

GENERAL NOTES

1. READ THE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER PERTINENT CONTRACT DOCUMENTS.
2. THE DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NATIONAL BUILDING CODE 2020 EDITION WITH MANITOBA AMENDMENTS AND REFERENCED STANDARDS THEREIN.
3. NOTIFY THE STRUCTURAL ENGINEER A MINIMUM OF 2 WORKING DAYS IN ADVANCE FOR SITE REVIEWS.
4. DRAWINGS SHOW COMPLETED STRUCTURES ONLY. PROVIDE TEMPORARY BRACING FOR CONSTRUCTION LOADING CONDITIONS AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LOADS. THE EXISTING ROOF SLABS HAVE EXPERIENCED COMPLETE CORROSION OF THE BOTTOM REINFORCING STEEL MAT AND THEREFORE HAVE NO RATED CAPACITY. PEDESTRIAN ACCESS IS PERMITTED; HOWEVER, VEHICLES AND CONSTRUCTION EQUIPMENT ARE PROHIBITED FROM LOADING THE SLABS.
5. CONTRACTOR TO CONFIRM WITH EQUIPMENT SUPPLIER DIMENSIONS AND ALL OTHER CRITICAL DETAILS PRIOR TO CONSTRUCTION. REPORT DISCREPANCIES AND OBTAIN APPROVAL PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. GEODETIC ELEVATIONS REFERENCED TO RECORD DRAWINGS WERE CONVERTED TO METERS. MAIN FLOOR ELEVATION OF 766'-0" CONVERTED TO ELEVATION OF 233.476 METERS AND ALL OTHER LEVELS ACCORDINGLY.

DEMOLITION

1. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF ALL SHORING. CONTRACTOR TO PROVIDE SHORING DRAWINGS WITH THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN MANITOBA.
2. REFER TO SPECIFICATIONS AND DRAWINGS FOR SEQUENCE OF DEMOLITION.

DELEGATED DESIGN OF STRUCTURAL ELEMENTS

1. THE FOLLOWING ITEMS REQUIRE DELEGATED DESIGN BY SPECIALIZED ENGINEERS REGISTERED AND LICENSED TO PRACTICE IN THE PROVINCE OF MANITOBA (SPECIALIZED ENGINEER):
 - CONCRETE MIX DESIGN
 - CONSTRUCTION LOADING AND SHORING
2. DELEGATED DESIGN ELEMENTS ARE TO BE DESIGNED ACCORDING TO INDUSTRY BEST PRACTICES AND TO ALL RELEVANT CODES AND STANDARDS ASSOCIATED WITH THE DELEGATED DESIGN ELEMENT.

REFERENCE STANDARDS

1. THIS LIST IS NOT EXHAUSTIVE AND CONTAINS A GENERAL OVERVIEW OF STANDARDS REFERENCED WITHIN THE DRAWINGS. SHOULD A DISCREPANCY OCCUR, THE NATIONAL BUILDING CODE 2020 GOVERNS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. STEEL DESIGN AND CONSTRUCTION TO CONFORM TO THE FOLLOWING STANDARDS AND REFERENCED STANDARDS THEREIN:
 - CSA S16:19 - DESIGN OF STEEL STRUCTURES
 - CSA G40.21-13 - STRUCTURAL QUALITY STEEL
 - CSA W47.1-09 (R2014) - CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL
 - CSA W59-18 - WELDED STEEL CONSTRUCTION (METAL ARC WELDING)
 - SSPC - SP6/NACE No. 4 (2007) - COMMERCIAL BLAST CLEANING
 - ASTM A123/A124M-15 - STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS
3. CONCRETE DESIGN AND CONSTRUCTION TO:
 - CSA A23.3:19 - DESIGN OF CONCRETE STRUCTURES
 - CSA G30.18-09 - CARBON STEEL BARS FOR CONCRETE REINFORCEMENT
 - CSA A23.1:24 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION TEST METHODS.
4. MASONRY DESIGN AND CONSTRUCTION TO:
 - CSA S304-14 - DESIGN OF MASONRY STRUCTURES
 - CSA A165.1-14 - CONCRETE BLOCK MASONRY UNITS
 - CAN/CSA-A176-14 - MORTAR AND GROUT FOR UNIT MASONRY
 - CAN/CSA-A370-14 - CONNECTORS FOR MASONRY
 - CAN/CSA-A371-14 - MASONRY CONSTRUCTION FOR BUILDINGS
 - CSA G30.18-09 - CARBON STEEL BARS FOR CONCRETE REINFORCEMENT

CONCRETE

1. CONCRETE MIX DESIGN TO FOLLOW THE REQUIREMENTS OF CSA A23.1.
 2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETING QC TESTING FOR ALL NEW CONCRETE POURS. THE CONTRACTOR SHALL SUBMIT CONCRETE TESTING INVOICES TO THE CONTRACT ADMINISTRATOR, AND THE ASSOCIATED COSTS WILL BE REIMBURSED THROUGH THE CASH ALLOWANCE.
- PERFORM THE FOLLOWING TESTS (IF NECESSARY).
1. TEST FINE COARSE AGGREGATE
 2. TAKE THREE TEST CYLINDERS PER 40m³ OF LOAD, OR FRACTION THEREOF OF EACH TYPE OF CONCRETE PLACED IN ANY ONE DAY. TEST CYLINDERS WILL BE CURED ON JOB-SITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS.
 3. TAKE AT LEAST ONE SLUMP TEST AND ONE ENTRAINED AIR TEST FOR EACH SET OF TEST CYLINDERS TAKEN

OPENINGS IN EXISTING STRUCTURE

1. PRIOR TO CUTTING OPENINGS IN EXISTING STRUCTURE, CONTRACTOR TO CLEARLY MARK PROPOSED LOCATIONS AND REQUEST ON SITE REVIEW BY THE CONSULTANT.
2. OPENING, CUTTING OR ALTERATION OF BEAMS, COLUMNS, CORE-FILLED MASONRY, TRUSSES OF ANY OTHER STRUCTURAL ASSEMBLY IS PROHIBITED, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER.
3. NOTIFY ENGINEER A MINIMUM OF 3 WORKING DAYS IN ADVANCE FOR SITE REVIEWS.

REINFORCING

1. CHAIR SLAB REINFORCING NOT FURTHER THAN 1.0m IN EITHER DIRECTION. SUPPLY SUPPORT BARS, CHAIRS AND CARRIERS AS REQUIRED.
2. DOWELS AND ANCHOR BOLTS SHALL BE SECURED IN POSITION BY MEANS OF TEMPLATES BEFORE CONCRETE IS POURED. "WET DOWELING" IS NOT PERMITTED.
3. ANCHOR BOLTS MUST BE LOCATED WITHIN REINFORCING STEEL CAGE.
4. NOTIFY CONSULTANT WHERE PLACEMENT OF REINFORCING STEEL CONFLICTS WITH WORK OF OTHER TRADES.
5. UNLESS NOTED OTHERWISE, ALL DOWELS TO PROJECT A MINIMUM OF 40 BAR DIAMETERS INTO SLAB OR WALL FROM FACE OF SUPPORT. REFER TO SPECIFICATIONS.
6. REFER TO SPLICE TABLES IN THIS DRAWING PACKAGE.

CONCRETE CONSTRUCTION JOINTS

1. THE CONTRACTOR SHALL SUBMIT DRAWINGS INDICATING LOCATIONS OF ALL PROPOSED CONSTRUCTION JOINTS FOR APPROVAL.
2. PROVIDE HORIZONTAL REINFORCING BARS EXTENDING A MINIMUM OF 40 BAR DIAMETERS PAST CONSTRUCTION JOINT. BAR SIZE AND SPACING TO MATCH REINFORCING SPECIFIED FOR FOOTING OR FOUNDATION WALL.
3. SLAB JOINTS TO BE LOCATED AS PER DRAWINGS.
4. REFER TO SPECIFICATIONS AND DRAWINGS FOR OTHER REQUIREMENTS.

CONCRETE COVER	
CONDITION	SPECIFIED COVER
FORMED EDGES NOT EXPOSED TO SOIL	50mm
FORMED EDGES EXPOSED TO SOIL	50mm
CONCRETE CAST AGAINST SOIL	75mm
SLAB TOP REINFORCEMENT	50mm
SLAB BOTTOM REINFORCEMENT	50mm
SLUDGE TANK INTERIOR FACE	40mm

EMBEDMENT AND SPLICE CONDITIONS							
CONCRETE STRENGTH	CONDITION	REINFORCEMENT DESIGNATION					
		10M	15M	20M	25M	30M	35M
25 MPa	EMBEDMENT	300	435	580	900	1080	1260
	SPLICE	390	565	750	1170	1405	1640
32 MPa	EMBEDMENT	300	395	530	825	990	1155
	SPLICE	390	515	685	1070	1285	1500
35 MPa	EMBEDMENT	300	370	490	765	915	1065
	SPLICE	390	475	635	990	1190	1385

NOTES:
1. INCREASE ABOVE LENGTHS BY 1.3 TIMES IF HORIZONTAL REINFORCING BARS ARE CAST WITH ≥ 300mm OF CONCRETE CAST BELOW THE BAR.

STRUCTURAL STEEL

1. FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH CSA S16.
2. PROVIDE STRUCTURAL STEEL TO CSA G40.21 WITH THE FOLLOWING GRADES:
 - 1. BEAMS - 350W
 - 2. CHANNELS AND ANGLES - 300W
 - 3. HSS SECTIONS (CLASS "C") - 350W
 - 4. STRUCTURAL BARS AND PLATES - 300W
 - 5. ANCHOR BOLTS - TO CSA G40.21.7
3. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
4. ALL GROUT UNDER BEARING PLATES AND BASE PLATES SHALL BE NON-METALLIC, NON-SHRINK TYPE WITH 28 DAY COMPRESSIVE STRENGTH OF 50 MPa, INSTALLED IN ACCORDANCE WITH SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATION.
5. STEEL TO BE HOT-DIP GALVANIZED TO ASTM A123/A123M WITH COATING GRADE 100 (705 g/m²).
6. DESIGN CONNECTIONS AND OTHER WORK NOT DETAILED ON DRAWINGS, BUT NECESSARY FOR COMPLETION OF THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE 2020 AND CSA S16.
7. SUBMIT SHOP DRAWINGS AND PRODUCT DATA PRIOR TO COMMENCEMENT OF FABRICATION.
8. WELDING SHALL BE UNDERTAKEN ONLY BY A COMPANY APPROVED BY THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA W47.1, CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES.
9. IT IS THE RESPONSIBILITY OF THE STEEL SUPPLIER TO DESIGN AND SUPPLY CONNECTIONS BETWEEN STEEL MEMBERS TO RESIST THE LOADS GIVEN IN THE TABLE BELOW OR AS NOTED IN THE CONSTRUCTION DRAWINGS. CONNECTIONS ARE PINNED UNLESS NOTED OTHERWISE. WHERE LOADS ARE NOT GIVEN, DESIGN THE CONNECTION FOR 67% OF THE SHEAR CAPACITY OF THE MEMBER.
10. PROVIDE 10mm WEB STIFFENER AT ALL BEAM CONNECTIONS.

MASONRY

1. MASONRY BLOCK UNITS SHALL CONFORM TO CSA CAN3-A165, CLASSIFICATION H/15/C/M WITH A MINIMUM UNIT STRENGTH OF 15MPa, UNLESS NOTED OTHERWISE.
2. ALL MORTAR FOR MASONRY BLOCK SHALL CONFORM TO CSA A179 AND SHALL BE TYPE 'S' WITH A MINIMUM COMPRESSIVE STRENGTH OF 15MPa.
3. ALL LINTELS, BOND BEAMS, AND PILASTERS SHALL BE FILLED WITH CONCRETE HAVING A COMPRESSIVE STRENGTH OF 20MPa. CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 10 AND A MAXIMUM SLUMP OF 175. MECHANICALLY VIBRATE CORE FILL.
4. PROVIDE 1-15M VERTICAL AND CORE FILL AT EACH SIDE OF EVERY OPENING AND AT EACH CORNER.
5. CORE FILLS SHALL BE DONE IN MAXIMUM 1200 LIFTS AND SHALL BE RODDED AND VIBRATED TO AVOID HONEYCOMBING AND VOIDS.
6. PROVIDE CONCRETE FILLED AND REINFORCED BOND BEAMS AT TOP OF WALLS AND WHERE SHOWN ON DRAWINGS, UNLESS NOTED OTHERWISE. REINFORCE EACH BOND BEAM WITH 2-15M CONTINUOUS, WITH MATCHING CORNER BARS.
7. PROVIDE 2-COURSE LINTELS C/W 2-15M BARS OVER EVERY PENETRATION. EXTEND LINTEL MINIMUM 400 BEYOND EDGES OF OPENINGS, INCLUDING THOSE FOR MECHANICAL OR ELECTRICAL SERVICES AND EQUIPMENT.
8. EXTEND ALL LINTEL REINFORCEMENT AND CONCRETE 400 PAST EDGE OF OPENINGS BOTH SIDES, UNLESS NOTED OTHERWISE.
9. REINFORCEMENT TO EXTEND FULL HEIGHT OF WALL AND BE ANCHORED 200 INTO CONTINUOUS BOND BEAMS AT TOP OF WALL.
10. PROVIDE VERTICAL CONTROL JOINTS AT MAXIMUM 9m SPACING. BOND BEAM REINFORCING CONTINUES THROUGH CONTROL JOINT. CUT ALTERNATE WIRE JOINT REINFORCEMENT.
11. EXTEND ALL NON-LOAD BEARING MASONRY WALLS TO FORM A 25 GAP BETWEEN TOP OF WALL AND UNDERSIDE OF STRUCTURE ABOVE. FILL GAP WITH COMPRESSIBLE ACOUSTIC OR FIRE-STOP MATERIAL TO MAINTAIN WALL RATING.
12. PROVIDE SOLID BLOCK OR CONCRETE FILLED BLOCK UNDER ALL CONCENTRATED LOADS BEARING ON MASONRY.
13. PROVIDE CONCRETE FILLED CORES AT ALL LOCATIONS WHERE METAL FABRICATIONS OR OTHER EQUIPMENT UTILITIES, ETC., FASTEN TO BLOCK WALLS. PROVIDE TEMPORARY BRACING FOR ALL WALLS UNTIL MASONRY HAS BEEN ANCHORED TO PERMANENT STRUCTURE.
14. REFER TO SPECIFICATIONS FOR OTHER REQUIREMENTS.

DESIGN LOADS

1. UNIFORM LOADING (UNLESS NOTED OTHERWISE ON PLANS) PER THE NATIONAL BUILDING CODE OF CANADA 2020:

LOCATION	LIVE LOAD (kPa)	'S.D.L. (kPa)
ROOF:	REFER TO ENVIRONMENTAL LOADING NOTES	---
MAIN FLOOR:	16.8	---

'S.D.L.: SUPER IMPOSED DEAD LOAD
2. DEAD LOADS:
 - EXISTING DOUBLE T CONCRETE ROOF: 2kPa + SUSPENDED LOADS
 - ROOF SUSPENDED LOADS:
 - MECHANICAL / ELECTRICAL COLLATERAL LOADS: 0.25kPa
 - 200 CMU WALLS 2.10 kPa (SQUARE METER OF WALL)
3. CONCENTRATED LOADS (UNLESS NOTED OTHERWISE ON PLANS):
 - ROOF: --- (EXISTING)
 - FLOORS: 9.0kN
 - MAIN FLOOR:

LIVE LOAD (kPa)	DEAD (kPa)
14.0	200 CMU WALLS: 2.1 (SQ. M OR WALL)
 - EQUIPMENT: DESIGN VEHICLE CL625
4. ENVIRONMENTAL LOADS:
 - LOCATION: WINNIPEG, MANITOBA

IMPORTANCE CATEGORY: POST DISASTER

PONDING: BASED ON A 24 RAINFALL OF 108mm (1/50 YEAR RETURN PERIOD)

SNOW: 2.15kPa (MINIMUM UNFACTORED)
 Is = 1.25 ULS, 0.9 SLS
 Ss = 1.9kPa
 Sr = 0.2kPa
 INDICATED PER THE FOLLOWING:

WIND: BUILDING: LOW RISE TERRAIN: OPEN
 Iw = 1.25 ULS, 0.75 SLS
 q50 = 0.45kPa (1/50 YEAR RETURN PERIOD)
 Ce = 0.9 TO 1.0

SEISMIC: SITE CLASS: D

SITE LOCATION
 LATITUDE: 49.89
 LONGITUDE: -97.15

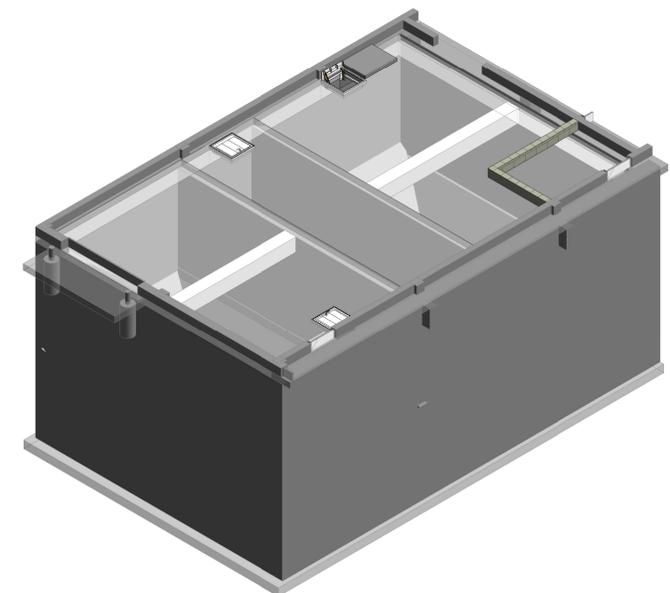
SEISMIC CATEGORY: SC1

le = 1.5
 Sg (0.2, XD) = 0.104
 Sg (0.5, XD) = 0.091
 Sg (1.0, XD) = 0.046
 Sg (2.0, XD) = 0.018
 Sg (5.0, XD) = 0.004
 Sg (10.0, XD) = 0.001

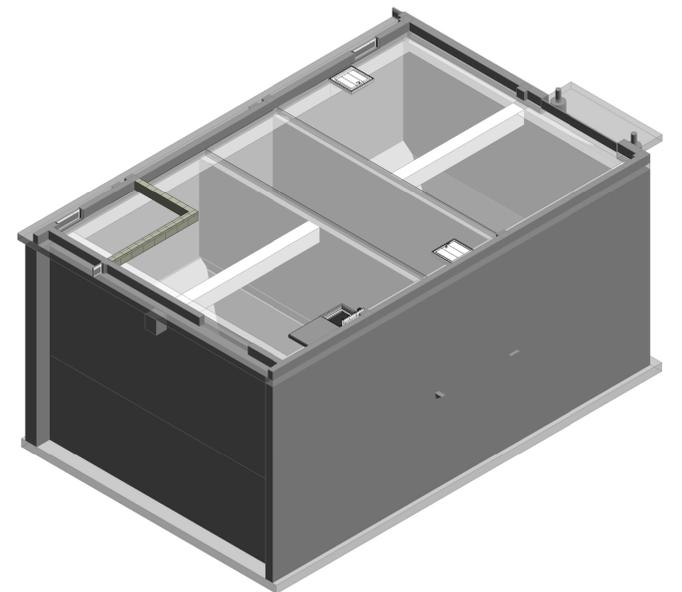
PGA (XD) = 0.062
 PGV (XD) = 0.047

CONCRETE SCHEDULE							
COMPONENT	TYPE	MINIMUM COMPRESSIVE STRENGTH (MPa)	EXPOSURE CLASS	MAXIMUM WATER TO CEMENT RATIO	AIR CONTENT	SLUMP RANGE (mm)	NOMINAL AGGREGATE SIZE (mm)
STRUCTURAL SLAB AND BEAMS (INTERIOR)	HS	35 @ 28 DAYS	A-1	0.4	< 4%	50-80	20-5
INTERIOR TANK WALLS	HS	35 @ 28 DAYS	A-1	0.4	< 4%	50-80	20-5
LEAN CONCRETE FOR MUD SLABS	GU	5 @ 28 DAYS	N	---	< 4%	50-110	SAND
MECHANICAL HOUSEKEEPING PADS AND INTERIOR TOPPING	GU	25 @ 28 DAYS	N	---	< 4%	MAX 150	10-5

NOTE:
 1. STRUCTURAL SLABS AND BEAMS TO BE CURED IN ACCORDANCE WITH CSA A23.1.
 2. CONCRETE TO BE MAINTAINED AT A TEMPERATURE BETWEEN 10°C AND 27°C WHILE CURING.
 3. CONCRETE SHOULD BE ALLOWED TO AIR DRY FOR A PERIOD OF AT LEAST ONE MONTH AFTER THE END OF THE CURING PERIOD BEFORE EXPOSURE TO DE-ICING CHEMICALS.



SOUTH EAST 3D VIEW
SCALE:



NORTH WEST 3D VIEW
SCALE:

M:\N-Draw\BA\00 City of Winnipeg\010 - WEMPPC SEMPCC Sludge Holding Tank Rehabilitation\AutoDesk\Revit\B400-10-00_South Bldg_Struct_V24.rvt

9		
8		
7		
6		
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4		
3		
2		
1		
NO.	DRAWING NUMBER	REFERENCE DRAWINGS TITLE



01	REVISED FOR CONSTRUCTION, TENDER NUMBER: 7-2026	26-02-17	BMA	MJB
00	ISSUED FOR CONSTRUCTION, TENDER NUMBER: 7-2026	26-01-13	BMA	MJB
NO.	REVISIONS	DATE	DESIGN	CHECK

MPE
a division of Englobe

DESIGNED BY: B. ANDERSON	CHECKED BY: M. BAKER
DRAWN BY: C. HURD	APPROVED BY: M. BAKER
SCALE: NOT TO SCALE	RELEASED FOR CONSTRUCTION By:
DATE: 2026-02-10	DATE:
CONSULTANT NO.: 8400-010-00	

ENGINEER'S SEAL

2026-02-17
REV 01

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

SOUTH END SEWAGE TREATMENT PLANT (SEWPPC)
SEWPPC SLUDGE HOLDING TANKS REFURBISHMENT
AREA D - FERMENTERS/SLUDGE THICKENERS
STRUCTURAL
GENERAL NOTES

CITY DRAWING NUMBER 1-0102-SAAA-001	SHEET 01	REV. 01	SIZE A1
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