BILL OF REINFORCING STEEL

NORTH ABUTMENT (NA)

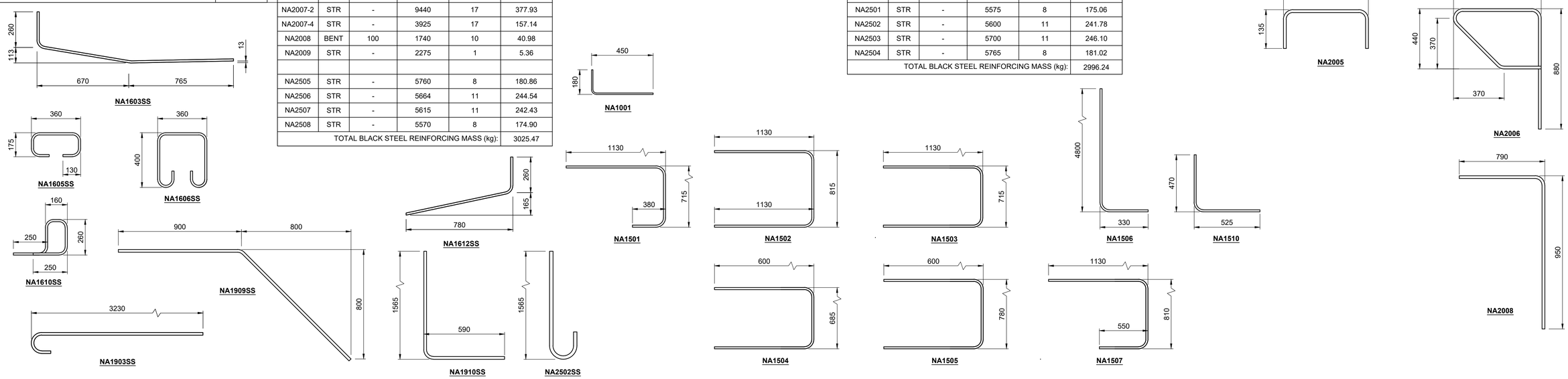
MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 1 NORTHBOUND (STAINLESS STEEL)					
NA1601SS	STR	-	10000	10	155.60
NA1602SS	STR	-	5450	10	84.80
NA1603SS	BENT	95	1705	101	267.95
NA1604SS	STR	-	3450	102	547.56
NA1605SS	BENT	95	970	39	58.86
NA1606SS	BENT	95	1500	39	91.03
NA1607SS	STR	-	10330	4	64.29
NA1608SS	STR	-	3250	4	20.23
NA1609SS	STR	-	800	22	27.39
NA1610SS	BENT	95	1180	19	34.89
NA16011S	STR	-	3900	4	24.27
NA1901SS	STR	-	10000	104	2329.60
NA1902SS	STR	-	5600	104	1304.58
NA1903SS	BENT	115	3430	51	391.84
NA1904SS	STR	-	10340	51	1181.24
NA1905SS	STR	-	4130	51	471.81
NA1908SS	STR	-	2400	63	338.69
NA1909SS	BENT	115	2030	63	286.47
NA1910SS	BENT	115	2155	6	28.96
NA2501SS	STR	-	2400	63	593.46
NA2502SS	BENT	150	1960	6	46.16
TOTAL REINFORCING STEEL MASS (kg):					8349.68

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 1 NOUTHBOUND (BLACK STEEL)					
NA1001	BENT	60	630	175	86.55
NA1002	STR	-	1300	2	2.04
NA1501	BENT	90	2225	20	69.87
NA1502	BENT	90	3070	52	250.63
NA1503	BENT	90	2975	4	18.68
NA1504	BENT	90	1885	4	11.84
NA1505	BENT	90	1980	12	37.30
NA1506	BENT	90	5130	15	120.81
NA1507	BENT	90	2490	20	78.19
NA1508-1	STR	-	4800	4	30.14
NA1508-2	STR	-	3950	4	24.81
NA1508-3	STR	-	2950	4	18.53
NA1509	STR	-	2125	3	10.01
NA1510	BENT	90	995	4	6.25
NA1511	STR	-	750	3	3.53
NA2001	BENT	100	1985	20	93.49
NA2002	BENT	100	3010	16	113.42
NA2003	BENT	100	2225	27	141.48
NA2004	BENT	100	1815	6	25.65
NA2005	BENT	100	835	6	11.80
NA2006	BENT	100	2300	63	341.24
NA2007-1	STR	-	2625	17	105.09
NA2007-2	STR	-	9440	17	377.93
NA2007-4	STR	-	3925	17	157.14
NA2008	BENT	100	1740	10	40.98
NA2009	STR	-	2275	1	5.36
NA2505	STR	-	5760	8	180.86
NA2506	STR	-	5664	11	244.54
NA2507	STR	-	5615	11	242.43
NA2508	STR	-	5570	8	174.90
TOTAL BLACK STEEL REINFORCING MASS (kg):					3025.47

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 2 SOUTHBOUND (STAINLESS STEEL)					
NA1601SS	STR	-	10000	10	155.60
NA1602SS	STR	-	5450	10	84.80
NA1604SS	STR	-	3450	102	547.56
NA1605SS	BENT	95	970	39	58.86
NA1606SS	BENT	95	1500	39	91.03
NA1607SS	STR	-	10330	4	64.29
NA1608SS	STR	-	3250	4	20.23
NA1609SS	STR	-	800	22	27.39
NA1610SS	BENT	95	1180	19	34.89
NA1611SS	STR	-	3900	4	24.27
NA1612SS	BENT	95	1060	101	166.59
NA1901SS	STR	-	10000	103	2307.20
NA1902SS	STR	-	5600	103	1292.03
NA1903SS	BENT	115	3430	51	391.84
NA1906SS	STR	-	4080	51	466.10
NA1907SS	STR	-	10330	51	1180.10
NA1908SS	STR	-	2400	63	338.69
NA1909SS	BENT	115	2030	63	286.47
NA2501SS	STR	-	2400	63	593.46
TOTAL REINFORCING STEEL MASS (kg):					8131.40

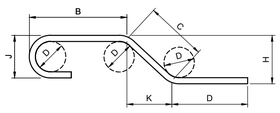
MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS
STAGE 2 SOUTHBOUND (BLACK STEEL)					
NA1001	BENT	60	630	175	86.55
NA1501	BENT	90	2225	20	69.87
NA1502	BENT	90	3070	52	250.63
NA1503	BENT	90	2975	4	18.68
NA1504	BENT	90	1885	4	11.84
NA1505	BENT	90	1980	12	37.30
NA1506	BENT	90	5130	15	120.81
NA1507	BENT	90	2490	20	78.19
NA1508-1	STR	-	4800	4	30.14
NA1508-2	STR	-	3950	4	24.81
NA1508-3	STR	-	2950	4	18.53
NA1510	BENT	90	995	4	6.25
NA1511	STR	-	750	3	3.53
NA2001	BENT	100	1985	20	93.49
NA2002	BENT	100	3010	16	113.42
NA2003	BENT	100	2225	27	141.48
NA2006	BENT	100	2300	63	341.24
NA2007-1	STR	-	2625	17	105.09
NA2007-2	STR	-	9440	17	377.93
NA2007-3	STR	-	4125	17	165.14
NA2008	BENT	100	1740	14	57.37
NA2501	STR	-	5575	8	175.06
NA2502	STR	-	5600	11	241.78
NA2503	STR	-	5700	11	246.10
NA2504	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

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

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 ELEV 228.166 m — 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.

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 — 2022-12-14 — REGISTERED PROFESSIONAL ENGINEER

CONSULTANT FILE NAME
2103510-SVB DD-BR-ABUT23.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 - NORTH ABUTMENT

CITY FILE NUMBER: B116-24-32
SHEET 118 OF 244
DRAWING NUMBER: 118

ISO A1 - 594mm x 841mm
Plotted: 12/14/2022 2:30 PM by Jake Han
Last Saved: 12/14/2022 2:29 PM by JHan2
X:\Proj\2021\2103510\00-St Vital Bridge over Red River PD\09. CAD\07 Sheets\Structural\Detailed Design\2103510-SVB DD-BR-ABUT23.dwg