

GENERAL

- 1. These notes are to be read in conjunction with the specifications.
2. This building has been designed in accordance with the 2011 edition of the Manitoba Building Code.
3. 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.
4. 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.
5. Any unsound structural conditions observed or created during construction are to be reported to Contract Administrator immediately.
6. Contractor shall review, stamp, sign and date all shop drawings prior to forwarding to architect and/or engineer.
7. Coordinate size and location of all openings in structural members with trades involved.
8. Refer to Architectural, Mechanical and Electrical drawings for small openings, sleeves, recesses, depressions, sumps, trenches, curbs, housekeeping pads, equipment bases, and slopes not indicated on the structural drawings.
9. Coordinate placement and location of items by subsequent trades.
10. Confirm the location of all sub-grade services prior to commencing site work.
11. Verify all dimensions and elevations with architectural drawings prior to construction.
12. Do not backfill against structure until main floor is in place.
13. Do not exceed, during construction, design live loads shown on plans.
14. Confirm all existing conditions prior to construction.
15. Drawings indicate general and typical details of construction.
16. Contract administrator to consult in written format with document author prior to any revisions or alterations of contract documents.

DESIGN LOADS

- 1. Unless noted otherwise, the loads noted on plan and in the table below are unfactored.
2. Climate Data:
Ss = 1.9 kPa
Sr = 0.2 kPa
q (1/50) = 0.45 kPa

FOUNDATION: C.I.P. FRICTION PILES

- 1. Cast-in-place piles are designed as per Dyregrov Robinson Inc. Geotech report dated December 10, 2015. Refer to table below.

Table with 4 columns: Depth Below Existing Site Grade (m), SLS Shaft Adhesive (kPa), Factored ULS Shaft Adhesive (kPa), and End Bearing (kPa). Rows show data for depths 0 to 3, 3 to 8, and 8 to 15 meters.

- 2. Concrete for cast-in-place piles shall be 30 MPa @ 28 days using Sulfate Resisting Type 50 cement, 1 1/2" maximum size aggregate, 3 1/2" slump and 3% to 5% air entrainment.
3. Piles shall be no more than 2% out of plumb; and no more than 2" out of alignment.
4. Pile reinforcing shall extend a minimum of 2'-0" into pilecap or grade beam/wall.
5. Slab sub-base to be built up of 'C-Base' granular fill compacted to 95% Standard Proctor Density in maximum 8" lifts.
6. Dyregrov Robinson to provide full time inspection during pile installation.

HELICAL SCREW PILES

- 1. Piles shall be no more than 2% out of plumb, and no more than 2" out of alignment in any direction.
2. Pipe shaft shall meet minimum requirements of API SCT 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.
3. Structural quality steel to conform per latest CSA Standard G40.21, ASTM A36 for helix blade.
4. Welding shall be performed by shop qualified to CSA Standard W47.1.
5. All welding shall conform to latest CSA Standard W59.
6. Only new material to be used in the construction of piers.
7. Sealed shop drawings by Engineer registered in Manitoba shall be provided for review prior to installation.
8. Pile supplier to measure installation torque during pile placement and provide all necessary changes and capacities on the layout shop drawing.
9. Piles to be certified by CCMC. Relevant test data to be provided for review prior to installation.

CONCRETE

- 1. 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.
2. Provide one set of concrete test cylinders in accordance with CSA A23.1-09 for every 50 m3 of concrete placed and a minimum of one set for each structural component.
3. Performance specification as per A23.1-09 Table 5:
a. Min. Concrete Strength @ 28 days:
i. Exposed conc. walls 40 MPa
ii. Precast conc. 35 MPa
iii. Piles & pile caps 32 MPa
iv. All other conc. 30 MPa
b. Exposure Class:
i. Precast conc. S-2
ii. Piles & pile caps S-2
iii. Parking structures above grade C-1
iv. Curbs/sidewalks/driveways C-2
v. All other conc. N
4. For floor slabs, design the concrete mix with aggregate grading and water to cement materials ratio to minimize shrinkage.
5. Walls, piers and columns shall be poured a minimum of 24 hours before slabs and beams.
6. Provide dovetail anchor slots in concrete walls and columns where masonry abuts.
7. All structural slabs framing into concrete walls or beams shall have a minimum 1 1/2" chase into supporting member x the height of the slab.
8. Where concrete beams frame into concrete walls or other concrete beams and are poured later, provide 1 1/2" chase (height and width to match beam).
9. The use of calcium chloride is not permitted.
10. Construction joint keys in grade beams shall be formed at pile locations only.
11. 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 @ 24" o/c top & bottom.
12. Saw cuts for slab on grade shall be 1" deep & 1/8" 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.

- 13. Slip joint all paving against structural members with 1/2" impregnated fiberboard.
14. Provide minimum 6 mil poly vapor barrier below all slab on grade concrete slabs unless noted otherwise on drawings.
15. Coordinate the location of all items embedded in concrete work with Architectural, Mechanical & Electrical drawings.
16. Contract Administrator to be notified at least 48 hours in advance of all major pours.
17. Refer to architectural drawings for concrete surfaces requiring architectural finishes.
18. Where void form is indicated on drawings use cardboard shearmat below structural slabs and low-density polystyrene below walls and gradebeams.
19. 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.
20. Exterior sidewalks to be 4" thick concrete on compacted granular fill reinforced with 10M @ 12" o/c each way mid depth. Provide tooled control joints @ maximum 5'-0" o/c (refer to Arch for specific locations) and construction joints @ maximum 20'-0" o/c.
21. See Architectural for additional colouring requirements

REINFORCING

- 1. All bars to conform to CSA G30.18-M92:
15M bars and larger to be grade 400
10M bars and supporting rods to be grade 300 or better
2. All steel to be detailed in accordance with the current ACI Detailing Manual.
3. Minimum clear cover to reinforcing – refer to table below:

Table titled 'CLEAR CONCRETE COVER TO REINFORCEMENT' showing exposure conditions (N, F-1, F-2, S-1, S-2, S-3) and corresponding exposure classes (C-XL, C-1, C-2, C-3, A-1, A-2, A-3) with their respective clear concrete cover requirements in inches.

- 4. Reinforcement noted with "C" as C10M is to have a standard hook at one end. Length of bar indicated is exclusive of hook length.
5. Reinforcement noted with "E" as 10ME is to be epoxy-coated.
6. All reinforcing shall be held in place with proper accessories.
7. Standard end hook lengths for reinforcement:

Table showing standard end hook lengths for reinforcement based on bar size (10M, 15M, 20M, 25M, 30M, 35M, 45M, 55M) and hook length (90°, 180°).

- 8. In concrete beams, bend horizontal reinforcing 24" around corners, or use extra corner bars 36" x 36".
9. All openings in concrete walls and/or slabs to have minimum 2-15M extra reinforcing all around.
10. Do not cut reinforcing at openings where it can be spread continuously around opening.
11. All openings in grade beams to be confirmed by the Contract Administrator.
12. Top steel in beams shall be lapped at centre span, bottom steel shall be lapped at support.
13. All reinforcing steel shall be cleaned of all dirt, grease and other deleterious materials prior to placing.
14. All reinforcing shall be new billet deformed bars.
15. Minimum reinforcing for equipment bases 10M @ 12" o/c each way.
16. All welded wire fabric shall be transported and delivered in flat sheets.
17. Reinforcing steel supplier to confer with contractor as to desired construction joint locations and supply dowels and bar lengths to accommodate these joints.
18. Reinforcing steel supplier shall submit shop drawings for review of fabrication, sizes, dimensions, placement and splice locations.

STRUCTURAL STEEL & SPACE FRAME

- 1. 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.
2. All welding shall conform to CSA W59-03 (R2008); fabricators to be certified in accordance with CSA W47.1-09.
3. Fabrication and erection shall be in accordance with CAN/CSA S16-09, "Limit States Design of Steel Structures".
4. 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.
5. 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.
6. Supply steel with properties noted in steel grades table below.

Table titled 'STEEL GRADES' with columns for MEMBER TYPE, GRADE, and GRADE. Lists various steel types like Rolled W-Shape, Welded Wide Flange Sections, Hollow Structural Shapes & Plates, etc.

- 7. 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.
8. Fabricator shall notify the engineer of any proposed member substitutions or changed connection details.
9. Holes required in steel sections must be approved by the engineer.
10. Provide 3/8"Ø weep holes at top and bottom of all HSS columns.
11. All beams continuous over columns shall have 2 web stiffeners on each side, the same thickness as column unless noted, but not less than 3/8".
12. 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.
13. All columns passing thru concrete shall have compressive material to isolate it from surrounding concrete.
14. All structural steel shall receive at least one coat primer to CISC/CPMA standard 1-73a 1975. Refer to Architectural for additional finish requirements.
15. Use asphalt base paint (flinkote 410-02 or eq.) at columns below slab.
16. All high strength bolts to be in accordance with the latest edition of ASTM A325M.
17. Provide minimum of 2 bolts in bolted connections.
18. All bolted connections to use snug-tightened high-strength bolts unless noted on drawings.
19. The shear capacity of all shear splices shall be at least equal to the shear capacity of the smaller beam, unless noted.
20. The steel supplier shall shop weld 1 1/2" x 1/8" masonry anchors to all steel members in contact with masonry walls. Maximum spacing of ties shall be 32" o/c unless noted.
21. Steel supplier is responsible for design and detailing of all structural steel connections not shown on drawings.
22. All miscellaneous steel not detailed on drawings, such as: stairs, railings, awnings and non-structural architectural steel shall be detailed by the steel supplier.
23. Anchor bolts shall be supplied by structural steel supplier & set by general contractor. General contractor to supply and install 1" non-shrink grout under all base plates unless noted.

- 24. All grout under bearing plates and base plates shall be non-metallic, non-shrink type with minimum 28 day compressive strength of 4500 PSI, installed in accordance with the specification and manufacturer's recommendations.
25. Expansion anchors to be zinc-plated steel wedge type with the following design values in 30 MPa concrete:
1/2"Ø - 2000 lbs shear, 2000 lbs pull-out
3/4"Ø - 4000 lbs shear, 4000 lbs pull-out
26. All exposed portions of ledge angles and connections to be coated with bituminous paint.
27. Provide 3" x 3" x 1/4" angle framing around all deck openings greater than 18" x 18" unless noted.
28. All steel beams supporting masonry walls to have minimum 3/4"Ø x 12" long nelson studs welded to beam at 24" o/c unless noted otherwise on drawings.
29. Structural steel supplier shall submit shop drawings for review of fabrication, sizes, dimensions and placement.
30. Frames which are resistance welded shall conform to CAN/CSA W55.3-08.
31. Steel space frame design shall allow for all snow build-ups prescribed by the 2010 edition of the National Building Code of Canada.
32. Frame shall conform to the latest code requirements.
33. Frame to be connected to all beams and walls.
34. Purlins to be provided by space frame supplier
35. Space frame supplier to design frame to support mechanical equipment all weights & locations to be confirmed by mechanical contractor.
36. Where point loads on frame do not occur at panel points, strengthen chords as required. Indicate all point load locations on shop drawings.
37. Camber frames for specified dead load plus half of the specified live load (min. 1/2") according to CSA-S16 unless noted otherwise.
38. Design and supply joist seats and bearing plates to suit elevations and skew angles indicated on drawings.
39. The space frame supplier shall submit drawings bearing the seal of an engineer, registered in the Province of Manitoba for review of:
- fabrication drawings of each component type c/w member sizes, dimensions, and design information.
- an erection drawing, showing the location of all truss and other information required by the contractor for the proper installation of the trusses.
- ensure sealed space frame shop drawings provided for review prior to pile placement.
40. Acceptable suppliers as follows:
A. Triodetic Canada, 10 Didak Drive, Amrpor Ontario Canada K7S 0C3
B. Canam Group Inc. 11535 1re Avenue Bureau 500 Saint-Georges Quebec Canada G5y 7H5
C. Or pre-approved equivalent. Request for equivalency must be completed minimum 7 working days prior to bid closure, and is at the full discretion of the Contract Administrator.

MASONRY

- 1. Concrete blocks to conform to CSA A165.1-04.
2. Masonry walls to be built with type "S" mortar having a minimum strength of 13 MPa @ 28 days. Mortar to be in accordance with CSA A179-04.
3. Use Dur-O-Wall (or equal) spaced vertically at minimum 16" o/c. Refer to drawings for requirements.
4. Cold weather construction of masonry shall conform to the 2010 National Building Code of Canada, with adequate preheating of materials, heating and heating during construction and thereafter as specified. THE 'TORCHING TECHNIQUE' WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.
5. Masonry contractor shall be responsible for temporary bracing of all masonry components until all related structural framing has been erected and completely installed.
6. Provide expansion joints at maximum of 20'-0" o/c unless noted otherwise. Submit drawing with locations of expansion joints for review prior to construction.
7. Provide continuous bond beams with 2-15M bars bottom in concrete fill at top of all exterior walls, bearing walls or as indicated on drawings.
8. Inspection holes shall be left at the base of concrete filled walls.
9. Masonry cores shall be filled in lifts not exceeding 10'-0".
10. Concrete blocks to be min. H/15A/M unless noted.
11. Ensure masonry cores filled with concrete at expansion anchor locations.
12. Typical masonry lintels unless noted on drawings:
spans up to 4'-0" - 8" U-block
2-15M cont. bottom
spans up to 6'-6" - 16" U-block
2-15M cont. bottom
Provide minimum 8" bearing w/n at each end.
13. Provide minimum 4" x 4" x 5/16" angles for brick or stone support over recessed units in masonry walls for spans up to 4'-0". For larger spans refer to drawings.

STEEL DECK & LIGHT GAUGE METAL FRAMING

- 1. Steel deck and light gauge metal framing to be designed in accordance with the latest issue of CSA 136-07 and CSA 136.1-107 to support the loads indicated on the drawings.
2. Steel deck work to be performed in accordance with the latest edition of Canadian Sheet Steel Building Institute Standards for Roof and Floor Decks.
3. Steel deck to be manufactured from ASTM A525 Grade A structural quality sheet steel; hot-dip galvanized to A25 wiped coat designation.
4. Submit shop drawings sealed by a Professional Engineer registered in the Province of Manitoba, indicating decking plan, profiles, supports and design loads.
5. Mechanically fasten side laps @ 12" o/c.
6. Fasten deck to support members with 3/4" fusion welds @ 12" o/c.
7. Reinforce deck openings up to 18" square with L2" x 2" x 3/16" each side. Extend reinforcing angles a minimum of two flutes beyond opening each side.
8. All rooftop equipment shop drawings shall be submitted for review prior to commitment of steel deck shop drawing review. Indicate equipment weight, overall dimensions, and connection requirements on shop drawings. Refer to Arch for special requirements at canopy.

PRECAST FLOOR PLANKS

- 1. The design of all precast floor slabs shall be by the supplier's engineer, as per specification, to support loads indicated on drawings.
2. Design shall be in accordance with CSA A23.4-09.
3. Minimum strength @ 28 days shall be 35 MPa.
4. The supplier shall check with architectural, mechanical and electrical drawings for openings larger than 6" and form them in shop. All framing and reinforcing for openings to be designed and supplied by supplier.
5. Layout of planks shown on drawings is for diagrammatic purposes only. Actual plank layout shall be determined by supplier shown on shop drawings. Four strip design by precast supplier.
6. The supplier shall provide to the erector, a procedure for installation of all slabs before construction begins.
7. The supplier shall provide the contractor with setting drawings, showing the locations of all embedded parts required.
8. Precast planks must be aligned and leveled before grouting the keys and joints with a 3:1 sand/cement grout, from the top.
9. No openings to be made on site without written approval by suppliers engineer.
10. Plank layout indicated on drawings is for diagrammatic purposes only. Actual plank layout to be determined by supplier.
11. The precast supplier shall submit drawings bearing the seal of an engineer, registered in the Province of Manitoba for review of:
- fabrication drawings of planks c/w sizes, dimensions, and design information.
- an erection drawing, showing the location of all planks and other information required by the contractor for the proper installation.

CONCRETE TOPPING SPECIFICATION

A. Surface Preparation

- 1. Remove all debris, including oil, grease, dirt, wax and other deleterious material, using a non-solvent de-greaser/ detergent.
2. Any areas exhibiting delamination, spalling or scaling to be repaired by removing deteriorated concrete to a sound surface.
3. Shot-blast surface with min. 390 shot heavy blast within 24 hrs of placing new concrete.
4. Vacuum clean prior to placement of new concrete and saturate for a minimum of 24 hrs. surface to be saturated surface-dry upon placement of new concrete.
5. A latex bonding agent, applied as slurry, mixed with fine aggregate and portland cement shall be applied just prior to placement of new concrete. The mix proportions of slurry to be cement/sand at 1:1 & water/cement at 0.42.
6. New concrete to be placed onto the receiving substrate while the bonding slurry is still plastic.

B. Materials

- 1. Cement to be normal type 10
2. Concrete strength at 28 days - 25 MPa
3. Minimum fly ash content 10%, maximum 15%.
4. Maximum coarse aggregate size 10mm
5. Maximum slump 50mm +/- 20mm

C. Placement, Finishing & Curing

- 1. Place concrete, continuously consolidating and finish to specified elevation, provide steel trowel finish.
2. Provide control joints at maximum 10ft. o/c.
3. Provide continuous wet burlap curing for 7 days after concrete placement.

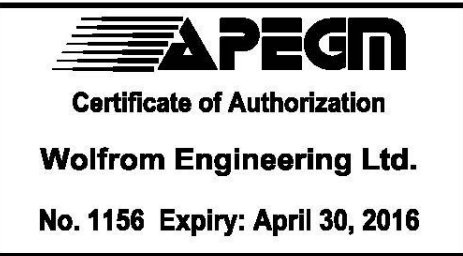


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