GENERAL NOTES AND SPECIFICATIONS

1. GENERAL NOTES
   - 1.1. WORK SHALL CONFORM TO THE CURRENT EDITION OF THE FOLLOWING CODES AND STANDARDS:
     - 1.1.1. CAN/CSA-A23.4 PRECAST CONCRETE MATERIALS AND CONSTRUCTION
     - 1.1.2. CAN/CSA-A23.3 DESIGN OF CONCRETE STRUCTURES
     - 1.1.3. CAN/CSA-G30.18 CARBON STEEL BARS FOR CONCRETE REINFORCEMENT
     - 1.1.4. CAN/CSA-S6 CANADIAN HIGHWAY BRIDGE DESIGN CODE
     - 1.1.5. CAN/CSA-A257 STANDARDS FOR CONCRETE PIPE AND MANHOLE SECTIONS
     - 1.1.6. ASTM C478 STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
   - 1.2. CITY OF SASKATOON TAKES RESPONSIBILITY FOR GENERAL ARRANGEMENT, SIZING, AND REINFORCING STEEL AS SHOWN.
   - 1.3. AS PER REQUIREMENTS OF CAN/CSA-A23.4 PRECAST MANUFACTURER TO SUBMIT SEALED SHOP DRAWINGS FOR ALL ELEMENTS NOT DETAILED IN THIS STANDARD.
   - 1.4. DEVIATION FROM THE DESIGN SHOWN IS PERMITTED ONLY BY APPROVAL OF THE ENGINEER AND WITH SUBMISSION OF SITE SPECIFIC SHOP DRAWING SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF SASKATCHEWAN.
   - 1.5. SEE DRAWING 102-0011-029 FOR FOR SECTIONS AND DETAILS.
   - 1.6. SEE DRAWING 102-0011-030 FOR CAST-IN-PLACE CONSTRUCTION.
2. CONSTRUCT PRECAST MANHOLE ACCORDING TO THE GEOMETRY AND REINFORCING PROVIDED. CONFIRM INLET/OUTLET QUANTITIES AND ORIENTATION. CONFIRM CONCRETE PIPE OUTSIDE DIAMETERS WITH PIPE SUPPLIER/CONTRACTOR PRIOR TO FABRICATION. DESIGN OF MANHOLE CHAMBER TO BE GOVERNED BY LARGEST PIPE ENTERING/EXITING THE CHAMBER AND DEPTH OF CHAMBER FROM FINAL GRADE TO TOP OF SLAB. CORNER GEOMETRY OTHER THAN 90° PERMITTED PROVIDED ELEMENT THICKNESS TO SPAN RATIO SHOWN IN TABLES IS NOT EXCEEDED.
3. CONCRETE MATERIAL
   - 3.1 REQUIREMENTS FOR CONCRETE MATERIAL
     - 3.1.1. CLASS OF EXPOSURE: A-1, S-2
     - 3.1.2. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 35MPa
     - 3.1.3. MAXIMUM WATER-CEMENT RATIO: 0.40
     - 3.1.4. AIR CONTENT: 5%-8%
     - 3.1.5. CEMENT TYPE: HS/HSb
   - 3.2. CONCRETE COVER TO OUTSIDE LAYER OF REINFORCING STEEL TO BE 50mm AT ALL LOCATIONS UNLESS NOTED OTHERWISE.
4. REINFORCING STEEL
   - 4.1.1. BARS TO BE BILLET STEEL, DEFORMED TO GRADE 400, PLAIN FINISH.
   - 4.1.2. PROVIDE LAP LENGTHS ON CORNER BARS AS FOLLOWS:
     - 10M = 450mm
     - 15M = 750mm
     - 20M = 900mm
     - 25M = 1300mm
     - 30M = 1600mm
     - 35M = 1900mm

     TRIM AT PIPE OPENINGS AS REQUIRED.
5. FOUNDATION
   - 5.1. EXCAVATE IN-SITU MATERIAL TO UNDERSIDE OF BOTTOM SLAB ELEVATION.
   - 5.2. ENSURE SURFACE IS VIRGIN, UNDISTURBED MATERIAL. OVER EXCAVATE IF REQUIRED.
   - 5.3. EXCAVATE DEPTH EQUAL TO BOTTOM SLAB THICKNESS TO MAXIMUM OF 600mm.
   - 5.4. BOULDERS AND COBBLES NOT PERMITTED TO PROTRUDE IN DEPTH OF GRANULAR BASE.
   - 5.5. SUBGRADE MATERIAL TO BE REVIEWED AND DEEMED ACCEPTABLE BY A PROFESSIONAL GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF GRANULAR BASE.
   - 5.6. GRANULAR MATERIAL TO CONFORM TO C.O.S. SPECIFICATION 03001 ITEM 3.2.7.
   - 5.7. DO NOT PLACE GRANULAR MATERIAL ON DESICCATED, FROZEN, OR WET SUBGRADE.
   - 5.8. PLACE GRANULAR MATERIAL IN 150mm LIFTS COMPACTED TO 98% STANDARD PROCTOR DENSITY.
6. MISCELLANEOUS REQUIREMENTS
   - 6.1. CONTRACTOR TO SUPPLY AND PLACE CHAMBER, MANHOLE BARRELS AND CONE, LADDER RUNGS, WALL PIPE RAIL, FRAME AND LOCKING COVER. SEE CITY OF SASKATOON STANDARDS FOR MORE INFORMATION.

NOTE:

THESE NOTES AND SCHEDULES TO BE USED IN CONJUNCTION WITH DRAWINGS 102-0011-029 – SECTIONS & DETAILS 102-0011-030 – CAST-IN-PLACE DETAILS

MAINTENANCE HOLE CHAMBERS LESS THAN 6 METERS DEEP

NOTE: CONCRETE THICKNESS AND REINFORCING GOVERNED BY LARGEST PIPE ENTERING THE CHAMBER

MANHOLE TYPE	BOTTOM SLAB			ALL WALLS							TOP SLAB		
	THICKNESS T1	HORIZONTAL		THICKNESS T2	HORIZ. & VERT.					CORNERS		THICKNESS T3	HORIZONTAL	
		"A" BARS UPPER FACE	"B" BARS LOWER FACE		"C" BARS OUTSIDE	"D" BARS INSIDE	"E" BARS EACH FACE	HEIGHT "H"	STIRRUPS "H"	"G" BARS VERTICAL	"G" BARS TIES		"F" BARS UPPER FACE	"G" BARS LOWER FACE
1050-1350	300	15M @ 200	10M @ 200	300	10M @ 150	10M @ 250	3-15M	450	10M @ 250	5-20M	A-10M @ 300	250	10M @ 250	20M @ 200
1500	300	15M @ 150	10M @ 150	300	15M @ 250	10M @ 250	4-15M	600	10M @ 250	5-20M	A-10M @ 300	275	10M @ 250	20M @ 200
1800	300	20M @ 175	15M @ 175	300	15M @ 225	10M @ 225	4-15M	800	10M @ 250	5-20M	A-10M @ 300	300	10M @ 250	20M @ 175
2100	325	20M @ 150	15M @ 150	300	15M @ 150	10M @ 150	5-15M	800	10M @ 250	7-20M	B-10M @ 300	300	10M @ 250	25M @ 200
2400	350	25M @ 225	20M @ 225	325	20M @ 225	15M @ 225	4-20M	800	10M @ 250	7-20M	B-10M @ 300	325	10M @ 250	25M @ 175
3000	400	25M @ 175	20M @ 175	375	20M @ 150	15M @ 150	5-20M	800	10M @ 200	7-20M	B-10M @ 300	375	10M @ 250	25M @ 150

MAINTENANCE HOLE CHAMBERS LESS THAN 12 METERS DEEP

NOTE: CONCRETE THICKNESS AND REINFORCING GOVERNED BY LARGEST PIPE ENTERING THE CHAMBER

MANHOLE TYPE	BOTTOM SLAB			ALL WALLS							TOP SLAB		
	THICKNESS T1	HORIZONTAL		THICKNESS T2	HORIZ. & VERT.					CORNERS		THICKNESS T3	HORIZONTAL	
		"A" BARS UPPER FACE	"B" BARS LOWER FACE		"C" BARS OUTSIDE	"D" BARS INSIDE	"E" BARS EACH FACE	HEIGHT "H"	STIRRUPS "H"	"G" BARS VERTICAL	"G" BARS TIES		"F" BARS UPPER FACE	"G" BARS LOWER FACE
1050-1350	400	25M @ 200	15M @ 200	350	15M @ 250	10M @ 250	4-15M	600	10M @ 250	7-20M	B-10M @ 300	350	10M @ 250	20M @ 150
1500	400	30M @ 250	20M @ 250	350	15M @ 200	10M @ 200	3-20M	600	10M @ 250	7-20M	B-10M @ 300	350	10M @ 250	25M @ 200
1800	400	30M @ 200	20M @ 200	350	20M @ 225	15M @ 225	5-20M	800	10M @ 250	7-20M	B-10M @ 300	400	10M @ 250	25M @ 200
2100	450	30M @ 200	20M @ 200	400	20M @ 200	15M @ 200	5-20M	800	10M @ 250	7-20M	B-10M @ 300	450	10M @ 250	30M @ 225
2400	500	30M @ 175	20M @ 175	450	20M @ 175	15M @ 175	5-20M	800	10M @ 200	7-25M	B-10M @ 400	450	10M @ 250	30M @ 200
3000	600	35M @ 200	25M @ 200	550	25M @ 225	20M @ 225	4-25M	1000	10M @ 150	10-25M	C-10M @ 400	550	10M @ 250	30M @ 175

MAINTENANCE HOLE CHAMBERS LESS THAN 20 METERS DEEP

NOTE: CONCRETE THICKNESS AND REINFORCING GOVERNED BY LARGEST PIPE ENTERING THE CHAMBER

MANHOLE TYPE	BOTTOM SLAB			ALL WALLS							TOP SLAB		
	THICKNESS T1	HORIZONTAL		THICKNESS T2	HORIZ. & VERT.					CORNERS		THICKNESS T3	HORIZONTAL	
		"A" BARS UPPER FACE	"B" BARS LOWER FACE		"C" BARS OUTSIDE	"D" BARS INSIDE	"E" BARS EACH FACE	HEIGHT "H"	STIRRUPS "H"	"G" BARS VERTICAL	"G" BARS TIES		"F" BARS UPPER FACE	"G" BARS LOWER FACE
1050-1350	500	30M @ 225	20M @ 225	400	20M @ 250	15M @ 250	4-20M	600	10M @ 250	7-20M	B-10M @ 300	400	10M @ 250	25M @ 175
1500	550	30M @ 225	20M @ 225	450	20M @ 250	15M @ 250	3-25M	600	10M @ 250	7-20M	B-10M @ 300	450	10M @ 250	30M @ 225
1800	600	30M @ 200	20M @ 200	500	20M @ 225	15M @ 225	3-25M	800	10M @ 250	7-25M	B-10M @ 400	500	10M @ 250	30M @ 200
2100	700	30M @ 175	20M @ 175	550	20M @ 175	15M @ 175	3-25M	800	10M @ 150	10-25M	C-10M @ 400	550	10M @ 250	35M @ 225
2400	750	35M @ 225	25M @ 225	650	25M @ 250	20M @ 250	4-25M	1000	10M @ 150	10-25M	C-10M @ 400	650	10M @ 250	35M @ 200
3000	900	35M @ 150	25M @ 175	750	30M @ 250	25M @ 250	4-30M	1000	10M @ 100	10-25M	C-10M @ 400	750	10M @ 250	35M @ 200

ALL DIMENSIONS IN mm (MILLIMETRES) UNLESS NOTED OTHERWISE

	PLAN DESCRIPTION/REVISION	DATE	BY
11			
10			
9			
8			
7			
6			
5			
4			
3			
2	REVISED AIR CONTENT FROM 4%-7% TO 5%-8%	2017-JAN-25	HLO
1	DESIGN PROVIDED BY WSP - 203 WELLMAN CRES. - SASKATOON	2014-JUN-23	J.W.C.

SEAL

A TRUE COPY OF SEALED ENGINEERED DRAWING ON RECORD AT SASKATOON WATER

SCALES : HOR. NTS VERT. NTS

DRAWN BY J.W.C. AT WSP (GENIVAR)

DATE 2014-APR-2

City of Saskatoon
Transportation & Utilities Department

STD. M.H. TYPES FOR LARGE SEWERS
NOTES AND SCHEDULES

FOR SEWERS LESS THAN 20 METERS DEEP

CHIEF ENGINEER JAN 30/17 DATE

ENGINEER JAN 30, 2017 DATE

SHEET NO.

PLAN NO. 102-0011-028r002