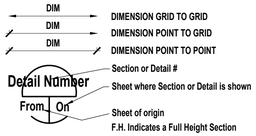
GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. Design live loads shall not be exceeded at any time during construction. For concrete structures, design live loads may only be applied after concrete reaches its design strength.
3. Construction loads must not be imposed on structure in excess of specified design live load. Design live loads may only be applied after concrete reached its design strength.
4. The Contractor is to verify dimensions, elevations, slopes, details, conditions and other data noted on the structural drawings with conditions on the site, co-ordinate all dimensions with the architectural drawings prior to construction or fabrication of any building component, and is held responsible for reporting any discrepancies that effect structural framing to the contract administrator before proceeding with the work. Variations and modifications to work shown on the structural drawings shall not be carried out without written permission from the contract administrator.
5. Modifications, alterations or substitutions must be authorized in writing by the Design contract administrator.
6. The Contractor shall locate all existing site services prior to construction.
7. For openings in slabs, floor, walls, roof, etc. refer to architectural, mechanical, structural and or other pertinent drawings.
8. Location of construction joints not indicated on plans is the responsibility of the general Contractor but approval must be obtained from the contract administrator before proceeding.
9. The Contractor shall be responsible for the design and installation of all necessary shoring, bracing and form work. Form work for new construction shall be bridged over existing services.
10. The structure and grade beams shall be braced in all directions to safely withstand all lateral forces which may be encountered during erection. The bracing shall remain in place until all permanent bracing, framing, cladding and backfill are in place.
11. All codes referenced in these notes shall be of the latest applicable revision.
12. All beams, angles and miscellaneous metals indicated on architectural drawings but not shown on structural drawings, shall be included in the tender price. The Contractor is responsible for confirming sizes and locations of these members with both the contract administrator prior to tender closing.
13. Do not cut or drill any openings into structural members without obtaining written permission from the contract administrator.
14. The Contractor shall retain a manufacturer's representative to provide onsite anchor installation training for all of their products specified. The contract administrator must receive documented confirmation that the Contractor's personnel are trained prior to the commencement of installing anchors.

DIMENSIONS & SYMBOLS



DESIGN SPECIFICATIONS

The building modifications are designed in accordance with the 2011 Manitoba Building Code

- Snow (Roof) 0.8(Ss) + (Sr) = 1.72 kPa
- Wind q(1/50) = 0.45 kPa

DRAWING LIST	
S1.1	GENERAL NOTES
S2.1	STAFF HOUSE LAYOUT SECTIONS & DETAILS
S2.2	FOREMAN'S HOUSE LAYOUT SECTIONS & DETAILS
S2.3	LAKEVIEW RESIDENCE LAYOUT SECTIONS & DETAILS

CONCRETE

1. Concrete, as specified in A23.1-09, shall have the following properties.

CONCRETE STRENGTH AND MIX SPECIFICATIONS							
USE	EXPOSURE CLASS	CEMENT TYPE	MINIMUM COMPRESSIVE STRENGTH	MAXIMUM WATER TO CEMENT RATIO	AIR CONTENT (%)	SLUMP	MAXIMUM AGGREGATE SIZE
PILES	S-2	HS	32 MPa AT 28 DAYS	0.45	4 - 7	90 mm	20 mm
SLABS	C1	MS	35 MPa AT 28 DAYS	0.4	4-7	90 mm	20 mm

2. Construction joints shall be made and located so as not to significantly impair the strength of the structure. The location of construction joints shall be approved by the contract administrator. Slab and beam construction joint details shall be approved by the contract administrator.
3. Provide 6" (150mm) plastic wrapped cardboard void form below all beams,walls and pile caps.
4. Place concrete as a continuous operation stopping only at construction joints.Construction joints shall be adequately dowelled and keyed. If not provided as part of this drawing set, details and locations of construction joints shall be provided by the Contractor and reviewed by the contract administrator.
5. Reinforcing steel must be reviewed by the contract administrator prior to placing concrete.
6. The Contractor shall notify the contract administrator at least 48 hours (72 hours for out-of-town projects) prior to all concrete pours.
7. Fins on concrete surfaces shall be removed. Honeycombed or otherwise defected concrete shall be removed sufficiently to expose sound concrete and shall be repaired as directed by the contract administrator.
8. Timing for removal of form work to be based on strength of concrete, as determined by the testing of field cured concrete cylinders. Do not remove form work from footings before concrete has reached 50% of its design strength. For walls and columns not supporting load, remove at 60% of design strength. For suspended structural slabs, form work may be removed at 80% of design strength, provided the slab is re-shored until full strength is reached.
9. Unless noted otherwise, Contractor to test concrete for each day's concreting and/or every 40 cubic meters each day concreting. Forward test results to the contract administrator.
10. All freshly placed and consolidated concrete shall be cured in accordance with CSA standard A23.1, latest edition.
11. All freshly placed, consolidated concrete shall be suitably protected during the curing period against damage from adverse weather conditions such as winds, precipitation and extreme temperatures in accordance with CSA standard A23.1, latest edition.

CAST IN PLACE CAISSONS

1. The Contractor shall confirm the location of subgrade services prior to commencing drilling for piles.
2. Cast-in-place concrete straight shaft mechanically cleaned caissons shall end bear on sound bed rock with a an allowable end bearing capacity of 500 kPa. Variance in soil conditions from the above shall be reported to the Contract Administrator before proceeding.
3. Pile reinforcing shall extend the full length of the caisson.
4. The full length of all caissons shall be consolidated with a mechanical vibrator.
5. Top of caisson elevations are shown on plan.

REINFORCING STEEL

1. Reinforcing steel shall be new billet, deformed bars in accordance with CSA Standard CAN/CSA-G30.18-M92 minimum yield strength to be 400 MPa, except 10M bars for stirrups and column ties may be 300 MPa.
2. Reinforcing steel shall be detailed in accordance with the latest RSIC Reinforcing Steel Manual of Standard Practice.
3. Lap top bars at centre span and bottom bars over supports.
4. All reinforcing to be held in place and tied by the use of proper accessories such as hi-chairs, spacers, etc., to be supplied by the reinforcing steel fabricator.
5. Reinforcing in concrete beams/walls and masonry bond beams to be bent 24" (600mm) around corners or use 3'-0" x 3'-0" (900mm x 900mm) corner bars.
6. Frame all openings in concrete beams, walls and/or slabs with 2-20M bars (extra) all four sides. Extend bars 24" (600 mm) beyond edges of openings except as noted.
7. Submit shop drawings which clearly indicate bar sizes, grade, spacing, hooks, bends, and supporting/spacing devices, etc., for review to the contract administrator prior to fabrication of the reinforcing steel.
8. Pit Walls/Slabs shall be 8" (200mm) thick reinforced with 15M @ 12" (300mm) o.c. each way at center unless otherwise shown.
9. Housekeeping pads shall be a minimum of 4" (100mm) thick and reinforced with 10M @ 12" (300mm) o.c. each way at centre unless otherwise shown.
10. Prior to placing concrete, ensure all reinforcing steel is clean, free of loose scale, rust, mud, oil or other foreign material which would reduce bond.
11. Heating, quenching and bending of reinforcing steel on the site is not allowed.
12. Splices at points of maximum tensile stress shall be avoided wherever possible. Such splices, where used, shall be approved by the consultant, the minimum lap shall be 48 bar diameters.
13. Continuous and temperature reinforcing bars shall be lapped 24 bar diameters, or 18" (450mm) minimum at splice or at corners. Terminate continuous bar at non-continuous ends with standard hook.
14. Minimum clear distance between parallel bars shall be greater than the largest of the following:
    a) 1.4 times bar diameter.
    b) 1.4 times maximum size of aggregates.
    c) 1 3/16" (30mm) minimum.
15. Minimum concrete cover for reinforcing:

Exposure Condition	Exposure Class		
	N	F-1, F-2, S-1, S-2	C-1, C-2, C-3, A-1, A-2, A-3
PILES, FOOTING, RETAINING WALL, AND CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.	--	75mm	75mm
BEAMS, GIRDERS, COLUMNS.	30mm	40mm	60mm
SLABS, WALLS, JOISTS, SHELLS AND FOLDED PLATES	20mm	40mm	60mm

GUARDRAILS AND HANDRAILS

1. All guardrail and handrails indicated on all architectural & structural drawings shall be deisgned by Contractor.
2. Guardrails and handrails shall be designed as per Part 4 NBC2010 (Manitoba building code 2011).
3. Provide sealed engineered shop drawings stamped by an engineer licensed to practice in the project province of (Manitoba). Drawings shall indicate dimensions, size and location of all components. All connections shall be indicated on the drawings.
4. Shop drawings will not be reviewed until sealed by P. Eng. All shop drawings shall be indicated as "Issued for construction"

STRUCTURAL STEEL

1. Fabricate & erect structural steel to CSA Standard CAN/CSA-S16-09
2. Structural steel shapes and plates shall conform to CSA Standard CAN/CSA-G40.21, Grade 350W and CAN/CSA-G40.21, Grade 350W for H.S.S., Class C.
3. All welding shall be performed by qualified welders fully approved for structural welding by the Canadian Welding Bureau in accordance with CSA Specifications W47 and W59.
4. Unless shown otherwise on the Drawings, connect all flexural members (beams, channels, etc...) at each end for one half of the total uniformly distributed factored load of the laterally supported beam, in addition to the transfer of factored moments, where shown on the Drawings.
5. Splicing of members not permitted unless otherwise noted.
6. Where beams are continuous over supports, no holes permitted in top flange. Provide 2-3/8" (10mm) welded web stiffener plates each side of beam, aligned with column walls.
7. Column base and cap plates shall be welded to columns. Provide 3/4" (20mm) thick cap plate c/w 4-3/4"Ø (20mm) bolts for all columns supporting cantilevered beams.
8. Structural steel erector shall supply and install all temporary guying and bracing necessary to provide stability for the structure as a whole. These shall remain in place until floor slabs are well cured, steel roof deck is fully welded and/or permanent bracing is installed.
9. Steel stairs, handrails, guardrails shall be designed by others. Fabricator shall submit shop drawings under the seal of a Professional Engineer registered in the project Province, to the contract administrator for approval prior to fabrication.
10. Structural Steel supplier shall submit shop drawings bearing the seal of a Professional Engineer in the project Province showing all design and fabrication details of connections to the contract administrator for review prior to fabrication.
11. Pipe sections to ASTM A53, minimum yield point 241 MPa (35 ksi).
12. Bolts, nuts, and washers to ASTM A325, minimum bolt diameter 3/4" (20mm).
13. Anchor bolts to ASTM A307.
14. Welding of reinforcing bars to CSA W186-M1990.
15. Primer to conform to the requirements of CGSB or CISC/CPMA standards.
16. Grout bed under base plates to be 35 MPa non shrink grout.
17. All bolted connections shall have a minimum of two bolts in each connected piece and be designed with bearing-type connections with threads included in shear plane, unless noted otherwise.
18. All steel shall receive a shop coat of primer except surfaces to be concreted, welded, light zinc coated or galvanized.
19. Clean all field welds after erection and touch up all unpainted surfaces with one coat of primer paint to match shop coat.
20. There shall be no cutting of the structural steel members for the work of other trades without prior written approval of the contract administrator.
21. Professional Engineer whose seal is on shop drawings shall review construction and provide a letter certifying that connections have been installed in accordance with the approved shop drawings.
22. All exposed steel to be galvanized.

NAILS AND LAG SCREWS

1. Nails shall be in accordance with CSA Standard B111, wire nails, spikes and staples. Material for lag screws shall be in accordance with ANSI/ASTM Standard A307, carbon steel externally threaded standard fasteners.

STAIRS

1. All stairs indicated on all architectural & structural drawings shall be designed by Contractor.
2. All stairs in entrances and exits shall be designed for a live load of 4.8 kPa (100 psf) min.
3. Provide sealed engineered shop drawings stamped by an engineer licensed to practice in the project province of (Manitoba). Drawings shall indicate dimensions, size and location of all components.
4. All connections shall be indicated on the drawing. Including connections of stairs to landings.
5. Stair drawings to be coordinated with guardrail details to ensure all guardrail to stair connections are allowed for in the design.
6. Shop drawings will not be reviewed until sealed by P. Eng. All shop drawings shall be indicated as "Issued for construction"

WOOD FRAMING

1. Sawn lumber for stud walls and lintels shall be Species Group D, Spruce Pine Fir Grade No.1/No.2 or better unless otherwise noted.
2. Composite beams or lintels shall be Parallam PSL (or approved equal). Materials shall comply with CCMC Report No. 11161-R.
3. Composite beams or lintels shall be Timberstrand LSL (or approved equal). Materials shall comply with CCMC Report No. 12627-R.
4. Composite beams or lintels shall be Microllam LVL (or approved equal). Materials shall comply with CCMC Report No. 08675-R.
5. Composite floor and roof joists shall be manufactured by Trus Joist MacMillan (or approved equal). Flange members, web members and adhesives shall conform to the provisions of NES Report No. NER-200 of the appropriate CCMC report number.
6. Joist supplier shall submit engineered shop drawings bearing the seal of a Professional Engineer in the projects Province covering the design of the wood joists prior to fabrication.
7. Truss supplier shall submit engineered shop drawings bearing the seal of a Professional Engineer in the projects Province covering the design of the trusses prior to fabrication. Truss supplier to provide metal tie downs at all truss to wall connections. Connection detail to be indicated on shop drawings.
8. Glue-Laminated beams shall be Douglas Fir Grade as follows: interior service, bending stress 24f-E quality appearance grade.
9. Glue-Laminated columns shall be Douglas Fir Grade as follows: 16c-E stress grade, quality appearance grade.
10. Parallam PSL and/or Timberstrand LSL and/or Microllam LVL supplier shall submit shop drawings bearing the seal of a Professional Engineer registered in the project Province covering the design of the beams and associated connections prior to fabrication.
11. Truss and joists shop drawings shall indicate all metal hangers, squash blocking, bridging/blocking and web stiffeners.

PLYWOOD

1. Plywood shall be Douglas Fir Plywood in accordance with CSA Standard O121.
2. Plywood for floor, wall, and roof sheathing shall be G.1.S. (good one side), installed with face grain at right angles to studs and joists and be of type and thickness indicated on the drawings.

SHEATHING

1. Wall sheathing shall be 12mm grade O-2 oriented strand board in accordance with CSA Standard CAN3-O437.0.
2. Floor sheathing shall be 19mm grade 0-2 oriented strand board in accordance with CSA Standard CAN3-O437.0.
3. Roof sheathing shall be 13mm (16mm over flat Roof) grade O-2 oriented strand board in accordance with CSA Standard CAN3-O437.0.
4. Sheathing for wall, floor and roof shall be installed with face grain at right angles to studs, trusses and joists.
5. Exterior wall sheathing to be fastened with 2 1/2"(64mm) nails @ 6"(152mm) o.c. @ panel edges and @ 12"(305mm) o.c. @ intermediate members.

DO NOT SCALE THE DRAWINGS. NO REPRODUCTION MAY BE MADE WITHOUT THE PERMISSION OF 2 ARCHITECTURE INC. THE GENERAL CONTRACTOR AND ALL SUB-TRADES SHALL CHECK AND VERIFY ALL DIMENSIONS AND DATA NOTED HEREIN WITH CONDITIONS OF THE SITE AND SHALL BE HELD RESPONSIBLE FOR REPORTING ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED, AND SEALED.

B.M.
ELEV.

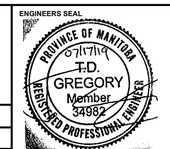
NO.	REVISIONS	DATE	BY
0	ISSUED FOR TENDER NO. 643-2019	2019.07.17	AP

Lavergne Draward & Associates Inc.
200-193 Dumoulin Street
Winnipeg, Manitoba R2H 0E4
Tel: (204)947-2222
Fax: (204)947-2522
E-mail: general@ldaeng.ca
Web: www.ldaeng.ca

Project Number: 19017

DESIGNED BY	TG	CHECKED BY	TG
DRAWN BY	AP	APPROVED BY	TG
SCALE: HORIZONTAL VERTICAL	AS NOTED	RELEASED FOR CONSTRUCTION	
DATE	07.17.19	DATE	

ENGINEERS SEAL



ENGINEERS SEAL

Certificate of Authorization
Lavergne Draward & Associates Inc.
No. 1912 Date: JULY 17, 2019

CONSULTANT DRAWING NUMBER
S1.1

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT
ENGINEERING DIVISION

SHOAL LAKE AQUADUCT INTAKE
RESIDENCE UPGRADES

GENERAL NOTES

CITY DRAWING NUMBER 1-0600A-S0004-001

SHEET 1 OF 4