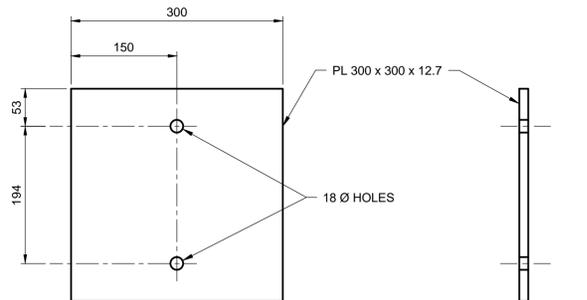


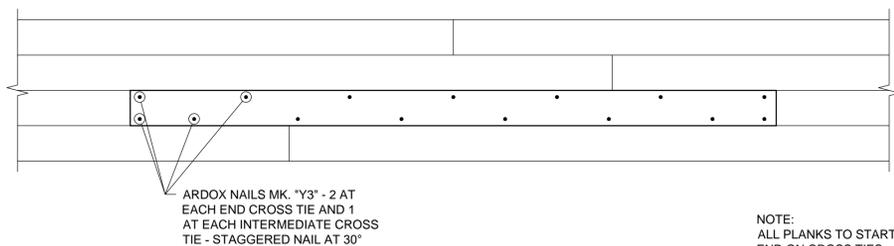
**BILL OF TIMBER**  
FOR SOUTH AND NORTH ABUTMENTS, DECK AND GUARDRAILS

MARK	No.	DESCRIPTION	SIZE	LENGTH (m)
<b>BACKWALL:</b>				
B1	14	*GLU-LAM TIMBER BACKWALL	175 x 460 x 8800	123.20
B2	6	TIMBER BACKWALL CAP	89 x 184 x 8800	52.80
B3	2	TREATED PLYWOOD SHIM	10 x 460 x 8800	26.40
B4	4	BRACE STRUT	152 x 305 x 1050	4.20
B5	2	TRANSOM BOLSTER	360 x 360 x CUT TO FIT (-350)	0.70
B6	36	WINGWALL PLANKS	76 x 305 x 5200	187.2
B7	12	WINGWALL NAILERS	102 x 152 x 3000	36.0
<b>DECK:</b>				
T1	24	NAILER	254 x 254 x 3048	73.15
T2	2	END FILLER	254 x 254 x 5330	10.66
T3	114	CROSS TIE	152 x 203 x 5330	602.29
T4	50	CURB BLOCKING	152 x 203 x 760	38.00
T5	255	RUNNING PLANKS	76 x 184 x 3660	834.48
T6	24	CURB	203 x 203 x 3048	73.15
<b>GUARDRAILS:</b>				
G4	22	TIMBER BLOCK	164 x 184 x 550	12.10
G5	24	TIMBER BLOCK	164 x 184 x 1550	37.20

NOTE:  
1. \*GLU-LAM TIMBER BACKWALL PLANKS SHALL BE EWS 24F-V4 DF/DF.  
2. ALL DIMENSIONS SHOWN IN THE ABOVE BILL OF TIMBER ARE ACTUAL DIMENSIONS REQUIRED.

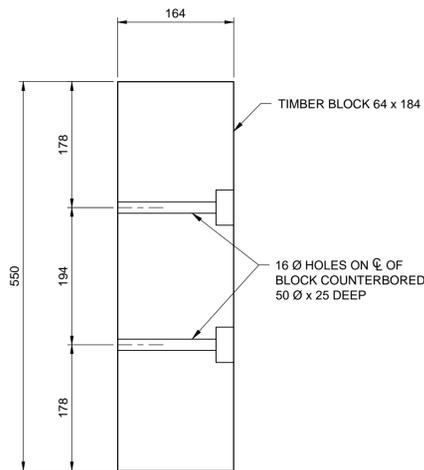


**REAR VIEW**      **SIDE VIEW**  
**STEEL PLATE MK. "G1"**  
1:5



**RUNNING PLANK NAILING PATTERN - PARTIAL PLAN**  
1:20

NOTE:  
ALL PLANKS TO START AND END ON CROSS TIES



**BLOCK MK. "G4"**  
1:5

**BILL OF REINFORCING STEEL**  
FOR PRECAST APPROACH BARRIER UNIT

MARK	TYPE	PIN Ø	LENGTH	No. /UNIT	TOTAL MASS	BENDING DIAGRAM
B1501	BENT	65	1650	8	20.72	
B1502	STR		2950	8	37.02	
MASS OF REINF. STEEL PER UNIT (kg)					57.78	
VOLUME OF CONCRETE PER UNIT (m3)					0.77	
MASS OF EACH UNIT (kg)					1903	

NOTE:  
1. ALL DIMENSIONS GIVEN EXCEPT RADIUS ARE OUT TO OUT. RADIUS IS INSIDE DIMENSION.  
2. ALL REINFORCING STEEL SHALL BE DEFORMED REINFORCING STEEL UNLESS NOTED OTHERWISE IN ABOVE 'BILL OF REINFORCING STEEL'.  
3. ALL REINFORCING STEEL SHALL CONFORM TO CAN/CSA-G30.18 GRADE 400R.

**BILL OF MISCELLANEOUS METAL**  
FOR PRECAST APPROACH BARRIER UNIT

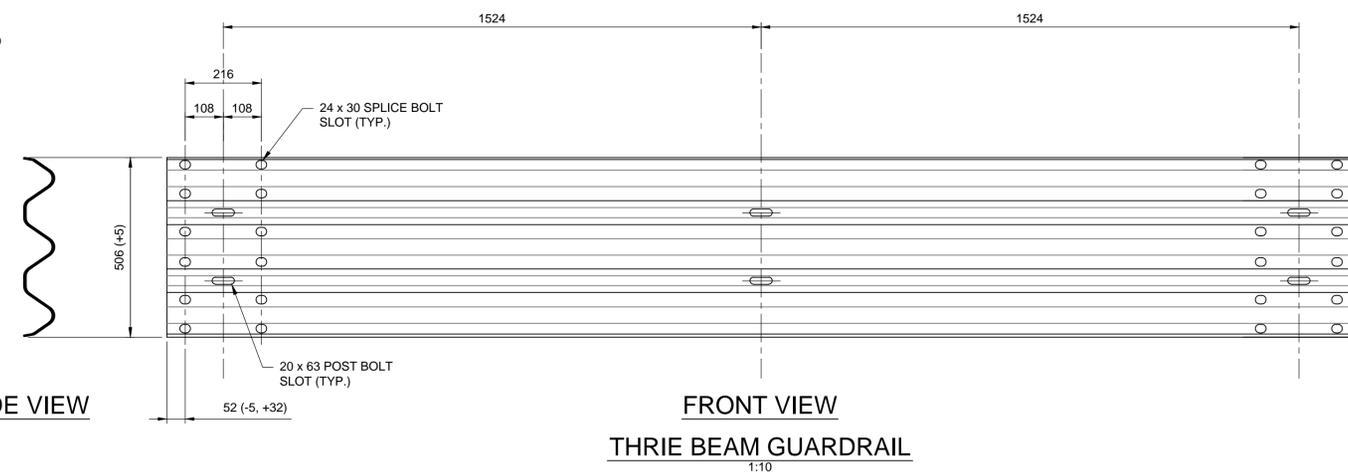
MARK	No.	DESCRIPTION	SIZE
	64	RICHMOND EC - 2W INSERTS FOR 25 Ø LEB	25 Ø
	64	RICHMOND LEB EYE BOLT	25 Ø x 75 LG.
	12	STEEL RETAINING PIN (AS DETAILED)	38 Ø x 750 LG.
	12	MACHINE BOLT	12 Ø x 30 LG.

NOTE:  
1. CONCRETE COVER TO BE 50 mm CLEAR, UNLESS NOTED OTHERWISE.  
2. MAXIMUM SIZE OF AGGREGATE IS 20 mm.  
3. MINIMUM 28 DAY CONCRETE COMPRESSIVE STRENGTH = 40 MPa.  
4. STEEL FORM FINISH.  
5. NORMAL PORTLAND CEMENT TO BE USED.  
6. CONCRETE MIX DESIGN SHALL CONFORM TO CAN/CSA-A23.1 EXPOSURE CLASS C-1.  
7. UNITS TO BE CONNECTED BY HAVING ENDS "ONE" AND "TWO" ADJACENT.  
8. MINIMUM CHAMFER ON ALL EDGES TO BE 20 mm.  
9. ALL REINFORCING STEEL SHALL BE DEFORMED REINFORCING STEEL UNLESS NOTED OTHERWISE.  
10. ALL REINFORCING STEEL SHALL CONFORM TO CAN/CSA-G30.18 GRADE 400W.  
11. ALL MATERIAL IN THE ABOVE BILL OF MISCELLANEOUS METAL SCHEDULE TO BE GALVANIZED AFTER FABRICATION.

**BILL OF MISCELLANEOUS METAL**  
FOR SOUTH AND NORTH ABUTMENTS, DECK AND GUARDRAILS

MARK	No.	DESCRIPTION	SIZE	REMARKS	UNIT MASS	TOTAL MASS
<b>ABUTMENTS:</b>						
BP1	4	BEARING BASE PLATE	PL 500 x 1200 x 25	AS DETAILED	117.75	471.00
BP2	24	SS EXPANSION ANCHOR C/W WASHER & NUT	25 Ø x 300	BASE PLATE MK. "BP1" TO ABUTMENT	1.623	38.95
BP3	4	SS EXPANSION ANCHOR C/W WASHER & NUT	16 Ø x 150	TRANSOM BOLSTER RETAINING ANGLE MK. "BR2" TO ABUTMENT	0.358	1.43
BP4	32	SS EXPANSION ANCHOR C/W WASHER & NUT	25 Ø x 250	FOR BRACE MK. "S1" TO ABUTMENT	1.414	45.25
BR1	4	EXPANSION BEARING RETAINING ANGLE	L 76 x 76 x 9.5 x 305 LG.	FOR EXPANSION BEARINGS ONLY (EAST ABUTMENT) AS DETAILED	3.264	13.05
BR2	2	TRANSOM BOLSTER RETAINING ANGLE	L 76 x 76 x 9.5 x 305 LG.	FOR TRANSOM BOLSTERS AS DETAILED	3.264	6.53
S1	4	GALVANIZED STEEL ANGLE BRACE UNIT AS DETAILED	AS DETAILED	AS DETAILED	92.95	371.80
S2	24	GALVANIZED LAG SCREWS	16 Ø x 250	BRACE STRUT MK. "B4" TO BACKWALL	0.397	9.53
S3	20	GALVANIZED LAG SCREWS	16 Ø x 100	BRACE MK. "S1" TO BRACE STRUT MK. "B4" AND RETAINING ANGLE MK. "BR2" TO TRANSOM BOLSTER MK. "B5"	0.161	3.22
S4	44	GALVANIZED THREADED ROD C/W NUTS AND WASHER AS DETAILED	25 Ø x 1560	AS DETAILED	5.868	258.19
W1	4	WINGWALL RETAINING ANGLE	L 152 x 152 x 13 x 2745 LG.	AS DETAILED	79.60	318.42
W2	36	GALVANIZED LAG SCREWS	16 Ø x 75	WINGWALL PLANKS TO ANGLE	0.116	4.18
W3	16	GALVANIZED BOLT C/W WASHER AND NUT	25 Ø x 525	RETAINING ANGLE TO BACKWALL	2.750	44.0
W4	16	GALVANIZED PLATE WASHER	100 x 100 WITH 28 Ø HOLE	FOR BOLT MK. "W3"	0.746	11.94
W5	12	SS EXPANSION ANCHOR C/W WASHER AND NUT	25 Ø x 300	RETAINING ANGLE TO ABUTMENT	1.623	19.48
W6	60	GALVANIZED BOLT C/W WASHERS AND NUT	19 Ø x 550	WINGWALL PLANKS TO NAILER AND PLANKS TO PILES	1.224	73.44
W7	48	GALVANIZED LAG SCREWS	16 Ø x 150	WINGWALL PLANKS TO PILE NAILER	0.232	11.14
<b>DECK:</b>						
PL1	2	EXPANSION COVER PLATE	19 x 500 x 4750	AS DETAILED	356.241	712.48
PL2	32	GALVANIZED LAG SCREWS FOR EXPANSION COVER PLATE	10 Ø x 125 LG.	AS DETAILED	0.071	2.27
PL3	32	STEEL PLATE FOR EXPANSION COVER PLATE	6 x 40 x 40	AS DETAILED	0.126	4.03
Y2	500	ARDOX NAILS, GALVANIZED	7 Ø x 200 LG.	CROSS TIE MK. "T3" TO NAILER MK. "T1"	0.060	30.00
Y3	3800	ARDOX NAILS, GALVANIZED	7 Ø x 200 LG.	RUNNING PLANKS MK. "T5" TO CROSS TIE MK. "T3"	0.038	144.40
R8	100	GALVANIZED THREADED ROD (C/W 2 HEX NUTS, 2 - 50 Ø WASHERS & 2 - 75 Ø WASHERS)	19 Ø x 875 LG.	AS DETAILED	2.550	255.00
<b>GUARDRAILS:</b>						
G1	24	PLATE	300 x 300 x 12.7 THICK	FOR THRIE BEAM RAILING SEE DETAILS	8.973	215.35
G2	44	GALVANIZED GUARDRAIL BOLT C/W WASHER & NUT	16 Ø x 170 LG.	BLOCKS MK. "G4" TO THRIE BEAM AT PANEL INTERMEDIATE VERTICAL BARS	0.194	8.54
G3	48	GALVANIZED GUARDRAIL BOLT C/W WASHER & NUT	16 Ø x 325 LG.	CHANNEL MK. "G1" TO PANEL END VERTICAL TO BLOCKS MK. "G5" TO THRIE BEAM	0.395	18.96
<b>TOTAL MASS (kg)</b>					<b>3091.57</b>	

NOTE:  
1. QUANTITIES SHOWN DO NOT INCLUDE ANY EXTRA ALLOWANCE FOR LOSS OR DAMAGE. CONTRACTOR IS RESPONSIBLE FOR MAKING APPROPRIATE ALLOWANCES AT HIS DISCRETION AND COST.  
2. BOLTS ARE TO BE GRADE 307 STEEL.  
3. ALL MISCELLANEOUS METALS SHALL BE GALVANIZED IN ACCORDANCE WITH TS 362 UNLESS NOTED OTHERWISE.  
4. THRIE BEAM TO BE FIELD DRILLED AS REQUIRED.  
5. SS DENOTES STAINLESS STEEL. ALL OTHER FASTENERS TO BE GALVANIZED.  
6. ALL NAIL HOLES TO BE PRE-DRILLED.



**SIDE VIEW**      **FRONT VIEW**  
**THRIE BEAM GUARDRAIL**  
1:10

DESIGNED BY	KGW	CHECKED BY	NR/MLB	CITY DRAWING NUMBER	
DRAWN BY	RCB	APPROVED BY	GCL	1-0701A-S0006-002	
HOR. SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION		SHEET 11 OF 14	
VERTICAL SCALE	AS SHOWN			CONSULTANT DRAWING NUMBER	
ISSUED FOR TENDER	18/01/10	RCB		16-4481	
NO. REVISIONS	DATE	BY	DATE	2017.12.01	
				CONSULTANT PROJECT NUMBER	
				16-4481	
				DECK AND GUARDRAIL DETAILS 2 OF 2	
				CS - 10	