STRUCTURAL GENERAL NOTES

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)
Snow Exposure Factor Ce 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:
Office 50 psf
Corridors/Stairs Occupancy Served

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
Exposure B
Components and Cladding Pressures DP 35 uno. Also see arch.
Seismic: Use Group II
Importance Factor 1.0
Spectral Response Acceleration Coefficient
Short Period Ss 0.24 g SDS 0.261 g
One Second S1 0.071 g SD1 0.189 g
Soils Site Class Table 1615.1.1 D
Design Category Table 1616.3 B
Basic Force Resisting System, Table 1617.6.2
Wodd Framed Shear Walls, etc
Seismic Response Coefficient Cs 0.044
Response Modification Coefficient R 6.5
Analysis Procedure Equivalent Lateral Force

FOUNDATION DESIGN:
Refer to soils report prepared #150083 by Summit Geoenginering Services; dated May, 26 2016. Remove all unsuitable soils and bear on galcial til per soils report. Soils engineer shall verify soil conditions and types during excavation and prior to concrete placement.

--Footings--
Design of footings is based on
Maximum allovable bearing pressure 3,000 psf
Refer to Geotechnical Report, and Civil plans for detailed site information.

CONCRETE AND REINFORCEMENT:

Concrete shall conform to applicable provisions of ACI-301 and 318.
Minimum 28 day compressive strength (F'c) as follows:
Footings and Walls: 3,000 w/ 4-6% air entrainment.
Interior Slabs: 4,000 psi w/ fibermesh
Cement Type: I/II
Deformed reinforcement: ASTM A615 grade 60, except bars specified to be field_bent, stirrups, and ties which shall be grade 40.
Fibermesh: 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 lb. per cubic yard.
Welded Wire Fabric (WWF): ASTM A185. See also plan.
Typical minimum foundation reinforcing: 2 #5 top and bottom, (except as noted) continuous at corners and steps.
Reinforcement shall be fabricated and placed per ACI Manual of Standard Practice (ACI_315). At splices, lap bars 50 diameters unless noted otherwise.
Minimum 2 #5 around all four sides of all openings, extend min. 2'_0 beyond openings.
Concrete cover over reinforcing: 11/2" for concrete placed against forms; 3" for concrete placed against earth. See also drawings.
In continuous members, splice top bars at mid span and bottom bars over supports.
Keep reinforcement clean and free of dirt, oil, and scale. Oil forms prior to placing reinforcement.

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, 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 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, 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 MASONRY:
Concrete masonry units (CMU) ASTM C90-N-1. Horizontal deformed reinforcement shall be placed in precut knock-out bond beam blocks.
* Mortar: Type S or N
* Grout: 2500 psi at 28 days. Vibrate to consolidate.
* Reinforcement: Standard Dur-O-Wall at 16" o.c. in CMU walls and rebar as noted on drawings
Deformed reinforcement shall be as specified for concrete unless otherwise noted, except that laps shall be min. 48 diameter.
If High Lift Grouting is used, cleanout holes shall be provided and bar-positioners shall be located at bottom and at 120 diameter maximum spacing.
* MSJC Level One Inspections are required.

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 SHEATHING SHALL BE OSB SHEATHING AND SHALL BE APA GRADED WITH PANEL IDENTIFICATION INDEX, THICKNESS, AND NAILING AS NOTED ON THE DRAWINGS,
Nail wall sheathing with 8d commons at 6" 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" 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 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.

PLANT FABRICATED / PRE-ENGINEERED WOOD FRAMING:
Trussed floor joists and roof joists shall be designed and stamped by a registered engineer to support the full dead loads and the superimposed design loads noted on the drawings.
All pre-engineered trusses shall be designed for the deflection listed unless noted other on plans:
Floor: Total Load = L/240 or 1" max. Live Load = L/600
Roof: Total Load = L/240 or 1" max. Snow Load = L/300
Stresses shall not exceed those listed in the current NDS. 15% stress increase may not be used.
Web arrangement and member forces shall be determined by the fabricator.
Manufacture and installation of trusses shall comply with
ANSI/TPI 1 "National Design Standard for Metal-Plate-Connected Wood Truss Construction",
TPI HIB "Commentary and Recommendations for Handling Installing and Bracing Metal Plate Connected Wood Trusses",
TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses".
Calculations and shop drawings, including member sizes, lumber species and grades, and substantiating data for connector capacities, shall be submitted to the Architect and Engineer for review prior to fabrication.
Manufactured "I"-series roof and floor joists shall be by TJI/ILevel, LPI, BCI, NJI, OJ with structural wood flanges and webs, and carry Code approval for the composite section.
Bridging and blocking shall be installed according to the fabricator's requirements.
Shop drawings shall be submitted to the Architect for review prior to fabrication.
Beams noted as LVL on plan shall be 1-3/4" wide Laminated Veneer Lumber beams of the depth noted on plan
Shall be plant-fabricated and manufactured by I Level,
Shall have the following minimum allowable design stresses:
Fb = 2600 psi Fv = 285 psi Fc (| |) = 2460 psi Fc(^) = 750 psi E = 1900 ksi
Beams noted as PSL on plan shall be plant-fabricated
Manufactured by I Level, and have the following minimum allowable design stresses:
Fb = 2900 psi Fv = 290 psi Fc (| |) = 2900 psi Fc(^) = 750 psi E = 2000 ksi

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, and wood trusses.
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.

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.

SINGLE-PLATE SHEAR CONNECTION SCHEDULE

CONN. BM. SIZE	# OF 3/4"Ø BOLTS	L (in.)	CONN CAP. (kips)
W8, W10	2	6	8
W12, W14	3	9	16
W16	4	12	26
W18	5	15	36
W21	6	18	46
W24	7	21	56

*ALL BOLTS TO BE ASTM A325 -TYP UNO
TYPICAL SINGLE PLATE SHEAR CONNECTION

STEEL BEAM TO COLUMN CONNECTIONS
N.T.S.

ABBREVIATIONS KEY

AB	Anchor Rod (Bolt)	EF	Each Face	MAC	Machine	SC	Slip Critic
ADDL	Additiona	EJ	Expansion Joint	MASY	Masonry	SC	Schedule
ADJ	Adjustable	ELEV	Elevatio	MATL	Materia	SDST	Self Drilling Self Tapping
AF	Above Finished Floor	ELE	Electric (Electrical)	MAX	Maximum	SECT	Section
ALT	Alternate	ENGR	Engineer	MB	Machine bolt	SF	Square Fo
AMT	Amount	EQ	Equal	MEC	Mechanica	SHT	Sheet
ANCH	Anchor, Anchorage	EQUIP	Equipment	MEZ	Mezzanine	SHTG	Sheathin
APPROX	Approximat	EQUIV	Equivalent	MFR	Manufacture, -er, -ed	SIM	Simila
ARCH	Architect, -ural	ES	Each Side	MIN	Minimum	SLH	Short Leg Horizontal
ATR	All Thread Rod	EST	Estimate	ML	Microlla (Trus-joist brand LVL)	SLV	Vertical
AVG	Average	E-	East to West			SOG	Slab on Grade
BC	Bottom of Concrete	EXC	Excavate	MO	Masonry Opening	SP	Spaces
BL	Brick Ledge	EXP	Expansio	MTL	Metal	SPE	Specifications
BLK	Block	EXT	Exterio	NF	Near Face	SQ	Square
BLKG	Blocking	FND	Foundatio	NIC	Not In Contract	ST	Snug Tight
BM	Beam	F	Far Face, Finished Floor	NS	Near Side	STD	Standar
BOT	Bottom	F-	Face to Face	N-S	North to South	STIFF	Stiffener
BRG	Bearing	FIG	Figure	NTS	Not to Scale	STL	Steel
BW	Bottom of Wall	FL	Flush	OCJ	OSHA Column Joist	STRUCT	Structure, -al
CB	Counterbor	FLG	Flange	OD	Outside Diameter	SUPT	Suppor
C	Cubic Foot	FLR	Floo	OF	Outside Face	SY	Square Yard
CG	Center of Gravity	FO	Face of	OH	Opposite Hand	SYM	Symmetrical
CI	Cast in Place	F	Full Penetration	OPNG	Opening	T&B	Top and Bottom
CJ	Construction Joint (Control Joint)	FS	Far Side	OP	Opposite	T&G	Tongue and Groove
		FTG	Footin	OSB	Oriented Strand Board	TB	Top of Beam
CLG	Ceilin	GA	Gage (Gauge)	PA	Powder Actuated Fast'nr	TC	Top of Concrete
CLR	Clea	GALV	Galvanized	P	Precast	TD	Top of Deck
CM	Construction Manager (Management)	GC	General Contractor	PC	Pounds Per Cubic Foot	THD	Thread
		GEN	General	PEN	Penetratio	THK	Thick, -ness
CMU	Concrete Masonry Unit	GL	Glue laminated (Glulam)	PER	Perpendicula	TJ	Top of Joist
COL	Column	GND	Ground	PL	Property Line	TL	Total Load
COM	Common	GR	Grade	PL	Pounds per Linear Foot	TPG	Topping
COMB	Combinatio	GT	Girder Truss	PNL	Pane	TRANS	Transverse
CONC	Concrete	BD	Gypsum Board	P	Panel Point	TW	Top of Wall
CONN	Connectio	HAS	Headed Anchor Stud	PS	Prestressed	TYP	Typical
CONT	Continue (Continuous)	HORIZ	Horizonta	PS	Pounds per Square Foot	ULT	Ultimate
COORD	Coordinate, -tion	HT	Height	PSI	Pounds per square Inch	UNO	Unless Noted Otherwise
CS	Countersink	ID	Inside Diameter	PSL	Parallel Strand Lumber (generic term)	VERT	Vertical
CTR	Center	IF	Inside Face	PT	Post Tensioned	VIF	Verify in Field
CY	Cubic Yard	INT	Interior (Intermediate)	(2)	Pressure Treated	WA	Wedge Anchor
DAB	Deformed Anchor Bar	JB	Joist Bearing	PTN	Partitio	W	Work Point
DET	Detail	JST	Joist	PWD	Plywood	WT	Weight
DEV	Develop	JT	Join	QTY	Quantity	WW	Welded Wire Fabric
DIAG	Diagona	K	Kip (1,000 lbs.)	R	Radius	XS	Extra Strong
DIM	Dimension	LD	Load	RE	Reference (refer to)	XSECT	Cross-section
DL	Dead Load	LL	Live Load	RECT	Rectangle	XXS	Double Extra Strong
DN	Down	LLH	Long Leg Horizontal	REINF	Reinforce, -ed, -ing		
DP	Drilled Pier	LLV	Long Leg Vertical	REQ	Required	(E)	Existing
DT	Double Tee	LOC	Locatio	REQMT	Requirement	(N)	New
DWG	Drawing	LSL	Laminated Strand Lumber (generic term)	RET	Retaining	(R)	Remove
DWL	Dowel			RM	Room		
EA	Each	LT	Light	RMO	Rough Masonry Opening		
EC	Eccentric	LVL	Laminated Veneer Lumber (generic term)	RO	Rough Opening		
E-	End to End						

STRUCTURAL DRAWING INDEX

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TYPICAL REINFORCING AT STEPS AND OPENINGS
N.T.S.

TYPICAL JOINTS AT INTERIOR SLAB-ON-GRADE
N.T.S.

TYPICAL CONCRETE WALL INTERSECTIONS
N.T.S.

STATE OF MAINE
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PROFESSIONAL ENGINEER

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Revisions:

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

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GENERAL NOTES

S1.0