A1 SIZE – 594mm x 841mm

REINFORCING STEEL:

1. ALL REINFORCING STEEL TO CONFORM TO CSA G30.18M, GRADE 400.
2. ALL REINFORCING STEEL TO BE DETAILED IN ACCORDANCE WITH THE LATEST RSIC REINFORCING STEEL MANUAL OF STANDARD PRACTICE, CSA–A23.1 AND CSA–A23.3.
3. CONCRETE CLEAR COVER (UNLESS NOTED OTHERWISE):

PILES	75mm
GRADE BEAMS (BOTTOM)	40mm
GRADE BEAMS (SIDE & TOP)	40mm
SLABS (BOTTOM)	30mm
SLABS (TOP)	20mm
WALLS	30mm

4. SUBMIT TO THE CONTRACT ADMINISTRATOR SHOP DRAWINGS WHICH CLEARLY INDICATE BAR SIZES, GRADE, SPACING, HOOKS, BENDS, AND SUPPORTING / SPACING DEVICES, ETC., FOR REVIEW PRIOR TO THE FABRICATION OF REINFORCING STEEL.
5. DO NOT PLACE REINFORCEMENT WITHOUT FIRST OBTAINING A COPY OF THE REVIEWED SHOP DRAWINGS FROM THE CONTRACT ADMINISTRATOR.
6. ALL REINFORCING SHALL BE HELD IN PLACE AND TIED BY THE USE OF PROPER ACCESSORIES SUPPLIED BY THE REINFORCING STEEL FABRICATOR.
7. ALL REINFORCING STEEL SHALL BE CLEANED OF ALL DIRT, GREASE AND OTHER DELETERIOUS MATERIALS PRIOR TO PLACING.
8. REINFORCING STEEL SHALL NOT BE WELDED OR HEATED UNLESS NOTED OTHERWISE.
9. EXTEND LONGITUDINAL STEEL IN GRADE BEAMS 450mm AROUND CORNERS, OR USE 900mm CORNER BARS UNLESS NOTED OTHERWISE.
10. IF REINFORCING STEEL IS LAPPED, BOTTOM STEEL SHALL ONLY BE LAPPED OVER SUPPORTS, TOP STEEL SHALL ONLY BE LAPPED AT MID–SPAN.

MASONRY:

1. ALL MASONRY WORK SHALL BE DONE IN ACCORDANCE WITH CSA–A371.
2. CONCRETE BLOCKS TO CONFORM TO CSA–A165. STANDARD HOLLOW MASONRY UNITS TO BE H/15/A/M. FLUTE SIZE, NUMBER–PER–BLOCK, AND SPACING TO MATCH EXISTING FLUTED MASONRY BLOCK.
3. MORTAR TO CONFORM TO CSA–A179, TYPES BASED ON PROPORTION SPECIFICATIONS, TYPE S.
4. USE 9 GAUGE TRUSS TYPE REINFORCEMENT WITH DEFORMATIONS, TIES AND ANCHORS EVERY SECOND COURSE. ALL SPLICES SHALL BE LAPPED 750mm COURSE TO COURSE.
5. JOINT REINFORCEMENT SHALL BE MADE CONTINUOUS AT ALL WALL CORNERS BY USE OF 'L' SHAPED PIECES SPECIFICALLY FABRICATED FOR THE APPLICATION.
6. BOTTOM COURSE TO BE BOND BLOCK AND TOP COURSE TO BE 'U'–BLOCK LINTEL WALLS WITH 2 – 15M REINFORCING BARS AND 20 MPa CONCRETE FILL CONTINUOUS UNLESS OTHERWISE NOTED. FILL CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 10mm AND A MAXIMUM SLUMP OF 200mm.
7. ALL MASONRY WALLS TO BE SECURELY BRACED UNTIL THE STRUCTURE IS CLOSED IN.
8. PROVIDE 'U'–BLOCK LINTELS OVER ALL OPENINGS IN BLOCK WALL (INCLUDING THOSE FOR MECHANICAL OR ELECTRICAL SERVICES AND EQUIPMENT) AS FOLLOWS UNLESS OTHERWISE NOTED:

   UP TO 1200mm 200mm 'U'–BLOCK, 2 – 15M
   BOTTOM, 20 MPa FILL,
   BEAR MINIMUM 200mm EACH END

   UP TO 2400mm 400mm 'U'–BLOCK, 2 – 15M
   BOTTOM, 20 MPa FILL,
   BEAR MINIMUM 400mm EACH END

9. VERTICAL REINFORCING: PROVIDE ONE 15M FULL HEIGHT VERTICAL BAR WITH MATCHING HOOKED DOWEL AND COREFILL AT:

   900mm OR AS PER DRAWINGS.
   UNSUPPORTED ENDS OF WALLS AND AT CONTROL JOINTS.
   EACH CORNER AND AT WALL INTERSECTIONS.
   EACH SIDE OF DOORS.
   EACH SIDE OF OPENINGS

10. COREFILLS SHALL BE DONE IN MAXIMUM 1200mm LIFTS, AND SHALL BE RODDED TO AVOID HONEYCOMBING.

ROUGH CARPENTRY:

1. WALL STUDS, PLATES, LINTELS TO BE SPF NO. 2 OR BETTER.
2. NAILING PATTERNS AND LENGTHS TO CONFORM TO THE REQUIREMENTS OF PART 9 OF THE NBBC.
3. ALL WOODEN TRUSSES TO BE DESIGNED IN ACCORDANCE WITH:

   086 ENGINEERING DESIGN IN WOOD
   THE NATIONAL BUILDING CODE OF CANADA.
   THE MANITOBA BUILDING CODE.

4. TRUSSES FRAMING INTO BEAMS OR OTHER TRUSSES SHALL BE CONNECTED WITH ENGINEERED FRAMING ACCESSORIES.
5. CONNECTION OF TRUSSES TO TOP PLATE SHALL BE ENGINEERED.
6. SECURE TOP PLATE WITH 12.7mm DIA. x 178mm LONG HILTI KWIK BOLT 3 WITH MINIMUM 102mm EMBEDMENT AND IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

BATT INSULATION:

1. MATERIAL: MINERAL WOOL INSULATION (ROXUL COMFORTBATT OR EQUIVALENT) UNFACED, MINIMUM R12 (STUD WALLS), R20 (CEILING).
2. VAPOUR BARRIER: MINIMUM 6 MIL POLYETHYLENE. TAPE SEAL ALL JOINTS AND JUNCTIONS.
3. INSTALL INSULATION TO MAINTAIN CONTINUITY OF THERMAL BARRIER, FIT TIGHT TO PENETRATIONS. SEAL JOINTS AND JUNCTIONS. DO NOT COMPRESS.
4. INSTALL VAPOUR BARRIER ON WARM SIDE OF INSULATION. COMPLETELY SEAL BY TAPING ALL JOINTS. PATCH ALL TEARS AND PENETRATIONS.

SEMI–RIGID BOARD INSULATION:

1. MATERIAL: 128kg/m^3 DENSITY MINERAL FIBER BOARD (ROXUL ROCKBOARD 80 OR EQUIVALENT).
2. FASTEN RIGID INSULATION AND SHEATHING WITH FLAT DISK CONCRETE ANCHORS, SPACING AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

METAL ROOFING:

1. PREFINISHED ROOF PANELS TO BE MINIMUM 24 GA. GALVANIZED STEEL SHEET CONFORMING TO ASTM A653M, GRADE 230, WITH Z275 COATING DESIGNATION. FINISH TO BE FACTORY PRECOATED, COLOUR COCOA BROWN (TO BE APPROVED BY THE CONTRACT ADMINISTRATOR).
2. DESIGN OF SYSTEM TO PROVIDE FOR THERMAL MOVEMENT CAUSED BY TEMPERATURE RANGE OF –40 TO + 40 C.
3. DESIGN OF SYSTEM TO PROVIDE FOR DIFFERENTIAL MOVEMENT BETWEEN THE NEW ROOFING SYSTEM OF THE EXISTING STRUCTURE AND THE NEW ROOFING SYSTEM OF THE ADDITION.
4. PROVIDE FOR MOISTURE DRAINAGE TO EXTERIOR.
5. MEMBRANE TO BE COMPATIBLE WITH ALL ADJACENT MATERIALS, AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
6. FLASHING, TRIM, SNOW DAM, RIDGE VENTING, GUTTERS, DOWNPIPES AND ACCESSORIES: OF SAME MATERIAL AND COLOUR AS CLADDING.
7. SCREWS: AS RECOMMENDED BY ROOFING SUPPLIER, GALVANIZED, LENGTH AND DIAMETER TO CONFORM TO ROOF SYSTEM DESIGN. HEAD COLOUR TO MATCH CLADDING.
8. SYSTEM TO BE FINISHED FREE FROM RATTLES, WIND WHISTLES, OR NOISE DUE TO THERMAL MOVEMENT.
9. SOFFITS AND ASSOCIATED TRIMS SHALL BE PERFORATED ALUMINUM, PREFINISHED TO MATCH CLADDING COLOUR. FASTENERS PER MANUFACTURER STANDARD COLOUR MATCHED.
10. SEALANTS: DOW CORNING 795 SILICONE SEALANT. SEALANT COLOUR TO MATCH ADJACENT SURFACES WHERE EXPOSED IN FINISHED ASSEMBLY.

DOORS:

1. EXTERIOR DOORS: 45mm STEEL DOOR, 18 GAUGE, WITH POLYURETHANE INSULATION FILL. FINISH COLOUR TO MATCH ROOFING SYSTEM.
2. EXTERIOR FRAME: 16 GAUGE PRESSED STEEL FRAME, BATT INSULATION FILL, FIX TO WALL WITH A MINIMUM OF 4 x 6.35mm TAPCON ANCHORS (MIN. EMBEDMENT = 45mm) PER JAMB (FINISH TO MATCH DOORS).
3. REFER TO SPECIFICATIONS FOR DOOR HARDWARE.

FINISH:

1. REFER TO SPECIFICATIONS FOR PAINT FINISHES AND FORMULAE.
2. PAINT SCHEDULE (OR AS APPROVED BY THE CONTRACT ADMINISTRATOR):

MARK	FORMULA	LOCATION
PT – 1	MPI EXT 6.4B–ALKYD GR (SEMI GLOSS) FINISH PREMIUM GRADE	ALL INT. PLYWOOD
PT – 2	MPI EXT 5.1D–ALKYD G5 (SEMI GLOSS) FINISH PREMIUM GRADE	METAL FABRICATIONS, LIFTING DEVICES
PT – 3	MPI EXT 3.1A–LATEX G5 (SEMI GLOSS) FINISH PREMIUM GRADE	ALL INT. CONCRETE WALLS & CEILINGS

3. THE CONTRACTOR SHALL APPLY FABRIKEM FABRISHIELD PAINT REPELLANT PR–61 TO THE EXTERIOR OF THE MASONRY BLOCK (NEW ADDITION AND THE EXISTING BUILDING) IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

CAULKING:

1. CAULKING: CLEAR SILICON.
2. BACKER: ETHAFOAM SB, OVERSIZED 30%.

LIFTING DEVICES:

1. ALL WELDS SHALL BE INSPECTED AND CERTIFIED TO CSA W47.1 PRIOR TO USE, AND THE LETTER OF CERTIFICATION SHALL BE SUBMITTED UNDER SEAL OF THE INSPECTION AGENCY'S ENGINEER.
2. ALL LIFTING DEVICES SHALL BE LOAD TESTED TO CSA B167 PRIOR TO USE, WITNESSED BY THE INSPECTION AGENCY'S ENGINEER, WHO SHALL PREPARE A SEALED REPORT DESCRIBING THE RESULTS OF THE LOAD TEST.
3. NO CHANGE IN THE CONFIGURATION, USE, OR LOADING CONDITIONS OF ANY LIFTING DEVICE IS PERMITTED.
4. ALL LIFTING DEVICES SHALL BE PAINTED INTERNATIONAL SAFETY YELLOW. IF NOT ALREADY DISPLAYED, THE MAXIMUM STIPULATED SERVICE LOAD CAPACITY SHALL BE INDICATED PROMINENTLY ON OR IMMEDIATELY ADJACENT TO EACH LIFTING DEVICE IN 150mm BLOCK LETTERS IN A CONTRASTING COLOR.
5. LIFTING DEVICE SERVICE LOAD CAPACITIES SHALL NOT BE EXCEEDED.
6. ALL LOADS SHALL BE LIFTED VERTICALLY; NO LATERAL LOADS SHALL BE IMPOSED ON ANY LIFTING DEVICE.
7. IT IS THE SOLE RESPONSIBILITY OF THE CITY TO ENSURE THAT THE LIFTING DEVICES ARE USED IN A SAFE MANNER, AND ARE INSPECTED AND MAINTAINED ON A REGULAR BASIS. THE OPERATIONAL CONDITION OF THE LIFTING DEVICES SHOULD BE VERIFIED PERIODICALLY BY THE CITY TO ENSURE CONTINUED SAFE OPERATION.

STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL ANGLES AND PLATES TO BE IN ACCORDANCE WITH CSA G40.21 GRADE 300W, ALL OTHERS MEMBERS TO BE GRADE 350W UNLESS OTHERWISE NOTED.
2. DETAILING, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH CSA–S16.
3. ALL WELDING TO CONFORM TO CSA W47.1 & W59.
4. INSTALL ANCHORS IN ACCORDANCE WITH MANUFACTURES INSTRUCTIONS.
5. WELDING SHOPS TO BE CERTIFIED TO DIVISION 1 OR 2 OF CSA W47.1 BY THE CANADIAN WELDING BUREAU. ALL WELDING TO BE PERFORMED BY CWB CERTIFIED WELDERS.

SHOP WELDED CONNECTIONS:

1. ALL SHOP WELDING SHALL CONFORM TO CSA W59. CONTRACTOR TO BE CERTIFIED IN ACCORDANCE WITH W47.1, DIVISION 1 OR 2. ALL WELDERS TO BE CWB CERTIIED FOR THE REQUIRED WELDS.
2. ALL WELDS TO BE CONTINUOUS FILLET OR GROOVE SEAL WELDS. GROOVE WELDS TO BE DETAILED AS FULL PENETRATION WELDS WITH BACKER PLATE.

DESIGN OF BOLTED CONNECTIONS:

1. DESIGN ALL BOLTED CONNECTIONS IN ACCORDANCE WITH CSA–S16 AND THE CISC CODE OF STANDARD PRACTICE FOR STRUCTURAL STEEL.
2. ALL CONNECTIONS SHALL BE DESIGNED AND DETAILED BY THE STEEL FABRICATOR. CONNECTION CONFIGURATIONS SHALL (IN GENERAL) CONFORM WITH THE DETAILS PROVIDED. THE STEEL FABRICATOR SHALL ADVISE THE ENGINEER IN WRITING WHEN DEVIATION FROM THE APPROVED CONNECTION CONFIGURATION DETAILS IS REQUIRED.
3. OVERSIZED HEAVY DUTY 60mm DIA. x 5mm THICK HARDENED PLATE WASHERS REQUIRED AT ALL SLOTTED/BOLTED CONNECTION LOCATIONS.

FIELD ANCHORING:

1. LOCATE EXISTING REINFORCING IN THE CONCRETE ELEMENTS TO RECEIVE POST–FACTO ANCHORAGE AND POSITION HOLES FOR THE NEW ANCHORS CLEAR OF THE EXISTING REINFORCING.
2. DRILL HOLES INTO THE EXISTING CONCRETE ADVANCING THE DRILL BIT TO FULL DEPTH OF REQUIRED ANCHORAGE. IF REINFORCEMENT IS ENCOUNTERED, TERMINATE DRILLING THE HOLE AND RELOCATE THE ANCHORAGE CLEAR OF THE REINFORCING. USE A STANDARD HARDENED CARBIDE TIPPED CONCRETE BIT, DO NOT USE A CORE DRILL THAT CAN INTERCEPT AND CUT THE EXISTING REINFORCING – EXCEPT WHERE NOTED.
3. ADVISE THE CONTRACT ADMINISTRATOR IMMEDIATELY IF THE REQUIRED ANCHORAGE HOLE LOCATIONS CANNOT BE FIELD ADJUSTED TO CLEAR THE EXISTING REINFORCING AND AWAIT FURTHER INSTRUCTIONS. THE SITE ENGINEER WILL REVIEW THE SITUATION AND MAKE A DETERMINATION REGARDING HOW BEST TO INSTALL THE ANCHORS, GIVEN THE ACTUAL POSITIONS OF THE REINFORCING ENCOUNTERED.
4. ALL ANCHORS MUST BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

DRAWING NUMBER	REFERENCE DRAWINGS
1–0304U–S0008	PUMPING STATION UPGRADES – MECH. OPENING DETAILS – ELEVATION AND SECTIONS
1–0304U–S0007	PUMPING STATION UPGRADES – ORIGINAL SUPERSTRUCTURE – DETAILS
1–0304U–S0006	PUMPING STATION UPGRADES – BUILDING ADDITION WALLS – PLANS & ELEVATIONS
1–0304U–S0005	PUMPING STATION UPGRADES – BUILDING FOUNDATION ADDITION – DETAILS
1–0304U–S0004	PUMPING STATION UPGRADES – BUILDING FOUNDATION ADDITION – SECTIONS
1–0304U–S0003	PUMPING STATION UPGRADES – BUILDING FOUNDATION ADDITION – PLANS
1–0304U–S0002	PUMPING STATION UPGRADES – ORIGINAL SUPERSTRUCTURE – PLAN & ELEVATIONS

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
SNC-Lavalin Inc.
No. 4489

NO.	REVISIONS	DATE	DESIGN	CHECK
00	ISSUED FOR CONSTRUCTION	2021/04/09	K.K.	D.S.

SNC·LAVALIN

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DESIGNED BY: K. KOTYK	CHECKED BY: D. SIDHU
DRAWN BY: B. DICKSON	APPROVED BY: B. CLEVEN
SCALE: N.T.S.	ISSUED FOR CONSTRUCTION BY: K. ZUREK
DATE: 2020/10/02	DATE: 2021/04/09
CONSULTANT NO.: 665338	

ENGINEER'S SEAL
PROVINCE OF MANITOBA
K.K. KOTYK
Member
21950
2021/04/09
REGISTERED PROFESSIONAL ENGINEER

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

KEEWATIN UNDERPASS PUMPING STATION
2021 UPGRADES
STRUCTURAL NOTES

CITY DRAWING NUMBER	SHEET	REV.	SIZE
1–0304U–S0001	002	00	A1

1–0304U–S0001–002.dwg

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