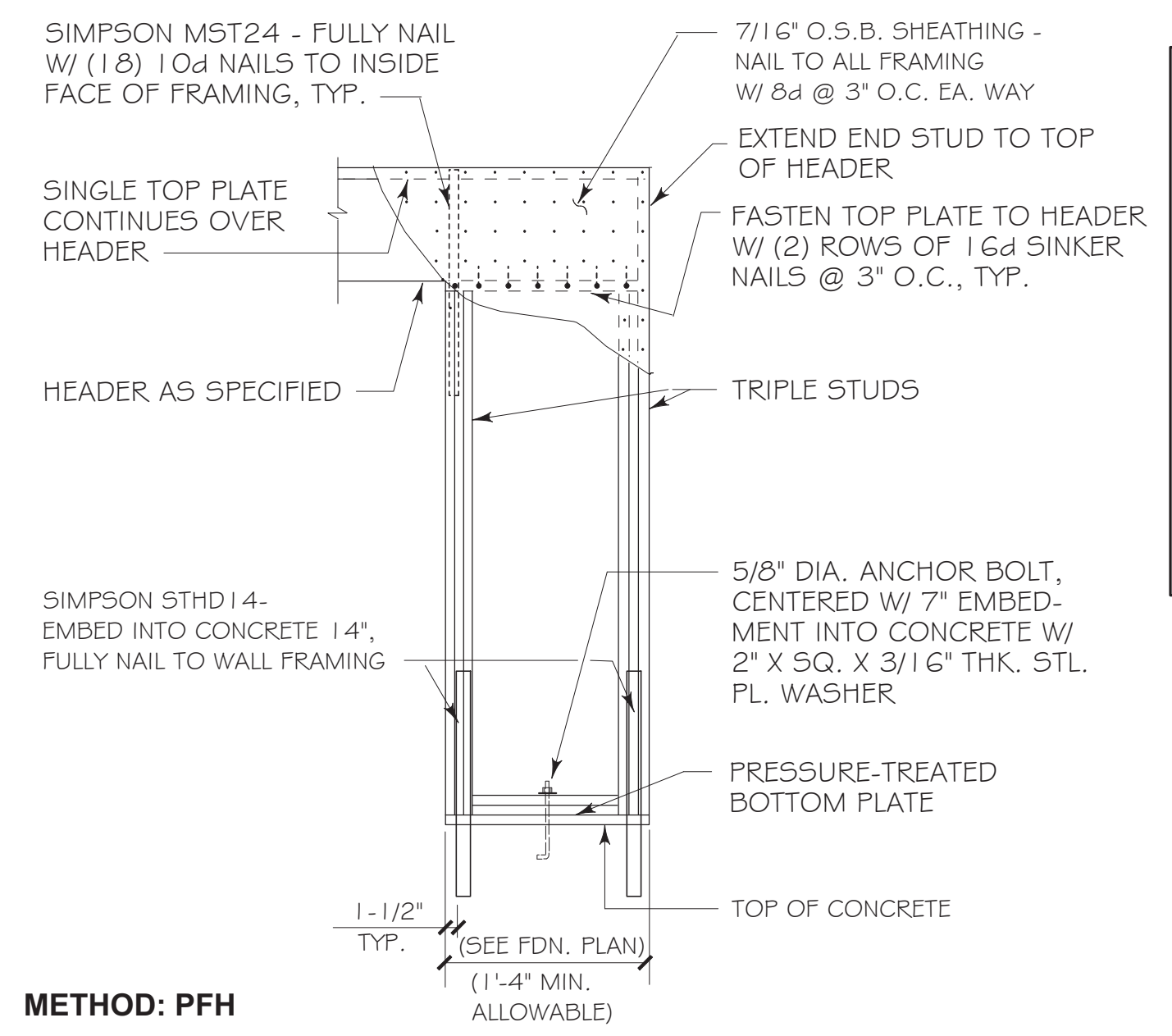
### 1 TYPICAL WALL SECTION @ SOFFIT

SCALE: 3/4" = 1'-0"



### 3 MONOLITHIC FOOTING DETAIL

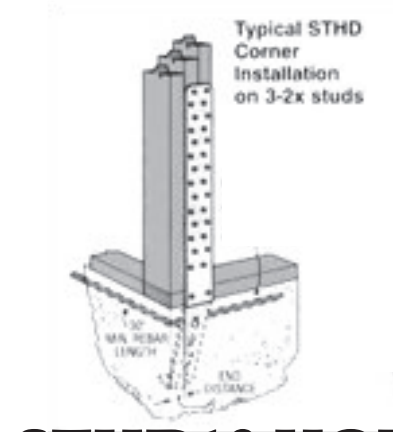
SCALE: 3/4" = 1'-0"



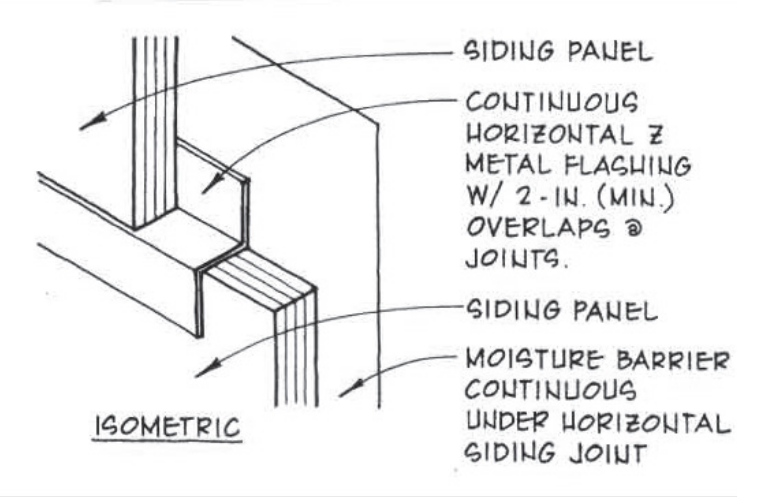
**METHOD: PFH**  
**(DOUBLE PORTAL FRAME)**  
**(mirror detail for other side)**

**4 ALTERNATE BRACED WALL PANEL DETAIL**

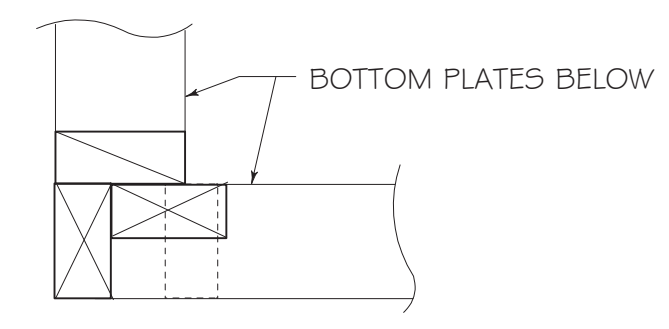
SCALE: 3/4" = 1'-0"



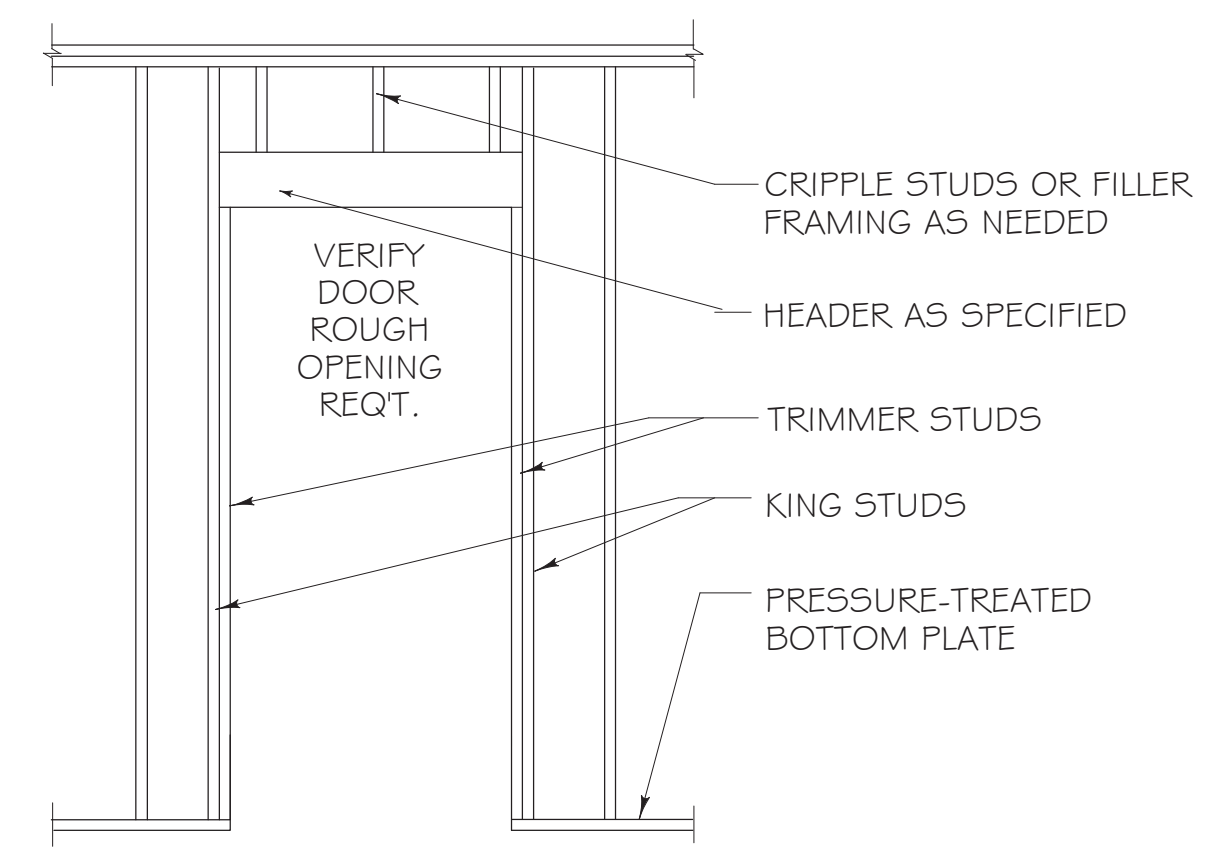
**STHD10 HOLDDOWN**



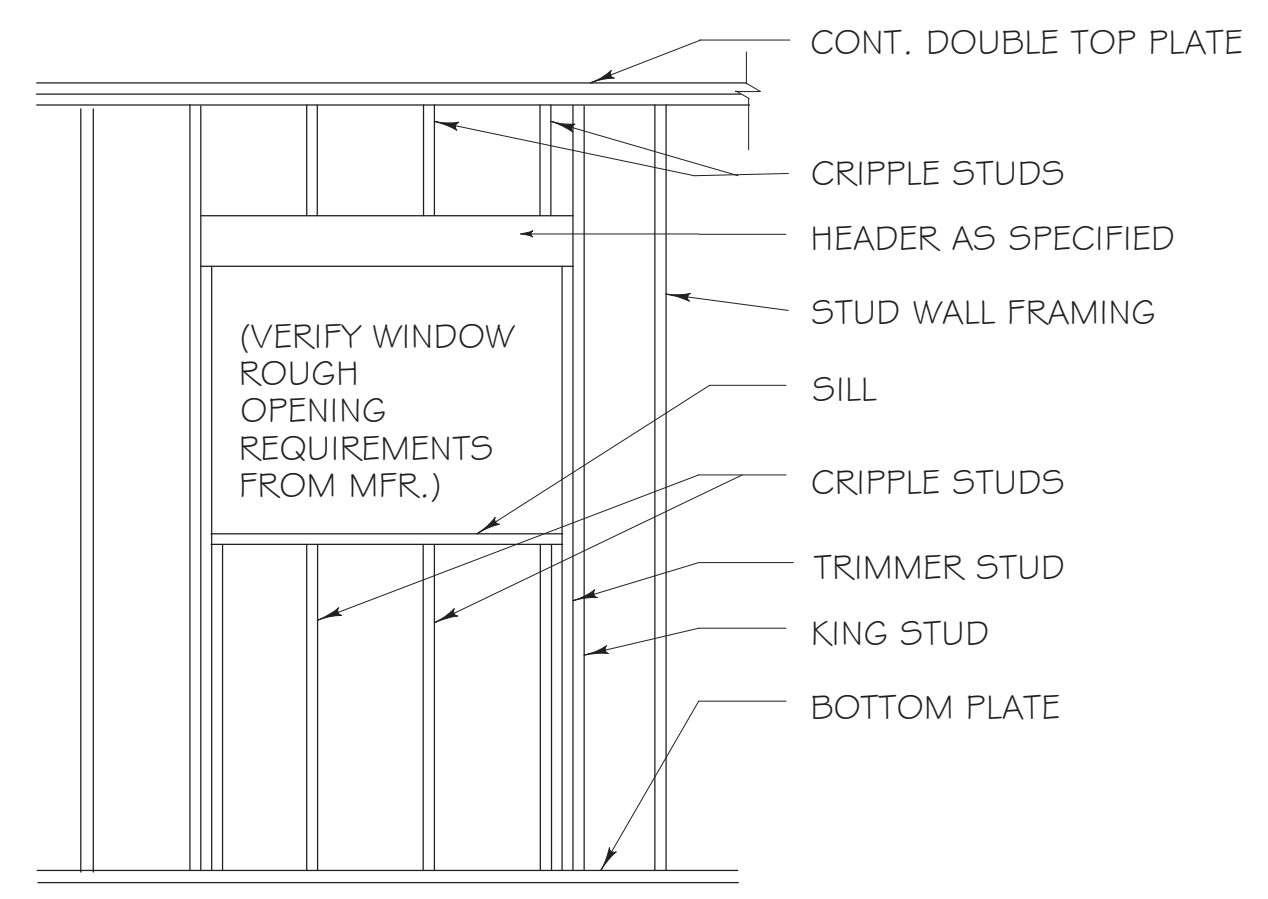
**5 FLASHING DETAIL (ALTERNATE PANEL SIDING ONLY)**



**STUDS @ CORNER (PLAN VIEW)**



**2 DOOR OPENING DETAIL**



**1 WINDOW OPENING DETAIL**

# STRUCTURAL/GENERAL NOTES & SPECIFICATIONS

## A. General

The following notes shall clarify and supplement the working drawings.

## B. Codes & Standards

International Residential Code (IRC) – 2015

ACI-318; ACI SP-15 / M.B.M.A Manual

(and comply with all local applicable codes as required by Building Official)

## C. Live Loads

Roof.....30 lbs/sf

Floors.....40 lbs/sf

Stairs & Exist ..... 100 lbs/sf

Wind.....100 mph - 3 sec. gust

Seismic zone.....A, B, C

Earth Pressure .....30lbs/cf equiv. Fluid pressure

## D. Soil & Foundation Data

1. Soil bearing data not available. Assumed soil bearing capacity = 1500 lbs/sf

2. Extend all footings down to undisturbed soil of the specified strength with a minimum depth of 1'-6" below adjacent grade, or as required by local building official, based on local frost line depth.

3. Center all footings on columns and walls unless specifically dimensioned otherwise.

4. Compacted fill to be well graded and granular with not more than 5% passing a 200 sieve. Place in 8-inch loose lifts and compact to 95% modified AASHO density at optimum moisture.

## E. Cast-In-Place Concrete and Reinforcing Steel

1. Concrete of the following 28-day strength: 5 sack cement/cy (min. 2500 psi); max. 6 gal water/sack for all structural concrete, including foundations and slabs on grade. Maximum sized aggregate 3/4". Maximum slump 4". Add Master Builders Pozzolith per manufacturer's recommendations to all concrete except footings. Concrete for exterior walks to be air entrained (5% air).

2. Reinforcing steel ASTM A-615 grade 40/60. Use grade 40 for temperature steel, stirrups and dowels. Detail, fabricate and place in accordance with the latest edition of A.C.I. "Manual Of Standard Practice".

3. Concrete cover on reinforcing steel (clear dimensions):

Suspended slabs.....3/4"

Beams & columns (to ties).....1 1/2"

Non-exposed vertical faces.....1"

Vertical faces exposed to earth or weather..2"

Bottom of footings.....3"

Slabs-on-grade (from top).....1 1/2"

4. Lap all field splices 24 diameters with minimum of 12". Bend outer wall footing bars 12 inches or use corner bars at all corners and wall intersections.

5. Provide min. one continuous #4 bar at top and bottom of foundation walls w/ #4 at 12" o.c. where wall height exceed two feet. Provide min. two continuous #4 bars in footings. Dowel foundation walls to footings w/ #4 x 1'-6" long @ 16" o.c. Embedded 6" into footing. (No shear keys required)

6. Reinforce around wall and slab openings, with sides of 12" or greater, with two #5 bars extending 24" beyond corners on all four sides. Provide one extra #5 diagonal bar, 4'-0" long, at each corner.

7. Slabs-on-grade: Roll sub grade and moisten before pour. Saw cut crack control joints within 24 hours of pour or install Zip-Strip, with maximum of 12'-0" for 4" non-reinforced slabs and 40'-0" for reinforced slabs. (min. reinforcing: w6 x 6 - w1.4 x 1.4, supported)

8. Vibrate all concrete. Segregation of materials to be prevented. Test cylinders not required.

9. Place no fill against foundation or basement walls until floors are in place or walls have been adequately shored to resist lateral earth pressures.

## F. Masonry (as applicable)

1. Hollow masonry units: F'M=1350 (half & half c.m.u.)

Mortar type S: 1 pc, 1/2 lime putty, 4 sand

Grout: 2000 psi pea gravel concrete (7 sack)

2. Reinforcing steel: ASTM A-615, grade 40.

3. Place grout in lifts no greater than 4'-0" height.

4. Wall reinforcing:

.....6" walls: #4 vertical @ 48" o.c. w/ #9 wire horiz. Joint reinf. @ 8" o.c.

.....8" walls: #5 vertical @ 48" o.c. w/ 3/16" dia. wire horiz. Joint reinf. @ 8" o.c.

Install two bars in corners, wall intersections, wall endings and around openings. Lap all bars 20 inches and joint reinforcing, 12 inches. Use corner bars for outer bars in bond beams and at intersecting walls.

5. Anchor brick veneer to wood framed wall as detailed with 22 ga. X 7/8" x 7" galvanized corrugated wall ties @ 16" o.c. ea. Way with one Simpson n20a nail.

## G. Timber and Wood Framing

1. Substitution of wood species identified herein may be as approved by local Building Official and material strength and capacities shall equal or exceed that of the species identified herein.

2. All lumber to be graded per book 16 of the West Coast Lumber Inspection Bureau:

HF/DF no. 2 for joists, rafters, light framing, plates and bracing

DF no. 1 for posts and beams

HF/DF "stud" for stud wall framing

4. Joists and rafters (lumber) shall have 2" nominal thick solid blocking at supports.

3. Comply with the latest edition of the NFPA "National Design Specification" as modified by the applicable code for all structural timber requirements.

5. Spike laminated members together w/ 10d nails @ 12" o.c., staggered. Splice laminations at supports only.

6. Provide cut washers for all bolts bearing on wood.

7. All nails shall be common wire nails.

8. Glue-laminated timbers, Douglas Fir, A.I.T.C. grading: combination 24F-V3 for simple spans: 24F-V8 for cantilevered spans. Dry conditions of use. Architectural appearance grade where exposed to view. Fabrication plant A.I.T.C. inspected./ Wrap individual members.

9. Plywood: Roof sheathing to be 15/32" C-D int-apa plywood with exterior glue, P.I. 24/0 (use 5-ply for panelized roofs) Nailing 8d @ 6" o.c. at panel edges and 8d @ 12" o.c. at intermediate supports. Sub-flooring to be 3/4" C-D-apa plywood with exterior glue, P.I. 32/16. Use T&G if no underlayment. Glue and nail with 10d @ 6" o.c. at panel edges and @ 10" at intermediate supports.

10. Pre-fabricated trussed members to be designed by applicable state licensed engineer in accordance with requirements shown in the drawings. Contractor shall verify as-framed dimensions and conditions prior to truss fabrication and coordinate as required. All engineering data shall be made available for submittal to the Building Official as required.

10. Pre-fabricated trussed members to be designed by applicable state licensed engineer in accordance with requirements shown in the drawings. Contractor shall verify as-framed dimensions and conditions prior to truss fabrication and coordinate as required. All engineering data shall be made available for submittal to the Building Official as required.

## H. Structural Steel

1. All steel, except tubing: ASTM A-36. Pipe: ASTM A-53, Type E or S, grade B. Tubular section: ASTM A500, grade B. All bolts: ASTM A-307.

2. All fabrication, erection and detailing shall be in accordance with the latest edition of the "Manual Of Steel Construction" of the American Institute Of Steel Construction.

3. All welding by WABO certified welders in accordance with the "Welding Handbook" by the American Welding Society.

4. All welds 3/16" min. continuous fillet welds using ASWA5, E70XX electrodes.

5. Provide washers on all bolted connections.

6. All steel not embedded in concrete or masonry shall receive one shop coat of an approved primer paint. Apply two coats of heavy asphaltic paint to all steel exposed to earth.

7. Furnish complete shop drawings prior to fabrication.

7. Furnish complete shop drawings prior to fabrication.

## I. Miscellaneous

1. Contractor shall verify all site conditions and dimensions in field.

2. Provide temporary bracing as required until all permanent connections and stiffening have been installed.

3. Verify size and locations of all openings in floor, roof and walls and coordinate with electrical and mechanical work.

4. Pre-fabricated items shall be handled and installed in accordance with manufacturers' recommendations. Pre-fabricated

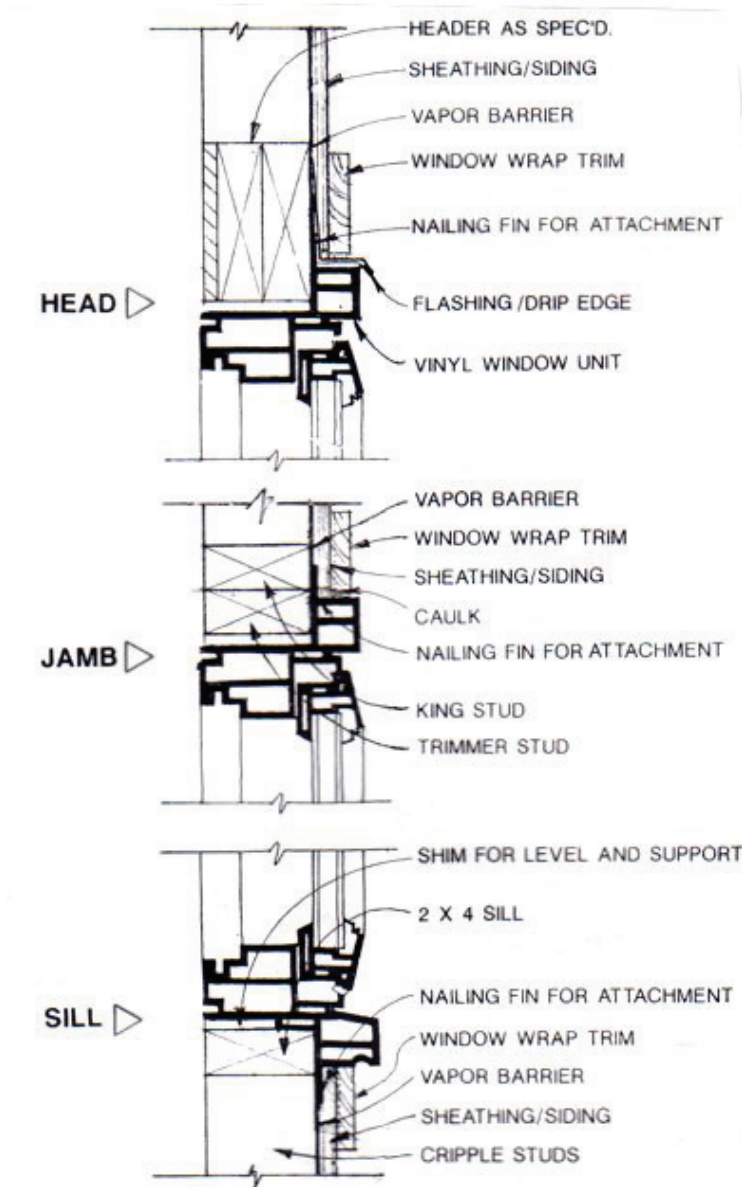
4. Pre-fabricated items shall be handled and installed in accordance with manufacturers' recommendations. Pre-fabricated

assemblies shall be coordinated with any as-built conditions by the contractor regarding dimensions, clearance and applicable building code requirements.

5. All HVAC equipment shall be determined by owner and/or contractor specific to this project and comply with all applicable codes. Performance data and distribution layout shall be provided by mechanical subcontractor. Submittals shall be coordinated by the contractor as required by the Building Official.

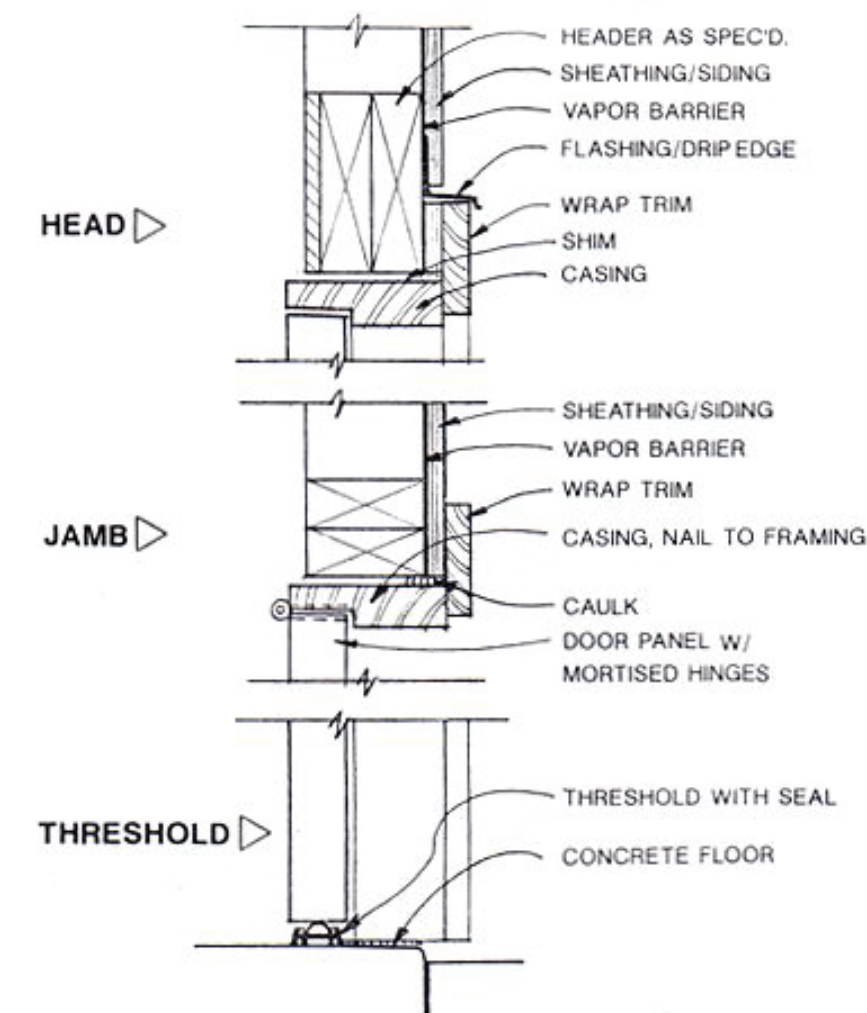
6. It is the intent of these drawings and specifications to comply with the requirements of the applicable Building Code and all other relevant codes and ordinances. Any discrepancies, omissions or errors shall be brought to the attention of the designer for clarification or correction before beginning the work. It is the responsibility of the general contractor to seek clarification or correction if needed.

6. It is the intent of these drawings and specifications to comply with the requirements of the applicable Building Code and all other relevant codes and ordinances. Any discrepancies, omissions or errors shall be brought to the attention of the designer for clarification or correction before beginning the work. It is the responsibility of the general contractor to seek clarification or correction if needed.



## WINDOW DETAILS

(NOT TO SCALE)



## DOOR DETAILS

(NOT TO SCALE)



QUESTIONS?..CALL  
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PLAN NO.  
**600-1**

DESIGN BY:  
JJB  
DATE:

SHEET CONTENTS:  
STRUCTURAL/GENERAL NOTES  
WINDOW DETAILS  
DOOR DETAILS

SHEET  
**7**  
OF **8**

# - FASTENING REQUIREMENTS -

**TABLE R602.3(3)**  
REQUIREMENTS FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES<sup>a,b,c</sup>

MINIMUM NAIL SIZE	MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inches)	MAXIMUM WALL STUD SPACING (inches)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (mph)			
				Edges (inches o.c.)	Field (inches o.c.)	Wind exposure category			
Size	Penetration (inches)			B	C	D			
6d Common (2.0" x 0.113")	1.5	24/0	3/8	16	6	12	110	90	85
8d Common (2.5" x 0.131")	1.75	24/16	7/16	16	6	12	130	110	105
				24	6	12	110	90	85

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.  
 a. Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.  
 b. Table is based on wind pressures acting toward and away from building surfaces per Section R301.2. Lateral bracing requirements shall be in accordance with Section R602.10.  
 c. Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

**TABLE R602.3(4)**  
ALLOWABLE SPANS FOR PARTICLEBOARD WALL SHEATHING<sup>a</sup>

THICKNESS (inch)	GRADE	STUD SPACING (inches)	
		When siding is nailed to studs	When siding is nailed to sheathing
3/8	M-1 Exterior glue	16	—
1/2	M-2 Exterior glue	16	16

For SI: 1 inch = 25.4 mm.  
 a. Wall sheathing not exposed to the weather. If the panels are applied horizontally, the end joints of the panel shall be offset so that four panels corners will not meet. All panel edges must be supported. Leave a 1/16-inch gap between panels and nail no closer than 1/4 inch from panel edges.

**TABLE R602.3(1)**  
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER <sup>a,b,c</sup>	SPACING OF FASTENERS	
			Edges (inches)	Intermediate supports (inches)
<b>Roof</b>				
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2 1/2" x 0.113")	—	—
2	Ceiling joists to plate, toe nail	3-8d (2 1/2" x 0.113")	—	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—	—
4	Collar tie rafter, face nail or 1 1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	—	—
5	Rafter to plate, toe nail	2-16d (3 1/2" x 0.135")	—	—
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	4-16d (3 1/2" x 0.135") 3-16d (3 1/2" x 0.135")	—	—
<b>Wall</b>				
7	Built-up corner studs	10d (3" x 0.128")	24" o.c.	—
8	Built-up header, two pieces with 1/2" spacer	16d (3 1/2" x 0.135")	16" o.c. along each edge	—
9	Continued header, two pieces	16d (3 1/2" x 0.135")	16" o.c. along each edge	—
10	Continuous header to stud, toe nail	4-8d (2 1/2" x 0.113")	—	—
11	Double studs, face nail	10d (3" x 0.128")	24" o.c.	—
12	Double top plates, face nail	10d (3" x 0.128")	24" o.c.	—
13	Double top plates, minimum 48-inch offset of end joints, face nail in lapped area	8-16d (3 1/2" x 0.135")	—	—
14	Sole plate to joist or blocking, face nail	16d (3 1/2" x 0.135")	16" o.c.	—
15	Sole plate to joist or blocking at braced wall panels	3-16d (3 1/2" x 0.135")	16" o.c.	—
16	Stud to sole plate, toe nail	3-8d (2 1/2" x 0.113") or 2-16d (3 1/2" x 0.135")	—	—
17	Top or sole plate to stud, end nail	2-16d (3 1/2" x 0.135")	—	—
18	Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	—	—
19	1" brace to each stud and plate, face nail	2-8d (2 1/2" x 0.113") 2 staples 1 1/4"	—	—
20	1" x 6" sheathing to each bearing, face nail	2-8d (2 1/2" x 0.113") 2 staples 1 1/4"	—	—
21	1" x 8" sheathing to each bearing, face nail	2-8d (2 1/2" x 0.113") 3 staples 1 1/4"	—	—
22	Wider than 1" x 8" sheathing to each bearing, face nail	3-8d (2 1/2" x 0.113") 4 staples 1 1/4"	—	—
<b>Floor</b>				
23	Joist to sill or girder, toe nail	3-8d (2 1/2" x 0.113")	—	—
24	1" x 6" subfloor or less to each joist, face nail	2-8d (2 1/2" x 0.113") 2 staples 1 1/4"	—	—
25	2" subfloor to joist or girder, blind and face nail	2-16d (3 1/2" x 0.135")	—	—
26	Rim joist to top plate, toe nail (roof applications also)	8d (2 1/2" x 0.113")	6" o.c.	—
27	2" planks (plank & beam - floor & roof)	2-16d (3 1/2" x 0.135")	at each bearing	—
28	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.	
29	Ledger strip supporting joists or rafters	3-16d (3 1/2" x 0.135")	At each joist or rafter	

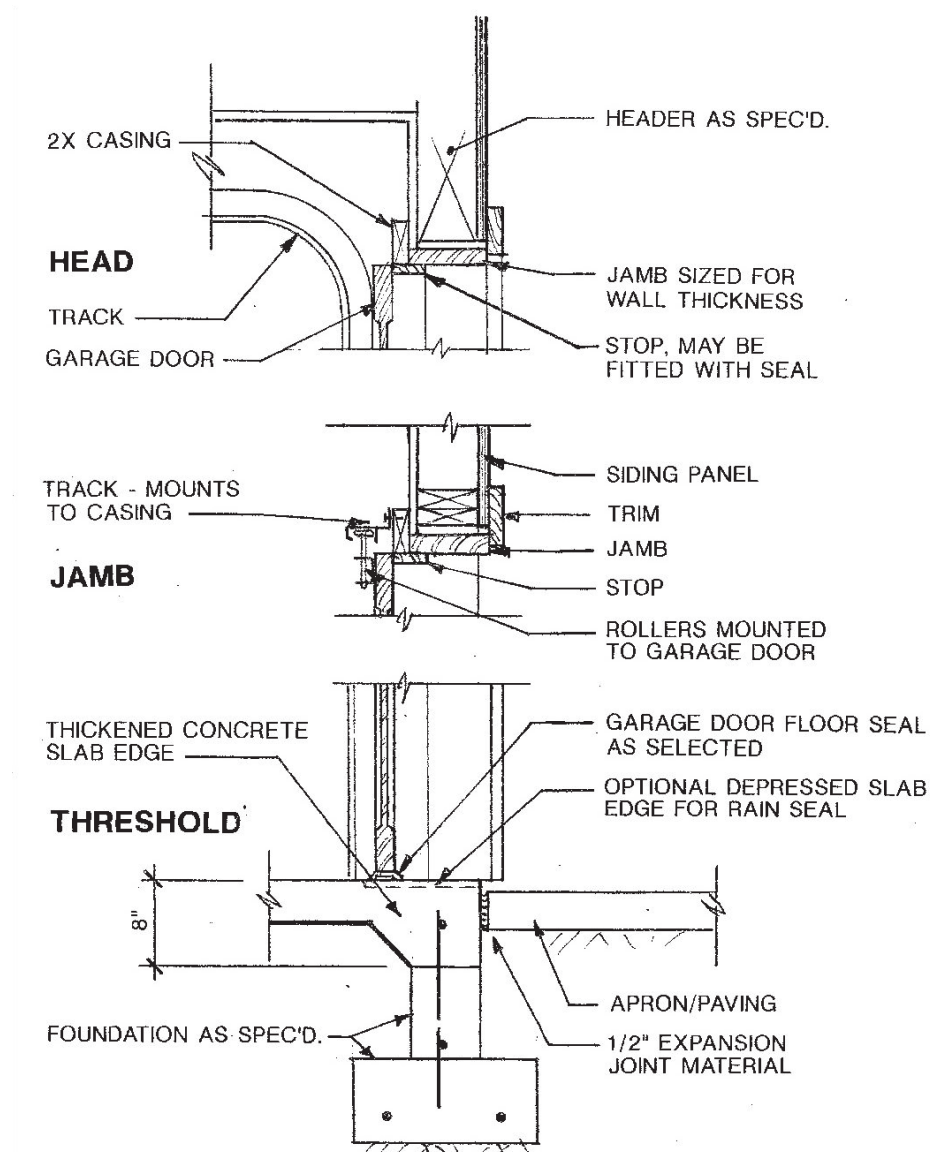
ITEM	DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER <sup>a,b,c</sup>	SPACING OF FASTENERS	
			Edges (inches)	Intermediate supports (inches)
<b>Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing</b>				
30	3/8" - 1/2"	6d common (2" x 0.113") nail (subfloor wall) 8d common (2 1/2" x 0.131") nail (roof)	6	12 <sup>e</sup>
31	5/16" - 1/2"	6d common (2" x 0.113") nail (subfloor, wall) 8d common (2 1/2" x 0.131") nail (roof) <sup>f</sup>	6	12 <sup>e</sup>
32	19/32" - 1"	8d common nail (2 1/2" x 0.131")	6	12 <sup>e</sup>
33	1 1/8" - 1 1/4"	10d common (3" x 0.148") nail or 8d (2 1/2" x 0.131") deformed nail	6	12
<b>Other wall sheathing<sup>g</sup></b>				
34	1/2" structural cellulosic fiberboard sheathing	1/2" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/4" long	3	6
35	25/32" structural cellulosic fiberboard sheathing	1 3/4" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/2" long	3	6
36	1/2" gypsum sheathing <sup>d</sup>	1 1/2" galvanized roofing nail; staple galvanized, 1 1/2" long; 1 1/4" screws, Type W or S	7	7
37	5/8" gypsum sheathing <sup>d</sup>	1 3/4" galvanized roofing nail; staple galvanized, 1 3/4" long; 1 3/8" screws, Type W or S	7	7
<b>Wood structural panels, combination subfloor underlayment to framing</b>				
38	3/4" and less	6d deformed (2" x 0.120") nail or 8d common (2 1/2" x 0.131") nail	6	12
39	7/8" - 1"	8d common (2 1/2" x 0.131") nail or 8d deformed (2 1/2" x 0.120") nail	6	12
40	1 1/8" - 1 1/4"	10d common (3" x 0.148") nail or 8d deformed (2 1/2" x 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.  
 a. All nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.  
 b. Staples are 16 gage wire and have a minimum 7/16-inch on diameter crown width.  
 c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.  
 d. Four-foot-by-8-foot or 4-foot-by-9-foot panels shall be applied vertically.  
 e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).  
 f. For regions having basic wind speed of 110 mph or greater, 8d deformed (2 1/2" x 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.  
 g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.  
 h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 209.  
 i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

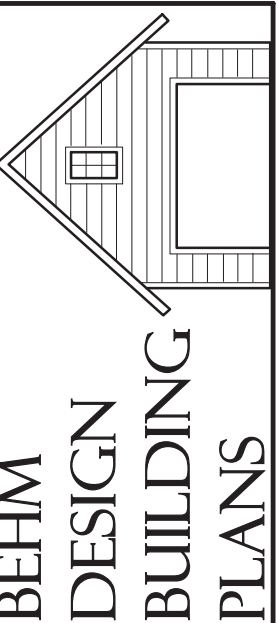
**TABLE R602.3(2)**  
ALTERNATE ATTACHMENTS

NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION <sup>a,b</sup> OF FASTENER AND LENGTH (inches)	SPACING OF FASTENERS	
		Edges (inches)	Intermediate supports (inches)
<b>Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing<sup>f</sup></b>			
up to 1/2	Staple 15 ga. 1 1/4"	4	8
	0.097 - 0.099 Nail 2 1/4"	3	6
	Staple 16 ga. 1 1/4"	3	6
19/32 and 5/8	0.113 Nail 2"	3	6
	Staple 15 and 16 ga. 2"	4	8
	0.097 - 0.099 Nail 2 1/4"	4	8
23/32 and 3/4	Staple 14 ga. 2"	4	8
	Staple 15 ga. 1 1/4"	3	6
	0.097 - 0.099 Nail 2 1/4"	4	8
1	Staple 16 ga. 2"	4	8
	Staple 14 ga. 2 1/4"	4	8
	0.113 Nail 2 1/4"	3	6
	Staple 15 ga. 2 1/4"	4	8
	0.097 - 0.099 Nail 2 1/2"	4	8
	<b>SPACING OF FASTENERS</b>		
NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION <sup>a,b</sup> OF FASTENER AND LENGTH (inches)	Edges (inches)	Body of panel <sup>d</sup> (inches)
			<b>Floor underlayment; plywood-hardboard-particleboard<sup>d</sup></b>
<b>Plywood</b>			
1/4 and 5/16	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	3	6
	Staple 18 ga., 7/8, 3/16 crown width	2	5
1 1/32, 3/8, 15/32, and 1/2	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8 <sup>e</sup>
19/32, 5/8, 23/32 and 3/4	1 1/2 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8
	Staple 16 ga. 1 1/2"	6	8
<b>Hardboard<sup>d</sup></b>			
0.200	1 1/2 long ring-grooved underlayment nail	6	6
	4d cement-coated sinker nail	6	6
	Staple 18 ga., 7/8 long (plastic coated)	3	6
<b>Particleboard</b>			
1/4	4d ring-grooved underlayment nail	3	6
	Staple 18 ga., 7/8 long, 3/16 crown	3	6
3/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 1/8 long, 3/8 crown	3	6
1/2, 5/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 1/8 long, 7/8 crown	3	6

For SI: 1 inch = 25.4 mm.  
 a. Nail is a general description and may be T-head, modified round head or round head.  
 b. Staples shall have a minimum crown width of 7/16-inch on diameter except as noted.  
 c. Nails or staples shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater. Nails or staples shall be spaced at not more than 12 inches on center at intermediate supports for floors.  
 d. Fasteners shall be placed in a grid pattern throughout the body of the panel.  
 e. For 5-ply panels, intermediate nails shall be spaced not more than 12 inches on center each way.  
 f. Hardboard underlayment shall conform to ANSI/AHA A135.4.



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SHEET CONTENTS:  
 CODE REQUIREMENTS FOR FASTENERS AND SHEATHING  
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