

GENERAL

- These notes are to be read in conjunction with the specifications.
- This building has been designed in accordance with the 2011 edition of the Manitoba Building Code.
- The Contractor shall be responsible for the design and installation of all necessary shoring, bracing and formwork. Formwork for new construction shall be bridged over existing services. Procedures must be approved by the Contract Administrator.
- Errors in Drawings and/or specifications and/or previously unknown existing conditions shall be brought to the attention of the Contract Administrator before proceeding with the work. During the tender stage, Contractor shall request an interpretation of conflicts prior to bid closing. If no request is made, both provisions shall be presumed to be included and the Contract Administrator shall determine which provision governs, and the Contractor shall perform the work at no additional cost to the City of Winnipeg.
- Any unsound structural conditions observed or created during construction are to be reported to the Contract Administrator immediately.
- Contractor shall review, stamp, sign and date all Shop Drawings prior to forwarding to Contract Administrator. The review is to be for conformance with the design concept and general compliance with the relevant contract documents. The review does not relieve the Contractor of the sole responsibility to review, check and coordinate the Shop Drawings prior to submission. The Contractor remains solely responsible for errors and omissions associated with the preparation of Shop Drawings as they pertain to member sizes, details, dimensions, etc..
- Coordinate size and location of all openings in structural members with trades involved. All openings not indicated on structural Drawings to be approved by Contract Administrator.
- Refer to Architectural, Mechanical and Electrical Drawings for small openings, sleeves, recesses, depressions, sumps, trenches, curbs, housekeeping pods, equipment bases, and slopes not indicated on the structural Drawings.
- Coordinate placement and location of items by subsequent trades. Relevant trades shall review prior to erection and/or installation.
- Confirm the location of all sub-grade services prior to commencing Site Work.
- Verify all dimensions and elevations with architectural Drawings prior to construction. Any discrepancies to be reported to the Contract Administrator immediately. Do not scale Drawings.
- Do not backfill against structure until main floor is in place.
- Do not exceed, during construction, design live loads shown on plans. Reduce as necessary until Materials reach design strength.
- Confirm all existing conditions prior to construction. Any discrepancies or conflicts to be reported to Contract Administrator immediately.
- Drawings indicate general and typical details of construction. Where conditions are not specifically shown, similar details of construction shall be used, subject to approval by the Contract Administrator.

DESIGN LOADS

- Unless noted otherwise, the loads noted on plan and are unfactored.
- Design loads noted on plans.

FOUNDATION

- Foundation design is based on the foundation investigation soils report dated May 27, 2016 as prepared by Dyregrov Robinson INC. Ensure that the requirements outlined in the report are read and understood prior to commencing with foundation work.
- Remove all organic Material from the building area as outlined in the geotechnical report.
- Bearing surfaces to be inspected in the presence of Professional Geotechnical Engineer registered in the province of Manitoba prior to placing concrete. Improve sub-grade as directed in writing by a Professional Geotechnical Engineer registered in the province of Manitoba.
- Unless otherwise shown on plans, foundation elements are to be centered under walls, grade beams, and columns.
- Provide dowels from footings, grade beams, and pilecaps. Reinforcing to match all vertical reinforcing in walls and columns or as noted on Drawings.
- Foundation and retaining walls have been designed based on a surface surcharge load of 12 kPa.
- Foundation and retaining walls have been design assuming an effective drainage system is provided behind the walls.
- Backfill Material to be compacted to 98% of standard proctor maximum dry density in maximum 150mm lifts.
- Do not backfill behind foundation walls until the floor system or concrete slabs are in place and concrete has reached 28 day design strength.
- Backfill walls below grade evenly on both sides ensuring that no portion of the fill is placed more than 600mm above any other portion of the fill during backfilling.

HELICAL SCREW PILES

- Piles shall be no more than 2% out of plumb, and no more than 2" out of alignment in any direction.
- Pipe shaft shall meet minimum requirements of API 5CT Grade 3 ASTM (minimum yield strength of 45,000 psi, and a minimum tensile strength of 66,000 psi) and meet and/or exceed ASTM A53, type E (welded) or S (seamless) Grade B.
- Structural quality steel shall conform to latest CSA Standard G40.21, ASTM A36 for helix blade.
- Pile shafts and helix blades shall be hot dip galvanized.
- Welding shall be performed by shop qualified to CSA Standard W47.1.
- All welding shall conform to latest CSA Standard W59.
- Only new Material shall be used in the construction of helical piles.
- Shop Drawings sealed by Engineer registered in Manitoba shall be provided for review prior to installation. Pile supplier shall confirm soil requirements full extent of structures prior to Shop Drawing review.
- Pile supplier shall measure installation torque during pile placement and provide all necessary changes and capacities on the layout Shop Drawings. Installation torque measurement logs shall be submitted to Wolfrom Engineering Ltd. immediately upon installation.
- At minimum one test location per every 10 piles installed, installer shall advance a pile to minimum 3 helix diameters greater depth than deepest pile in represented group, and maintain torque measurement log of test pile installation. Torque log of test pile shall be submitted to Wolfrom Engineering Ltd., and to Contract Administrator to permit confirmation of soil characteristics below the typical bearing stratum.
- Helix of pile shall NOT be installed in back-filled Material. If back-filled Material extends down more than 4 ft. below finished grade, both screw pile installer/manufacturer and Contract Administrator shall immediately be informed of back-fill depth, Material and compaction method.
- Pile bearing helix shall be at minimum 8 ft. depth below finished grade, at all areas subject to frost, and at minimum 6 ft. depth below finished grade at all areas.
- Helical screw pile supplier and installer shall be CCMC certified.

THICKENED EDGES

- Footings and pads designed for a maximum (SL5) bearing pressure of 75 kPa & a maximum (ULS) bearing pressure of 110 kPa with a resistance FACTOR of 0.5 as per the foundation investigation soils report dated May 27, 2016 as prepared by Dyregrov Robinson INC..
- All footings shall extend a minimum of 1800mm into native undisturbed soil, and bear on a loose to compacted sand surface capable of supporting the maximum design pressure.
- Footings excavations & footings to be protected from frost at all times, during construction.
- Concrete for footings, pads and piers shall be 35 MPa @ 28 days. Use Sulphate Resisting Type 50 cement, 40mm max aggregate size, 90mm slump and 3% to 5% air entrainment.
- All exterior footings shall have at least 2440mm of earth cover, or equivalent continuous 50mm rigid type SM insulation with a minimum 1200mm width and 2% slope away from the building with a minimum of 500mm soil cover for frost protection.
- Footings bases shall be stepped at a maximum 1 to 1 slope where bearing levels vary.
- Slab sub-base & over excavated footings to be built up of "C-Bases" granular fill compacted to 95% Standard Proctor Density in maximum 200mm lifts. Final lift to be 150mm "A-Base" granular fill compacted to 98% Standard Proctor Density. All compaction details to be confirmed by an independent testing agency prior to placement of any concrete.

CONCRETE

- Concrete Work shall be in accordance with CSA A23.1-09 for "Concrete Materials and Methods of Concrete Construction" including cold weather requirements when the temperature falls below 5°C.
- Provide one set of concrete test cylinders in accordance with CSA A23-09 for every 50 m³ of concrete placed and a minimum of one set for each structural component.
- Performance specification as per A23.1-09 Table 5:
Min. Concrete Strength @ 28 Days:
a. Exposed Grade Beams 35 MPa
b. Curbs/Sidewalks/Driveways 32 MPa
c. All other concrete 30 MPa
Exposure Class:
a. All Concrete C-1
- For floor slabs, design the concrete mix with aggregate grading and water to cement Materials ratio to minimize shrinkage.
- Walls, piers and columns shall be poured a minimum of 24 hours before slabs and beams.
- Provide dovetail anchor slots in concrete walls and columns where masonry abuts.
- All structural slab framing into concrete walls or beams shall have a minimum 40mm chase into supporting member by the height of the slab.
- Where concrete beams frame into concrete walls or other concrete beams and are poured later, provide 40mm chase (height and width to match beam).
- The use of calcium chloride is not permitted.
- Construction joint keys in grade beams shall be formed at pile locations only.
- Construction joint keys in structural slabs to be formed at 1/3 span. Provide key width equal to half the thickness of the slab. Provide 15M dowels @ 600 o/c top & bottom.
- Saw cuts for slab on grade shall be 25mm deep & 3mm wide. Cutting to be done not sooner than 12 hours, and not later than 24 hours after the slab is poured. Cuts to be filled with approved bituminous compound or caulking.
- Saw cuts for slab on grade shall be spaced at maximum 6000mm o/c unless noted otherwise on Drawings. Provide diamond saw cuts around all columns unless noted otherwise on Drawings.
- Slip joint oil paving against structural members with 12mm impregnated fibreboard.
- Provide minimum 6 mil poly vapour barrier below all slab on grade concrete slabs unless noted otherwise on Drawings.
- Coordinate the location of all items embedded in concrete work with Architectural, Mechanical & Electrical Drawings.
- Contract Administrator to be notified at least 48 hours in advance of all major pours.
- Refer to architectural Drawings for concrete surfaces requiring architectural finishes.
- Where voidform is indicated on Drawings use cardboard shearnat below structural slabs and plastic wrapped cardboard below walls and grade beams. 150mm Voidform to be provided below all concrete subgrade elements, including all walls, gradebeams, structural slabs, pilecaps, and pilasters unless noted otherwise.
- For structural slabs at grade, plywood over biodegradable wax mat cardboard, complete with moisture resistant treated paper faces, with sufficient strength to support the weight of wet concrete until initial set.
- Exterior sidewalks to be 100mm thk. concrete on compacted granular fill reinforced with 10M @ 300 o/c E.W. mid-depth. Provide tooled control joints @ max. 1500 o/c and construction joints @ max. 6100 o/c.
- Thicken sidewalk with 150mm X 150mm thickened edge adjacent members shown on main floor c/w matching horizontal dowels.

REINFORCING

- All bars to conform to CSA G30.18-09:
15M bars and larger to be grade 400
10M bars and supporting rods to be grade 300 or better
- All steel to be detailed in accordance with the current ACI Detailing Manual.
- Minimum clear cover to reinforcing - refer to table below.

CLEAR CONCRETE COVER TO REINFORCEMENT			
EXPOSURE CONDITION	EXPOSURE CLASS		
	N	F-1, F-2 S-1, S-2, S-3	C-XL, C-1, C-2, C-3 A-1, A-2, A-3
Coat applied and permanently exposed to earth.	-	75mm	75mm
Beams, girders, columns, and piles to ties/strips (except as noted below)	32mm	38mm	60mm
Slabs, walls, joists, shells, and folded plates (except as noted below)	19mm	38mm	60mm
Parade beams (to strips)	-	-	38mm
Ratio of cover to nominal bar diameter	-	-	38mm
Ratio of cover to nominal maximum aggregate size	1.0	1.5	2.0

NOTE: THE LARGEST COVER REQUIRED FOR ANY ONE ELEMENT SHALL GOVERN.

- All reinforcing shall be held in place with proper accessories.
- Standard and hook lengths for reinforcement - refer to table below.

BAR SIZE	STANDARD END HOOKS						
	10M	15M	20M	25M	30M	35M	45M
90° HOOK LENGTH	175	250	300	400	500	650	1025
180° HOOK LENGTH	150	175	200	300	400	550	675

- In concrete beams, bend horizontal reinforcing 600mm around corners, or use extra corner bars 900mm x 900mm.
- All openings in concrete walls and/or slabs to have minimum 2-15M extra reinforcing all around, 1 each face, extend minimum 600mm past, plus additional 15M diagonal bars each face 1.5 times longer than shortest opening size or min. 500mm and maximum 1500mm in length at corner unless noted otherwise. Maximum opening size 900mm wide; top of opening to be minimum 600mm below top of wall elevation. For all openings greater than 900mm contact the Engineer for further instruction. Coordinate all openings with Architectural, Electrical and Mechanical Drawings.
- Do not cut reinforcing at openings where it can be spread continuously around opening.
- All openings in grade beams to be confirmed by the Contract Administrator.
- Top steel in beams shall be lapped at centre span, bottom steel shall be lapped at support.
- All reinforcing steel shall be cleaned of all dirt, grease and other deleterious Materials prior to placing.
- All reinforcing shall be new billet deformed bars.
- Minimum reinforcing for equipment bases 10M @ 300 o/c each way.
- All welded wire fabric shall be transported and delivered in flat sheets.
- Reinforcing steel supplier to confer with Contractor as to desired construction joint locations and supply dowels and bar lengths to accommodate these joints.
- Reinforcing steel supplier shall submit Shop Drawings for review of fabrication, sizes, dimensions, placement and splice locations.
- Except as noted otherwise, provide dowels matching vertical or horizontal reinforcing at adjacent concrete members and/or elements.

STRUCTURAL WOOD

- All wood framing shall be in accordance with the latest edition of CSA O86-09.
- All lumber shall conform to 2014 N.L.G.A. standard grading rules for Canadian lumber.
- All lumber exposed to weathering shall be pressure treated unless noted.
- Wall studs to be minimum #2 Spruce-Pine-Fir or better U/N on Drawings, kiln-dried to a maximum moisture content of 19%.
- Joists, lintels, and built-up beams to be minimum #2 Spruce-Pine-Fir or better U/N on Drawings, properly seasoned to a maximum moisture content of 19%.
- The carpentry Sub-Contractor in conjunction with the general Contractor shall be responsible for supplying and installing all temporary and permanent bracing required to provide the stability of the structure.
- All OSB/Plywood sheathing to be exterior grade. All sheathing shall conform to CAN/CSA O325-07 "Construction Sheathing"
- All wall & roof sheathing to be nailed secure in a controlled random pattern as follows:
Non-shear walls & roof:
Panel edges - 75mm nails @ 150 o/c
Intermediate supports & blocking - 75mm nails @ 250 o/c
Shear walls: Unless noted on Drawings
Panel edges - 75mm nails @ 75 o/c
Intermediate supports & blocking - 75mm nails @ 125 o/c
- The Floor and/or Roof system supplier shall be responsible for the design and supply of all floor and/or roof systems, gable end trusses, bridging and hardware required for the connections.
- The Floor and/or Roof system supplier shall submit Drawings bearing the seal of an engineer, registered in the Province of Manitoba for review of:
- fabrication Drawings of each wood floor and/or roof system type c/w member sizes, dimensions, and design information.
- an erection Drawing, showing the location of all wood floor systems and/or roof systems and other information required by the Contractor for the proper installation of the floor and/or roof system.
- Wood floor system and/or roof system layouts indicated on Drawings is for diagrammatic purposes only. Actual floor and/or roof system layouts to be determined by supplier.
- Floor and/or Roof system supplier to provide matching depth rimboard to all vertical faces of floor framing along exterior and corridor walls, minimum 1 1/2" thick, nailed to each joist/truss top & bottom.
- No site modifications to be made to floor and/or roof members without prior approval of supplier and Contract Administrator.
- All repairs made to damaged floor and/or roof members to be approved by supplier and Contract Administrator.
- All built-up wood columns and post to be continuously blocked down to foundation with minimum (38 x Material matching wall or post width) squash blocks or approved alternate.
- Provide additional studs (cripples) below bearing points of built-up beams and lintels. Number of studs to equal number of plies of beam or lintel unless noted.
- Provide joist cross-bridging at intervals not exceeding 8 times the member depth.
- Provide cont. horizontal solid blocking @ max. 1200 o/c vertically in all exterior stud walls and at plywood joints.
- Minimum lintels for stud bearing walls u/n on Drawings:
- openings up to 1m use 2 ply 38x184 SPF #2
- openings up to 1.5m use 2 ply 38x235 SPF #2
- Provide additional bracing @ maximum 610 o/c between floor joists below partition walls parallel to joist spans.
- Provide double joist below perpendicular partition walls where possible & block at spacing to match joists all other areas.
- All double joists to have filler and backed blocks.
- All load-bearing or braced/shear walls above perpendicular floor joists to be continuously blocked below. Floor joists below wall to have web stiffeners each side.

STRUCTURAL STEEL

- All 'W' and 'HSS' sections shall be in accordance with CAN/CSA G40.21-04 M350W, all other sections shall be in accordance with CAN/CSA G40.21-04 M300W.
- All welding shall conform to CSA W59-03 (R2008); fabricators to be certified in accordance with the latest edition CSA W47.1-09.
- Fabrication and erection shall be in accordance with CAN/CSA S16.1-09, "Steel Structures for Buildings".
- Unless noted otherwise, design connections for non-composite beams for factored moment shear force equal to 67% of the total beam load tabulated in the CISC handbook of steel construction.
- Unless noted otherwise, design moment connections for non-composite beams for a factored moment equal to the full moment capacity of the smaller member joined.
- Supply steel with properties noted in steel grades table below.

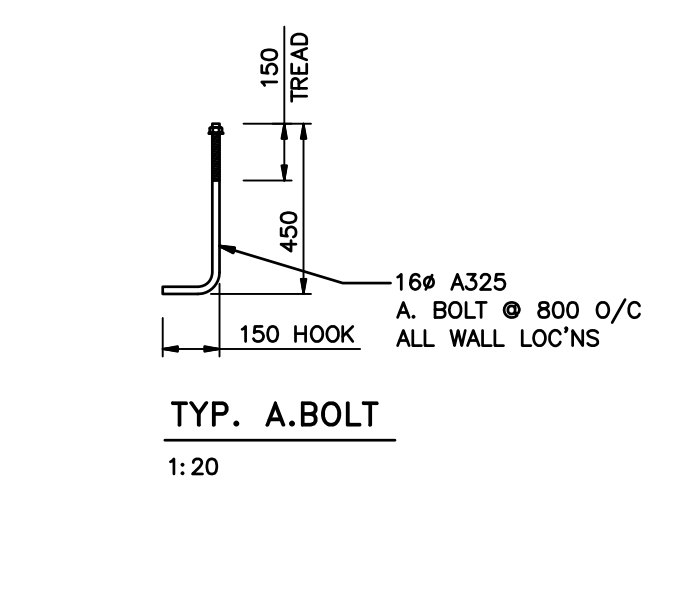
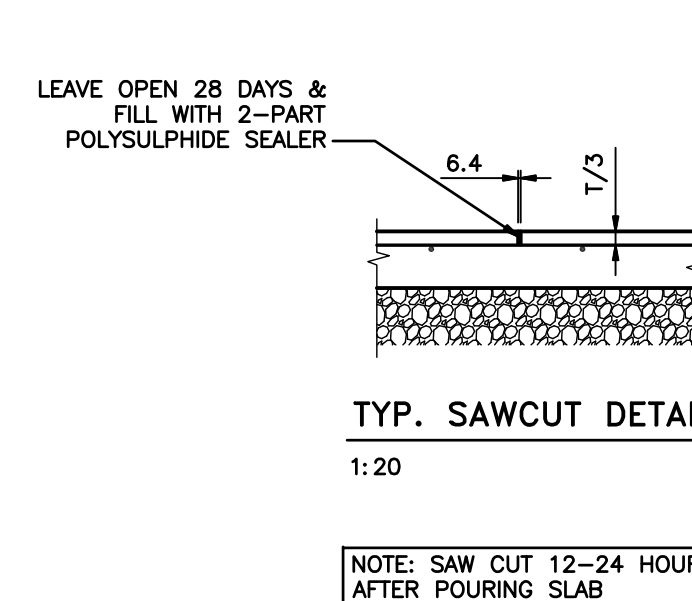
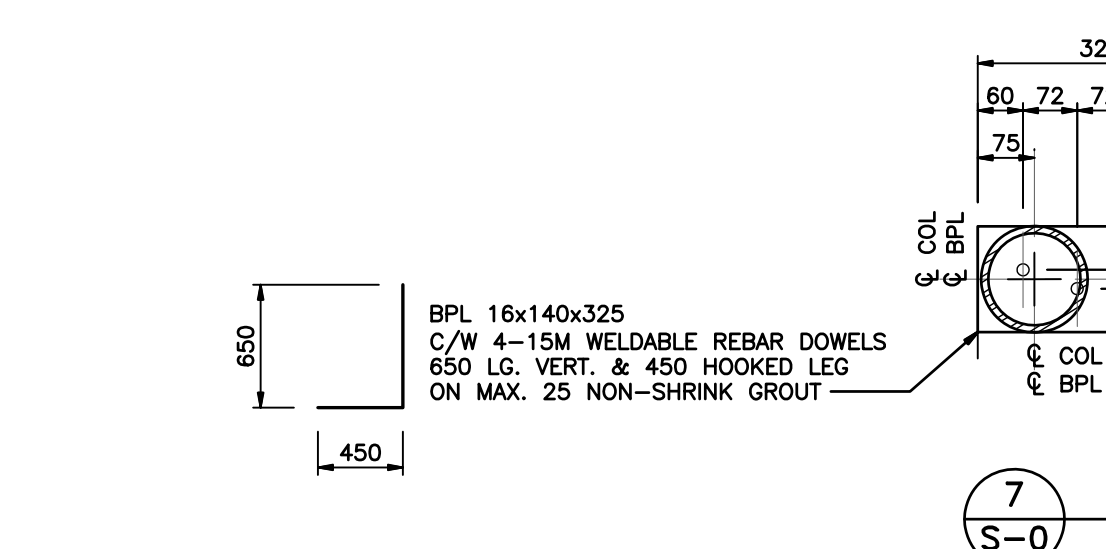
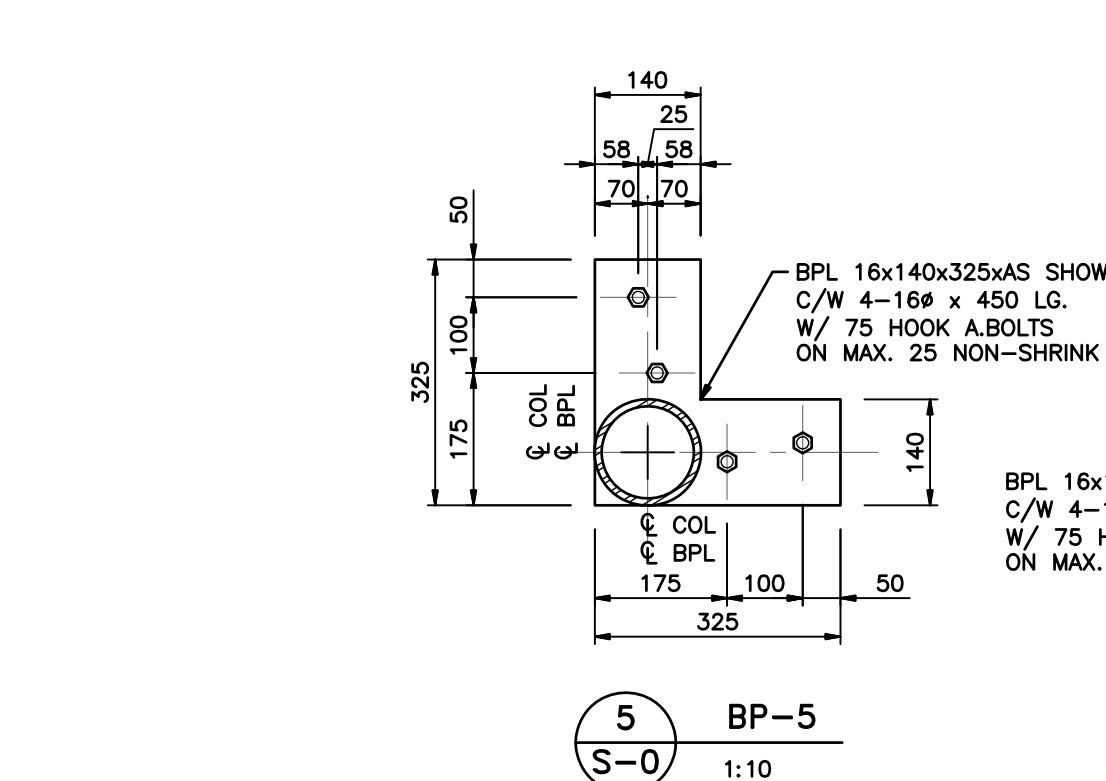
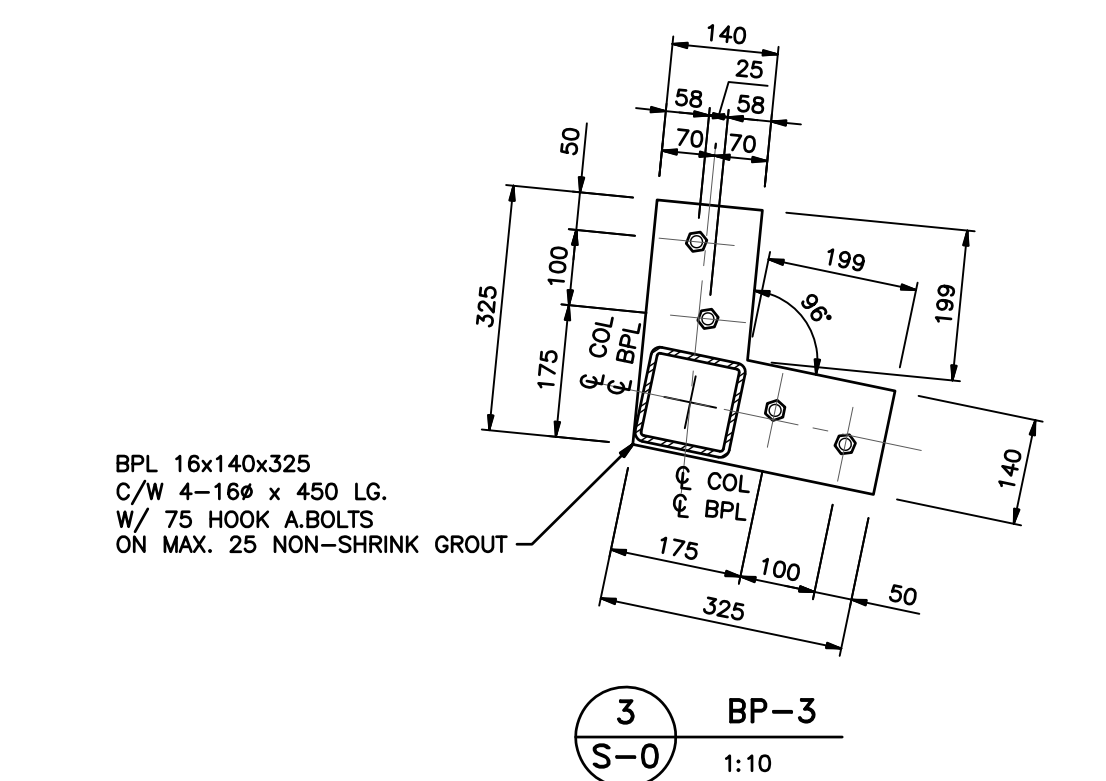
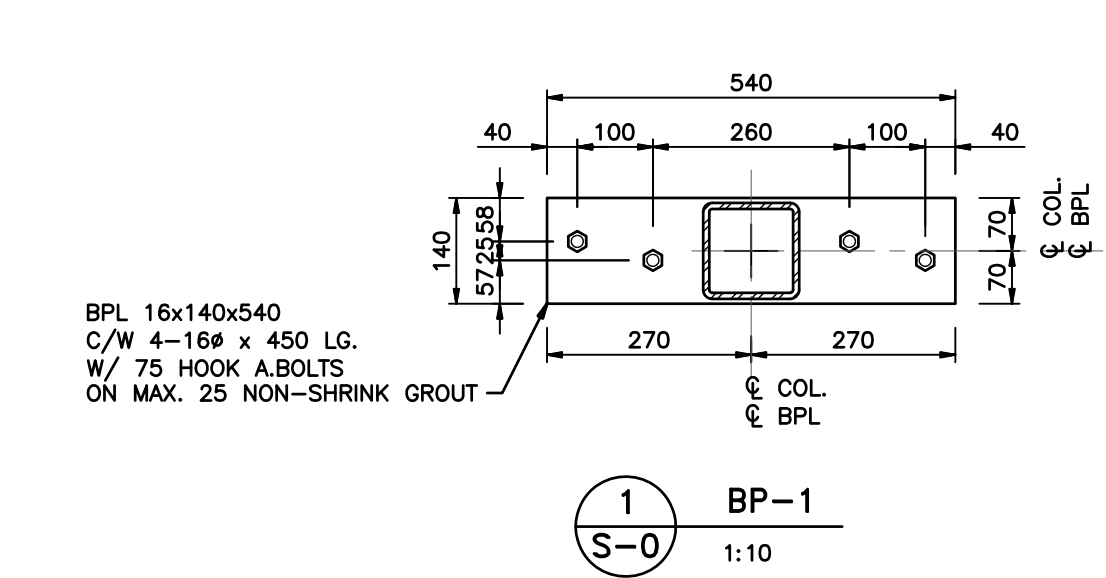
MEMBER TYPE	STEEL GRADES	GRADE
ROLLED W-SHAPES, TEES	CSA G40.21 350W OR ASTM A 992 GRADE 50	
WELDED WIDE FLANGE SECTIONS	CSA G40.21 350W	
HOLLOW STRUCTURAL SECTIONS	CSA G40.21 350W CLASS C	
OTHER STRUCTURAL SHAPES AND PLATES	CSA G40.21 350W C	
BOLTS	ASTM A325	
ANCHOR RODS	ASTM F1554 GRADE 36	
HEADED STUD ANCHORS	ASTM A108	
THREADED RODS	ASTM A36	

- Steel erector shall be responsible for supplying and erecting all temporary bracing to provide stability for the structure as a whole, until all related structural framing is erected and completely installed.
- Fabricator shall notify the engineer of any proposed member substitutions or changed connection details.
- Holes required in steel sections must be approved by the engineer.
- Provide 9.5mm ø weep holes at top and bottom of all HSS columns.
- All beams continuous over columns shall have 2 web stiffeners on each side, the same thickness as column unless noted, but not less than 10mm.
- No holes permitted in top of beams at columns where beams are continuous over columns, unless loss of section by holes is compensated by equal material area welded to side of flange.
- All columns passing thru concrete shall have compressive material to isolate it from surrounding concrete.
- All structural steel shall receive at least one coat primer to CISC/CPMA standard 1-73.
- All exterior steel exposed to weathering to be galvanized.
- Use asphalt base paint (ClovaTor 22 coal tar epoxy or eq.) at columns below slab.
- All high strength bolts to be in accordance with the latest edition of ASTM A325.
- Provide minimum of 2 bolts in bolted connections.
- All bolted connections to use snug-tightened high-strength bolts unless noted on drawings.
- The shear capacity of all shear splices shall be at least equal to the shear capacity of the smaller beam, unless noted.
- The steel supplier shall shop weld 40mm x 3mm masonry anchors to all steel members in contact with masonry walls. Maximum spacing of ties shall be 800mm o/c unless noted.

- Steel supplier is responsible for design and detailing of all structural steel connections not shown on drawings.
- All miscellaneous steel not detailed on drawings, such as; stairs, railings, awnings and non-structural architectural steel shall be detailed by the steel supplier.
- Anchor bolts shall be supplied by structural steel supplier & set by general contractor. General contractor to supply and install 25mm non-shrink grout under all base plates unless noted.
- All grout under bearing plates and base plates shall be non-metallic, non-shrink type with minimum 28 day compressive strength of 31 MPa, installed in accordance with the specification and manufacturer's recommendations.
- Expansion anchors to be zinc-plated steel wedge type with the following design values in 30 MPa concrete:
12mm ø - 9 kN shear, 9 kN pull-out
20mm ø - 18 kN shear, 18 kN pull-out
- All exposed portions of ledge angles and connections to be coated with bituminous paint.
- Provide 75 x 75 x 6mm angle framing around all deck openings greater than 450mm x 450mm unless noted.
- All steel beams supporting masonry walls to have minimum 19mm ø x 305mm long nelson studs welded to the beam at 610mm o/c unless noted otherwise on drawings.
- Provide minimum S200x27 Elevator Hoist beam c/w end bearing connections unless noted otherwise.
- Structural steel supplier shall submit shop drawings for review of fabrication, sizes, dimensions and placement. All connections not shown on drawing are to be sealed by a Professional Engineer registered in the Province of Manitoba. A certification letter, sealed by a professional engineer registered in Manitoba, is to be submitted to verify installation is in conformance with shop drawings.

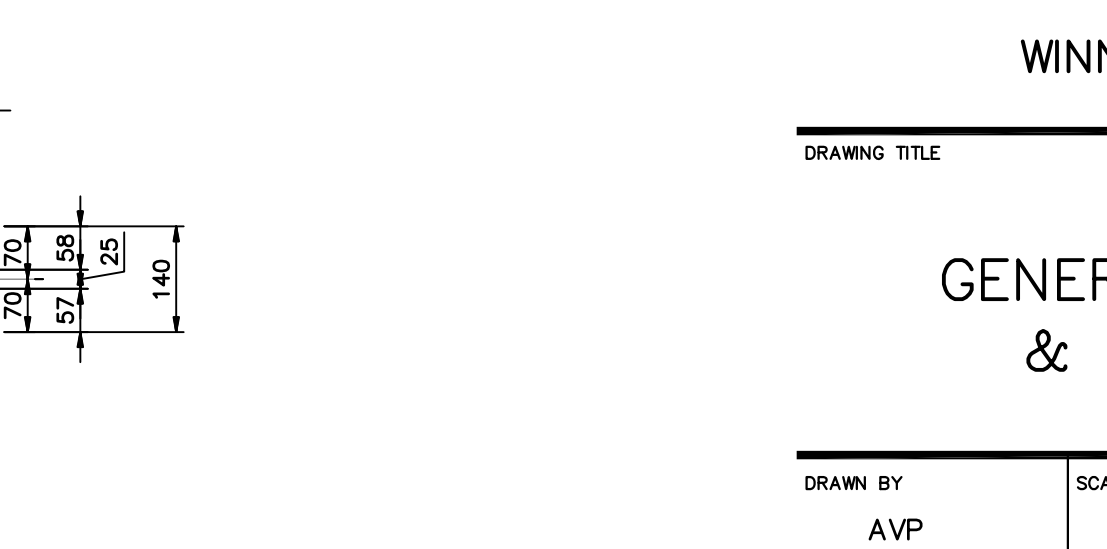
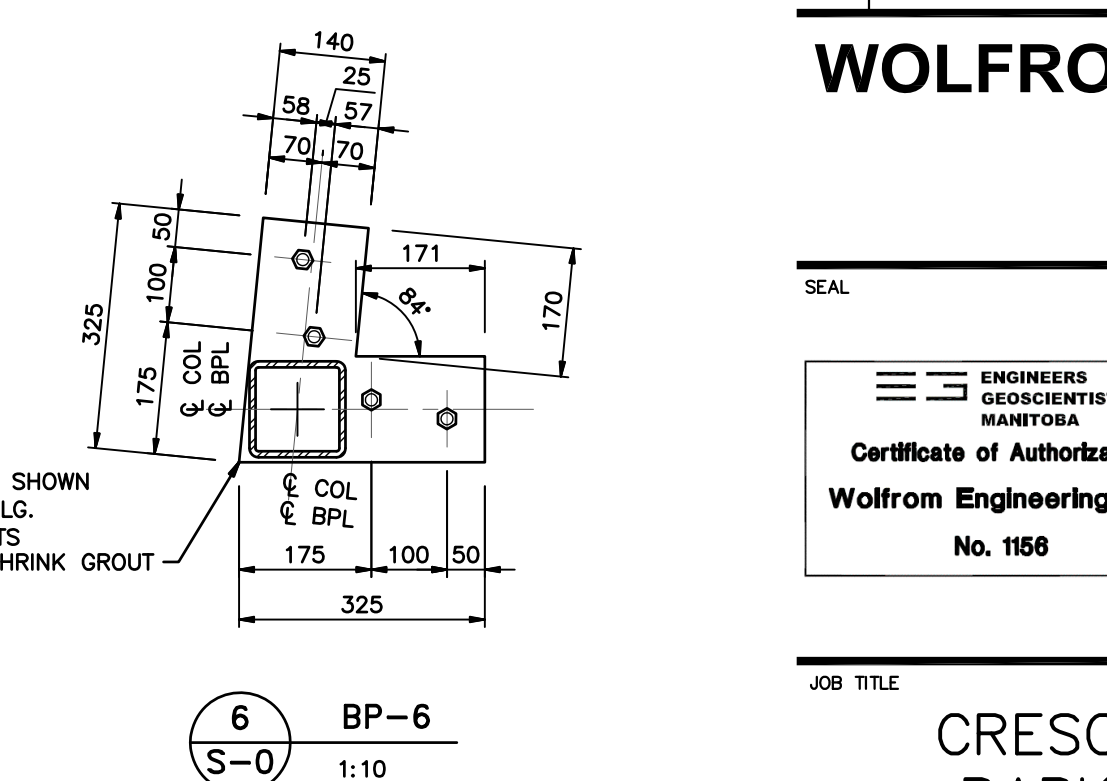
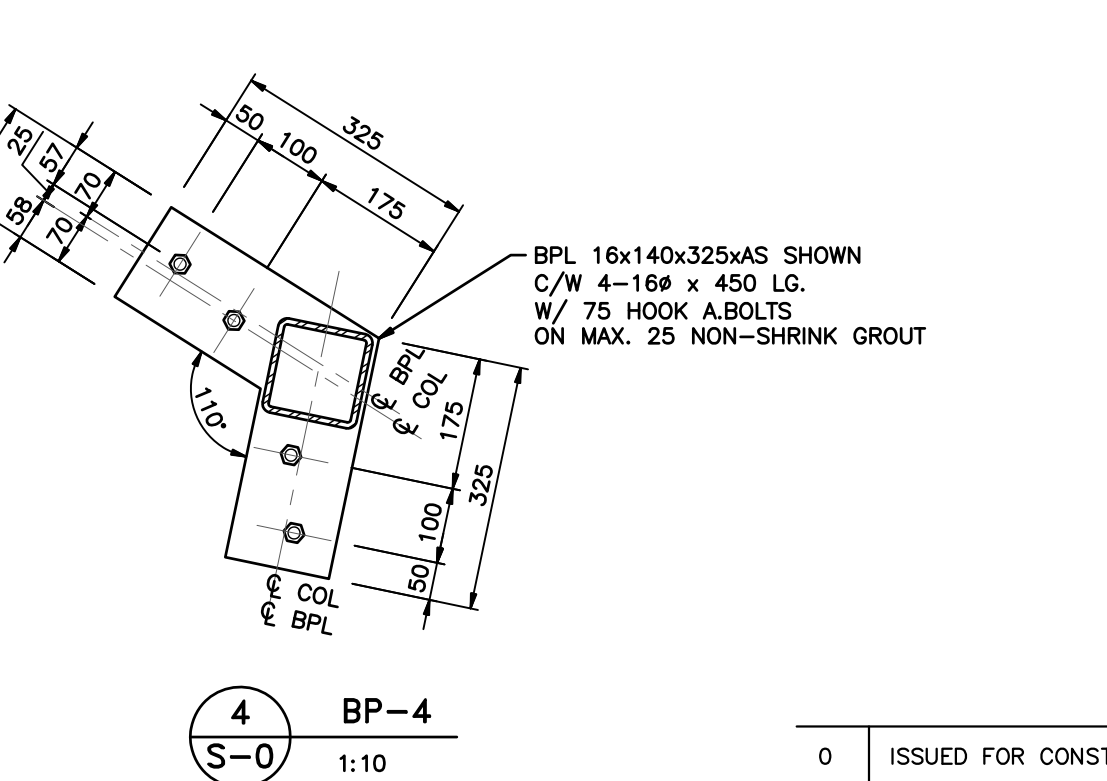
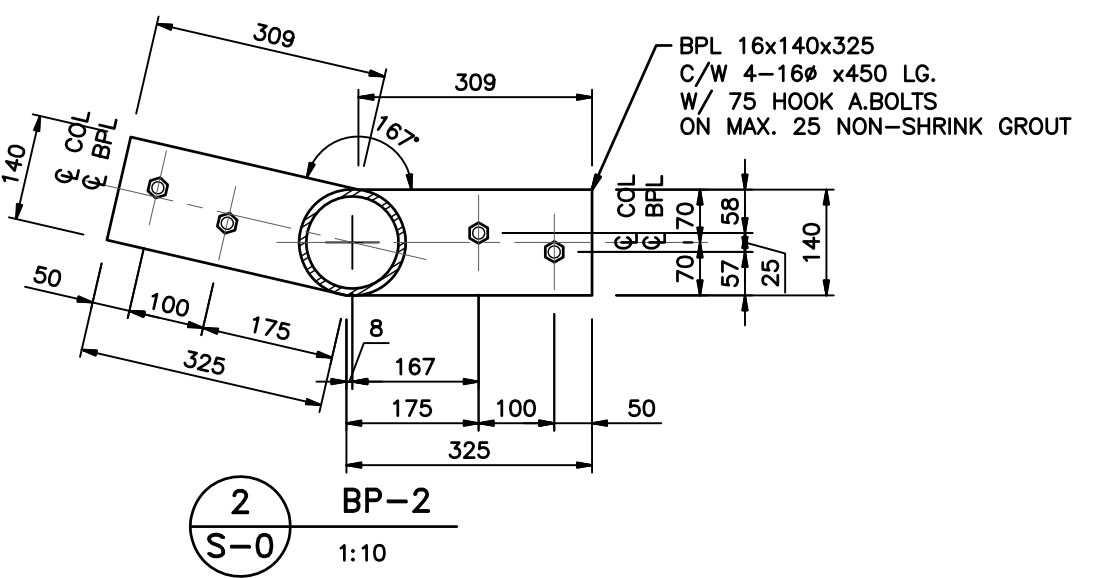
MISCELLANEOUS METAL

- Refer to architectural Drawings for miscellaneous metal details.
- All steel shall conform to CSA G40.21-04
- Welded rebar anchors to be grade 300 weldable.
- All exposed miscellaneous metal to be reviewed for architectural appearance as per AISC. Specification for Architecturally Exposed Structural Steel.



NOTE: SAW CUT 12-24 HOURS AFTER POURING SLAB

NOTE: SPACING FOR SAW CUTS NOTED ON PLANS OR GENERAL NOTES. FOR AREAS WITH TILE FINISH, PROVIDE SAW CUTS TO MATCH CONTROL JOINTS IN FLOORS



0	ISSUED FOR CONSTRUCTION	2018.07.27	JCR
No.	REVISION	DATE	BY

WOLFROM ENGINEERING LTD
CONSULTING ENGINEERS
3445 WARDLAW AVENUE
WINNIPEG, CANADA R3L 0L5
(204)452-0041 FAX: 284-8680
E-Mail: info@wolfromeng.com

SEAL
ENGINEERS
GEOMETRISTS
MANITOBA
Certificate of Authorization
Wolfrom Engineering Ltd.
No. 1168

JOB TITLE
**CRESCENT DRIVE
PARK PAVILION**
WINNIPEG, MB.

DRAWING TITLE
**GENERAL NOTES
& DETAILS**

DRAWN BY AVP	SCALE AS NOTED	DRAWING NO. S-0
FILE NO. W15085	DATE JULY 27, 2018	REVISION NO. 0