BILL OF REINFORCING STEEL (MMFX - 2)
FOR STAGE 1 - EAST SHOULDER BARRIER

Site No. 2924-00

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
1301	BENT	50	750	225	167.74	300 / 150 / 300
1601	BENT	65	1 630	567	1434.37	90 / 690 / 690 / 690 / 250
1602	BENT	65	1 800	64	178.79	100 / 760 / 770 / 770 / 260
1603	BENT	65	1 780	2	5.53	90 / 760 / 770 / 770 / 240
1604	BENT	65	1 690	42	110.16	770 / 150 / 770
1605	BENT	65	1 790	12	33.34	820 / 150 / 820
1606	STR		3 180	8	39.48	
1607	STR		3 750	104	605.28	
1608	STR		2 140	8	26.57	
1609	STR		2 790	12	51.96	
1610	STR		3 850	72	430.21	
1611	STR		4 650	8	57.73	

BILL OF REINFORCING STEEL (MMFX - 2)
FOR STAGE 1 - EAST SHOULDER BARRIER

Site No. 2924-00

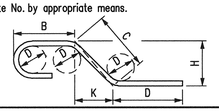
MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
1612	STR		5 220	8	64.81	
1613	STR		4 320	8	53.64	
1614	STR		4 050	8	50.28	
1615	STR		2 900	16	72.01	
1616	STR		3 700	16	91.88	
1619	STR		3 930	4	24.40	
1620	STR		3 790	4	23.53	
1621	STR		4 440	4	27.56	
1622	STR		3 600	8	44.70	
1623	STR		4 600	4	28.56	
1624	STR		3 540	8	43.95	
1626	STR		3 950	8	49.04	
1627	STR		4 820	8	59.85	
1628	STR		4 230	8	52.52	
1629	STR		3 460	8	42.96	
1630	STR		2 630	4	16.33	
1631	STR		3 490	8	43.33	
1632	STR		4 060	4	25.20	
1633	STR		3 970	4	24.65	
1634	STR		3 170	8	39.36	
1635	BENT	65	1 560	857	2074.90	690 / 690 / 180 / 80
1636	BENT	65	1 720	64	170.84	770 / 770 / 770 / 180 / 90
1637	BENT	65	1 700	6	15.83	770 / 770 / 770 / 160 / 80
1638	STR		600	90	83.81	

Total mass of reinforcing steel 6365.11 kg

Total volume of structural concrete Stage 1 = 44.34 m³

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 standard 90°, 135° & 180° hooks referenced from the RSIC "Manual of Standard Practice". Radii are inside dimensions. All reinforcing steel bends and hooks for low carbon chromium steel bars shall conform to the same requirements listed for C.S.A. G30.18 Grade 400W in Clause 6.6.2 of C.S.A. A23.1-04, unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2).
2. All reinforcing steel shall be deformed steel, unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2)
3. All reinforcing steel shall be low carbon chromium steel bars conforming to ASTM A615 Grade 75 and ASTM A1035 unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2)
4. 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.
5. All bars shall be bent in accordance with the following detail:



BILL OF REINFORCING STEEL (MMFX - 2)
FOR STAGE 2 - WEST SHOULDER BARRIER

Site No. 2924-00

MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
1301	BENT	50	750	220	164.01	300 / 150 / 300
1601	BENT	65	1 630	559	1414.14	90 / 690 / 690 / 690 / 250
1602	BENT	65	1 800	31	86.60	100 / 760 / 770 / 770 / 260
1603	BENT	65	1 780	4	11.05	90 / 760 / 770 / 770 / 240
1604	BENT	65	1 690	30	78.69	770 / 150 / 770
1605	BENT	65	1 790	12	33.34	820 / 150 / 820
1606	STR		3 180	8	39.48	
1607	STR		3 750	104	605.28	
1608	STR		2 140	8	26.57	
1609	STR		2 790	8	34.64	
1610	STR		3 850	72	430.21	
1611	STR		4 650	8	57.73	

BILL OF REINFORCING STEEL (MMFX - 2)
FOR STAGE 2 - WEST SHOULDER BARRIER

Site No. 2924-00

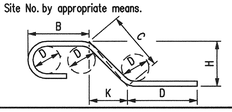
MARK	TYPE	PIN DIAMETER	LENGTH	No.	MASS	BENDING DIAGRAM
1612	STR		5 220	8	64.81	
1613	STR		4 320	8	53.64	
1614	STR		4 050	8	50.28	
1615	STR		2 900	8	36.01	
1616	STR		3 700	16	91.88	
1617	STR		4 210	8	52.27	
1618	STR		4 850	8	60.22	
1619	STR		3 930	8	48.79	
1625	STR		2 460	8	30.54	
1635	BENT	65	1 560	267	646.44	690 / 690 / 690 / 180 / 80
1636	BENT	65	1 720	31	82.75	770 / 770 / 770 / 180 / 90
1638	STR		600	88	81.95	

Total mass of reinforcing steel 4281.33 kg

Total volume of structural concrete Stage 2 = 42.83 m³

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 standard 90°, 135° & 180° hooks referenced from the RSIC "Manual of Standard Practice". Radii are inside dimensions. All reinforcing steel bends and hooks for low carbon chromium steel bars shall conform to the same requirements listed for C.S.A. G30.18 Grade 400W in Clause 6.6.2 of C.S.A. A23.1-04, unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2).
2. All reinforcing steel shall be deformed steel, unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2)
3. All reinforcing steel shall be low carbon chromium steel bars conforming to ASTM A615 Grade 75 and ASTM A1035 unless noted otherwise in the BILL OF REINFORCING STEEL (MMFX - 2)
4. 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.
5. All bars shall be bent in accordance with the following detail:



BILL OF MISCELLANEOUS METAL
FOR SHOULDER AND MEDIAN BARRIERS

SITE No. 2924-00

MARK	No.	DESCRIPTION		SIZE	LENGTH	REMARKS	MASS PER UNIT	MASS
R25	111	Stainless steel dowels		25 ø	600	For EAST SHOULDER BARRIER	2.31	256.41
R25	102	do		25 ø	600	For WEST SHOULDER BARRIER	2.31	235.62
R25	114	do		25 ø	600	For MEDIAN BARRIER	2.31	263.34
						TOTAL MASS kg =		755.37

REVISIONS

DATE	BY	DESCRIPTION

PROVINCE OF MANITOBA
Mar 8/10
S.S
RIHAL
REGISTERED PROFESSIONAL ENGINEER

SHOULDER BARRIER -STAGE 1 & 2 REINFORCING DETAILS

RECONSTRUCTION AND STRENGTHENING OF EXISTING BRIDGE
OVER ASSINIBOINE RIVER - CONTRACT THREE
ON P.T.H. No. 100 IN R.L.'S 72, 73 & 94
PARISH OF ST. CHARLES

CITY OF WINNIPEG

Manitoba
Infrastructure and Transportation
Water Control & Structures

DESIGN	BY: M.B.C.	
	CHECKED: S.S.R.	
DETAILS	BY: D.P.W.	
	CHECKED: K.P.	

RELEASED FOR CONSTRUCTION BY:

Ruth Yaden — March 8/10
DIRECTOR — DATE
STRUCTURES DESIGN AND CONSTRUCTION BRANCH

SCALE: Not To Scale

SHEET No. 107

SITE No. 2924-00