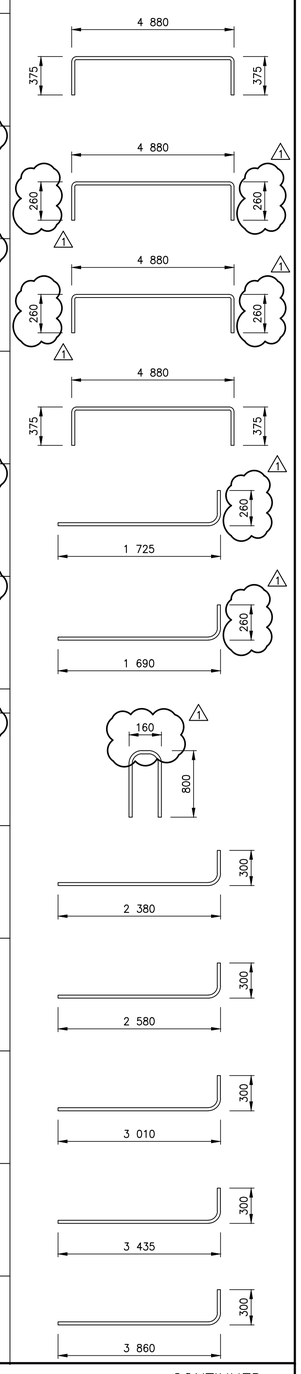
A1 SIZE (594 mm x 841 mm)

BILL OF REINFORCING STEEL
FOR BOX CULVERT (SUBSTRUCTURE)

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS
C2001	BENT	120	5 630	74	981.14
C2002	BENT	120	5 400 ⚠1	123	1 564.19 ⚠1
C2003	BENT	120	5 400 ⚠1	147	1 869.40 ⚠1
C2004	BENT	120	5 630	74	981.14
C2005	BENT	120	1 985 ⚠1	246	1 149.97 ⚠1
C2006	BENT	120	1 950 ⚠1	246	1 129.69 ⚠1
C2007	STR		9 255	24	523.09
C2008	BENT	120	1 760 ⚠1	84	348.16 ⚠1
C2009	BENT	120	2 680	16	100.98
C2010–1	BENT	120	2 880	8	54.26
C2010–2	BENT	120	3 310	8	62.36
C2010–3	BENT	120	3 735	8	70.37
C2010–4	BENT	120	4 160	8	78.37

BENDING DIAGRAM

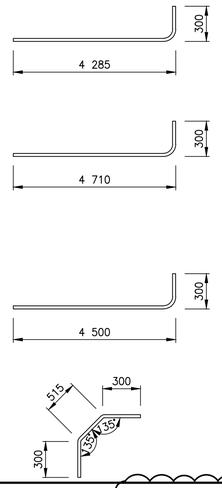


CONTINUED→

BILL OF REINFORCING STEEL
FOR BOX CULVERT (SUBSTRUCTURE)

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS
C2010–5	BENT	120	4 585	8	86.38
C2010–6	BENT	120	5 010	8	94.39
C2011	STR		14 775	4	139.18
C2012	STR		15 255	28	1 005.91
C2013	BENT	120	4 800	48	542.59
C2014	BENT	120	1 115	126	330.85

BENDING DIAGRAM

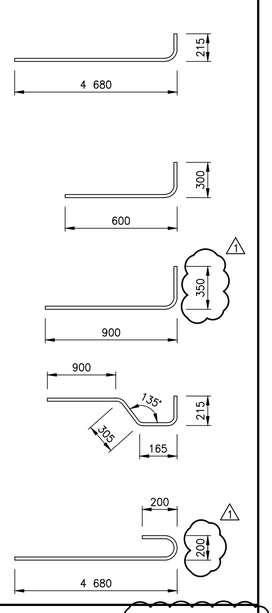


TOTAL MASS OF REINFORCING STEEL: 18 787.93 kg ⚠1

BILL OF REINFORCING STEEL
FOR TWO APPROACH SLABS

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS
A1001	STR		4 680	4	14.70
A1501	BENT	95	4 895	76	584.07
A1502	STR		3 675	96	553.90
A1503	BENT	95	900	76	107.39
A1504	BENT	95	1 250 ⚠1	148	290.45 ⚠1
A1505	BENT	95	1 585	120	298.61
A2001	STR	120	7 500	80	1 413.00
A2501	BENT	150 ⚠1	5 080	120	2 392.68 ⚠1

BENDING DIAGRAM



TOTAL MASS OF REINFORCING STEEL: 5 654.80 kg ⚠1

BILL OF REINFORCING STEEL
FOR FOUR TRANSITION BARRIERS

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS
B1501	STR		2 130	117	391.26
B1502	STR		2 880	72	325.56
B1503	STR		2 380	16	59.79
B2001–1	STR		1 000	6	14.13
B2001–2	STR		950	6	13.42
B2001–3	STR		900	6	12.72
B2001–4	STR		850	6	12.01
B2001–5	STR		800	6	11.30
B2001–6	STR		750	6	10.60
B2001–7	STR		700	6	9.89
B2001–8	STR		650	6	9.18
B2001–9	STR		600	6	8.48
B2001–10	STR		550	6	7.77
B2001–11	STR		510	6	7.21
B2001–12	STR		460	6	6.50
B2001–13	STR		410	6	5.79
B2001–14	STR		360	6	5.09
B2001–15	STR		310	6	4.38
B2002–1	STR		970	2	4.57
B2002–2	STR		880	2	4.14
B2002–3	STR		790	2	3.72
B2002–4	STR		700	2	3.30
B2002–5	STR		600	2	2.83
B2002–6	STR		510	2	2.40
B2002–7	STR		420	2	1.98
B2002–8	STR		340	2	1.60

TOTAL MASS OF REINFORCING STEEL: 939.62 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: _____ DATE _____
SUPV U/G STRUCTURES

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
1	ISSUED FOR ADDENDUM No. 2	17.12.08	JL
0	ISSUED FOR TENDER	17.11.23	JL

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www.wsp.com

DESIGNED BY	AG	CHECKED BY	MLW
DRAWN BY	FD	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
A. CHATEFAR
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 LINWOOD STREET

BILL OF REINFORCING STEEL (SHEET 2 OF 2)

CITY DRAWING NUMBER: C321-17-17
BID OPPORTUNITY NUMBER: 1014-2017
SHEET 17 OF 19
REV 1

Plotted: December 8, 2017 at 12:16:43 PM | Last saved by: Petersonc
File: P:\2017\17M-00806-00 – Truro Creek Culvert Replacements\MMM Drawings\17M-00806-00 Truro Creek Culvert Replacements DD Linwood 16 17 bill of materials.dwg | Layout: 17 Bill of Reinforcing Steel (Sheet 2 of 2)