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### STRUCTURAL GENERAL NOTES

**New Building**  
62 India St.  
Portland, ME  
**DESIGN LOADS:** International Building Code, IBC 2009 Edition, except as noted  
Occupancy Category, Table 1604.5

Roofs:			
Ground Snow, Pg	60 psf	(used for drifting calculations)	
Flat Roof Snow, Pf	42 psf		
Snow Exposure Factor, Cc	Table 1608.3.1	1.0	
Snow importance Factor, Is	Table 1604.5	1.0	
Snow Thermal Factor, Ct	Table 1608.3.2	1.0	

Floors:			
Residential	40 psf		
Corridors & Public Spaces	100 psf		
Commercial 1 <sup>st</sup> floor	100 psf		

Lateral				
Wind	IBC 1603.1.4, ASCE 7-05	Analytic Method		
3 Second Gust Velocity	100 mph			
Importance Factor	1.0			
Building Category and Internal Pressure Coefficient	IBC 1609.2, ASCE Figure 6-5	Enclosed	GCPi=0.55	
Exposure	DP 35psf unbr.	Also see arch.		
Seismic Use Group	1			
Importance Factor	1.0			
Spectral Response	Acceleration	Coefficient		
Short Period	Ss	0.314 g	SpS	0.324 g
One Second	S1	0.077 g	Sp1	0.123 g

Soils			
Soils Site Class	Table 1615.1.1	D	
Design Category	Table 1616.3	B	
Basic Force Resisting System	Table 1617.6.2		
Design Base Shear		234 kips	
Seismic Response Coefficient	Cs	0.102	
Response Modification Coefficient	R	3	
Analysis Procedure		Equivalent Lateral Force	

### STRUCTURAL STEEL

Structural steel shall be detailed, fabricated, and erected in accordance with latest AISC Specifications, and Code of Standard Practice. Structural steel web flange beams shall conform to ASTM A992. Except as noted, framed beam connections shall be bearings-type with 3/4" diameter, snug tight, A490-N bolts, detailed in conformance with Part 4, Tables II and III, for 0.6 times the allowable uniform loads tabulated in Part 2 of the AISC Manual, 9th Edition. Install bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts". All beams shall have full depth web stiffeners each side of webs above and below columns. Anchor rods shall conform to ASTM F1554, Grade 55, with weldability supplement S1. Headed anchor studs (HAS) shall be attached to structural steel with equipment approved by the stud manufacturer according to the stud manufacturer's recommendations. Welding shall be done by a certified welder in accordance with AISC and AWS specifications and recommendations using E70T electrodes. Where not specifically noted, minimum weld shall be 3/16" fillet by length of contact edge. All post-installed anchors shall have current National Evaluation Report, and shall be installed in accordance with the manufacturer's requirements. Expansion anchors shall be approved "wedge" type unless specifically noted to be "sleeve" type. Chemical anchors shall be approved epoxy or similar adhesive type and shall have current National Evaluation Report. Where base material is not solid, approved screen tubes shall be used. Grout beneath column base and beam-bearing plates shall be minimum 28-day compressive strength of 7,500 psi, approved pre-bagged, non-metallic, non-gaseous, bleed free, non-shrink, when tested in accordance with ASTM C1107. Grade B or C at a flow cone fluid consistency of 20 to 30 seconds. **STRUCTURAL MASONRY:** Design is based on Unit Strength Method MSJC, Section SC-1.4 B.2. Compressive strength of masonry assembly used for design is 1500 psi, based on net-bedded area. Hollow load-bearing concrete masonry (CMU) shall be medium-weight units conforming to ASTM C90, Grade N1, minimum compressive strength 1300 psi based on average net area. Mortar shall be Type S conforming to ASTM C270. Masonry cement shall not be used. Provide full shovelled mortar in all head and bed joints. Except for lintels, bond beam units shall be produced from standard vertically voided units with pre-cut knockout cross walls. Grout used in masonry walls and block cells shall be course grout, as defined by ASTM C476, with a minimum cube strength = 2,000 psi. 3000 psi concrete having 3/8" diameter aggregate, placed by vibrating unless an approved self-consolidating mix is used. Lifts shall not exceed five feet in height. If grout pour height exceeds 5 feet, clean-out holes shall be provided. Space continuous horizontal joint reinforcing at 16" maximum in all CMU walls. Joint reinforcing shall be welded type w/ 9 gage side-wires and 9 gage trussed or ladder cross wires. Reinforcing bars shall be as for reinforced concrete except as noted.

### REINFORCED CONCRETE

We encourage the use of blast furnace slag. Design is based on "Building Code Requirements for Reinforced Concrete" (ACI 318). Concrete work shall conform to "Standard Specifications for Structural Concrete" (ACI 301.9). Structural concrete shall have the following properties:

Intended Use	f'c, psi 28day	Max W/C Ratio	Maximum Aggregate	Slump inches	Entrained Air Percent ±1.5%	Cement Type	Admixtures, Comments
Footings	3,500	.6	3/4" Stone	4	---	III	
walls	4,000	.45	3/4" Stone	4	---	III	
struct slab on deck	4,000	.5	3/4" Stone	4	---	III	6x6 - W2 1xW2.1 W.F.F.
formed struct slab	4,000	.45	3/4" Stone	4	---	III	
exterior slab on grade	4,500	.45	3/4" Stone	4	---	III	
interior slabs on grade	3,500	.5	3/4" Stone	4	---	III	Fibermesh
beams, columns	4,000	.45	3/4" Stone	4	---	III	

### FOUNDATION DESIGN:

See geotechnical report by GSI w/ Project No. 212234A, dated March 29, 2016

Soils engineer shall verify soil conditions and types during excavation and prior to concrete.

### Footings--

Design of footings is based on subgrade improvements described in the geotech report.

### REINFORCED CONCRETE

Detailing, fabrication, and placement of reinforcing steel shall be in accordance with the Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315). Welded wire fabric shall conform to ASTM A185. Reinforcing bars shall conform to ASTM A615, Grade 60, except ties or bars shown to be field-bent, which shall be Grade 40. Epoxy coated reinforcing bars shall conform to ASTM 775. Zinc coated (galvanized) reinforcing bars shall conform to ASTM 767. Bars to be welded shall conform to ASTM 706. At splices, lap bars 50 diameters unless noted otherwise. At corners and intersections, make horizontal bars continuous or provide matching corner bars. Around openings in walls and slabs, provide 2#5, extending 2'-0" beyond edge of opening. In continuous members, splice top bars at mid-span and splice bottom bars over supports. Provide intermittent shear keys at all construction joints and elsewhere as shown on the drawings. Except as noted on the drawings, concrete protection for reinforcement in cast-in-place concrete shall be as follows:

a. Cast against and permanently exposed to earth 2"

b. Exposed to earth or weather: #6 through #18 bars 3"

#5 bar, W31 or D31 wire, and smaller 1-1/2"

c. Not exposed to weather or in contact with ground: Slabs, walls, joists: #11 bar and smaller 3/4"

Beams, columns: Primary reinforcement 1-1/2"

Stirrups, ties, spirals 1-1/2"

Fibermesh admixture shall be 100% virgin polypropylene, fibrillated fibers as manufactured by Fibermesh Co. per ASTM C-1116 type 111 4.1.3 and ASTM C-1116 performance level one, 1.5 lbs per cubic yard of concrete.

Anchor bolts and rods for beam and column-bearing plates shall be placed with setting templates.

Permanent corrugated steel forms for concrete floor slabs shall be manufactured and erected according to the "Specifications and Code of Standard Practice" of the Steel Deck Institute.

All concrete work is subject to inspection by a qualified special inspector employed by the owner in accordance with IBC Section 1704.4.

### STRUCTURAL WOOD FRAMING:

In-Grade Base Values have been used for design.

2x framing shall be Spruce-Pine-Fir S4S No. 2 and better unless noted.

All lumber shall be 19% maximum moisture content, unless noted.

Solid timber beams and posts shall be Douglas Fir-Larch No. 1.

Studs shall be Spruce-Pine-Fir S4S No. 2 and better.

Top and bottom plates shall be Spruce-Pine-Fir S4S No. 2 and better.

Wood in contact with concrete shall be pressure-treated Spruce-Pine-Fir S4S No. 2 or Southern Yellow Pine.

Conventional light framing shall comply with IBC Section 2308.

Except as noted otherwise, minimum nailing shall be provided as specified in IBC Table 2304.9.1 "Fastening Schedule."

All plywood and oriented strand board (OSB) sheathing shall be engineered grades with APA grade stamp indicating appropriate maximum spacing of supports.

Floor sheathing: nominal 3/4" APA Stud-4-floor @ 24 inch o.c. tongue & groove glued and nailed.

Roof sheathing: minimum 5/8" CDX plywood, or 5/8" OSB, APA 32/16, nailed.

Wall sheathing: 1/2" CDX plywood or 7/16" OSB, APA 24/16, blocked and nailed.

Nail wall sheathing with 8d commons at 4" o.c. at panel edges, and 12" o.c. at intermediate framing except as noted.

Sheath all exterior walls. Sheath interior walls as shown on the drawings. Block and nail all sheathing panel edges between studs.

Sheathing shall be continuous from bottom plate to top plate. Cut in "L" and "T" shapes around openings. Lap sheathing over rim joists mm. 4" at all floors to tie upper and lower stud walls together.

Minimum height of sheathing panels shall be 16" to assure that plates are tied to studs.

Minimum 3-8d per stud and nail plates with "edge nail" spacing.

Sole plate at all perimeter walls and at designated shear walls shall be nailed as for braced panels with 3-16d x 3 1/2" long box nails (coated or deformed shank) per 16". 12d nails are not acceptable.

Provide solid blocking between joists under jamb studs of openings.

Pre-engineered, prefabricated trusses shall be designed for the fabricator by a Professional Engineer Registered in the State of construction, and shall comply with Code Requirements.

Truss to truss connections specified shall be by truss supplier, unless specifically noted on the drawings.

Lower chord of gable end trusses shall be anchored to wall plate with framing anchors at 4'-0" spacing and laterally braced to roof framing at 8'-0" spacing.

Truss supplier shall specify all floor and roof truss bracing and bridging.

All roof rafters, joists, trusses, and beams shall be anchored to supports with metal framing anchors.

Light gage framing anchors shown or required, shall be Simpson "Strong Tie" or equal Code approved connectors and installed with the number and type of nails recommended by the manufacturer to develop the rated capacity.

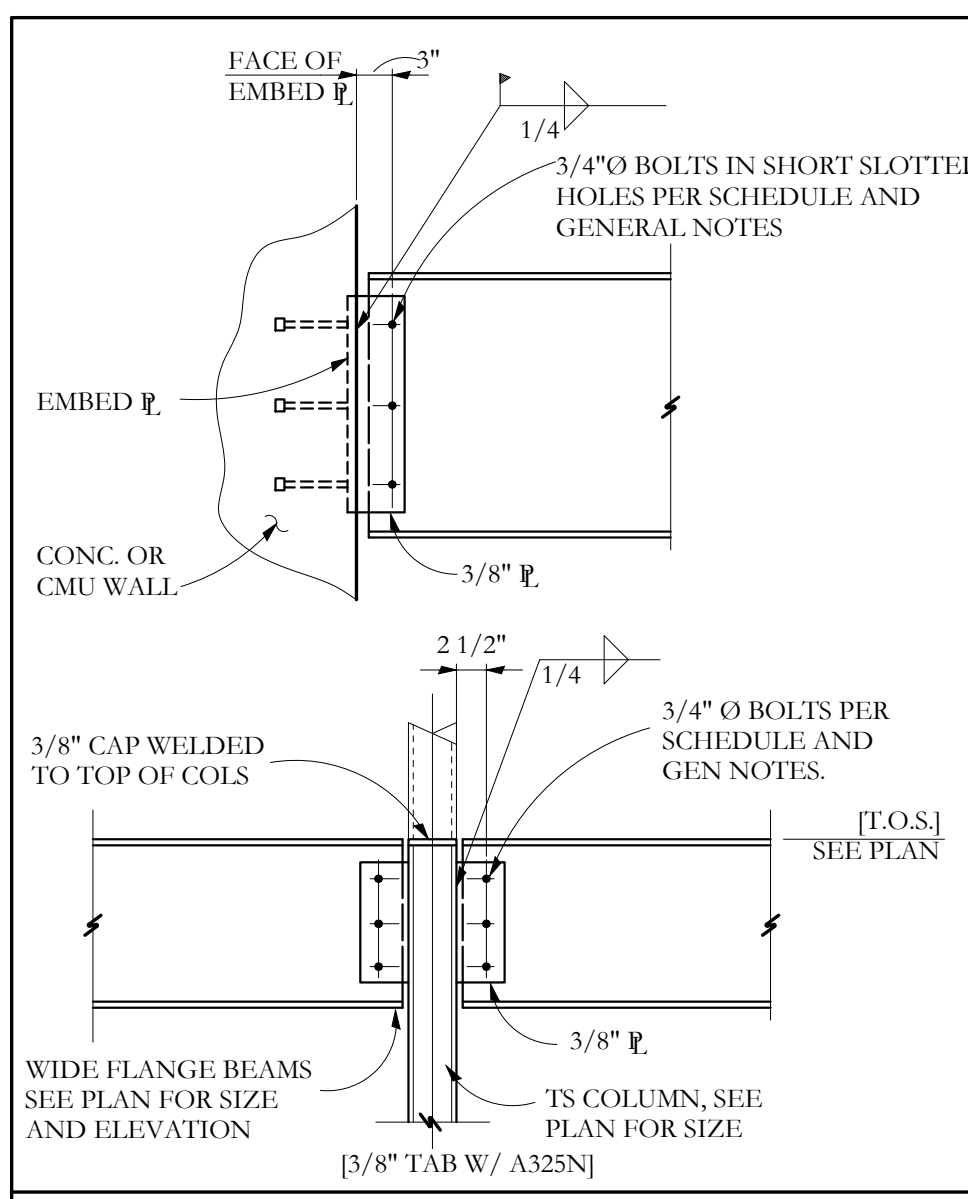
Note that heavy-duty hangers and skewed hangers may not be stocked locally and require special order from the factory.

All beams and trusses shall be braced against rotation at points of bearing.

Unless otherwise indicated, install two lengths of solid blocking x joint depth x 12 inches long in floor framing under column loads.

Columns must have a continuous load path to foundation.

Lead holes for lag screws shall be drilled in accordance with Table 6.23 of the ATC Timber Construction Manual, 3rd edition.

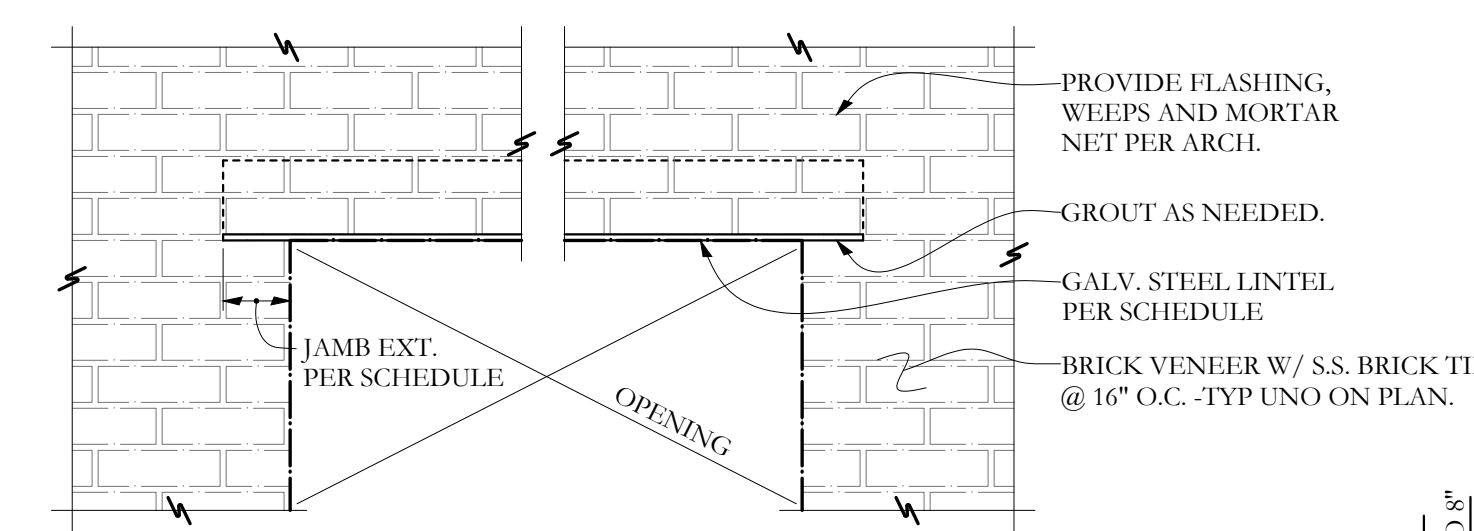


SINGLE-PLATE SHEAR CONNECTION SCHEDULE			
BM. SIZE	# OF 3/4" O BOLTS	L, (in.)	CONN CAP. (kips)
W8, W10	2	6	16.3
W12, W14	3	9	25.6
W16	4	12	34.8
W18	5	15	43.5
W21	6	18	51.6
W24	7	21	59.7

### TYPICAL SINGLE PLATE SHEAR CONNECTION

(PROVIDE SIMILAR BOLTING AT BEAM-TO-BEAM CONNECTION)

\*STEEL FABRICATOR TO PROVIDE DESIGN AND CALCS FOR COPES ETC.

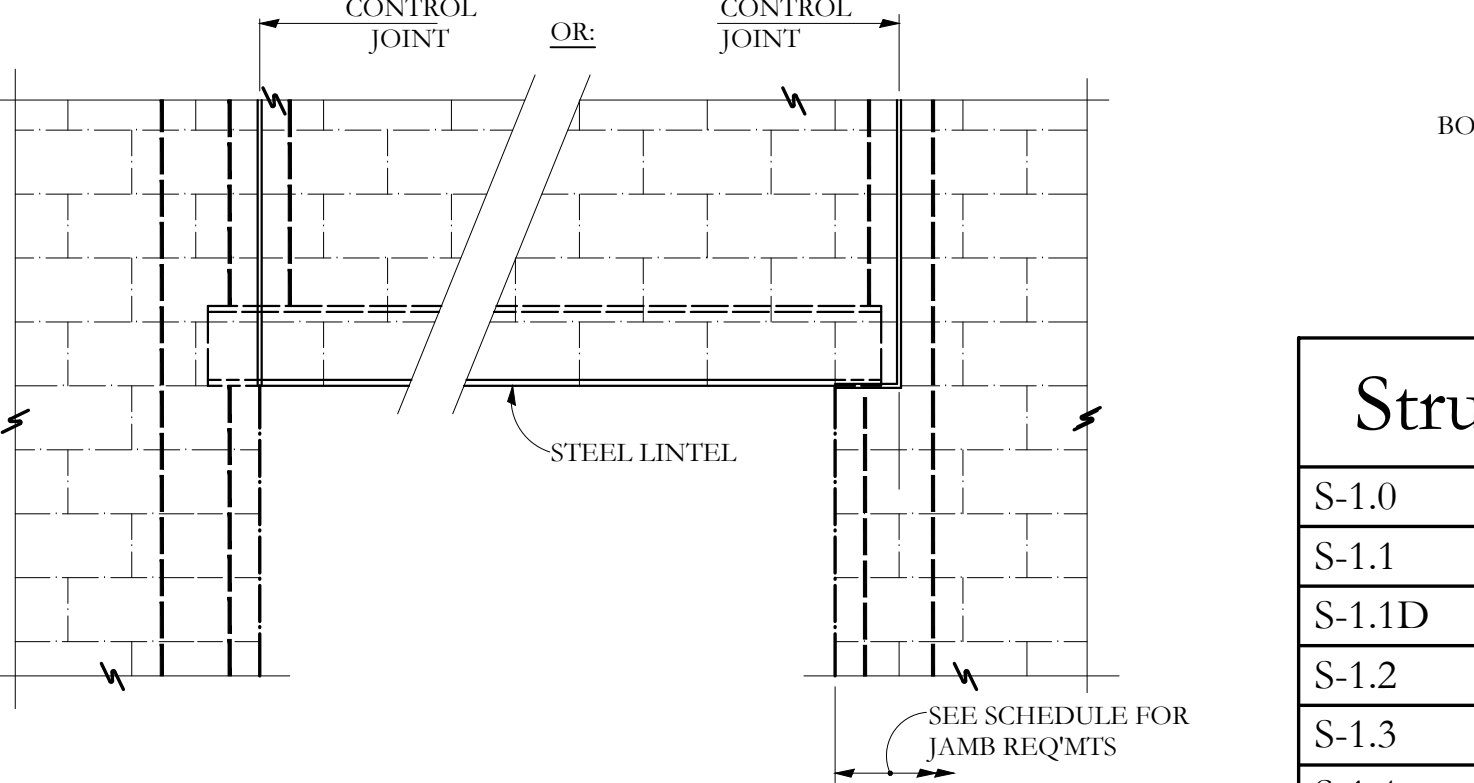


OPENING SIZE*	LINTEL PER WYTHE	JAMB EXTENSION
LESS THAN 4'-0"	1.3 1/2 x 3 1/2 x 1/4"	4"
4'-1 TO 5'-4"	1.5 x 3 1/2 x 1/4"	4"
5'-5 TO 6'-6"	1.6 x 3 1/2 x 5/16"	8"

\* FOR OPENINGS GREATER THAN LISTED, SEE PLAN.  
\*\* ALL TEMPORARY SHORING BY G.C. TYP.

### LINTEL INSTALLATION IN BRICK VENEER

NO SCALE



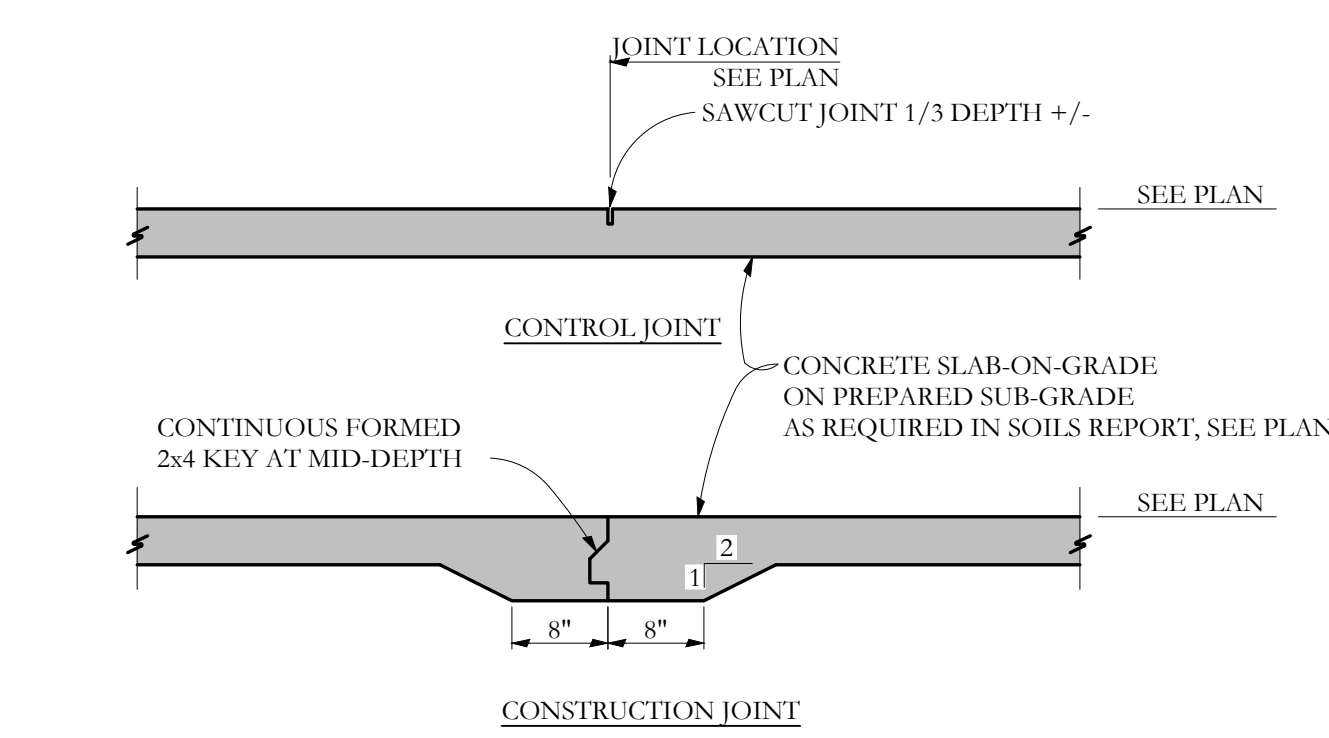
OPENING SIZE	LINTEL SIZE	GROUTED JAMB WIDTH
LESS THAN 4'-0"	1.3 1/2 x 3 1/2 x 1/4"	8"
4'-0" TO 5'-4"	1.5" x 3 1/2" x 1/4"	8"
5'-5" TO 6'-6"	1.6" x 3 1/2" x 5/16"	1'-4"

\* Minimum lintel except as noted, one angle for each 4" of wall thickness to bear 6" each end

### TYPICAL LOOSE LINTEL INSTALLATION

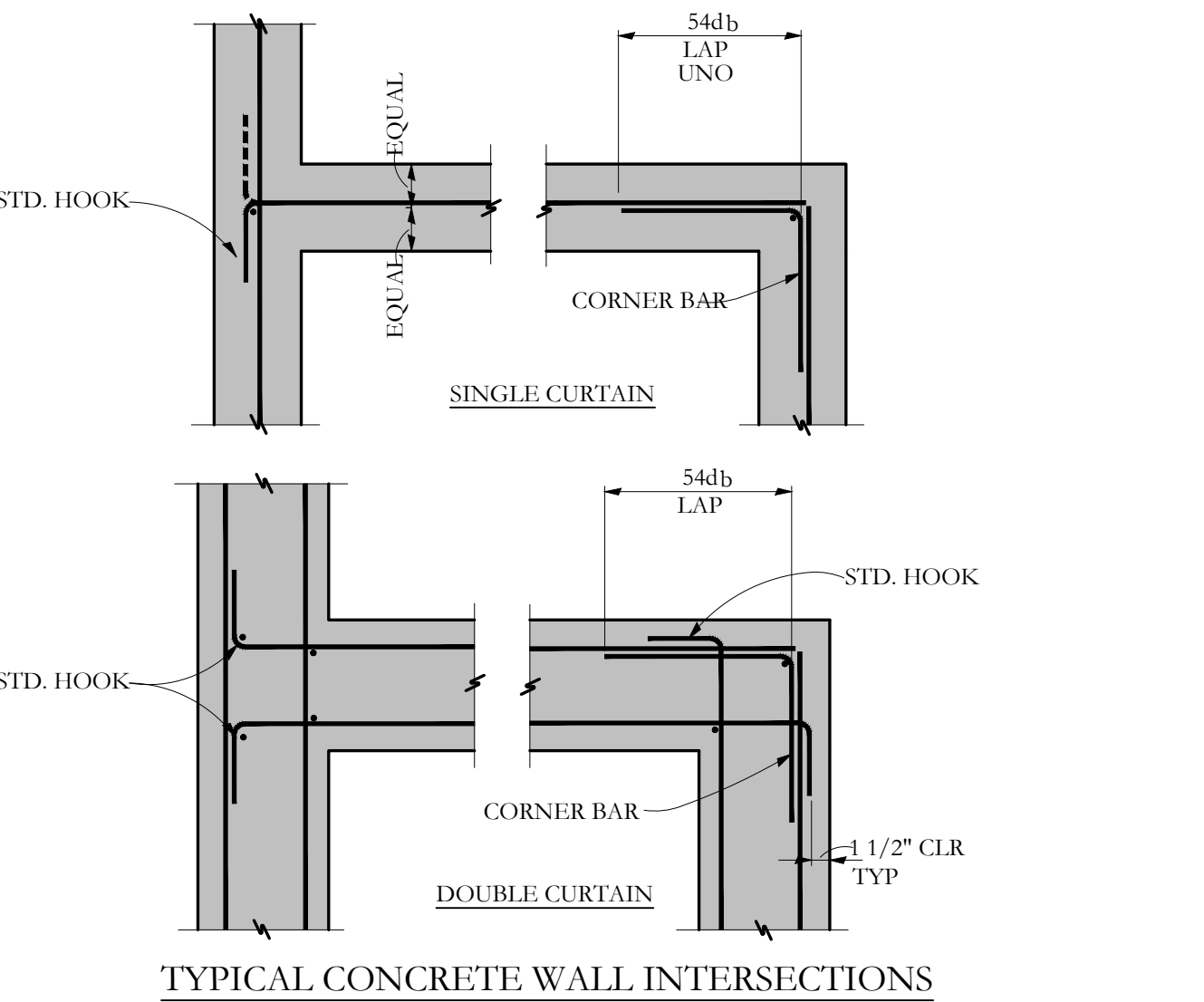
NO SCALE

SUGGESTED GYPCRETE PROCEDURE TO REDUCE GYPSOM CRACKS DUE TO DEFLECTION  
1. HABG GYP AS DESIRED WITHOUT TAPING AND MUDDING  
2. POUR GYPCRETE TOP FLOOR DOWN.  
3. MUD AND TAPE ONCE COMPLETE



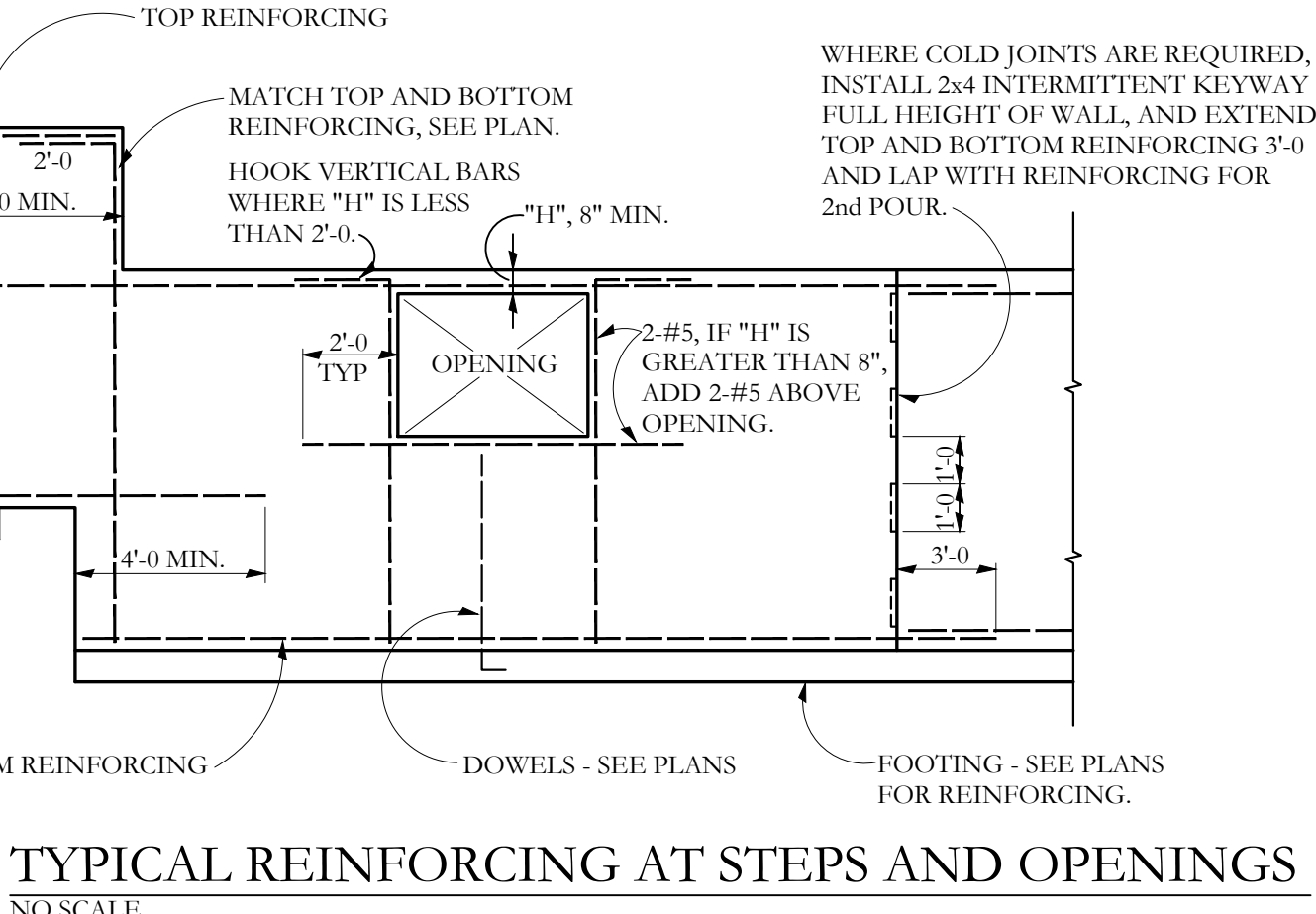
### TYPICAL JOINTS AT INTERIOR SLAB-ON-GRADE

\*SAW CUT JOINTS W/ GREEN SAW WITHIN 18 TO 24 HRS -TYP UNO



### TYPICAL CONCRETE WALL INTERSECTIONS

NO SCALE

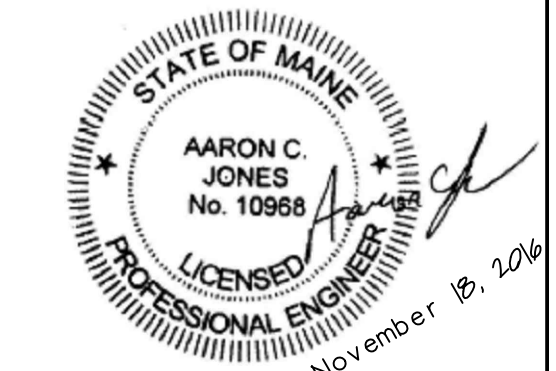


### TYPICAL REINFORCING AT STEPS AND OPENINGS

NO SCALE

### Structural Drawing Index

S-1.0	General Notes, Etc.
S-1.1	Foundation/First Floor Plan
S-1.1D	Foundation Dimension Plan
S-1.2	Second Floor Framing Plan
S-1.3	Third Floor Framing Plan
S-1.4	Fourth Floor Framing Plan
S-1.5	Roof Framing Plan
S-2.1	Sections
S-2.2	Sections
S-2.3	Sections
S-2.4	Sections
S-2.5	Sections
S-2.6	Sections



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