

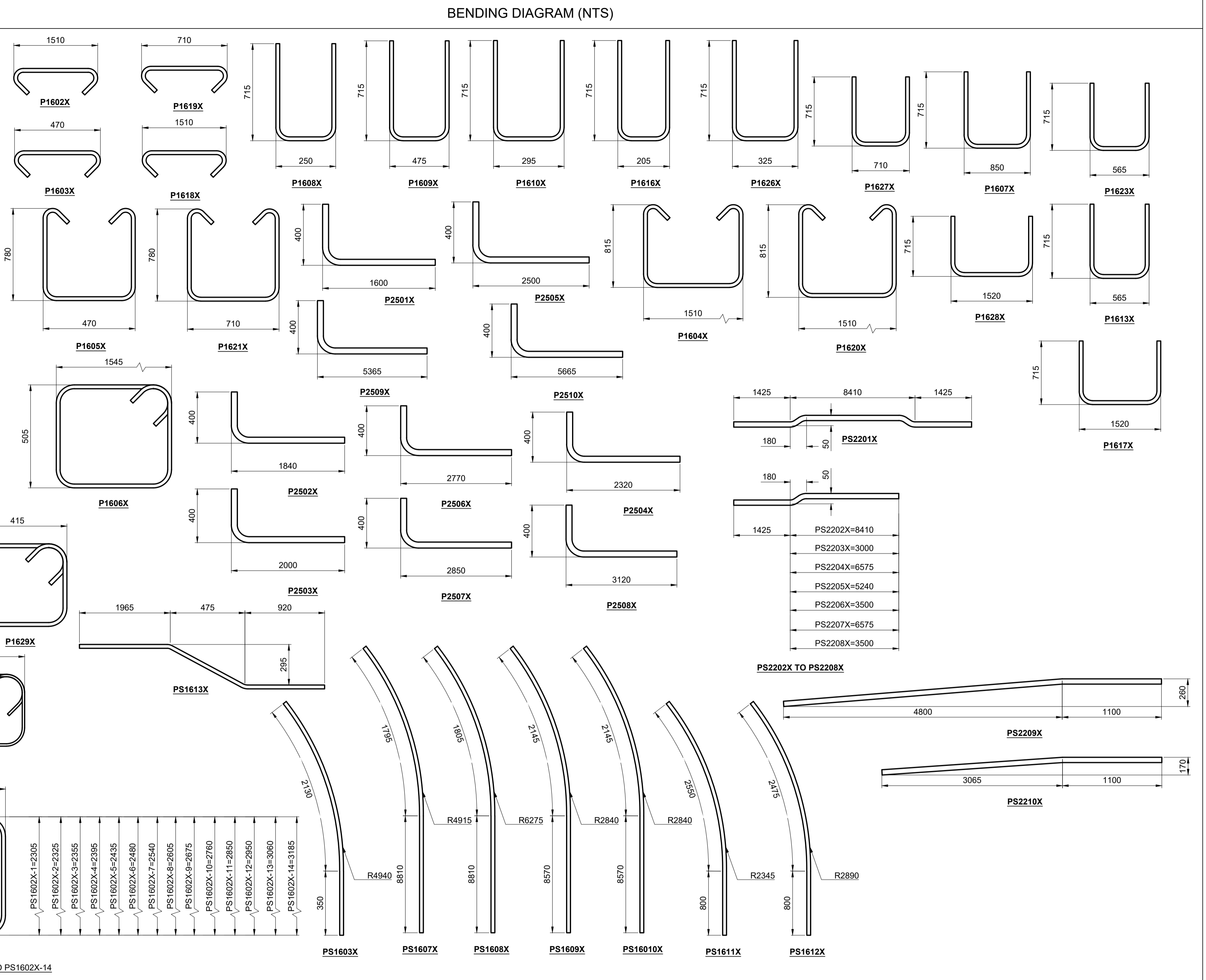
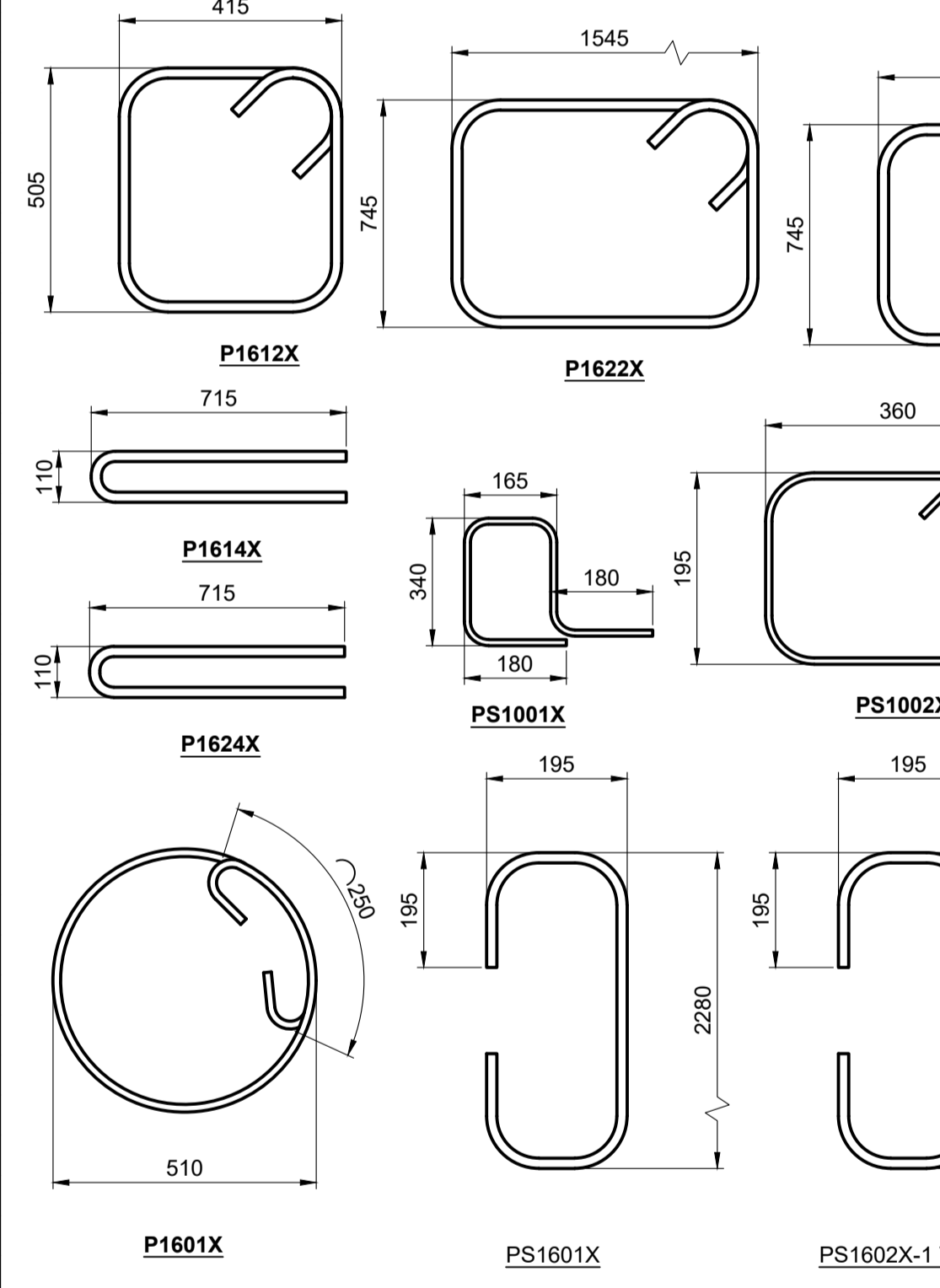
O:\Winipeg\Proj\W160034-DD Empress - Reinf - Ramps&Wall.dwg
 Last Saved: 10/02/2018 3:47 PM by AlacanaPerez
 Project: 10/02/2018 4:15 PM by Alex Hegner
 ISO A1 - 564mm x 841mm
 SHEETS: 167 OF 169

BILL OF REINFORCING STEEL (BLACK STEEL, CHROMX, & STAINLESS STEEL)

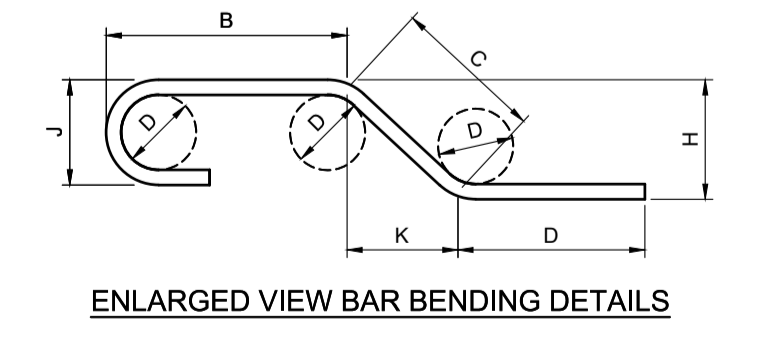
MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS (kg)
S1612X-2	BENT	-	8 760	1	13.63
S1612X-3	BENT	-	8 735	1	13.59
S1613X	STR	-	4 270	4	26.58
S1614X	BENT	-	720	2	2.24
S1615X-1	STR	-	2 260	20	70.33
S1615X-2	STR	-	2 830	6	26.42
S1615X-3	STR	-	3 060	20	95.23
S1615X-4	BENT	-	1 120	8	13.94
S1616X-1	BENT	-	7 835	4	48.77
S1616X-2	BENT	-	7 680	4	47.80
S1617X-1	STR	-	2 760	18	77.30
S1617X-2	STR	-	2 785	2	8.67
S1617X-3	STR	-	2 840	2	8.84
S1617X-4	STR	-	2 920	2	9.09
S1617X-5	STR	-	3 040	2	9.46
S1617X-6	STR	-	3 195	2	9.94
S1617X-7	STR	-	3 405	2	10.60
S1617X-8	STR	-	3 690	2	11.48
S1617X-9	STR	-	4 125	2	12.84
S1617X-10	STR	-	5 790	2	18.02
S1617X-11	STR	-	5 865	2	18.25
S1617X-12	STR	-	5 940	2	18.49
S1617X-13	STR	-	6 015	2	18.72
S1617X-14	STR	-	6 090	2	18.95
S1617X-15	STR	-	6 160	2	19.17
S1617X-16	STR	-	6 235	2	19.40
S1617X-17	STR	-	6 310	2	19.64
S1617X-18	STR	-	6 385	2	19.87
S1617X-19	STR	-	1 000	4	6.22
S1617X-20	BENT	-	905	2	2.82
S1618X-1	STR	-	6 360	2	19.79
S1618X-2	STR	-	6 645	20	206.79
S1618X-3	STR	-	3 825	2	11.90
S1618X-4	STR	-	3 375	2	10.50
S1618X-5	STR	-	3 085	2	9.60
S1618X-6	STR	-	2 870	2	8.93
S1618X-7	STR	-	2 710	2	8.43
S1618X-8	STR	-	2 590	2	8.06
S1618X-9	STR	-	2 505	2	7.80
S1618X-10	STR	-	2 450	2	7.62
S1618X-11	STR	-	2 430	2	7.56
S1618X-12	STR	-	2 375	2	7.39
S1618X-13	STR	-	2 310	2	7.19
S1618X-14	STR	-	2 270	2	7.06
S1618X-15	STR	-	2 260	2	7.03
S1619X	BENT	-	6 200	4	38.59
S1620X-1	BENT	-	6 370	1	9.91
S1620X-2	BENT	-	6 425	1	10.00
S1620X-3	BENT	-	4 320	1	6.72
S1621X-1	STR	-	2 265	2	7.05
S1621X-2	STR	-	2 300	2	7.16
S1621X-3	STR	-	2 380	2	7.41
S1621X-4	STR	-	2 510	2	7.81
S1621X-5	STR	-	2 710	2	8.43
S1621X-6	STR	-	3 030	2	9.43
S1621X-7	STR	-	3 165	2	9.85
S1621X-8	STR	-	3 150	2	9.80
S1621X-9	STR	-	3 115	2	9.69
S1621X-10	STR	-	3 070	2	9.55
S1621X-11	STR	-	3 010	2	9.37
S1621X-12	STR	-	2 940	2	9.15
S1621X-13	STR	-	2 855	2	8.88
S1621X-14	STR	-	2 750	2	8.56
S1621X-15	STR	-	2 635	2	8.20
S1621X-16	STR	-	2 500	2	7.78
S1621X-17	STR	-	2 350	2	7.31
S1621X-18	STR	-	2 180	2	6.78
S1621X-19	STR	-	2 010	2	6.26
S1621X-20	STR	-	1 835	2	5.71
S1621X-21	STR	-	1 665	2	5.18
S1621X-22	STR	-	1 490	2	4.64
S1621X-23	STR	-	1 320	2	4.11
S1621X-24	STR	-	1 150	2	3.58
S1621X-25	STR	-	975	2	3.03

MARK	TYPE	PIN DIAMETER	LENGTH (mm)	NO. BARS	MASS (kg)
S1621X-26	STR	-	805	2	2.51
S1621X-27	STR	-	630	2	1.96
S1621X-28	STR	-	460	2	1.43
S1621X-29	STR	-	290	2	0.90
S1622X-1	STR	-	3 260	2	10.15
S1622X-2	STR	-	3 810	2	11.86
S1622X-3	STR	-	4 230	2	13.16
S1622X-4	STR	-	4 620	2	14.38
S1622X-5	STR	-	5 010	2	15.59
S1622X-6	STR	-	5 400	2	16.80
S1622X-7	STR	-	5 790	2	18.02
S1622X-8	STR	-	6 180	2	19.23
S1622X-9	STR	-	6 205	2	19.31
S1622X-10	STR	-	5 980	2	18.61
S1622X-11	STR	-	5 865	2	18.25
S1622X-12	STR	-	6 010	2	18.70
S1623X-1	BENT	-	7 700	2	23.96
S1623X-2	BENT	-	7 100	1	11.05
S1623X-3	BENT	-	7 070	1	11.00
S1624X-1	BENT	-	1 775	1	2.76
S1624X-2	BENT	-	1 775	1	2.76
S1624X-3	BENT	-	1 875	1	2.92
S1601SS	STR	-	600	50	46.68
SP1501	STR	-	12 000	18	339.12
SP1502	STR	-	2 300	71	256.38

TOTAL REINFORCING MASS - CHROMX (KG): 28021.58
 TOTAL REINFORCING MASS - STAINLESS STEEL (KG): 74.31
 TOTAL REINFORCING MASS - PLAIN STEEL (KG): 4676.46



- NOTES:**
- REINFORCING MARKED WITH AN ASTERISK (*) ARE CONSIDERED INCIDENTAL TO OTHER PAY ITEMS AND ARE NOT INCLUDED IN THE MASS-BASED QUANTITIES FOR THE REINFORCEMENT BAR PAY ITEMS, REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 - 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.



ENGINEERS GEOSCIENTISTS
 Certificate of Authorization
 MORRISON HERSHFIELD
 No. 1736

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.

MORRISON HERSHFIELD

DESIGNED BY: AF
 CHECKED BY: BAP
 DRAWN BY: AH
 APPROVED BY: BE

HOR SCALE: AS SHOWN
 VERT SCALE: AS SHOWN

RELEASED FOR CONSTRUCTION: N/A

PROFESSIONAL'S SEAL
 PROVINCE OF MANITOBA
A. FATHI
 Member
 41159
 REGISTERED PROFESSIONAL ENGINEER

CONSULTANT FILE NAME
 W160034-DD EMPRESS - REINF - RAMP&WALL.DWG

THE CITY OF WINNIPEG
 PUBLIC WORKS DEPARTMENT
 ENGINEERING DIVISION

EMPRESS STREET PROJECT
 SOUTH RAMP, DRAINAGE CHANNEL, NORTH RAMP AND
 EMPRESS STREET RETAINING WALL
 BILL OF REINFORCING 2

CITY DRAWING NUMBER: P-3494-167
 SHEET OF: 167 OF 169
 DRAWING No.: 167
 REV: A