

GENERAL NOTES

- 1. THE METRIC SYSTEM OF MEASUREMENT IS USED ON ALL DRAWINGS. ELEVATIONS AND STATIONS ARE SHOWN IN METERS AND ALL OTHER DIMENSIONS ARE SHOWN IN MILLIMETERS.
- 2. CONTRACTOR MUST VERIFY ALL EXISTING GEOMETRY AS WELL AS PROPOSED DIMENSION AND LAYOUT IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION AND NOTIFY THE CONTRACT ADMINISTRATOR OF ANY CHANGES.
- 3. CONTRACTOR MUST VERIFY ALL EXISTING UTILITIES PRIOR TO EXCAVATION OR CONSTRUCTION.
- 4. ANY DAMAGE TO EXISTING STRUCTURES AND UTILITIES BY THE CONTRACTORS OPERATIONS MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
- 5. ALL REFERENCES TO CODES, STANDARDS, SPECIFICATIONS, GUIDELINES, ETC. SHALL MEAN THE LATEST EDITION.

BRIDGE DESIGN DATA

- 1. DESIGN CODES:
- AREMA, 2013 U.N.O.
- CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, JAN 2006
- 2. DESIGN LIVE LOAD:
COOPER E90; VERTICAL LOAD TRACTION & BRAKING ALTERNATIVE LIVE LOAD AS PER AREMA
- 3. LIVE LOAD IMPACT FACTOR: 28.05%
- 4. BALLAST DEPTH: 405mm PRESENT AND 305mm ADDITIONAL IN FUTURE
- 5. STRUCTURAL STEEL ALLOWABLE STRESSES
f (TENSION) CSA GRADE 350A/AT: 192.5 MPa

RETAINING WALL DESIGN DATA

- 1. DESIGN CODES:
- AREMA, 2013 U.N.O.
- CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, JAN 2006
- CANADIAN HIGHWAY BRIDGE DESIGN CODE CAN/CSA S6-06 CLAUSE 3.8.11
- 2. DESIGN LOAD:
- COOPER E90 FOR UPPER RETAINING WALLS
- CAN/CSA S6-06 MAINTENANCE VEHICLE LOAD CLAUSE 3.8.11 FOR LOWER RETAINING WALLS
- 3. STRUCTURAL STEEL ALLOWABLE STRESSES:
- f (TENSION) CSA GRADE 350W: 192.5 MPa

FOUNDATION NOTES

- 1. FOR GEOTECHNICAL DESIGN SEE REPORT BY AECOM CANADA LTD. DATED MARCH 15, 2013, TEST CAISSON MEMORANDUM DATED SEPTEMBER 5, 2013, SUPPLEMENTAL BRIDGE TEST HOLES MEMORANDUM DATED SEPTEMBER 18, 2013 AND DETOUR STABILITY MEMORANDUM DATED OCTOBER 25, 2013.
- 2. THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR, WHO SHALL NOTIFY THE GEOTECHNICAL ENGINEER FOR INSPECTION ONCE EXCAVATION HAS BEEN CARRIED OUT TO DESIGN ELEVATIONS.
- 3. BACKFILL SHALL NOT BE PLACED AGAINST THE ABUTMENTS UNTIL THE CONCRETE HAS ACHIEVED THE FULL 28 DAY STRENGTH.
- 4. HEAVY EARTH COMPACTING EQUIPMENT, OR OTHER HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE USED WITHIN 3.0m OF THE ABUTMENTS, WING WALLS AND RETAINING WALLS. HAND TAMPING EQUIPMENT MUST BE USED IN THESE AREAS.

CONCRETE NOTES

- 1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH CSA-A23.1.
- 2. CEMENT SHALL CONFORM TO THE REQUIREMENTS OF CSA STANDARD LATEST EDITION.
- 3. ALL CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, CEMENT TYPE, EXPOSURE CLASS, AND WATER/CEMENT RATIO AS FOLLOWS:

	STRENGTH	CEMENT TYPE	CLASS	AIR CONTENT
TYPE 1 - CAISSONS	35 MPa	TYPE HS OR HSB	CLASS S1	5 - 8%
TYPE 2 - ABUTMENTS	35 MPa	TYPE GU	CLASS C1 (WITH FLYASH)	5 - 8%
TYPE 3 - PIER CAP	35 MPa	TYPE GU	CLASS C1	5 - 8%
TYPE 4 - SIDEWALK / ATP SLABS, RETAINING WALL CAPS, RETAINING WALL CLADDING, & TRAFFIC BARRIERS, FOOTINGS AND CAPS	35 MPa	TYPE GU	CLASS C1 (WITH FIBRES)	5 - 8%
- 4. CONCRETE CLEAR COVER TO REINFORCEMENT UNLESS NOTED OTHERWISE:

CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	100 ± 25
FOOTING, PIER, ABUTMENT EXPOSED TO EARTH	70 ± 10
ABUTMENT NOT EXPOSED TO EARTH, PIER CAP	60 ± 10
SIDEWALK/ATP SLABS, RETAINING WALL CAPS AND CLADDING, TRAFFIC BARRIERS	60 +10, -0
- 5. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 20mm U.N.O.
- 6. PRIOR TO POURING CONCRETE THE CONTRACTOR SHALL CHECK FOR ALL OPENINGS, ANCHOR BOLTS, INSERTS AND EMBEDDED ITEMS REQUIRED FOR MECHANICAL, ELECTRICAL OR UTILITY SUPPORT PURPOSES AS SHOWN ON THE DRAWINGS. ANY DISCREPANCIES NOT REPORTED TO THE CONTRACT ADMINISTRATOR FOR CLARIFICATION WILL BECOME THE RESPONSIBILITY OF THE CONTRACTOR.
- 7. GROUT SHALL BE OF THE NON-SHRINK, NON-METALLIC TYPE. MINIMUM 28 DAYS COMPRESSIVE STRENGTH SHALL BE 40 MPa.
- 8. BONDING SURFACE BETWEEN NEW AND PREVIOUSLY POURED CONCRETE SHALL BE SATURATED SURFACE DRY. ROUGHENED CONCRETE SURFACES SHALL BE WET ABRASIVE BLAST CLEANED TO SOUND CONCRETE IN ACCORDANCE WITH ASTM STANDARD D 4259 TO A MINIMUM PROFILE 6mm.
- 9. BEARING SEATS SHALL BE FINISHED SMOOTH AND LEVELED TO EXACT ELEVATION SHOWN.

REINFORCING STEEL NOTES

- 1. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA-G30.18 GRADE 400W, UNLESS NOTED OTHERWISE.
- 2. FOR SIDEWALK/ATP SLABS, RETAINING WALL CAPS AND CLADDING, & TRAFFIC BARRIERS: STAINLESS STEEL CONFORMING TO ASTM A955M, GRADE 0 (420), TYPE 2205 DUPLEX (UNS S30803), TYPE 316 LN (UNS S31653), TYPE XM-28 (S24100), TYPE 2304 (UNS S32304).
- 3. FOR PIER CAISSON AND PIER CAP GALVANIZED REINFORCEMENT SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A767M-00a TO A MINIMUM ZINC THICKNESS OF 610 g/m².
- 4. ALL LAPS OF REINFORCING BARS FOR SPLICES SHALL BE AS FOLLOWS:

BLACK / GALVANIZED	EQUIVALENT STAINLESS STEEL DIA.	REBAR	TOP BARS *
10M	10	400	550
15M	16	600	850
20M	19	800	1100
25M	25	1100	1550
30M	29	1600	2150
35M	36	2200	3050

*HORIZONTAL REINFORCEMENT WITH MORE THAN 300mm CONCRETE BELOW BARS.

- 5. REINFORCEMENT LAPS TO BE STAGGERED UNLESS NOTED OTHERWISE.

STRUCTURAL STEEL

- 1. STEEL DESIGN IN ACCORDANCE WITH LISTED DESIGN CODES.
- 2. WORKMANSHIP, MATERIALS AND STEEL FABRICATION SHALL BE IN ACCORDANCE WITH THE AREMA AND CN RAIL SPECIFICATIONS.
- 3. WELDING SHALL BE IN ACCORDANCE WITH CSA-W59-13.
- 4. ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE NOTES ON THE STEEL FRAMING DRAWINGS.
- 5. WEATHERING STEEL CONFORMING TO CAN CSA G40.21-13, CHARPY V-NOTCH IMPACT TESTING, IMPACT TEST REQUIREMENTS WILL BE AS PER ZONE 3 SERVICE TEMPERATURES OF TABLE 15-1-14 OF AREMA CHAPTER 15 FOR FRACTURE CRITICAL MEMBERS, AND WILL BE AS PER ZONE 3 SERVICE TEMPERATURES OF TABLE 15-1-2 FOR NONFRACTURE CRITICAL ELEMENTS.
- 6. ALL SHOP AND FIELD CONNECTIONS SHALL BE BOLTED WITH HIGH-STRENGTH BOLTS EXCEPT WHERE OTHERWISE SHOWN OR NOTED IN THE DRAWINGS TO BE BOLTED WITH MACHINE BOLTS OR WELDED.
- 7. ALL HIGH-STRENGTH BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325M, TYPE 3, AND HAVE A HARDENED WASHER UNDER THE ELEMENT TURNED IN TIGHTENING.
- 8. BOLTS SHALL BE 22mm DIAMETER U.N.O.
- 9. HOLES SHALL BE 2mm LARGER THAN BOLT SIZE UNLESS OTHERWISE NOTED FOR SHOP FASTENERS AND 3mm LARGER THAN BOLT SIZE UNLESS OTHERWISE NOTED FOR FIELD FASTENERS. HOLES FOR SHOP FASTENERS SHALL BE SUBPUNCHED OR SUBDRILLED AND REAMED THROUGH A TEMPLATE IN ACCORDANCE WITH AREMA SPECIFICATIONS.
- 10. BOLT HEADS SHALL BE INSTALLED ON THE EXPOSED SURFACES OF THE GIRDER U.N.O.
- 11. TIGHTENING OF BOLT SHALL BE DONE BY THE TURN-OF-NUT METHOD PER AREMA AND SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325M TYPE 3 BOLTS.
- 12. SHOP ASSEMBLY AND MATCH MARKING OF ALL STRUCTURAL STEEL IS REQUIRED TO ENSURE PROPER FIT.
- 13. IN ADDITION TO THE REQUIREMENTS OF AREMA CHAPTER 15, SECTION 1.14 AND 3.5, NONDESTRUCTIVE TESTING OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES AS FOLLOWS:
a) VISUAL EXAMINATION - 100% OF ALL WELDS
b) RADIOGRAPHIC TEST METHOD - 100% OF BUTT JOINT GROOVE WELDS AT FLANGES AND WEB SPLICES. FOR BOTTOM FLANGES, TEST TO BE CARRIED OUT AFTER HEAT TREATMENT.
c) ULTRASONIC TEST METHOD - 100% OF FLANGE TO BEARING STIFFENERS BUTT GROOVE WELD. 100% OF FLANGE TO WEB PLATE BUTT GROOVE WELD OF FCM MEMBERS. 100% OF BOTTOM FLANGES AND 10% OF THE TOP FLANGES AND WEB SPLICES ON NON-FCM MEMBERS BUTT GROOVE WELDS. 10% OF ALL OTHER WELDS.
d) MAGNETIC PARTICLE TEST METHOD - 100% OF FILLET WELDS FOR MAIN MEMBERS AND 50% OF FILLET WELDS FOR SECONDARY MEMBERS.
- 14. NONDESTRUCTIVE TESTING OF THE FRACTURE CRITICAL MEMBERS TO BE PERFORMED BY AN INDEPENDENT TESTING COMPANY APPROVED BY THE CONTRACT ADMINISTRATOR, THE CITY, AND CN AND CONTRACTED FOR BY THE CONTRACT ADMINISTRATOR. PERSONNEL QUALIFICATION AND CERTIFICATION IS TO BE IN ACCORDANCE WITH CURRENT AREMA CHAPTER 15 SPECIFICATIONS FOR FRACTURE CRITICAL MEMBERS, COPIES OF THE TEST REPORTS ARE TO BE FURNISHED TO THE CONTRACT ADMINISTRATOR.
- 15. CERTIFIED COPIES OF THE MILL REPORTS FOR THE MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH THE SPECIFICATIONS, CONTRACT ADMINISTRATOR'S APPROVAL MUST BE OBTAINED PRIOR TO FABRICATION.
- 15. THE STRUCTURAL STEEL SHALL BE CLEANED AND LEFT UNPAINTED EXCEPT WHERE SPECIFIED ON DRAWINGS.

STEEL SHEET PILE

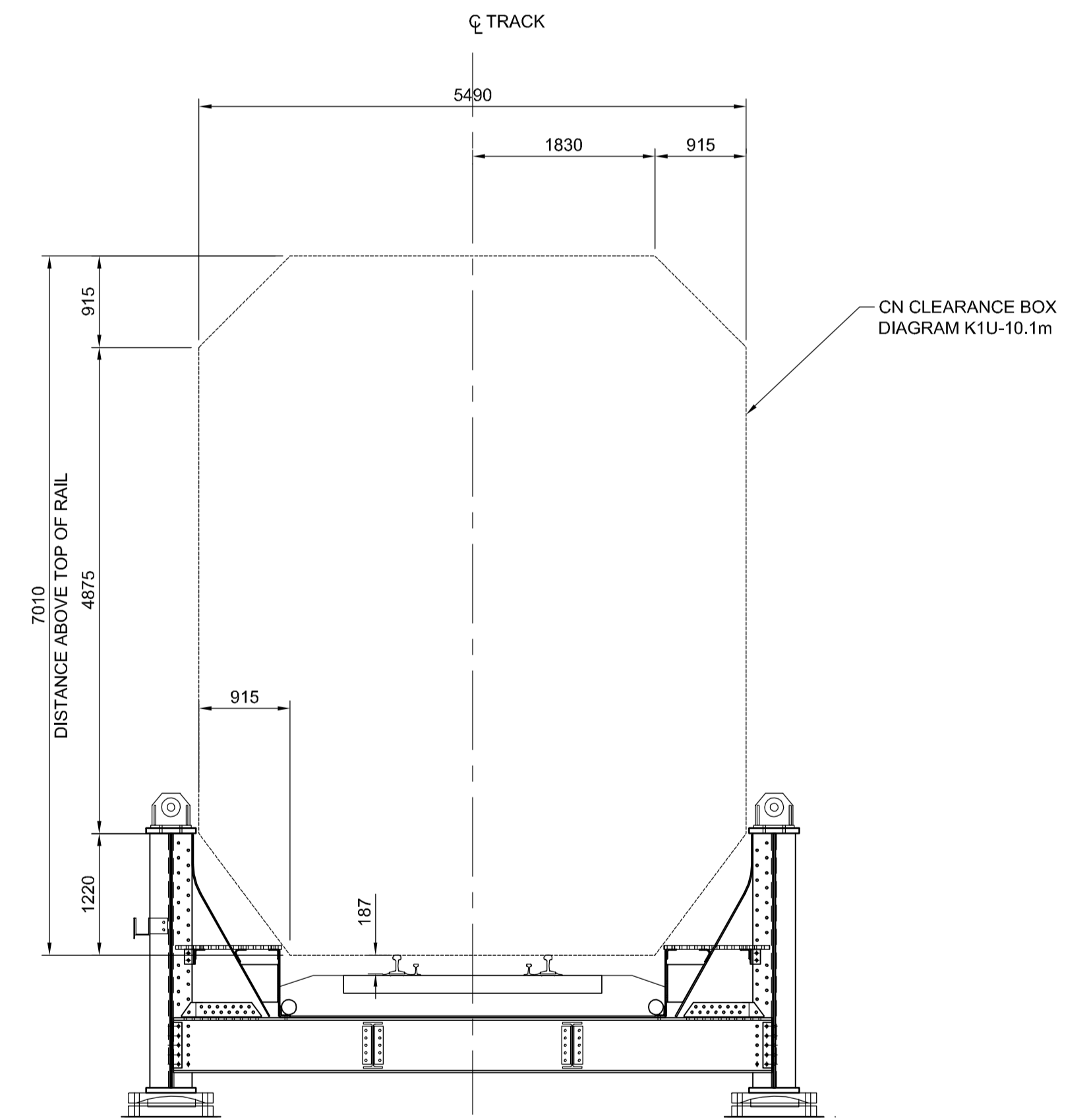
- 1. SHEET PILE SHALL BE HOT ROLLED SECTION AND IN ACCORDANCE WITH THE SPECIFICATIONS AND CAN/CSA G40.20 GRADE 350W.
- 2. UPPER SHEET PILE WALLS TO BE INSTALLED 50mm BACK FROM DESIGN LOCATION TO ACCOMMODATE WALL MOVEMENT AFTER EXCAVATION AND PRIOR TO CASTING THE CONCRETE CLADDING.
- 3. LOWER SHEET PILE WALLS TO BE INSTALLED 25mm BACK FROM DESIGN LOCATION AND WITH A 3% BATTER TO ACCOMMODATE WALL MOVEMENT AFTER EXCAVATION AND PRIOR TO CASTING THE CONCRETE CLADDING.

MISCELLANEOUS METAL NOTES

- 1. ALL MISCELLANEOUS METAL SHALL CONFORM TO CAN/CSA-G40.21 GRADE 350A, EXCEPT THE STAINLESS STEEL SIGN SHALL CONFORM TO AISI TYPE 316, U.N.O.
- 2. BOLTS SHALL CONFORM TO AISI TYPE 316 U.N.O. FOR STAINLESS STEEL SIGN.

LIST OF ABBREVIATIONS

ABUT	-	ABUTMENT	MAX	-	MAXIMUM
ADDL	-	ADDITIONAL	m	-	METRES
ALT.	-	ALTERNATE	M.F.	-	MID FACE
ATP	-	ACTIVE TRANSPORTATION PATHWAY	MIN.	-	MINIMUM
B/R	-	BASE OF RAIL	MK.	-	MARK
BOT.	-	BOTTOM	mm	-	MILLIMETRES
B.O.	-	BOTTOM OF	N.F.	-	NEAR FACE
BRG'S	-	BEARINGS	N.I.C.	-	NOT IN CONTRACT
C.I.P.	-	CAST IN PLACE	N.T.S.	-	NOT TO SCALE
C/C	-	CENTER TO CENTER	No.	-	NUMBER
CLR	-	CLEAR	O.C.	-	ON CENTER
C.M.P.	-	CORRUGATED METAL PIPE	O/O	-	OUT TO OUT
CTR'D	-	CENTERED	OPP.	-	OPPOSITE
C/W	-	COMPLETE WITH	PERF.	-	PERFORATED
CONC.	-	CONCRETE	PL.	-	PLATE
CONST.	-	CONSTRUCTION	PROJ.	-	PROJECTION
CONT.	-	CONTINUOUS	REINF.	-	REINFORCING
CSP	-	CORRUGATED STEEL PIPE	R.O.W.	-	RIGHT OF WAY
DJCP	-	DECK JOINT COVER PLATE	SK	-	SKEWED (FROM CL BEARING)
DWG.	-	DRAWING	SPCS	-	SPACES
E.F.	-	EACH FACE	SQ	-	SQUARE (TO CL BEARING)
EL	-	ELEVATION	SS	-	STAINLESS STEEL
ESCP	-	EROSION & SEDIMENTATION CONTROL PLAN	STA.	-	STATION
EXP.	-	EXPANSION	STIR	-	STIRRUP
FCM	-	FRACTURE CRITICAL MEMBER	STR.	-	STRAIGHT
F.F.	-	FAR FACE	SU	-	SUBSTRUCTURE UNIT
FIN	-	FINISHED	THK.	-	THICK
FTG	-	FOOTING	T & B	-	TOP AND BOTTOM
GALV.	-	GALVANIZED	T.O.	-	TOP OF
G.W.L.	-	GROUND WATER LEVEL	T.P.G.	-	THROUGH PLATE GIRDER
EL	-	GROUP	TYP.	-	TYPICAL
HORIZ	-	HORIZONTAL	U.N.O.	-	UNLESS NOTED OTHERWISE
LG.	-	LONG	UIS	-	UNDERSIDE
LW	-	LAP WITH	VERT.	-	VERTICAL
			WP	-	WORK POINT



STANDARD CLEARANCE DIAGRAM

Scale 1:50

BID OPPORTUNITY NO. 712-2013

LOCATION APPROVED UNDERGROUND STRUCTURES	B.M. ELEV.	DESIGNED BY FT	CHECKED BY CD	ENGINEER'S SEAL PROVINCE OF MANITOBA ORIGINAL SIGNED BY F. TABET Member 30659 ON NOV 21, 2013 REGISTERED PROFESSIONAL ENGINEER	THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT	CITY DRAWING NUMBER U238-2014-2001	
						SHEET 01 OF 37	
SUPV. U/G STRUCTURES COMMITTEE DATE		DRAWN BY DJH	APPROVED BY EBL	CONSULTANT DRAWING NO. 60273041-01-CS-001	PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION CONTRACT 3	BRIDGE & RETAINING WALLS GENERAL NOTES	CS-0001
NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT NO GUARANTEE IS GIVEN 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.		HOR. SCALE: AS NOTED	RELEASED FOR CONSTRUCTION BY:	DATE 2013-06-04			
		NO. REVISIONS	DATE	DATE			

