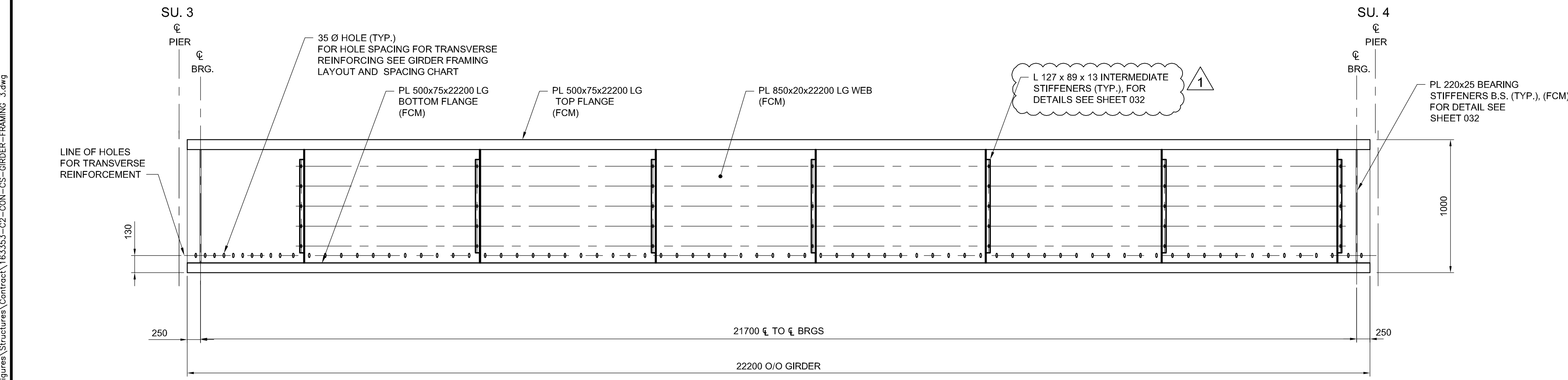


GIRDER FRAMING LAYOUT
SCALE 1:50



GIRDER MK. "G3" ELEVATION

HORZ. SCALE: 1:50
VERT. SCALE: 1:20
NOTE: GIRDER LINE 10 SHOWN.

GIRDER LINE	SU.3	TRANSVERSE REINFORCEMENT HOLE SPACING - SPAN 3	SU.4
1	162 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
2	162 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
3	162 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
4	162 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
5	162 176 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
6	162 176 176 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
7	162 176 176 176 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
8	162 176 176 176 176 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
9	162 176 176 176 176 176 176 176 176 246	66 SPACES @ 300 = 19800	246 176 176 176 176 176 176 176 176 176 162
10	162 176 176 176 176 176 176 176 176 176 246	66 SPACES @ 300 = 19800	246 162

SECTION PROPERTIES AND STRESSES							
21700mm SPAN LENGTH (C/C BEARINGS)							
STEEL SECTION							
TOP FLANGE PLATE SIZE	500mm	75mm	AREA =	37500mm ²			
WEB PLATE SIZE	850mm	20mm	AREA =	17000mm ²			
BOTTOM FLANGE PLATE SIZE	500mm	75mm	AREA =	37500mm ²			
SECTION MODULES X 10 ⁶ [mm ³]							
n = 7.15	CONC. DECK	STEEL TOP FLANGE	STEEL BOTTOM FLANGE				
STEEL ONLY	-	34.010	34.010				
COMPOSITE - n	50.56	64.240	51.170				
COMPOSITE - 3n	37.72	47.330	42.200				
TABLE OF STRESSES							
	LOAD	END REACTION	SHEAR STRESS	BENDING MOMENT	BENDING STRESS		
					STEEL		CONC. DECK
					TOP FLANGE	BOTTOM FLANGE	
[kN/m]	[kN]	[MPa]	[kNm]	[MPa]	[MPa]	[MPa]	
DEAD LOAD NON-COMPOSITE	28.72	311.64	18.33	1690.62	49.71	49.71	-
SUPERIMPOSED DEAD LOAD NON-COMPOSITE	15.09	163.69	9.63	888.03	26.11	26.11	3.29
LIVE LOAD E90 NON-COMPOSITE	-	525.38	30.90	2423.25	71.25	71.25	6.70
IMPACT I = 35.39%	-	185.93	10.94	857.59	25.22	25.22	2.37
CENTRIFUGAL FORCE	-	-	-	-	-	-	-
TOTAL GROUP A	1186.64	69.80	5859.49	172.29	172.29	12.37	
ALLOWABLE STRESSES (BENDING & SHEAR)			122.50		192.50	192.50	14.00
RATIO OF WORKING STRESS TO ALLOWABLE			0.57		0.89	0.89	0.88
$\frac{D(L+I)}{SPAN} = \frac{1}{906}$							
ALLOWABLE STRESS RANGE FOR FATIGUE CATEGORY "B" FOR N > 2 000 000 CYCLES:							
S Rfat = 110.30 MPa							
MAXIMUM DESIGN STRESS RANGE AT BOTTOM FLANGE TO WEB WELD AT MIDSPAN (35% MEAN IMPACT LOAD) :							
68.06 MPa < S Rfat							

ESTIMATED QUANTITIES (PER SPAN):

- TOTAL SPAN STRUCTURAL STEEL WEIGHT (WITHOUT BRGS) 163 954 kg
- LIFTING WEIGHT OF I-GIRDER (WITH BRGS) 16 420 kg
- STRUCTURAL STEEL IN BEARINGS 2 304 kg
- CONCRETE
- DECK 203 m³
- TRAINMAN'S WALKWAY 30 m³
- WATERPROOFING 196 m²

NOTE: ALL WEIGHTS AND QUANTITIES SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR CALCULATING EXACT LIFTING WEIGHTS OF NEW SPANS.

G:\CAD\163353\Technical\Workspaca\Engineering\Drawings and Figures\Structures\Contract\163353-C2-CON-CS-GIRDER-FRAMING-3.dwg



DESIGNED BY	RE	CHECKED BY	SSR
DRAWN BY	NBG	APPROVED BY	DBW
HOR. SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION	
VERTICAL	AS SHOWN		
NO.	REVISIONS	DATE	BY
1	ADDENDUM #4	17/02/24	RE
0	ISSUED FOR TENDER	17/01/09	RE

DESIGNED BY: RE
DRAWN BY: NBG
HOR. SCALE: AS SHOWN
VERTICAL: AS SHOWN

ENGINEER'S SEAL
PROVINCE OF MANITOBA
R.B. ERIC
Member 22665
REGISTERED PROFESSIONAL ENGINEER

WAVERLEY STREET UNDERPASS AT CN MILE 3.89 RIVERS SUB
CONTRACT 2: UNDERPASS STRUCTURE, RAILWORKS,
ROADWORKS, LAND DRAINAGE SEWER, PUMPING STATION
AND LANDSCAPING WORKS

CONSULTANT PROJECT NUMBER
16-3353

STEEL GIRDER DETAILS
SPAN 3 (21.70 m)

CITY DRAWING NUMBER
U-239-2016-C2-CS-030
SHEET **030** OF **085**
CONSULTANT DRAWING NUMBER
C2-CS-030