A. GENERAL NOTES

1. THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH, AND SHALL BE CONSTRUCTED IN COMPLIANCE WITH, THE NATIONAL BUILDING CODE OF CANADA 2010, THE MANITOBA BUILDING CODE 2011, AND ALL APPLICABLE LOCAL BYLAWS.
2. DESIGN LOADS ARE INDICATED ON THE DRAWINGS.
3. DESIGN LIVE LOADS SHALL NOT BE EXCEEDED AT ANY TIME DURING CONSTRUCTION.
4. DO NOT SCALE DRAWINGS.
5. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED PRIOR TO COMMENCING CONSTRUCTION.
6. VERIFY ALL DIMENSIONS, ELEVATIONS, SLOPES, DETAILS, CONDITIONS, ETC., SHOWN ON THE STRUCTURAL DRAWINGS; WITH THE OTHER DISCIPLINE DRAWINGS AND WITH SITE CONDITIONS, PRIOR TO CONSTRUCTION OR PREFABRICATION OF ANY BUILDING COMPONENT.
7. MODIFICATIONS, ALTERNATIONS OR SUBSTITUTIONS MUST BE AUTHORIZED IN WRITING BY THE CONTRACT ADMINISTRATOR.
8. DESIGN AND INSTALL ALL NECESSARY SHORING, BRACING AND FORM WORK. FORM WORK FOR CONSTRUCTION SHALL BE BRIDGED OVER EXISTING SERVICES. PROCEDURE MUST BE APPROVED BY THE CONTRACT ADMINISTRATOR.
9. FOR OPENINGS IN SLAB, FLOOR, WALLS, ROOF, ETC. REFER TO MECHANICAL, PROCESS AND ELECTRICAL DRAWINGS.
10. REVIEW LOCATION OF INTENDED CONSTRUCTION JOINTS WITH CONTRACT ADMINISTRATOR PRIOR TO PROCEEDING.
11. CONSTRUCTION SAFETY REQUIREMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
12. DEFECTIVE OR UNACCEPTABLE WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR AT NO ADDITIONAL COST TO THE PROJECT.
13. WHERE THERE IS A DISCREPANCY BETWEEN PROJECT SPECIFICATIONS AND GENERAL NOTES, INFORMATION SHOWN IN SPECIFICATIONS SHALL GOVERN.

B. DESIGN LOAD PARAMETERES

1. ENVIRONMENTAL LOAD INFORMATION
   Ss = 1.9 kPa
   Sr = 0.2 kPa
   Iw = Is = 1.0 kPa
   HOURLY WIND PRESSURE (1/50) = 0.45 kPa

2. MAIN FLOOR LOADS / GALLERY No.5
   Dead Load: = 4.8 kPa
   SELF WEIGHT OF EXISTING CONC. SLABS & BEAMS
   SELF WEIGHT OF NEW STEEL BEAMS
   Live Load: = 9.6 kPa

3. ROOF LOADS
   Dead Load: = 5.37 kPa
   SELF WEIGHT OF EXISTING CONC. SLABS & BEAMS
   SELF WEIGHT OF NEW CONC SLAB
   Superimposed Dead Load: = 1.2 kPa
   Live Load = 4.8 kPa
   Snow Load = 1.72 kPa

C. CAST-IN-PLACE-CONCRETE

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH CAN/CSA-A23.1-09 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION / METHODS OF TEST AND STANDARD PRACTICES FOR CONCRETE.
2. SUPPLEMENTARY CEMENTITIOUS MATERIALS TO CAN/CSA-A3000-08 CEMENTITIOUS MATERIALS COMPENDIUM.
3. CHEMICAL ADMIXTURES TO ASTM C494/C494M-12 AND ASTM C1017/C1017M-07.
4. GENERAL CONTRACTOR TO PROVIDE PROPRIETARY MIX DESIGN PERFORMANCE RECORD AS REQUIRED BY THE MANITOBA READY-MIX ASSOCIATION.
5. CONCRETE SPECIFICATIONS:
   SEE TABLE C.1
6. CONSTRUCT FORM WORK, SHORING AND BRACING TO MEET DESIGN, CODE AND CAN3-A23.1-09 REQUIREMENTS. CONSTRUCT ACCURATELY, SO THAT RESULTANT FINISHED CONCRETE CONFORMS TO SHAPES, LINES AND DIMENSIONS INDICATED ON THE DRAWINGS.
7. VIBRATE ALL CONCRETE WORK WITH APPROPRIATE INTERNAL VIBRATORS.
8. CONCRETE WORKING TIME, FROM BATCHING TO PLACEMENT AND CONSOLIDATION, SHALL NOT EXCEED 1-1/2 HOURS.
9. CONCRETE CONTRACTOR SHALL PLACE ALL COMPONENTS TO BE EMBEDDED IN THE CONCRETE (ie. WELD PLATES, DOWELS FOR CONCRETE AND/OR MASONRY, ANCHOR BOLTS, INSERTS, WATER STOP BARS, SLEEVING, PIPE SLEEVES, PIPE EXTENSIONS, ETC.) SEE STRUCTURAL, MECHANICAL AND ANY OTHER PERTINENT DRAWINGS.
10. CLEAR CONCRETE COVER TO REINFORCING STEEL SHALL BE AS FOLLOWS U.N.O.:
    SEE TABLE C.2
11. WHERE NO EMBEDMENT OR EMBEDMENT TYPE IS INDICATED ON THESE DRAWINGS IT SHALL BE A TENSION EMBEDMENT EXCEPT FOR COLUMNS WHICH SHALL BE A COMPRESSION EMBEDMENT.
    SEE TABLE C.3
12. WHERE NO SPLICE OR SPLICE TYPE IS INDICATED ON THESE DRAWINGS IT SHALL BE A TENSION SPLICE EXCEPT FOR COLUMNS WHICH SHALL BE A COMPRESSION SPLICE (UNLESS DETAILED OTHERWISE):
    SEE TABLE C.4
13. SEE DRAWINGS FOR SURFACE FINISHES, EDGE TREATMENTS, ETC.
14. UNDER IDEAL WEATHER CONDITIONS, ALLOW MINIMUM CURING TIME AS SCHEDULED BELOW BEFORE REMOVING FORM WORK:
    • SLABS 7 DAYS
19. ALL HOLES CORED THROUGH REINFORCED CONCRETE TO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER.
20. CONSTRUCT FORM WORK, SHORING AND BRACING TO MEET DESIGN, CODE AND CAN3-A23.1-09 REQUIREMENTS.
21. CONSTRUCTION JOINTS, CONCRETE PLACEMENT SCHEDULING AND WORK PROCEDURES SHALL BE DISCUSSED WITH THE CONTRACT ADMINISTRATOR PRIOR TO COMMENCING CONSTRUCTION.
24. FOR COLD WEATHER CONCRETE WORK, ALL ICE, SNOW AND FROST SHALL BE REMOVED FROM FORM WORK AND THE TEMPERATURE OF ALL CONTACT SURFACES SHALL BE RAISED ABOVE 10C FOR 24 HOURS PRIOR TO PLACING CONCRETE. CONCRETE SHALL BE NOT LESS THAN 20 DEGREES CELSIUS NOR MORE THAN 30 DEGREES CELSIUS WHEN DEPOSITED. CONCRETE SHALL BE ENCLOSED AND THIS AREA SHALL HAVE A TEMPERATURE OF NOT LESS THAN 20 DEGREES CELSIUS FOR THREE (3) DAYS AND NOT LESS THAN 5C FOR AN ADDITIONAL FOUR (4) DAYS.
23. NOTIFY THE C.A. AT LEAST 48 HOURS PRIOR TO ALL CONCRETE PLACEMENT TO ALLOW FOR SITE INSPECTIONS.
24. CONCRETE TESTING SHALL BE PERFORMED BY AN INDEPENDENT CSA APPROVED TESTING COMPANY. THREE (3) CONCRETE TEST CYLINDERS AND ONE (1) SLUMP TEST SHALL BE TAKEN FOR EVERY 50 (OR LESS) CUBIC METERS, OR EACH DAY CONCRETE IS PLACED, WHICHEVER IS GREATER. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH CAN3-A23.2-09. THE RESULTS SHALL BE FORWARDED TO THE CONTRACT ADMINISTRATOR.

D. REINFORCING STEEL

1. REINFORCING STEEL SHALL BE NEW BILLET, DEFORMED BARS WITH A MINIMUM SPECIFIED YIELD STRENGTH OF 400MPa OR EQUAL IN ACCORDANCE WITH CAN G30.18-09.
2. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST A.C.I. & R.S.I.C. DETAILING MANUALS.
3. LAP TOP BARS AT CENTER 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.
5. SUBMIT SHOP DRAWINGS WHICH CLEARLY INDICATE BAR SIZES, GRADE, SPACING, HOOKS, BENDS AND SUPPORTING/SPACE DEVICES, ETC. FOR REVIEW TO THE CONTRACT ADMINISTRATOR PRIOR TO FABRICATION OF THE REINFORCING STEEL.
6. PRIOR TO PLACING CONCRETE, ENSURE THAT ALL REINFORCING STEEL IS CLEAN, FREE OF LOOSE SCALE, RUST, MUD, OIL OR OTHER FOREIGN MATERIAL, WHICH WOULD REDUCE BOND.
7. HEATING, QUENCHING AND BENDING OF REINFORCING STEEL ON THE SITE IS NOT ALLOWED.

E. STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO CSA STANDARD G40.21-04
2. WIDE FLANGE SECTIONS TO BE G40.21-04 350MPa.
3. ALL ROLLED OR WELDED STRUCTURAL SECTIONS AND PLATES TO BE G40.21-04 300MPa GRADE STEEL.
4. FABRICATION AND ERECTION SHALL CONFORM TO CSA STANDARD S16-09.
5. 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.
6. STRUCTURAL STEEL SUPPLIER SHALL SUBMIT SHOP DWGS, SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA SHOWING ALL DESIGN AND FABRICATION DETAILS OF CONNECTIONS TO THE CONTRACT ADMINISTRATOR FOR REVIEW PRIOR TO START OF FABRICATION.
7. SUPPLY ALL COMPONENTS WITH ONE (1) COAT OF SHOP PRIMER CONFORMING TO C.I.S.C./C.P.M.A. 1-73A OR EQUIVALENT UNLESS NOTED OTHERWISE.
8. GALVANIZING AS INDICATED SHALL BE HOT DIPPED GALVANIZED TO CSA G164-M92 (R2003).
9. PROVIDE MIN 6.4mm WELD U.N.O.
10. DESIGN STEEL SECTIONS, PLATES & CONNECTIONS FOR MIN 50% OF SHEAR CAPACITY.

TABLE C.1

READ IN CONJUNCTION WITH DESIGN NOTES SECTION C. CAST-IN-PLACE CONCRETE

CONTROLLED CONCRETE

CONCRETE LOCATION	MAX. AGG. SIZE	28 DAY STRENGTH	EXPOSURE CLASS	AIR CONTENT	CEMENT TYPE
ROOF SLABS	20 mm	35 MPa	C-1	-	GU
REPAIR MORTAR	14 mm	35 MPa	C-1	-	GU
SHOTCRETE	4.75 m	40 MPa			SILICA FUME

TABLE C.2

READ IN CONJUNCTION WITH DESIGN NOTES SECTION C. CAST-IN-PLACE CONCRETE

CONCRETE COVER TO REINFORCEMENT

STRUCTURAL SLABS - TOP	25 mm
STRUCTURAL SLABS - BOTTOM	25 mm
COLUMNS	50 mm

TABLE C.3

READ IN CONJUNCTION WITH DESIGN NOTES SECTION C. CAST-IN-PLACE CONCRETE

EMBEDMENT OF DOWELS

BAR DESIGNATION	REINFORCEMENT GRADE (MPa)	COMPRESSION EMBEDMENT (BASED ON CONCRETE STRENGTH MPa)			REGULAR TENSION EMBEDMENT (BASED ON CONCRETE STRENGTH MPa) (SEE NOTE 1)				
		20 MPa	25 MPa	30 MPa AND OVER	20 MPa	25 MPa	30 MPa	35 MPa	40 MPa
10M	400	250	225	200	325	300	300	300	300
15M	400	350	300	275	490	440	400	380	380
20M	400	430	385	350	650	580	530	490	450
25M	400	540	480	440	1010	900	825	760	710
30M	400	645	580	530	1210	1080	990	910	840
35M	400	760	680	620	1690	1520	1400	1270	1200

NOTE 1: TOP EMBEDMENT VALUES ARE 1.3 TIMES REGULAR EMBEDMENT VALUES. TOP EMBEDMENT APPLIES TO HORIZONTAL REINFORCEMENT CAST WITHIN 300 mm OR MORE OF CONCRETE BELOW THE BAR.

NOTE 2: FOR EPOXY REINFORCEMENT INCREASE THESE LENGTHS BY 1.5. INCREASE THESE LENGTHS BY 1.7 FOR EPOXY COATED TOP REINFORCEMENT.

TABLE C.4

READ IN CONJUNCTION WITH DESIGN NOTES SECTION C. CAST-IN-PLACE CONCRETE

REINFORCEMENT SPLICES (UNLESS NOTED OTHERWISE)

BAR DESIGNATION	REINFORCEMENT GRADE (MPa)	COMPRESSION SPLICE	REGULAR TENSION SPLICE (CLASS B) (BASED ON CONCRETE STRENGTH MPa) (SEE NOTE 1)				
			20 MPa	25 MPa	30 MPa	35 MPa	40 MPa
10M	400	330	490	430	400	390	390
15M	400	470	690	610	570	520	480
20M	400	570	840	740	690	640	590
25M	400	740	1350	1180	1090	1020	950
30M	400	880	1600	1400	1290	1210	1130
35M	400	1050	1910	1680	1540	1440	1350

NOTE 1: TOP BAR TENSION SPLICES ARE 1.3 TIMES REGULAR SPLICES. TOP SPLICE LENGTHS APPLY TO HORIZONTAL REINFORCEMENT CAST WITHIN 300mm OR MORE OF CONCRETE BELOW THE BAR.

NOTE 2: FOR EPOXY REINFORCEMENT INCREASE THESE LENGTHS BY 1.5. INCREASE THESE LENGTHS BY 1.7 FOR EPOXY COATED TOP REINFORCEMENT.

STRUCTURAL ABBREVIATION SCHEDULE

1E	1 END	O/C OR o/c	ON CENTRE
1S	1 SIDE	O/O	OUT TO OUT
AB	ANCHOR BOLTS	OF OR O/F	OUTSIDE FACE
B OR BOT	BOTTOM	Pf	POINT LOAD (FACTORED)
BLL	BOTTOM LOWER LAYER	PL	PLATE
BUL	BOTTOM UPPER LAYER	Ps	POINT LOAD (SERVICE)
C/W OR c/w	COMPLETE WITH	REINF	REINFORCMENT BARS
CANT	CANTILEVER	REQ'D	REQUIRED
CONT	CONTINUOUS	S/S	STAINLESS STEEL
Cf	COMPRESSION (FACTORED)	SCHD	SCHEDULE
CL	CENTRE LINE	SHT NOTES	SHEET NOTES
Cs	COMPRESSION (SERVICE)	STD HKS OR HKS	STANDARD HOOKS
DWG	DRAWINGS	STIR	STIRRUPS
DWL	DOWEL	T OR TOP	TOP
EE	EACH END	T&B	TOP AND BOTTOM
EF	EACH FACE	T/O	TOP OF
EL OR ELEV	ELEVATION	Tf	TENSION (FACTORED)
ES	EACH SIDE	TJ	STRUT JOIST
EW	EACH WAY	TJ 1E	STRUT JOIST ONE END
HC	HOLLOW CORE	TLL	TOP LOWER LAYER
HD GALV	HOT DIPPED GALVANIZED	TOC	TOP OF CONCRETE
HI	HIGH	TOS	TOP OF STEEL
H OR HORIZ	HORIZONTAL	Ts	TENSION (SERVICE)
H IF	HORIZONTAL INSIDE FACE	TUL	TOP UPPER LAYER
H OF	HORIZONTAL OUTSIDE FACE	TYP	TYPICAL
IC	IN CENTER	U/N	UNLESS NOTED
IF OR I/F	INSIDE FACE	U/S	UNDERSIDE
LLH	LONG LEG HORIZONTAL	UNO	UNLESS NOTED OTHERWISE
LLV	LONG LEG VERTICAL	V IF	VERTICAL INSIDE FACE
LO	LOW	V OF	VERTICAL OUTSIDE FACE
Mf	MOMENT (FACTORED)	V EF	VERTICAL EACH FACE
Ms	MOMENT (SERVICE)	V OR VERTS	VERTICAL
NSA	NELSON STUD ANCHORS	Vf	SHEAR (FACTORED)
		Vs	SHEAR (SERVICE)

APEGM
Certificate of Authorization
Stantec Consulting Ltd.
No. 1301

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE — DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M.
ELEV.

NO.	REVISIONS	DATE	BY
3	ISSUED FOR TENDER	12.11.01	S.K.B
2	ISSUED FOR 95% REVIEW	12.09.12	S.K.B
1	ISSUED FOR 60% REVIEW	12.07.27	S.K.B

Stantec
Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 Fax 204-453-9012

DESIGNED BY	B.F.	CHECKED BY	BF
DRAWN BY	I.R.	APPROVED BY	S.K.B.
HOR. SCALE: VERTICAL:	N/A	RELEASED FOR CONSTRUCTION:	
DATE	2011.12.15	DATE	

ENGINEER'S SEAL

ORIGINAL SEALED BY B.E. FRASER P. ENG. 12.11.01

BID OPPORTUNITY NO. 573-2012

Winnipeg

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

NORTH END WATER POLLUTION CONTROL CENTRE
REHABILITATION OF DIGESTER No. II AND SLUDGE HOLDING TANK No. 5 AND 7

GENERAL NOTES & SCHEDULES

CITY DRAWING NUMBER: I-0101D-S0001-001

SHEET 3 OF 29