

GENERAL NOTES:

- UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE FOLLOWING NOTES SHALL GOVERN.
- ALL WORK ON THIS PROJECT SHALL CONFORM TO THE 2012 BRITISH COLUMBIA BUILDING CODE (BCBC 2012), ANY LOCAL REGULATIONS AND BYLAWS, AND THE CURRENT OCCUPATIONAL HEALTH AND SAFETY ACT (OHS) AND CURRENT REGULATIONS FOR CONSTRUCTION PROJECTS. ALL CODES AND STANDARDS SHALL BE THOSE REFERENCED IN BCBC 2012.
- THIS SET OF DRAWINGS SUPERCEDES AND REPLACES ALL PREVIOUS DRAWINGS.
- READ THESE DRAWINGS IN CONJUNCTION WITH ALL RELATED CONTRACT DOCUMENTS AND ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS.
- THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND MEASUREMENTS AT THE SITE AND VERIFY ALL DIMENSIONS GIVEN ON THE STRUCTURAL DRAWINGS WITH THE ARCHITECTURAL DRAWINGS. REPORT TO THE ENGINEER ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS WHICH MAY ADVERSELY AFFECT THE PROPER COMPLETION OF THE PROJECT BEFORE PROCEEDING WITH THE WORK.
- IF ANY STRUCTURAL DISCREPANCIES ON THE DRAWINGS EXIST, THE MOST STRINGENT SHALL APPLY.
- DRAWINGS ARE NOT TO BE SCALED.
- CONSTRUCTION AND SHOP DRAWING REVIEW MUST BE PROVIDED AS PER CODE.
- CONSTRUCTION LOADINGS SHALL NOT EXCEED THE SPECIFIED DESIGN LOADS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL MAKE ADEQUATE PROVISION FOR CONSTRUCTION LOADS AND TEMPORARY BRACING TO KEEP STRUCTURE PLUMB AND IN TRUE ALIGNMENT AT ALL PHASES OF CONSTRUCTION. ANY BRACING MEMBERS SHOWN ON THE DRAWINGS ARE REQUIRED FOR THE FINISHED STRUCTURE AND MAY NOT BE SUFFICIENT FOR ERECTION PURPOSES.
- CONSTRUCTION REVIEWS SHALL BE COMPLETED AS REQUIRED BY THE LOCAL AUTHORITY.

DESIGN PARAMETERS:

- DESIGN LOADS ARE UNFACTORED UNLESS NOTED OTHERWISE.
 - CLIMATIC DESIGN DATA (NORTH VANCOUVER):

Snow Load	S _s	= 3.0 kPa
	S _r	= 0.3 kPa
Wind Pressure	$q(\frac{h}{z})$	= 0.45 kPa
Seismic Data	S _a (0.2)	= 0.88
	S _a (0.5)	= 0.61
	S _a (1.0)	= 0.33
	S _a (2.0)	= 0.17
	PGA	= 0.44
 - BUILDING IMPORTANCE CATEGORY = Normal
 - SEISMIC INFORMATION (FOR FOUNDATION WALL DESIGN ONLY):

Importance Factor	I _E	= 1.0
Assumed Site Classification		= D
Acceleration Coefficient	F _a	= 1.1
Seismic Hazard Index	I _E F _a S _a (0.2)	= 0.97
Design Method		= Equivalent Static Force Method
 - WIND

Importance Factor	I _w	U _L S	= 1.0
	I _w	S _L S	= 0.75
INTERNAL PRESSURE CATEGORY			= 2
 - ROOF

Importance Factor	I _s	U _L S	= 1.0
	I _s	S _L S	= 0.9
	S		= I _w [S _w (C _{bx} C _w C _o) + S _r]
	S		= 1.0x[3.0x0.55+0.3]
	S		= 1.95 kPa (40.7 psf)
ROOF DEAD LOAD			= 0.86 kPa (18 psf)
ROOF OVERHANG DEAD LOAD			= 0.5 kPa (10 psf)
 - MAIN FLOOR

OCCUPANCY (LIVE)		= 1.9 kPa (40 psf)
DEAD LOAD		= 0.5 kPa (10 psf)
 - GARAGE SUSPENDED SLAB

OCCUPANCY (LIVE)		= 2.4 kPa (50 psf) + TWO-POST CAR LIFT SYSTEM WITH MAX. LOAD OF 10 kN (2250 lbs) PER POST
DEAD LOAD		= 6.6 kPa (138 psf)
		= 10" CONCRETE FLOOR SLAB + 0.6 kPa (12 psf) SUPERIMPOSED
 - BELOW GRADE WALLS

SURCHARGE (LIVE)		= 2.4 kPa (50 psf)
SOIL WEIGHT		= 4.71 kN/m ³ (30 pcf)

- ADDITIONAL DEAD LOAD ALLOWANCE WAS NOT INCLUDED FOR ITEMS SUCH AS HEAVY TILE FLOORING. CONTACT TACOMA ENGINEERS IF THE WOOD FRAMED FLOOR DEAD LOAD EXCEEDS 0.5 kPa.

- GUARD DESIGN LOADS TO BCBC 9.8.8.2.

FOUNDATIONS:

- A SLS DESIGN BEARING PRESSURE OF 75 kPa (1500 psf) WAS ASSUMED FOR ALL FOOTINGS.
- SOFT AREAS UNCOVERED DURING EXCAVATION SHALL BE SUB-EXCAVATED TO SOUND MATERIAL AND FILLED WITH CLEAN, FREE DRAINED GRANULAR SOIL COMPACTED TO 100% STANDARD PROCTOR DRY DENSITY (SPDD).
- LOCATE ALL FOOTINGS CENTRALLY UNDER COLUMNS AND WALLS UNLESS NOTED OTHERWISE.
- PLACE FOOTINGS WHICH ARE EXPOSED TO FREEZING WEATHER A MINIMUM OF 1200mm (48") BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
- FOUNDATION WALLS SHALL BE Laterally SUPPORTED AT THE TOP AND BOTTOM PRIOR TO BACKFILLING.
- SHOULD UNDERGROUND WATER BE ENCOUNTERED, PROVIDE Dewatering FACILITIES TO KEEP WATER LEVEL BELOW FOOTINGS. REFER TO SOIL ENGINEERS RECOMMENDATIONS FOR REMEDIAL MEASURES.
- HYDROSTATIC PRESSURE DUE TO WATER BUILD-UP HAS NOT BEEN INCLUDED IN THE DESIGN. FOUNDATION WALL AND RETAINING WALL BACKFILL SHALL BE DRAINED IN ACCORDANCE WITH 9.4.4.6.
- THE MAXIMUM AGGREGATE SIZE FOR THE ICF CONCRETE SHALL NOT EXCEED 9.5mm (3/8") IN DIAMETER.
- SURFACE GRADING AROUND THE BUILDING IS TO SLOPE AWAY FROM THE BUILDING TO ALLOW SURFACE WATER TO DRAIN AWAY.
- PROVIDE 2 - 15M FULL HEIGHT VERTICAL BARS IN ICF AT BOTH SIDES OF ALL WINDOW & DOOR OPENINGS AND AT ENDS OF WALL SEGMENTS.
- PROVIDE 10m x 24" x 24" BENT DOWELS @ 12" VERTICAL SPACING FOR THE FULL HEIGHT OF THE WALL AT ALL CORNER LOCATIONS.

REINFORCING STEEL:

- ALL REBAR SHALL BE DEFORMED BARS CONFORMING TO G30.18 WITH A MINIMUM YIELD STRENGTH OF 400 MPa.
- REINFORCING STEEL SHALL BE FABRICATED BY A SUPPLIER EXPERIENCED IN BAR BENDING. ALL BEND DIAMETERS SHALL CONFORM TO CAN/CSA-A23.1.
- ALL REBAR SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH REINFORCING STEEL MANUAL OF STANDARD PRACTICE, BY R.S.I.O., 4TH EDITION (2004).
- MAINTAIN THE FOLLOWING CLEAR CONCRETE COVER TO REINFORCEMENT (U.N.O.):
 - 40 mm (1.5") FOR CONCRETE PLACED IN FORMWORK FOR 20M OR SMALLER BARS.
 - 50 mm (2") FOR CONCRETE PLACED IN FORMWORK FOR 25M OR LARGER BARS.
 - 65 mm (2.5") FOR SLAB ON GRADE, TOP OF SLAB TO TOP LAYER OF STEEL.
 - 75 mm (3") FOR CONCRETE PLACED AGAINST THE EARTH (BOTTOM OF FOOTINGS). CHAIRS SHALL BE USED TO MAINTAIN THE SPECIFIED CONCRETE COVER.
- MINIMUM BAR LAP LENGTH (25 MPa, NORMAL DENSITY, NON COATED BARS) SHALL BE:
 - 450 mm (18") FOR 10M BARS
 - 600 mm (24") FOR 15M BARS
 - 750 mm (30") FOR 20M BARS
 - 1200 mm (48") FOR 25M BARS
 - 1400 mm (56") FOR 30M BARS
- LAP ALL HORIZONTAL BARS AT CORNERS WITH BENT DOWELS MEETING THE MINIMUM LAP REQUIREMENTS IN BOTH DIRECTIONS.

CONCRETE

- ALL REINFORCED CONCRETE ELEMENTS ARE DESIGNED USING THE LIMIT STATES DESIGN METHOD IN ACCORDANCE WITH CAN/CSA-A23.3.

- CONCRETE WORK SHALL CONFORM TO CAN/CSA-A23.1,2,3 FOR MATERIALS AND WORKMANSHIP.

- CLASSES OF CONCRETE SHALL BE PLACED IN THE LOCATIONS NOTED:

CLASS OF CONCRETE	LOCATION
C-1	EXTERIOR STRUCTURALLY REINFORCED SLABS, GARAGE SLAB
C-2	EXTERIOR UNREINFORCED SLABS ON GRADE, CURBS
F-2	RETAINING WALL
N-1	INTERIOR FLOOR SLABS
N-2	FOOTINGS, FOUNDATION WALLS, RETAINING WALL FOOTING

- CLASSES OF CONCRETE SHALL HAVE THE FOLLOWING MIX REQUIREMENTS:

CLASS OF CONCRETE	STRENGTH	W/C RATIO	AIR ENTRAINMENT	CHLORIDE ION
C-1	35 MPa	0.40	5% TO 8%	<1500 COLOUMBS AT 56 d
C-2	32 MPa	0.45	5% TO 8%	
F-2	25 MPa	0.55	4% TO 7%	
N-1	25 MPa	0.55		
N-2	20 MPa			

ADJUST AIR ENTRAINMENT PERCENTAGE FOR AGGREGATE SIZE BASED ON A23.1-04 TABLE 4.

- CONCRETE DESIGN IS BASED ON THE ABOVE MIX REQUIREMENTS. PHYSICAL PROPERTIES (SLUMP, AGGREGATE SIZE, ETC.) TO SUIT INSTALLATION (BY OTHERS) AND SHALL NOT AFFECT REQUIREMENTS SPECIFIED.

- ALL CONCRETE SHALL BE KEPT MOIST DURING THE FIRST THREE DAYS OF CURING.

- TAKE ADEQUATE MEASURES TO PROTECT THE CONCRETE FROM EXPOSURE TO FREEZING TEMPERATURES AT LEAST SEVEN DAYS AFTER CONCRETE PLACEMENT. COLD WEATHER PROTECTION IS REQUIRED FOR ALL CONCRETE PLACED WHERE IT IS FORECASTED THAT THE TEMPERATURE WILL DROP BELOW 5°C WITHIN 24 HOURS OF PLACEMENT. PROTECTION PROVIDED, INCLUDING INSULATED TARPS, POLY COVERED STRAW, SUPPLEMENTAL HEAT AND/OR CHEMICAL ADMIXTURES, IS TO BE SUFFICIENT TO MAINTAIN A MINIMUM CURING TEMPERATURE OF 10°C FOR 3 DAYS.

- FINISH EXPOSED CONCRETE WORK AS PER ARCHITECTURAL DRAWINGS.

- DO NOT ADD WATER TO CONCRETE ON SITE.

- CALCIUM CHLORIDE OR ANY ADMIXTURE FORMULATION CONTAINING CHLORIDE SHALL NOT BE USED IN CONCRETE CONTAINING REINFORCEMENT, OR IN CONCRETE CLASSIFICATIONS S-1, S-2, OR C-1, C-2, OR FOR PARKING STRUCTURES, FLOORS RECEIVING DRY-SHAKE METALLIC HARDENERS, OR CONCRETE CONTAINING EMBEDDED ALUMINUM. USE ONLY IN DOSAGES LESS THAN 2% BY WEIGHT OF CEMENT.

- REBAR CHAIRS (BAR SUPPORTS) ARE TO BE OF PRECAST CONCRETE, PLASTIC OR STEEL. WOOD, CLAY BRICK AND CONCRETE BLOCK IS NOT ACCEPTABLE.

- FOR CONCRETE SLABS ON GRADE, PLACE SLAB ON 150mm (6") GRANULAR FILL COMPACTED TO 98% SPDD FOUNDED ON NATIVE SOILS OR APPROVED ENGINEERED FILL, UNLESS NOTED OTHERWISE.

- CONCRETE FLOORS SHALL BE COVERED WITH PLASTIC AND KEPT MOIST FOR THE FIRST THREE (3) DAYS OF CURING.

STRUCTURAL STEEL:

- ALL STRUCTURAL STEEL ELEMENTS ARE DESIGNED USING THE LIMIT STATES DESIGN METHOD IN ACCORDANCE WITH CAN/CSA-S16.

- STANDARD CONNECTIONS SHALL CONFORM TO THE HANDBOOK OF STEEL CONSTRUCTION.
- ALL STRUCTURAL STEEL SHALL BE COMPLETED BY A FABRICATOR WHO IS A CURRENT MEMBER OF THE CANADIAN INSTITUTE OF STEEL CONSTRUCTION.
- STRUCTURAL STEEL BEAMS AND COLUMNS SHALL CONFORM TO CAN/CSA G40.21 GRADE 350W UNLESS NOTED.
- STRUCTURAL STEEL CHANNELS AND ANGLES SHALL CONFORM TO CAN/CSA G40.21 GRADE 300W UNLESS NOTED.
- ALL H.S.S. SHALL CONFORM TO CAN/CSA G40.21 GRADE 350W (CLASS C) UNLESS NOTED.
- ALL STEEL PLATE TO BE A36 (250W MPa) MATERIAL (MINIMUM).
- WELDING SHALL CONFORM TO CSA W47.1 AND CSA W59, BY THE CANADIAN WELDING BUREAU. ALL WELDING SHALL BE COMPLETED BY CWB CERTIFIED WELDERS. THIRD PARTY WELDING INSPECTION SHALL BE PERFORMED BY FIRMS CERTIFIED TO CSA W178.1 AND W178.2.
- BOLTED CONNECTIONS SHALL BE MADE USING GRADE A325 BOLTS, UNLESS NOTED OTHERWISE. ANCHOR BOLTS SHALL CONFORM TO ASTM A307.
- ALL STRUCTURAL STEEL SHALL BE NEW MATERIAL UNLESS APPROVED BY TACOMA ENGINEERS.
- STRUCTURAL STEEL MEMBERS SHALL NOT BE SPLICED WITHOUT THE APPROVAL OF THE ENGINEER.
- DO NOT CUT OPENINGS IN STRUCTURAL STEEL MEMBERS WITHOUT ENGINEERS APPROVAL.

WOOD CONSTRUCTION

- WOOD FRAMING DESIGN AND CONSTRUCTION SHALL CONFORM TO CAN/CSA-086 "ENGINEERING DESIGN IN WOOD".
- WOOD TRUSSES AND MANUFACTURED FRAMING MEMBERS ARE TO BE DESIGNED & CERTIFIED BY A PROFESSIONAL ENGINEER FOR THE LOADS AND CONDITIONS INDICATED ON THE DRAWINGS.
- PROVIDE ADEQUATE BEARING SURFACE FOR THE TRUSS BEARING LOADS.
- LUMBER SHALL BE SPF No. 1/2 OR BETTER UNLESS NOTED OTHERWISE. MOISTURE CONTENT SHALL BE 19% OR LESS.
- LUMBER SHALL NOT BE NOTCHED OR DRILLED IN THE FIELD WITHOUT PERMISSION OF THE CONSULTANT.
- ENGINEERED LUMBER SHALL BE LVL OR PSL MANUFACTURED BY WEYERHAEUSER. THE GRADE SHALL BE AS INDICATED ON THE DRAWINGS.
- ROOF SHEATHING SHALL BE 12.5mm (1/2") PLYWOOD CONFORMING TO CSA O151 "CANADIAN SOFTWOOD PLYWOOD" OR 0-2 OSB TO CSA 0452 "DESIGN RATED OSB".
- WALL SHEATHING SHALL BE 9.5mm (3/8") PLYWOOD TO CSA O151 "CANADIAN SOFTWOOD PLYWOOD" OR 11mm (7/16") 0-2 OSB TO CSA 0452 "DESIGN RATED OSB", U.N.O.
- FLOOR SHEATHING SHALL BE 15.5mm (5/8") T&G PLYWOOD TO CSA O151 "CANADIAN SOFTWOOD PLYWOOD" OR 11mm (7/16") 0-2 OSB TO CSA 0452 "DESIGN RATED OSB". SUBFLOOR IS TO BE GLUED AND NAILED / SCREWED SECURELY TO EVERY SUPPORTING MEMBER.
- BOLTED CONNECTIONS SHALL BE MADE USING GRADE A307 BOLTS, UNLESS NOTED OTHERWISE.
- USE PRESSURE TREATED LUMBER (CWBP APPROVED) OR APPLY SUITABLE WOOD PRESERVATIVE TO ALL WOOD IN CONTACT WITH SOIL.
- WOOD IS NOT PERMITTED TO BEAR DIRECTLY ON MASONRY OR CONCRETE WITHOUT PROTECTION. PROVIDE EITHER PRESSURE TREATED LUMBER, SUITABLE WOOD PRESERVATIVE OR 6 MIL (0.152mm) POLYETHYLENE SHEET.
- HORIZONTAL BLOCKING SHALL BE PROVIDED AT 1200mm (4'-0") O.C. IN THE FIRST TWO JOIST SPACES ADJACENT TO THE EXTERIOR WALLS. BRIDGING SHALL BE ATTACHED TO THE EXTERIOR WALL TO PROVIDE LATERAL STABILITY.
- ALL NAILS USED SHALL CONFORM TO STEEL WIRE NAILS AND SPIKES AS DEFINED IN CSA STANDARD B111 "WIRE NAILS, SPIKES AND STAPLES" UNLESS NOTED OTHERWISE.
- USE JOIST HANGERS WHERE FRAMING MEMBERS CONNECT INTO THE SIDES OF SUPPORTING MEMBERS.
- ALL STEEL CONNECTORS (UPLIFT CLIPS, BRACKETS, JOIST HANGERS etc.) SHALL BE SIMPSON STRONG TIE CONNECTORS UNLESS NOTED OTHERWISE.
- ALL NAILS AND FASTENERS IN CONTACT WITH PRESSURE TREATED WOOD ARE TO BE HOT DIP GALVANIZED (TO CSA-G164) OR STAINLESS STEEL.
- FOR ALL BUILT UP MEMBERS (TRUSSES, BEAMS, LINTELS) PROVIDE A BUILT UP POST WITH AN EQUAL OR GREATER THICKNESS UNLESS NOTED OTHERWISE. ALL BUILT UP POSTS TO BE CONTINUOUS (INCLUDING TRANSFER BLOCKING AT FLOORS) DOWN TO THE FOUNDATIONS.
- ALL BUILT UP MEMBERS TO BE FASTENED TOGETHER WITH TWO 75mm (3") SPIRAL NAILS AT 300mm (12") O.C. FOR EVERY PLY UNLESS NOTED OTHERWISE.

CONSTRUCTION JOINTS:

- CONSTRUCTION JOINTS SHALL BE MADE AND LOCATED SO AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE.
- IF CONSTRUCTION JOINTS ARE NOT SPECIFICALLY LOCATED ON THE DRAWINGS AND THERE IS ANY DOUBT CONCERNING THE LOCATION, THE CONTRACTOR MUST CONSULT WITH THE ENGINEER.

No.	Date	Issue
A	Dec 9, 2013	For Comment/Markup
1	March 24, 2014	Issued for Building Permit App.



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Project Title	
<h1>The Enclosure</h1> <p>Pemberton Heights, North Vancouver - British Columbia</p>	
Drawing	
<h2>Structural Notes and Details</h2>	
Scale:	Dwg. #:
No Scale	
Date:	S0
March 24, 2014	
Drawn By:	
SW	