

STRUCTURAL GENERAL NOTES

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

Roofs:		II	Standard
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 1608.2	1.1	

Floors:		
Corridors & Public Spaces		100 psf
Storage Areas		125 psf
Residential floors		40 psf
Parking		40 psf

Lateral			
Wind	IBC 1603.1.4, ASCE 7-02	Analytical Method	
	3 Minimum Gust Velocity	100 mph	
	Importance Factor	1.0	
	Building Category and Internal Pressure Coefficient		
	IBC 1609.2, ASCE Figure 6-5	Enclosed	GCpi=0.18
	Exposure	C	

Seismic			
Use Group		1	
Importance Factor		1.0	
Spectral Response	Acceleration	Coefficient	
Short Period	S _s	0.24g	0.256g
One Second	S ₁	0.078g	0.125g
Soils Site Class	Table 1615.1.1	D	
Design Category	Table 1616.3	B	
Basic Force Resisting System	Table 1617.6.2	R = 3	
Coefficient of braced frame			
Light Framed Wall with Structural Wood Panels			
Seismic Response Coefficient	Cs	0.046	
Response Modification Coefficient	R	6.5	
Analysis Procedure		Equivalent Lateral Force	

FOUNDATION DESIGN

Refer to soils report no. 13,163, By Summit Geotechnical, dated 11/2013.
Soils engineer shall verify soil conditions and types during excavation and prior to concrete placement.

-Footings--

Design of footings is based on
Maximum allowable bearing pressure 3,000 psf
Bearing on crushed stone blanket on the natural undisturbed soil, bedrock, or compacted structural fill, below frost depth.

-Retaining Structures--

Earth Equivalent Fluid Lateral Pressure:
Restrained Walls (at rest) 50 psf
Passive Resisting 275 psf
Coefficient of Friction 0.55

REINFORCED CONCRETE.

Design is based on "Building Code Requirements for Reinforced Concrete"(ACI 318-05). Concrete work shall conform to "Standard Specifications for Structural Concrete" (ACI 301).
Structural concrete shall have the following properties:

Intended Use	f'c, psi	Max W/C Ratio	Maximum Aggregate	Slump inches	Entrained Air Percent ±.5%	Cement Type	Admixtures, Comments
Footings	3,000	.6	3/4" Stone	4	3%	I/II	
Walls / Piers	4,000	.5	3/4" Stone	4	5%	I/II	
exterior slab on grade	4,000	.45	3/4" Stone	4	6%	I/II	Fibermesh
interior slabs on grade	3,500	.5	3/4" Stone	4	3%	I/II	Fibermesh

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 54 diameters unless noted otherwise.

At corners and intersections, make horizontal bars continuous or providematching 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:

- Cast against and permanently exposed to earth 3"
- Exposed to earth or weather:
 - #6 through #18 bars 2"
 - #5 bar, W31 or D31 wire, and smaller 1-1/2"
- 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"
 - Stimups, ties, spirals 1-1/2"

Fibermesh admixture shall be 100% virgin polypropylene, fibrillated fibers as manufactured by Fibermesh Co. per ASTM C-1116 type 1114.1.3 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.

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

STRUCTURAL STEEL.

Structural steel shall be detailed, fabricated, and erected in accordance with the latest version of 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, 13th Edition. Install bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

All beams shall have full depth 1/4" web stiffeners each side of webs above and below columns. Unless Noted Otherwise.

Anchor rods shall conform to ASTM F1554, Grade 36 (or high strength Gr 55 or Gr 105 as noted), with weldability supplement S1. 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 edges.

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.

Studs shall be SPF No. 2 and better unless noted.

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 SPF No. 1.

Studs shall be SPF No. 2 and better.

Top and bottom plates shall be SPF No. 2 and better.

Wood in contact with concrete shall be pressure-treated SPF 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" "Nailing 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 and in the specs.

Install panels with moisture barrier facing out.

Nail wall sheathing with 10d commons at 6" o.c. at panel edges, and 12" o.c. at intermediate framing except as noted.

SHIELD ALL EXTERIOR WALLS. SHIELD INTERIOR WALLS AS SHOWN ON THE DRAWINGS. BLOCK AND NAIL ALL JOISTS 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 3/8" 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, 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 roof 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.

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.

Stresses shall not exceed those listed in the 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 "P"-series roof and floor joists shall be buy I/JL-level, LPI, BCI, NJI, OI or equal 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 or equal.

Shall have the following minimum allowable design stresses:

F_b = 2600 psi F_v = 285 psi F_c (⊥) = 2460 psi F_c(L) = 750 psi E = 1800 ksi

Beams noted as PSL on plan shall be plant-fabricated.

Manufactured by I Level or equal, and have the following minimum allowable design stresses:

F_b = 2900 psi F_v = 290 psi F_c (⊥) = 2900 psi F_c(L) = 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 bases 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.

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.

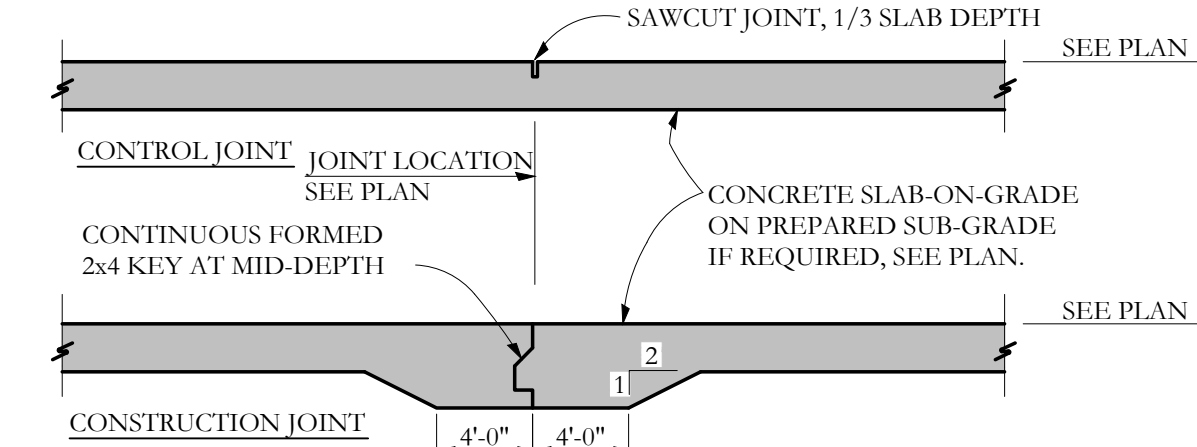
Any discrepancies or omissions discovered in the course of the work shall be immediately reported to the architect for resolution. Continuation of work without notification of discrepancies relieves the architect and engineer from all consequences. Unless otherwise specifically indicated, the drawings 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.

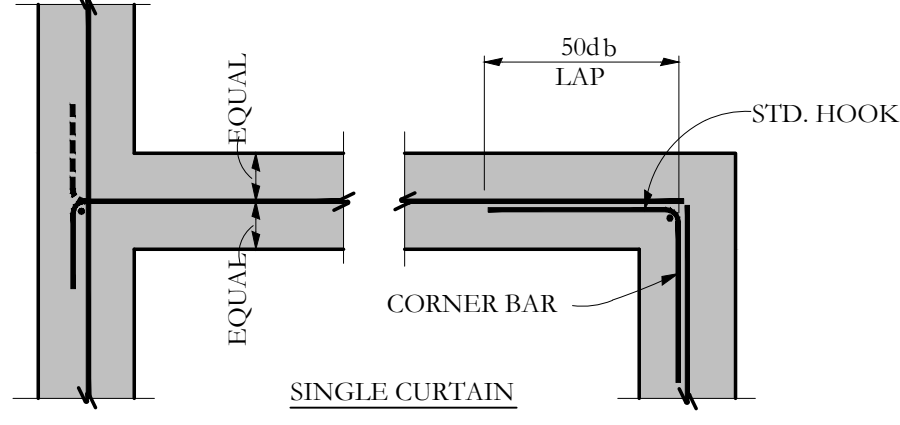
Such work shall include, but not be limited to, bracing, shoring for construction equipment, shoring for excavation, formwork, scaffolding, safety devices and programs of all kinds support and bracing for cranes and other erection equipment.

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.

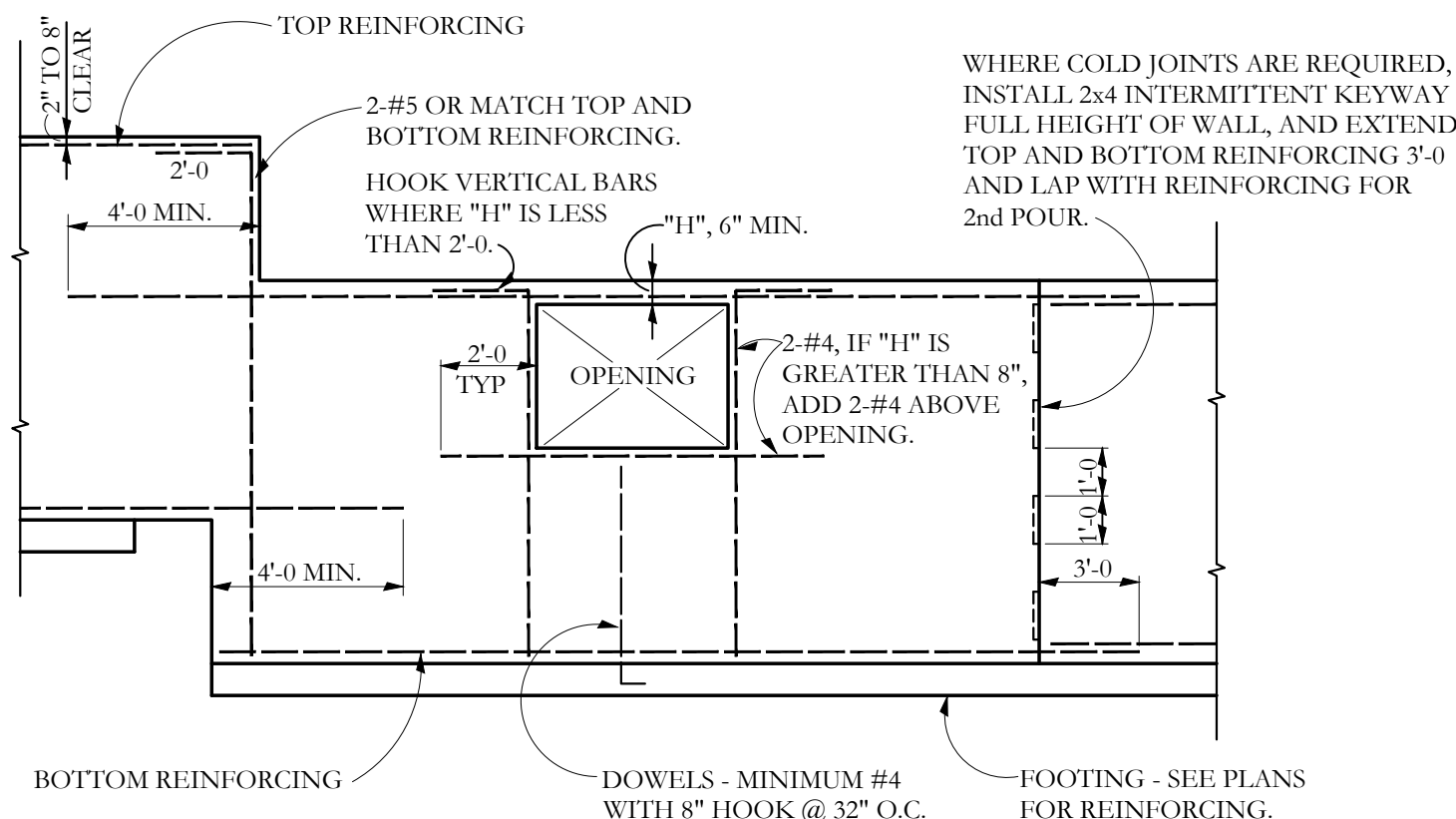
Temporary bracing shall remain in place until all floors, walls, roofs and any other supporting elements are in place. The architect and engineer bear no responsibility for the above items, and observation visits to the site do not in any way include inspection of them.



TYPICAL JOINTS AT INTERIOR SLAB-ON-GRADE



TYPICAL CONCRETE WALL INTERSECTIONS



TYPICAL REINFORCING AT STEPS AND OPENINGS
NO SCALE

ABBREVIATIONS KEY

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