

STRUCTURAL GENERAL NOTES

North School Apartments Community Room
Portland, ME

SI Job #: 16-0187

DESIGN LOADS: International Building Code; IBC 2009 Edition, except as noted
Occupancy Category, Table 1604.5

	II	Standard
Roofs:		
Ground Snow, Pg		60 psf (used for drifting calculations)
Sloped Roof Snow, Ps		61 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	1.1

Floors:	N/A	
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		Partially Enclosed, GCpi=0.55
Exposure		B
Components and Cladding Pressures		DP 45 uno. Also see specs
Seismic Use Group		1
Importance Factor		1.0
Spectral Response	Acceleration	Coefficient
Short Period	Ss 0.314 g	S _{DS} 0.324 g
One Second	S1 0.077 g	S _{D1} 0.123 g
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		1 kip
Seismic Response Coefficient	Cs 0.078	
Response Modification Coefficient R	6.5	
Analysis Procedure		Equivalent Lateral Force

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 1,900 psi based on average net area.
Mortar shall be Type S conforming to ASTM C270.
Masonry cement shall not be used.
Provide full shovled mortar in all head and bed joints.
Admixtures shall not be added for any reason unless approved by the Architect.
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:
coarse grout, as defined by ASTM C476, with a minimum cube strength = 2,000 psi.
3000 psi concrete using 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 with 9 gage side-wires and 9 gage trussed or ladder cross wires.
Reinforcing bars shall be as for reinforced concrete except as noted.
At splices, lap bars 48 diameters.
Provide reinforced grouted vertical cells
at corners, ends of walls, jambs of openings, each side of vertical control joints, and
at spacing shown on drawings.
Reinforcement shall be secured against displacement prior to grouting
by wire bar locators or other suitable devices at intervals not exceeding 200 bar diameters or 10 feet.
Where noted on the drawings,
provide clearance between masonry and structural elements, or
wrap steel with polyethylene film.
Provide vertical control joints in all masonry walls
as located on architectural drawings or
at 25'-0" maximum spacing
at both jambs of openings wider than six feet.
Submit for review
Certificates for materials used in masonry construction indicating compliance with the contract documents
Special Inspection is required by design. See Special Inspection Notes.
MSJC **Level 2** Quality Assurance, MSJC Table 1.14.2
Prism and grout tests will be required prior to the start of masonry work shall consist of five (5) masonry prisms.
Test specimens shall be made by the masons, at the direction of the owner's representative,
with materials and techniques currently being used in the wall.
Specimens shall be protected and field cured for 48 hours before being transported to a testing agency.
The testing agent will be hired by the owner and shall be responsible for laboratory care and curing of specimens, testing, and
reporting results to the owner, contractor, architect, and engineer in accordance with ASTM E447-92

LOOSE LINTELS:
Unless noted otherwise, provide galvanized loose lintels as follows: (One angle for each 4" of wall thickness to bear 6" minimum each end).
Openings to 4'-0: Angle 3-1/2 x 3-1/2 x 1/4
Openings 4'-1 to 5'-4: Angle 5 x 3-1/2 x 1/4
Openings 5'-5 to 6'-6: Angle 6 x 3-1/2 x 5/16

STRUCTURAL STEEL:
Structural steel shall be detailed, fabricated, and erected in accordance with latest AISC Specifications, and Code of Standard Practice.
Structural steel wide flange beams shall conform to ASTM A992.
Except as noted, framed beam connections shall be bearing-type with 3/4" diameter, snug tight, A325-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 E70-electrodes. Where not specifically noted, minimum weld shall be 3/16" fillet by length of contact edge.
All post-installed anchors shall have current ICC 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 ICC 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 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 or Southern Yellow Pine.
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."
Plywood and oriented strand board (OSB) floor and roof sheathing shall be APA graded with panel identification index, thickness, and nailing as noted on the drawings.
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 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 min. 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" 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 joist 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 AITC Timber Construction Manual, 3rd edition.

SHOP DRAWINGS:
Construction Documents are copyrighted and shall not be copied for use as erection plans or shop details.
Use of SI Inc's electronic files as base for shop drawings requires prior approval by SI Inc,
signed release of liability by subcontractor,
payment of an administration fee of \$100 per drawing sheet to SI Inc, and
deletion of SI Inc's name and Logo from all sheets so used.
The General Contractor and his subcontractors shall submit in writing any requests to modify the plans or specifications.
All shop and erection drawings shall be checked and stamped by the General Contractor prior to submission for Engineer's review.
Unchecked submittals will be returned without review.
Furnish one (1) reproducible and two (2) prints of shop and erection drawings to the Structural Engineer for review prior to fabrication for, reinforcing steel, structural steel, pre-engineered trusses, and misc. metals.
Submit in a timely manner to permit ten (10) working days for review.
Shop drawings submitted for review do not constitute "in writing" unless specific suggested changes are clearly marked.
In any event, such changes by means of the shop drawing submittal process become the responsibility of the one initiating such change.

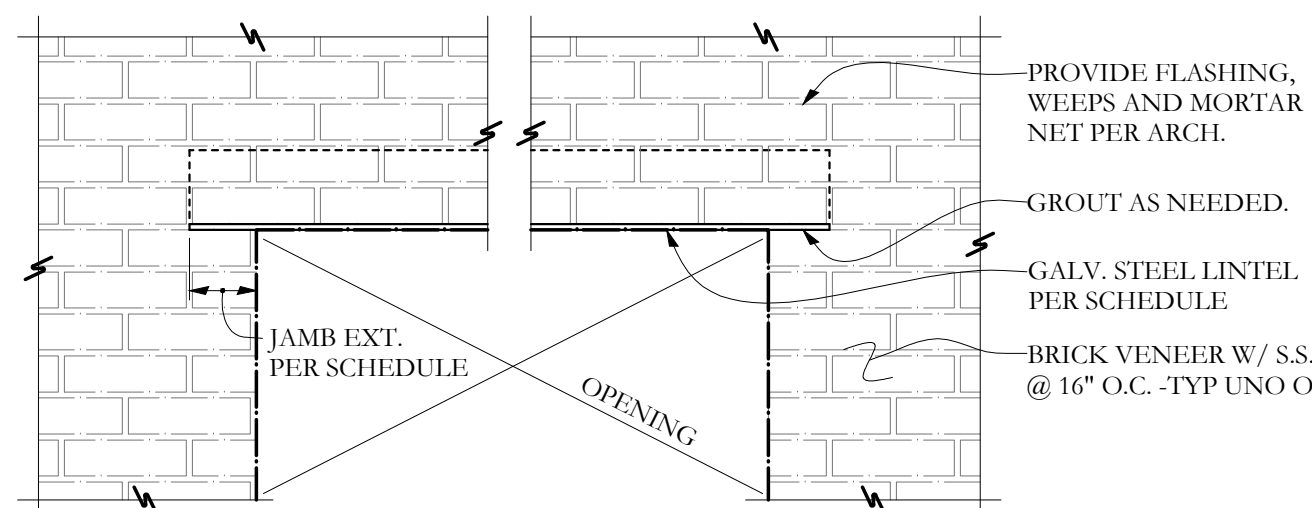
FIELD VERIFICATION OF EXISTING CONDITIONS:
Contractor shall thoroughly inspect and survey existing structure to verify conditions that affect the work shown on the drawings.
Contractor shall report any variations or discrepancies to the Architect before proceeding.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:
The structural drawings illustrate the completed structure with elements in their final positions, properly supported and braced.
These construction documents contain typical and representative details to assist the contractor.
Details shown apply at all similar conditions unless otherwise indicated.
Although due diligence has been applied to make the drawings as complete as possible, not every detail is illustrated, nor is every exceptional condition addressed.
All proprietary connections shall be installed in accordance with the manufacturers' recommendations.
All work shall be accomplished in a workmanlike manner and in accordance with the applicable code and local ordinances.
The general contractor is responsible for coordination of all work, including layout and dimension verification, materials coordination, shop drawing review, and the work of subcontractors.
Any discrepancies or omissions discovered in the course of the work shall be immediately reported to the architect for resolution.
Continuation of work without notification of discrepancies relieves the architect and engineer from all consequences.
Unless otherwise specifically indicated, the drawings do not describe methods of construction.
The contractor, in the proper sequence, shall perform or supervise all work necessary to achieve the final completed structure, and to protect the structure, workmen, and others during construction.
Such work shall include, but not be limited to, bracing, shoring for construction equipment, shoring for excavation, formwork, scaffolding, safety devices and programs of all kinds, support and bracing for cranes and other erection equipment.
Do not backfill against basement or retaining walls until supporting slabs and floor framing are in place and securely anchored, unless adequate bracing is provided.
Temporary bracing shall remain in place until all floors, walls, roofs and any other supporting elements are in place.
The architect and engineer bear no responsibility for the above items, and observation visits to the site do not in any way include inspection of them.

ABBREVIATIONS KEY			
AB	Anchor Rod (Bolt)	EF	Each Face
ADDL	Additional	EJ	Expansion Joint
ADJ	Adjustable	ELEV	Elevation
AF	Above Finished Floor	ELEC	Electric (Electrical)
ALT	Alternate	ENGR	Engineer
AMT	Amount	EQ	Equal
ANCH	Anchor, Anchorage	EQUIP	Equipment
APPROX	Approximate	EQUIV	Equivalent
ARCH	Architect, -ural	ES	Each Side
ATR	All Thread Rod	EST	Estimate
AVG	Average	E-W	East to West
BC	Bottom of Concrete	EXC	Excavate
BL	Break Ledge	EXP	Expansion
BLK	Block	EXT	Exterior
BLKG	Blocking	FND	Foundation
BM	Beam	FF	Far Face, Finished Floor
BOT	Bottom	F-F	Face to Face
BRG	Bearing	FIG	Figure
BW	Bottom of Wall	FL	Flush
CB	Counterbore	FLG	Flange
CF	Cubic Foot	FLR	Floor
CG	Center of Gravity	FO	Face of
CIP	Cast in Place	FP	Full Penetration
CJ	Construction Joint (Control Joint)	FS	Far Side
CLG	Ceiling	FTG	Footing
CLR	Clear	GALV	Galvanized
CM	Construction Manager (Management)	GC	General Contractor
CMU	Concrete Masonry Unit	GEN	General
COL	Column	GL	Glue laminated (Glulam)
COM	Common	GND	Ground
COMB	Combination	GR	Grade
CONC	Concrete	GT	Girder Truss
CONN	Connection	GYP BD	Gypsum Board
COORD	Coordinate, -tion	HAS	Headed Anchor Stud
CONT	Continue (Continuous)	HORIZ	Horizontal
COORD	Coordinate, -tion	HIT	Height
CS	Countersink	ID	Inside Diameter
CTR	Center	IF	Inside Face
CY	Cubic Yard	INT	Interior (Intermediate)
DAB	Deformed Anchor Bar	JB	Joist Bearing
DET	Detail	JST	Joist
DEV	Develop	JT	Joint
DIAG	Diagonal	K	Kip (1,000 lbs.)
DIM	Dimension	LD	Load
DL	Dead Load	LL	Live Load
DN	Down	LLH	Long Leg Horizontal
DP	Drilled Pier	LLV	Long Leg Vertical
DT	Double Tee	LOC	Location
DWG	Drawing	LSL	Laminated Strand Lumber (generic term)
DWL	Dowel	LT	Light
EA	Each	LVL	Laminated Veneer Lumber (generic term)
ECC	Eccentric	RO	Rough Opening
E-E	End to End		
MACH	Machine	SC	Slip Critical
MASY	Masonry	SCH	Schedule
MATL	Material	SDST	Self Drilling Self Tapping
MAX	Maximum	SECT	Section
MB	Machine bolt	SF	Square Foot
MCH	Mechanical	SHT	Sheet
MEZZ	Mezzanine	SITG	Sheathing
MFR	Manufacture, -er, -cd	SIM	Similar
MIN	Minimum	SLH	Short Leg Horizontal
ML	Microfilm (Trus-joist brand LVL)	SLV	Short Leg Vertical
MO	Masonry Opening	SOG	Slab on Grade
MTL	Metal	SP	Spaces
NF	Near Face	SPEC	Specifications
NIC	Not In Contract	SQ	Square
NS	Near Side	ST	Snug Tight
N-S	North to South	STD	Standard
NTS	Not to Scale	STIFF	Stiffener
OCJ	OSHA Column Joist	STL	Steel
OD	Outside Diameter	STRUCT	Structure, -al
OF	Outside Face	SUPT	Support
OH	Opposite Hand	SY	Square Yard
OPNG	Opening	SYM	Symmetrical
OPP	Opposite	T&B	Top and Bottom
OSB	Oriented Strand Board	T&G	Tongue and Groove
PAF	Powder Actuated Fastener	TB	Top of Beam
PC	Precast	TC	Top of Concrete
PCF	Pounds Per Cubic Foot	TD	Top of Deck
PEN	Penetration	TF	Top of Footing
PERP	Perpendicular	THD	Thread
PL	Property Line	THK	Thick, -ness
PLF	Pounds per Linear Foot	TL	Top of Joist
PNL	Panel	TL	Total Load
PP	Panel Point	TPG	Topping
PS	Prestressed	TRANS	Transverse
PSF	Pounds per Square Foot	TS	Top of Shelf
PSI	Pounds per Square Inch	TW	Top of Wall
PSL	Parallel Strand Lumber (generic term)	TYP	Typical
PT (1)	Post Tensioned	ULT	Ultimate
PT (2)	Pressure Treated	UNO	Unless Noted Otherwise
PTN	Partition	VERT	Vertical
PWD	Plywood	VIF	Verify in Field
QTY	Quantity	WA	Wedge Anchor
R	Radius	WP	Work Point
RE	Reference (refer to)	WT	Weight
RECT	Rectangle	WWF	Welded Wire Fabric
REINF	Reinforce, -ed, -ing	XS	Extra Strong
REQ	Required	XSECT	Cross-section
REQMT	Requirement	XXS	Double Extra Strong
RET	Retaining	(E)	Existing
RM	Room	(N)	New
RMO	Rough Masonry Opening	(R)	Remove

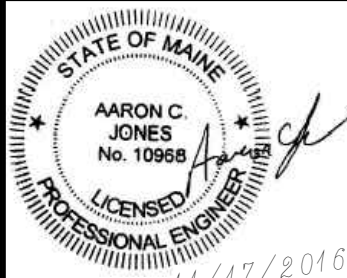
Structural Drawing Index

S1.0	General Notes, Etc.
S1.1	Roof Framing Plans and Details



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

* FOR OPENINGS GREATER THAN LISTED, SEE PLAN.
** ALL TEMPORARY SHORING BY G.C. -TYP.
LINTEL INSTALLATION IN BRICK VENEER
NO SCALE



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Revisions:

Scale: As indicated
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GENERAL NOTES

S1.0