

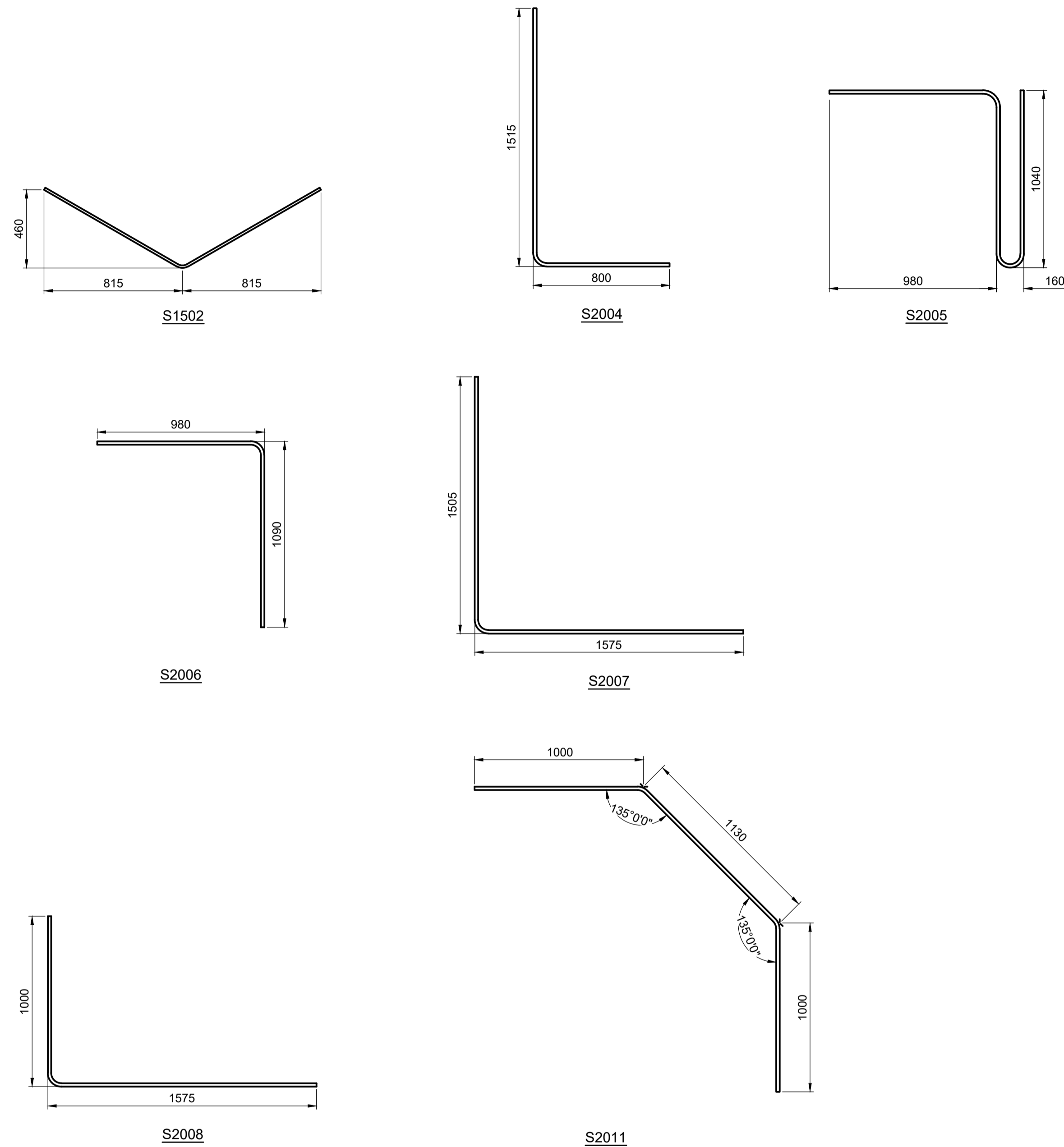
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 Last Saved: 9/13/2017 1:54 PM by mshaabbir
 Plotted: 9/13/2017 1:54 PM by Mufaddal Shaabbir
 ISO A1 - 594mm x 841mm

BILL OF REINFORCING STEEL (BLACK STEEL)

FOR HEADWALLS AND APRON SLAB

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
S1501	STR	-	6200	48	467.2320
S1502	BENT	-	1870	120	352.3080
S1503	STR	-	6475	80	813.2600
S1504	STR	-	13270	12	250.0068
S1505	STR	-	1600	16	40.1920
S2001	STR	-	5750	88	1191.6300
S2002	STR	-	5420	8	102.1128
	STR	-	4900	8	92.3160
	STR	-	4380	8	82.5192
	STR	-	3860	8	72.7224
	STR	-	3340	8	62.9256
	STR	-	2820	8	53.1288
	STR	-	2300	8	43.3320
	STR	-	1780	8	33.5352
	STR	-	1260	8	23.7384
	STR	-	740	8	13.9416
S2003	STR	-	13130	4	123.6846
	STR	-	12955	4	122.0361
	STR	-	12780	4	120.3876
	STR	-	12610	4	118.7862
	STR	-	12435	4	117.1377
	STR	-	12260	4	115.4892
	STR	-	12090	4	113.8878
	STR	-	11915	4	112.2393
	STR	-	11745	4	110.6379
	STR	-	11570	4	108.9894
	STR	-	11395	4	107.3409
	STR	-	11220	4	105.6924
	STR	-	11050	4	104.0910
	STR	-	10875	4	102.4425
	STR	-	10700	4	100.7940
	STR	-	10530	4	99.1926
	STR	-	10355	4	97.5441
	STR	-	10180	4	95.8956
	STR	-	10010	4	94.2942
	STR	-	9835	4	92.6457
	STR	-	9660	4	90.9972
	STR	-	9490	4	89.3958
	STR	-	9315	4	87.7473
	STR	-	9140	4	86.0988
	STR	-	8970	4	84.4974
	STR	-	8795	4	82.8489
	STR	-	8625	4	81.2475
	STR	-	8450	4	79.5990
	STR	-	8275	4	77.9505
	STR	-	8105	4	76.3491
	STR	-	7930	4	74.7006
	STR	-	7755	4	73.0521
	STR	-	7585	4	71.4507
	STR	-	7410	4	69.8022
	STR	-	7235	4	68.1537
	STR	-	7065	4	66.5523
	STR	-	6890	4	64.9038
	STR	-	6720	4	63.3024
	STR	-	6545	4	61.6539
S2004	BENT	-	2315	156	850.4847
S2005	BENT	-	3220	90	682.4790
S2006	BENT	-	2070	90	438.7365
S2007	BENT	-	3080	28	203.0952
S2008	BENT	-	2575	136	824.7210
S2009	STR	-	2750	28	181.3350
S2010	STR	-	950	16	35.7960
	STR	-	730	16	27.5064
	STR	-	575	16	21.6660
	STR	-	465	16	17.5212
	STR	-	380	16	14.3184
	STR	-	320	16	12.0576
	STR	-	280	16	10.5504
	STR	-	255	24	14.4126
S2011	BENT	-	3130	32	235.8768
S2012	STR	-	450	108	114.4530
TOTAL REINFORCING STEEL MASS - BLACK STEEL (kg):					10993.4226

BENDING DIAGRAM (1:20)

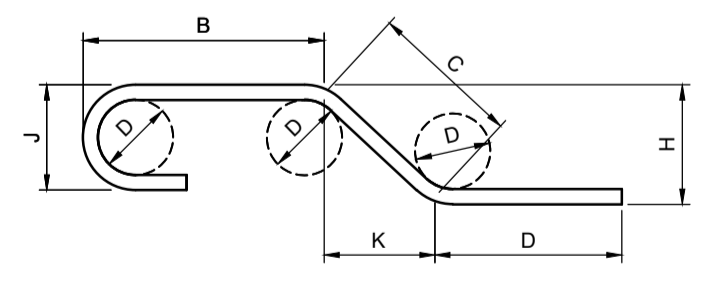


BILL OF MISCELLANEOUS METAL

MARK	NO.	DESCRIPTION	SIZE	COMPONENT MASS (kg)	MASS PER UNIT (kg)	TOTAL MASS (kg)
P1	32	PL 12 X 75 X 1100 SS AS DETAILED	-	7.63	7.63	244.16
R1	128	19 Ø X 225 LONG SS ANCHOR RODS C/W PLAIN SS WASHER AND SS NUT	-	0.54	0.54	69.12
P2	20	PL 13 X 140 X 200 (GALV) AS DETAILED	-	1.67	1.67	33.40
R2	40	16 Ø X 190 LONG SS ANCHOR RODS C/W PLAIN SS WASHER AND SS NUT	-	0.32	0.32	12.80

NOTES:

- ALL DIMENSIONS GIVEN IN BENDING DIAGRAM ARE OUT-TO-OUT, EXCEPT RADII AND EXTENSIONS ON 90°, 135° & 180° HOOKS. EXTENSIONS ON 90°, 135° & 180° HOOKS ARE THE "A" OR "G" DIMENSIONS FOR THE STANDARD 90°, 135° & 180° HOOKS REFERENCED FROM THE RSIC "MANUAL OF STANDARD PRACTICE". RADII ARE INSIDE DIMENSIONS. ALL REINFORCING STEEL SHALL CONFORM TO THE LATEST EDITION OF CAN/CSA-S6 CLAUSE 8.14 "DETAILS OF REINFORCEMENT AND SPECIAL DETAILING PROVISIONS", UNLESS NOTED OTHERWISE IN THE BILL OF REINFORCING STEEL.
- ALL REINFORCING STEEL SHALL BE DEFORMED STEEL, UNLESS NOTED OTHERWISE IN THE BILL OF REINFORCING STEEL.
- ALL REINFORCING STEEL SHALL CONFORM TO THE LATEST EDITION OF CAN/CSA G30.18 "CARBON STEEL BARS FOR CONCRETE REINFORCEMENT" GRADE 400W, UNLESS NOTED OTHERWISE.
- LIKE BARS SHALL BE BUNDLED, SECURELY TIED AND IDENTIFIED AS TO MARK AND SITE NO. BY APPROPRIATE MEANS. ALL OTHER ITEMS TO BE IDENTIFIED IN A SIMILAR FASHION.
- UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME ALL HOOKS AND BENDS ON A BAR. WHERE SLOPE DIFFERS FROM 45° DIMENSIONS "H" AND "K" MUST BE SHOWN.



BID OPPORTUNITY No. 698-2017



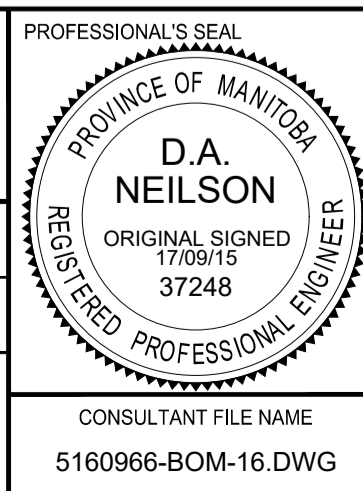
METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED UNDERGROUND STRUCTURES

SUPR. U/G STRUCTURES DATE _____
NOTE:
 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 EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

NO.	REVISIONS	DATE	BY
0	ISSUED FOR TENDER	17/09/15	DAN

DESIGNED BY: AGG		CHECKED BY: BE	
DRAWN BY: MS		APPROVED BY: SAL	
HOR SCALE: NTS		RELEASED FOR CONSTRUCTION	
VERT SCALE:		DATE:	



THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

RUE DES TRAPPISTES AT WESTENDORF
COULEE CULVERT REPLACEMENT AND
ROAD RECONSTRUCTION
BILL OF STEEL REINFORCEMENT AND
BILL OF MATERIALS

CITY DRAWING NUMBER
C372-17-16

SHEET 16 OF 22

DRAWING No. 16
REV 0