GENERAL REQUIREMENTS

- All work shall conform to the requirements of the British Columbia Building Code (BCBC), 2018. All documents designated therein and all local
- codes and bylaws. The General Contractor shall compare and coordinate the drawings of all the disciplines and report any discrepancy to the Architect and the
- Engineers for assessment / clarification before proceeding with the work. B. It is assumed these drawings accurately reflect actual site conditions. This design has been reviewed for the adequacy of permanent primary
- structural components only. Excavation, soil mechanics, shoring and falsework components necessary for construction safety are not included and will not be reviewed by the structural engineer. The Contractor is responsible for the safety in and around the work site during construction, and for the design, erection and inspection of all temporary structure, formwork, falsework, shoring, etc. needed during
- construction as required by the Worker's Compensation Board (WCB). These structural drawings do not include the design of non-structural elements, including, but not limited to: handrails, snow retention, skylights, glazing systems, brick & stone veneer ties, and seismic restraint of mechanical and electrical equipment.
- 6. The General Contractor must check his/her work and the work of his/her sub-trades before review by the Engineer.
- Where conflicts exist between structural documents, the strictest
- requirements, as indicated by the Structural Engineer, shall govern. 8. No Structural member shall be cut or notched or otherwise reduced in strength unless approved by the Engineer.

SITE REVIEWS

Site reviews of construction will be performed by the Engineer. The contractor shall give 24 HOURS NOTICE for request of any such reviews. These reviews will be limited to concrete reinforcing steel installation, structural steelwork & decking, reinforced masonry and rough carpentry items only. They will not include site safety, methods of construction, electrical or mechanical installations.

DESIGN CRITERIA

. Building Code

British Columbia Building Code (BCBC) 2018

DESI	GN LOADS		
Location	Loading		
Location	psf	kPa	
Ground Snow	73	3.50	
Roof Design Snow	42.3	2.03	
Floor Live	40	1.92	
Floor Live Load Deflection	L/360		
Floor Dead	15	0.72	
Deck Live	40	1.92	
Deck Dead	40	1.92	
Roof Dead	12	0.57	
1/50 Wind	8.4	0.40	

FOUNDATIONS / FOUNDATION WALLS

- The Owner is responsible for engaging a Geotechnical Engineer. 2. No review of slope stability or ground bearing conditions for this have been performed by the Structural Engineer. Such reviews, if required, shall be performed by a Geotechnical Engineer.
- Do not backfill foundation walls more than 4'-0" (1220mm) until floor construction at top and bottom is completed. Ensure free draining backfill and drainage is in place.
- 4. Footings are to be constructed and backfilled as soon as possible following excavation to avoid softening or drying out by exposure.

DESIGN

1. The design uses the following assumed values: a. Allowable bearing pressure = 1500 psf

b. Frost depth = 3'-0" c. Lateral soil pressure = 45 psf per foot of depth

- d. Seismic Site Class D
- Willerton Engineering recommends a Geotechnical Engineer review and approve the above assumed values. All costs associated with incorrect assumptions are the responsibility of the Owner.
- B. Use engineering for al walls backfilled greater than 4'-0" (1200mm). Walls backfilled less than 4'-0" (1200mm) do not require engineering.

SITE PREPARATION

- The Contractor shall be responsible for maintaining any excavations in a stable condition without adversely affecting surrounding properties including services. This includes obtaining all necessary approvals for shoring and anchoring systems.
- 2. Footings near boundaries must not be located higher or lower than footings of adjacent properties unless approved.
- 3. Keep footings clean and free of loose material before inspection,
- immediately prior to pouring concrete ad during pouring. 4. Footings are to bear on native undisturbed soil or rock, free of all organic
- material with a frost protection as specified above, unless otherwise directed / supervised and approved by a Geotechnical Engineer.

REINFORCING STEEL

- 1. Detail and place reinforcing steel in accordance with the "Reinforcing Steel Manual of Standard Practice" and CSA-A23.1 unless noted otherwise.
- 2. Provide deformed bars with yield strength of 400 MPa as specified in CSA G30.18.
- B. Provide welded wire fabric as specified in CSA G40.20/G40.21. 4. Provide a minimum of (2) 15M bars extending 2'-0" (610mm) beyond all corners at wall and slab openings greater than 2'-0" (610mm) wide.

INSTALLATION

- Reinforcing steel is to be free of all dirt, excessive rust and scale at the time of placing and is to be securely in place prior to placing any concrete. No bars are to be wet doweled with the exception of anchor bolts. 2. All bars shown as being bent on the drawings are to be machine bent
- prior to being placed. Concrete cover and bar splices are to be as indicated or in accordance
- with N.B.C. The minimum clear cover for reinforcement in non-pre-stressed concrete
- with expose to earth or weather shall be as shown on the drawings. Reinforcing steel which requires splicing must have a minimum lap of 40 bar diameters. Bars must be continuous around corners and at intersections of walls, either by bending around the corner, or by adding corner bars with the minimum 40 bar diameter lap length. Space laps so that no more than 50% of bars placed are lapped
- within 4'-0" (1200mm) for beams and columns. 6. Provide a minimum of (2) 15M bars extending 2'-0" (610mm) beyond all
- corners at wall and slab openings greater than 2'-0" (610mm) wide. All wall and grade beam reinforcing shall be continuous at corners and intersections. Use corner bars.
- 8. Provide chairs, spacer bars, support bars & other accessories to support reinforcing in accordance with the latest editions of CSA A23.1 and A23.3
- Min. reinforcing bar lap / splice U.N.O.: Bar Size Inches Bar Size Inches mm 16" 410 36" 20M 915 24" 610 25M 44" 1200

CONCRETE - CAST IN PLACE

- 1. The contractor shall provide minimum 24 hours notice for reinforcement
- inspections. Concrete shall not be poured until the reinforcing has been inspected by Willerton Engineering and final approval is obtained. 2. No coring, holes, chases or embedment of pipes other than those shown on the structural drawings is permitted without written permission from
- Willerton Engineering 3. Mix designs shall be submitted by the contractor to the testing agency for review.
- No chlorides are permitted. 5. For slabs on grade and suspended slabs, concrete is to have a curing agent (i.e. Master Seal) applied immediately after finishing the surface
- with a steel power trowel to a smooth and flat finish. 6. Use a minimum of 4" (102mm) concrete slab-on-grade, reinforced with 10M bars @ 18" c/c (460mm) each way placed at mid-depth, UNO.

7. Damp proof all walls below grade with (2) coats of asphalt emulsion, and

- plug tie holes with fiber-gum. 8. Construction joints shall be installed at 100'-0" (30.0m) c/c maximum
- spacing, unless noted otherwise. 9. Control joints in slab-on-grade shall be saw cut at a maximum distance of 50 times the slab thickness or 20'-0" (6.0m) whichever is less, before shrinkage cracks can form.

- 1. All concrete placement and performance shall be in accordance with CSA-A23.1. 2. No more than 2 hours shall elapse between concrete batching and concrete placement unless approved by the testing agency. No water should be added after initial batching. These items are to be monitored by the Contractor.
- 3. Concrete should be protected at all times from being damaged during construction. 4. All concrete shall be compacted with mechanical vibrators. 5. Formed concrete shall be cured for a minimum of 7 days prior to stripping

TESTING

of formwork.

1. Concrete testing shall be done by a testing laboratory at the Owner's expense. Concrete testing shall be conducted for every 70 cubic yards of concrete, but not less than 1 test for concrete cast each day.

		CONCRETE MIX DESIGN:						
		LOCATION	28 Day Strength (MPa)	Air Content (%)	Water Cement Ratio	SIZE ¾"		
	œ	Footings Perimeter	30	1 to 3	0.55	ЫS		
	EXTERIOR	Walls Perimeter	30	4 to 7	0.55	MAX. AGGREGAT (20mm)		
		Retaining walls	30	5 to 8	0.55			
		Piles and piers	30	5 to 8	0.55	AGC		
	INTERIOR	Footings	30	1 to 3	-	X.		
		Walls	30	1 to 3	-	≥		
		The concrete mix shall be in conformance with CSA A23.1 Strength, water cement ratio, and air content shall conform to Tables 7, 8 & 9 of CSA A23.1						

COLD WEATHER REQUIREMENT

- 1. Forecasted temperature no below 2°C:
- a. If concrete drops below 10° C at point of pouring, the mixing water shall be heated to maintain a minimum concrete temperature of 10°C. b. Concrete shall not be placed on or against any surface which is at
- temperatures less than 4°C. c. Contractor should be prepared to cover concrete pour if unexpected
- weather occurs.
- 2. Forecasted temperature below 2°C but above -4°C: a. Forms and steel should be free of ice and snow.
- b. Mixing water shall be heated to give a minimum concrete temperature
- of 10°C at point of pour. c. Concrete shall not be placed on or against any surface which is at
- temperatures less the 4°C. d. Poured concrete shall be covered with canvas or similar and kept a
- few inches from the surface. e. Protection should be maintained for at least 3 days.
- 3. Forecasted temperature below -4°C:
- a. Forms and steel should be free of ice and snow.
- b. Mixing water shall be heated to give a minimum concrete temperature of 10°C at point of pour.
- c. Concrete shall not be placed on or against any surface which is at temperatures less the 4°C.
- d. Poured concrete shall be covered with canvas or similar and kept a
- few inches from the surface.
- e. Temperature of the the concrete at all surfaces shall be kept at
- minimum of 20°C for 3 days, or 10°C for 5 days. The concrete must be kept above freezing for a minimum of 7 days.
- f. The enclosure must be constructed so that air can circulate outside the outer of edge members.

1. All materials shall be kept dry and protected from the environment at all times. 2. No cutting or notching of members without the approval from the Structural Engineer.

DIMENSIONAL LUMBER

- 1. All sawn lumber is to conform to CAN/CSA O141. 2. All dimensional lumber shall be graded in accordance with the
- National Lumber Grades Authority. 3. All dimensional lumber shall be dry with a maximum moisture content of 12%.
- 4. All dimensional lumber shall be SPF No. 2 or better unless noted otherwise. 5. Wood in contact with concrete or masonry shall be pressure treated or separated from contact with a moisture barrier.

STRUCTURAL COMPOSITE LUMBER

1. All manufactured beams are to be minimum 2.0E/2900Fb unless noted otherwise & identified with a stamp indicating the product type and grade.

SHEATHING (Plywood and Oriented Strand Board)

- 1. All floor, roof and wall sheathing shall be plywood conforming to CAN/ CSA O121 or CAN/CSA O151 or; Oriented Strand Board (OSB) to CAN/CSA O325.
- 2. Sheathing shall be fastened directly to the supporting framing with the face grain oriented perpendicular to the framing. 3. Panel edges and openings shall be reinforced with back framing, H-clips or tongue and groove.

- 1. (2) ply built-up beams shall be fastened together with minimum (2) rows of $3\frac{1}{2}$ " (90mm) common nails @ 10" (255mm) c/c UNO.
- 2. (3) ply built-up beams shall be fastened together with minimum (2) rows of $3\frac{1}{2}$ " (90mm) common nails @ 10" (255mm) c/c, on each face unless noted otherwise.
- 3. (4) ply and (5) ply built-up beams shall be fastened together with minimum (2) rows of $\frac{1}{2}$ " (13mm) Ø bolts @ 16" (410mm) c/c UNO.
- 4. Equivalent length $\frac{1}{4}$ " (6mm) Ø structural screws (GRK or Simpson) may be used in place of common nails.

- 1. (2) ply built-up columns shall be fastened together with minimum (2) rows of 3" (75mm) common nails @ 9" (230mm) c/c alternating face or (1) row for 2x4 (28x89mm) lumber.
- 2. (3) ply built-up columns shall be fastened together with minimum (2) rows of $4\frac{1}{2}$ " (115mm) common nails @ 9" (230mm) c/c alternating face. or (1) row for 2x4 (28x89mm) lumber 3. (4) ply built-up columns shall be fastened together with minimum
- (2) rows of 6" (150mm) common nails @ 9" (230mm) c/c alternating face. 4. (5) ply built-up columns shall be fastened together with minimum
- $(1)\frac{1}{2}$ " (13mm) Ø bolt @ 12" (305mm) c/c unless noted otherwise. Equivalent length $\frac{1}{4}$ " (6mm) Ø structural screws (GRK or Simpson) may be used in place of common nails.

TEMPORARY SHORING AND BRACING

- - Temporary shoring and bracing, formwork, falsework, etc, are the responsibility of the Contractor.
 - 2. These drawings show the completed structure only and not components that may be required for construction and safety during construction.
 - 3. All work shall be carried out in accordance with WorkSafe BC (or authority having jurisdiction) requirements.

STRUCTURAL STEEL AND STRUCTURAL WELDING

- 1. Structural Steel Shall Comply with CAN/CSA-S16-14 and the following grades and specifications, unless otherwise noted:
 - a. Rolled Sections: CAN/CSA-G40.20 & G40.21 350W b. Plates : CSA G40.21 - 300W c. HSS (Tube) Sections: CAN/CSA-G40.21 - 350W Class C
- e. Anchor Bolts: ASTM A307 2. All welding work and materials shall comply with CSA W59.

d. Steel to Steel Connection Bolts - ASTM A325

- 3. All structural steel shall be detailed, fabricated and erected in accordance with CAN/CSA S16-14.
- 4. Center all bearing plates under beams unless noted otherwise. 5. Do not cut or core any openings in any structural steel members without prior written approval from Willerton Engineering.

TIMBER FRAMING

- . All timbers shall be graded in accordance with the national lumber grades authority (NLGA) standard grading rules for Canadian lumber (2010).
- All timbers shall be D.Fir No. 1 or better, unless noted otherwise. 3. Lumber shall be seasoned or kiln dried with a moisture contact at
- construction of 12% or less. 4. The use of end grain sealer is recommended for all timbers to help resist
- recommended for all timber exposed to weather. Some warping, twisting, checking, and splitting of timbers as they reach equilibrium moisture content can be expected.

end checking. Surface sealers to resist moisture penetration are

TIMBER CONNECTORS

- Screws:
- a. 'RSS' (Rugged Structural Screws) high tensile/bending yield strength by GRK fasteners, or equal. Screws shall be washer-headed. Shaft diameters shall be $\frac{5}{16}$ " (8mm) Ø up to $\frac{7}{4}$ " (185mm) long and $\frac{3}{8}$ " (9.5mm) Ø from 8" (205mm) long and above. Screws shall penetrate a minimum of 4" (102mm) in receiving timber. Where heads would be visible, screws shall be installed in counter-bored holes to clear the head and allow approximately $\frac{1}{2}$ " for plugging. See
- www.grkfasteners.com for additional information. b. "ASSY-VG-CSK all-threaded, zinc plated (electroplated with a zinc layer thickness of 5-8 micro meters), self-countersinking screws (ICC/ESR #3178) provided by My-Ti-Con Timber Connectors (my-ti-con.com),

Lag Screws:

- a. Lag screws shall be 'galvanized' unless otherwise noted. Drill two lead holes: the first for the threads at 65% to 85% of the shank diameter in wood with a specific gravity (SG) greater than 0.60; 60% to 75% for an SG between 0.50 and 0.60; and 40% to 70% for an SG equal to or less than 0.50 to insure a 'tight grip' into the timber receiving the threads; and the lead hole for the smooth shank equal to the diameter of the
- shank. Pegs:
- 1"Ø, Structural, Straight Grained, Black Walnut, White Oak, Red Oak or Locust treated with paraffin, linseed oil or similar sealing substance.
- 4. Tenons: (minimum dimensions unless otherwise noted)
- a. STUB TENONS: 2" (51mm) Thick by $\frac{3}{4}$ " (19mm) Long b. FULL TENONS: 2" (51mm) Thick by $4\frac{1}{2}$ " Long
- $1\frac{1}{2}$ " (38mm) tenons into $5\frac{1}{2}$ " (140mm) thick timber c. SPACING: End Distance: $2\frac{1}{2}$ " (65mm)
- Edge Distance: 2" (51mm) Spacing: $2\frac{1}{2}$ " to 3" (65 to 75mm)
- Bolts and Pins: a. ASTM Grade A307 (Interior) or Grade 316 Stainless Steel (Exterior) extend past the face of any nuts.) Bolt holes in timber shall be drilled to yield a tight fit requiring 'moderate' driving force with a mallet to seat
- the bolts. To compensate for the effects of cross grain shrinkage on bolted connections in 'green' timber, re-tighten all bolts:
- immediately prior to occupancy; - six months after occupancy; and, - 18 months after occupancy. Where the equilibrium moisture content is equal to or less than 19%,
- re-tighten bolts: - immediately prior to occupancy; and,
- 12 months after occupancy.
- Timberlinx™ by www.timberlinx.com Type and size noted on the details.

Dowels and Threaded Rod Tension Tie Bolts:

a. Rafters: ³/₄" (19mm) unless otherwise noted

past the face of any nuts or threaded turn-buckle sleeves.) Hi-Strength rods where noted shall be ASTM Grade A572 Gr 50. 8. Concrete Anchor System: Cold Weather: Simpson AT-XP Acrylic Adhesive (14 degree limit); Warm Weather: Simpson SET-XP (45 degree limit) or SET-3G (40 degree limit)

ASTM Grade A36 (Installer Note: At least two full threads shall extend

- All installed in strict accordance with Simpson instructions. Installer Note: Temperatures are 'base material temperatures NOT air temperature with
- differences in cure time vs temperature.
- 9. Steel Angles, Plates and Fabricated Connections: (As detailed) 10. Post Bases/Brackets: (As detailed)
- 11. Finishes: All steel connections and hardware exposed to weather to be hot-dip
- galvanized, electrostatically coated or stainless steel UNO. TF JOINERY/CONNECTIONS (As noted below and on the dwg. and details) Housings/Connections
- c/w (2) 9" (230mm) GRK-RSS screws b. Floor Joists: 3/4" (19mm) unless otherwise noted c/w (2) 9" (230mm) GRK-RSS Screws c. Non-load bearing beams and connecting girts: 1" plus $3\frac{1}{2}$ " (25mm
- plus 89mm) tenon as described below (unless otherwise noted) w/ (2) pegs or connecting splines as shown plus two (2) GRK RSS Screws from top of beam 3½" (89mm) min. into receiving timber d. Load bearing beams: $1\frac{1}{2}$ " plus $3\frac{1}{2}$ " (25mm plus 89mm) tenon as
- described below (unless otherwise noted) w/ (2) pegs or connecting splines as shown plus two (2) GRK RSS Screws from top of beam $3\frac{1}{2}$ " (89mm) min. into receiving timber 2. Rafters to Posts:
- 1½" (38mm) housings with (2) Peg M&T connection or two (2) GRK RSS screws with $3\frac{1}{2}$ " (89mm) min. into receiving timber.

Quantity Shown (see specs for mortise and tenon sizes and peg spacing)

ITEMS NOT SPECIFICALLY DETAILED AND DIMENSIONED ARE TO CONFORM TO PART 9 OF THE BRITISH COLUMBIA BUILDING CODE (BCBC) AND ARE BY OTHERS.

REFER TO TRUSS AND JOIST DRAWINGS BY SALMON ARM TRUSS

REFER TO ARCHITECTURAL DRAWINGS BY WOOD CREEK CONSTRUCTION FOR FURTHER INFORMATION.

DRAWING INDEX

PROJECT NOTES

FOUNDATION PLAN & DETAILS

SYSTEMS LTD. FOR FURTHER INFORMATION.

ROOF FRAMING PLAN & DETAILS

2nd FLOOR FRAMING PLAN & DETAILS

ENGINEERING

email: admin@willerton.ca web : willerton.ca COPYRIGHT

4408 28th STREET, VERNON, B.C.

phone: 250-542-5434

WILLERTON ENGINEERING

CONSULTANTS

REVISIONS NO. DATE DESCRIPTION A 22/04/22 BUILDING PERMIT 0 22/04/27 CONSTRUCTION

RESIDENCE

PROJECT

1170 - 19th AVE. SE SALMON ARM, B.C.

DRAWING

PROJECT NOTES

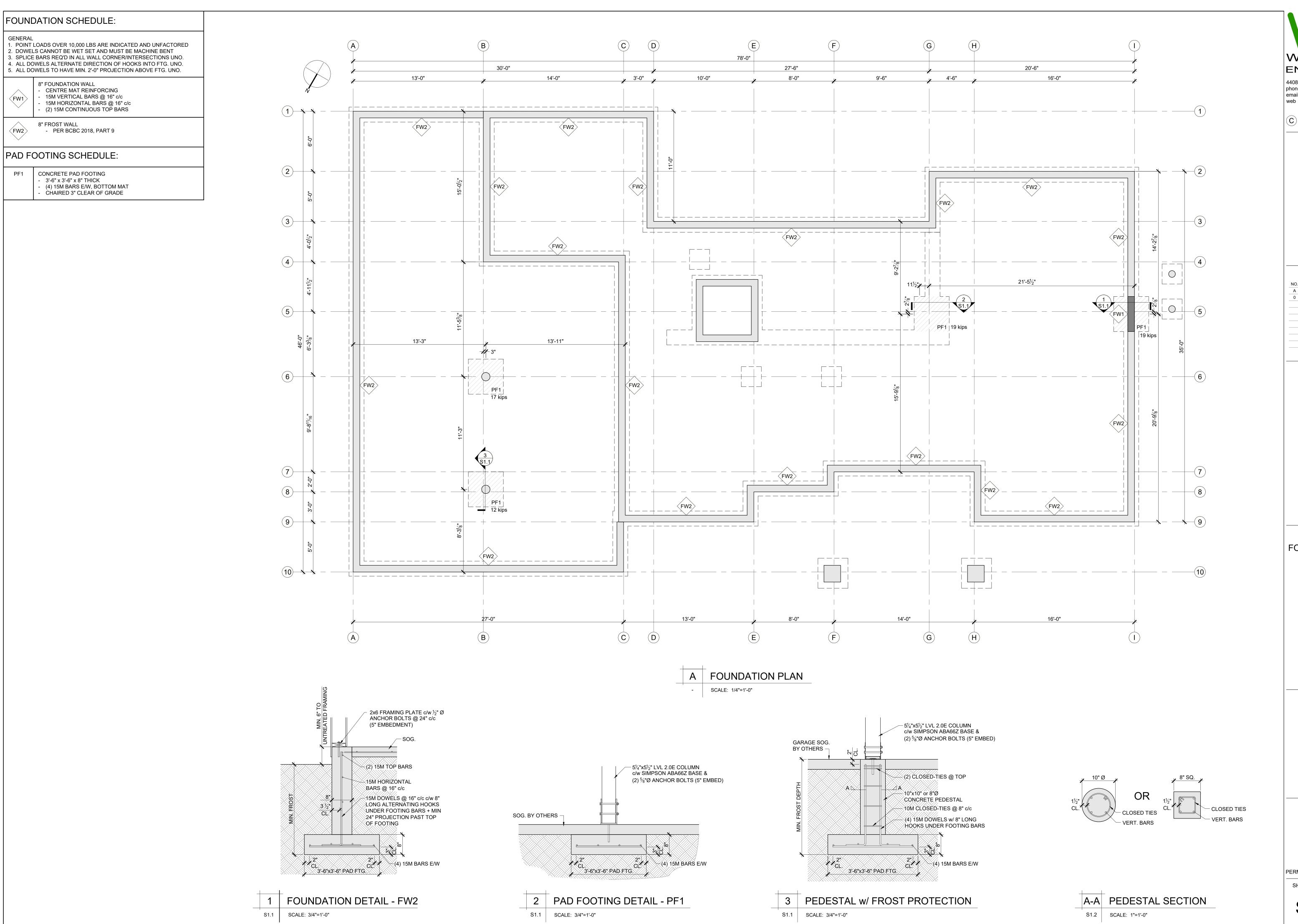
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AS NOTED

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SHEET NUMBER



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GREEN RESIDENCE

1170 - 19th AVE. SE SALMON ARM, B.C.

DRAWING

FOUNDATION PLAN & DETAILS

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DATE
27 April 2022

SCALE
AS NOTED

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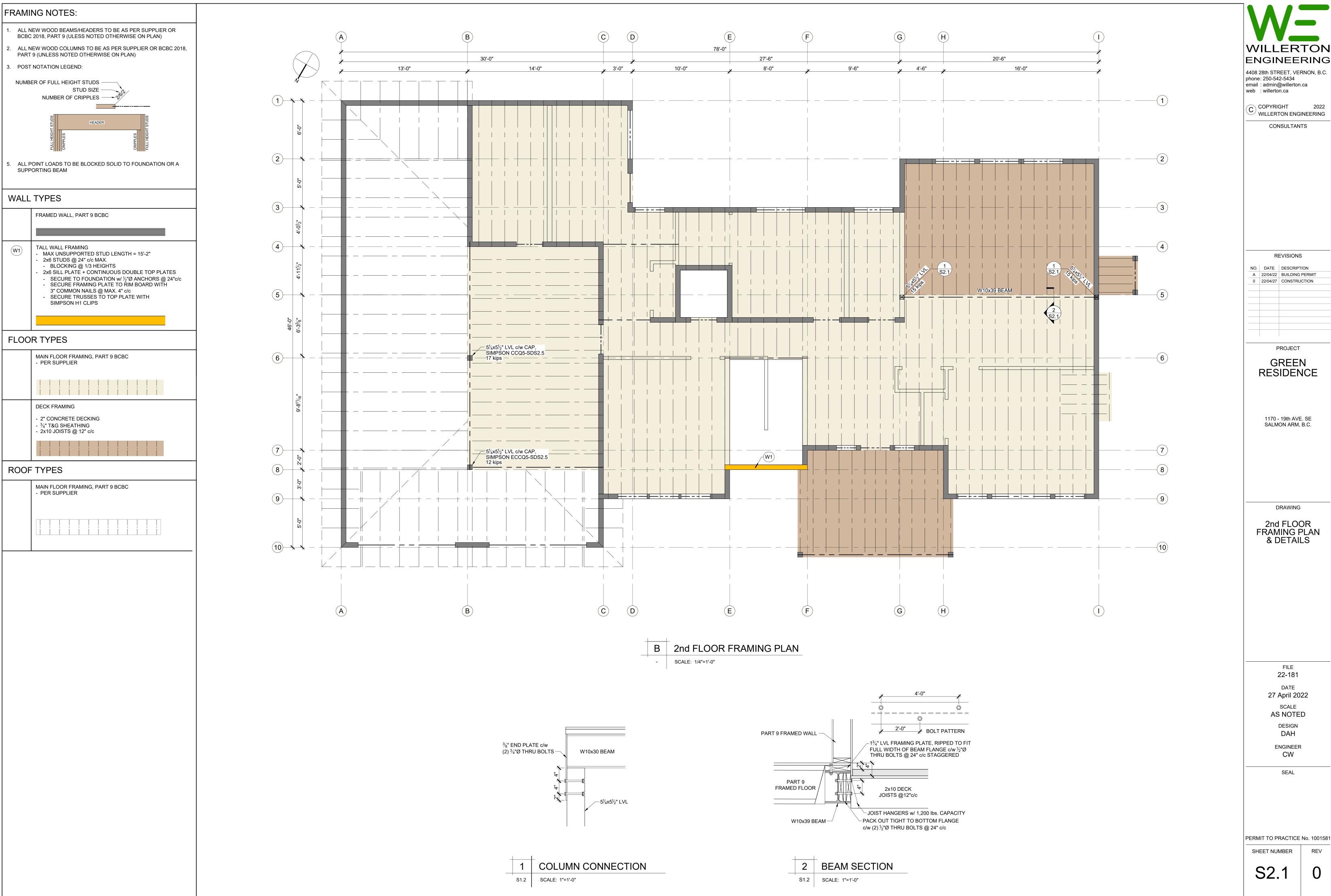
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PROJECT

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> > DRAWING

2nd FLOOR FRAMING PLAN & DETAILS

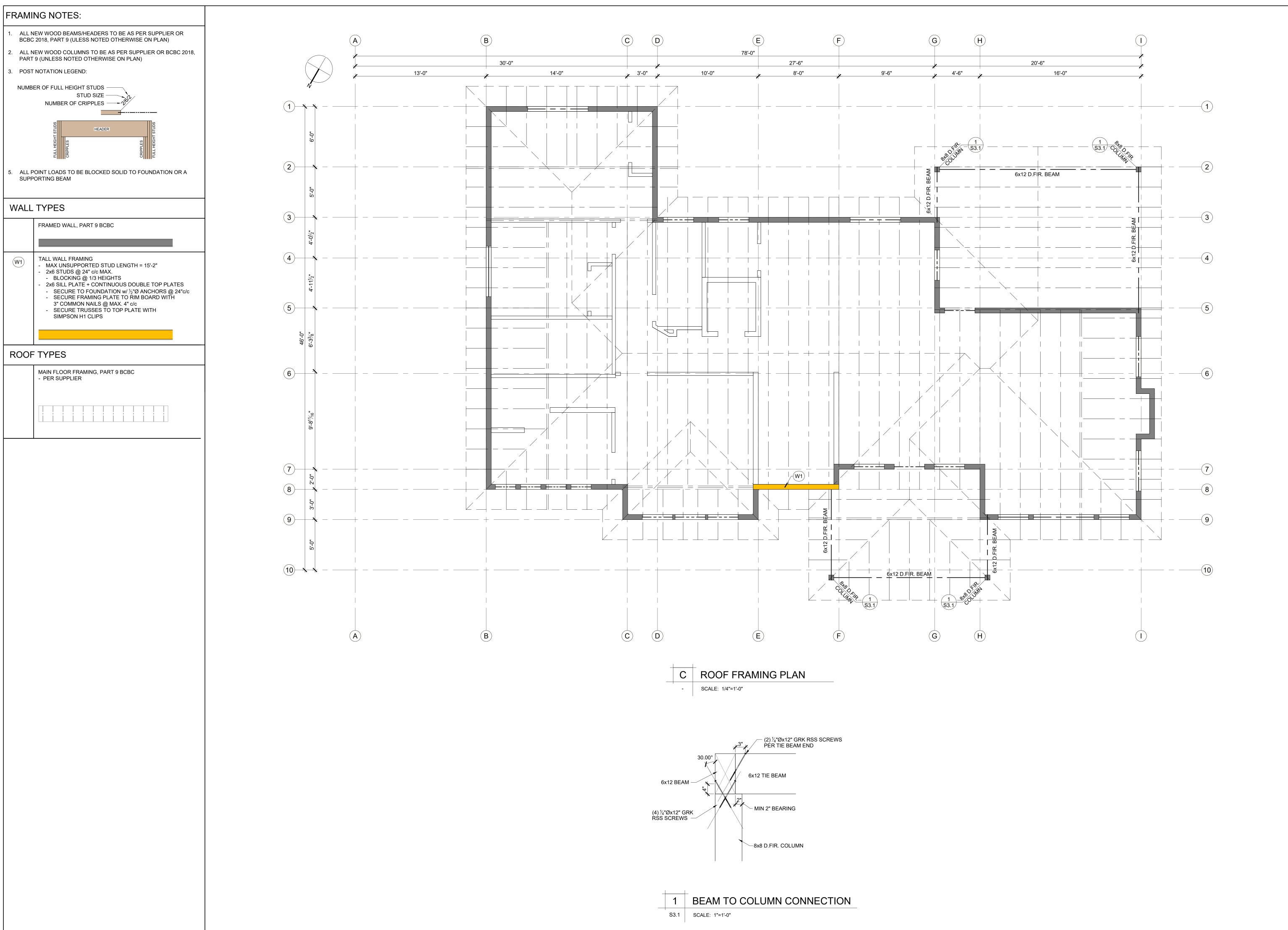
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> > DRAWING

ROOF FRAMING PLAN & DETAILS

22-181

DATE
27 April 20

27 April 2022 SCALE AS NOTED DESIGN

> ENGINEER CW

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PERMIT TO PRACTICE No. 1001581

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