

PLANS OF PROPOSED P.P.C.C. BRIDGE OVER ON

LENGTH 12 352 OUT TO OUT OF ABUTMENT PRECAST BACKWALL PANELS

SUPERSTRUCTURE ONE SIMPLY SUPPORTED SPAN OF PRECAST PRESTRESSED CONCRETE CHANNEL GIRDERS WITH ASPHALT OVERLAY

SUBSTRUCTURE TWO PRECAST CONCRETE ABUTMENTS WITH STEEL H-PILES

ROADWAY WIDTH 10 800 OUT TO OUT OF GIRDERS

LOCATION IN R.M. OF

SHEET LEGEND

1. COVER SHEET
2. GENERAL ELEVATION
3. BORING LOGS
4. SITE AND EROSION CONTROL DETAILS
5. ASSEMBLY DETAILS
6. ASSEMBLY DETAILS
7. STEEL PILE CAP DETAILS
8. BEARING AND ERECTION DETAILS
9. RAILING LAYOUT AND DETAILS
10. RAILING DETAILS
11. RAILPOST DETAILS

- P1. PRECAST PANEL DETAILS
- P2. PRECAST PANEL DETAILS

- G1. PRECAST PRESTRESSED CHANNEL GIRDER DETAILS
- G2. PRECAST PRESTRESSED CHANNEL GIRDER DETAILS
- G3. PRECAST PRESTRESSED CHANNEL GIRDER DETAILS
- G4. PRECAST PRESTRESSED CHANNEL GIRDER DETAILS
- G5. PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

DESIGN DATA

SPECIFICATIONS

AASHTO LRFD Bridge Design Specifications, First Edition, 1994 plus 1996/97 Interims

VEHICULAR LIVE LOADING

1. Modified AASHTO HSS-25 Truck
2. AASHTO LRFD "HL-93" Loading

STRUCTURAL CONCRETE

CSA A23.1, Exposure Class C-1 Air content category 1

1. PRECAST PRESTRESSED CONCRETE CHANNEL GIRDERS - $f_c = 45$ MPa at 28 days
 $f_{ci} = 35$ MPa at time of de-stressing
2. PRECAST PANELS - $f_c = 35$ MPa

REINFORCING STEEL

1. PRECAST PRESTRESSED CONCRETE CHANNEL GIRDERS - CAN/CSA-G30.18-M92 Grade 400W black (i.e. no epoxy coating)
2. PRECAST PANELS - CAN/CSA-G30.18-M92 Grade 400W black (i.e. no epoxy coating)

STRUCTURAL STEEL

1. All Structural Steel shall conform to CAN/CSA G40.21-M92 Grade 300W
2. HSS Tubing for Bridge Rail shall conform to CAN/CSA G40.21-M92 Grade 350W

PRESTRESSING STRAND

20-13 ϕ low relaxation strands, $f_{pu} = 1860$ MPa

PILE LOADING

	END PILE BENTS	INTERMEDIATE PILE BENTS
MAXIMUM FACTORED LOAD FACTORED BEARING RESISTANCE	628 kN	610 kN

HYDRAULIC DESIGN DATA

DESIGN DISCHARGE

$Q = \text{-----} \text{ m}^3/\text{sec}$

SURVEY CONTROL

HORIZONTAL DATUM: NAD83CSRS
 VERTICAL DATUM: CGVD28
 ELLIPSOID: GRS 1980
 GEOID (HT2.0): -----
 UTM: ZONE ----
 SCALE FACTOR: -----

SITE CONTROL POINT DATA

CONTROL POINT #-----	NORTHING: -----	EASTING: -----	ELEVATION: -----	DATE: -----
CONTROL POINT #-----	NORTHING: -----	EASTING: -----	ELEVATION: -----	DATE: -----
CONTROL POINT #-----	NORTHING: -----	EASTING: -----	ELEVATION: -----	DATE: -----



TP. - PLACE LOCATION
MAP HERE

RGE. -
LOCATION MAP
Not to Scale

MANITOBA INFRASTRUCTURE

WATER MANAGEMENT AND STRUCTURES

ENVIRONMENTAL APPROVALS

MANITOBA ENVIRONMENT ACT LICENCE
DATE : _____
FILE # : _____

FISHERIES AND OCEANS CANADA - AUTHORIZATION OR REVIEW
DATE : _____
FILE # : _____

TRANSPORT CANADA - NAVIGATION ACT
DATE : _____
FILE # : _____

MANITOBA INFRASTRUCTURE ENVIRONMENTAL APPROVAL
DATE : _____
FILE # : _____

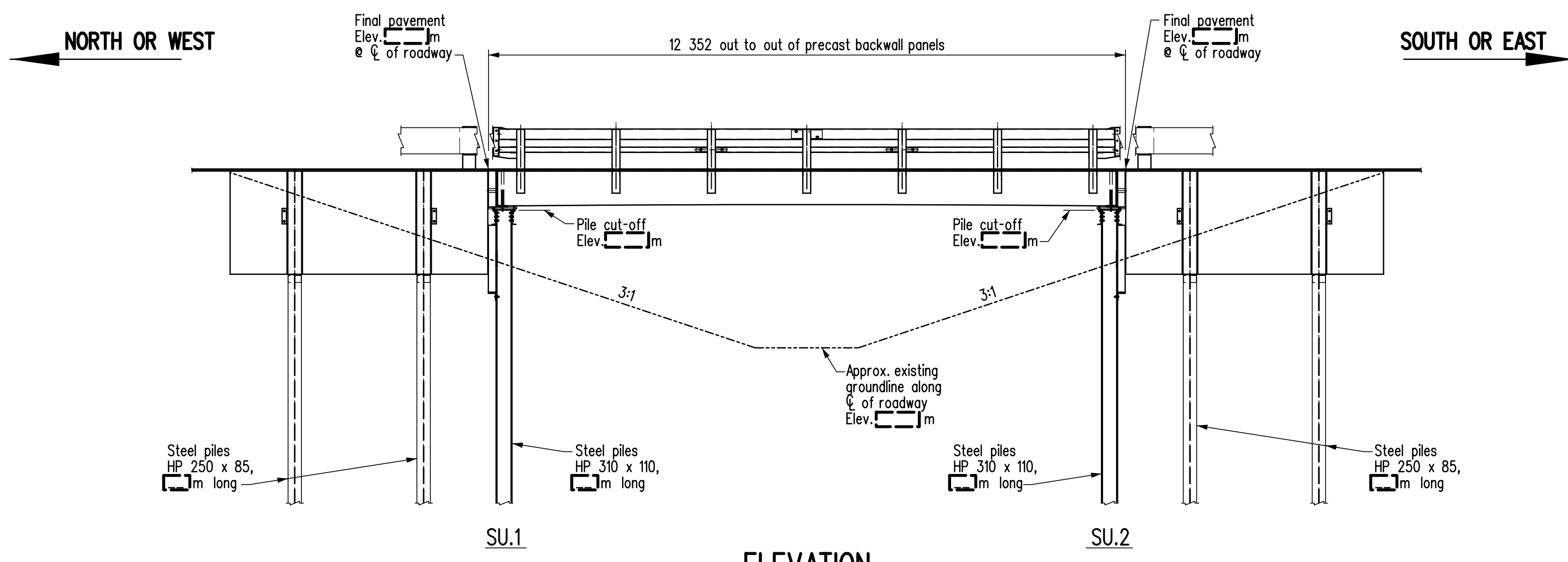
ENVIRONMENTAL REVIEW COMPLETED
DATE : _____
COMPLETED BY : _____

ALL DIMENSIONS ARE IN MILLIMETRES (mm) AND ALL ELEVATIONS AND STATIONS ARE IN METRES (m) UNLESS SHOWN OTHERWISE.

RELEASED FOR CONSTRUCTION BY :
EXECUTIVE DIRECTOR OF STRUCTURES
DATE _____

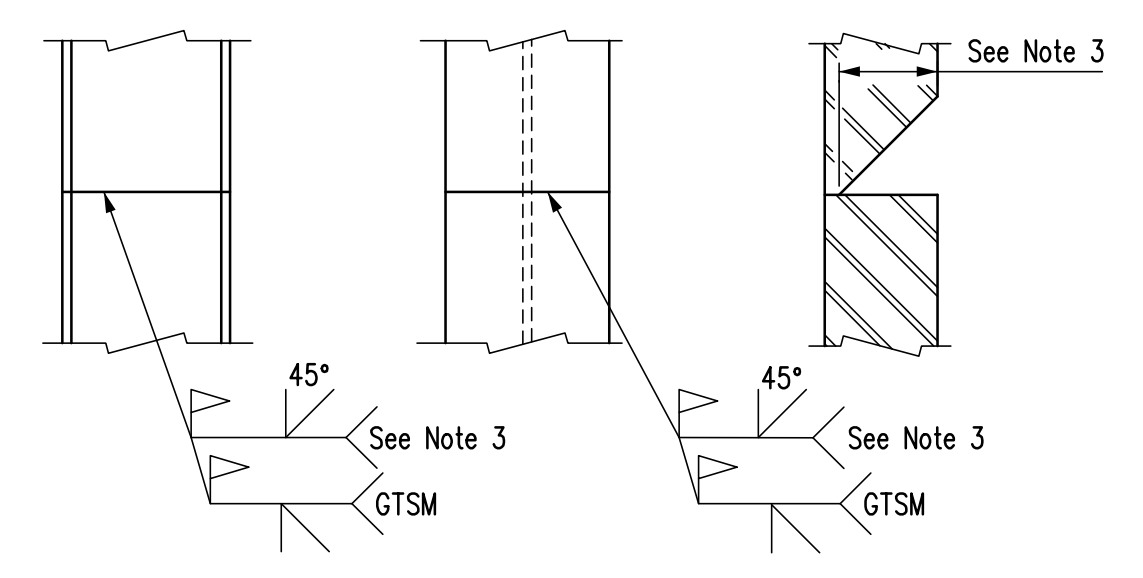
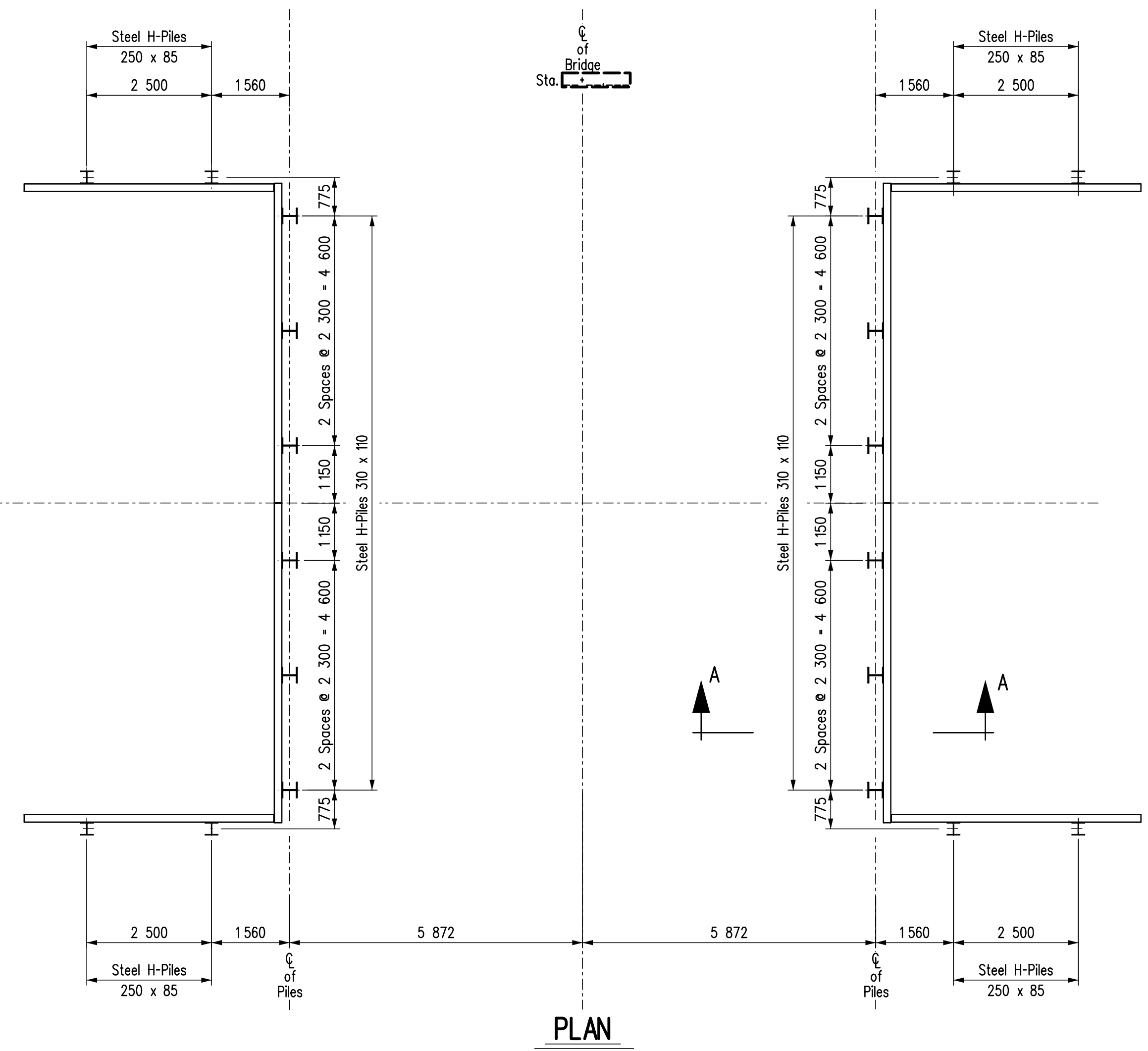
DRAWN BY:	DATE:	SHEET No. 1
CHECKED BY:	DATE:	SITE No.





BILL OF PILES				Site No.
LOCATION	DESCRIPTION	No. OF PILES	LENGTH	TOTAL LENGTH (m)
SU.1 & SU.2	Steel piles - HP310 x 110 (abutments)	12		0
SU.1 & SU.2	Steel piles - HP250 x 85 (wing walls)	8		0
				0
TOTAL LENGTH OF PILES (m) =				0

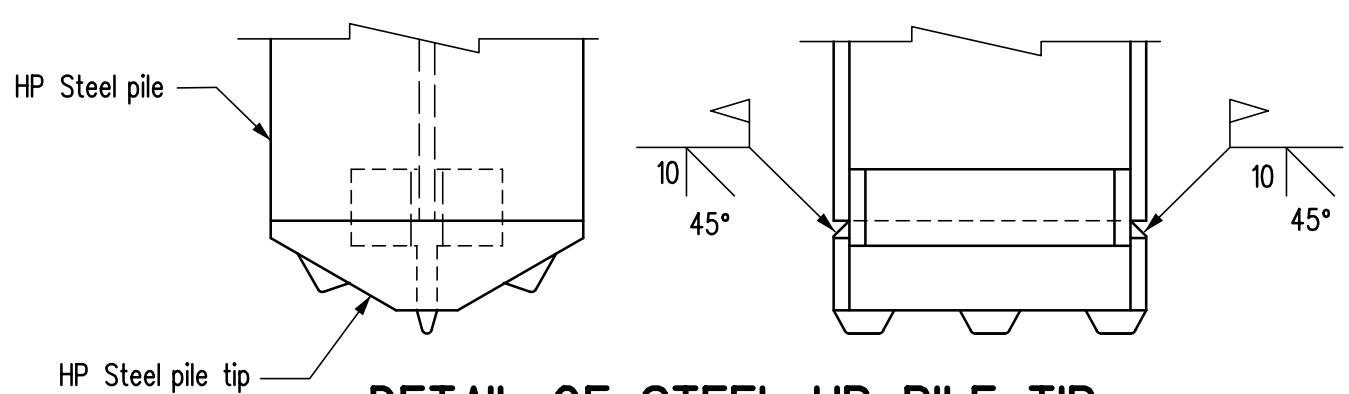
BILL OF PILE TIPS		
LOCATION	DESCRIPTION	No. OF PILES
SU.1 & SU.2	Hard-Bite Point HP-77750-B for HP310 x 110 (Abutments)	12



NOTES:
re: Welding

- Low hydrogen +E70 series electrodes shall be used.
- The minimum root pass shall be 6 mm.
- Preparation for welding requires 13 mm bevel for HP 250 piles and 14 mm bevel for HP 310 piles.
- Weld both flanges and web as shown. The inside beveling and welds to be completed first.
- Before undertaking the back welds, the weld preparation shall be carried out with a carbon Arc-Air gouger.

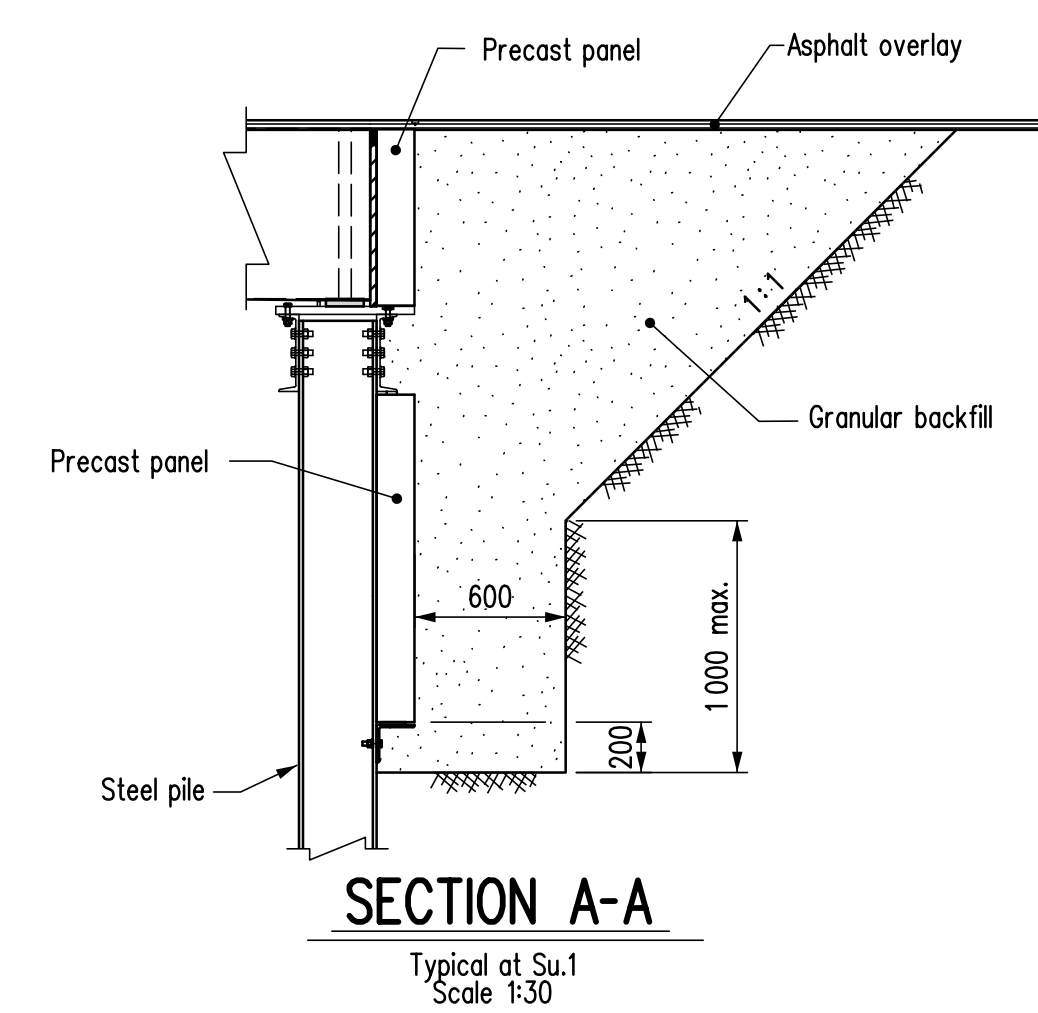
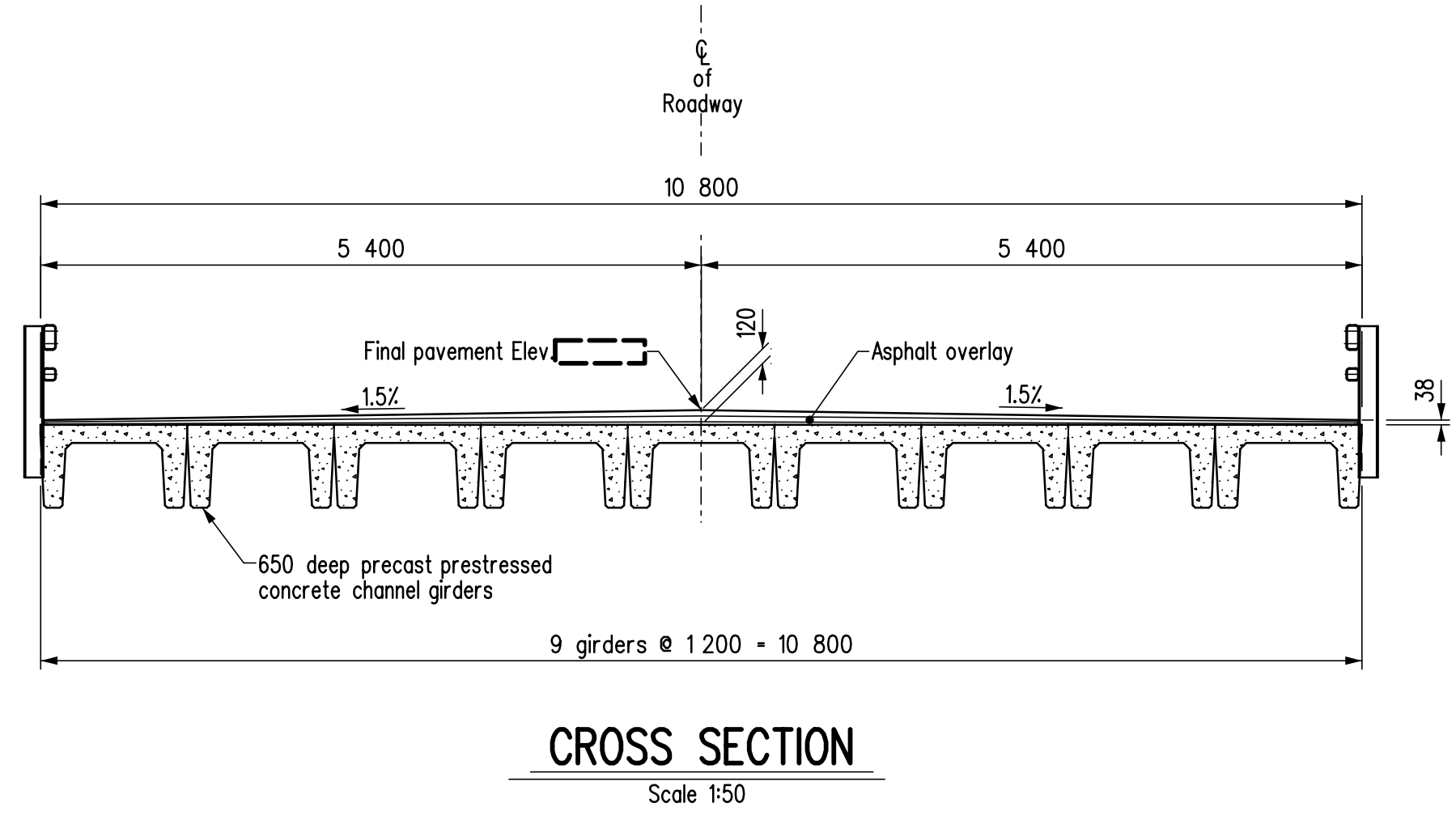
+E48018 equivalent metric electrode



NOTES :

- Edges of HP Steel pile tip to be ground on 45° bevel for 10 mm.
- Low hydrogen +E70 series electrodes shall be used.
- The minimum root pass shall be 6 mm.

+E48018 equivalent metric electrode



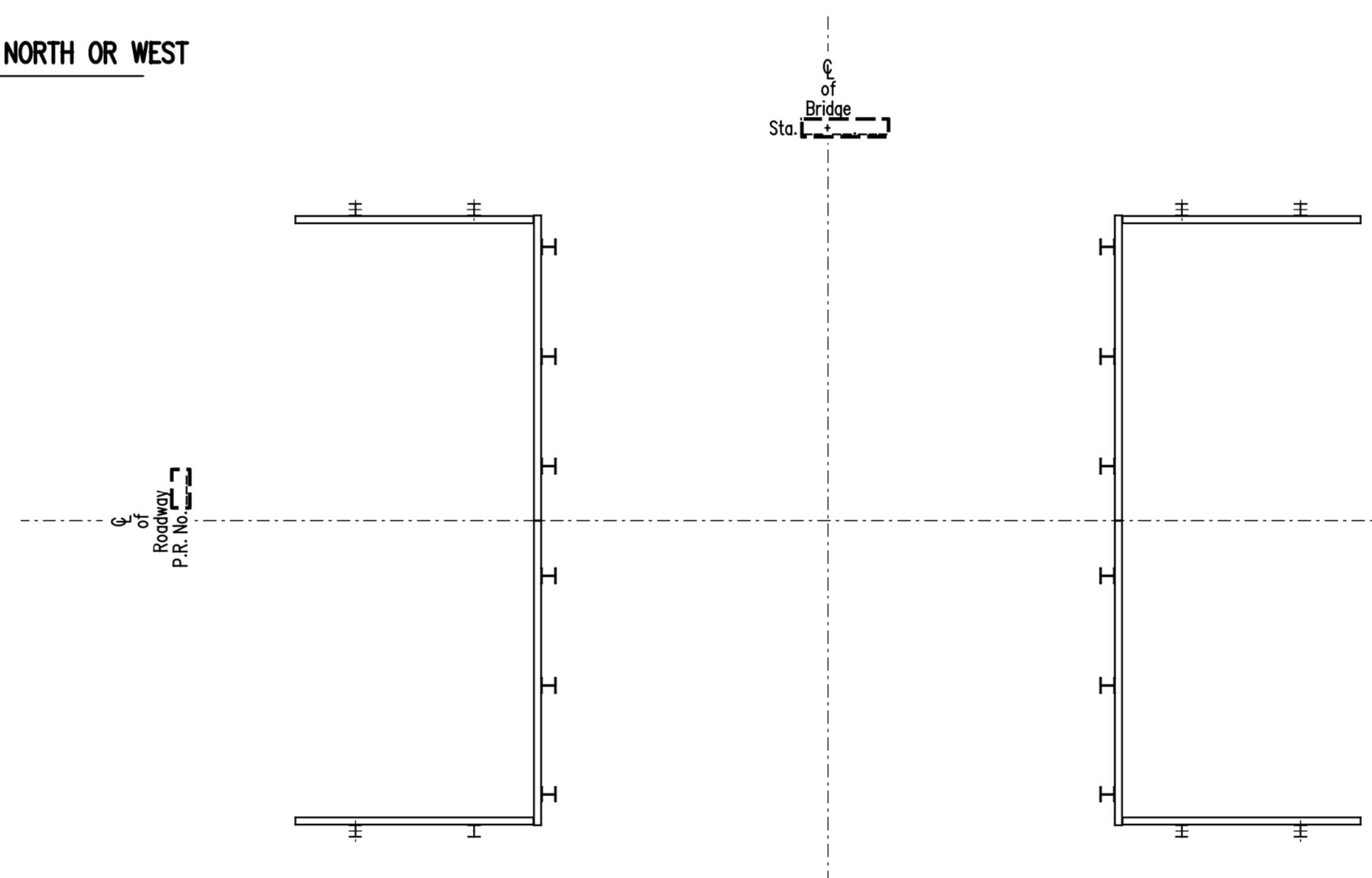
NOTES :
re: Backfill Behind Abutment Ballast Walls

- Backfill behind ballast wall and wingwall panels shall be Type 1 - Granular backfill supplied and placed in accordance with Bridge Specification 1001 (I). The granular backfill shall be placed and compacted in lifts not exceeding 150 mm.
- Compaction equipment used within 2 m of ballast walls and wingwalls shall be limited to light vibratory equipment with a mass not exceeding 120 kg unless otherwise approved.
- Steel pile tip to be PRUYN "Hard-Bite" or equivalent.

REVISIONS				GENERAL ELEVATION			
DATE	BY	DESCRIPTION		DESIGN			
		DESIGN SEAL	RECORD SEAL			RELEASED FOR CONSTRUCTION BY:	
<p style="text-align: center;">PLACE ENGINEERS ELECTRONIC SEAL HERE</p>						BY: <u> </u> B.A.N. <u> </u> CHECKED: <u> </u> BY: <u> </u> K.P. <u> </u> CHECKED: <u> </u>	EXECUTIVE DIRECTOR OF STRUCTURES <u> </u> DATE <u> </u> SCALE: <u> </u> 1: 75

← NORTH OR WEST

→ SOUTH OR EAST



SU.1

SU.2

PLAN

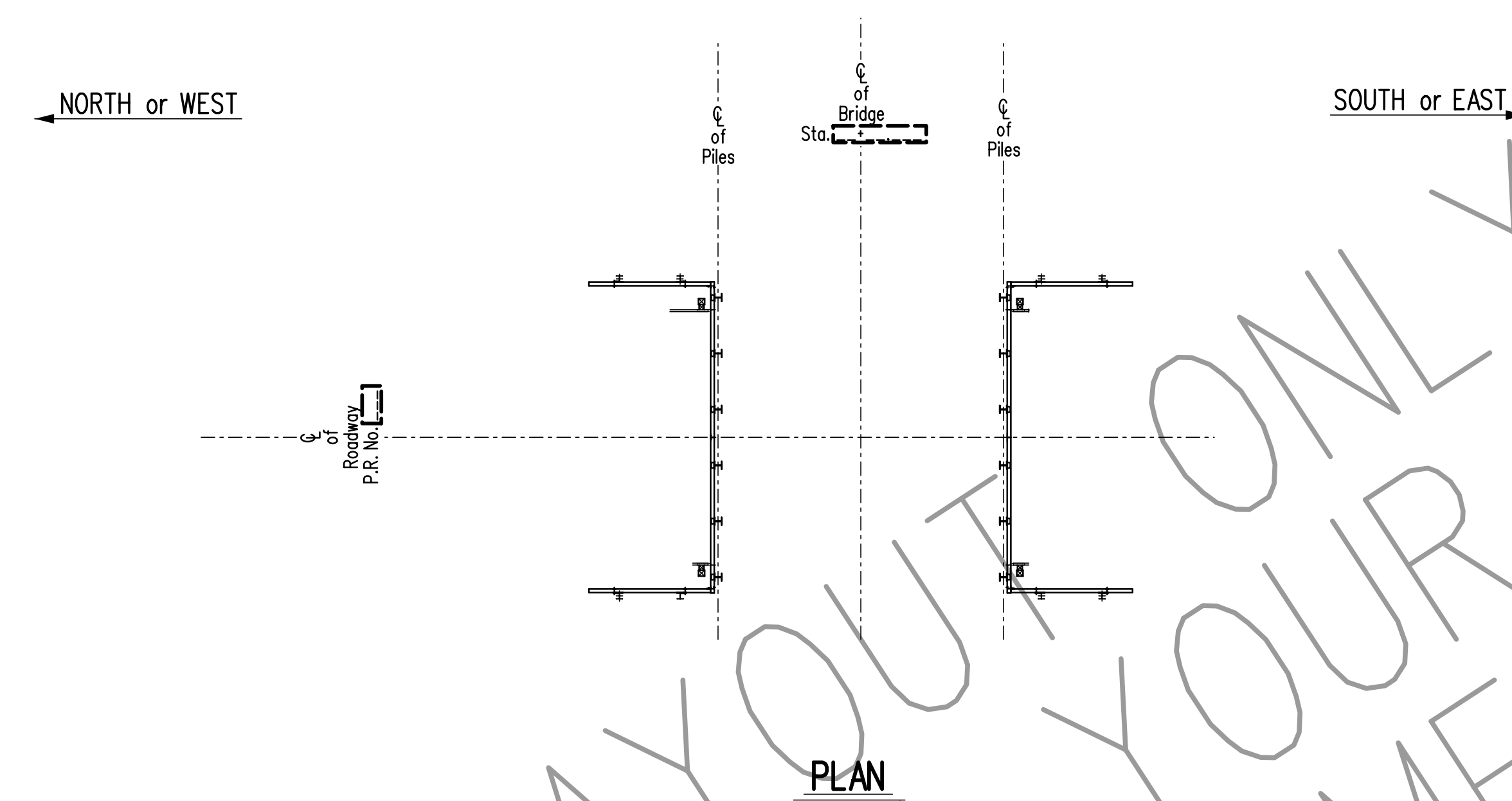
Showing Bore Hole Locations

NOTES - re: Boring Logs

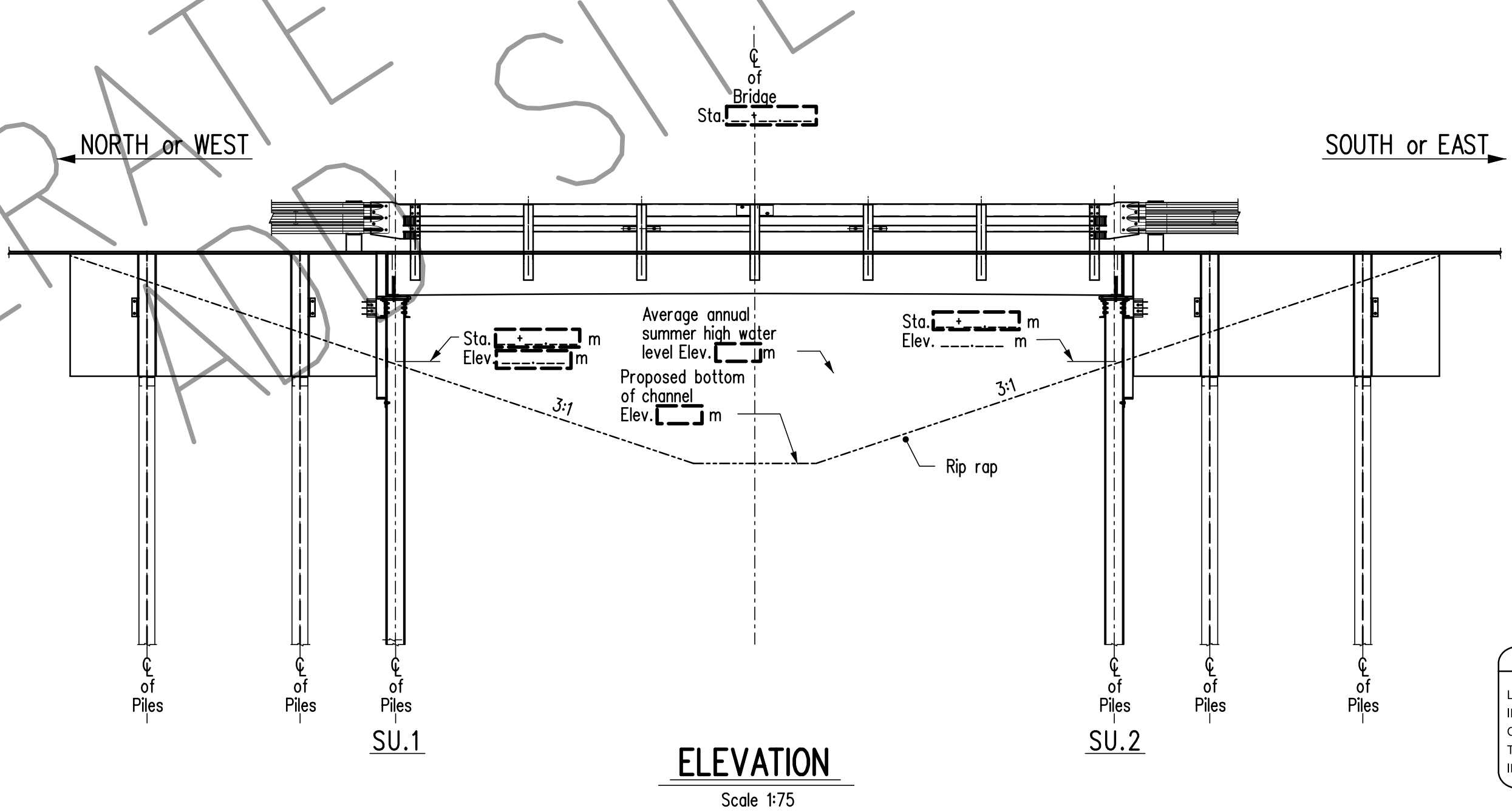
1. The Department provides log boring information shown on the Plans. This information may not be representative of the soil conditions throughout the site. Contractors may peruse all available soil information in the Water Management and Structures Branch located at 6th floor, 215 Garry Street, Winnipeg.
2. The following abbreviations apply to bore hole information:
 - Qu - Laboratory unconfined compressive strength in kPa
 - SPT (N) - Number of blows per 300 mm - Standard Penetration Test
 - USC - Unified Soil Classification
 - M.C. - Moisture Content
3. All stations, elevations, offsets and depths as shown are in meters. All dimensions are in millimeters.
4. All bore hole locations shown in plan view are approximate.
5. Elevations on boring logs are at a vertical scale of 1:100.

REVISIONS		BORING LOGS	
DATE	BY	DESCRIPTION	
		DESIGN SEAL	RECORD SEAL
<p>PLACE ENGINEERS ELECTRONIC SEAL HERE</p>		<p>Manitoba Infrastructure Water Management and Structures</p>	
		<p>RELEASED FOR CONSTRUCTION BY: _____</p>	
		<p>BY: _____ B.A.N. _____</p>	
		<p>CHECKED: _____</p>	
<p>BY: _____ K.P. _____</p>		<p>SCALE: 1:100</p>	<p>SHEET No. 3</p>
<p>CHECKED: _____</p>		<p>or as shown</p>	<p>SITE No. 631</p>

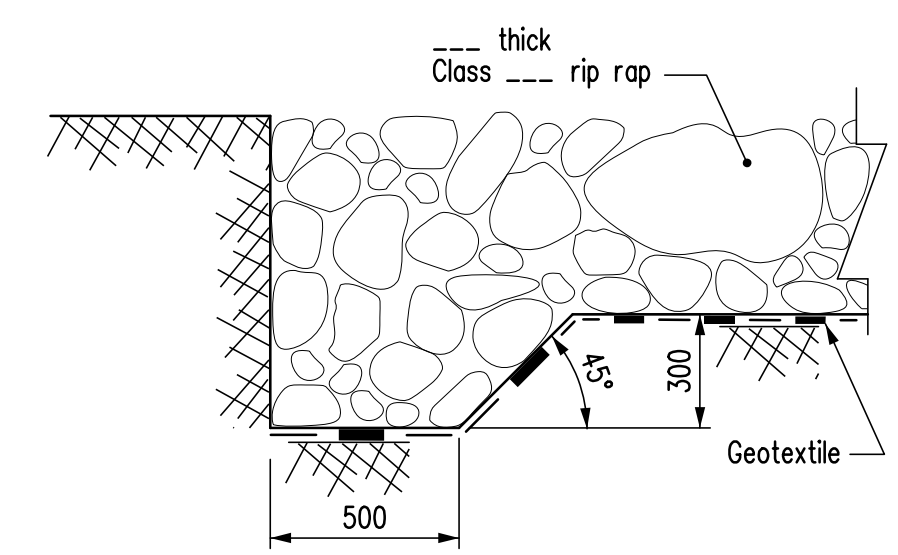
GENERATED ONLY SITE PLAN
EXAMPLE LAYOUT FROM YOUR SITE DIMENSIONS
SHEET SPECIFIC DIMENSIONS



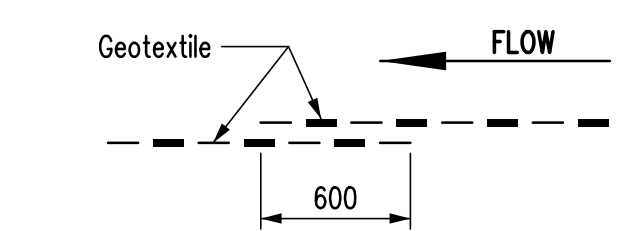
PLAN



ELEVATION
Scale 1:75



EDGE TREATMENT



OVERLAPPING DETAILS

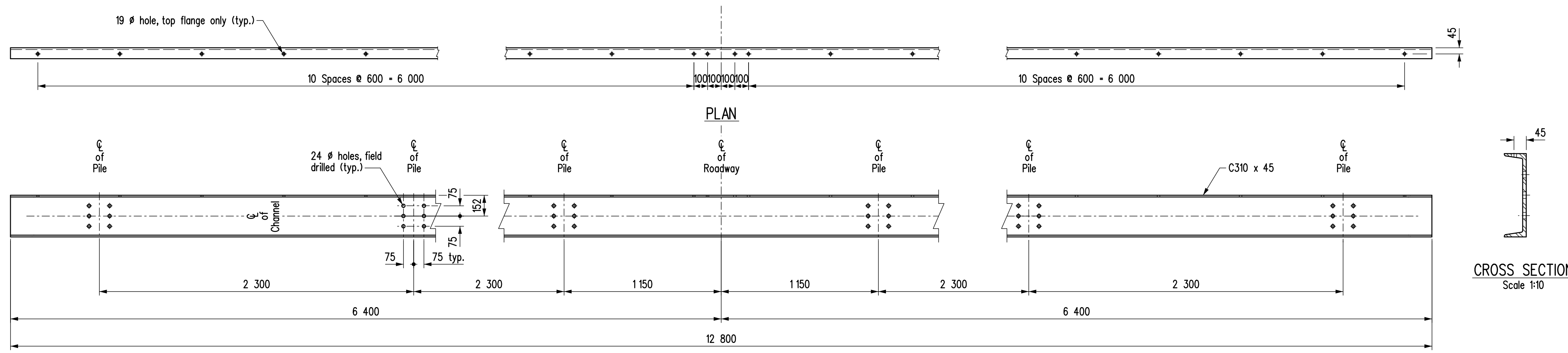
RIP RAP DETAILS
Not To Scale

- NOTES:
- All geotextile shall be Non-Woven Geotextile, Class 1 (Heavy Duty) from the Manitoba Infrastructure's Approved Product List.
 - Geotextile shall be placed under all rip rap, overlapping 600mm in direction of flow.

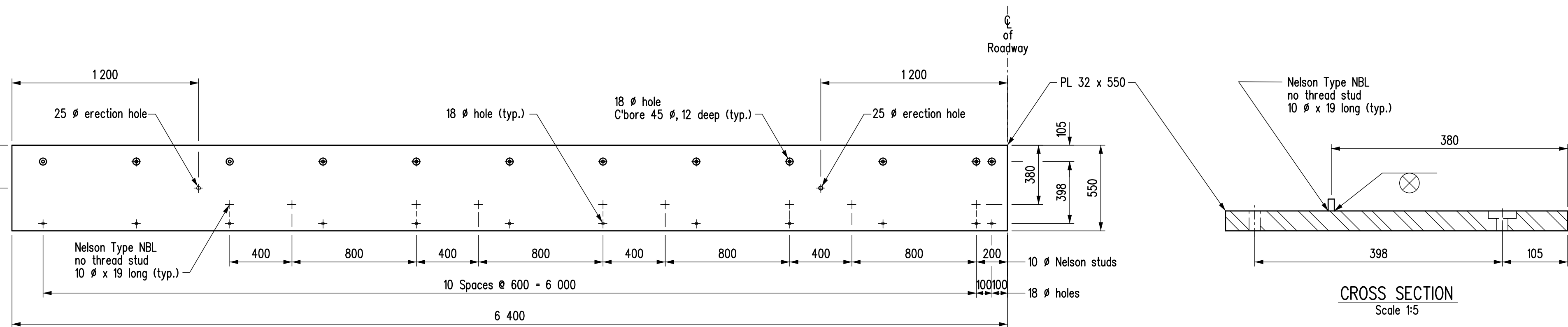
NOTE:
Existing pile bents to be removed by Bridge Contractor.

UTILITY DISCLAIMER:
LOCATIONS OF UTILITIES AS SHOWN ARE BASED ON READILY AVAILABLE INFORMATION. NO GUARANTEE IS GIVEN THAT ALL UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONTRACTOR SHALL CONFIRM THE EXISTENCE AND LOCATION OF UTILITIES BY OBTAINING FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

REVISIONS		SITE AND EROSION CONTROL DETAILS	
DATE	BY	DESCRIPTION	
DESIGN SEAL		RECORD SEAL	
PLACE ENGINEERS ELECTRONIC SEAL HERE		Manitoba Infrastructure Water Management and Structures	
DESIGN		RELEASED FOR CONSTRUCTION BY:	
BY: _____		EXECUTIVE DIRECTOR OF STRUCTURES DATE	
CHECKED: _____		SCALE:	
BY: _____ K.P.		1:200	
CHECKED: _____		SHEET No. 4	
		or as shown SITE No. _____	



ELEVATION
STEEL CHANNEL MK "P3"



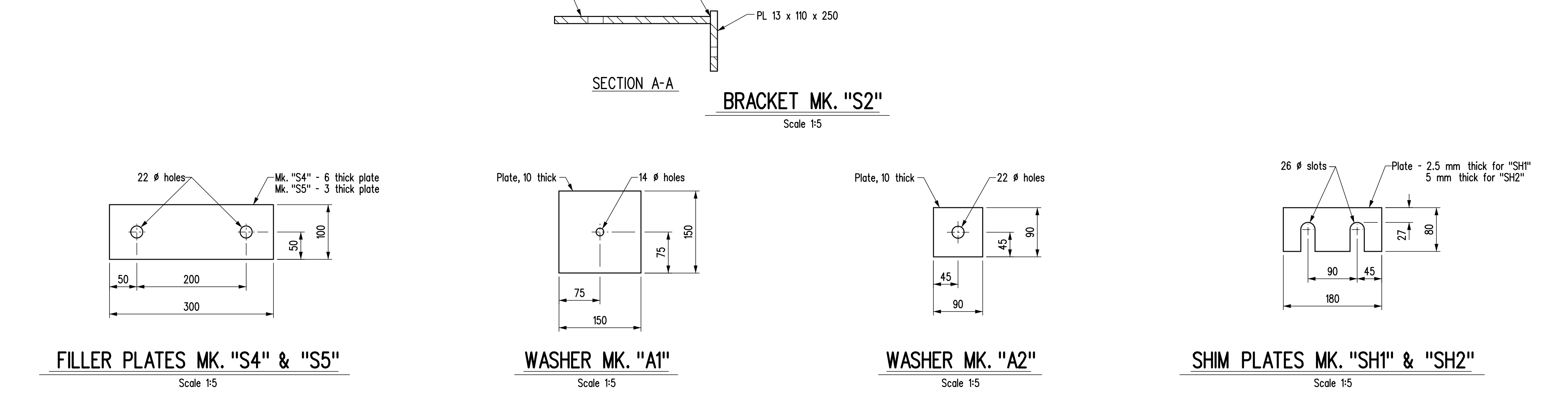
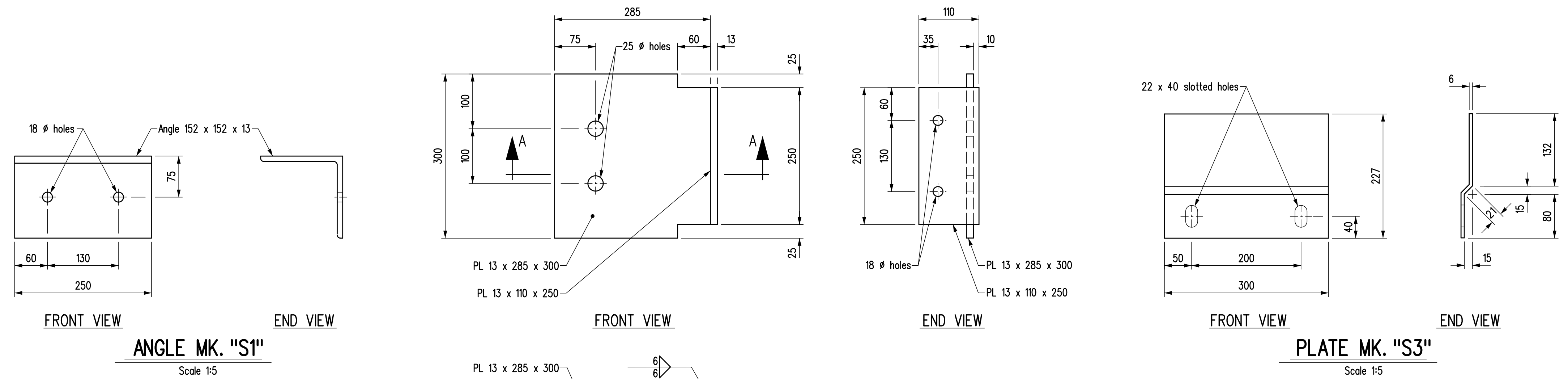
STEEL PLATE MK "P1" & "P1a"

Plate Mk. "P1" as shown, Plate "P1a" opposite hand

FOR ABUTMENTS

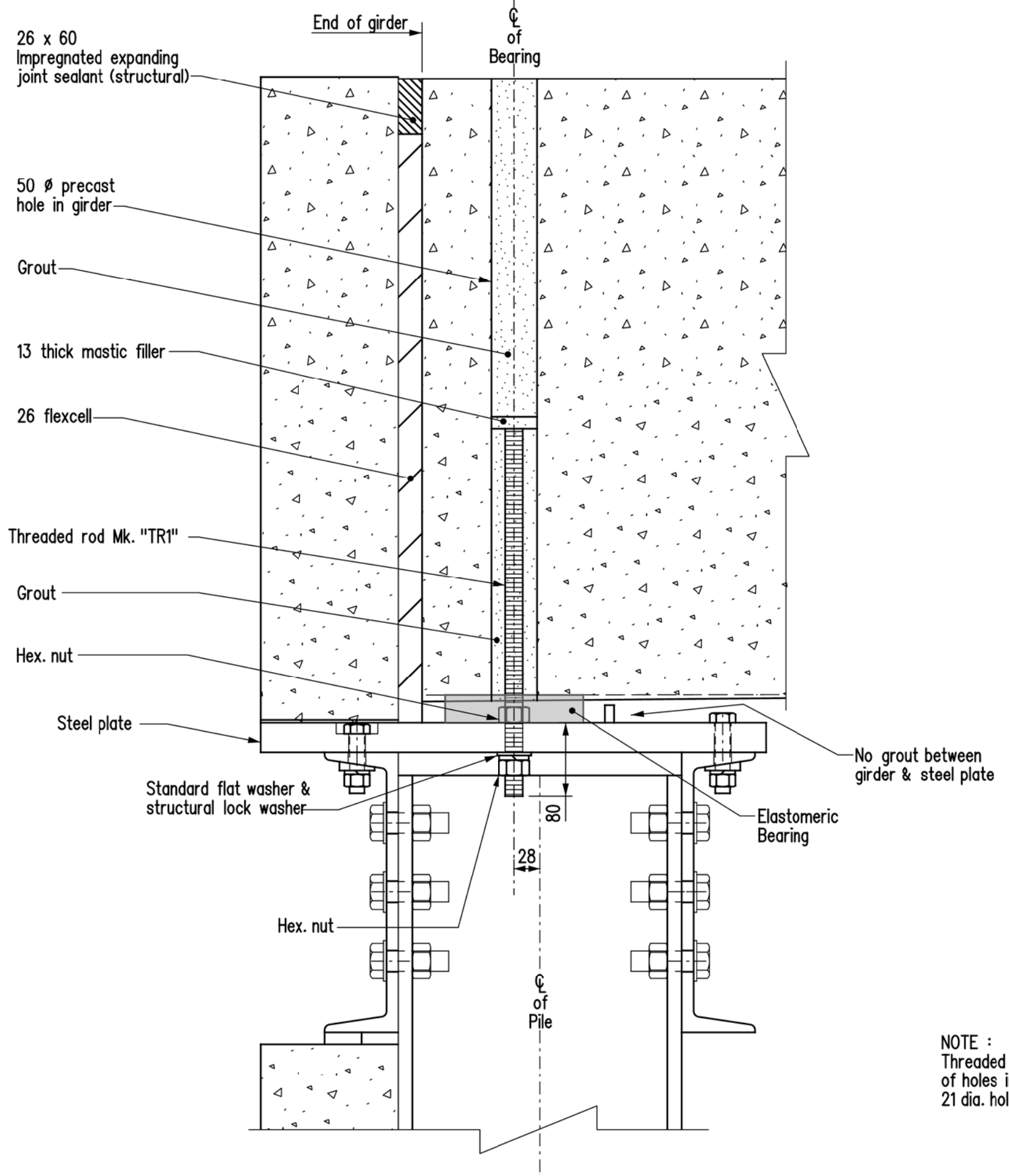
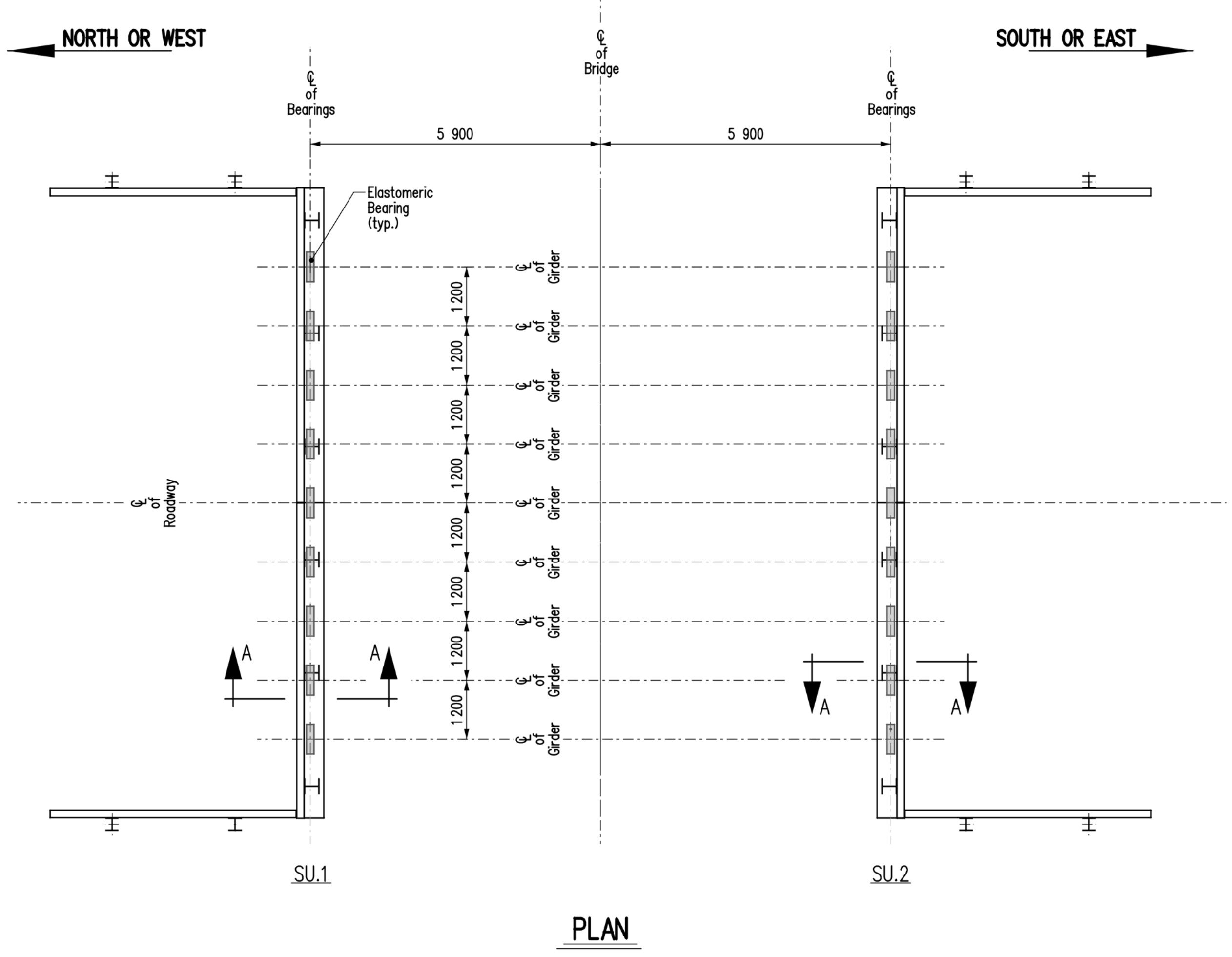
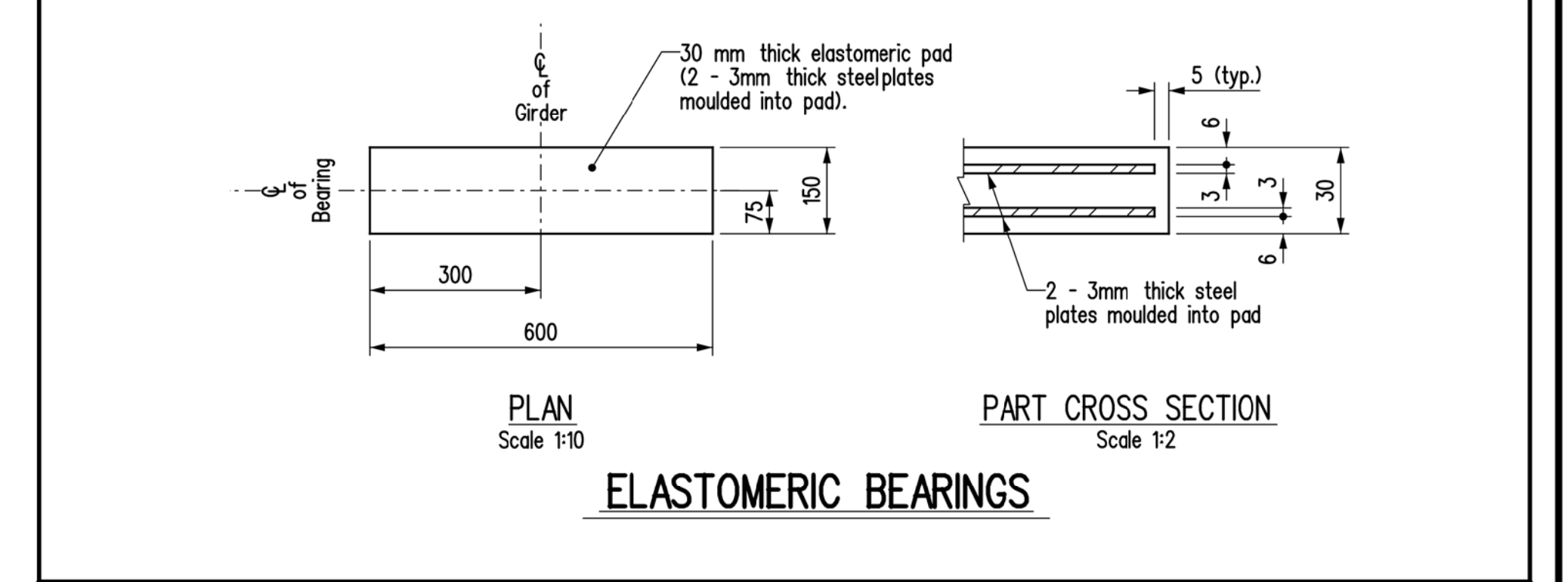
BILL OF MISCELLANEOUS METAL 10 800 ROADWAY WIDTH - 1 SPAN										Site No.		
MARK No.	No.	DESCRIPTION	CORROSION PROTECTION	SIZE	LENGTH	REMARKS	COMPONENT MASS	MASS PER UNIT	TOTAL MASS			
P1	2	Steel plate	Hot dip galvanized									1768.66
		Each unit to be fabricated from:										
		1 - Steel plate		PL 32x550	6 400	See detail for Abutment	884.224	884.224				
		9 - Nelson Type NBL, no thread studs		10 dia.	19	Part No. 101-063-167	0.012	0.108				
								884.332				
P1a	2	Steel plate	Hot dip galvanized									1768.66
		Each unit to be fabricated from:										
		1 - Steel plate		PL 32x550	6 400	See detail for Abutment	884.224	884.224				
		9 - Nelson Type NBL, no thread studs		10 dia.	19	Part No. 101-063-167	0.012	0.108				
								884.332				
P3	4	Steel channel	Hot dip galvanized	C310x45	12 800	See detail for Abutment			572.160			2288.64
R30	48	A325 bolt assembly	Hot dip galvanized	16 dia.	89	Steel plate to channels			0.245			11.76
R32	48	A325 bolt assembly	Hot dip galvanized	16 dia.	76	Steel plate to channels Cbore holes			0.225			10.80
R35	144	A325 bolt assembly	Hot dip galvanized	22 dia.	64	Channels to piles			0.461			66.38
R36	48	A325 bolt assembly	Hot dip galvanized	16 dia.	64	Angles Mk. "S1" to piles & bracket Mk. "S2" to cap			0.205			9.84
S1	20	Angle	Hot dip galvanized	L 152x152x13	250	As detailed			7.250			145.00
S2	4	Bracket	Hot dip galvanized			As detailed			11.226			44.90
S3	16	Plate	Hot dip galvanized	PL 6x300		As detailed			3.223			51.57
S4	32	Filler plate	Hot dip galvanized	PL 6x100	300	As detailed			1.413			45.22
S5	16	Filler plate	Hot dip galvanized	PL 3x100	300	As detailed			0.707			11.31
A1	18	Structural plate washer	Hot dip galvanized	PL 10x150	150	As detailed - One to threaded rod Mk. "TR2"			1.766			28.26
A2	8	Structural plate washer	Hot dip galvanized	PL 10x90	90	As detailed - One to bolt Mk. "R34"			0.636			5.09
TR1	18	Threaded rods c/w tw o hex. nuts	Hot dip galvanized	19 dia.	400	Girder to steel cap plate			0.940			16.92
TR3	32	Threaded rods c/w tw o hex. nuts	Hot dip galvanized	19 dia.	300	Steel plates Mk. "S3" to precast panels			0.660			21.12
	96	Hardened bevel washer	Hot dip galvanized	for 16 dia. bolts		One to bolts Mk. "R30" & "R32"			0.110			10.56
	18	Standard flat washer	Hot dip galvanized	for 13 dia. rod		One to threaded rod Mk. "TR2"			0.010			0.18
	82	Standard flat washer	Hot dip galvanized	for 19 dia. rod		One to "TR1", tw o to "TR3"			0.020			1.64
	18	Structural lock washer	Hot dip galvanized	for 12 dia. rod		One to threaded rod Mk. "TR2"			0.010			0.18
	50	Structural lock washer	Hot dip galvanized	for 19 dia. rod		One to "TR1" & "TR3"			0.020			1.00
	144	F436 Hardened washer	Hot dip galvanized	for 22 dia. bolts		One to bolt Mk. "R35"			0.032			4.61
	48	F436 Hardened washer	Hot dip galvanized	for 16 dia. bolts		One to bolt Mk. "R36"			0.014			0.67
R1	64	A325 bolt assembly	Hot dip galvanized	22 dia.	76	R.C. girder connection			0.499			31.94
W1	64	Structural flat washer	Hot dip galvanized	for 22 dia. bolts		One to bolt Mk. "R1"			0.050			3.20
	64	Pair Nord-Lock lock washers		for 22 dia. bolts		One pair to bolt Mk. "R1"			0.020			1.28
SH1	32	Shim plate	Hot dip galvanized	PL 2.5x80	180	As detailed - use as required			0.231			7.39
SH2	32	Shim plate	Hot dip galvanized	PL 5x80	180	As detailed - use as required			0.463			14.82
							TOTAL MASS (kg) =		6371.60			

- NOTES:
- All material noted in the above Bill shall be hot dip galvanized after fabrication in accordance with CSA G164 for a minimum net retention of 610 g/m² unless otherwise stated in the specified material ASTM standards. The fabricator and galvanizer shall safeguard against embrittlement using recommended practices from applicable standards.
 - Seal all welds prior to galvanizing.
 - Apply Galvaloy to all field welds and areas where galvanizing has been damaged.
 - All bolts and threaded rod in the above Bill shall be Imperial thread.



REVISIONS		STEEL PILE CAP DETAILS	
DATE	BY	DESIGN	RELEASED FOR CONSTRUCTION BY:
		DESIGN SEAL	EXECUTIVE DIRECTOR OF STRUCTURES DATE
		RECORD SEAL	SCALE: 1:20 SHEET No. 8
PLACE ENGINEERS ELECTRONIC SEAL HERE			
		DESIGN BY: B.A.N. CHECKED: _____ DETAILS BY: K.P. CHECKED: _____	
		or as shown SITE No. _____	

BILL OF BEARINGS			10 800 ROADWAY WIDTH - 1 SPAN	Site No.
No.	LOCATION	DESCRIPTION	REMARKS	
18	SU.1 - SU.2	Elastomeric bearings	As detailed	
NOTE:				
1. Elastomer shall be natural rubber. Elastomer shall be AASHTO low temperature Grade 5 with a minimum shear modulus $G \geq 0.9$ MPa and a 60 durometer Shore A hardness.				
2. Internal steel reinforcing plates for laminate bearings shall be rolled mild steel with a minimum yield strength of 300 Mpa.				



NOTE :
Threaded rods Mk. "TRI", set exactly on centreline of holes in precast girders and grouted. Field drill 21 dia. hole in steel plate to match girders.

SECTION "A-A"
Threaded rods at SU.1 & SU.2. See sheet No. 6 for layout.
Scale 1:5

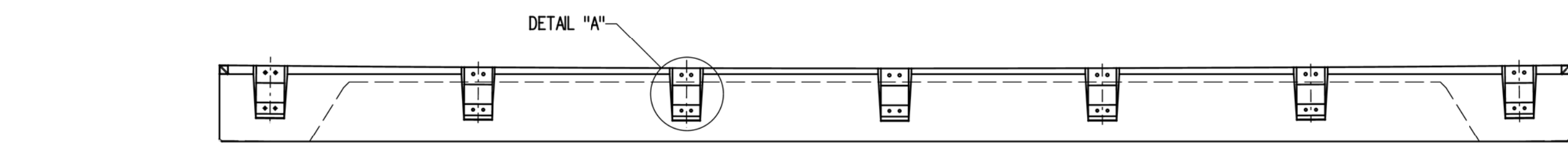
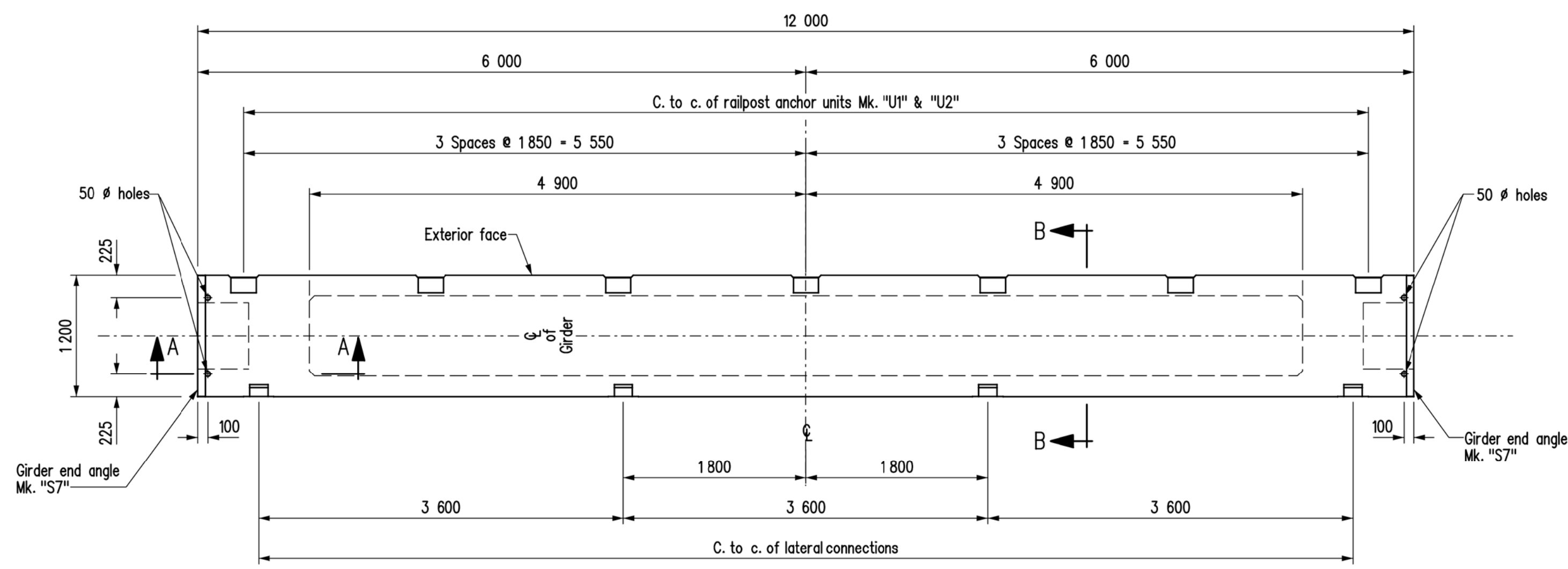
NOTES:

Re: Girder Erection Operations Behind Abutment Ballast Walls

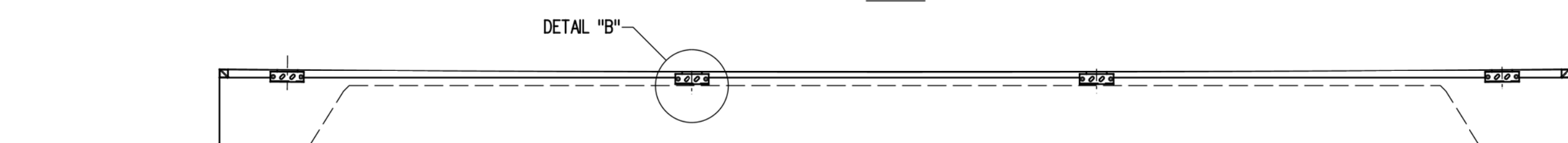
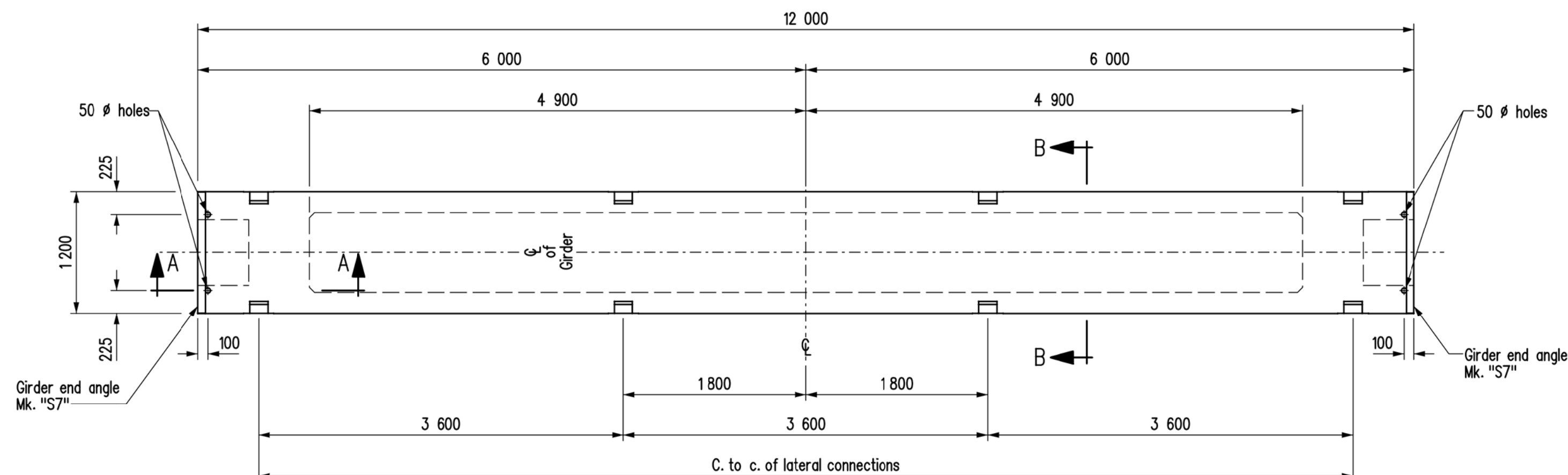
- Surcharge loading on the backfill resulting from girder erection operations shall be minimized near the precast concrete ballast walls and wingwalls.
- Where possible, girder erection equipment shall be positioned such that there are no surcharge loads behind the back face of the precast panels within a distance equal to the depth of backfill to the bottom of the panels at the time of girder erection.
- Should the Contractor propose to encroach on this zone, the following requirements must be satisfied:
 - Submit a girder erection procedure for approval outlining type, configuration, weights and locations of equipment including expected tipping forces on crane outriggers, etc.
 - Perform all precautionary measures outlined by the Department as a result of that submission.
 - All surcharge loads encroaching in this zone must be distributed over an area not less than 2.0 m².

REVISIONS		BEARING AND ERECTION DETAILS	
DATE	BY	DESCRIPTION	RELEASED FOR CONSTRUCTION BY:

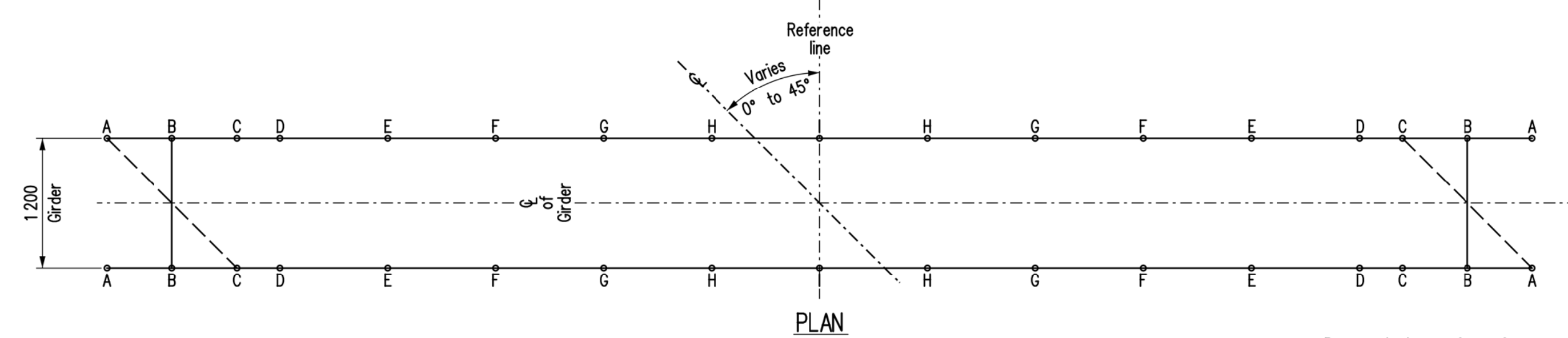
PLACE ENGINEERS ELECTRONIC SEAL HERE	DESIGN SEAL	RECORD SEAL	<p>Infrastructure Water Management and Structures</p>	EXECUTIVE DIRECTOR OF STRUCTURES	DATE	
			BY: <u> B.A.N. </u>			
			CHECKED: <u> </u>	SCALE: <u> 1:75 </u>		
			BY: <u> K.P. </u>		SHEET No. <u> 9 </u>	



EXTERIOR ELEVATION
EXTERIOR GIRDER MK. "G1"

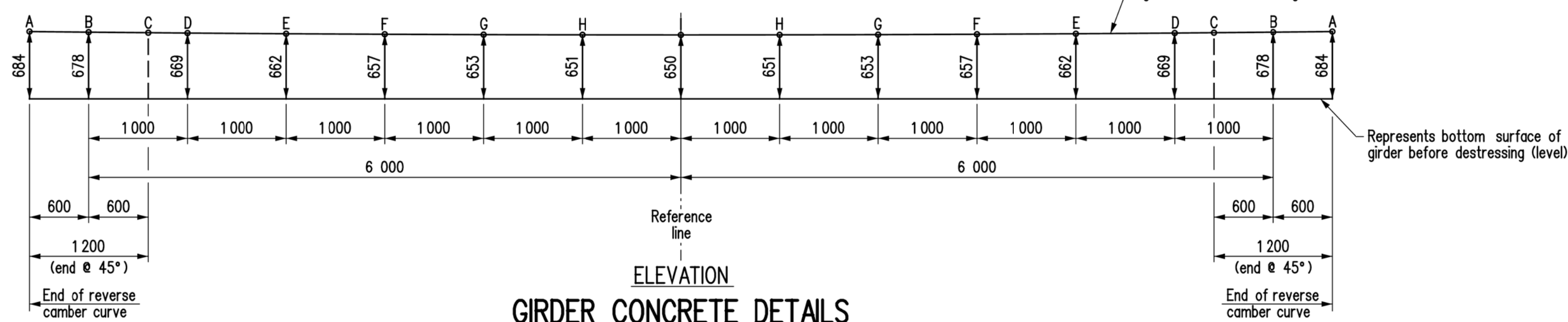


ELEVATION
INTERIOR GIRDER MK. "G2"



NOTE: Top surface of girder shall be screeded perpendicular to side forms

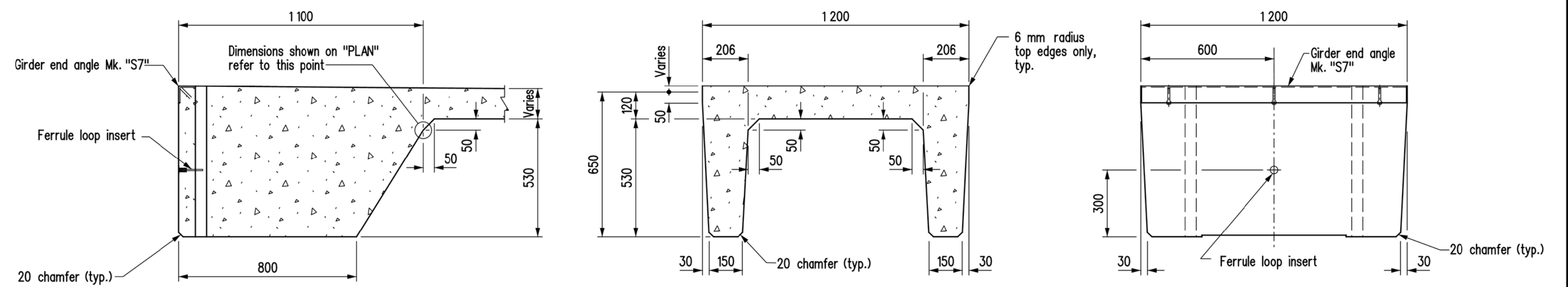
Represents top surface of girder before distressing



ELEVATION
GIRDER CONCRETE DETAILS

Showing variable depth of girder to eliminate camber on top surface after distressing

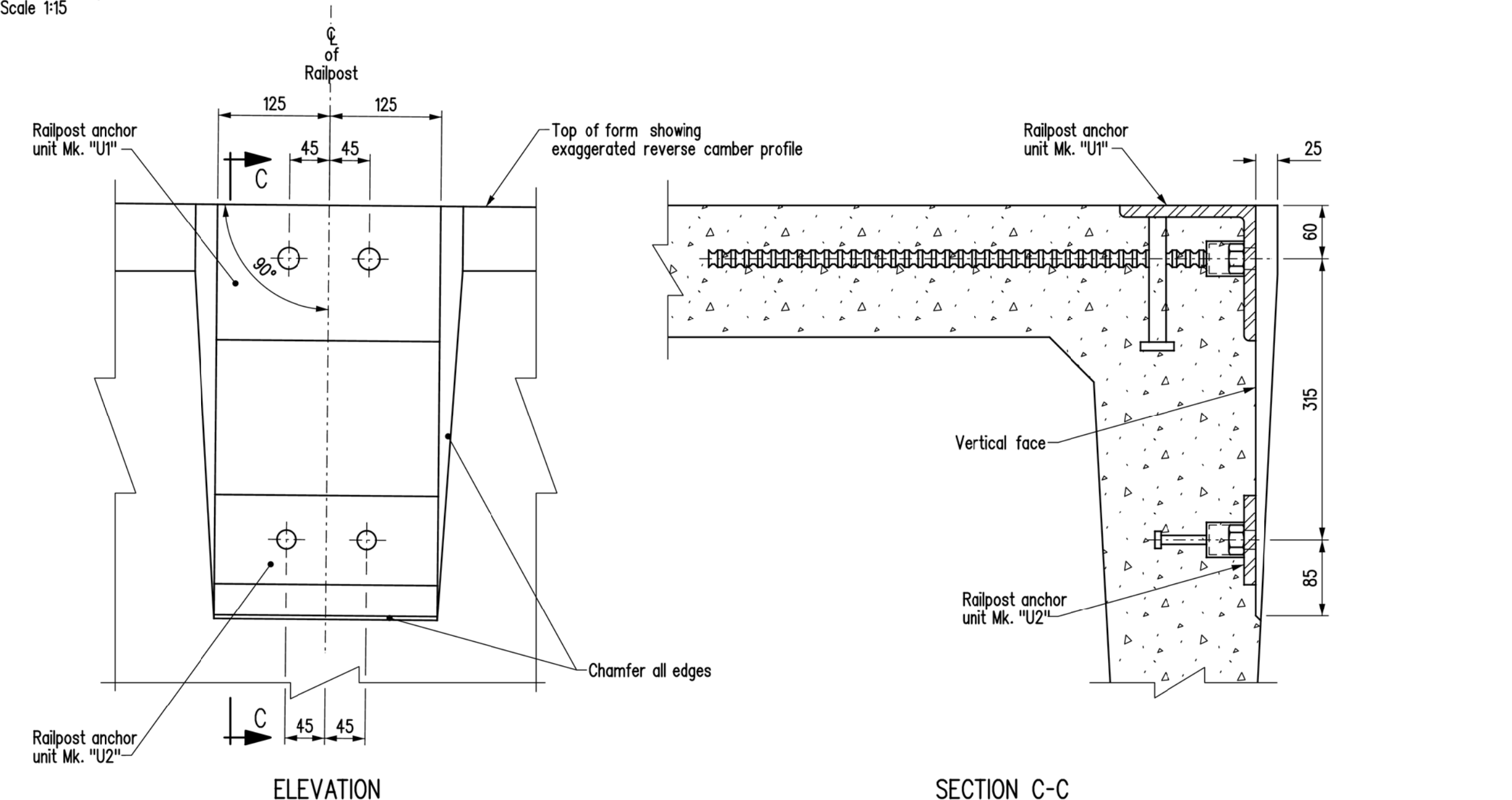
NOTE: The end of girder will fall between POINT "A" and POINT "C" on curve because of various skew angles.



SECTION A-A
Typical at both ends of girders
Scale 1:15

SECTION B-B
Scale 1:15

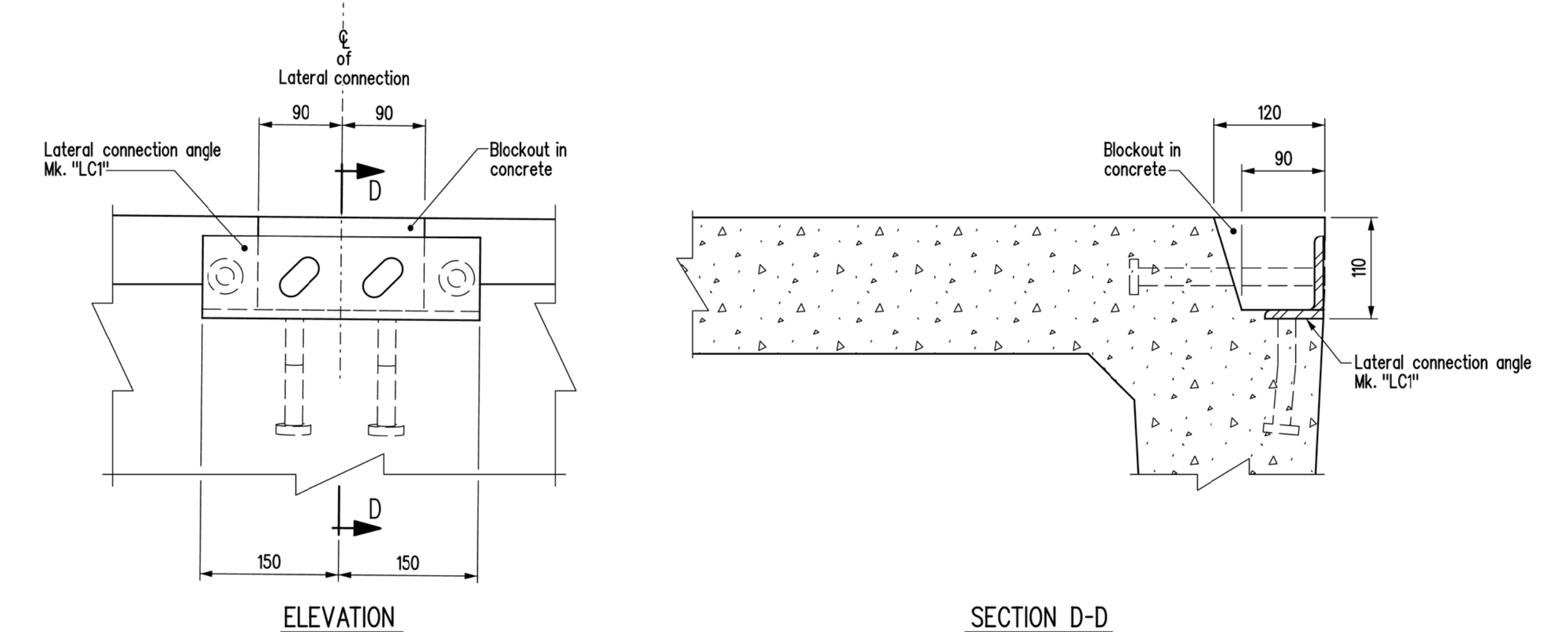
END VIEW
Scale 1:15



ELEVATION

SECTION C-C

DETAIL "A"
Scale 1:5



ELEVATION

SECTION D-D

DETAIL "B"
Scale 1:5

NOTES:

- Design in accordance with AASHTO LRFD Bridge Design Specifications, First Edition, 1994 plus 1996/1997 interim's.
- Design Vehicular Live Load: Modified AASHTO HSS-25 AASHTO LRFD "HL-93"
- Design distribution factor = 0.5 lanes/girder.
- Concrete strength: f_c transfer, f_{ci} = 35 MPa
 f_c 28 days, f_c = 45 MPa
- Prestressing steel: 13 mm ϕ low relaxation strands
Minimum ultimate strength, f_{pu} = 1 860 MPa
Jacking force/strand, f_{pj} = 128.5 kN/strand
- Girder dimensioning tolerances: Length 3 mm \pm
Cross section 2 mm \pm
- Approximate mass per girder = 12 000 kg

REVISIONS		PRECAST PRESTRESSED CHANNEL GIRDER DETAILS	
DATE	BY	DESCRIPTION	RELEASED FOR CONSTRUCTION
			BY: _____
			EXECUTIVE DIRECTOR OF STRUCTURES DATE
			SCALE: _____
			Scale 1:40 SHEET No. G1
			or as shown SITE No. _____



PLACE ENGINEERS
ELECTRONIC SEAL
HERE

DESIGN

BY: B.A.N.

DETAILS

CHECKED: K.P.

