

LOCALITY PLAN

TP1802 - IZINGOLWENI PEDESTRIAN FACILITIES LIST OF DRAWINGS: PACKAGE A	
Drawing Number	Description
01 ROADS - KEY PLANS	
TP1802-19-05-25-01-001	LOCALITY PLAN & LIST OF DRAWINGS
02-ROADS - TYPICAL CROSS SECTIONS	
TP1802-19-05-25-02-001	TYPICAL CROSS SECTION SIDEWALKS - CUT CONDITIONS
TP1802-19-05-25-02-002	TYPICAL CROSS SECTION SIDEWALKS - FILL CONDITIONS
TP1802-19-05-25-02-003	TYPICAL CROSS SECTION WIDENING OF EXISTING SIDEWALKS
TP1802-19-05-25-02-004	TYPICAL CROSS SECTION SIDEWALKS EMBANKMENT STAIRS
04-ROADS - BASIC PAVEMENT DESIGN	
TP1802-19-05-25-04-001	BASIC PAVEMENT DESIGN FILL CONDITIONS
TP1802-19-05-25-04-002	BASIC PAVEMENT DESIGN CUT CONDITIONS
TP1802-19-05-25-04-003	BASIC PAVEMENT DESIGN RETAINING STRUCTURES
TP1802-19-05-25-04-004	BASIC PAVEMENT DESIGN WIDENING OF EXISTING SIDEWALKS
TP1802-19-05-25-04-005	BASIC PAVEMENT DESIGN BUS BAYS
05A - ACTIVITY PLANS	
TP1802-19-05-25-05A-001	PACKAGE A: N2-22 - ACTIVITY PLAN - SHEET 1 OF 4
TP1802-19-05-25-05A-002	PACKAGE A: N2-22 - ACTIVITY PLAN - SHEET 2 OF 4
TP1802-19-05-25-05A-003	PACKAGE A: N2-22 - ACTIVITY PLAN - SHEET 3 OF 4
TP1802-19-05-25-05A-004	PACKAGE A: N2-22 - ACTIVITY PLAN - SHEET 4 OF 4
05B - ACTIVITY PLANS SETTING OUT DATA	
TP1802-19-05-25-05B-001	SETTING OUT DATA
TP1802-19-05-25-05B-002	SETTING OUT DATA
07-GEOMETRIC LAYOUTS LAYBY	
TP1802-19-05-25-07-001	GEOMETRIC LAYOUT LAYBY KM 0,720 RIGHT
TP1802-19-05-25-07-002	GEOMETRIC LAYOUT LAYBY KM 0,900 LEFT
TP1802-19-05-25-07-003	GEOMETRIC LAYOUT LAYBY KM 5,540 RIGHT
TP1802-19-05-25-07-004	GEOMETRIC LAYOUT LAYBY KM 7,500 LEFT
08-ROADS - TYPICAL PLANS	
TP1802-19-05-25-08-001	TYPICAL DETAILS GUARDRAIL ELEMENT AND MOUNTING DETAILS
TP1802-19-05-25-08-002	TYPICAL DETAILS GUARDRAIL PLACING DETAILS
TP1802-19-05-25-08-003	TYPICAL DETAILS GUARDRAIL PLACING DETAILS AT BRIDGE APPROACHES (SINGLE CARRIAGEWAY)
TP1802-19-05-25-08-004	TYPICAL DETAILS TYPICAL DETAILS OF DANGER PLATES
TP1802-19-05-25-08-005	TYPICAL DETAILS INFORMATION BOARD DETAILS

TP1802 - IZINGOLWENI PEDESTRIAN FACILITIES LIST OF DRAWINGS: PACKAGE A	
TP1802-19-05-25-08-006	TYPICAL DETAILS STOCK PROOF FENCING 6 STRANDS ON TIMBER POSTS
TP1802-19-05-25-08-007	TYPICAL DETAILS STOCK PROOF FENCING 6 STRANDS ON STEEL POSTS AT BORROW PITS
TP1802-19-05-25-08-008	TYPICAL DETAILS PEDESTRIAN HANDRAILS
TP1802-19-05-25-08-009	TYPICAL DETAILS : PEDESTRIAN HANDRAILS
TP1802-19-05-25-08-010	TYPICAL DETAILS : PEDESTRIAN HANDRAILS
TP1802-19-05-25-08-011	TYPICAL DETAILS : F-SHAPE PARAPET ELECTRIFIED RAILWAY LINES - 1,64m HIGH: TYPE A & B
TP1802-19-05-25-08-012	TYPICAL DETAILS : TYPICAL STANDARD DETAILS PEDESTRIAN RAMPs FOR THE DISABLED
TP1802-19-05-25-08-013	TYPICAL LAYOUT OF OFFICES AND LABORATORY UNITS
TP1802-19-05-25-08-014	SECURITY FENCING AT OFFICES AND LABORATORIES
TP1802-19-05-25-08-015	NJ RETAINING WALL DETAILS GENERAL DETAILS
TP1802-19-05-25-08-016	NJ RETAINING WALL DETAILS ENDBLOCK DETAILS 01
TP1802-19-05-25-08-017	NJ RETAINING WALL DETAILS ENDBLOCK DETAILS 02
TP1802-19-05-25-08-018	NJ RETAINING WALL DETAILS BENDING SCHEDULES & MISCELLANEOUS DETAILS
09-ROADS - ACCOMMODATION OF TRAFFIC TYPICAL DETAILS	
TP1802-19-05-25-09-001	TEMPORARY SIGN SEQUENCE FOR SECONDARY ROADS SHOULDER CLOSURE
TP1802-19-05-25-09-002	TEMPORARY SIGN SEQUENCE FOR SECONDARY ROADS LANE CLOSURE (STOP/GO OPERATION)
TP1802-19-05-25-09-003	TRAFFIC CALMING MEASURES
TP1802-19-05-25-09-004	DETAILS OF SPEED HUMP
TP1802-19-05-25-09-005	TEMPORARY ROAD TRAFFIC MANAGEMENT : GENERAL DETAILS
TP1802-19-05-25-09-006	TEMPORARY ROAD TRAFFIC MANAGEMENT : TRAFFIC CALMING MEASURES
16-CATCHPIT - DETAIL CROSS SECTIONS	
TP1802-19-05-25-16-001	PACKAGE A: N2-22 CATCHPIT DETAIL SECTIONS
TP1802-19-05-25-16-002	PACKAGE A: N2-22 CATCHPIT DETAIL SECTIONS
TP1802-19-05-25-16-003	PACKAGE A: N2-22 CATCHPIT DETAIL SECTIONS
18-DRAINAGE - SCHEDULES	
TP1802-20-01-00-18-001	DRAIN SCHEDULES SHEET 1 OF 2
TP1802-20-01-00-18-002	DRAIN SCHEDULES SHEET 2 OF 2
19-DRAINAGE - TYPICAL DETAILS	
TP1802-19-05-25-19-001	DRAINAGE TYPICALS PIPE LAYING DETAILS
TP1802-19-05-25-19-002	DRAINAGE TYPICALS PRECAST CULVERT WINGWALLS DIMENSIONS
TP1802-19-05-25-19-003	DRAINAGE TYPICALS PRECAST CULVERT WINGWALLS REINFORCEMENT

TP1802 - IZINGOLWENI PEDESTRIAN FACILITIES LIST OF DRAWINGS: PACKAGE A	
TP1802-19-05-25-19-004	DRAINAGE TYPICALS PRECAST CULVERT WINGWALLS REINFORCEMENT SCHEDULE
TP1802-19-05-25-19-005	DRAIN TYPE DETAILS
TP1802-19-05-25-19-006	INLET STRUCTURES: KERB INLET FOR URBAN ENVIRONMENTS
TP1802-19-05-25-19-007	DRAINAGE TYPICALS: DOWNPIPE OUTLET AND STILLING BASIN
TP1802-19-05-25-19-008	DRAINAGE TYPICALS: GRID INLETS FOR TYPE F SIDE DRAINS
TP1802-19-05-25-19-009	DRAINAGE TYPICALS: GRID INLETS FOR TYPE E DRAINS
TP1802-19-05-25-19-010	DRAINAGE TYPICALS: PRECAST FIBRE CONCRETE GRID AND STEEL FRAME DETAILS
TP1802-19-05-25-19-011	DRAINAGE TYPICALS: GRID INLETS FOR MEDIANS: DUAL CARRIAGEWAY FIELD INLET AND DISH INLET
TP1802-19-05-25-19-012	DRAINAGE TYPICALS: GENERAL ARRANGEMENT OF MANHOLE AND GRID CHAMBERS
TP1802-19-05-25-19-013	DRAINAGE TYPICALS: CHUTES FOR TYPE F DRAINS
TP1802-19-05-25-19-014	DRAINAGE TYPICALS: TYPE C KERB ON RURAL BELLMOUTHS
TP1802-19-05-25-19-015	DRAINGAE TYPICALS: TYPICAL BERM ARRANGMENTS
TP1802-19-05-25-19-016	DRAINAGE TYPICALS: STONE PITCHING AND GABIONS SHEET 1 OF 3
TP1802-19-05-25-19-017	DRAINAGE TYPICALS: STONE PITCHING AND GABIONS SHEET 2 OF 3
TP1802-19-05-25-19-018	DRAINAGE TYPICALS: STONE PITCHING AND GABIONS SHEET 3 OF 3
TP1802-19-05-25-19-019	TYPICAL SUBSURFACE DRAINAGE DETAILS: TYPICAL SUBSOIL DRAIN CROSS SECTIONS
TP1802-19-05-25-19-020	TYPICAL SUBSURFACE DRAINAGE DETAILS: SUBSOIL CLEANING EYE JUNCTION BOX AND OUTLET MARKER
TP1802-19-05-25-19-021	TYPICAL SUBSURFACE DRAINAGE DETAIL: SUBSOIL DRAIN OUTLET STRUCTURES
TP1802-19-05-25-19-022	DRAINAGE TYPICALS: TYPE A DRAIN OUTLET TRANSITION
20-DETAIL CROSS SECTIONS N2-22 LEFT	
TP1802-19-05-25-20-001A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-002A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-003A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-004A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-005A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-006A	DETAIL CROSS SECTIONS
TP1802-19-05-25-20-007A	DETAIL CROSS SECTIONS
20-DETAIL CROSS SECTIONS N2-22 RIGHT	
TP1802-19-05-25-20-008B	DETAIL CROSS SECTIONS

FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
SANRAL PROJECT MANAGER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

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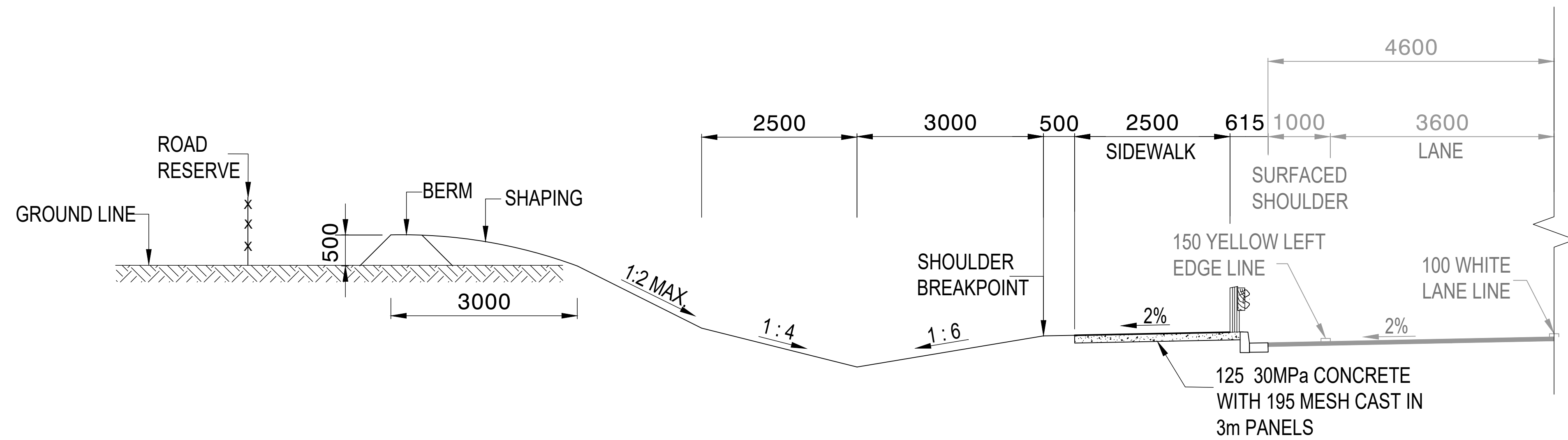
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58 van Eck Place
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3201
PO Box 100410
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3209
Tel: (033) 392 8100

ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD.
Date: _____

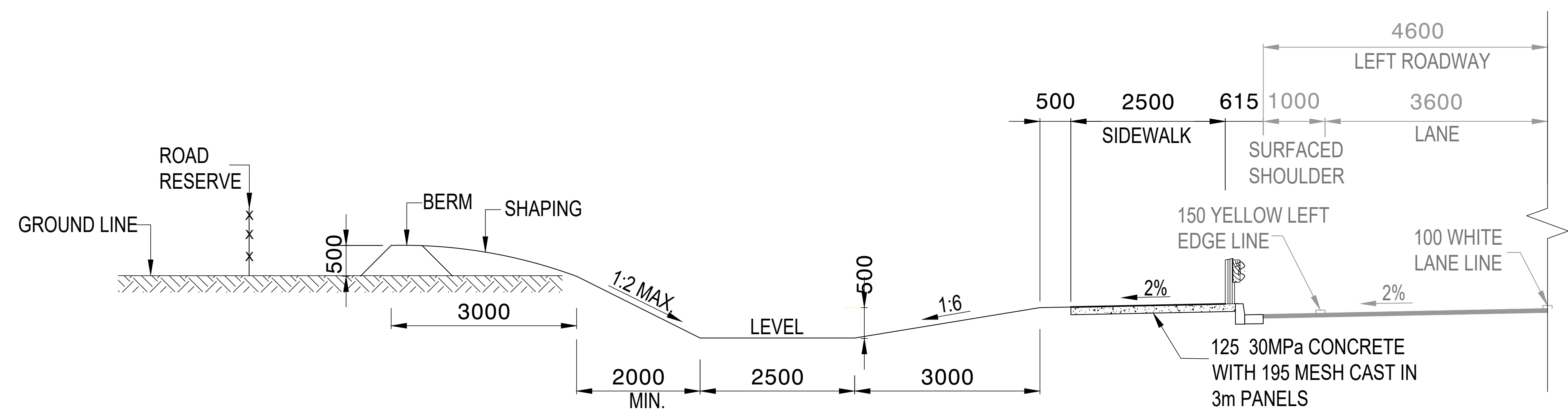
PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 LOCALITY PLAN AND LIST OF DRAWINGS	
SCALE : NTS	SHEET 1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	ROADS - LOCALITY		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-01-001		
SANRAL DOCUMENT #	-		VER V1

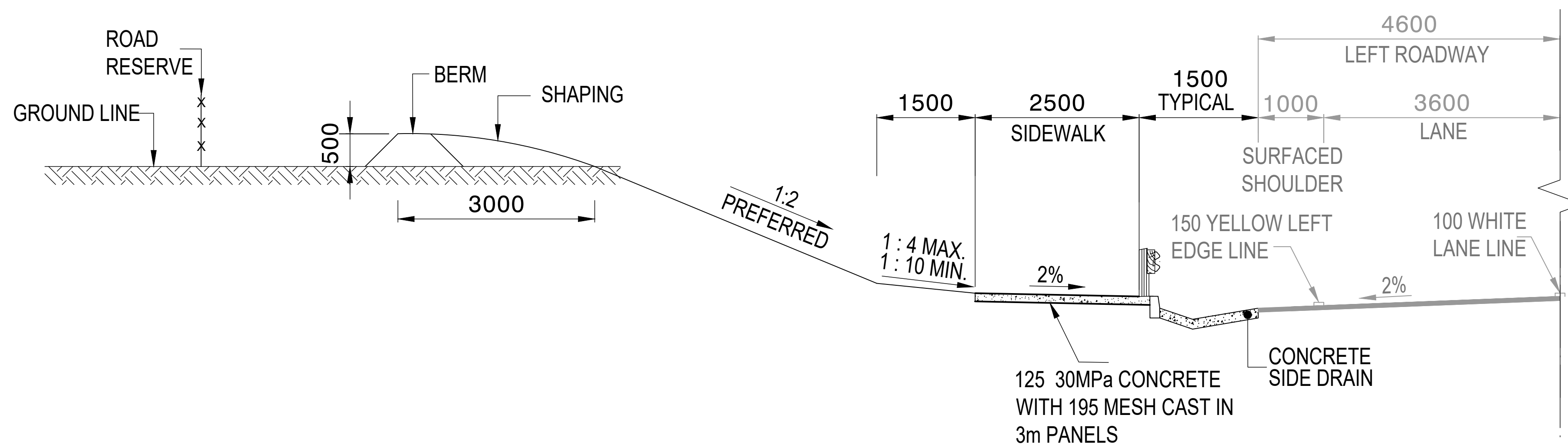
DRAWING No. TP1802-19-05-25-01-001



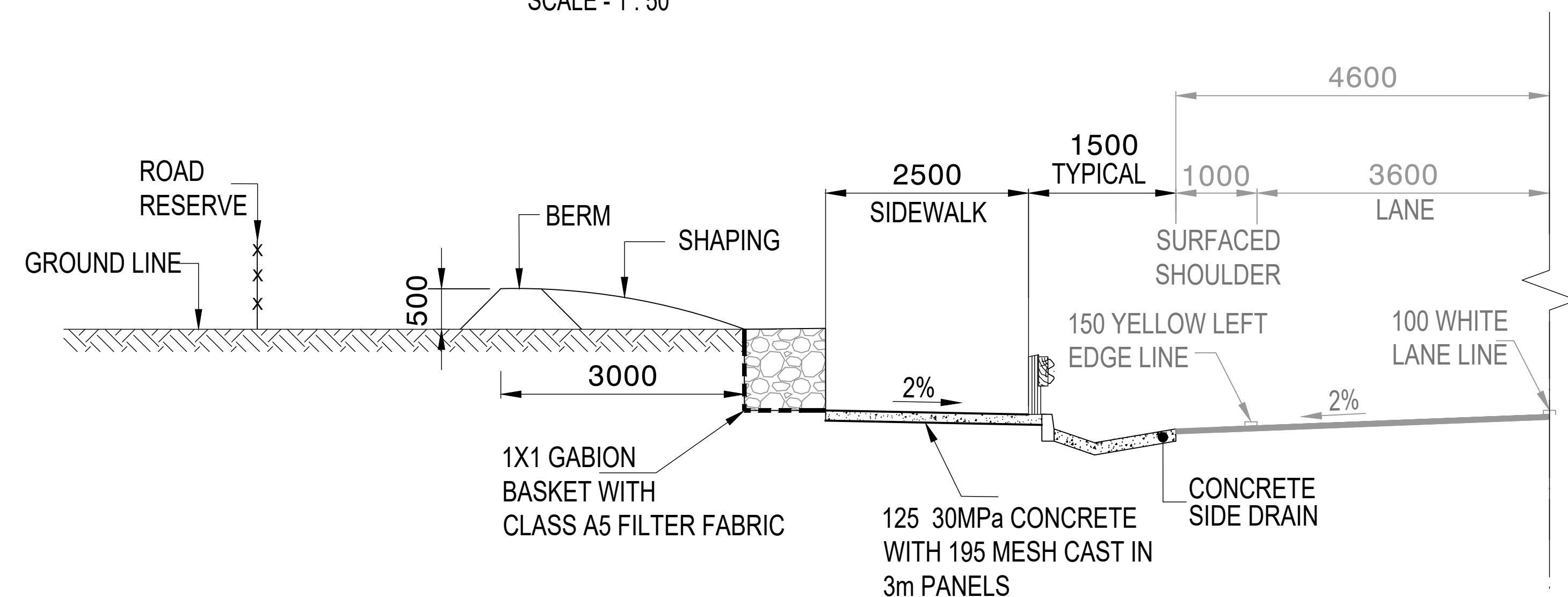
SHALLOW CUT (WITH "V" DRAIN)
CUT CONDITION - CASE C1
SCALE - 1 : 50



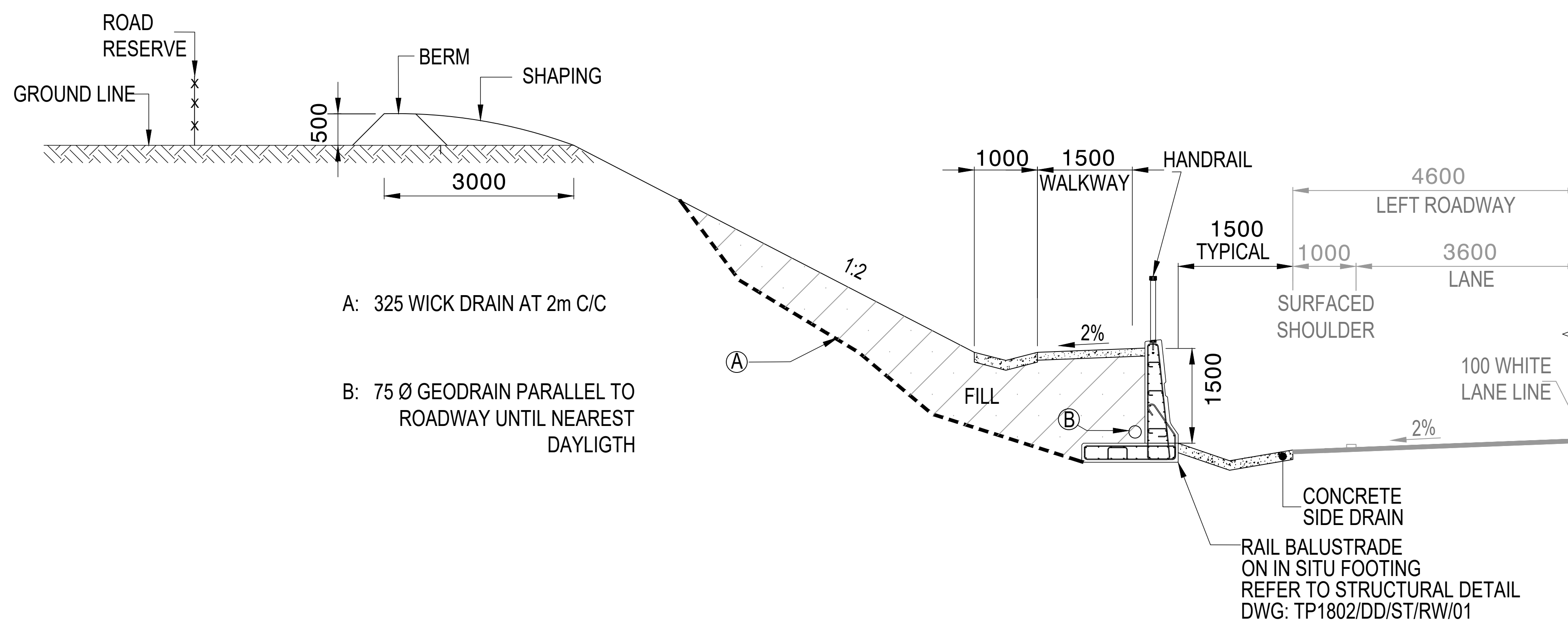
SHALLOW CUT (WITH LEVEL DRAIN)
CUT CONDITION - CASE C2
SCALE - 1 : 50



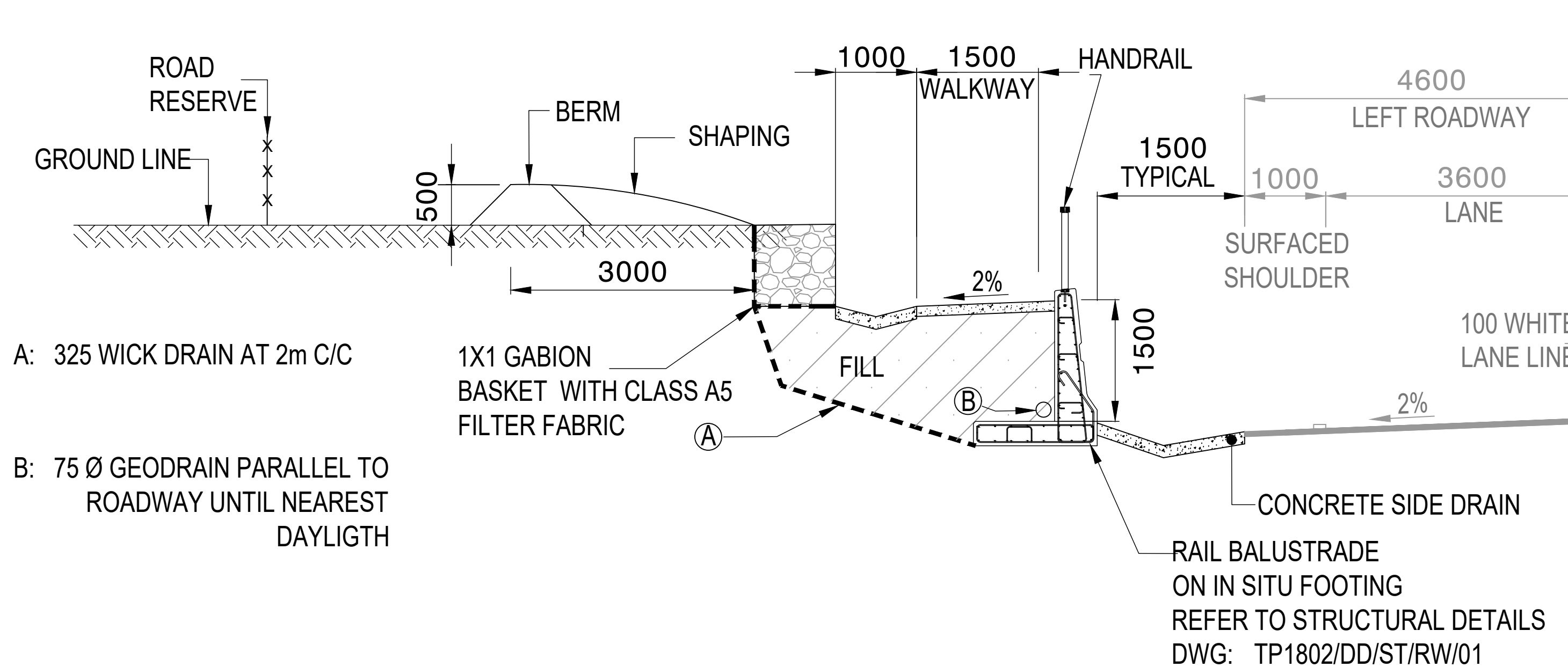
DEEP CUT WITHOUT ENTRAPMENT PROTECTION
CUT CONDITION - CASE C3A
SCALE - 1 : 50



DEEP CUT WITHOUT ENTRAPMENT PROTECTION
CUT CONDITION - CASE C3B
SCALE - 1 : 50



DEEP CUT WITH ENTRAPMENT PROTECTION
CUT CONDITION - CASE C4A
SCALE - 1 : 50



DEEP CUT WITH ENTRAPMENT PROTECTION
CUT CONDITION - CASE C4B
SCALE - 1 : 50

FOR TENDER PURPOSES

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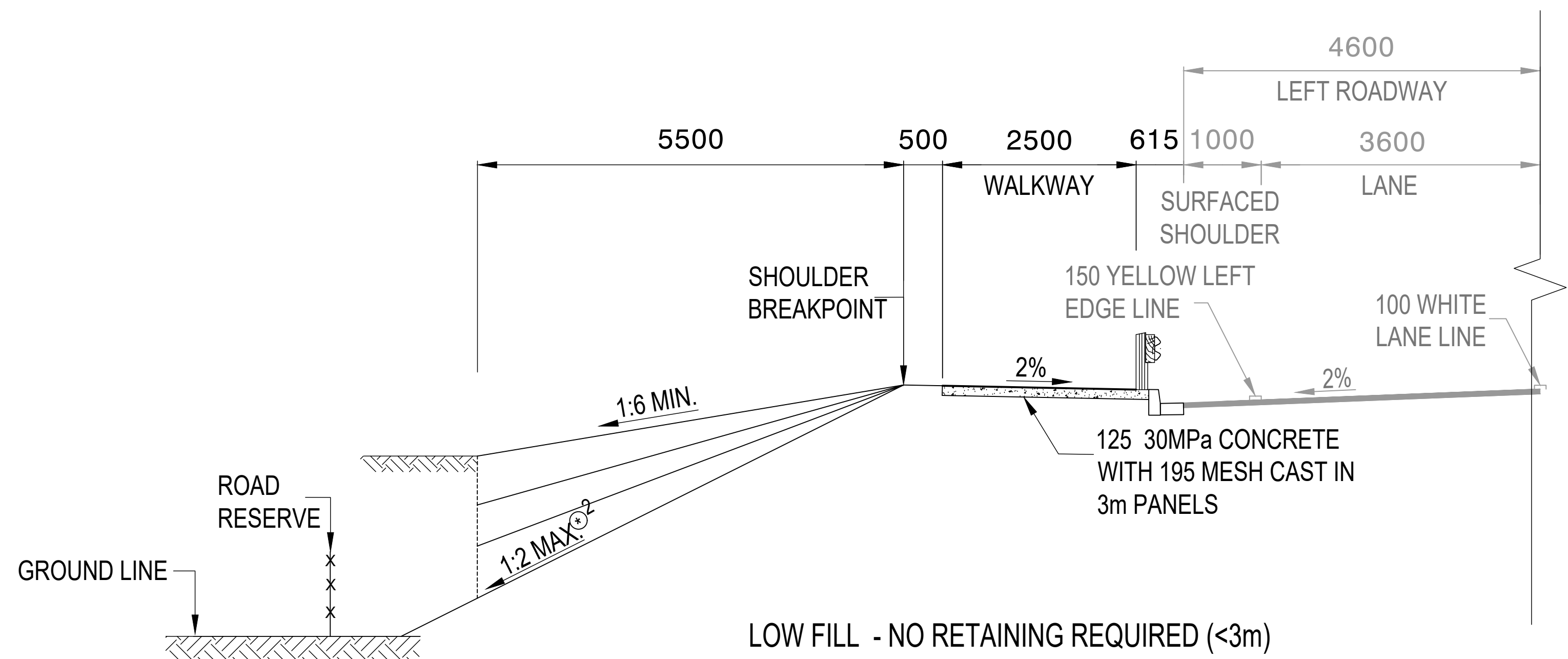
HEAD OFFICE			
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Tel: (012) 844 8000			

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Scottsville			
3209			
Tel: (033) 392 8100			

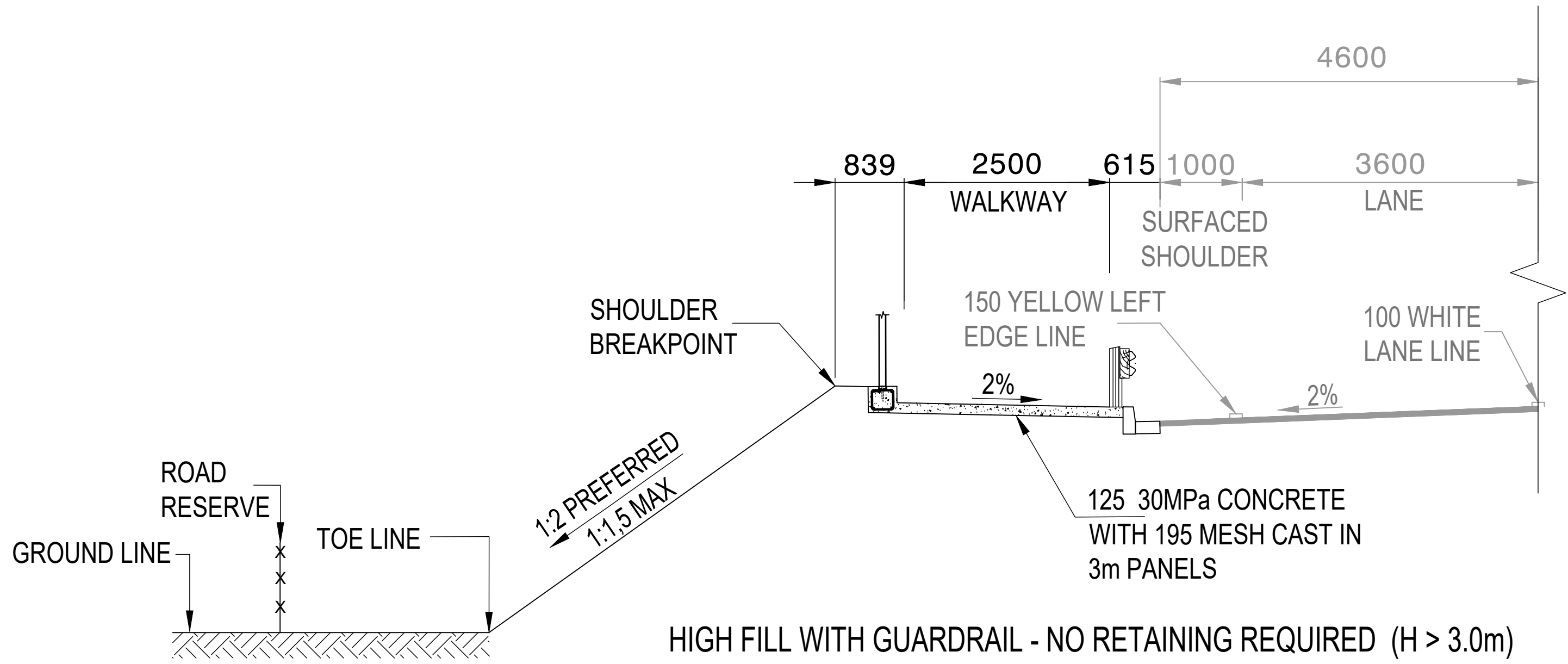
ACCEPTANCE			
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AND DOES NOT ATTRACT LEGAL LIABILITY OR			
LIABILITY OF ANY KIND FROM WHATSOEVER			
CAUSE OR HOWEVER ARISING			
for CEO: SA NATIONAL ROADS AGENCY LTD.			
Date:			

PROJECT DESCRIPTION			
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2,			
SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)			
DRAWING DESCRIPTION			
TYPICAL CROSS SECTION SIDEWALKS			
CUT CONDITIONS			
SCALE : AS SHOWN			
SHEET 1 OF 4			

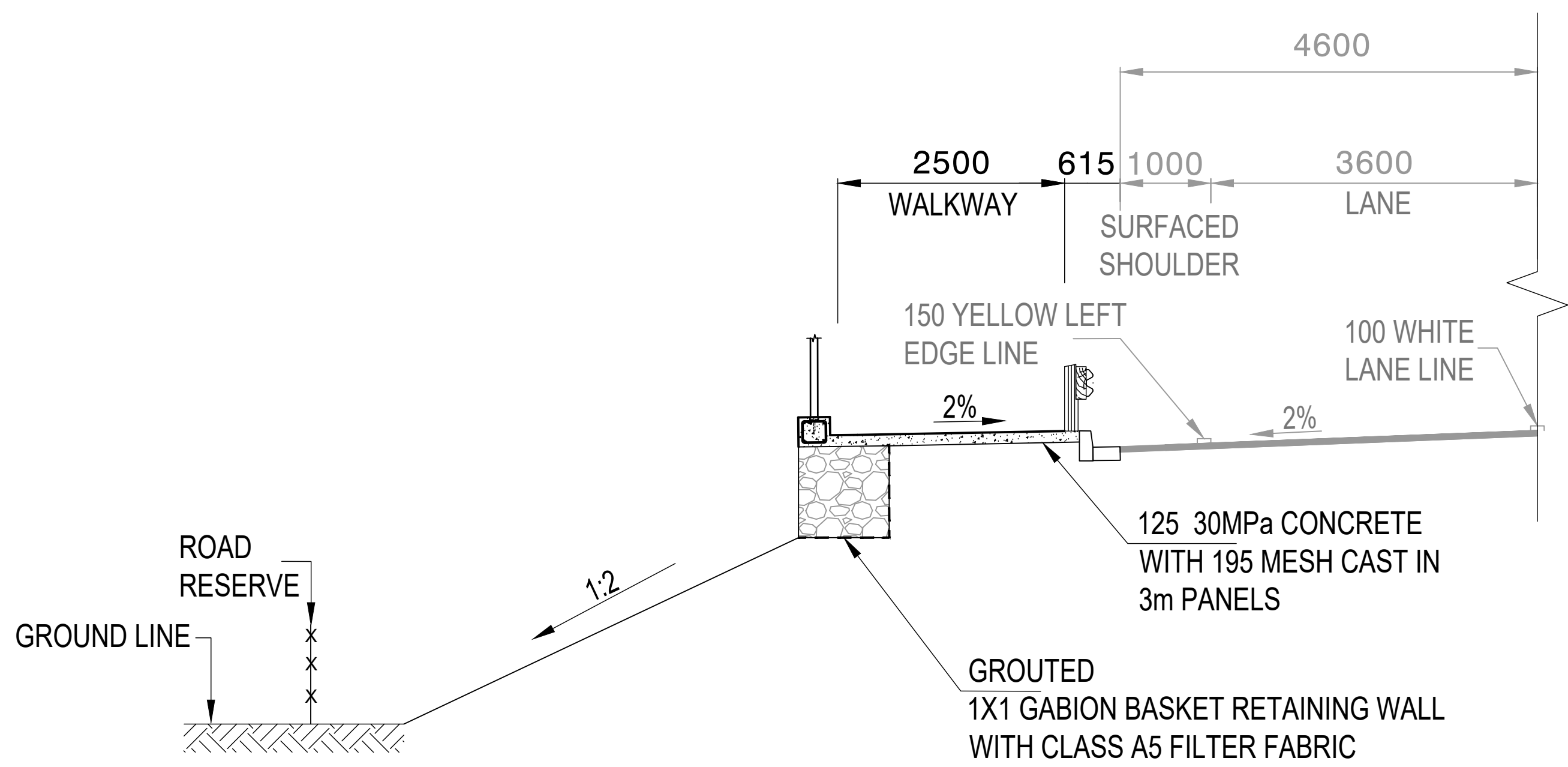
PROJECT NUMBER			
NRA.C.004-099-2023/1			
DRAWING LOCATION DATA			
ROUTE			
SECTION			
DRAWING km DISTANCE			
DRAWING TYPE			
BRIDGE/STRUCTURE No.			
CONSULTANT DRAWING No.			
SANRAL DOCUMENT #			



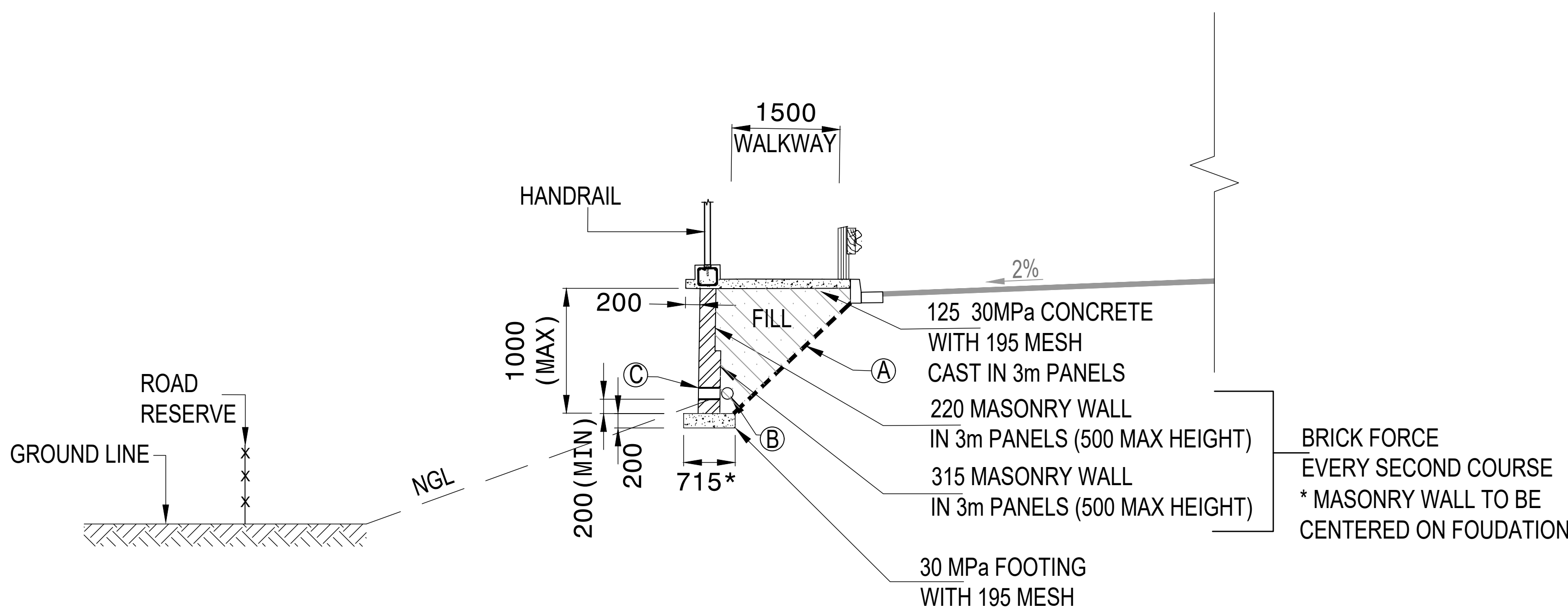
FILL CONDITION - CASE F1
SCALE - 1 : 50



FILL CONDITION - CASE F2
SCALE - 1 : 50



GABION RETAINING STRUCTURE (H < 1m):
FILL CONDITION - CASE F3
SCALE - 1 : 50



WALKWAY WITH MASONRY WALL (H 1m Max):
FILL CONDITION - CASE F4
SCALE - 1 : 50

A: 325 WICK DRAIN AT 2m C/C
B: 75 Ø GEODRAIN PARALLEL TO ROADWAY UNTIL DAYLIGHT
C: 75 Ø GEODRAIN OUTLET WRAPPED IN GRADE A4 GEOTEXTILE 20mC/C

FOR TENDER PURPOSES

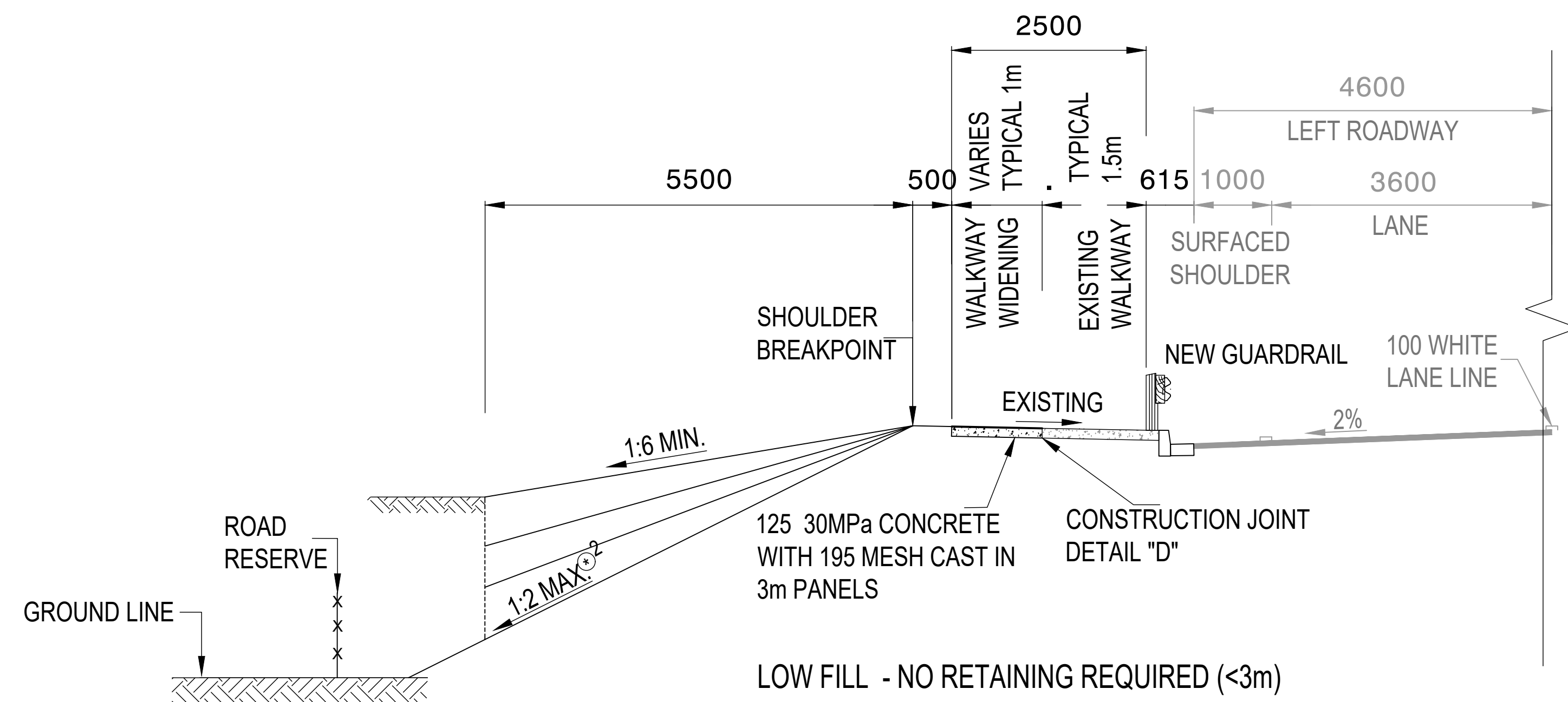
CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name :			
Prof. Reg. No. :			
Date :			
SANRAL PROJECT MANAGER			
Name :			
Prof. Reg. No. :			
Date :			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE		SANRAL		EASTERN REGION	
48 Tambotie Avenue		SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD		58 van Eck Place	
Val de Grace				Pietermaritzburg	
Pretoria				3201	
0184				PO Box 100410	
PO Box 415				Scottsville	
Pretoria 0001				3209	
South Africa				Tel: (033) 392 8100	
Tel: (012) 844 8000		BUILDING SOUTH AFRICA			
		THROUGH BETTER ROADS			

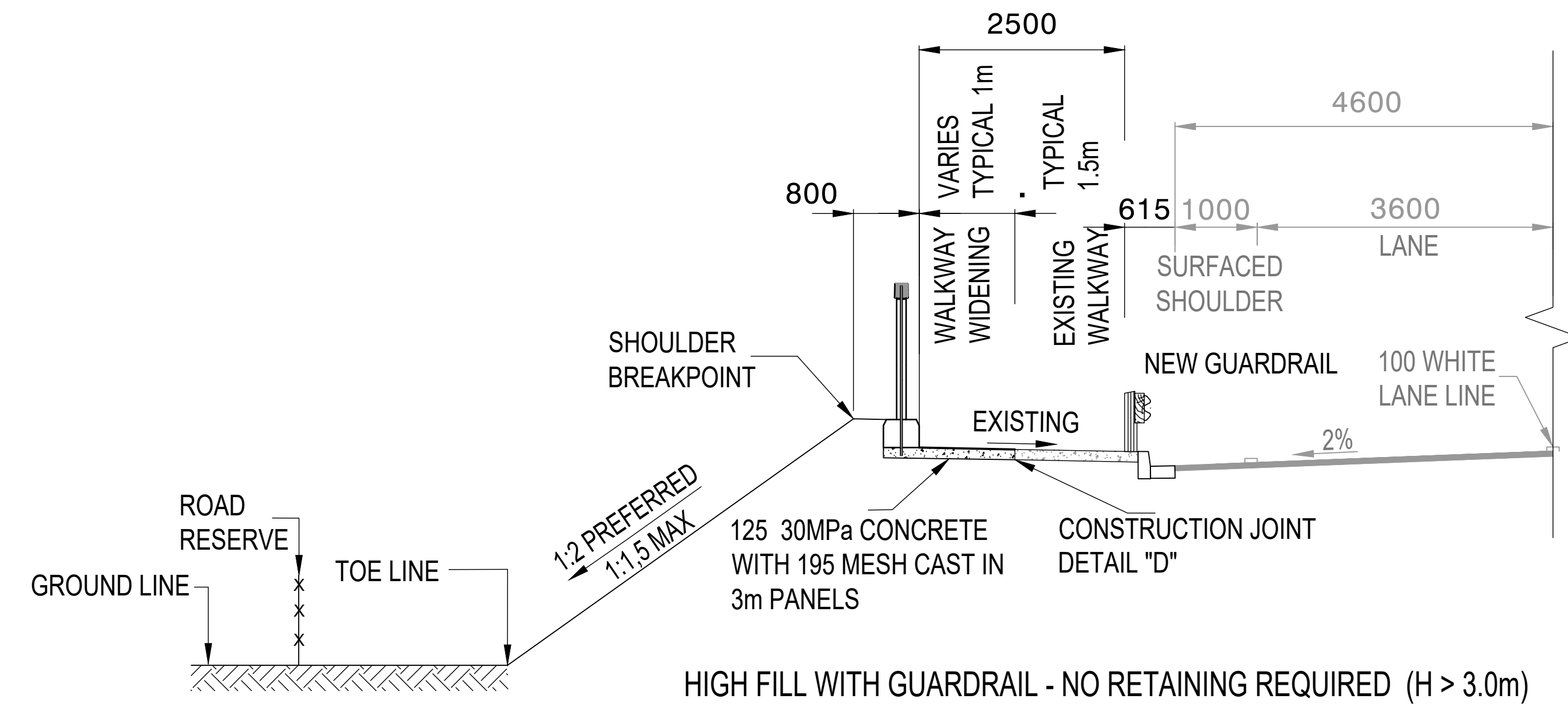
ACCEPTANCE		PROJECT DESCRIPTION	
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
for CEO: SA NATIONAL ROADS AGENCY LTD		DRAWING DESCRIPTION	
Date:		TYPICAL CROSS SECTION SIDEWALKS FILL CONDITIONS	
		SCALE : AS SHOWN	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	
ROUTE		N2	
SECTION		22	
DRAWING km DISTANCE		km 00.80	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-02-002	
SANRAL DOCUMENT #		VER	

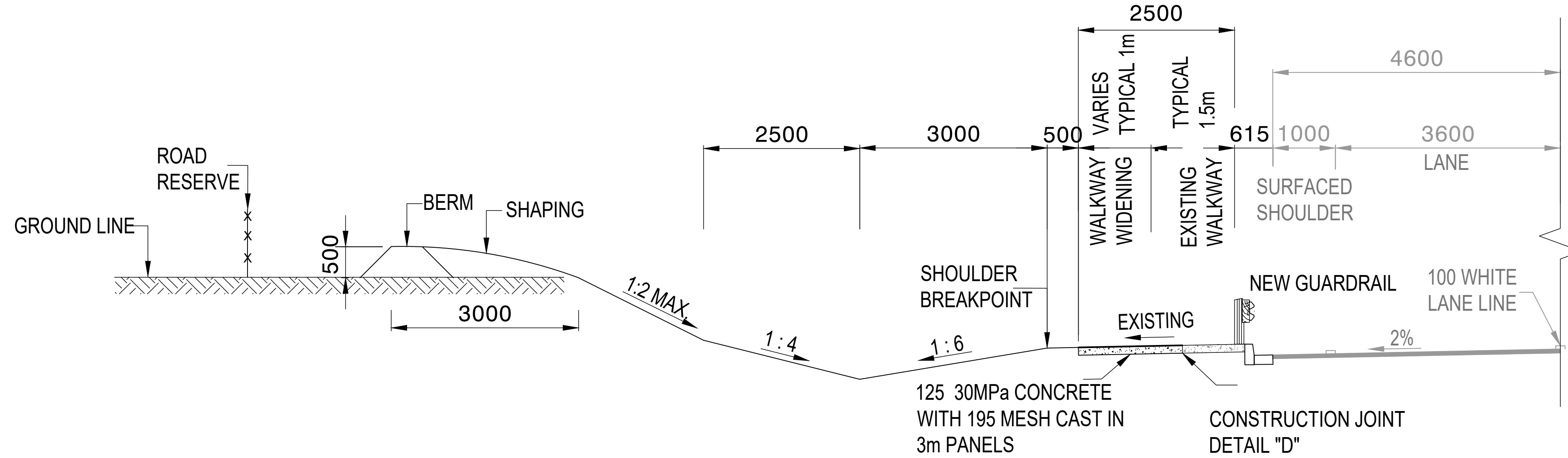
PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	
ROUTE		N2	
SECTION		22	
DRAWING km DISTANCE		km 00.80	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-02-002	
SANRAL DOCUMENT #		VER	



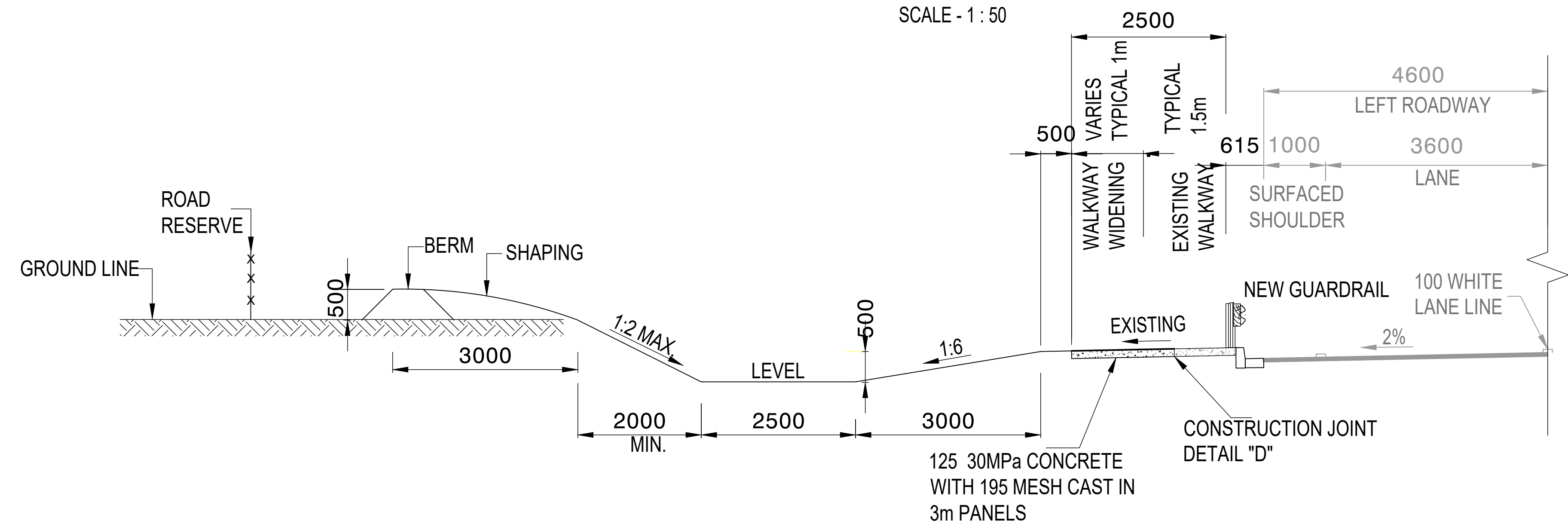
FILL CONDITION - CASE F1
SCALE - 1 : 50



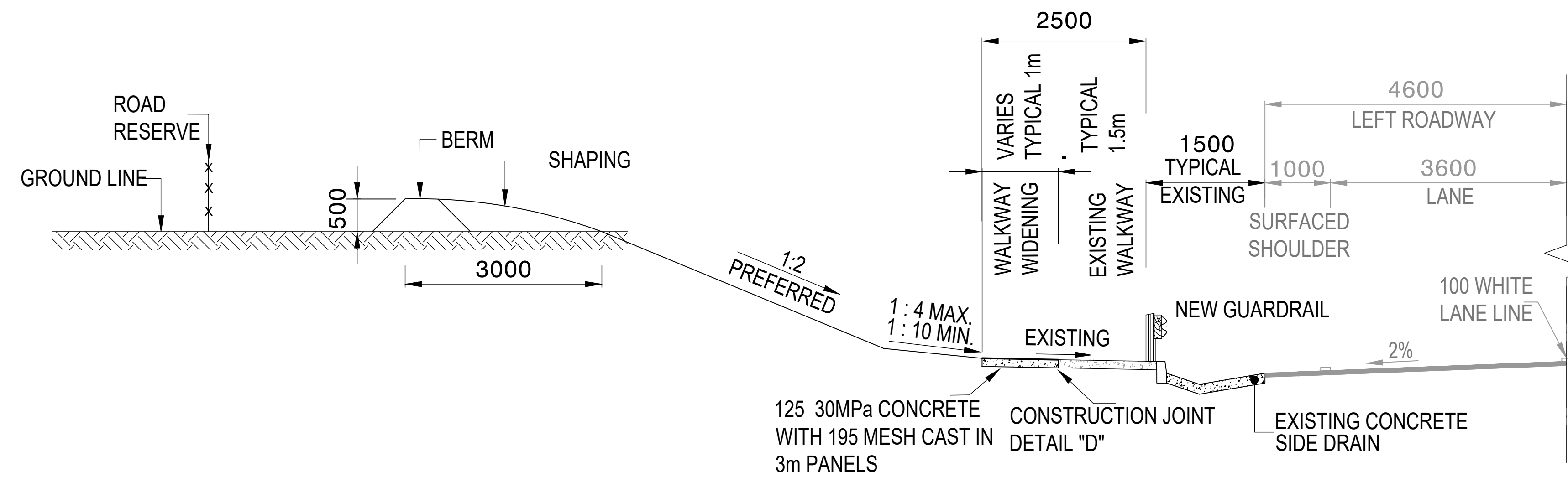
FILL CONDITION - CASE F2
SCALE - 1 : 50



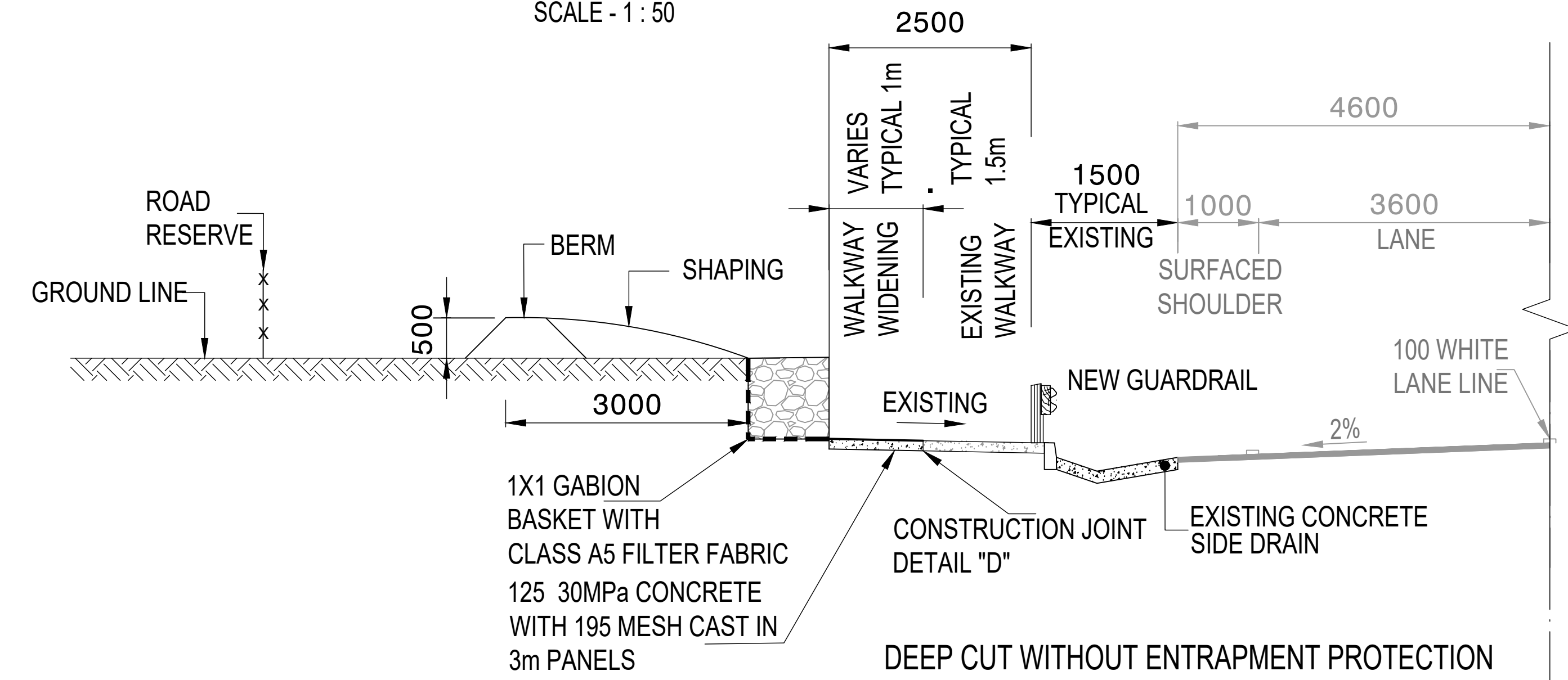
CUT CONDITION - CASE C1
SCALE - 1 : 50



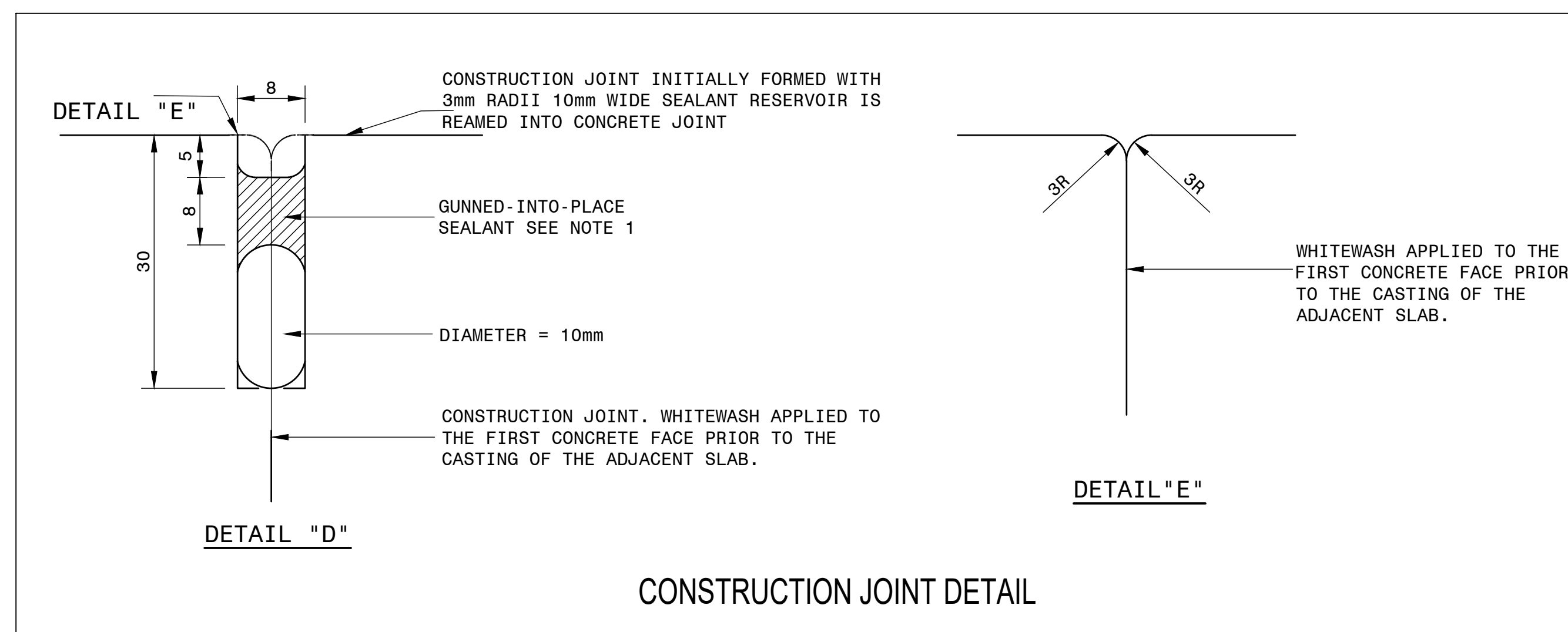
CUT CONDITION - CASE C2
SCALE - 1 : 50



CUT CONDITION - CASE C3A
SCALE - 1 : 50



CUT CONDITION - CASE C3B
SCALE - 1 : 50



FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name :			
Prof. Reg. No. :			
Date :			
SANRAL PROJECT MANAGER			
Name :			
Prof. Reg. No. :			
Date :			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

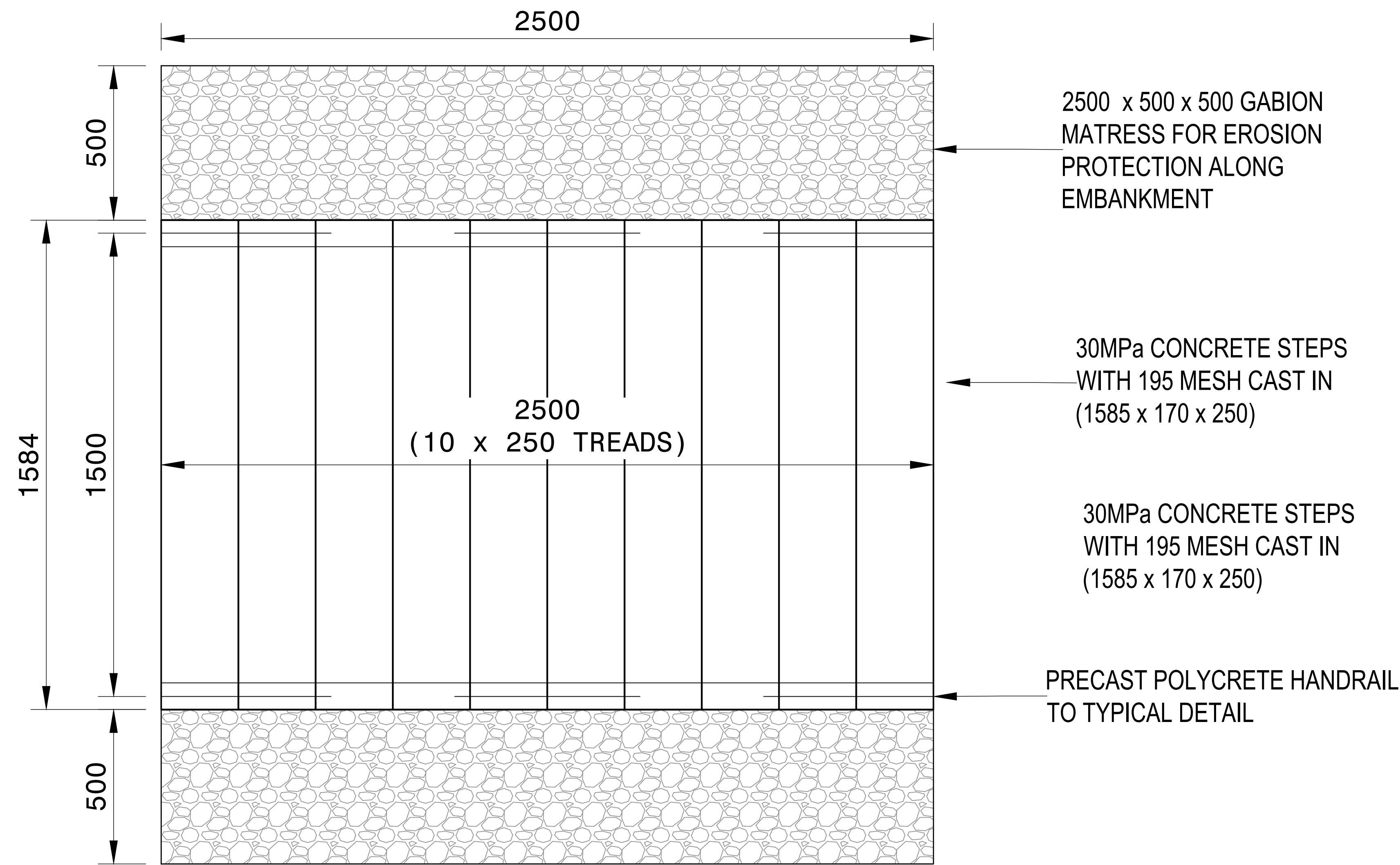
HEAD OFFICE			
48 Tambotie Avenue			
Val de Grace			
Pretoria			
0184			
PO Box 415			
Pretoria 0001			
South Africa			
Tel: (012) 844 8000			

EASTERN REGION			
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3209			
Tel: (033) 392 8100			

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for CEO: SA NATIONAL ROADS AGENCY LTD			
Date:			

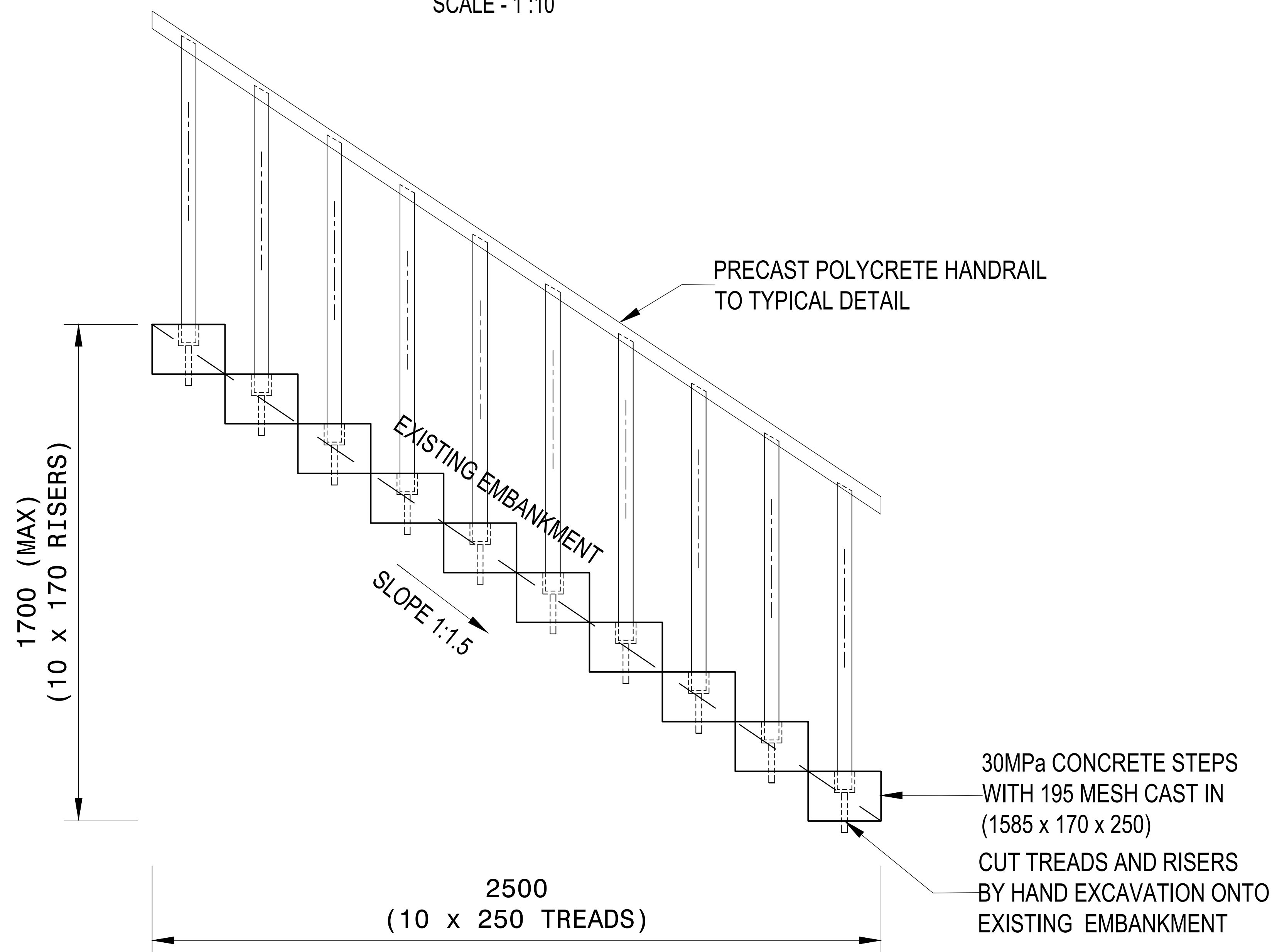
PROJECT DESCRIPTION			
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)			
DRAWING DESCRIPTION			
TYPICAL CROSS SECTION			
WIDENING OF EXISTING SIDEWALKS			
SCALE : AS SHOWN			

PROJECT NUMBER			
NRA.C.004-099-2023/1			
DRAWING LOCATION DATA			
ROUTE			
SECTION			
DRAWING km DISTANCE			
ROADS - X SECTION			
BRIDGE/STRUCTURE No.			
CONSULTANT DRAWING No.			
SANRAL DOCUMENT #			



PLAN VIEW

SCALE - 1 : 10

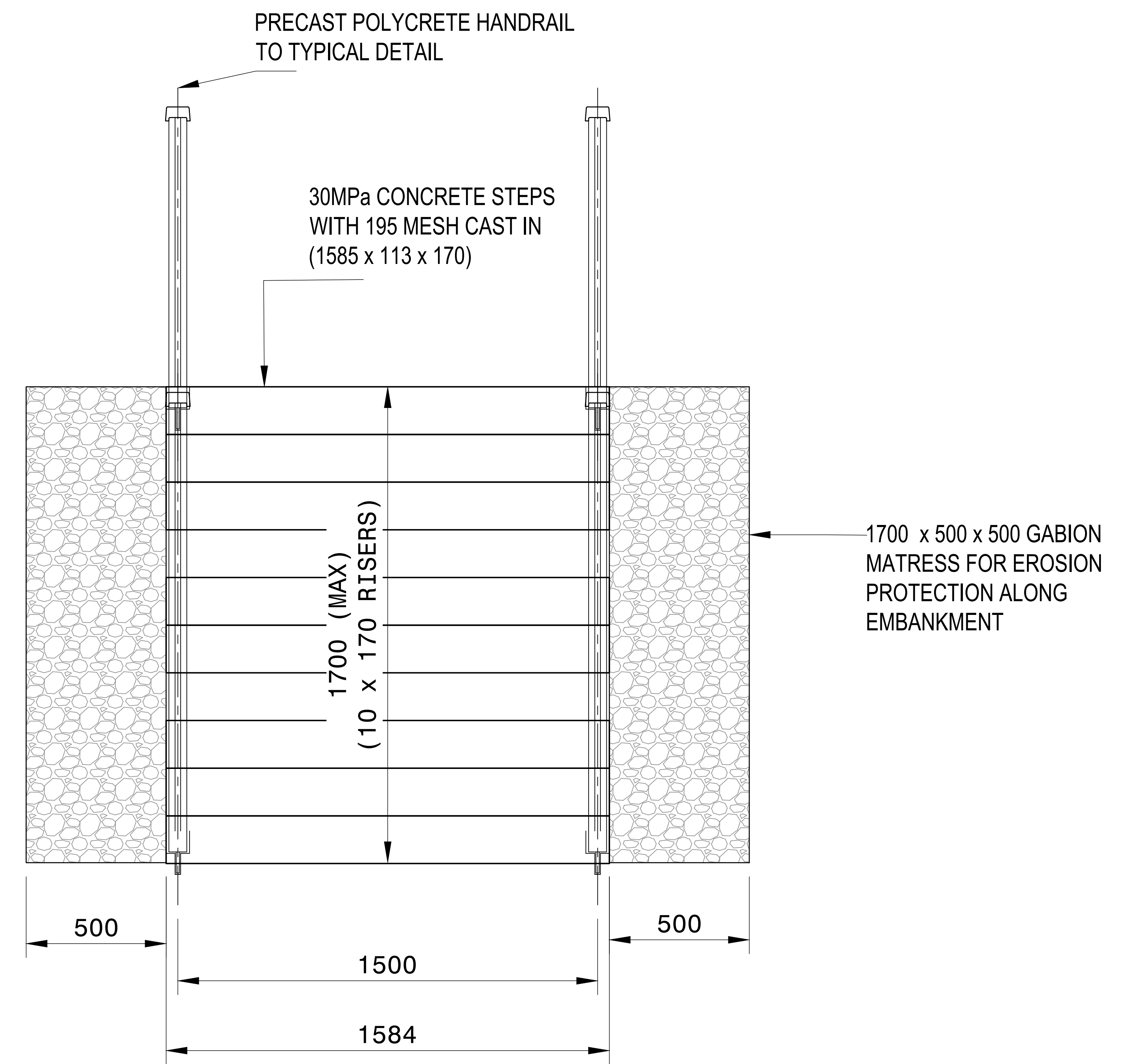


SECTION VIEW

SCALE - 1 : 10

NOTES:

1. SUITABLE POSITIONS FOR EMBANKMENT STRAIRS TO BE IDENTIFIED ON SITE.
2. DETAIL LIMITED TO HEIGHT DIFFERENCE OF 10 STEPS (1.133m).
3. HAND EXCAVATION OF TREADS AND RISERS TO BE LEVEL AND CLEAN.
4. CONCRETE STEP ELEMENTS TO BE CAST IN SITU.
5. HANDRAIL DETAIL AS PER TYPICAL SANRAL PEDESTRIAN HANDRAIL.



ELEVATION VIEW

SCALE - 1 : 10

FOR TENDER PURPOSES

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HEAD OFFICE
48 Tamboite Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000

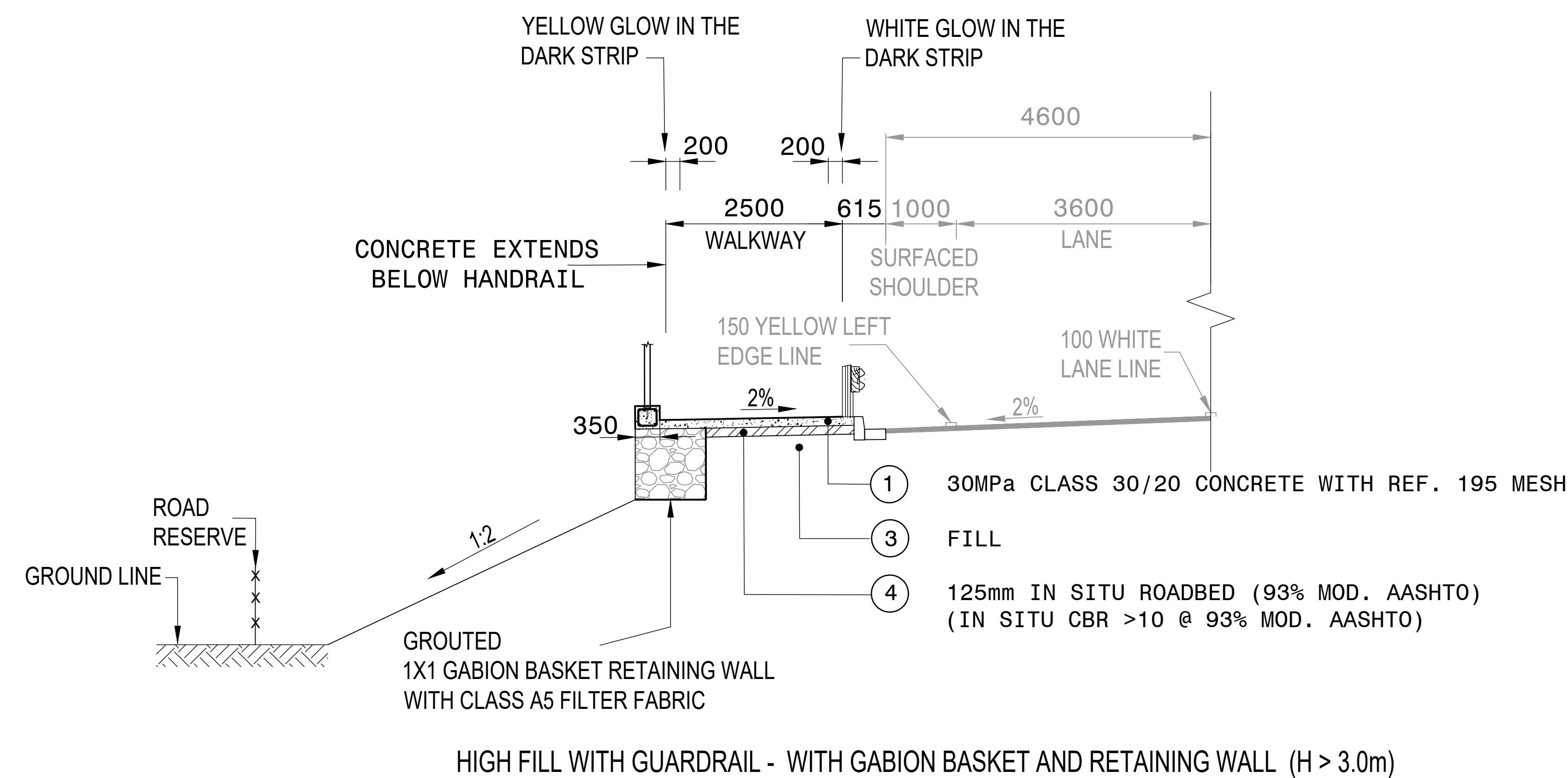
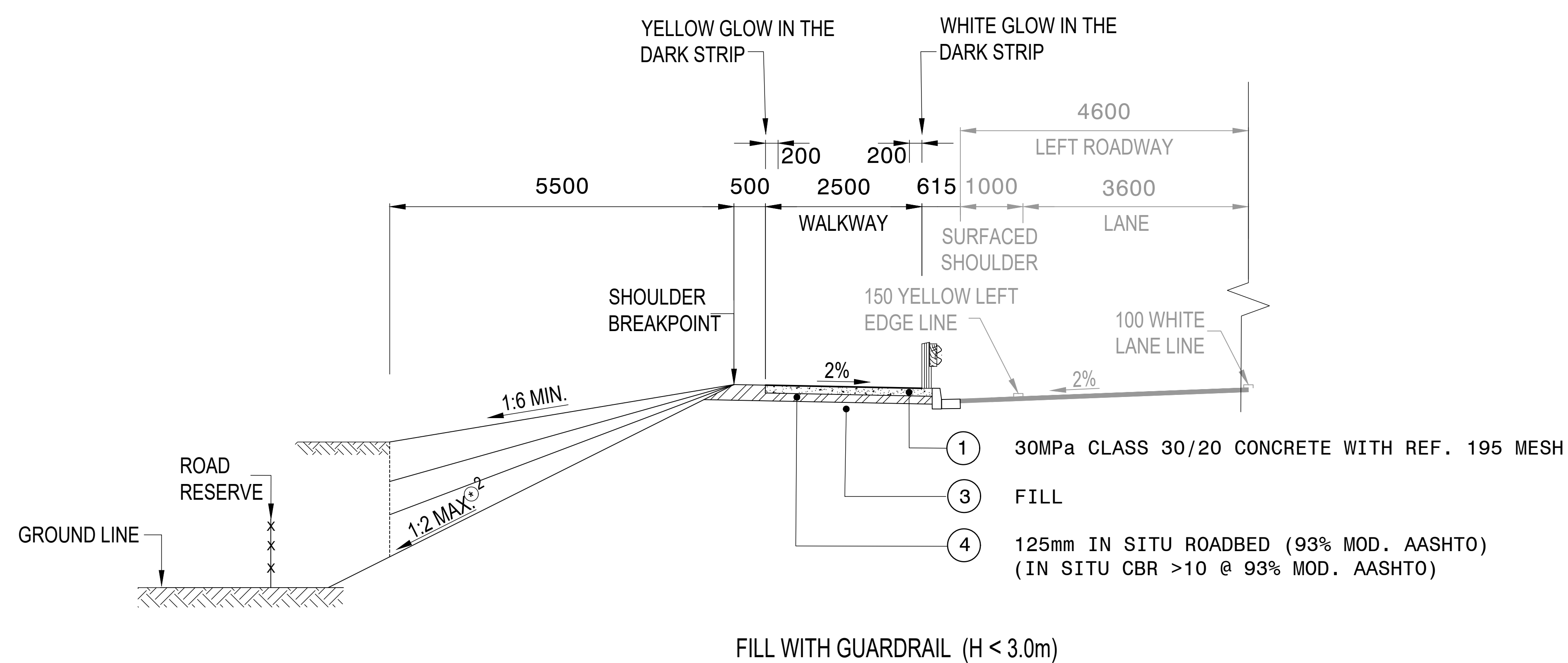


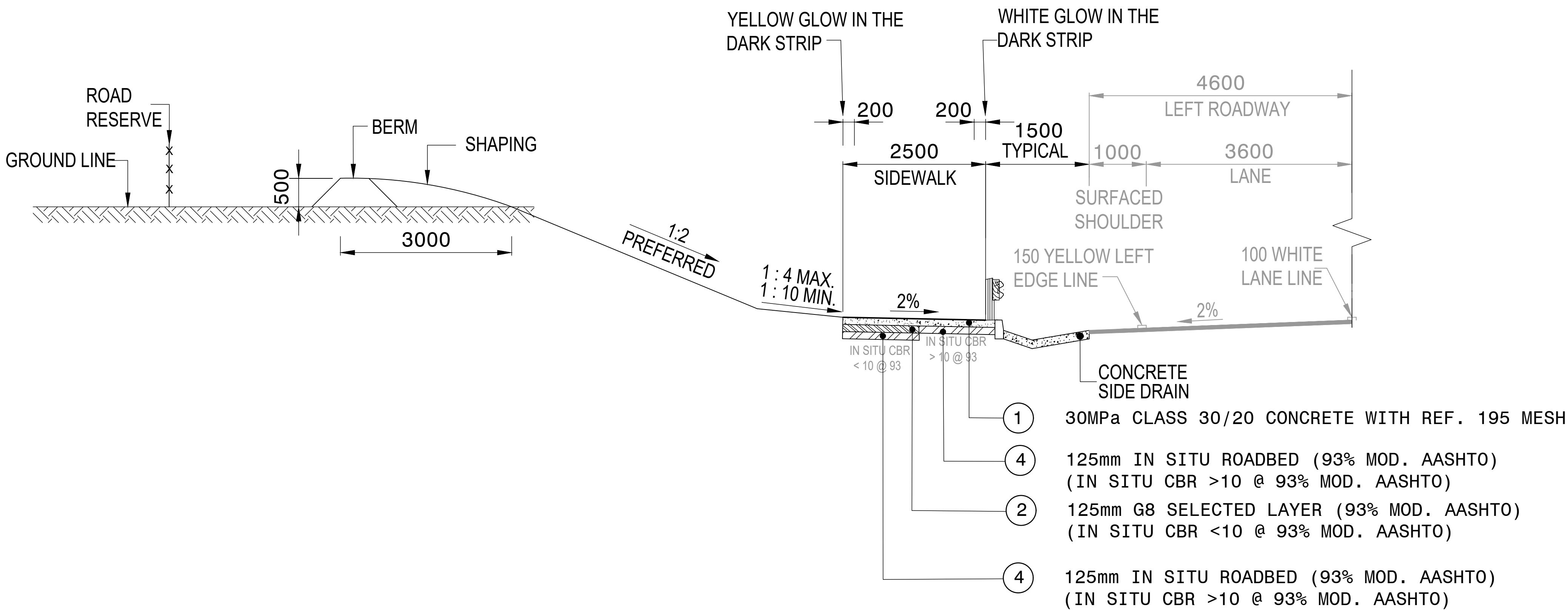
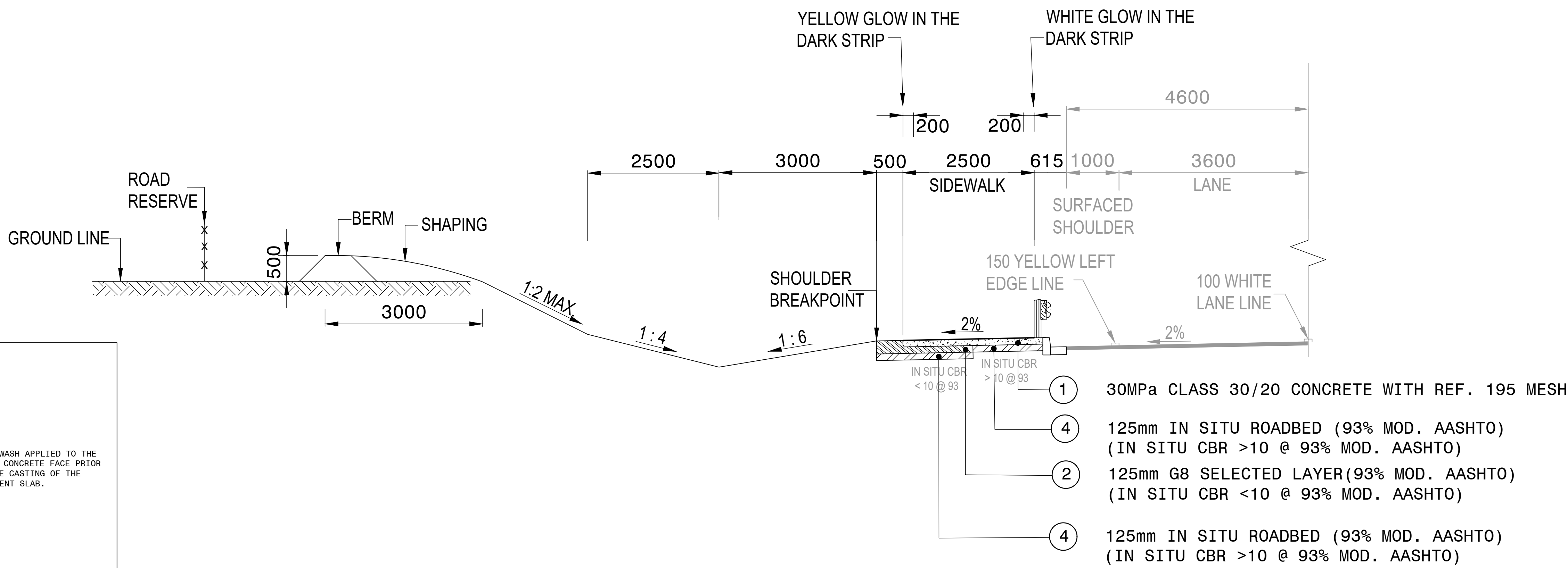
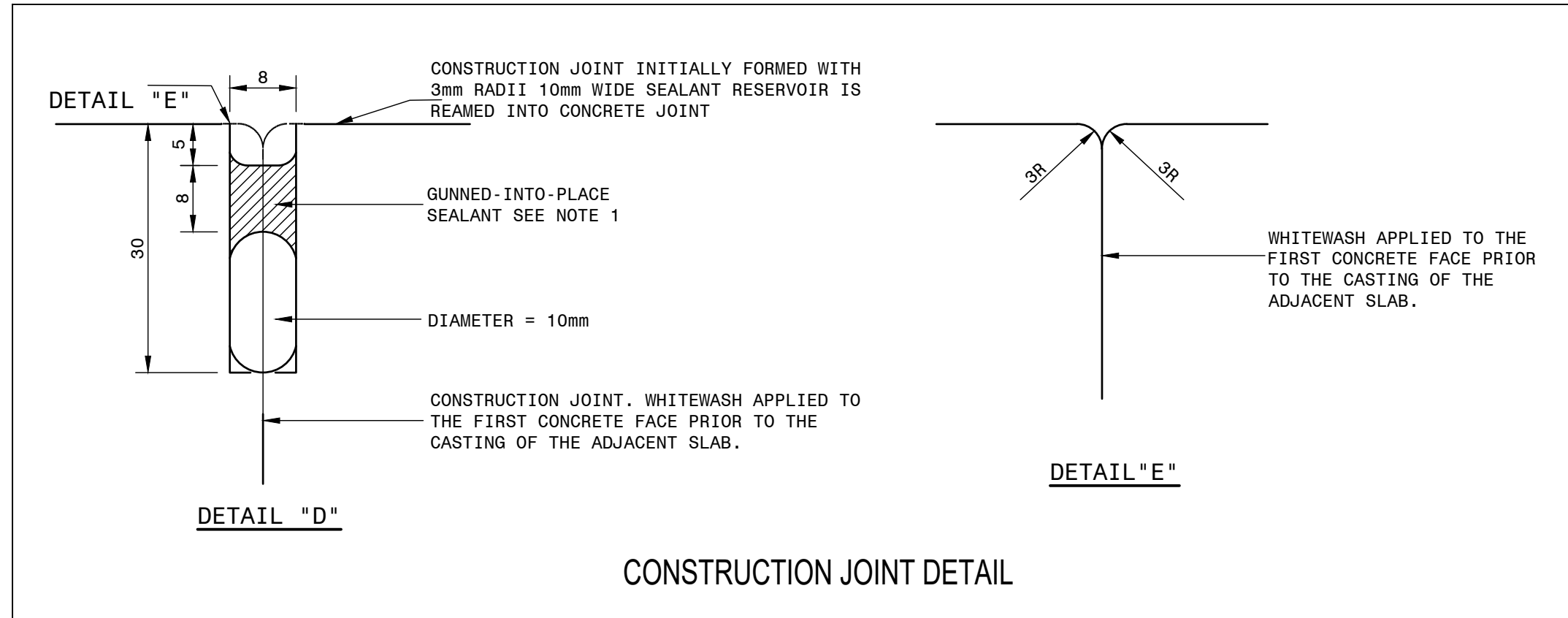
EASTERN REGION
58 van Eck Place
Pietmaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

ACCEPTANCE
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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
TYPICAL CROSS SECTION SIDEWALKS EMBANKMENT STAIRS	
SCALE :	AS SHOWN

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 00.80	km 18.64
DRAWING TYPE		ROADS - X SECTION	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-02-004	
SANRAL DOCUMENT #		-	VER V1





PAVEMENT DESIGN: CUT CONDITIONS

NOTES

- EXPANSION JOINT AT EVERY THIRD PANEL
- V2 SURFACE FINISH
- GLOW IN THE DARK AGGREGATE IN OUTER 200mm EDGES
 - OUTER EDGE YELLOW
 - INNER EDGE WHITE
 - 20% NORMAL COVER RATE

MATERIAL REQUIREMENTS

LAYER NO.	THICKNESS	DESCRIPTION	TRH 14 MATERIAL TYPE	G.M. (MIN)	P.I. (MAX)	UCS / CBR	SWELL (MAX)	SECTION OF SPECIFICATION	COMPACTION (% OF MDD)
①	125 mm	30MPa CLASS 30/20 CONCRETE WITH REF. 195 MESH (3m PANELS)	PPC	-	-	-	-	7100	-
②	125 mm	G8 SELECTED LAYER	G8	0.75 - 2.7	<12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO
④	125 mm	IN SITU ROADBED	G7/G8	0.75 - 2.7	<12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO

FOR TENDER PURPOSES

			CONSTRUCTION RECORD	
			WORKS CONTRACT ENGINEER	
			Name	
			Prof. Reg. No. :	
			Date	
			SANRAL PROJECT MANAGER	
			Name	
			Prof. Reg. No. :	
			Date	
V1	SEPT 2023	ORIGINAL VERSION	S.KASPIERSAD	
No.	DATE	REVISION	CONSULT. ENG.	

HEAD OFFICE			
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DRAWING DESCRIPTION

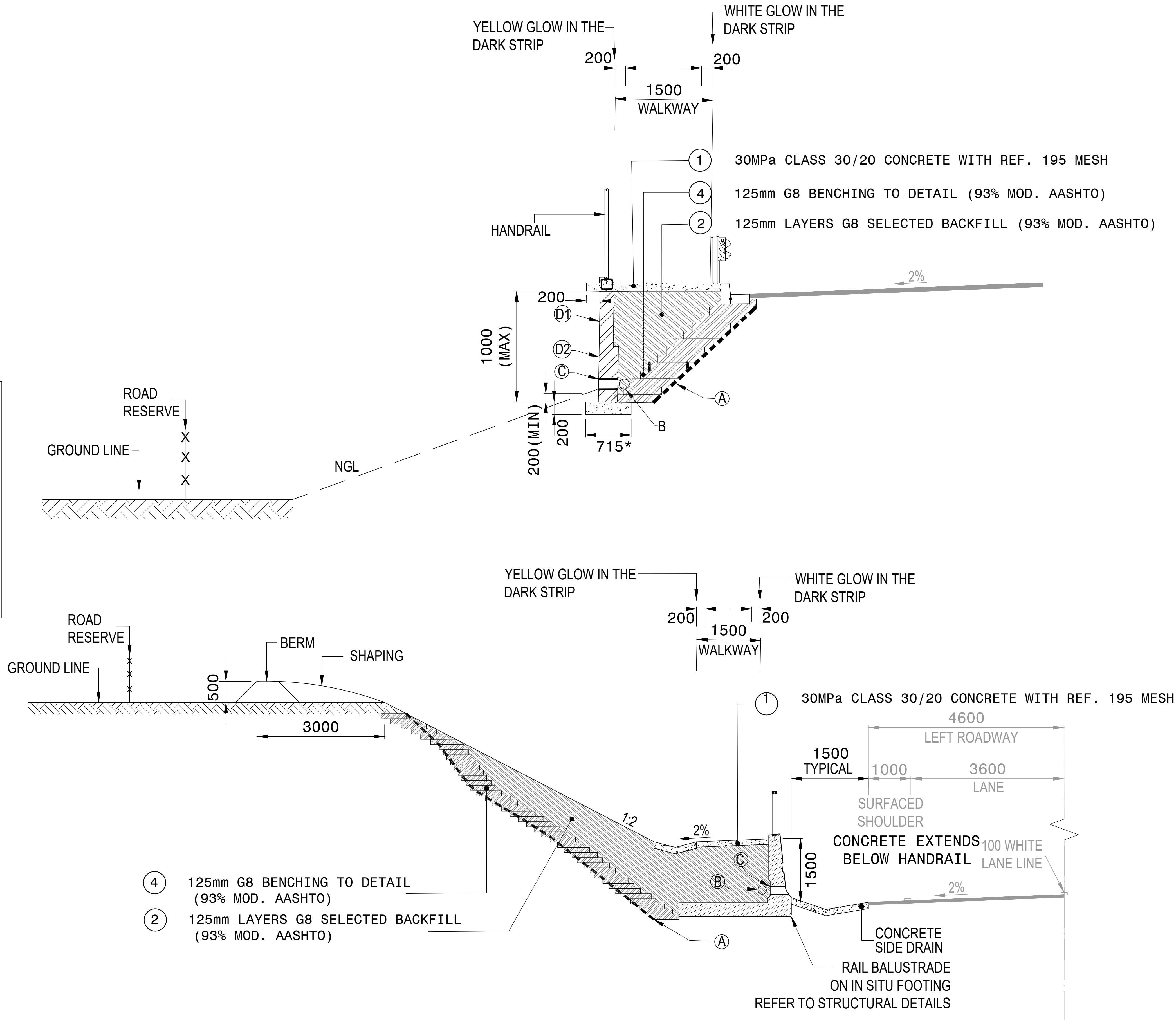
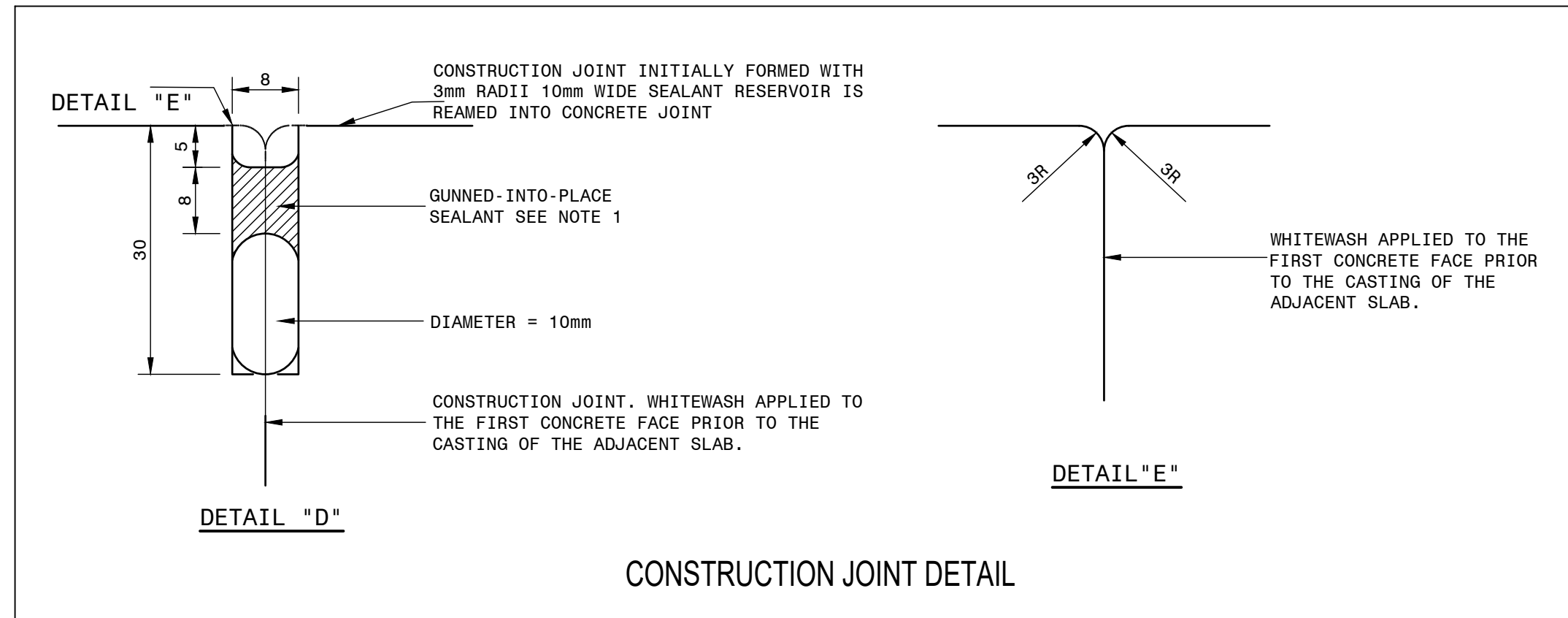
BASIC PAVEMENT DESIGN

CUT CONDITIONS

SCALE: 1:500

SHEET 2 OF 4

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0.80	km 18.64
DRAWING TYPE		ROADS - PAVEMENT CONTROL	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-04-002	
SANRAL DOCUMENT #		-	
		VER	V1



- A: 325 WICK DRAIN AT 2m C/C
- B: 75 Ø GEODRAIN PARALLEL TO ROADWAY UNTIL NEAREST DAYLIGHT
- C: 75 Ø GEODRAIN OUTLET WRAPPED IN GRADE A4 GEOTEXTILE 20m/C
- D1: 220 MASONRY WALL 3m PANELS (500mm MAX.) BRICK FORCE EVERY SECOND COURSE
- D2: 315 MASONRY WALL IN 3m PANELS (500mm MAX.) BREAK FORCE EVERY SECOND COURSE

NOTES

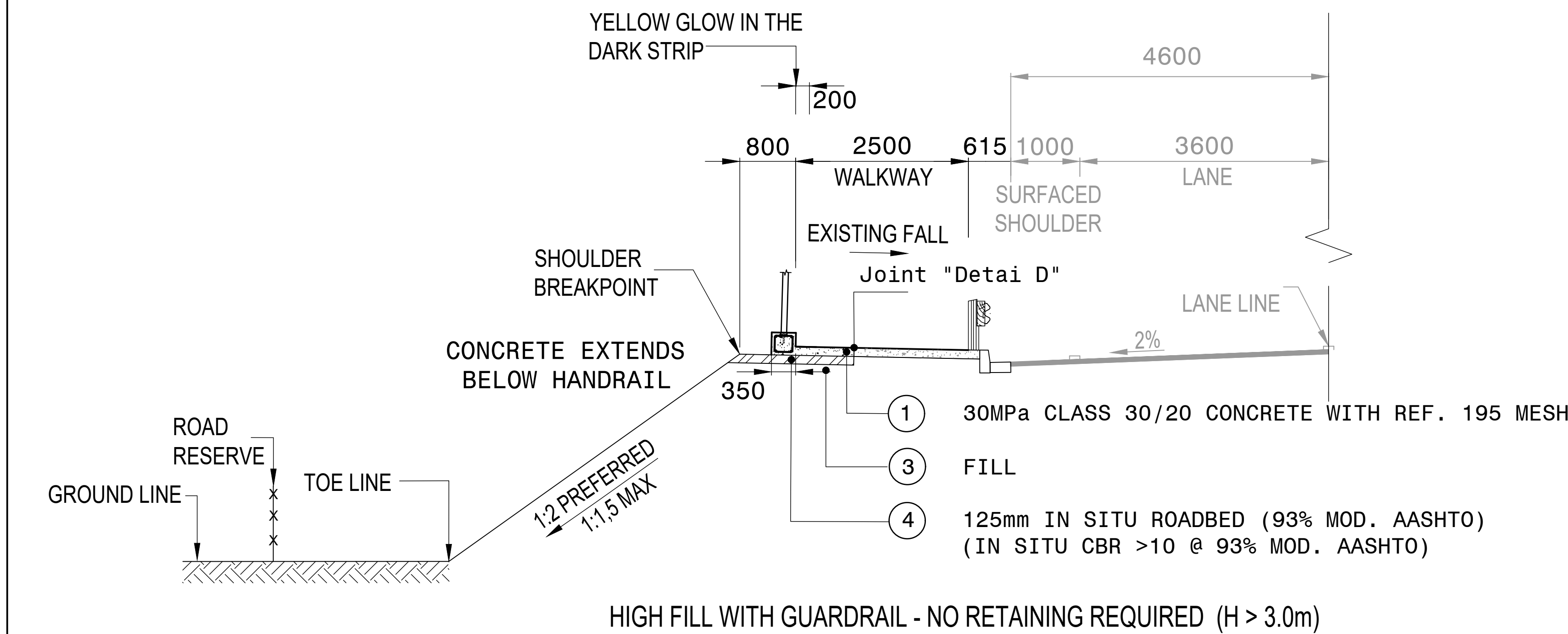
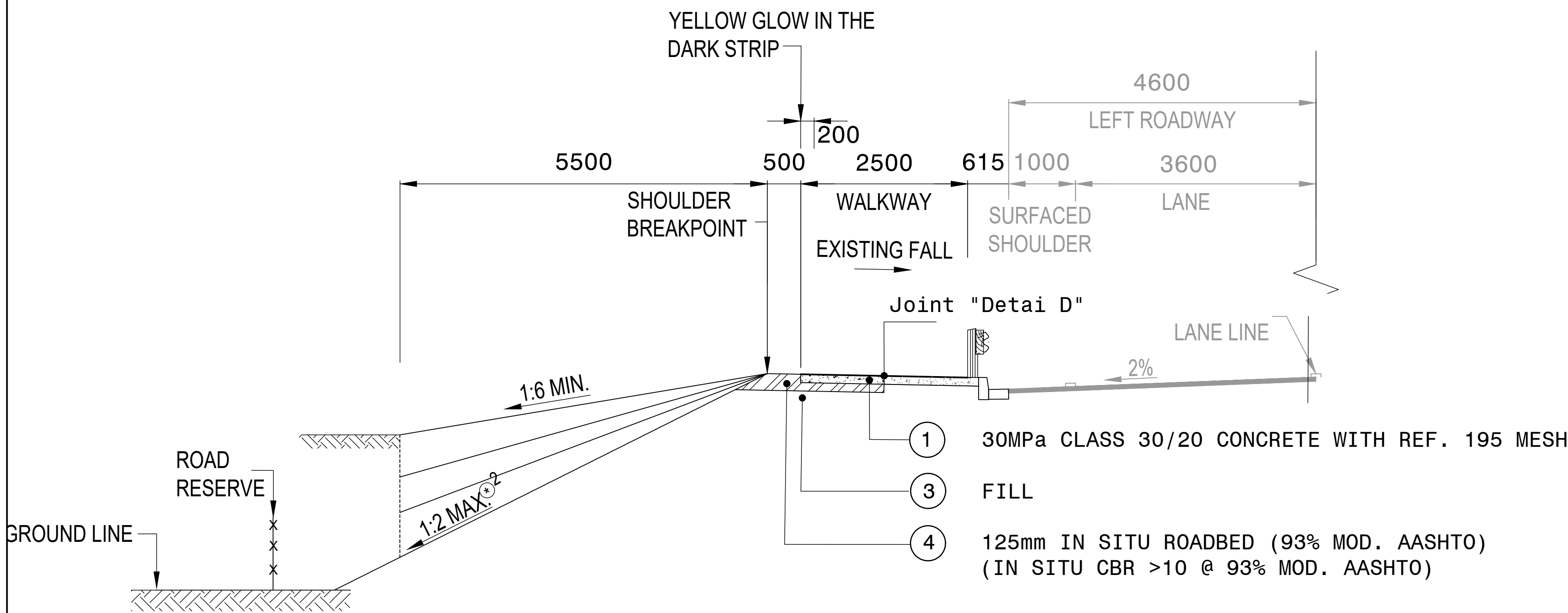
- EXPANSION JOINT AT EVERY THIRD PANEL
- V2 SURFACE FINISH
- GLOW IN THE DARK AGGREGATE IN OUTER 200mm EDGES
 - OUTER EDGE YELLOW
 - INNER EDGE WHITE
 - 20% NORMAL COVER RATE

MATERIAL REQUIREMENTS

LAYER NO.	THICKNESS	DESCRIPTION	TRH 14 MATERIAL TYPE	G.M. (MIN)	P.I. (MAX)	UCS / CBR	SWELL (MAX)	SECTION OF SPECIFICATION	COMPACTION (% OF MDD)
1	125 mm	30MPa CLASS 30/20 CONCRETE WITH REF. 195 MESH (3m PANELS)	PPC	-	-	-	-	7100	-
2	125 mm LAYERS	G8 SELECTED BACKFILL	G8	0.75 - 2.7	< 12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO
4	125 mm	G8 BENCHING (600X125)	G8	0.75 - 2.7	< 12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO

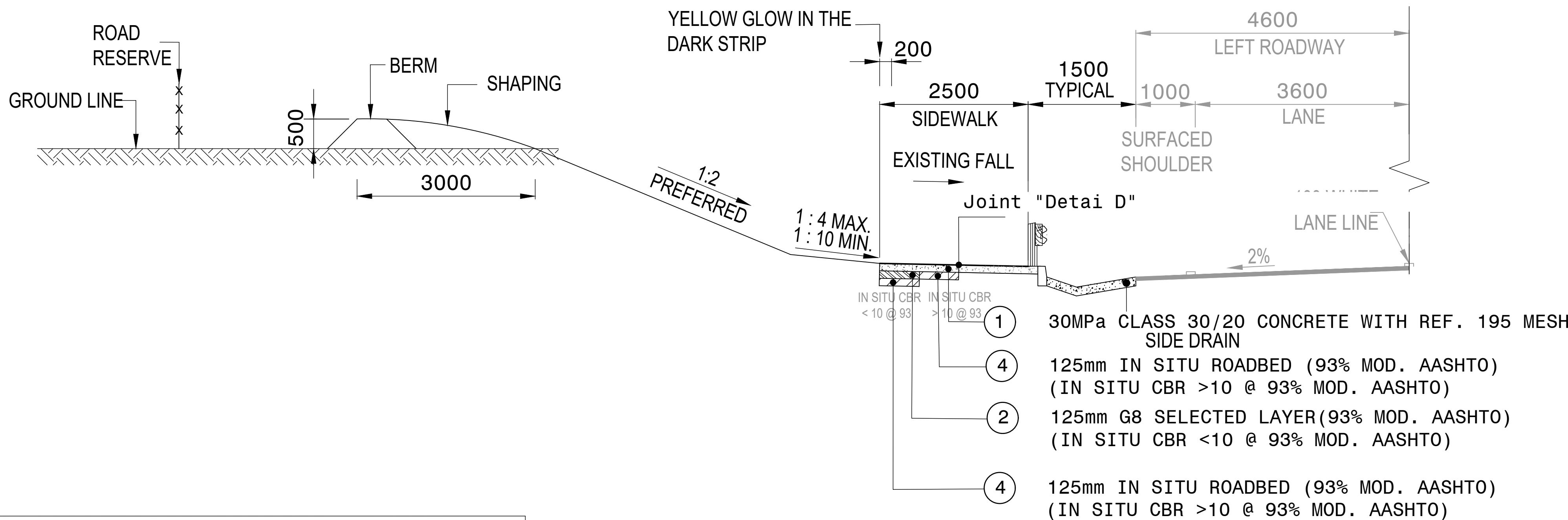
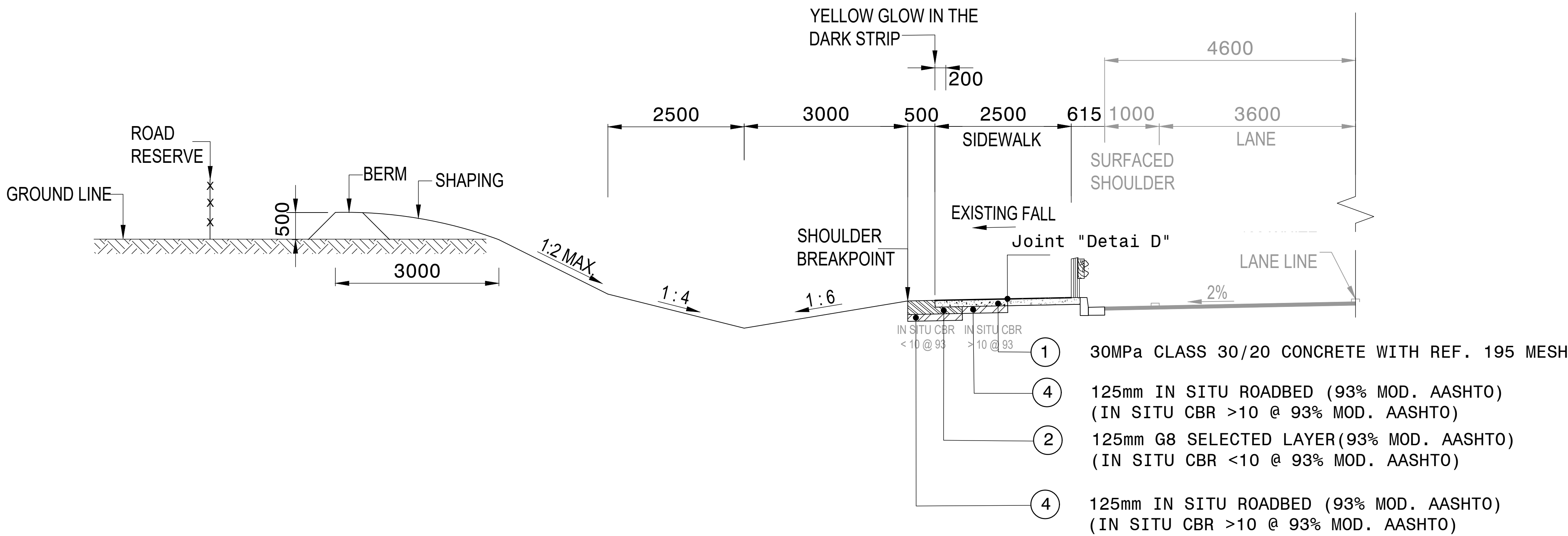
FOR TENDER PURPOSES

				CONSTRUCTION RECORD		WORKS CONTRACT ENGINEER		HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA C.004-095-2023/1	
				Name :		Prof. Reg. No. :		Date :		48 Tambotse Avenue Val de Grace Pretoria 0184		PO Box 100410 Scottsville 3209		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWSOEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START END	
				Name :		Prof. Reg. No. :		Date :		PO Box 415 Pretoria 0001 South Africa		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.				ROUTE		N2 N2	
				Name :		Prof. Reg. No. :		Date :		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		Tel: (033) 392 8100						SECTION		22 22	
				Name :		Prof. Reg. No. :		Date :										DRAWING km DISTANCE		km 0.80 km 18.64	
				Name :		Prof. Reg. No. :		Date :										DRAWING TYPE		ROADS - PAVEMENT CONTROL	
				Name :		Prof. Reg. No. :		Date :										CONSULTANT DRAWING No.		TP1802:19-05-25-04-003	
				Name :		Prof. Reg. No. :		Date :										SANRAL DOCUMENT #		-	
				Name :		Prof. Reg. No. :		Date :										SCALE :		1 : 500	
				Name :		Prof. Reg. No. :		Date :										SHEET		3 OF 5	
				Name :		Prof. Reg. No. :		Date :													
				Name :		Prof. Reg. No. :		Date :													
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				Name :		Prof. Reg. No. :		Date :													



PAVEMENT DESIGN: FILL CONDITIONS

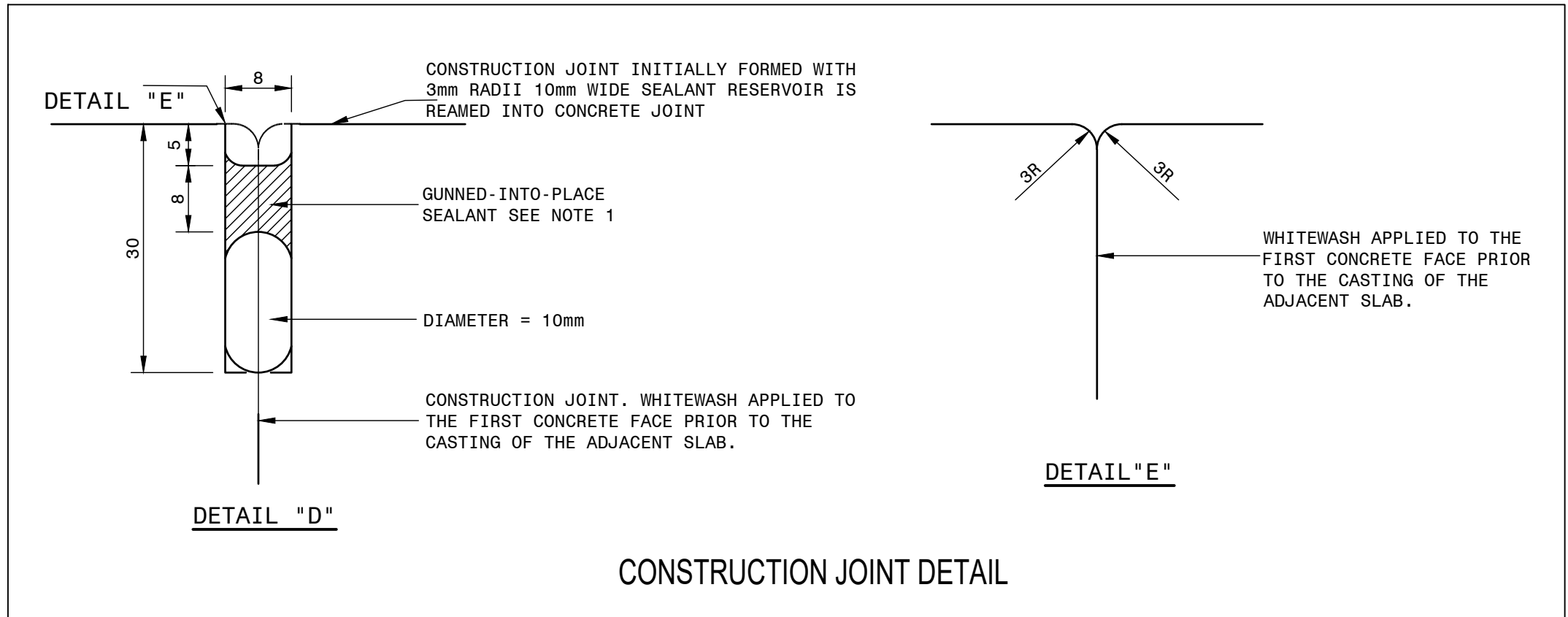
- NOTES
- EXPANSION JOINT AT EVERY THIRD PANEL
 - V2 SURFACE FINISH
 - GLOW IN THE DARK AGGREGATE IN OUTER 200mm EDGES
 - OUTER EDGE YELLOW
 - INNER EDGE WHITE
 - 20% NORMAL COVER RATE



PAVEMENT DESIGN: CUT CONDITIONS

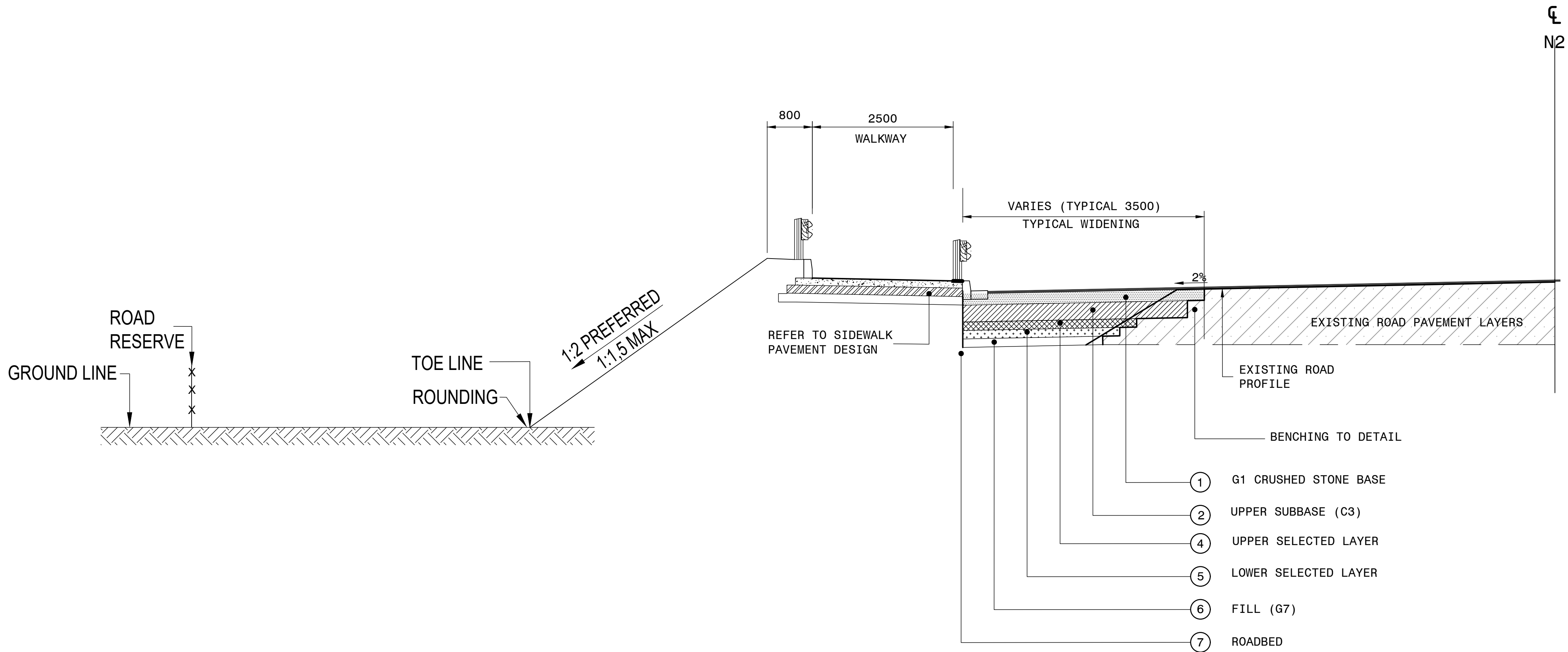
MATERIAL REQUIREMENTS

LAYER NO.	THICKNESS	DESCRIPTION	TRH 14 MATERIAL TYPE	G.M. (MIN)	P.I. (MAX)	UCS / CBR	SWELL (MAX)	SECTION OF SPECIFICATION	COMPACTION (% OF MDD)
1	125 mm	30MPa CLASS 30/20 CONCRETE WITH REF. 195 MESH (3m PANELS)	PPC	-	-	-	-	7100	-
3	150 mm LAYERS	FILL	G7/G8	0.75 - 2.7	<12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO
4	125 mm	IN SITU ROADBED	G7/G8	0.75 - 2.7	<12	10 @ 93% MOD AASHTO	< 1.5%	3400	93% Mod AASHTO



FOR TENDER PURPOSES

					CONSTRUCTION RECORD	
					WORKS CONTRACT ENGINEER	
					Name	1
					Prof. Reg. No.	2
					Date	3
					SANRAL PROJECT MANAGER	
					Name	4
					Prof. Reg. No.	5
					Date	6
V1	SEPT 2023	ORIGINAL VERSION		S.KASPIERSAD		
No.	DATE	REVISION		CONSULT. ENG.		





PAVEMENT DESIGN: WIDENING FOR BUS BAYS

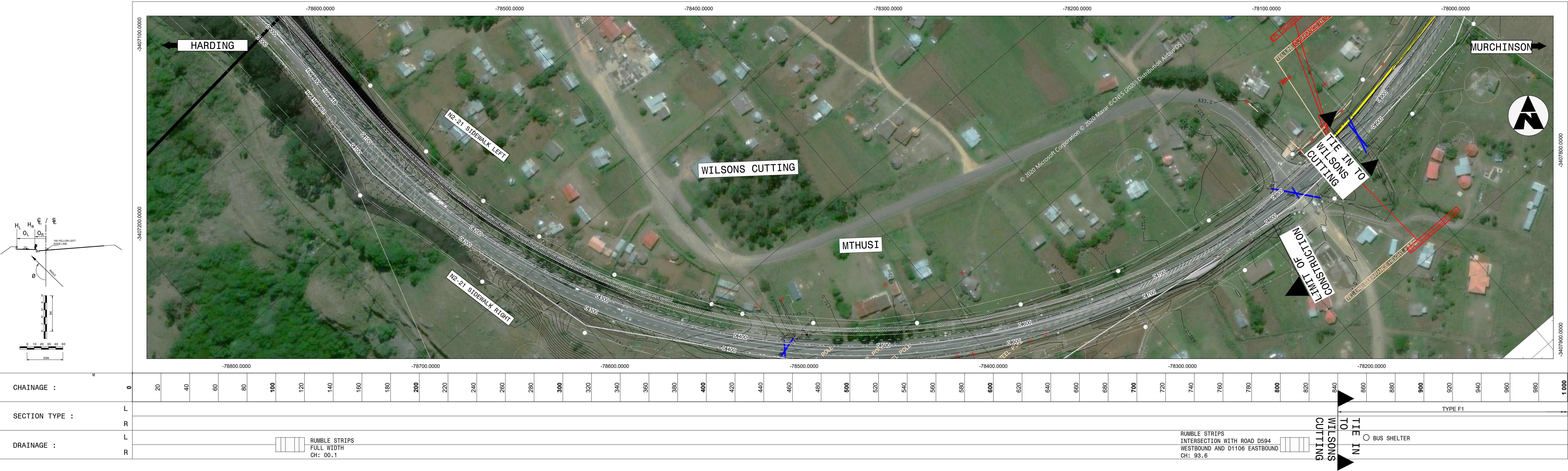
MATERIAL REQUIREMENTS										
SURFACING: 50mm THICK CONTINUOUSLY GRADED MEDIUM ASPHALT SURFACING (SABITA MANUAL 19 COARSE GRADE; A-E) WITH 14,0mm PRECOATED ROLLED IN CHIPPINGS										
LAYER NO.	DESCRIPTION	TRH 14 MATERIAL TYPE	SECTION OF SPECIFICATION	COMPACTION (% OF MDD. AASHTO)	P. I. (MAX)	G. M. (MIN)	CBR @ % MOD AASHTO	UCS (kPa)@ % MOD AASHTO	ITS (kPa)@ % MOD AASHTO	WET / DRY DURABILITY
1	150mm CRUSHED STONE BASE	G1	3600	89% OF APPARENT DENSITY	4	-	-	-	-	-
2	150mm THICK STABILIZED UPPER SUBBASE LAYER	C3 (G4* FOR UNSTABILIZED MATERIAL)	3800, 3500 & 3400	96% AVERAGE 97% TOP 150mm	4	-	-	2000 @ 100% (MAX 4500)	300 @ 100%	20%
4	150mm UPPER SELECTED LAYER	G6	3400	95%	10	1,50	25 @ 95%	-	-	-
5	150mm LOWER SELECTED LAYER	G6	3400	93%	10	1,5	25 @ 93%	-	-	-
6	150mm GRAVEL SHOULDER	G6	3400	93%	MAX 6 MIN 4	1,2	25 @ 95%	-	-	-
7	FILL	G9	3300	93%	-	-	7 @ 93%	-	-	-
8	ROADBED PREPARATION	-	3300	90% OR "n"-PASS ROLLER COMPACTION	-	-	3 @ 90%	-	-	-

NOTE: IF WEATHERED BASIC IGNEOUS MATERIAL IS STABILIZED IN BASE OR SUBBASE LAYERS,THE MAXIMUM P.I. AFTER STABILIZATION IS TO BE SLIGHTLY PLASTIC AT MOST.
*G4 TO COMPLY WITH TABLE 3402 / 1 (26,5mm NOMINAL SIZE) .

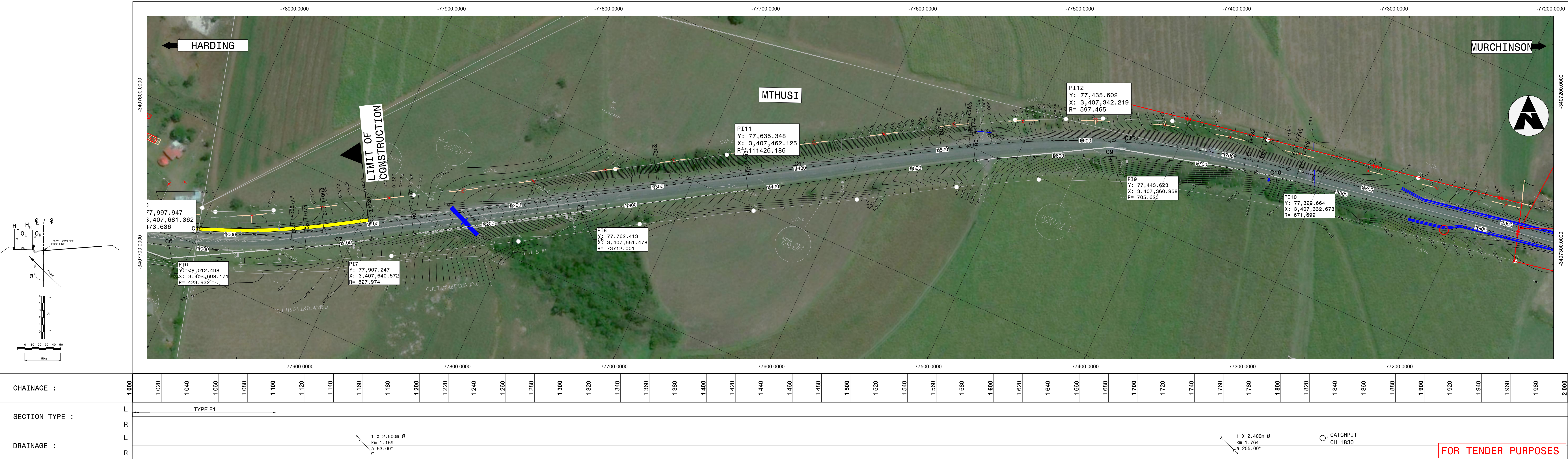
FOR TENDER PURPOSES

				CONSTRUCTION RECORD		<div>HEAD OFFICE 58 van Eck Place Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000</div>	<div> SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD  BUILDING SOUTH AFRICA THROUGH BETTER ROADS</div>	<div>EASTERN REGION 58 van Eck Place Pletersmaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100</div>		<div>ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____</div>	<div>PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0.80) TO MURCHISON (Km 18.64) DRAWING DESCRIPTION BASIC PAVEMENT DESIGN BUS BAYS</div>		<div>PROJECT NUMBER NRA.C.004-099-2023/1</div> <table><tr><td>DRAWING LOCATION DATA</td><td>START</td><td>END</td></tr><tr><td>ROUTE</td><td>N2</td><td>N2</td></tr><tr><td>SECTION</td><td>21</td><td>21</td></tr><tr><td>DRAWING km DISTANCE</td><td>km 0.80</td><td>km 18.64</td></tr></table> <div>DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #</div> <div>ROADS - PAVEMENT CONTROL N/A TP1802-20-01-00-04-005 -</div>		DRAWING LOCATION DATA	START	END	ROUTE	N2	N2	SECTION	21	21	DRAWING km DISTANCE	km 0.80	km 18.64	<div>VER V1</div>	
DRAWING LOCATION DATA	START	END																										
ROUTE	N2	N2																										
SECTION	21	21																										
DRAWING km DISTANCE	km 0.80	km 18.64																										
				WORKS CONTRACT ENGINEER																								
				Name : _____ Prof. Reg. No. : _____ Date : _____																								
				SANRAL PROJECT MANAGER																								
V1	SEPT 2023	ORIGINAL VERSION	S.KASPIERSAD	Name : _____ Prof. Reg. No. : _____ Date : _____																								
No.	DATE	REVISION	CONSULT. ENG.											SCALE : 1 : 500		SHEET 5 OF 5												

ROUTE N2-22



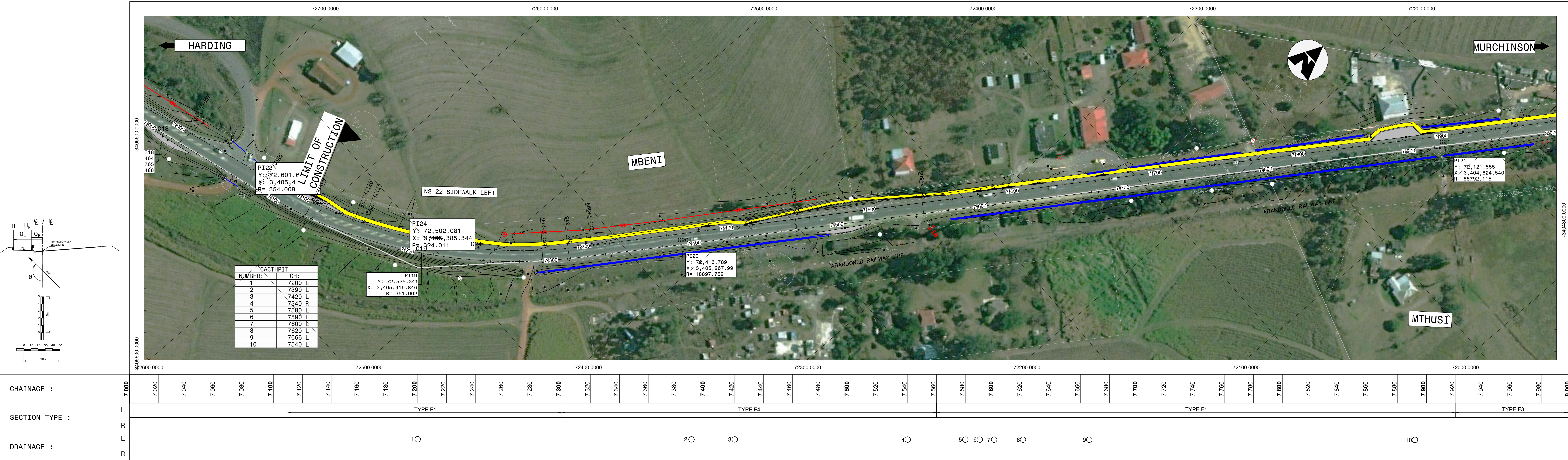
ROUTE N2-22



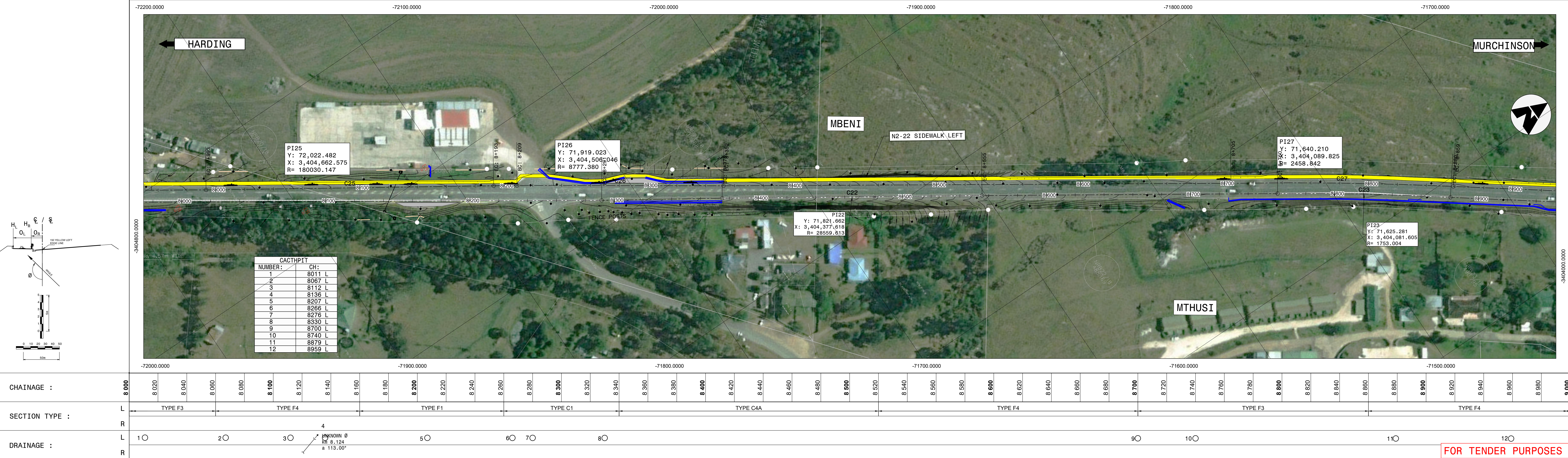
CONSTRUCTION RECORD WORKS CONTRACT ENGINEER				SANRAL PROJECT MANAGER			
Name : Prof. Reg. No. : Date :				Name : Prof. Reg. No. : Date :			
S. KASIPERSAD CONSULT. ENG.				TP1802-19-05-25-05A-001			
V1 SEPT 2023 ORIGINAL VERSION				VER V1			
No. DATE REVISION				SANRAL DOCUMENT #			

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000				EASTERN REGION 58 van Eck Place Pletermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100			
SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS				ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:			
PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)				DRAWING DESCRIPTION PACKAGE A: N2-22 ACTIVITY PLAN			
PROJECT NUMBER DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No.				PROJECT NUMBER START END N2 22 km 0,80 km 18,64 ROADS - LAYOUT N/A TP1802-19-05-25-05A-001			
SCALE : 1:1000				SHEET 1 OF 4			

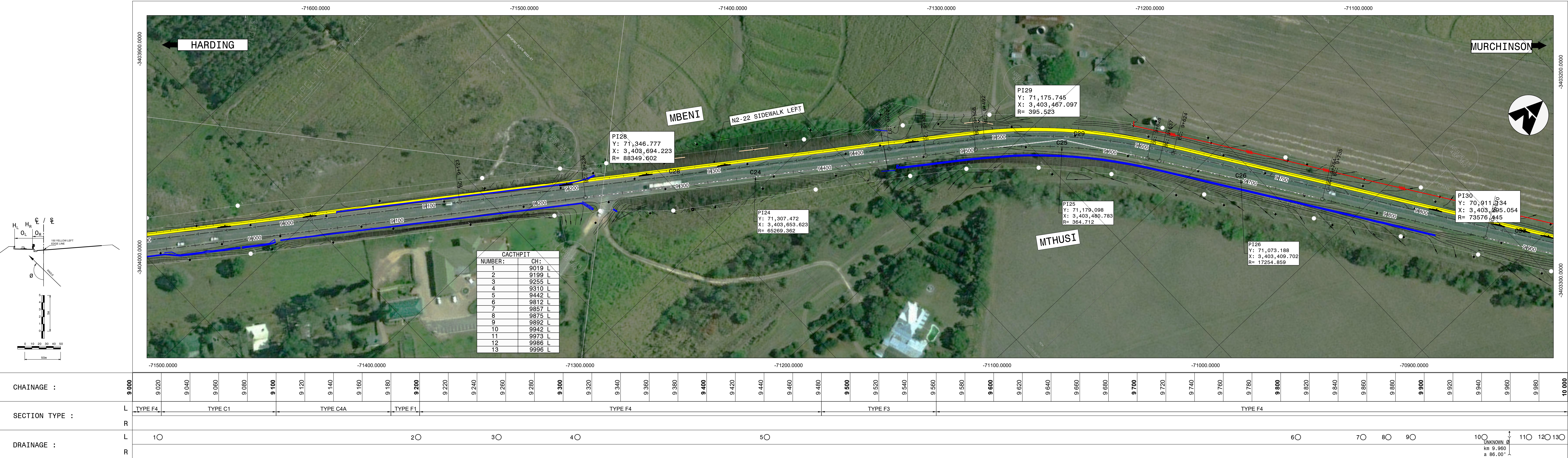
ROUTE N2-22



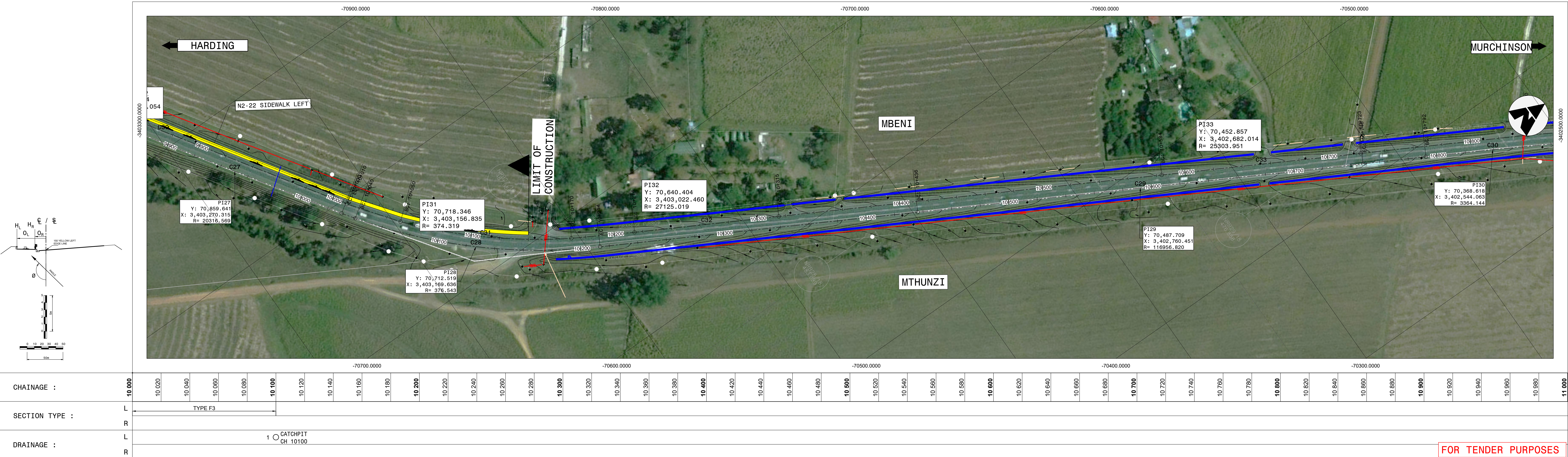
ROUTE N2-22



ROUTE N2-22



ROUTE N2-22



FOR TENDER PURPOSES

CONSTRUCTION RECORD		SANRAL PROJECT MANAGER	
WORKS CONTRACT ENGINEER		Name : Prof. Reg. No. : Date :	
Name : Prof. Reg. No. : Date :		Name : Prof. Reg. No. : Date :	
S. KASIPERSAD		CONSULT. ENG.	
No.	DATE	REVISION	
V1	SEPT 2023	ORIGINAL VERSION	

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000

SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY (Pty) Ltd
BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

EASTERN REGION
58 van Eck Place
Pleasantonville
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND
ADMINISTRATIVE REVIEW PURPOSES ONLY
AND DOES NOT ATTRACT LEGAL LIABILITY OR
LIABILITY OF ANY KIND FROM WHATSOEVER
CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2,
SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)

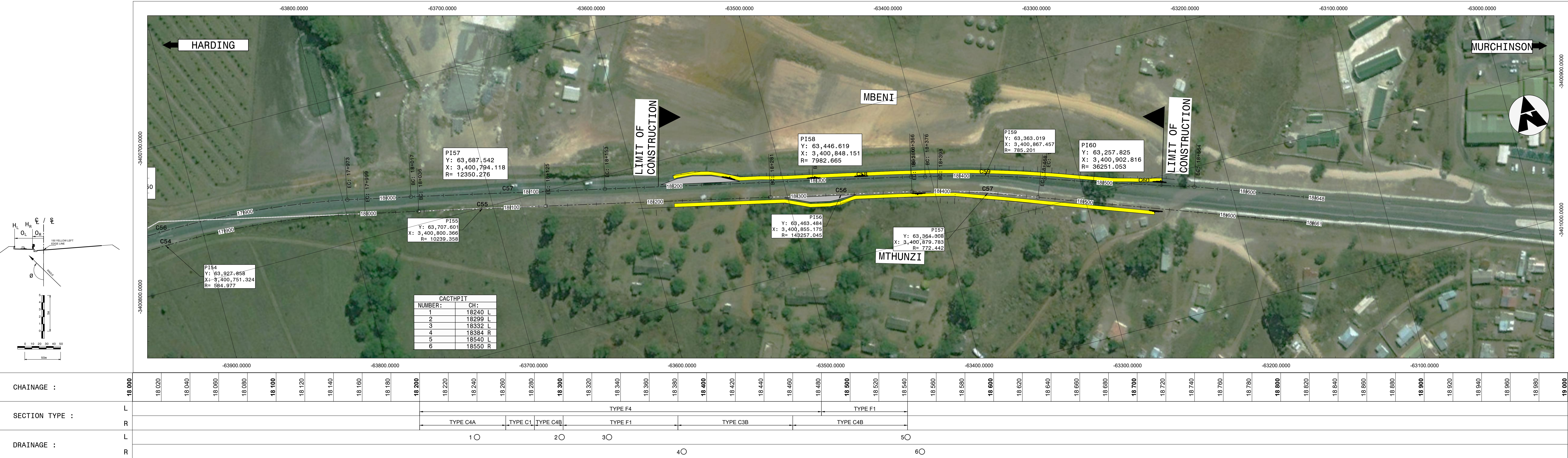
DRAWING DESCRIPTION
PACKAGE A: N2-22
ACTIVITY PLAN

SCALE: 1:1000

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	ROUTE	START	END
	N2	N2	N2
SECTION	22	22	22
	km 0,80	km 18,64	
DRAWING TYPE		ROADS - LAYOUT	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-05A-003	
SANRAL DOCUMENT #		VER V1	

DRAWING No. TP1802-19-05-25-05A-003

ROUTE N2-22



FOR TENDER PURPOSES

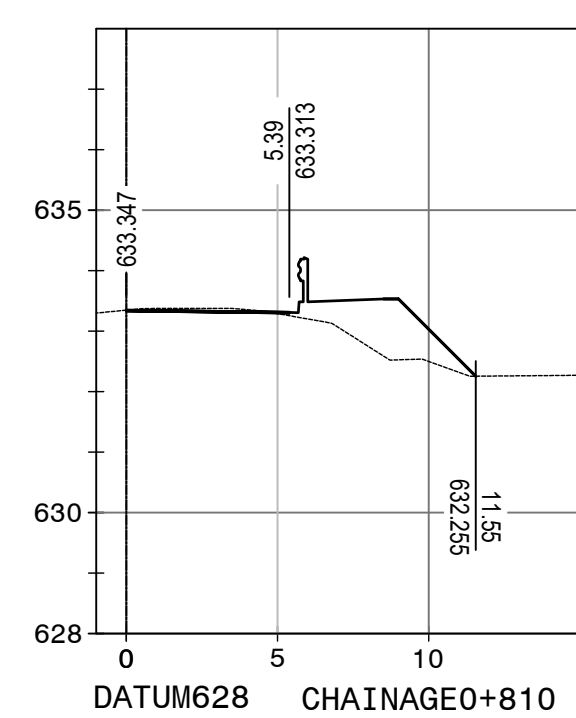
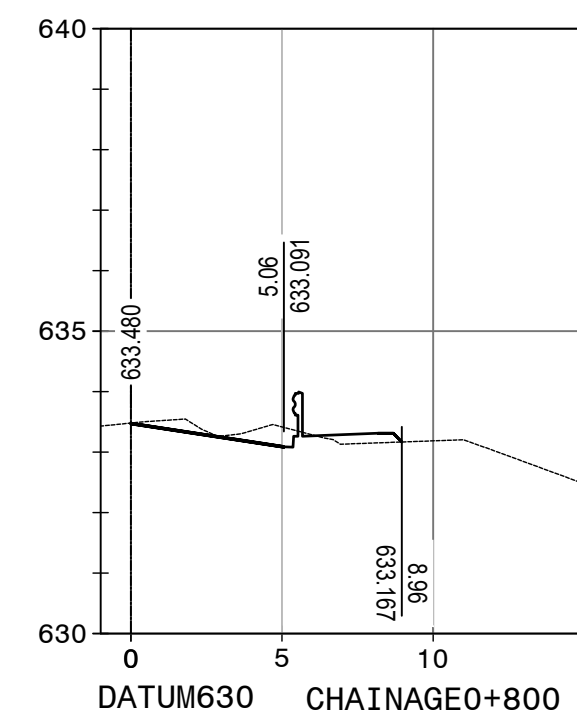
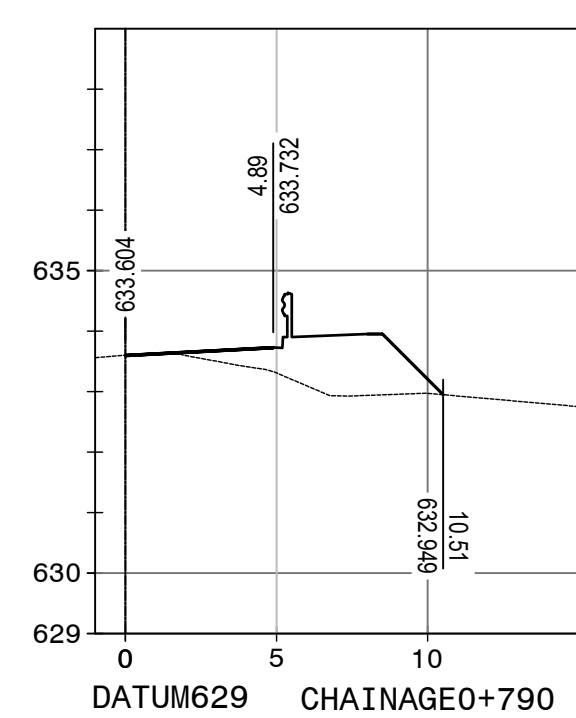
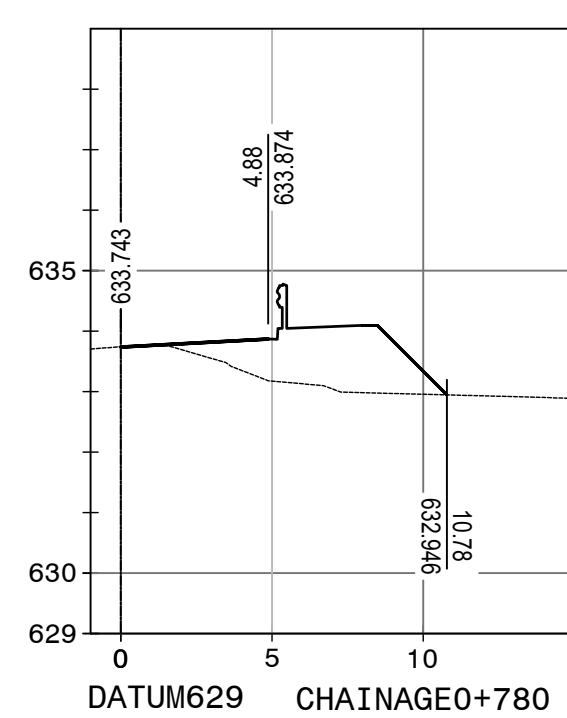
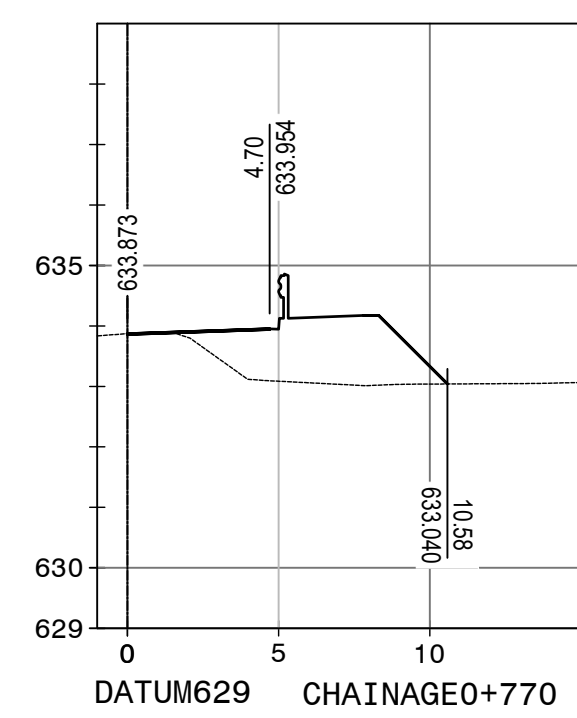
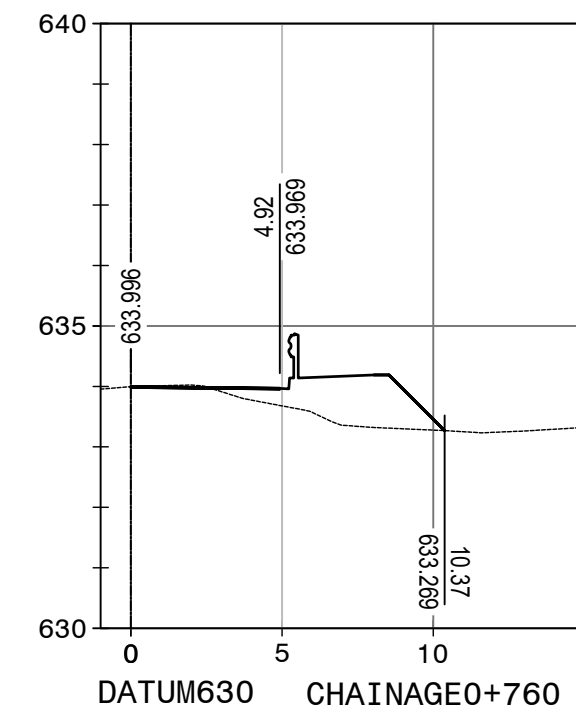
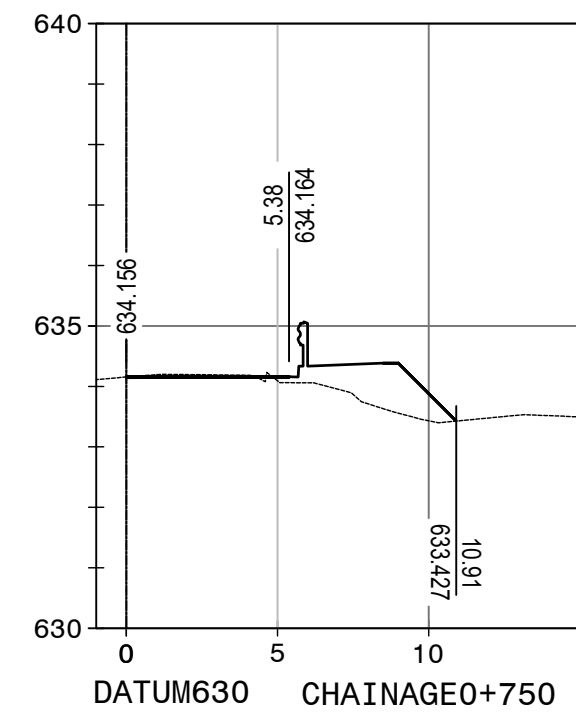
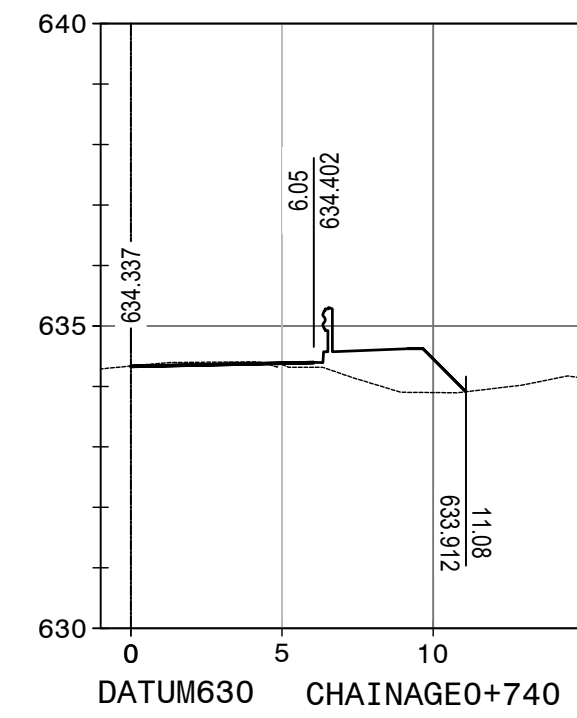
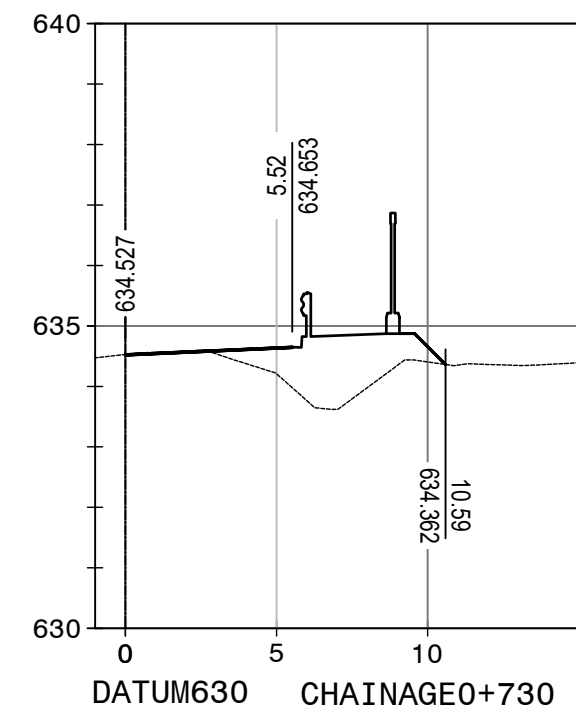
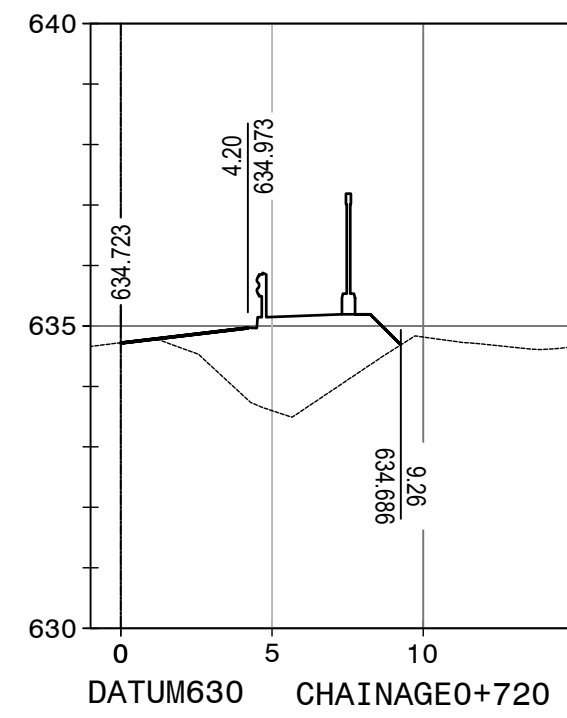
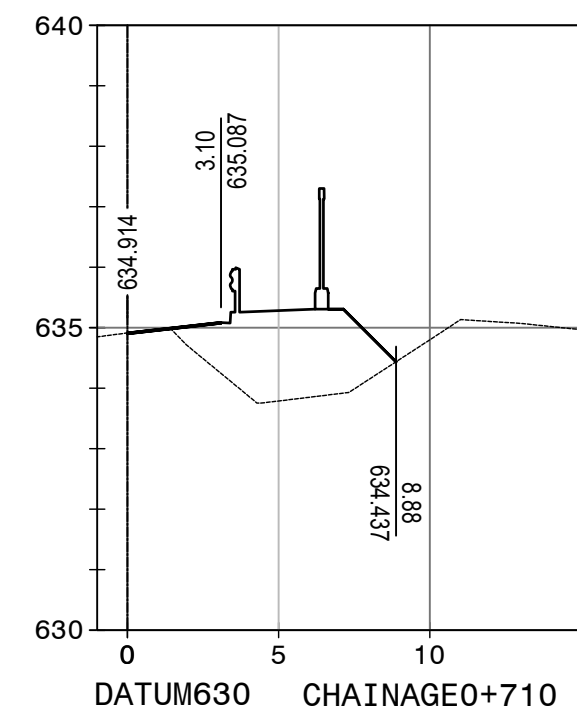
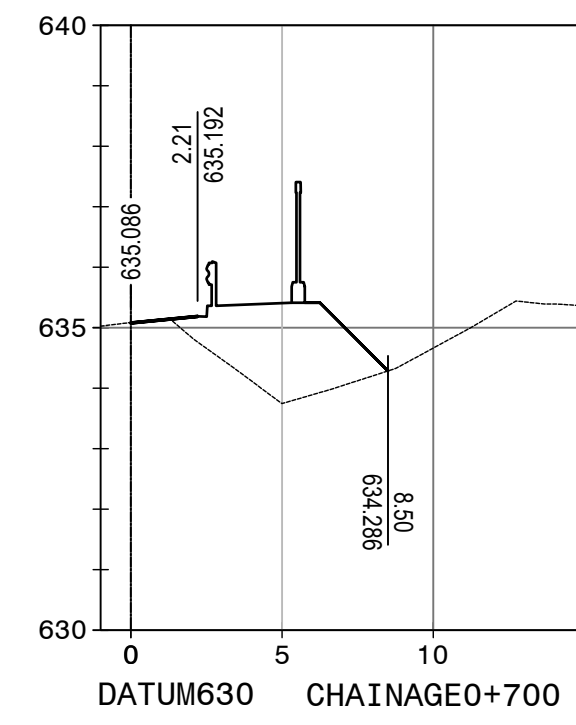
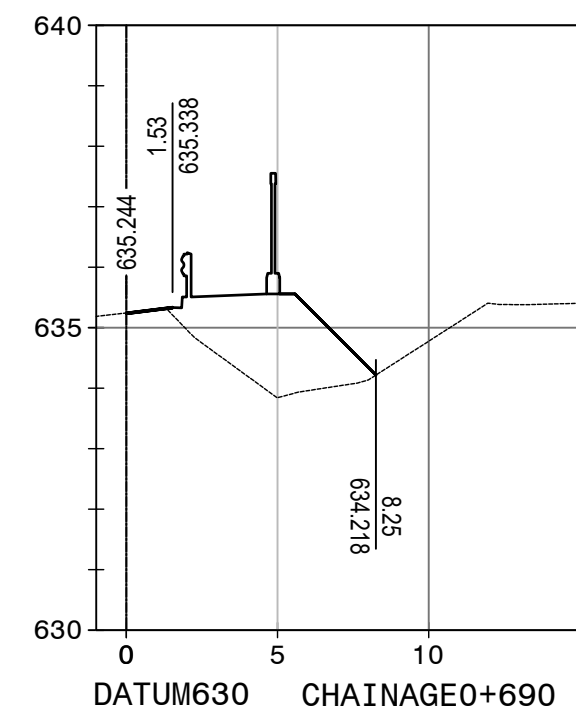
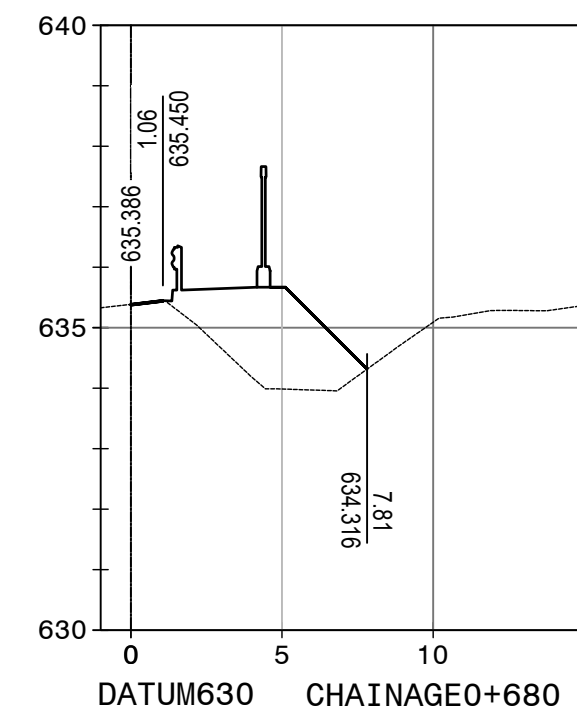
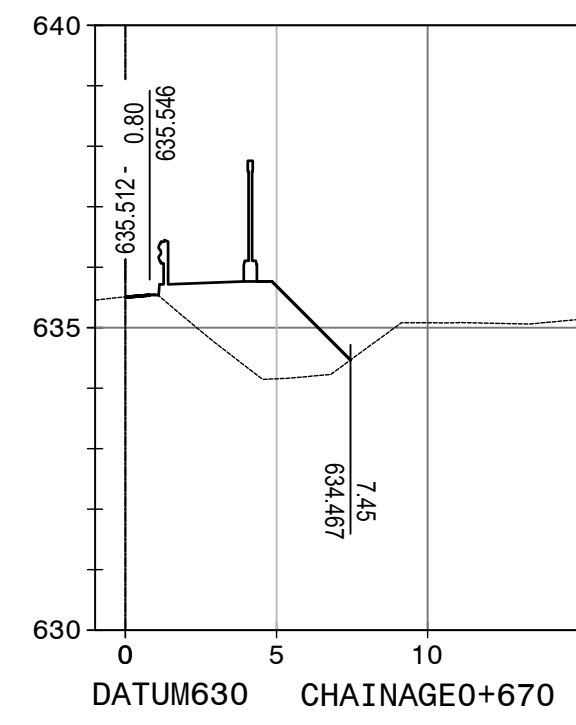
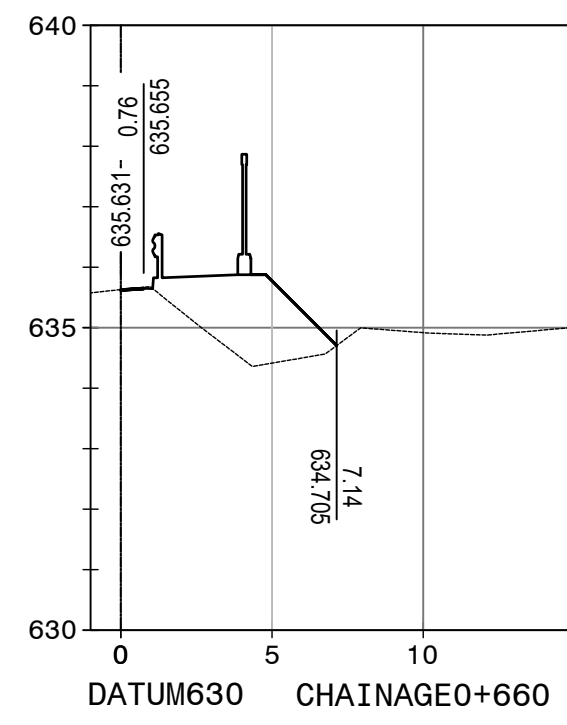
				CONSTRUCTION RECORD				HEAD OFFICE		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
				WORKS CONTRACT ENGINEER				48 Tambotie Avenue		58 van Eck Place		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
				Name : ..				Pretoria		Pietermaritzburg				ROUTE		N2		N2	
				Prof. Reg. No. : ..				0184		3201				SECTION		22		22	
				Date : ..				PO Box 415		Scottsville				DRAWING km DISTANCE		km 0,80		km 18,64	
				SANRAL PROJECT MANAGER				Tel: (012) 844 8000		Tel: (033) 392 8100				DRAWING TYPE		ROADS - LAYOUT			
				Name : R. ROMNY				BUILDING SOUTH AFRICA THROUGH BETTER ROADS						BRIDGE/STRUCTURE No.		N/A			
				Prof. Reg. No. : ..										CONSULTANT DRAWING No.		TP1802-19-05-25-05A-004			
				Date : ..										SANRAL DOCUMENT #					
V1 SEPT 2023 ORIGINAL VERSION				S. KASIPERSAD										SCALE : 1:1000		SHEET 4 OF 4		VER V1	
No. DATE REVISION				CONSULT. ENG.															

CURVE TABLE: (ENTER ROUTE NO)								
CURVE NO.	PI	Y CO-ORDINATE	X CO-ORDINATE	CHAINAGE	RADIUS	DIRECTION	INTERSECTION ANGLE	ARC LENGTH
C1	PI 1	-78,630.735	3,407,191.437	38.727	962.219	BACK 178°12'42" FRONT 181°24'39"	3°11'58"	53.730
	CC 1	-79,593.324	-3,407,194.608					
	BC 1	-78,631.574	3,407,164.578	11.855				
	EC 1	-78,631.397	3,407,218.301	65.585				
C2	PI 2	-78,629.722	3,407,292.946	140.260	378.939	BACK 177°48'00" FRONT 166°38'24"	11°09'37"	73.811
	CC 2	-78,252.483	-3,407,241.405					
	BC 2	-78,631.143	3,407,255.951	103.237				
	EC 2	-78,621.167	3,407,328.967	177.048				
C3	PI 3	-78,606.053	3,407,390.568	240.478	492.713	BACK 166°00'36" FRONT 154°18'53"	11°41'44"	100.575
	CC 3	-78,140.154	-3,407,222.488					
	BC 3	-78,618.252	3,407,341.602	190.015				
	EC 3	-78,584.181	3,407,436.044	290.590				
C4	PI 4	-78,549.631	3,407,500.448	363.685	488.809	BACK 151°15'58" FRONT 138°06'55"	13°09'03"	112.195
	CC 4	-78,148.099	-3,407,216.051					
	BC 4	-78,576.718	3,407,451.041	307.341				
	EC 4	-78,512.013	3,407,542.396	419.535				
C5	PI 5	-78,434.258	3,407,622.207	530.971	463.677	BACK 135°21'05" FRONT 113°52'11"	21°28'54"	173.845
	CC 5	-78,166.194	-3,407,233.781					
	BC 5	-78,496.069	3,407,559.633	443.016				
	EC 5	-78,353.826	3,407,657.799	616.860				
C6	PI 6	-78,284.699	3,407,687.699	692.177	525.661	BACK 113°17'22" FRONT 99°12'44"	14°04'39"	129.154
	CC 6	-78,136.479	-3,407,179.208					
	BC 6	-78,344.314	3,407,662.037	627.274				
	EC 6	-78,220.632	3,407,698.089	756.428				
C7	PI 7	-78,169.640	3,407,697.105	807.522	1,229.663	BACK 86°54'35" FRONT 90°29'28"	3°34'53"	76.864
	CC 7	-78,141.738	-3,408,927.053					
	BC 7	-78,208.029	3,407,699.178	769.078				
	EC 7	-78,131.197	3,407,697.435	845.942				
C8	PI 8	-78,102.703	3,407,697.622	874.437	52.456	BACK 91°30'59" FRONT 83°29'50"	8°01'09"	7.342
	CC 8	-78,104.991	-3,407,645.087					
	BC 8	-78,106.379	3,407,697.524	870.760				
	EC 8	-78,099.050	3,407,697.205	878.102				
C9	PI 9	-77,997.947	3,407,681.362	980.440	473.636	BACK 81°00'25" FRONT 59°35'24"	21°25'01"	177.044
	CC 9	-78,160.449	-3,407,227.549					
	BC 9	-78,086.413	3,407,695.363	890.872				
	EC 9	-77,920.702	3,407,636.025	1,067.916				
C10	PI 10	-77,635.348	3,407,462.125	1,402.084	111,426.186	BACK 58°43'23" FRONT 58°37'14"	0°06'09"	199.357
	CC 10	-135,570.181	-3,312,281.455					
	BC 10	-77,720.540	3,407,513.876	1,302.405				
	EC 10	-77,550.249	3,407,410.222	1,501.762				
C11	PI 11	-77,435.602	3,407,342.219	1,635.061	597.465	BACK 59°24'28" FRONT 80°49'20"	21°24'52"	223.304
	CC 11	-77,228.784	-3,407,914.017					
	BC 11	-77,532.848	3,407,399.712	1,522.091				
	EC 11	-77,324.078	3,407,324.200	1,745.395				
C12	PI 12	-74,756.753	3,406,879.788	4,350.901	565,629.055	BACK 80°09'05" FRONT 80°14'56"	0°05'51"	962.297
	CC 12	21,517.820	-3,964,255.483					
	BC 12	-75,230.811	3,406,962.086	3,869.752				
	EC 12	-74,282.556	3,406,798.296	4,832.049				
C13	PI 13	-73,951.670	3,406,741.688	5,167.744	2,635.315	BACK 80°45'33" FRONT 78°34'53"	2°10'41"	100.178
	CC 13	-74,424.300	-3,404,148.617					
	BC 13	-74,001.115	3,406,749.732	5,117.649				
	EC 13	-73,902.567	3,406,731.770	5,217.827				
C14	PI 14	-73,669.025	3,406,674.186	5,458.364	600.790	BACK 76°06'04" FRONT 35°20'21"	40°45'43"	427.420
	CC 14	-74,030.011	-3,406,144.602					
	BC 14	-73,885.694	3,406,727.802	5,235.160				
	EC 14	-73,539.920	3,406,492.108	5,662.580				
C15	PI 15	-73,440.199	3,406,337.048	5,846.940	1,395,931.415	BACK 32°32'25" FRONT 32°32'58"	0°00'34"	227.052
	CC 15	1,103,288.971	-4,157,291.768					
	BC 15	-73,501.263	3,406,432.752	5,733.414				
	EC 15	-73,379.118	3,406,241.354	5,960.466				
C16	PI 16	-73,251.275	3,406,039.597	6,199.319	5,226.106	BACK 32°05'32" FRONT 34°20'57"	2°15'25"	205.869
	CC 16	-68,878.442	-3,408,903.355					
	BC 16	-73,305.970	3,406,126.814	6,096.371				
	EC 16	-73,193.188	3,405,954.602	6,302.240				
C17	PI 17	-73,114.853	3,405,842.897	6,438.675	18,494.063	BACK 35°12'15" FRONT 35°39'02"	0°26'47"	144.119
	CC 17	-58,044.828	-3,416,563.432					
	BC 17	-73,156.395	3,405,901.777	6,366.615				
	EC 17	-73,072.854	3,405,784.342	6,510.734				
C18	PI 18	-72,978.375	3,405,651.340	6,673.880	1,293.851	BACK 34°43'48" FRONT 36°43'13"	1°59'25"	44.942
	CC 18	-71,927.832	-3,406,406.929					
	BC 18	-72,991.178	3,405,669.809	6,651.407				
	EC 18	-72,964.938	3,405,633.326	6,696.348				
C19	PI 19	-72,912.501	3,405,569.172	6,779.217	381.505	BACK 39°40'50" FRONT 59°58'17"	20°17'27"	135.106
	CC 19	-72,662.478	-3,405,865.306					
	BC 19	-72,956.090	3,405,621.712	6,710.949				
	EC 19	-72,853.396	3,405,535.008	6,846.055				
C20	PI 20	-72,819.531	3,405,517.460	6,884.198	393.272	BACK 63°10'51" FRONT 69°32'21"	6°21'31"	43.644
	CC 20	-72,661.591	-3,405,878.285					
	BC 20	-72,839.026	3,405,527.316	6,862.354				
	EC 20	-72,799.065	3,405,509.824	6,905.998				

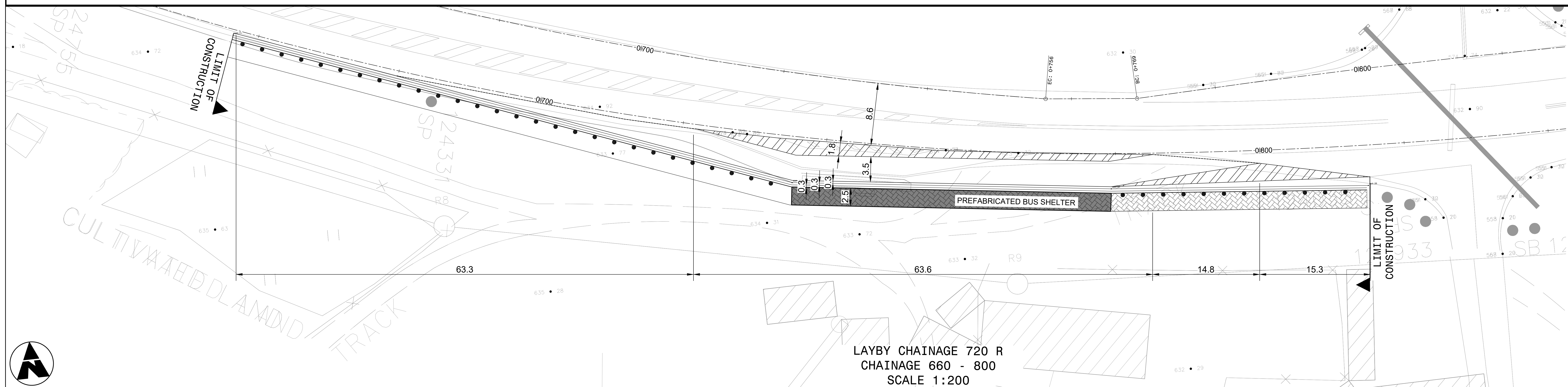
CURVE TABLE: (ENTER ROUTE NO)								
CURVE NO.	PI	Y CO-ORDINATE	X CO-ORDINATE	CHAINAGE	RADIUS	DIRECTION	INTERSECTION ANGLE	ARC LENGTH
C21	PI 21	-72,745.131	3,405,490.668	6,963.236	33,071.352	BACK 70°44'01" FRONT 70°53'12"	0°09'12"	88.463
	CC 21	-61,874.577	-3,436,724.421					
	BC 21	-72,786.885	3,405,505.263	6,919.004				
	EC 21	-72,703.338	3,405,476.185	7,007.467				
C22	PI 22	-72,601.620	3,405,440.514	7,115.261	354.009	BACK 69°52'09" FRONT 61°51'15"	8°00'54"	49.522
	CC 22	-72,746.744	-3,405,116.667					
	BC 22	-72,624.906	3,405,449.050	7,090.459				
	EC 22	-72,579.752	3,405,428.815	7,139.981				
C23	PI 23	-72,502.081	3,405,385.344	7,228.990	324.011	BACK 60°48'32" FRONT 32°22'48"	28°25'44"	160.767
	CC 23	-72,731.760	-3,405,142.514					
	BC 23	-72,573.731	3,405,425.374	7,146.916				
	EC 23	-72,458.127	3,405,316.032	7,307.682				
C24	PI 24	-72,022.482	3,404,662.575	8,093.047	180,030.147	BACK 33°14'21" FRONT 33°18'10"	0°03'49"	199.592
	CC 24	-78,498.239	-3,503,426.821					
	BC 24	-72,077.184	3,404,746.044	7,993.251				
	EC 24	-71,967.688	3,404,579.168	8,192.843				
C25	PI 25	-71,919.023	3,404,506.046	8,280.679	8,777.380	BACK 33°42'26" FRONT 34°38'34"	0°56'08"	143.328
	CC 25	-64,657.022	-3,409,436.651					
	BC 25	-71,958.794	3,404,565.663	8,209.013				
	EC 25	-71,878.285	3,404,447.085	8,352.341				
C26	PI 26	-71,640.210	3,404,089.825	8,781.665	2,458.842	BACK 33°05'19" FRONT 36°41'00"	3°35'41"	154.268
	CC 26	-69,622.247	-3,409,496.836					
	BC 26	-71,682.334	3,404,154.471	8,704.505				
	EC 26	-71,584.116	3,404,027.947	8,858.773				
C27	PI 27	-71,346.777	3,403,694.223	9,274.162	88,349.602	BACK 36°32'40" FRONT 36°20'55"	0°11'44"	301.687
	CC 27	-142,416.311	-3,403,208.069					
	BC 27	-71,436.596	3,403,815.410	9,123.319				
	EC 27	-71,257.372	3,403,572.730	9,425.006				
C28	PI 28	-71,175.745	3,403,467.097	9,558.513	395.523	BACK 38°24'42" FRONT 57°37'04"	19°12'22"	132.582
	CC 28	-70,907.404	-3,403,765.273					
	BC 28	-71,217.322	3,403,519.632	9,491.594				
	EC 28	-71,119.232	3,403,431.257	9,624.177				
C29	PI 29	-70,911.134	3,403,295.054	9,872.886	73,576.445	BACK 56°51'25" FRONT 56°38'33"	0°12'51"	275.198
	CC 29	-111,252.916	-3,341,764.145					
	BC 29	-71,026.346	3,403,370.284	9,735.287				
	EC 29	-70,796.203	3,403,219.394	10,010.485				
C30	PI 30	-70,718.346	3,403,156.835	10,110.405	374.319	BACK 49°50'54" FRONT 31°27'36"	18°23'18"	120.133
	CC 30	-71,006.020	-3,402,909.796					
	BC 30	-70,764.655	3,403,195.903	10,049.818				
	EC 30	-70,686.725	3,403,105.154	10,169.951				
C31	PI 31	-70,640.404	3,403,022.460	10,264.737	27,125.019	BACK 28°54'02" FRONT 28°41'13"	0°12'49"	101.120
	CC 31	-94,411.708	-3,389,957.457					
	BC 31	-70,664.839	3,403,066.723	10,214.177				
	EC 31	-70,616.134	3,402,978.106	10,315.296				
C32	PI 32	-70,452.857	3,402,682.014	10,653.423	25,303.951	BACK 28°44'30" FRONT 29°03'27"	0°18'57"	139.510
	CC 32	-48,299.975	-3,414,910.858					
	BC 32	-70,466.400	3,402,743.176	10,583.668				
	EC 32	-70,418.978	3,402,621.039	10,723.178				
C33	PI 33	-70,297.177	3,402,402.283	10,973.560	461.910	BACK 29°21'13" FRONT 61°34'02"	32°12'49"	259.702
	CC 33	-69,959.955	-3,402,744.969					
	BC 33	-70,362.561	3,402,518.541	10,840.177				
	EC 33	-70,179.862	3,402,338.775	11,099.879				
C34	PI 34	-69,960.080	3,402,217.497	11,350.920	261,971.034	BACK 61°07'17" FRONT 61°01'36"	0°05'41"	432.846
	CC 34	-196,670.185	-3,172,928.555					
	BC 34	-70,149.590	3,402,322.020	11,134.487				
	EC 34	-69,770.744	3,402,112.661	11,567.343				
C35	PI 35	-69,673.548	3,402,059.748	11,678.008	639.362	BACK 61°26'19" FRONT 76°39'20"	15°13'01"	169.805
	CC 35	-69,442.881	-3,402,662.135					
	BC 35	-69,749.560	3,402,100.580	11,592.602				
	EC 35	-69,590.449	3,402,040.036	11,762.40				

CURVE TABLE: (ENTER ROUTE NO)								
CURVE NO.	PI	Y CO-ORDINATE	X CO-ORDINATE	CHAINAGE	RADIUS	DIRECTION	INTERSECTION ANGLE	ARC LENGTH
C1	PI 1	-78,641.479	3,407,168.844	15.105	453.925	BACK 176°10'04" FRONT 179°53'31"	3°43'27"	29.505
	CC 1	-79,095.375	-3,407,184.457					
	BC 1	-78,642.465	3,407,154.119	0,347				
	EC 1	-78,641.451	3,407,183.601	29.852				
C2	PI 2	-78,643.918	3,407,276.632	122.932	413.458	BACK 182°23'21" FRONT 166°59'53"	15°23'28"	111.065
	CC 2	-78,228.490	-3,407,238.047					
	BC 2	-78,641.589	3,407,220.812	67.063				
	EC 2	-78,631.348	3,407,331.069	178.128				
C3	PI 3	-78,600.048	3,407,453.497	304.499	459.060	BACK 165°24'50" FRONT 140°04'14"	25°20'35"	203.052
	CC 3	-78,181.777	-3,407,238.001					
	BC 3	-78,626.041	3,407,353.609	201.285				
	EC 3	-78,593.801	3,407,532.645	404.337				
C4	PI 4	-78,406.447	3,407,682.136	600.720	478.730	BACK 139°32'38" FRONT 97°14'28"	42°18'10"	353.456
	CC 4	-78,162.363	-3,407,230.570					
	BC 4	-78,526.630	3,407,541.202	415.501				
	EC 4	-78,222.705	3,407,705.482	768.957				
C5	PI 5	-78,169.907	3,407,710.790	822.021	653.953	BACK 95°44'27" FRONT 86°27'46"	9°16'41"	105.896
	CC 5	-78,157.291	-3,407,054.809					
	BC 5	-78,222.705	3,407,705.482	768.957				
	EC 5	-78,116.844	3,407,707.516	874.853				
C6	PI 6	-78,012.498	3,407,698.171	979.721	423.932	BACK 84°39'51" FRONT 61°20'59"	23°18'52"	172.504
	CC 6	-78,139.003	-3,406,928.522					
	BC 6	-78,099.581	3,407,706.304	892.259				
	EC 6	-77,935.744	3,407,656.236	1,064.763				
C7	PI 7	-77,907.247	3,407,640.572	1,097.282	827.974	BACK 60°52'25" FRONT 57°40'58"	3°11'27"	46.112
	CC 7	-78,330.400	-3,406,928.522					
	BC 7	-77,927.593	3,407,651.797	1,074.220				
	EC 7	-77,887.758	3,407,628.243	1,120.332				
C8	PI 8	-77,762.413	3,407,551.478	1,267.316	73,712.001	BACK 58°31'50" FRONT 58°42'47"	0°10'57"	234.883
	CC 8	-77,178.315	-3,407,021.589					
	BC 8	-77,862.581	3,407,612.786	1,149.874				
	EC 8	-77,662.050	3,407,490.488	1,384.757				
C9	PI 9	-77,443.623	3,407,360.958	1,638.734	705.623	BACK 60°28'49" FRONT 75°44'33"	15°14'44"	187.755
	CC 9	-77,178.315	-3,407,021.589					
	BC 9	-77,525.813	3,407,407.464	1,544.299				
	EC 9	-77,352.097	3,407,337.700	1,732.053				
C10	PI 10	-77,329.664	3,407,932.678	1,755.043	671.699	BACK 77°50'07" FRONT 80°14'22"	2°24'14"	28.183
	CC 10	-77,201.699	-3,407,992.265					
	BC 10	-77,343.441	3,407,335.648	1,740.949				
	EC 10	-77,315.774	3,407,330.289	1,769.132				
C11	PI 11	-76,466.347	3,407,183.426	2,631.162	2,004,175.227	BACK 80°12'24" FRONT 80°11'15"	0°01'09"	666.061
	CC 11	-417,696.644	-1,432,270.685					
	BC 11	-76,794.524	3,407,240.073	2,298.131				
	EC 11	-76,138.188	3,407,126.670	2,964.193				
C12	PI 12	-75,258.123	3,406,974.327	3,857.347	234,452.233	BACK 80°06'09" FRONT 80°12'48"	0°06'39"	453.640
	CC 12	-35,182.569	-3,637,976.169					
	BC 12	-75,481.567	3,407,013.314	3,630.527				
	EC 12	-75,034.604	3,406,935.772	4,084.166				
C13	PI 13	-74,169.249	3,406,786.371	4,962.323	6,957,909.252	BACK 80°14'11" FRONT 80°13'58"	0°00'13"	444.318
	CC 13	-1,254,335.822	3,450,305.437					
	BC 13	-74,388.190	3,406,824.046	4,740.164				
	EC 13	-73,950.310	3,406,748.683	5,184.482				
C14	PI 14	-73,880.640	3,406,736.509	5,255.210	634.861	BACK 80°22'17" FRONT 71°11'57"	9°10'20"	101.632
	CC 14	-74,037.034	-3,406,119.109					
	BC 14	-73,930.847	3,406,745.027	5,204.286				
	EC 14	-73,832.432	3,406,720.097	5,305.918				
C15	PI 15	-73,626.872	3,406,639.632	5,526.666	600.751	BACK 68°40'17" FRONT 33°04'56"	35°35'21"	373.156
	CC 15	-74,024.987	-3,406,150.158					
	BC 15	-73,806.484	3,406,709.763	5,333.848				
	EC 15	-73,521.624	3,406,478.072	5,707.004				
C16	PI 16	-73,192.627	3,405,961.516	6,319.434	5,379.587	BACK 32°20'33" FRONT 36°11'21"	3°50'48"	361.164
	CC 16	-68,744.250	-3,408,992.118					
	BC 16	-73,289.271	3,406,114.141	6,138.784				
	EC 16	-73,085.961	3,405,815.719	6,499.948				
C17	PI 17	-72,900.455	3,405,559.914	6,815.962	363.250	BACK 37°01'25" FRONT 67°15'04"	30°13'39"	191.639
	CC 17	-72,669.515	-3,405,856.969					
	BC 17	-72,959.529	3,405,638.240	6,717.856				
	EC 17	-72,809.981	3,405,521.977	6,909.495				
C18	PI 18	-72,712.464	3,405,488.765	7,012.527	11,697.488	BACK 71°45'09" FRONT 72°30'00"	0°44'51"	152.588
	CC 18	-69,122.200	-3,416,621.917					
	BC 18	-72,784.922	3,405,512.655	6,896.292				
	EC 18	-72,639.700	3,405,465.823	7,088.820				
C19	PI 19	-72,525.341	3,405,416.846	7,213.297	351.002	BACK 65°31'26" FRONT 37°53'22"	27°38'04"	169.293
	CC 19	-72,749.335	-3,405,133.163					
	BC 19	-72,603.910	3,405,452.612	7,126.970				
	EC 19	-72,472.325	3,405,348.717	7,296.263				
C20	PI 20	-72,416.789	3,405,267.991	7,394.261	18,897.752	BACK 34°03'57" FRONT 33°35'00"	0°28'57"	159.180
	CC 20	-68,116.167	-3,394,748.441					
	BC 20	-72,461.371	3,405,333.923	7,314.671				
	EC 20	-72,372.764	3,405,201.685	7,473.851				

CURVE TABLE: (ENTER ROUTE NO)								
CURVE NO.	PI	Y CO-ORDINATE	X CO-ORDINATE	CHAINAGE	RADIUS	DIRECTION	INTERSECTION ANGLE	ARC LENGTH
C21	PI 21	-72,121.555	3,404,824.540	7,927.001	88,792.115	BACK 33°37'18" FRONT 34°05'31"	0°28'13"	728.782
	CC 21	1,614.866	-3,454,292.840					
	BC 21	-72,323.322	3,405,127.974	7,562.608				
	EC 21	-71,917.304	3,404,522.772	8,291.390				
C22	PI 22	-71,821.662	3,404,377.618	8,465.223	28,559.613	BACK 33°40'47" FRONT 33°19'05"	0°21'42"	180.291
	CC 22	-95,637.567	-3,388,614.932					
	BC 22	-71,871.652	3,404,452.633	8,375.077				
	EC 22	-71,772.146	3,404,302.289	8,555.369				
C23	PI 23	-71,625.281	3,404,081.605	8,820.456	1,753.004	BACK 33°23'31" FRONT 37°18'52"	3°55'21"	120.015
	CC 23	-70,194.690	-3,405,096.512					
	BC 23	-71,658.320	3,404,131.726	8,760.425				
	EC 23	-71,588.891	3,404,033.861	8,880.440				
C24	PI 24	-71,307.472	3,403,653.623	9,353.491	65,269.362	BACK 36°33'41" FRONT 36°21'06"	0°12'35"	238.956
	CC 24	-123,804.297	-3,364,869.769					
	BC 24	-71,378.643	3,403,749.590	9,234.013				
	EC 24	-71,236.653	3,403,557.996	9,472.969				
C25	PI 25	-71,179.098	3,403,480.783	9,568.792	364.712	BACK 36°58'44" FRONT 55°53'34"	18°54'50"	120.395
	CC 25	-70,924.288	-3,403,748.696					
	BC 25	-71,215.641	3,403,529.314	9,508.042				
	EC 25	-71,128.797	3,403,446.717	9,628.438				
C26	PI 26	-71,073.188	3,403,409.702	9,695.241	17,254.859	BACK 56°30'55" FRONT 56°54'10"	0°23'15"	116.685
	CC 26	-61,602.081	-3,417,833.006					
	BC 26	-71,121.848	3,403,441.891	9,636.898				
	EC 26	-71,024.312	3,403,377.844	9,753.583				
C27	PI 27	-70,859.641	3,403,270.315	9,950.253	20,316.569	BACK 56°55'32" FRONT 56°28'28"	0°27'04"	159.958
	CC 27	-82,013.962	-3,386,289.429					
	BC 27	-70,926.661	3,403,313.962	9,870.274				
	EC 27	-70,792.967	3,403,226.142	10,020.232				
C28	PI 28	-70,712.591	3,403,169.636	10,128.541	376.543	BACK 54°53'54" FRONT 28°31'57"	26°21'57"	173.274
	CC 28	-71,001.201	-3,402,912.290					
	BC 28	-70,784.678	3,403,220.353	10,040.342				
	EC 28	-70,670.390	3,403,092.149	10,213.617				
C29	PI 29	-70,487.709	3,402,760.451	10,592.293	116,956.820	BACK 28°48'46" FRONT 28°57'56"	0°09'11"	312.194
	CC 29	-91,914.601	-3,459,264.337					
	BC 29	-70,562.939	3,402,897.223	10,436.196				
	EC 29	-70,412.113	3,402,623.860	10,748.390				
C30	PI 30	-70,368.618	3,402,544.063	10,839.289	3,364.144	BACK 28°29'51" FRONT 30°04'37"	1°35'47"	93.727
	CC 30	-67,483.961	-3,404,189.497					
	BC 30	-70,390.967	3,402,585.258	10,792.422				
	EC 30	-70,345.130	3,402,503.507	10,886.150				
C31	PI 31	-70,275.292	3,402,401.749	11,009.576	457.999	BACK 34°44'23" FRONT 60°14'04"	25°29'41"	203.794
	CC 31	-69,957.975	-3,402,747.882					
	BC 31	-70,334.335	3,402,486.892	11,005.963				
	EC 31	-70,185.350	3,402,350.310	11,109.757				
C32	PI 32	-69,678.358	3,402,069.677	11,689.236	584.576	BACK 60°54'18" FRONT 76°42'31"	15°48'12"	161.239
	CC 32	-69,464.998	-3,402,619.941					
	BC 32	-69,749.255	3,402,109.130	11,608.101				
	EC 32	-69,599.397	3,402,051.024	11,769.341				
C33	PI 33	-69,470.659	3,402,023.233	11,901.046	16,187.447	BACK 77°56'03" FRONT 77°11'31"	0°44'32"	209.692
	CC 33	-72,956.939	-3,386,215.315					
	BC 33	-69,573.190	3,402,045.150	11,796.198				
	EC 33	-69,368.420	3,401,999.990	12,005.890				
C34	PI 34	-69,174.304	3,401,956.072	12,204.913	76,317.861	BACK 77°12'51" FRONT 77°26'20"	0°13'29"	299.285
	CC 34	-52,430.653	-3,476,414.707					
	BC 34	-69,320.236	3,401,989.189	12,055.270				
	EC 34	-69,028.243	3,401,923.528	12,354.555				
C35	PI 35	-68,731.480	3,401,854.860	12,659.166	443.087	BACK 76°16'39" FRONT 56°32'11"	19°44'30"	152.668
	CC 35	-68,911.486	-3,401,442.710					
	BC 35	-68,806.378	3,401,873.150	12,582.068				
	EC 35	-68,667.163	3,401,812.348	12,764.735				
C36	PI 36	-68,525.747	3,401,717.289	12,905.131	63,080.148	BACK 56°01'09" FRONT 56°15'28"	0°14'18"	262.476
	CC 36	-38,378.194	-3,454,098.314					
	BC 36	-68,634.573	3,401,780.640	12,773.893				
	EC 36	-68,416.617	3,401,644.392	13,068.368				
C37	PI 37	-68,052.500	3,401,399.763	13,475.030	123,062.126	BACK 56°04'28" FRONT 55°58'42"	0°05'46"	206.506
	CC 37	-136,821.133	-3,299,345.010					
	BC 37	-68,138.176	3,401,457.390	13,371.777				
	EC 37	-67,966.922	3,401,341.992	13,578.283				
C38	PI 38	-67,893.151	3,401,293.062	13,666.806	465.331	BACK 56°17'47" FRONT 67°00'18"	10°42'31"	86.971
	CC 38	-67,671.222	-3,401,704.380					
	BC 38	-67,929.433	3,401,317.263	13,623.193				
	EC 38	-67,853.004	3,401,276.025	13,710.164				
C39	PI 39	-67,788.717	3,401,250.871	13,779.198	418.273	BACK 68°38'23" FRONT 83°14'18"	14°35'55"	106.574
	CC 39	-67,686.265	-3,401,659.927					
	BC 39	-67,838.614	3,401,270.385	13,725.621				
	EC 39	-67,735.512	3,401,244.563	13,832.195				
C40	PI 40	-67,595.827	3,401,227.870	13,972.874	32,822.001	BACK 83°14'11" FRONT 83°33'19"	0°19'07"	182.577
	CC 40	-63,820.976	-3,433,832.204					
	BC 40	-67,686.480	3,401,238.621	13,881.585				
	EC 40	-67,505.115	3,401,217.623	14,064.162				



LAYBY SETTING OUT			
POINT	Y CO-ORDINATE	X CO-ORDINATE	LEVEL
N2-22 0800 R BE1	-78,331.832	-3,407,679.144	635.710
N2-22 0800 R BE2	-78,256.638	-3,407,706.447	634.513
N2-22 0800 R BE3	-78,212.711	-3,407,711.307	633.880
N2-22 0800 R BE4	-78,177.233	-3,407,714.054	633.259



LAYBY CHAINAGE 720 R
CHAINAGE 660 - 800
SCALE 1:200

FOR TENDER PURPOSES

CONSTRUCTION RECORD		SANRAL PROJECT MANAGER	
WORKS CONTRACT ENGINEER		Name :	
Name :		Prof. Reg. No. :	
Date :		Name :	
Date :		Prof. Reg. No. :	
Date :		Date :	
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
48 Tambotie Avenue		58 van Eck Place		PO Box 100410		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
Val de Grace		Pietermaritzburg		Scottsville		Date:		ROUTE		ROUTE		N2	
0184		3209		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		N2		22	
PO Box 415		PO Box 100410		Tel: (033) 392 8100		Date:		DRAWING km DISTANCE		km 0,80		km 18,64	
Pretoria 0001		Scottsville		Tel: (033) 392 8100		Date:		DRAWING TYPE		ROADS - LAYOUT		N/A	
South Africa		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		BRIDGE/STRUCTURE No.		CONSULTANT DRAWING No.		TP1802-19-05-25-07-001	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		GEOMETRIC LAYOUT LAYBY KM 720 RIGHT		SANRAL DOCUMENT #		VER	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		SCALE : 1:1000		SHEET 1 OF 1		V1	

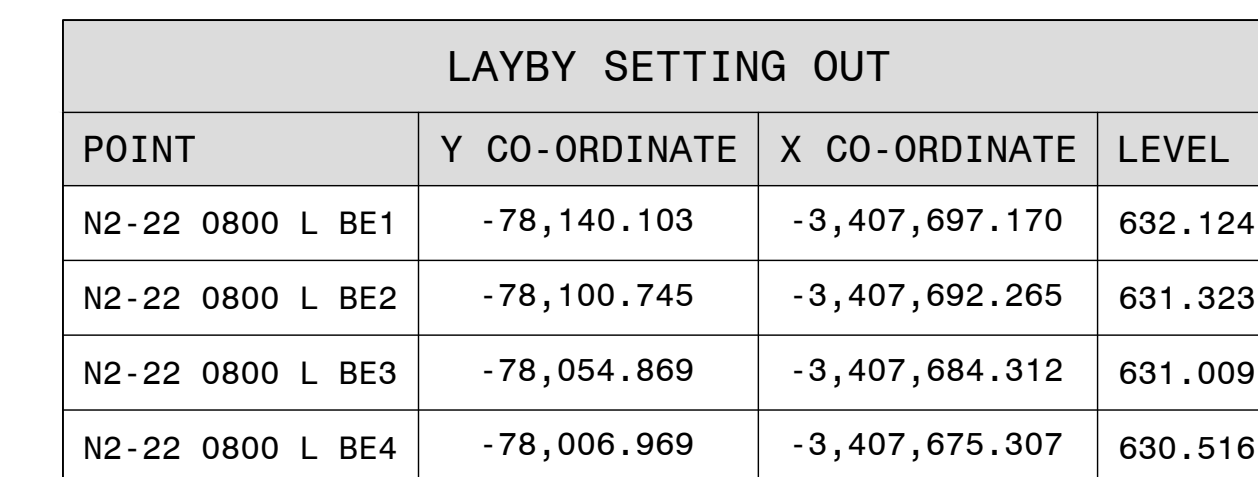
HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
48 Tambotie Avenue		58 van Eck Place		PO Box 100410		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
Val de Grace		Pietermaritzburg		Scottsville		Date:		ROUTE		ROUTE		N2	
0184		3209		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		N2		22	
PO Box 415		PO Box 100410		Tel: (033) 392 8100		Date:		DRAWING km DISTANCE		km 0,80		km 18,64	
Pretoria 0001		Scottsville		Tel: (033) 392 8100		Date:		DRAWING TYPE		ROADS - LAYOUT		N/A	
South Africa		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		BRIDGE/STRUCTURE No.		CONSULTANT DRAWING No.		TP1802-19-05-25-07-001	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		GEOMETRIC LAYOUT LAYBY KM 720 RIGHT		SANRAL DOCUMENT #		VER	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		SCALE : 1:1000		SHEET 1 OF 1		V1	


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Val de Grace		Pietermaritzburg		Scottsville		Date:		ROUTE		ROUTE		N2	
0184		3209		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		N2		22	
PO Box 415		PO Box 100410		Tel: (033) 392 8100		Date:		DRAWING km DISTANCE		km 0,80		km 18,64	
Pretoria 0001		Scottsville		Tel: (033) 392 8100		Date:		DRAWING TYPE		ROADS - LAYOUT		N/A	
South Africa		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		BRIDGE/STRUCTURE No.		CONSULTANT DRAWING No.		TP1802-19-05-25-07-001	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		GEOMETRIC LAYOUT LAYBY KM 720 RIGHT		SANRAL DOCUMENT #		VER	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		SCALE : 1:1000		SHEET 1 OF 1		V1	

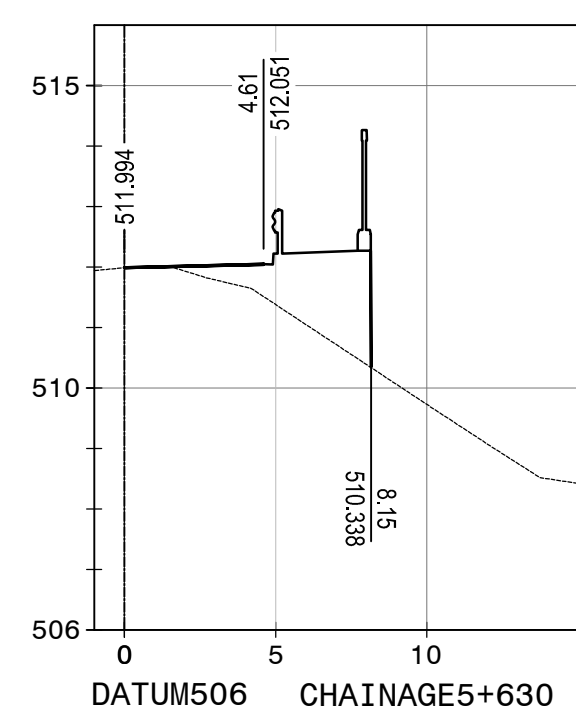
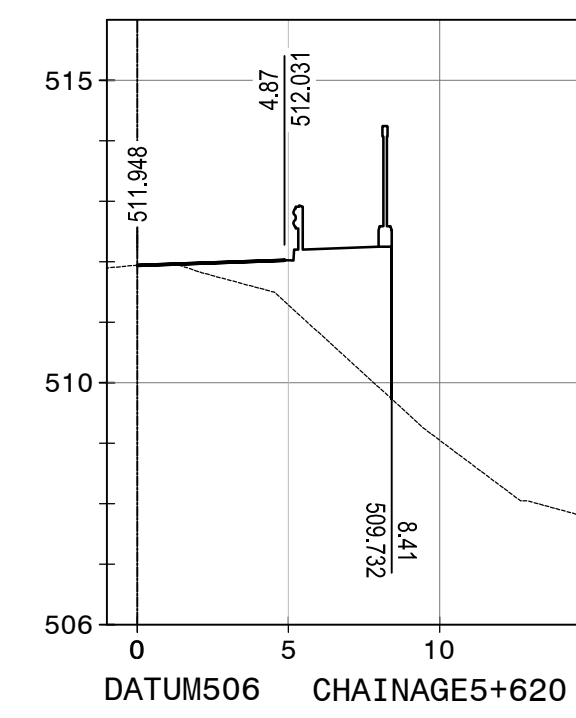
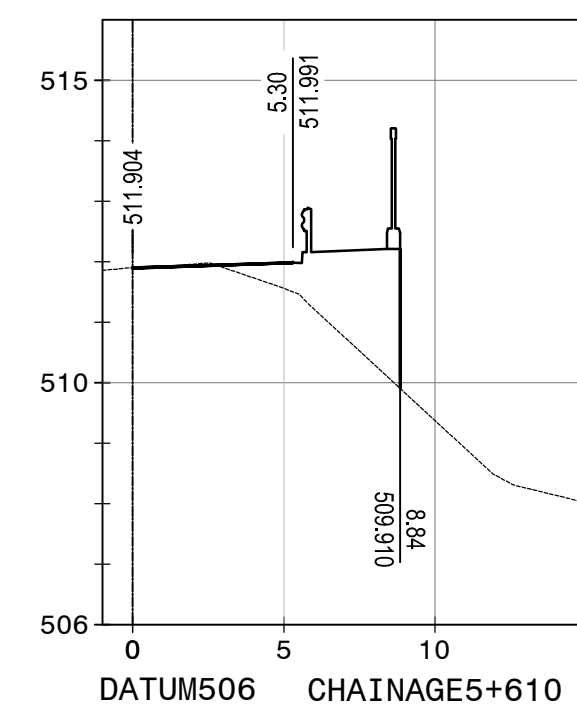
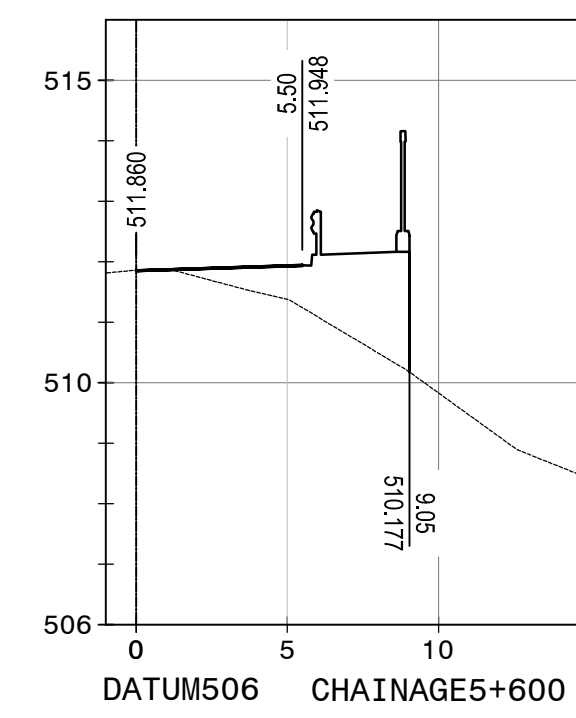
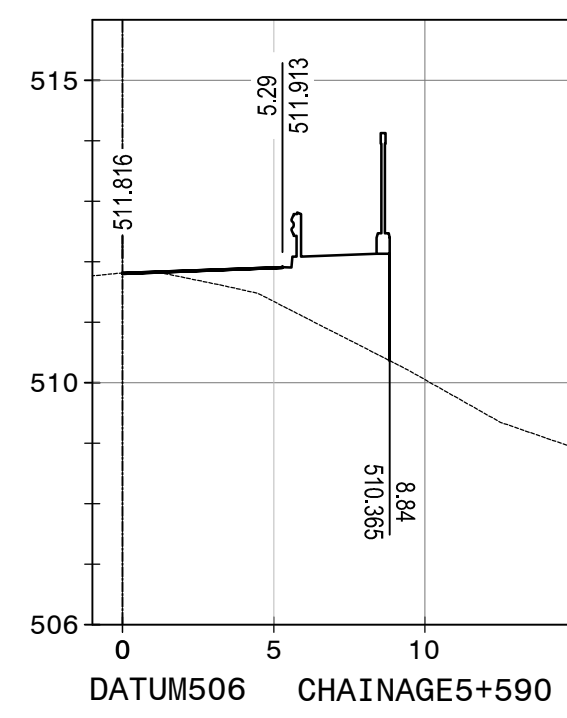
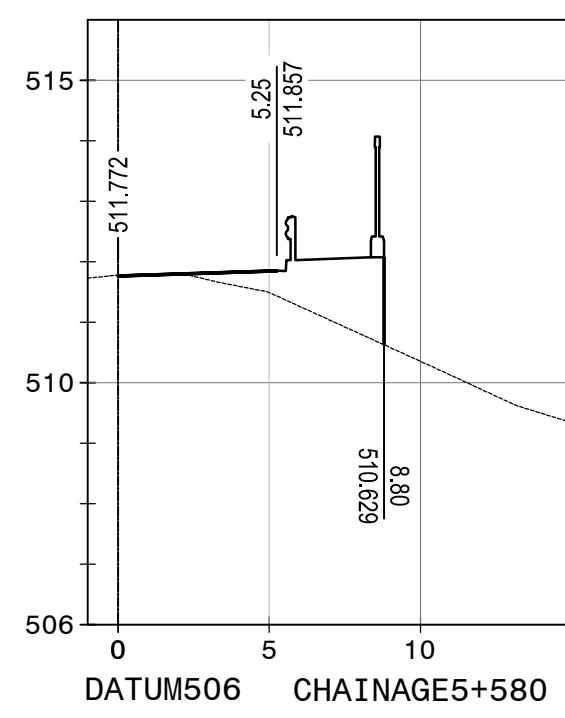
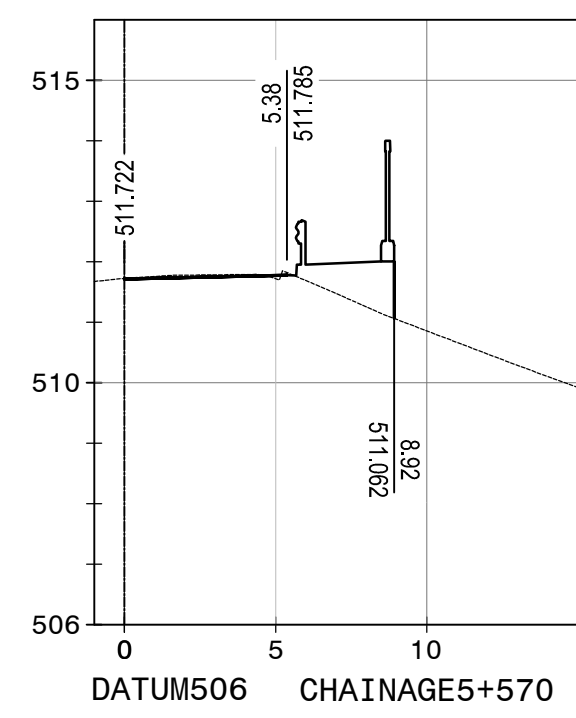
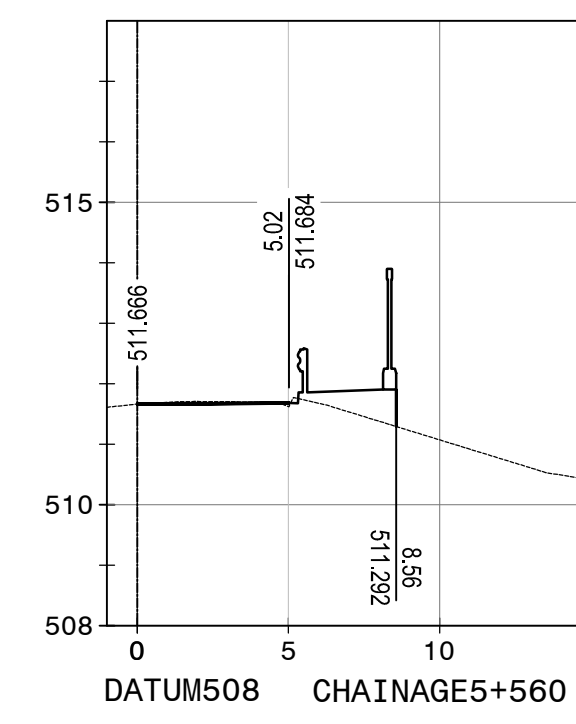
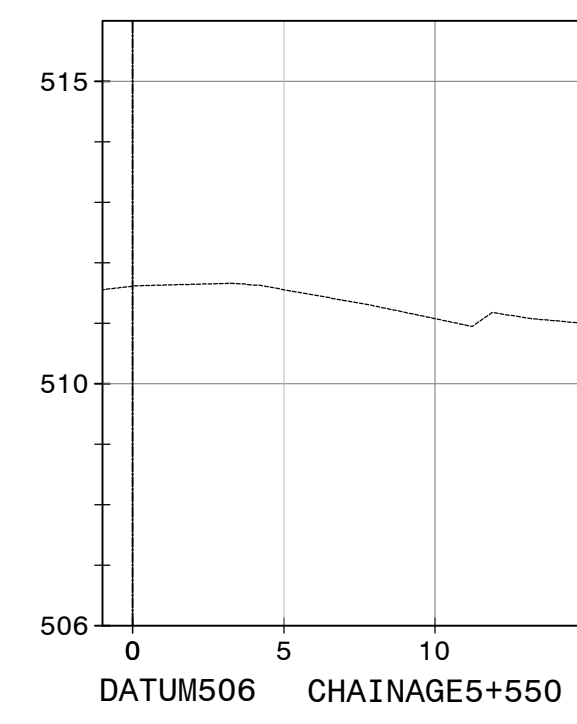
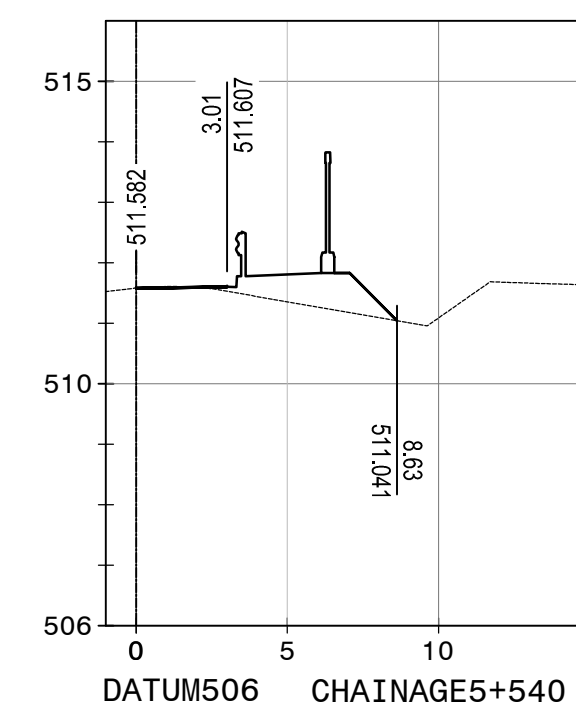
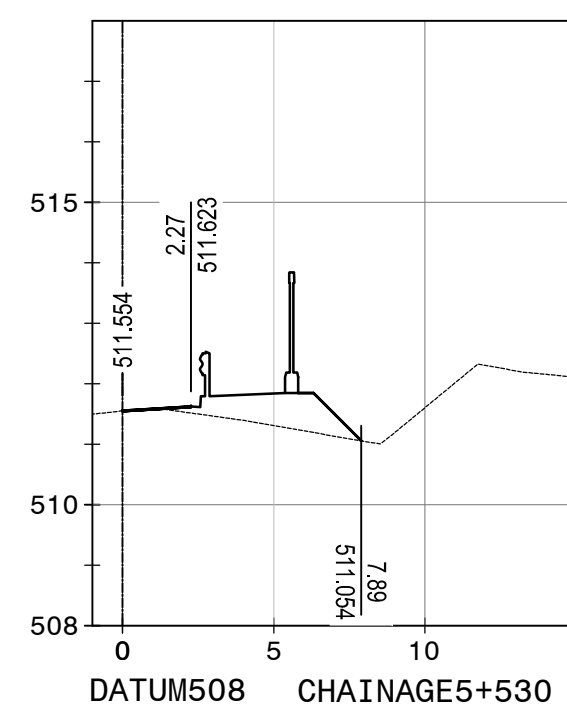
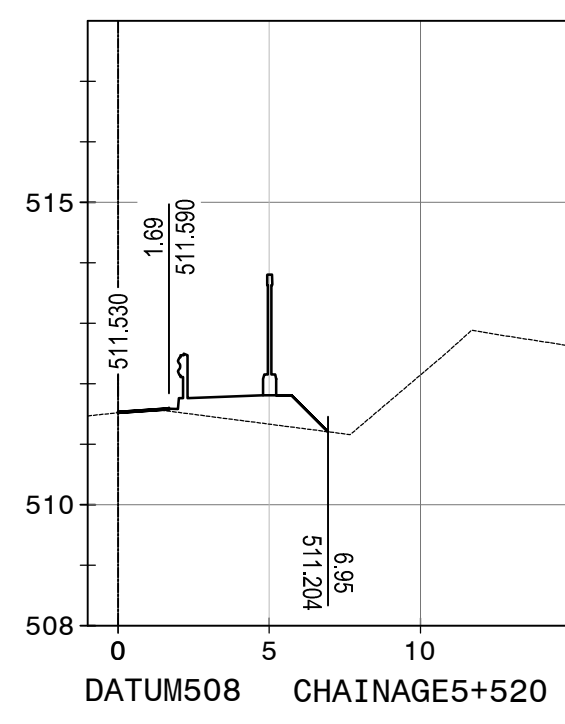
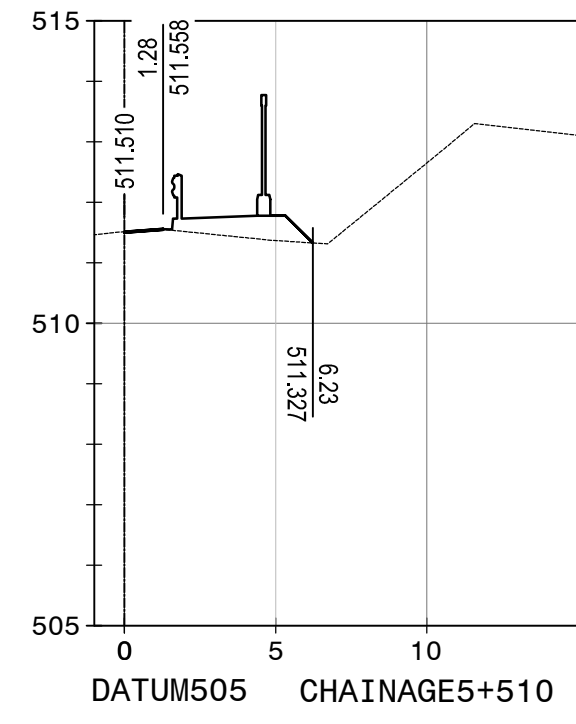
HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
48 Tambotie Avenue		58 van Eck Place		PO Box 100410		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
Val de Grace		Pietermaritzburg		Scottsville		Date:		ROUTE		ROUTE		N2	
0184		3209		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		N2		22	
PO Box 415		PO Box 100410		Tel: (033) 392 8100		Date:		DRAWING km DISTANCE		km 0,80		km 18,64	
Pretoria 0001		Scottsville		Tel: (033) 392 8100		Date:		DRAWING TYPE		ROADS - LAYOUT		N/A	
South Africa		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		BRIDGE/STRUCTURE No.		CONSULTANT DRAWING No.		TP1802-19-05-25-07-001	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		GEOMETRIC LAYOUT LAYBY KM 720 RIGHT		SANRAL DOCUMENT #		VER	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		SCALE : 1:1000		SHEET 1 OF 1		V1	

HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
48 Tambotie Avenue		58 van Eck Place		PO Box 100410		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
Val de Grace		Pietermaritzburg		Scottsville		Date:		ROUTE		ROUTE		N2	
0184		3209		Tel: (012) 844 8000		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		N2		22	
PO Box 415		PO Box 100410		Tel: (033) 392 8100		Date:		DRAWING km DISTANCE		km 0,80		km 18,64	
Pretoria 0001		Scottsville		Tel: (033) 392 8100		Date:		DRAWING TYPE		ROADS - LAYOUT		N/A	
South Africa		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		BRIDGE/STRUCTURE No.		CONSULTANT DRAWING No.		TP1802-19-05-25-07-001	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		GEOMETRIC LAYOUT LAYBY KM 720 RIGHT		SANRAL DOCUMENT #		VER	
Tel: (012) 844 8000		Tel: (033) 392 8100		Tel: (033) 392 8100		Date:		SCALE : 1:1000		SHEET 1 OF 1		V1	

<u>PROJECT DESCRIPTION</u>									
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)									
<u>DRAWING DESCRIPTION</u>									
PACKAGE A: N2-22 GEOMETRIC LAYOUT LAYBY KM 720 RIGHT									
SCALE: 1:1000					SHEET 1 OF 1				

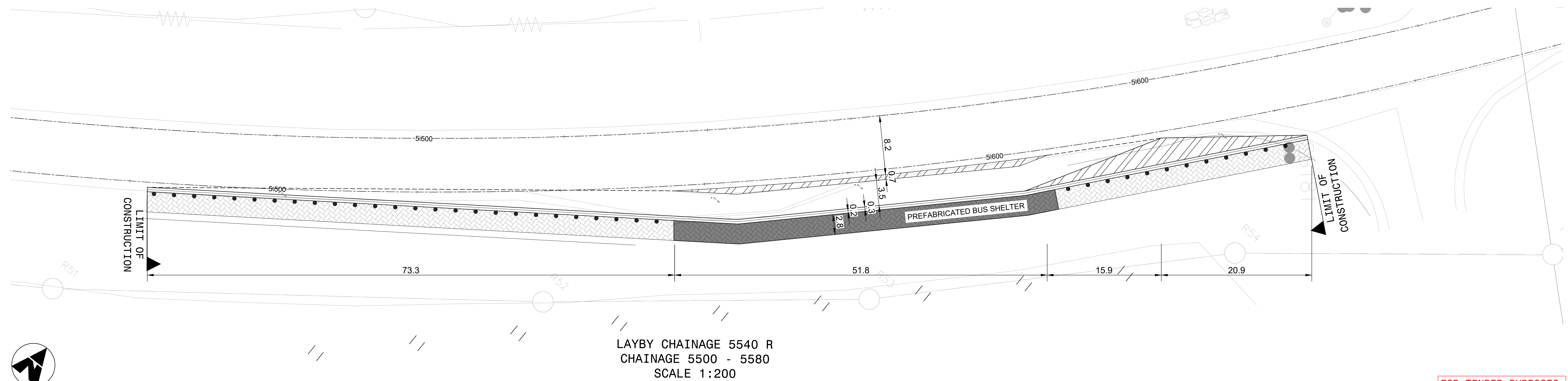


			CONSTRUCTION RECORD		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		<div><div>SANRAL</div><div><small>SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD</small></div><div><div><div>BUILDING SOUTH AFRICA THROUGH BETTER ROADS</div></div></div></div> <div><div>EASTERN REGION</div><div>58 van Eck Place Pietmaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100</div></div>		<div>ACCEPTANCE</div> <div>THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATEVER CAUSE OR HOWEVER ARISING</div> <div></div> <div>for CEO, SA NATIONAL ROADS AGENCY LTD.</div>		<div>PROJECT DESCRIPTION</div> <div>CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)</div> <div>DRAWING DESCRIPTION</div> <div>PACKAGE A: N2-22 GEOMETRIC LAYOUT LAYBY KM 900 LEFT</div>		<div>PROJECT NUMBER</div> <div>NRA.C.004-099-2023/1</div>	
			WORKS CONTRACT ENGINEER						<div>DRAWING LOCATION DATA</div> <div>ROUTE SECTION DRAWING KM DISTANCE DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No.</div>		<div>START</div> <div>N2 22 km 0,80 N/A TP1802-19-05-25-07-002</div>		<div>END</div> <div>N2 22 km 18,64 ROADS - LAYOUT N/A VER</div>	
			Name : Prof. Reg. No. : Date :						<div>DRAWING DESCRIPTION</div> <div>SCALE : 1:1000 SHEET 1 OF 1</div>		<div>SANRAL DOCUMENT #</div> <div>-</div>			
			SANRAL PROJECT MANAGER											
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD											
No.	DATE	REVISION	CONSULT.											



LAYBY SETTING OUT				
POINT	Y CO-ORDINATE	X CO-ORDINATE	LEVEL	
N2-22 5540 R BE1	-73,661.043	-3,406,628.734	511.510	
N2-22 5540 R BE2	-73,614.071	-3,406,591.108	511.678	
N2-22 5540 R BE3	-73,599.811	-3,406,577.042	511.804	
N2-22 5540 R BE4	-73,565.180	-3,406,539.476	512.024	

DETAIL CROSS SECTIONS



FOR TENDER PURPOSES

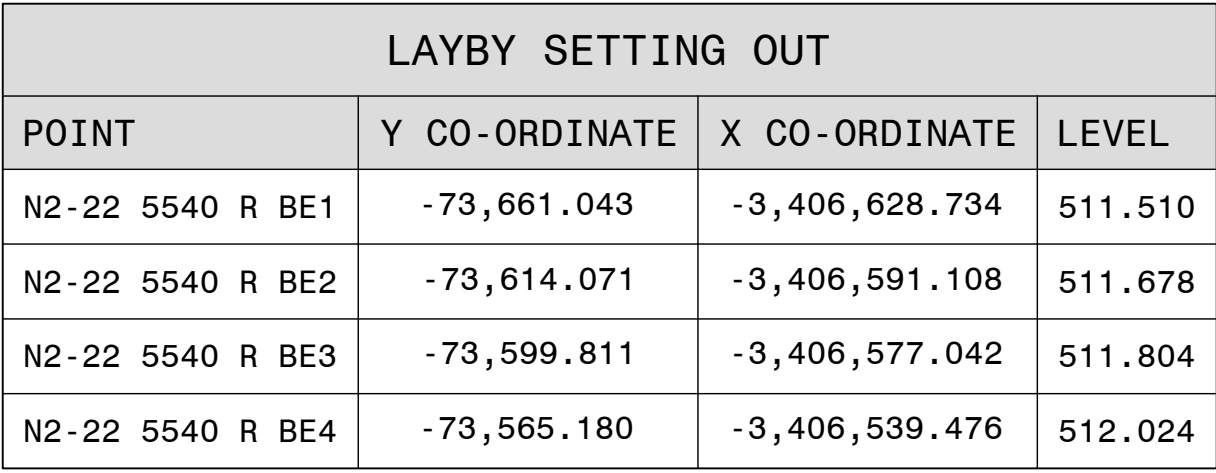
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CONSTRUCTION RECORD		
WORKS CONTRACT ENGINEER		
Name	S. KASIPERSAD	
Prof. Reg. No.	3209	
Date	15/09/2023	
SANRAL PROJECT MANAGER		
Name	S. KASIPERSAD	
Prof. Reg. No.	3209	
Date	15/09/2023	
CONSULT. ENG.		
No.	DATE	REVISION
V1	SEPT 2023	ORIGINAL VERSION

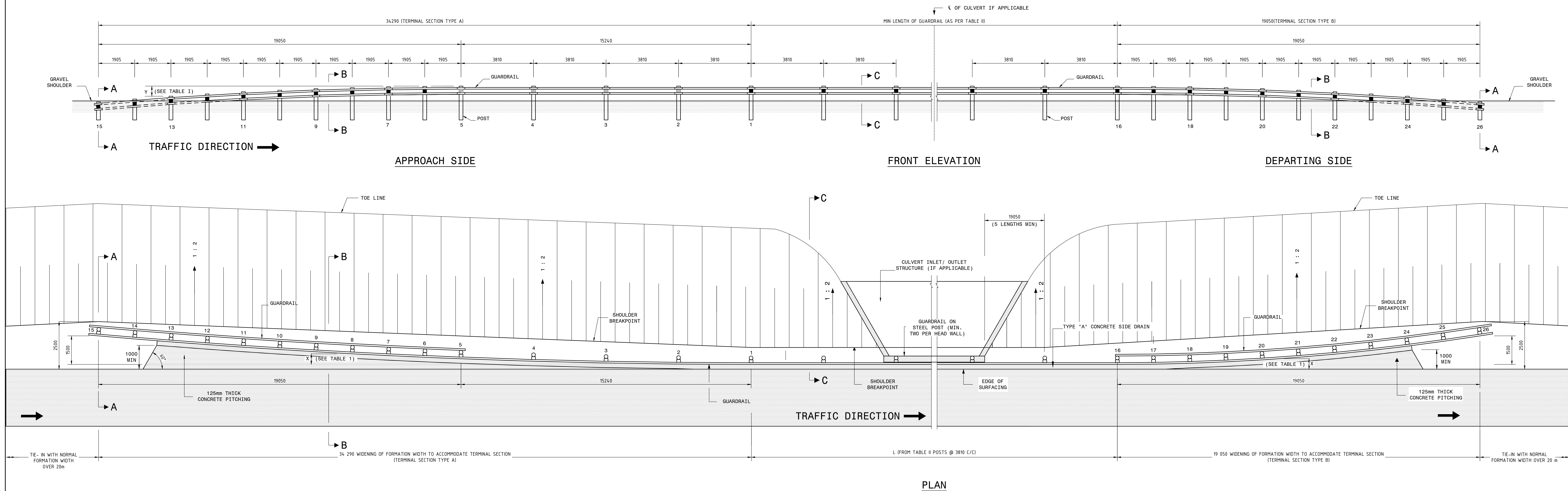
HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:
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PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 GEOMETRIC LAYOUT LAYBY KM 5540 RIGHT	
SCALE :	1:1000

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING TYPE		ROADS - LAYOUT	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-07-003	
SANRAL DOCUMENT #		-	

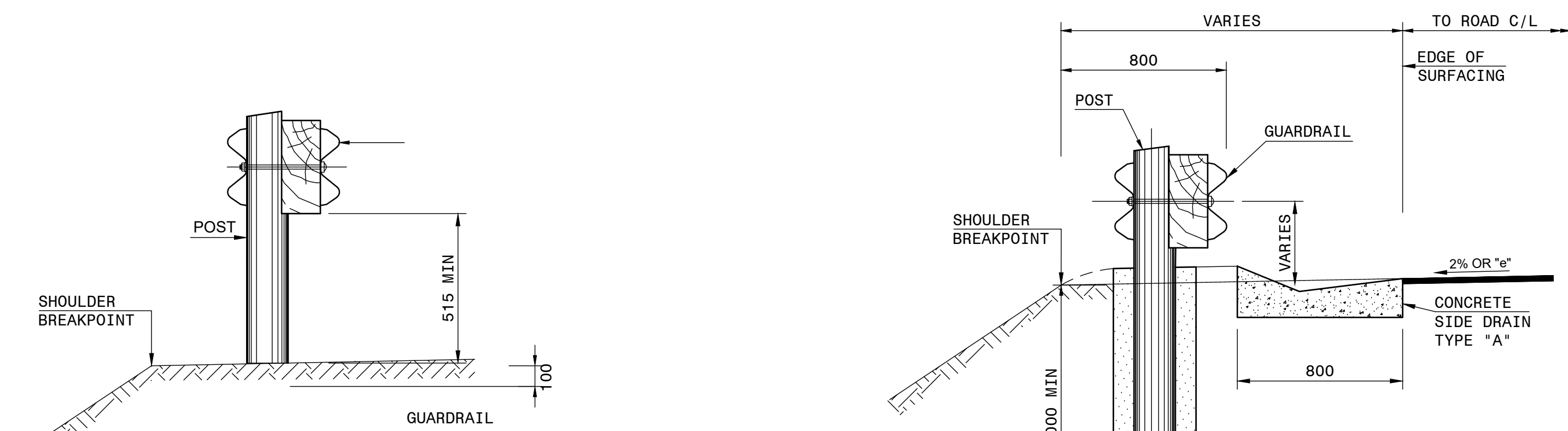
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GUARDRAIL PLACING DETAILS



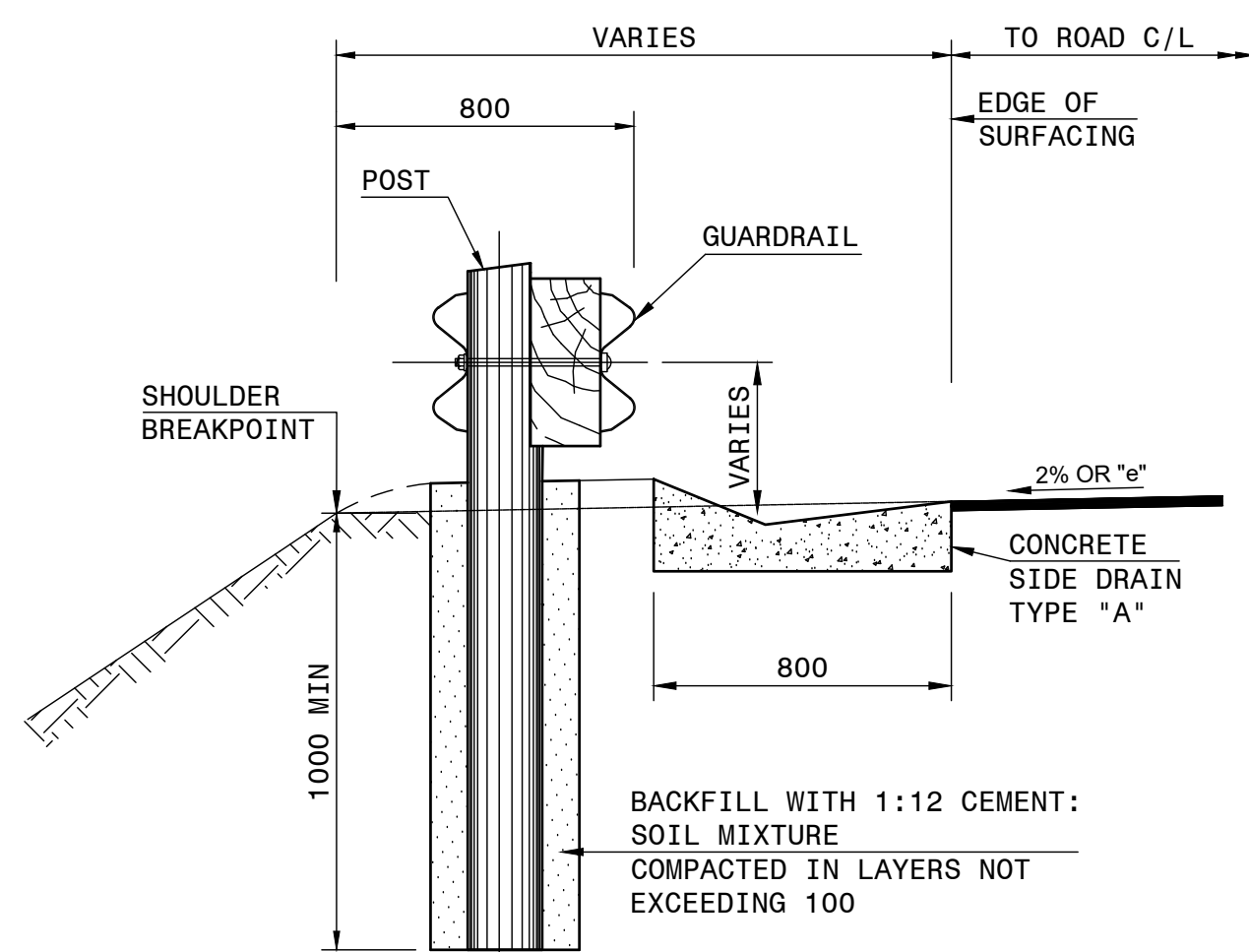
DETAIL OF TERMINAL SECTIONS AT APPROACH AND DEPARTING SIDES

SCALE 1 : 75

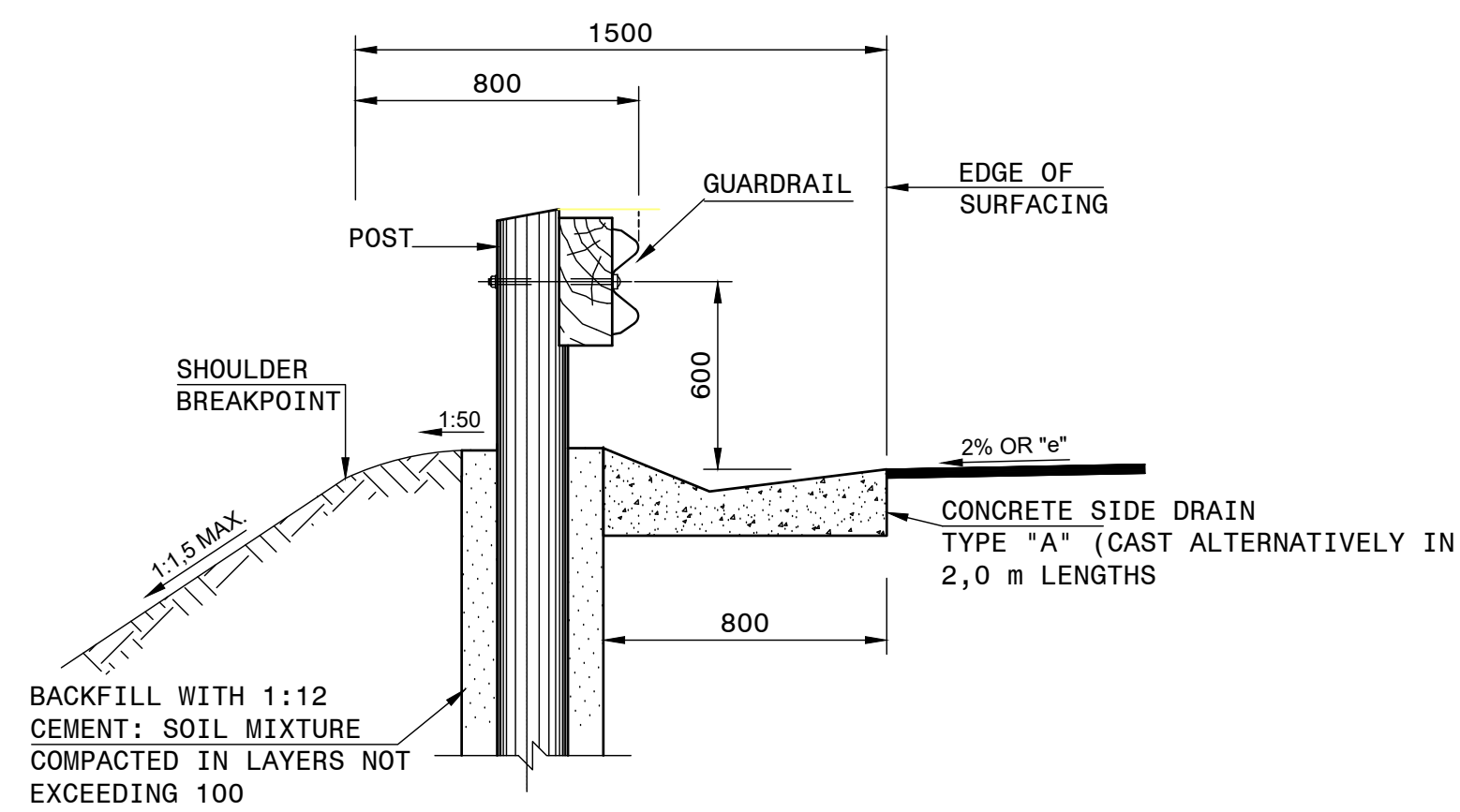


SECTION A - A

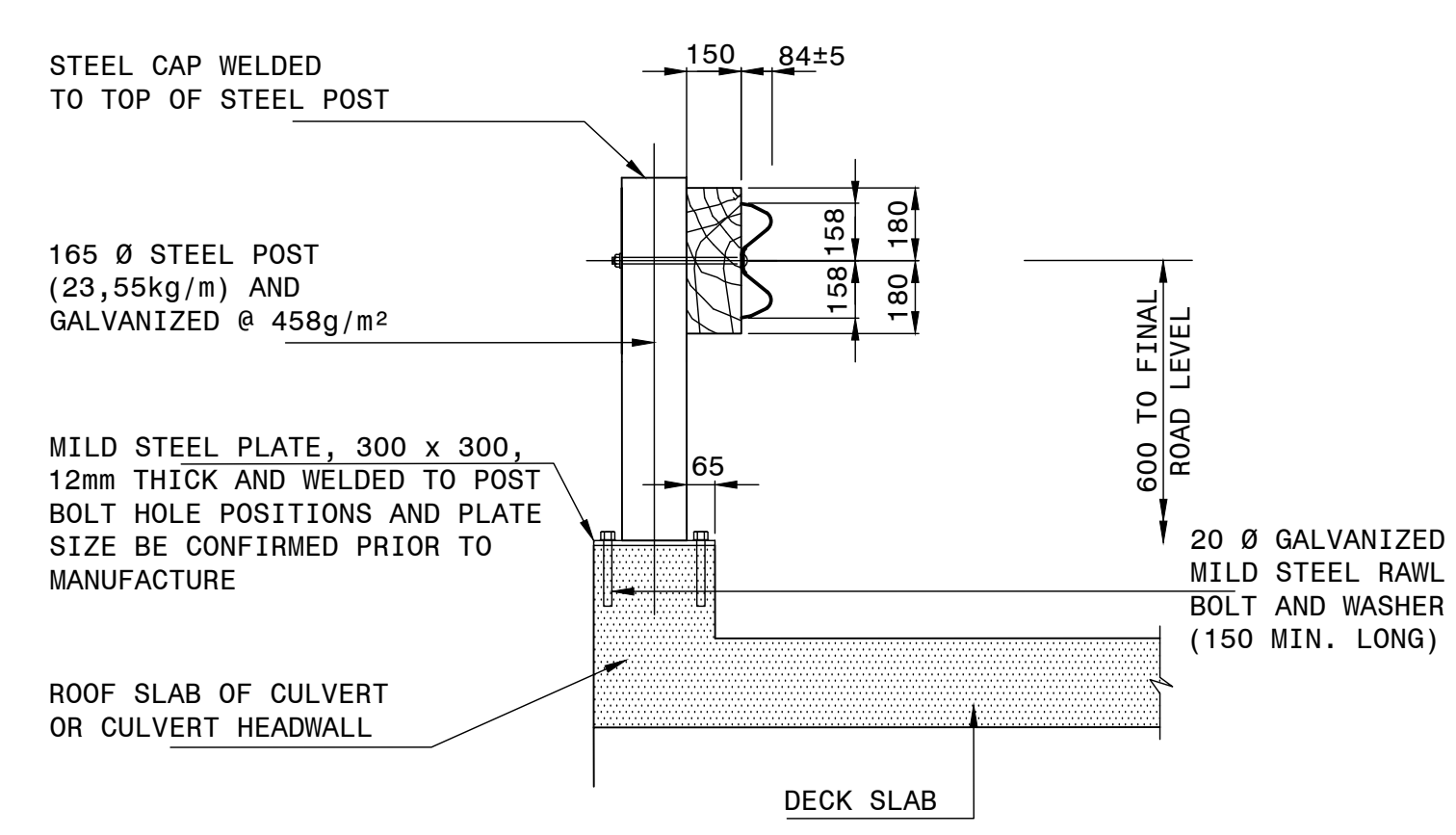
SCALE 1-20



SECTION B - E

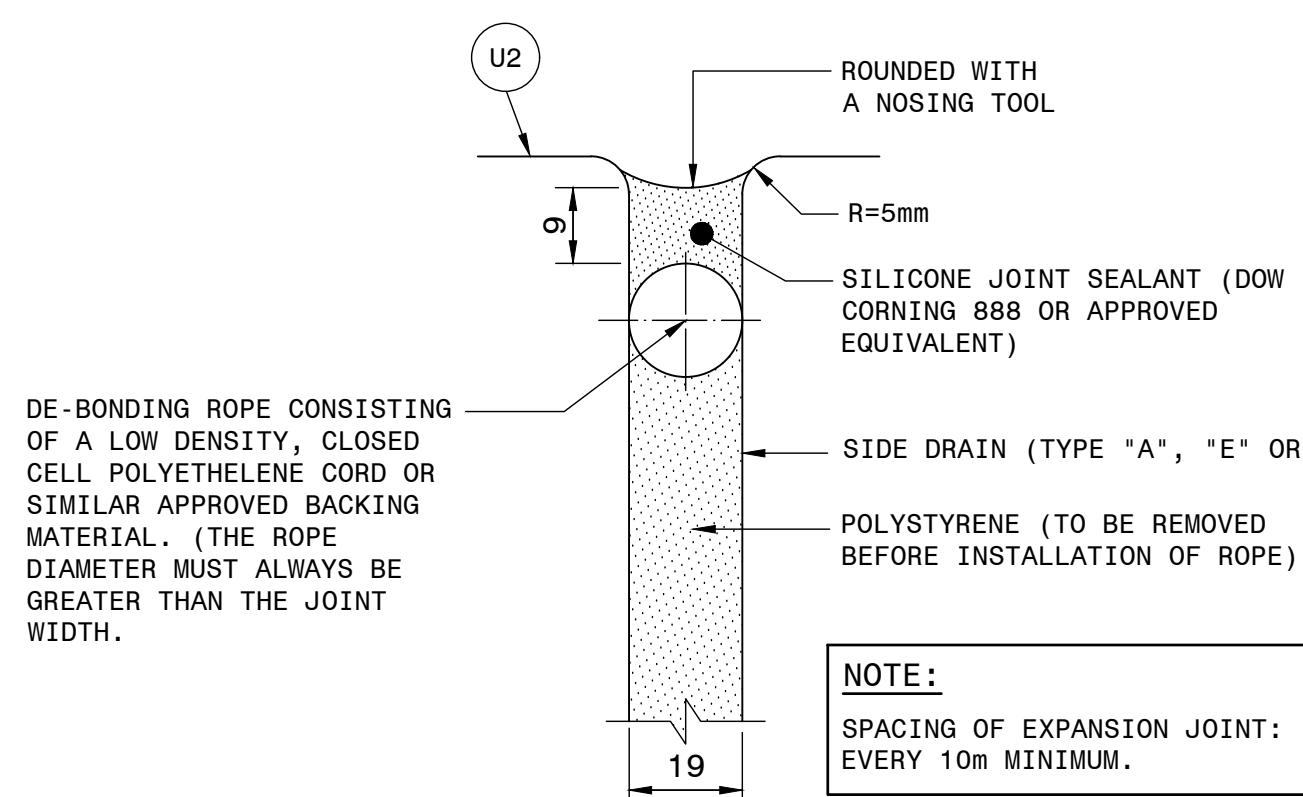


SECTION C - C
WITH CONCRETE SIDE DRAIN



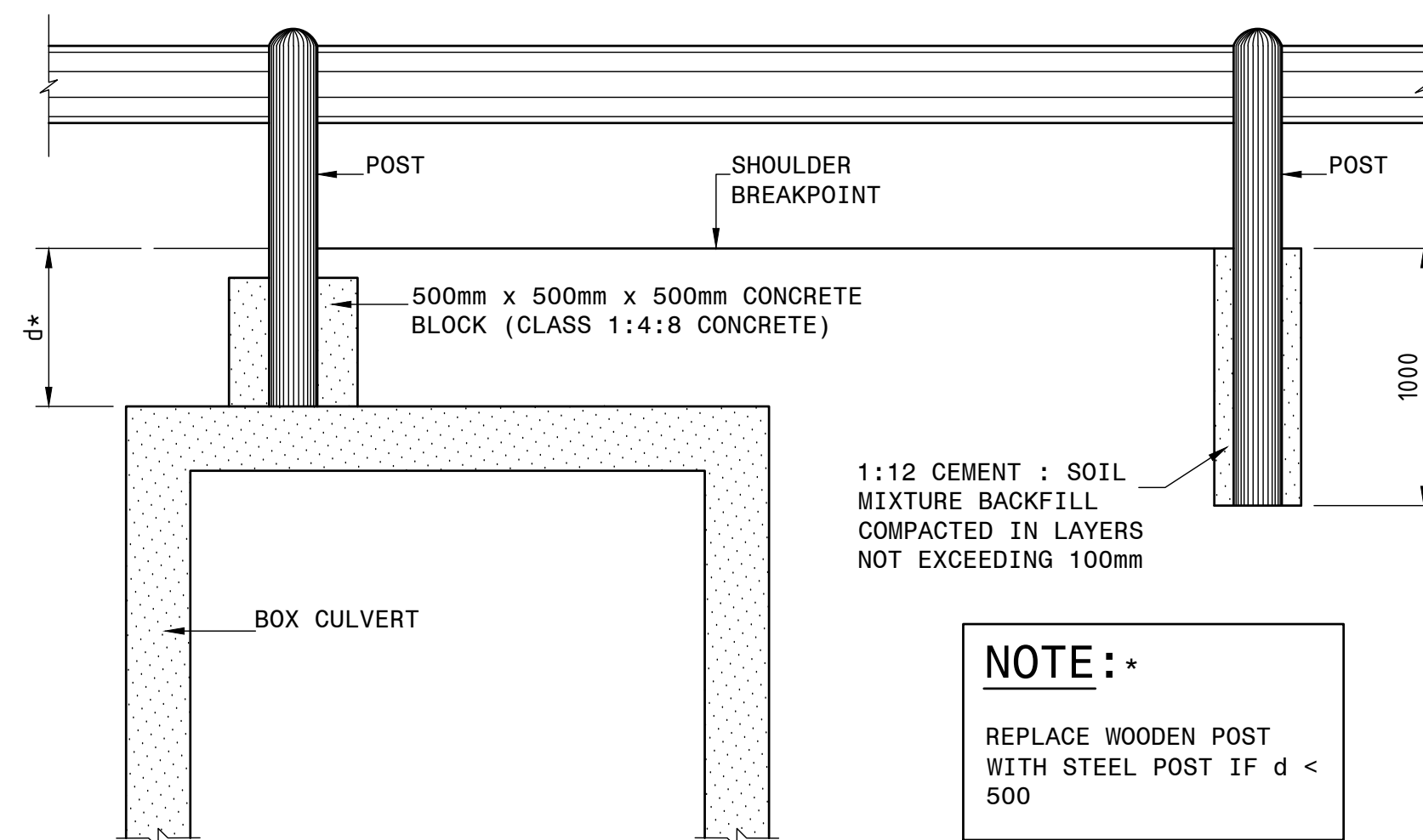
DETAIL OF STEEL GUARDRAIL POST

TABLE I			TABLE II		
SETTING OUT POSITIONS OF GUARDRAIL POSTS			MIN. LENGTH OF GUARDRAIL REQUIRED (EXCLUDING TERMINAL SECTIONS)		
POST No.	HORIZONTAL OFF-SET X - (mm)	VERTICAL OFF-SET Y - (mm)	DESIGN SPEED km/h	MIN. LENGTH (m)	
APPROACH SIDE	1	0	60	12 LENGTHS (45,72)	
	2	19	70	14 LENGTHS (53,34)	
	3	74	80	16 LENGTHS (60,96)	
	4	167	90	20 LENGTHS (76,20)	
	5	296	100	23 LENGTHS (87,63)	
	6	375	-	110	27 LENGTHS (102,87)
	7	463	33	120	29 LENGTHS (110,49)
	8	560	-	130	32 LENGTHS (121,92)
	9	667	133	140	35 LENGTHS (133,35)
	10	782	-		
DEPARTING SIDE	11	907	229		
	12	1042	-		
	13	1185	531		
	14	1338	-		
	15	1500	830		
	16	0	0		
	17	15	-		
	18	60	33		
	19	135	-		
	20	240	133		
	21	375	-		
	22	540	299		
	23	735	-		
	24	960	531		
	25	1215	-		
	26	1500	830		

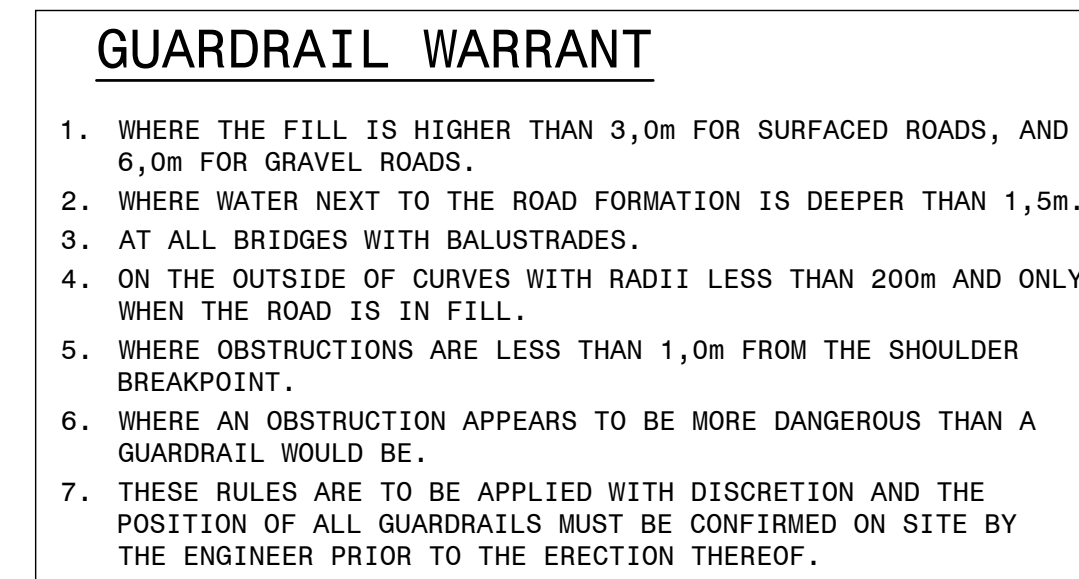


DETAIL OF EXPANSION JOINT

N.T.S.

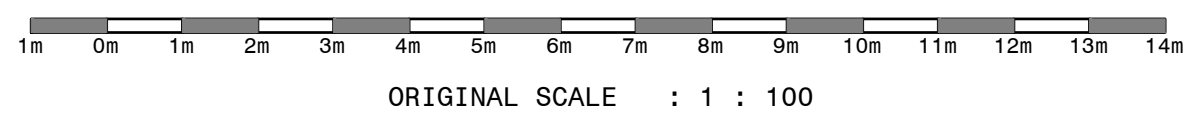


DETAIL 1



ERECTION DETAILS

1. THE HOLES FOR TIMBER POSTS SHALL BE OF SUFFICIENT SIZE TO PERMIT PROPER SETTING OF THE POSTS AND TO ALLOW SUFFICIENT ROOM FOR BACKFILLING THE HOLE.
2. AT LEAST 1.0m OF POST SHALL BE EMBEDDED IN THE GROUND.
3. WHERE APPROPRIATE, THE END OF THE GUARDRAIL WHICH OVERLAPS ON THE SIDE OF THE TRAFFIC SHALL POINT IN THE DIRECTION OF THE TRAFFIC MOVEMENT.
4. THE HOLE SHALL BE BACKFILLED WITH A 1:12 CEMENT/ SAND MIXTURE AND COMPACTED WHILE AT OR NEAR THE OPTIMUM MOISTURE CONTENT IN LAYERS NOT EXCEEDING 100mm.
5. THE DIRECTION OF GUARDRAILS IS ONLY TO BE DETERMINED BY INSTRUCTION FROM THE ENGINEER.



FOR TENDER PURPOSES

[illegible]

CONSTRUCTION RECORD

Name :
Prof. Reg. No. :
Date :
SANRAL PROJECT MANAGE

Name : -
Prof. Reg. No. : .
Date : .

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184

PO Box 415
Pretoria 0001
South Africa

Tel: (012) 844 8000



EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201

**PO Box 100410
Scottsville
3209
Tel: (033) 392 8100**

ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION

**CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2,
SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)**

DRAWING DESCRIPTION

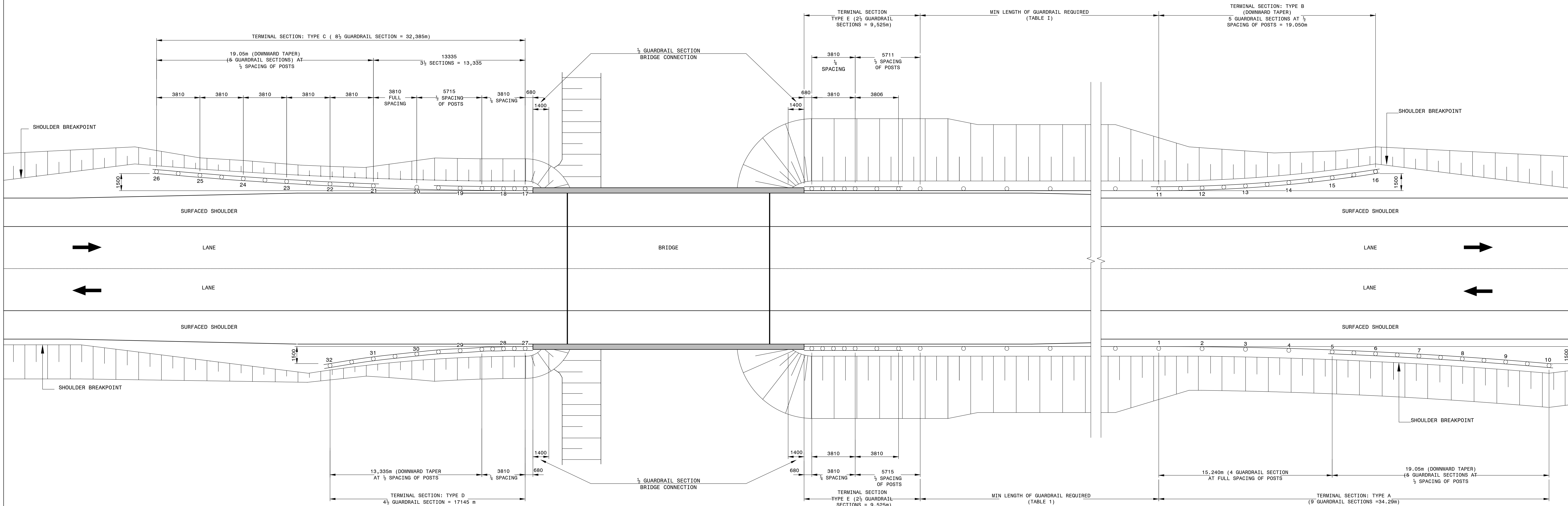
**PACKAGE A: N2-22 TYPICAL DETAIL
GUARDRAIL PLACING DETAILS**

SCALE : AS SHOWN	SHEET 1 OF
------------------	------------

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
ROADS - TYPICALS			
BRIDGE/STRUCTURE No.			
N/A			
CONSULTANT DRAWING No.		TP1802-19-05-25-08-002	VE
SANRAL DOCUMENT #			

DRAWING NO. **TP1802-19-05-25-08-002**

GUARDRAIL PLACING DETAILS AT BRIDGE APPROACHES AND HIGH FILL (SINGLE CARRIAGEWAY)



MINIMUM GUARDRAIL LENGTH AT BRIDGES
(FILL BELOW 3m)

FILL > 3m

BRIDGE APPROACH

SCALE 1 : 125

SETTING OUT POSITIONS OF GUARDRAIL POSTS

TERMINAL SECTION TYPE A			TERMINAL SECTION TYPE B			TERMINAL SECTION TYPE C			TERMINAL SECTION TYPE D		
POST No.	HORIZONTAL OFF-SET X - (mm)	VERTICAL OFF-SET Y - (mm)	POST No.	HORIZONTAL OFF-SET X - (mm)	VERTICAL OFF-SET Y - (mm)	POST No.	HORIZONTAL OFF-SET X - (mm)	VERTICAL OFF-SET Y - (mm)	POST No.	HORIZONTAL OFF-SET X - (mm)	VERTICAL OFF-SET Y - (mm)
1	0	0	11	0	0	17	0	0	27	0	0
2	19	0	12	60	33	18	0	0	28	0	0
3	74	0	13	240	133	19	23	0	29	94	52
4	164	0	14	540	299	20	94	0	30	375	208
5	296	0	15	960	531	21	211	0	31	844	467
6	463	33	16	1500	830	22	375	33	32	1500	830
7	667	133				23	586	133			
8	907	299				24	844	299			
9	1185	531				25	1148	531			
10	1500	830				26	1500	830			

TABLE I

MIN. LENGTH OF GUARDRAIL REQUIRED (EXCLUDING TERMINAL SECTIONS)	
DESIGN SPEED km/h	MIN. LENGTH (m)
60	12 LENGTHS (45,72)
70	14 LENGTHS (53,34)
80	16 LENGTHS (60,96)
90	20 LENGTHS (76,20)
100	23 LENGTHS (87,63)
110	27 LENGTHS (102,87)
120	29 LENGTHS (110,49)
130	32 LENGTHS (121,92)
140	35 LENGTHS (133,35)

1m 0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m 11m 12m 13m 14m
ORIGINAL SCALE : 1 : 100

FOR TENDER PURPOSES

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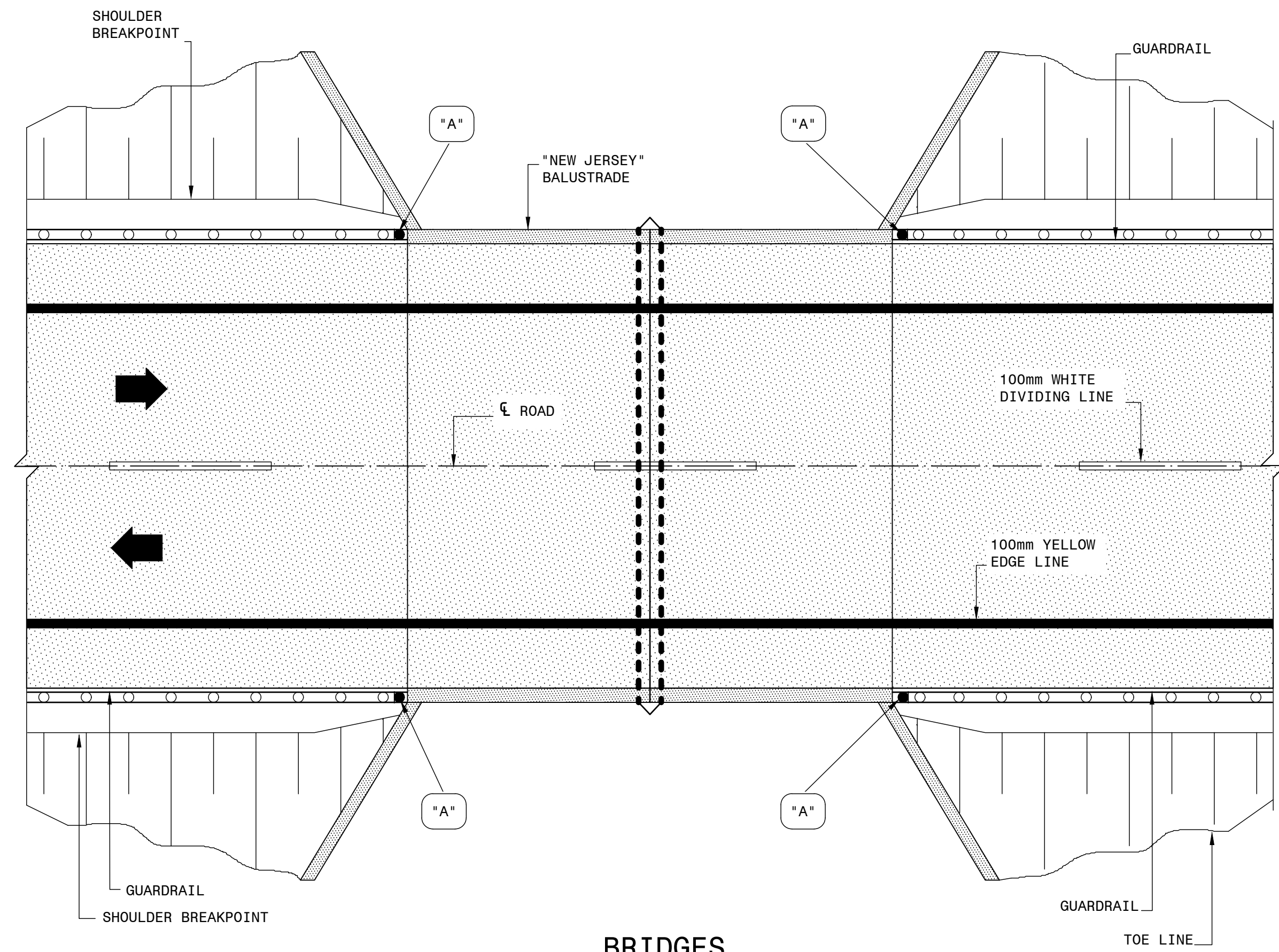
HEAD OFFICE 48 Tambotie Avenue Vai de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		
SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY BUILDING SOUTH AFRICA THROUGH BETTER ROADS		
EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100		
ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:		

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 TYPICAL DETAILS: GUARDRAIL PLACING DETAILS AT BRIDGE APPROACHES (SINGLE CARRIAGEWAY)	
SCALE :	AS SHOWN
SHEET	1 OF 1

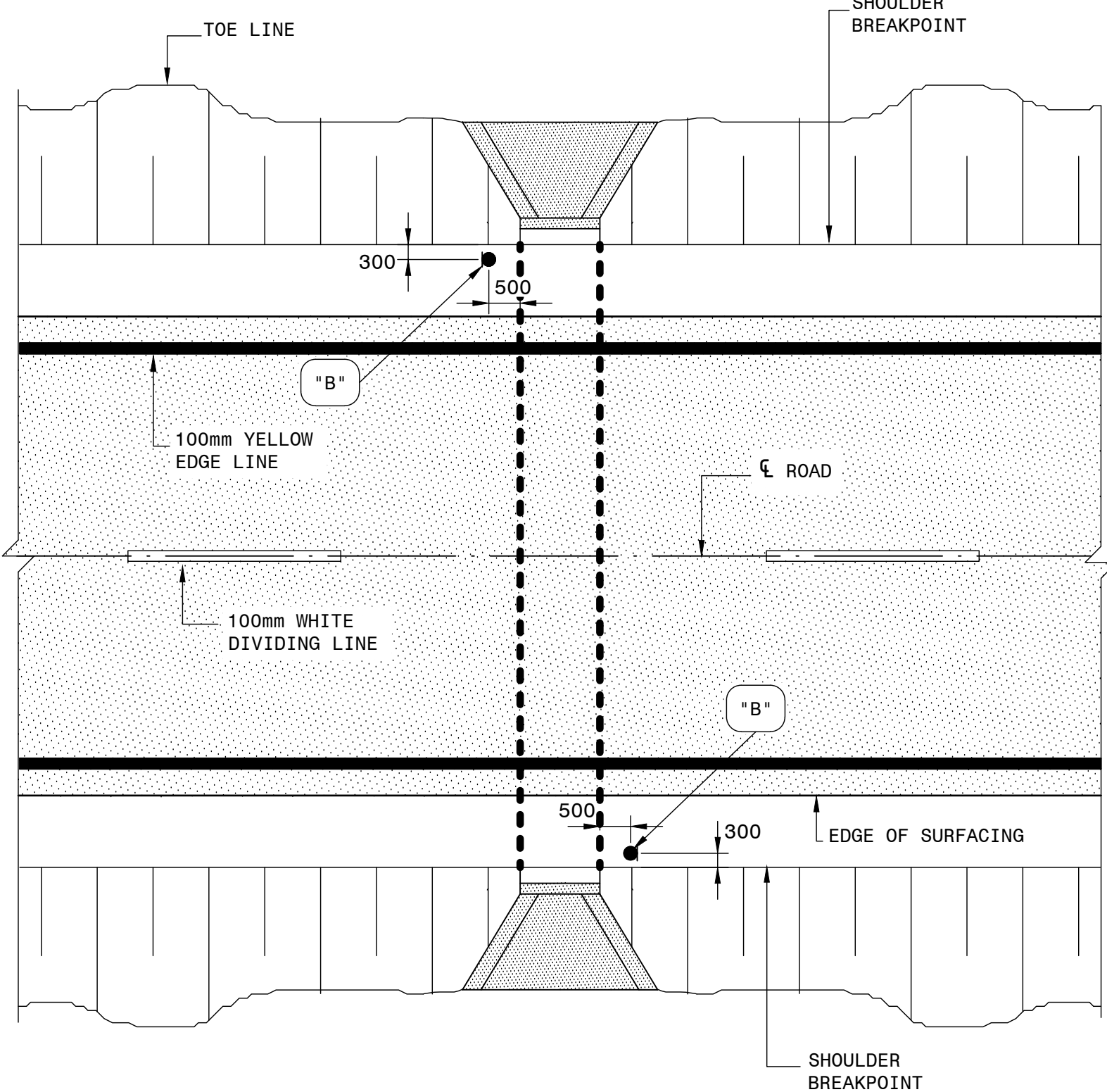
PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING TYPE		ROADS - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-003	
SANRAL DOCUMENT #		VER	
		V1	

DRAWING No. TP1802-19-05-25-08-003

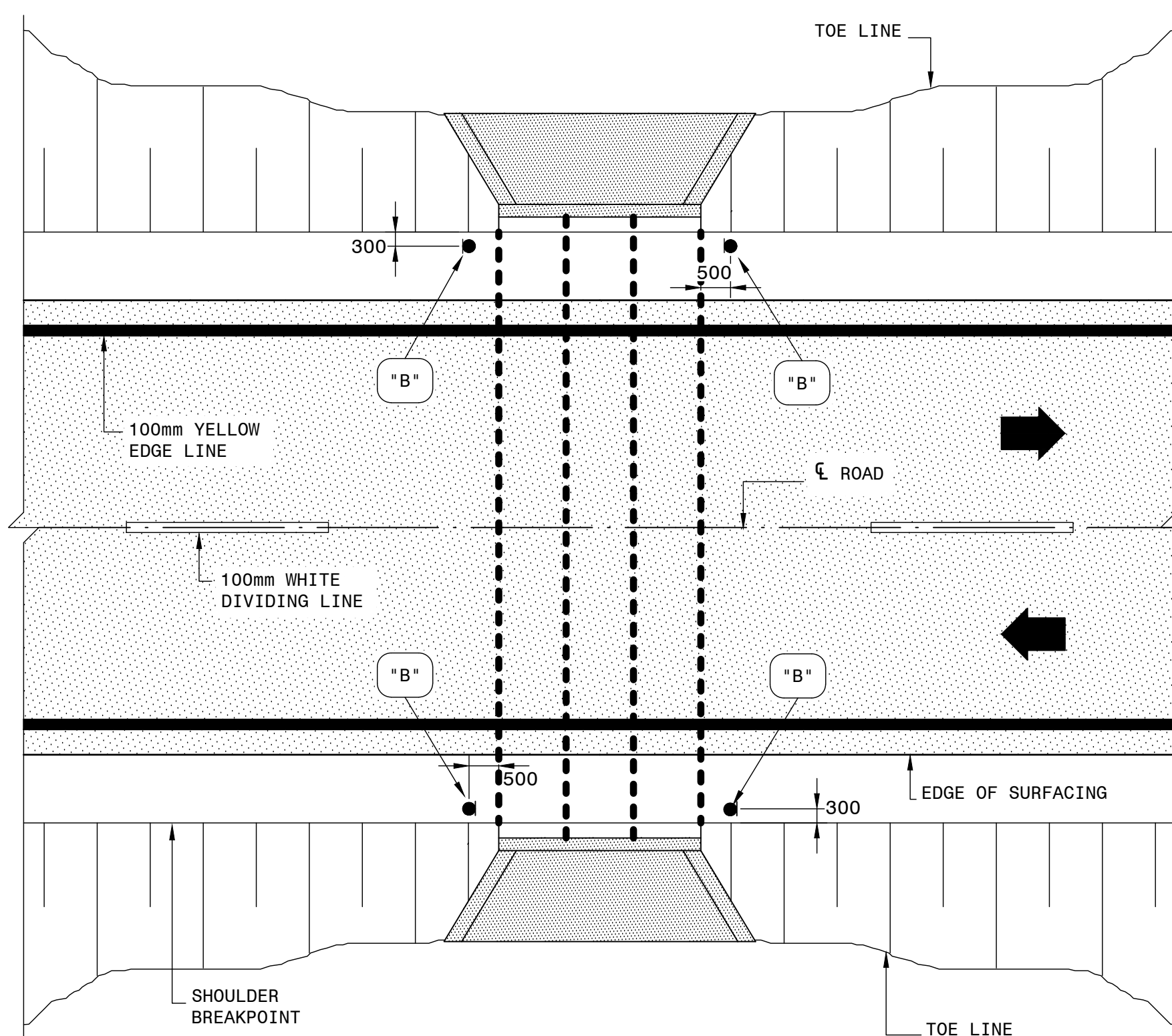
TYPICAL DETAILS OF DANGER PLATES



BRIDGES



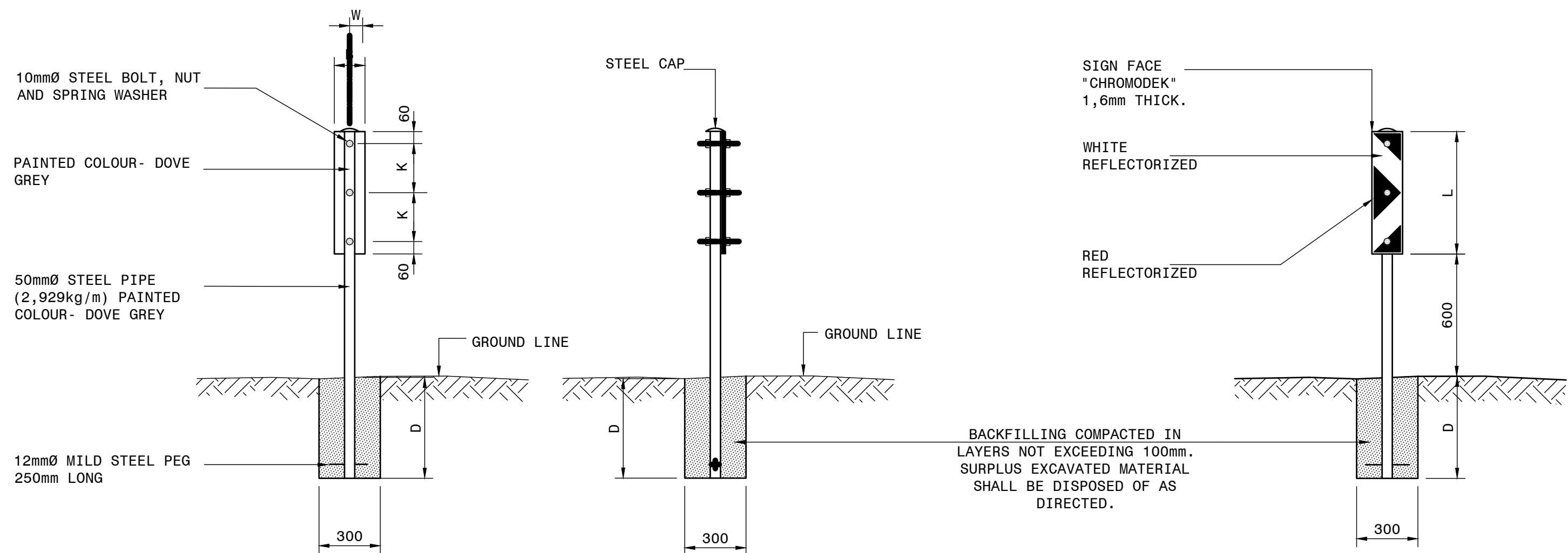
SINGLE CULVERTS



MULTIPLE CULVERTS

POSITION OF TYPE "A" DANGER PLATES AT BRIDGES
AND TYPE "B" DANGER PLATES AT CULVERTS

SCALE 1:100



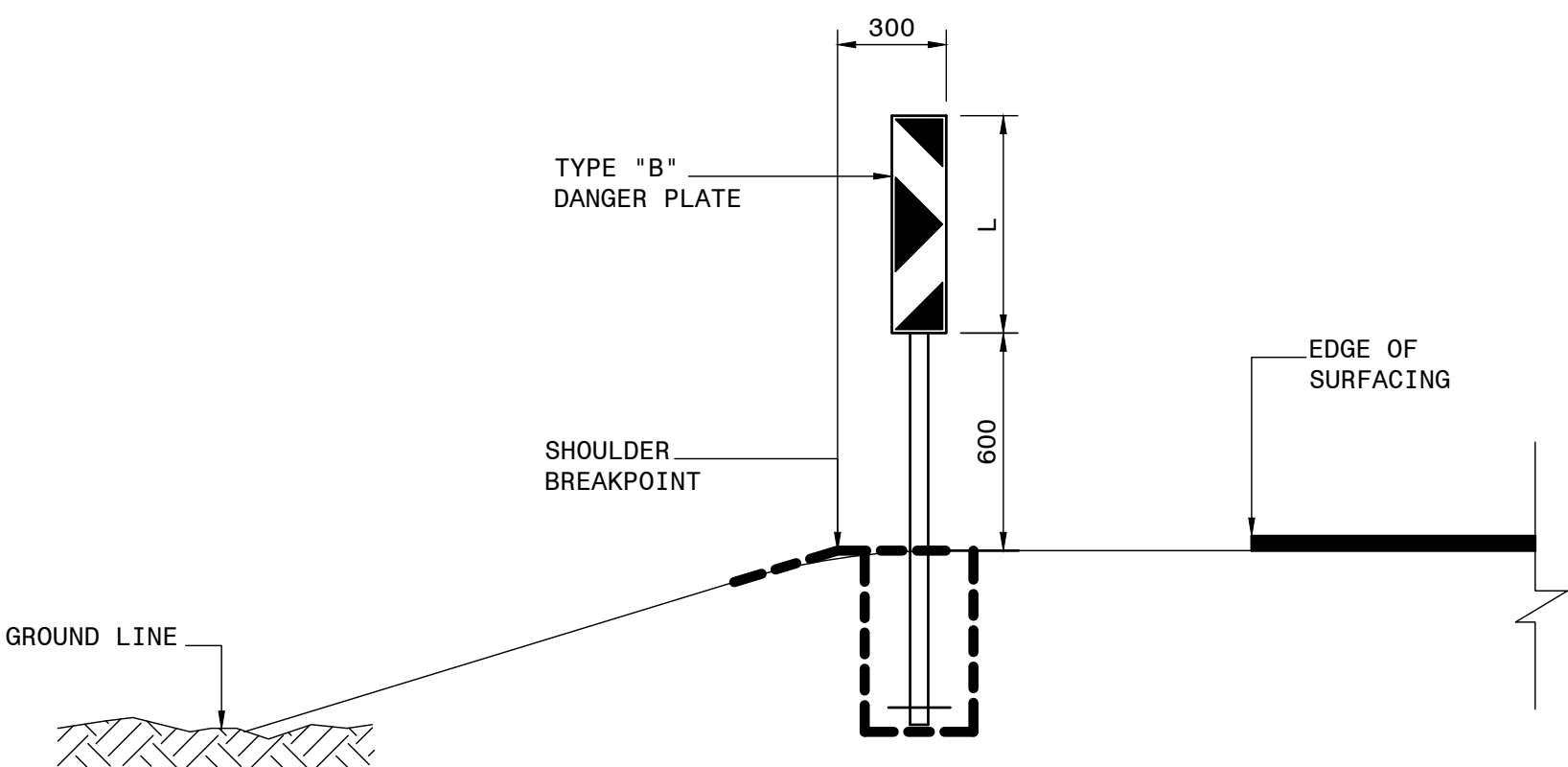
REAR ELEVATION

SIDE ELEVATION

FRONT ELEVATION

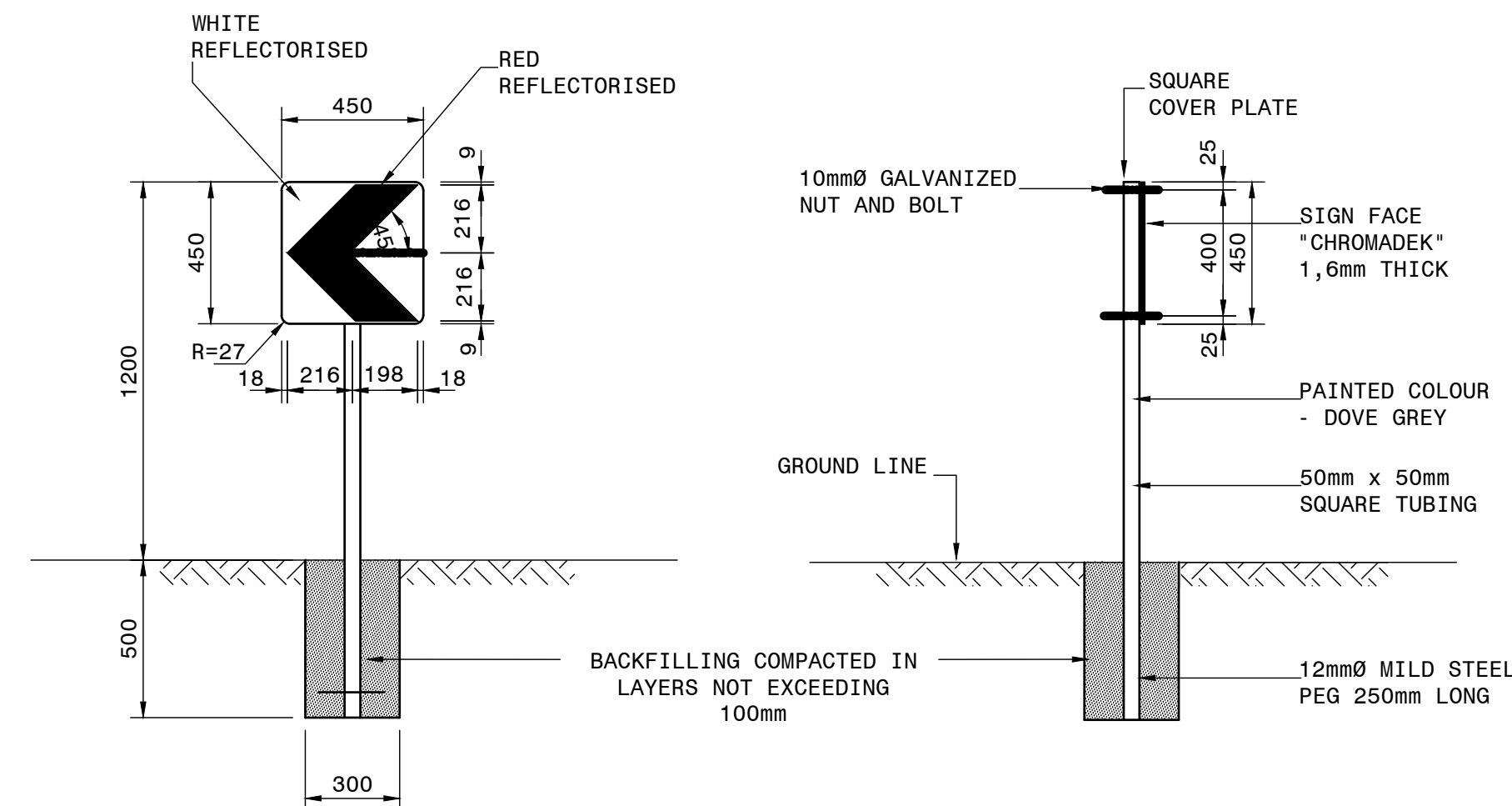
TYPE "A" AND "B" DANGER PLATES (AT BRIDGES AND CULVERTS)

SCALE 1:20



SECTION SHOWING POSITION OF
TYPE "B" DANGER PLATES AT CULVERTS

SCALE 1:20



FRONT ELEVATION

SIDE ELEVATION

TYPE "C" DANGER PLATES
(AT HORIZONTAL CURVES)

SCALE 1:20

NOTES:

DANGER PLATES:

- THE COLOURS AND SHADES SHALL CONFORM TO THE COLOURS AND SHADES SPECIFIED IN CKS 193 AND SHOWN IN CKS 279.
- THE PREPARATION OF SURFACES AND PAINTING SHALL BE CARRIED OUT AS SPECIFIED IN SECTION 8400 OF THE STANDARD SPECIFICATIONS.

DIMENSIONS FOR DANGER PLATES (TYPE "A" AND "B")

AT BRIDGES	TYPE	L	B	D	W	K
	A	1200	300	700	150	540
AT CULVERTS	B	600	150	500	75	240

ORIGINAL SCALE : 1 : 100

FOR TENDER PURPOSES

No.	DATE	REVISION	CONSULT. ENG.
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD

CONSTRUCTION RECORD	WORKS CONTRACT ENGINEER
Name : ..	Prof. Reg. No. : ..
Date : ..	SANRAL PROJECT MANAGER
Name : ..	Prof. Reg. No. : ..
Date : ..	CONSULT. ENG.

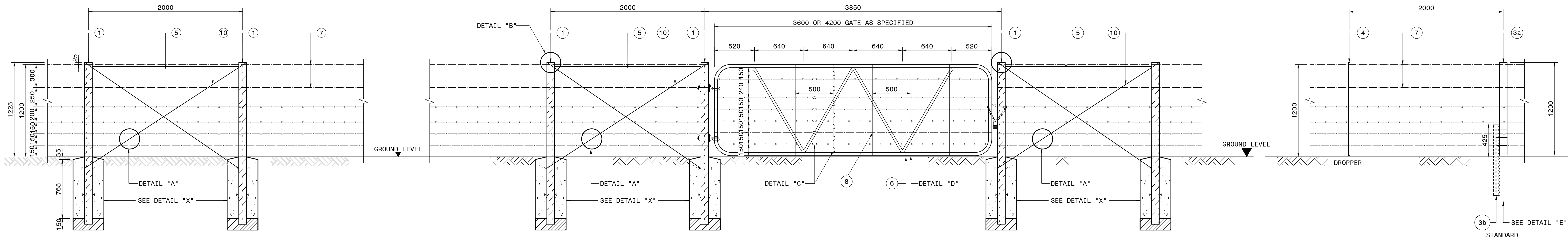
HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD. BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date: ..
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PROJECT DESCRIPTION	CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION	PACKAGE A: N2-22 TYPICAL DETAILS: TYPICAL DETAILS OF DANGER PLATES
SCALE :	AS SHOWN

PROJECT NUMBER	NRA.C.004-099-2023/1
DRAWING LOCATION DATA	ROUTE N2 SECTION 22 DRAWING TYPE km 0,80 BRIDGE/STRUCTURE No. ROADS - TYPICALS CONSULTANT DRAWING No. TP1802-19-05-25-08-004 SANRAL DOCUMENT #
START	N2 22 km 18,64
END	N2 22
VER	V1

DRAWING No. TP1802-19-05-25-08-004

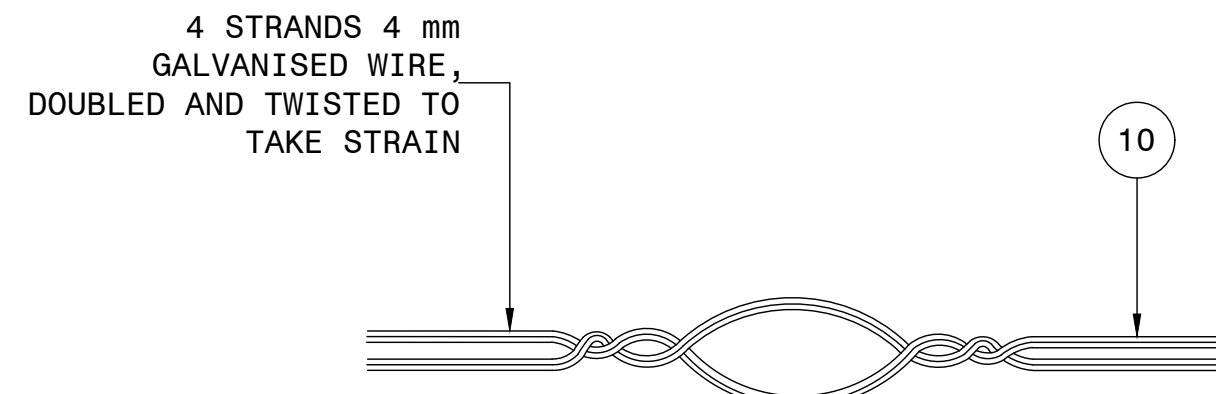
STOCK PROOF FENCING :
6 STRANDS ON TIMBER POSTS



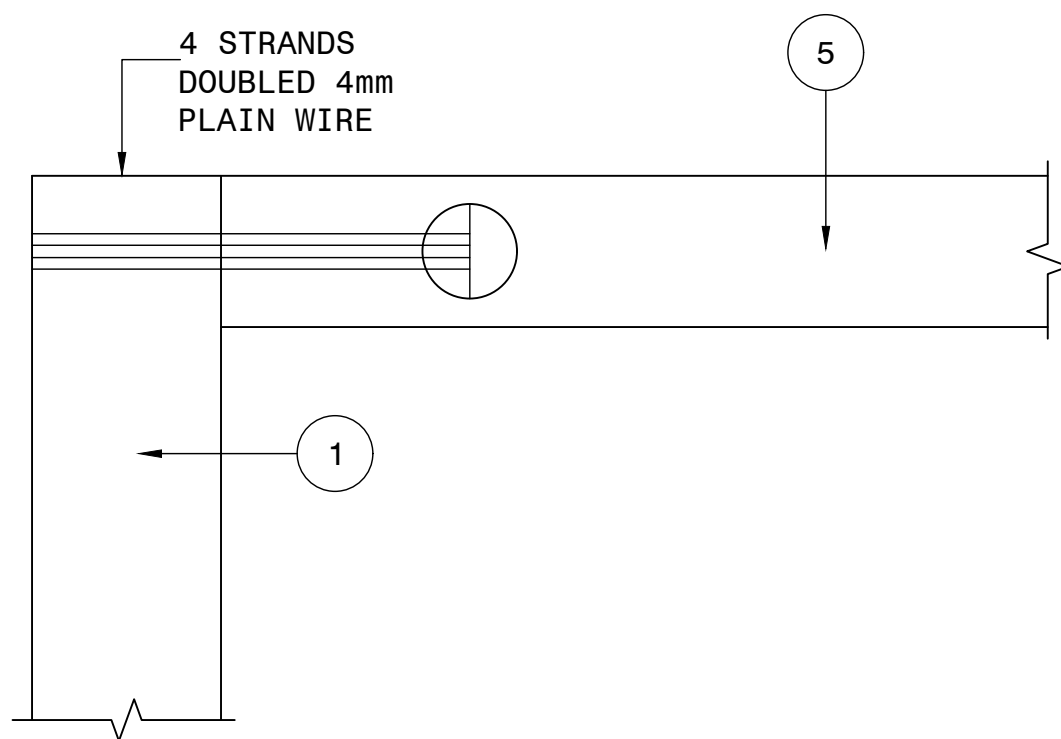
STRAINING POST DETAIL
SCALE 1:20

FENCE DETAIL AT GATE
SCALE 1:20

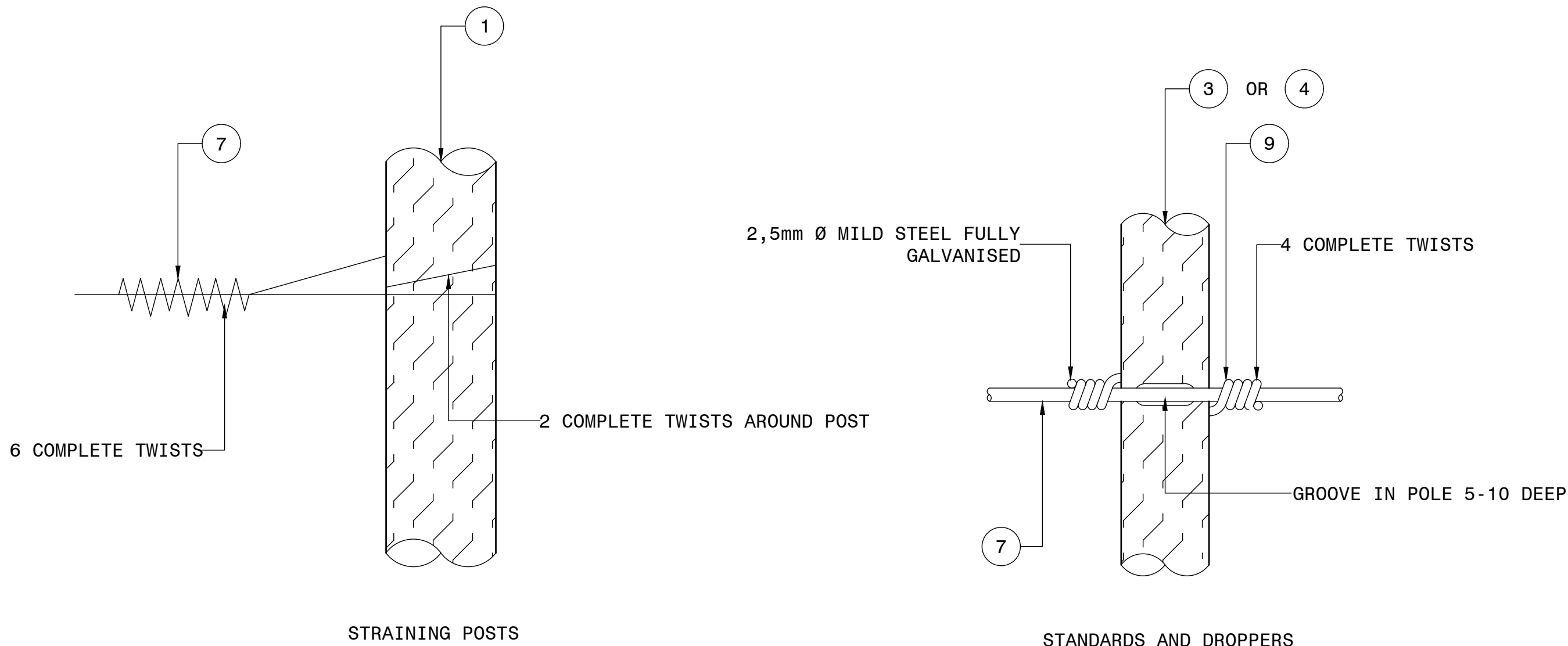
STANDARDS AND DROPPERS
SCALE 1:20



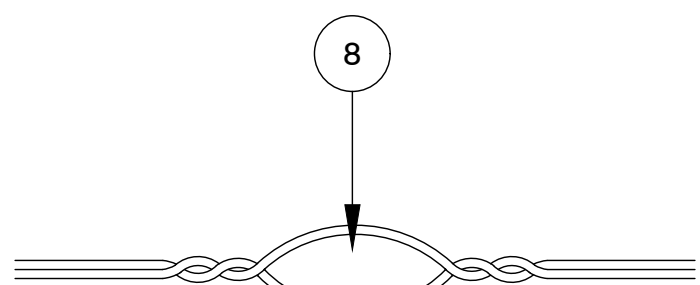
DETAIL A
N.T.S.



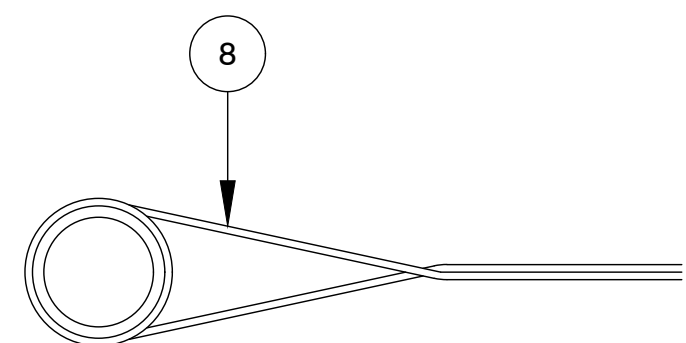
DETAIL B
SCALE 1 : 5



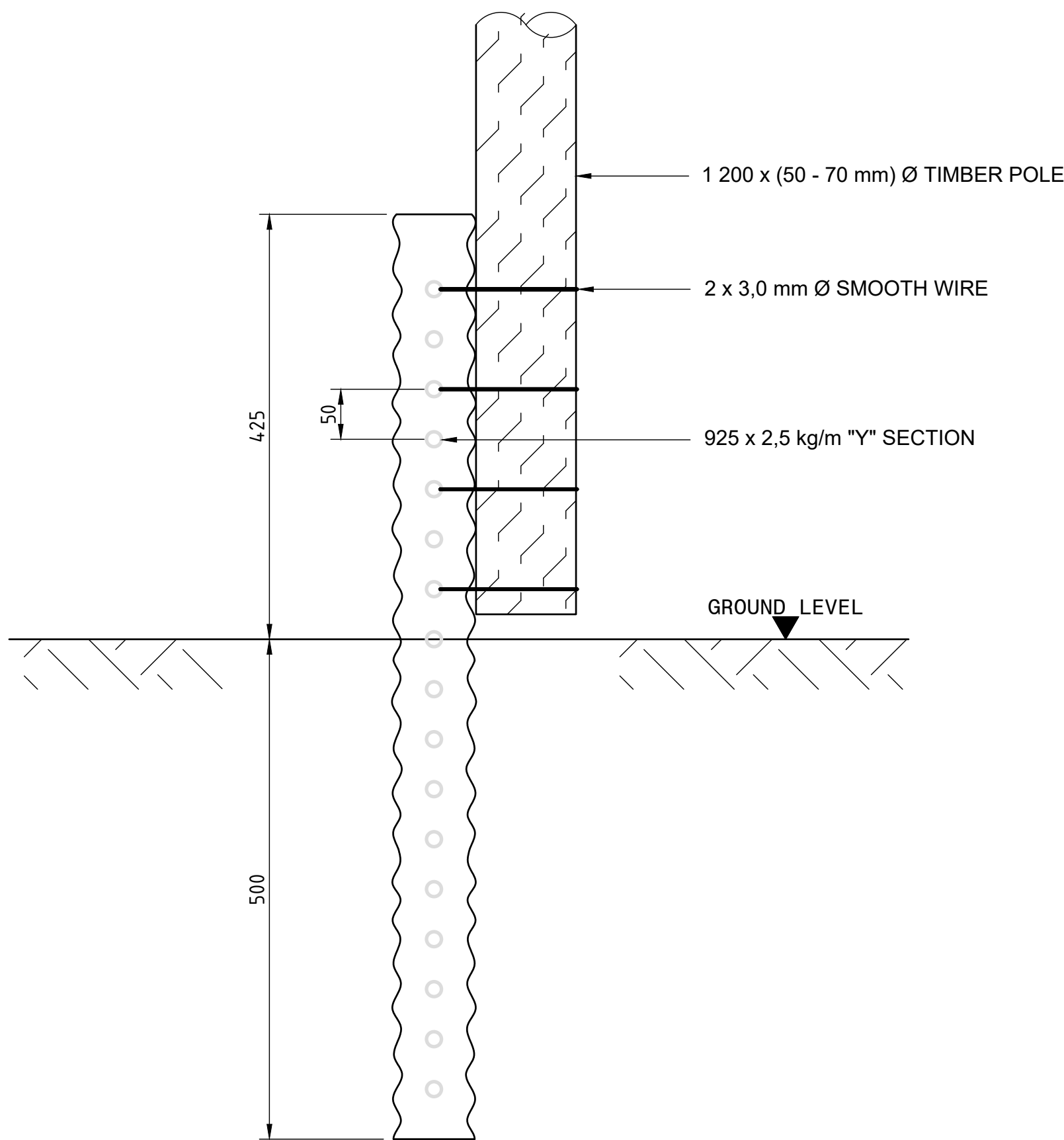
FASTENING OF BARBED WIRE TO DROPPERS,
STANDARDS AND POSTS
SCALE 1 : 5



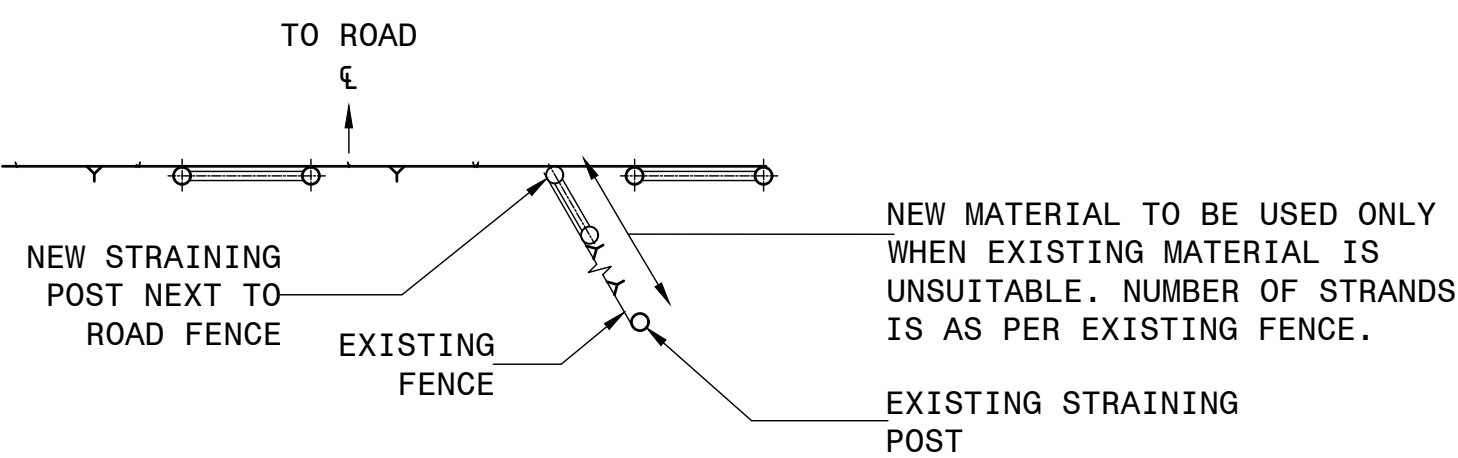
DETAIL C
N.T.S.



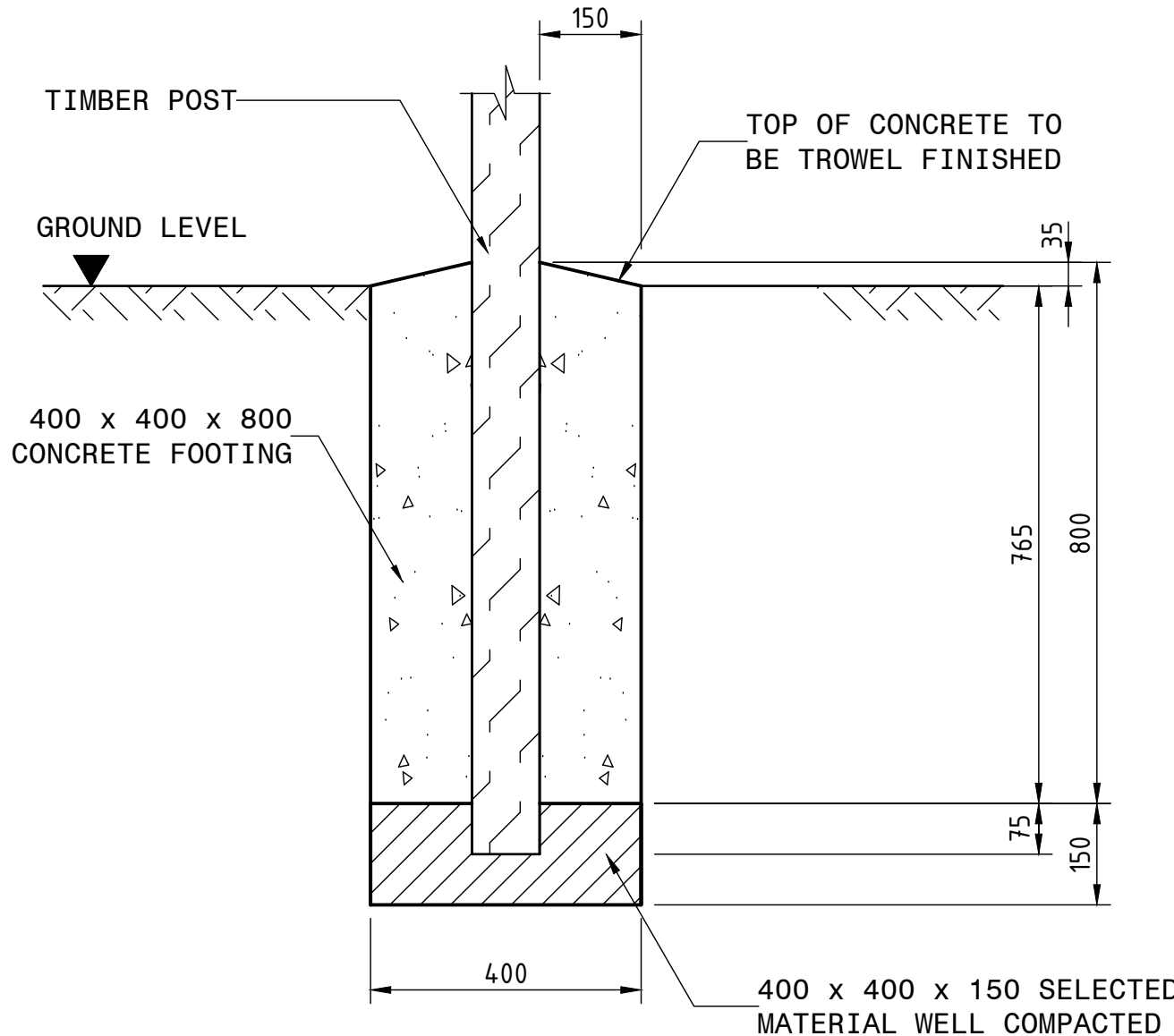
DETAIL D
N.T.S.



DETAIL "E"
SCALE 1 : 5



FENCING IN RELATION TO ROAD AND REPAIR OF EXISTING FENCE
IF CUT BY ROAD RESERVE
SCALE 1 : 100



DETAIL "X"
DETAILS OF POST FOOTINGS
400mm x 400mm x 600mm
SCALE 1 : 10

ITEM:

- STRAINING POSTS:
2100 X 125mm Ø, NOTCHED AND ANCHORED IN CONCRETE
- ALL TIMBER POSTS, STANDARDS AND DROPPERS SHALL BE TREATED WITH COPPER CHROME ARSENIC (CCA)
- STANDARDS:
a) 1 200 x (50-70 mm) Ø TIMBER POLE
b) 925 x 2,5 kg/m "Y" SECTION COMPLETE WITH HOLES AT 50mm CENTRES. FULLY GALVANIZED (SANS 121/ISO1461) IF WITHIN 25 km FROM THE COAST.
- DROPPERS:
1200 X (30-50 mm) Ø TIMBER POLE
- CROSS BRACE SUPPORT:
100 mm Ø.
- GOVERNMENT PATTERN FARM GATE:
MANUFACTURED FROM 42,9 Ø x 2,6mm STEEL TUBING WITH HINGES, WASHERS, BOLTS AND LOCKING CHAIN ATTACHED TO GATE (COMPLYING WITH CKS 146). ALL FULLY GALVANIZED (SANS 121/ISO 1461).
- BARBED WIRE:
3,2 x 2,5 mm OVAL HIGH TENSILE GRADE SINGLE STRAND (SANS 675), FULLY GALVANIZED.
- SMOOTH WIRE:
3,0 mm Ø HIGH TENSILE GRADE (SANS 675) FULLY GALVANIZED.
- TYING WIRE:
2,5 mm Ø MILD STEEL (SANS 675), FULLY GALVANIZED FOR TYING TO STANDARDS AND DROPPERS.
- STRAINING WIRE:
4 mm Ø MILD STEEL (SANS 675), FULLY GALVANIZED. (4 STRANDS, DOUBLED AND TWISTED TO TAKE STRAIN).
- BOLTS FOR STAYS:
NONE.
- MAXIMUM SPACING OF:
STRAINING POSTS 180 m c/c
STANDARDS 18 m c/c
DROPPERS 2 m c/c
- ALL WIRES TO BE ERECTED ON THE ROAD SIDE OF THE FENCE UNLESS OTHERWISE INSTRUCTED.
- MINIMUM CONCRETE STRENGTH OF FOOTINGS 20 MPa AT 28 DAYS.

COMPLYING
WITH
CKS 82

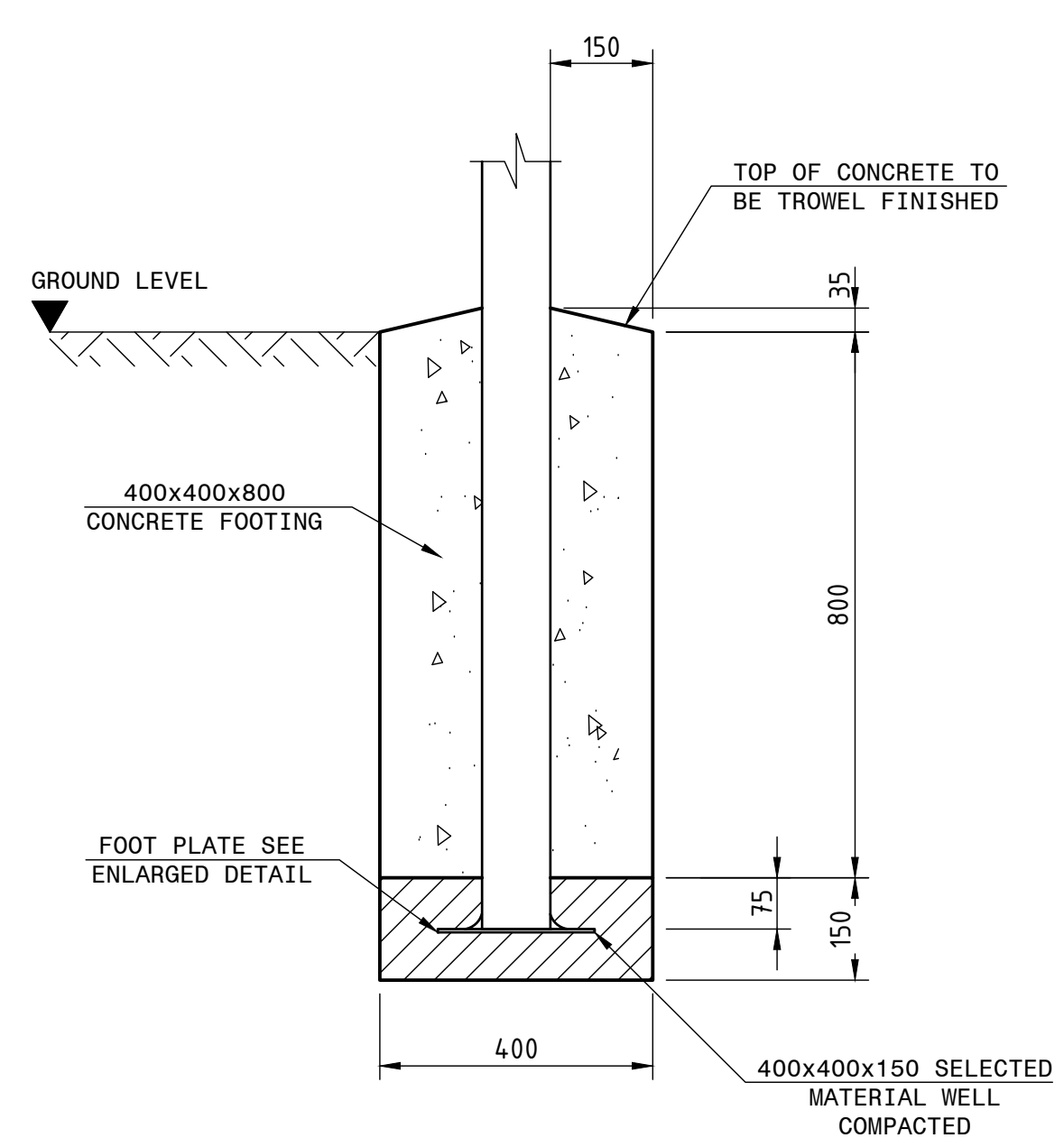
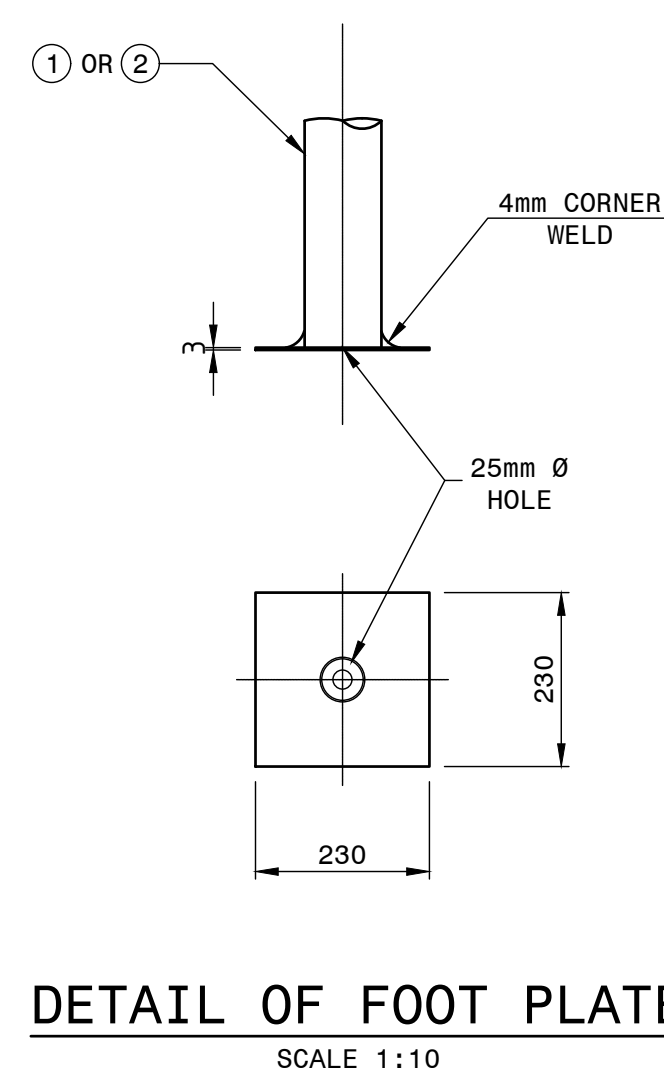
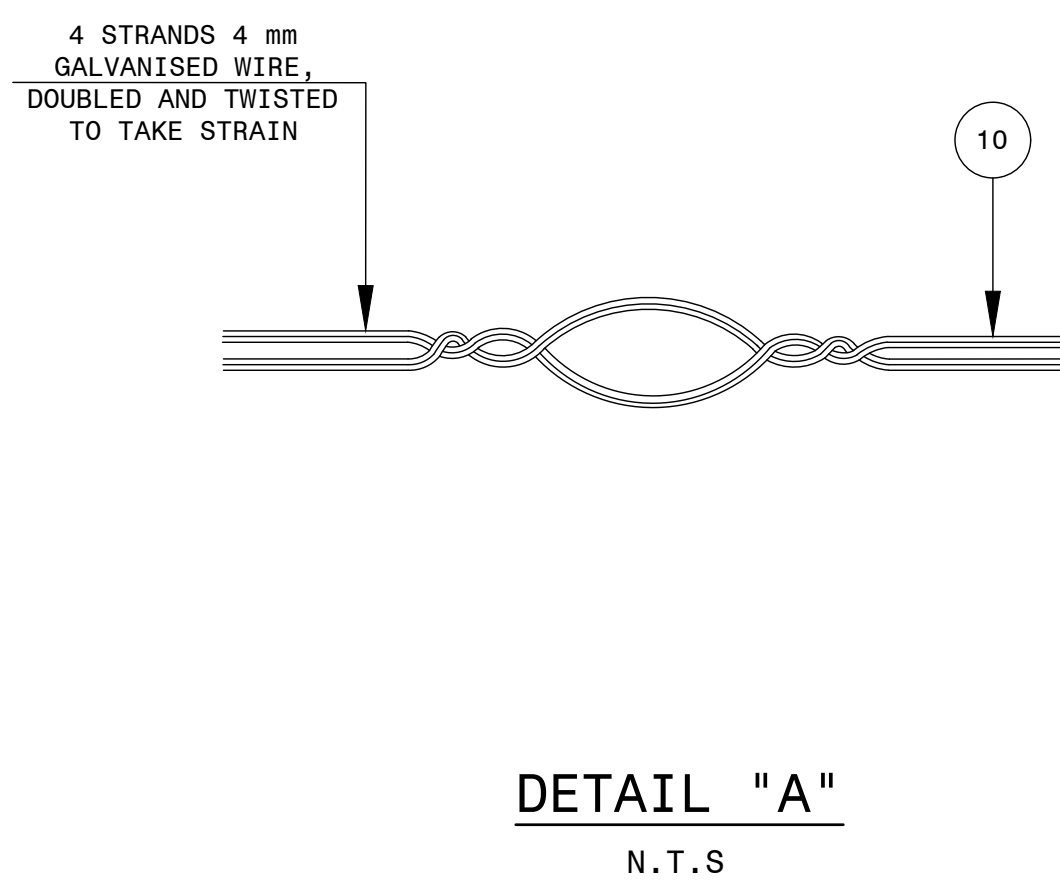
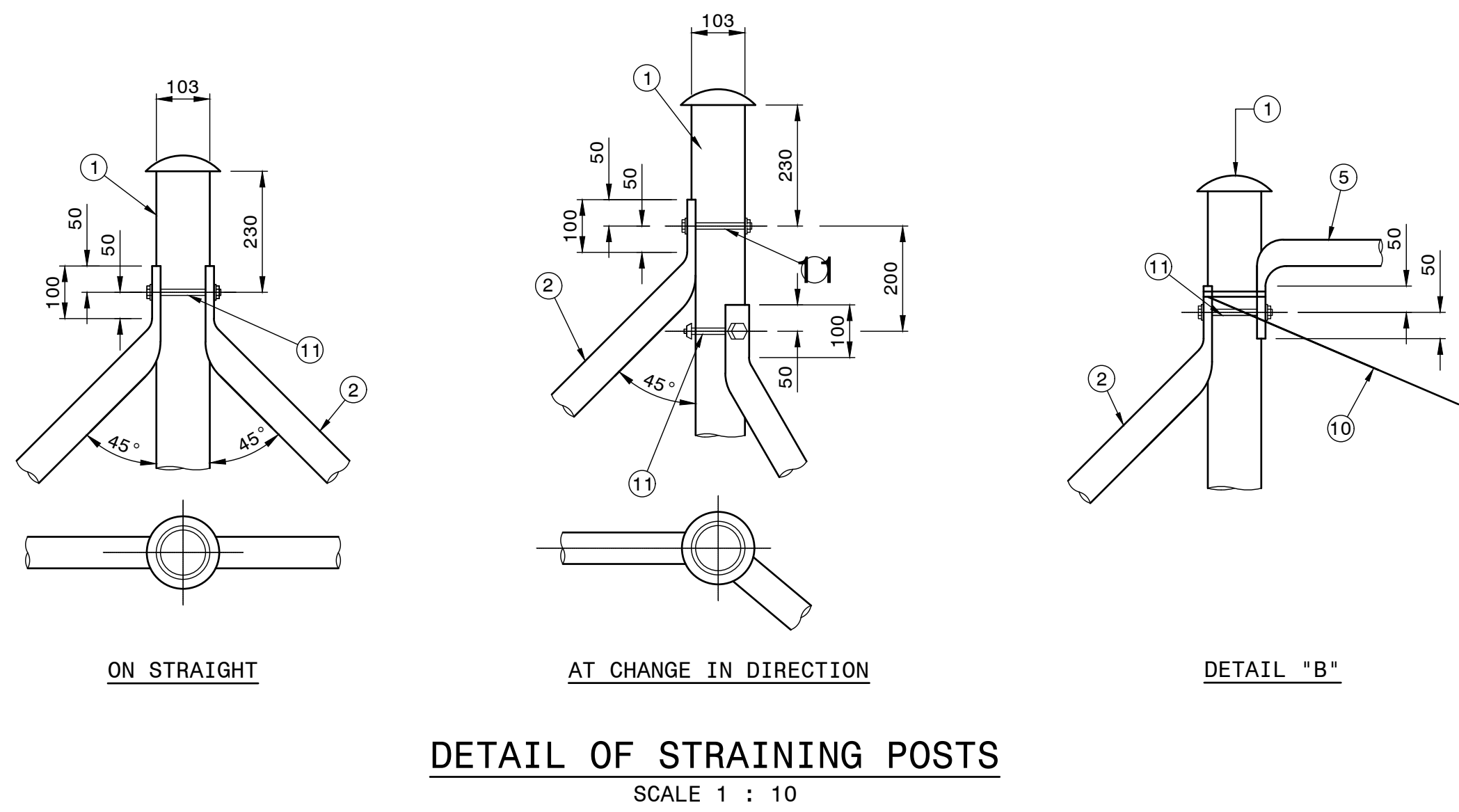
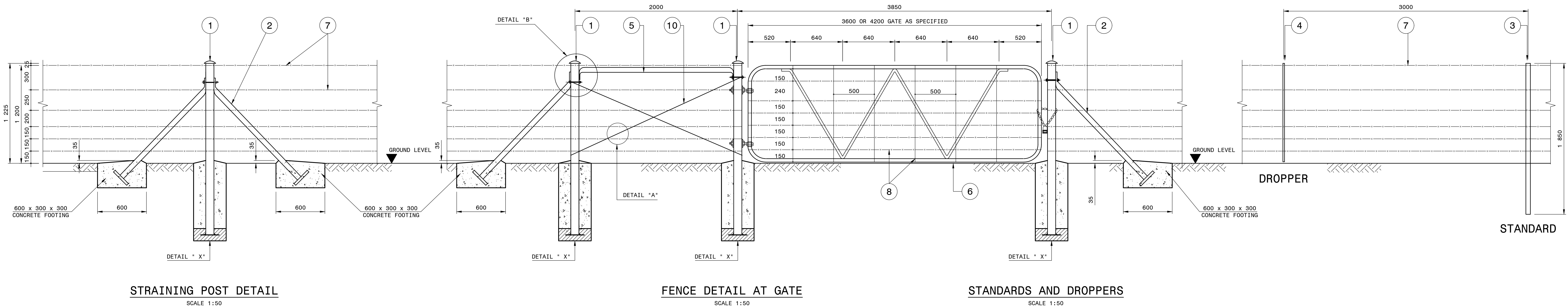
ORIGINAL SCALE : 1 : 100

FOR TENDER PURPOSES

				CONSTRUCTION RECORD	
				WORKS CONTRACT ENGINEER	
				Name	..
				Prof. Reg. No.	..
				Date	..
				SANRAL PROJECT MANAGER	

<div>HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000</div> <div>SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD. BUILDING SOUTH AFRICA THROUGH BETTER ROADS</div> <div>EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100</div> <div>ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:</div> <div>PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)</div> <div>PROJECT NUMBER NRA.C.004-099-2023/1</div>											

STOCK PROOF FENCING:
6 STRANDS ON STEEL POSTS AT BORROW PITS

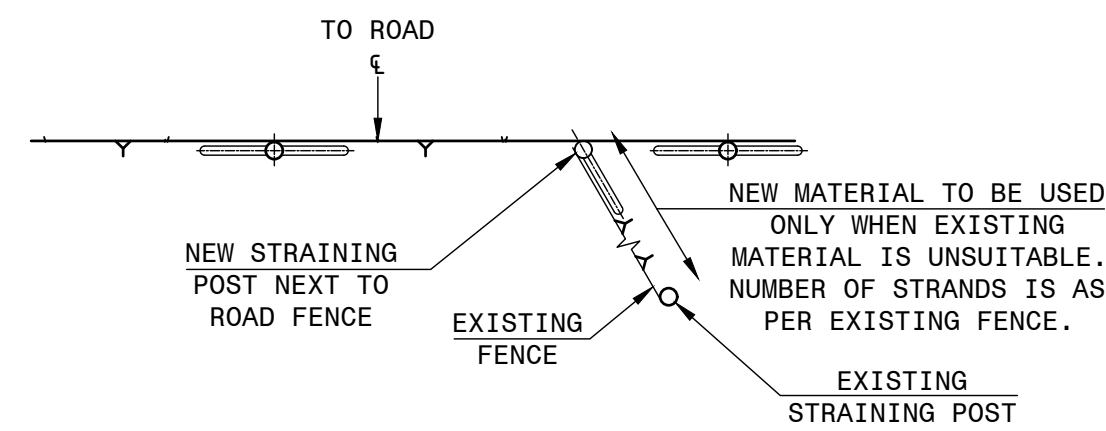


DETAILS OF POST FOOTINGS
DETAIL "X" 400x400x800

SCALE 1 : 10

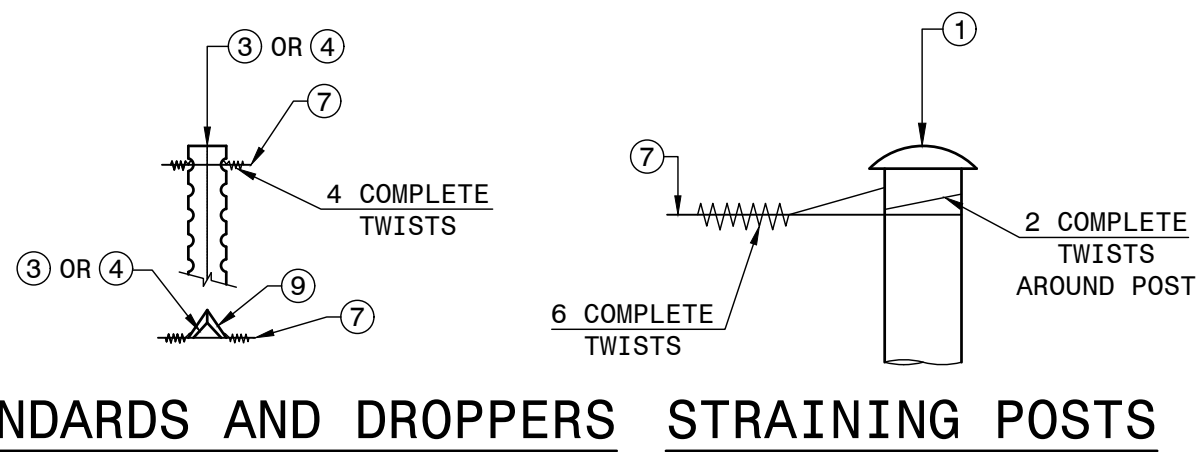
FENCING IN RELATION TO ROAD AND REPAIR OF EXISTING FENCE IF
CUT BY ROAD RESERVE

SCALE 1:100



FASTENING OF BARBED WIRE TO STANDARDS, DROPPERS AND
POSTS

SCALE 1:10



ITEM:

- POSTS: 2130 x 100 Ø x 3mm MILD STEEL TUBING WITH STEEL CAP AND 230 x 230 x 3 mm BASE PLATE, FULLY GALVANIZED (SANS 121/ISO 1461) (WITHOUT HOLES FOR WIRES).
- STAYS: 1 690 x 60 Ø x 3 mm MILD STEEL TUBING WITH 230 x 230 x 3 mm BASE PLATE, FULLY GALVANIZED. (SANS 121/ISO 1461).
- STANDARDS: 1850 x 2,5 kg/m "Y" SECTION COMPLETE WITH HOLES AT 50mm CENTRES, FULLY GALVANIZED (SANS 121/ISO 1461). IF WITHIN 25 km FROM THE COAST.
- DROPPERS: 1200 x 0,56 mm kg/m RIDGEBACK PATTERN (SANS 121/ISO 1461), FULLY GALVANIZED IF WITHIN 25 km FROM THE COAST.
- CROSS BRACE SUPPORT: 2400 x 60 Ø x 3 mm MILD STEEL TUBING BENT AND FLATTENED AS SHOWN, FULLY GALVANIZED (SANS 121/ISO 1461). ENDS PRESSED FLAT TO ± 8mm.
- GOVERNMENT PATTERN FARM GATE: MANUFACTURED FROM 42,9 Ø x 2,6mm STEEL TUBING WITH HINGES, WASHERS, BOLTS AND LOCKING CHAIN ATTACHED TO GATE (COMPLYING WITH OKS 146). ALL FULLY GALVANIZED (SANS 121/ISO 1461).
- BARBED WIRE: 3,2 x 2,5 mm OVAL HIGH TENSILE GRADE SINGLE STRAND (SANS 675), FULLY GALVANIZED.
- SMOOTH WIRE: 3,0 mm Ø HIGH TENSILE GRADE (SANS 675) FULLY GALVANIZED.
- TYING WIRE: 2,5 mm Ø MILD STEEL (SANS 675), FULLY GALVANIZED FOR TYING TO STANDARDS AND DROPPERS.
- STRAINING WIRE: 4 mm Ø MILD STEEL (SANS 675), FULLY GALVANIZED. (4 STRANDS, DOUBLED AND TWISTED TO TAKE STRAIN).
- BOLTS FOR STAYS: 12 mm Ø MILD STEEL, INCLUDING NUTS AND WASHERS, FULLY GALVANIZED.
- MAXIMUM SPACING OF: STRAINING POSTS 180 m c/c STANDARDS 15 m c/c DROPPERS 3 m c/c
- ALL WIRES TO BE ERECTED ON THE ROAD SIDE OF THE FENCE UNLESS OTHERWISE
- MINIMUM CONCRETE STRENGTH OF FOOTINGS 20 MPa AT 28 DAYS.

COMPLYING WITH OKS 82

0m 1m 2m 3m 4m 5m 6m 7m 8m

ORIGINAL SCALE : 1 : 100

FOR TENDER PURPOSES

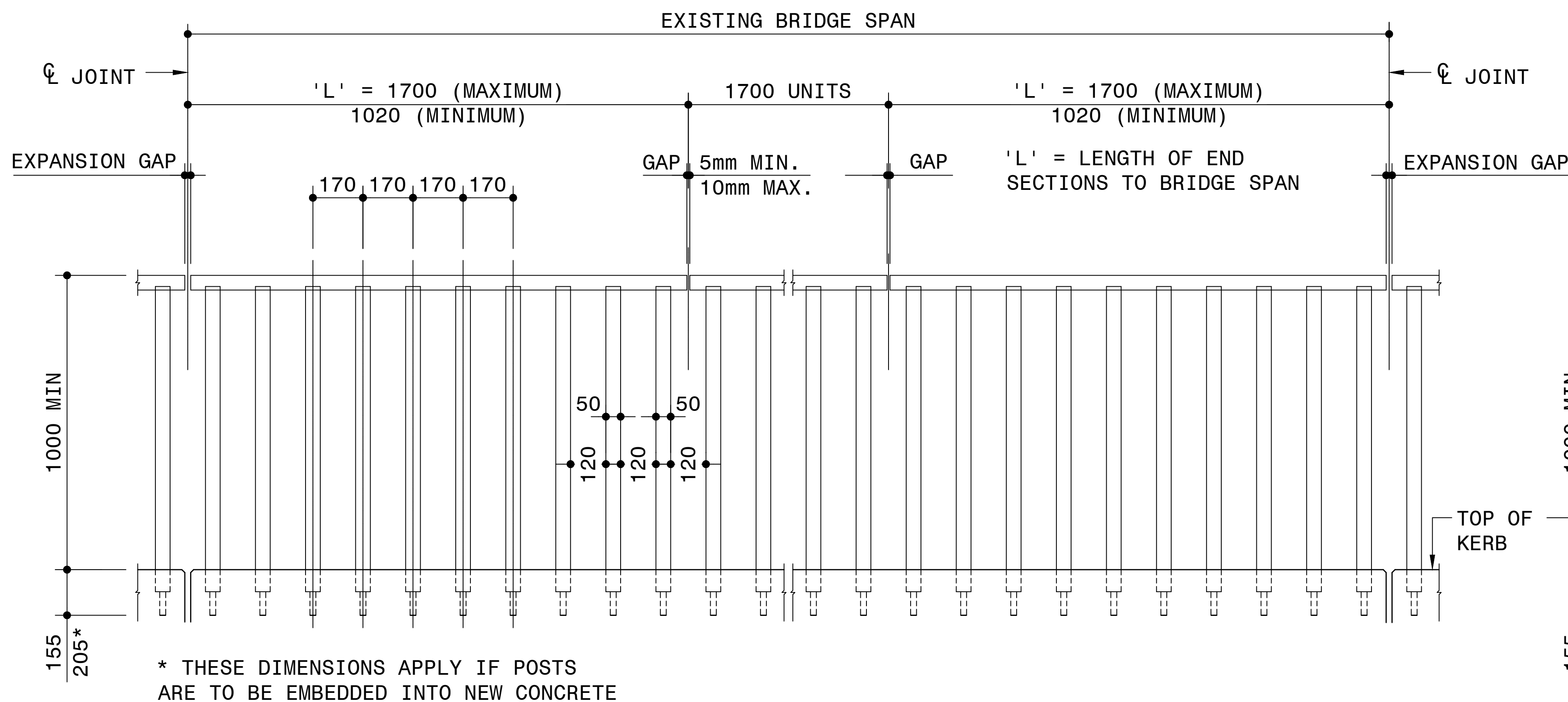
				CONSTRUCTION RECORD	
				WORKS CONTRACT ENGINEER	
				Name	_____
				Prof. Reg. No.	_____
				Date	_____
				SANRAL PROJECT MANAGER	
V1	SEPT 2023	ORIGINAL VERSION		S. KASIPERSAD	
No.	DATE	REVISION		CONSULT. ENG.	
				Name	_____
				Prof. Reg. No.	_____
				Date	_____

HEAD OFFICE 48 Tambotie Avenue Vai de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:
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PROJECT DESCRIPTION			
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)			
DRAWING DESCRIPTION			
PACKAGE A: N2-22 TYPICAL DETAILS: STOCK PROOF FENCING: 6 STRANDS ON STEEL POSTS AT BORROW PITS			
SCALE :	AS SHOWN	SHEET	1 OF 1

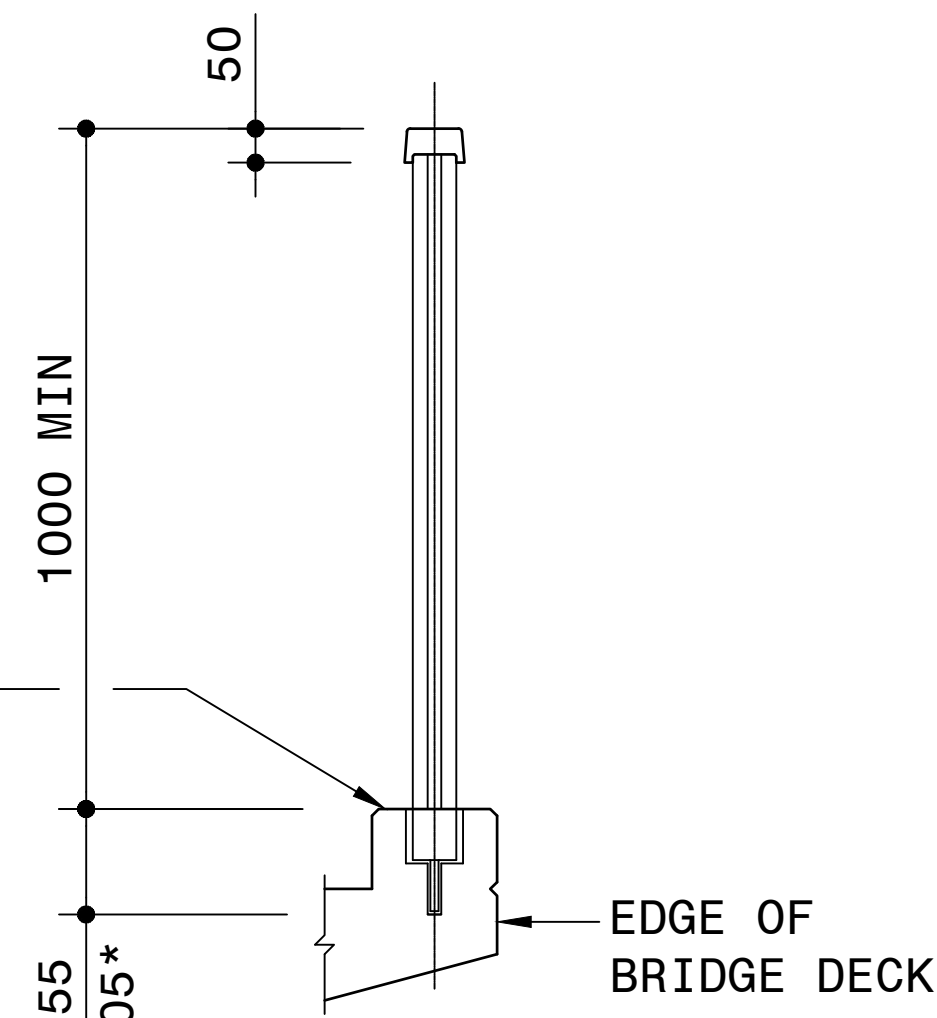
PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-007	
SANRAL DOCUMENT #		VER	
		V1	

PRECAST POLYCRETE PEDESTRAIN HANDRAIL



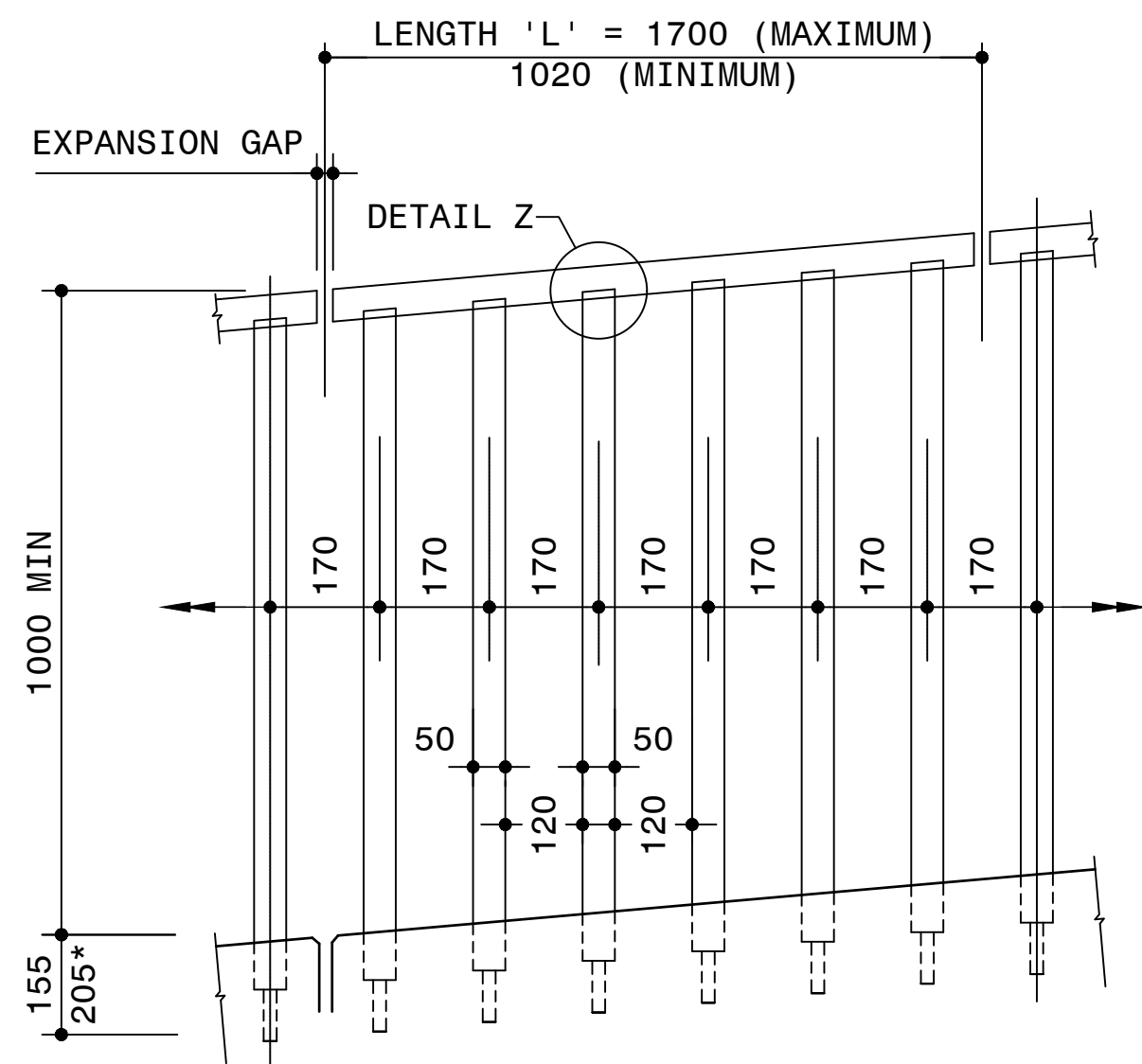
TYPICAL ELEVATION OF HANDRAIL

SCALE 1:20



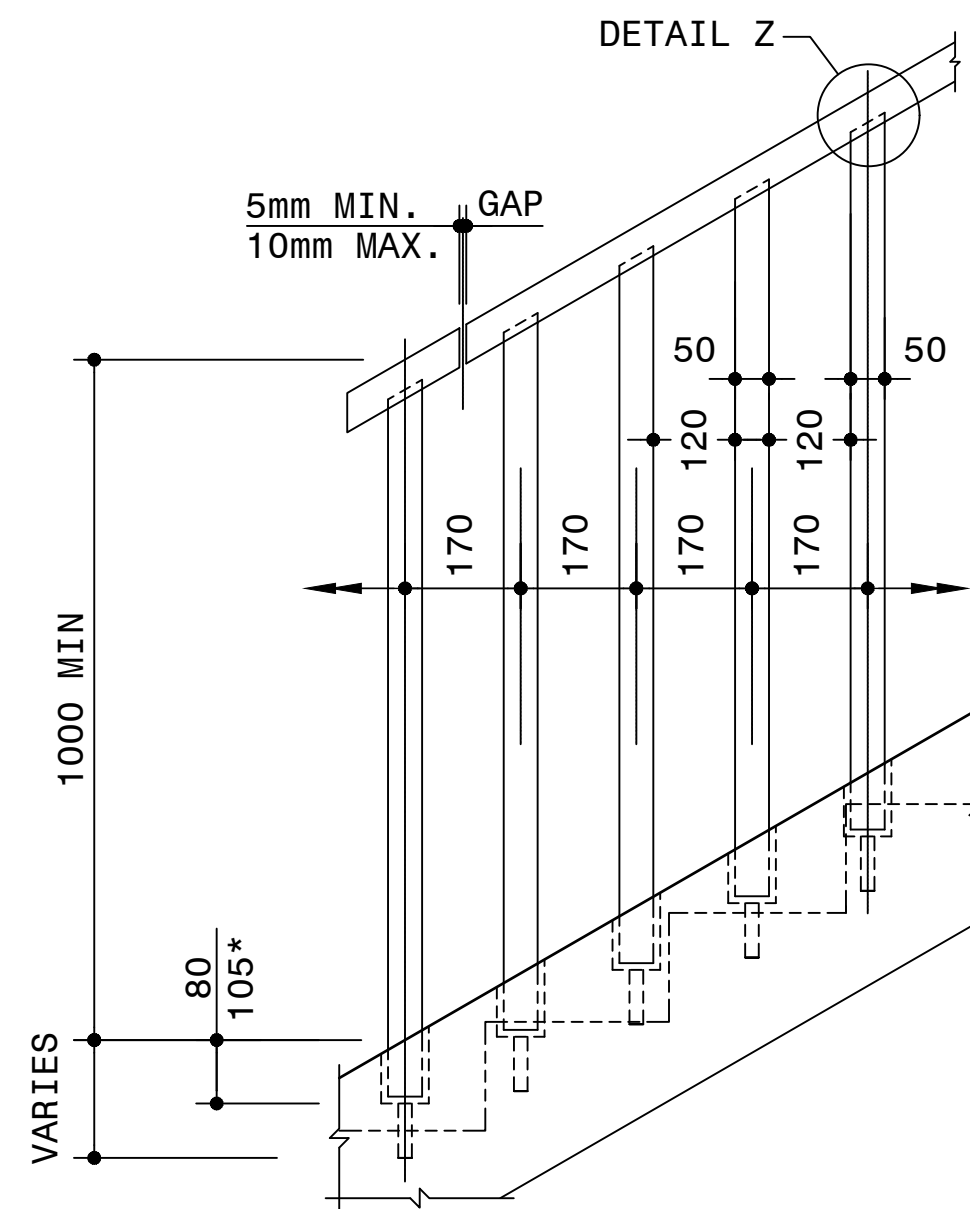
TYPICAL SECTION OF HANDRAIL

SCALE 1:20



ELEVATION OF HANDRAIL ON GRADE

SCALE 1:15



ELEVATION OF HANDRAIL ON FOOTBRIDGE STAIRWAY

SCALE 1:15

NOTE:

1. GENERAL

- 1.1 THE REQUIRED LENGTH OF THE HANDRAIL, THE LAYOUT AND THE REQUIRED UNIT QUANTITIES AND LENGTHS SHALL BE DETERMINED ON SITE.
- 1.2 HANDRAIL DESIGNED FOR LOADING ON PEDESTRIAN BARRIERS ACCORDING TO TMH 7, CLASS II (i.e. 4.5 kN/m VERTICALLY & 4.5L kN TRANSVERSE). ALSO TO BE USED FOR 1,5 kN/m LOAD CASE.

2.0 MATERIALS AND FINISHES

THE MATERIAL AND WORK SHALL COMPLY WITH THE RELEVANT CLAUSES OF SERIES 6000 AND 7000 OF THE STANDARD SPECIFICATIONS, THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE FOLLOWING.

2.1 CHARACTERISTIC STRENGTH OF MATERIALS:

2.1.1 REINFORCEMENT:

DESCRIPTION	CHARACTERISTIC STRENGTH (MPa)	YOUNG'S MODULUS (GPa)
MILD STEEL BARS	250	200
HIGH TENSILE STEEL	450	200

2.1.2 FLAME RETARDANT POLYCRETE WITH UV STABILISER:

DESCRIPTION	CHARACTERISTIC STRENGTH (MPa)	CHARACTERISTIC TENSILE STRENGTH	YOUNG'S MODULUS (GPa)
PRECAST UNIT	250	70	200

2.2 SURFACE FINISHES: - CLASS F3 - STEEL SHUTTER FINISH
CLASS U3 - STEEL TROWEL FINISH

- 2.3 MINIMUM POLYCRETE COVER : 10mm
- 2.4 MINIMUM LAP LENGTH : 150mm

3. MANUFACTURE

- 3.1 THE PRECAST HANDRAIL UNITS SHALL CONFORM TO ALL DETAILS, INCLUDING DIMENSIONAL TOLERANCES SHOWN ON THE DRAWINGS.
- 3.2 THE SHUTTER RELEASE AGENT MUST NOT STAIN THE FINISHED PRODUCT. IT MUST BE CLEANED WITH A SOLVENT PRIOR TO APPLYING EPOXY ADHESIVE.
- 3.3 ALL REINFORCEMENT TO BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

4. TOLERANCES

- 4.1 MANUFACTURING TOLERANCES:
THE MOULD SHALL BE MANUFACTURED TO TOLERANCES THAT WILL ENSURE THAT UNITS COMPLY WITH THE FOLLOWING TOLERANCES AFTER CASTING:

- 4.1.1 DIMENSIONS:
SECTIONAL DIMENSIONS : +5mm - 0mm
LENGTHS : +0mm - 5mm
- 4.1.2 SURFACE IRREGULARITIES AND WARP MEASURED BY MEANS OF A STRAIGHT EDGE:
VERTICAL : 2mm
HORIZONTAL : 3mm OVER THE LENGTH OF UNIT
- 4.1.3 SQUARENESS OF ENDS:
NO DIMENSION SHALL DEVIATE BY MORE THAN 2mm FROM THE THEORETICAL SQUARE PLANE CORRESPONDING TO THE FURTHEST PROJECTING POLYCRETE.

4.2. ERECTION TOLERANCE:

- 4.2.1. DIMENSIONS FROM SETTING OUT LINE TO FRONT FACE:
5mm OUTWARD, 0mm INWARD.
- 4.2.1 STEPS IN POLYCRETE FRONT FACES AND ABUTTING UNITS: 3mm
- 4.2.2 DEVIATION FROM LINE AND LEVEL MEASURED OVER ANY 5 UNITS: 5mm
- 4.2.3 POSTS SHALL ALWAYS BE FIXED VERTICAL IN THE CASE OF DECKS ON GRADE AND STEPS IN FOOTBRIDGES. THE ENGINEER TO ADVISE ON VERTICAL ALIGNMENT FOR ALL STRUCTURES ON VERTICAL CURVES.

5. ERECTION OF HANDRAIL UNITS

5.1 GENERAL:

- 5.1.1 NON-SHRINK CEMENTITIOUS GROUT AND EPOXY GROUT AS APPROVED BY THE ENGINEER.
- 5.1.2 NO UNIT SHALL BE TRANSPORTED OR ERECTED BEFORE IT HAS ATTAINED A CHARACTERISTIC STRENGTH OF 75MPa.
- 5.1.3 IN ORDER TO ACHIEVE GOOD ALIGNMENT WITH A UNIFORM APPEARANCE THE FOLLOWING PROCEDURE SHALL BE FOLLOWED FOR EACH INDIVIDUAL BRIDGE:
a) ONLY UNITS OF MATCHING COLOUR AND FINISH FROM ONE MOULD SHALL BE USED IN A PARTICULAR HANDRAIL.
b) LINING UP OF THE HANDRAIL UNITS SHALL BE COMPLETED OVER THE FULL LENGTH OF THE BRIDGE PRIOR TO FINAL GROUTING.
- 5.1.4 THE PREPARATION OF THE POLYCRETE SURFACES PRIOR TO THE PLACING AND GROUTING IN OF THE UNITS AND THE GROUTING OPERATION SHALL BE AS SPECIFIED IN THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE RECOMMENDATIONS OF THE GROUT MANUFACTURER.

5.2 ERECTION PROCEDURE:

- 5.2.1 ERECT TEMPORARY PROTECTION SCREEN.
- 5.2.2 REMOVE ANY EXISTING POSTS, BRACKETS AND PATCH BOLT HOLES, WHERE APPLICABLE.
- 5.2.3 DRILL 80 DIA. AND 16 DIA. HOLES INTO THE EXISTING KERB AS PER DETAIL.
- 5.2.4 PREPARE CONTACT SURFACES AS IN 5.1.4 ABOVE.
- 5.2.5 PLACE AND GROUT VERTICAL POSTS OF PRECAST UNITS AND ENSURE ALIGNMENT AS IN 4.2
- 5.2.6 GROUT AND FIX TO TOP RAIL.
- 5.2.7 REMOVE TEMPORARY PROTECTION SCREEN AFTER COMPLETION OF WORK.

LIST OF APPROVED MANUFACTURERS:

1. BRILLIANT BALUSTRADES - P.O. BOX 28 DURBAN 4000 (031) 700 5029

FOR TENDER PURPOSES

No.	DATE	REVISION	CONSULT. ENG.
V1	SEPT 2023	ORIGINAL VERSION	S.KASIPERSAD

CONSTRUCTION RECORD	WORKS CONTRACT ENGINEER
Name : ..	Prof. Reg. No. : ..
Date : ..	Date : ..
SANRAL PROJECT MANAGER	
Name : ..	Prof. Reg. No. : ..
Date : ..	Date : ..

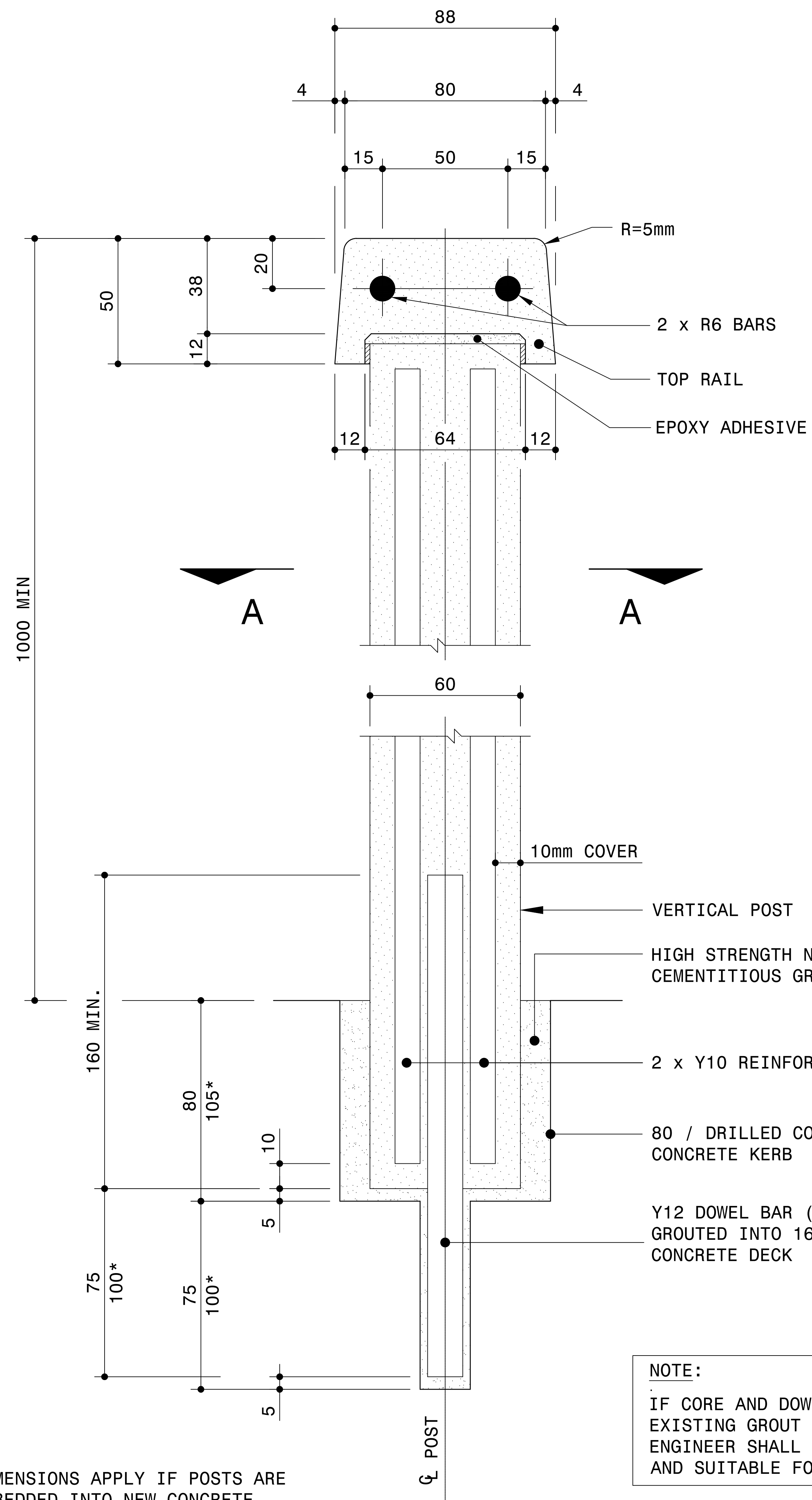
HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY  BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100
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ACCEPTANCE
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for CEO: SA NATIONAL ROADS AGENCY LTD. Date: ..

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION
PACKAGE A: N2-22 TYPICAL DETAILS: PEDESTRAIN HANDRAIL
SCALE : AS SHOWN

PROJECT NUMBER	NRA.C.004-099-2023/1
DRAWING LOCATION DATA	START END
ROUTE	N2 N2
SECTION	22 22
DRAWING km DISTANCE	km 0,80 km 18,64
DRAWING TYPE	ROADS - TYPICALS
BRIDGE/STRUCTURE No.	N/A
CONSULTANT DRAWING No.	TP1802-19-05-25-08-008
SANRAL DOCUMENT #	VER V1

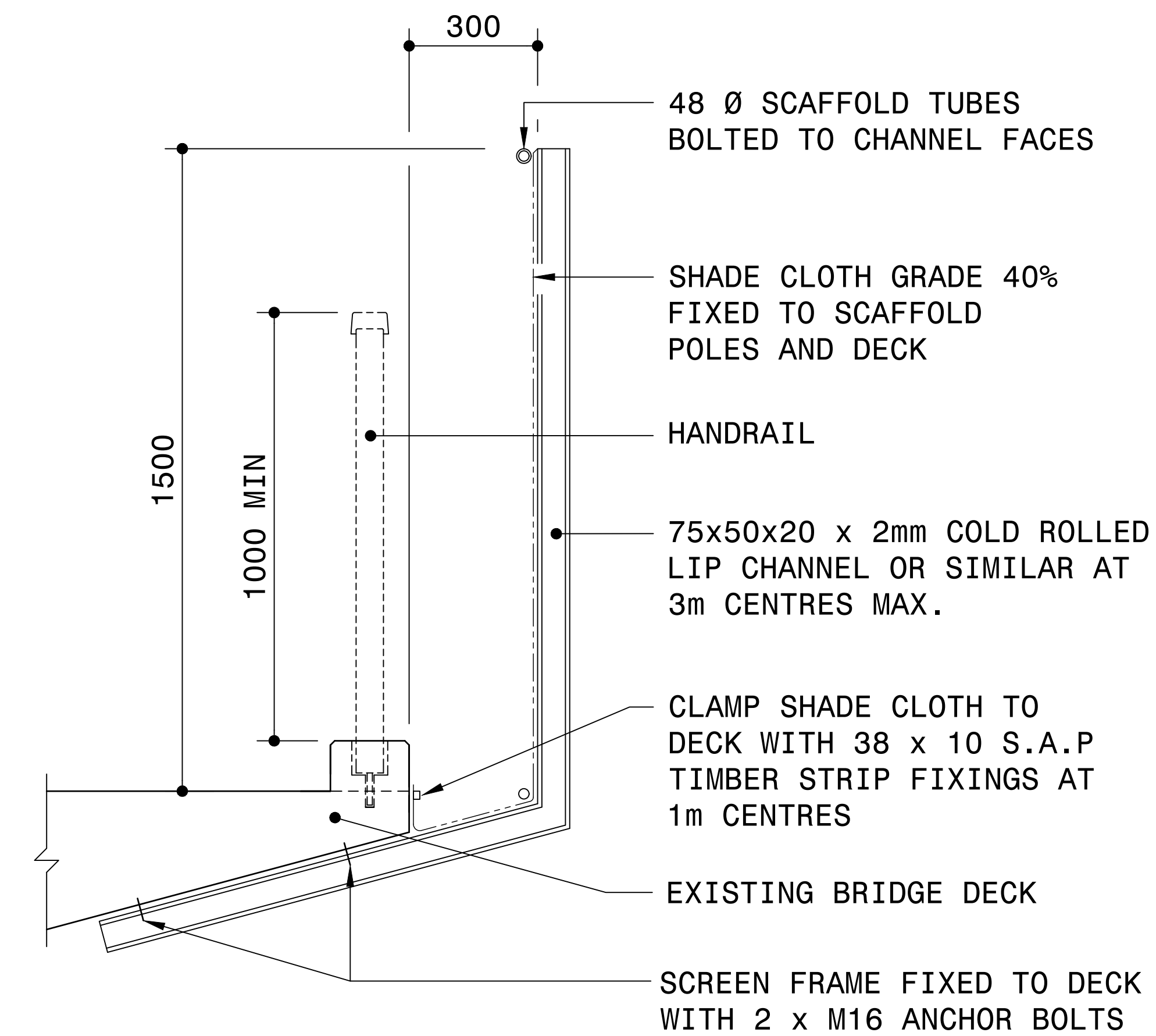
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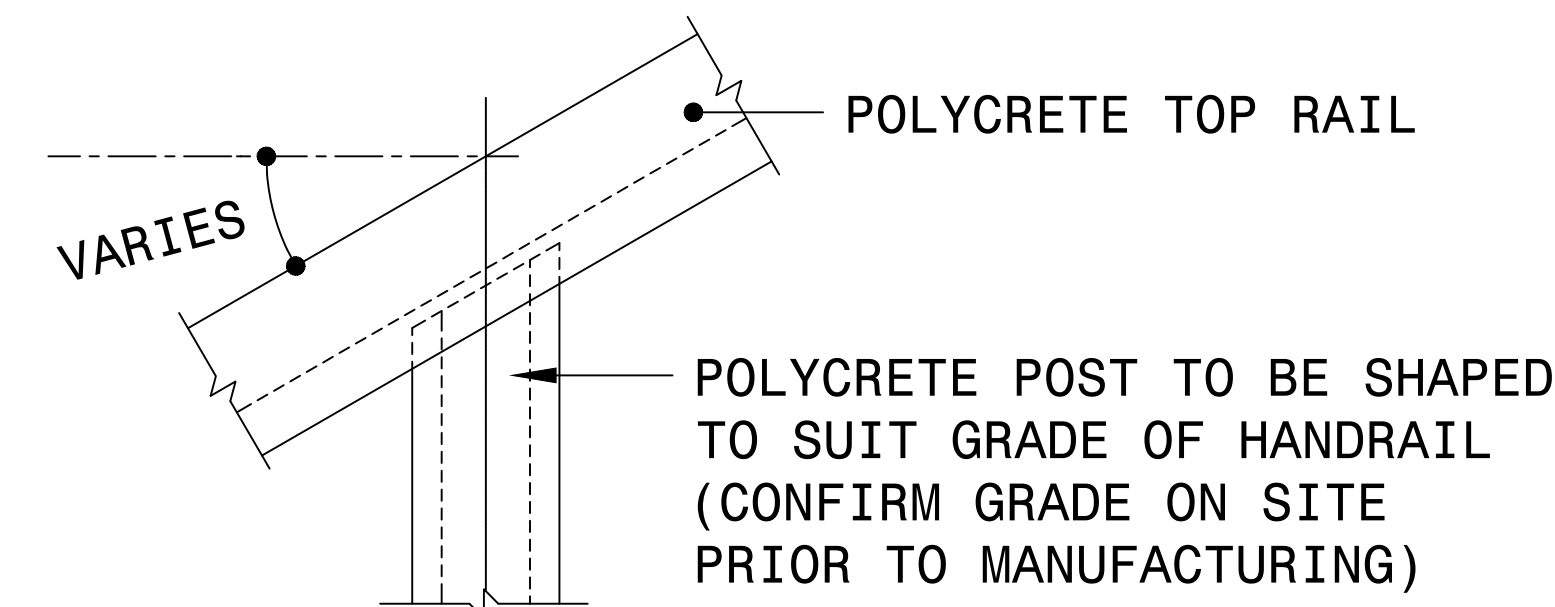
* THESE DIMENSIONS APPLY IF POSTS ARE TO BE EMBEDDED INTO NEW CONCRETE.

FIXING OF POSTS
SCALE 1:2

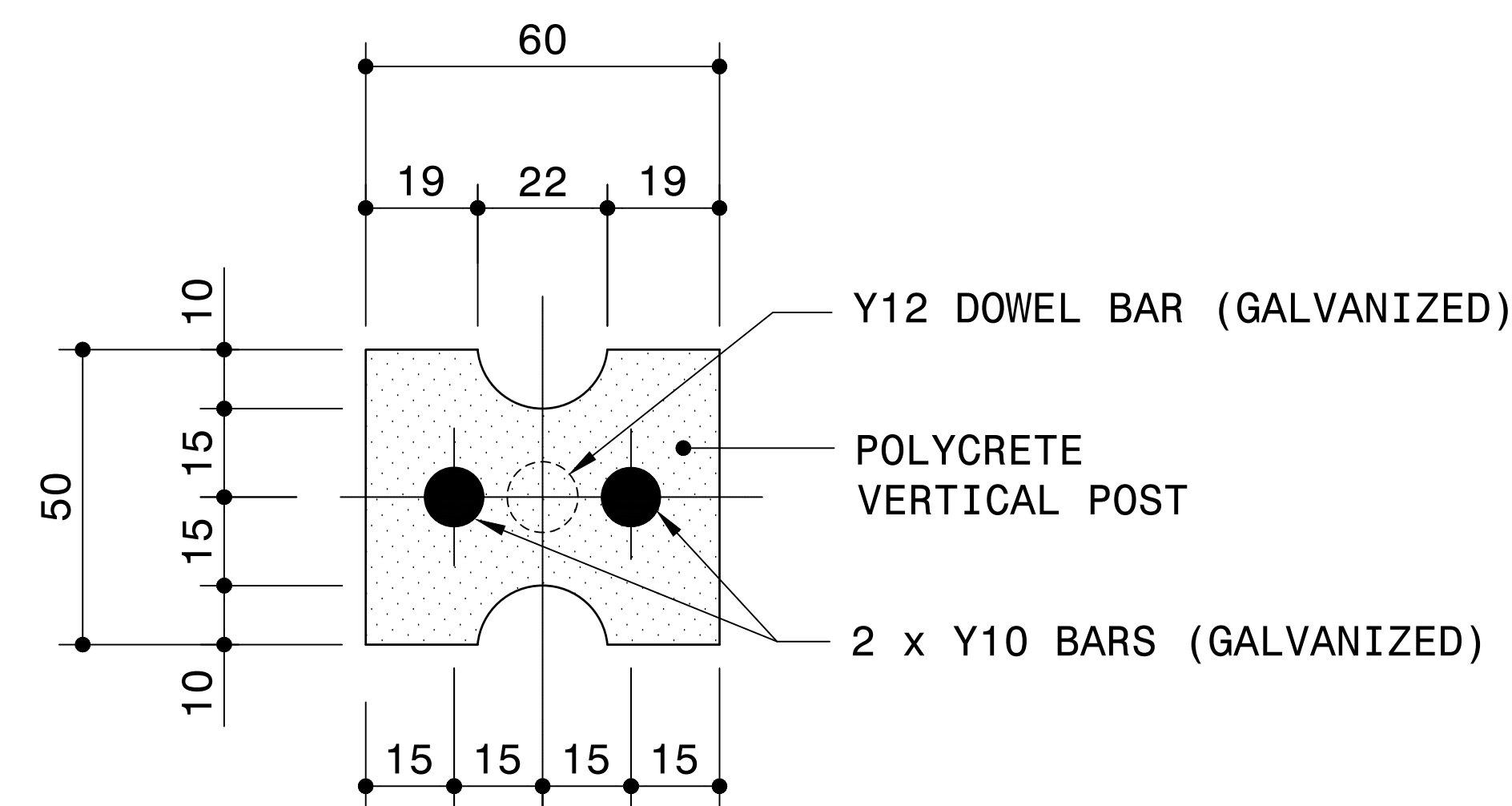
NOTE:
IF CORE AND DOWEL HOLES ARE DRILLED INTO EXISTING GROUT FILLED GROOVES, THE ENGINEER SHALL CONFIRM THAT GROUT IS SOUND AND SUITABLE FOR ANCHORING NEW POSTS.



**CONSTRUCTION
TEMPORARY SCREEN DETAILS**
SCALE 1:20



DETAIL 'Z'
SCALE 1:5



SECTION A-A
SCALE 1:2

FOR TENDER PURPOSES

				CONSTRUCTION RECORD	
				WORKS CONTRACT ENGINEER	
				Name	_____
				Prof. Reg. No.	_____
				Date	_____
				SANRAL PROJECT MANAGER	

HEAD OFFICE			
48 Tambotie Avenue			
Val de Grace			
Pretoria			
0184			
PO Box 415			
Pretoria 0001			
South Africa			
Tel: (012) 844 8000			

SANRAL	
SOUTH AFRICAN NATIONAL ROADS AGENCY LTD.	
BUILDING SOUTH AFRICA THROUGH BETTER ROADS	

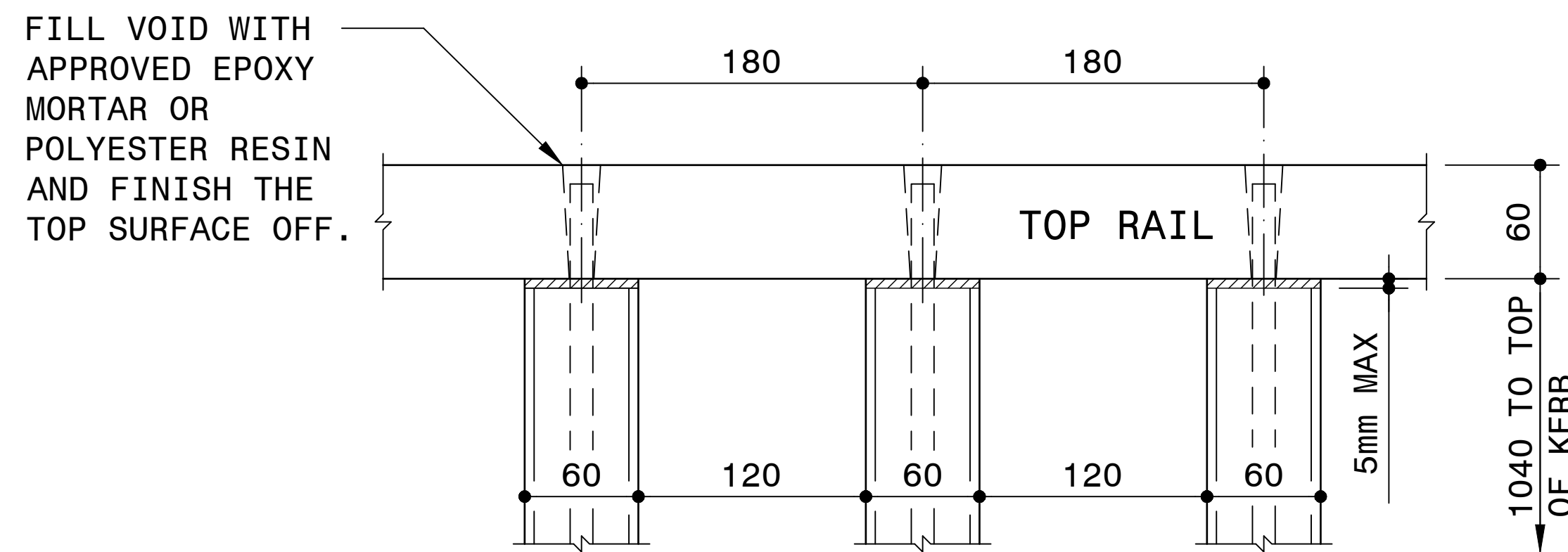
EASTERN REGION	
58 van Eck Place	
Pietermaritzburg	
3201	
PO Box 100410	
Scottsville	
3209	
Tel: (033) 392 8100	

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for CEO: SA NATIONAL ROADS AGENCY LTD.	
Date:	

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 TYPICAL DETAILS: PEDESTRAIN HANDRAIL	
SCALE : AS SHOWN	

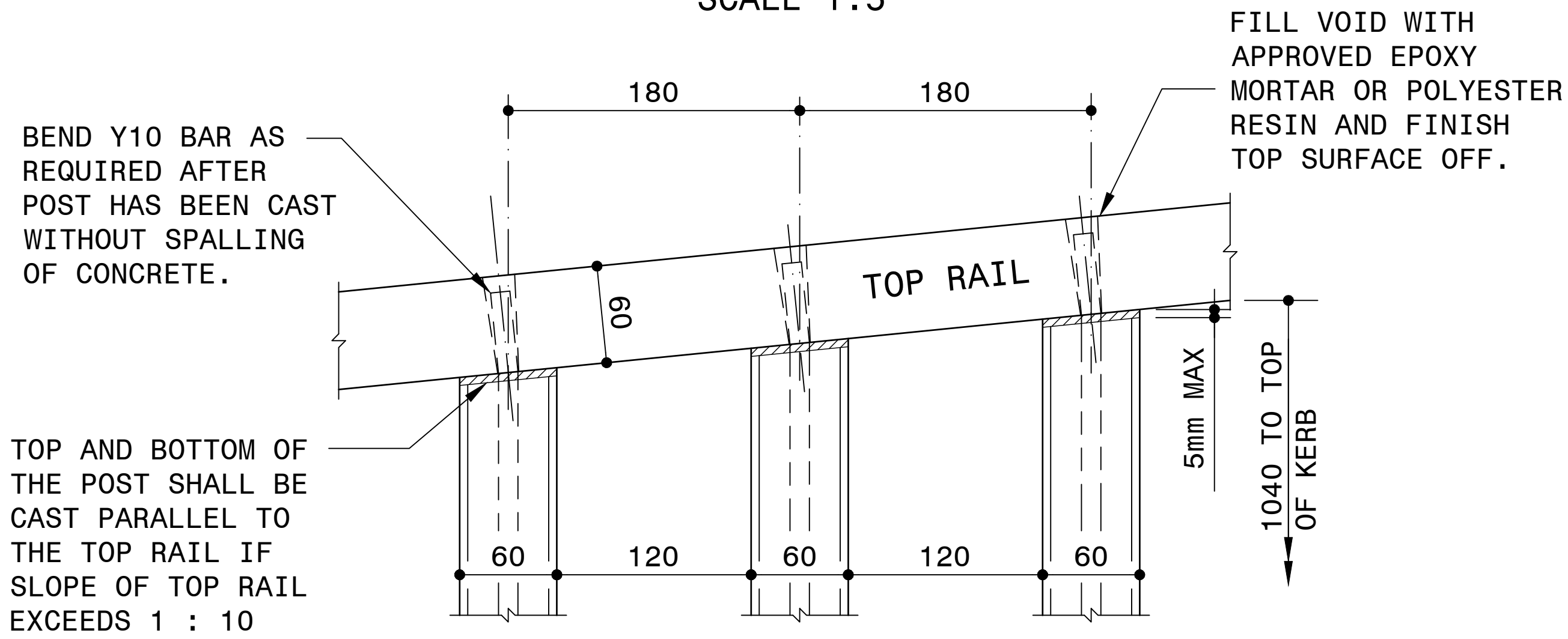
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ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-009	
SANRAL DOCUMENT #		VER V1	

DRAWING No. TP1802-19-05-25-08-009



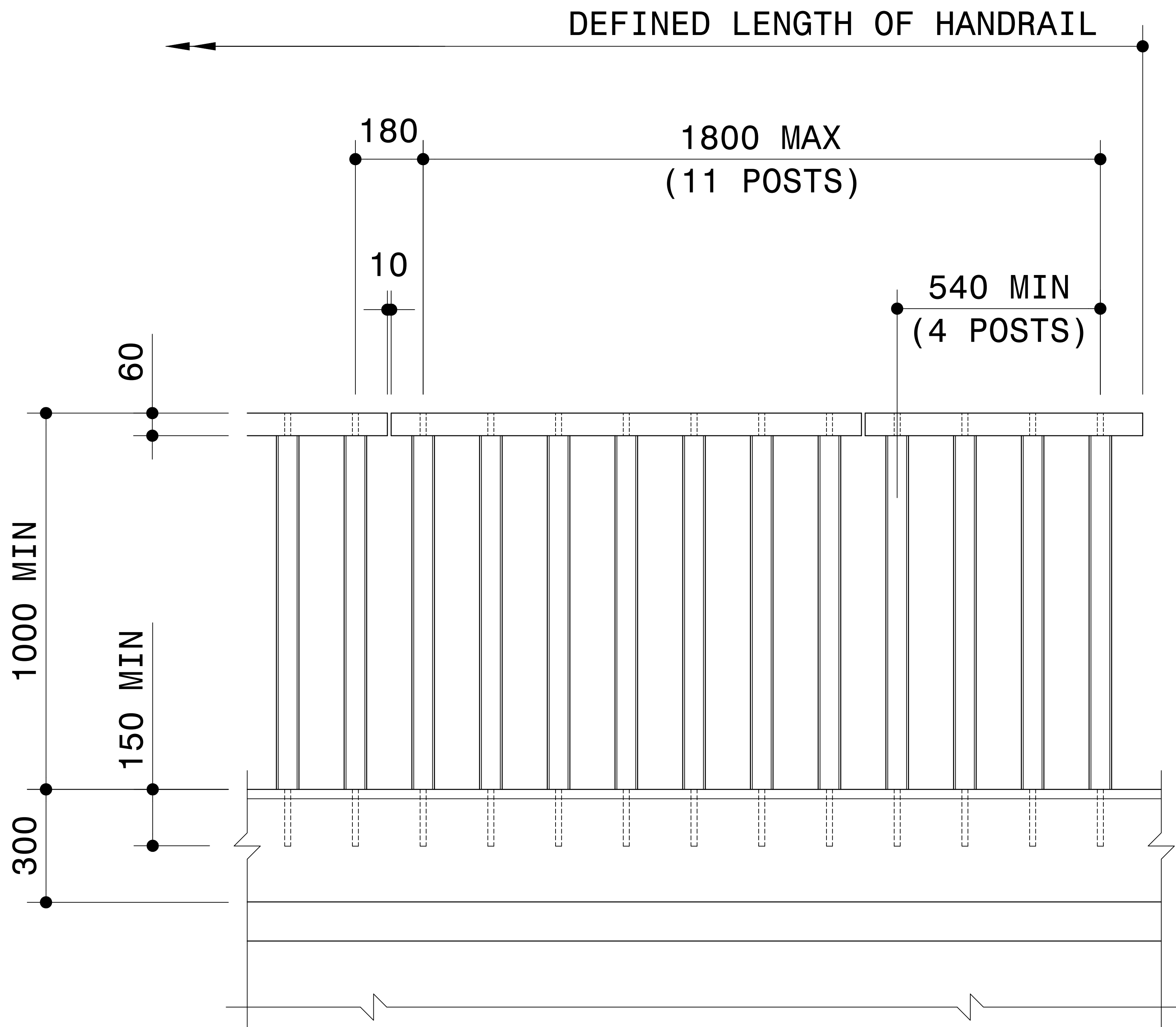
INSIDE ELEVATION B-B OF HANDRAIL

SCALE 1:5



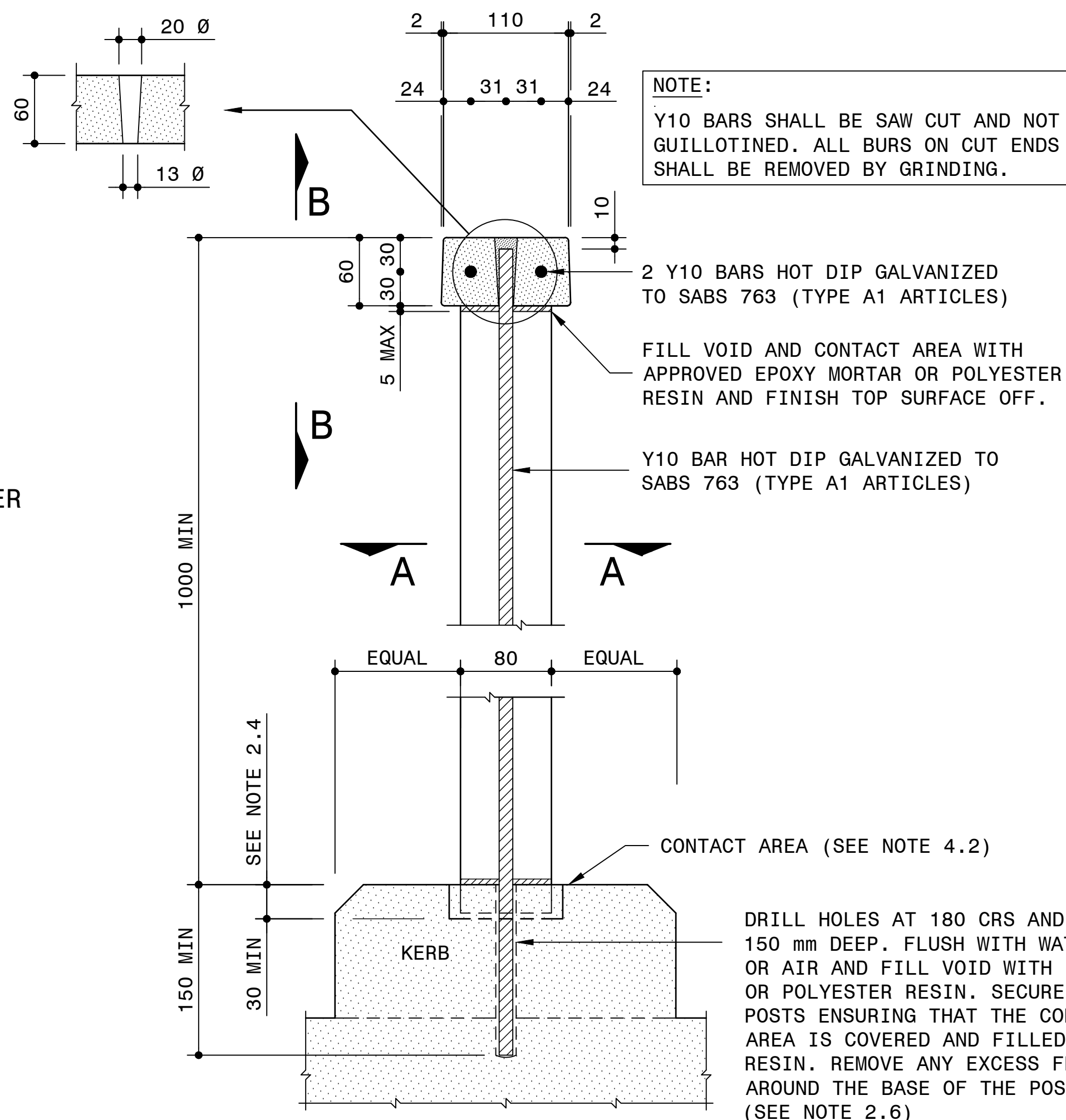
INSIDE ELEVATION B-B OF HANDRAIL ON SLOPE

SCALE 1:5



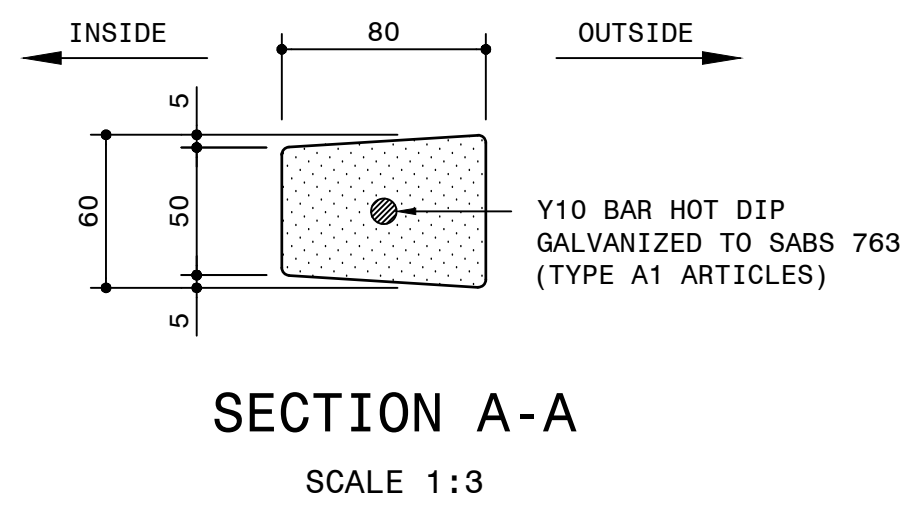
HANDRAIL ELEVATION

SCALE 1:25



FIXING OF POSTS

SCALE 1:5



SECTION A-A

SCALE 1:3

NOTES

1. GENERAL

- 1.1 CONCRETE FOR PRECAST CONCRETE HANDRAIL MEMBERS SHALL BE CLASS 40/13 AND SHALL BE DESIGNED FOR LOW SHRINKAGE VALUES.
- 1.2 ALL BONDED CONNECTIONS SHALL BE MADE WITH RESIN WITH A SHEAR AND BOND STRENGTH GREATER THAN THAT OF THE CONCRETE.
- 1.3 FINISH TO PRECAST MEMBERS SHALL BE CLASS F3 AND U3 (STEEL TROWEL). ALL CORNERS TO BE ROUNDED 3mm.
- 1.4 NO SAG WILL BE ALLOWED BETWEEN THE ENDS OF ANY SINGLE TOP RAIL UNIT. MAXIMUM PERMISSIBLE BOWING WILL BE 2 mm PER METER OF TOP RAIL.
- 1.5 POSTS AND TOP RAILS SHALL BE PROPERLY BRACED UNTIL THE RESIN USED FOR FIXING HAS SET. CURING TIME SHALL BE VERIFIED BY THE ENGINEER.

2. DESIGN AND DETAILING REQUIREMENTS:

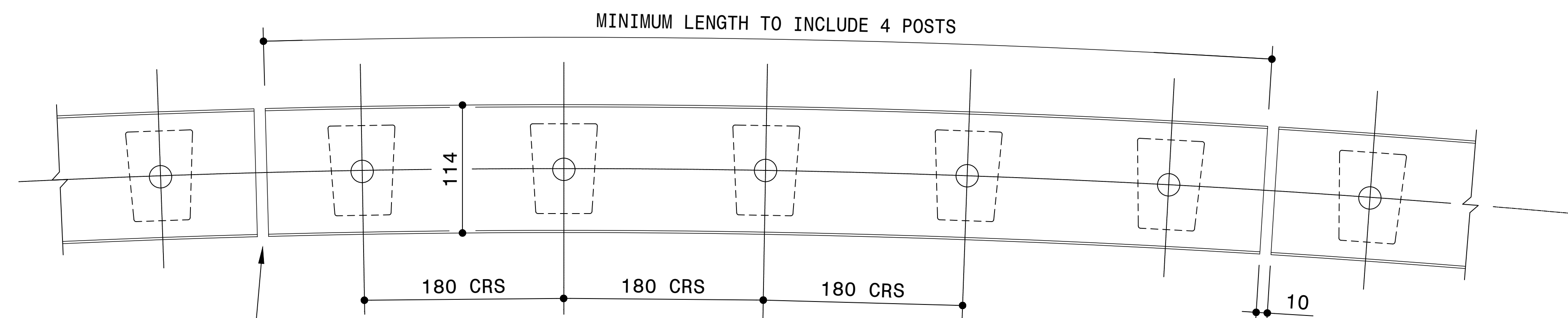
- 2.1 HANDRAIL DESIGNED FOR 1,5 kN/m LOADING AS DEFINED IN TMH 7. USE ON PEDESTRIAN BRIDGES OR WITH SIDEWALK PROTECTED BY VEHICLE BARRIER.
- 2.2 ALLOWANCE SHALL BE MADE FOR VERTICAL AND HORIZONTAL IRREGULARITIES OF THE TOP OF THE KERB OR BRIDGE DECK WHERE HANDRAILS ARE INSTALLED ON EXISTING BRIDGES.
- 2.3 THE ENGINEER SHALL VERIFY THAT THE REINFORCEMENT AND CONCRETE IN THE KERB IS ADEQUATE FOR THE INSTALLATION OF THE HANDRAILS.
- 2.4 WHERE THE TOP SURFACE OF THE KERB IS IRREGULAR OR OF INSUFFICIENT STRENGTH FOR ANCHORING THE POSTS, MIN 30 mm DEEP CORE HOLES OR A 30mm DEEP SLOT SHALL BE PROVIDED TO ENSURE PROPER BEDDING OF THE POSTS. THE CORE HOLES OR SLOTS SHALL BE FILLED WITH AN APPROVED PROPRIETARY BEDDING GROUT AFTER THE POSTS HAVE BEEN FIXED.
- 2.5 WHERE EXISTING HANDRAIL MEMBERS ARE REMOVED PRIOR TO THE INSTALLATION OF NEW PRECAST CONCRETE HANDRAILS, THE EXISTING MEMBERS SHALL BE REMOVED TO A DEPTH OF AT LEAST 3 mm BELOW THE TOP OF THE KERB AND THE SURFACE SHALL BE MADE GOOD WITH AN APPROVED PATCHING MORTAR,
- 2.6 DIAMETERS OF HOLES FOR THE BONDED CONNECTIONS WILL DEPEND ON THE RESIN USED BY THE CONTRACTOR. THE ENGINEER SHALL VERIFY THE REQUIRED HOLE SIZES AND ACCEPTABILITY OF THE PROPOSED RESIN.

3. APPROVAL OF INSTALLERS AND MATERIALS:

- 3.1 THE CONTRACTOR SHALL SUBMIT SAMPLES OF THE HANDRAIL MEMBERS HE INTENDS USING TO THE ENGINEER FOR APPROVAL. SUCH SAMPLES WILL BE KEPT AND USED BY THE ENGINEER AS A COMPARATIVE STANDARD FOR THE MEMBERS ACTUALLY INSTALLED ON THE BRIDGE.
- 3.2 THE ENGINEER MAY ALSO REQUIRE DESTRUCTIVE TESTING OF INDIVIDUAL MEMBERS TO CONFIRM THEIR COMPLIANCE WITH THE SPECIFIED MANUFACTURING PROCEDURES.
- 3.3 THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE ENGINEER WITH PROOF OF COMPETENCE OF THE PROPOSED INSTALLERS OF THE HANDRAILS.

4. VERTICAL ALIGNMENT

- 4.1 WHERE THE TOP OF THE KERB OR DECK DISPLAYS POOR VERTICAL ALIGNMENT, THE ALIGNMENT SHALL BE IMPROVED BY MEANS OF GRINDING PRIOR TO THE INSTALLATION OF THE POSTS OR BY CASTING AN UPSTAND AROUND THE POSTS AFTER INSTALLATION. THIS DECISION WILL BE MADE BY THE ENGINEER.
- 4.2 A RECESS SHALL BE FORMED IN THE KERB OR DECK UNDER THE CONTACT AREA UNDER THE POST BY MEANS OF CORING OR PROVIDING A SLOT. THE SLOT OR CORED HOLES SHALL BE FILLED WITH AN APPROVED REPAIR MORTAR AFTER THE POSTS HAVE BEEN INSTALLED. THIS METHOD MAY BE ELIMINATED ONLY ON THE EXPRESS INSTRUCTION OF THE ENGINEER.



PLAN OF CURVED PRECAST TOP RAIL

SCALE 1:5

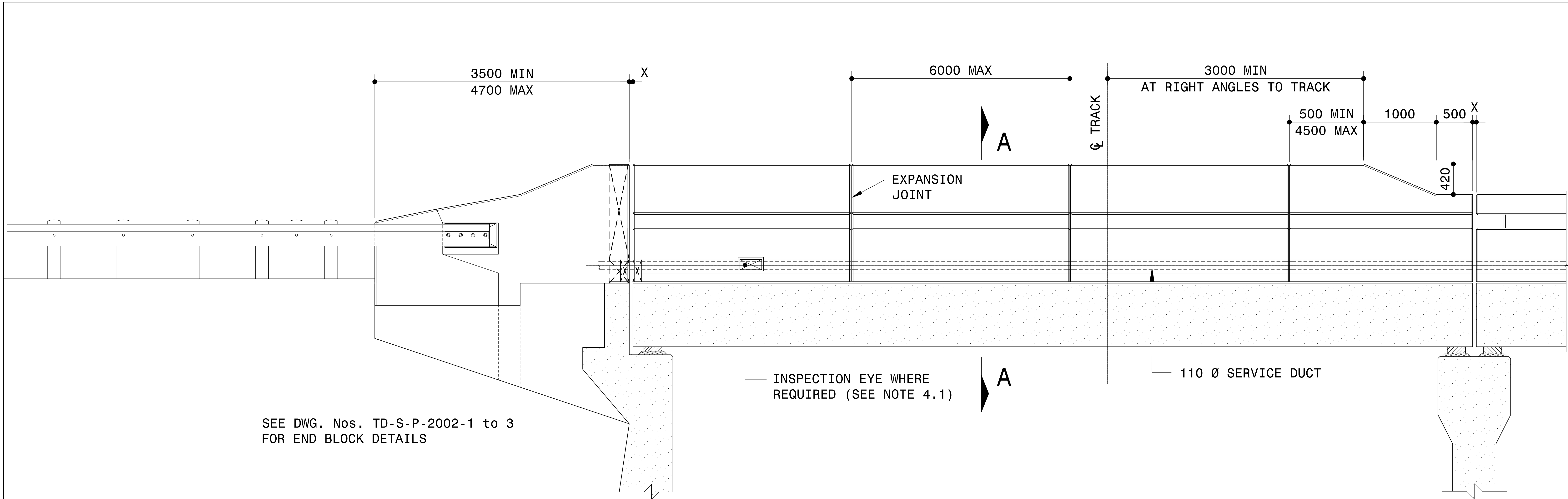
FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	..		
Prof. Reg. No.	..		
Date	..		
SANRAL PROJECT MANAGER			
Name	..		
Prof. Reg. No.	..		
Date	..		
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date: ..
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PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 TYPICAL DETAILS: PEDESTRAIN HANDRAIL	
SCALE : AS SHOWN	SHEET 1 OF 1

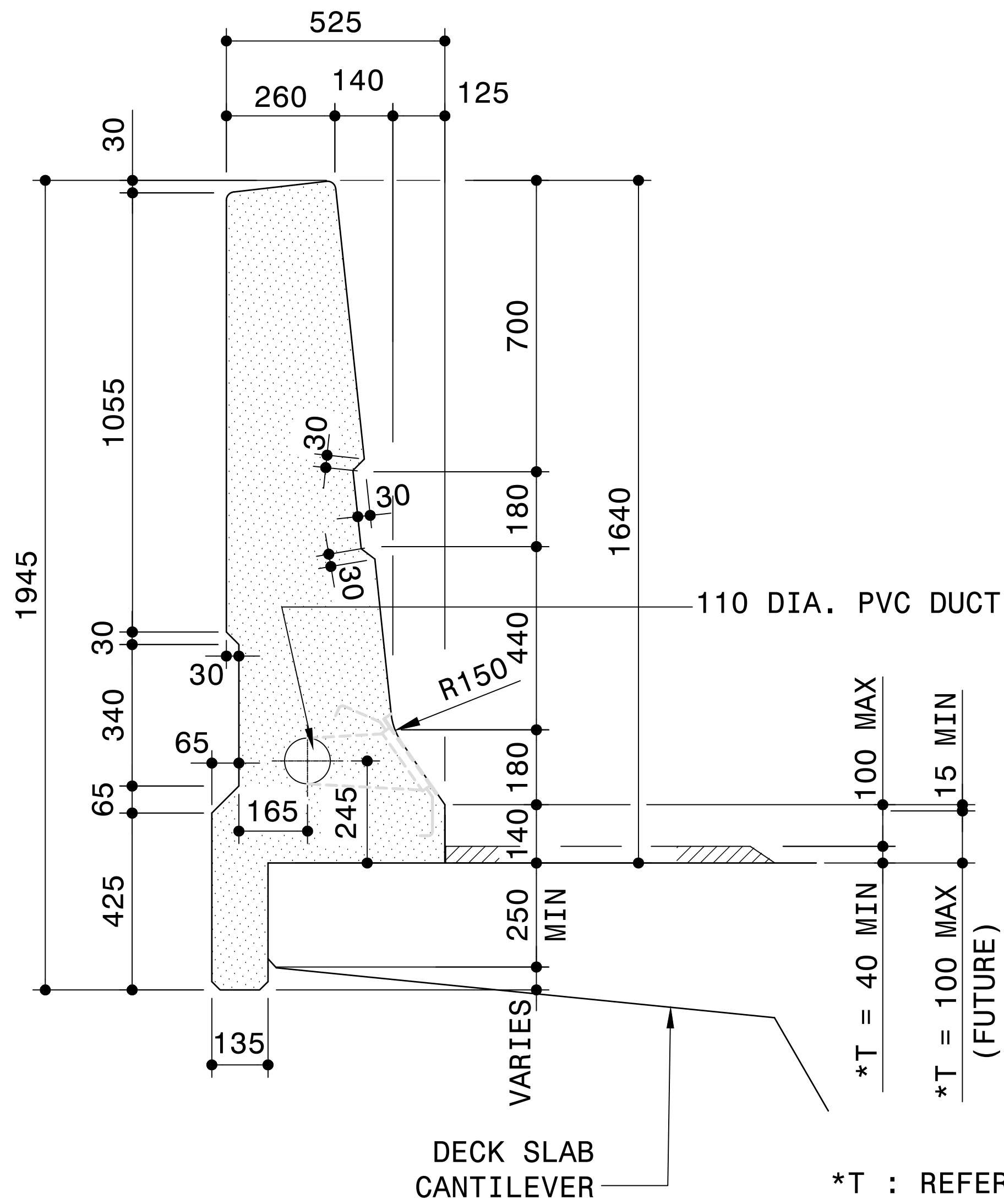
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DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	ROADS - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-08-010		
SANRAL DOCUMENT #			V1



SEE DWG. Nos. TD-S-P-2002-1 to 3
FOR END BLOCK DETAILS

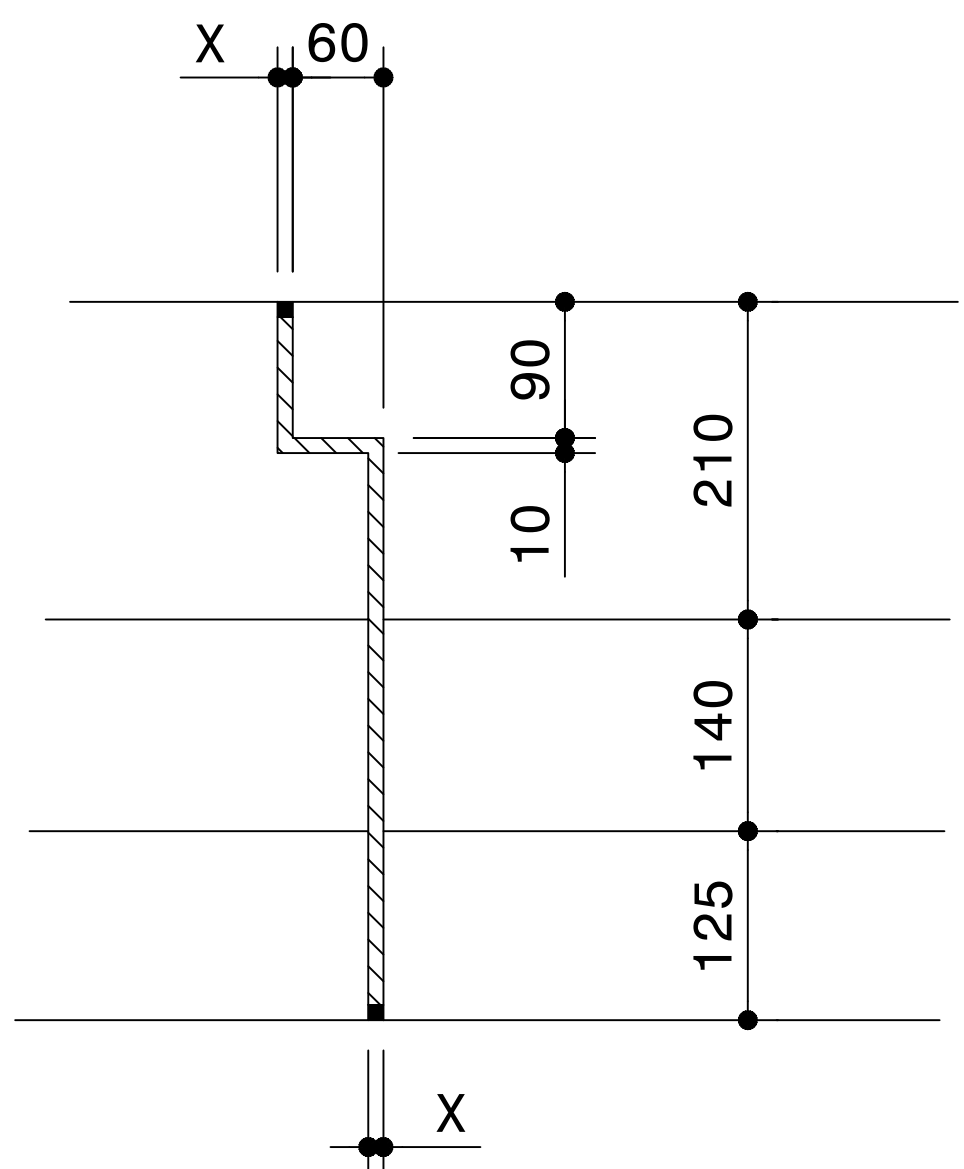
INSIDE ELEVATION

SCALE 1:50



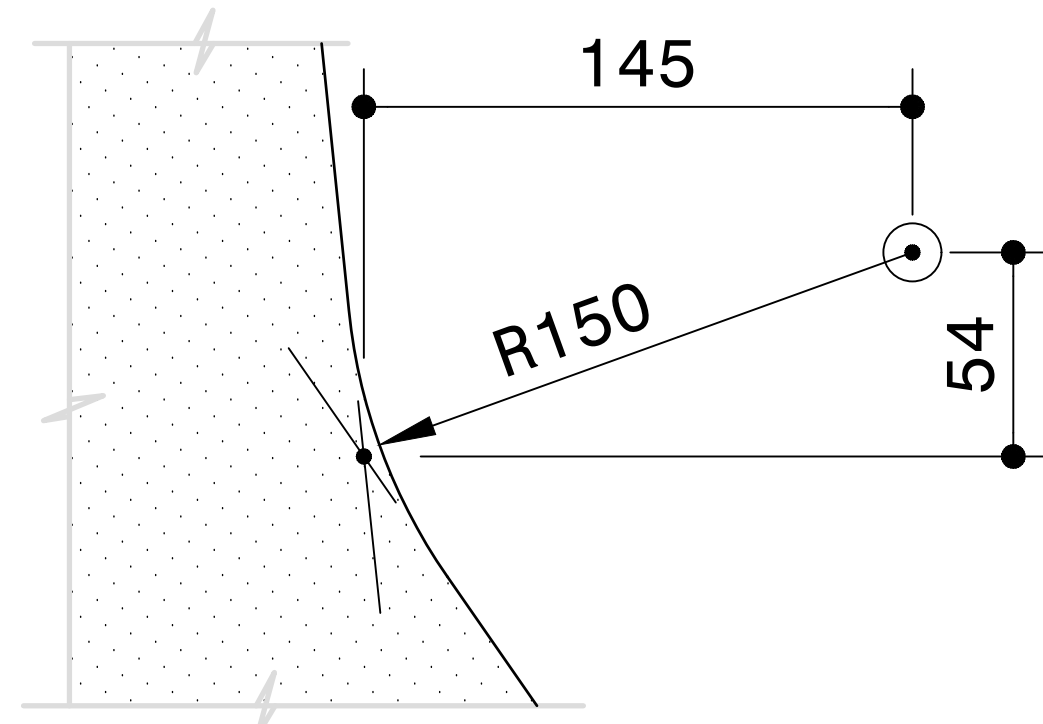
SECTION A-A

SCALE 1:10



PLAN OF EXPANSION JOINT

SCALE 1:5



RADIUS DETAIL SETTING OUT DETAILS

SCALE 1:5

NOTES

- DESIGN LOADING
 - TYPE A BRIDGE PARAPETS SHALL BE DESIGNED FOR A NOMINAL POINT LOAD OF 100kN ACTING AT A HEIGHT OF 700mm ABOVE THE ROAD SURFACE.
TYPE B BRIDGE PARAPETS SHALL BE DESIGNED FOR A NOMINAL POINT LOAD OF 200kN ACTING AT A HEIGHT OF 900mm ABOVE THE ROAD SURFACE.
- THE PARAPET
 - SHALL NOT BE DESIGNED AS AN INTERGRAL PART OF THE DECK WITHOUT APPROVAL I.E. IT SHALL BE POSSIBLE TO REMOVE THE BALUSTRADE SHOULD THE BRIDGE REQUIRE WIDENING, THE BALUSTRADE SHALL BE CAST AFTER THE DECK IS SELF SUPPORTING.
 - ALL WORK MUST BE EXECUTED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS". (COLTO)
- MATERIAL AND FINISHES

THE MATERIAL AND WORK SHALL COMPLY WITH THE RELEVANT CLAUSES OF SERIES 6000 AND 8000 OF THE STANDARD SPECIFICATIONS, THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE FOLLOWING.

 - CONCRETE CLASS (MPa/mm) : W30/19 UNLESS DURABILITY CONCRETE IS NOT REQUIRED (EXPOSURE CLASS XC1a)
 - STEEL REINFORCING BARS SHALL COMPLY WITH SANS 920:1985
HIGH YIELD BARS : MIN YIELD STRESS 450 MPa.
MILD STEEL BARS : MIN YIELD STRESS 250 MPa.
ALL REINFORCING TO BE HOT DIPPED GALVANISED.
NOTE : GALVANISING SHALL APPLY ONLY WHEN W CLASS DURABILITY CONCRETE IS REQUIRED
 - MINIMUM CONCRETE COVER TO REINFORCEMENT : 40mm.
 - SURFACE FINISHES: (EXPOSED FACES)
 - CLASS F3 - STEEL SHUTTER FINISH.
 - CLASS U3 - STEEL TROWEL FINISH.
 - CURING
PARAPETS ARE TO BE CURED BY EITHER METHOD (d), (e) OR (f) OF COLTO CLAUSE 6409, AS AGREED WITH ENGINEER.
- GENERAL
 - INSPECTION EYES TO BE PROVIDED AT DISTANCES NOT EXCEEDING 50m.
 - *T = 60mm MIN (20mm LEVELLING COURSE + 40mm ASPHALT)
OR 100mm MAX (20mm LEVELLING COURSE + 2x40mm ASPHALT)

FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name :			
Prof. Reg. No. :			
Date :			
SANRAL PROJECT MANAGER			
Name :			
Prof. Reg. No. :			
Date :			
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE
48 Tambotie Avenue
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PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000



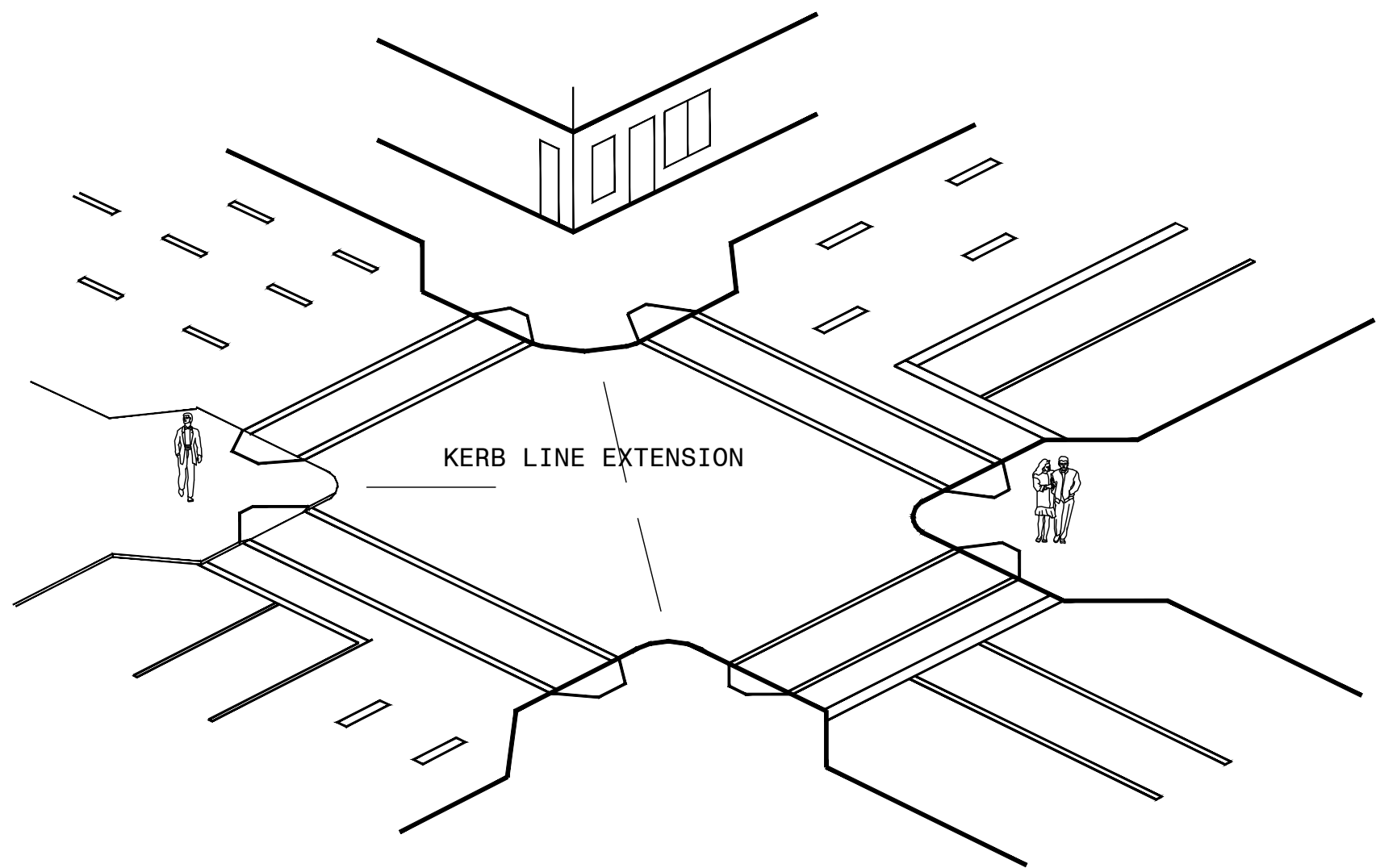
EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
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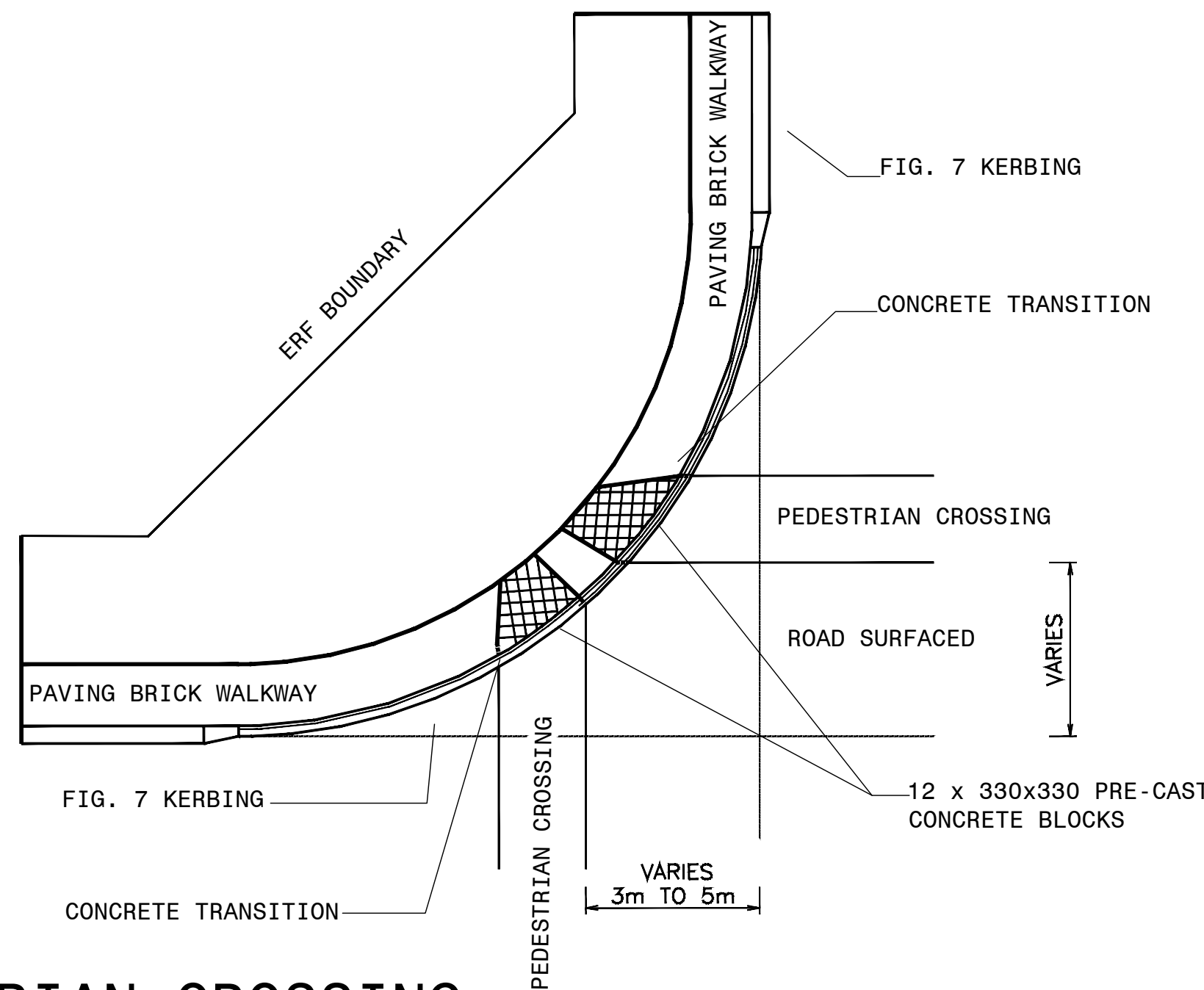
PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 TYPICAL DETAILS: F-SHAPE PARAPET ELECTRIFIED RAILWAY LINES - 1,64m HIGH: TYPE A & B	
SCALE :	AS SHOWN

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-011	
SANRAL DOCUMENT #		VER	
		V1	

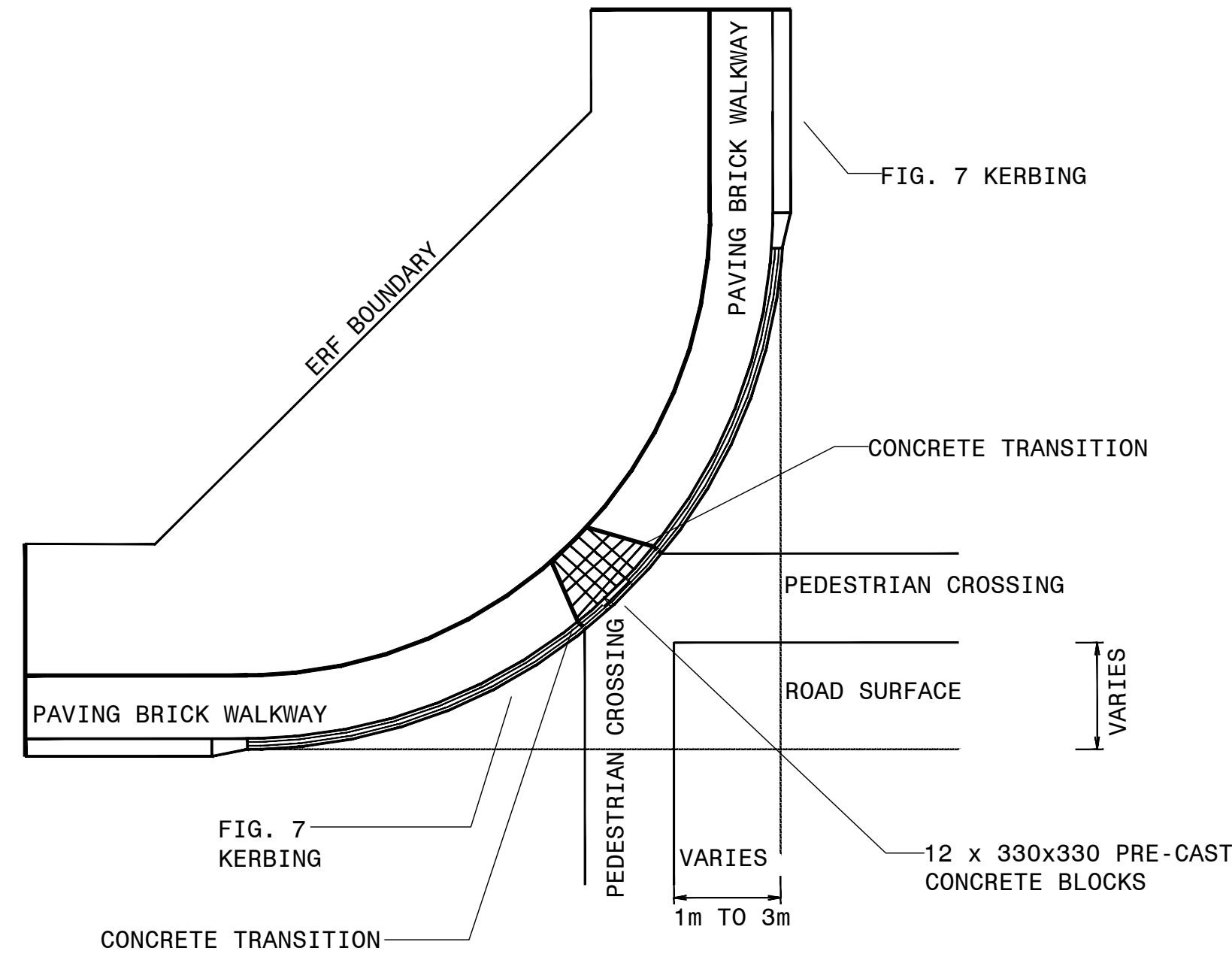
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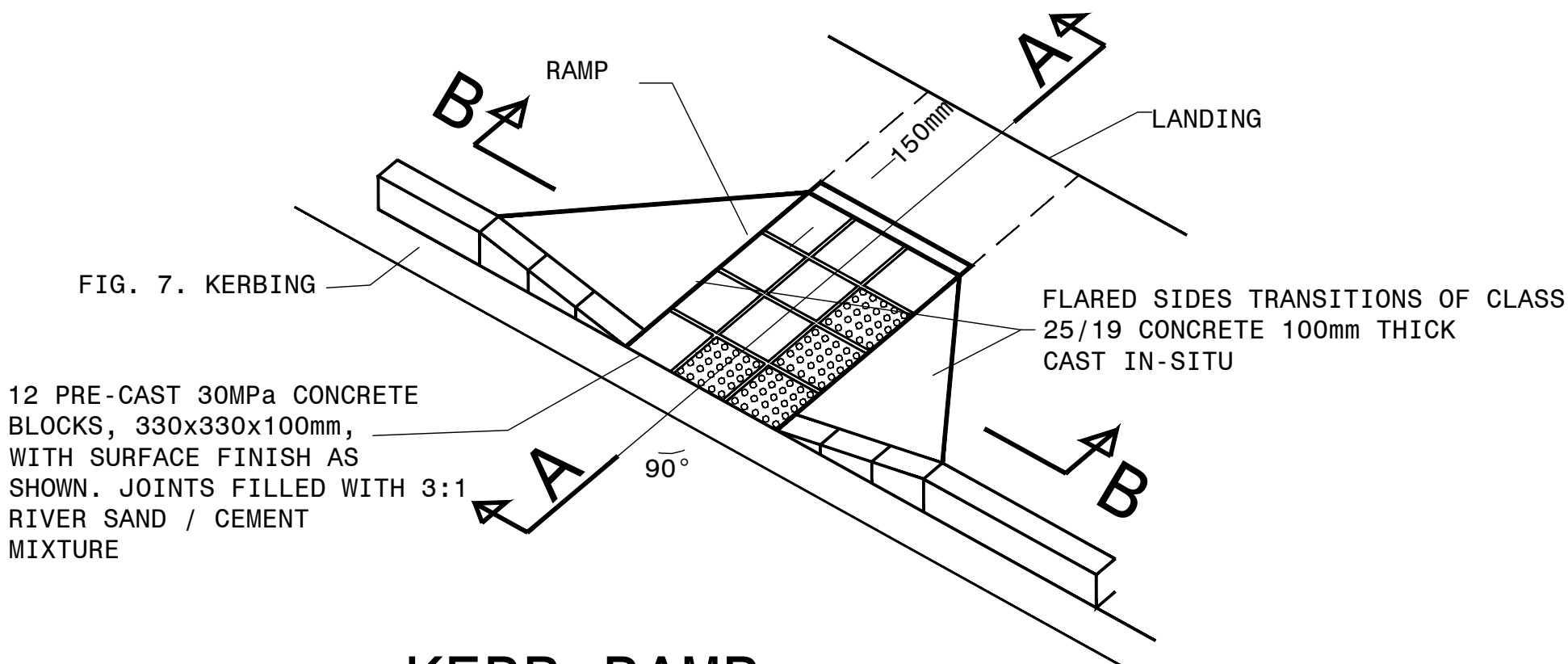
PEDESTRIAN RAMP AT STREET CROSSINGS



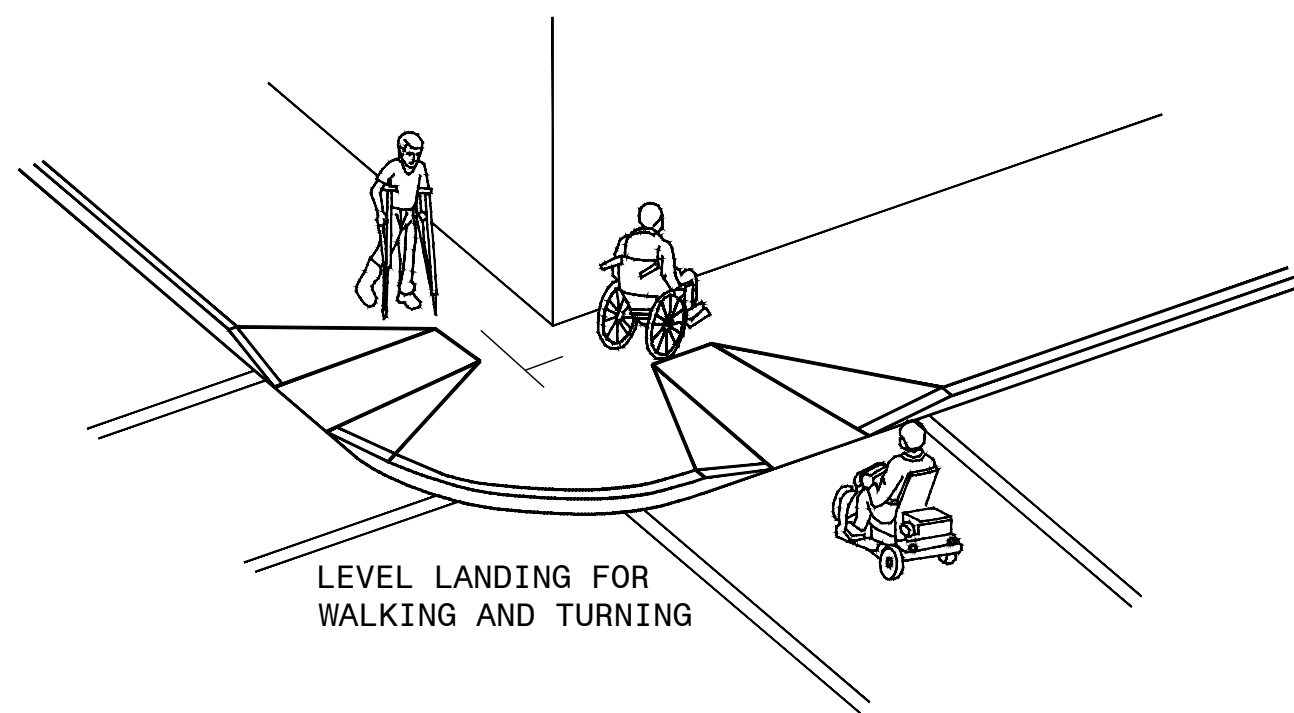
TYPE A PEDESTRIAN CROSSING



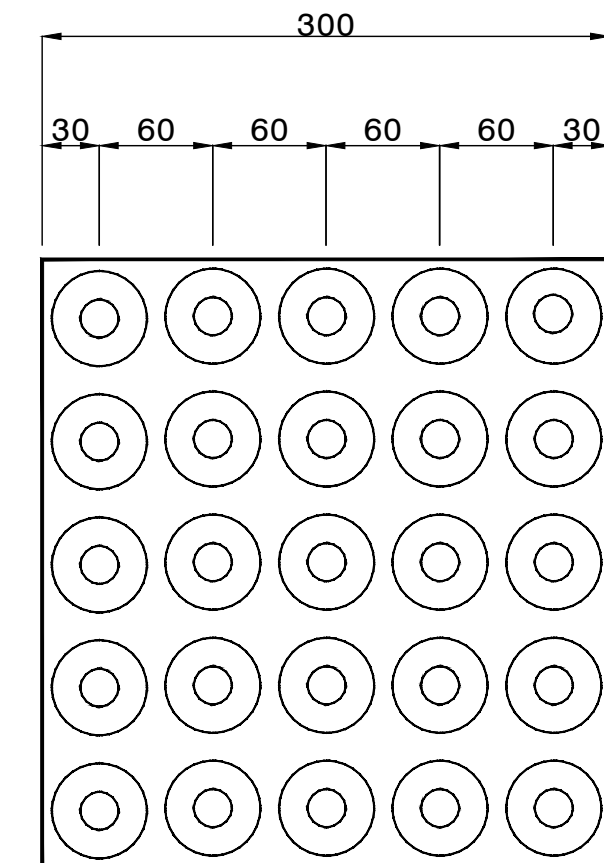
TYPE B PEDESTRIAN CROSSING



KERB RAMP - ISOMETRIC VIEW

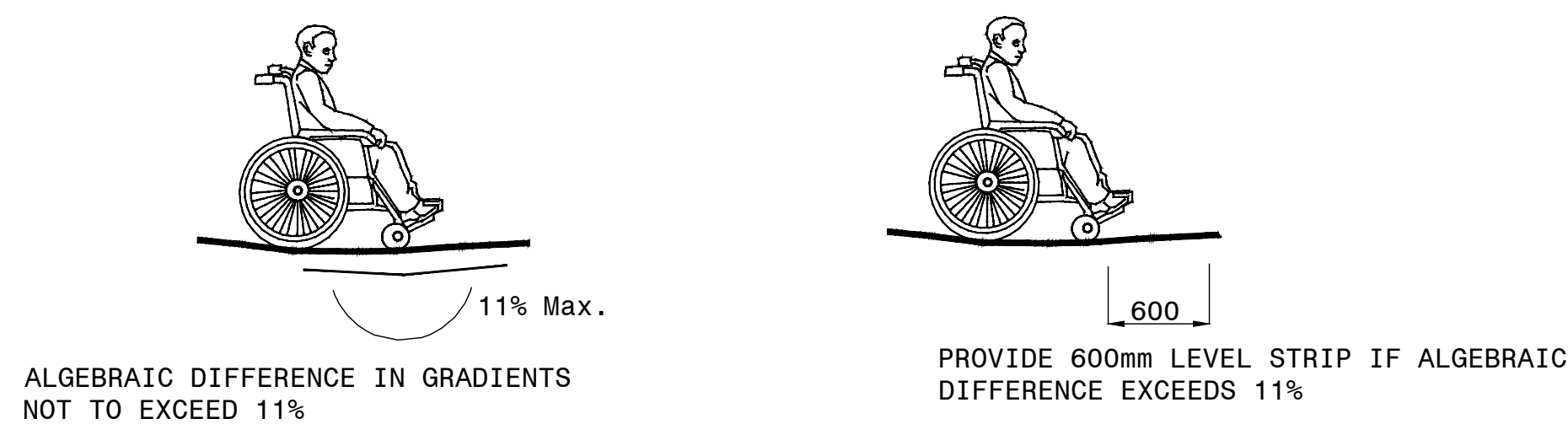


THE NEED FOR A LANDING AT A KERB RAMP

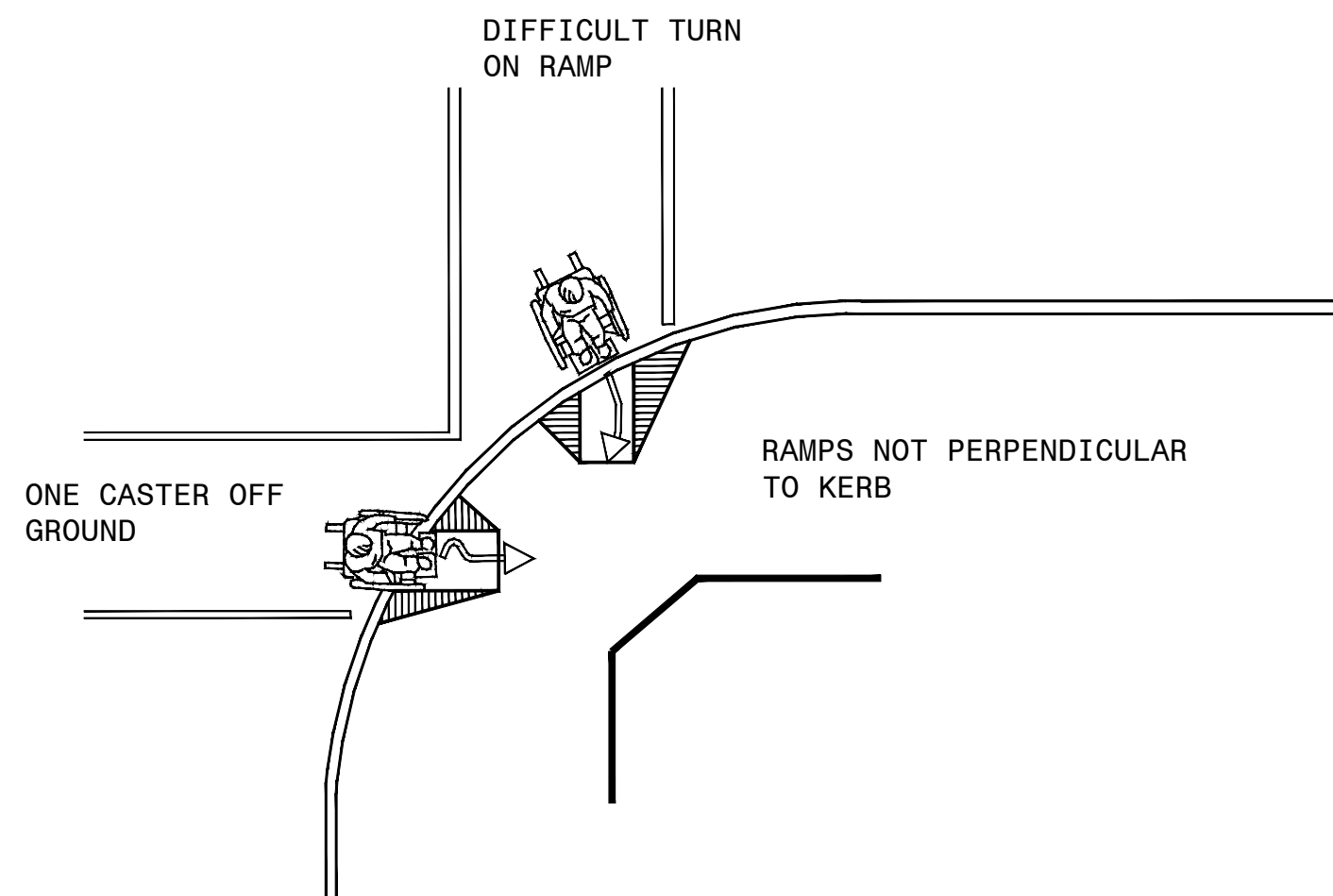


DOMES SPACING

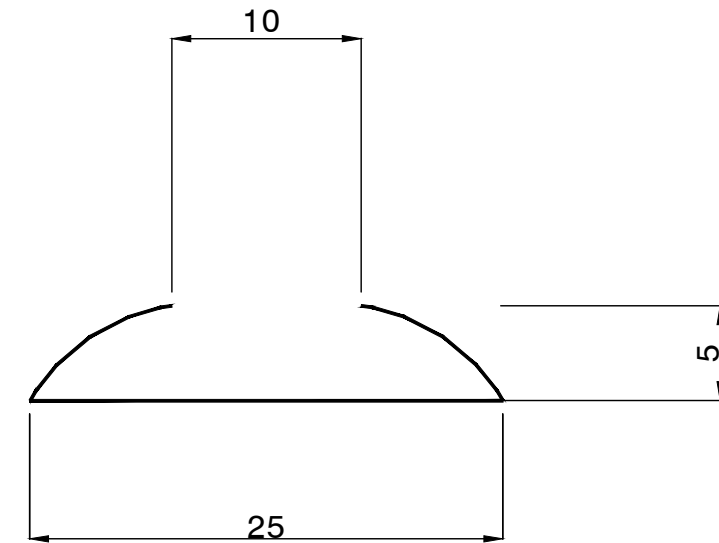
NOTE :
IT IS THE TOP DIAMETER OF THE DOME THAT IS IMPORTANT IN ENSURING DETECTION THROUGH SHOES.



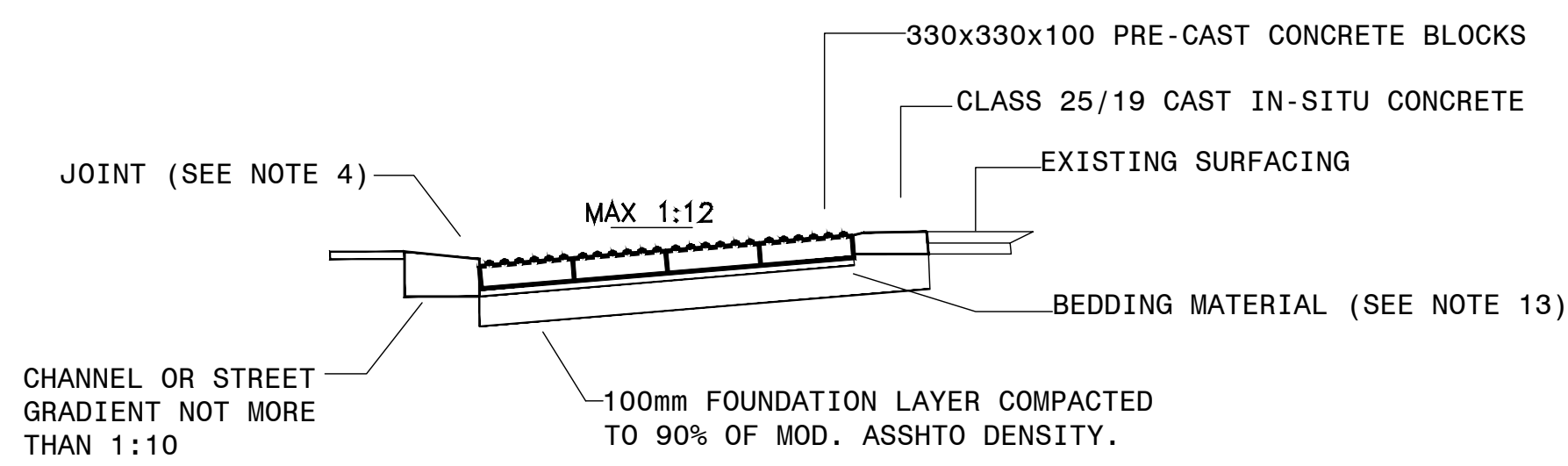
KERB RAMPS



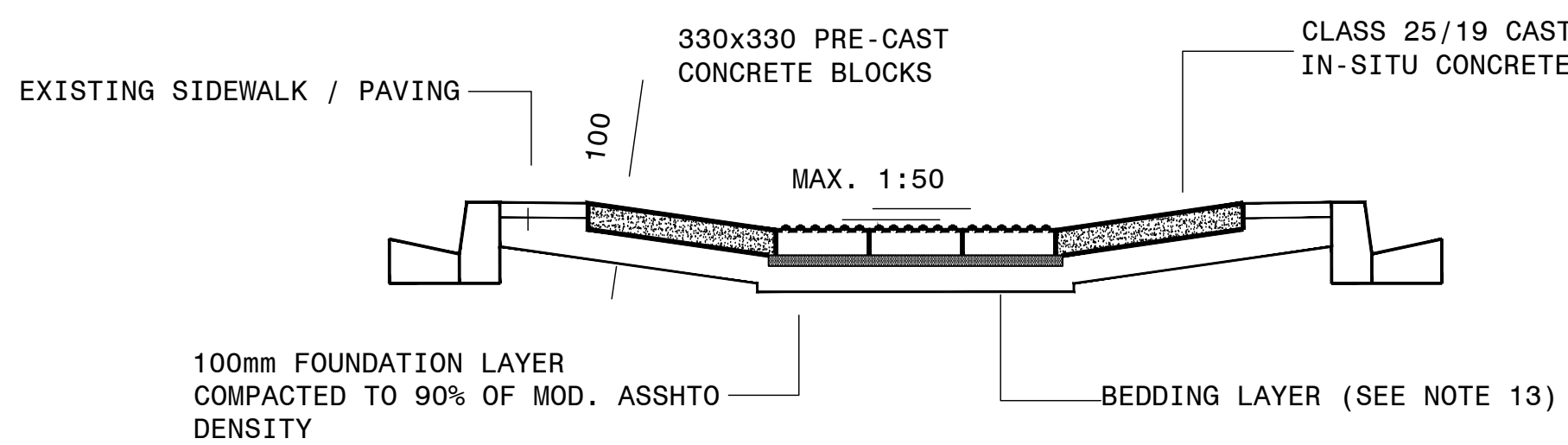
PROBLEMS WITH KERB RAMPS THAT ARE NOT PERPENDICULAR TO THE KERB



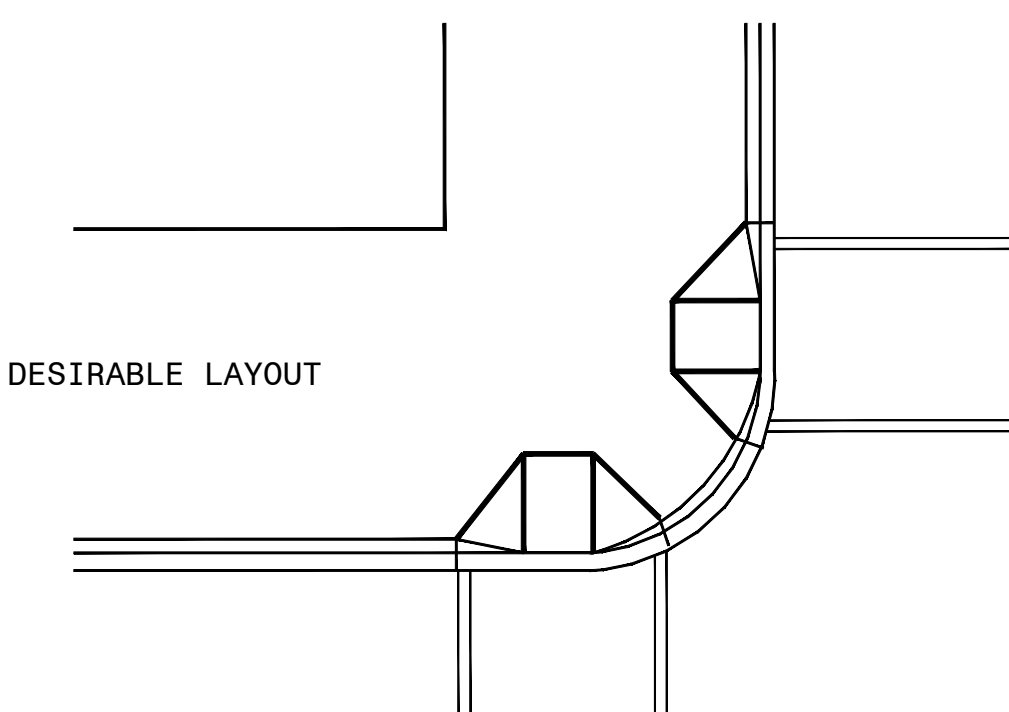
DOMES SECTION PEDESTRIAN RAMP DETECTABLE WARNING



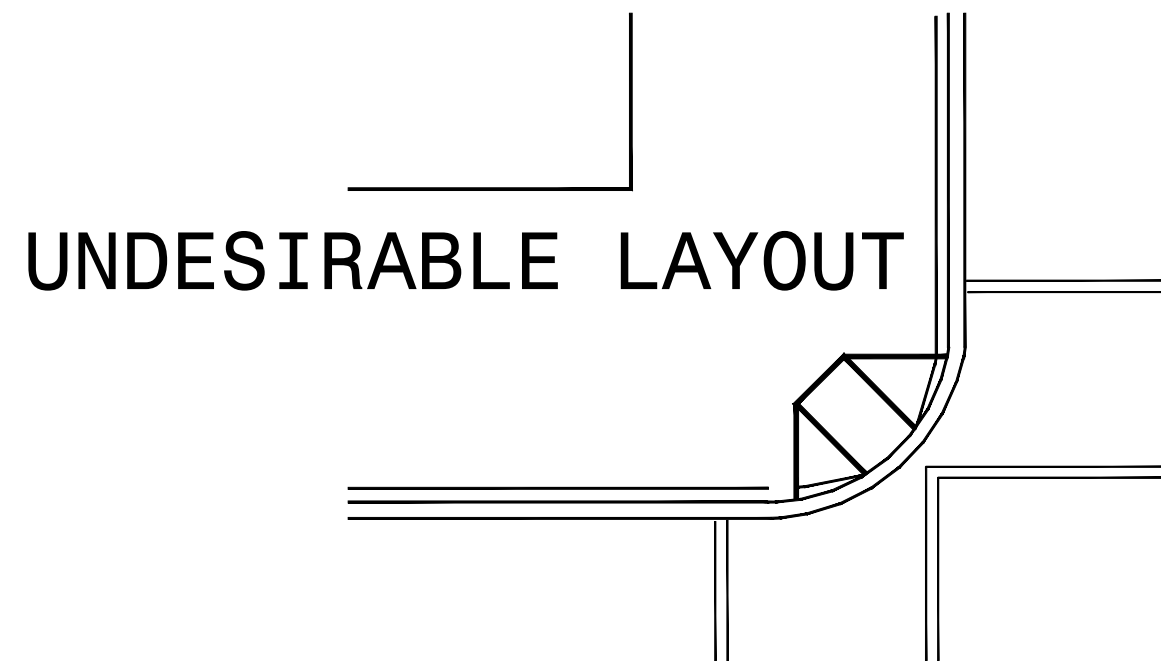
SECTION A-A



SECTION B-B



DOUBLE PEDESTRIAN KERB RAMP AT JUNCTION CORNER (DESIRABLE DESIGN)



SINGLE PEDESTRIAN KERB RAMP AT JUNCTION CORNER (UNDESIRABLE DESIGN)

NOTES AND SPECIFICATIONS

SPECIFICATIONS OF PEDESTRIAN RAMPS AT STREET CROSSINGS

PEDESTRIAN RAMPS SHALL BE WITH 30 MPa PRECAST CONCRETE BLOCKS, 330mm x 330mm x 100mm WITH SURFACE FINISH AS SPECIFIED, CONSTRUCTED AND THE TRANSITION SECTIONS SHALL BE CAST IN-SITU CLASS 25/19 CONCRETE, 100mm THICK.

- THE PRECAST CONCRETE BLOCKS SHALL BE PLACED WITH JOINTS NOT SMALLER THAN 5mm OR EXCEEDING 10mm.
- THE JOINTS SHALL BE FILLED WITH A MORTAR CONSISTING OF ONE PART CEMENT AND THREE PARTS APPROVED SAND, MEASURED PER VOLUME.
- THE JOINT BETWEEN THE KERB'S CAST IN-SITU CHANNEL (EXISTING OR NEW) AND THE CONCRETE BLOCKS SHALL BE FILLED WITH A 3:1 RIVER SAND/CEMENT MORTAR. WHERE THIS JOINT EXCEEDS 25mm, IN WIDTH CLASS 25/19 IN-SITU CONCRETE MUST BE USED FOR FILLING.
- RAMPS SHALL NOT BE REQUIRED AT SLOPING KERBS.
- RAMPS SHALL BE BUILT AT THE INTERSECTION OF THE EXTENDED KERB LINES. EXCEPTIONS TO ACCOMMODATE ROAD SIDE FURNITURE, SUCH AS TRAFFIC LIGHTS, POWER LINES, ETC. MUST BE APPROVED BY THE ENGINEER.
- THE SLOPE OF THE RAMP SHALL NOT EXCEED 1:12. OTHERWISE, THE RAMP MUST BE EXTENDED.
- THE CROSS FALL OF THE KERB'S CAST IN-SITU CHANNEL AT THE RAMP SHALL NOT EXCEED 1:10 OTHERWISE THE CHANNEL AND THE KERB SHALL BE RECONSTRUCTED OVER A MINIMUM LENGTH OF 3 METERS. CARE MUST BE TAKEN TO PREVENT POSSIBLE DRAINAGE PROBLEMS.
- THE CROSS FALL OF THE RAMP SHALL NOT EXCEED 1:50.
- IF NECESSARY, THE PAVING ADJACENT TO THE RAMP AND TRANSITION SECTIONS SHALL BE ADJUSTED TO AVOID SEVERE CHANGES IN GRADE BETWEEN THE PAVING AND THE TRANSITION SECTIONS.
- ALL IN-SITU CONCRETE SHALL BE CURED FOR AT LEAST 12 HOURS.
- THE FOUNDATION LAYER SHALL CONSIST OF A 100mm LAYER OF IN-SITU MATERIAL FINISHED TO THE REQUIRED GRADE AND LEVEL. THE FOUNDATION LAYER SHALL BE COMPACTED TO AT LEAST 90% OF THE MODIFIED AASHTO DENSITY.
- THE BEDDING MATERIAL UNDER THE CONCRETE BLOCKS, SHALL CONSIST OF A 6:1 RIVER SAND/CEMENT MIXTURE.
- EXISTING PAVING MUST BE CUT IN STRAIGHT LINES, FOLLOWING AN APPROVED METHOD.

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	..		
Prof. Reg. No.	..		
Date	..		
SANRAL PROJECT MANAGER			
Name	..		
Prof. Reg. No.	..		
Date	..		
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	..		
Prof. Reg. No.	..		
Date	..		
SANRAL PROJECT MANAGER			
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V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY  BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100
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ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD. Date: ..

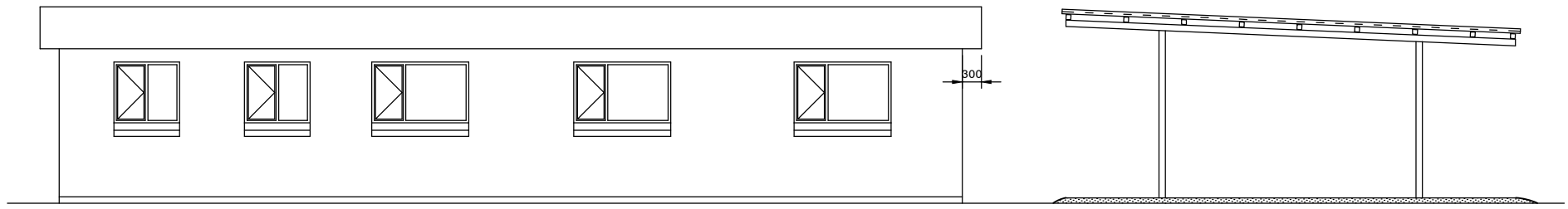
PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
TYPICAL DETAILS: TYPICAL STANDARD DETAILS PEDESTRIAN RAMPS FOR THE DISABLED	
SCALE : AS SHOWN	SHEET 1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	ROADS - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-08-012		
SANRAL DOCUMENT #			V1

FOR TENDER PURPOSES

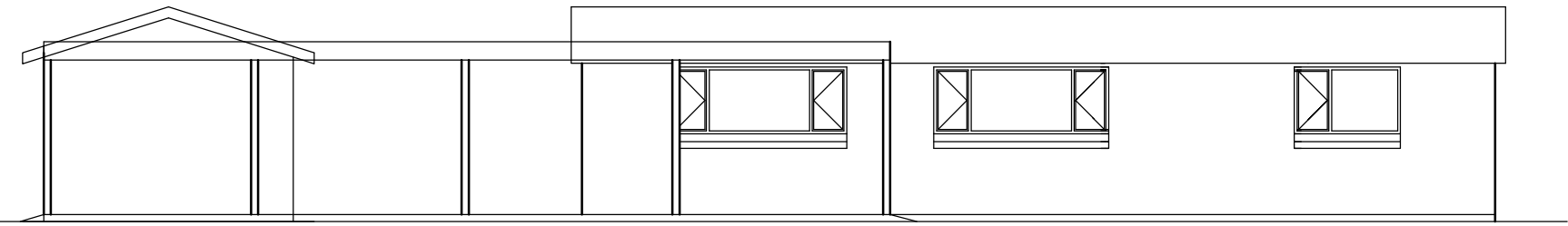
DRAWING No. TP1802-19-05-25-08-012

TYPICAL LAYOUT OF OFFICES AND LABORATORY UNITS



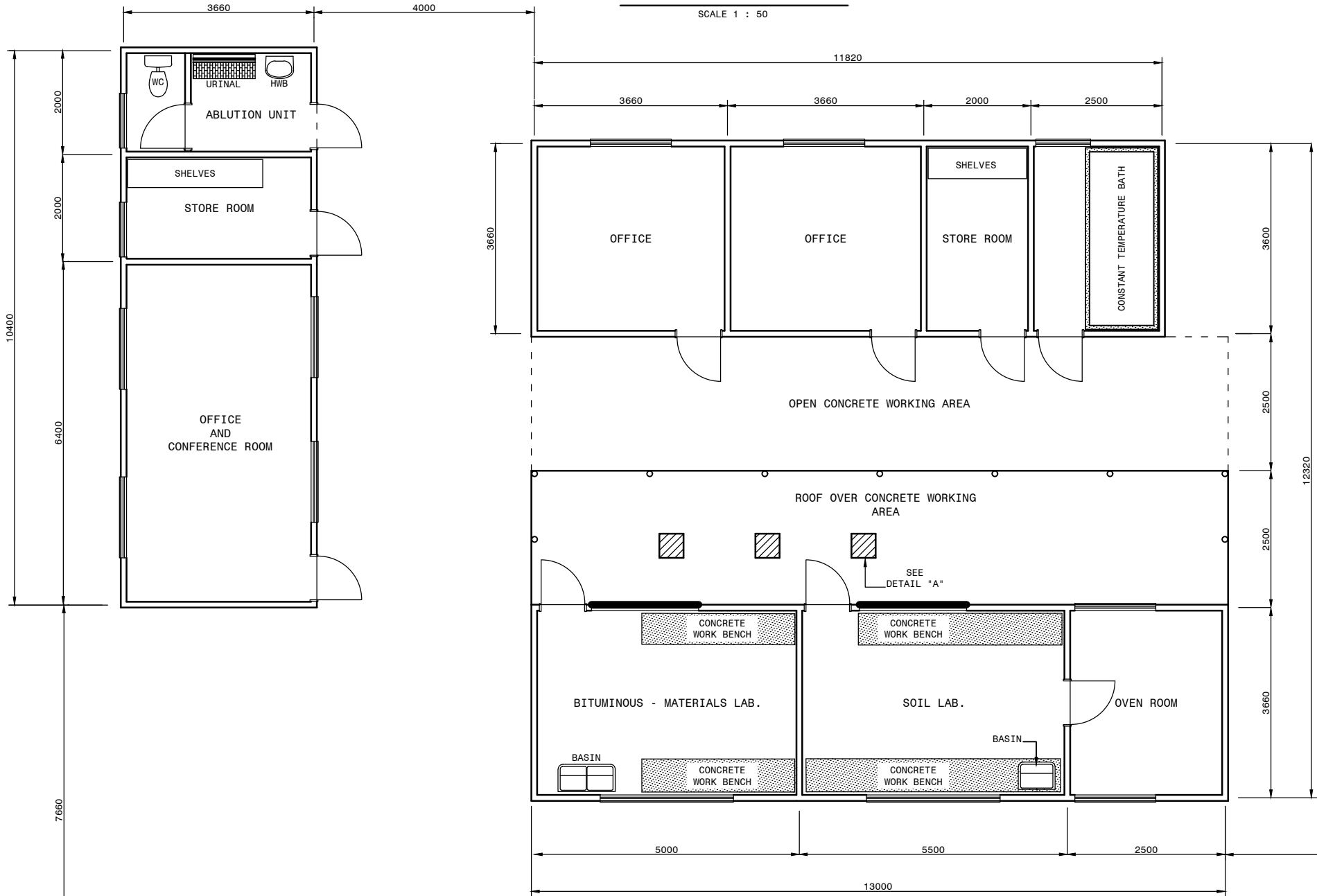
NORTH ELEVATION

SCALE 1 : 50



WEST ELEVATION

SCALE 1 : 50



PLAN

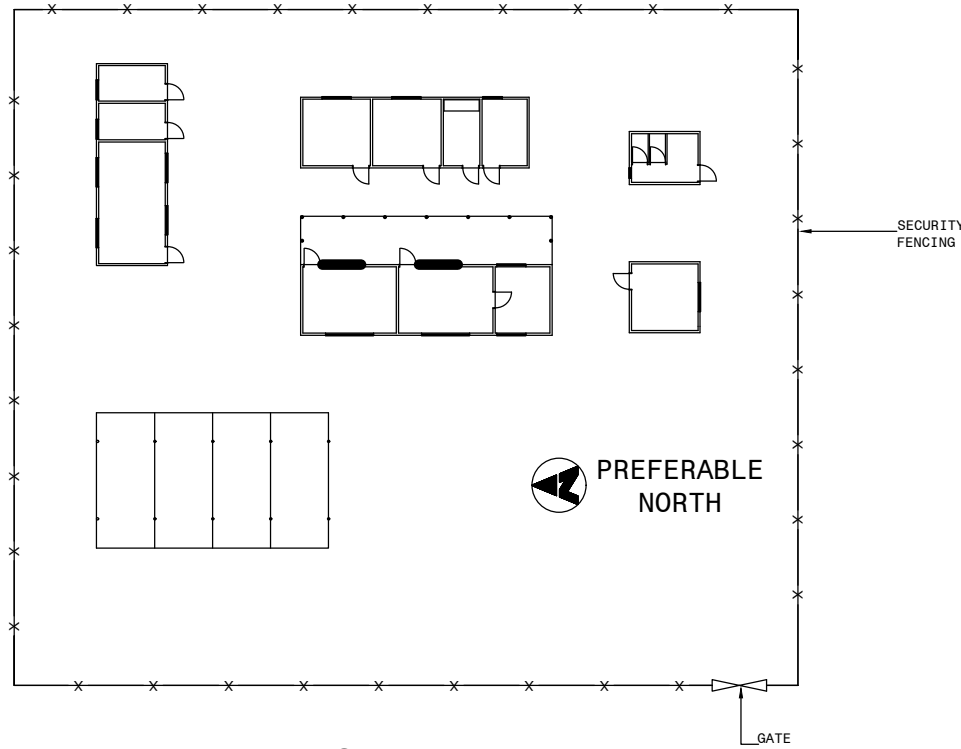
SCALE 1 : 50

NOTE :

THE LAYOUT OF THE OFFICE AND LABORATORY UNITS IS ONLY A PROPOSAL AND IS SUBJECT TO ALTERNATIVES PROPOSED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

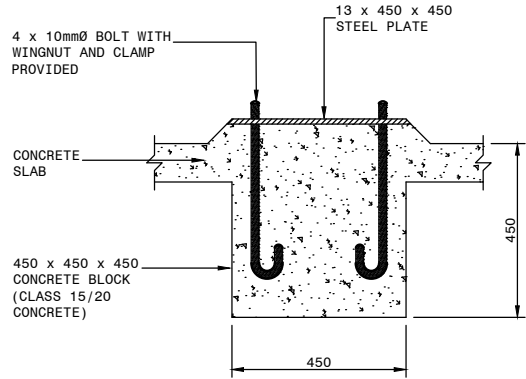


PREFERABLE NORTH



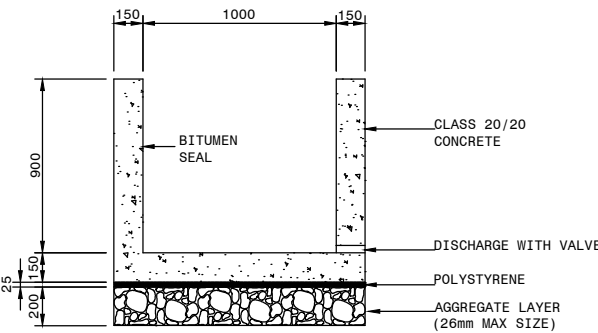
SITE PLAN

SCALE 1 : 200



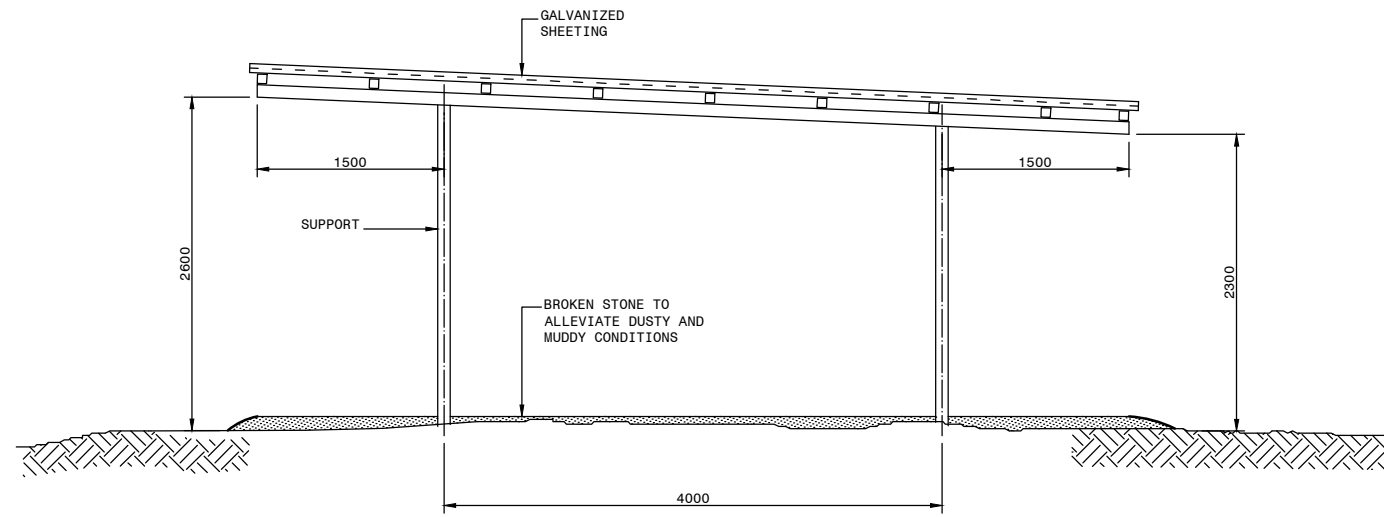
DETAIL "A"

SCALE 1 : 10



DETAIL OF CONCRETE TEMPERATURE BATH

SCALE 1 : 20



SIDE ELEVATION OF CARPORTS

SCALE 1 : 30

PLAN OF CARPORTS

SCALE 1 : 50

No.	DATE	REVISION
V1	SEPT 2023	ORIGINAL VERSION

CONSTRUCTION RECORD
WORKS CONTRACT ENGINEER
Name : S. KASIPERSAD
Prof. Reg. No. : CONSULT. ENG.
Date :
SANRAL PROJECT MANAGER
Name :
Prof. Reg. No. :
Date :

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ACCEPTANCE
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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION
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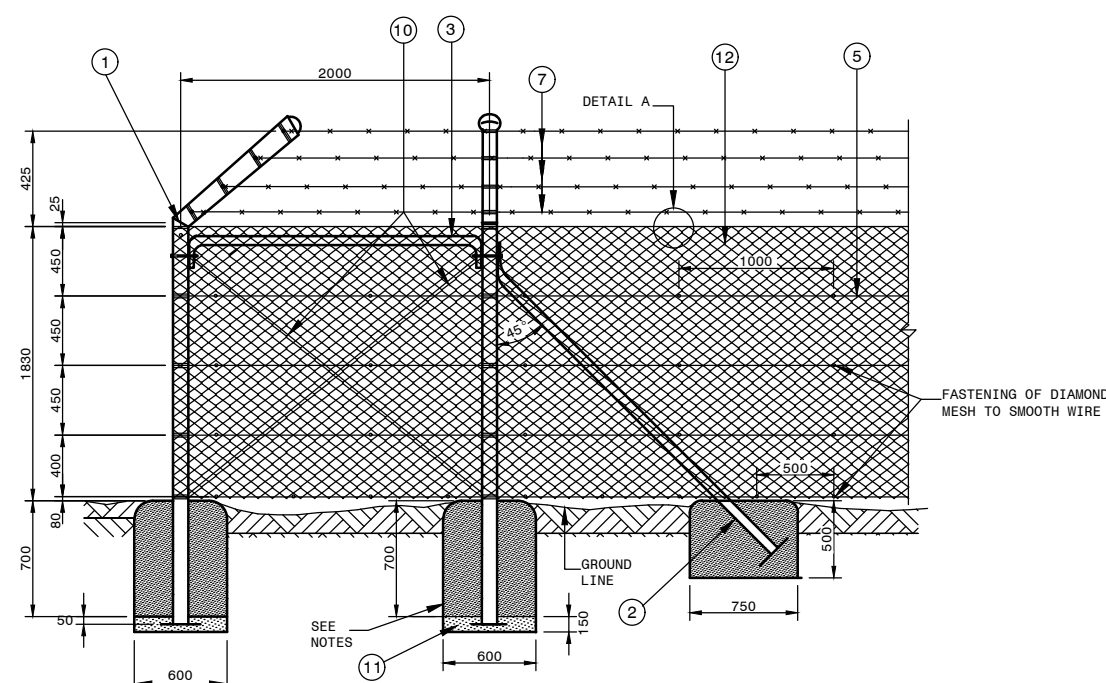
DRAWING DESCRIPTION
TYPICAL LAYOUT OF OFFICES AND LABORATORY UNITS

SCALE : AS SHOWN

PROJECT NUMBER	NRA.C.004-099-2023/1
DRAWING LOCATION DATA	START END
ROUTE	N2 N2
SECTION	22 22
DRAWING km DISTANCE	km 0,80 km 18,64
DRAWING TYPE	ROADS - TYPICALS
BRIDGE/STRUCTURE No.	N/A
CONSULTANT DRAWING No.	TP1802-19-06-25-08-013
SANRAL DOCUMENT #	VER V1

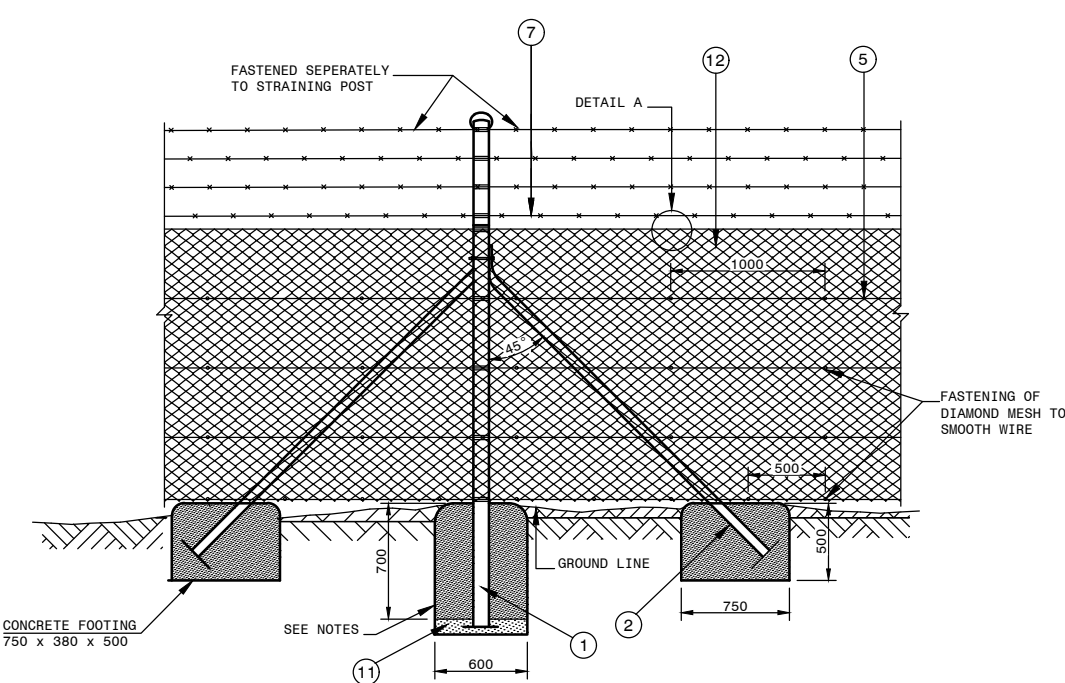
FOR TENDER PURPOSES

SECURITY FENCING AT OFFICES AND LABORATORIES



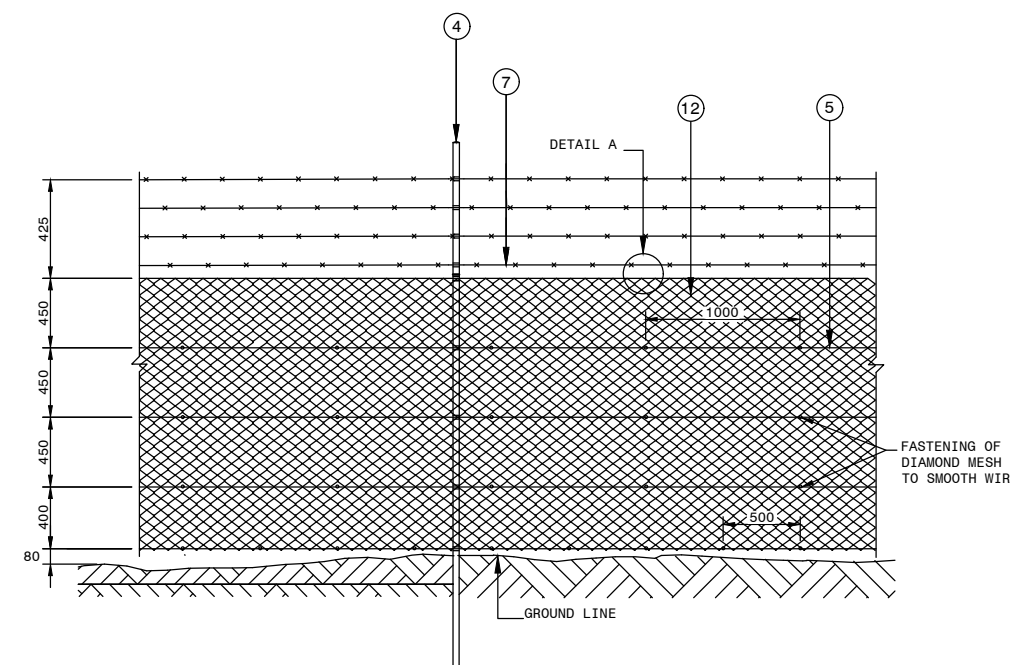
CORNER POST

SCALE 1 : 25



STRAINING POST

SCALE 1 : 25



STANDARD

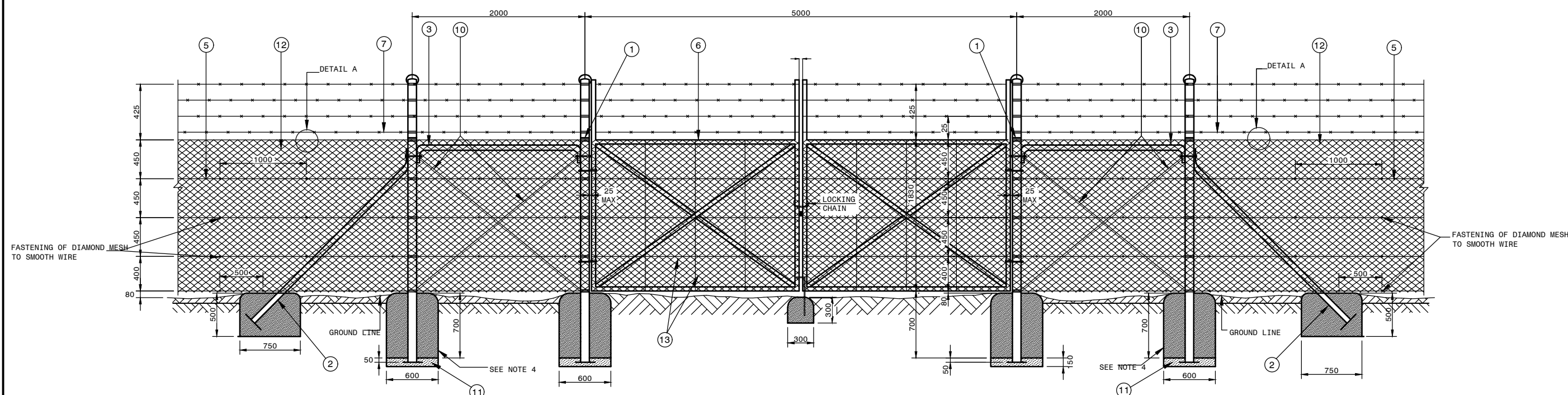
SCALE 1 : 25

- A. GENERAL NOTES:

1. ALL TUBULAR POSTS MUST BE FULLY GALVANIZED IN ACCORDANCE WITH SABS 763 FOR CLASS B1 ARTICLES.
2. ROLLED STEEL SECTIONS MUST BE PROTECTED WITH A LAYER OF TAR OR OTHER APPROVED MATERIAL.
3. MAXIMUM SPACING OF SUPPORTS IS AS FOLLOWS:-
STRAINING POSTS = 35m c/c
 = 3,5m c/c
4. ALL VISIBLE CONCRETE EDGES MUST BE BEVELLED. THE CLASS OF CONCRETE SHALL BE 1:3:3¹⁰
5. ALL TUBULAR POSTS ARE TO BE SEALED BY WELDING A PRESSED MUSHROOM CAP TO THE TOP OF THE POST.

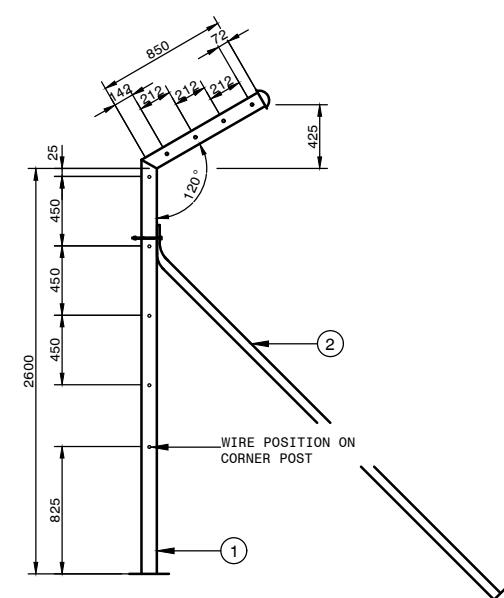
B. DESCRIPTION OF MATERIALS USED:

- ① POSTS: 2,6m x 101,6mm (TUBULAR STEEL POST, WALL THICKNESS 2,95mm COMPLETE WITH PRESSED MUSHROOM TOP AND BASE PLATE.
- ② STAY: 2,7m x 60mm (WITH BASE PLATE.
- ③ SUPPORT: 2,4m x 60mm (BENT AND FLATTENED AS SHOWN.
STANDARD: 2,45m x 2,5kg/m "Y" SECTION.
- ④ SMOOTH WIRE: 2,24 (HIGH TENSILE GRADE, FULLY GALVANIZED.
- ⑤ GATE: GOVERNMENT PATTERN FARM GATE FULLY GALVANIZED AND MANUFACTURED FROM 48,24mm (x 2,95 STEEL TUBING INCLUDING HINGES, WASHERS BOLTS AND LOCKING CHAIN ATTACHED TO GATE.
- ⑥ BARBED WIRE: HIGH TENSILE GRADE SINGLE STRAND 3,15mm x 2,50mm OVAL-SHAPED WIRE AND FULLY GALVANIZED.
- ⑦ TYING WIRE: 2,5mm (MILD STEEL FOR FASTENING OF MESH TO POSTS AND STANDARDS.
- ⑧ BOLTS FOR STAYS: 12mm ((MIN.) FULLY GALVANIZED INCLUDING NUTS AND WASHERS.
- ⑨ STRAINING WIRE: 4,0mm (FULLY GALVANIZED.
- ⑩ SELECTED MATERIAL: 150mm THICK WELL COMPACTED NATURAL GRAVEL.
- ⑪ DIAMOND MESH: 2,5mm (WITH 64mm x 64mm OPENINGS.
- ⑫ STRAINING WIRE: 4,0mm (FULLY GALVANIZED.

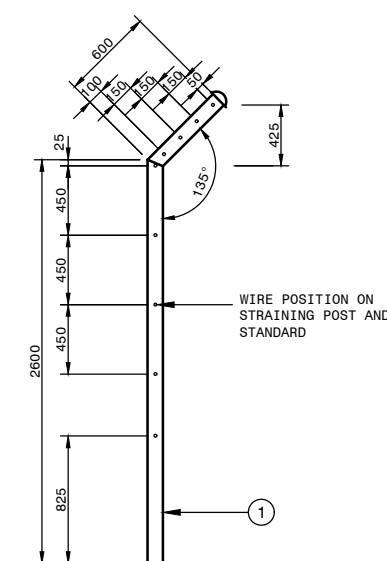


MOTOR GATE

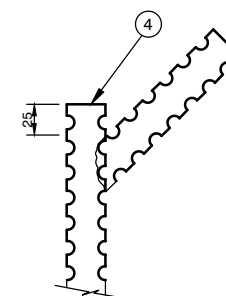
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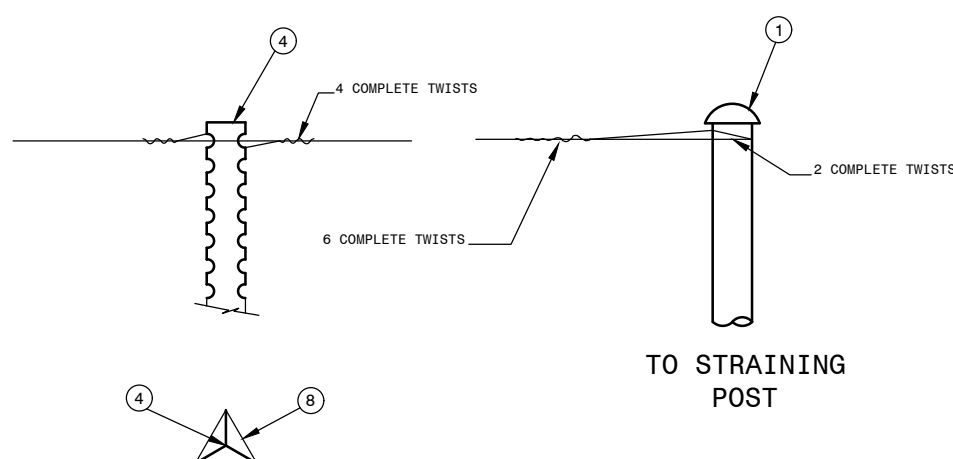
DETAIL OF CORNER POST



DETAIL OF STRAINING POST



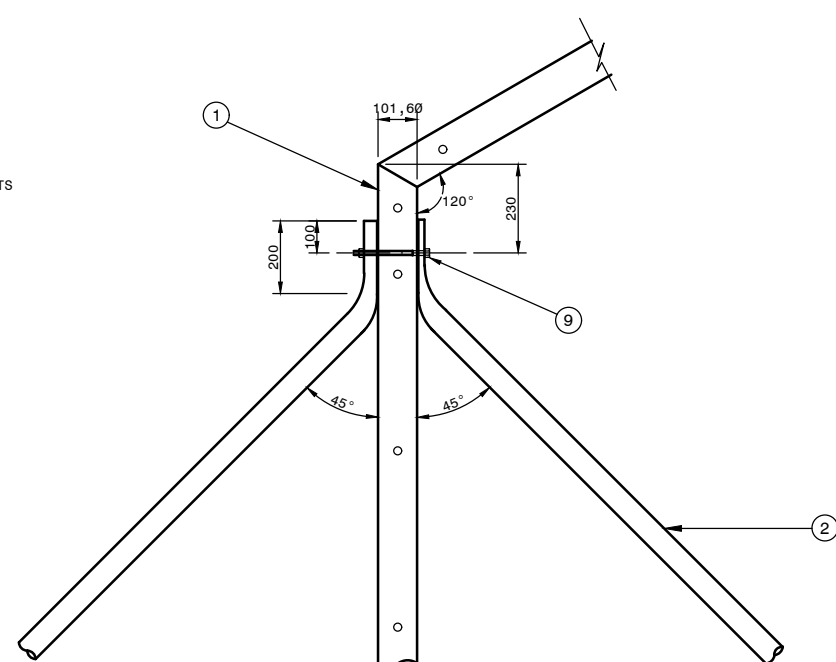
DETAIL OF TOP
OF STANDARD



TO STANDARDS AND DROPPERS

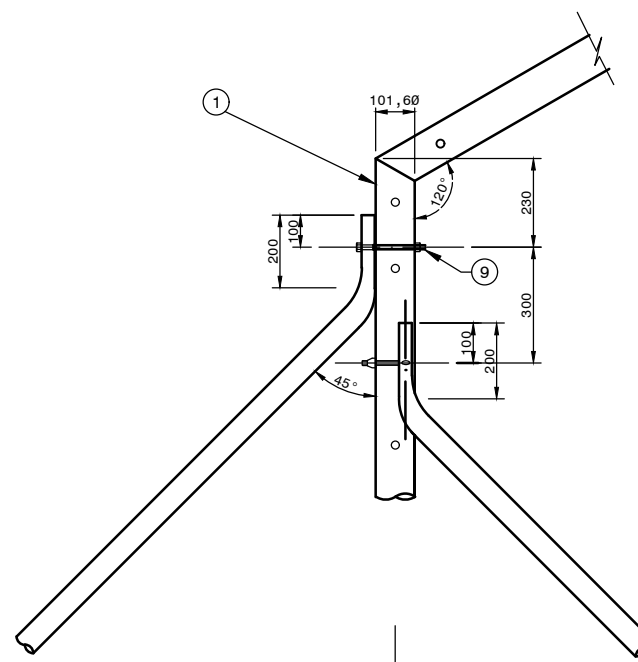
FASTENING OF BARBED - AND SMOOTH WIRE

SCALE 1 : 10

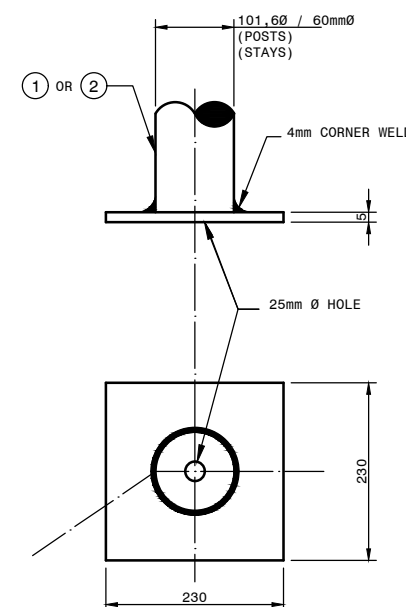


POSITION OF STAYS

SCALE 1 : 10

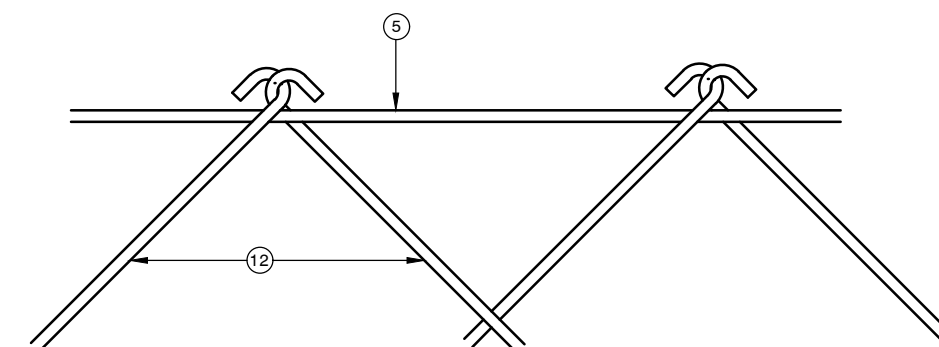


AT CHANGE OF ANGLE AND CORNER



DETAIL OF BASE PLATE

SCALE 1 - 5




DETAIL A

METHOD OF FASTENING TO TOP OF DIAMOND MESH

N T S

FOR TENDER PURPOSES

[illegible]

HEAD OFFICE 48 Tambolie Avenue val of Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	 <p>SANRAL <small>SOUTH AFRICAN NATIONAL ROADS AGENCY LTD</small></p> <p>Building South Africa Through Better Roads</p>	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	<p><u>ACCEPTANCE</u></p> <p>THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWSOEVER ARISING</p> <p>Date: _____</p> <p>for CEO: SA NATIONAL ROADS AGENCY LTD.</p>
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<u>PROJECT DESCRIPTION</u>	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
<u>DRAWING DESCRIPTION</u>	
SECURITY FENCING AT OFFICES AND LABORATORIES	
SCALE	AS SHOWN
SHEET	1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-014	
SAMPLE DOCUMENT #		V1	



REINFORCEMENT NOTES

1. THE REINFORCEMENT DETAILS SHOWN ON THIS DRAWING ARE FOR CONVENTIONAL REINFORCING STEEL BARS TO SANS 1020 - 2005
MILD STEEL: R-BARS : 250MPa
HIGH TENSILE STEEL : Y-BARS : 450MPa
2. REINFORCEMENT DETAILING ACCORDING TO SANS 282 : 2011.
3. MINIMUM CONCRETE COVER TO REINFORCEMENT SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
4. ATTENTION SHALL BE GIVEN TO THE NUMBER AND POSITIONING OF THE COVER BLOCKS TO ENSURE THAT MINIMUM CONCRETE COVER IS MAINTAINED DURING CONCRETING.
5. MINIMUM LAP LENGTH SHALL BE 45 x BAR DIA.
6. REINFORCEMENT SHALL BE INSPECTED BY THE ENGINEER PRIOR TO CASTING OF CONCRETE.
7. ALL REINFORCING TO BE HEAVY DUTY HOT-DIP GALVANISED IN ACCORDANCE WITH SANS 121:2000 AND COTO CLAUSE A13.9.7.1(m) TO A ZINC COAT THICKNESS OF NOT LESS THAN 85 MICROMETRE.
8. ABBREVIATIONS:
AS = AS SHOWN
B1 = LOWEST OF THE BOTTOM LAYERS
B2 = SECOND LOWEST OF THE BOTTOM LAYERS
NF = NEAR FACE
FF = FAR FACE
T1 = HIGHEST OF THE TOP LAYERS
T2 = SECOND HIGHEST OF THE TOP LAYERS

GENERAL NOTES

1. **STRUCTURE DESCRIPTION**
1.1 THIS WALL IS A REINFORCED CONCRETE BARRIER WALL FOUNDED BY MEANS OF STRIP FOOTINGS.

2. **GENERAL**
2.1 THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND LEVELS ON SITE BEFORE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ENGINEER.

2.2 A CLASS F3 SURFACE FINISH IS REQUIRED TO THE EXPOSED FACE OF THE WALL. A CLASS F1 FINISH IS REQUIRED TO THE CONCEALED FACE OF THE WALL AND FOOTING. ALL UNFORMED SURFACES SHALL HAVE A U2 FINISH.

2.3 20x20mm CHAMFERS ON ALL EXPOSED SHARP EDGES UNLESS INDICATED OTHERWISE.

2.4 THE WALL SHALL BE CONSTRUCTED IN ALTERNATE PANELS.

2.5 BACKFILLING OF THE WALL MAY ONLY COMMENCE AFTER THE CONCRETE IN THE WALL HAS ATTAINED A STRENGTH GREATER THAN 23 OF THE SPECIFIED 28 DAY CHARACTERISTIC STRENGTH.

2.6 ALL JOINTS BETWEEN PANELS AND ALL VERTICAL DIMENSIONS SHOWN SHALL BE PERPENDICULAR TO THE ROAD SURFACE IN ALL CASES.

3. **DESIGN CRITERIA**
3.1 THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF TMH 7 PARTS 1 AND 2 (1988 REVISION).

4. **LOAD STATEMENT**
4.1 THIS STRUCTURE IS DESIGNED FOR IMPACT LOADS IN ACCORDANCE WITH THE REQUIREMENTS OF TMH 7 PARTS 1 AND 2 (1988 REVISION) AND TMH 7 PART 3. "THE CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA".

5. **STRUCTURAL ANALYSIS AND PARAMETERS**
5.1 THIS STRUCTURE HAS BEEN DESIGNED USING ELASTIC ANALYSIS AND THE LIMIT STATE APPROACH IN ACCORDANCE WITH THE TMH 7 PART 3 (AS AMENDED).

5.2 THE WALL ANALYSIS WAS PERFORMED USING PROKON SOFTWARE ACCORDING TO THE COULOMB METHOD, AND IN HOUSE SOFTWARE.

5.3 DESIGN CHARACTERISTICS FOR SOIL:
(a) INTERNAL FRICTION ANGLE OF SOIL = 3°
(b) THE WALLS HAVE BEEN DESIGNED AS SHOULDER BREAKPOINT WALLS.
(c) A LINEAR SOIL PRESSURE DISTRIBUTION WAS ASSUMED FOR LATERAL EARTH LOADING.
(d) A LINEAR SOIL PRESSURE DISTRIBUTION WAS ASSUMED FOR THE FOUNDATIONS REACTIONS.

5.4 UNIT WEIGHTS OF MATERIALS:
(a) EARTH FILL = 20 kN/m³
(b) REINFORCED CONCRETE = 25.5 kN/m³

5.5 LOADING:
IMPACT LOADING: 50kN HORIZONTAL LOAD ACTING 700mm ABOVE ROAD LEVEL

6. **DESIGN PARAMETERS FOR MATERIALS**
6.1 YOUNG'S MODULUS FOR CONCRETE (30 MPa) = 28 GPa
6.2 YOUNG'S MODULUS FOR STEEL (REINFORCEMENT) = 200 GPa
6.3 COEFFICIENT OF EXPANSION FOR CONCRETE = 12 x 10⁻⁶ C⁻¹

7. **CHARACTERISTICS STRENGTHS OF MATERIALS**
7.1. FOUNDATIONS:
(a) FOUNDATION MATERIAL - ROAD FILL / BOLDERS
(b) MAXIMUM ALLOWABLE BEARING PRESSURE = 200 kPa (ON ROAD FILL)
(b)(i) MAXIMUM ALLOWABLE BEARING PRESSURE = 300 kPa (ON BOLDERS)

7.2 THE PROMS OF MATERIAL BELOW THE WALL BASE SHALL BE COMPACTED TO 85% MOD AASHTO. WHEN THE BASES ARE NOT FOUND ON ROCK A MASS CONCRETE FOUNDATION WALL SHALL BE CONSTRUCTED TO A MAXIMUM DEPTH OF 1 METER BELOW THE WALL BASE ONTO ROCK.

7.3. CONCRETE CLASSES:

	CHARACTERISTIC STRENGTH	CLASS
SCREED	15	C12/15-20
MASS CONCRETE	20	C18/20-20
FOUNDATIONS	30	C25/30-20
BARRIERS	30	D25/30-20-XC4
ENDBLOCKS	30	D25/30-20-XC4
HANDRAIL MEMBERS	40	C32/40-14

7.4. CURING:
CONCRETE IS TO BE CURED BY EITHER METHOD (a), (i) OR (ii)
OF COTO CLAUSE A13.4.7.1(2)(a). AS AGREED WITH ENGINEER.

HANDRAIL NOTES

- 1. GENERAL**

1.1. ALL BONDED CONNECTIONS SHALL BE MADE WITH RESIN WITH A SHEAR AND BOND STRENGTH GREATER THAN THAT OF THE CONCRETE.
- 1.2. NO SAG WILL BE ALLOWED BETWEEN THE ENDS OF ANY TOP RAIL UNIT. MAXIMUM PERMISSIBLE BOWING WILL BE 2mm PER METER OF TOP RAIL.
- 1.3. POSTS AND TOP RAILS SHALL BE PROPERLY BARED UNTIL THE RESIN USED FOR FIXING HAS SET. CURING TIME SHALL BE VERIFIED BY THE ENGINEER.
- 2. DESIGN AND DETAILING REQUIREMENTS**

2.1. HANDRAIL, DESIGNED FOR 4.5 kN/m² LOADING AS DEFINED IN TM 7.

2.2. DIAMETERS OF HOLES FOR BONDED CONNECTIONS WILL DEPEND ON THE RESIN USED BY THE CONTRACTOR. THE ENGINEER SHALL VERIFY THE REQUIRED HOLE SIZES AND ACCEPTABILITY OF THE PROPOSED RESIN.
- 3. APPROVAL OF INSTALLERS AND MATERIALS**

3.1. THE CONTRACTOR SHALL SUBMIT SAMPLES OF THE HANDRAIL MEMBERS HE INTENDS USING TO THE ENGINEER FOR APPROVAL. SUCH SAMPLES WILL BE KEPT AND USED BY THE ENGINEER AS A COMPARATIVE STANDARD FOR THE MEMBERS ACTUALLY INSTALLED.

3.2. THE ENGINEER MAY ALSO REQUIRE DESTRUCTIVE TESTING OF INDIVIDUAL MEMBERS TO CONFIRM THEIR COMPLIANCE WITH THE SPECIFIED MANUFACTURING PROCEDURES.

3.3. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE ENGINEER WITH PROOF OF COMPETENCE OF THE PROPOSED INSTALLERS OF THE HANDRAILS.
- 4. DESIGN AND DETAILING REQUIREMENTS**

4.1. A RECESS SHALL BE FORMED IN THE KERB OR DECK UNDER THE CONTACT AREA UNDER THE POST BY MEANS OF CORING OR PROVIDING A SLOT. THE SLOT OR CORED HOLES SHALL BE FILLED WITH AN APPROVED REPAIR MORTAR AFTER THE POSTS HAVE BEEN INSTALLED. THIS METHOD MAY BE ELIMINATED ONLY ON THE EXPRESS INSTRUCTION OF THE ENGINEER.

04	BENDING SCHEDULES & MISCELLANEOUS DETAILS	-
03	ENDBLOCK DETAILS 02	-
02	ENDBLOCK DETAILS 01	-
01	GENERAL DETAILS	-
No.	DESCRIPTION	SANRAL DOCUMENT No.
LIST OF DRAWINGS		


[illegible]

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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD



Reg No 1995/005942/01

**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201

PO Box 100410
Scottsville
3209

Tel: (033) 392 8100

ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

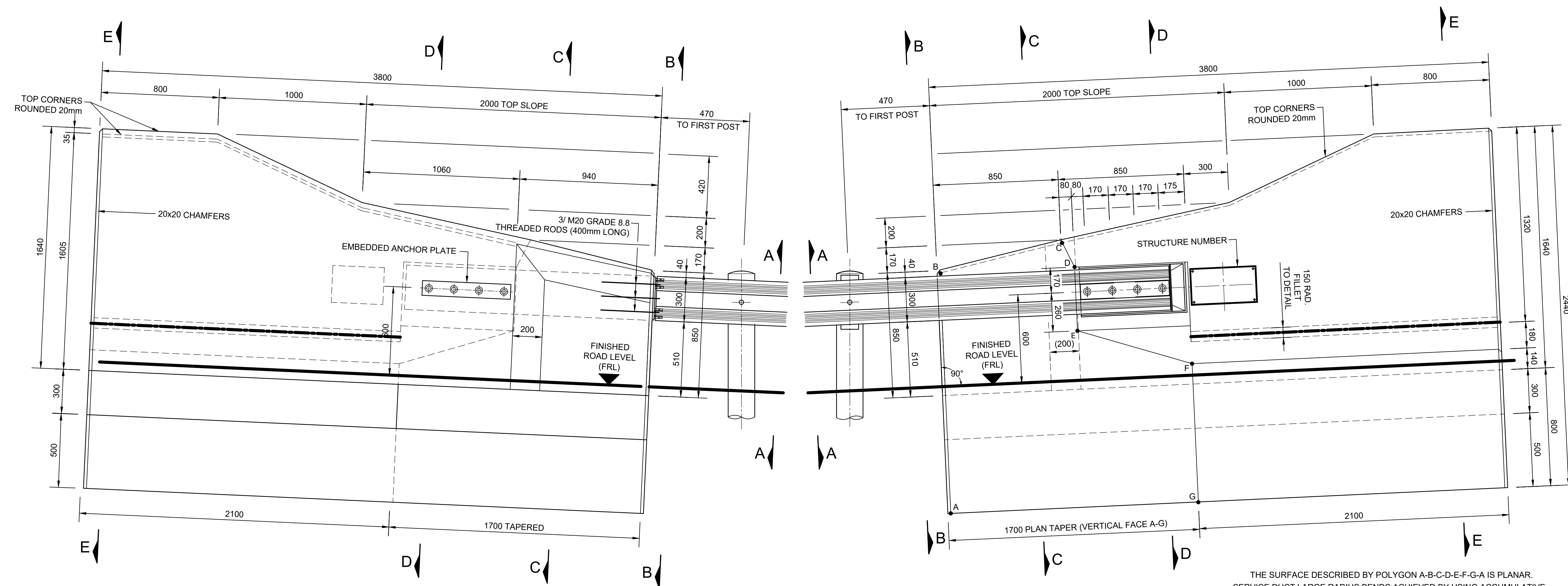
for CEO: SA NATIONAL ROADS AGENCY LTD.

Date: _____

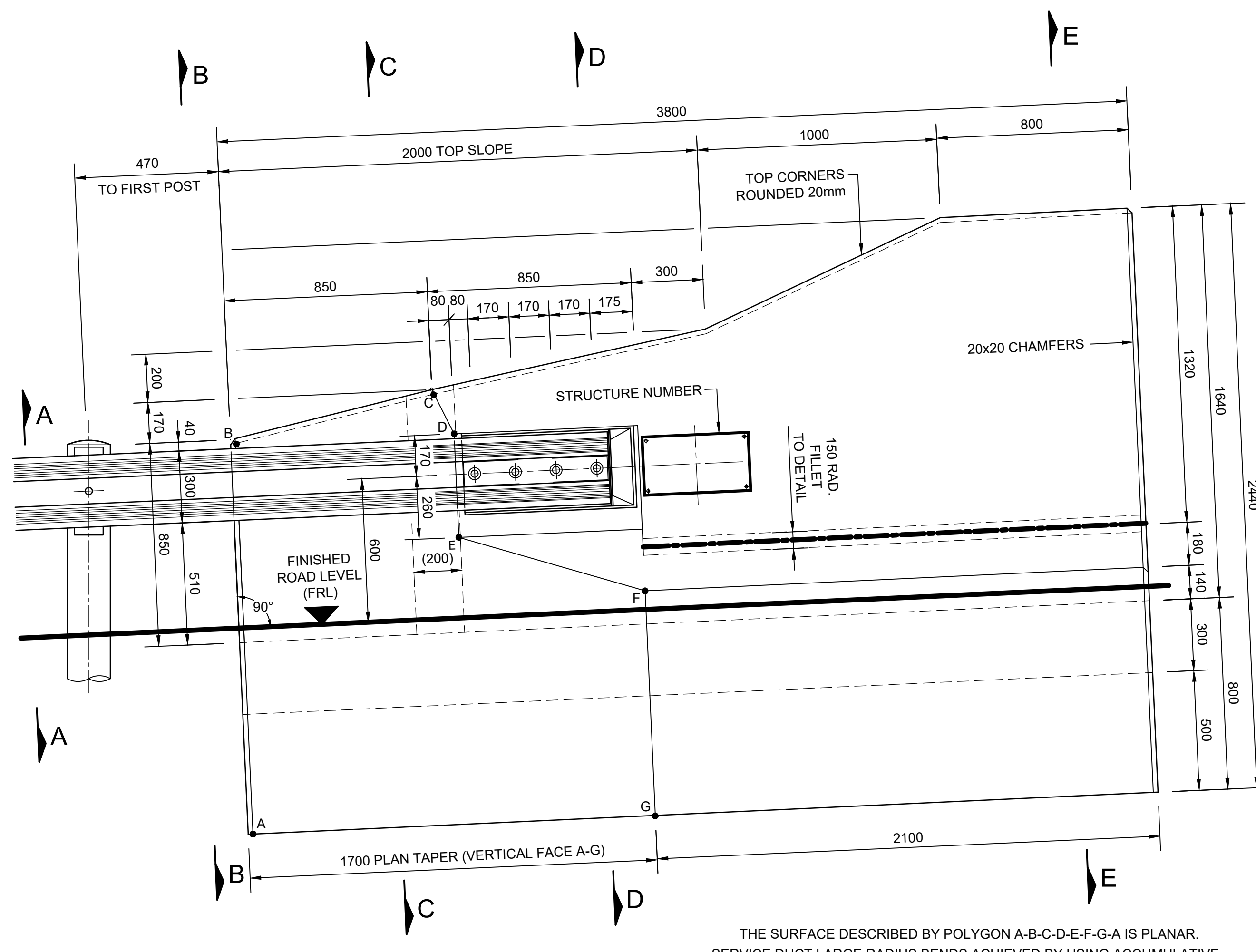
<p align="center"><u>PROJECT DESCRIPTION</u></p> <p align="center">CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)</p>			
<p align="center"><u>DRAWING DESCRIPTION</u></p> <p align="center">NJ RETAINING WALL DETAILS GENERAL DETAILS</p>			
<p>SCALE : AS SHOWN</p>		<p>SHEET 1 OF 4</p>	

PROJECT NUMBER	NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	22	22
DRAWING KM DISTANCE	km 0,80	km 18,64
DRAWING TYPE	ROADS - ANCILLARY WORKS	
BRIDGE/STRUCTURE No.	N/A	
CONSULTANT DRAWING No.	TP1802-19-05-25-08-015	VE
SANRAL DOCUMENT #	-	V1

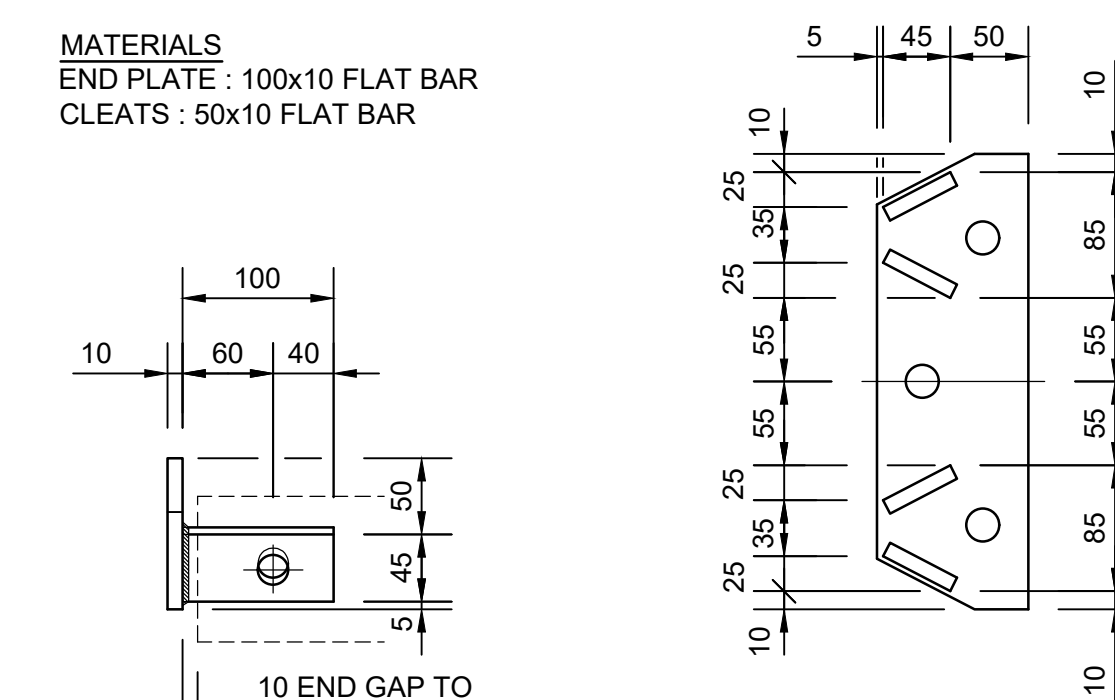
NOTE
REFER TO DETAIL DRAWING TP1802/DD/ST/RW/01 FOR
LIST OF DRAWINGS AND GENERAL DETAIL NOTES.



ENDBLOCK - CONCRETE DETAILS
OUTSIDE ELEVATION
SCALE 1:15

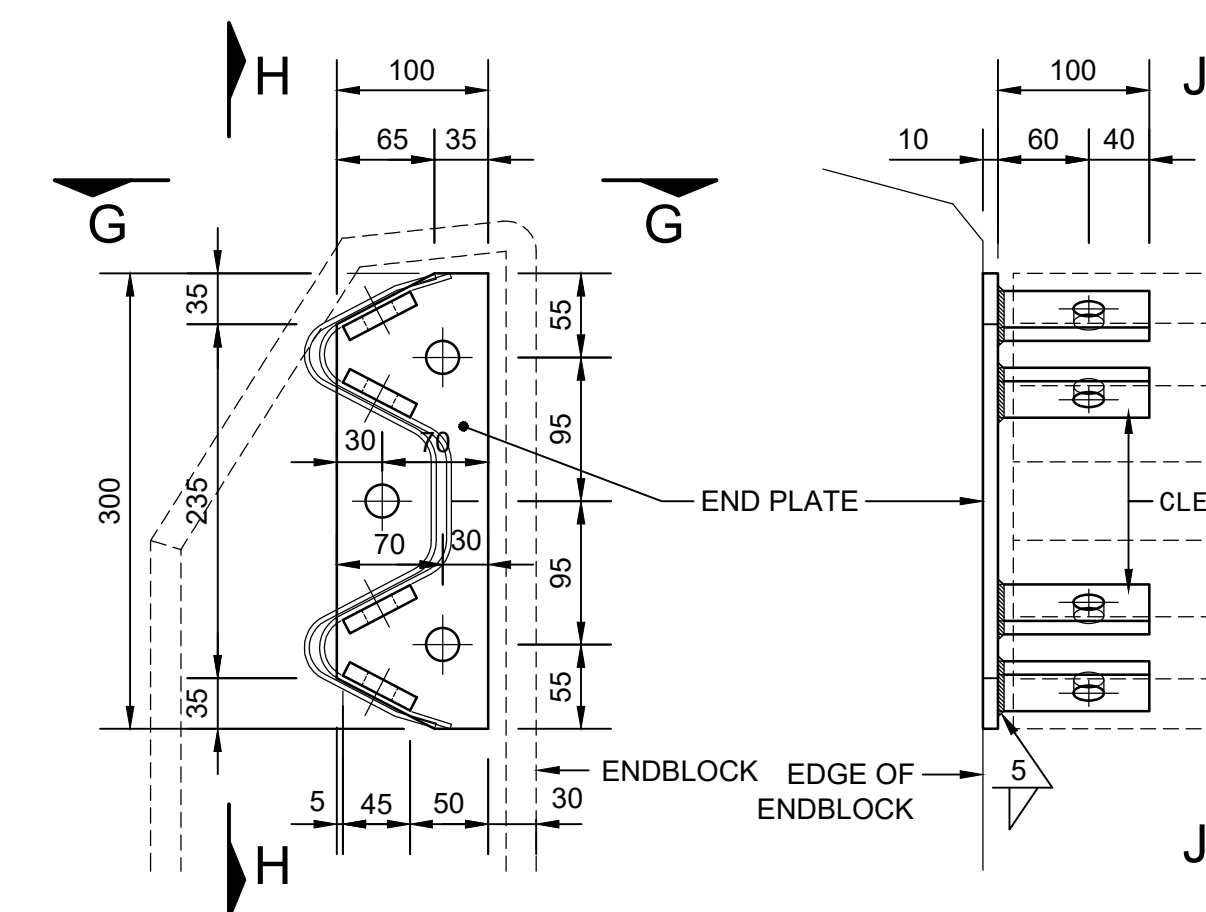


ENDBLOCK - CONCRETE DETAILS
INSIDE ELEVATION
SCALE 1:15



PLAN G - G CLEAT SETTING OUT DETAILS

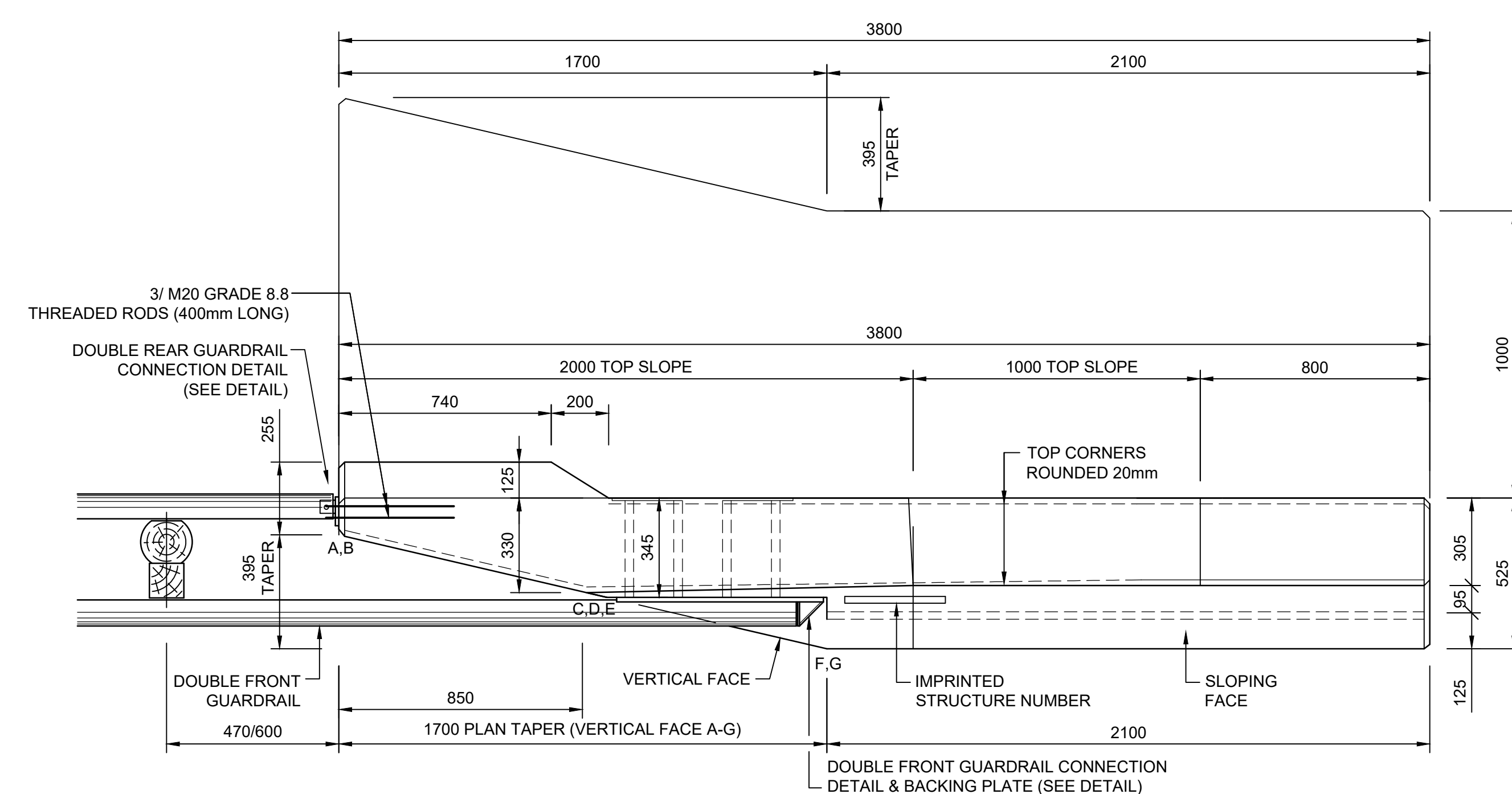
CLEAT SETTING OUT DIMENSIONS ARE PROVISIONAL
AND SHALL BE CONFIRMED WITH THE ACTUAL
GUARDRAIL SECTION TO BE USED



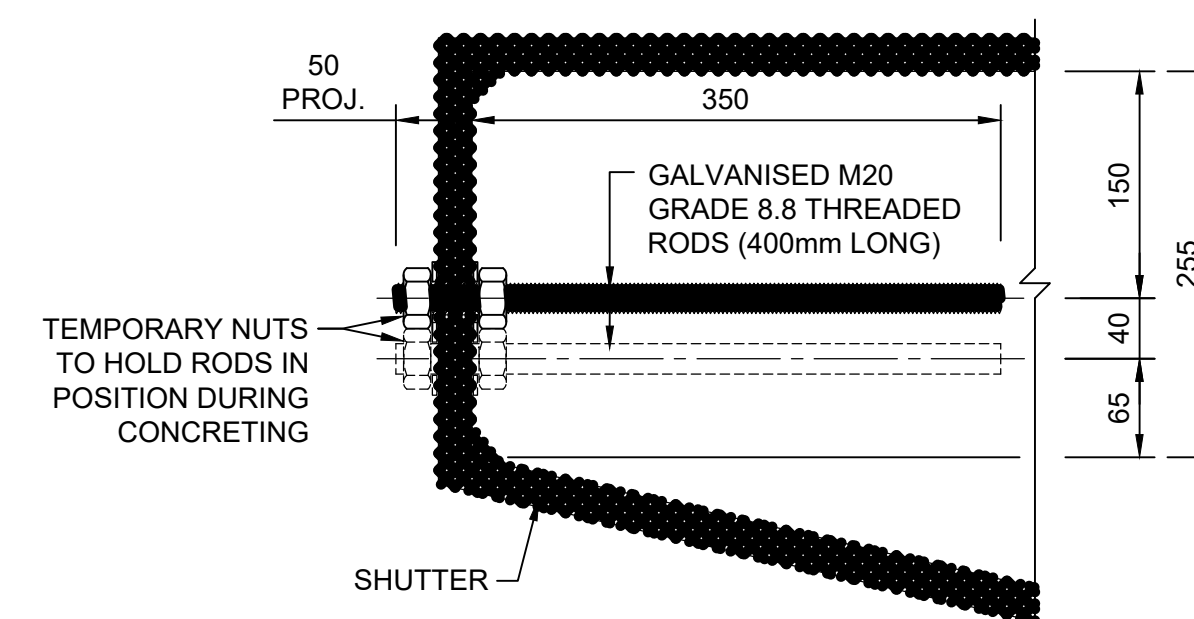
ELEVATION J - J **ELEVATION H - H**
SCALE 1:5 SCALE 1:5

ALL HOLES ARE 22 DIA.
FOR 20 DIA. FIXING
BOLTS AND THREADED ANCHORS

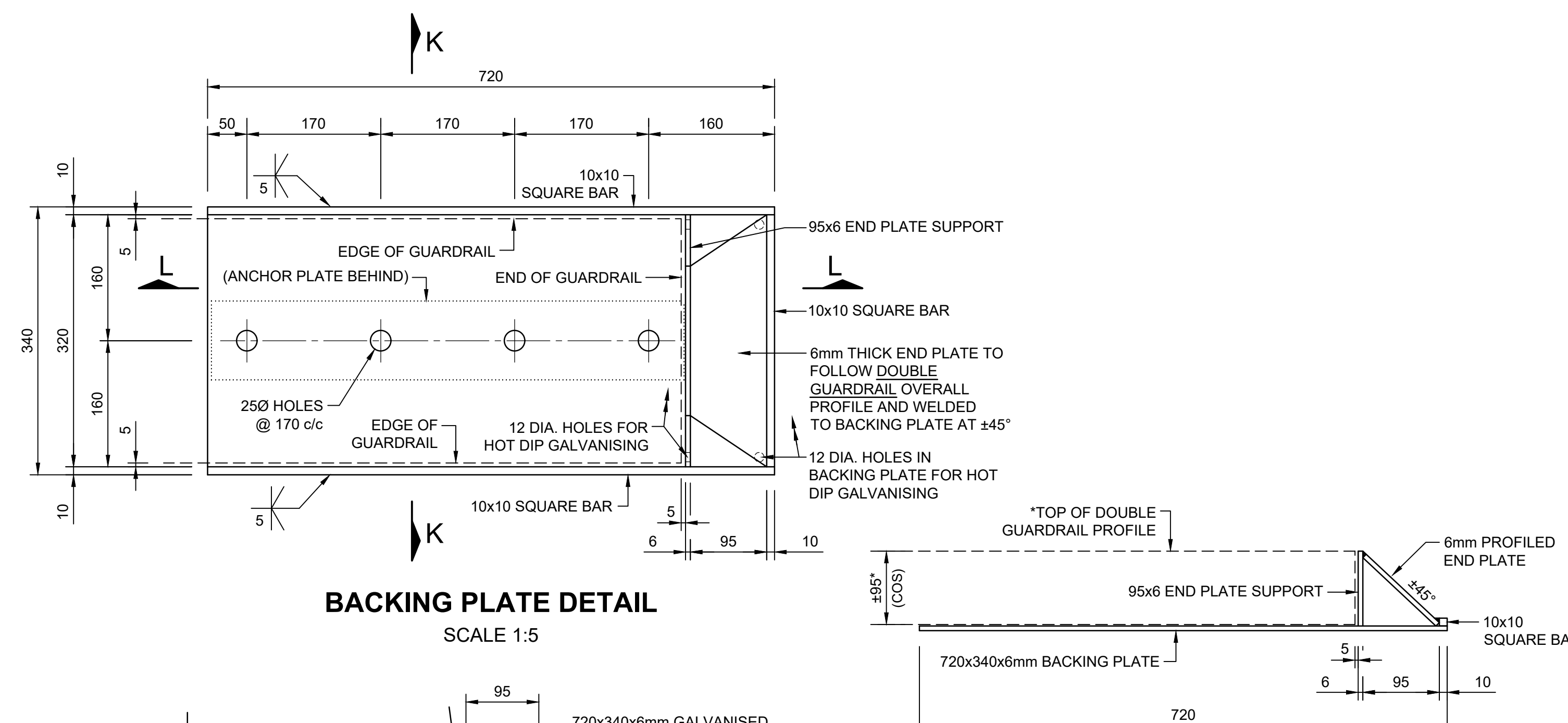
REAR GUARDRAIL TO ENDBLOCK CONNECTION DETAILS



ENDBLOCK - PLAN
SCALE 1:15

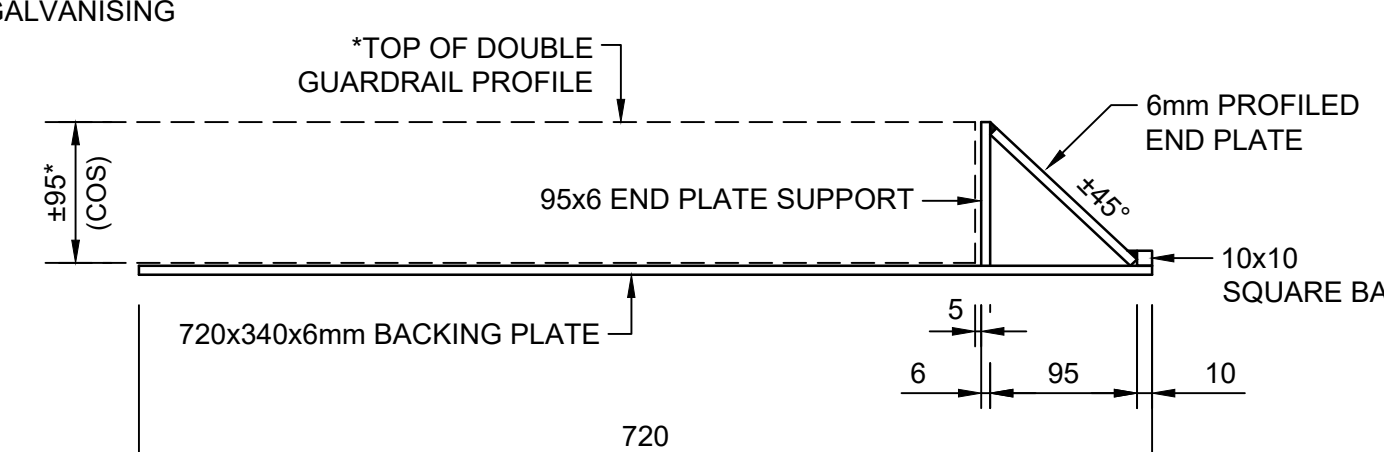


END OF ENDBLOCK - PLAN SECTION
SCALE 1:5

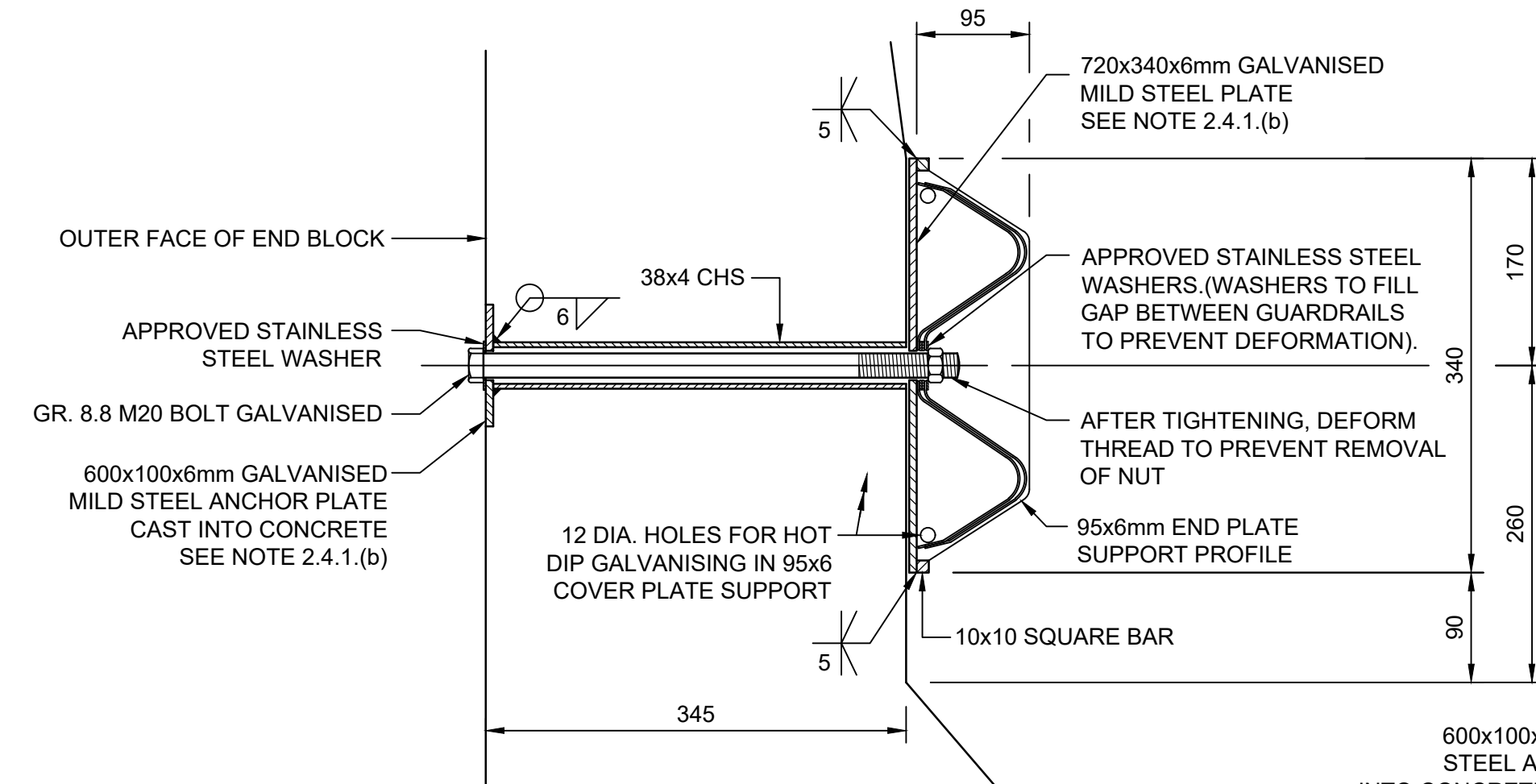


BACKING PLATE DETAIL

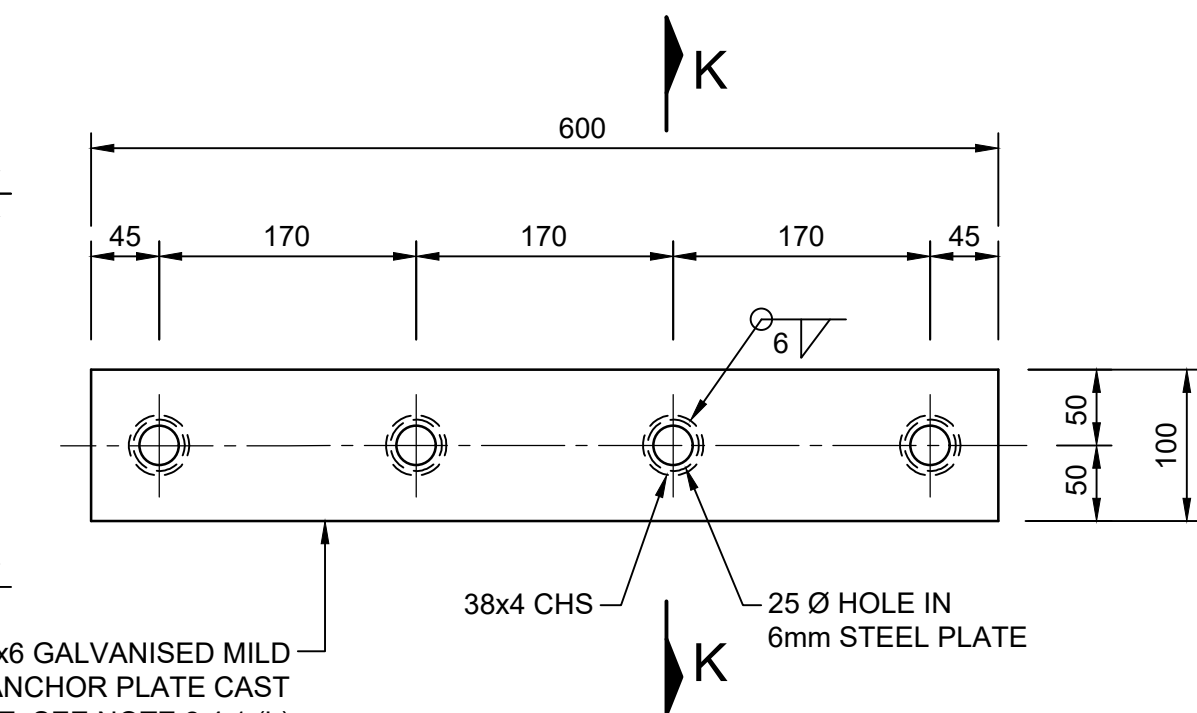
SCALE 1:5



SECTION L - L
SCALE 1:5

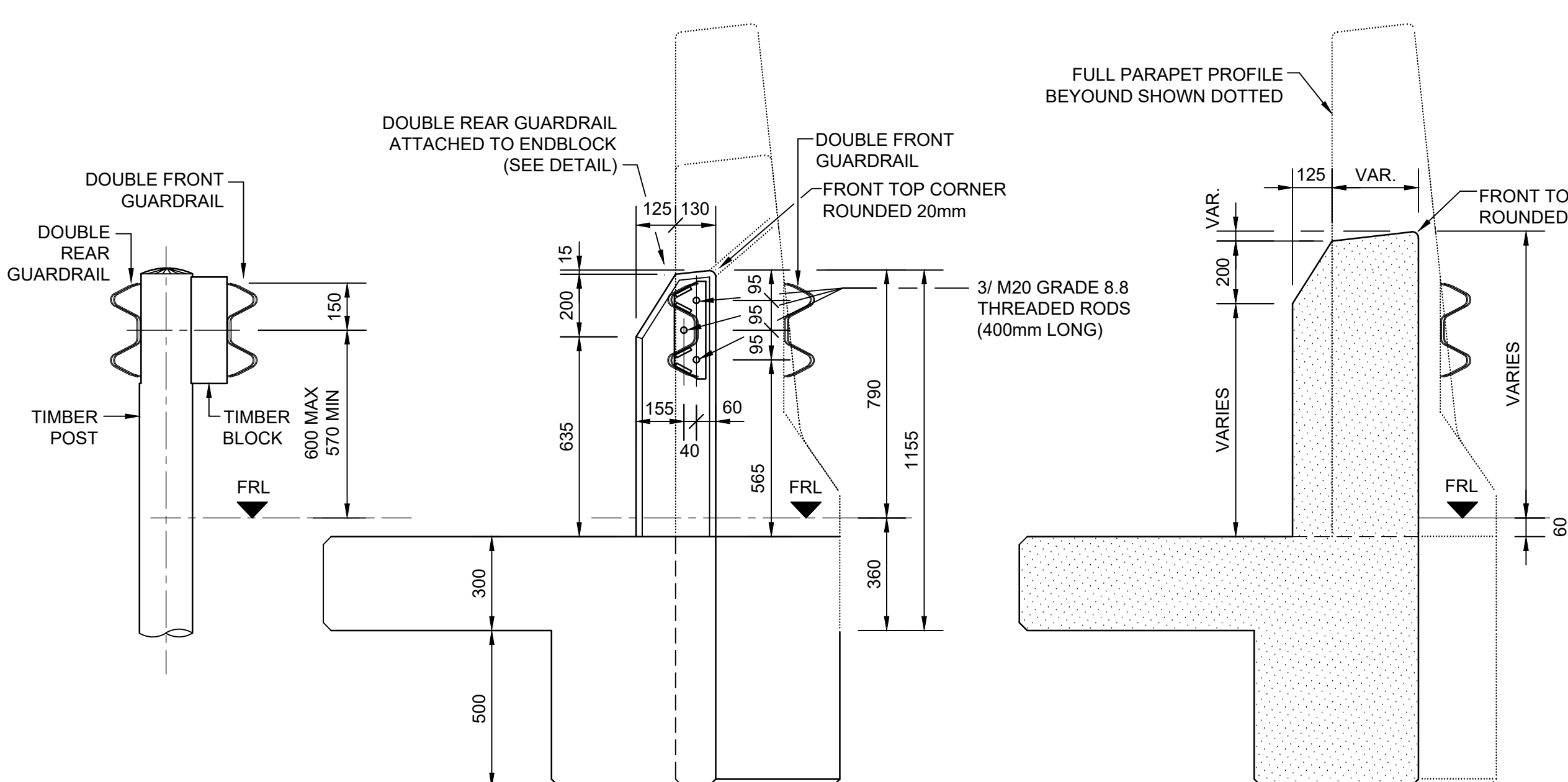


SECTION K - K
SCALE 1:5

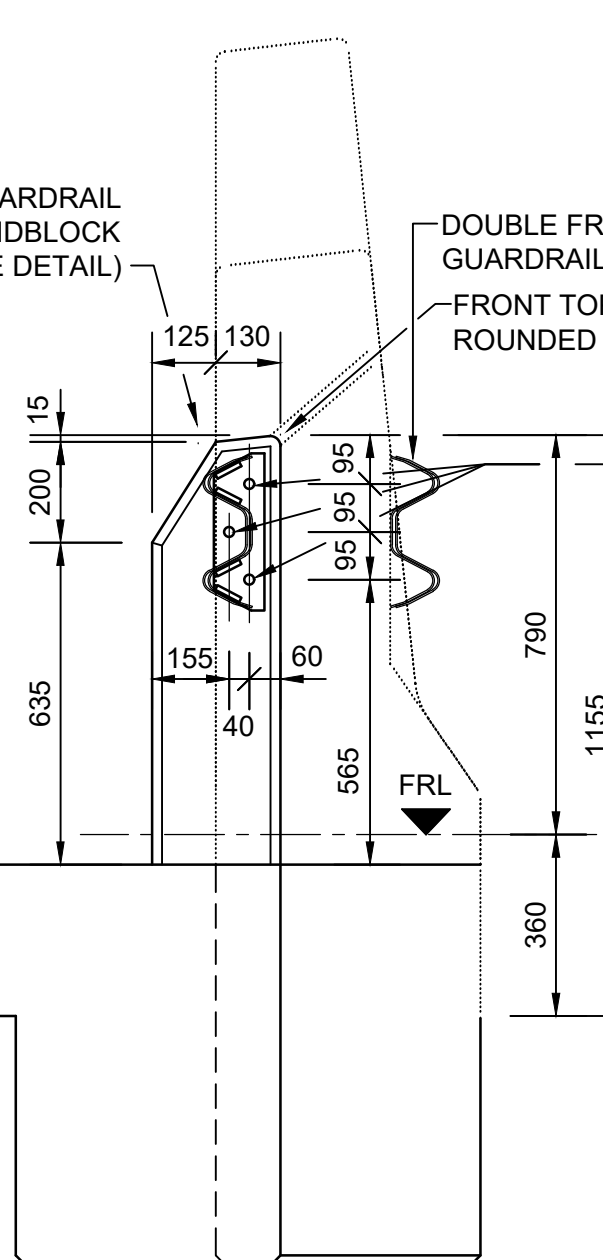


ANCHOR PLATE DETAIL
SCALE 1:5

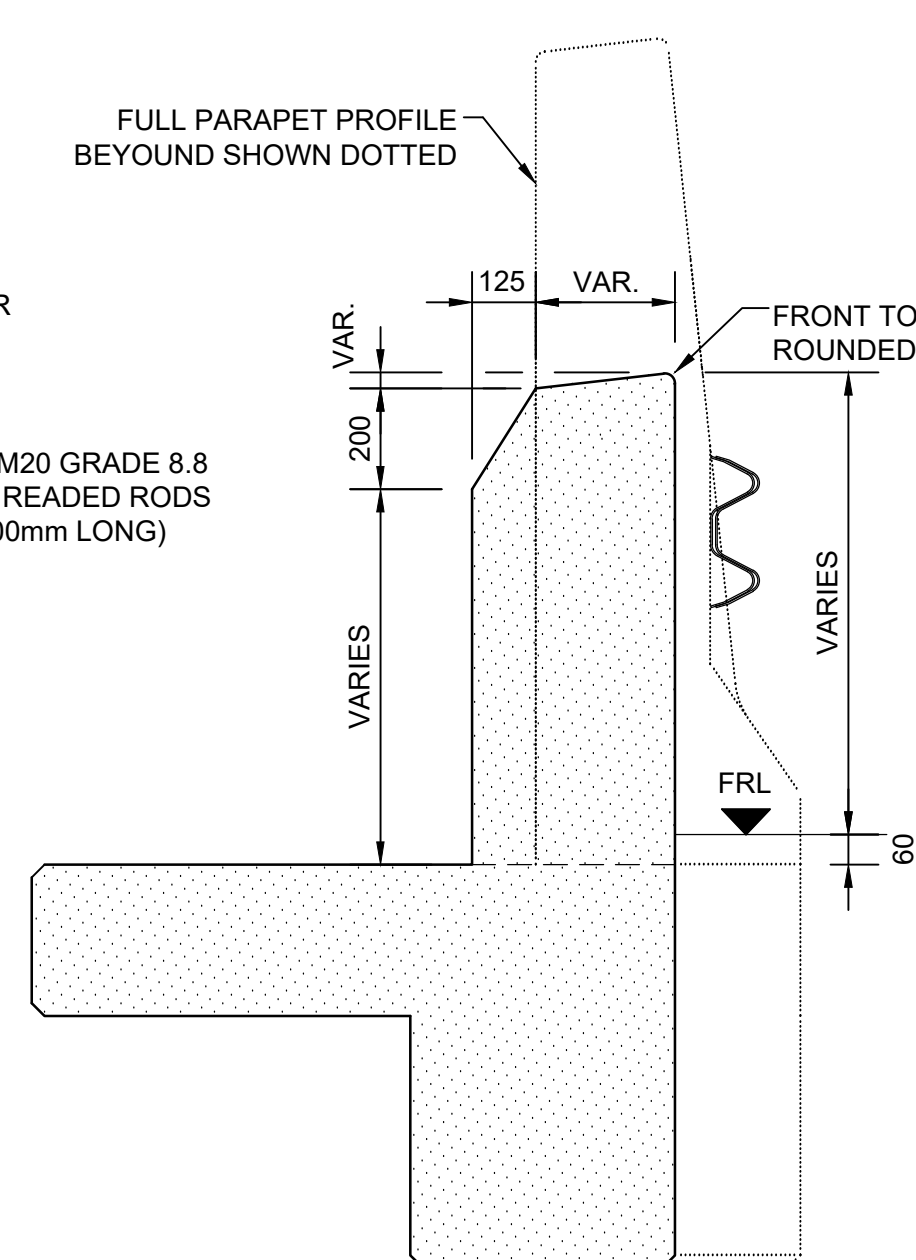
ENDBLOCK - BACKING PLATE DETAILS



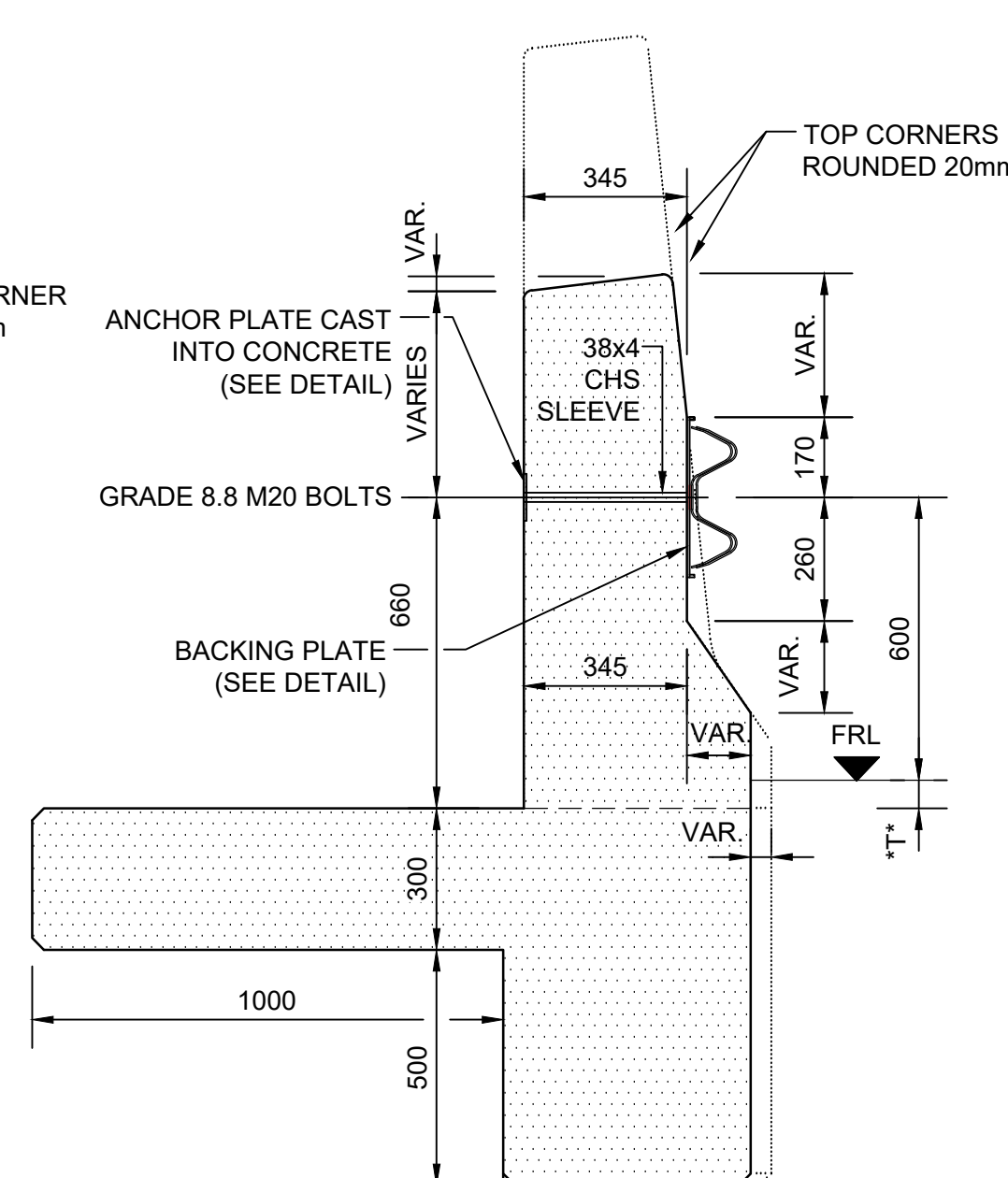
SECTION A - A
SCALE 1:15



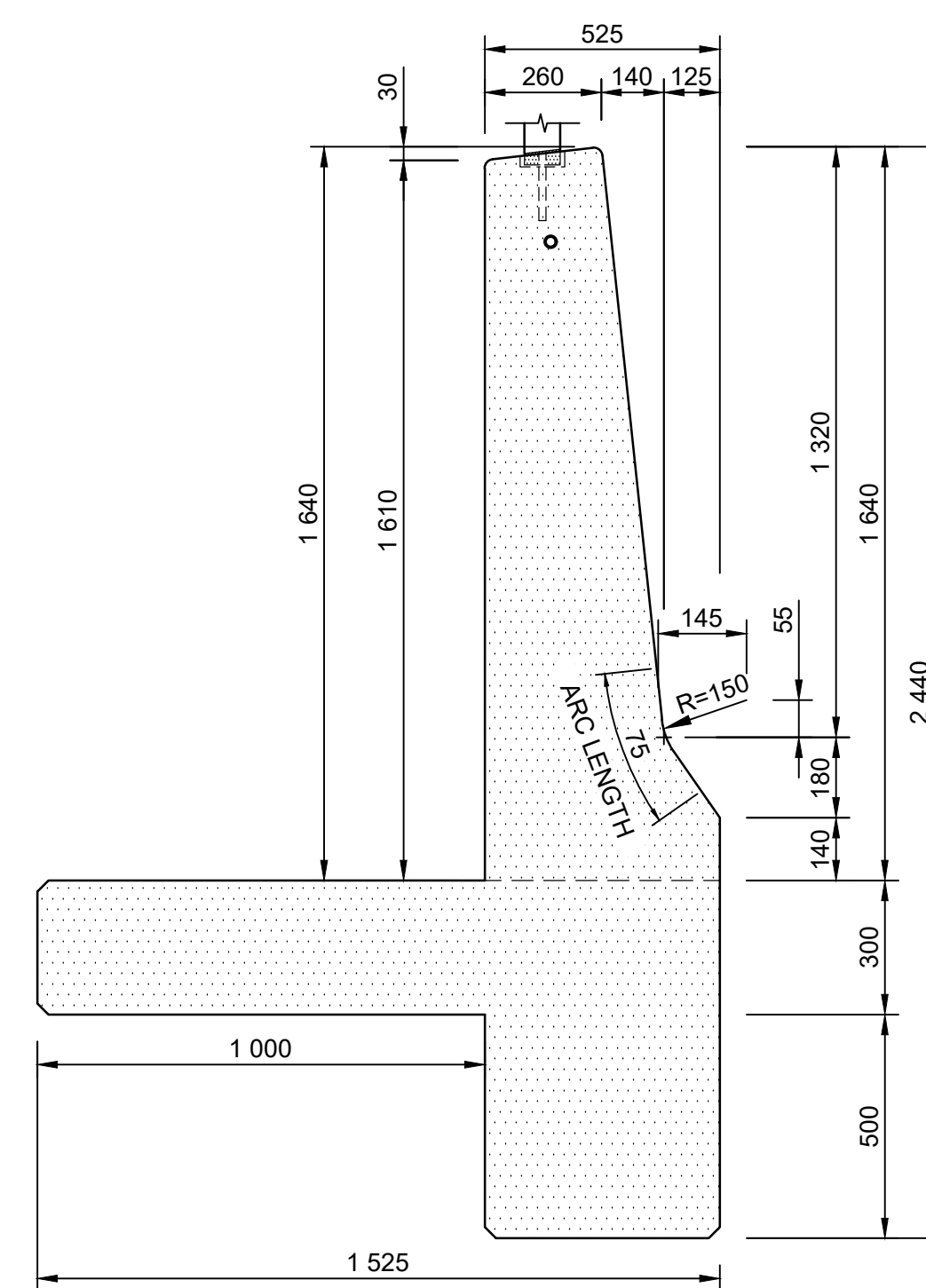
END ELEVATION B - B
SCALE 1:15



SECTION C - C
SCALE 1:15



SECTION D - D
SCALE 1:15



SECTION E - E
SCALE 1:15

						CONSTRUCTION RECORD WORKS CONTRACT ENGINEER
						Name : _____
						Prof. Reg. No. : _____
						Date : _____ <u>SANRAL PROJECT MANAGER</u>
V1	SEPT 2023	ORIGINAL VERSION			S. KASIPERSAD CONSULT. ENIG	Name : _____ Prof. Reg. No. : _____ Date : _____
No.	DATE	REVISION				

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for CEO: SA NATIONAL ROADS AGENCY LTD

Date:

<p align="center"><u>PROJECT DESCRIPTION</u></p> <p align="center">CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MUTHUSI (Km 0,80) TO MURCHISON (Km 18,64)</p>			
<p align="center"><u>DRAWING DESCRIPTION</u></p> <p align="center">NJ RETAINING WALL DETAILS ENDBLOCK DETAILS 01</p>			
SCALE :		SHEET 2 OF	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - ANCILLARY WORKS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-016	VI
SANRAL DOCUMENT #		-	

FOR TENDER PURPOSES

DRAWING NO. **TP1802-19-05-25-08-016**

NOTE

REFER TO DETAIL DRAWING TP1802/DD/ST/RW/01 FOR
LIST OF DRAWINGS AND GENERAL DETAIL NOTES.



FOR TENDER PURPOSES

[illegible]

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for CEO: SA NATIONAL ROADS AGENCY LTD

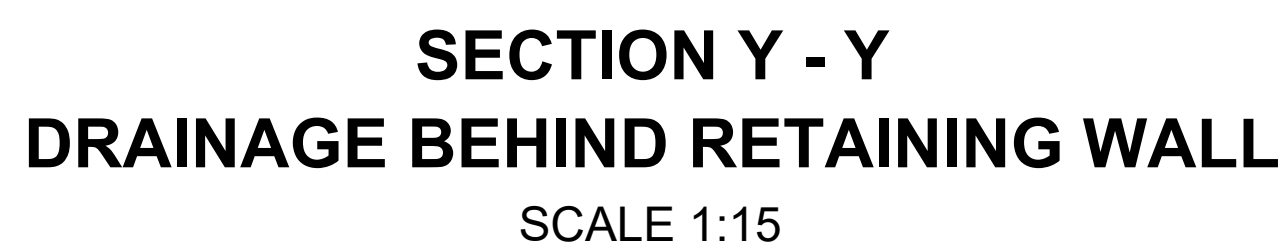
Date:

<p align="center"><u>PROJECT DESCRIPTION</u></p> <p align="center">CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)</p>			
<p align="center"><u>DRAWING DESCRIPTION</u></p> <p align="center">NJ RETAINING WALL DETAILS ENDBLOCK DETAILS 02</p>			
<p>SCALE :</p>		<p align="right">SHEET 3 OF</p>	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - ANCILLARY WORKS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-08-017	
SANRAL DOCUMENT #		-	

DRAWING No. **TP1802-19-05-25-08-017**

REFER TO DETAIL DRAWING TP1802/DD/ST/RW/01 FOR
LIST OF DRAWINGS AND GENERAL DETAIL NOTES.



1. 200mm wide FILTER ELEMENTS (APPROVED GEOTEXTILE DRAINAGE STRIPS) SECURED TO BACK FACE OF STRUCTURE PLACED VERTICALLY AT EDGES.
2. CONCRETE NAILS WITH 25 x 25mm HOOP IRON WASHERS TO SECURE FILTER ELEMENTS TO STRUCTURE AT 1 000mm CENTRES.
3. CONCRETE SLORED (CLASS 15/20) TO GRADATION AND LEVEL OF DRAINAGE PIPES PRIOR TO PLACING OF DRAINAGE PIPES.
4. 65mm dia PERFORATED DRAINAGE PIPES WRAPPED IN APPROVED GEOTEXTILE FILTER FABRIC WHICH SHALL HAVE AN OVERLAP OF NOT LESS THAN 150mm AND BE TIED AT CENTRES NOT GREATER THAN 200mm.
5. 50 mm dia uPVC WEEPHOLE PIPES AT 1500c/c TO SANS 967. THE CONTRACTOR SHALL ENSURE THAT THE WEEPHOLES ARE CLEAR AND APPROVED BY THE ENGINEER BEFORE THE FILLER ELEMENTS ARE INSTALLED.
6. 200mm wide FILTER ELEMENT SECURED TO BACK FACE OF STRUCTURE AT SAME SPACING AS 15.
7. TEMPORARY POLYSTYRENE PLUG TO PREVENT INGRESS OF GROUT DURING PLACING OF CONCRETE.
8. NON PERFORATED 65mm dia DRAINAGE EXTENSION PIPE, FIXED TO PERFORATED DRAINAGE PIPE (ITEM 4), DISCHARGING ONTO FILL.

		REINFORCEMENT BENDING SCHEDULE SUMMARY									
		PROJECT NO.: NRA-C 004-031-2018/1 TITLE: ZINGQI/WEI NJ WALL									
		SCHEDULE NO. 001 TO					SCHEDULE NO. 004				
R-BAR SUMMARY											
DIAMETER	R6	R8	R10	R12	R16	R20	R25	R32	R40	TOTAL MASS	
TOTAL LENGTH (m)		100	171				117			560.8	
TOTAL MASS (kg)		39.5	105.5				450.8			500.8	
Y-BAR SUMMARY											
DIAMETER	Y6	Y8	Y10	Y12	Y16	Y20	Y25	Y32	Y40	TOTAL MASS	
TOTAL LENGTH (m)		22095.9	46940.2	415.2	148					17 STEEL	
TOTAL MASS (kg)		13653.2	11463.3	6332.6	365					62014.3	

NON STANDARD 99 SHAPE CODES			
<p>99F</p>	<p>99K</p>	<p>99V</p>	<p>99AD</p>
<p>99G</p>	<p>99S</p>	<p>99X</p>	
<p>99H</p>	<p>99U</p>	<p>99J</p>	

FOR TENDER PURPOSES

PROJECT NUMBER	NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	22	22
DRAWING km DISTANCE	km 0,80	km 18,64
DRAWING TYPE	ROADS - ANCILLARY WORKS	
BRIDGE/STRUCTURE No.	N/A	
CONSULTANT DRAWING NO.	TP1802-19-05-25-08-018	
SANRAL DOCUMENT #	-	VER V

DRAWING No. **TP1802-19-05-25-08-018**

THE MAXIMUM SPEED LIMIT SHALL BE CONSISTENT WITH THE PREVAILING CONDITIONS ON SITE IN TERMS OF ROAD SAFETY REQUIREMENTS AND MAY BE INCREASED/DECREASED ON INSTRUCTION FROM THE ENGINEER.

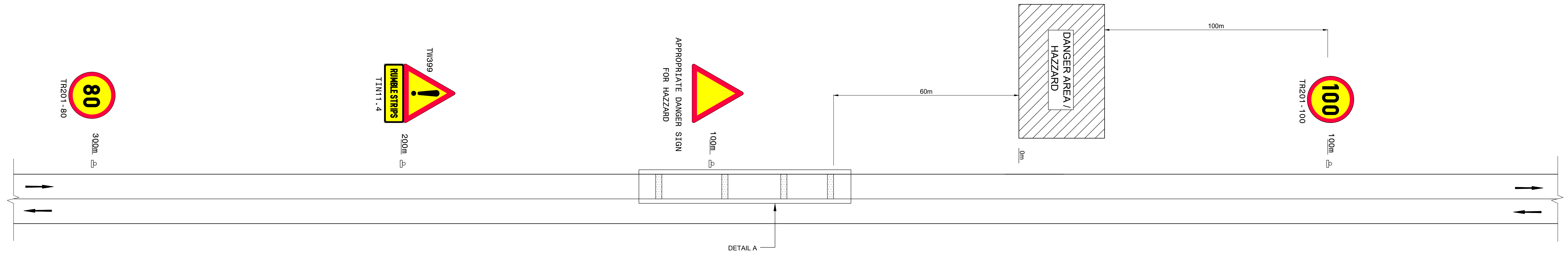
1. TRANSITION AREA : 10 m c/c
2. STABILIZING AREA : 10 m c/c FOR THE FIRST 50 m, THEN 30 m c/c ON STRAIGHT.
3. WORK AREA : 30 m c/c
4. TERMINATION AREA : 10 m c/c

1. TRAFFIC SIGNS SHALL COMPLY WITH THE REQUIREMENTS OF THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL (SARTSM) - ROAD WORKS SIGNING: CHAPTER 13.
2. ALL TRAFFIC ACCOMMODATION SHALL COMPLY WITH THE LATEST COTO STANDARDS: CHAPTER 1.5 TRAFFIC ACCOMMODATION.

SIGN SEQUENCE FOR STOP/GO OPERATION

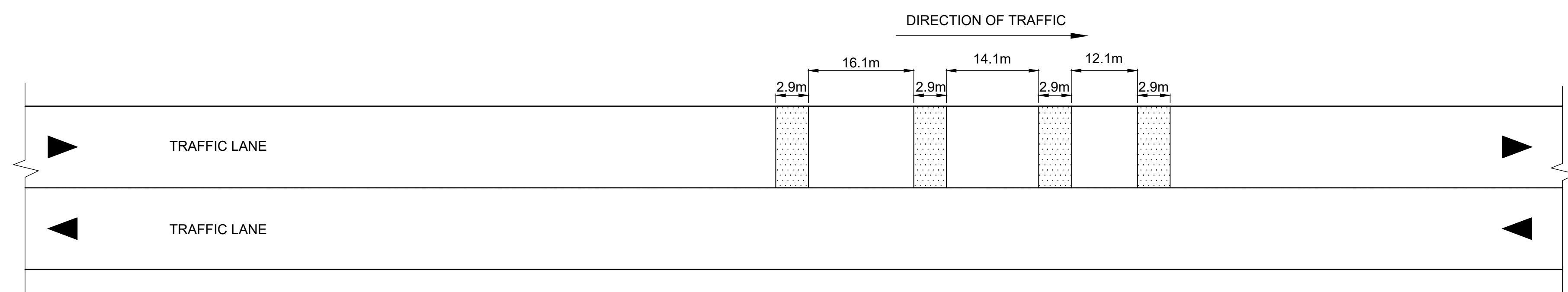
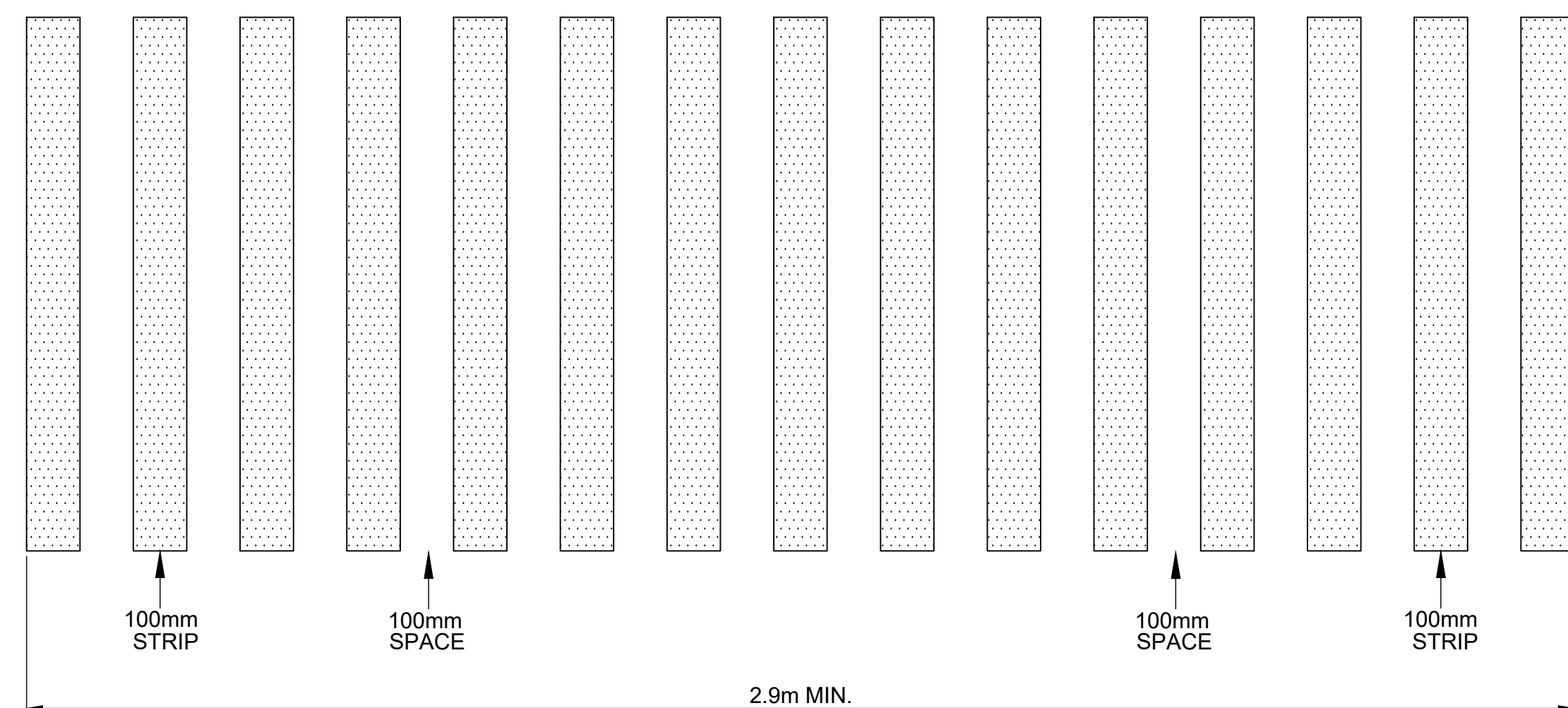
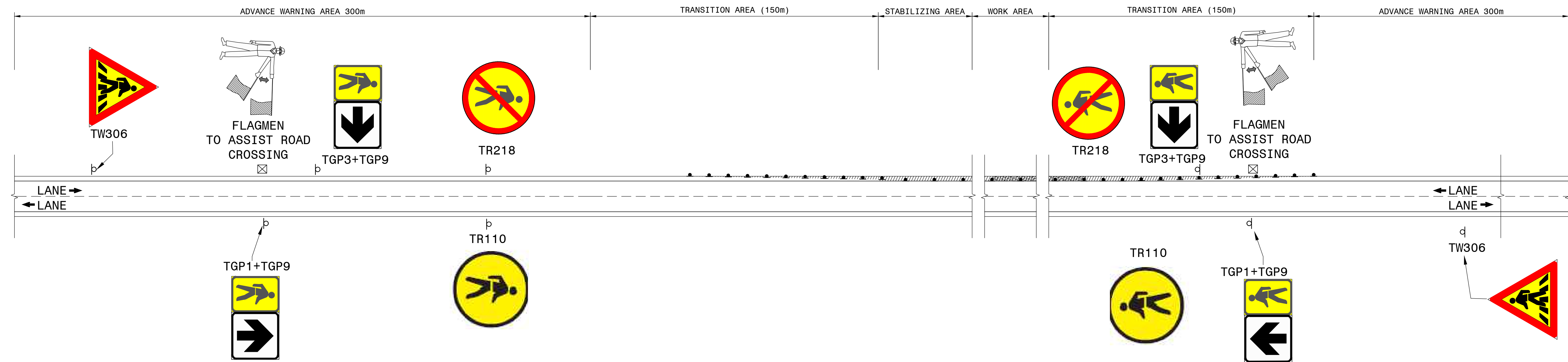
FOR TENDER PURPOSES

DRAWING NO. **TP1802-19-05-25-09-002**



TRAFFIC CALMING MEASURES

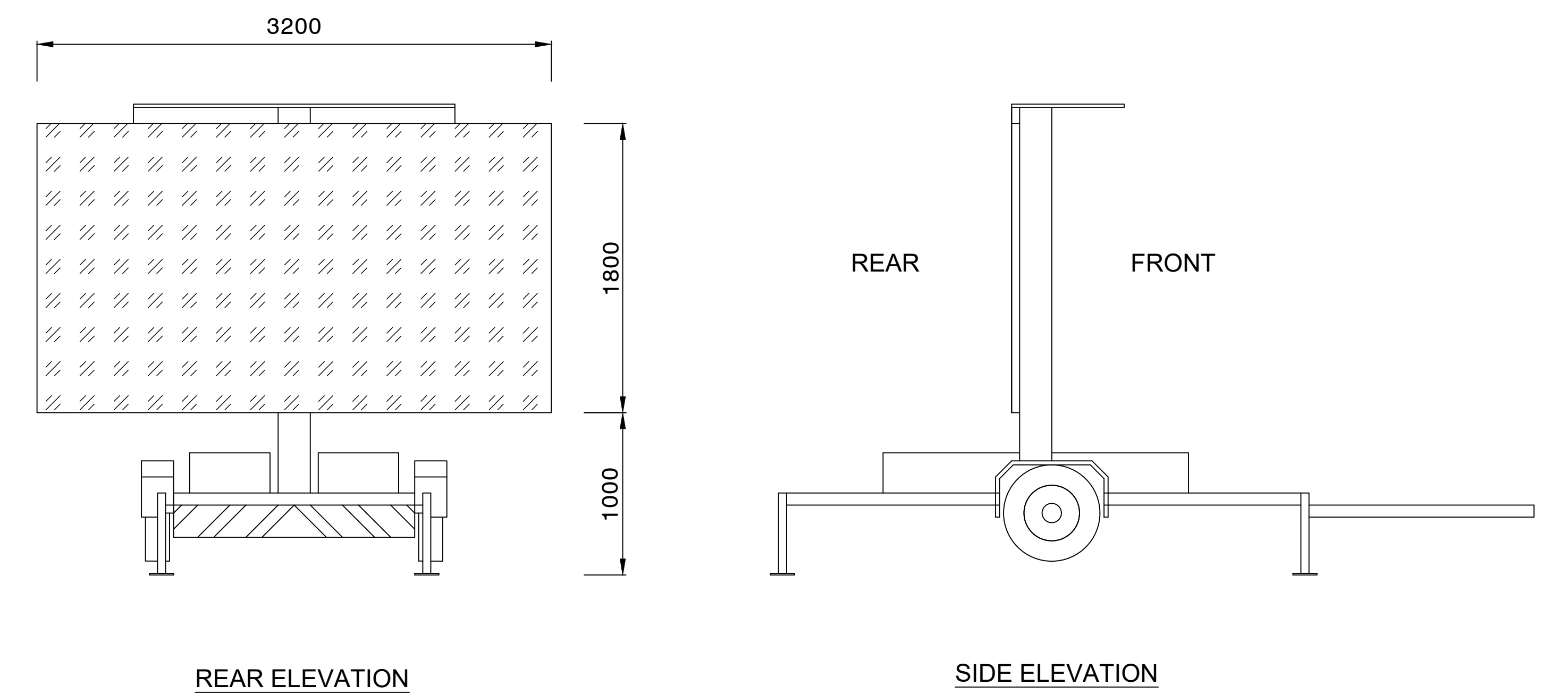
N.T.S.



DETAIL A

SCHEMATIC LAYOUT OF RUMBLE STRIPS WITH 19mm AGGREGATE

SCALE : N.T.S.



REAR ELEVATION

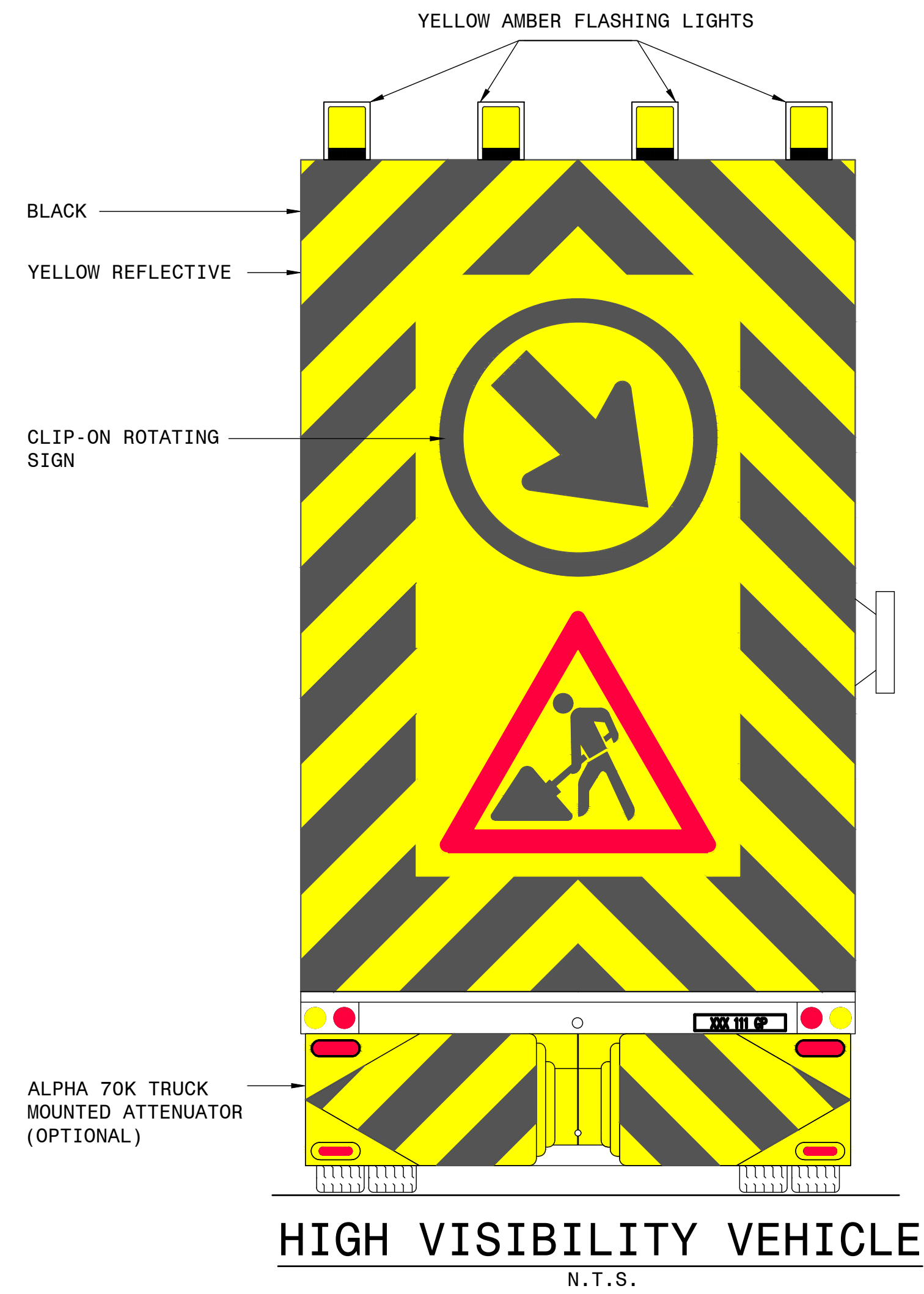
SIDE ELEVATION

MOBILE ELECTRONIC BOARD

FOR TENDER PURPOSES

CONSTRUCTION RECORD WORKS CONTRACT ENGINEER				DESIGNED BY				CONSULTANT APPROVAL				PROJECT DESCRIPTION				PROJECT NUMBER			
Name : Prof. Reg. No. : Date :				Name : Prof. Reg. No. : Date :				Name : Prof. Reg. No. : Date :				CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)				START			
SANRAL PROJECT MANAGER				CHECKED BY				THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING				DRAWING DESCRIPTION				ROUTE			
Name : Prof. Reg. No. : Date :				Name : Prof. Reg. No. : Date :				for CEO SA NATIONAL ROADS AGENCY LTD.				TRAFFIC CALMING MEASURES				SECTION			
V1 SEPT 2023 ORIGINAL VERSION				DRAWN BY				HEAD OFFICE				SCALE : 1:1000				DRAWING km DISTANCE			
No. DATE REVISION				NAME				48 Tambotie Avenue Val de Grace Pretoria 0184				SHEET 1 OF 1				BRIDGE/STRUCTURE No.			
S. KASIPERSAD CONSULT. ENG.				NAME				58 van Eck Place Pietermaritzburg 3201				SANRAL DOCUMENT #				ROADS - TRAFFIC ACCOM			
Tel: 012 001 0528 e-mail: info@skicivil.co.za				NAME				PO Box 100410 Scottsville 3209				VER				N/A			
SKI Civil & Structural Engineers				NAME				Tel: (033) 392 8100				V1				TP1802-19-05-25-09-003			

DRAWING No. TP1802-19-05-25-09-003

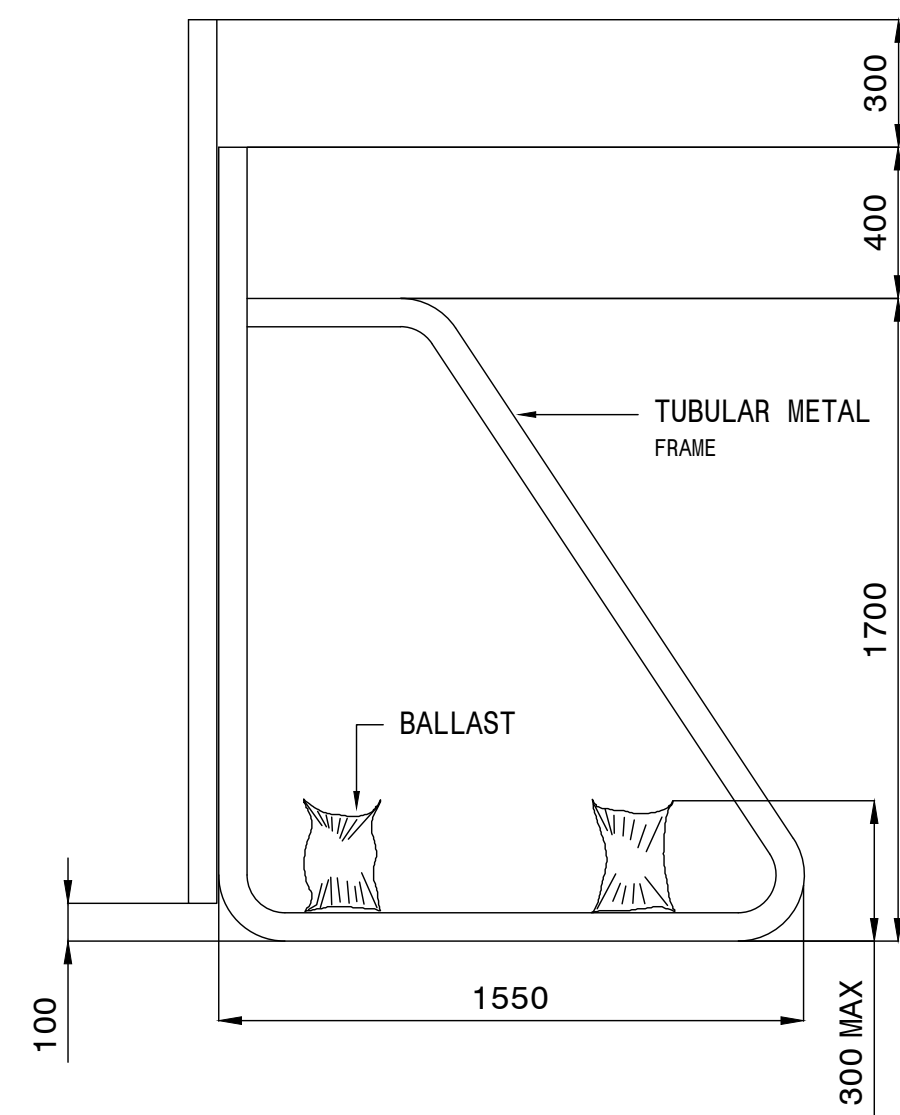


NOTE : (MOUNTING AND REINFORCING DETAILS)

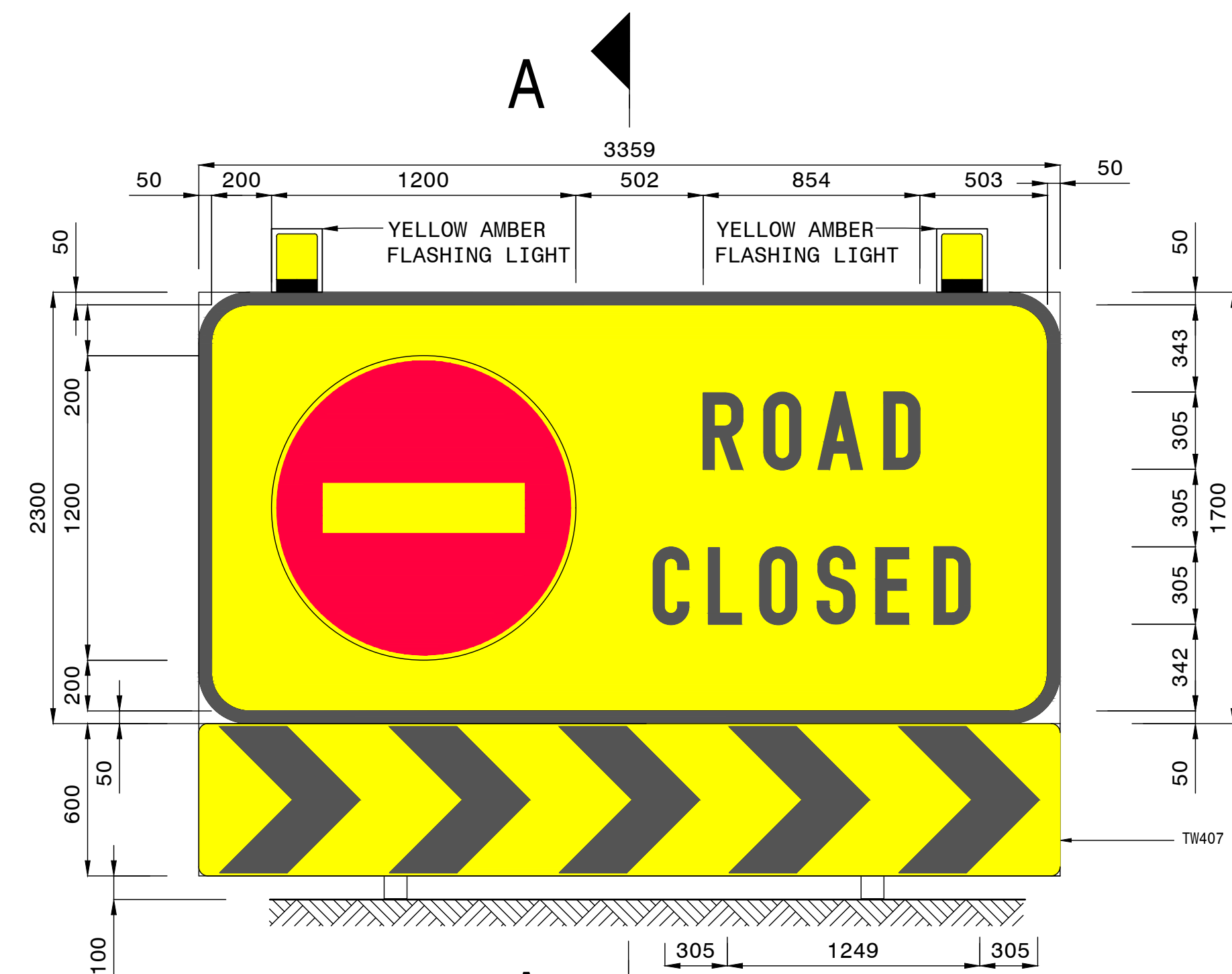
1. WHEREVER POSSIBLE SIGNS MUST BE MOUNTED ON POLES PLACED FIRMLY IN THE GROUND.
2. WHEN THIS IS NOT POSSIBLE, TRADITIONAL METHOD OF MOUNTING USING STANDS JUNE BE USED PROVIDED THESE DO NOT IMPINGE UPON THE TRAFFIC RUNNING WAY.
3. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING WHICH SIGNS WILL BE MOUNTED ON POLES AND WHICH WILL BE MOUNTED IN STANDS SUBJECT TO THE AGREEMENT OF THE ENGINEER.
4. SANDBAGS WILL BE REQUIRED FOR BALLASTING SIGN STANDS (ALL DELINEATOR SIGNS WILL BE STAND MOUNTED)

NOTE :

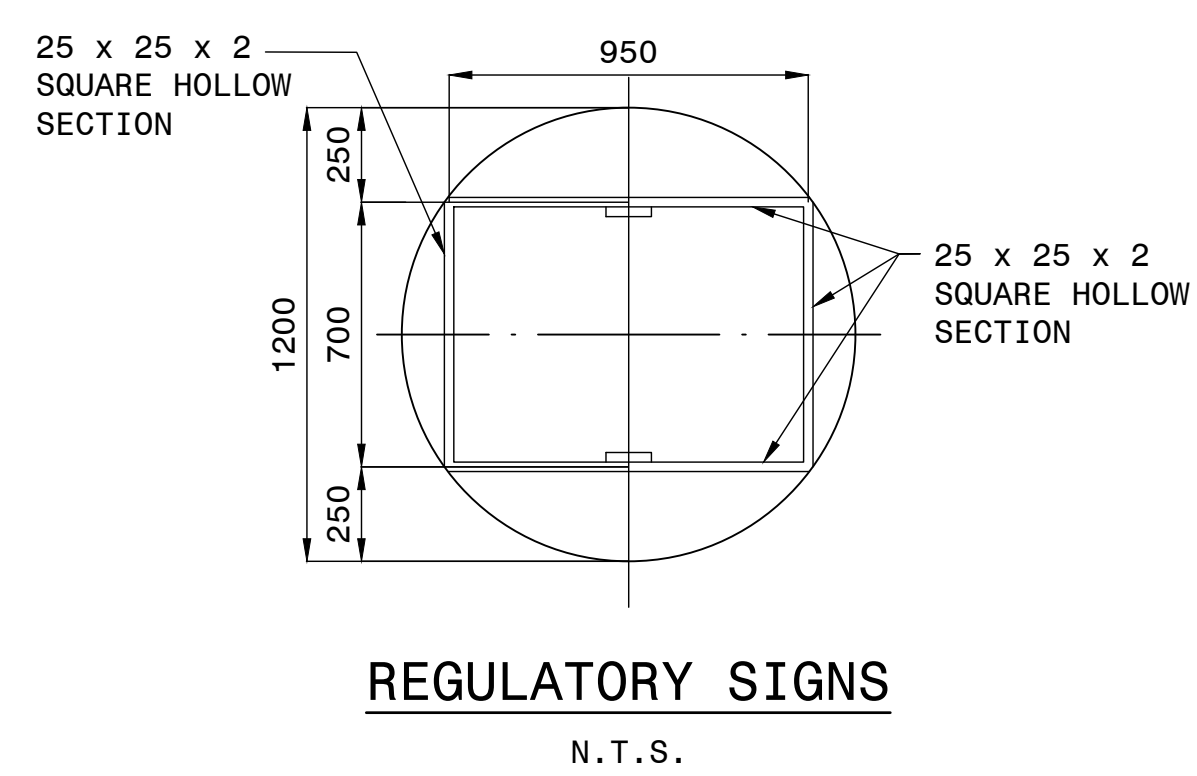
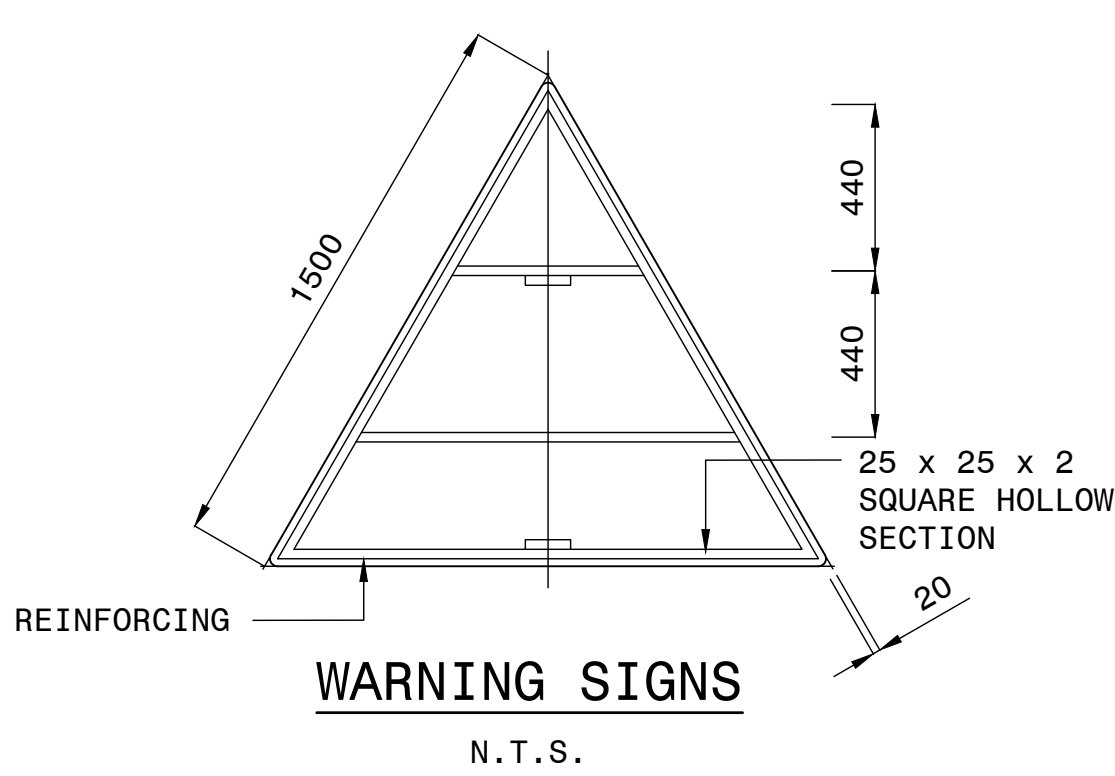
1200mm SIGNS CAN BE MOUNTED ON SINGLE POLES WHEN POLES ARE PLACED IN THE GROUND.



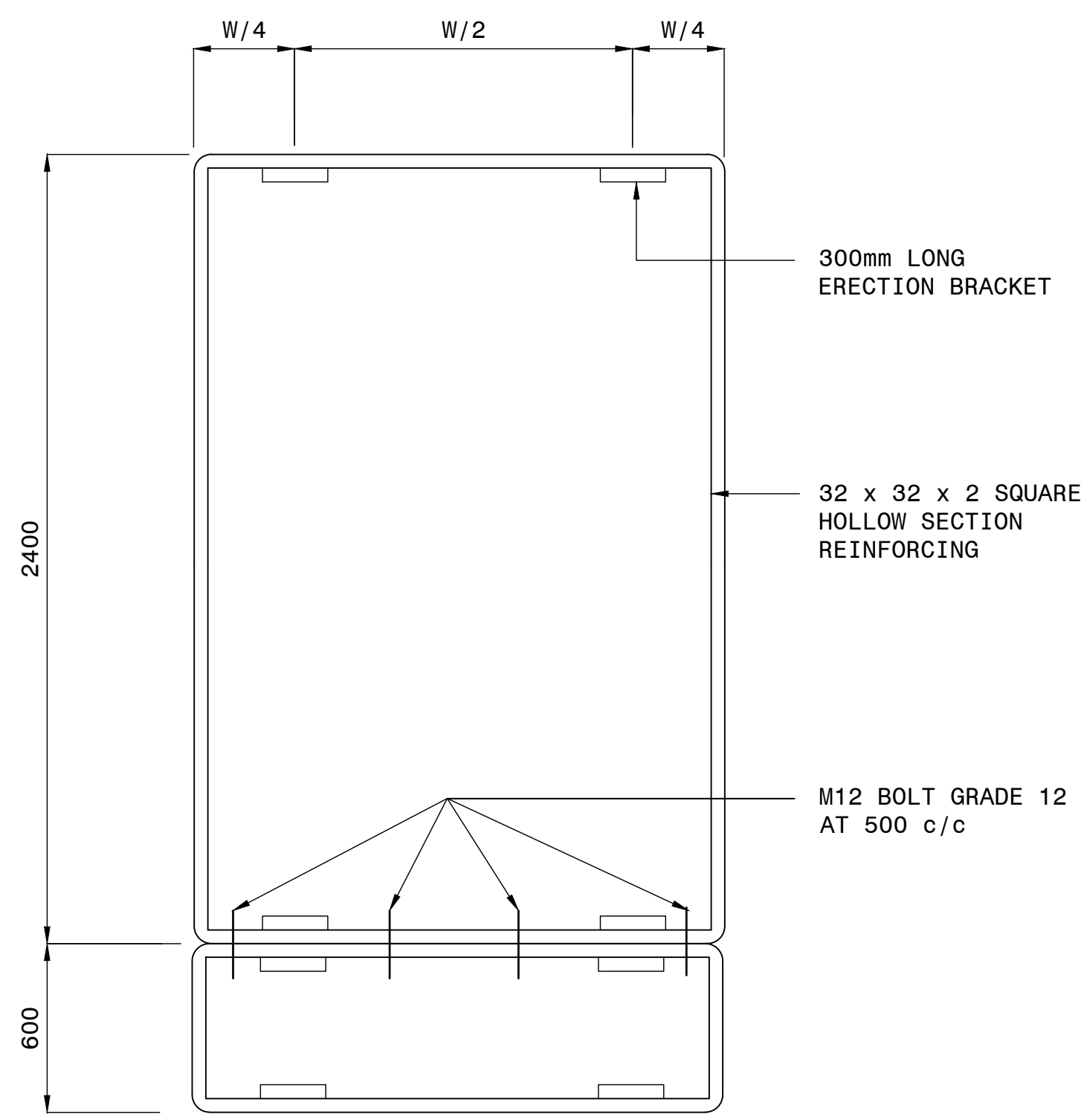
SECTION A-A



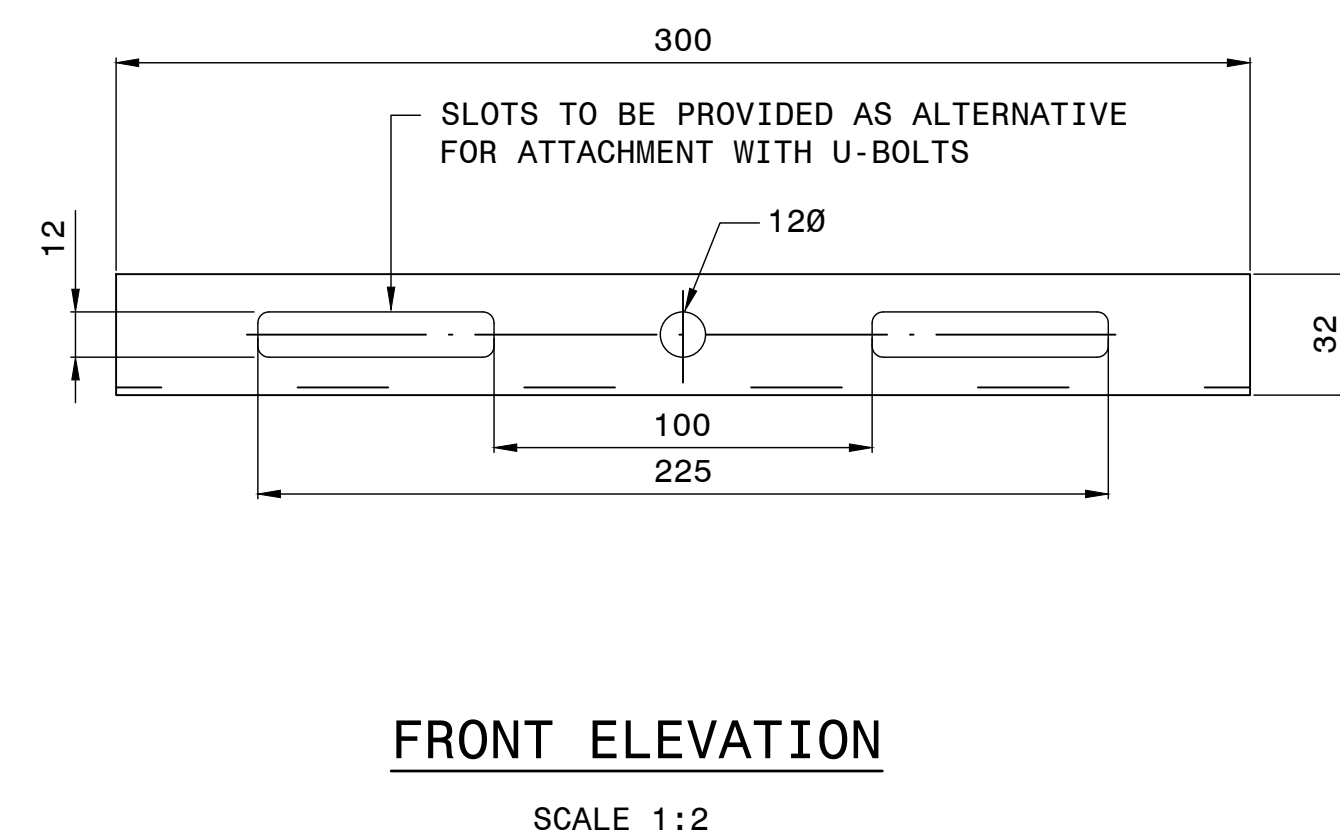
"ROAD CLOSED" BARRICADE



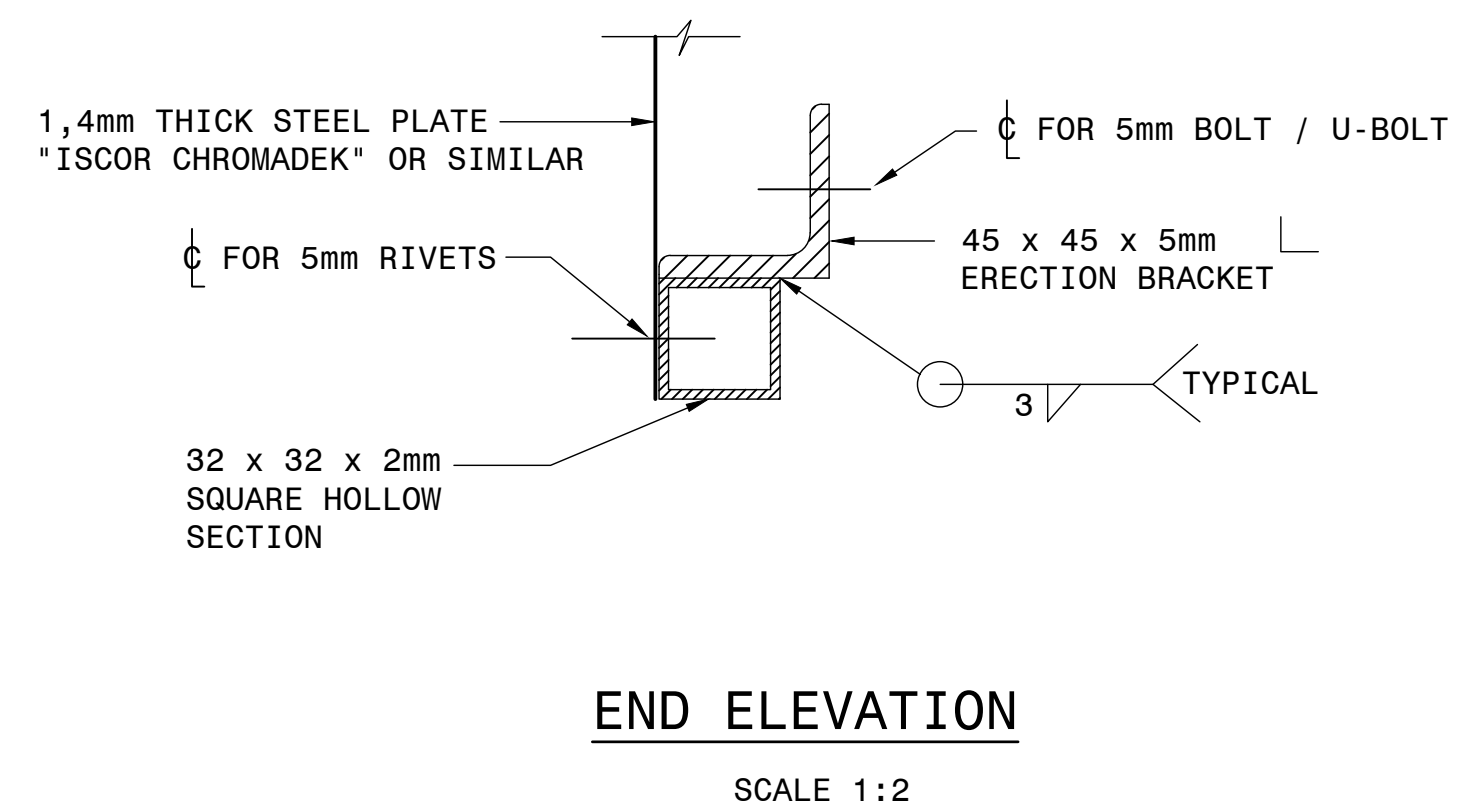
TYPICAL REINFORCING DETAILS



GUIDANCE SIGN N.T.S.

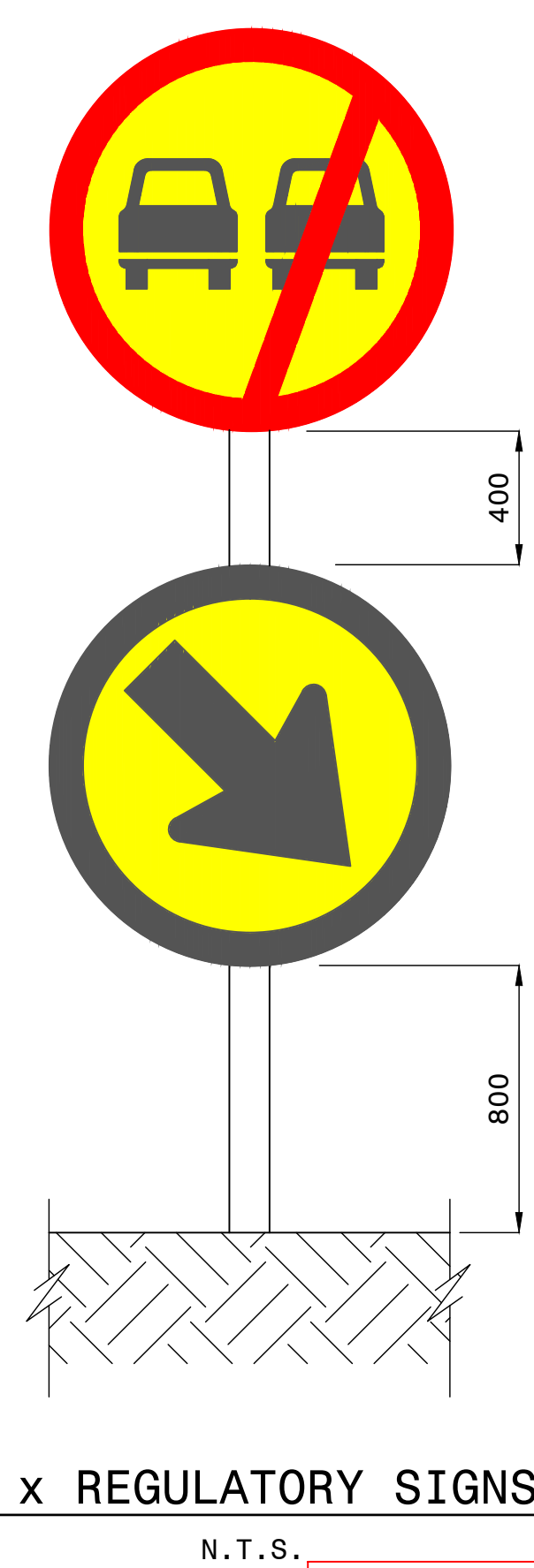
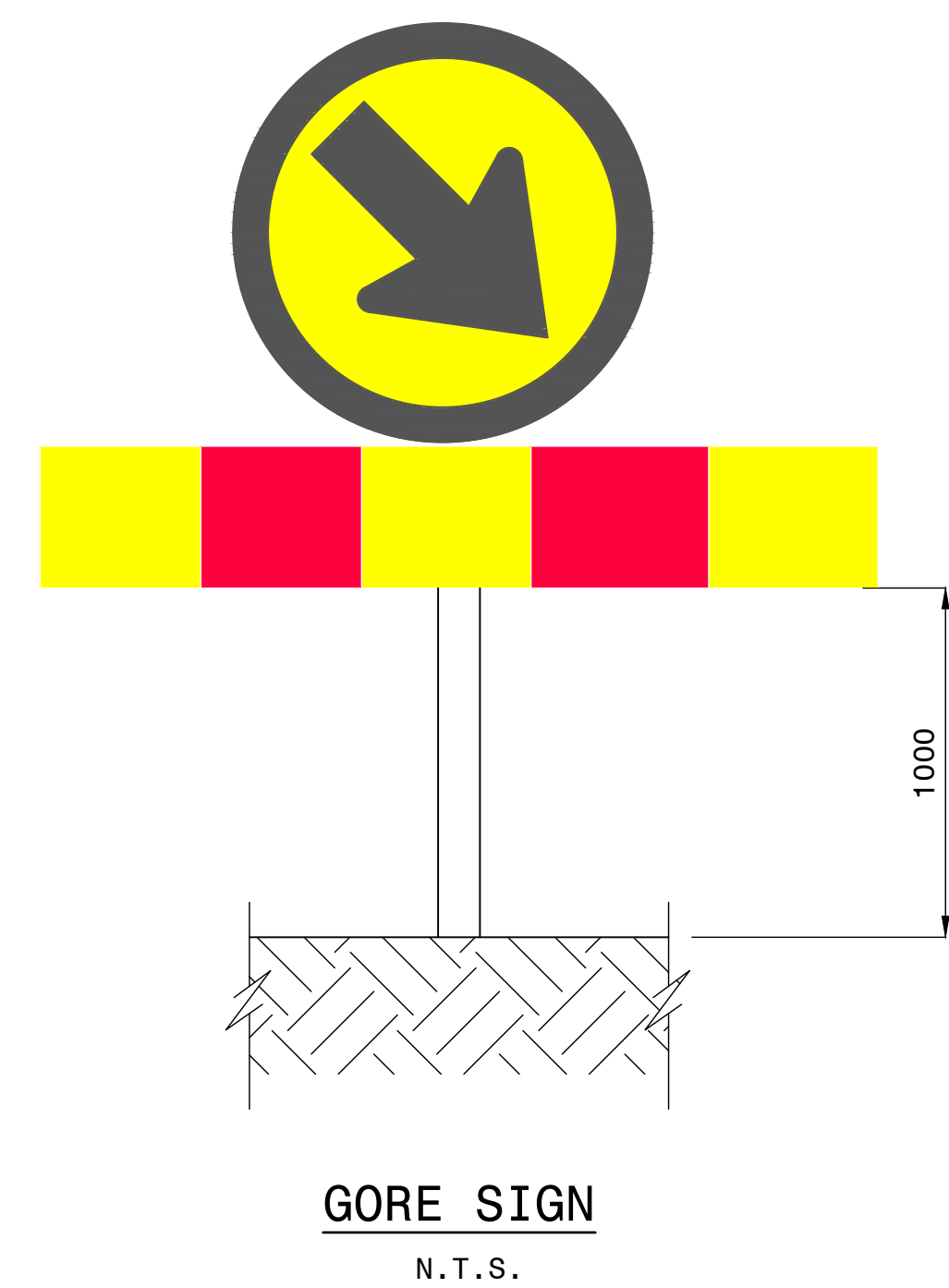
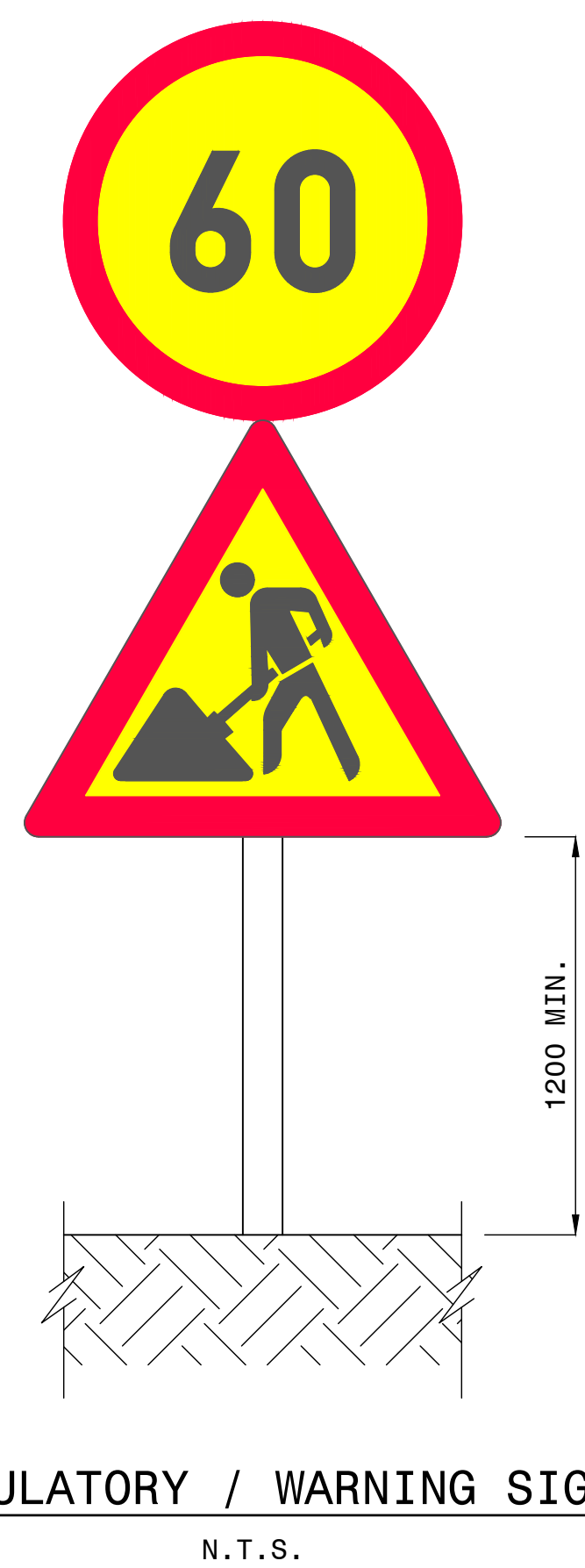
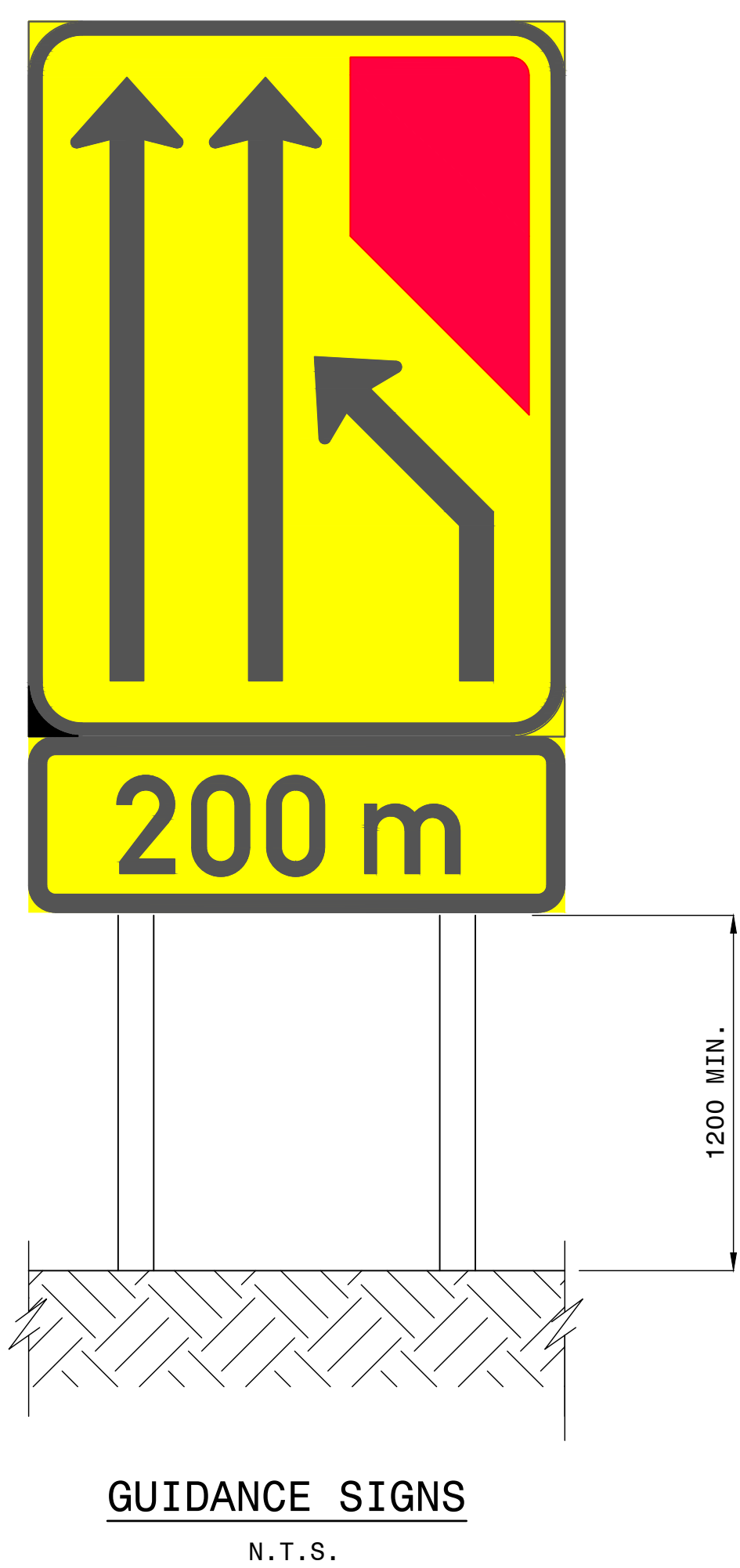
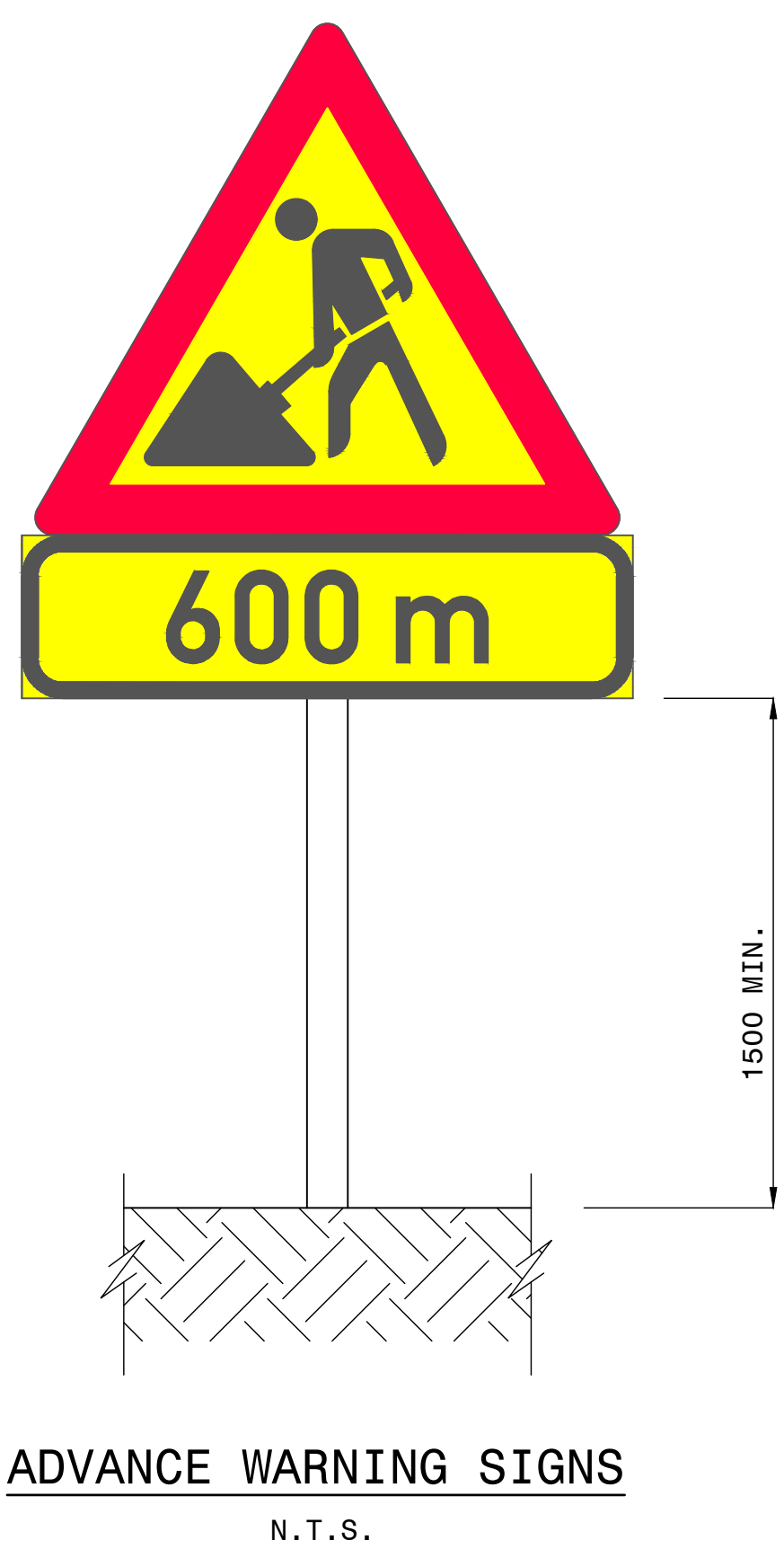
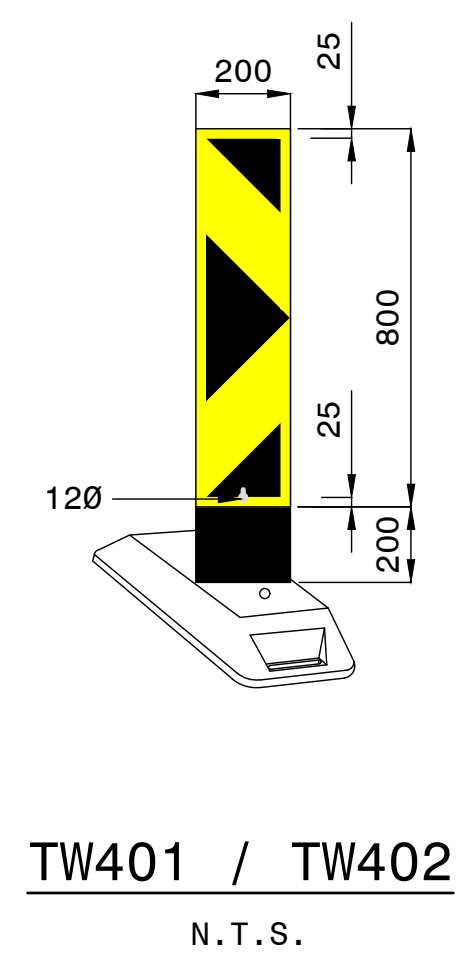
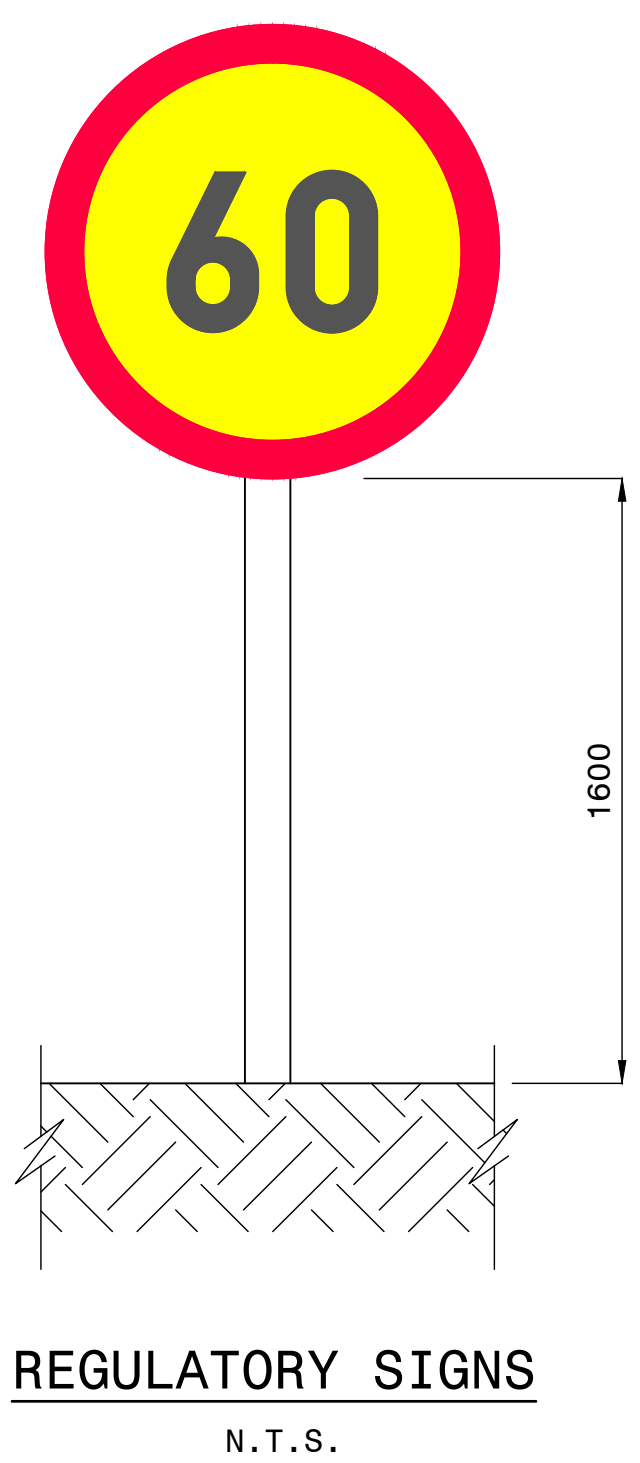


FRONT ELEVATION SCALE 1:2



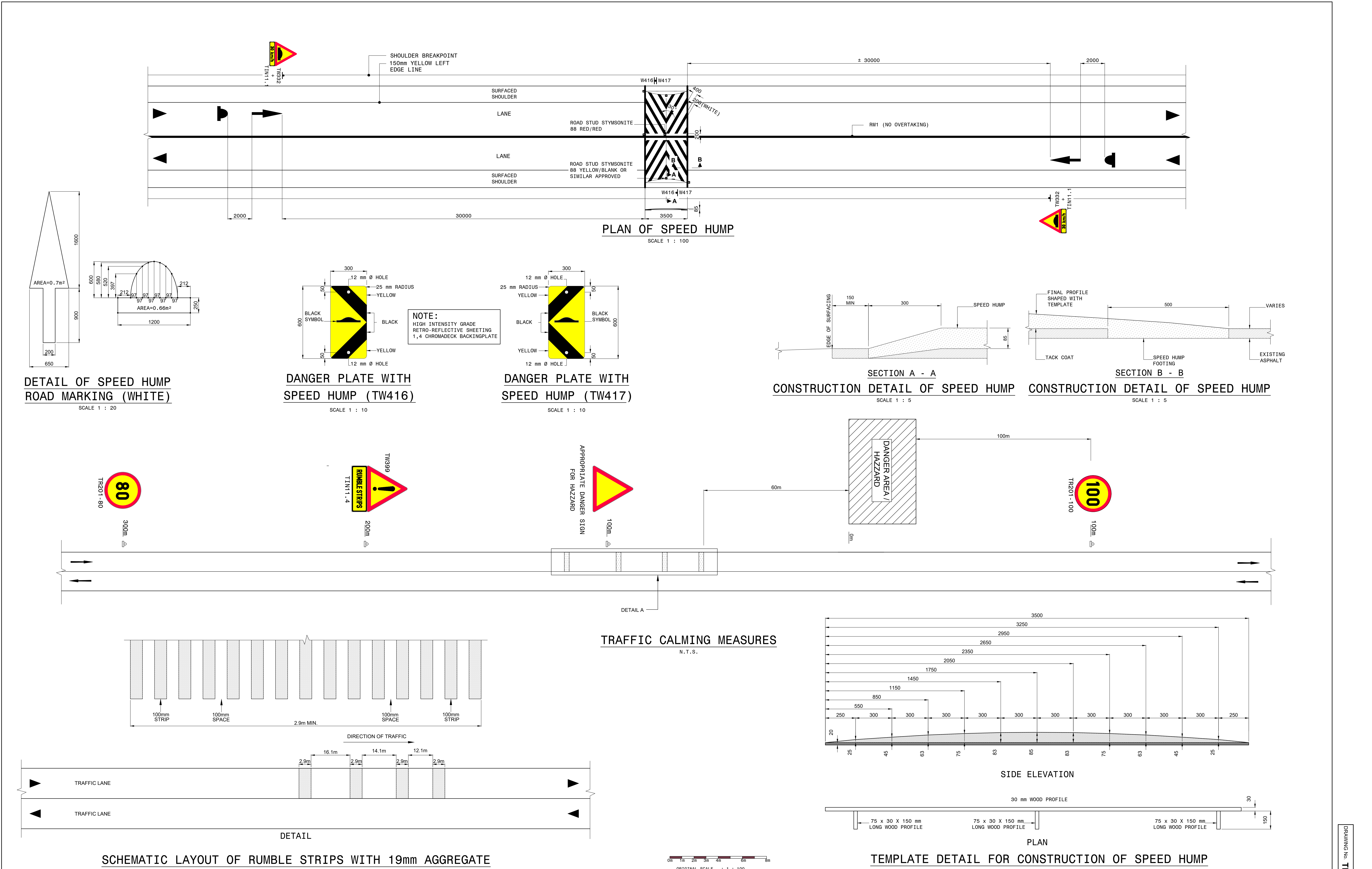
END ELEVATION SCALE 1:2


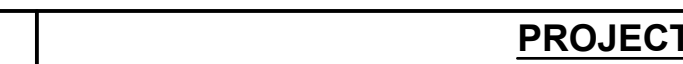
TYPICAL ERECTION BRACKET



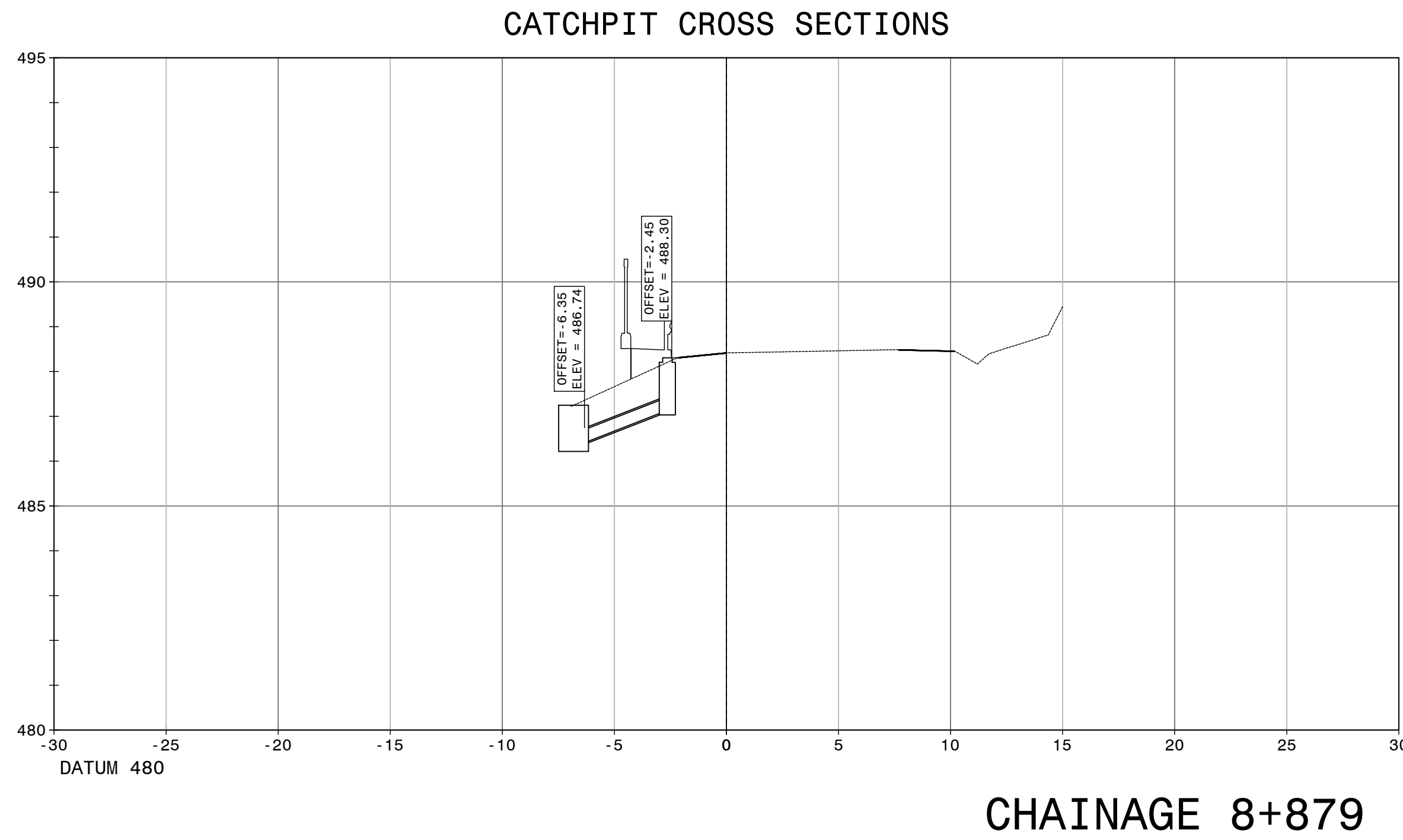
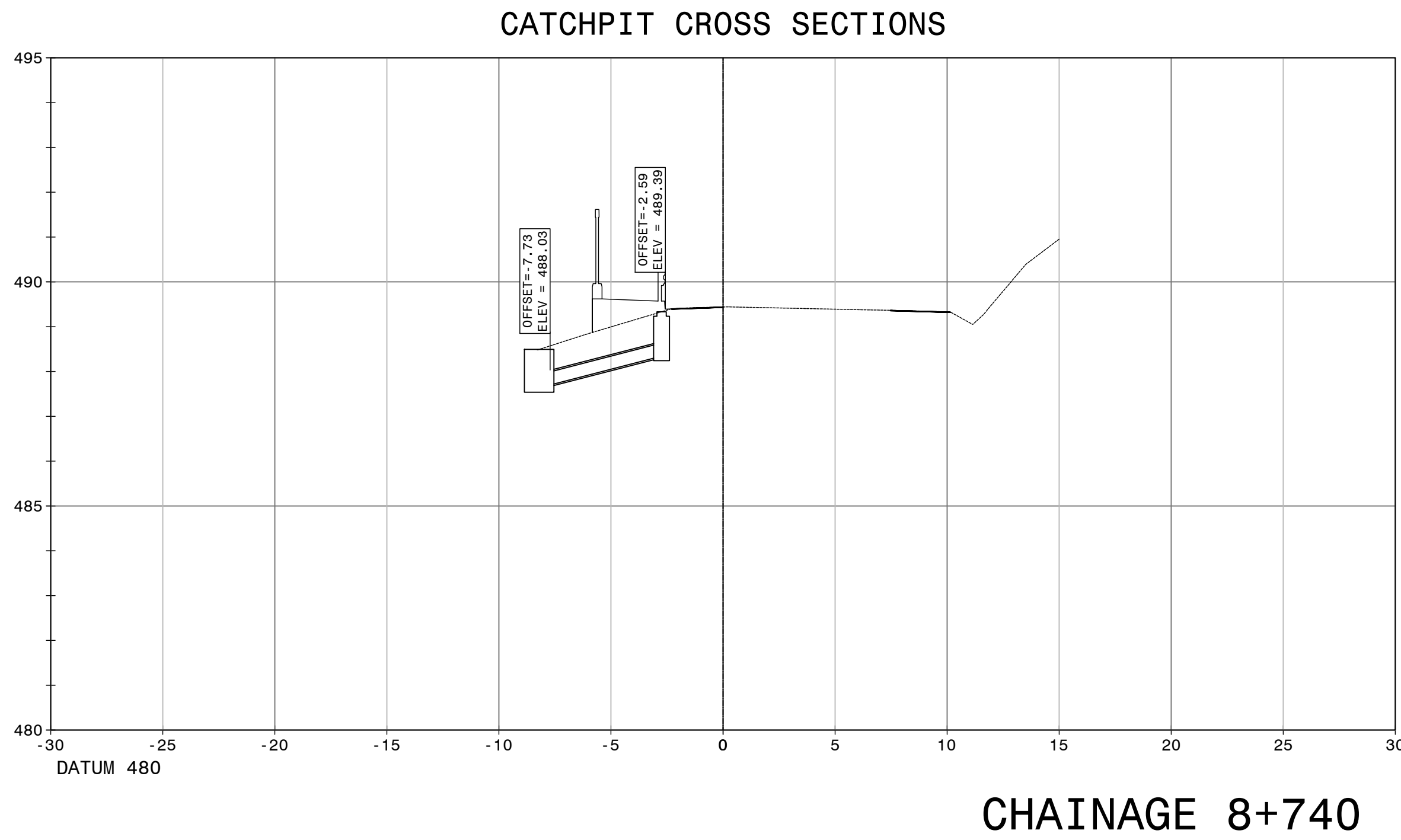
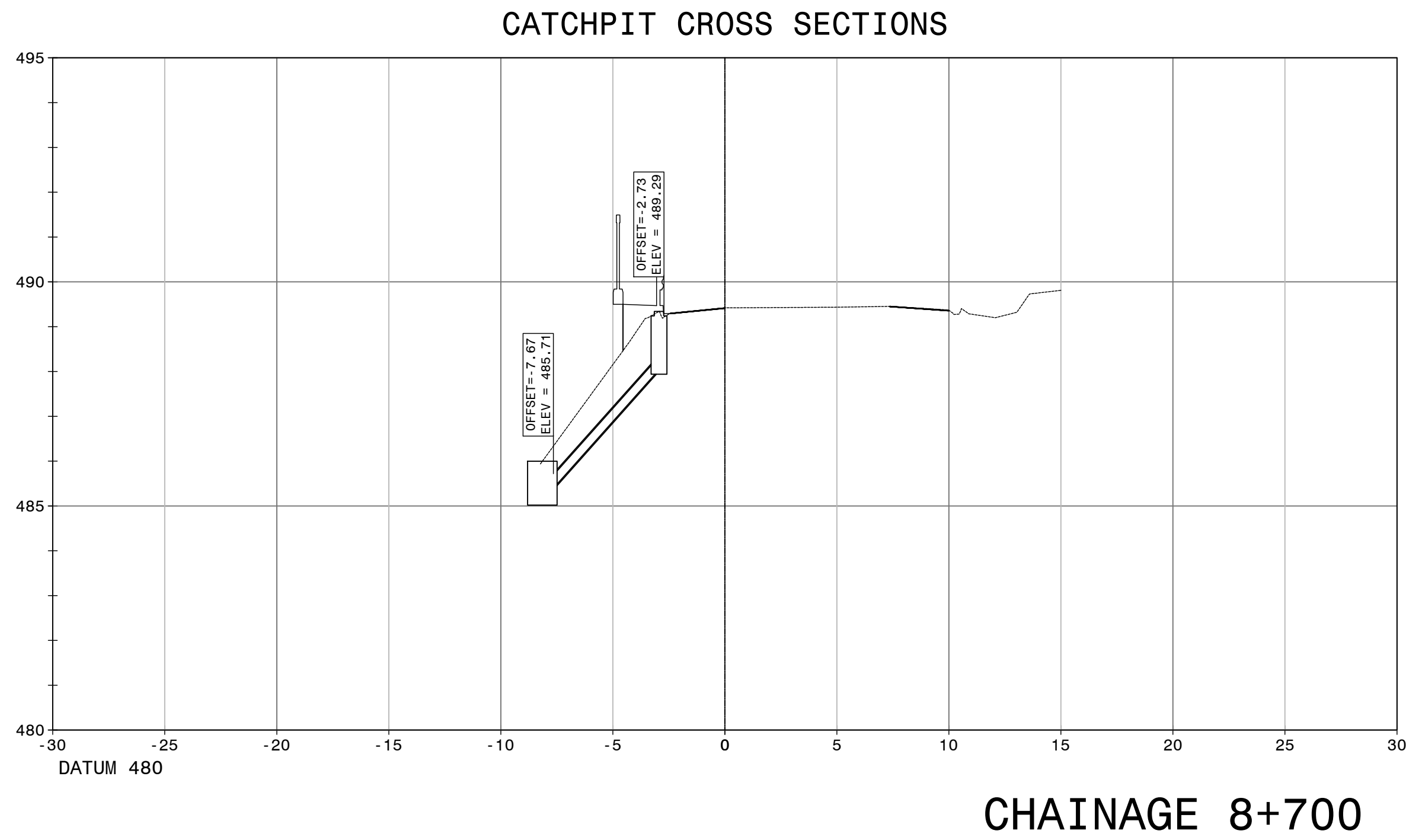
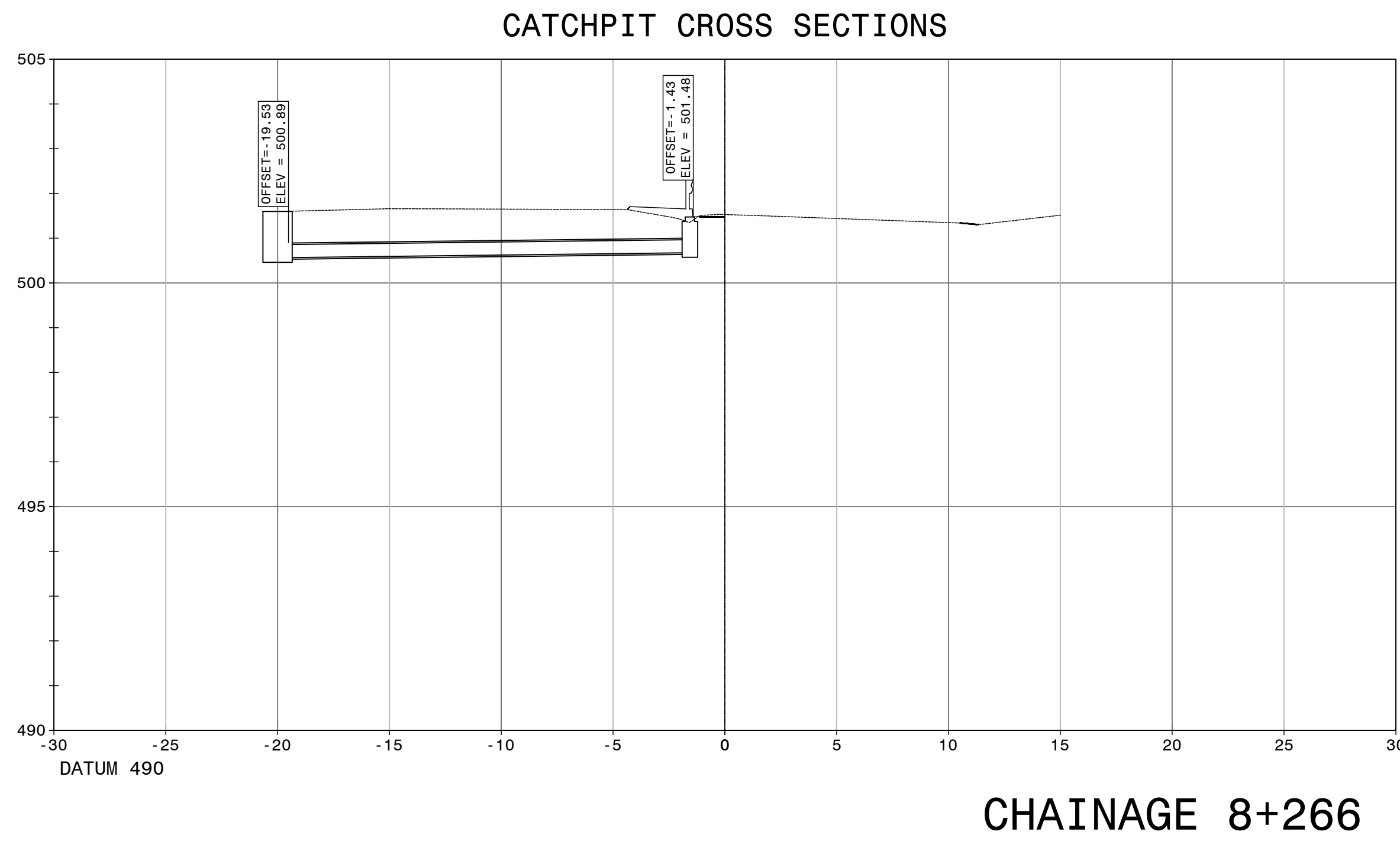
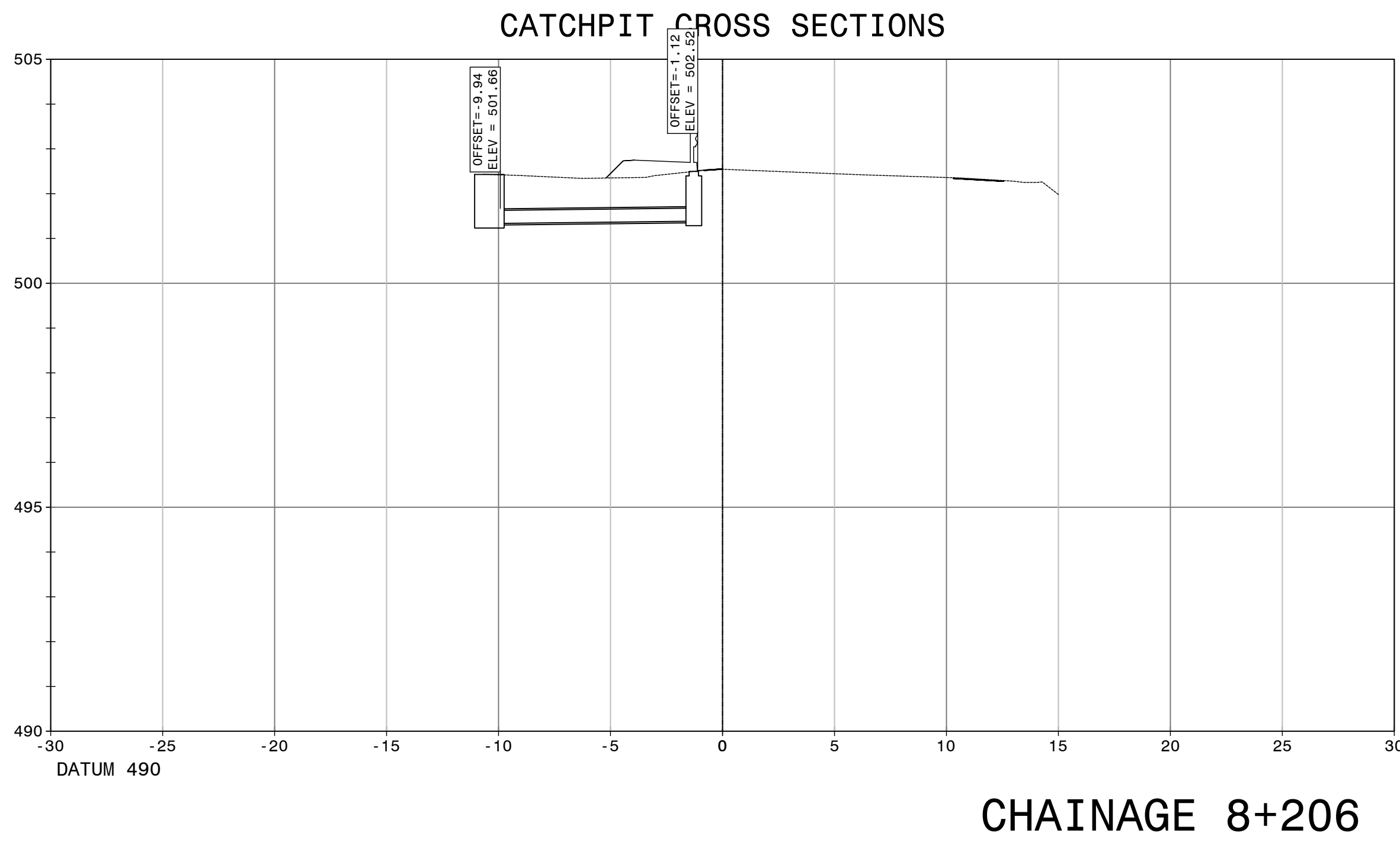
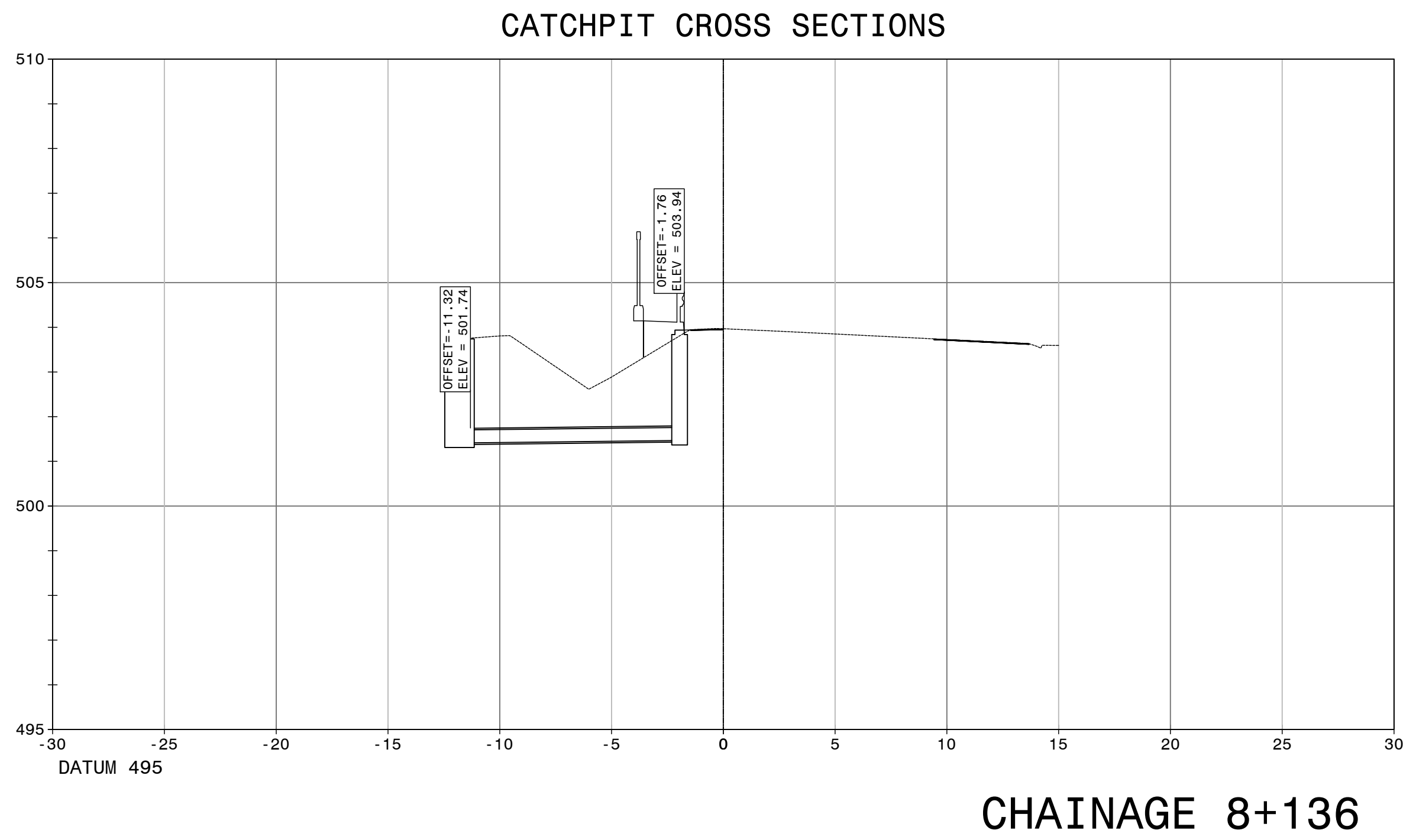
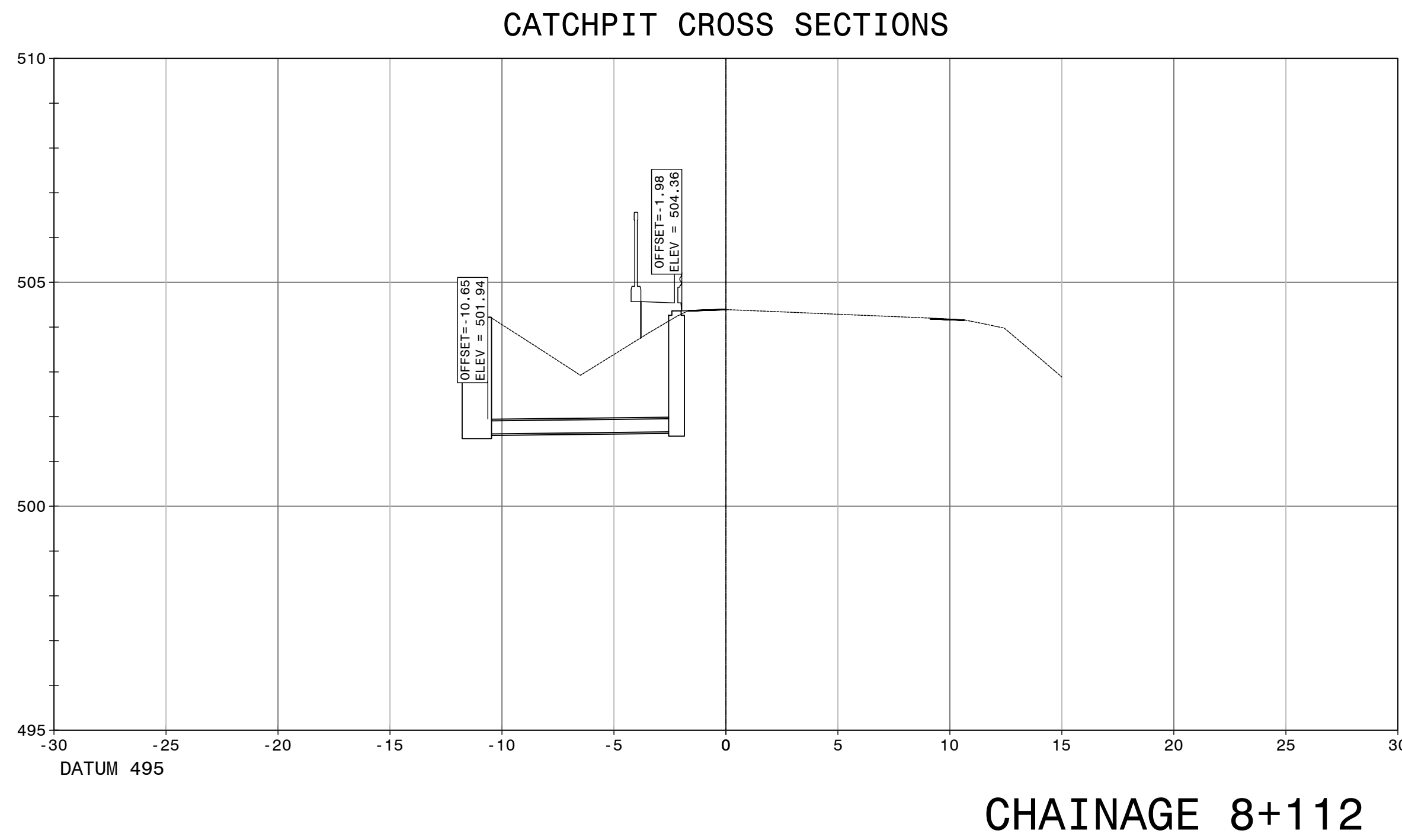
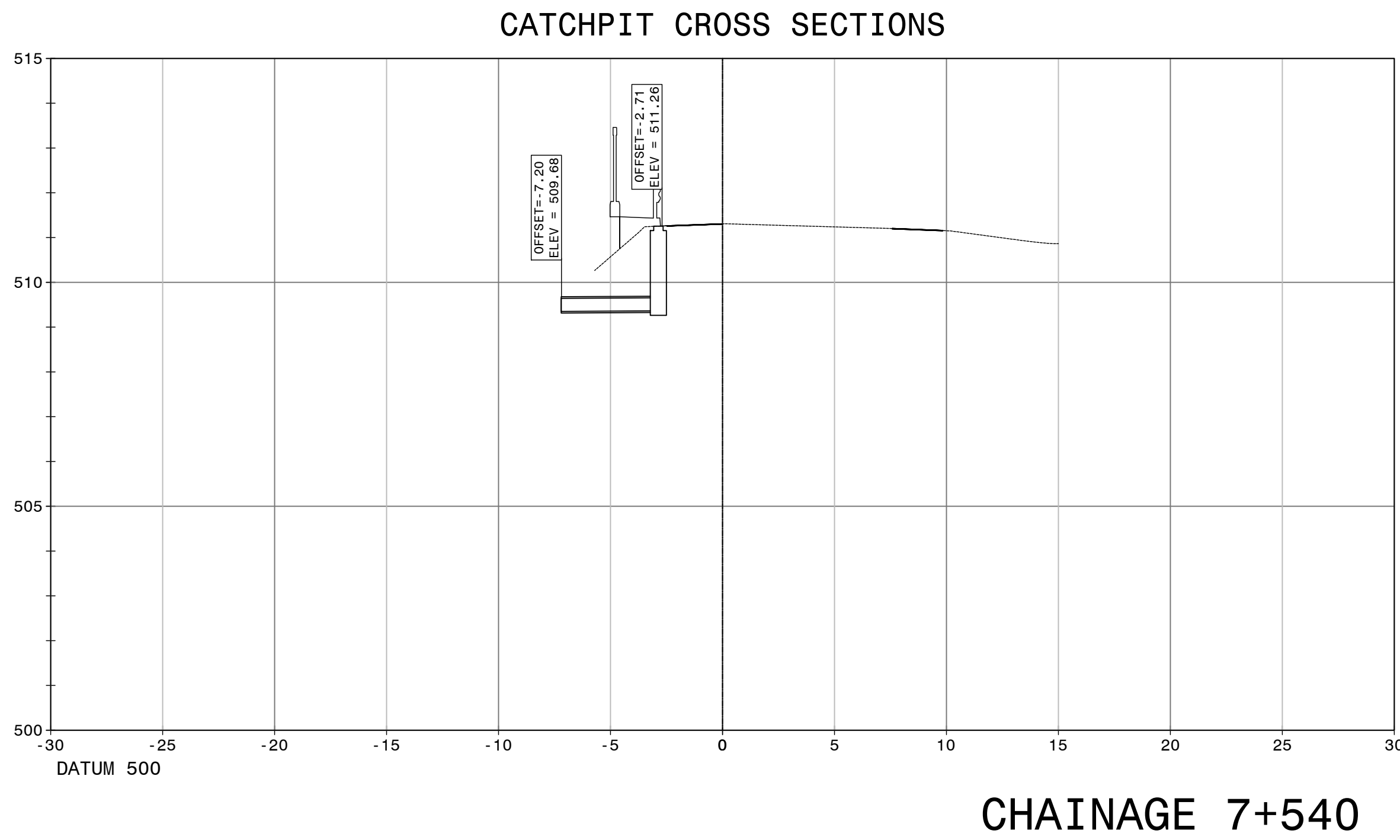
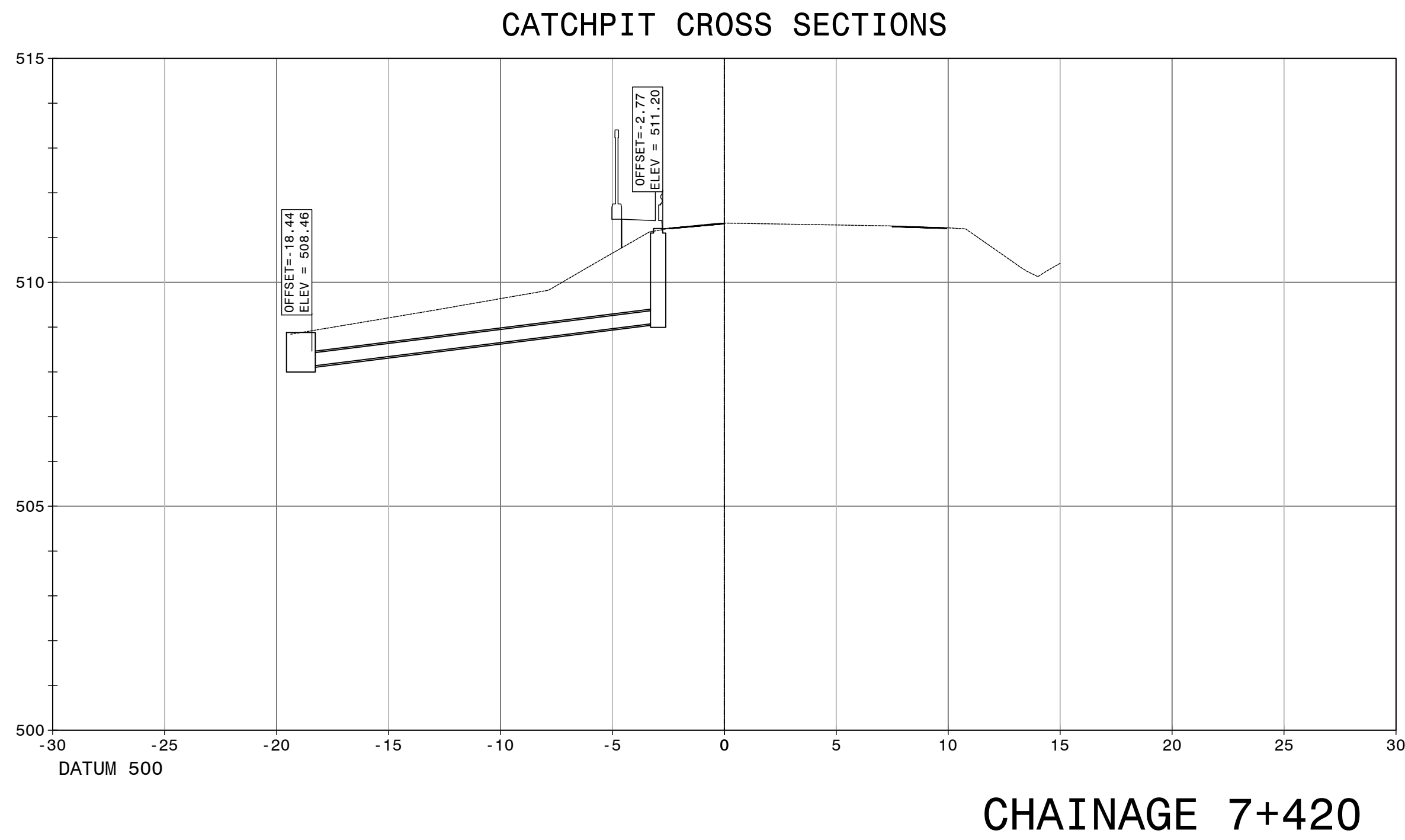
FOR TENDER PURPOSES

CONSTRUCTION RECORD WORKS CONTRACT ENGINEER				DESIGNED BY				CONSULTANT APPROVAL				PROJECT DESCRIPTION			
Name : Prof. Reg. No. : Date :				Name : H.KRITZINGER Prof. Reg. No. : 202202081 Checked by : Name : S.KASIPERSAD Prof. Reg. No. : 20100184 Drawn by : W.JOUBERT				Name : S.KASIPERSAD Prof. Reg. No. : 20100184 Date : SEPT 2023				CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)			
SANRAL PROJECT MANAGER				HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000				EASTERN REGION 58 van Eck Place Pietmaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100				DRAWING DESCRIPTION TEMPORARY ROAD TRAFFIC MANAGEMENT : GENERAL DETAILS			
V1 SEPT 2023 ORIGINAL VERSION				S. KASIPERSAD CONSULT. ENG.				for CEO SA NATIONAL ROADS AGENCY LTD.				PROJECT NUMBER DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #			
No. DATE REVISION				Tel: 012 001 0528 e-mail : info@skicivil.co.za				Scale : 1:1000				SHEET 1 OF 1			
				SKI Civil & Structural Engineers				BUILDING SOUTH AFRICA THROUGH BETTER ROADS				VER 1			



				CONSTRUCTION RECORD WORKS CONTRACT ENGINEER		POSTAL ADDRESS : PRIVATE BAG X37 LYNNWOOD RIDGE PRETORIA 0040		 SKI Civil & Structural Engineers		PHYSICAL ADDRESS : 78 PONY STREET TYSER VALLEY PRETORIA 0056		DESIGNED BY NAME : Prof. Reg. No. : CHECKED BY NAME : Prof. Reg. No. : DRAWN BY NAME : W. JOUBERT		CONSULTANT APPROVAL Name : Prof. Reg. No. : Date : S. KASIPERSAD 20160184 SEPT 2023		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		 BUILDING SOUTH AFRICA THROUGH BETTER ROADS		EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100		ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:		PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		PROJECT NUMBER DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #		NRA.C.004-099-2023/1 START N2 22 km 0,80 ROADS - TRAFFIC ACCOM N/A TP1802-19-05-25-09-006 VER V1	
V1 SEPT 2023		ORIGINAL VERSION		S. KASIPERSAD CONSULT. ENG.		Tel: 012 001 0528 e-mail : info@skicivil.co.za																DRAWING DESCRIPTION TEMPORARY ROAD TRAFFIC MANAGEMENT TRAFFIC CALMING MEASURES		SCALE : 1:1000		SHEET 1 OF 1			

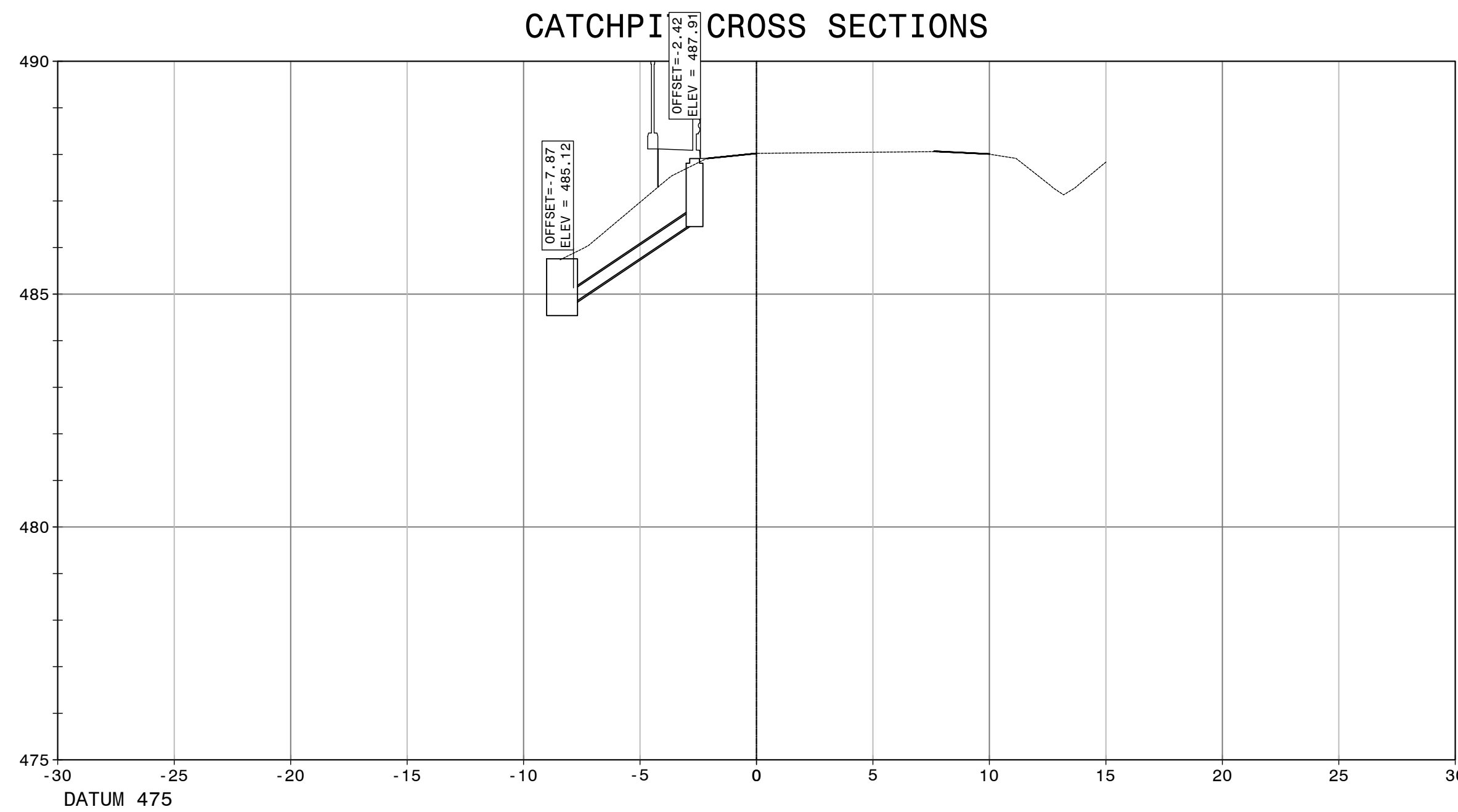
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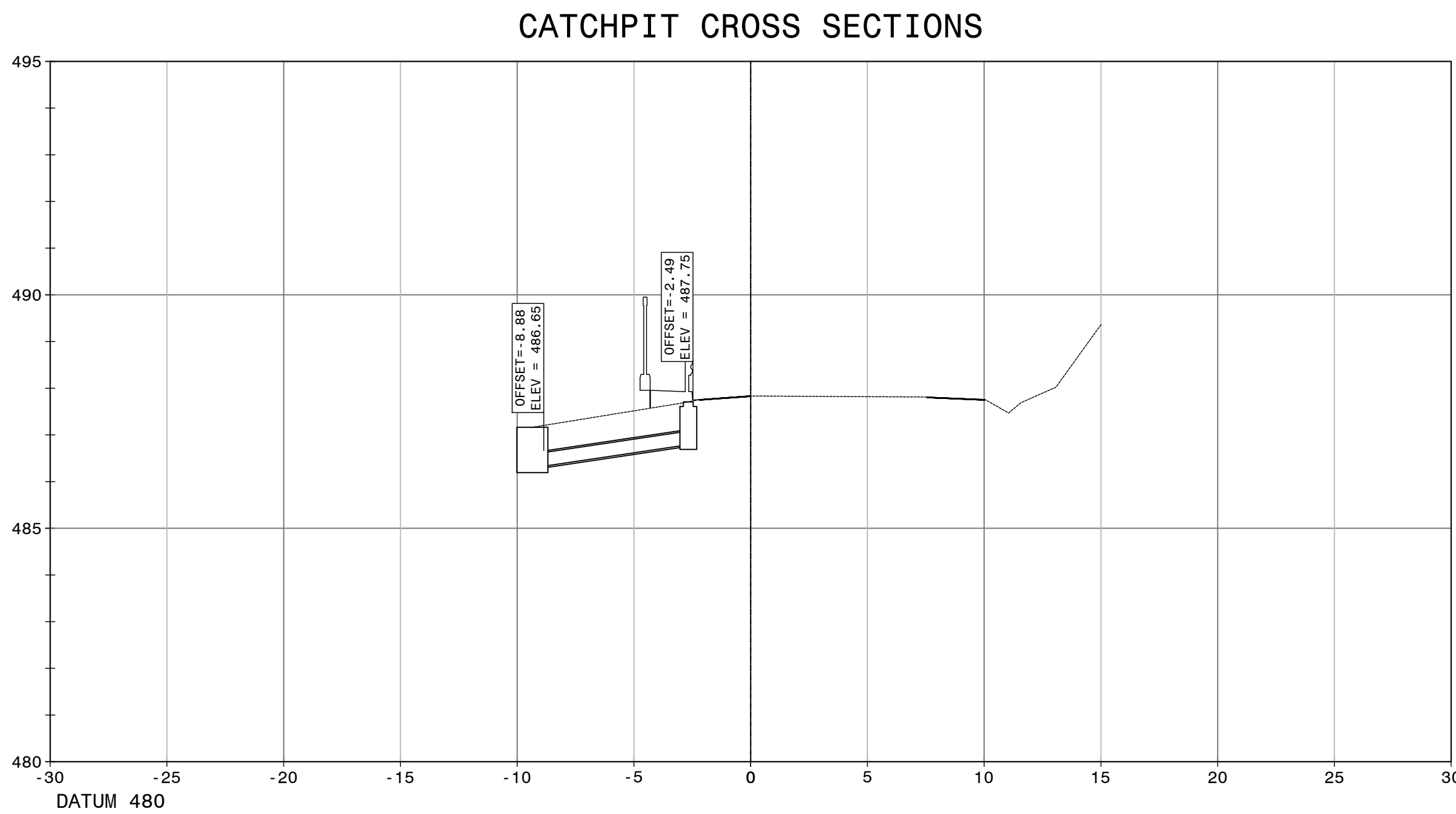
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			CONSTRUCTION RECORD		HEAD OFFICE		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
			WORKS CONTRACT ENGINEER		48 Tambotie Avenue		58 van Eck Place		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
			Name : ..		Val de Grace		Pietermaritzburg				ROUTE		N2		N2	
			Prof. Reg. No. : ..		0184		3201				SECTION		22		22	
			Date								DRAWING km DISTANCE		km 0,80		km 18,64	
			SANRAL PROJECT MANAGER		PO Box 415		PO Box 100410				DRAWING TYPE		ROADS - DRAINAGE			
			Name : ..		Pretoria 0001		Scottsville				BRIDGE/STRUCTURE No.		N/A			
			Prof. Reg. No. : ..		South Africa		3209				CONSULTANT DRAWING No.		TP1802-19-05-25-16-001		VER	
			Date								SANRAL DOCUMENT #		-		V1	
V1	SEPT 2023	ORIGINAL VERSION	G.J. LOUBSER								PACKAGE A: N2-22 CATCHPIT DETAIL SECTIONS		SCALE : 1:200		SHEET 1 OF 3	
No.	DATE	REVISION	CONSULT. ENG.													

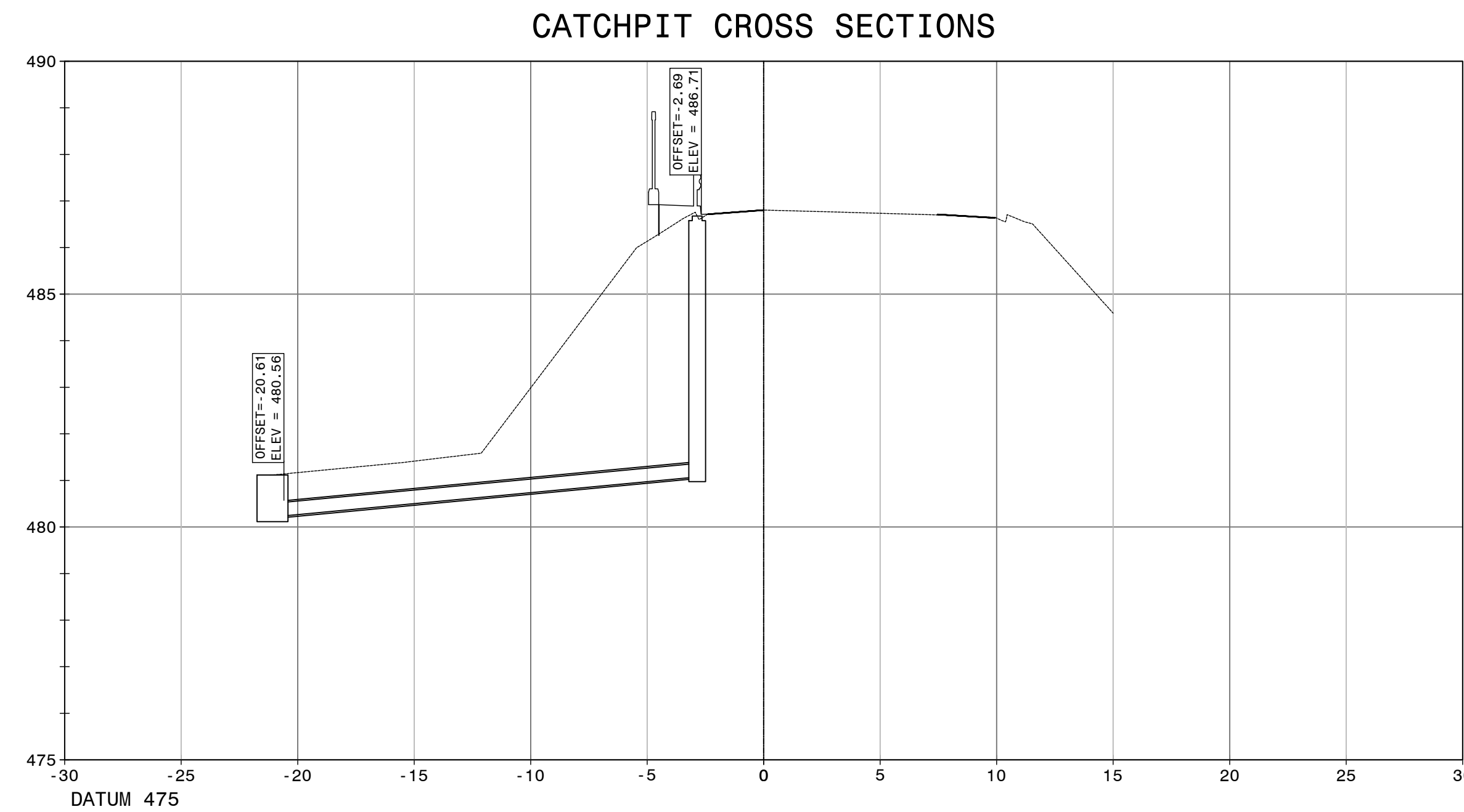
DRAWING No. TP1802-19-05-25-16-001



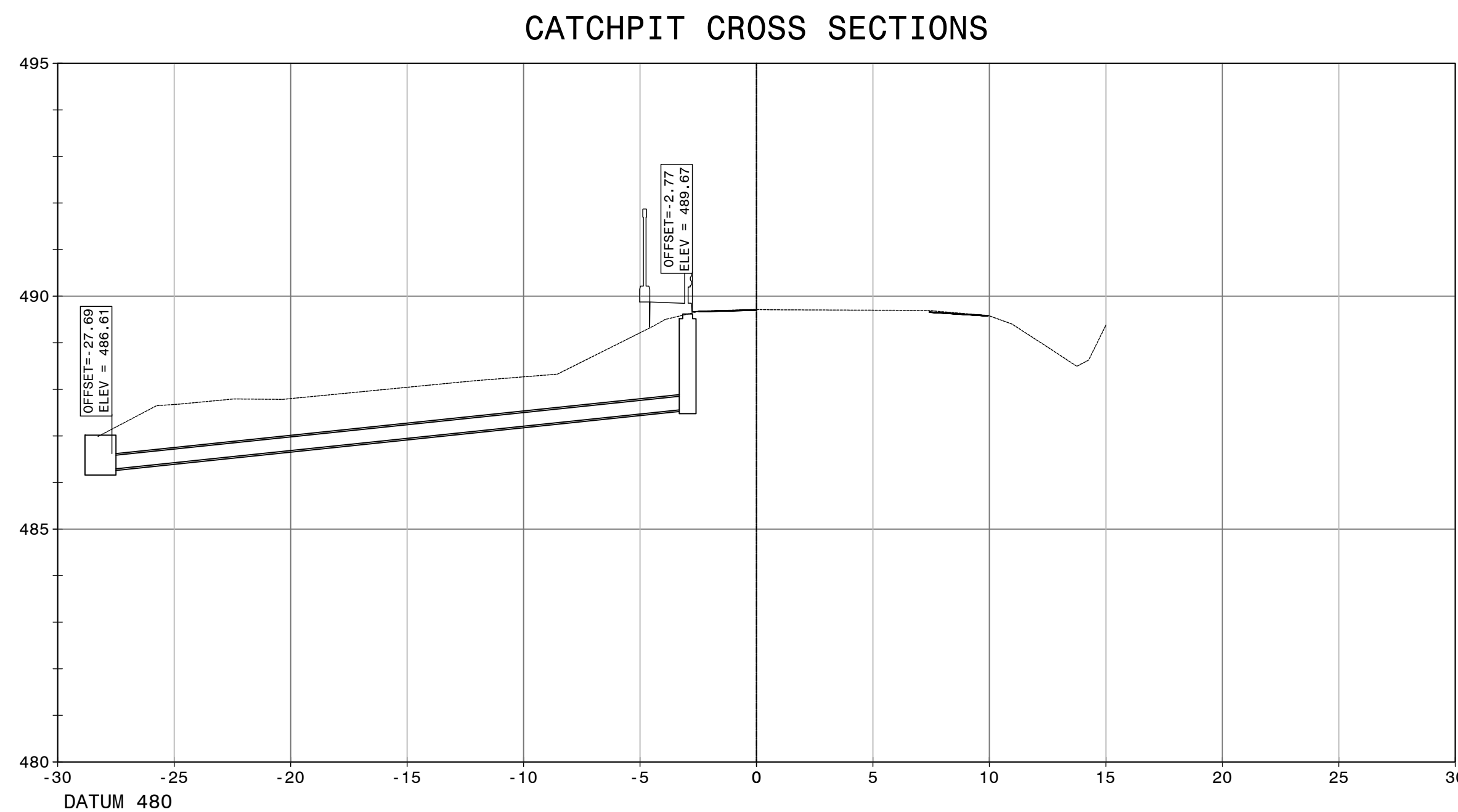
CHAINAGE 8+959



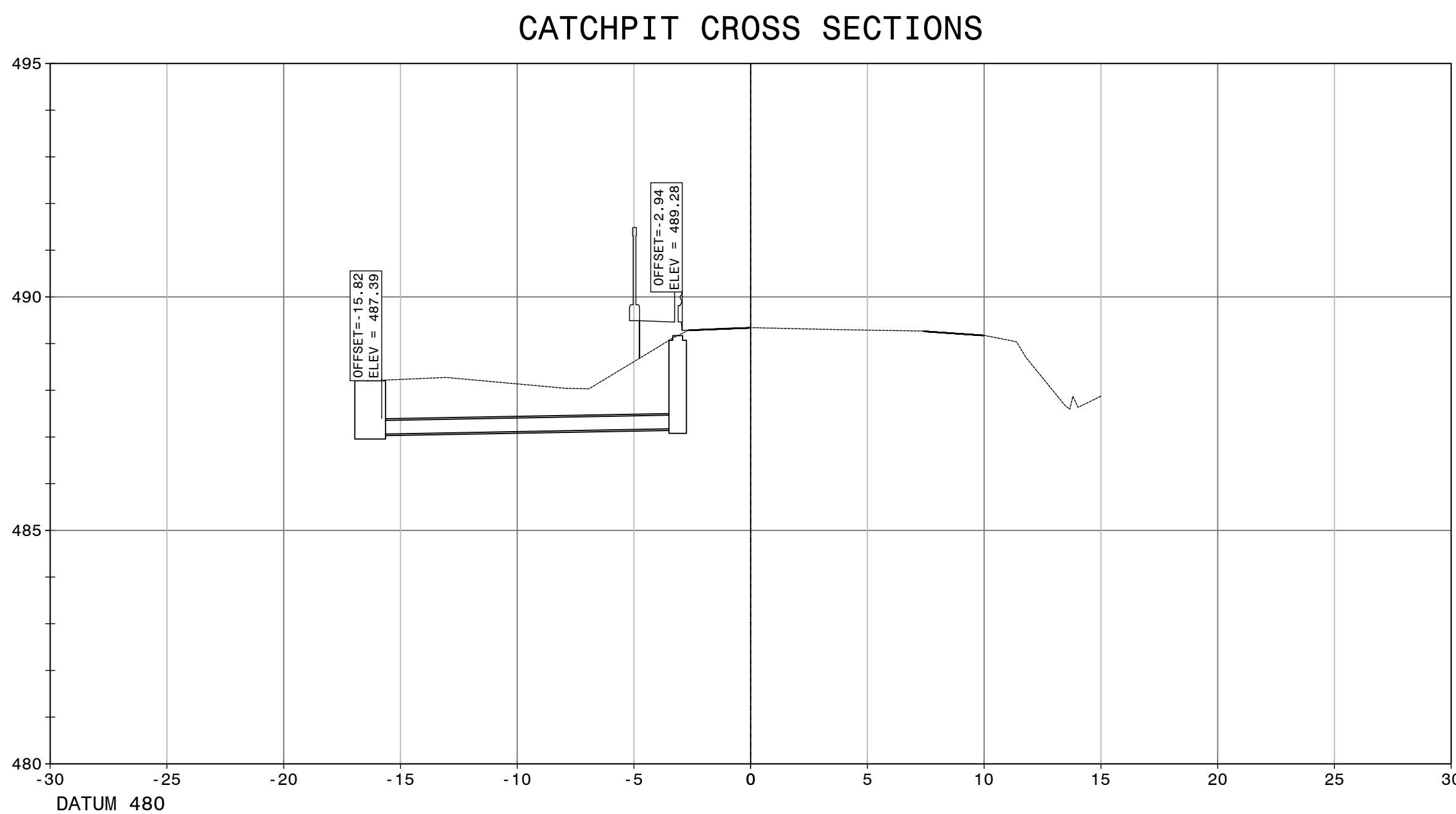
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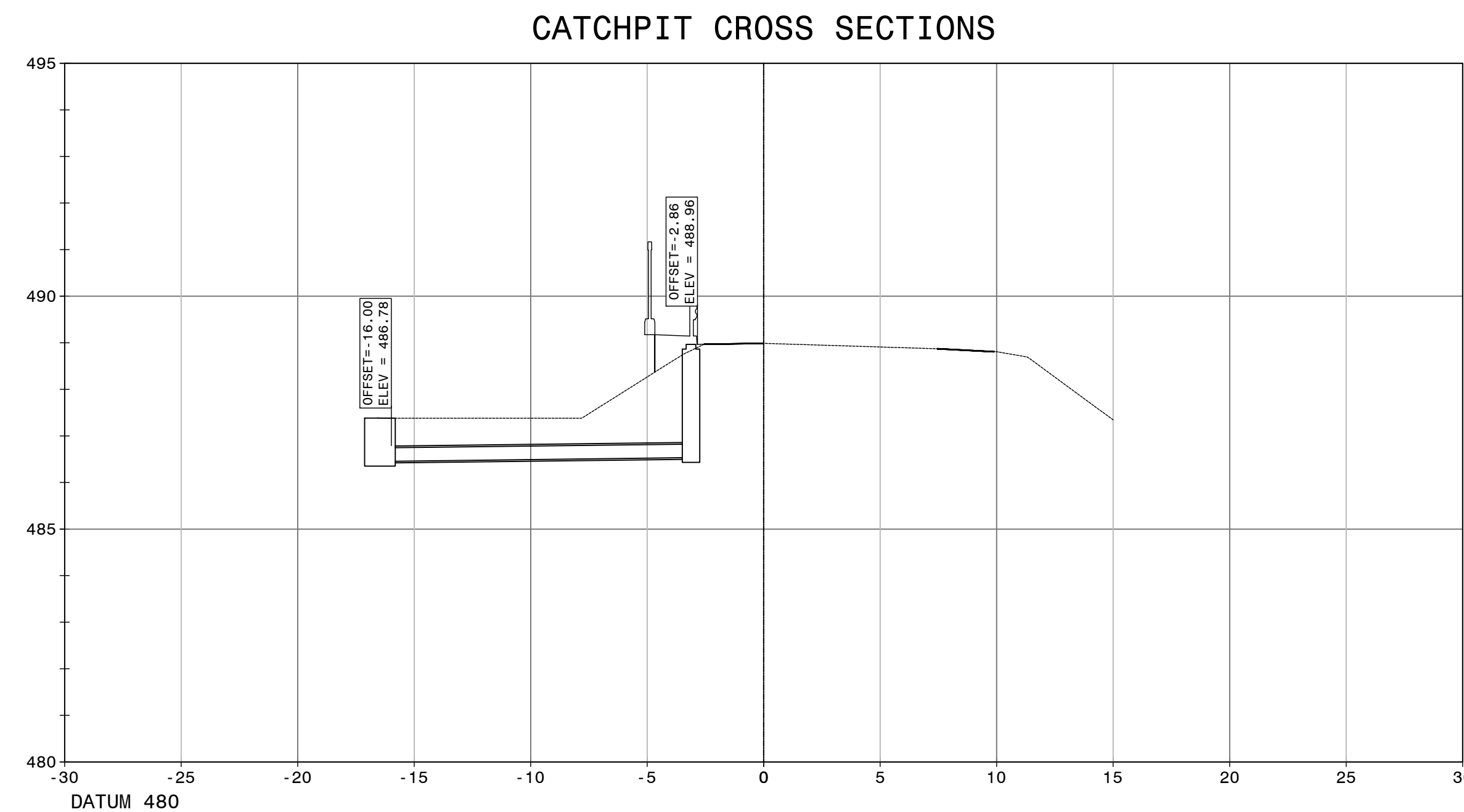
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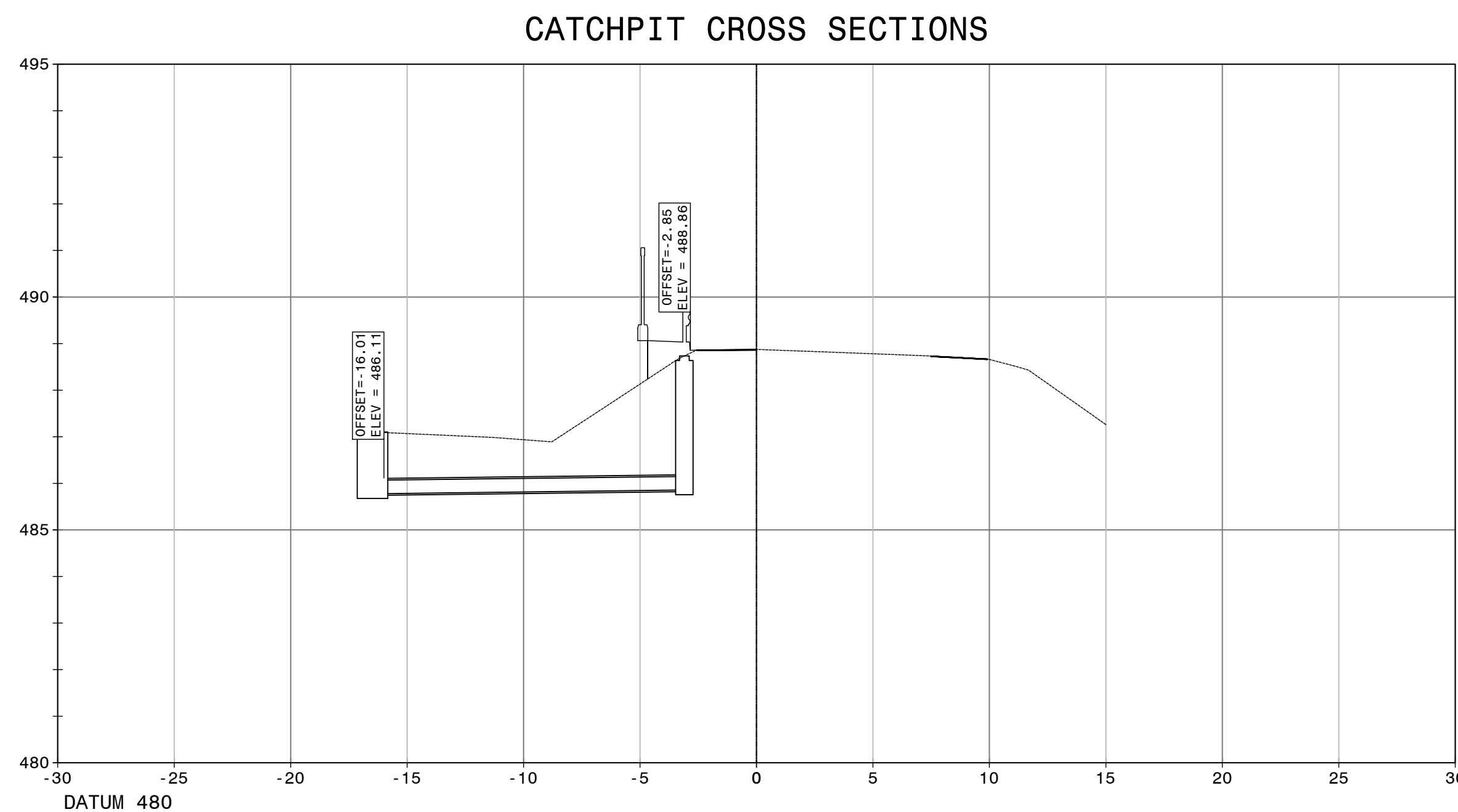
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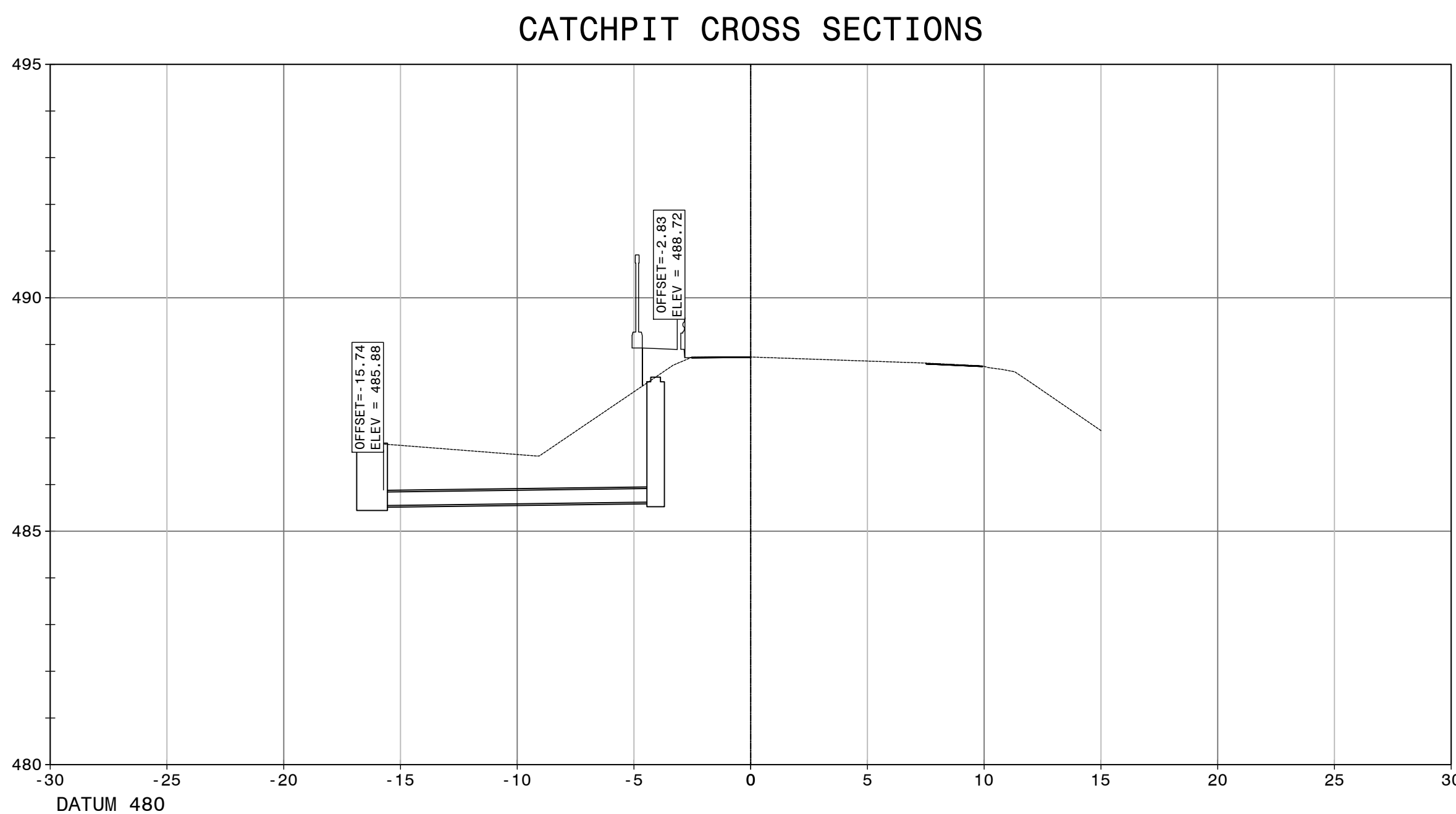
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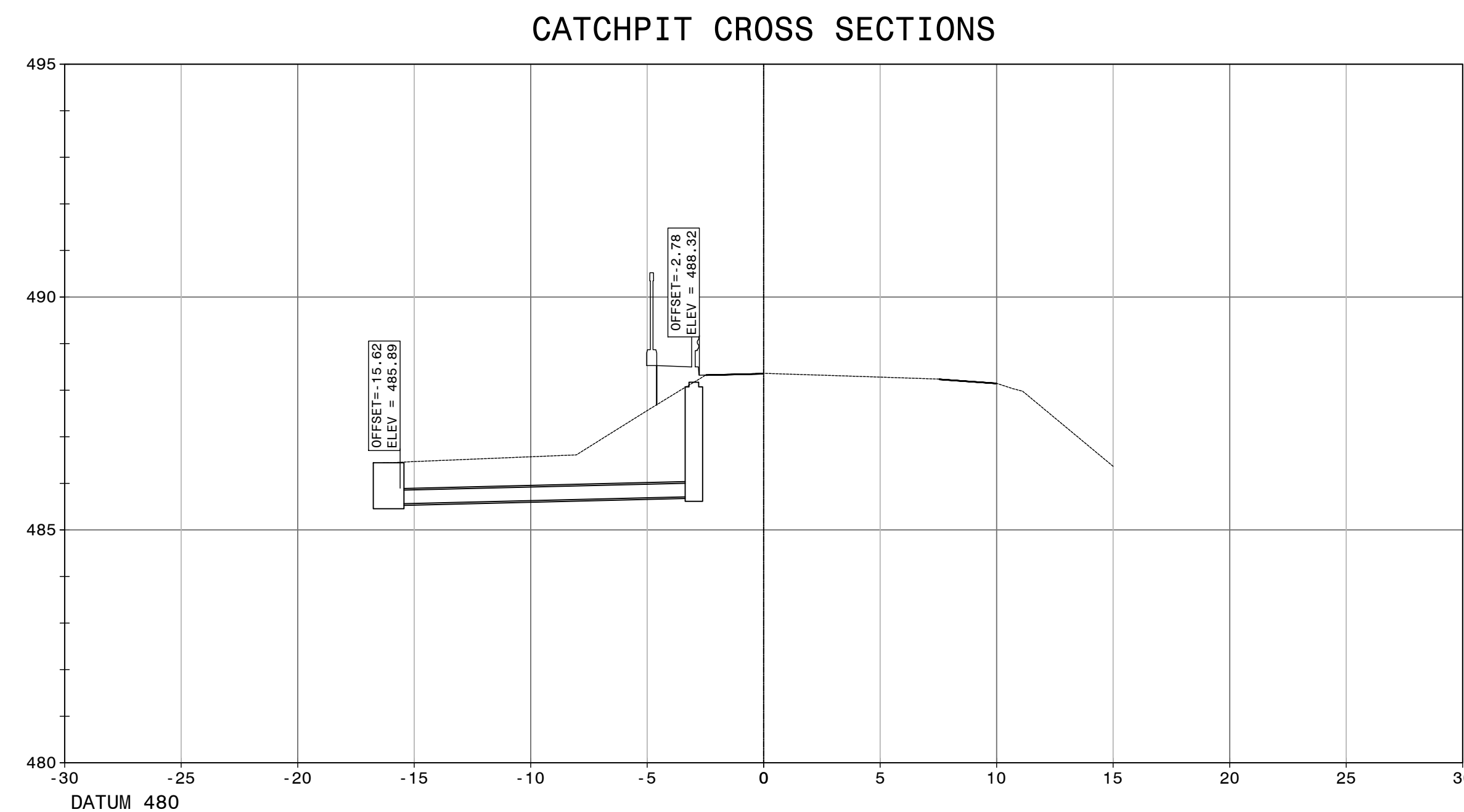
CHAINAGE 9+857



CHAINAGE 9+875



CHAINAGE 9+892



CHAINAGE 9+942

FOR TENDER PURPOSES

			CONSTRUCTION RECORD		
			WORKS CONTRACT ENGINEER		
			Name : ..		
			Prof. Reg. No. : ..		
			Date : ..		
			SANRAL PROJECT MANAGER		
			</		

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000



EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:


PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
PACKAGE A: N2-22 CATCHPIT DETAIL SECTIONS	
SCALE :	1:200
SHEET 2 OF 3	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - DRAINAGE	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-16-002	
SANRAL DOCUMENT #		-	VER V1

DRAWING No. TP1802-19-05-25-16-002

LEFT EDGE N2-22							
CHANAGE (km)		TOTAL LENGTH (m)	Design flow (m³/s)	DRAIN TYPE	OUTLET TYPE	DRAIN NOTES	OUTLET NOTES
START	OUTLET						
0.837	0.870	33	84	Grass-lined drain	Culvert inlet	Replace existing drain	Connect to new inlet headwall on existing culvert
0.900	0.972	28	72	Grass-lined drain	Culvert inlet	Replace existing drain. Grade in the direction of decreasing channage	Same inlet as above
0.837	0.890	53	80	Barrier Kerb and 300mm channel	Kerb inlet Type C		Connect into grass-lined drain above
0.900	0.898	18	8	Barrier Kerb and 300mm channel	Kerb inlet Type C (Same)		
0.900	0.940	40	77	Barrier Kerb and 300mm channel	Transition to F1.5 drain		
0.940	0.992	52	145	F1.5	Chute F1.5		Chute past end of sidewalk into existing grass-lined drain. Erosion protection as directed by the engineer
7.200	7.110	90	70	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.380	7.200	180	124	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.380	7.420	30	9	Barrier Kerb and 300mm channel	Kerb inlet Type C		
7.540	7.420	120	40	Barrier Kerb and 300mm channel	Kerb inlet Type C (Same)		
7.580	7.540	40	5	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.580	7.880	10	2	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.800	7.580	10	2	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.820	7.800	20	4	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.820	7.894	46	6	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.868	7.892	228	40	Barrier Kerb and 300mm channel	Kerb inlet Type B		
7.892	8.011	119	27	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.011	8.067	96	10	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.067	8.112	45	6	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.112	8.136	24	4	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.136	8.207	71	10	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.207	8.294	99	11	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.298	8.276	10	2	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.276	8.330	54	9	Barrier Kerb and 300mm channel	Transition to F1.5 drain	Between km 8.280 and km 8.300, the shoulder has no cross-fall, and the flow will just spread across the road	
8.330	8.550	220	81	F1.5	Grid inlet (2 grids)		excavate channel to daylight outlet
8.340	8.540	200	72	E1	Chute E1	Last 20m to turn away from the sidewalk and continue along the existing cut slope as the section type transitions to type F-4	
8.900	8.700	140	63	Barrier Kerb and 300mm channel	Kerb inlet Type C		
8.740	8.700	40	11	Barrier Kerb and 300mm channel	Kerb inlet Type C (Same)		
8.740	8.879	139	56	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.879	8.859	80	44	Barrier Kerb and 300mm channel	Kerb inlet Type B		
8.880	9.019	90	31	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.019	9.199	180	31	Barrier Kerb and 300mm channel	Kerb inlet Type B		Angle outlet in direction of increasing channage to daylight at the toe of the fill
9.199	9.254	56	9	Barrier Kerb and 300mm channel	Kerb inlet Type C		
9.310	9.255	55	25	Barrier Kerb and 300mm channel	Kerb inlet Type C (Same)		
9.442	9.310	132	74	Barrier Kerb and 300mm channel	Kerb inlet Type B		
F-AL50E	F-AL50E	268	29	High side kerb and channel			
9.700	9.812	112	19	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.812	9.857	45	7	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.857	9.875	18	3	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.875	9.892	17	3	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.892	9.942	90	9	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.942	9.973	31	6	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.973	9.988	13	5	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.988	9.996	10	7	Barrier Kerb and 300mm channel	Kerb inlet Type B		
9.996	10.136	139	98	Barrier Kerb and 300mm channel	Kerb inlet Type B		
18.240	18.200	40	14	Barrier Kerb and 300mm channel	Kerb inlet Type B		
18.240	18.286	96	12	Barrier Kerb and 300mm channel	Kerb inlet Type B		
18.286	18.302	33	6	Barrier Kerb and 300mm channel	Kerb inlet Type B		
18.302	18.540	208	24	High side kerb and channel			

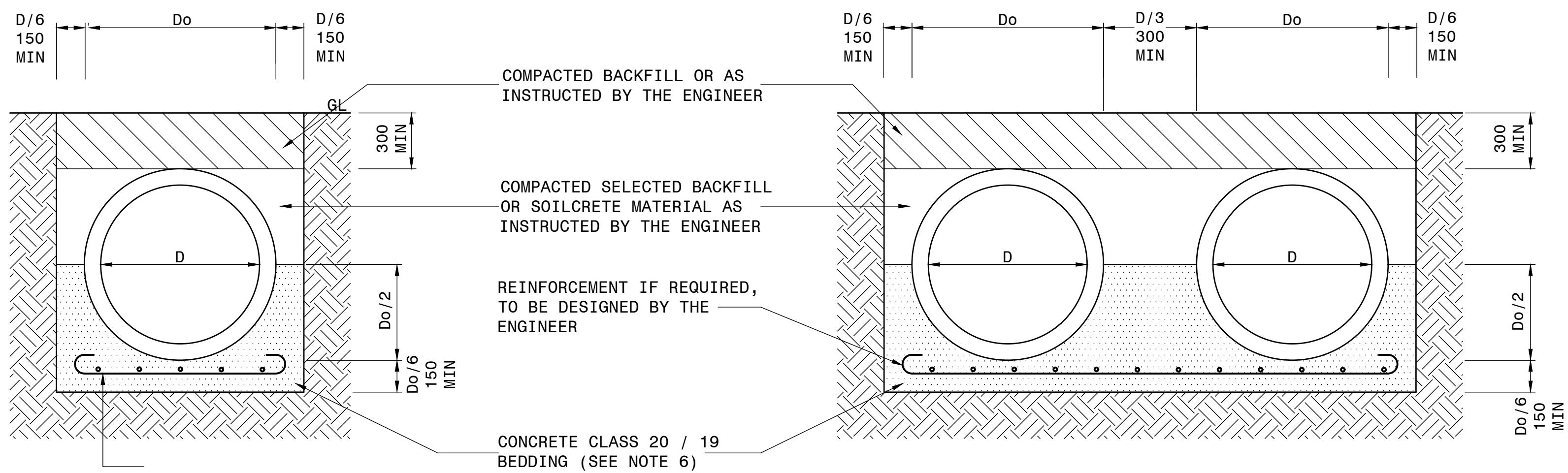
FOR TENDER PURPOSES

			CONSTRUCTION RECORD				HEAD OFFICE				EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER	
			WORKS CONTRACT ENGINEER				58 van Eck Place		SOUTH AFRICAN NATIONAL ROADS AGENCY LTD		58 van Eck Place		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		NRA.C.004-099-2023/1	
			Name : _____				Val de Grace				Pietermaritzburg						DRAWING LOCATION DATA	
			Prof. Reg. No. : _____				Pretoria				3201						ROUTE	
			Date : _____				0184				PO Box 100410						SECTION	
							PO Box 415				Scottsville						DRAWING km DISTANCE	
							Pretoria 0001				3209						km 0,80 km 18,64	
							South Africa				Tel: (033) 392 8100						ROADS - LOCALITY	
			SANRAL PROJECT MANAGER															
			Name : _____															
			Prof. Reg. No. : _____															
			Date : _____															
					</													

N2-22: RIGHT EDGE						
CHAINAGE (km)		TOTAL LENGTH (m)	DISCHARGE (l/s)	DRAIN TYPE	OUTLET TYPE	DRAIN NOTES
START	OUTLET					
18.254	18.200	190	328	F1.5	Tie into existing drain	Opening under sidewalk to accommodate existing downchute at start of drain. Existing drain along top of cutting to be retained. Total length and flow are given to the end of the existing drain.
18.240	18.160	80	137	E1	Junction	Join into existing F1.5 drain. Energy dissipation before junction as directed by the engineer.
18.300	18.384	84	98	E1	Grid inlet (4 grids)	Steep section of drain: at transition from section type C4B to type F1 (km 18+320 to 18+340) to be constructed from grouted stone-pitching with stones protruding to roughen the drain.
18.268	18.384	116	121	F1	Grid inlet (4 grids)	
18.480	18.550	70	161	E1	Grid inlet (6 grids)	
18.384	18.554	170	300	F1.5	Existing inlet	
		0	#N/A			

FOR TENDER PURPOSES

			CONSTRUCTION RECORD				HEAD OFFICE		SANRAL		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1			
			WORKS CONTRACT ENGINEER				48 Tambotie Avenue		58 van Eck Place		58 van Eck Place		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START		END	
			Name :				Val de Grace		Pietermaritzburg		Pietermaritzburg						ROUTE		N2		N2	
			Prof. Reg. No. :				Pretoria		3201		3201						SECTION		22		22	
			Date :				0184										DRAWING km DISTANCE		km 0,80		km 18,64	
			SANRAL PROJECT MANAGER				PO Box 415		Scottsville		PO Box 100410						DRAWING TYPE		ROADS - LOCALITY			
			Name :				Pretoria 0001		3209		for CEO: SA NATIONAL ROADS AGENCY LTD.						BRIDGE/STRUCTURE No.		N/A			
			Prof. Reg. No. :				South Africa				Date :						CONSULTANT DRAWING No.		TP1802-19-05-25-18-002		VER	
			Date :														SANRAL DOCUMENT #		-		V1	
V1 SEPT 2023 ORIGINAL VERSION			S. KASIPERSAD														SCALE : 1:1000		SHEET 2 OF 2			
No. DATE REVISION			CONSULT. ENG.																			

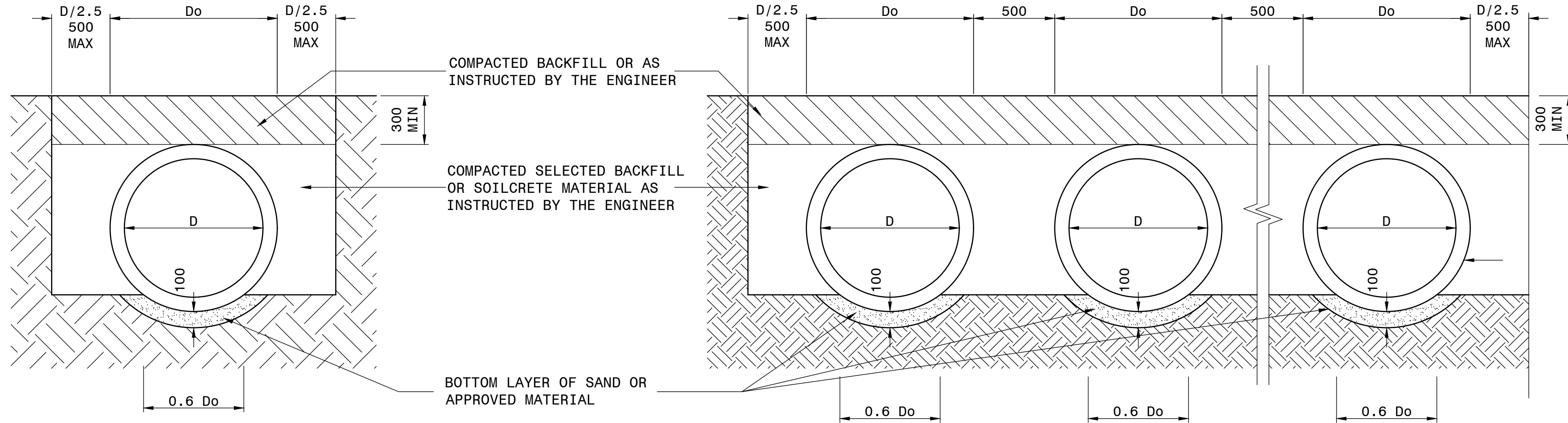


CLASS "A" BEDDING FOR SOFT EXCAVATIONS (SINGLE PIPE)

N.T.S.

CLASS "A" BEDDING FOR SOFT EXCAVATIONS (DOUBLE PIPE)

N.T.S.

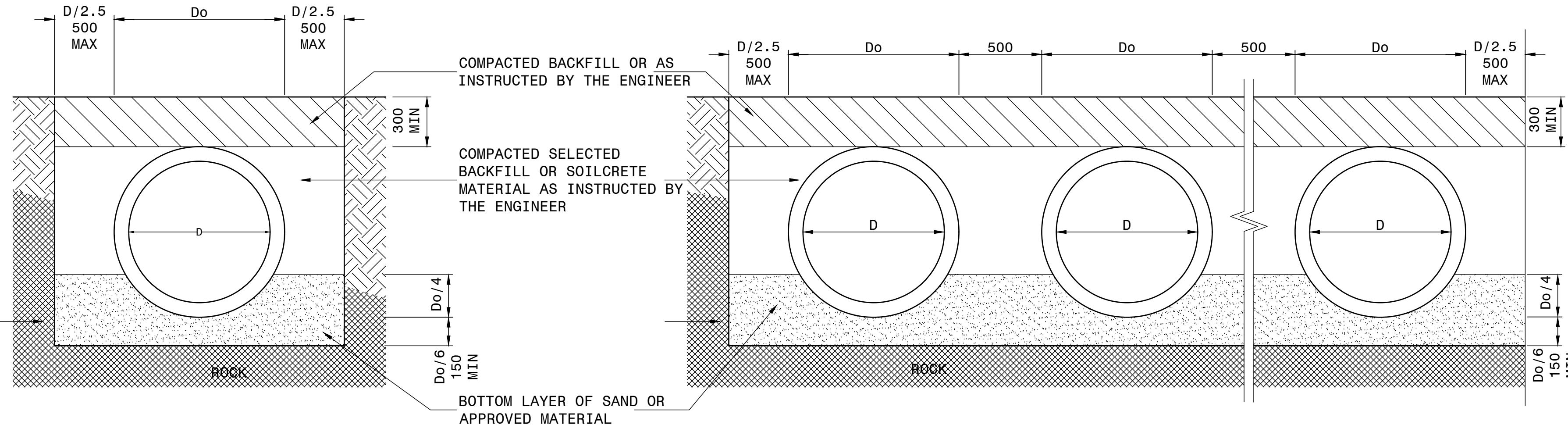


CLASS "B" BEDDING FOR SOFT EXCAVATIONS (SINGLE PIPE)

N.T.S.

CLASS "B" BEDDING FOR SOFT EXCAVATIONS (DOUBLE PIPE)

N.T.S.

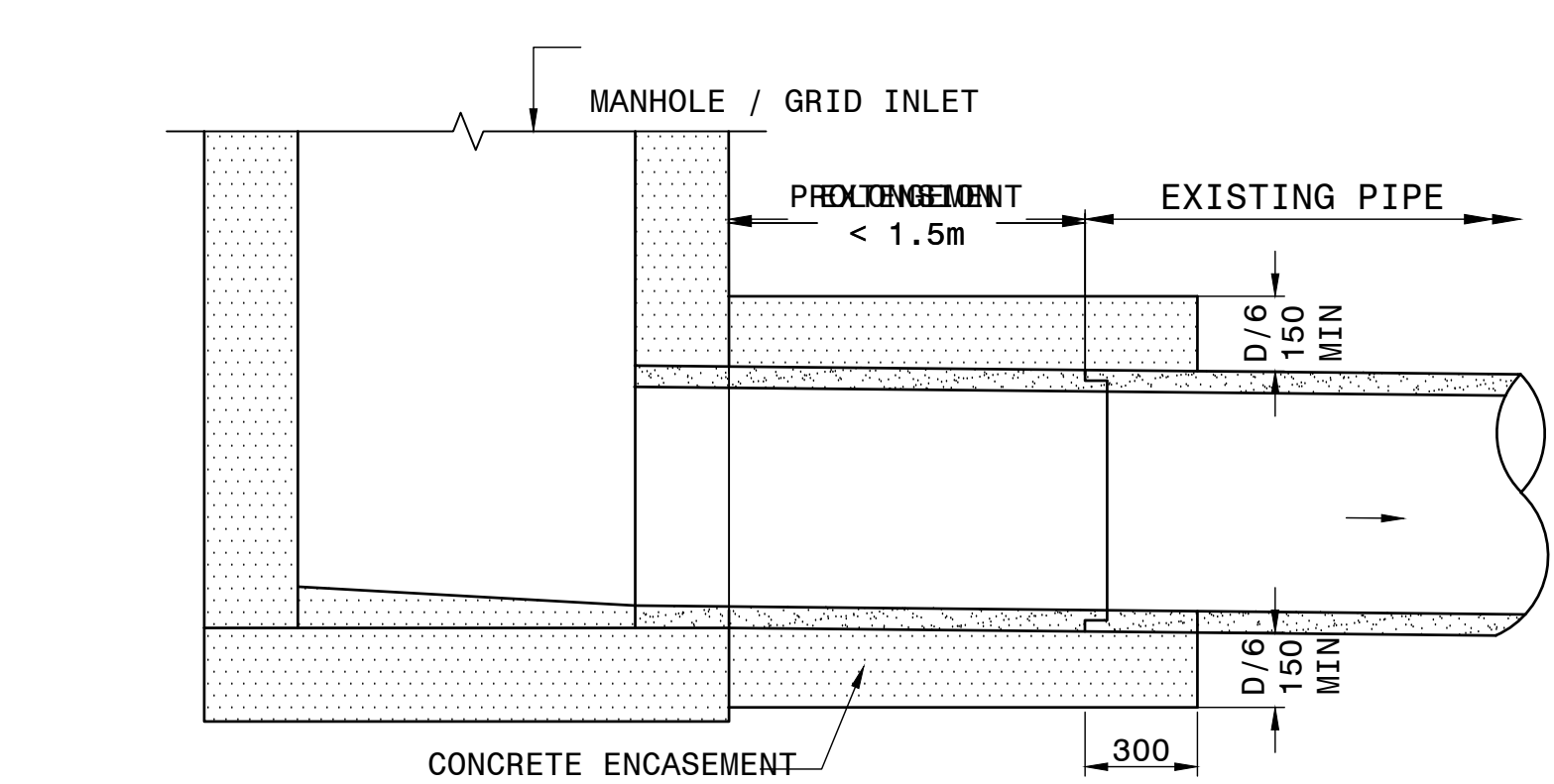


CLASS "B" BEDDING FOR HARD EXCAVATIONS (SINGLE PIPE)

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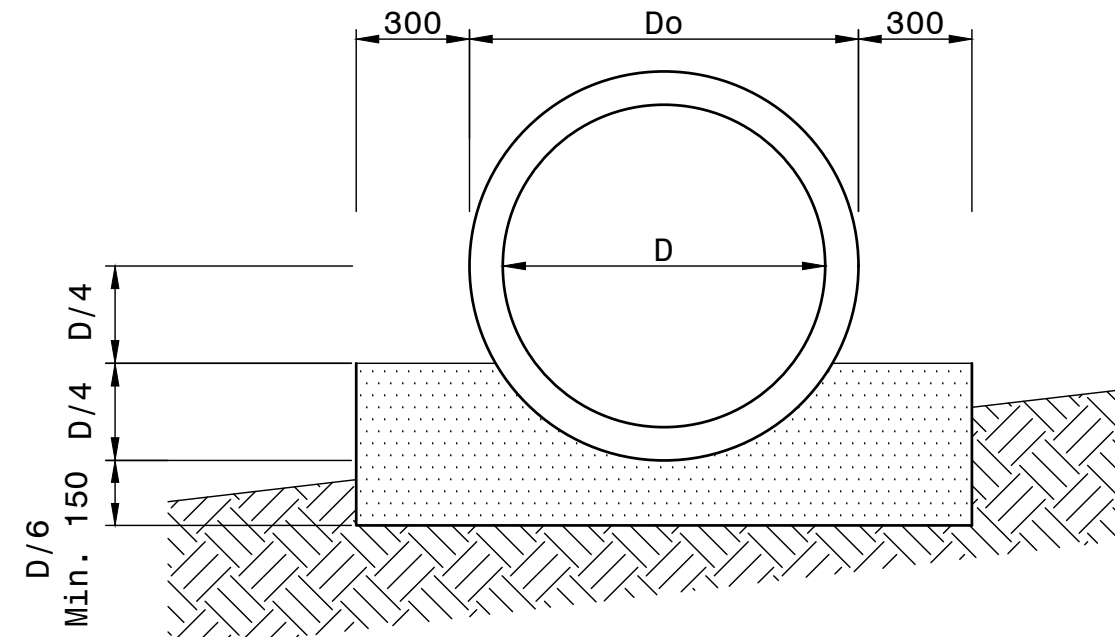
CLASS "B" BEDDING FOR HARD EXCAVATIONS (DOUBLE PIPE)

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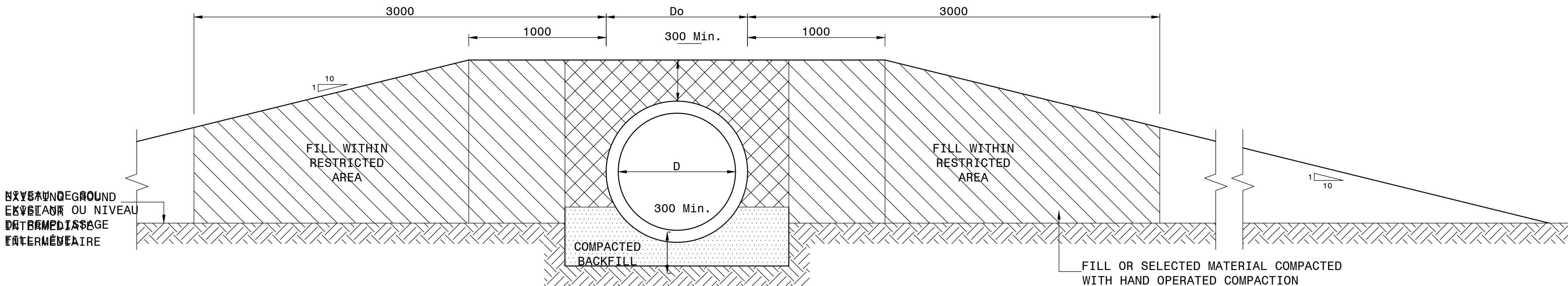
TYPICAL CROSS SECTION CONCRETE ENCASEMENT OF PIPE EXTENSIONS LESS THAN 1.5m IN LENGTH

NTS



CLASS "A" BEDDING FOR EMBANKMENT CONDITIONS

N.T.S.



EMBANKMENT INSTALLATION (CLASS "A" BEDDING)

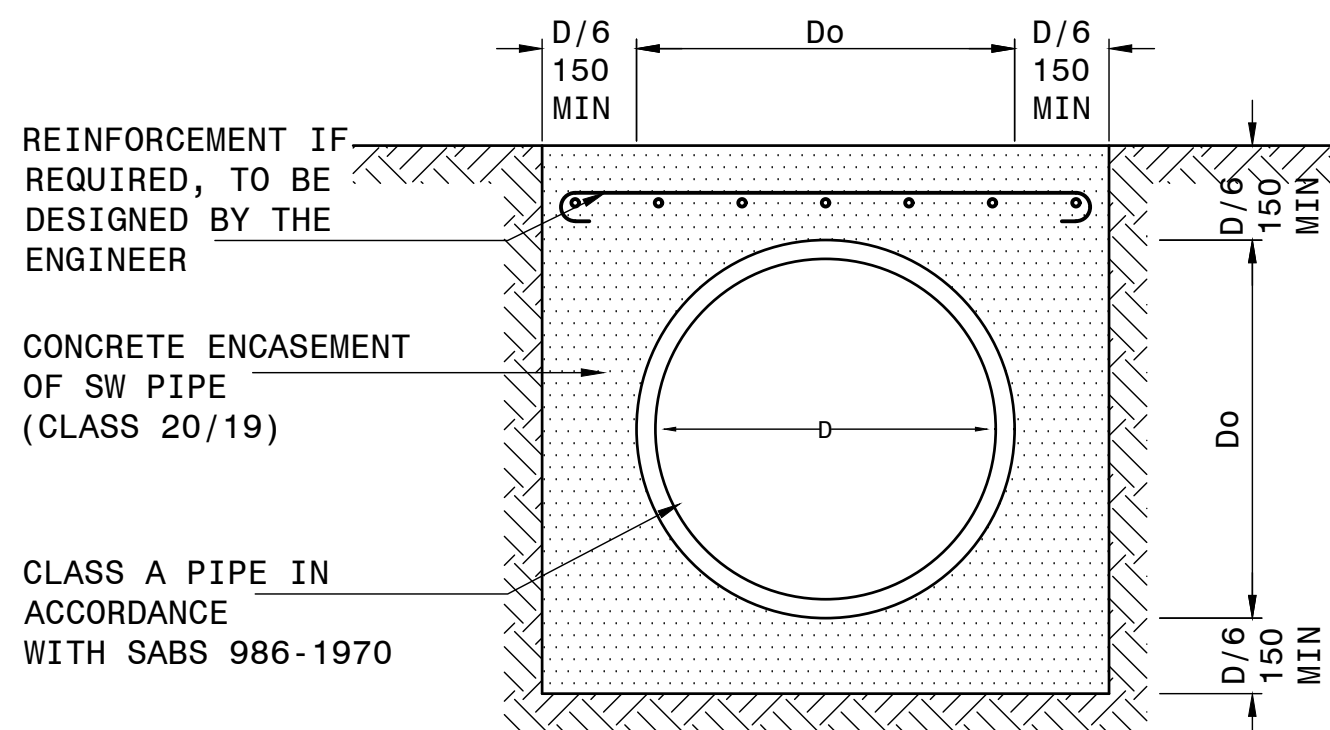
N.T.S.

LEGEND:

H = TOTAL COVER OVER THE PIPE BELOW THE FINAL ROAD LEVEL
D = INTERNAL BARREL DIMENSION
Do = OUTSIDE BARREL DIMENSION
QL = GROUND LEVEL MEANING EITHER OF THE INTERMEDIATED FILL LEVEL IN ORDER TO PROVIDE THE MINIMUM COVER OVER THE PIPE FOR A TRENCH CONDITION OR THE UNDERSIDE OF THE SELECTED SUBGRADE OR SUBBASE.

NOTES:

- ALL CONCRETE PIPES MUST COMPLY WITH REQUIREMENTS OF WITHOUT 667 - 1986, STANDARD SPECIFICATIONS FOR PRESSURE FREE PIPES.
- THE MAXIMUM WHEEL LOAD AUTHORIZED ON THE PIPE IS 90 KN, WITH A MINIMUM FILLING OF 300 mm ON THE TOP OF THE PIPE.
- THE TRENCH SHALL BE UNIFORMLY GRADED SUCH THAT EACH PIPE BARREL CAN BE UNIFORMLY SUPPORTED OVER ITS FULL LENGTH AT THE CORRECT GRADES AND LEVELS.
- MATERIAL THAT THE ENGINEER CONSIDERS TO BE UNSUITABLE AS THE BOTTOM OF THE TRENCH SHALL BE EXCAVATED TO THE DEPTHS DIRECTED AND DISPOSED OF IN THE MANNER DIRECTED BY THE ENGINEER.
- HARD OBJECTS AND ROCKS SHALL BE REMOVED TO A DEPTH OF 100mm BELOW THE SPECIFIED TRENCH BOTTOM.
- WHERE THE BOTTOM OF THE TRENCH HAS BEEN LOOSENED DURING EXCAVATION, IT SHALL BE COMPACTED TO 90% MODAASHTO MAXIMUM DENSITY BEFORE PLACING THE BEDDING.
- CLASS B BEDDING MATERIAL SHALL BE COHESIONLESS MATERIAL, ALL OF WHICH SHALL PASS THROUGH A 6.7mm SIEVE AND NONE WHICH SHALL PASS THROUGH A 0.15mm SIEVE.
- JOINT HOLES SHALL BE FORMED IN THE BEDDING CRADLE TO ENSURE THAT THE PIPE IS FULLY SUPPORTED AND ALLOW FOR WRAPPING. THESE HOLES ARE TO BE FILLED WITH SAND OR APPROVED GRANULAR MATERIAL AFTER WRAPPING.
- THE PIPES SHALL BE LAID FROM ONE END, HARD UP AGAINST EACH OTHER SO AS TO OBTAIN TIGHT JOINTS.
- ALL JOINTS SHALL FIRST BE TREATED WITH A BITUMEN PRIMER OF 60% BITUMEN EMULSION AND THEN WRAPPED ALL ROUND WITH TWO LAYERS OF BITUMEN IMPREGNATED BURLAP OF 340g / m², EXTENDING 75mm ON EACH SIDE OF THE JOINT.
- BACKFILL SHALL BE PLACED IN LAYERS NOT EXCEEDING 150mm SIMULTANEOUSLY AND EQUALLY ON BOTH SIDES OF THE CULVERT.
- BACKFILL SHALL BE COMPACTED TP 93% OF MODAASHTO MAXIMUM DENSITY IN AREAS SUBJECT TO TRAFFIC LOADS AND 90% OF MODAASHTO MAXIMUM DENSITY IN OTHER AREAS.
- CLASS CONCRETE A BED AND A CONCRETE ENVELOPE MUST BE CLASSIFIED 20/19.
- CLASS CONCRETE, A BEDDING MAY BE REINFORCED OR NOT REINFORCED IN ACCORDANCE WITH THE CONDITIONS.
- MINIMUM 300 mm OF FILLER OR CONCRETE MATERIAL SELECTED ON PIPES.
- IN CASES WHERE H < 600 mm THE PIPE MUST BE COATED WITH 20/19 CLASS CONCRETE AS INDICATED.
- ALL CULVERTS TO BE EXTENDED MUST BE CONSTRUCTED UNDER FILLING CONDITIONS TO GUARANTEE THE FREE PASSAGE OF RUNOFF WATERS DURING CONSTRUCTION.
- ON CULVERT EXTENSIONS WHERE THE CURRENT SOIL LEVEL IS LESS THAN THE INTENDED TURNING LEVEL, THE SPACE MUST BE FILLED WITH FOUNDATION FILLING MATERIAL UP TO A LEVEL WHICH WILL BEABLY PLACED IN THE BEDDING.




CONCRETE ENCASUREMENT OF PIPES

SCALE : N.T.S.

NOMINAL PIPE DIA (D) Ø	DIA OUTSIDE (Do) (approx)	SIDE ALLOWANCE PER SIDE		
		ENCASE 150min	BEDDING	
			CLASS A Do/6 150 MIN	CLASS B Do/2.5 150 MAX
600	700	150	150	275
750	870	150	150	350
900	1 030	175	175	400
1 050	1 195	200	200	500
1 200	1 360	225	225	500
1 350	1 525	250	250	500
1 500	1 680	300	300	500

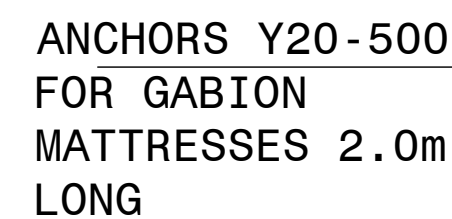
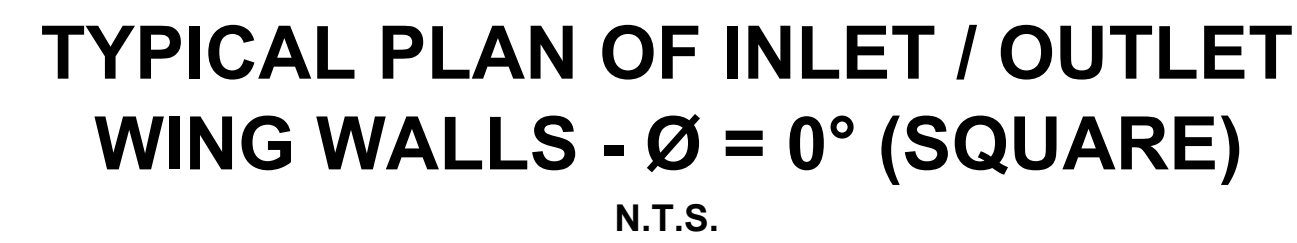
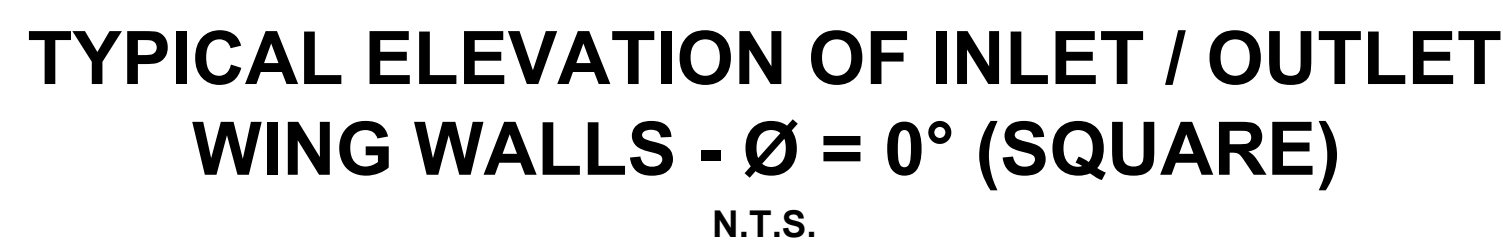
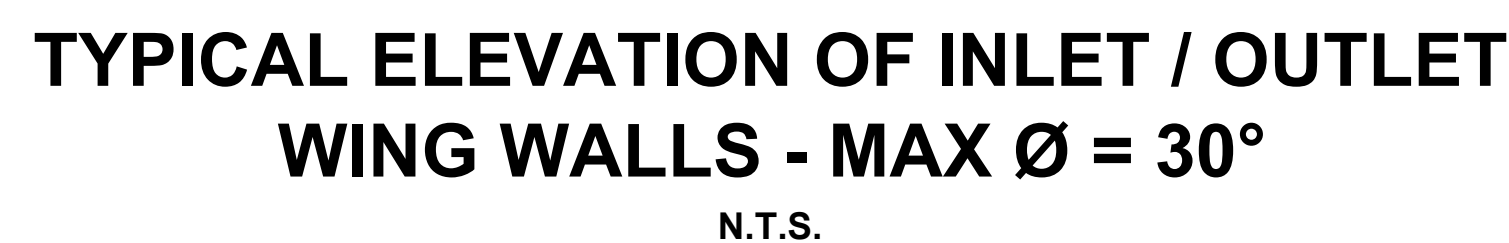
CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name: _____			
Prof. Reg. No.: _____			
Date: _____			
SANRAL PROJECT MANAGER			
Name: _____			
Prof. Reg. No.: _____			
Date: _____			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY  BUILDING SOUTH AFRICA THROUGH BETTER ROADS		EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100		ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____		PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		PROJECT NUMBER NRA.C.004-099-2023/1	
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DRAWING DESCRIPTION	
DRAINAGE TYPICALS PIPE LAYING DETAILS	
SCALE : AS SHOWN	SHEET 1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-19-001	
SANRAL DOCUMENT #		-	
		VER	V1

DRAWING No. TP1802-19-05-25-19-001



NOTES FOR INLET / OUTLET WING WALLS:

1. DESIGN CRITERIA

- | | | | |
|------|---|-----------|---------------|
| 1.01 | THE WING WALLS ARE DESIGNED AS CANTILEVERS FIXED TO THE BASE AND SUPPORTED BY THE HEADWALL. | | |
| 1.02 | THE WING WALLS ARE DESIGNED FOR A SURCHARGE OF 750mm AND A MAXIMUM SLOPE OF 1:1,5 FOR ANY FILL HEIGHT. | | |
| 1.03 | THE DENSITY OF SOIL = 20 kN/CUBIC METER | | |
| 1.04 | SOIL PRESSURES DETERMINED USING RANKIN'S THEORY. | | |
| 1.05 | CONCRETE: | WING WALL | INSITU BARREL |
| | CHARACTERISTIC STRENGTH (MPa) | 30 | 30 |
| | CLASS CONCRETE | 30 / 20 | 30 / 20 |
| 1.06 | REINFORCEMENT ACCORDING TO SABS 920 - LATEST REVISION. | | |
| | CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL = 450 MPa. | | |
| | CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL MESH = 450 MPa. | | |
| 1.07 | A LINEAR SOIL PRESSURE DISTRIBUTION IS ASSUMED. | | |
| 1.08 | THE INSITU BARREL IS DESIGNED FOR SNABC TRAFFIC LOADING IN ACCORDANCE WITH TMH 7 PARTS 1,2&3 (AS AMENDED 1988) "CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA". | | |

2. GENERAL

- | | |
|------|--|
| 2.01 | THE REQUIRED CLASS OF SURFACE FINISH IS F2 FOR ALL VISIBLE SURFACES. |
| 2.02 | ALL VISIBLE CORNERS MUST HAVE A 25 x 25 mm CHAMFER. |
| 2.03 | TWO 150 mm LAYERS OF APPROVED MATERIAL, COMPACTED TO 93% MDD AASHTO DENSITY, ARE REQUIRED UNDER THE INLETS AND OUTLETS. |
| 2.04 | MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm. |
| 2.05 | THE INLET AND OUTLET UNITS ARE DESIGNED TO ACT AS INDEPENDENT UNITS WHEN USED TOGETHER WITH PIPES, PRECAST BARRELS, AS WELL AS IN SITU BARREL UNITS. |
| 2.06 | THE HEADWALLS MUST BE ALIGNED PARALLEL TO THE ROAD SHOULDER. |

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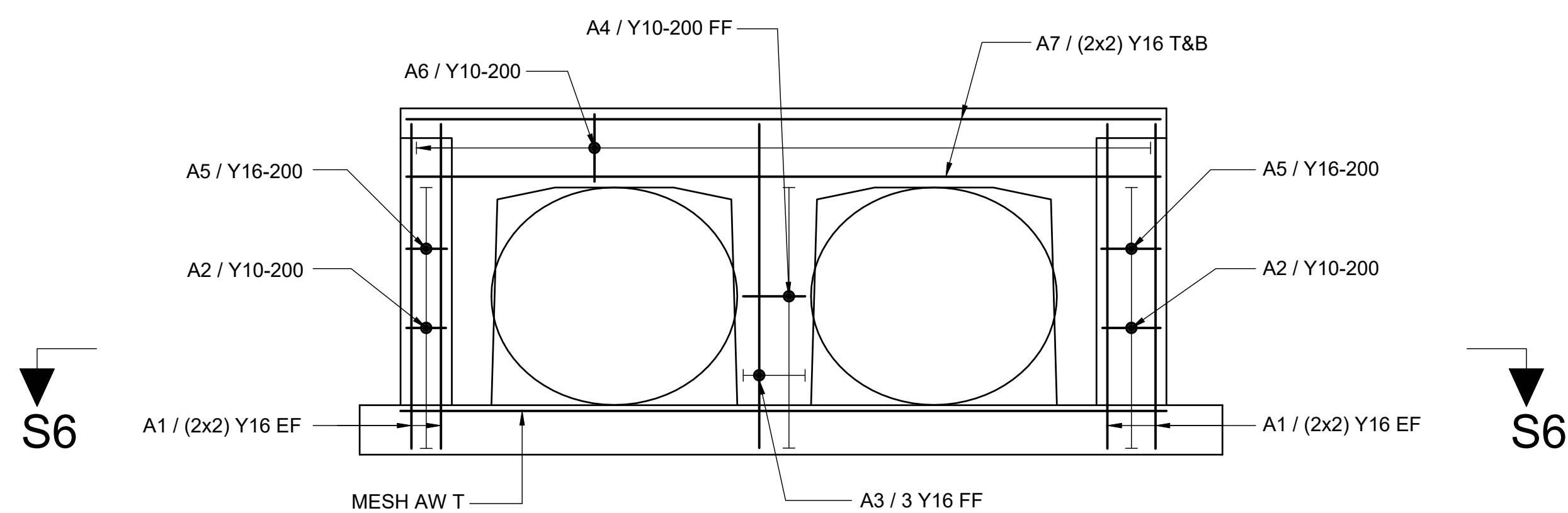
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for CEO: SA NATIONAL ROADS AGENCY LTD.

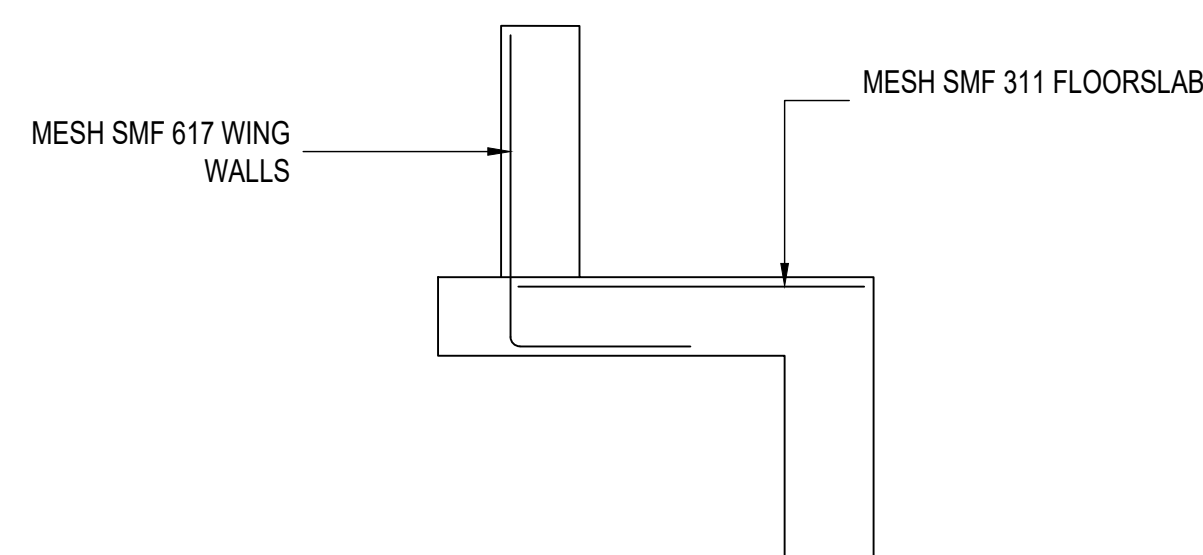
Date: _____

DRAWING No. **TP1802-19-05-25-19-002**

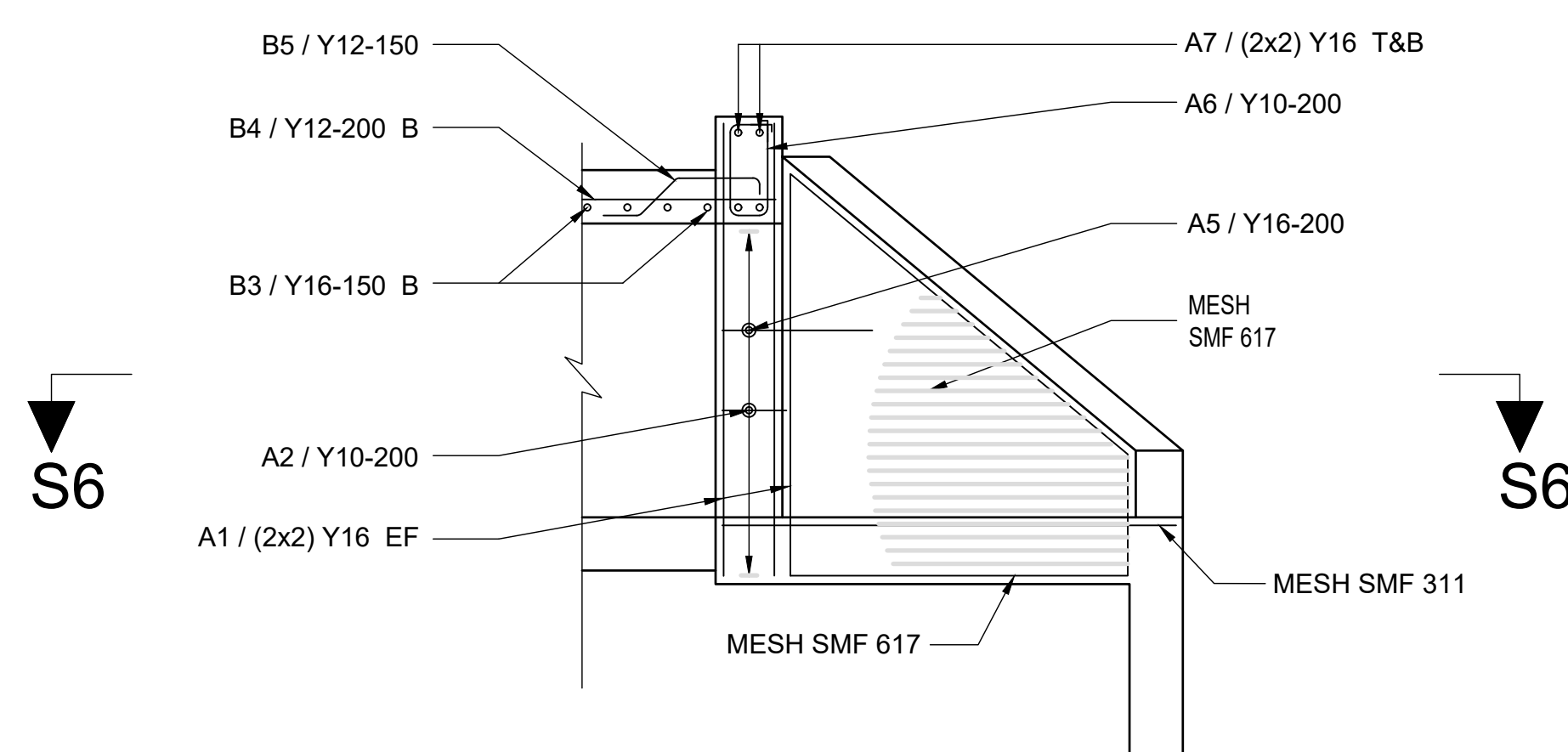


SECTION S1-S1 INLET/OUTLET WING WALLS
HEADWALL & COLUMNS - REINFORCEMENT

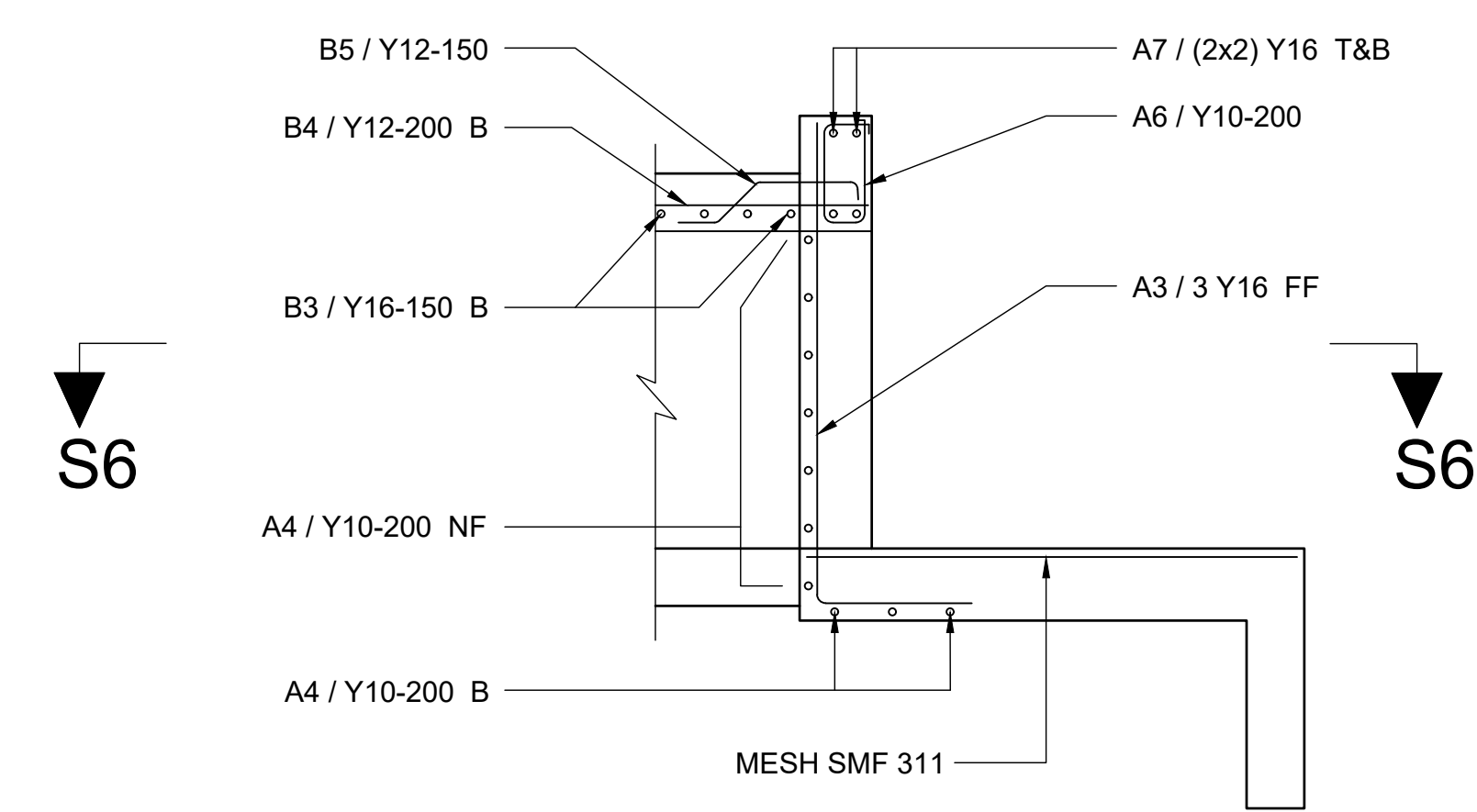
NOTE:
MESH REINFORCEMENT ONLY
FOR CULVERTS WHERE
VERTICAL OPENING, JA > 900



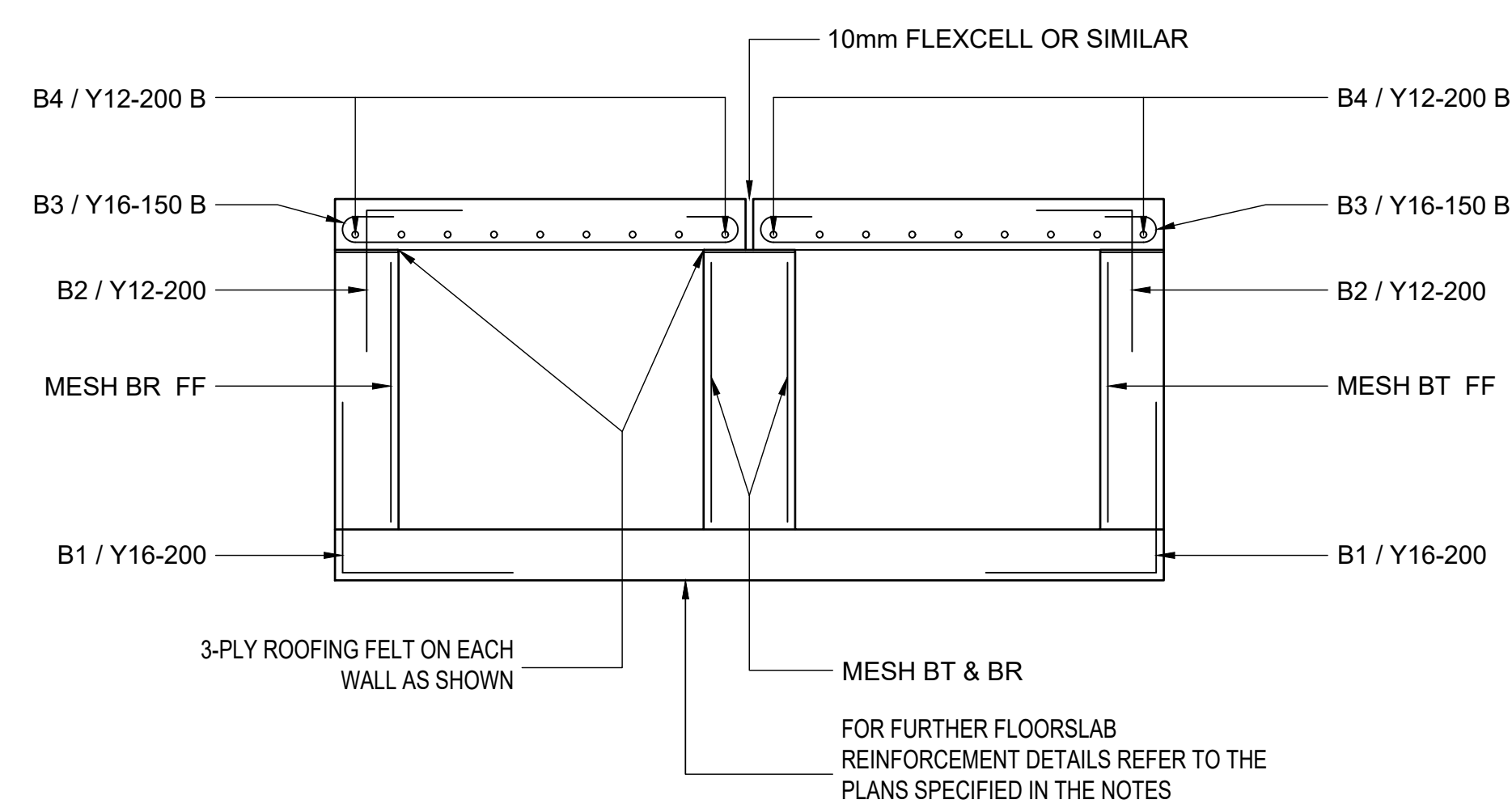
SECTION S4-S4 INLET/OUTLET WING WALLS
WING WALLS & FLOORSLAB - REINFORCEMENT



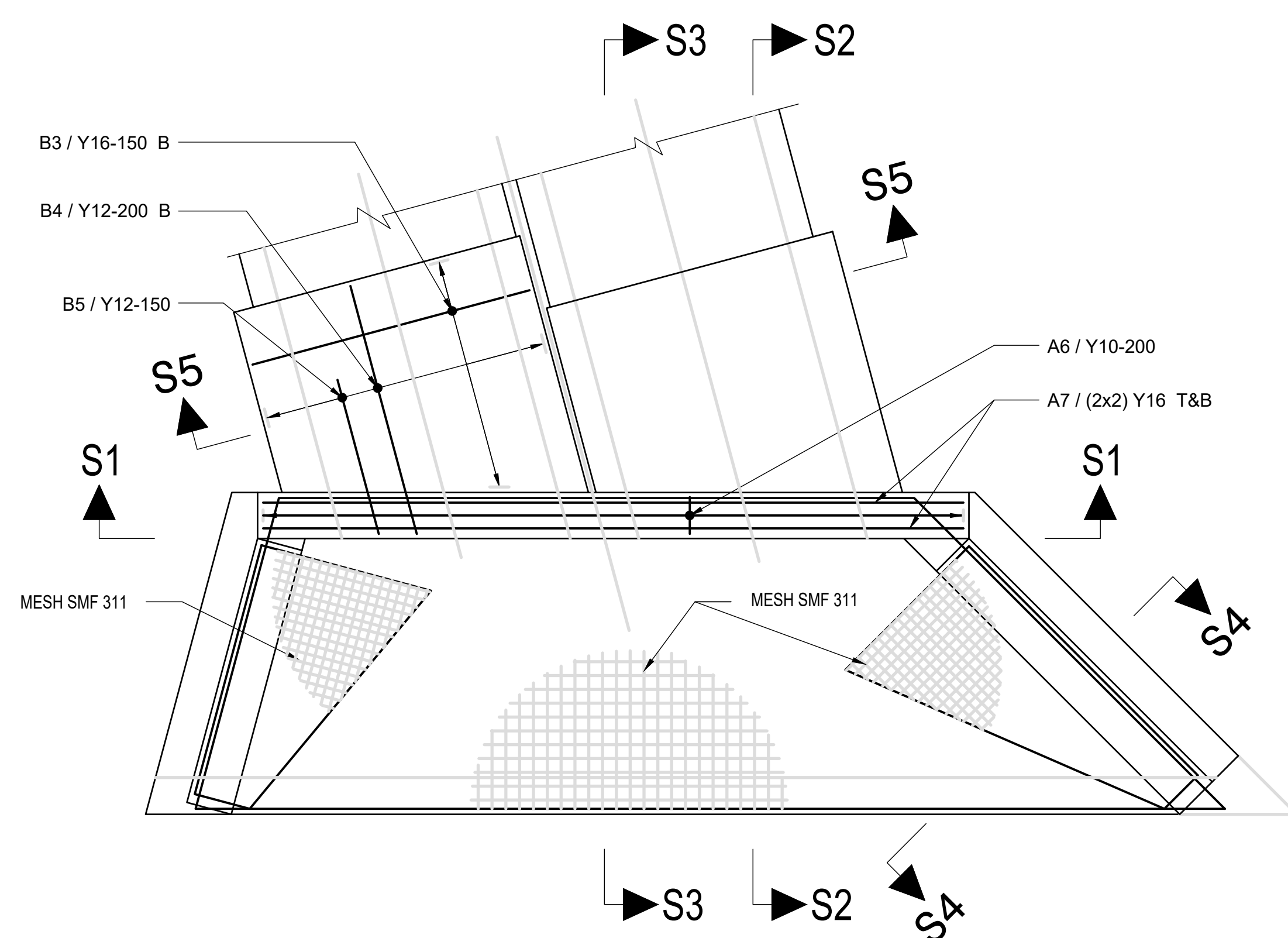
SECTION S2-S2 INLET/OUTLET WING WALLS
HEADWALL & WING WALLS - REINFORCEMENT



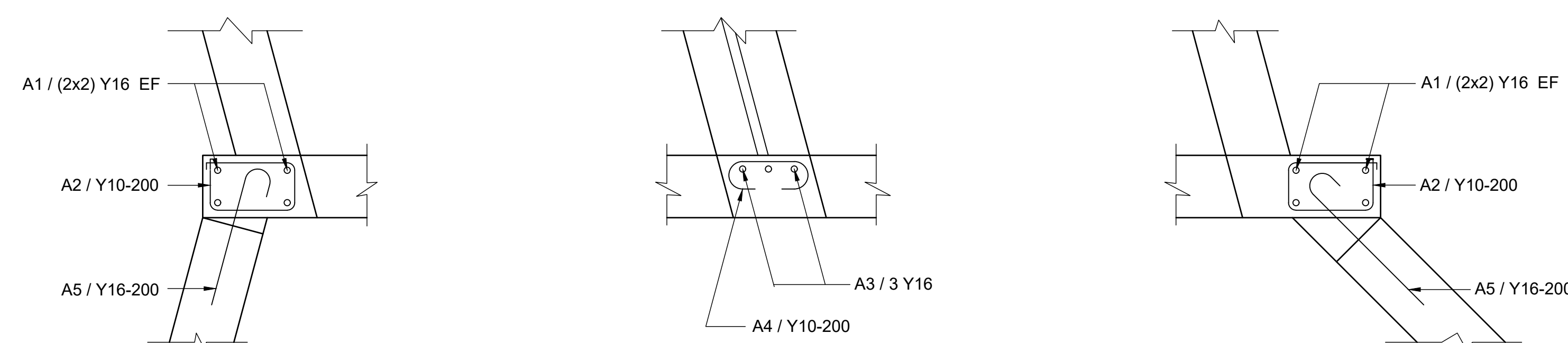
SECTION S3-S3 INLET/OUTLET WING WALLS
HEADWALL & COLUMNS - REINFORCEMENT



SECTION S5-S5 INLET/OUTLET WING WALLS
INSITU BARREL (BOX CULVERTS ONLY) - REINFORCEMENT



TYPICAL REINFORCEMENT PLAN OF INLET/OUTLET WING WALLS
- MAX Ø = 30°



SECTION S6-S6 INLET/OUTLET WING WALLS
HEADWALL COLUMNS - REINFORCEMENT

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS PRECAST CULVERT WINGWALLS REINFORCEMENT	
SCALE :	AS SHOWN
SHEET	2 OF 3

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-003		
SANRAL DOCUMENT #	-		
VER	V1		

DRAWING No.
TP1802-19-05-25-19-003

CULVERT WINGWALLS SCHEDULE

CULVERT DESCRIPTION	Wingwall Reference		WR1	WR2	WR3	WR4
	Culvert Type (PC/BC)		PC	PC	PC	PC
	No. of spans		1	1	1	1
	Span / Dam		300	450	600	600
INLET/OUTLET WINGWALL CONCRETE DIMENSIONS	Angle of skew		60° / 120° / 240° / 300° or more skew	90° / 270°	90° / 270°	60° / 120° / 240° / 300° or more skew
	Headwall right of centreline	FA	820	680	750	990
	Headwall offset from foundation R	FB	10	100	100	10
	Headwall left of centreline	GA	600	680	760	770
	Headwall offset from foundation L	GB	200	100	100	200
	Headwall total height	HA	590	750	890	890
	Wingwall height at drop-wall/Apron slab thickness	HB	150	150	150	150
	Wingwall height above end point	HC	290	450	590	590
	Wingwall depth below headwall	HD	150	150	150	150
	Culvert barrel clear height	JA	292	445	585	585
	Headwall beam height	JB	300	300	300	300
	Floor thickness (box culvert only)	JC	Box only	Box only	Box only	Box only
	Headwall exposed beam height behind	JD	270	260	240	240
	Wingwall thickness	KA	225	225	225	225
	Long wingwall skew cut-off (side)	KB	360	210	210	360
	Apron slab length from headwall	L	1500	1500	1500	1500
	Long wingwall length	MA	2610	1600	1600	2610
	Short wingwall length (inner) (NA)	NA	1500	1600	1600	1500
	Long wingwall length from front (PA)	PA	2590	860	860	2590
	Long wingwall square cut-off (PB)	PB	850	490	490	850
	Long wingwall skew cut-off (front) (PC)	PC	210	360	360	210
	Short wingwall length from front (QA)	QA	0	860	860	0
	Short wingwall square cut-off (QB)	QB	420	490	490	420
	Cast-in-situ- outer wall thickness (R)	R	NA	NA	NA	NA
	Cast-in-situ- inner wall thickness (T)	T	0	0	0	0
	Culvert wall thickness (t)	t	35	44	57	57
	Headwall length between inner corners (W)	W	740	850	990	1080
	Culvert trench excavation width	U1	602	893	1179	1179
	Apron slab cut-off wall length	W+QA+QB+PA+PB	4600	3550	3690	4940
	Wingwall floor width behind	FA+FB+GA+GB	1630	1560	1710	1970
INLET/OUTLET WINGWALL REINFORCEMENT		1.58	A1 (mass(kg))	8.3	10.4	12.1
			Di	Y16	Y16	Y16
			No. off	8	8	8
			Cut length	660	820	960
		0.617	A2 (mass(kg))	4.9	6.2	6.2
			Di	Y10	Y10	Y10
			No. off	8	10	10
			aa	225	225	225
			ab	145	145	145
			Cut length	1000	1000	1000
		1.58	A3 (mass(kg))	0.0	0.0	0.0
			Di			
		3	No. off			
			aa			
			Cut length			
		0.617	A4 (mass(kg))	0.0	0.0	0.0
			Di			
			No. off			
			aa			
			Cut length			
		1.58	A5 (mass(kg))	9.9	13.1	13.1
			Di	Y16	Y16	Y16
			No. off	6	8	8
			aa	800	800	800
			Cut length	1040	1040	1040
		0.617	A6 (mass(kg))	4.4	4.4	5.1
			Di	Y10	Y10	Y10
			No. off	7	7	8
			aa	145	145	145
			ab	220	220	220
			Cut length	1030	1030	1030
		1.58	A7 (mass(kg))	9.6	9.2	10.2
			Di	Y16	Y16	Y16
			No. off	4	4	4
			aa	1340	1280	1430
			ab	220	220	220
			Cut length	1520	1460	1610
INLET/OUTLET WINGWALL MESH REINFORCEMENT			Notation	AM	AM	AM
			SMF			
			ma			
			mb			
			mc			
			md			
			me			
			AM (mass(kg))	0.0	0.0	0.0
			Notation	AN	AN	AN
			SMF			
			na			
			nb			
			nc			
			nd			
			ne			
			AN (mass(kg))	0.0	0.0	0.0
			Notation	AW	AW	AW
			SMF			
			wa			
			wb			
			wc			
			wd			
			AW mass (kg)	0.0	0.0	0.0

NOTE:

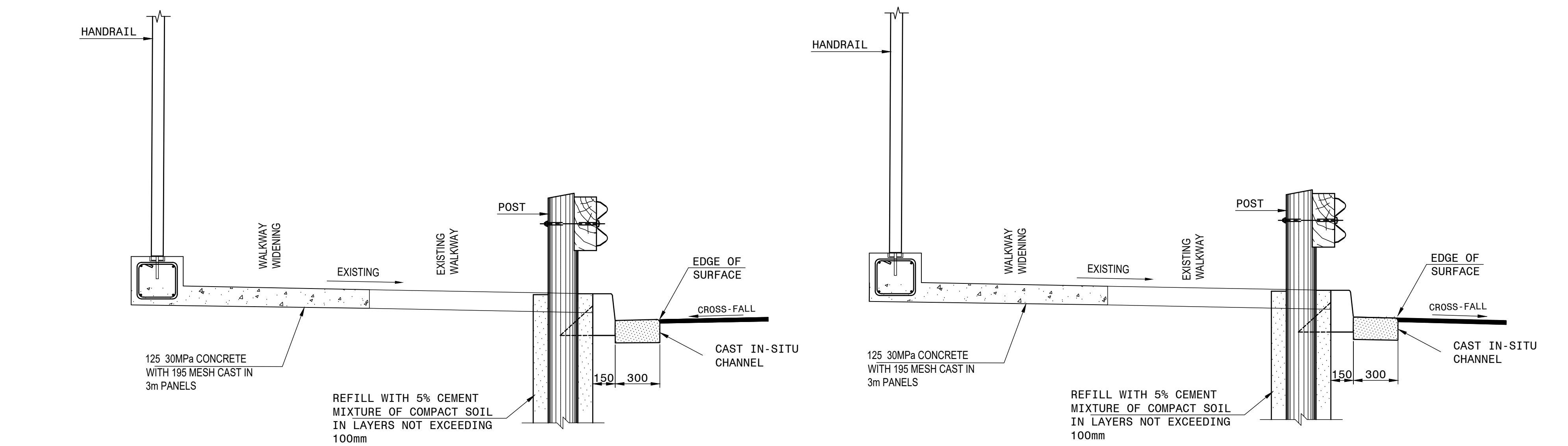
1. ALL DIMENSIONS TO BE CHECKED AND CONFIRMED ON SITE WITH THE ENGINEER BEFORE CONSTRUCTION COMMENCES.
2. THE ENGINEER TO BE INFORMED OF ANY DISCREPANCIES AS SOON AS POSSIBLE AFTER THEY HAVE BEEN DISCOVERED.

THIS DRAWING MUST BE READ IN CONJUNCTION WITH DRAWINGS:

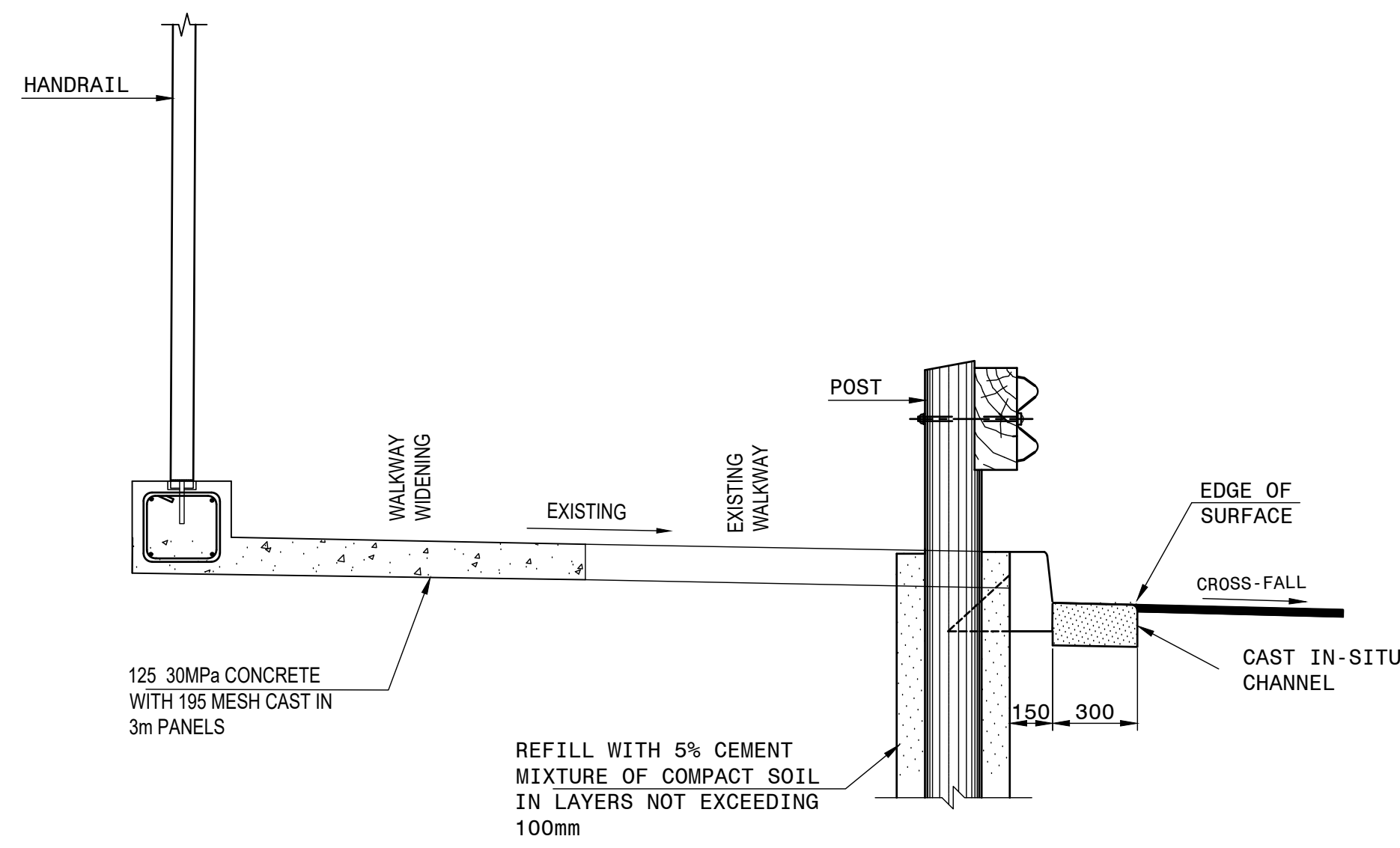
1. PRECAST CULVERT WINGWALLS - DIMENSIONS
2. PRECAST CULVERT WINGWALLS - REINFORCEMENT

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
SANRAL PROJECT MANAGER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

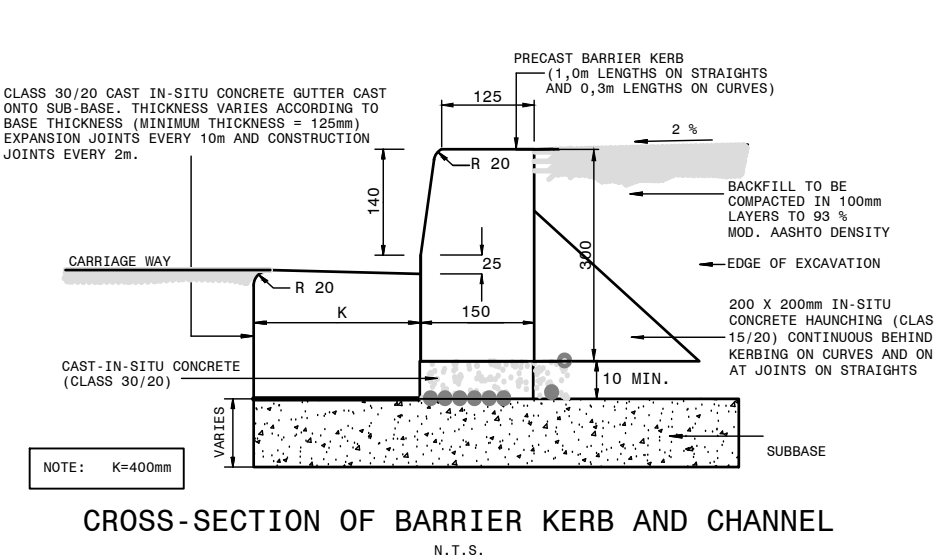
HEAD OFFICE		EASTERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		NRA.C.004-099-2023/1	
48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____		CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		DRAWING LOCATION DATA		START	
								ROUTE		N2	
								SECTION		22	
								DRAWING km DISTANCE		km 0,80	
								DRAWING TYPE		DRAINAGE - TYPICALS	
								BRIDGE/STRUCTURE No.		N/A	
								CONSULTANT DRAWING No.		TP1802-19-05-25-19-004	
								SANRAL DOCUMENT #		-	
								SCALE : AS SHOWN		SHEET 3 OF 3	
										VER V1	



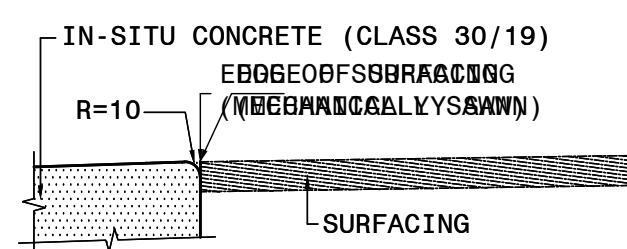
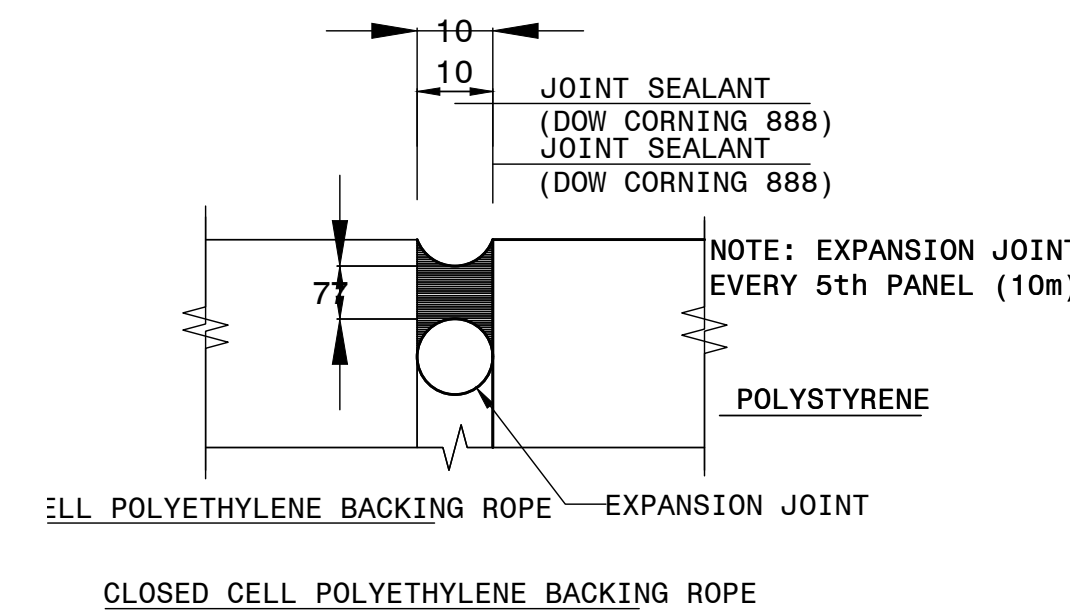
TYPICAL POSITION OF A DRAIN WITH SIDEWALK
SCALE 1:20



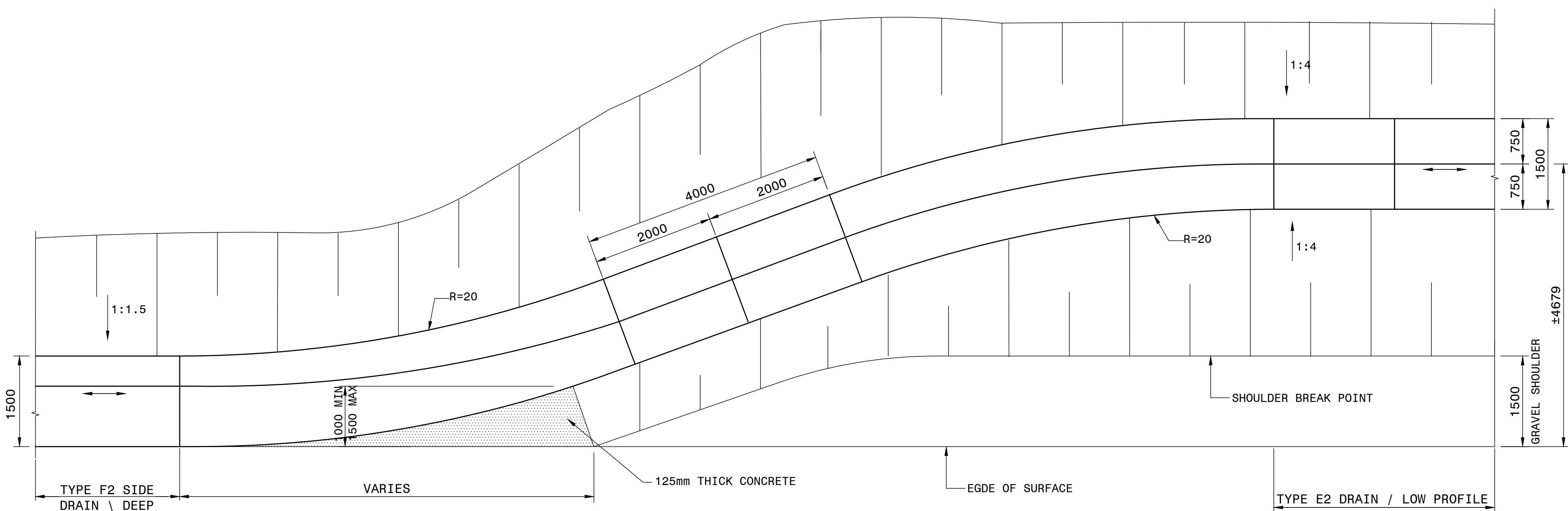
TYPICAL POSITION OF A DRAIN WITH SIDEWALK
SCALE 1:20



CROSS-SECTION OF BARRIER KERB AND CHANNEL
N.T.S.



DETAIL X
N.T.S.

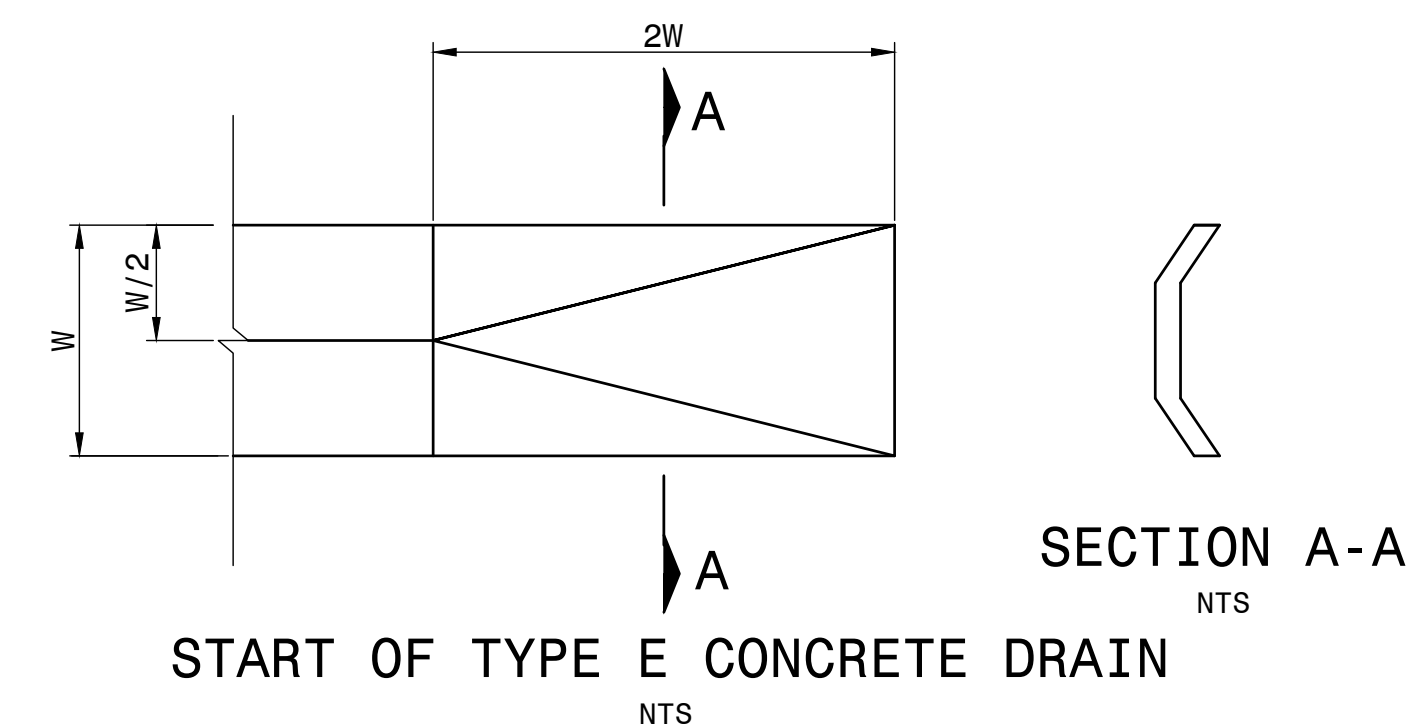


PLAN DRAIN TRANSITION DETAILS
TYPE F2 TO E2

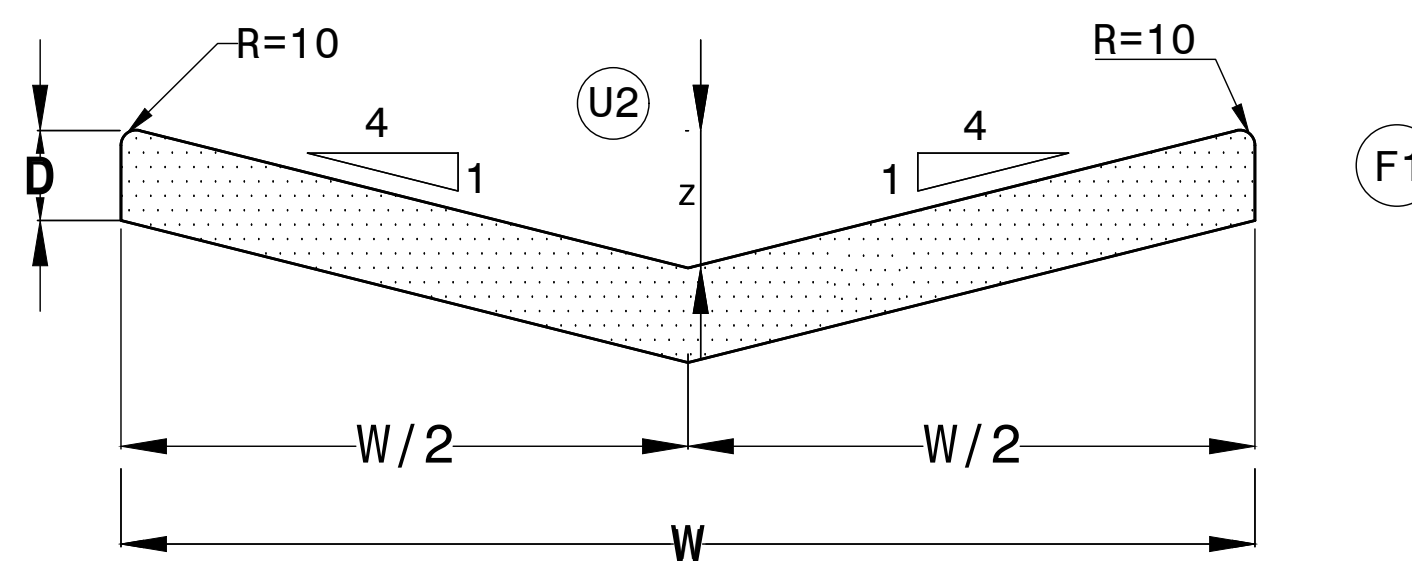
- NOTES :
- ALL CONCRETE CHANNELS AND OTHER DRAINAGE STRUCTURES ON THIS PLAN TO BE CAST USING CLASS 30/19 CONCRETE.
 - TYPES 'E' AND 'F' CONCRETE MUST BE CAST IN ALTERNATIVE LENGTHS OF 2.0m MAXIMUM WITH EXPANSION JOINTS EVERY 5th PANEL (10 m)
 - ALL EXPOSED CORNERS MUST BE ROUNDED TO A MINIMUM RADIUS OF 10mm.
 - THE TYPE OF SURFACE FINISH IS INDICATED AS F1 & U2.
F - FORMED SURFACES
U - UNFORMED SURFACES
 - PRECAST KERBING FIG. 5 & FIG. 7 REFER SANS. 927

TYPE	W	W/2	Z	D UNREINFORCED	*D REINFORCED
E1	1000	500	125	125	100
E2	1500	750	188	125	100
E3	2000	1000	250	150	100
E4	2500	1250	313	150	100

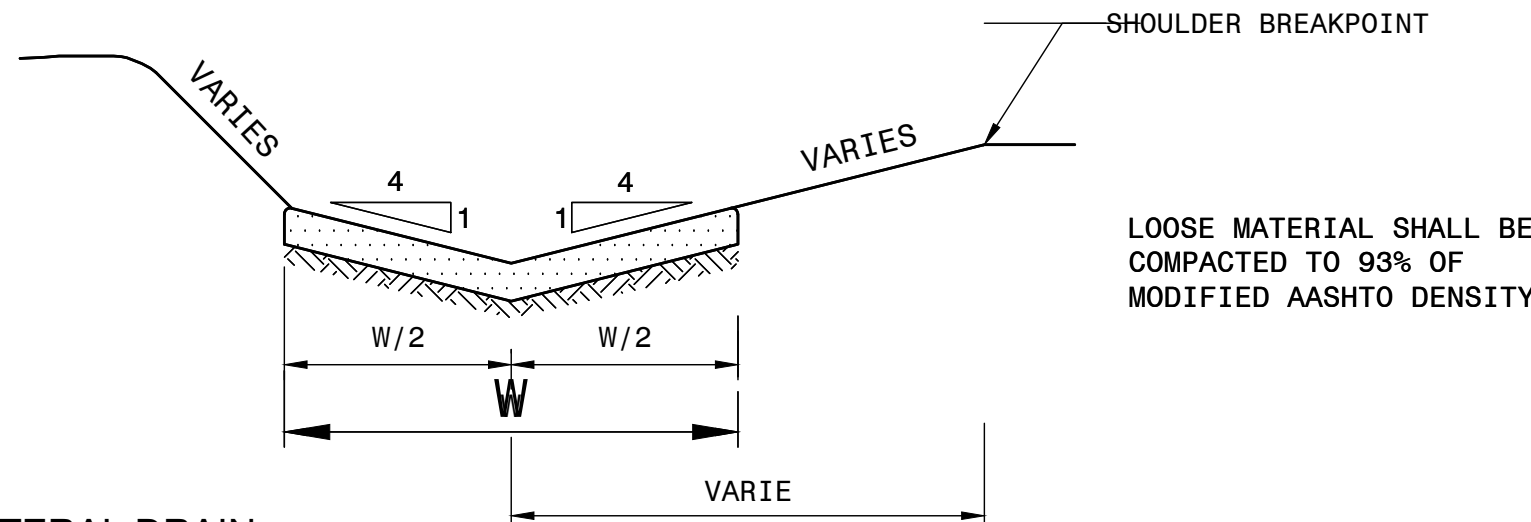
DIMENSIONS OF TYPE 'E' CONCRETE DRAINS
* HTS 395 MESH REINFORCEMENT



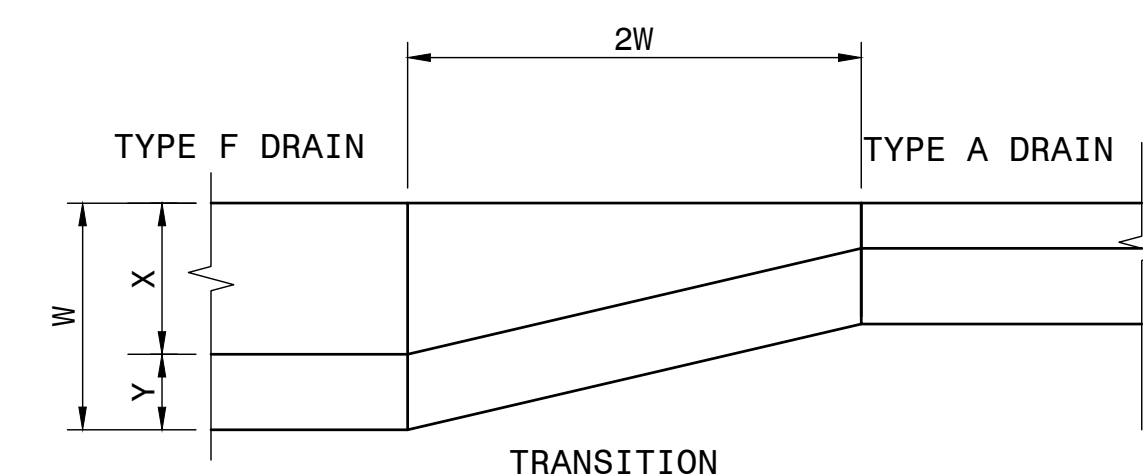
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N.T.S.



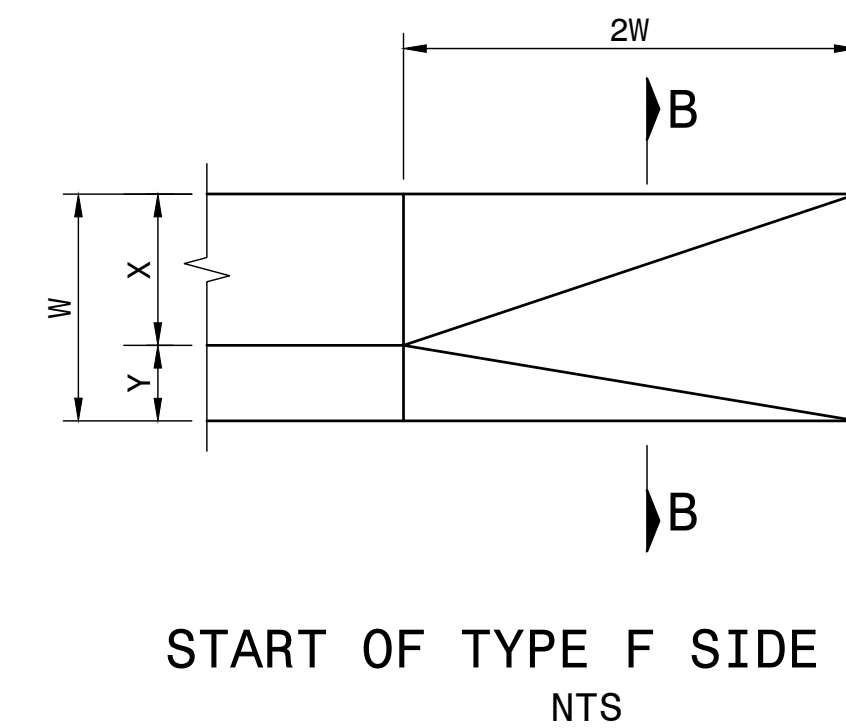
CROSS SECTION OF THE 'E' TYPE CONCRETE CANAL
N.T.S.



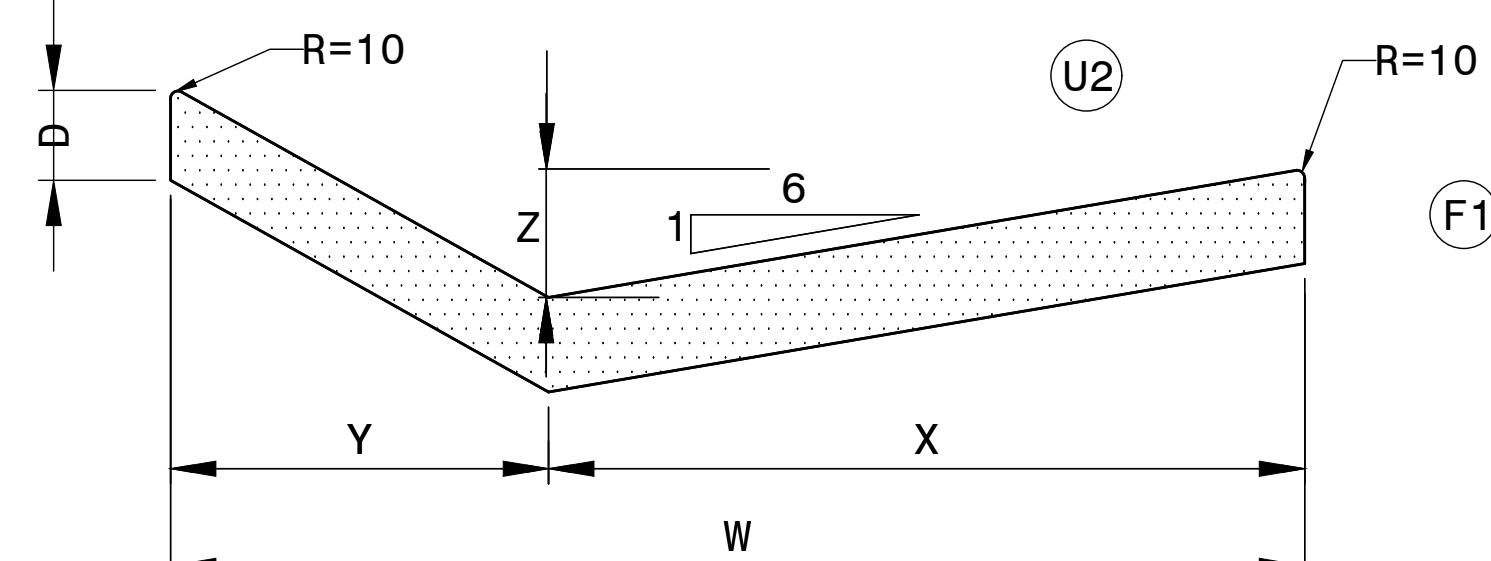
POSITION OF THE TYPE OF CONCRETE CHANNEL
"E"



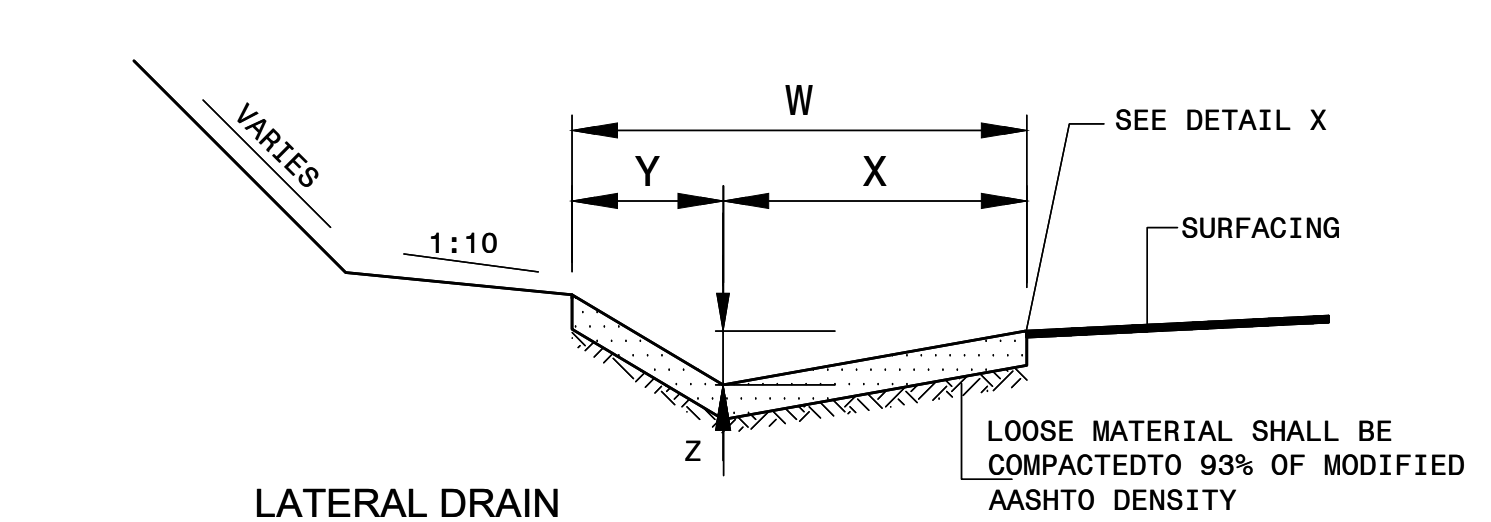
TRANSITION TYPE F TO A DRAIN



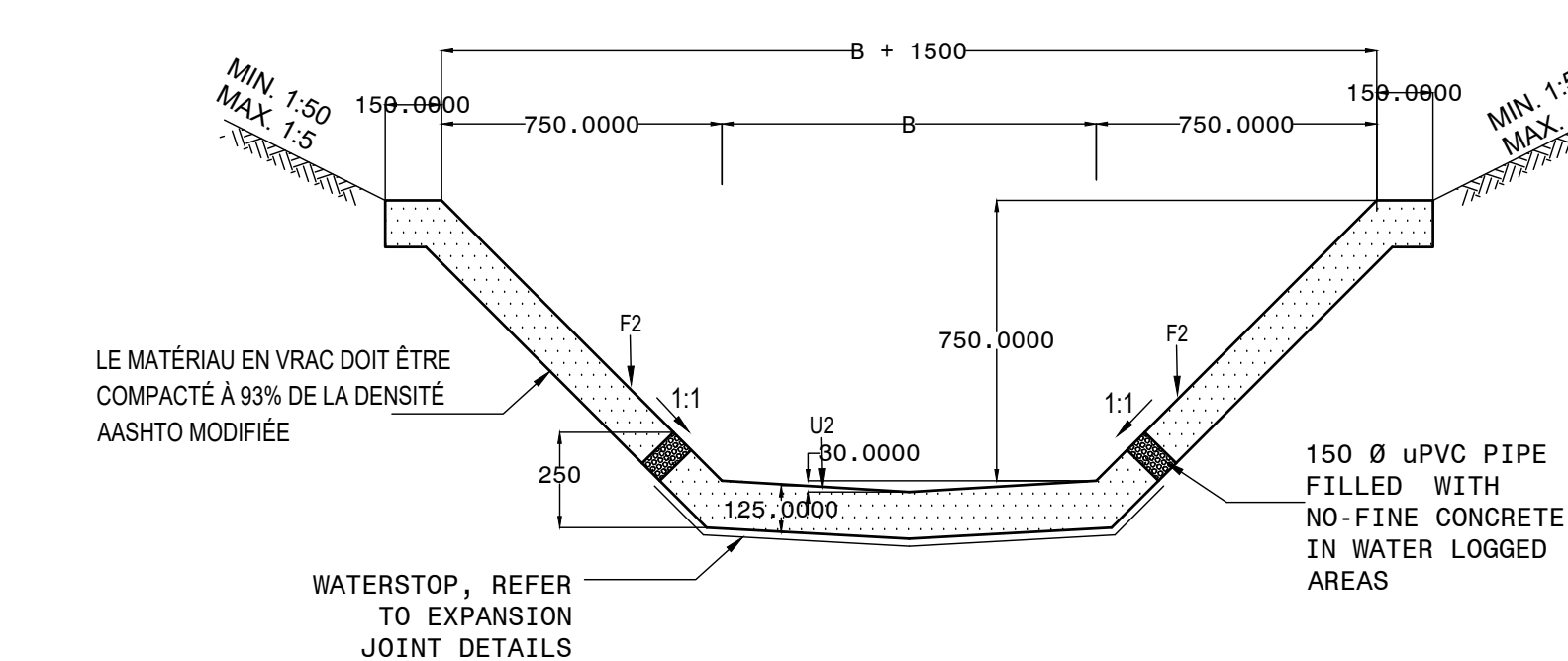
START OF TYPE F SIDE DRAIN
N.T.S.



CROSS SECTION OF THE TYPE 'F' CONCRETE CANAL
N.T.S.



POSITION OF TYPE "F" CONCRETE CHANNEL



FOR TRAPEZOIDAL CHANNEL DETAILS,
SEE DRAWING TP1911-04-01-T1-11

B
500
1000
1250

DIMENSIONS OF TRAPEZOIDAL CHANNELS

TYPE	W	X	Y	Z	D UNREINFORCED	*D REINFORCED
F1	1000	670	330	110	125	100
F2	1500	1000	500	170	125	100
F3	2000	1330	670	220	150	100
F4	2500	1670	830	280	150	100

DIMENSIONS OF TYPE 'F' CONCRETE DRAINS
* HTS 395 MESH REINFORCEMENT

No.	DATE	REVISION	CONSULT. ENG.
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD

CONSTRUCTION RECORD	WORKS CONTRACT ENGINEER
Name :	
Prof. Reg. No. :	
Date :	
SANRAL PROJECT MANAGER	
Name :	
Prof. Reg. No. :	
Date :	

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000

SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY
BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

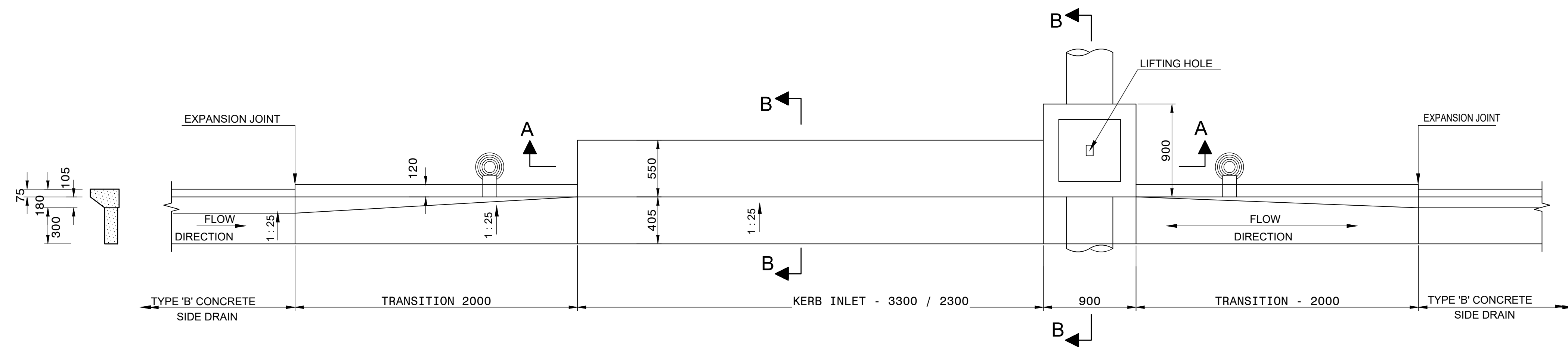
EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

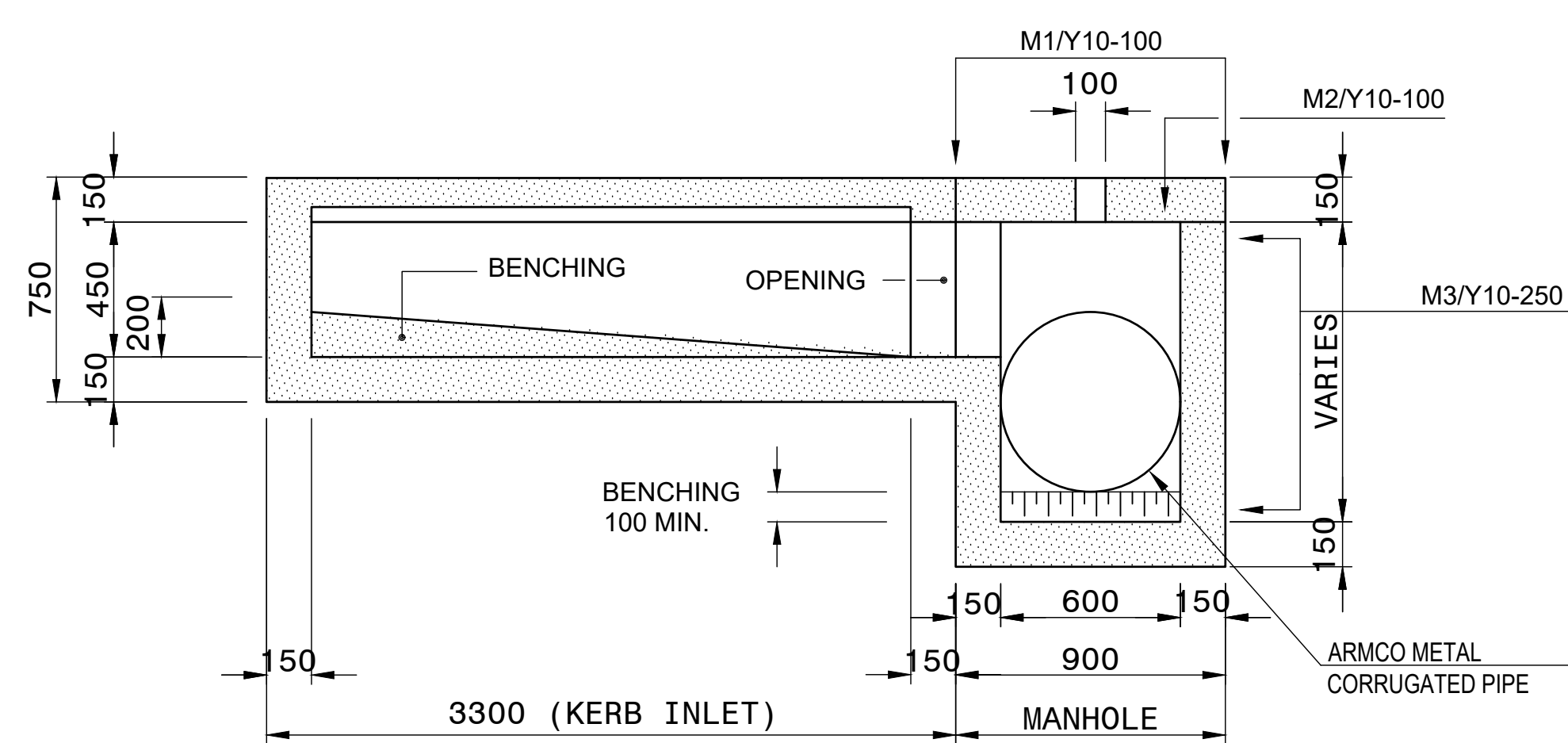
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DRAWING DESCRIPTION	DRAINAGE - TYPICALS DRAIN TYPE DETAILS
SCALE :	1:1000
SHEET	1 OF 1

PROJECT NUMBER	NRA.C.004-099-2023/1		
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-005	VER	
SANRAL DOCUMENT #	-	V1	

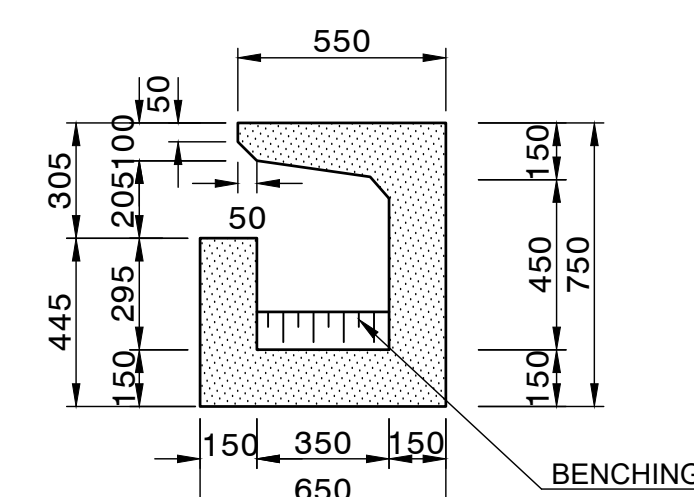
DRAWING No. TP1802-19-05-25-19-005



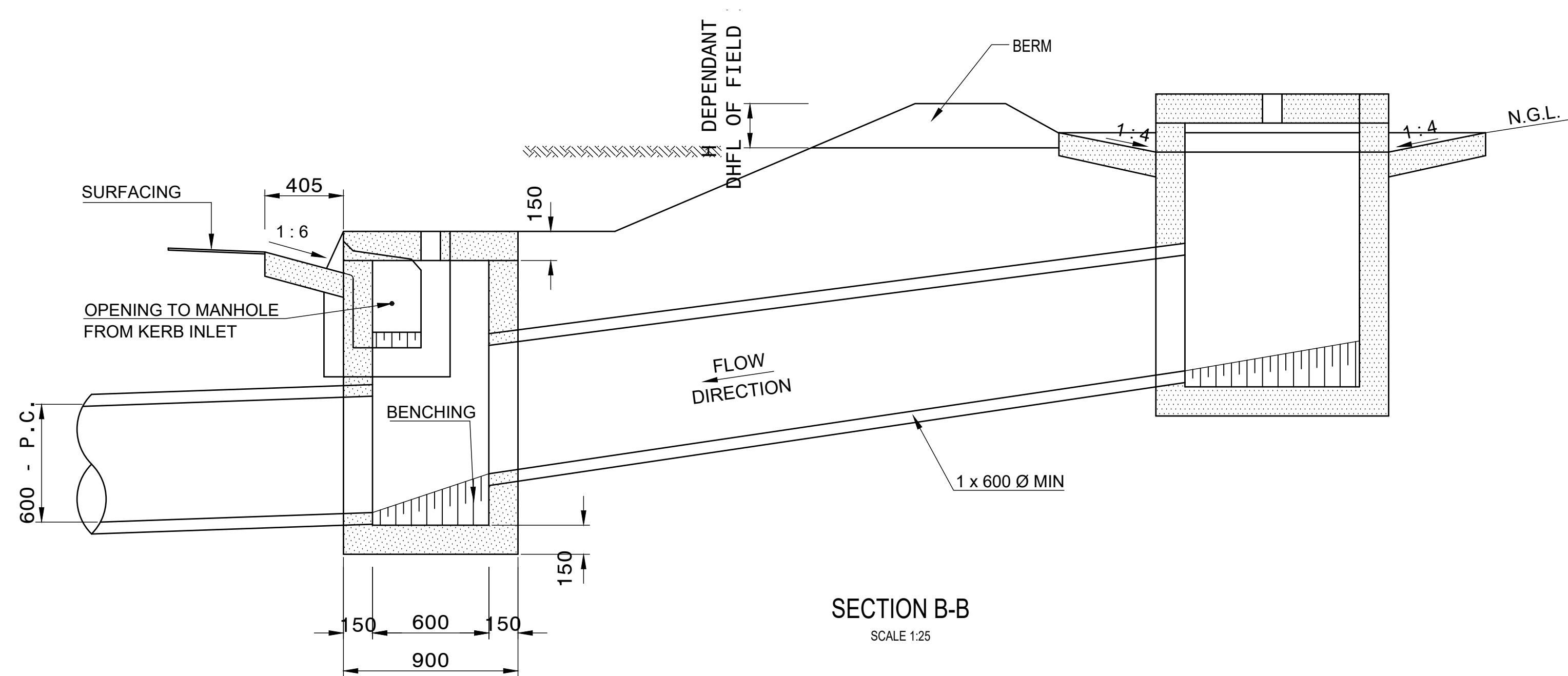
PLAN OF TRANSITION AND KERB INLET
TYPE 'B' ALONG SLOPE
TYPE 'C' AT LOW POINT
SCALE 1:20



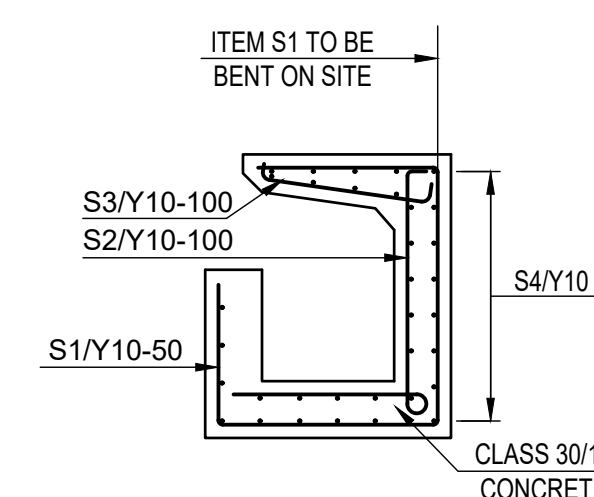
SECTION A-A
SCALE 1:20



SECTION C-C
SCALE 1:20



SECTION B-B
SCALE 1:25



KERB INLET
REINFORCEMENT
SCALE 1:20

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HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000



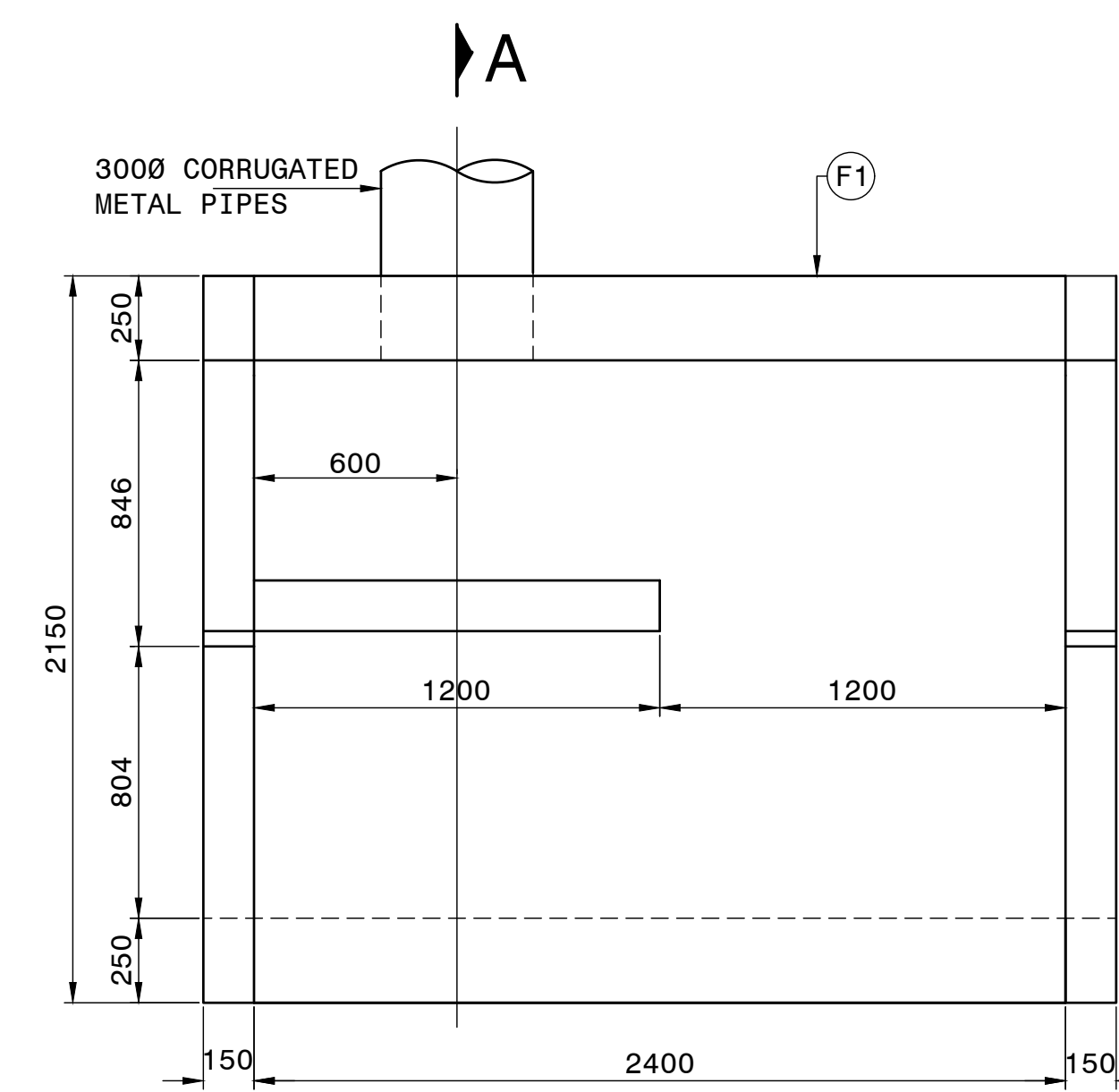
EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

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Date:

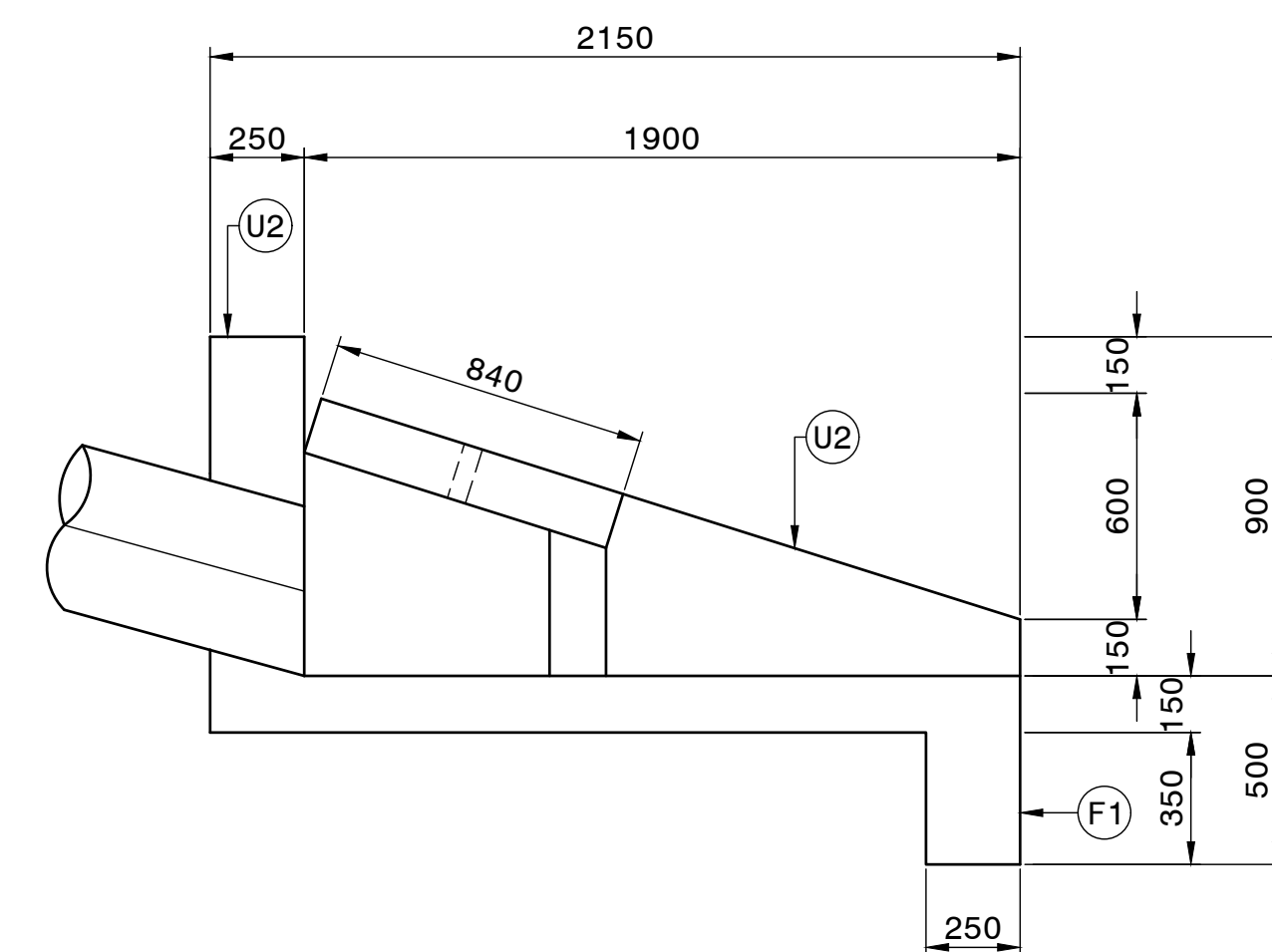
PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS INLET STRUCTURES KERB INLET FOR URBAN ENVIRONMENTS	
SCALE :	AS SHOWN
SHEET	1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-006		
SANRAL DOCUMENT #	-		
			V1

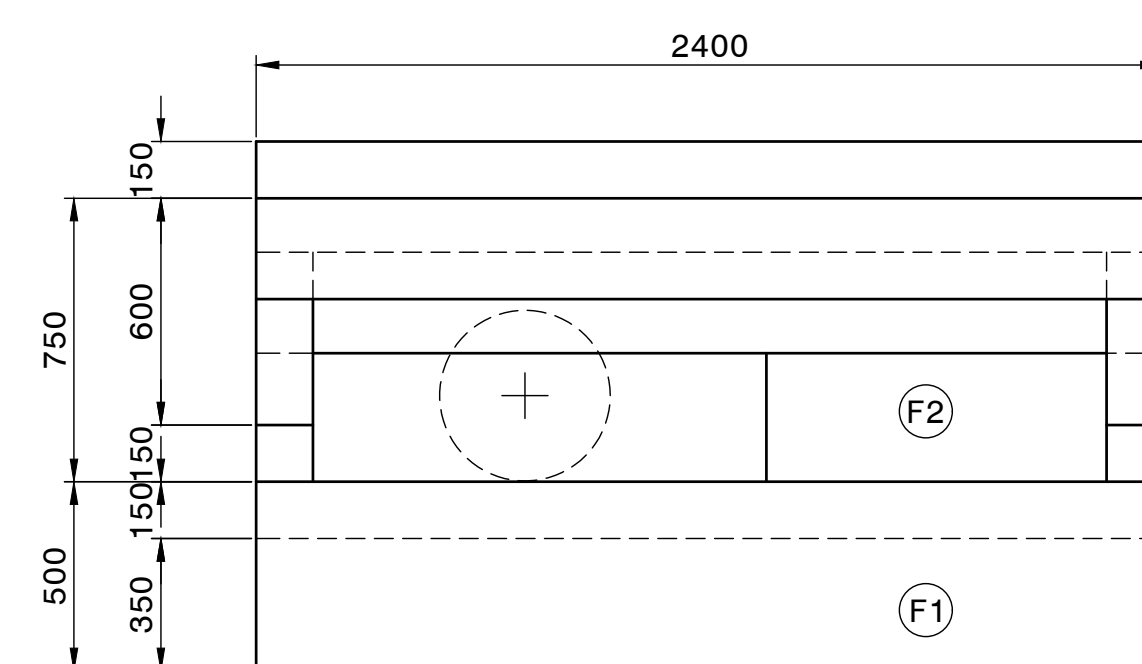
DOWN PIPE OUTLET AND STILLING BASIN OUTLET



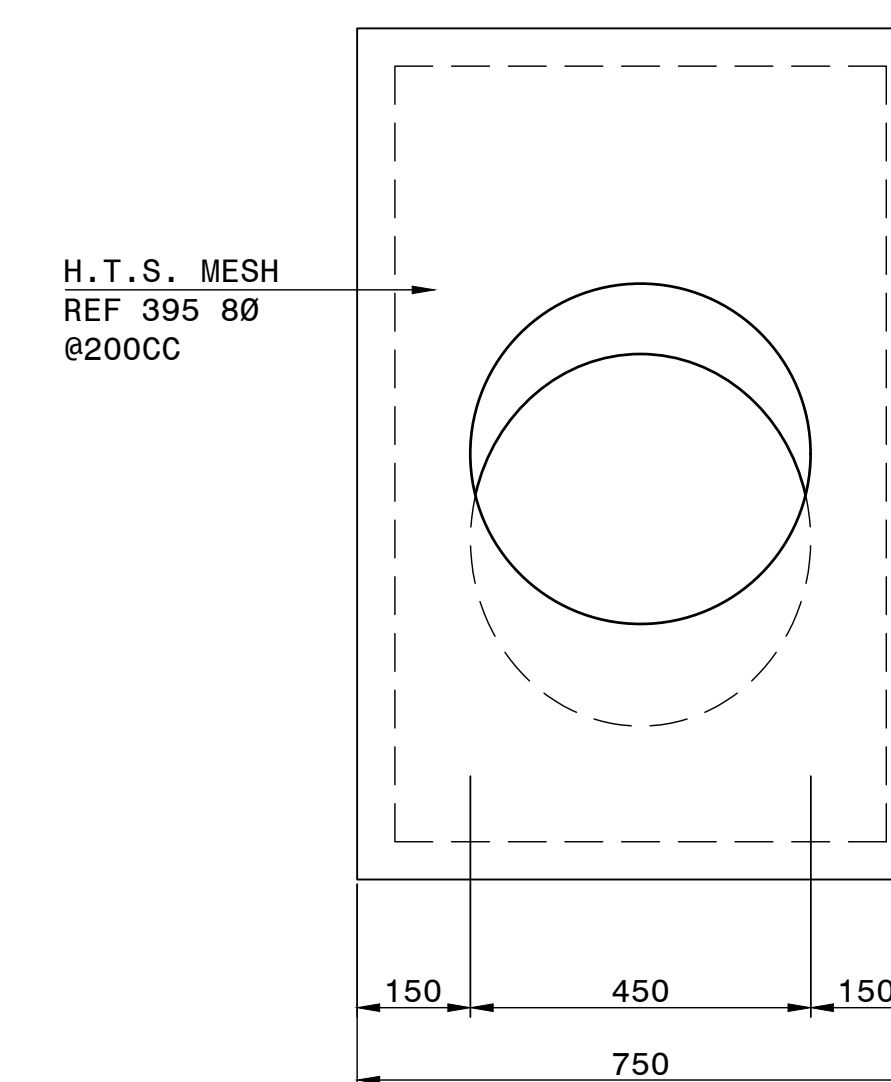
PLAN OF STILLING BASIN
(TOP SLAB REMOVED)
SCALE 1:20



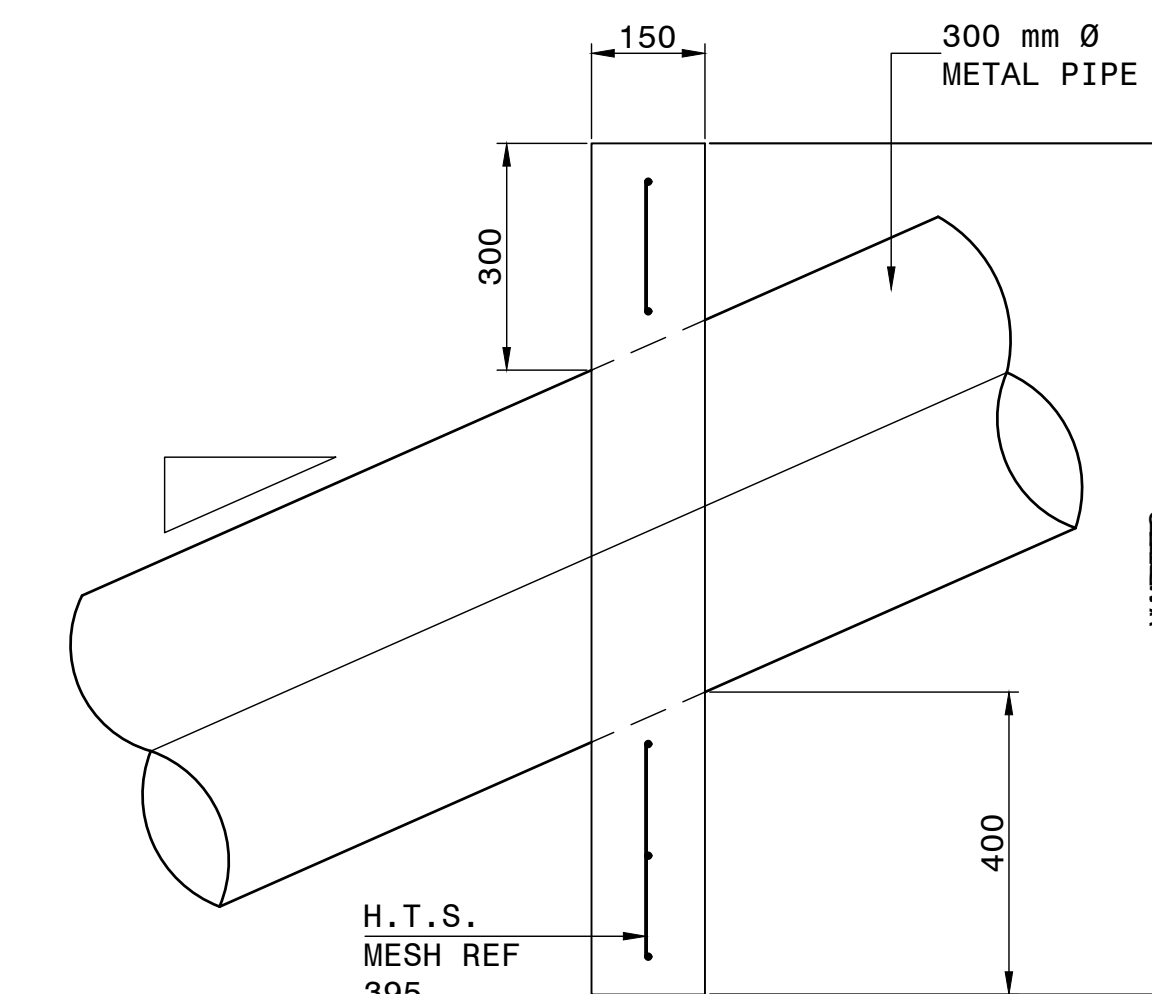
SECTION A-A
WITH TOP SLAB
SCALE 1:20



FRONT ELEVATION OF
STILLING BASIN
SCALE 1:20

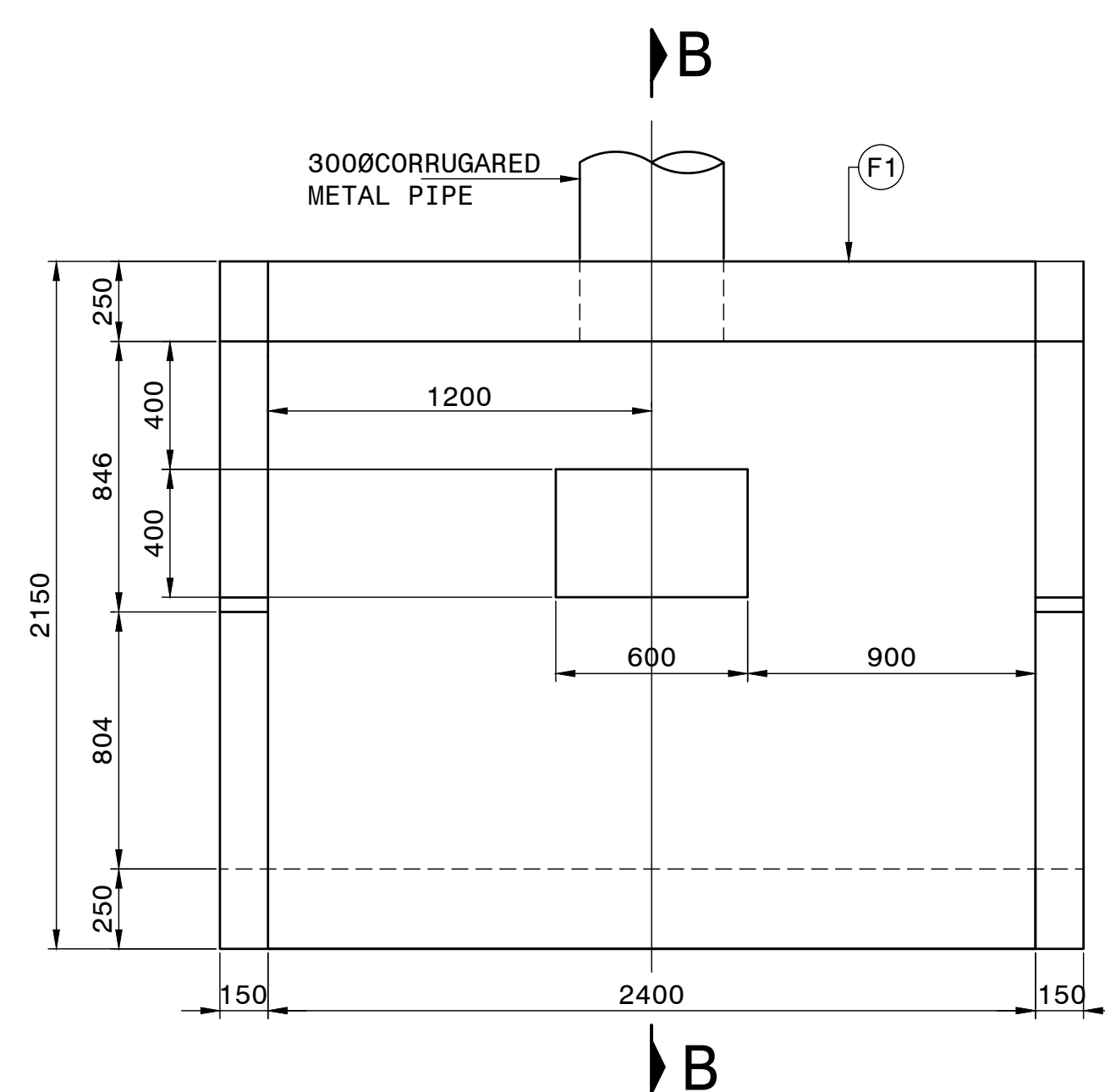


SECTIONAL VIEW
OF ANCHOR BLOCK



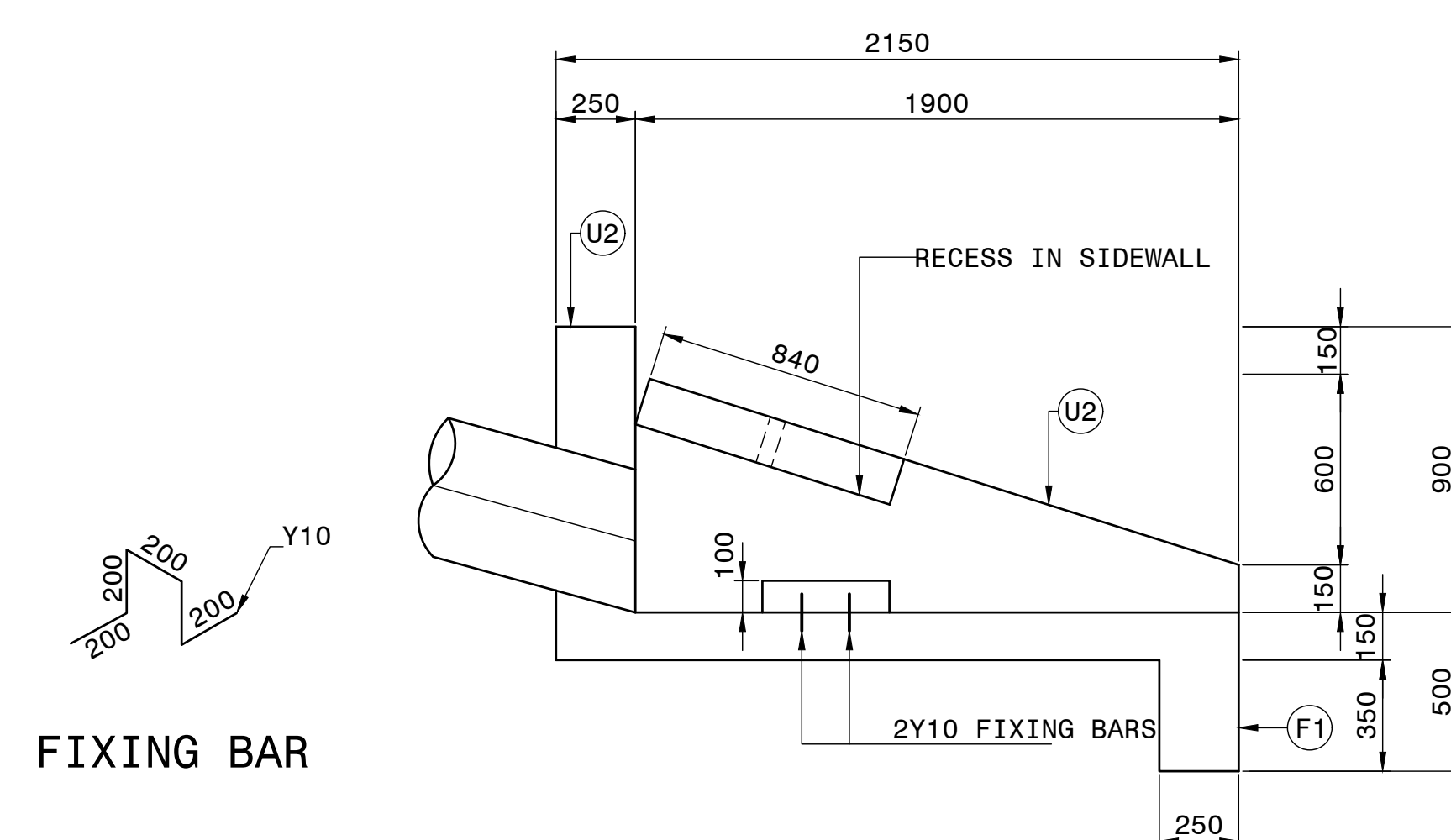
ANCHOR BLOCK

SCALE 1:10

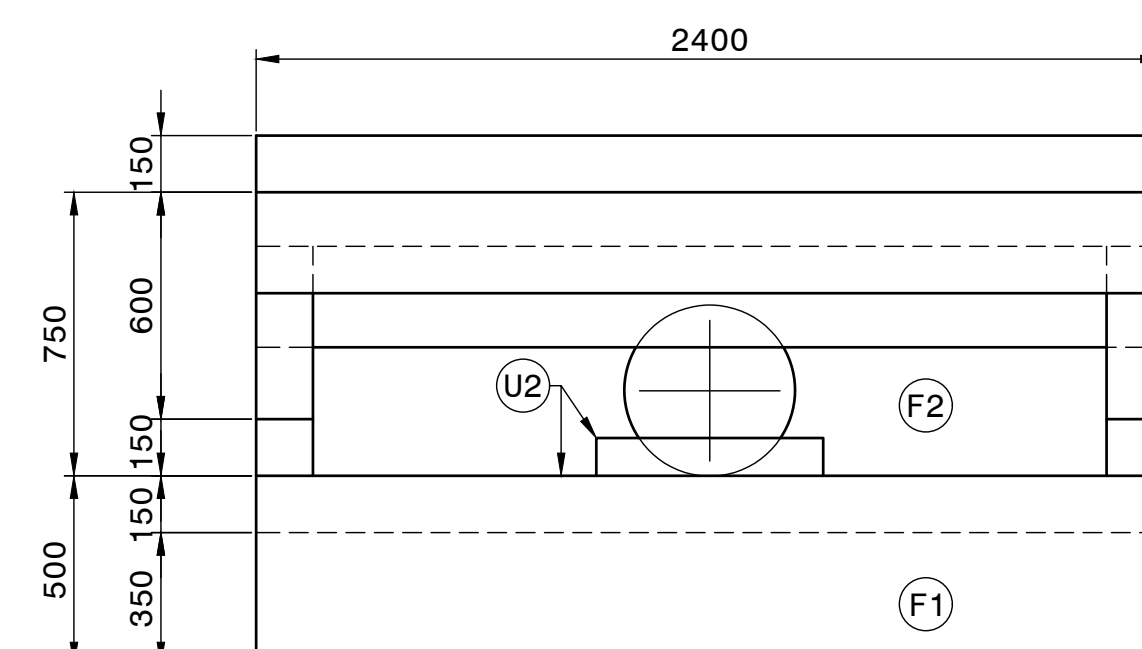


PLAN OF DOWN PIPE OUTLET
(TOP SLAB REMOVED)
SCALE 1:20

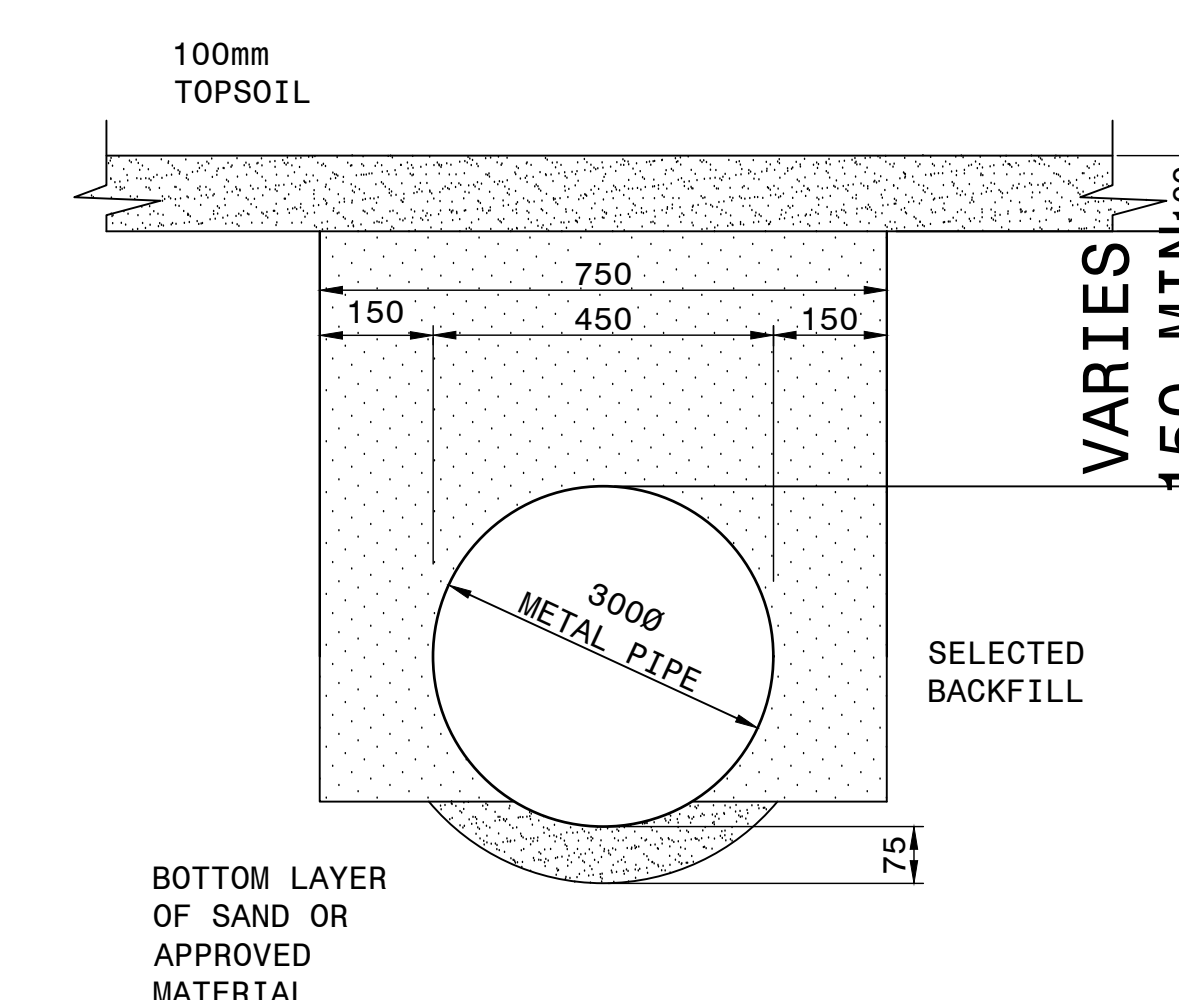
DOWNPIPE OUTLET TYPE B



SECTION B-B
WITH TOP SLAB
SCALE 1:20

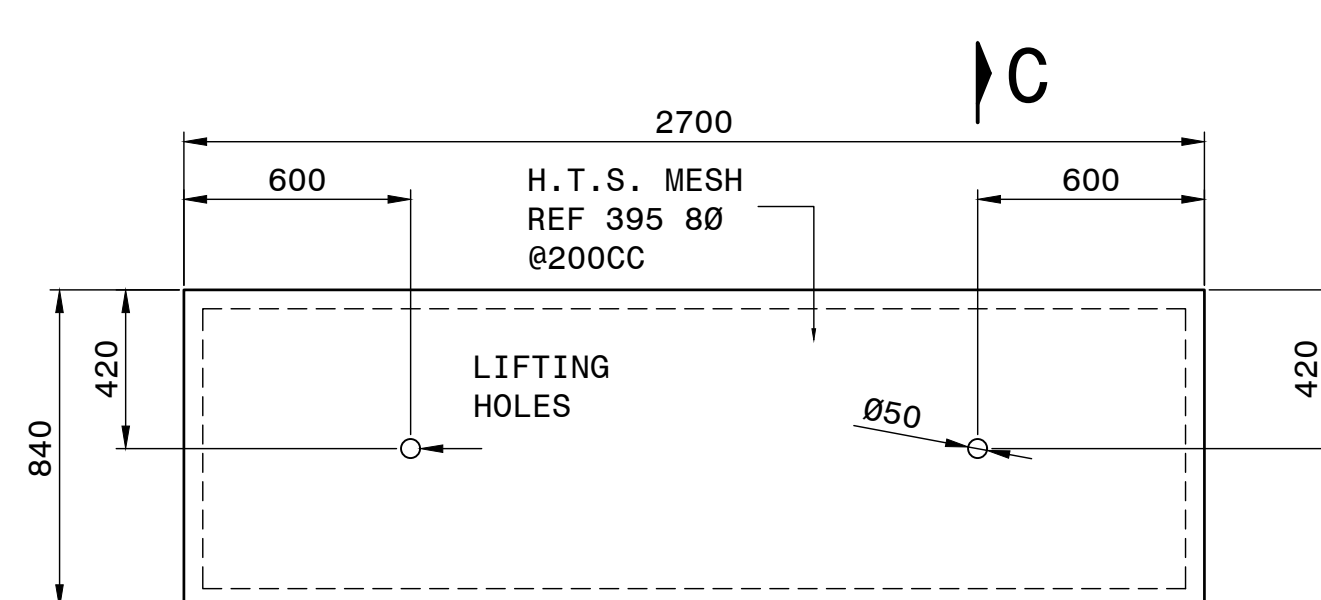


FRONT ELEVATION OF DOWN
PIPE OUTLET
SCALE 1:20

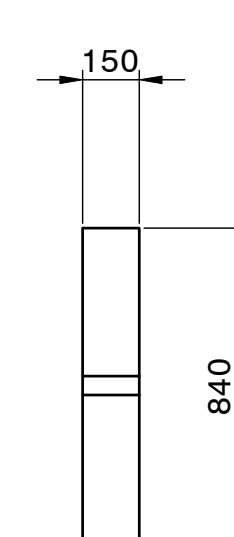


BEDDING FOR DOWN PIPES

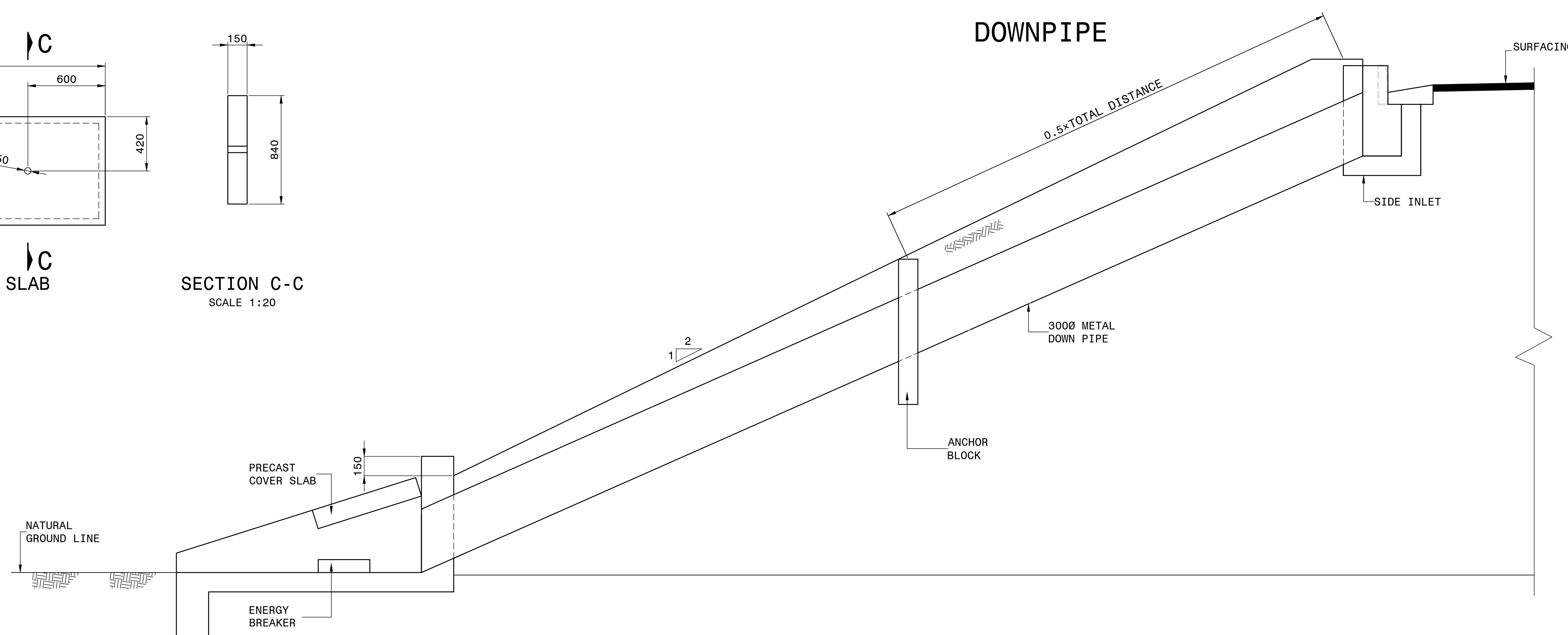
COVER FOR DOWNPIPE OUTLET (TYPE A OR TYPE B)



PLAN OF PRECAST SLAB
SCALE 1:20



SECTION C-C
SCALE 1:20



ELEVATION OF DOWN PIPE

[illegible]

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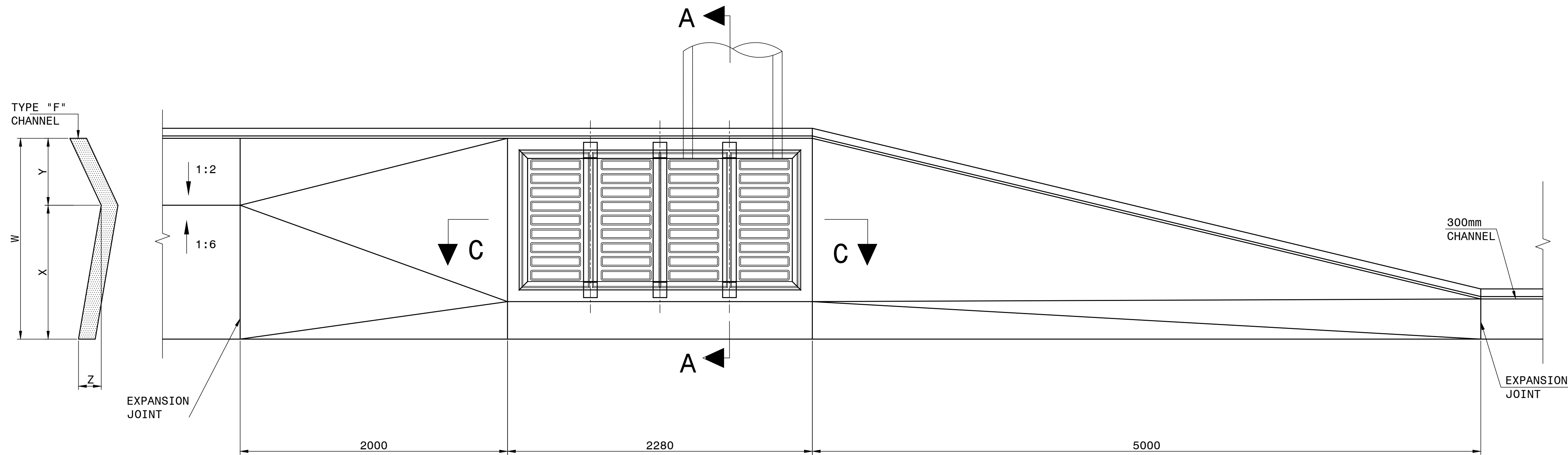
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for CEO: SA NATIONAL ROADS AGENCY LTD

Date: _____

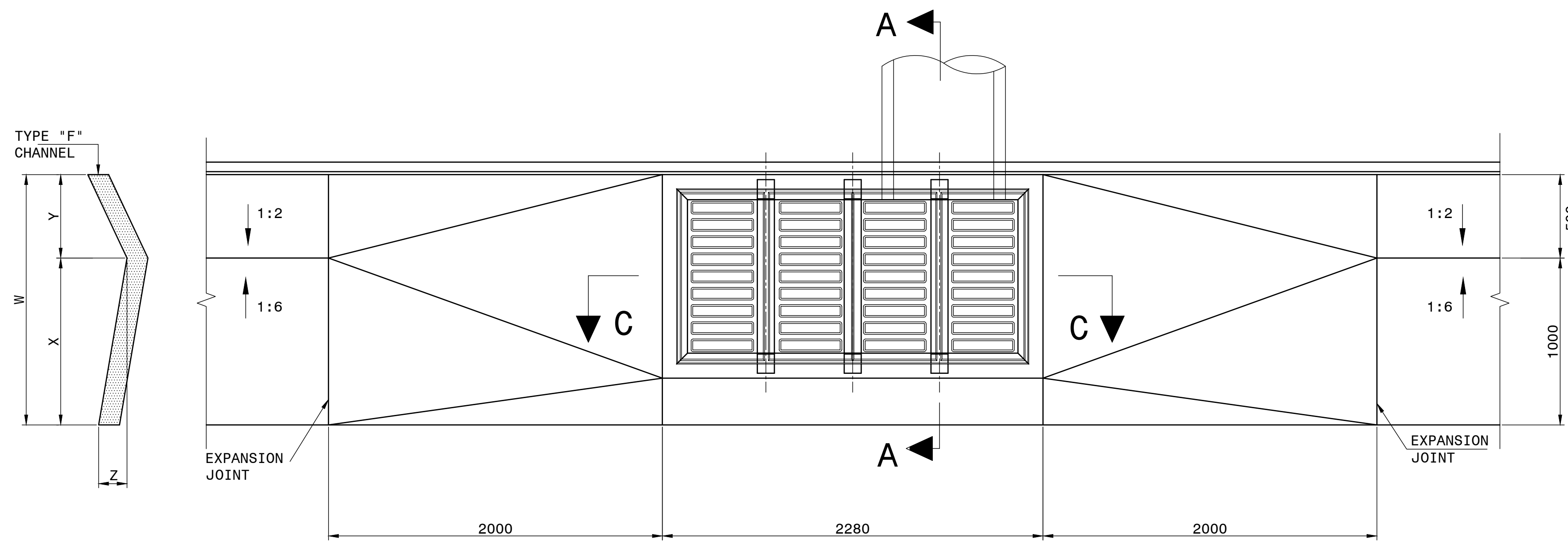
PROJECT DESCRIPTION										PROJECT NUMBER		NRA.C.004-099-2023/1	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)										DRAWING LOCATION DATA		START	END
										ROUTE		N2	N2
										SECTION		22	22
DRAWING DESCRIPTION										DRAWING KM DISTANCE		km 0,80	km 18,64
DRAINAGE TYPICALS DOWNPIPE OUTLET AND STILLING BASIN										DRAWING TYPE		DRAINAGE - TYPICALS	
										BRIDGE/STRUCTURE No.		N/A	
										CONSULTANT/DRAWING No.		TP1802-19-05-25-19-007	
SCALE	AS SHOWN	SHEET		1	OF	1							

DRAWING NO. TP1802-19-05-25-19-007



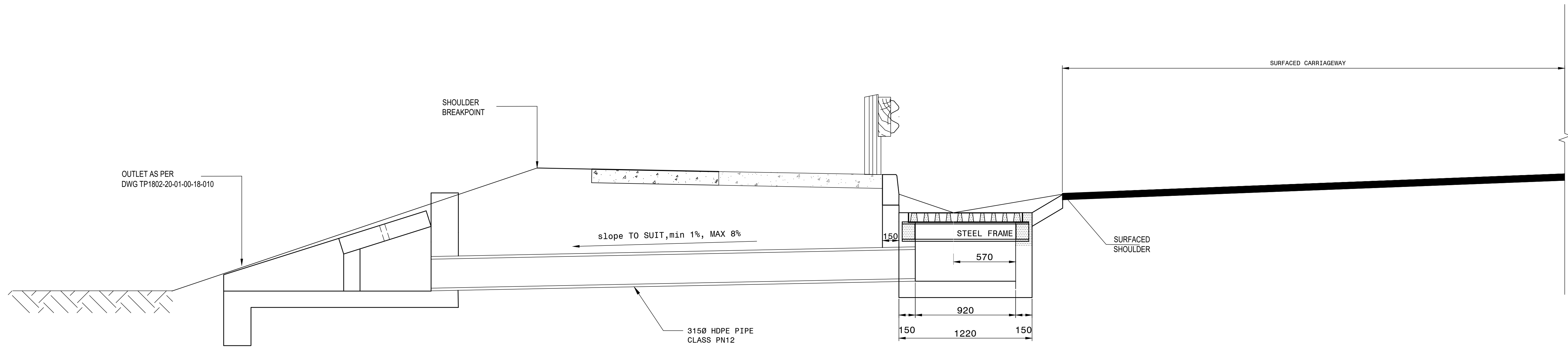
SIDE DRAIN GRID INLET AT END OF TYPE "F" CHANNEL
(4 GRIDS SHOWN ACTUAL NUMBER AS PER SCHEDULE)

SCALE 1:20



SIDE DRAIN GRID INLET ALONG TYPE "F" CHANNEL
(4 GRIDS SHOWN ACTUAL NUMBER AS PER SCHEDULE)

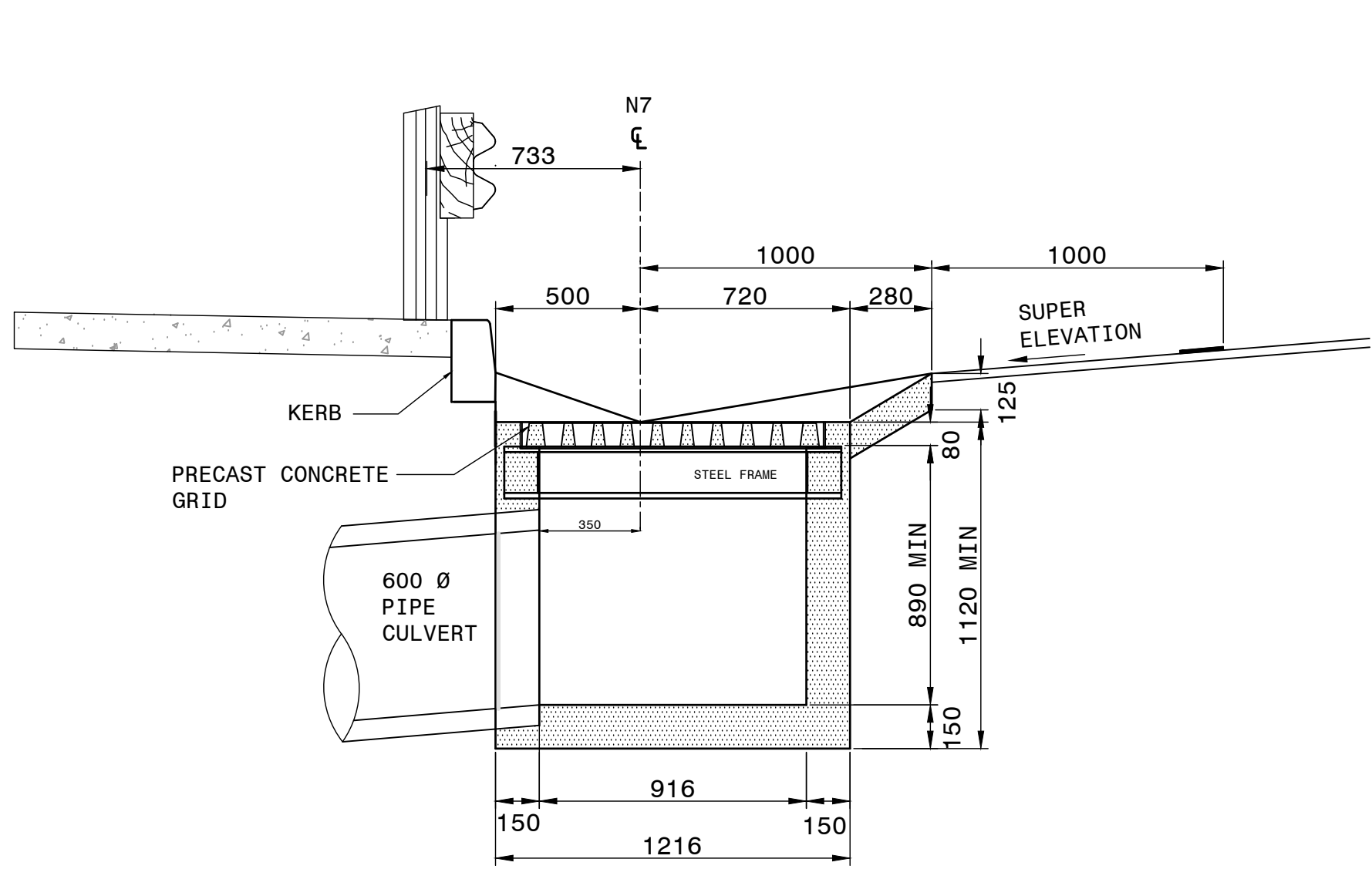
SCALE 1:20



SECTION "A-A" NOT AT EXISTING CULVERT

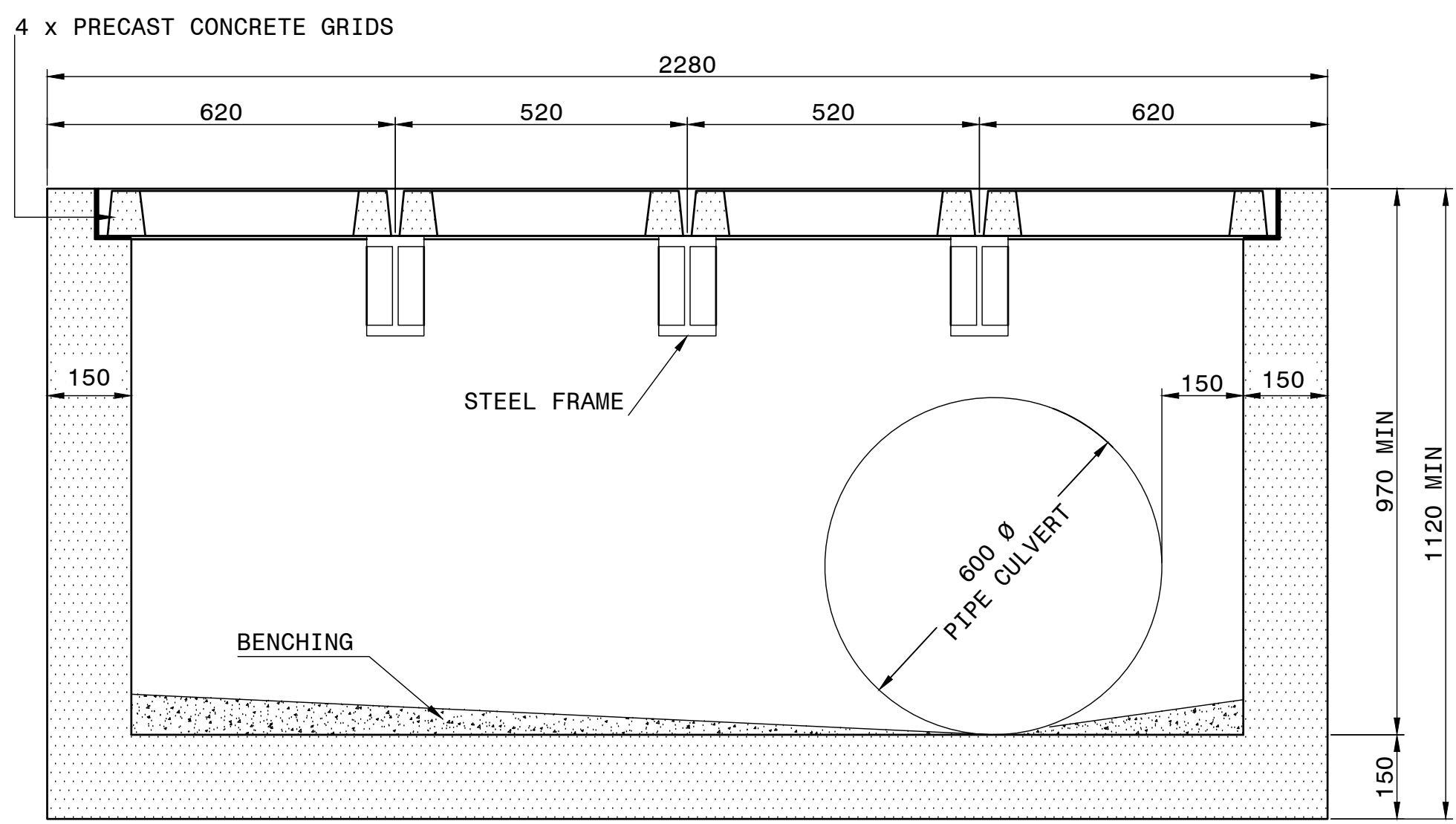
SCALE 1:20

Number of grids	L
2	1240
3	1760
4	2280
5	2800
6	3320
7	3840
8	4360
10	5400
12	6440
14	7480
16	8520



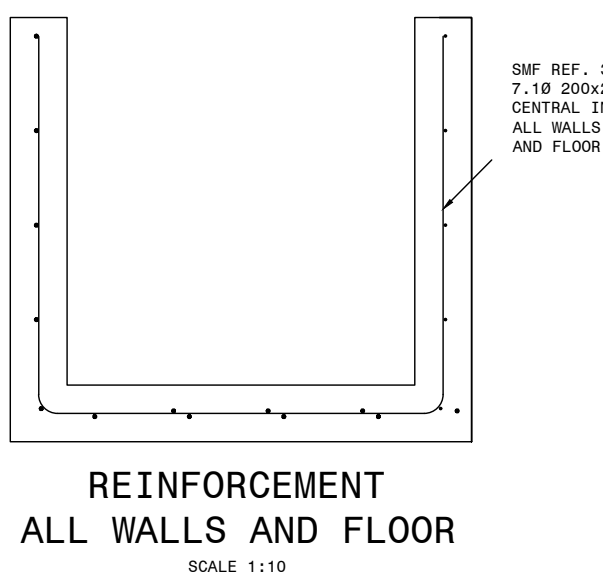
SECTION "A-A" AT EXISTING CULVERT

SCALE 1:20



SECTION "C-C"

SCALE 1:10



REINFORCEMENT
ALL WALLS AND FLOOR

SCALE 1:10

NOTES:

- MATERIAL:
- REINFORCEMENT:
SANS 920 LATEST VERSION.
- CONCRETE: (CAST IN SITU)
 - SIDE DRAINS AND TRANSITIONS -30MPa CONCRETE WITH 20mm STONE
 - KERB INLETS AND MANHOLES -30MPa CONCRETE WITH 20mm STONE
 - ENERGY BREAKERS -30MPa CONCRETE WITH 20mm STONE
 - ANCHOR BLOCKS -30MPa CONCRETE WITH 20mm STONE
 - BENCHING -15MPa CONCRETE WITH 20mm STONE
- THE TYPE OF SURFACE FINISH IS INDICATED AS F1 AND U2.
F - FORMED
U - UNFORMED SURFACES
- MINIMUM CONCRETE COVER OVER REINFORCEMENT:50mm.
- ALL EXPOSED CORNERS MUST BE ROUNDED AT A MINIMUM RADIUS OF 10mm OR CHAMFERED 25mm x 25mm.

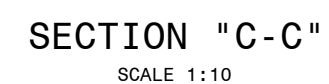
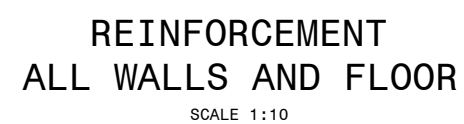
CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	:		
Prof. Reg. No.	:		
Date	:		
SANRAL PROJECT MANAGER			
Name	:		
Prof. Reg. No.	:		
Date	:		
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE 48 Tambotie Avenue Vai de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:
---	---	---	---

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS GRID INLETS FOR TYPE F SIDE DRAINS	
SCALE :	AS SHOWN

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-19-008	
SANRAL DOCUMENT #		-	

VER	V1
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- ## NOTES:
1. MATERIAL:

REINFORCEMENT: 920 SABS, LATEST REVISION.

(CAST IN SITU)

: ROOMS D' : CLASS 30/19.

: CLASS 15/19.
 4. THE TYPE OF SURFACE FINISH IS INDICATED AS F1 AND U2.

F - FORMED SURFACES

U - INFORMED SURFACES
 5. MINIMUM MAIN CONCRETE COVER REINFORCEMENT 50mm.
 6. ALL EXPOSED CORNERS MUST BE ROUNDED AT A MINIMUM RAY OF 10mm OR CHAMFER 25mm x 25mm.
 7. THE POSITION OF THE DESCENT PIPE HOSE OUTPUT AND THE RUNNING BASIN IS SHOWN ON DRAIN DIAGRAM NO. 1072/4-04-01-T1-13

						CONSTRUCTION RECORD
						<u>WORKS CONTRACT ENGINEER</u>
						Name : _____
						Prof. Reg. No. : _____
						Date : _____
						<u>SANRAL PROJECT MANAGER</u>
V1	SEPT 2023	ORIGINAL VERSION			S.KASPERSAID	Name : _____
No.	DATE		REVISION		CONSULT. ENG.	Prof. Reg. No. : _____
						Date : _____

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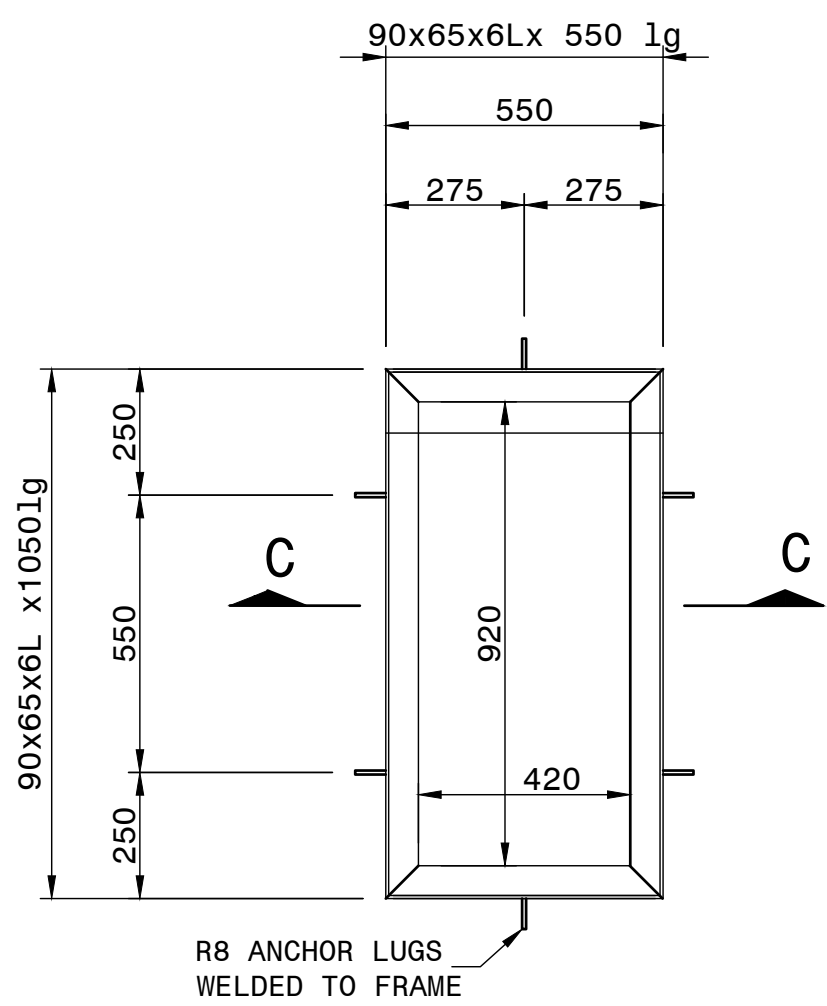
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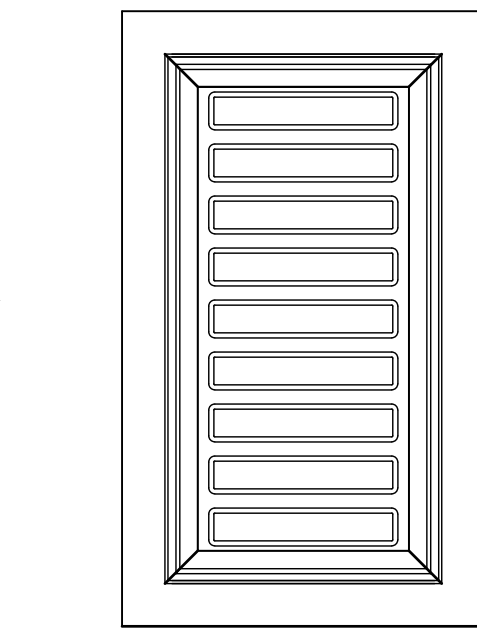
Date: _____

<p align="center"><u>PROJECT DESCRIPTION</u></p> <p align="center">CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUASI (Km 0,80) TO MURCHISON (Km 18,64)</p>			
<p align="center"><u>DRAWING DESCRIPTION</u></p> <p align="center">DRAINAGE TYPICALS GRID INLETS FOR TYPE E SIDE DRAINS</p>			
SCALE :	AS SHOWN	SHEET	4 OF 4

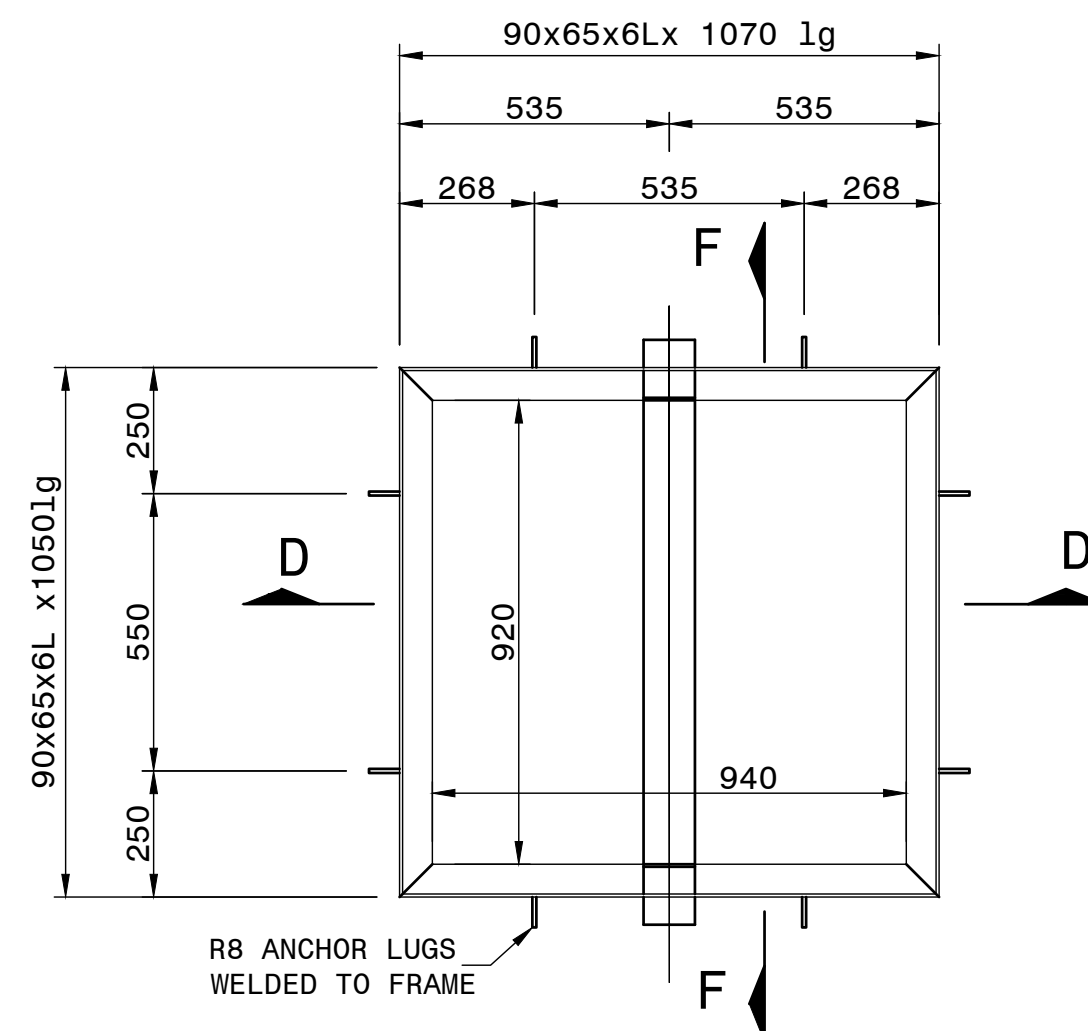
PROJECT NUMBER	NRA.C.004-099-2023/1		
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0.80	km 18.64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-009	VER 1/1	
SHEET DOCUMENT #.			



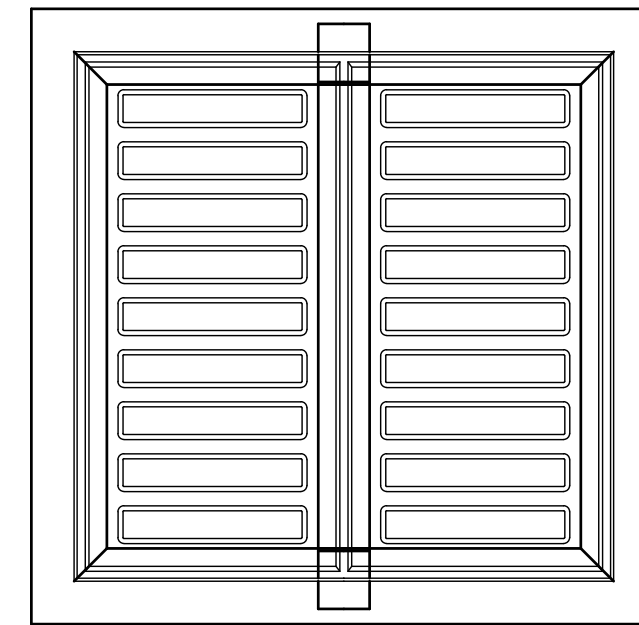
PLAN ON FRAME
SCALE 1 : 15



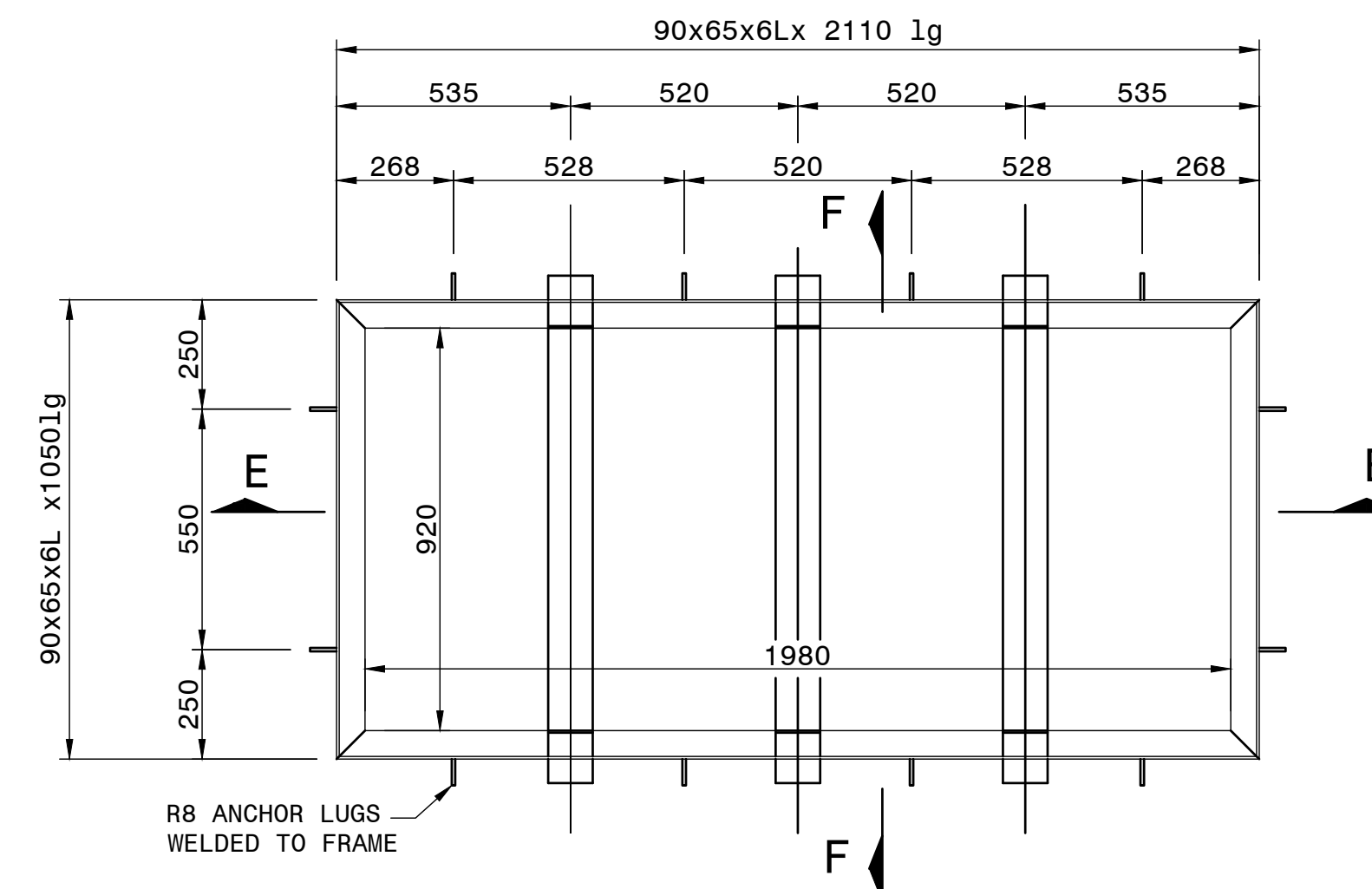
STEEL FRAME WITH
GRID IN PLACE
SCALE 1 : 15



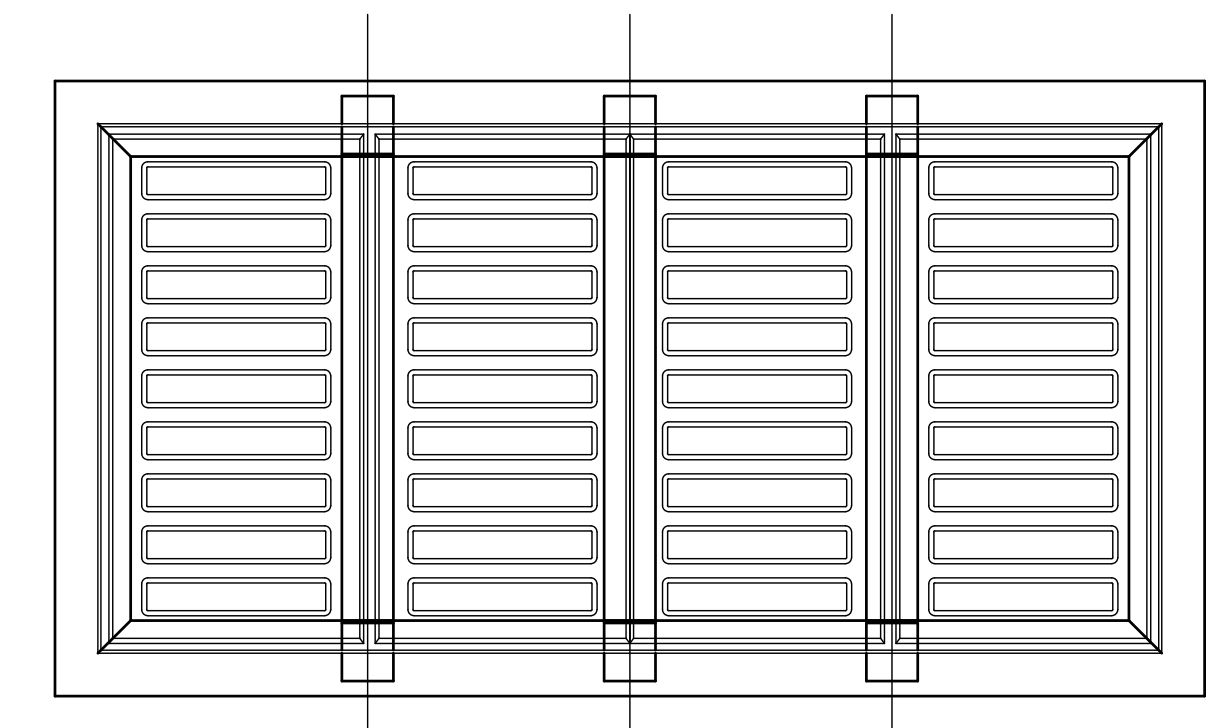
PLAN ON FRAME
SCALE 1 : 15



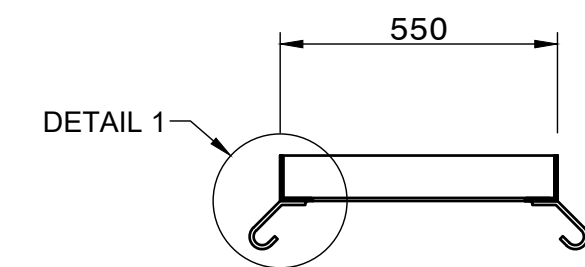
STEEL FRAME WITH GRIDS IN PLACE
SCALE 1 : 15



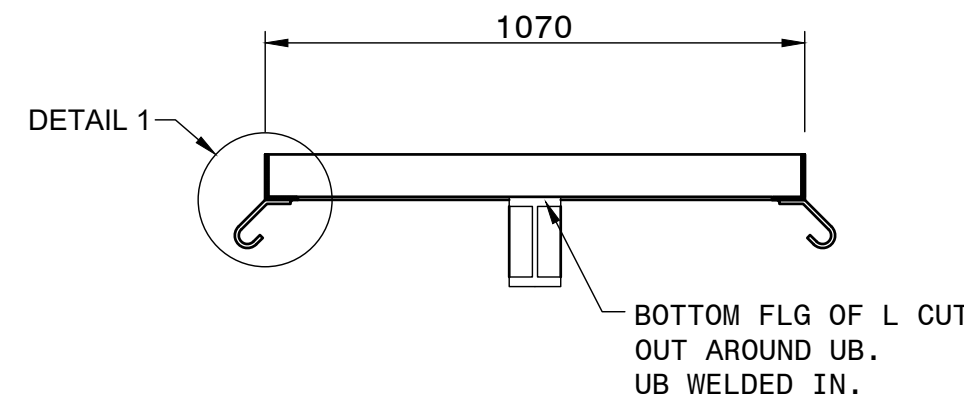
PLAN ON FRAME
SCALE 1 : 15



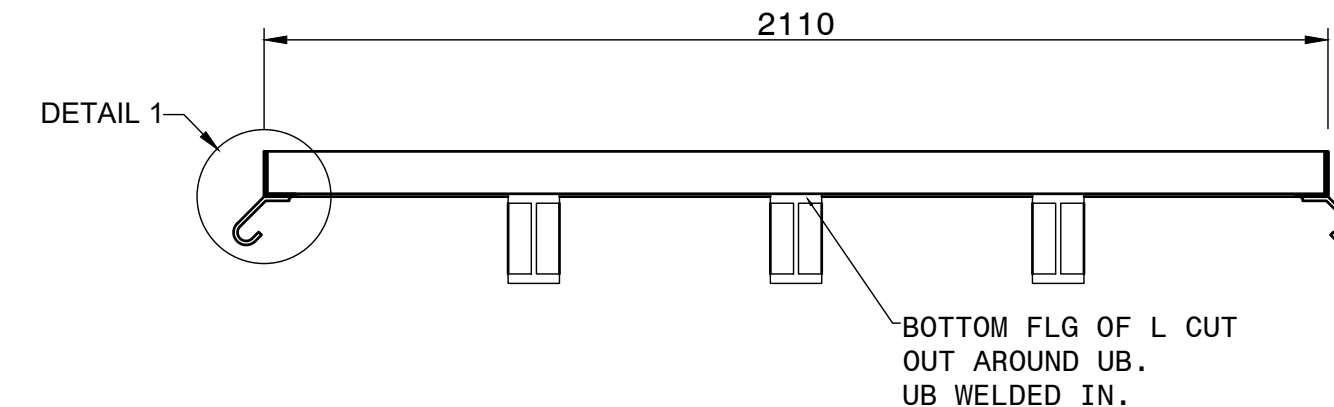
STEEL FRAME WITH GRIDS IN PLACE
SCALE 1 : 15



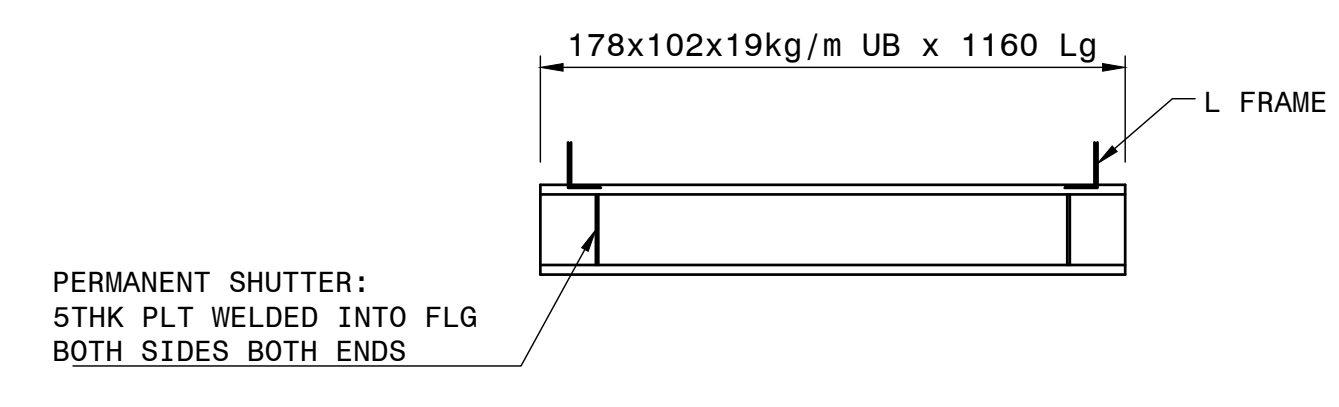
SECTION C-C
SCALE 1 : 15



SECTION D-D
SCALE 1 : 15

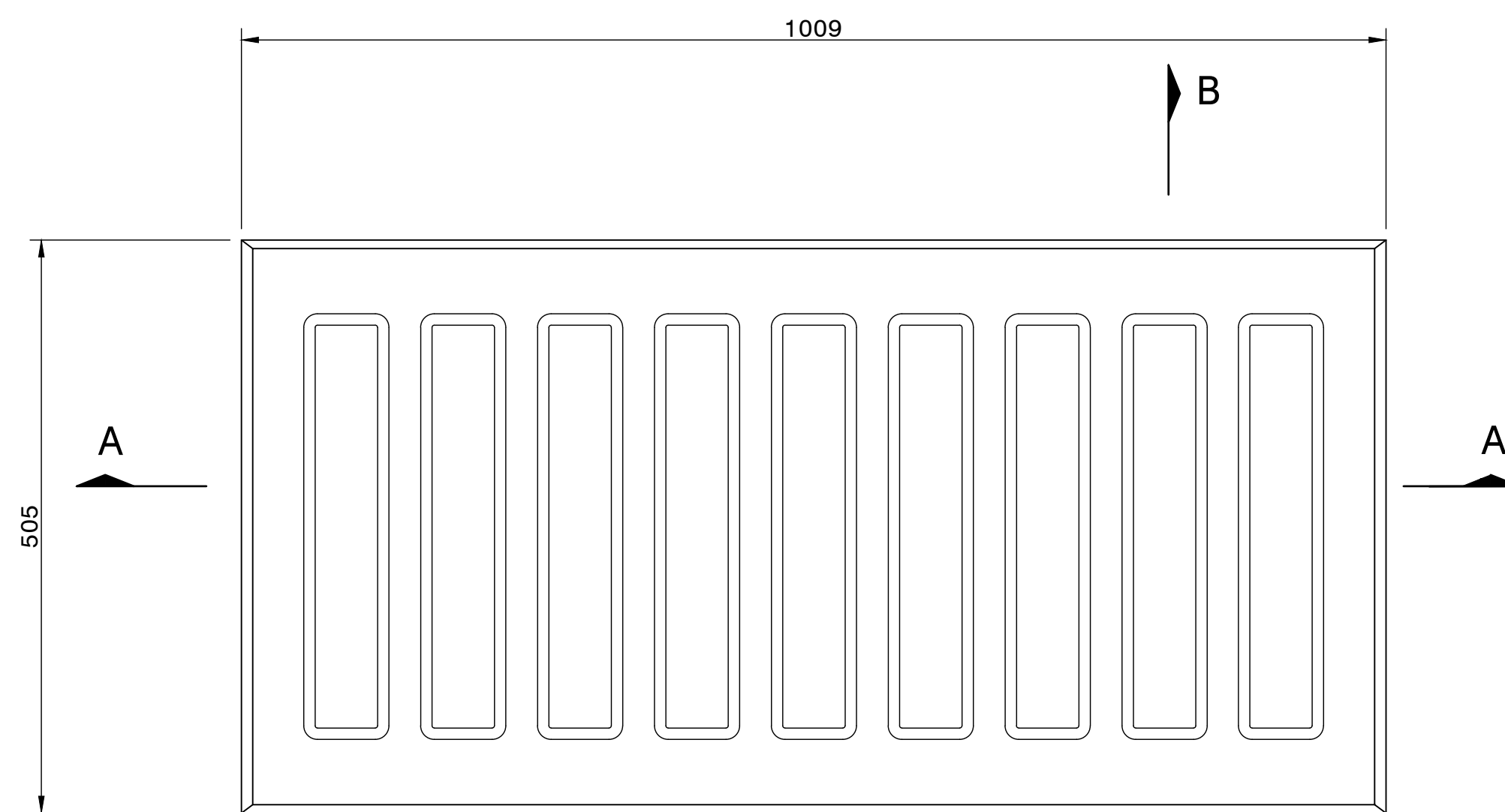


SECTION E-E
SCALE 1 : 15

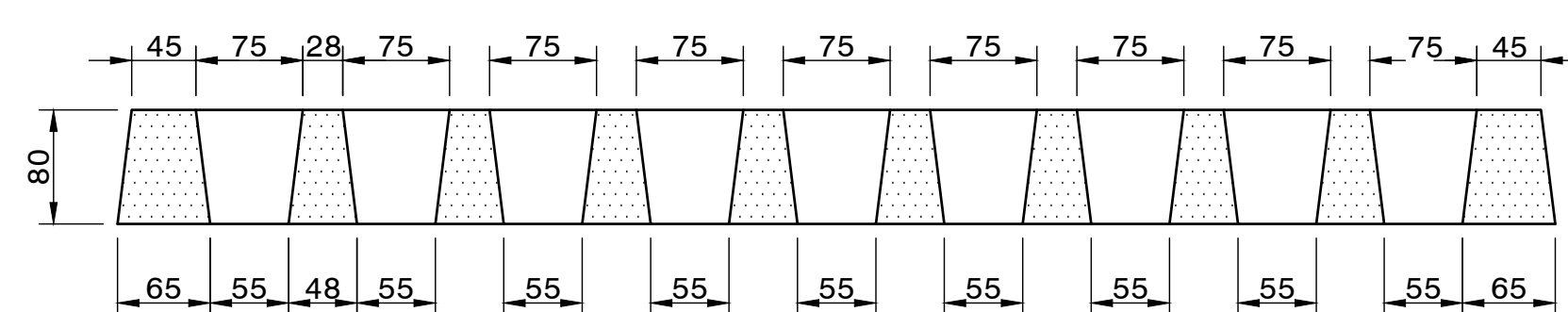
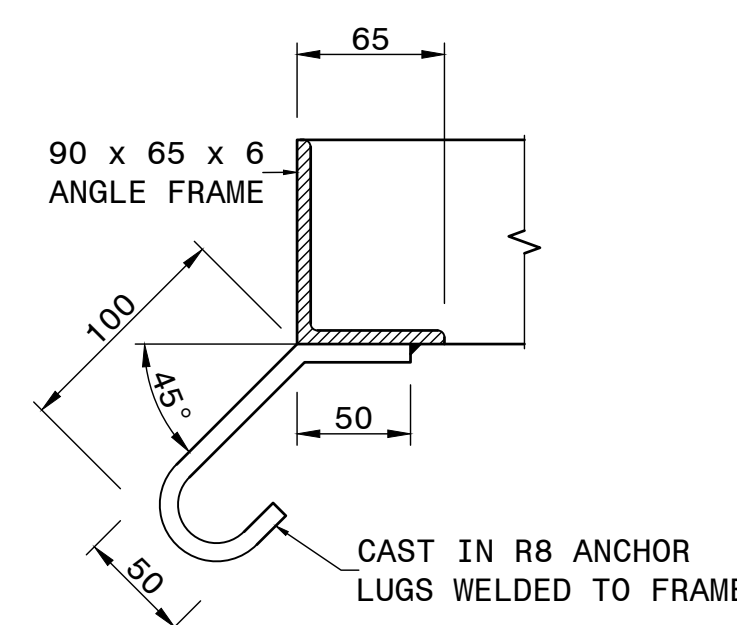


SECTION F-F
SCALE 1 : 15

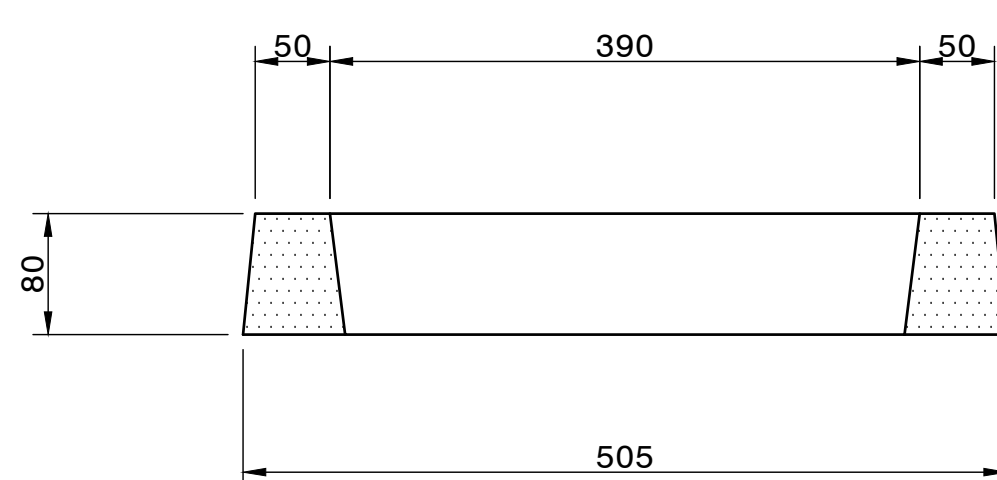
DETAIL OF STEEL FRAME FOR GRID



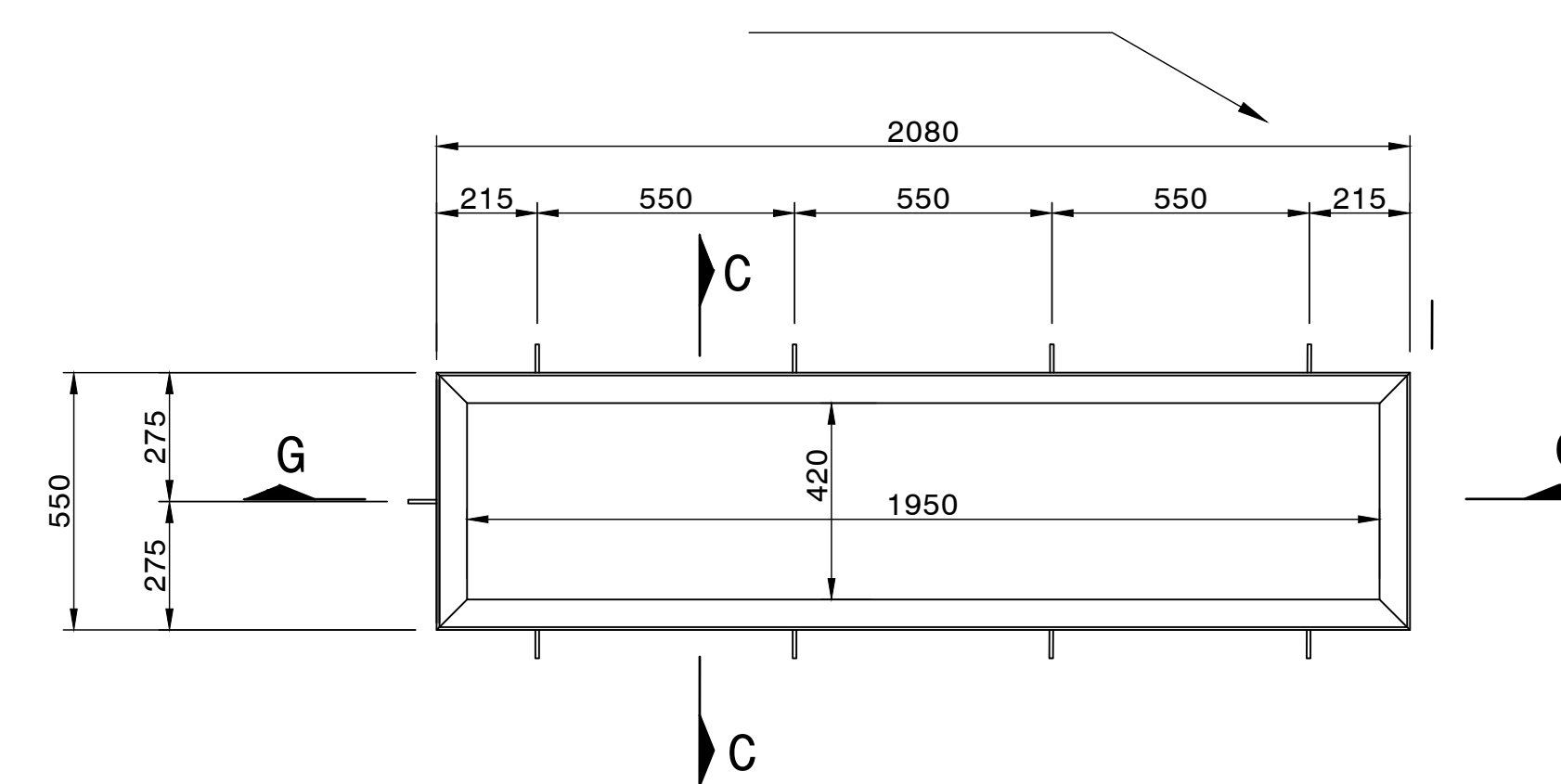
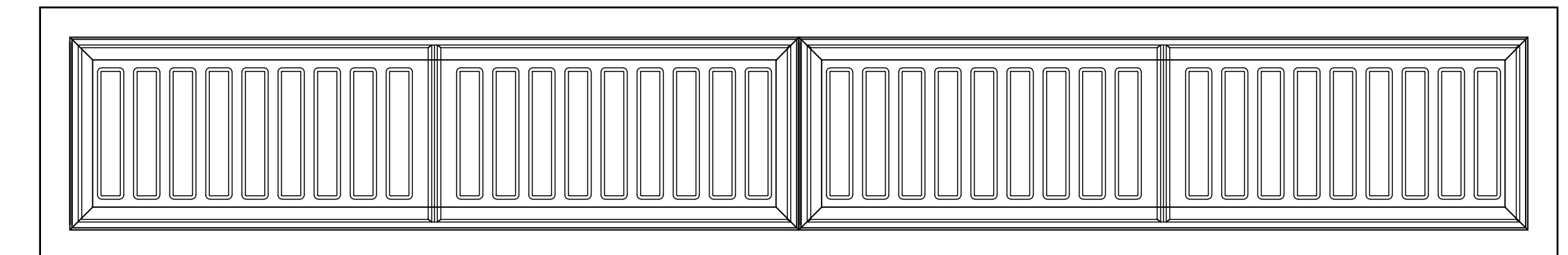
PLAN ON GRID
SCALE 1 : 5



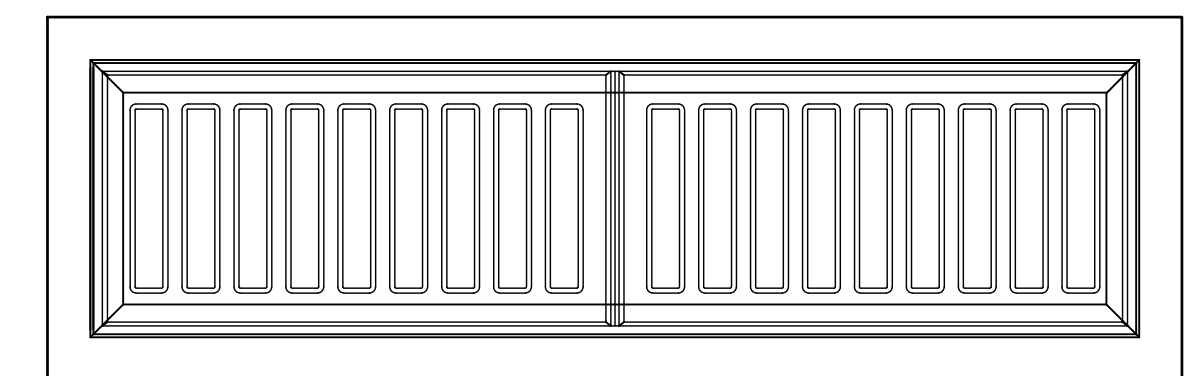
SECTION A-A
SCALE 1 : 5



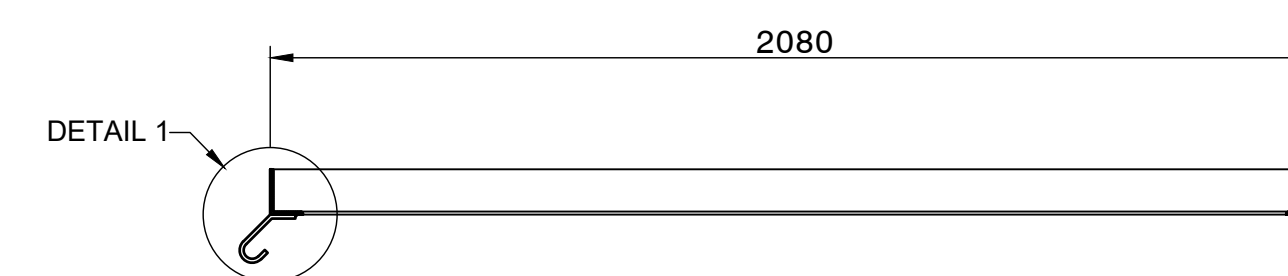
SECTION B-B
SCALE 1 : 5



PLAN ON FRAME
SCALE 1 : 15



STEEL FRAME WITH GRIDS IN PLACE
SCALE 1 : 15



SECTION G-G
SCALE 1 : 15

NOTES:

1. FRAME TO BE MANUFACTURED FROM MILD STEEL GRADE: 350 IN COMPLIANCE WITH THE REQUIREMENTS OF BS 4360 PART 2.
2. THE MANUFACTURING, ASSEMBLY AND FIXING OF THE GRIDS AND FRAMES SHALL COMPLY WITH SANS 0162.
3. ALL WELDING SHALL BE FULL-JOINT PENETRATION CONTINUOUS BUTT-JOINTS, CONTINUOUS FILLET WELDS (ANCHOR LUGS TO FRAME) CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF BS 5135.
4. STEEL MEMBERS SHALL BE HOT-DIP GALVANISED WITH AN 85 μ COATING IN ACCORDANCE WITH SANS 763, ONLY AFTER ALL THE MEMBERS HAVE BEEN WELDED TOGETHER.
5. GRID TO WITHSTAND 40 KN WHEEL LOAD.
6. PROPRIETARY BRAND DURASET FIBRE CONCRETE GRIDS OR SIMILAR TO BE USED WITH STEEL FRAMES AS INDICATED

DETAIL OF PRECAST FIBRE CONCRETE GRIDS

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
SANRAL PROJECT MANAGER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

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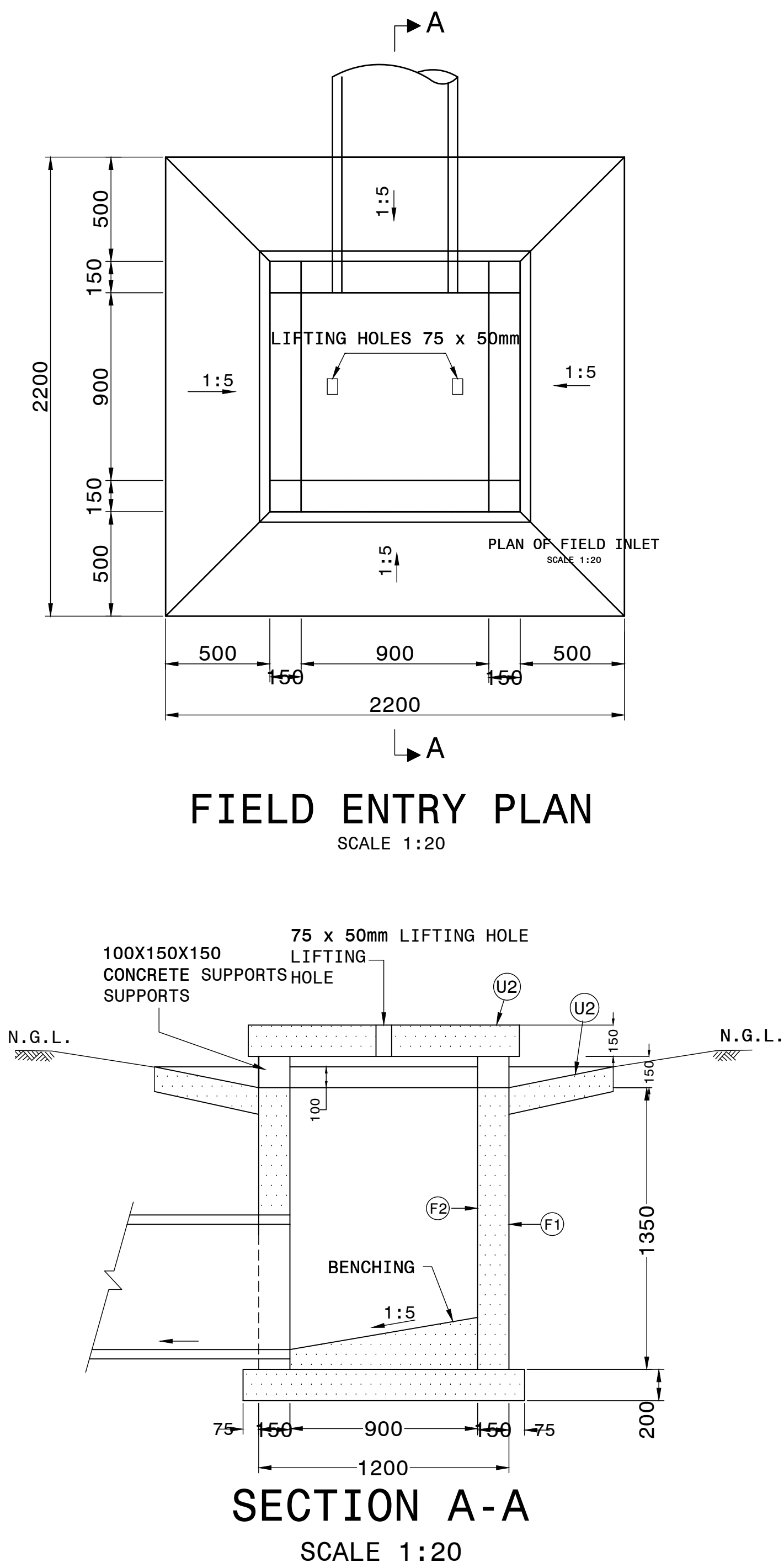
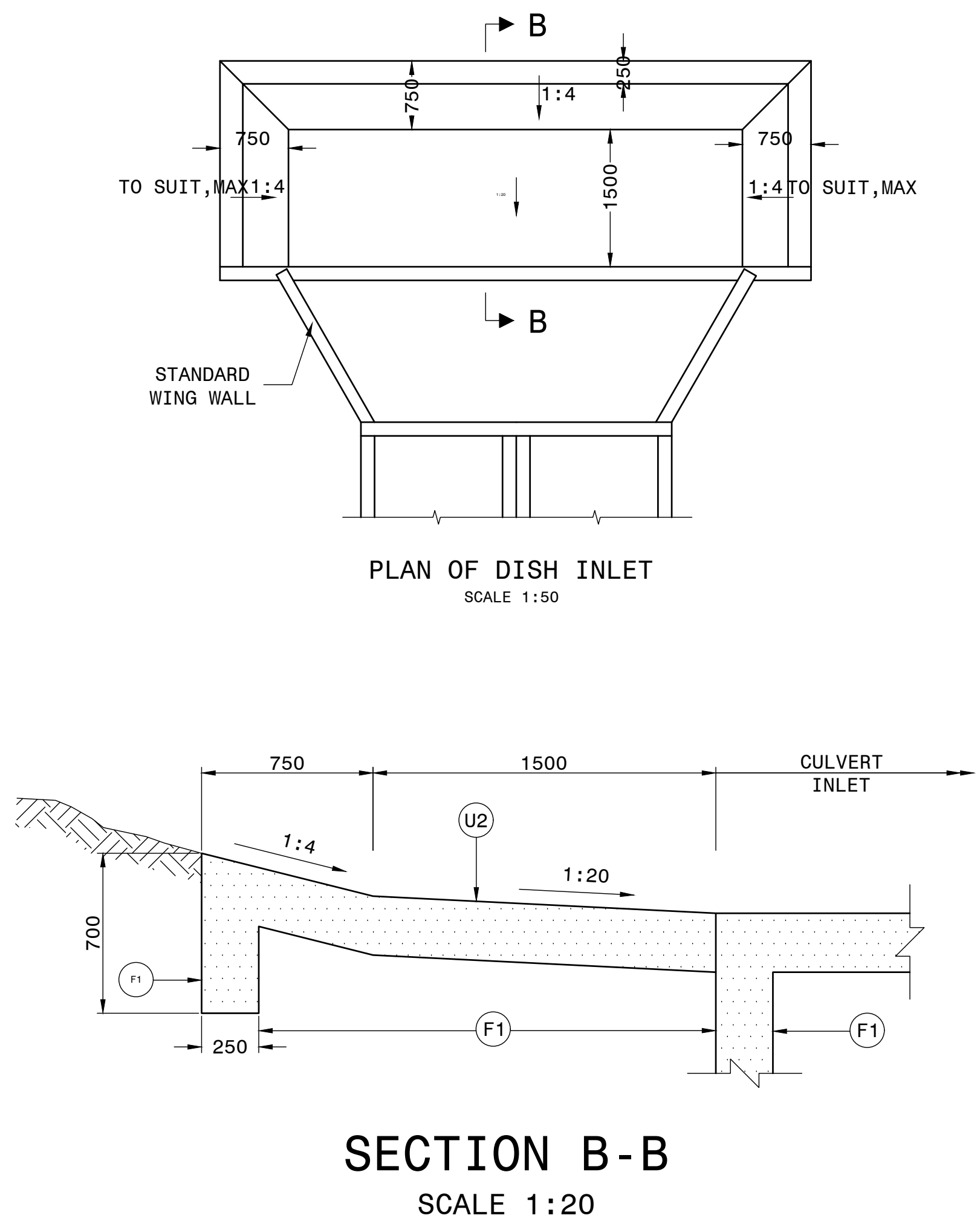
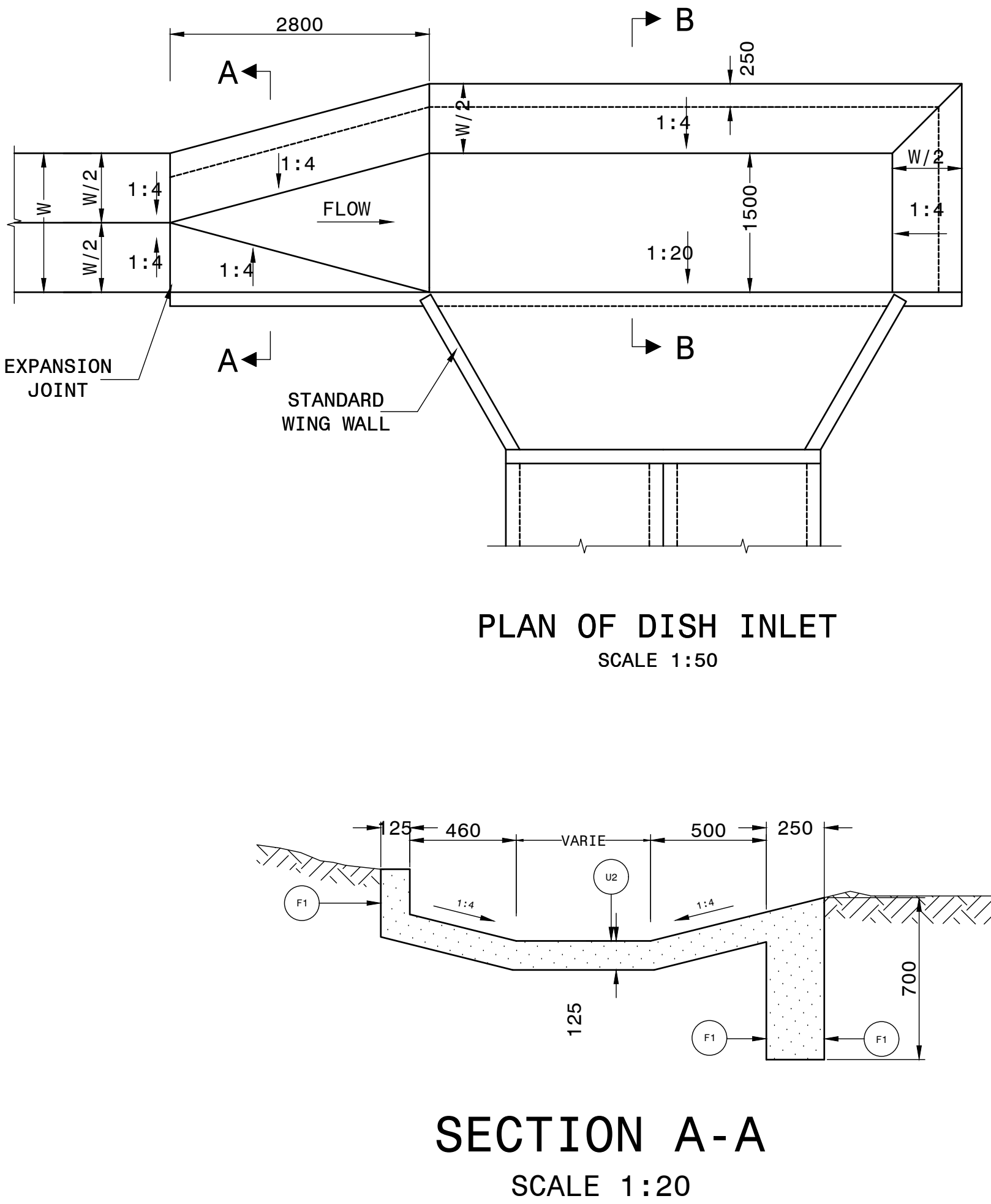
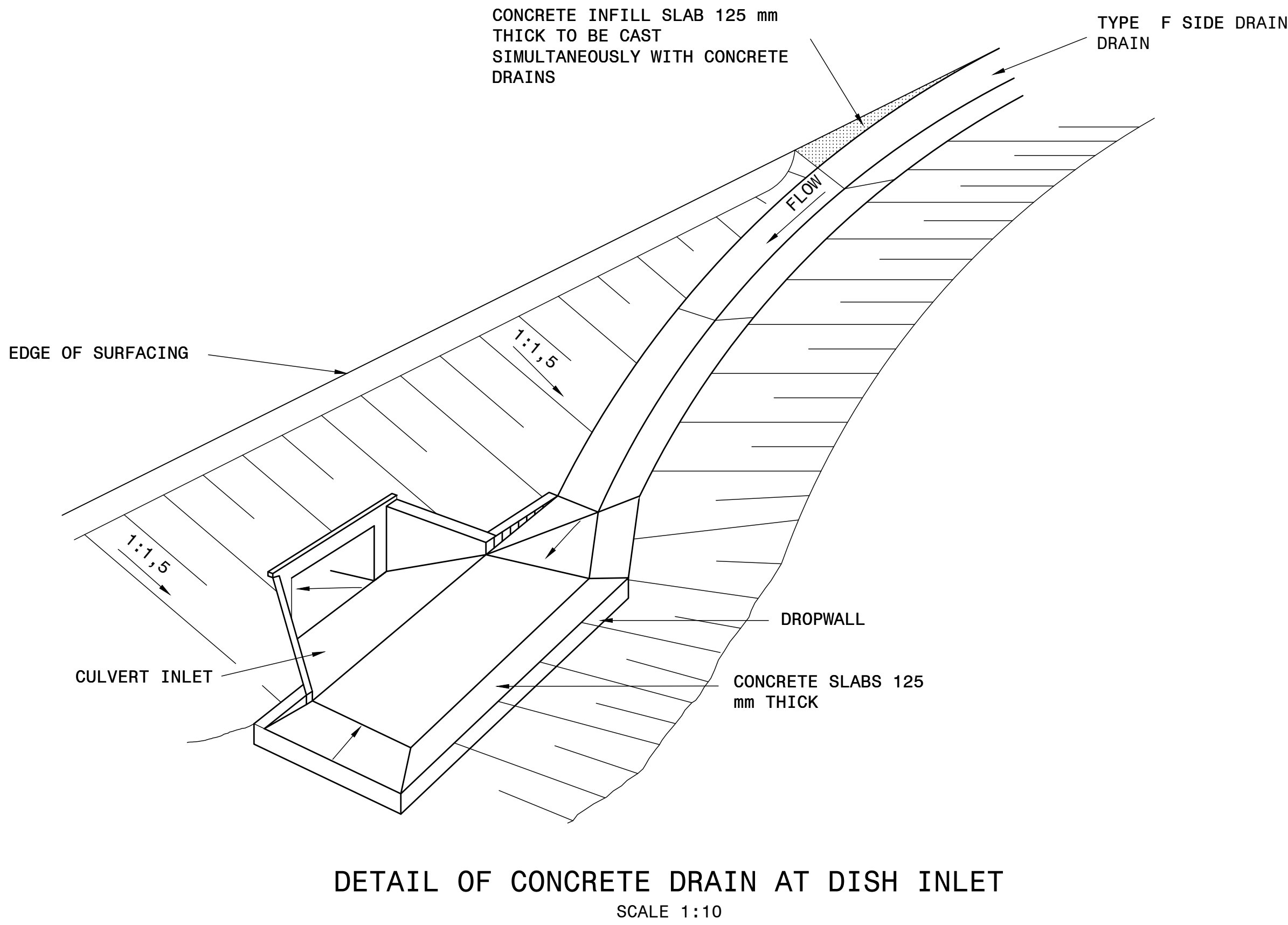
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Tel: (033) 392 8100

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date: _____

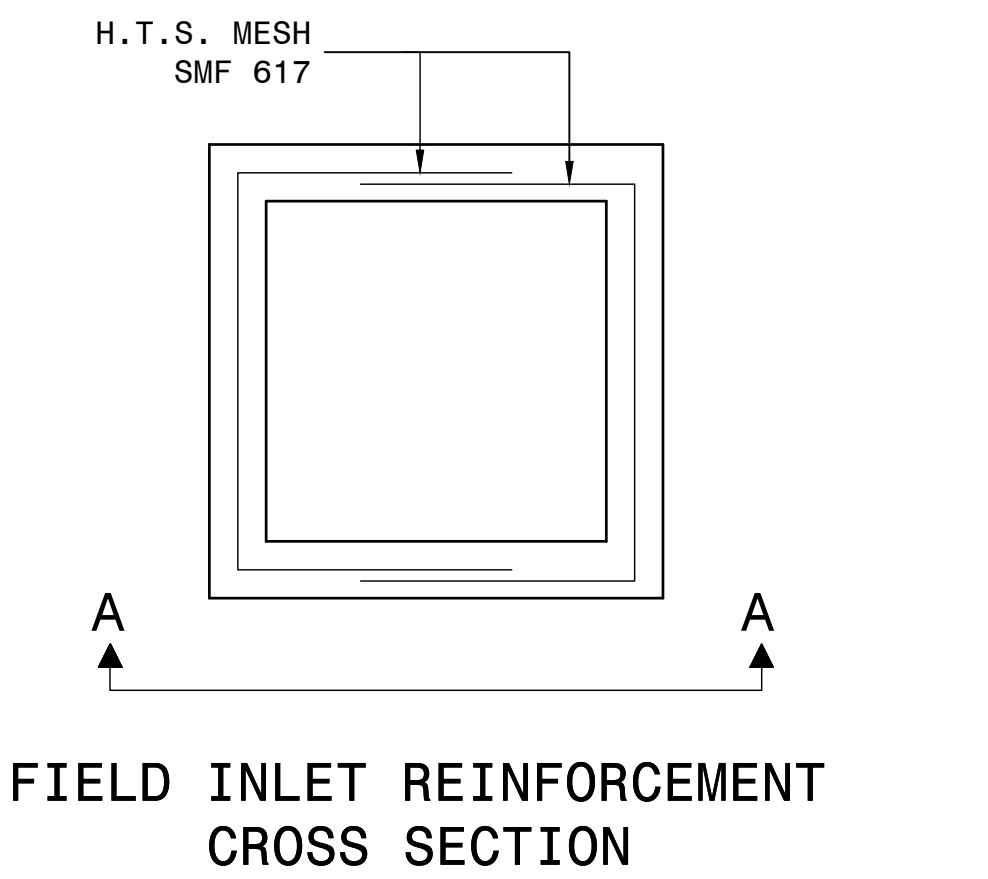
PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS PRECAST FIBRE CONCRETE GRID AND STEEL FRAME DETAILS	
SCALE :	AS SHOWN

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-19-010	
SANRAL DOCUMENT #		-	VER
			V1

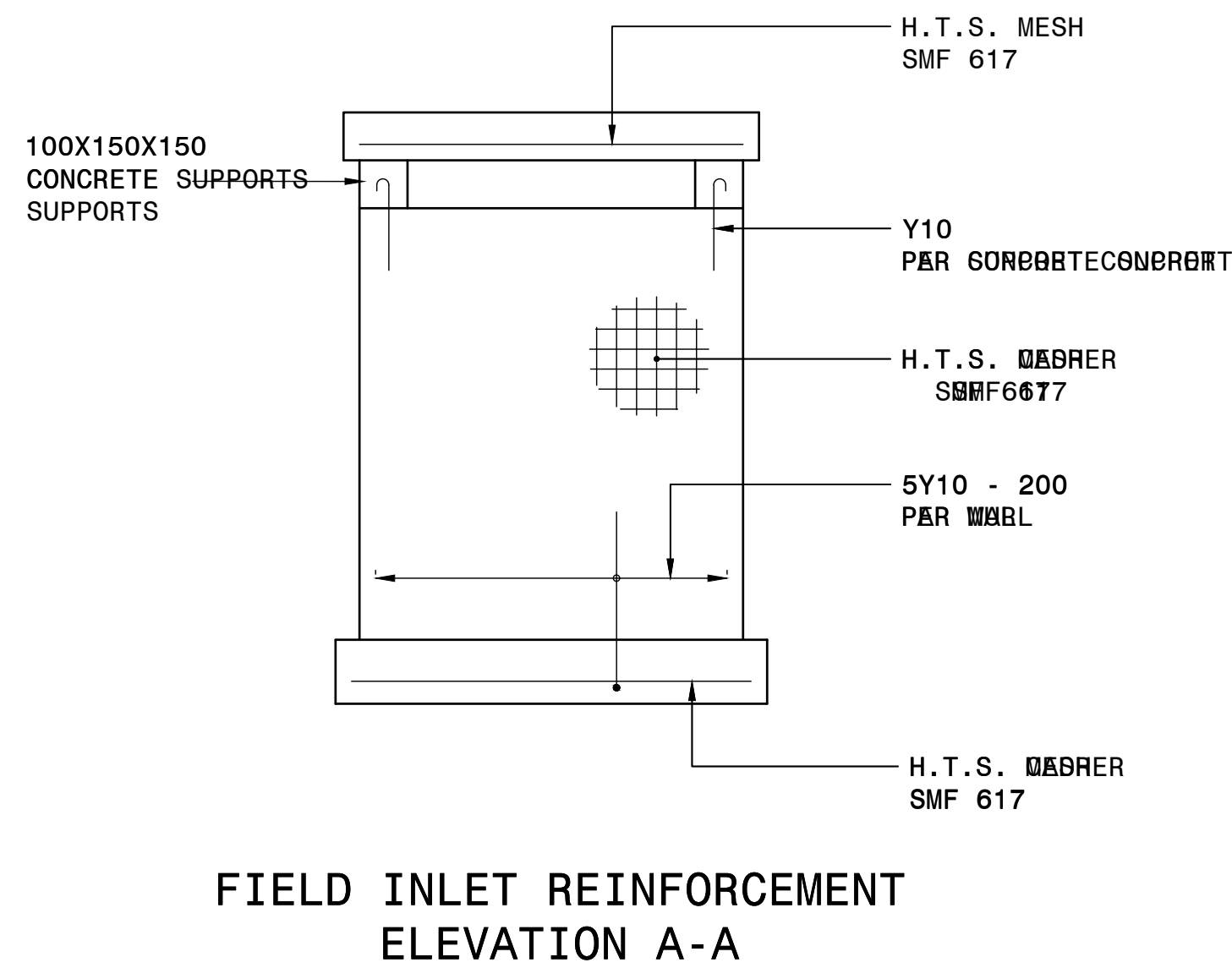
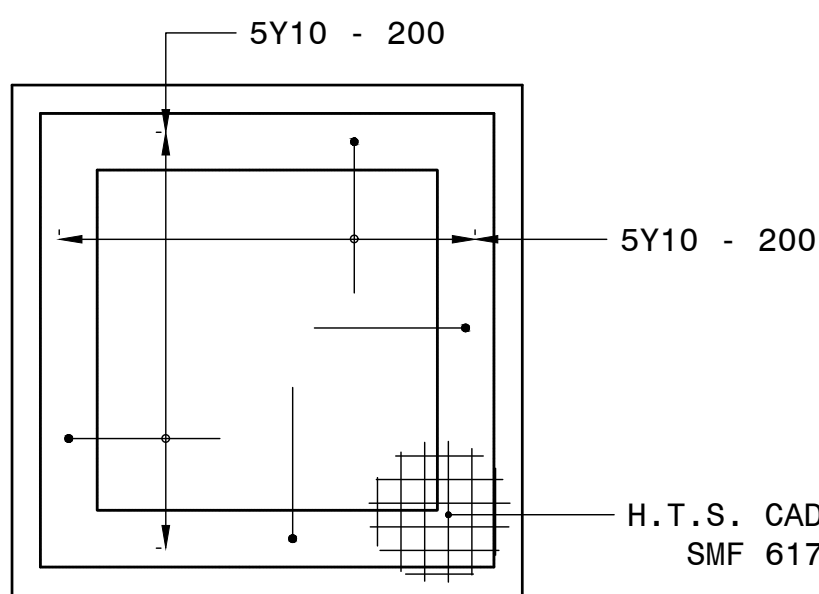
DISH INLET



FIELD INLET REINFORCEMENT
PLAN OF TOP SLAB



FIELD INLET REINFORCEMENT
PLAN OF BOTTOM SLAB



NOTES:

- MATERIAL:
- REINFORCEMENT:
HIGH STRENGTH STEEL: WORKING STRESS - 210 MPa.
- CONCRETE: (CAST IN SITU)
 - SIDE DRAINS AND TRANSITIONS - 30MPa CONCRETE WITH 20mm STONE
 - KERB INLETS AND MANHOLES - 30MPa CONCRETE WITH 20mm STONE
 - ENERGY BREAKERS - 30MPa CONCRETE WITH 20mm STONE
 - ANCHOR BLOCKS - 30MPa CONCRETE WITH 20mm STONE
 - BENCHING - 15MPa CONCRETE WITH 20mm STONE
- THE TYPE OF SURFACE FINISH IS INDICATED AS F1 AND U2.
F - FORMED -
U - UNFORMED SURFACES
- MINIMUM CONCRETE COVER OVER REINFORCEMENT: 50mm.
- ALL EXPOSED CORNERS MUST BE ROUNDED AT A MINIMUM RADIUS OF 10mm OR CHAMFERED 25mm x 25mm.

				CONSTRUCTION RECORD	
				WORKS CONTRACT ENGINEER	
				Name	:
				Prof. Reg. No.	:
				Date	:
				SANRAL PROJECT MANAGER	
V1	SEPT 2023	ORIGINAL VERSION		S.KASPER SAD	
No.	DATE	REVISION		CONSULT. ENG.	
				Name	:
				Prof. Reg. No.	:
				Date	:

HEAD OFFICE			
48 Tambotie Avenue Val de Grace Pretoria 0184			
PO Box 415 Pretoria 0001 South Africa			
Tel: (012) 844 8000			



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58 van Eck Place
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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS GRID INLETS FOR MEDIANS: DUAL CARRIAGEWAY FIELD INLET AND DISH INLET	
SCALE :	AS SHOWN

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-011		
SANRAL DOCUMENT #			
			V1

DRAWING No. TP1802-19-05-25-19-011

SECTION A-A
SCALE 1:20

SECTION B-B
SCALE 1:50

NOTE
F = 90 FOR GRID FRAME
F = 120 FOR M.H. FRAME

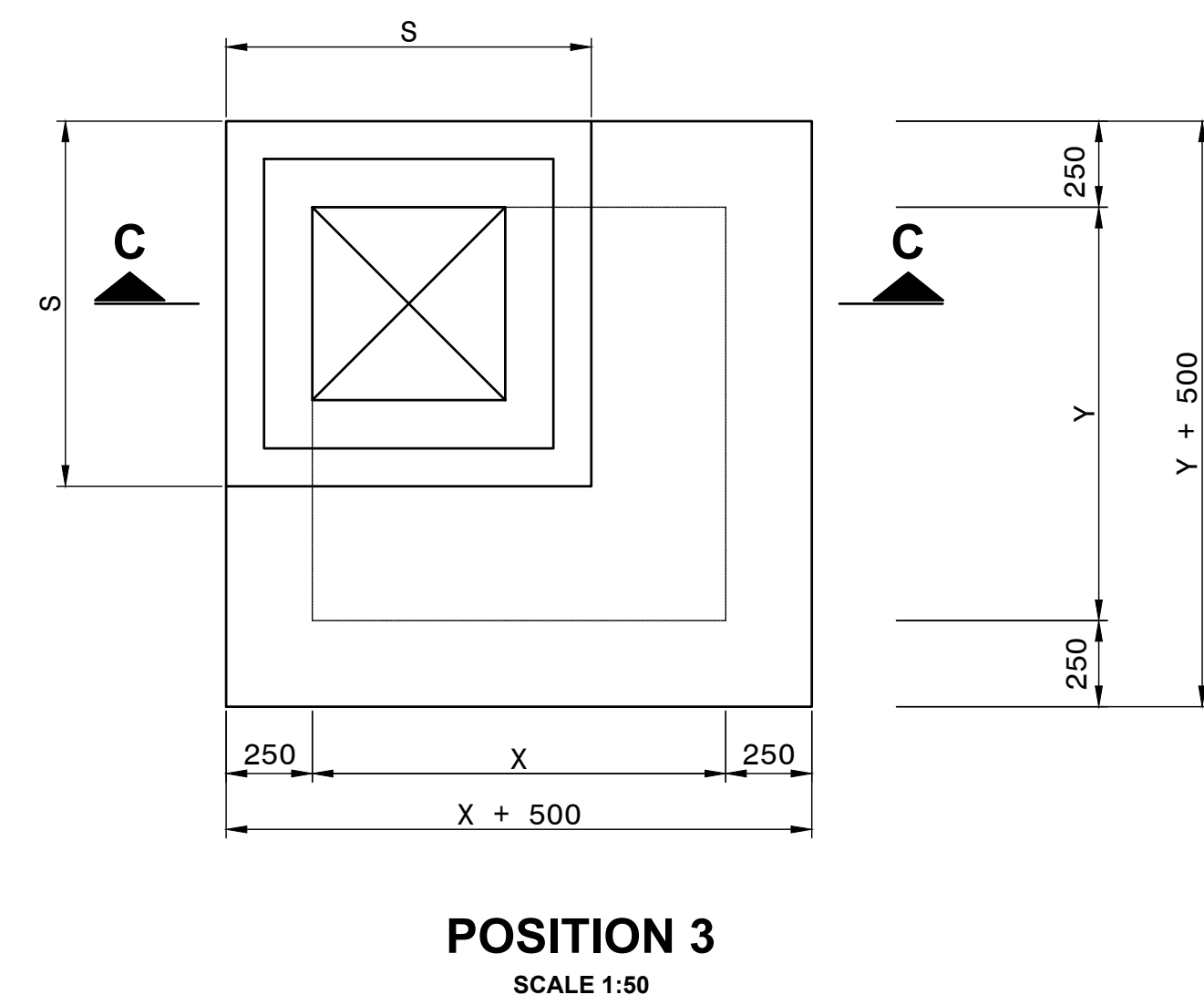
SECTION C-C
SCALE 1:50

SECTION D-D
SCALE 1:50

Technical drawings of two cross-sections of a manhole structure, labeled SECTION C-C and SECTION D-D, both at a scale of 1:50.

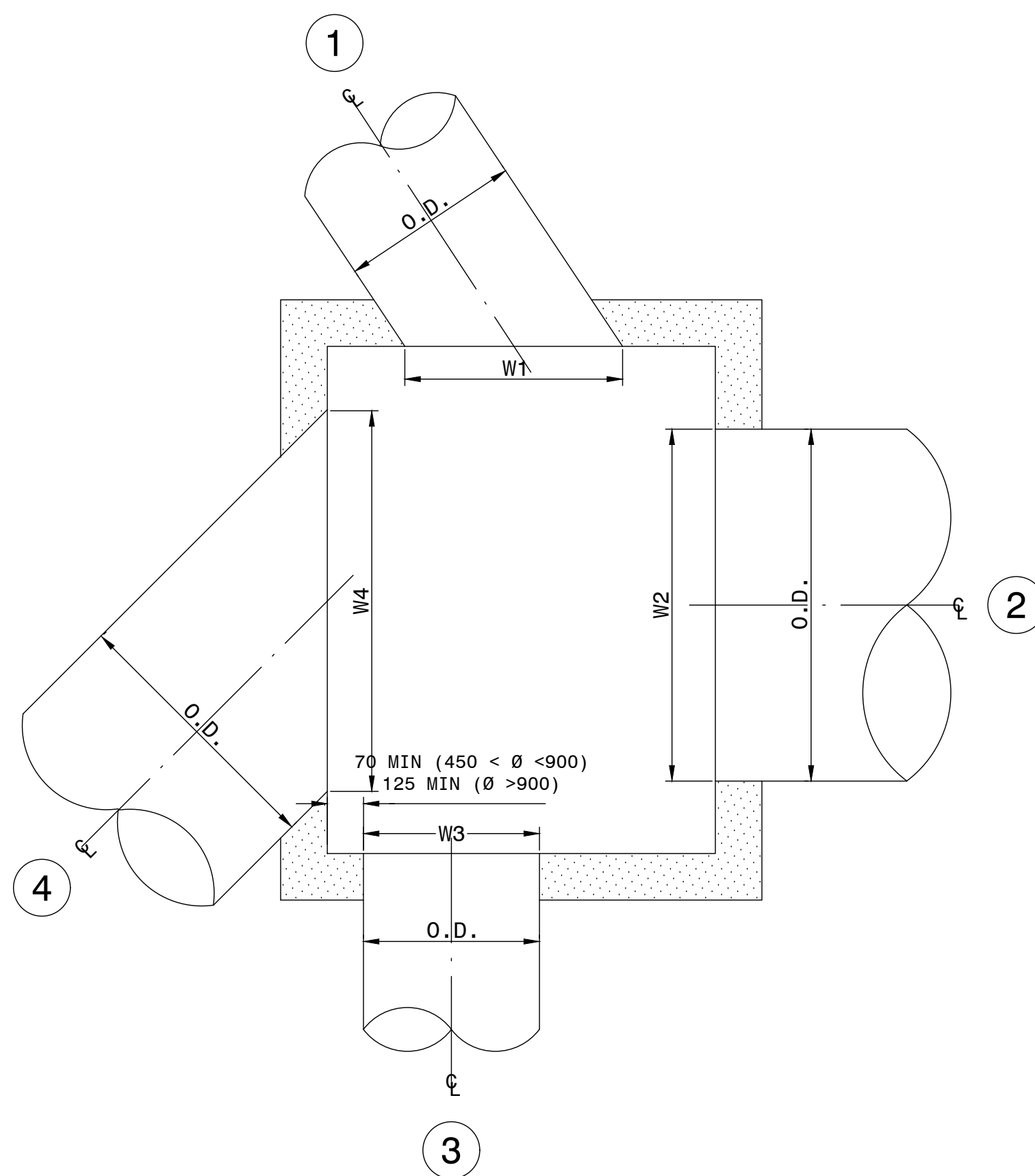
SECTION C-C: This drawing shows a cross-section of a manhole. The top part is a rectangular structure with a width of 250 and a height of 300. Below this is a larger rectangular section with a width of $X + 500$ and a height of 250. The bottom part is a smaller rectangular section with a width of 250 and a height of 75. The total height of the structure is 2500 MAX. The drawing includes a note: "DEPTH VARIES 2500 MAX". The bottom part is labeled "FLOOR THICKNESS FOR TYPE A TOE". The drawing also includes a note: "S = SHAFT DIMENSION DEPENDANT ON APPLICATION (MANHOLE COVER OR GRID)".

SECTION D-D: This drawing shows a cross-section of a manhole. The top part is a rectangular structure with a width of 250 and a height of 300. Below this is a larger rectangular section with a width of $X + 500$ and a height of 250. The bottom part is a smaller rectangular section with a width of 250 and a height of 75. The total height of the structure is 2500 MAX. The drawing includes a note: "DEPTH VARIES 2500 MAX". The bottom part is labeled "FLOOR THICKNESS FOR TYPE F TO J".



1. CONCRETE FOR CHAMBERS TO BE REINFORCED.
2. FOR TRAFFIC LOADING REFER TO TMH 7 PART 1 AND 2, LATEST REVISION 3.
3. 840 x 840 x 120 RECESS TO ACCOMMODATE MANHOLE COVER AND FRAME TYPE 2A ACCORDING TO SANS 558.
4. FOR GRID DETAILS REFER TO MANHOLE AND FRAME DETAIL DRAWING.

CHAMBER TYPE	DIMENSION					MANHOLES	
	CHAMBER		EXTERNAL		FLOOR	Position of frame	300mm shaft on cover slab
	X	Y	X+500	Y+500			
A	900	900	1400	1400	250	2	NO
B	1200	900	1700	1400	250	3	NO
C	1200	1200	1700	1700	250	3	YES
D	1500	1200	2000	1700	250	3	YES
E	1500	1500	2000	2000	250	3	YES
F	2000	1500	2500	2000	300	3	YES
G	2000	2000	2500	2500	300	3	YES
H	2500	2000	3000	2500	300	3	YES
I	2500	2500	3000	3000	300	3	YES
J	2000	1000	2500	1500	300	N/A	

[illegible]

						CONSTRUCTION RECORD					
						WORKS CONTRACT ENGINEER					
						Name : _____					
						Prof. Reg. No. : _____					
						Date : _____					
						SANJAL PROJECT MANAGER					
V1	SEPT 2023	ORIGINAL VERSION				S.KASPERAD		Name : _____			
No.	DATE	REVISION				CONSULT. ENG.		Prof. Reg. No. : _____			
								Date : _____			

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184

PO Box 415
Pretoria 0001
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Tel: (012) 844 8000



EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201

PO Box 100410
Scottsville
3209

Tel: (033) 392 8100

ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

for CEO: SA NATIONAL ROADS AGENCY LTD.

Date:

**CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2,
SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)**

DRAINAGE TYPICALS

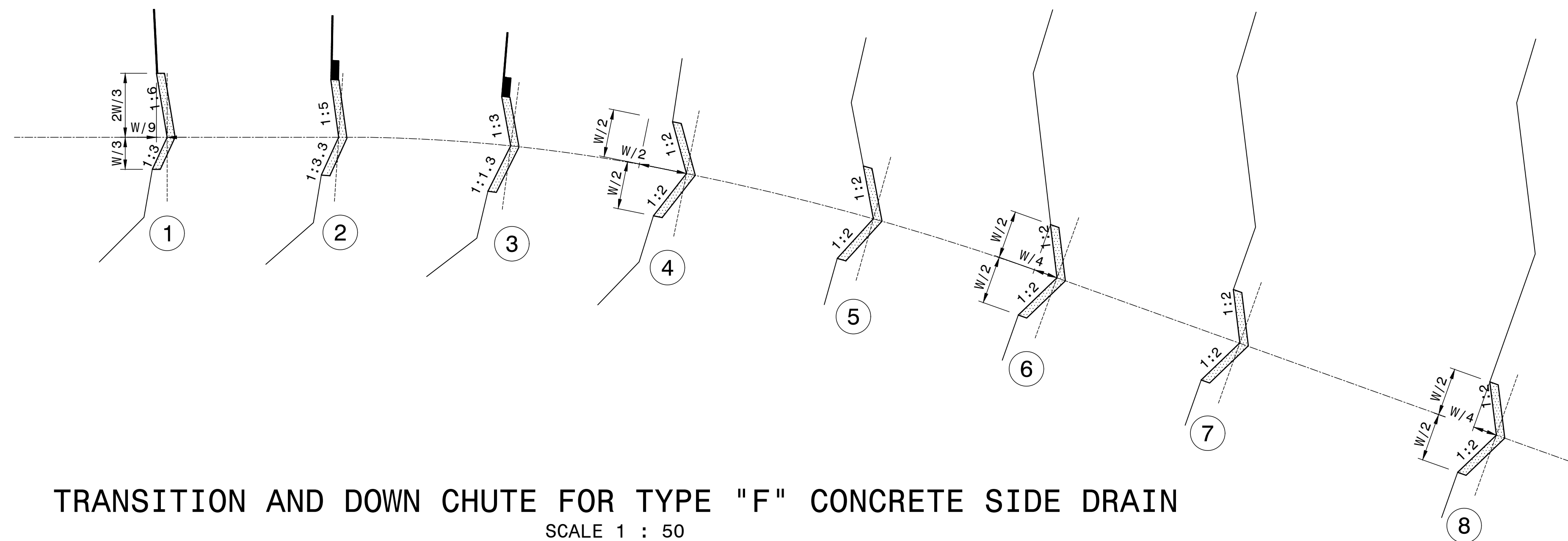
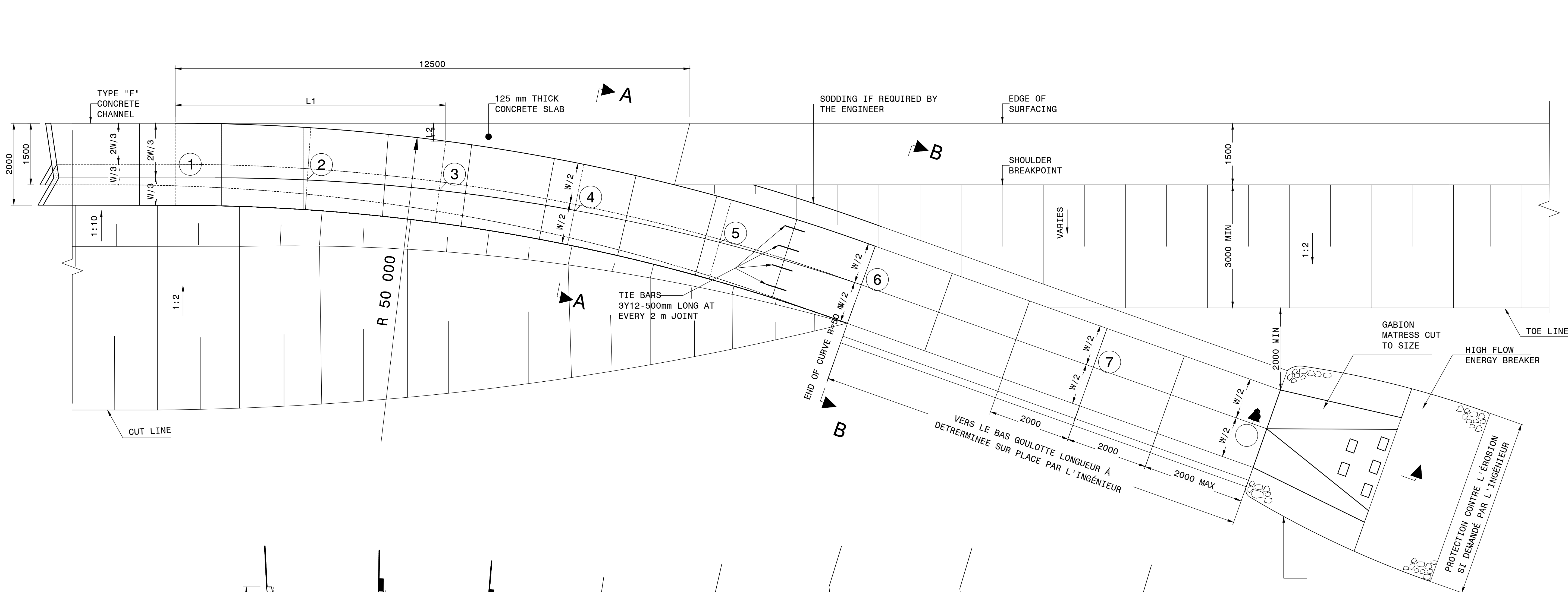
GENERAL ARRANGEMENT OF MANHOLE AND GRID CHAMBERS

SCALE : AS SHOWN

TRAINING LOCATION DATE:	NAME	MAIL
-------------------------	------	------

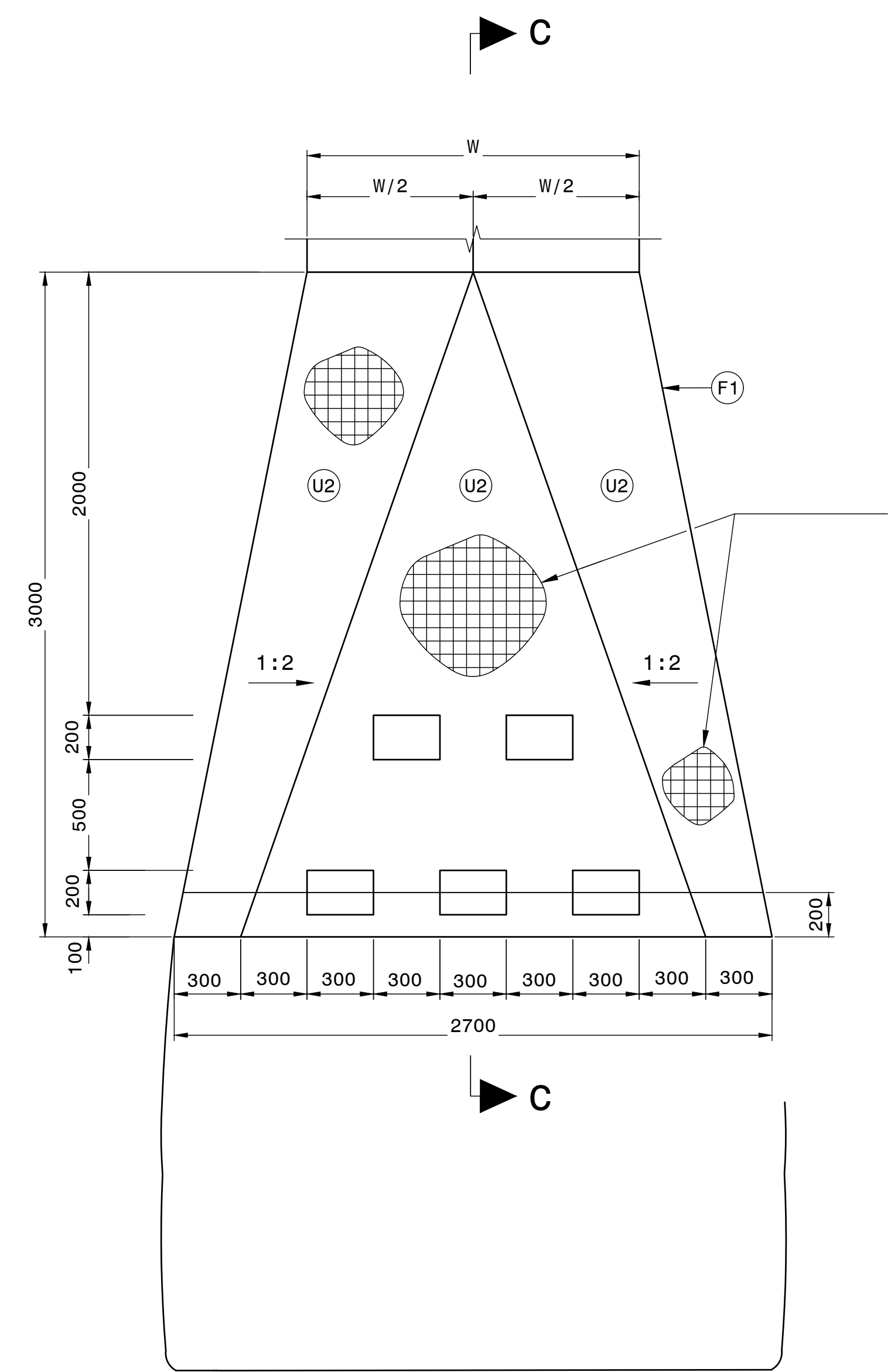
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	22	22
DRAWING km DISTANCE	km 0,80	km 18,64
DRAWING TYPE	DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.	N/A	
CONSULTANT DRAWING No.	TP1802-19-05-25-19-012	
SANRAL DOCUMENT #	-	

DRAWING NO. **TP1802-19-05-25-19-012**

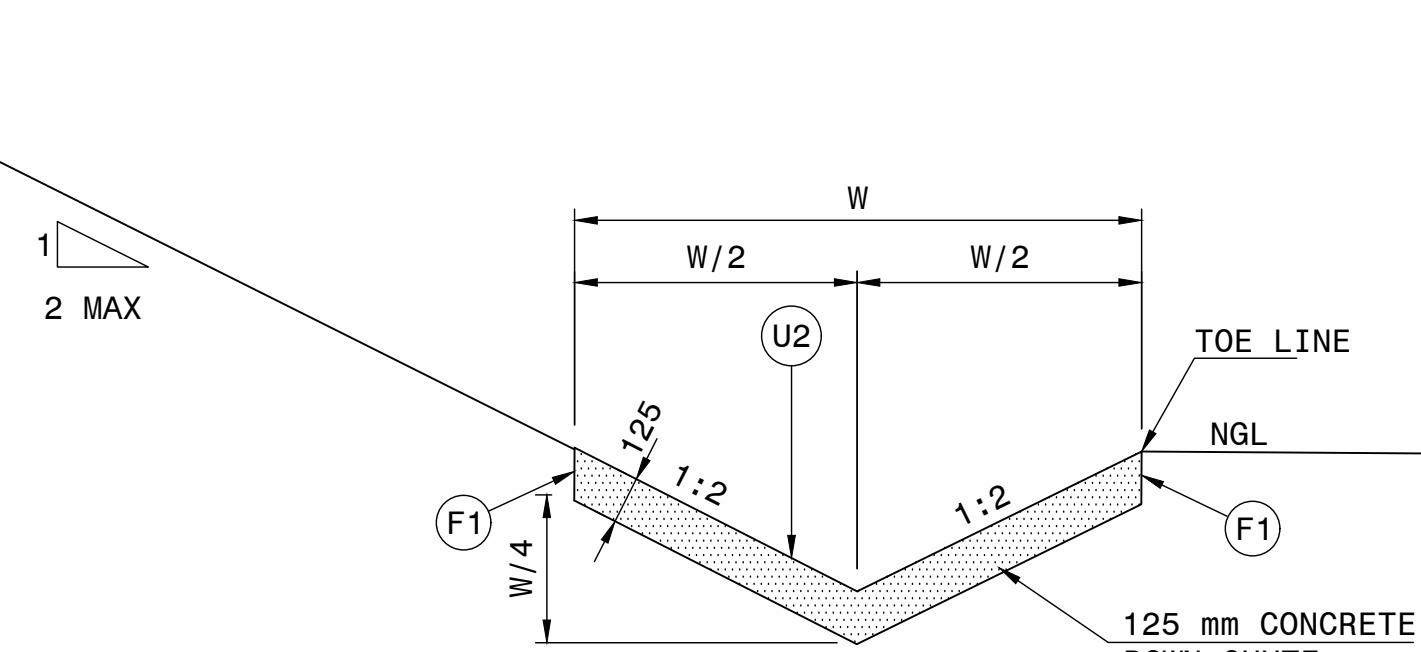


TRANSITION AND DOWN CHUTE FOR TYPE "F" CONCRETE SIDE DRAIN
SCALE 1 : 50

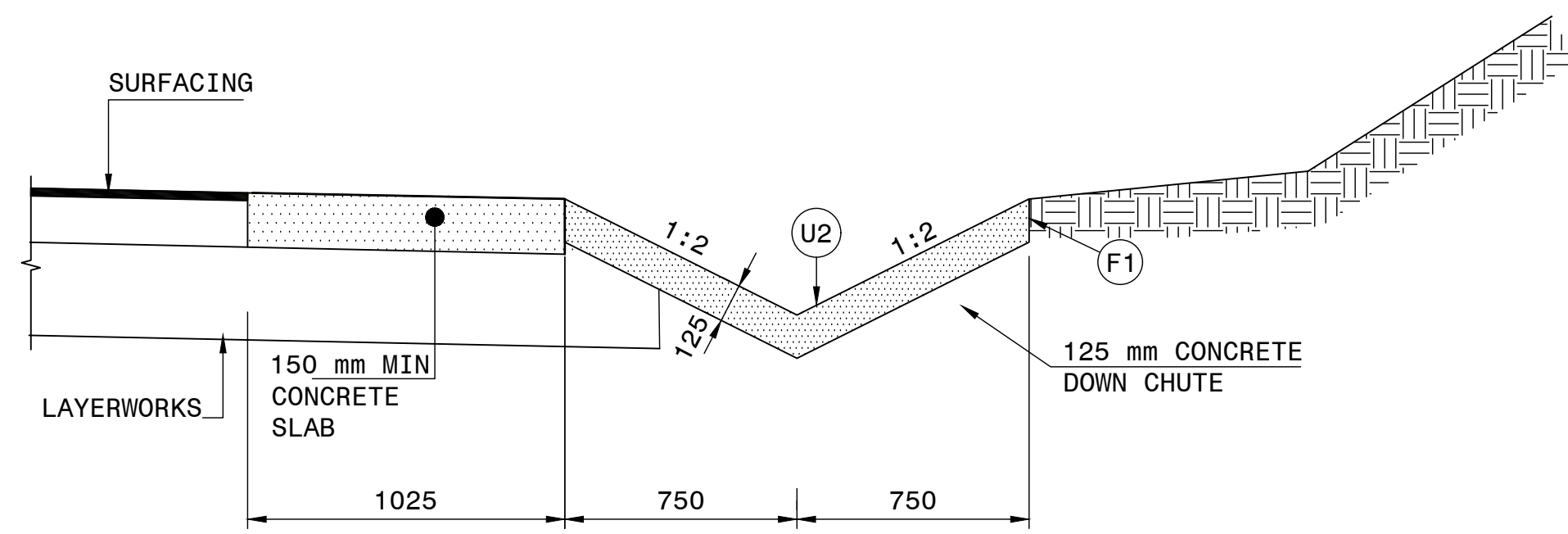
OFFSETS FROM EDGE OF SURFACING		
SECTION	A	B
1	0	0
2	3 300	110
3	6 590	435
4	9 950	1 000
5	13 540	6 590
6	17 045	3 000
7	22 690	5 000
8	26 910	6 500



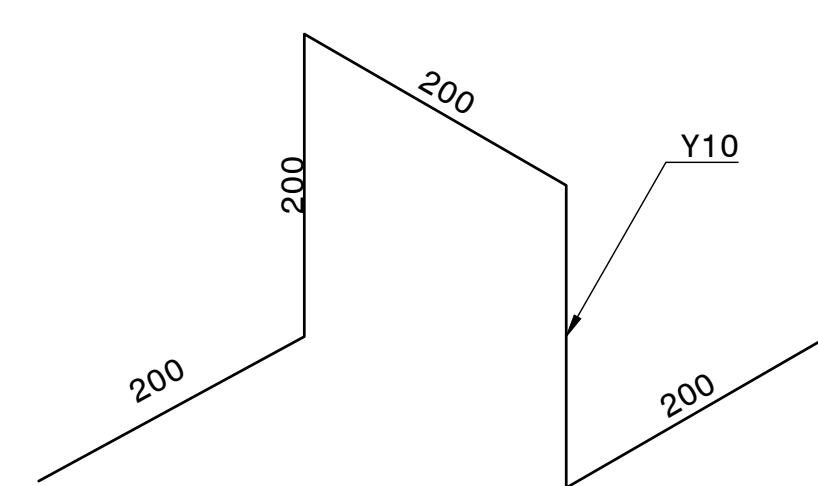
DETAIL OF OUTLET STRUCTURE
SCALE : 1:20



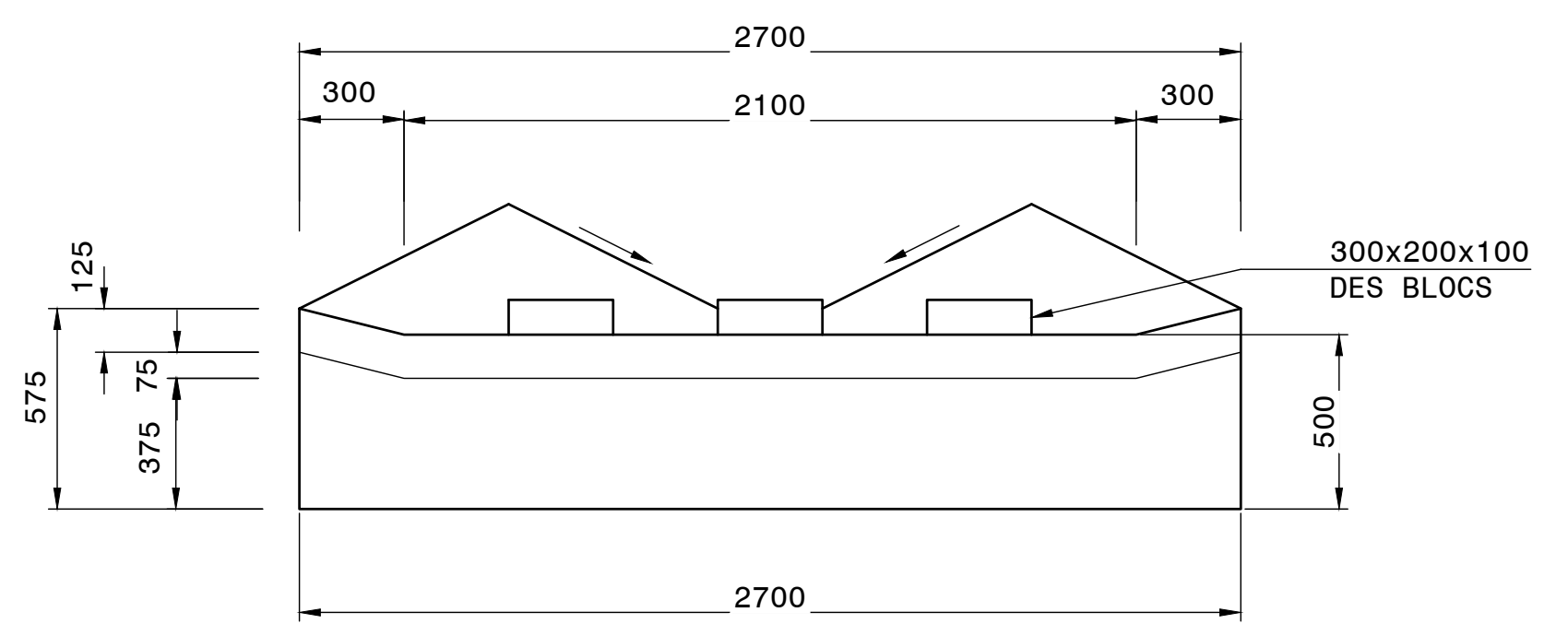
SECTION B-B
SCALE: 1:20



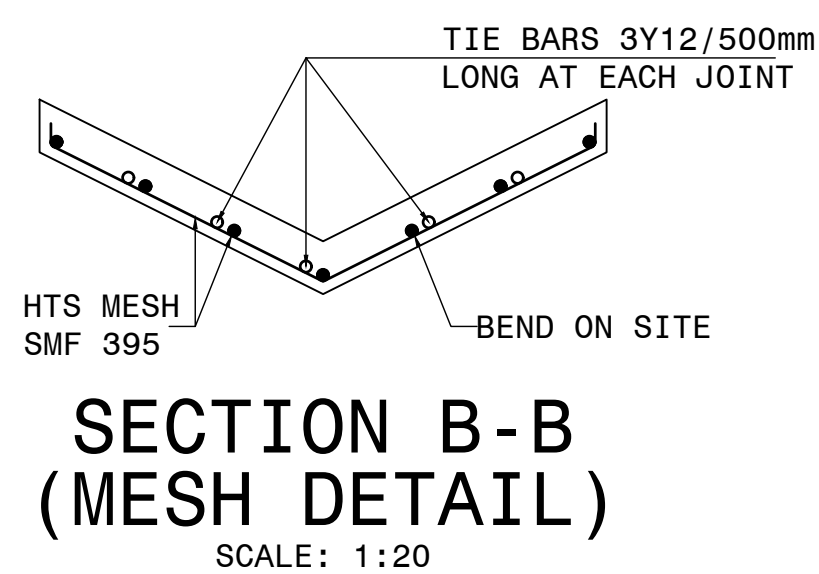
SECTION A-A
SCALE: 1:20



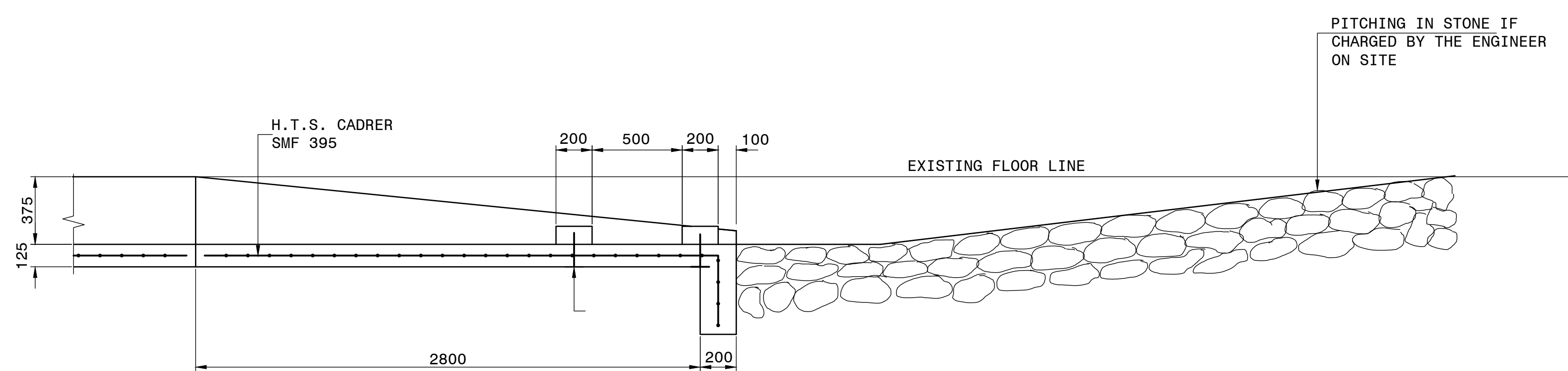
DETAIL OF SELLES
SCALE: 1:5



FRONT ELEVATION
SCALE: 1:20



SECTION B-B (MESH DETAIL)
SCALE: 1:20



SECTION C-C ACROSS THE ENERGY BREAKER
SCALE: 1:20

NOTES:

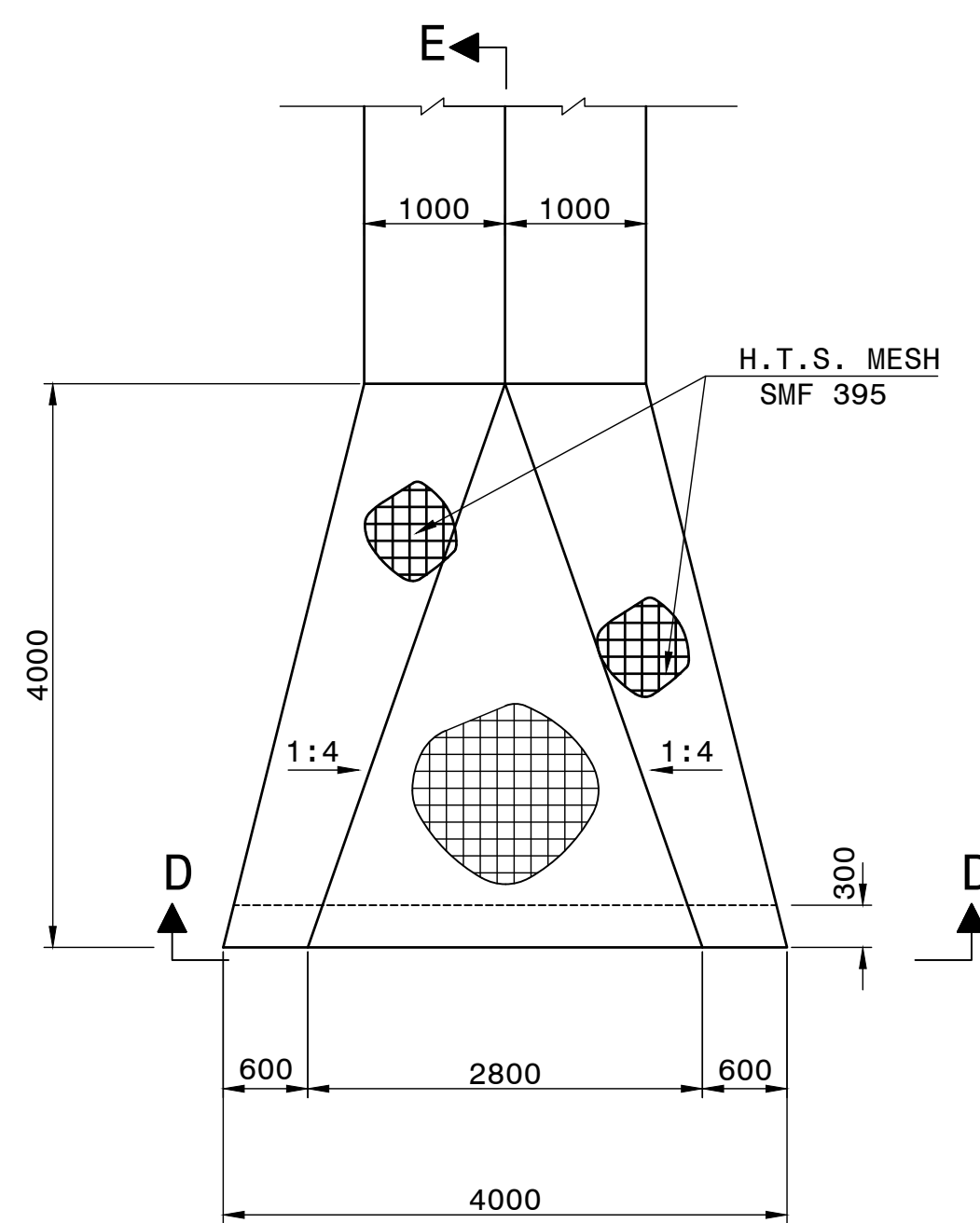
- ALL CONCRETE DRAINS AND OTHER DRAINAGE STRUCTURES OF THIS PLAN MUST BE CAST IN CLASS 30MPa CONCRETE WITH 20mm STONES.
- ALL CONCRETE CHANNELS MUST BE CAST IN AN ALTERNATE LENGTHS OF 2.0 m MAXIMUM WITH EXPANSION JOINTS EVERY 5 PANELS (10 m) FOR EXPANSION JOINT DETAIL REFER TO DRAWING TP1802-20-01-00-18-009
- ALL EXPOSED CORNERS MUST BE ROUNDED AT A MINIMUM RADIUS OF 10 mm OR CHAMFERED 25 mm x 25 mm.
- THE TYPE OF SURFACE FINISH IS INDICATED AS F1 AND U2.
F - FORMED SURFACES
U - INFORMED SURFACES
- MINIMUM REINFORCING COVER IS 50 mm.
- REFER TO GENERAL NOTES CONCERNING CONCRETE DRAINS IN DRAWINGS No. TP1802-20-01-00-18-009.

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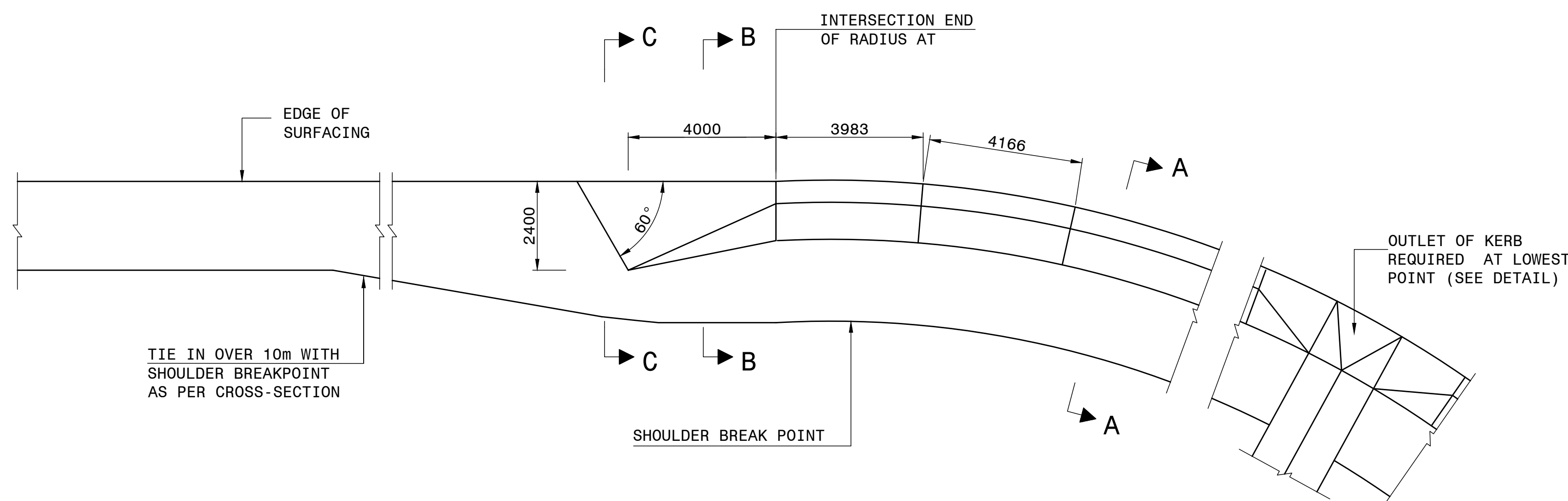
HEAD OFFICE		
48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		
SANRAL		
BUILDING SOUTH AFRICA THROUGH BETTER ROADS		
EASTERN REGION		
58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100		
ACCEPTANCE		
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for CEO: SA NATIONAL ROADS AGENCY LTD.		
Date:		

PROJECT DESCRIPTION		
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)		
DRAWING DESCRIPTION		
DRAINAGE TYPICALS CHUTES FOR TYPE F DRAINS		
SCALE : AS SHOWN		
SHEET 1 OF 1		

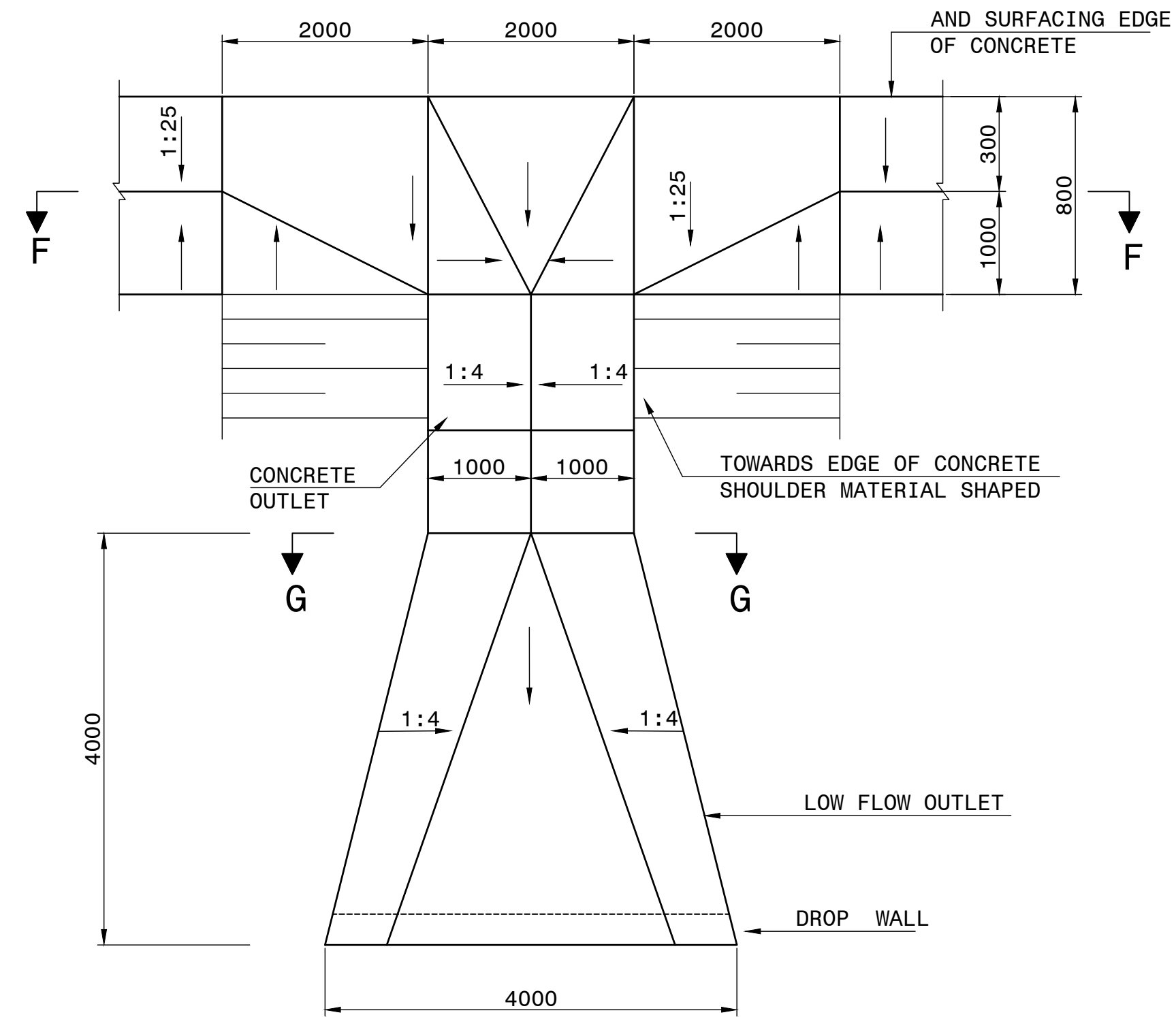
PROJECT DESCRIPTION				PROJECT NUMBER		NRA.C.004-099-2023/1	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)				DRAWING LOCATION DATA		START	N2
				ROUTE		N2	N2
<u>DRAWING DESCRIPTION</u>				SECTION		22	22
				DRAWING km DISTANCE		km 0,80	km 18,64
DRAINAGE TYPICALS CHUTES FOR TYPE F DRAINS				DRAWING TYPE		DRAINAGE - TYPICALS	
				BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.				SANRAL DOCUMENT #		TP1802-19-05-25-19-013	VER V1
SCALE :	AS SHOWN	SHEET	1	OF	1		



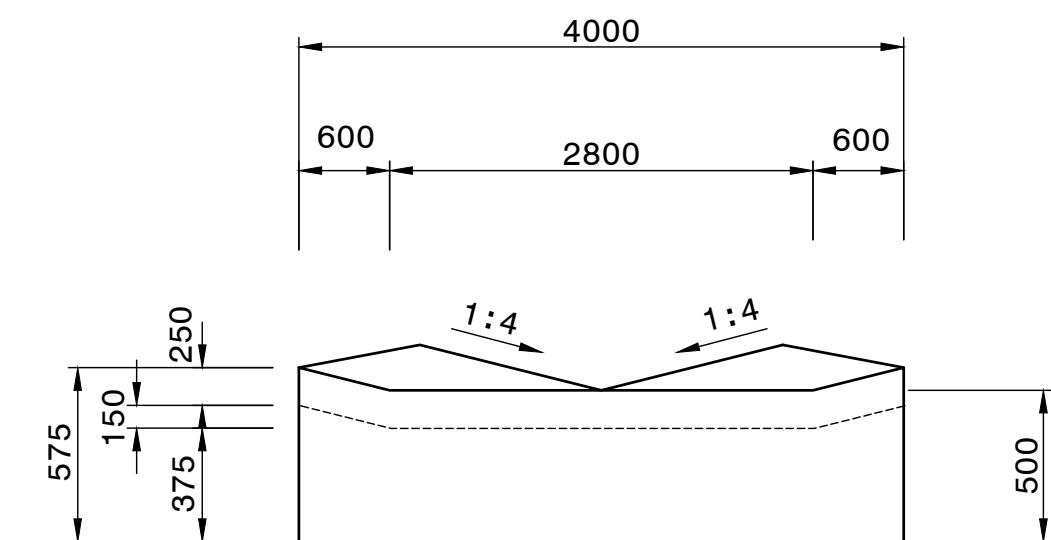
PLAN
SCALE 1:50



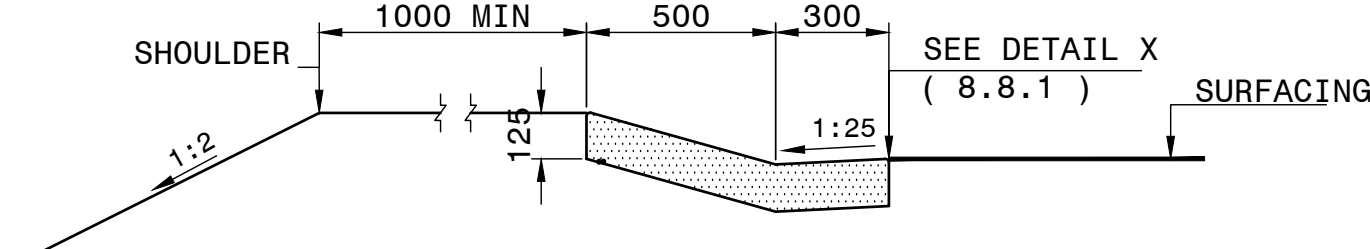
DETAIL OF TYPE 'C' IN SITU MOUNTABLE KERB AT INTERSECTIONS
SCALE 1:100



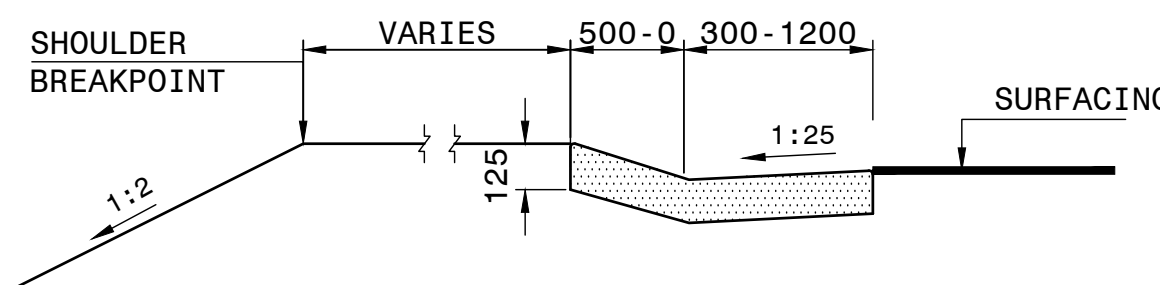
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SCALE 1:50



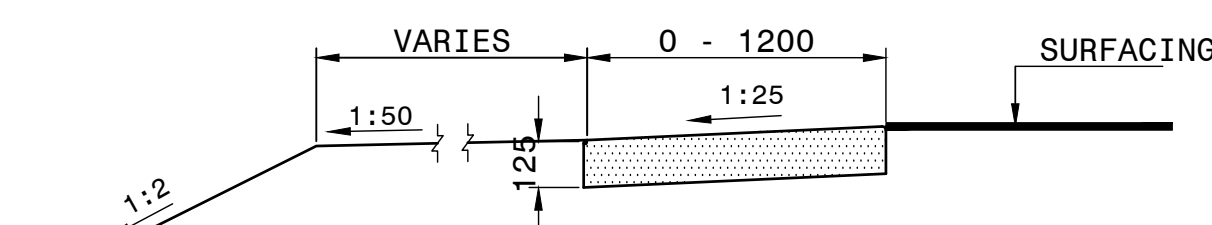
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SCALE 1:50



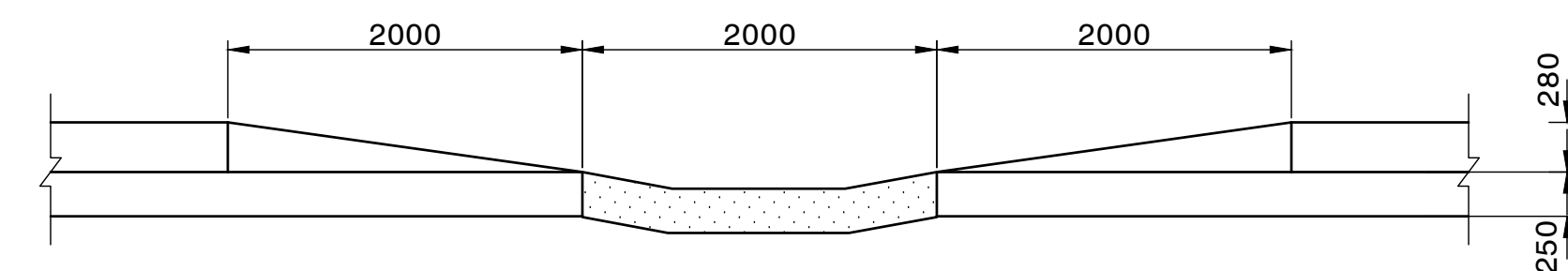
SECTION A-A
SCALE 1 : 20



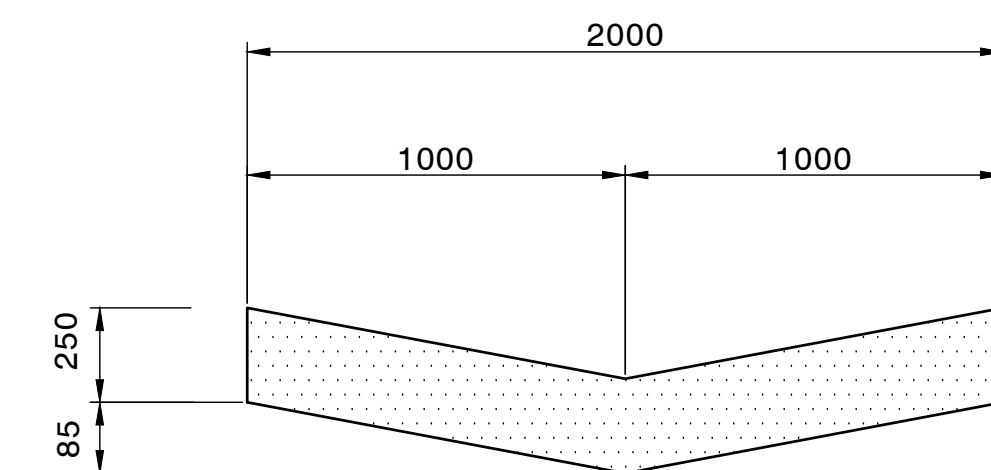
SECTION B-B
SCALE 1 : 20



SECTION C-C
SCALE 1 : 20




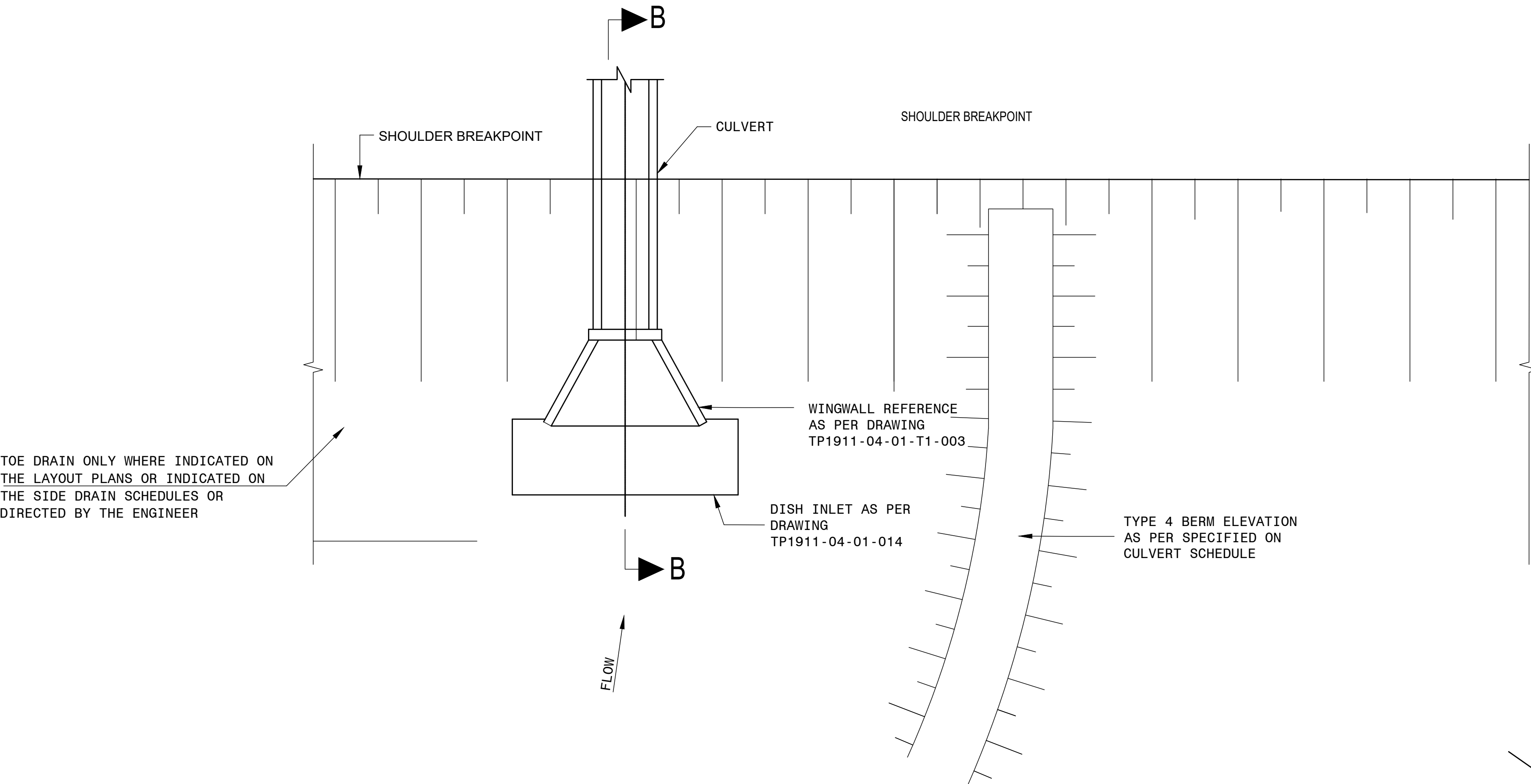
SECTION F-F
SCALE 1:40



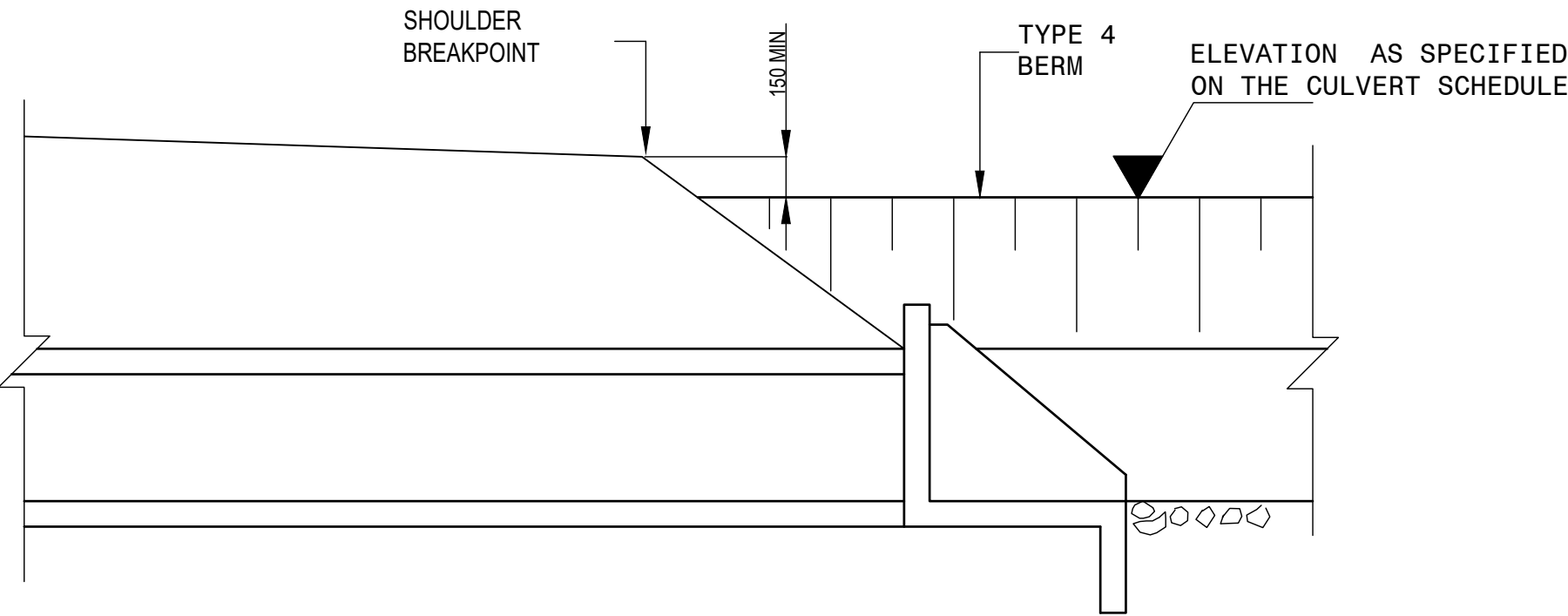
SECTION G-G
SCALE 1 : 20

						CONSTRUCTION RECORD	
						WORKS CONTRACT ENGINEER	
						Name	:
						Prof. Reg. No.	:
						Date	:
						SANRAL PROJECT MANAGER	
						Name	:
						Prof. Reg. No.	:
						Date	:
V1	SEPT 2023	ORIGINAL VERSION				S.KASPERSAD	
No.	DATE	REVISION				CONSULT. ENG.	

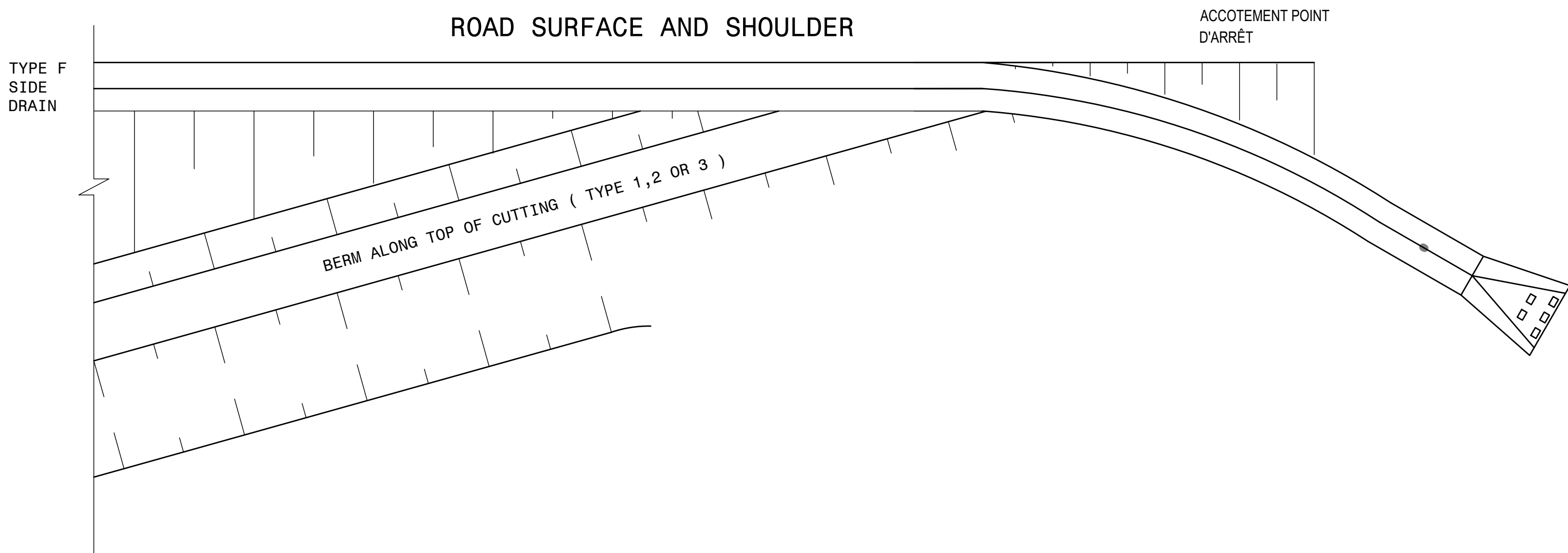
HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD.  BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100	ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:	PROJECT DESCRIPTION CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64) DRAWING DESCRIPTION DRAINAGE TYPICALS TYPE C KERB ON RURAL BELLMOUTHS SCALE : AS SHOWN	PROJECT NUMBER NRA.C.004-099-2023/1 DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #	START N2 22 km 0,80 N/A TP1802-19-05-25-19-014 -	END N2 22 km 18,64 DRAINAGE - TYPICALS N/A VER V1
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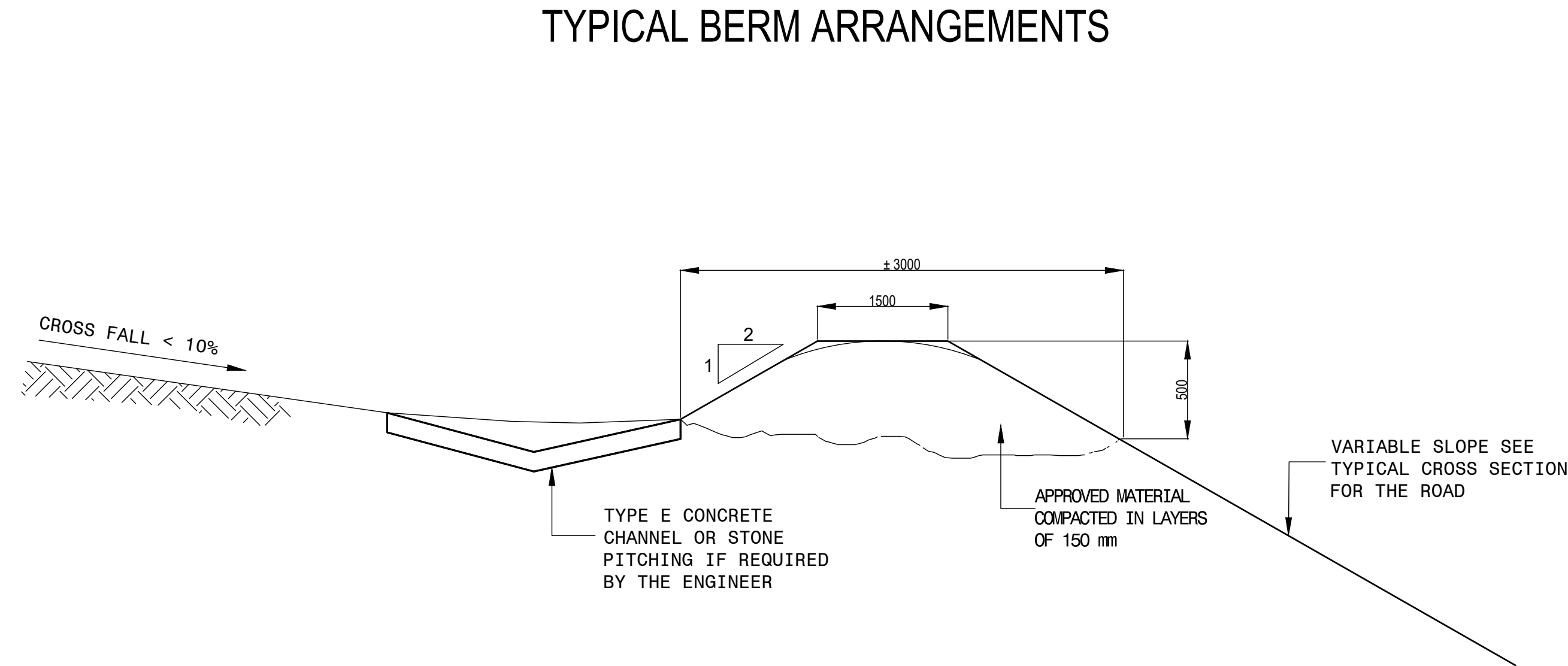
TYPICAL PLAN OF CULVERT INLET WITH BERM
N.T.S.



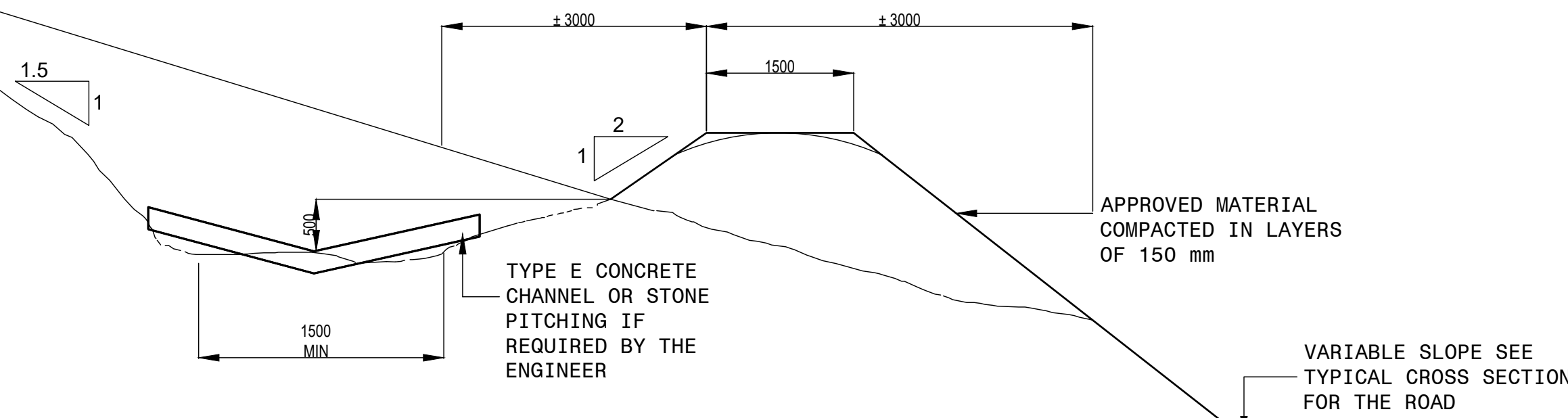
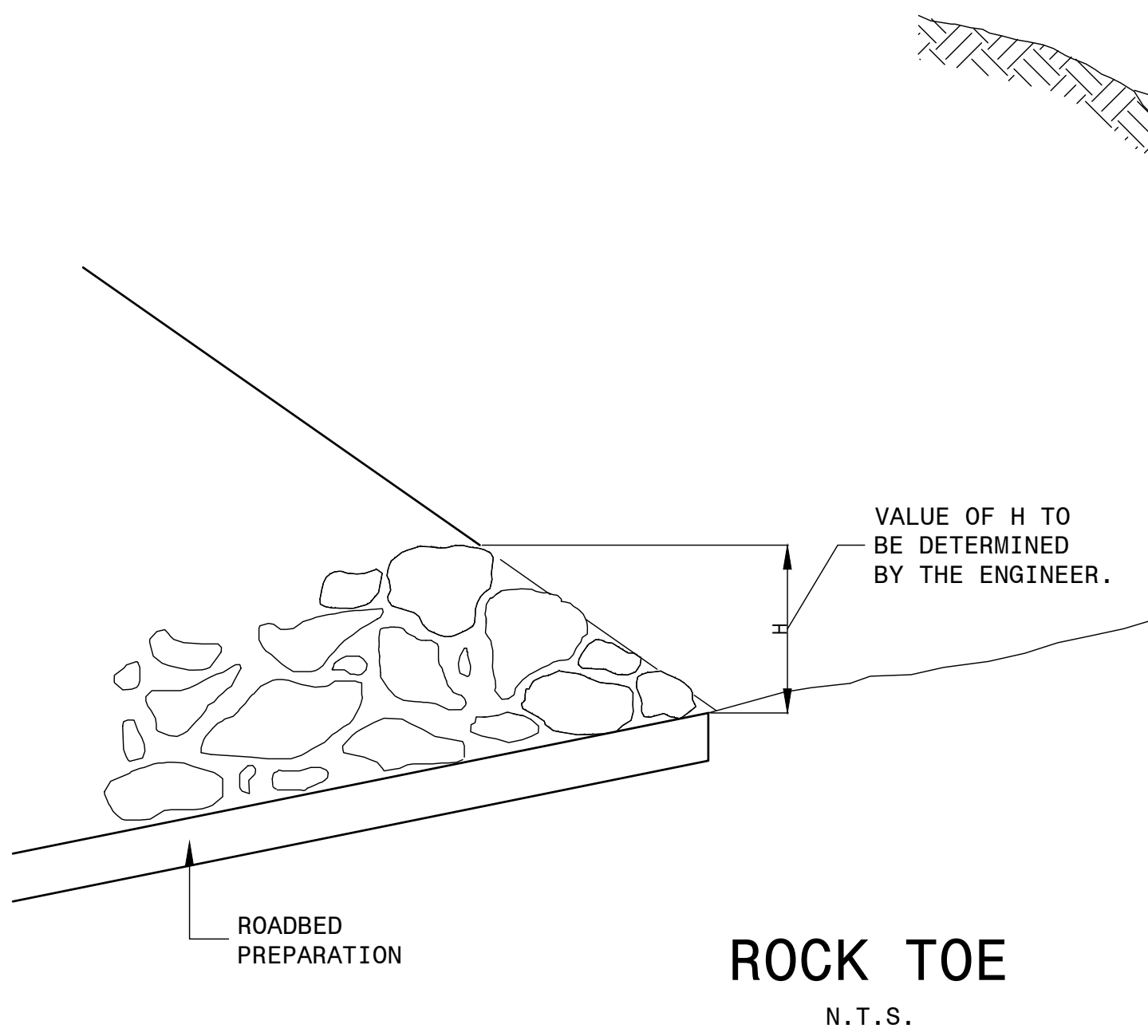
SECTION B-B
N.T.S.



PLAN SHOWING END OF BERM AT CUT-TO FILL TRANSITION

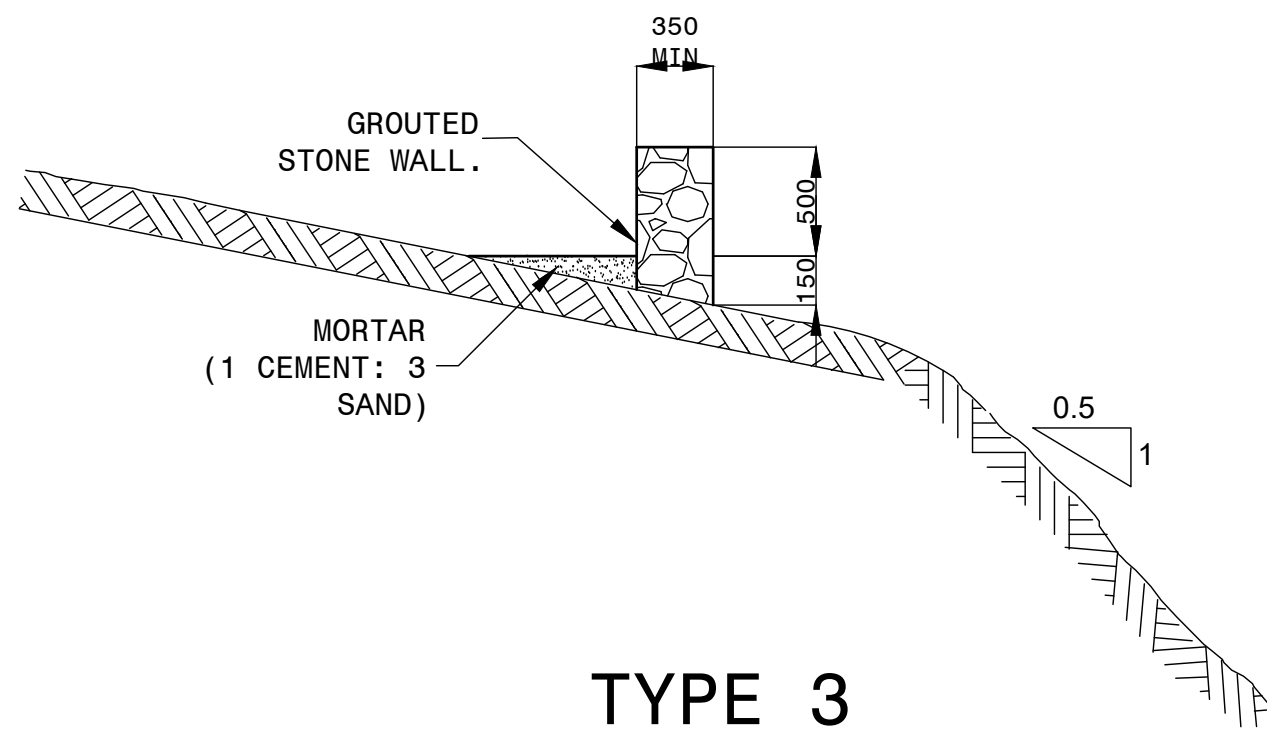


TYPICAL BERM ARRANGEMENTS
TYPE 1 BERM
CUTTING IN SOFT MATERIAL WITH FLAT CROSS FALL
N.T.S.

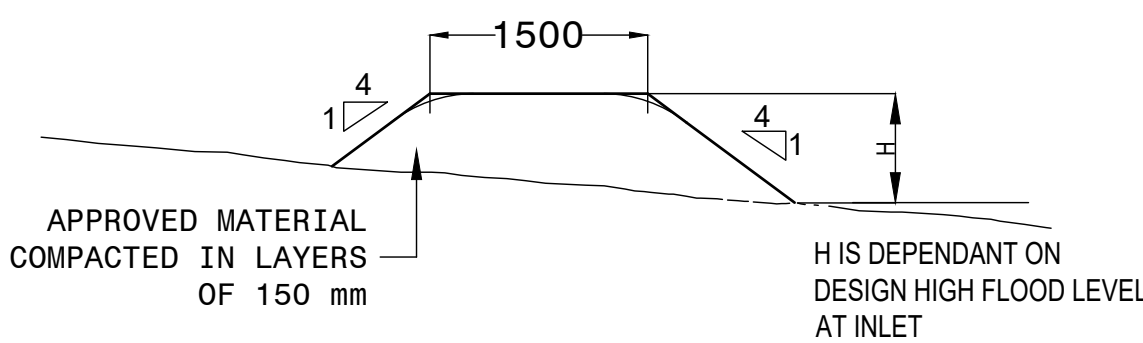


TYPE 2 BERM
CUTTING IN SOFT MATERIAL WITH STEEP CROSS FALL
N.T.S.

- NOTES :TYPE 3
- STONE SHALL BE SOUND, TOUGH AND DURABLE.
 - THE MINIMUM STONE DIMENSION SHALL BE 75mm AND THE MINIMUM STONE MASS SHALL BE 10kg, EXCEPT FOR SPALL USED TO FILL VOIDS BETWEEN THE LARGER STONES.
 - STONE SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
 - THE WALL FOUNDATION SHALL BE EXCAVATED DOWN TO ROCK.
 - STONES SHALL BE LAID WITH THE STAGGERED JOINTS WITH A MINIMUM OF VOIDS AND SHALL BE FIRMLY BEDDED AGAINST ADJINING STONES.
 - STONES SHALL BE LAID WITH LARGEST DIMENSION HORIZONTALLY
 - THE STONES SHALL BE WETTED AND SET IN A MORTAR CONSISTING OF SIX PARTS SAND TO ONE PART CEMENT.
 - THE MORTAR SHALL BE FINISHED FLUSH ON THE SIDES AND TOP OF THE WALL SUCH THAT THE FINISHED WALL PRESENTS AN EVEN, TIGHT SURFACE.
 - THE WALLING SHALL BE PROTECTED FROM THE ELEMENTS AND KEPT MOIST FOR A MINIMUM PERIOD OF FOUR DAYS AFTER COMPLETION.



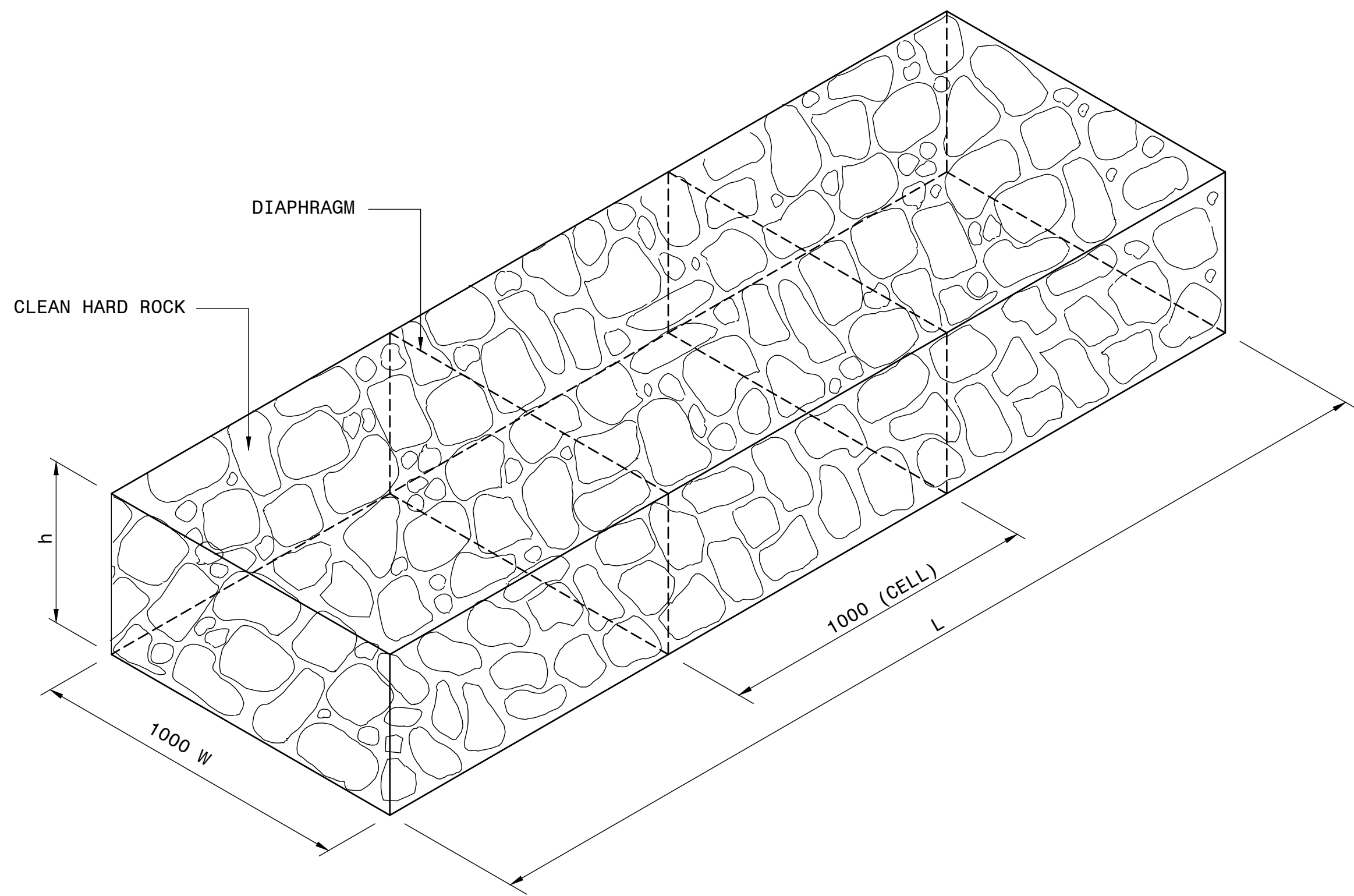
TYPE 3
CUTTING IN ROCK MATERIAL
N.T.S.



TYPE 4 BERM
EARTH BERM AT CULVERT INLET AND OUTLET
N.T.S.

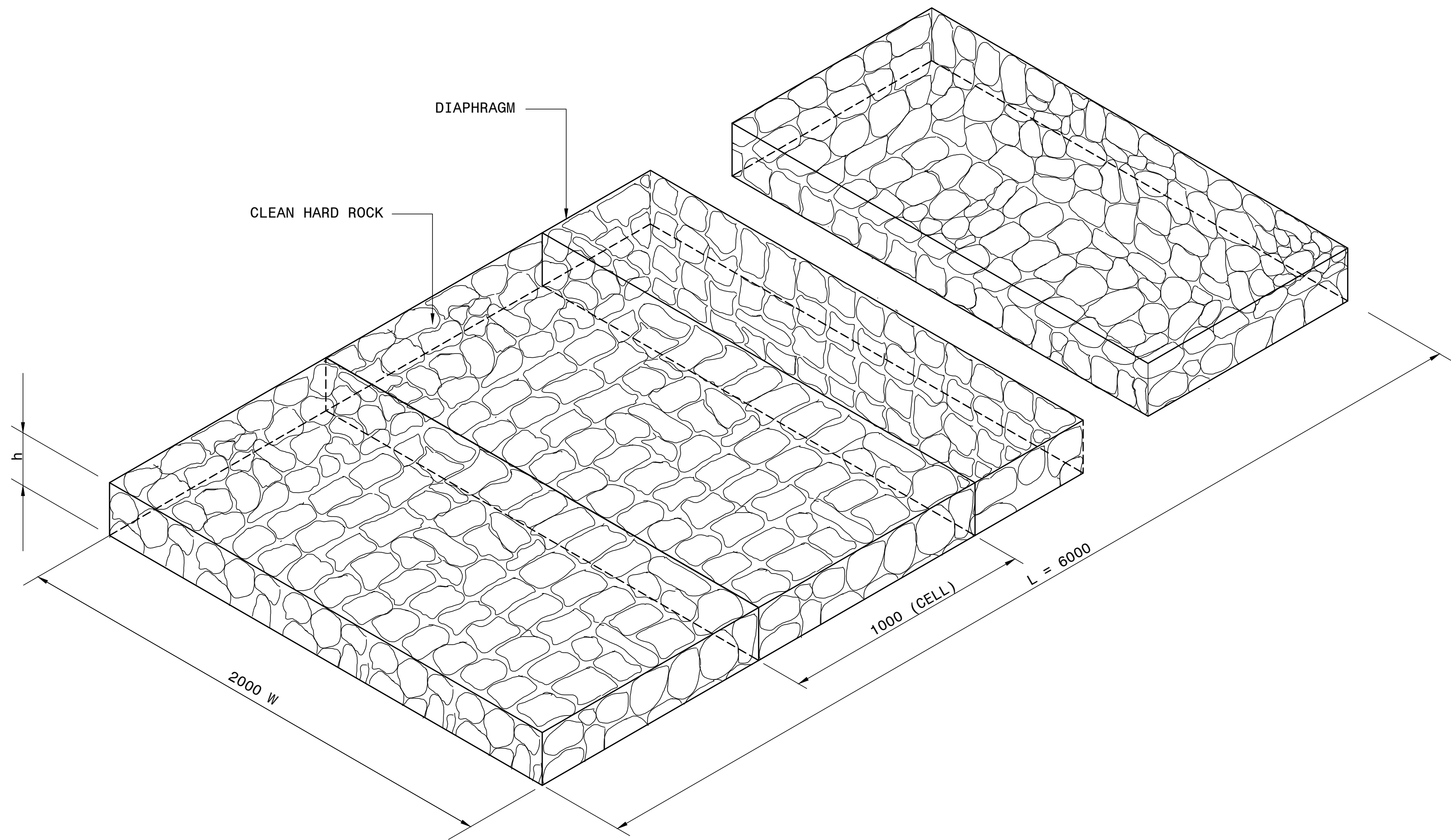
CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
SANRAL PROJECT MANAGER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

					CONSTRUCTION RECORD		
					WORKS CONTRACT ENGINEER		
					Name : _____		
					Prof. Reg. No. : _____		
					Date : _____		
					SANRAL PROJECT MANAGER		
					Name : _____		
					Prof. Reg. No. : _____		
					Date : _____		
V1	SEPT 2023	ORIGINAL VERSION		S.KASPIERSAD	Name : _____		
No.	DATE	REVISION		CONSULT. ENG.	Prof. Reg. No. : _____		
					Date : _____		



BOXES

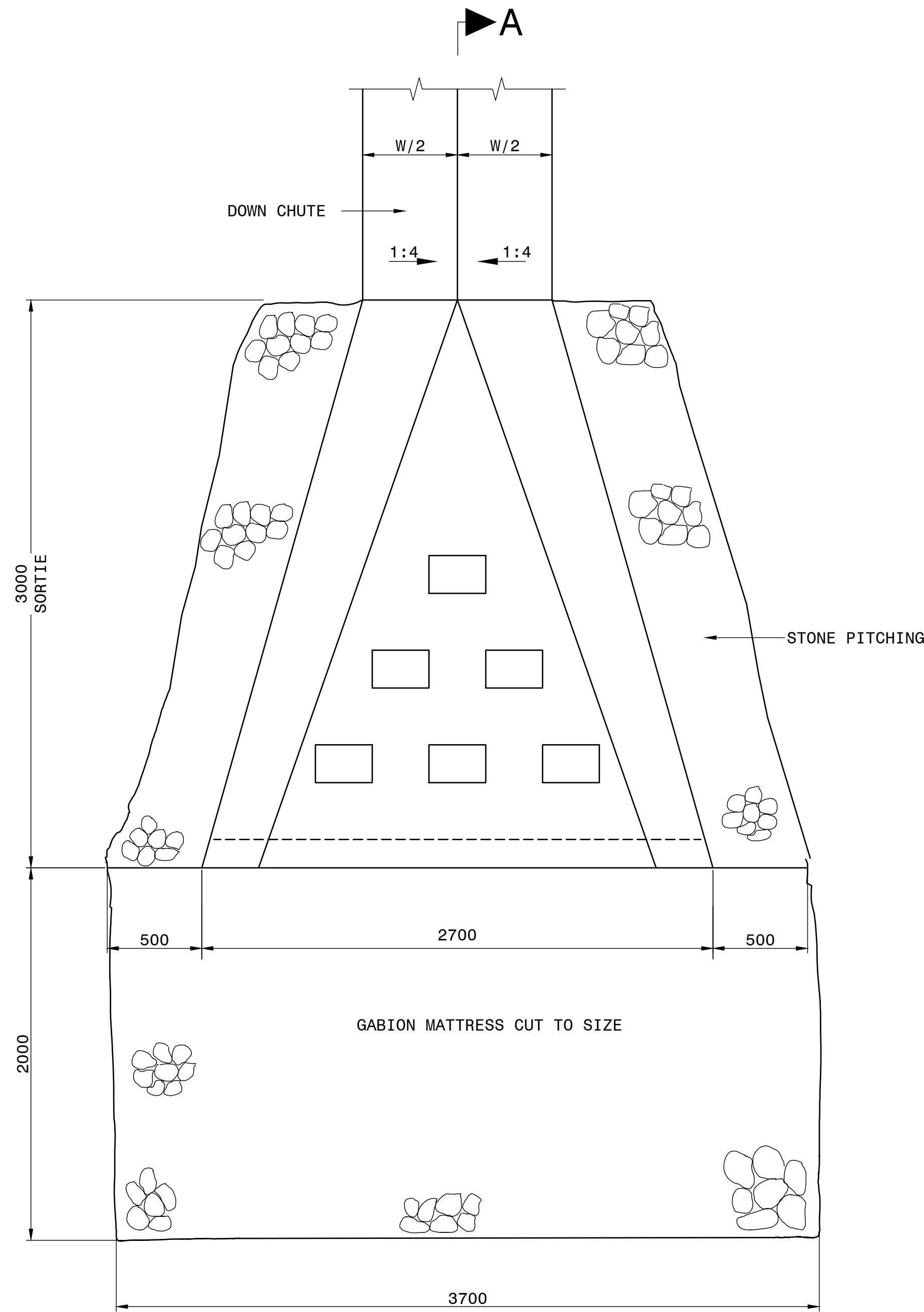
SCALE: 1 : 20



MATTRESSES

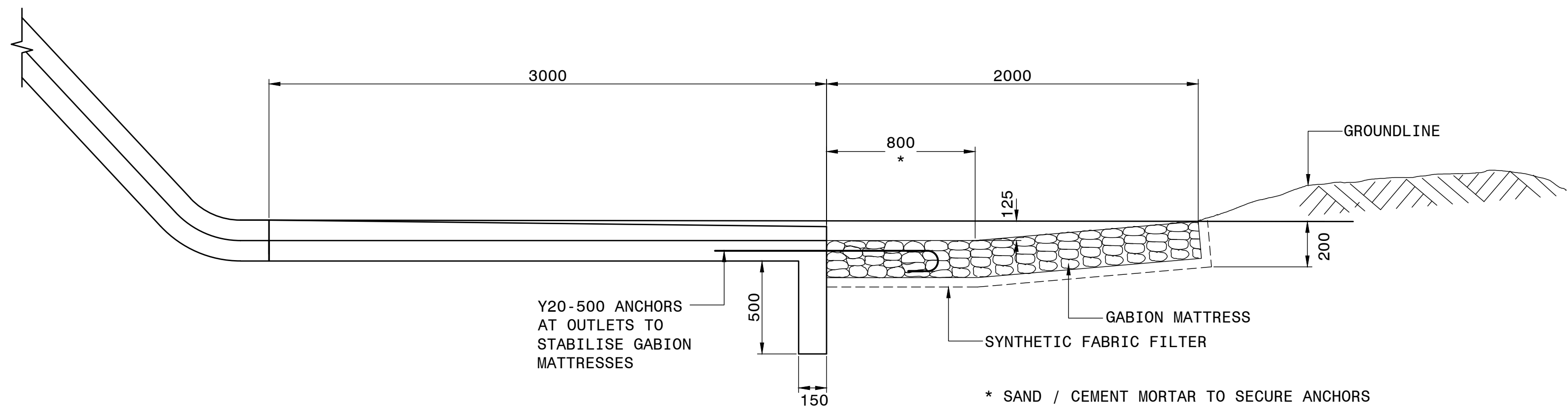
SCALE: 1 : 20

DESIGN INFORMATION FOR GABIONS				
STANDARD SIZES FOR BOXES (mm)				
LENGTH (L)	1000	2000	3000	4000
WIDTH (W)	1000			
DEPTH (H)	500	1000		
DIAPHRAGM SPACING	1000			
STANDARD SIZES FOR MATTRESSES (mm)				
LENGTH (L)	6000			
WIDTH (W)	2000			
DEPTH (H)	170	230	300	
MESH SIZE AND WIRE DIAMETER FOR CAGES (mm)				
DEPTH OF GABION	MESH SIZE	WIRE DIA.		
500 mm AND OVER	80 x 100	2.7		
200 mm TO 300 mm	80 x 100	2.5		
ROCK SIZES FOR FILLING CAGES (mm)				
DEPTH OF CAGE	MIN.	MAX.		
230	100	125		
300	100	200		
500	100	250		
1000	100	300		
GALVANISED STEEL ANCHORS FOR MATTRESSES				
<div><div></div><div>1500mm</div></div>				
MATTRESSES		Y10 - 1500 x 1500mm		
INLETS AND OUTLETS		Y20 - 500mm		



PLAN OF DOWN CHUTE AND ENERGY BREAKER

SCALE: 1 : 20



SECTION A-A

SCALE: 1 : 20

NOTE:
PROTECTION AGAINST EROSION IF
ASKED BY THE ENGINEER

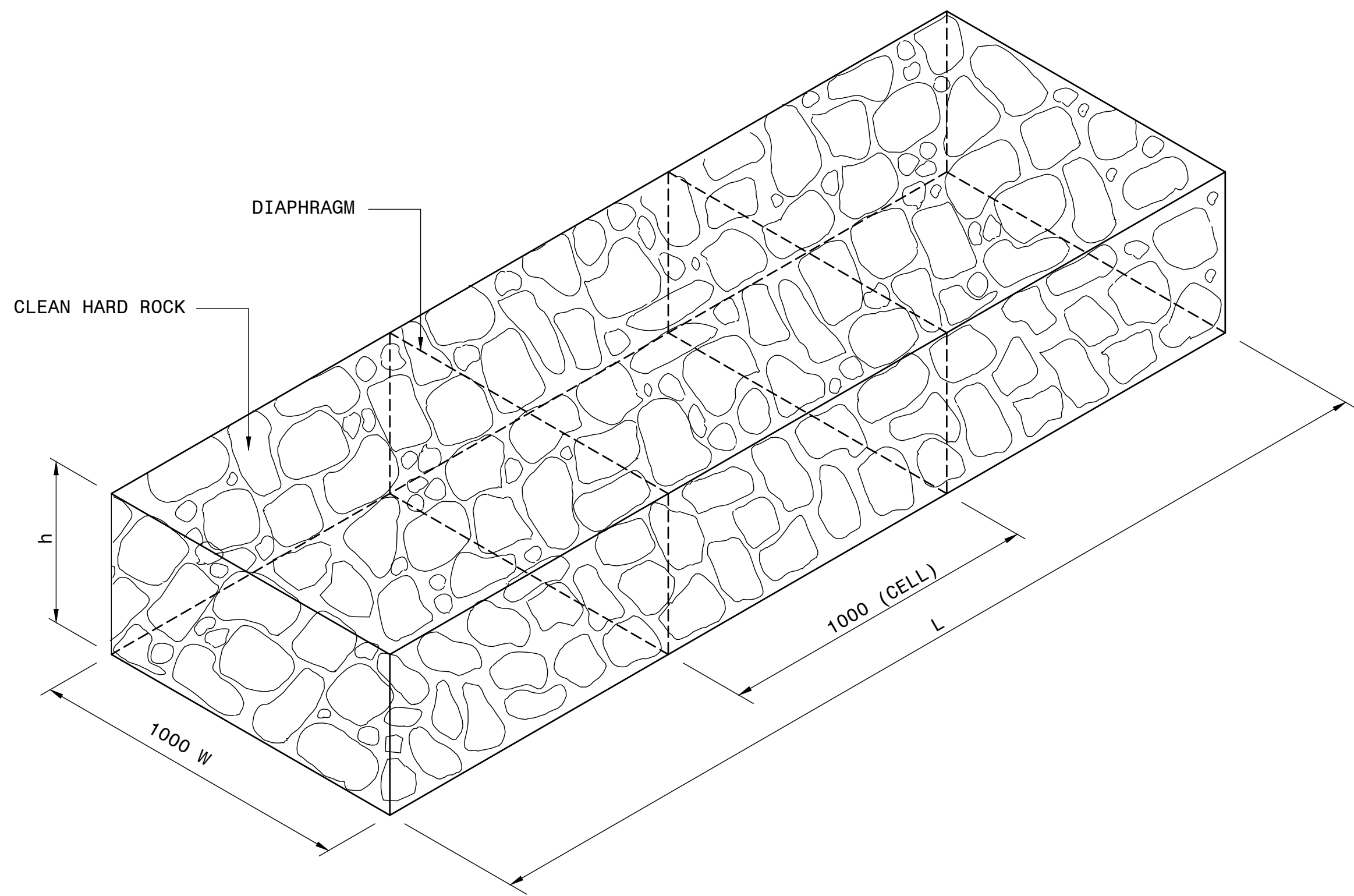
					CONSTRUCTION RECORD	
					WORKS CONTRACT ENGINEER	
					Name	:
					Prof. Reg. No.	:
					Date	:
					SANRAL PROJECT MANAGER	
					Name	:
					Prof. Reg. No.	:
					Date	:
V1	SEPT 2023	ORIGINAL VERSION		S.KASPERSAD		
No.	DATE	REVISION		CONSULT. ENG.		

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000			
			
BUILDING SOUTH AFRICA THROUGH BETTER ROADS			
EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100			
ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:			

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS STONE PITCHING AND GABIONS SHEET 2 OF 3	
SCALE :	AS SHOWN

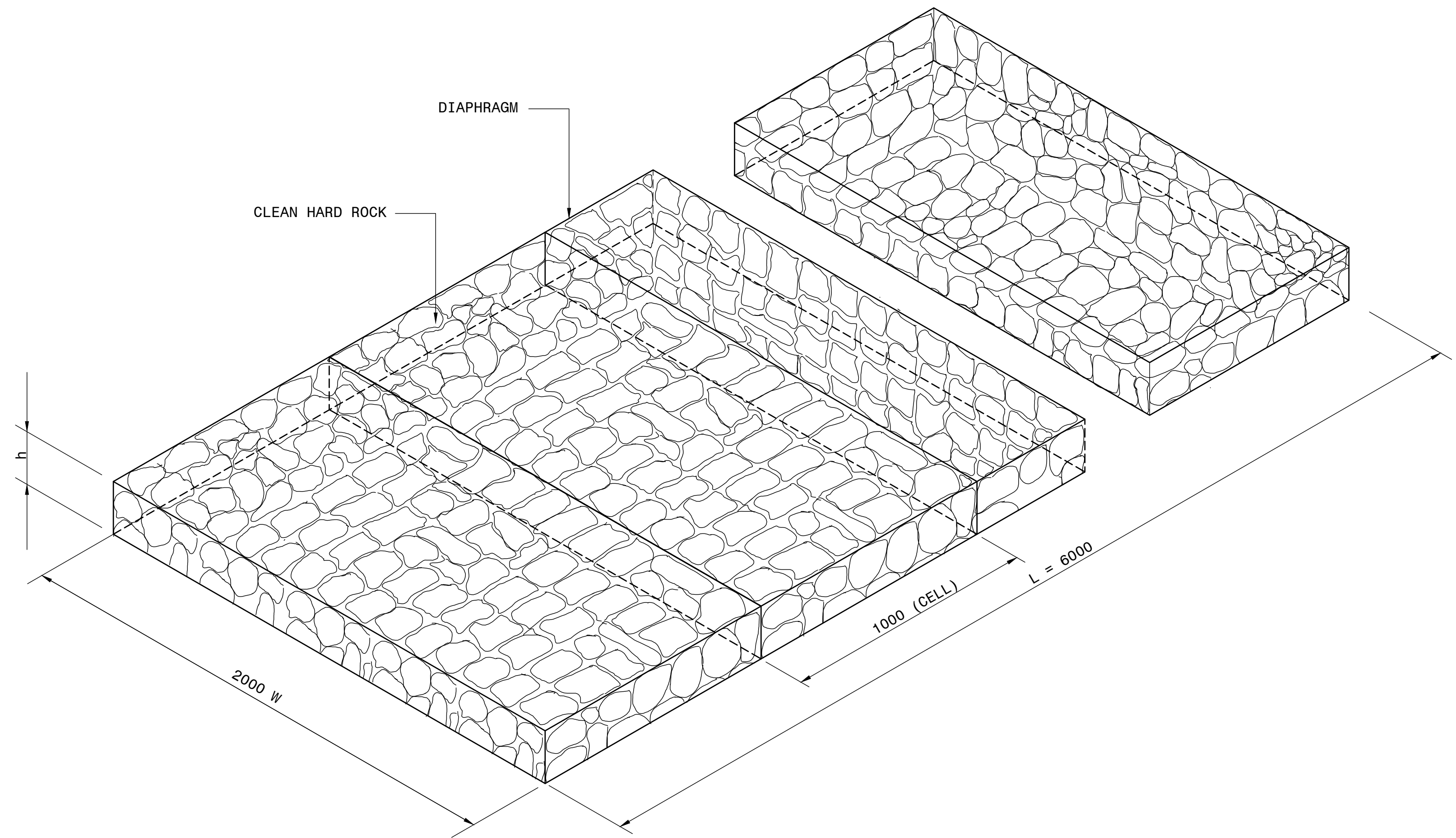
PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-017		VER V1
SANRAL DOCUMENT #	-		

DRAWING No. TP1802-19-05-25-19-017



BOXES

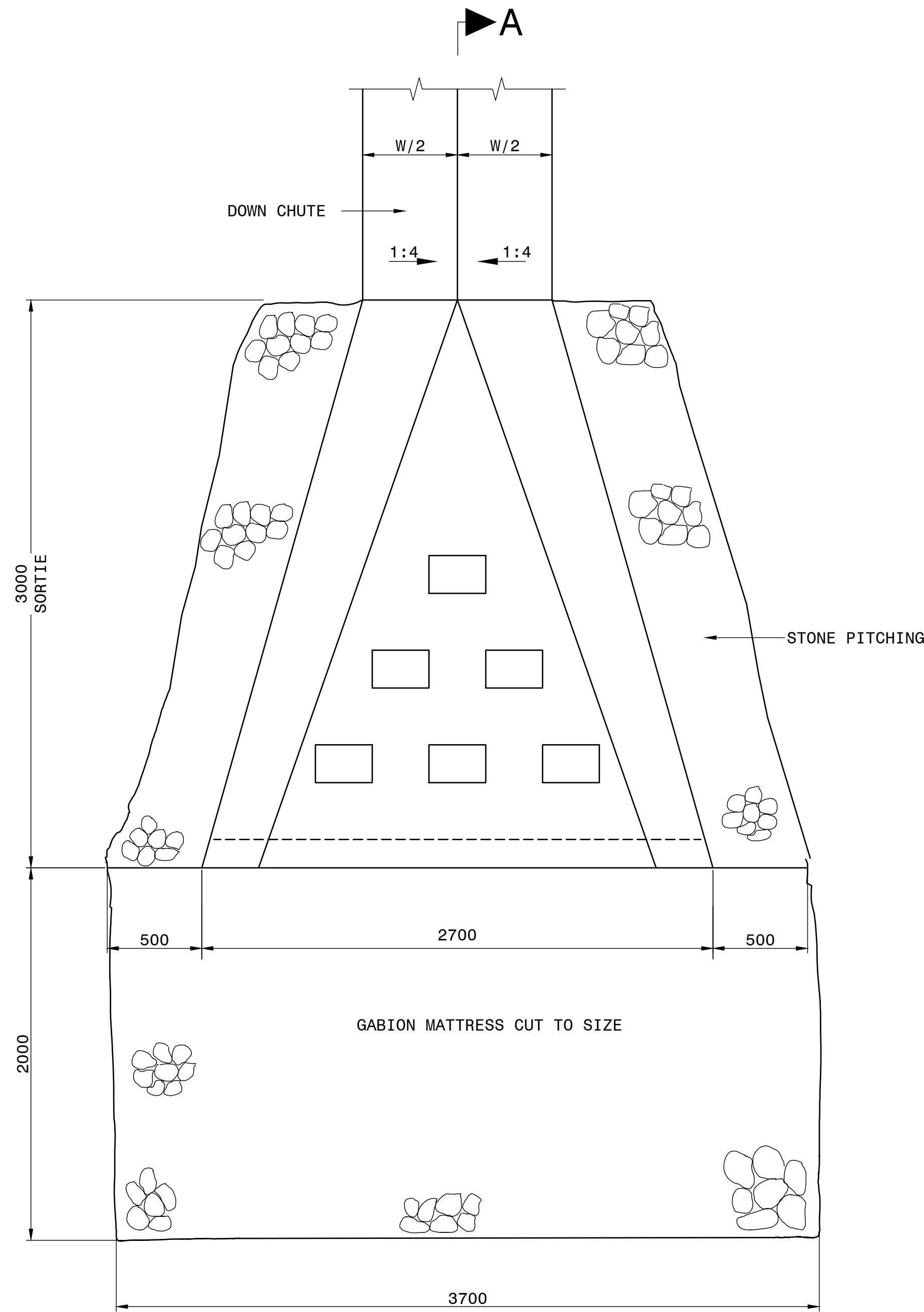
SCALE: 1 : 20



MATTRESSES

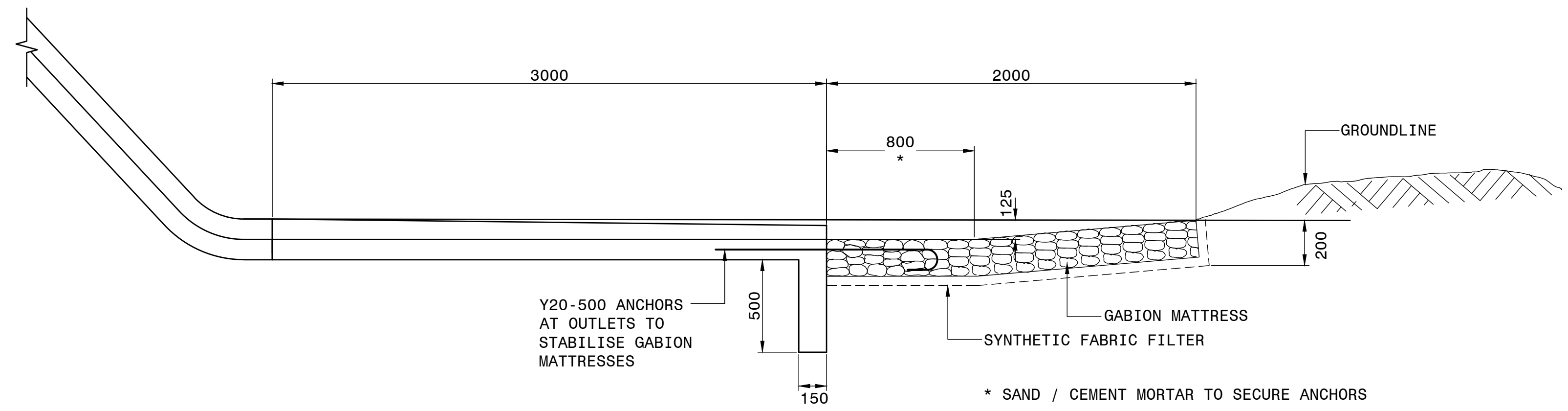
SCALE: 1 : 20

DESIGN INFORMATION FOR GABIONS				
STANDARD SIZES FOR BOXES (mm)				
LENGTH (L)	1000	2000	3000	4000
WIDTH (W)	1000			
DEPTH (H)	500	1000		
DIAPHRAGM SPACING	1000			
STANDARD SIZES FOR MATTRESSES (mm)				
LENGTH (L)	6000			
WIDTH (W)	2000			
DEPTH (H)	170	230	300	
MESH SIZE AND WIRE DIAMETER FOR CAGES (mm)				
DEPTH OF GABION	MESH SIZE	WIRE DIA.		
500 mm AND OVER	80 x 100	2.7		
200 mm TO 300 mm	80 x 100	2.5		
ROCK SIZES FOR FILLING CAGES (mm)				
DEPTH OF CAGE	MIN.	MAX.		
230	100	125		
300	100	200		
500	100	250		
1000	100	300		
GALVANISED STEEL ANCHORS FOR MATTRESSES				
<div><div></div><div>1500mm</div><div></div></div>				
MATTRESSES		Y10 - 1500 x 1500mm		
INLETS AND OUTLETS		Y20 - 500mm		



PLAN OF DOWN CHUTE AND ENERGY BREAKER

SCALE: 1 : 20




SECTION A-A

SCALE: 1 : 20

NOTE:
PROTECTION AGAINST EROSION IF
ASKED BY THE ENGINEER

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HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000			
			
BUILDING SOUTH AFRICA THROUGH BETTER ROADS			
EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100			
ACCEPTANCE THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING for CEO: SA NATIONAL ROADS AGENCY LTD. Date:			

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS STONE PITCHING AND GABIONS SHEET 3 OF 3	
SCALE :	AS SHOWN
SHEET	3 OF 3

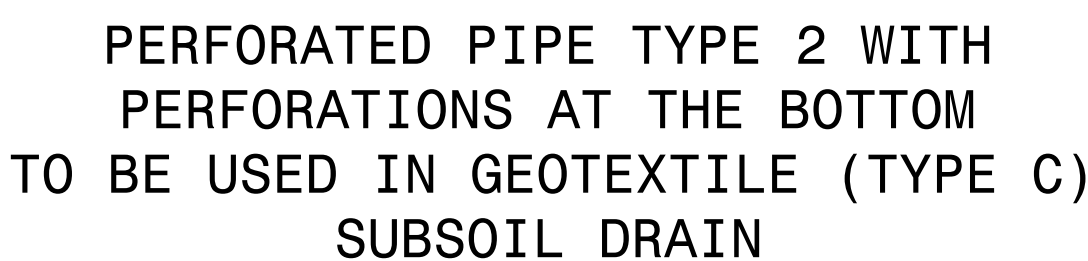
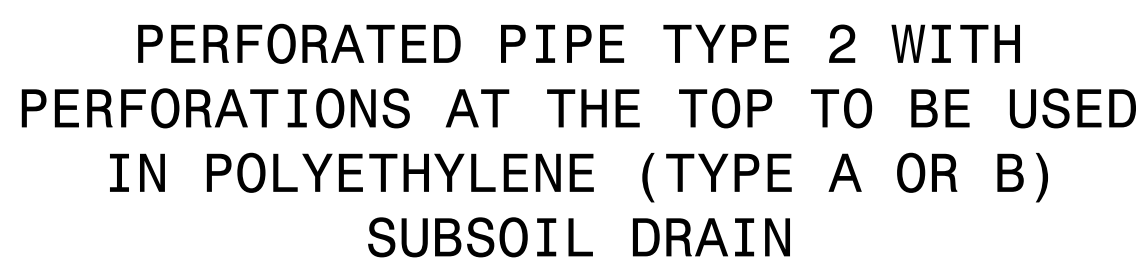
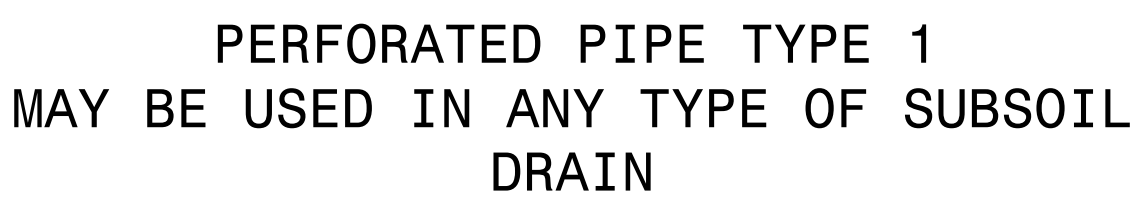
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DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-19-018	
SANRAL DOCUMENT #		-	
		VER	V1

DRAWING No. TP1802-19-05-25-19-018





1. ALL CRITERIA ASSUME THAT FILTER SAND AND FILTER STONES ARE CONTINUOUSLY GRADED FROM COARSE TO FINE.
2. WHERE SUBSOIL DRAINAGE IS INSTALLED IN SOLID ROCK THE GEOTEXTILE LINING MAY BE OMITTED.
3. SYNTHETIC FIBRE FILTER FABRIC (TYPE C) TO BE REPLACED WITH POLYETHYLENE LINING (TYPE B) IN THE FOLLOWING INSTANCES:
 - (a) WHERE THE SURROUNDING SOIL IS VERY PERMIOSUS.
 - (b) WHERE THE SURROUNDING SOIL HAS HIGH FINES CONTENT WHICH COULD LEAD TO CLOGGING OF FILTER FABRICS.
4. FOR DRAIN DIMENSIONS W, X AND Y, REFER TO DRAWING TP1802-20-01-00-18-009

No	
1	THIS DIMENSION MAY BE REDUCED TO A MINIMUM OF PIPE DIAMETER + 200mm PROVIDED THAT THE CROSS-SECTIONAL AREA IS ADEQUATE
2	IMPERMEABLE BACKFILL MATERIAL. (MIN 150mm THICK) TAKEN TO TOP OF WATER BEARING LAYER IN CASES WHERE NO CONCRETE SIDE DRAIN IS PROVIDED.
3	FILTER SAND OF APPROVED SOURCE AND GRADE.
4	FILTER STONE: COARSE GRADE 4.75mm NOMINAL PARTICLE SIZE.
5	PERFORATED / SLOTTED SUBSOIL DRAINAGE PIPES. (POSITION OF PERFORATIONS INDICATED).
6a	SYNTHETIC FIBRE FILTER FABRIC WITH 200mm OVERLAP POLYETHYLENE 0.15mm THICK
6b	SYNTHETIC FIBRE FILTER FABRIC WITH 200mm OVERLAP NON- WOVEN FIBRE FABRIC TO COMPLY WITH THE REQUIREMENTS OF AASHTO M228-06 FOR SUBSURFACE DRAINAGE GEOTEXTILE FOR THE PARTICULAR IN-SITU SOIL .
7	LEVEL TO WHICH SURROUNDING AREA IS TO BE DRAINED.
8	PERFORATED PIPE 110mm OR 160mm OUTSIDE DIAMETER AS REQUIRED BY THE ENGINEER
9	WATER BEARING STRATA.

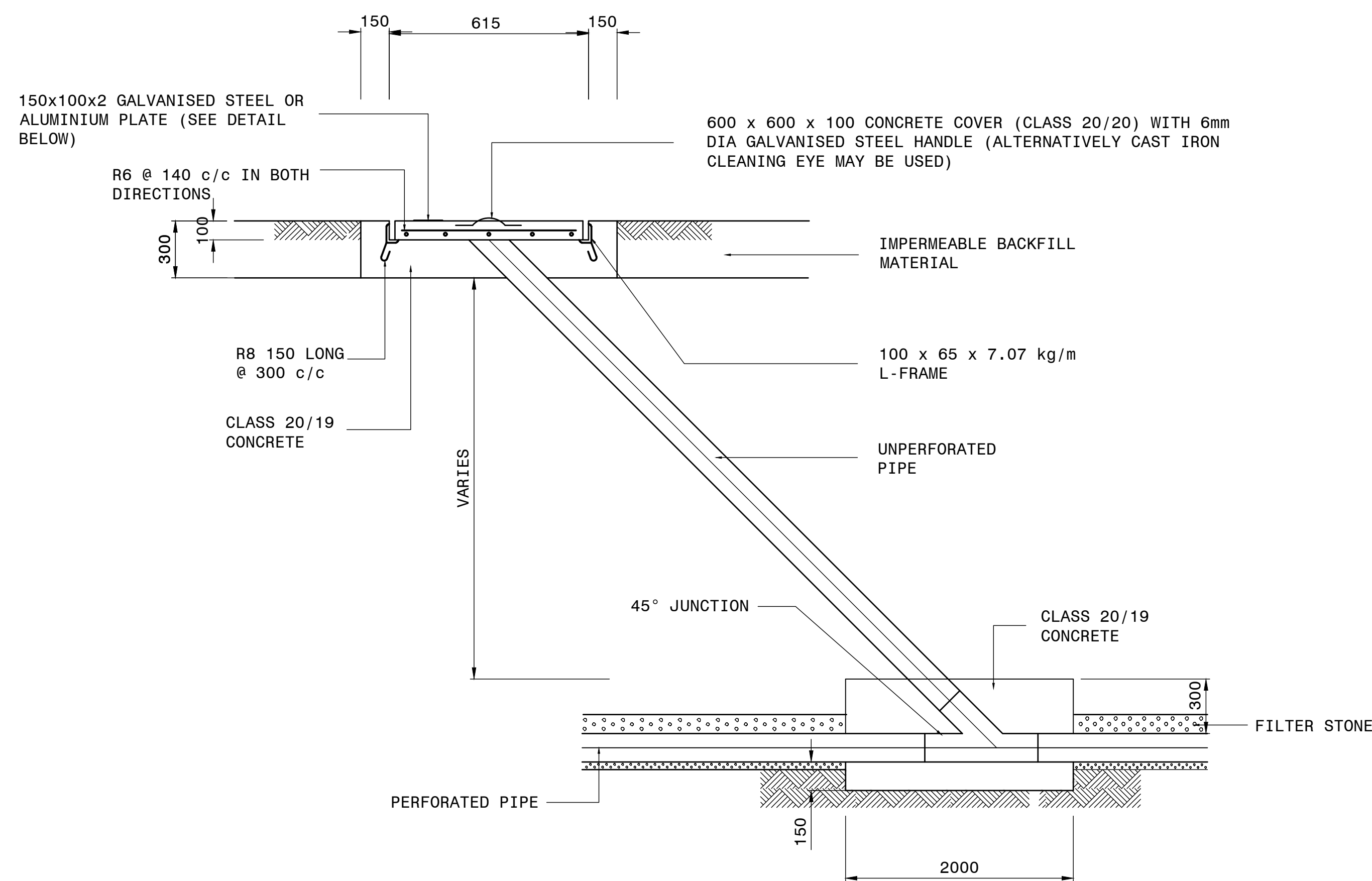


POSITION OF PERFORATIONS IN SUBSOIL DRAINS PIPES

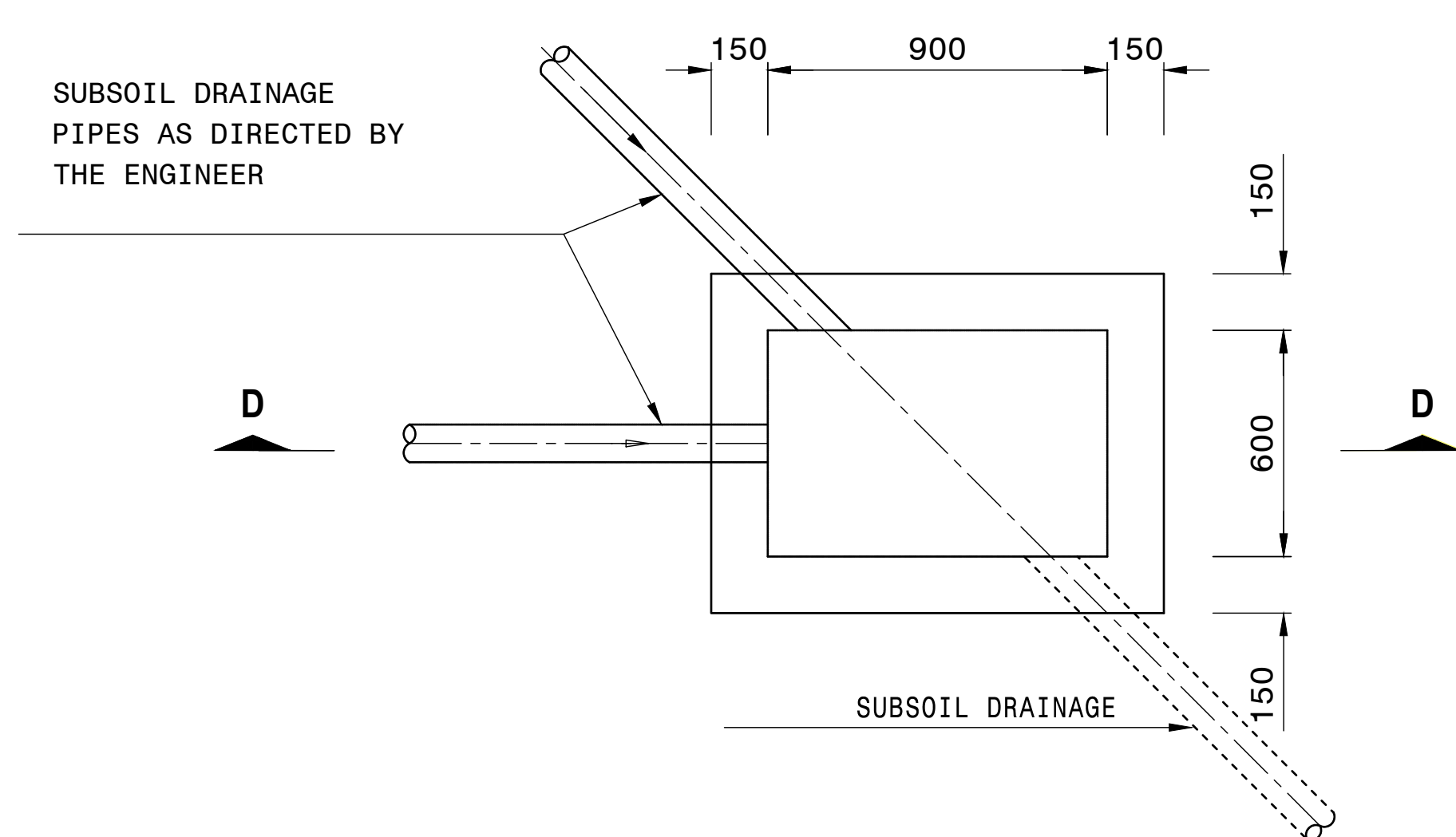
LEGEND

	IMPERMEABLE BACKFILL
	NATURAL PERMEABLE SAND FROM EITHER APPROVED SOURCES ON SITE OR COMMERCIAL.
	6,0mm SINGLE SIZE STONE
	19mm SINGLE SIZE STONE

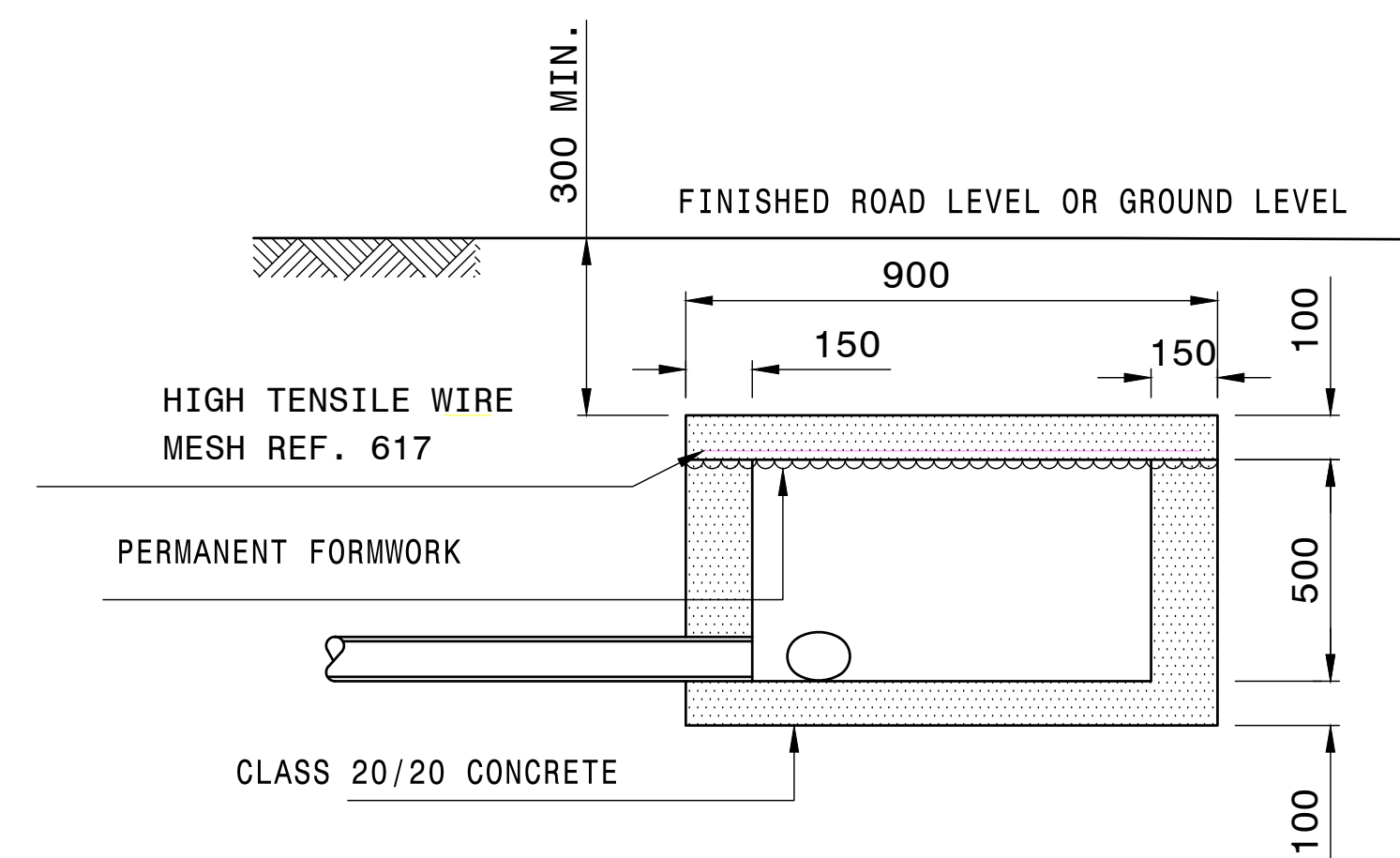
PROJECT NUMBER	NRA.C.004-099-2023/1		
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-019		
SANRAL DOCUMENT #	-		
			VER V1



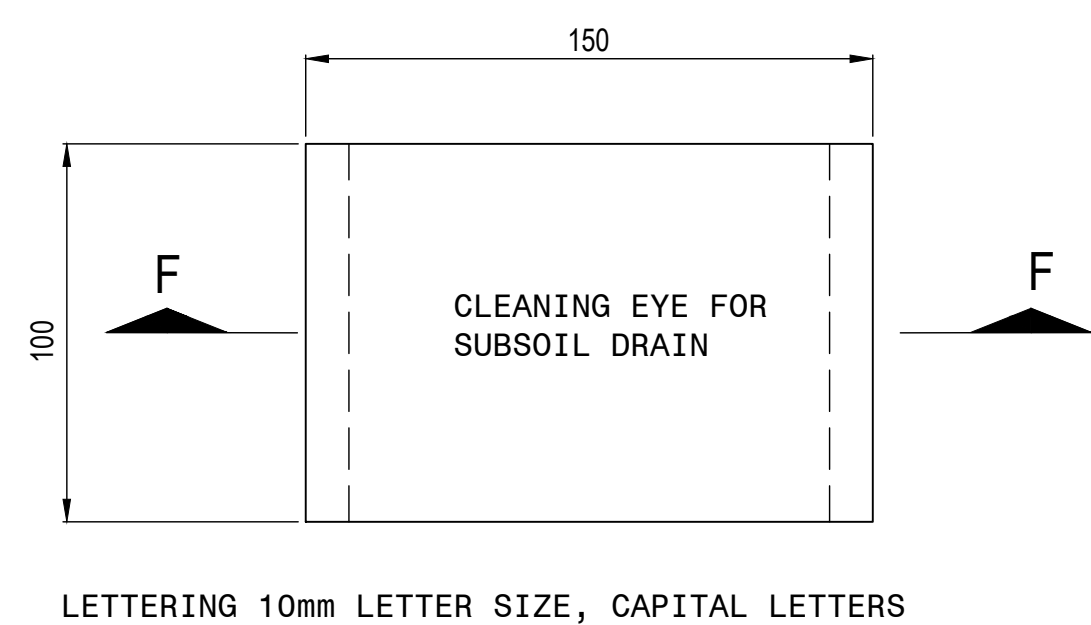
SUBSOIL DRAIN CLEANING EYE
SCALE: 1:20



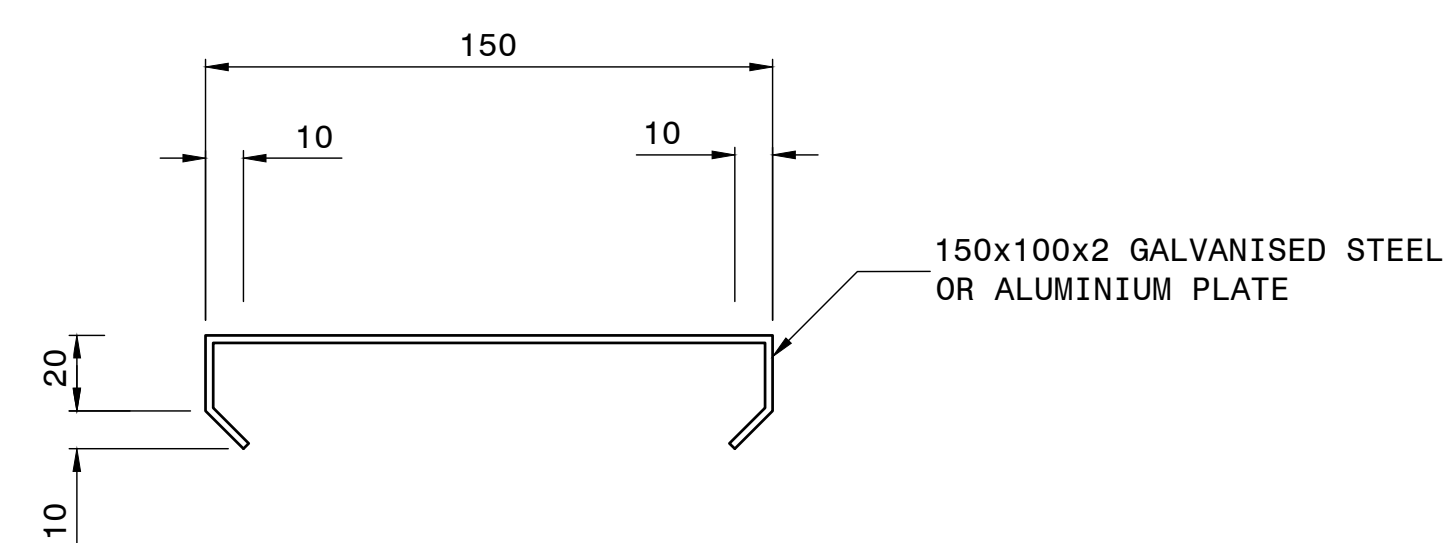
JUNCTION BOX FOR SUBSOIL DRAIN
N.T.S.



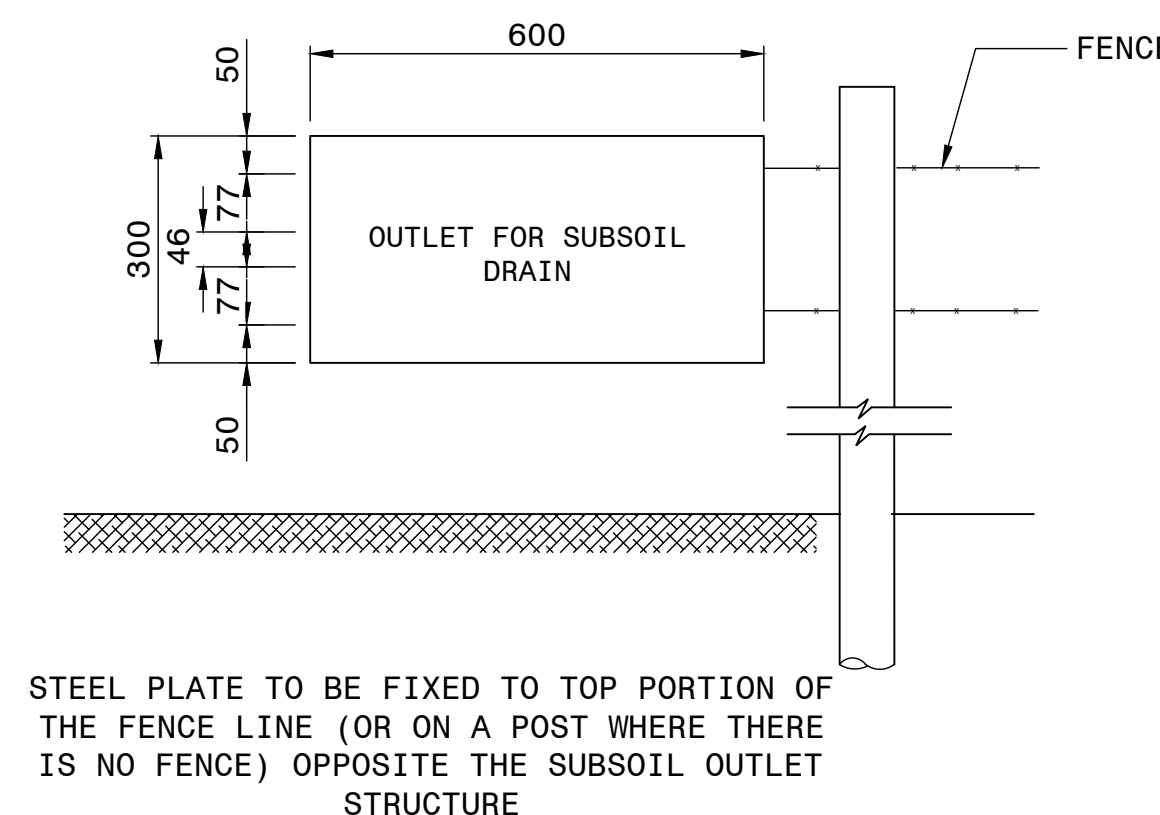
SUBSOIL OUTLET MARKER BOARD
SCALE 1:10



MARKER PLATE FOR CLEANING EYE
SCALE 1:20



SECTION F-F
SCALE 1:2



CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	:		
Prof. Reg. No.	:		
Date	:		
SANRAL PROJECT MANAGER			
Name	:		
Prof. Reg. No.	:		
Date	:		
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000

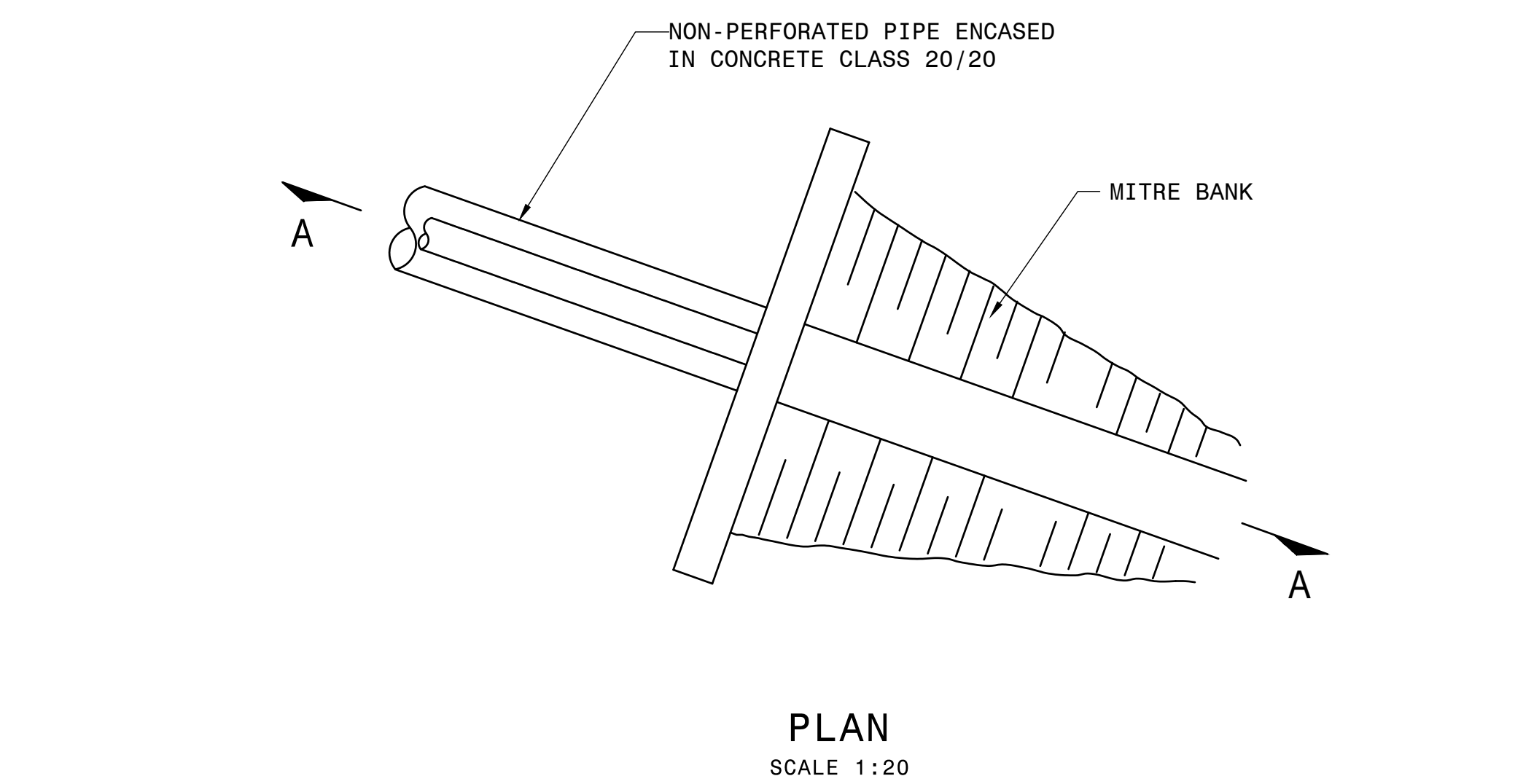


EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

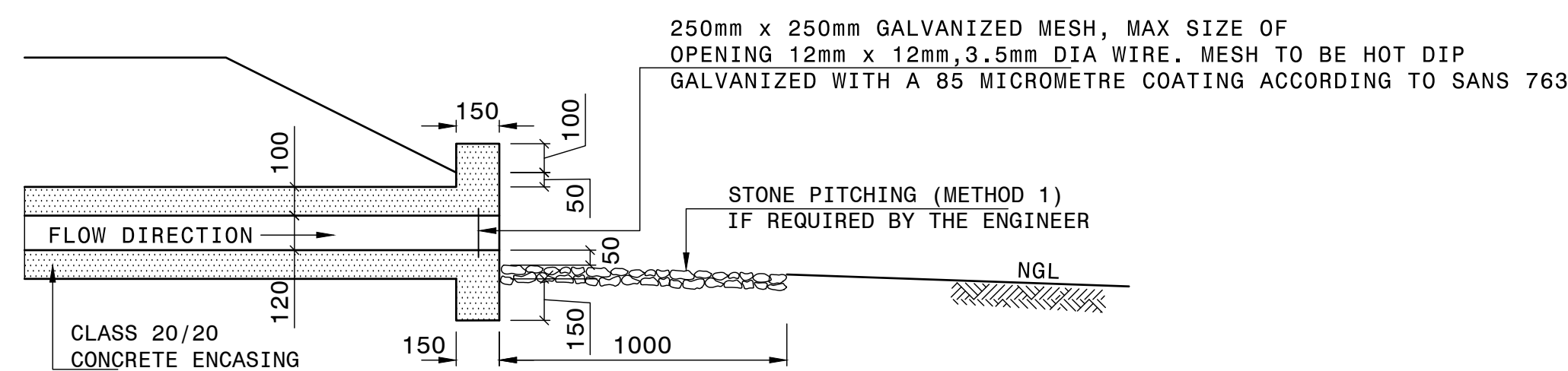
ACCEPTANCE
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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS SUBSOIL CLEANING EYE JUNCTION BOX AND OUTLET MARKER	
SCALE :	AS SHOWN

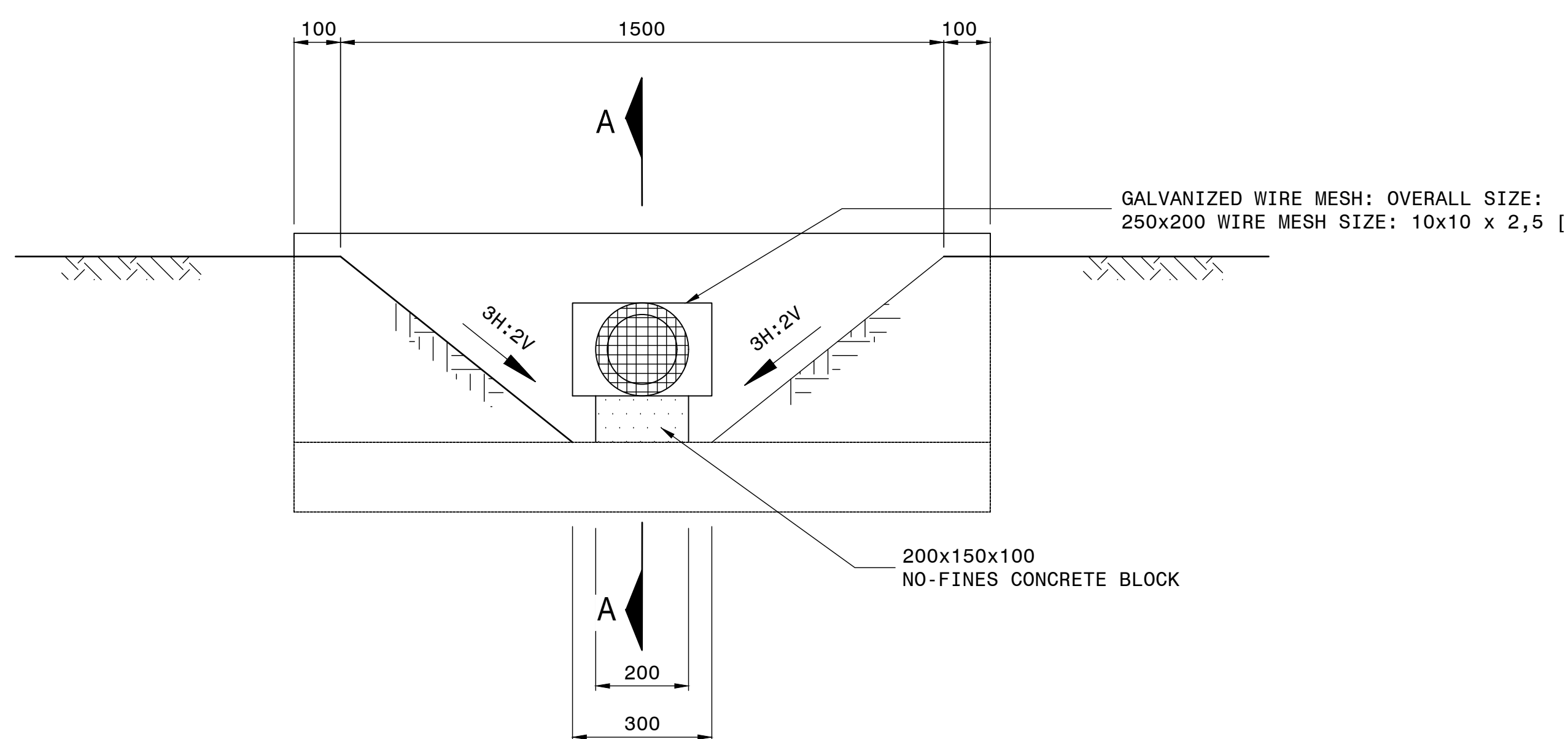
PROJECT NUMBER	NRA.C.004-099-2023/1		
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-020		
SANRAL DOCUMENT #	-		
		VER	V1



PLAN
SCALE 1:20

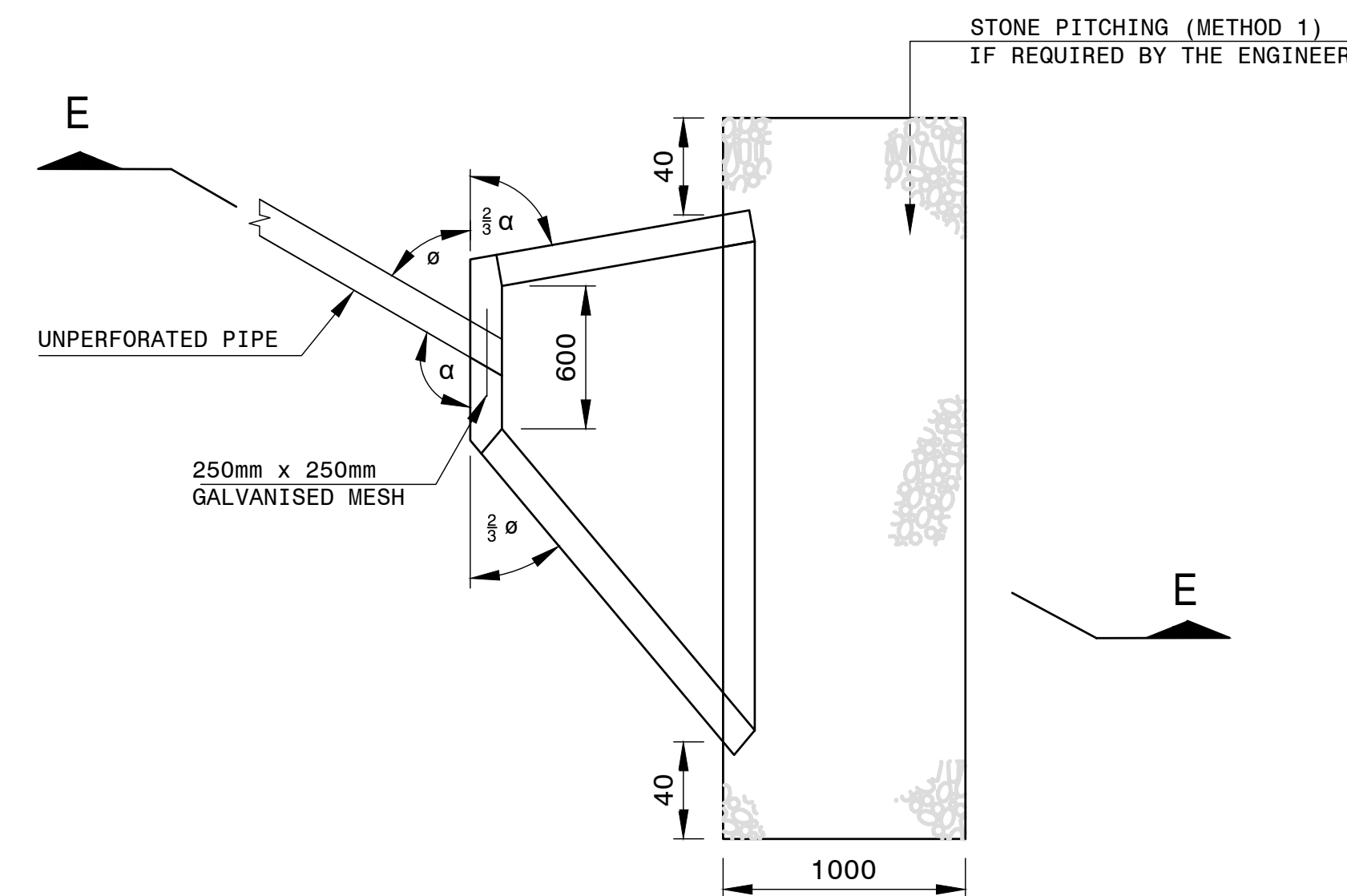


SECTION A-A
SCALE 1:20

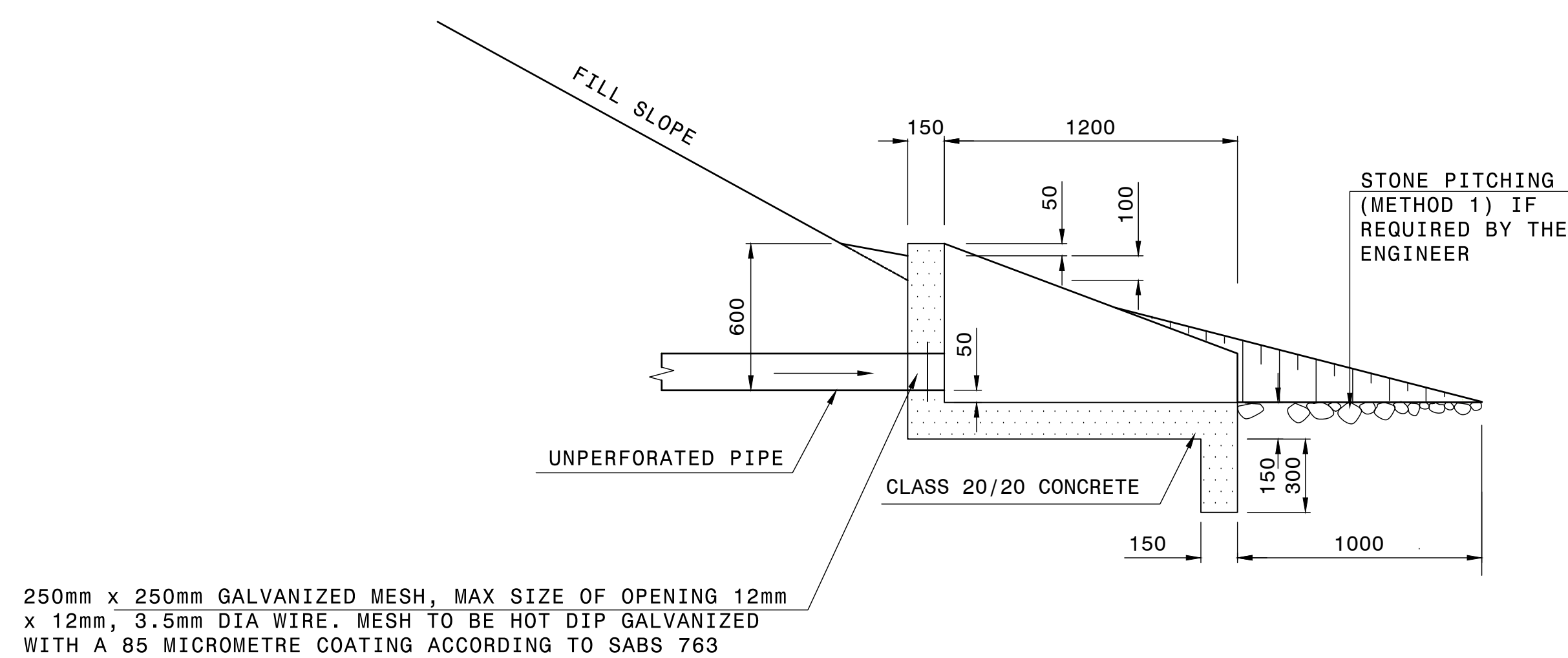


ELEVATION FRONTALE
N.T.S.

SUBSOIL DRAIN OUTLET TYPE B



PLAN
N.T.S.



SECTION E-E
(WHERE $\alpha = 90^\circ$)
SCALE: 1:20

SUBSOIL DRAIN OUTLET TYPE A

NOTE:

1. TYPE A OUTLET PREFERABLY TO BE USED WHERE THE GROUND LEVELS ALLOW IT.
2. OUTLETS MAY ALSO BE COMBINED WITH CULVERT INLETS OR OUTLETS

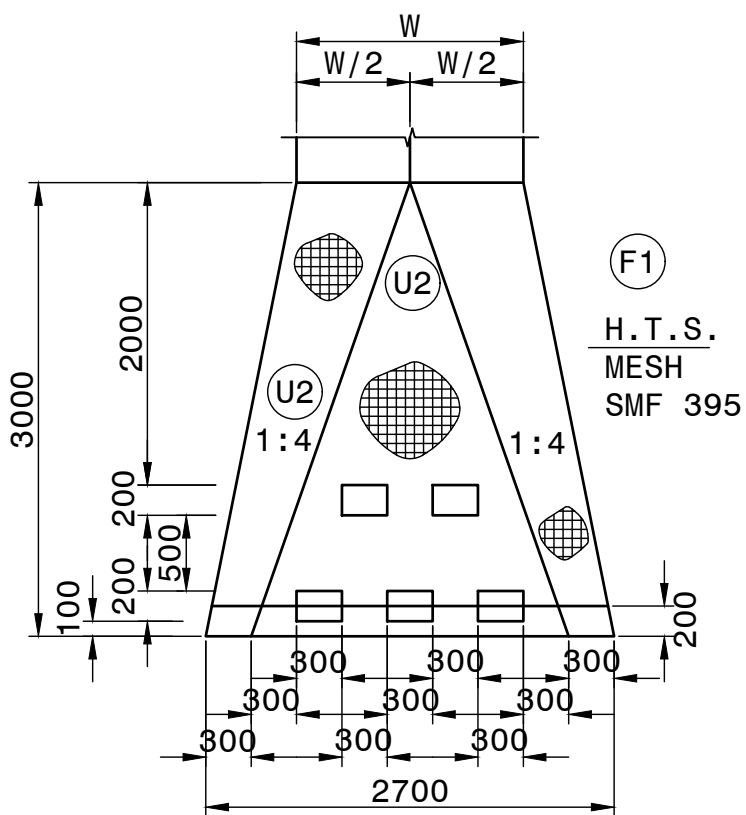
CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name	:		
Prof. Reg. No.	:		
Date	:		
SANRAL PROJECT MANAGER			
Name	:		
Prof. Reg. No.	:		
Date	:		
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY LTD. BUILDING SOUTH AFRICA THROUGH BETTER ROADS	EASTERN REGION 58 van Eck Place Pietermaritzburg 3201 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100
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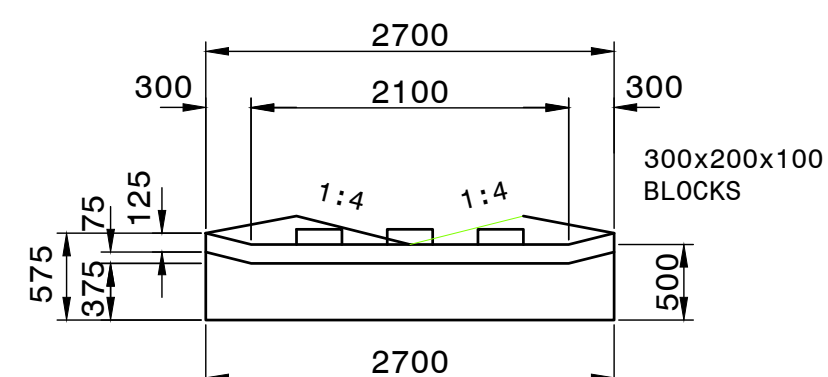
ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD. Date:

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION
DRAINAGE TYPICALS TYPICAL SUBSURFACE DRAINAGE DETAILS SUBSOIL DRAIN OUTLET STRUCTURES
SCALE : AS SHOWN

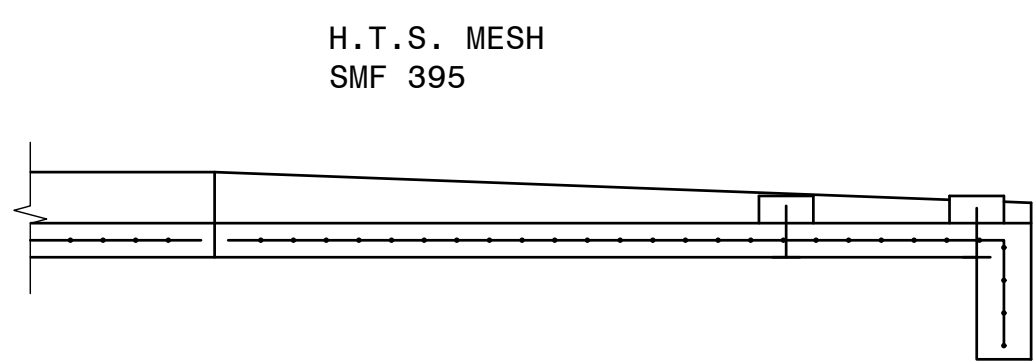
PROJECT NUMBER	NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	22	22
DRAWING km DISTANCE	km 0,80	km 18,64
DRAWING TYPE	DRAINAGE - TYPICALS	
BRIDGE/STRUCTURE No.	N/A	
CONSULTANT DRAWING No.	TP1802-19-05-25-19-021	VER
SANRAL DOCUMENT #	-	V1



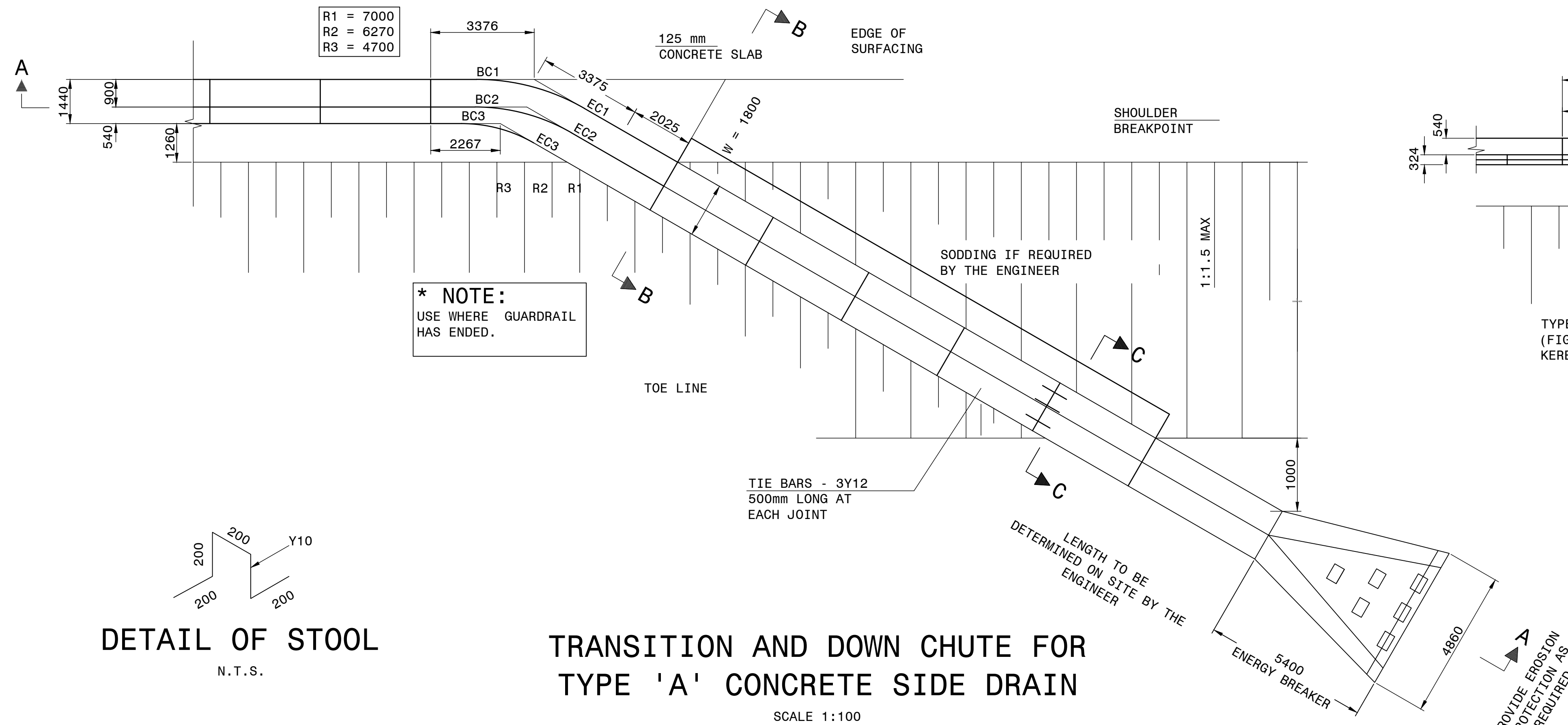
PLAN
SCALE 1:50



ELEVATION
SCALE 1:50



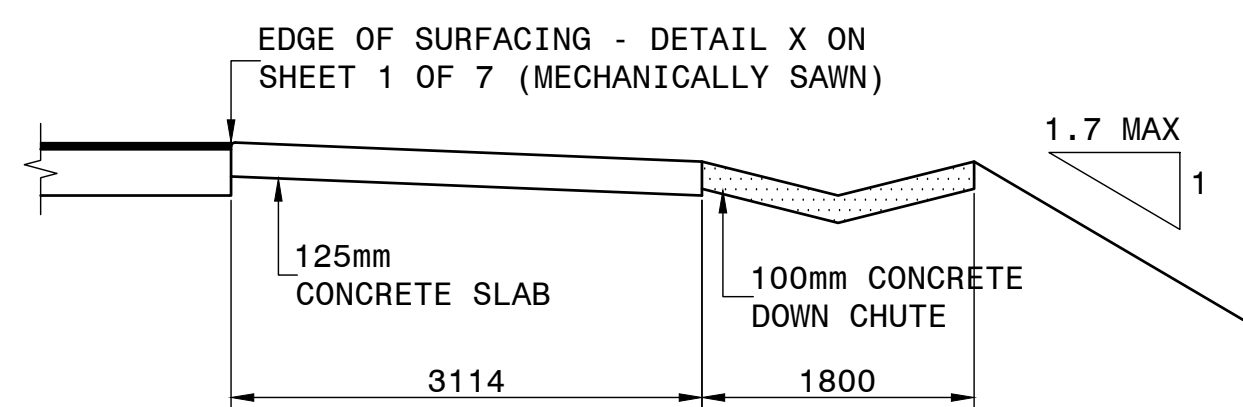
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SCALE 1:50



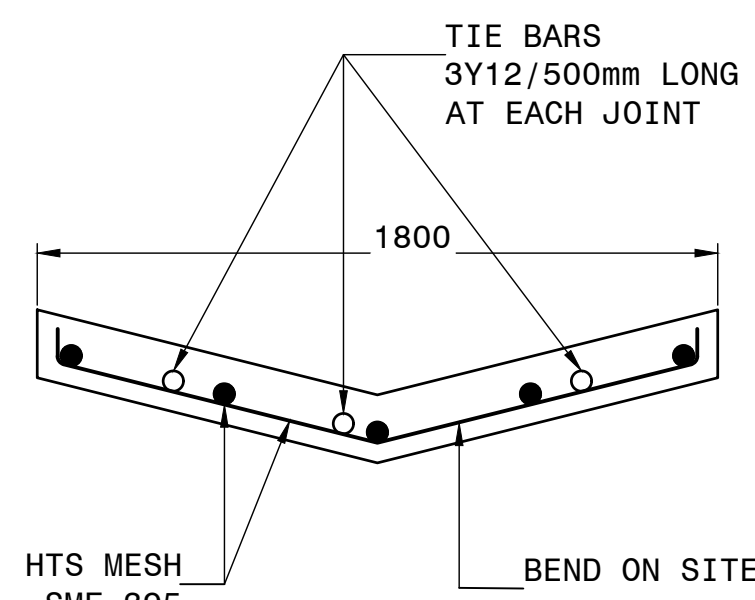
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TYPE 'A' CONCRETE SIDE DRAIN

SCALE 1:100

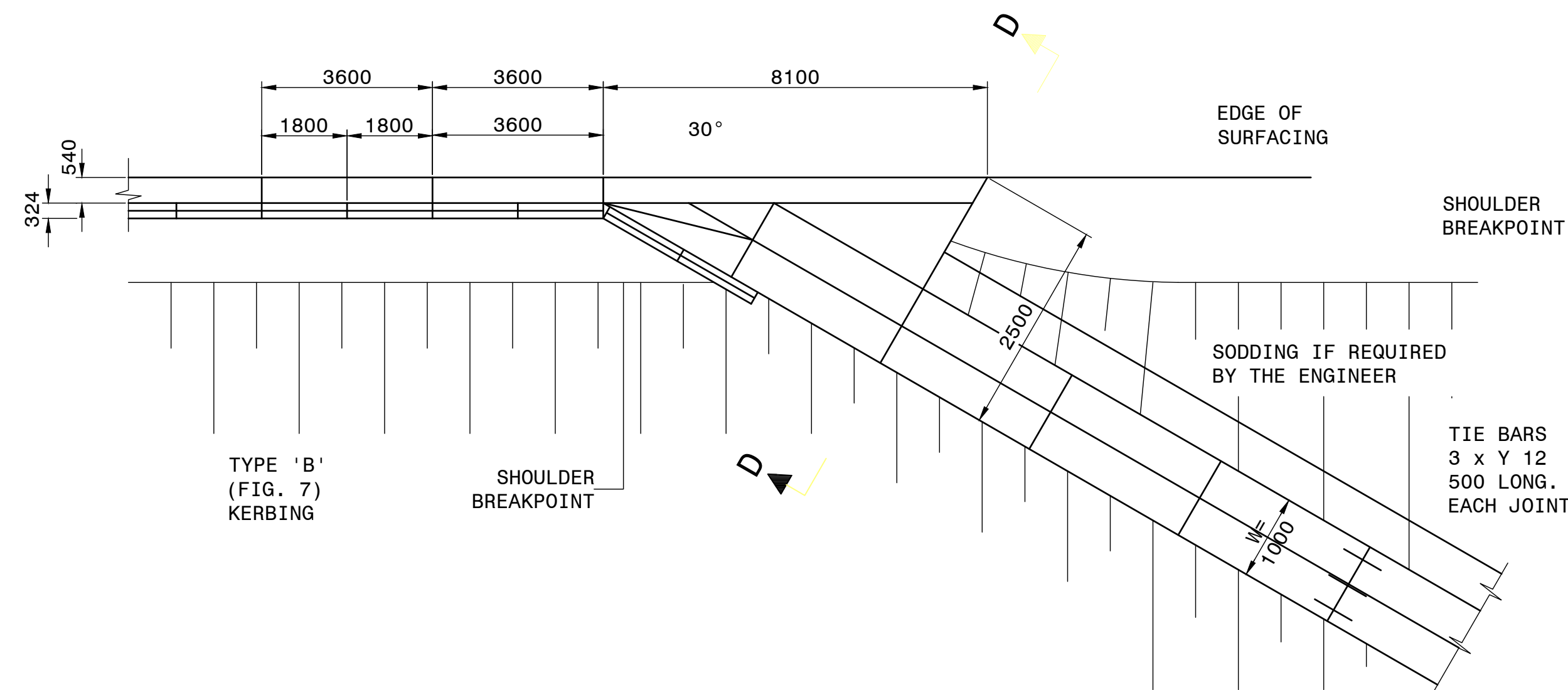
DETAIL OF STOOL
N.T.S.



SECTION B-B
SCALE 1:50

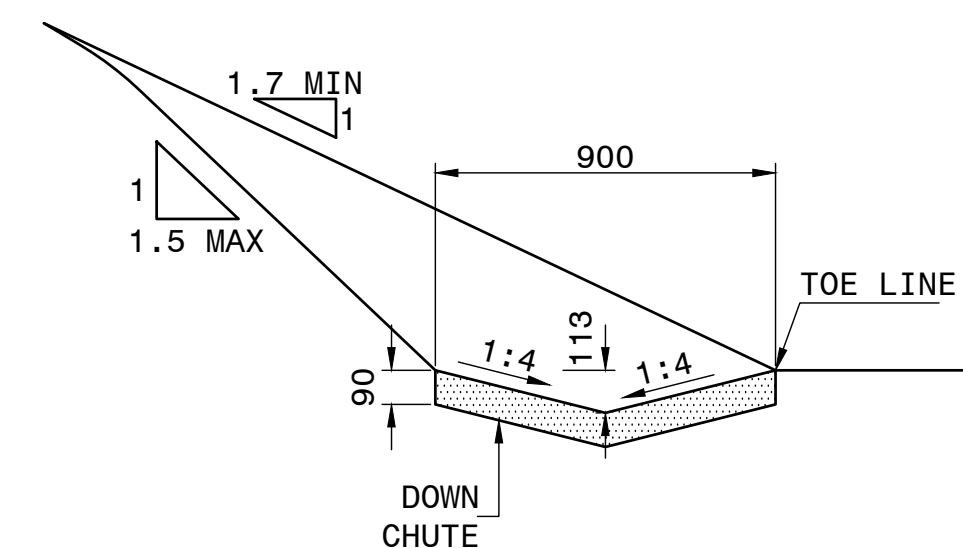


SECTION C-C
SCALE 1:20

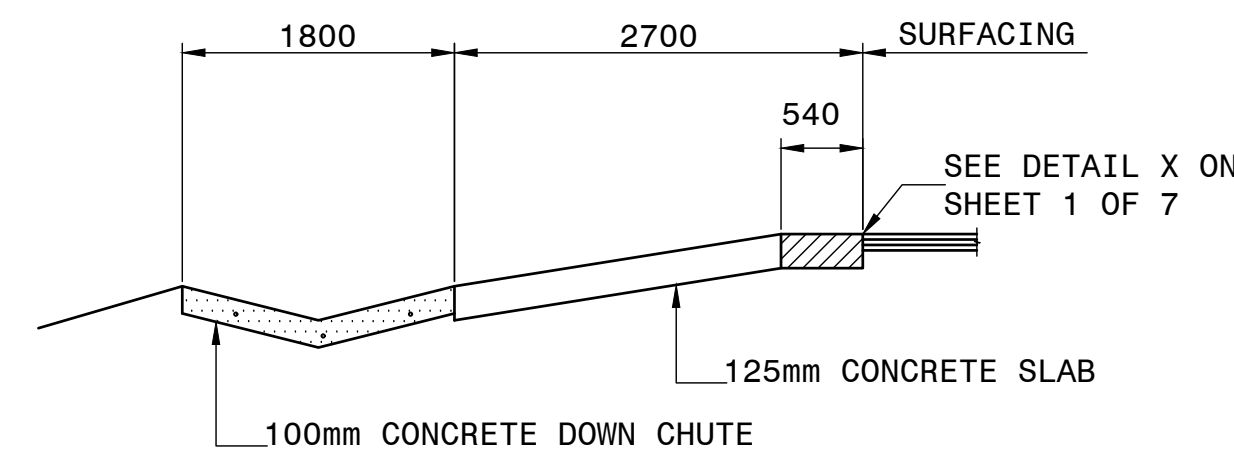


TRANSITION AND DOWN CHUTE FOR
TYPE 'B' CONCRETE KERBING

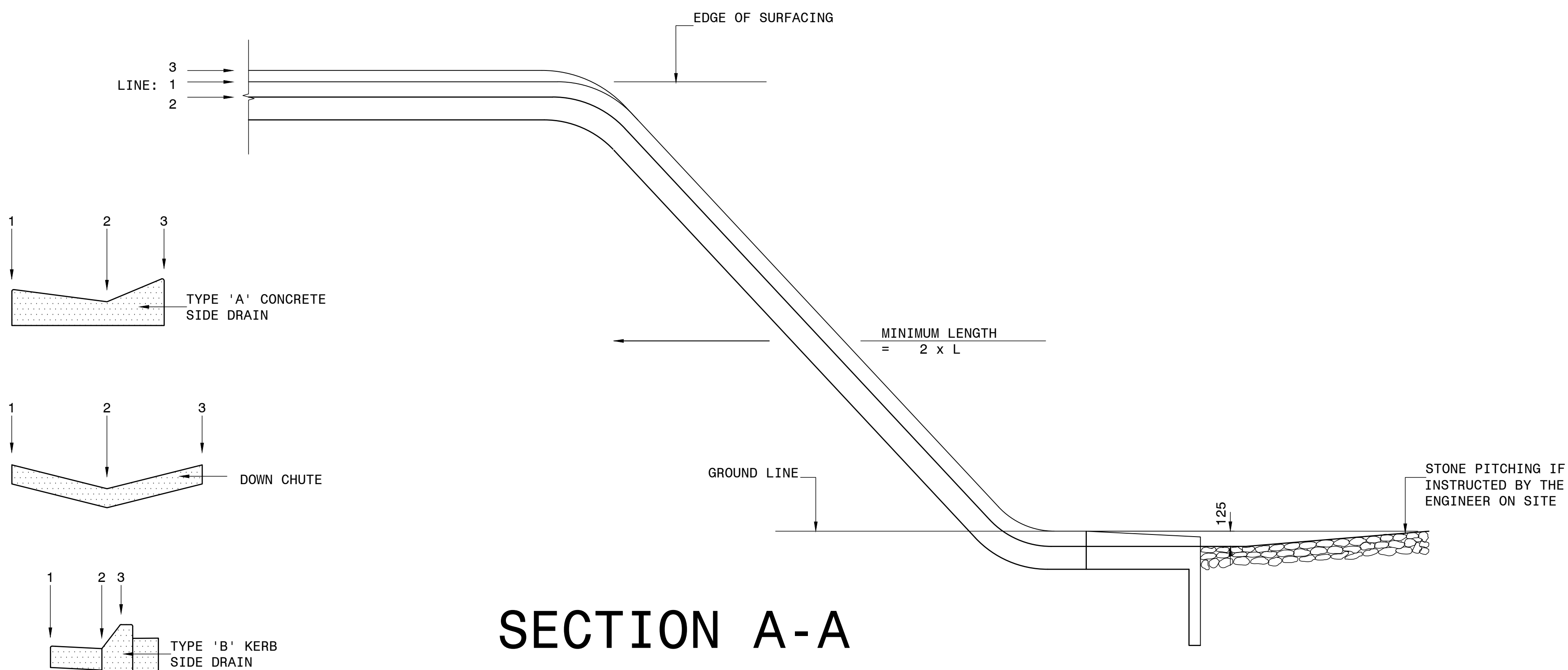
SCALE 1:100



SECTION C-C
SCALE 1:20



SECTION D-D
SCALE 1:50



SECTION A-A
SCALE NTS

CONSTRUCTION RECORD			
WORKS CONTRACT ENGINEER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
SANRAL PROJECT MANAGER			
Name : _____			
Prof. Reg. No. : _____			
Date : _____			
V1	SEPT 2023	ORIGINAL VERSION	S.KASPERSAD
No.	DATE	REVISION	CONSULT. ENG.

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000

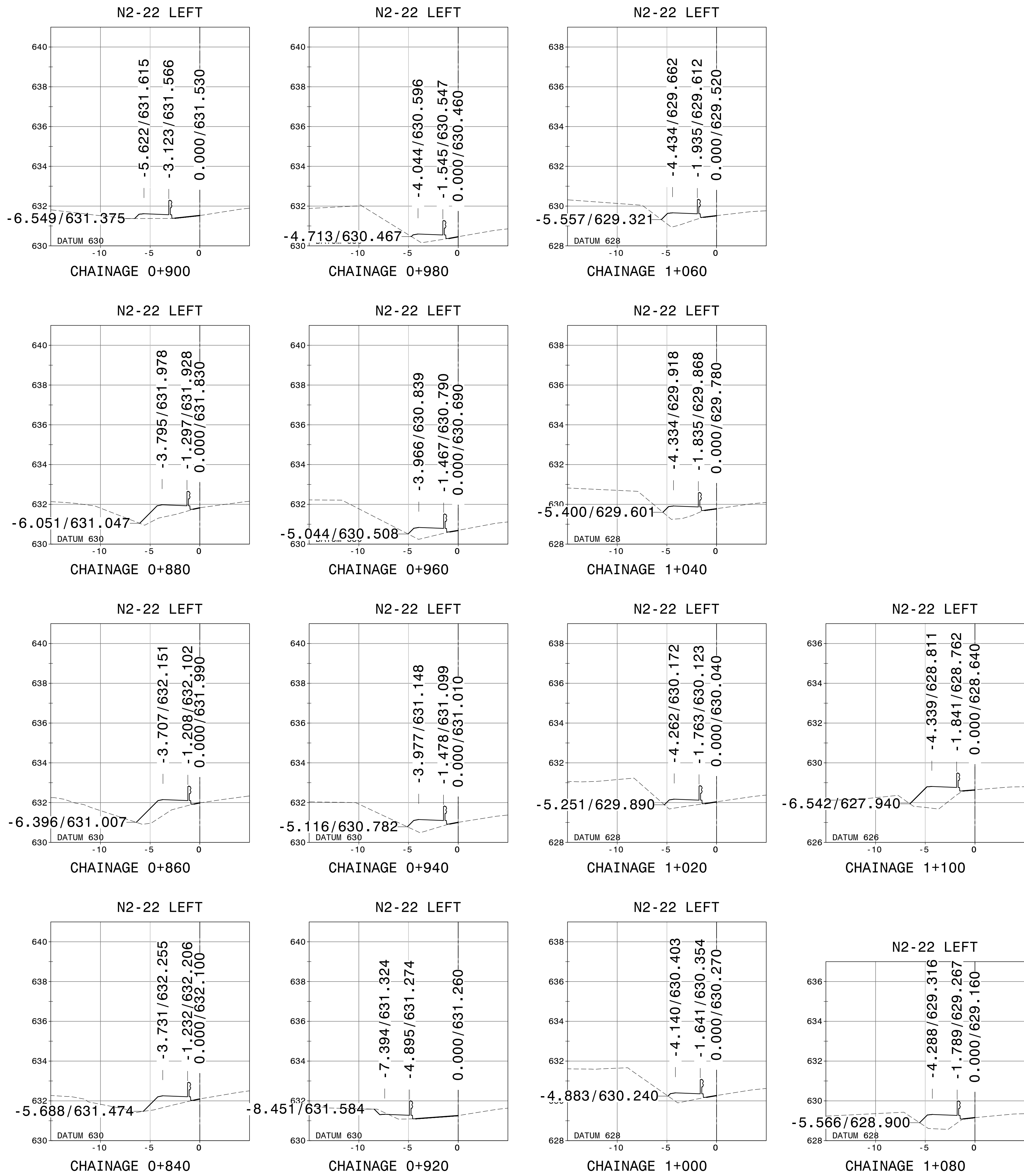


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PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date: _____

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DRAINAGE TYPICALS TYPE A DRAIN OUTLET TRANSITIONS	
SCALE : AS SHOWN	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	22	22	
DRAWING km DISTANCE	km 0,80	km 18,64	
DRAWING TYPE	DRAINAGE - TYPICALS		
BRIDGE/STRUCTURE No.	N/A		
CONSULTANT DRAWING No.	TP1802-19-05-25-19-022		
SANRAL DOCUMENT #	-		
SHEET 1 OF 1		VER V1	



FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKING CONTRACT ENGINEER			
Name:			
Prof. Reg. No.:			
Date:			
SANRAL PROJECT MANAGER			
Name:			
Prof. Reg. No.:			
Date:			
V1	SEPT 2023	ORIGINAL VERSION	S. KASPIERSAD
No.	DATE	REVISION	CONSULT. ENG.

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EASTERN REGION
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Pietermaritzburg
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PO Box 100410
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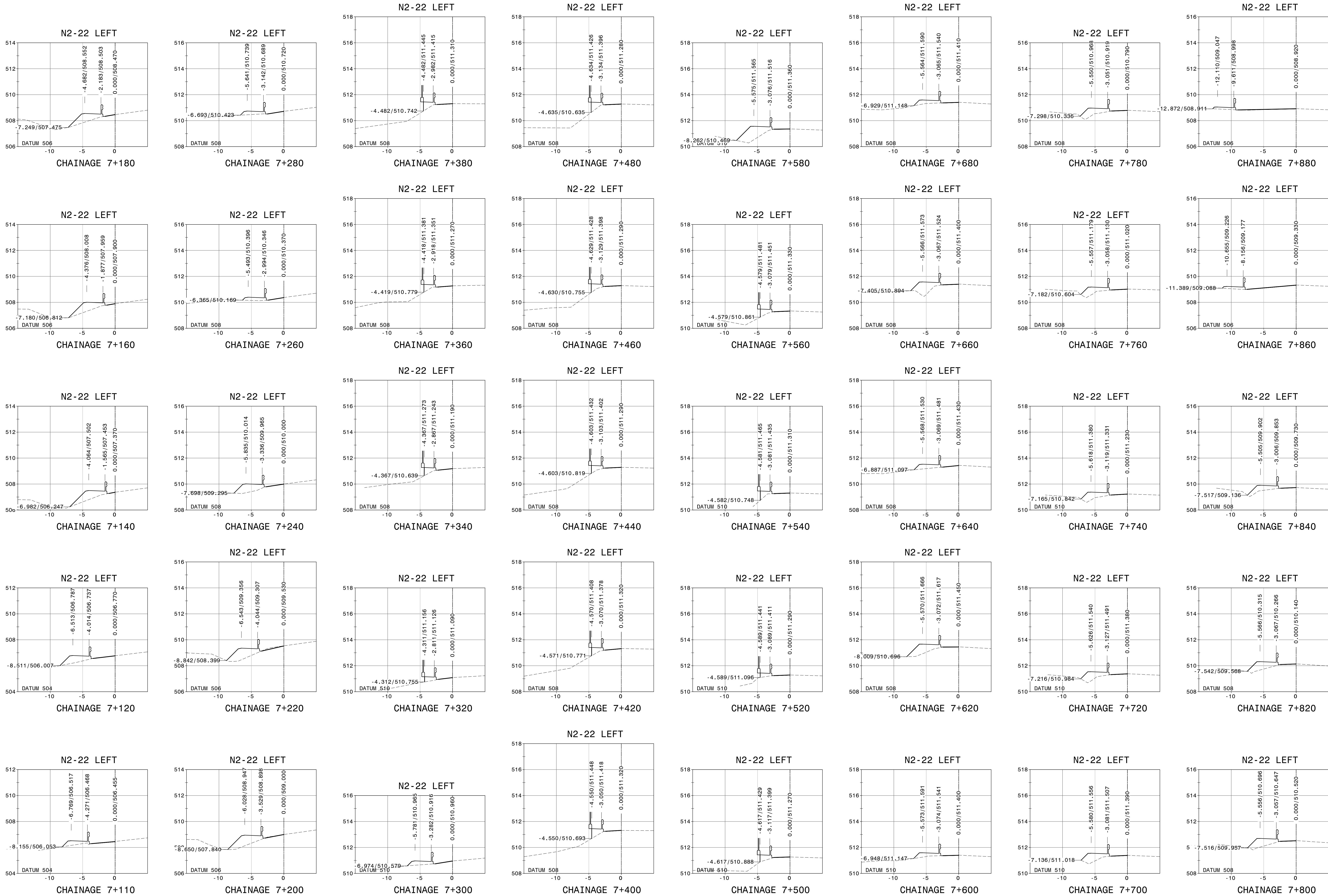
ACCEPTANCE
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Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DETAIL CROSS SECTIONS N2-22 LEFT	

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
BRIDGE/STRUCTURE No.		N/A	
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SANRAL DOCUMENT #		V1	

SCALE : 1:200 SHEET 01 OF 07

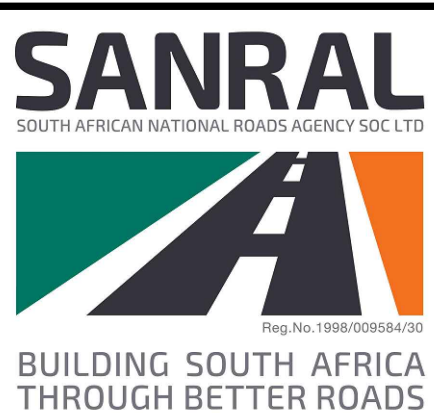
DRAWING NO. TP1802-19-05-25-20-001A



FOR TENDER PURPOSES

			CONSTRUCTION RECORD		
			WORKING CONTRACT ENGINEER		
			Name :		
			Prof. Reg. No. :		
			Date :		
			SANRAL PROJECT MANAGER		
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD CONSULT. ENG.		
No.	DATE	REVISION	Name :		
			Prof. Reg. No. :		
			Date :		

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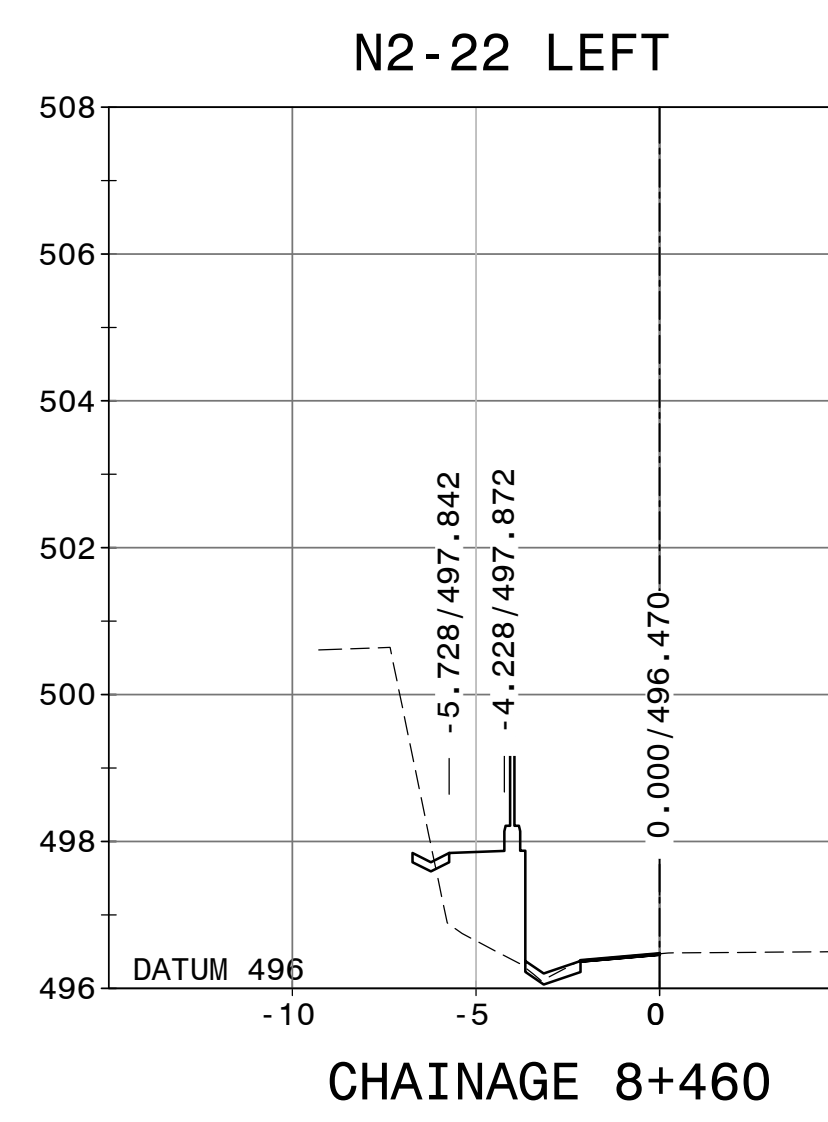
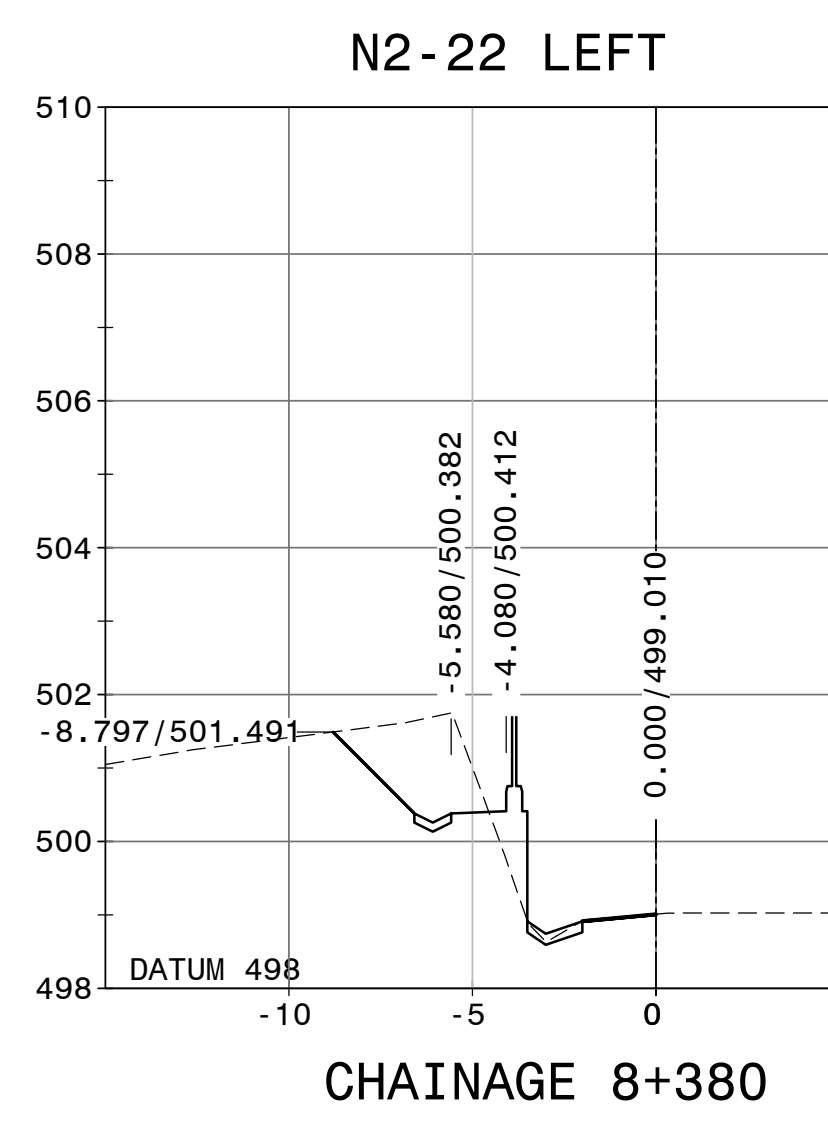
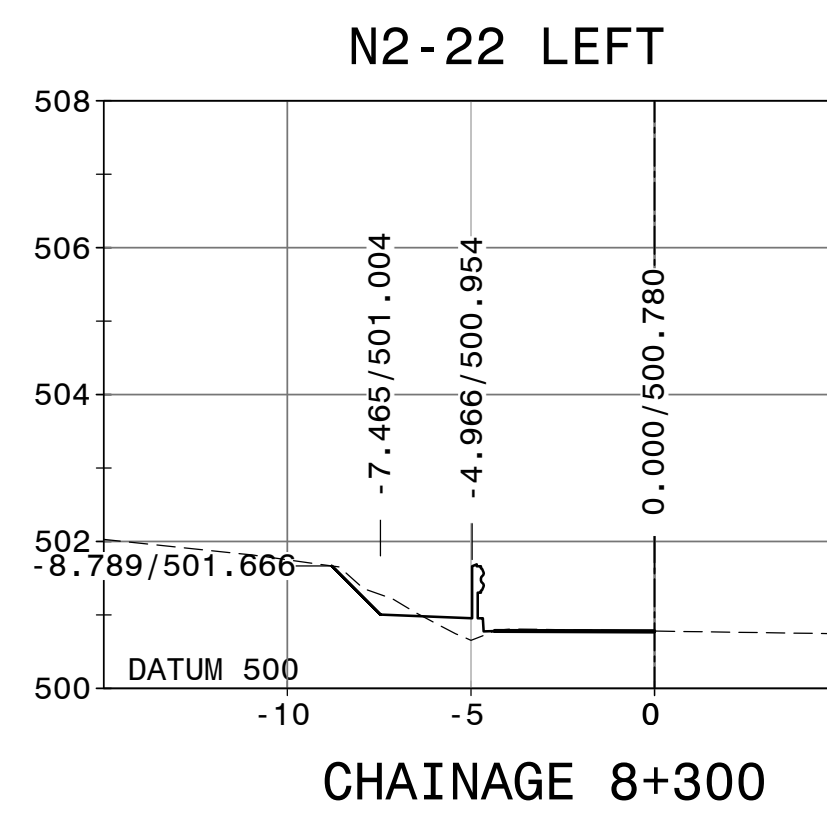
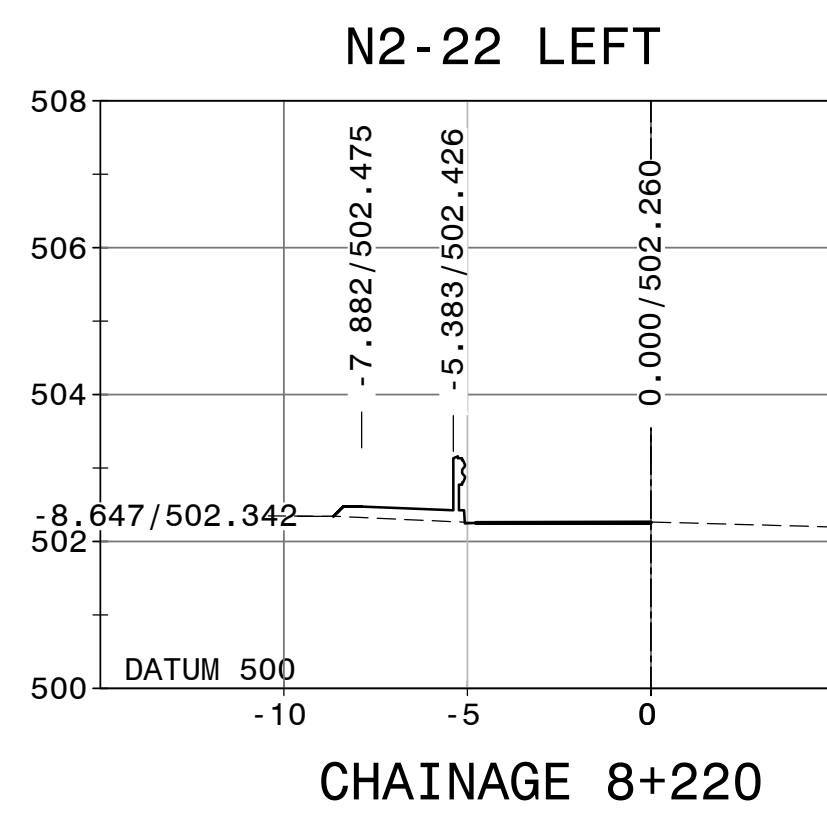
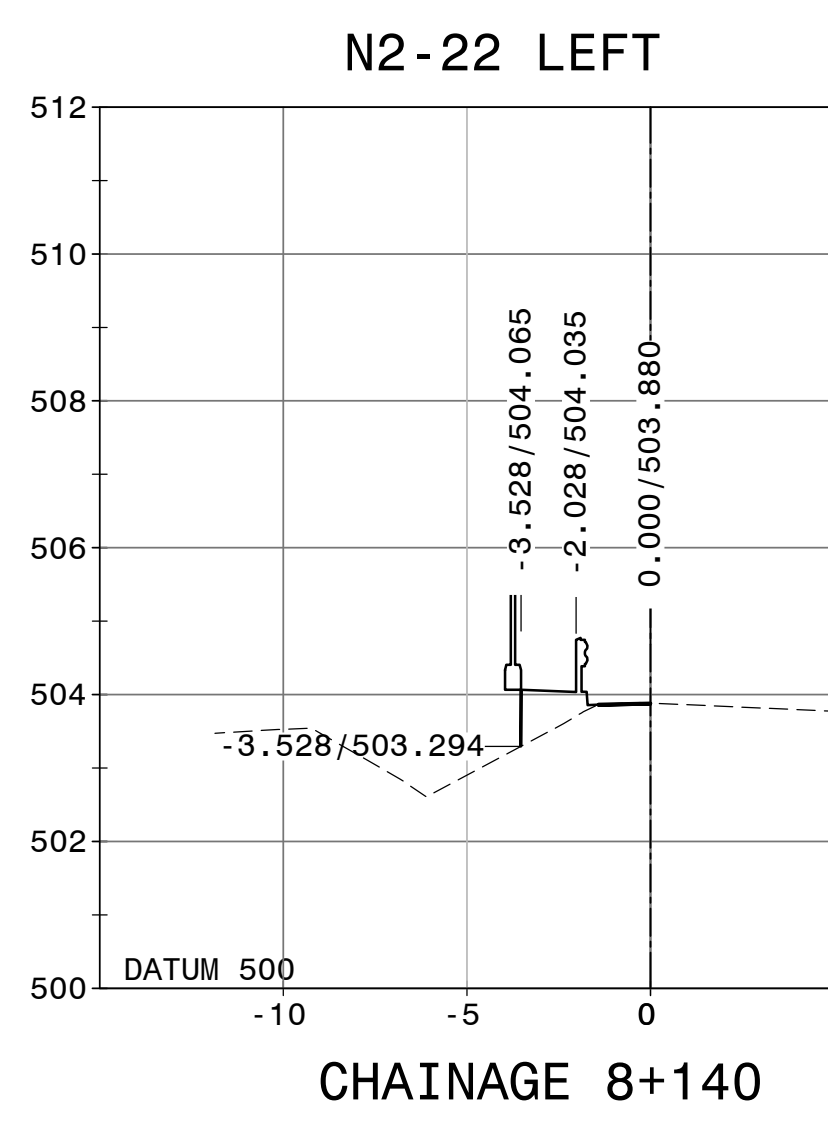
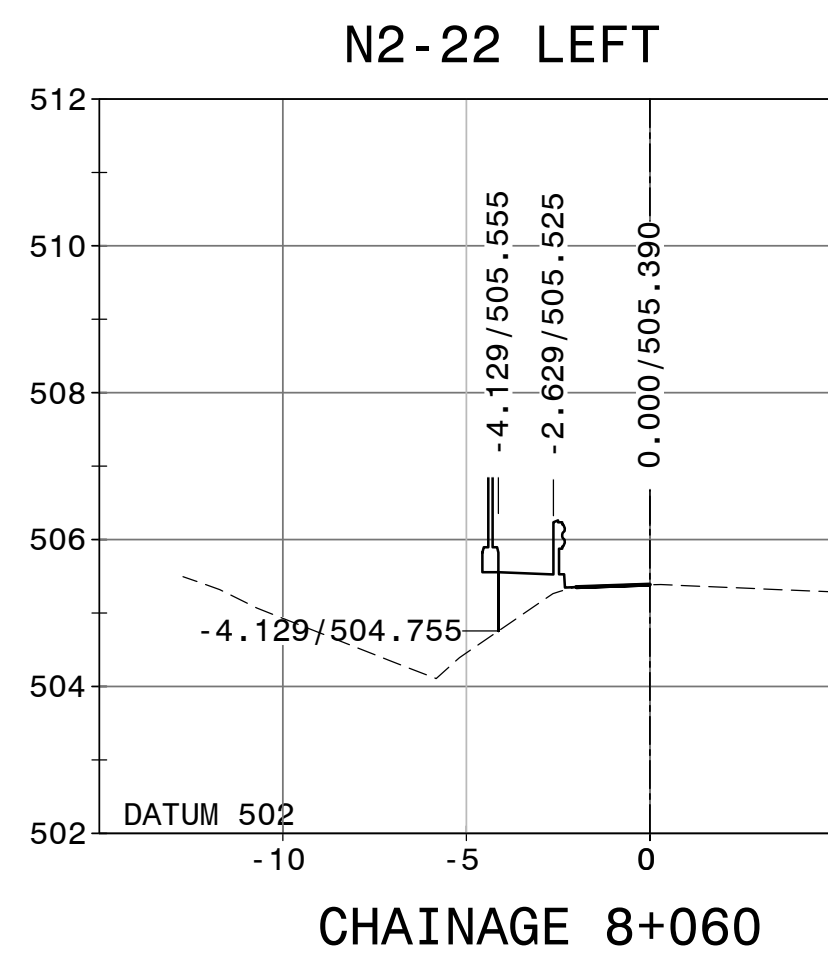
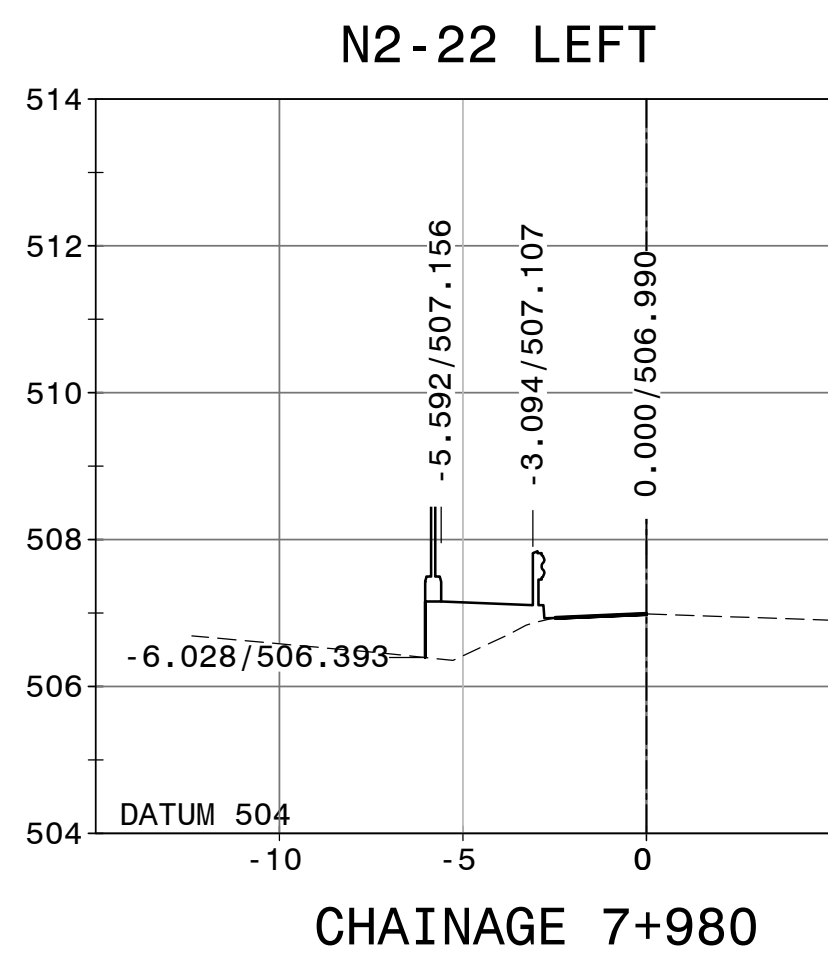
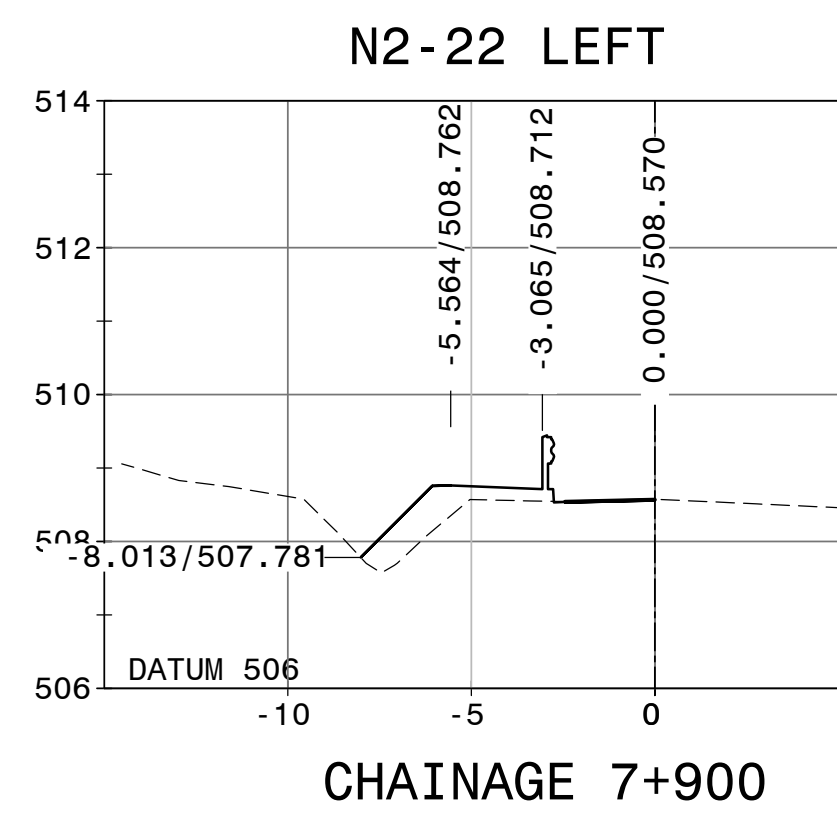
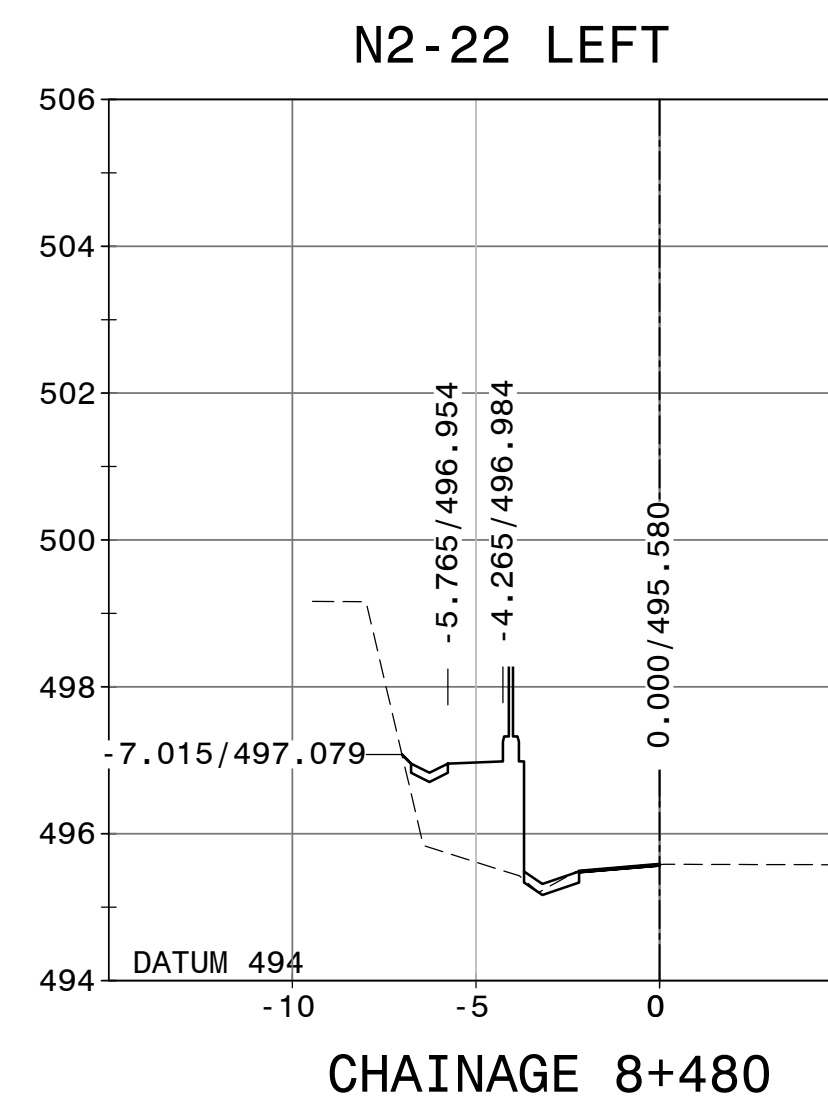
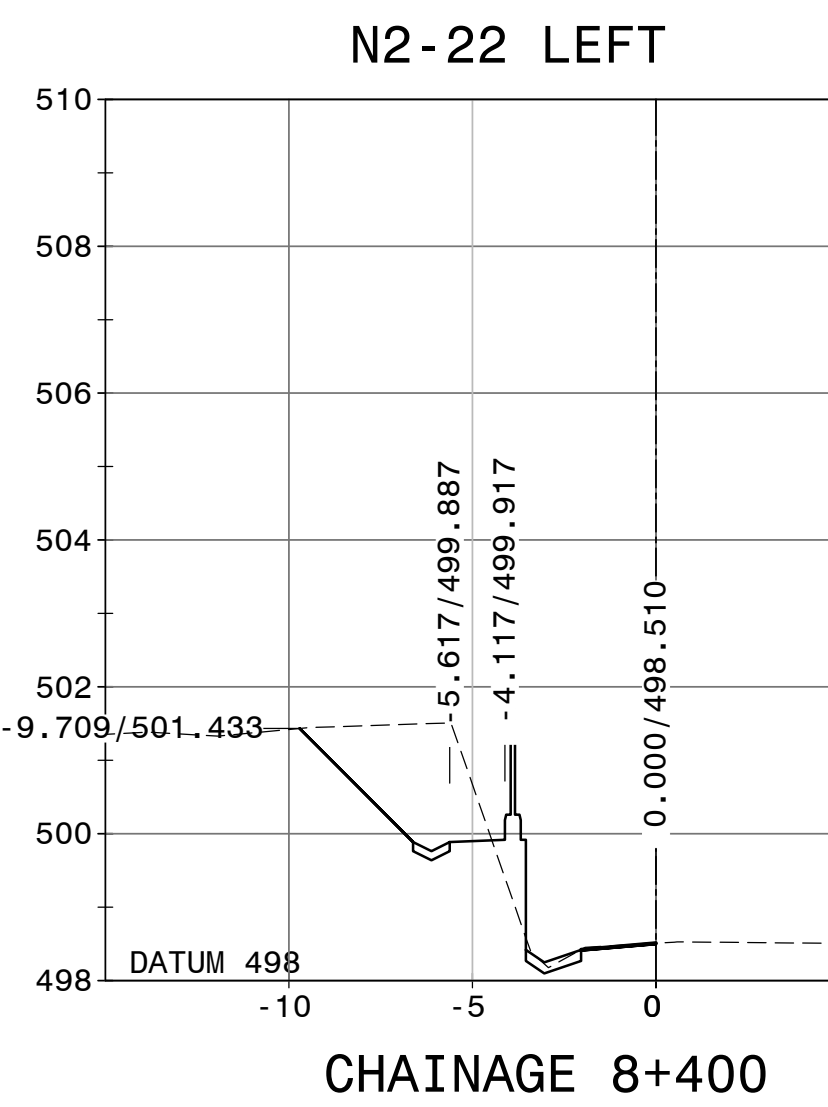
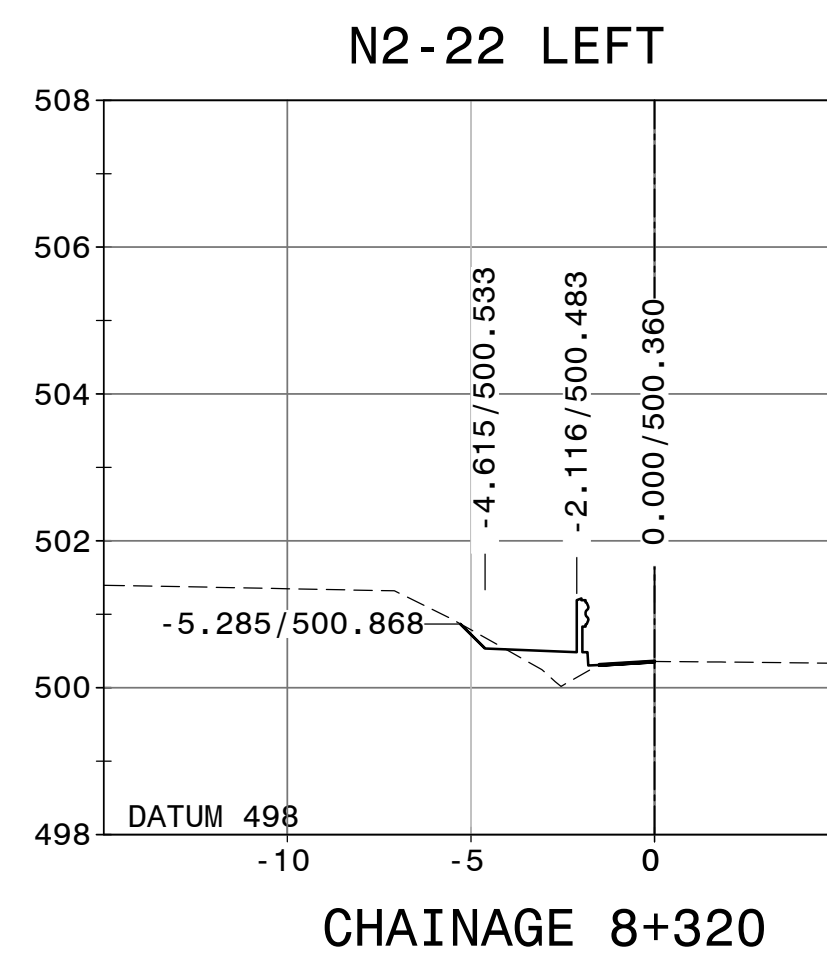
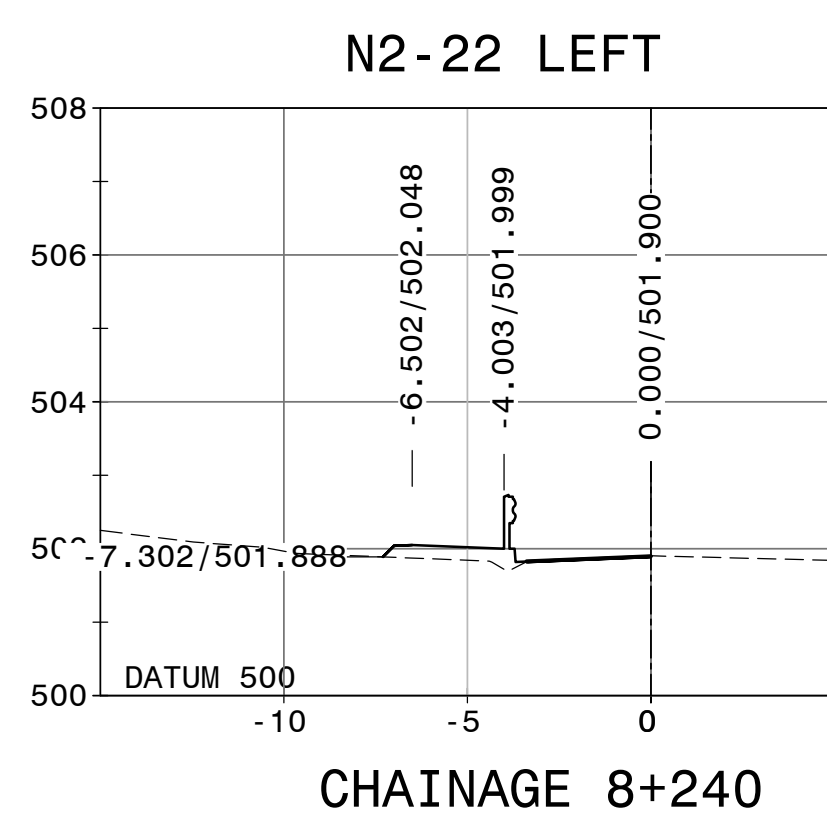
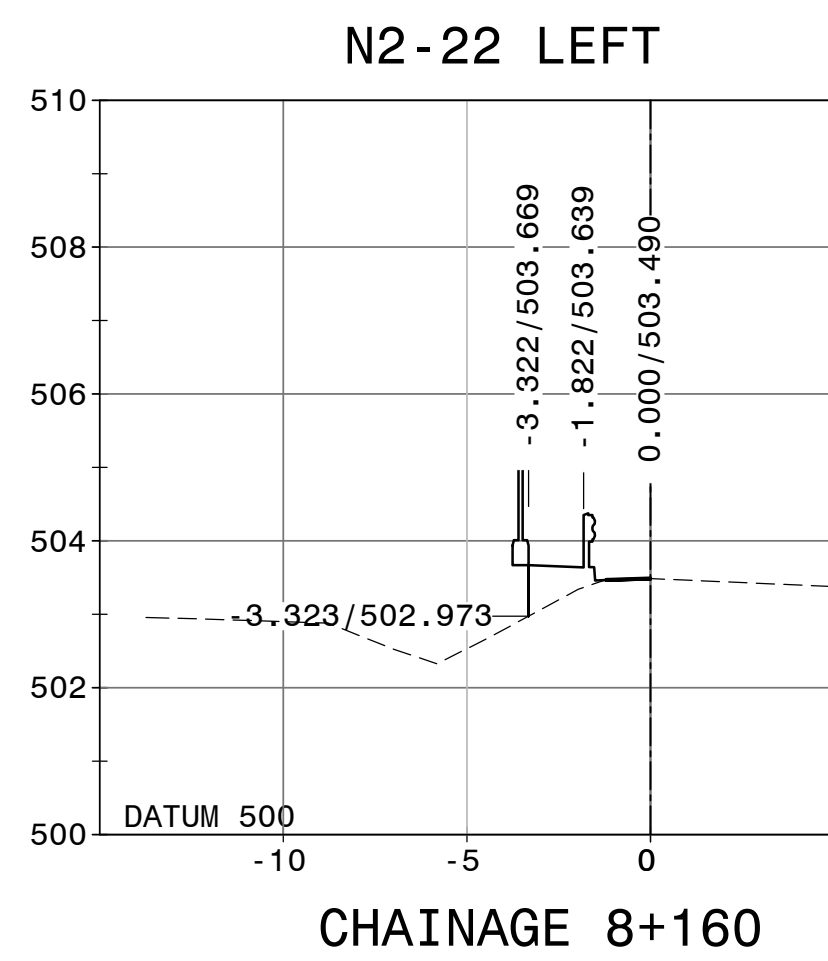
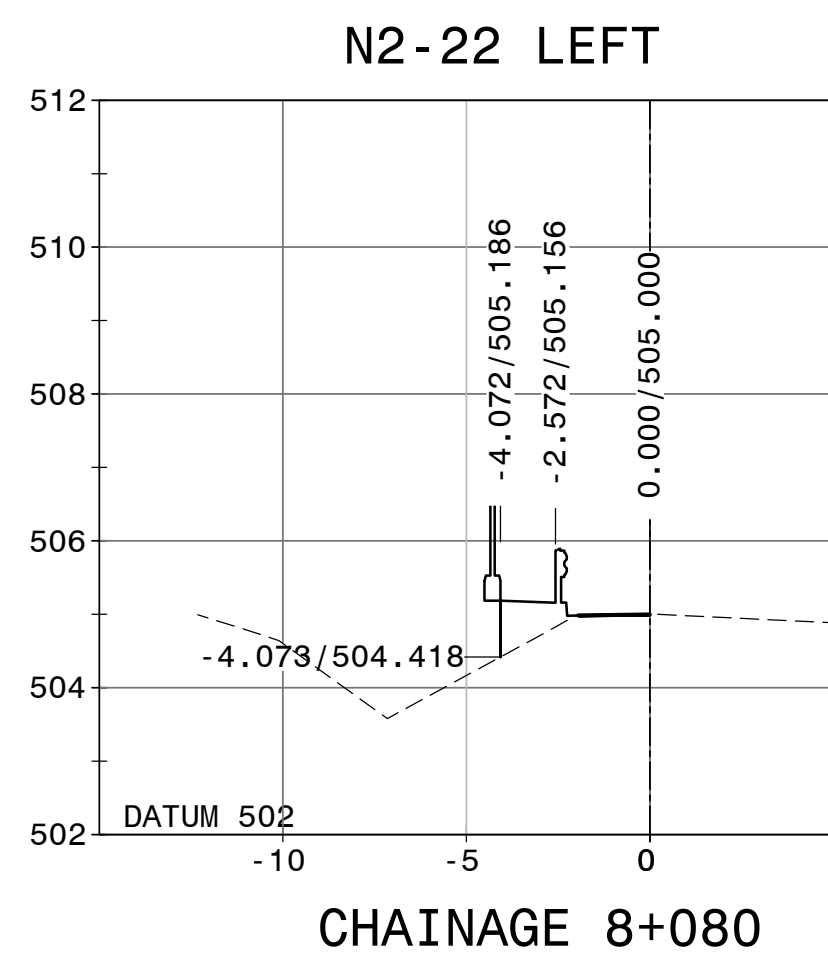
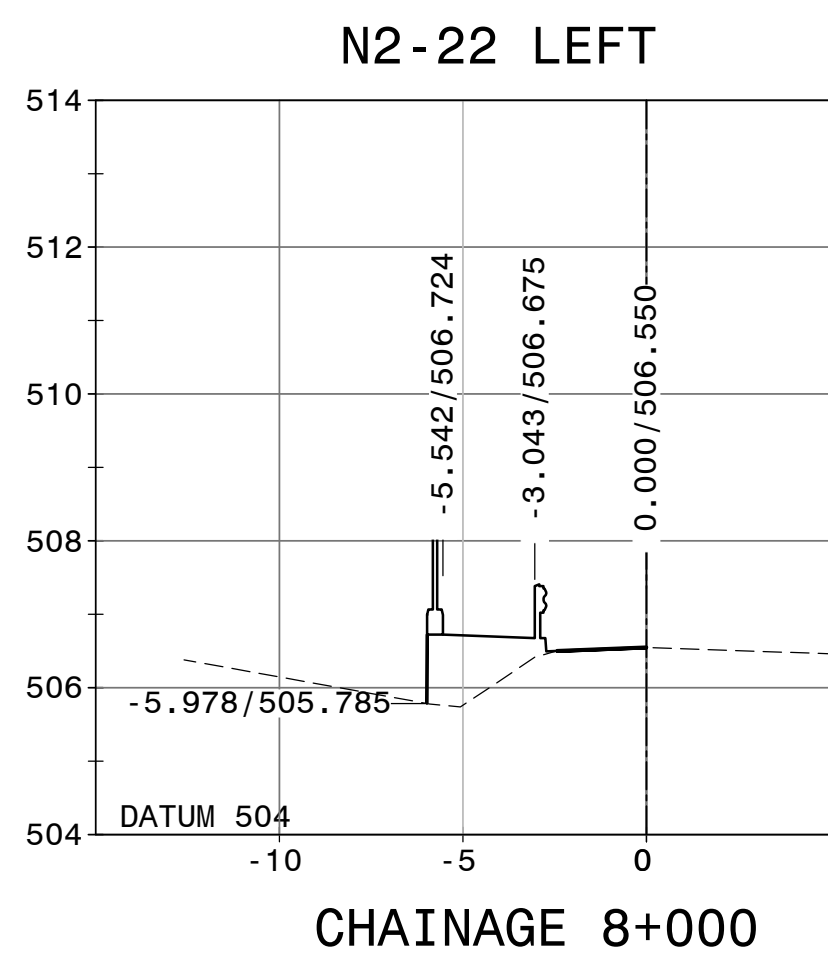
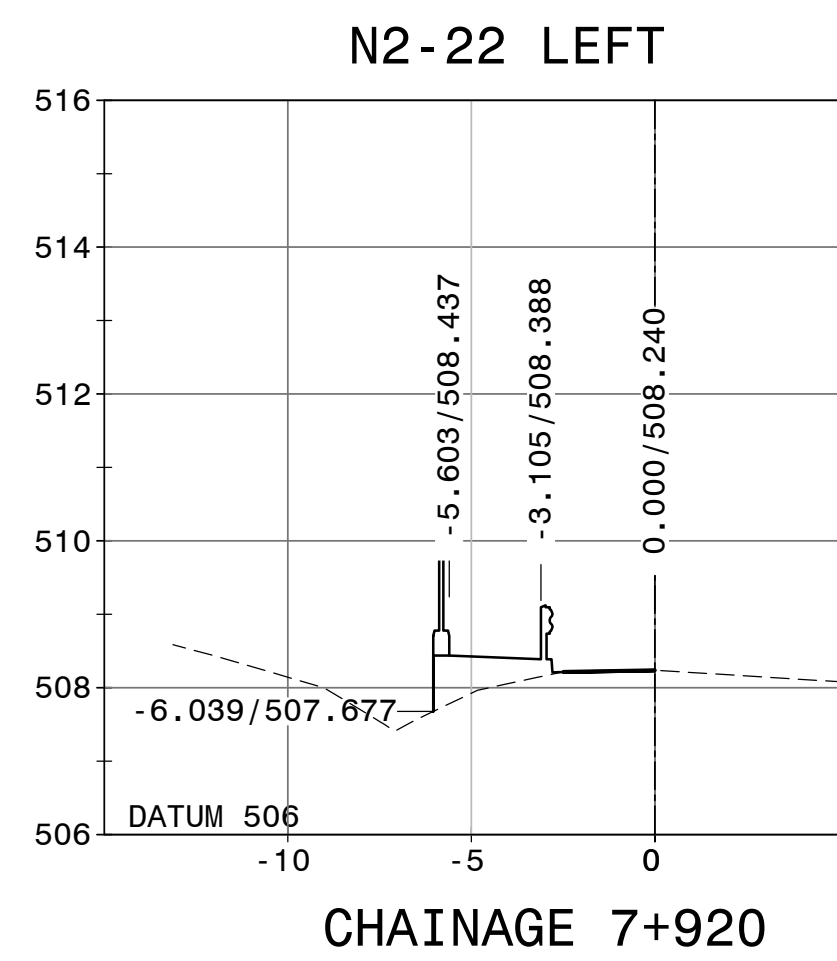
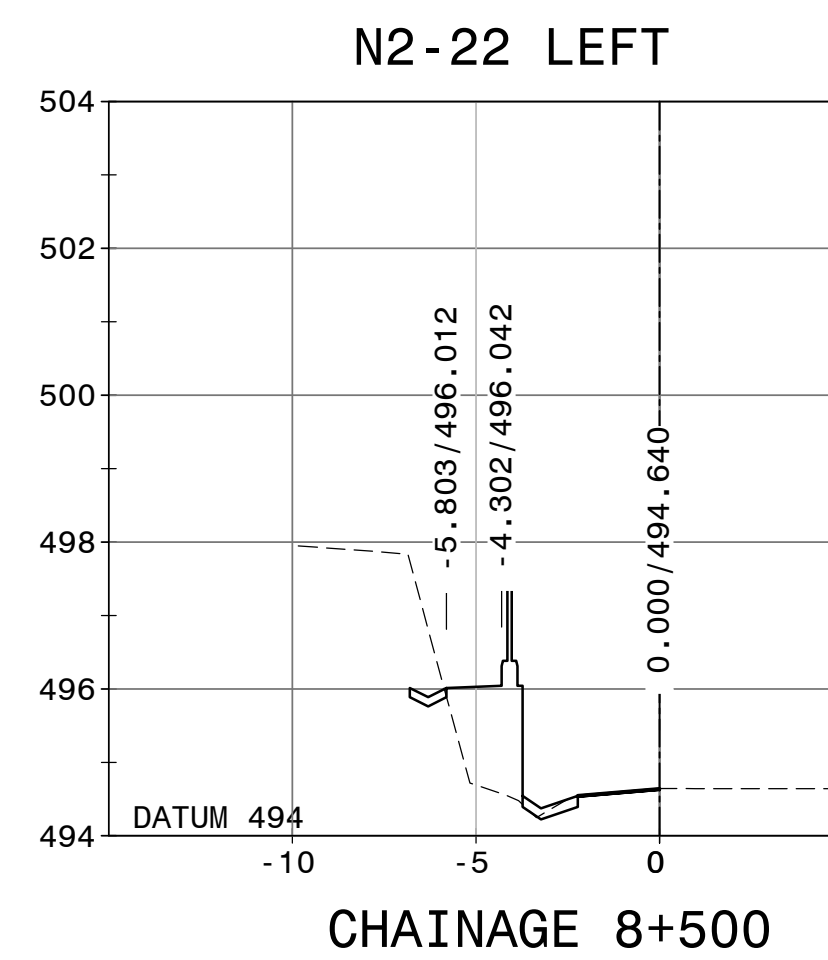
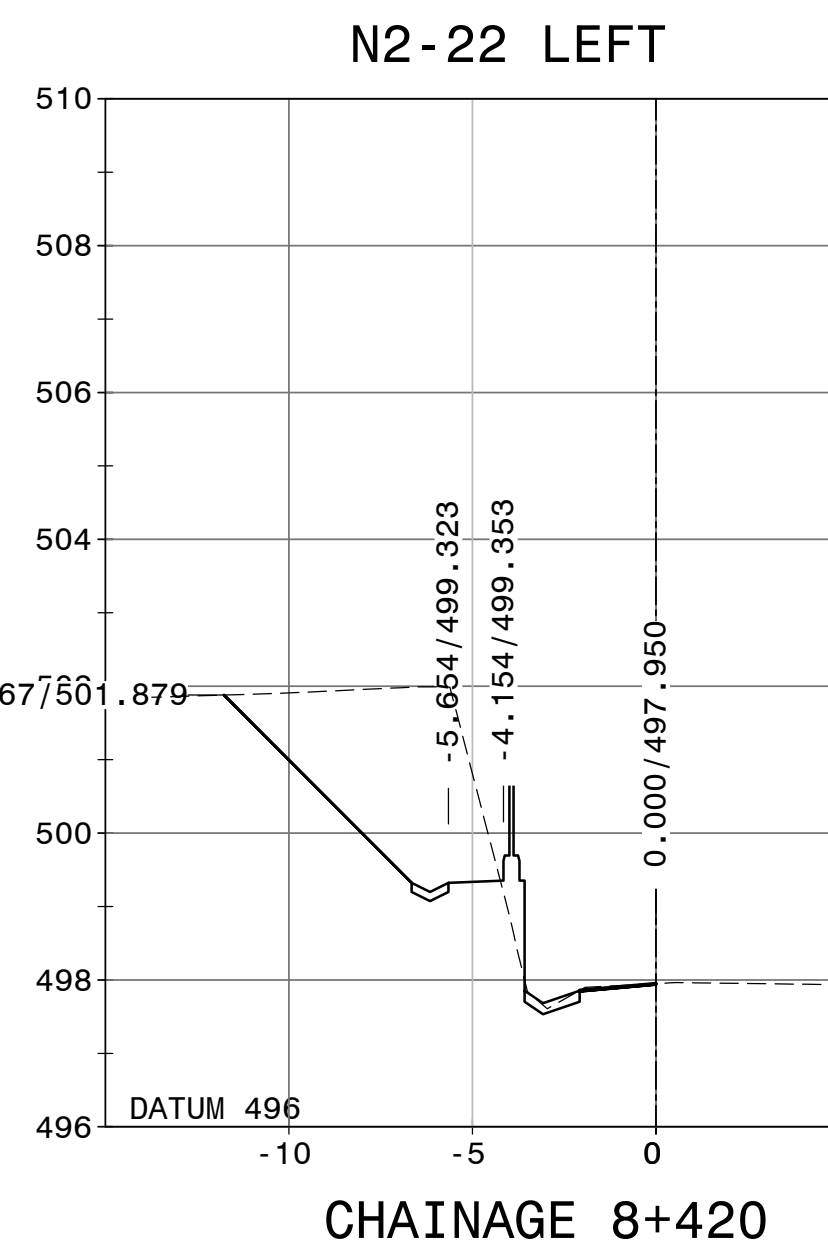
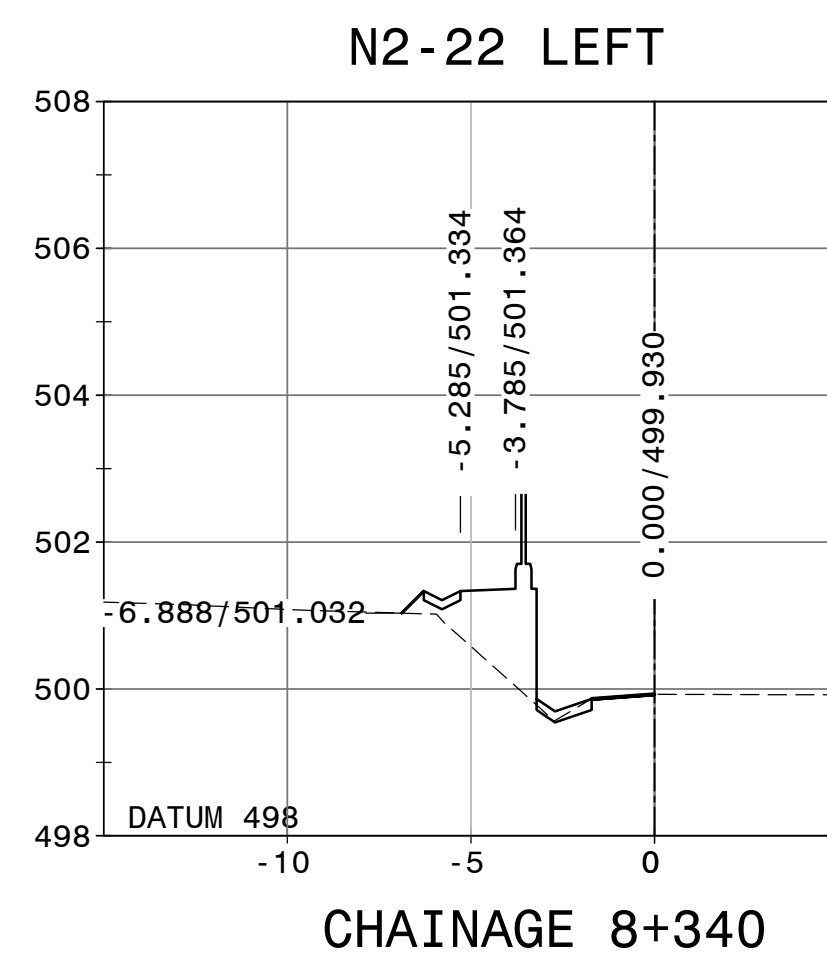
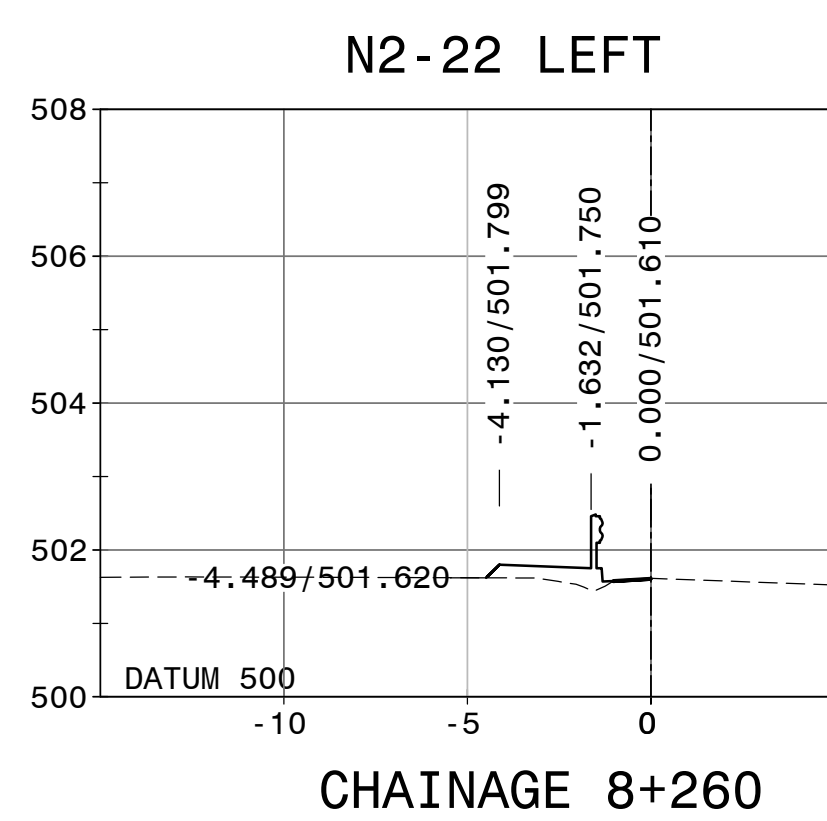
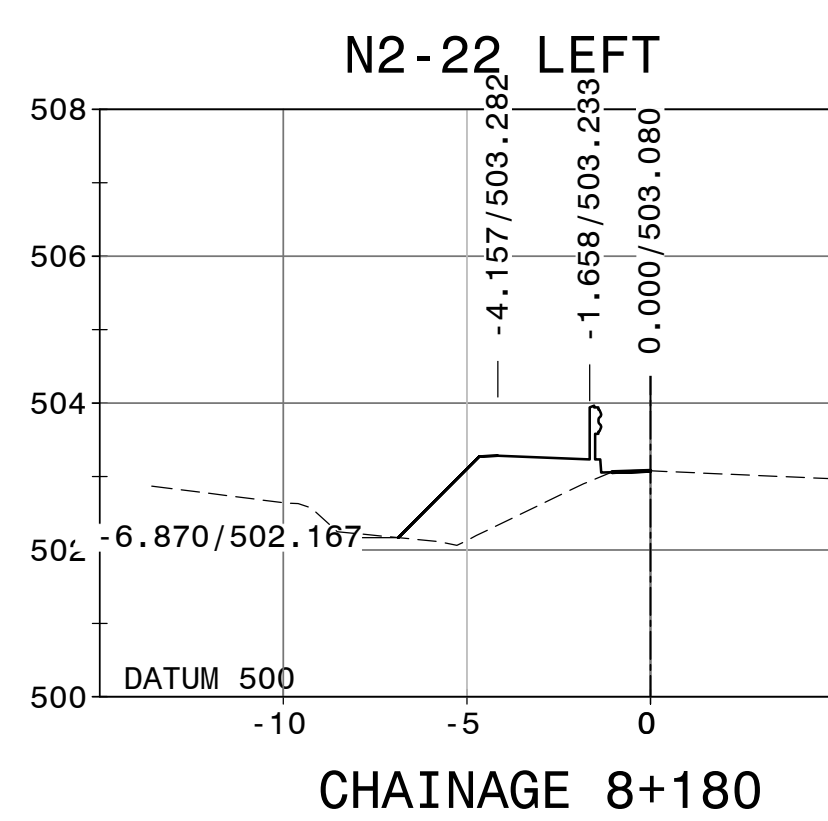
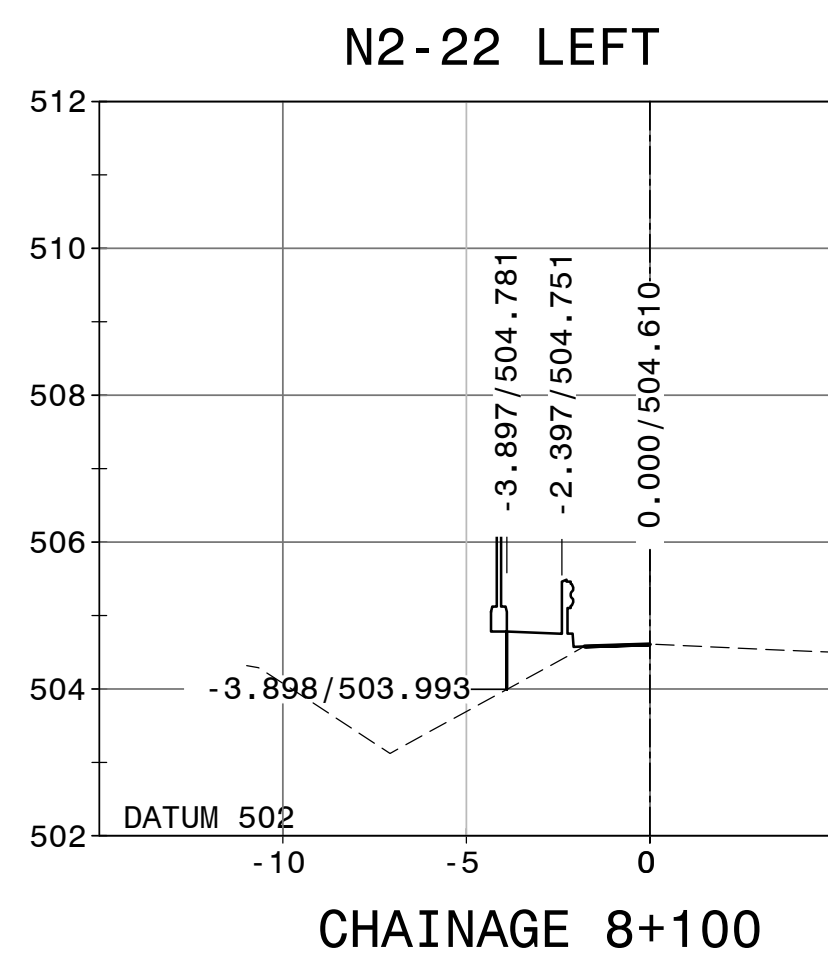
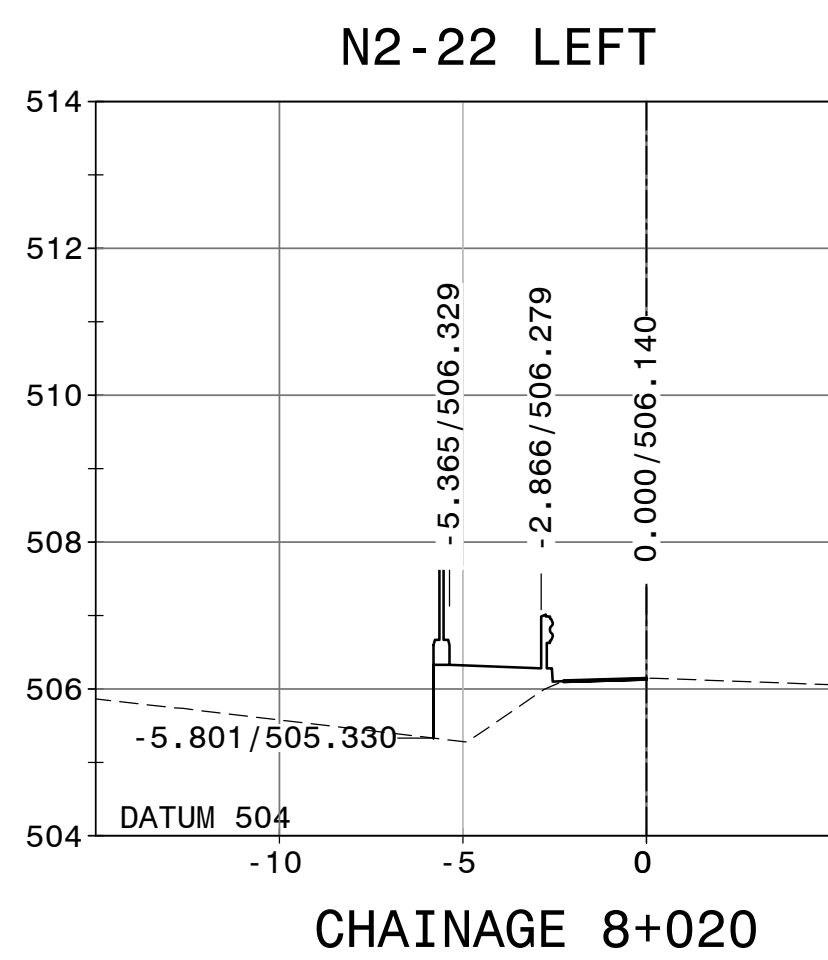
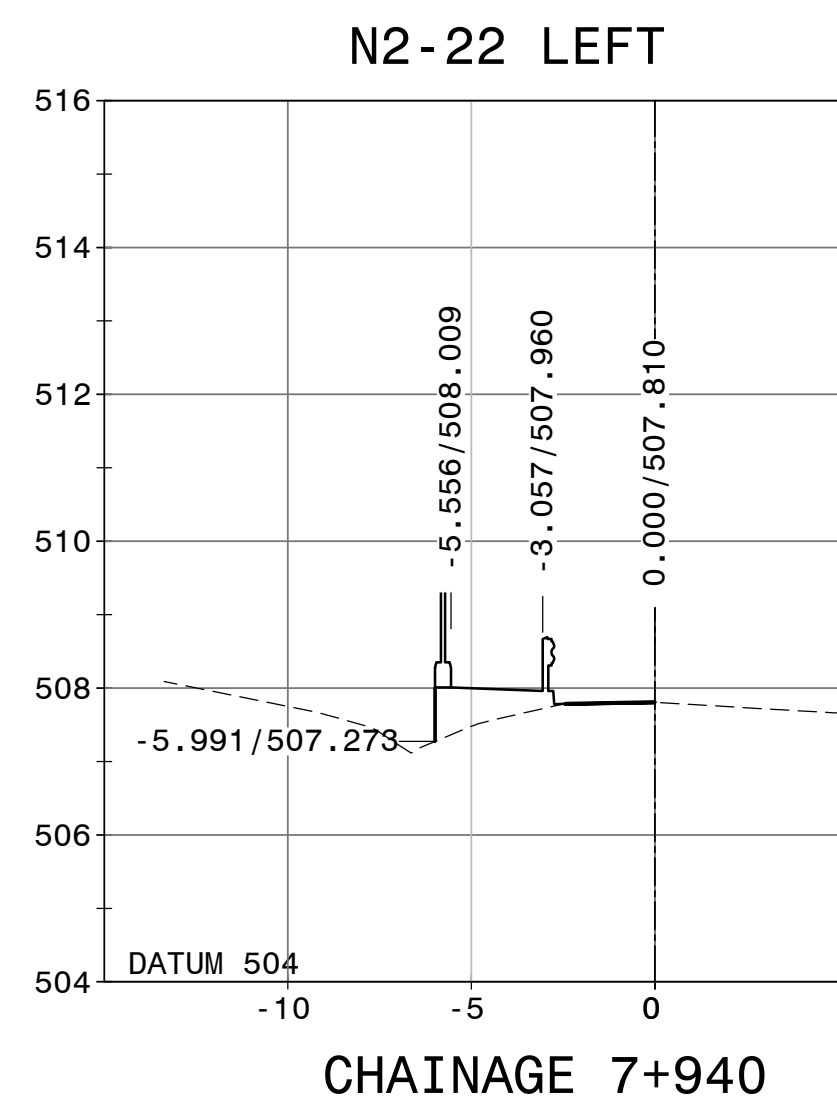
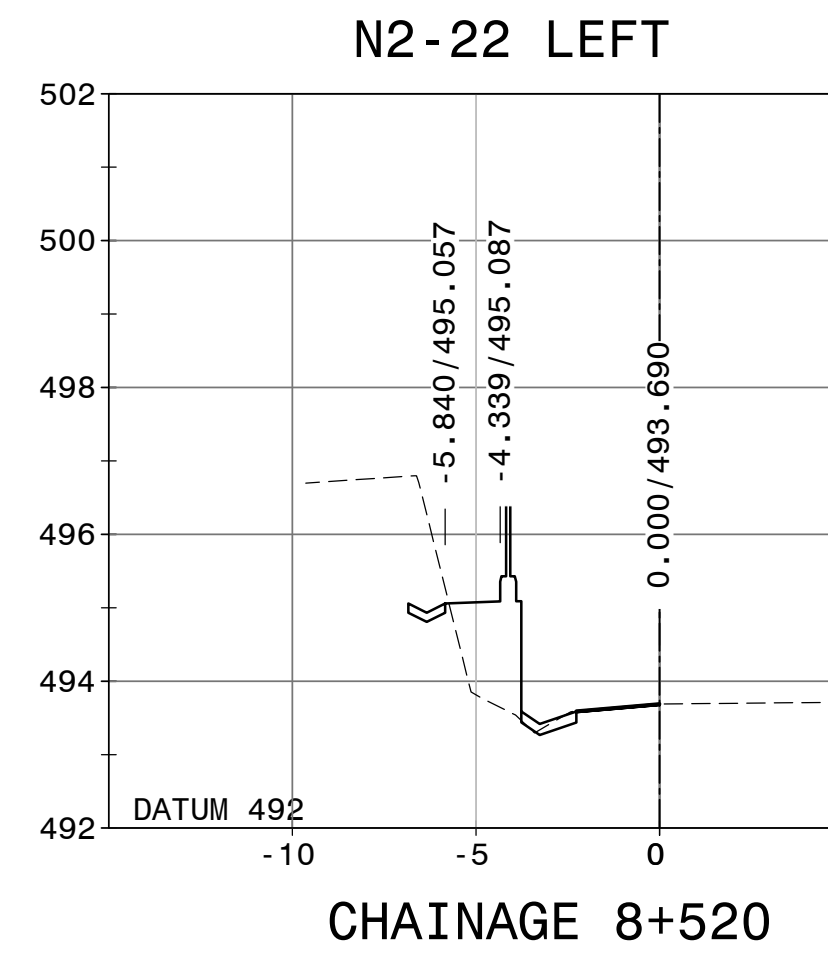
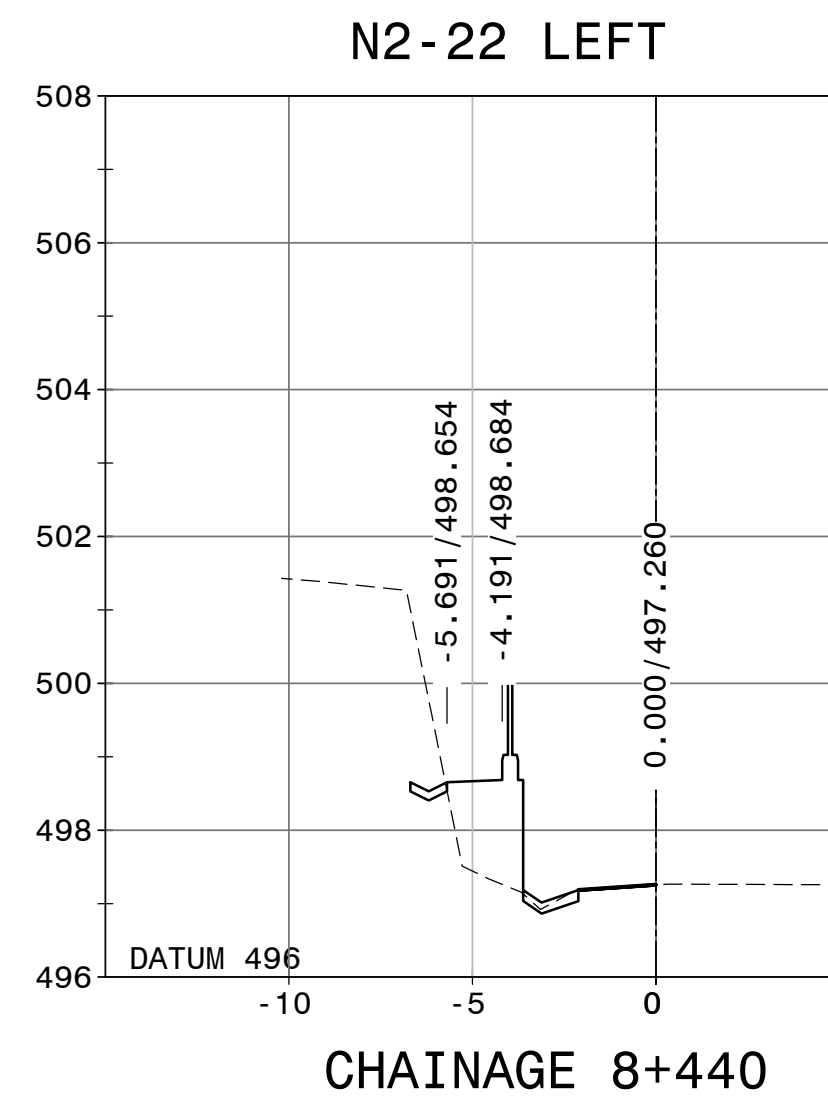
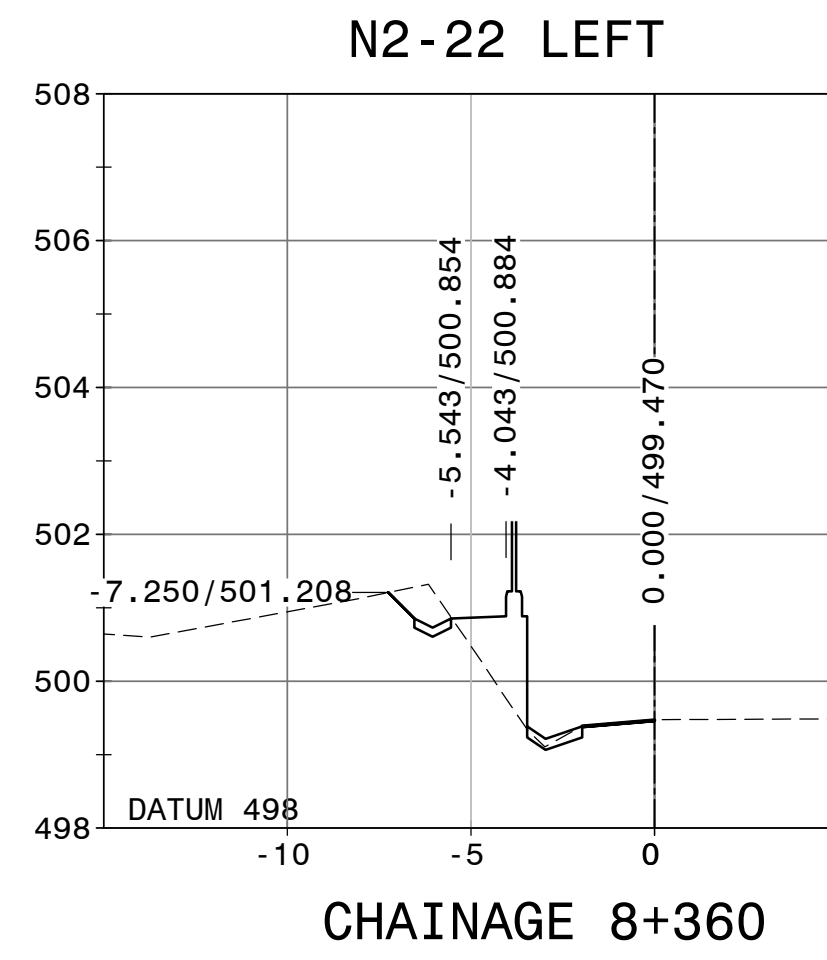
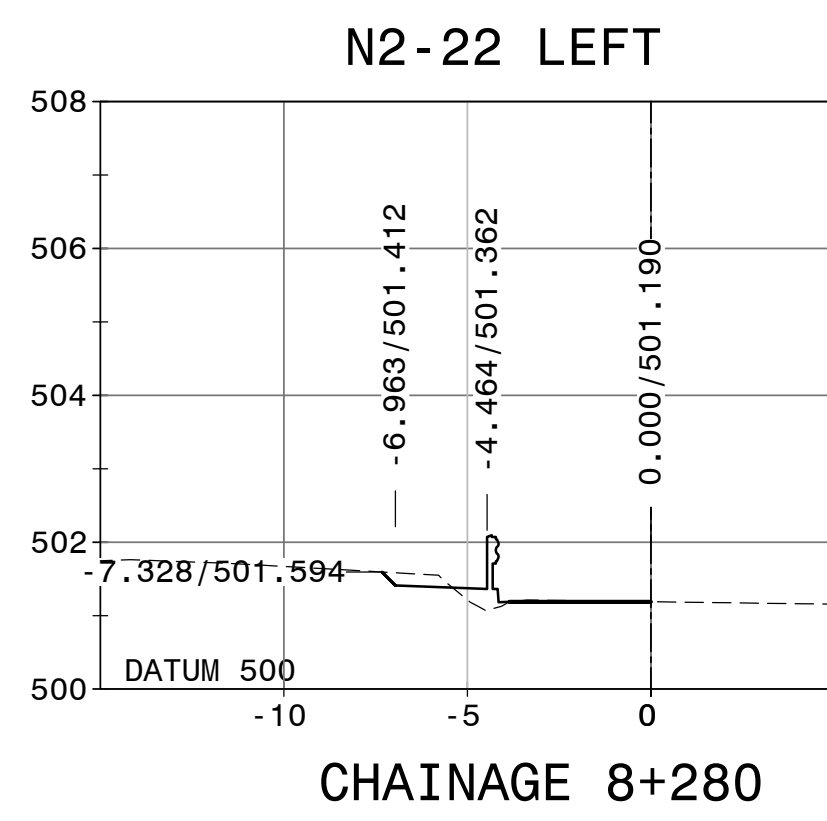
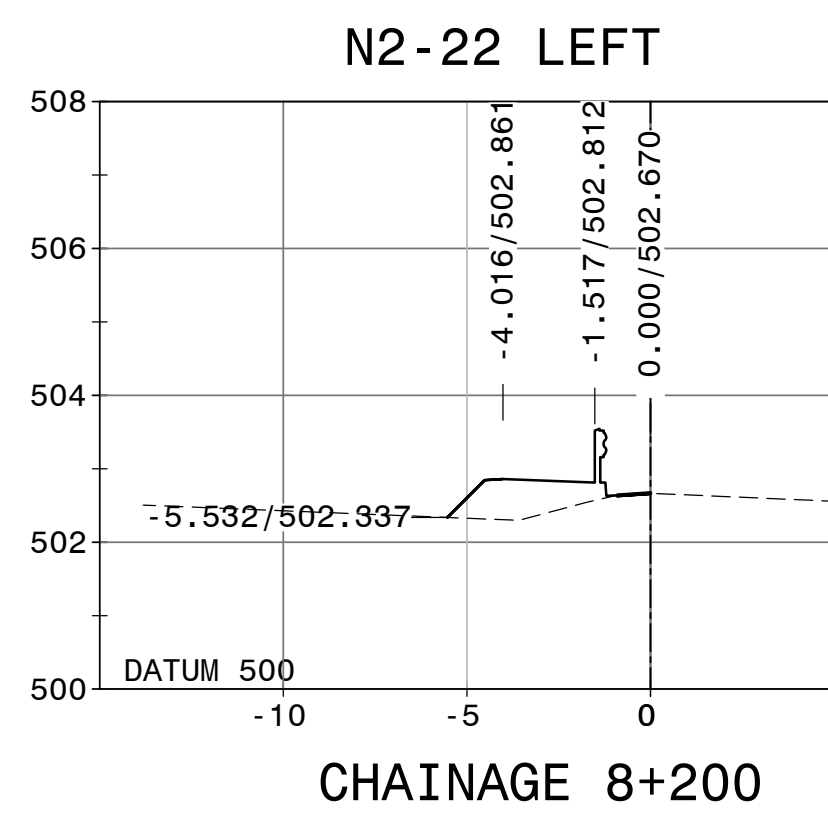
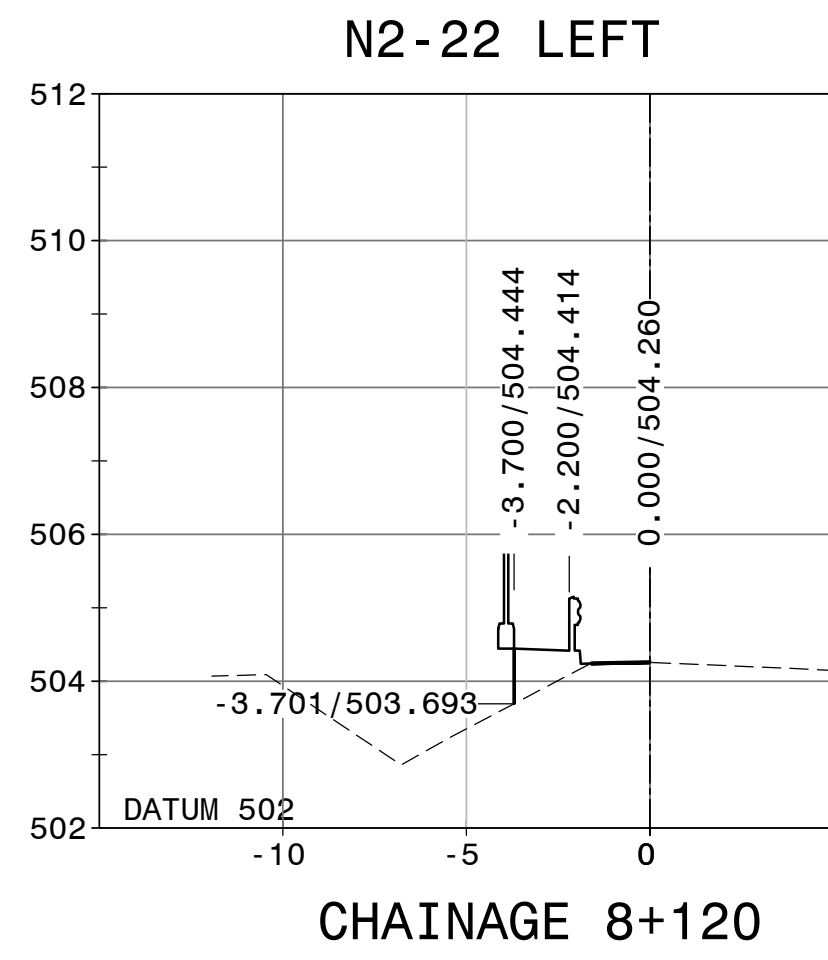
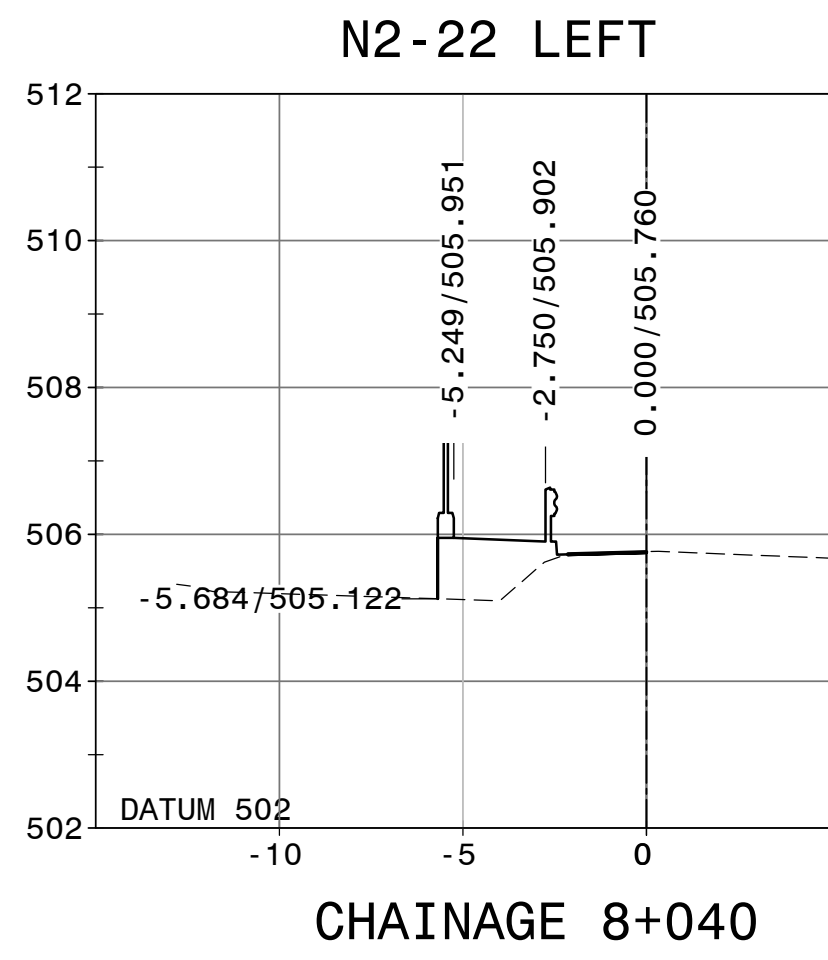
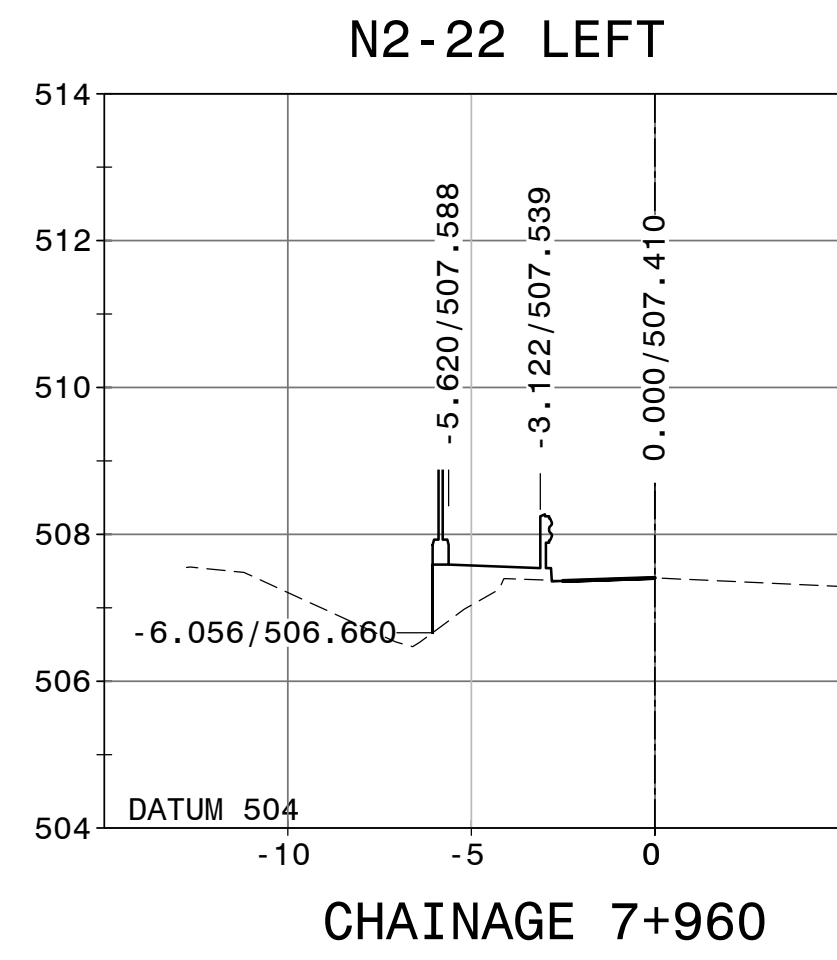
ACCEPTANCE
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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)

DRAWING DESCRIPTION
DETAIL CROSS SECTIONS
N2-22 LEFT

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
DRAWING/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-20-002A	
SANRAL DOCUMENT #		V1	

DRAWING
TP1802-19-05-25-20-002A



FOR TENDER PURPOSES

			CONSTRUCTION RECORD		
			WORKS CONTRACT ENGINEER		
			Name :		
			Prof. Reg. No. :		
			Date :		
			SANRAL PROJECT MANAGER		
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD		
			CONSULT. ENG.		
			Name :		
			Prof. Reg. No. :		
			Date :		

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000



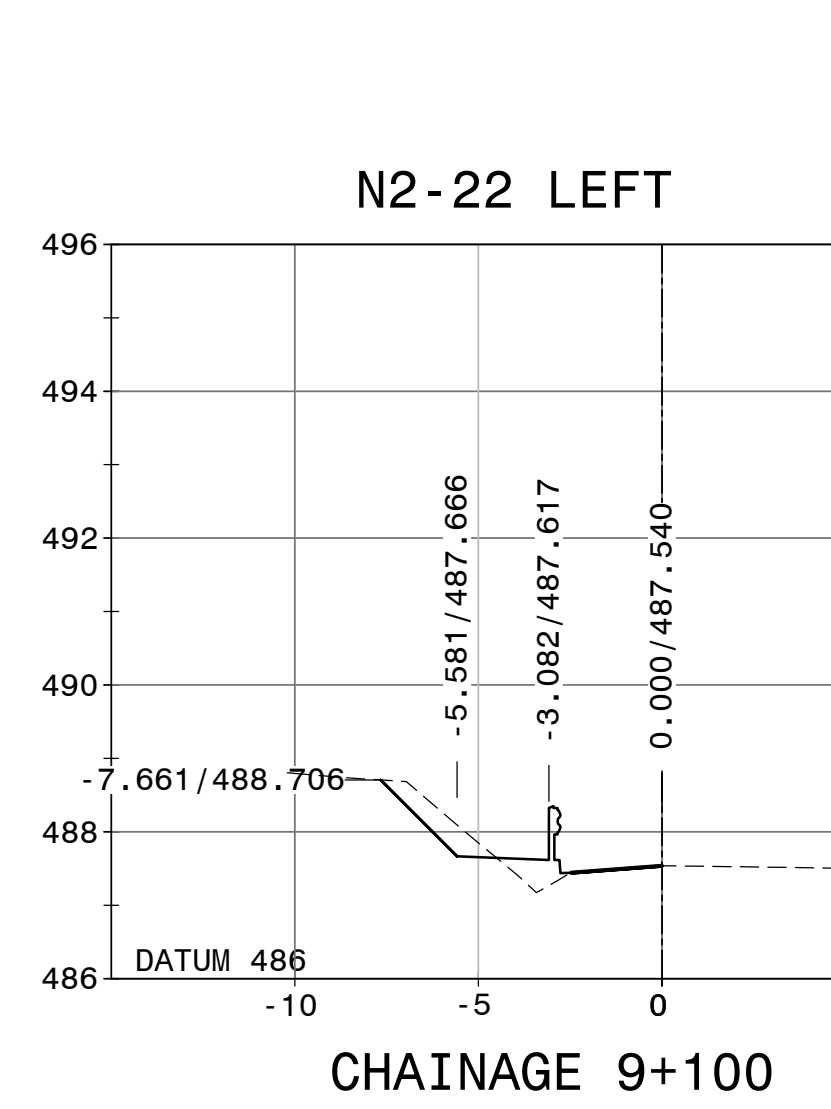
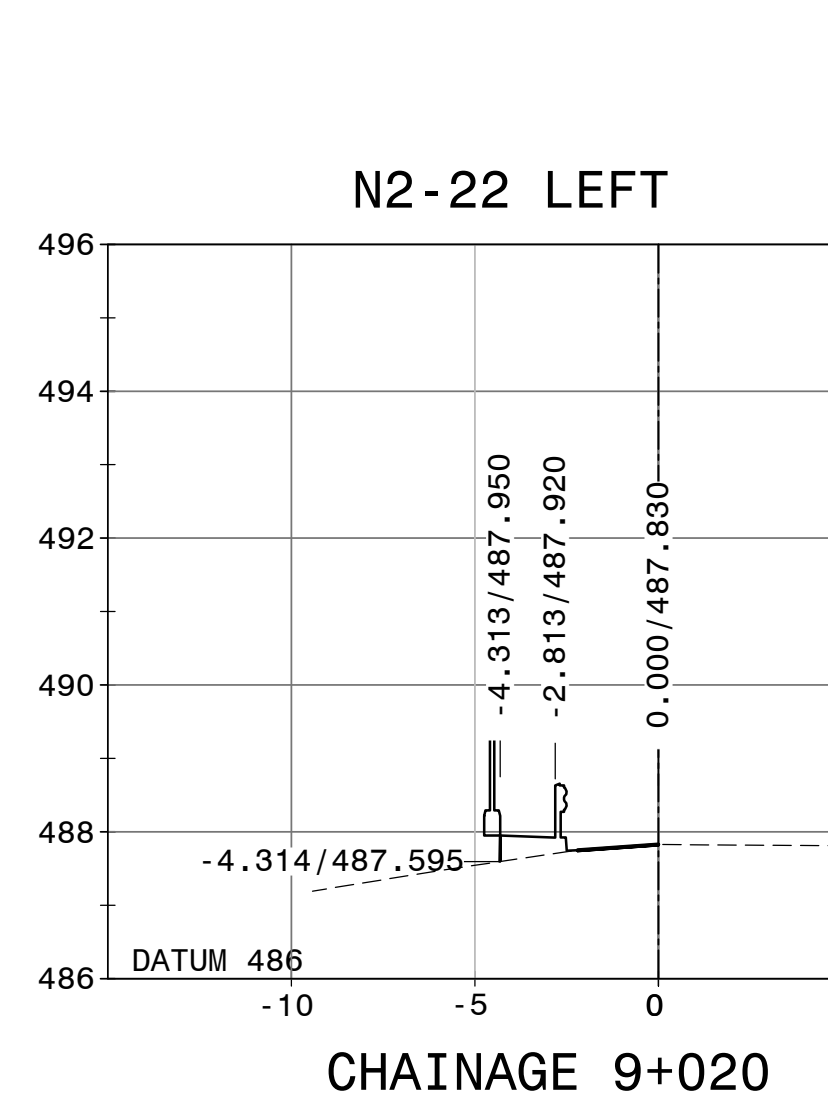
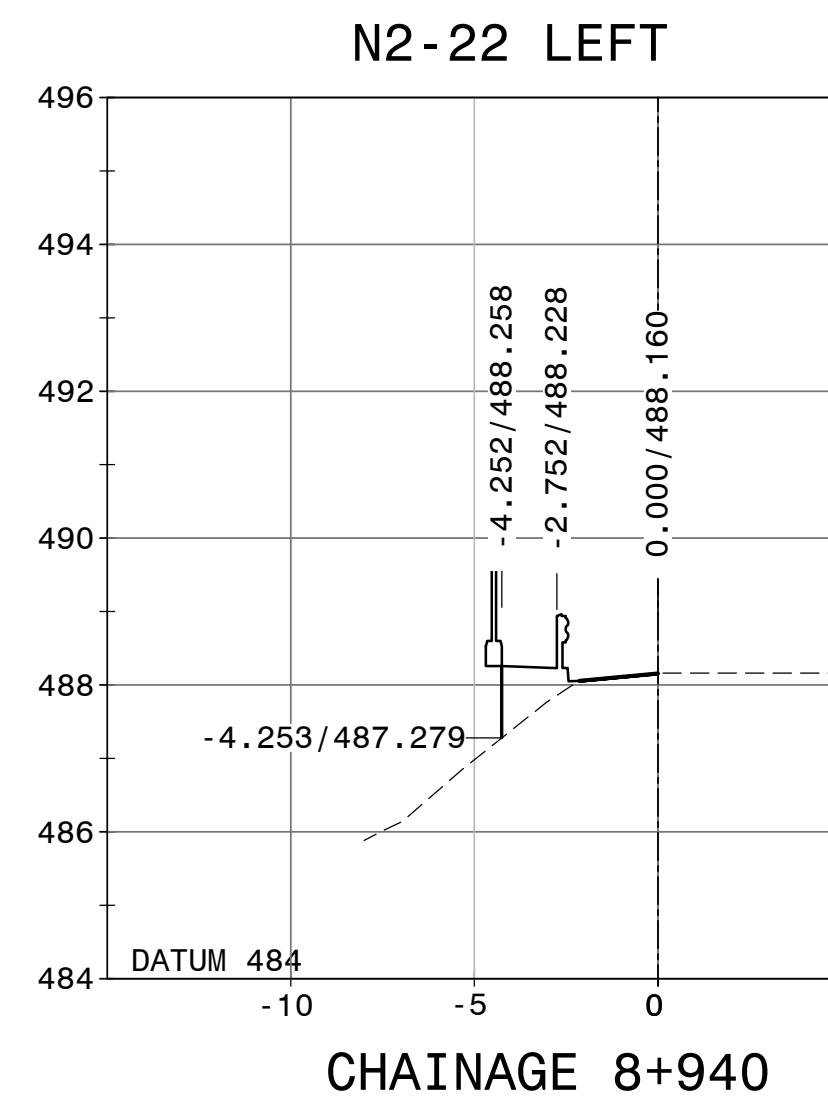
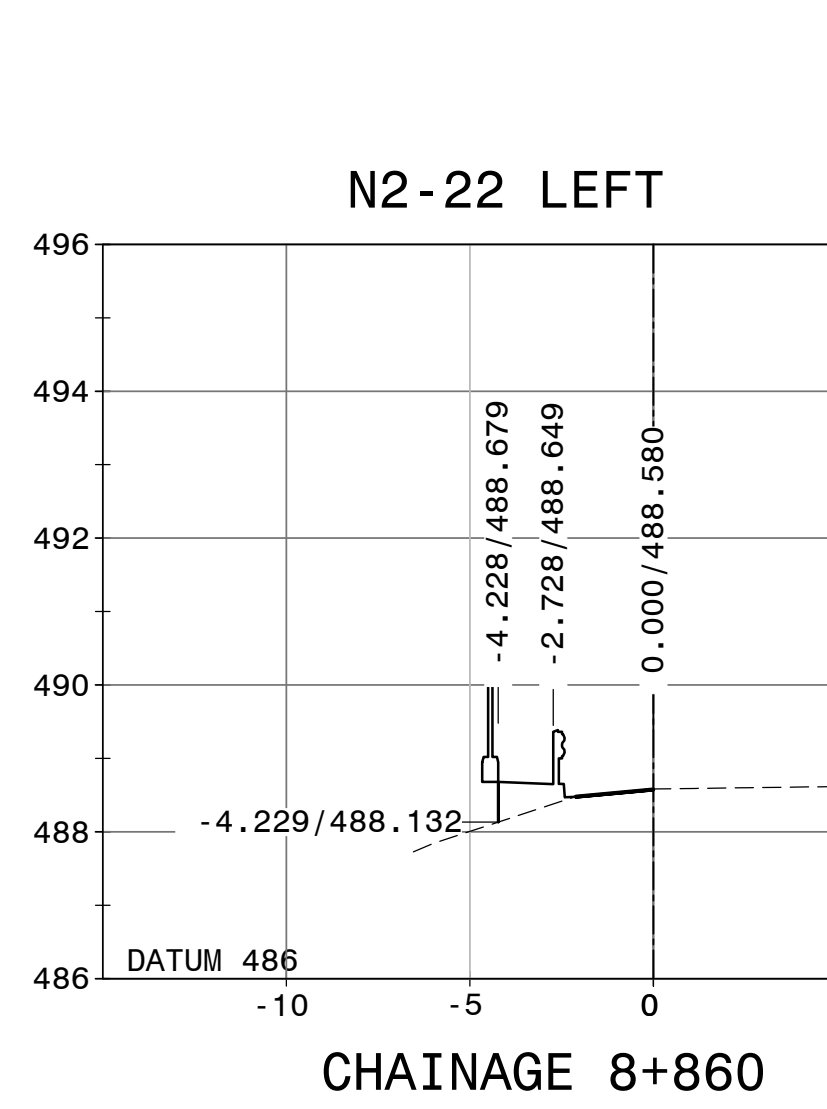
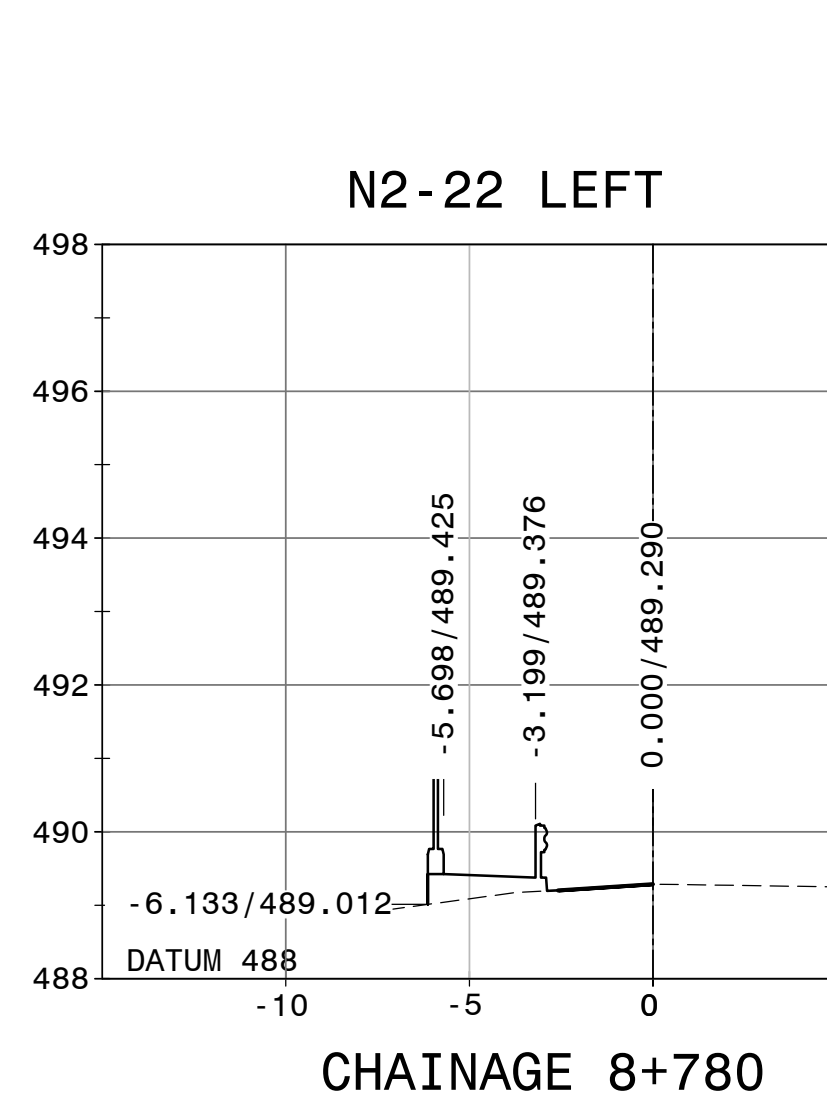
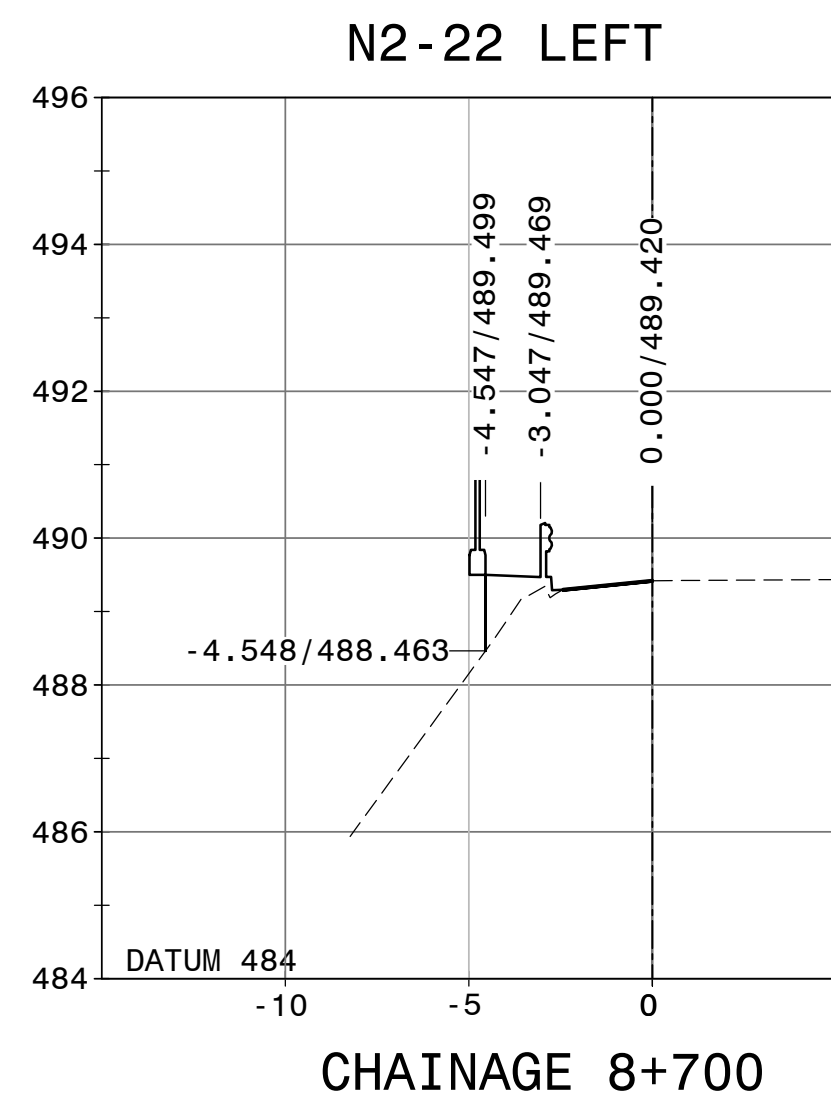
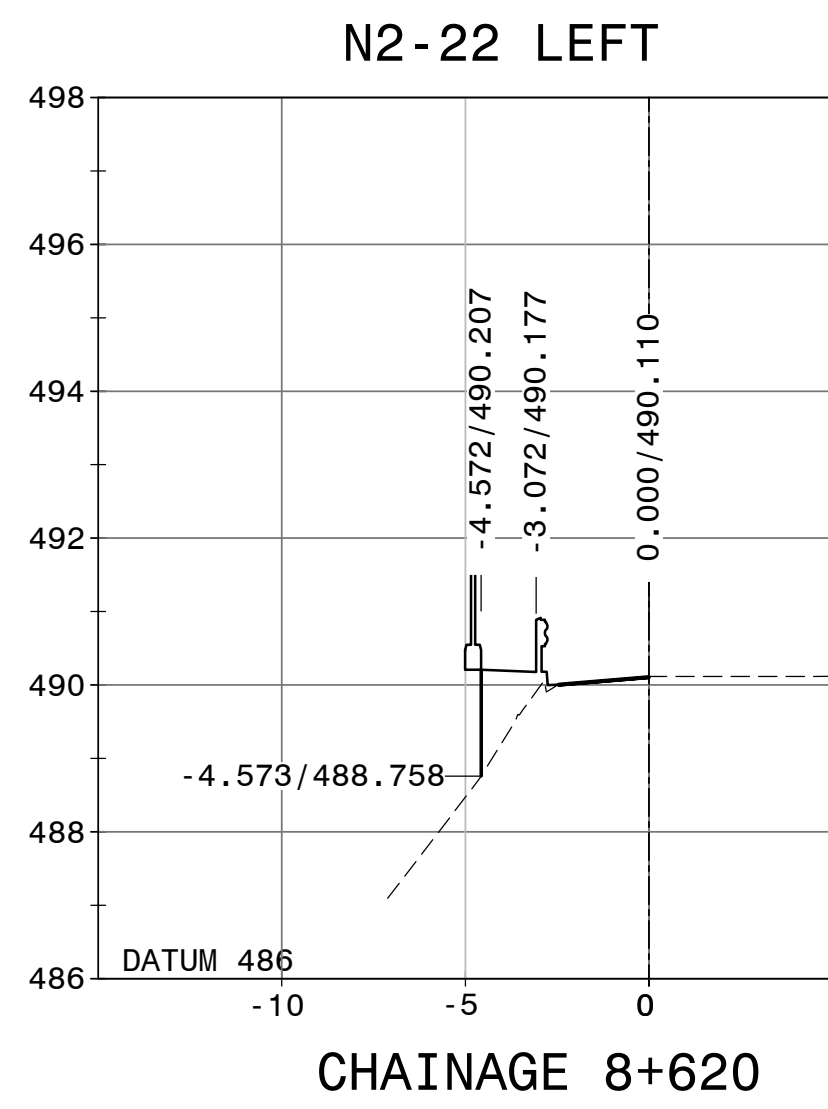
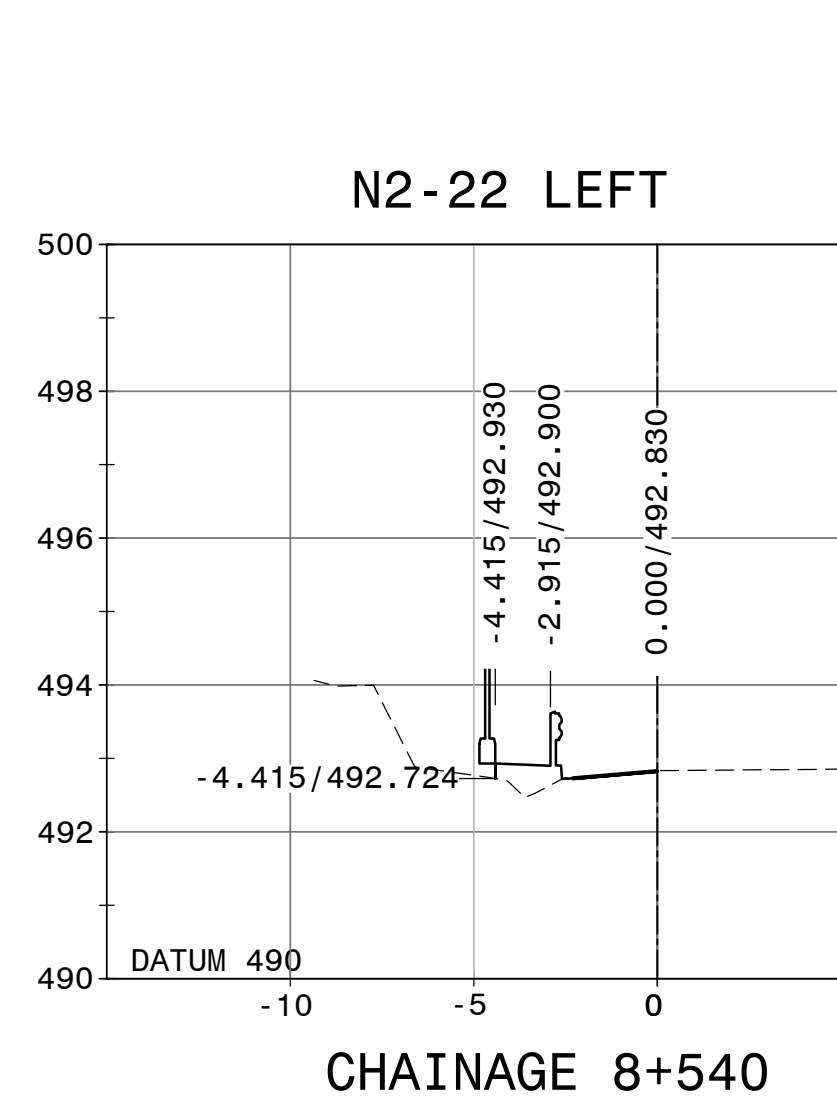
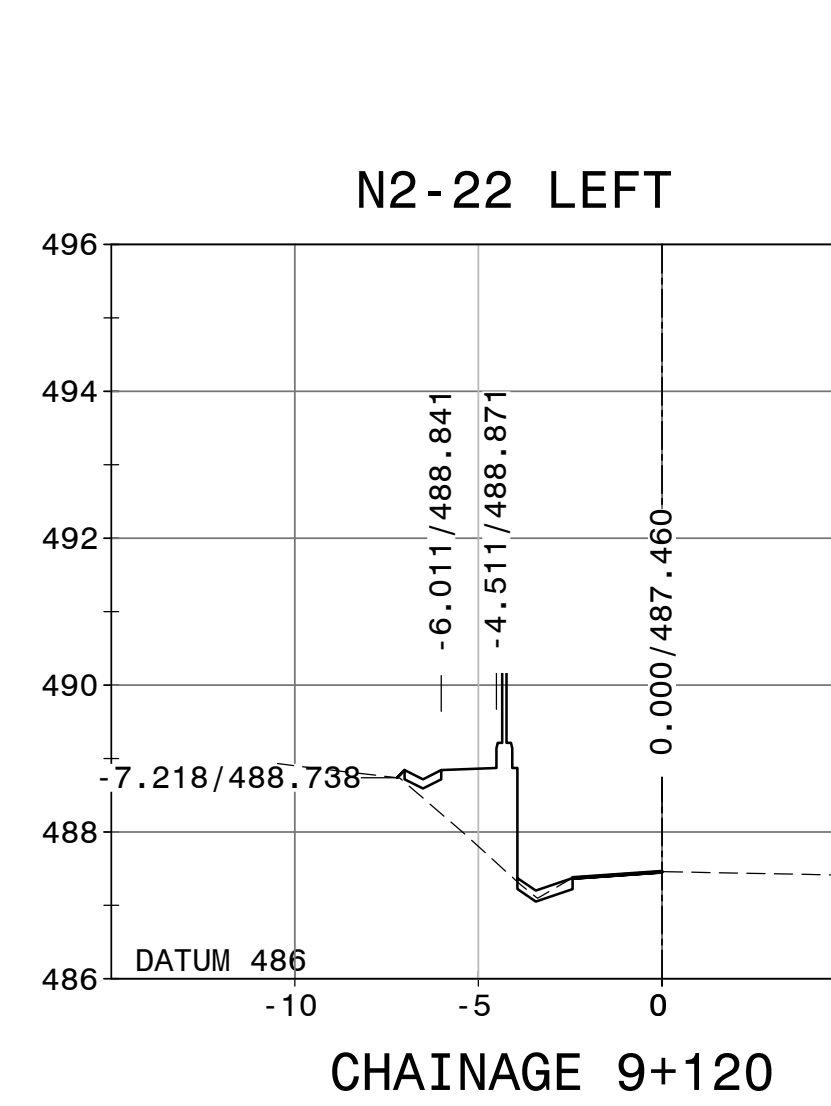
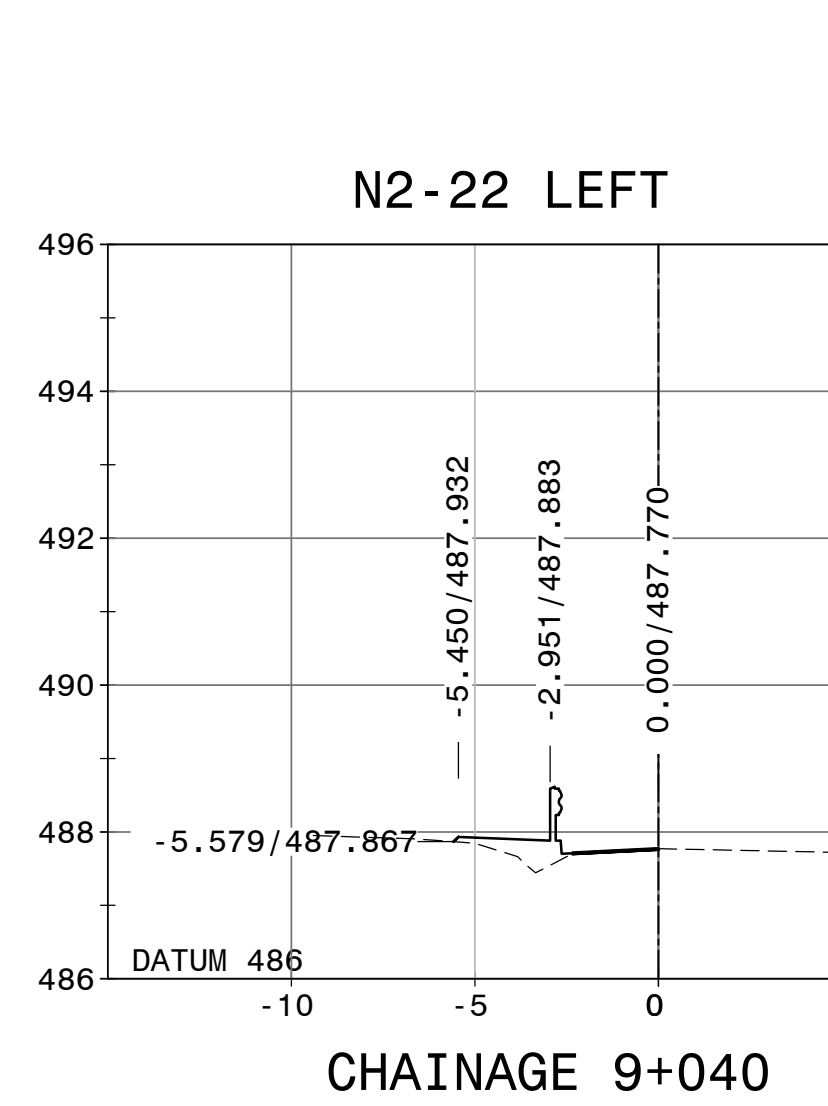
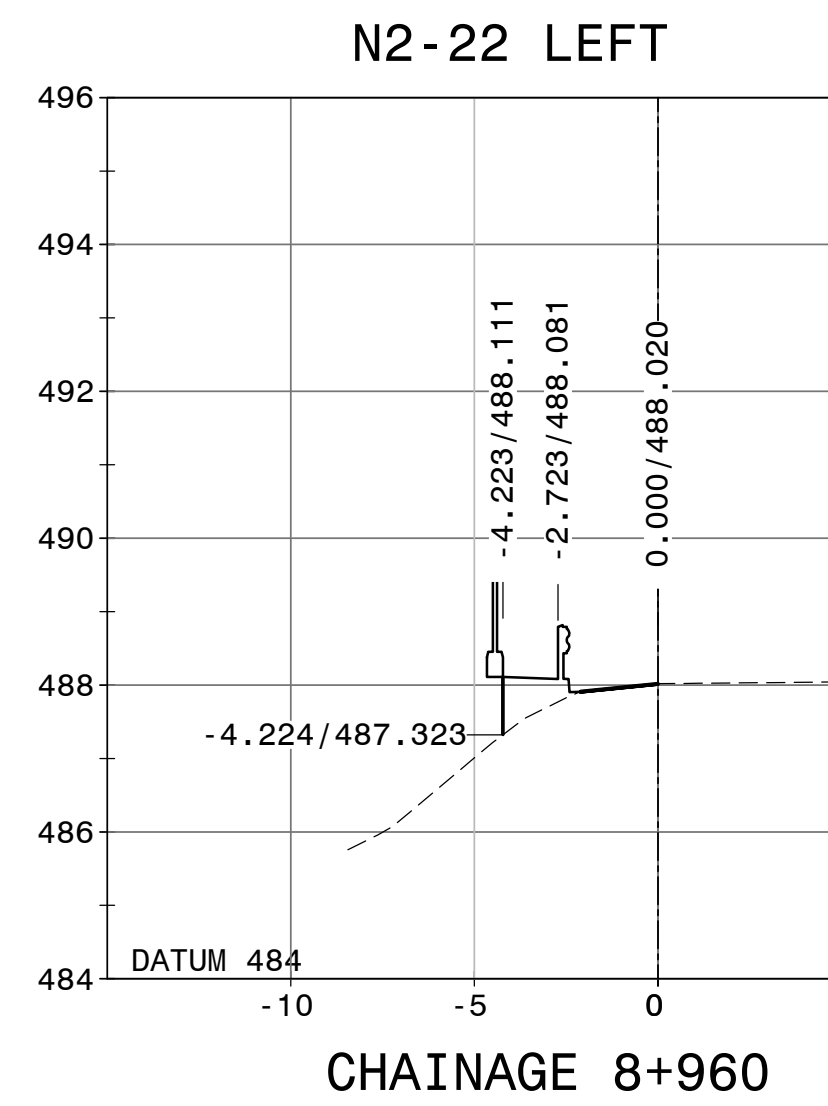
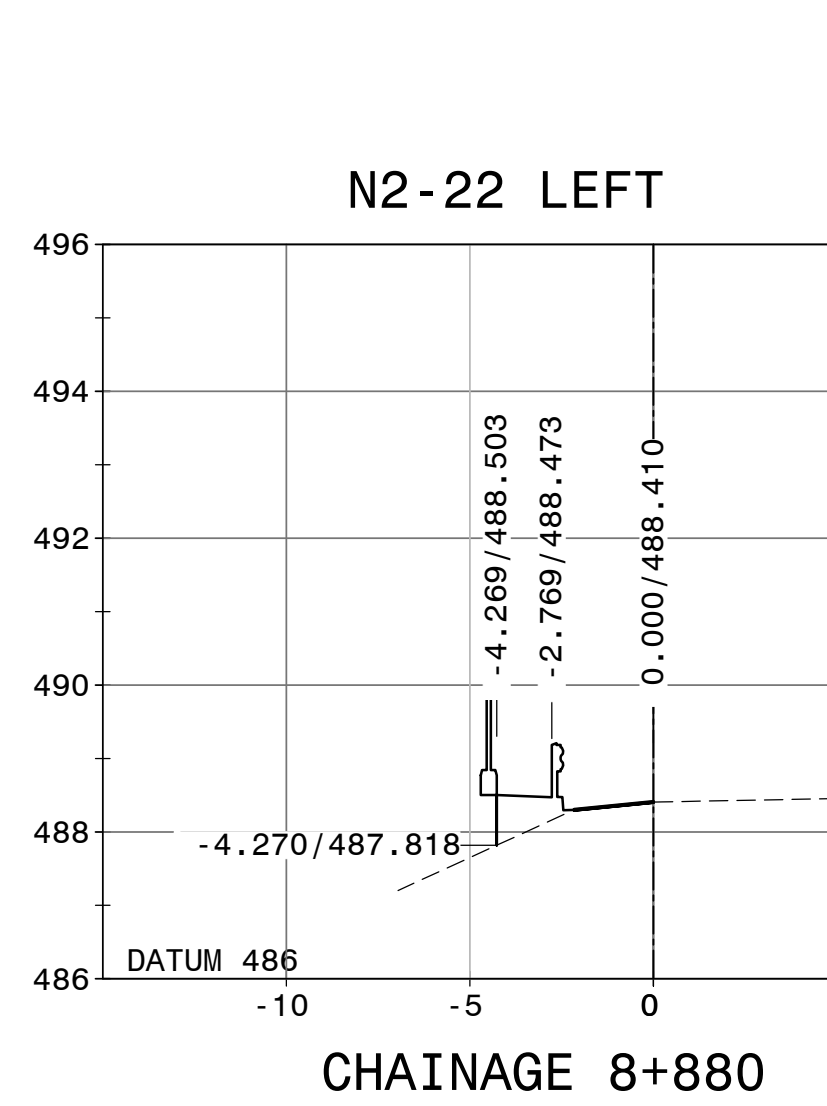
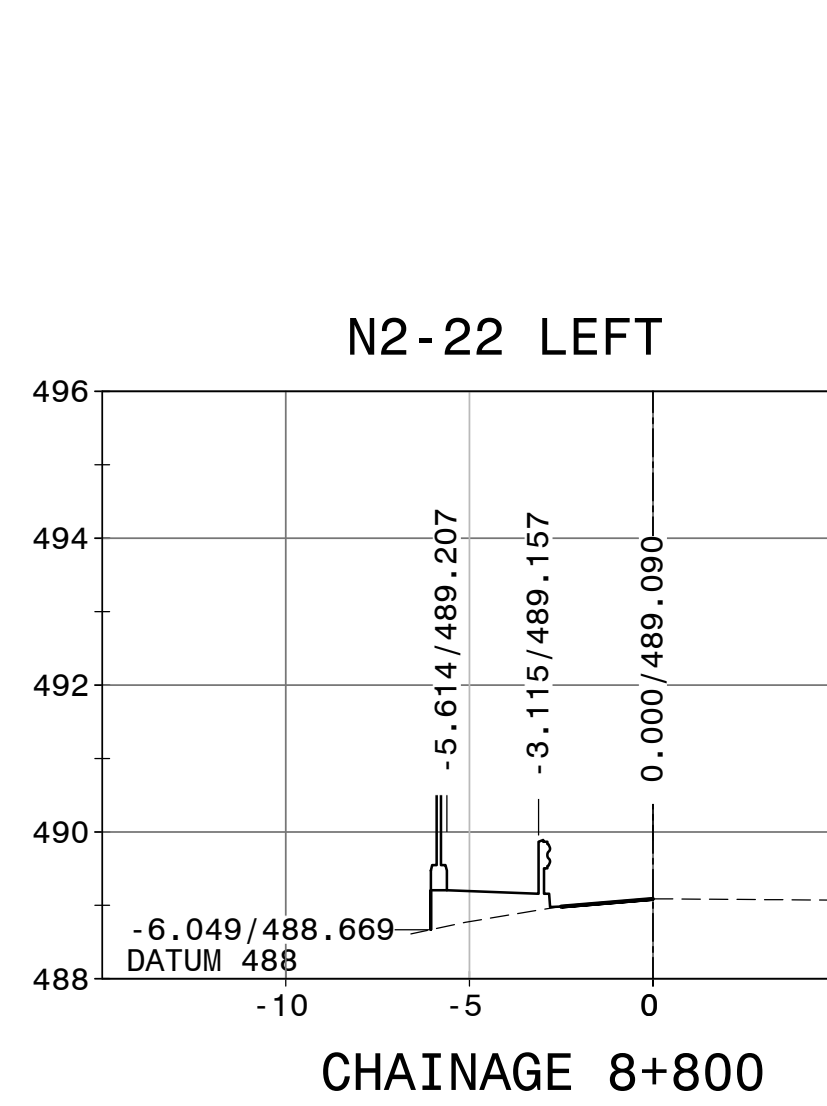
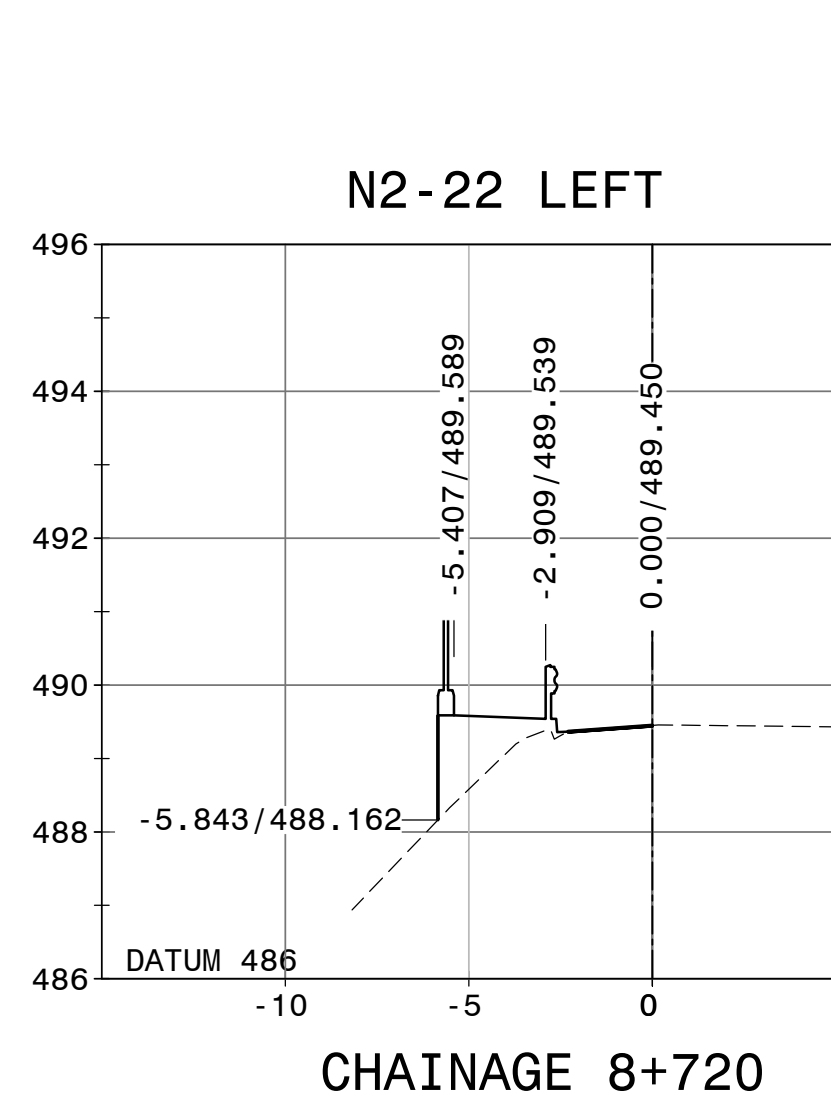
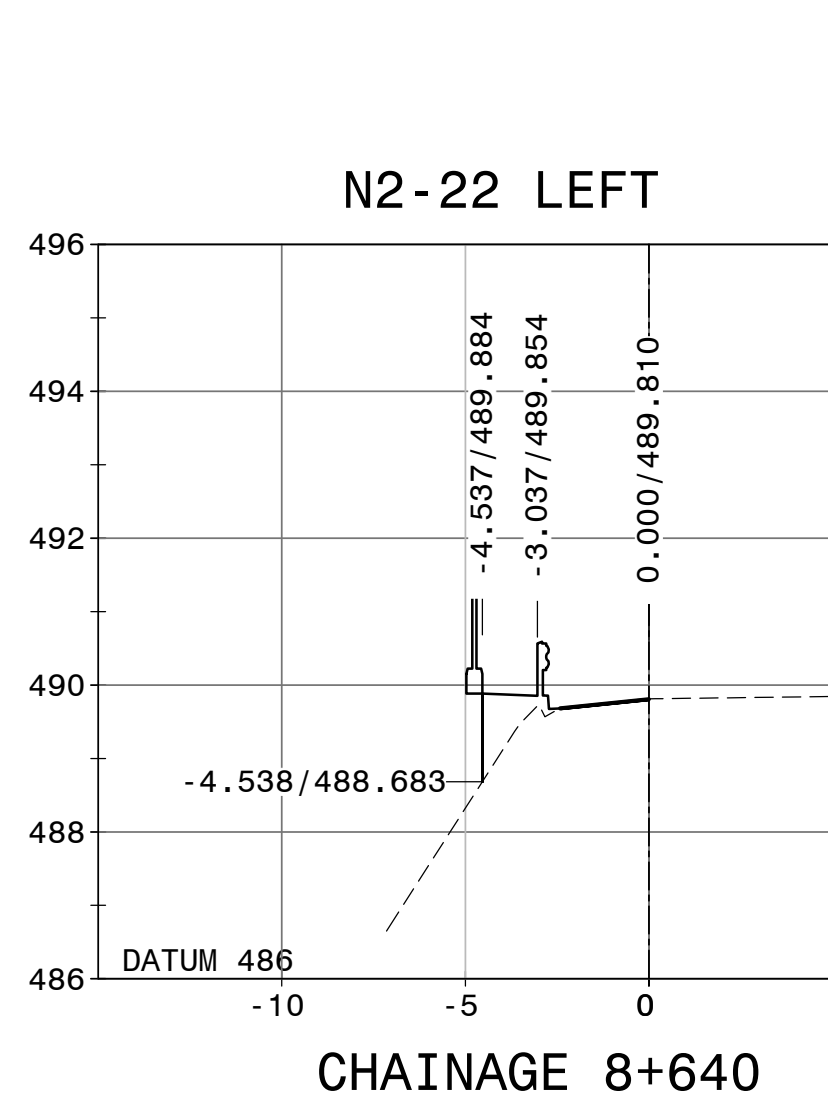
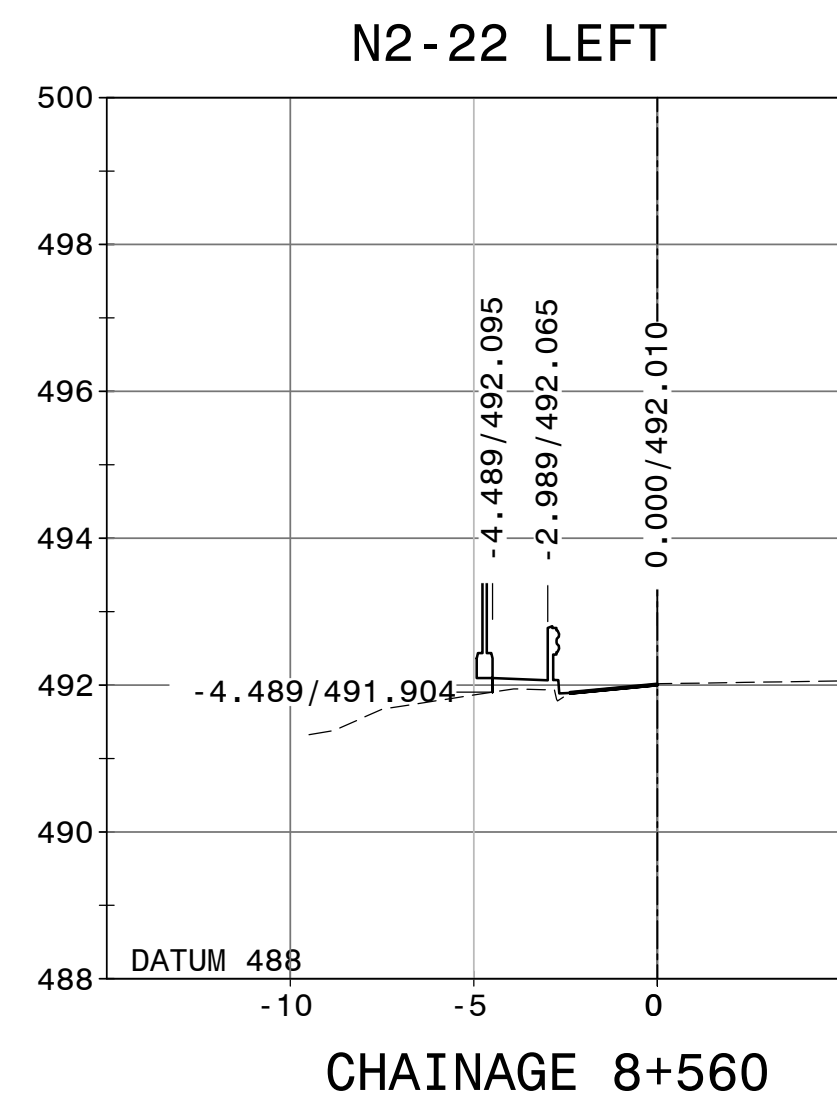
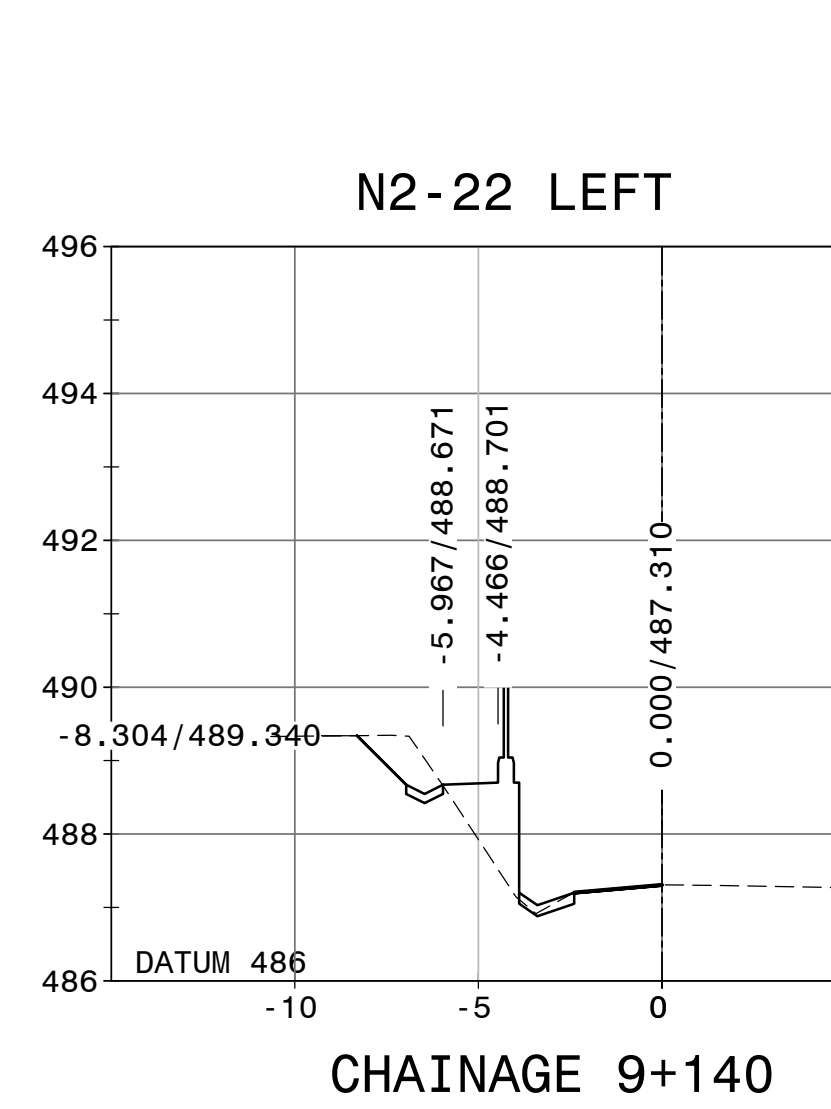
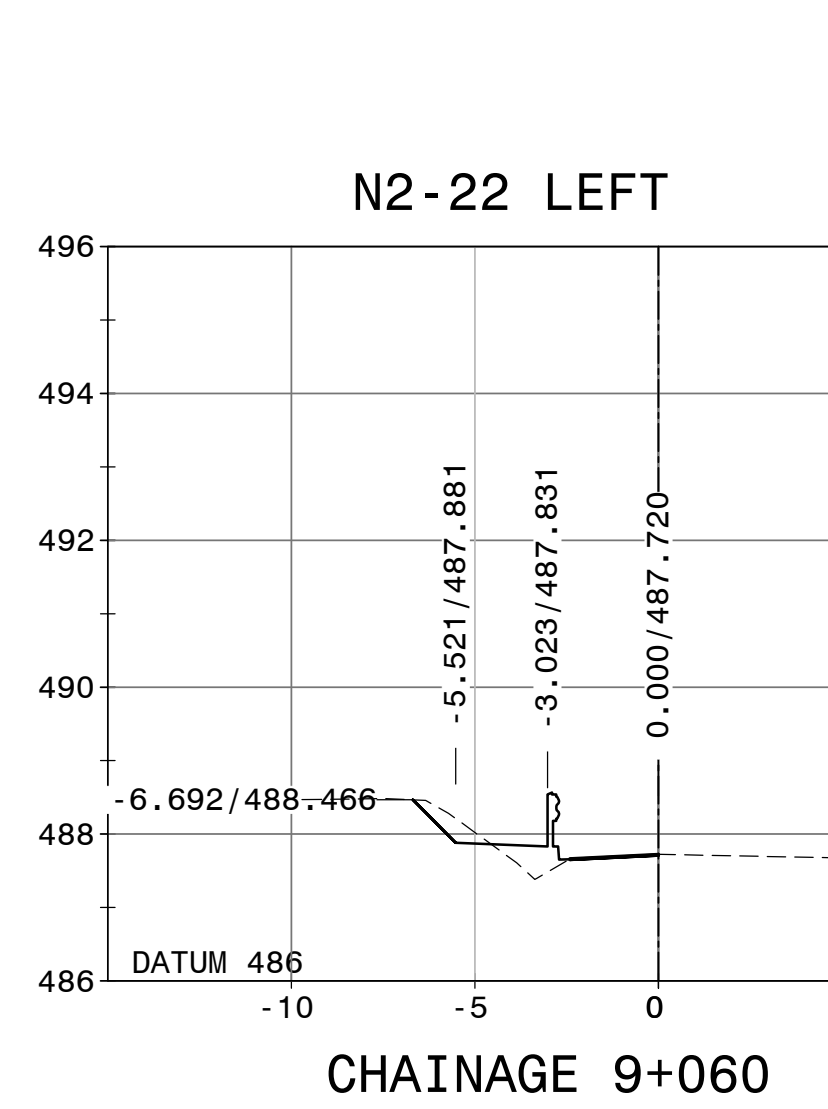
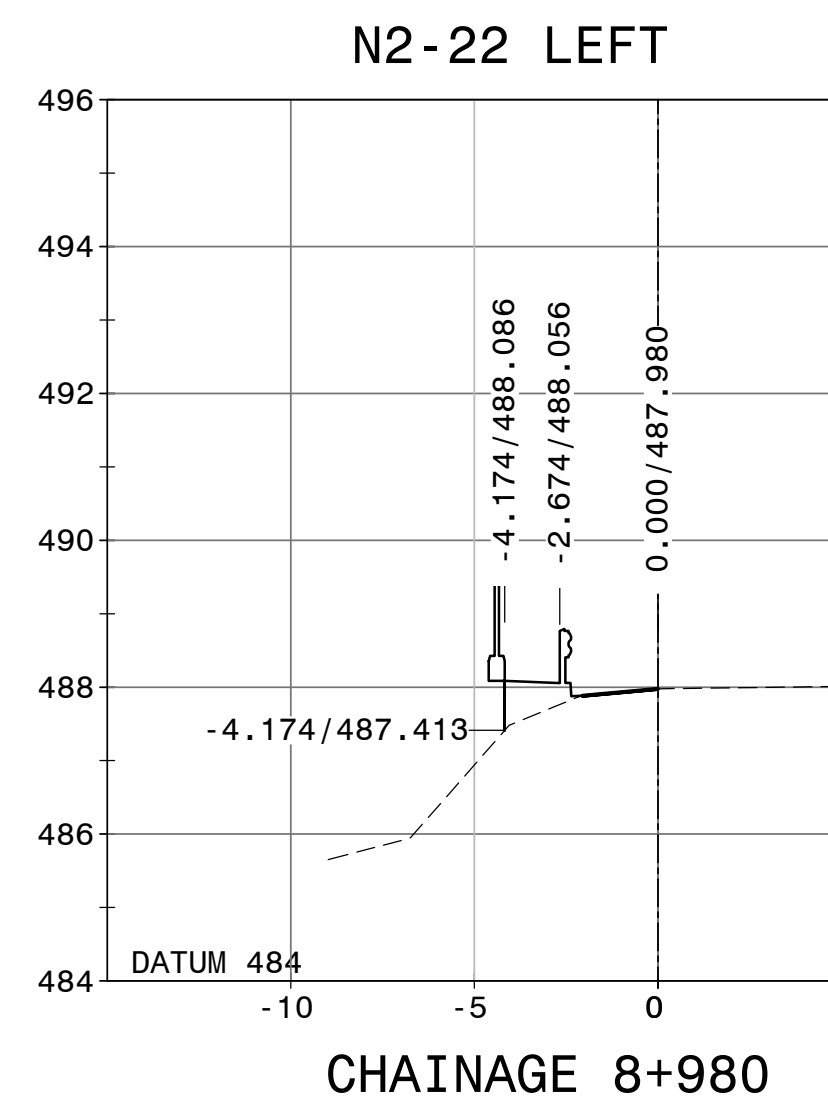
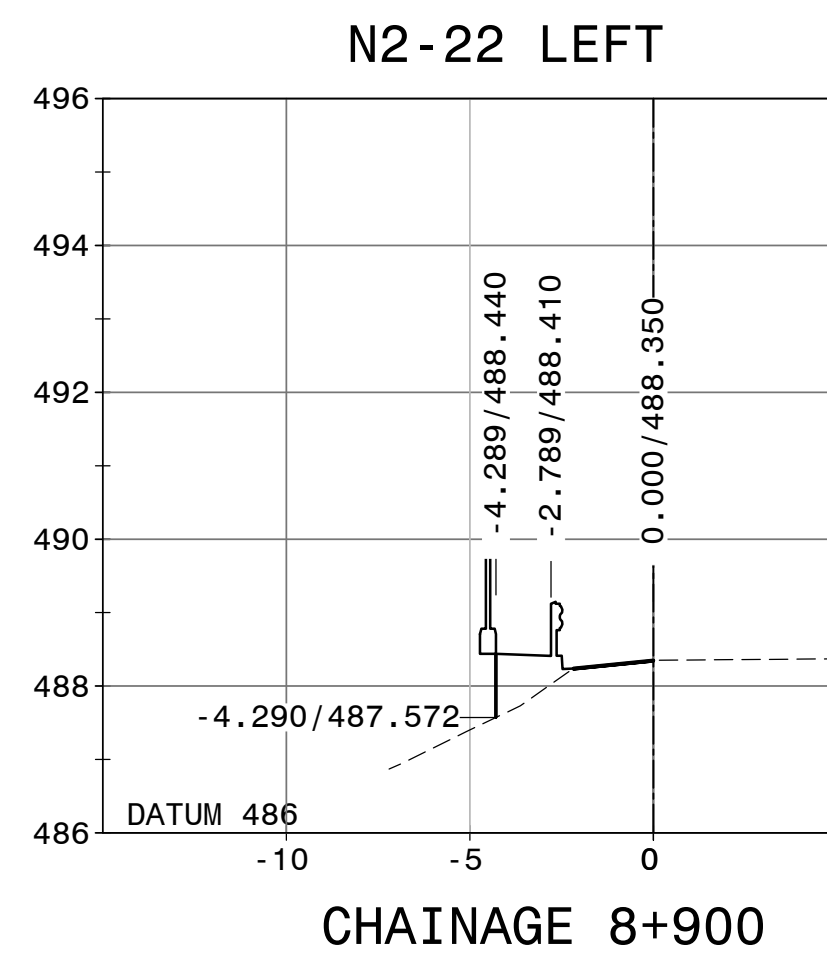
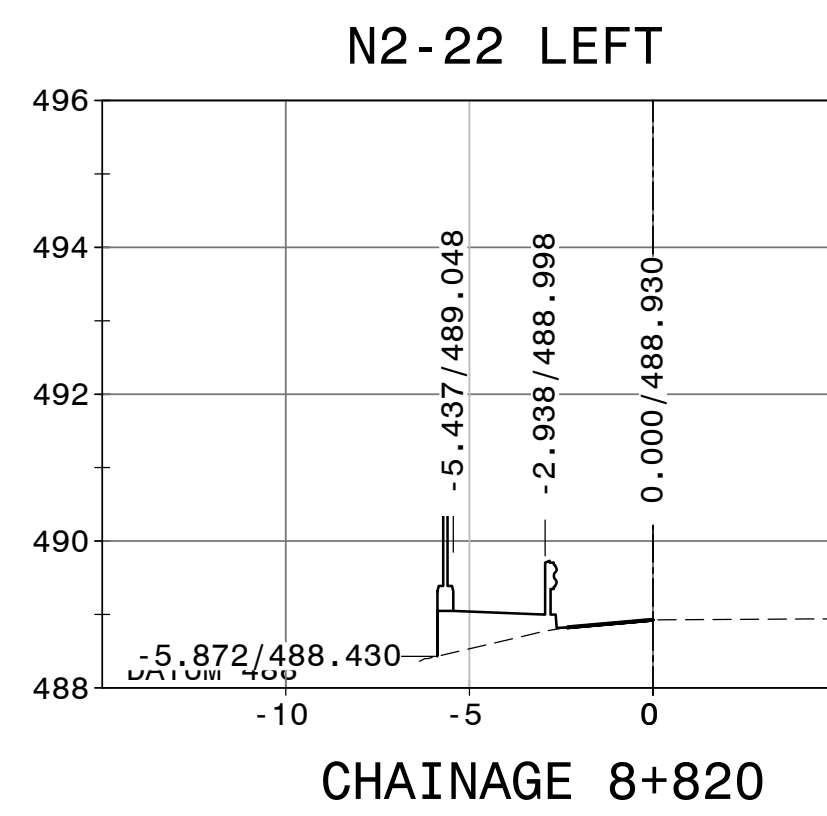
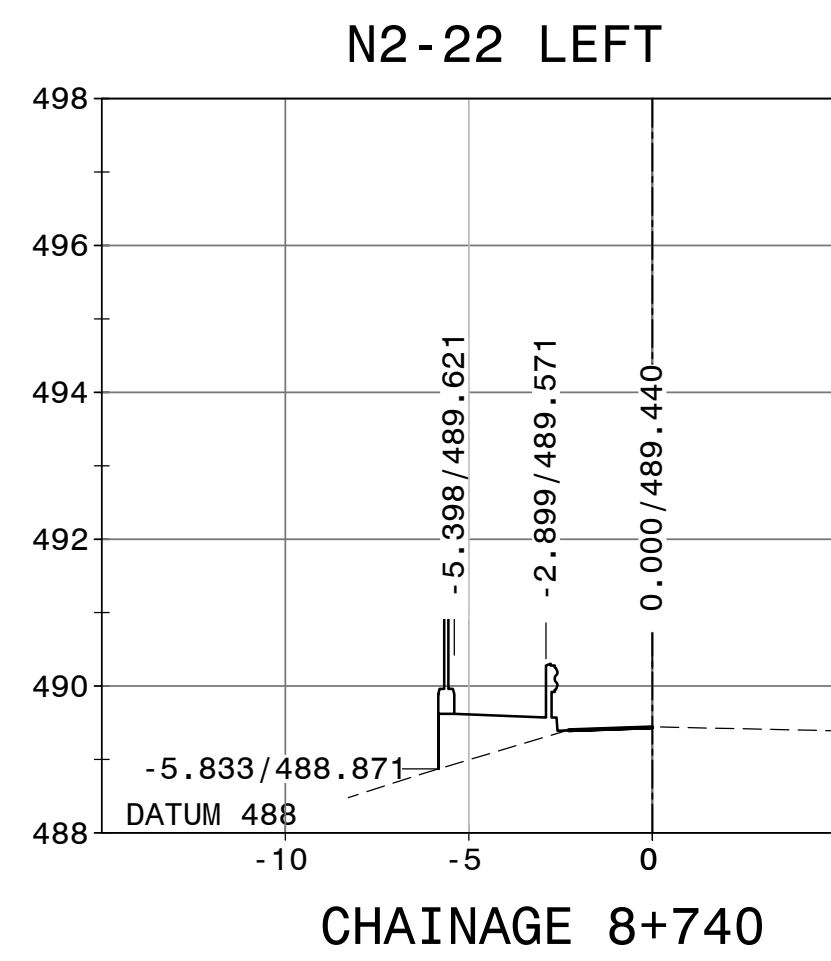
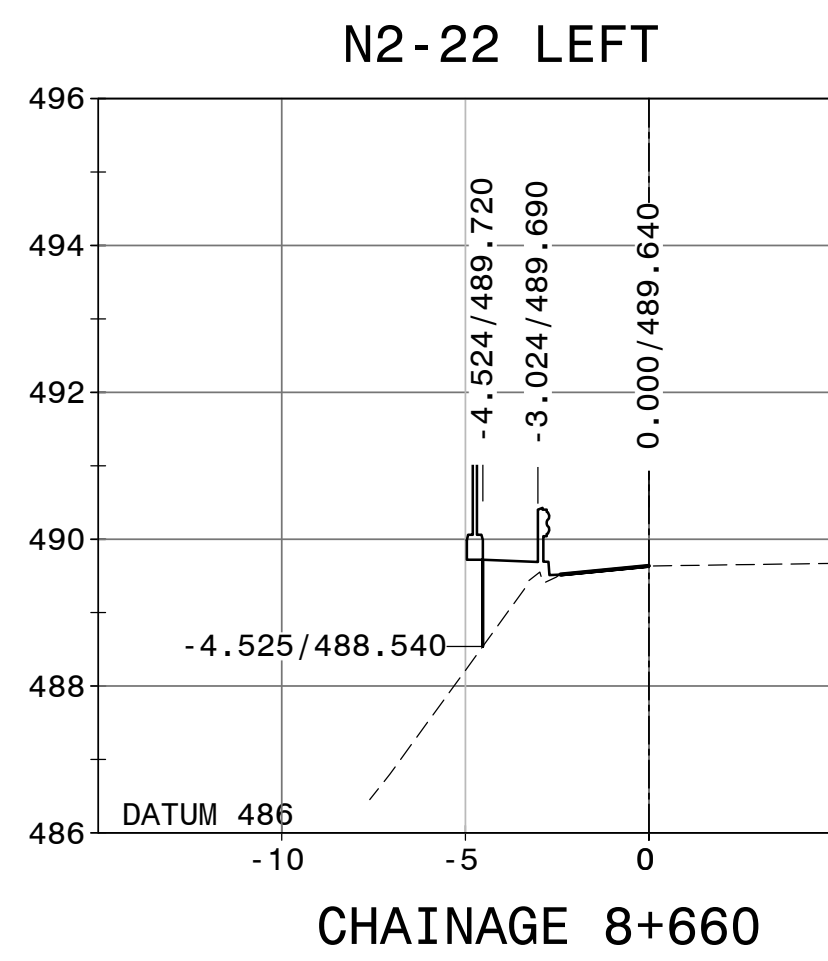
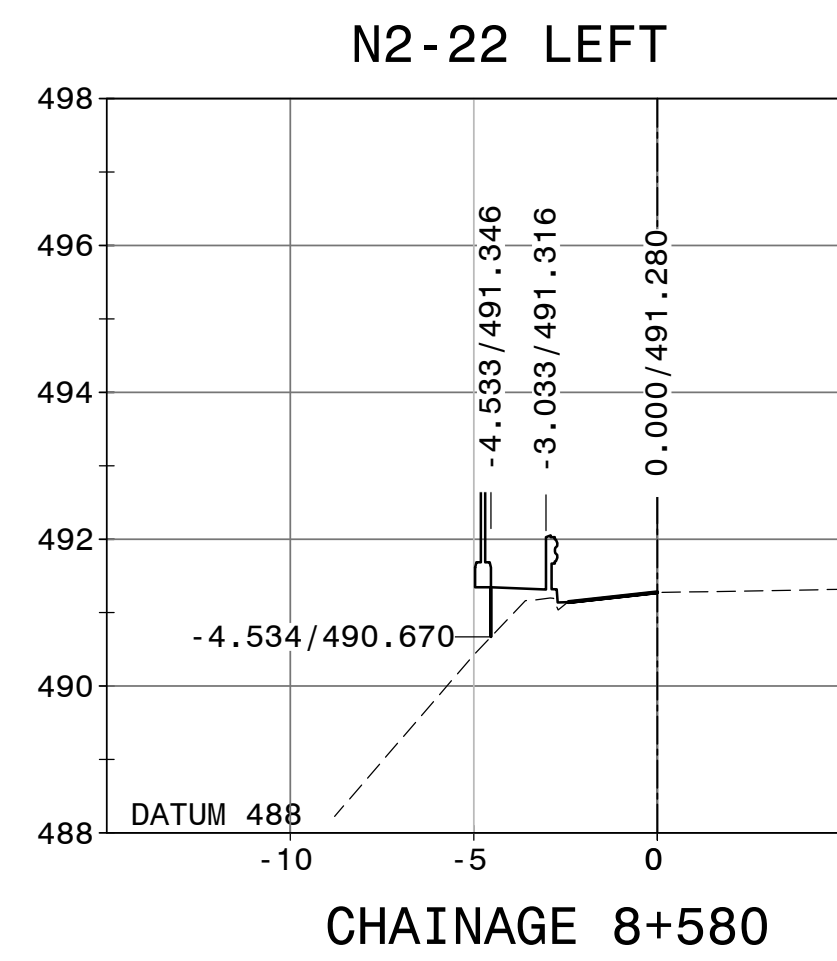
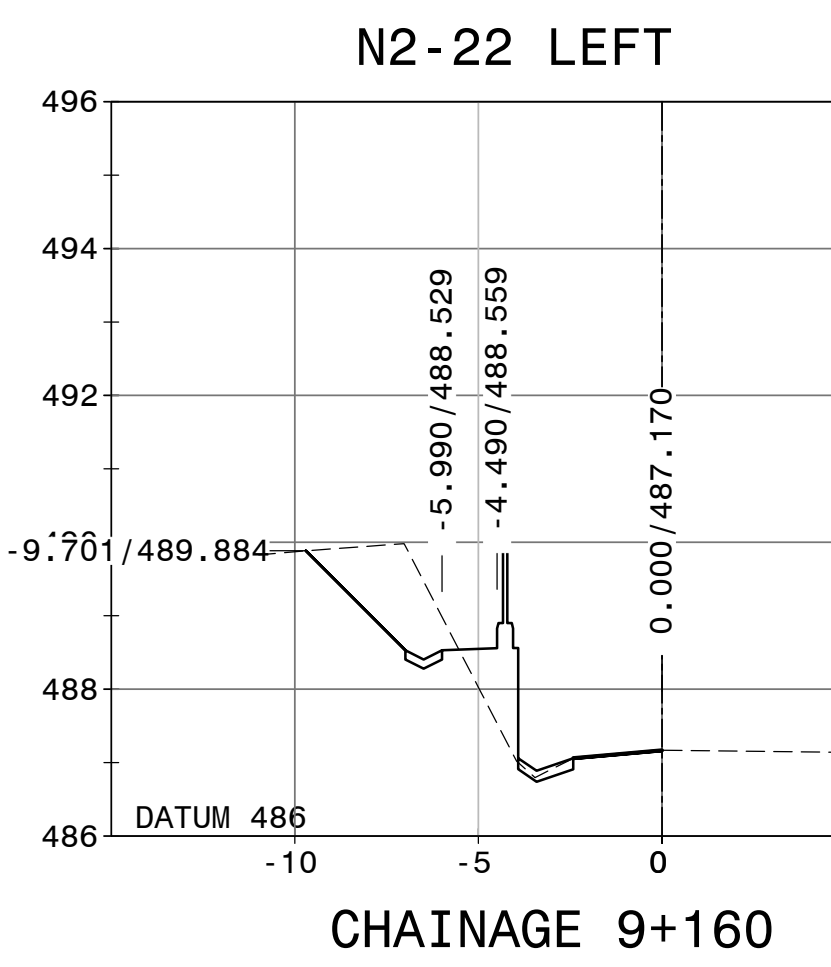
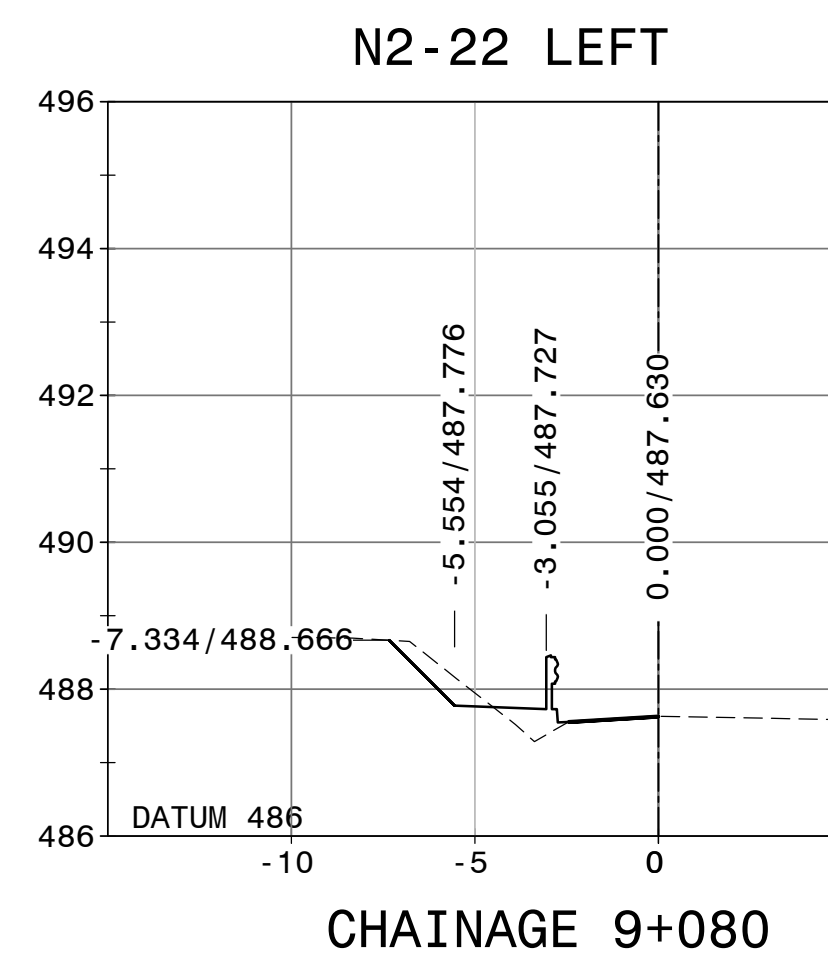
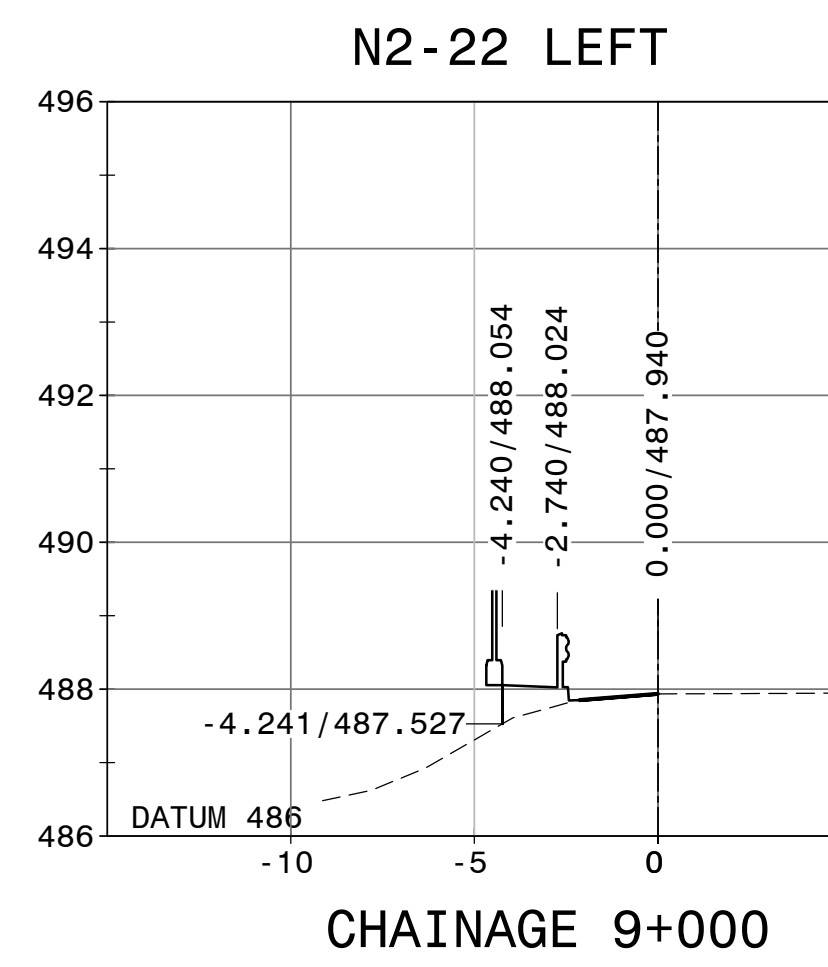
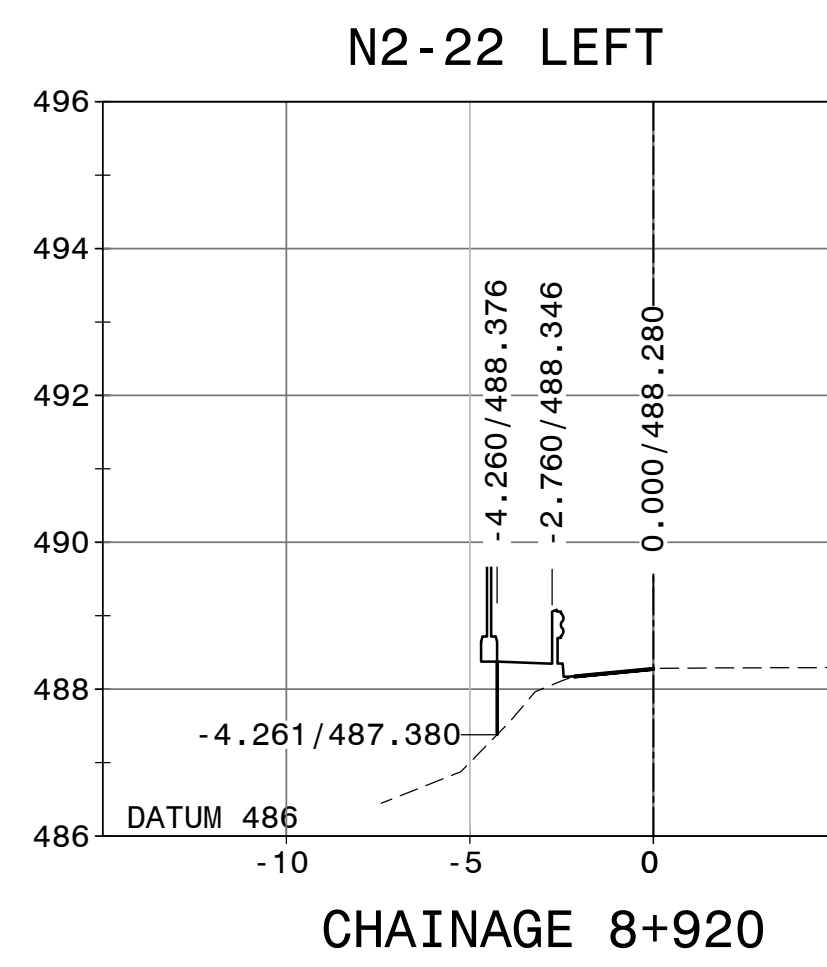
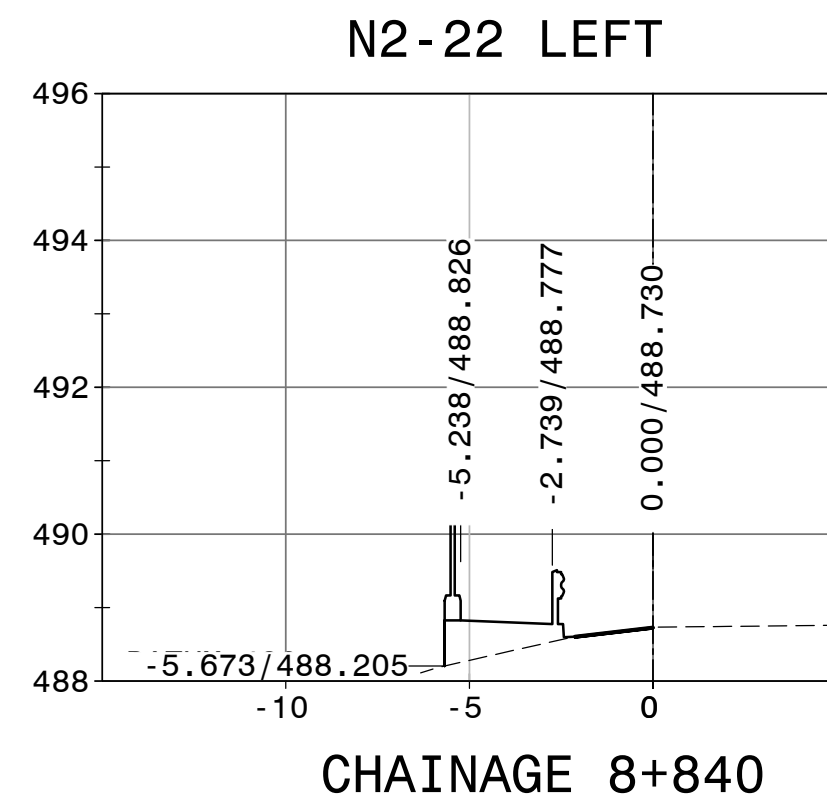
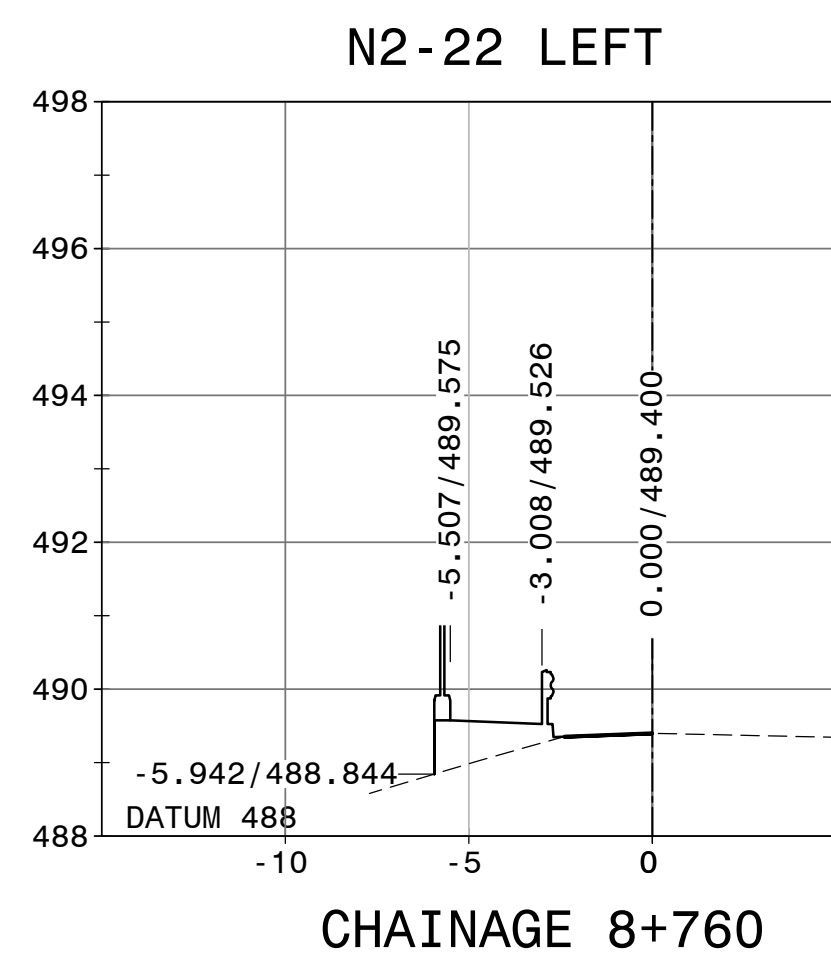
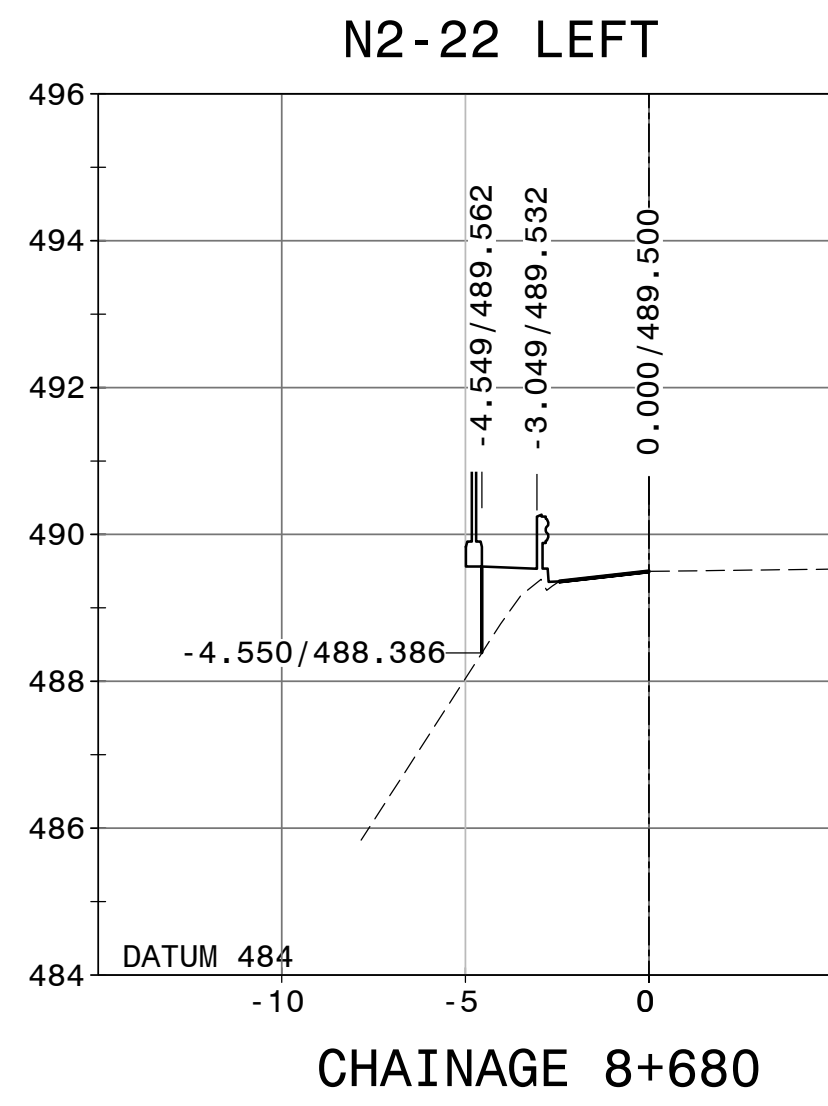
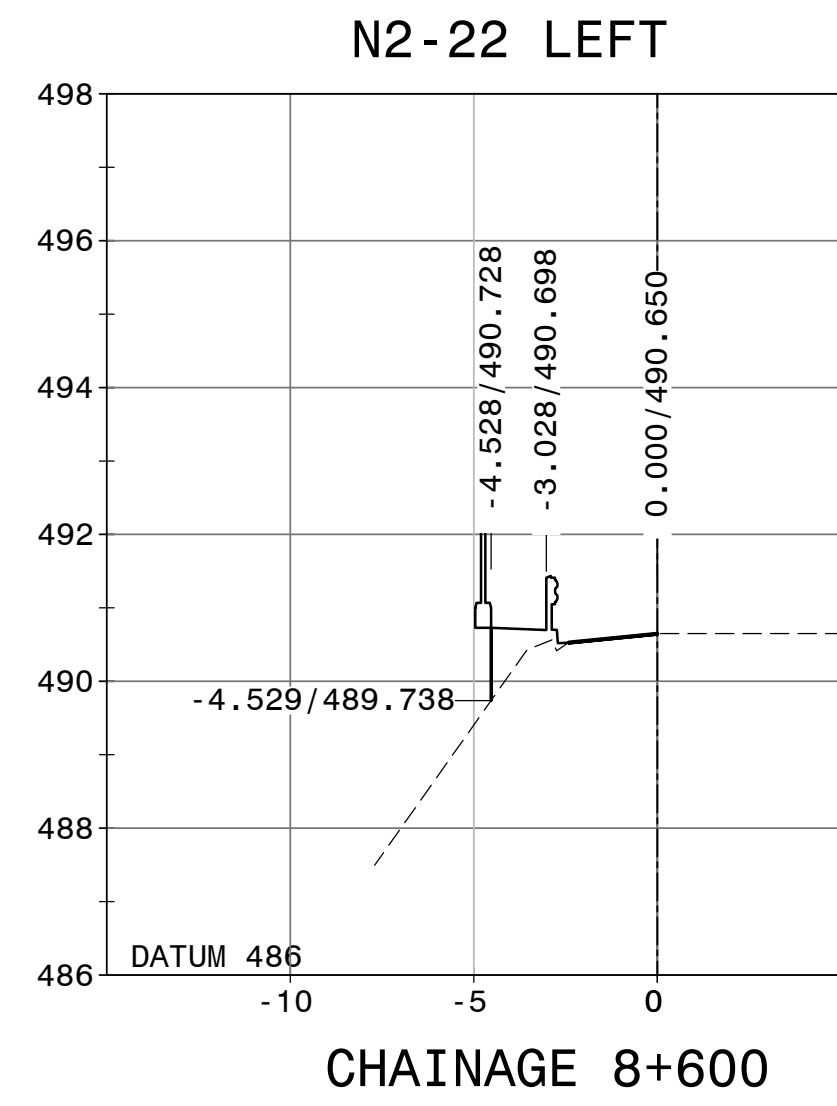
EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION
DETAIL CROSS SECTIONS
N2-22 LEFT
SCALE: 1:200
SHEET 03 OF 07

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-20-003A	
SANRAL DOCUMENT #		V1	

DRAWING: TP1802-19-05-25-20-003A



FOR TENDER PURPOSES

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HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184
PO Box 415
Pretoria 0001
South Africa
Tel: (012) 844 8000



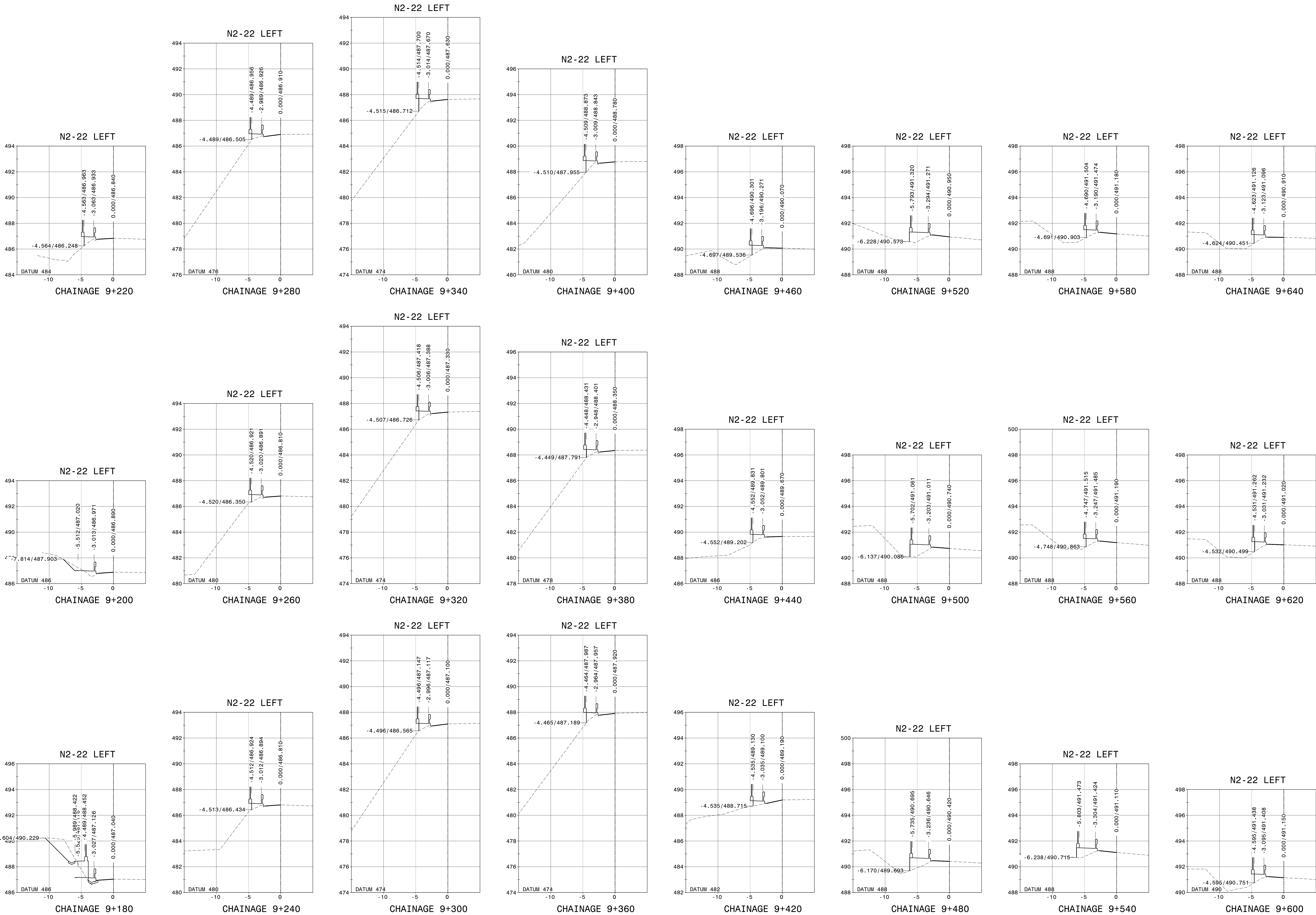
EASTERN REGION
58 van Eck Place
Pietermaritzburg
3201
PO Box 100410
Scottsville
3209
Tel: (033) 392 8100

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION
DETAIL CROSS SECTIONS
N2-22 LEFT

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
CONSULTANT DRAWING No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-20-004A	
SANRAL DOCUMENT #		V1	

DRAWING: TP1802-19-05-25-20-004A



FOR TENDER PURPOSES

			CONSTRUCTION RECORD	
			WORKING CONTRACT ENGINEER	
			Name:	
			Prof. Reg. No.:	
			Date:	
			SANRAL PROJECT MANAGER	
			Name:	
			Prof. Reg. No.:	
			Date:	
Y1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD	
No.	DATE	REVISION	CONSULT. ENG.	

HEAD OFFICE
48 Tambotie Avenue
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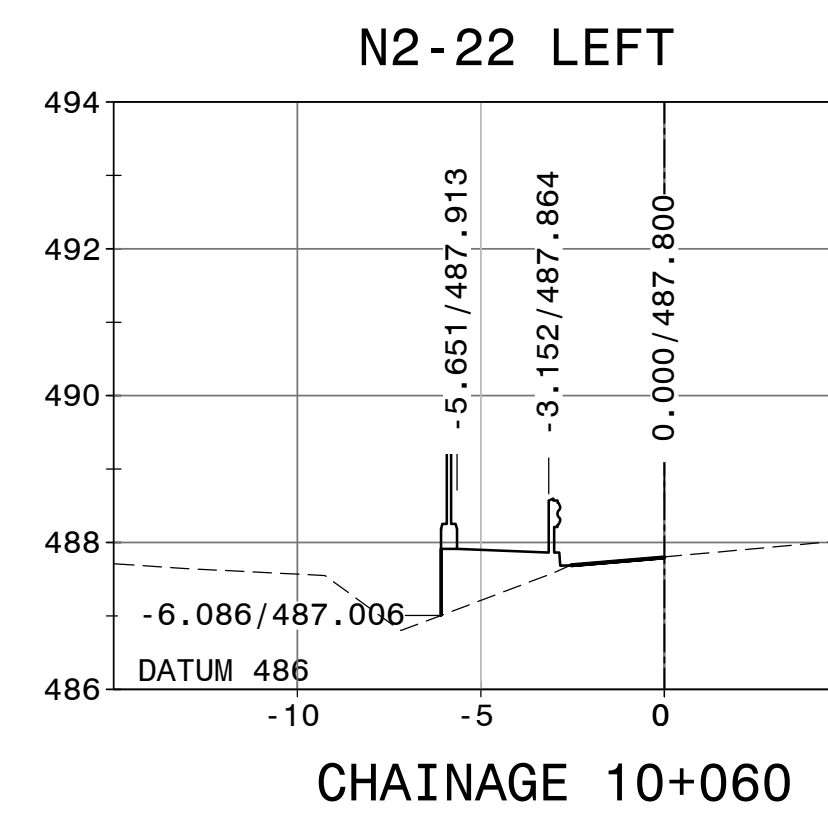
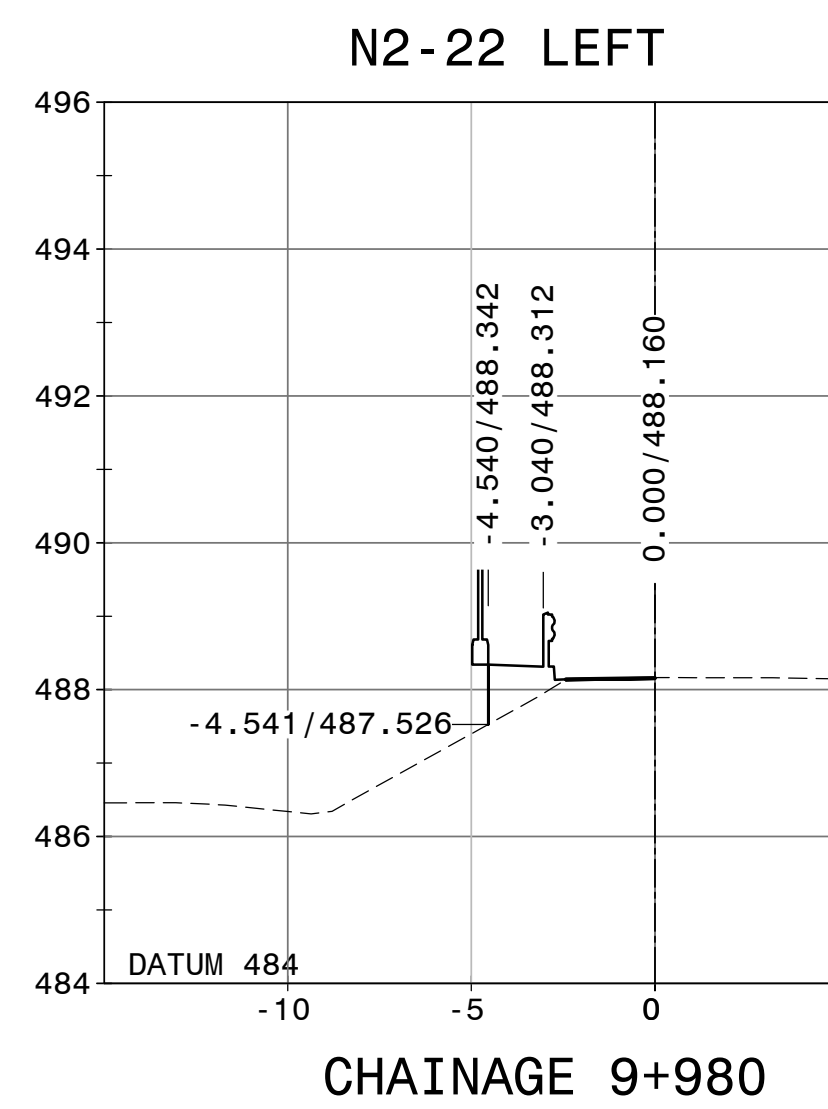
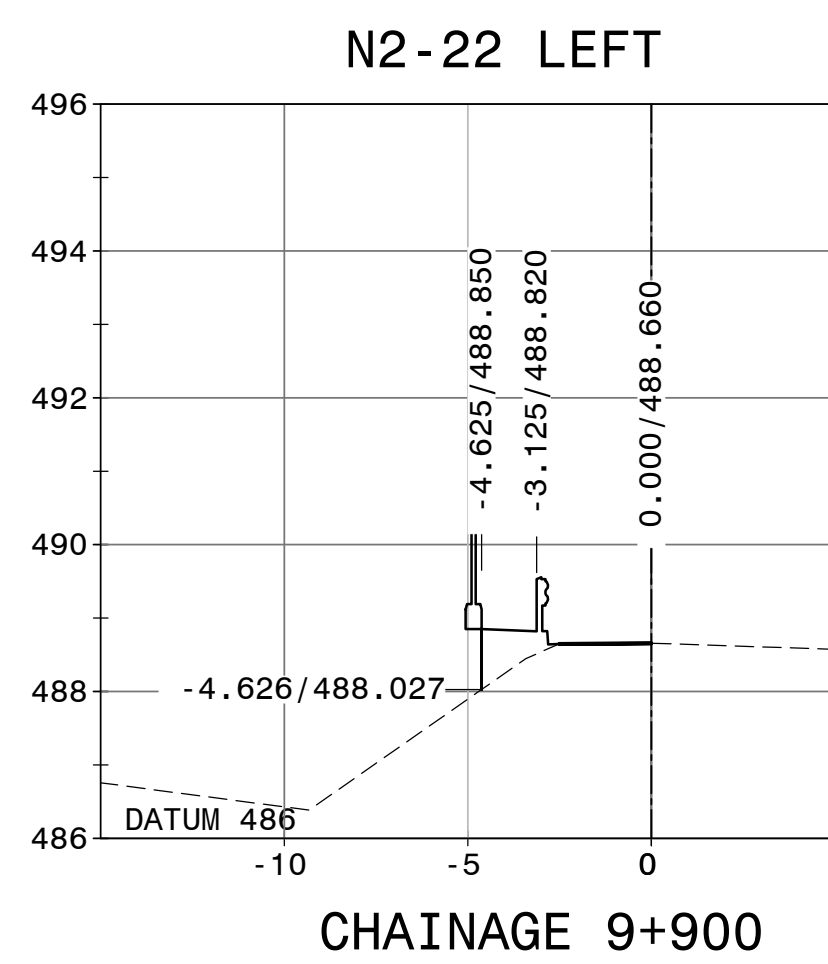
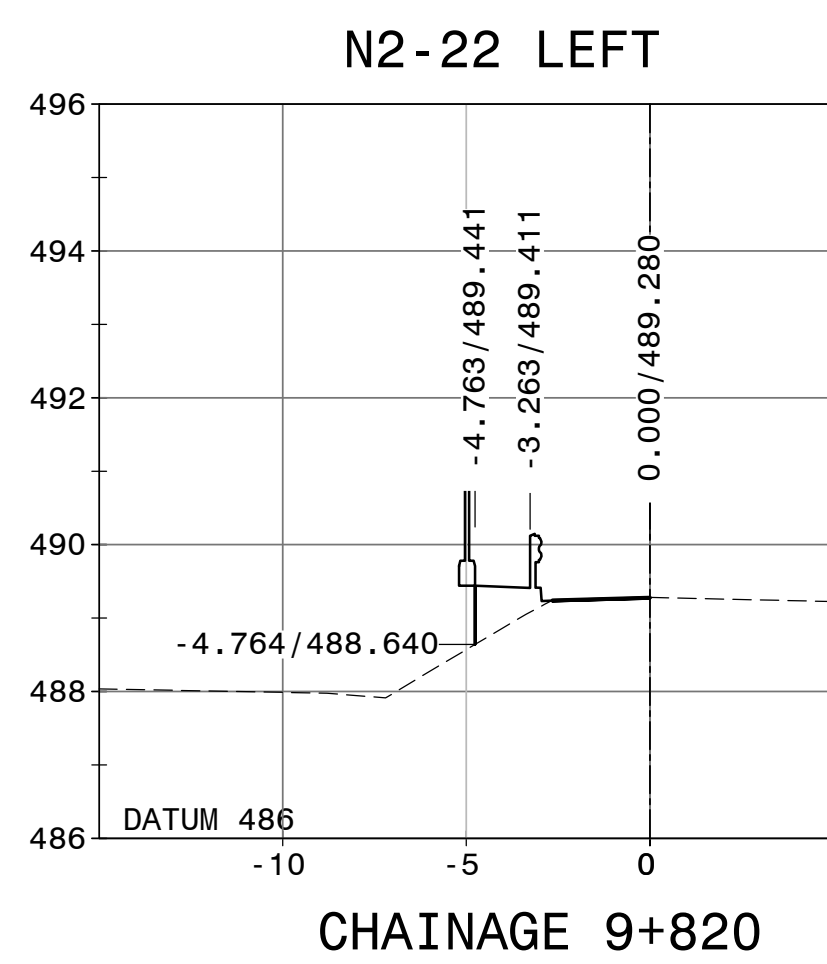
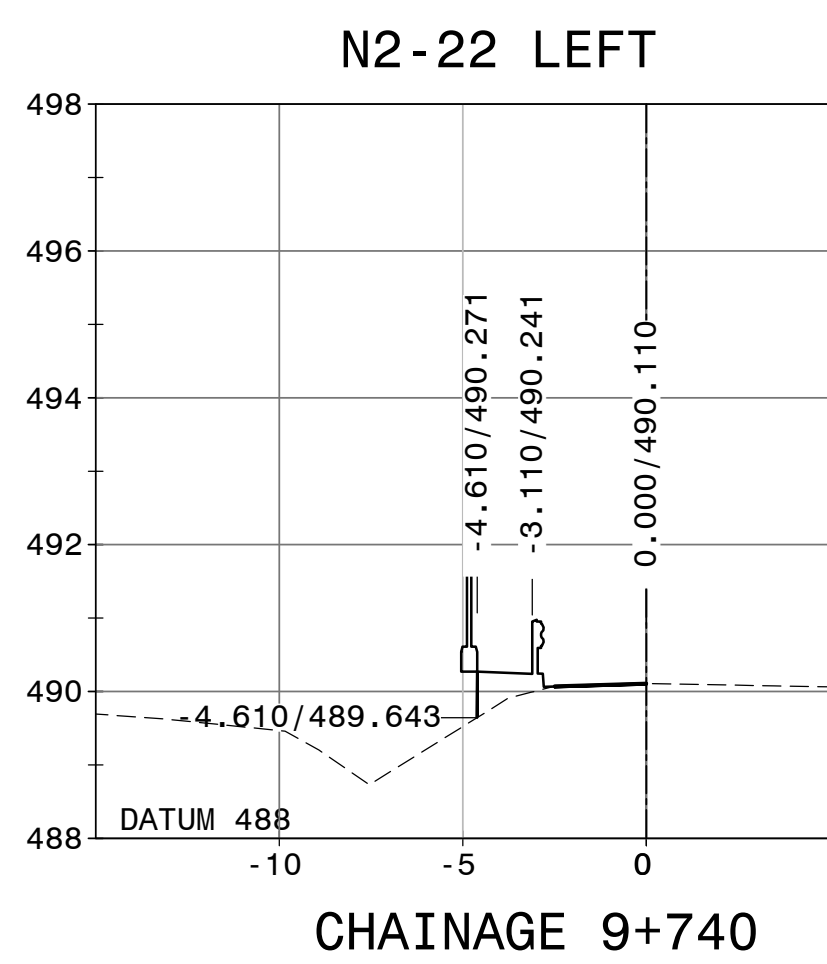
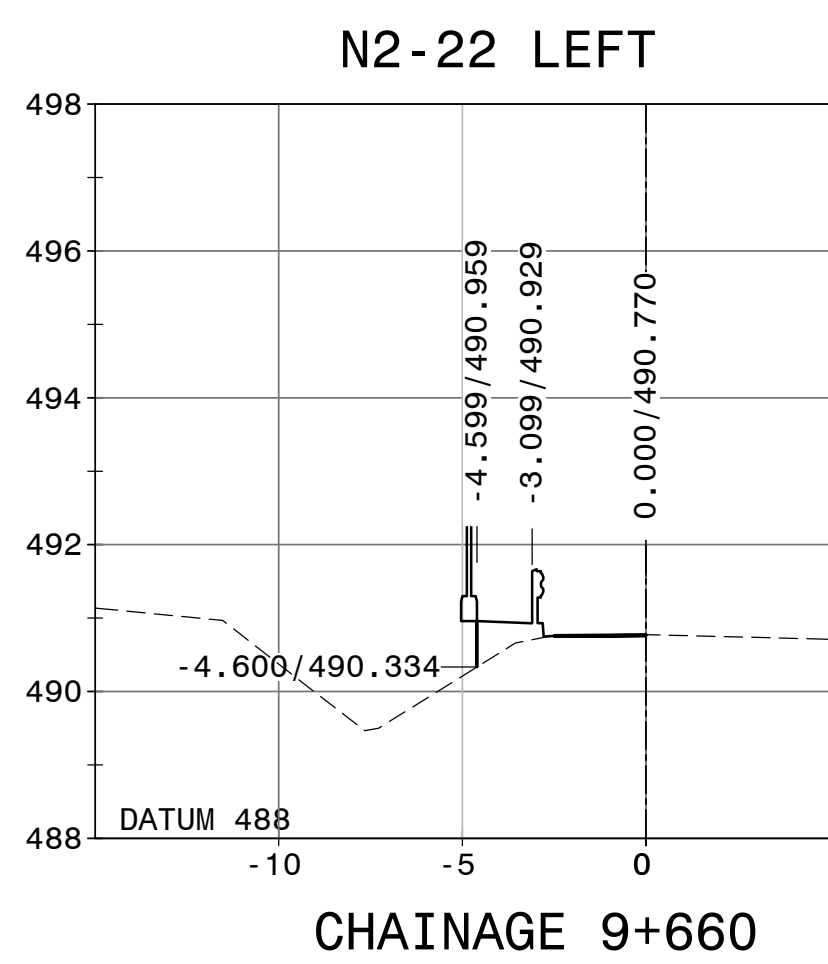
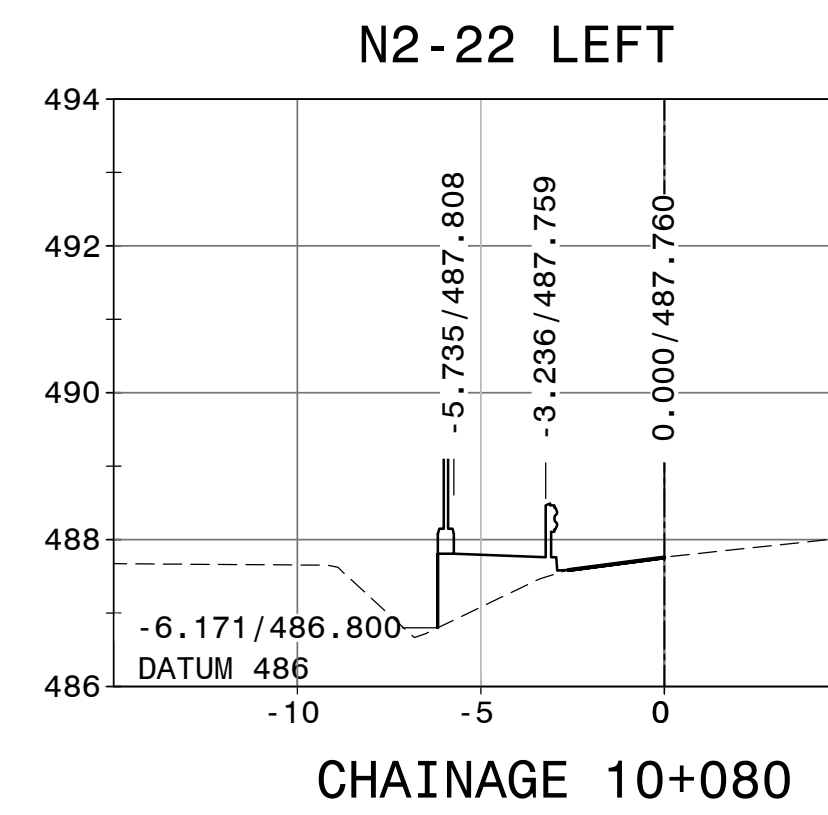
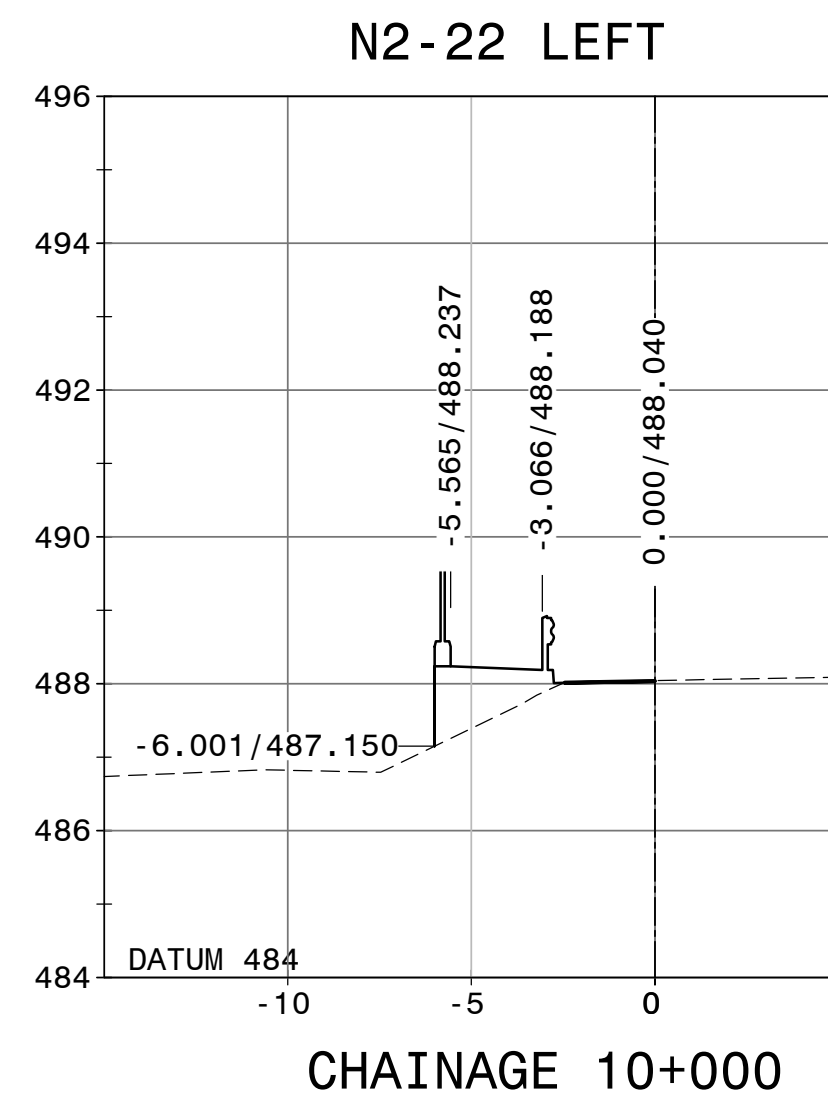
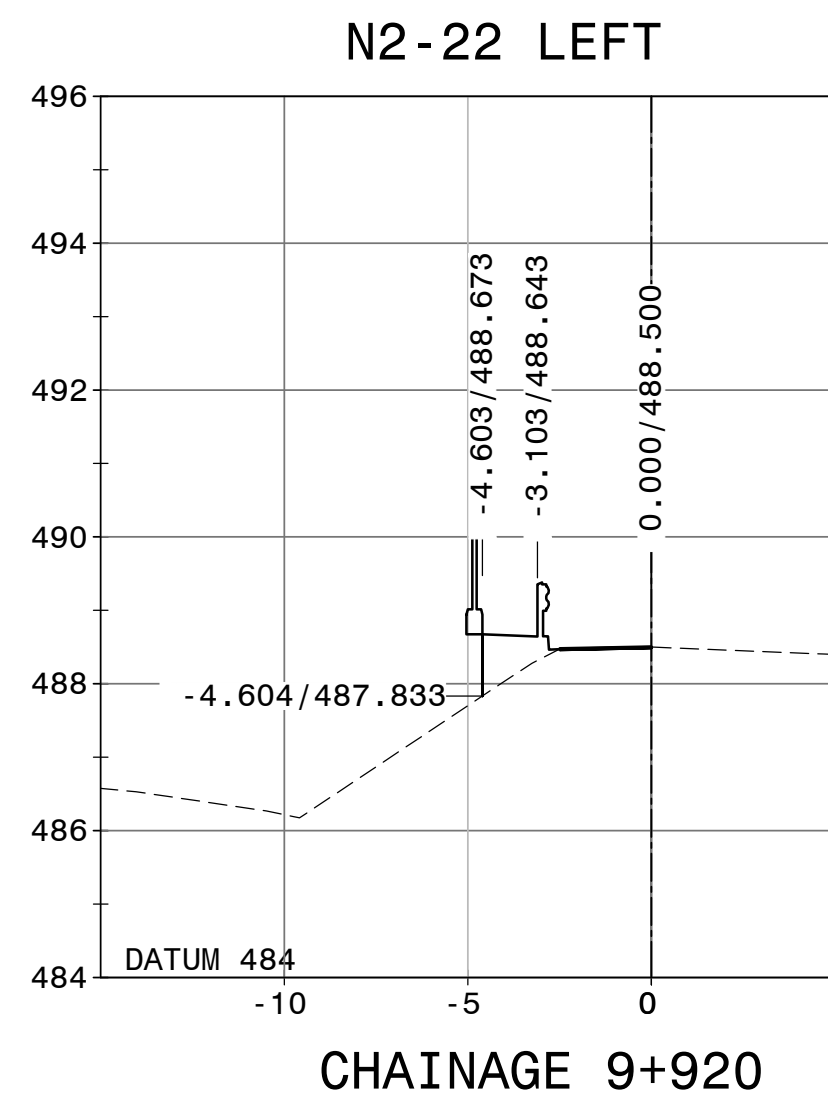
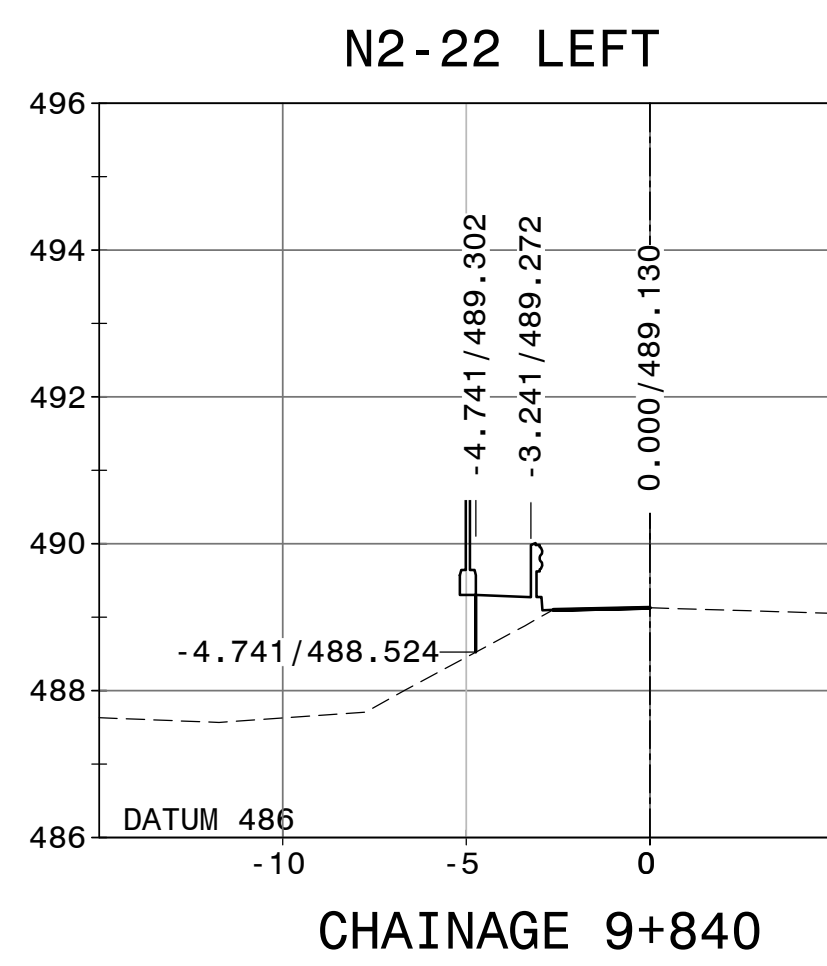
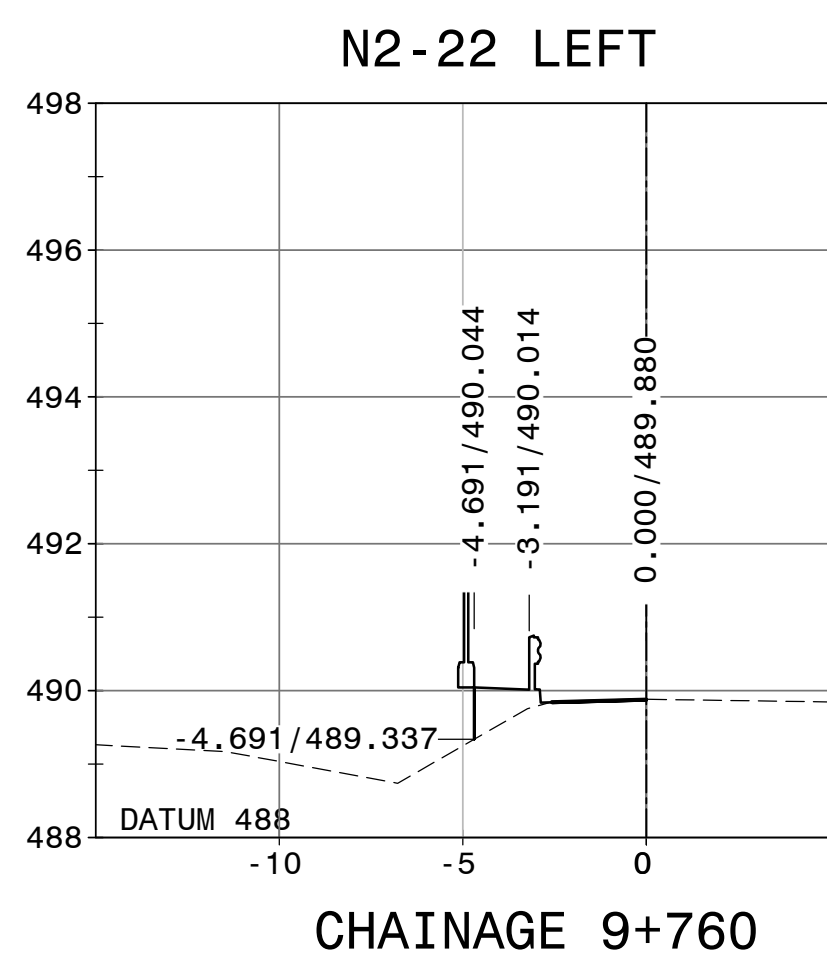
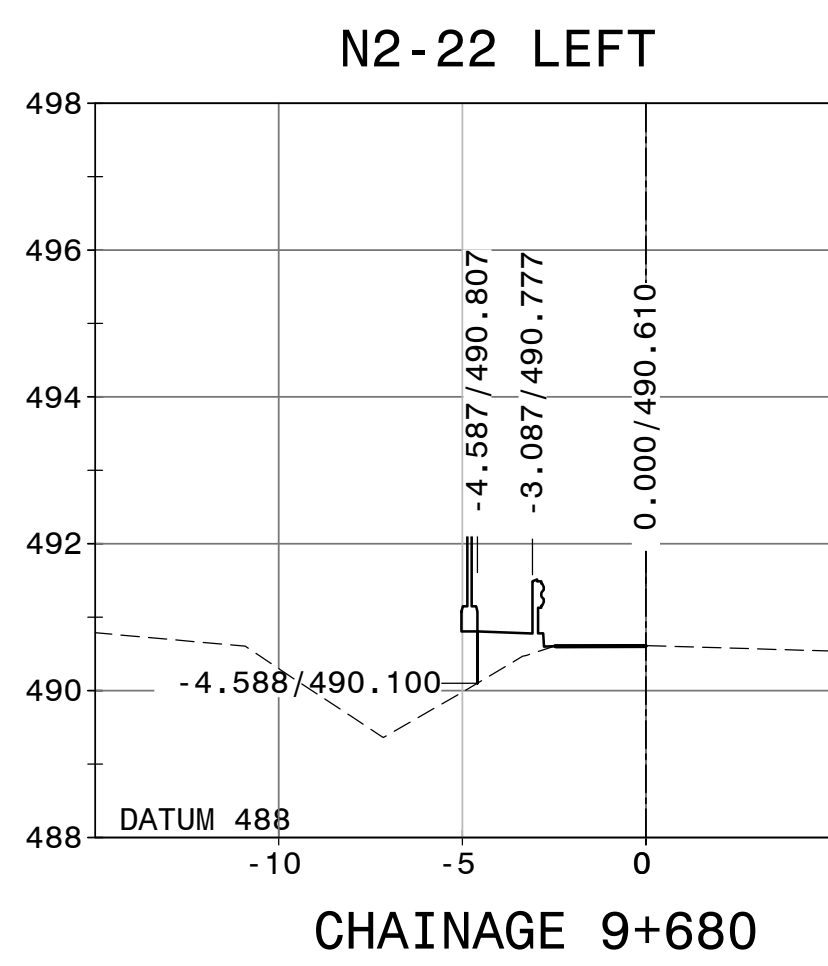
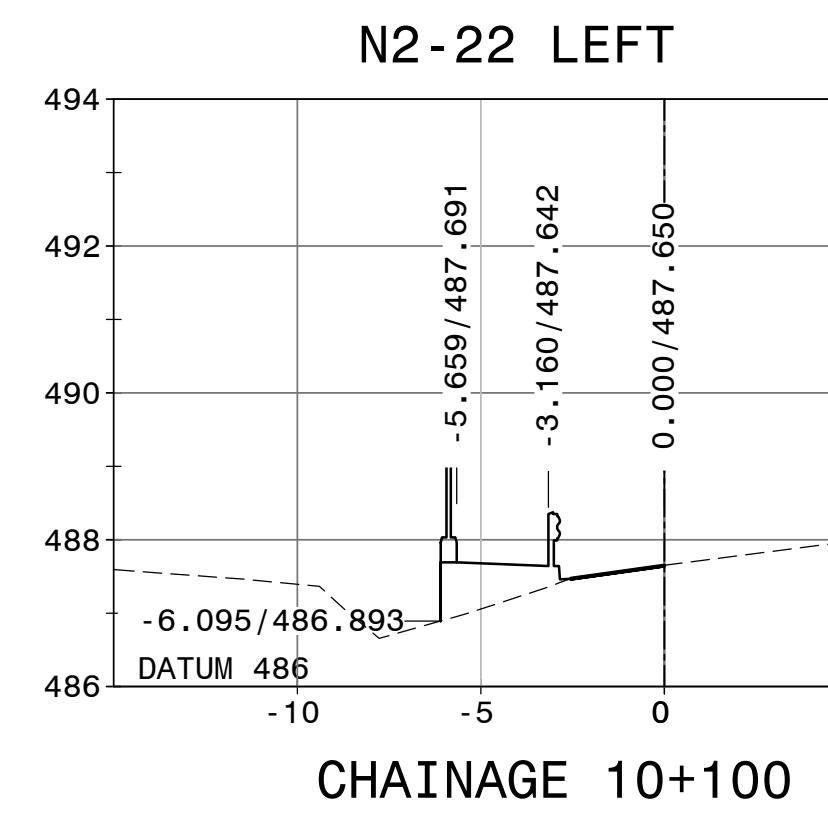
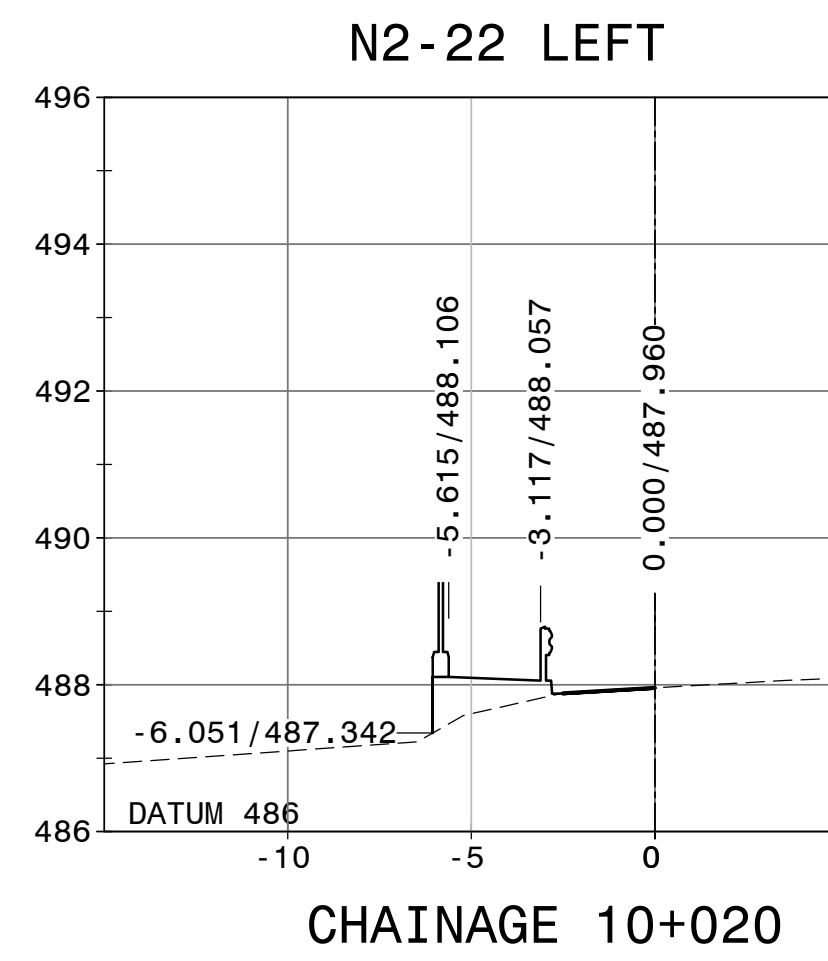
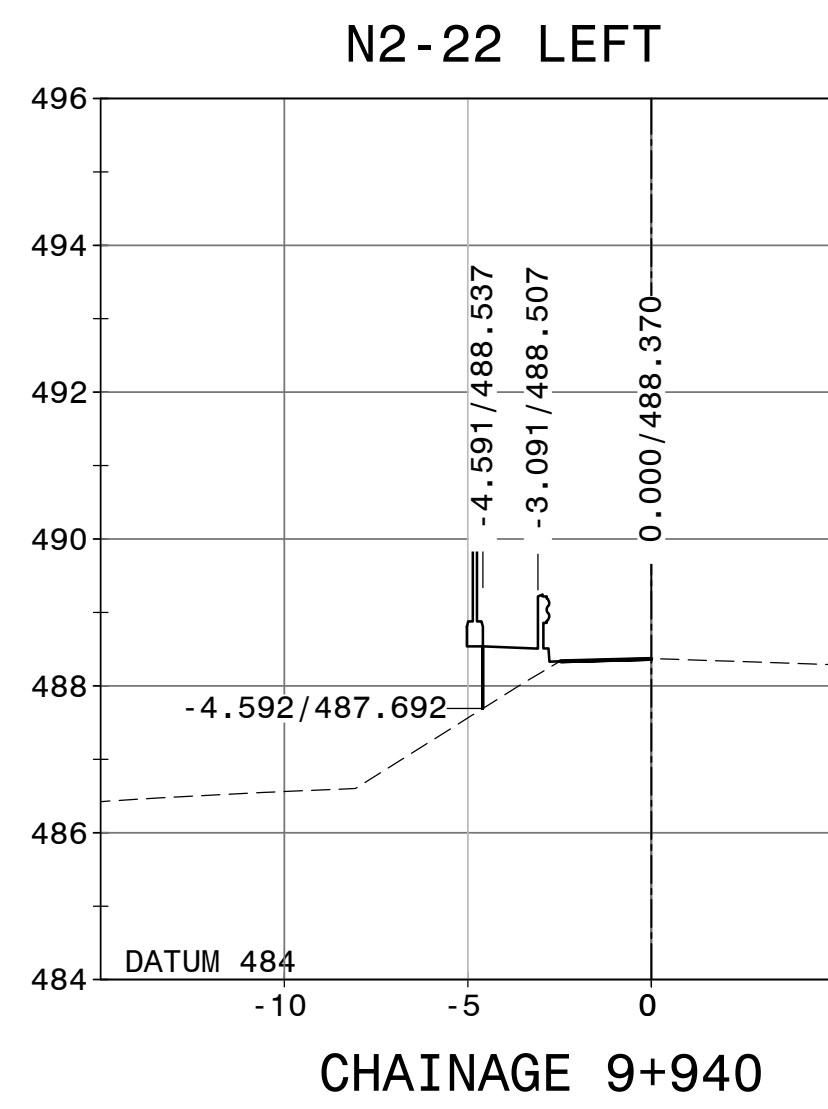
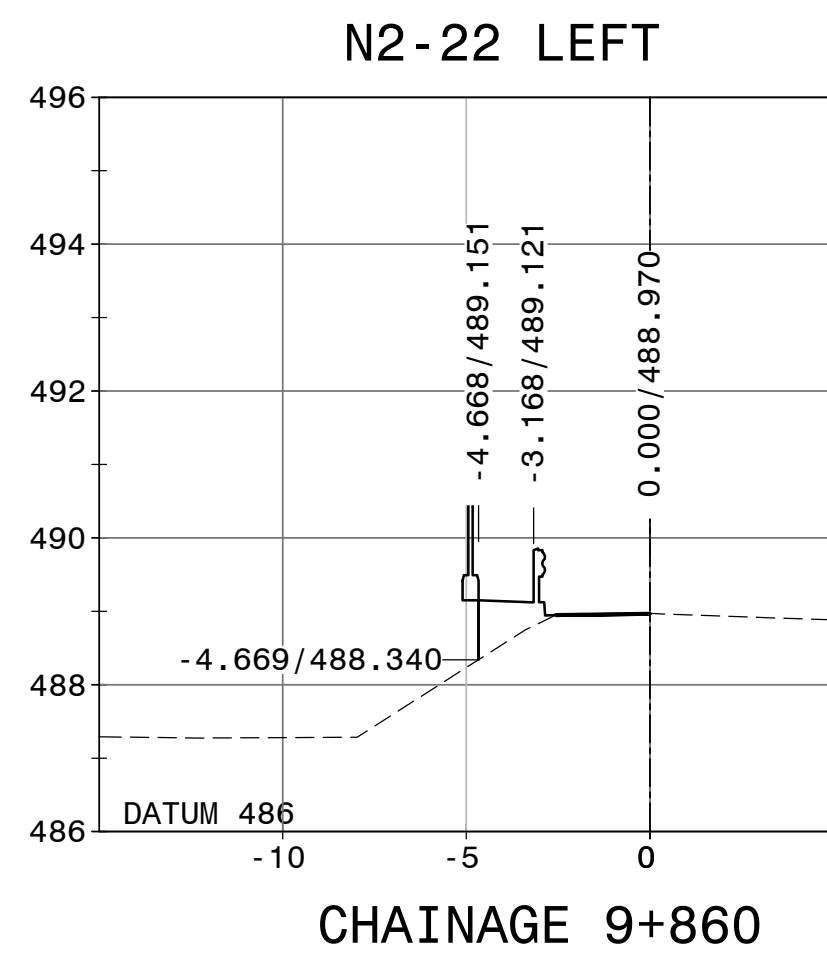
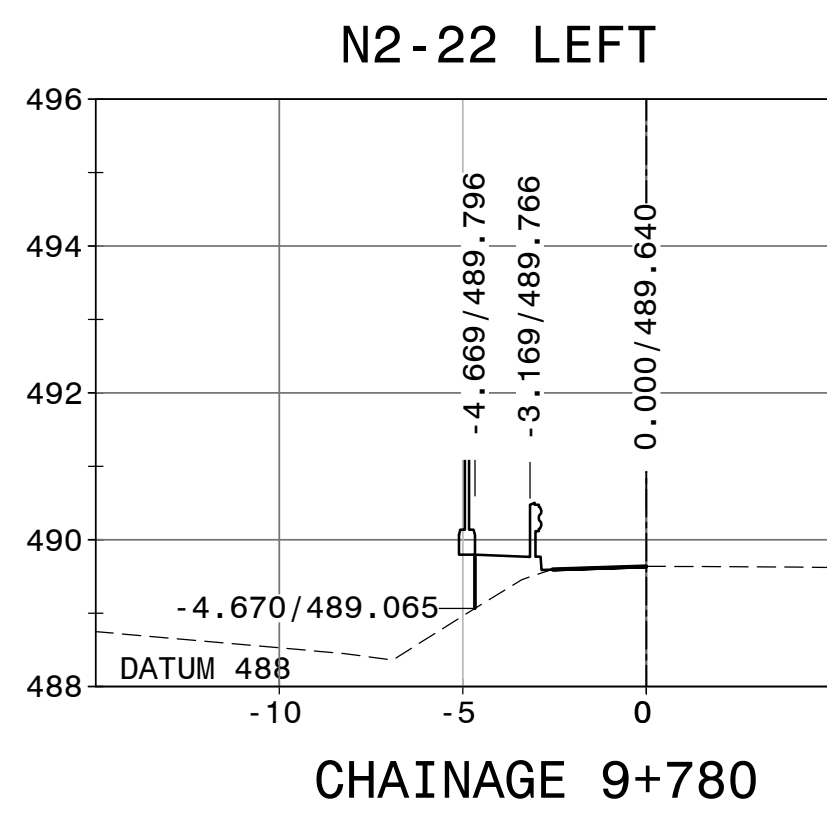
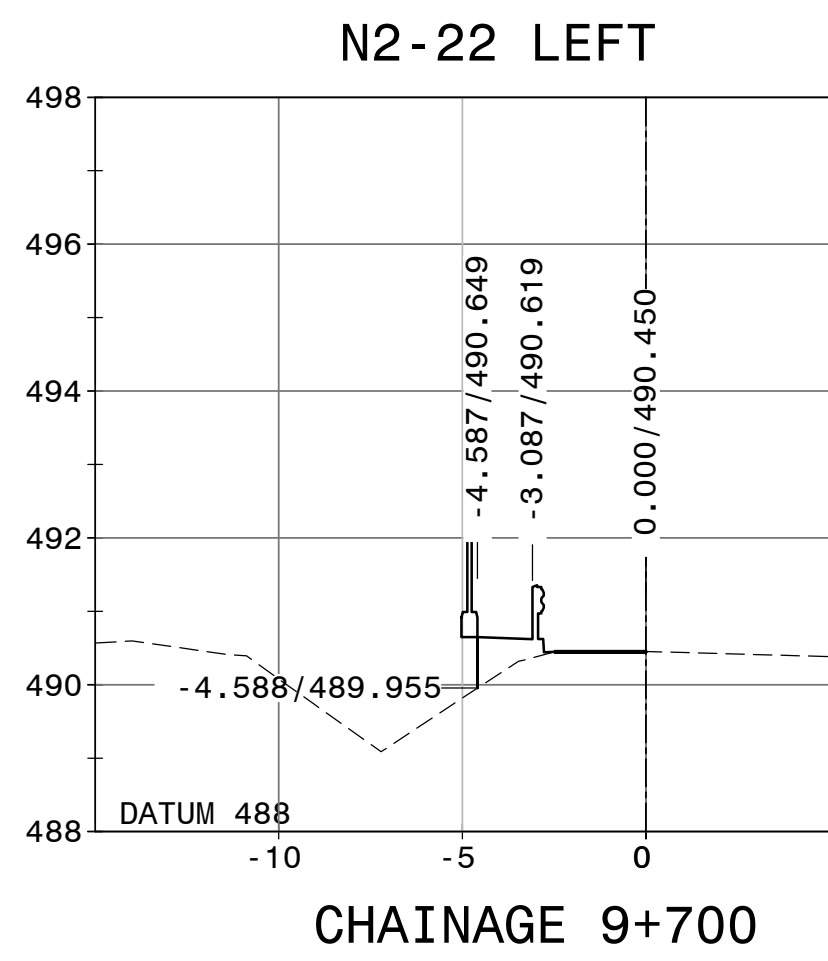
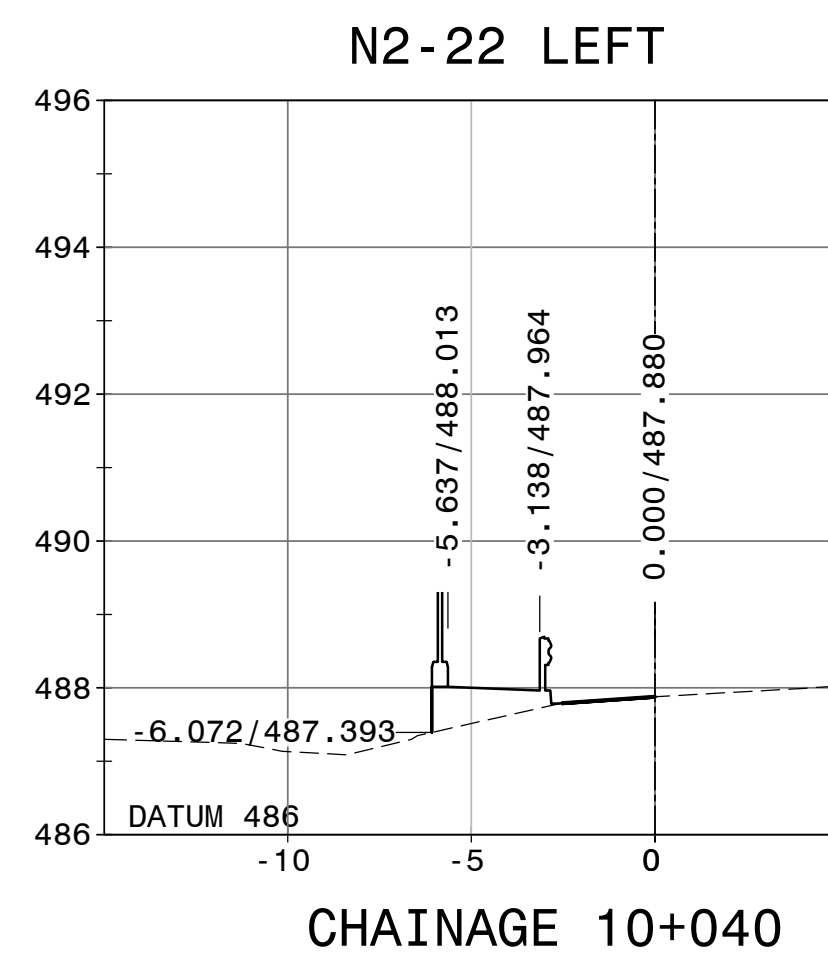
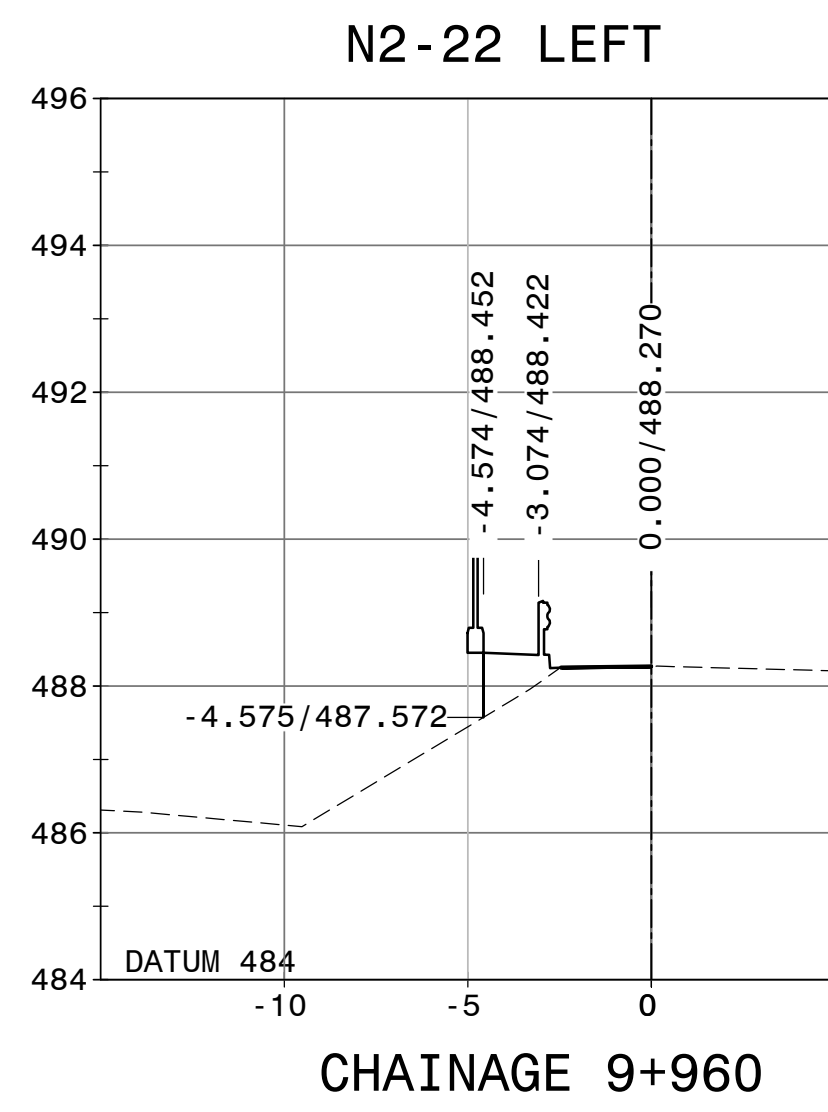
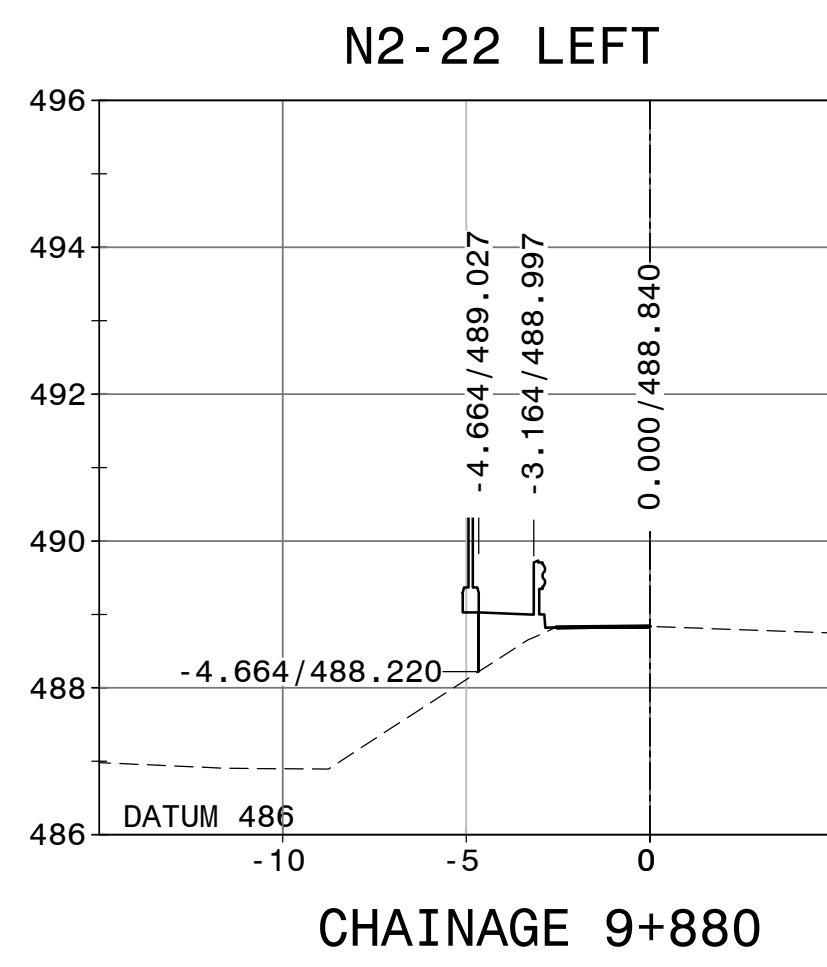
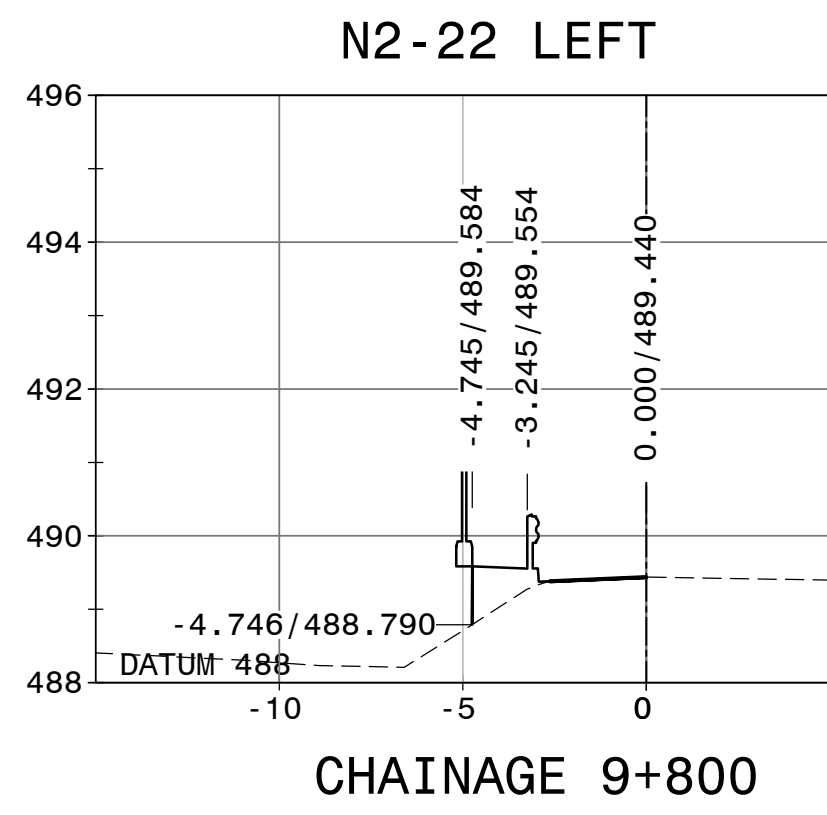
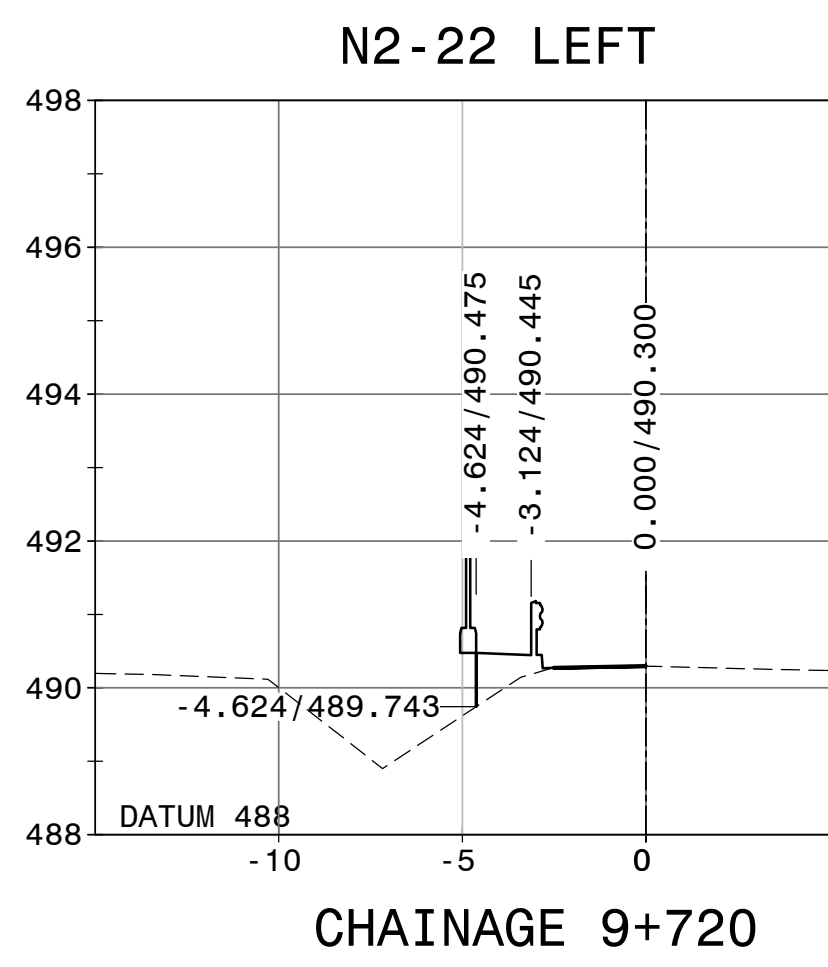
DRAWING DESCRIPTION
DETAIL CROSS SECTIONS
N2-22 LEFT

SCALE : 1:200

SHEET 05 OF 07

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
BRIDGE/STRUCTURE TYPE		ROADS - X SECTION	
CONSULTANT DRAWING No.		N/A	
SANRAL DOCUMENT #		TP1802-19-05-25-20-005A	
		V1	

DRAWING NO. TP1802-19-05-25-20-005A



FOR TENDER PURPOSES

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PO Box 415
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South Africa
Tel: (012) 644 8000



EASTERN REGION
58 van Eck Place
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PO Box 100410
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Tel: (033) 392 8100

ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

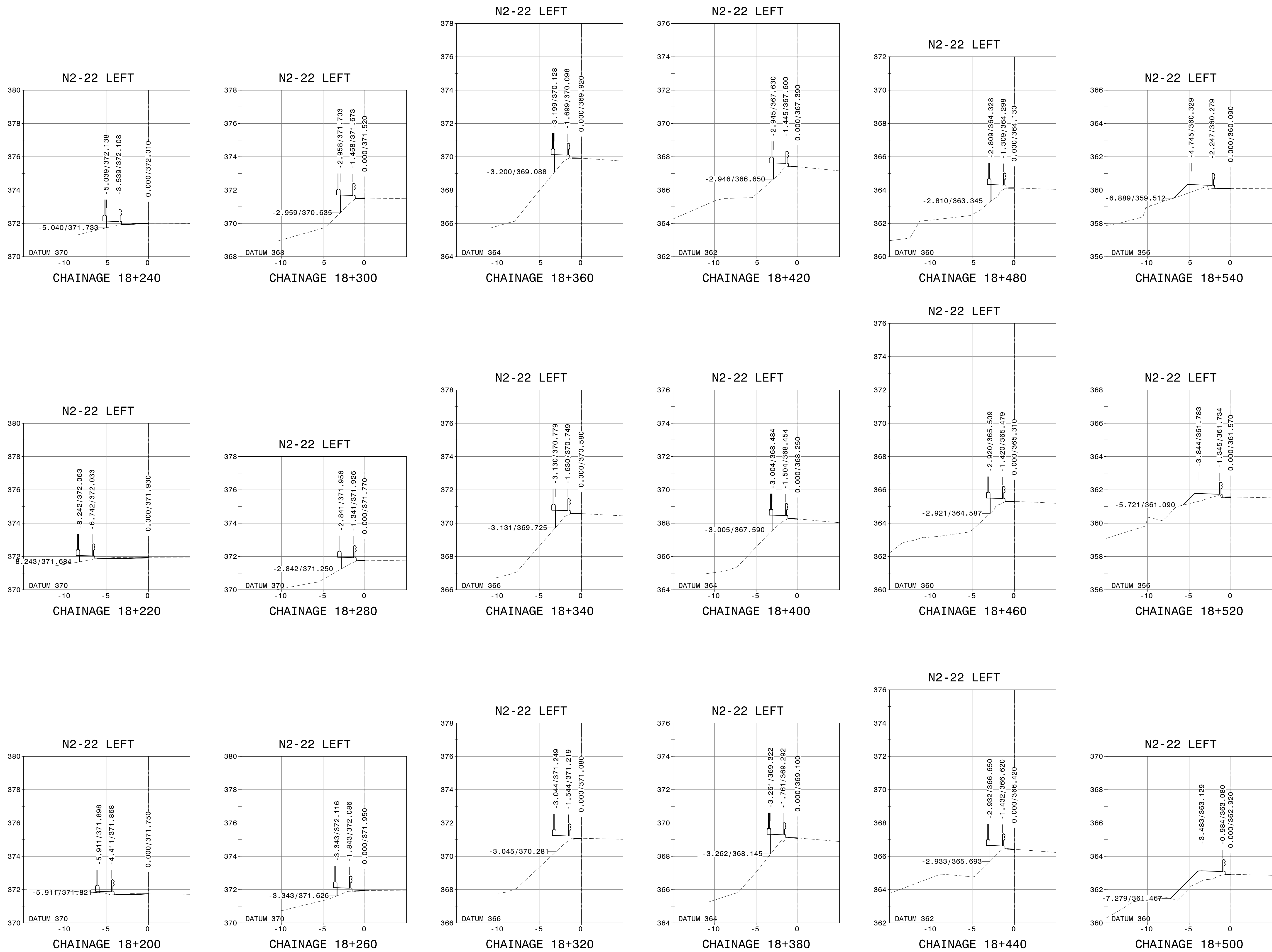
PROJECT DESCRIPTION
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)
DRAWING DESCRIPTION
DETAIL CROSS SECTIONS
N2-22 LEFT

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-20-006A	
SANRAL DOCUMENT #		V1	

SCALE: 1:200

SHEET 06 OF 07

DRAWING: TP1802-19-05-25-20-006A



FOR TENDER PURPOSES

CONSTRUCTION RECORD			
WORKING CONTRACT ENGINEER			
Name: _____			
Prof. Reg. No.: _____			
Date: _____			
SANRAL PROJECT MANAGER			
Name: _____			
Prof. Reg. No.: _____			
Date: _____			
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD
No.	DATE	REVISION	CONSULT. ENG.

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48 Tambotie Avenue
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Pretoria
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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY (Pty) Ltd.

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Pietermaritzburg
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BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date: _____

PROJECT DESCRIPTION

CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)

DRAWING DESCRIPTION

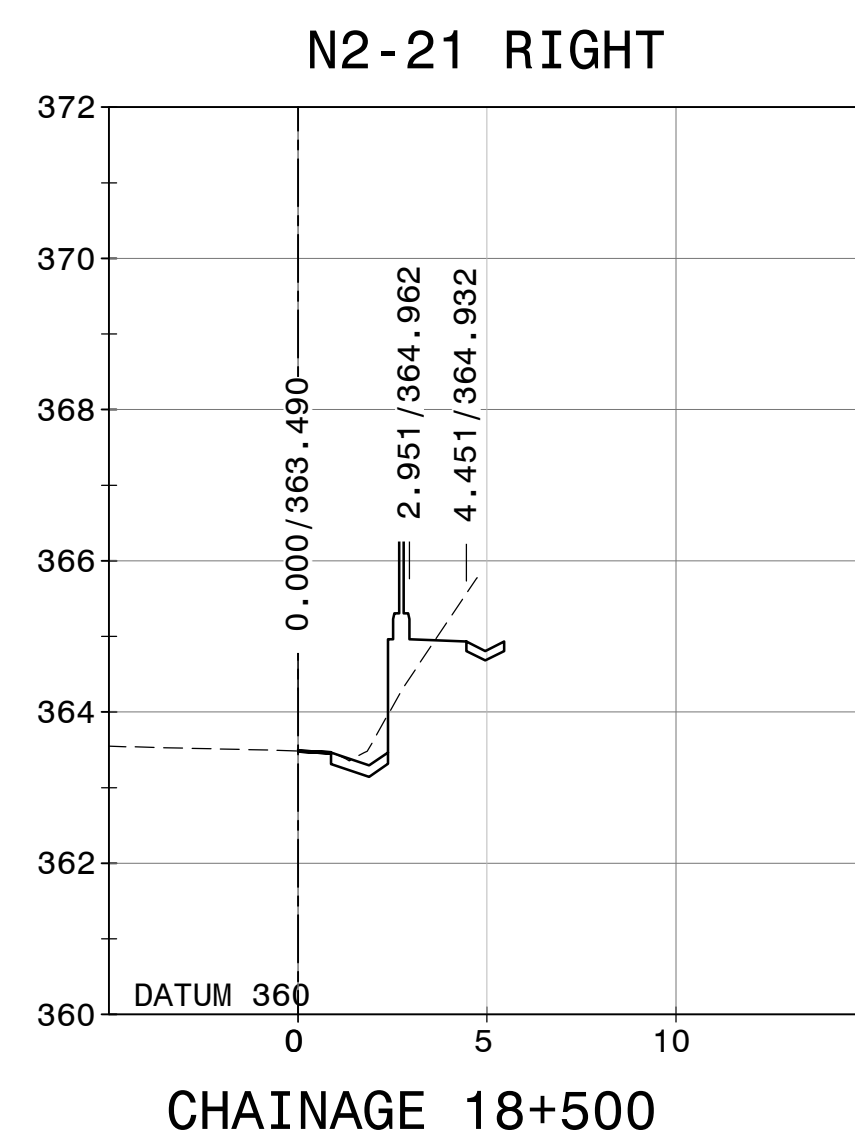
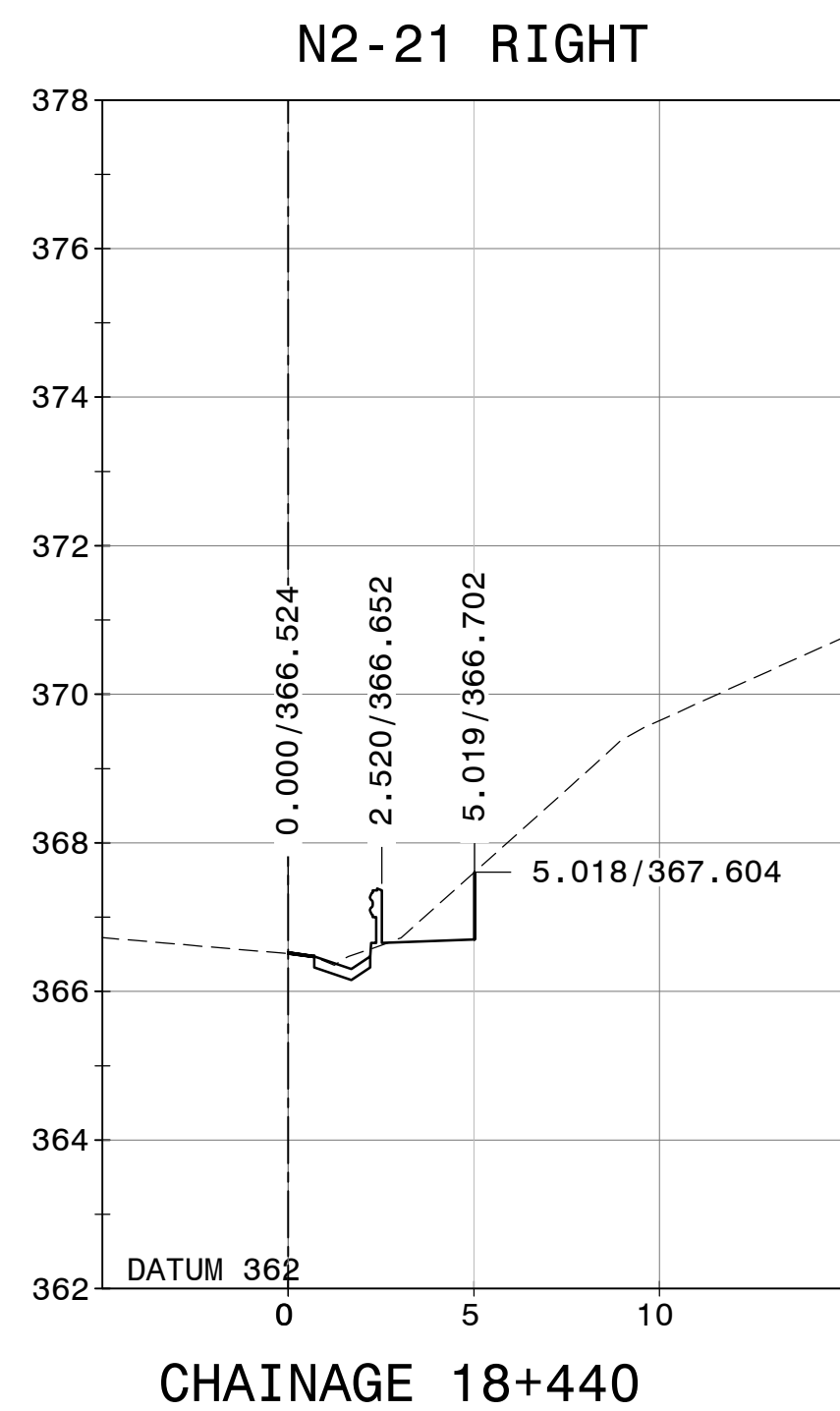
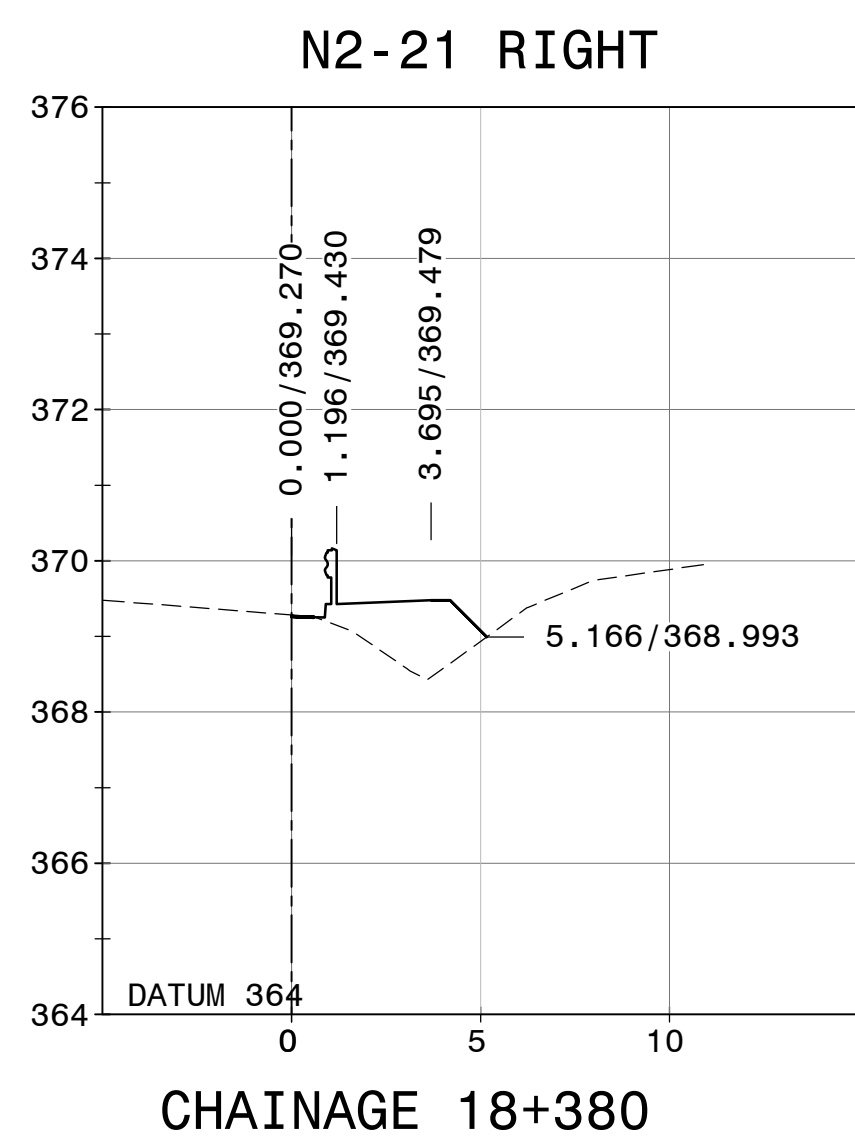
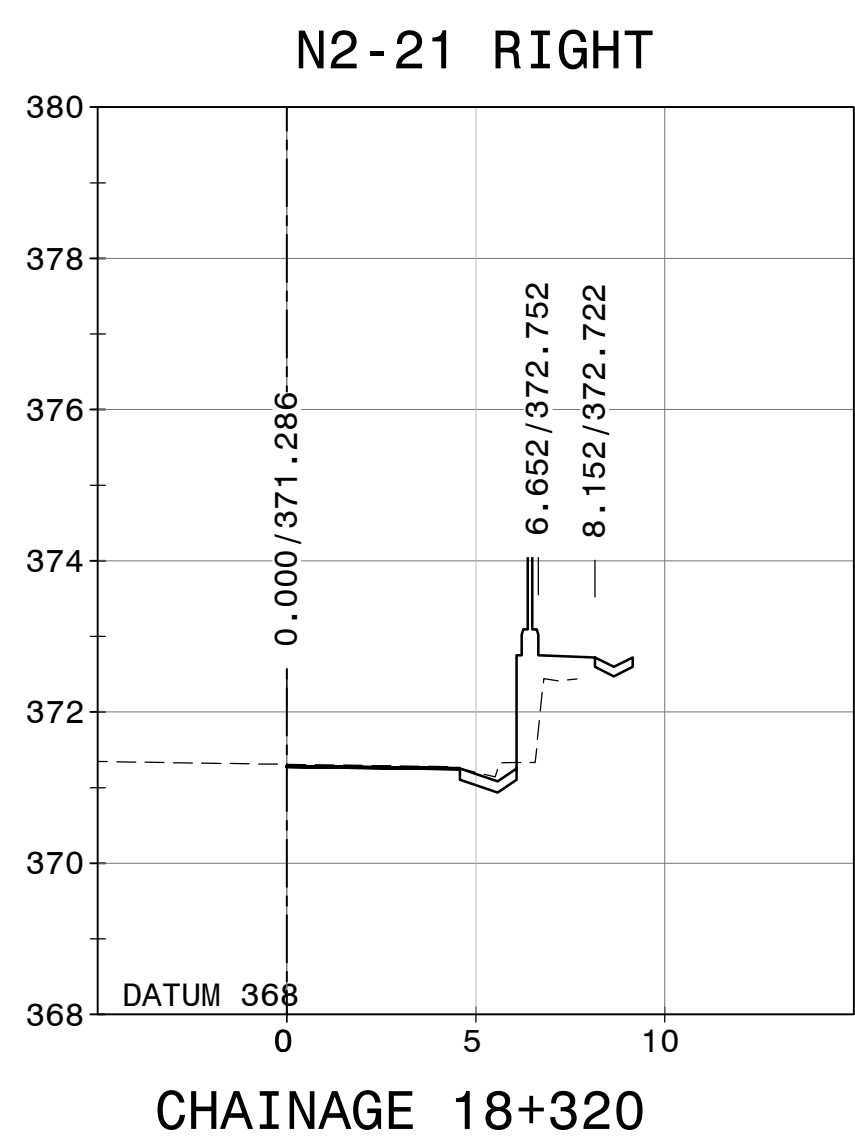
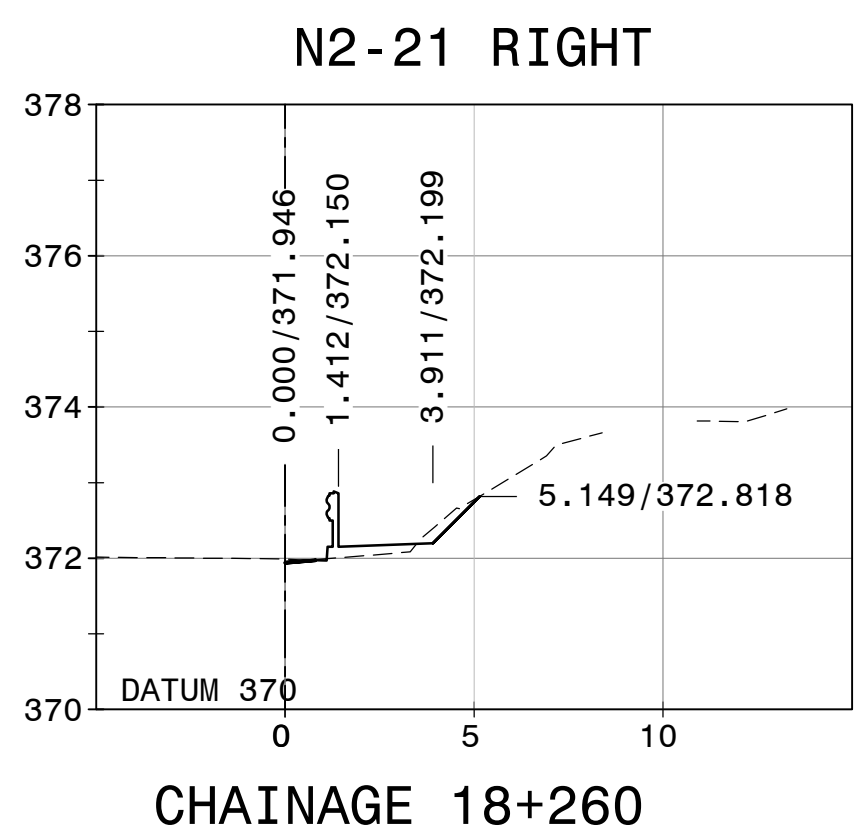
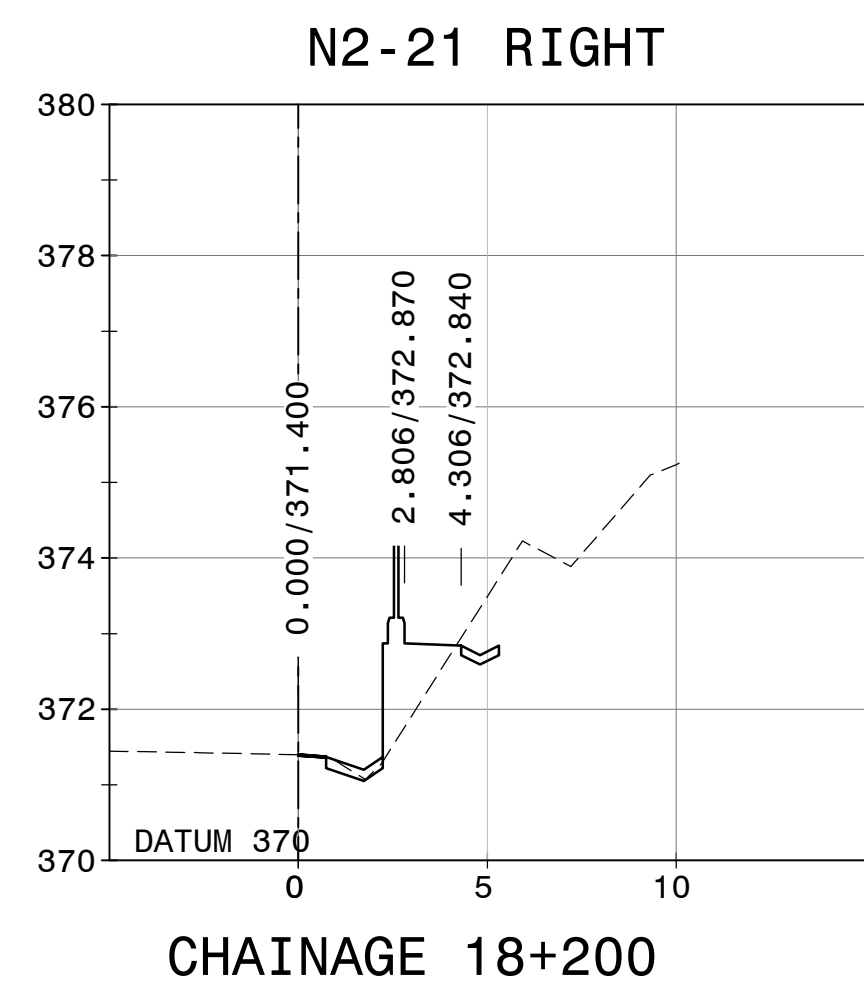
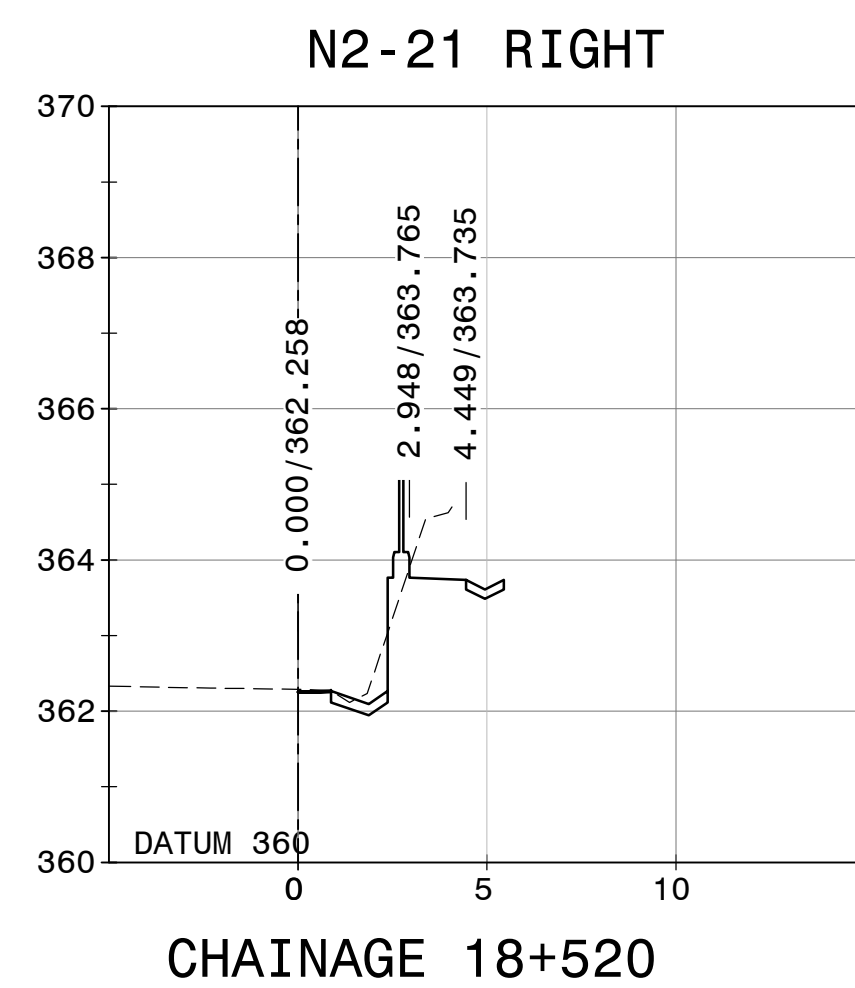
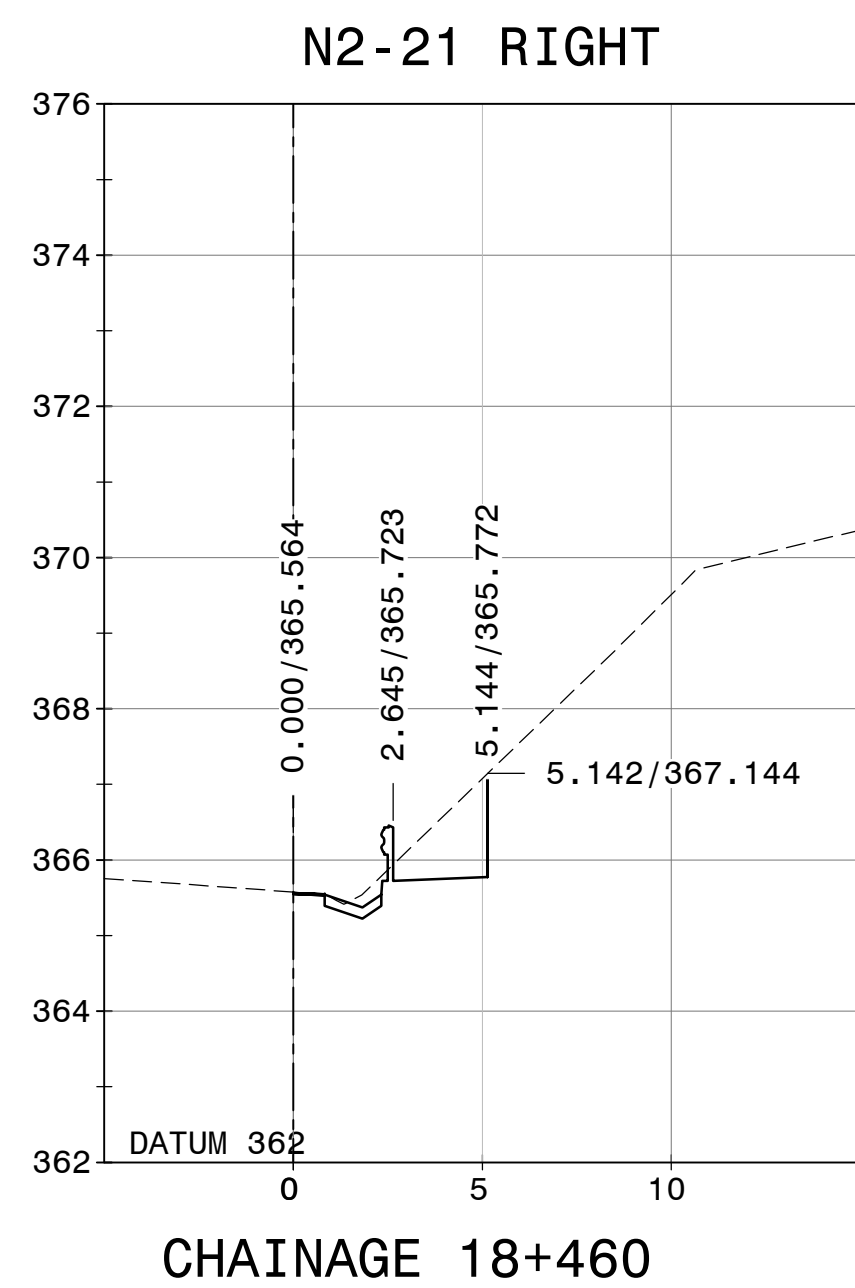
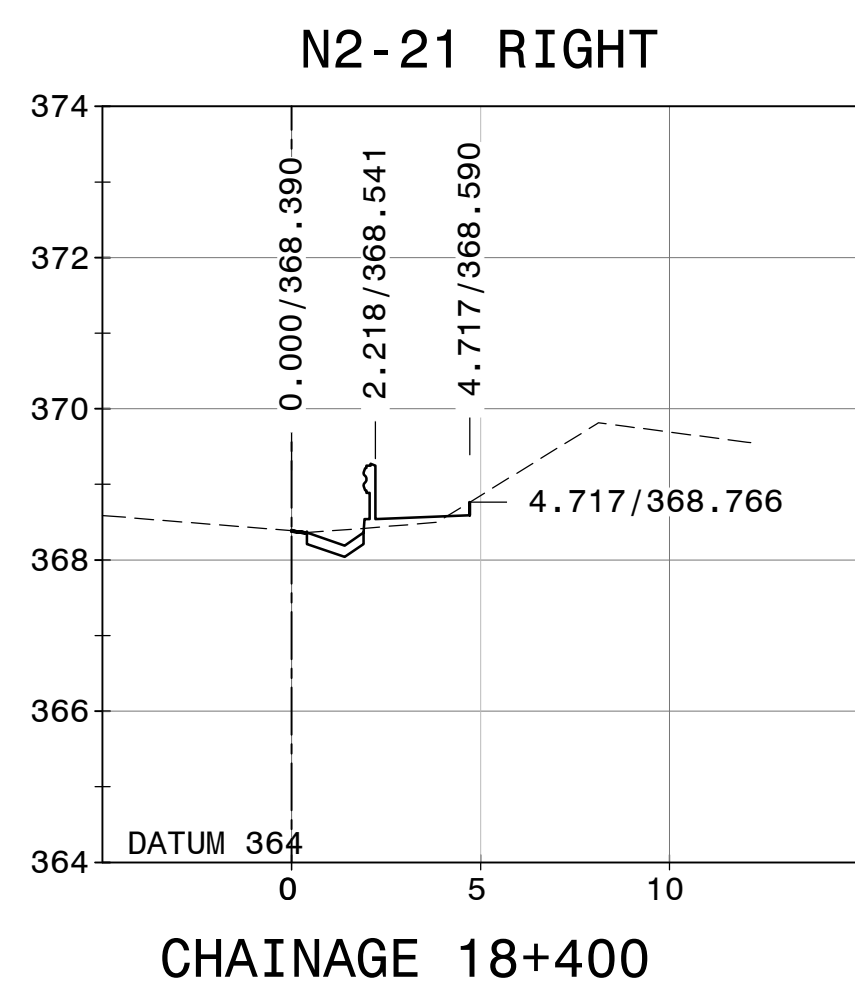
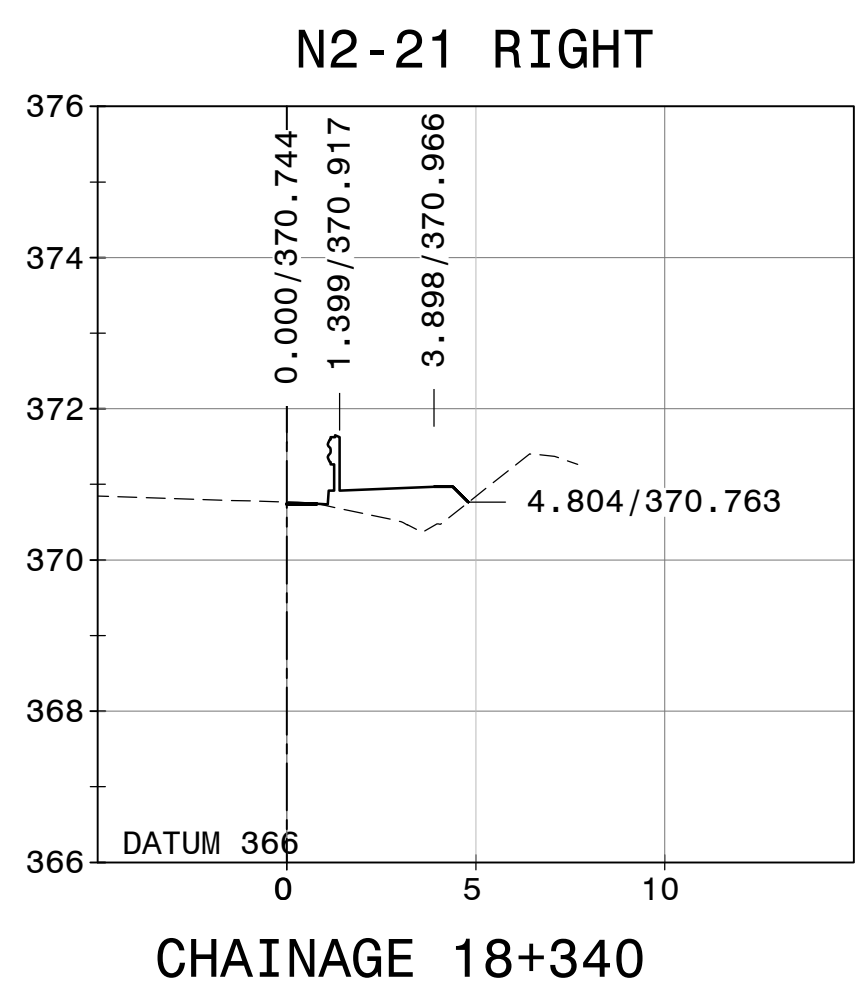
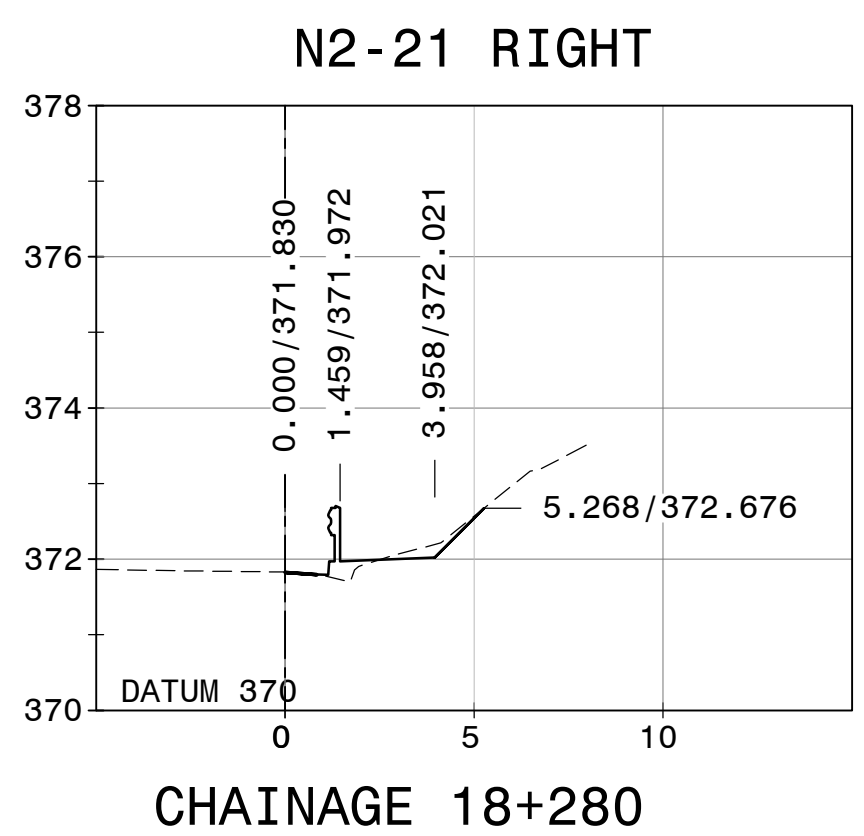
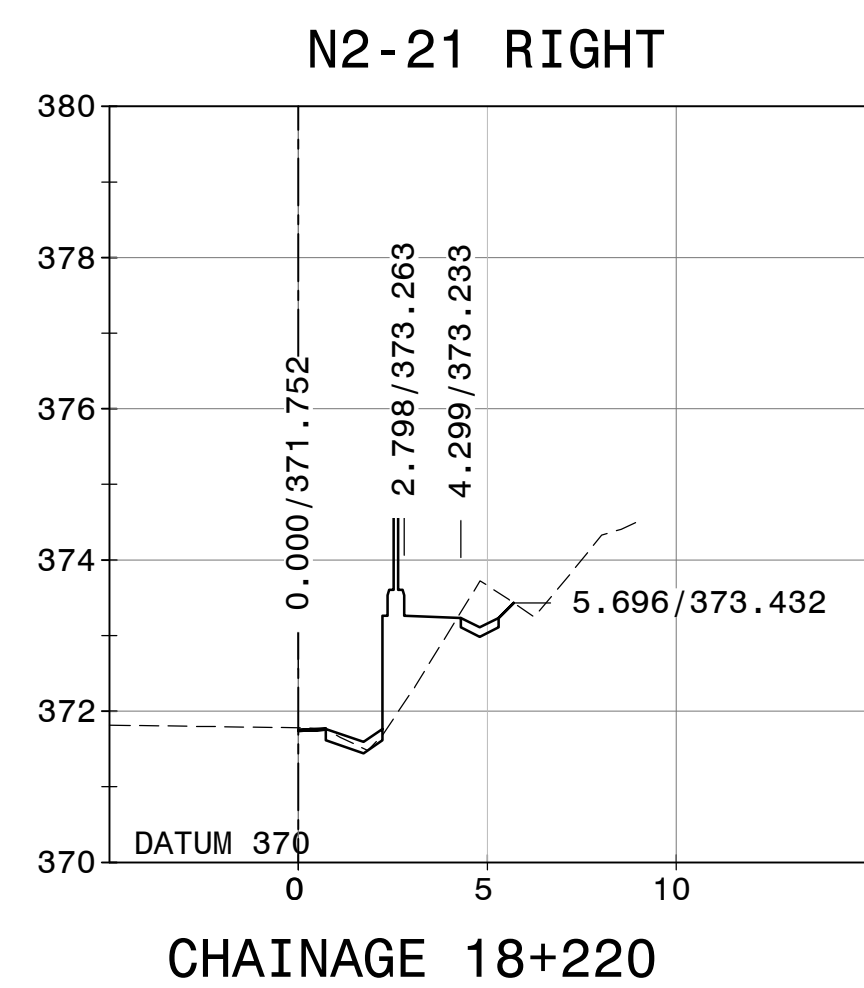
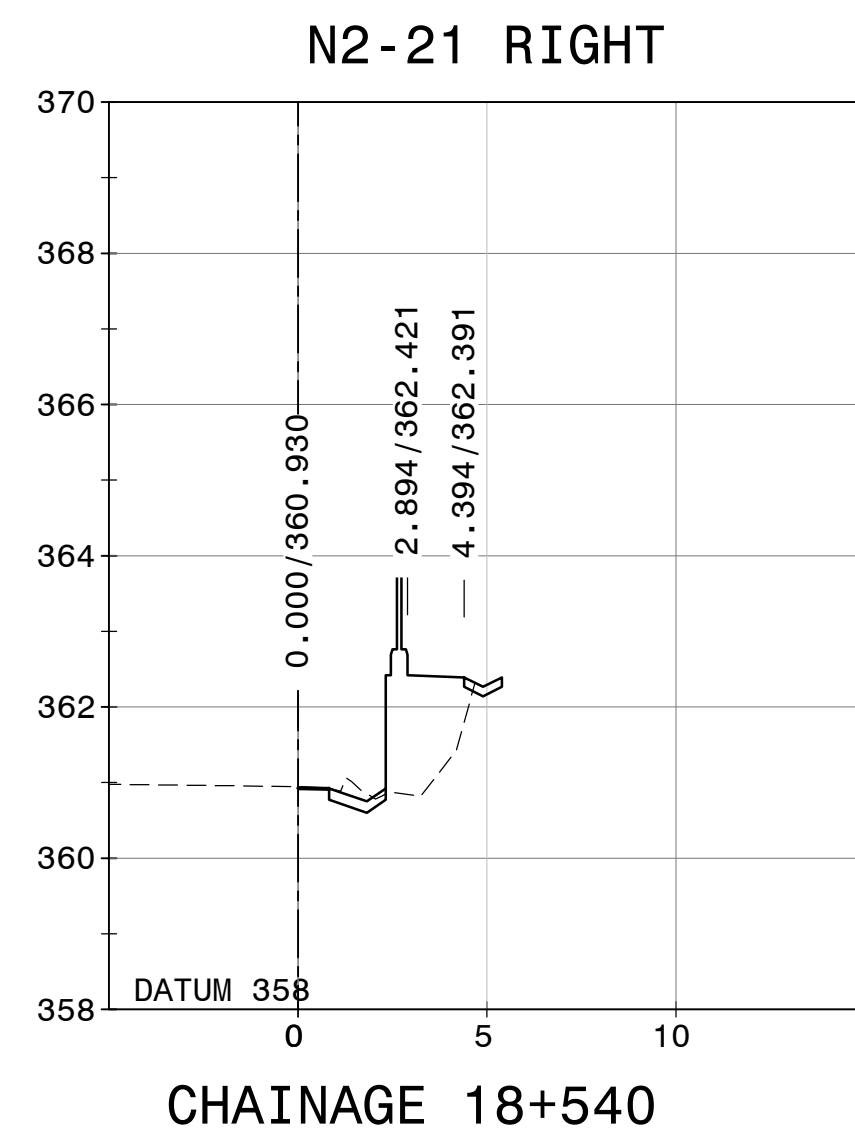
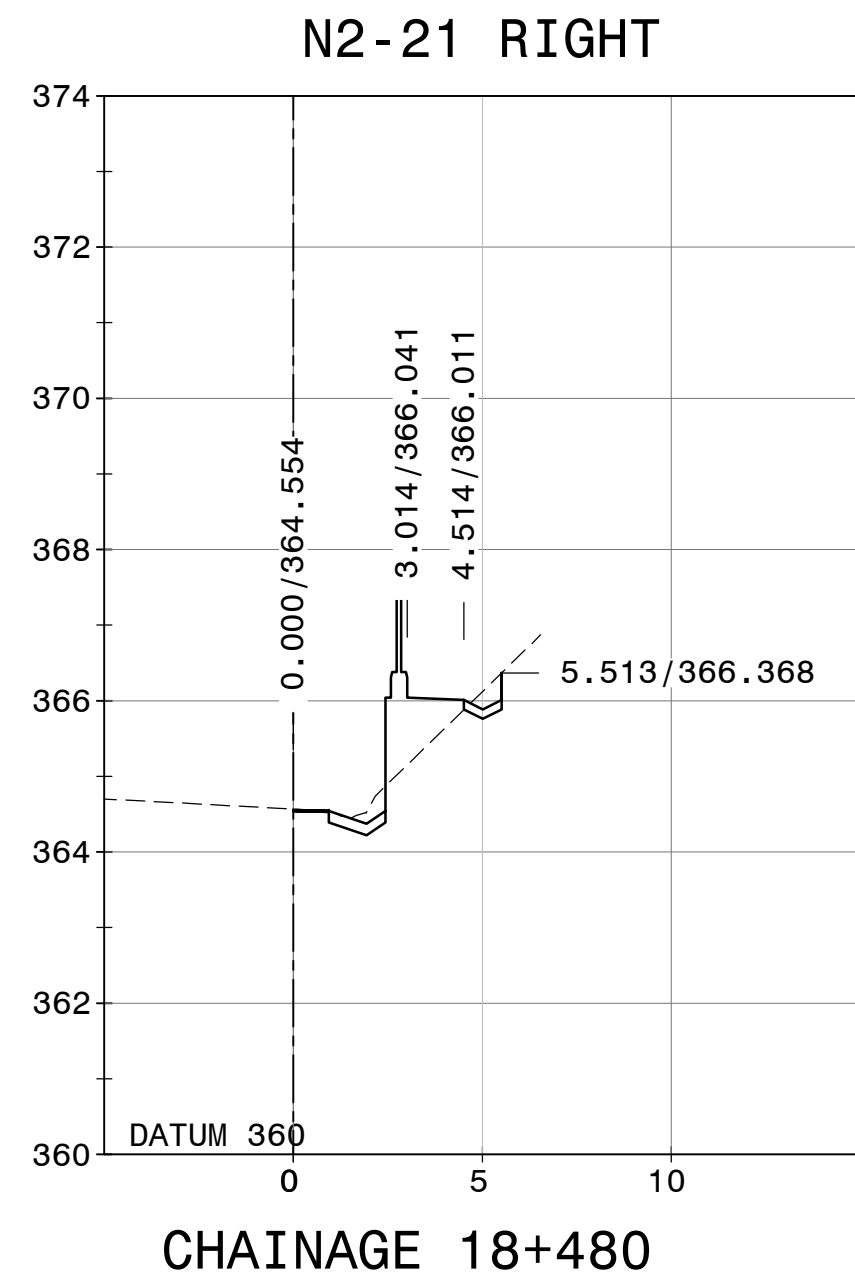
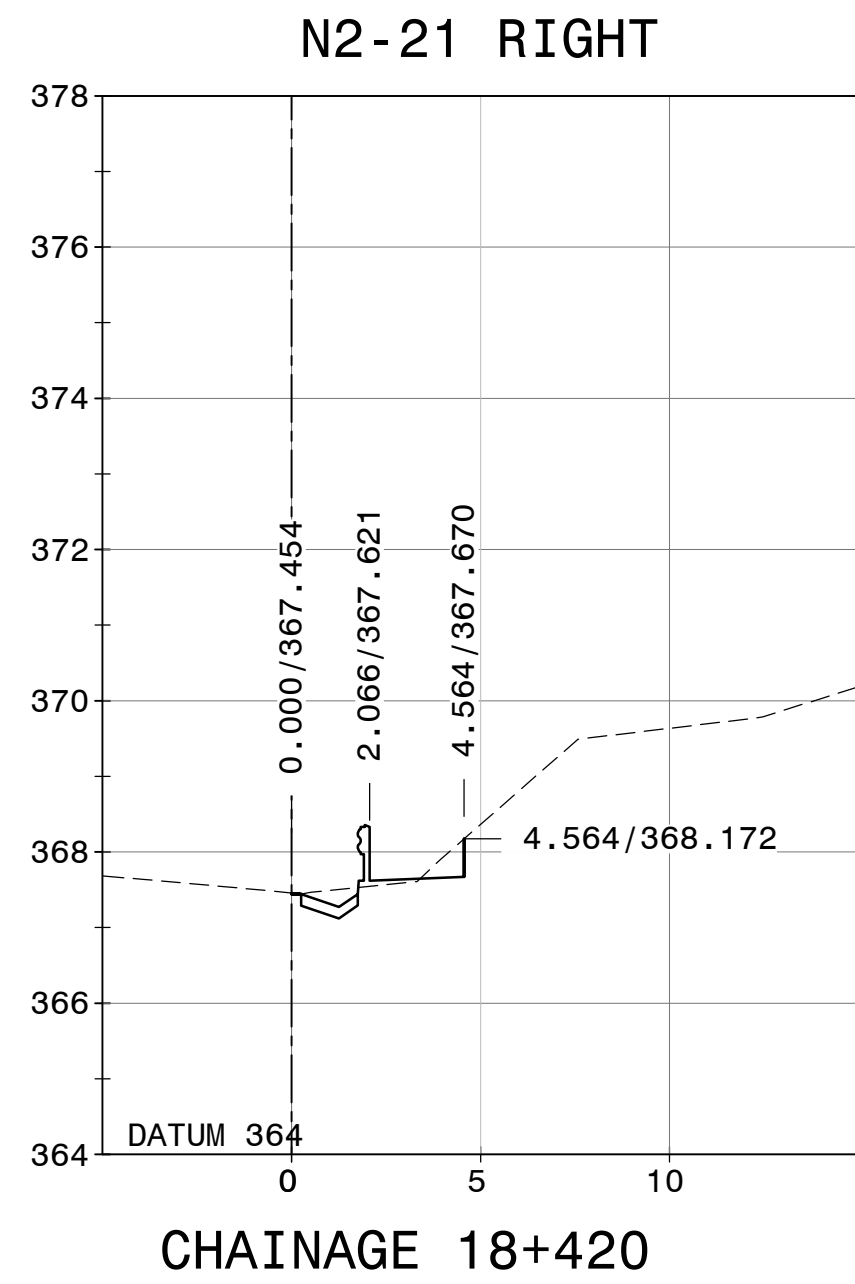
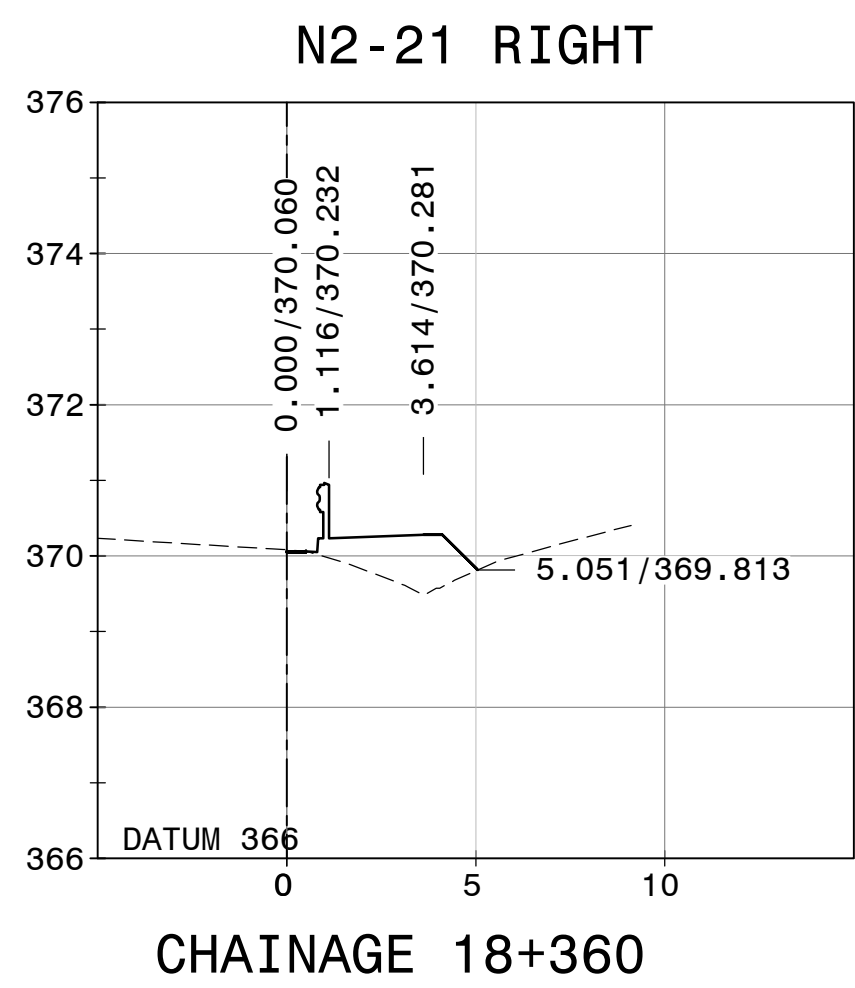
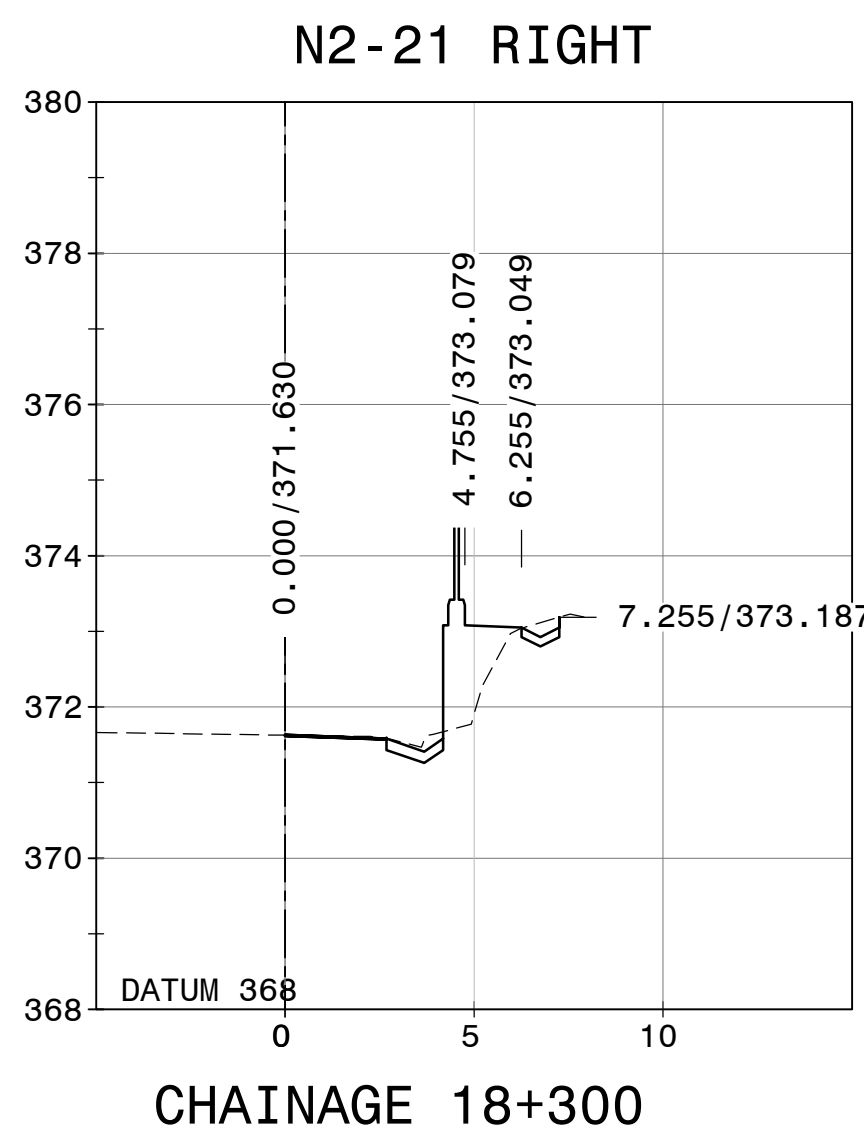
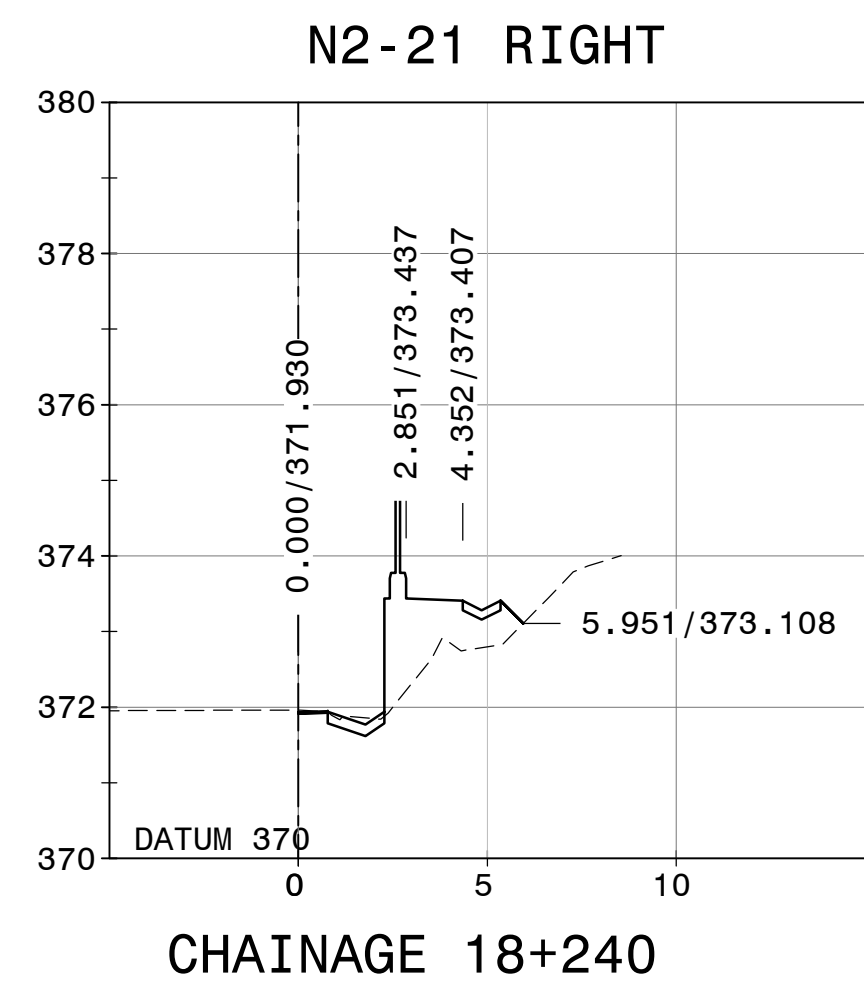
DETAIL CROSS SECTIONS
N2-22 LEFT

SCALE: 1:200

SHEET 07 OF 07

PROJECT NUMBER	NRA.C.004-099-2023/1	
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	22	22
DRAWING km DISTANCE	km 0,80	km 18,64
DRAWING TYPE	ROADS - X SECTION	
BRIDGE/STRUCTURE No.	N/A	
CONSULTANT DRAWING No.	TP1802-19-05-25-20-007A	
SANRAL DOCUMENT #	V1	

DRAWING NO. TP1802-19-05-25-20-007A



FOR TENDER PURPOSES

CONSTRUCTION RECORD			WORKS CONTRACT ENGINEER	
			Name :	
			Prof. Reg. No. :	
			Date :	
			SANRAL PROJECT MANAGER	
			Name :	
			Prof. Reg. No. :	
			Date :	
V1	SEPT 2023	ORIGINAL VERSION	S. KASIPERSAD	
No.	DATE	REVISION	CONSULT. ENG.	

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for CEO: SA NATIONAL ROADS AGENCY LTD.
Date:

PROJECT DESCRIPTION	
CONSTRUCTION OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 2, SECTION 22X FROM MTHUSI (Km 0,80) TO MURCHISON (Km 18,64)	
DRAWING DESCRIPTION	
DETAIL CROSS SECTIONS	
N2-22 RIGHT	
SCALE :	1:200
SHEET	1 OF 1

PROJECT NUMBER		NRA.C.004-099-2023/1	
DRAWING LOCATION DATA		START	END
ROUTE		N2	N2
SECTION		22	22
DRAWING km DISTANCE		km 0,80	km 18,64
DRAWING TYPE		ROADS - X SECTION	
BRIDGE/STRUCTURE No.		N/A	
CONSULTANT DRAWING No.		TP1802-19-05-25-20-008B	
SANRAL DOCUMENT #			VER V1