

- ### GENERAL NOTES
- All levels, dimensions and setting out details to be verified by the Consultant, Site Engineer and Contractors on site prior to construction.
 - All existing drainage culverts are to be inspected to be as specified by the Engineer on site.
 - Culvert inverts are to be decided by Engineer on site unless shown otherwise. Min cover = 600mm, min. slope = 2%.
 - Pipe culverts are to be laid in accordance with S2001 with headwalls as per S2002, S2003 or S2005. Min dia=450mm for minor access roads and access belt-mouths, and min dia= 600mm for major road drainage.
 - Box culverts < 1.8m high are to be constructed in accordance with S2004 or S20047. Box culverts > 1.8m high are to be appropriately designed by a Structural Engineer in accordance with K2NDOT standards.
 - For erosion control Reno mattresses are recommended at culvert outlets, to be confirmed by Engineer on site.
 - All gabions protection works are to be as per drawings issued and to be confirmed on site by Engineer prior to construction. All gabions are to be founded onto the natural ground.
 - Earth beams are to be constructed at culvert inlets to direct storm water into culverts where necessary, to be confirmed by Engineer on site.
 - Road bolters are to be placed across the invert of drains as recommended for every 2m vertical drop, to be confirmed by Engineer on site.
 - Grassed/Concrete lined V-drains as per SD 0601/2 & 4 are recommended for shallow cuttings of depth less than 5m measured at a point from edge of carriageway. Concrete lined 1000 V-drains as per SD 0601/2 are recommended for cuttings of depth greater than 5m measured at a point from edge of carriageway.
 - Subsoil drains as per SD 0501 are to be installed with 1000 V-drains or where high water tables are encountered.
 - Kerb and channel drains as per SD 0701 are to be provided where all embankments exceed 3m in height, also used in cuts here.
 - Where surface runoff is toward the road, catch water banks are to be provided to divert storm water to other cross drainage structures, to be confirmed by Engineer on site.
 - The positions of accesses are to be determined in consultation with the local community. Daylighting requirements are to be decided by the Engineer on site. Concrete wedges as per SD 0303 may be used in place of subsoil drains where accesses serving single residential properties.
 - Guardrails are to be installed in accordance with SD1101 & SD1102 where all embankments exceed 5m in height or where hazardous obstructions cannot be removed.
 - Existing road signs, services and marking affected by construction are to be removed/indicated where necessary, to be confirmed by Engineer on site.
 - Underground service crossings and markers are to be in accordance with S1001.3.
 - All new road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
 - All work is to be carried out in accordance with COYO (2020) Specifications for Road and Bridge Works for State Road Authorities.
 - All survey and setting out data provided is based on WGS 84.
 - New files and exposed cuttings are to be top-soiled and vegetated immediately after construction to prevent erosion, to be confirmed by Engineer on site.

NOTATION

BCC	Beginning of circular curve
ECC	End of circular curve
PI	Point of Intersection
R	Radius of circular curve
Δ	Deflection angle of circular curve
L	Length of circular curve
T	Length of tangent

- ### NOTE:
- FOR THE STANDARD DETAILS THAT ARE USED IN THIS DESIGN PLEASE SEE STANDARD DETAIL LAYOUT.
 - FOR DETAILS ON ROADING EYE SPACING AND CHUTE DETAILS OF SUBSOIL DRAIN PLEASE SEE STANDARD DETAIL LAYOUT.
 - DUE TO SPACE CONSTRAINTS ON THIS LAYOUT, SIGHT DISTANCES FOR ALL ACCESSES ARE LOCATED ON THE LONGITUDINAL SECTIONS.

SETTING OUT CONTROL POINTS (WGS 84)

POINT NAME	X CO-ORDINATE	Y CO-ORDINATE	ELEVATION
W90	36649.750	-3098207.590	731.821
W91	36727.100	-3098034.000	721.191
W92	36706.800	-3097707.000	705.756
BPA	36800.695	-3097609.688	694.880
BPB	36814.432	-3097571.318	694.410
BPC	36831.733	-3097577.719	694.910
BPD	36817.895	-3097613.487	695.330
Q2A	36814.949	-3097525.805	698.780
W93	36642.000	-3097490.000	707.747
Q2B	36496.915	-3097439.932	717.965
W94	36327.800	-3097204.000	753.733

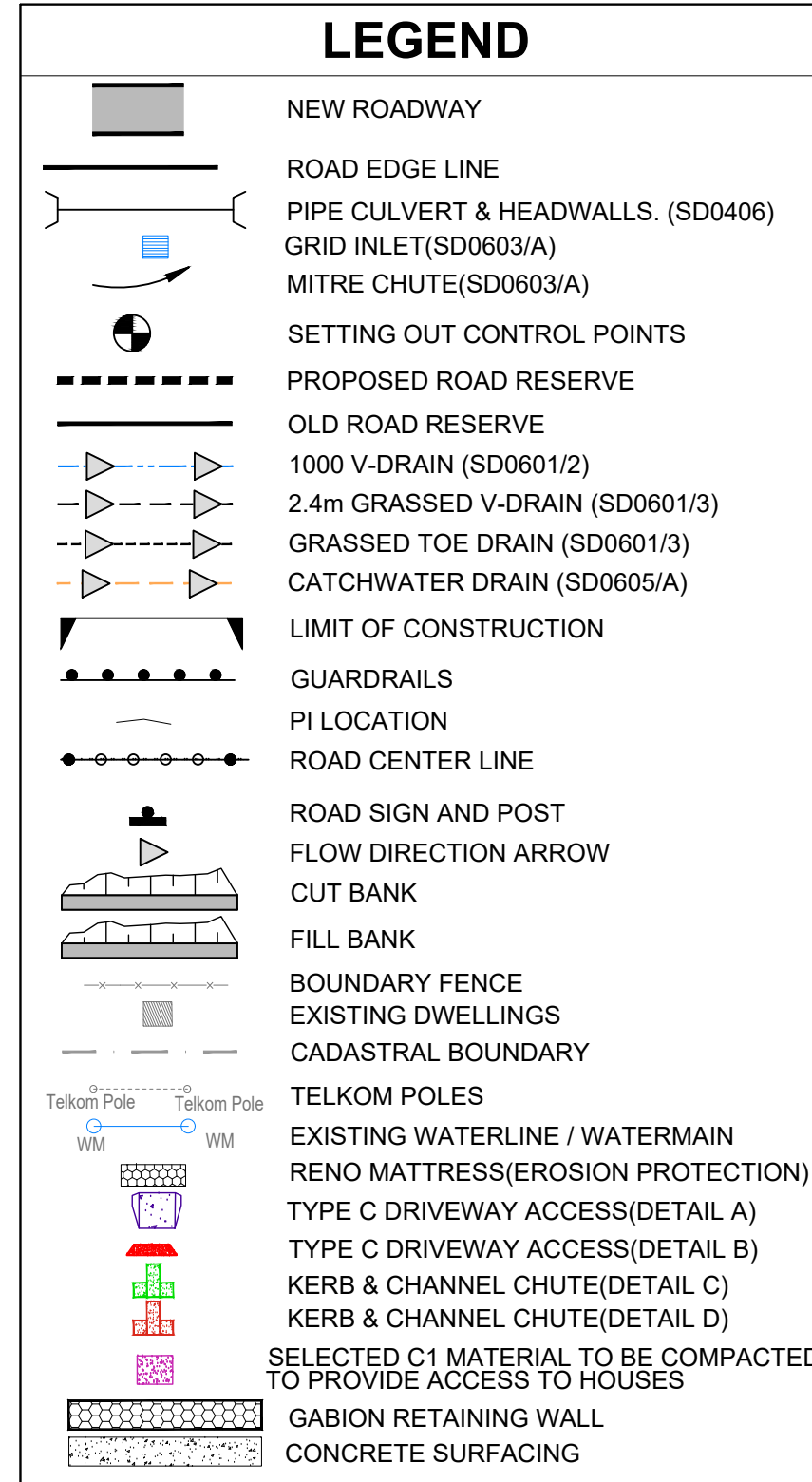
SIGN POSTING SCHEDULE TO SD 1302/A D1724

LEFT HAND SIDE			RIGHT HAND SIDE		
CH	SIGN	SIZE (mm)	CH	SIGN	SIZE (mm)
0	R1	900.00	0	R1	900.00
25	R1	900.00	0	W203+W104	900x900
70	W202	900.00	180	R1	900.00
96	W108	900.00	180	W203	900.00
180	R201-40	900.00	240	W107	900.00
320	W108	900.00	420	W402	600X150
380	W203	900.00	440	W401	600X150
400	GLS-1	940X640	455	W402	600X150
420	W401	600X150	485	W401	600X150
440	W402	600X150	500	GLS-1	940X640
454	W401	600X150	520	R1	900.00
485	W402	600X150	620	R201-40	900.00
500	W203	900.00	680	W107	900.00
620	R201-60	900.00	740	W202	900.00
660	W202	900.00	1000	R201-60	900.00
890	W102	900.00	1046	R1	900.00
1000	R201-60	900.00	1100	W203	900.00
1056	R1	900.00			

BOREHOLE POSITION

POINTS	X	Y
BH1	-3097573.991	36757.363
BH2	-3097583.317	36762.646
BH3	-3097594.755	36770.284

- ### ADDITIONAL NOTES:
- All pipes to be cleared of obstructions (debris, vegetation and litter).
 - All Existing/newly constructed services e.g. Water main/pipes, are to be proved prior to construction.
 - All Existing services that cross the road alignment are to be sleeved as per KZN DOT Policy. All existing structures that are in the road reserve are to be relocated out of the road reserve as per KZN DOT Policy.
 - All service providers are to be contacted/issued notice of relocation of services prior to relocations.
 - Drainage provisions to protect dwellings from discharge. On site evaluation required.



ROAD CLASS

ROAD NO.	CLASS
D1724	U4b PROVINCIAL DISTRICT ROAD
P487	R4 MAIN PROVINCIAL ROAD

ROAD CLASS ACCORDING TO RCAM CLASSIFICATION TRH 26

CURVE SETTING OUT DATA (WGS 84)

Position	Chainage	Y Co-ordinate	X Co-ordinate	Radius (m)	Curve	Tangent Length (m)	Deflection
START (D1724)	0+000	-36741.93	3098022.98	0.00	0	0.00	0°00'00"
BCC1	0+017	-36731.16	3098014.81				
PI1	0+037	-36713.39	3098001.33	50.00	1	22.30	48°04'59"
ECC1	0+058	-36711.56	3097997.10				
BCC2	0+094	-36708.60	3097943.35				
PI2	0+118	-36706.61	3097919.27	120.00	2	24.16	22°45'47"
ECC2	0+142	-36714.09	3097896.30				
BCC3	0+159	-36781.28	3097689.97				
PI3	0+402	-36795.16	3097647.33	110.00	3	44.84	44°21'11"
ECC3	0+444	-36775.28	3097607.14				
BCC4	0+514	-36744.52	3097544.96				
PI4	0+560	-36722.83	3097501.10	110.00	4	48.93	47°57'27"
ECC4	0+606	-36675.74	3097487.84				
BCC5	0+698	-36586.56	3097462.73				
PI5	0+876	-36399.29	3097410.00	350.00	5	194.55	58°08'07"
ECC5	1+053	-36345.22	3097223.12				

ROAD MARKING SCHEDULE D1724

FROM CH	TO CH	LENGTH (m)	TYPE
0	4984	4984.00	WM4.1
0	20	20.00	RM1
7	-	-	RTM1
25	-	-	RTM1
35	140	105.00	RM1
20	35	15.00	WM3
140	155	15.00	WM3
155	200	45.00	RM1
200	360	160.00	WM3
220	-	-	WM8.3
260	-	-	WM8.3
300	-	-	WM8.3
340	-	-	WM8.3
360	520	160.00	RM1
520	535	15.00	WM3
525	-	-	RTM1
535	606	71.00	RM1
606	2480	1874.00	WM3
640	-	-	WM8.3
680	-	-	WM8.3
720	-	-	WM8.3
1051	-	-	RTM1
1051	-	-	RTM1

DESIGN SPEED SCHEDULE FOR D1724

FROM CH	TO CH	LENGTH (m)	DESIGN SPEED	OPERATING SPEED
0	520	520.00	40KM/H	40KM/H
621	3580	2959.00	60KM/H	60KM/H

EXPROPRIATION POINTS (WGS 31°)

POINT	X-CO-ORDINATE	Y-CO-ORDINATE
L1	3097912.128	-36700.127
L2	3097656.654	-36776.918
L3	3097635.297	-36773.195
L4	3097604.607	-36759.359
L5	3097574.669	-36744.055
L6	3097524.491	-36711.795
L7	3097497.740	-36672.471
L8	3097482.794	-36620.811
L9	3097436.054	-36498.761
L10	3097367.481	-36414.506

SIDE DRAIN SCHEDULE FOR D1724

LEFT HAND SIDE				RIGHT HAND SIDE			
FROM CH	TO CH	LENGTH (m)	TYPE	FROM CH	TO CH	LENGTH (m)	TYPE
260	310	50.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	160	370	210.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)
330	370	40.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	510	1130	620.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)
500	900	400.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)				
1020	1580	560.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)				

GUARDRAIL SCHEDULE TO SD 1101/A

LEFT HAND SIDE			RIGHT HAND SIDE		
FROM CH	TO CH	LENGTH (m)	FROM CH	TO CH	LENGTH (m)
360	456	96.00	360	456	96.00
486	516	30.00	486	516	30.00

NOTE: ENTREATMENT OF GUARDRAILS TO BE FLARED

MITRE DRAIN SCHEDULE TO SD 0603/1 (D1724)

LEFT HAND SIDE		RIGHT HAND SIDE	
No.	Ch Position	No.	Ch Position
1	310	1	370
2	370	2	510
3	500	3	-
4	1020	4	-

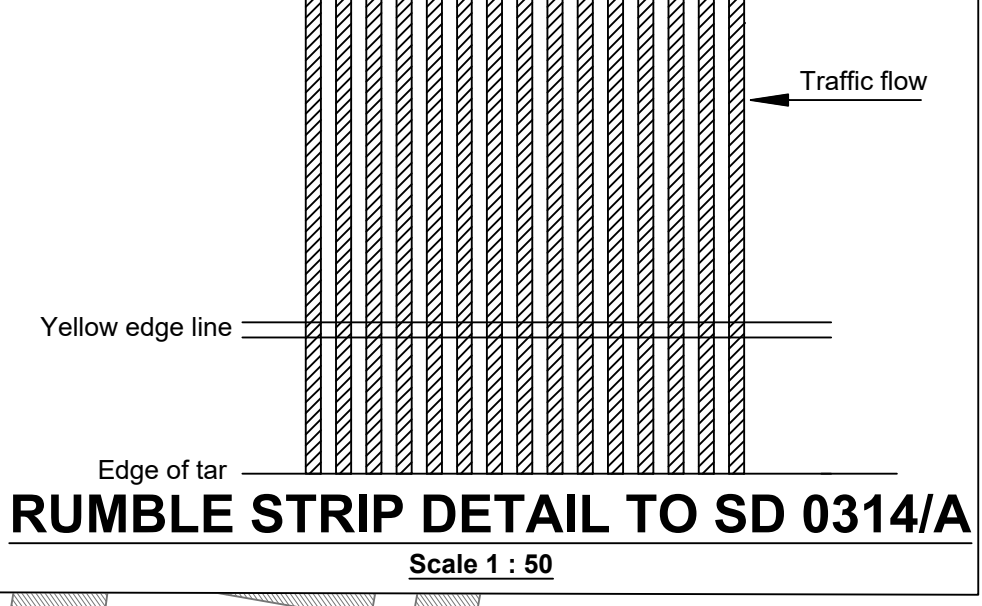
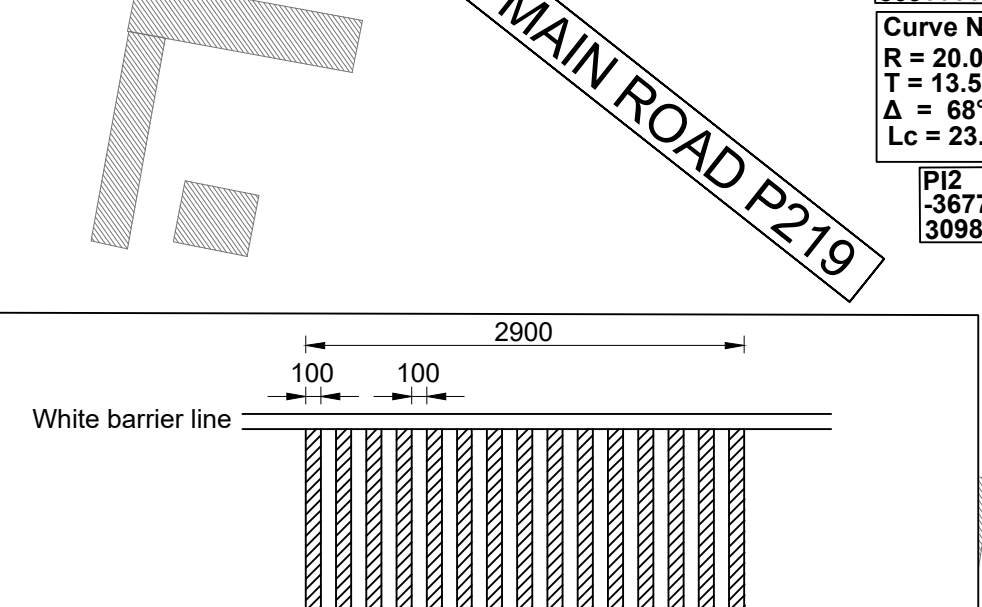
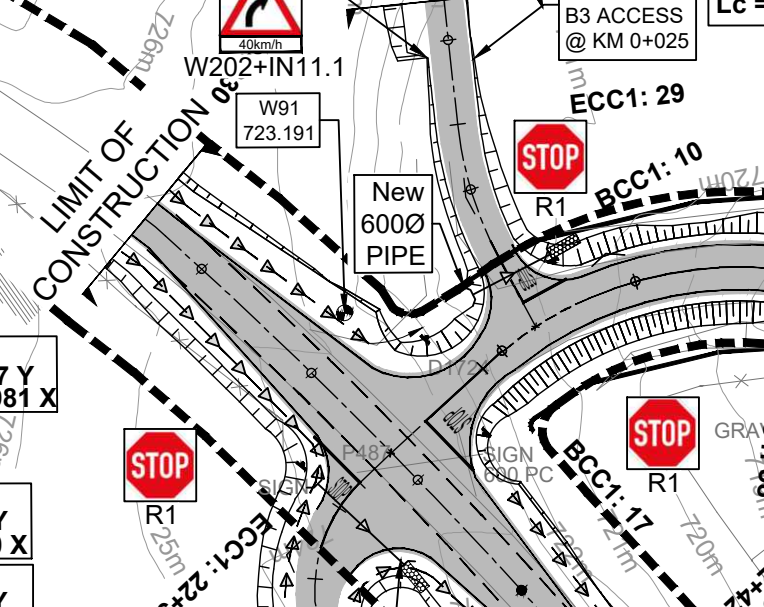
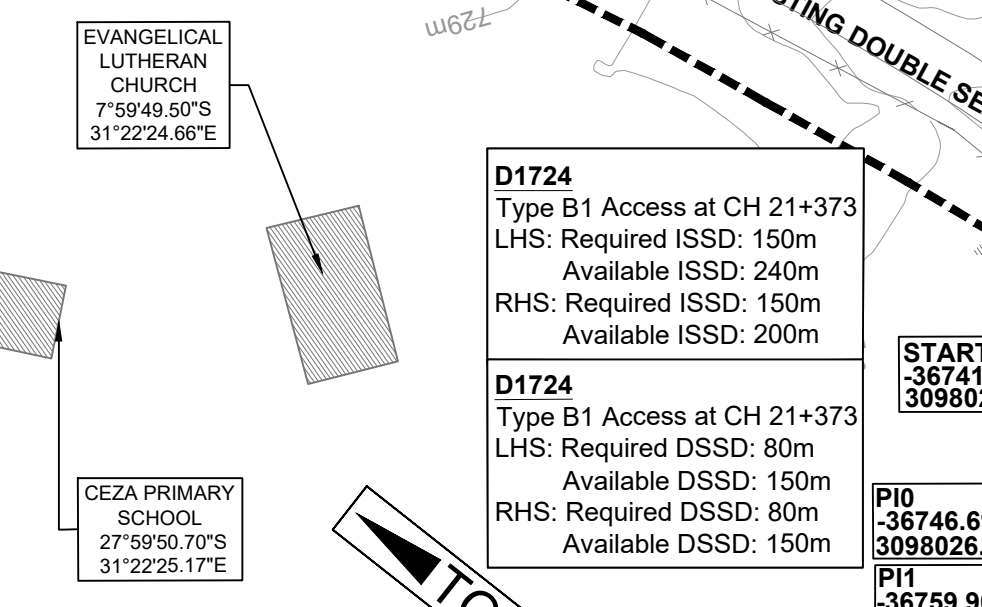
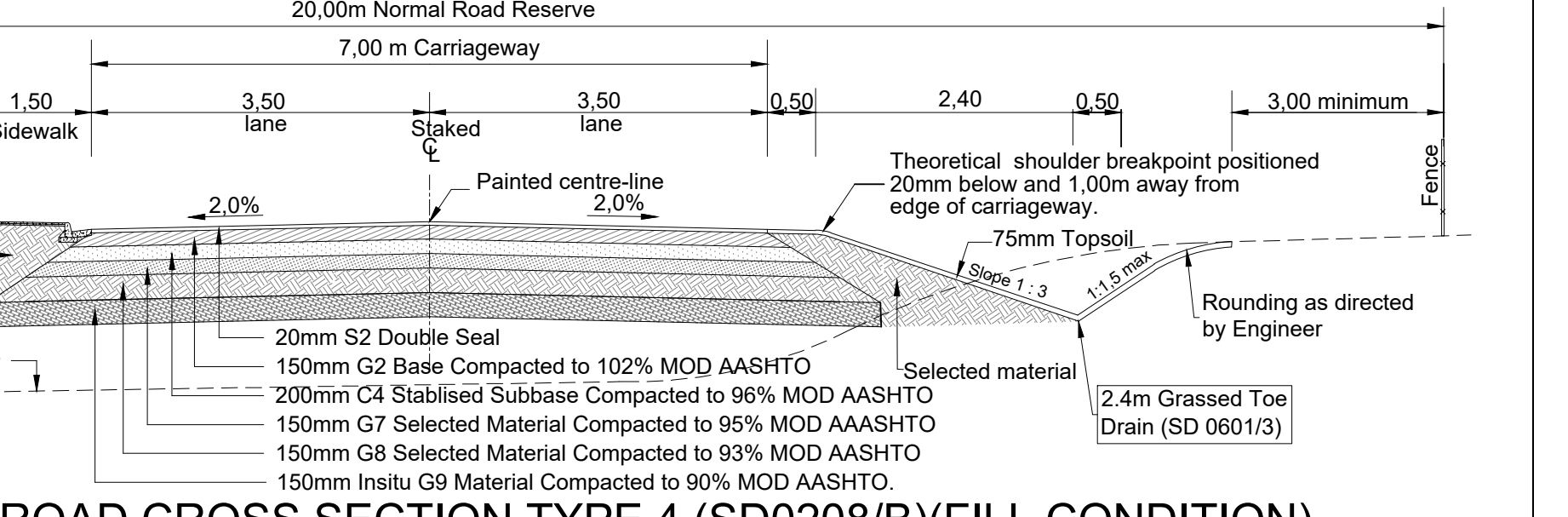
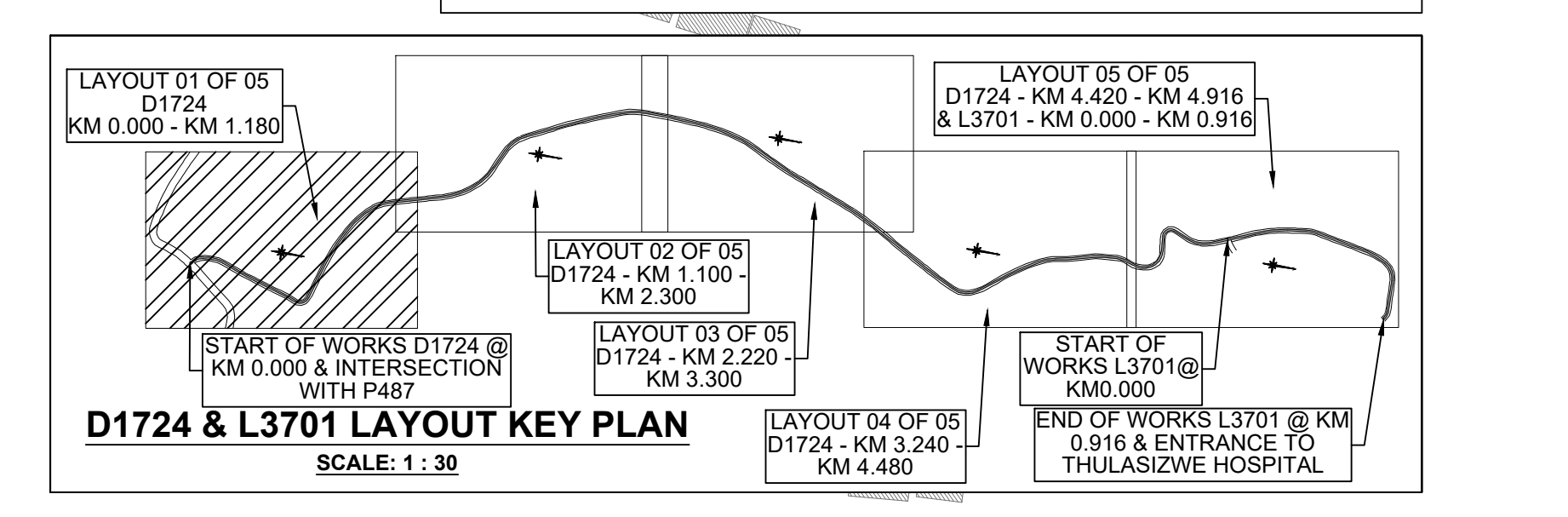
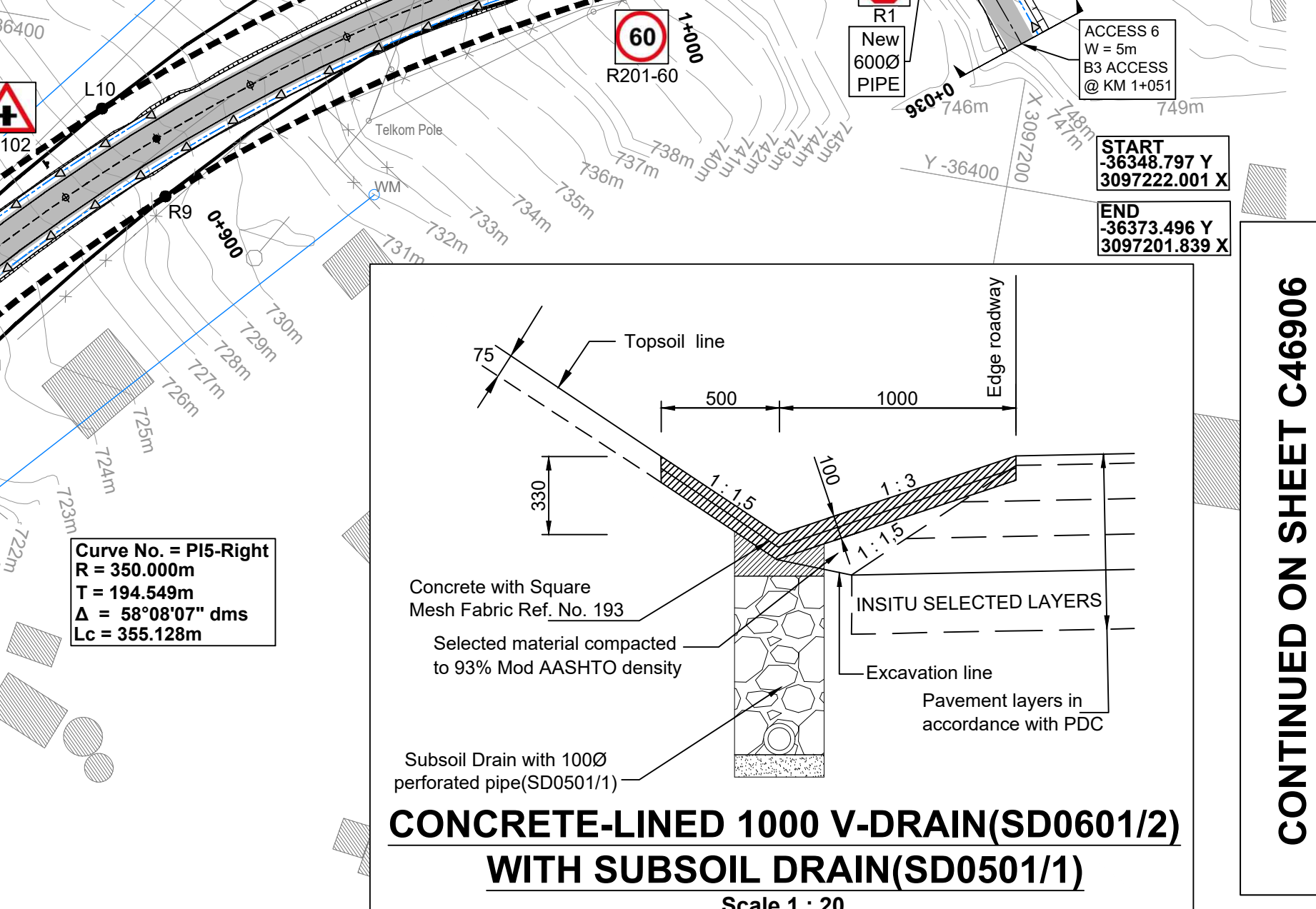
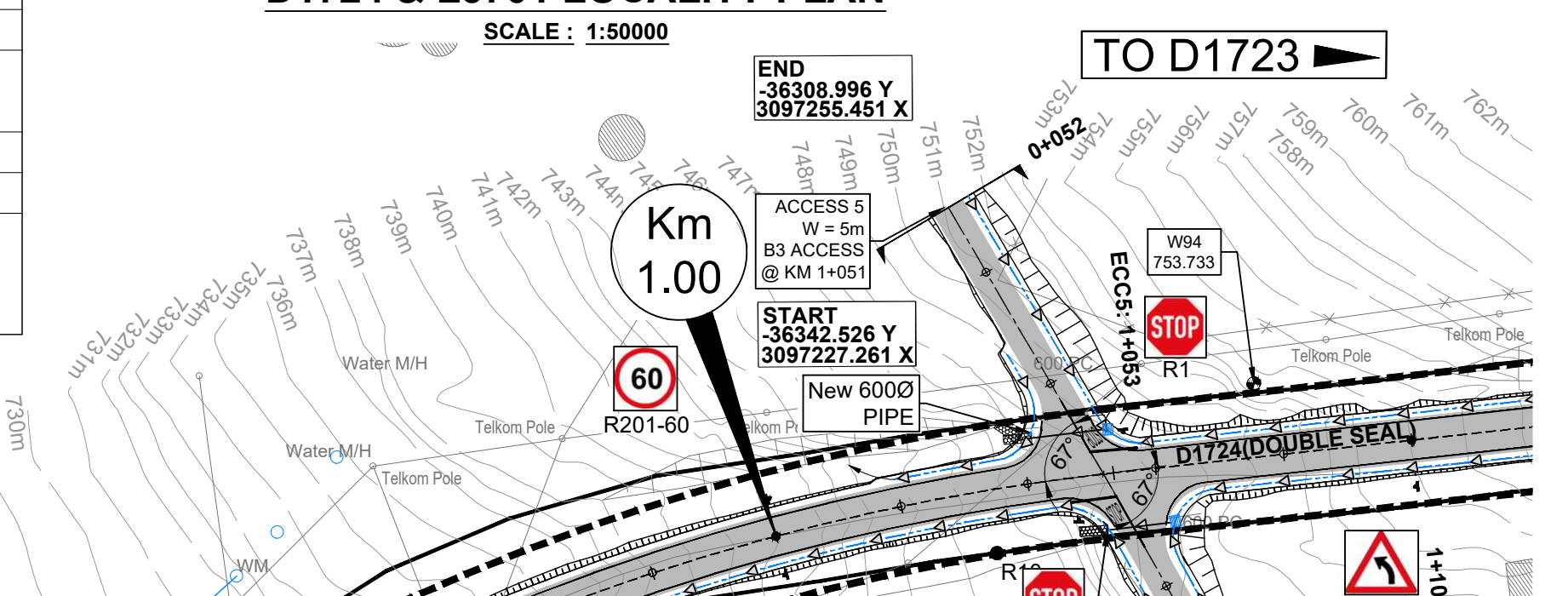
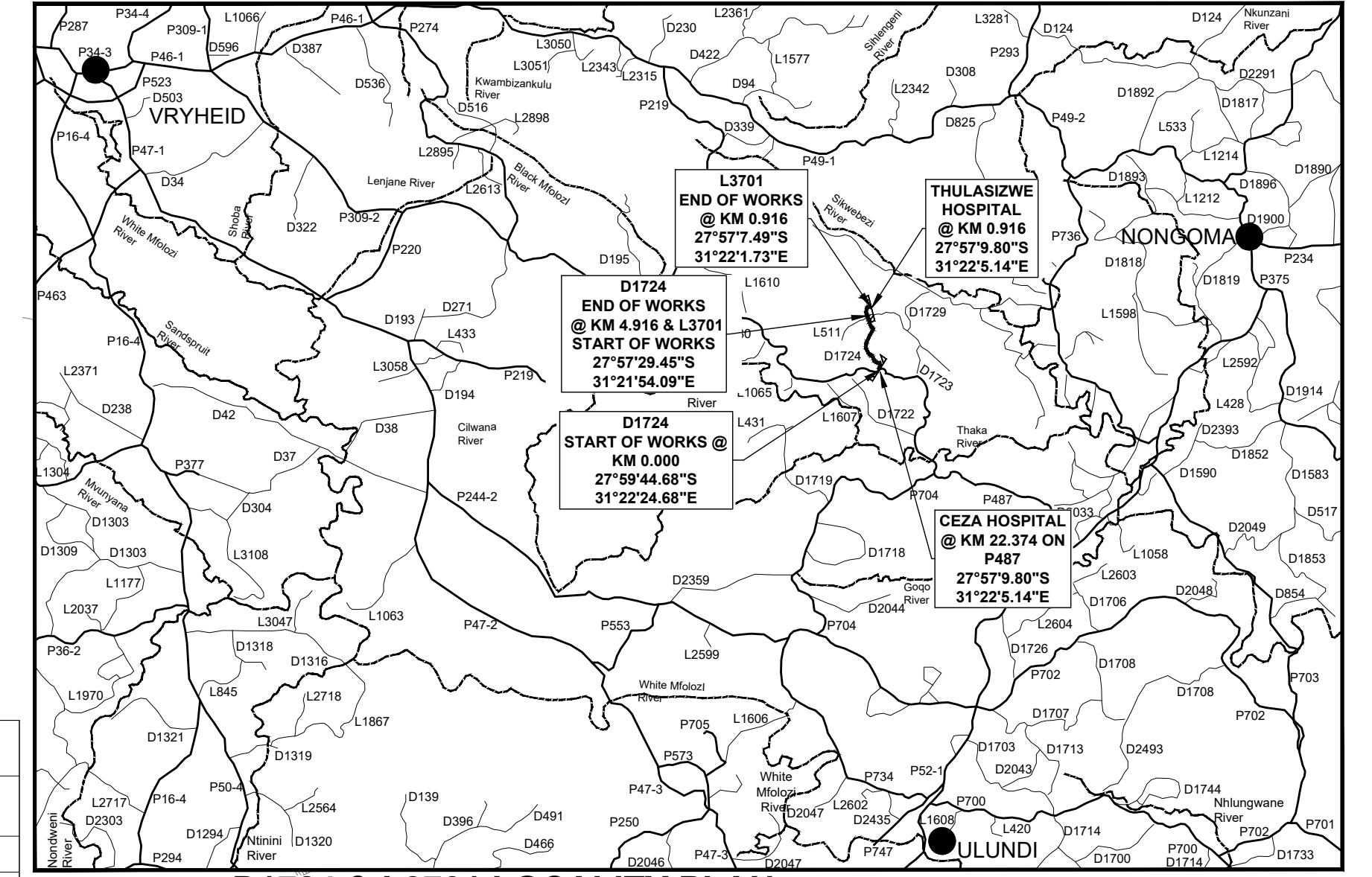
PIPE CROSSING SCHEDULE

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Stew Detail (E)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m³/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment
0	600X450	100D	PORTAL	C	8.45	180°	2.00%	722.53	722.36	0.13	0.48	48.28%	1.13	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN
25	600	100D	PC	C	10.60	180°	5.86%	721.82	721.20	0.29	1.03	64.48%	2.44	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN
145	600X450	100D	PORTAL	C	11.37	180°	2.00%	710.82	710.59	0.36	1.28	69.97%	3.04	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN
162	900	100D	PC	C	16.04	275°	5.15%	709.13	708.30	0.88	1.39	65.05%	7.38	EXISTING PIPE LAID IN PREVIOUS CONTRACT TO BE UPGRADED
1051	600	100D	PC	C	10.25	180°	6.30%	747.47	746.82	0.07	0.26	38.18%	0.60	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN
1051	600	100D	GI	C	12.89	180°	5.29%	748.19	747.51	0.11	0.38	44.51%	0.91	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN

NOTE: ALL EXISTING PIPES ARE TO BE CLEARED OF ALL DEBRIS/BLOCKAGES DURING CONSTRUCTION
PIPE CULVERTS TO BE CONSTRUCTED AS PER S2006
PORTAL CULVERTS TO BE CONSTRUCTED AS PER S20047

GABION RETAINING WALL SCHEDULE TO SD 0901/A

LEFT HAND SIDE			RIGHT HAND SIDE				
FROM CH	TO CH	LENGTH (m)	MAX. HEIGHT (m)	FROM CH	TO CH	LENGTH (m)	MAX. HEIGHT (m)
390	415	25.00	3m	-	-	-	-
415	425	10.00	4m	-	-	-	-
440	455	15.00	4m	-	-	-	-
487	497	10.00	4m	-	-	-	-
510	590	80.00	4m	-	-	-	-



AS BUILT

REV	NO.	DATE	DESCRIPTION	CHECKED	SIGNED
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.		
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.		
REV 1	17/08/21	ISSUED FOR APPROVAL	P.N.		
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.		

NOTES:

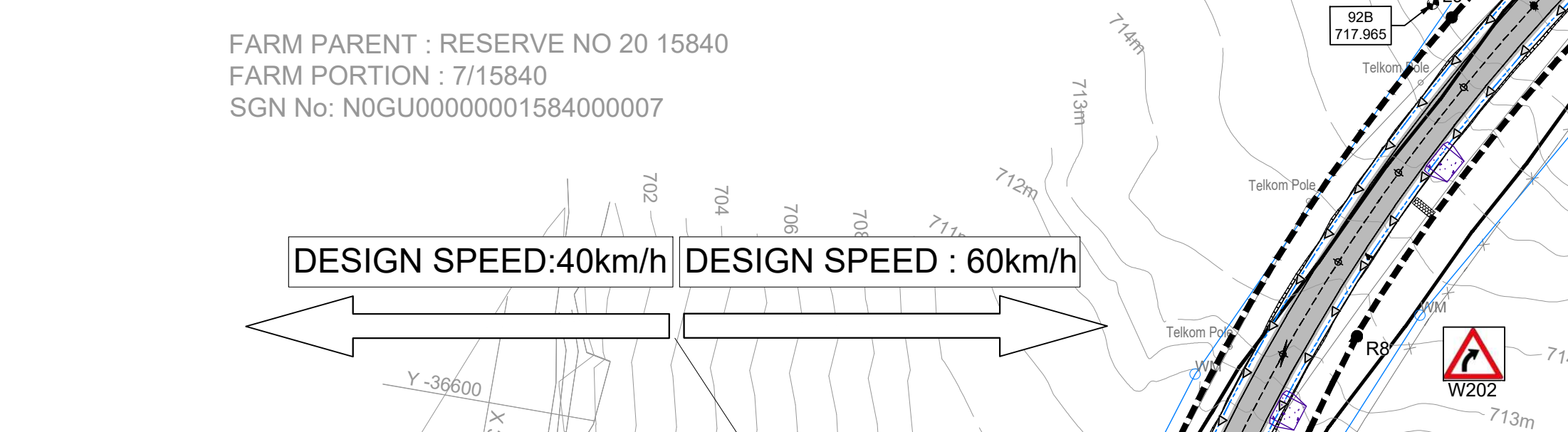
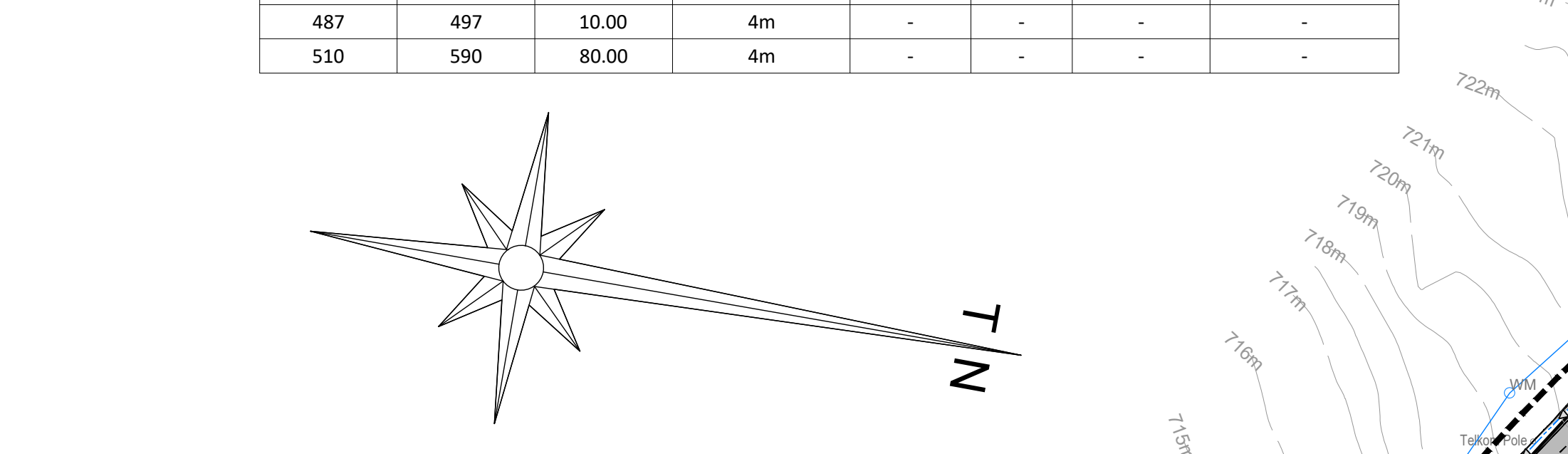
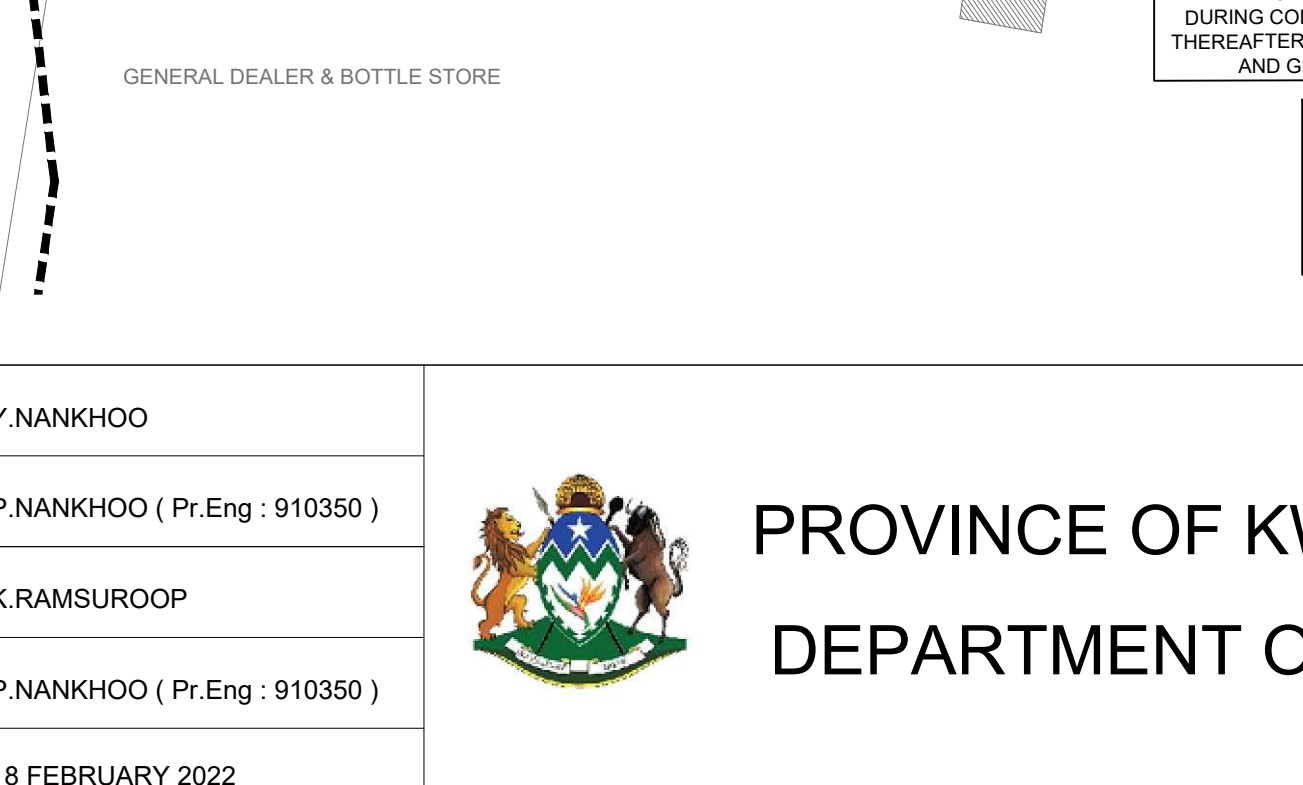
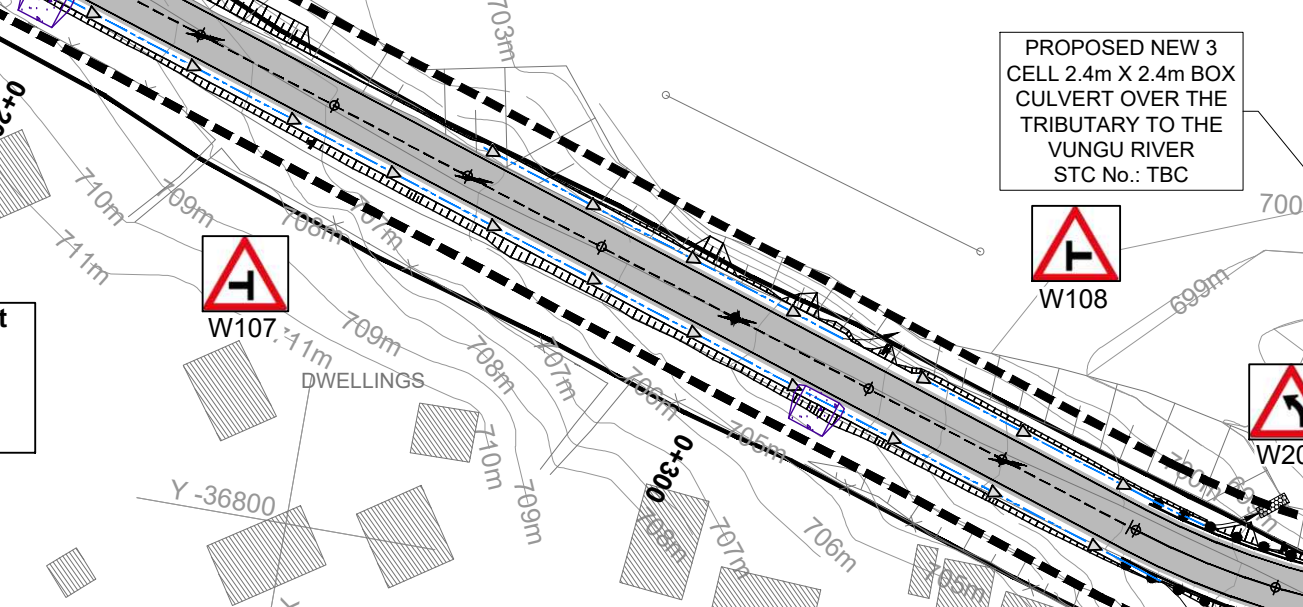
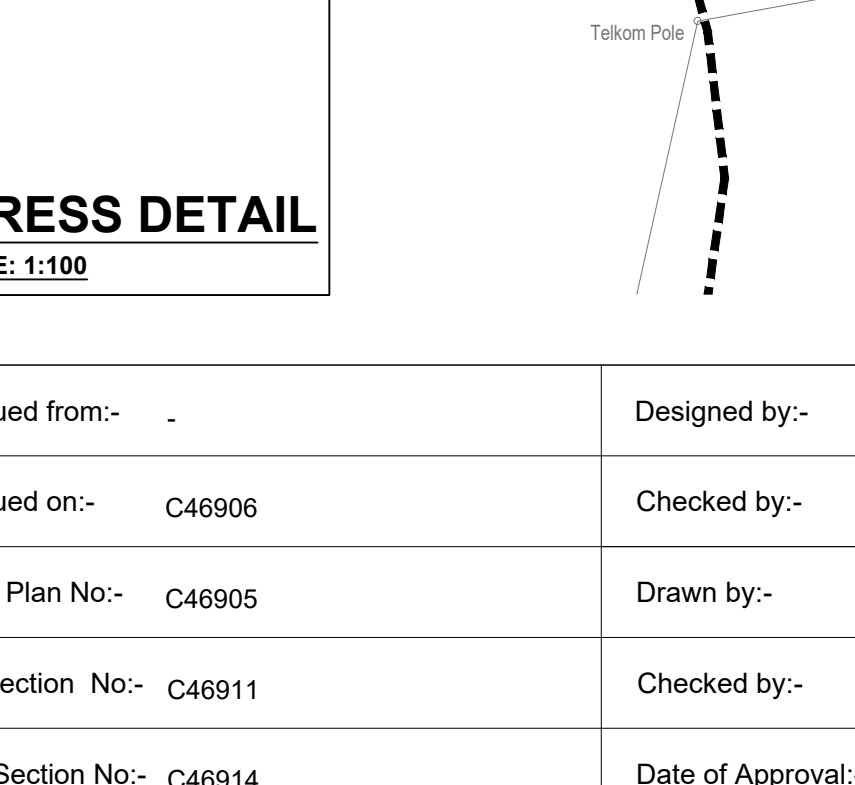
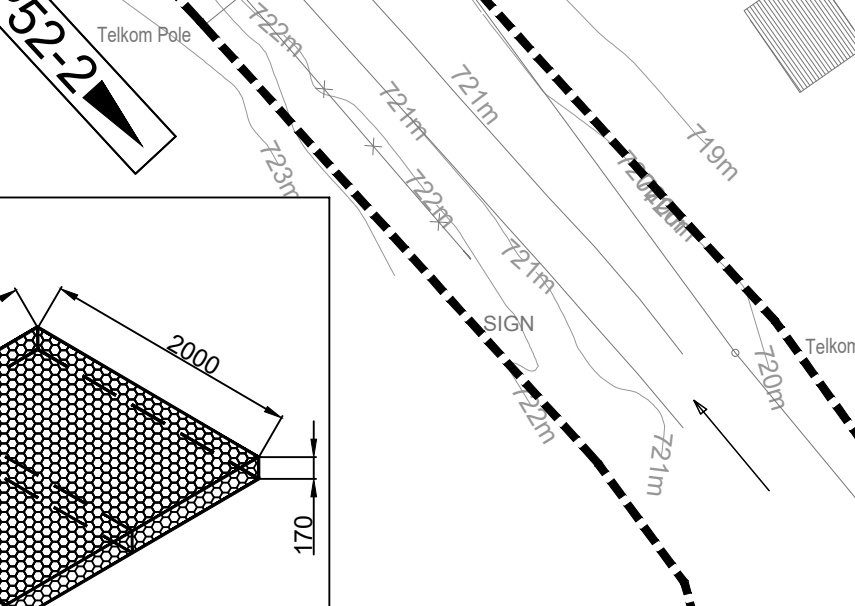
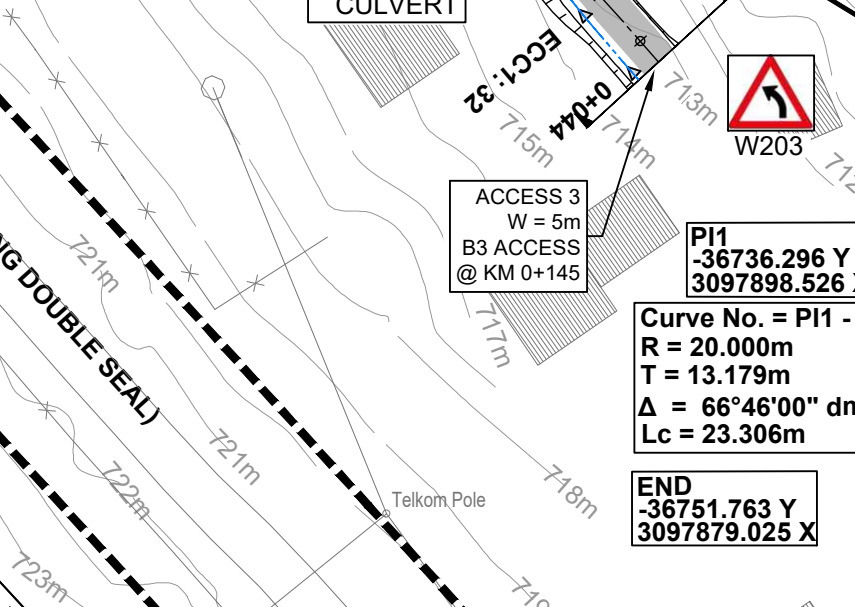
- All wire used in the making of Reno mattresses shall be galvanneal in accordance with the provisions SABS 1500:1993 or Class A heavy galvanneal mild steel wire.
- Lacing and bracing to be done in accordance with manufacturer's recommendations.
- Rock size to be between 100mm & 200mm.

Supervising Authority

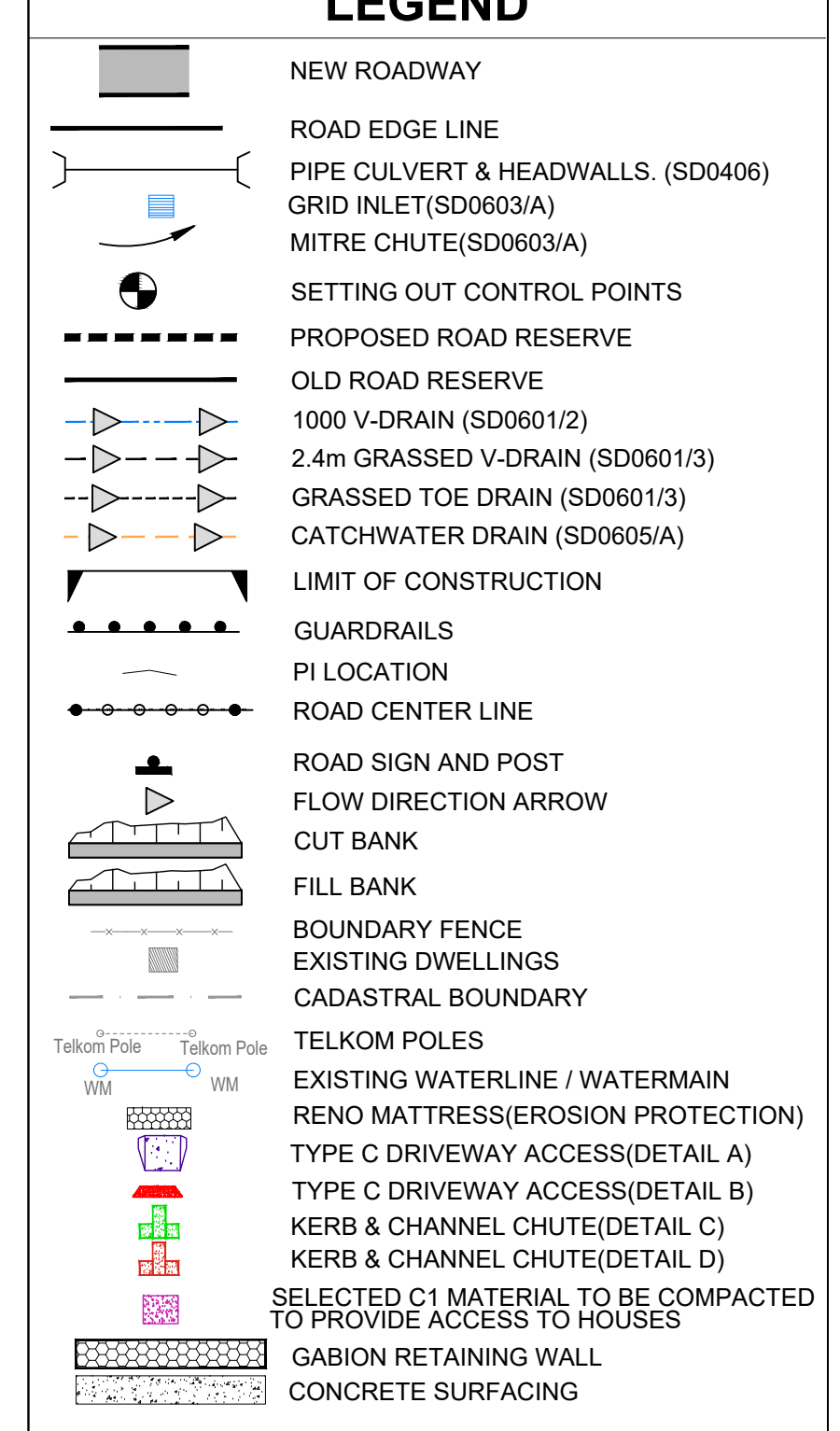
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Continued on:-	C46906	Checked by:-	P.NANKHOO (Pr.Eng: 910350)
Design Plan No:-	C46905	Drawn by:-	K.RAMSURROOP
Long Section No:-	C46911	Checked by:-	P.NANKHOO (Pr.Eng: 910350)
Cross Section No:-	C46914	Date of Approval:-	18 FEBRUARY 2022

Supervising Authority

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Design Plan No:-	C46905	Drawn by:-	K.RAMSURROOP
Long Section No:-	C46911	Checked by:-	P.NANKHOO (Pr.Eng: 910350)
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- ### GENERAL NOTES
- All levels, dimensions and setting out details to be verified by the Consultant, Site Engineer and Contractors on site prior to construction.
 - All existing drainage culverts are to be replaced by Engineer on site.
 - Culvert inverts are to be decided by Engineer on site unless shown otherwise. min cover = 600mm, min slope = 2%.
 - Pipe culverts are to be laid in accordance with SDO402, SDO403 & SDO406. Min dia=450mm for minor access roads and access belt-mouths, and min dia= 600mm for major road cross drainage.
 - Box culverts < 1.8m high are to be constructed in accordance with SDO404 or SDO407. Box culverts > 1.8m high are to be appropriately designed by a Structural Engineer in accordance with KZN DOT standards.
 - For erosion control Reno mattresses are recommended at culvert outlets, to be confirmed by Engineer on site.
 - All gabions protection works are to be as per drawings issued and to be confirmed on site by Engineer prior to construction. All gabions are to be founded onto the natural ground.
 - Earth beams are to be constructed at culvert inlets to direct storm water into culverts where necessary, to be confirmed by Engineer on site.
 - Road bolters are to be placed across the invert of drains susceptible to erosion for every 2m vertical drop, to be confirmed by Engineer on site.
 - Grassed/Concrete lined V-drains as per SD 0601/3 & 4 are recommended for shallow cutting of depth less than 5m measured at a point on edge of carriageway. Concrete lined 1000V-drains as per SD 0601/2 are recommended for shallow cutting of depth greater than 5m measured at a point on edge of carriageway.
 - Subsoil drains as per SD 0501 are to be installed with 1000V-drains or where high water tables are encountered.
 - Kerb and channel drains as per SD 0701 are to be provided where all embankments exceed 3m in height, also used in cuts here.
 - Where surface runoff is toward the road, catch-water banks are to be provided to divert storm water to roadside cross drainage structures, to be confirmed by Engineer on site.
 - The positions of accesses are to be determined in consultation with the local community. Daylighting requirements are to be decided by the Engineer on site. Concrete winged as per SD 0303 may be used in place of subsoil drains to provide access to drains where hazardous obstructions cannot be removed.
 - Guardrails are to be installed in accordance with SD 1011 & SD 1012 where all embankments exceed 3m in height or where hazardous obstructions cannot be removed.
 - Existing road signs, services and fencing affected by construction are to be removed/indicated where necessary, to be confirmed by Engineer on site.
 - Underground service crossings and markers are to be in accordance with SD 1001.3.
 - All new road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
 - All work is to be carried out in accordance with COTD (2020) Specifications for Road and Bridge Works for State Road Authorities.
 - All survey and setting out data provided is based on WGS 84.
 - New fills and exposed cuttings are to be top-soiled and vegetated immediately after construction to prevent erosion, to be confirmed by Engineer on site.



CURVE SETTING OUT DATA (WGS 84)

Position	Chainage	Y Co-ordinate	X Co-ordinate	Radius (m)	Curve	Tangent Length (m)	Deflection
ECC0	2-179	-35816.34	3096283.53				
BCC0	2-268	-35818.41	3096194.33				
PI0	2-289	-35818.89	3096173.62	1000.00	10	20.71	2°22'24"
ECC10	2-310	-35820.23	3096152.55				
PI1	2-411	-35826.8	3096051.2				
ECC11	2-444	-35828.89	3096019.2	500.00	11	32.39	7°24'45"
ECC11	2-476	-35831.13	3095987.42				
ECC12	2-512	-35842.03	3095952.87				
PI2	2-577	-35854.77	3095827.48	500.00	12	66.07	15°03'21"
ECC12	2-643	-35863.91	3095828.18				
BCC13	2-762	-35936.26	3095721.67				
PI3	2-795	-35950.88	3095691.91	750.00	13	33.16	5°03'46"
ECC13	2-828	-35962.82	3095660.98				
BCC14	3-095	-36059.14	3095411.49				
PI4	3-117	-36066.89	3095391.4	500.00	14	21.53	4°55'56"
ECC14	3-138	-36076.35	3095372.89				
BCC15	3-163	-36087.17	3095349.89				
PI5	3-189	-36098.75	3095326.2	1000.00	15	26.37	3°01'17"
ECC15	3-216	-36111.56	3095303.14				

SETTING OUT CONTROL POINTS (WGS 84)

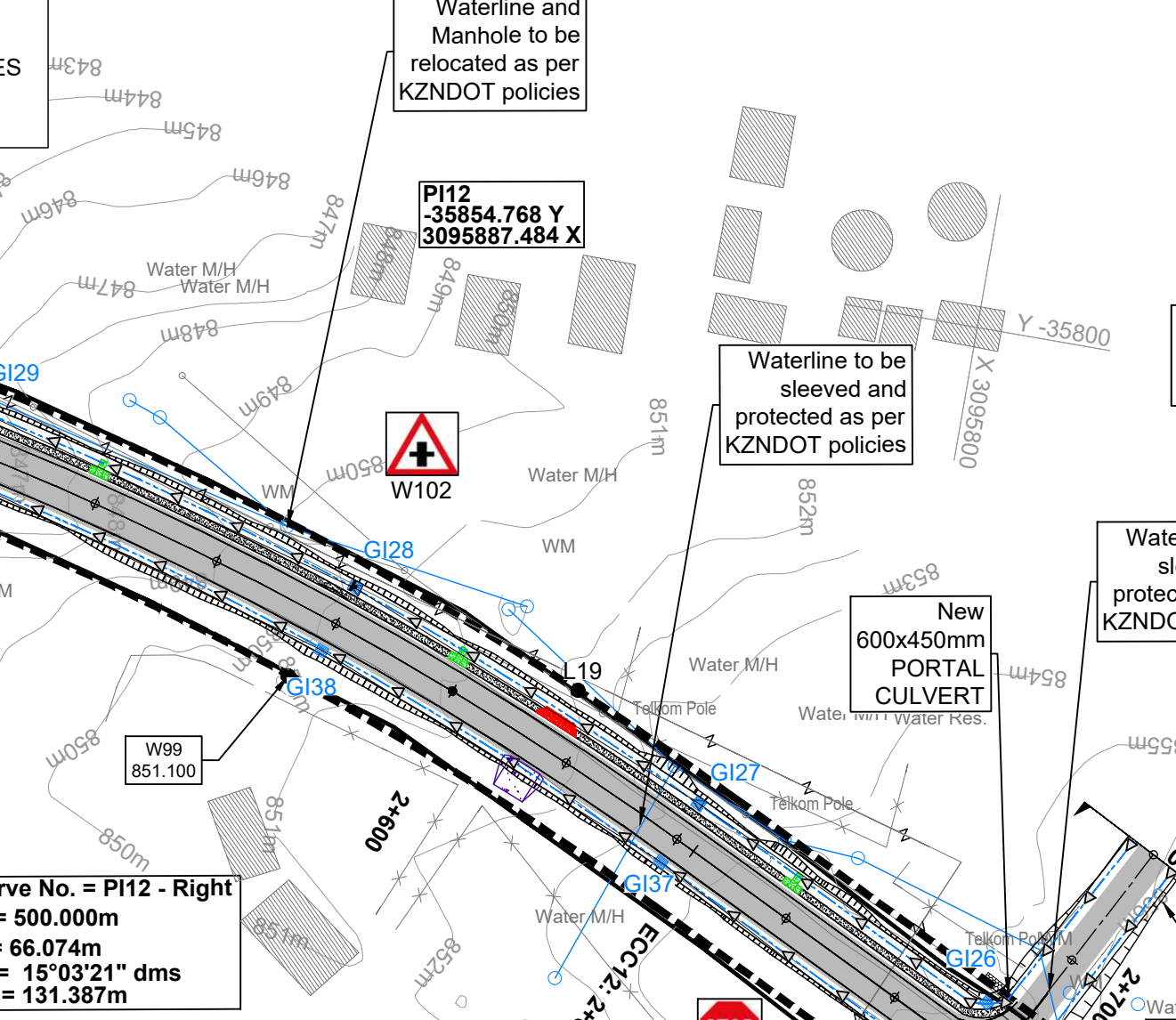
POINT NAME	Y CO-ORDINATE	X CO-ORDINATE	ELEVATION
97A	35811.983	-3096175.919	830.631
W98	35815.300	-3096103.000	835.663
W99	35868.600	-3095892.000	851.100
99A	35994.275	-3095499.209	860.361

ROAD CLASS

ROAD NO.	CLASS
D1724	U4b PROVINCIAL DISTRICT ROAD

ROAD CLASS ACCORDING TO RCAM CLASSIFICATION TRH 26

FARM PARENT : RESERVE NO 20 15840
 FARM PORTION : 7/15840
 SGN No: NOGU00000001584000007



SIDE DRAIN SCHEDULE FOR D1724

LEFT HAND SIDE				RIGHT HAND SIDE			
FROM CH	TO CH	LENGTH (m)	TYPE	FROM CH	TO CH	LENGTH (m)	TYPE
2340	2910	570.00	1000 V-DRAIN(SD0601/2)-SUBSOIL(SD0501/1)	2360	2730	370.00	1000 V-DRAIN(SD0601/2)-SUBSOIL(SD0501/1)
3150	3460	310.00	1000 V-DRAIN(SD0601/2)-SUBSOIL(SD0501/1)	3160	3700	540.00	1000 V-DRAIN(SD0601/2)-SUBSOIL(SD0501/1)

KERB AND CHANNEL SCHEDULE TO SD 0701/B FOR D1724

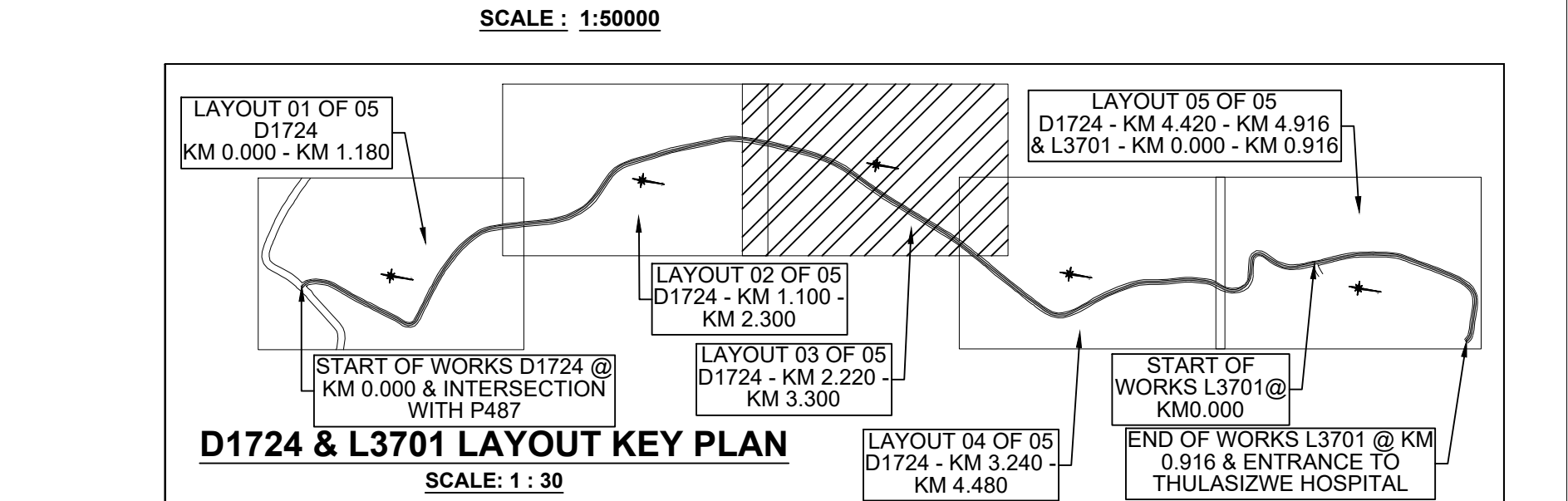
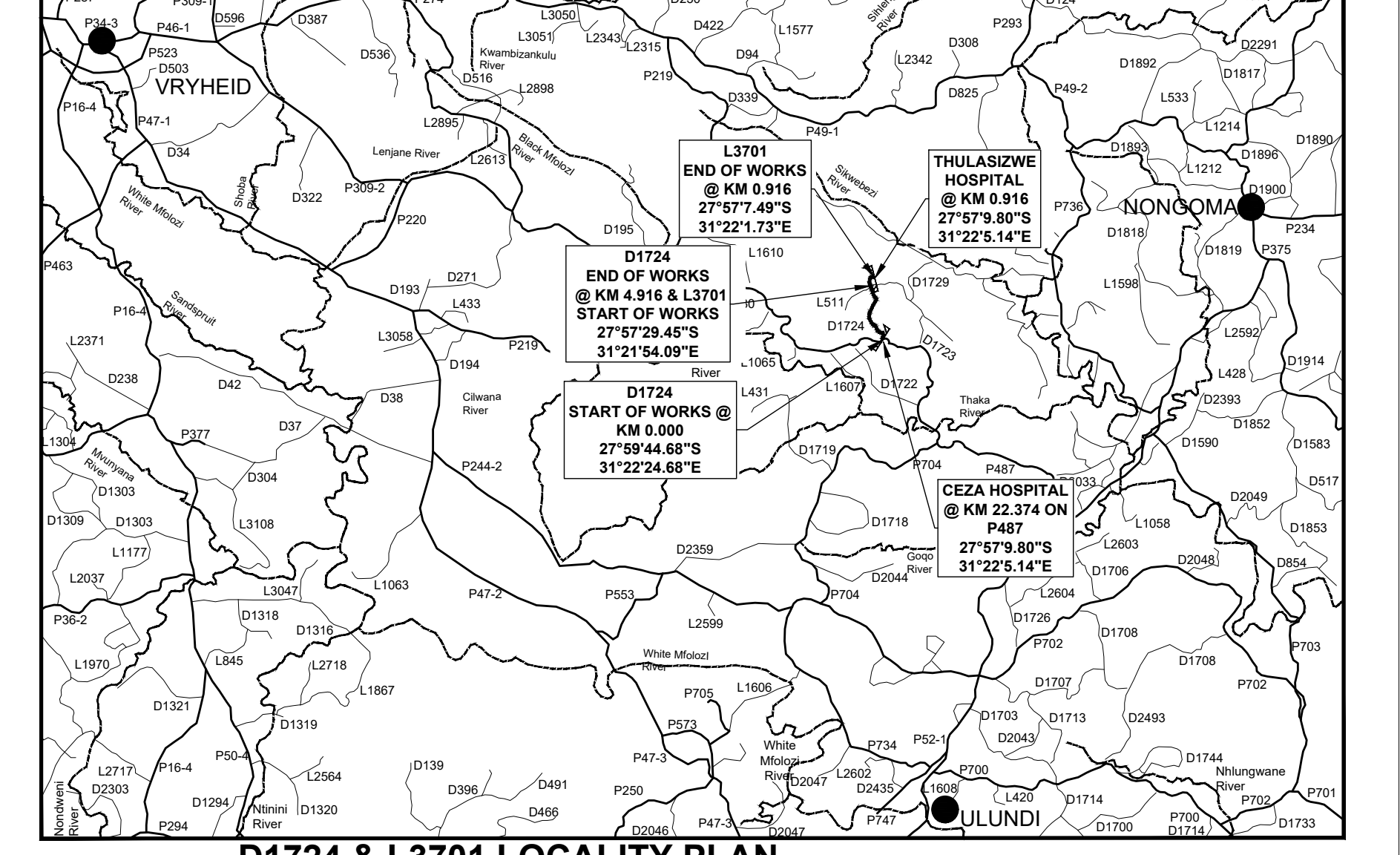
LEFT HAND SIDE			RIGHT HAND SIDE		
FROM CH	TO CH	LENGTH(m)	FROM CH	TO CH	LENGTH(m)
1900	4894	2994.00	-	-	-

SIGN POSTING SCHEDULE TO SD 1302/A D1724

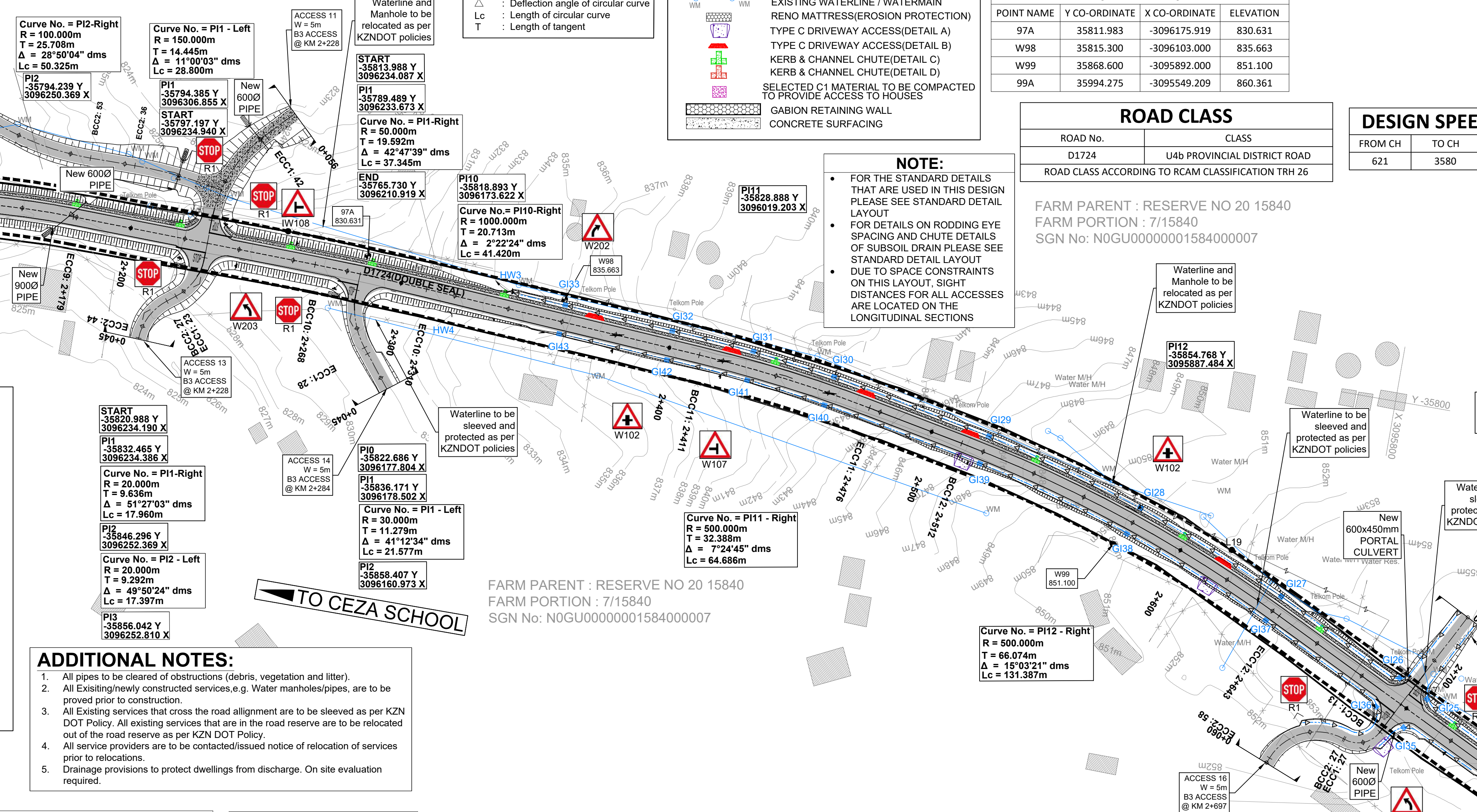
LEFT HAND SIDE			RIGHT HAND SIDE		
CH	SIGN	SIZE (mm)	CH	SIGN	SIZE (mm)
2234	R1	900.00	2219	R1	900.00
2260	W108	900.00	2240	W203	900.00
2340	W202	900.00	2276	R1	900.00
2580	W102	900.00	2380	W102	900.00
2703	R1	900.00	2420	W107	900.00
2900	W108	900.00	2690	R1	900.00
2940	R201-60	900.00	2720	W203	900.00
3040	W203	900.00	2780	W102	900.00
-	-	-	2940	R201-60	900.00
-	-	-	2975	R1	900.00
-	-	-	3060	W107	900.00

EXPROPRIATION POINTS (WGS 31°)

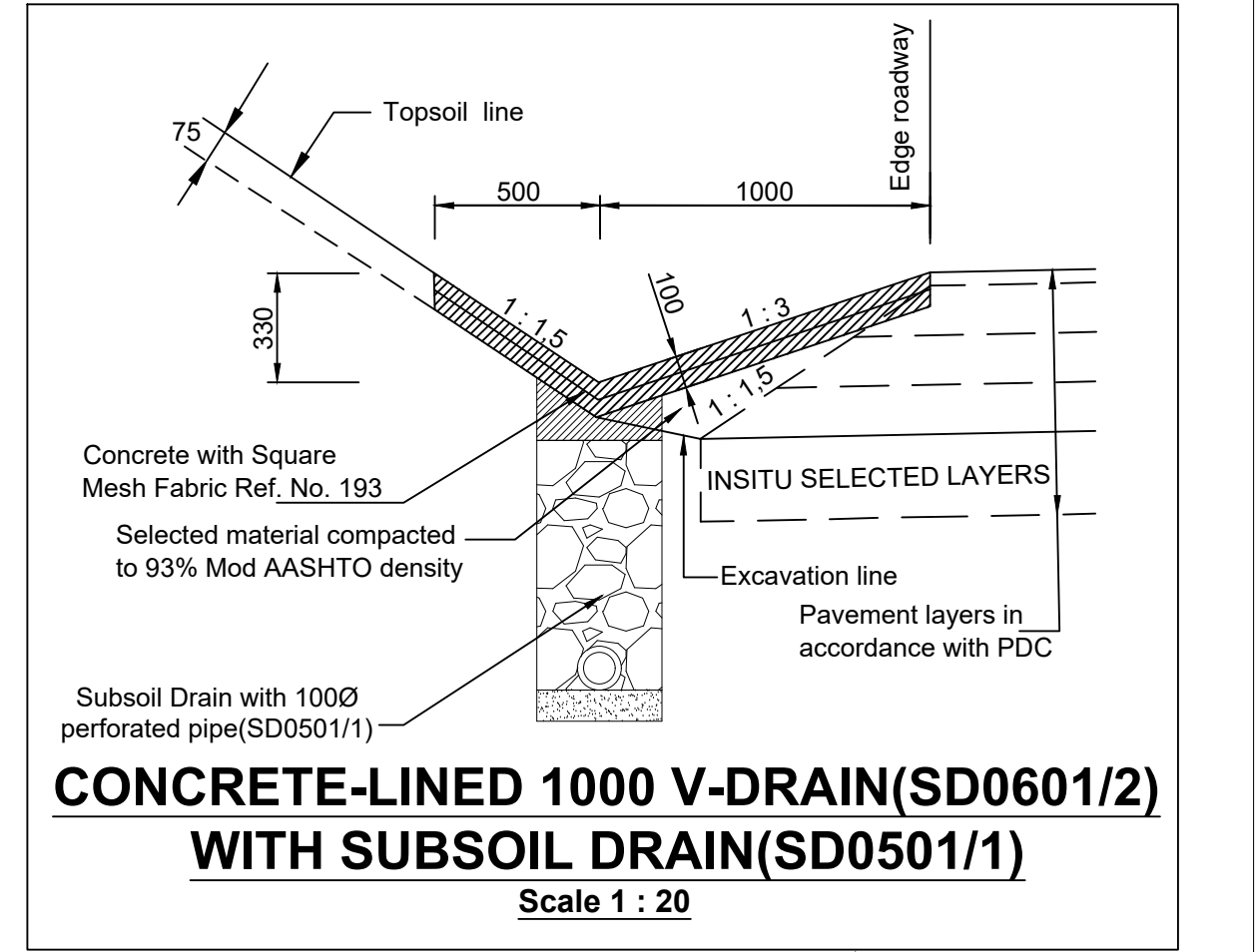
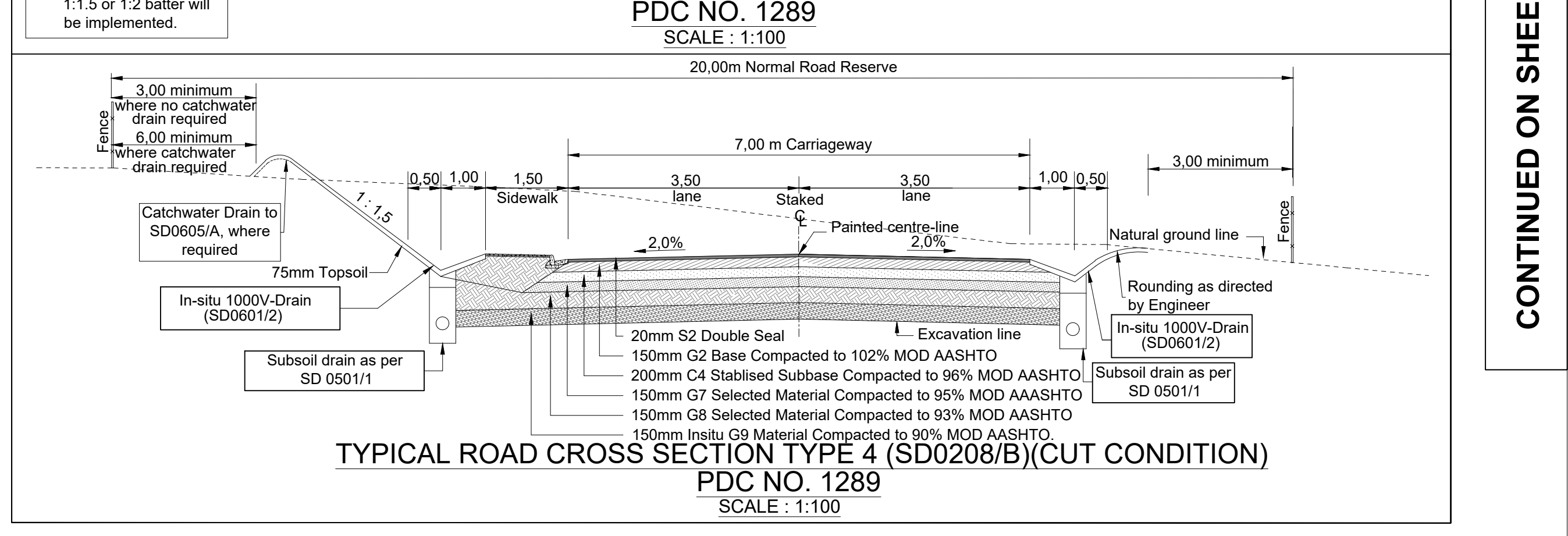
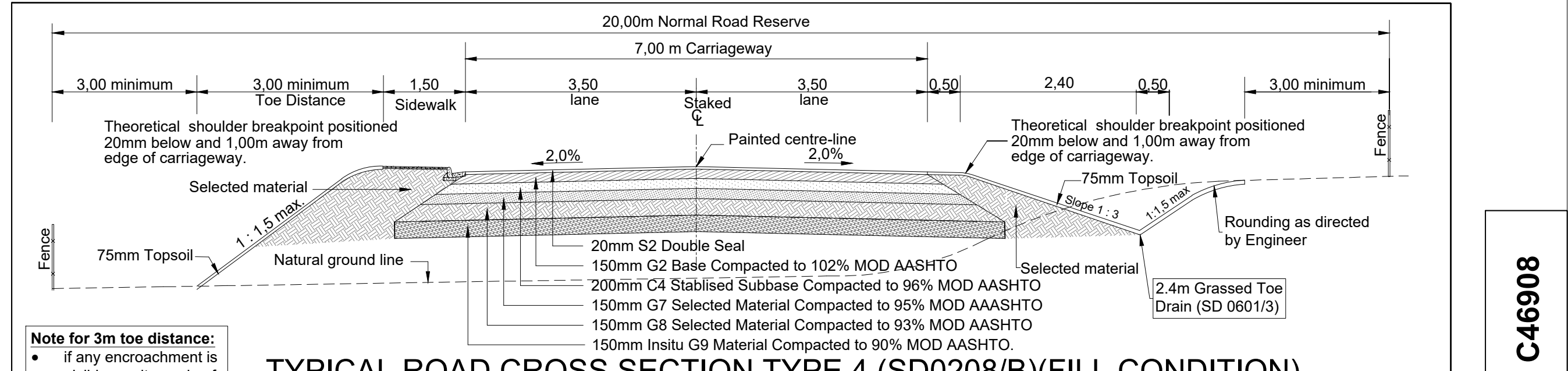
LEFT HAND SIDE			RIGHT HAND SIDE		
POINT	X-CO-ORDINATE	Y-CO-ORDINATE	POINT	X-CO-ORDINATE	Y-CO-ORDINATE
L19	3095849.190	-35863.300	L20	3095724.454	-35923.718
L20	3095724.454	-35923.718	L15	3095377.365	-36084.880



CONTINUED FROM SHEET C46906



DESIGN SPEED : 60km/h



ROAD MARKING SCHEDULE D1724

FROM CH	TO CH	LENGTH(m)	TYPE
2228	-	-	RTM1
2228	-	-	RTM1
2284	-	-	RTM1
2380	-	-	WM8.3
2420	-	-	WM8.3
2460	-	-	WM8.3
2480	2690	210.00	RM1
2690	2705	15.00	WM3
2697	-	-	RTM1
2697	-	-	RTM1
2705	2780	75.00	RM1
2780	3480	700.00	WM3
2800	-	-	WM8.3
2840	-	-	WM8.3
2880	-	-	WM8.3
2983	-	-	RTM1

KERB & CHANNEL CHUTE SCHEDULE (D1724)

LEFT HAND SIDE		RIGHT HAND SIDE	
No.	Ch Position	No.	Ch Position
1	2180	1	-
2	2220	2	-
3	2260	3	-
4	2290	4	-
5	2315	5	-
6	2420	6	-
7	2540	7	-
8	2600	8	-
9	2660	9	-
10	2720	10	-
11	2780	11	-
12	2840	12	-
13	2900	13	-
14	2960	14	-
15	3020	15	-
16	3080	16	-
17	3220	17	-

- ### ADDITIONAL NOTES:
- All pipes to be cleared of obstructions (debris, vegetation and litter).
 - All existing constructed services (e.g. Water mains/pipes) are to be provided prior to construction.
 - All existing services that cross the road alignment are to be sleeved as per KZN DOT Policy. All existing services that are in the road reserve are to be relocated out of the road reserve as per KZN DOT Policy.
 - All service providers are to be contacted/issued notice of relocation of services prior to relocation.
 - Drainage provisions to protect dwellings from discharge. On site evaluation required.

NOTE:
 KERB & CHANNEL CHUTE TO BE CONSTRUCTED WITHIN SIDEWALK AS PER STANDARD DETAIL ON STANDARD DETAIL LAYOUT

PIPE CROSSING SCHEDULE

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Skew (Detail E)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m³/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment
2177	900	100D	PC	C	14.15	130°	2.77%	828.06	827.67	0.70	2.49	89.64%	5.88	NEW PIPE ALONG ALIGNMENT
2797	600	100D	GI	C	18.69	92°	2.06%	854.20	853.82	0.33	1.15	67.22%	2.73	NEW PIPE ALONG ALIGNMENT
2972	900	100D	PC	C	12.59	114°	6.53%	859.67	858.85	0.54	1.92	81.30%	1.92	NEW PIPE ALONG ALIGNMENT
2983	600	100D	PC	C	8.01	180°	8.54%	857.50	856.82	0.37	1.29	70.17%	3.06	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN

- NOTE:
 ALL EXISTING PIPES ARE TO BE CLEARED OF ALL DEBRIS/BLOCKAGES DURING CONSTRUCTION
 PIPE CULVERTS TO BE CONSTRUCTED AS PER SDO406
 PORTAL CULVERTS TO BE CONSTRUCTED AS PER SDO407

AS BUILT

Supervising Engineer	Date	Continued from-	C4896	Designed by-	Y.NANKHOO
Continued on-	C4898	Checked by-	P.NANKHOO (Pr.Eng : 910350)		
Design Plan No-	C46907	Drawn by-	K.RAMSUROOP		
Long Section No-	C46912	Checked by-	P.NANKHOO (Pr.Eng : 910350)		
Cross Section No-	C46915 - C46916	Date of Approval-	18 FEBRUARY 2022		

NANKHOO
Consulting Engineers

TRANSPORTATION ENGINEERING : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

FOR TENDER PURPOSES

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
 LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
 GENERAL ARRANGEMENT

Staked km distance Sheet 03
 Km 2.220 to Km 3.300 of 05

Scale 1:1000 Plan No.: C46907

CONTINUED ON SHEET C46908

C46907

GENERAL NOTES

- All levels, dimensions and setting out details to be verified by the Consultant, Site Engineer and Contractors on site prior to construction.
- All existing drainage culverts are to be as per drawings issued and to be confirmed on site by Engineer prior to construction. All gullies are to be founded onto the natural ground.
- Culvert inlets are to be decided by Engineer on site unless otherwise, min cover = 600mm, min slope = 2%.
- Pipe culverts are to be laid in accordance with SDO401 with headwalls as per SDO402, SDO403 or SDO404. Min dia=500mm for minor access roads and access belt-mouths, and min dia= 600mm for major road cross drainage.
- Box culverts < 1.8m high are to be constructed in accordance with SDO404 or SDO407. Box culverts > 1.8m high are to be appropriately designed by a Structural Engineer in accordance with KZN DOT standards.
- For erosion control Reno mattresses are recommended at culvert outlets, to be confirmed by Engineer on site.
- All gullies protection works are to be as per drawings issued and to be confirmed on site by Engineer prior to construction. All gullies are to be founded onto the natural ground.
- Earth beams are to be constructed at culvert inlets to direct storm water into culverts where necessary, to be confirmed by Engineer on site.
- Road bolters are to be placed across the invert of drains susceptible to erosion for every 2m vertical drop, to be confirmed by Engineer on site.
- Grassed/Concrete lined V-drains as per SD 0601/2 & 4 are recommended for shallow cuttings of depth less than 5m measured at a point 5m from edge of carriageway. Concrete lined 1000V - drains as per SD 0601/2 are recommended for deep cuttings of depth greater than 5m measured at a point 5m from edge of carriageway.
- Subsoil drains as per SD 0501 are to be installed with 1000V - drains or where high water tables are encountered.
- Kerb and channel drains as per SD 0701 are to be provided where fill embankments exceed 3m in height, also used in cuts here.
- Where surface runoff is toward the road, catch water tanks are to be provided to divert storm water to major cross drainage structures, to be confirmed by Engineer on site.
- The positions of accesses are to be determined in consultation with the local community. Daylighting requirements are to be decided by the Engineer on site.
- Concrete winged as per SD 0303 is to be used in place of surfaced belt-mouths for accesses serving single residential properties.
- Guardrails are to be installed in accordance with SD1011 & SD1102 where fill embankments exceed 3m in height or where hazardous obstructions cannot be removed.
- Existing road signs, services and fencing affected by construction are to be removed/indicated where necessary, to be confirmed by Engineer on site.
- Underground service crossings and markers are to be in accordance with SD 1001.3.
- All work is to be carried out in accordance with COYO (2020) Specifications for Road and Bridge Works for State Road Authorities.
- All survey and setting out data provided is based on WGS 84.
- All road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
- New fills and exposed cuttings are to be top-soiled and vegetated immediately after construction to prevent erosion, to be confirmed by Engineer on site.

NOTATION

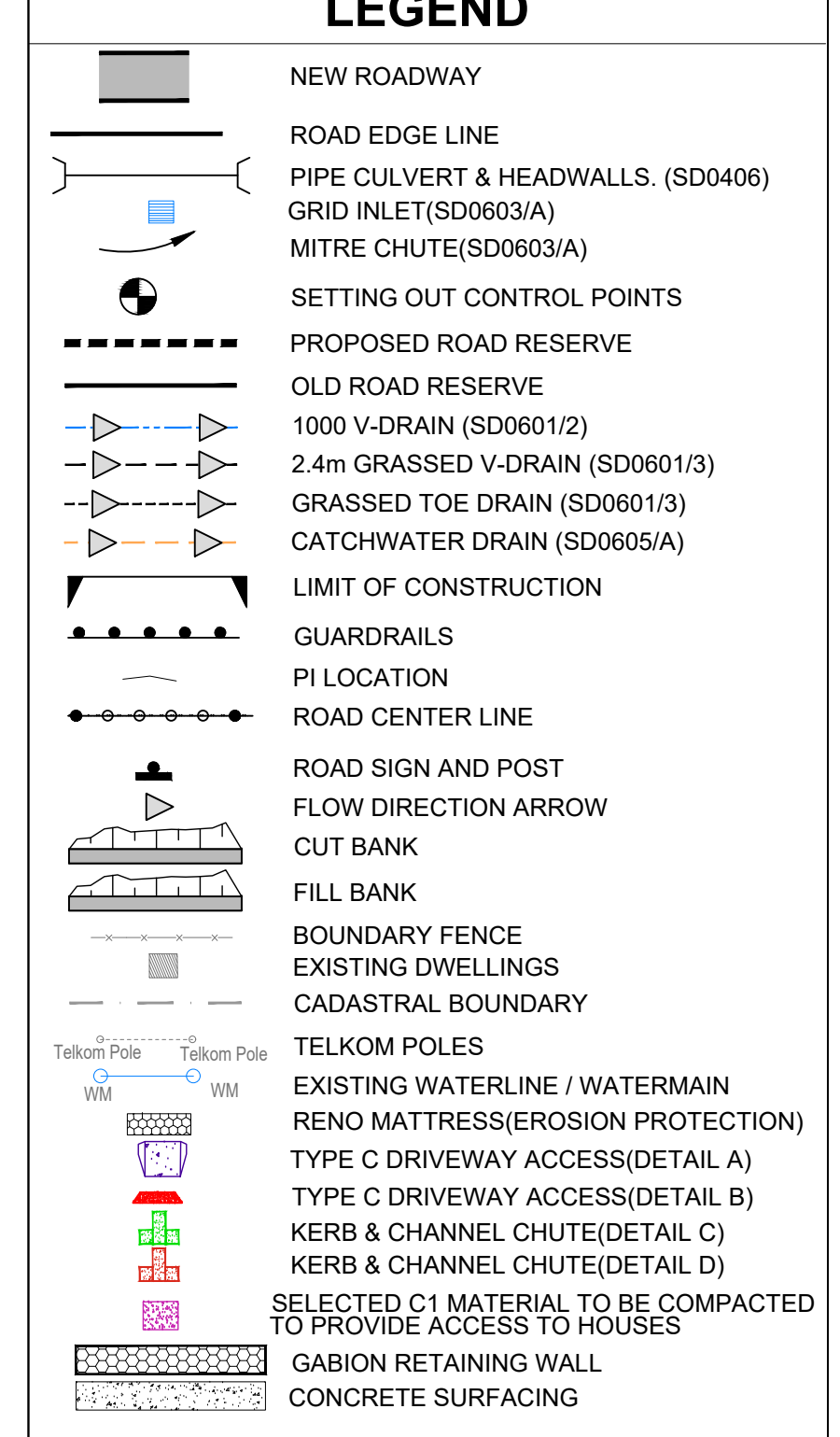
BCC Beginning of circular curve
 ECC End of circular curve
 PI Point of intersection
 R Radius of circular curve
 Δ Deflection angle of circular curve
 L Length of circular curve
 T Length of tangent

SIGN POSTING SCHEDULE TO SD 1302/A D1724

LEFT HAND SIDE		RIGHT HAND SIDE	
CH	SIGN	CH	SIGN
3480	W108	3280	W203
3540	W205	3580	R201-60
3580	R201-40	3596	R1
3620	W102	3680	W107
3736	R1	3725	R1
3840	W202	3800	R201-40
3900	W108	3840	W202
3940	W108	3880	W102
4300	W202	3976	R1
4320	R201-40	4080	W107
4380	W211	4140	W203
4400	W108	4300	W203
-	-	4320	R201-60

NOTE

- FOR THE STANDARD DETAILS THAT ARE USED IN THIS DESIGN PLEASE SEE STANDARD DETAIL LAYOUT.
- FOR DETAILS ON ROADING EYE SPACING AND CHUTE DETAILS OF SUBSOIL DRAIN PLEASE SEE STANDARD DETAIL LAYOUT.
- DUE TO SPACE CONSTRAINTS ON THIS LAYOUT, SIGHT DISTANCES FOR ALL ACCESSES ARE LOCATED ON THE LONGITUDINAL SECTIONS.



CURVE SETTING OUT DATA (WGS 84)

Position	Chainage	Y Co-ordinate	X Co-ordinate	Radius (m)	Curve	Tangent length (m)	Deflection
ECC15	3+216	-36111.56	3095303.14				
BCC16	3+500	-36249.43	3095055.67				
PI16	3+521	-36259.65	3095036.67	750.00	16	21.05	3°12'56"
ECC16	3+542	-36268.83	3095017.72				
BCC17	3+631	-36307.94	3094936.99				
PI17	3+686	-36334.61	3094881.92	100.00	17	61.19	62°55'31"
ECC17	3+741	-36297.72	3094833.11				
BCC18	3+896	-36204.52	3094709.77				
PI18	3+925	-36186.65	3094686.13	500.00	18	29.63	6°47'00"
ECC18	3+955	-36171.7	3094660.55				
BCC19	4+015	-36141.5	3094608.84				
PI19	4+050	-36123.83	3094578.6	200.00	19	35.03	19°52'10"
ECC19	4+084	-36117.49	3094544.15				
BCC20	4+131	-36109.02	3094498.13				
PI20	4+140	-36107.41	3094489.36	200.00	20	8.92	5°06'31"
ECC20	4+149	-36105.02	3094480.76				
BCC21	4+249	-36078.3	3094384.63				
PI21	4+320	-36058.68	3094314.04	250.00	21	73.26	32°40'01"
ECC21	4+391	-36080.26	3094244.03				
BCC22	4+419	-36088.47	3094217.38				

ROAD CLASS

ROAD No.	CLASS
D1724	U4b PROVINCIAL DISTRICT ROAD

ROAD CLASS ACCORDING TO RCAM CLASSIFICATION TRH 26

GUARDRAIL SCHEDULE TO SD 1101/A

LEFT HAND SIDE		RIGHT HAND SIDE	
FROM CH	TO CH	LENGTH (m)	TO CH
4420	4465	45.00	

NOTE: END TREATMENT OF GUARDRAILS TO BE FLARED

PIPE CROSSING SCHEDULE

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. length (m)	Skew (Detail E)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m³/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment
3597	900	100D	GI	C	10.21	90°	2.00%	923.34	923.14	0.08	0.29	40.28%	0.70	NEW PIPE ALONG ALIGNMENT
3731	600	100D	PC	C	11.08	180°	15.68%	927.66	925.92	0.06	0.22	36.13%	0.52	NEW PIPE AT ACCESS FOR CONTINUITY OF DRAIN
3739	900	100D	PC	C	13.68	270°	3.97%	929.60	929.06	1.04	1.64	69.33%	8.74	EXISTING PIPE LAID IN PREVIOUS CONTRACT
4257	600	100D	GI	C	12.30	90°	2.14%	975.62	975.36	0.18	0.63	53.54%	1.49	NEW PIPE ALONG ALIGNMENT
4365	600	100D	GI	C	12.92	90°	2.14%	980.87	980.59	0.15	0.51	49.60%	1.21	NEW PIPE ALONG ALIGNMENT

NOTE:
 1. ALL EXISTING PIPES ARE TO BE CLEARED OF ALL DEBRIS/BLOCKAGES DURING CONSTRUCTION
 2. PIPE CULVERTS TO BE CONSTRUCTED AS PER SDO406
 3. PORTAL CULVERTS TO BE CONSTRUCTED AS PER SDO407

ADDITIONAL NOTES:

- All pipes to be cleared of obstructions (debris, vegetation and litter).
- All existing/newly constructed services e.g. Water manholes/pipes, are to be provided prior to construction.
- All existing services that cross the road alignment are to be sleeved as per KZN DOT Policy. All existing services that are in the road reserve are to be relocated out of the road reserve as per KZN DOT Policy.
- All service providers are to be contacted/issued notice of relocation of services prior to relocations.
- Drainage provisions to protect dwellings from discharge. On site evaluation required.

SIDE DRAIN SCHEDULE FOR D1724

LEFT HAND SIDE				RIGHT HAND SIDE			
FROM CH	TO CH	LENGTH (m)	TYPE	FROM CH	TO CH	LENGTH (m)	TYPE
3150	3460	310.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	3160	3700	540.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)
3600	3700	100.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	3840	3960	120.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)
3840	3950	110.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	4120	4210	90.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)
4120	4600	480.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)	4280	4310	30.00	1000 V-DRAIN(SD0601/2)+SUBSOIL(SD0501/1)

CATCHWATER DRAIN SCHEDULE TO SDO605/A

LEFT HAND SIDE		RIGHT HAND SIDE	
FROM CH	TO CH	LENGTH (m)	TO CH
4260	4620	80.00	-
4366	4600	234.00	-

KERB AND CHANNEL SCHEDULE TO SD 0701/B FOR D1724

LEFT HAND SIDE		RIGHT HAND SIDE	
FROM CH	TO CH	LENGTH (m)	TO CH
1900	4916	3016.00	-

SEWAGE SCHEDULE D1724

LEFT HAND SIDE		RIGHT HAND SIDE	
FROM CH	TO CH	LENGTH (m)	TO CH
1900	4894	2994.00	-

GABION RETAINING WALL SCHEDULE TO SD 0901/A

LEFT HAND SIDE		RIGHT HAND SIDE	
FROM CH	TO CH	LENGTH (m)	MAX. HEIGHT (m)
4290	4270	20.00	3m
4250	4310	20.00	3m
4310	4330	20.00	4m
4330	4350	20.00	3m
4380	4420	40.00	2m

MITRE DRAIN SCHEDULE TO SD 0603/1 (D1724)

LEFT HAND SIDE		RIGHT HAND SIDE	
No.	Ch Position	No.	Ch Position
1	3600	1	3860
2	3840	2	4120
3	4120	3	4280

KERB & CHANNEL CHUTE SCHEDULE (D1724)

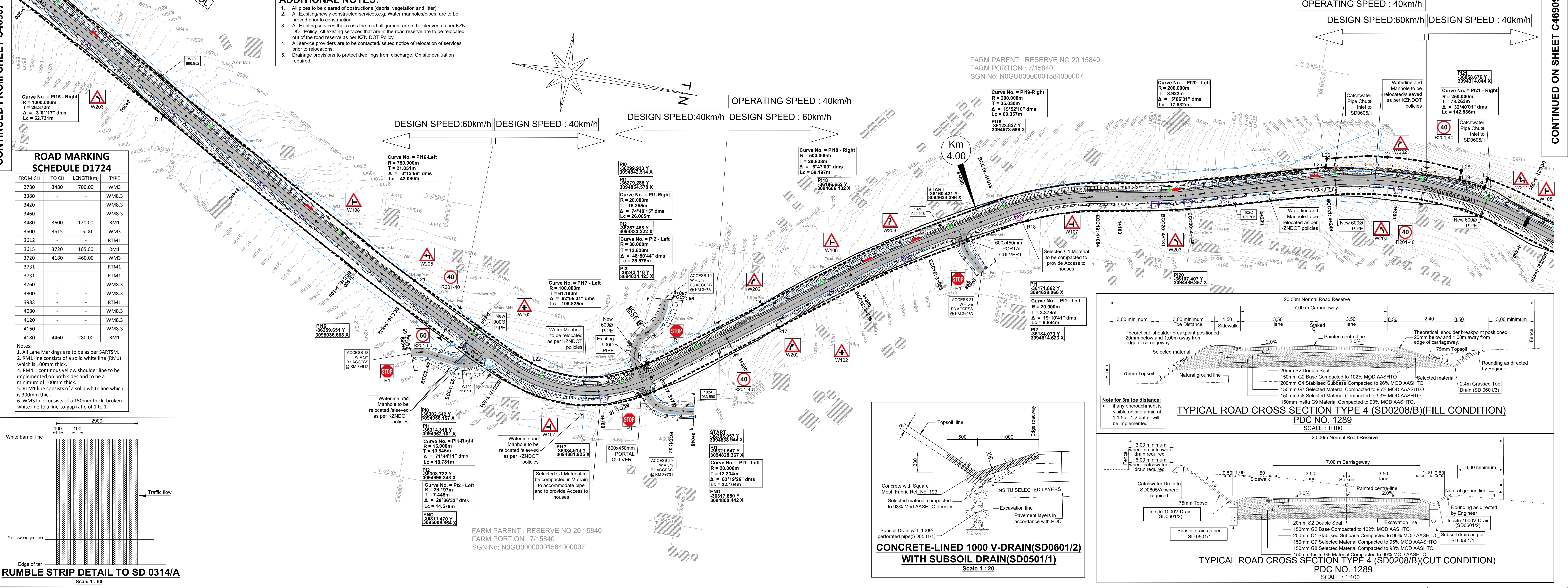
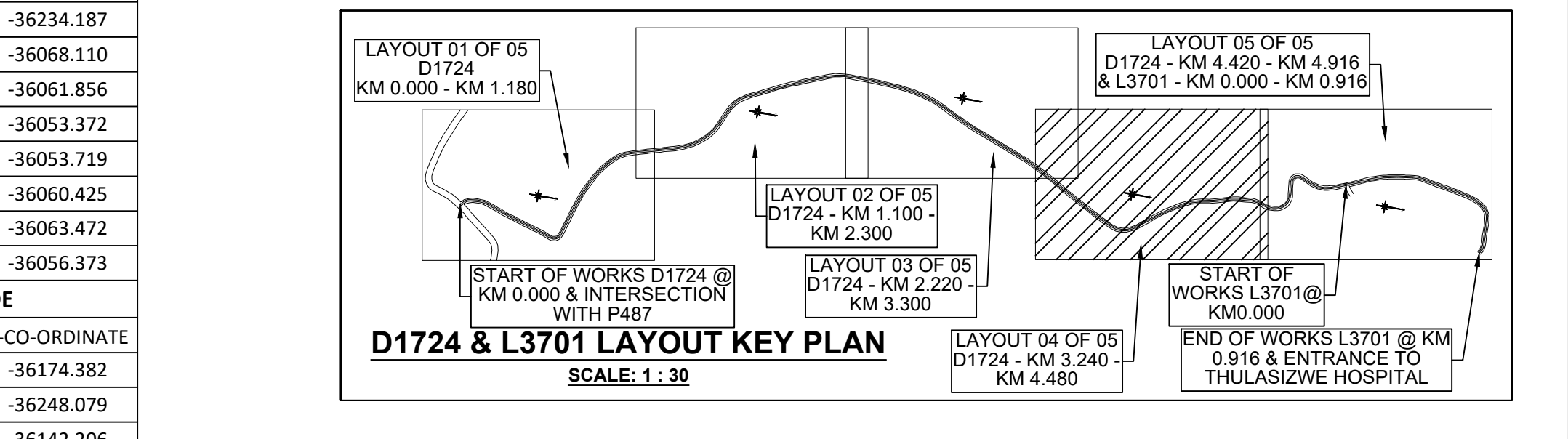
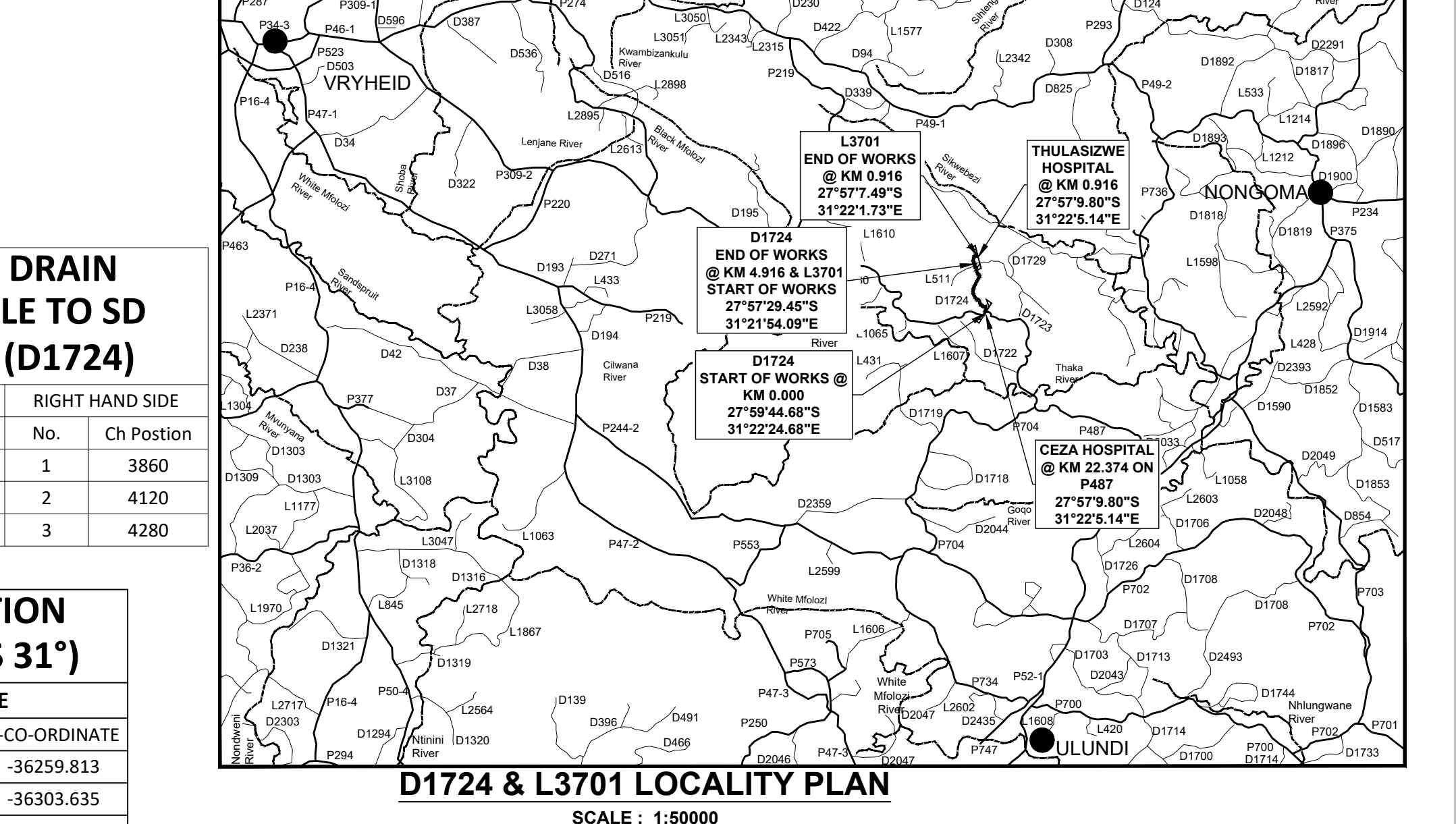
LEFT HAND SIDE		RIGHT HAND SIDE	
No.	Ch Position	No.	Ch Position
1	3210	1	-
2	3360	2	-
3	3567	3	-
4	3650	4	-
5	3720	5	-
6	3780	6	-
7	3880	7	-
8	3980	8	-
9	4020	9	-
10	4140	10	-
11	4256	11	-
12	4320	12	-
13	4366	13	-

EXPROPRIATION POINTS (WGS 31°)

LEFT HAND SIDE			RIGHT HAND SIDE		
POINT	X-CO-ORDINATE	Y-CO-ORDINATE	POINT	X-CO-ORDINATE	Y-CO-ORDINATE
L21	3095013.395	-36259.813	R16	3095210.433	-36174.382
L22	3094920.891	-36303.635	R17	3094751.143	-36248.079
L23	3094839.135	-36289.741	R18	3094588.717	-36142.206
L24	3094765.620	-36234.187			
L25	3094385.881	-36068.110			
L26	3094385.632	-36061.856			
L27	3094383.626	-36053.372			
L28	3094289.255	-36053.719			
L29	3094289.402	-36060.425			
L30	3094271.296	-36063.472			
L31	3094269.724	-36056.373			

DESIGN SPEED SCHEDULE FOR D1724

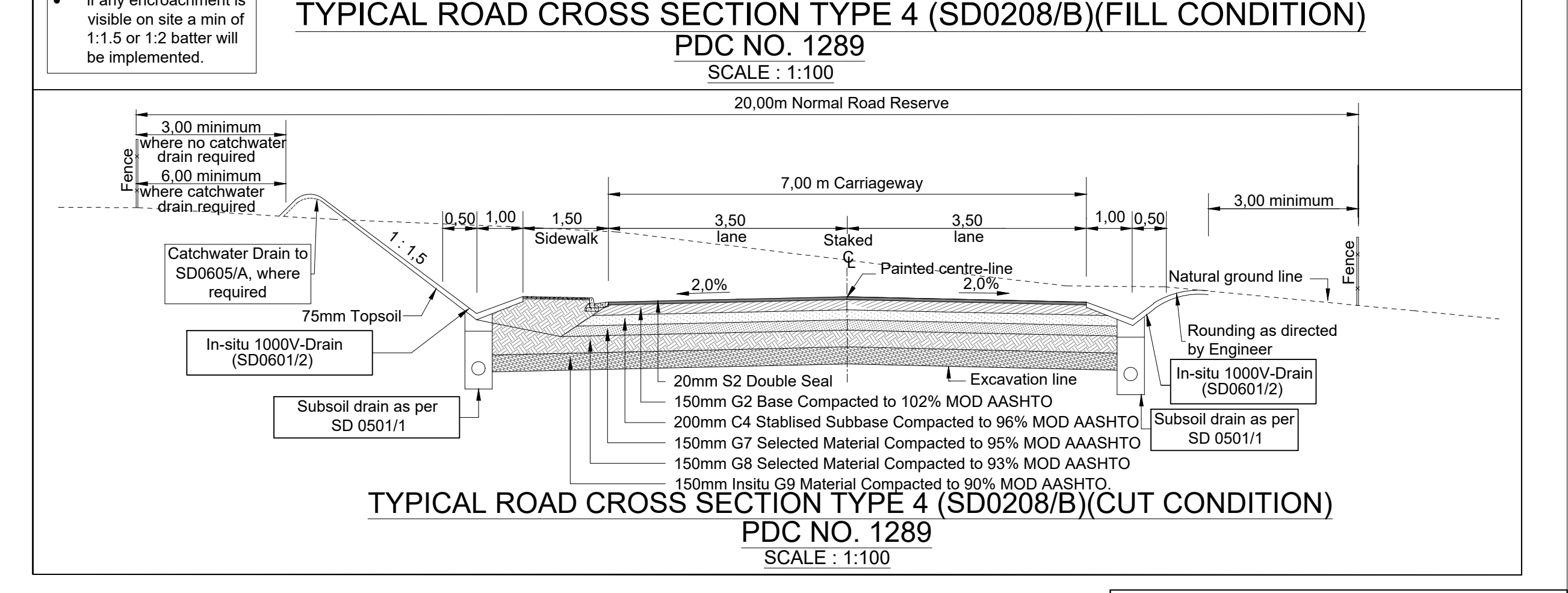
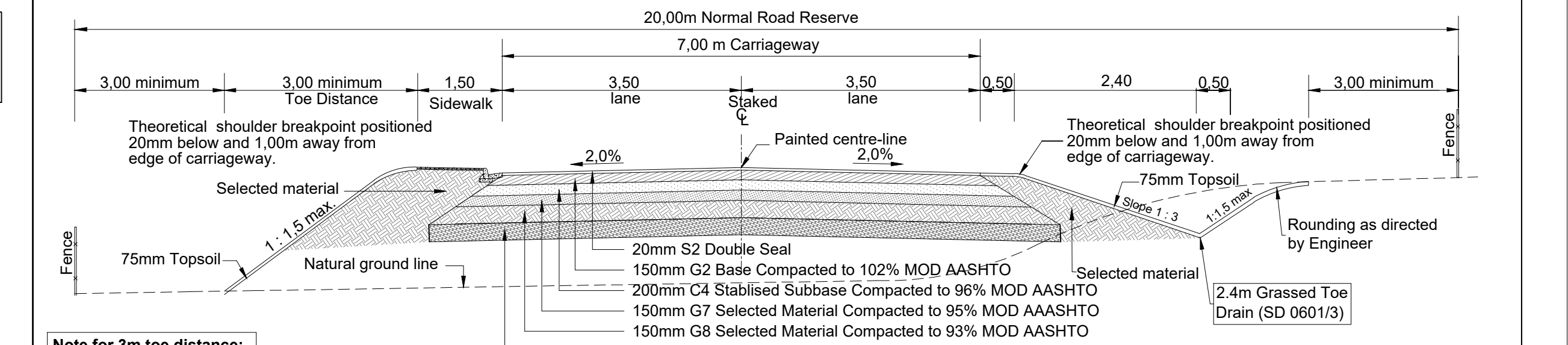
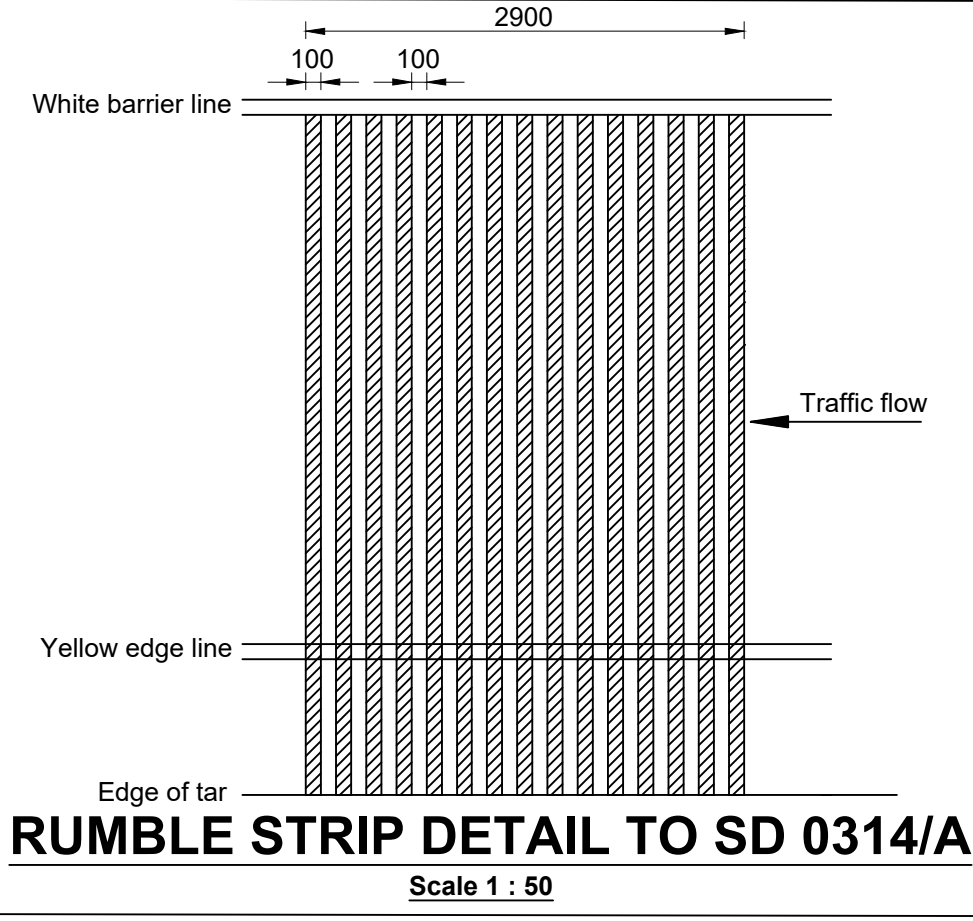
FROM CH	TO CH	LENGTH (m)	DESIGN SPEED	OPERATING SPEED
621	3580	2959.00	60KM/H	60KM/H
3581	3800	219.00	40KM/H	40KM/H
3801	4320	519.00	60KM/H	40KM/H
4321	4867	546.00	40KM/H	40KM/H



ROAD MARKING SCHEDULE D1724

FROM CH	TO CH	LENGTH (m)	TYPE
2780	3480	700.00	WM3
3380	-	-	WM3.3
3420	-	-	WM3.3
3460	-	-	WM3.3
3480	3600	120.00	RM1
3600	3615	15.00	WM3
3612	-	-	RTM1
3615	3720	105.00	RM1
3720	4180	460.00	WM3
3731	-	-	RTM1
3731	-	-	RTM1
3760	-	-	WM3.3
3800	-	-	WM3.3
3983	-	-	RTM1
4080	-	-	WM3.3
4120	-	-	WM3.3
4150	-	-	WM3.3
4180	4460	280.00	RM1

Notes:
 1. All Lane Markings are to be as per SARTSM.
 2. RM1 line consists of a solid white line (RM1) which is 100mm thick.
 3. RTM1 continuous yellow shoulder line to be implemented on both sides and to be a minimum of 100mm thick.
 4. RM4.1 continuous yellow shoulder line to be implemented on both sides and to be a minimum of 100mm thick.
 5. RTM1 line consists of a solid white line which is 300mm thick.
 6. WM3 line consists of a 150mm thick, broken white line to a line-to-gap ratio of 1 to 1.



AS BUILT

Supervising Engineer	Date

Continued from:-	C4697	Designed by:-	Y.NANKHOO
Continued on:-	C4699	Checked by:-	P.NANKHOO (Pr.Eng: 910350)
Design Plan No:-	C4698	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46912	Checked by:-	P.NANKHOO (Pr.Eng: 910350)
Cross Section No:-	C46916 - C46917	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
 DEPARTMENT OF TRANSPORT

NANKHOO
 Consulting Engineers
 1474141 HWY 17, P.O. BOX 100, TROMPSBURG, KWAZULU-NATAL
 TEL: 031 201 1111 FAX: 031 201 1112
 www.nankhoo.co.za

Transportation Engineering: Chief Engineer

Head: Transport

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
 LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
 (Km 0.000 to Km 0.540 & Km 0.000 to Km 0+916)

GENERAL ARRANGEMENT

FOR TENDER PURPOSES

Staked km distance: Km 3.240 to Km 4.480
 Sheet of 05
 Scale: 1:1000
 Plan No.: C46908

C46908

GENERAL NOTES

- All levels, dimensions and setting out details to be verified by the Consultant, Site Engineer and Contractors on site prior to construction.
- All existing drainage culverts are to be inspected, and any found in unserviceable condition are to be replaced by the Contractor.
- Culvert inverts are to be decided by Engineer and unless otherwise advised, min cover = 600mm, min slope = 2%.
- Pipe culverts are to be laid in accordance with SDO062, SDO063 & SDO065. Min dia=450mm for minor access roads and access below 600mm, and min dia=600mm for major road cross drainage.
- Box culverts < 1.8m high are to be constructed in accordance with SDO004 or SDO047. Box culverts > 1.8m high are to be appropriately designed by a Structural Engineer in accordance with KZN001 standards.
- For erosion control Reno mattresses are recommended at culvert outlets, to be confirmed by Engineer on site.
- All gabbion protection works are to be as per drawings issued and to be confirmed on site by Engineer prior to construction. All gabbions are to be founded onto the natural ground.
- Earth beams are to be constructed at culvert inlets to direct storm water into culverts as recommended by Engineer on site.
- Rock batters are to be placed across the invert of drains susceptible to erosion every 2m vertical drop, to be confirmed by Engineer on site.
- Grass/Cement-lined V-drains as per SD 0601/1 & 4 are recommended for shallow cuttings of depth less than 5m measured at a point 5m from edge of carriageway. Concrete lined 1000V-drains as per SD 0602/1 are recommended for cuttings of depth greater than 5m measured at a point 5m from edge of carriageway.
- Subsoil drains as per SD 0501 are to be installed with 1000V-drains or where high water tables are encountered.
- Kerb and channel drains as per SD 0701 are to be provided where fill embankments exceed 3m in height. Also used in cuts here where surface runoff is toward the road, catch-water banks are to be provided to direct storm water to major cross drainage structures, to be confirmed by Engineer on site.
- The positions of accesses are to be determined in consultation with the local community. Daylighting requirements are to be decided by the Engineer on site. Concrete widening as per SD 0302 may be used in place of subsoil drains where drainage serving single residential properties.
- Guardrails are to be installed in accordance with SD101 & SD102 where fill embankments exceed 3m in height or where hazardous obstructions cannot be removed.
- Existing road signs, services and marking affected by construction are to be removed/indicated where necessary, to be confirmed by Engineer on site.
- Underground service crossings and markers are to be in accordance with SD 1001.3.
- All new road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
- All work is to be carried out in accordance with COTO (2020) Specifications for Road and Bridge Works for State Road Authorities.
- All survey and setting out data provided is based on WGS 84.
- New fills and exposed cuttings are to be top-soiled and vegetated immediately after construction to prevent erosion, to be confirmed by Engineer on site.

NOTATION

BCC Beginning of circular curve
 ECC End of circular curve
 R Radius of circular curve
 Δ Deflection angle of circular curve
 L Length of circular curve
 T Length of tangent

NOTE:
 FOR THE STANDARD DETAILS THAT ARE USED IN THIS DESIGN PLEASE SEE STANDARD DETAIL LAYOUT
 FOR DETAILS ON ROOFING EYE SPACING AND CHUTE DETAILS OF SUBSOIL DRAIN PLEASE SEE STANDARD DETAIL LAYOUT
 DUE TO SPACE CONSTRAINTS ON THIS LAYOUT, SIGHT DISTANCES FOR ALL ACCESSES ARE LOCATED ON THE LONGITUDINAL SECTIONS

ROAD CLASS

ROAD NO.	CLASS
D1724	U4B PROVINCIAL DISTRICT ROAD
LS11	USB URBAN RESIDENTIAL LOCAL STREET
L3701	USB URBAN RESIDENTIAL LOCAL STREET

ROAD CLASS ACCORDING TO RCAM CLASSIFICATION TRM 26

SETTING OUT CONTROL POINTS (WGS 84)

POINT NAME	Y CO-ORDINATE	X CO-ORDINATE	ELEVATION
W104	36055.140	-3094190.600	993.516
W105	35931.650	-3093931.520	1002.935
105A	35830.995	-3093642.187	993.374
105B	35824.456	-3093485.238	997.048
105C	35840.728	-3093404.707	993.096
105D	35906.085	-3093185.508	971.532
105E	36126.769	-3093165.609	968.420

SIGN POSTING SCHEDULE TO SD 1302/A D1724

LEFT HAND SIDE	RIGHT HAND SIDE
CH SIGN SIZE (mm)	CH SIGN SIZE (mm)
4400 W108 900x00	4420 W405+W406 450 X 450
4580 W405+W406 450 X 450	4460 W405+W406 450 X 450
4600 W405+W406 450 X 450	4460 W405+W406 450 X 450
4620 W405+W406 450 X 450	4463 R1 900x00
4640 W405+W406 450 X 450	4480 W405+W406 450 X 450
4660 W405+W406 450 X 450	4500 W405+W406 450 X 450
4680 W405+W406 450 X 450	4520 W405+W406 450 X 450
4700 W405+W406 450 X 450	4540 W405+W406 450 X 450
4710 W203 900x00	4560 W405+W406 450 X 450
4720 W405+W406 450 X 450	4836 GD2 3500X2200
4740 W110 900x00	4840 R1 900x00
4800 R201-60+W108 900x900	4894 GD2 3500X2200
4894 GD2 3500X2200	-

ROAD MARKING SCHEDULE D1724

FROM CH	TO CH	LENGTH(m)	TYPE
4460	4475	15.00	WM3
4471	-	-	RTM1
4475	4820	345.00	RM1
4820	4845	25.00	WM3
4836	-	-	RTM1
4845	4888	43.00	RM1
4888	-	-	RTM1
4894	-	-	RTM1

KERB & CHANNEL CHUTE SCHEDULE (D1724)

LEFT HAND SIDE	RIGHT HAND SIDE
No. Position	No. Position
1 4420	1 4620
2 4457	2 4660
3 4520	3 -
4 4580	4 -
5 4640	5 -
6 4686	6 -
7 4740	7 -
8 4787	8 -

PIPE CROSSING SCHEDULE TO SD 0602/B

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m3/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment	
4457	600	100D	GI	C	13.41	90°	1.11	984.08	983.80	0.22	0.78	58.15%	1.86	NEW PIPE ALONG ALIGNMENT
4629	900	100D	PC	C	14.68	100°	6.62%	990.99	990.02	0.33	0.513	44.82%	2.73	NEW PIPE ALONG ALIGNMENT
4686	900	100D	GI	C	14.97	104°	3.12%	996.79	996.32	0.69	2.44	89.02%	0.46	NEW PIPE ALONG ALIGNMENT
4787	600	100D	GI	C	12.35	90°	2.00%	999.73	999.48	0.24	0.85	59.90%	0.75	NEW PIPE ALONG ALIGNMENT

PIPE CROSSING SCHEDULE TO SD 0602/B

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m3/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment	
4457	600	100D	GI	C	13.41	90°	1.11	984.08	983.80	0.22	0.78	58.15%	1.86	NEW PIPE ALONG ALIGNMENT
4629	900	100D	PC	C	14.68	100°	6.62%	990.99	990.02	0.33	0.513	44.82%	2.73	NEW PIPE ALONG ALIGNMENT
4686	900	100D	GI	C	14.97	104°	3.12%	996.79	996.32	0.69	2.44	89.02%	0.46	NEW PIPE ALONG ALIGNMENT
4787	600	100D	GI	C	12.35	90°	2.00%	999.73	999.48	0.24	0.85	59.90%	0.75	NEW PIPE ALONG ALIGNMENT

ROAD MARKING SCHEDULE L3701

FROM CH	TO CH	LENGTH(m)	TYPE
0	916	916.00	WM4.1
8	-	-	RTM1
8	100	92.00	RM1
100	580	480.00	WM3
120	-	-	WM8.3
160	-	-	WM8.3
200	-	-	WM8.3
330	-	-	RTM1
480	-	-	WM8.3
520	-	-	WM8.3
560	-	-	WM8.3
660	660	20.00	RM1
669	-	-	RTM1
680	800	120.00	RM1
800	916	116.00	WM3
820	-	-	WM8.3
860	-	-	WM8.3

ROAD MARKING SCHEDULE L3701

FROM CH	TO CH	LENGTH(m)	TYPE
0	916	916.00	WM4.1
8	-	-	RTM1
8	100	92.00	RM1
100	580	480.00	WM3
120	-	-	WM8.3
160	-	-	WM8.3
200	-	-	WM8.3
330	-	-	RTM1
480	-	-	WM8.3
520	-	-	WM8.3
560	-	-	WM8.3
660	660	20.00	RM1
669	-	-	RTM1
680	800	120.00	RM1
800	916	116.00	WM3
820	-	-	WM8.3
860	-	-	WM8.3

PIPE CROSSING SCHEDULE TO SD 0602/B

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m3/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment	
4457	600	100D	GI	C	13.41	90°	1.11	984.08	983.80	0.22	0.78	58.15%	1.86	NEW PIPE ALONG ALIGNMENT
4629	900	100D	PC	C	14.68	100°	6.62%	990.99	990.02	0.33	0.513	44.82%	2.73	NEW PIPE ALONG ALIGNMENT
4686	900	100D	GI	C	14.97	104°	3.12%	996.79	996.32	0.69	2.44	89.02%	0.46	NEW PIPE ALONG ALIGNMENT
4787	600	100D	GI	C	12.35	90°	2.00%	999.73	999.48	0.24	0.85	59.90%	0.75	NEW PIPE ALONG ALIGNMENT

PIPE CROSSING SCHEDULE TO SD 0602/B

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m3/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment	
4457	600	100D	GI	C	13.41	90°	1.11	984.08	983.80	0.22	0.78	58.15%	1.86	NEW PIPE ALONG ALIGNMENT
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PIPE CROSSING SCHEDULE TO SD 0602/B

Ch Position	Size (mm)	Class	Type	Bedding Class	Est. Length (m)	Slope	Invert Level (m)	Outlet Level (m)	Flow (m3/s)	Velocity (m/s)	Capacity (%)	Catchment Area (ha)	Comment	
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4629	900	100D	PC	C	14.68	100°	6.62%	990.99	990.02	0.33	0.513	44.82%	2.73	NEW PIPE ALONG ALIGNMENT
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4787	600	100D	GI	C	12.35	90°	2.00%	999.73	999.48	0.24	0.85	59.90%	0.75	NEW PIPE ALONG ALIGNMENT

AS BUILT

Supervising Engineer	Date	Supervising Authority
Continued from- C46908	Designed by- Y.NANKHOO	
Continued on- C46910	Checked by- P.NANKHOO (Pr.Eng : 910350)	
Design Plan No- C46909	Drawn by- K.RAMSUROOP	
Long Section No- C46913	Checked by- P.NANKHOO (Pr.Eng : 910350)	
Cross Section No- C46917 - C46919	Date of Approval- 18 FEBRUARY 2022	

LEGEND

NEW ROADWAY
 ROAD EDGE LINE
 PIPE CULVERT & HEADWALLS (SD0405)
 MITRE CHUTE(SD0603A)
 SETTING OUT CONTROL POINTS
 PROPOSED ROAD RESERVE
 OLD ROAD RESERVE
 1000 V-DRAIN (SD0601/2)
 2.4m GRASSED V-DRAIN (SD0601/3)
 CRATCHED TIE DRAIN (SD0601/3)
 CATCHWATER DRAIN (SD0605/A)
 LIMIT OF CONSTRUCTION
 GUARDRAILS
 PI LOCATION
 ROAD CENTER LINE
 ROAD SIGN AND POST
 FLOW DIRECTION ARROW
 CUT BANK
 FILL BANK
 BOUNDARY FENCE
 EXISTING DWELLINGS
 CADASTRAL BOUNDARY
 TELKOM POLES
 EXISTING WATERLINE / WATERMAIN
 RENO MAT TRESSER (EROSION PROTECTION)
 TYPE C DRIVEWAY ACCESS(DETAIL A)
 TYPE C DRIVEWAY ACCESS(DETAIL B)
 KERB & CHANNEL CHUTE(DETAIL C)
 KERB & CHANNEL CHUTE(DETAIL D)
 SELECTED C1 MATERIAL TO BE COMPACTED TO PROVIDE ACCESS TO HOUSES
 EXISTING TELKOM POLES AND TELKOM LINE
 PROPOSED NEW POSITION OF TELKOM POLES AND LINE
 GABBION RETAINING WALL
 CONCRETE SURFACING

SIGN POSTING SCHEDULE TO SD 1302/A D1724

LEFT HAND SIDE	RIGHT HAND SIDE
CH SIGN SIZE (mm)	CH SIGN SIZE (mm)
4400 W108 900x00	4420 W405+W406 450 X 450
4580 W405+W406 450 X 450	4460 W405+W406 450 X 450
4600 W405+W406 450 X 450	4460 W405+W406 450 X 450
4620 W405+W406 450 X 450	4463 R1 900x00
4640 W405+W406 450 X 450	4480 W405+W406 450 X 450
4660 W405+W406 450 X 450	4500 W405+W406 450 X 450
4680 W405+W406 450 X 450	4520 W405+W406 450 X 450
4700 W405+W406 450 X 450	4540 W405+W406 450 X 450
4710 W203 900x00	4560 W405+W406 450 X 450
4720 W405+W406 450 X 450	4836 GD2 3500X2200
4740 W110 900x00	4840 R1 900x00
4800 R201-60+W108 900x900	4894 GD2 3500X2200
4894 GD2 3500X2200	-

SIGN POSTING SCHEDULE TO SD 1302/A D1724

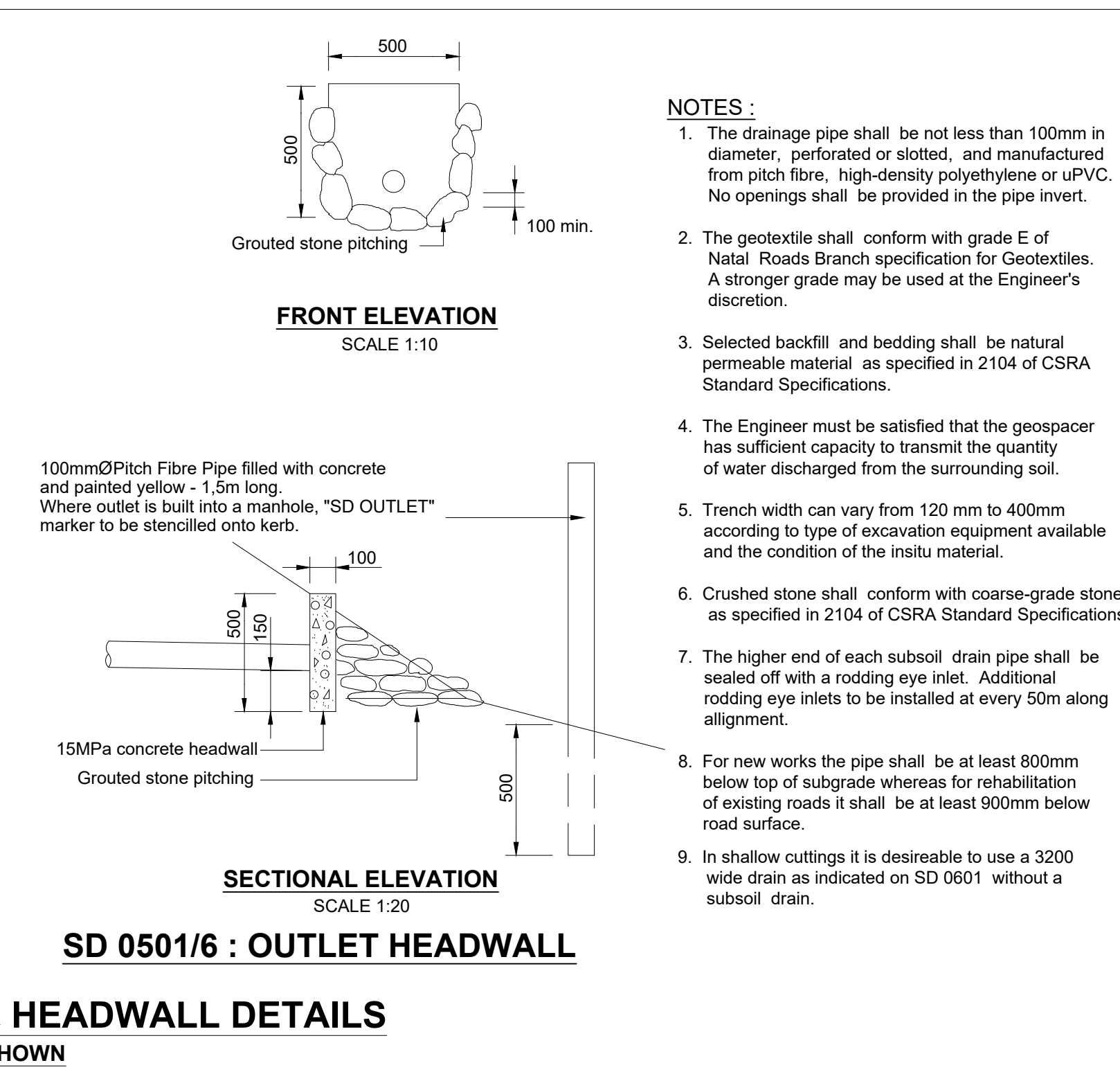
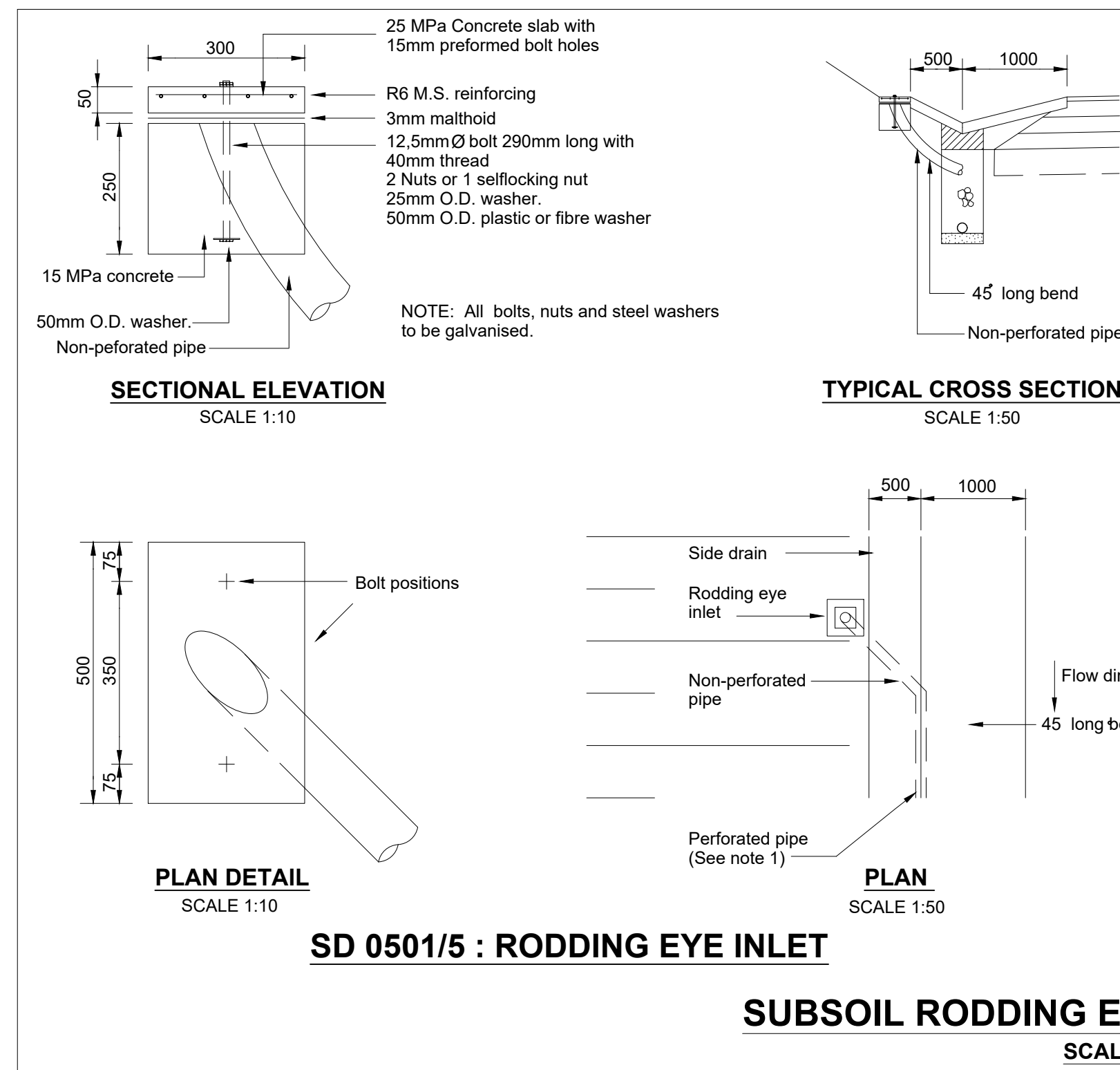
LEFT HAND SIDE	RIGHT HAND SIDE
CH SIGN SIZE (mm)	CH SIGN SIZE (mm)
4400 W108 900x00	4420 W405+W406 450 X 450
4580 W405+W406 450 X 450	4460 W405+W406 450 X 450
4600 W405+W406 450 X 450	4460 W405+W406 450 X 450
4620 W405+W406 450 X 450	4463 R1 900x00
4640 W405+W406 450 X 450	4480 W405+W406 450 X 450
4660 W405+W406 450 X 450	4500 W405+W406 450 X 450
4680 W405+W406 450 X 450	4520 W405+W406 450 X 450
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4720 W405+W406 450 X 450	4836 GD2 3500X2200
4740 W110 900x00	4840 R1 900x00
4800 R201-60+W108 900x900	4894 GD2 3500X2200
4894 GD2 3500X2200	-

ROAD MARKING SCHEDULE D1724

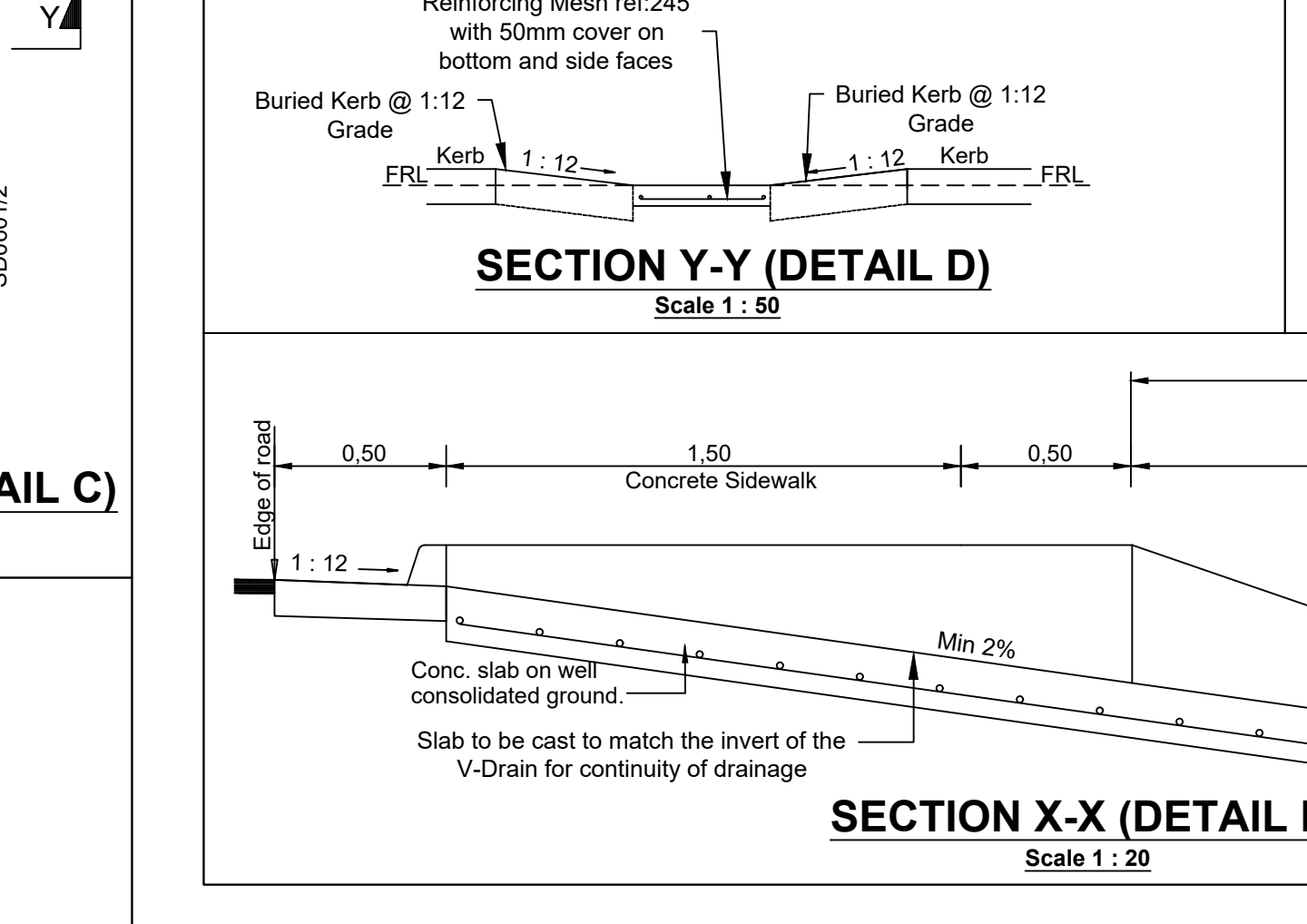
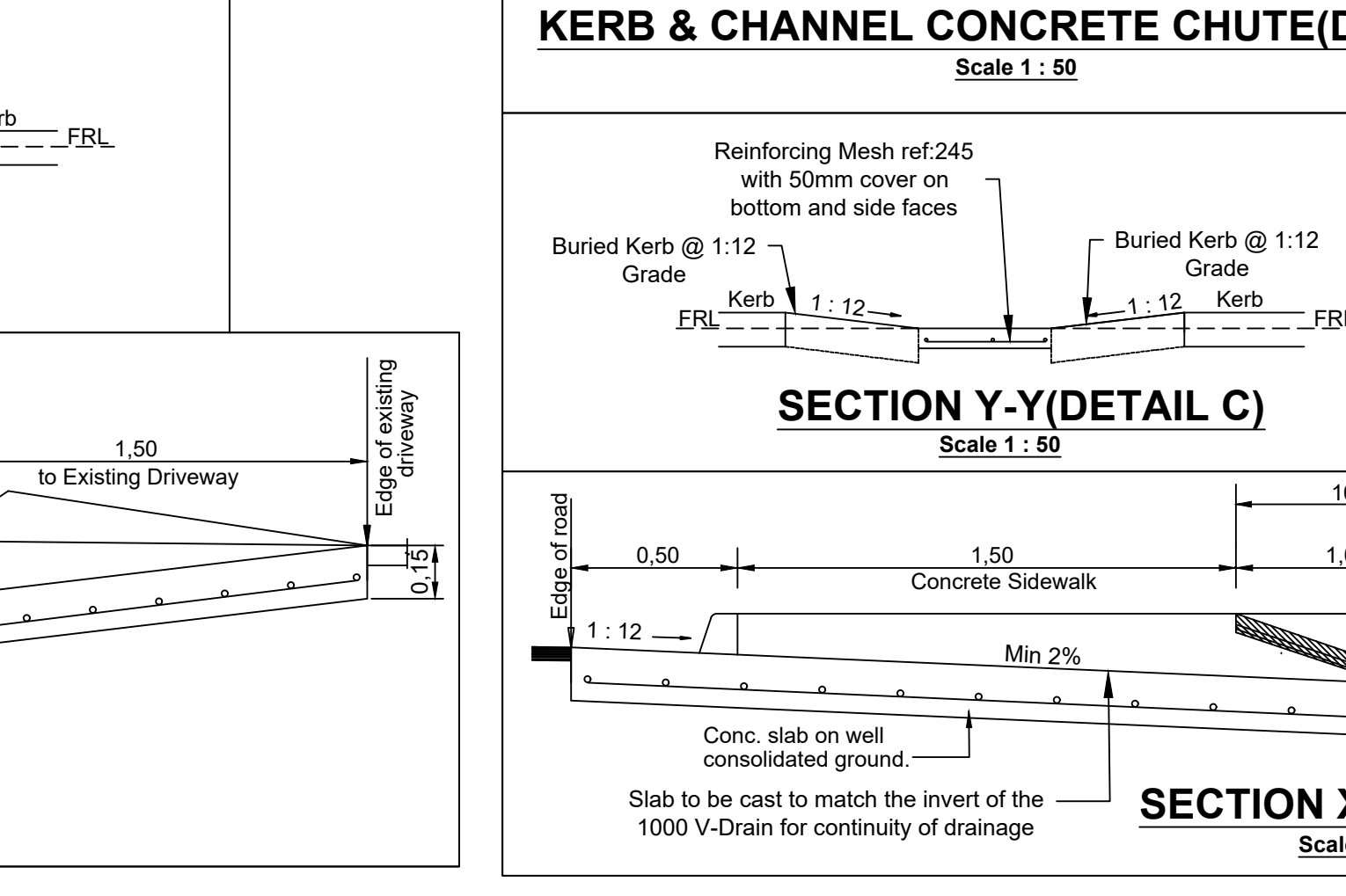
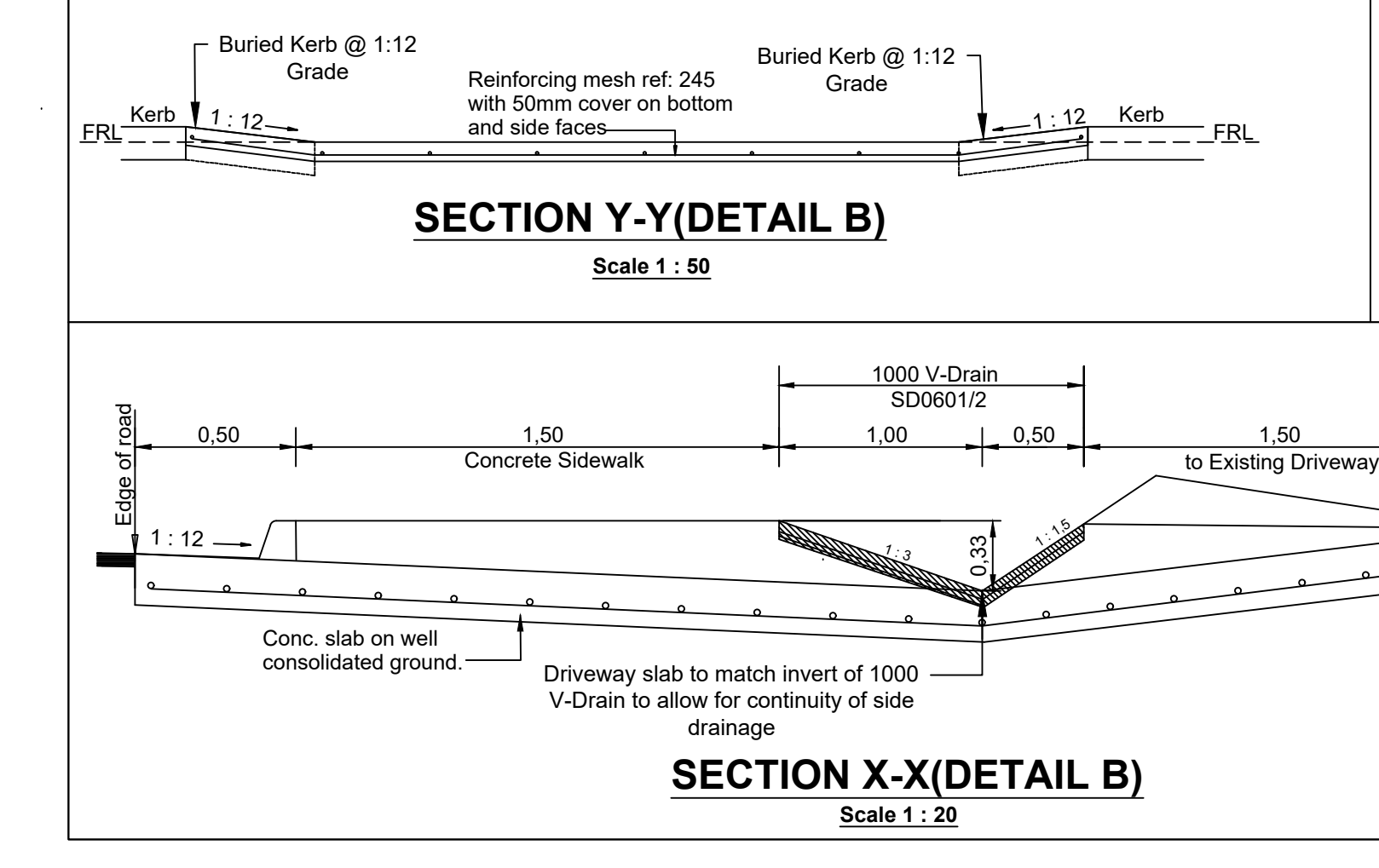
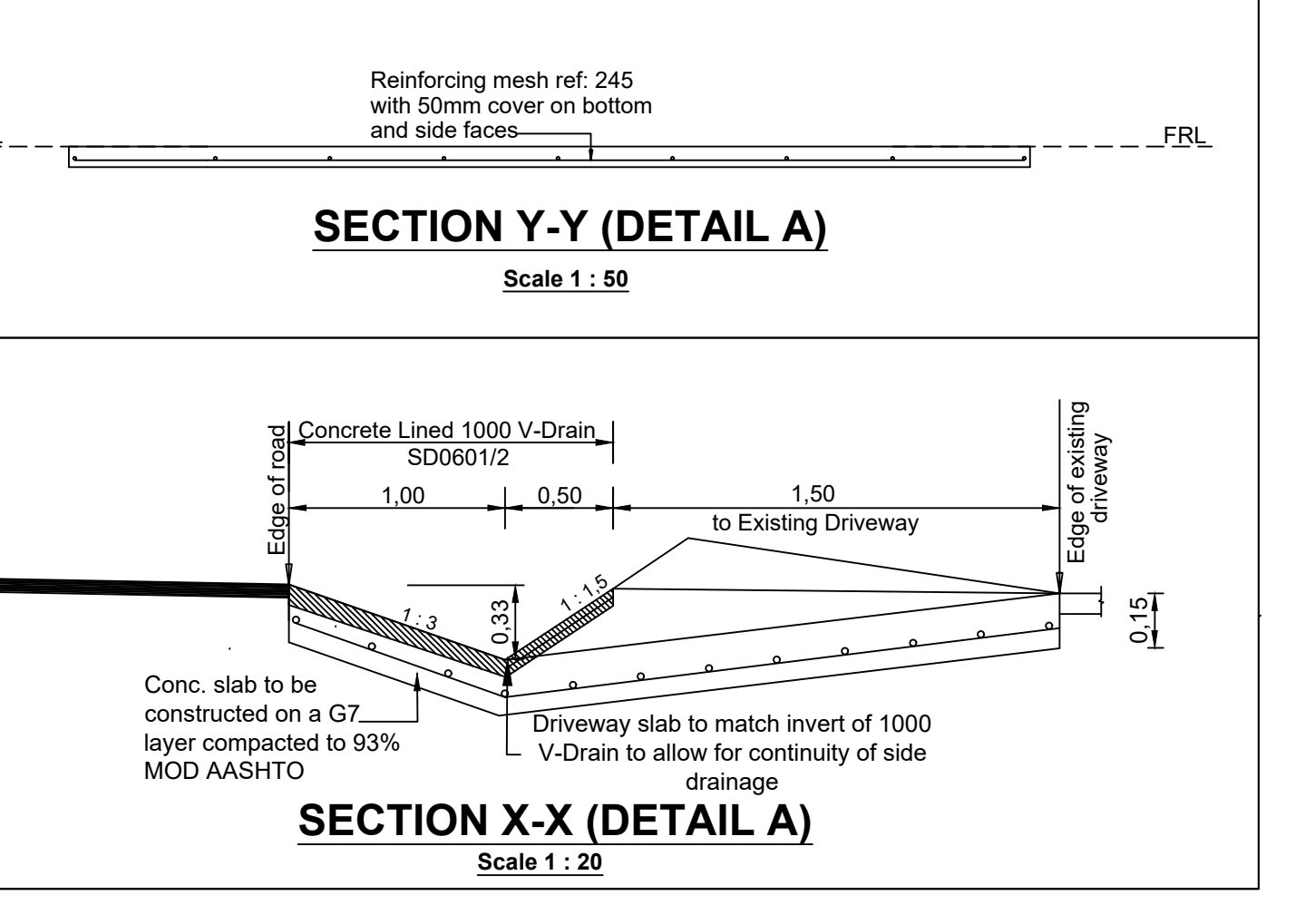
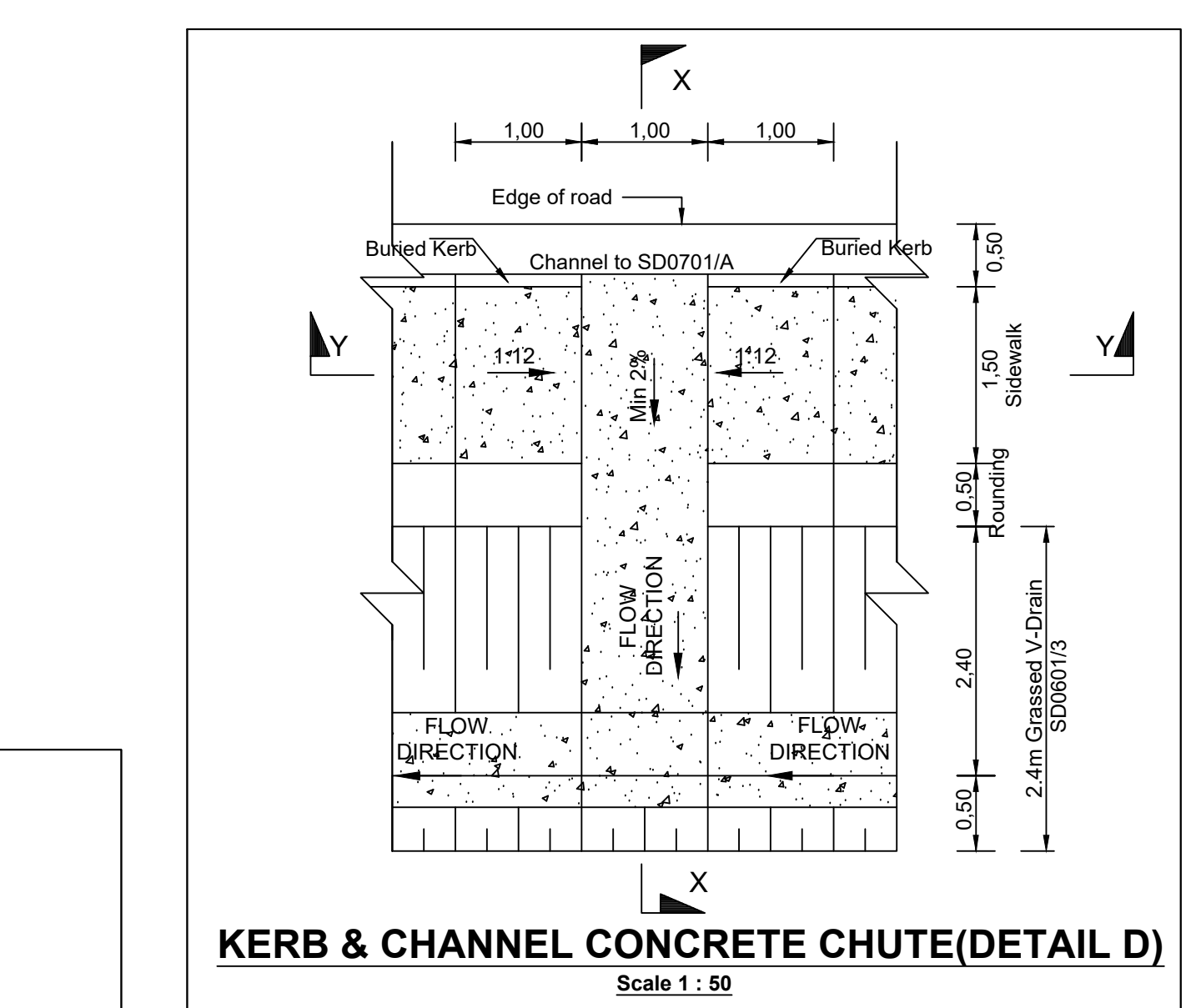
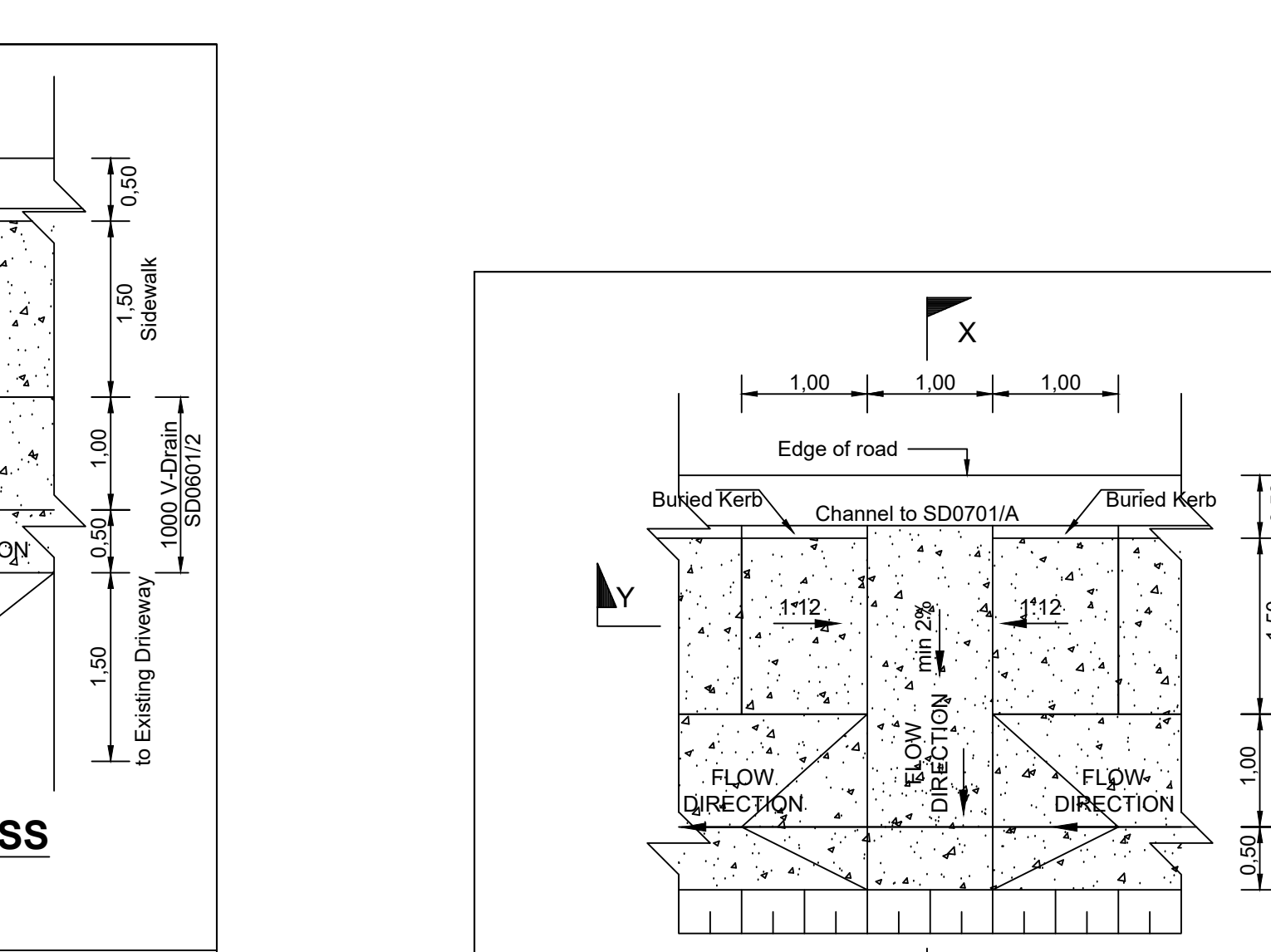
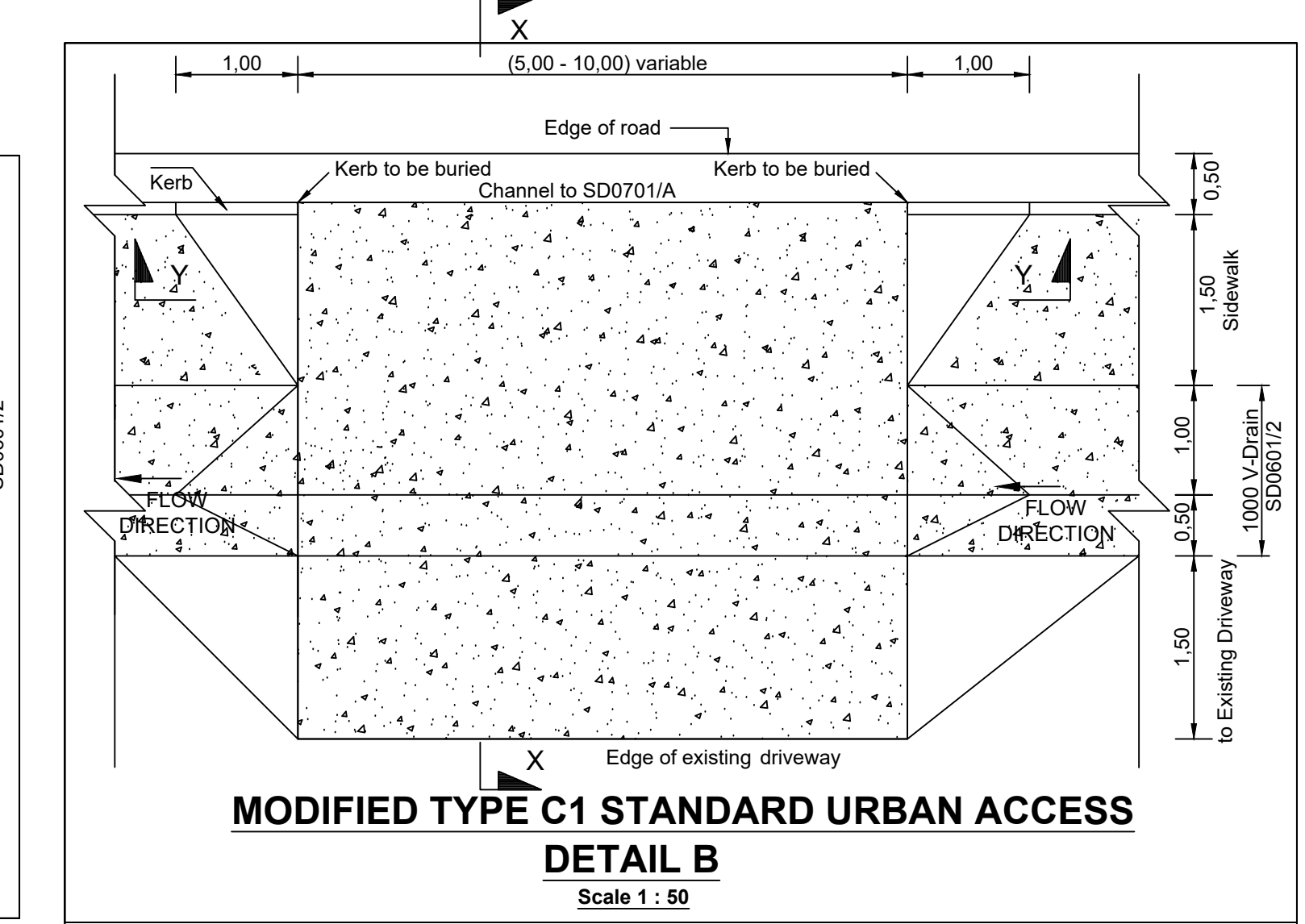
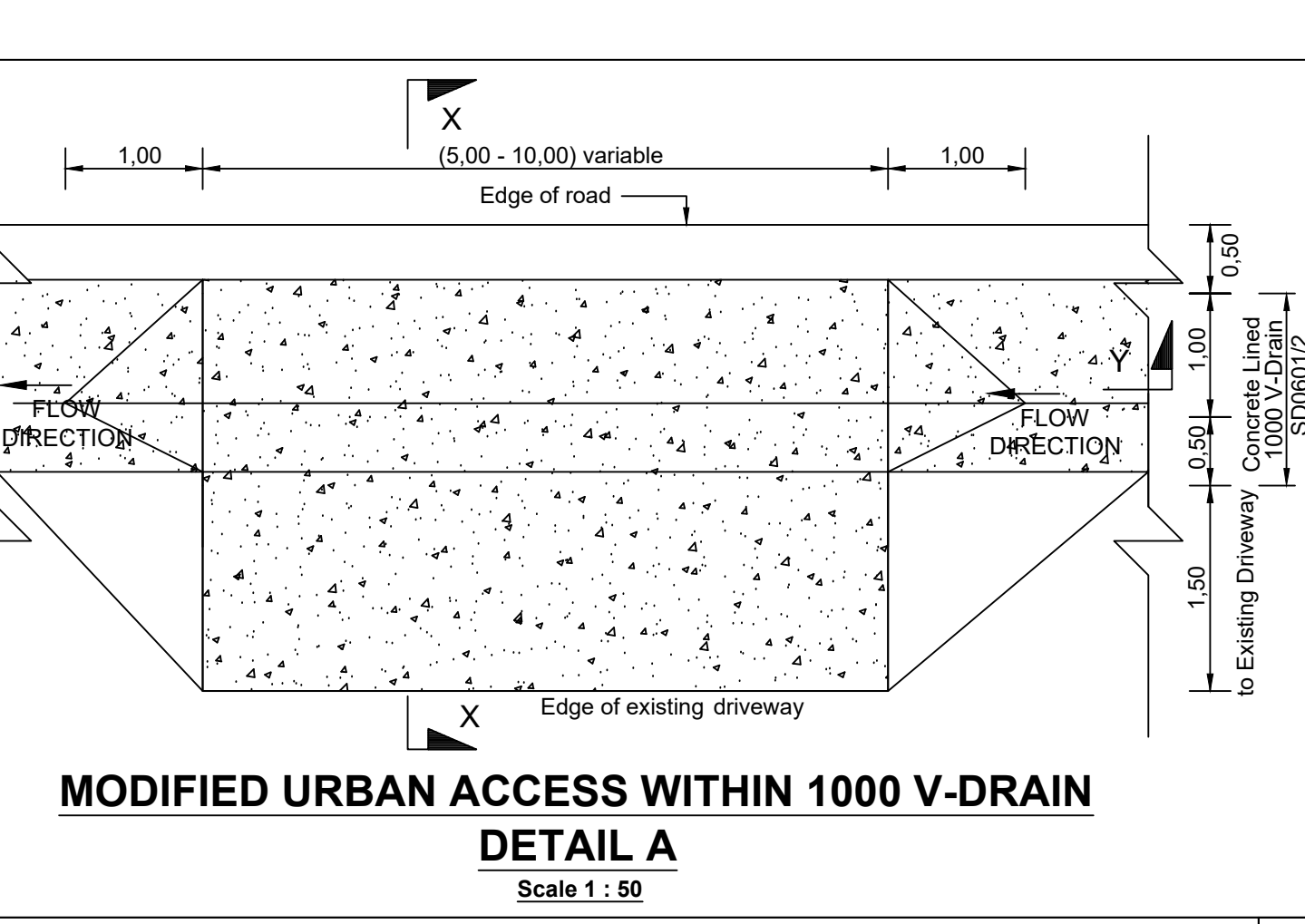
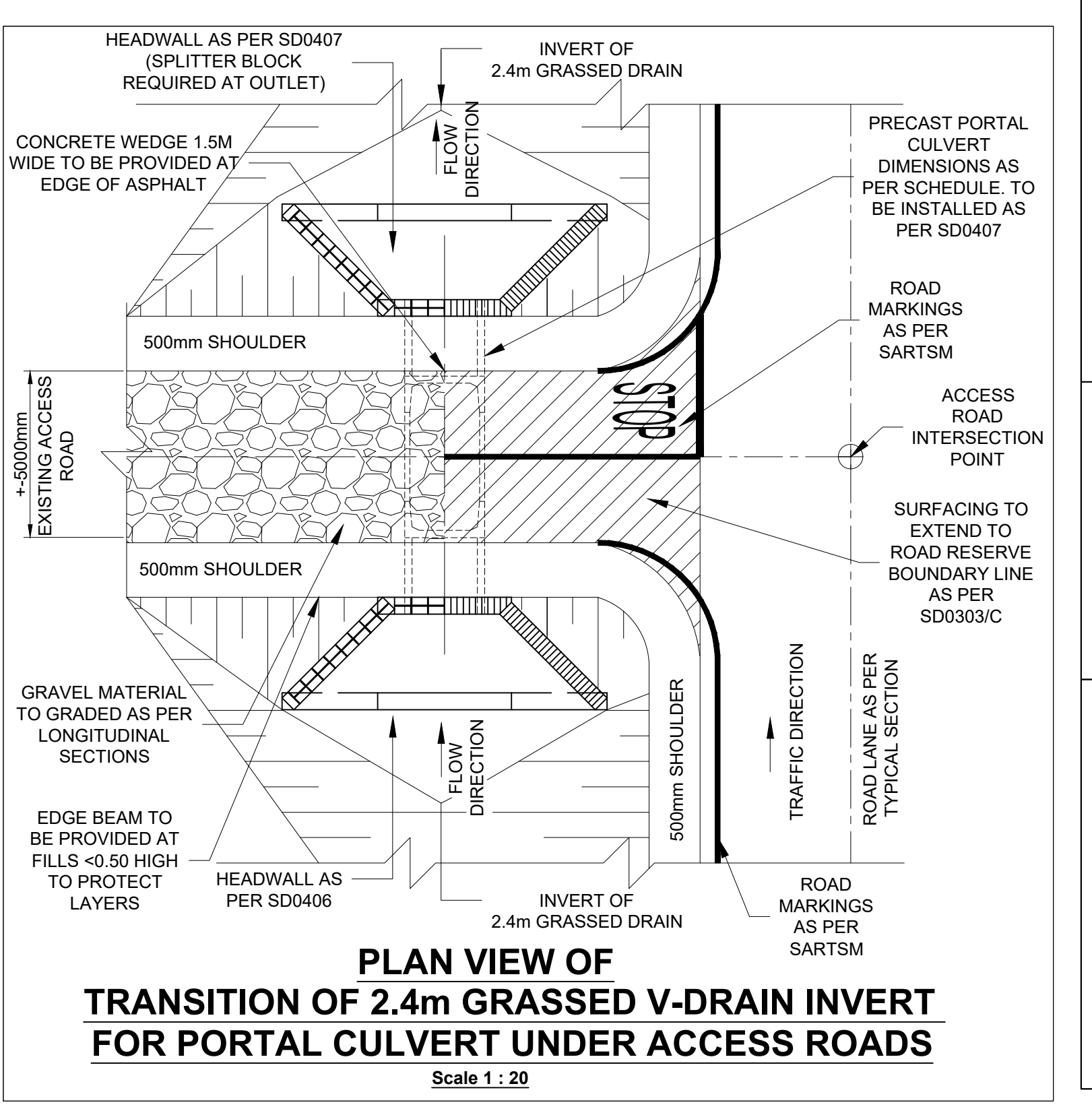
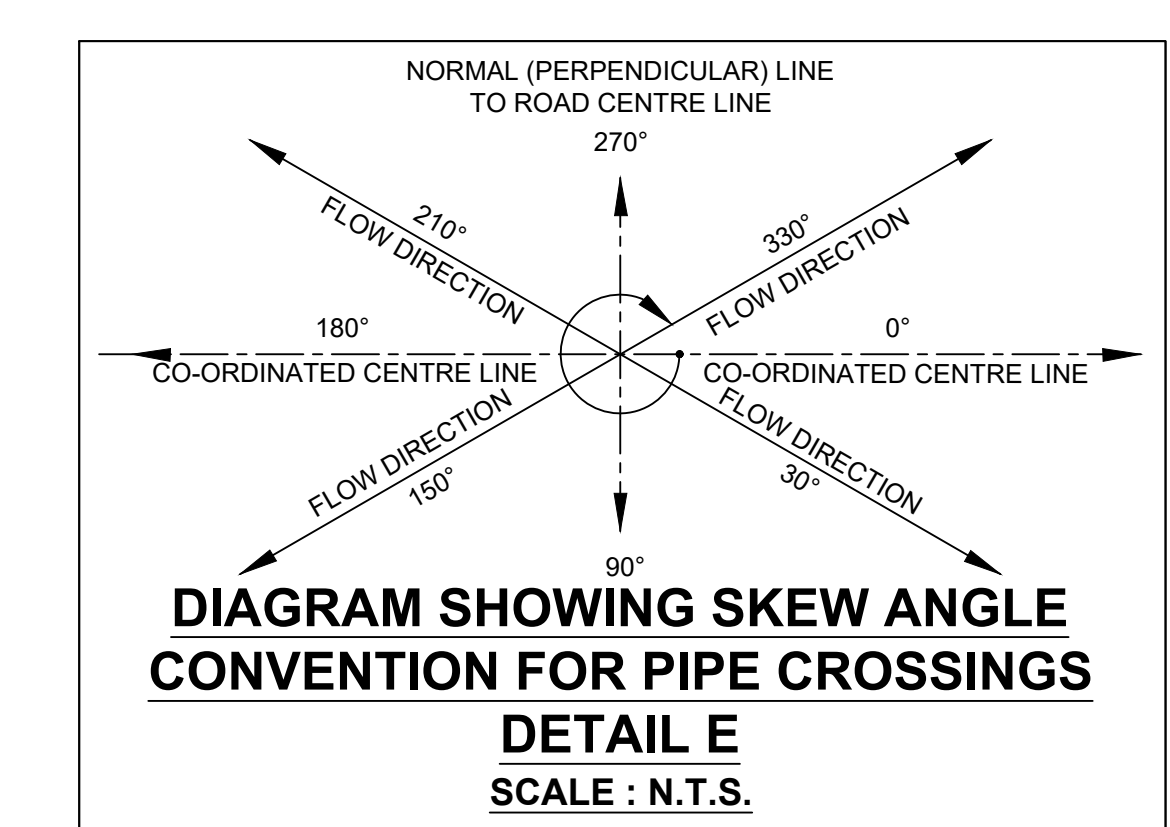
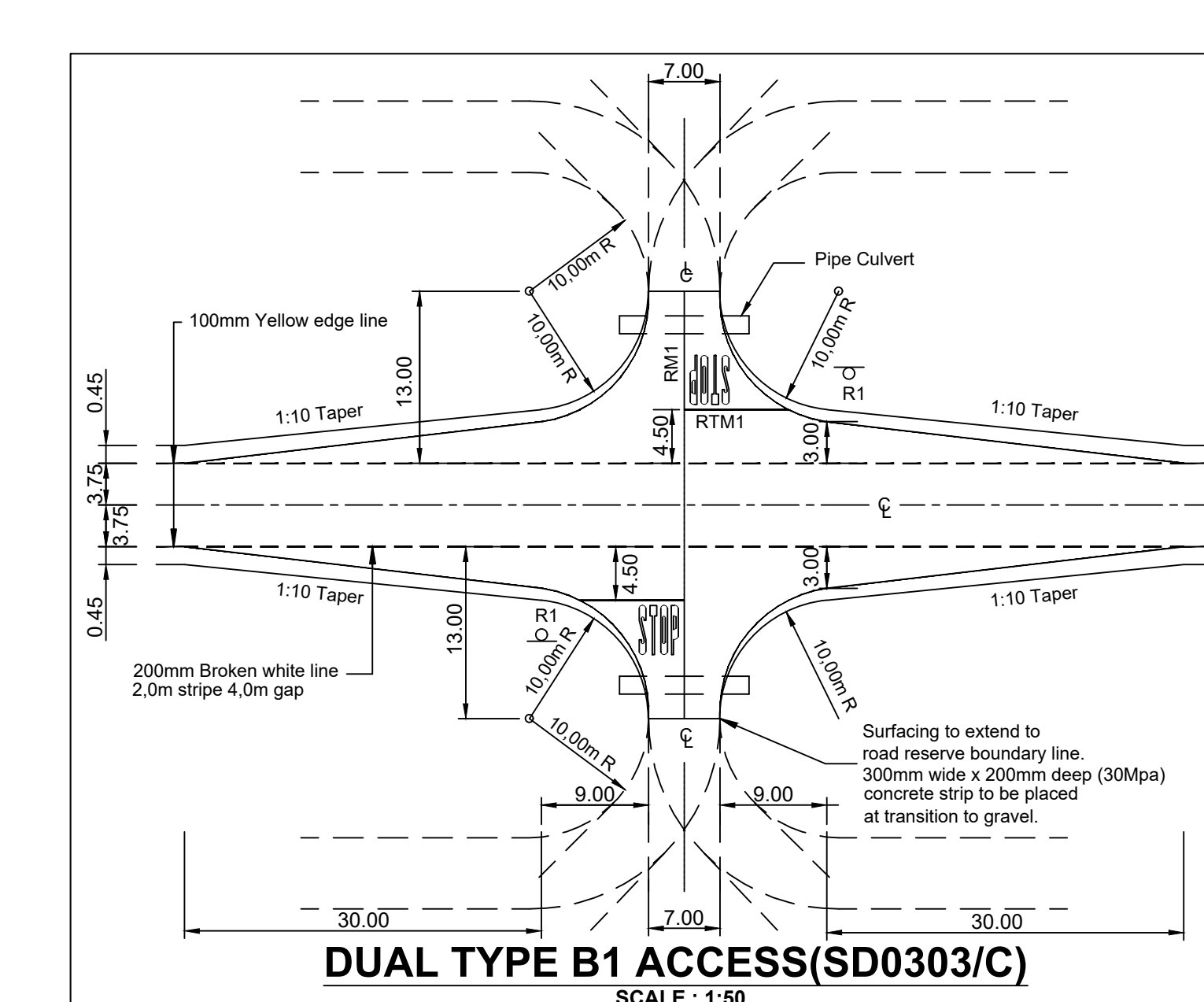
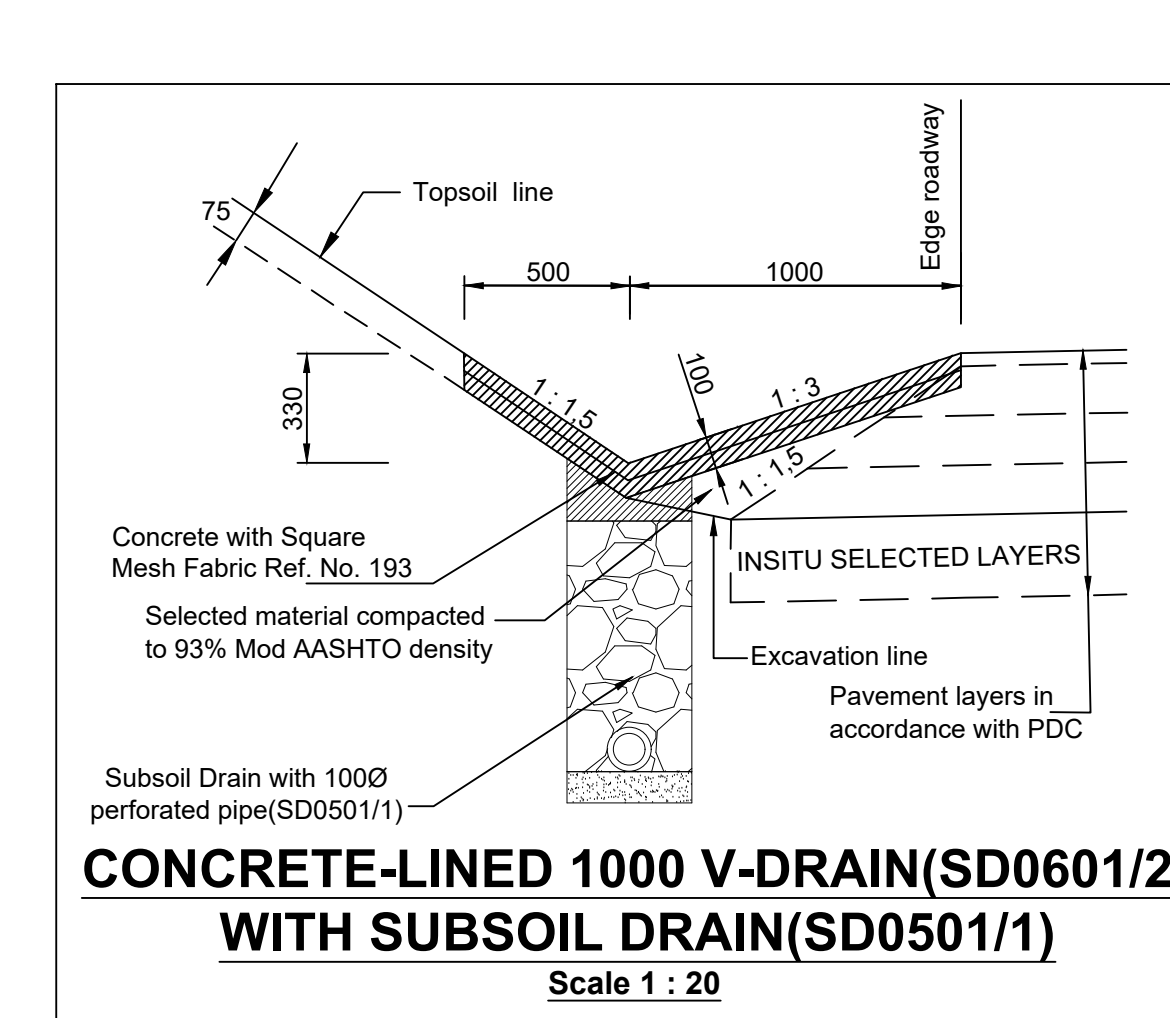
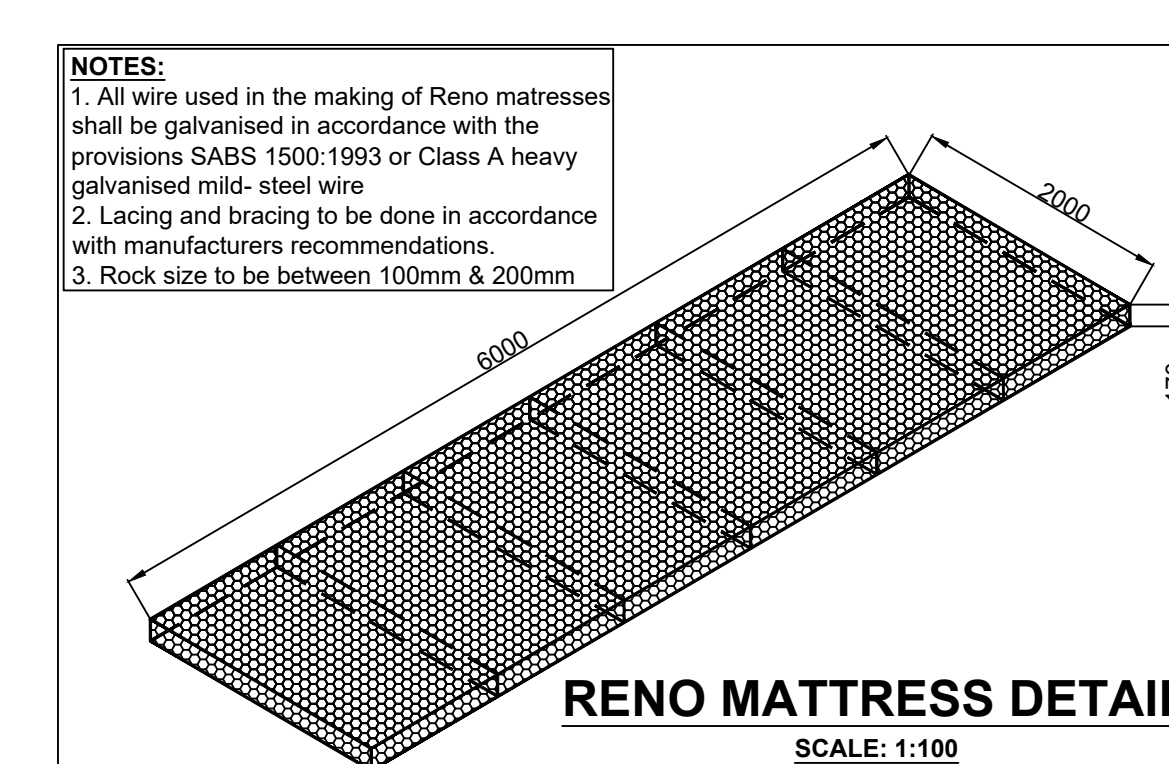
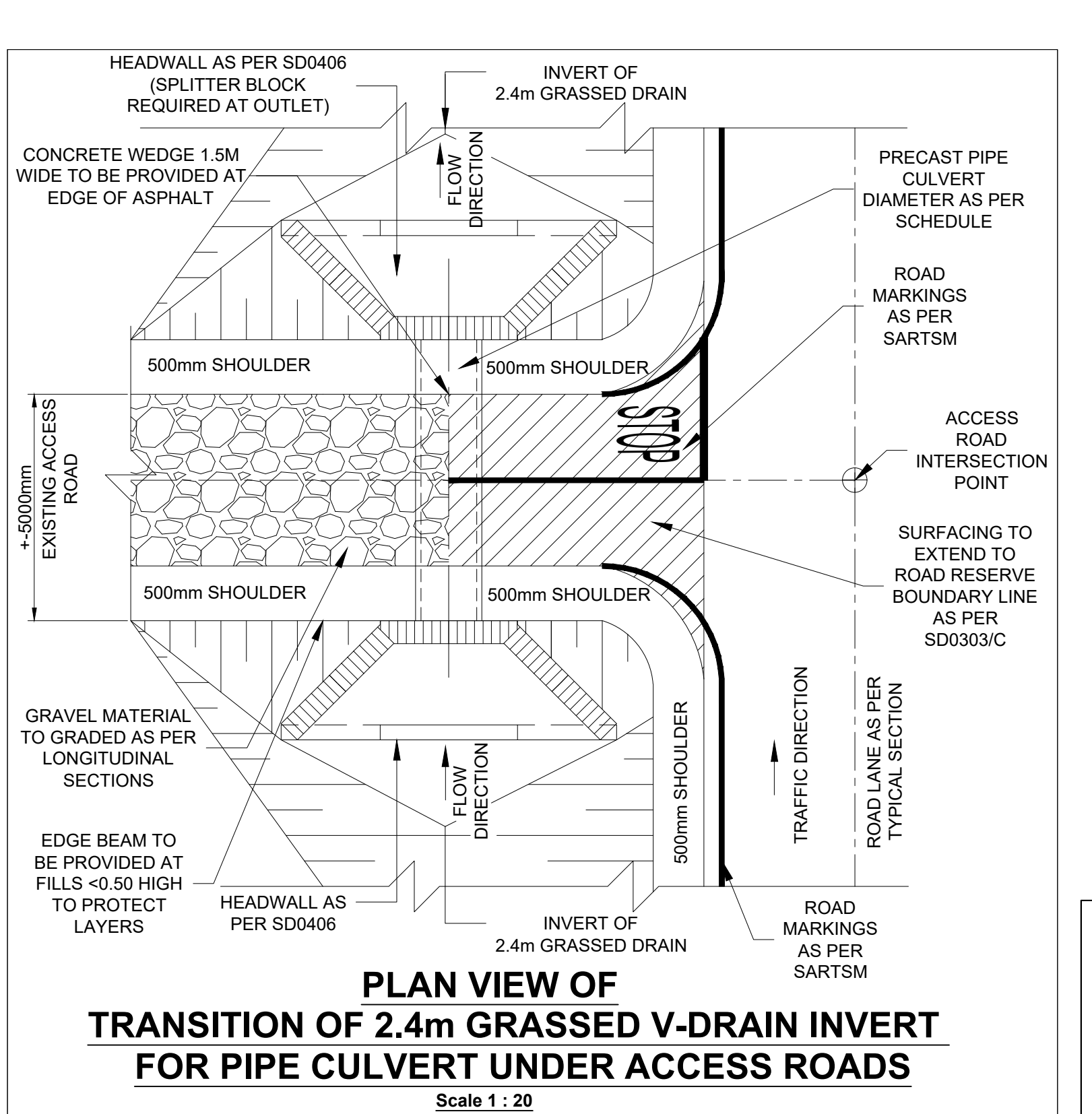
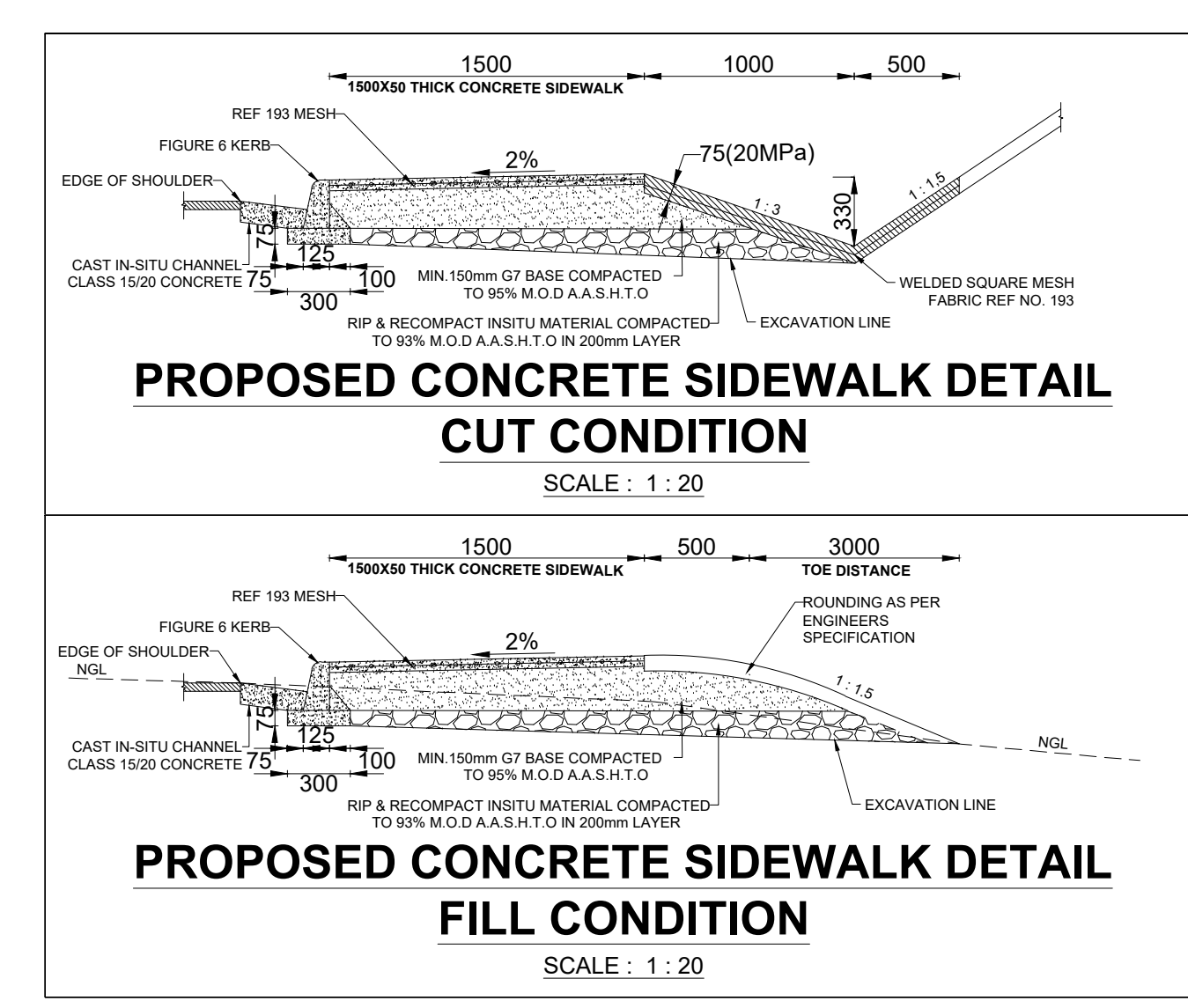
FROM CH	TO CH	LENGTH(m)	TYPE
4460	4475	15.00	WM3
4471	-	-	RTM1
4475	4820	345.00	RM1
4820	4845	25.00	WM3
4836	-	-	RTM1
4845	4888	43.00	RM1
4888	-	-	RTM1
4894	-	-	RTM1

ROAD MARKING SCHEDULE D1724

FROM CH	TO CH	LENGTH(m)	TYPE
4460	4475	15.00	WM3
44			



SUBSOIL RODDING EYE & HEADWALL DETAILS
SCALE: AS SHOWN



REV	NO	DATE	DESCRIPTION	CHECKED	SIGNED
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.		
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.		
REV 1	17/08/21	ISSUED FOR APPROVAL	P.N.		
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.		

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	-	Designed by:-	Y.NANKHOO
Continued on:-	-	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46905 - C46909	Drawn by:-	K RAMSUROOP
Long Section No:-	C46911 - C46913	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46914 - C46919	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
Consulting Engineers
151-153 HERMANUS STREET, DURBAN
TEL: 031 261 1111 FAX: 031 261 1112
WWW.NANKHOO.CO.ZA

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

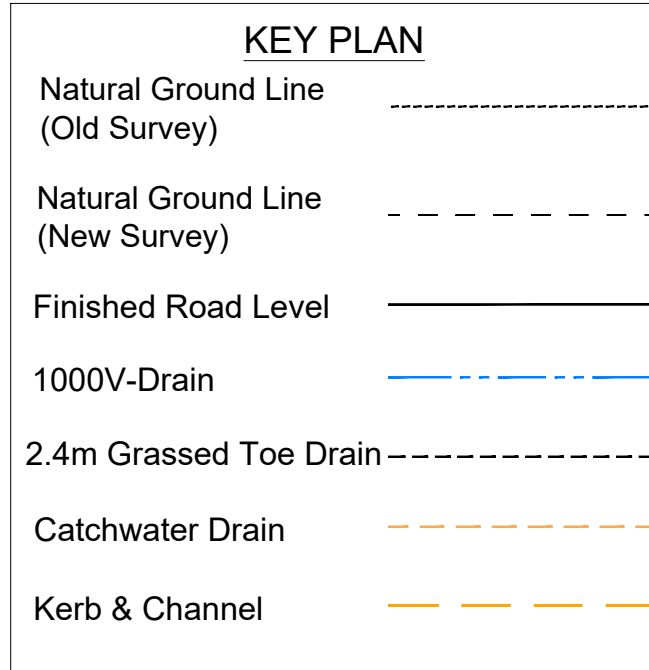
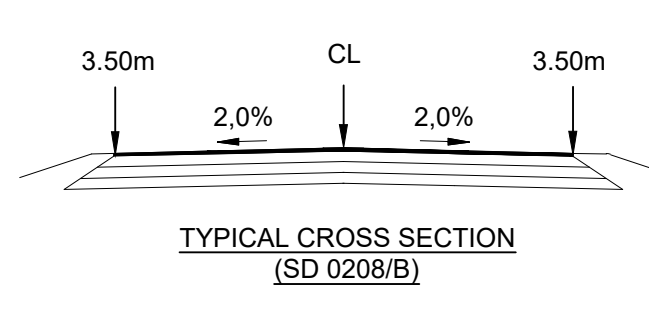
STANDARD DETAILS

FOR TENDER PURPOSES	
Staked km distance	Sheet 01 of 01
Scale AS SHOWN	Plan No.: C46910

NOTE:
Schedule including Surfacing Type and Chainages.

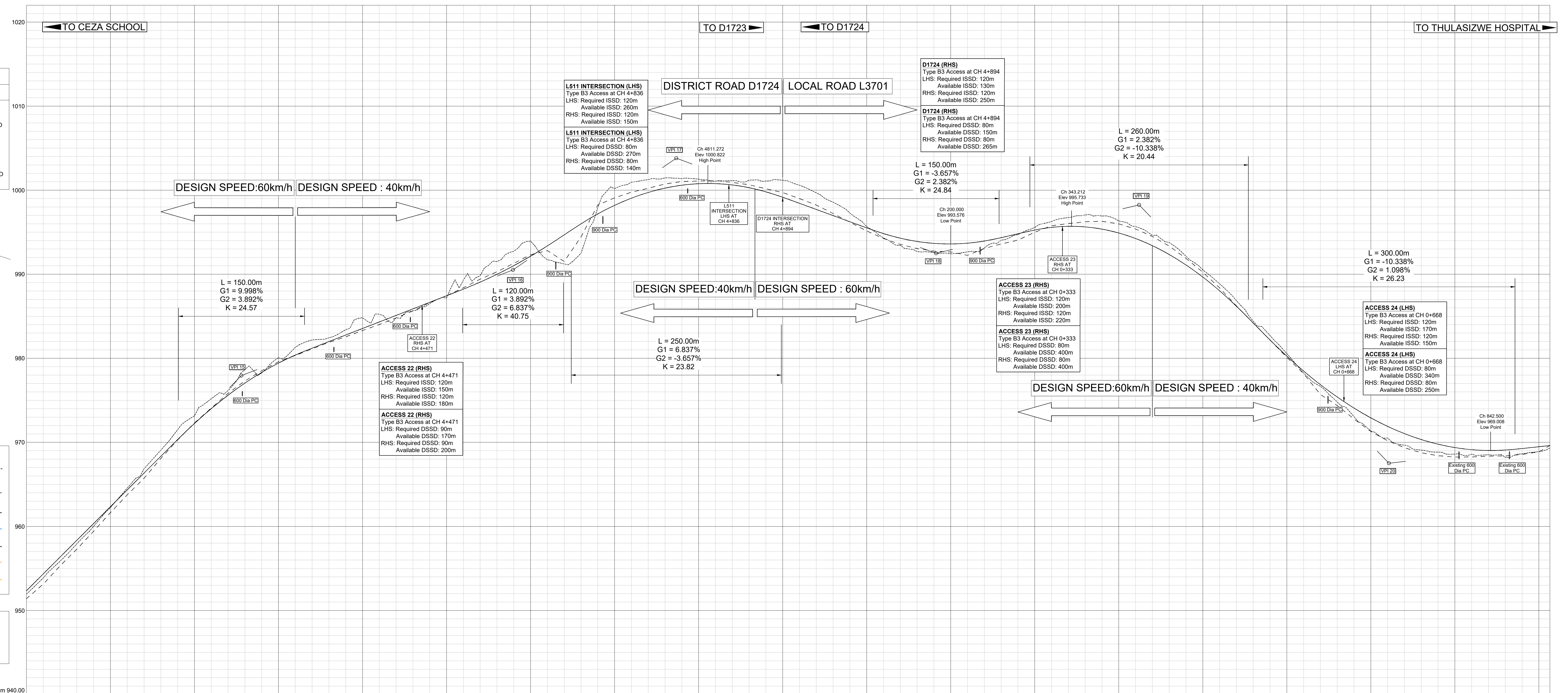
Chainage (km)	Surfacing Type
4.000 - 4.894 & 0.000 - 0.922	S2 DOUBLE SEAL

PAVEMENT DESIGN
 20mm S2 Double Seal
 150mm C4 Base Compacted to 98% MOD AASHTO
 150mm C4 Stabilised Subbase Compacted to 96% MOD AASHTO
 150mm G7 Selected Material Compacted to 95% MOD AASHTO
 150mm G7 Selected Material Compacted to 93% MOD AASHTO
 200mm In situ G10 Material Compacted to 90% MOD AASHTO

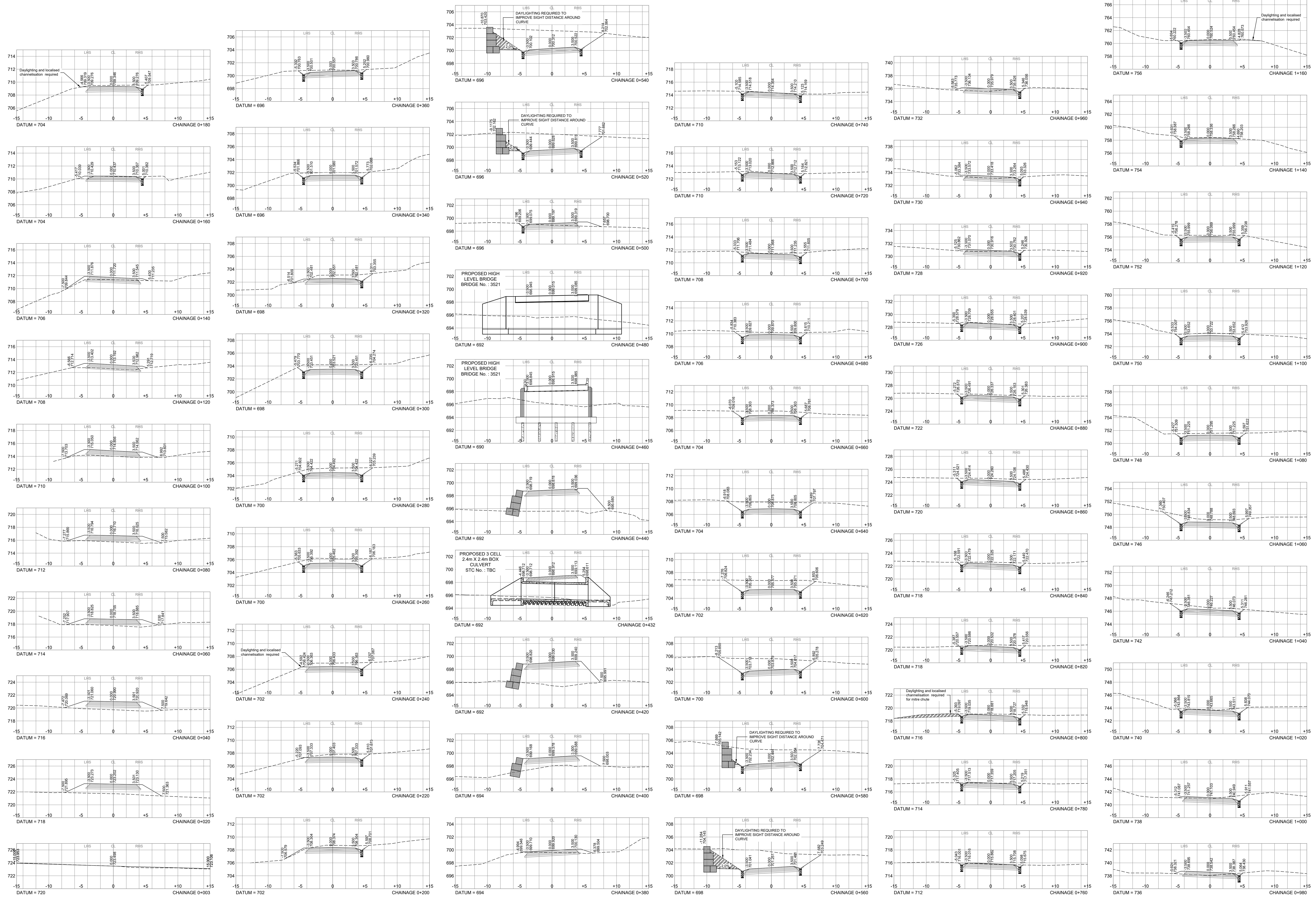


SCALE

Horizontal 1:2000
Vertical 1:200




Staked Ground Level	60 Km/hr										40 Km/hr										60 Km/hr										40 Km/hr																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Cut Volumes (m³) (+)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Fill Volumes (m³) (-)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Net Volumes (m³)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Vertical Alignment	<table border="1"> <thead> <tr> <th>Staked Ground Level</th> <th>Left Edge 3.50m Left of Centerline</th> <th>Centre Line</th> <th>Right Edge 3.50m Right of Centerline</th> <th>Grades</th> <th>Vertical Curves</th> <th>Superelevation</th> <th>Horizontal Curves</th> </tr> </thead> <tbody> <tr> <td>951.671</td><td>952.348</td><td>952.348</td><td>952.278</td><td>9.998 %</td><td>BVC 4180.97</td><td>5.20%</td><td>C 19 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>951.126</td><td>951.803</td><td>951.803</td><td>951.733</td><td>4.255/967</td><td>180.00m VC K=24.57</td><td>-2.00%</td><td>C 20 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>950.350</td><td>950.827</td><td>950.827</td><td>950.757</td><td>3.892 %</td><td>EVC 4330.97</td><td>4.80%</td><td>C 21 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>949.574</td><td>950.051</td><td>950.051</td><td>949.984</td><td>6.837 %</td><td>BVC 4519.14</td><td>5.50%</td><td>C 22 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>948.798</td><td>949.275</td><td>949.275</td><td>949.208</td><td>4.773/394</td><td>EVC 4634.39</td><td>6.00%</td><td>C 23 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>948.022</td><td>948.500</td><td>948.500</td><td>948.433</td><td>1003.800</td><td>BVC 4803.89</td><td>5.95%</td><td>C 24 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>947.246</td><td>947.723</td><td>947.723</td><td>947.656</td><td>-3.657 %</td><td>EVC 4919.14</td><td>3.40%</td><td>C 25 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>946.470</td><td>946.947</td><td>946.947</td><td>946.880</td><td>2.382 %</td><td>BVC 5107.55</td><td>4.15%</td><td>C 26 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>945.694</td><td>946.171</td><td>946.171</td><td>946.104</td><td>4.242/12</td><td>EVC 5222.80</td><td>-2.00%</td><td>C 27 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>944.918</td><td>945.395</td><td>945.395</td><td>945.328</td><td>998.250</td><td>BVC 5411.21</td><td>-4.75%</td><td>C 28 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>944.142</td><td>944.620</td><td>944.620</td><td>944.553</td><td>1.098 %</td><td>EVC 5526.46</td><td>0.00%</td><td>C 29 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>943.366</td><td>943.843</td><td>943.843</td><td>943.776</td><td></td><td>BVC 5714.87</td><td></td><td>C 30 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>942.590</td><td>943.067</td><td>943.067</td><td>943.000</td><td></td><td>EVC 5830.12</td><td></td><td>C 31 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>941.814</td><td>942.291</td><td>942.291</td><td>942.224</td><td></td><td>BVC 6018.53</td><td></td><td>C 32 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>941.038</td><td>941.515</td><td>941.515</td><td>941.448</td><td></td><td>EVC 6133.78</td><td></td><td>C 33 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>940.262</td><td>940.739</td><td>940.739</td><td>940.672</td><td></td><td>BVC 6322.19</td><td></td><td>C 34 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>939.486</td><td>939.963</td><td>939.963</td><td>939.896</td><td></td><td>EVC 6437.44</td><td></td><td>C 35 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>938.710</td><td>939.187</td><td>939.187</td><td>939.120</td><td></td><td>BVC 6625.85</td><td></td><td>C 36 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>937.934</td><td>938.411</td><td>938.411</td><td>938.344</td><td></td><td>EVC 6741.10</td><td></td><td>C 37 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>937.158</td><td>937.635</td><td>937.635</td><td>937.568</td><td></td><td>BVC 6929.51</td><td></td><td>C 38 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>936.382</td><td>936.859</td><td>936.859</td><td>936.792</td><td></td><td>EVC 7056.76</td><td></td><td>C 39 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>935.606</td><td>936.083</td><td>936.083</td><td>936.016</td><td></td><td>BVC 7245.17</td><td></td><td>C 40 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>934.830</td><td>935.307</td><td>935.307</td><td>935.240</td><td></td><td>EVC 7361.42</td><td></td><td>C 41 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>934.054</td><td>934.531</td><td>934.531</td><td>934.464</td><td></td><td>BVC 7529.83</td><td></td><td>C 42 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>933.278</td><td>933.755</td><td>933.755</td><td>933.688</td><td></td><td>EVC 7647.08</td><td></td><td>C 43 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>932.502</td><td>932.979</td><td>932.979</td><td>932.912</td><td></td><td>BVC 7816.24</td><td></td><td>C 44 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>931.726</td><td>932.203</td><td>932.203</td><td>932.136</td><td></td><td>EVC 7932.53</td><td></td><td>C 45 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>930.950</td><td>931.427</td><td>931.427</td><td>931.360</td><td></td><td>BVC 8104.65</td><td></td><td>C 46 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>930.174</td><td>930.651</td><td>930.651</td><td>930.584</td><td></td><td>EVC 8220.84</td><td></td><td>C 47 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>929.398</td><td>929.875</td><td>929.875</td><td>929.808</td><td></td><td>BVC 8392.76</td><td></td><td>C 48 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>928.622</td><td>929.100</td><td>929.100</td><td>929.033</td><td></td><td>EVC 8508.01</td><td></td><td>C 49 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>927.846</td><td>928.324</td><td>928.324</td><td>928.257</td><td></td><td>BVC 8680.13</td><td></td><td>C 50 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>927.070</td><td>927.548</td><td>927.548</td><td>927.481</td><td></td><td>EVC 8796.32</td><td></td><td>C 51 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>926.294</td><td>926.772</td><td>926.772</td><td>926.705</td><td></td><td>BVC 8968.24</td><td></td><td>C 52 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>925.518</td><td>926.000</td><td>926.000</td><td>925.933</td><td></td><td>EVC 9081.59</td><td></td><td>C 53 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>924.742</td><td>925.224</td><td>925.224</td><td>925.157</td><td></td><td>BVC 9253.71</td><td></td><td>C 54 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>923.966</td><td>924.448</td><td>924.448</td><td>924.381</td><td></td><td>EVC 9367.00</td><td></td><td>C 55 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>923.190</td><td>923.672</td><td>923.672</td><td>923.605</td><td></td><td>BVC 9535.83</td><td></td><td>C 56 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>922.414</td><td>922.896</td><td>922.896</td><td>922.829</td><td></td><td>EVC 9652.29</td><td></td><td>C 57 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>921.638</td><td>922.120</td><td>922.120</td><td>922.053</td><td></td><td>BVC 9827.41</td><td></td><td>C 58 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>920.862</td><td>921.344</td><td>921.344</td><td>921.277</td><td></td><td>EVC 9943.76</td><td></td><td>C 59 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>920.086</td><td>920.568</td><td>920.568</td><td>920.501</td><td></td><td>BVC 10101.93</td><td></td><td>C 60 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>919.310</td><td>919.792</td><td>919.792</td><td>919.725</td><td></td><td>EVC 10217.18</td><td></td><td>C 61 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>918.534</td><td>919.016</td><td>919.016</td><td>918.949</td><td></td><td>BVC 10389.30</td><td></td><td>C 62 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>917.758</td><td>918.240</td><td>918.240</td><td>918.173</td><td></td><td>EVC 10504.42</td><td></td><td>C 63 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>916.982</td><td>917.464</td><td>917.464</td><td>917.397</td><td></td><td>BVC 10676.44</td><td></td><td>C 64 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>916.206</td><td>916.688</td><td>916.688</td><td>916.621</td><td></td><td>EVC 10791.67</td><td></td><td>C 65 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>915.430</td><td>915.912</td><td>915.912</td><td>915.845</td><td></td><td>BVC 10943.79</td><td></td><td>C 66 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>914.654</td><td>915.136</td><td>915.136</td><td>915.069</td><td></td><td>EVC 11058.90</td><td></td><td>C 67 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>913.878</td><td>914.360</td><td>914.360</td><td>914.293</td><td></td><td>BVC 11221.01</td><td></td><td>C 68 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>913.102</td><td>913.584</td><td>913.584</td><td>913.517</td><td></td><td>EVC 11337.02</td><td></td><td>C 69 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>912.326</td><td>912.808</td><td>912.808</td><td>912.741</td><td></td><td>BVC 11503.14</td><td></td><td>C 70 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>911.550</td><td>912.032</td><td>912.032</td><td>911.965</td><td></td><td>EVC 11618.15</td><td></td><td>C 71 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>910.774</td><td>911.256</td><td>911.256</td><td>911.189</td><td></td><td>BVC 11784.26</td><td></td><td>C 72 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>910.000</td><td>910.480</td><td>910.480</td><td>910.413</td><td></td><td>EVC 11829.27</td><td></td><td>C 73 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>909.224</td><td>909.704</td><td>909.704</td><td>909.637</td><td></td><td>BVC 12057.38</td><td></td><td>C 74 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>908.448</td><td>908.928</td><td>908.928</td><td>908.861</td><td></td><td>EVC 12172.39</td><td></td><td>C 75 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>907.672</td><td>908.152</td><td>908.152</td><td>908.085</td><td></td><td>BVC 12343.50</td><td></td><td>C 76 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>906.896</td><td>907.376</td><td>907.376</td><td>907.309</td><td></td><td>EVC 12458.51</td><td></td><td>C 77 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>906.120</td><td>906.600</td><td>906.600</td><td>906.533</td><td></td><td>BVC 12619.62</td><td></td><td>C 78 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>905.344</td><td>905.824</td><td>905.824</td><td>905.757</td><td></td><td>EVC 12734.63</td><td></td><td>C 79 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>904.568</td><td>905.048</td><td>905.048</td><td>904.981</td><td></td><td>BVC 12900.73</td><td></td><td>C 80 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>903.792</td><td>904.272</td><td>904.272</td><td>904.205</td><td></td><td>EVC 13015.74</td><td></td><td>C 81 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>903.016</td><td>903.496</td><td>903.496</td><td>903.429</td><td></td><td>BVC 13181.85</td><td></td><td>C 82 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>902.240</td><td>902.720</td><td>902.720</td><td>902.653</td><td></td><td>EVC 13296.85</td><td></td><td>C 83 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>901.464</td><td>901.944</td><td>901.944</td><td>901.877</td><td></td><td>BVC 13457.96</td><td></td><td>C 84 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>900.688</td><td>901.168</td><td>901.168</td><td>901.101</td><td></td><td>EVC 13572.97</td><td></td><td>C 85 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>900.000</td><td>900.480</td><td>900.480</td><td>900.413</td><td></td><td>BVC 13739.07</td><td></td><td>C 86 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>899.224</td><td>899.704</td><td>899.704</td><td>899.637</td><td></td><td>EVC 13854.08</td><td></td><td>C 87 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>898.448</td><td>898.928</td><td>898.928</td><td>898.861</td><td></td><td>BVC 14020.19</td><td></td><td>C 88 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>897.672</td><td>898.152</td><td>898.152</td><td>898.085</td><td></td><td>EVC 14135.20</td><td></td><td>C 89 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>896.896</td><td>897.376</td><td>897.376</td><td>897.309</td><td></td><td>BVC 14301.30</td><td></td><td>C 90 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>896.120</td><td>896.600</td><td>896.600</td><td>896.533</td><td></td><td>EVC 14416.31</td><td></td><td>C 91 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>895.344</td><td>895.824</td><td>895.824</td><td>895.757</td><td></td><td>BVC 14582.41</td><td></td><td>C 92 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>894.568</td><td>895.048</td><td>895.048</td><td>894.981</td><td></td><td>EVC 14697.42</td><td></td><td>C 93 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>893.792</td><td>894.272</td><td>894.272</td><td>894.205</td><td></td><td>BVC 14863.52</td><td></td><td>C 94 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>893.016</td><td>893.496</td><td>893.496</td><td>893.429</td><td></td><td>EVC 14978.53</td><td></td><td>C 95 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>892.240</td><td>892.720</td><td>892.720</td><td>892.653</td><td></td><td>BVC 15144.63</td><td></td><td>C 96 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>891.464</td><td>891.944</td><td>891.944</td><td>891.877</td><td></td><td>EVC 15259.54</td><td></td><td>C 97 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>890.688</td><td>891.168</td><td>891.168</td><td>891.101</td><td></td><td>BVC 15420.65</td><td></td><td>C 98 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>889.912</td><td>890.392</td><td>890.392</td><td>890.325</td><td></td><td>EVC 15535.66</td><td></td><td>C 99 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>889.136</td><td>889.616</td><td>889.616</td><td>889.549</td><td></td><td>BVC 15701.76</td><td></td><td>C 100 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>888.360</td><td>888.840</td><td>888.840</td><td>888.773</td><td></td><td>EVC 15816.77</td><td></td><td>C 101 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>887.584</td><td>888.064</td><td>888.064</td><td>888.000</td><td></td><td>BVC 15982.87</td><td></td><td>C 102 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>886.808</td><td>887.288</td><td>887.288</td><td>887.221</td><td></td><td>EVC 16097.88</td><td></td><td>C 103 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>886.032</td><td>886.512</td><td>886.512</td><td>886.445</td><td></td><td>BVC 16263.98</td><td></td><td>C 104 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>885.256</td><td>885.736</td><td>885.736</td><td>885.669</td><td></td><td>EVC 16378.99</td><td></td><td>C 105 Right R=2000.00 I=19°52'00"</td> </tr> <tr> <td>884.480</td><td>884.960</td><td>884.960</td><td>884.893</td><td></td><td>BVC 16545.09</td><td></td><td>C 106 Left R=2000.00 I=19°52'00"</td> </tr> <tr> <td>883.704</td><td>884.184</td><td>884.184</td><td>884.117</td><td></td><td>EVC</td></tr></tbody></table>																																																		Staked Ground Level	Left Edge 3.50m Left of Centerline	Centre Line	Right Edge 3.50m Right of Centerline	Grades	Vertical Curves	Superelevation	Horizontal Curves	951.671	952.348	952.348	952.278	9.998 %	BVC 4180.97	5.20%	C 19 Right R=2000.00 I=19°52'00"	951.126	951.803	951.803	951.733	4.255/967	180.00m VC K=24.57	-2.00%	C 20 Left R=2000.00 I=19°52'00"	950.350	950.827	950.827	950.757	3.892 %	EVC 4330.97	4.80%	C 21 Right R=2000.00 I=19°52'00"	949.574	950.051	950.051	949.984	6.837 %	BVC 4519.14	5.50%	C 22 Left R=2000.00 I=19°52'00"	948.798	949.275	949.275	949.208	4.773/394	EVC 4634.39	6.00%	C 23 Right R=2000.00 I=19°52'00"	948.022	948.500	948.500	948.433	1003.800	BVC 4803.89	5.95%	C 24 Left R=2000.00 I=19°52'00"	947.246	947.723	947.723	947.656	-3.657 %	EVC 4919.14	3.40%	C 25 Right R=2000.00 I=19°52'00"	946.470	946.947	946.947	946.880	2.382 %	BVC 5107.55	4.15%	C 26 Left R=2000.00 I=19°52'00"	945.694	946.171	946.171	946.104	4.242/12	EVC 5222.80	-2.00%	C 27 Right R=2000.00 I=19°52'00"	944.918	945.395	945.395	945.328	998.250	BVC 5411.21	-4.75%	C 28 Left R=2000.00 I=19°52'00"	944.142	944.620	944.620	944.553	1.098 %	EVC 5526.46	0.00%	C 29 Right R=2000.00 I=19°52'00"	943.366	943.843	943.843	943.776		BVC 5714.87		C 30 Left R=2000.00 I=19°52'00"	942.590	943.067	943.067	943.000		EVC 5830.12		C 31 Right R=2000.00 I=19°52'00"	941.814	942.291	942.291	942.224		BVC 6018.53		C 32 Left R=2000.00 I=19°52'00"	941.038	941.515	941.515	941.448		EVC 6133.78		C 33 Right R=2000.00 I=19°52'00"	940.262	940.739	940.739	940.672		BVC 6322.19		C 34 Left R=2000.00 I=19°52'00"	939.486	939.963	939.963	939.896		EVC 6437.44		C 35 Right R=2000.00 I=19°52'00"	938.710	939.187	939.187	939.120		BVC 6625.85		C 36 Left R=2000.00 I=19°52'00"	937.934	938.411	938.411	938.344		EVC 6741.10		C 37 Right R=2000.00 I=19°52'00"	937.158	937.635	937.635	937.568		BVC 6929.51		C 38 Left R=2000.00 I=19°52'00"	936.382	936.859	936.859	936.792		EVC 7056.76		C 39 Right R=2000.00 I=19°52'00"	935.606	936.083	936.083	936.016		BVC 7245.17		C 40 Left R=2000.00 I=19°52'00"	934.830	935.307	935.307	935.240		EVC 7361.42		C 41 Right R=2000.00 I=19°52'00"	934.054	934.531	934.531	934.464		BVC 7529.83		C 42 Left R=2000.00 I=19°52'00"	933.278	933.755	933.755	933.688		EVC 7647.08		C 43 Right R=2000.00 I=19°52'00"	932.502	932.979	932.979	932.912		BVC 7816.24		C 44 Left R=2000.00 I=19°52'00"	931.726	932.203	932.203	932.136		EVC 7932.53		C 45 Right R=2000.00 I=19°52'00"	930.950	931.427	931.427	931.360		BVC 8104.65		C 46 Left R=2000.00 I=19°52'00"	930.174	930.651	930.651	930.584		EVC 8220.84		C 47 Right R=2000.00 I=19°52'00"	929.398	929.875	929.875	929.808		BVC 8392.76		C 48 Left R=2000.00 I=19°52'00"	928.622	929.100	929.100	929.033		EVC 8508.01		C 49 Right R=2000.00 I=19°52'00"	927.846	928.324	928.324	928.257		BVC 8680.13		C 50 Left R=2000.00 I=19°52'00"	927.070	927.548	927.548	927.481		EVC 8796.32		C 51 Right R=2000.00 I=19°52'00"	926.294	926.772	926.772	926.705		BVC 8968.24		C 52 Left R=2000.00 I=19°52'00"	925.518	926.000	926.000	925.933		EVC 9081.59		C 53 Right R=2000.00 I=19°52'00"	924.742	925.224	925.224	925.157		BVC 9253.71		C 54 Left R=2000.00 I=19°52'00"	923.966	924.448	924.448	924.381		EVC 9367.00		C 55 Right R=2000.00 I=19°52'00"	923.190	923.672	923.672	923.605		BVC 9535.83		C 56 Left R=2000.00 I=19°52'00"	922.414	922.896	922.896	922.829		EVC 9652.29		C 57 Right R=2000.00 I=19°52'00"	921.638	922.120	922.120	922.053		BVC 9827.41		C 58 Left R=2000.00 I=19°52'00"	920.862	921.344	921.344	921.277		EVC 9943.76		C 59 Right R=2000.00 I=19°52'00"	920.086	920.568	920.568	920.501		BVC 10101.93		C 60 Left R=2000.00 I=19°52'00"	919.310	919.792	919.792	919.725		EVC 10217.18		C 61 Right R=2000.00 I=19°52'00"	918.534	919.016	919.016	918.949		BVC 10389.30		C 62 Left R=2000.00 I=19°52'00"	917.758	918.240	918.240	918.173		EVC 10504.42		C 63 Right R=2000.00 I=19°52'00"	916.982	917.464	917.464	917.397		BVC 10676.44		C 64 Left R=2000.00 I=19°52'00"	916.206	916.688	916.688	916.621		EVC 10791.67		C 65 Right R=2000.00 I=19°52'00"	915.430	915.912	915.912	915.845		BVC 10943.79		C 66 Left R=2000.00 I=19°52'00"	914.654	915.136	915.136	915.069		EVC 11058.90		C 67 Right R=2000.00 I=19°52'00"	913.878	914.360	914.360	914.293		BVC 11221.01		C 68 Left R=2000.00 I=19°52'00"	913.102	913.584	913.584	913.517		EVC 11337.02		C 69 Right R=2000.00 I=19°52'00"	912.326	912.808	912.808	912.741		BVC 11503.14		C 70 Left R=2000.00 I=19°52'00"	911.550	912.032	912.032	911.965		EVC 11618.15		C 71 Right R=2000.00 I=19°52'00"	910.774	911.256	911.256	911.189		BVC 11784.26		C 72 Left R=2000.00 I=19°52'00"	910.000	910.480	910.480	910.413		EVC 11829.27		C 73 Right R=2000.00 I=19°52'00"	909.224	909.704	909.704	909.637		BVC 12057.38		C 74 Left R=2000.00 I=19°52'00"	908.448	908.928	908.928	908.861		EVC 12172.39		C 75 Right R=2000.00 I=19°52'00"	907.672	908.152	908.152	908.085		BVC 12343.50		C 76 Left R=2000.00 I=19°52'00"	906.896	907.376	907.376	907.309		EVC 12458.51		C 77 Right R=2000.00 I=19°52'00"	906.120	906.600	906.600	906.533		BVC 12619.62		C 78 Left R=2000.00 I=19°52'00"	905.344	905.824	905.824	905.757		EVC 12734.63		C 79 Right R=2000.00 I=19°52'00"	904.568	905.048	905.048	904.981		BVC 12900.73		C 80 Left R=2000.00 I=19°52'00"	903.792	904.272	904.272	904.205		EVC 13015.74		C 81 Right R=2000.00 I=19°52'00"	903.016	903.496	903.496	903.429		BVC 13181.85		C 82 Left R=2000.00 I=19°52'00"	902.240	902.720	902.720	902.653		EVC 13296.85		C 83 Right R=2000.00 I=19°52'00"	901.464	901.944	901.944	901.877		BVC 13457.96		C 84 Left R=2000.00 I=19°52'00"	900.688	901.168	901.168	901.101		EVC 13572.97		C 85 Right R=2000.00 I=19°52'00"	900.000	900.480	900.480	900.413		BVC 13739.07		C 86 Left R=2000.00 I=19°52'00"	899.224	899.704	899.704	899.637		EVC 13854.08		C 87 Right R=2000.00 I=19°52'00"	898.448	898.928	898.928	898.861		BVC 14020.19		C 88 Left R=2000.00 I=19°52'00"	897.672	898.152	898.152	898.085		EVC 14135.20		C 89 Right R=2000.00 I=19°52'00"	896.896	897.376	897.376	897.309		BVC 14301.30		C 90 Left R=2000.00 I=19°52'00"	896.120	896.600	896.600	896.533		EVC 14416.31		C 91 Right R=2000.00 I=19°52'00"	895.344	895.824	895.824	895.757		BVC 14582.41		C 92 Left R=2000.00 I=19°52'00"	894.568	895.048	895.048	894.981		EVC 14697.42		C 93 Right R=2000.00 I=19°52'00"	893.792	894.272	894.272	894.205		BVC 14863.52		C 94 Left R=2000.00 I=19°52'00"	893.016	893.496	893.496	893.429		EVC 14978.53		C 95 Right R=2000.00 I=19°52'00"	892.240	892.720	892.720	892.653		BVC 15144.63		C 96 Left R=2000.00 I=19°52'00"	891.464	891.944	891.944	891.877		EVC 15259.54		C 97 Right R=2000.00 I=19°52'00"	890.688	891.168	891.168	891.101		BVC 15420.65		C 98 Left R=2000.00 I=19°52'00"	889.912	890.392	890.392	890.325		EVC 15535.66		C 99 Right R=2000.00 I=19°52'00"	889.136	889.616	889.616	889.549		BVC 15701.76		C 100 Left R=2000.00 I=19°52'00"	888.360	888.840	888.840	888.773		EVC 15816.77		C 101 Right R=2000.00 I=19°52'00"	887.584	888.064	888.064	888.000		BVC 15982.87		C 102 Left R=2000.00 I=19°52'00"	886.808	887.288	887.288	887.221		EVC 16097.88		C 103 Right R=2000.00 I=19°52'00"	886.032	886.512	886.512	886.445		BVC 16263.98		C 104 Left R=2000.00 I=19°52'00"	885.256	885.736	885.736	885.669		EVC 16378.99		C 105 Right R=2000.00 I=19°52'00"	884.480	884.960	884.960	884.893		BVC 16545.09		C 106 Left R=2000.00 I=19°52'00"	883.704	884.184	884.184	884.117		EVC
Staked Ground Level	Left Edge 3.50m Left of Centerline	Centre Line	Right Edge 3.50m Right of Centerline	Grades	Vertical Curves	Superelevation	Horizontal Curves																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
951.671	952.348	952.348	952.278	9.998 %	BVC 4180.97	5.20%	C 19 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
951.126	951.803	951.803	951.733	4.255/967	180.00m VC K=24.57	-2.00%	C 20 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
950.350	950.827	950.827	950.757	3.892 %	EVC 4330.97	4.80%	C 21 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
949.574	950.051	950.051	949.984	6.837 %	BVC 4519.14	5.50%	C 22 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
948.798	949.275	949.275	949.208	4.773/394	EVC 4634.39	6.00%	C 23 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
948.022	948.500	948.500	948.433	1003.800	BVC 4803.89	5.95%	C 24 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
947.246	947.723	947.723	947.656	-3.657 %	EVC 4919.14	3.40%	C 25 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
946.470	946.947	946.947	946.880	2.382 %	BVC 5107.55	4.15%	C 26 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
945.694	946.171	946.171	946.104	4.242/12	EVC 5222.80	-2.00%	C 27 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
944.918	945.395	945.395	945.328	998.250	BVC 5411.21	-4.75%	C 28 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
944.142	944.620	944.620	944.553	1.098 %	EVC 5526.46	0.00%	C 29 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
943.366	943.843	943.843	943.776		BVC 5714.87		C 30 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
942.590	943.067	943.067	943.000		EVC 5830.12		C 31 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
941.814	942.291	942.291	942.224		BVC 6018.53		C 32 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
941.038	941.515	941.515	941.448		EVC 6133.78		C 33 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
940.262	940.739	940.739	940.672		BVC 6322.19		C 34 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
939.486	939.963	939.963	939.896		EVC 6437.44		C 35 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
938.710	939.187	939.187	939.120		BVC 6625.85		C 36 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
937.934	938.411	938.411	938.344		EVC 6741.10		C 37 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
937.158	937.635	937.635	937.568		BVC 6929.51		C 38 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
936.382	936.859	936.859	936.792		EVC 7056.76		C 39 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
935.606	936.083	936.083	936.016		BVC 7245.17		C 40 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
934.830	935.307	935.307	935.240		EVC 7361.42		C 41 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
934.054	934.531	934.531	934.464		BVC 7529.83		C 42 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
933.278	933.755	933.755	933.688		EVC 7647.08		C 43 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
932.502	932.979	932.979	932.912		BVC 7816.24		C 44 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
931.726	932.203	932.203	932.136		EVC 7932.53		C 45 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
930.950	931.427	931.427	931.360		BVC 8104.65		C 46 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
930.174	930.651	930.651	930.584		EVC 8220.84		C 47 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
929.398	929.875	929.875	929.808		BVC 8392.76		C 48 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
928.622	929.100	929.100	929.033		EVC 8508.01		C 49 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
927.846	928.324	928.324	928.257		BVC 8680.13		C 50 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
927.070	927.548	927.548	927.481		EVC 8796.32		C 51 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
926.294	926.772	926.772	926.705		BVC 8968.24		C 52 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
925.518	926.000	926.000	925.933		EVC 9081.59		C 53 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
924.742	925.224	925.224	925.157		BVC 9253.71		C 54 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
923.966	924.448	924.448	924.381		EVC 9367.00		C 55 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
923.190	923.672	923.672	923.605		BVC 9535.83		C 56 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
922.414	922.896	922.896	922.829		EVC 9652.29		C 57 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
921.638	922.120	922.120	922.053		BVC 9827.41		C 58 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
920.862	921.344	921.344	921.277		EVC 9943.76		C 59 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
920.086	920.568	920.568	920.501		BVC 10101.93		C 60 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
919.310	919.792	919.792	919.725		EVC 10217.18		C 61 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
918.534	919.016	919.016	918.949		BVC 10389.30		C 62 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
917.758	918.240	918.240	918.173		EVC 10504.42		C 63 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
916.982	917.464	917.464	917.397		BVC 10676.44		C 64 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
916.206	916.688	916.688	916.621		EVC 10791.67		C 65 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
915.430	915.912	915.912	915.845		BVC 10943.79		C 66 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
914.654	915.136	915.136	915.069		EVC 11058.90		C 67 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
913.878	914.360	914.360	914.293		BVC 11221.01		C 68 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
913.102	913.584	913.584	913.517		EVC 11337.02		C 69 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
912.326	912.808	912.808	912.741		BVC 11503.14		C 70 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
911.550	912.032	912.032	911.965		EVC 11618.15		C 71 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
910.774	911.256	911.256	911.189		BVC 11784.26		C 72 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
910.000	910.480	910.480	910.413		EVC 11829.27		C 73 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
909.224	909.704	909.704	909.637		BVC 12057.38		C 74 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
908.448	908.928	908.928	908.861		EVC 12172.39		C 75 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
907.672	908.152	908.152	908.085		BVC 12343.50		C 76 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
906.896	907.376	907.376	907.309		EVC 12458.51		C 77 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
906.120	906.600	906.600	906.533		BVC 12619.62		C 78 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
905.344	905.824	905.824	905.757		EVC 12734.63		C 79 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
904.568	905.048	905.048	904.981		BVC 12900.73		C 80 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
903.792	904.272	904.272	904.205		EVC 13015.74		C 81 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
903.016	903.496	903.496	903.429		BVC 13181.85		C 82 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
902.240	902.720	902.720	902.653		EVC 13296.85		C 83 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
901.464	901.944	901.944	901.877		BVC 13457.96		C 84 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
900.688	901.168	901.168	901.101		EVC 13572.97		C 85 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
900.000	900.480	900.480	900.413		BVC 13739.07		C 86 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
899.224	899.704	899.704	899.637		EVC 13854.08		C 87 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
898.448	898.928	898.928	898.861		BVC 14020.19		C 88 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
897.672	898.152	898.152	898.085		EVC 14135.20		C 89 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
896.896	897.376	897.376	897.309		BVC 14301.30		C 90 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
896.120	896.600	896.600	896.533		EVC 14416.31		C 91 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
895.344	895.824	895.824	895.757		BVC 14582.41		C 92 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
894.568	895.048	895.048	894.981		EVC 14697.42		C 93 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
893.792	894.272	894.272	894.205		BVC 14863.52		C 94 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
893.016	893.496	893.496	893.429		EVC 14978.53		C 95 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
892.240	892.720	892.720	892.653		BVC 15144.63		C 96 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
891.464	891.944	891.944	891.877		EVC 15259.54		C 97 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
890.688	891.168	891.168	891.101		BVC 15420.65		C 98 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
889.912	890.392	890.392	890.325		EVC 15535.66		C 99 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
889.136	889.616	889.616	889.549		BVC 15701.76		C 100 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
888.360	888.840	888.840	888.773		EVC 15816.77		C 101 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
887.584	888.064	888.064	888.000		BVC 15982.87		C 102 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
886.808	887.288	887.288	887.221		EVC 16097.88		C 103 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
886.032	886.512	886.512	886.445		BVC 16263.98		C 104 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
885.256	885.736	885.736	885.669		EVC 16378.99		C 105 Right R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
884.480	884.960	884.960	884.893		BVC 16545.09		C 106 Left R=2000.00 I=19°52'00"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
883.704	884.184	884.184	884.117		EVC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											




Symbol	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/08/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

Continued from:-	-	Designed by:-	Y.NANKHOO
Continued on:-	C46915	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46905	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46911	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46914	Date of Approval:-	18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



NANKHOO
Consulting Engineers
www.nankhooceng.co.za

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____

DATE _____

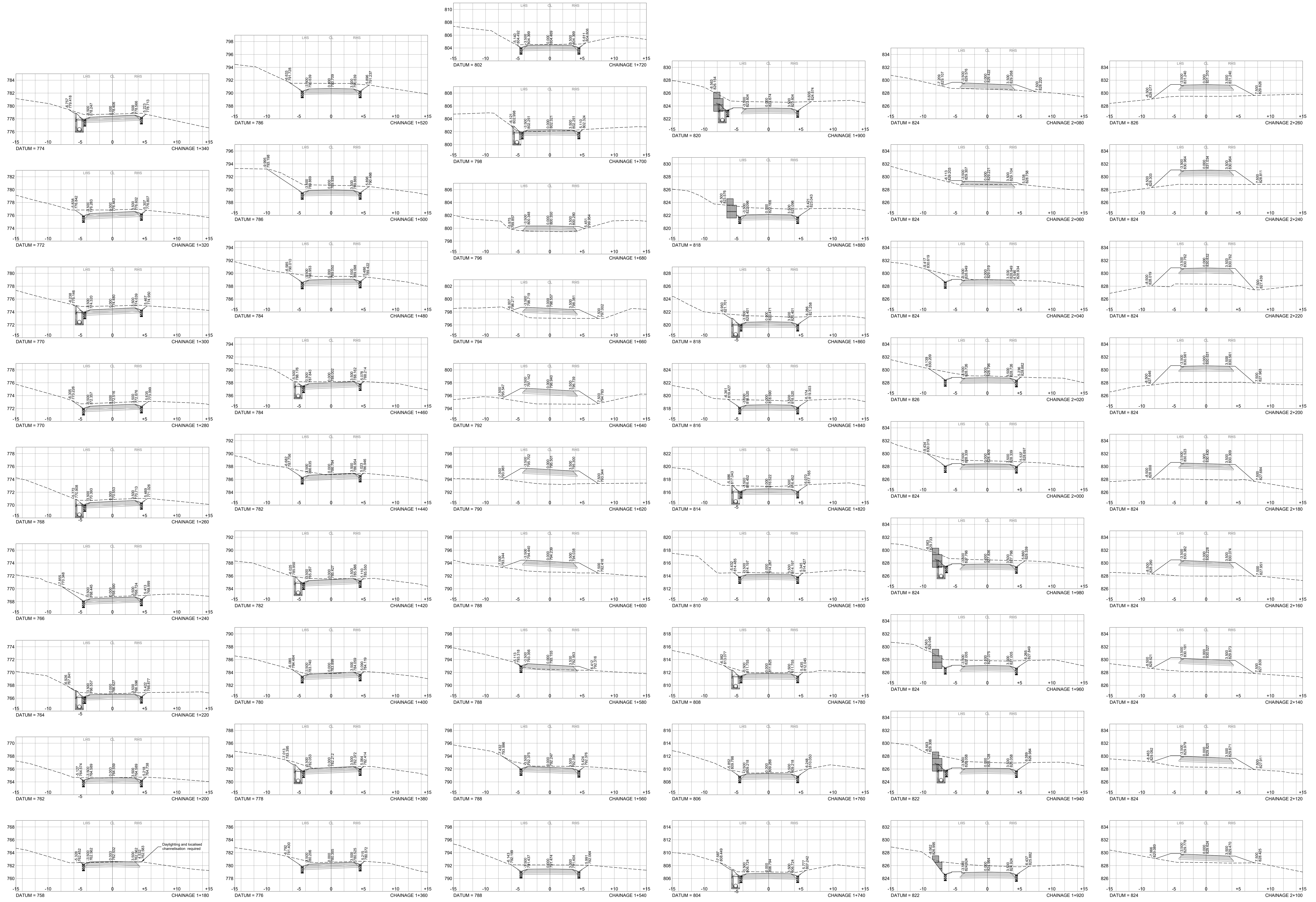
DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

CROSS SECTIONS

FOR TENDER PURPOSES	
Staked km distance	Sheet 01
Km 0.000 to Km 1.160	of 06
Scale HOR : 200 VERT : 200	Plan No.:- C46914

CONTINUED FROM SHEET C46914



CONTINUED ON SHEET C6916

REV	DATE	DESCRIPTION	CHECKED	SIGNED
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/05/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	C46914	Designed by:-	Y.NANKHOO
Continued on:-	C46916	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46906	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46911	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46915	Date of Approval:-	18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
Consulting Engineers
www.nankhoocorp.co.za

Signature: _____ Date: _____

Transportation Engineering : Chief Engineer

Head: Transport

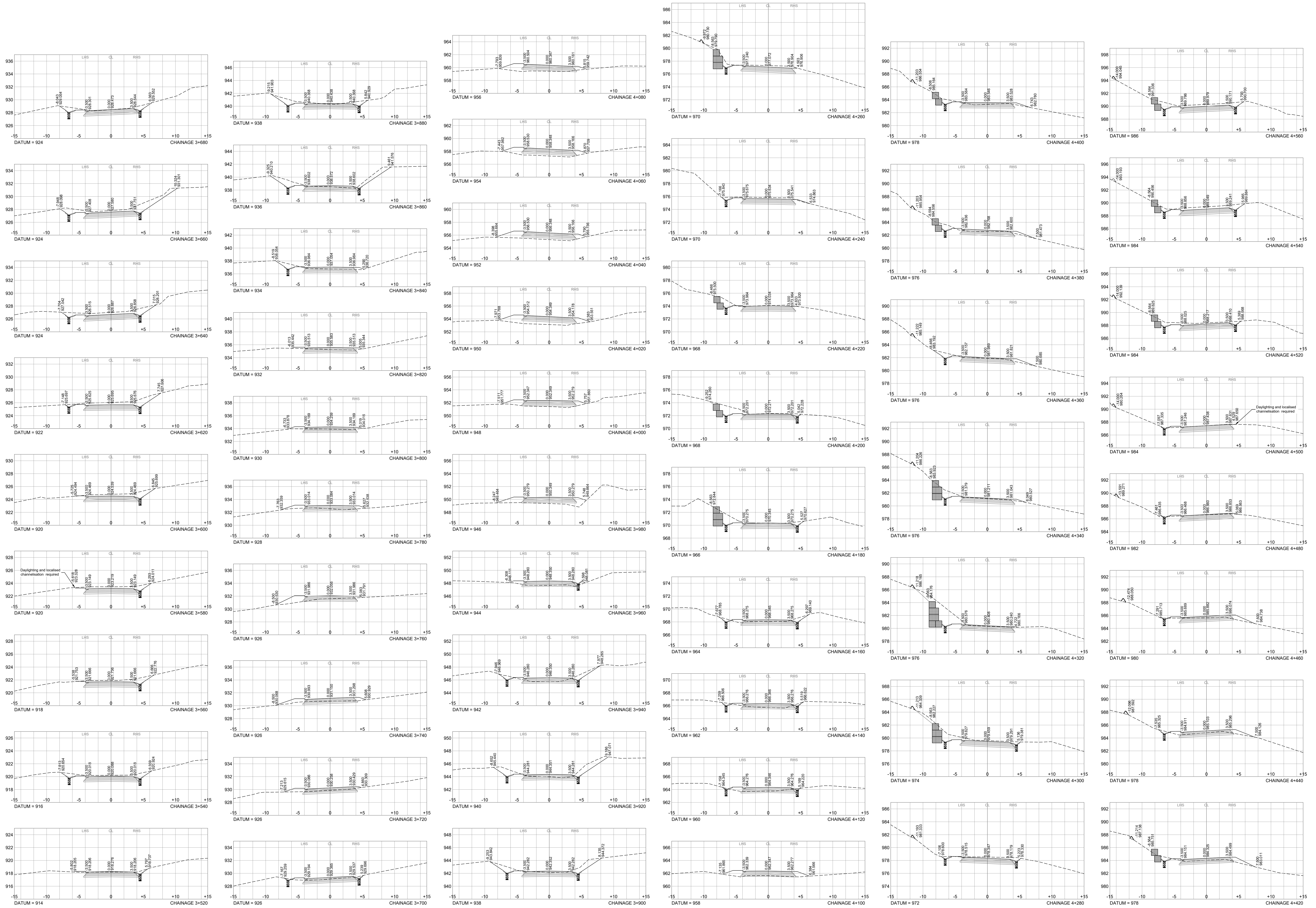
DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)
CROSS SECTIONS

FOR TENDER PURPOSES	
Staked km distance	Sheet 02
Km 1.180 to Km 2.260	of 06
Scale HOR : 200 VERT : 200	Plan No.:- C46915

C46915

CONTINUED FROM SHEET C46916



CONTINUED ON SHEET C46918

REV	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/05/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	C46916	Designed by:-	Y.NANKHOO
Continued on:-	C46918	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46908	Drawn by:-	K.RAMSURROOP
Long Section No:-	C46912 - C46913	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46917	Date of Approval:-	18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



NANKHOO
Consulting Engineers
1174111 HERZOG PAVILION, BLOCK 2001, FREE STATE UNIVERSITY
1174111 HERZOG PAVILION, BLOCK 2001, FREE STATE UNIVERSITY

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____

DATE _____

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

CROSS SECTIONS

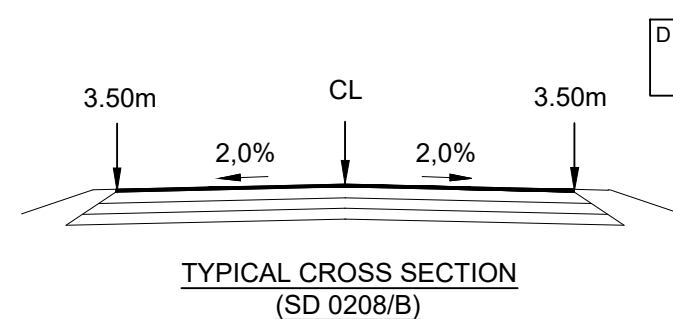
FOR TENDER PURPOSES	
Staked km distance	Sheet 04
Km 3.520 to Km 4.560	of 06
Scale HOR : 200 VERT : 200	Plan No.:- C46917

C46917

NOTE:
Schedule including Surfacing Type and Chainages.

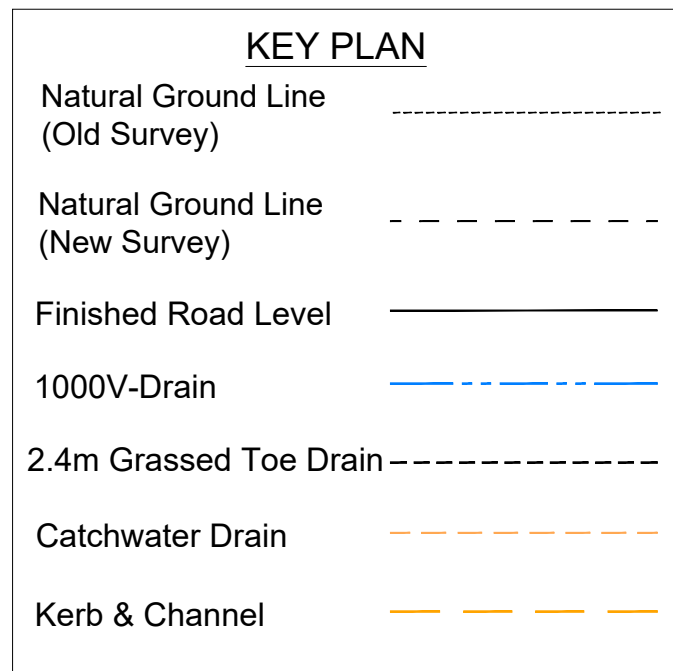
Chainage (km)	Surfacing Type
0.000 - 0.922	S2 DOUBLE SEAL

PAVEMENT DESIGN
20mm S2 Double Seal
150mm G4 Base Compacted to 98% MOD AASHTO
150mm C4 Stabilised Subbase Compacted to 96% MOD AASHTO
150mm G7 Selected Material Compacted to 95% MOD AASHTO
150mm G7 Selected Material Compacted to 93% MOD AASHTO
200mm Insitu G10 Material Compacted to 90% MOD AASHTO

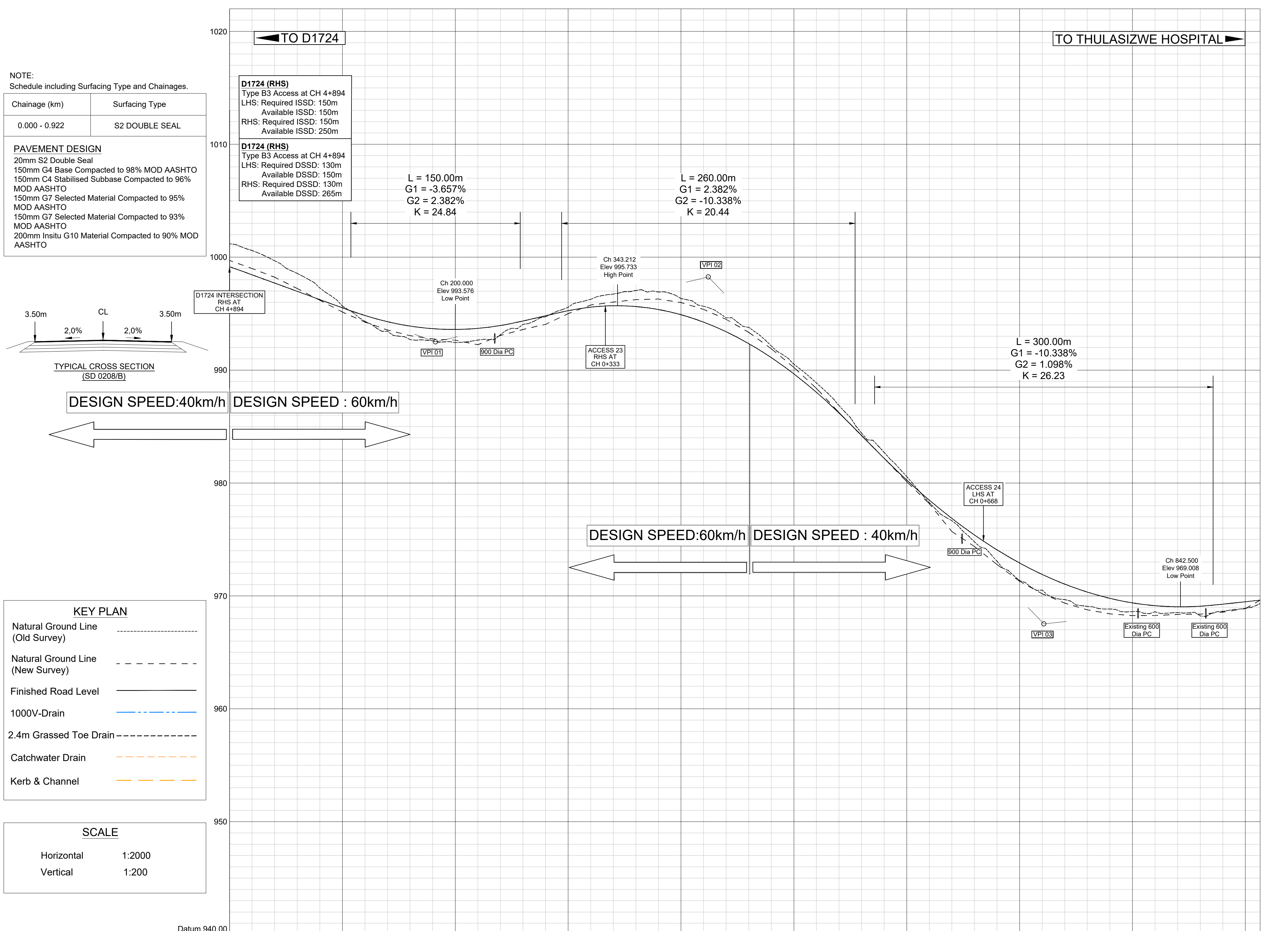


DESIGN SPEED: 40km/h DESIGN SPEED : 60km/h

DESIGN SPEED: 60km/h DESIGN SPEED : 40km/h



SCALE
Horizontal 1:2000
Vertical 1:200



Staked Kilometre Distance	Staked Ground Level		Cut Volumes (m³) (+)		Fill Volumes (m³) (-)		Nett Volumes (m³)	
	Old	New	Old	New	Old	New	Old	New
0+000	998.100	998.100	0.00	188.90	0.00	0.00	0.00	0.00
0+020	998.308	998.308	0.00	188.90	0.00	0.00	0.00	0.00
0+040	997.637	997.637	0.00	171.20	0.00	0.00	0.00	0.00
0+060	996.800	996.800	1.40	121.10	0.00	0.00	0.00	0.00
0+080	995.824	995.824	27.90	53.90	0.00	0.00	0.00	0.00
0+100	994.621	994.621	5.30	0.00	0.00	0.00	0.00	0.00
0+120	993.202	993.202	0.00	0.00	0.00	0.00	0.00	0.00
0+140	991.573	991.573	0.00	0.00	0.00	0.00	0.00	0.00
0+160	989.735	989.735	0.00	0.00	0.00	0.00	0.00	0.00
0+180	987.687	987.687	0.00	0.00	0.00	0.00	0.00	0.00
0+200	985.437	985.437	0.00	0.00	0.00	0.00	0.00	0.00
0+220	982.989	982.989	0.00	0.00	0.00	0.00	0.00	0.00
0+240	980.441	980.441	0.00	0.00	0.00	0.00	0.00	0.00
0+260	977.793	977.793	0.00	0.00	0.00	0.00	0.00	0.00
0+280	975.045	975.045	0.00	0.00	0.00	0.00	0.00	0.00
0+300	972.197	972.197	0.00	0.00	0.00	0.00	0.00	0.00
0+320	969.249	969.249	0.00	0.00	0.00	0.00	0.00	0.00
0+340	966.201	966.201	0.00	0.00	0.00	0.00	0.00	0.00
0+360	963.053	963.053	0.00	0.00	0.00	0.00	0.00	0.00
0+380	959.805	959.805	0.00	0.00	0.00	0.00	0.00	0.00
0+400	956.457	956.457	0.00	0.00	0.00	0.00	0.00	0.00
0+420	953.009	953.009	0.00	0.00	0.00	0.00	0.00	0.00
0+440	949.461	949.461	0.00	0.00	0.00	0.00	0.00	0.00
0+460	945.813	945.813	0.00	0.00	0.00	0.00	0.00	0.00
0+480	942.065	942.065	0.00	0.00	0.00	0.00	0.00	0.00
0+500	938.217	938.217	0.00	0.00	0.00	0.00	0.00	0.00
0+520	934.269	934.269	0.00	0.00	0.00	0.00	0.00	0.00
0+540	930.221	930.221	0.00	0.00	0.00	0.00	0.00	0.00
0+560	926.073	926.073	0.00	0.00	0.00	0.00	0.00	0.00
0+580	921.825	921.825	0.00	0.00	0.00	0.00	0.00	0.00
0+600	917.477	917.477	0.00	0.00	0.00	0.00	0.00	0.00
0+620	913.029	913.029	0.00	0.00	0.00	0.00	0.00	0.00
0+640	908.481	908.481	0.00	0.00	0.00	0.00	0.00	0.00
0+660	903.833	903.833	0.00	0.00	0.00	0.00	0.00	0.00
0+680	899.085	899.085	0.00	0.00	0.00	0.00	0.00	0.00
0+700	894.237	894.237	0.00	0.00	0.00	0.00	0.00	0.00
0+720	889.289	889.289	0.00	0.00	0.00	0.00	0.00	0.00
0+740	884.241	884.241	0.00	0.00	0.00	0.00	0.00	0.00
0+760	879.093	879.093	0.00	0.00	0.00	0.00	0.00	0.00
0+780	873.845	873.845	0.00	0.00	0.00	0.00	0.00	0.00
0+800	868.500	868.500	0.00	0.00	0.00	0.00	0.00	0.00
0+820	863.052	863.052	0.00	0.00	0.00	0.00	0.00	0.00
0+840	857.504	857.504	0.00	0.00	0.00	0.00	0.00	0.00
0+860	851.856	851.856	0.00	0.00	0.00	0.00	0.00	0.00
0+880	846.108	846.108	0.00	0.00	0.00	0.00	0.00	0.00
0+900	840.260	840.260	0.00	0.00	0.00	0.00	0.00	0.00
0+916	834.312	834.312	0.00	0.00	0.00	0.00	0.00	0.00

Longitudinal Section for CH 0+000 to CH 0+916
Local Road L3701 Intersecting D1724 @ Km 4.894

REV	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL		P.N.
REV 2	15/10/21	ISSUED FOR APPROVAL		P.N.
REV 1	17/08/21	ISSUED FOR APPROVAL		P.N.
REV 0	14/11/17	ISSUED FOR APPROVAL		P.N.

AS BUILT
Supervising Engineer: _____ Date: _____
Supervising Authority: _____

Continued from: -
Continued on: -
Design Plan No: C46909
Long Section No: C46921
Cross Section No: C46922

Designed by: Y.NANKHOO
Checked by: P.NANKHOO (Pr.Eng : 910350)
Drawn by: K RAMSUROOP
Checked by: P.NANKHOO (Pr.Eng : 910350)
Date of Approval: 18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
Consulting Engineers
14741 HERZOG PAVILION DRIVE, TOLKENTON
14741 HERZOG PAVILION DRIVE, TOLKENTON

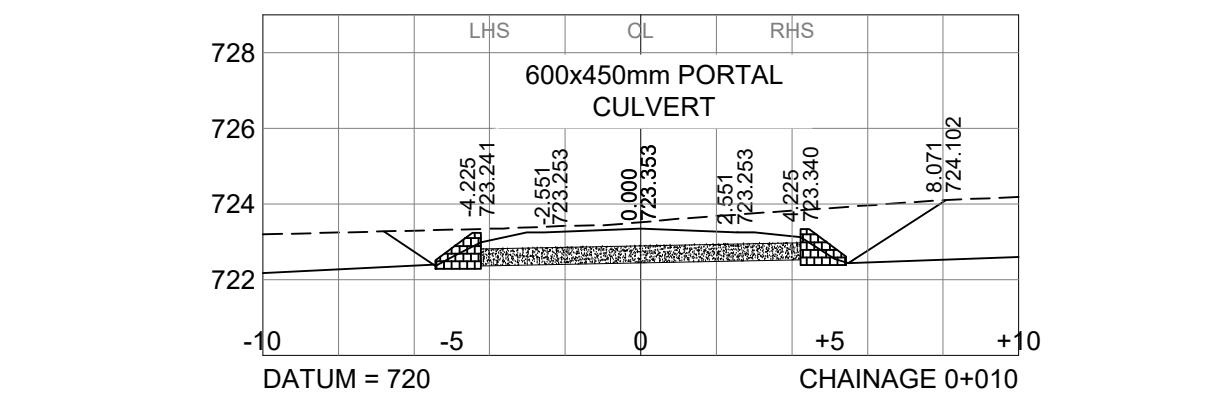
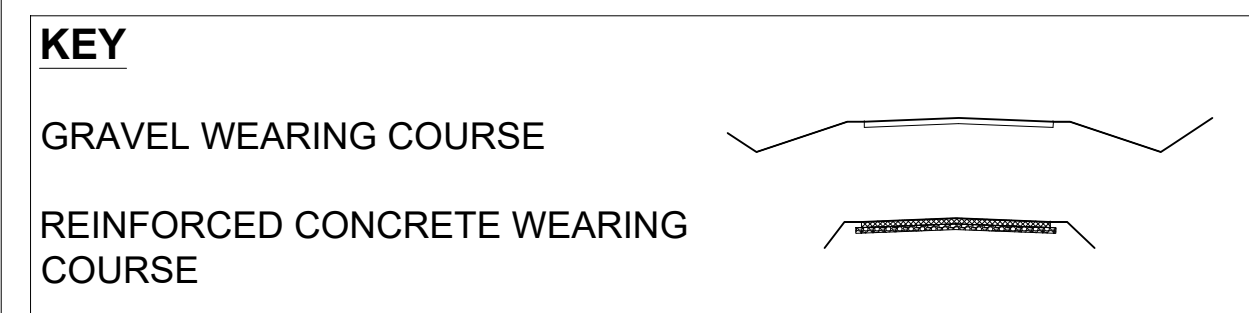
Transportation Engineering : Chief Engineer
Head: Transport

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)
L3701 LONGITUDINAL SECTIONS

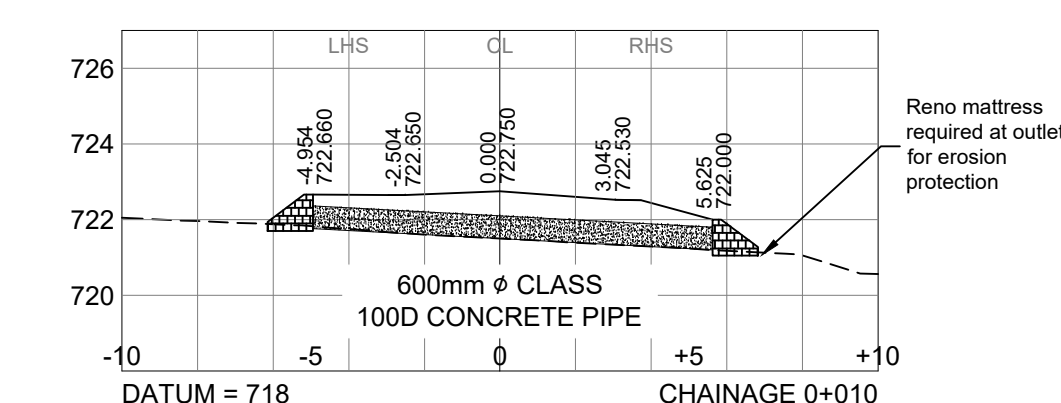
FOR TENDER PURPOSES
Staked km distance: Km 0.000 to Km 0.916
Scale: AS SHOWN
Sheet: 01 of 01
Plan No.: C46921

C46921



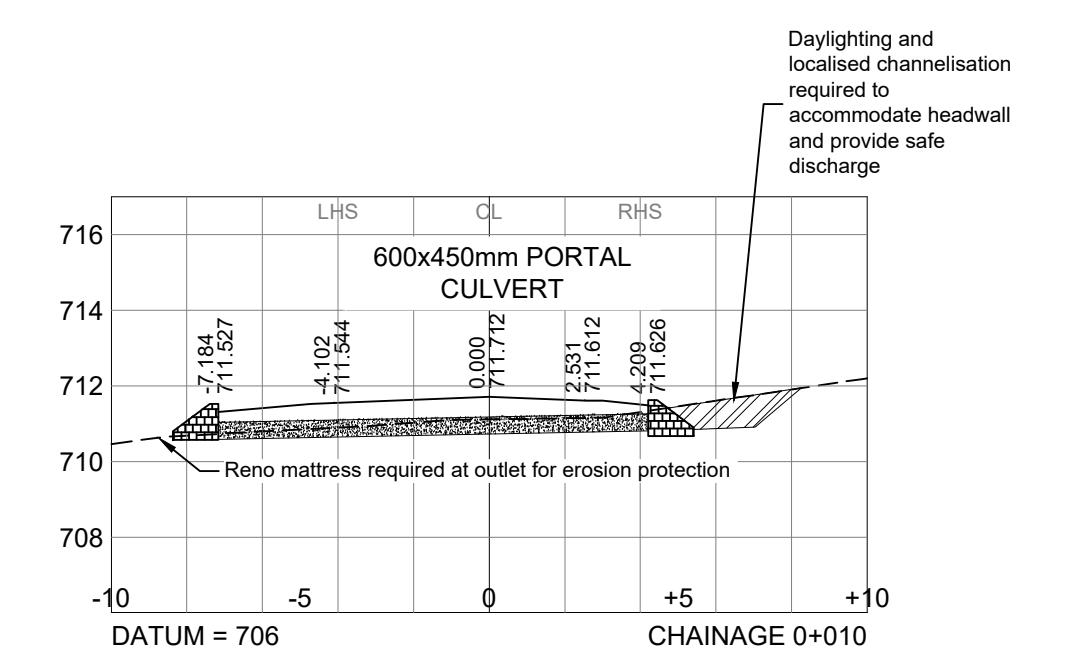
Pipe Cross Sections
Access 1 Intersecting D1724 @ Ch 21+373 RHS

Scale
Horizontal 1:200
Vertical 1:200



Pipe Cross Sections
Access 2 Intersecting D1724 @ Ch 0+025 LHS

Scale
Horizontal 1:200
Vertical 1:200



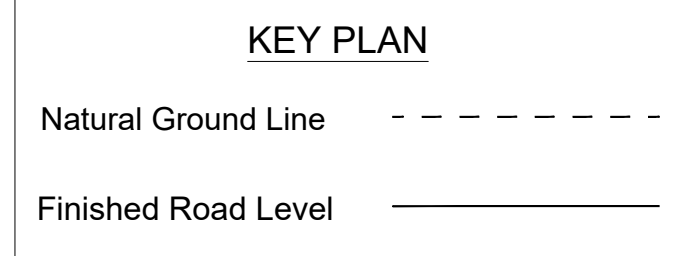
Pipe Cross Sections
Access 3 Intersecting D1724 @ Ch 0+145 RHS

Scale
Horizontal 1:200
Vertical 1:200

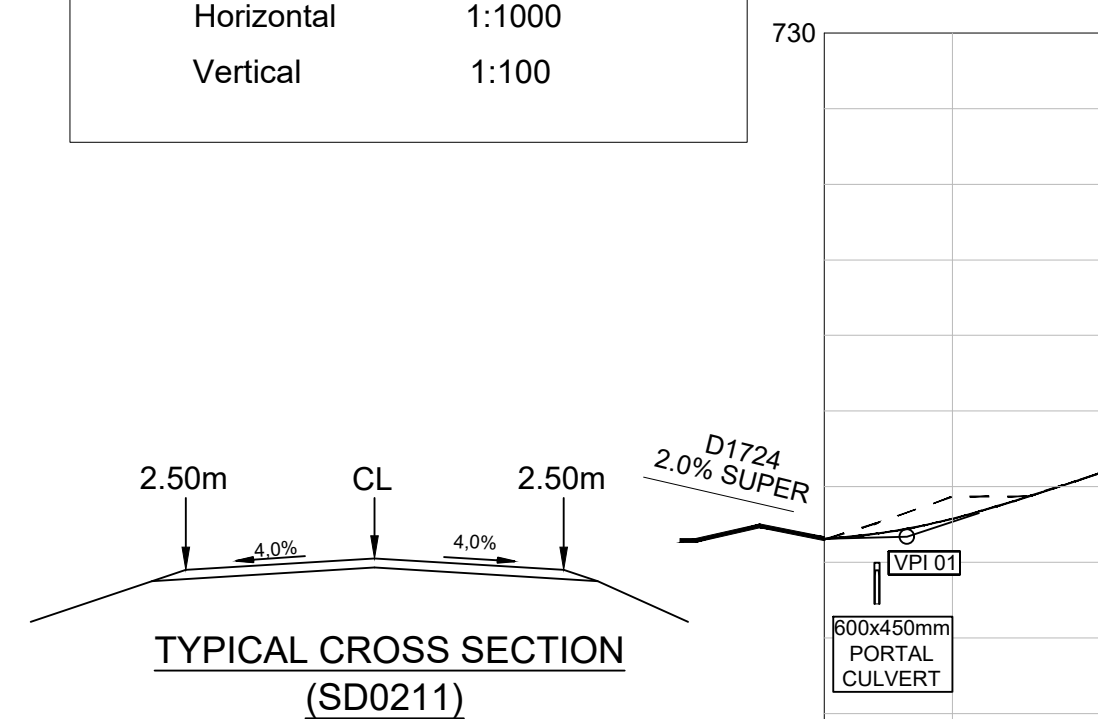
NOTE:
Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.040	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20



SCALE
Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails	Drainage: Side Drains
Centre Line Road Marking	CHUTE (SD0603/1)	2.4 GRASSED V-DRAIN (SD0601/2)
Right Hand Side	Drainage: Side Drains	Guardrails
Staked Ground Level		
Vertical Alignment	Finished Road Levels	
	Grades	
	Vertical Curves	
Superelevation	Left edge - - - - -	Center Line _____
Horizontal Curves		
Staked Kilometre Distance		

Longitudinal Section for 0+000 to 0+040
Access 1 Intersecting D487 @ Ch 21+373 RHS

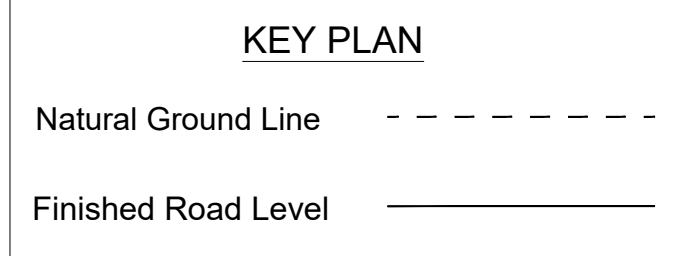
Cross Sections for 0+000 to 0+040
Access 1 Intersecting D487 @ Ch 21+373 RHS

Scale
Horizontal 1:200
Vertical 1:200

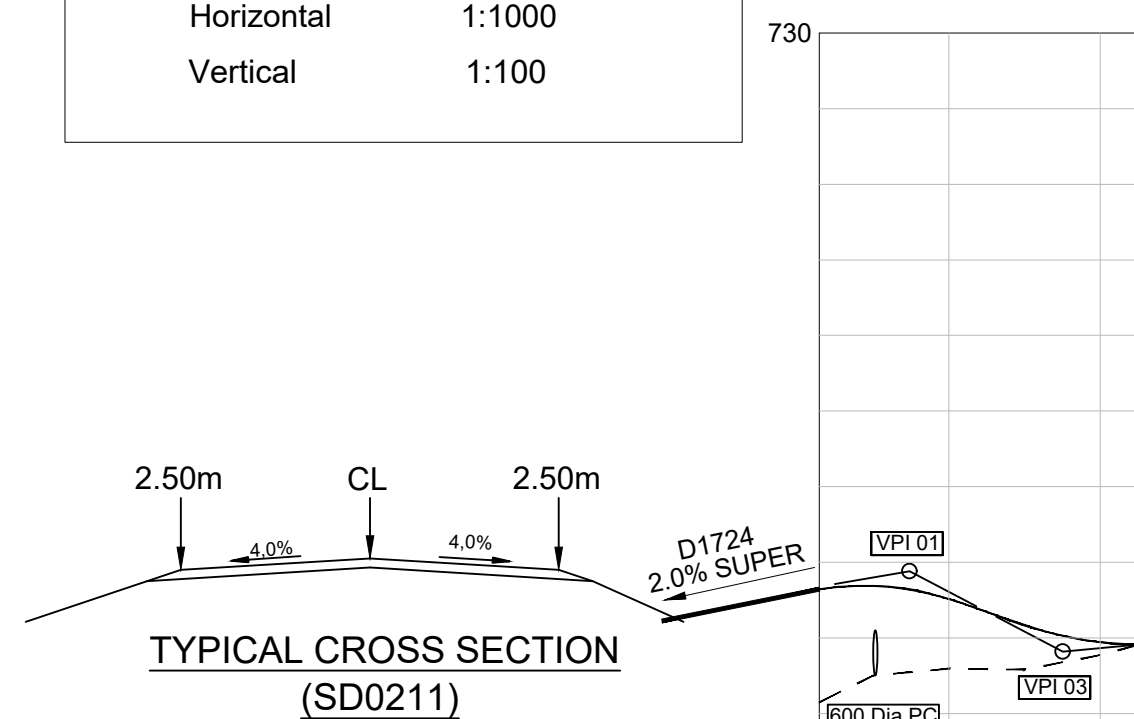
NOTE:
Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.045	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20



SCALE
Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails	Drainage: Side Drains
Centre Line Road Marking	CHUTE (SD0603/1)	1000 V-DRAIN (SD0601/2)
Right Hand Side	Drainage: Side Drains	Guardrails
Staked Ground Level		
Vertical Alignment	Finished Road Levels	
	Grades	
	Vertical Curves	
Superelevation	Left edge - - - - -	Center Line _____
Horizontal Curves		
Staked Kilometre Distance		

Longitudinal Section for 0+000 to 0+045
Access 2 Intersecting D1724 @ Ch 0+025 LHS

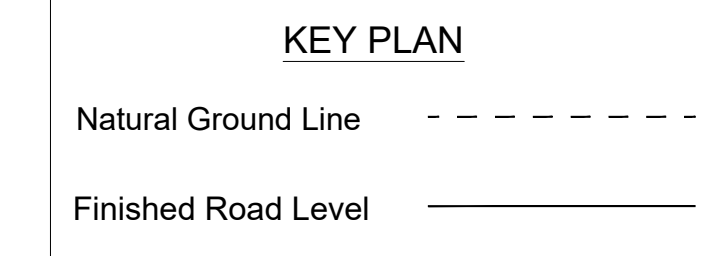
Cross Sections for 0+000 to 0+045
Access 2 Intersecting D1724 @ Ch 0+025 LHS

Scale
Horizontal 1:200
Vertical 1:200

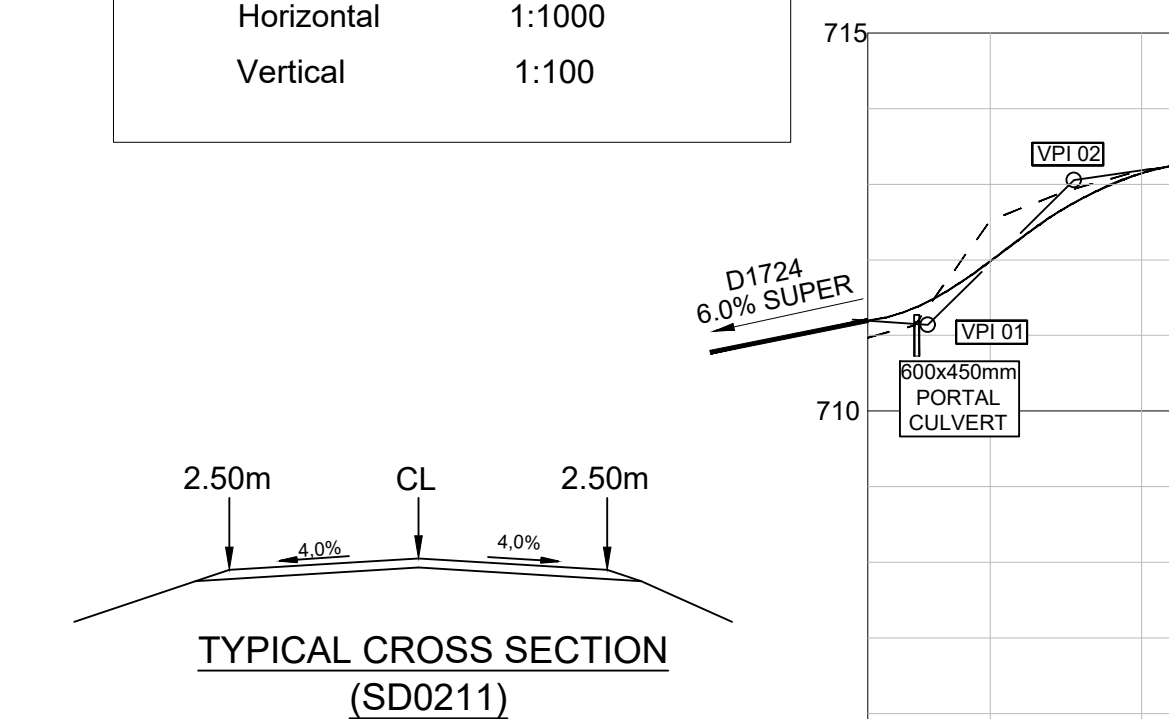
NOTE:
Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.045	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20



SCALE
Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails	Drainage: Side Drains
Centre Line Road Marking	CHUTE (SD0603/1)	1000 V-DRAIN (SD0601/2)
Right Hand Side	Drainage: Side Drains	Guardrails
Staked Ground Level		
Vertical Alignment	Finished Road Levels	
	Grades	
	Vertical Curves	
Superelevation	Left edge - - - - -	Center Line _____
Horizontal Curves		
Staked Kilometre Distance		

Longitudinal Section for 0+000 to 0+045
Access 3 Intersecting D1724 @ Ch 0+145 RHS

Cross Sections for 0+000 to 0+045
Access 3 Intersecting D1724 @ Ch 0+145 RHS

Scale
Horizontal 1:200
Vertical 1:200

REV	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/05/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

AS BUILT

Supervising Engineer	Date

Supervising Authority

Continued from:-	-	Designed by:-	Y.NANKHOO
Continued on:-	C46925	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46905	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46924	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46924	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

ACCESS LONGITUDINAL SECTIONS & CROSS SECTIONS

FOR TENDER PURPOSES

Staked km distance	Sheet 01
-	of 08
Scale AS SHOWN	Plan No.:- C46924

CONTINUED ON SHEET C46925

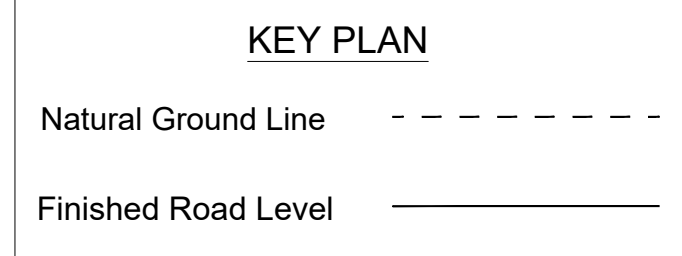
C46924

CONTINUED FROM SHEET C46925

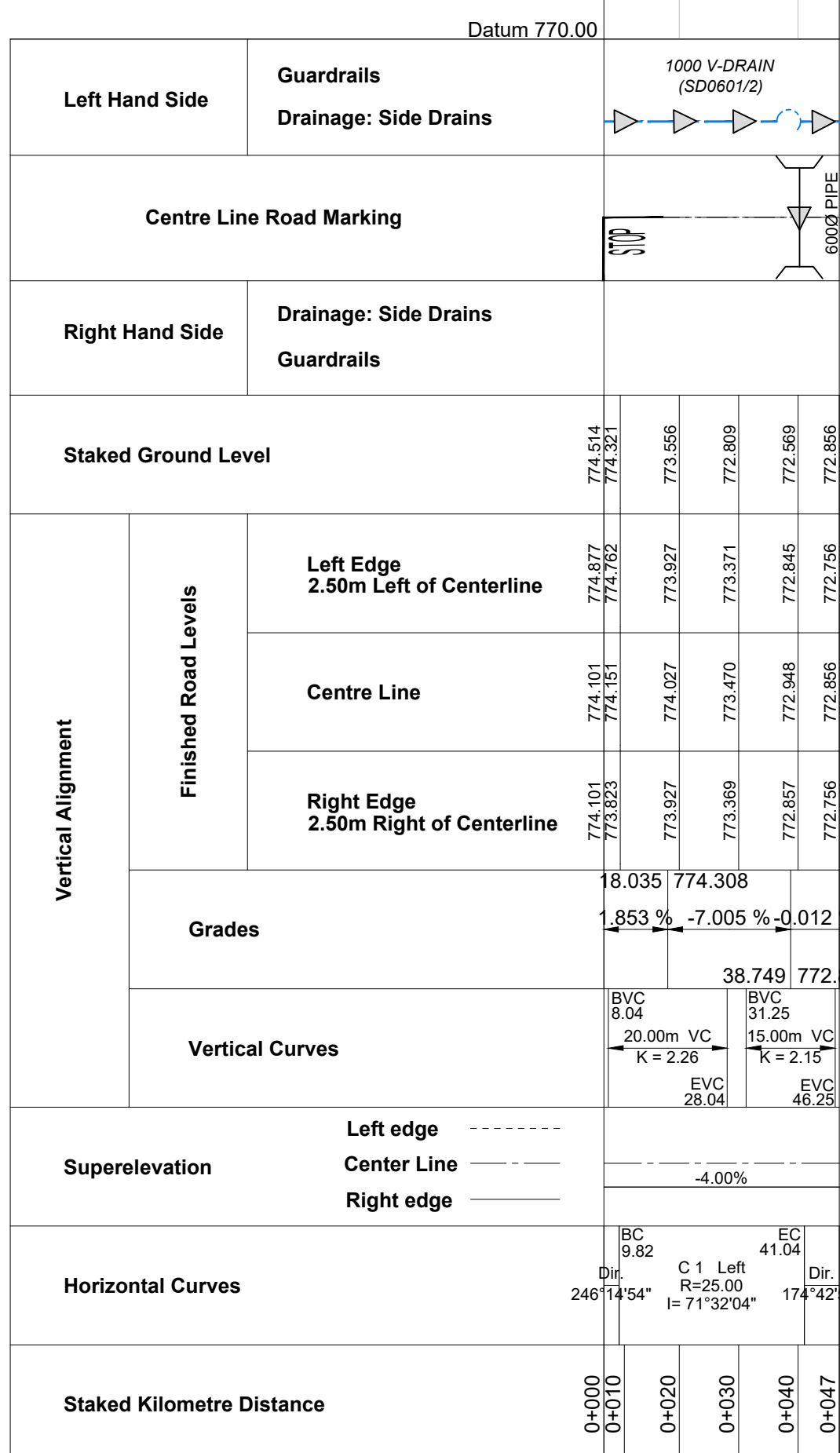
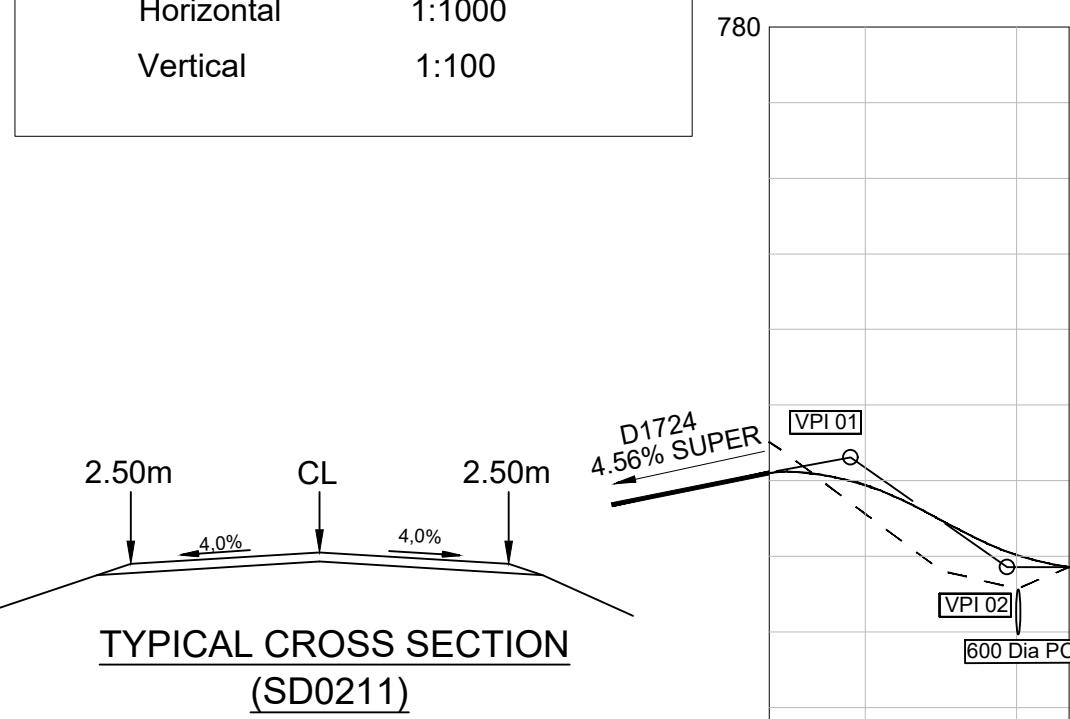
NOTE: Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.047	150mm Gravel Wearing Course to TRH 20

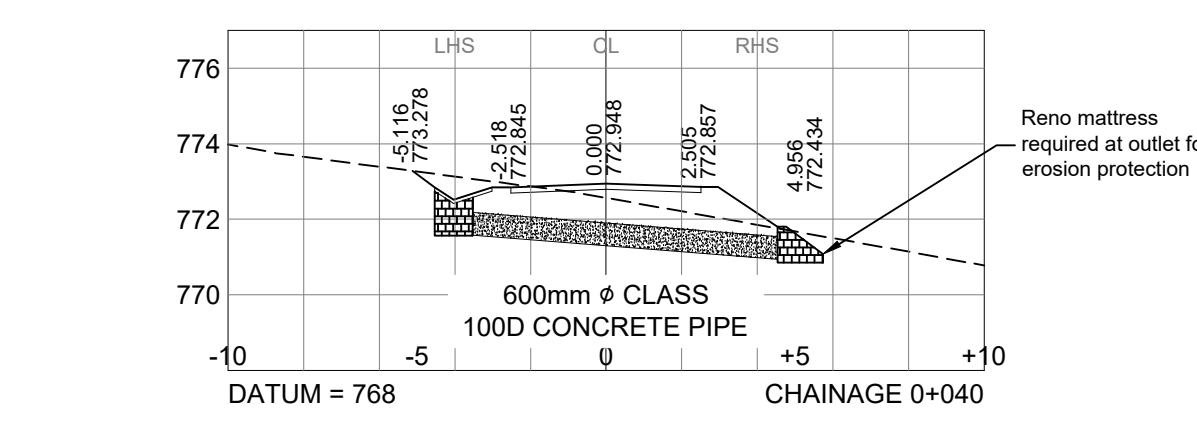
PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20



SCALE	
Horizontal	1:1000
Vertical	1:100

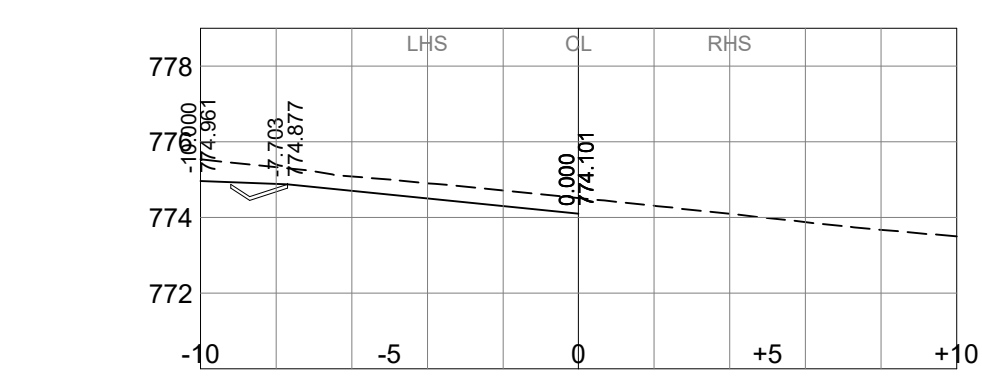
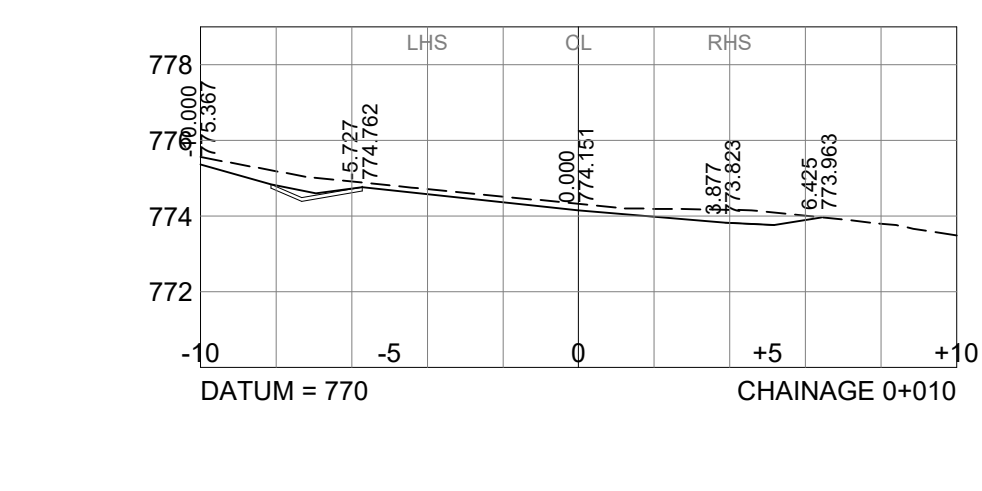
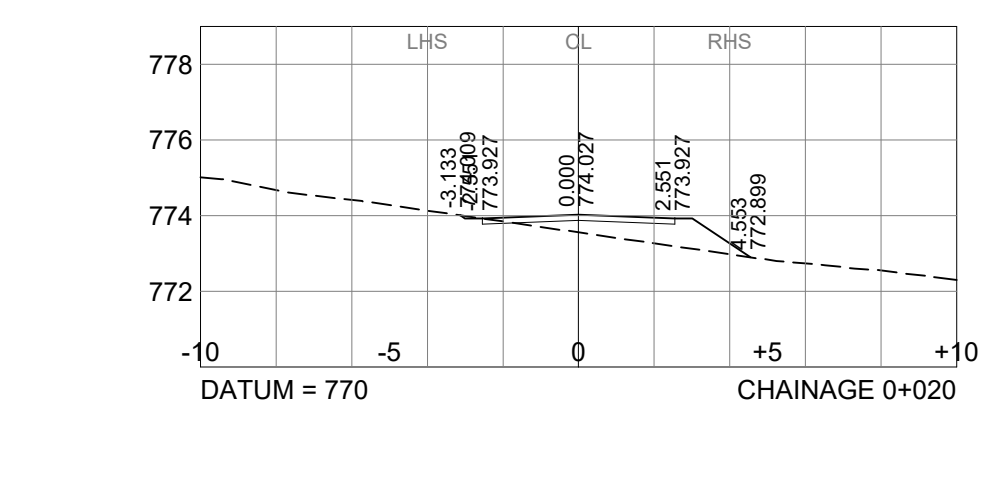
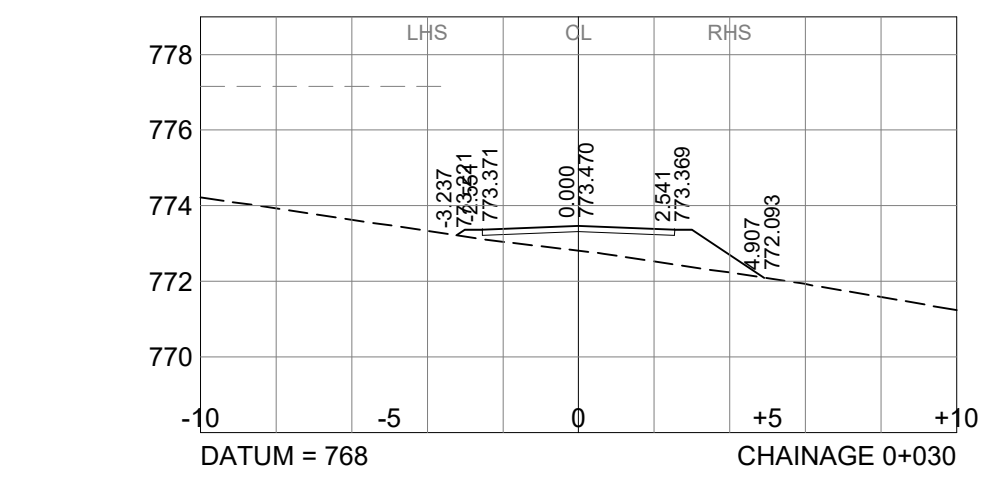
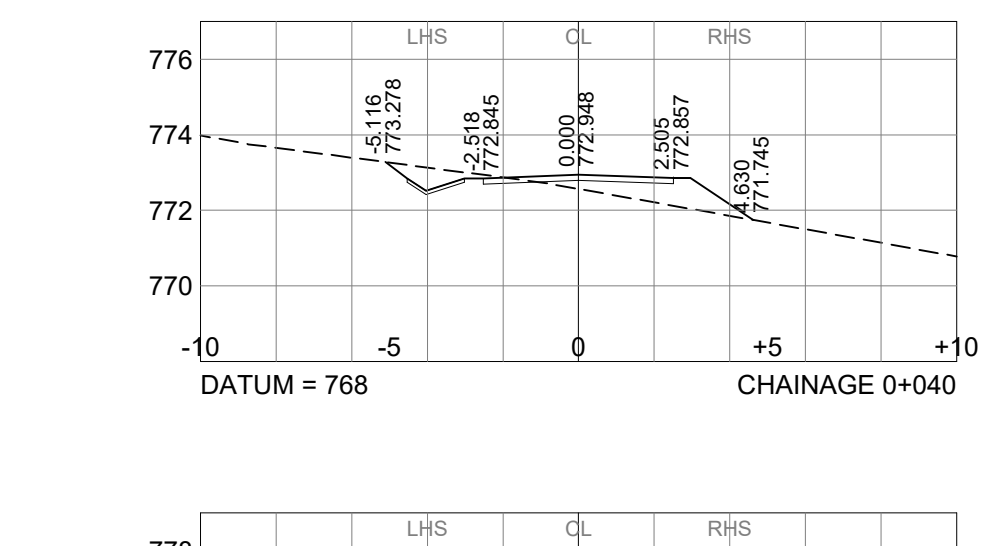
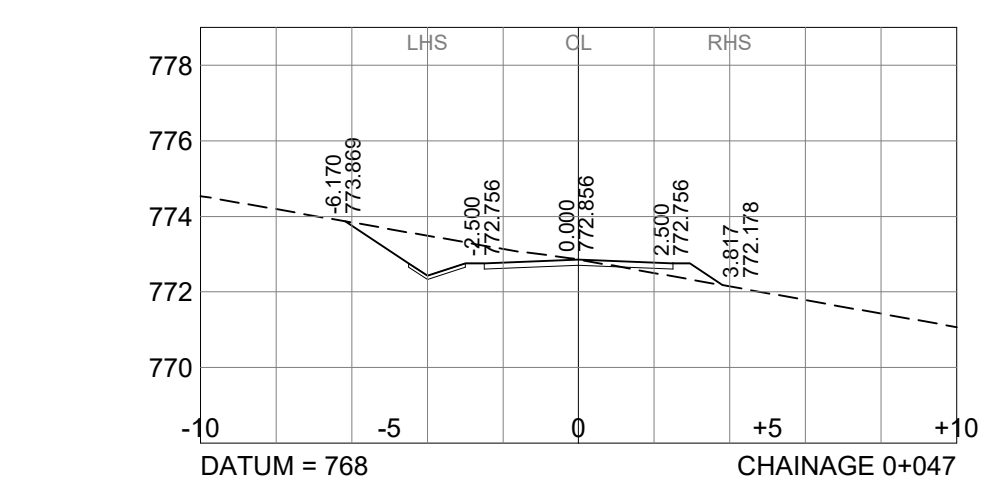


Longitudinal Section for 0+000 to 0+047
Access 7 Intersecting D1724 @ Ch 1+294 RHS



Pipe Cross Sections
Access 7 Intersecting D1724 @ Ch 1+294 RHS

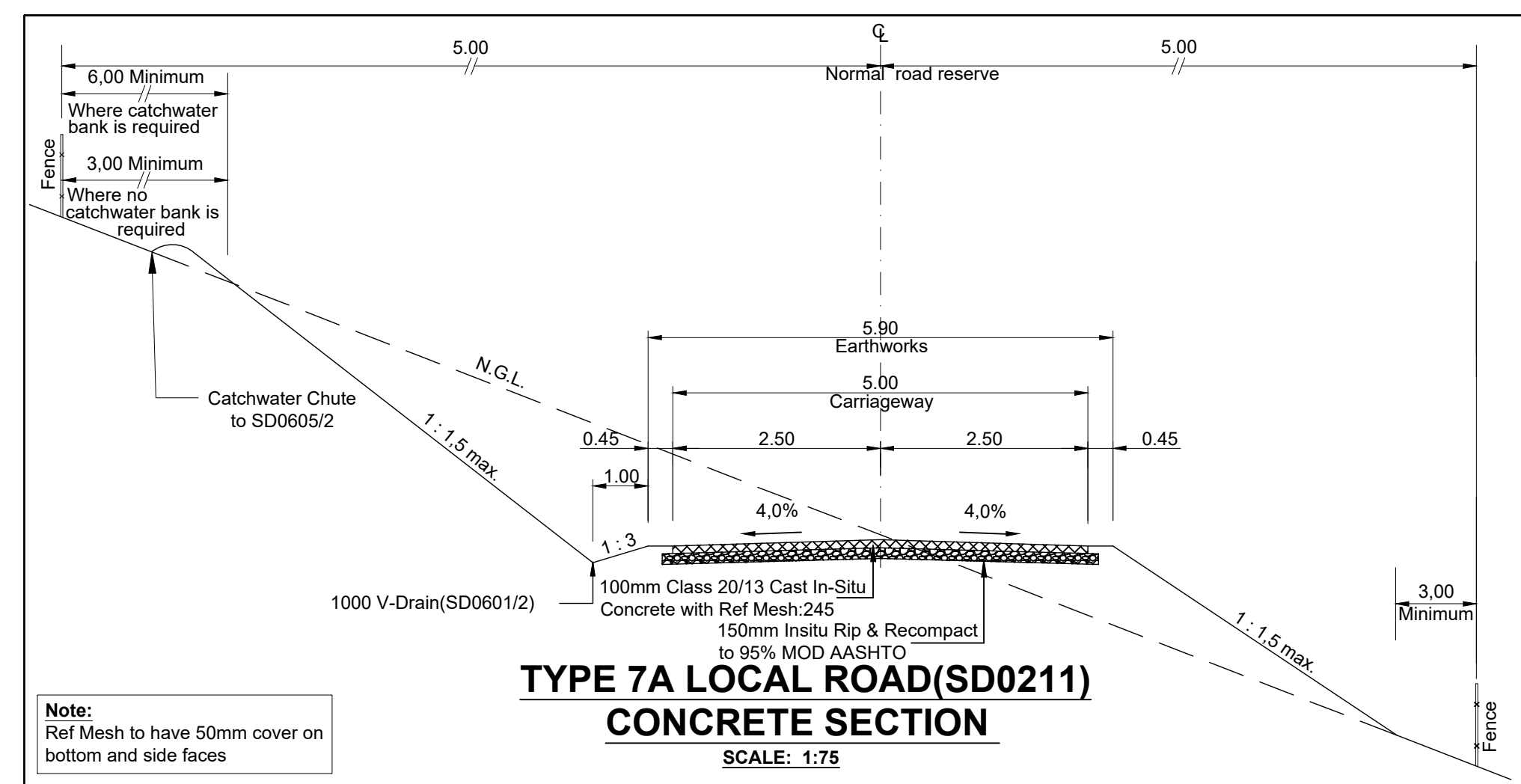
Scale	
Horizontal	1:200
Vertical	1:200



Cross Sections for 0+000 to 0+047
Access 7 Intersecting D1724 @ Ch 1+294 RHS

Scale	
Horizontal	1:200
Vertical	1:200

KEY
GRAVEL WEARING COURSE
REINFORCED CONCRETE WEARING COURSE

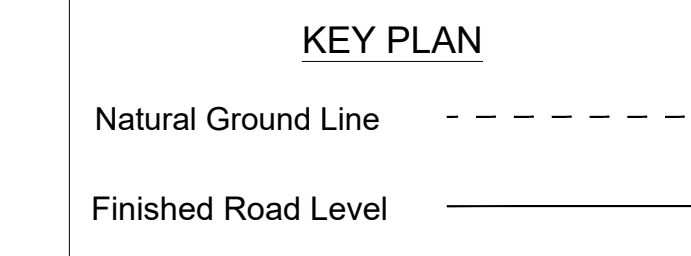


TYPE 7A LOCAL ROAD(SD0211)
CONCRETE SECTION
SCALE: 1:75

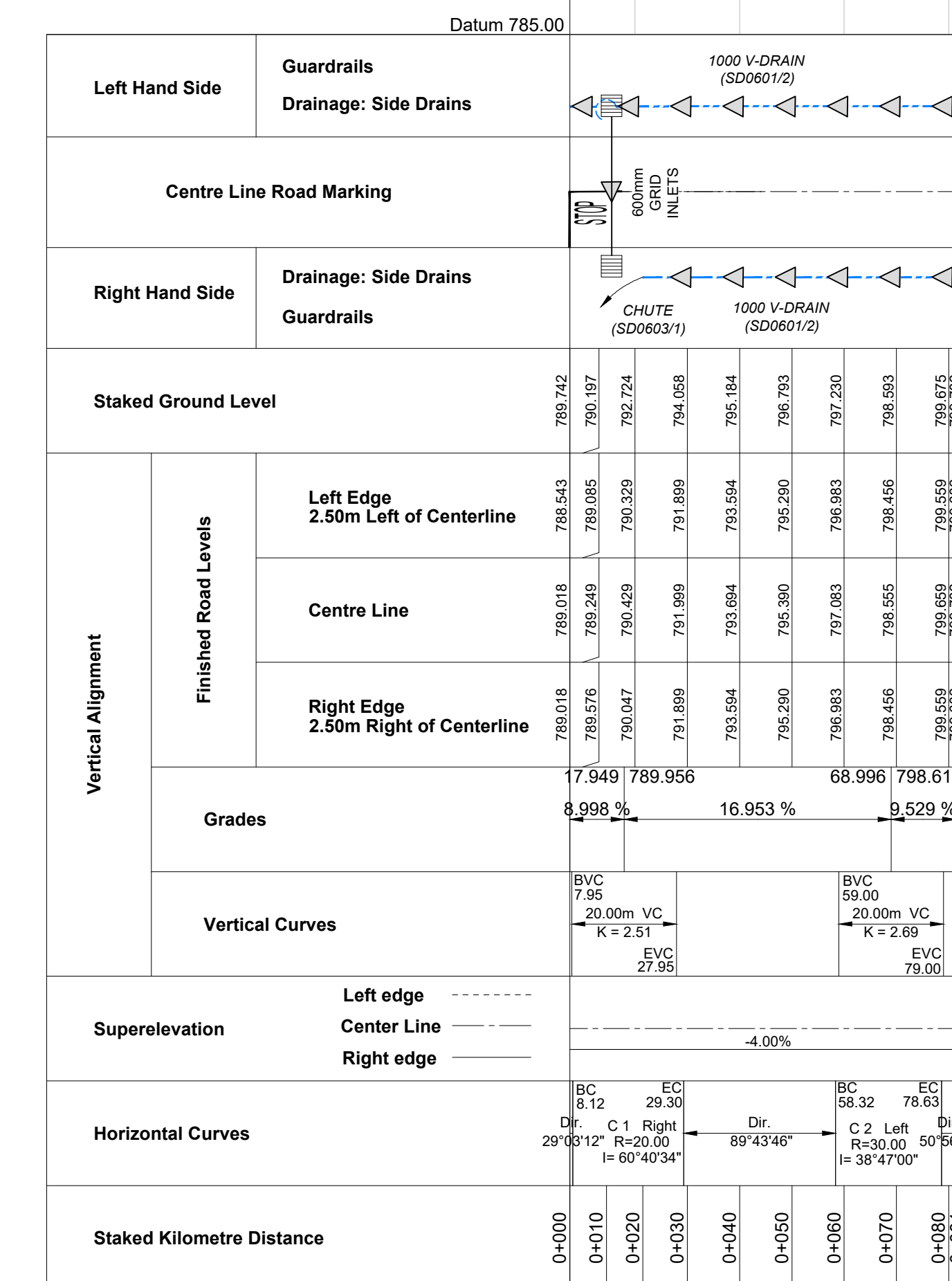
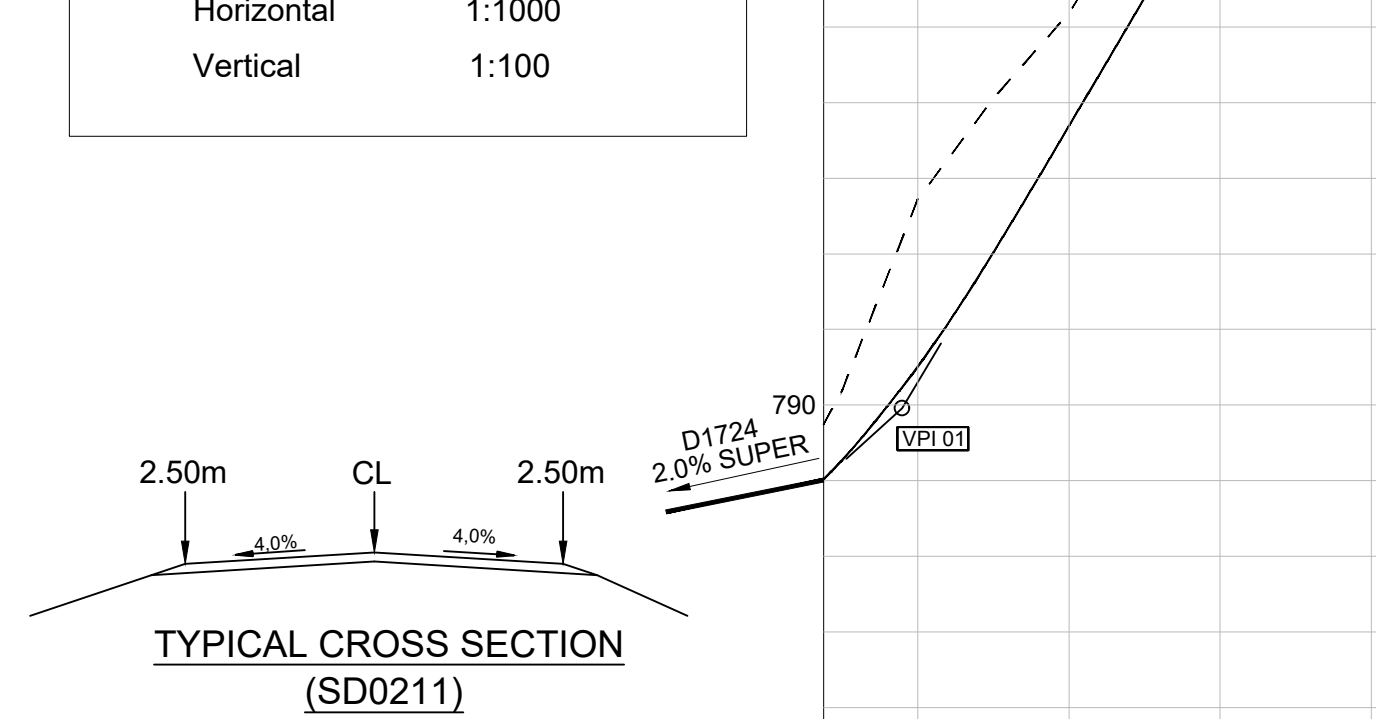
NOTE: Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.081	100mm REINFORCED CONCRETE SURFACING

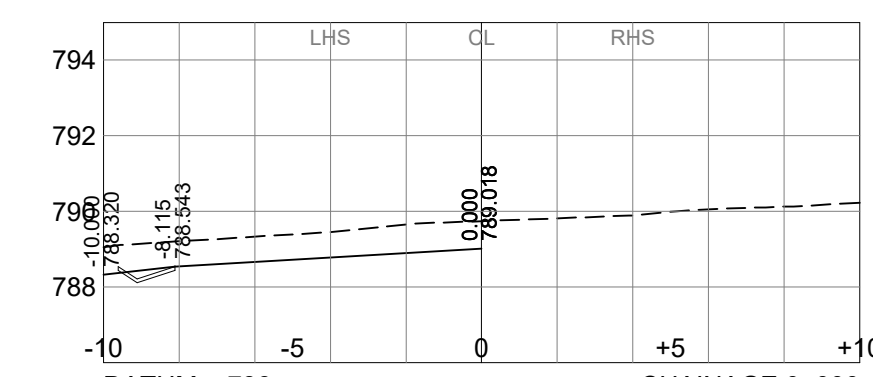
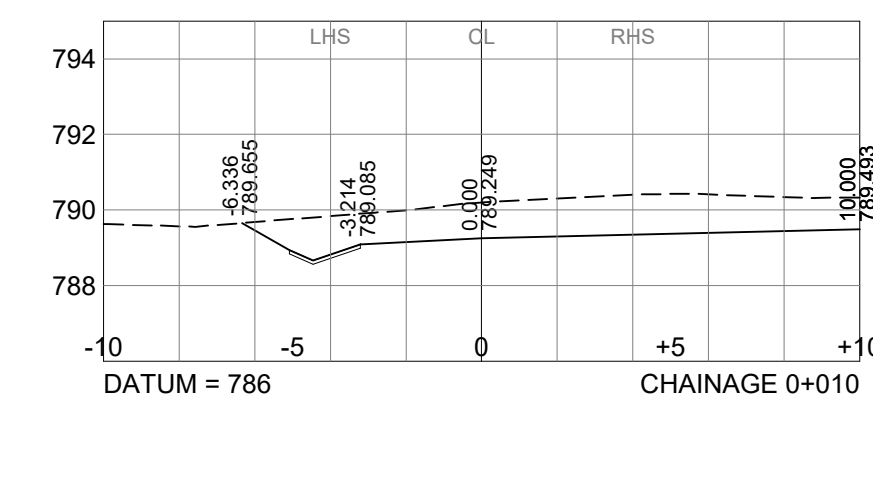
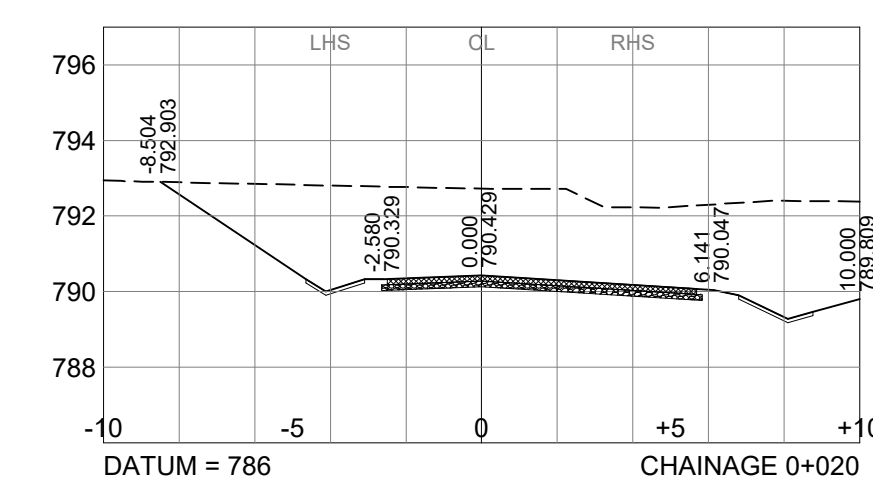
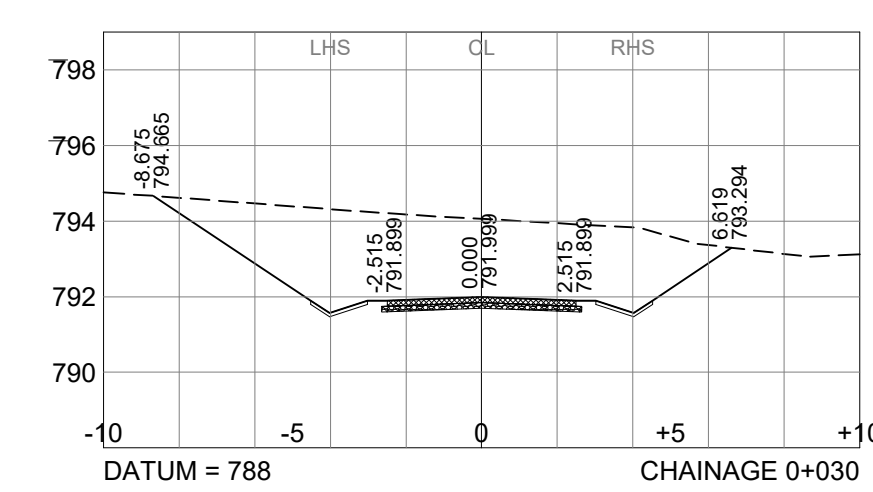
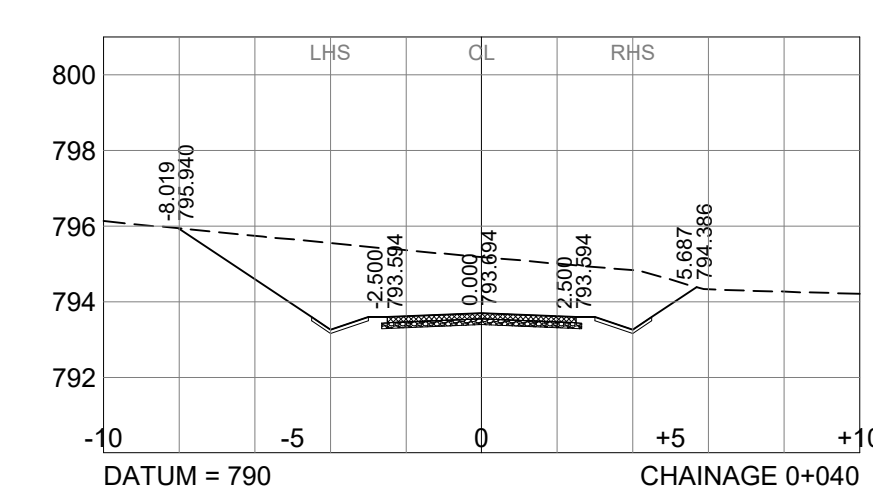
PAVEMENT DESIGN
100mm REINFORCED CONCRETE SURFACING



SCALE	
Horizontal	1:1000
Vertical	1:100



Longitudinal Section for 0+000 to 0+081
Access 8 Intersecting D1724 @ Ch 1+481 LHS



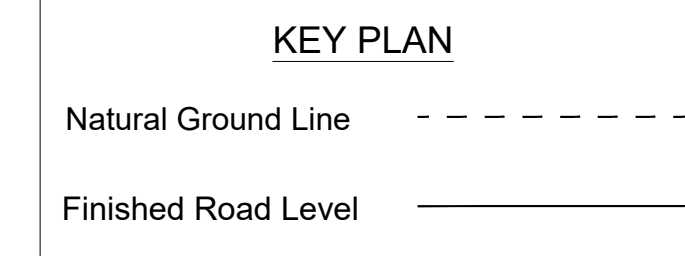
Cross Sections for 0+000 to 0+081
Access 8 Intersecting D1724 @ Ch 1+481 LHS

Scale	
Horizontal	1:200
Vertical	1:200

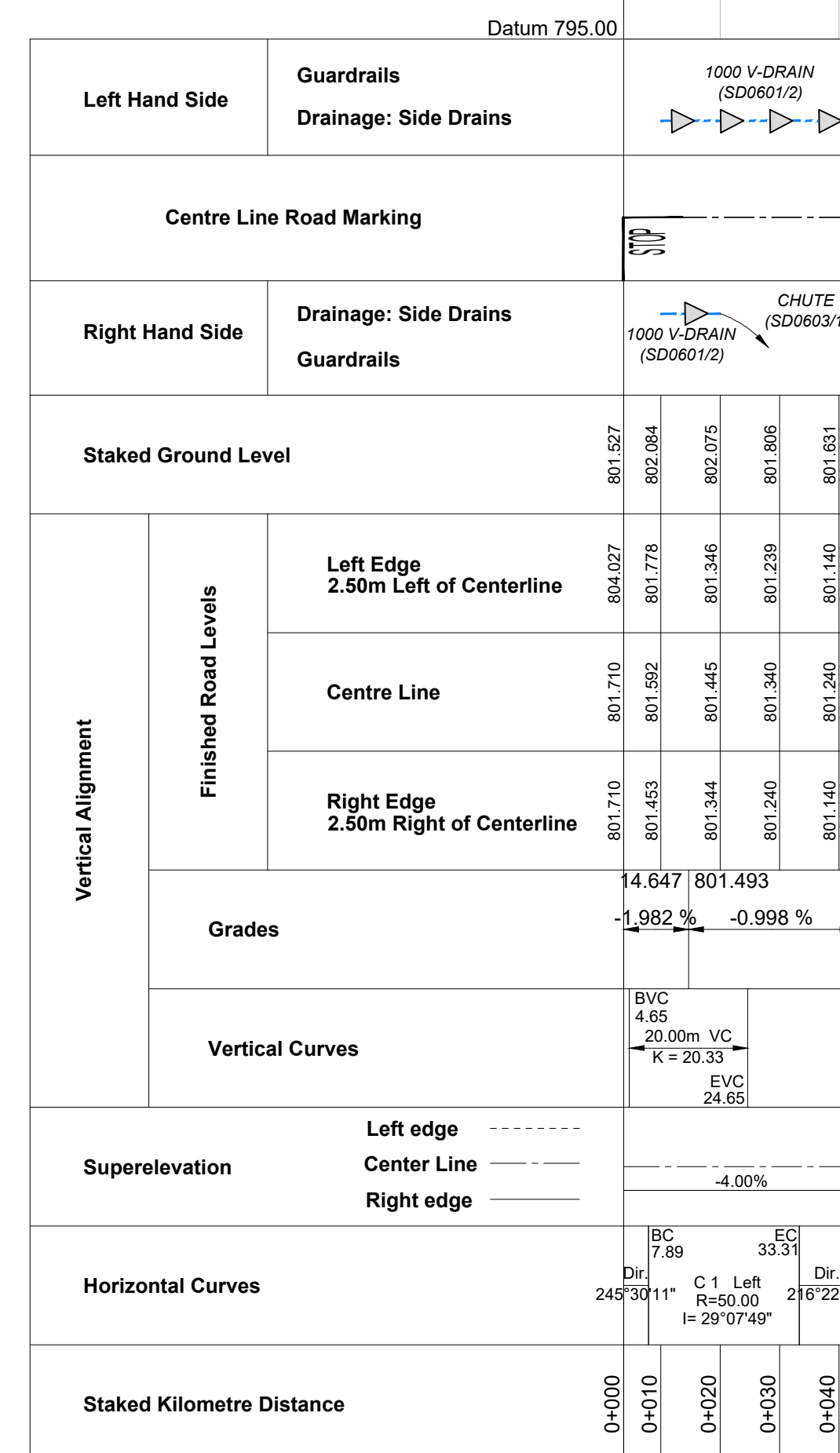
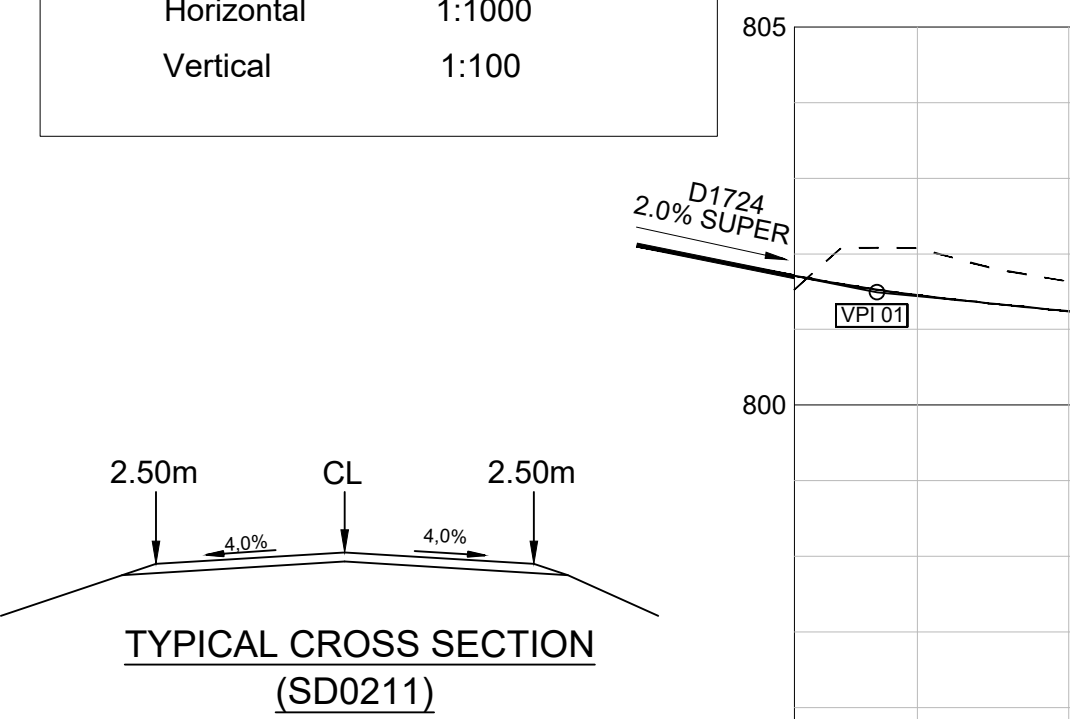
NOTE: Schedule including Surfacing Type and Chainages.

Chainage (km)	Surfacing Type
0.000 - 0.043	150mm Gravel Wearing Course to TRH 20

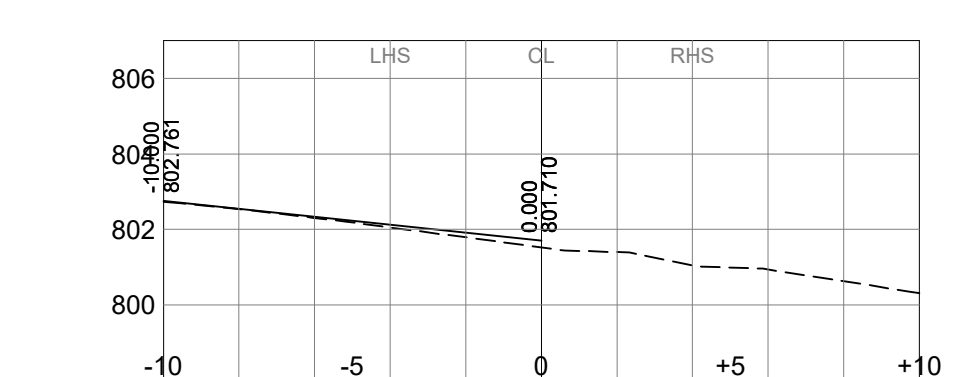
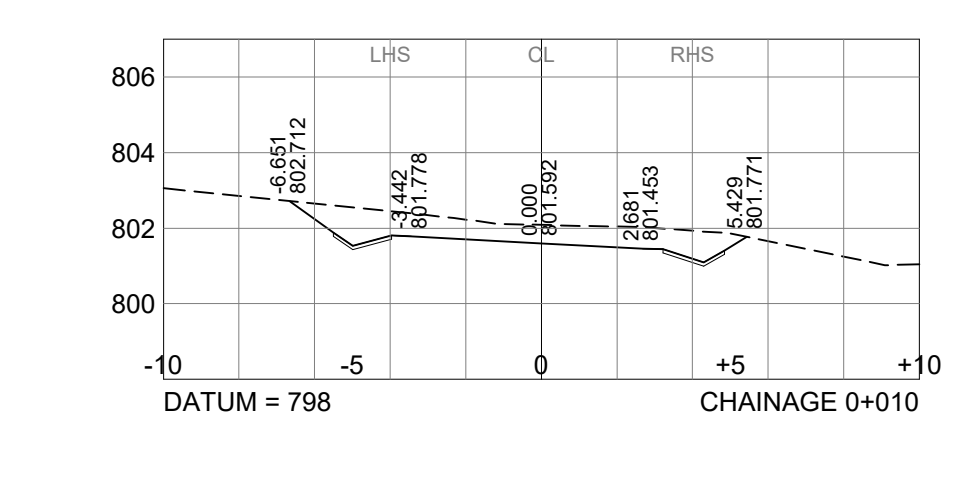
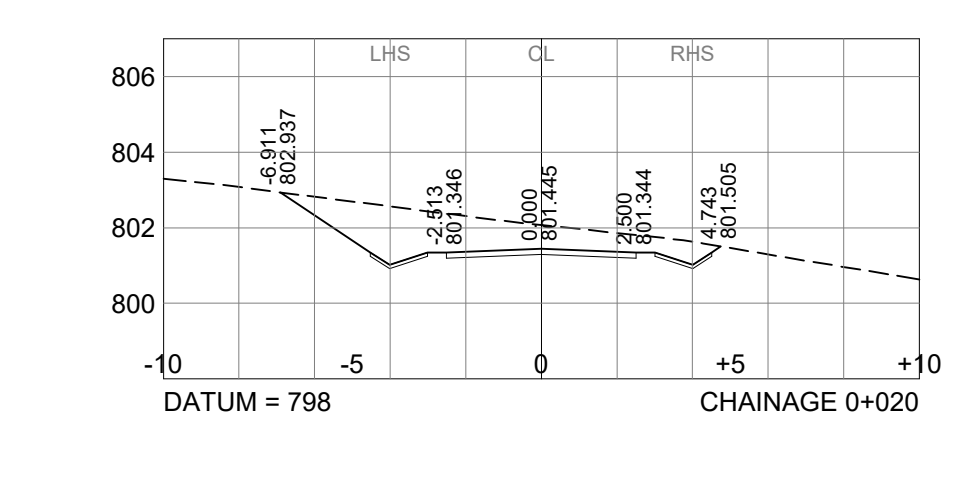
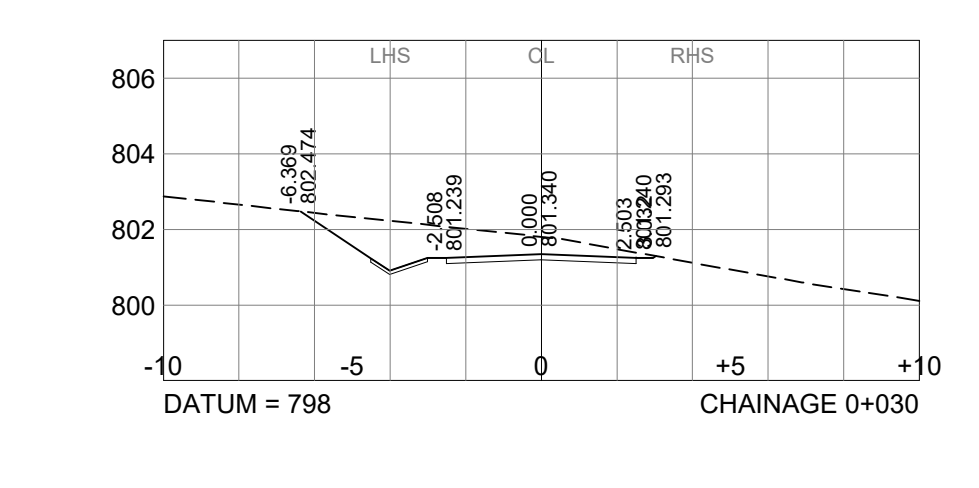
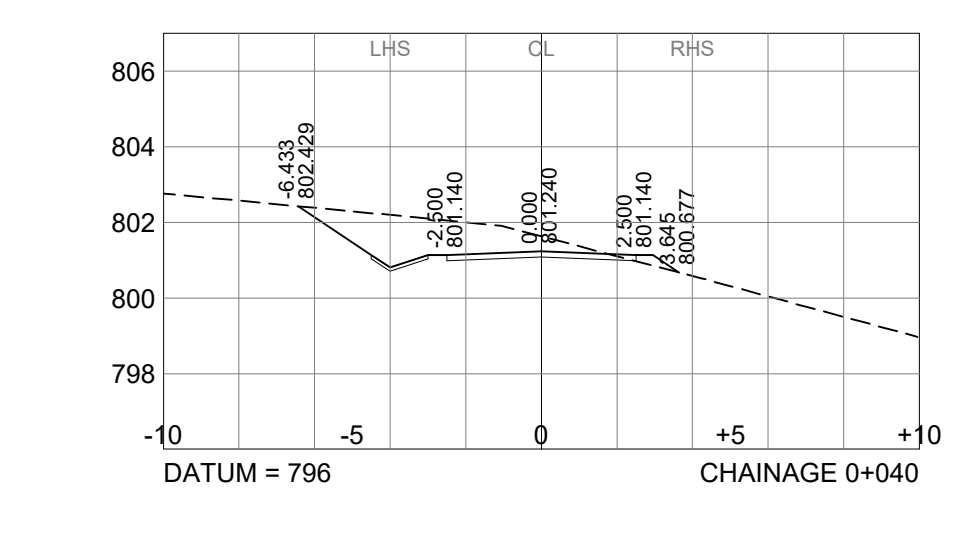
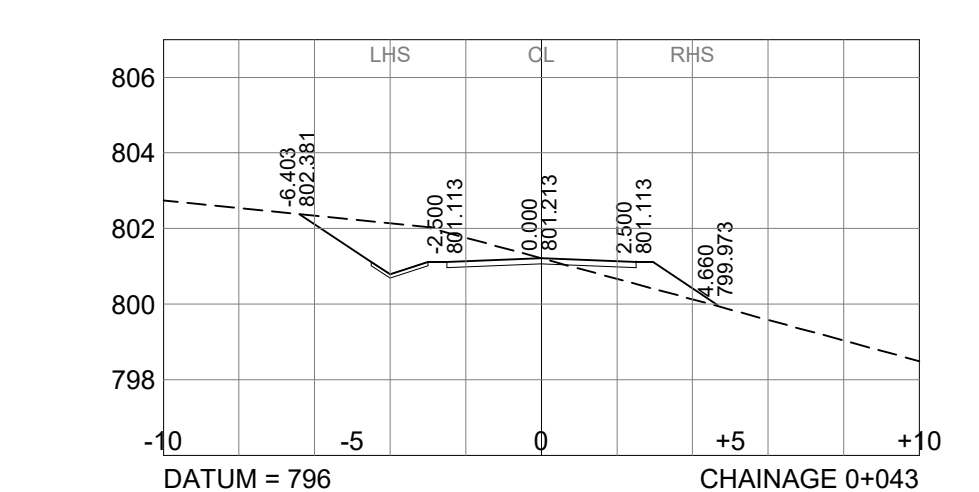
PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20



SCALE	
Horizontal	1:1000
Vertical	1:100



Longitudinal Section for 0+000 to 0+043
Access 9 Intersecting D1724 @ Ch 1+694 RHS



Cross Sections for 0+000 to 0+043
Access 9 Intersecting D1724 @ Ch 1+694 RHS

Scale	
Horizontal	1:200
Vertical	1:200

AS BUILT

Supervising Engineer

Date

Supervising Authority

Continued from:- C46925

Continued on:- C46927

Design Plan No:- C46905 - C46906

Long Section No:- C46926

Cross Section No:- C46926

Designed by:- Y.NANKHOO

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

Drawn by:- K.RAMSUROOP

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

Date of Approval:- 18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



TRANSPORTATION ENGINEERING : CHIEF ENGINEER

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE DATE

FOR TENDER PURPOSES

Staked km distance

Sheet 03

of 08

Scale AS SHOWN

Plan No.:- C46926

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723

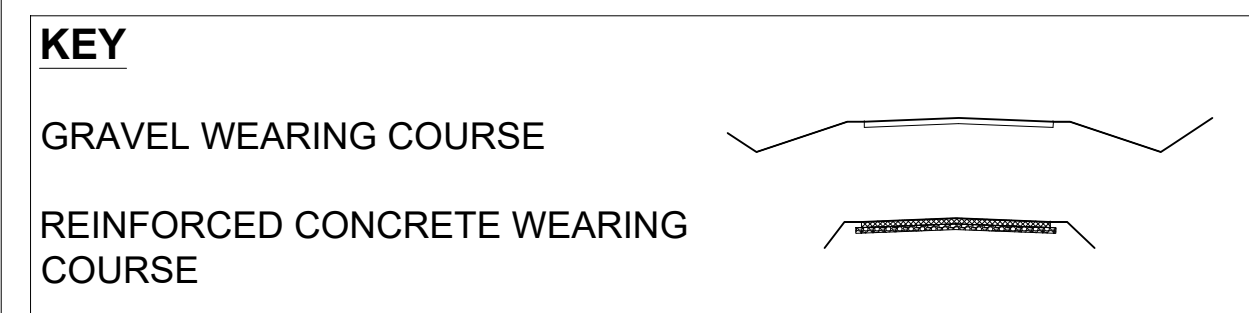
PORTION

DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE

(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

ACCESS LONGITUDINAL SECTIONS & CROSS SECTIONS

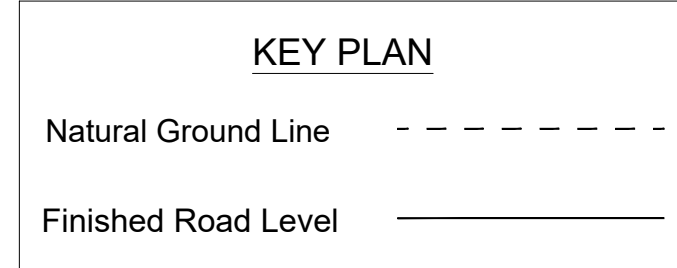
C46926



NOTE:
Schedule including Surfacing Type and Chainages.

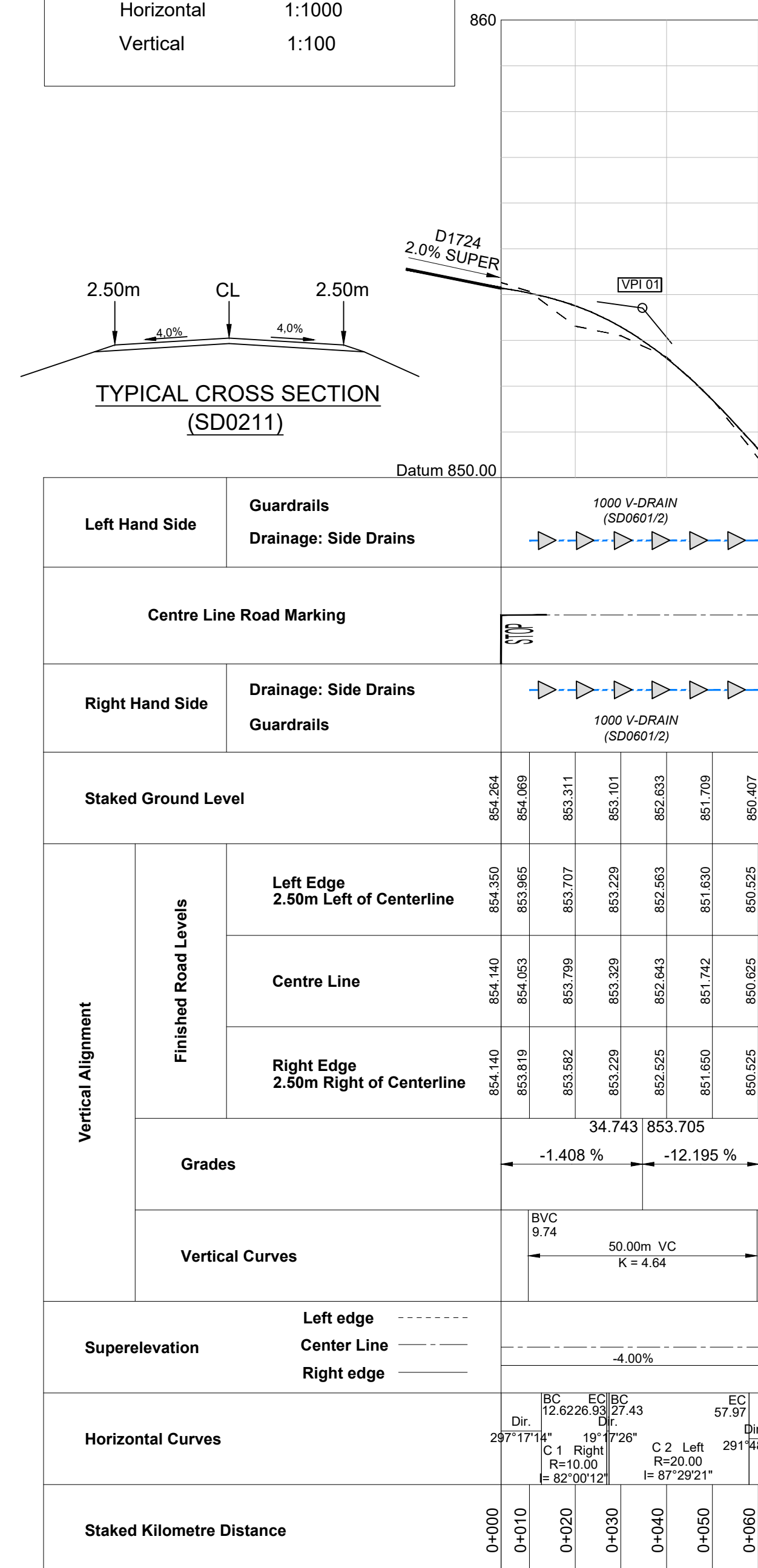
Chainage (km)	Surfacing Type
0.000 - 0.060	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20

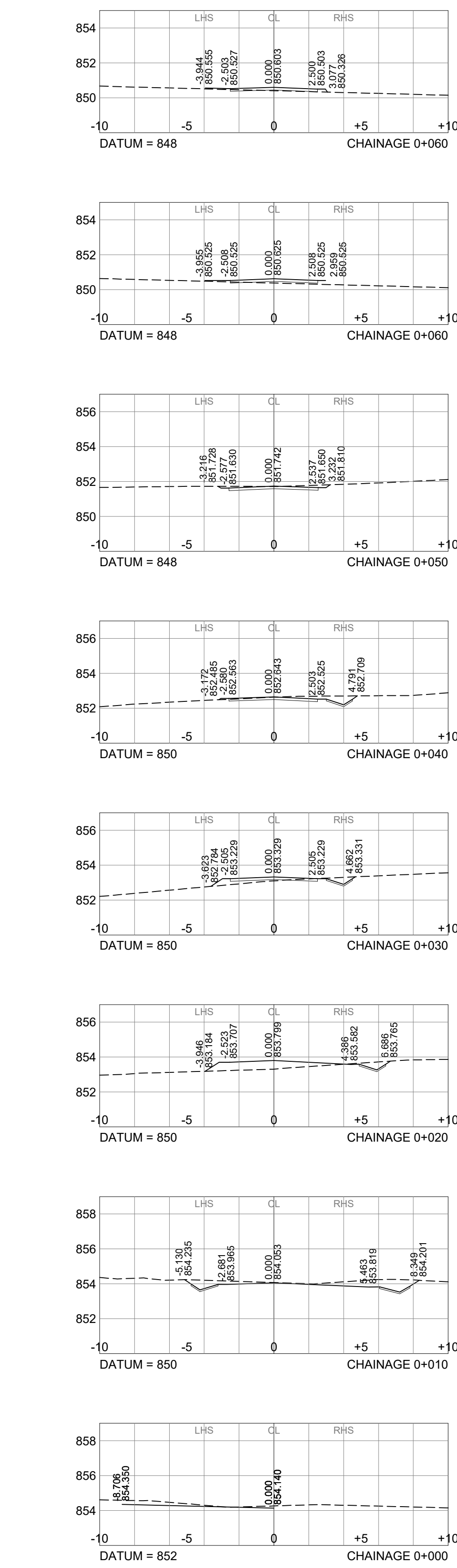


SCALE

Horizontal 1:1000
Vertical 1:100



Longitudinal Section for 0+000 to 0+060
Access 16 Intersecting D1724 @ Ch 2+697 RHS



Cross Sections for 0+000 to 0+060
Access 16 Intersecting D1724 @ Ch 2+697 RHS

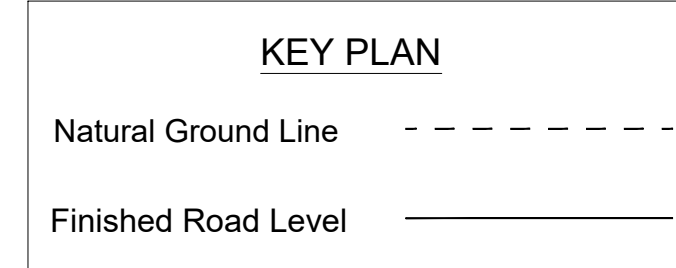
Scale

Horizontal 1:200
Vertical 1:200

NOTE:
Schedule including Surfacing Type and Chainages.

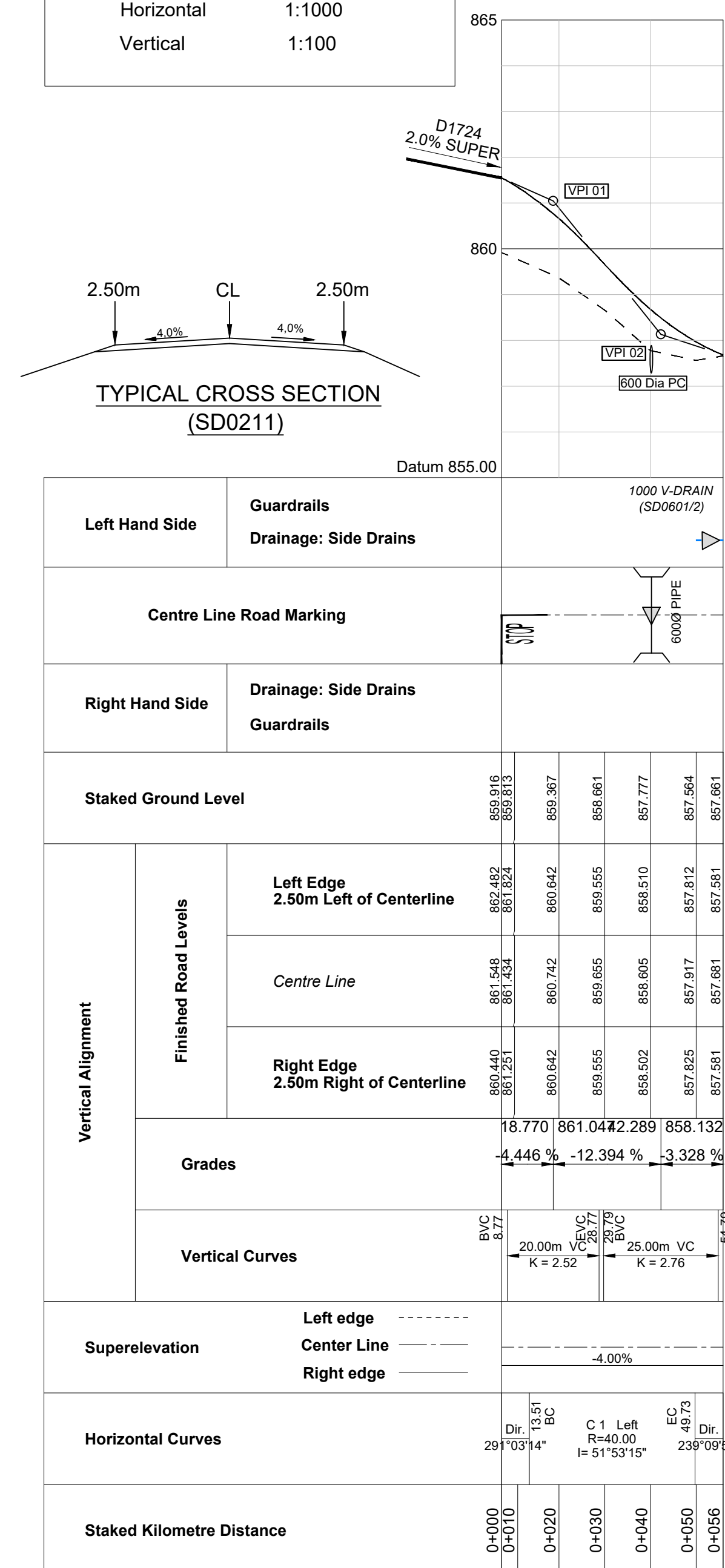
Chainage (km)	Surfacing Type
0.000 - 0.056	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20

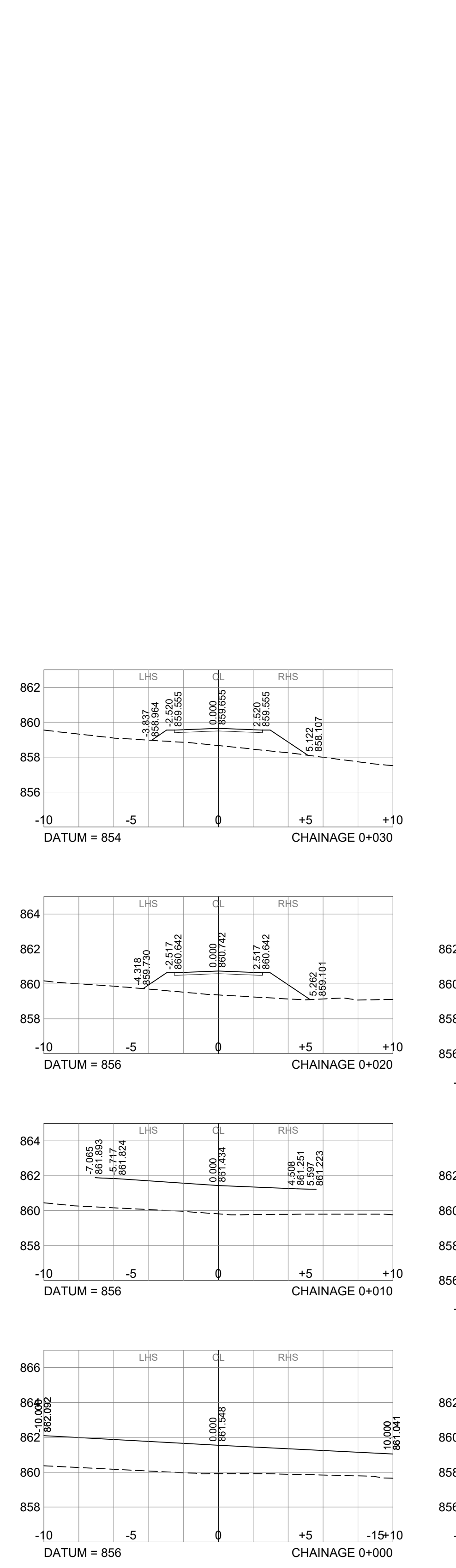


SCALE

Horizontal 1:1000
Vertical 1:100



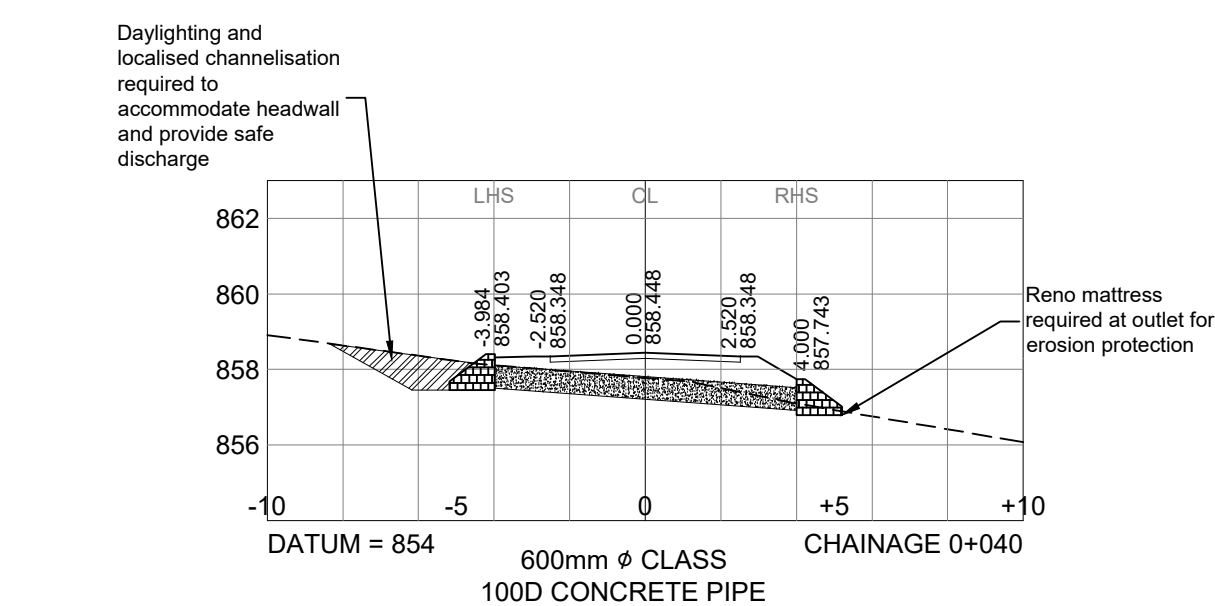
Longitudinal Section for 0+000 to 0+056
Access 17 Intersecting D1724 @ Ch 2+983 LHS



Cross Sections for 0+000 to 0+056
Access 17 Intersecting D1724 @ Ch 2+983 LHS

Scale

Horizontal 1:200
Vertical 1:200



Pipe Cross Section
Access 17 Intersecting D1724 @ Ch 2+983 LHS

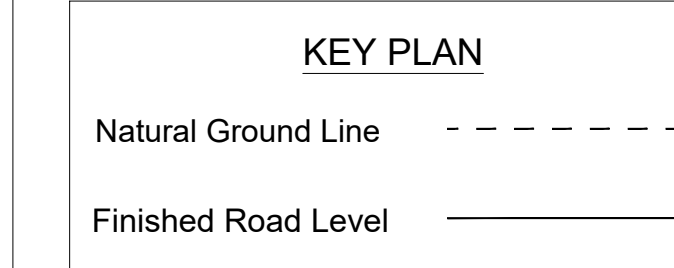
Scale

Horizontal 1:200
Vertical 1:200

NOTE:
Schedule including Surfacing Type and Chainages.

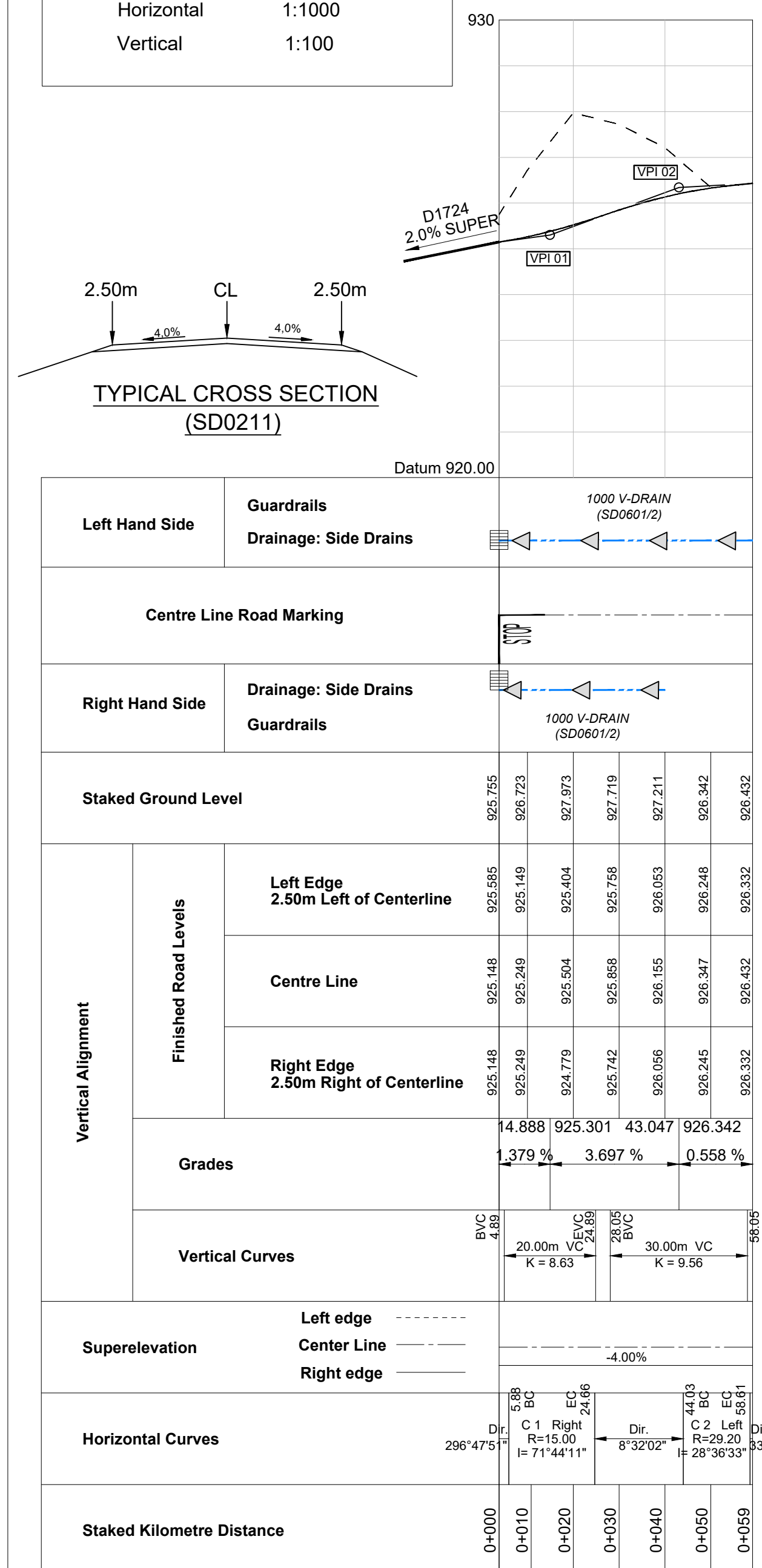
Chainage (km)	Surfacing Type
0.000 - 0.059	150mm Gravel Wearing Course to TRH 20

PAVEMENT DESIGN
150mm Gravel Wearing Course to TRH 20

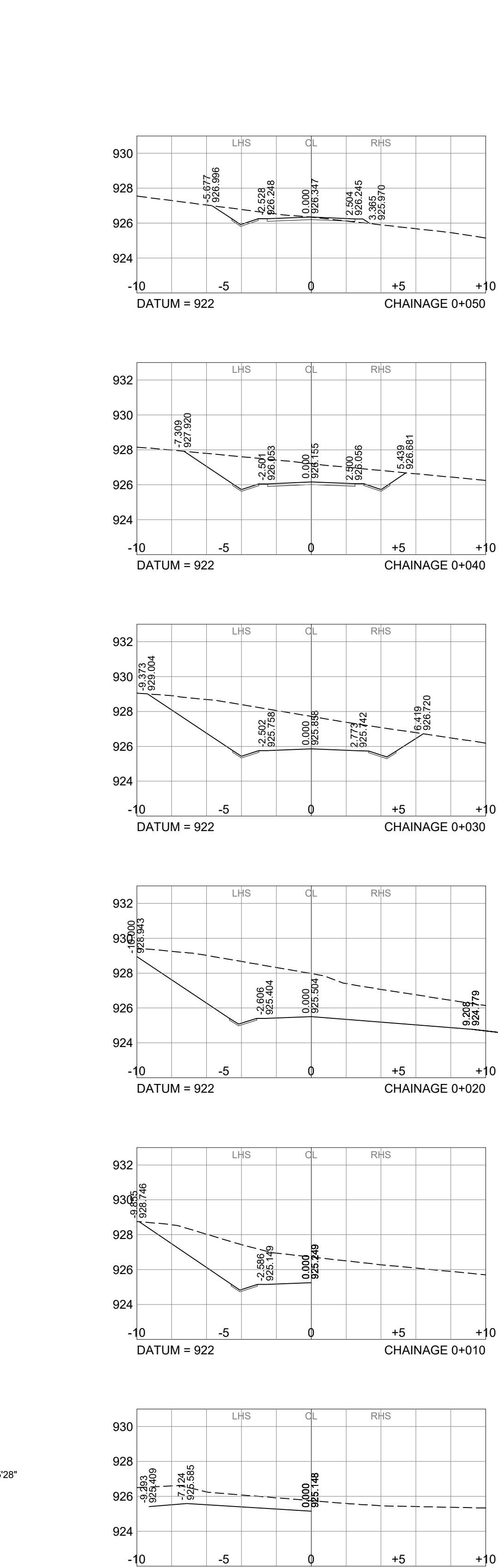


SCALE

Horizontal 1:1000
Vertical 1:100



Longitudinal Section for 0+000 to 0+059
Access 18 Intersecting D1724 @ Ch 3+612 RHS



Cross Sections for 0+000 to 0+059
Access 18 Intersecting D1724 @ Ch 3+612 RHS

Scale

Horizontal 1:200
Vertical 1:200

CONTINUED FROM SHEET C46928

CONTINUED ON SHEET C46930

REV	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/05/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	C46928	Designed by:-	Y.NANKHOO
Continued on:-	C46930	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Design Plan No:-	C46907 - C46908	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46929	Checked by:-	P.NANKHOO (Pr.Eng : 910350)
Cross Section No:-	C46929	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)
ACCESS LONGITUDINAL SECTIONS & CROSS SECTIONS

FOR TENDER PURPOSES

Staked km distance	Sheet
-	06
Scale	of
AS SHOWN	08
Plan No.:-	
	C46929

C46929

KEY

GRAVEL WEARING COURSE	
REINFORCED CONCRETE WEARING COURSE	

NOTE:
Schedule including Surfacing Type and Chainages.

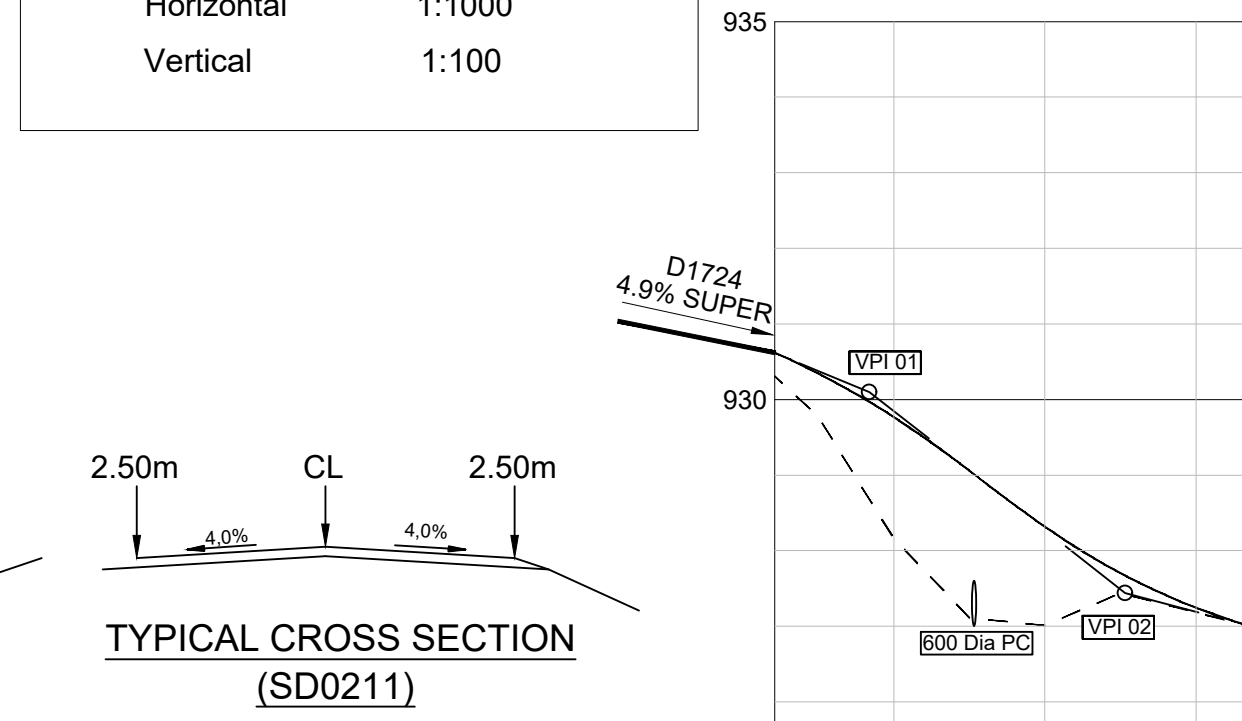
Chainage (km)	Surfacing Type
0.000 - 0.067	150mm Gravel Wearing Course to TRH 20
PAVEMENT DESIGN	
150mm Gravel Wearing Course to TRH 20	

KEY PLAN

Natural Ground Line	- - - - -
Finished Road Level	—————

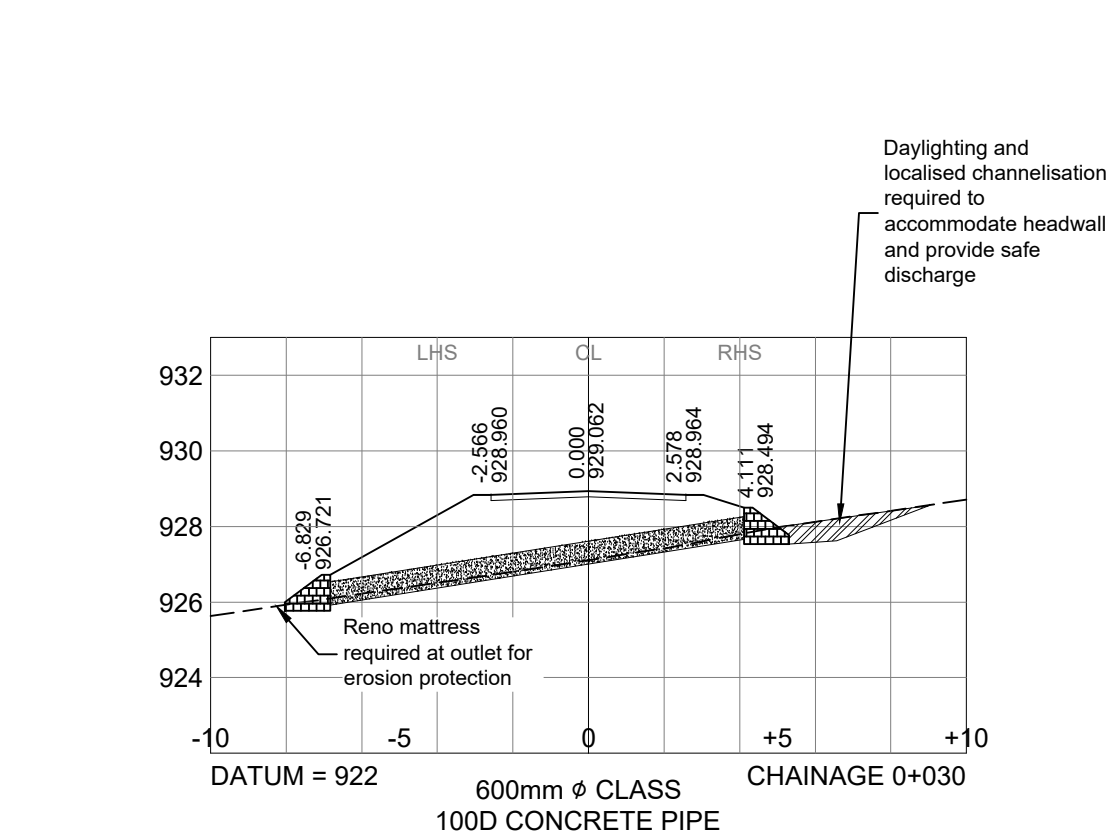
SCALE

Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails Drainage: Side Drains
Centre Line Road Marking	
Right Hand Side	Drainage: Side Drains Guardrails
Staked Ground Level	
Vertical Alignment	Finished Road Levels
	Grades
	Vertical Curves
Superelevation	
Horizontal Curves	
Staked Kilometre Distance	

Longitudinal Section for 0+000 to 0+067
Access 19 Intersecting D1724 @ Ch 3+731 LHS



Pipe Cross Section
Access 19 Intersecting D1724 @ Ch 3+731 LHS

Scale
Horizontal 1:200
Vertical 1:200

NOTE:
Schedule including Surfacing Type and Chainages.

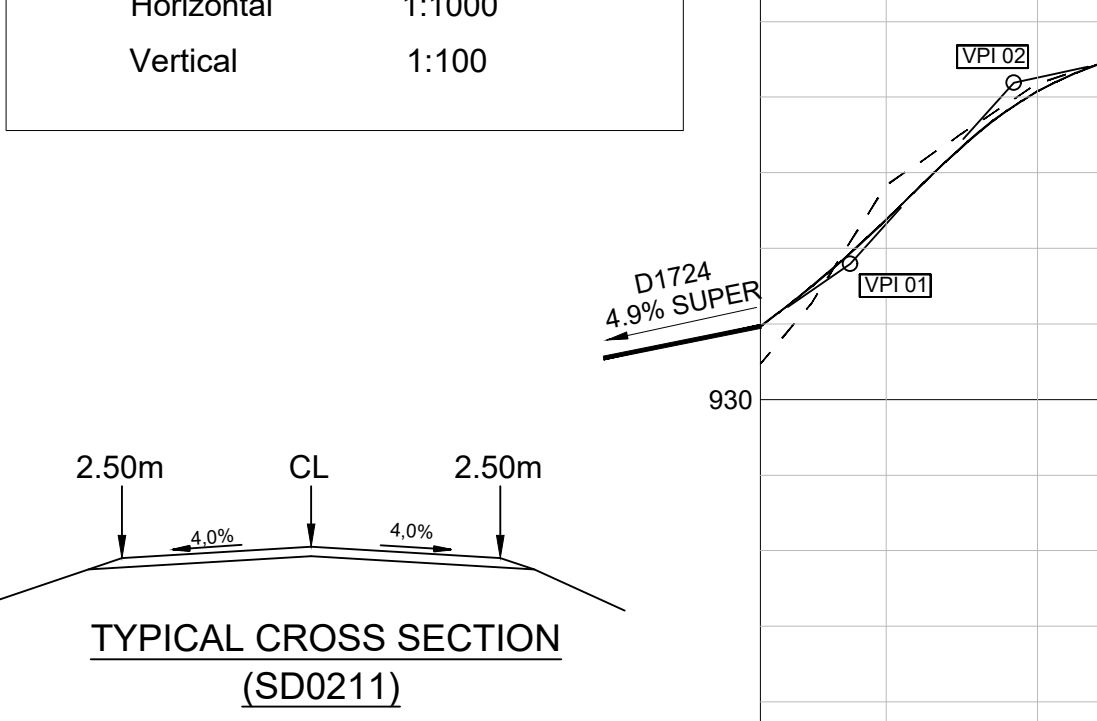
Chainage (km)	Surfacing Type
0.000 - 0.048	150mm Gravel Wearing Course to TRH 20
PAVEMENT DESIGN	
150mm Gravel Wearing Course to TRH 20	

KEY PLAN

Natural Ground Line	- - - - -
Finished Road Level	—————

SCALE

Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails Drainage: Side Drains
Centre Line Road Marking	
Right Hand Side	Drainage: Side Drains Guardrails
Staked Ground Level	
Vertical Alignment	Finished Road Levels
	Grades
	Vertical Curves
Superelevation	
Horizontal Curves	
Staked Kilometre Distance	

Longitudinal Section for 0+000 to 0+067
Access 20 Intersecting D1724 @ Ch 3+731 RHS

NOTE:
Schedule including Surfacing Type and Chainages.

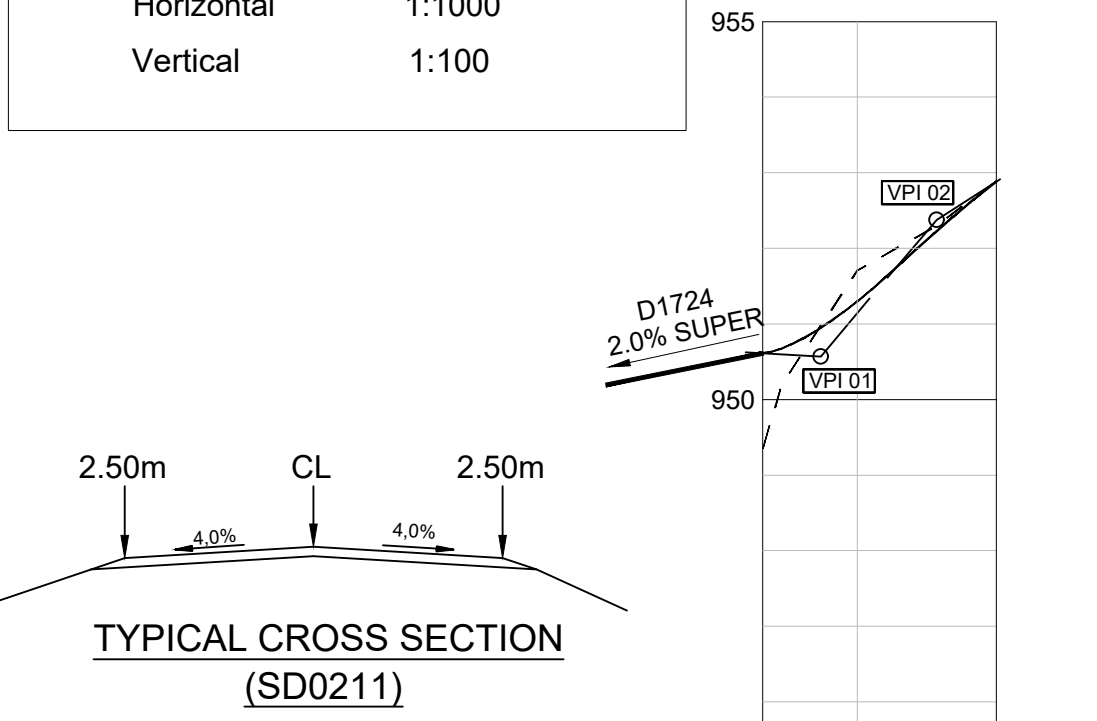
Chainage (km)	Surfacing Type
0.000 - 0.038	150mm Gravel Wearing Course to TRH 20
PAVEMENT DESIGN	
150mm Gravel Wearing Course to TRH 20	

KEY PLAN

Natural Ground Line	- - - - -
Finished Road Level	—————

SCALE

Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails Drainage: Side Drains
Centre Line Road Marking	
Right Hand Side	Drainage: Side Drains Guardrails
Staked Ground Level	
Vertical Alignment	Finished Road Levels
	Grades
	Vertical Curves
Superelevation	
Horizontal Curves	
Staked Kilometre Distance	

Longitudinal Section for 0+000 to 0+038
Access 21 Intersecting D1724 @ Ch 3+983 RHS

NOTE:
Schedule including Surfacing Type and Chainages.

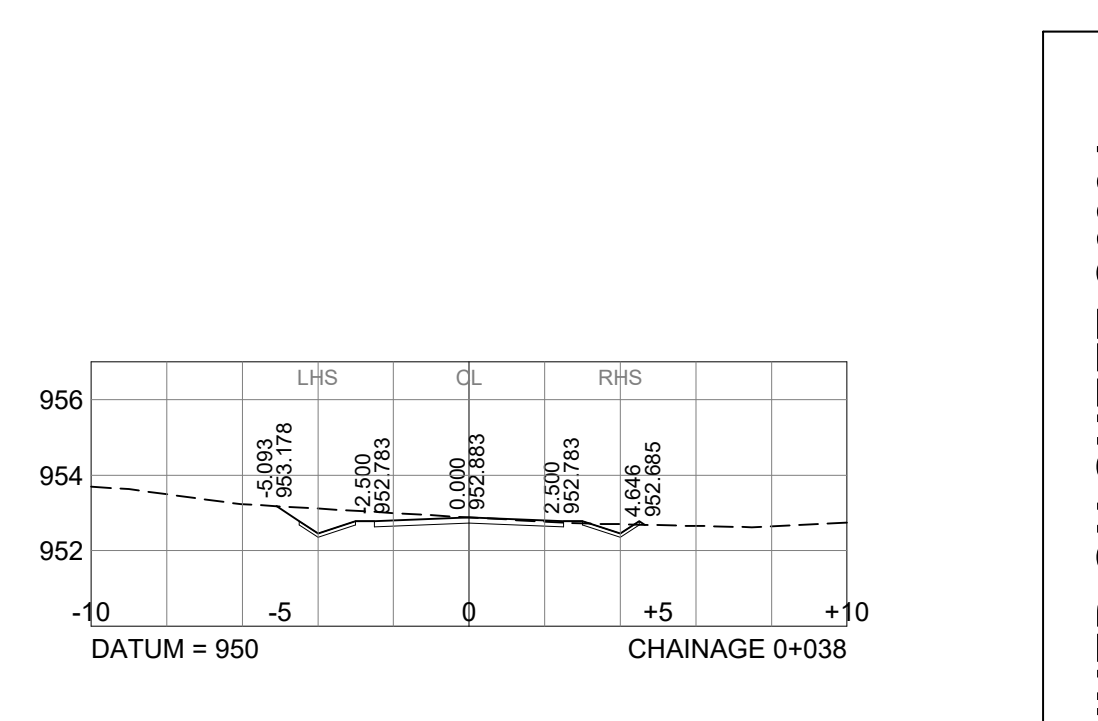
Chainage (km)	Surfacing Type
0.000 - 0.038	150mm Gravel Wearing Course to TRH 20
PAVEMENT DESIGN	
150mm Gravel Wearing Course to TRH 20	

KEY PLAN

Natural Ground Line	- - - - -
Finished Road Level	—————

SCALE

Horizontal 1:1000
Vertical 1:100



Left Hand Side	Guardrails Drainage: Side Drains
Centre Line Road Marking	
Right Hand Side	Drainage: Side Drains Guardrails
Staked Ground Level	
Vertical Alignment	Finished Road Levels
	Grades
	Vertical Curves
Superelevation	
Horizontal Curves	
Staked Kilometre Distance	

Longitudinal Section for 0+000 to 0+038
Access 21 Intersecting D1724 @ Ch 3+983 RHS

CONTINUED FROM SHEET C46929

CONTINUED ON SHEET C6931

REV	NO	DATE	DESCRIPTION	CHECKED	SIGNED
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.		
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.		
REV 1	17/05/21	ISSUED FOR APPROVAL	P.N.		
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.		

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	C46929	Designed by:-	Y.NANKHOOD
Continued on:-	C46931	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Design Plan No:-	C46908	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46930	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Cross Section No:-	C46930	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOOD
Consulting Engineers
www.nankhoo.co.za

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

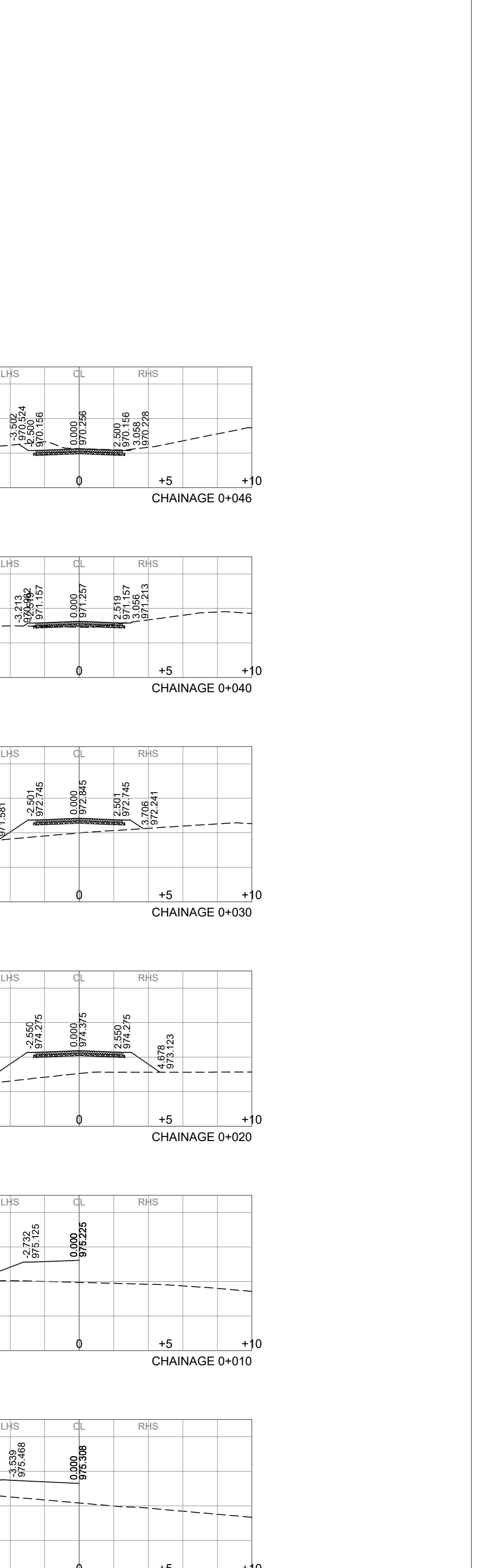
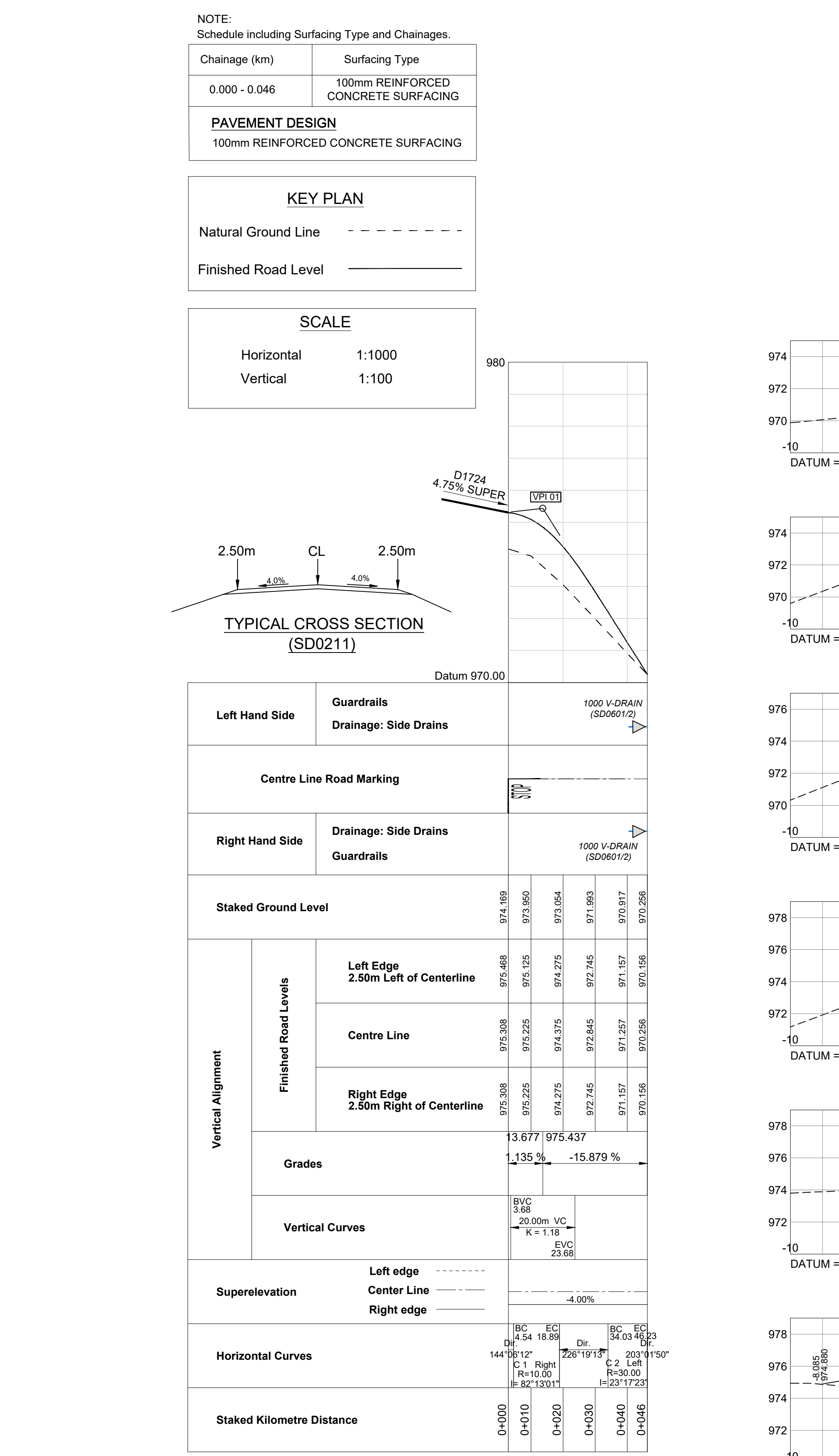
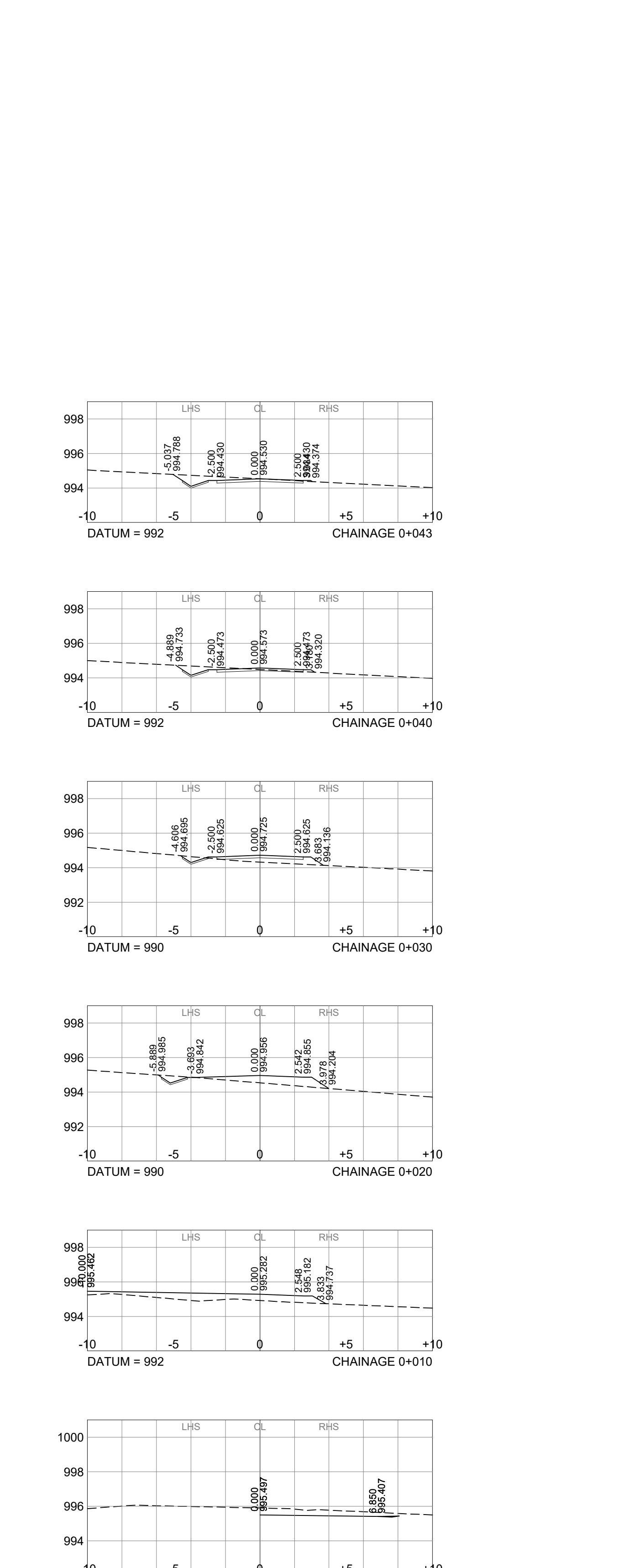
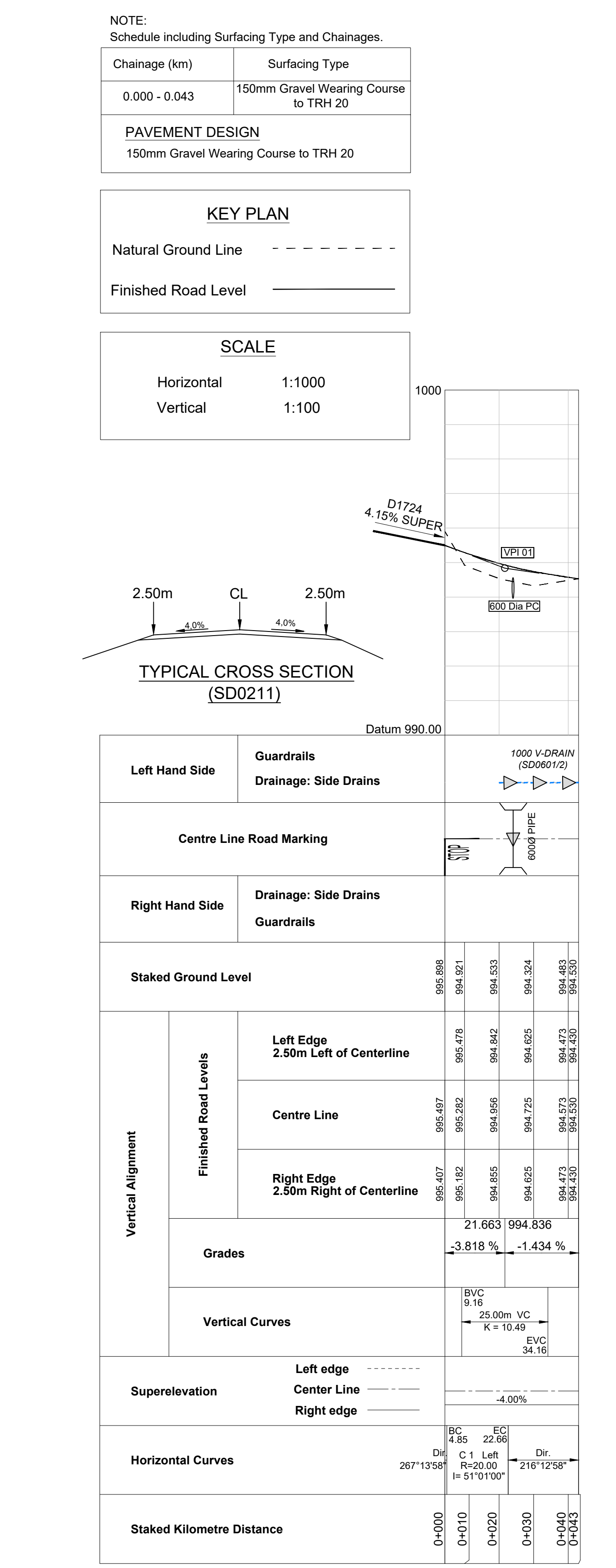
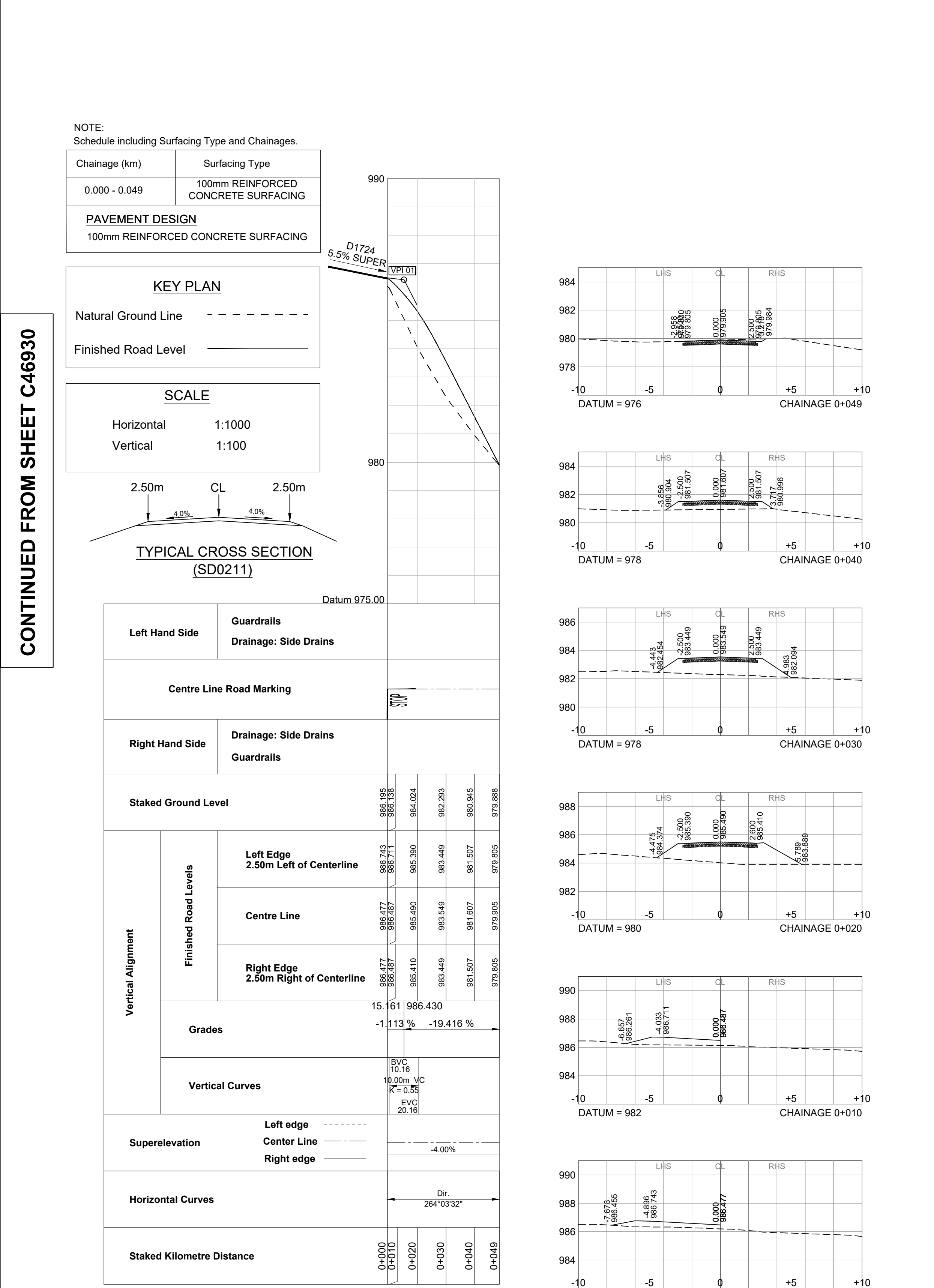
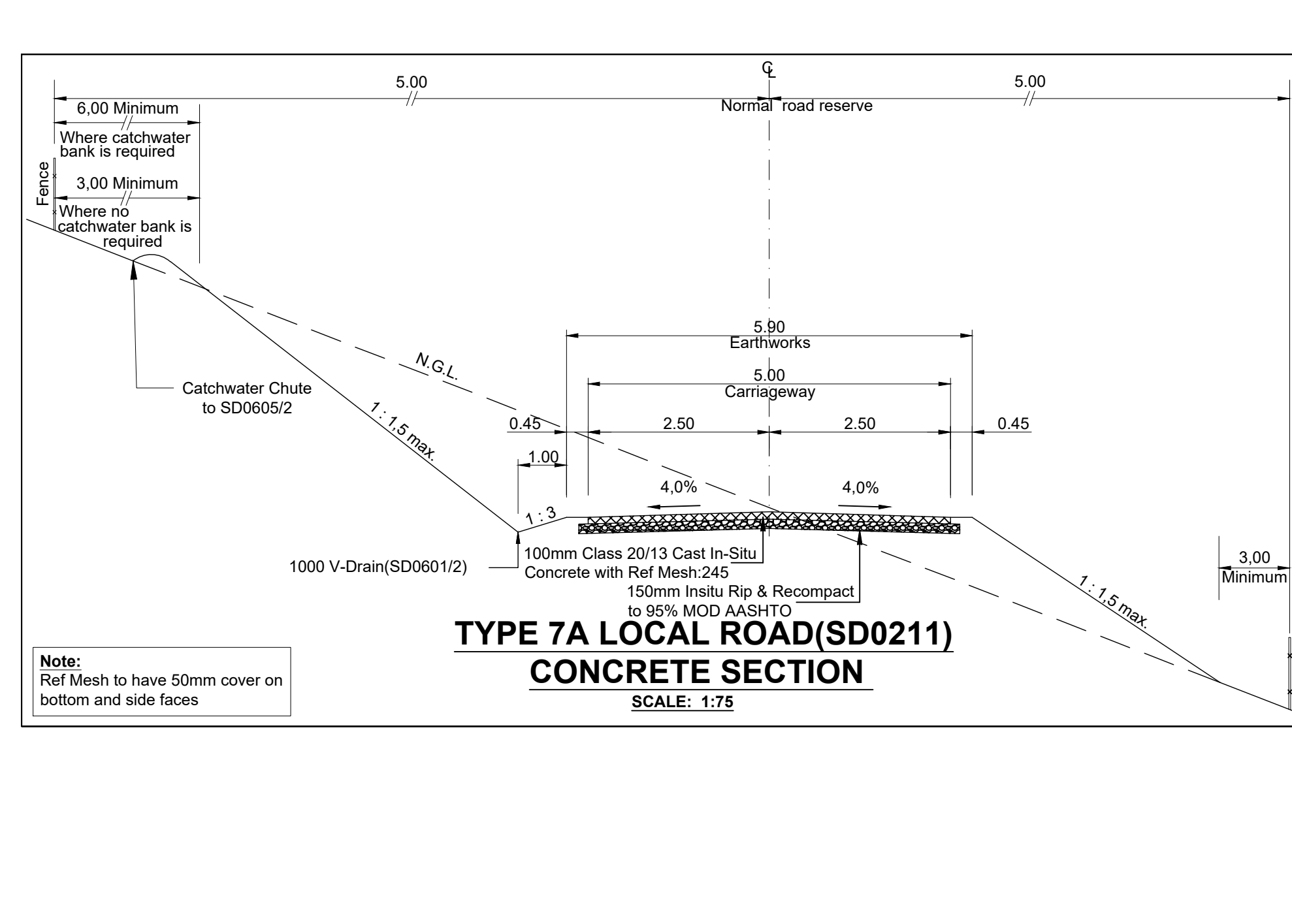
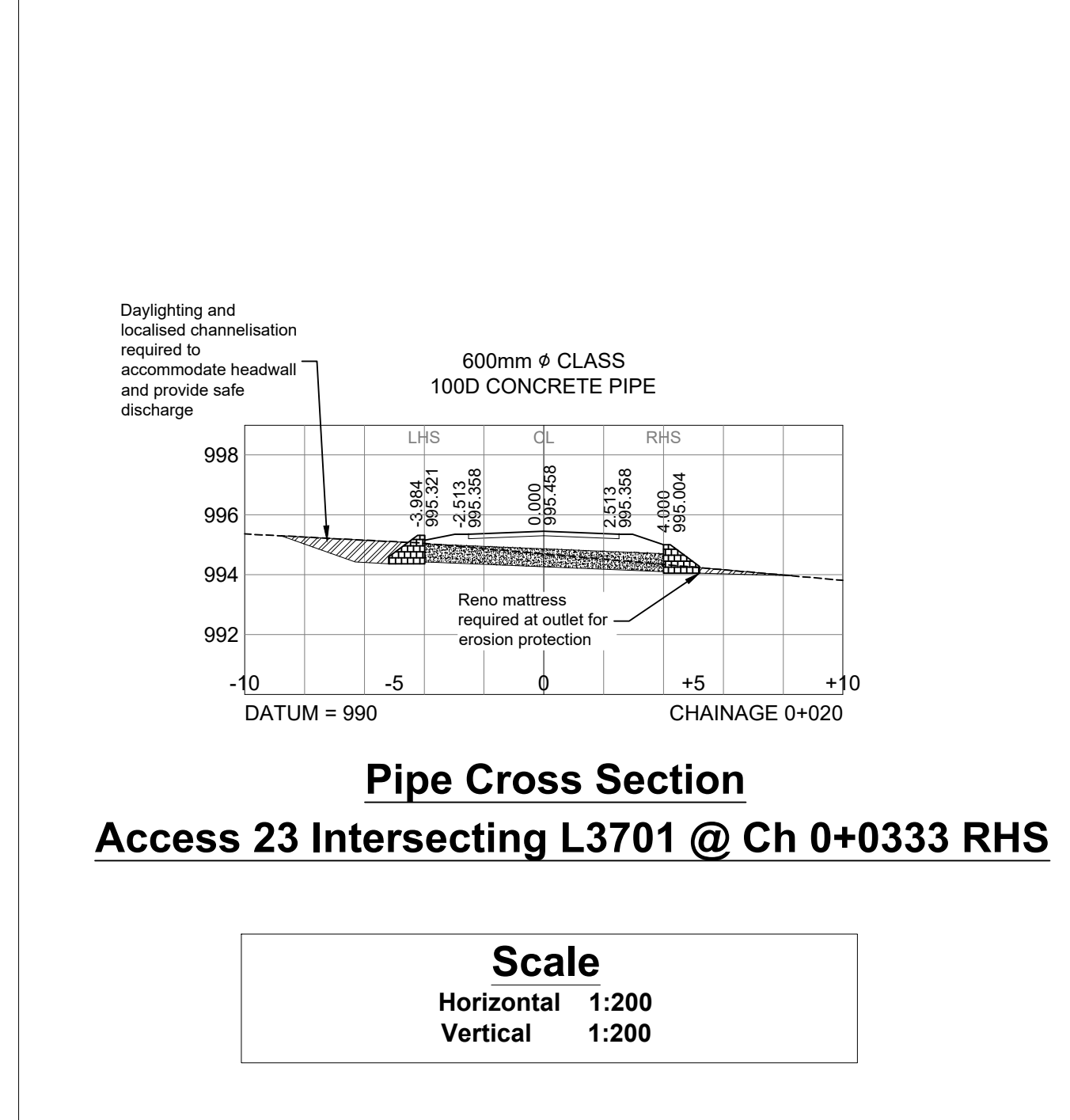
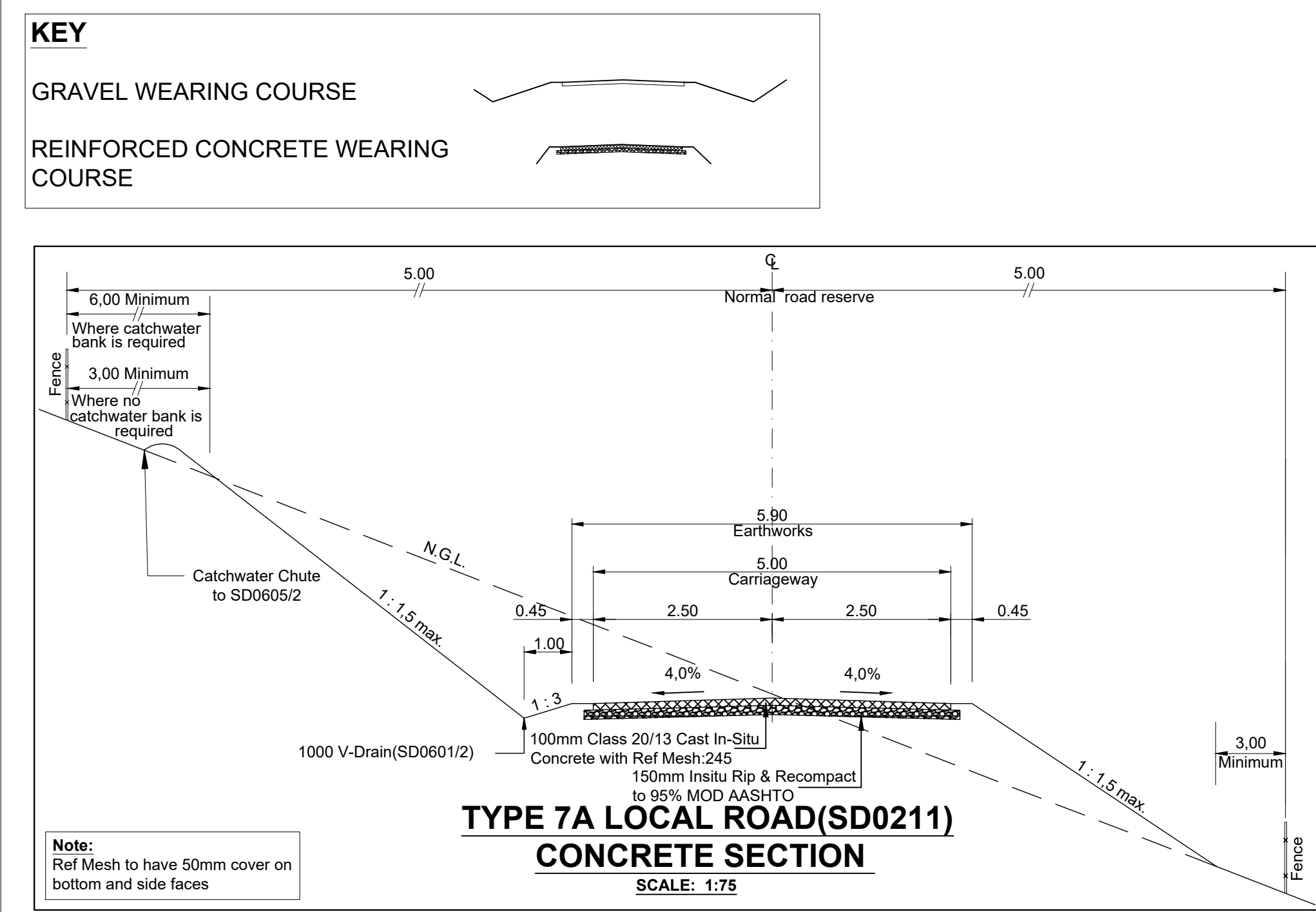
PORTION

DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)

ACCESS LONGITUDINAL SECTIONS & CROSS SECTIONS

FOR TENDER PURPOSES	
Staked km distance	Sheet 07 of 08
Scale AS SHOWN	Plan No.: C46930

C46930



Longitudinal Section for 0+000 to 0+049
Access 22 Intersecting D1724 @ Ch 4+471 RHS

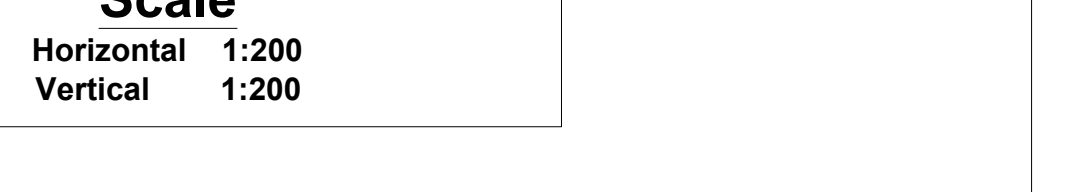
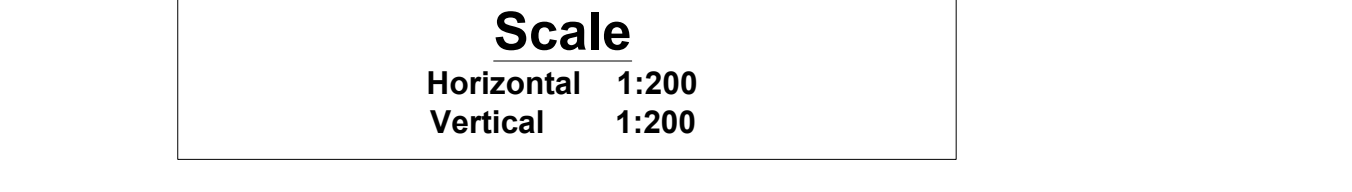
Cross Sections for 0+000 to 0+049
Access 22 Intersecting D1724 @ Ch 4+471 RHS

Longitudinal Section for 0+000 to 0+043
Access 23 Intersecting L3701 @ Ch 0+333 RHS

Cross Sections for 0+000 to 0+043
Access 23 Intersecting L3701 @ Ch 0+333 RHS

Longitudinal Section for 0+000 to 0+046
Access 24 Intersecting L3701 @ Ch 0+668 LHS

Cross Sections for 0+000 to 0+046
Access 24 Intersecting L3701 @ Ch 0+668 LHS



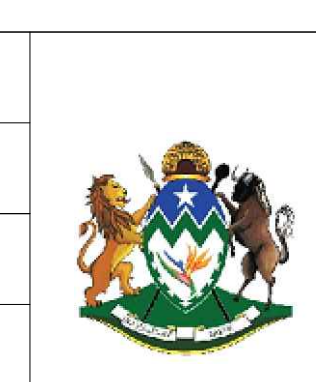
AS BUILT

Symbol	Date	Description	Checked	Signed
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.	
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.	
REV 1	17/08/21	ISSUED FOR APPROVAL	P.N.	
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.	

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	C46930	Designed by:-	Y.NANKHOOD
Continued on:-	-	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Design Plan No:-	C46909	Drawn by:-	K.RAMSUROOP
Long Section No:-	C46931	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Cross Section No:-	C46931	Date of Approval:-	18 FEBRUARY 2022



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



Transportation Engineering : Chief Engineer

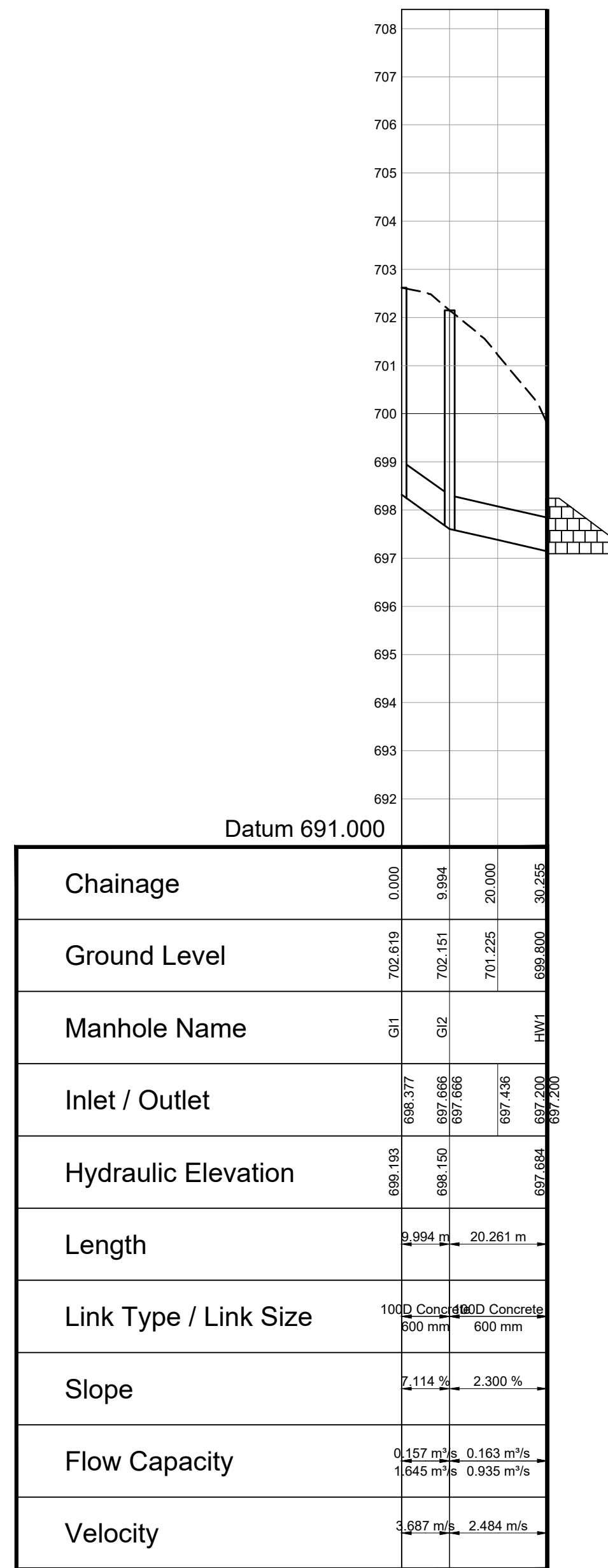
Head: Transport

FOR TENDER PURPOSES

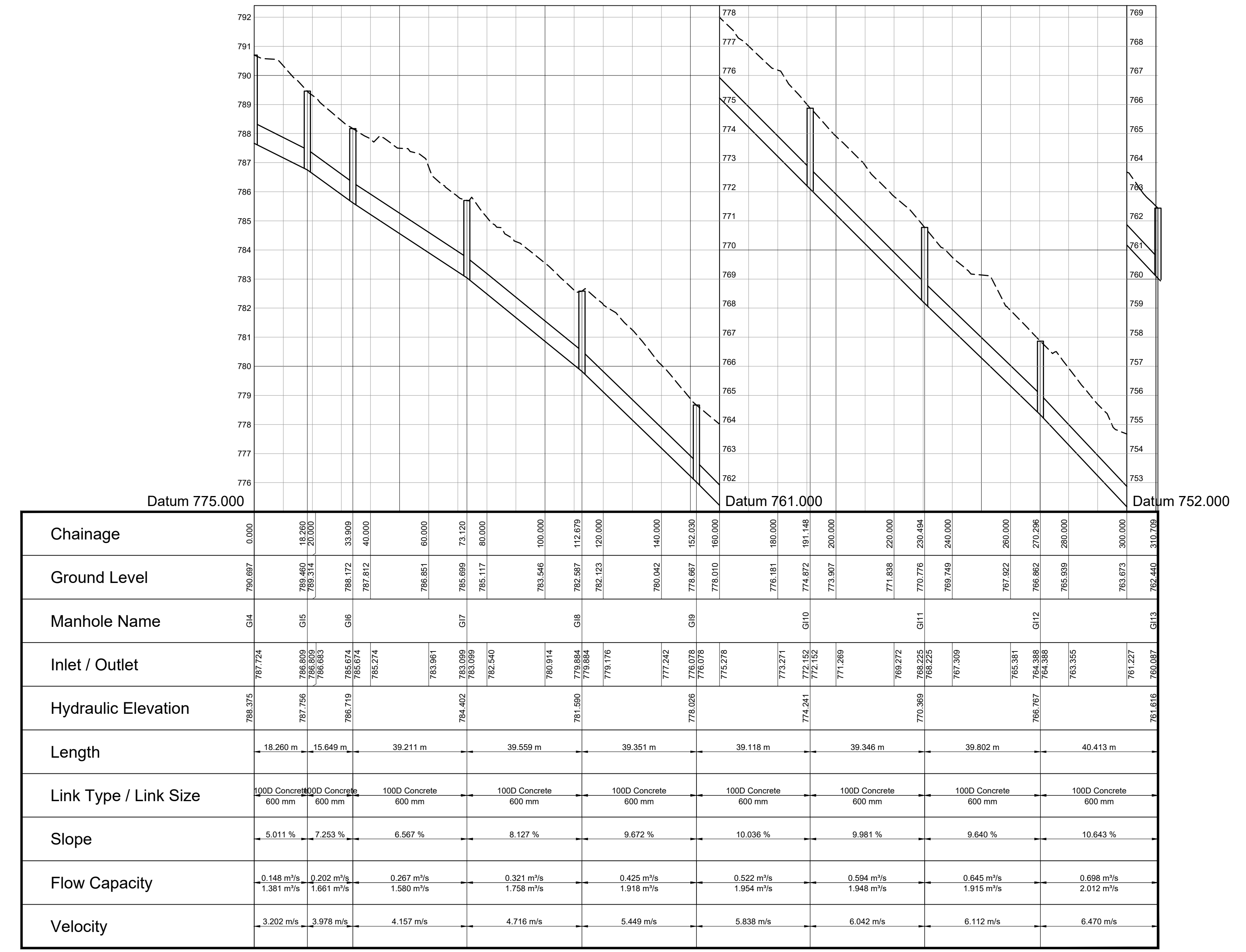
DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723 LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL	Staked km distance	Sheet	08
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE (Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)	Scale	Plan No.:-	C46931
ACCESS LONGITUDINAL SECTIONS & CROSS SECTIONS	AS SHOWN		

C46931

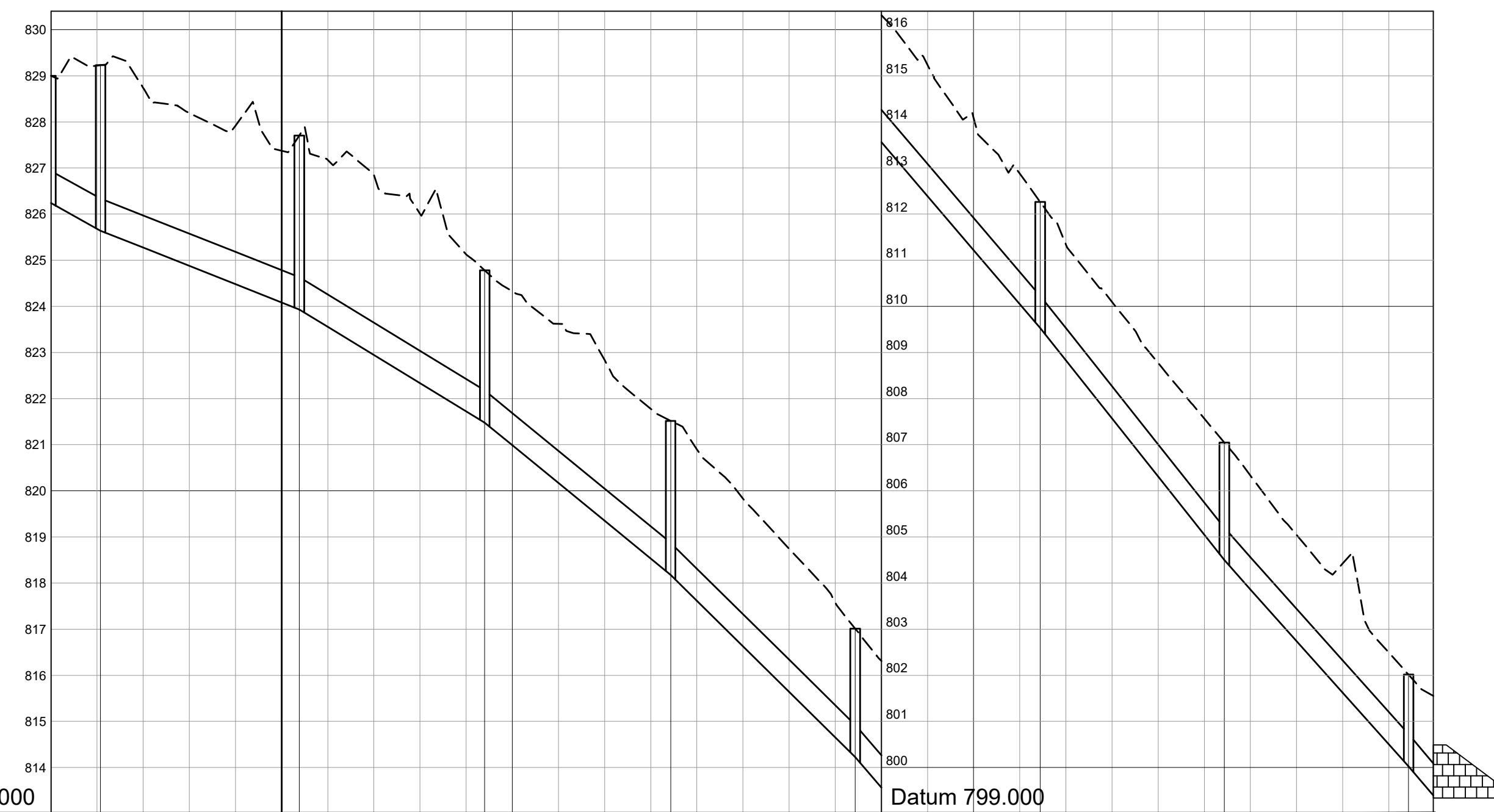
GRID INLET SETTING OUT (SD0602/B)											
CHAINAGE	NAME OF GRID	SIDE OF CARRIAGEWAY	POSITION FROM	SIZE	TYPE	LENGTH OF PIPE(m)	INVERT	TOP OF GRID	DEPTH (m)	Y-CO-ORDINATE	X CO-ORDINATE
505	HW1				HW		697.50			-36753.353	3097550.276
524	G12	RHS	ACCESS 4	600	GI	19.00	697.67	699.48	1.815	-36744.465	3097532.068
535	G11			600	GI	11.00	698.38	700.19	1.815	-36739.672	3097523.298
1177	G13				TIE IN					-36305.911	3097103.041
1220	G12			600	GI	43.00	764.39	766.20	1.815	-36294.734	3097064.204
1260	G11			600	GI	40.00	768.23	770.04	1.815	-36282.761	3097026.246
1300	G10			600	GI	40.00	772.15	773.97	1.815	-36266.106	3096990.599
1340	G9	LHS	ACCESS 8	600	GI	40.00	776.08	777.89	1.815	-36244.662	3096957.883
1380	G8			600	GI	40.00	779.88	781.70	1.815	-36218.676	3096928.332
1420	G7			600	GI	40.00	783.10	784.91	1.815	-36188.531	3096902.715
1460	G6			600	GI	40.00	785.67	787.49	1.815	-36155.356	3096881.812
1475	G5			600	GI	15.00	786.81	788.62	1.815	-36140.742	3096876.216
1493	G4			600	GI	18.00	787.72	789.54	1.815	-36124.514	3096867.844
1684	HW2				HW		800.08	801.90	1.815	-35976.095	3096731.629
1740	G22			600	GI	56.00	804.56	806.37	1.815	-35959.021	3096699.503
1780	G21			600	GI	40.00	809.59	811.40	1.815	-35947.023	3096669.424
1820	G20			600	GI	40.00	814.28	816.10	1.815	-35924.855	3096623.168
1860	G19	LHS	ACCESS 10	600	GI	40.00	818.23	820.05	1.815	-35907.878	3096586.944
1900	G18			600	GI	40.00	823.35	825.17	1.815	-35890.003	3096550.814
1940	G17			600	GI	40.00	823.99	825.80	1.815	-35874.581	3096513.734
1983	G16			600	GI	43.00	827.51	829.32	1.815	-35857.161	3096474.3
1994	G15			600	GI	11.00	826.29	828.11	1.815	-35852.863	3096464.453
2340	HW3				HW		833.95	833.76	1.815	-35815.807	3096122.997
2360	G33			600	GI	20.00	833.02	834.84	1.815	-35817.269	3096102.44
2400	G32			600	GI	40.00	835.70	837.51	1.815	-35819.896	3096062.636
2430	G31			600	GI	30.00	837.16	838.97	1.815	-35822.147	3096032.406
2460	G30			600	GI	30.00	840.00	841.82	1.815	-35826.258	3096002.067
2520	G29	LHS	ACCESS 15	600	GI	60.00	844.34	846.15	1.815	-35837.782	3095943.038
2580	G28			600	GI	60.00	847.76	849.58	1.815	-35853.909	3095884.547
2640	G27			600	GI	60.00	850.41	852.23	1.815	-35876.889	3095828.668
2692	G26			600	GI	52.00	851.20	853.02	1.815	-35898.638	3095781.407
2705	G25			600	GI	13.00	852.15	853.96	1.815	-35904.477	3095770.212



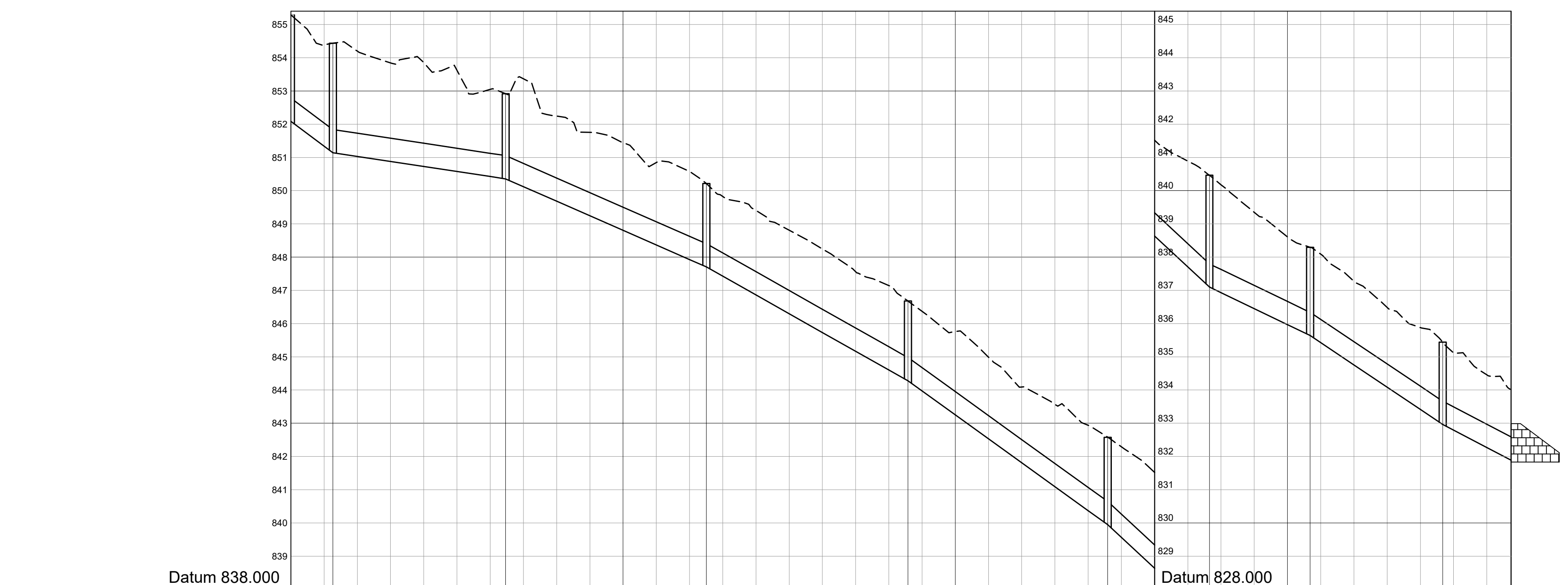
GRID INLET G1 to HW1
Scale: Hor: 1000 ; Vert:100



GRID INLET G4 to G13
Scale: Hor: 1000 ; Vert:100



GRID INLET G15 to HW2
Scale: Hor: 1000 ; Vert:100



GRID INLET G12 to HW3
Scale: Hor: 1000 ; Vert:100

REV	NO	DATE	DESCRIPTION	CHECKED	SIGNED
REV 3	18/11/21	ISSUED FOR APPROVAL	P.N.		
REV 2	15/10/21	ISSUED FOR APPROVAL	P.N.		
REV 1	17/08/21	ISSUED FOR APPROVAL	P.N.		
REV 0	14/11/17	ISSUED FOR APPROVAL	P.N.		

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	C46930	Designed by:-	Y.NANKHOOD
Continued on:-	-	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Design Plan No:-	C46909	Drawn by:-	K RAMSUROOP
Long Section No:-	C46931	Checked by:-	P.NANKHOOD (Pr.Eng : 910350)
Cross Section No:-	C46931	Date of Approval:-	18 FEBRUARY 2022

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOOD
Consulting Engineers
www.nankhoo.co.za

Transportation Engineering : Chief Engineer

Head: Transport

SIGNATURE _____ DATE _____

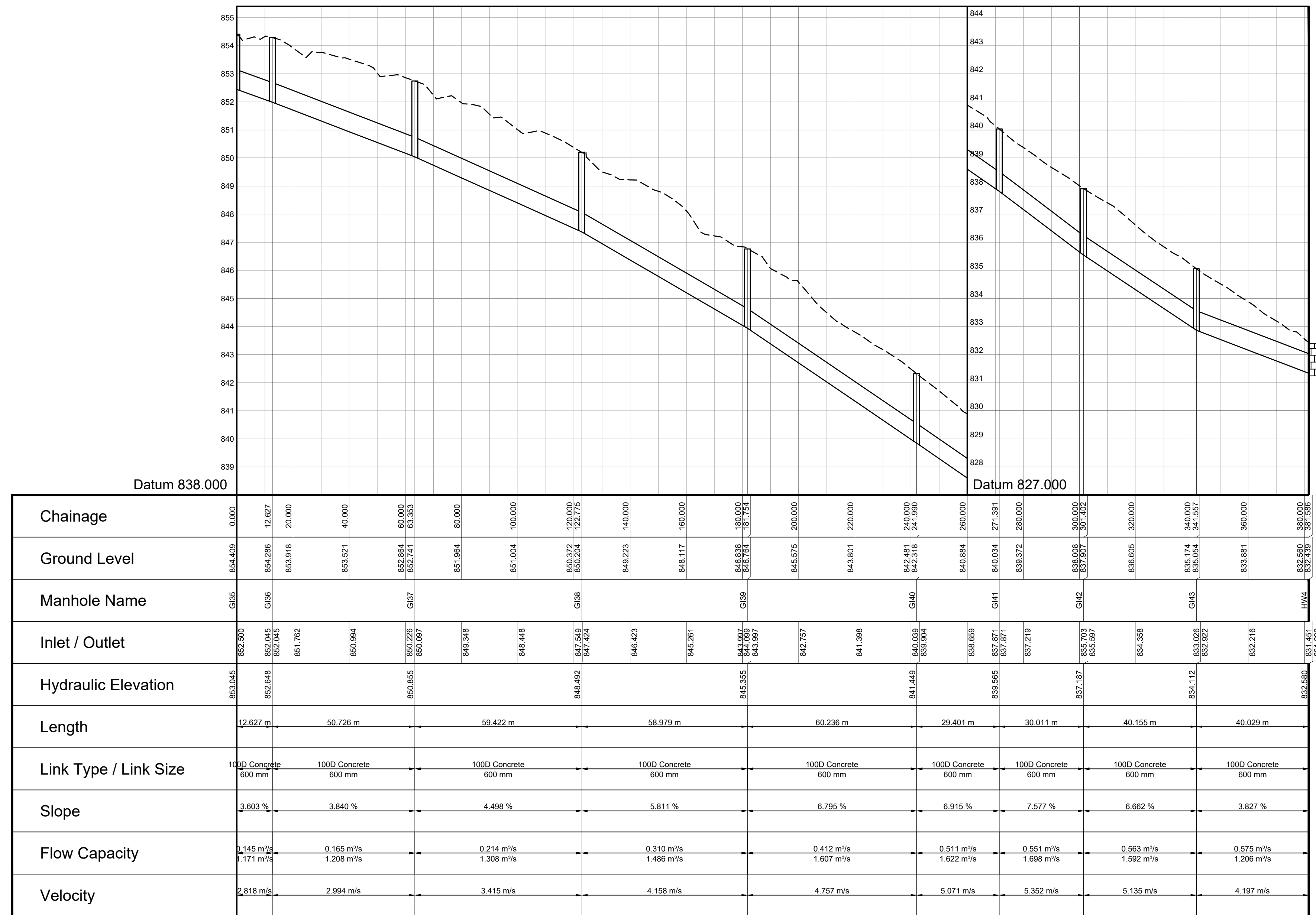
DISTRICT ROAD 1724 : CEZA PRIMARY SCHOOL - DISTRICT ROAD D1723
LOCAL ROAD L3701 : D1724 - THULASIZWE HOSPITAL

PORTION

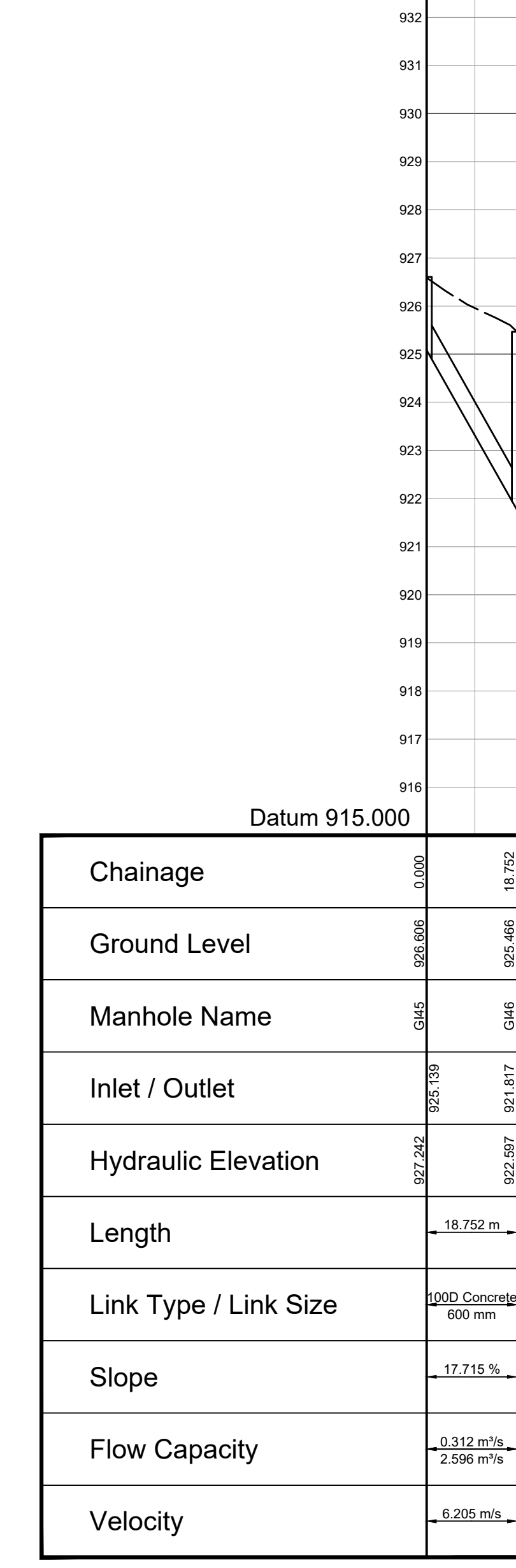
DISTRICT ROAD 1724 & LOCAL ROAD 3701 UPGRADE
(Km 0.000 to Km 5.040 & Km 0.000 to Km 0+916)
STORMWATER GRID INLET LONGITUDINAL SECTIONS

FOR TENDER PURPOSES	
Staked km distance	Sheet 01 of 02
Scale AS SHOWN	Plan No.:-

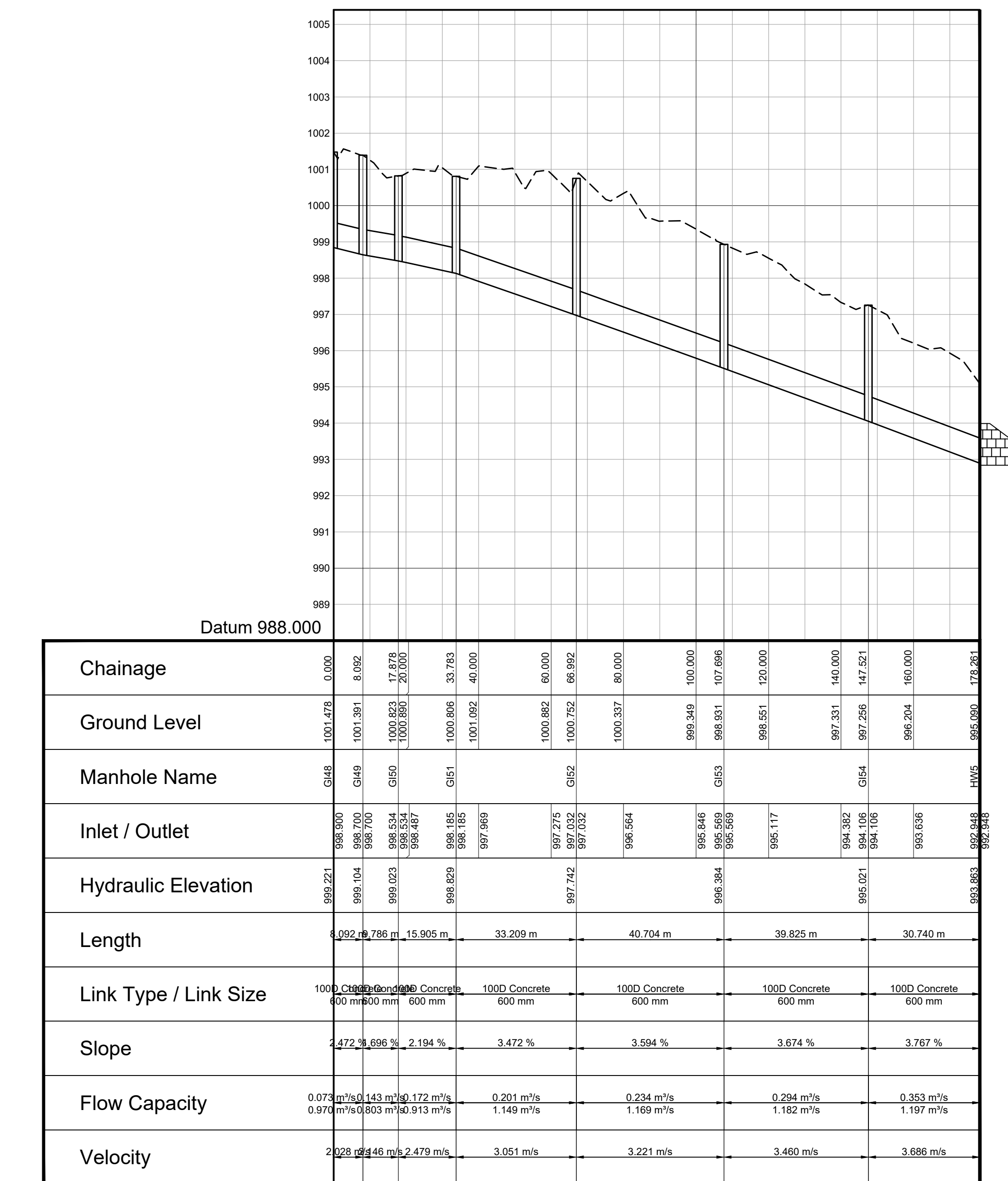
GRID INLET SETTING OUT (SD0602/B)																
CHAINAGE	NAME OF GRID	SIDE OF CARRIAGEWAY	POSITION FROM	SIZE	TYPE	LENGTH OF PIPE(m)	INVERT	TOP OF GRID	DEPTH (m)	Y-CO-ORDINATE	X CO-ORDINATE					
2320	HW4	RHS	ACCESS 16	600	GI	40.00	831.39	833.21	1.815	-35827.247	3096142.902					
2360	GI43						832.92	834.74	1.815	-35827.976	3096102.88					
2400	GI42						835.60	837.41	1.815	-35830.559	3096062.808					
2430	GI41						837.87	839.69	1.815	-35832.844	3096032.884					
2460	GI40						839.90	841.72	1.815	-35836.907	3096003.765					
2520	GI39						844.00	845.81	1.815	-35848.125	3095944.583					
2580	GI38						847.42	849.24	1.815	-35864.053	3095887.796					
2640	GI37						850.10	851.91	1.815	-35886.386	3095832.731					
2692	GI36						852.05	853.86	1.815	-35910.266	3095787.977					
2705	GI35						853.05	854.86	1.815	-35916.106	3095776.782					
3598	GI46						LHS	ACCESS 18	600	GI	18.00	-	-	-	-36298.926	3094970.259
3616	GI45											925.14	926.95	1.815	-36307.809	3094953.744
4827	GI48											998.30	1000.72	1.815	-35930.509	3093925.534
4836	GI49											998.70	1000.91	2.207	-35927.622	3093917.974
4844	GI50	998.53	1000.35	1.815	-35929.421	3093908.355										
4860	GI51	998.18	1000.00	1.815	-35923.422	3093893.625										
4894	GI52	997.03	998.85	1.815	-35911.263	3093862.722										
40	GI53	995.57	997.38	1.815	-35896.093	3093824.95										
80	GI54	994.11	995.92	1.815	-35880.539	3093788.288										
112	HW5	992.95	995.09	2.142	-35868.372	3093760.058										

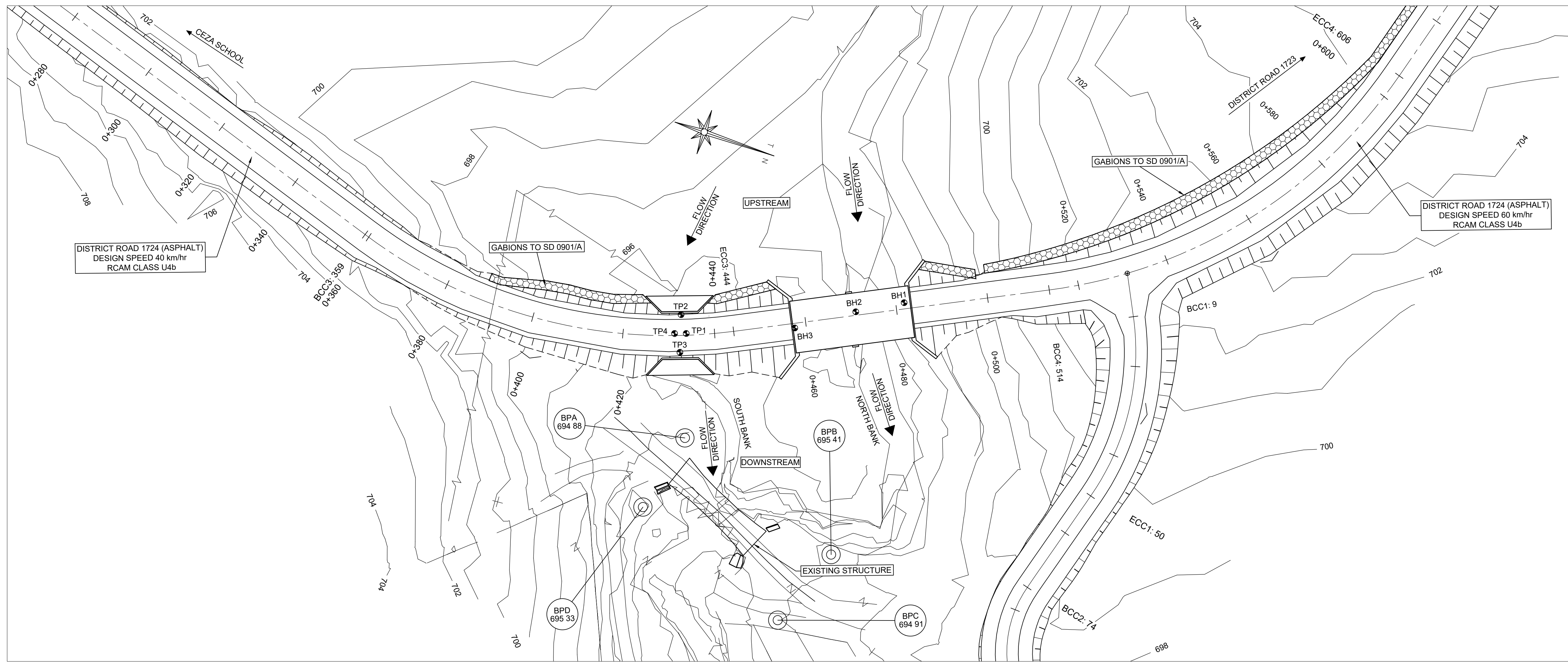


GRID INLET GI35 to HW4
Scale: Hor: 1000 ; Vert:100



GRID INLET GI45 to GI46
Scale: Hor: 1000 ; Vert:100





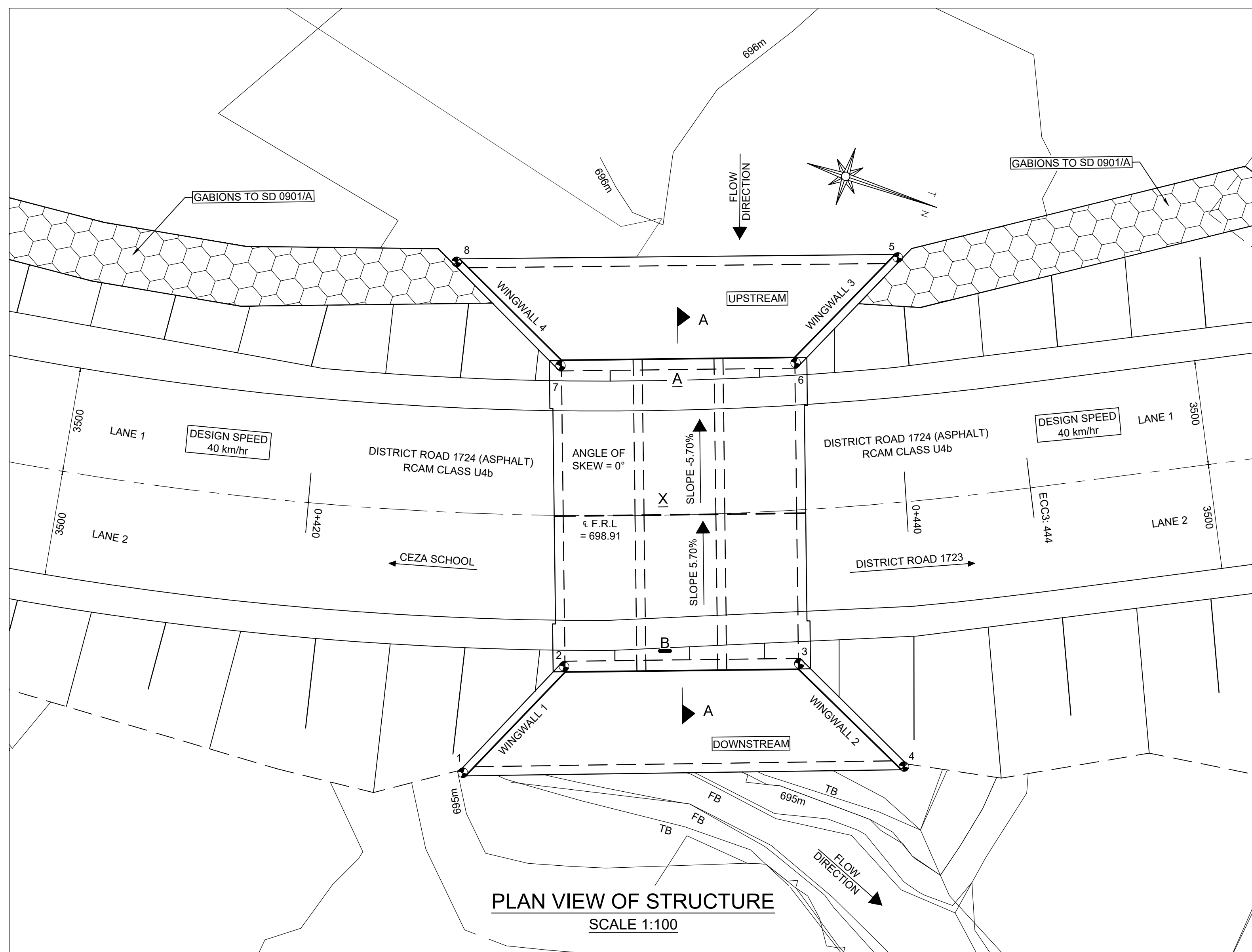
SITE PLAN
SCALE 1:500

SETTING OUT POINTS WGS 84

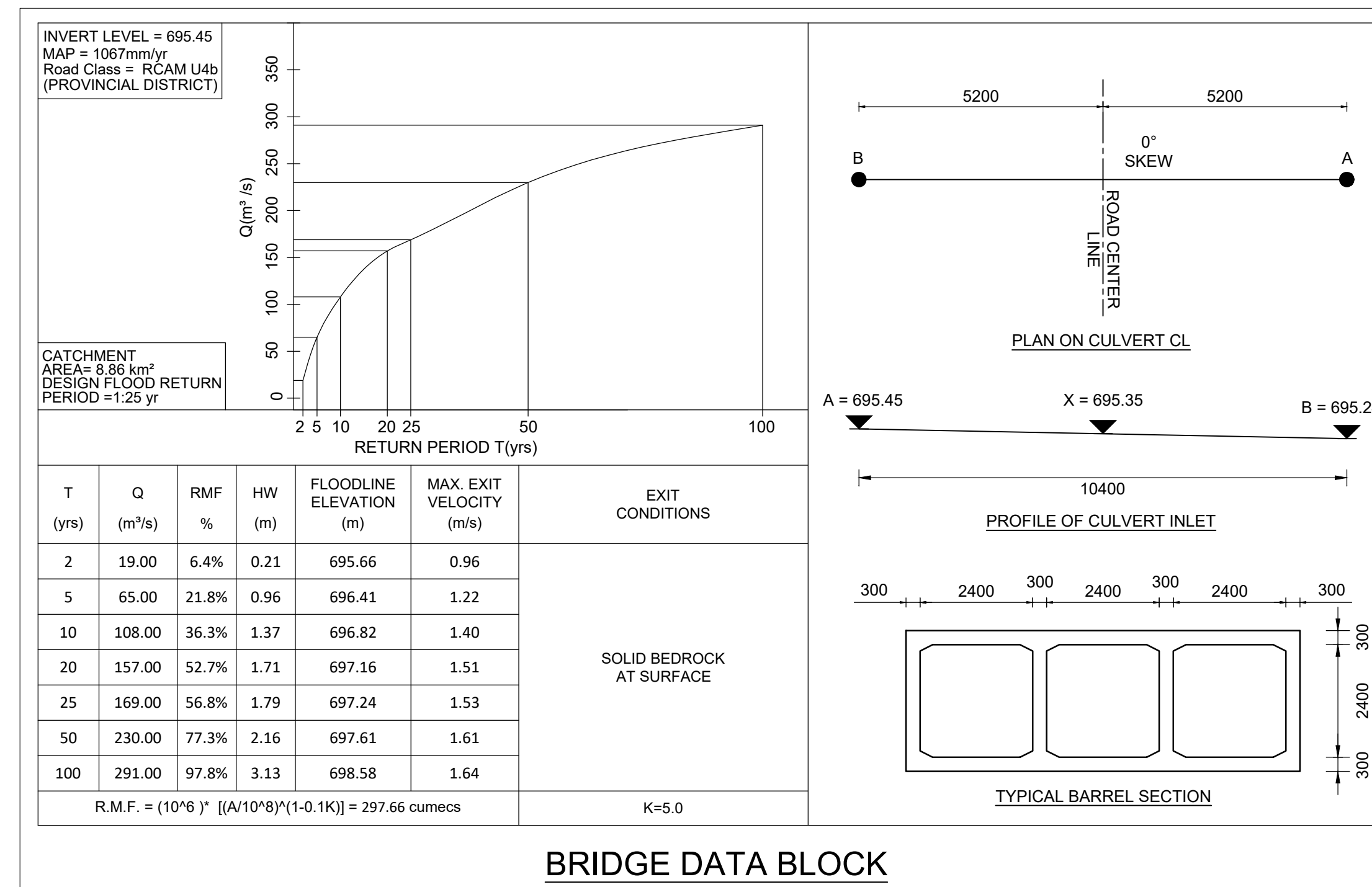
POINTS	X	Y	Z
1	3097622.008	-36790.415	695.240
2	3097619.956	-36785.962	695.240
3	3097612.550	-36783.333	695.240
4	3097608.130	-36785.458	695.240
5	3097613.820	-36769.426	695.450
6	3097615.912	-36773.862	695.450
7	3097623.317	-36776.491	695.450
8	3097627.718	-36774.327	695.450

CONTROL POINTS WGS 84

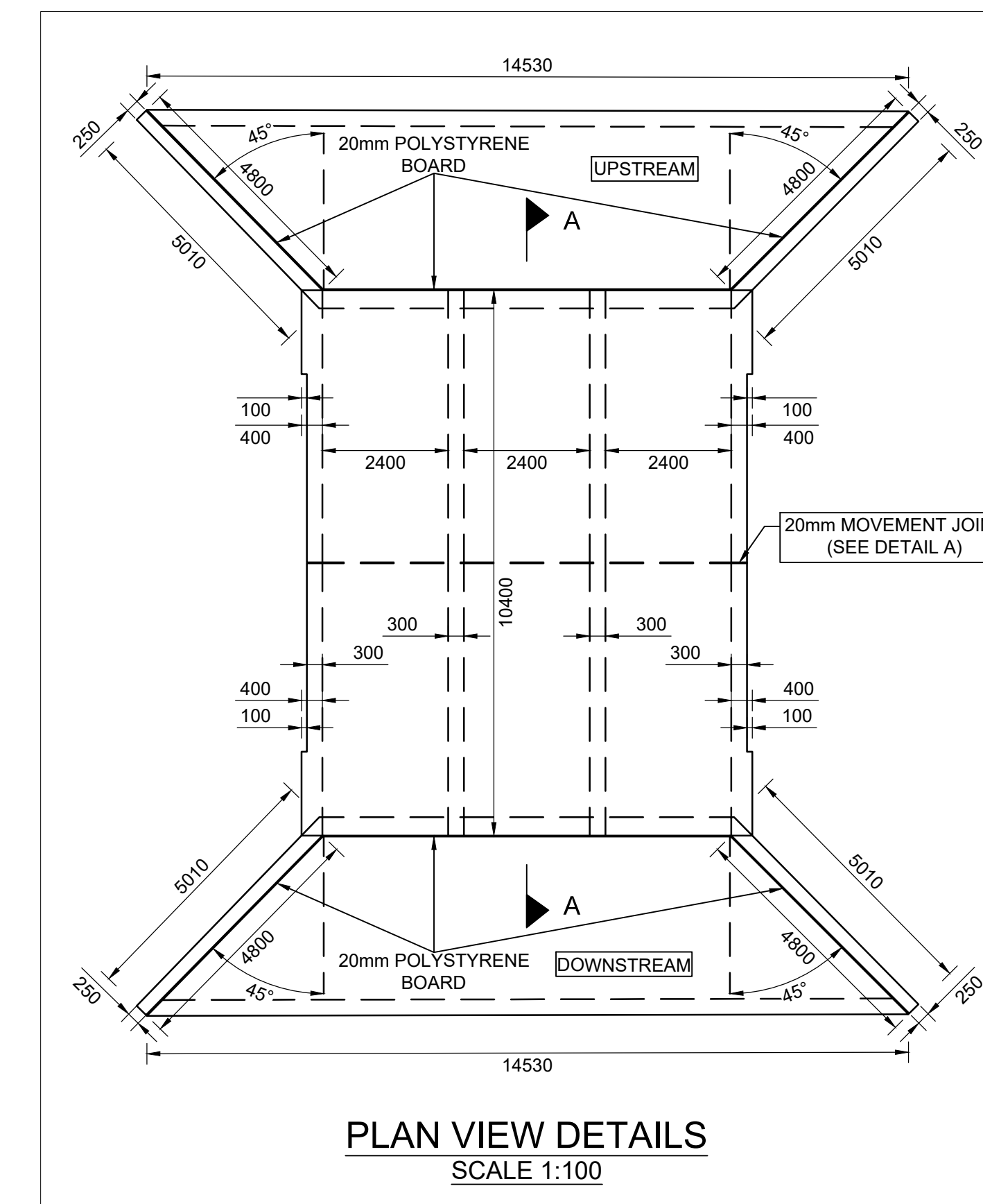
POINTS	X	Y	Z
BPA	3097609.672	-36800.687	694.887
BPB	3097571.324	-36814.419	695.410
BPC	3097577.743	-36831.721	694.906
BPD	3097613.487	-36817.895	695.329



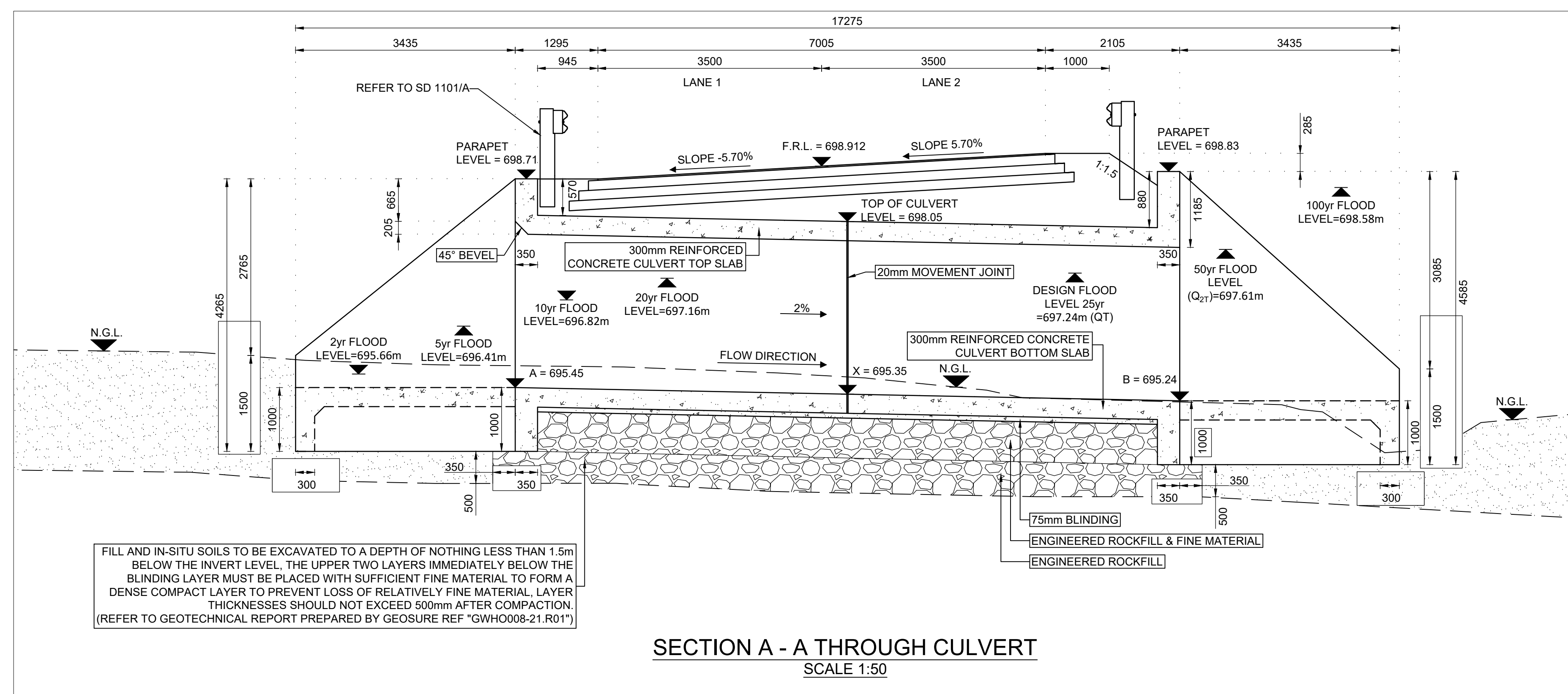
PLAN VIEW OF STRUCTURE
SCALE 1:100



BRIDGE DATA BLOCK



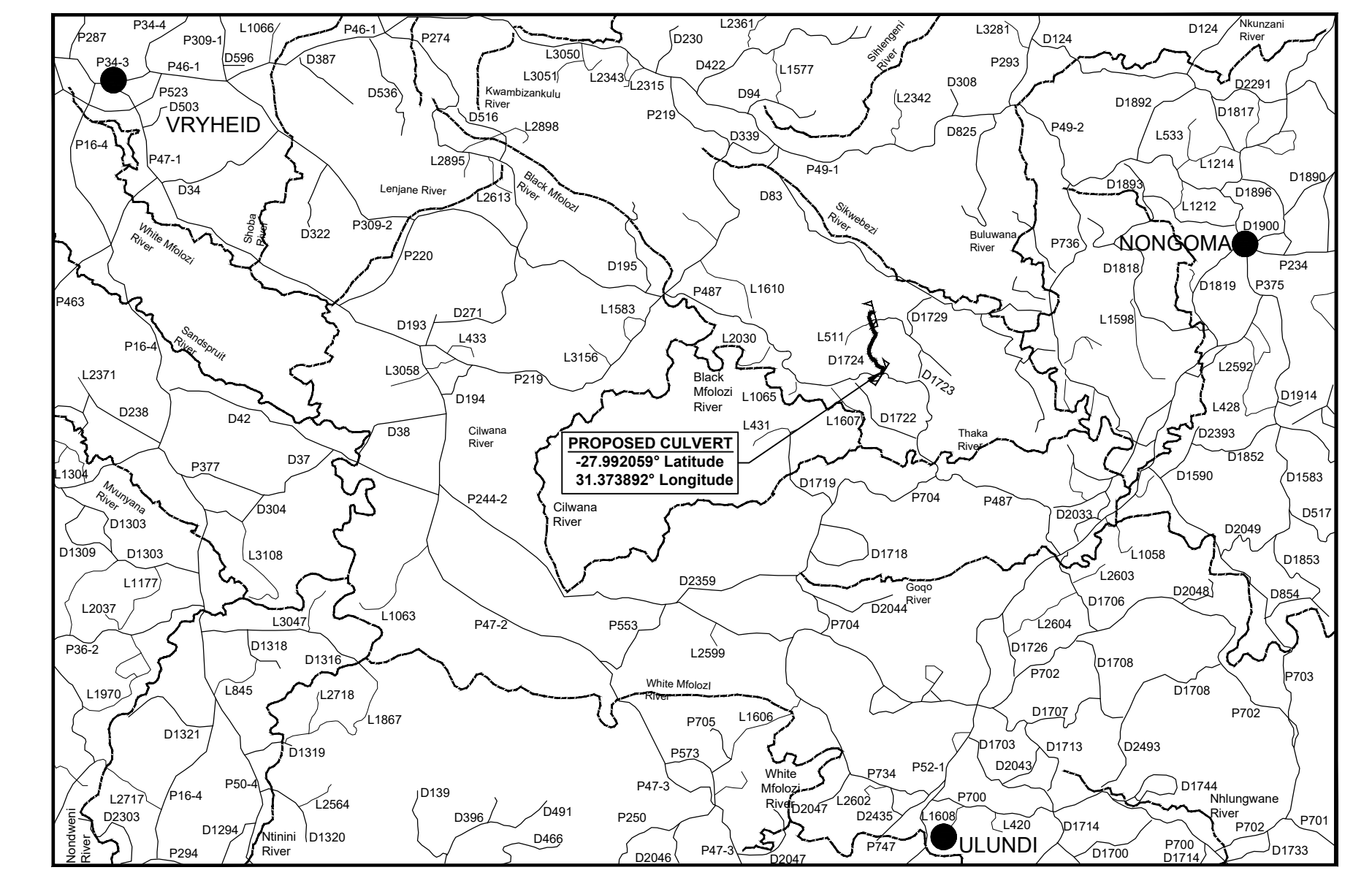
PLAN VIEW DETAILS
SCALE 1:100



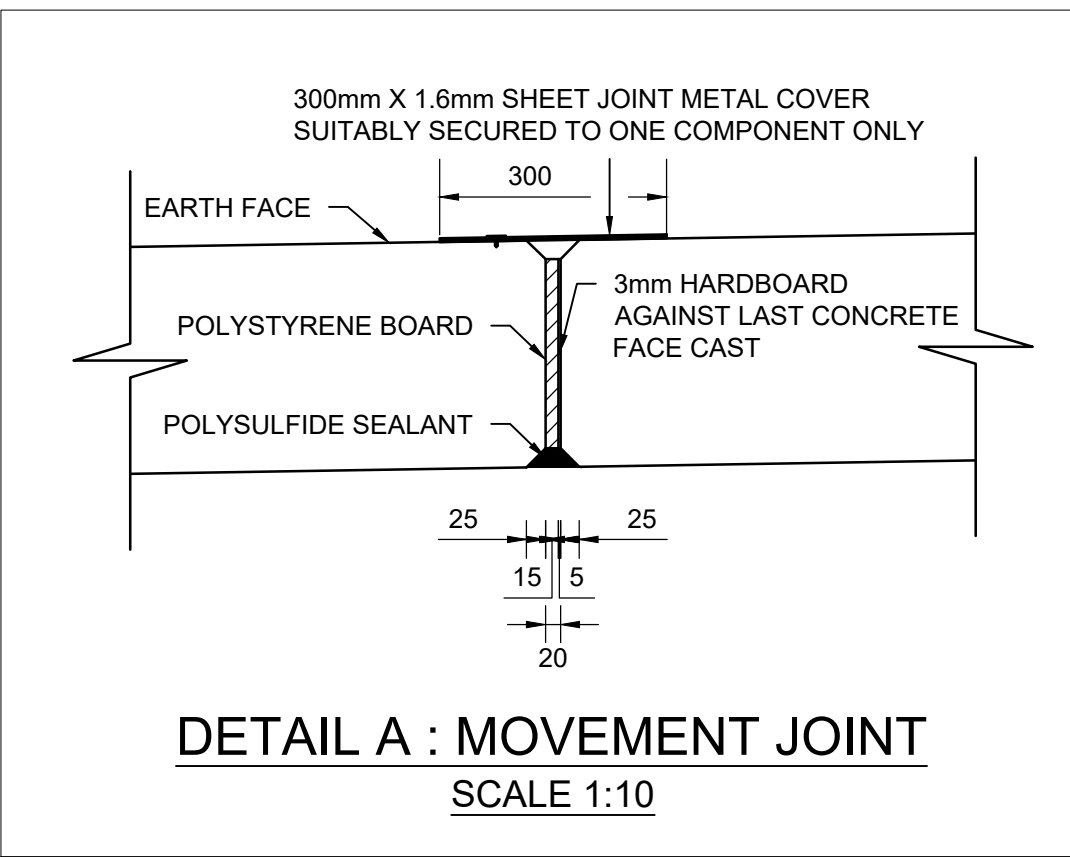
SECTION A - A THROUGH CULVERT
SCALE 1:50

DRAWING INDEX

DRAWING No.	TITLE OF DRAWING
STC 3283 /01	GENERAL ARRANGEMENT A
STC 3283 /02	GENERAL ARRANGEMENT B
STC 3283 /03	STEEL LAYOUT 1
STC 3283 /04	STEEL LAYOUT 2
STC 3283 /05	STEEL LAYOUT 3
STC 3283 /06	STEEL LAYOUT 4



D1724 LOCALITY PLAN
SCALE 1:50000



DETAIL A : MOVEMENT JOINT
SCALE 1:10

GENERAL DESIGN NOTES:

1. THE STRUCTURE CONSISTS OF 3 / 2.4 X 2.4m OPENINGS CONSTRUCTED FROM CAST INSITU REINFORCED CONCRETE.
2. THE DESIGN IS IN ACCORDANCE WITH THE PROVISIONS OF TMH 7 AS AMENDED 1988 FOR LOADING.
3. THE BALUSTRADE DESIGN IS IN ACCORDANCE WITH THE PROVISIONS OF TMH 7 SECTION 3.5 AS AMENDED 1988

DESIGN LOADINGS:

1. LIVE LOADS: NA AND NB24 LOADINGS
2. DEAD LOADS: REINFORCED CONCRETE - 25 kN/m³
3. BACKFILL DENSITY - 19kN/m³
4. EARTH PRESSURE: CALCULATED ACCORDING TO RANKINE'S THEORY AND ARE ASSUMED TO VARY LINEARLY INTERNAL ANGLE OF FRICTION OF FILL MATERIAL TAKEN AS 30°

DESIGN PARAMETERS

1. YOUNG'S MODULUS OF 30 MPa CONCRETE : E = 28 GPa
- REINFORCING BARS : E = 200 GPa

MATERIAL STRENGTHS:

1. CONCRETE CLASSES: BLINDING 15/19 CULVERT 30/19 FOOTINGS/BASES 30/19 WINGWALLS 30/19

2. HIGH YIELD STRESS REINFORCEMENT SHALL COMPLY TO S.A.B.S. 920-1985 AND THE CHARACTERISTICS STRENGTH IS 450 MPa

CONCRETE COVER AND FINISHES

1. CULVERT - 40mm
- WINGWALLS - 40mm
2. ALL VISIBLE CORNERS TO BE CHAMFERED 25mm

DESIGN BEARING PRESSURES:

1. FOUNDATION BEARING: CULVERT - 100kPa

SUPERSTRUCTURE:

1. METHOD OF ANALYSIS: GRILLAGE
2. TYPE OF BALUSTRADE: PARAPET
3. FINISHED CONCRETE SURFACES:-
HIDDEN FACES - F2
EXPOSED FACES - F3
PARAPET - F3
TOP OF BALUSTRADES - U3

GENERAL NOTES

1. CURING TIMES TO BE IN ACCORDANCE WITH CLAUSE A13.4.7 OF THE COTO STANDARD SPECIFICATION FOR ROAD AND BRIDGE WORKS
2. STC 3283 IS TO BE RECESSED 10mm DEEP IN 100mm LETTERS AND NUMERALS WITH THE YEAR OF CONSTRUCTION, CENTRALLY ORIENTATED, BELOW IN 75mm NUMERALS, CENTRALLY POSITIONED IN THE PARAPET WALL ON THE DOWNSTREAM FACE OF THE OUTLET HEADWALL. ALL NUMBERS AND LETTERS ARE TO BE CAREFULLY PAINTED WITH 2 COATS OF BLACK ALKALINE RESISTANT PAINT.

FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/1

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Chief Engineer: Structural Design
Head: Transport

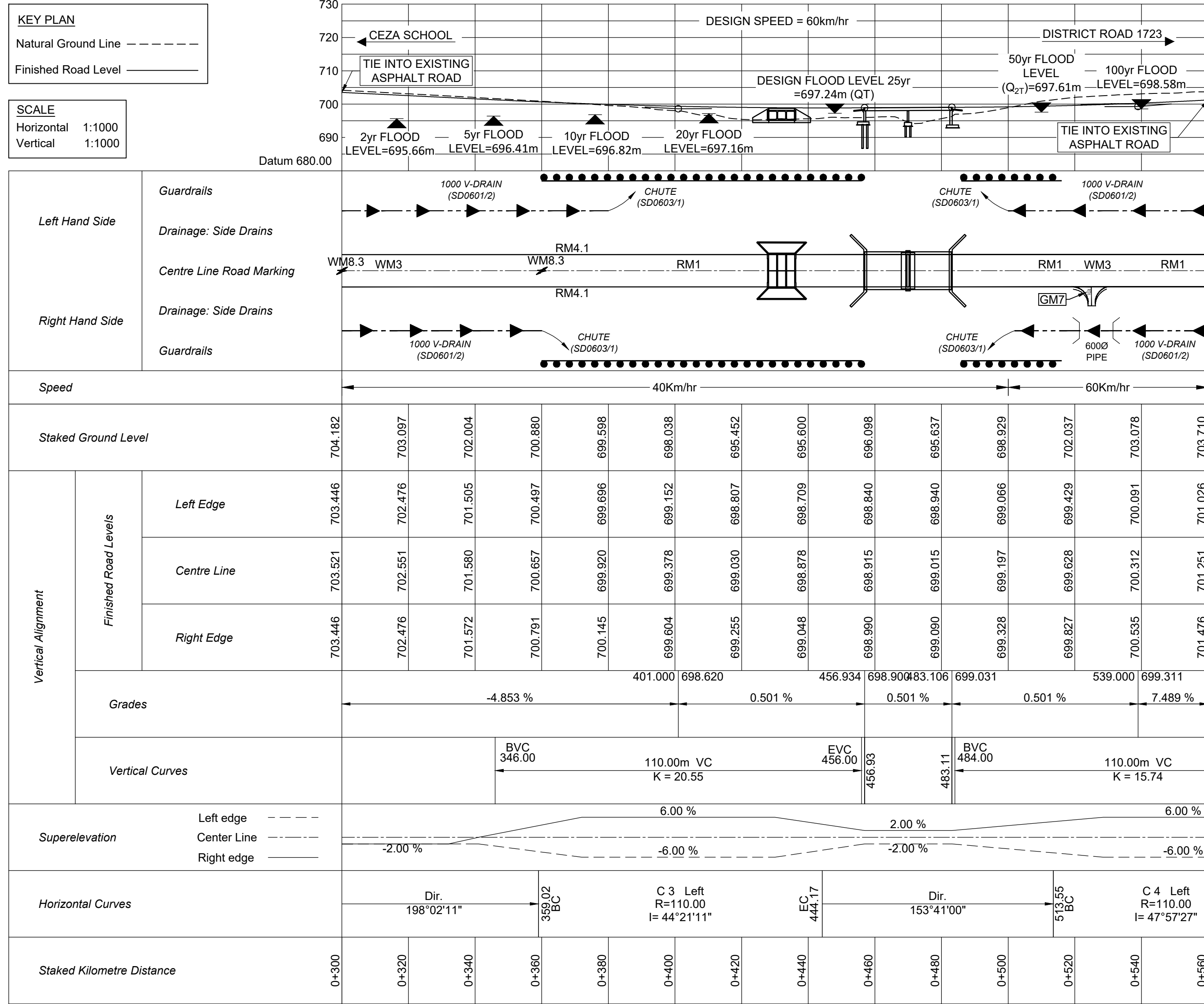
SIGNATURE	DATE
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DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.992059° Latitude
31.373892° Longitude

PORTION
3 / 2.4m X 2.4m CAST INSITU BOX CULVERT
GENERAL ARRANGEMENT A

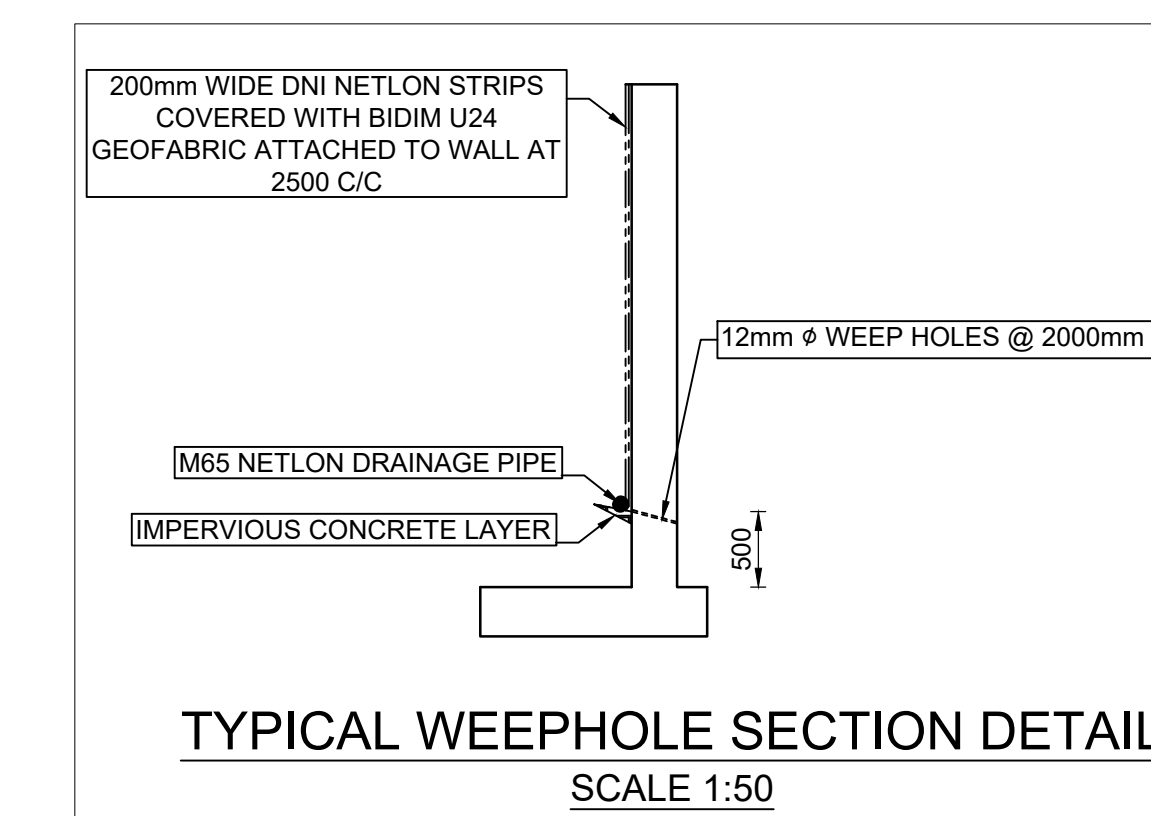
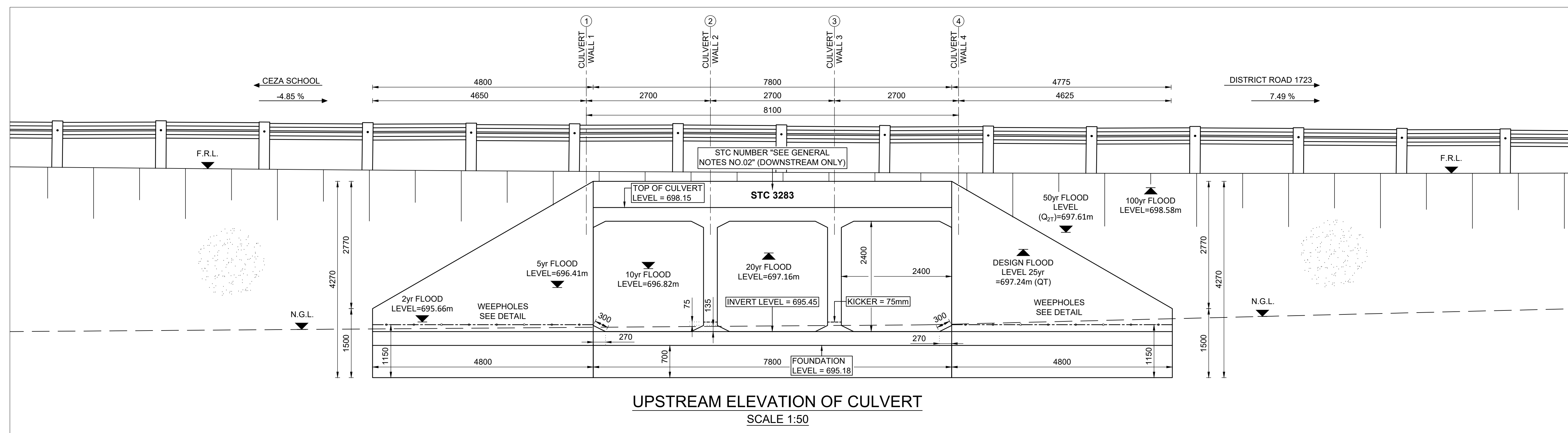
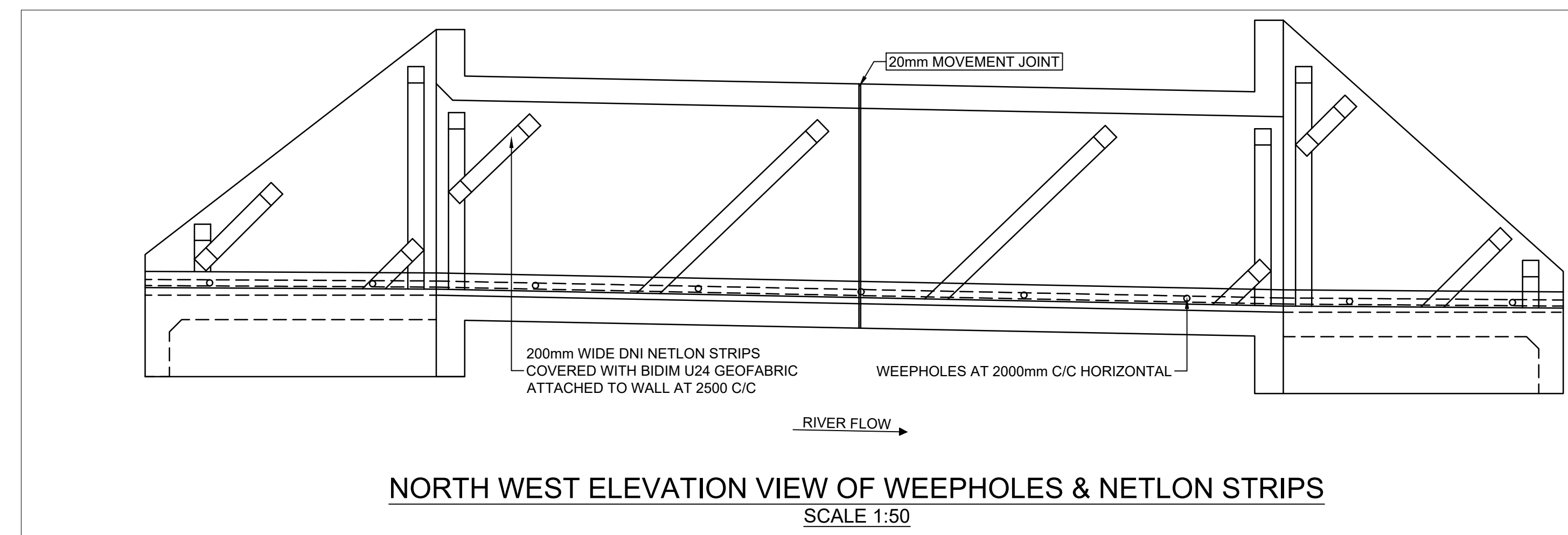
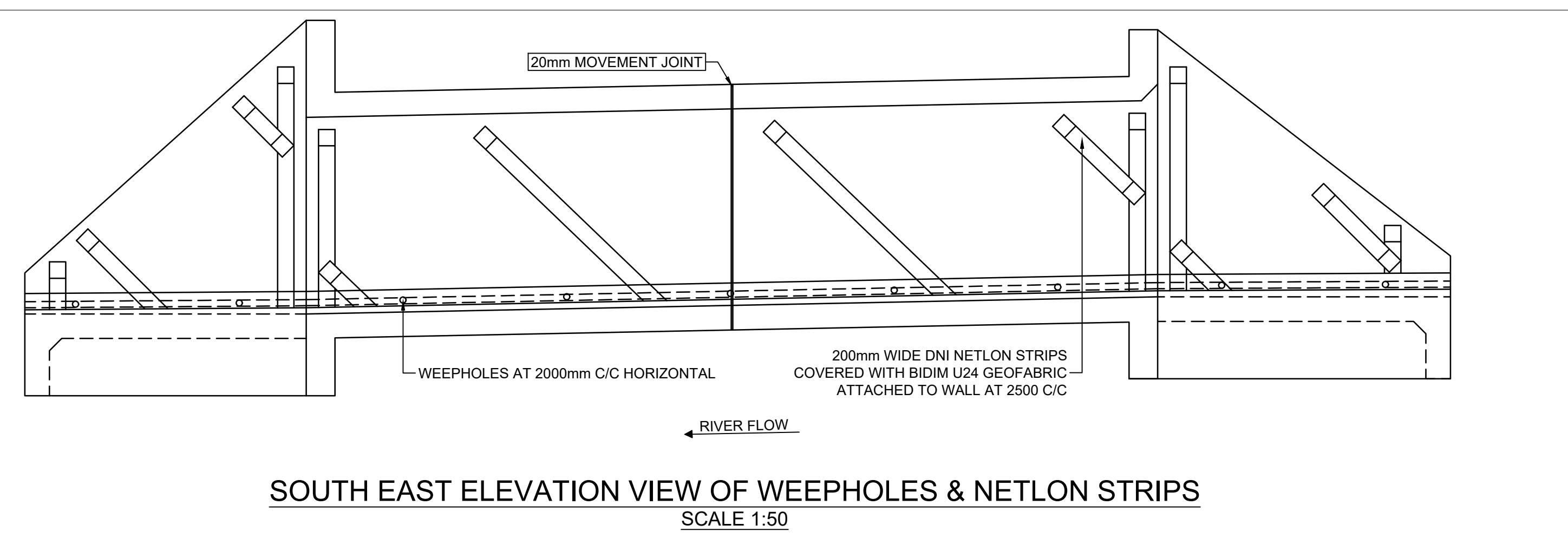
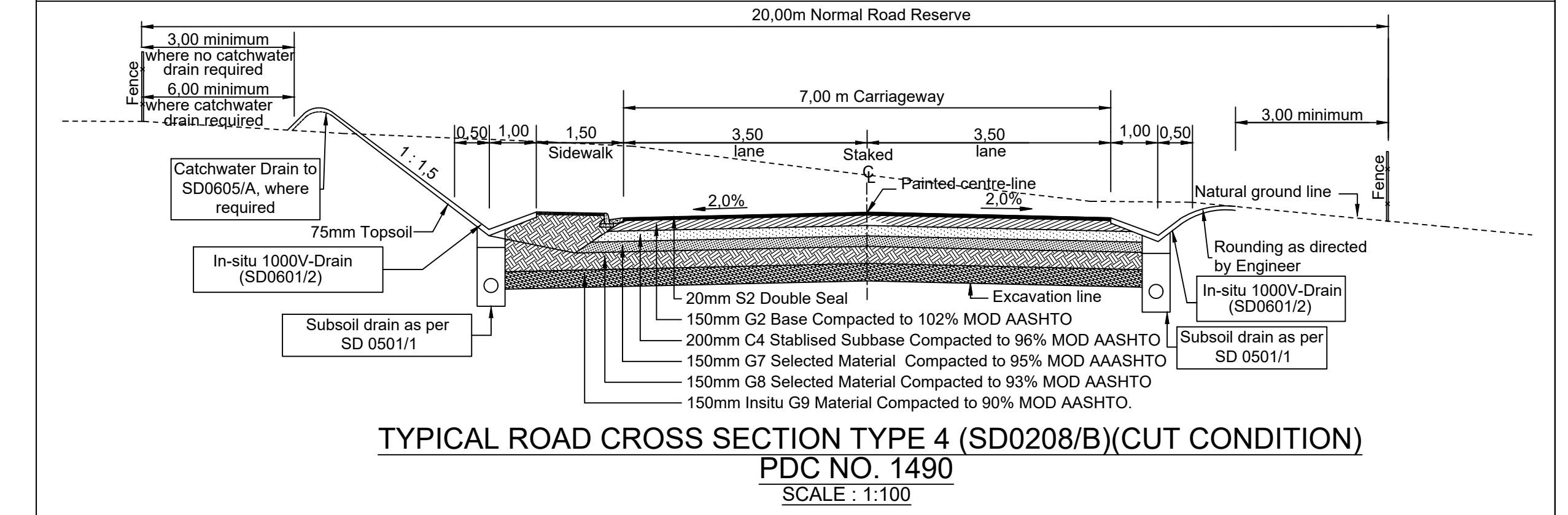
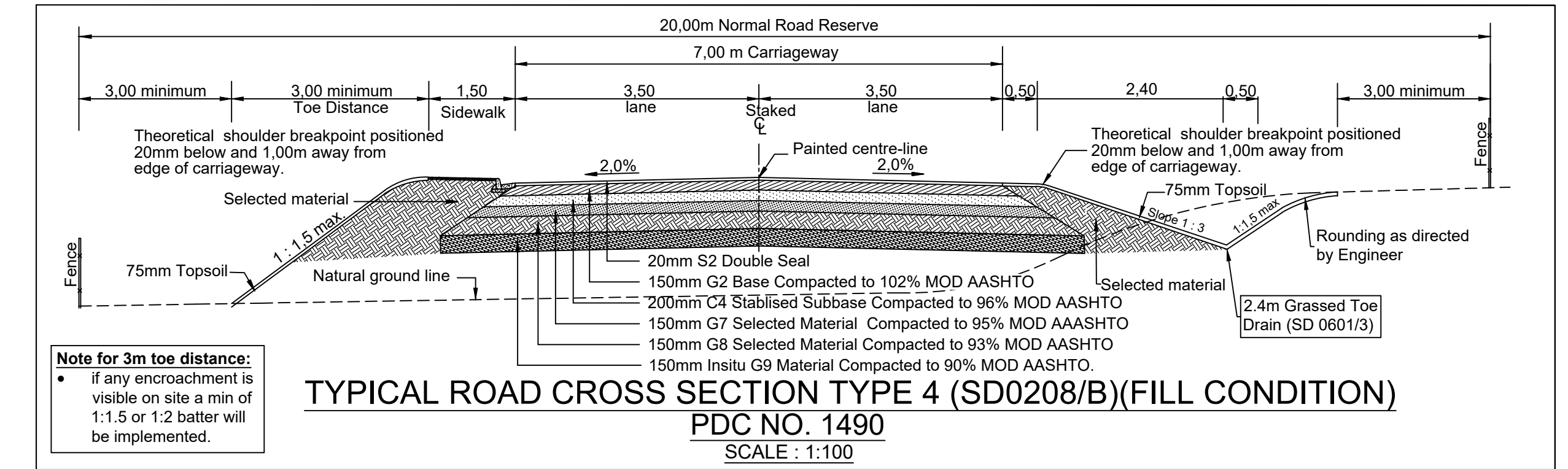
Staked km distance	Sheet 01
0.42	of 06
Scale	Plan No.:-
AS SHOWN	STC 3283/01

STC 3283/01



DRAWING INDEX

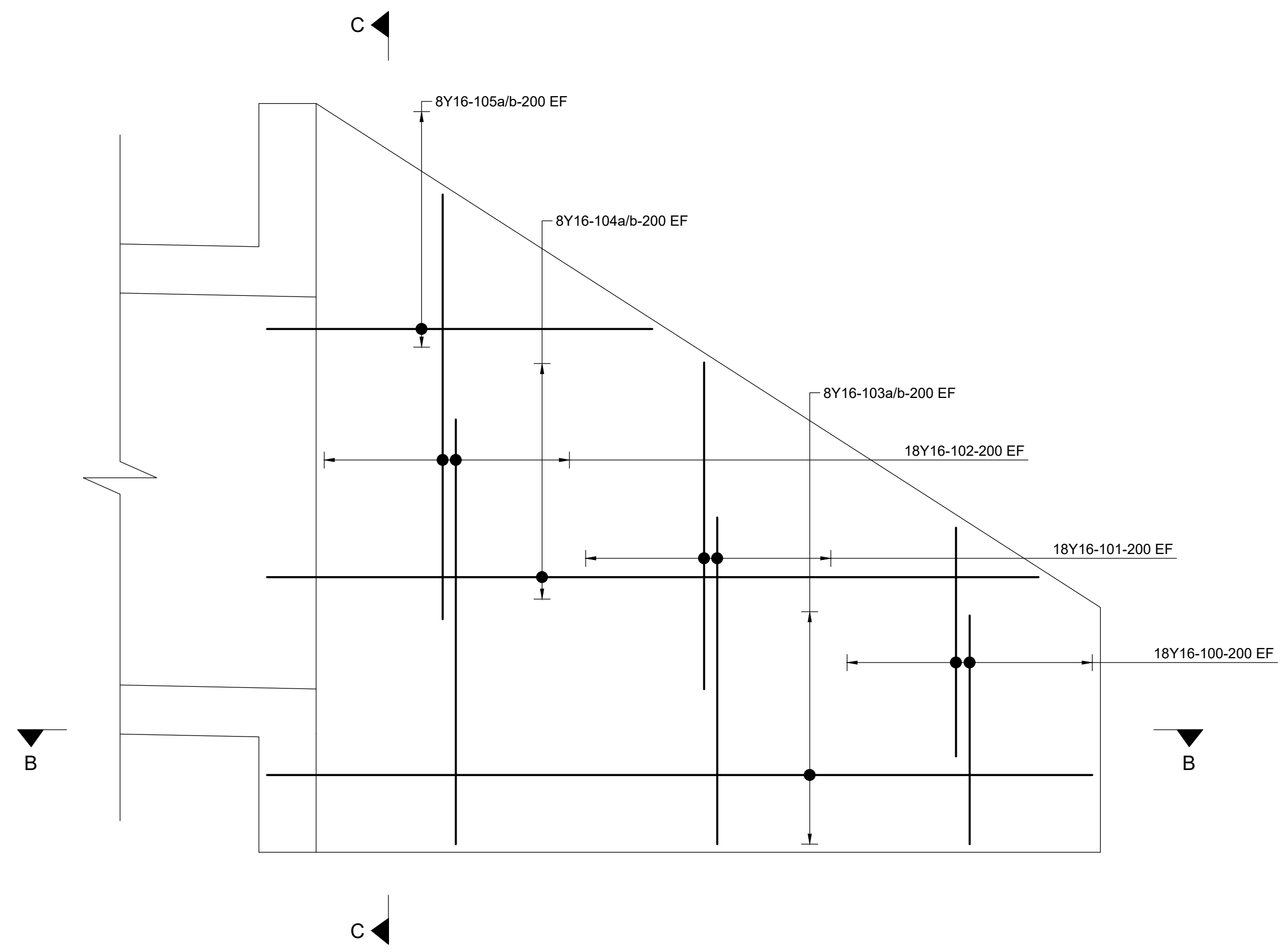
DRAWING No.	TITLE OF DRAWING
STC 3283 /01	GENERAL ARRANGEMENT A
STC 3283 /02	GENERAL ARRANGEMENT B
STC 3283 /03	STEEL LAYOUT 1
STC 3283 /04	STEEL LAYOUT 2
STC 3283 /05	STEEL LAYOUT 3
STC 3283 /06	STEEL LAYOUT 4



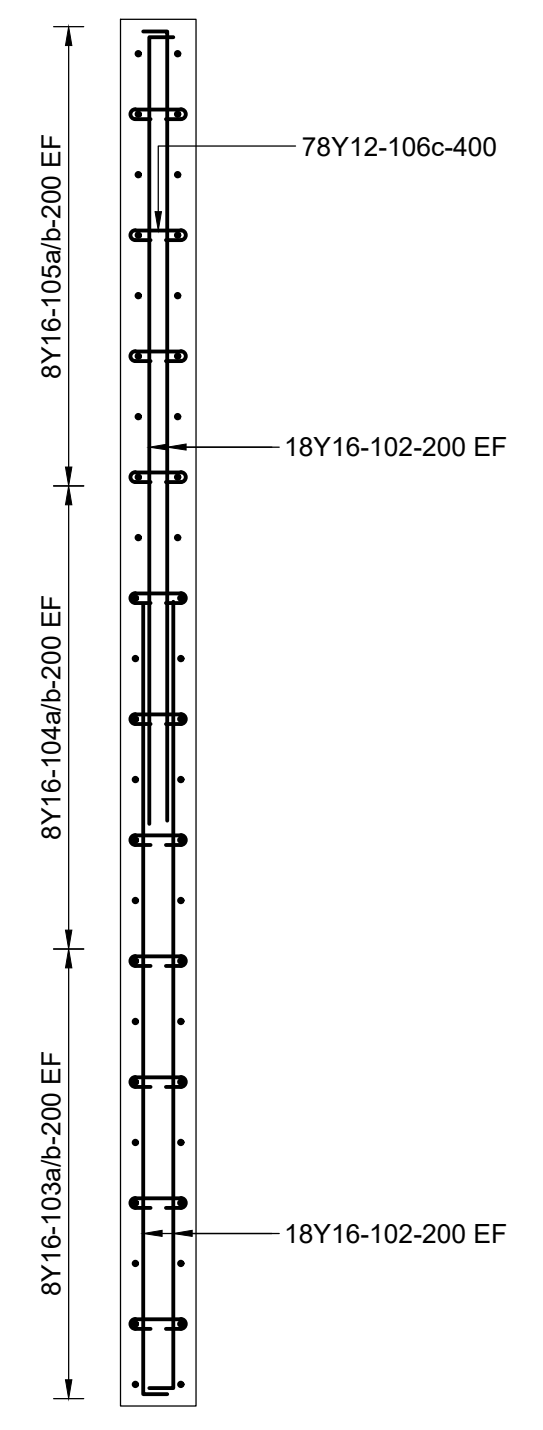
AS BUILT				FOR TENDER PURPOSES	
Supervising Engineer	Date	Continued from:-	Designed by:-	DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723	WGS 84:- 27.992059° Latitude 31.373892° Longitude
		Continued on:-	Checked by:-	Staked km distance	Sheet 02
		Design Plan No:-	Drawn by:-	0.42	of 06
		Long Section No:-	Checked by:-	Scale	Plan No:-
		Cross Section No:-	File Reference:-	AS SHOWN	STC 3283/02
<p>PROVINCE OF KWAZULU-NATAL DEPARTMENT OF TRANSPORT</p> <p>NANKHOO CONSULTING ENGINEERS</p>				<p>3 / 2.4m X 2.4m CAST INSITU BOX CULVERT</p> <p>GENERAL ARRANGEMENT B</p>	
<p>Supervising Authority</p>				<p>Chief Engineer: Structural Design</p> <p>Head: Transport</p>	
<p>AMENDMENTS</p>				<p>SIGNATURE DATE</p>	

STC 3283/02

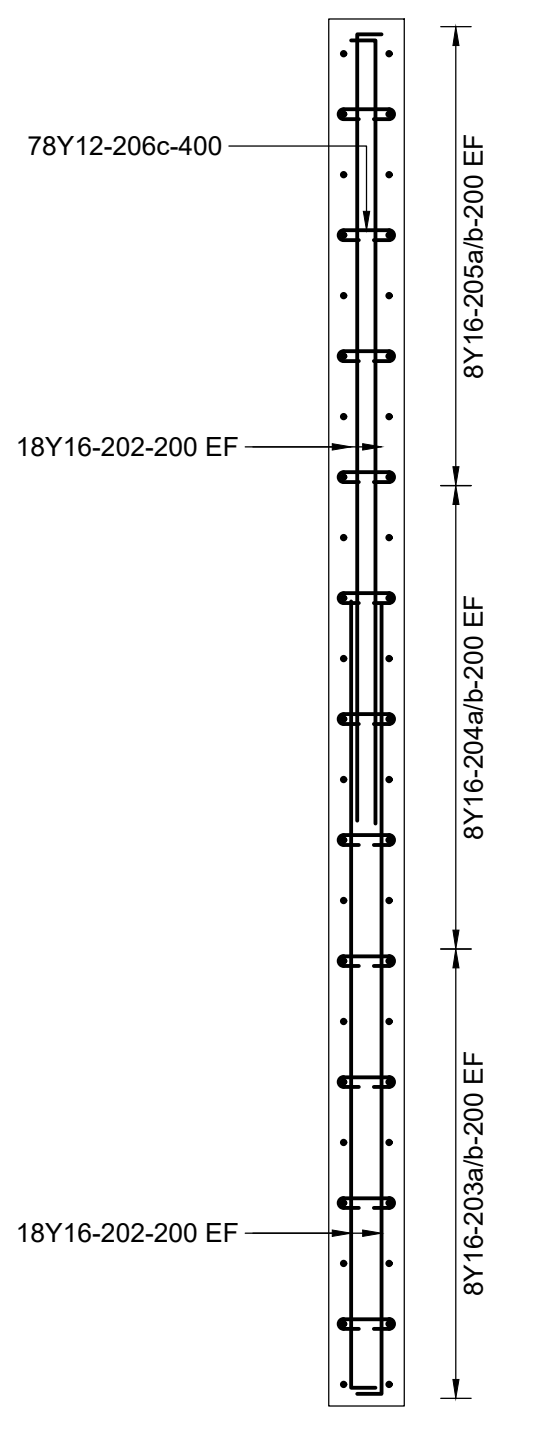
DRAWING INDEX	
DRAWING No.	TITLE OF DRAWING
STC 3283 /01	GENERAL ARRANGEMENT A
STC 3283 /02	GENERAL ARRANGEMENT B
STC 3283 /03	STEEL LAYOUT 1
STC 3283 /04	STEEL LAYOUT 2
STC 3283 /05	STEEL LAYOUT 3
STC 3283 /06	STEEL LAYOUT 4



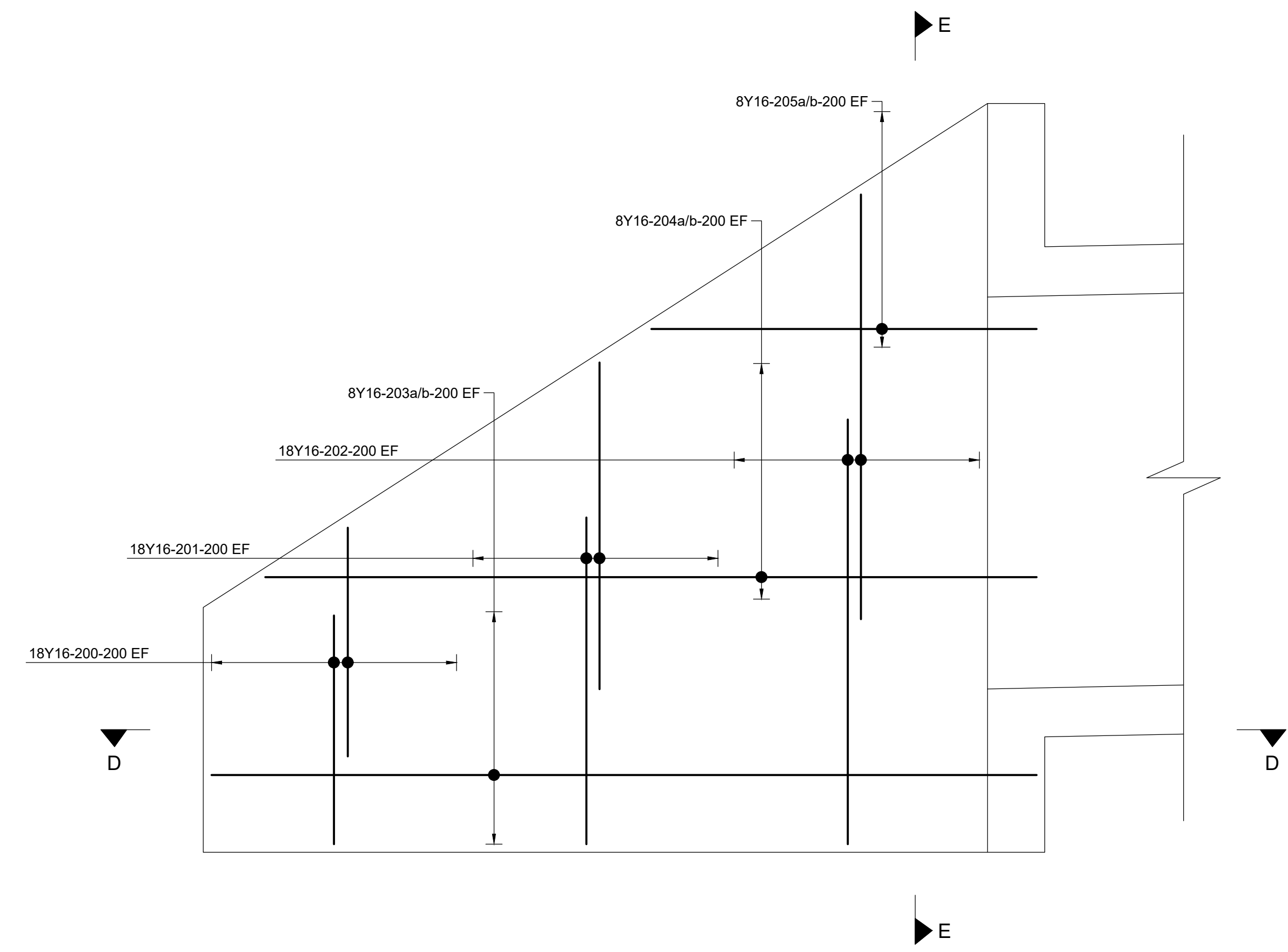
SECTIONAL ELEVATION THROUGH WINGWALL 1
SCALE 1:25



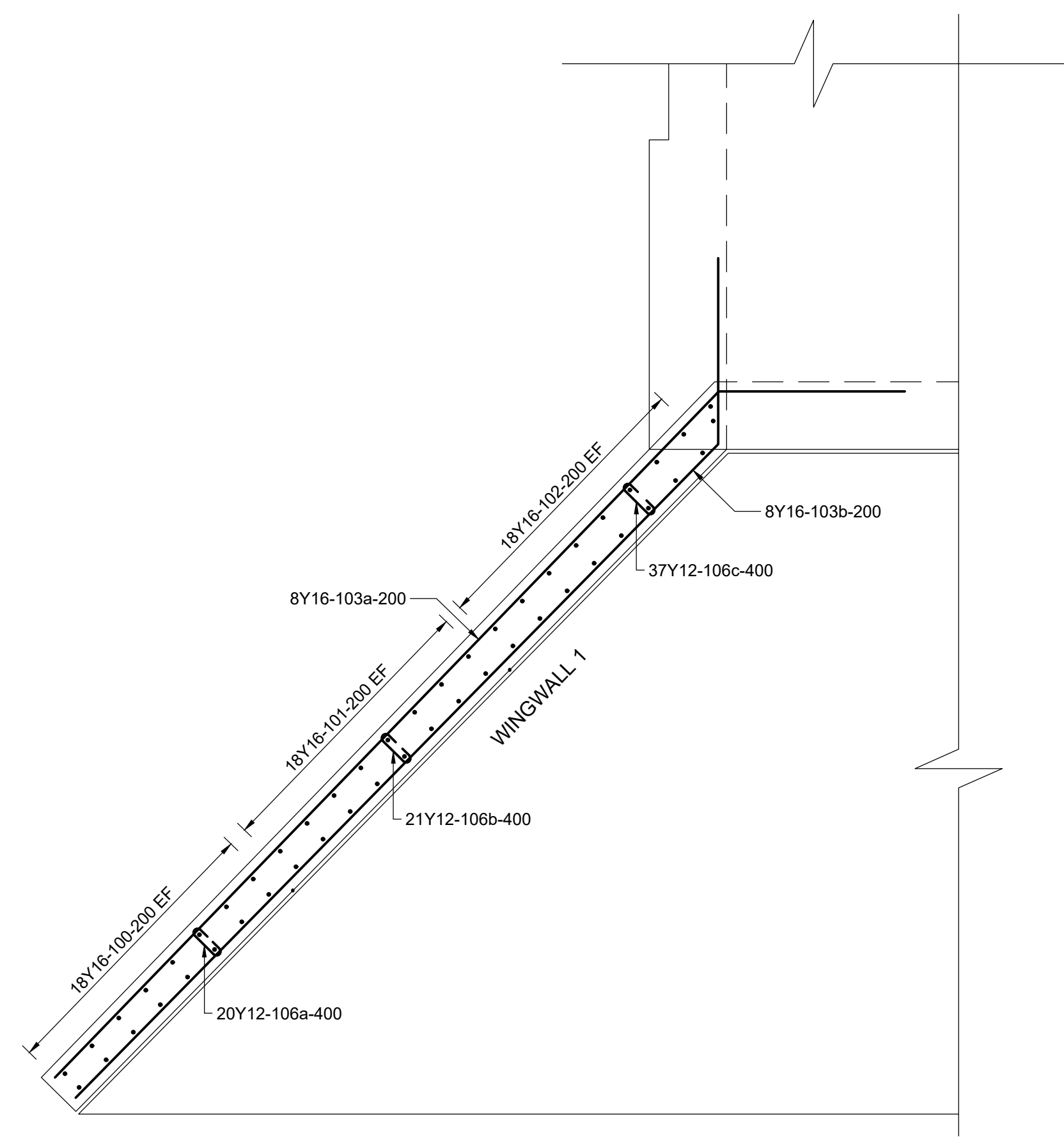
SECTION C - C
SCALE 1:25



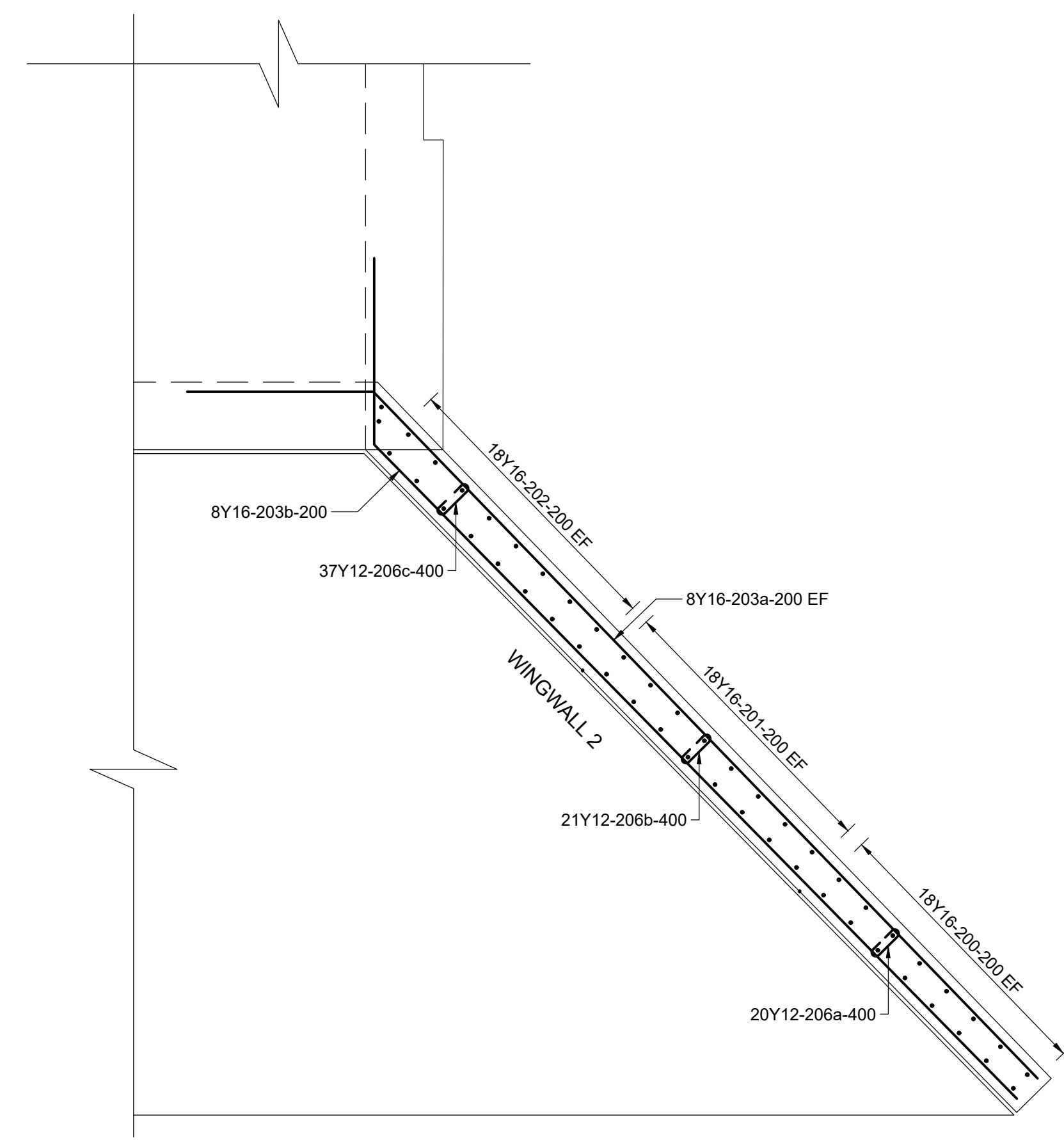
SECTION E - E
SCALE 1:25



SECTIONAL ELEVATION THROUGH WINGWALL 2
SCALE 1:25



SECTION B - B
SCALE 1:25




SECTION D - D
SCALE 1:25

FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/1


PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT


NANKHOO
 CONSULTING ENGINEERS
 GATED 13 GREEN PARK, BLOCK ONE TEL: 0850 565056
 INDEPENDENT AVENUE, PARK WEST, 6001 FAX: 0850 242424
 4001 email: nankhoo@nankhoo.co.za

Chief Engineer: Structural Design
 Head: Transport
 SIGNATURE _____ DATE _____

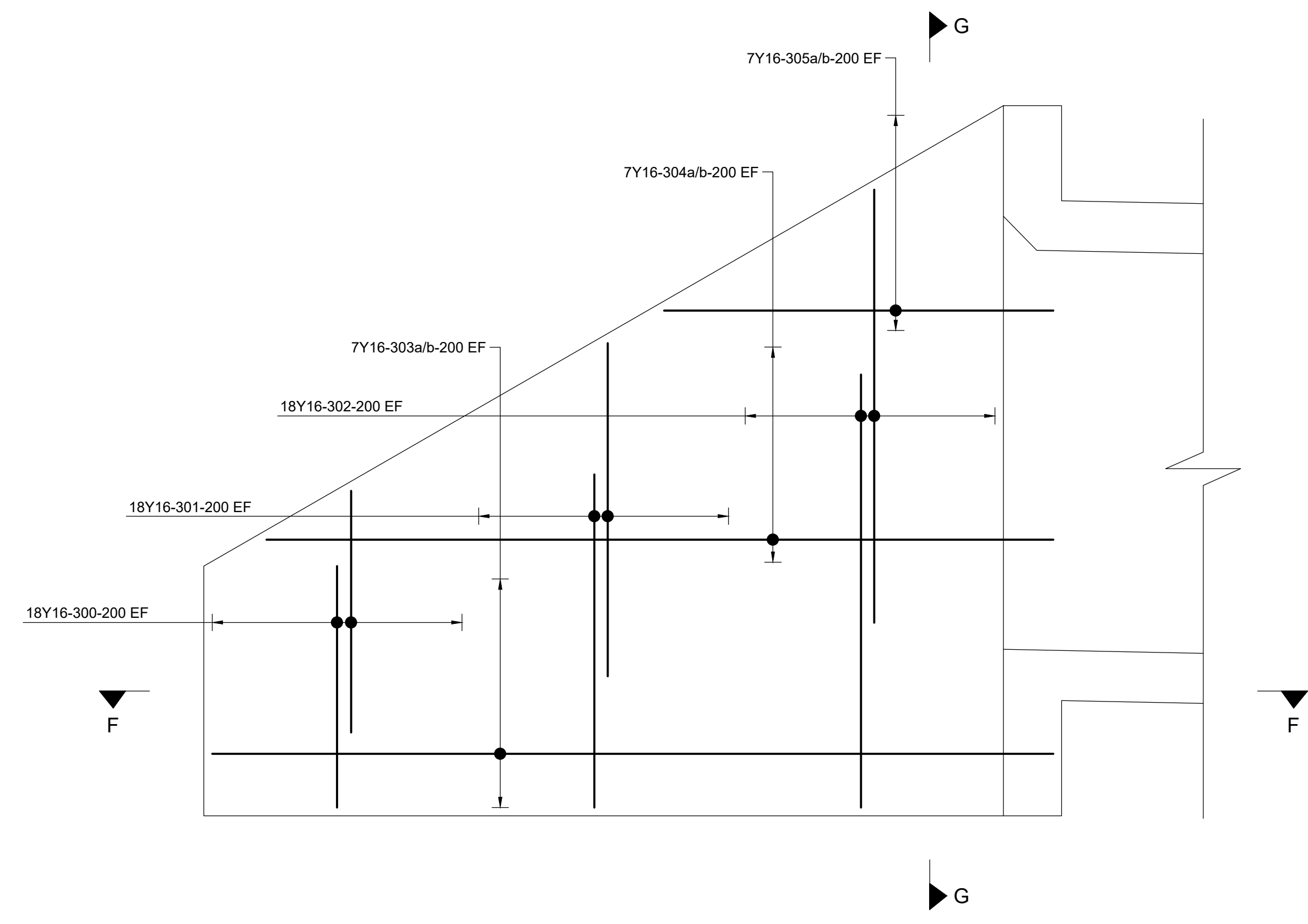
DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.992059° Latitude
 31.373892° Longitude

PORTION
3 / 2.4m X 2.4m CAST INSITU BOX CULVERT
 STEEL LAYOUT 2

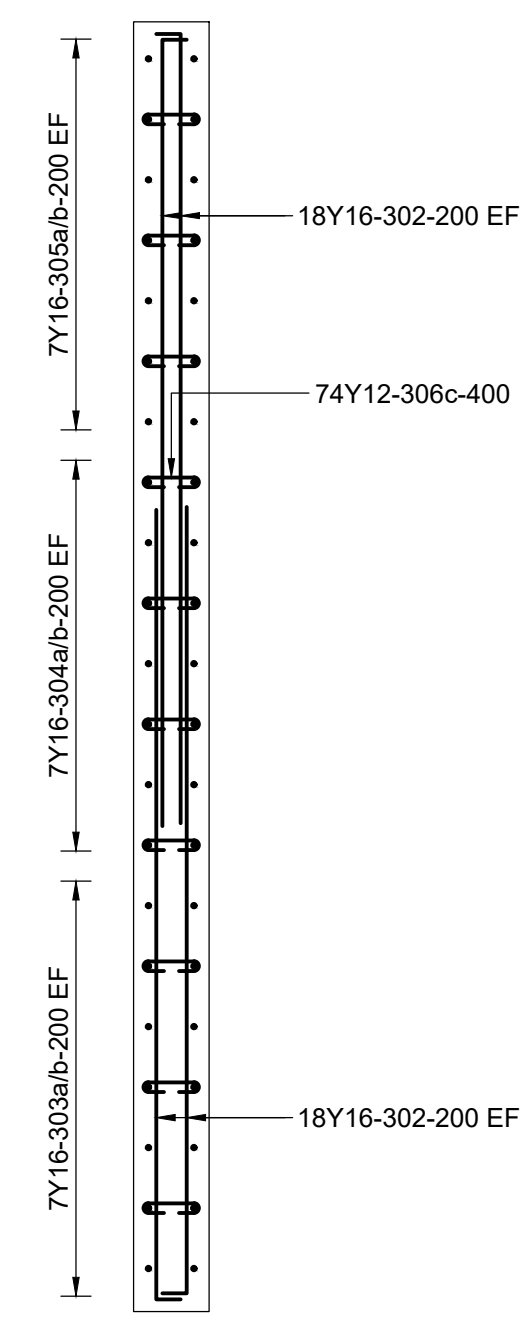
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0.42	of 06
Scale	Plan No.:-
AS SHOWN	STC 3283/04

STC 3283/04

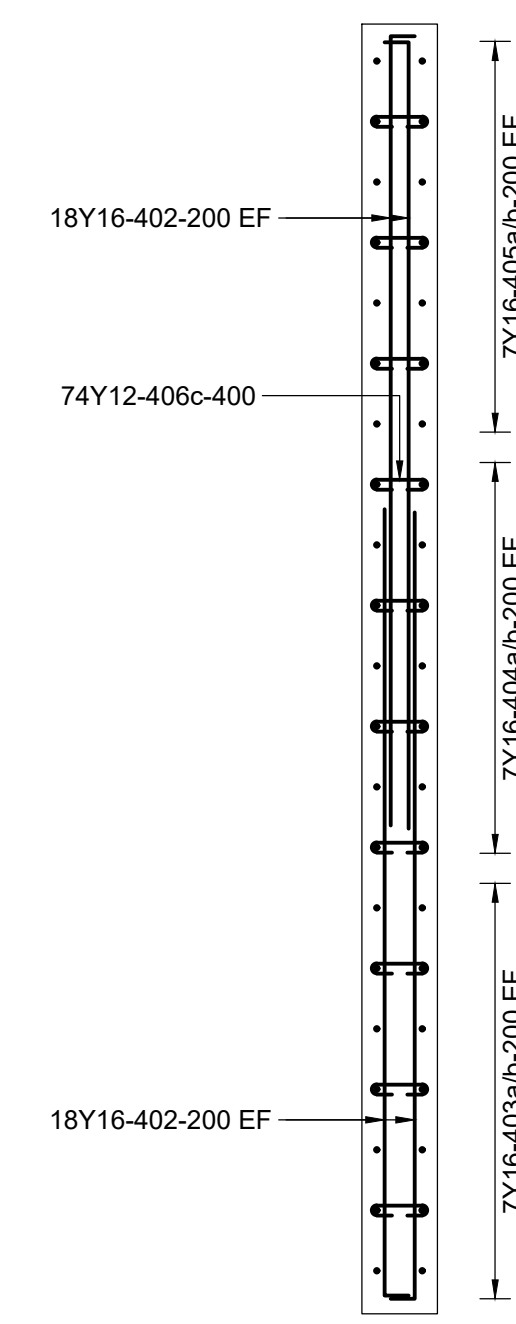
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DRAWING No.	TITLE OF DRAWING
STC 3283 /01	GENERAL ARRANGEMENT A
STC 3283 /02	GENERAL ARRANGEMENT B
STC 3283 /03	STEEL LAYOUT 1
STC 3283 /04	STEEL LAYOUT 2
STC 3283 /05	STEEL LAYOUT 3
STC 3283 /06	STEEL LAYOUT 4



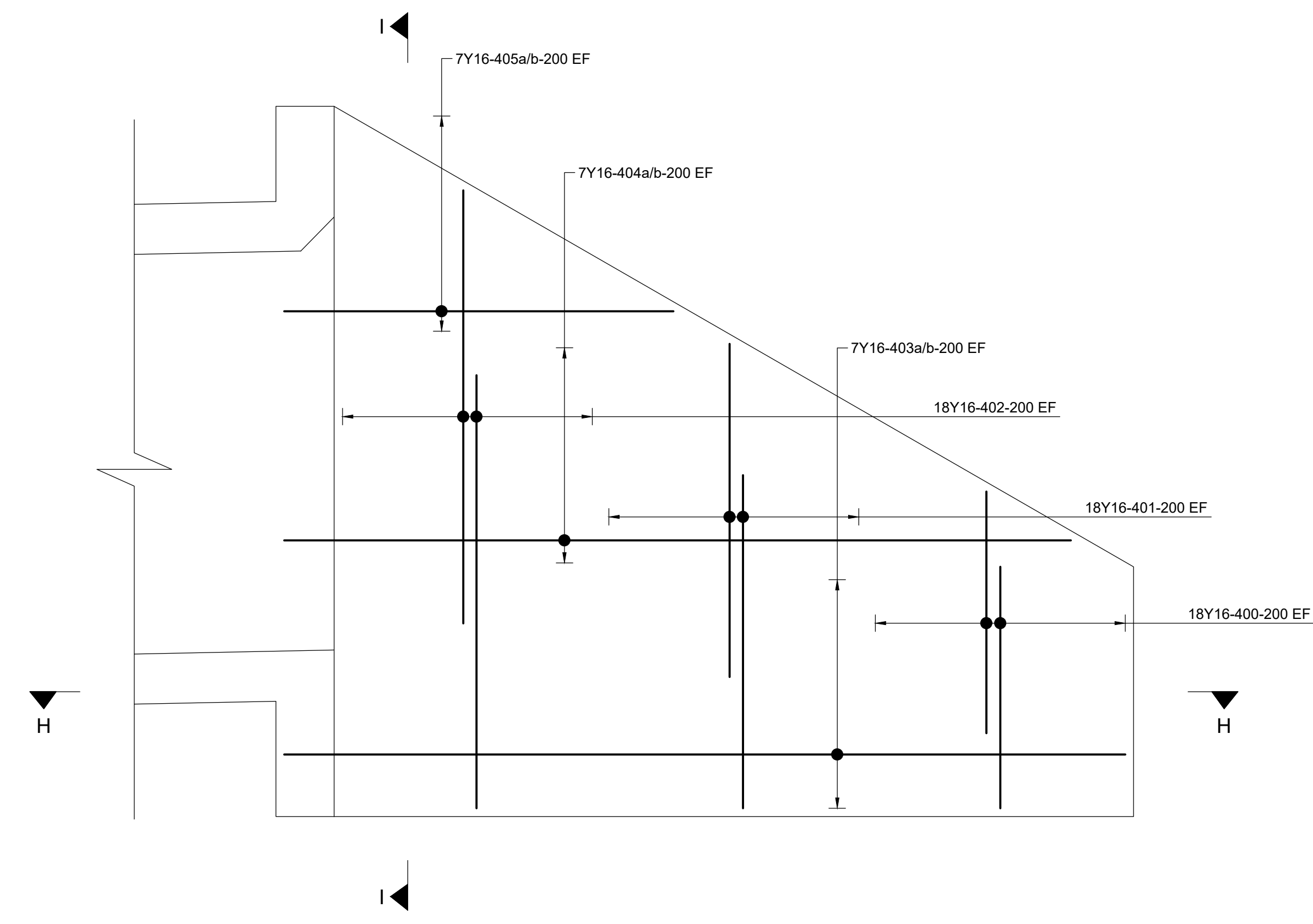
SECTIONAL ELEVATION THROUGH WINGWALL 3
SCALE 1:25



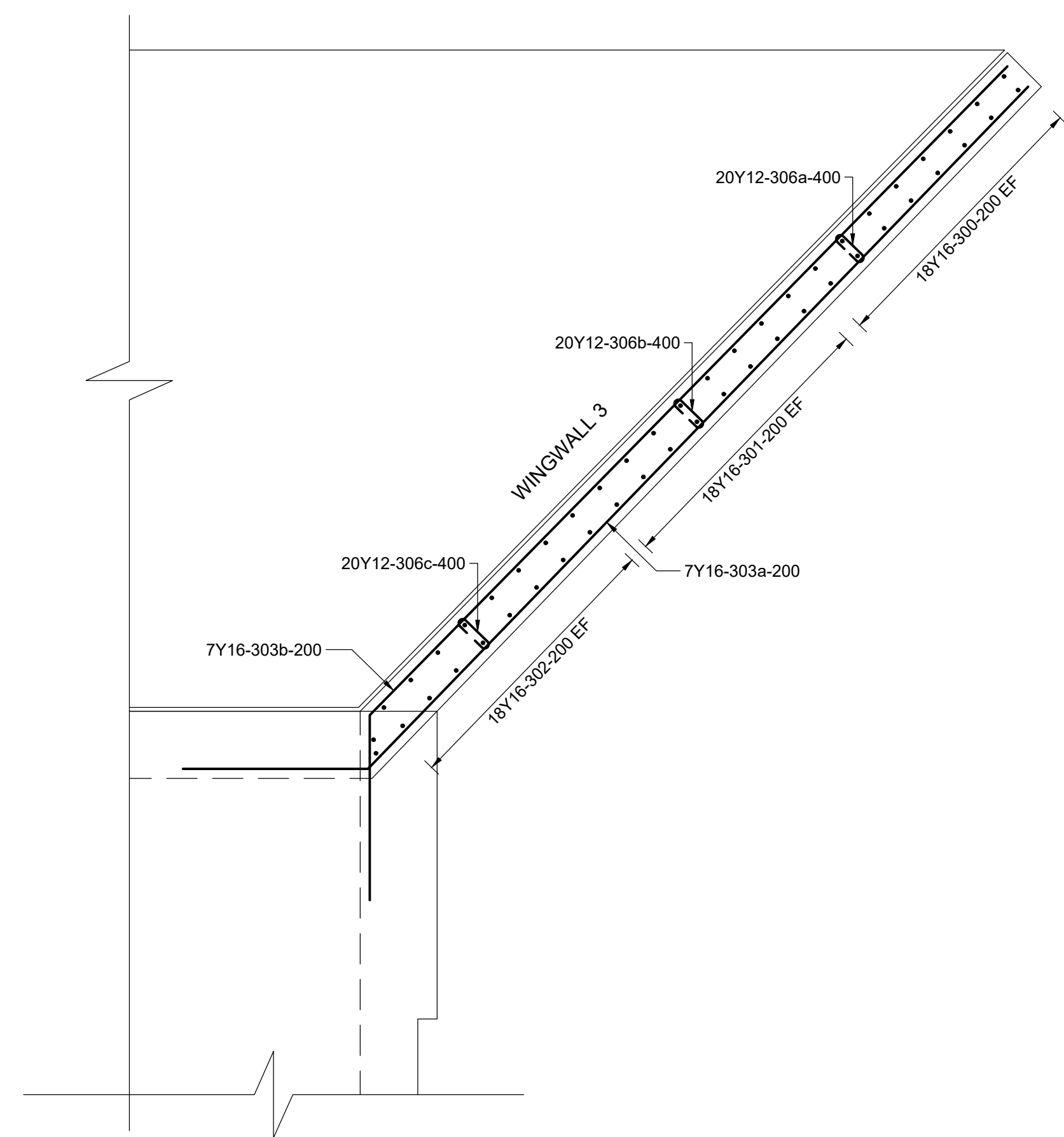
SECTION G - G
SCALE 1:25



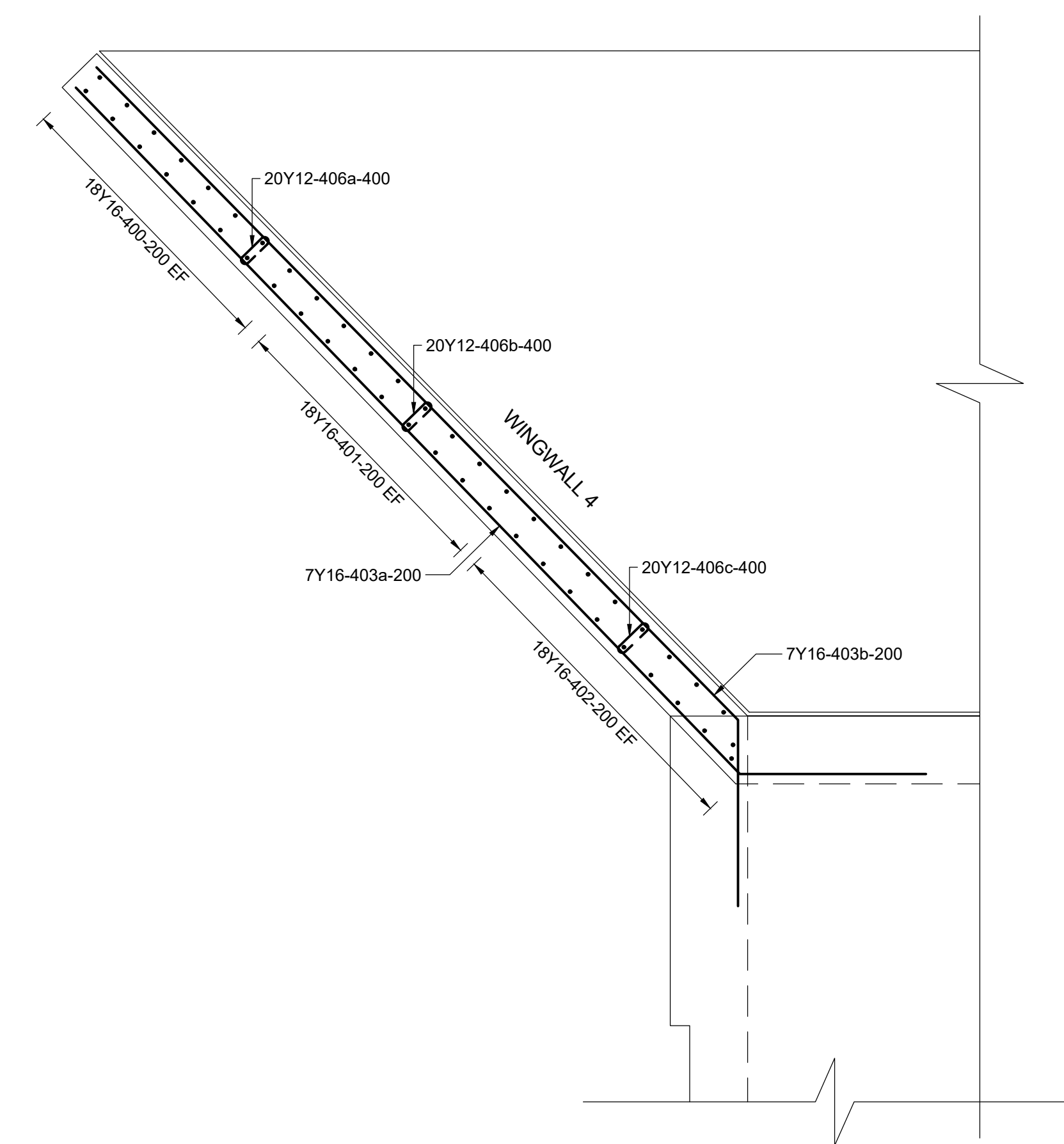
SECTION I - I
SCALE 1:25



SECTIONAL ELEVATION THROUGH WINGWALL 4
SCALE 1:25



SECTION F - F
SCALE 1:25




SECTION H - H
SCALE 1:25


FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/1


PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT


NANKHOO
 CONSULTING ENGINEERS
 GATEWAY DRIVE, PARK ROAD ONE TEL: 030 5500 5000
 1 ENGLISH EMBASSY PARK, SANDHURST FAX: 030 5500 5000
 4001

Chief Engineer: Structural Design

Head: Transport

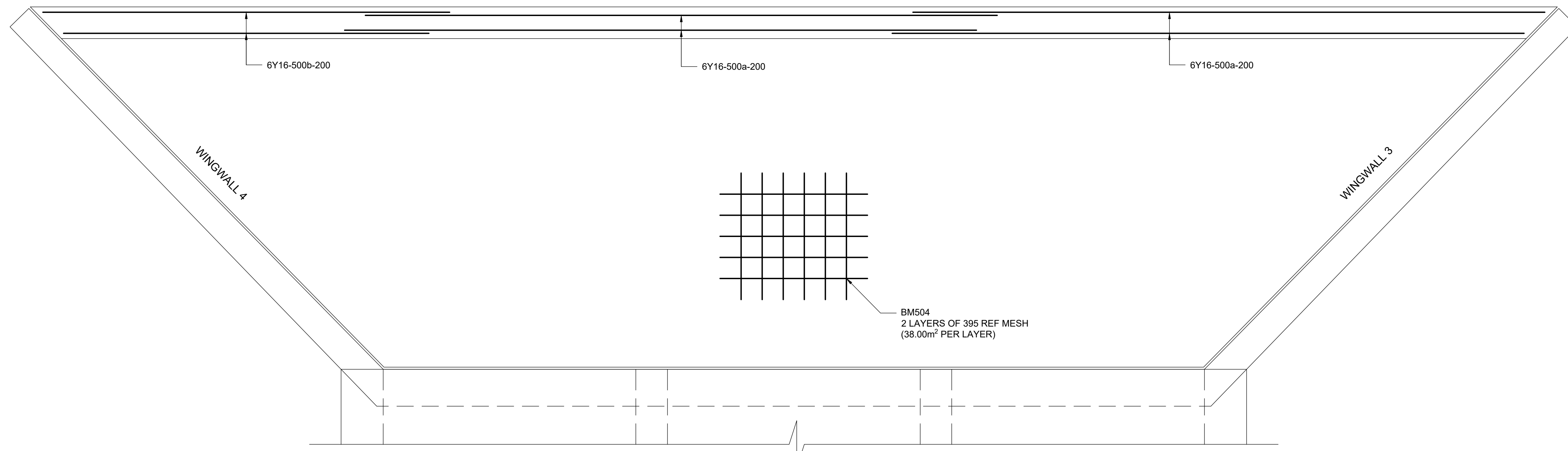
SIGNATURE DATE

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.992059° Latitude
 31.373892° Longitude

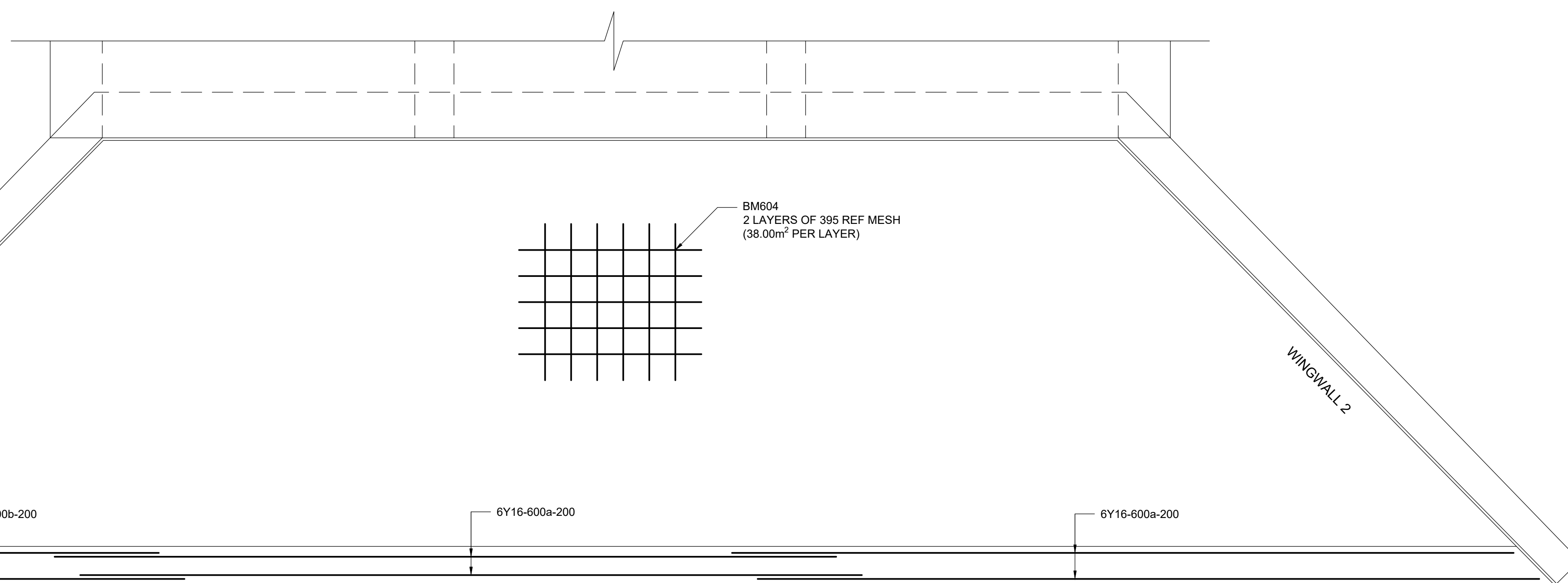
PORTION
3 / 2.4m X 2.4m CAST INSITU BOX CULVERT
 STEEL LAYOUT 3

Staked km distance	Sheet 05
0.42	of 06
Scale AS SHOWN	Plan No.:- STC 3283/05

STC 3283/05



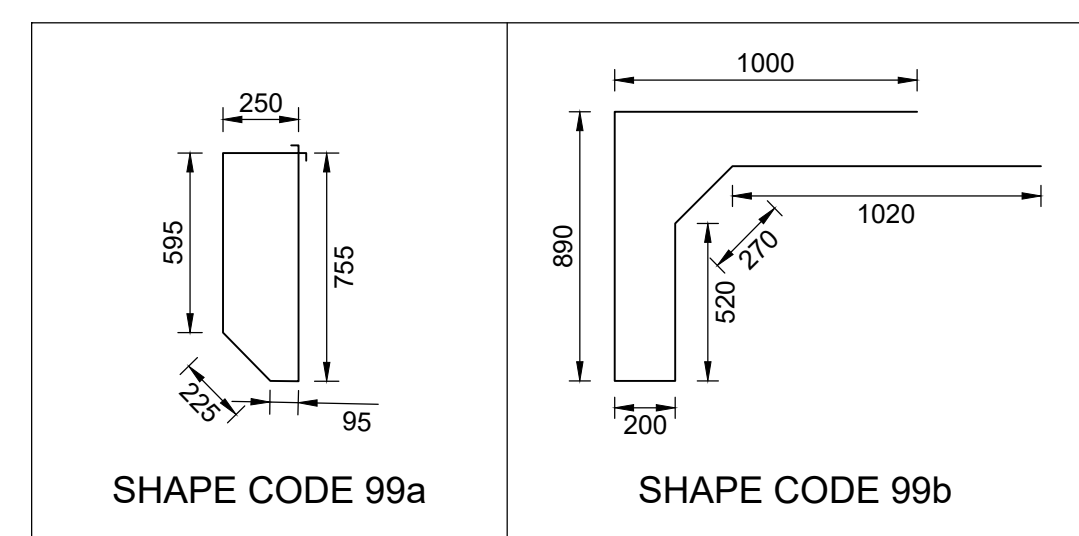
PLAN VIEW OF UPSTREAM APRON SLAB
SCALE 1:25



PLAN VIEW OF DOWNSTREAM APRON SLAB
SCALE 1:25

REINFORCING SCHEDULE FOR CULVERT																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
CULVERT	1	01	Y	32	200	212	212	37	3430	1275	2250			6.31	21.64	4588.38	
	1	02	Y	16	200	318	318	37	1510	300	1250			1.58	2.39	758.68	
	1	03	Y	20	200	212	212	20	2150	2150				2.47	5.31	1125.83	
	1	04	Y	20	200	318	318	20	2055	2055			CUT TO SIZE	2.47	5.08	1614.12	
	1	05a	Y	20	175	192	192	38	5390	200	5090	200		2.47	13.31	2556.15	
	1	05b	Y	16	175	320	320	38	5410	200	5090	200		1.58	8.55	2735.30	
	1	05c	Y	16	175	48	48	54	5495	200	5095	200		1.58	8.68	416.74	
	1	05d	Y	16	175	48	48	38	5275	200	4955	200		1.58	8.33	400.06	
	1	06	R	12	1000	220	220	83	770	200	144	200	200		0.89	0.68	150.43
	1	07	Y	16	125	332	332	37	3575	200	3415			1.58	5.65	1875.30	
	1	08	Y	12	200	636	636	45	790	505	215	100		0.89	0.70	446.17	
	1	09	Y	12	175	120	120	20	3910	3910				0.89	3.47	416.65	
	1	10	Y	16	200	318	318	20	2370	2370				1.58	3.74	1190.78	
	1	11	Y	10	400	756	756	33	420	200				0.62	0.26	195.91	
	1	12	Y	20	150	56	56	20	1000	1000			GALVANIZED	2.47	2.47	138.32	
	1	13a	Y	12	200	42	42	60	2785	1070	250			0.89	2.47	103.87	
	1	13b	Y	12	200	42	42	99a	2015					0.89	1.79	75.15	
1	14	Y	12	200	16	16	20	8300	8300				0.89	7.37	117.93		
1	15	Y	10	400	176	176	33	470	250				0.62	0.29	51.04		
1	16	Y	16	200	20	20	20	8300	8300				1.58	13.11	262.28		
1	17	Y	16	200	84	84	60	2540	925	250			1.58	4.01	337.11		
													TOTAL KG HT STEEL		19405.76		
													TOTAL KG MS STEEL		150.43		
													TOTAL KG DOWELS		138.32		
													TOTAL KG STEEL		19556.19		

DRAWING INDEX	
DRAWING No.	TITLE OF DRAWING
STC 3283 /01	GENERAL ARRANGEMENT A
STC 3283 /02	GENERAL ARRANGEMENT B
STC 3283 /03	STEEL LAYOUT 1
STC 3283 /04	STEEL LAYOUT 2
STC 3283 /05	STEEL LAYOUT 3
STC 3283 /06	STEEL LAYOUT 4



REINFORCING SCHEDULE FOR WINGWALL 1																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
WINGWALL 1	1	100	Y	16	200	36	36	37	1510	150	1400			1.58	2.39	85.89	
	1	101	Y	16	200	36	36	37	2130	170	2000			1.58	3.37	121.15	
	1	102	Y	16	200	36	36	37	2750	190	2600			1.58	4.35	156.42	
	1	103a	Y	16	200	16	16	62	5900	4935	690	962	CUT TO SIZE	134"	1.58	9.32	149.15
	1	103b	Y	16	200	16	16	62	5700	4740	675	962	CUT TO SIZE	135"	1.58	9.01	144.10
	1	104a	Y	16	200	16	16	62	5570	4605	690	962	CUT TO SIZE	134"	1.58	8.80	140.81
	1	104b	Y	16	200	16	16	62	5370	4410	675	962	CUT TO SIZE	135"	1.58	8.48	135.75
	1	105a	Y	16	200	16	16	62	3200	2240	690	962	CUT TO SIZE	134"	1.58	5.06	80.90
	1	105b	Y	16	200	16	16	62	3010	2045	675	962	CUT TO SIZE	135"	1.58	4.76	76.09
	1	106a	Y	10	400	20	20	33	370	150				0.62	0.23	4.57	
	1	106b	Y	10	400	21	21	33	390	170				0.62	0.24	5.05	
	1	106c	Y	10	400	37	37	33	410	190				0.62	0.25	9.36	
													TOTAL KG HT STEEL		1109.24		
													TOTAL KG MS STEEL		0.00		
													TOTAL KG DOWELS				
													TOTAL KG STEEL		1109.24		

REINFORCING SCHEDULE FOR WINGWALL 2																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
WINGWALL 2	1	200	Y	16	200	36	36	37	1510	150	1400			1.58	2.39	85.89	
	1	201	Y	16	200	36	36	37	2130	170	2000			1.58	3.37	121.15	
	1	202	Y	16	200	36	36	37	2750	190	2600			1.58	4.35	156.42	
	1	203a	Y	16	200	16	16	62	5900	4935	690	962	CUT TO SIZE	134"	1.58	9.32	149.15
	1	203b	Y	16	200	16	16	62	5700	4740	675	962	CUT TO SIZE	135"	1.58	9.01	144.10
	1	204a	Y	16	200	16	16	62	5570	4605	690	962	CUT TO SIZE	134"	1.58	8.80	140.81
	1	204b	Y	16	200	16	16	62	5370	4410	675	962	CUT TO SIZE	135"	1.58	8.48	135.75
	1	205a	Y	16	200	16	16	62	3200	2240	690	962	CUT TO SIZE	134"	1.58	5.06	80.90
	1	205b	Y	16	200	16	16	62	3010	2045	675	962	CUT TO SIZE	135"	1.58	4.76	76.09
	1	206a	Y	10	400	20	20	33	370	150				0.62	0.23	4.57	
	1	206b	Y	10	400	21	21	33	390	170				0.62	0.24	5.05	
	1	206c	Y	10	400	37	37	33	410	190				0.62	0.25	9.36	
													TOTAL KG HT STEEL		1109.24		
													TOTAL KG MS STEEL		0.00		
													TOTAL KG DOWELS				
													TOTAL KG STEEL		1109.24		

REINFORCING SCHEDULE FOR WINGWALL 3																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
WINGWALL 3	1	300	Y	16	200	36	36	37	1560	150	1450			1.58	2.46	88.73	
	1	301	Y	16	200	36	36	37	2110	170	2000			1.58	3.33	120.02	
	1	302	Y	16	200	36	36	37	2710	190	2600			1.58	4.28	154.14	
	1	303a	Y	16	200	16	16	62	5900	4935	690	962	CUT TO SIZE	134"	1.58	9.32	149.15
	1	303b	Y	16	200	16	16	62	5700	4740	675	962	CUT TO SIZE	135"	1.58	9.01	144.10
	1	304a	Y	16	200	16	16	62	5570	4605	690	962	CUT TO SIZE	134"	1.58	8.80	140.81
	1	304b	Y	16	200	16	16	62	5370	4410	675	962	CUT TO SIZE	135"	1.58	8.48	135.75
	1	305a	Y	16	200	16	16	62	3200	2240	690	962	CUT TO SIZE	134"	1.58	5.06	80.90
	1	305b	Y	16	200	16	16	62	3010	2045	675	962	CUT TO SIZE	135"	1.58	4.76	76.09
	1	306a	Y	10	400	20	20	33	370	150				0.62	0.23	4.57	
	1	306b	Y	10	400	21	21	33	390	170				0.62	0.24	5.05	
	1	306c	Y	10	400	37	37	33	410	190				0.62	0.25	9.36	
													TOTAL KG HT STEEL		1108.67		
													TOTAL KG MS STEEL		0.00		
													TOTAL KG DOWELS				
													TOTAL KG STEEL		1108.67		

REINFORCING SCHEDULE FOR WINGWALL 4																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
WINGWALL 4	1	400	Y	16	200	36	36	37	1560	150	1450			1.58	2.46	88.73	
	1	401	Y	16	200	36	36	37	2110	170	2000			1.58	3.33	120.02	
	1	402	Y	16	200	36	36	37	2710	190	2600			1.58	4.28	154.14	
	1	403a	Y	16	200	16	16	62	5900	4935	690	962	CUT TO SIZE	134"	1.58	8.90	142.45
	1	403b	Y	16	200	16	16	62	5700	4740	675	962	CUT TO SIZE	135"	1.58	8.60	137.52
	1	404a	Y	16	200	16	16	62	5570	4605	690	962	CUT TO SIZE	134"	1.58	8.38	134.11
	1	404b	Y	16	200	16	16	62	5370	4410	675	962	CUT TO SIZE	135"	1.58	8.07	129.18
	1	405a	Y	16	200	16	16	62	3200	2240	690	962	CUT TO SIZE	134"	1.58	4.65	74.32
	1	405b	Y	16	200	16	16	62	3010	2045	675	962	CUT TO SIZE	135"	1.58	4.34	69.39
	1	406a	Y	10	400	20	20	33	370	150				0.62	0.23	4.57	
	1	406b	Y	10	400	21	21	33	390	170				0.62	0.24	5.05	
	1	406c	Y	10	400	37	37	33	410	190				0.62	0.25	9.36	
													TOTAL KG HT STEEL		1068.86		
													TOTAL KG MS STEEL		0.00		
													TOTAL KG DOWELS				
													TOTAL KG STEEL		1068.86		

REINFORCING SCHEDULE FOR UPSTREAM APRON SLAB																
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS
			TYPE	SIZE						A	B	C	D			
UPSTREAM APRON SLAB	1	500a	Y	16	200	12	12	20	6000	6000				1.58	6.10	73.19
	1	500b	Y	16	200	6	6	20	3860	3860				1.58	6.16	



CONTROL POINTS WGS 84			
POINTS	X	Y	Z
BPA	3097609.672	-36800.687	694.887
BPB	3097571.324	-36814.419	695.410
BPC	3097577.743	-36831.721	694.906
BPD	3097613.487	-36817.895	695.329

LEGEND	
GL	: GRID LINE
△	: APPROXIMATE POSITION OF DYNAMIC PENETROMETER LIGHT (DPL) TEST
●	: SETTING OUT POINT
⊕	: CENTRE LINE
⊕	: 457mm Ø ROTAPILE
⊙	: CONTROL POINTS

SITE PLAN
SCALE 1:500

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



Chief Engineer: Structural Design

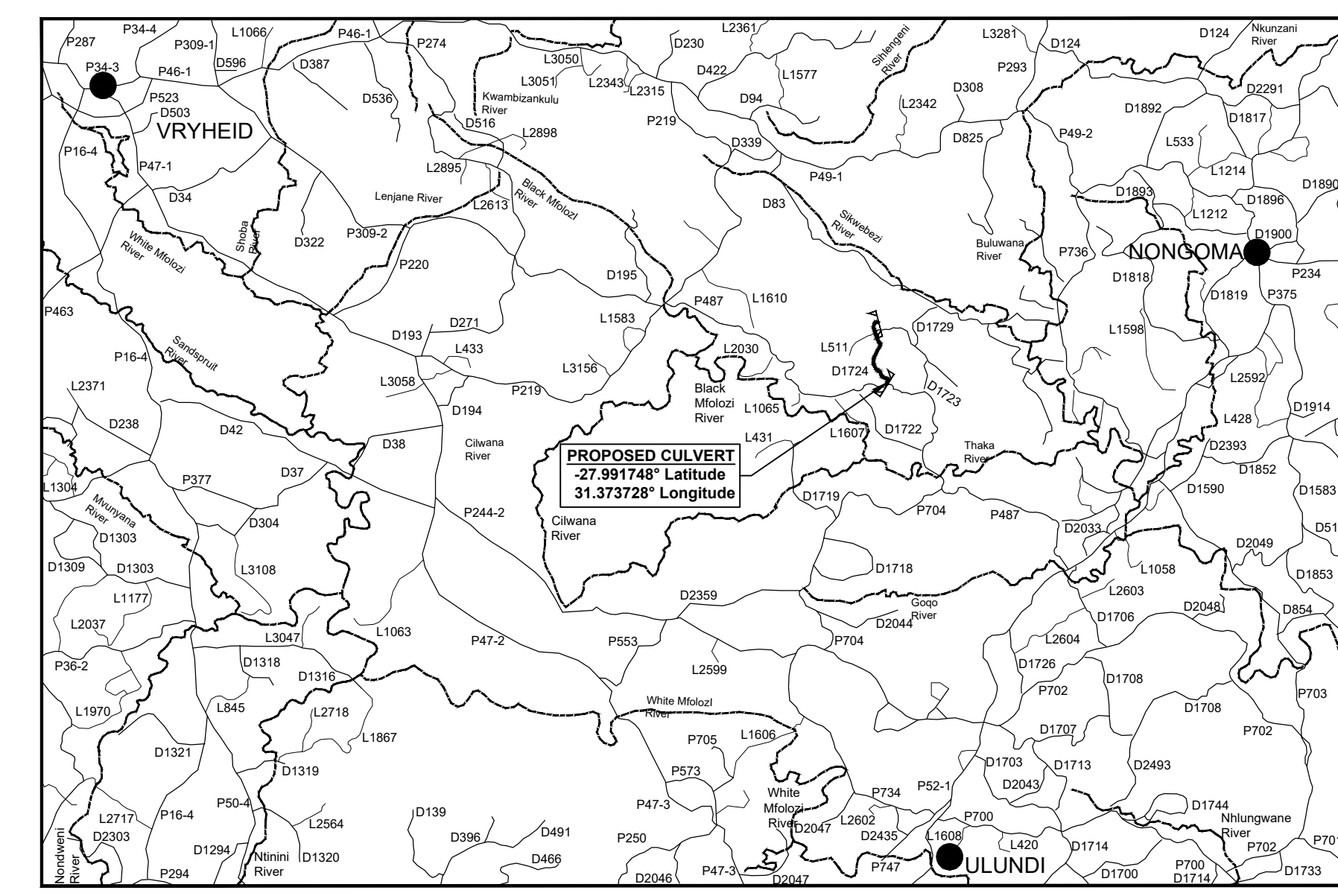
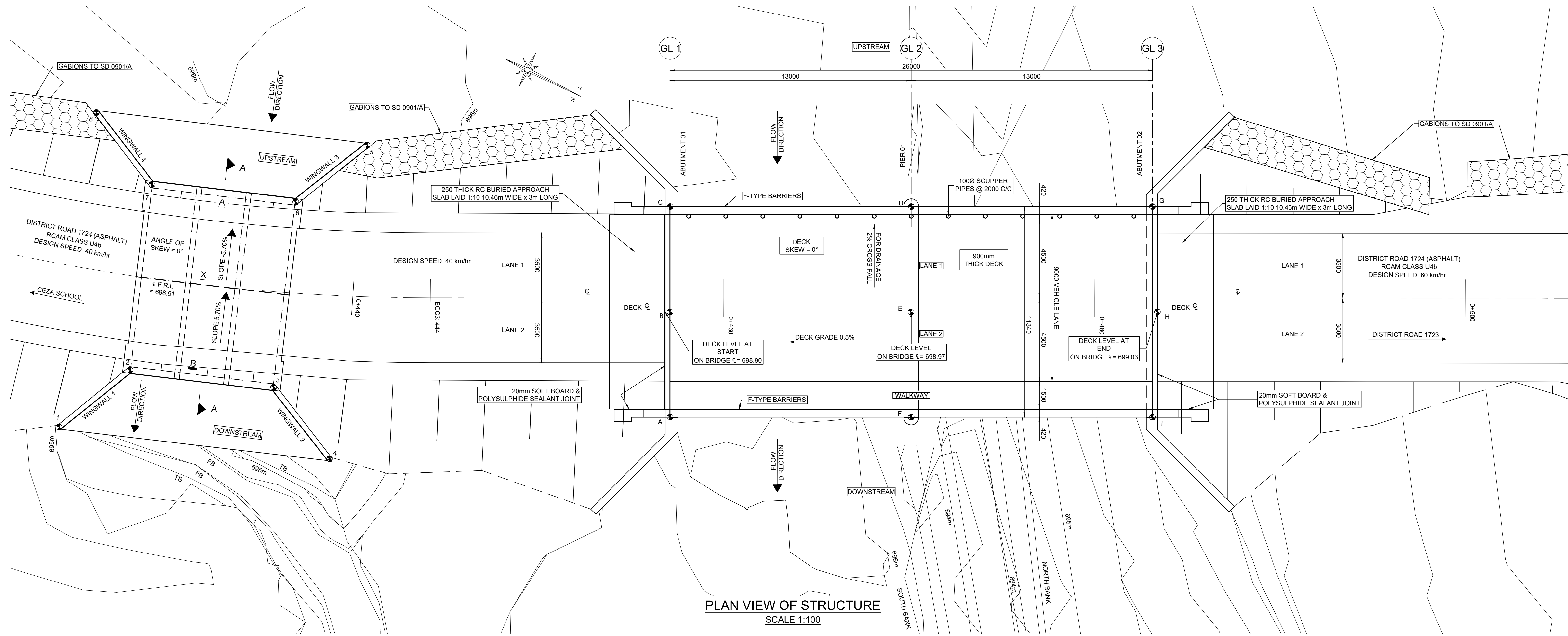
SIGNATURE DATE

Head: Transport

FOR DESIGN APPROVAL	
DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723	WGS 84:- -27.991748° Latitude 31.373728° Longitude
Staked km distance	0.47
Scale	AS SHOWN
Sheet 01 of 23	Plan No.:- 3521/SS/01

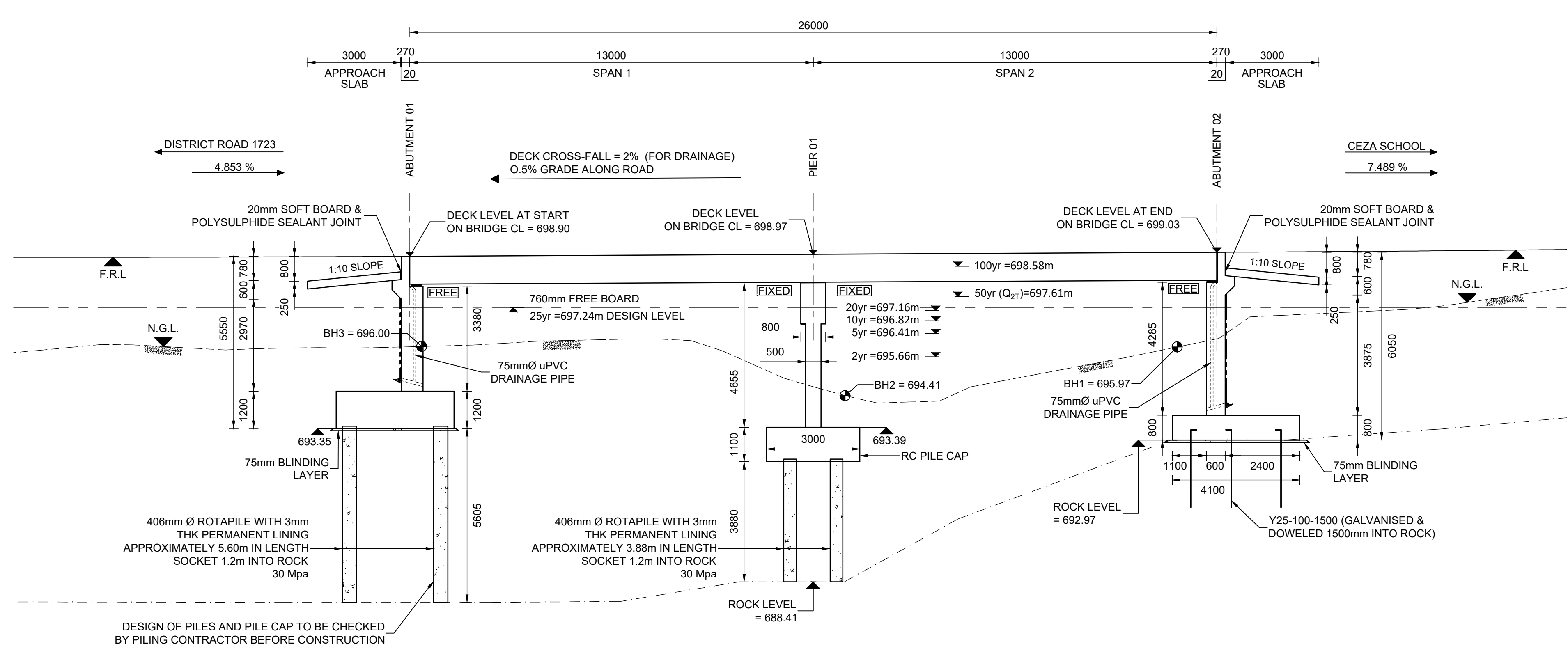
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
SITE PLAN

3521/SS/01



PLAN VIEW OF STRUCTURE
SCALE 1:100

- GENERAL NOTES:**
- ALL WORK AND MATERIALS SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS 2020 (COTO).
 - LOADING : DESIGN LOADING IS IN ACCORDANCE WITH TMH 7 PARTS 1 & 2 AS AMENDED JULY 1991 & KZN DOT STRUCTURES DESIGN MANUAL.
 - TRAFFIC : NA & NB.24
 - EARTH : DENSITY OF BACKFILL - 2000kg/m³
HORIZONTAL EARTH PRESSURE - 7.8kPa PER METRE DEPTH
 - CONCRETE CLASS :
15/19 (15MPa) : BLINDING
30/19 (30MPa) : ABUTMENTS & PIERS
40/19 (40MPa) : DECKS
 - REINFORCING STEEL :
ALL REINFORCEMENT SHALL COMPLY WITH SANS 10100-1.
REINFORCEMENT SHALL BE BENT IN ACCORDANCE WITH SANS 282.
 - CONCRETE COVER TO REINFORCEMENT :
50mm TO ABUTMENTS, PIERS & DECKS
 - CHAMFERS :
ALL SHARP CONCRETE EDGES TO BE CHAMFERED 25mm UNLESS OTHERWISE SHOWN.
 - FORMED CONCRETE SURFACE FINISHES :
CLASS F1 : CONCEALED SURFACES (ROUGH)
CLASS F2 : VISIBLE SURFACES (SMOOTH)
 - UNFORMED CONCRETE SURFACE FINISHES :
CLASS U1 : CONCEALED SURFACES
CLASS U2 : VISIBLE SURFACES
 - THE RIVER NAME (-) 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 (-) 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.
 - DESIGN BEARING PRESSURES:
PERMISSIBLE BEARING PRESSURE: - MEDIUM HARD ROCK - 750 KPa
ABUTMENTS - MEDIUM HARD ROCK - 750 KPa
PIER - MEDIUM HARD ROCK - 750 KPa
(REFER TO GEOTECHNICAL REPORT PREPARED BY GEOSURE REF "GWH008-21.R01")



LONGITUDINAL SECTION ON CENTRELINE OF BRIDGE
SCALE 1:100

DRAWING INDEX

DRAWING No.	TITLE OF DRAWING
/ISS/01	SITE PLAN
/02	GENERAL ARRANGEMENT A
/03	GENERAL ARRANGEMENT B
/04	LONGITUDINAL SECTION
/05	PILE DATA
/06	FOUNDATION PLAN
/07	ABUTMENT 1
/08	PIER 1
/09	ABUTMENT 2
/10	DECK PLAN
/11	F-TYPE BARRIERS & END BLOCK DETAIL
/12	MISCELLANEOUS DETAILS

LEGEND

GL	: GRID LINE
△	: APPROXIMATE POSITION OF DYNAMIC PENETROMETER LIGHT (DPL) TEST
●	: SETTING OUT POINT
⊕	: CENTRE LINE
⊕	: 457mm Ø ROTAPILE
⊙	: CONTROL POINTS

SETTING OUT POINTS WGS 84

POINTS	X	Y	Z	NAME	POSITION
A	3097592.700	-36775.305	699.02		EDGE OF DECK
B	3097595.216	-36770.223	698.90		CENTRE OF DECK
C	3097597.732	-36765.142	698.79		EDGE OF DECK
D	3097586.082	-36759.374	698.86		EDGE OF DECK
E	3097583.566	-36764.455	698.95	PIER 1	CENTRE OF DECK
F	3097581.050	-36769.536	699.08		EDGE OF DECK
G	3097574.432	-36753.606	698.92		EDGE OF DECK
H	3097571.916	-36758.687	699.03	ABUTMENT 2	CENTRE OF DECK
I	3097569.400	-36763.768	699.14		EDGE OF DECK

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:- _____
 Designed by:- Y. JEAOWN Pr Eng (202101910)
 Checked by:- P. NANKHOO Pr Eng (910350)
 Design Plan No:- _____
 Drawn by:- A. GUNAS
 Long Section No:- _____
 Checked by:- Y. JEAOWN Pr Eng (202101910)
 Cross Section No:- _____
 File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Chief Engineer: Structural Design

Head: Transport

SIGNATURE: _____ DATE: _____

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

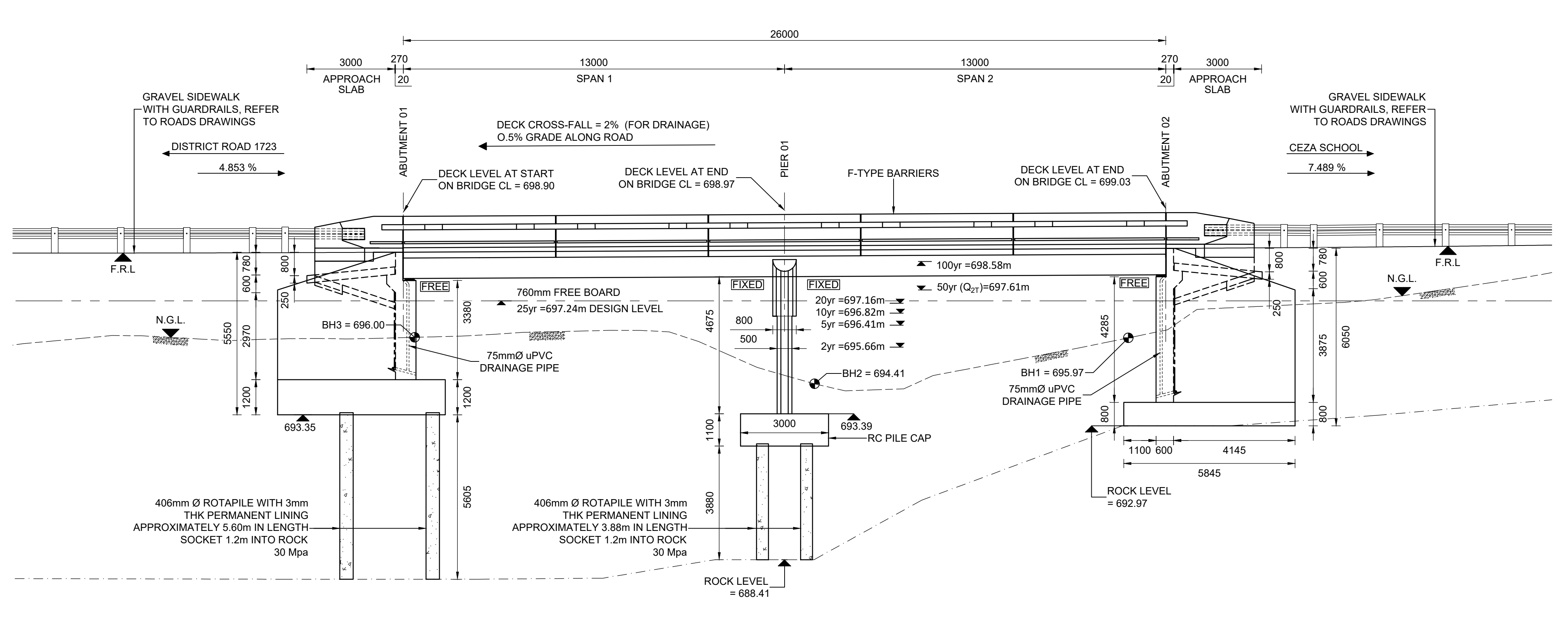
Staked km distance: 0.47
 Sheet of: 23

Scale: AS SHOWN
 Plan No.: 3521/02

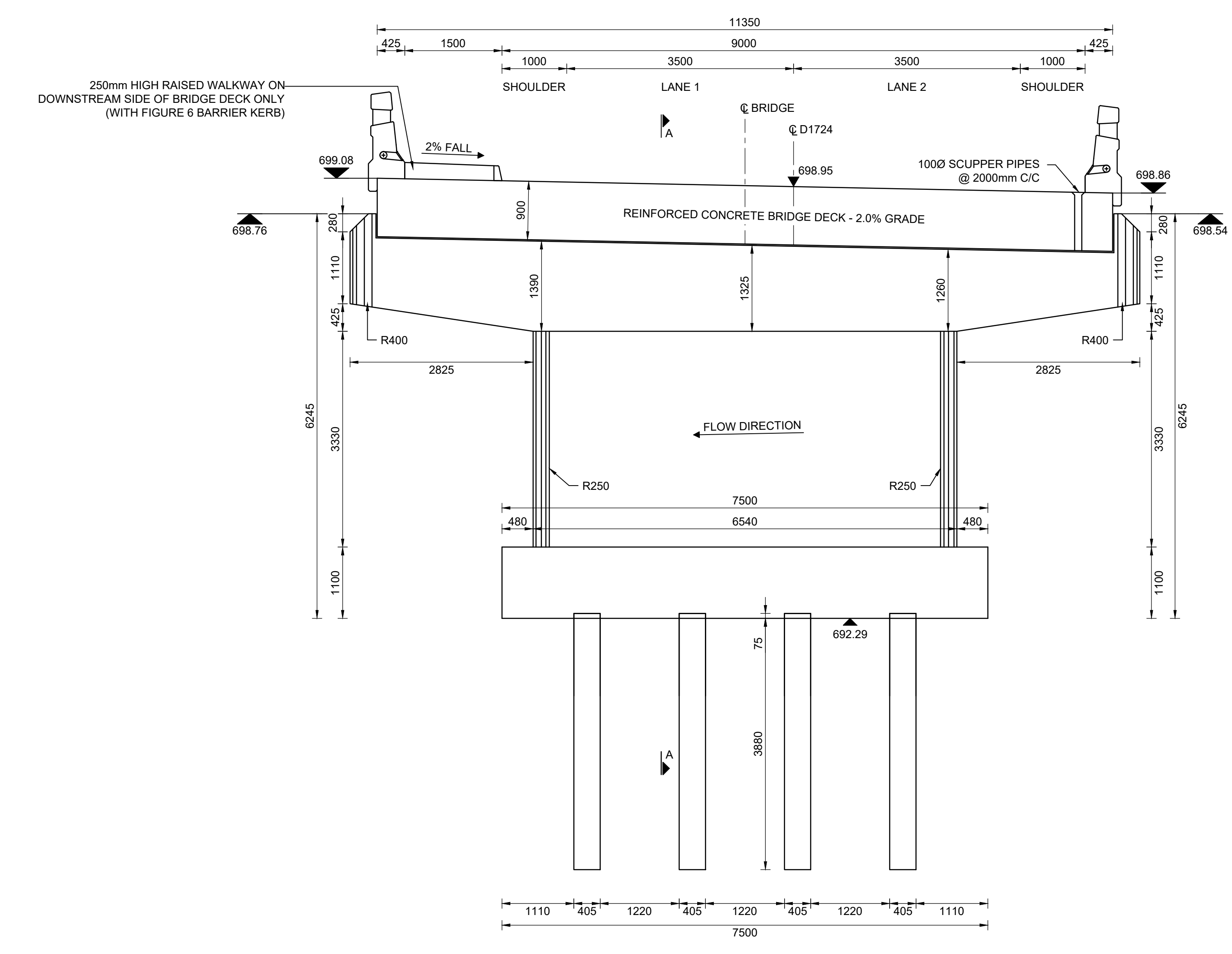
FOR TENDER PURPOSES

PORTION: VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
 GENERAL ARRANGEMENT A

3521/02



LONGITUDINAL SECTION ON CENTRELINE OF BRIDGE
SCALE 1:100



TYPICAL SECTION THROUGH DECK & ELEVATION VIEW OF PIER
SCALE 1:50

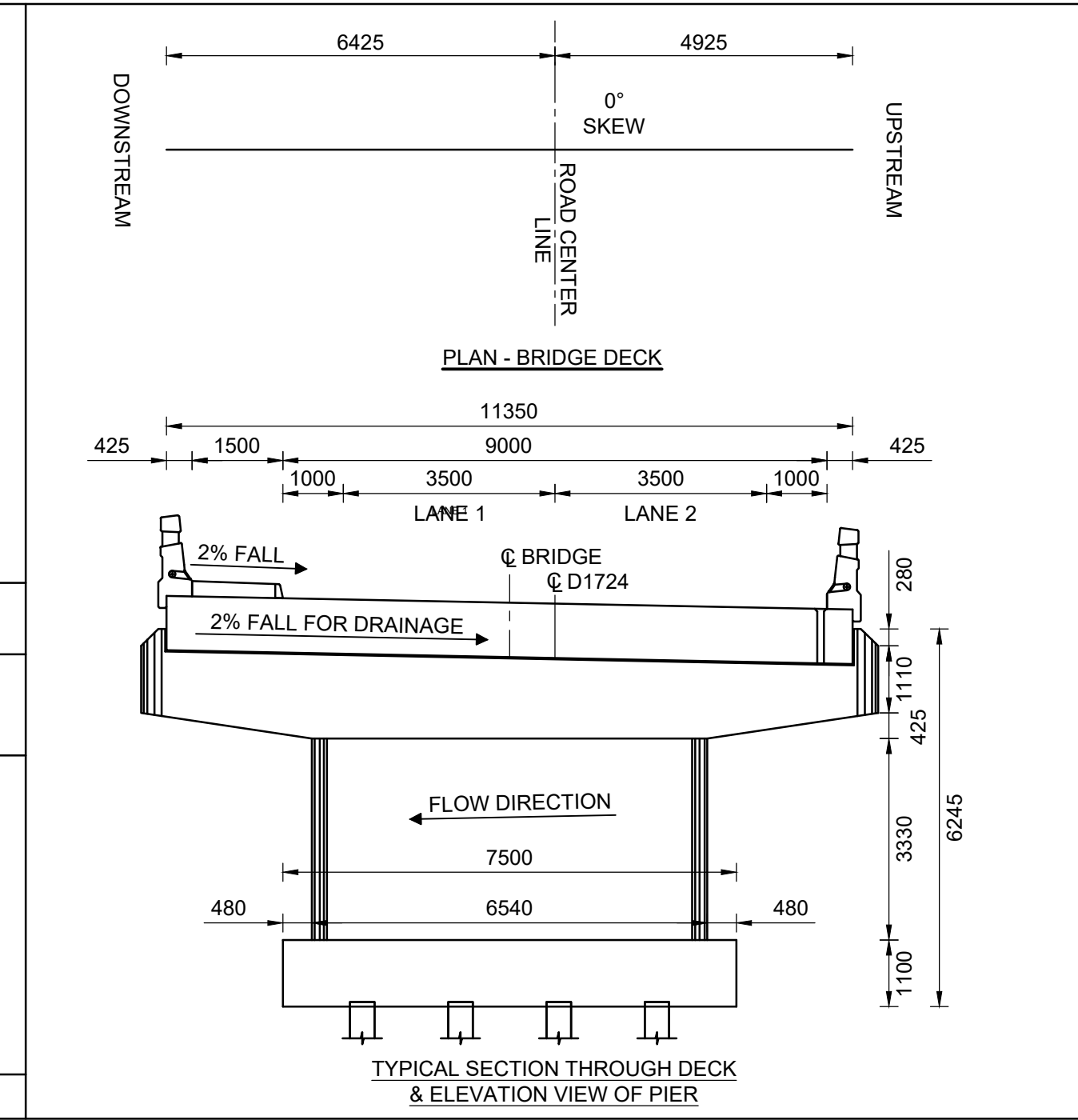
INVERT LEVEL = 693.46
MAP = 1067mm²
Road Class = RCAM (LBS)
(PROVINCIAL DISTRICT)

CATCHMENT AREA = 8.86 km²
DESIGN FLOOD RETURN PERIOD = 1-25 yr

T (yrs)	Q (m ³ /s)	RMF (%)	HW (m)	FLOODLINE ELEVATION (m)	MAX. EXIT VELOCITY (m/s)	EXIT CONDITIONS
2	19.00	6.4%	2.20	695.66	0.96	
5	65.00	21.8%	2.95	696.41	1.22	
10	108.00	36.3%	3.36	696.82	1.40	
20	157.00	52.7%	3.70	697.16	1.51	
25	169.00	56.8%	3.78	697.24	1.53	
50	230.00	77.3%	4.15	697.61	1.61	SOIL & VEGETATION
100	291.00	97.8%	5.12	698.58	1.64	

R.M.F. = (10⁻⁴)^{1/3} [(A/10⁶)^{1/3}(1-0.1K)] = 297.66 cumecs K=0.0

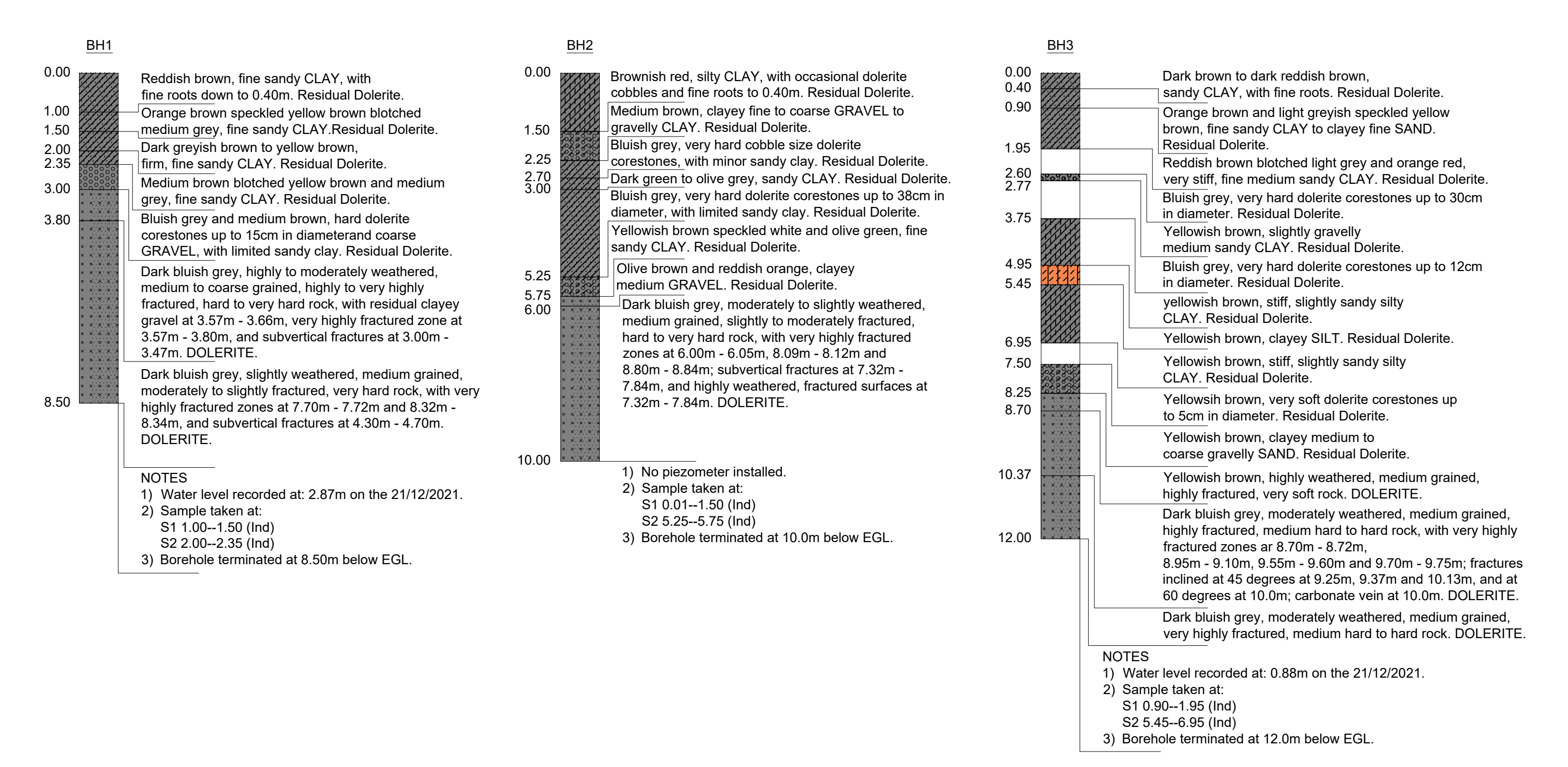
BRIDGE DATA BLOCK



BRIDGE DATA BLOCK

BOREHOLE POSITION

POINTS	X	Y
BH1	3097594.755	-36770.284
BH2	3097583.317	-36762.646
BH3	3097573.991	-36757.363



BOREHOLE PROFILES
SCALE 1:100

GENERAL NOTES:

- ALL WORK AND MATERIALS SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS 2020 (COTO).
- LOADING : DESIGN LOADING IS IN ACCORDANCE WITH TMH 7 PARTS 1 & 2 AS AMENDED JULY 1991 & KZN DOT STRUCTURES DESIGN MANUAL.
 - TRAFFIC : NA & NB.24
 - EARTH : DENSITY OF BACKFILL - 2000kg/m³ HORIZONTAL EARTH PRESSURE - 7.8kPa PER METRE DEPTH
- CONCRETE CLASS :
 - 15/19 (15MPa) : BLINDING
 - 30/19 (30MPa) : ABUTMENTS & PIERS
 - 40/19 (40MPa) : DECKS
- REINFORCING STEEL : ALL REINFORCEMENT SHALL COMPLY WITH SANS 10100-1. REINFORCEMENT SHALL BE BENT IN ACCORDANCE WITH SANS 282.
- CONCRETE COVER TO REINFORCEMENT : 50mm TO ABUTMENTS, PIERS & DECKS
- CHAMFERS : ALL SHARP CONCRETE EDGES TO BE CHAMFERED 25mm UNLESS OTHERWISE SHOWN.
- FORMED CONCRETE SURFACE FINISHES : CLASS F1 : CONCEALED SURFACES (ROUGH) CLASS F2 : VISIBLE SURFACES (SMOOTH)
- UNFORMED CONCRETE SURFACE FINISHES : CLASS U1 : CONCEALED SURFACES CLASS U2 : VISIBLE SURFACES
- THE RIVER NAME (-) 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 (-) IS TO BE REBATED 10mm IN 75mm NUMBERING INTO THE TOP OF THE SLOPING HORSESHOE SURFACE. ALL NUMBERS AND LETTERING IS TO BE CAREFULLY PAINTED WITH TWO COATS OF BLACK ALKALI RESISTANT PAINT.
- DESIGN BEARING PRESSURES:
 - PERMISSIBLE BEARING PRESSURE: - MEDIUM HARD ROCK - 750 KPa
 - ABUTMENTS - MEDIUM HARD ROCK - 750 KPa
 - PIER - MEDIUM HARD ROCK - 750 KPa
 - (REFER TO GEOTECHNICAL REPORT PREPARED BY GEOSURE REF "GWH008-21.R01")

- ADDITIONAL NOTES FOR F-TYPE BARRIERS:
- CLASS OF CONCRETE SHALL BE 30/19 (MPa) UNLESS OTHERWISE SPECIFIED.
 - ALL CORNERS TO BE CHAMFERED WITH 20mm X 20mm UNLESS OTHERWISE SPECIFIED. THE TOP CORNERS OF THE PARAPET WALL ARE TO BE ROUNDED WITH A 20mm RADIUS
 - CONSTRUCTION JOINTS BETWEEN SEGMENTS TO BE 20mm THICK FILLED WITH POLYSULPHIDE SEALANT OR SIMILAR APPROVED. JOINTS ARE TO LINE UP WITH EXISTING 20mm JOINTS IN THE BRIDGE DECK.
 - ALL STEEL REINFORCING TO BARRIERS SHALL HAVE A MINIMUM CONCRETE COVER OF 40mm.
 - SURFACE FINISHES ON ALL EXPOSED SURFACES TO BE CLASS F3 FOR STEEL SHUTTER FINISHES AND CLASS U3 FOR STEEL TROWEL FINISHES.
 - SHALL COMPLY WITH SANS 920: 1985. HIGH TENSILE BARS MIN YIELD STRESS MUST BE 450MPa AND MILD STEEL BARS MIN YIELD STRESS MUST BE 250MPa
 - BARRIER CAN WITHSTAND A 100kN FORCE APPLIED 700mm ABOVE THE ROAD SURFACE.
 - ALL WORK MUST BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS." (COTO)
 - RIGHT HAND SIDE APPROACH END BLOCKS WILL BE A MIRROR IMAGE OF THE LEFT HAND SIDE APPROACH END BLOCKS.

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Chief Engineer: Structural Design

Head: Transport

SIGNATURE: _____ DATE: _____

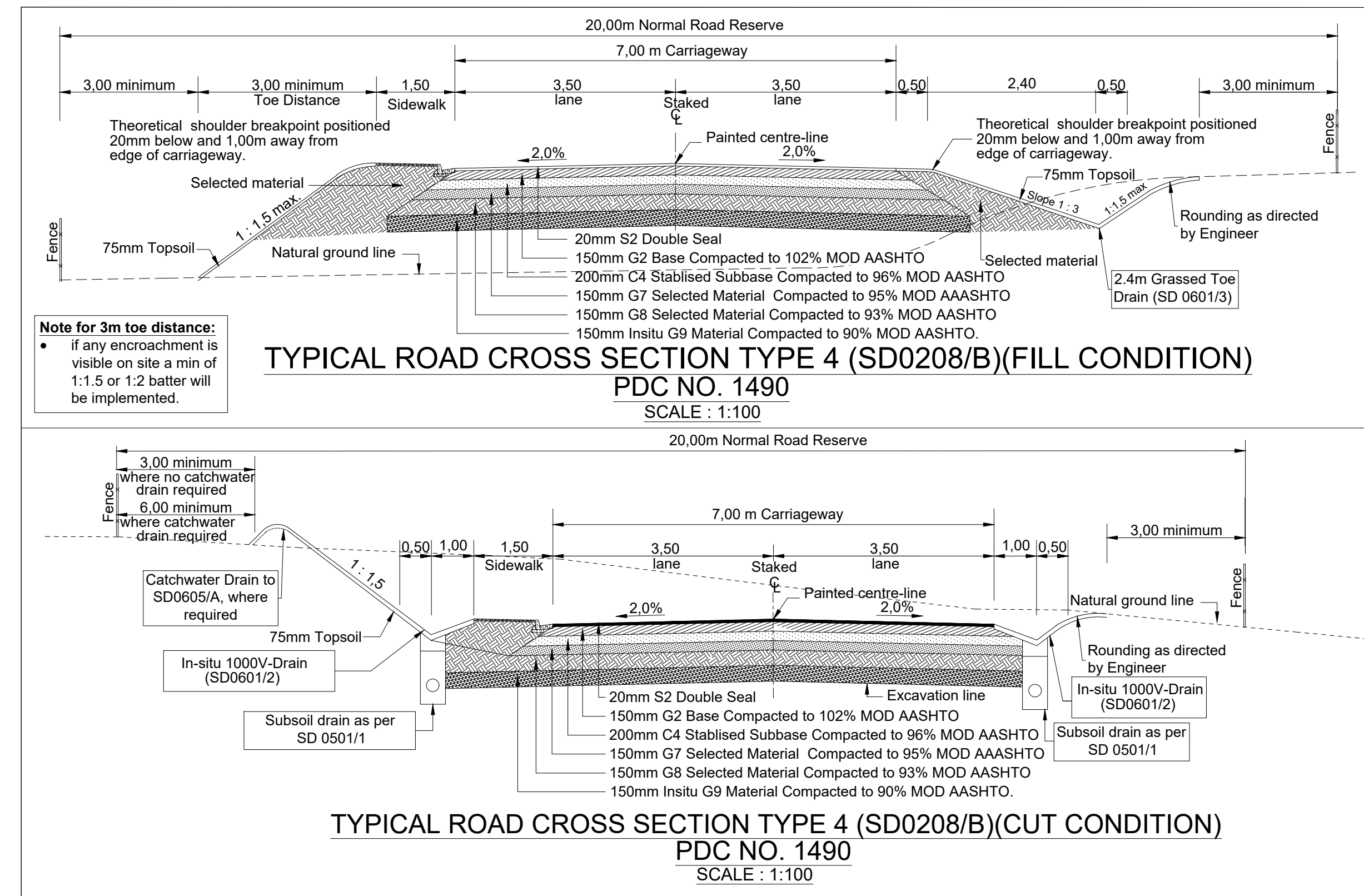
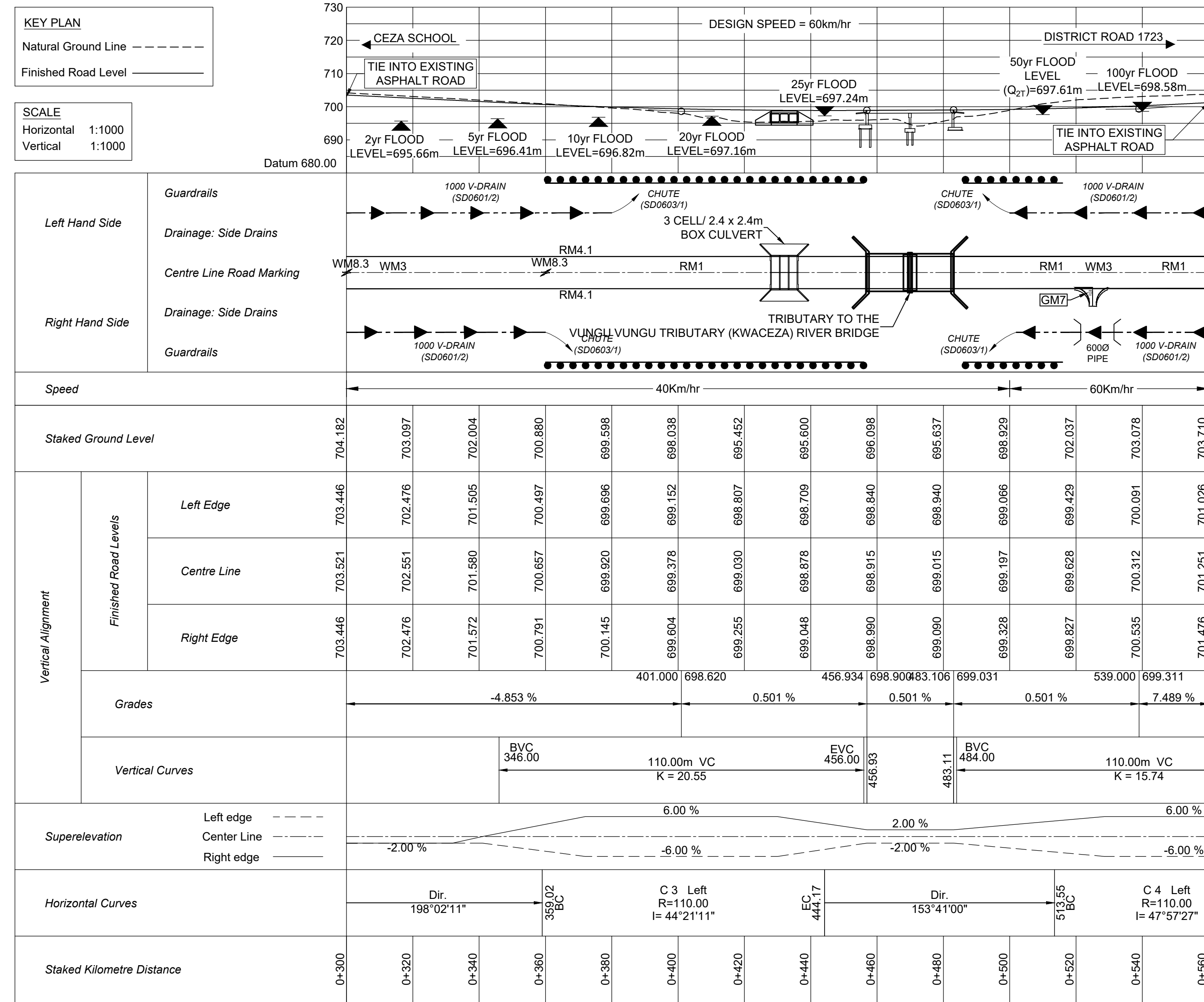
DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723	WGS 84:- -27.991748° Latitude 31.373728° Longitude
Staked km distance	Sheet 03
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/03

VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

GENERAL ARRANGEMENT B

FOR TENDER PURPOSES

Staked km distance	Sheet 03
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/03



DRAWING INDEX

DRAWING No.	TITLE OF DRAWING
- /01-05	GENERAL ARRANGEMENT
- /06-07	INTERSECTION SETTING OUT & STANDARD DETAILS
- /08-10	LONGITUDINAL SECTION
- /11-17	CROSS SECTIONS

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Supervising Engineer	Continued on:-	Checked by:- P. NANKHOO Pr Eng (9103350)
Date	Design Plan No:-	Drawn by:- A. GUNAS
Supervising Authority	Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
	Cross Section No:-	File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
CONSULTING ENGINEERS

GATEWAY OFFICE PARK, BEAUFORT ST. TEL: 035 958 5800
LONGACRE CENTRE, DURBAN. FAX: 035 958 5800
WWW.NANKHOOENGINEERS.CO.ZA

SIGNATURE: _____ DATE: _____

Chief Engineer: Structural Design

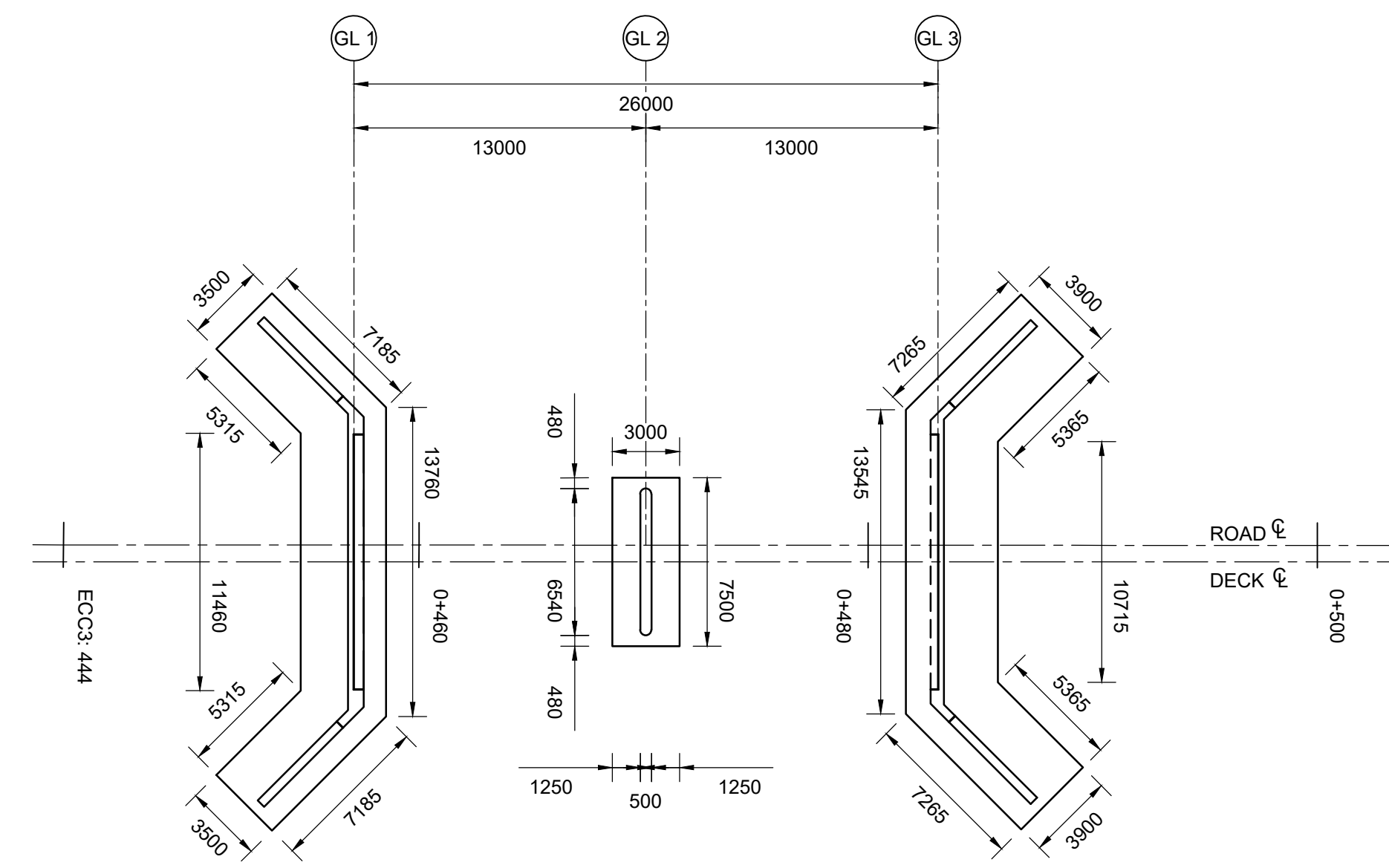
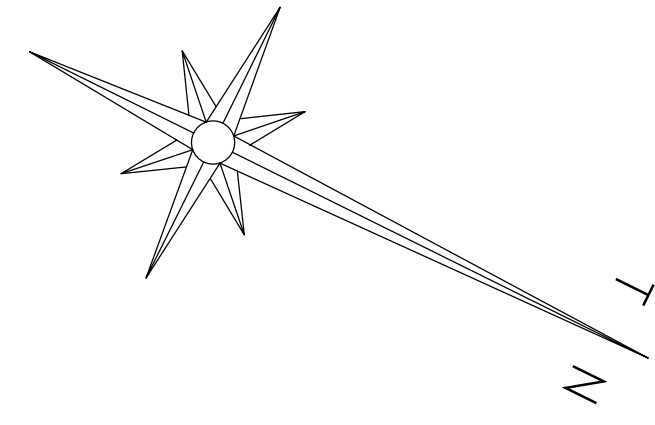
Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
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31.373728° Longitude

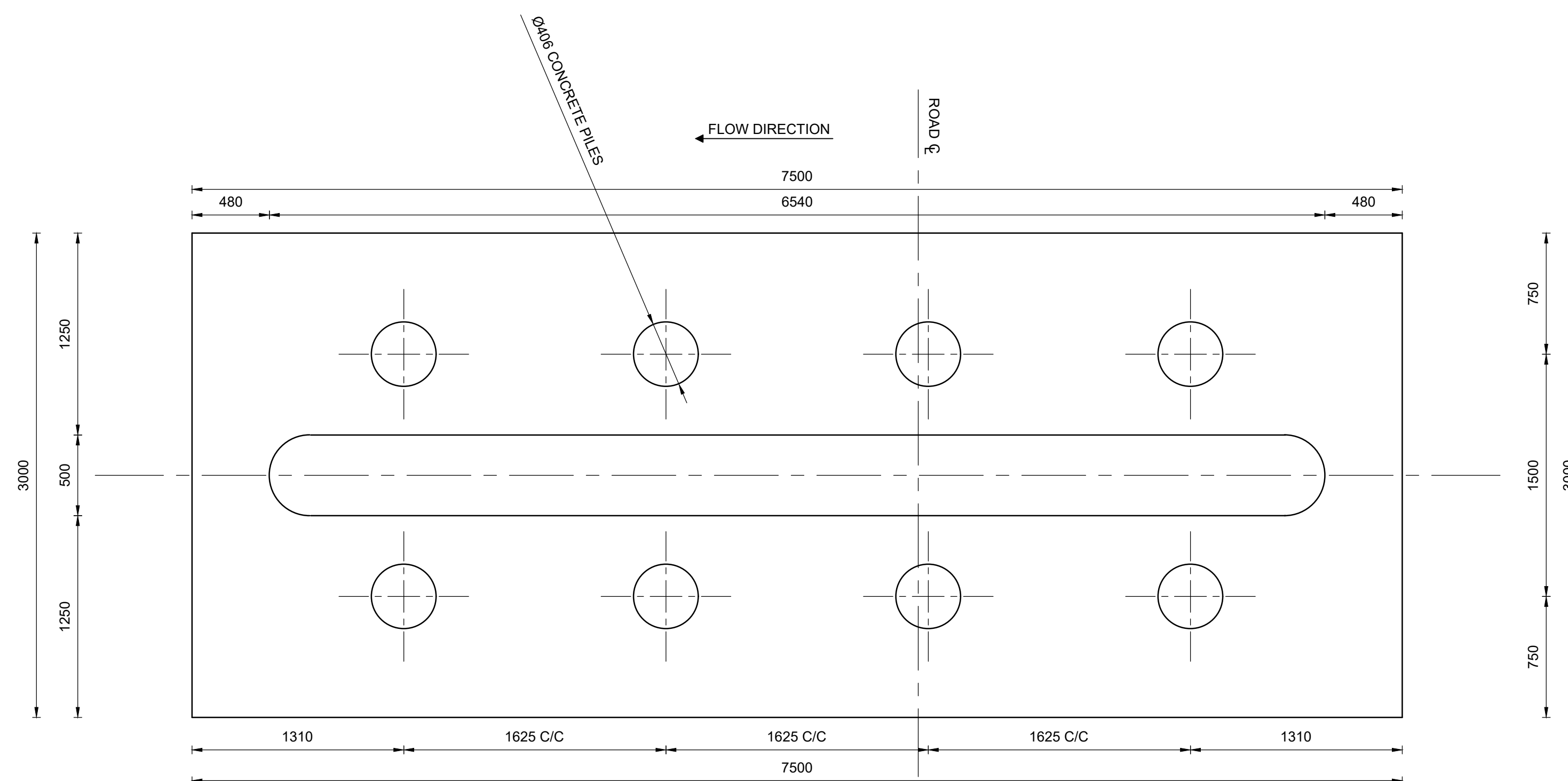
PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
LONGITUDINAL SECTION

FOR TENDER PURPOSES

Staked km distance	Sheet 04
0.47	of 23
Scale AS SHOWN	Plan No.:- 3521/04



FOUNDATION LAYOUT
SCALE 1:250



PIER FOUNDATION LAYOUT
SCALE 1:25

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



Chief Engineer: Structural Design

SIGNATURE _____ DATE _____

Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:- -27.991748° Latitude
31.373728° Longitude

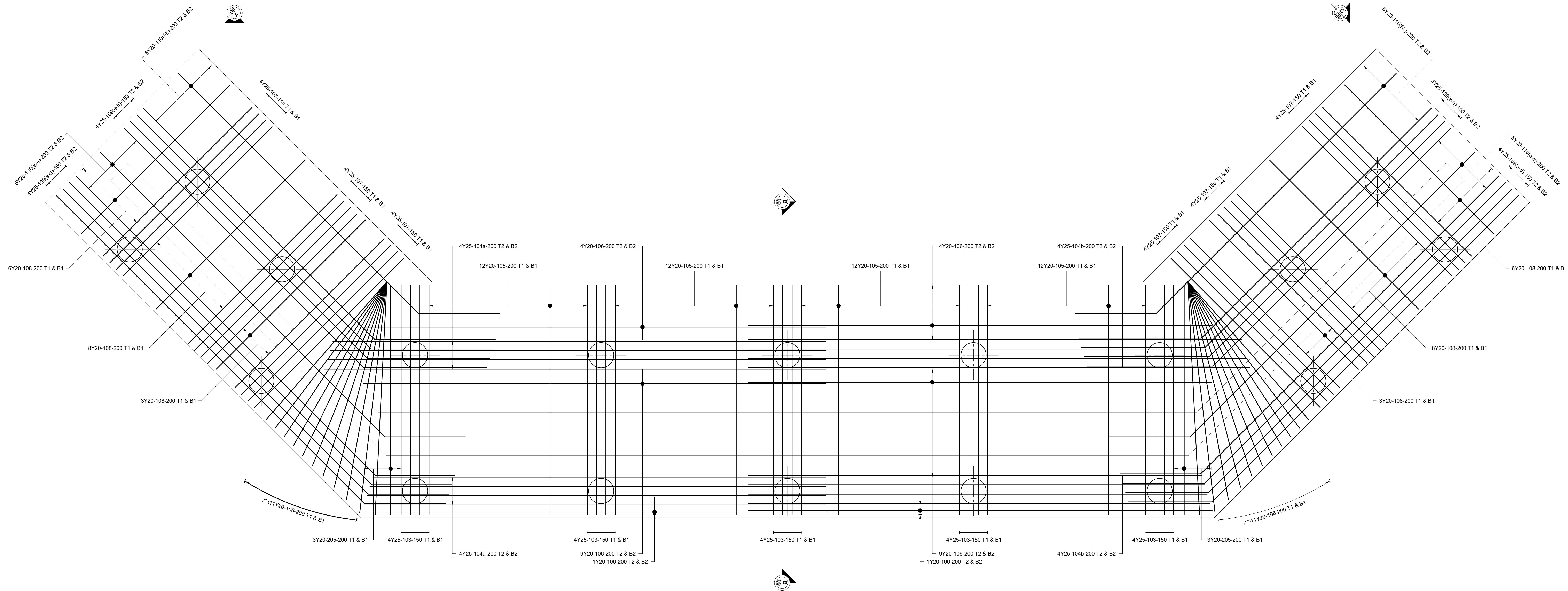
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

FOUNDATION PLAN

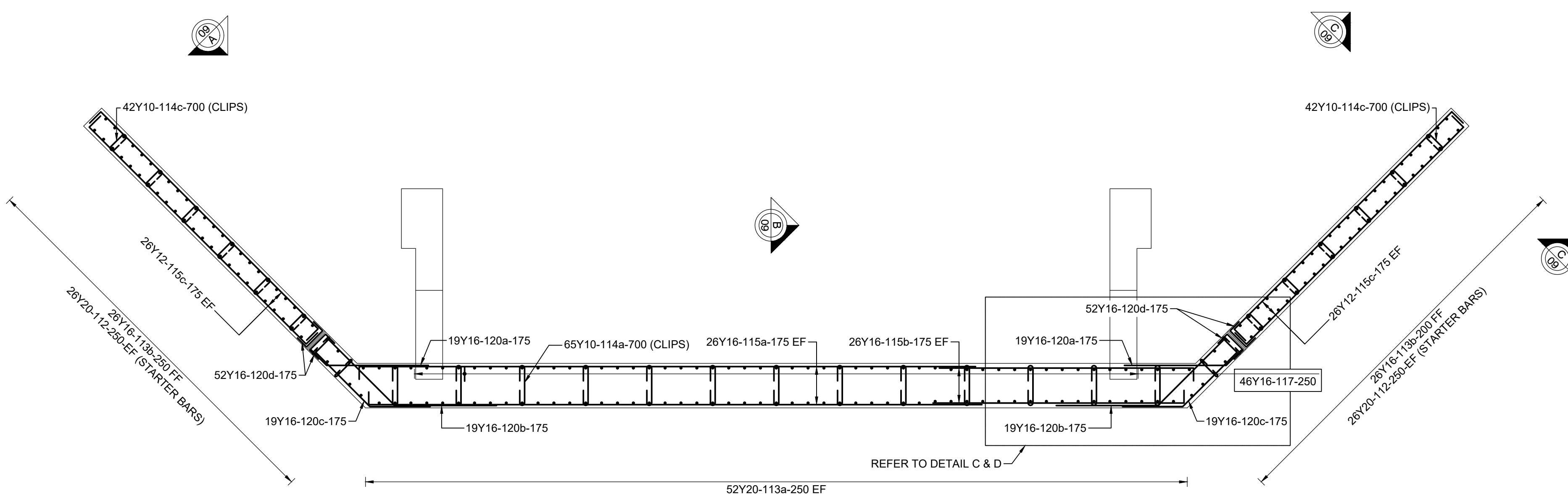
FOR TENDER PURPOSES

Staked km distance	Sheet 06
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/06

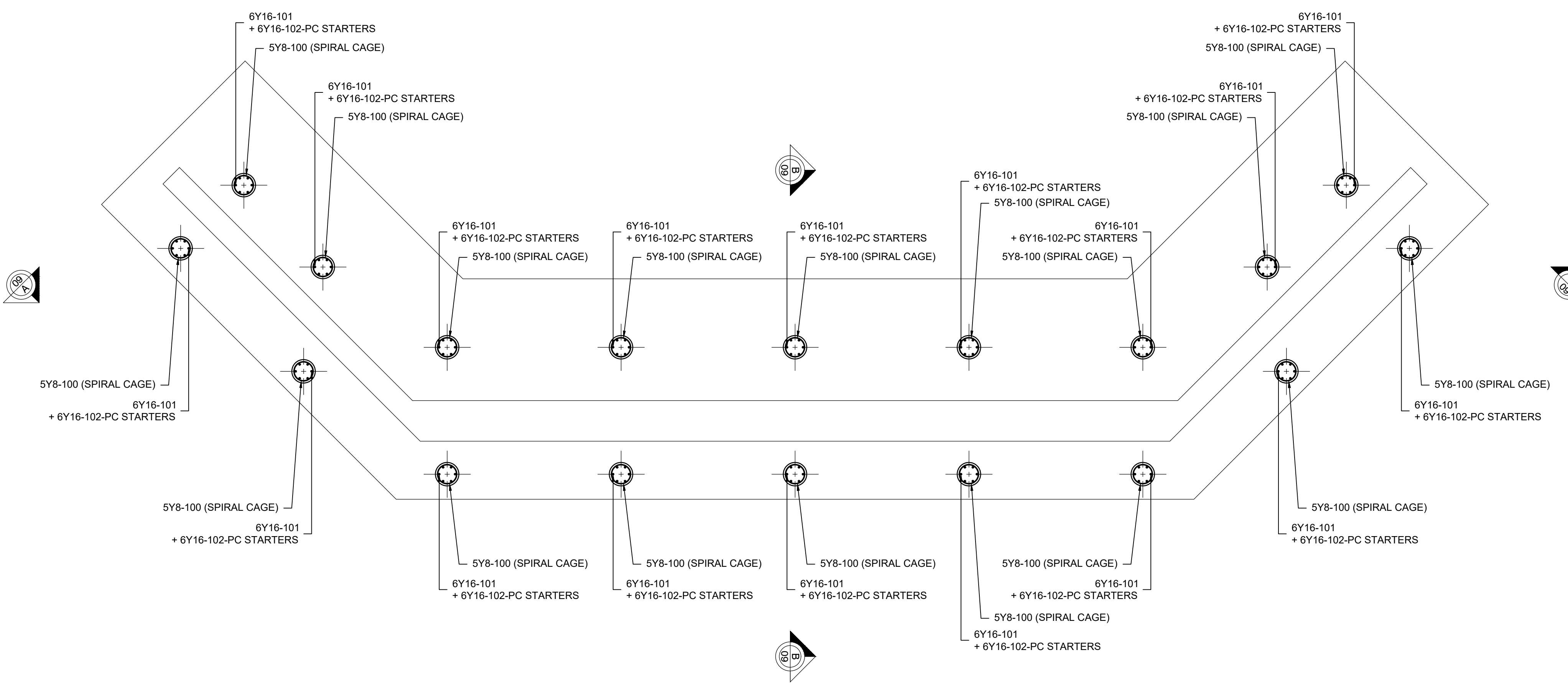
3521/06



PLAN VIEW 2/3
 ABUTMENT 1 PILE CAP
 (TOP & BOTTOM REBAR)
 SCALE 1:25



SECTION D - D
 SCALE 1:50



PLAN VIEW 1/3
 ABUTMENT 1 PILE CAP
 (PILE REBAR)
 SCALE 1:50

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
 DEPARTMENT OF TRANSPORT

NANKHOO
 CONSULTING ENGINEERS
 GATEWAY OFFICE PARK, BLOCK ONE TEL: 0853 584000
 150 GARDEN EMBANKMENT, FAIRVIEW, JOHANNESBURG FAX: 011 462 2322
 4001 email: nankhoocap@nankhoocap.co.za

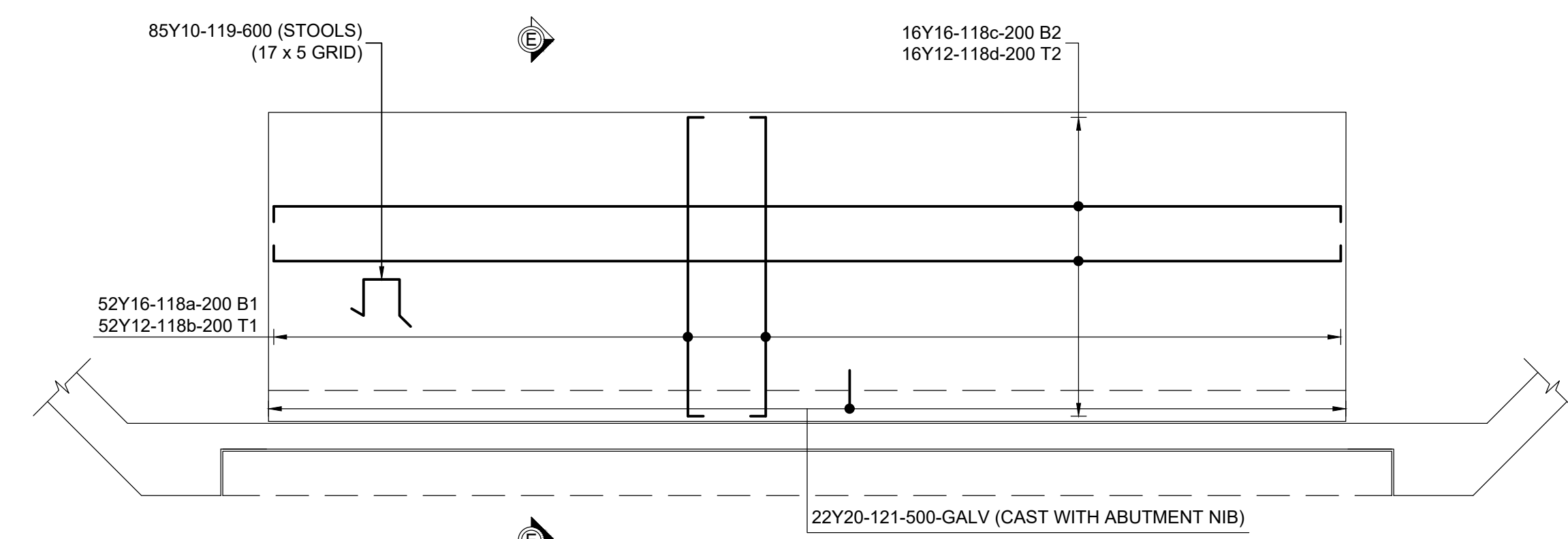
Chief Engineer: Structural Design
 Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

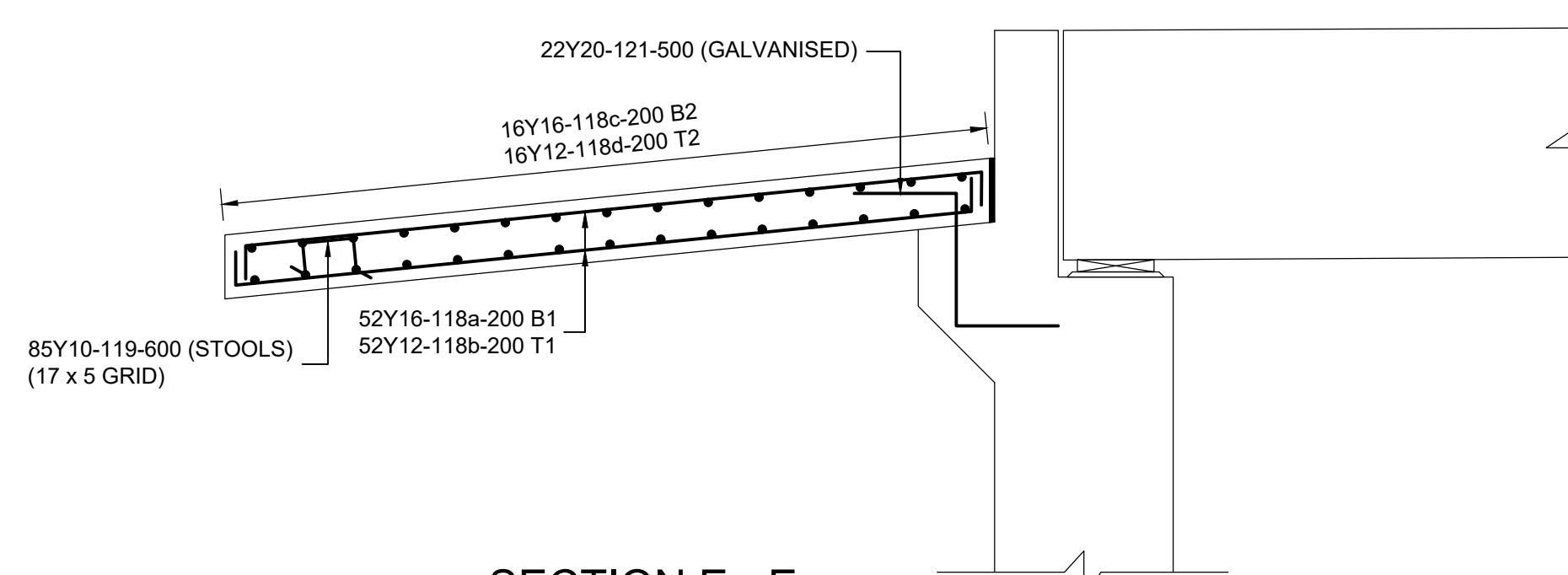
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
 ABUTMENT 1 STEEL LAYOUT A

FOR TENDER PURPOSES	
Staked km distance	Sheet 08 of 23
Scale AS SHOWN	Plan No.: 3521/08

3521/08

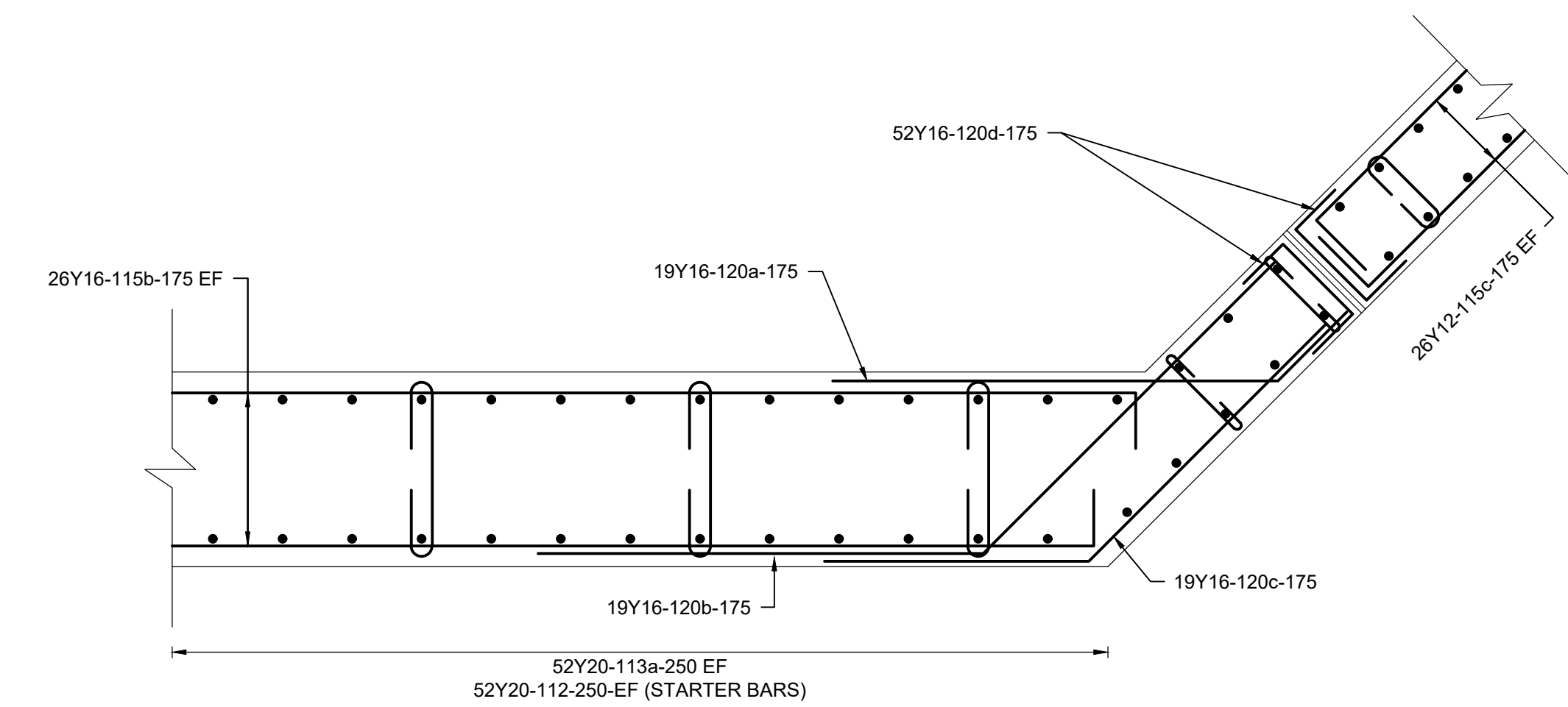


APPROACH SLAB PLAN
SCALE 1:50

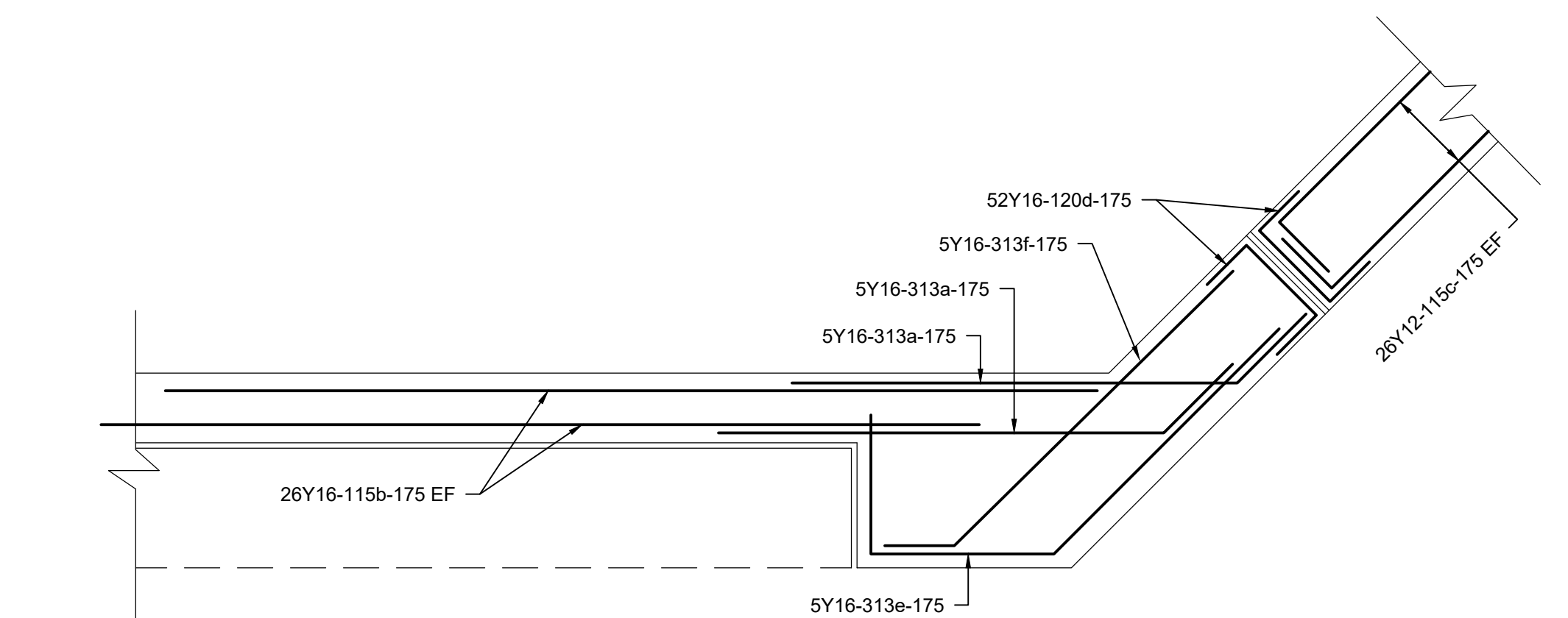


SECTION E - E
SCALE 1:25

- NOTES:**
- MINIMUM CONCRETE COVER - 50mm ALL SIDES
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :-
 B1 - LOWEST BOTTOM LAYER
 B2 - SECOND LOWEST BOTTOM LAYER
 T1 - TOPMOST TOP LAYER
 T2 - SECOND HIGHEST TOP LAYER
 EF - EACH FACE
 NF - NEAR FACE
 FF - FAR FACE
 ALT. - ALTERNATING
 STG. - STAGGERED
 H. - HORIZONTAL
 V. - VERTICAL
 ABR. - ALTERNATE BAR REVERSED
 EW. - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985 HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
 HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
 BLINDING - 15/19 (15MPa)
 ABUTMENT/ PILE CAP - 30/19 (30MPa)
 PILE - 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 50mmØ HOLE 1500mm DEEP AND BLOW OUT DUST WITH COMPRESSOR. INJECT INTO GROUT (EPIDERMIX 385) TO PREVENT AIRLOCKS AND INSERT 125 DOWEL
 - LEVELS SHOWN ON CONCRETE DRAWINGS.

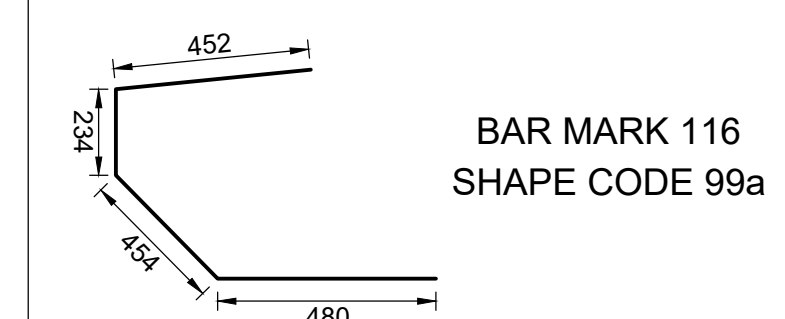


DETAIL C
(TYPICAL PLAN AT ABUTMENT/WING WALL JUNCTION)
SCALE 1:20



DETAIL D
(TYPICAL PLAN AT MID CURTAIN WALL)
SCALE 1:20

MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				
4060 ROTA PILE	18	100	Y	8	AS-SHOWN	6	108	86	5060	326	200	1000		0.395	2.00	215.86	
	18	101	Y	16	60	6	108	20	5580	5580				1.58	8.82	952.17	
	18	102	Y	16	60	6	108	37	1760	200	1600			1.58	2.78	300.33	
	1	103	Y	25	150	40	40	38	5350	900	3700	900		3.85	20.60	823.90	
	1	104a	Y	25	200	16	16	37	8125	850	7350			3.85	31.28	500.50	
	1	104b	Y	25	200	16	16	37	8120	850	7345			3.85	31.26	500.19	
	1	105	Y	20	200	96	96	38	5400	900	3700	900		2.47	13.34	1280.45	
	1	106	Y	20	200	56	56	37	8255	850	7455			2.47	20.39	1141.83	
	1	107	Y	25	150	48	48	38	5050	900	3400	900		3.85	19.44	933.24	
	1	108	Y	20	200	112	112	38	5100	900	3400	900		2.47	12.60	1410.86	
	1	109a	Y	25	150	4	4	62	8330	1315		7015	135°	3.85	32.07	128.28	
	1	109b	Y	25	150	4	4	62	8250	1295		6955	135°	3.85	31.76	127.05	
1	109c	Y	25	150	4	4	62	8175	1280		6895	135°	3.85	31.47	125.90		
1	109d	Y	25	150	4	4	62	8095	1265		6830	135°	3.85	31.17	124.66		
1	109e	Y	25	150	4	4	62	7450	1990		5460	135°	3.85	28.68	114.73		
1	109f	Y	25	150	4	4	62	7375	1975		5400	135°	3.85	28.39	113.58		
1	109g	Y	25	150	4	4	62	7290	1955		5335	135°	3.85	28.07	112.27		
1	109h	Y	25	150	4	4	62	7215	1940		5275	135°	3.85	27.78	111.11		
1	110a	Y	20	200	4	4	62	8010	1300		6710	135°	2.47	19.78	79.14		
1	110b	Y	20	200	4	4	62	7900	1300		6600	135°	2.47	19.51	78.05		
1	110c	Y	20	200	4	4	62	7795	1300		6495	135°	2.47	19.25	77.01		
1	110d	Y	20	200	4	4	62	7690	1300		6390	135°	2.47	18.99	75.98		
1	110e	Y	20	200	4	4	62	7580	1300		6280	135°	2.47	18.72	74.89		
1	110f	Y	20	200	4	4	62	7195	1300		5895	135°	2.47	17.77	71.09		
1	110g	Y	20	200	4	4	62	7090	1300		5790	135°	2.47	17.51	70.05		
1	110h	Y	20	200	4	4	62	6985	1300		5685	135°	2.47	17.25	69.01		
1	110i	Y	20	200	4	4	62	6875	1300		5575	135°	2.47	16.98	67.93		
1	110j	Y	20	200	4	4	62	6770	1300		5470	135°	2.47	16.72	66.89		
1	110k	Y	20	200	4	4	62	6660	1300		5360	135°	2.47	16.45	65.80		
1	111a	Y	16	250	2	2	62	11605	1300		10305	135°	1.58	18.34	36.67		
1	111b	Y	16	250	2	2	62	5905	1300		4605	135°	1.58	9.33	18.66		
1	111c	Y	16	250	2	2	37	9610	2500	7150			1.58	15.18	30.37		
1	111d	Y	16	250	2	2	37	7810	2500	5350			1.58	12.34	24.68		
1	111e	Y	16	250	2	2	62	10500	1300		9200	135°	1.58	16.59	33.18		
1	111f	Y	16	250	2	2	62	4805	1300		3505	135°	1.58	7.59	15.18		
1	112	Y	20	250	208	208	37	3020	800	2270			2.47	7.46	1551.56		
ABUTMENT 1 (700 THICK STEM) (400 THICK WING WALL)	1	113a	Y	20	250	104	104	37	3760	600	3210			2.47	9.29	965.87	
	1	113b	Y	16	250	104	104	37	4435	300	4175			1.58	7.01	728.76	
	1	114a	Y	10	700	65	65	33	820	600				0.617	0.51	32.89	
	1	114b	Y	10	700	26	26	33	370	150				0.617	0.23	5.94	
	1	114c	Y	10	700	84	84	33	520	300				0.617	0.32	26.95	
	1	115a	Y	20	175	52	52	37	9860	200	9700			2.47	24.35	1266.42	
	1	115b	Y	20	175	52	37	4160	200	4000				2.47	10.28	534.31	
	1	115c	Y	20	175	104	104	38	5380	300	4860	300		2.47	13.29	1382.01	
	1	116	Y	16	200	52	52	99a	1620					1.58	2.56	133.10	
	1	117	Y	16	250	46	46	38	2730	1330	150	1330		1.58	4.31	198.42	
	1	118a	Y	16	200	52	52	38	3120	150	2900	150		1.58	4.93	256.34	
	1	118b	Y	12	200	52	52	38	3140	150	2900	150		0.888	2.79	144.99	
APPROACH SLAB (10460 x 3000 x 250 DP @60° SKEW)	1	118c	Y	16	200	16	16	38	10580	150	10360	150		1.58	16.72	267.46	
	1	118d	Y	12	200	16	16	38	10600	150	10360	150		0.888	9.41	150.60	
	1	119	Y	10	600	85	85	83	688	200	94	200	200		0.617	0.42	36.08
	1	120a	Y	16	175	58	58	62	1900	350		1600	135°	1.58	3.00	174.12	
ABUTMENT 1 (700 THICK STEM) (400 THICK WING WALL)	1	120b	Y	16	175	38	38	62	3100	1600		1500	135°	1.58	4.90	186.12	
	1	120c	Y	16	175	38	38	62	2150	950		1200	135°	1.58	3.40	129.09	
	1	120d	Y	16	175	104	104	38	620	200		300	200		1.58	0.98	101.88
	1	120e	Y	16	175	10	10	45	2305	1145	700	500		1.58	3.64	36.42	
	1	120f	Y	16	175	10	10	62	1660	250		1410	135°	1.58	2.62	26.23	
	1	120g	Y	16	175	8	8	38	990	200	670	200		1.58	1.56	12.51	
ABUTMENT 1 PILE CAP	1	121	Y	20	500	22	22	54	1320	400	520	400		2.47	3.26	71.73	
	1	122	Y	16	600	118	118	60	3160	935	550			1.58	4.99	589.15	
														TOTAL KG HT STEEL		18980.42	
														TOTAL KG MS STEEL			
														TOTAL KG DOWELS			
														TOTAL KG STEEL		18980.42	



Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-
 Continued on:-
 Design Plan No:-
 Long Section No:-
 Cross Section No:-

Designed by:- Y. JEAOWN Pr Eng (202101910)
 Checked by:- P. NANKHOO Pr Eng (910350)
 Drawn by:- A. GUNAS
 Checked by:- Y. JEAOWN Pr Eng (202101910)
 File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

Chief Engineer: Structural Design

Head: Transport

SIGNATURE: _____ DATE: _____

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

Staked km distance: 0.47

Sheet 10 of 23

VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

ABUTMENT 1 STEEL LAYOUT C

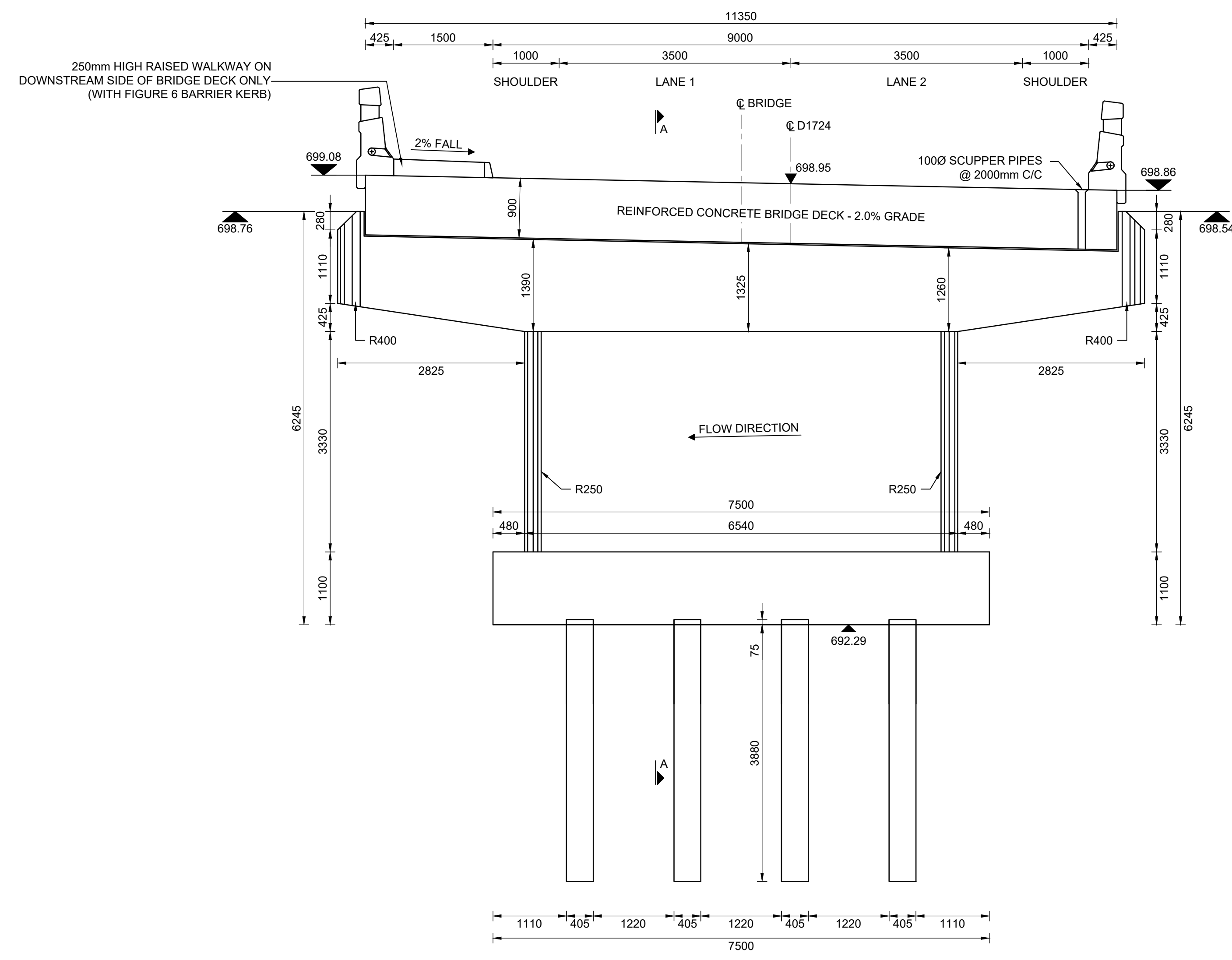
Scale: AS SHOWN

Plan No.: 3521/10

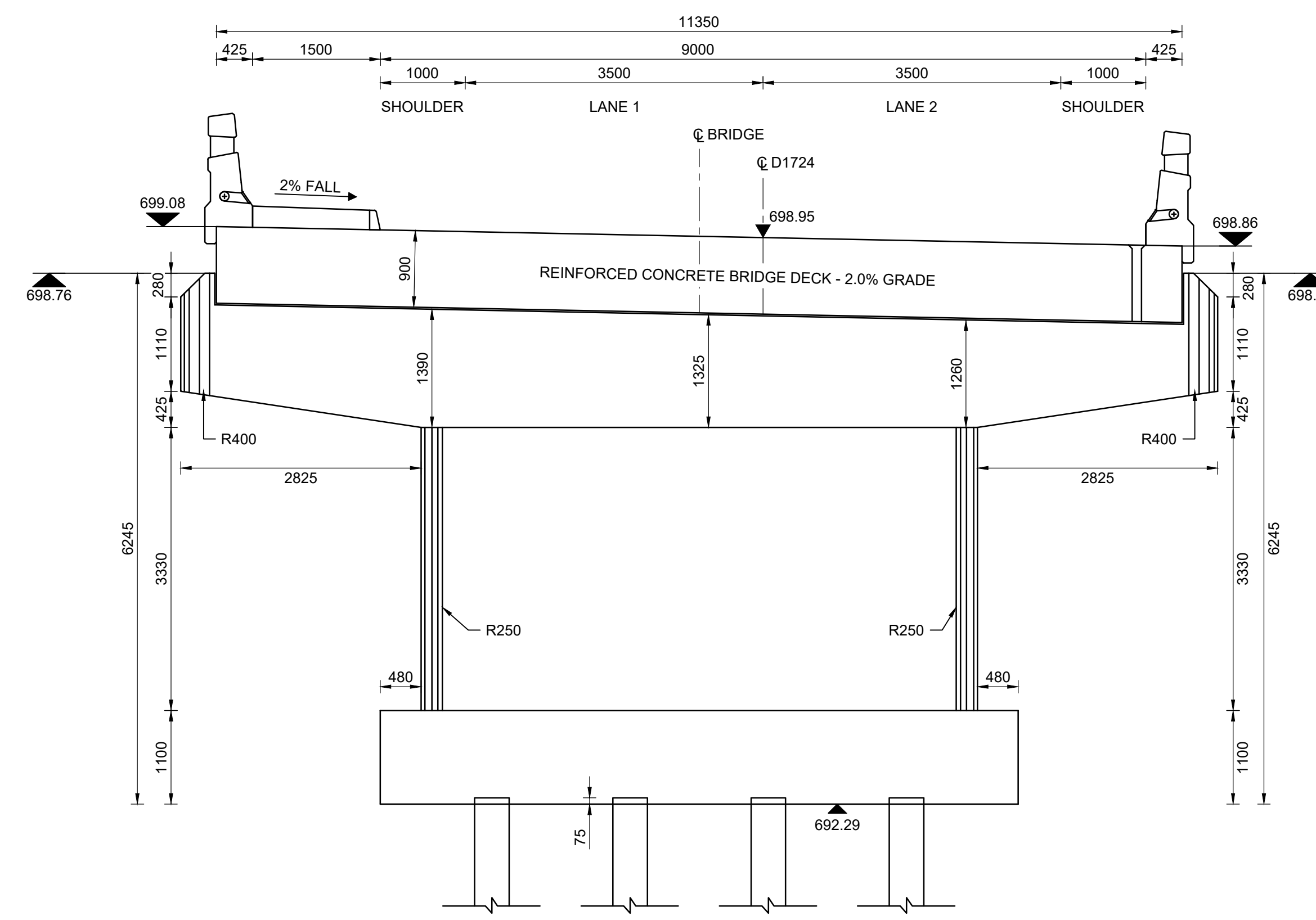
FOR TENDER PURPOSES

Scale: AS SHOWN

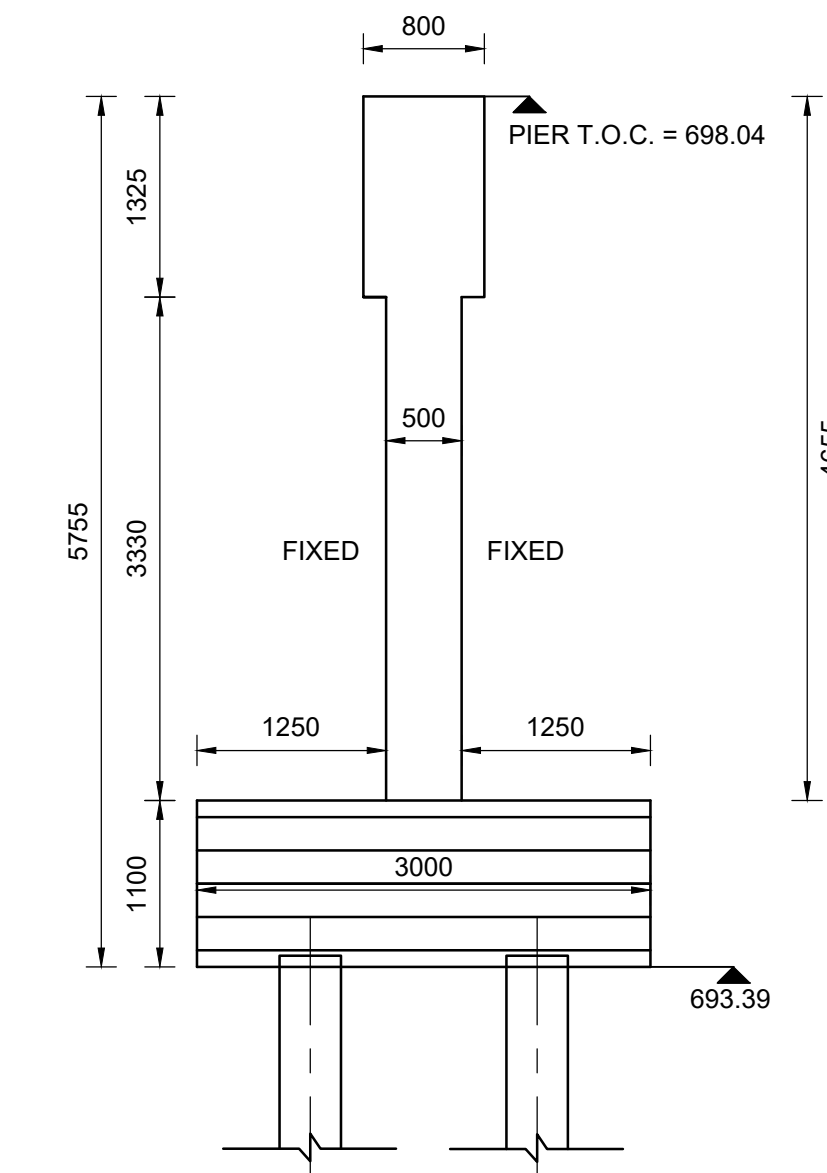
Plan No.: 3521/10



ELEVATION - PIER 1
SCALE 1:50

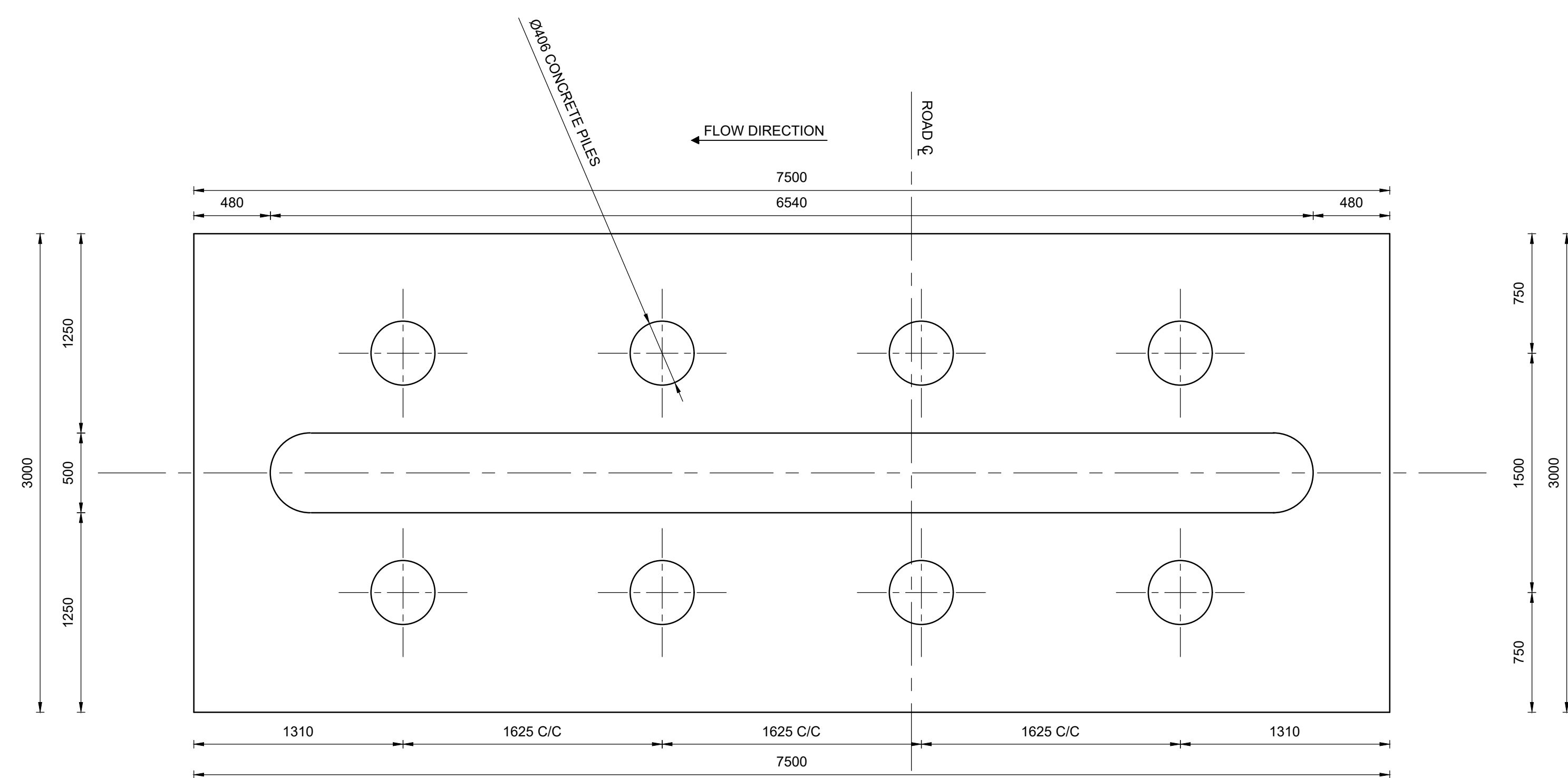


TYPICAL SECTION THROUGH DECK & ELEVATION VIEW OF PIER 1
SCALE 1:50

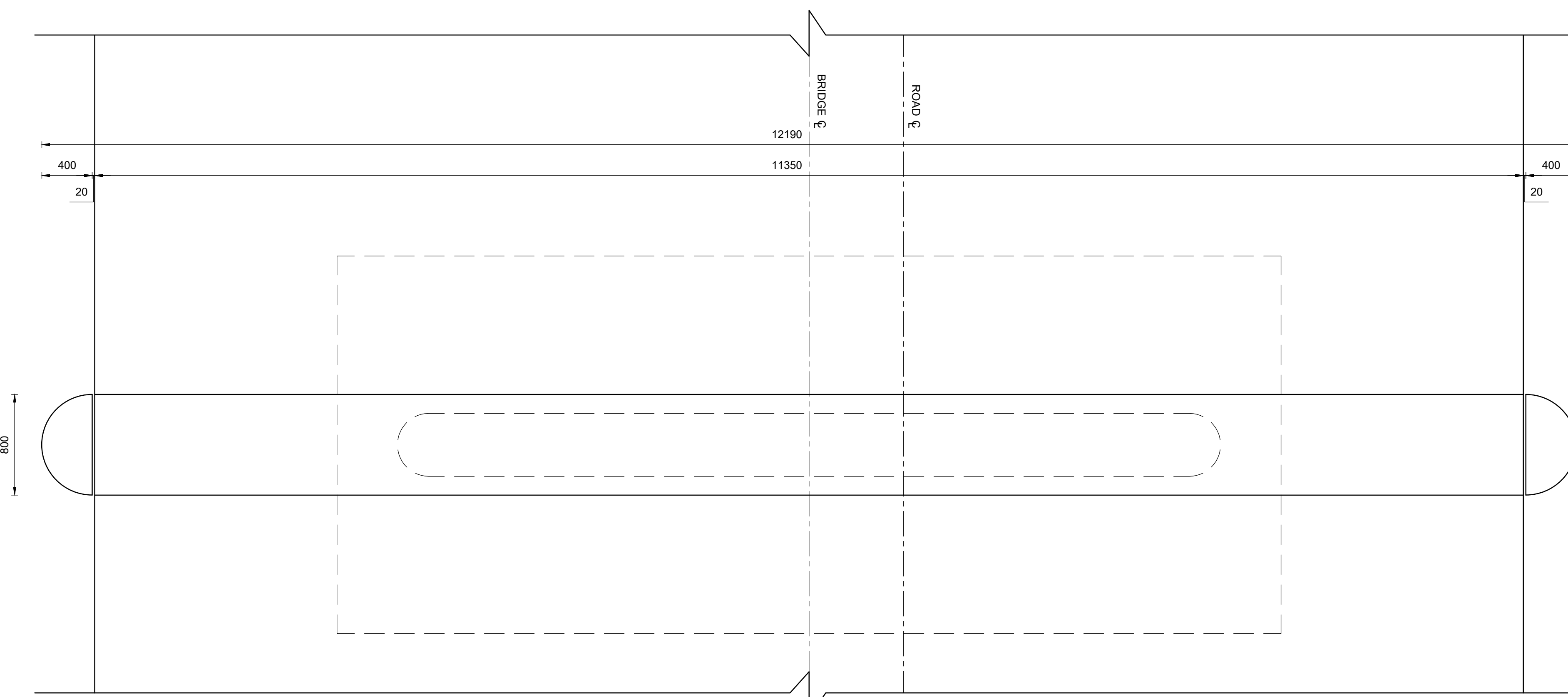


TYPICAL SECTION OF PIER 1
SCALE (1:50)

PIER HEIGHTS	
PIER NAME	PIER HEIGHT (T.O.C. FOOTING TO UNDER SIDE OF DECK AT BRIDGE CENTER LINE)
PIER 01	4655mm



PIER FOUNDATION LAYOUT
SCALE 1:25



PIER HEAD LAYOUT
SCALE 1:25

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



Chief Engineer: Structural Design

SIGNATURE DATE

Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.991748° Latitude
31.373728° Longitude

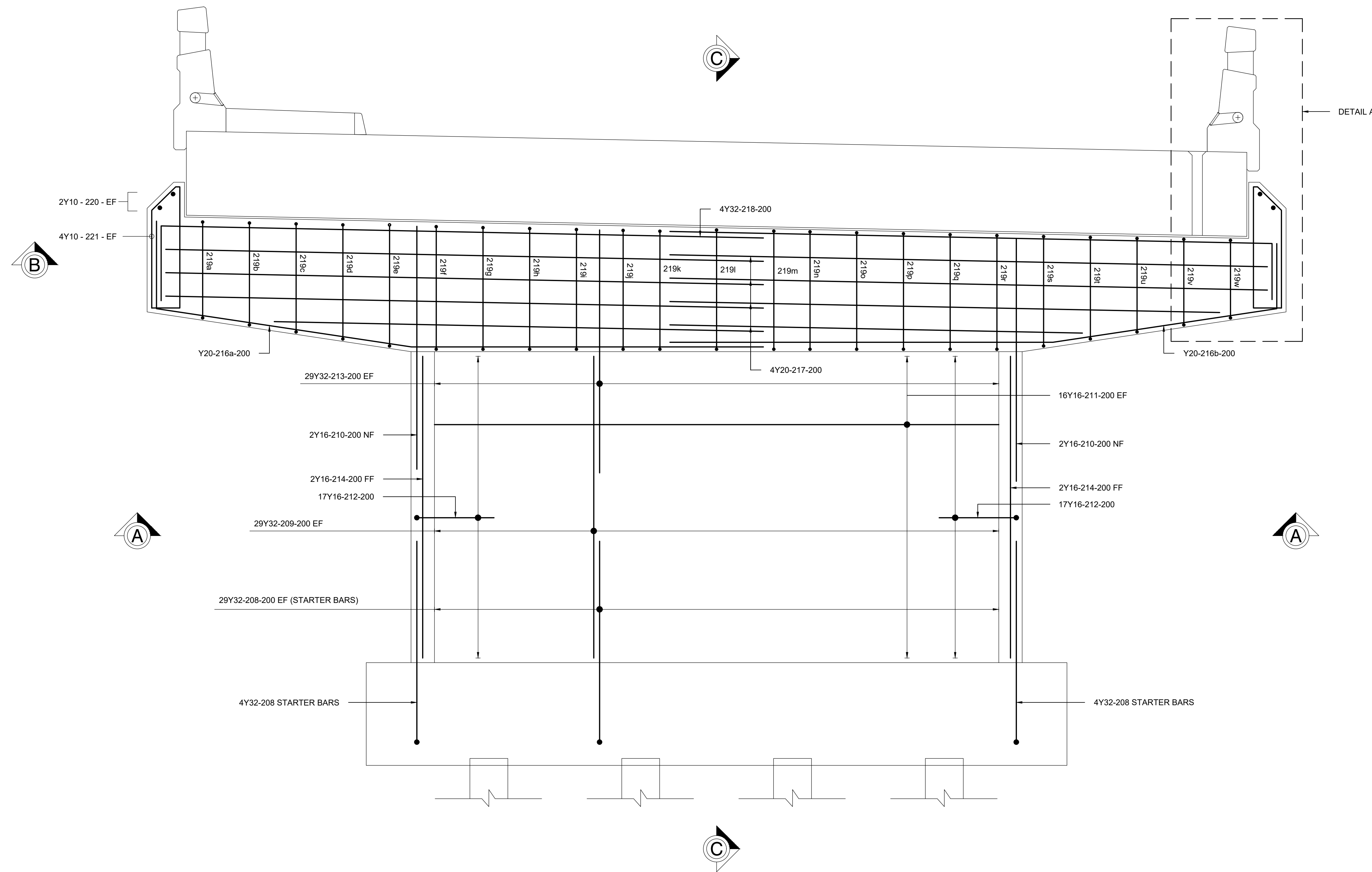
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

PIER 1 CONCRETE DETAILS

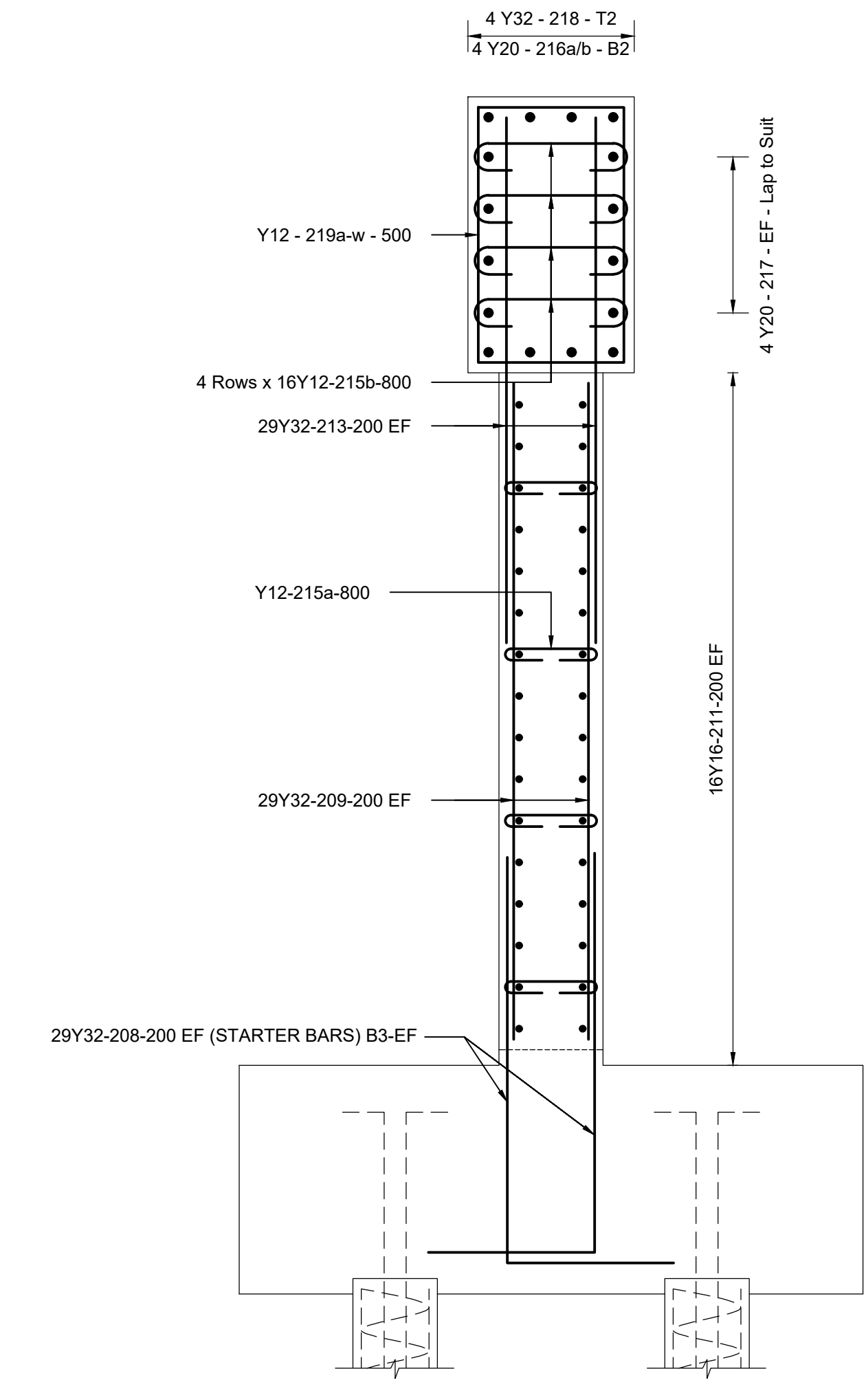
FOR TENDER PURPOSES

Staked km distance	Sheet 11
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/11

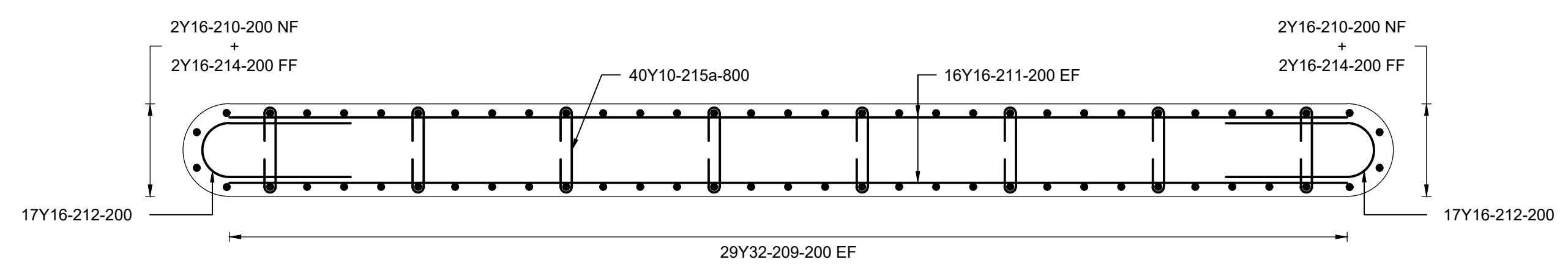
3521/11



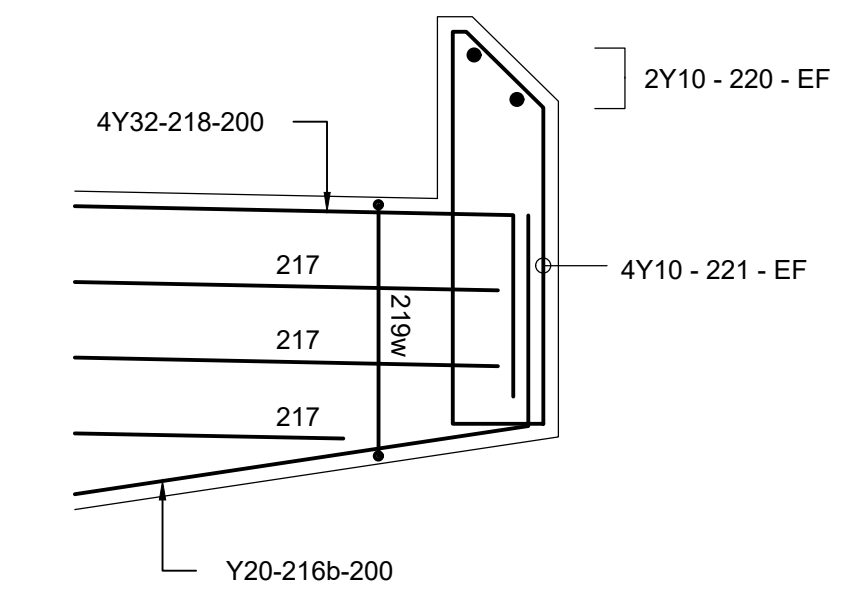
ELEVATION VIEW OF PIER 1
SCALE 1:25



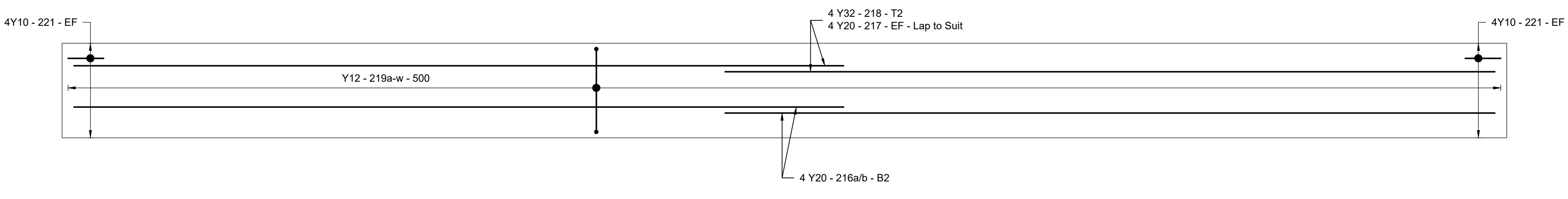
SECTION C - C
SCALE 1:25



SECTION A - A
SCALE 1:25



DETAIL A
SCALE 1:25



SECTION B - B
SCALE 1:25

- NOTES :**
- MINIMUM CONCRETE COVER - 50mm ALL SIDES
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :
 - B1 - LOWEST BOTTOM LAYER
 - B2 - SECOND LOWEST BOTTOM LAYER
 - T1 - TOPMOST TOP LAYER
 - T2 - SECOND HIGHEST TOP LAYER
 - EF - EACH FACE
 - NF - NEAR FACE
 - FF - FAR FACE
 - ALT. - ALTERNATING
 - STG. - STAGGERED
 - H - HORIZONTAL
 - V - VERTICAL
 - ABR - ALTERNATE BAR REVERSED
 - EW - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985
HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
 - BLINDING - 15/19 (15MPa)
 - PIER/ PILE CAP - 30/19 (30MPa)
 - PILE - 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 50mmØ HOLE 1500mm DEEP AND BLOW OUT DUST WITH COMPRESSOR. INJECT INTO GROUT (EPIDERMIX 395) TO PREVENT AIR-LOCKS AND INSERT Y25 DOWEL
 - LEVELS SHOWN ON CONCRETE DRAWINGS.

FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



Chief Engineer : Structural Design

SIGNATURE DATE

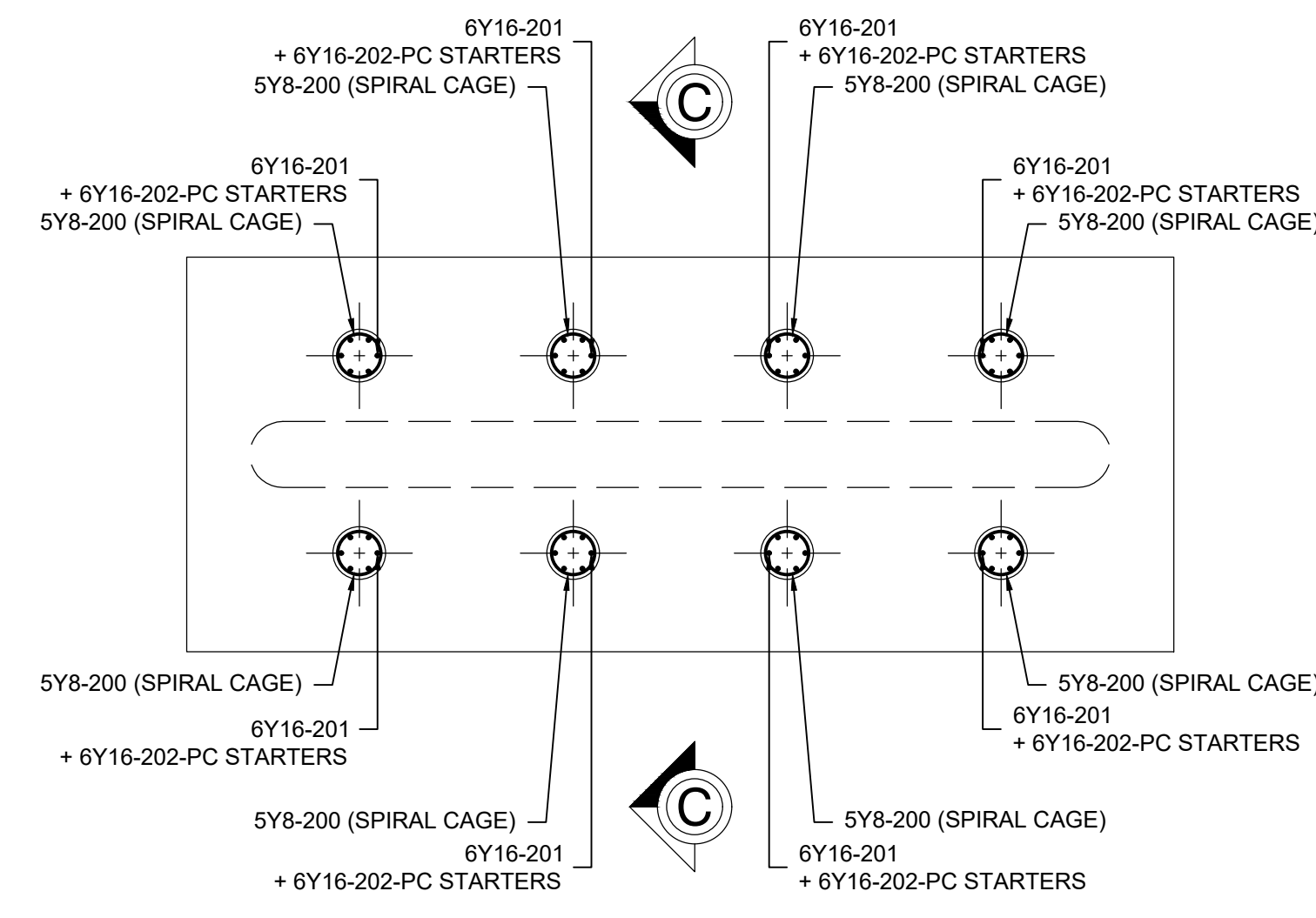
Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.991748° Latitude
31.373728° Longitude

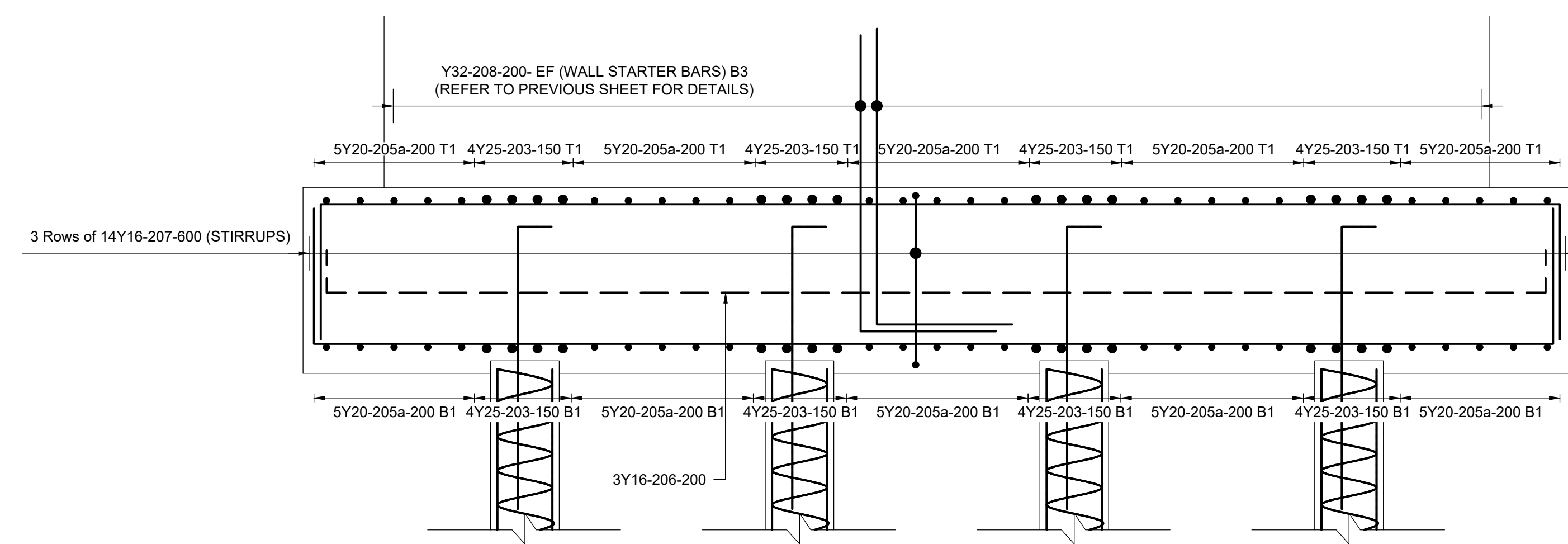
PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
PIER 1 STEEL LAYOUT A

Staked km distance	Sheet 12
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/12

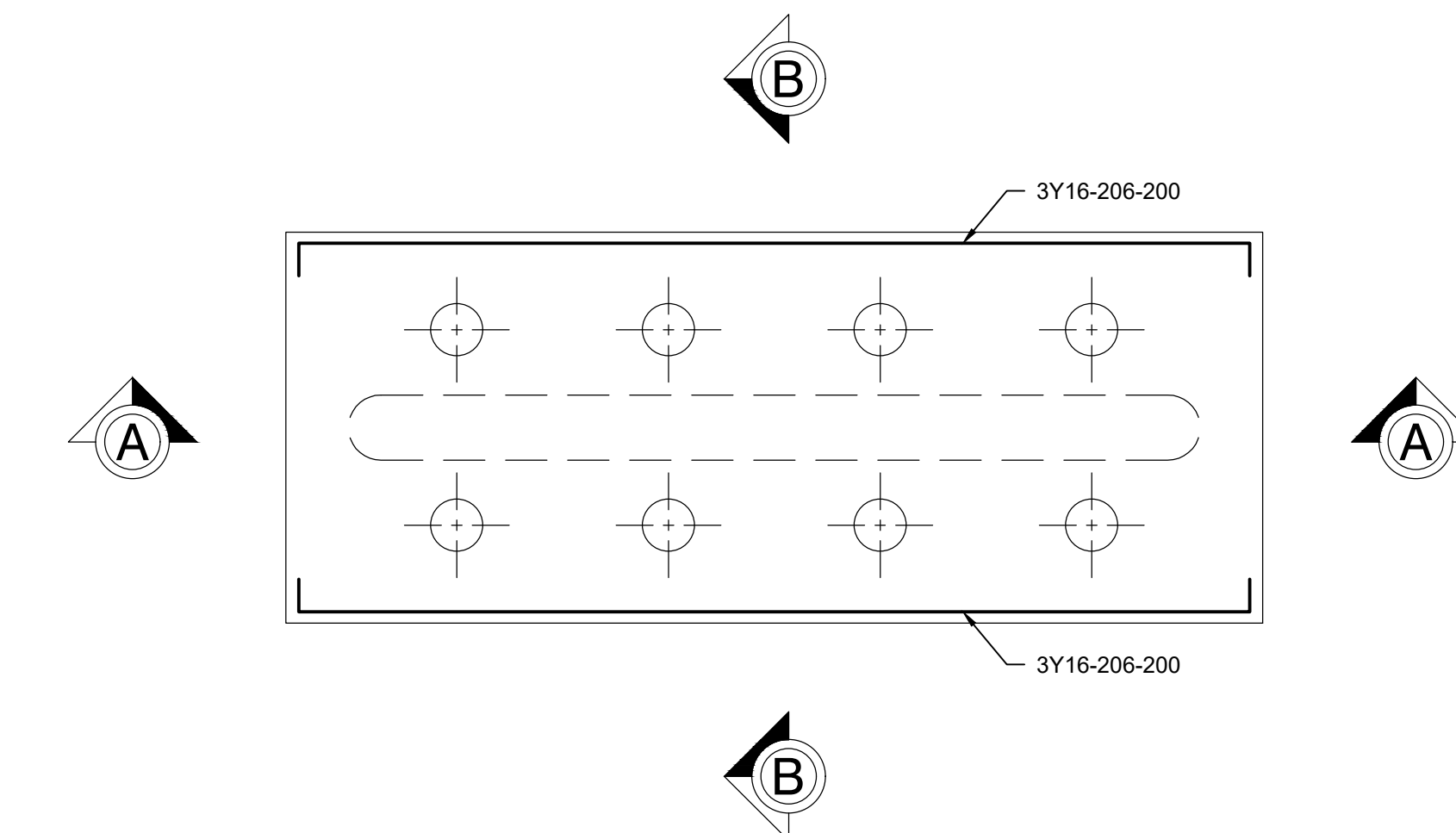
3521/12



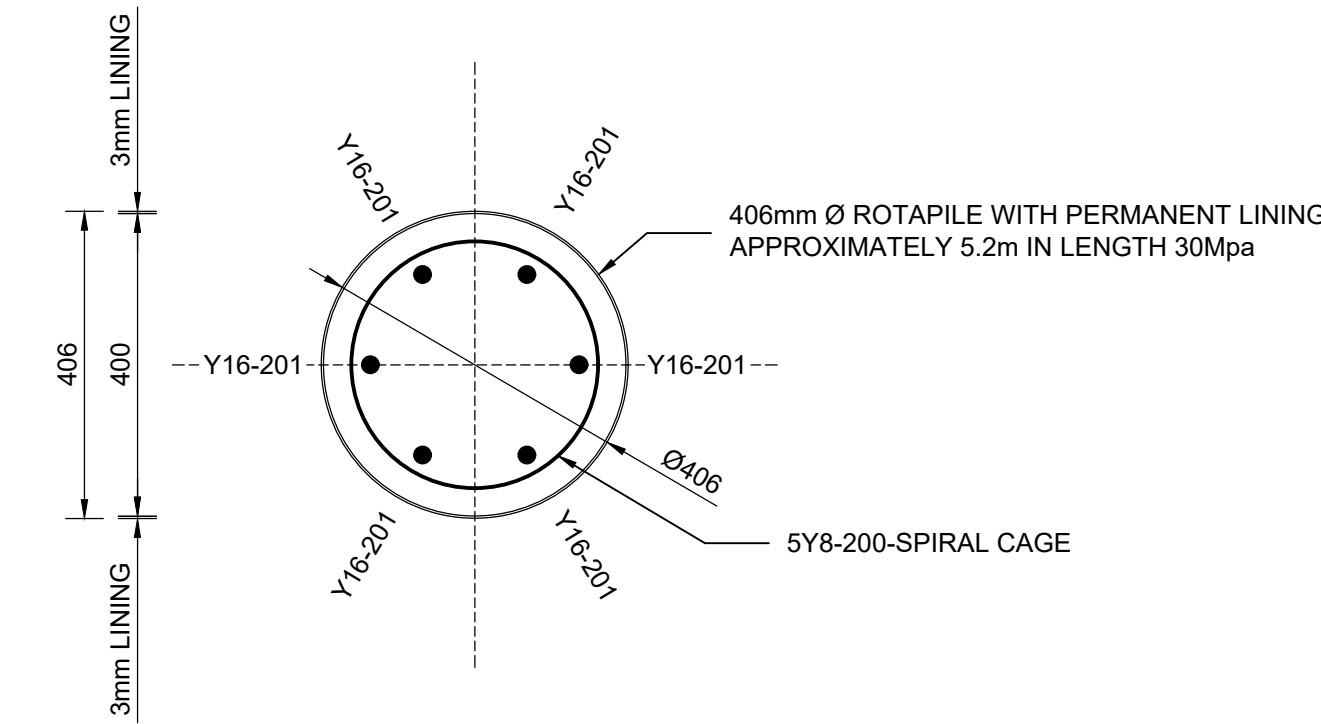
PLAN VIEW 1/3
PIER 1 PILE CAP
(PILE REBAR)
SCALE 1:50



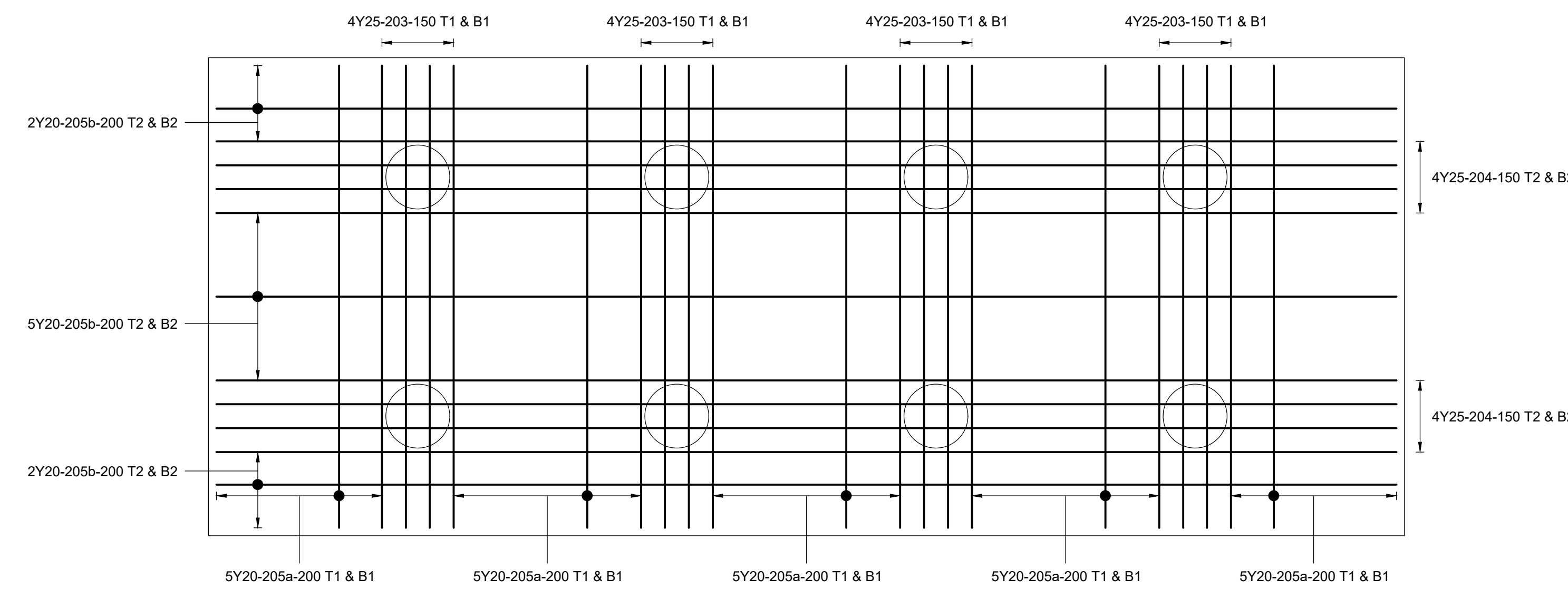
SECTION A-A
PIER 1 PILE CAP
SCALE 1:25



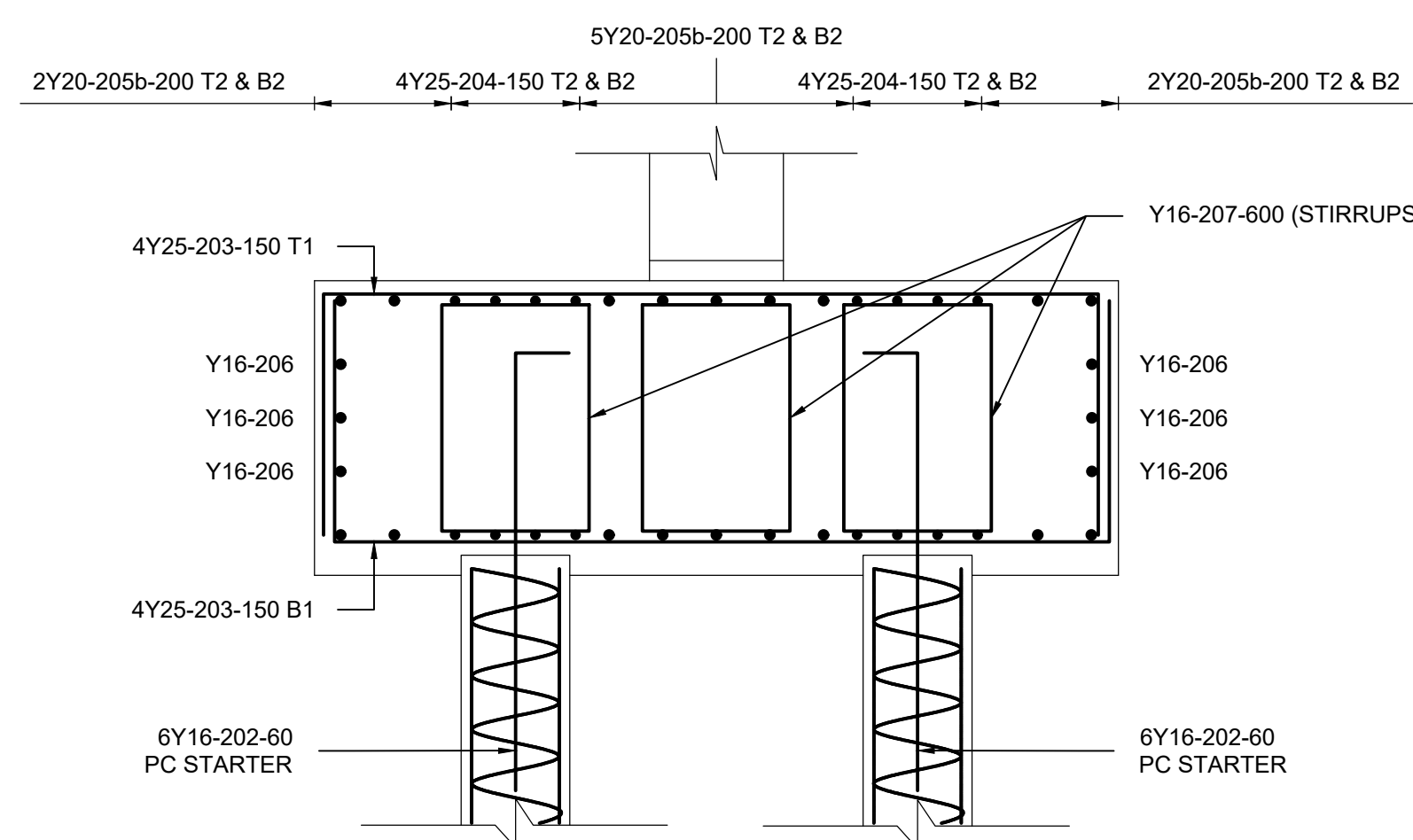
PLAN VIEW 3/3
PIER 1 PILE CAP
(SIDE REBAR)
SCALE 1:50



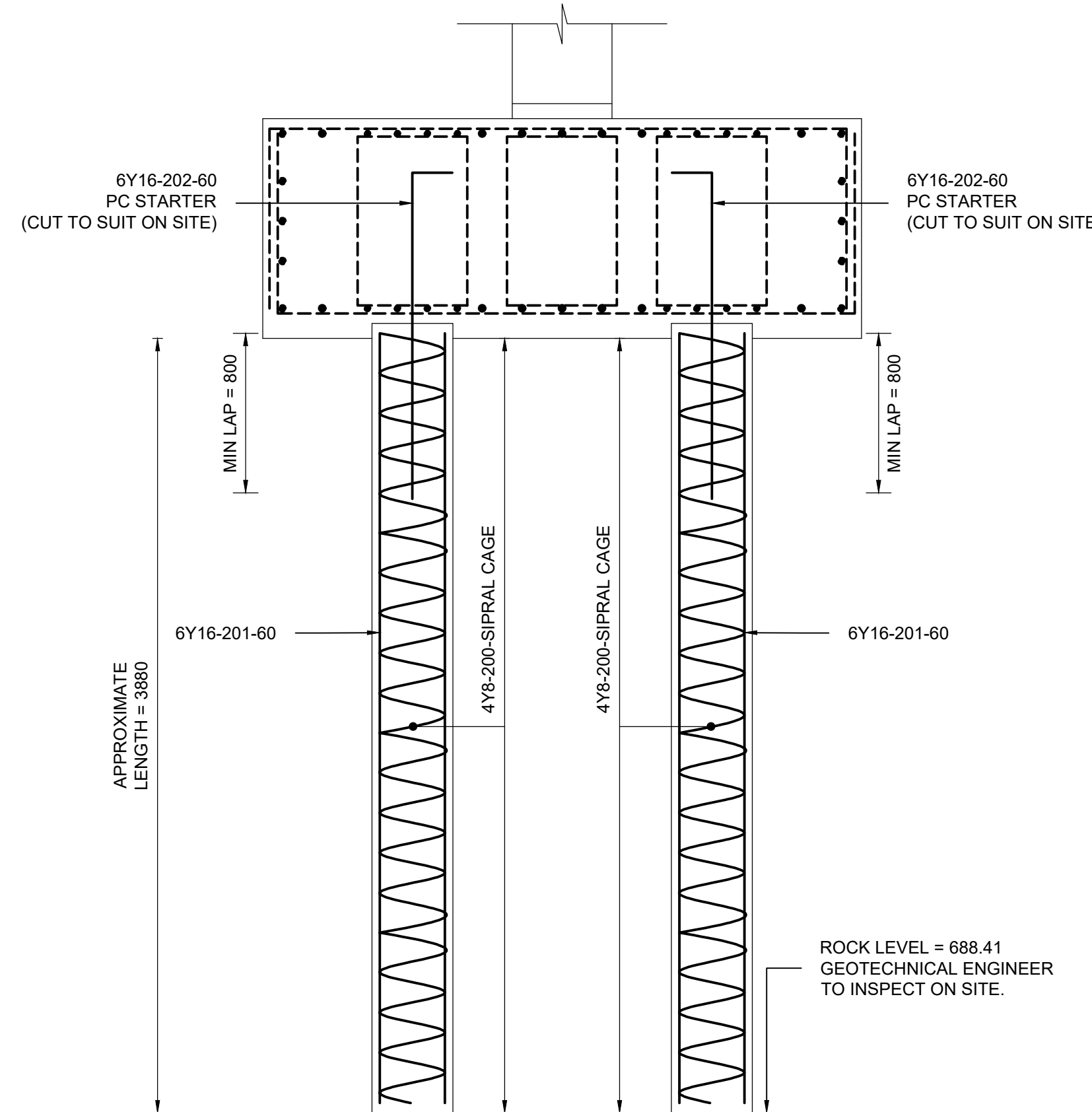
TYPICAL PILE SECTION
SCALE 1:10



PLAN VIEW 2/3
PIER 1 PILE CAP
(TOP & BOTTOM REBAR)
SCALE 1:25



SECTION B-B
THROUGH PIER 1 PILE CAP
SCALE 1:25



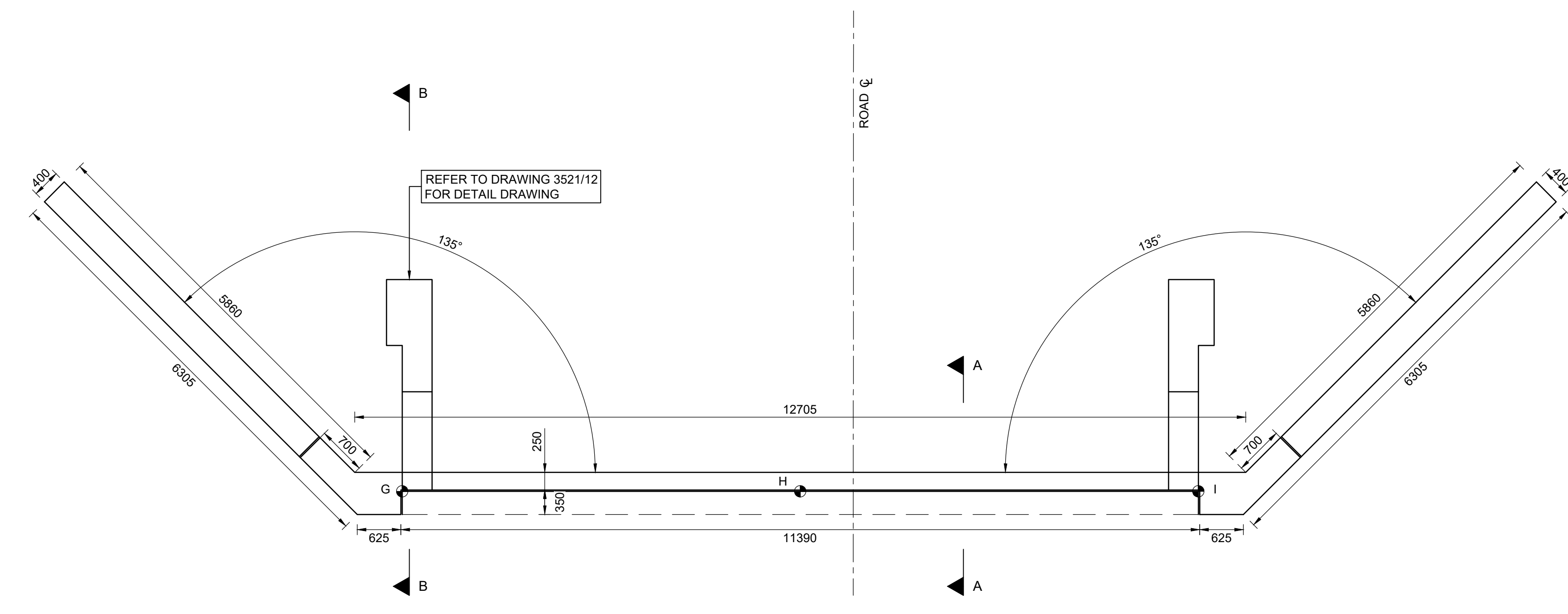
SECTION C-C
THROUGH PIER 1 PILE CAP
SCALE 1:25

REINFORCING SCHEDULE FOR PIER 1																
MEMBER	NO. OF MEMBER	BAR MARK	TYPE	SIZE	SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/METER	KG PER BAR	KG OF ALL BARS
										A	B	C	D			
4060 ROTA PILE	8	200	Y	8	AS-SHOWN	4	32	86	5060	326	200	1000		0.395	2.00	63.96
	8	201	Y	16	60	6	48	20	3850	3850				1.58	6.08	291.98
	8	202	Y	16	60	6	48	37	1760	200	1600			1.58	2.78	133.48
	1	203	Y	25	150	16	16	38	4550	900	2900	900		3.85	17.52	280.28
PIER 1 PILE CAP	1	204	Y	25	150	8	8	38	8950	850	7400	850		3.85	34.46	275.66
	1	205a	Y	20	200	25	25	38	4800	1000	2900	1000		2.47	11.86	296.40
	1	205b	Y	20	200	9	9	38	9200	950	7400	950		2.47	22.72	204.52
	1	206	Y	16	200	6	6	38	7720	250	7300	250		1.58	12.20	73.19
	1	207	Y	16	600	42	42	60	2940	825	550			1.58	4.65	195.10
	1	208	Y	32	200	58	58	37	2655	1950	800			6.31	16.75	971.68
	1	209	Y	32	200	58	58	20	3155	3155				6.31	19.91	1154.67
	1	210	Y	16	200	4	4	20	2600	2600				1.58	4.11	16.43
	1	211	Y	16	200	32	32	20	6040	6040				1.58	9.54	305.38
	1	212	Y	16	200	34	34	39	1820	825	340	825		1.58	2.88	97.77
	1	213	Y	32	200	58	58	20	2600	2600				6.31	16.41	951.55
	1	214	Y	16	200	4	4	20	3230	3230				1.58	5.10	20.41
	1	215a	Y	10	800	40	40	33	880	400				0.617	0.42	16.78
	1	215b	Y	10	800	64	64	33	980	700				0.617	0.60	38.70
	1	216a	Y	20	200	4	4	48	7460	3765	2760	935	171*	2.47	18.43	73.70
	1	216b	Y	20	200	4	4	48	7220	4100	2425	695	171*	2.47	17.83	71.33
	1	217	Y	20	200	16	16	20	6395	6395				2.47	15.80	252.73
	1	218	Y	32	200	4	4	37	7050	700	6445			6.31	44.49	177.94
	1	219a	Y	12	500	1	1	60	3545	1000	700			0.888	3.15	3.15
	1	219b	Y	12	500	1	1	60	3675	1065	700			0.888	3.26	3.26
1	219c	Y	12	500	1	1	60	3805	1130	700			0.888	3.38	3.38	
1	219d	Y	12	500	1	1	60	3935	1195	700			0.888	3.49	3.49	
1	219e	Y	12	500	1	1	60	4065	1260	700			0.888	3.61	3.61	
1	219f	Y	12	500	1	1	60	4115	1285	700			0.888	3.65	3.65	
1	219g	Y	12	500	1	1	60	4095	1275	700			0.888	3.64	3.64	
1	219h	Y	12	500	1	1	60	4075	1265	700			0.888	3.62	3.62	
1	219i	Y	12	500	1	1	60	4055	1255	700			0.888	3.60	3.60	
1	219j	Y	12	500	1	1	60	4035	1245	700			0.888	3.58	3.58	
1	219k	Y	12	500	1	1	60	4014	1235	700			0.888	3.56	3.56	
1	219l	Y	12	500	1	1	60	3995	1225	700			0.888	3.55	3.55	
1	219m	Y	12	500	1	1	60	3975	1215	700			0.888	3.53	3.53	
1	219n	Y	12	500	1	1	60	3955	1205	700			0.888	3.51	3.51	
1	219o	Y	12	500	1	1	60	5535	1995	700			0.888	4.92	4.92	
1	219p	Y	12	500	1	1	60	3915	1185	700			0.888	3.48	3.48	
1	219q	Y	12	500	1	1	60	3895	1175	700			0.888	3.46	3.46	
1	219r	Y	12	500	1	1	60	3875	1165	700			0.888	3.44	3.44	
1	219s	Y	12	500	1	1	60	3785	1120	700			0.888	3.36	3.36	
1	219t	Y	12	500	1	1	60	3615	1035	700			0.888	3.21	3.21	
1	219u	Y	12	500	1	1	60	3445	950	700			0.888	3.06	3.06	
1	219v	Y	12	500	1	1	60	3275	865	700			0.888	2.91	2.91	
1	219w	Y	12	500	1	1	60	3105	780	700			0.888	2.76	2.76	
1	220	Y	10	AS-SHOWN	4	4	20	700	700				0.617	0.43	1.73	
1	221	Y	10	200	8	8	99a	3045	3045				0.617	1.88	15.03	
														TOTAL KG HT STEEL		6060.13
														TOTAL KG MS STEEL		
														TOTAL KG DOWELS		
														TOTAL KG STEEL		6060.13

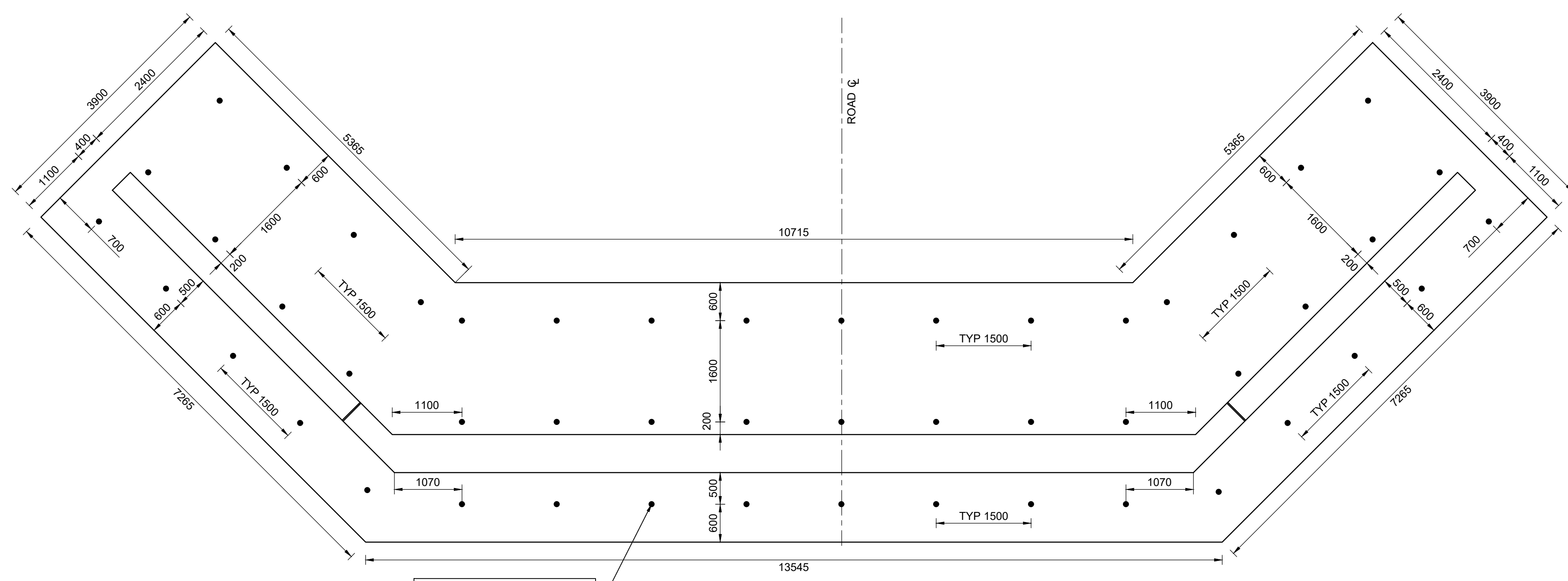
- NOTES:**
- MINIMUM CONCRETE COVER: PILE CAP = 40mm, PILE = 50mm
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - MINIMUM LAP LENGTH TO BE 45 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985 HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa, HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES: BLINDING - 15/19 (15MPa), PIER/PILE CAP - 30/19 (30MPa), PILE - 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 50mmØ HOLES 1500mm DEEP AND BLOW OUT DUST WITH COMPRESSOR, INJECT INTO GROUT (EPIDERMIX 350) TO PREVENT AIR LOCKS AND INSERT Y25 DOWEL
 - SCHEME PILE DIA = 406mm BASED ON AN END BEARING STRESS OF 5.5MPa ie. MAXIMUM PILE CAPACITY USED=800kN
 - ALL LEVELS REFER TO MSL.
 - MAXIMUM ALLOWABLE ECCENTRICITY OF PILE = 75mm.
 - ALL ADDITIONAL COSTS INCURRED DUE TO PILES OUT OF TOLERANCE, ARE FOR PILING CONTRACTOR'S ACCOUNT.
 - INTEGRITY TESTING TO BE CARRIED OUT ON 100% OF PILES
 - ALL TEST RESULTS TO BE ISSUED TO ENGINEER
 - ALL PILE CO-ORDINATES GIVEN ARE BASED ON WGS 31 SYSTEM, DRAWING No. 392205
 - THE CONTRACTOR TO ENSURE THAT ALL PILE REINFORCING PROJECTS 40 x BAR DIAMETER INTO THE PILE CAP.
 - WHERE 40 x BAR DIAMETER EXCEEDS PILE CAP/BASE DEPTH, BARS TO BE BENT INTO PILE CAP/BASE.
 - ALL LEVELS REFER TO FINISHED CONCRETE LEVEL UNLESS OTHERWISE SHOWN.
 - PILE CONCRETE STRENGTH 30MPa AT 28 DAYS, UNLESS OTHERWISE SPECIFIED. CUBE SLUMP TESTS TO BE CARRIED OUT IN ACCORDANCE WITH SABS REQUIREMENTS. RESULTS TO BE SUBMITTED TO ENGINEER.
 - REINFORCEMENT BARS WITH SPIRAL REINFORCEMENT TO BE PROVIDED RIGHT THROUGH THE WHOLE LENGTH OF PILES.
 - LAP LENGTH OF REINFORCEMENT IN PILES TO BE MINIMUM OF 40 TIMES REINFORCEMENT BAR DIAMETER.
 - COVER OF REINFORCEMENT STEEL IN PILES TO BE 40mm.
 - THE CONTRACTOR TO APPOINT AN INDEPENDENT REGISTERED LAND SURVEYOR TO SURVEY AND VERIFY THE AS BUILT POSITIONS OF THE PILES PRIOR TO COMMENCEMENT OF SUBSTRUCTURE WORKS.

FOR TENDER PURPOSES

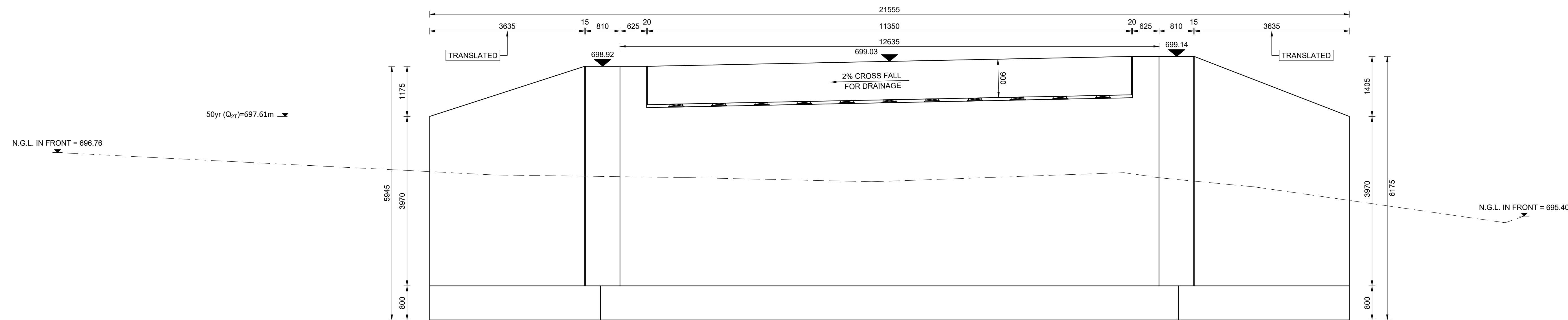
AS BUILT				Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)			Chief Engineer: Structural Design Head: Transport	DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-		-27.991748° Latitude	Staked km distance	Sheet 13	
Supervising Engineer				Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)				31.373728° Longitude		0.47	of 23		
Date				Design Plan No:-	Drawn by:- A. GUNAS				PORTION		Scale	Plan No.:-		
Supervising Authority				Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)				VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE		AS SHOWN	3521/13		
AMENDMENTS				Cross Section No:-	File Reference:- D1724/6/3521/4	PIER 1 11 STEEL LAYOUT B								



PLAN VIEW OF WALL (TOP)
SCALE 1:50

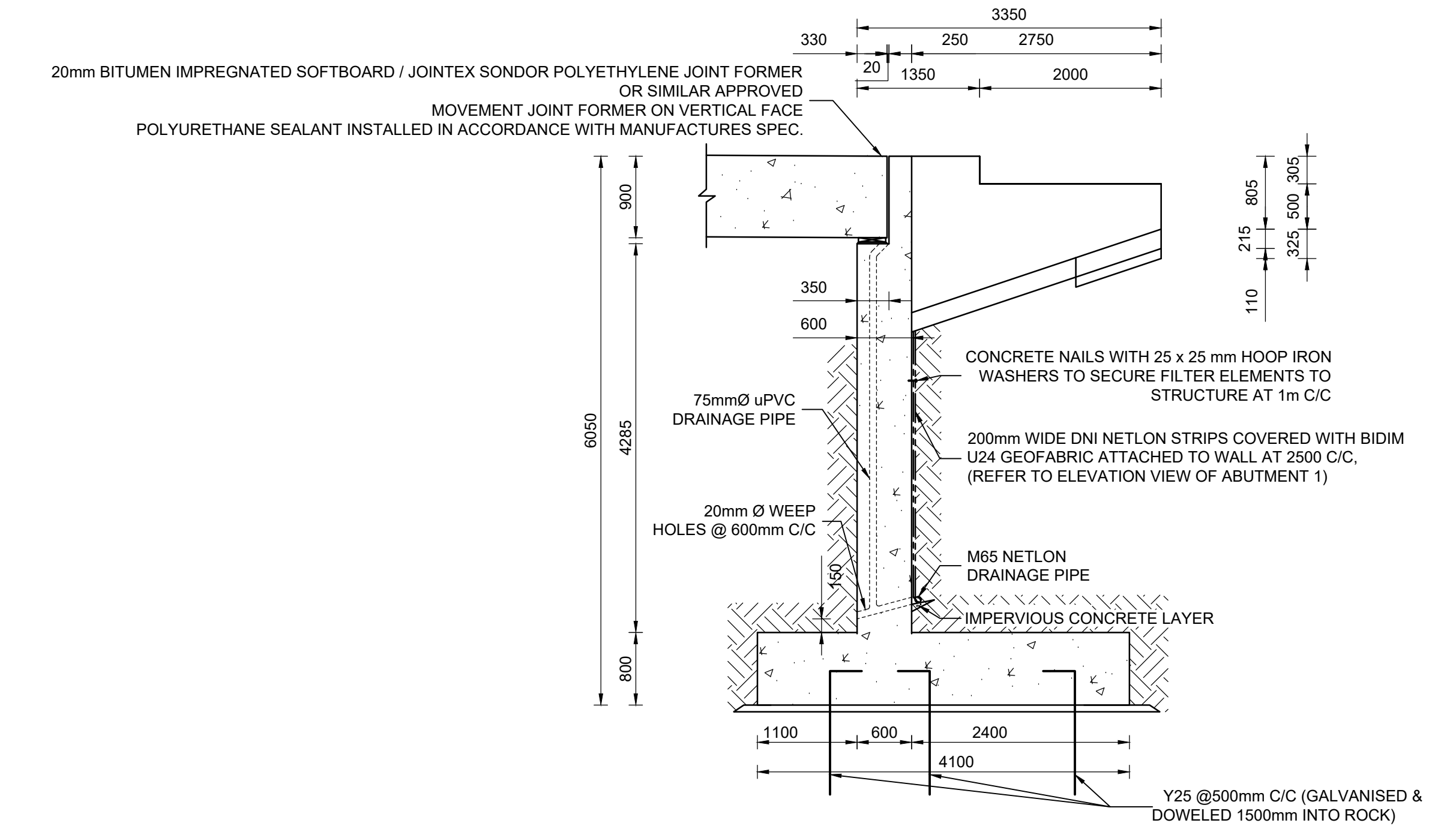


FOUNDATION
SCALE 1:50

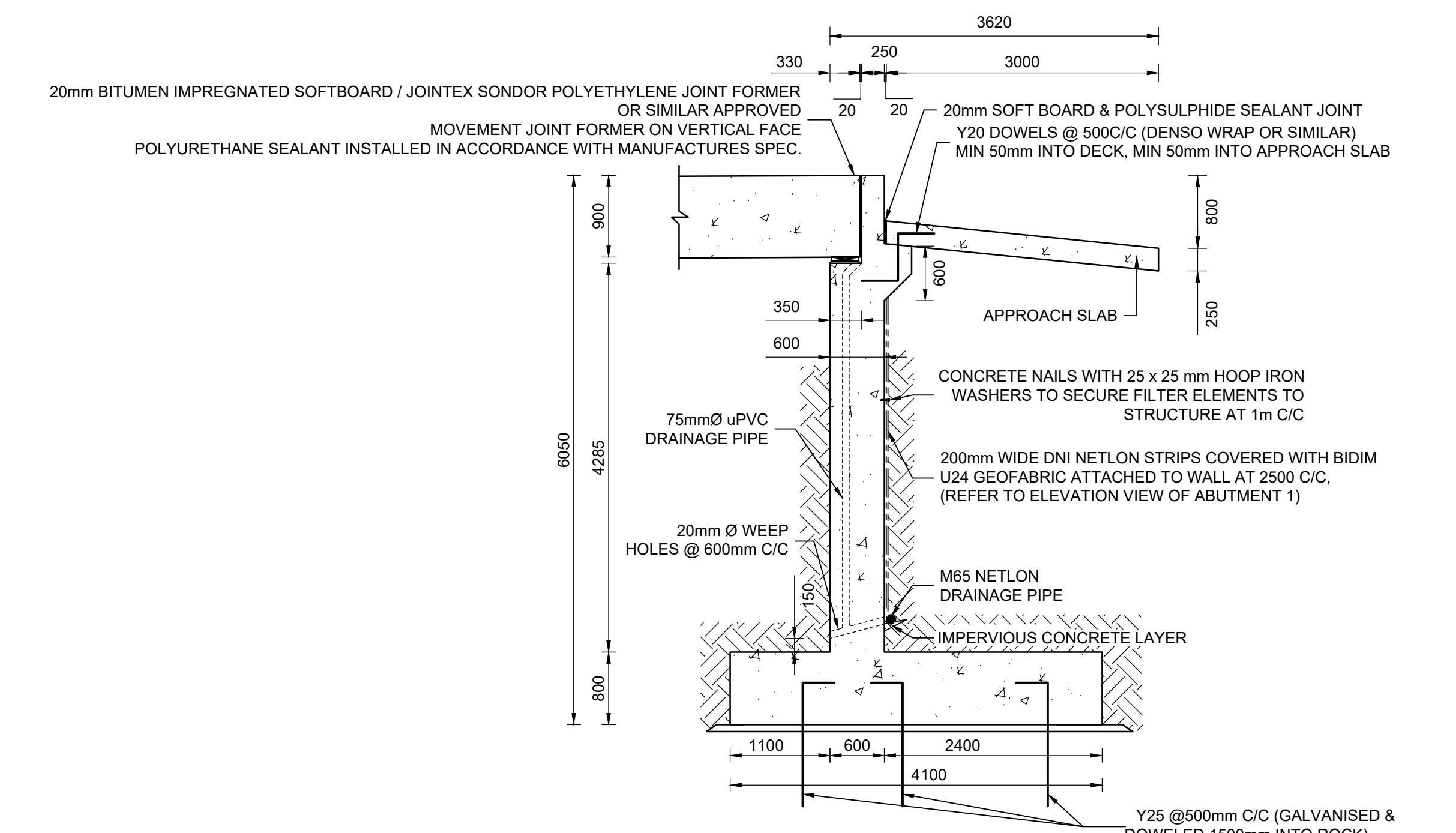


FLOW DIRECTION

ELEVATION
SCALE 1:50



SECTION B - B OF ABUTMENT
SCALE 1:50




SECTION A - A OF ABUTMENT
SCALE 1:50


FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4


PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT


NANKHOO
 CONSULTING ENGINEERS
 GATEWAY OFFICE PARK, BLOCK ONE TEL: 0853 584876
 150 GARDEN EMBANKMENT, FAIRVIEW, JOHANNESBURG
 2001

Chief Engineer: Structural Design

Head: Transport

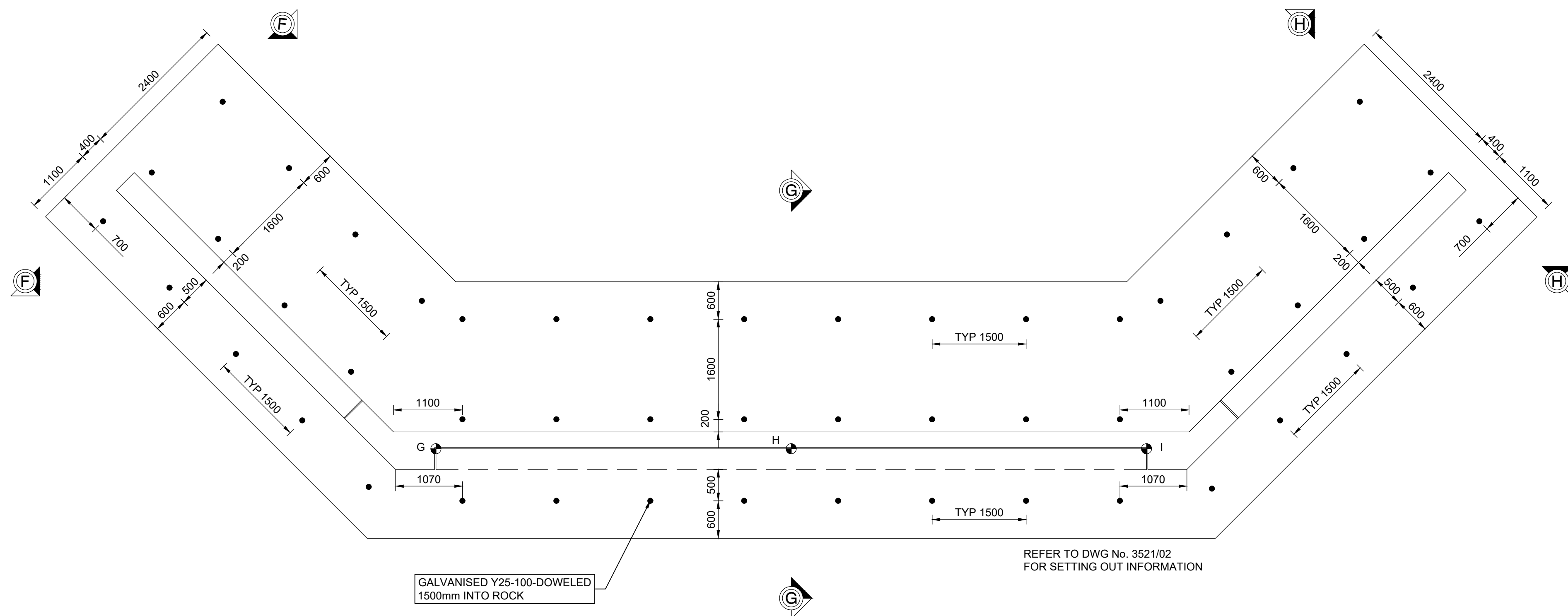
SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

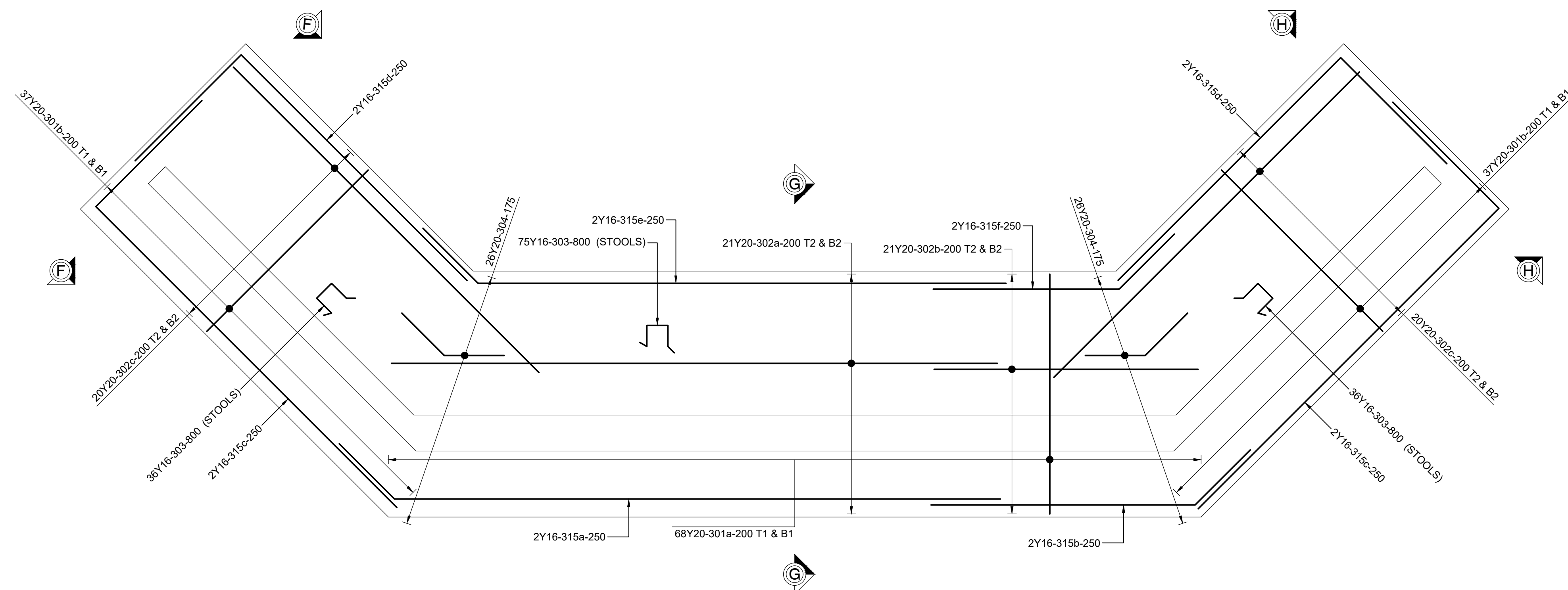
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
 ABUTMENT 2 CONCRETE DETAILS

Staked km distance	0.47	Sheet 14 of 23
Scale	AS SHOWN	Plan No.:- 3521/14

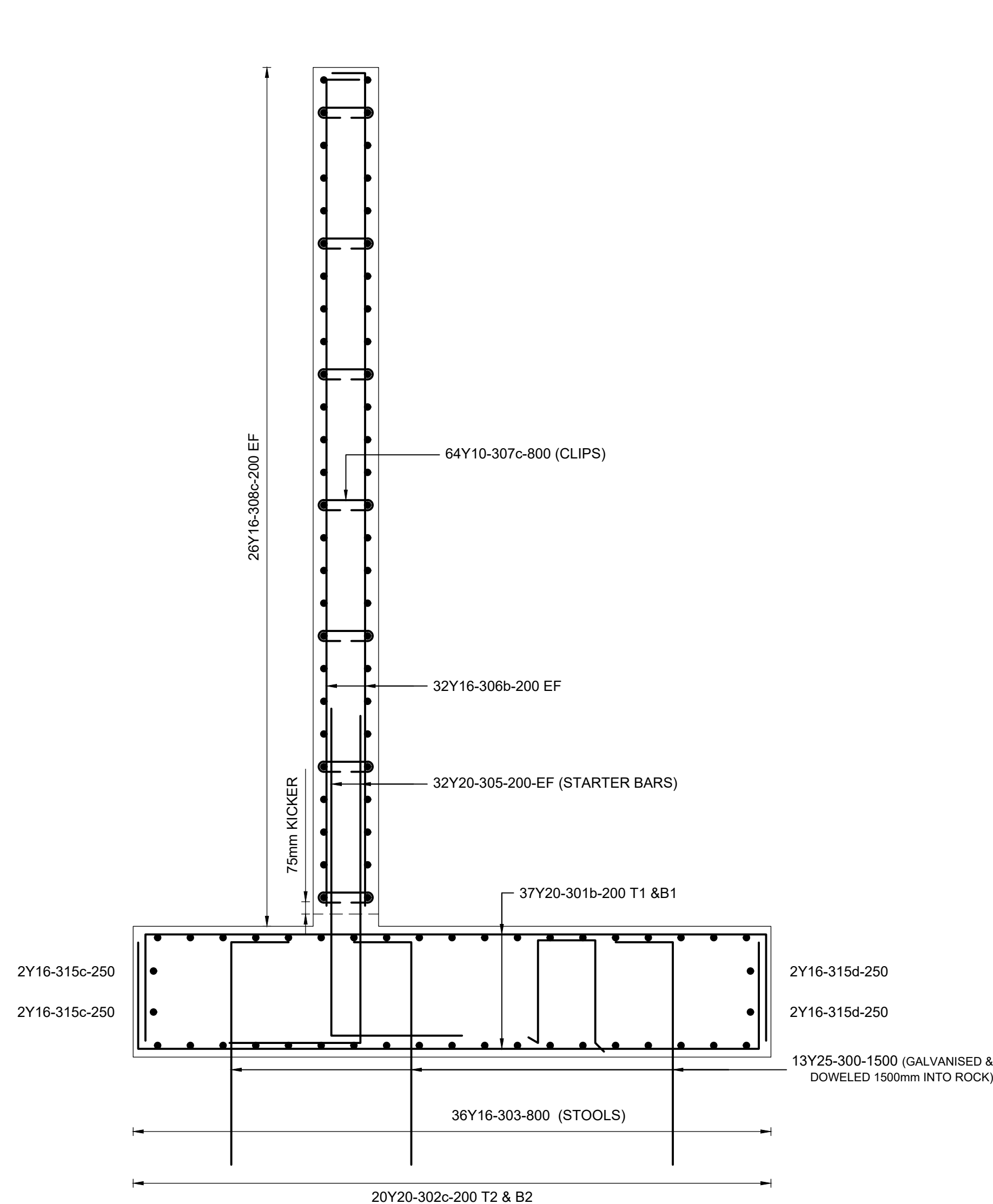
3521/14



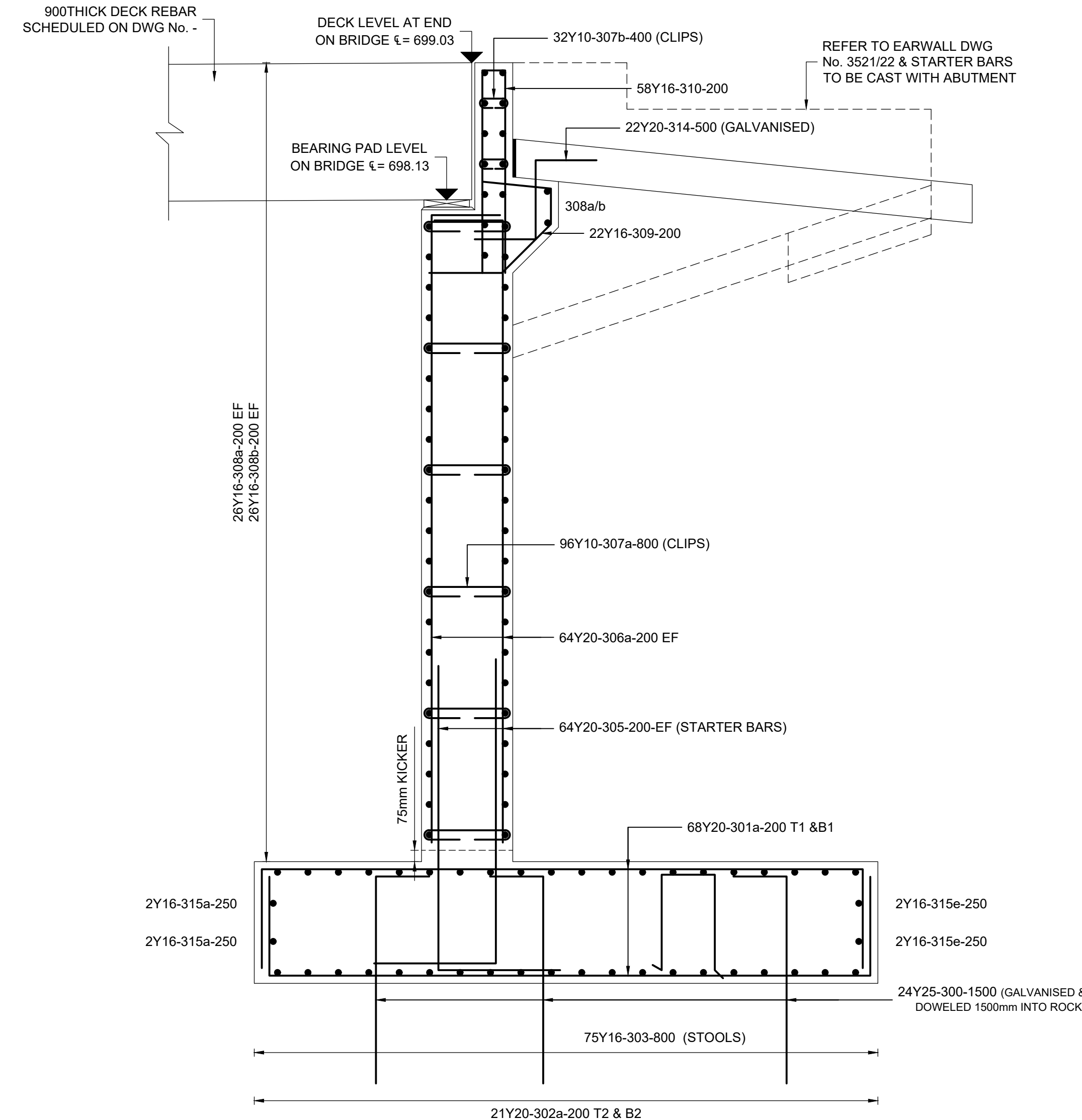
DOWEL PLAN
SCALE 1:50



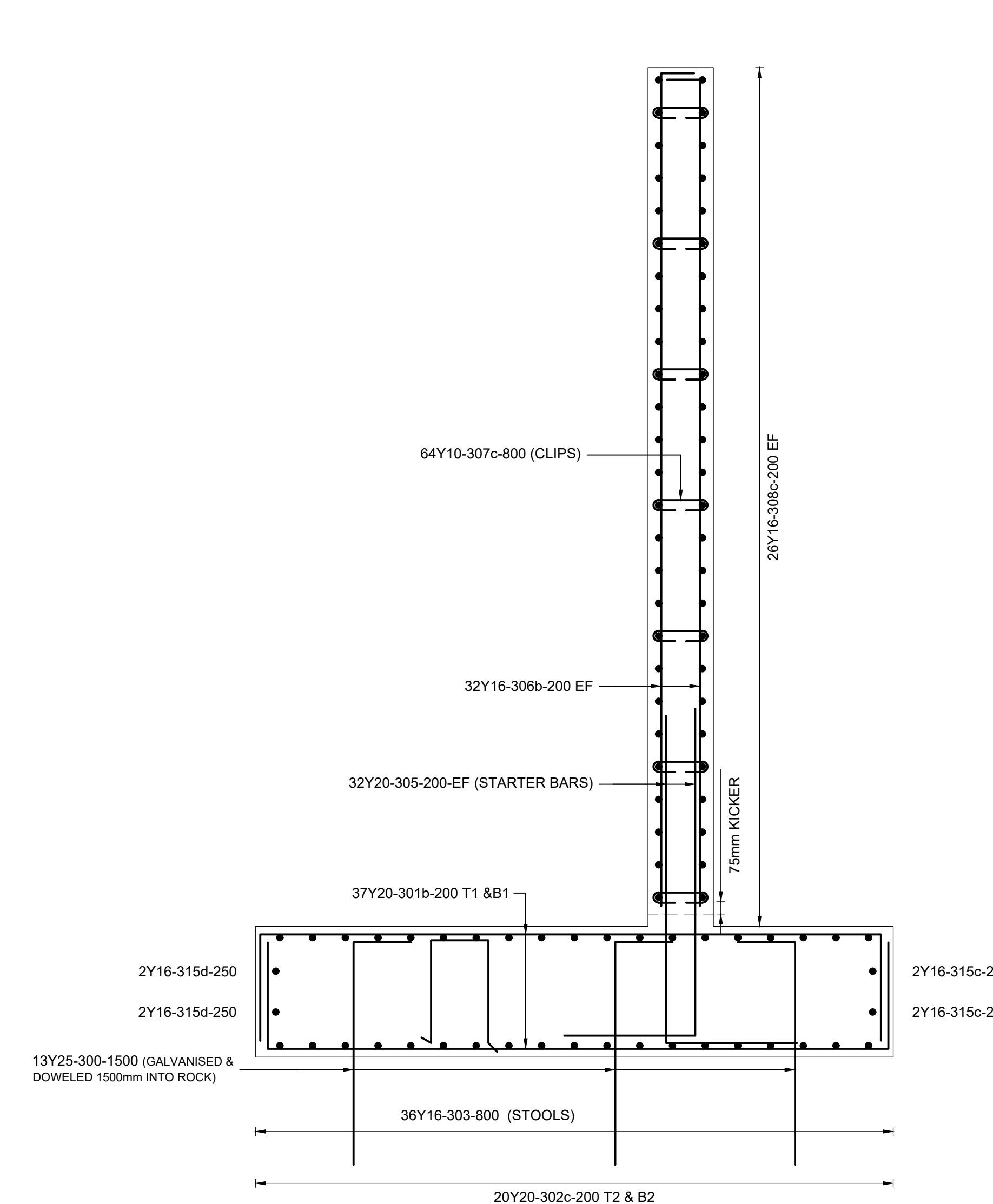
ABUTMENT 2 FOUNDATION PLAN
SCALE 1:50



SECTION F - F
SCALE 1:25



SECTION G - G
SCALE 1:25



SECTION H - H
SCALE 1:25


- NOTES :**
- MINIMUM CONCRETE COVER - 50mm
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :
B1 - LOWEST BOTTOM LAYER
B2 - SECOND LOWEST BOTTOM LAYER
T1 - TOPMOST TOP LAYER
T2 - SECOND HIGHEST TOP LAYER
EF - EACH FACE
NF - NEAR FACE
FF - FAR FACE
ALT. - ALTERNATING
STG. - STAGGERED
H - HORIZONTAL
V - VERTICAL
ABR. - ALTERNATE BAR REVERSED
EW - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985
HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
BLINDING - 15/19 (15MPa)
ABUTMENT - 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 40mm HOLE: 150mm DEEP AND BLOW OUT DUST WITH COMPRESSOR, INJECT INTO GROUT (EPIDERMIX 395) TO PREVENT AIR-LOCKS AND INSERT Y25 DOWEL


- DOWELLING NOTES.**
- CHISEL ROCK TO EXPOSE CLEAN FACE AND CAST MASS CONCRETE BASES. ENGINEER TO INSPECT PRIOR TO POURING CONCRETE.
 - DRILL DOWEL HOLES THROUGH INTO ROCK BELOW TO A DEPTH OF 1.5m SIZE OF DRILL HOLE 40mm MIN 50mm MAX.
 - GROUT TO BE MIXED TO MANUFACTURES INSTRUCTION AND POURED INTO DRILLED HOLES TO DISPLACE WATER. DOWELS TO BE INSERTED WITH A PUMPING ACTION TO REMOVE TRAPPED AIR BUBBLES.

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAWON Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAWON Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4


PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT


NANKHOO
 CONSULTING ENGINEERS
 GATEWAY OFFICE PARK, BEAUFORT ST. TEL: 031 556 5676
 15001 CENTRAL BUSINESS DISTRICT, DURBAN. FAX: 031 556 5677
 4001. email: nankhoo@nankhoo.co.za

Chief Engineer: Structural Design

Head: Transport

SIGNATURE _____ DATE _____

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:- -27.991748° Latitude
31.373728° Longitude

Staked km distance 0.47

Sheet 15 of 23

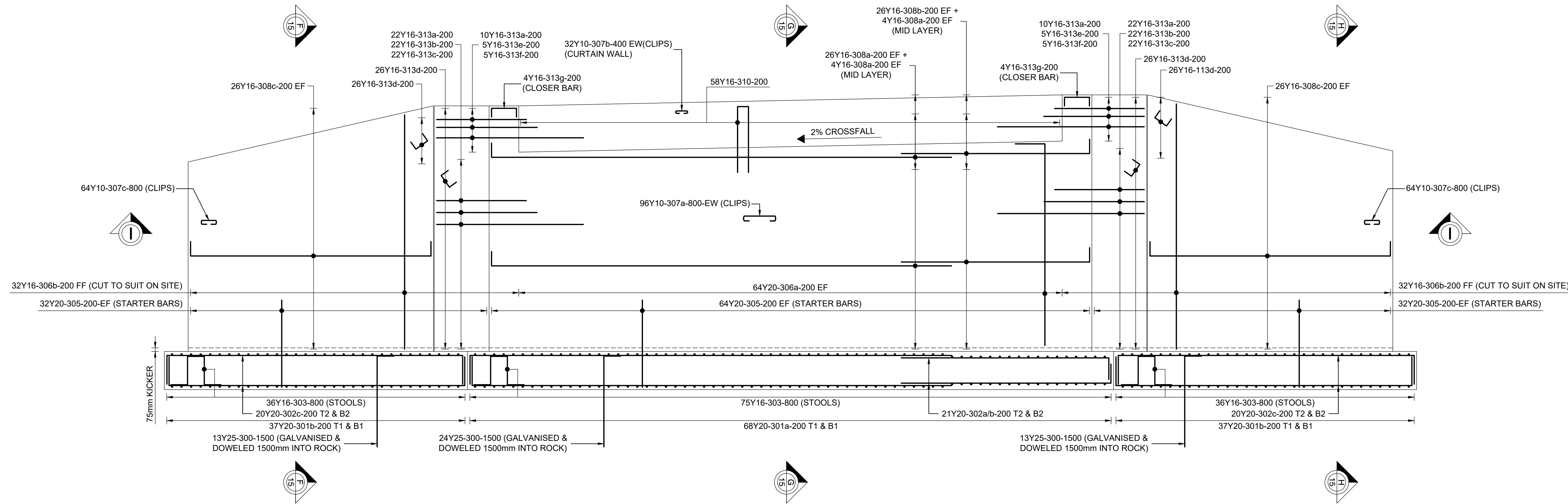
Scale AS SHOWN

Plan No.:- 3521/15

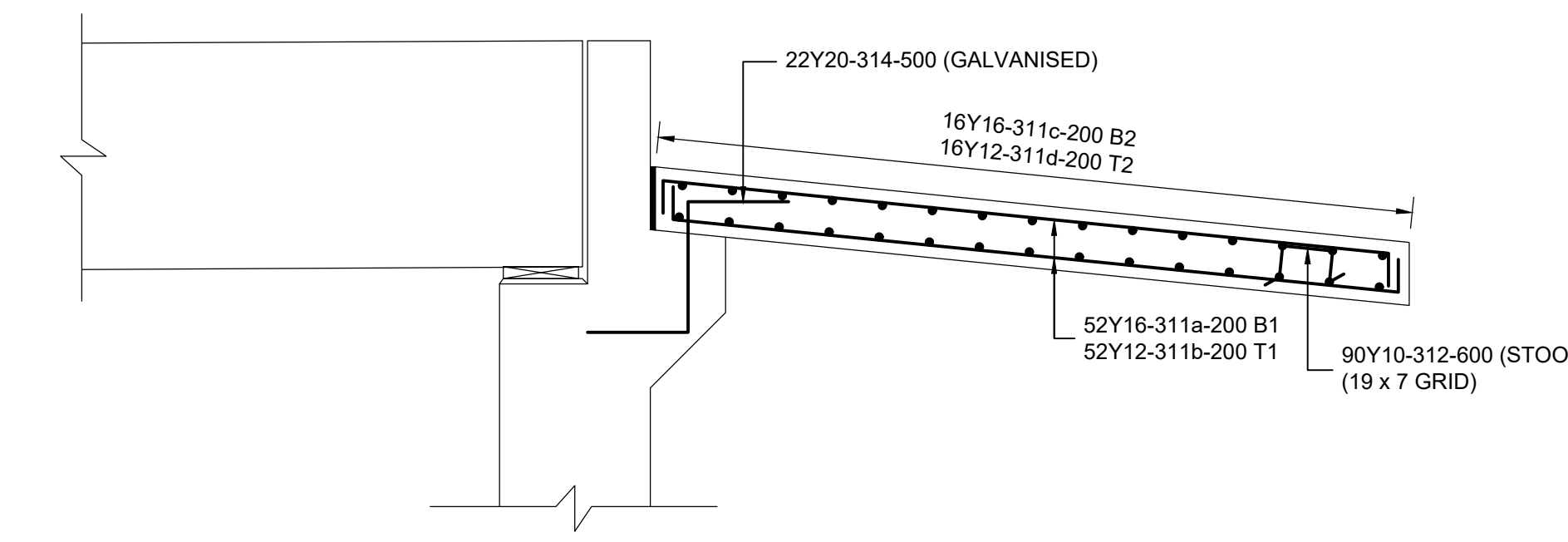
FOR TENDER PURPOSES

ABUTMENT 2 STEEL LAYOUT A

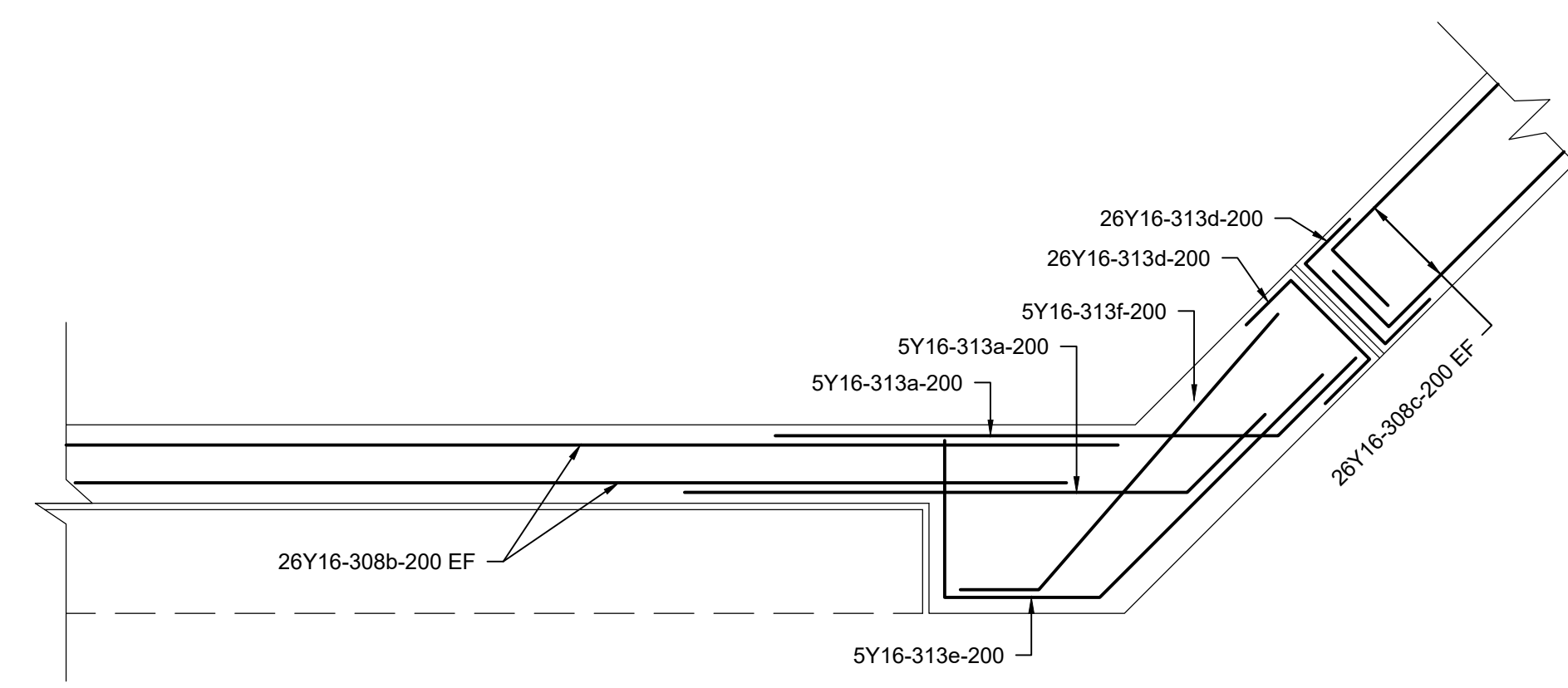
3521/15



WALL ELEVATION
ABUTMENT 2
SCALE 1:50



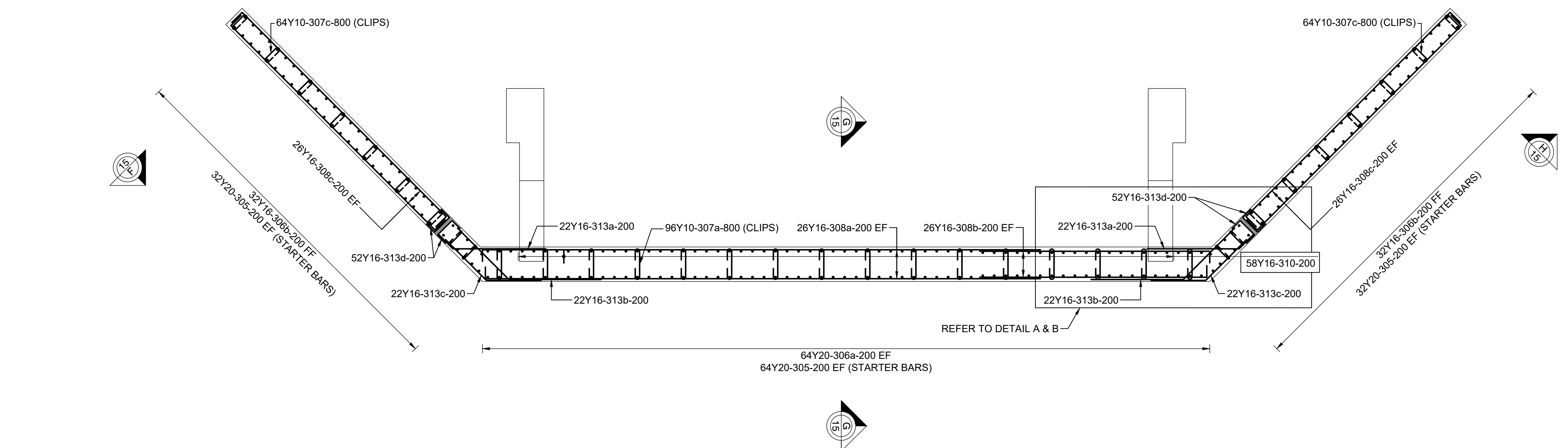
SECTION J - J
SCALE 1:25



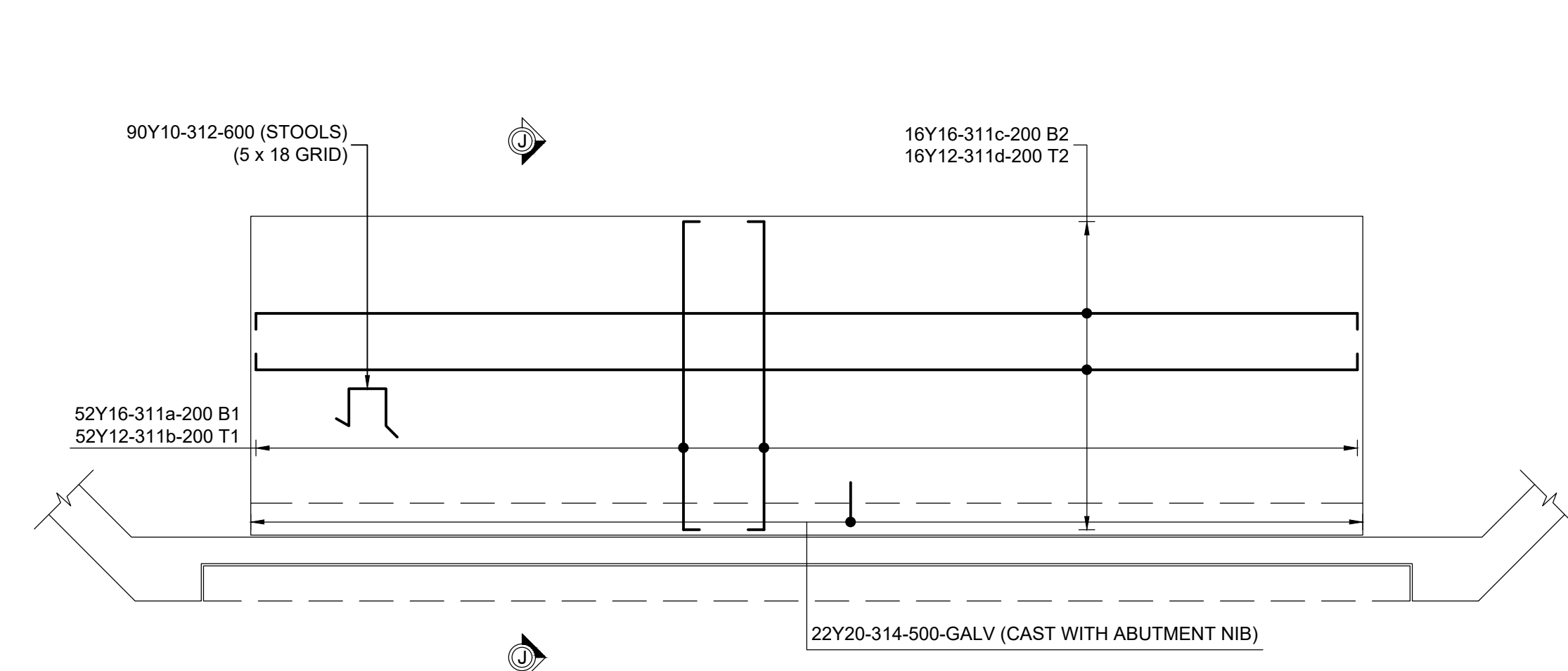
DETAIL B
(TYPICAL PLAN AT MID CURTAIN WALL)
SCALE 1:20

- NOTES :**
- MINIMUM CONCRETE COVER - 50mm
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :
B1 - LOWEST BOTTOM LAYER
B2 - SECOND LOWEST BOTTOM LAYER
T1 - TOPMOST TOP LAYER
T2 - SECOND HIGHEST TOP LAYER
EF - EACH FACE
NF - NEAR FACE
FF - FAR FACE
ALT - ALTERNATING
STG - STAGGERED
H - HORIZONTAL
V - VERTICAL
ABR - ALTERNATE BAR REVERSED
EW - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985
HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
BLINDING - 15/19 (15MPa)
ABUTMENT - 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 40mm Ø HOLE 150mm DEEP AND BLOW OUT DUST WITH COMPRESSOR. INJECT INTO GROUT (EPIDERMIX 35) TO PREVENT AIR-LOCKS AND INSERT Y25 DOWEL

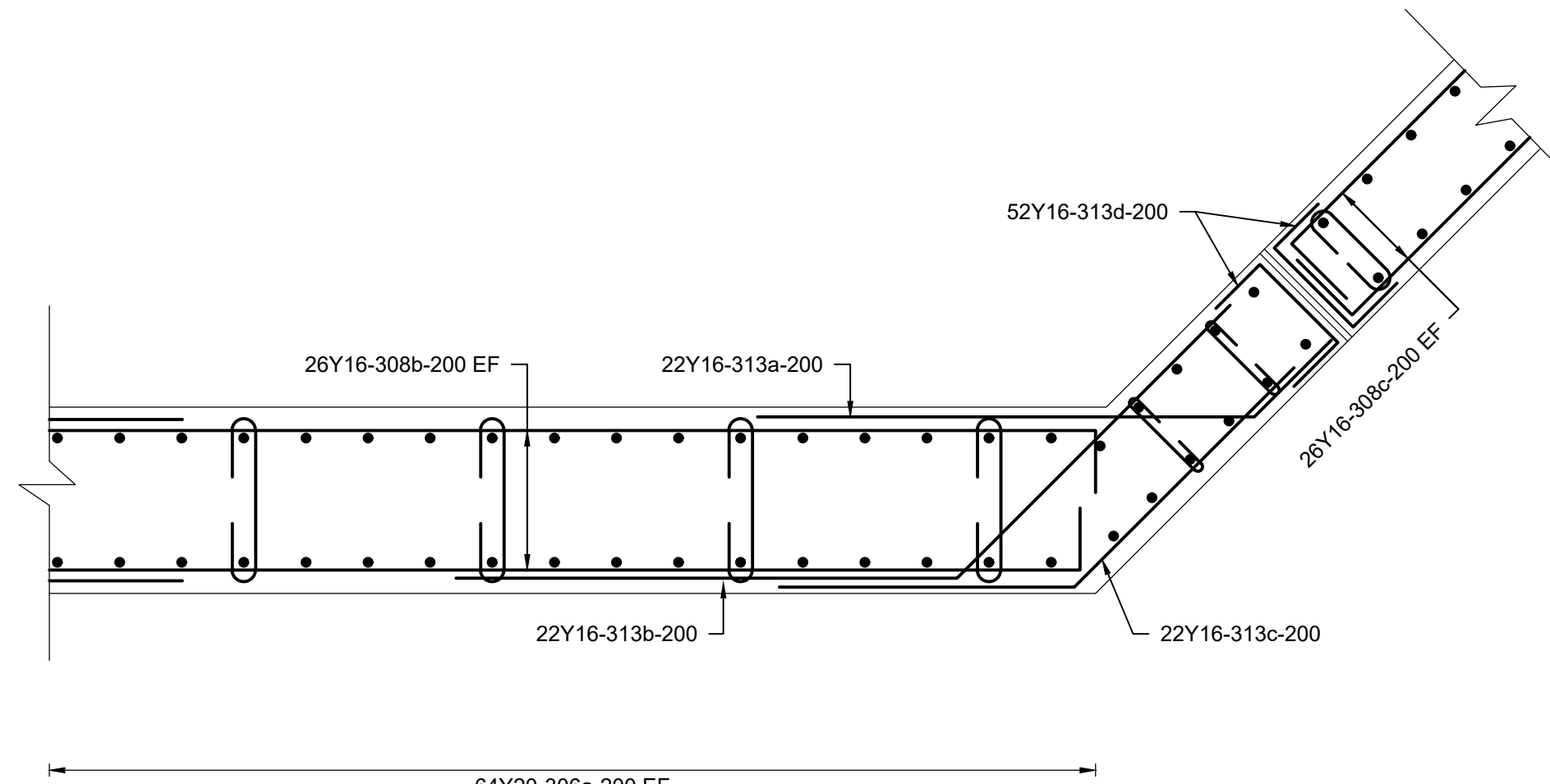
- DOWELLING NOTES.**
- CHISEL ROCK TO EXPOSE CLEAN FACE AND CAST MASS CONCRETE BASES. ENGINEER TO INSPECT PRIOR TO POURING CONCRETE.
 - DRILL DOWEL HOLES THROUGH INTO ROCK BELOW TO A DEPTH OF 1.5m SIZE OF DRILL HOLE 40mm MIN 50mm MAX.
 - GROUT TO BE MIXED TO MANUFACTURERS INSTRUCTION AND POURED INTO DRILLED HOLES TO DISPLACE WATER. DOWELS TO BE INSERTED WITH A PUMPING ACTION TO REMOVE TRAPPED AIR BUBBLES.



SECTION I - I
SCALE 1:50

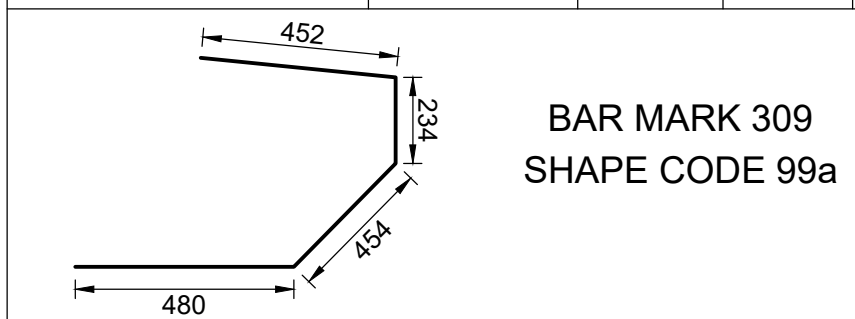


APPROACH SLAB PLAN
SCALE 1:50



DETAIL A
(TYPICAL PLAN AT ABUTMENT/WING WALL JUNCTION)
SCALE 1:20

REINFORCING SCHEDULE FOR ABUTMENT 2																	
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				
ABUTMENT 2 (800 THICK BASE) (600 THICK STEM) (400 THICK WING WALL)	1	300	Y	25	1500	50	50	37	2000	350	1900			3.85	7.70	385.00	
	1	301a	Y	20	200	136	136	38	5300	700	4000	700		2.47	13.09	1780.38	
	1	301b	Y	20	200	148	148	38	5100	700	3800	700		2.47	12.60	1864.36	
	1	302a	Y	20	200	42	42	37	10700	650	10100			2.47	26.43	1110.02	
	1	302b	Y	20	200	42	42	37	5000	650	4400			2.47	12.35	518.70	
	1	302c	Y	20	200	80	80	38	8400	650	7200	650		2.47	20.75	1659.84	
	1	303	Y	16	800	147	147	83	2130	350	620	350	350	1.58	3.37	494.71	
	1	304	Y	20	175	52	52	62	2000	1000	705	1000		2.47	4.94	256.88	
	1	305	Y	20	200	256	256	37	2725	800	2000			2.47	6.73	1723.07	
	1	306a	Y	20	200	128	128	37	4560	500	4110			2.47	11.26	1441.69	
	1	306b	Y	16	200	128	128	38	5335	300	5075			1.58	8.43	1078.95	
	1	307a	Y	10	800	96	96	33	720	500				0.617	0.44	42.65	
	1	307b	Y	10	400	32	32	33	370	150				0.617	0.23	7.31	
	1	307c	Y	10	800	128	128	33	520	300				0.617	0.32	41.07	
	1	308a	Y	16	200	52	52	37	9860	200	9700			1.58	15.58	810.10	
	1	308b	Y	16	200	52	52	37	4160	200	4000			1.58	6.57	341.79	
	1	308c	Y	16	200	104	104	38	5560	300	5040	300		1.58	8.78	913.62	
	1	309	Y	16	200	22	22	99a	1620					1.58	2.56	56.31	
	1	310	Y	16	200	58	58	38	2730	1330	150	1330		1.58	4.31	250.18	
	1	311a	Y	16	200	52	52	38	2120	150	1900	150		1.58	3.35	174.18	
	APPROACH SLAB (10460 x 3000 x 250 DP @60° SKEW)	1	311b	Y	12	200	52	52	38	2140	150	1900	150		0.888	1.90	98.82
		1	311c	Y	16	200	16	16	38	10580	150	10360	150		1.58	16.72	267.46
		1	311d	Y	12	200	16	16	38	10600	150	10360	150		0.888	9.41	150.60
	1	312	Y	10	600	90	90	83	688	200	94	200	200	0.617	0.42	38.20	
	ABUTMENT 2 (800 THICK BASE) (600 THICK STEM) (400 THICK WING WALL)	1	313a	Y	16	200	64	64	62	1950	350	245	1600	135°	1.58	3.08	197.18
		1	313b	Y	16	200	44	44	62	2860	1260	895	1600	135°	1.58	4.52	198.83
		1	313c	Y	16	200	44	44	62	1950	1000	705	950	135°	1.58	3.08	135.56
		1	313d	Y	16	200	104	104	38	620	200	300	200		1.58	0.98	101.88
		1	313e	Y	16	200	10	10	45	2015	1005	550	500		1.58	3.18	31.84
		1	313f	Y	16	200	10	10	62	1415	250	990	1165	129°	1.58	2.24	22.36
1		313g	Y	16	200	8	8	38	840	200	520	200		1.58	1.33	10.62	
1		314	Y	20	500	22	22	54	1320	400	520	400		2.47	3.26	71.73	
1		315a	Y	16	250	2	2	62	11400	1300	920	10100		1.58	18.01	36.02	
1		315b	Y	16	250	2	2	62	5700	1300	920	4400		1.58	9.01	18.01	
1		315c	Y	16	250	4	4	37	9610	2500	7150			1.58	15.18	60.74	
1		315d	Y	16	250	4	4	37	7810	2500	5350			1.58	12.34	49.36	
1		315e	Y	16	250	2	2	62	10100	1300	920	8800	135°	1.58	15.96	31.92	
1		315f	Y	16	250	2	2	62	4400	1300	920	3100	135°	1.58	6.95	13.90	
														TOTAL KG HT STEEL	16485.82		
														TOTAL KG MS STEEL			
														TOTAL KG DOWELS	385.00		
														TOTAL KG STEEL	16485.82		



BAR MARK 309
SHAPE CODE 99a

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Supervising Engineer	Date	Checked by:- P. NANKHOO Pr Eng (910350)
		Drawn by:- A. GUNAS
		Checked by:- Y. JEAOWN Pr Eng (202101910)
		File Reference:- D1724/6/3521/4

Supervising Authority	Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
	Design Plan No:-	Drawn by:- A. GUNAS
	Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
	Cross Section No:-	File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO CONSULTING ENGINEERS
GATEWAY OFFICE PARK, BLOCK ONE TEL: 0853 58600
ENGLAND CREST, DURBAN ONE FAX: 0853 58600
4001 email: nankhoo@nankhoo.co.za

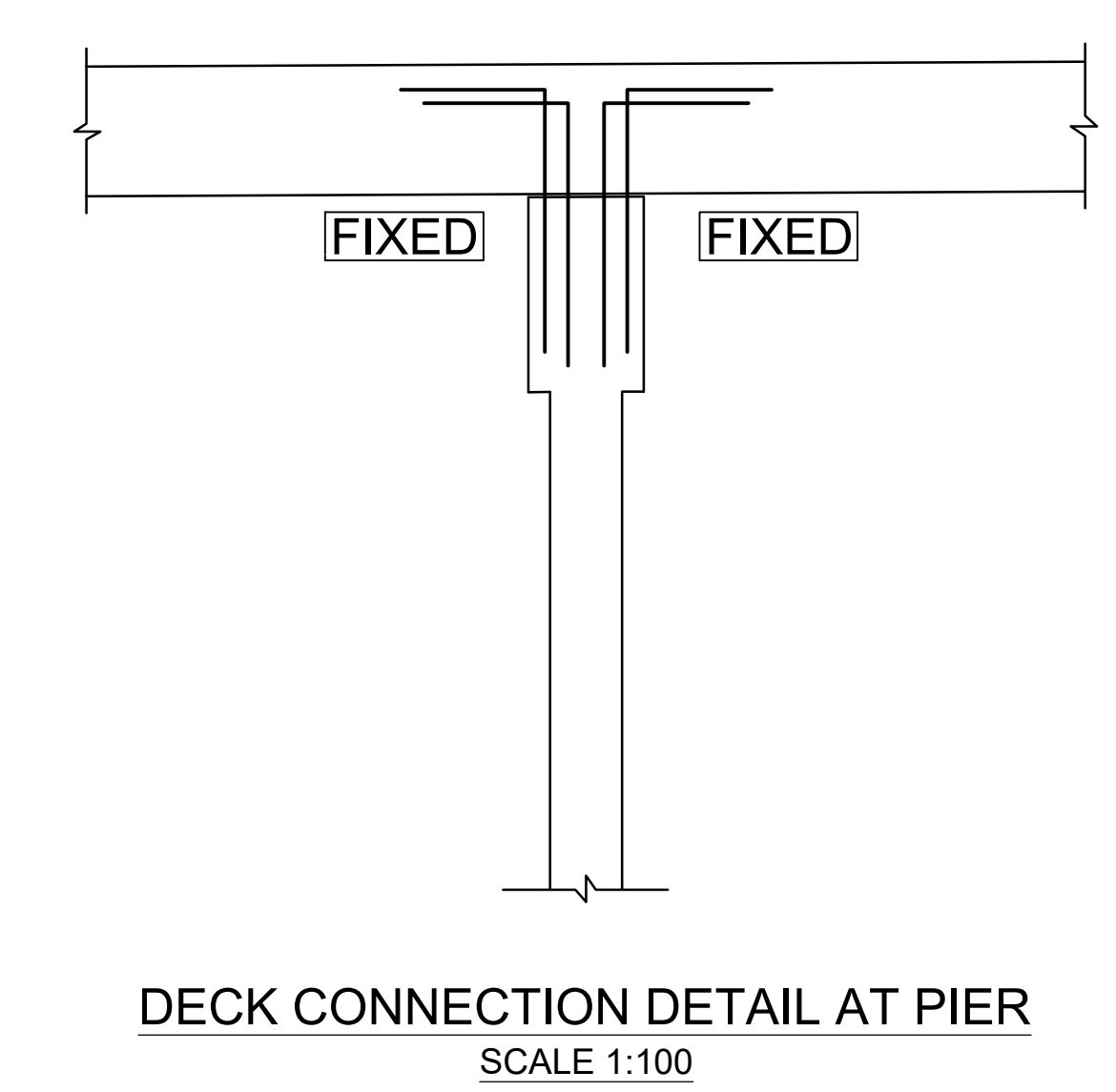
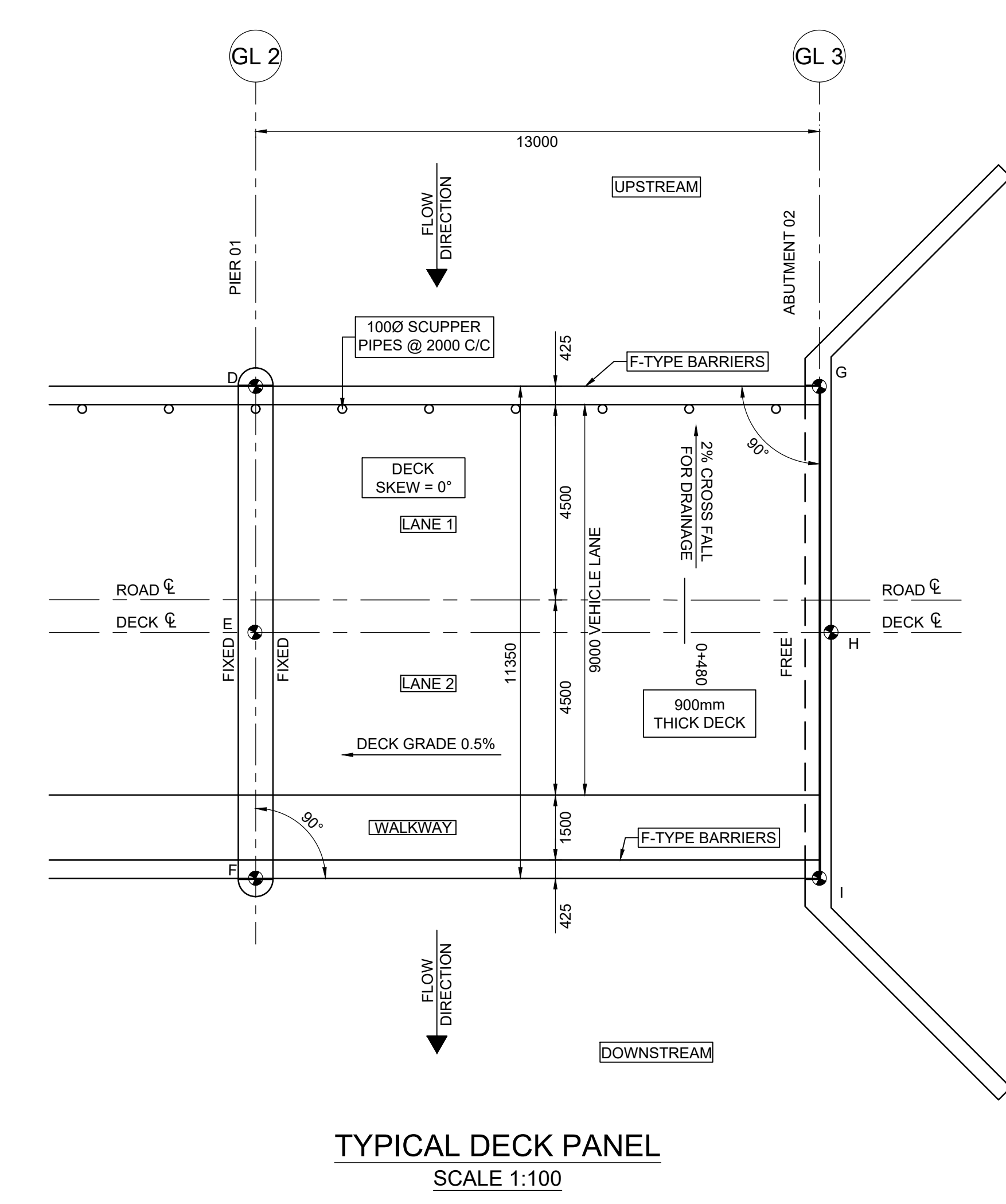
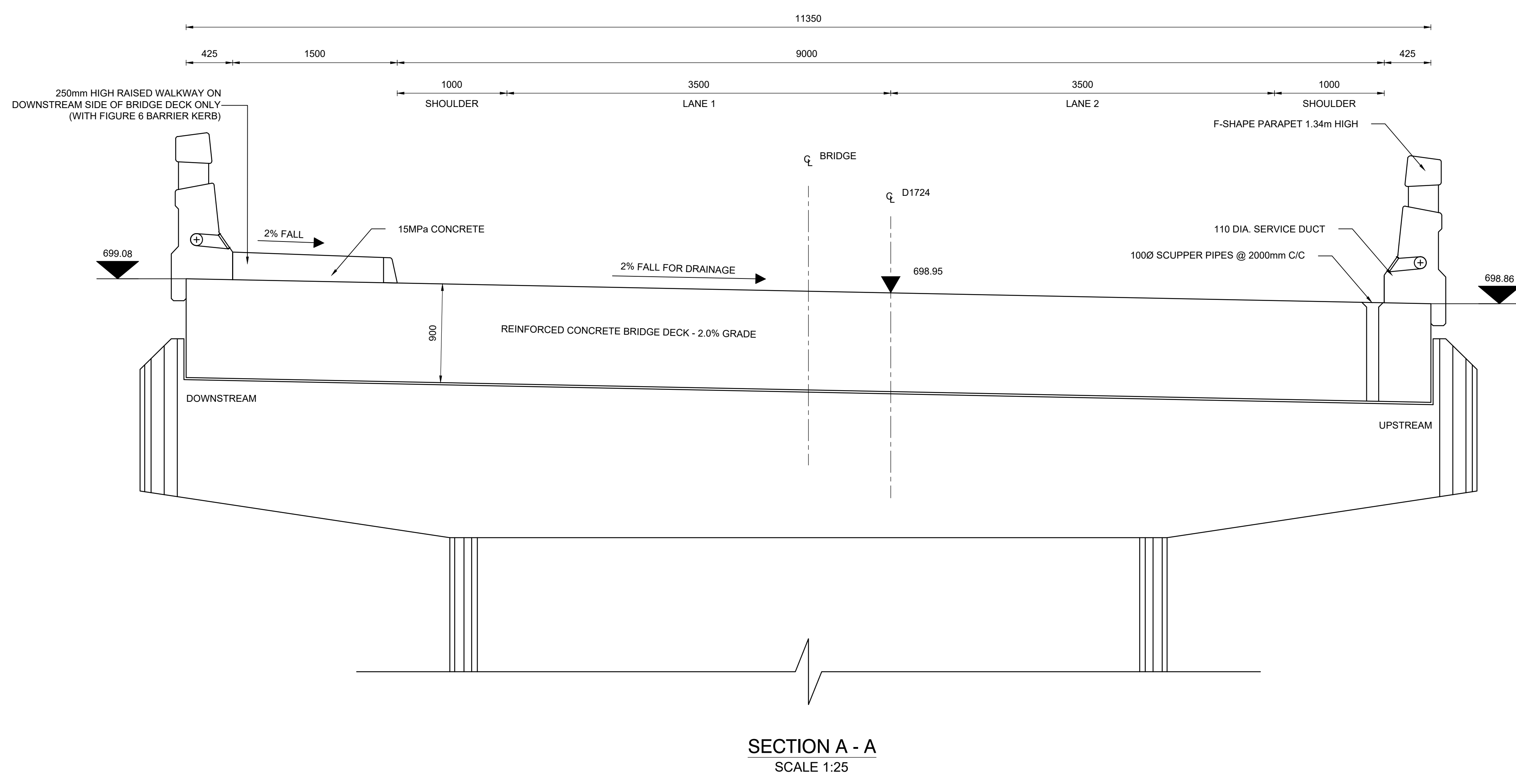
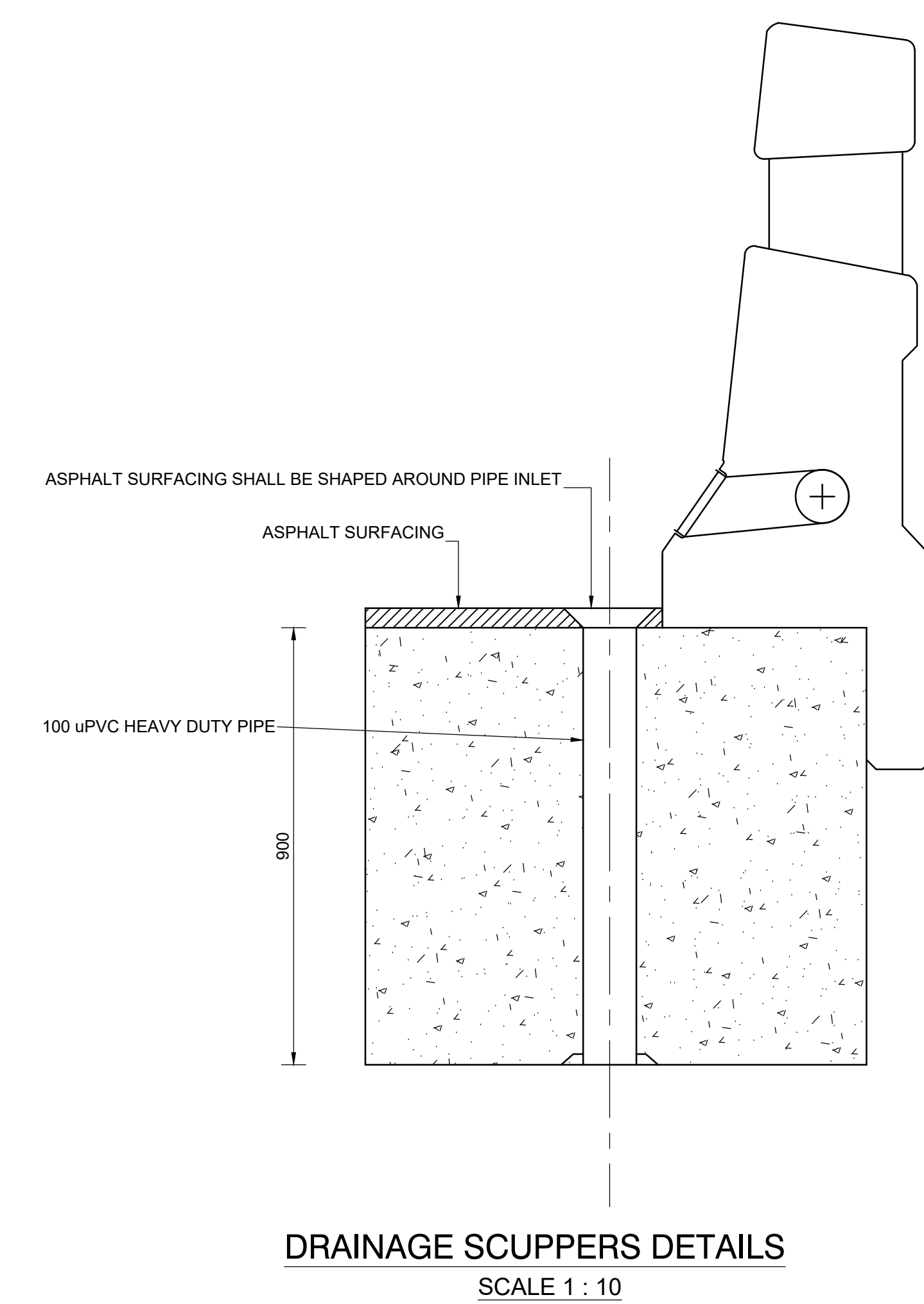
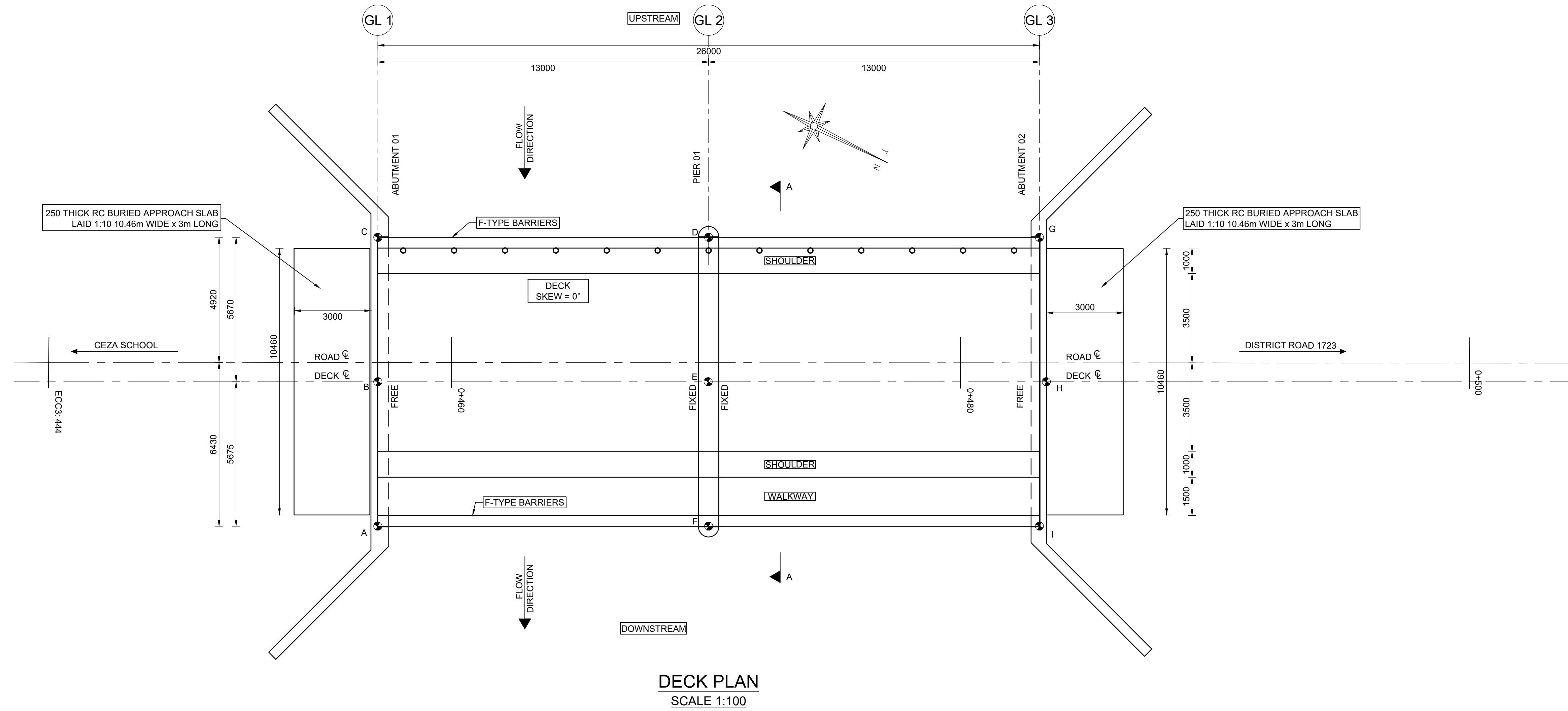
Chief Engineer: Structural Design	SIGNATURE	DATE
Head: Transport		

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.991748° Latitude
31.373728° Longitude

PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
ABUTMENT 2 STEEL LAYOUT B

FOR TENDER PURPOSES	Staked km distance	Sheet 16
	0.47	of 23
	Scale AS SHOWN	Plan No.:- 3521/16

3521/16



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

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-
 Designed by:- Y. JEAOWN Pr Eng (202101910)
 Checked by:- P. NANKHOO Pr Eng (910350)
 Drawn by:- A. GUNAS
 Checked by:- Y. JEAOWN Pr Eng (202101910)
 File Reference:- D1724/6/3521/4

**PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT**

NANKHOO
CONSULTING ENGINEERS

Chief Engineer: Structural Design

Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

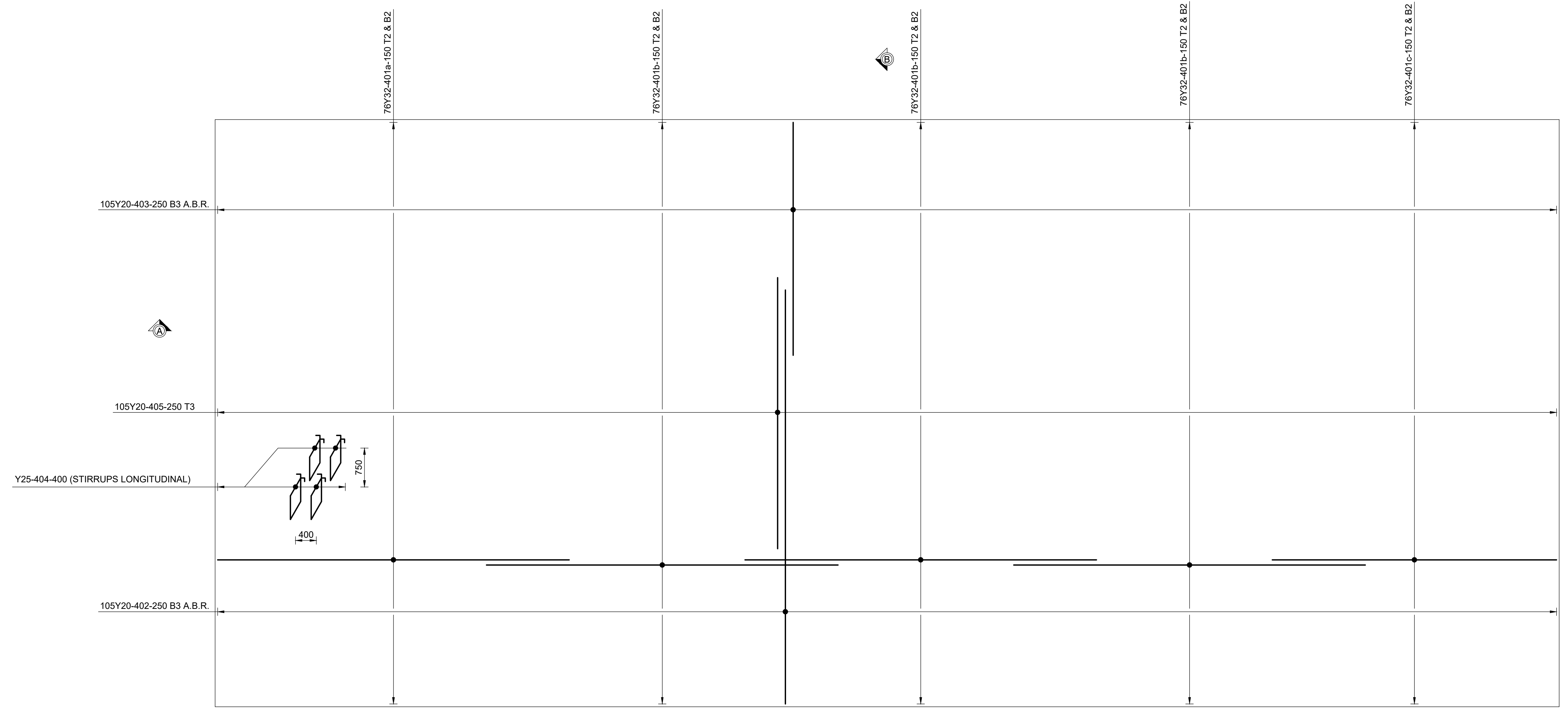
PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

DECK PLAN

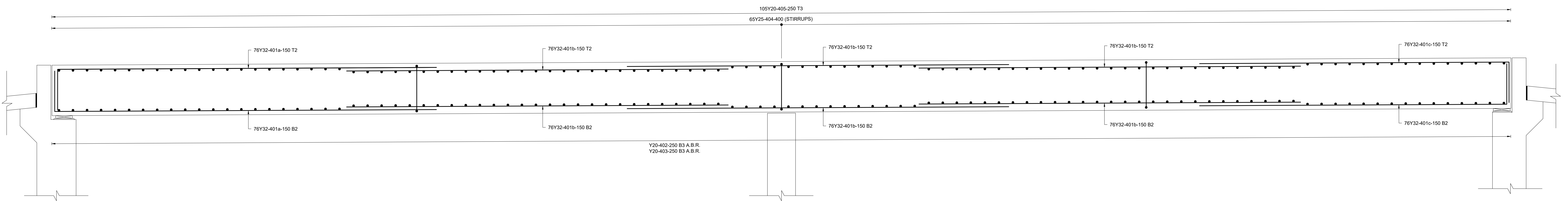
FOR TENDER PURPOSES

Staked km distance	Sheet 17
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/17

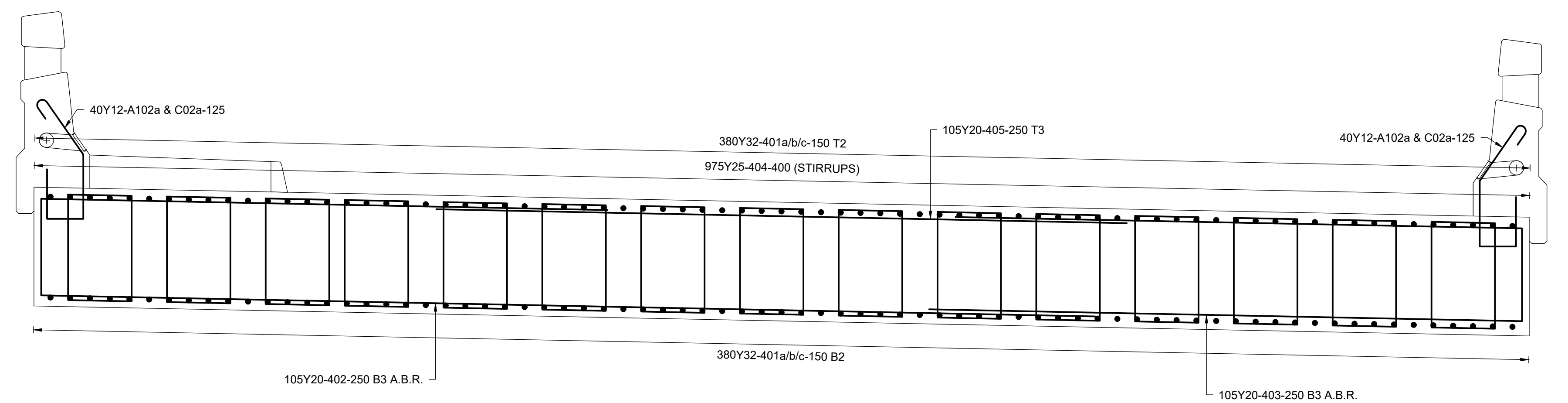
3521/17



TYPICAL PLAN VIEW OF DECK
(1 CONTINUOUS SPAN @ 26m LONG X 11.34m WIDE)
SCALE 1:50



SECTION A-A
SCALE 1:25



SECTION B-B
SCALE 1:25

MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING			BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	D				
900mm THICK RC DECK 26m SPAN X 11.34m WIDE, 0° SKEW TO PIER	1	401a	Y	32	150	76	76	37	7455	750	6800		6.31	47.04	3575.12	
	1	401b	Y	32	150	228	228	20	6800	6800			6.31	42.91	9783.02	
	1	401c	Y	32	150	76	76	37	6155	750	5500		6.31	38.84	2951.69	
	1	402	Y	20	250	105	105	20	8000	8000			2.47	19.76	2074.80	
	1	403	Y	20	250	105	105	20	4500	4500			2.47	11.12	1167.08	
	1	404	Y	20	400	975	975	60	2900	800	500		2.47	7.16	6983.93	
	1	405	Y	20	250	105	105	20	5240	5240			2.47	12.94	1358.99	
														TOTAL KG HT STEEL	27894.63	
														TOTAL KG MS STEEL		
														TOTAL KG DOWELS		
													TOTAL KG STEEL	27894.63		

- NOTES :**
- MINIMUM CONCRETE COVER - 50mm
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
- ABBREVIATIONS :-**
- B1 - LOWEST BOTTOM LAYER
 - B2 - SECOND LOWEST BOTTOM LAYER
 - T1 - TOPMOST TOP LAYER
 - T2 - SECOND HIGHEST TOP LAYER
 - EF - EACH FACE
 - NF - NEAR FACE
 - FF - FAR FACE
 - ALT - ALTERNATING
 - STG - STAGGERED
- MINIMUM LAP LENGTH TO BE 45 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1085
HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
DECK - 40/19 (40MPa)
 - CONCRETE FINISHES:
EXPOSED FACES - CLASS F2 (SMOOTH)
CONCEALED FACES - CLASS F1 (ROUGH)
TOP OF DECK - CLASS U1 FINISH (FLOATED AND BROOMED)
WALKWAY - CLASS U1 FINISH (BROOMED)
UNFORMED - CLASS F1 (ROUGH)
CONCEALED FACES - CLASS U1 (SCREEDED AND TAMPED)
 - ALL EXPOSED EDGES TO BE CHAMFERED 25 x 25

FOR TENDER PURPOSES

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-
Continued on:-
Design Plan No:-
Long Section No:-
Cross Section No:-

Designed by:- Y. JEAOWN Pr Eng (202101910)
Checked by:- P. NANKHOO Pr Eng (9103350)
Drawn by:- A. GUNAS
Checked by:- Y. JEAOWN Pr Eng (202101910)
File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
CONSULTING ENGINEERS

GATEWAY OFFICE PARK, BEAUFORT CREEK, DURBAN
LONGUEUR DRIVE, DURBAN 4001

TEL: 031 950 5800
FAX: 031 950 5800
EMAIL: nankhoo@nankhoo.co.za

Chief Engineer: Structural Design

Head: Transport

SIGNATURE: _____ DATE: _____

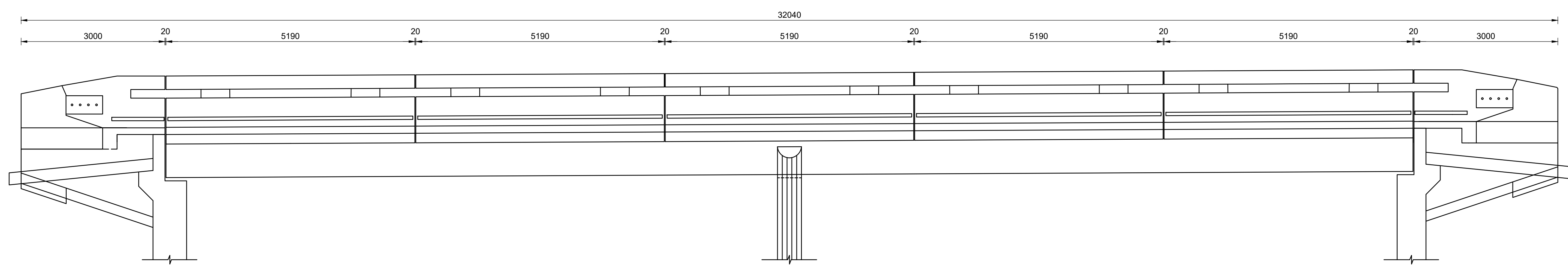
DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.991748° Latitude
31.373728° Longitude

Staked km distance: 0.47
Sheet 18 of 23

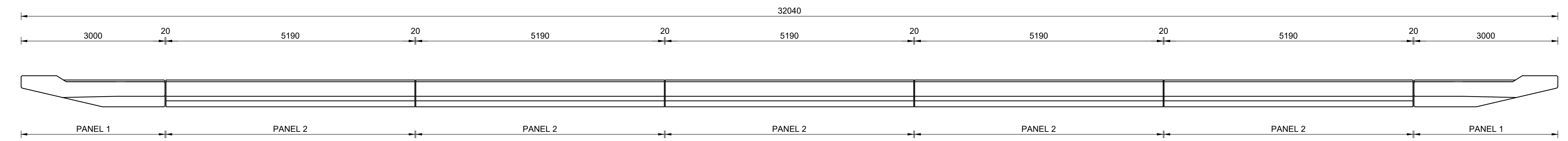
Scale: AS SHOWN
Plan No.: 3521/18

PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
DECK STEEL

3521/18

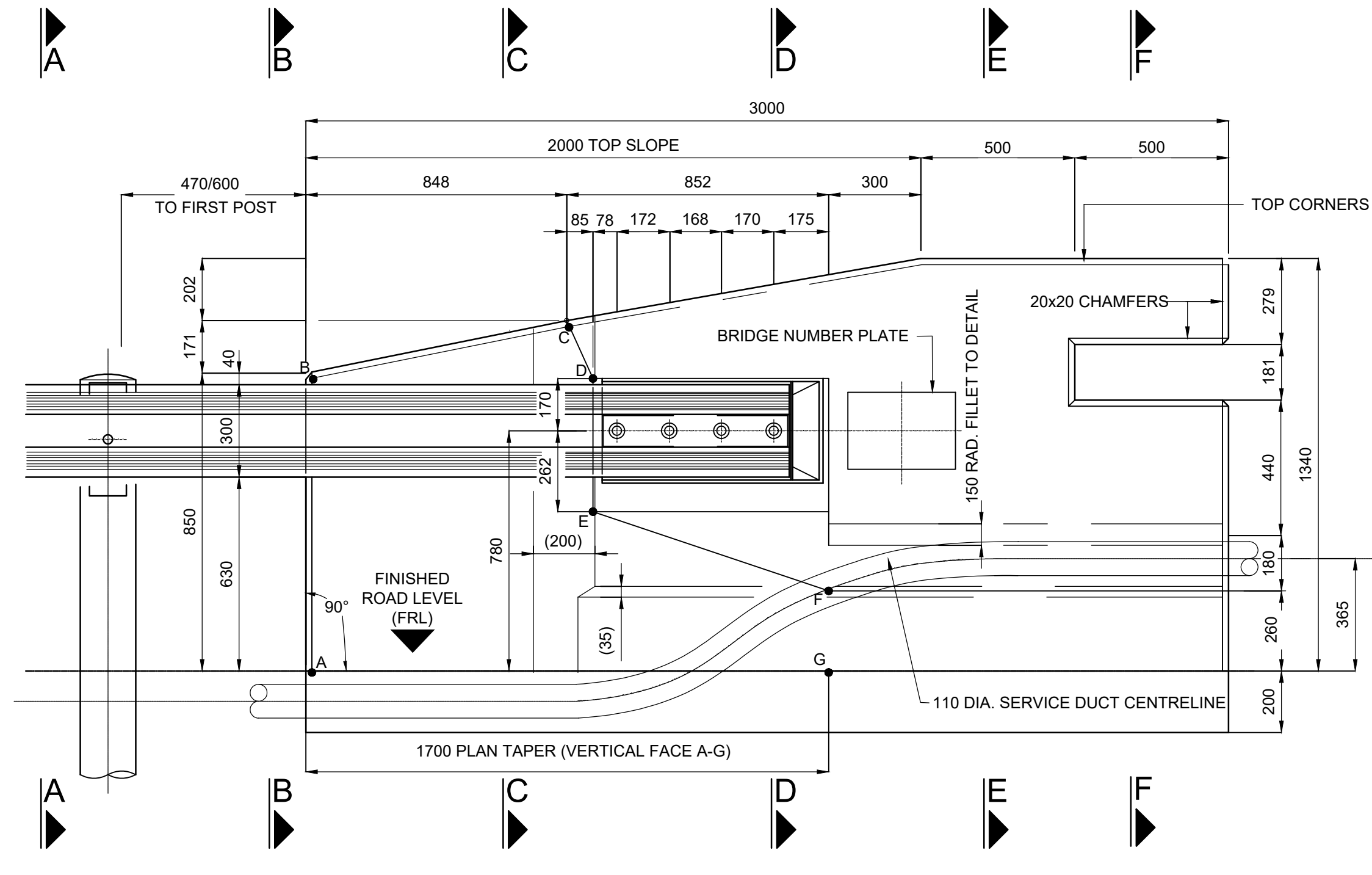


TYPICAL PARAPET INSIDE ELEVATION
SCALE 1:50

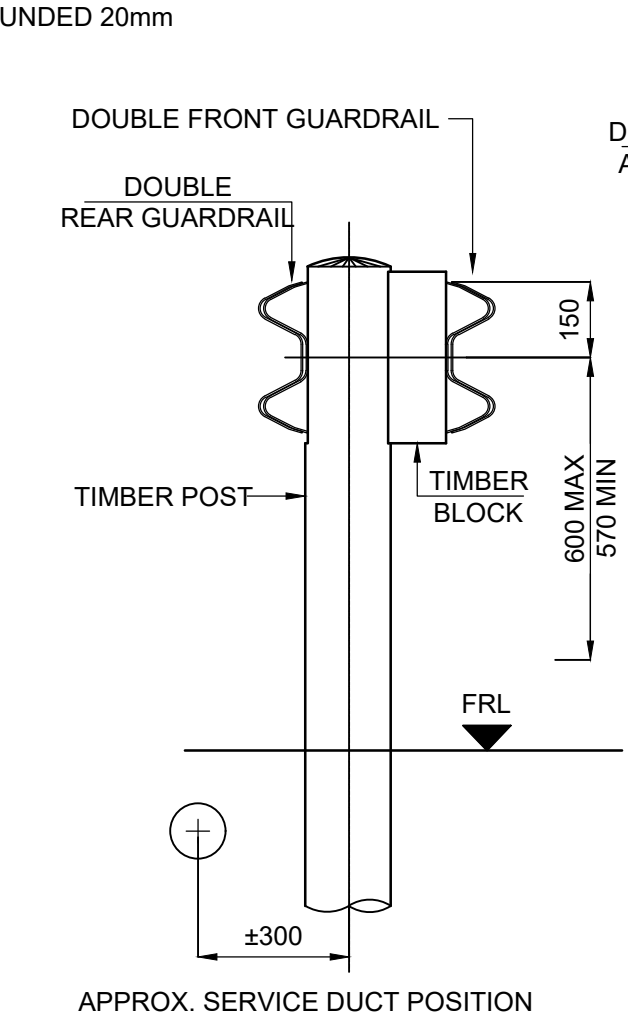


TYPICAL PLAN ON PARAPETS
SCALE 1:50

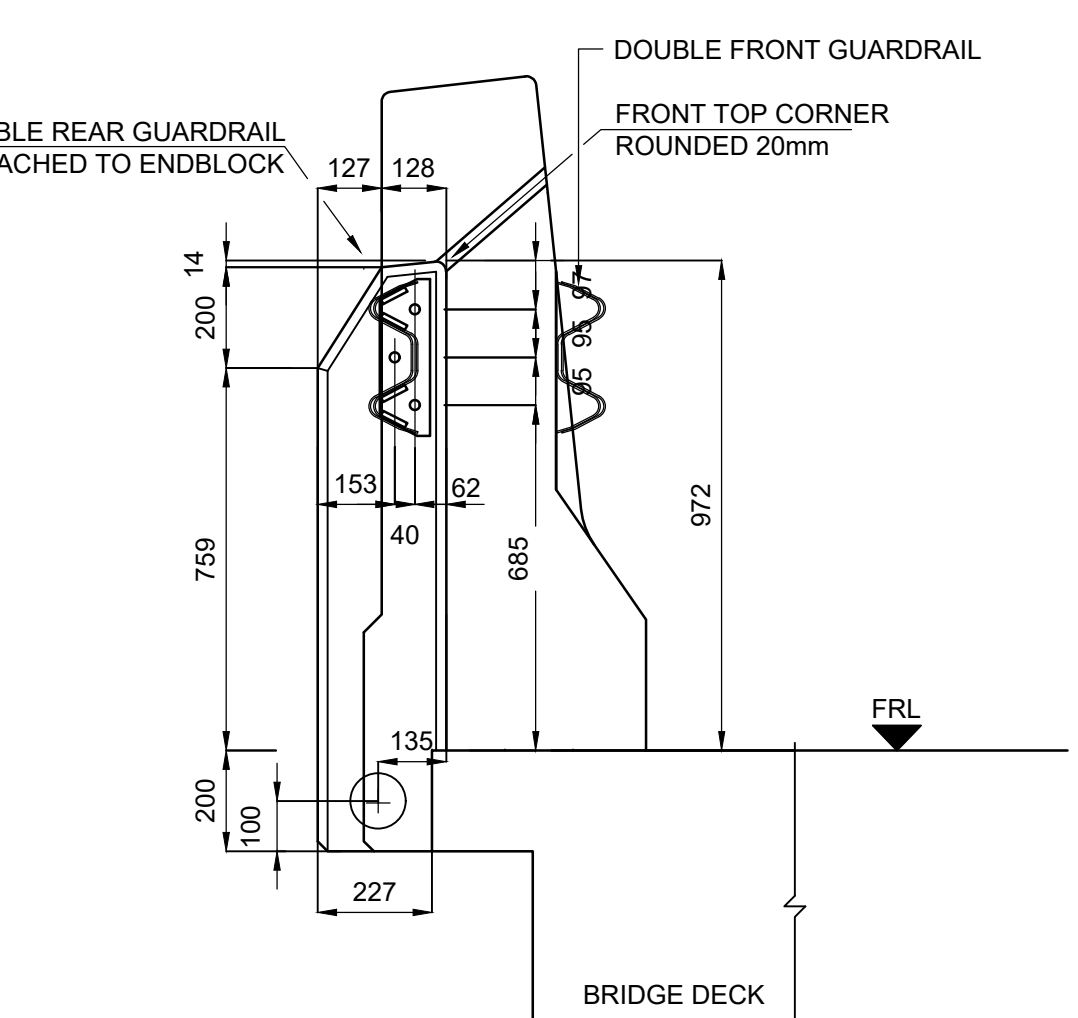
- NOTES :**
- PARAPETS**
1. CONCRETE CLASS - 30/19 (30 MPa)
 2. CONCRETE FINISHES:
 - EXPOSED FACES - CLASS F3 (SMOOTH RUBBED)
 - CONCEALED FACES - CLASS F1 (ROUGH)
 - UNFORMED SURFACES - CLASS U3 (STEEL TROWEL)
 3. ALL EXPOSED EDGES SHALL BE CHAMFERED 20 x 20.
 4. REBATED LETTERING SHALL RECEIVE TWO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



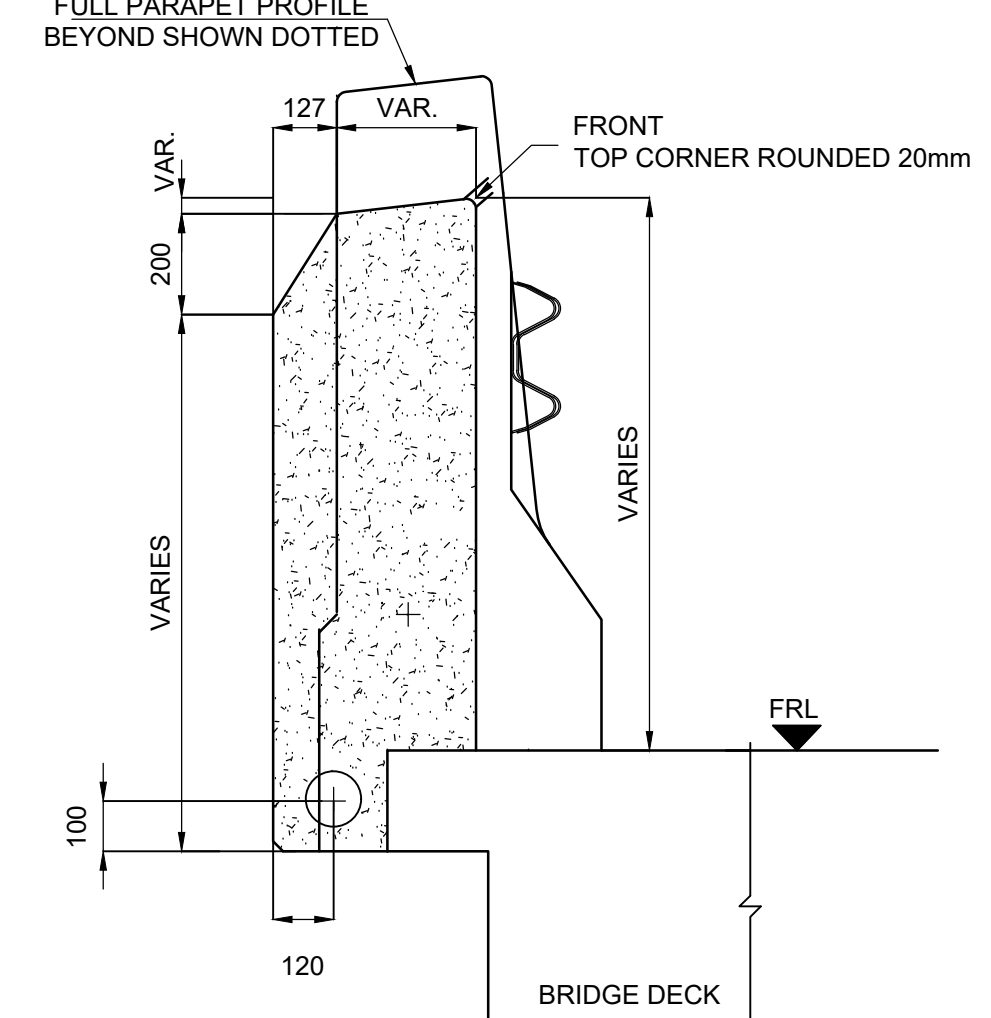
TYPICAL ENDBLOCK INSIDE ELEVATION - PANEL 1
SCALE 1:15



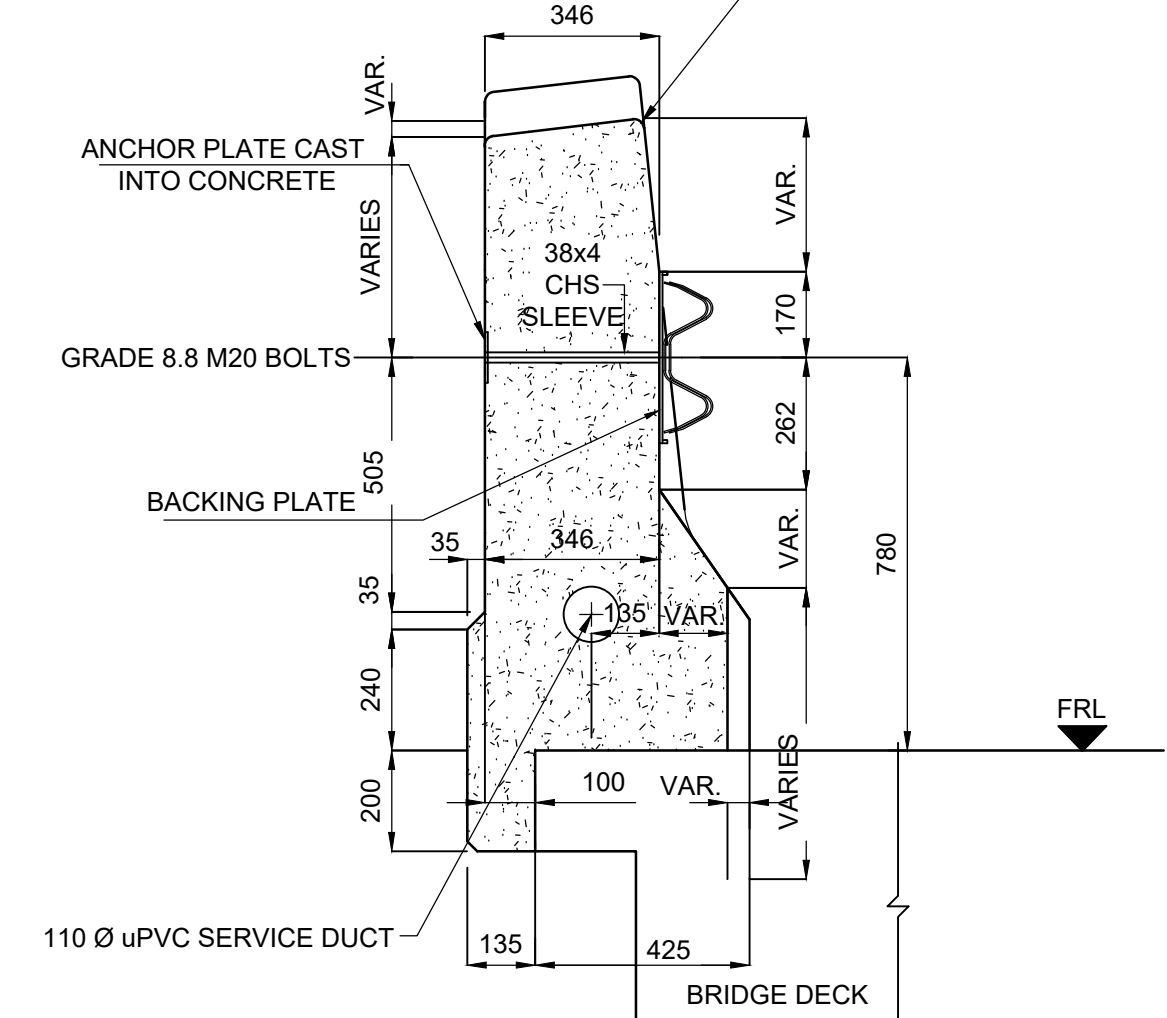
SECTION A-A
SCALE 1:15



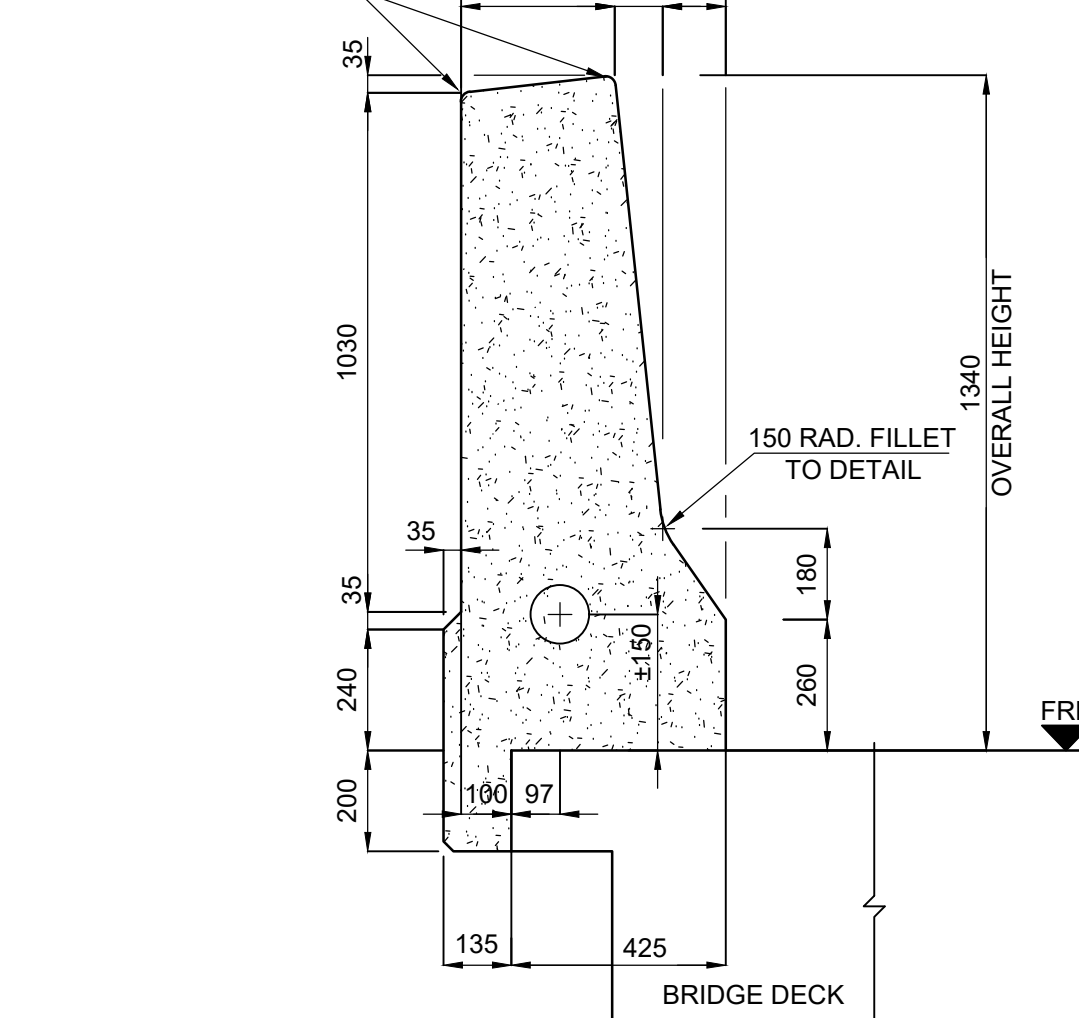
END ELEVATION B-B
SCALE 1:15



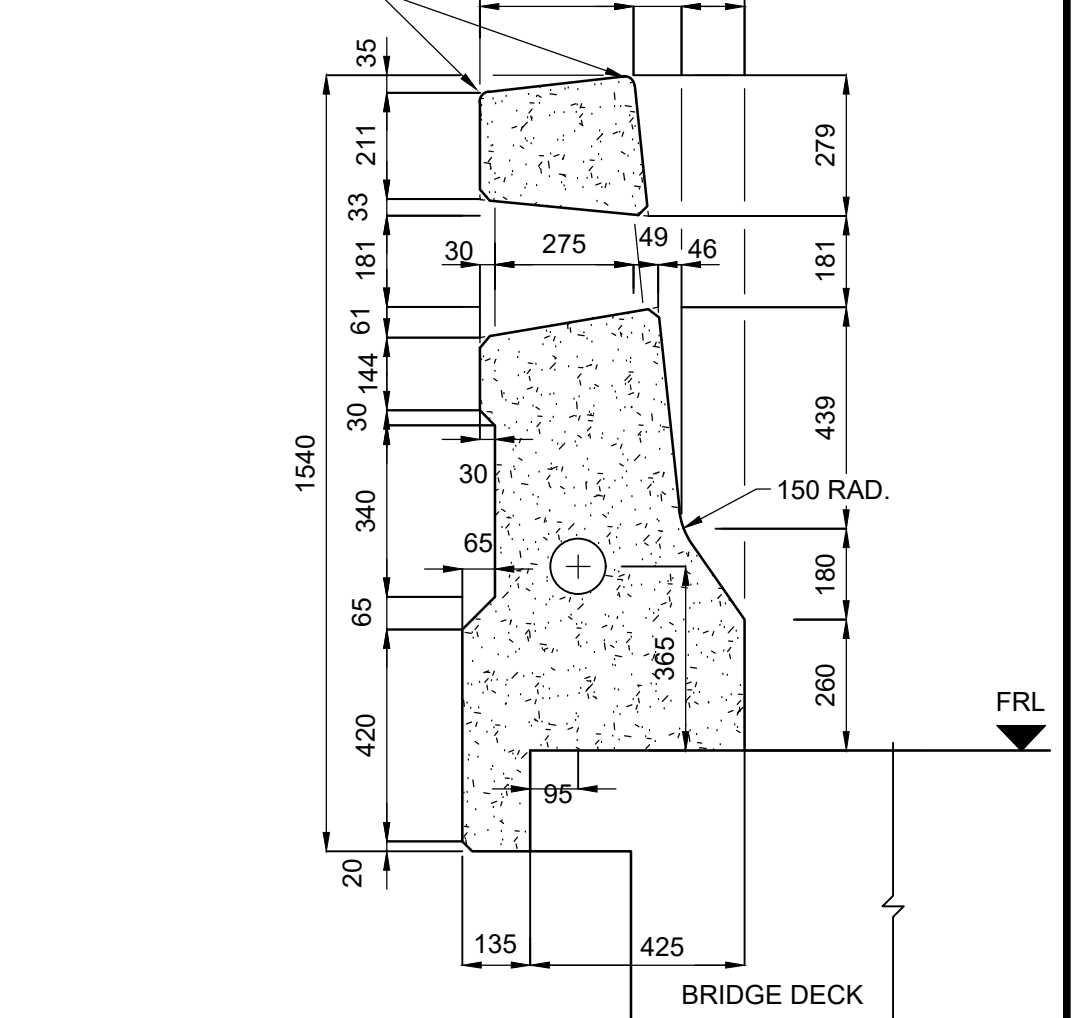
SECTION C-C
SCALE 1:15



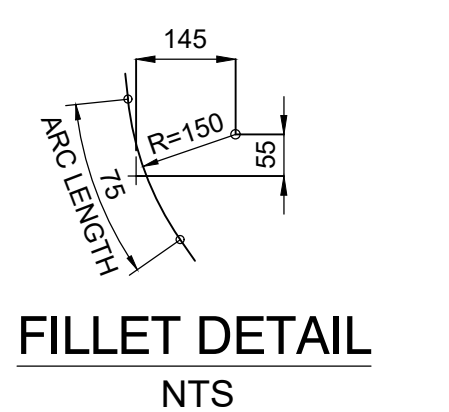
SECTION D-D
SCALE 1:15



SECTION E-E
SCALE 1:15

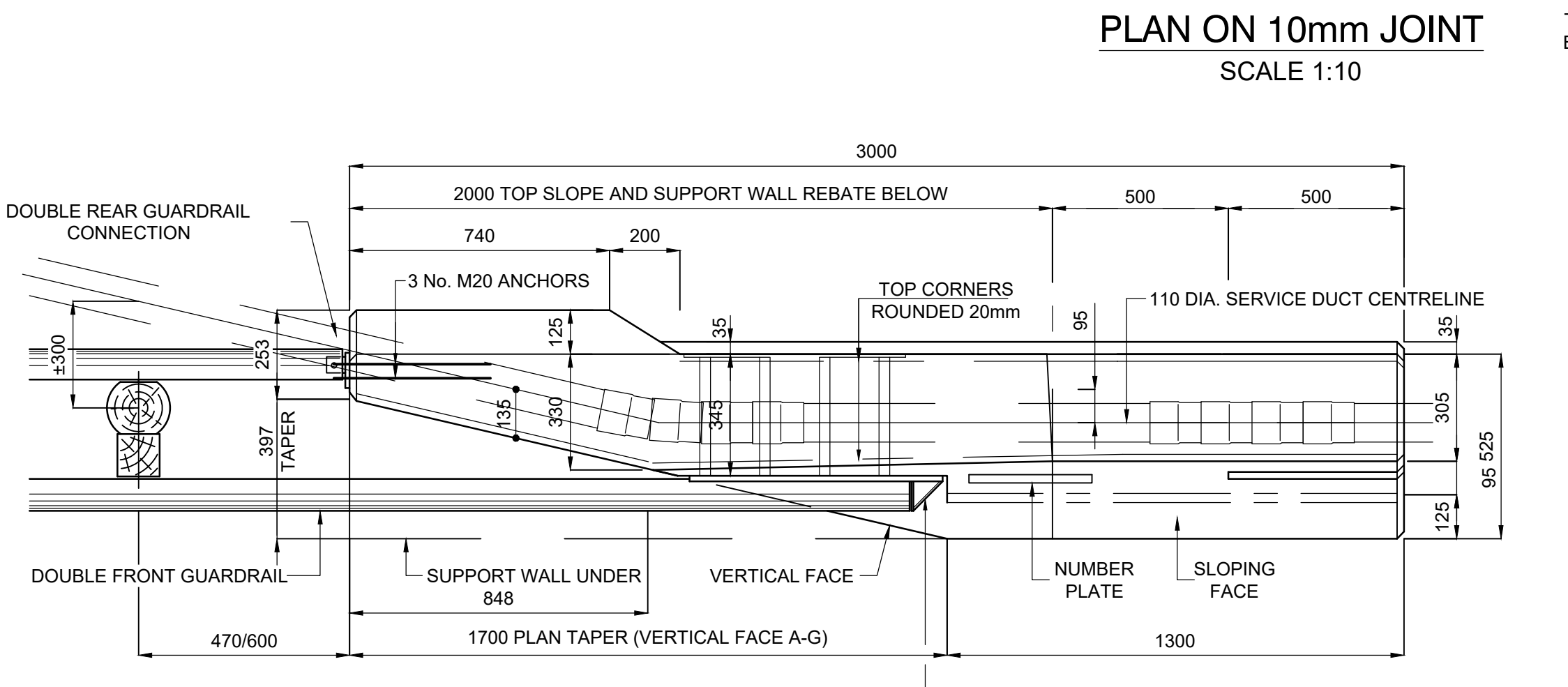


SECTION F-F
SCALE 1:15

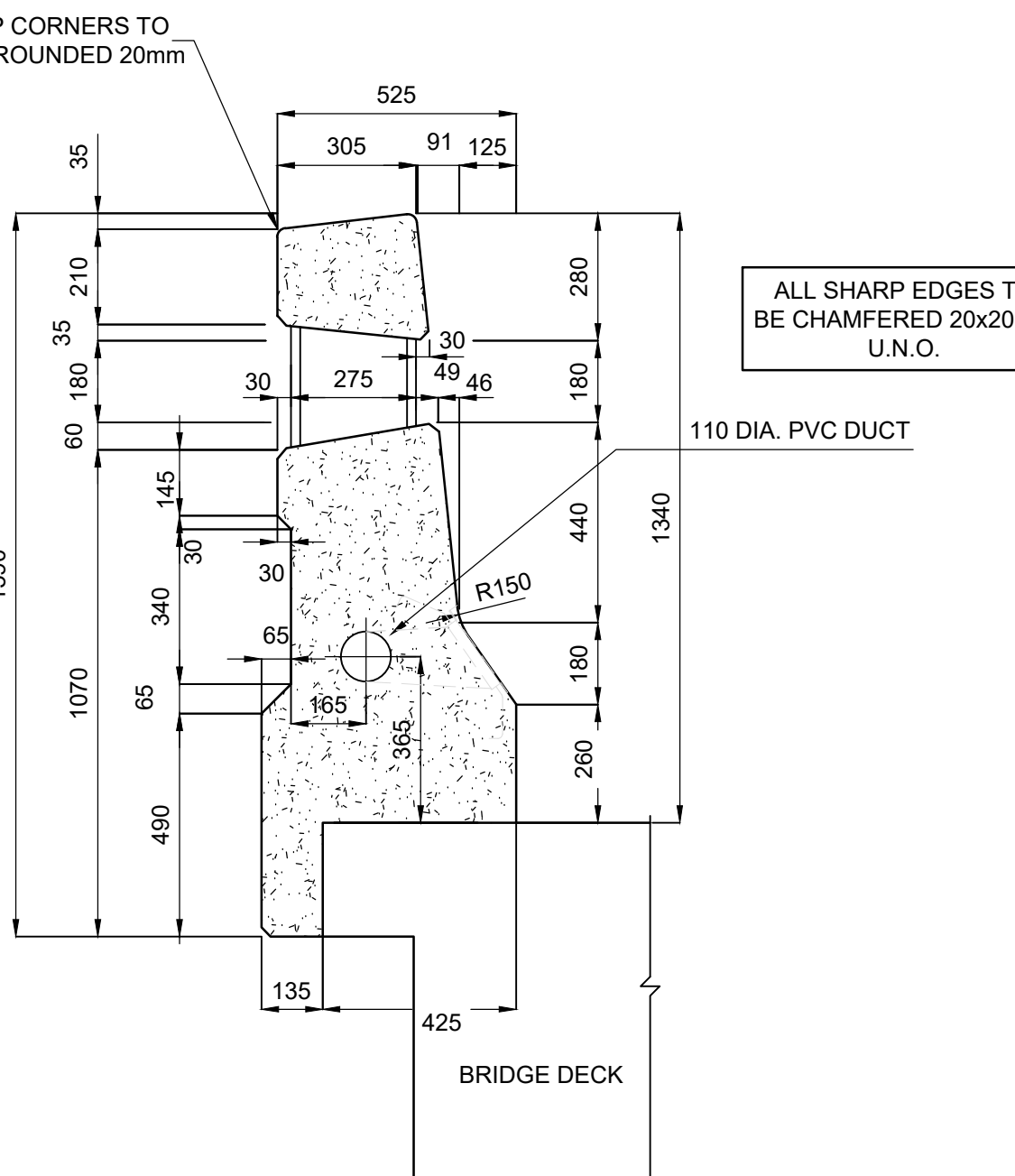


FILLET DETAIL
NTS

THE SURFACE DESCRIBED BY POLYGON A-B-C-D-E-F-G-A IS PLANAR

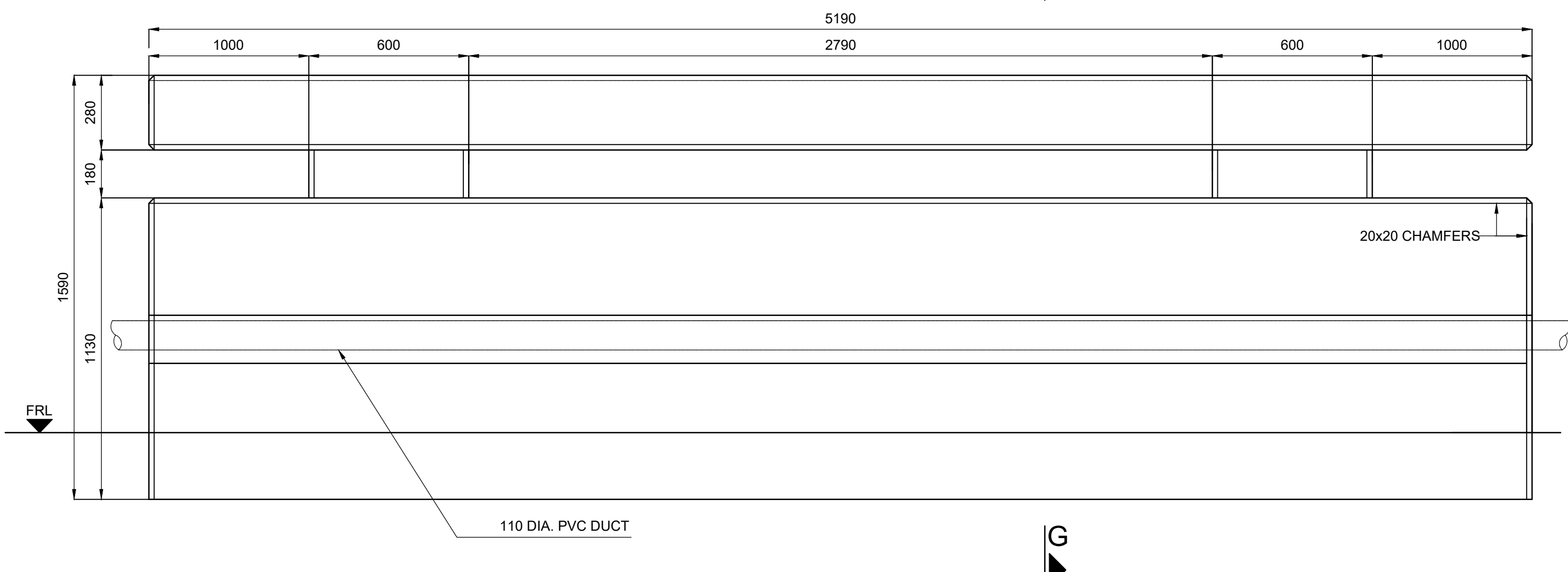


PLAN ON 10mm JOINT
SCALE 1:10



TYPICAL SECTION G-G
SCALE 1:15

ALL SHARP EDGES TO BE CHAMFERED 20x20mm U.N.O.



TYPICAL PARAPET INSIDE ELEVATION - PANEL 2
SCALE 1:15

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT



NANKHOO
CONSULTING ENGINEERS

Chief Engineer: Structural Design

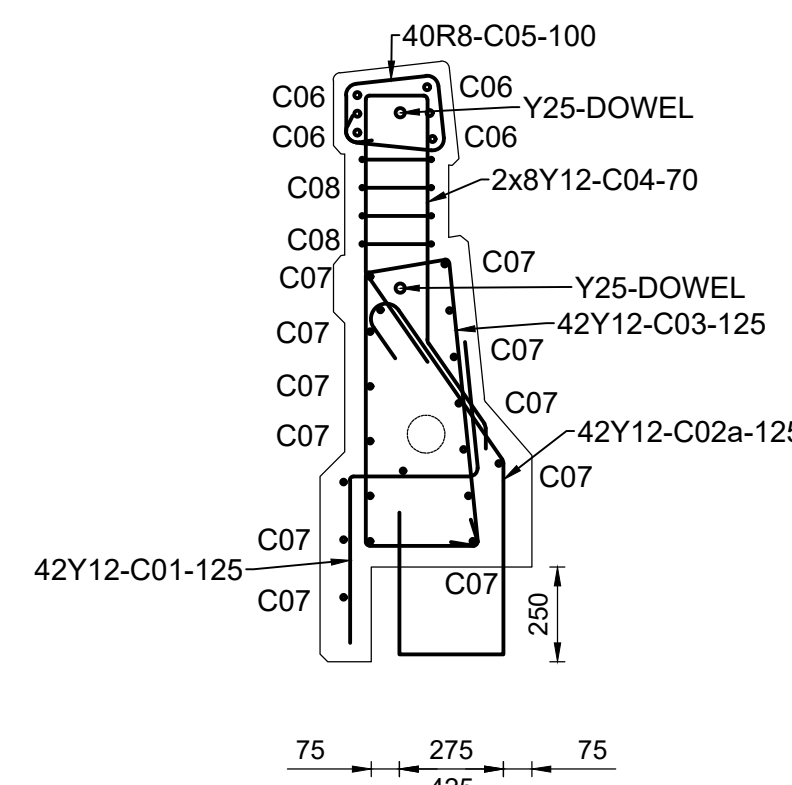
SIGNATURE DATE

Head: Transport

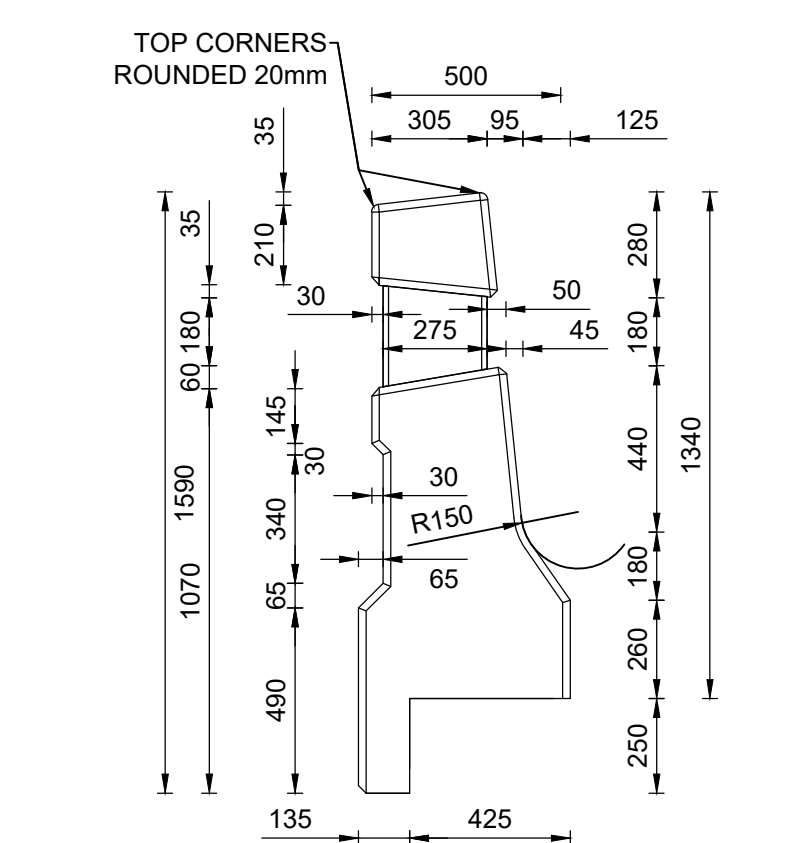
DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723		WGS 84:- -27.991748° Latitude 31.373728° Longitude	
PORTION		Staked km distance	Sheet 19 of 23
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE		Scale AS SHOWN	Plan No.:- 3521/19
PARAPET CONCRETE DETAILS			

FOR TENDER PURPOSES

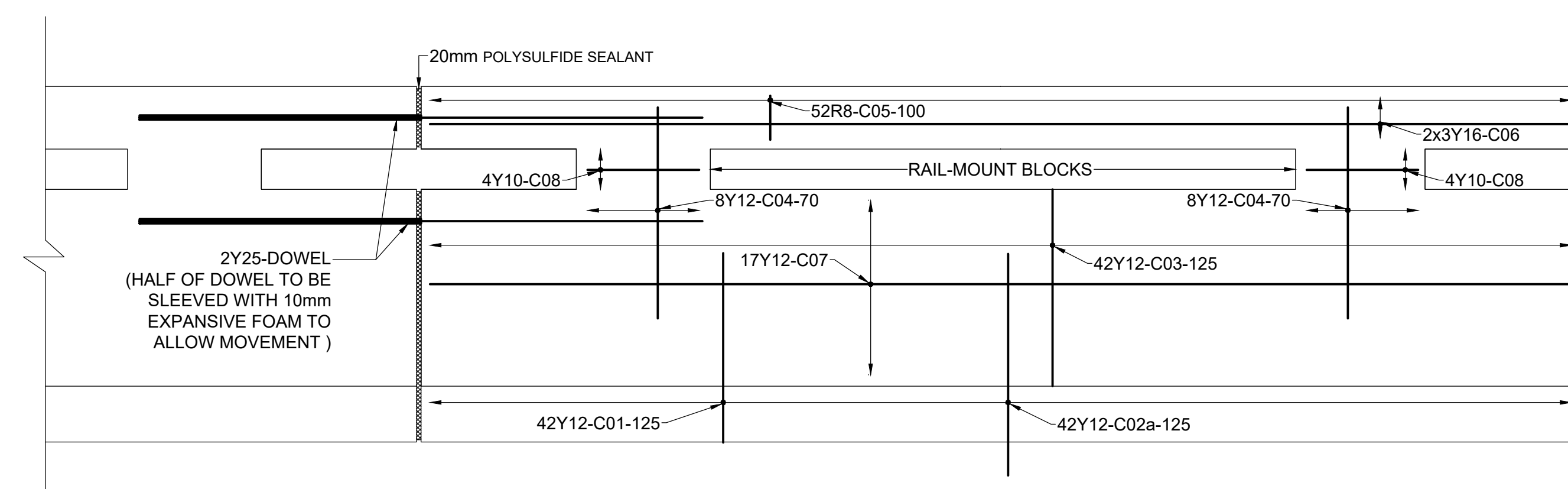
3521/19



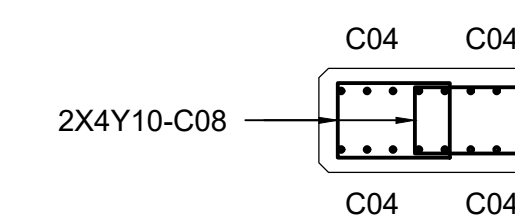
TYPICAL CROSS-SECTION THROUGH F-TYPE PARAPET
SCALE 1:20



TYPICAL SECTIONAL ELEVATION OF F-TYPE BARRIER SECTION
SCALE 1:20

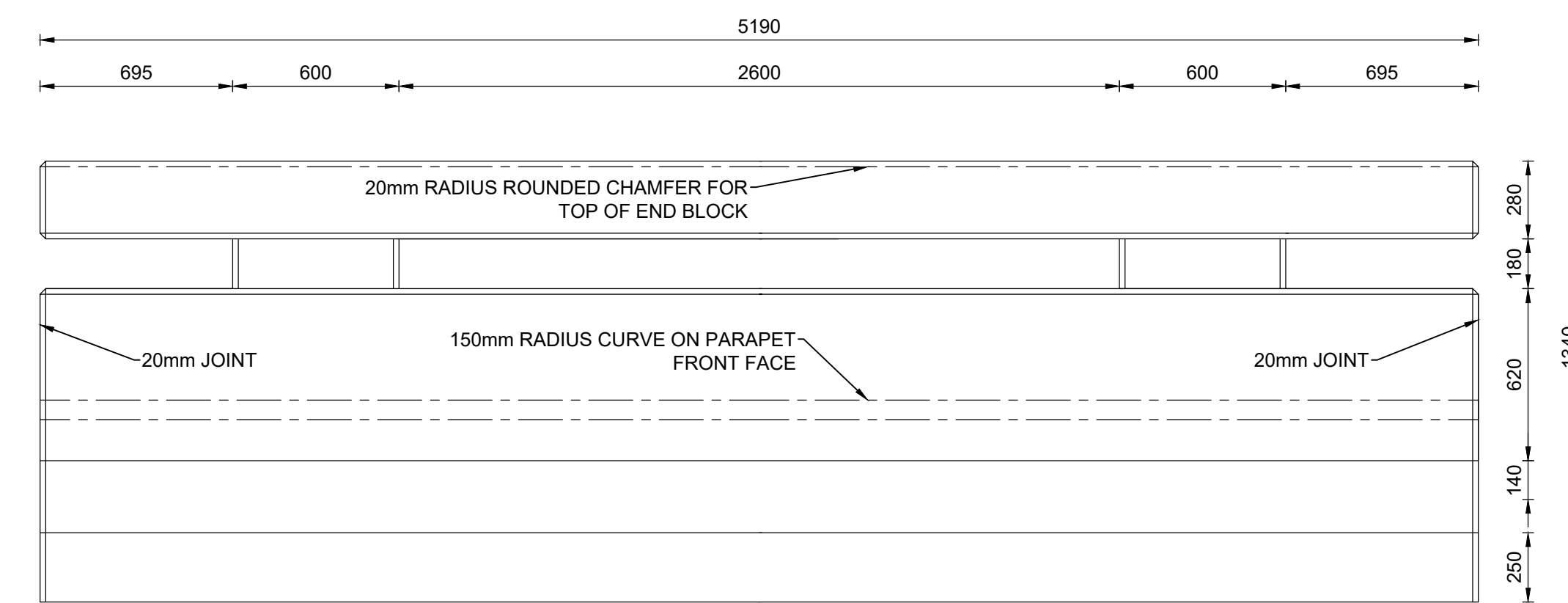


TYPICAL ELEVATION-SECTION THROUGH F-TYPE PARAPET (5.19m PANEL - 10 No. OFF PANELS)
SCALE 1:20

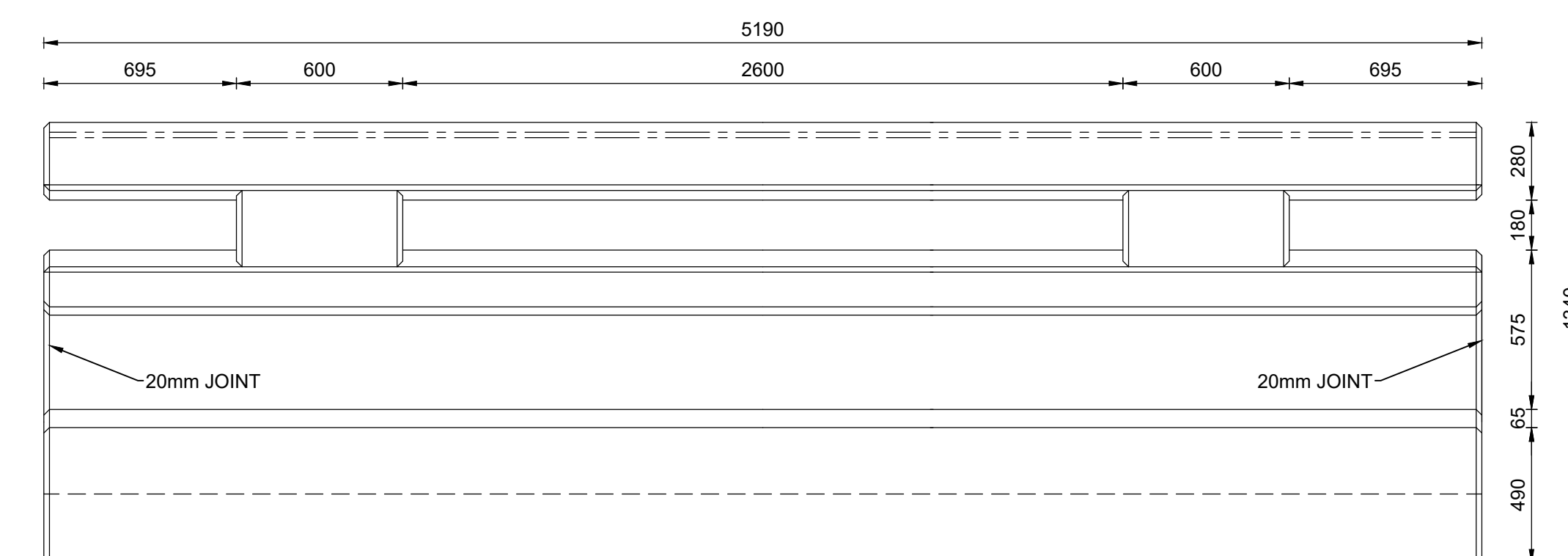


TYPICAL PLAN-SECTION THROUGH F-TYPE PARAPET RAIL-MOUNT BLOCK
SCALE 1:20

- NOTES :**
- MINIMUM CONCRETE COVER - 40mm ALL SIDES
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :-
 - B1 - LOWEST BOTTOM LAYER
 - B2 - SECOND LOWEST BOTTOM LAYER
 - T1 - TOPMOST TOP LAYER
 - T2 - SECOND HIGHEST TOP LAYER
 - EF - EACH FACE
 - EP - NEAR FACE
 - FF - FAR FACE
 - ALT. - ALTERNATING
 - STG. - STAGGERED
 - H. - HORIZONTAL
 - V. - VERTICAL
 - ABR. - ALTERNATE BAR REVERSED
 - EW. - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985 HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
 - F-TYPE BARRIER - 40/19 (40MPa)
 - CONCRETE FINISHES:
 - EXPOSED FACES - CLASS F2 (SMOOTH)
 - CONCEALED FACES - CLASS F1 (ROUGH)
 - ALL EXPOSED EDGES TO BE CHAMFERED 25 x 25
 - ALL DESIGNATED BARS FOR GALVANISING SHALL BE HEAVY DUTY HOT DIP GALVANISE IN ACCORDANCE WITH SANS 121: 2000 TO A ZINC COAT THICKNESS NOT LESS THAN 105 MICRONS.

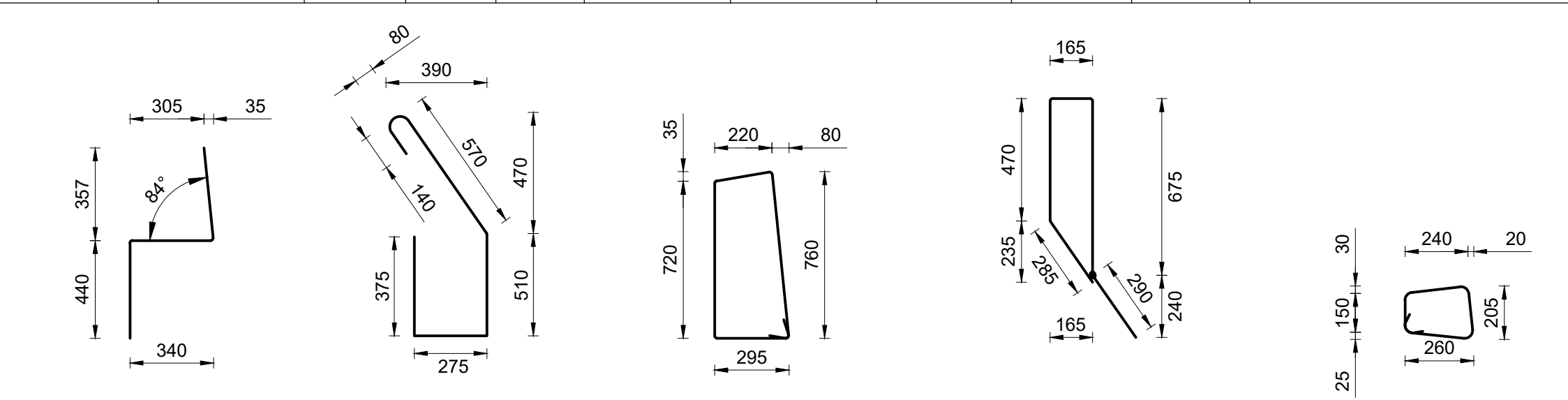


FRONT VIEW OF TYPE A PARAPET, F-TYPE BARRIER SECTION (5.19m PANEL)
SCALE 1:20



REAR VIEW OF TYPE A PARAPET, F-TYPE BARRIER SECTION (5.19m PANEL)
SCALE 1:20

REINFORCING SCHEDULE FOR F-TYPE BARRIER																
MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS
			TYPE	SIZE						A	B	C	D			
F-TYPE PARAPETS (5.19m PANEL)	10	C01	Y	12	125	42	420	99b	1045	SEE DETAIL BELOW				0.888	0.93	389.74
	10	C02a	Y	12	125	42	420	99c	1750	SEE DETAIL BELOW				0.888	1.55	652.68
	10	C03	Y	12	125	42	420	99d	1880	SEE DETAIL BELOW				0.888	1.67	701.16
	10	C04	Y	12	125	16	160	99e	1875	SEE DETAIL BELOW				0.888	1.67	266.40
	10	C05	Y	10	100	52	520	99f	940	SEE DETAIL BELOW				0.617	0.58	301.59
	10	C06	Y	16	SHOWN	6	60	20	5110					1.58	8.07	484.43
	10	C07	Y	16	SHOWN	17	170	20	5110					1.58	8.07	1372.55
	10	C08	Y	10	SHOWN	16	160	60	1470	500	175			0.617	0.91	145.12
	12	DOWEL	Y	25	SHOWN	2	24	20	2520	GALVANISED >105 MICRONS				3.85	9.70	232.85
													TOTAL KG HT STEEL		4546.52	
													TOTAL KG MS STEEL			
													TOTAL KG DOWELS		232.85	
												TOTAL KG STEEL		4546.52		



FOR DESIGN APPROVAL

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Supervising Engineer	Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Date	Design Plan No:-	Drawn by:- A. GUNAS
Supervising Authority	Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
	Cross Section No:-	File Reference:- D1724/6/3521/4

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

NANKHOO
 CONSULTING ENGINEERS
 GATEWAY OFFICE PARK, BLOCK ONE TEL: 0853 580600
 100 KAROO DRIVE, DURBAN FAX: 0853 580600
 4001 email: nankhoo@nankhoo.co.za

Chief Engineer: Structural Design

Head: Transport

SIGNATURE DATE

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:- -27.991748° Latitude
31.373728° Longitude

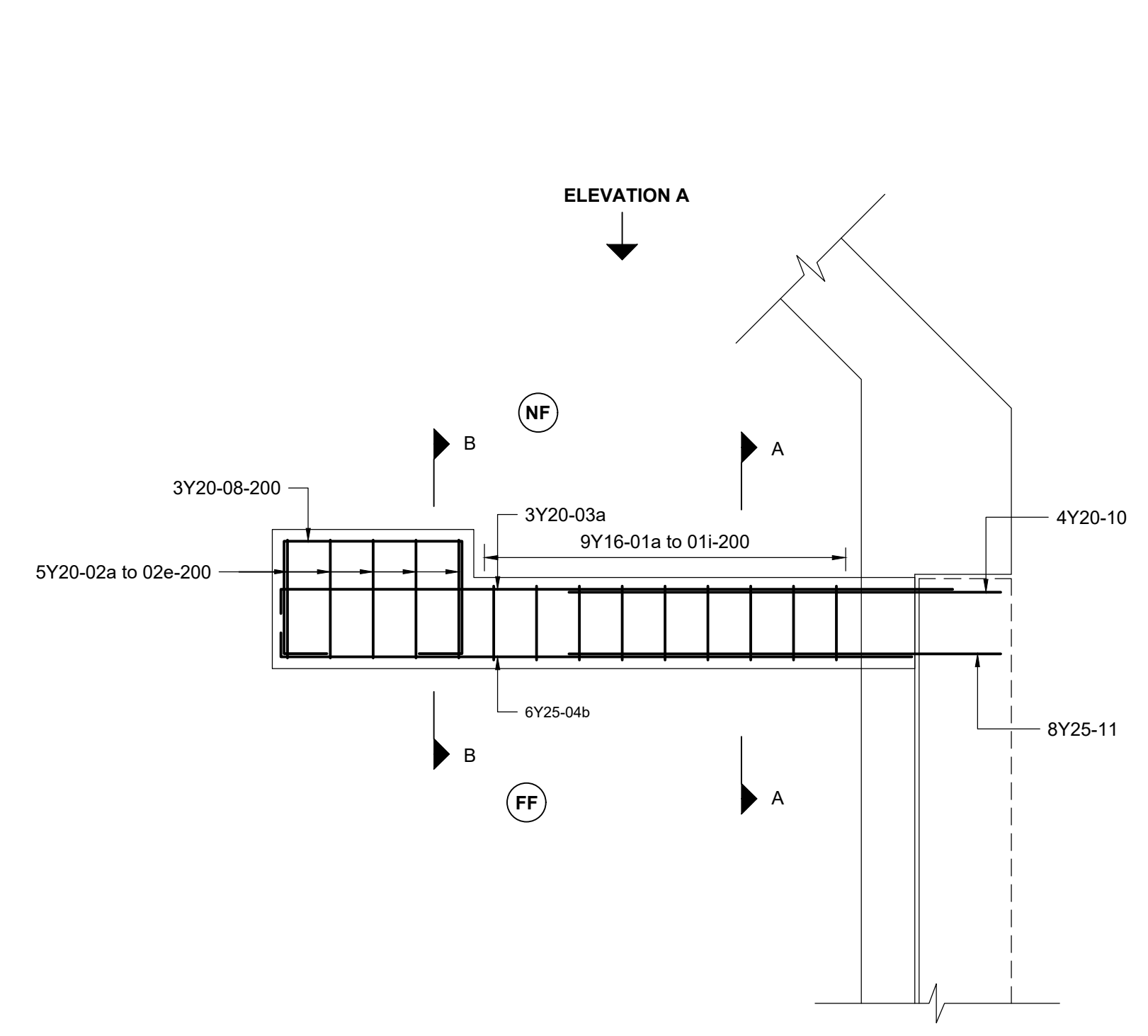
PORTION

VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE

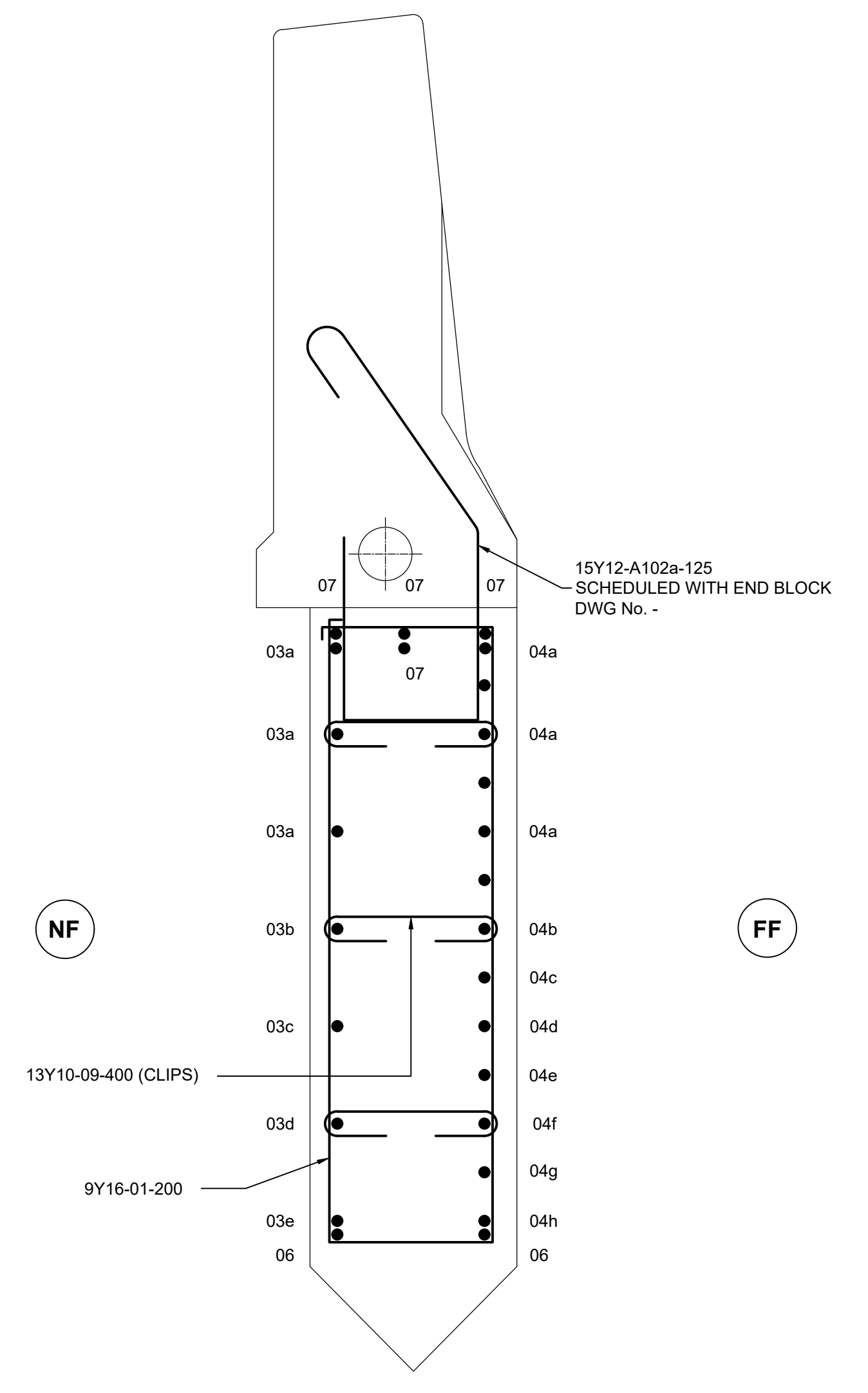
F-TYPE BARRIER STEEL

Staked km distance	Sheet 20
0.47	of 23
Scale	Plan No.:-
AS SHOWN	3521/20

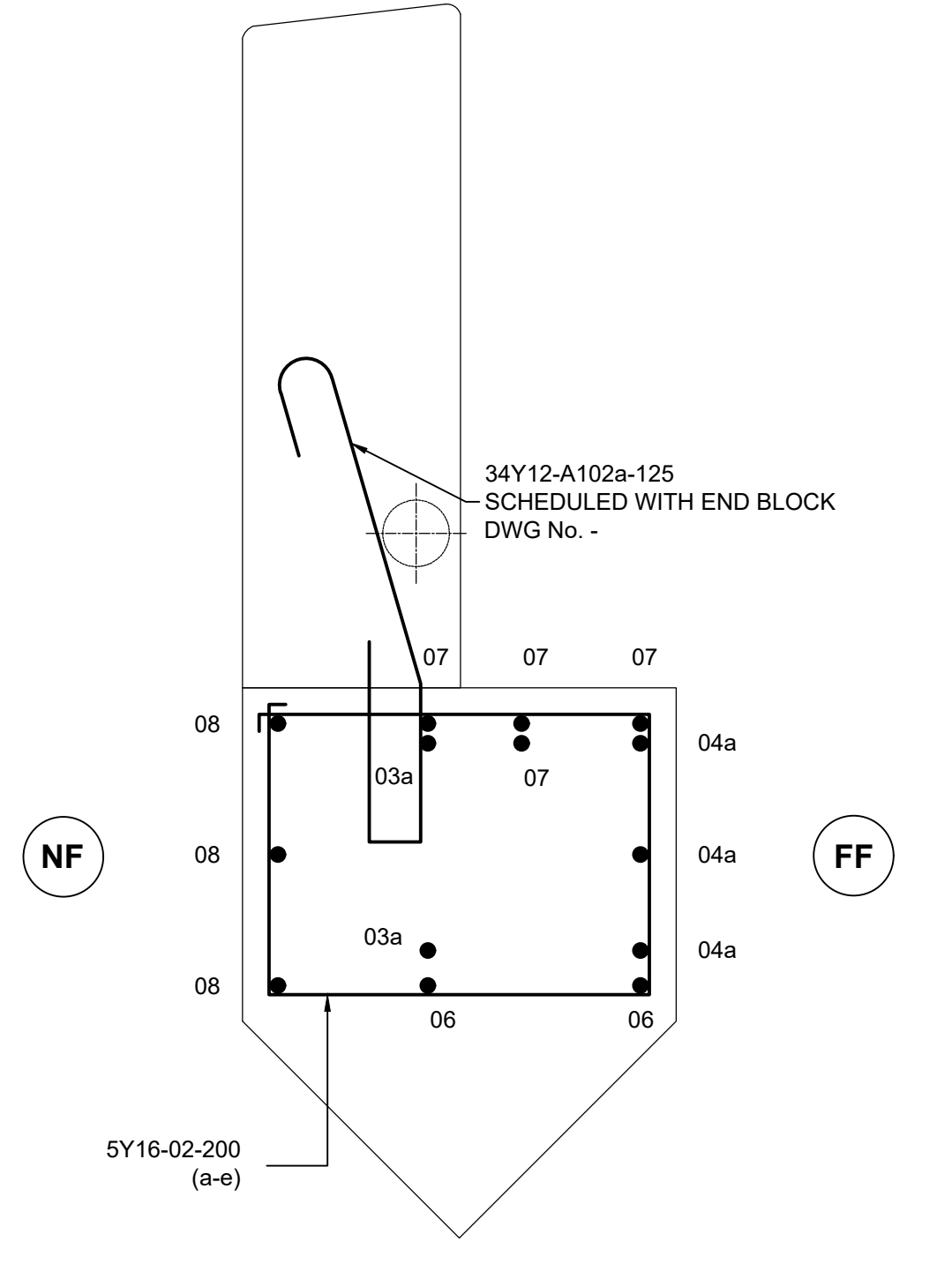
3521/20



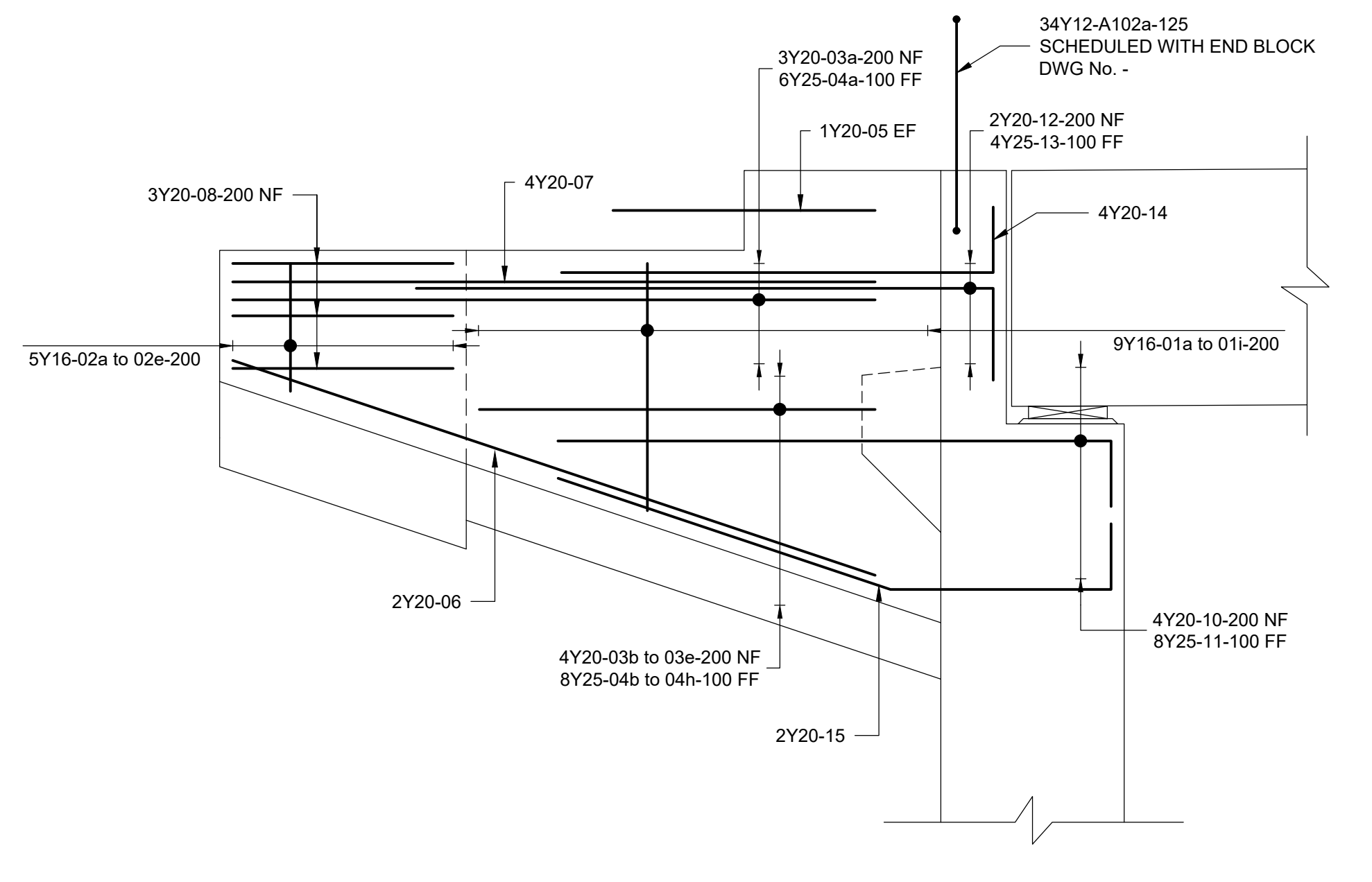
TYPICAL EARWALL PLAN
SCALE (1:25)



TYPICAL SECTION A - A
SCALE (1:10)



SECTION B - B
SCALE (1:10)



ELEVATION A
SCALE (1:20)

- NOTES:**
- MINIMUM CONCRETE COVER - 50mm ALL SIDES
 - REINFORCEMENT DETAILED IN ACCORDANCE WITH SABS 0144 - 1995
 - ABBREVIATIONS :-
 B1 - LOWEST BOTTOM LAYER
 B2 - SECOND LOWEST BOTTOM LAYER
 T1 - TOPMOST TOP LAYER
 T2 - SECOND HIGHEST TOP LAYER
 EF - EACH FACE
 NF - NEAR FACE
 FF - FAR FACE
 ALT. - ALTERNATING
 STG. - STAGGERED
 H. - HORIZONTAL
 V. - VERTICAL
 ABR. - ALTERNATE BAR REVERSED
 EW. - EACHWAY
 - MINIMUM LAP LENGTH TO BE 50 x DIA. OF THE SMALLER BAR
 - REINFORCEMENT TO CONFORM TO SABS 920-1985
 HOT ROLLED HIGH YIELD STRESS DEFORMED (Y) BARS - CHARACTERISTIC STRENGTH 450 MPa
 HOT ROLLED ROUND MILD STEEL (R) BARS - CHARACTERISTIC STRENGTH 250 MPa
 - CONCRETE CLASSES:
 EARWALL - 40/19 (40MPa)
 - CONCRETE FINISHES:
 EXPOSED FACES - CLASS F2 (SMOOTH)
 CONCEALED FACES - CLASS F1 (ROUGH)
 - ALL EXPOSED EDGES TO BE CHAMFERED 25 x 25
 - ALL DESIGNATED BARS FOR GALVANISING SHALL BE HEAVY DUTY
 HOT DIP GALVANISE IN ACCORDANCE WITH SANS 121: 2000 TO A ZINC COAT THICKNESS NOT LESS THAN 105 MICRONS.

MEMBER	NO. OF MEMBER	BAR MARK	BAR		SPACING	NO. PER MEMBER	TOTAL NUMBER	SHAPE CODE	LENGTH	BENDING				BAR KG/ METER	KG PER BAR	KG OF ALL BARS	
			TYPE	SIZE						A	B	C	D				E/r
EARWALL	4	01a	Y	16	200	1	4	60	2330	745	325			1.58	3.68	14.73	
	4	01b	Y	16	200	1	4	60	2470	815	325			1.58	3.90	15.61	
	4	01c	Y	16	200	1	4	60	2600	880	325			1.58	4.11	16.43	
	4	01d	Y	16	200	1	4	60	2730	945	325			1.58	4.31	17.25	
	4	01e	Y	16	200	1	4	60	2870	1015	325			1.58	4.53	18.14	
	4	01f	Y	16	200	1	4	60	3000	1080	325			1.58	4.74	18.96	
	4	01g	Y	16	200	1	4	60	3140	1150	325			1.58	4.96	19.84	
	4	01h	Y	16	200	1	4	60	3270	1215	325			1.58	5.17	20.67	
	4	01i	Y	16	200	1	4	60	3400	1280	325			1.58	5.37	21.49	
	4	02a	Y	20	200	1	4	60	2130	420	550			2.47	5.26	21.04	
	4	02b	Y	20	200	1	4	60	2270	490	550			2.47	5.61	22.43	
	4	02c	Y	20	200	1	4	60	2400	555	550			2.47	5.93	23.71	
	4	02d	Y	20	200	1	4	60	2530	620	550			2.47	6.25	25.00	
	4	02e	Y	20	200	1	4	60	2670	690	550			2.47	6.59	26.38	
	4	03a	Y	20	200	3	12	37	2725	325	2450			2.47	6.73	80.77	
4	03b	Y	20	200	1	4	37	1510	325	1510		CUT TO SIZE	2.47	3.73	14.92		
4	03c	Y	20	200	1	4	37	1510	325	1510		CUT TO SIZE	2.47	3.73	14.92		
4	03d	Y	20	200	1	4	37	1510	325	1510		CUT TO SIZE	2.47	3.73	14.92		
4	03e	Y	20	200	1	4	37	975	325	700		CUT TO SIZE	2.47	2.41	9.63		
4	04a	Y	25	100	6	24	37	2700	325	2450			3.85	10.40	249.48		
4	04b	Y	25	100	1	4	37	1510	325	1510		CUT TO SIZE	3.85	5.81	23.25		
4	04c	Y	25	100	1	4	37	1510	325	1510		CUT TO SIZE	3.85	5.81	23.25		
4	04d	Y	25	100	1	4	37	1510	325	1510		CUT TO SIZE	3.85	5.81	23.25		
4	04e	Y	25	100	1	4	37	1550	325	1300		CUT TO SIZE	3.85	5.97	23.87		
4	04f	Y	25	100	1	4	37	1500	325	1300		CUT TO SIZE	3.85	5.78	23.10		
4	04g	Y	25	100	1	4	37	950	325	700		CUT TO SIZE	3.85	3.66	14.63		
4	04h	Y	25	100	1	4	37	950	325	700		CUT TO SIZE	3.85	3.66	14.63		
4	05	Y	20	AS-SHOWN		1	4	20	1000	1000			2.47	2.47	9.88		
4	06	Y	20	AS-SHOWN		2	8	37	2855	325	2580		2.47	7.05	56.41		
4	07	Y	20	AS-SHOWN		4	16	37	2725	325	2450		2.47	6.73	107.69		
4	08	Y	20	200		3	12	60	3020	840	550		2.47	7.46	89.51		
4	09	Y	10	400		13	52	33	545	325			0.617	0.34	17.49		
4	10	Y	20	200		4	16	37	2410	350	2110		2.47	5.95	95.24		
4	11	Y	25	100		8	32	37	2385	350	2110		2.47	3.85	9.18	293.83	
4	12	Y	20	200		2	8	37	2500	350	2200		2.47	6.18	49.40		
4	13	Y	25	100		4	16	37	2475	350	2200		3.85	9.53	152.46		
4	14	Y	20	AS-SHOWN		4	16	37	1850	250	1650		2.47	4.57	73.11		
4	15	Y	20	AS-SHOWN		2	8	45	2340	1350	790	250	2.47	5.78	46.24		
													TOTAL KG HT STEEL		1803.58		
													TOTAL KG MS STEEL				
													TOTAL KG DOWELS				
													TOTAL KG STEEL		1803.58		

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer: _____ Date: _____

Supervising Authority: _____

Continued from:-
 Designed by:- Y. JEAON Pr Eng (202101910)
 Checked by:- P. NANKHOO Pr Eng (910350)
 Design Plan No:-
 Drawn by:- A. GUNAS
 Long Section No:-
 Checked by:- Y. JEAON Pr Eng (202101910)
 Cross Section No:-
 File Reference:- D1724/6/3521/4

PROVINCE OF KWAZULU-NATAL
 DEPARTMENT OF TRANSPORT

NANKHOO
 CONSULTING ENGINEERS

GATEWAY OFFICE PARK, BLOCK ONE TEL: 0850 58400
 100 KAROO DRIVE, DURBAN FAX: 0850 72322
 4001

Chief Engineer: Structural Design

Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
 -27.991748° Latitude
 31.373728° Longitude

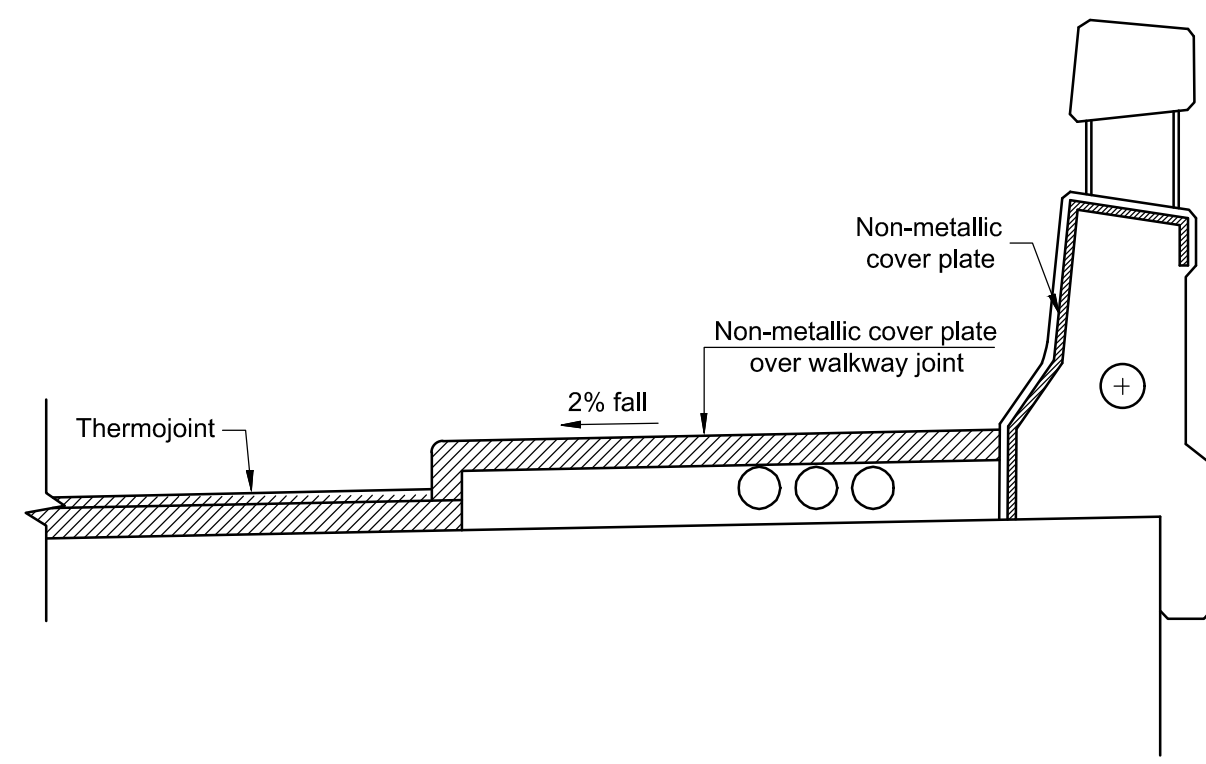
PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
 EARWALL STEEL

FOR DESIGN APPROVAL

Staked km distance: 0.47
 Sheet 22 of 23

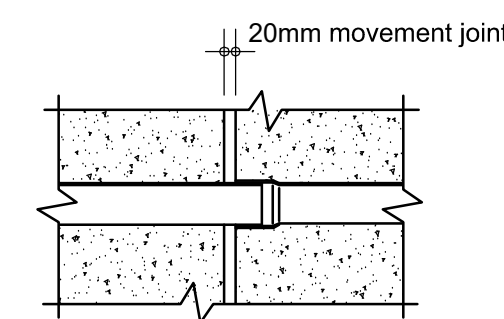
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 Plan No.: 3521/22

3521/22



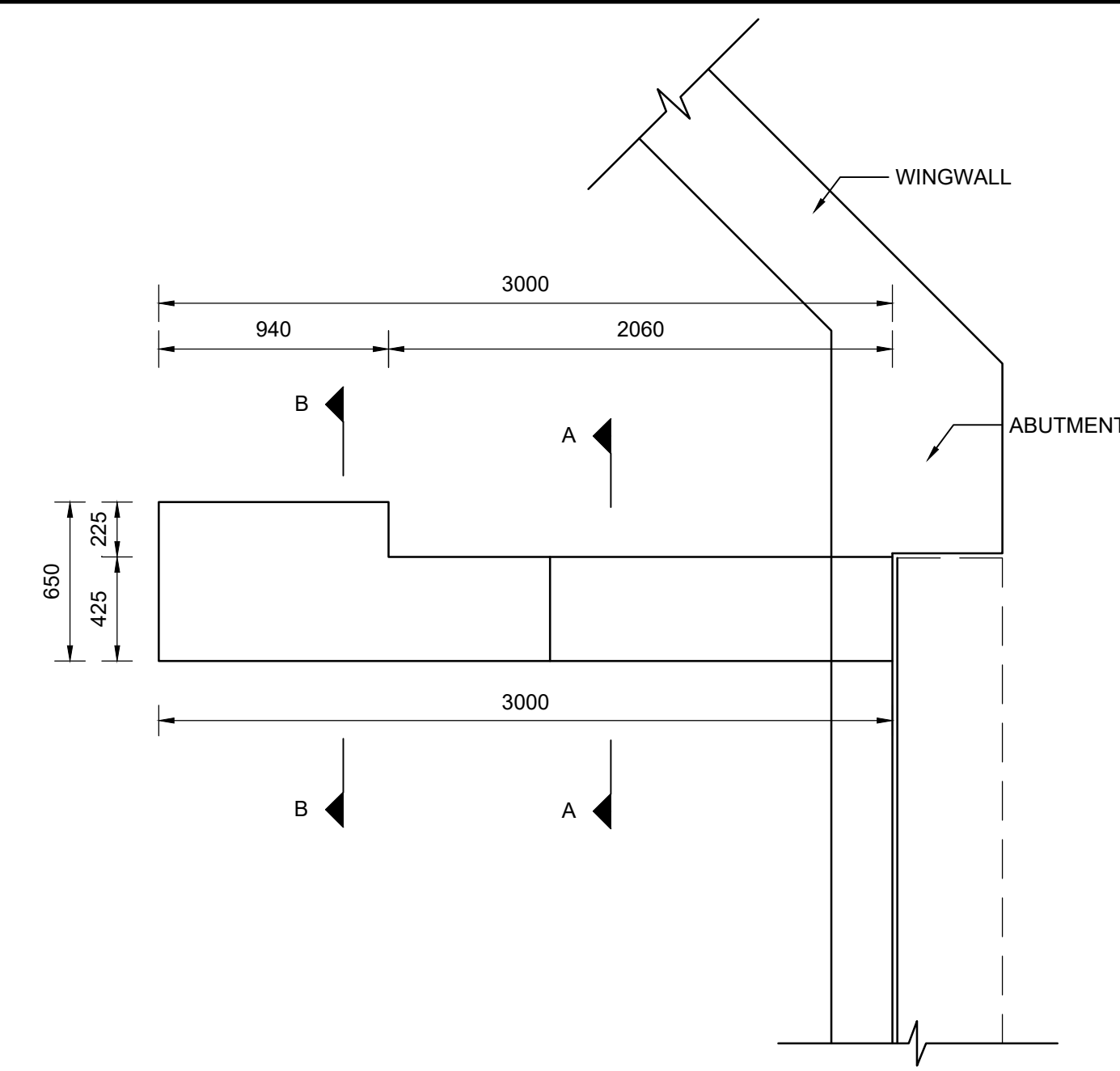
SECTION THROUGH EXPANSION JOINT RECESS
1:20

DETAIL OF uPVC SERVICE DUCTS ACROSS JOINTS
1:20

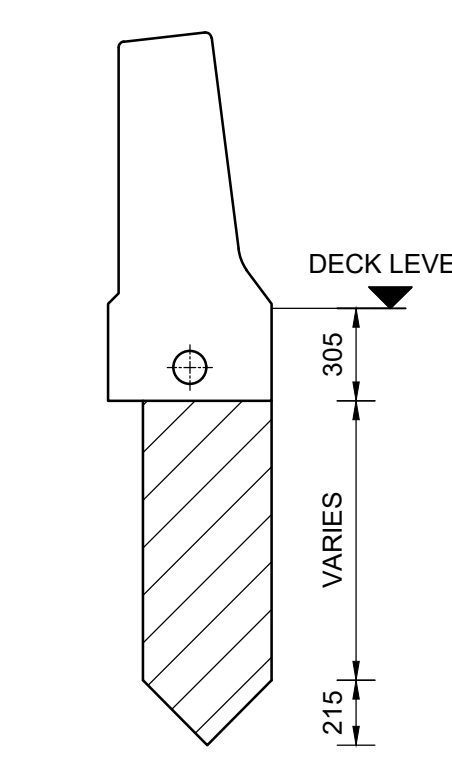


SECTION A-A
1:20

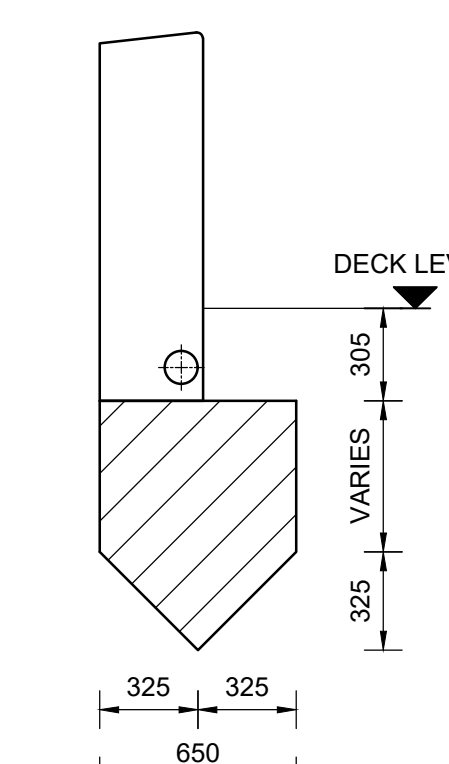
SECTION A-A
1:20



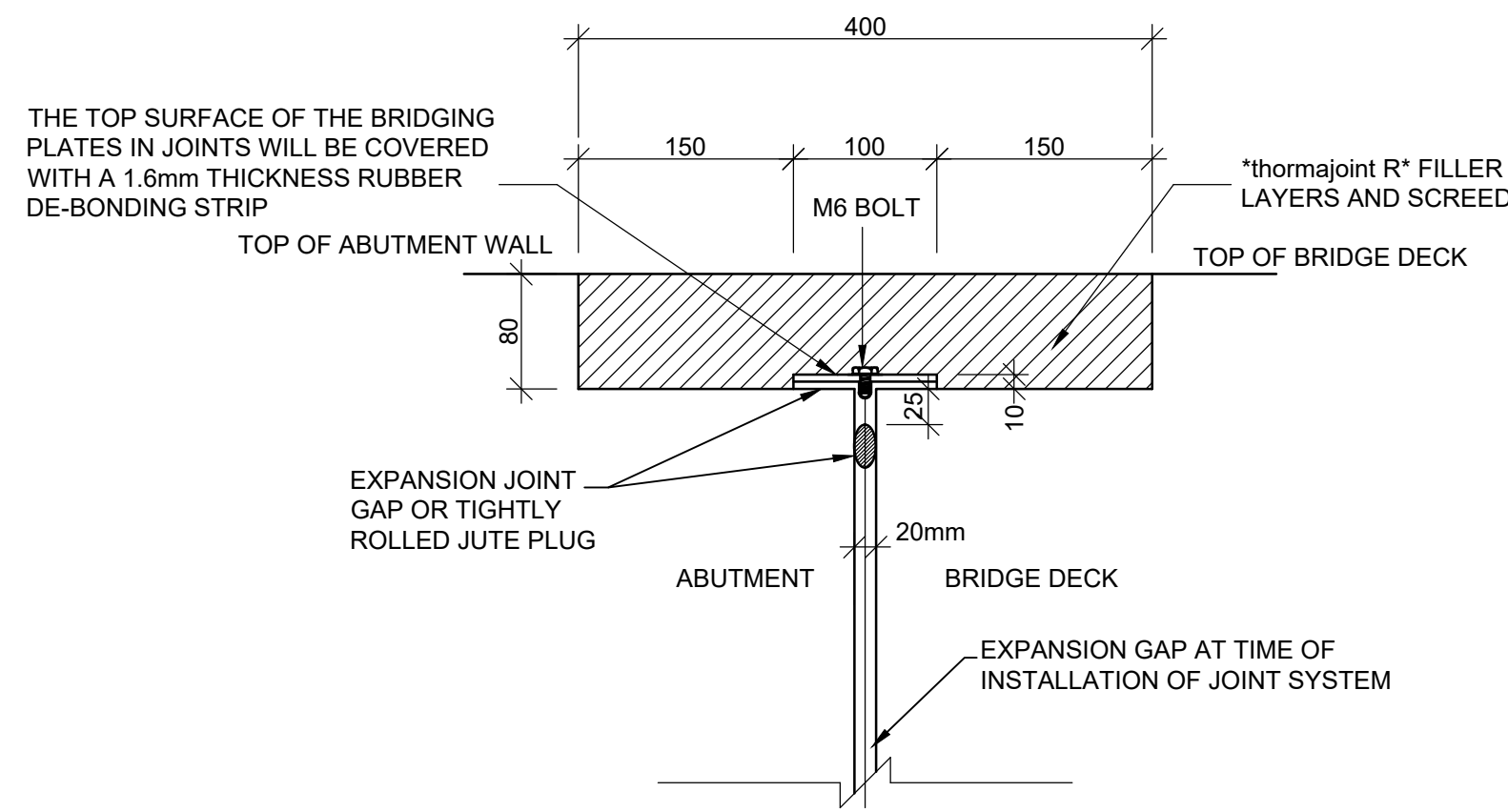
EAR WALL PLAN
SCALE (1:25)



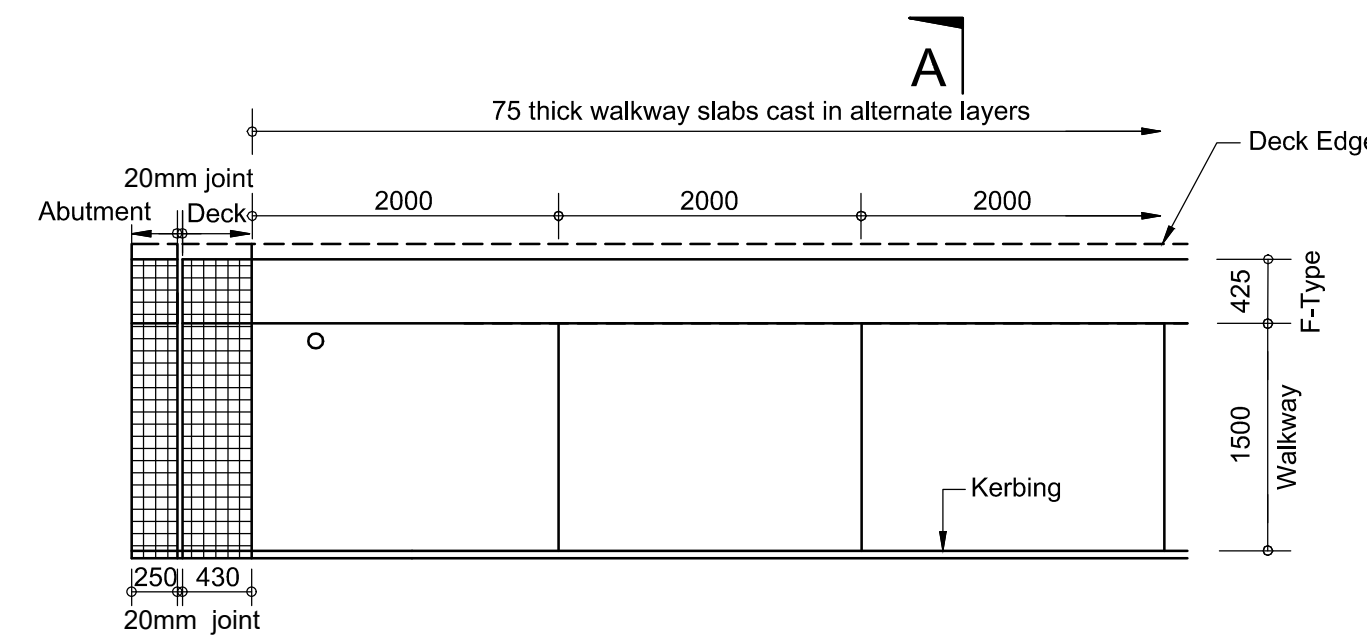
SECTION A - A
SCALE (1:25)



SECTION B - B
SCALE (1:25)



THORMAJOINT DETAIL
1:5

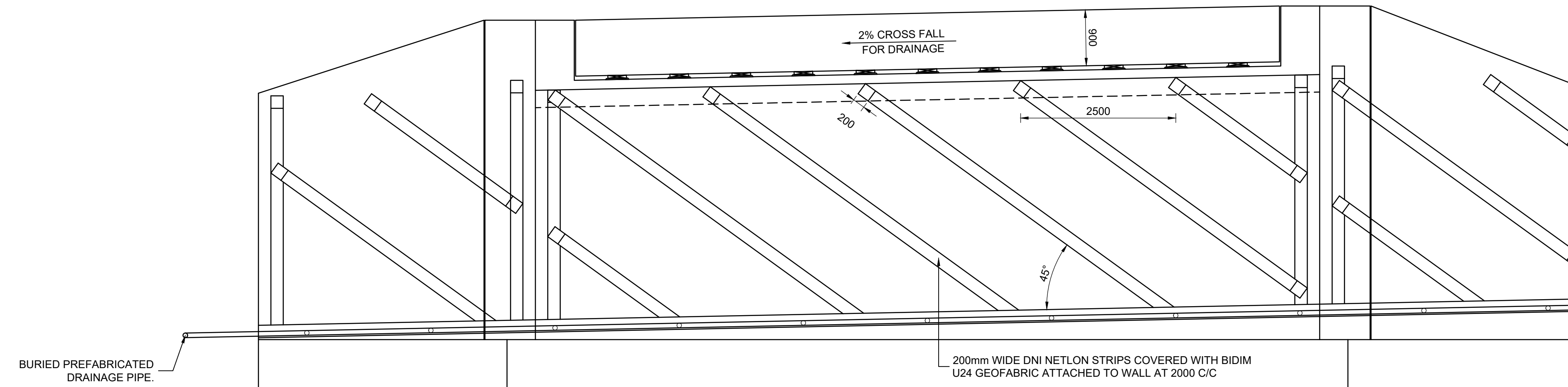


- Denotes 200 wide x 110 recesses either side of 30 wide expansion Recesses filled up with Class 40/13 nosing concrete after installation of the joint.
- Denotes 200 wide x 110 recesses either side of 30 wide expansion Recesses filled up with Class 40/13 nosing concrete after installation of the joint.

TYPICAL PLAN WALKING JOINT RECESSES AND WALKWAY DETAILS
1:50

WALKWAY NOTES

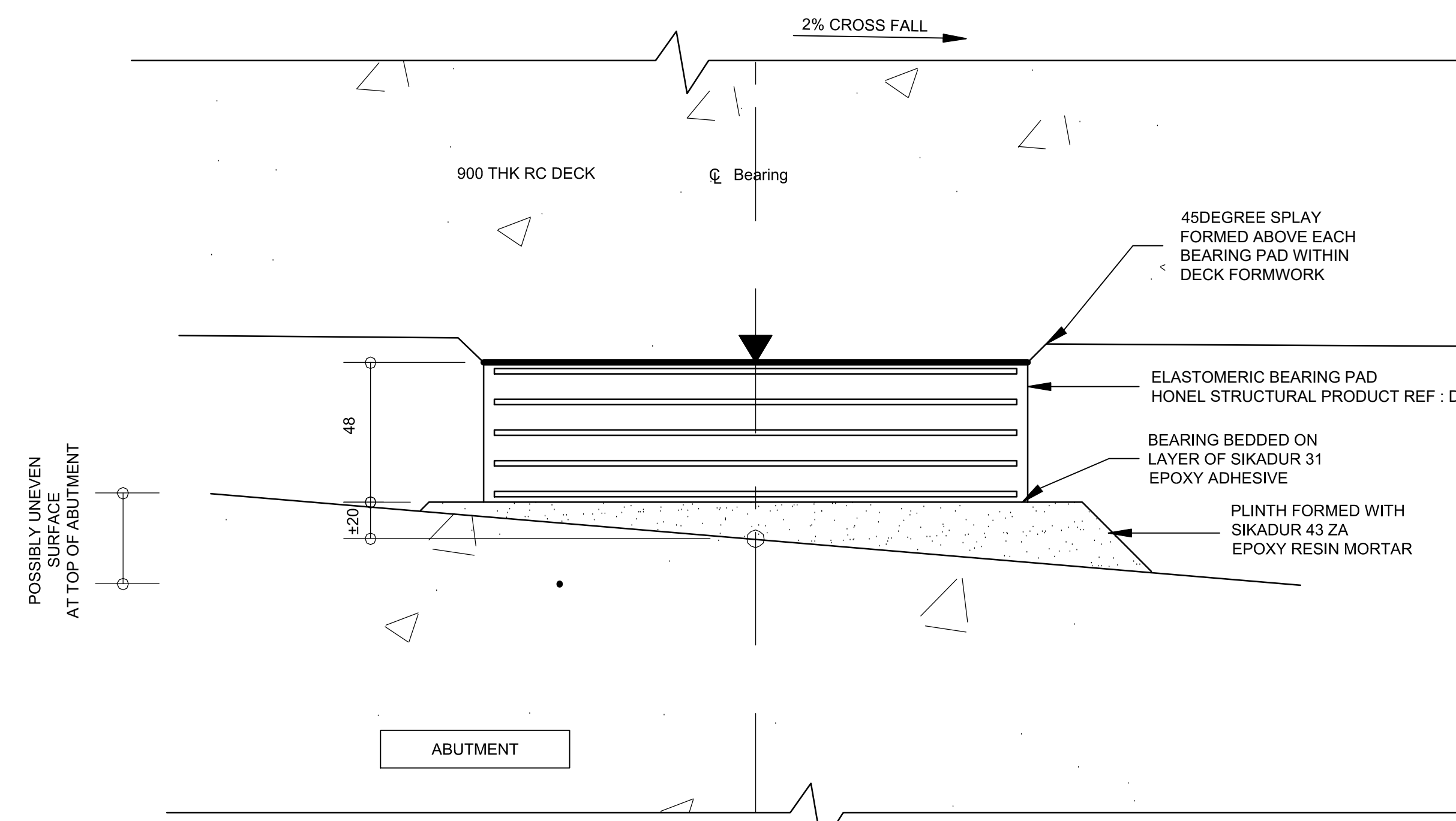
1. Class 20/19 concrete to walkway.
2. Class U2 surface finish to walkway slabs.
3. Class F2 surface finish to sides and ends of footway slabs.
4. Walkway expansion joint 10mm wide shall be provided at 12 metre centres. The joint filler shall consist of expanded polystyrene and the joint shall be sealed 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 6003 (a) (ii) for silicone sealants).
5. Mesh reinforcement Ref. 193 to walkway slabs.



TYPICAL NETLON DRAINAGE STRIPS DETAIL
SCALE 1:50

BEARING PADS SETTING OUT

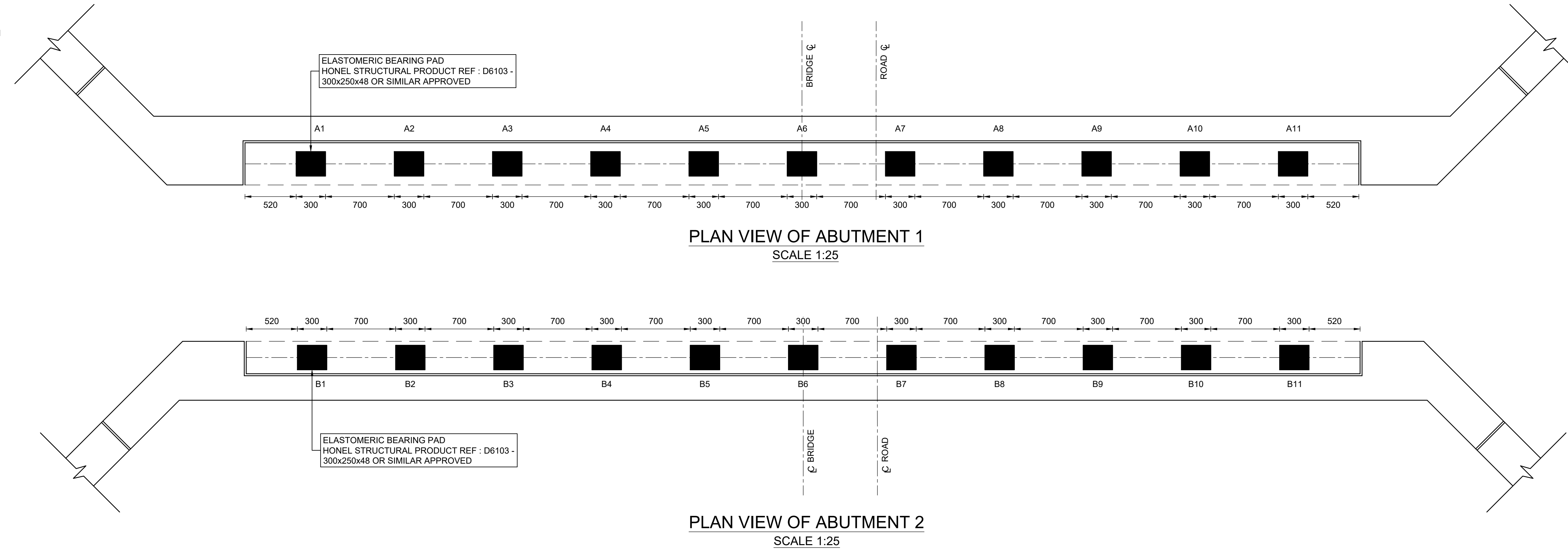
POINTS	X	Y	Z
A1	3097592.805	-36774.609	698.11
A2	3097593.248	-36773.713	698.09
A3	3097593.692	-36772.817	698.07
A4	3097594.136	-36771.920	698.05
A5	3097594.579	-36771.024	698.03
A6	3097595.023	-36770.128	698.01
A7	3097595.467	-36769.232	697.98
A8	3097595.911	-36768.336	697.96
A9	3097596.354	-36767.440	697.94
A10	3097596.798	-36766.543	697.92
A11	3097597.242	-36765.647	697.90
B1	3097569.845	-36763.241	698.23
B2	3097570.289	-36762.345	698.21
B3	3097570.733	-36761.448	698.19
B4	3097571.176	-36760.552	698.17
B5	3097571.620	-36759.656	698.15
B6	3097572.064	-36758.760	698.13
B7	3097572.507	-36757.864	698.10
B8	3097572.951	-36756.968	698.08
B9	3097573.395	-36756.072	698.06
B10	3097573.839	-36755.175	698.04
B11	3097574.282	-36754.279	698.02



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 ABUTMENT 1
SCALE 1:25

PLAN VIEW OF ABUTMENT 2
SCALE 1:25

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT	
Supervising Engineer	Date
Supervising Authority	

Continued from:-	Designed by:- Y. JEAOWN Pr Eng (202101910)
Continued on:-	Checked by:- P. NANKHOO Pr Eng (910350)
Design Plan No:-	Drawn by:- A. GUNAS
Long Section No:-	Checked by:- Y. JEAOWN Pr Eng (202101910)
Cross Section No:-	File Reference:- D1724/6/3521/4



PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

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Chief Engineer: Structural Design
Head: Transport

DISTRICT ROAD 1724 CEZA SCHOOL - DISTRICT ROAD 1723 WGS 84:-
-27.991748° Latitude
31.373728° Longitude
PORTION
VUNGU TRIBUTARY (KWACEZA) RIVER BRIDGE
MISCELLANEOUS DETAILS

FOR TENDER PURPOSES	
Staked km distance	Sheet 23 of 23
Scale AS SHOWN	Plan No.:- 3521/23