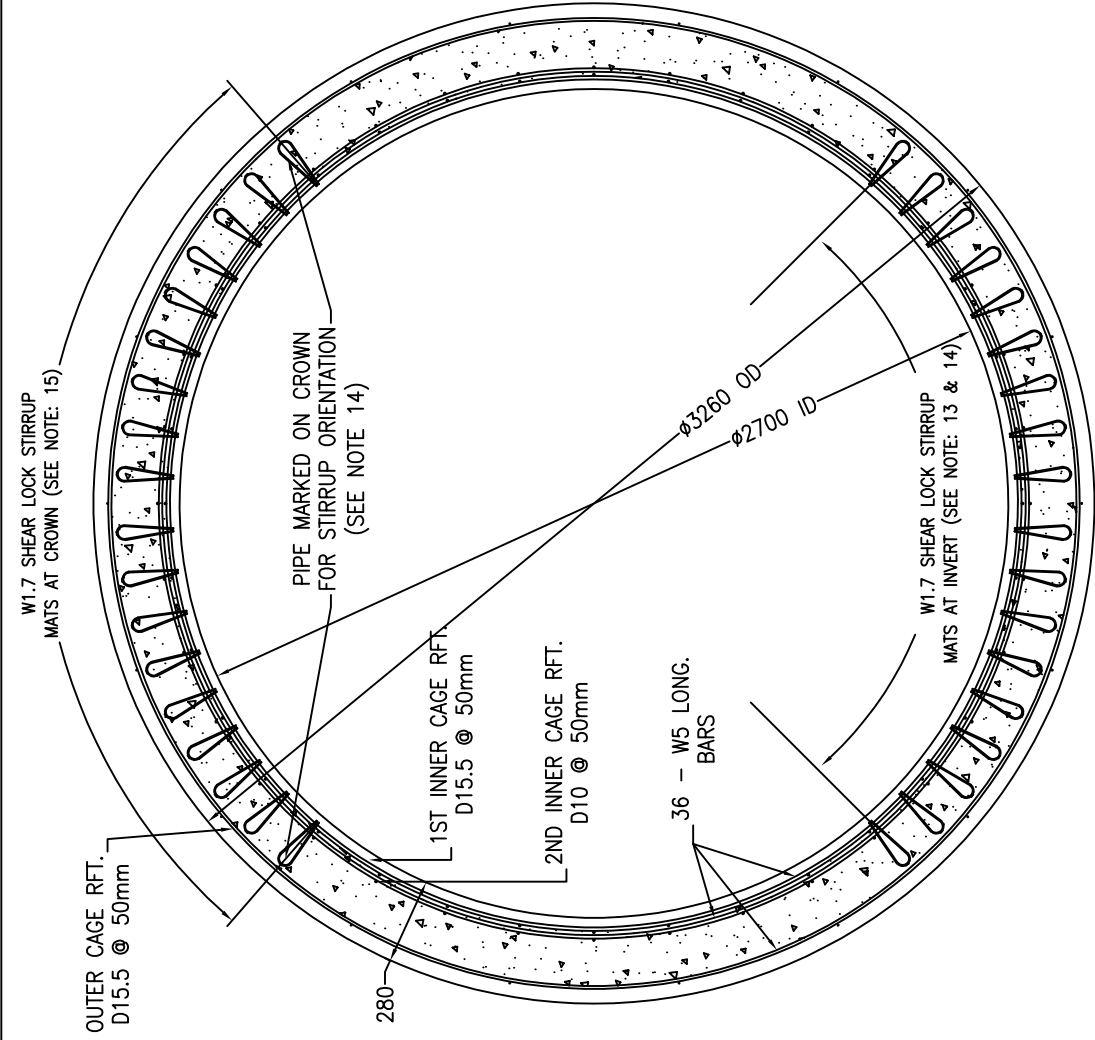
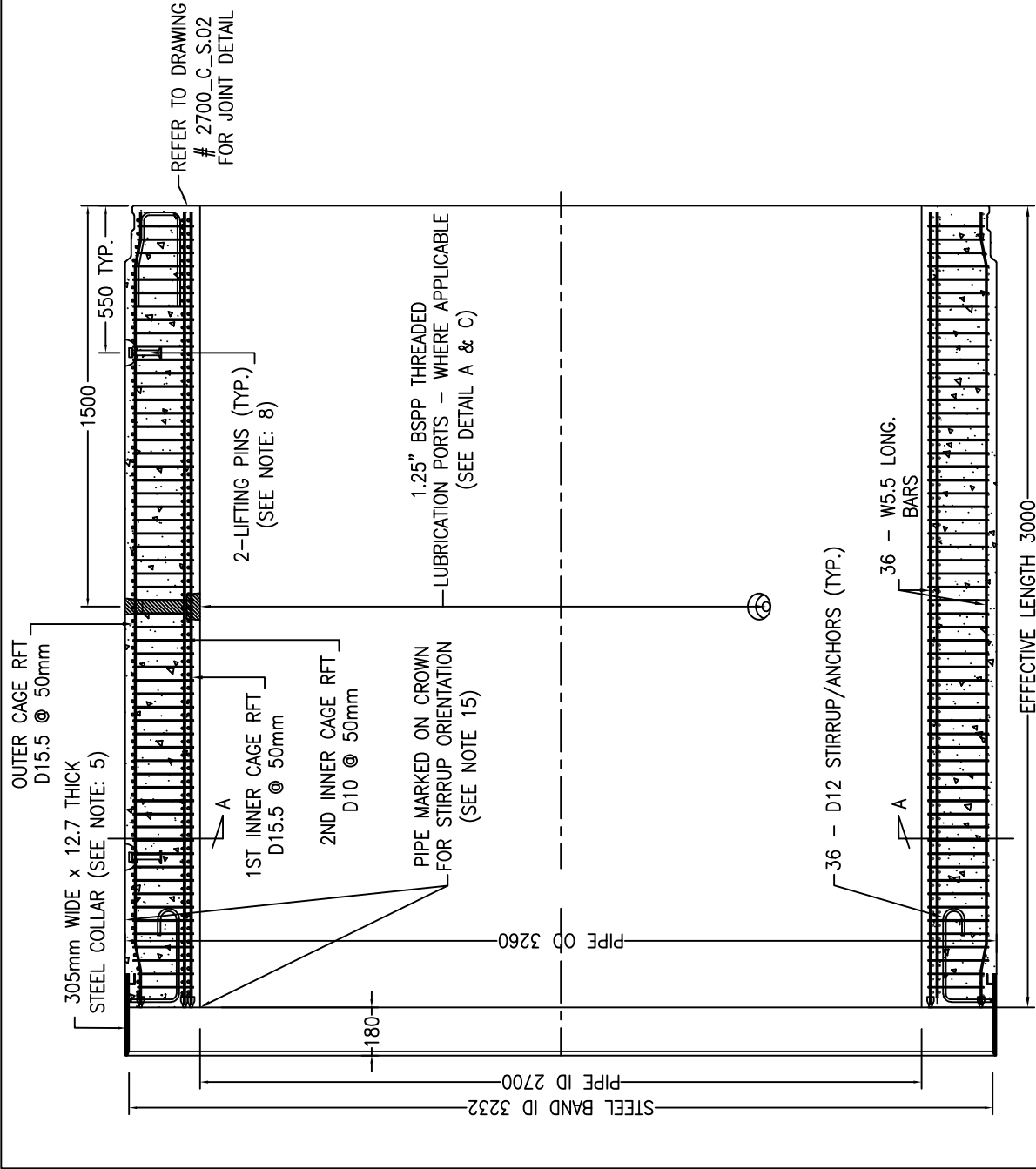
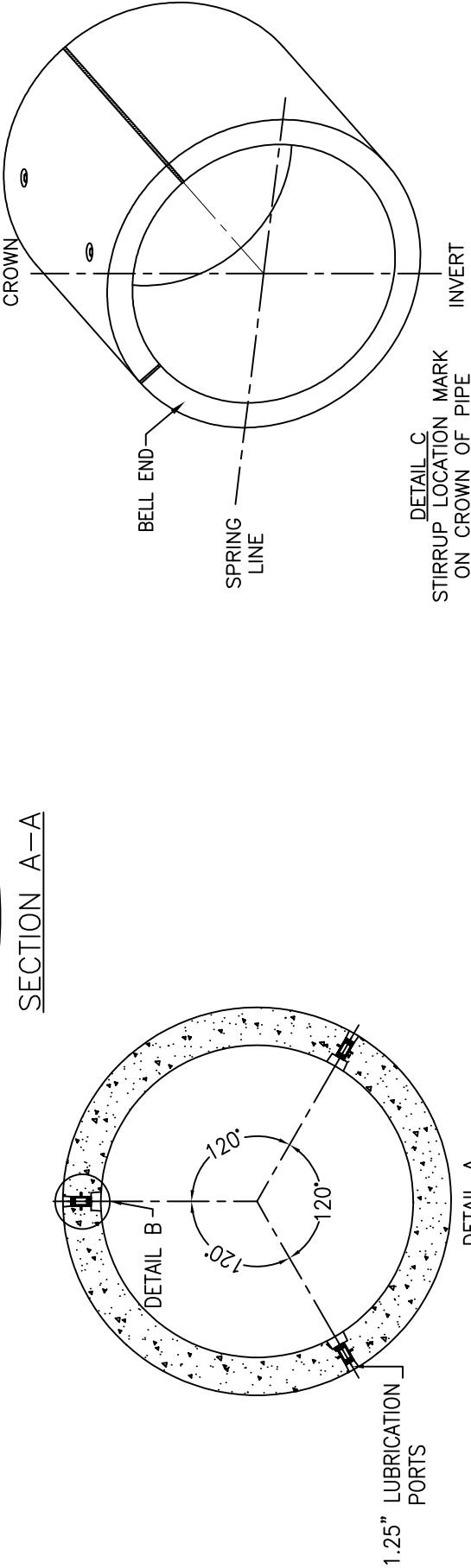


QTY	MARK #	DESCRIPTION:
125	MT2700X300CS	2700 ID x 3260 OD x 3000 LG CLASS V MT STD PIPE
45	MT2700X300CP	2700 ID x 3260 OD x 3000 LG CLASS V MT STD PIPE w/ PORTS



SECTION A-A



- NOTES:
- PIPE IS DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C76 CLASS V; PIPE JOINT COMPLIES TO ASTM C443
 - 28 DAY DESIGN CONCRETE COMPRESSIVE STRENGTH OF 48.3 MPa (PIPE WILL NOT BE SHIPPED BEFORE ATTAINING 100% OF COMPRESSIVE STRENGTH)
 - CONCRETE COVER OVER REINFORCING STEEL SHALL BE MINIMUM 25mm FROM OUTSIDE AND MINIMUM 30mm FROM INSIDE
 - MAIN REINFORCEMENT OF HELICAL WIRE AND LONG. BARS ARE FROM DEFORMED WIRES TO ASTM A1064 WITH YIELD STRENGTH OF 500 MPa
 - STEEL BELL COLLAR FROM 1/2" THICK STEEL PLATE TO ASTM A36 WITH MINIMUM 10 MILS DFT OF AMERCOAT 2 EPOXY COATING ON SURFACE
 - RUBBER GASKETS ARE GRS & BLOCK SEAL
 - JOINT DESIGNED TO MAXIMUM EXTERNAL HYDRO STATIC PRESSURE OF 30psi (207kPa)
 - LIFTING PINS ARE DS P 52 SWIFT LIFTS -2 PER PIPE- 20T x 8" LENGTH
 - APPROXIMATE WEIGHT OF STANDARD PIPE IS 20,000 KG
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED
 - CONCRETE MEETS CSA A3001 DESIGNATION OF TYPE HSB FOR CEMENTING MATERIALS
 - RECOMMENDED MAXIMUM JACKING FORCE = 4,000 METRIC TONS WITH FULL CONCENTRIC CONTACT/NO DEFLECTION; MAXIMUM JACKING FORCE = 2,500 METRIC TONS WITH FULL ECCENTRIC CONTACT/MAX 0.21" DEFLECTION
 - SHEAR REINFORCEMENT AND STIRRUP MATS ARE FROM COLD DRAWN WIRES TO ASTM A1064 WITH MINIMUM YIELD STRENGTH OF 400 MPa
 - STIRRUP MATS -8 PER PIPE- HAVE 8 LOOPS SPACED @ 6" C.C. ALONG 42" WIDTH, 2" SPACING ALONG 56" LENGTH, LOOPS ARE W1.7 WIRES WITH 7.25" AMPLITUDE
 - SHEAR STIRRUP LOCATION WILL BE MARKED ON THE PIPE EXTERIOR; AS SHOWN ON DETAIL C. MARKINGS MADE LONGITUDINALLY AND AT BOTH ENDS, PIPE MUST BE ORIENTATED IN THE FIELD WITH THE DESIGNED INVERT AND CROWN IN PROPER POSITION, AND CENTERED ON THE SHEAR STIRRUPS AT THE TOP AND BOTTOM QUADRANT; AS SHOWN IN SECTION A-A

DECAST

T 705.734.2892
TF 800.461.5632
F 705.734.2920

8807 County Road 56
Utopia, ON L0M 1T0
decastltd.com

NOTICE: THIS DRAWING CONTAINS PROPRIETARY SUBJECT MATTER. This drawing contains subject matter proprietary to DECAST LTD. and may be covered by one or more intellectual property rights including trade secret and confidential information, copyright, patent, design and other intellectual property rights of DECAST LTD. Upon receipt of this drawing the recipient irrevocably agrees that all contents of the drawing together with the intellectual property rights thereto is and remain the property of DECAST LTD. No right to reproduce, disclose, disseminate or otherwise deal with the subject matter of the drawing is given nor is any license right or other entitlement given with respect to the intellectual property rights in the subject matter without the express prior written permission of DECAST LTD.

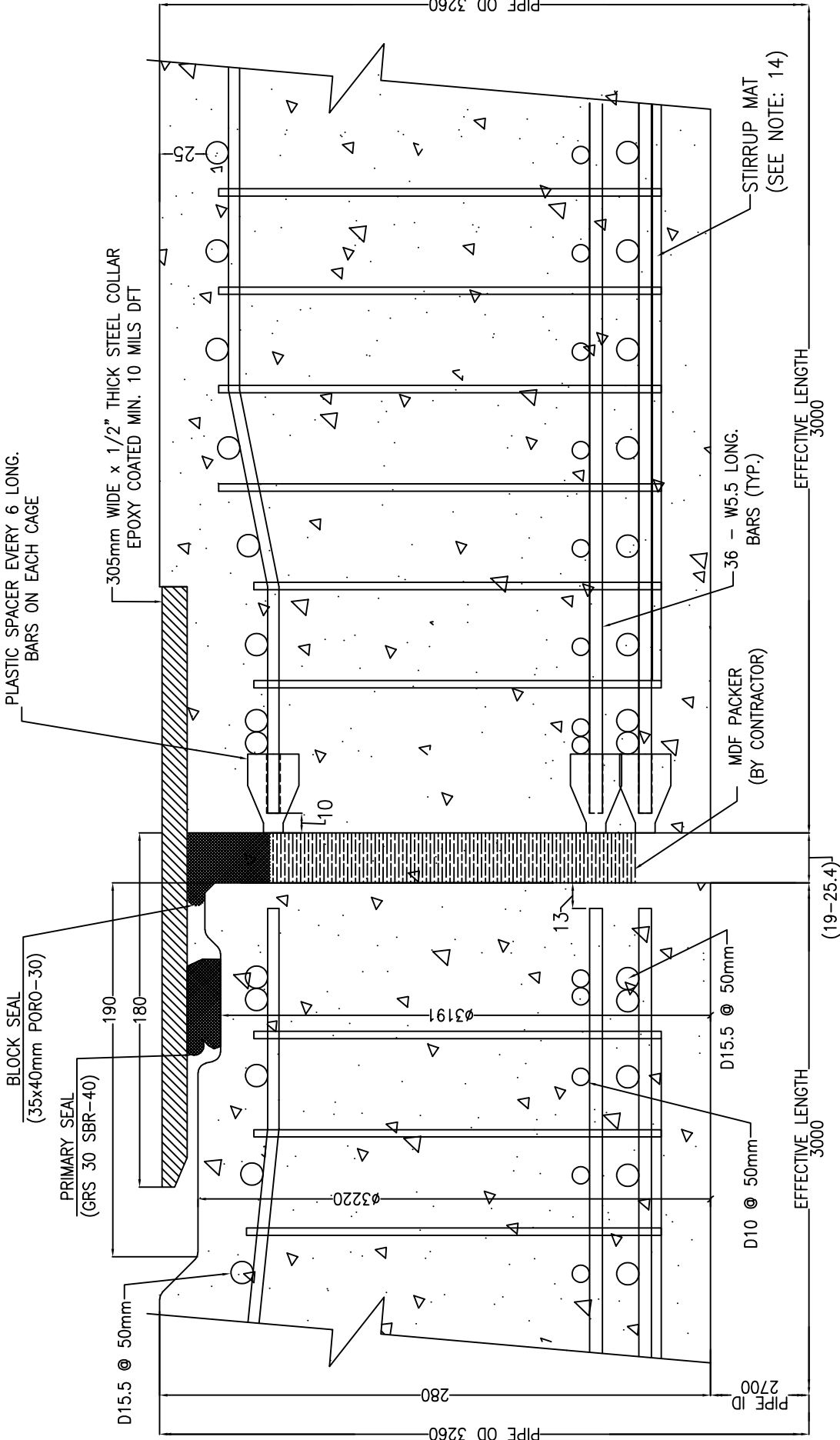
CLIENT: WARD & BURKE / City of Winnipeg - Water and Waste Department

PROJECT NAME: 2700 ID x 3260 OD x 3000 LG MT

Cockburn and Calrossie Combined Sewer Relief Works - Contract 4

STRUCTURE	DRAWN BY: AR	CHECKED BY: BR	ENG BY: --
DECAST LTD PROJECT NO.: 5001 2236	DATE: FEB 23 / 17	SCALE: NTS	DWG No.: 2700_C_S.01

MARK #	DESCRIPTION:
MT2700X300CS/P	STANDARD 2700x3260 MT PIPE JOINT RFT



- NOTES:
- PIPE IS DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C76 CLASS V; PIPE JOINT COMPLIES TO ASTM C443
 - 28 DAY DESIGN CONCRETE COMPRESSIVE STRENGTH OF 48.3 MPA (PIPE WILL NOT BE SHIPPED BEFORE ATTAINING 100% OF COMPRESSIVE STRENGTH)
 - CONCRETE COVER OVER REINFORCING STEEL SHALL BE MINIMUM 25mm FROM OUTSIDE AND MINIMUM 30mm FROM INSIDE
 - MAIN REINFORCEMENT OF HELICAL WIRE AND LONG. BARS ARE FROM DEFORMED WIRES TO ASTM A1064 WITH YIELD STRENGTH OF 500 MPA
 - STEEL BELL COLLAR FROM 1/2" THICK STEEL PLATE TO ASTM A36 WITH MINIMUM 10 MILS DFT OF AMERCOAT 2 EPOXY COATING ON SURFACE
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 - LIFTING PINS ARE DS P 52 SWIFT LIFTS -2 PER PIPE- 20T x 8" LENGTH
 - APPROXIMATE WEIGHT OF STANDARD PIPE IS 20,000 KG
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED
 - CONCRETE MEETS CSA A3001 DESIGNATION OF TYPE HSB FOR CEMENTING MATERIALS
 - RECOMMENDED MAXIMUM JACKING FORCE = 4,000 METRIC TONS WITH FULL CONCENTRIC CONTACT/NO DEFLECTION; MAXIMUM JACKING FORCE = 2,500 METRIC TONS WITH FULL ECCENTRIC CONTACT/MAX 0.21" DEFLECTION
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2017/11/07



2017/11/07



PROJECT: Construction of 2700 Trunk Sewer - Cockburn
& Calrossie Sewer Relief Works - Contract 4

INSPECTOR: Jacqueline MacLennan

CLIENT CONTRACT 748-2016

DATE: November 8, 2017

CONTRACTOR: Ward & Burke Microtunnelling Ltd.

STARTUP: 7:00 SHUTDOWN: 19:30 WORKING DAYS 103

WEATHER: AM -10°C overcast PM -8°C partly cloudy WORKING DAYS TO DATE 143

COMPLETION DATE

FORCE
Ward & Burke (W&B)
Project Manager 0
Site Manager 1
Site Engineer 1
Safety Officer 0
Foreman 2
TBM Operator 0
Operator/Labourer 5
Surveyor 0

KGS Group
Surveyor 0

ON-SITE MEETINGS:

SAFETY OBSERVATIONS:
- No safety incidents to report.

ENVIRONMENTAL OBSERVATIONS:
- No environmental incidents to report.

EQUIPMENT
CAT 328D 1
CAT 312EL 1
CAT 302.7D 1
Kobelco SK75SR 1
Kobelco SK500 1
Kobelco CK1100G 1
Liebherr LR1130 1
Thwaites 6t Dumper 1
Kawasaki 80z Loader (RVP) 1

EXTRA WORK

WORK AREA
EQUIPMENT COMMENTS HOURS/QUANTITY

EXTRA WORK

WORK AREA
EQUIPMENT COMMENTS HOURS/QUANTITY

EXTRA WORK

WORK AREA
EQUIPMENT COMMENTS HOURS/QUANTITY

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EXTRA WORK

WORK AREA
EQUIPMENT COMMENTS HOURS/QUANTITY

EXTRA WORK

WORK PROGRESS:

INSPECTOR: J. MacLennan

Ward & Burke

- W&B broke up the concrete shaft pieces removed from the Wilton shaft and a tandem hauled the concrete off site
 - Di-Tech was on site to cut off the damaged pavement structure on Wilton
 - CAT 312 removed the cut pavement from around the Wilton reception shaft
 - W&B backfilled the collar area with gravel. The material was placed, leveled and compacted with one ton plate compactors.
 - W&B backfilled the top approx. 1 m of the Wilton reception shaft with 3/4 down The material was placed and leveled in approx. 0.15 m lifts and compacted with one ton plate compactors
 - W&B installed dowels along the inside of the Wilton shaft and along the existing pavement structure
 - Lafarge and Granite were on site at 4:30 to pour the concrete for the Wilton shaft cap and Wilton St repair.
- The crew vibrated the concrete constantly and heated and horded the concrete.

- W&B placed the manhole chamber and 1350 mm connection on Sparring Ave for MH32.
- The crew positioned the pipes and prepared the 1350 mm pipe connected to the 2700 mm pipe for concrete pour tomorrow.

- Di-Tech was on site working on the cuts for the Walmart shaft.

GENERAL COMMENTS:

DISCUSSIONS WITH CONTRACTOR:

- W&B indicated they will construct a temporary curb on Wilton for the winter and replace the curb to meet City of Winnipeg specs in the spring

MATERIALS & QUANTITIES

[illegible]



Photo 1 (Looking W): W&B excavating damaged pavement west of Wilton shaft



Photo 2 (Looking NE): W&B compacting 3/4 down within Wilton shaft



Photo 3 (Looking E): Lowering MH32 chamber and 1350 mm pipe



Photo 4 (Looking W): Preparing MH32 chamber connection for a concrete pour tomorrow.



Photo 5 (Looking N): Wilton shaft prepared for concrete pour.



Photo 6 (Looking W): W&B vibrating concrete at Wilton shaft.

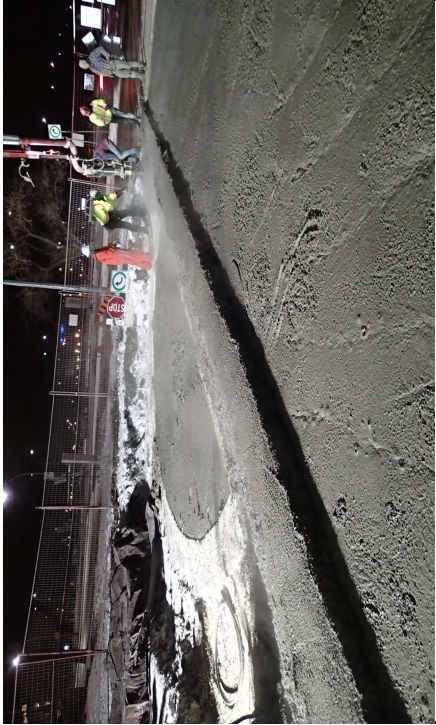
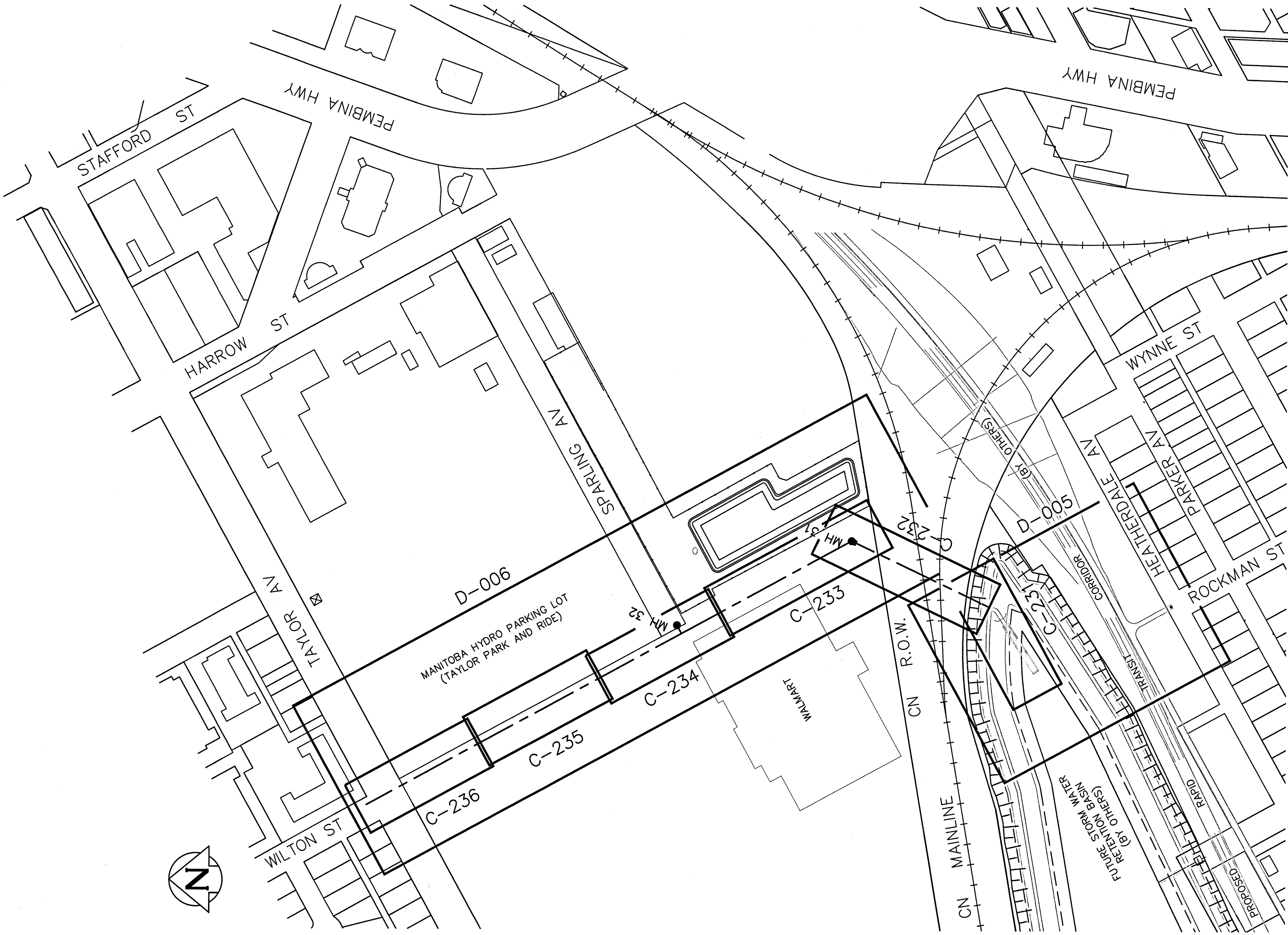


Photo 7 (looking SE): temporary curb on Wilton (east side).

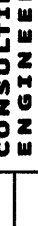
DRAWING INDEX

SHEET DRAWING NUMBER	CITY DRAWING NUMBER	DRAWING TITLE
1	D-003	LD-7889 COVER
2	D-004	LD-7890 GENERAL PLAN AND MANHOLE SCHEDULE
3	D-005	LD-7957 GENERAL SOUTH CONSTRUCTION ACCESS
4	D-006	LD-7958 GENERAL NORTH CONSTRUCTION ACCESS
5	C-231	LD-7891 FROM STA 1+000 TO 1+040
6	C-232	LD-7892 CN CROSSING – FROM STA 1+000 TO MH 31
7	C-233	LD-7893 WILTON STREET – FROM MH 31 TO STA 1+220
8	C-234	LD-7894 WILTON STREET – FROM STA 1+220 TO STA 1+310
9	C-235	LD-7895 WILTON STREET – FROM STA 1+310 TO STA 1+410
10	C-236	LD-7896 WILTON STREET – FROM STA 1+410 TO MH 32
11	C-502	LD-7897 RISER MANHOLE AND MONITORING POINT DETAILS
12	C-503	LD-7898 SPURLING AVENUE CONNECTION AND JACKING PIPE DETAILS

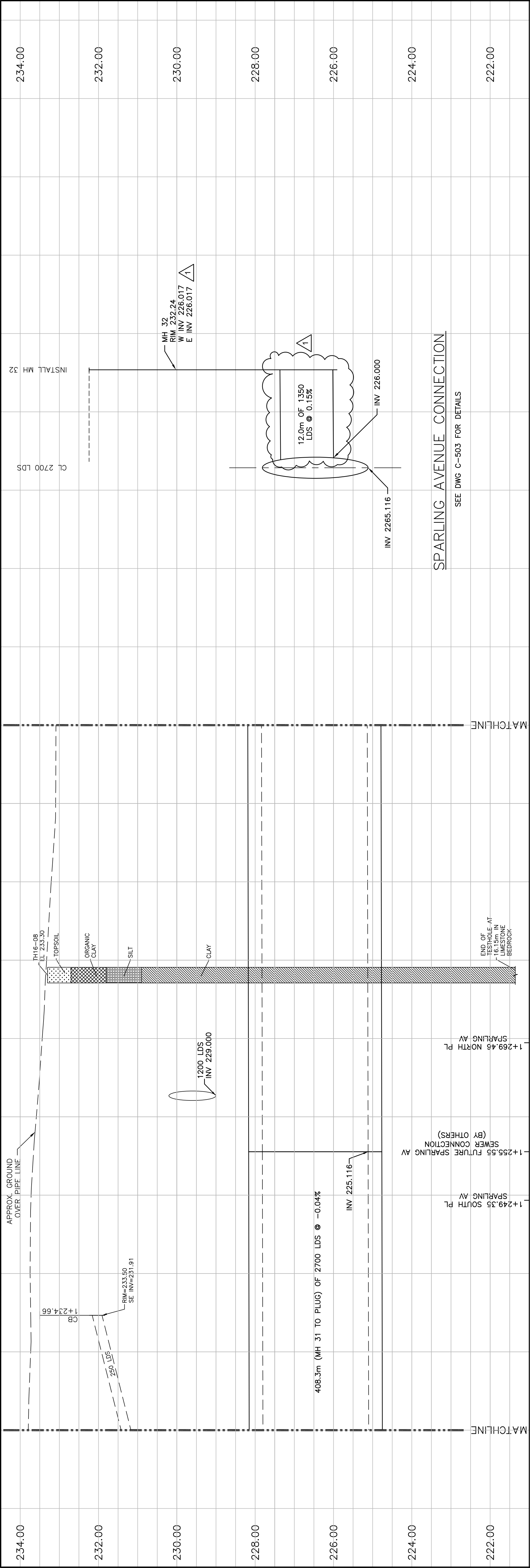
MANHOLE SCHEDULE		
REFERENCE	NORTHING	EASTING
MH 31	5523888.430	632474.894
MH 32	5524017.519	632412.188



KEY MAP

S.W. ELEV.		KGS GROUP CONSULTING ENGINEERS		ch2m.		ENGINEERING NO. 25524						THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT	
			DESIGNED BY	SDG	CHECKED BY	MD	PROJECT TITLE		COCKBURN AND CALROSSIE COMBINED SEWER RELIEF WORKS – CONTRACT 4				
			DRAWN BY	JBC	APPROVED BY	R30	SHEET OF		2 OF 12				
					RELEASED FOR CONSTRUCTION:		COMPUTER FILE NAME		D-004.dwg				
					HOR. SCALE: N.T.S.		CONSULTANT DRAWING NO.		GENERAL PLAN AND MANHOLE SCHEDULE				
			DATE		DATE		D-004		LD-7890				
0	ISSUED FOR TENDER	01/2017	JBC										
NO.	REVISIONS	DATE	BY										

FileName C:\pw-workdir\ch2mhill_wbg\jcor tez1\0204789\



SPARLING AVENUE CONNECTION

SEE DWG C-503 FOR DETAILS

WARNING

IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:

- 1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.
- 2) TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.

SEE PROVINCIAL REGULATION 210/72 FOR DETAILS

PROPERTY LIMITS DELINEATION

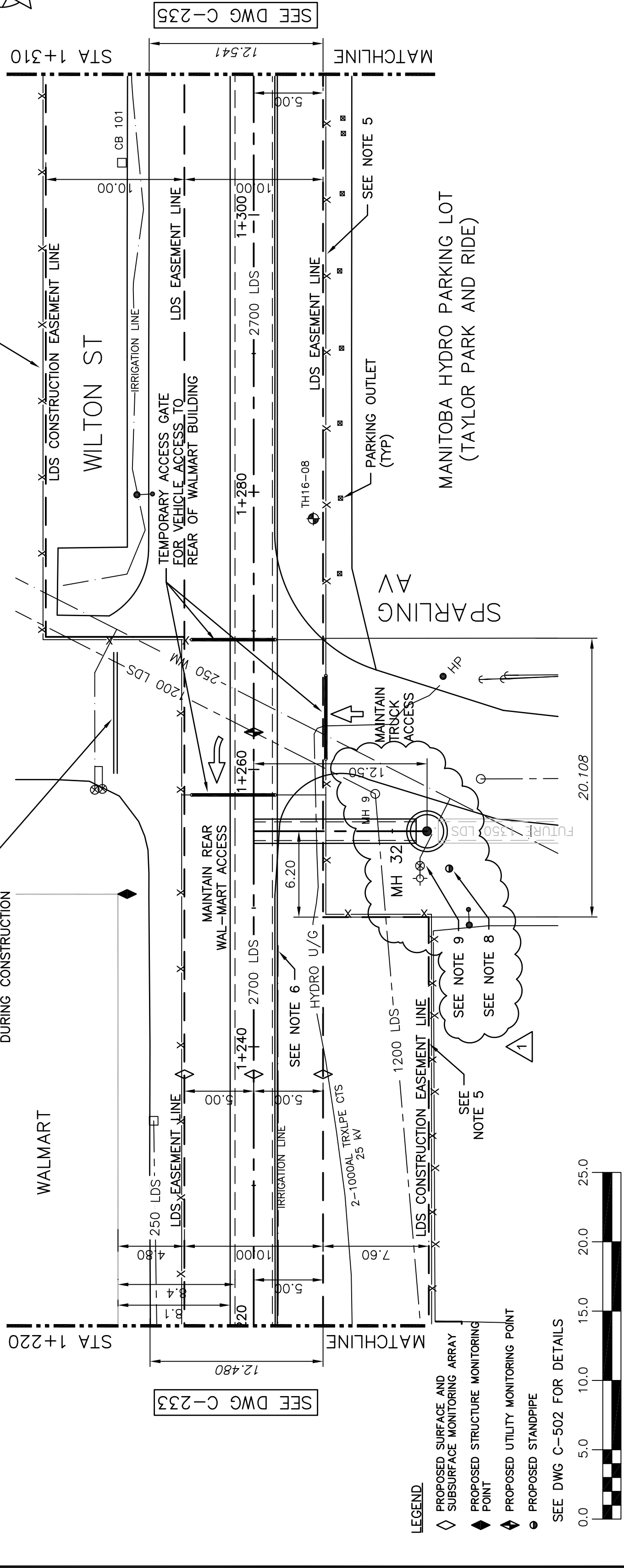
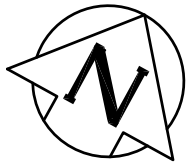
DELINEATION OF PROPERTY LIMITS AS SHOWN ON THIS DWG DOES NOT REPRESENT A "LEGAL SURVEY". CH2M HILL MAKES NO REPRESENTATION OR WARRANTY AS TO THE ACCURACY OF PROPERTY LIMITS DELINEATED ON THIS DRAWING, NOR ON THE DIMENSIONAL ACCURACY OF DRAWING FEATURES RELATIVE TO THOSE PROPERTY LIMITS.

- CONSTRUCTION NOTES:
1. SEWER AND WATER SERVICES SHOWN ON DRAWING ARE APPROXIMATE ONLY.
 2. LOCATION OF ALL SEWER AND WATER LINES TO BE CONFIRMED IN FIELD.
 3. INSTALL NEW SEWER BY TRENCHLESS METHODS, UNLESS OTHERWISE NOTED.
 4. MAINTAIN TRUCK ACCESS TO REAR OF WAL-MART FROM SPARLING AVENUE AT ALL TIMES.
 5. INSTALL AND MAINTAIN TEMPORARY CONSTRUCTION FENCING ALONG ALL LDS CONSTRUCTION EASEMENT LINES. TEMPORARY ACCESS GATES TO BE INSTALLED AS SHOWN.
 6. IRRIGATION LINE TO BE CONFIRMED PRIOR TO CONSTRUCTION AND RELOCATED IF NECESSARY.
 7. THE PROPOSED 1200 LDS TO BE LOCATED EITHER NORTH OR SOUTH OF PROPOSED LOCATION TO ALLOW CONNECTION POINT TO BE ALIGNED TO AVOID PIPE JOINTS BY MINIMUM OF 450mm.
 8. PROPOSED STANDPIPE LOCATION TO BE DETERMINED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
 9. COMMENCEMENT. REFER TO SPECIFICATION FOR DETAILS, RELOCATE EXISTING HYDRANT, HYDRANT VALVE AND PIPE AS REQUIRED FOR MH 32 INSTALLATION AS DIRECTED BY CONTRACT ADMINISTRATOR.



Certificate of Authorization
CH2M HILL Canada Ltd.
No. 1441

KEY PLAN

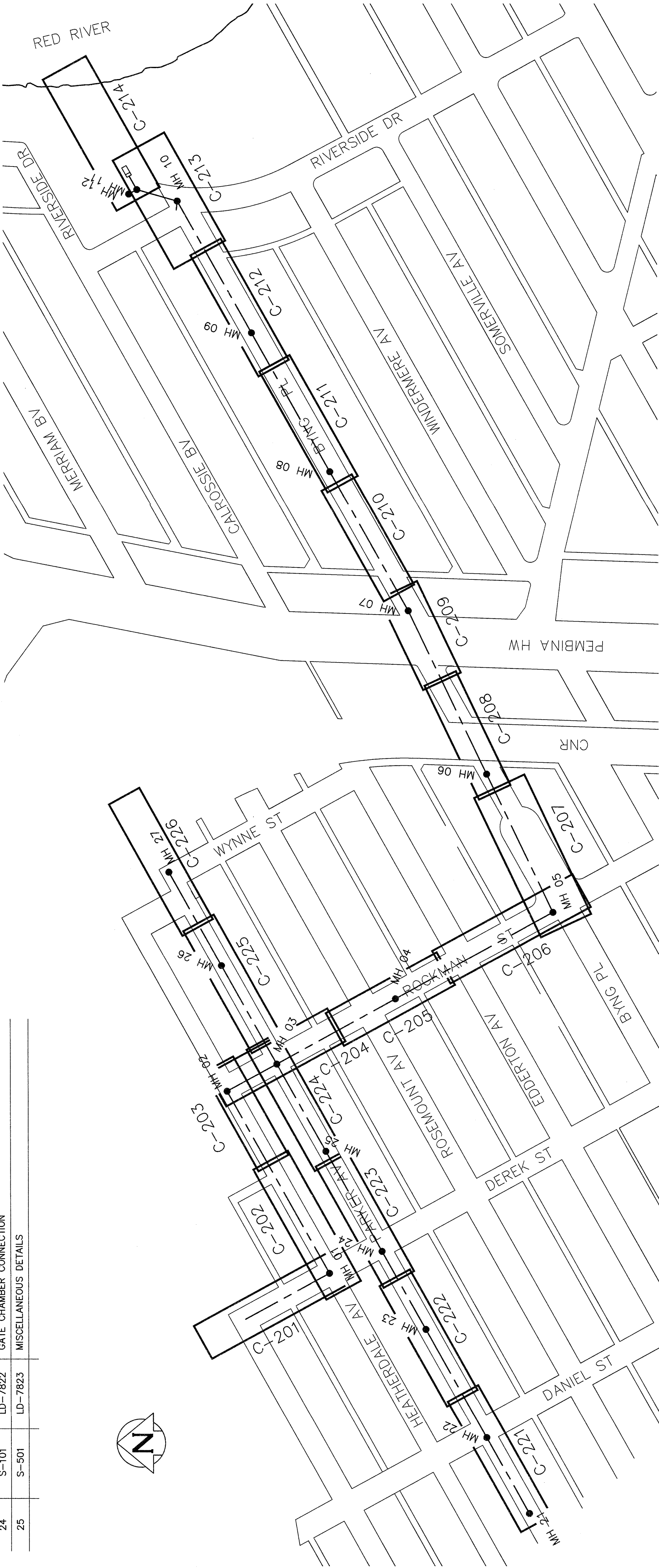
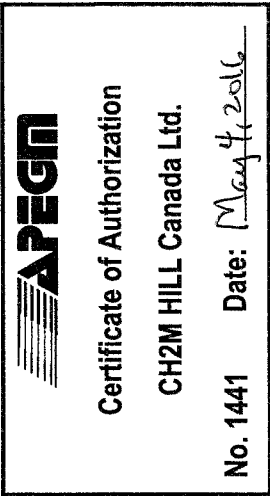


DESIGNED BY		SDG		CHECKED BY		MD	
DRAWN BY		JBC		APPROVED BY			
HOR. SCALE: 1:250		VERTICAL: 1:50		RELEASED FOR CONSTRUCTION:			
DATE		DATE		DATE		DATE	
1		ISSUED FOR ADDENDUM NO. 2		01/2017		JBC	
0		ISSUED FOR TENDER		01/2017		JBC	
NO.		REVISIONS		DATE		DATE	
LOCATION APPROVED UNDERGROUND STRUCTURES		DATE		DATE		DATE	
SUPV. U/G STRUCTURES COMMITTEE		DATE		DATE		DATE	
NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AND ARE NOT GUARANTEED. THAT THE GIVEN LOCATIONS ARE EXACT. LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.		DATE		DATE		DATE	
LEGEND-PROFILE		LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN	
WATER MAIN		HYDRANT		HYDRO M.T.S.		CONCRETE	
LAND DRAINAGE SEWER		WASTE WATER SEWER		SIDEWALK		PROPERTY LINE	
WASTE WATER SEWER		CENTRELINE		NORTH/WEST GUTTER		SURVEY BAR	
MANHOLE		CATCH BASIN		CURB INLET		BEND	
REDUCER		CURB STOP		TEE		EXISTING	
LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN	
PROJECT TITLE		PROJECT TITLE		PROJECT TITLE		PROJECT TITLE	
COCKBURN AND CALROSSIE COMBINED		COCKBURN AND CALROSSIE COMBINED		COCKBURN AND CALROSSIE COMBINED		COCKBURN AND CALROSSIE COMBINED	
SEWER RELIEF WORKS - CONTRACT 4		SEWER RELIEF WORKS - CONTRACT 4		SEWER RELIEF WORKS - CONTRACT 4		SEWER RELIEF WORKS - CONTRACT 4	
WILTON STREET		WILTON STREET		WILTON STREET		WILTON STREET	
FROM STA 1+220 TO STA 1+310		FROM STA 1+220 TO STA 1+310		FROM STA 1+220 TO STA 1+310		FROM STA 1+220 TO STA 1+310	
CONSULTANT DRAWING NO.		CONSULTANT DRAWING NO.		CONSULTANT DRAWING NO.		CONSULTANT DRAWING NO.	
C-234		C-234		C-234		C-234	
SHEET OF		SHEET OF		SHEET OF		SHEET OF	
8		8		8		8	
OF 12		OF 12		OF 12		OF 12	
COMPUTER FILE NAME		COMPUTER FILE NAME		COMPUTER FILE NAME		COMPUTER FILE NAME	
C-234.dwg		C-234.dwg		C-234.dwg		C-234.dwg	
CITY DRAWING NUMBER		CITY DRAWING NUMBER		CITY DRAWING NUMBER		CITY DRAWING NUMBER	
LD-7894		LD-7894		LD-7894		LD-7894	

DRAWING INDEX

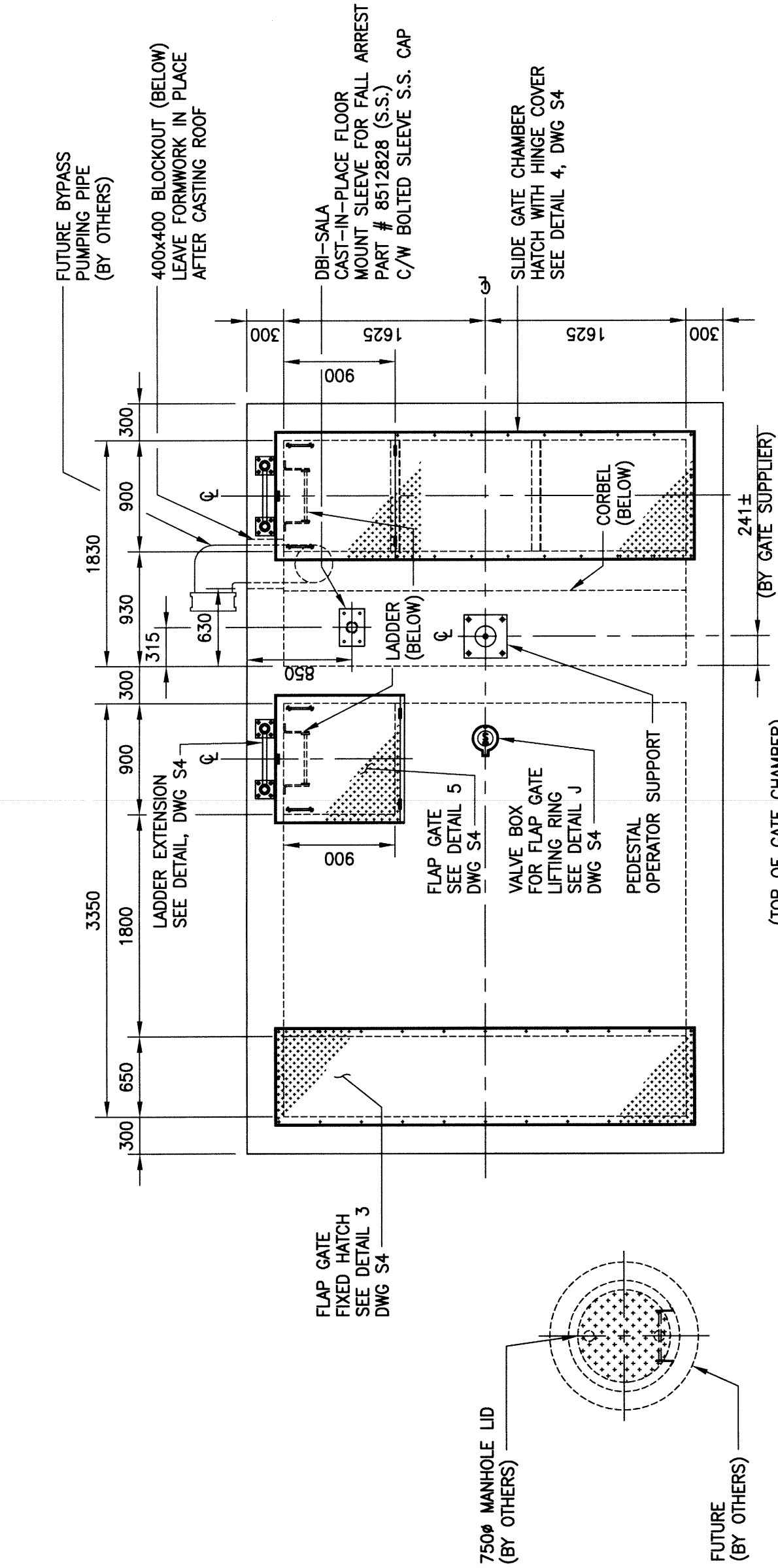
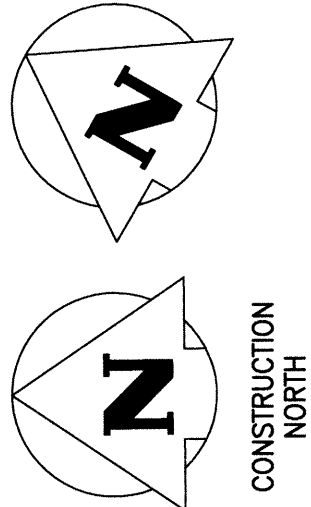
SHEET NUMBER	CONSULTANT DRAWING NUMBER	CITY DRAWING NUMBER	DRAWING TITLE
1	D-001	LD-7799	COVER
2	D-002	LD-7800	GENERAL PLAN AND MANHOLE SCHEDULE
3	C-201	LD-7801	DEREK STREET – FROM STA 0+900 TO HEATHERDALE AV
4	C-202	LD-7802	HEATHERDALE AVENUE – FROM DEREK STREET TO STA 1+170
5	C-203	LD-7803	HEATHERDALE AVENUE – FROM STA 1+170 TO ROCKMAN STREET
6	C-204	LD-7804	ROCKMAN STREET – FROM HEATHERDALE AV TO STA 1+340
7	C-205	LD-7805	ROCKMAN STREET – FROM STA 1+340 TO STA 1+440
8	C-206	LD-7806	ROCKMAN STREET – FROM STA 1+440 TO BYNG PLACE
9	C-207	LD-7807	BYNG PLACE – FROM ROCKMAN STREET TO STA 1+650
10	C-208	LD-7808	BYNG PLACE – CNR CROSSING
11	C-209	LD-7809	BYNG PLACE – PEMBINA HIGHWAY CROSSING
12	C-210	LD-7810	BYNG PLACE – FROM STA 1+830 TO STA 1+930
13	C-211	LD-7811	BYNG PLACE – FROM STA 1+930 TO STA 2+040
14	C-212	LD-7812	BYNG PLACE – FROM STA 2+040 TO STA 2+150
15	C-213	LD-7813	BYNG PLACE – FROM STA 2+150 TO MH 11
16	C-214	LD-7814	BYNG PLACE – FROM MH 11 TO EXISTING GATE CHAMBER
17	C-221	LD-7815	PARKER AVENUE – FROM STA 1+000 TO STA 1+110
18	C-222	LD-7816	PARKER AVENUE – FROM STA 1+110 TO STA 1+220
19	C-223	LD-7817	PARKER AVENUE – FROM STA 1+220 TO STA 3+330
20	C-224	LD-7818	PARKER AVENUE – FROM STA 1+330 TO STA 1+440
21	C-225	LD-7819	PARKER AVENUE – FROM STA 1+440 TO STA 1+550
22	C-226	LD-7820	PARKER AVENUE – FROM STA 1+550 TO MH 027
23	C-501	LD-7821	MISCELLANEOUS DETAILS
24	S-101	LD-7822	GATE CHAMBER CONNECTION
25	S-501	LD-7823	MISCELLANEOUS DETAILS

MANHOLE SCHEDULE			
REFERENCE	NORTHING	EASTING	
MH 01	5523565.542	632276.010	
MH 02	5523647.993	632424.814	
MH 03	5523607.740	632447.050	
MH 04	5523511.503	632500.326	
MH 05	5523383.794	632571.083	
MH 06	5523437.284	632684.060	
MH 07	5523500.510	632817.600	
MH 08	5523563.631	632931.247	
MH 09	5523626.753	633044.894	
MH 10	5523686.595	633152.636	
MH 11	5523719.266	633161.982	
MH 12	5523725.817	633158.344	
MH 21	5523404.131	632079.704	
MH 22	5523438.551	632141.803	
MH 23	5523487.514	632230.141	
MH 24	5523522.903	632293.989	
MH 25	5523568.231	632375.768	
MH 26	5523652.340	632527.517	
MH 27	5523694.760	632604.047	

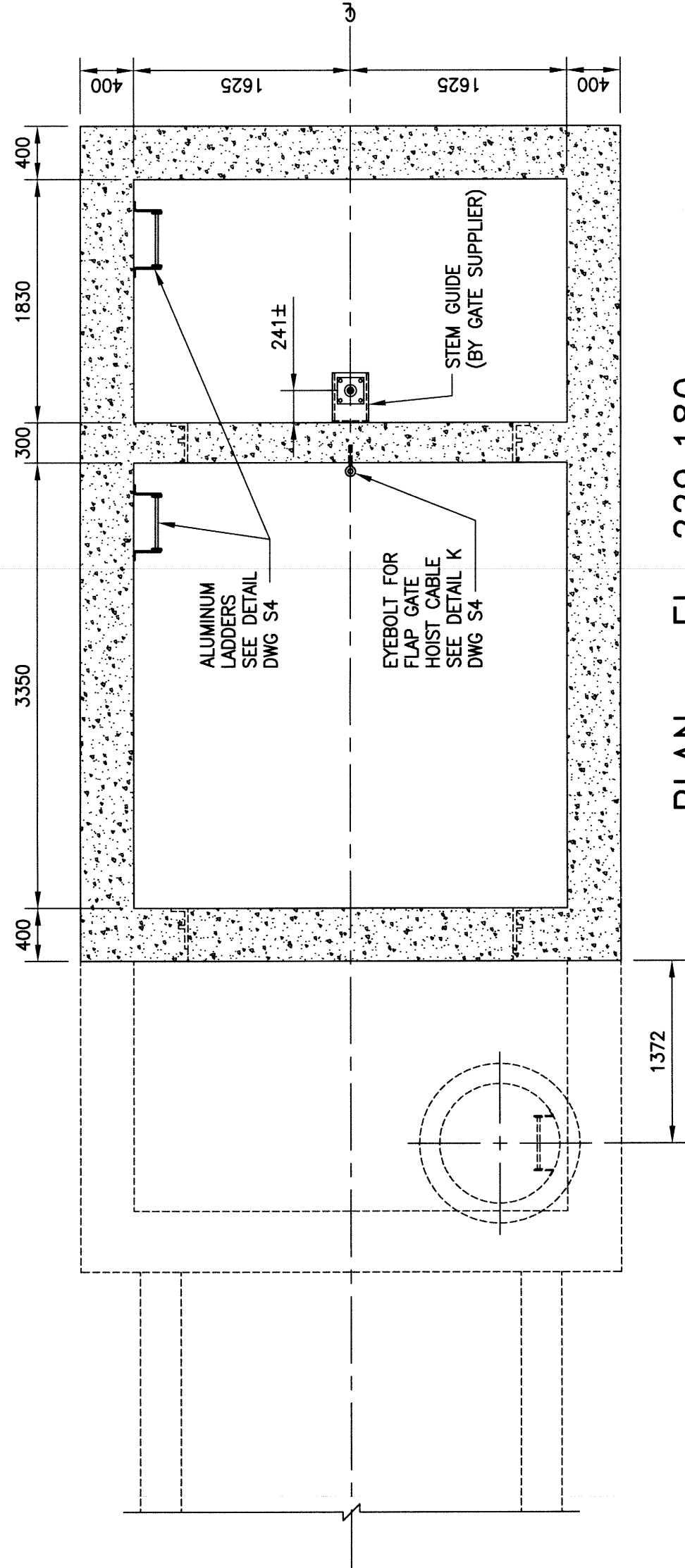


KEY MAP

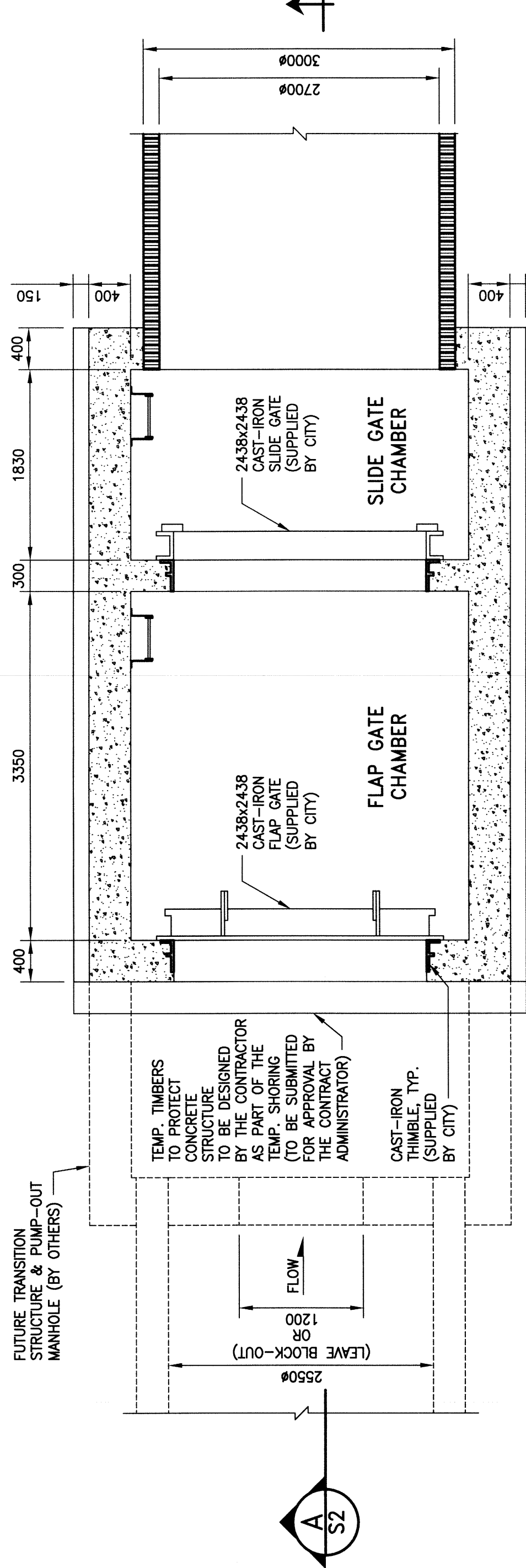
ch2m KGS GROUP CONSULTING ENGINEERS		THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT ENGINEERING DIVISION		Winnipeg COCKBURN AND CALROSSIE COMBINED SEWER RELIEF WORKS		SHEET 2 OF 25 CITY DRAWING NUMBER LD-7800	
ENGINEER'S SEAL PROFESSOR OF MANHOLES REGISTERED PROFESSIONAL ENGINEER 25524 Member 2016 2016		CONSULTANT DRAWING NUMBER D-002		GENERAL PLAN AND MANHOLE SCHEDULE		FILE PATH: C:\new_works\ch2m\mill_mh\p\portest\ld0204789\ FILE NAME: D-002.dwg	
CONSTRUCTION COMPLETION DATE: YYYY MM DD		DESIGNED BY: SDG DRAWN BY: JBC		CHECKED BY: MAF APPROVED BY: ES		RELEASED FOR CONSTRUCTION DATE: 04/2016 DATE: 02/2016	
ISSUED FOR CONSTRUCTION DATE: 04/2016		REVISIONS DATE: 02/2016		SCALE: HORIZONTAL 1:250 SCALE: VERTICAL 1:50		DATE: 04/2016 DATE: 02/2016	
NO.		DATE: 04/2016		DATE: 02/2016		DATE: 04/2016	
2016 05 03		2016 05 03		2016 05 03		2016 05 03	



PLAN — EL. 231.907
SCALE: 1:40



PLAN — EL. 229.180
SCALE: 1:40



PLAN — EL. 222.712
SCALE: 1:40

GENERAL NOTES:

- THIS STRUCTURE HAS BEEN DESIGNED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF PART 9 OF THE NATIONAL BUILDING CODE (LATEST).
- ALL SPECIFICATIONS AND CODES SPECIFIED SHALL BE THE LATEST REVISION AVAILABLE.
- SITE VERIFY ALL DIMENSIONS, ELEVATIONS, DETAILS, QUANTITIES AND CONDITIONS PRIOR TO START OF ANY DEMOLITION, CONSTRUCTION OR PREFABRICATION OF ANY STRUCTURAL COMPONENT.
- THE CONTRACTOR SHALL ENSURE THAT ALL BURIED SERVICES ARE LOCATED AND MARKED PRIOR TO EXCAVATION.
- SHIP, STORE, HANDLE, ERECT, INSTALL, ETC. ALL BUILDING MATERIALS, COMPONENTS, FIXTURES, EQUIPMENT, ETC. AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
- ALL DEMOLITION, FABRICATION, CONSTRUCTION, ETC. SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL PERTINENT BUILDING CODES, AND LOCAL BYLAWS AND ORDINANCES.
- DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT TECHNICAL SPECIFICATIONS.
- DESIGN LOADS ARE AS FOLLOWS:
FLOOR LIVE LOADS: 3.60 kPa
SNOW LOAD: 1.30 kPa
FOUNDATION WALL LOADS:
LIVE LOAD: $q = 6.0 \text{ kPa}$ (SURCHARGE LOAD)
SOIL LOAD: $\gamma_{\text{soil}} = 18 \text{ kN/m}^3$
AT REST LATERAL EARTH PRESSURE COEFFICIENT: $K_0 = 0.70$
LATERAL PRESSURE ON WALL: $P = K_0 \cdot (\gamma_{\text{soil}} \cdot H + q)$, WHERE H = HEIGHT OF SOIL
- DESIGN FLOOD LEVEL
1/700 YEAR EVENT: 230.810m.

SURVEY NOTES:

- REFER TO MUNICIPAL DWG LD-7231 FOR SURVEY DETAILS.

REINFORCING STEEL:

- REINFORCING STEEL TO BE NEW DEFORMED BILLET STEEL BARS CONFORMING TO CSA G30.18 (LATEST). GRADE TO BE 400 MPa.
- REINFORCING STEEL SHALL BE CLEAN, FREE OF RUST, DIRT, LOOSE SCALE, OIL, GREASE OR ANY OTHER MATERIAL WHICH WOULD REDUCE BOND WITH THE CONCRETE.
- BEND ALL HORIZONTAL REINFORCING 305mm AROUND CORNERS OR PROVIDE ADDITIONAL 610mm X 610mm ANGLE BARS.
- TIE, SUPPORT AND SPACE ALL REINFORCING STEEL WITH PROPER APPROVED DEVICES DESIGNED FOR USE IN REINFORCED CONCRETE TO PREVENT DISPLACEMENT OF REINFORCING AND ENSURE SPECIFIED CONCRETE COVER.
- PROVIDE MINIMUM CONCRETE COVER FOR REINFORCING STEEL AS FOLLOWS:
BASE SLAB (EXTERIOR FACES) 75mm
BASE SLAB (INTERIOR FACES) 50mm
FOUNDATION WALLS (EXTERIOR FACE) 75mm
FOUNDATION WALLS (INTERIOR FACE) 50mm
CHAMBER ROOF SLAB (TOP & BOTTOM) 50mm
INTERIOR WALLS 50mm
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.

STRUCTURAL AND MISCELLANEOUS STEEL:

- STRUCTURAL AND MISCELLANEOUS STEEL FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH CAN/CSA S16 (LATEST).
- STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF CAN/CSA G40.20/G40.21 (LATEST).
- ROLLED SHAPES & PLATES CSA G40.21-300W
WELDING SHALL BE IN ACCORDANCE WITH CSA W59 (LATEST), BY WELDERS CERTIFIED AND QUALIFIED IN ACCORDANCE WITH CSA W47.1 (LATEST). ALL WELDS TO BE 6mm UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
- STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE FINISHED AS INDICATED BELOW, UNLESS OTHERWISE NOTED, OR APPROVED EQUAL:
GALVANIZED STEEL
— SURFACE PREP. TO SP8 (PICKLING)
— HOT DIPPED GALVANIZED TO CAN/CSA G164 (LATEST).

GALVANIZED STEEL
— SURFACE PREP. TO SP8 (PICKLING)
— HOT DIPPED GALVANIZED TO CAN/CSA G164 (LATEST).

CONCRETE:

- CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH CSA A23.1 (LATEST). SEE BELOW FOR MIX REQUIREMENTS.
- ADMIXTURES SHALL NOT BE USED UNLESS SPECIFIED HEREIN OR APPROVED BY THE DESIGN ENGINEER. CALCIUM CHLORIDE SHALL NOT BE USED.
- MIX WATER SHALL BE POTABLE.
- DESIGN, FABRICATE AND ERECT FORMWORK/SHORING IN ACCORDANCE WITH CAN/CSA-S269.3 (LATEST). ALLOW SUFFICIENT CONCRETE CURING TIME PRIOR TO REMOVAL.
- CONTRACTOR SHALL SUBMIT SHORING SHOP DRAWINGS FOR REVIEW PRIOR TO INSTALLATION SHORING SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED OR LICENSED TO PRACTICE IN THE PROVINCE OF MANITOBA AND EXPERIENCED IN THE STRUCTURAL DESIGN OF SHORING SYSTEMS.
- CONCRETE FINISHING SHALL MEET THE REQUIREMENTS OF CSA A23.1 (LATEST).
- FORM RELEASE AGENT SHALL BE BIODEGRADABLE, NON-STAINING AND NON-VOLATILE.
- PROVIDE ADEQUATE COLD/HOT WEATHER PROTECTION AS REQUIRED DURING CURING PERIOD.
- PLACE AND SECURE ALL EMBEDDED ANCHORS, WELD PLATES, SLEEVES, BOLTS, DOWELS, INSERTS, WATERSTOPS, ETC. PRIOR TO CASTING CONCRETE. COORDINATE WITH ALL TRADES FOR EMBEDDING OF ALL OTHER, CONDUIT, SERVICES, BLOCKING, ETC.
- LOCATE AND FABRICATE ALL CONSTRUCTION JOINTS, CONTROL JOINTS AND EXPANSION JOINTS AS DETAILED ON THE DRAWINGS. JOINTS NOT SHOWN SHALL BE APPROVED BY THE DESIGN ENGINEER PRIOR TO THE PLACEMENT OF CONCRETE.
- WATERSTOP TO BE HYDROTITE CJ-0725-3K OR APPROVED ALTERNATE NON-BENTONITE WATERSTOP.
- ALL EXPOSED CORNERS TO HAVE 25mm CHAMFER FILLET UNLESS NOTED.
- ADHESIVE ANCHORS SHALL BE HILTI HAS RODS COMPLETE WITH HT150 ADHESIVE OR APPROVED EQUAL, UNLESS NOTED. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- THE CONCRETE SUPPLIER SHALL BE CERTIFIED TO MEET THE REQUIREMENTS OF CSA-A23.1.
- THE CONCRETE SUPPLIER SHALL SUBMIT CONCRETE MIX DATA SUBMISSION FORMS FOR EACH TYPE OF CONCRETE SPECIFIED FOR REVIEW PRIOR TO BATCHING ANY CONCRETE.

CONCRETE MIX DESIGNS:

CONCRETE MIX DESIGN SHALL BE PROPORTIONED TO MEET THE FOLLOWING PERFORMANCE REQUIREMENTS:

EXPOSURE CLASS	S-1
MIN. 28 DAY COMP. STRENGTH	35 MPa
CEMENT TYPE	TYPE 50 (HS)
MAX. W/C RATIO	0.40
MAX. AGGREGATE SIZE	20mm
ENTRAINED AIR CONTENT	5% TO 8%
MAXIMUM SLUMP	80mm±20mm

ALUMINUM:

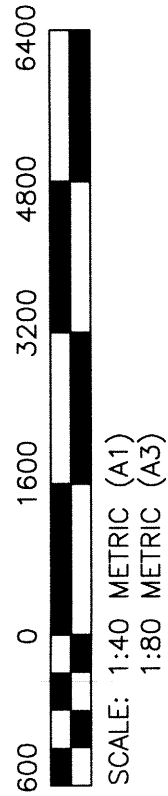
- ALUMINUM SHALL BE IN ACCORDANCE WITH CAN/CSA S517 AND THE ALUMINUM ASSOCIATION "SPECIFICATION FOR ALUMINUM STRUCTURES". ALUMINUM FOR PLATES AND EXTRUDED SHAPES SHALL BE TYPE 6061-T651.
- ALUMINUM WELDING SHALL BE IN ACCORDANCE WITH CSA W59.2 (LATEST) BY WELDERS CERTIFIED AND QUALIFIED IN ACCORDANCE WITH CSA W47.2 (LATEST). ALL WELDS TO BE 6mm UNLESS OTHERWISE NOTED.
- INSTALL NYLITE ELECTROCHEMICAL ISOLATION GASKETS TO ELECTRICALLY ISOLATE DISSIMILAR METALS (SUPPLIER: SPAENAUR).
- ALL ALUMINUM IN CONTACT WITH CONCRETE OR CAST INTO CONCRETE TO HAVE BITUMINOUS ISOLATION COATING.
- ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL & TYPE 316. MEETING ASTM F593/F738M.

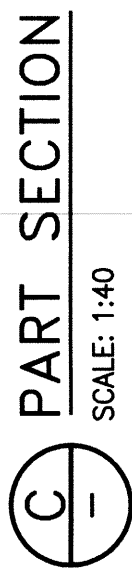
METRIC
DECIMALIZED NUMBERS INDICATE METRES
WHOLE NUMBERS INDICATE MILLIMETRES

KGS GROUP CONSULTING ENGINEERS		ENGINEER'S SEAL 		THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT	
DESIGNED BY	KRD	CHECKED BY	CMS	PROJECT TITLE COCKBURN/CALROSSIE COMBINED SEWER RELIEF WORKS	
DRAWN BY	FBV	APPROVED BY		SHEET 01 OF 01 COMPUTER FILE NAME 11-0107-18_S1	
SCALE	AS NOTED	RELEASED FOR CONSTRUCTION		CITY DRAWING NUMBER LD-7236	
NO.	ISSUED FOR TENDER	DATE	13/10/16	CONSULTANT DRAWING NO. 11-0107-18_S1	
NO.	REVISIONS	DATE	BY	PLANS STRUCTURAL	

LOCATION APPROVED UNDERGROUND STRUCTURES
DATE
NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ON THESE DRAWINGS IS FOR INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR LOCATION OF EXISTING UTILITIES IS EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE APPROPRIATE UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

APEN
Certificate of Authorization
KGS Group
No. 245





METRIC
DECIMALIZED NUMBERS INDICATE METRES

APEGN
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No. 245

