A1 SIZE (594 mm x 841 mm)

BILL OF REINFORCING STEEL
FOR BOX CULVERT (SUBSTRUCTURE)

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
C1520–13	BENT	95	1 930	2	6.06	1045, 127, 305, 580
C1520–14	BENT	95	2 020	2	6.34	1135, 127, 305, 580
C1520–15	BENT	95	2 110	2	6.63	1225, 127, 305, 580
C1520–16	BENT	95	2 195	2	6.89	1310, 127, 305, 580
C1520–17	BENT	95	2 285	2	7.17	1400, 127, 305, 580
C1520–18	BENT	95	2 370	2	7.44	1485, 127, 305, 580
C1520–19	BENT	95	2 460	2	7.72	1575, 127, 305, 580
C1520–20	BENT	95	2 550	2	8.01	1665, 127, 305, 580
C2001	BENT	120	5 630	74	981.14	4 880, 375, 375
C2002	BENT	120	5 360	123	1 552.60	4 880, 240, 240
C2003	BENT	120	5 360	147	1 855.55	4 880, 240, 240
C2004	BENT	120	5 630	74	981.14	4 880, 375, 375
C2005	BENT	120	1 965	246	1 138.38	240, 1 725

CONTINUED→

BILL OF REINFORCING STEEL
FOR BOX CULVERT (SUBSTRUCTURE)

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
C2006	BENT	120	1 930	246	1 118.11	240, 1 690
C2007	STR		9 255	12	261.55	
C2008	BENT	120	1 720	74	299.74	120, 800, 800
C2009	BENT	120	2 680	8	50.49	300, 2 380
C2010–1	BENT	120	2 880	4	27.13	300, 2 580
C2010–2	BENT	120	3 310	4	31.18	300, 3 010
C2010–3	BENT	120	3 735	4	35.18	300, 3 435
C2010–4	BENT	120	4 160	4	39.19	300, 3 860
C2010–5	BENT	120	4 585	4	43.19	300, 4 285
C2010–6	BENT	120	5 010	4	47.19	300, 4 710
C2011	STR		14 775	2	69.59	
C2012	STR		15 255	12	431.11	
C2013	STR		6 590	15	232.79	
C2014–1	BENT	120	2 060	2	9.70	53°, 900, 1 160
C2014–2	BENT	120	2 790	2	13.14	53°, 900, 1 890
C2014–3	BENT	120	3 520	2	16.58	53°, 900, 2 620
C2014–4	BENT	120	4 245	2	19.99	53°, 900, 3 345

CONTINUED→

BILL OF REINFORCING STEEL
FOR BOX CULVERT (SUBSTRUCTURE)

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
C2014–5	BENT	120	4 975	2	23.43	53°, 900, 4 075
C2014–6	BENT	120	5 705	2	26.87	53°, 900, 4 805
C2015	BENT	120	2 680	16	100.98	300, 2 380
C2016	STR		6 810	14	224.53	
C2017	BENT	120	1 150	6	16.25	53°, 900, 250
C2018–1	BENT	120	3 280	2	15.45	300, 2 980
C2018–2	BENT	120	3 725	2	17.54	300, 3 425
C2018–3	BENT	120	4 170	2	19.64	300, 3 870
C2019–1	BENT	120	2 235	2	10.53	53°, 900, 1 335
C2019–2	BENT	120	2 680	2	12.62	53°, 900, 1 780
C2019–3	BENT	120	3 125	2	14.72	53°, 900, 2 225
C2019–4	BENT	120	3 570	2	16.81	53°, 900, 2 670
C2020	BENT	120	4 740	10	111.63	300, 4 440
C2021	BENT	120	4 800	24	271.30	300, 4 500
C2022	BENT	120	1 115	122	320.35	515, 300, 35°, 35°, 300

TOTAL MASS OF REINFORCING STEEL: 17 208.25 kg

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

NOTE:
These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract.

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
WSP Canada Group Limited
No. 6657

LOCATIONS APPROVED UNDERGROUND STRUCTURES

SIGNED BY: _____ SUPV U/G STRUCTURES
DATE _____

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 EXISTANCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING

G.B.M. = TOP NUT OF FIRST HYDRANT SOUTH OF INTERSECTION BETWEEN NESS AVENUE AND LINWOOD STREET
ELEV. = 233.659

No.	REVISIONS	DATE	BY
0	ISSUED FOR TENDER	17.11.23	JL

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www.wsp.com

DESIGNED BY	AG	CHECKED BY	MLW
DRAWN BY	CP	APPROVED BY	JL
HOR. SCALE	N.T.S.	RELEASED FOR CONSTRUCTION	
VERTICAL	N.T.S.		
DATE	17.11.23	DATE	

ENGINEER'S SEAL
PROVINCE OF MANITOBA
ATEFAR
Member
37456
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT PROJECT No.
17M-00806-00

Winnipeg

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TRURO CREEK CULVERT REPLACEMENT AT WINCHESTER STREET

BILL OF REINFORCING STEEL (SHEET 2 OF 3)

CITY DRAWING NUMBER: C322-17-22
BID OPPORTUNITY NUMBER: 1014-2017
SHEET 22 OF 25
REV 0

Plotted: November 24, 2017 at 1:23:40 PM | Last saved by: dzvitf
File: P:\2017\17M-00806-00 – Truro Creek Culvert Replacements\MM Drawings\17M-00806-00 Truro Creek Culvert Replacements DD Winchester 21 bill of materials.dwg | Layout: 22 Bill of Reinforcing Steel (Sheet 2 of 3)