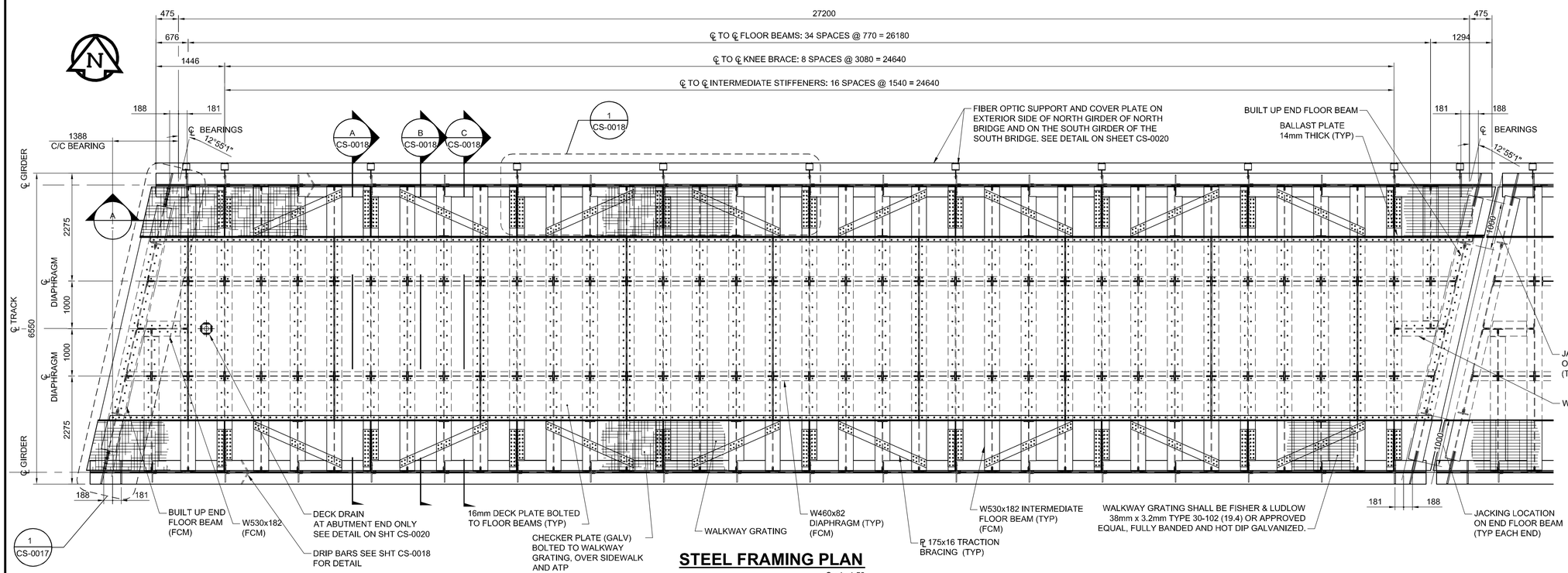
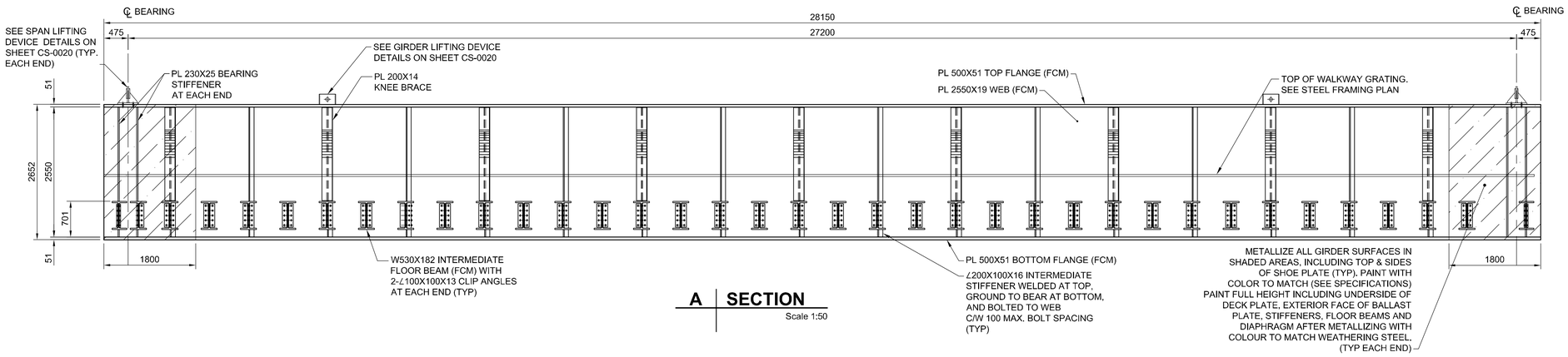


STEEL FRAMING PLAN

Scale 1:50

WEST SPAN SHOWN
EAST SPAN SIMILAR



A SECTION

Scale 1:50

TABLE OF STRESSES

27.2m SPAN (C/C BRGS)

STEEL: SEE NOTES

TOP FLANGE PLATE	51 x 500	AREA = 25500mm²
WEB PLATE	19 x 2550	AREA = 48450mm²
BOTTOM FLANGE PLATE	51 x 500	AREA = 25500mm²

Sx-x TOP = 8.486 x10⁷ mm³ Ix = 1.125 x10¹¹ mm⁴
Sx-x BOT = 8.486 x10⁷ mm³

	END REACTION kN	SHEAR STRESS MPa	BENDING MOMENT kN.m	BENDING STRESSES TOP FLANGE MPa
DEAD LOAD 52.552 kN/m	715	15	4860	57
LIVE LOAD E90	1364	28	8025	95
IMPACT 28%	382	8	2251	27
CENTRIFUGAL FORCE COMPOSITE	-	-	-	-
TOTAL GROUP "1"	2461	51	15136	179
ALLOWABLE STRESSES (BENDING AND SHEAR)	-	123	-	190
RATIO OF WORKING STRESS TO ALLOWABLE	-	41%	-	94%

DEFLECTION:

$$\frac{\triangle LL + I}{SPAN} = \frac{1}{771}$$

FATIGUE:

ALLOWABLE STRESS RANGE FOR FATIGUE CATEGORY "B" FOR N > 2,000,000 CYCLES
S_{RSF} = 110 MPa

MAXIMUM DESIGN STRESS RANGE AT BOTTOM FLANGE TO WEB WELD AT MIDSPAN
104 MPa < S_{RSF}

$$\frac{\text{MAX. STRESS RANGE}}{\text{PERMISS. FATIGUE STRESS}} = 94\%$$

STEEL GIRDER NOTES:

1. FOR GENERAL NOTES SEE SHEET CS-0001.
2. MATERIAL SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
   - STRUCTURAL STEEL: CSA CAN-G40.21-13
     - GRADE 350AT, CATEGORY 5 IN GIRDER WEBS, FLANGES, STIFFENER PLATES, END FLOOR BEAMS
     - GRADE 350AT, CATEGORY 3 IN INTERMEDIATE FLOOR BEAMS, DIAPHRAGMS, CONNECTION ANGLES FOR FLOOR BEAMS
     - GRADE 350A IN DECK PLATE, KNEE BRACE PLATES, STIFFENER ANGLES AND ALL REMAINING MEMBERS.
     - GRADE 300W FOR BEARING PLATES.
   - BRONZE PLATES: A.S.T.M. B22-13, COPPER ALLOY UNS No. C86300. (2)
   - WELDING: C.S.A. W59-13 (R2008) AND AWS D1.5
   - ANCHOR BOLTS: A.S.T.M. F1554, GRADE 105
   - H.S. BOLTS: A.S.T.M. A325, M22, TYPE 3 (OR EQUIVALENT)
   - METALLIZING: A.S.T.M. B833
   - GALVANIZING: ASTM A123/A123M-12
3. ALL HOLES SHALL BE DRILLED OR SUB-PUNCHED AND REAMED.
4. ALL H.S. BOLTS SHALL BE TIGHTENED BY THE TURN-OF-NUT METHOD.
5. BOTTOM FLANGES OF GIRDERS OVER BEARINGS SHALL BE TRUE AND SQUARE: MAXIMUM MEASURED DEVIATION AT OUTSIDE OF EDGE OF BEARING PLATES SHALL NOT EXCEED 1mm.
6. DEVIATION RESULTING IN NEGATIVE CAMBER SHALL NOT BE PERMITTED.
7. DEVIATION FROM STRAIGHTNESS OF MAIN GIRDERS SHALL NOT EXCEED 6mm.
8. ALL NON-SLIDING SURFACES OF BEARINGS SHALL BE ZINC-METALLIZED IN ACCORDANCE WITH C.S.A. G189. ZINC COATING SHALL NOT BE LESS THAN 0.25mm.
10. REFER TO CN STANDARD DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN ON THIS DRAWING
11. ALL BOLT HOLES TO BE 24 DIA U/N
12. SPAN SHALL BE SHOP ASSEMBLED

ESTIMATED QUANTITIES (PER SPAN):

-TOTAL SPAN STRUCTURAL STEEL WEIGHT (WITHOUT BRGS)
123,808 kg
- LIFTING WEIGHT OF ONE I-GIRDER (WITH BEARINGS)
29,206 kg
- WALKWAY GRATING
57m²
-CHECKER PLATE
24m²

NOTE: ALL WEIGHTS SHOWN ARE APPROXIMATE, CONTRACTOR IS RESPONSIBLE FOR CALCULATE EXACT LIFTING WEIGHTS OF NEW SPANS

BID OPPORTUNITY NO. 712-2013

APEGM
Certificate of Authorization
AECOM Canada Ltd.
No. 4671 Date: ORIGINAL SIGNED ON 2013/11/21

LOCATION APPROVED
UNDERGROUND STRUCTURES
SUPV. 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.

B.M.
ELEV.

NO.	REVISIONS	DATE	BY
2	ISSUED FOR ADDENDUM	2013/17/10	DJH
1	ISSUED FOR ADDENDUM	2013/12/10	DJH
0	ISSUED FOR TENDER	2013/11/21	KC

AECOM

DESIGNED BY	FT	CHECKED BY	CD
DRAWN BY	KC	APPROVED BY	EBL
HOR. SCALE:	AS NOTED	RELEASED FOR CONSTRUCTION BY:	
VERTICAL:	AS NOTED		
DATE	2013-06-04	DATE	

ENGINEER'S SEAL
PROVINCE OF MANITOBA
ORIGINAL SIGNED BY
F. TABET
Member 33659
ON NOV 21, 2013
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT DRAWING NO.
60273041-01-CS-201

Winnipeg

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION CONTRACT 3

CITY DRAWING NUMBER U238-2014-2016

SHEET 16 OF 37

STEEL FRAMING PLAN & ELEVATION

CS-0016

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