BILL OF REINFORCING STEEL

1

SOUTH ABUTMENT (SA)

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 1 SOUTHBOUND (STAINLESS STEEL)					
SA1601SS	STR	-	10000	10	155.60
SA1602SS	STR	-	5450	10	84.80
SA1603SS	BENT	95	1705	101	267.95
SA1604SS	STR	-	3450	102	547.56
SA1605SS	BENT	95	970	39	58.86
SA1606SS	BENT	95	1500	39	91.03
SA1607SS	STR	-	10330	4	64.29
SA1608SS	STR	-	3250	4	20.23
SA1609SS	STR	-	800	22	27.39
SA1610SS	BENT	95	1180	19	34.89
SA1611SS	STR	-	3900	4	24.27
SA1901SS	STR	-	10000	106	2374.40
SA1902SS	STR	-	5600	106	1329.66
SA1903SS	BENT	115	3430	51	391.84
SA1906SS	STR	-	3900	51	445.54
SA1907SS	STR	-	10400	51	1188.10
SA1908SS	STR	-	2400	63	338.69
SA1909SS	BENT	115	2030	63	286.47
SA1910SS	BENT	115	2155	6	28.96
SA2501SS	STR	-	2400	63	593.46
SA2502SS	BENT	150	1960	6	46.16
TOTAL STAINLESS STEEL REINFORCING MASS (kg):					8400.15

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 1 SOUTHBOUND (BLACK STEEL)					
SA1001	BENT	60	630	175	86.55
SA1002	STR	-	1300	2	2.04
SA1501	BENT	90	2225	20	69.87
SA1502	BENT	90	3070	52	250.63
SA1503	BENT	90	2975	4	18.68
SA1504	BENT	90	1885	4	11.84
SA1505	BENT	90	1980	12	37.30
SA1506	BENT	90	5130	15	120.81
SA1507	BENT	90	2490	20	78.19
SA1508-1	STR	-	4800	4	30.14
SA1508-2	STR	-	3950	4	24.81
SA1508-3	STR	-	2950	4	18.53
SA1509	STR	-	2125	3	10.01
SA1510	BENT	90	995	4	6.25
SA1511	STR	-	750	3	3.53
SA2001	BENT	100	1985	20	93.49
SA2002	BENT	100	3010	16	113.42
SA2003	BENT	100	2225	27	141.48
SA2004	BENT	100	1815	6	25.65
SA2005	BENT	100	835	6	11.80
SA2006	BENT	100	2300	63	341.24
SA2007-1	STR	-	2625	17	105.09
SA2007-2	STR	-	9440	17	377.93
SA2007-4	STR	-	3925	17	157.14
SA2008	BENT	100	1740	10	40.98
SA2009	STR	-	2275	1	5.36
SA2505	STR	-	5760	8	180.86
SA2506	STR	-	5664	11	244.54
SA2507	STR	-	5615	11	242.43
SA2508	STR	-	5570	8	174.90
TOTAL BLACK STEEL REINFORCING MASS (kg):					3025.47

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 2 NORTHBOUND (STAINLESS STEEL)					
SA1601SS	STR	-	10000	10	155.60
SA1602SS	STR	-	5450	10	84.80
SA1603SS	BENT	95	1705	101	267.95
SA1604SS	STR	-	3450	102	547.56
SA1605SS	BENT	95	970	39	58.86
SA1606SS	BENT	95	1500	39	91.03
SA1607SS	STR	-	10330	4	64.29
SA1608SS	STR	-	3250	4	20.23
SA1609SS	STR	-	800	22	27.39
SA1610SS	BENT	95	1180	19	34.89
SA1611SS	STR	-	3900	4	24.27
SA1901SS	STR	-	10000	106	2374.40
SA1902SS	STR	-	5600	106	1329.66
SA1903SS	BENT	115	3430	51	391.84
SA1904SS	STR	-	9500	51	1085.28
SA1905SS	STR	-	4700	51	536.93
SA1908SS	STR	-	2400	63	338.69
SA1909SS	BENT	115	2030	63	286.47
SA2501SS	STR	-	2400	63	593.46
TOTAL STAINLESS STEEL REINFORCING MASS (kg):					8313.60

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 2 NORTHBOUND (BLACK STEEL)					
SA1001	BENT	60	630	175	86.55
SA1501	BENT	90	2225	20	69.87
SA1502	BENT	90	3070	52	250.63
SA1503	BENT	90	2975	4	18.68
SA1504	BENT	90	1885	4	11.84
SA1505	BENT	90	1980	12	37.30
SA1506	BENT	90	5130	15	120.81
SA1507	BENT	90	2490	20	78.19
SA1508-1	STR	-	4800	4	30.14
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SA1508-3	STR	-	2950	4	18.53
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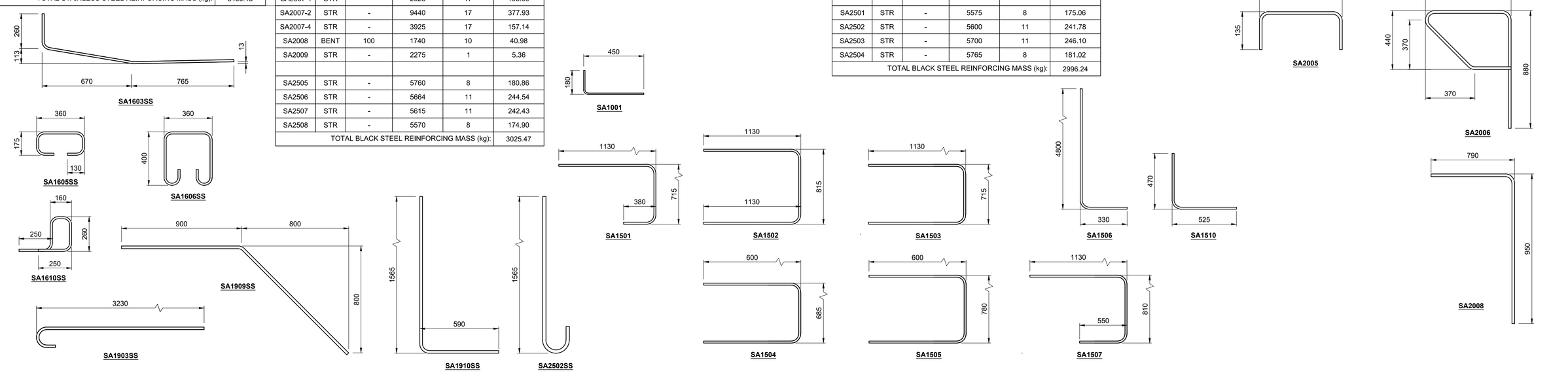
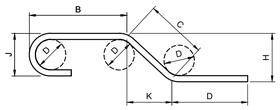
SA1511	STR	-	750	3	3.53
SA2001	BENT	100	1985	20	93.49
SA2002	BENT	100	3010	16	113.42
SA2003	BENT	100	2225	27	141.48
SA2006	BENT	100	2300	63	341.24
SA2007-1	STR	-	2625	17	105.09
SA2007-2	STR	-	9440	17	377.93
SA2007-3	STR	-	4125	17	165.14
SA2008	BENT	100	1740	14	57.37
SA2501	STR	-	5575	8	175.06
SA2502	STR	-	5600	11	241.78
SA2503	STR	-	5700	11	246.10
SA2504	STR	-	5765	8	181.02
TOTAL BLACK STEEL REINFORCING MASS (kg):					2996.24

BENDING DIAGRAM (NTS)



NOTES:

1. 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.
2. ALL REINFORCING STEEL SHALL BE DEFORMED STEEL, UNLESS NOTED OTHERWISE IN THE BILL OF REINFORCING STEEL.
3. ALL REINFORCING WITH SUFFIX "SS" SHALL BE STAINLESS STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A955M, 300 SERIES, MINIMUM GRADE 420, OF ONE OF THE FOLLOWING UNS DESIGNATIONS: S31653, S31803, OR S32304.
4. 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.
5. 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.
6. 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.
7. BILL OF REINFORCING AND BENDING DIAGRAMS DO NOT INCLUDE CHANGES MADE DURING CONSTRUCTION. RECORD DRAWING REINFORCEMENT CHANGES ARE INCLUDED IN THE RESPECTIVE REINFORCING DETAILS.



ENLARGED VIEW BAR BENDING DETAILS

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
MORRISON HERSHFIELD
No. 1736

TENDER No. 615-2022

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPR. U/G STRUCTURES COMMITTEE — 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.

BM 54-006 — Tblt. in S. face of E. Conc. pier in 1st row of Conc. piers N. of S. end of St. Vital Bridge over Red River, N. of Kingston Row, 5 m W. of E. end of Pier.
ELEV 228.166 m

No.	REVISIONS	YY/MM/DD	BY
1	REVISED FOR ADDENDUM 1	22/12/13	BAP
0	ISSUED FOR TENDER	22/11/24	BAP

MORRISON HERSHFIELD

DESIGNED BY	SF	CHECKED BY	AGG
DRAWN BY	AH	APPROVED BY	BE
HOR SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION	
VERT SCALE	AS SHOWN		
DATE	NOV 24, 2022	DATE	

PROFESSIONAL'S SEAL
PROVINCE OF MANITOBA — S. Faraz — Member 42621 — 2023-12-14 — REGISTERED PROFESSIONAL ENGINEER

CONSULTANT FILE NAME
2103510-SVB DD-BR-ABUT13.dwg

Winnipeg

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ST. VITAL TWIN BRIDGE OVER THE RED RIVER
REHABILITATION AND RELATED WORKS

BRIDGE REHABILITATION
BILL OF REINFORCING - SOUTH ABUTMENT

CITY FILE NUMBER: B116-24-20
SHEET 106 OF 244
DRAWING NUMBER: 106

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

ISO A1 - 594mm x 841mm

X:\Proj\2021\2103510\00-St Vital Bridge over Red River PD\09. CAD\07 Sheets\Structural\Detailed Design\2103510-SVB DD-BR-ABUT13.dwg Last Saved: 12/14/2022 10:15 AM by AHeppner Plotted: 12/14/2022 3:18 PM, by Alex Heppner