



GIRDER TRANSVERSE REINFORCEMENT HOLE SPACING - SPAN 1 & SPAN 4

LINE	SU.1/SU.4	SU.2/SU.5
1	162 296 52 SPACES @ 300 = 15600 296 176 176 176 176 176 176 176 176 176 162	
2	162 176 296 52 SPACES @ 300 = 15600 296 176 176 176 176 176 176 176 176 176 162	
3	162 176 176 296 52 SPACES @ 300 = 15600 296 176 176 176 176 176 176 176 176 176 162	
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10	162 176 176 176 176 176 176 176 176 176 296 52 SPACES @ 300 = 15600 296 176 176 176 176 176 176 176 176 176 162	

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SECTION PROPERTIES AND STRESSES							
17600 mm SPAN LENGTH (C/C BEARINGS)							
STEEL SECTION							
TOP FLANGE PLATE SIZE	500mm	50mm	AREA =	25000mm ²			
WEB PLATE SIZE	900mm	20mm	AREA =	18000mm ²			
BOTTOM FLANGE PLATE SIZE	500mm	50mm	AREA =	25000mm ²			
SECTION MODULES X 10 ⁶ [mm ³]							
n = 7.14	CONC. DECK	STEEL TOP FLANGE	STEEL BOTTOM FLANGE				
STEEL ONLY	-	24.820	24.820				
COMPOSITE - n	44.78	56.830	45.690				
COMPOSITE - 3n	30.89	38.760	34.490				
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	27.36	240.74	13.37	1059.25	42.68	42.68	-
SUPERIMPOSED DEAD LOAD NON-COMPOSITE	16.50	145.18	8.07	638.82	25.74	25.74	2.90
LIVE LOAD E90 NON-COMPOSITE	-	514.13	28.56	1713.37	69.03	69.03	5.36
IMPACT I = 38.32%	-	196.99	10.94	656.48	26.45	26.45	2.05
CENTRIFUGAL FORCE	-	-	-	-	-	-	-
TOTAL GROUP A		1097.03	60.95	4067.92	163.90	163.90	10.31
ALLOWABLE STRESSES (BENDING & SHEAR)			122.50		192.50	192.50	14.00
RATIO OF WORKING STRESS TO ALLOWABLE			0.50		0.85	0.85	0.74
$\frac{D(L+I)}{\text{SPAN}} = \frac{1}{1369}$							
ALLOWABLE STRESS RANGE FOR FATIGUE CATEGORY "B" FOR N> 2 000 000 CYCLES:							
S Rfat = 110.30MPa							
MAXIMUM DESIGN STRESS RANGE AT BOTTOM FLANGE TO WEB WELD AT MIDSPAN (35% MEAN IMPACT LOAD) :							
70.45 < S Rfat							

ESTIMATED QUANTITIES (PER SPAN):

- TOTAL SPAN STRUCTURAL STEEL WEIGHT (WITHOUT BRGS)	98 160 kg
- LIFTING WEIGHT OF I-GIRDER (WITH BRGS)	9 816 kg
- STRUCTURAL STEEL IN BEARINGS	2 304 kg
- CONCRETE	
- DECK	177 m ³
- TRAINMAN'S WALKWAY	27 m ³
- WATERPROOFING	177 m ²

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



NO.	REVISIONS	DATE	BY	DATE
0	ISSUED FOR TENDER	17/01/09	RE	

	DESIGNED BY	RE	CHECKED BY	SSR
	DRAWN BY	NBG	APPROVED BY	DBW
	HOR. SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION	
	VERTICAL	AS SHOWN		
		CONSULTANT PROJECT NUMBER		
		16-3353		
		WAVERLEY STREET UNDERPASS AT CN MILE 3.89 RIVERS SUB CONTRACT 2: UNDERPASS STRUCTURE, RAILWORKS, ROADWORKS, LAND DRAINAGE SEWER, PUMPING STATION AND LANDSCAPING WORKS		
		CITY DRAWING NUMBER		
		U-239-2016-C2-CS-028		
		SHEET OF		
		028 OF 085		
		CONSULTANT DRAWING NUMBER		
		C2-CS028		