

GENERAL STRUCTURAL NOTES

14-0177
Harkleroad Residence
Portland, ME.

DESIGN LIVE LOADS: 2009 IBC, MU/EBC

Snow	50 psf (Pg)
Wind	100 mph, exp B, 3 second gust
Floor	40 psf
Deck	40 psf

FOUNDATION:

- New foundations are designed without an engineer's soil investigation. Foundation design criteria was assumed for purpose of foundation design and shall be confirmed by a soils engineer, at owner's expense, prior to construction. (This procedure may require revisions to foundation design, at additional expense to the owner, if soils engineer determines that such design criteria are inappropriate for this building site.)
- Footings shall be placed on undisturbed natural soil or compacted fill tested and approved by soils engineer.
- Maximum design soil pressure: 1,500 psf
- Design lateral soil pressure (equivalent fluid pressure):
- Building retaining walls: 45 psf
- Backfill all retaining walls with free draining granular material except the top two feet.
- Provide perimeter drain system with invert minimum of 6" below top of footings. Extend perimeter drain to daylight or to sump.
- Slope perimeter grade away from building.
- Place concrete continuously without horizontal cold joints.

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 psi 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, filamented 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 (WWD): 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: 1 1/2" 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:

- Angles, misc.: ASTM A36
- Anchor Bolts: ASTM A307 or A36
- Expansion Anchors shall be NER approved, installed in accordance with manufacturers specifications.
- In concrete: Wedge Type
- In solid masonry: Sleeve Type
- Non-shrink grout beneath column base and beam bearing plates shall be non-metallic with minimum compressive strength 5000psi.
- All structural steel shall be fabricated and erected per the current edition of AISC Steel Construction Manual.
- Welding by qualified welders. E70XX electrodes.
- Except as noted, framed beam connections shall be detailed to develop 0.6 x Allowable Uniform Load values tabulated in the 9th Edition AISC Manual, Pp. 2-27 and following.
- All beams shall have fitted web stiffeners welded to each side of webs above and below columns. (1/2" plate or as noted)
- Attach wood nailer plates to beams with 1/2" diameter machine or carriage bolts at maximum 32" o.c., or 3/8" diameter bolts at 32" with glued contact face, or 5/32" diameter powder actuated drive pins at 24" o.c., U.O.N.

WOOD FRAMING:

- Dimension Lumber is designed and shall be supplied using BASE VALUES Design Criteria.
- Hem-Fir #2 and better (Maximum Moisture Content 19%) U.O.N.
- Plates: Sill plates: Pressure Treated Hem Fir or Southern Pine
- "Pressure treated lumber" shall be framing material of the specified species which has been pressure treated with a decay and insect resistant solution, meeting all current standards for wood in contact with concrete or earth.
- Sill plates in contact with masonry or concrete foundations, footings or slabs may be treated Timber Strand LSL (zinc borate treatment). Sodium borate treatment may also be acceptable for sill plate applications when protected from weather.
- Acceptable treatment mediums for wood in contact with earth or in exterior applications include: ACQ-C and ACQ-D (Alkaline Copper Quaternary) and copper azole (CBA-A and CBA-B).
- DO NOT USE WOODS WHICH HAVE BEEN TREATED WITH AMMONIA BASED CARRIERS.
- All connectors shall meet the recommendations of the pressure treated wood manufacturer, but shall be not less than Hot Dipped Galvanized meeting requirements of ASTM A653, such as Simpson ZMAX, (G185). All screws, nails and bolts shall match hangers and other connectors, and shall meet ASTM A123 for individual connectors, and ASTM A153 for fasteners.
- For durability, it is our recommendation that connectors used in exposed conditions with treated lumber be stainless steel.
- Do not mix galvanized and stainless products.
- Do not allow aluminum to contact treated wood.

- Top and Bottom Plates: S.P.F.
- S.P.F. Studs U.O.N: 2 x 4 and 2 x 6 to 8'-0" stud grade
 - 2 x 4 over 8'-0": standard and better
 - 2 x 6 over 8'-0": No. 2 and better
- Floor Joists: SEE PLAN
- Rafters: SEE PLAN
- Laminated Veneer Lumber (LVL): Manufactured 1 3/4" wide Microlam (ML) by Trus Joist or equivalent.
- Flx=2,600 psi, E=1,900,000 psi, Fv=285 psi, depth noted on plans.
- LSL Rim Joists = 1-1/4" x depth indicated laminated strand lumber by Trus Joist. No substitutions.
- 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-I-floor @ 24 inch o.c. tongue & groove glued and nailed (Coordinate with architectural).
- Roof sheathing minimum 5/8" CDX plywood, or 19/32" OSB, APA 40/20, nailed (Coordinate with architectural).
- Wall sheathing: 1/2" CDX plywood or 7/16" OSB, APA 24/16, blocked and nailed (Coordinate with architectural).

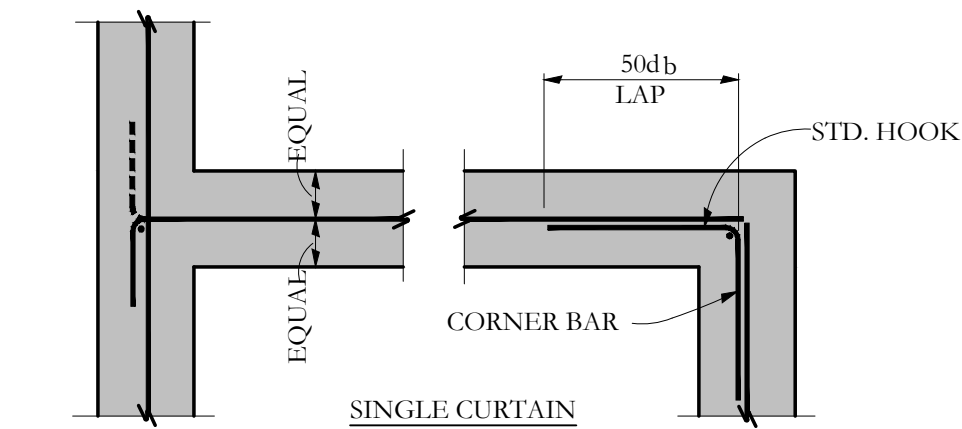
- Nail wall sheathing with 8d commons at 6" o.c. at panel edges, and 12" o.c. intermediate framing U.N.O. BLOCK AND NAIL ALL EDGES BETWEEN STUDS. Sheathing shall be continuous from bottom plate to top plate. Cut in "L" and "T" shapes around openings. Lap sheathing over rim joists min. 4" at all floors to tie upper and lower stud walls together. Minimum height of sheathing panels shall be 16" to assure that plates are tied to studs. Use 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.

SHEATH ALL EXTERIOR WALLS. SHEATH INTERIOR WALLS AS SHOWN ON THE DRAWINGS.

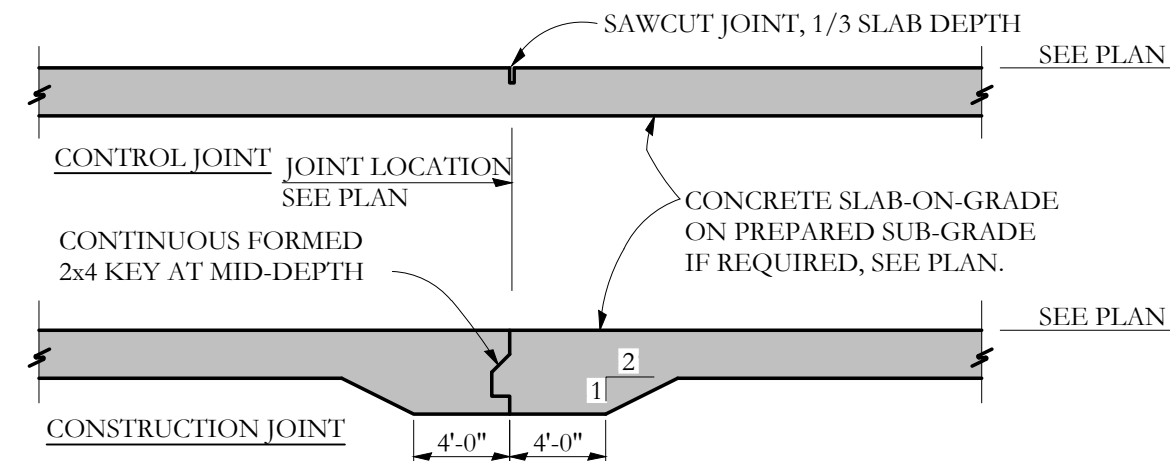
- Minimum nailing shall comply with IBC Table 2304.9.1 except where more or larger nailing shown on drawings.
- All roof rafters, joists, trusses, beams shall be anchored to supports with metal framing anchors. Truss to truss connections specified by truss supplier, unless specifically noted on the drawings.
- Double joists under partitions where joists are parallel to partitions.
- Provide continuous wall studs each side of wall openings equal to one half or greater of number of studs interrupted by openings.
- All wall studs shall be continuous from floor to floor or from floor to roof.
- Cross bridge all dimension lumber roof and floor joists at midspan and provide solid blocking or rim joists at all joint supports and joint ends. Truss supplier shall specify all roof truss bracing and bridging. See prefabricated I-joist recommendations for blocking.
- Solid block between trusses at bearings.
- All prefabricated plywood Web I-type joists shall be installed per the manufacturer's recommendations. Do not cut or notch chords in any manner.
- Holes in webs shall not exceed manufacturer's published limit criteria.
- Metal connectors: Simpson Strong Tie unless otherwise noted, installed with number and type of nails to achieve maximum rated capacity. Note that heavy duty and skewed hangers may require special order.
- All beams shall be braced against rotation at points of bearing.
- Drypack grout all beam pockets full after beams are set.
- 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 bolts shall be 60% to 70% of lag shank diameter in compliance with AITC criteria.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS

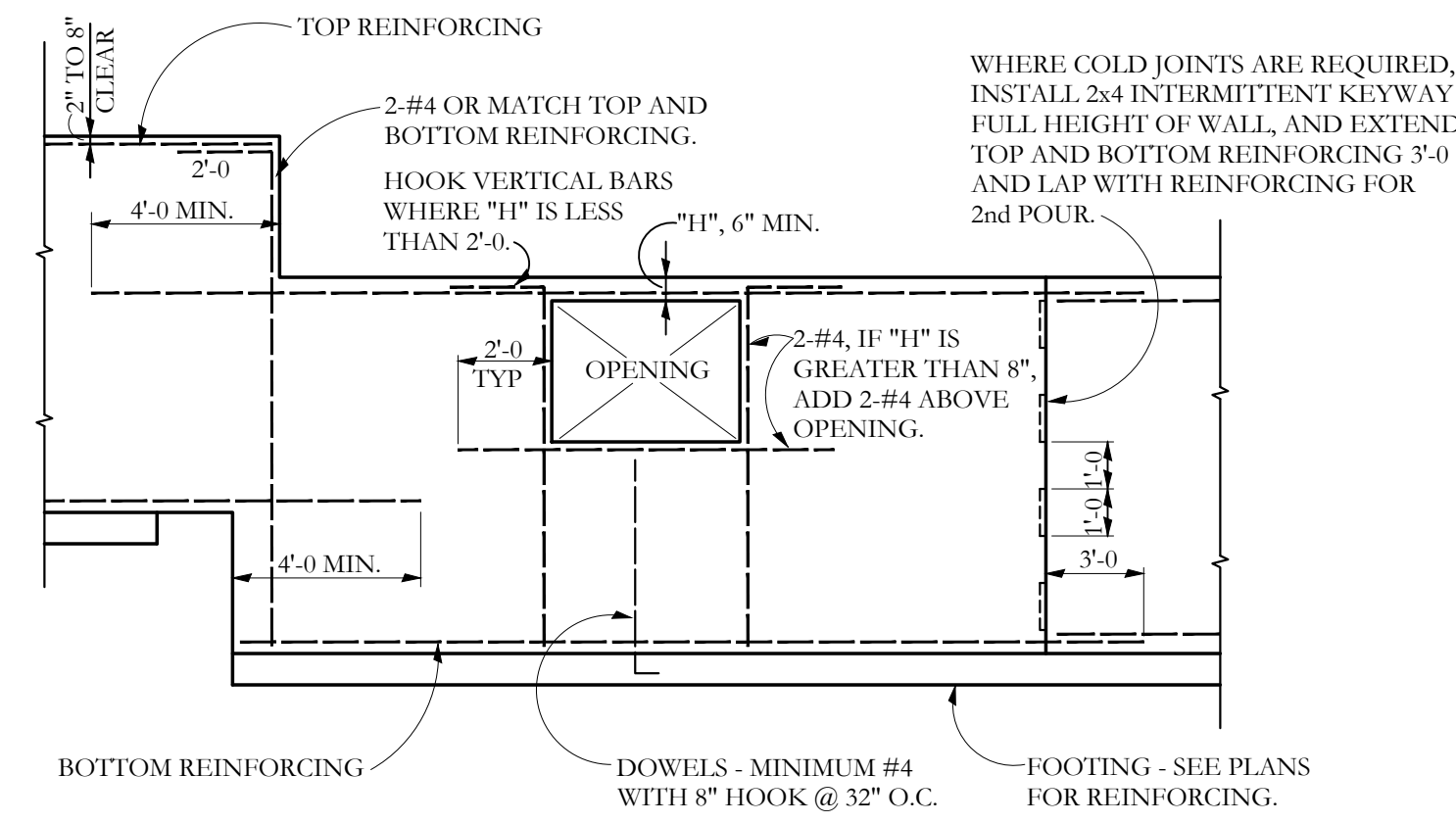
- The structural drawings illustrate the completed structure with all elements in their final positions, properly supported and braced. The contractor, in the proper sequence, shall provide proper shoring and bracing as may be required to achieve the final completed structure.
- These plans have been engineered for construction at one specific building site. Builder assumes ALL responsibility for use of these plans at Any Other building site. Plans shall not be used for construction at any other building site without specific review by the engineer.
- Observations of foundation reinforcing or framing required by the owner, lender, insurer, building department or any other party will be accomplished by the engineer at the owner's expense. At least 24 hours advance notice is requested.
- All slabs on grade shall be separated from adjacent structural and finish elements to allow free movement of the slab, unless specifically shown and noted otherwise.



TYPICAL CONCRETE WALL INTERSECTIONS



TYPICAL JOINTS AT INTERIOR SLAB-ON-GRADE



TYPICAL REINFORCING AT STEPS AND OPENINGS
NO SCALE

ABBREVIATIONS KEY

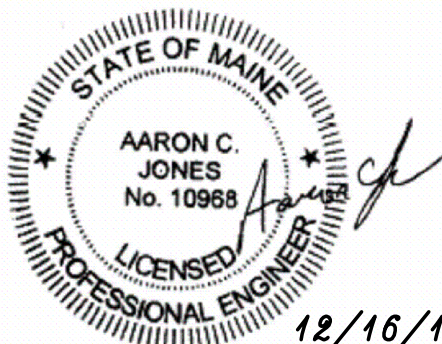
AB	Anchor Rod (Bolt)	EF	Each Face	MACH	Machine	SC	Slip Critical
ADDL	Additional	EJ	Expansion Joint	MASY	Masonry	SCH	Schedule
ADJ	Adjustable	ELEV	Elevation	MATL	Material	SDST	Self Drilling Self Tapping
AF	Above Finished Floor	ELEC	Electric (Electrical)	MAX	Maximum	SECT	Section
ALT	Alternate	ENGR	Engineer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

FRAMING PLAN SYMBOLS KEY

□	WOOD POST
○	STEEL COLUMN
⊗	NUMBER OF WOOD STUDS IN POST BELOW
A	COLUMN ABOVE THIS LEVEL
C	COLUMN CONTINUOUS THROUGH THIS LEVEL
—	JOIST BEARING
—	CONTINUOUS JOIST WITH INTERMEDIATE BEARING
—	FLUSH FRAMED JOIST BEARING WITH HANGER
—	WOOD STUD BEARING WALL BELOW
—	OVER FRAMING BY OTHERS -TYP
—	NUMBER OF TRIM STUDS UNDER HEADER
—	NUMBER OF KING STUDS ADJACENT TO HEADER

Structural Drawing Index

SL0	General Notes, Etc.
SL1	Foundation Plan
SL2	First Floor Framing Plan
SL3	Second Floor Framing Plan
SL4	Roof Framing Plan
SL2.1	Sections / Details



Structural Integrity
Consulting Engineers, Inc.
77 Oak Street
Portland, ME 04101
p. 207-774-6164
f. 866-793-7835
www.structuralintegrity.com

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SL# 14-0177



100 Commercial Street
Suite 205
Portland, Maine 04101
Phone: 207.774.9057
Fax: 207.773.3851
Email: mark@muellerarchitects.com

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MUELLER ARCHITECTS, LLC

HARKLEROAD RESIDENCE

47 HOWARD STREET
PORTLAND, MAINE 04101

REVISIONS

GENERAL NOTES

FOR PRINT

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PROJECT
HARKLEROAD RESIDENCE

DRAWN BY
WJC

CHECK BY
ACJ

S1.0