

GENERAL NOTES

- 1. All levels, dimensions and setting out details to be verified by the Consultant...

NOTATION

- BCC Beginning of circular curve
- ECC End of circular curve
- PI Point of intersection

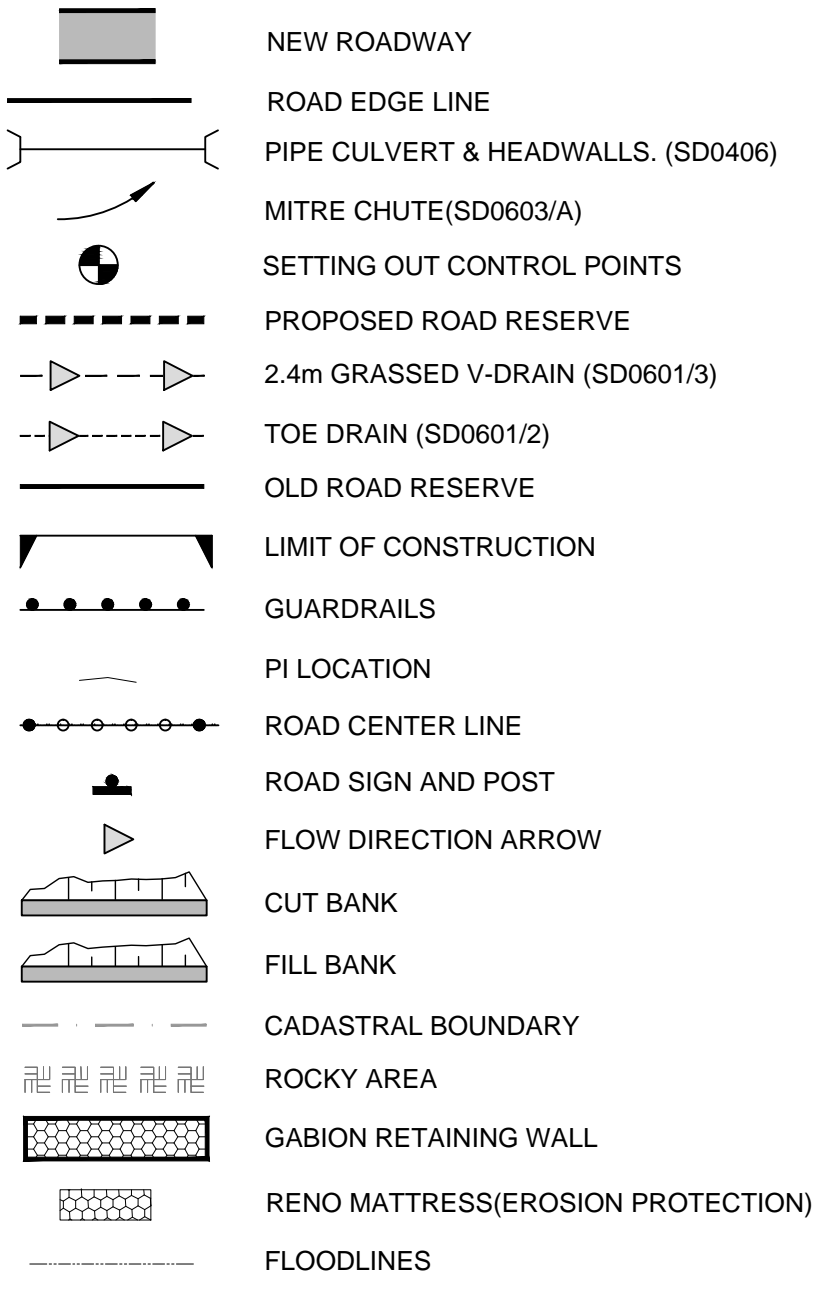
SIGN POSTING SCHEDULE TO SD 1302/A

Table with columns: CH, SIGN, SIZE (mm), CH, SIGN, SIZE (mm). Lists sign specifications for both left and right hand sides.

SIGN POSTING SCHEDULE TO SD 1302/A

Table with columns: X CO-ORDINATE, LEFT HAND SIDE, RIGHT HAND SIDE, Y CO-ORDINATE, SIGN, SIZE (mm).

LEGEND



ROAD CLASS

Table with columns: ROAD NO., CLASS. Lists Road Class R4 District Road and R5 Local Road.

SETTING OUT CONTROL POINTS

Table with columns: POINT NAME, X CO-ORDINATE, Y CO-ORDINATE, ELEVATION. Lists control points CA03 to CA04.

CURVE SETTING OUT DATA

Table with columns: Position, Chaining, Y Co-ordinate, X Co-ordinate, Radius, Curve, Tangent Length, Deflection.

CURVE SETTING OUT DATA

Table with columns: Position, Chaining, Y Co-ordinate, X Co-ordinate, Radius, Curve, Tangent Length, Deflection.

PIPE CROSSING SCHEDULE TO SD 0406

Table with columns: Ch Position, Size (mm), Class, Type, Bedding Class, Est. Length, Skew, Slope, Invert Level, Outlet Level, Flow, Velocity, Capacity, Catchment Area.

PIPE CROSSING SCHEDULE TO SD 0406

Table with columns: Ch Position, Size (mm), Class, Type, Bedding Class, Est. Length, Skew, Slope, Invert Level, Outlet Level, Flow, Velocity, Capacity, Catchment Area.

PIPE CROSSING SCHEDULE TO SD 0406

Table with columns: Ch Position, Size (mm), Class, Type, Bedding Class, Est. Length, Skew, Slope, Invert Level, Outlet Level, Flow, Velocity, Capacity, Catchment Area.

BOREHOLE POSITION

Table with columns: POINTS, X, Y. Lists borehole positions BH1 to BH4.

SIDE DRAIN SCHEDULE

Table with columns: FROM CH, TO CH, LENGTH, TYPE for Left Hand Side and Right Hand Side.

SIDE DRAIN SCHEDULE

Table with columns: FROM CH, TO CH, LENGTH, TYPE for Left Hand Side and Right Hand Side.

MITRE DRAIN SCHEDULE

Table with columns: LEFT HAND SIDE, RIGHT HAND SIDE, CH POSITION.

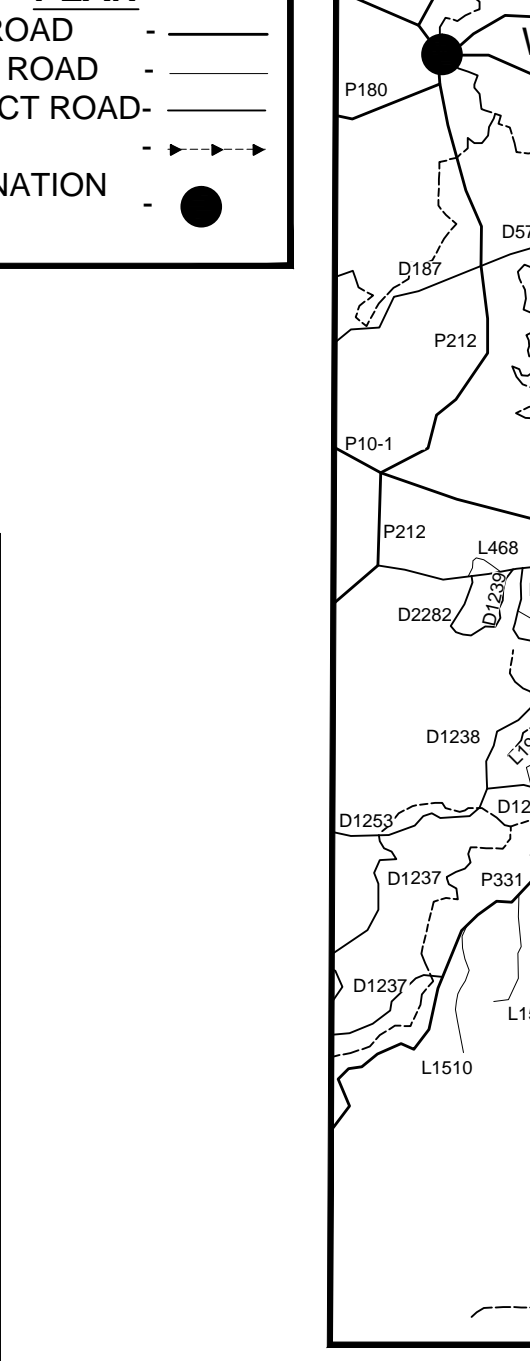
ROAD MARKING SCHEDULE

Table with columns: FROM CH, TO CH, LENGTH, TYPE. Lists road marking specifications.

EXPROPRIATION SCHEDULE

Table with columns: POINT NAME, X CO-ORDINATE, Y CO-ORDINATE. Lists expropriation points.

LOCALITY KEY



SCHEDULE

Table with columns: FROM CH, TO CH, LENGTH, TYPE. Lists guardrail schedule details.

GABION RETAINING WALL SCHEDULE

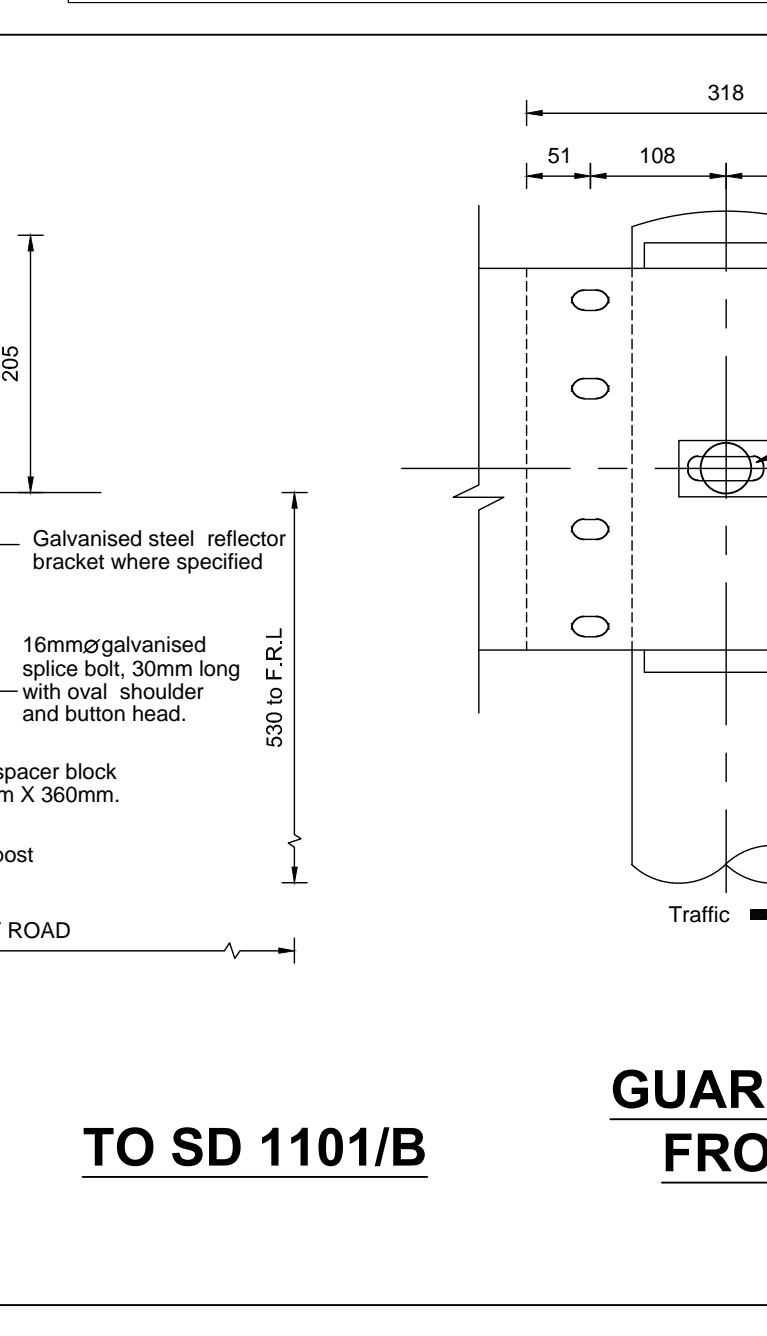
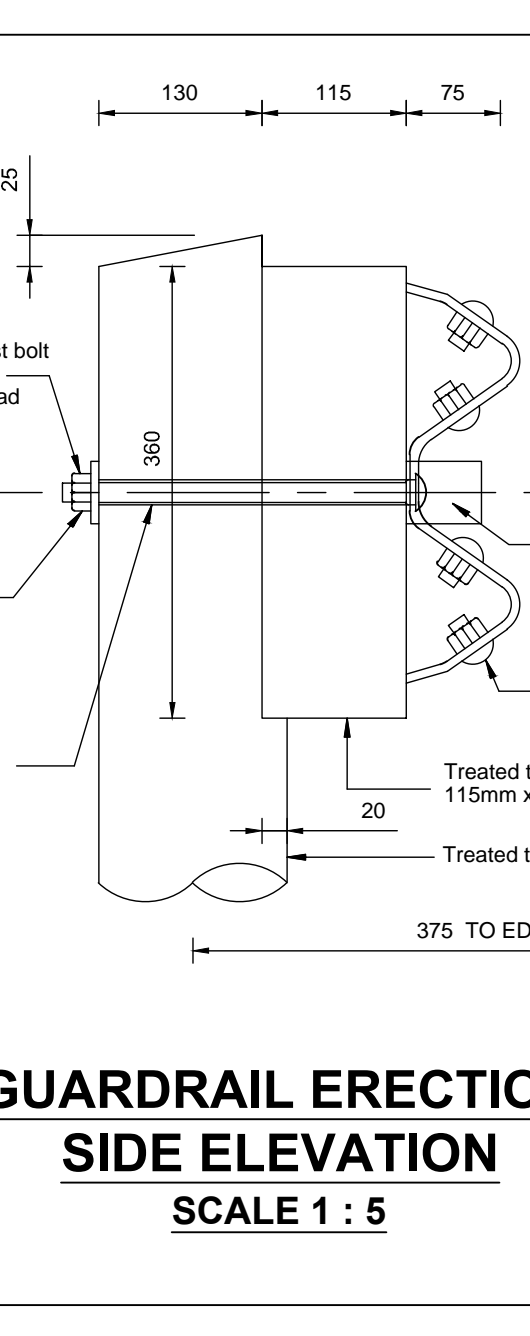
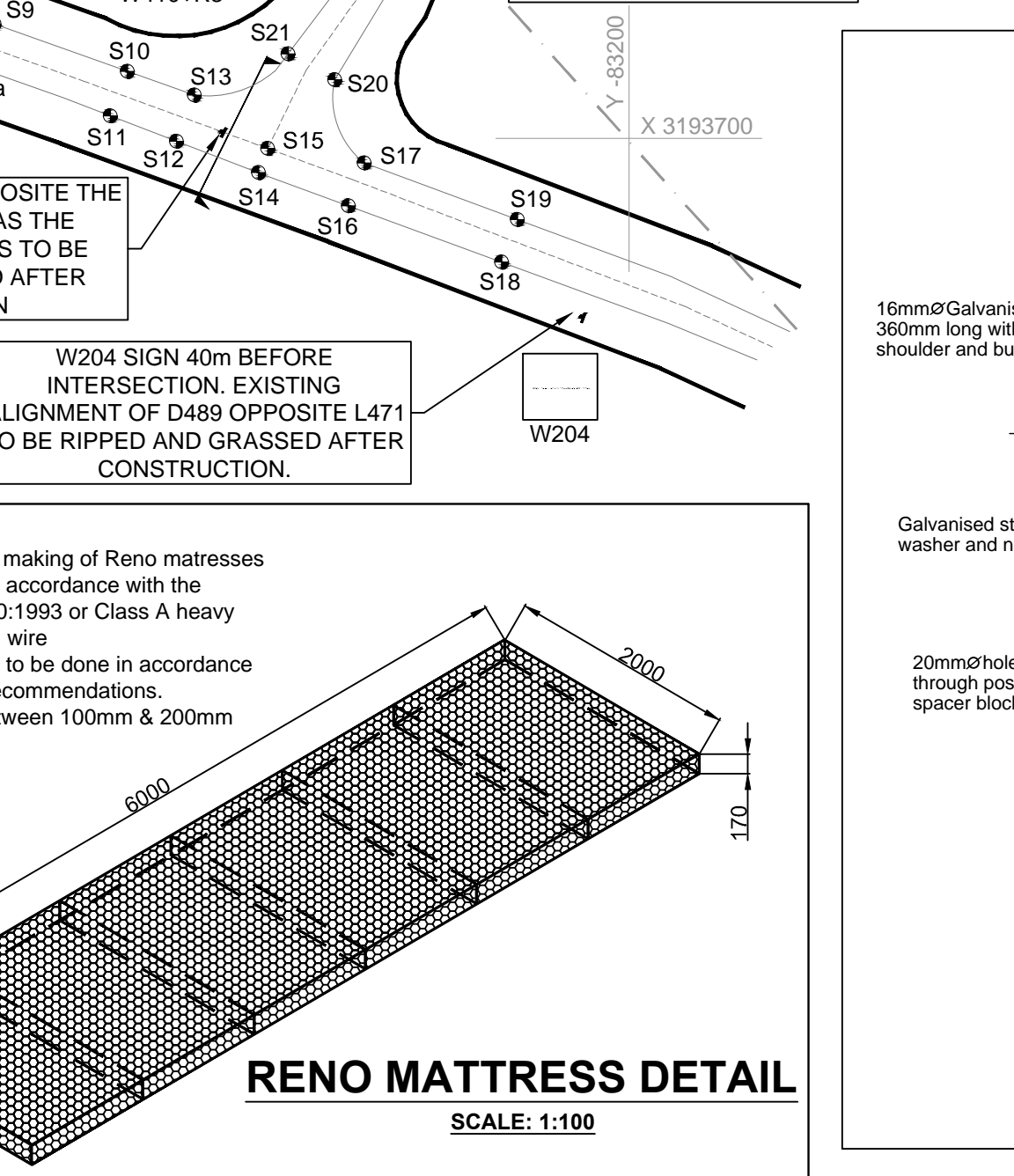
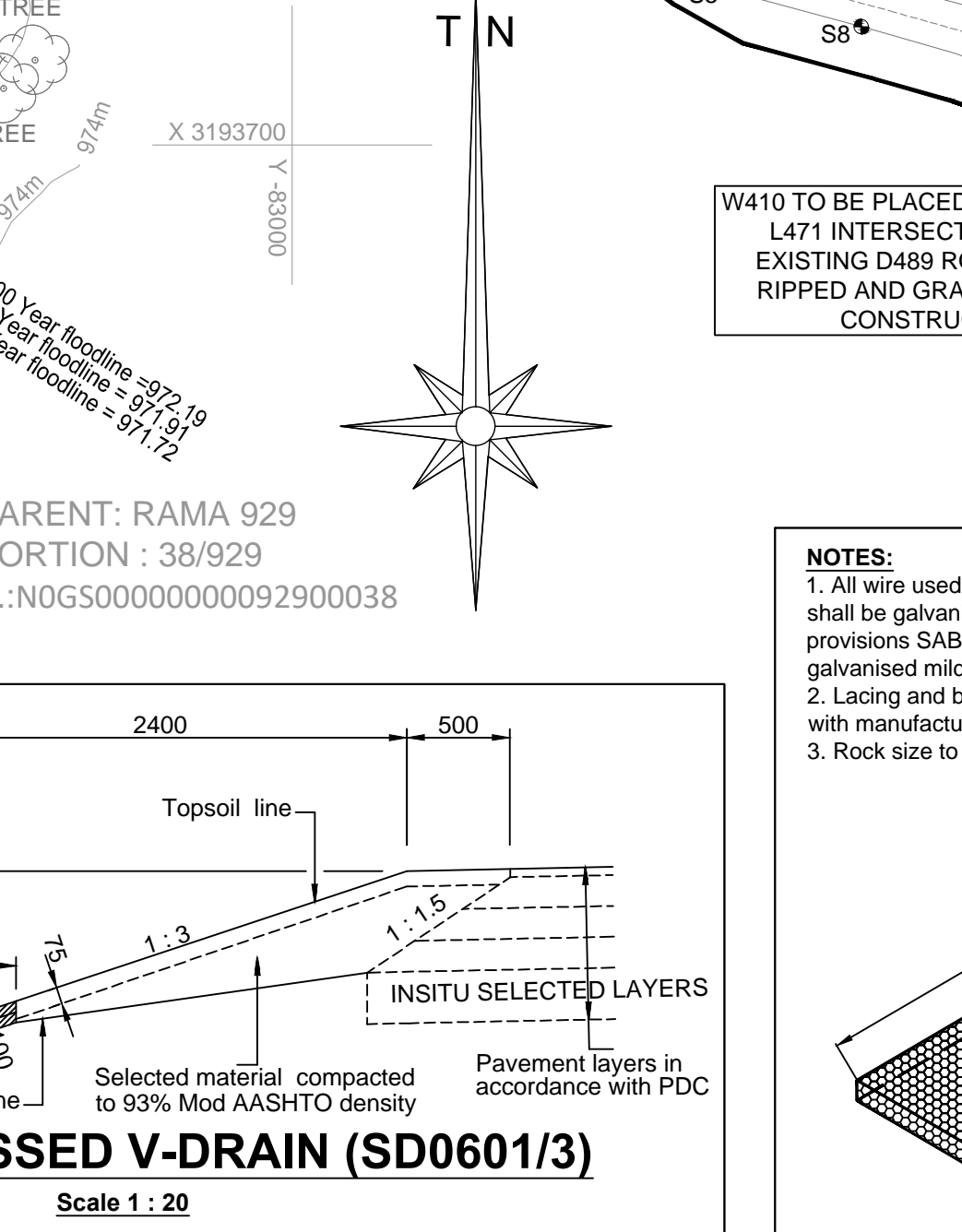
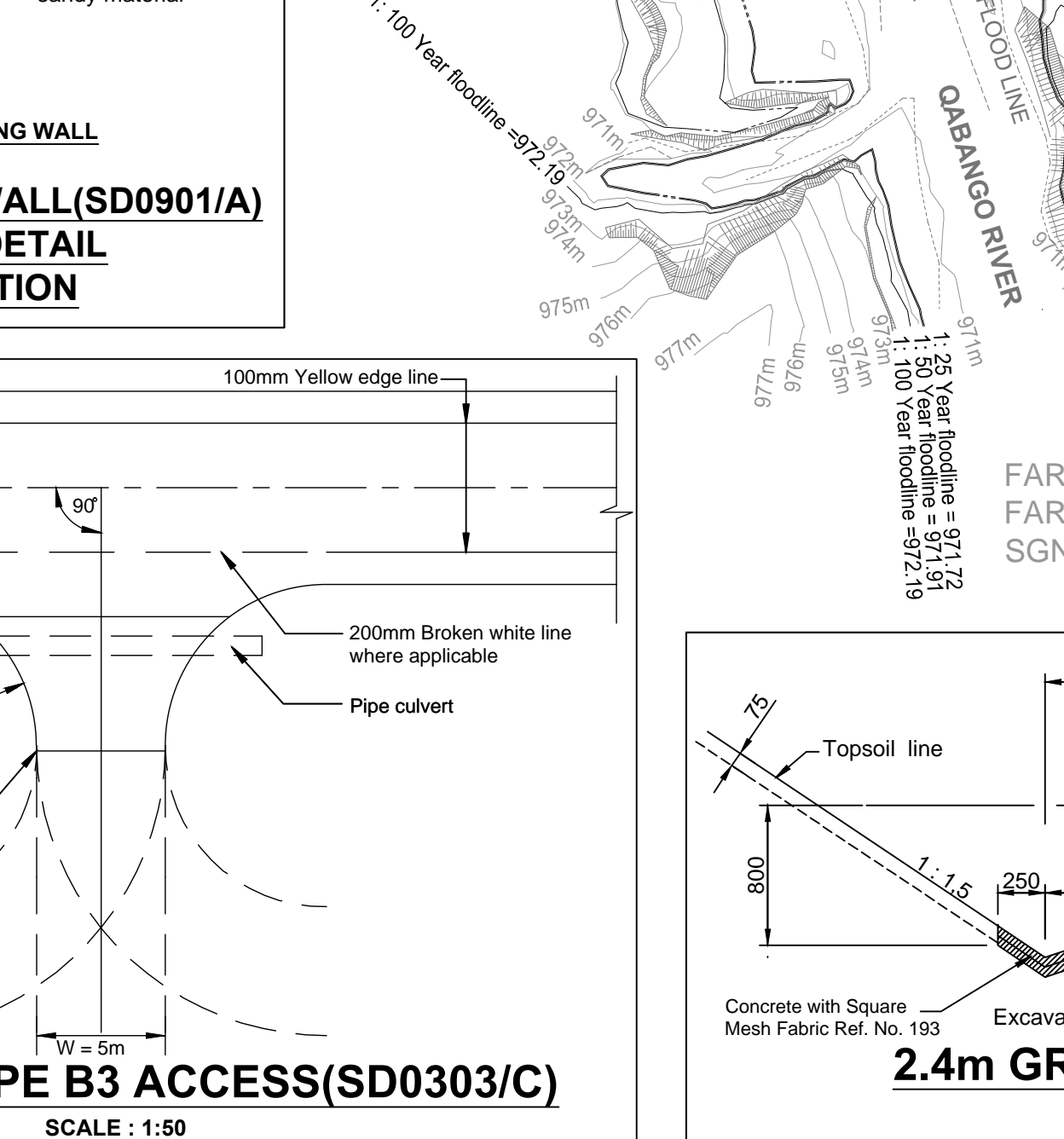
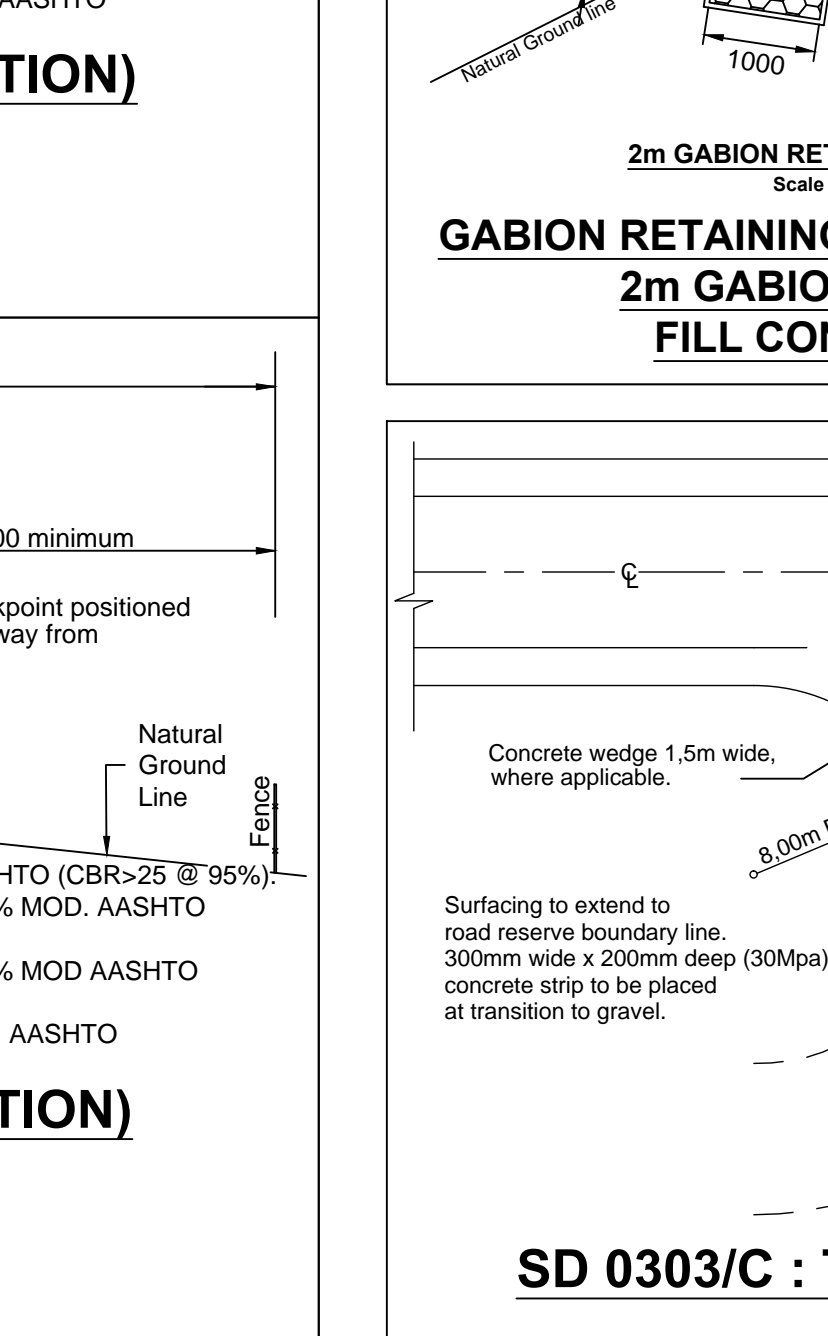
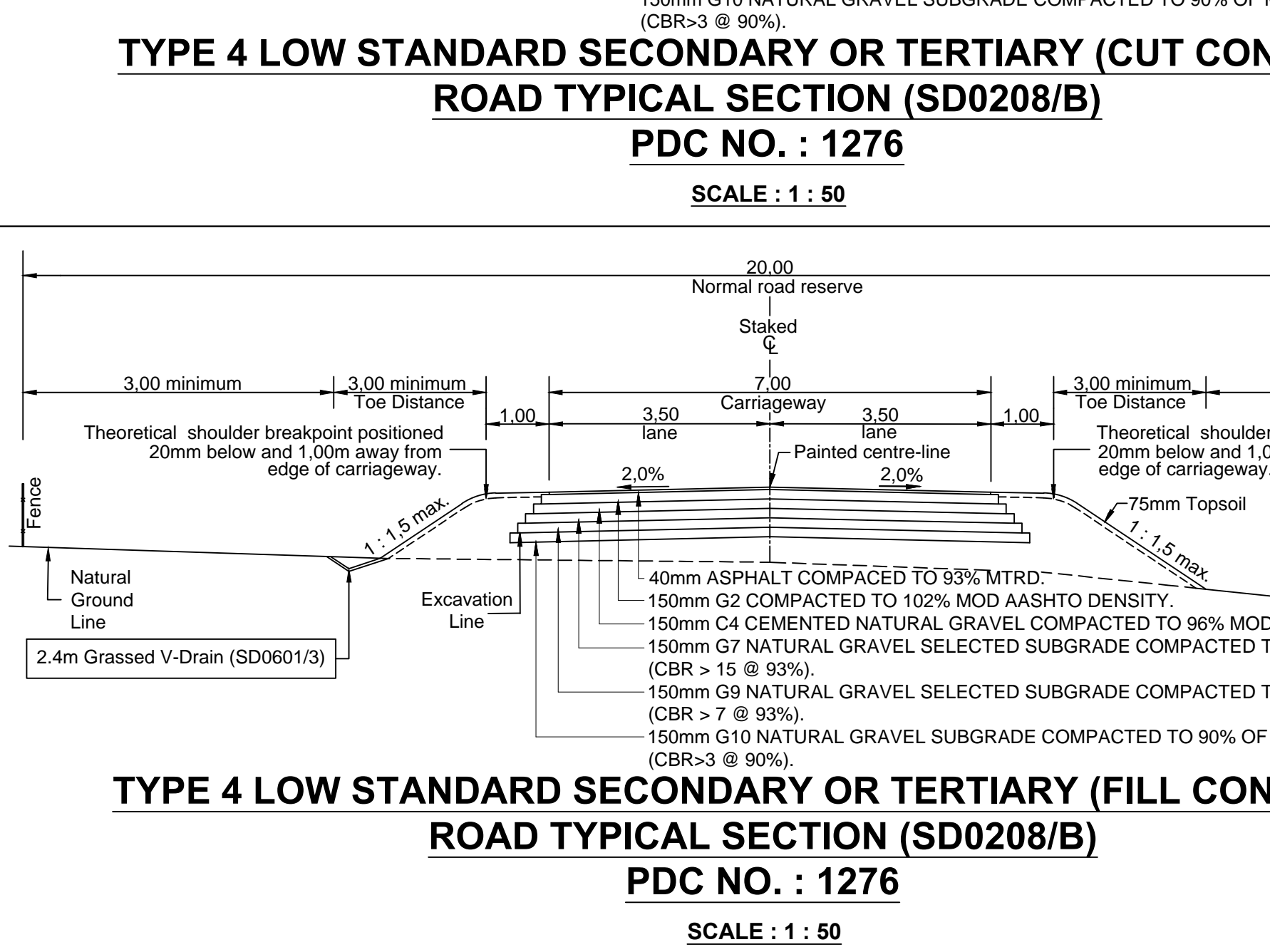
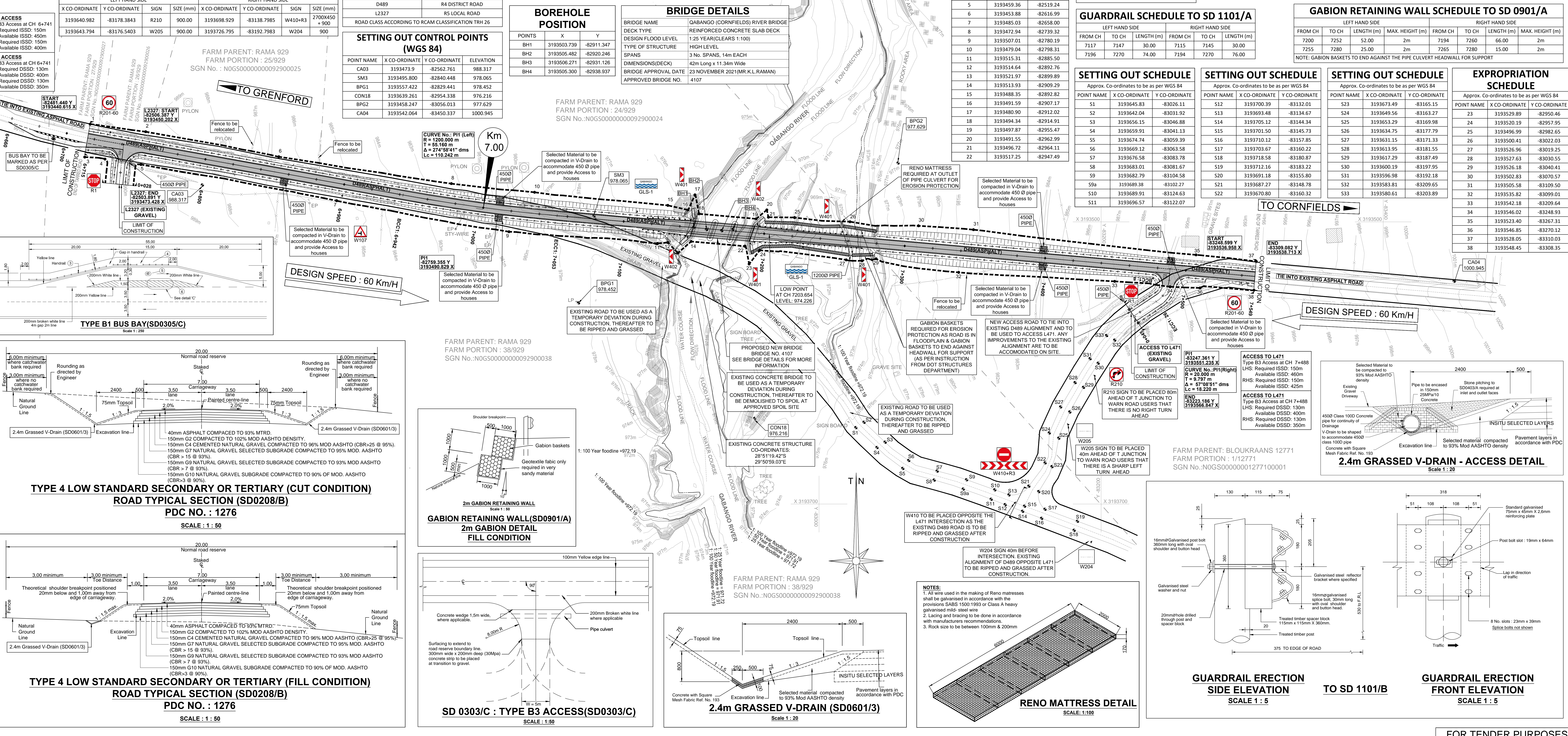
Table with columns: FROM CH, TO CH, LENGTH, TYPE. Lists gabion retaining wall schedule.

SETTING OUT SCHEDULE

Table with columns: POINT NAME, X CO-ORDINATE, Y CO-ORDINATE. Lists setting out schedule details.

EXPROPRIATION SCHEDULE

Table with columns: POINT NAME, X CO-ORDINATE, Y CO-ORDINATE. Lists expropriation schedule details.



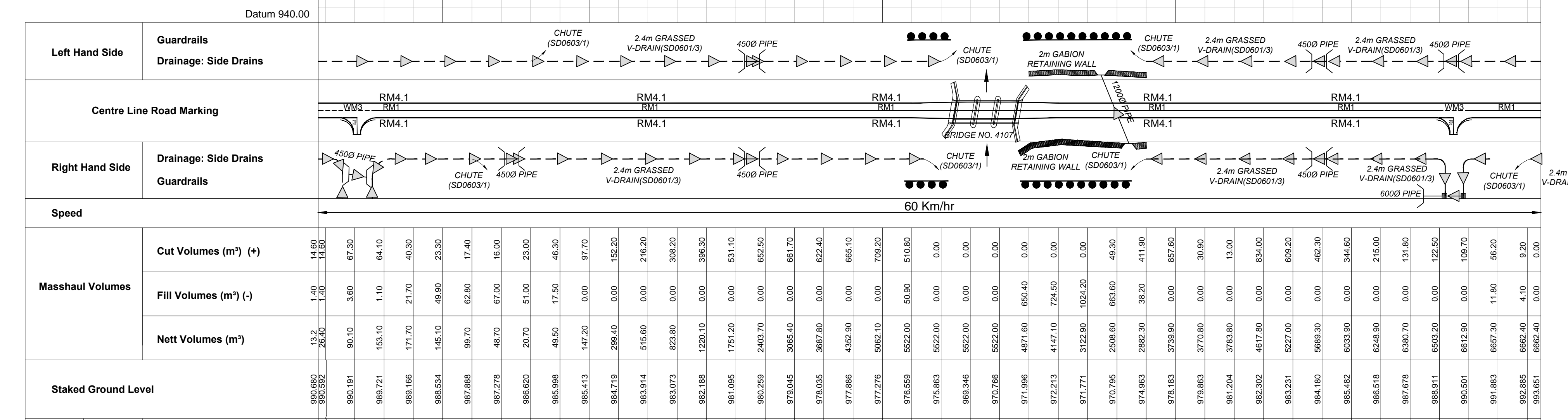
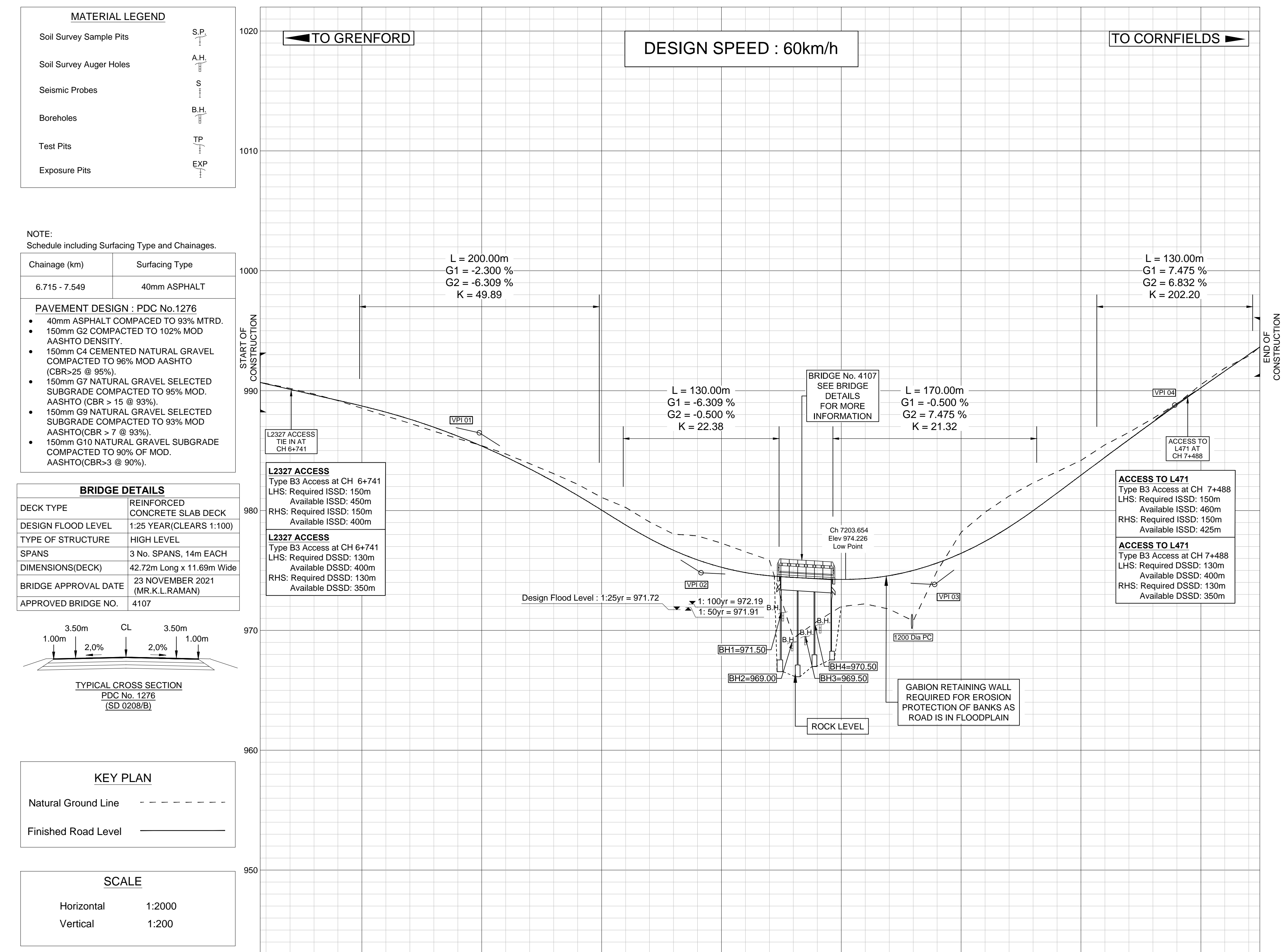
AS BUILT table with columns for Date, Description, Checked, and Signed.

Design information table with columns for Designer, Checked, Drawn, Checked by, Date of Approval.

PROVINCE OF KWAZULU-NATAL DEPARTMENT OF TRANSPORT logo and contact information.

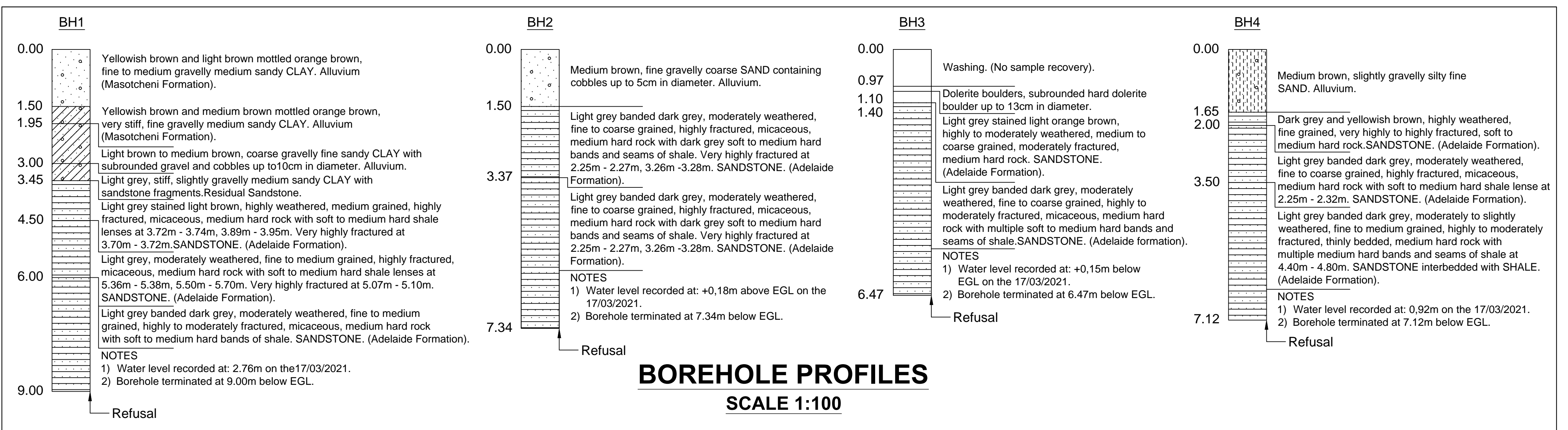
DISTRICT ROAD 489 BRIDGE APPROACHES (Km 6.715 to Km 7.549) GENERAL ARRANGEMENT

FOR TENDER PURPOSES table with columns for Staked km distance, Scale, Sheet, and Plan No.



Vertical Alignment	Finished Road Levels		Grades	Vertical Curves	Superelevation	Horizontal Curves	Staked Kilometre Distance
	Left Edge 3.50m Left of Centerline	Right Edge 3.50m Right of Centerline					
Cut Volumes (m³) (+)	14.90	14.90	-2.300 %	200.00m VC K = 49.89	-2.00%	Dir 280°14'31"	6+715
	14.90	14.90					6+715
Fill Volumes (m³) (-)	0.00	0.00	-6.309 %	698.03	-2.00%	Dir 354°40'	6+740
	0.00	0.00					6+740
Net Volumes (m³)	14.90	14.90	-0.500 %	130.00m VC K = 22.38	-0.45%	Dir 274°56'41"	6+760
	14.90	14.90					6+760
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+780
	998.50	998.50					6+780
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+800
	998.50	998.50					6+800
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+820
	998.50	998.50					6+820
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+840
	998.50	998.50					6+840
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+860
	998.50	998.50					6+860
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+880
	998.50	998.50					6+880
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+900
	998.50	998.50					6+900
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+920
	998.50	998.50					6+920
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+940
	998.50	998.50					6+940
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+960
	998.50	998.50					6+960
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	6+980
	998.50	998.50					6+980
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+000
	998.50	998.50					7+000
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+020
	998.50	998.50					7+020
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+040
	998.50	998.50					7+040
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+060
	998.50	998.50					7+060
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+080
	998.50	998.50					7+080
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+100
	998.50	998.50					7+100
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+120
	998.50	998.50					7+120
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+140
	998.50	998.50					7+140
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+160
	998.50	998.50					7+160
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+180
	998.50	998.50					7+180
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+200
	998.50	998.50					7+200
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+220
	998.50	998.50					7+220
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+240
	998.50	998.50					7+240
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+260
	998.50	998.50					7+260
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+280
	998.50	998.50					7+280
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+300
	998.50	998.50					7+300
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+320
	998.50	998.50					7+320
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+340
	998.50	998.50					7+340
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+360
	998.50	998.50					7+360
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+380
	998.50	998.50					7+380
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+400
	998.50	998.50					7+400
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+420
	998.50	998.50					7+420
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+440
	998.50	998.50					7+440
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+460
	998.50	998.50					7+460
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+480
	998.50	998.50					7+480
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+500
	998.50	998.50					7+500
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+520
	998.50	998.50					7+520
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+540
	998.50	998.50					7+540
Staked Ground Level	998.50	998.50	7.475 %	718.50	-2.00%	Dir 274°56'41"	7+549
	998.50	998.50					7+549

Longitudinal Section for D489 from CH 6+715 to CH 7+549



BOREHOLE PROFILES
SCALE 1:100

Symbol	Date	Description	Checked	Signed

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	
Continued on:-	
Design Plan No:-	C47156
Long Section No:-	C47156
Cross Section No:-	C47157 - C47158

Designed by:-	Y.NANKHOOD
Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Drawn by:-	K.RAMSUROOP
Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Date of Approval:-	03 JUNE 2022



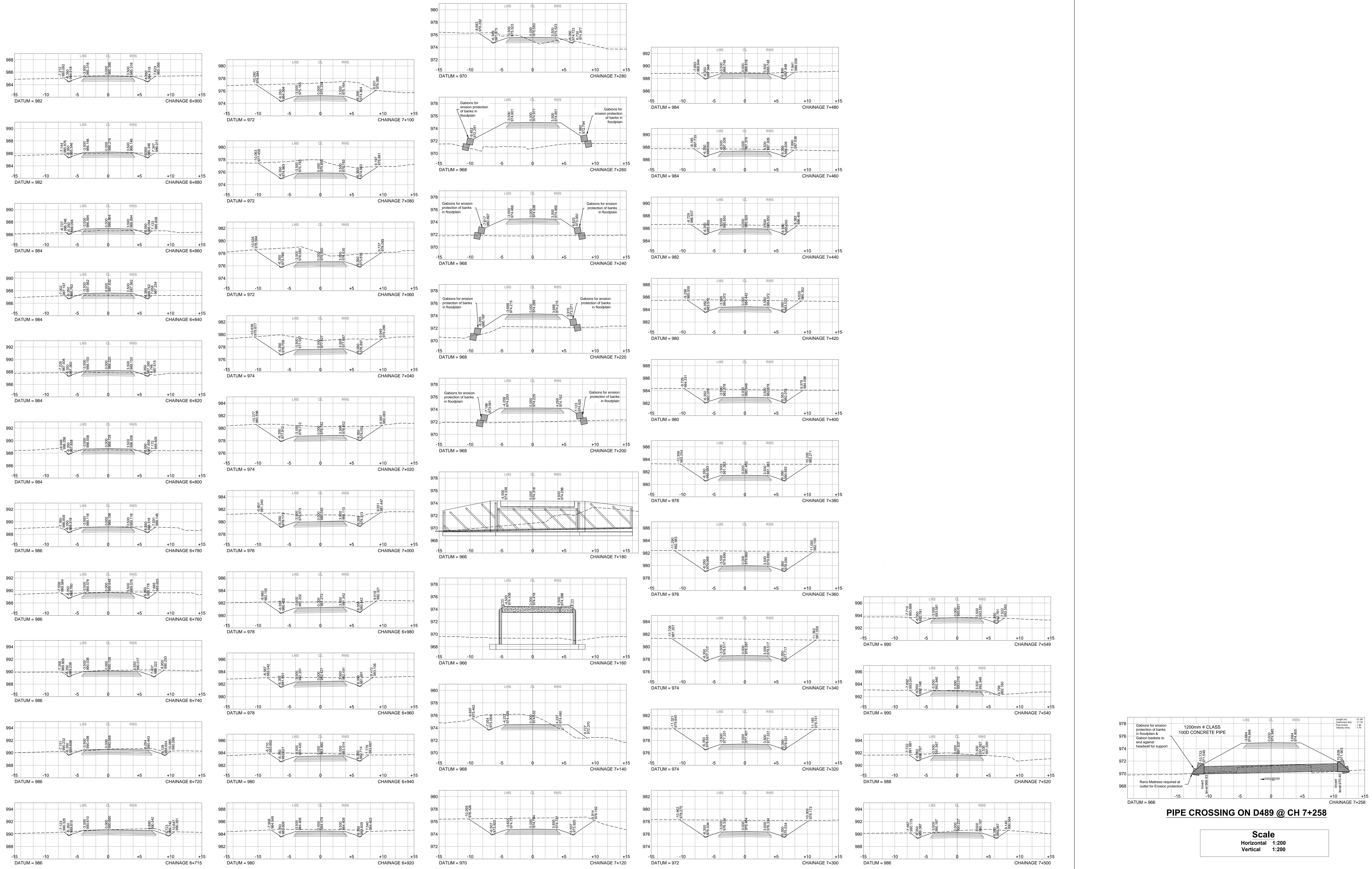
PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

SIGNATURE	DATE

Transportation Engineering : Chief Engineer
Head: Transport

DISTRICT ROAD D489 : GRENFOR - CORNFIELDS
QABANG (CORNFIELDS) RIVER BRIDGE
PORTION
DISTRICT ROAD 489 BRIDGE APPROACHES
(Km 6.715 to Km 7.549)
LONGITUDINAL SECTION

FOR TENDER PURPOSES	
Staked km distance Km 6.715 to Km 7.549	Sheet 01 of 01
Scale HOR: 2000 VERT: 200	Plan No.:- C47156



PIPE CROSSING ON D489 @ CH 7+558

Scale
Horizontal 1:200
Vertical 1:200

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-

Continued on:- C47158

Design Plan No:- C47155

Long Section No:- C47156

Cross Section No:- C47157 - C47158

Designed by:- Y.NANKHOOD

Checked by:- P.NANKHOOD (Pr.Eng: 910350)

Drawn by:- K.RAMSUROOP

Checked by:- P.NANKHOOD (Pr.Eng: 910350)

Date of Approval:- 03 JUNE 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOOD
Consulting Engineers
www.nankhoo.co.za

SIGNATURE _____ DATE _____

Transportation Engineering : Chief Engineer

Head: Transport

DISTRICT ROAD D489 : GRENFOR - CORNFIELDS
QABANG (CORNFIELDS) RIVER BRIDGE

PORTION
DISTRICT ROAD 489 BRIDGE APPROACHES
(Km 6.715 to Km 7.549)
D489 CROSS SECTIONS

FOR TENDER PURPOSES

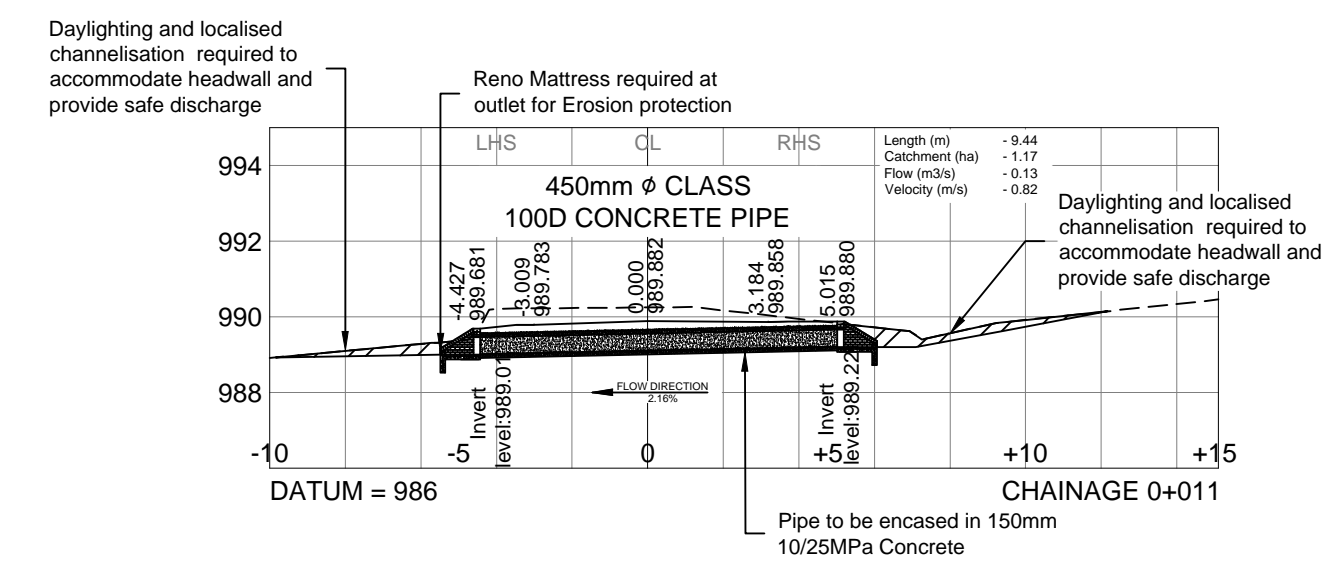
Staked km distance: Km 6.715 to Km 7.549

Sheet 01 of 01

Scale: HOR: 200 VERT: 200

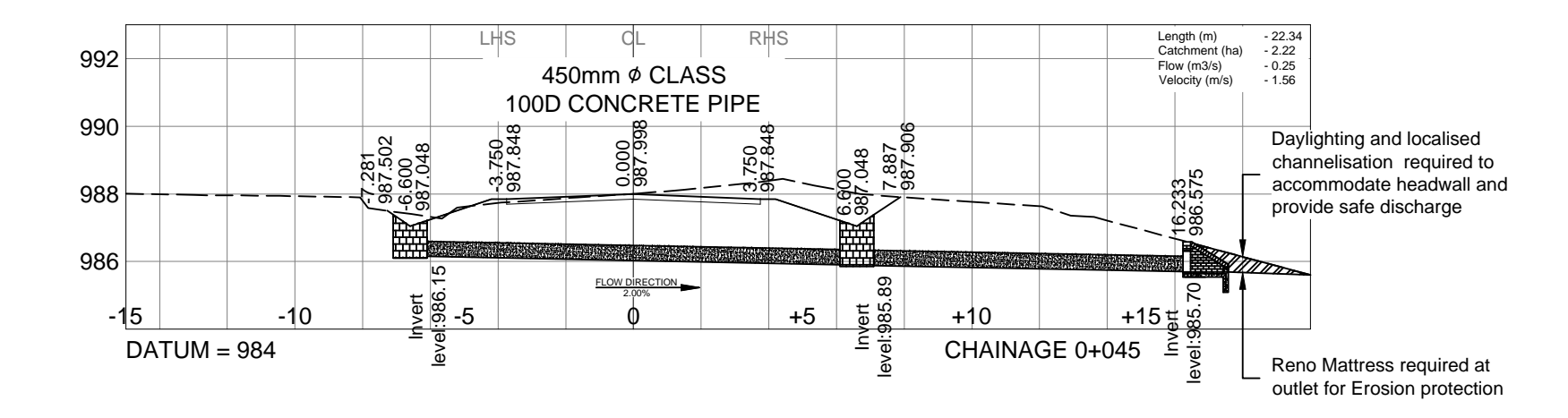
Plan No.: C47157

C47157



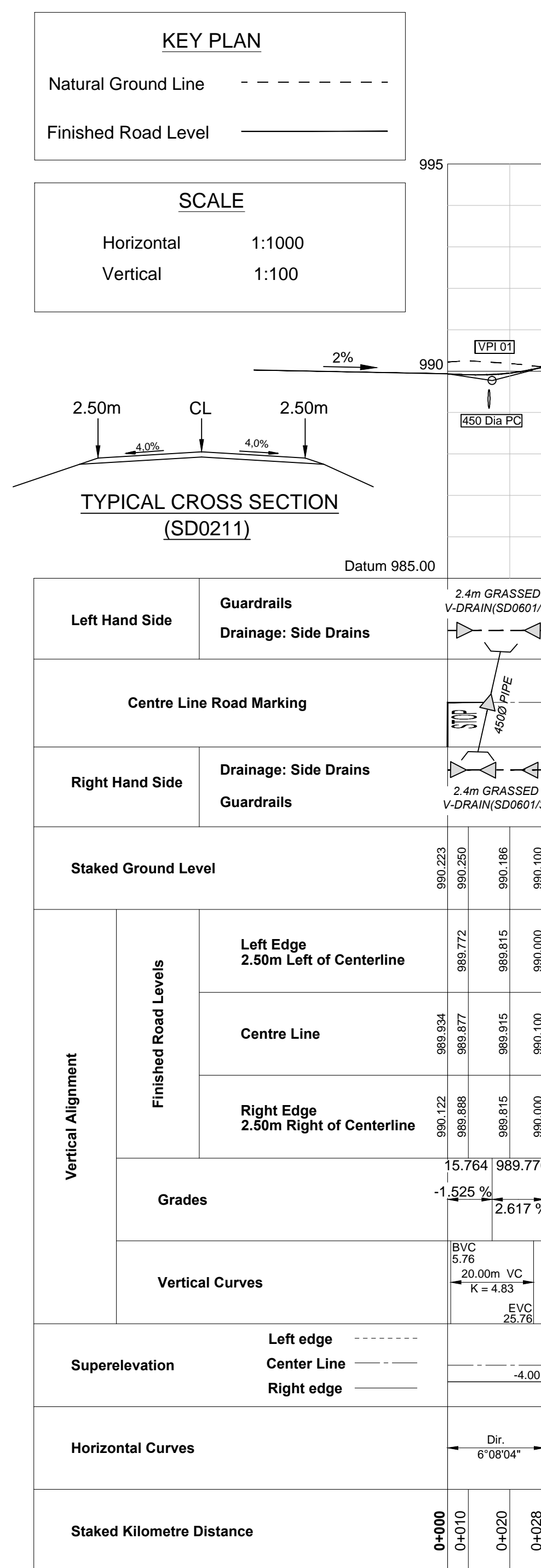
PIPE CROSSING ON L2327 @ CH 0+011

Scale
Horizontal 1:200
Vertical 1:200

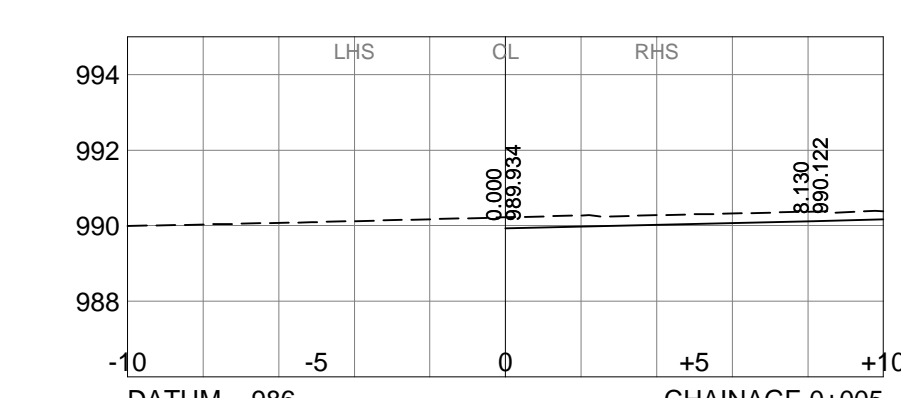
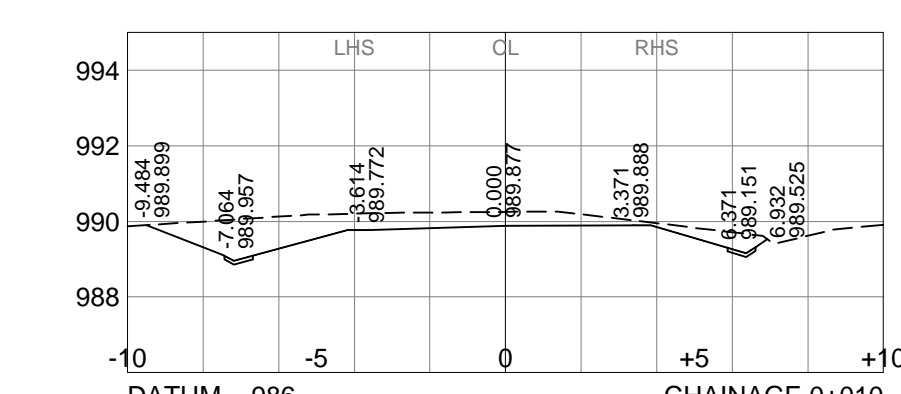
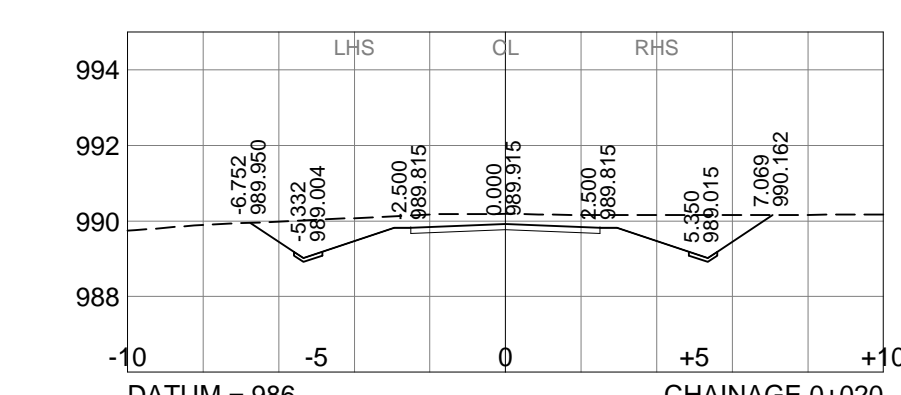
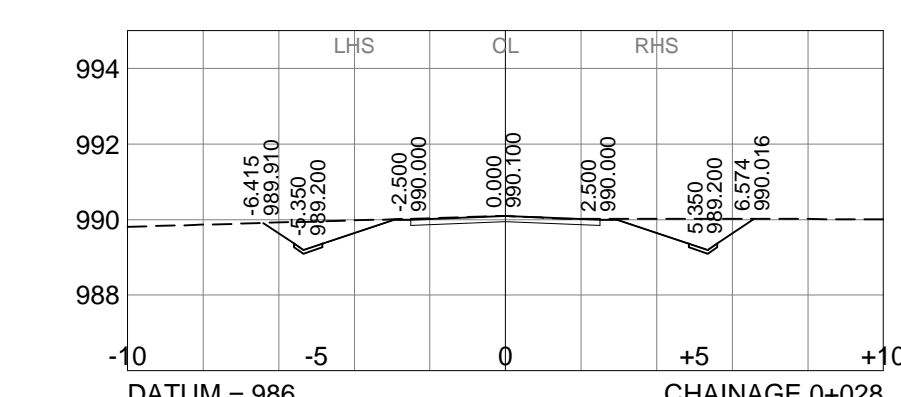


PIPE CROSSING ON L471 ACCESS ROAD @ CH 0+045

Scale
Horizontal 1:200
Vertical 1:200

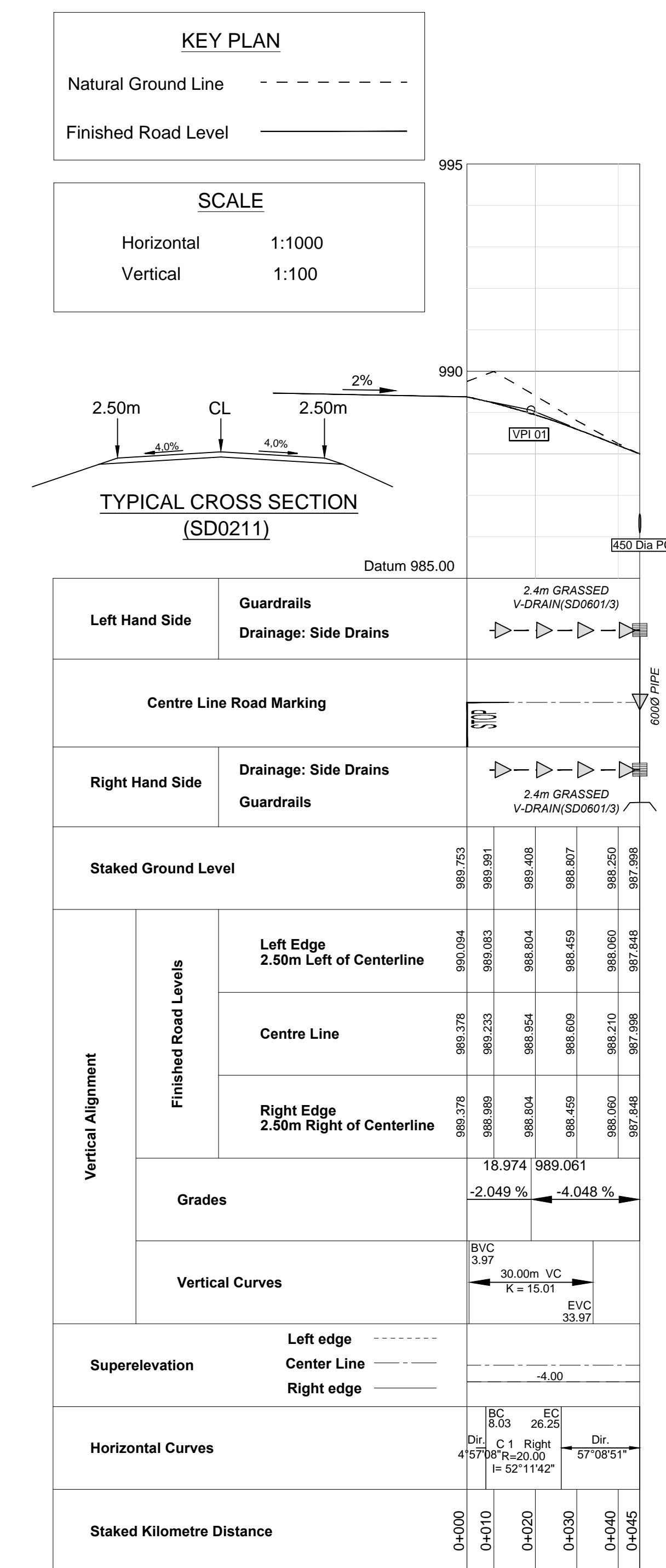


**Longitudinal Section for 0+000 to 0+028
L2327 Intersects with D489 @ CH 6+741**

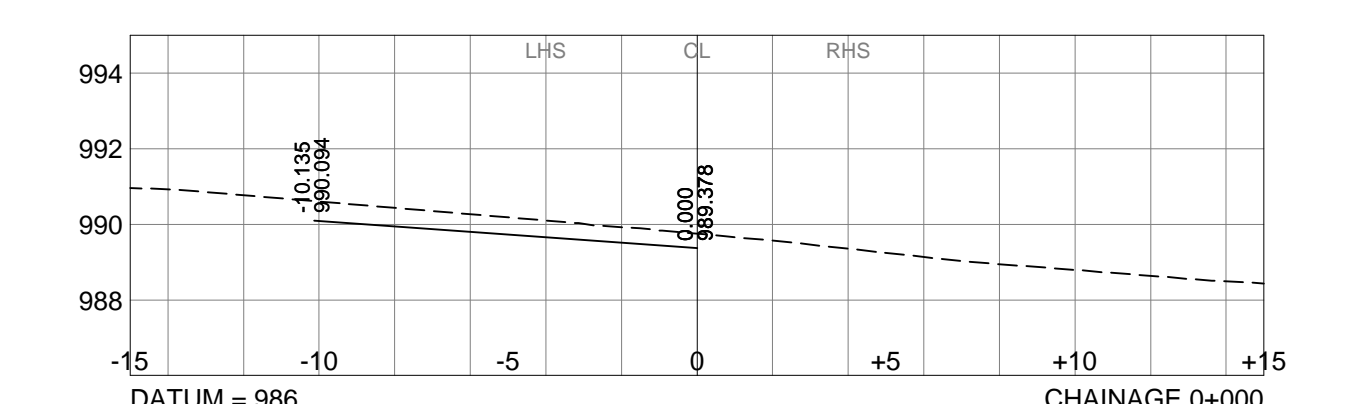
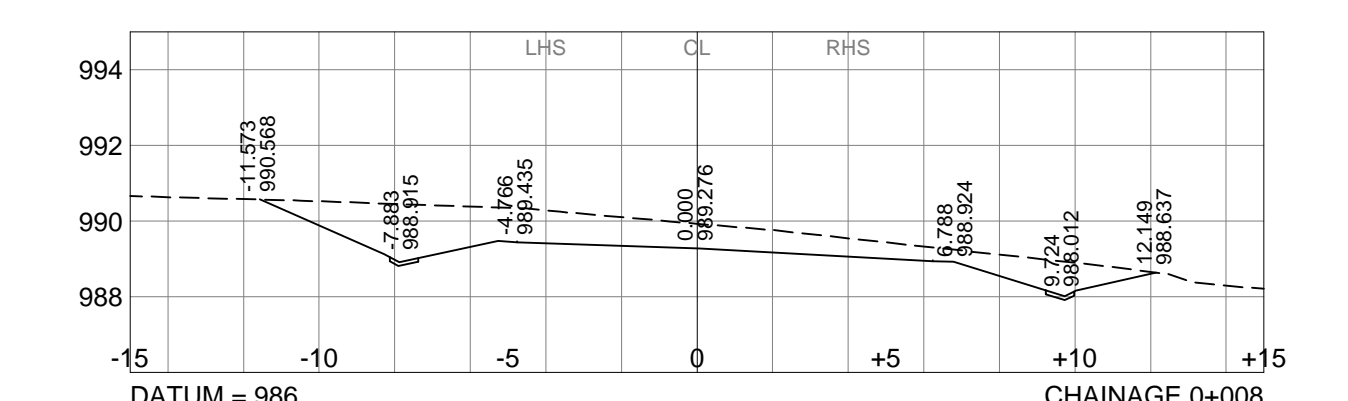
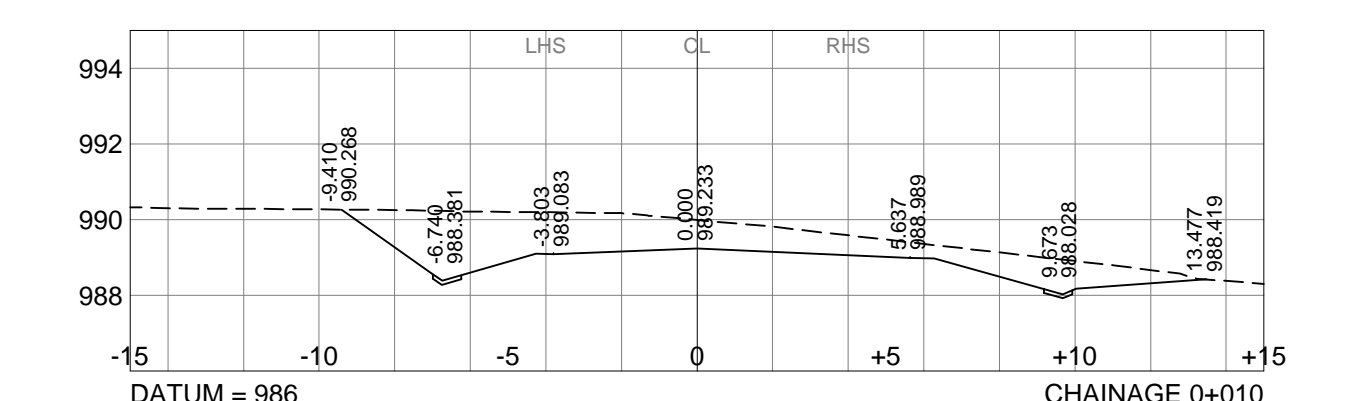
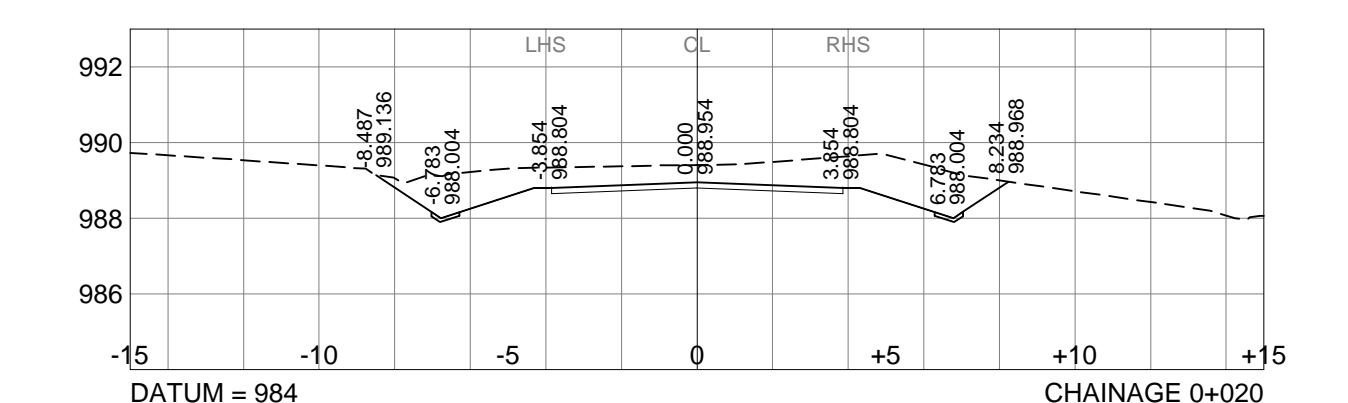
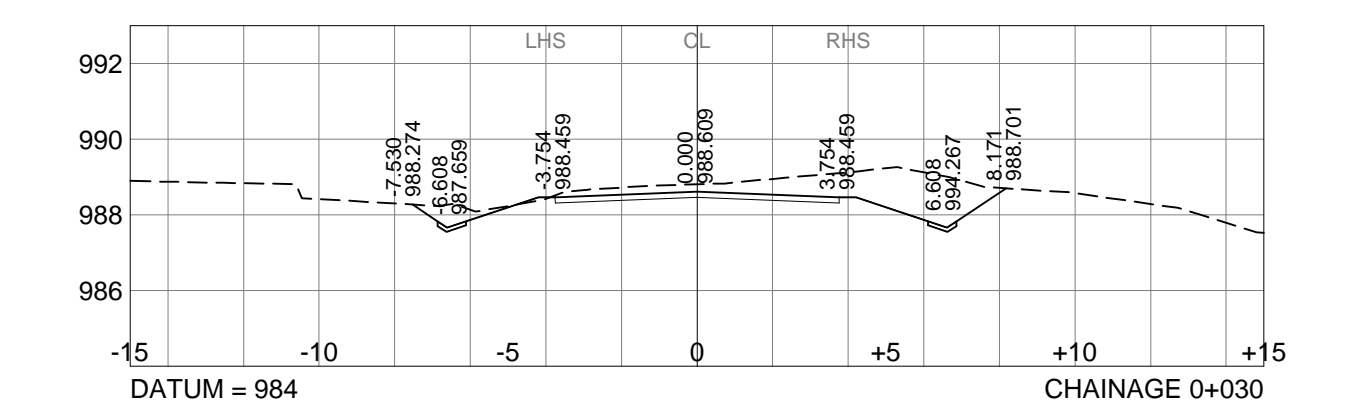
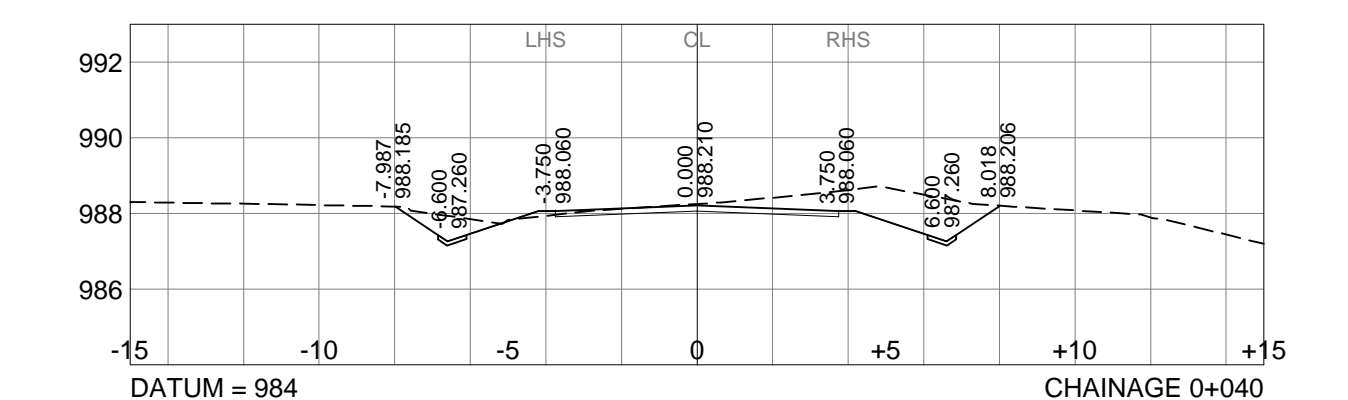
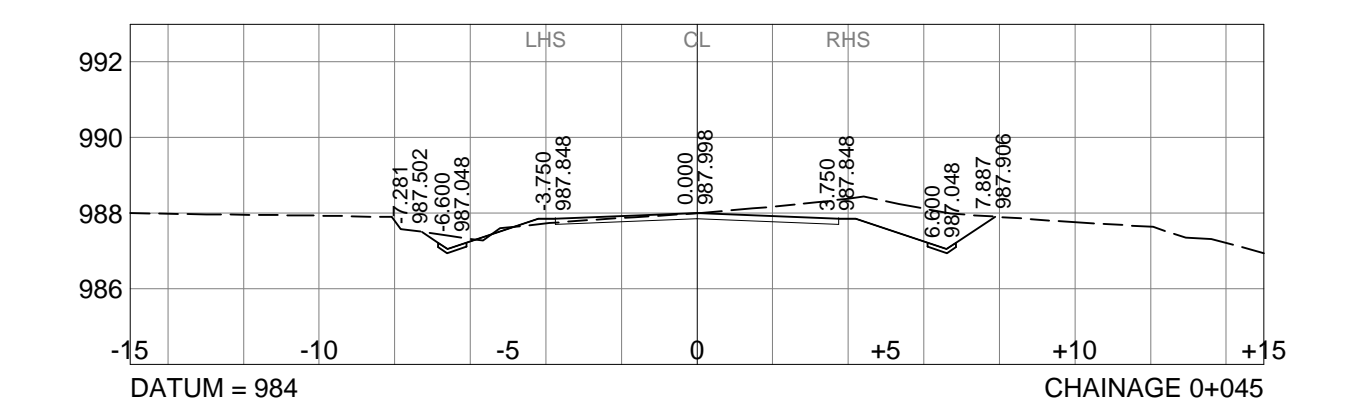


**Cross Sections for 0+000 to 0+028
L2327 Intersects with D489 @ CH 6+741**

Scale
Horizontal 1:200
Vertical 1:200



**Longitudinal Section for 0+000 to 0+045
Access road to L471 Intersects with D489 @ CH 7+489**



**Cross Sections for 0+000 to 0+045
Access road to L471 Intersects with D489 @ CH 7+489**

Scale
Horizontal 1:200
Vertical 1:200

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	C47157	Designed by:-	Y.NANKHOOD
Continued on:-	-	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Design Plan No:-	C47155	Drawn by:-	K.RAMSUROOP
Long Section No:-	C47156	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Cross Section No:-	C47157 - C47158	Date of Approval:-	03 JUNE 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOOD Consulting Engineers
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TRANSPORTATION ENGINEERING : Chief Engineer

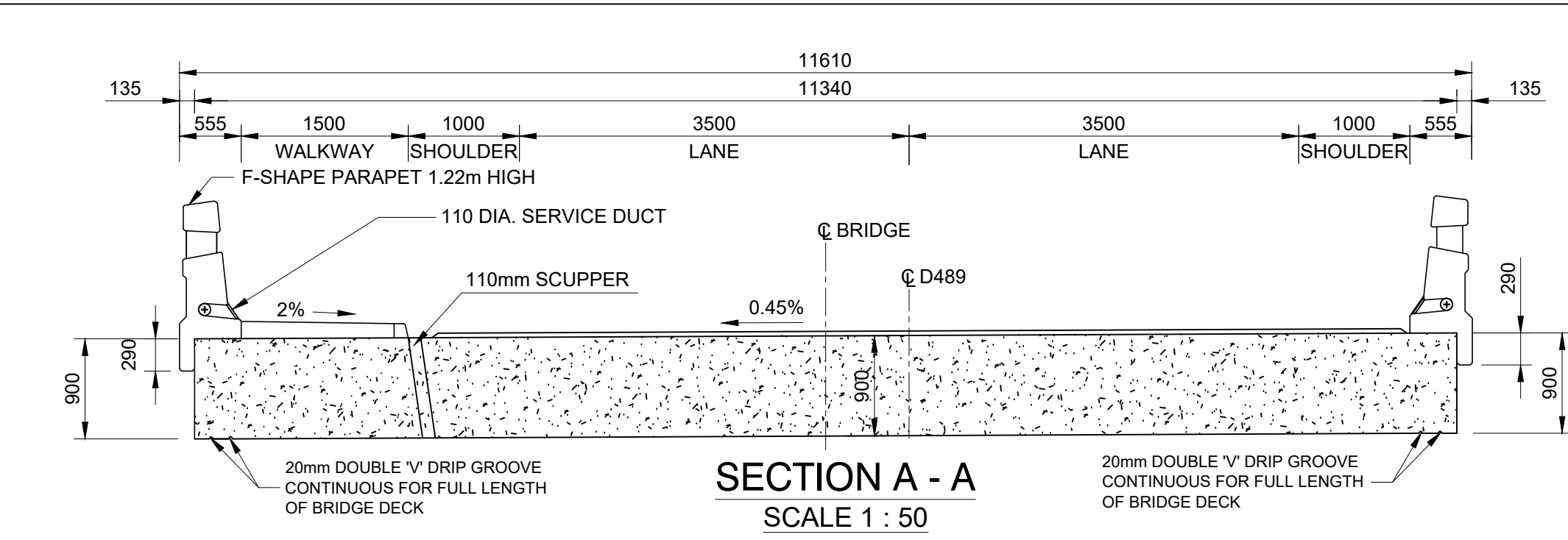
Head: Transport

SIGNATURE: _____ DATE: _____

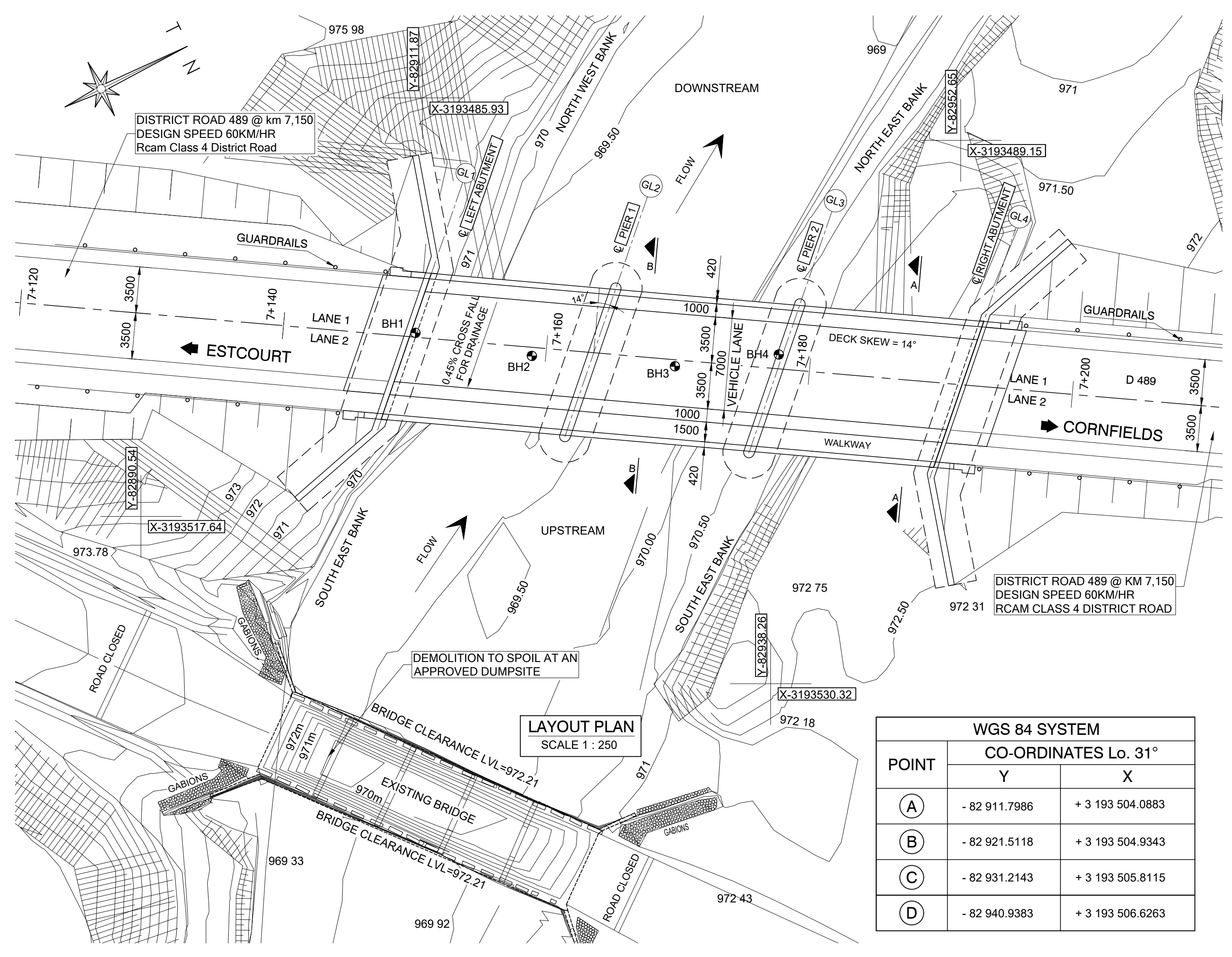
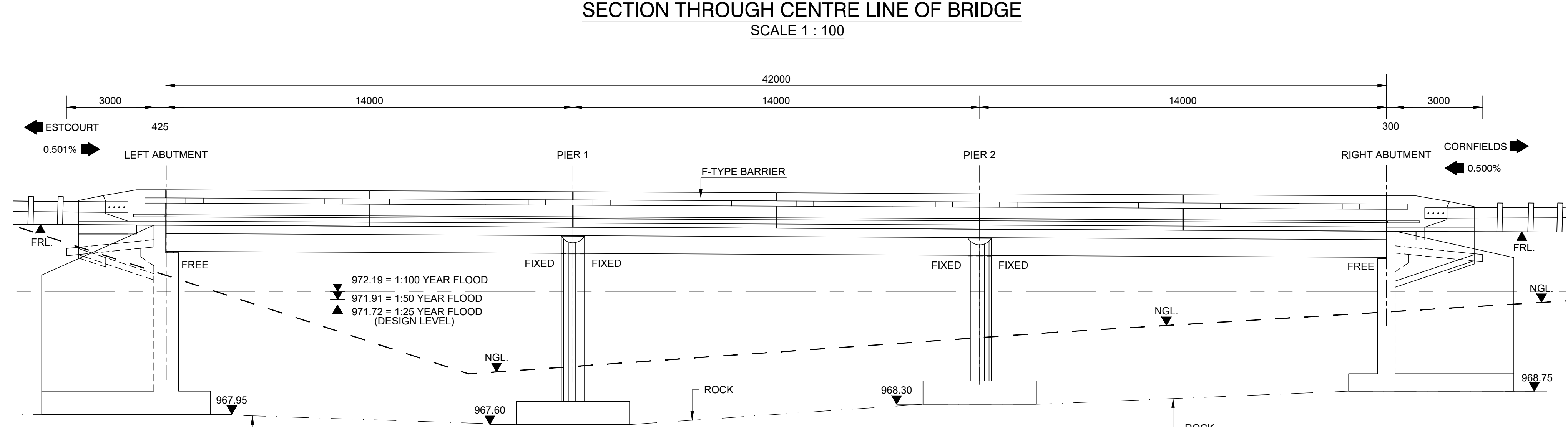
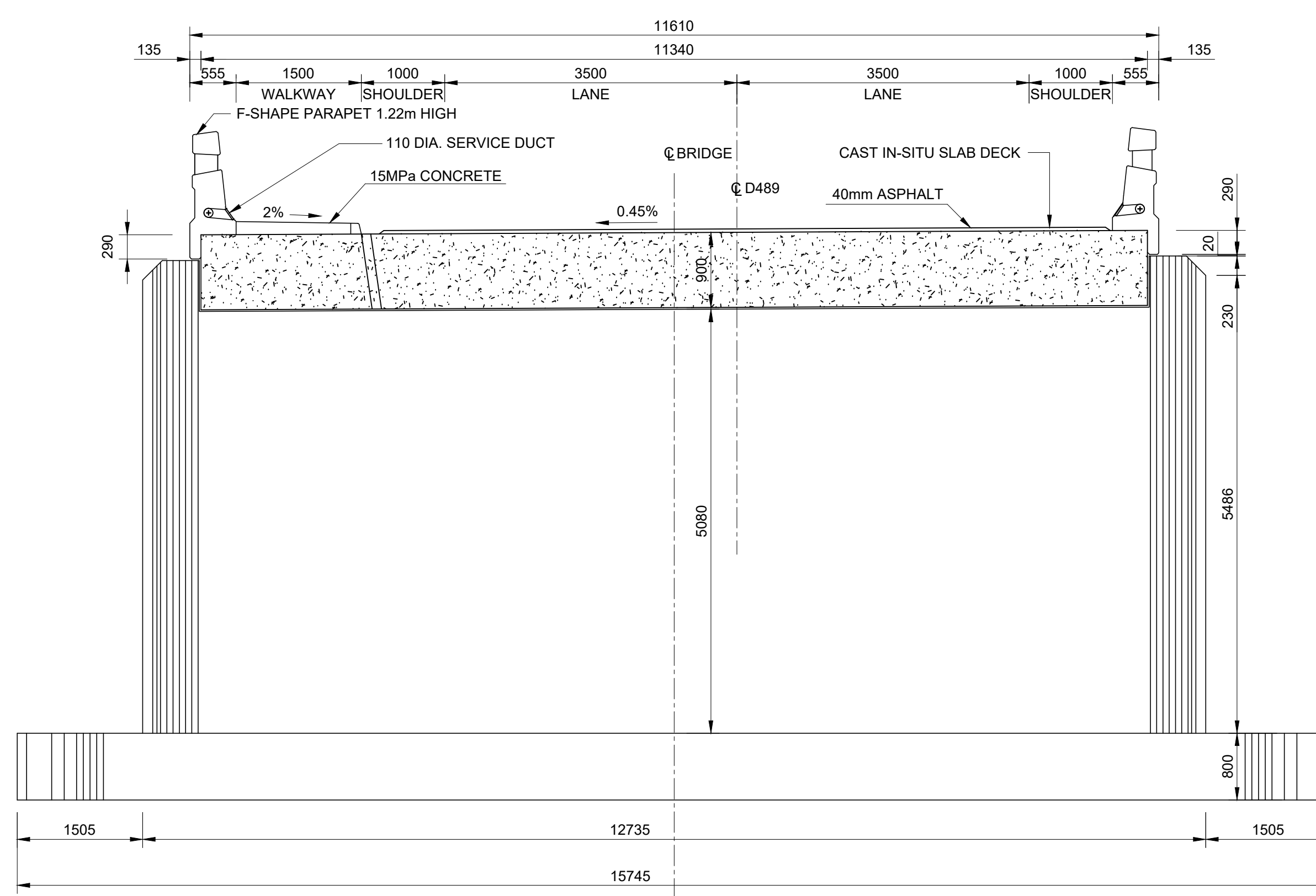
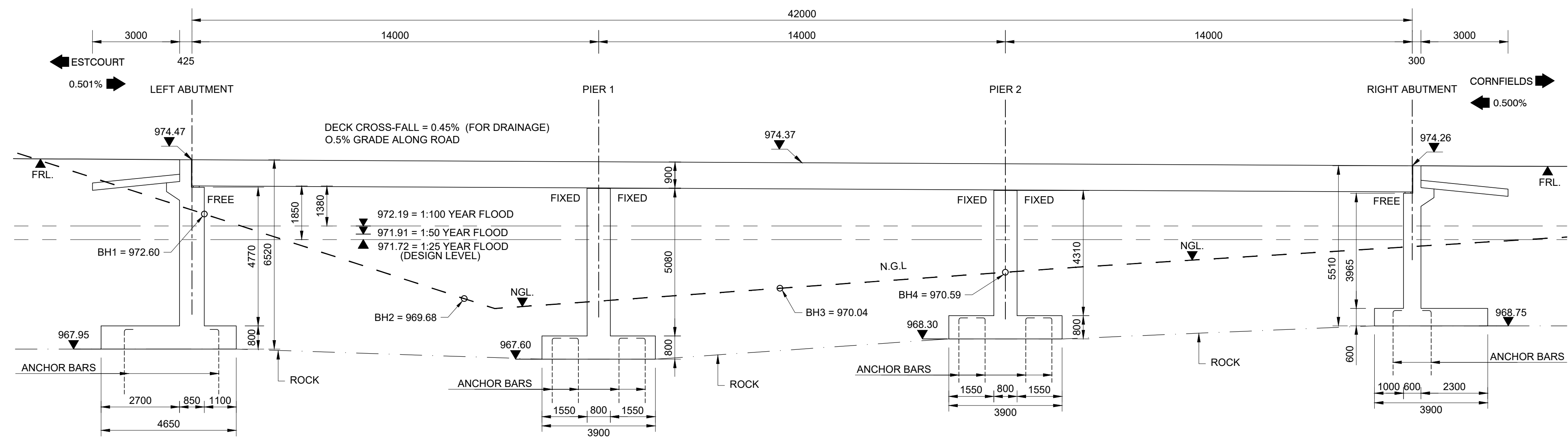
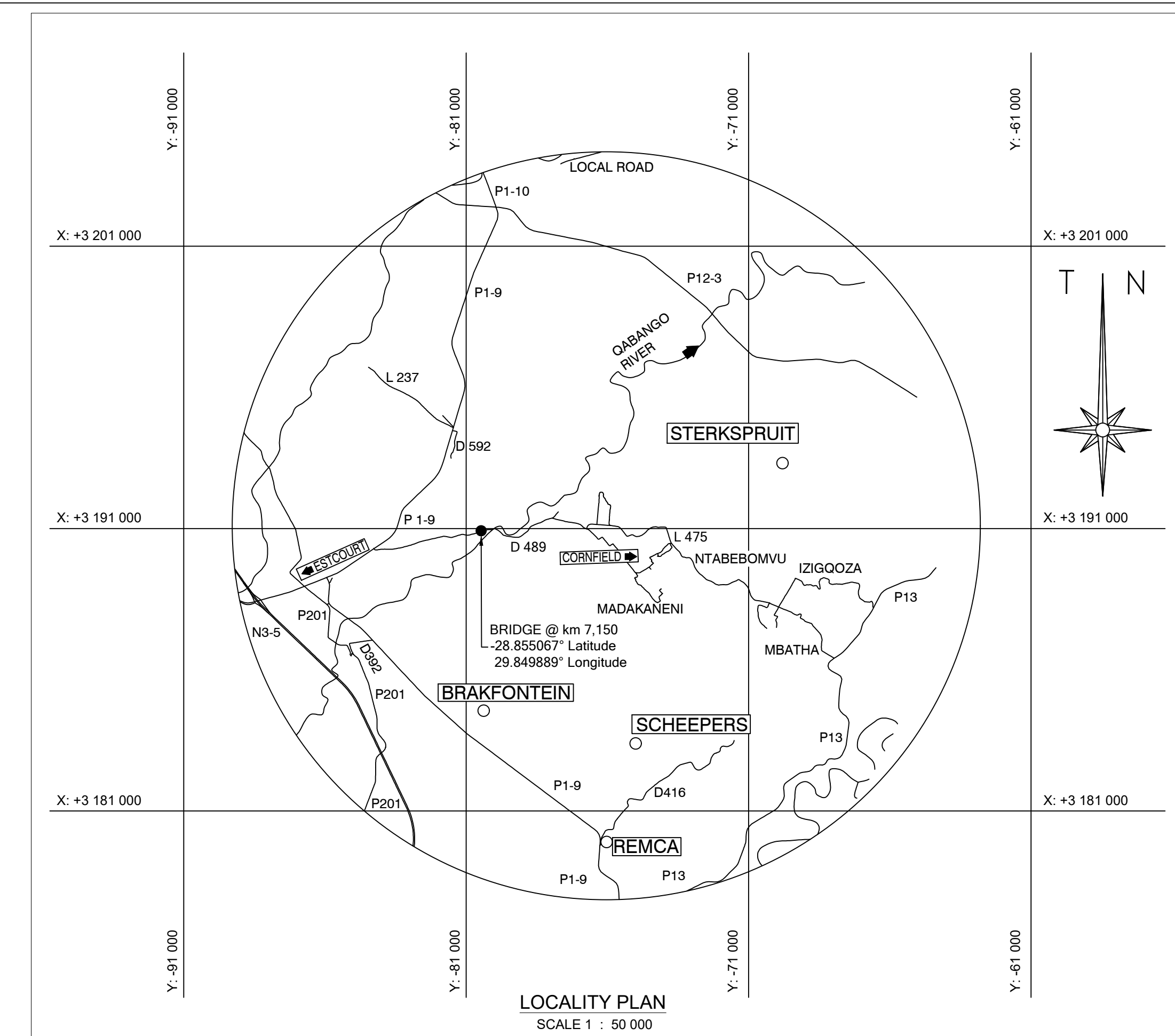
DISTRICT ROAD D489 : GRENFORD - CORNFIELDS
QABANGO (CORNFIELDS) RIVER BRIDGE

PORTION
DISTRICT ROAD 489 BRIDGE APPROACHES
(Km 6.715 to Km 7.549)
ACCESS LONGITUDINAL SECTIONS

FOR TENDER PURPOSES	
Staked km distance	Sheet 01
Km 6.715 to Km 7.549	of 01
Scale	Plan No.:-
HOR: 200	C47158
VERT: 200	



4107/01	GENERAL ARRANGEMENT
4107/02	FOUNDATION LAYOUT OF ABUTMENTS AND PIERS
4107/03	PIER CONCRETE DETAILS
4107/04	LEFT ABUTMENT CONCRETE DETAILS
4107/05	RIGHT ABUTMENT CONCRETE DETAILS
4107/06	DECK CONCRETE DETAILS
4107/07	PARAPETS CONCRETE DETAILS
4107/08	MISCELLANEOUS DETAILS
DRAWING No.	DESCRIPTION
	LIST OF DRAWINGS



KEY PLAN

Natural Ground Line
Finished Road Level
Approximate Rock Level

SCALE
Horizontal 1:1000
Vertical 1:1000

INVERT LEVEL = 969.05
MAP = 734mm/yr
Road Class R4 (RCAM)
CATCHMENT AREA = 34.35 km²
RIVER = 11.5 km
Tc = 127.88min

DESIGN FLOOD RETURN PERIOD = 125 yr
MIN FREEBOARD = 1640mm

T (hrs)	Q (m ³ /s)	% RMF	HW (m)	FLOODLINE ELEVATION (m)	MAX. EXIT VELOCITY (m/s)	EXIT CONDITIONS
2	17.88	3.1%	1.16	970.21	0.36	
5	55.54	9.5%	1.73	970.78	0.66	
10	90.04	15.4%	2.09	971.14	0.86	
20	128.82	22.0%	2.44	971.49	1.05	
25	157.58	26.9%	2.67	971.72	1.08	
50	234.43	40.0%	2.86	971.91	1.24	
100	285.34	48.7%	3.14	972.19	1.34	

R.M.F. = (10⁻⁶)^{1/3} [(A^{1/10})^{1/3} - (1-0.1K)] = 586.09 m³/s
K = 5.0

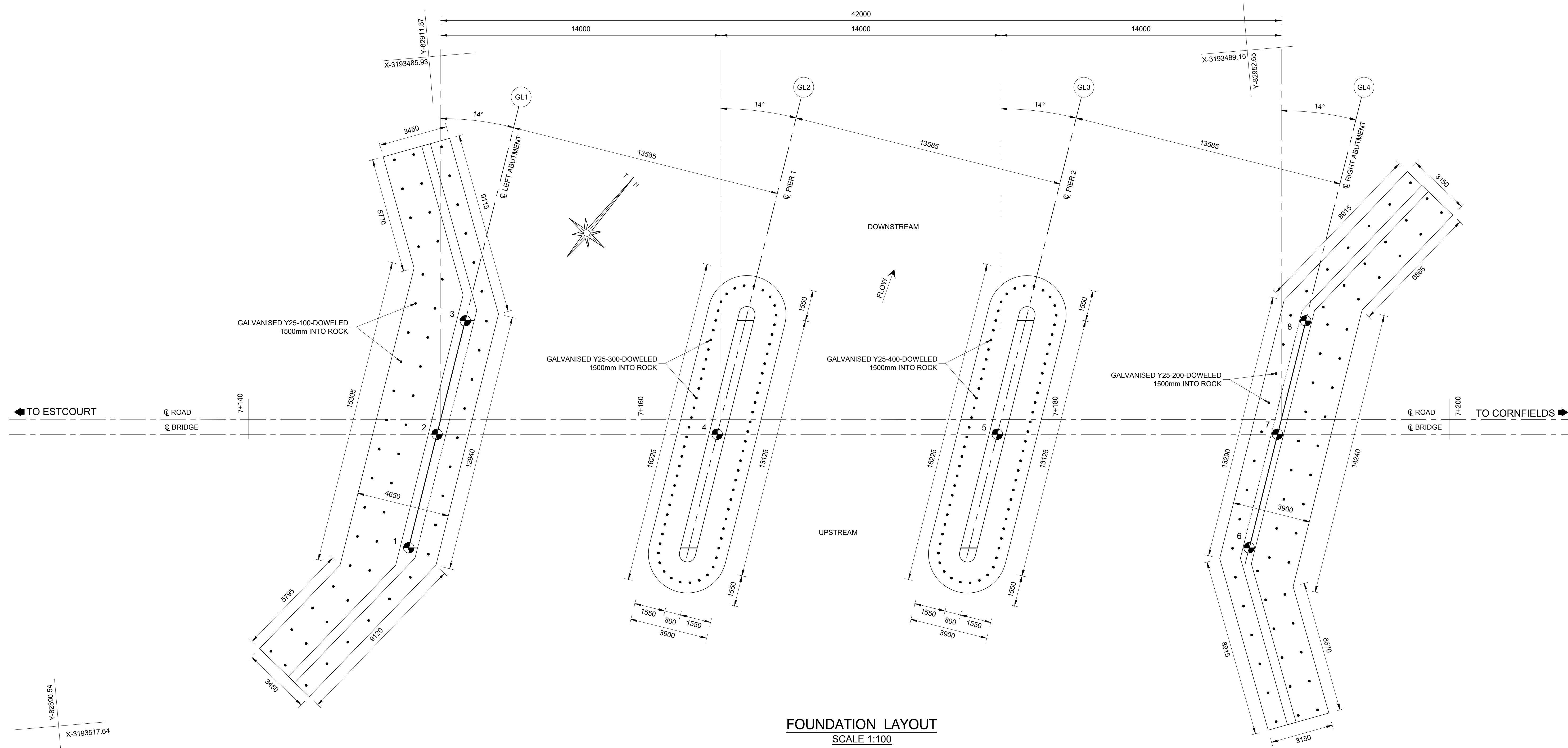
LONGITUDINAL SECTION - ROAD D489 KM 7.15
CHAINAGE 7+020m - 7+320m

Staked Distance	Staked Ground Level	Vertical Curves	Grades	Superelevation	Horizontal Curves
7+020	969.05	130.00m VC K = 24.59	-5.788%	Left edge: 2.00%, Center Line: -2.00%, Right edge: -2.00%	Dir: 274°58'41"
7+040	970.95	EVC: 7148.05	-0.501%		
7+060	972.85	BVC: 7193.00	-0.500%		
7+080	974.75		-0.500%		
7+100	976.65		-0.500%		
7+120	978.55		-0.500%		
7+140	980.45		-0.500%		
7+160	982.35		-0.500%		
7+180	984.25		-0.500%		
7+200	986.15		-0.500%		
7+220	988.05		-0.500%		
7+240	989.95		-0.500%		
7+260	991.85		-0.500%		
7+280	993.75		-0.500%		
7+300	995.65		-0.500%		
7+320	997.55		-0.500%		

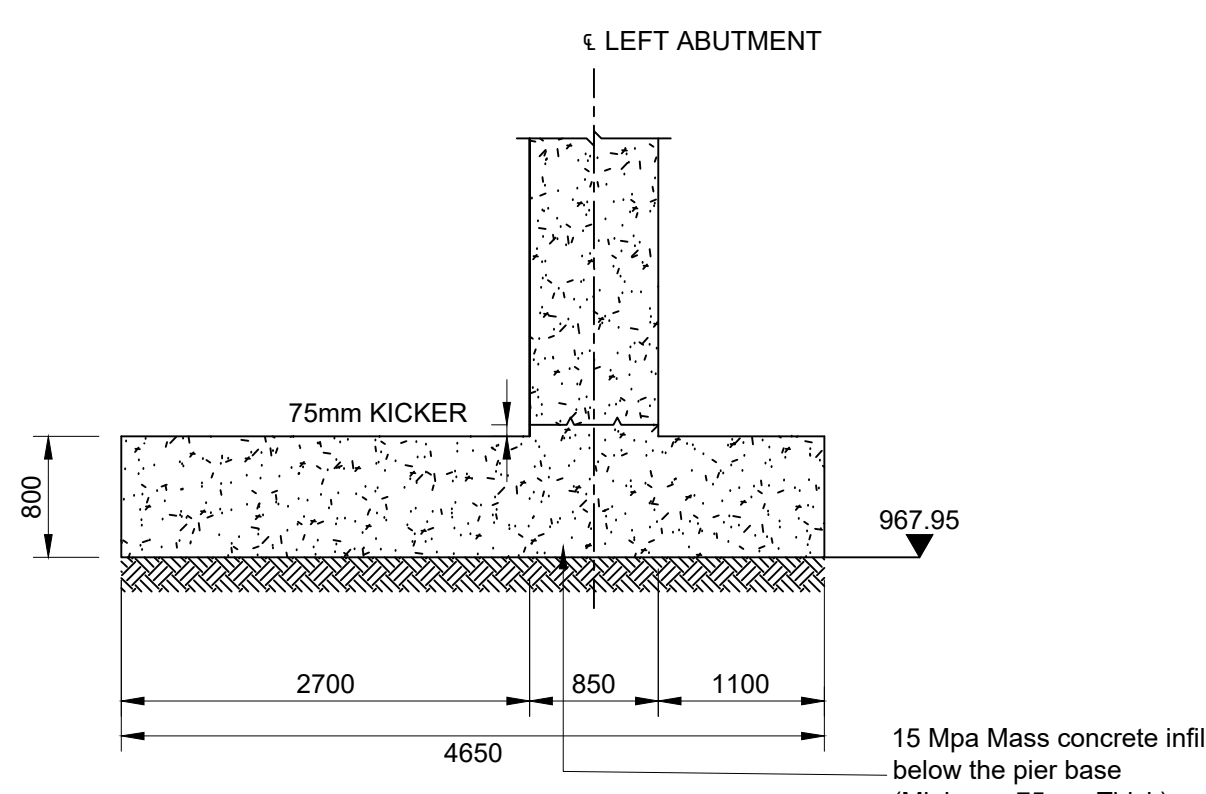
- NOTES:**
- DESCRIPTION OF STRUCTURE
THE BRIDGE IS A 3 SPAN, NORMALLY REINFORCED, AND CAST-IN-SITU SLAB. THE ABUTMENTS ARE CLOSED ABUTMENTS WITH WINGWALLS AT 14° TO THE RIVER FLOW. THE PIERS ARE SOLID WALL TYPE WITH CHAMFERED ENDS.
 - DESIGN CRITERIA
THE BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH LIVE LOAD SURFACING : NA, NB24
TMH 7 PARTS 1 & 2 (AS AMENDED 1989) : 40mm THICK ASPHALT
 - STRUCTURAL ANALYSIS & PARAMETERS
THE STRUCTURE HAS BEEN DESIGNED USING ELASTIC ANALYSIS & LIMIT STATE DESIGN METHODS IN ACCORDANCE WITH TMH 7
 - QUALITY OF MATERIALS
 - REINFORCING STEEL OF SABS 920 CHARACTERISTIC STRENGTH : 250 MPa
MILD STEEL : 250 MPa
HIGH YIELD STEEL : 450 MPa
 - CONCRETE CHARACTERISTIC STRENGTH : 30 MPa
BASES : 15 MPa
ABUTMENTS : 30 MPa
PIERS : 30 MPa
DECK : 40 MPa
PARAPETS : 40 MPa
 - FOUNDING MATERIAL : SANDSTONE
ALLOWABLE BEARING PRESSURE : LEFT/RIGHT ABUTMENT AND PIERS (750-1000 kPa)
 - BEARINGS : LAMINATED ELASTOMERIC BEARINGS
 - EXPANSION JOINTS AT ABUTMENTS : ASPHALTIC PLUG TYPE JOINT
 - CONSTRUCTION REQUIREMENTS
 - FINISHES
ALL UNEXPOSED FORMED SUBSTRUCTURE SURFACES : F1
ALL EXPOSED FORMED SUBSTRUCTURE SURFACES : F2
ALL FORMED DECK SURFACES : F3
 - CONCRETE COVER : 50mm
ABUTMENTS : 50mm
PIERS : 50mm
DECK : 50mm
PARAPETS : 50mm
 - CHAMFERS ON ALL SHARP EDGES : 25mm x 25mm
PARAPETS : 20mm x 20mm
 - DRAINAGE
NETLON STRIPS & PIPES
 - ALL LEVELS TO BE VERIFIED BY ENGINEER ON SITE BEFORE CONSTRUCTION COMMENCES.
 - BRIDGE NAME, YEAR AND BRIDGE NUMBER AS PER DETAIL.
 - THE RIVER NAME (QABANGO) IS TO BE REBATED 10mm DEEP IN 100mm CAPITAL LETTERING WITH THE YEAR OF CONSTRUCTION IN 75mm NUMBERING. CENTRALLY ORIENTATED BELOW THE NAME. THE NAME AND DATE IS TO BE HORIZONTALLY PLACED. CENTRALLY ORIENTATED ON THE LEFT HAND APPROACH END BLOCK ON EACH END OF THE F-TYPE BALUSTRADE. ABOVE THE GUARDRAIL RECESS LEVEL. THE BRIDGE NUMBER (4107) IS TO BE REBATED 10mm IN 75mm NUMBERING INTO THE TOP OF THE SLOPING HORIZONTAL SURFACE. ALL NUMBERS AND LETTERING IS TO BE CAREFULLY PAINTED WITH TWO COATS OF BLACK ALKALI RESISTANT PAINT.

AS BUILT		CAD File Ref- File Ref- Cross Section No- Longitudinal Section No- Survey Plan No-	Designed by: Y. JEAOWN Pr Eng (202101910) Checked by: P. NANKHOOP Pr Eng (910350) Drawn by: A. GUNAS Checked by: P. NANKHOOP Pr Eng (910350) Date of approval:		Designed by: Chief Engineer: Structures Head Transport	DISTRICT ROAD 489 ESTCOURT - CORNFIELDS WGS 84: -28.855067° Latitude 29.849889° Longitude	Staked km tender km 7.170	Sheet: 01 of: 08
Supervising Engineer: _____ Date: _____ Supervising Authority: _____						QABANGO (CORNFIELDS) RIVER BRIDGE	Scale: As Shown	Plan No: 4107/01
AMENDMENTS						GENERAL ARRANGEMENT		

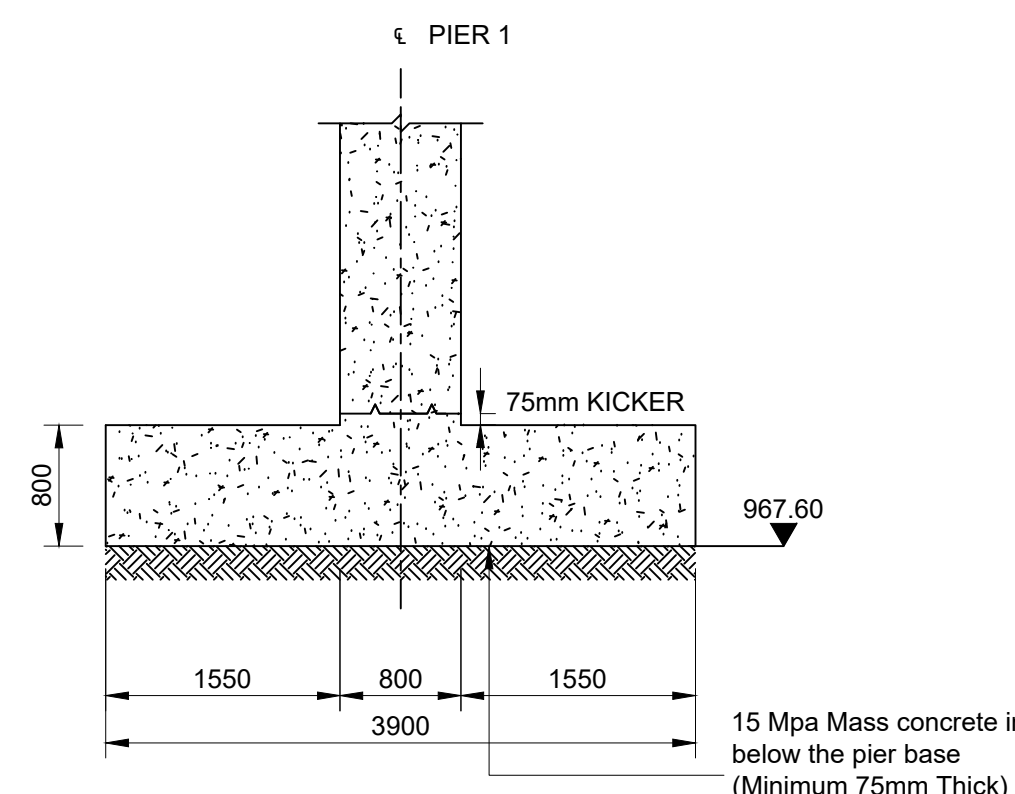
4107/01



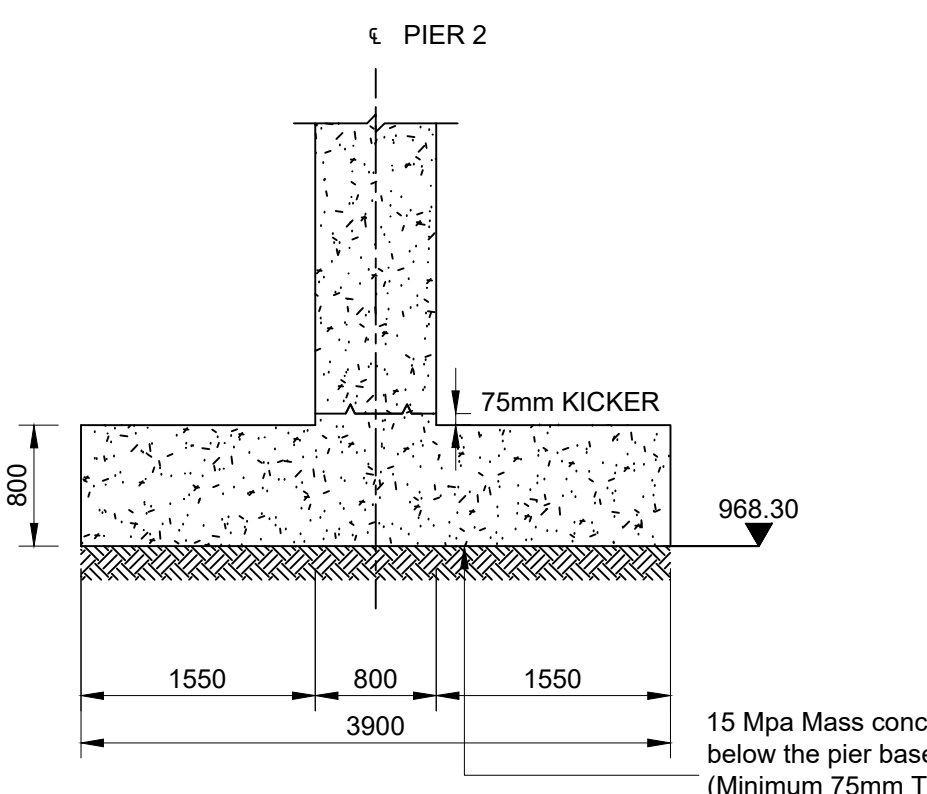
FOUNDATION LAYOUT
SCALE 1:100



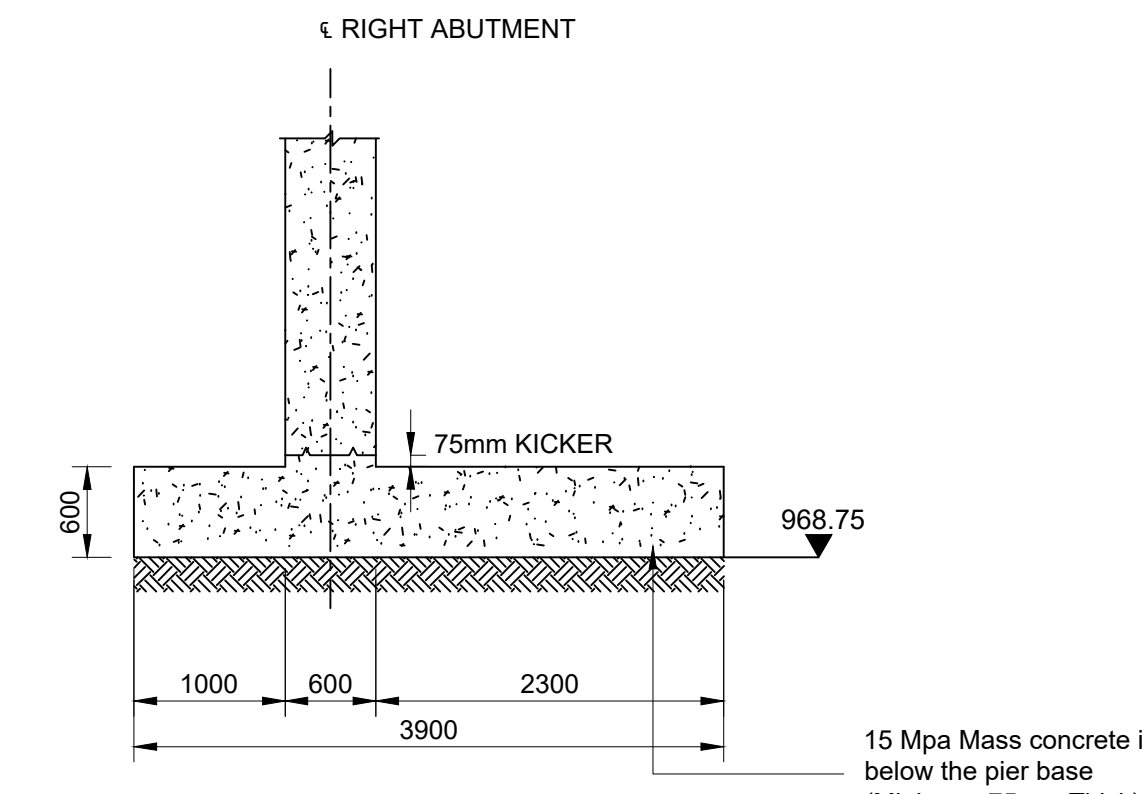
SECTION - LEFT ABUTMENT
SCALE 1:50



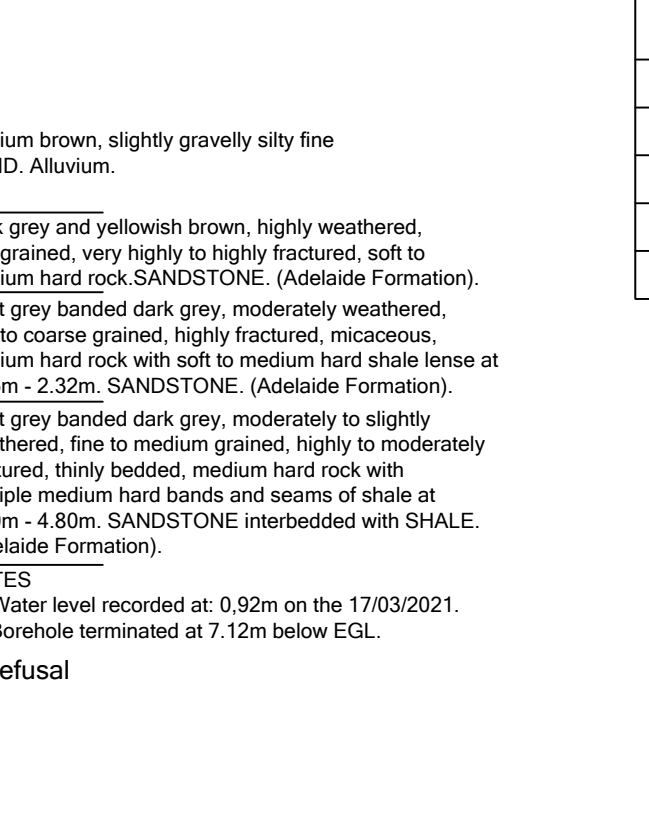
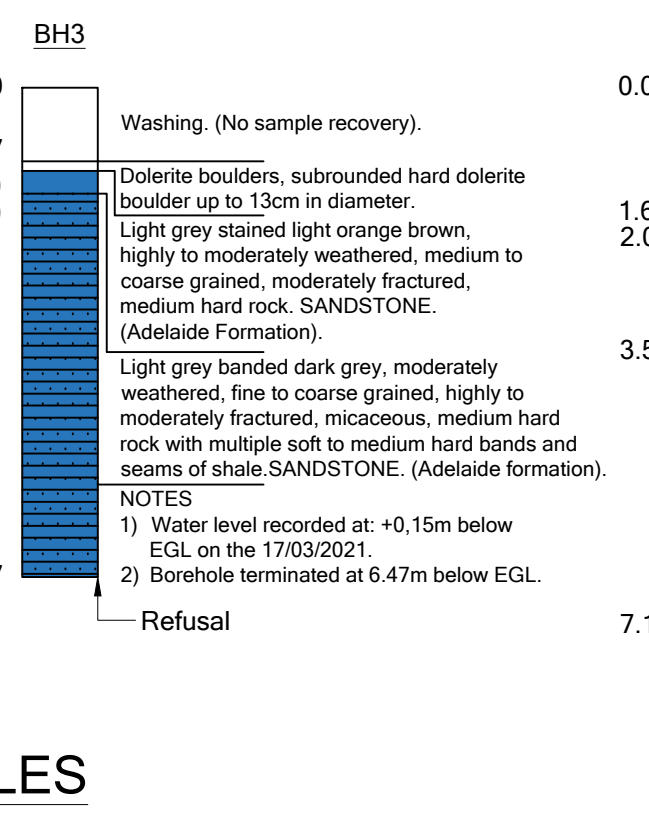
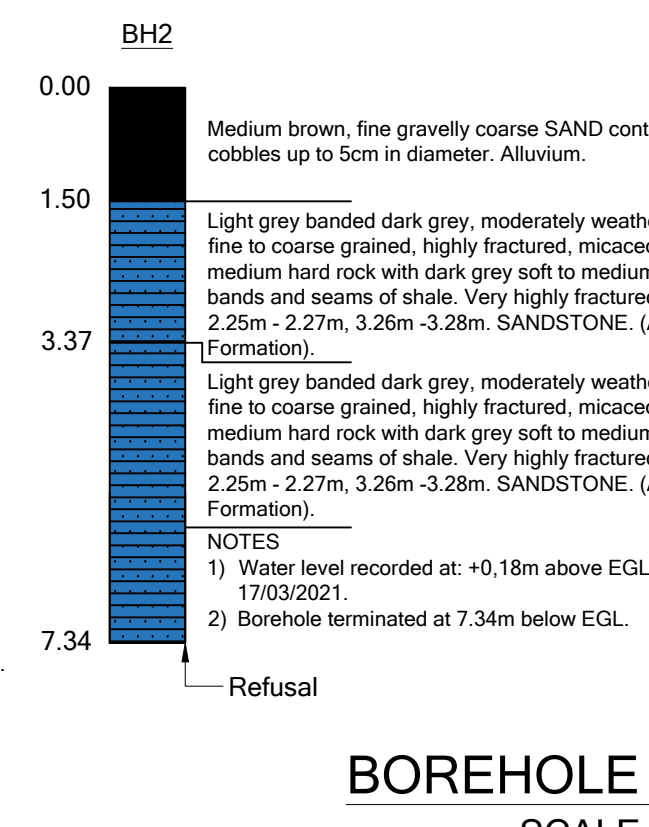
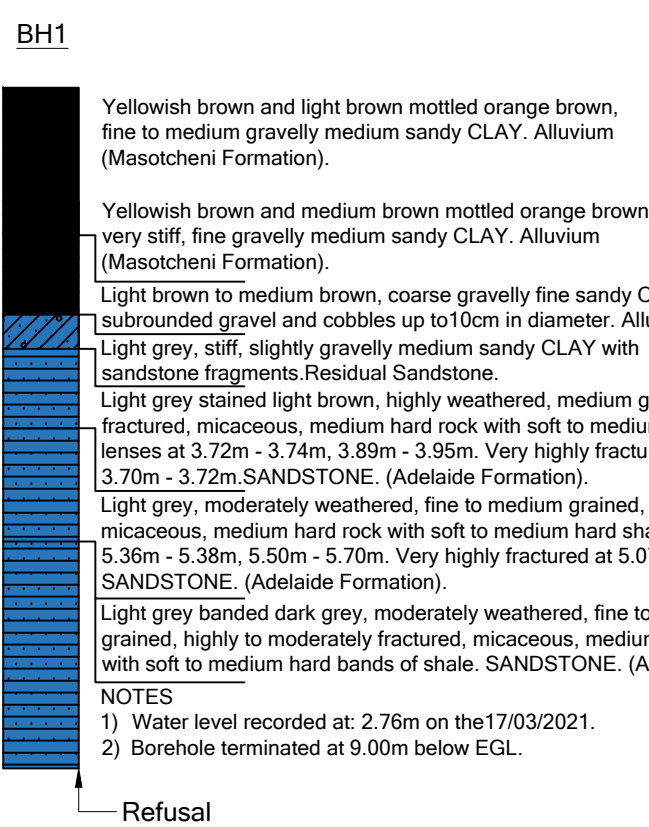
SECTION - PIER 1
SCALE 1:50



SECTION - PIER 2
SCALE 1:50



SECTION - RIGHT ABUTMENT
SCALE 1:50



BOREHOLE POSITION			
POINTS	X	Y	Z
BH1	3193503.739	-82911.347	968.050
BH2	3193505.482	-82920.246	967.500
BH3	3193506.271	-82931.126	968.400
BH4	3193505.300	-82938.937	968.850

- NOTES:**
- DESCRIPTION OF STRUCTURE
THE BRIDGE IS A 3 SPAN, NORMALLY REINFORCED, AND CAST-IN-SITU SLAB.
THE ABUTMENTS ARE CLOSED ABUTMENTS WITH WINGWALLS AT 14° TO THE RIVER FLOW.
THE PIERS ARE SOLID WALL TYPE WITH CHAMFERED ENDS.
 - DESIGN CRITERIA
THE BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH TMH 7 PARTS 1 & 2 (AS AMENDED 1989).
LIVE LOAD : NA, NB24
SURFACING : 40mm THICK ASPHALT
 - STRUCTURAL ANALYSIS & PARAMETERS
THE STRUCTURE HAS BEEN DESIGNED USING ELASTIC ANALYSIS & LIMIT STATE DESIGN METHODS IN ACCORDANCE WITH TMH 7
 - QUALITY OF MATERIALS
 - REINFORCING STEEL OF SABS 920
CHARACTERISTIC STRENGTH
MILD STEEL : 250 MPa
HIGH YIELD STEEL : 450 MPa
 - CONCRETE CHARACTERISTIC STRENGTH
 - SCREED : 15 MPa
BASES : 30 MPa
ABUTMENTS : 30 MPa
PIERS : 30 MPa
DECK : 40 MPa
PARAPETS : 40 MPa
 - FOUNDING MATERIAL : SANDSTONE
ALLOWABLE BEARING PRESSURE : LEFT/RIGHT ABUTMENT AND PIERS (750-1000 KPa)
 - BEARINGS : LAMINATED ELASTOMERIC BEARINGS
 - EXPANSION JOINTS AT ABUTMENTS : ASPHALTIC PLUG TYPE JOINT
 - CONSTRUCTION REQUIREMENTS
 - FINISHES
ALL UNEXPOSED FORMED SUBSTRUCTURE SURFACES : F1
ALL EXPOSED FORMED SUBSTRUCTURE SURFACES : F2
ALL FORMED DECK SURFACES : F3
PARAPETS : F3
 - CONCRETE COVER
BASES : 50mm
ABUTMENTS : 50mm
PIERS : 50mm
DECK : 50mm
PARAPETS : 50mm
 - CHAMFERS ON ALL SHARP EDGES
GENERALLY : 25mm x 25mm
PARAPETS : 20mm x 20mm
 - DRAINAGE
NETLON STRIPS & PIPES
 - ALL LEVELS TO BE VERIFIED BY ENGINEER ON SITE BEFORE CONSTRUCTION COMMENCES.
 - BRIDGE NAME, YEAR AND BRIDGE NUMBER AS PER DETAIL.
 - THE RIVER NAME (QABANGO) IS TO BE REBATED 10mm DEEP IN 100mm CAPITAL LETTERING WITH THE YEAR OF CONSTRUCTION IN 75mm NUMBERING, CENTRALLY ORIENTATED BELOW THE NAME. THE NAME AND DATE IS TO BE HORIZONTALLY PLACED, CENTRALLY ORIENTATED ON THE LEFT HAND APPROACH END BLOCK, ON EACH END OF THE F-TYPE BALUSTRADE, ABOVE THE GUARDRAIL RECESS LEVEL. THE BRIDGE NUMBER (4107) IS TO BE REBATED 10mm IN 75mm NUMBERING INTO THE TOP OF THE SLOPING HORIZONTAL SURFACE. ALL NUMBERS AND LETTERING IS TO BE CAREFULLY PAINTED WITH TWO COATS OF BLACK ALKALI RESISTANT PAINT.

FOR TENDER PURPOSES

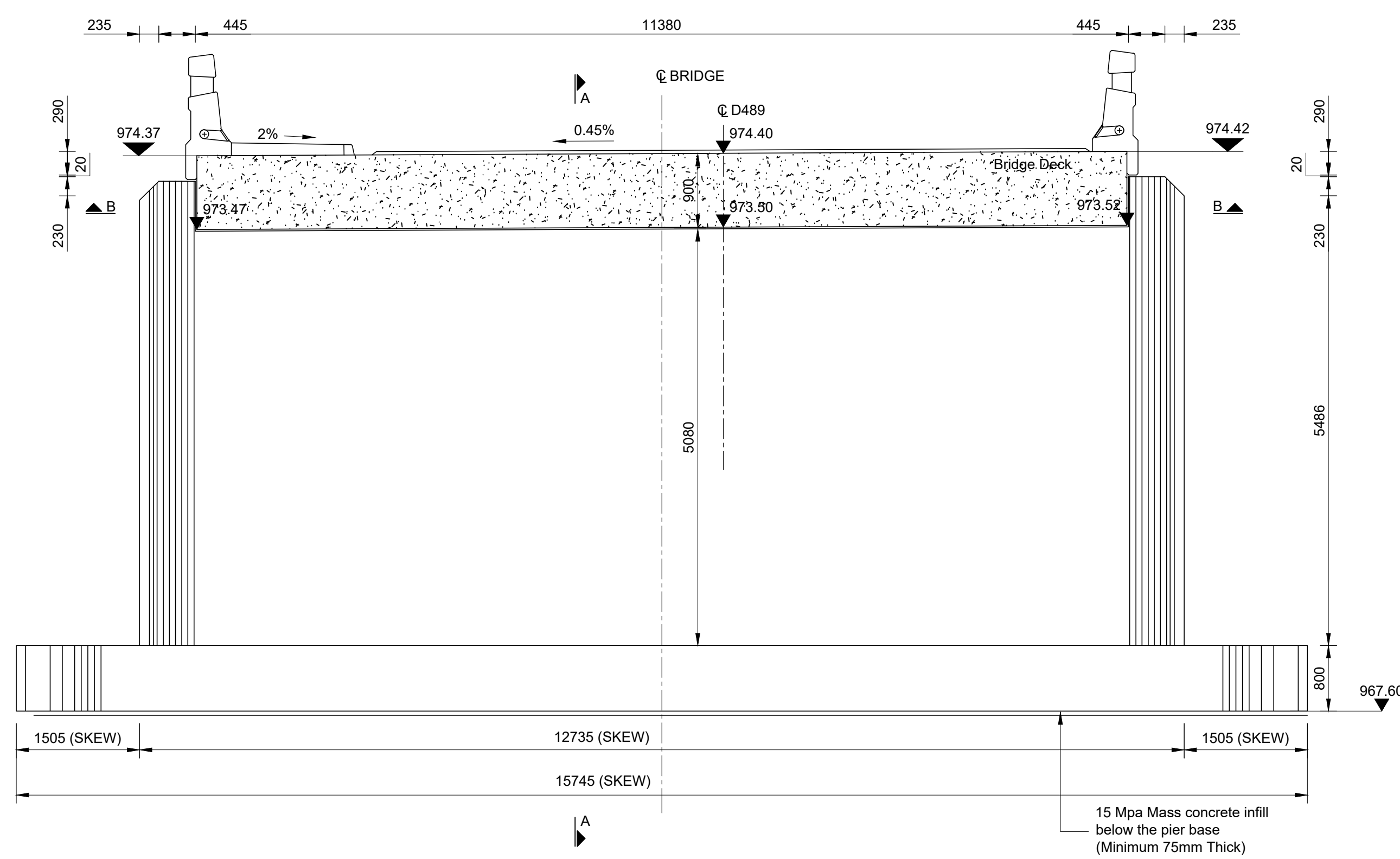
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Supervising Engineer : _____ Date : _____		File Ref:- D489/6/1	Checked by : P. NANKHOOP Pr Eng (910350)	Chief Engineer : Structures		QABANGO (CORNFIELDS) RIVER BRIDGE		Scale	Plan No :	4107/02
Symbol Date Description Checked Signed		Cross Section No:-	Drawn by : A. GUNAS	Head Transport		FOUNDATION LAYOUT OF ABUTMENTS AND PIERS		As Shown		
AMENDMENTS		Longitudinal Section No:-	Checked by : P. NANKHOOP Pr Eng (910350)							
		Survey Plan No:-	Date of approval :							



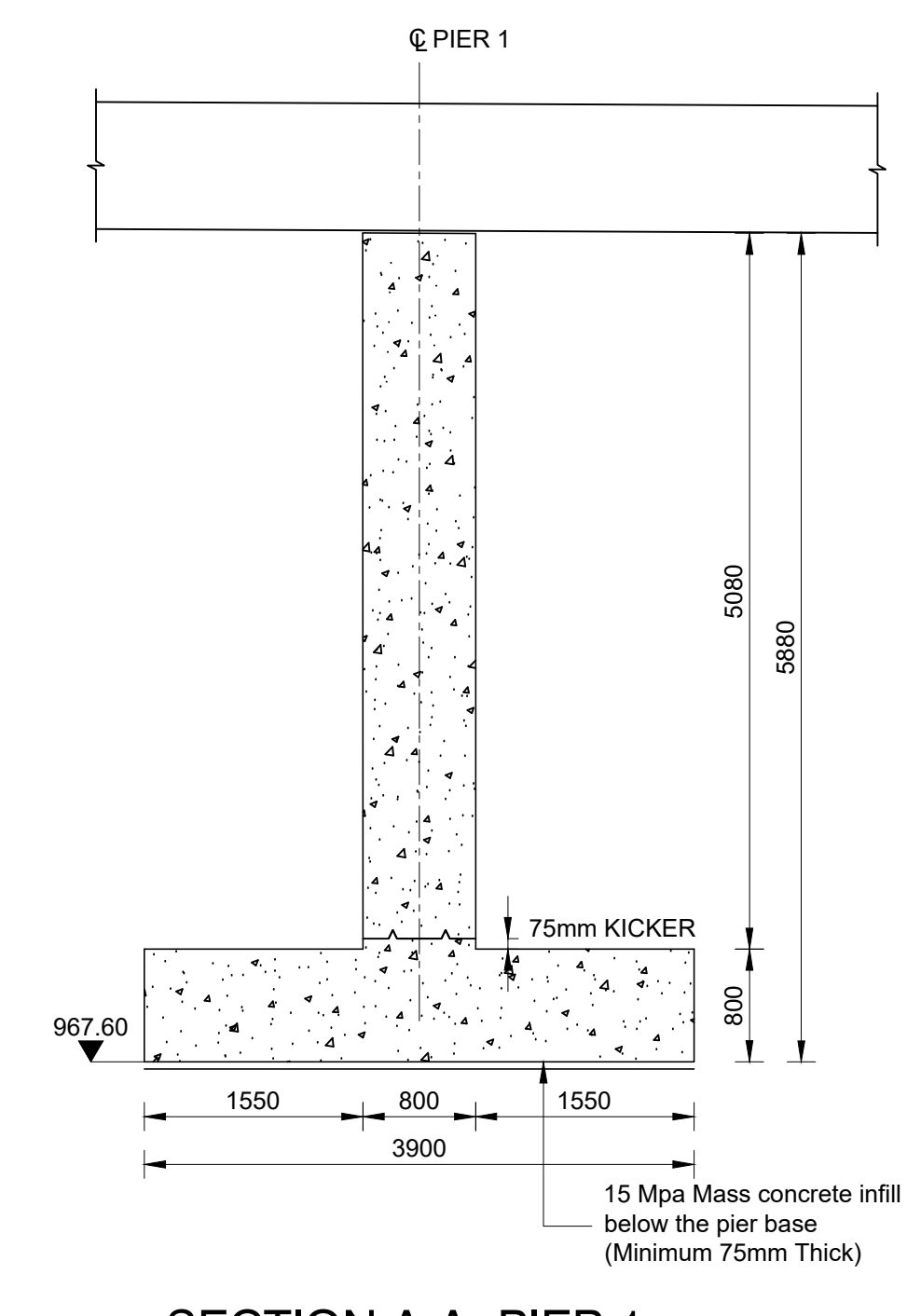
PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



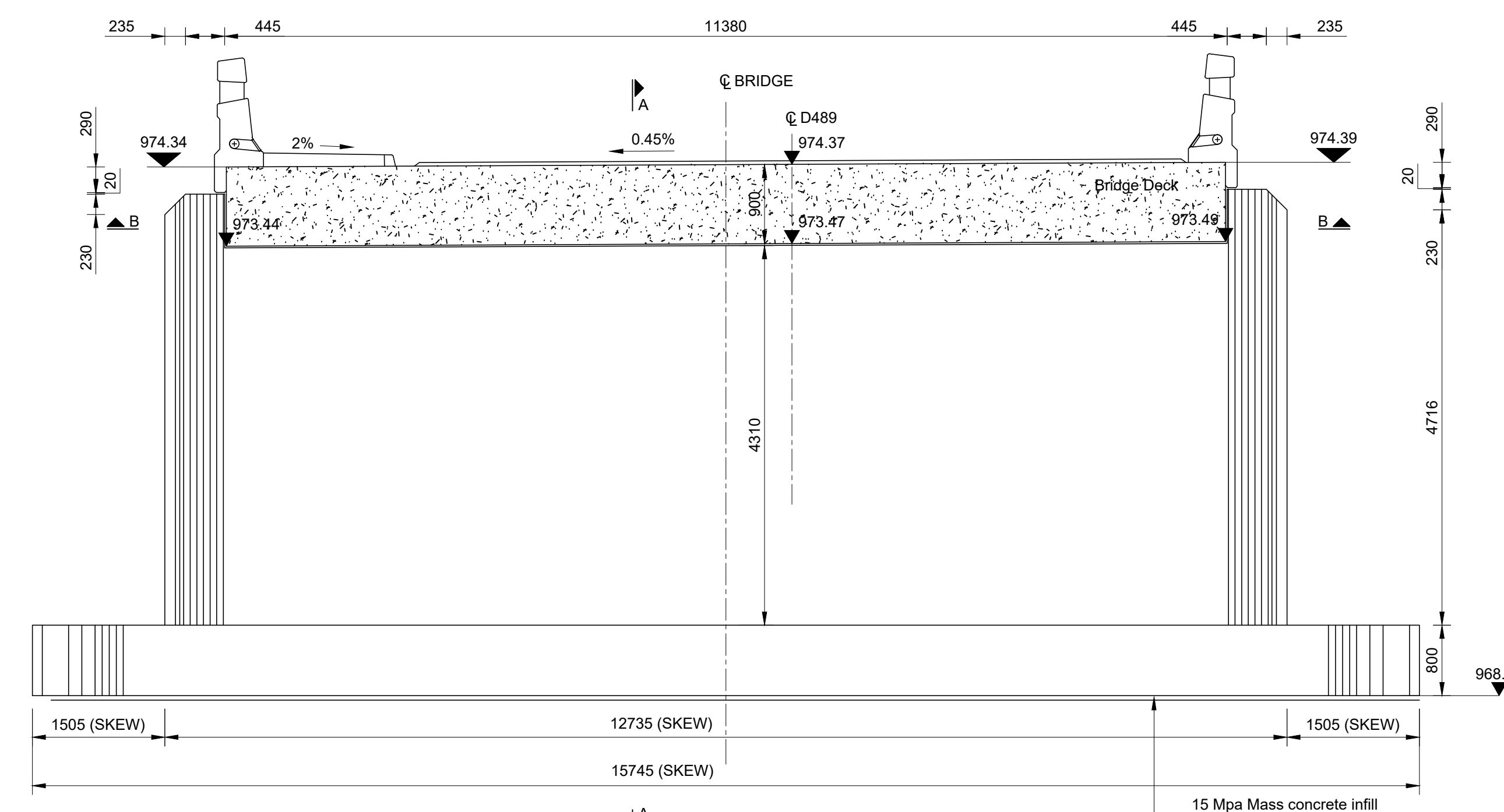
NANKHOOP
Consulting Engineers
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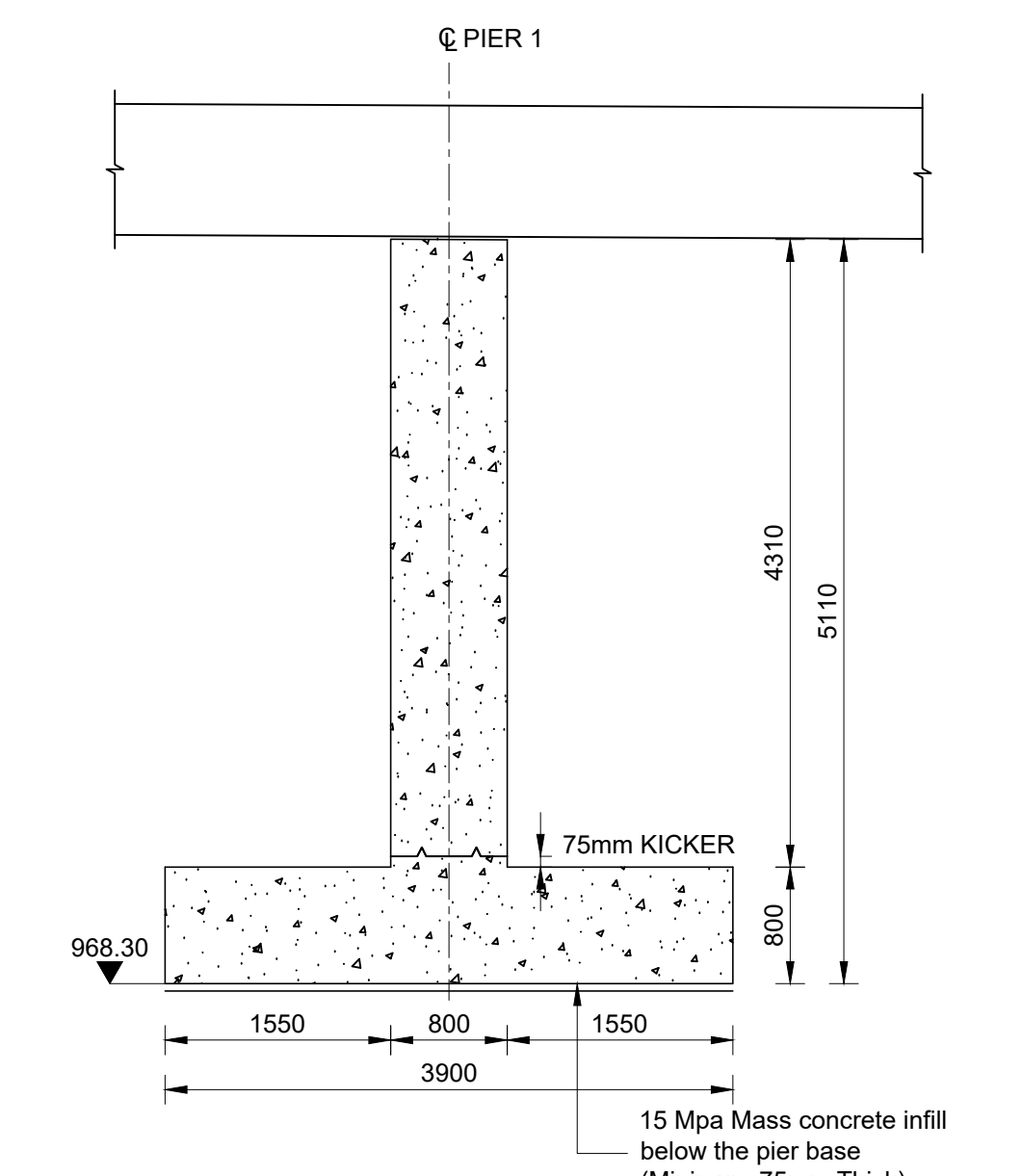
ELEVATION - PIER 1
SCALE 1:50



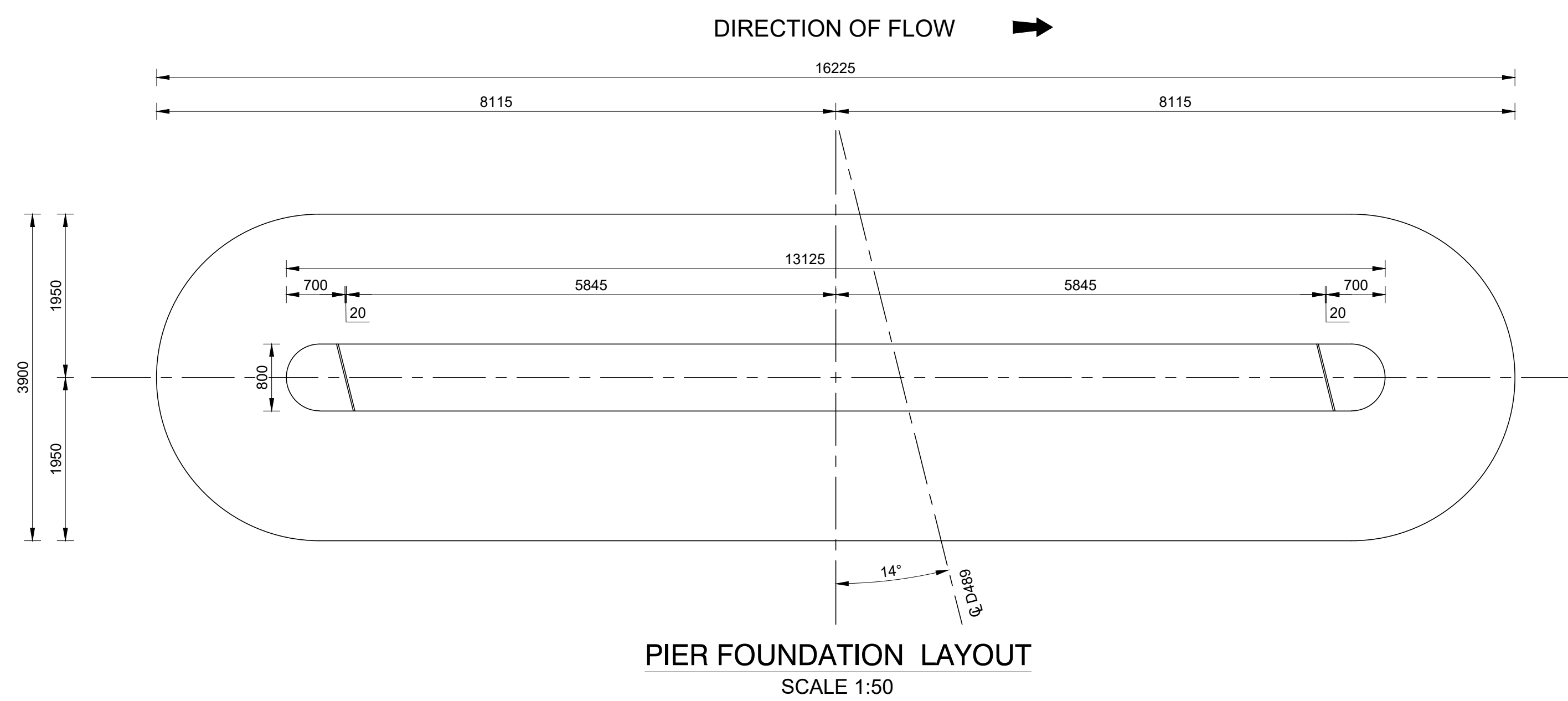
SECTION A-A - PIER 1
SCALE 1:50



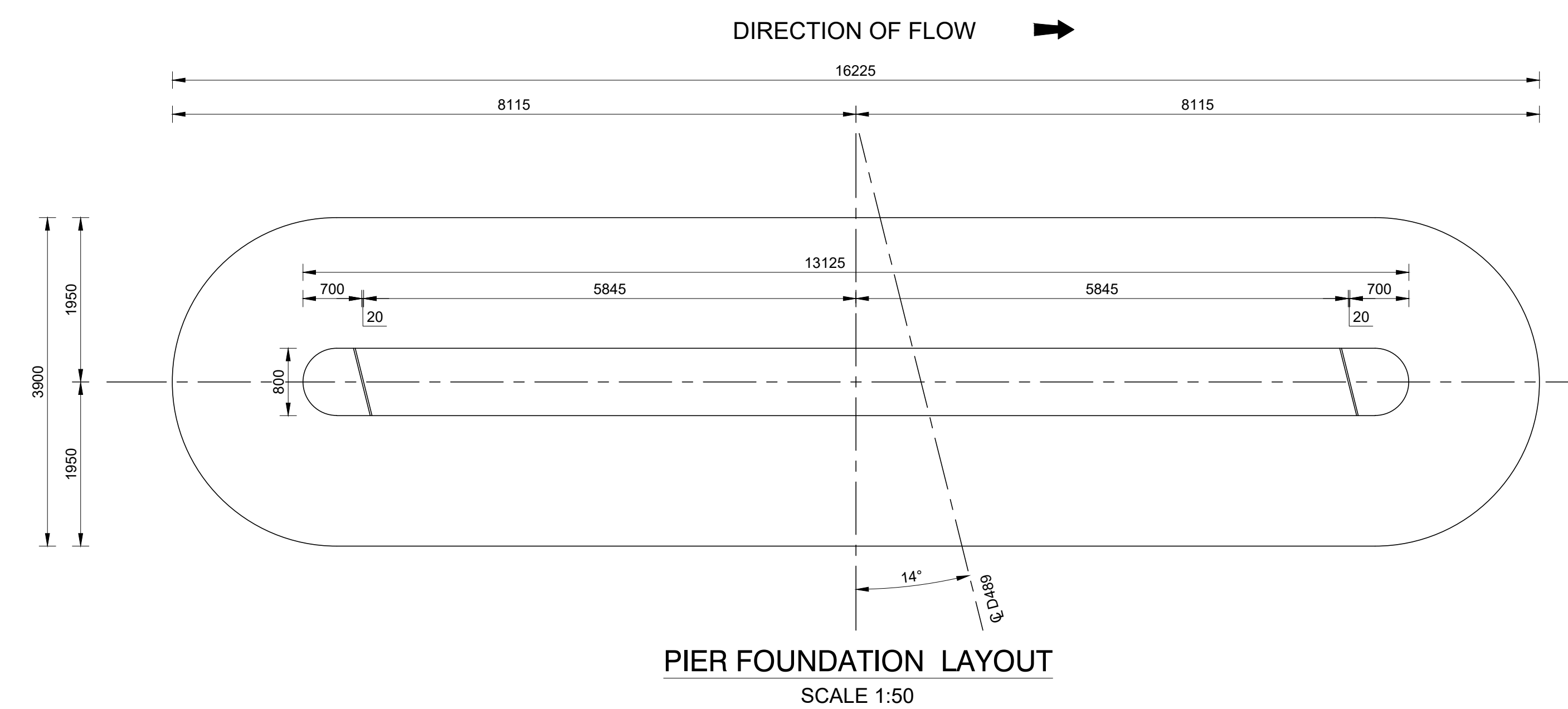
ELEVATION - PIER 2
SCALE 1:50



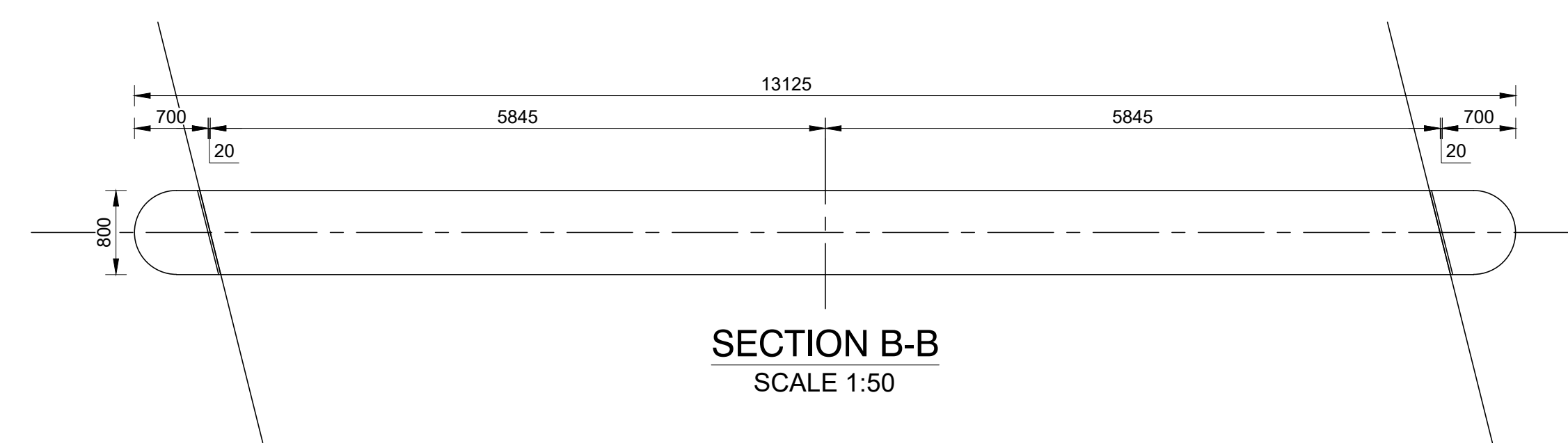
SECTION A-A - PIER 2
SCALE 1:50



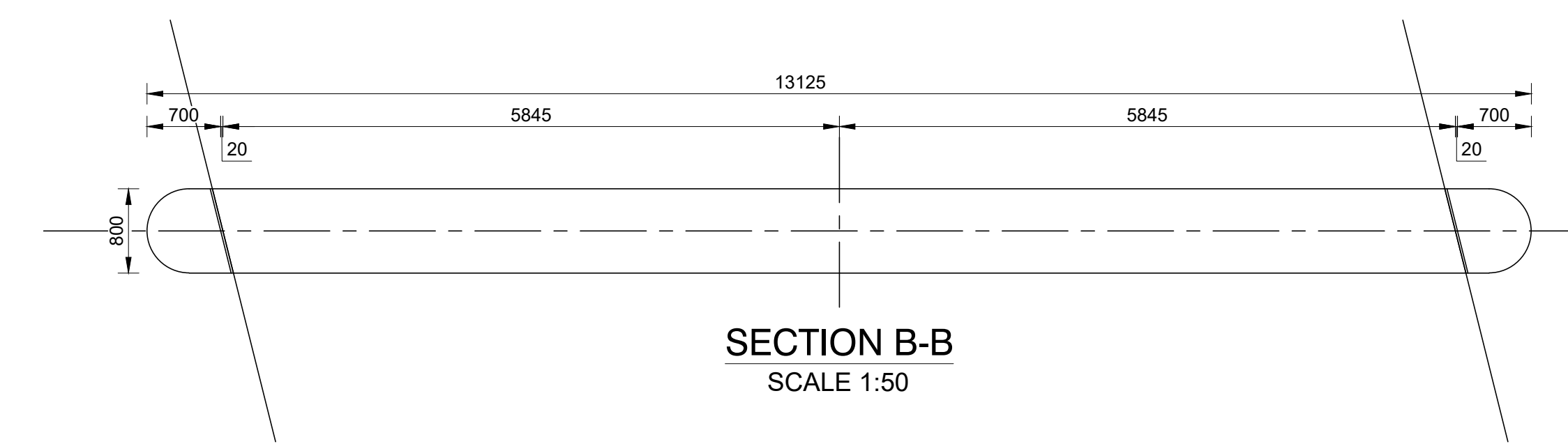
PIER FOUNDATION LAYOUT
SCALE 1:50



PIER FOUNDATION LAYOUT
SCALE 1:50



SECTION B-B
SCALE 1:50



SECTION B-B
SCALE 1:50

- NOTES :**
- CONCRETE CLASSES:
BLINDING - 15/19 (15MPa)
PIERS - 30/19 (30MPa)
 - CONCRETE FINISHES:
EXPOSED FACES - CLASS F2 (SMOOTH)
CONCEALED FACES - CLASS F1 (ROUGH)
 - ALL EXPOSED EDGES TO BE CHAMFERED 25 x 25
 - DOWELLING INTO ROCK:
DRILL 40mmØ HOLES 1500mm DEEP AND BLOW OUT DUST WITH COMPRESSOR, INJECT INTO GROUT (EPIDERMIX 395) TO PREVENT AIR-LOCKS AND INSERT Y25 DOWEL

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____
Supervising Authority: _____

CAD File Ref:-	Designed by : Y. JEAWON Pr Eng (202101910)
File Ref:- D489/6/1	Checked by : P. NANKHOO Pr Eng (910350)
Cross Section No:-	Drawn by : A. GUNAS
Longitudinal Section No:-	Checked by : P. NANKHOO Pr Eng (910350)
Survey Plan No:-	Date of approval :



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Designed by :
NANKHOO
Consulting Engineers
www.nankhoo.co.za
Signature: _____ Date: _____

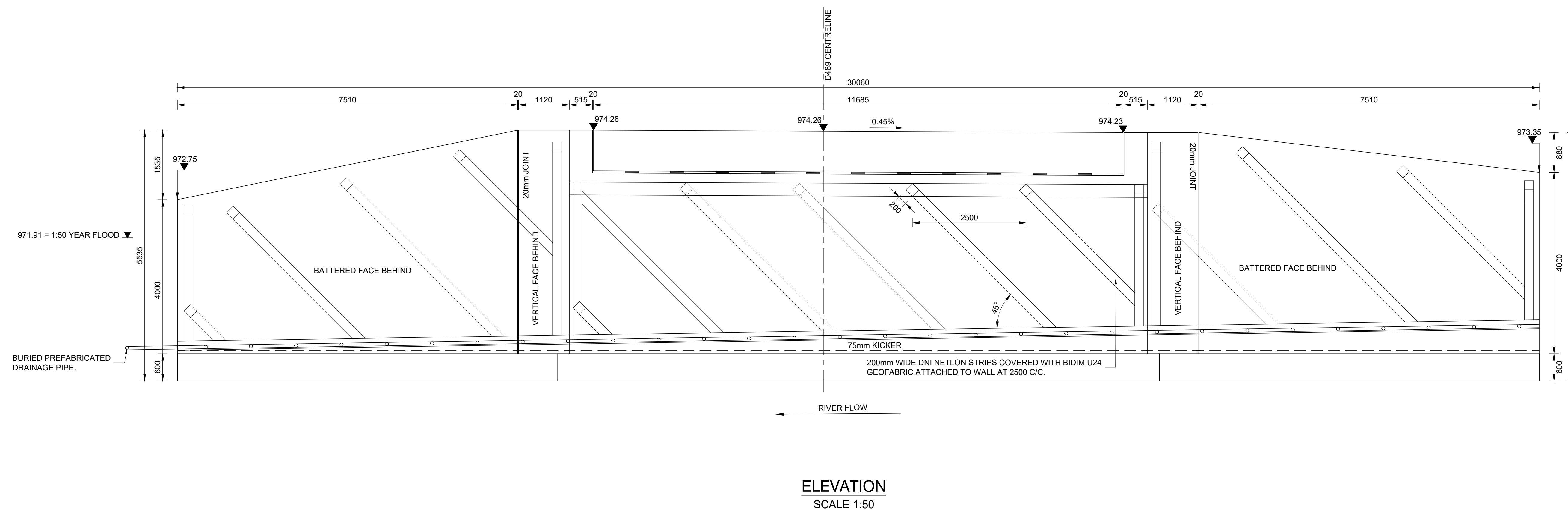
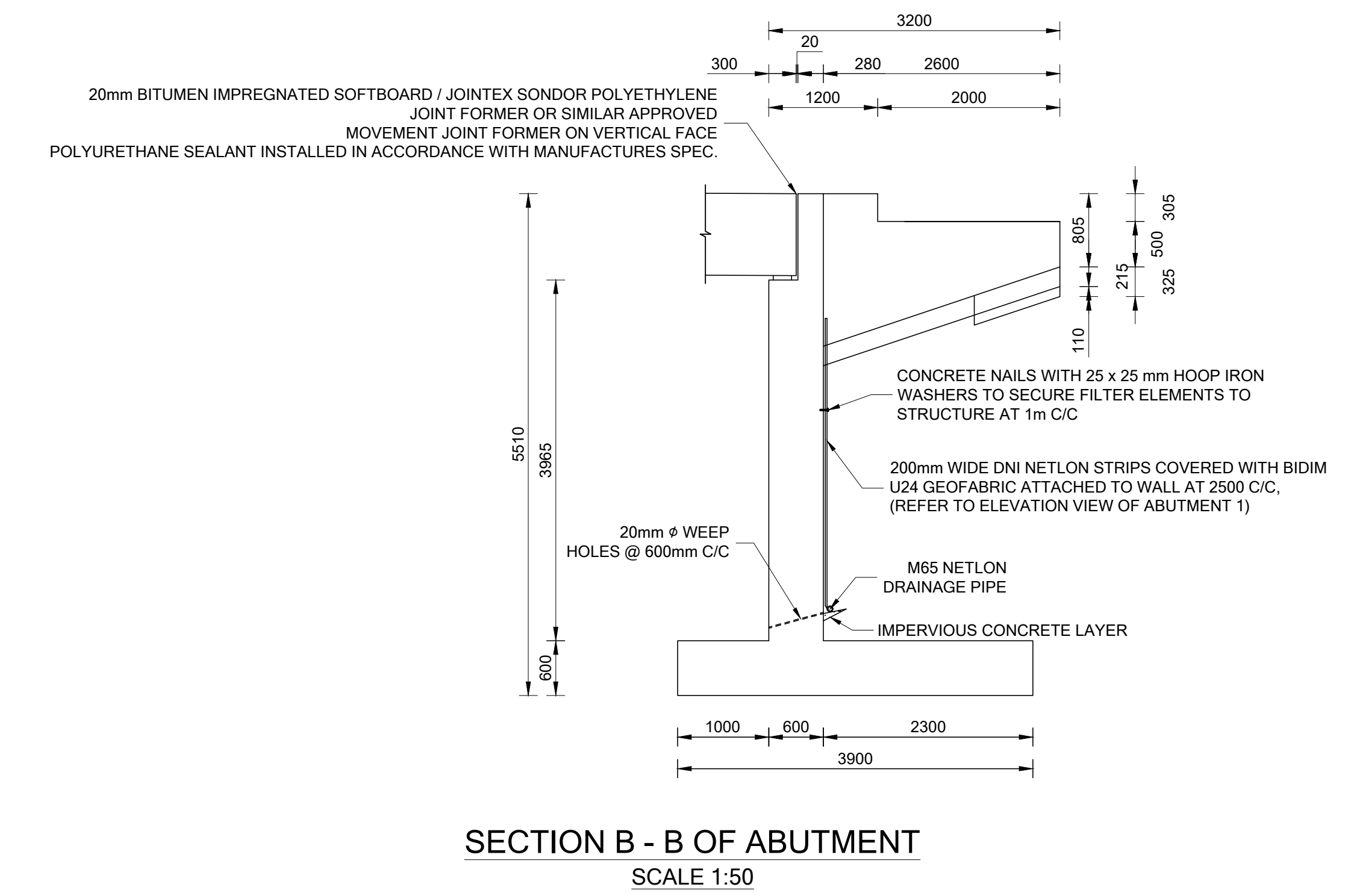
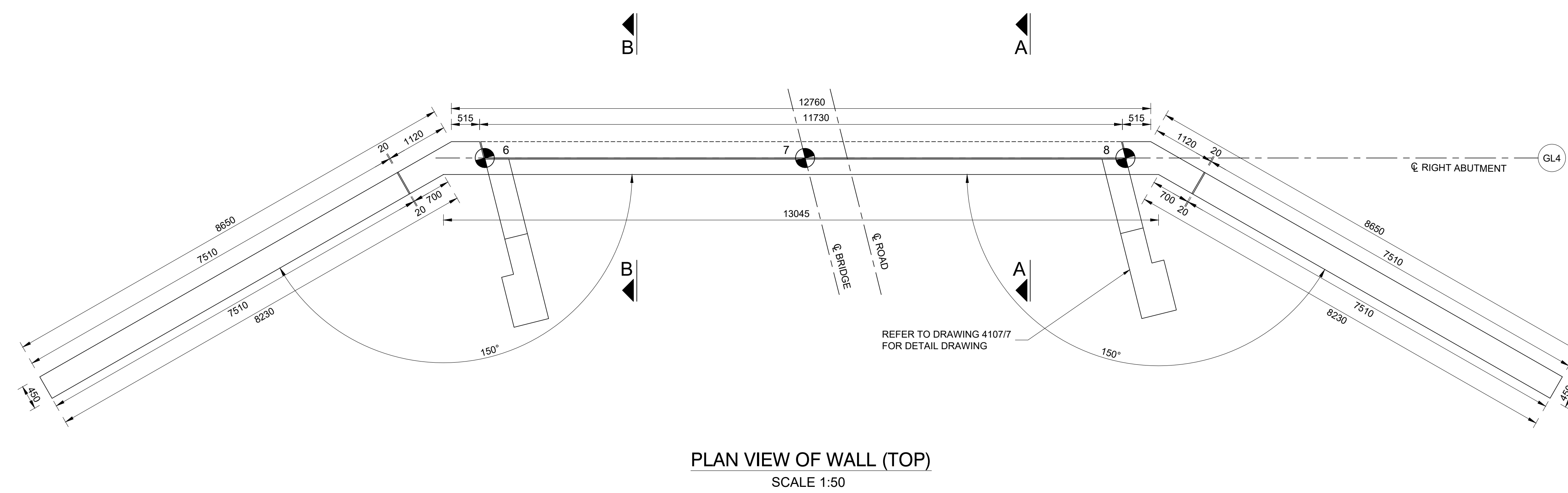
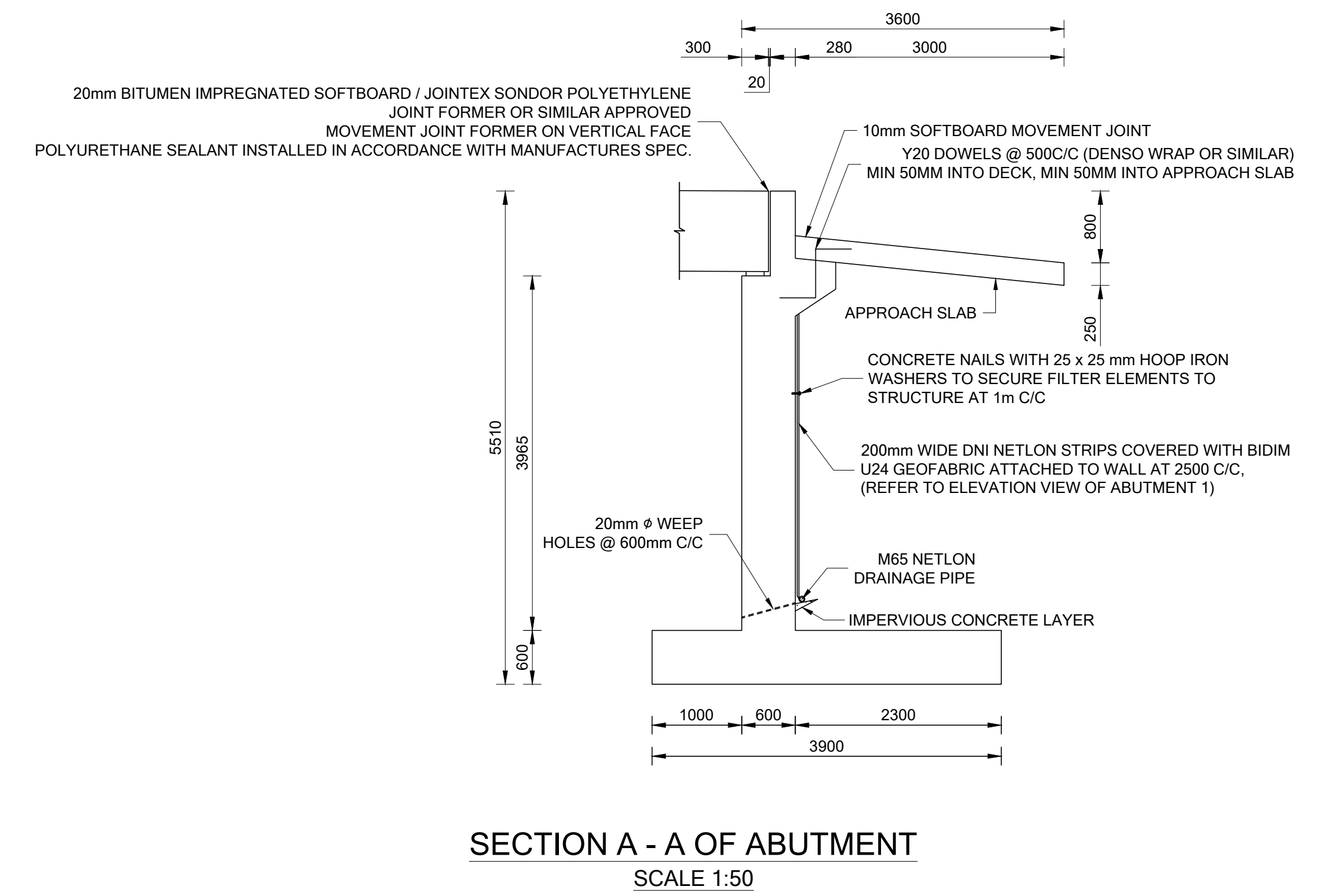
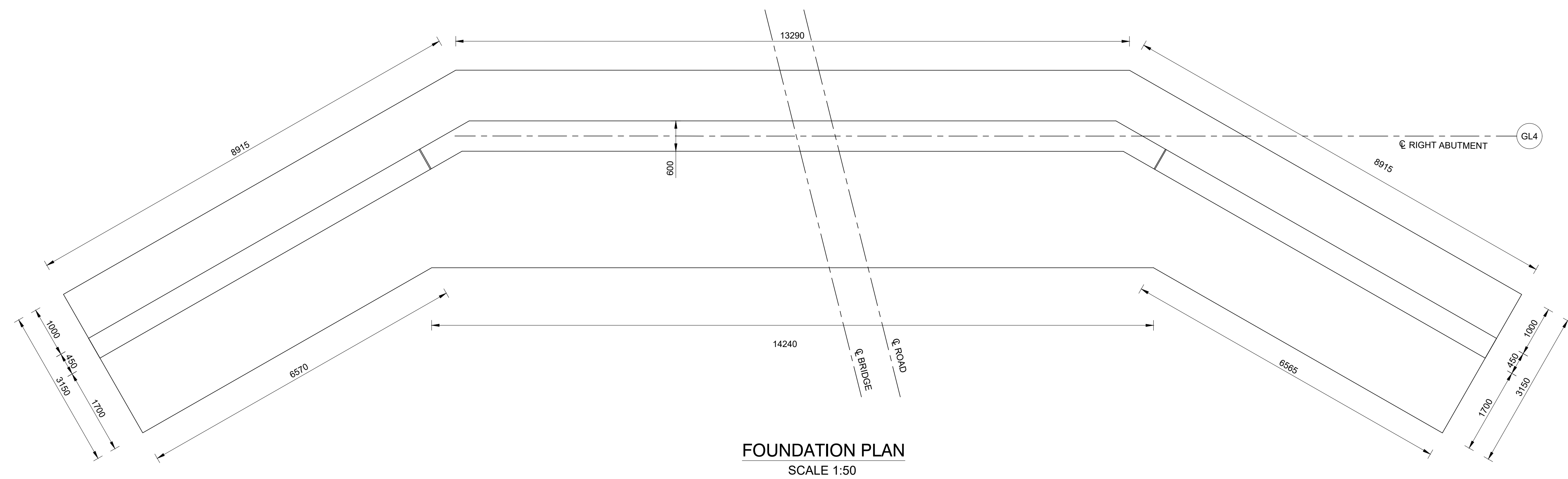
Chief Engineer : Structures
Head : Transport

DISTRICT ROAD 489 ESTCOURT - CORNFIELDS
QABANGO (CORNFIELDS) RIVER BRIDGE
PIER CONCRETE DETAILS

FOR TENDER PURPOSES

WGS 84: -28.855067° Latitude 29.849889° Longitude	Staked km distance km 7.170	Sheet : 03 of : 08
Scale As Shown	Plan No : 4107/03	

4107/03



- NOTES :**
1. CONCRETE CLASSES:
BLINDING - 15/19 (15MPa)
ABUTMENTS - 30/19 (30MPa)
 2. CONCRETE FINISHES:
EXPOSED FACES - CLASS F2 (SMOOTH)
CONCEALED FACES - CLASS F1 (ROUGH)
WALL TOPS - CLASS U2 (FLOATED)
 3. ALL EXPOSED EDGES TO BE CHAMFERED 25 x 25
 4. RECOMMEND THE USE OF HONEL ELASTOMERIC BEARING PADS: STRUCTURAL REF NO. C6103 OR SIMILAR, 300x200 OVERALL HEIGHT = 48mm.

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

CAD File Ref:-	Designed by : Y. JEAWON Pr Eng (202101910)
File Ref:- D489/6/1	Checked by : P. NANKHOO Pr Eng (910350)
Cross Section No:-	Drawn by : A. GUNAS
Longitudinal Section No:-	Checked by : P. NANKHOO Pr Eng (910350)
Survey Plan No:-	Date of approval :

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Designed by : _____
Signature: _____ Date: _____

Chief Engineer : Structures
Head: Transport

DISTRICT ROAD 489 ESTCOURT - CORNFIELDS

WGS 84: -28.855067° Latitude
29.849889° Longitude

Staked km distance: km 7.170

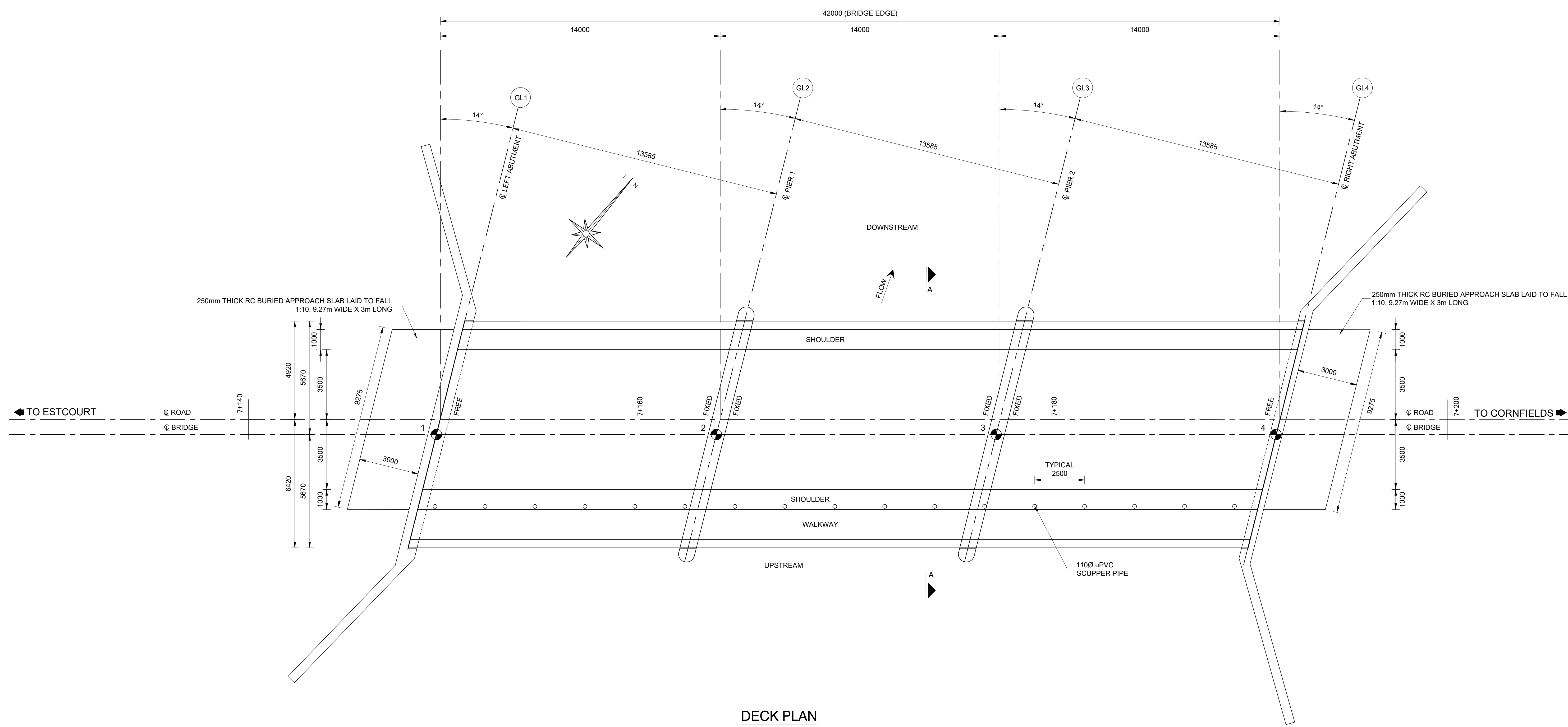
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FOR TENDER PURPOSES

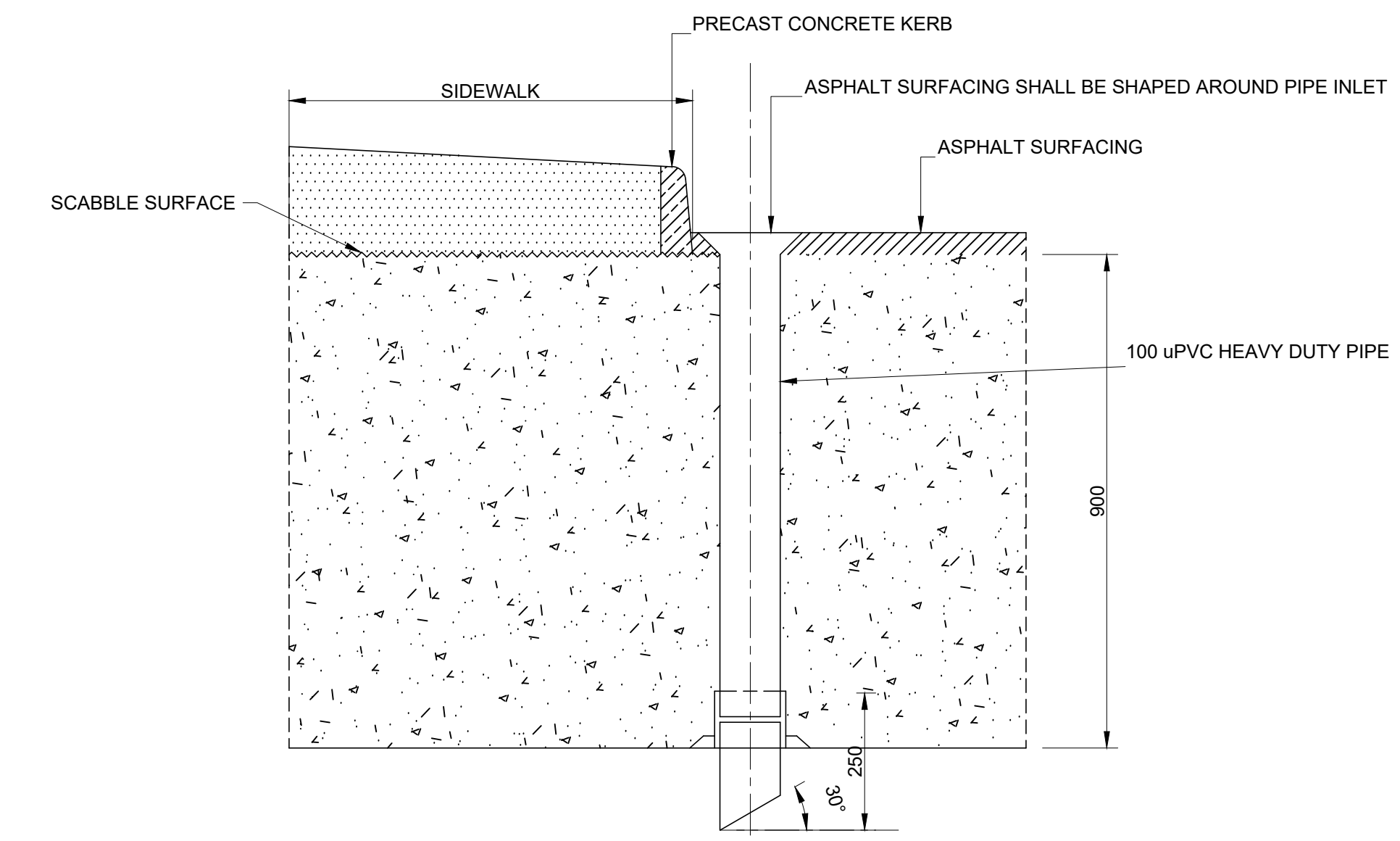
Sheet: 05 of: 08

Plan No: 4107/05

QABANGO (CORNFIELDS) RIVER BRIDGE
RIGHT ABUTMENT CONCRETE DETAILS

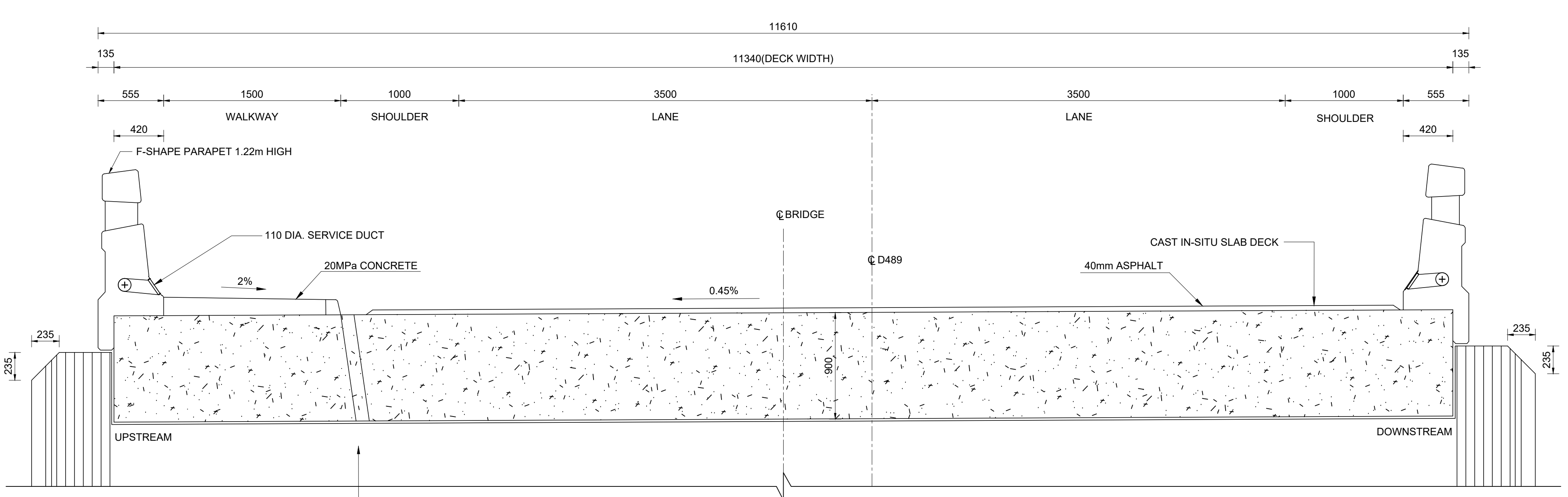


DECK PLAN
SCALE 1:100

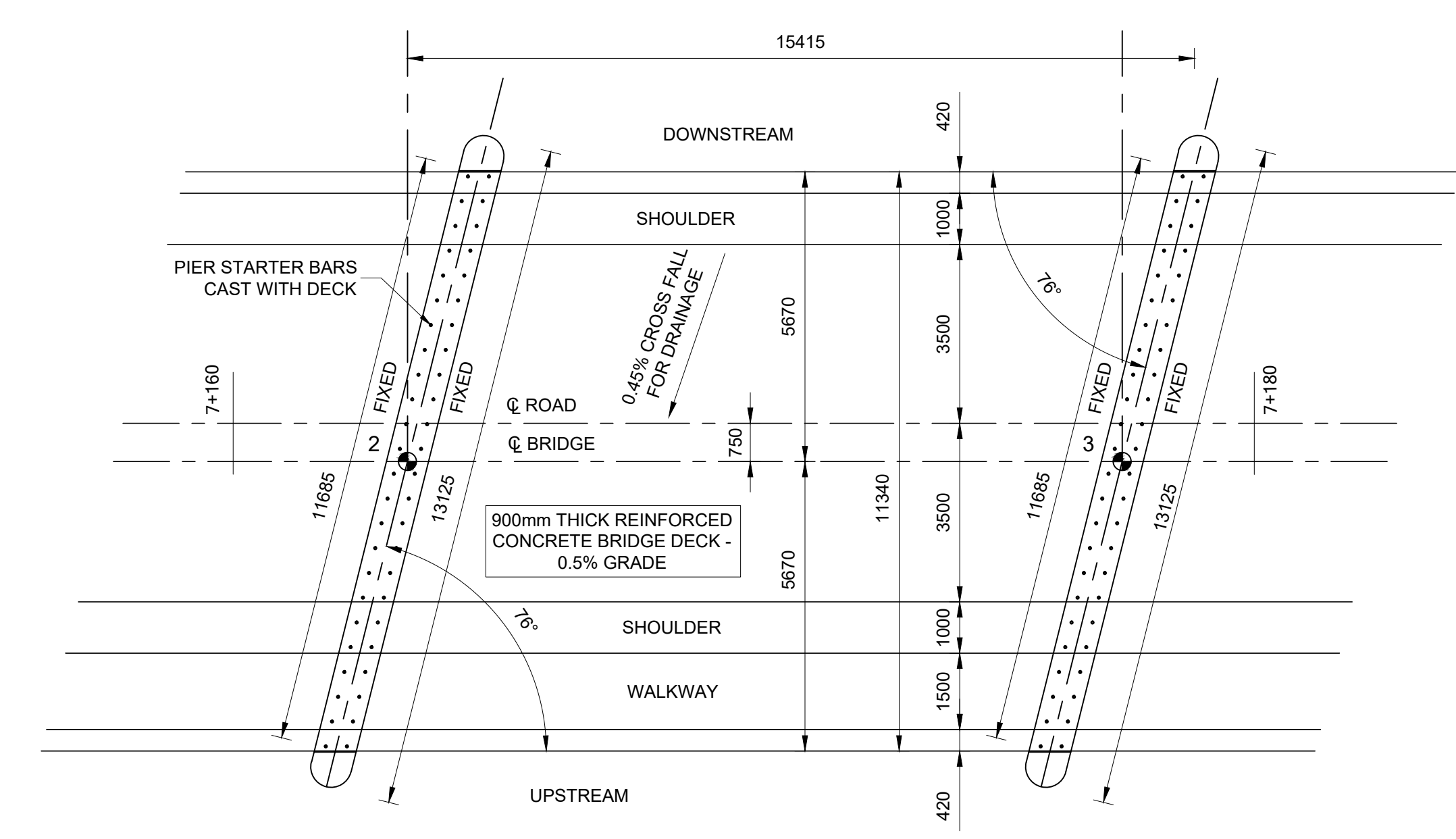


DRAINAGE SCUPPERS DETAILS
SCALE 1:10

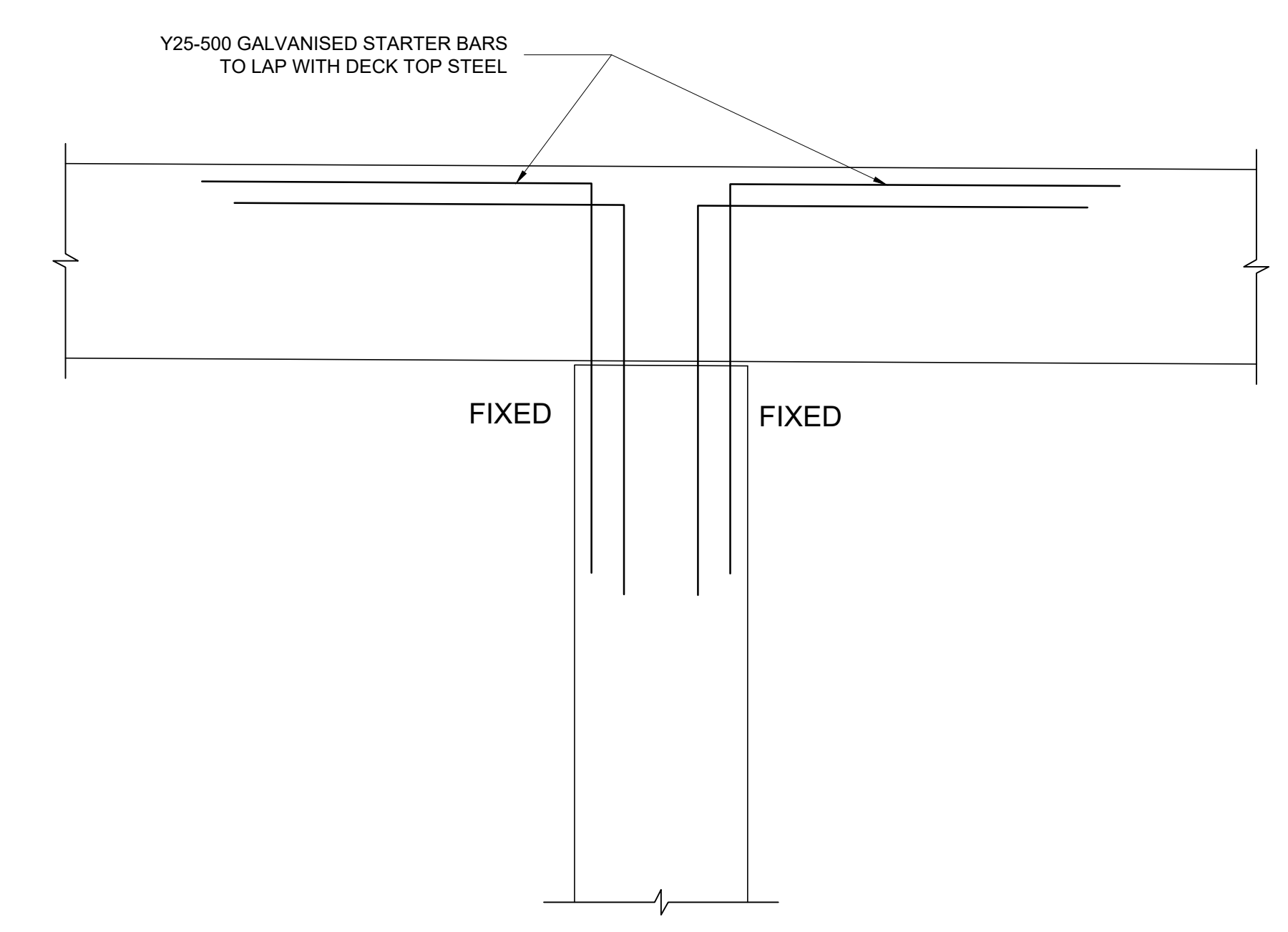
- NOTES :
- DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS AND CHANGES ARE IN METRES UNLESS NOTED OTHERWISE.
 - CLASS OF CONCRETE:
DECK -40/19 (40MPa)
PARAPETS -30/19 (30MPa)
 - REINFORCING STEEL SHALL BE GRADE 450 UNLESS OTHERWISE SPECIFIED.
 - CONCRETE FINISHES:
EXPOSED FACES -CLASS F2 (SMOOTH)
CONCEALED FACES -CLASS F1 (ROUGH)
TOP OF DECK -CLASS U1 (FLOATED AND BROOMED)
WALKWAY -CLASS U1 (BROOMED)
 - ALL EXPOSED EDGES TO HAVE 25 x 25 CHAMFERS UNLESS NOTED OTHERWISE.



SECTION A - A
SCALE 1:25



TYPICAL DECK PANEL
SCALE 1:100



DECK CONNECTION DETAIL
SCALE 1:25

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT		CAD File Ref:-	Designed by : Y. JEAWON Pr Eng (202101910)
Supervising Engineer	Date	File Ref:- D489/6/1	Checked by : P. NANKHOO Pr Eng (910350)
Supervising Authority		Cross Section No:-	Drawn by : A. GUNAS
		Longitudinal Section No:-	Checked by : P. NANKHOO Pr Eng (910350)
		Survey Plan No:-	Date of approval :

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Designed by :
NANKHOO
Consulting Engineers
www.nankhoo.co.za

Chief Engineer : Structures
Head : Transport

DISTRICT ROAD 489 ESTCOURT - CORNFIELDS

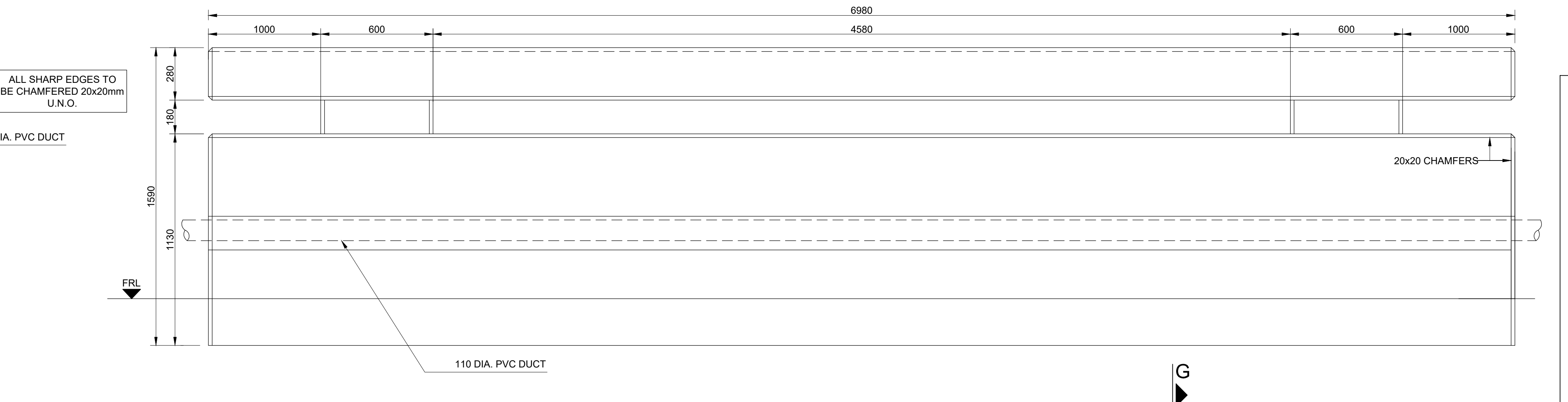
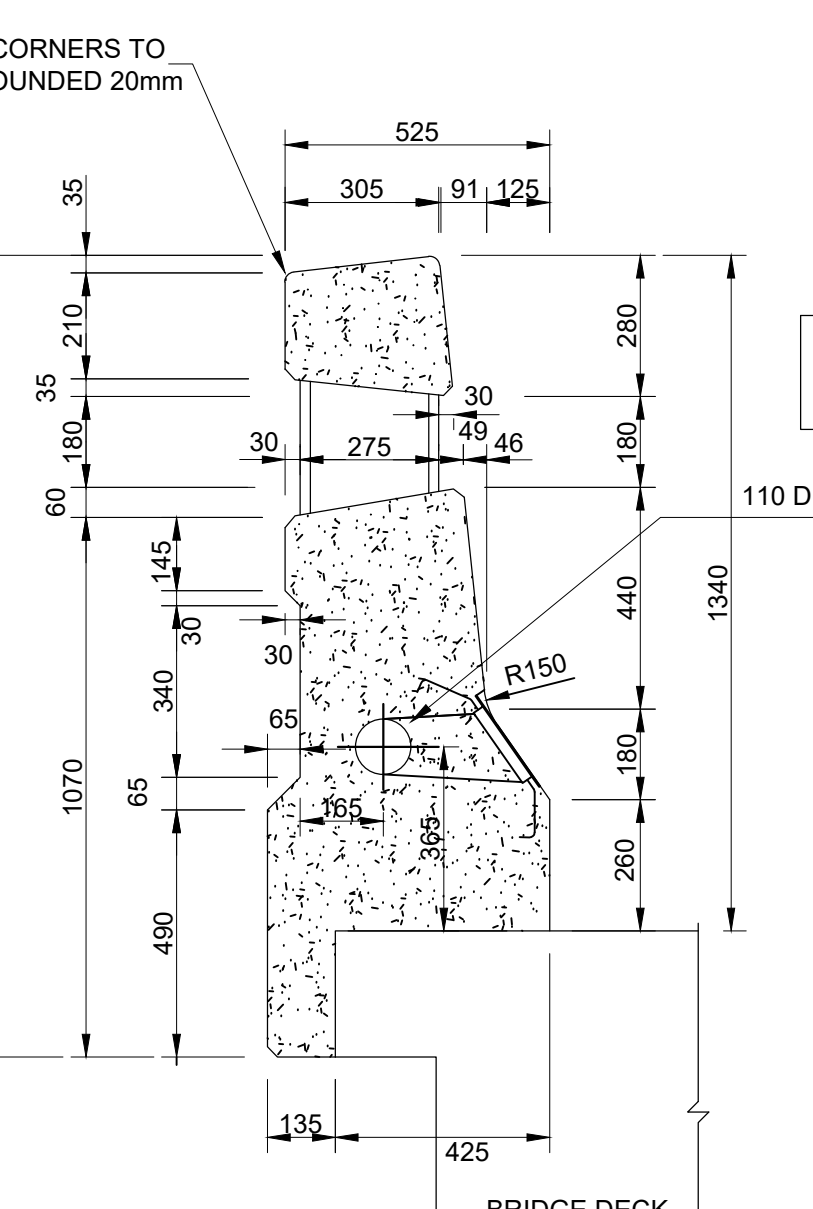
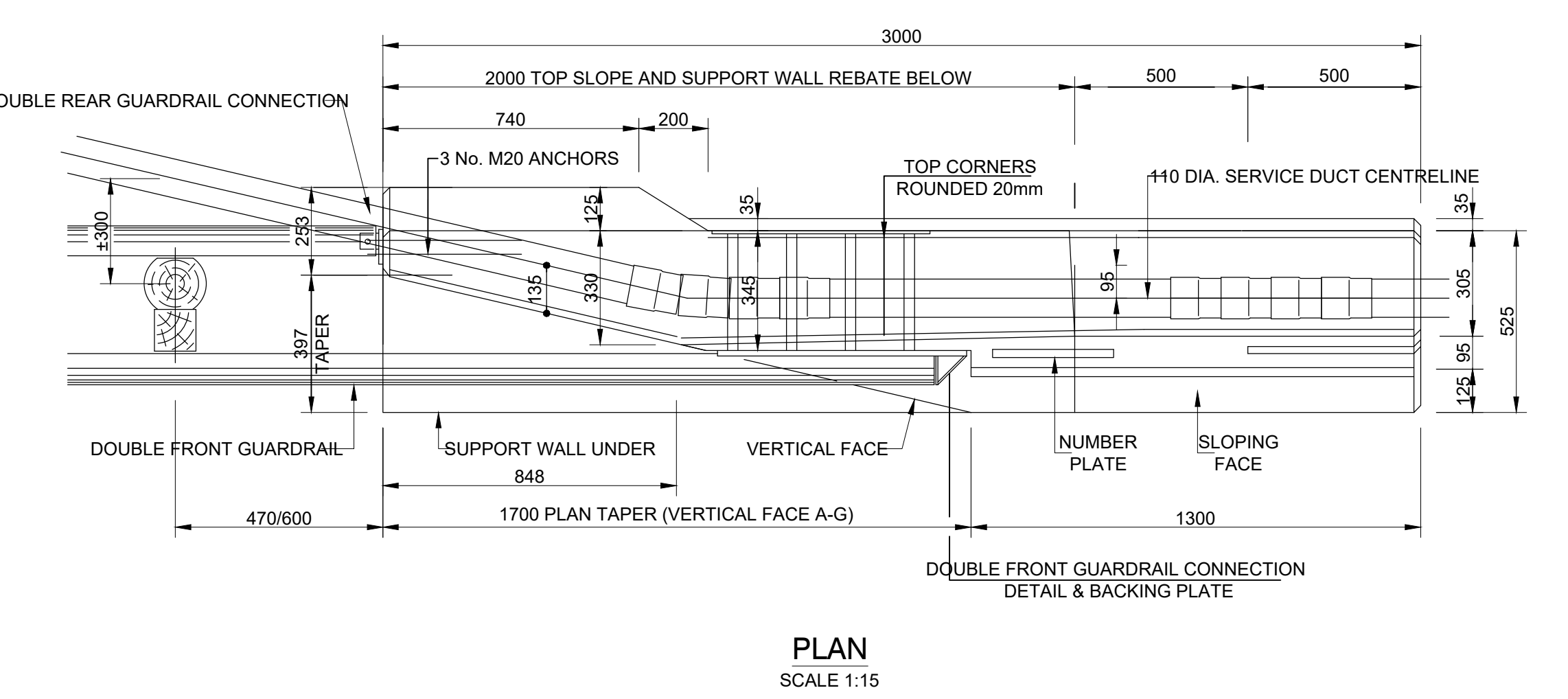
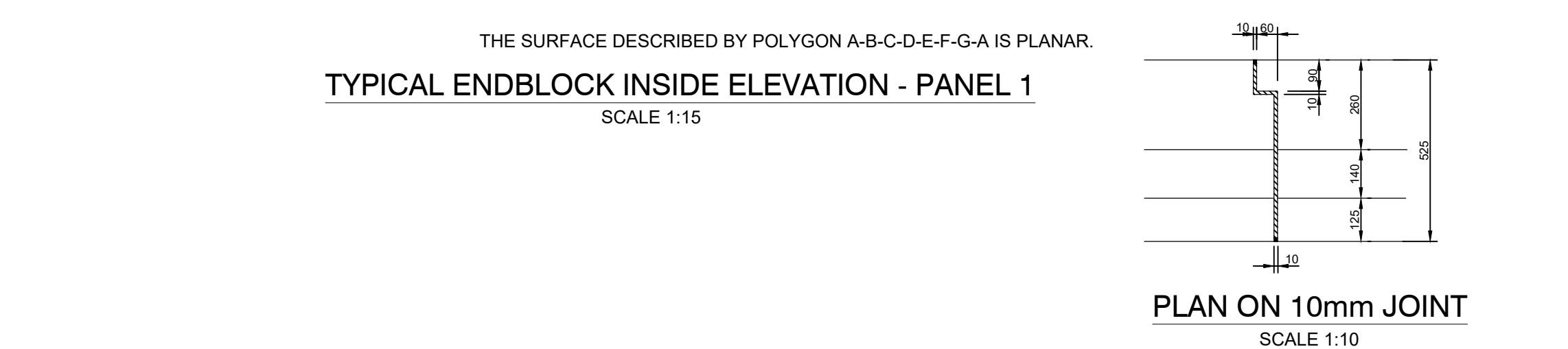
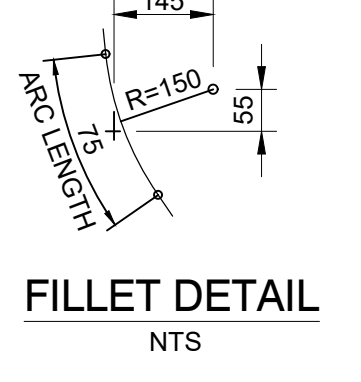
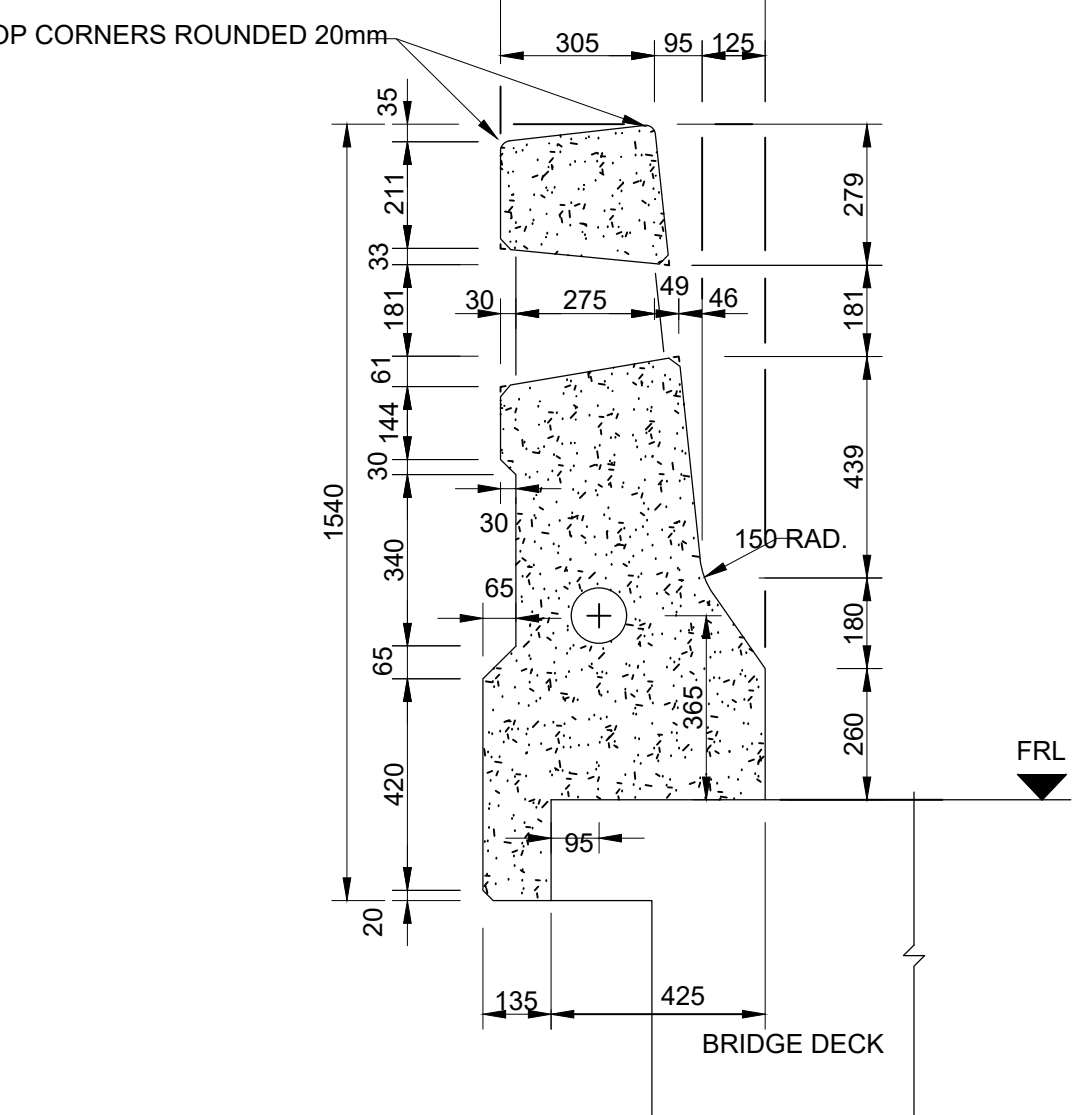
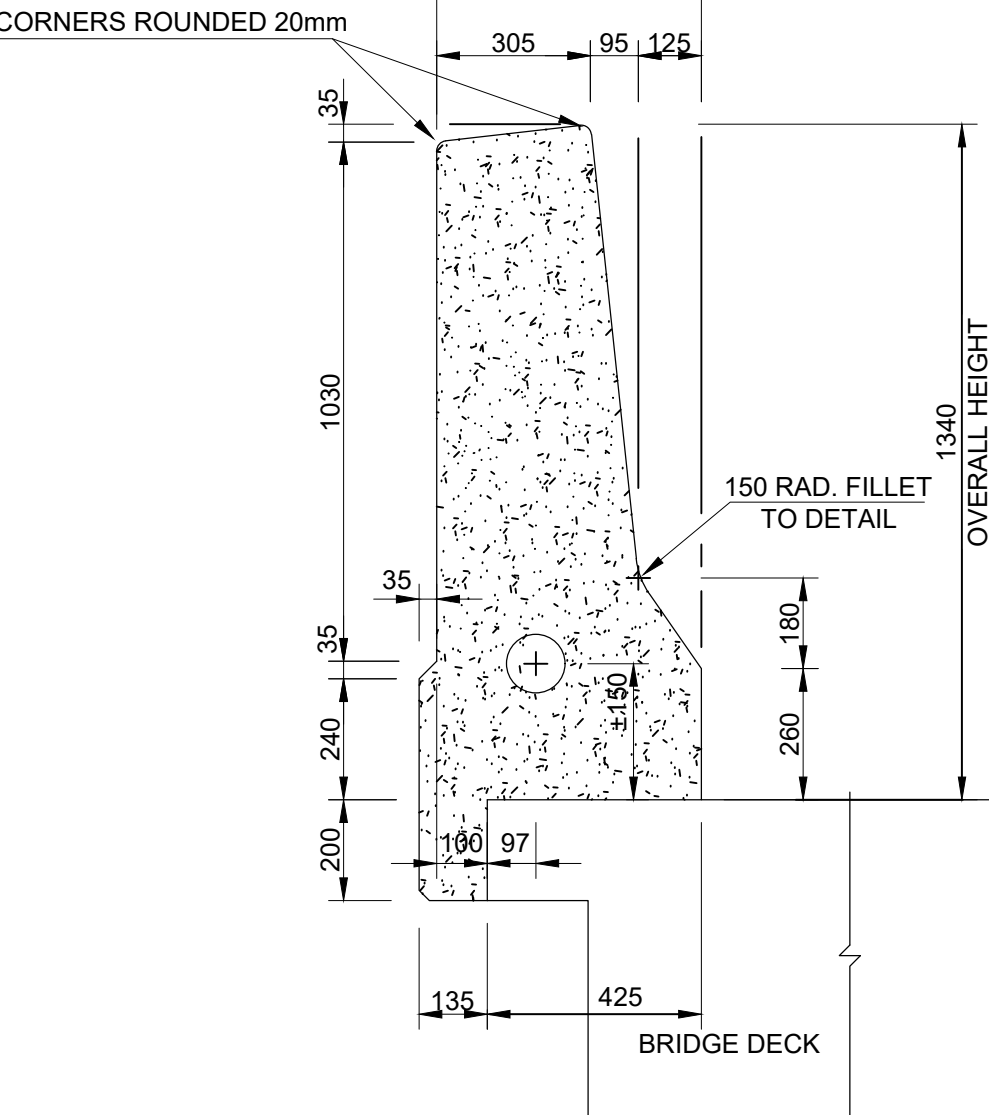
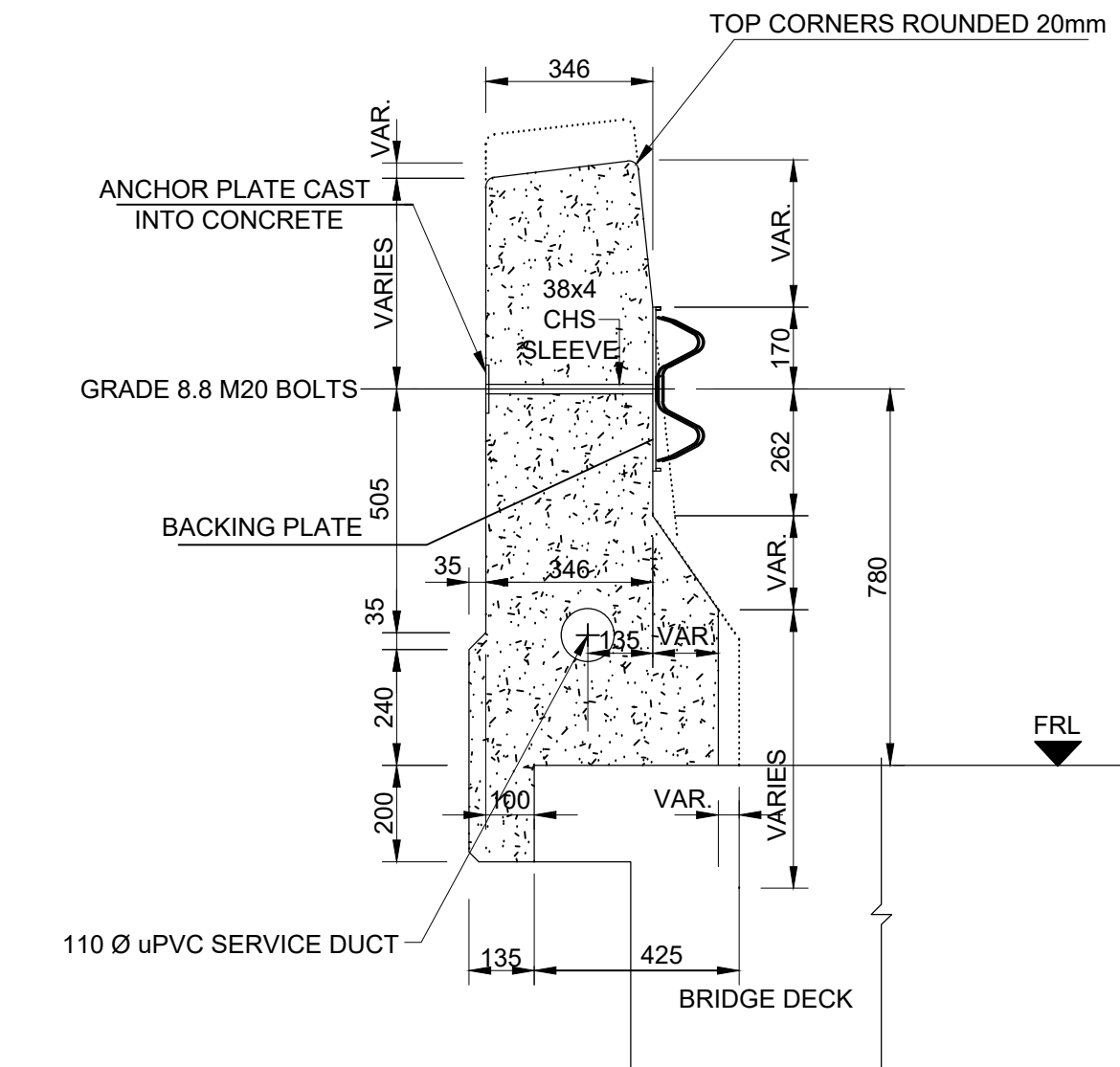
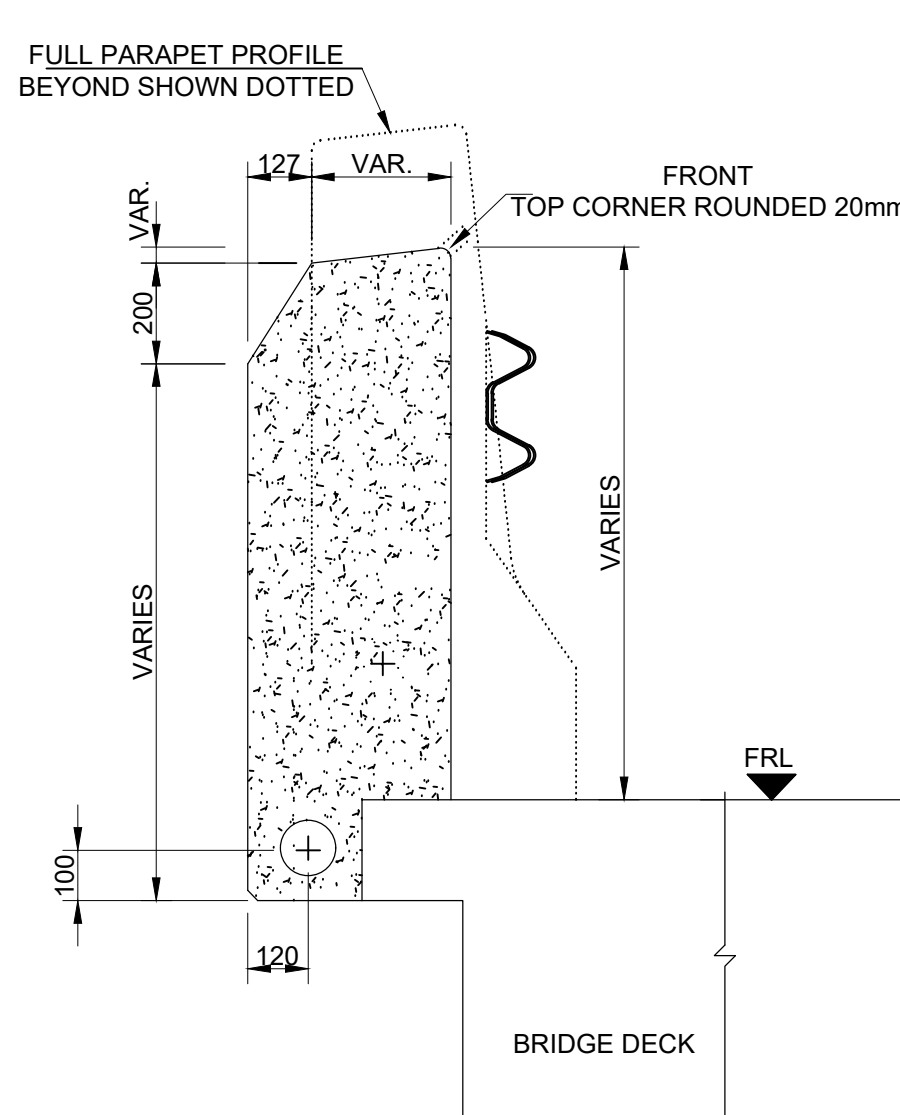
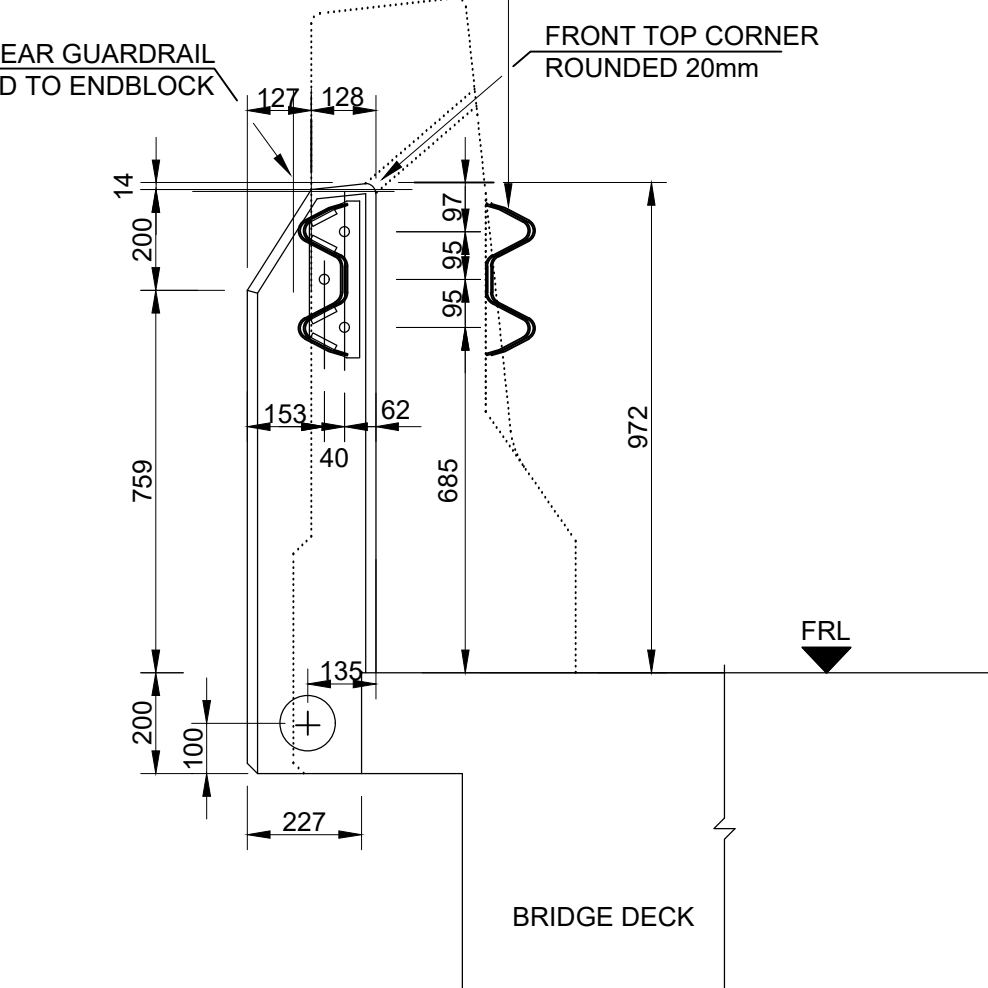
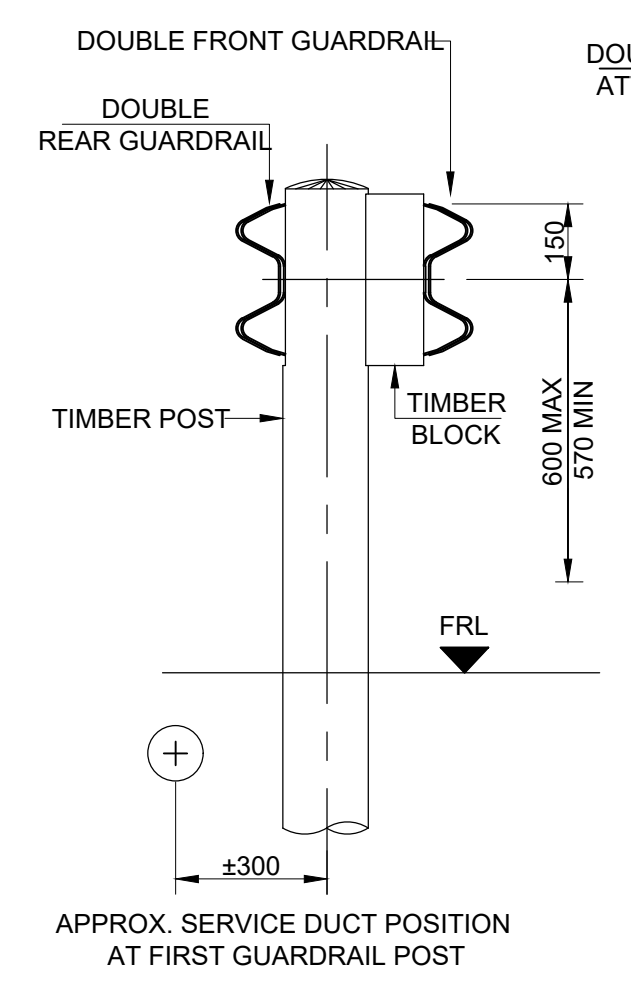
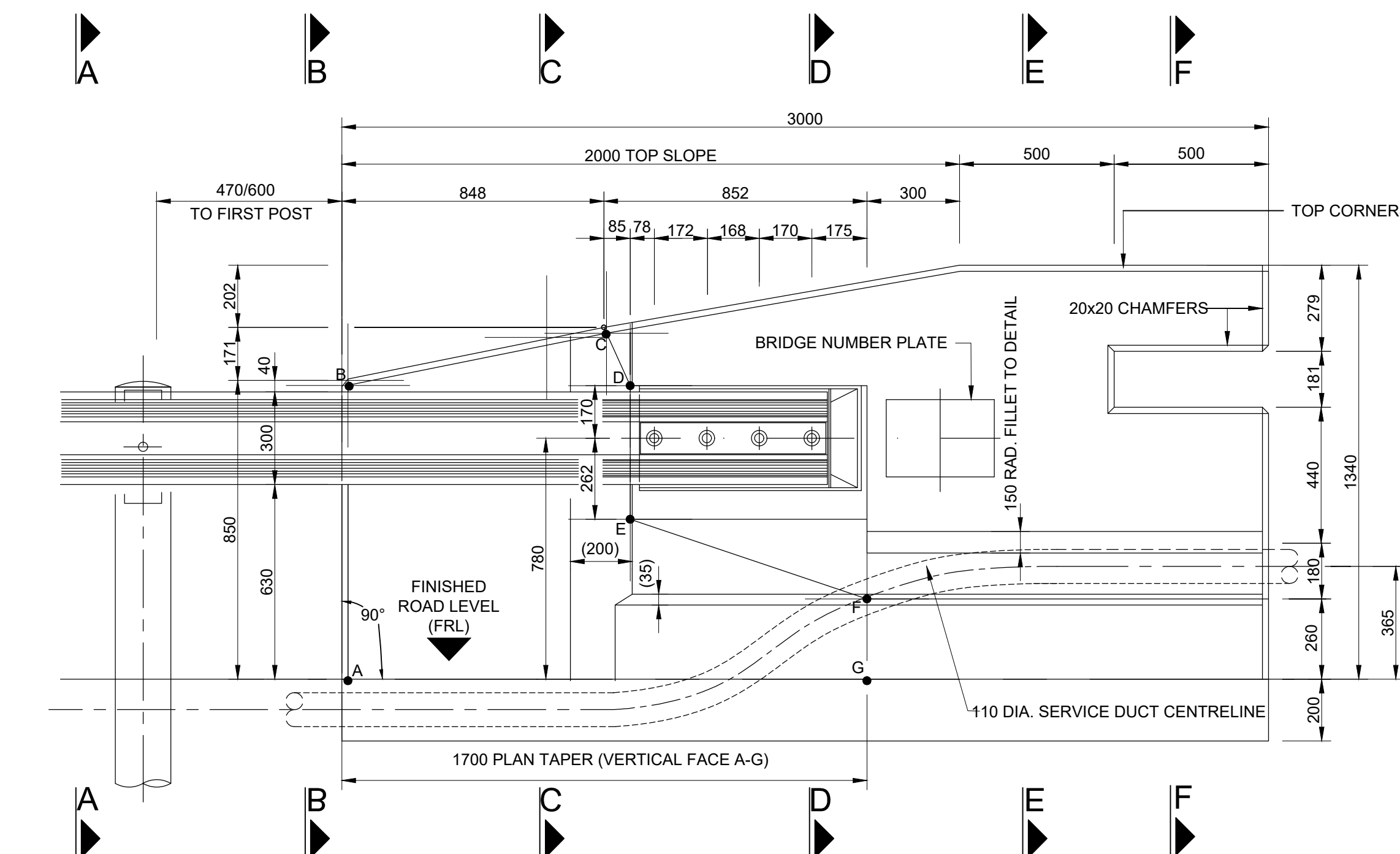
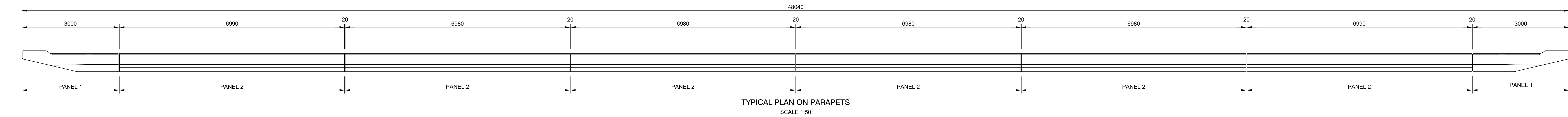
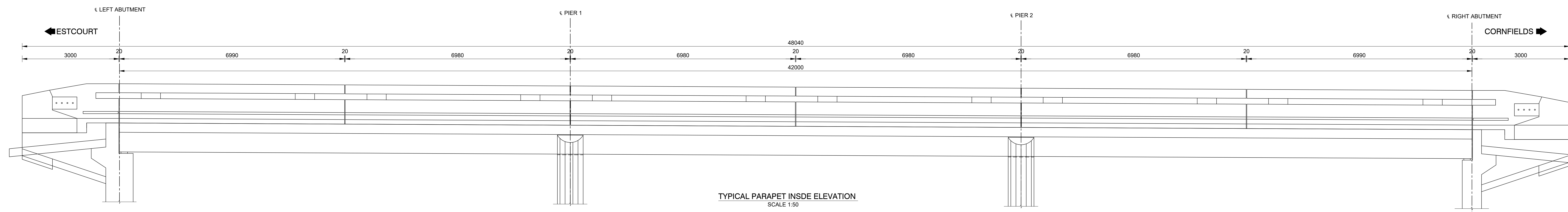
WGS 84: -28.855067° Latitude
29.849889° Longitude

QABANGO (CORNFIELDS) RIVER BRIDGE

DECK CONCRETE DETAILS

FOR TENDER PURPOSES	
Staked km distance km 7.170	Sheet : 06 of : 08
Scale As Shown	Plan No : 4107/06

4107/06



- NOTES:**
- CONCRETE CLASS - 30/19 (30 MPa)
 - CONCRETE FINISHES:
 - EXPOSED FACES - CLASS F3 (SMOOTH RUBBED)
 - CONCEALED FACES - CLASS F1 (ROUGH)
 - UNFORMED SURFACES - CLASS U3 (STEEL TROWEL)
 - ALL EXPOSED EDGES SHALL BE CHAMFERED 20 x 20.
 - REBATED LETTERING SHALL RECEIVE TWO COATS OF BLACK ALKALI RESISTANT PAINT
 - KERB DETAIL
 - KERBS SHALL BE UNREINFORCED 25 MPa PRECAST CONCRETE TO FIG. 6 OF S.A.S. 927
 - SAND INFILL SHALL BE CLEAN RIVER SAND AND OR ALTERNATIVELY SUITABLE GRADED CRUSHER DUST.
 - PRECAST KERB SHALL BE BEDDED ON 5mm THICK 1 : 3 MORTAR AFTER PROPER CHIPPING OF THE CONCRETE SEATING.
 - SUPPORTING 100 x 100 MASS CONCRETE BLOCK SHALL BE DOWELED BY DRILLING A 12mm Ø HOLE 60mm DEEP AND 10mm BAR GROUTED IN USING A SUITABLE RESIN GROUT.
 - WALKWAY TO BE 1.5m WIDE.

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

CAD File Ref:-	Designed by : Y. JEAOWN Pr Eng (202101910)
File Ref:- D489/6/1	Checked by : P. NANKHOOP Pr Eng (910350)
Cross Section No:-	Drawn by : A. GUNAS
Longitudinal Section No:-	Checked by : P. NANKHOOP Pr Eng (910350)
Survey Plan No:-	Date of approval :

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Designed by : _____

Chief Engineer : Structures

Head : Transport

DISTRICT ROAD 489 ESTCOURT - CORNFIELDS

WGS 84 : -28.855067° Longitude Latitude 29.849889°

Staked km distance km 7.170

Scale As Shown

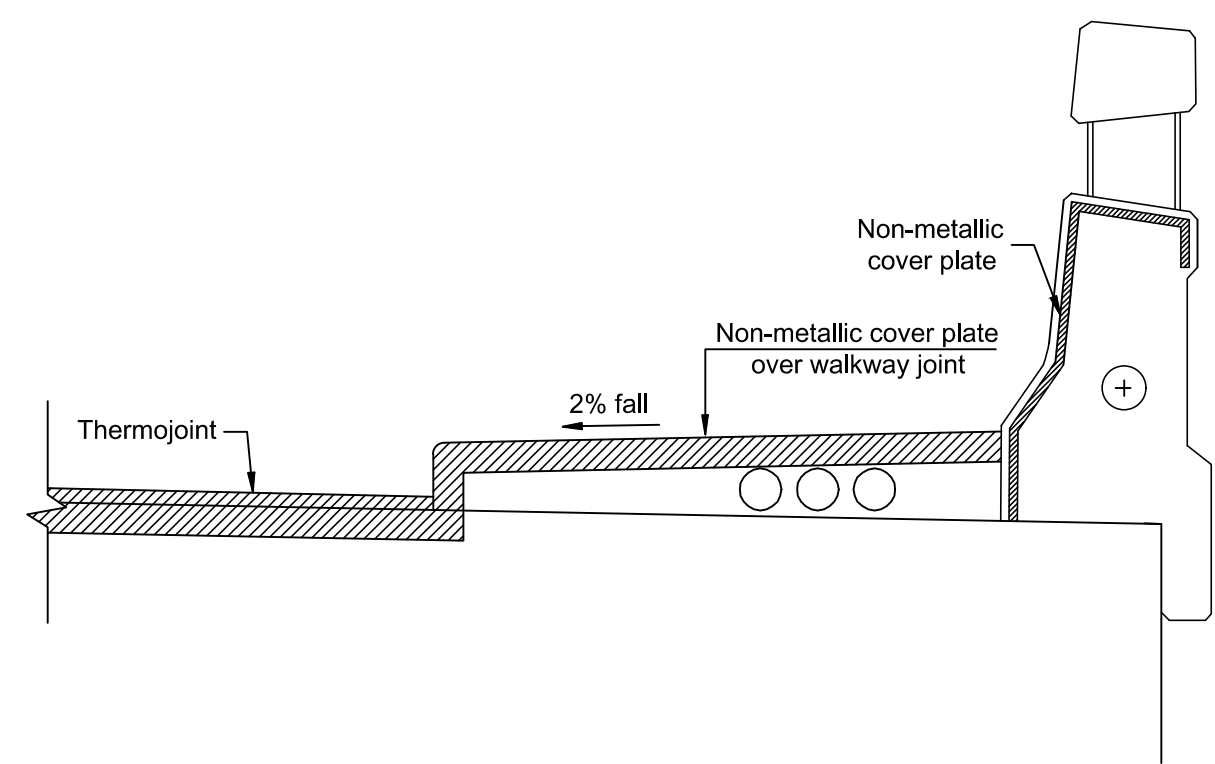
Sheet : 07 of : 08

Plan No : 4107/07

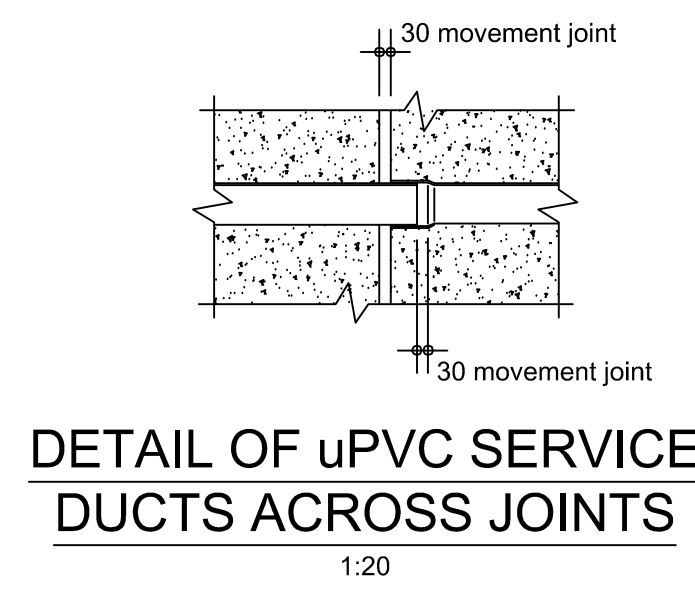
FOR TENDER PURPOSES

PARAPETS CONCRETE DETAILS

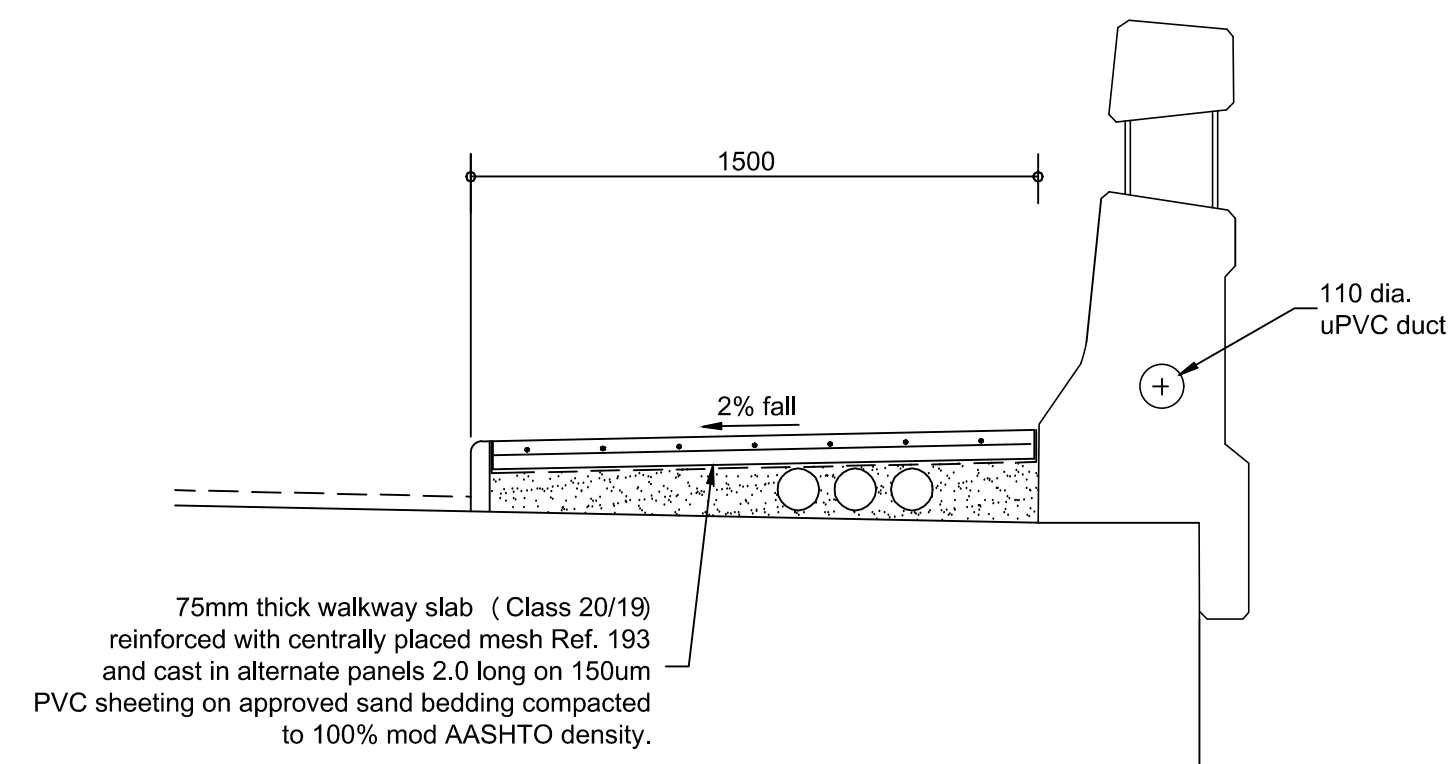
4107/07



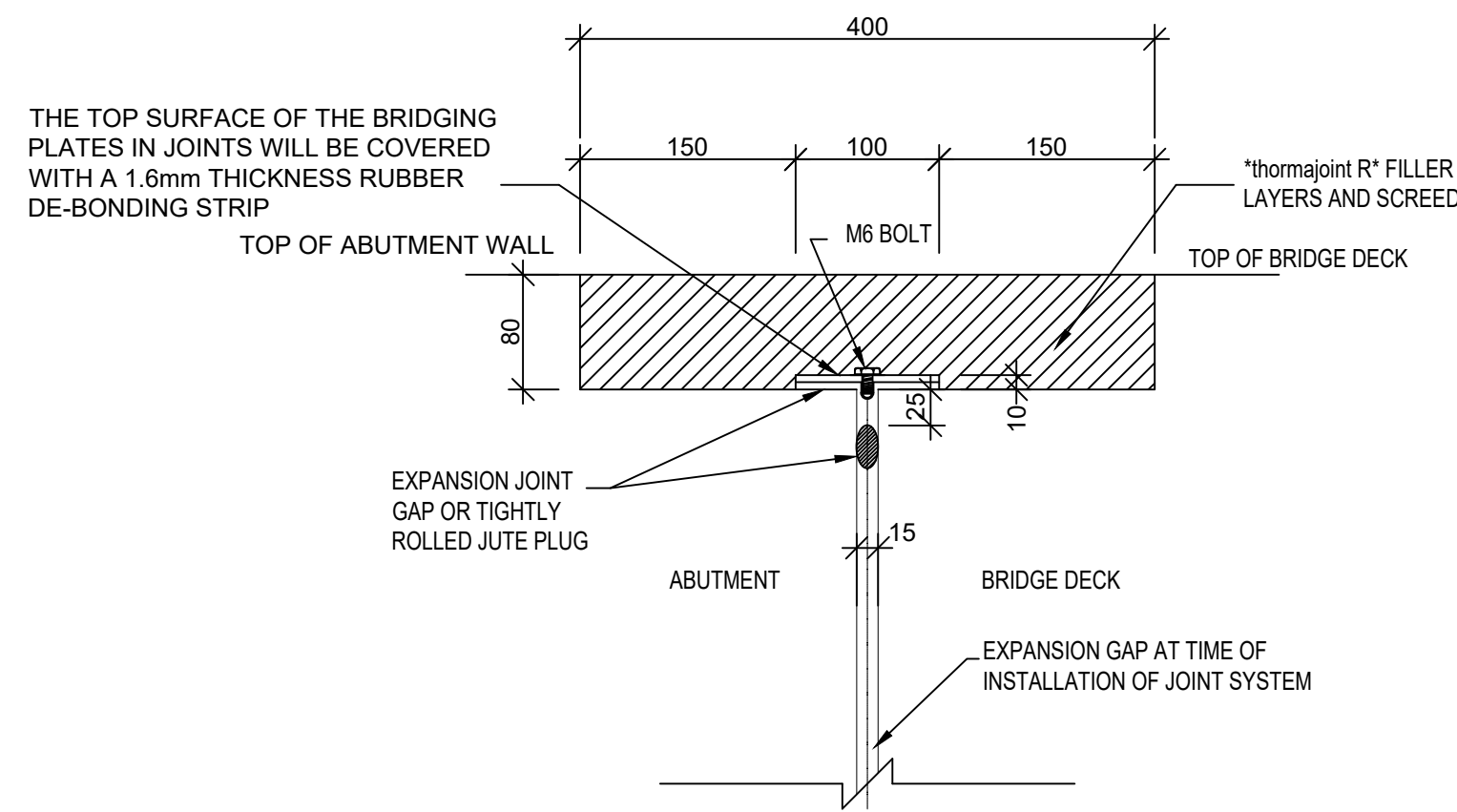
SECTION THROUGH EXPANSION JOINT RECESS
1:20



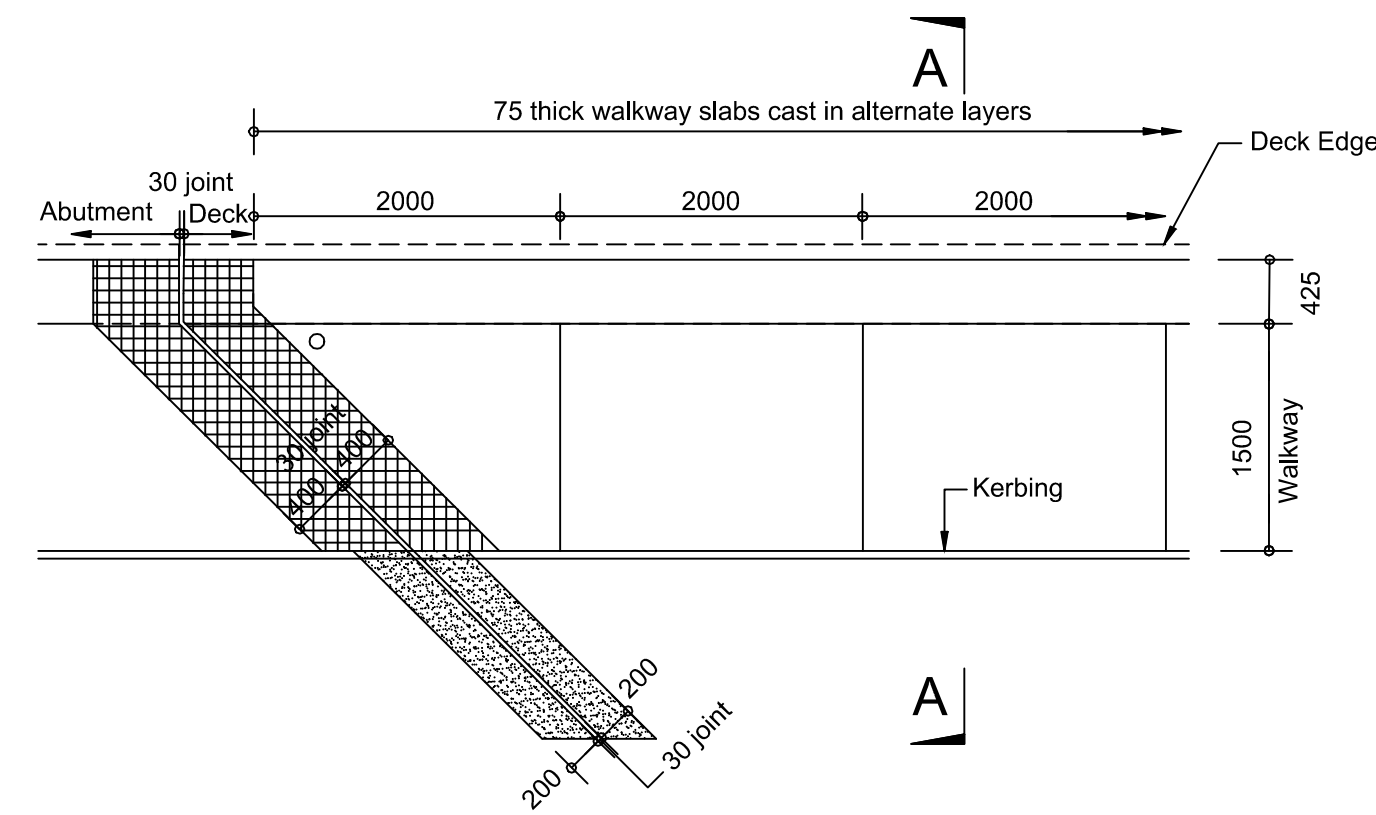
DETAIL OF uPVC SERVICE DUCTS ACROSS JOINTS
1:20



SECTION A-A
1:20



THORMAJOINT DETAIL
1:5

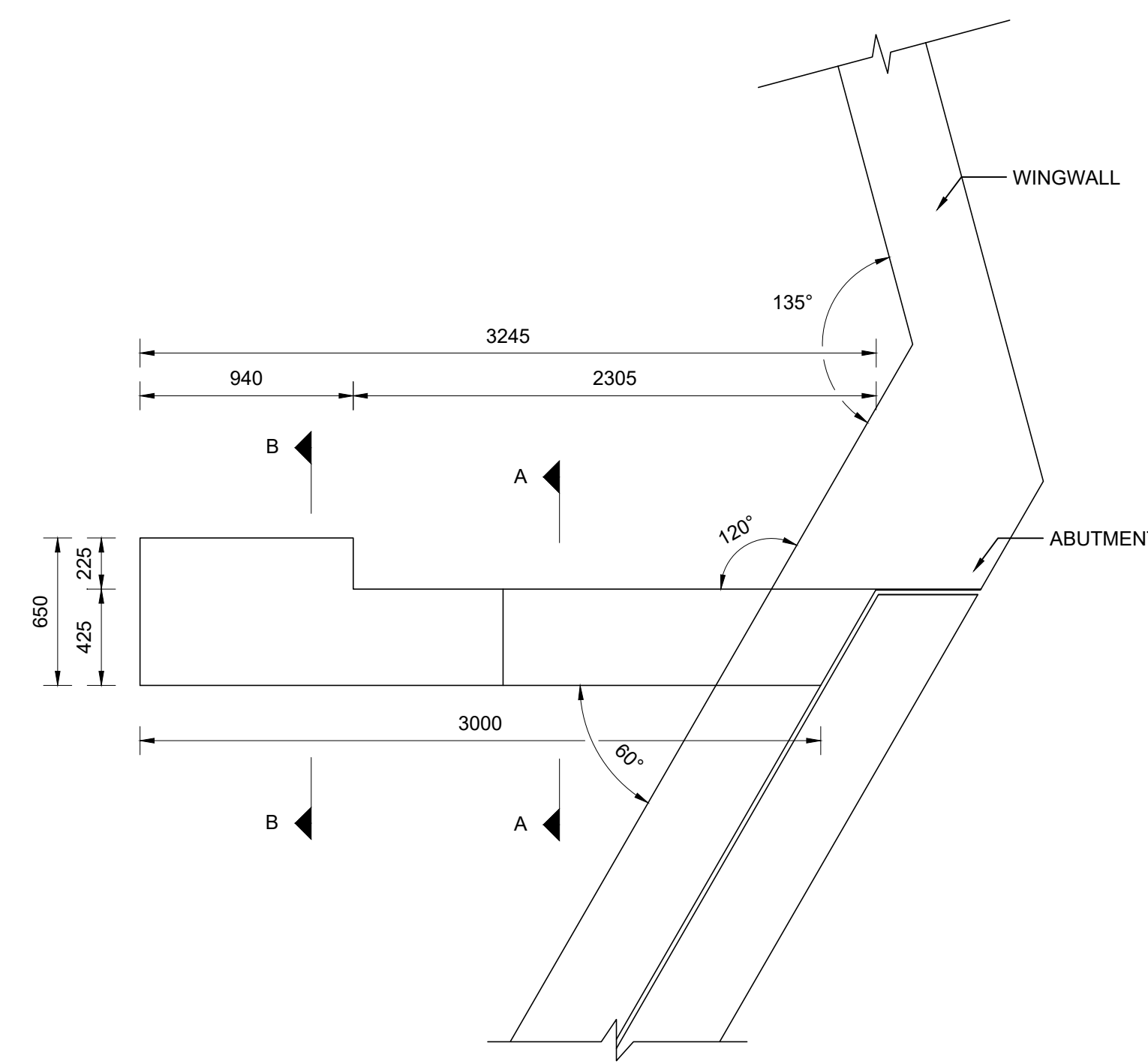


- Denotes 200 wide x 110 recesses either side of 30 wide expansion. Recesses filled up with Class 40/13 nosing concrete after installation of the joint.
- Denotes 200 wide x 110 recesses either side of 30 wide expansion. Recesses filled up with Class 40/13 nosing concrete after installation of the joint.

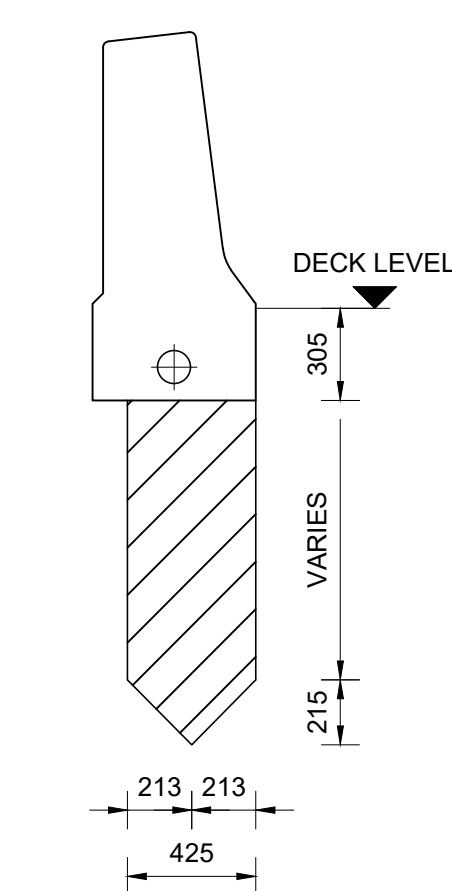
TYPICAL PLAN SHOWING JOINT RECESSES AND WALKWAY DETAILS
1:50

WALKWAY NOTES

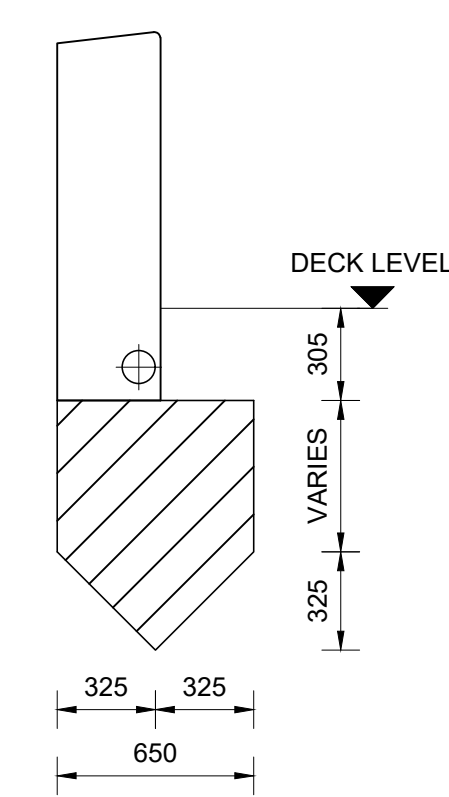
- Class 20/19 concrete to walkway.
- Class U2 surface finish to walkway slabs.
- Class F2 surface finish to sides and ends of footway slabs.
- Walkway expansion joint 10mm wide shall be provided at 12 metre centres. The joint filler shall be closed cell expanded polyethylene and the joint shall be sealed using an approved silicone sealant system of depth 10mm and installed with proprietary backing chord (Dow Corning 888 system or similar and approved, in accordance with the COLTO Standard Specifications for Road and Bridge Works for State Road and Bridge Works for State Road Authorities subclause 6603 (a) (ii) for silicone sealants).
- Mesh reinforcement Ref. 193 to walkway slabs.



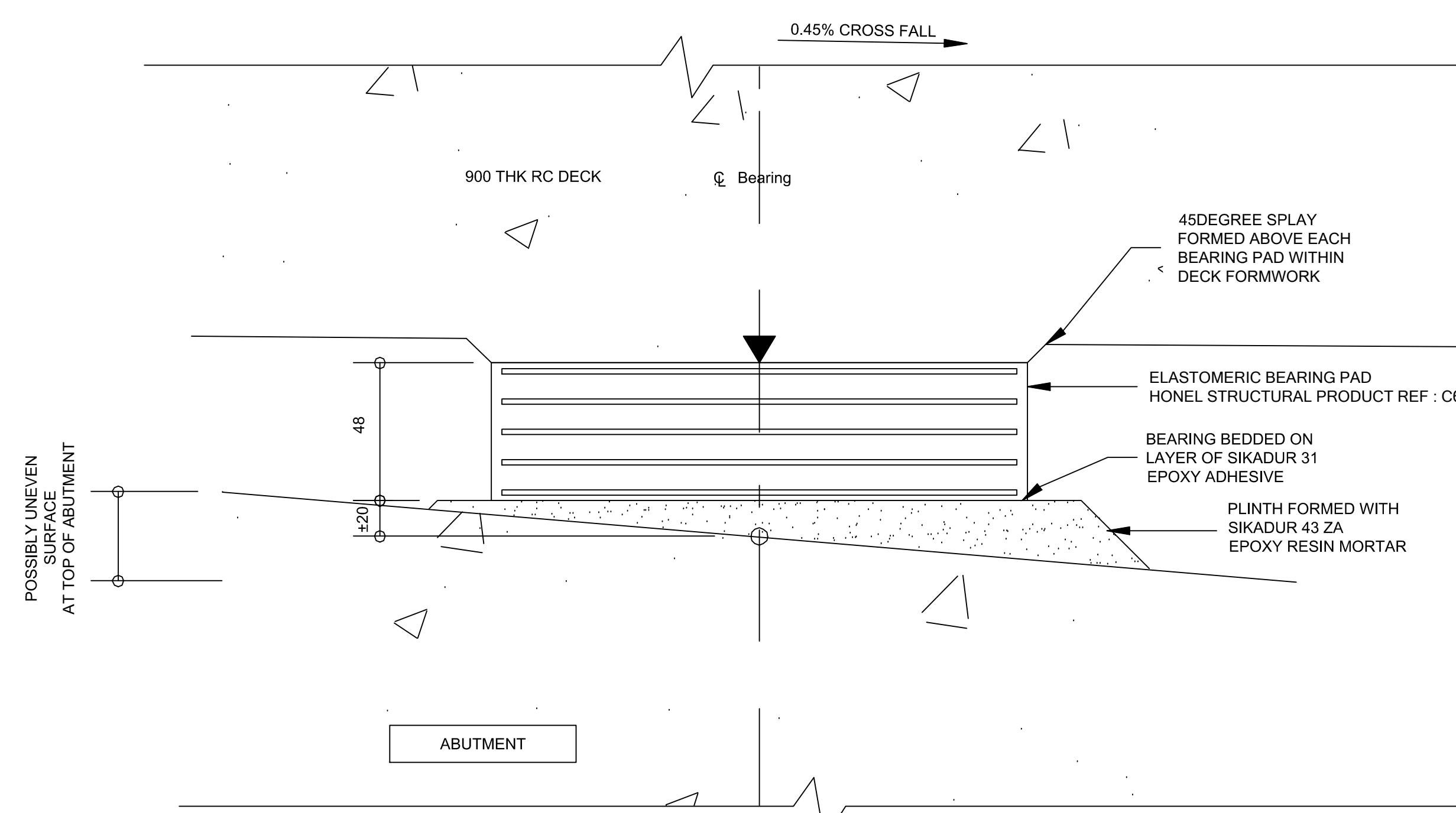
EAR WALL PLAN
SCALE (1:25)



SECTION A - A
SCALE (1:25)

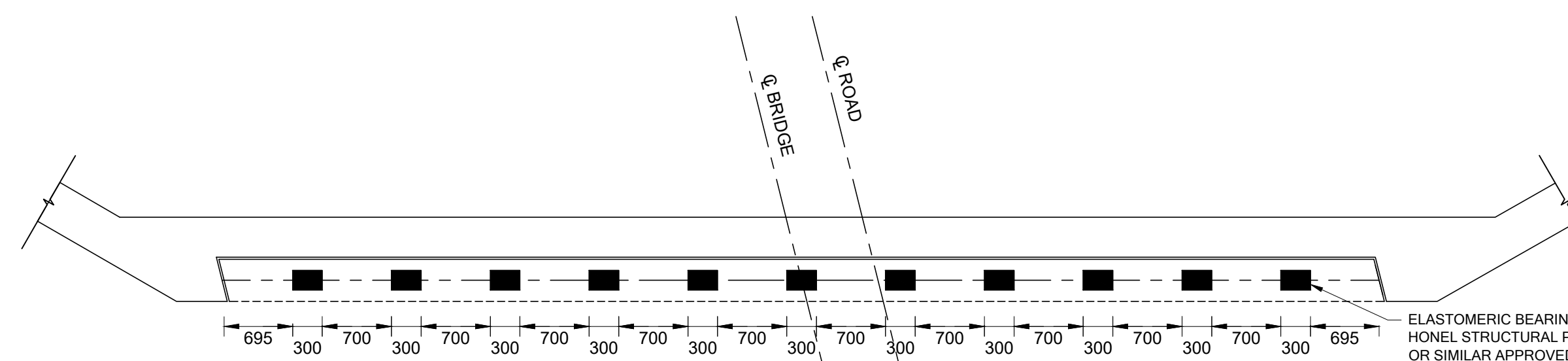


SECTION B - B
SCALE (1:25)

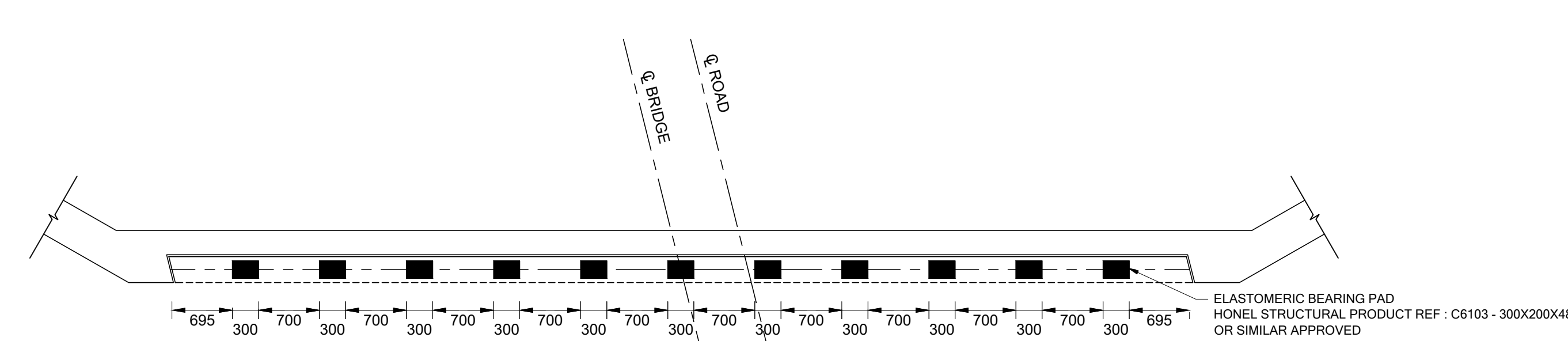


BEARING INSTALLATION ELEVATIONAL VIEW
N.T.S.

NOTES:
BEARING SHALL BE BEDDED TRULY HORIZONTAL TO THE CORRECT LEVELS ON A LAYER OF SIKADUR 31 EPOXY ADHESIVE ON PLINTHS FORMED WITH SIKADUR 43 ZA EPOXY RESIN MORTAR AS PER SUPPLIER'S INSTRUCTIONS.



PLAN VIEW OF LEFT ABUTMENT
SCALE 1:50



PLAN VIEW OF RIGHT ABUTMENT
SCALE 1:50

FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____
Supervising Authority: _____

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PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Designed by :



Signature: _____ Date: _____

Chief Engineer : Structures

Head: Transport

DISTRICT ROAD 489 ESTCOURT - CORNFIELDS

WGS 84: -28.855067° Latitude
29.849889° Longitude

QABANGO (CORNFIELDS) RIVER BRIDGE

MISCELLANEOUS DETAILS

Staked km distance
km 7.170

Sheet : 08
of : 08

Scale

Plan No :

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4107/08

4107/08