# GENERAL

responsibility of the owner/contractor.

The structural engineer shall arrange a pre-construction meeting to discuss various design requirements and expectations. The owner, superintendent, framer and other design consultants will be required to attend.

The use of these drawings is limited to that identified in the revision column. Any revisions made to the design drawings prior to "issue for tender" & "issued for construction" resulting in construction cost changes are the

Contractors are to ensure they are working from current "Issued for Construction" plans.

The contractor shall check and verify all dimensions and details on the structural drawings for compatibility with architectural and other consultants' drawings before commencing with the work.

These drawings are to be read in conjuction with Architectrual drawings provided by Moore Wilson Architects Inc. All structural specifications to take precedence over architectural.

The contractor shall inform the engineer in writing during the bidding period of any discrepancies or omissions noted on the drawings or in the specifications. Upon receipt of such information the engineer will provide additional instructions. Any such discrepancy, omission, or variation not reported shall be the responsibility of the contractor, and corrective work shall be performed as directed by the engineer

The contractor is responsible for all costs associated with the correction of deficiencies, as determined by the engineer. All dimensions to take precedence over scale shown on plans, sections, and details.

Engineering services presented on these drawings are for permanent structure only. The contractor is responsible for all temporary bracing required for structure stability and for construction loading until the project is completed.

Refer to architecutral/building envelope consultant drawings for all specifications regarding water proofing(roof, exterior walls, below grade foundation walls, suspended slabs, etc). Any special concrete mix designs required for water proofing is the responsibility of the materials consultant

Architectural Design, Electrical, Mechanical, Civil, and Geotechnical Engineering are the responsibility of others.

All formwork, shoring for the excavation, and underpinning of adjacent structures, if required, is the responsibility of the contractor and shall be designed and inspected by others to current Worker's Compensation Board regulations.

The contractor is responsible for safety on the job site during construction and shall ensure compliance to current WorkSave BC regulations.

See mechanical, electrical, and/or manufacturer's drawings for size, location, and anchor bolt requirements of all machine bases and holes in walls and floors. All design of machine and equipment bases responsibility of others, unless specifically detailed on drawings. Subcontractors to furnish templates to general contractor showing anchor bolt location for equipment furnished by them. Co-ordinate with architectural, mechanical, and electrical drawings for openings, slopes, curbs, drainage, and waterproofing, etc.

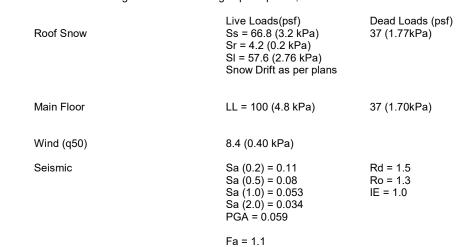
In cases of discrepancies on structural drawings, the more stringent requirements shall govern.

The completed base structural components have been designed to Part 4/Part 9 of B.C. Building Code 2012.

Refer to additional notes regarding "Elements Designed By Others" for items not the direct responsibility of Kerkhoff Engineering.

#### Design Loads

This structure has been designed for the following superimposed, service loads:



#### **ELEMENTS DESIGNED BY OTHERS**

The architectural specifications require the review of a professional engineer for the structural capacity of all non-structural components. These components include interior & exterior steel studding, glazing & windows frames, skylights, guardrails/handrails, and masonry veneer. The design of these components is the esponsibility of the general contractor's subtrades professional engineers. All shop drawings for these items

FV = 1.2

are to be sealed and signed by the professional engineer who is responsible for these items. Canopies may be specified as steel or aluminum framed in accordance with architectural specifications. All canopies to be designed by canopy contractor, to resist code snow loads and wind loads. Sealed shop

drawings shall be submitted for review prior to fabrication. All shop drawings shall be submitted to Kerkhoff Engineering for review prior to fabrication. Shop drawings

not bearing the seal of a Professional Engineer Registered in BC will not be reviewed. The sub-consultant shall submit schedules B & C-B upon satisfactory completion.

Kerkhoff Engineering has designed the base structure to support the intended load of the secondary between the base structure and secondary components so as not to provide additional rigidity to the primary structural resisting system. Expansion & deflection mechanisms shall be built into the structure, and shall be clearly shown on component drawings.

# FOUNDATIONS

foundation area.

Foundation design based on the following Geotechnical report provided by GeoNorth Engineering Ltd. Project No. K-4485 dated September 30, 2016.

Soil bearing pressure	SLS = 3133 psf (150 kPa) ULS = 4700 psf (225 kPa)	
Site Class	D	

Prepare site for foundations in accordance with geotechnical report recommendations. Copies of all field review reports and materials testing (compaction tests, etc.) shall be forwarded to Kerkhoff

Engineer minimum 24 hrs. prior to placement of concrete and/or backfilling Soil conditions to be inspected by the geotechnical engineer to verify the conditions and confirm the allowable

bearing pressure after excavation and prior to construction of formwork for foundations. Site report and recommendations shall be forwarded to Structural Engineer.

Approval to pour concrete during an inspection does not imply assurance of assumed bearing capacity or subgrade conditions used in the structural design of footings and foundations for this project.

Bottom of footings to be minimum 18" below final finished grade for frost cover.

Footing elevations and sizes are subject to revision where site conditions differ from anticipated soil conditions. Where footings are stepped down for mechanical and electrical services (where allowances have not been provided for in the drawings), additional structural requirements may be required at the discretion of the engineer.

All footings to bear on firm, undisturbed material. Grass, roots, top soil, etc., are to be removed from

Footings or slab-on-grade bearing on compacted, granular structural fill shall be compacted to a standard proctor as outlined in the geotechnical engineer's report. Standard proctor value to be verified by compaction testing and results to be submitted to the enginee

All footings shall be centred below walls and columns unless detailed otherwise. Dowels to match vertical

Backfill walls only after a minimum of 7 days following the completion of interior level floor system (unless walls are adequately braced) with clean, free-draining, moderately compacted, granular material or as specified by the geotechnical engineer and slope grade to drain away from building.

Coordinate with architectural and other consultants' drawings for ground elevations, openings, drainage slopes, waterproofing, etc.

#### Inspection of foundation drainage, waterproofing, excavation and shoring is the responsibility of others. CONCRETE EMBEDMENTS

Install conduits and ducts embedded in concrete in accordance with the following guidelines except with the approval of the Structural Engineer. Conduits

Locate between reinforcing steel layers. Maximum size in one layer to be 1/3 of the concrete slab thickness. Maximum size in two layers crossing to be 1/4 of the slab thickness. Crossing of three lavers will not be permitted Clear space between parallel conduits shall be one diameter or 1 1/2" minimum horizontally and vertically. 2 Ducts Locate between reinforcing steel layers Maximum size to be 1/3 of the slab thickness. Crossing of ducts will not be permitted. Clear space between ducts to be 12". The maximum size of conduit or fittings not to exceed 4 percent of the column area. Embedded piping will not be allowed unless approved by Engineer. 4.

Beams The maximum size of conduit not to exceed 4 percent of the area. Sleeves and embedded piping as directed by Engineer.

Co-ordinate with architectural and mechanical drawings for openings curbs sleeves waterproofing etc. The contractor shall provide 1000 pounds of 15M steel reinforcement for the engineer to use at his discretion during construction. The contractor shall reimburse the owner for the unused portion.

# CONCRETE

<b>CONCRETE</b> Provide concrete and perform work to CAN/CSA A23.3-14. Provide copy of standard at site for reference. The contractor shall arrange for the taking and testing of concrete cylinders by an independent testing agency in	Cross-lap strip footing steel 300 mm (12") minimum at corners or provide corner bars. 2) All walls and columns shall be doweled into footings, walls, beams, or slabs with bars of the same size and spacing	And me pro
accordance with CAN/CSA-A23.1-14 at the expense of the contractor. A minimum of 3 test cylinders shall be cast for each 100 c.m. (minimum 3 test cylinders for each day's pour), and each class of concrete. Test 1 cylinder at 7 days and 2 cylinders at 28 days. One cylinder shall be field cured and tested at 7 days. Copies of all concrete test results to be sent the structural engineer.	ch as the bars above. Unless noted, provide:	sha per esr inst eva
CONCRETE MIX REQUIREMENTS         LOCATION       COMPRESSIVE       SLUMP       MAX AGG.       AIR       EXP         STRENGTH       +/- 19 mm (3/4")       SIZE       CLASS	<ol> <li>Two 15M bars at all free edges of suspended slab.</li> <li>Two 15M bars around all wall and slab openings extending 600 mm (2'-0") past corners, plus</li> <li>2-15M by 1200 mm (4'-0") diagonal bars at corners and placed at centre of wall or slab.</li> </ol>	Inst
Foundation & footings         3600 PSI (25MPa)         19 mm (3/4")         3/4"         4-7%         F2           Int'r Columns & Walls         3600 PSI (25MPa)         19 mm (3/4")         3/4"         1-4%         F2	4) Install column reinforcement accurately with templates. 5)	Ove
Ext'r Columns & Walls       3600 PSI (25MPa)       19 mm (3/4")       3/4"       1-4%       F2         Int'r S.O.G. General       4350 PSI (30MPa)       19 mm (3/4")       3/4"       1-4%	Hooks shown are to be CSA standard hooks, unless otherwise noted.	The trai doc
Tilt         4350 PSI (30MPa)         19 mm (3/4")         3/4"         4-7%         F2	Unless shown otherwise: 1. Top reinforcing in slabband to be centered over columns. 2. Top slab reinforcing to be centered over slabband. 6)	to t And
All concrete normal weight 2400 kg/m3, type 50 sulphate resistace cement, type F flyash, unless otherwise noted. Slumps noted are before the addition of superplastisizer.	3. Bottom reinforcing to be centered between supports except at end spans where all bars shall extend a minimum of 150 mm (6") into exterior supports.	edg dra
No more than 120 minutes shall elapse between concrete batching and concrete placement unless approved by the testin agency and the structural engineer. Contractor's superintendent to monitor this period. Testing agency has the authority		Exi: Unl
reject concrete if not in accordance with specifications. Do not use admixtures other than air entrainment and standard water reducers or superplastisizers.	Grade         Thickness (Min)           Roof         D.Fir         13 mm (1/2") + "H" clips	stru of ti <b>\MIN</b>
Maximum chloride as to CAN/CSA-A23.1-14. Concrete temperatures as delivered shall comply with Table 14 of CAN/CSA	Walls OSB (structural) 10 mm (3/8")	nber wor
A23.1-14. Provide storage facility on site for the initial 24 hour curing of test cylinders.	rated OSB shall conform to CSA Standard 0437 All fram	-
The contractor shall be responsible for design of all formwork. Forms shall be built of sufficient strength and rigidity to car the weight or fluid pressure of the concrete and additionally all construction loads including those due to wind, equipment, and runways. The forms shall be clean and free of any accumulation of debris. All water shall be removed from the place concrete deposit.	warranty requirements prior to pricing or construction. All thicnesses/grades specified on structural drawings are responsible position       responsible position         a of       Equivalent panel marks for CSA 0325 construction sheathing       Provide	ilers are nsible fo sitioned de conti
Provide 19 mm (3/4") chamfer on all exposed column corners. Unless noted otherwise, slabs and beams shall be camber 3 mm (1/8") for each 2400 mm (8'-0") of span.		de doub Provid
Compact concrete throughout with mechanical vibrators. Work concrete around all embedded material and into corners o forms. Embedded material shall be free from grease, scale and other coatings.	16 2R40/2F20 suppor of Provide a minimum gap of 2mm shall be left between panels to accommodate swelling. Provide	orts for c de solid
All hot and cold weather concrete work to be carried out in accordance with CAN/CSA-A23.1-14. When temperature is	Minimum nailing of plywood sheathing on walls, roofs and floors (unless noted otherwise on plans):	el with t
expected to fall below 0 degrees Celsius within 3 days of pouring concrete, the Contractor shall notify the Engineer of the following:	63 mm (2 1/2") nails @ 300 mm (12") o/c intermediate support members (Staples are not permitted u.n.o.) Pressu	ure bloc
<ol> <li>Provisions for heating fresh concrete</li> <li>Provisions for heating concrete in forms</li> <li>Alterations to mix design</li> </ol>	Sawn timber to be SPF #2 or better u.n.o.o/c or la(8) 80 r	
<ol> <li>Provisions for curing</li> <li>Concrete shall be protected from all harmful effects during construction. Concrete shall be cured by approved means for</li> </ol>	All sawn timber exposed to the exterior or in contact with concrete to be given a preservative treatment approved by the designer. (This treatment to be a minimum of 2 coats of green cuprinol or equivalent). Strongt	
least 5 days subsequent to pour.	Building Movements: Although attempts of specifying and designing with all structural wood components to be 19% or less in moisture content, wood will dry up to 9% in services. Under these circumstances, wood will shrink. Also under load conditions, structural elements will deflect. Although within the allowable limits as outline in the Building Code, the All build	
Cold Weather Requirements:       1.       Place and protect concrete in accordance with CAN/CSA-A23.1-2000.         2.       Air Temperature not below 5 degrees Celsius.	movements induced by loads or shrinkage will damage brittle finishes attached directly to structural elements. Movement (16") o/ joints including water proofing for these brittle finishes shall be provided by a building envelope specialist.	o/c min.
<ul> <li>a. If concrete temperature drops below 10 degrees C at point of pouring, the mixing water shall be heated to maintain a minimum concrete temperature of 10 degrees</li> <li>b. Concrete shall not be placed on or against any surface which is at a temperature</li> </ul>	SC. Any lumber not grade marked will be rejected.	am splie ilt-up be
<ul> <li>less than 5 degrees C.</li> <li>c. Contractor shall be prepared to cover slab if air temperature falls below 5 degrees</li> <li>3. Air Temperature below 5 degrees C but not below 0 degrees C</li> </ul>	s C. Design prefabricated wood trusses in accordance with B.C.Building Code 2012 Part 4, CSA 086, TPIC Cantile standards, and Local Bylaws. Design trusses for unbalanced loading in accordance with B.C.B.C Structural	evered
<ul> <li>a. Forms and steel shall be free from ice and snow.</li> <li>b. Mixing water shall be heated to give to a minimum concrete temperature of 10 degrees C at point of pour.</li> </ul>	Commentaries.	nate stud erally ur
<ul> <li>c. Concrete shall not be placed on or against any surface which is at a temperature less than 5 degrees C.</li> <li>d. Slabs shall be covered with canvas or similar, kept a few inches clear of surface.</li> </ul>	and/or beams to be engineered by manufacturer to design loads specified plus snow build up as per B.C.B.C. 2012	2 pl
<ul><li>e. Storey below slab shall be enclosed.</li><li>f. Protection shall be maintained for at least 5 days.</li></ul>	See General notes for design load requirements.	3 p
<ul> <li>Temperatures below 0 degrees C (See item iii above for a, b, c, d.)</li> <li>a. Storey below shall be enclosed and supplementary heat provided.</li> <li>b. Heating to be started at least one hour ahead of pouring and maintained</li> </ul>	In addition, the Truss manufacturer shall design trusses for: Mechanical unit weights specified by mechanical subcontractor/mechanical engineer.	0 0
for a minimum of 3 days after. c. Temperature of the concrete at all surfaces shall be kept at 10 degrees C for 7 da d. Enclosure to be constructed so that air can circulate around all structural member	Ays.       Camber to be equal to dead load deflection u.n.o         Ays.       Live load deflections shall not exceed span/360 for roof trusses u.n.o.         rs.       All canopy areas to be designed for a minimum net uplift pressure of 0.96 kPa (20 psf).	4 pl
Hot Weather Requirements 1. Place and protect concrete in accordance with CAN/CSA-A23.1-2000. When air temperature is great than 25 degrees C, protect concrete so that its temperature does not exceed 30 degrees C.		e sheath ") nails
2. Protect from drying, which causes shrinkage cracking, by effective means as required by conditions. Effective measures include windshield, dampen, cover, place and finish at night.	hardware required for stability of the truss or joist assembly, including details for bearing, where required 1200 m	adbearin mm (4'-
Do not remove forms for footings and walls until a minimum of 48 hours after placing concrete and after the concrete has attained a strength of at least 10 MPa. Forms for suspended slabs may be removed and reshoring installed after the concrete has attained at least 75% of the specified strength. Strength of concrete at time of stripping forms to be determined at least 75% of the specified strength.	ned Submit 2 sets of shop drawings and layout drawings to engineer for review minimum 10 working days prior to	n non-lo
by testing field cured concrete cylinders. Recess walls to full width of wall where required to support beams.	fabrication and start of any framing. Drawings must include: Provide	de cripp de backi
Construction joints to be keyed and doweled. Joints below grade to have continuous 150 mm (6") P.V.C. "RB6-316" waterstop. The location of construction joints shall be approved by the engineer and additional reinforcement and keys	Truss/joist layout cross referenced to individual shop drawings. 2-2x10 Professional Engineer's original seal registered in B.C.	0 KD SI ure Trea
added as requested. All concrete slabs on grade shall be placed on 6 mil polyethylene lapped 300 mm (12"), on 150 mm (6") minimum approve	Changes to truss/joist types and layouts to those indicated on drawings may require additional review and Pressu structural revisions at the expense of the contractor.	ure trea
granular material compacted to geotechnical engineers' recommendations (minimum 95% standard proctor density). Provide 3 mm (1/8") by 32 mm (1 1/4") DP. perforated or sawcut control joints around columns and at 6000 mm (20'-0") o/ maximum spacing.	The manufacturer shall inspect the truss/joist installation and provide sealed engineer's certificate, certifying be stain that the trusses and joists have been manufactured in accordance with the truss design and CSA standards and that all bracing, hangers, lavout and applicable details have been installed as per approved shop As a m	ainless s ninimur d galvar
Openings in slabs to be as far away as possible from columns. No openings or cans for pipes in any case to be closer the 400 mm (16") to face of column without prior approval from the engineer. Reinforcing at openings shall not be cut or bent but shall be fanned where possible or crowded to either side to clear opening.	GLUE LAMINATED TIMBER (GLULAM)	facture i uilding l
REINFORCING REQUIREMENTS	Glulam members shall be Douglas Fir 24f-E stress grade with quality appearance grade. Industrial type of appearance grade may be used where beams are to be concealed	of corros
Use clean new deformed reinforcing bars conforming to CSA G30.18, grade 400 MPa unless noted. Welded wire fabrics CSA G30.5. At the engineer's discretion, rebar mill certificates shall be provided. Reinforcement that is suspect may be	to Glulam shall be manufactured in conformance with CAN/CSA 0177 stainles	ess con
required to be tested as directed by the engineer at the expense of the contractor. Fabricate and place reinforcing steel to CAN/CSA-A23.1-14.	Affix authorized label to all members supplied. Also identify each member with mark number	cation ai
All reinforcing steel to be secured in final position before concrete is placed. Support reinforcing steel on approved support spacers, or hangers provided. Maximum free end of reinforcing bars to be 1200 mm (4'-0"). Where concrete surfaces are	e to until permanent protection from the weather is in place, but cut holes on underside of wrapping to prevent the	Gei Sta
be exposed, only non-corrosive type reinforcing chairs shall be used to support reinforcing. Reinforcing steel must be inspected by the Engineer before concrete is placed. Formwork shall be inspected by Temporary Works Engineer and copies of report to be forwarded to Kerkhoff Engineering Ltd.	All pressure treated glulam to be treated according to CAN/CSA 080 Series M-89 "Wood Preservation". Treat	ural ste weldin
Any reinforcing substitutions to welded wire mesh must be reviewed and confirmed by Kerkhoff Engineering Ltd.	using CCA Vacuum Pressure impregnation to be 0.4pcf or to refusal. All cutting and drilling to be completed C.W.B. before the treatment. Field apply preservative to equivalent standard to all areas to be cut or drilled.	3. to CS
Clear concrete cover for reinforcing (unless otherwise noted):	shall be	pear the ections a
Footings (Top and sides)	a. Anchorage to concrete Materia 1. Adhesive anchors for cracked and uncracked concrete use:	1.
Walls outside face and exposed surfaces50 mm (2") Beams to stirrups	<ol> <li>HILTI HIT-HY 200 safe set system with the hilti hit-z rod per icc esr-3187</li> <li>HILTI HIT-HY 200 safe set system with hilti hollow drill bit (te-cd</li> </ol>	2. 3. 4.
Slabs top and bottom19 mm (3/4") Designation of reinforcing bars:	or te-yd) and vc 20/40 vacuum (vc 20-u or vc 40-u) system with has-e threaded rod per icc esr-3187 3. HILTI HIT-RE 500V3 safe set system with hilti hollow drill bit (te-	5. 6.
(solid line) denotes top steel or near face of wall (dashed line) denotes bottom steel or far face of wall	cd or te-yd) and vc 20/40 vacuum (vc 20-u or vc 40-u) with has-e threaded rod per icc esr-3814	0. 7. 8.
Straight bar lengths:4-15M 5000 means 5-15M bars 5000 long (metric)4-15M 10.9 means 4-15M bars 10'-9" long (imperial)	ii) Medium duty mechanical anchors for cracked and uncracked concrete use:	nnectior
Splice Reinforcement as follows (unless otherwise noted):         Bar       Comp         Tension Splice	esr-3027 be desi 2. HILTI KWIK BOLT-TZ expansion anchors per icc esr-1917 U.D.L.	0
Size Splice Concrete Strength 20MPa 25MPa 30MPa 35MPa		de minir side of l
10M         450 mm (18")         525 mm (21")         475 mm (19")         450 mm (18")         450 mm (18")           15M         475 mm (19")         750 mm (30")         675 mm (27")         625 mm (25")         575 mm (23")           20M         575 mm (23")         925 mm (37")         825 mm (33")         750 mm (30")         700 mm (28")	1.       HILTI HDA undercut anchors per icc esr 1546       momer         2.       HILTI HSL-3 expansion anchors per icc esr 1545       Shern diagonal	ent conn drawing
25M         725 mm (29")         1500 mm (60")         1350 mm (54")         1225 mm (49")         1125 mm (45")           30M         875 mm (35")         1775 mm (71")         1600 mm (64")         1450 mm (58")         1350 mm (54")           35M         1050 mm (42")         2125 mm (85")         1900 mm (76")         1725 mm (69")         1600 mm (64")	1.       Adhesive anchors for cracked and uncracked concrete use:       Columb         1.       HILTI HIT-HY 200 safe set system with hilti hollow drill bit (te-cd       Boview	nbia who w of sho
Welded wire mesh 300 mm (12").	continuously deformed rebar per icc esr-3187require2.HILTI HIT-HY 500V3 safe set system with hilti hollow drill bit (te-to be a	ed by a
No splices are permitted without the engineer's approval where the length of bars has been given on the drawings. All slabs to have temperature steel perpendicular to and immediately above slab bottom reinforcing as follows:	cd or te-yd) and vc 20/40 vacuum (vc 20-u or vc 40-u) system with continuously deformed rebar per icc esr-3814 ULT LITE RE 500V3 safe set exetom with bit i roughoping tool (bit welds/c	khoff Er /compo
greater than 150mm-180 mm (6"-7") slab 10M @ 300 mm (12") o/c l 15M @ 500 mm (20") o/c	rt) with continuously deformed rebar per icc esr-3814 in diamond cored holes Anchorage to solid grouted masonry.	mburse
greater than 180 mm-200 mm (7"-8") slab       10M @ 10" o/c I 15M @ 500 mm (20") o/c         greater than 200 mm-230 mm (8"-9") slab       15M @ 430 mm (17") o/c         greater than 230 mm-250 mm (9"-10") slab       15M @ 380 mm (15") o/c         state them them 250 mm (9"-10") slab       15M @ 250 mm (4") o/c	c) Anchorage to solid grouted masonry anchor 1. Adhesive anchors use: 1. HILTI HIT-HY 70 masonry adhesive anchoring system (icc	or bolts r
greater than 250 mm-280 mm (10"-11") slab 15M @ 350 mm (14") o/c greater than 280 mm-300 mm (11"-12") slab 15M @ 300 mm (12") o/c	ponding)	lded he llet weld
Temperature reinforcement shall have a lap of 18" and splices in adjacent bars shall be staggered to be no less than 1200 mm (4'-0") apart.	ii) Mechanical anchors use: 1. HILTI KWIK BOLT-3 expansion anchors per icc esr 1385 Anchoremente to hollow (multi watthe measure)	
All concrete to be reinforced. Reinforce unspecified slab areas with 15M @ 450 mm (18") o/c each way bottom. Minimum wall reinforcing (including planters, sumps, pits, trenches, architectural walls, etc.) unless noted otherwise:	Adhesive anchors use:     up welc     I. HILTI HIT-HY 70 masonry adhesive anchoring system per icc	
150 mm (6") wall 10M @ 450 mm (18") E.W. 200 mm (8") wall 15M @ 500 mm (20") E.W. 250 mm (10") wall 15M @ 100 mm (16") E.W.	esr-3342. Hot dip 2. Steel anchor element shall be hilti has-e continuously threaded rod or continuously deformed steel rebar Erectio	p galva on brac
250 mm (10") wall       15M @ 400 mm (16") E.W.         300 mm (12") wall       15M @ 500 mm (20") E.W./E.F.	3. The appropriate size screen tube shall be used per adhesive	anges o
	wood n No bur	nailers

Provisions for heating fresh concrete
Provisions for heating concrete in forms
Alterations to mix design
Provisions for curing

NCRETE									
ide concrete and perform work to CAN	CSA A23.3-14. Provide co	py of standard at site	for reference		Cross-lap strip foo	ting steel 3	300 mm (12") minimum a	at corners or provide corner bars.	2) And met
contractor shall arrange for the taking a rdance with CAN/CSA-A23.1-14 at the	expense of the contractor.	A minimum of 3 test	cylinders sha	ll be cast for each	as the bars above.		be doweled into footings,	, walls, beams, or slabs with bars of the same size and spacing	pro sha
c.m. (minimum 3 test cylinders for each ders at 28 days. One cylinder shall be tructural engineer.					Unless noted, prov 1.		pars to match horizontal	wall reinforcement at all wall intersections.	per esr inst
CRETE MIX REQUIREMENTS					1. 2. 3.	Two 15M	<i>I</i> bars at ends of walls. <i>I</i> bars at all free edges o		eva
ATION COMPRESS STRENGT		MAX AGG. SIZE	AIR	EXP CLASS	4.	Two 15M	/I bars around all wall and	d slab openings extending 600 mm (2'-0") past corners, plus nal bars at corners and placed at centre of wall or slab.	3) Inst
dation & footings 3600 PSI (25	MPa) 19 mm (3/4")	3/4"	4-7%	F2	Install column rein	forcement	accurately with template	es.	4) Ove
Columns & Walls 3600 PSI (25 Columns & Walls 3600 PSI (25	, , , ,	3/4" 3/4"	1-4% 4-7%	F2 F2	Hooks shown are t	to be CSA	standard hooks, unless	otherwise noted.	5) The train
S.O.G. General 4350 PSI (30	, , , ,	3/4" 2/4"	1-4% 4-7%		Unless shown othe 1.		forcing in slabband to be	e centered over columns.	doc to t
4350 PSI (30 oncrete normal weight 2400 kg/m3, typ	, , , ,	3/4" nent, type F flyash, ur		F2 e noted.	2. 3.	Top slab	reinforcing to be center		6) And edg
ps noted are before the addition of sup	perplastisizer.					extend a	a minimum of 150 mm (6	") into exterior supports.	dra
nore than 120 minutes shall elapse bet							<b><u>NN TIMBER</u></b> oor, Walls) Structural or	approved equal	7) Exi Unl
cy and the structural engineer. Contra t concrete if not in accordance with spe		nitor this period. Test	iting agency h	as the authority to	Roof	j (1001, 110	Grade D.Fir	Thickness (Min) 13 mm (1/2") + "H" clips	
ot use admixtures other than air entrair	ment and standard water re	educers or superplast	tisizers.		Floor Walls		D.Fir OSB (structu	16 mm (5/8") T&G	FRAMIN
mum chloride as to CAN/CSA-A23.1-1 1-14.	4. Concrete temperatures a	s delivered shall com	ply with Table	e 14 of CAN/CSA-	All D.Fir plywood s	hall confo	Υ.	SA Standard 0121, and softwood to CSA Standard 0151. Design	All timber wor
ide storage facility on site for the initial	24 hour curing of test cylind	ders.					CSA Standard 0437		All framing de
contractor shall be responsible for desi					warranty requireme	ents prior t		be confirmed satisfactory for architectural, building envelope, and n. All thicnesses/grades specified on structural drawings are	responsible for
reight or fluid pressure of the concrete unways. The forms shall be clean and					minimum requirem		CSA 0325 construction s	shoothing	be positioned
rete deposit.					Equivalent parlern		n nominal thickness (mm		Provide contin Provide doub
ide 19 mm (3/4") chamfer on all expose n (1/8") for each 2400 mm (8'-0") of spa		noted otherwise, slabs	s and beams	shall be cambered		13 16		2R32/2F16 or 1F16 2R40/2F20	span. Provid supports for c
pact concrete throughout with mechani s. Embedded material shall be free fro			ed material ar	nd into corners of	Provide a minimur		mm shall be left betweer	n panels to accommodate swelling.	Provide solid
ot and cold weather concrete work to be	0	0	1-14 When te	emperature is		0 1		is and floors (unless noted otherwise on plans):	parallel with the
cted to fall below 0 degrees Celsius wi ving:					-	63 mm (2 63 mm (2	2 1/2") nails @  150 mm 2 1/2") nails @ 300 mm	n (6") o/c at sheet edges. (12") o/c intermediate support members	All floor joists
1. Provisions for heating f	resh concrete					、 ·	are not permitted u.n.o.	)	Pressure bloc o/c or laminat
<ol> <li>Provisions for heating of</li> <li>Alterations to mix designation</li> </ol>	oncrete in forms				Sawn timber to be				(8) 80 mm (3
4. Provisions for curing								with concrete to be given a preservative treatment approved by th ts of green cuprinol or equivalent).	e Use approved Strongtie LUS
rete shall be protected from all harmfu 5 days subsequent to pour.	l effects during constructior	n. Concrete shall be c	cured by appr	oved means for at				ng and designing with all structural wood components to be 19% or ervices. Under these circumstances, wood will shrink. Also under	
Weather Requirements:	rete in accordance with OAA	N/CSA-422 1 2000			load conditions, st	ructural ele	ements will deflect. Alth	nough within the allowable limits as outline in the Building Code, the age brittle finishes attached directly to structural elements. Movem	e All built-up sa
2. Air Temperature not be	rete in accordance with CAI low 5 degrees Celsius. oncrete temperature drops		at point of pour	ring the mixing				es shall be provided by a building envelope specialist.	All beam splic
wat	er shall be heated to maintain acrete shall not be placed o	ain a minimum concre	ete temperatu	re of 10 degrees C.	Any lumber not gra		•		All built-up be
les	s than 5 degrees C. htractor shall be prepared to						D WOOD TRUS	The second state is the se	Cantilevered
3. Air Temperature below	5 degrees C but not below ( ms and steel shall be free f	0 degrees C		5				balanced loading in accordance with B.C.B.C Structural	Laminate stud
deg	ing water shall be heated to rees C at point of pour.	0				d trusses a	and built-up areas on wo	pod trusses not detailed on structural drawings, joists,	All laterally ur
les	ncrete shall not be placed o s than 5 degrees C.	0 1			and/or beams to b 2012	e engineei	red by manufacturer to d	design loads specified plus snow build up as per B.C.B.C.	2 pl
e. Sto	bs shall be covered with ca rey below slab shall be enc	losed.	a few inches o	clear of surface.	See General notes	s for desig	n load requirements.		
4. Temperatures below 0	tection shall be maintained degrees C (See item iii abov rey below shall be enclosed	ve for a, b, c, d.)	haat provided		In addition, the Tru	iss manufa	acturer shall design trus		3 pl
b. Hea	ating to be started at least of a minimum of 3 days after.						engineer.	ts specified by mechanical subcontractor/mechanical	
c. Ter	nperature of the concrete a closure to be constructed so						Live load deflections s	shall not exceed span/360 for roof trusses u.n.o. e designed for a minimum net uplift pressure of	4 pl
Veather Requirements							0.96 kPa (20 psf).		
than 25 degrees C, pro	rete in accordance with CAN acct concrete so that its tem	perature does not exc	ceed 30 degre	es C.	Truss tie-down clip tie down unless no			f trusses as spec'd by Engineer. Minimum H2.5A (SST)	Where sheath (2-1/2") nails
	ch causes shrinkage crack ude windshield, dampen, c			by conditions.				f all bridging, blocking accessories, and metal connection	All loadbearin
ot remove forms for footings and walls							ty of the truss or joist ass d those given on the stru	sembly, including details for bearing, where required actural drawings.	1200 mm (4'- Fasten non-lo
ned a strength of at least 10 MPa. Forr rete has attained at least 75% of the sp sting field cured concrete cylinders.								to engineer for review minimum 10 working days prior to	Provide cripp
ess walls to full width of wall where requ	ired to support beams				fabrication and sta	1.	raming. Drawings must i Project name and loca Design loads and all a	ation.	Provide backi
struction joints to be keyed and doweled		ve continuous 150 mi	m (6") P V C	"RB6-316"			enced to individual shop inal seal registered in B.	o drawings.	2-2x10 KD SF
rstop. The location of construction join d as requested.					-	•	-	licated on drawings may require additional review and	Pressure Trea
oncrete slabs on grade shall be placed	on 6 mil polyethylene lappe	ed 300 mm (12"), on 1	150 mm (6") m	ninimum approved			pense of the contractor.		Pressure trea wood. Metal
ular material compacted to geotechnica ide 3 mm (1/8") by 32 mm (1 1/4") DP.								ation and provide sealed engineer's certificate, certifying in accordance with the truss design and CSA standards	be stainless s
mum spacing. nings in slabs to be as far away as pos	ible from columns. No or				and that all bracing drawings.	g, hangers	, layout and applicable c	details have been installed as per approved shop	As a minimun dipped galvar manufacture
nm (16") to face of column without pric hall be fanned where possible or crowd	r approval from the engine	er. Reinforcing at ope			<u>GLUE LAM</u>	INATE	D TIMBER (GL	ULAM)	The Building
IFORCING REQUIREMENTS		Jerning.					ouglas Fir 24f-E stress g sed where beams are to	grade with quality appearance grade. Industrial be concealed	type of corros
clean new deformed reinforcing bars co	onforming to CSA G30.18, o	grade 400 MPa unless	s noted. Weld	ded wire fabrics to	Glulam shall be ma	anufacture	ed in conformance with C	CAN/CSA 0177	Galvanized fa stainless con
G30.5. At the engineer's discretion, rered to be tested as directed by the eng	bar mill certificates shall be	provided. Reinforce			Camber simple sp	an beams	10 mm (3/8") per 3000 r	mm (10'-0") of span	<u>STRUCT</u>
cate and place reinforcing steel to CAI	V/CSA-A23.1-14.				Affix authorized la	bel to all m	nembers supplied. Also	identify each member with mark number.	Fabrication and in accord
inforcing steel to be secured in final po								ed between members. Keep wrapping on the members ce, but cut holes on underside of wrapping to prevent the	Ger Sta
ers, or hangers provided. Maximum from the second sec	cing chairs shall be used to	support reinforcing. I	Reinforcing st	eel must be	accumulation of co		•		Structural ste
ected by the Engineer before concrete es of report to be forwarded to Kerkhoff		be inspected by Temp	orary Works I	ngineer and				o CAN/CSA 080 Series M-89 "Wood Preservation". Treat lpcf or to refusal. All cutting and drilling to be completed	All arc weldin
reinforcing substitutions to welded wire	mesh must be reviewed an	d confirmed by Kerkh	noff Engineeri	ng Ltd.	before the treatme	nt. Field a	apply preservative to equ	uivalent standard to all areas to be cut or drilled.	C.W.B. to CS Contractor sh
r concrete cover for reinforcing (unless	otherwise noted):							NSTALLED ANCHORS oost-installed anchors shall consist of the following anchor	shall bear the connections a
Footings (Top and side (Bottom)	s)	50 mm (; 75 mm (;	2") 3")		types as	provided	by hilti, inc. Contact hilti age to concrete	ti at (800) 879-8000 for product related questions.	Materials:
Walls inside face Walls outside face and	exposed surfaces	25 mm (* 50 mm (:	1") (2")			1.	Adhesive anchors for a 1. HILTI HIT-H	cracked and uncracked concrete use: IY 200 safe set system with the hilti hit-z rod per icc	1. 2.
Beams to stirrups Column to ties			1 1/2") 1 1/2")				esr-3187 2. <b>HILTI HIT-H</b>	IY 200 safe set system with hilti hollow drill bit (te-cd	3. 4.
							has-e thread	d vc 20/40 vacuum (vc 20-u or vc 40-u) system with ded rod per icc esr-3187	5.
	op steel or near face of wall s bottom steel or far face o						cd or te-yd)	RE 500V3 safe set system with hilti hollow drill bit (te- ) and vc 20/40 vacuum (vc 20-u or vc 40-u) with has-e	6. 7.
	5M 5000 means 5-15M bar						4. Hilti hit-re 5	d per icc esr-3814 500v3 safe set system with hilti roughening tool (hit rt)	8.
	5M 10.9 means 4-15M bars		)			ii)	Medium duty mechanic	hreaded rod per icc esr-3814 for diamond cored holes ical anchors for cracked and uncracked concrete use:	All connectior Design bolted
e Reinforcement as follows (unless oth	,						esr-3027	A HUS EZ and KWIK HUS EZ-I screw anchors per icc	be designed b U.D.L. from h
Comp Splice	Tension S Concrete S	Strength		2-				<b>BOLT-TZ expansion anchors</b> per icc esr-1917 <b>BOLT 3 expansion anchors</b> (uncracked concrete only) 2302	Provide minin
450 mm (18") 525	<u>/IPa 25MPa</u> 5 mm (21") 475 mm (1	<u>30MPa</u> 9") 450 mm (18	35MF 3") 450 r	nm (18")		iii)	Heavy duty mechanica	al anchors for cracked and uncracked concrete use: undercut anchors per icc esr 1546	each side of t moment conn
575 mm (23") 925	0 mm (30") 675 mm (2 5 mm (37") 825 mm (3 10 mm (60") 1350 mm (	33") 750 mm (30	0") 700 r	mm (23") mm (28") 	b)	Rehard		<b>3 expansion anchors</b> per icc esr 1545	Shop drawing
875 mm (35") 177	00 mm (60") 1350 mm ( ′5 mm (71") 1600 mm ( ′5 mm (85") 1900 mm (	(64") 1450 mm (5	58") 1350	mm (45") mm (54") mm (64")	<i>,</i>	1.	Adhesive anchors for o	cracked and uncracked concrete use: IY 200 safe set system with hilti hollow drill bit (te-cd	Columbia who
1050 mm (42") 212 Welded wire mesh 300 mm (		, 1720 mm (6	, 1000	(0+ )			or te-yd) and continuously	nd vc 20/40 vacuum (vc 20-u or vc 40-u) system with y deformed rebar per icc esr-3187	Review of sho required by an
plices are permitted without the engine	· · ·	gth of bars has been o	given on the c	Irawings.			2. HILTI HIT-H cd or te-yd)	Y 500V3 safe set system with hilti hollow drill bit (te- and vc 20/40 vacuum (vc 20-u or vc 40-u) system with	to be approve
abs to have temperature steel perpend			•	Ū			3. HILTI HIT-R	y deformed rebar per icc esr-3814 <b>E 500V3 safe set system with hilti roughening tool</b> (hit	If Kerkhoff Er welds/compore
greater than 150mm-180 mm (6"-	7") slab 10M @ 30	0 mm (12") o/c l 15M	@ 500 mm (2				rt) with conti cored holes	nuously deformed rebar per icc esr-3814 in diamond	be reimburse All anchor bo
greater than 180 mm-200 mm (7" greater than 200 mm-230 mm (8"	-8 <sup>′′</sup> ) slab 10M @ 10 -9'') slab 15M @ 43	" o/c l Ì5Ḿ @ 500 mn 0 mm (17") o/c			c)	Anchora 1.	age to solid grouted ma Adhesive anchors use	2:	anchor bolts r contractor.
greater than 230 mm-250 mm (9" greater than 250 mm-280 mm (10	"-11 <sup>"</sup> ) slab   15M @ 35	0 mm (15") o/c 0 mm (14") o/c					pending).	IY 70 masonry adhesive anchoring system (icc	All welded he
greater than 280 mm-300 mm (11	"-12") slab 15M @ 30	0 mm (12") o/c		- 14			continuously	r element shall be hilti has-e continuously threaded rod or y deformed steel rebar	Any fillet welc
perature reinforcement shall have a lap mm (4'-0") apart.	ot 18" and splices in adjac	ent bars shall be stag	ggered to be r	o less than		ii)		<b>BOLT-3 expansion anchors</b> per icc esr 1385	Minimum weld
oncrete to be reinforced. Reinforce un					d)	Anchora 1.	age to hollow / multi-wy Adhesive anchors use	ythe masonry e:	One shop coa up welds afte
num wall reinforcing (including planters		. ,	uniess noted	outerWISE:			esr-3342.	IY 70 masonry adhesive anchoring system per icc	Hot dip galva
150 mm (6") wall 200 mm (8") wall 250 mm (10") wall	10M @ 450 mm (18' 15M @ 500 mm (20' 15M @ 400 mm (16'	΄) Ε.W.					continuously	r element shall be hilti has-e continuously threaded rod or y deformed steel rebar riste size screen tube shall be used per adhesive	Erection brac
300 mm (10") wall	15M @ 400 mm (16 15M @ 500 mm (20"	,						riate size screen tube shall be used per adhesive er's recommendation	Top flanges o
									with welding o wood nailers
									No burning of

CONCRETE											
Provide concrete and performance The contractor shall arrange							-	) mm (12") minimum a doweled into footings.		rovide corner bars. , or slabs with bars of the same size and spacing	2) And me pro
accordance with CAN/CSA 100 c.m. (minimum 3 test o	A-A23.1-14 at the expense cylinders for each day's po	of the contractor. ur), and each clas	A minimum of 3 to s of concrete. Te	test cylinders est 1 cylinder a	shall be cast for each at 7 days and 2	as the bars abo Unless noted, p	ove.		,	,	sha per
cylinders at 28 days. One the structural engineer.		and tested at 7 o	days. Copies of a	all concrete te	st results to be sent to	1. 2.		s to match horizontal v ars at ends of walls.	wall reinforcer	nent at all wall intersections.	esr inst eva
CONCRETE MIX REQUIR	COMPRESSIVE	SLUMP	MAX AGG.	AIR	EXP	3. 4.	Two 15M ba		d slab opening	gs extending 600 mm (2'-0") past corners, plus	3) Inst
Foundation & footings	STRENGTH 3600 PSI (25MPa)	<b>+/- 19 mm (3/4")</b> 19 mm (3/4")	<b>SIZE</b> 3/4"	4-7%	CLASS F2	Install column re		curately with template		ners and placed at centre of wall or slab.	4) Ove
Int'r Columns & Walls Ext'r Columns & Walls	3600 PSI (25MPa) 3600 PSI (25MPa)	19 mm (3/4") 19 mm (3/4")	3/4" 3/4"	1-4% 4-7%	F2 F2			andard hooks, unless		ed.	5) The trai
Int'r S.O.G. General Tilt	4350 PSI (30MPa) 4350 PSI (30MPa)	19 mm (3/4") 19 mm (3/4")	3/4" 3/4"	1-4% 4-7%	 F2	Unless shown o 1.		cing in slabband to be	e centered ove	er columns	doc to t
All concrete normal weight		( )				2. 3.	Top slab rei Bottom rein	inforcing to be centered forcing to be centered	ed over slabb d between sup	and. ports except at end spans where all bars shall	6) And edg
Slumps noted are before the	he addition of superplastisi	zer.				PLYWOO	extend a mi	inimum of 150 mm (6" N TIMBER	") into exterior	supports.	dra 7) Exi
No more than 120 minutes agency and the structural e	engineer. Contractor's sup	perintendent to mo						, Walls) Structural or a Grade	approved equ	al. Thickness (Min)	Unl
reject concrete if not in acc Do not use admixtures othe			educers or superr	olastisizers		Roof Floor		D.Fir D.Fir		13 mm (1/2") + "H" clips 16 mm (5/8") T&G	of t FRAMIN
Maximum chloride as to C/					able 14 of CAN/CSA-	Walls		OSB (structu	,	10 mm (3/8")	All timber wor
A23.1-14. Provide storage facility on	aita far tha initial 24 hours	ouring of toot ouling	doro				ll conform to CSA		SA Standard (	0121, and softwood to CSA Standard 0151. Design	n All framing de
The contractor shall be res		0 ,		ufficient streng	th and rigidity to carry	warranty require	ements prior to p			satisfactory for architectural, building envelope, ar es/grades specified on structural drawings are	responsible for
the weight or fluid pressure and runways. The forms s	e of the concrete and addit	ionally all construc	ction loads includi	ing those due	to wind, equipment,	minimum requir		A 0325 construction st	hoothing		be positioned Provide conti
concrete deposit. Provide 19 mm (3/4") chan	mfer on all exposed columr	n corners. Unless i	noted otherwise.	slabs and bea	ms shall be cambered			ominal thickness (mm		Minimum panel mark	Provide doub
3 mm (1/8") for each 2400	mm (8'-0") of span.						13 16		2R32/ 2R40/	2F16 or 1F16 2F20	span. Provid supports for c
Compact concrete through forms. Embedded materia				edded materia	al and into corners of	Provide a minim	num gap of 2mm	n shall be left between	n panels to ac	commodate swelling.	Provide solid parallel with t
All hot and cold weather co expected to fall below 0 de						Minimum nailing	63 mm (2 1/	/2") nails @ 150 mm	(6") o/c at she		' All floor joists
following:	ione for booting from boot			-	-			/2") nails @ 300 mm ( e not permitted u.n.o.)		nediate support members	Pressure bloc o/c or laminat
2. Provisi	sions for heating fresh conc sions for heating concrete in tions to mix design						be SPF #2 or be				(8) 80 mm (3
4. Provisi	sions for curing		_					exterior or in contact v a minimum of 2 coats		to be given a preservative treatment approved by t prinol or equivalent).	the Use approved Strongtie LUS
Concrete shall be protected least 5 days subsequent to		during construction	n. Concrete shall	be cured by a	pproved means for at					ng with all structural wood components to be 19% these circumstances, wood will shrink. Also unde	
	and protect concrete in acc		N/CSA-A23.1-200	00.		movements ind	luced by loads or	r shrinkage will damaq	ge brittle finish	e allowable limits as outline in the Building Code, the attached directly to structural elements. Move	
2. Air Ter		emperature drops			pouring, the mixing ature of 10 degrees C.	, ,	grade marked w		s shall be pro	vided by a building envelope specialist.	All beam spli
	b. Concrete sha less than 5 d	all not be placed o legrees C.	n or against any s	surface which	is at a temperature	PRE-FAB	-	WOOD TRUS	SES/JO	<u>ISTS</u>	All built-up be
3. Air Ter	mperature below 5 degrees		0 degrees C		alls below 5 degrees C.		Local Bylaws. D			g Code 2012 Part 4, CSA 086, TPIC ing in accordance with B.C.B.C Structural	Cantilevered Laminate stud
	b. Mixing water degrees C at	shall be heated to the shall be heated to the shall be heated to be the shall be heated to be the shall be heated to be he	o give to a minimu	um concrete te				l built-up areas on woo	od trusses no	t detailed on structural drawings, joists,	All laterally ur
	less than 5 d	legrees C.			is at a temperature es clear of surface.	and/or beams to 2012	o be engineered	by manufacturer to de	esign loads sj	pecified plus snow build up as per B.C.B.C.	2 p
	e. Storey below f. Protection sh	slab shall be enc nall be maintained	losed. for at least 5 day			See General no	otes for design lo	oad requirements.			
4. Tempe		C (See item iii abov / shall be enclosed e started at least c	and supplement			In addition, the	Μ	•		mechanical subcontractor/mechanical	3 p
	for a minimu	m of 3 days after.			) degrees C for 7 days.		C	ngineer. Camber to be equal to ive load deflections sl		flection u.n.o d span/360 for roof trusses u.n.o.	4 p
		be constructed so	o that air can circu	ulate around a	Il structural members.		A			a minimum net uplift pressure of	
	s and protect concrete in ac 5 degrees C, protect concr						clips to be provid noted on structu		f trusses as sp	bec'd by Engineer. Minimum H2.5A (SST)	Where sheath (2-1/2") nails
2. Protec	t from drying, which cause ive measures include wind	s shrinkage crack	ing, by effective n	neans as requ		Manufacturer is	s responsible for	design and supply of	all bridging, b	locking accessories, and metal connection	All loadbearin
Do not remove forms for for at lea								of the truss or joist ass tose given on the struc		ling details for bearing, where required s.	1200 mm (4'- Fasten non-lo
concrete has attained at le by testing field cured concr	east 75% of the specified st						start of any fram	ning. Drawings must in	nclude:	r review minimum 10 working days prior to	Provide cripp
Recess walls to full width o	of wall where required to su	ipport beams.				Truss/ioist lavo	2. D	Project name and locat Design loads and all ap ced to individual shop	pplicable deta	ils.	Provide back 2-2x10 KD SI
Construction joints to be kee waterstop. The location of						Professional En	ngineer's original	l seal registered in B.C	C.		Pressure Trea
added as requested. All concrete slabs on grade	e shall be placed on 6 mil r	polvethylene lappe	ed 300 mm (12")	on 150 mm (6	") minimum approved			d layouts to those indi- nse of the contractor.	cated on drav	ings may require additional review and	Pressure trea
granular material compacte Provide 3 mm (1/8") by 32	ed to geotechnical enginee	ers' recommendati	ons (minimum 95	% standard pr	octor density).	The manufactur that the trusses	rer shall inspect i and joists have	the truss/joist installat been manufactured in	tion and provi n accordance	de sealed engineer's certificate, certifying with the truss design and CSA standards	be stainless s
maximum spacing. Openings in slabs to be as	s far away as possible from	columns No ope	enings or cans for	r pipes in any	case to be closer than	drawings.	0.0			een installed as per approved shop	As a minimur dipped galvai manufacture
400 mm (16") to face of co but shall be fanned where	olumn without prior approva	al from the engine	er. Reinforcing at					TIMBER (GL		ity appearance grade. Industrial	The Building
REINFORCING REQUIRE	MENTS					appearance gra	ade may be used	where beams are to	be concealed		type of corros Galvanized fa
Use clean new deformed re CSA G30.5. At the engine	eer's discretion, rebar mill c	ertificates shall be	provided. Reinfo					n conformance with C mm (3/8") per 3000 m			stainless con STRUCT
required to be tested as dir Fabricate and place reinfor	, ,		contractor.					. ,.	. ,	nember with mark number.	Fabrication and in accord
All reinforcing steel to be s	secured in final position bei	fore concrete is pla	aced. Support re	inforcing steel	on approved supports	,				mbers. Keep wrapping on the members es on underside of wrapping to prevent the	Gei Sta
spacers, or hangers provid be exposed, only non-corro inspected by the Engineer	osive type reinforcing chair	rs shall be used to	support reinforci	ng. Reinforcin	g steel must be	accumulation of	fcondensation				Structural ste
copies of report to be forwa			be inspected by T	emporary wo		using CCA Vac	uum Pressure in	npregnation to be 0.4p	pcf or to refus	30 Series M-89 "Wood Preservation". Treat al. All cutting and drilling to be completed	All arc weldin C.W.B. to CS
Any reinforcing substitutior Clear concrete cover for re			ld confirmed by K	erkhoff Engine	eering Ltd.			FOR POST-IN		ard to all areas to be cut or drilled. D ANCHORS	Contractor sh shall bear the
	gs (Top and sides)		50 m	nm (2")		1. Except types	as provided by l	hilti, inc. Contact hilti	ost-installed a i at (800) 879-	nchors shall consist of the following anchor 8000 for product related questions.	connections a
Walls i	(Bottom) inside face outside face and exposed		75 m 25 m	າm (3") າm (1")		a.				ncracked concrete use: t system with the hilti hit-z rod per icc	Materials: 1. 2.
Beams Colum	s to stirrups In to ties		32 m 32 m	ım (1 1/2") ım (1 1/2")			2.	esr-3187 . HILTI HIT-H	Y 200 safe se	t system with hilti hollow drill bit (te-cd	2. 3. 4.
	top and bottom						3.	has-e thread	ed rod per icc	cuum (vc 20-u or vc 40-u) system with esr-3187 set system with hilti hollow drill bit (te-	5. 6.
(soli (da	id line) denotes top steel o shed line) denotes bottom	r near face of wall steel or far face o	f wall				3.	cd or te-yd)		vacuum (vc 20-u or vc 40-u) with has-e	6. 7. 8.
Straight bar leng		means 5-15M bar means 4-15M bars					4.	. Hilti hit-re 50 with has-e th	00v3 safe set readed rod pe	system with hilti roughening tool (hit rt) er icc esr-3814 for diamond cored holes	All connection
Splice Reinforcement as fo			-3 (bc	,			ii) M 1.			r cracked and uncracked concrete use: KWIK HUS EZ-I screw anchors per icc	Design bolted be designed l
Bar Comp Size Splice		Tension S Concrete S					2. 3.	HILTI KWIK	BOLT 3 expa	pansion anchors per icc esr-1917 Insion anchors (uncracked concrete only)	U.D.L. from h
10M 450 mi	<u>20MPa</u> m (18") 525 mm (21"	<u>25MPa</u> ) 475 mm (1	<u>30MPa</u> 19") 450 mm	n (18") 4	<u>5MPa</u> 50 mm (18")		,	, ,	al anchors for	cracked and uncracked concrete use:	Provide minir each side of l moment conr
20M 575 m	ım (19") 750 mm (30" ım (23") 925 mm (37" ım (29") 1500 mm (60	') 825 mm (3	33") 750 mm	n (30") 7	75 mm (23") 00 mm (28") 125 mm (45")	b)		HILTI HSL-3 reling into concrete	expansion a	h <b>ors</b> per icc esr 1546 <b>nchors</b> per icc esr 1545	Shop drawing
30M 875 m	mm (35") 1775 mm (71 mm (42") 2125 mm (85	1") 1600 mm (	(64") 1450 m	m (58") 1	350 mm (54") 600 mm (64")	,		Adhesive anchors for c . HILTI HIT-H	Y 200 safe se	ncracked concrete use: t system with hilti hollow drill bit (te-cd	Columbia who Review of sho
Welded wire mea	sh 300 mm (12").						2.	continuously	deformed reb	cuum (vc 20-u or vc 40-u) system with par per icc esr-3187 set system with hilti hollow drill bit (te-	required by a to be approve
No splices are permitted w	0 11	·		Ū	0			cd or te-yd) continuously	and vc 20/40 deformed reb	vacuum (vc 20-u or vc 40-u) system with par per icc esr-3814	If Kerkhoff Er welds/compo
All slabs to have temperatu	ure steel perpendicular to a )mm-180 mm (6"-7") slab		bove slab bottom 0 mm (12") o/c l 1	Ū			3.			set system with hilti roughening tool (hit ned rebar per icc esr-3814 in diamond	be reimburse
greater than 180 greater than 200	) mm-200 mm (7"-8 <sup>r</sup> ) slab ) mm-230 mm (8"-9") slab	10M @ 10 15M @ 43	" o/c l Ì5Ḿ @ 500 0 mm (17") o/c			c)		e to solid grouted ma dhesive anchors use:	:		All anchor bo anchor bolts i contractor.
greater than 230 greater than 250	) mm-250 mm (9"-10 <sup>"</sup> ) slab ) mm-280 mm (10"-11") sla	b 15M @ 38 b 15M @ 35	0 mm (15"́) o/c 0 mm (14") o/c				1.	. HILTI HIT-HY pending).	Y 70 masonry	/ adhesive anchoring system (icc	All welded he
greater than 280 Temperature reinforcemen	) mm-300 mm (11"-12") sla nt shall have a lap of 18" ar	-	0 mm (12") o/c ent bars shall be	staggered to I	be no less than		2. ii) M		deformed ste	l be hilti has-e continuously threaded rod or el rebar	Any fillet welc
1200 mm (4'-0") apart.	·					d)	1. Anchorage	. HILTI KWIK to hollow / multi-wy	BOLT-3 expa /the masonry	<b>nsion anchors</b> per icc esr 1385 ,	Minimum wel One shop coa
All concrete to be reinforce Minimum wall reinforcing (i							1. A 1.	dhesive anchors use: . HILTI HIT-HY esr-3342.		/ adhesive anchoring system per icc	up welds afte
150 mm (6") wall 200 mm (8") wall 250 mm (10") wal	I 15	M @ 450 mm (18' M @ 500 mm (20'	') E.W.				2.	. Steel anchor continuously	deformed ste		Hot dip galva Erection brac
250 mm (10") wa 300 mm (12") wa		M @ 400 mm (16' M @ 500 mm (20'	/				3.		iate size scree r's recommen	en tube shall be used per adhesive dation	Top flanges o
											with welding of wood nailers
											No burning of



Anchor capacity used in design shall be based on the technical data published by hilti or such other method as approved by the structural engineer of record. Substitution requests for alternate products must be approved in writing by the structural engineer of record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an icc esr showing compliance with the relevant building code for seismic uses, load resistance, nstallation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in-service temperature and installation temperature. nstall anchors per the manufacturer instructions, as included in the anchor packaging. Overhead adhesive anchors must be installed using the hilti profi system. The contractor shall arrange an anchor manufacturer's representative to provide onsite installation raining for all of their anchoring products specified. The structural engineer of record must receive documented confirmation that all of the contractor's personnel who install anchors are trained prior to the commencement of installing anchors. Anchor capacity is dependant upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Jnless noted on the drawings that the bars can be cut, the contractor shall review the existing structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by hilti ferroscan, gpr, x-ray, chipping or other means. work shall conform to the requirements of CAN/CSA-086-14. details shall conform to B.C.B.C. 2012 sections 9.23 and 9.24. are permitted, but all nail diameters/lengths shall be as specified on drawings. The contractor is ble for installing nails into all metal hangers in accordance with suppliers specifications (all nails to ned in supplied holes). ntinuous cross bridging between floor joists at 2100 mm (7'-0") o/c max. u.n.o. buble joists (or solid cross blocking @ 600 mm (24") o/c) under all partition walls parallel to joist vide solid blocking between joists at all loadbearing walls, top of beams or headers, and at all or cantilevered joists. lid blocking @ 600 mm (24") o/c or double trimmer joists at locations where bearing walls run ith the joist span. ists to be 2x10 KD SPF #2 @ 400 mm (16") o/c unless noted otherwise. blocking not permitted for joist spans over 3000 mm (10'-0") or joist spacing less than 400 mm (16") nated joists. Minimum (7) 80 mm (3 1/4") toe nails and (4) 80 mm (3 1/4") end nails per joist and n (3 1/4") nails per pressure block to beam. ved joist hangers at all flush beams each having a minimum of 1200 lb. capacity. Use Simpson LUS210 or pre-approved alternative. Nailing as per manufacturer's specifications. with studs where possible. sawn timber beams or headers to be nailed together with (3) rows 80 mm (3 1/4") nails @ 400 mm min. per lamination or 13 mm (1/2") Ø thru bolts with washers @ 900 mm (36") o/c staggered. plices are to occur at supports, unless noted otherwise. beams to have full bearing at top plate. red beams greater than 2-ply nail with 3 rows of 80 mm (3 1/4") nails @ 150 mm (6") o/c each ply. studs solid under all beams to full beam width unsupported built-up posts to have the following nailing: 2 ply 50 x 100 (2 x 4) - 75 mm (3") nails @ 200 mm (8") o/c staggered (1-1/8" offset) 50 x 150 (2 x 6) - (2) rows 75 mm (3") nails @ 200 mm (8") o/c (1-1/2" between rows) 50 x 200 (2 x 8) - (2) rows 75 mm (3") nails @ 200 mm (8") o/c (2-1/8" between rows) 50 x 100 (2 x 4) - 113 mm (4-1/2") nails @ 200 mm (8") o/c staggered (1-1/8" offset) 50 x 150 (2 x 6) - (2) rows 113 mm (4-1/2") nails @ 200 mm (8") o/c (1-1/2" between rows) 50 x 200 (2 x 8) - (2) rows 113 mm (4-1/2") nails @ 200 mm (8") o/c (2-1/8" between rows) ply 50 x 100 (2 x 4) -150 mm (6") nails @ 200 mm (8") o/c staggered (1-1/8" offset) 50 x 150 (2 x 6) - (2) rows 150 mm (6") nails @ 200 mm (8") o/c (1-1/2" between rows) 50 x 200 (2 x 8) - (2) rows 150 mm (6") nails @ 200 mm (8") o/c (2-1/8" between rows) athing fastened to built up posts, fasten sheathing to each ply of post with minimum 63 mm ails @ 100 mm (4") o/c, and laminate each ply with (2) rows 80 mm (3 1/4") nails @ 200 mm (8") o/c. ring stud walls to be anchored to concrete at the base with 16 mm (5/8") Ø Hilti-Hit Kwik Bolts @ (4'-0") o/c. u.n.o. l-loadbearing partition walls with power-activated fasteners @ 600 mm (24") o/c maximum. pples to each side of cut top plate. cking in walls and floors for handrail connections. All drop beams, lintels and flush beams to be SPF.#2 unless noted otherwise. reated Material: reated wood can be highly corrosive to metal fasteners and connectors that are in contact with the etal fasteners and connectors including nails, screws, anchor bolts, bolts, washers, etc may need to ess steel or galvanized in certain situations. num connectors used for ACZ or CA treated wood must be manufactured from steel either hotvanized in accordance with ASTM A653, G185 designations, or hot dipped galvanized after ure in accordance with ASTM A123. ng Envelope consultant is responsible for the specifications of pressure treated material, and the osion protection for the metal fasteners and connectors. I fasteners must be used for galvanized connectors, and Stainless fasteners must be used for onnectors. CTURAL STEEL and erection of structural steel work shall conform to CAN/CSA-S16-09 (including S16S1-05, Supplement 31), ordance with the following standards: General Requirements for Rolled or Welded Structural Quality Steel: G40.20-04/G40.21-04 Standard spec for Steel for Structural Shapes for use in bldg framing: A 992/A992M-01 steel fabricators to be certified by C.W.B. to CAN/CSA W47.1-1983, Division 2.1 minimum. ding to conform to CSA-W59 by C.W.B. approved welders. All fabrication and erection shall be certified by CSA-W47.1(division 1 or 2) r shall submit shop drawings for all structural steel work for review prior to fabrication. These shop drawings r the seal and signature of the Professional Engineer registered in B.C. responsible for the design of ons and prefabricated members. Structural steel to conform to CAN/CSA G40.21 Steel shapes & miscellaneous metals 300W (44ksi) W Shapes (CSA G40.21 & ASTM A992) 350W (50ksi Hollow structural sections, Class H . 350W (50ksi) (conforming to CSA G40.21 or ASTM 500) Rods & round bars ... ASTM A36 (36ksi) Bolts, Nuts & Washers (minimum size 3/4" dia.).. ASTM A325 Anchor bolts, nuts & washers ASTM A307 ASTM-A108 Shear stud connectors ctions shall be designed by the fabricator unless otherwise noted. ted connections to ASTM-A325 assuming threads included in shear plane. Unless detailed, all connections to ned by the fabricator as bearing type to CAN CSA-S16.1 for force shown on drawing or for 60% of allowable n handbook beam span table. Provide a minimum of (2) 19 mm (3/4")  $\emptyset$  bolts in each connected member. nimum 10 mm (3/8") thick web stiffeners each side of all beams continuous over columns. Provide 2 stiffeners of beams aligned with walls of HSS column/flanges of W columns supporting point load from above or at full ings for all connections shall be sealed by a qualified professional engineer registered in the province of British who is familiar with this type of construction and is responsible for the design of the connections. shop drawings by Kerkhoff Engineer does not guarantee any dimensioning, and/or miscellaneous steel

r architectural drawings. All roof & floor slopes shall be in accordance with architectural specifications and are oved by such parties f Engineering determines the welds or structural members to be inadequate based on visual inspection, such ponents shall be examined by a non-destructive testing method. The cost of such testing and reporting shall rsed by the contractor.

bolt locations shall be verified with the contractor prior to fabrication. Any modifications to base plates and or Its may be rejected, and upgrades required as determined by the engineer will be at the expense of the

headed studs and welded deformed bar anchors shall be installed as per the manufacturer's specifications. elded deformed bars or studs will be rejected.

velds for connections to be 5 mm (3/16") fillet welds. Grind smooth where exposed.

coat of primer shall be applied to all steelwork except where encased in concrete and field weld areas. Touch after erection is approved.

Ivanize those items exposed to weather, corrosive environments or ground.

racing during construction is the responsibility of the contractor.

es of beams shall be free of all paint, dirt, heavy rust, mill scale, sand and other materials which will interfere ng of stud shear connections and steel deck to beams. Pre-drill flanges as necessary for bolted attachments of rs etc. with 11 mm (7/16") holes staggered @ 600 mm (24") o/c.

No burning of holes or field cutting will be permitted in any structural steel element without the approval of the Engineer. Welding and bolt torquing to be inspected in accordance with CAN/CSA-S16.1-04. Connections to columns at floor and roof levels shall be designed to resist a stabilizing force in any direction equal to 2% of the capacity of the column.

Provide drainage holes in the bottom of all HSS columns.

## SHOP DRAWINGS

Shop drawings for the following items shall be submitted for the engineer's review prior to any fabrication: Structural Steel

Prefabricated wood trusses

The engineer's review will be for the sole purpose of ascertaining conformance with the general design concept only and such review does not relieve the contractor of responsibility for errors and omissions in the shop drawings or of his responsibility for meeting all requirements of the contract documents.

The contractor is responsible for verifying and correlating site dimensions, fabrication processes, methods of construction and installation, and co-ordination of all sub-trade work.

Shop drawings shall include

- Date and revision dates Project title and number
- Name of contractor and supplier Identification of product or material

Applicable standards and codes that have been used in the preparation of the drawings.

Provide clear cross-reference between layout and individual member shop drawings

Letters of Certification and the stamp of a Professional Engineer are required on shop drawings as indicated under the appropriate sections elsewhere in the notes and specifications.

Shop drawings shall be submitted to the engineer by the contractor or architect only and shall be returned to the same unless directed otherwise. One copy of shop drawings will be retained for the engineer's records.

Allow a minimum of 10 working days for the engineer's review of shop drawings.

#### FIELD REVIEWS

The Contractor's Superintendent is required to pre-inspect the work to confirm work is completed as per documents and provide the Engineer (Kerkhoff Engineering Ltd., 604-858-3730) or their representative with a minimum of 24 hours notice in accordance with B.C.Building Code 2012 and municipal bylaws for routine Field Reviews of:

- General site conditions prior to forming. Reinforcing steel and pour conditions prior to each concrete pour
- Masonry and reinforcing steel prior to each grout pour. Wood framing, roof, floor, and wall sheathing after mechanical electrical rough-in is complete.

Field reviews performed by Kerkhoff Engineering are only for the base building structure as specified on these drawings. These reviews are periodic and are to be performed at the discretion of the engineer, in order to ascertain the construction is in general conformance with structural documents. Field reviews are performed on behalf of the client and not for the benefit of quality control of the contractor. The contractor retains full responsibility for ensuring all requirements specified on structural drawings and all amendments are strictly adhered too.

The contractor shall notify the truss manufacturer to inspect all trusses and provide a sealed certificate for installation of trusses, bracing, hangers, and all pertinent hardware prior to installation of any roof membrane. See also additional requirements under "Pre-fabricated trusses/joists".

The geotechnical engineer shall review final plans and inspect the site preparation work to confirm that the soil conditions are consistent with design assumptions and design recommendations. Inspection to include the following:

Base materials for confirmation of assumed soil bearing Testing for compaction of any structural fill required under footings, slab-on-grade, or retaining walls. Backfill behind foundation & retaining walls.

The geotechnical engineer to be notified minimum 24 hours prior to any footing pours for inspection as noted above.

Reinspection required by the engineer due to incomplete work and/or deficiencies from previous Field Reviews, shall be at the expense of the contractor

All work shall be made accessible for inspection. Failure to give required notification and accessibility may result in the Engineer requesting the removal and replacement of the work at the contractor's expense.

Review of the work, or any portion thereof, by the engineer shall not in any way relieve the contractor of his responsibility and obligation to comply with the contract drawings and specifications.

STRUCTURAL COMPOSITE MEMBERS (SCM) To be manufactured to CSA Standards by Truss Joist or Louisiana Pacific. Alternative manufactured products will

be allowed if supporting Documentation (sealed by P. Eng.) are forwarded to Kerkhoff Engineering to confirm the proposed product is equal or better than specified.

Manufacturer to supply layout drawings showing location and specifications for their product.

Manufacturer to provide upon request appropriate documentation endorsed by a registered professional engineer to support the proposed strength values set out in the manufacturer's technical literature. Parallam (PSL): Laminations of 87.5 mm (3 1/2"), 131.25 mm (5 1/4"), and 175 mm (7") x 231.25 mm (9 1/4"), 237.5 mm (9 1/2"),

287.5 mm (11 1/2"), 350 mm (14"), 400 (16"), 468.75 mm (18 3/4") 6 E = 2.0 x 10 psi / Fb=5360psi, Fc(perp)=1365psi Fasten laminations together with minimum of (2) rows of 13 mm (1/2") Ø thru bolts @ 600 mm (24") o/c for top loaded beams or as noted.

Timberstrand (LSL)

Laminations of 87.5 mm (3 1/2"), 131.25 mm (5 1/4"), and 175 mm (7") x 231.25 mm (9 1/4"), 237.5 mm (9 1/2"), 287.5 mm (11 1/2"), 350 mm (14"), 400 (16"), 468.75 mm (18 3/4") 6 E = 1.7 x 10 psi/ Fb = 3510psi, Fc(perp) = 1600psi 6 E = 1.3 x 10 psi/ Fb = 3140psi, Fc(perp) = 1240psi Fasten laminations together with minimum of (2) rows of 13 mm (1/2") Ø thru bolts @ 600 mm (24") o/c for top loaded beams or as noted.

Gang-Lam (LVL). Laminations of 87.5 mm (3 1/2"), 131.25 mm (5 1/4"), and 175 mm (7") x 231.25 mm (9 1/4"), 237.5 mm (9 1/2"), 287.5 mm (11 1/2"), 350 mm (14"), 400 (16"), 468.75 mm (18 3/4") 6 E = 1.8 x 10 psi/ Fb = 2650psi, Fc(perp) = 1365psi

Fasten laminations together with minimum of (2) rows of 13 mm (1/2") Ø thru bolts @ 600 mm (24") o/c for top loaded beams or as noted.

Any other S.C.M. to be approved by engineer upon submission of Documentation of proposed strength values endorsed by a registered professional engineer 3 weeks prior to ordering material.

# Delivery, Storage and Handling

All materials shall be delivered to the site in consultation with the supplier and contractor to suit the construction schedule.

All materials shall be stored level on the site and shall be raised off the ground, stacked using separating spacers, and covered with a waterproof material. In the case of wrapped members, the wrapping shall be slit on the underside to prevent the accumulation of condensation.

Members that will be exposed to view in the finished building shall be handled using nylon or fabric slings to prevent surface damage

# NOTICE TO JOIST SUPPLIER

Joist supplier to provide 4 complete sets of shop drawings sealed & signed by a professional engineer registered in british columbia showing the following:

- Installation drawing showing how holes can and cannot be cut through joists and how mechanical piping can and cannot be supported by joists. Floor joist layouts.
- Joists depth and spacing Joist loadings and deflections
- All connection details including Rim joist details
- Minimum bearing

Required blocking at supports Complete set of engineering data sheets for each different joist span spacing or unusual loading case as specified on the framing plans.

Maximum spacing of floor joists to be:

38 concrete topping on floor joists - 400 o/c No concrete topping on floor - 400 o/c

Rim board to be min. 32 timberstrand Isl or approved equal. Thinner or osb type rim boards will not be accepted.

Joist shop drawings will not be accepted as a partial package. They must be complete for the entire project and issued to both the architect and project engineer for review and approval minimum 2 weeks prior to abrication.

Contractor is responsible to confirm joist quantities, dimensions, etc. Prior to approving shop drawings.

Inspection of the joist installation must be provided by the joist supplier.

If joist layouts on shop drawings differ from anticipated layouts, indicated beam sizing, spans and locations will require further review.

Floor i-joist system to be designed by manufacturer using a rating system calibrated to meet the intended performance of NBC 2005 vibration criteria. Documentation for this system should be submitted with sealed shop drawings

### **HANDRAILS & GUARDRAILS**

Handrails, guardrails and balustrades to be designed and detailed in accordance with B. C. Building Code Section 4.1.5.15 by the supplier. The minimum specified horizontal load applied inward or outward at the top of every required guard shall be 1.0kN(225lbs) point load, or 0.75kN/m(51.4plf). Provide sealed shop drawings of all handrails and connections showing all design loads to project engineer prior to fabrication. Contractor to co-ordinate with supplier for installation of all necessary backing material.

# LIMITS OF LIABILITY

Engineering judgement has been applied in developing this design in an attempt to strike a reasonable balance between risk of failure and economic factors. Beyond a certain level of cost, increments of security are attained only by disproportionate increases in cost. A more conservative approach could be adopted in return for increased design and construction costs.

These designs have been prepared in accordance with generally accepted structural engineering practices and to the requirements of all applicable Codes. No other warranty is made, either expressed or implied.

Structural design of all architectural components, and their seismic restraint is to be reviewed by others.

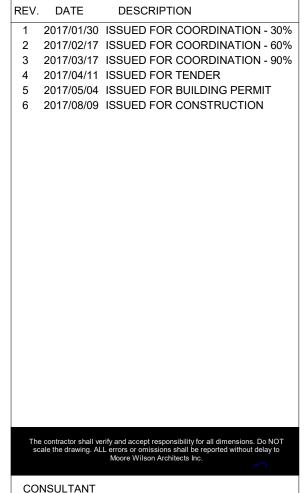
# STRUCTURAL DRAWING LIST NO. TITLE

S1.1	STRUCTURAL NOTES	S3.2	BUILDING SECTIONS
S2.1	FOUNDATION PLAN	S3.3	BUILDING SECTIONS
S2.2	LEVEL 1 FRAMING PLAN	S4.1	SECTIONS AND DETAIL
S2.2-1	LEVEL 1 FLOOR PLAN	S4.2	SECTIONS AND DETAIL
S2.3	LOW ROOF FRAMING PLAN	S4.3	SECTIONS AND DETAIL
S2.4	HIGH ROOF FRAMING PLAN	S4.4	SECTIONS AND DETAIL
S3.1	BUILDING SECTIONS	S4.5	SECTIONS AND DETAIL

STRUCTURAL DRAWING LIST

NO.

TITLE





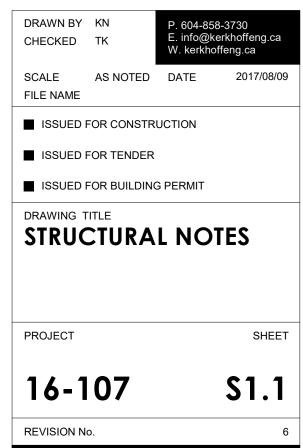


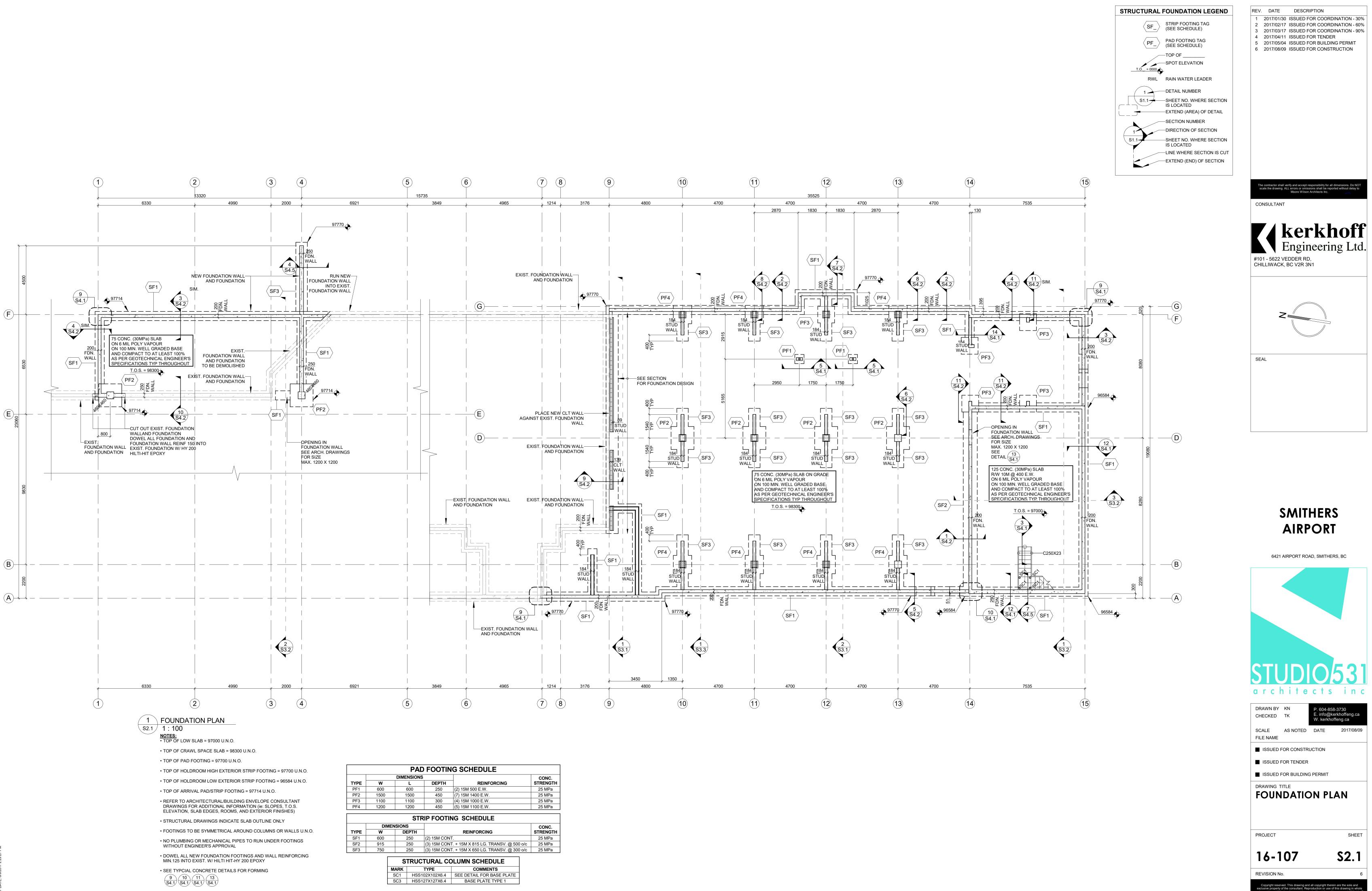


SEAL

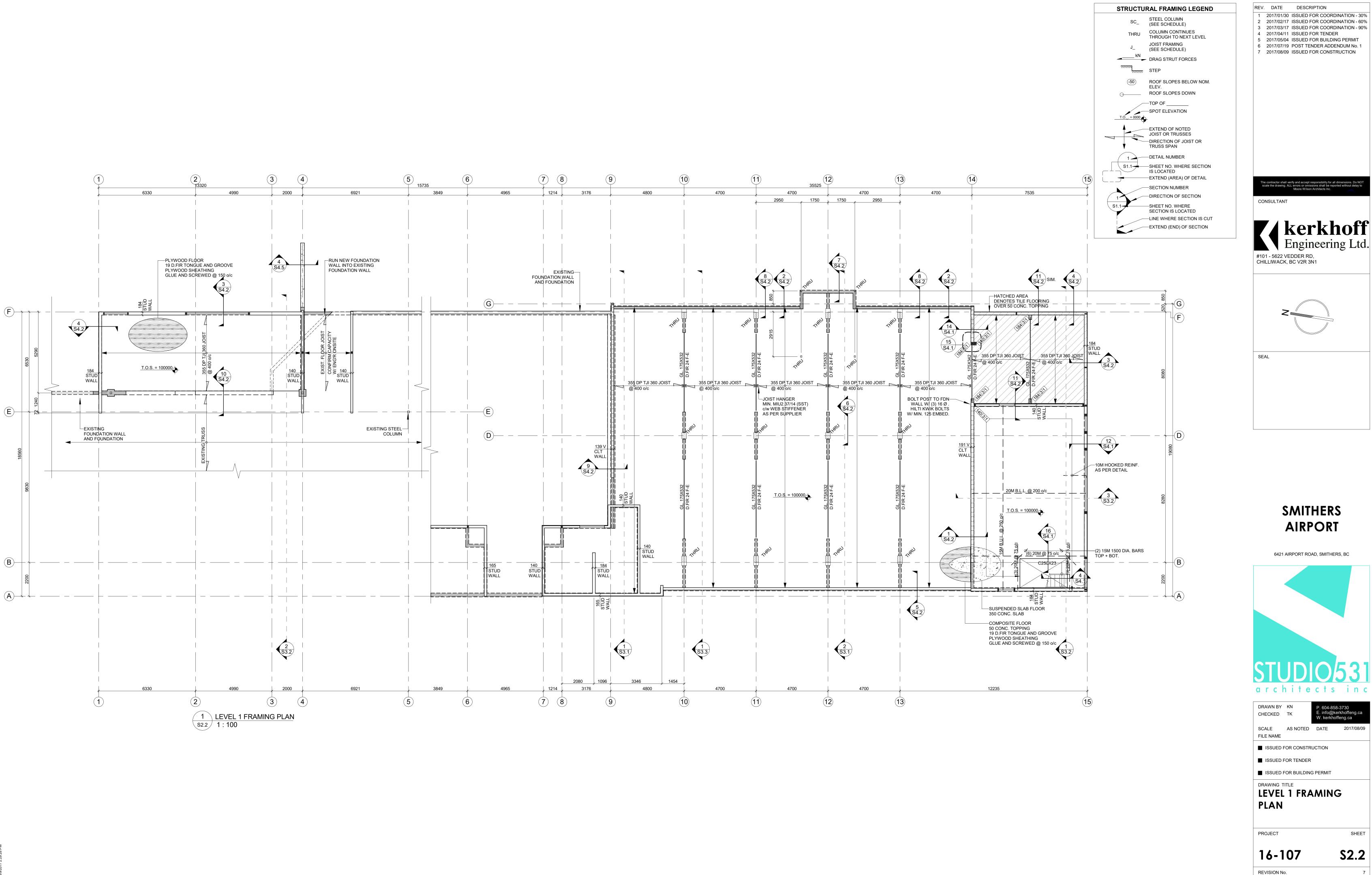




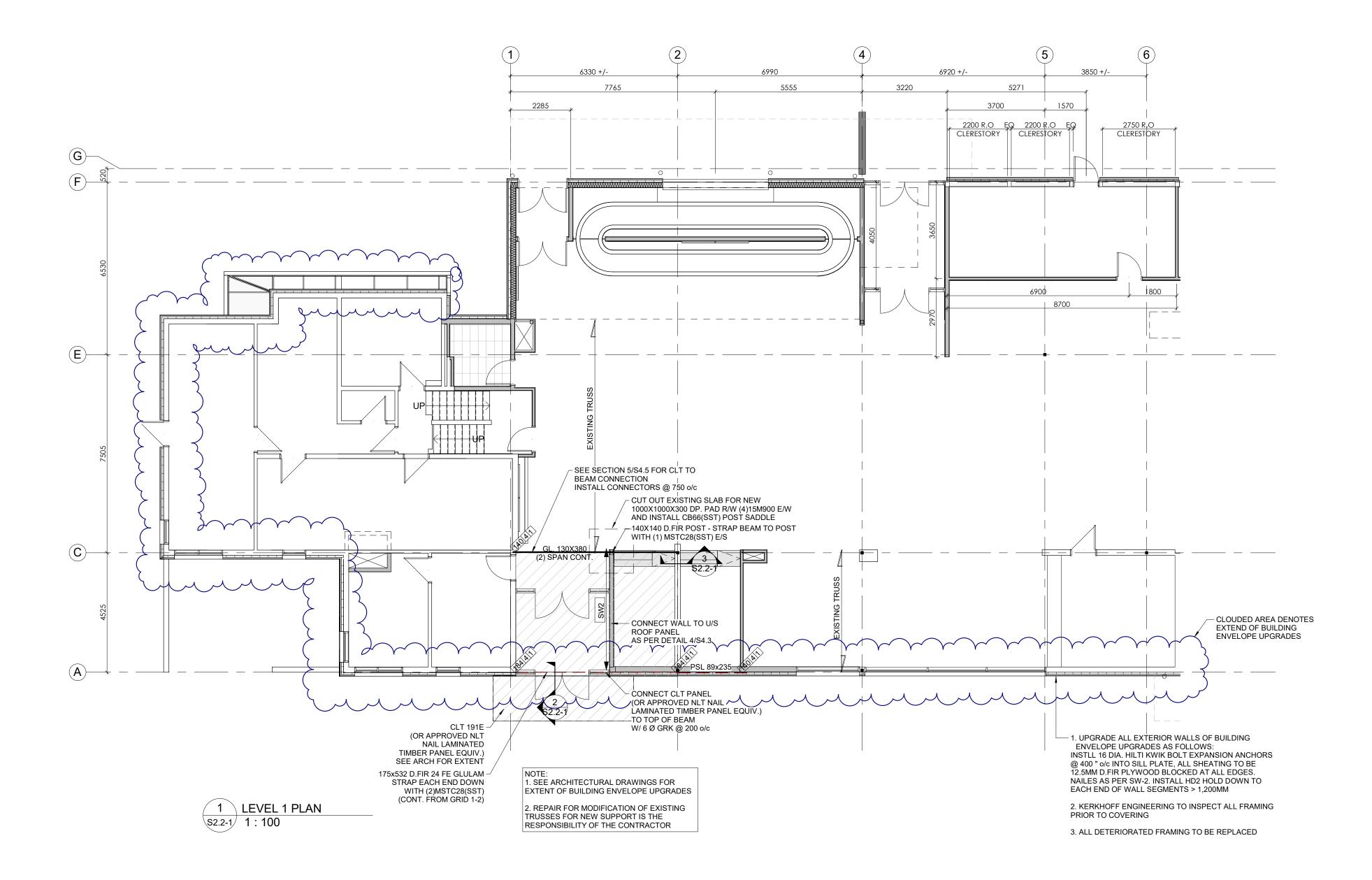


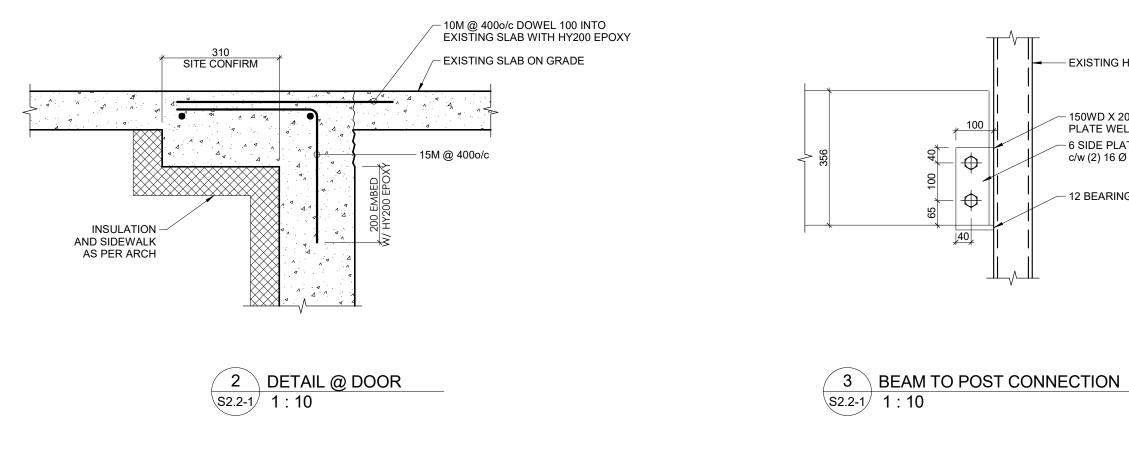


EDULE		
REINFORCING		CONC. STRENGTH
00 E.W.		25 MPa
400 E.W.		25 MPa
000 E.W.		25 MPa
100 E.W.		25 MPa
IEDULE		
FORCING		CONC. STRENGTH
		•••••••••
		25 MPa
315 LG. TRANSV. @ 500	) o/c	
		25 MPa
315 LG. TRANSV. @ 500		25 MPa 25 MPa
315 LG. TRANSV. @ 500		25 MPa 25 MPa
315 LG. TRANSV. @ 500 350 LG. TRANSV. @ 300		25 MPa 25 MPa
315 LG. TRANSV. @ 500 350 LG. TRANSV. @ 300 SCHEDULE		25 MPa 25 MPa



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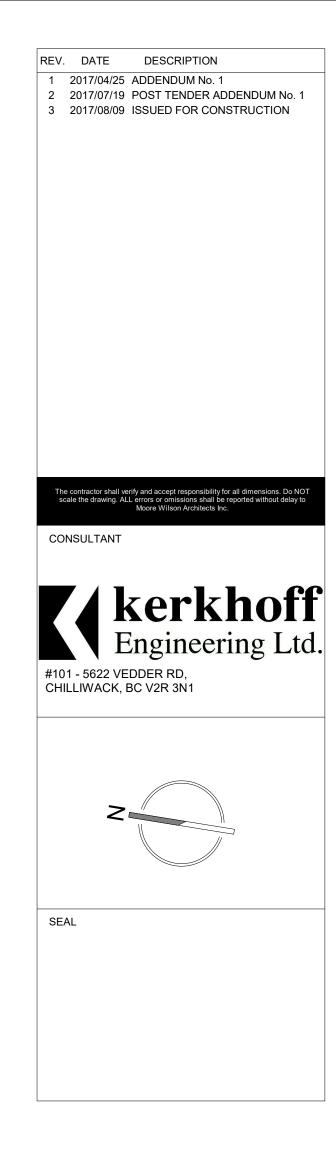




- EXISTING HSS 102X102

150WD X 205X12.5 BACKING PLATE WELD TO COLUMN --- 6 SIDE PLATES c/w (2) 16 Ø THROUGH BOLTS

- 12 BEARING PLATE

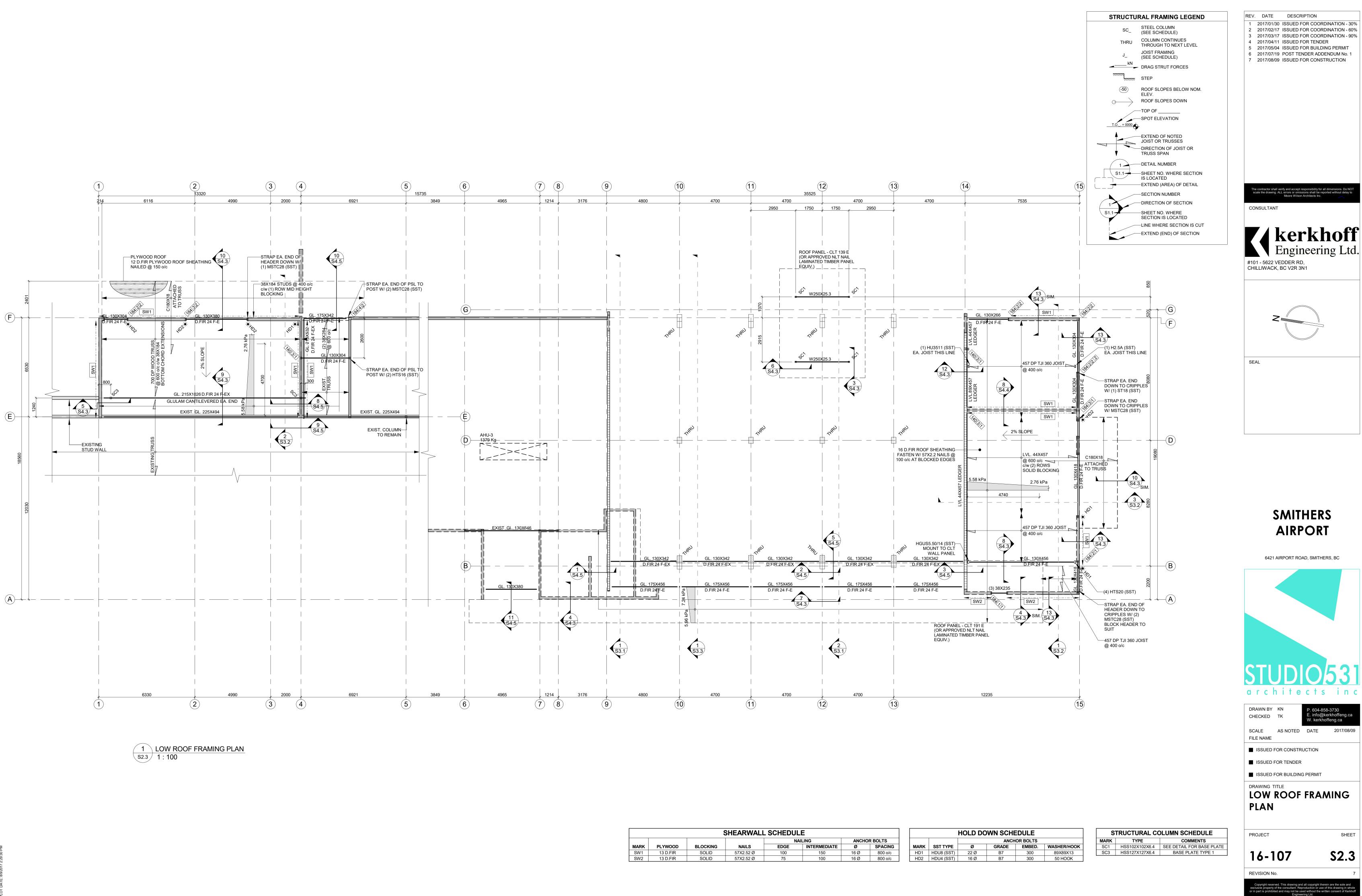




6421 AIRPORT ROAD, SMITHERS BC



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SCALE AS NOTED FILE NAME	DATE 2017/08/09							
■ ISSUED FOR CONSTRUCTION								
ISSUED FOR TENDER								
	G PERMIT							
DRAWING TITLE LEVEL 1 FLOOR PLAN								
	SHEET							
PROJECT	sheet <b>\$2.2-1</b>							



SHEARWALL SCHEDULE										
				NAILING ANCHOR BOLTS				1		
MARK	PLYWOOD	BLOCKING	NAILS	EDGE	INTERMEDIATE	Ø	SPACING	1	MARK	SST TYF
SW1	13 D.FIR	SOLID	57X2.52 Ø	100	150	16 Ø	800 o/c	1	HD1	HDU8 (SS
SW2	13 D.FIR	SOLID	57X2.52 Ø	75	100	16 Ø	800 o/c	]	HD2	HDU4 (SS

<u>Cross Laminted Timber General Notes</u> All Cross Laminated Timber (CLT) Panels as shown on structural drawings are to be supplied by Structurlam wood products.

Alternative equivalent products are allowed, and supplier is to incur all costs of redesign. All panels are to support snow, wind and dead loads as noted. Design specifications for alternative products to be forwarded to Kerkhoff Engineering.

Unsolicited alternative proposals, and unsolicited substitutions of materials, structure, connections or otherwise, must be submitted with sketches and calculations sealed by a Professional Engineer registered in the Province/State of British Columbia and will require reviews by the consultants. Detailed reviews such as these, including changes to construction drawings and coordination, will be undertaken on an additional fee basis, at the Contractor's cost. This cost must be included in the proposal by the Contractor. Such review does not guarantee acceptance of the unsolicited alternative proposal(s).

CLT panels shall meet the following standards CAN/CSA O122-06, ANSI D3737-07 Structural Glued Laminated Timber.

- CSA O86-14, Engineering Design in Wood, including Annex B. CSA O112 SERIES-M1977 (R2006), CSA Standards for Wood Adhesives.
- CSA 0177-16, Qualification Code for Manufacturers of Structural Glued Laminated Timber. APA Standard for Performance Rated CLT ANSI/APA PRG 320/2012.
- The general contractor is responsible for ensuring all product handling and construction site safety is in

conformance with Worksafe BC guidelines. Shop Drawings - Clearly indicate stress grade, service grade, appearance grade, connection details, shop applied

finishes, shop and erection details, including cuts, holes, fastenings, camber and connection hardware.

Submit PDF shop drawings showing all applicable details and material specifications to the Engineer for review prior to fabrication. Shop drawings shall be accompanied by a certificate of conformance to manufacturing standard.

Cross Laminated Timber (CLT) manufacturer certified by CSA Administrative Board, Structure Glued Laminated Timber Division in accordance with CAN/CSA O177- to manufacture:

Class 1 interior softwood glued laminated members. Class X exterior softwood glued laminated members.

#### Submit certificate in accordance with CAN/CSA O177. Storage and Protection

Slit underside of membrane covering during storage at site. Do not deface members. Store CLT panels, blocked off ground and separated with striping, so air may circulate around all faces of

members. Cover top and sides with opaque moisture resistant membrane if outside. Maintain protection of CLT panels during construction.

Materials Laminating Stock for Cross Laminated Timber (CLT) panels: Spruce Pine #1/2 to CSA- 0122 - 06 or CSA 086 - 09.

Underside of all roof panels to be D.Fir grade. See Architectural Division 6 specifications for finishing requirements.

#### Adhesives: To CSA 0112.10, and Sections 2.1.3 and 3.3 (ASTM D7247 heat durability) of AITC 405. Acceptable Product: Purbond HB E452 (or approved equivalent).

#### Fabrication Fabricate Cross Laminated Timber (CLT) panels in accordance with ANSI/APA PRG 320/2012 except where specified otherwise and to following classifications. Use multiple layers of 19mm minimum to 38mm maximum thick laminations. Exceptions only with written consent of the Consultant.

CLT grade: as indicated on drawings and referenced by APA/PRG 320 and APA PR-L314C.

## Appearance Classification:

Erection

Exposed – where panels are in view in final construction. Exposed face to utilize "J" grade SPF lumber, or L3 &Btr D. fir

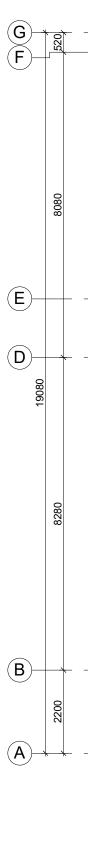
- Shake and checks allowed up to 610mm long, none through Up to a maximum of 5% Blue stain allowed, heart stain permitted. Knots – firm and tight (NLGA #2) Pitch streaks not limited Wane on face not permitted
- Side pressure on exposed faces required
- Erect CLT panels in accordance with final reviewed shop drawings.

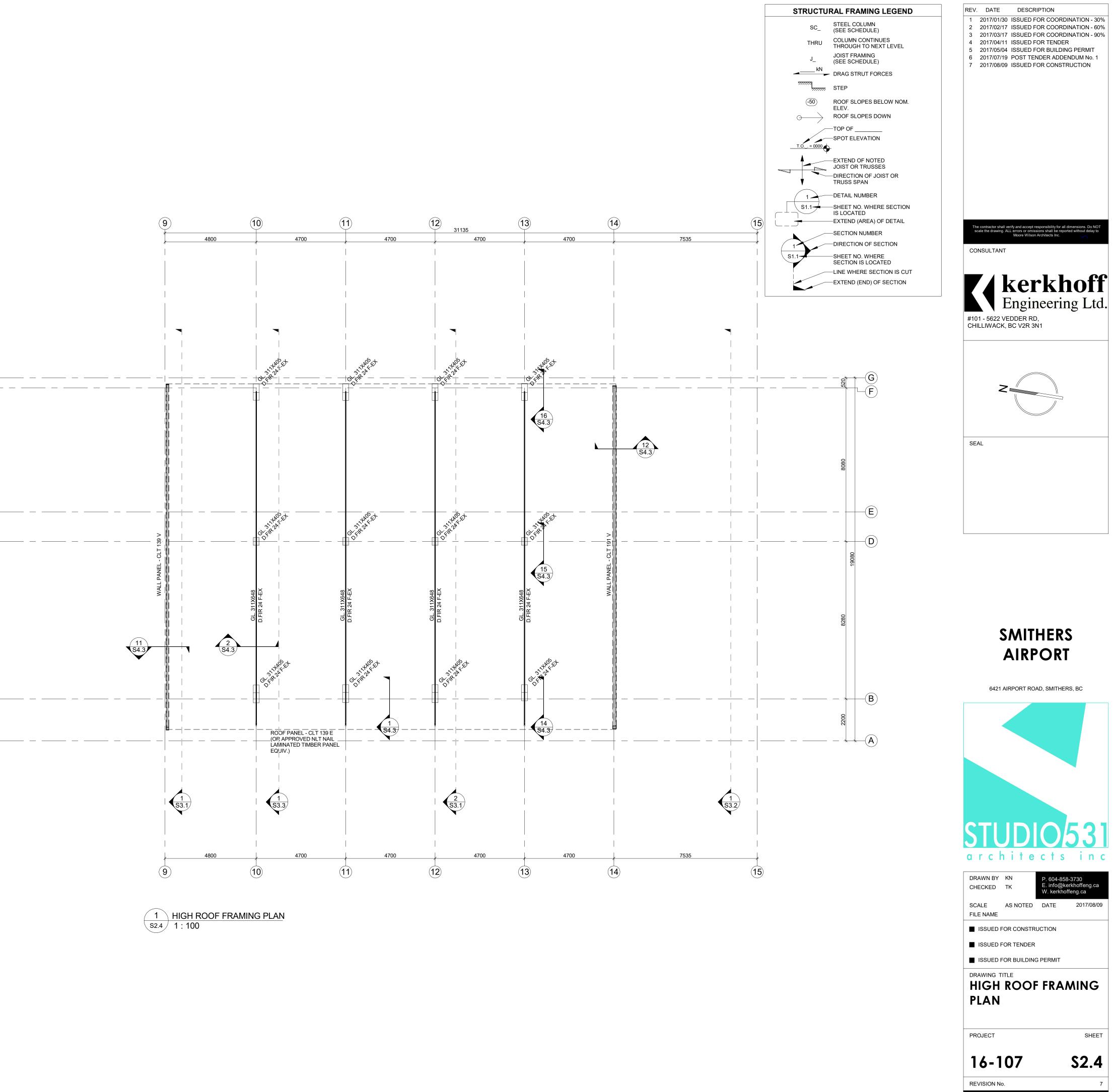
Make adequate provision for possible erection stresses. Set panels level and plumb to correct positions. Securely brace panels and anchor in place to maintain plumb until permanently secured by finished structure.

Fit CLT panels closely and accurately, without trimming, cutting or other modifications, unless approved in writing by Engineer.

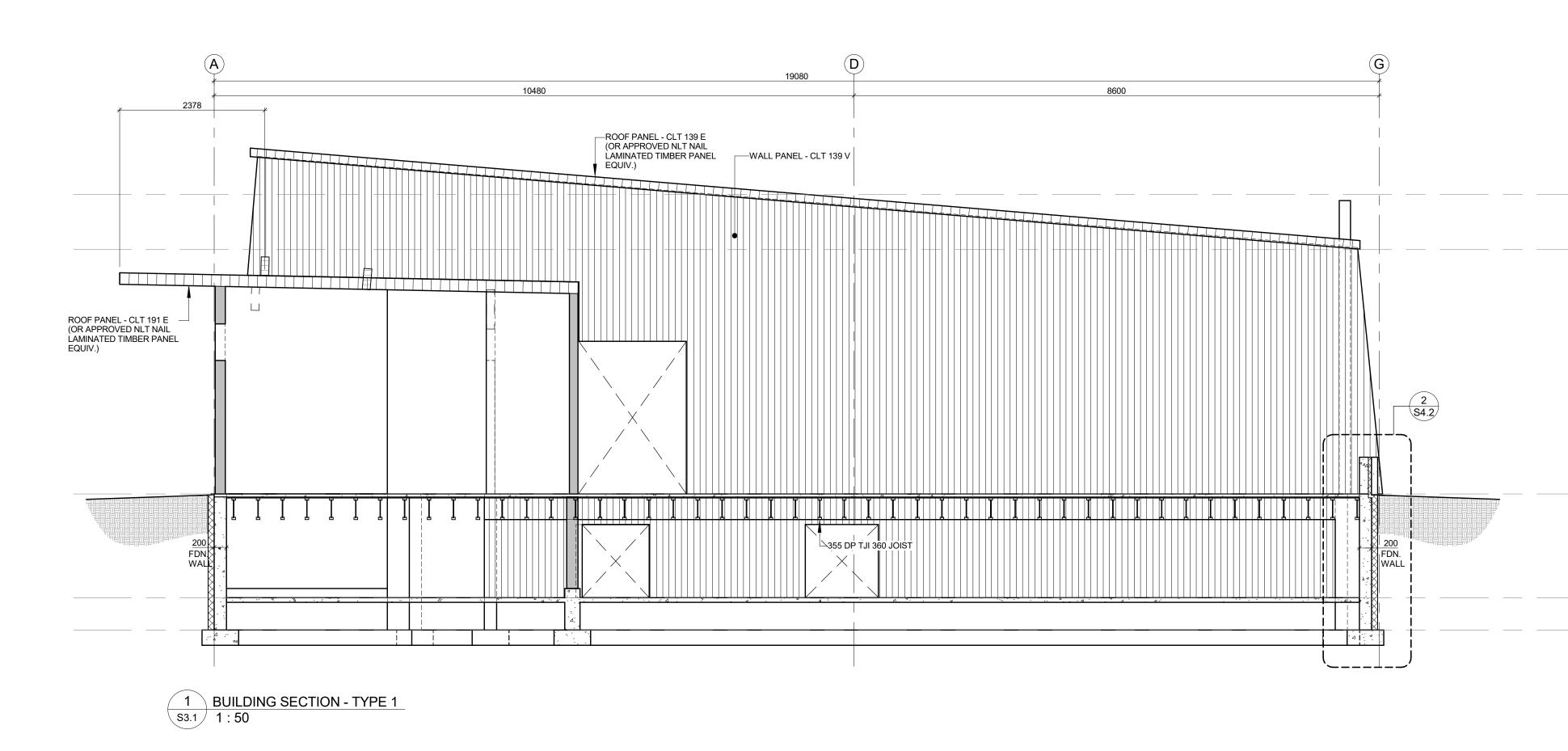
Site cutting or boring of CLT panels, other than shown on shop drawings not permitted without written consent of Engineer.

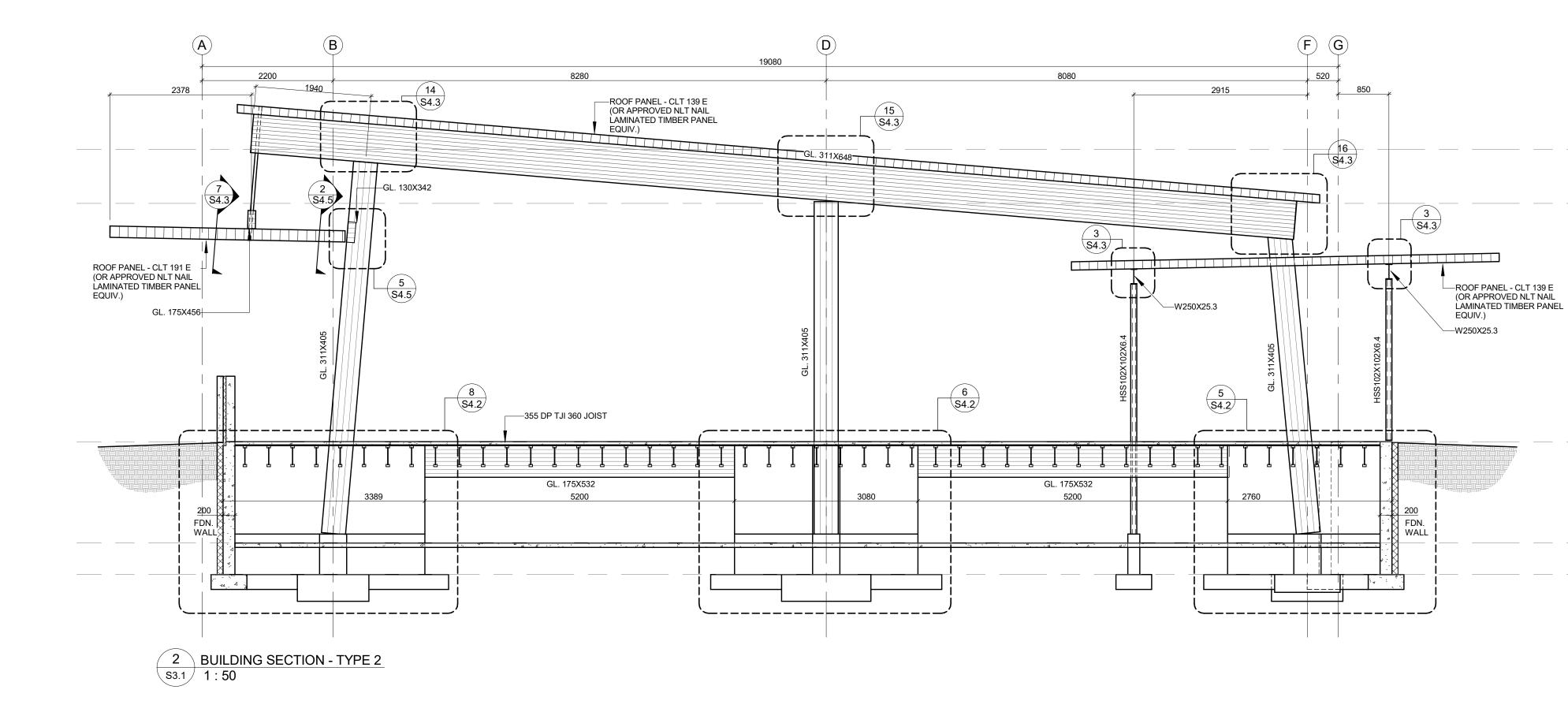
2 CLT SPECIFICATIONS \$2.4 1:25

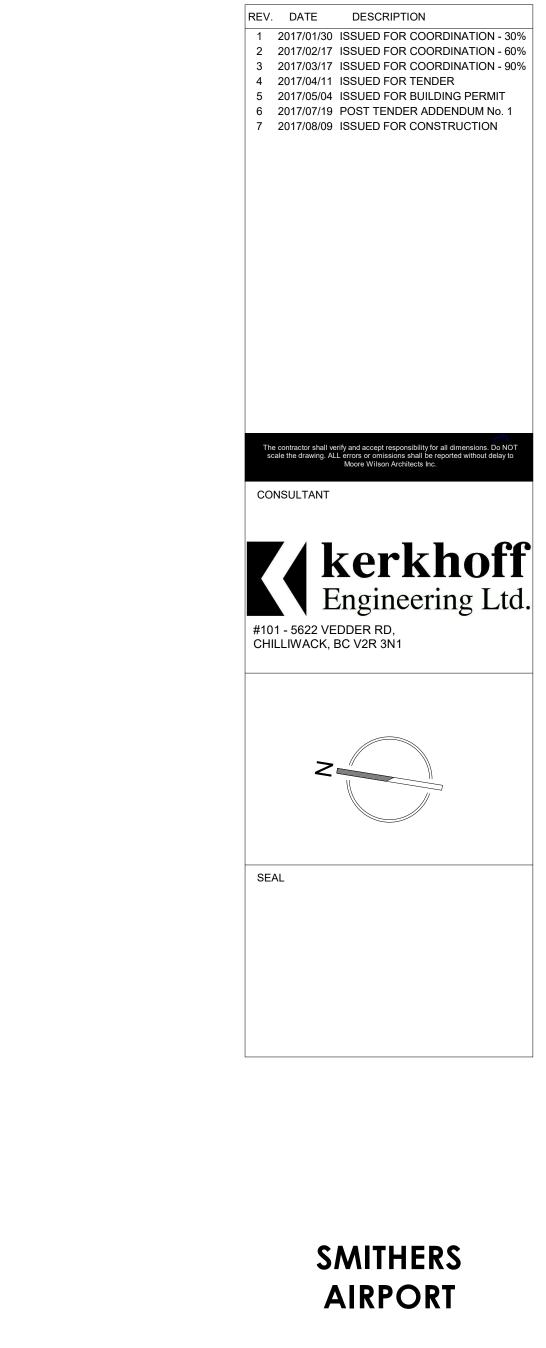




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# DRAWING TITLE BUILDING SECTIONS PROJECT SHEET 16-107 S3.1 REVISION No. 7

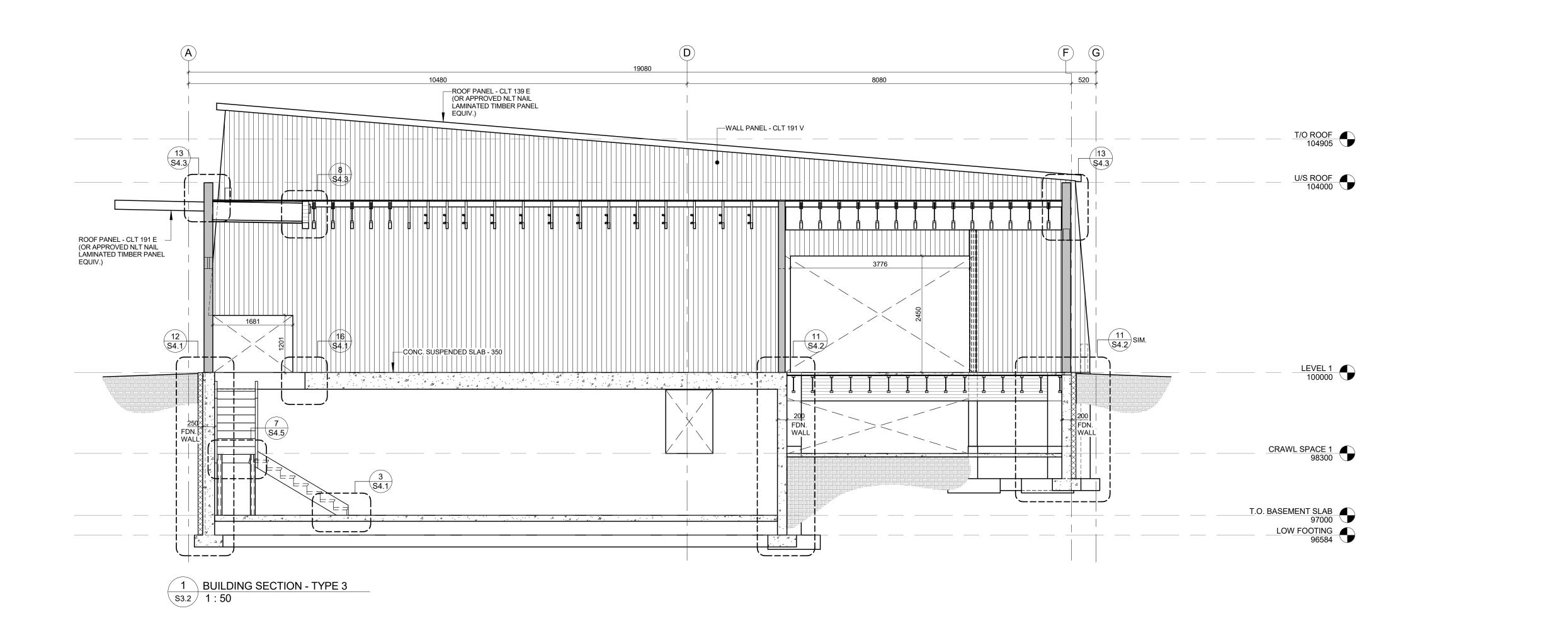
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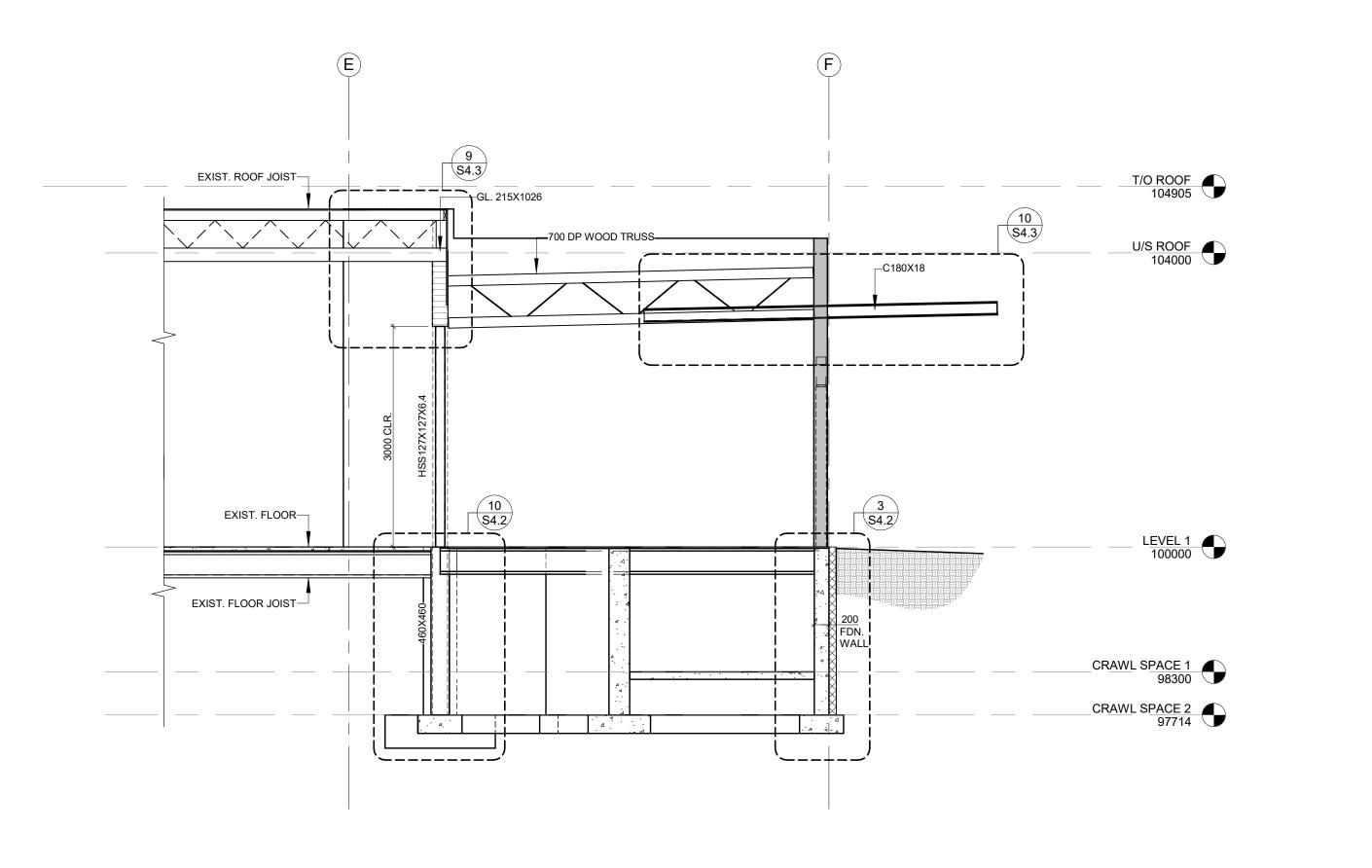
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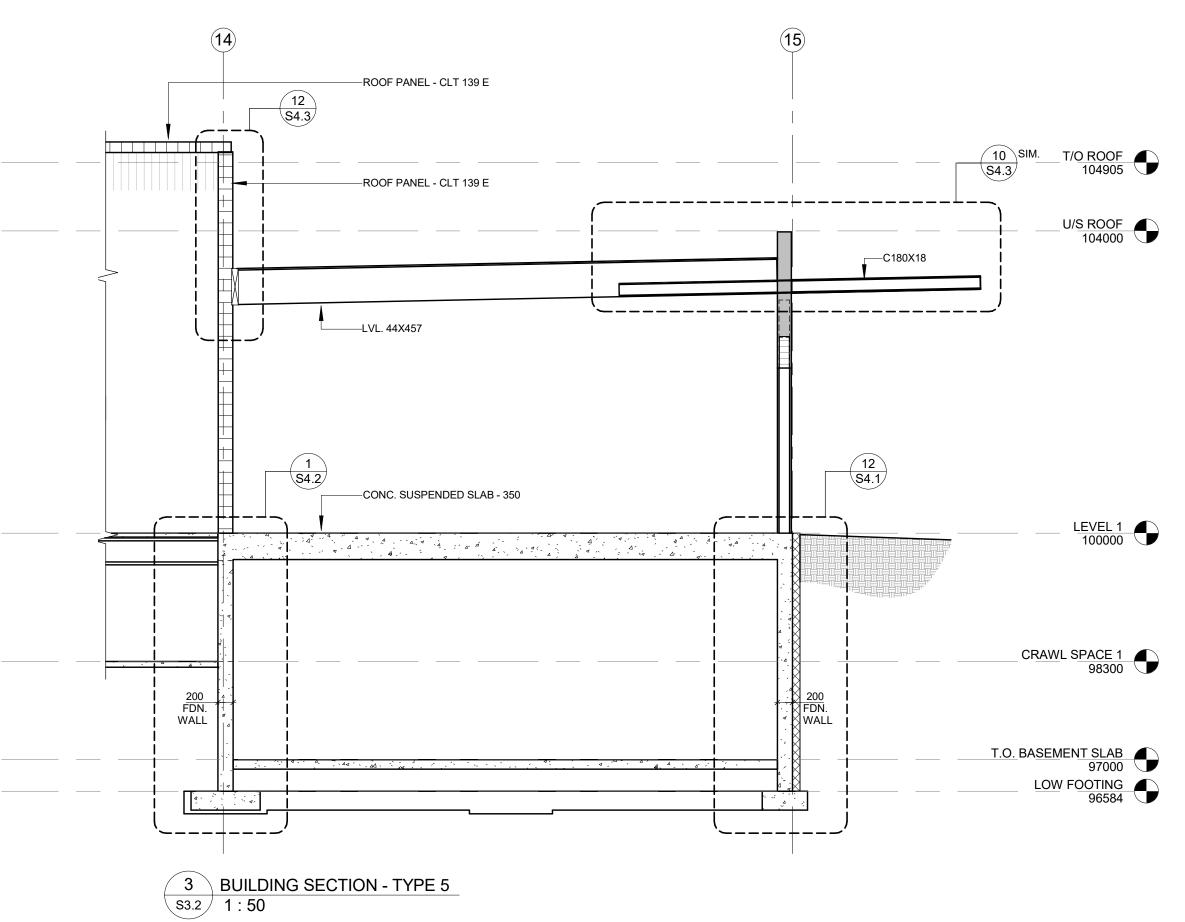
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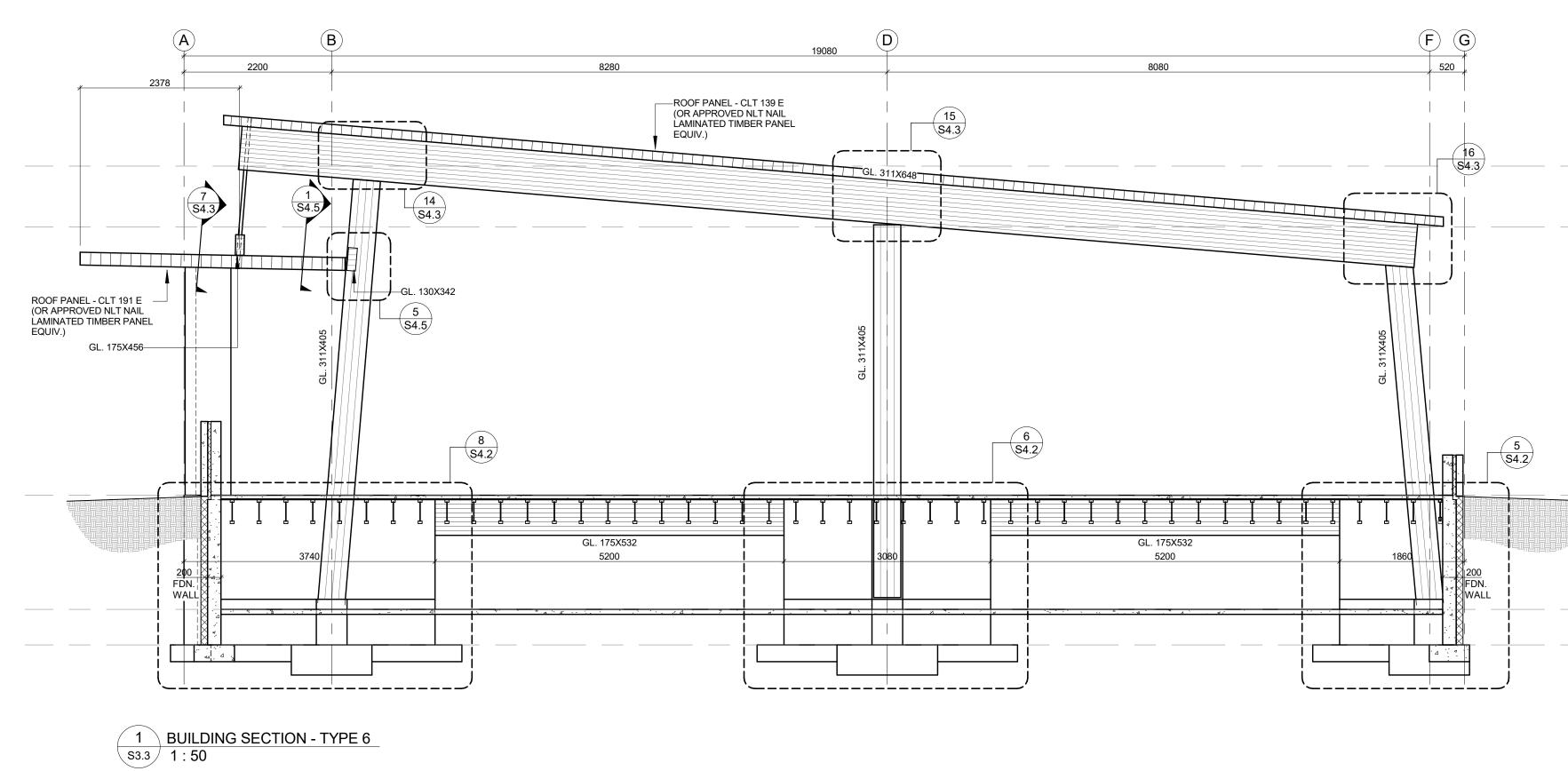
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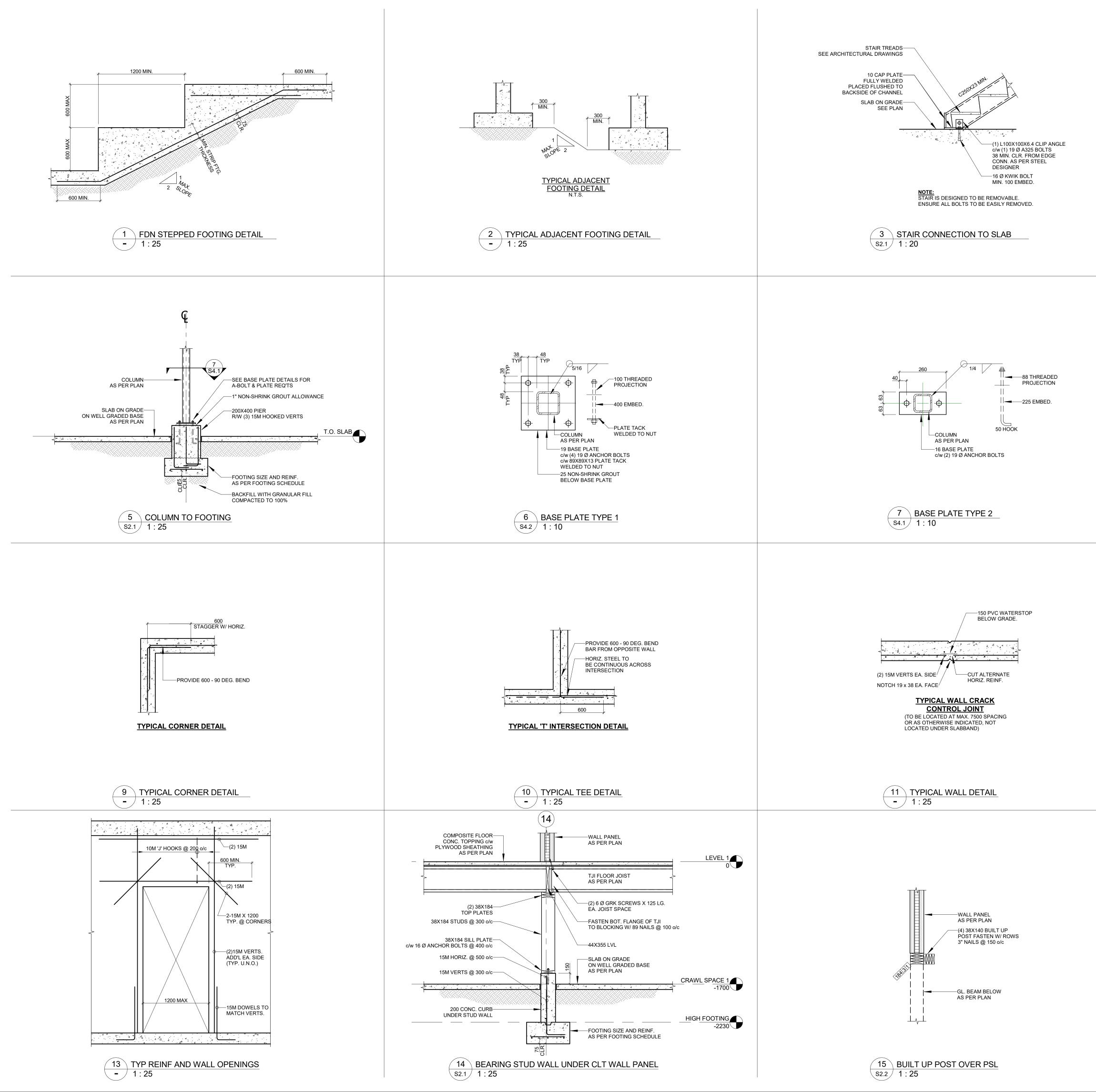


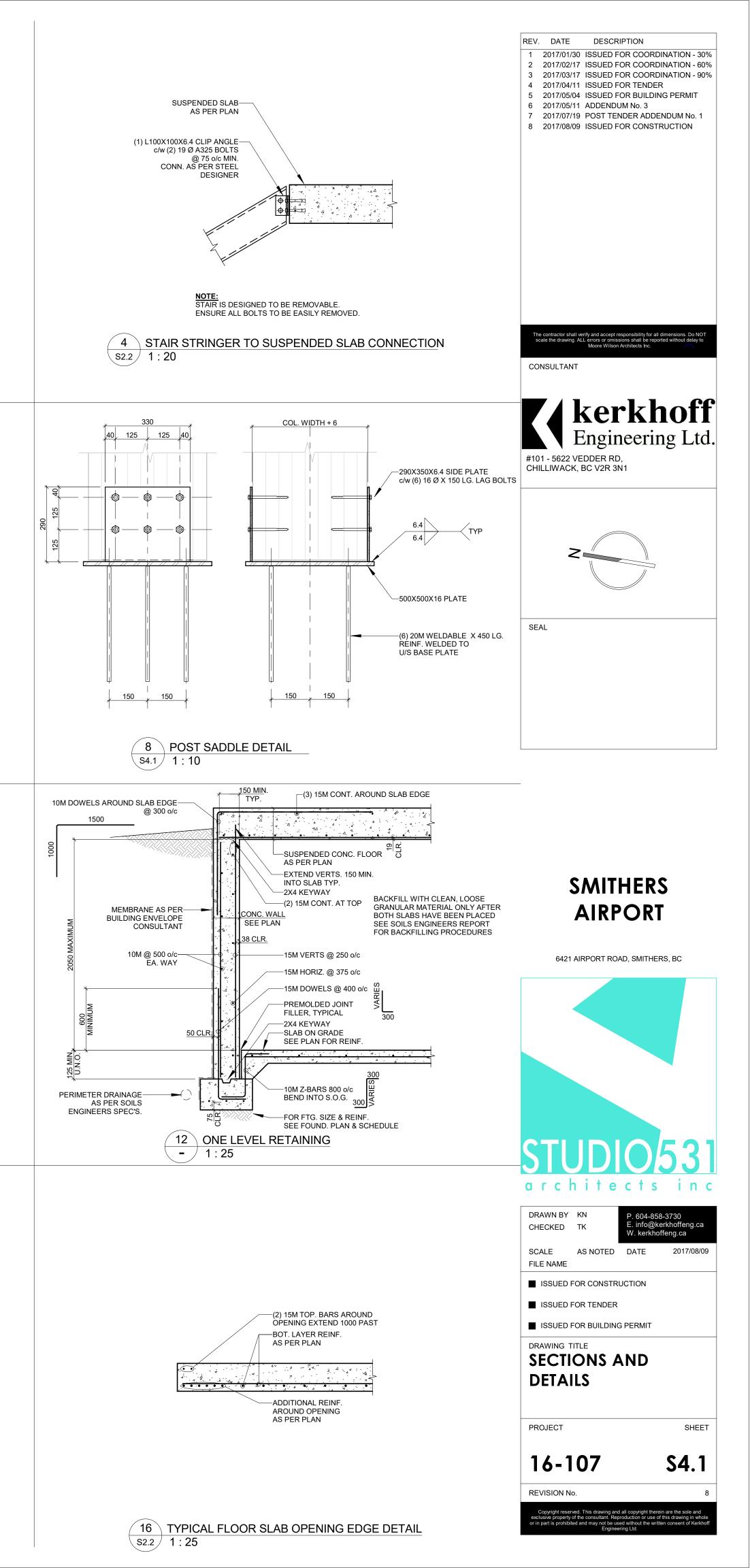
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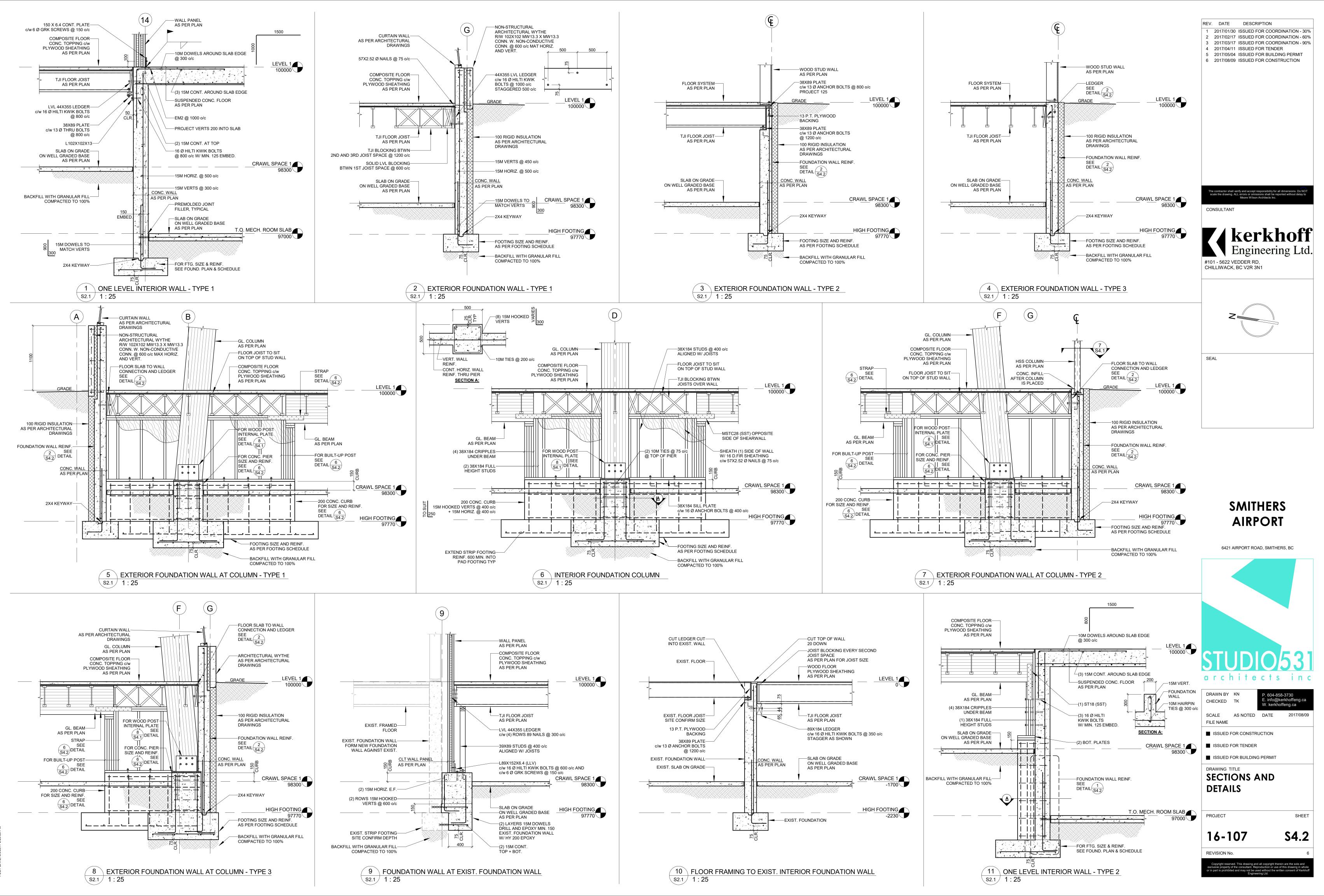
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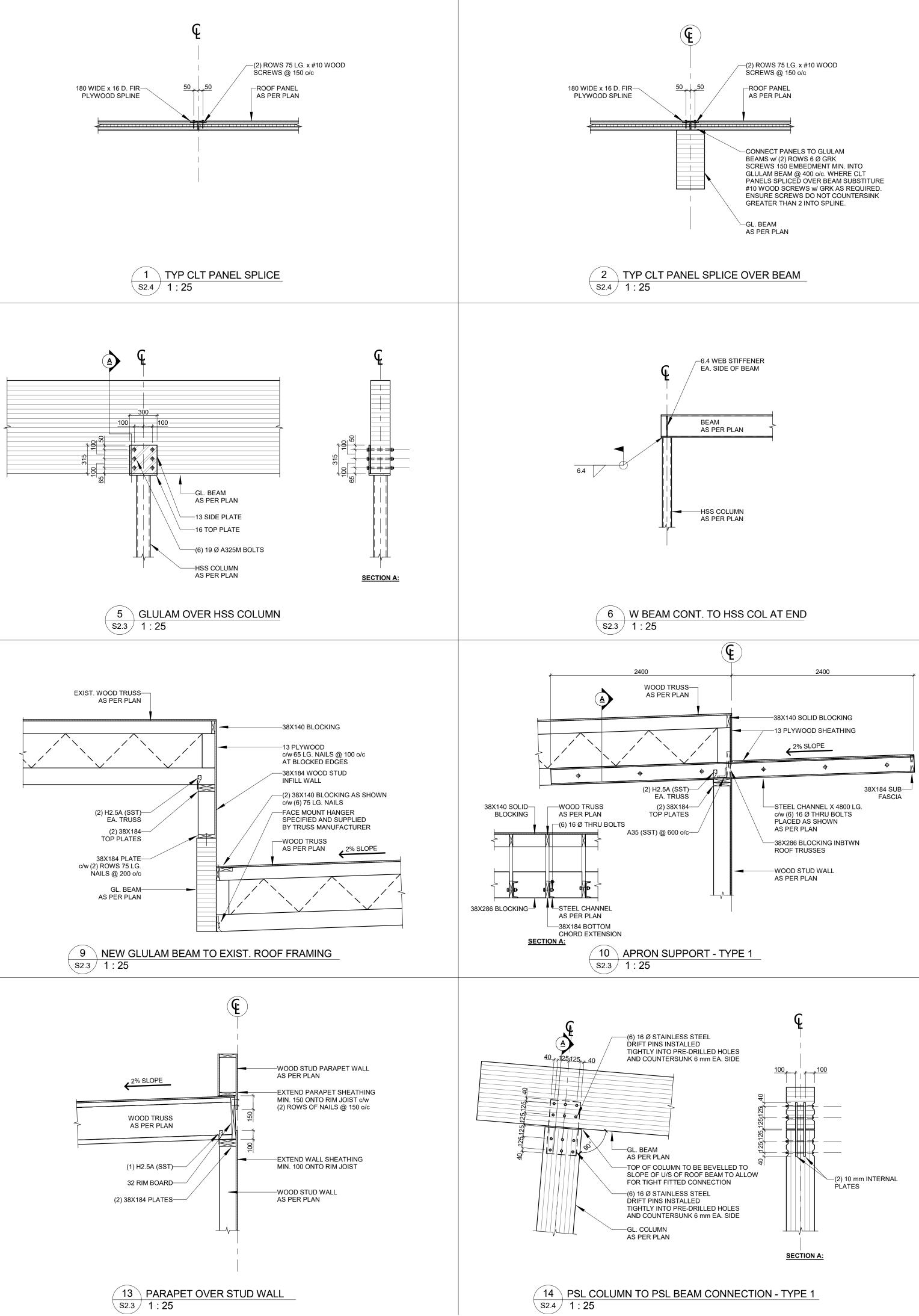
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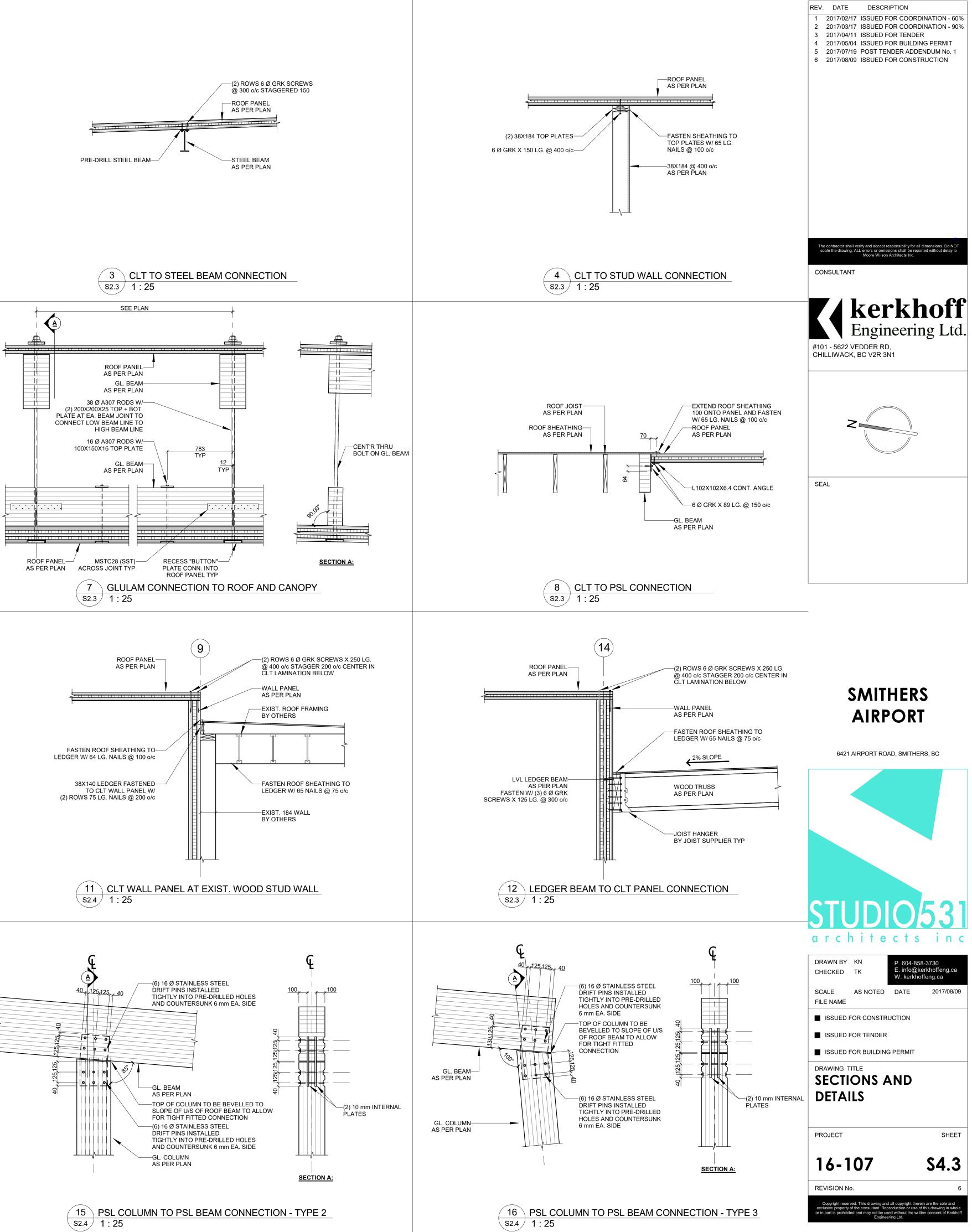




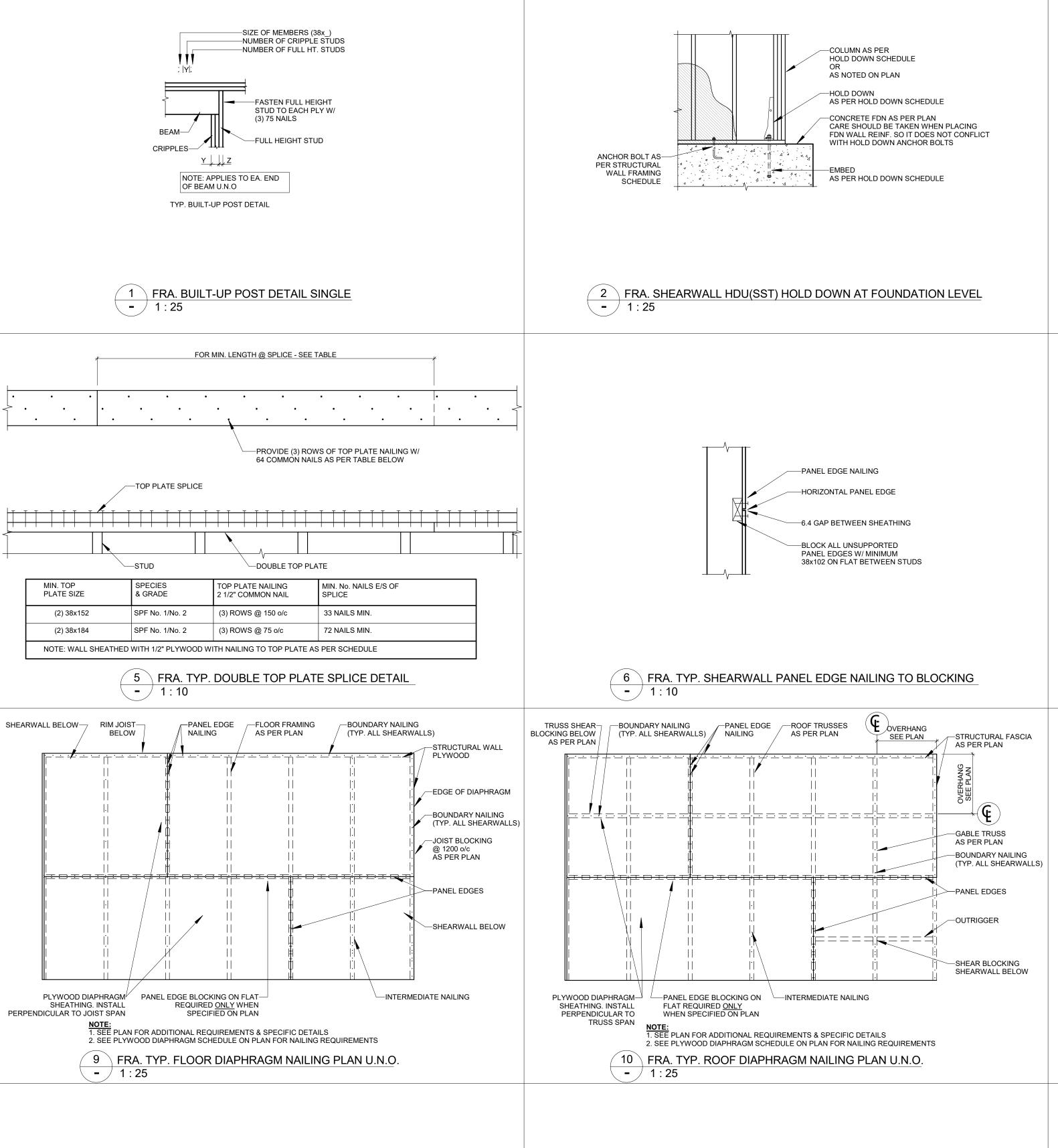


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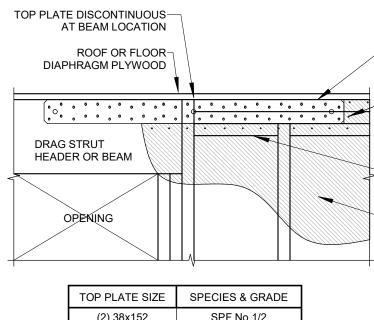


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