

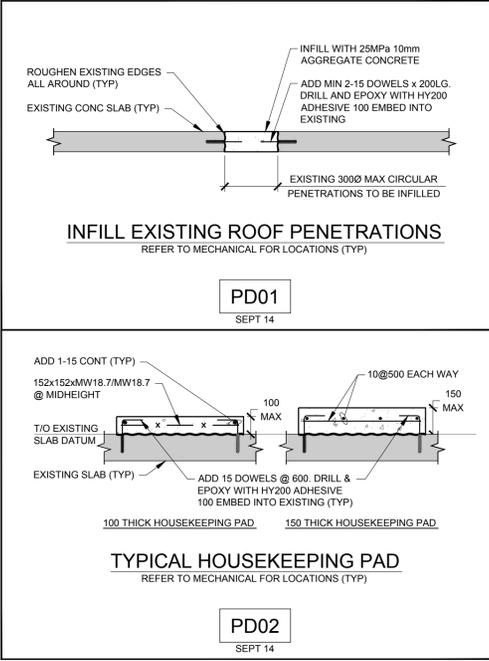
STRUCTURAL WORK

- 1. GENERAL
1.1. PROVIDE ALL MATERIAL AND LABOUR REQUIRED FOR THE COMPLETION OF THE WORK.
1.2. COORDINATE ALL WORK SHOWN ON THE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.
1.3. MAKE GOOD ALL EXISTING WORK DISTURBED BY THE SHORING OPERATIONS, EXCAVATION AND OTHER CONSTRUCTION PROCEDURES.
2. CODES AND STANDARDS
2.1. IN COMPLIANCE WITH THE REQUIREMENTS OF THE 2010 NATIONAL BUILDING CODE OF CANADA (NBC2010) IN FORCE AND THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
3. SUBMITTALS
3.1. SUBMIT FOR REVIEW BEFORE START OF WORK, 4 COPIES OF SHOP DRAWINGS FOR:
- CONCRETE FORMING
- CONCRETE REINFORCEMENT (INCLUDING PLACING DIAGRAMS AND BAR LISTS)
- STRUCTURAL STEEL
3.2. SUBMIT CONCRETE MIX DESIGNS BEFORE START OF WORK.
3.3. SHOP DRAWINGS FOR CONCRETE FORMING AND STRUCTURAL STEEL SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN ONTARIO.
3.4. REVIEW OF SHOP DRAWINGS IS ONLY FOR GENERAL CONFORMITY WITH STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS.
3.5. NOT REVIEWED - SHOWS WORK WHICH IS NOT WITHIN THE SCOPE OF STRUCTURAL CONSULTING SERVICES.
3.6. ALLOW A MINIMUM OF 5 WORKING DAYS FOR REVIEW OF EACH SUBMISSION OF SHOP DRAWINGS IN THE STRUCTURAL ENGINEER'S OFFICE.
4. EXISTING STRUCTURE
4.1. EXISTING STRUCTURAL INFORMATION IS BASED UPON DRAWINGS PREPARED BY REID CROWTHER AND PARTNERS LTD. DATED DEC 1972.
4.2. TAKE ALL PRECAUTIONS NECESSARY TO PROTECT THE EXISTING STRUCTURE DURING CONSTRUCTION.
4.3. UNDERTAKE CHIPPING, CUTTING, CORING, REPAIRS, PATCHING, AND REMOVAL OF DEBRIS. MAKE CUTS WITH THE PROPER SAWS AND BITS WHEN A CLEAN LINE IS REQUIRED.
4.4. PROVIDE TEMPORARY SHORING AND BRACING REQUIRED FOR ALL CONSTRUCTION OPERATIONS, INCLUDING SUPPORT OF CRANES, TRUCKS AND ALL OTHER CONSTRUCTION EQUIPMENTS.
4.5. EXISTING DRAWINGS CONDITIONS ARE ASSUMED. REPORT ANY VARIATIONS TO THE DEPARTMENTAL REPRESENTATIVE BEFORE PROCEEDING WITH THE WORK. MAKE GOOD ONCE STRUCTURAL WORK IS DONE AND REVIEWED.
5. CONCRETE
5.1. CONFORM TO CSA A23.1 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".
5.2. INTERIOR APPLICATIONS (UNLESS OTHERWISE NOTED):
- CLASS OF EXPOSURE: N
- CEMENT: TYPE GU
- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 25 MPa
- MAXIMUM WATER/CEMENTING MATERIAL RATIO: 0.45
- NOMINAL SIZE OF COARSE AGGREGATE: 20mm (3/4")
- SLUMP AT TIME AND POINT OF DISCHARGE: 50mm (2") TO 110mm (4 1/2")
5.3. FOR DRILLED CONCRETE ANCHORS (DCA), LOCATE REBAR AND OTHER EMBEDMENTS IN CONCRETE FIRST AND ADJUST LOCATIONS OF ANCHORS AS INSTRUCTED BY ENGINEER IF THERE IS A CONFLICT. DO NOT CUT REBAR.
5.4. USE NEW EXTERIOR PLYWOOD CONFORMING TO CAN/CSA O121 FOR FORMWORK, EXCEPT FOR ROUGH CONCRETE IN AN UNEXPOSED LOCATION. SUCH AS FOUNDATIONS WHERE USED MATERIAL IS ACCEPTABLE. USE INTERNAL FORM TIES OF ADJUSTABLE METAL DESIGNED TO ACT AS SPREADERS, AND, WHICH WHEN REMOVED, WILL LEAVE NO METAL CLOSER THAN 25mm (1") TO CONCRETE SURFACE.
5.5. REINFORCEMENT: USE NEW DEFORMED BAR REINFORCEMENT CONFORMING TO CAN/CSA G30.18 GRADE 400R OR 400W.
5.6. WELDED WIRE FABRIC: CONFORM TO ASTM A185. PROVIDE IN FLAT SHEETS ONLY.
6. STRUCTURAL STEEL
6.1. CONFORM TO CAN/CSA S16 "LIMIT STATES DESIGN OF STEEL STRUCTURES". LATEST VERSION IN EFFECT.
6.2. FABRICATOR SHALL BE CERTIFIED BY CANADIAN WELDING BUREAU UNDER REQUIREMENTS OF CSA W47.1, DIVISION 1 OR 2.
6.3. PROTECT COMBUSTIBLE MATERIALS AND FINISHES DURING WELDING OPERATIONS.
6.4. MATERIALS:
- WIDE FLANGE SECTIONS: CAN/CSA G40.21, GRADE 350W
- CHANNEL, ANGLES AND PLATES: CAN/CSA G40.21, GRADE 300W
- STEEL JOISTS: CAN/CSA G40.21, GRADE 350W, OR CAN/CSA S136
- HOLLOW STRUCTURAL SECTIONS: ASTM A500, GRADE C (345 MPa FOR SQUARE / RECTANGULAR AND 317 MPa FOR ROUND), OR CAN/CSA G40.21, GR. 350W, CLASS C OR H
- HSS MEMBERS REQUIRED TO BE GALVANIZED SHALL BE CLASS H, OR STRESS RELIEVED PRIOR TO GALVANIZING
- MACHINE BOLTS: ASTM A307
- HIGH-STRENGTH BOLTS: ASTM A325M
- ANCHOR RODS: CAN/CSA G40.21, GRADE 300W
- FABRICATION: CAN/CSA S16
- WELDING: CSA W59
- PRIMER PAINT: CIS/CPMA 2-75
- ZINC-RICH PRIMER: CGS8 1-GP-171M
- GALVANIZING: CAN/CSA G164
- DRILLED ANCHORS: SEE DRAWINGS
6.5. ALL STRUCTURAL STEEL CONNECTIONS MUST BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR TO CONFORM TO CAN/CSA S16-01. USE HEADER ANGLES AND HIGH-STRENGTH BOLTS. DESIGN BEAM CONNECTIONS FOR AN END REACTION DUE TO THE UNIFORMLY DISTRIBUTED LOAD CAPACITY OF THE MEMBER UNLESS A GREATER REACTION IS NOTED ON THE DRAWINGS. DO NOT SPLICE SECTIONS WITHOUT THE PRIOR ACCEPTANCE OF THE DEPARTMENTAL REPRESENTATIVE AND THE SUBMISSION OF PERTINENT SHOP DRAWINGS. ACCEPTED SPLICES WILL BE REQUIRED TO DEVELOP THE SECTION. EACH SPLICE SHALL BE GIVEN A NON-DESTRUCTIVE TEST BY AN INDEPENDENT INSPECTION COMPANY ACCEPTABLE TO THE DEPARTMENTAL REPRESENTATIVE. TESTING SHALL BE AT THE CONTRACTOR'S EXPENSE. EVALUATE RESULTS IN ACCORDANCE WITH CSA W59 AND REPORT TO THE DEPARTMENTAL REPRESENTATIVE.
6.6. APPLY PRIMER PAINT TO ALL STEELWORK, EXCEPT WHERE ZINC-RICH PAINT IS CALLED FOR ON THE DRAWINGS. TOUCH-UP PAINT AFTER ERECTION. SURFACES RECEIVING ZINC-RICH PAINT SHALL FIRST RECEIVE COMMERCIAL BLAST CLEANING.
6.7. ALL STEEL TO BE HOT DIPPED GALVANIZED TO CAN/CSA G164.
6.8. PROVIDE ALL ERECTION BRACING REQUIRED TO KEEP THE STRUCTURE STABLE AND IN ALIGNMENT DURING CONSTRUCTION.

- 7. INSPECTION AND TESTING
7.1. THE CONTRACTOR MUST PROVIDE INSPECTION REPORTS FOR STRUCTURAL STEEL, MASONRY STRENGTH TESTS AND TEST REPORTS FOR CONCRETE. ALL REPORTS MUST BE PREPARED BY AN INDEPENDENT INSPECTION AND TESTING AGENCY.
7.2. MAKE ONE STANDARD TEST FOR EACH 50 CUBIC METRES OF CONCRETE, BUT NOT LESS THAN ONE TEST FOR CONCRETE CAST EACH DAY. PROVIDE A GROUP OF THREE CONCRETE CYLINDERS FOR EACH STANDARD CONCRETE TEST. BREAK ONE CYLINDER AT 7 DAYS.
7.3. AT LEAST 6 MORTAR CUBES ARE TO BE TESTED FOR EACH 500 SQUARE METRES OF WALL, OR PORTION THEREOF. AT LEAST 2 CYLINDER TESTS SHALL BE MADE FOR EACH 20 CUBIC METRES OF GROUT OR LESS. TEST METHODS AND RESULTS SHALL CONFORM TO CSA A179.
8. CUTTING AND CORING
8.1. CONTRACTOR SHALL CARRY THE PRICE TO RETAIN AN INDEPENDENT TESTING COMPANY TO LOCATE EXISTING REINFORCEMENT AND CONDUIT IN THE AREAS OF PROPOSED OPENINGS AND TO MARK LOCATIONS ON THE SURFACES OF SLABS AND WALLS ON WHICH THE CORES AND CUTS ARE TO BE STARTED. X-RAY CONCRETE UNLESS OTHER METHODS CAN BE SHOWN BY CONTRACTOR TO ACCURATELY LOCATE REINFORCEMENT AND CONDUIT. IF LOCATIONS ARE NOT ACCEPTABLE TO DEPARTMENTAL REPRESENTATIVE, RELOCATE PROPOSED OPENINGS AND REPEAT PROCESS AT NO EXTRA COST TO THE CONTRACTOR. CORING: DO NOT CUT EXISTING REINFORCEMENT AND CONDUIT WHEN CORING EXISTING CONCRETE UNLESS APPROVED IN ADVANCE BY THE DEPARTMENTAL REPRESENTATIVE. SAVE THE COMPLETE LENGTH OF ALL CORES. LABEL EACH CORE WITH LOCATION TAKEN. MAKE ALL CORES AVAILABLE FOR REVIEW BY DEPARTMENTAL REPRESENTATIVE. DISPOSE OF CORES ONLY WITH APPROVAL OF DEPARTMENTAL REPRESENTATIVE.
8.2. CUTTING: DO NOT CUT EXISTING REINFORCEMENT AND CONDUIT WHEN CUTTING EXISTING CONCRETE UNLESS APPROVED IN ADVANCE BY THE DEPARTMENTAL REPRESENTATIVE. DO NOT OVER CUT OPENINGS. CORE FOUR CORNERS AND ENDS OF INTERMEDIATE SAWCUTS OF ALL OPENINGS PRIOR TO CUTTING SIDES AND INTERMEDIATE LINES. SAWCUT SIDES AND INTERMEDIATE LINES. CHIP CORNERS SQUARE IF NECESSARY. IF NEW REINFORCEMENT IS REQUIRED AT AN OPENING, INSTALL REINFORCEMENT BEFORE CUTTING OPENING OR SHORE UP STRUCTURE UNTIL NEW REINFORCEMENT IS INSTALLED.
9. CONSTRUCTION REVIEW
9.1. NOTIFY THE DEPARTMENTAL REPRESENTATIVE 48 HOURS PRIOR TO COVERING UP THE STRUCTURE WITH FINISHES.
10. TEMPORARY BRACING AND SHORING
10.1. MAKE ADEQUATE PROVISIONS FOR ALL LOADS ACTING ON THE STRUCTURE DURING ERECTION. PROVIDE TEMPORARY SHORING AND BRACING TO KEEP THE STRUCTURE PLUMB AND IN TRUE ALIGNMENT DURING CONSTRUCTION. MEMBERS SHOWN ON THE PLANS ARE THOSE REQUIRED FOR THE COMPLETED STRUCTURE AND MAY NOT BE SUFFICIENT DURING CONSTRUCTION.
10.2. TEMPORARY BRACING AND SHORING ARE THE RESPONSIBILITY OF THE CONTRACTOR. ALL SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR. PREPARE SHORING DRAWINGS SIGNED AND SEALED BY THE ENGINEER.
11. REJECTED WORK
11.1. DO NOT DELIVER TO THE SITE MATERIALS, WHICH ARE KNOWN NOT TO MEET THE REQUIREMENTS OF THE SPECIFICATIONS. IF REJECTED AFTER DELIVERY, REMOVE IMMEDIATELY FROM SITE.

DRAWING ABBREVIATIONS

Table of drawing abbreviations including: ABC A-ROD, ALG ANCHOR ROD, ALT ARCH, B BOT, BOP BOTTOM OF PILE, BCBC BRITISH COLUMBIA BUILDING CODE, BEW BOTTOM EACH WAY, BLL BOTTOM LOWER LAYER, BP BEAM, BSMT BASE PLATE, BUL BOTTOM UPPER LAYER, BUP BOTTOM OF UNDERPINNING, CA CANT, CAMT CANTLEVER, CB COLUMN BELOW, C/C CENTRE TO CENTRE, C/C CUT OFF ELEVATION FOR PILES, CEL CONCRETE FIREPROOFED CONSTRUCTION JOINT, CF CLEAR, CL CENTRELINE, COM COMP, COL COLUMN, CONC CONCRETE, CONT CONTINUOUS, CP CONNECTION PLATE, CWS SEE GENERAL NOTES, CSS DRILLED CONCRETE ANCHOR, DCA DET, D FIR-L, DIA Ø, DIM DIMENSION, DL DEAD LOAD IN kN/m², DMA DRILLED MASONRY ANCHOR, DN DOWN, DO DITTO, DP DEEP, DWG DRAWING, DWL DOWEL, EA EACH, ECR EPOXY COATED REINFORCEMENT, EE EACH END, EF EACH FACE, ELP EXP JT, ELECT ELECTRICAL, EL ELEVATION, ELEV ELEVATOR, EMB EMBEDMENT, EQ EQUAL, EW EACH WAY, EX, EXIST EXISTING, FD FLOOR DRAIN, FF FAR FACE, FIN FINISHED, FMC FULL MOMENT CONNECTION, FTG FOOTING, fc COMPRESSIVE STRENGTH OF CONG, fy YIELD STRENGTH IN MPa, GALV GALVANIZING, GB GRADE BEAM, GL GRIDLINE, h TOTAL THICKNESS, H, HOR HORIZONTAL, HDG HOT DIPPED GALVANIZED, HEF HOOK EACH END, HH HORIZONTAL IN CENTRE, HIC HOOK, HK HOOK, HP HIGH POINT, IBA INTEGRITY BARS ADDED, IBI INTEGRITY BARS INTERIOR, IBE INTEGRITY BARS EXTERIOR, JG JOIST GIRDER, ts TENSION DEVELOPMENT LENGTH OF REBAR, cdc COMPRESSION DEVELOPMENT LENGTH OF REBAR, L SINGLE ANGLE, 2-L BACK TO BACK ANGLES, LE LEFT END, LG LONG, UL UPPER LEVEL, LL LOWER LEVEL, LL FACTORED AXIAL LOAD IN KN, LL LIVE LOAD IN kN/m², LLH LONG LEG HORIZONTAL, LLV LONG LEG VERTICAL, LSV LONG SIDE VERTICAL, LSH LONG SIDE HORIZONTAL, LP LOW POINT, MAX MAXIMUM, MECH MECHANICAL, MF FACTORED MOMENT IN kNm, MIN MINIMUM, MJ MOVEMENT JOINT, MPL MASONRY PARTITION LOAD, MPT FACTORED TORSION IN kNm, MOMENT CONNECTION, NBC NATIONAL BUILDING CODE, NF NEAR FACE, NIC NOT IN CONTRACT, NTS NOT TO SCALE, OBC ONTARIO BUILDING CODE, P POINT LOAD IN kN, POST FACTORED POINT LOAD IN kN, PL PLATE, PS PIPE SUPPORT, PT POST TENSION, RA ROOF ANCHOR, RD ROOF DRAIN, REIN REINFORCEMENT, RE RIGHT END, RF RIGID FRAME, RH FACTORED VERTICAL REACTION IN kN, RH/ FACTORED HORIZONTAL REACTION IN kN, RTU ROOF TOP UNIT, SDF STEP DOWN FOOTING IN DIRECTION OF ARROW, SCA STEEL COLUMN ABOVE (NO STEEL COLUMN BELOW), SDL SUPERIMPOSED DEAD LOAD (EXCLUDING SELF-WEIGHT) IN kNm², SEC SECTION, SIM SIMILAR, SJ STEEL JOIST, SLS SERVICEABILITY LIMIT STATE, SOG DRAWING, SPF SPRUCE PINE FIR, STIR STIRRUP, STIFF STIFFENER, T THICKNESS, TB TRANSFER BEAM, T TOP, TEW TOP EACH WAY, THK THICK, TJA TIE JOIST, TLL TIE JOIST SUBJECT TO AXIAL LOAD, TPL TOP LOWER LAYER, TPF TOP OF FOOTING, TPO TOP OF PILE, TPC TOP OF PILE CAP, TS TENSION SPLICE, TUL TOP UPPER LAYER, TYP TYPICAL, ULS ULTIMATE LIMIT STATE, UIS UNDERSIDE, UN UNLESS NOTED, UPT UPTURNED, VB VERTICAL BRACING, VBBL VANCOUVER BUILDING BYLAW, V VERTICAL, VEF VERTICAL EACH FACE, VF FACTORED SHEAR IN kN, VIC VERTICAL IN CENTRE, V, VERT, VERTS VERTICAL, VERTICALS, VSC VERTICALLY SLOTTED CONNECTION, VXB VERTICAL 'X' BRACING, WC WIND COLUMN, WWA WINDOW WASHING ANCHORS, WWF WELDED WIRE FABRIC, ZRP ZINC RICH PAINT, MASONRY WALL, FULLY GROUTED MASONRY WALL



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A Detail No. - where detail required
B dessin no. - où détail exigé
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dessin no. - où détaillé

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GENERAL REQUIREMENTS

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VERTICAL SCALE: 1/4" = 1'-0" HORIZONTAL SCALE: 1/4" = 1'-0" ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETRES (IN PARENTHESES) SHEET SIZE: READ DRAWING ACCORDINGLY. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETRES (IN PARENTHESES) SHEET SIZE: READ DRAWING ACCORDINGLY.

