



BLOUBERG MUNICIPALITY

TENDER No.: -

FOR

SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE II

TENDER DRAWINGS

November 2021

ISSUED TO:

BLOUBERG MUNICIPALITY

P.o.Box 1593
SENWABARWANA
0790

Tel: (015) 505-7100
Fax: (014) 555 6636

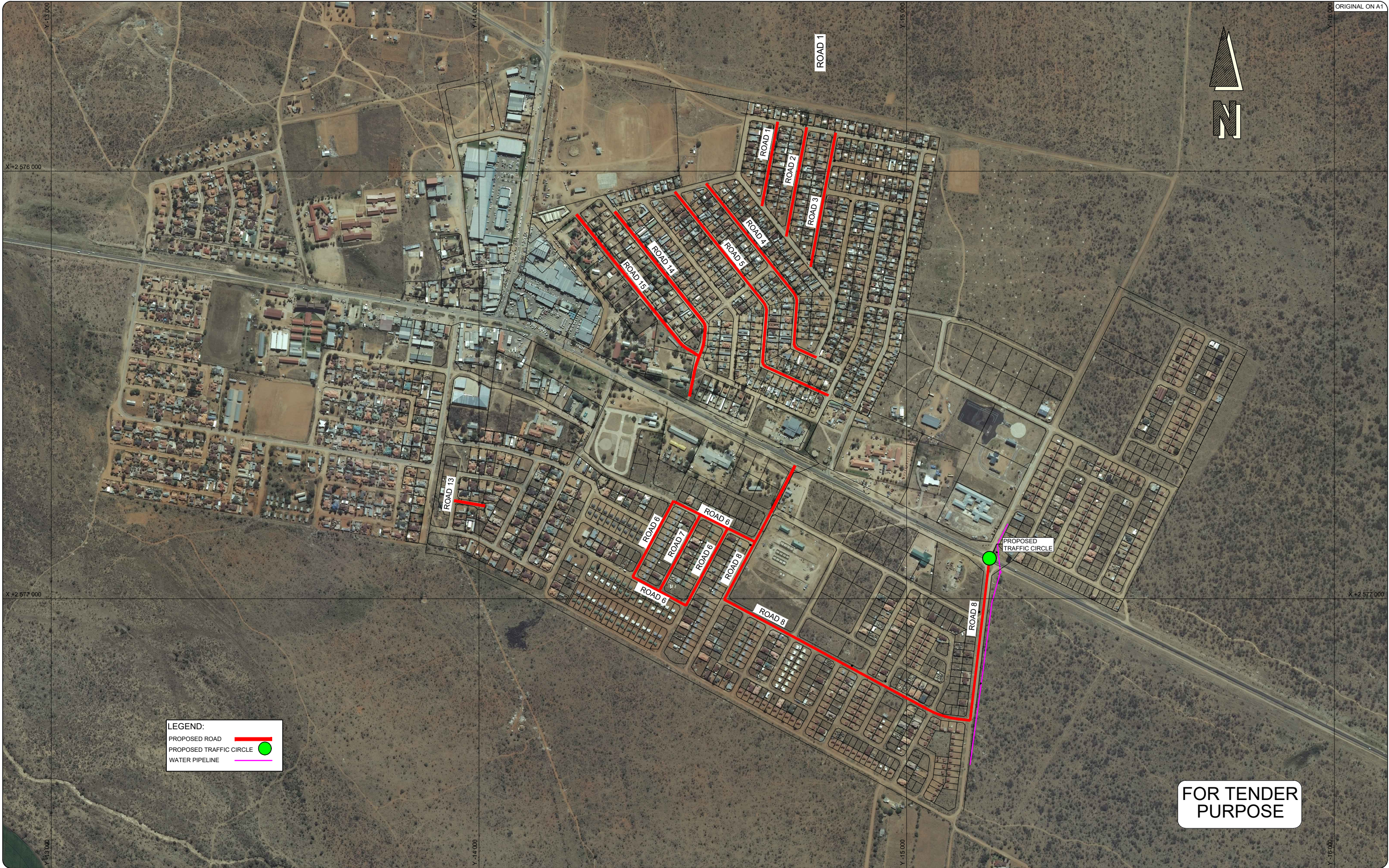
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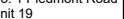
MORULA CONSULTING ENGINEERS

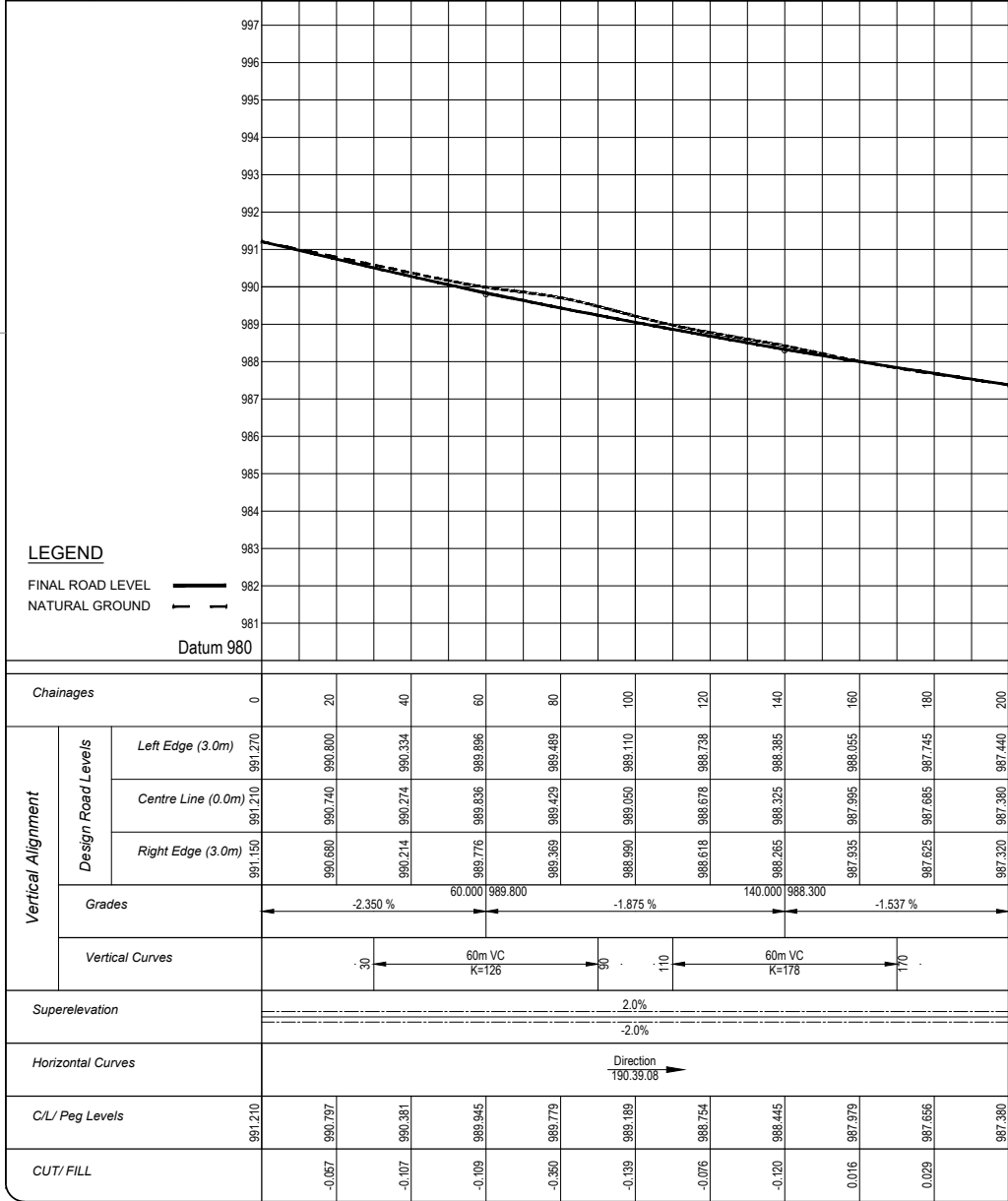
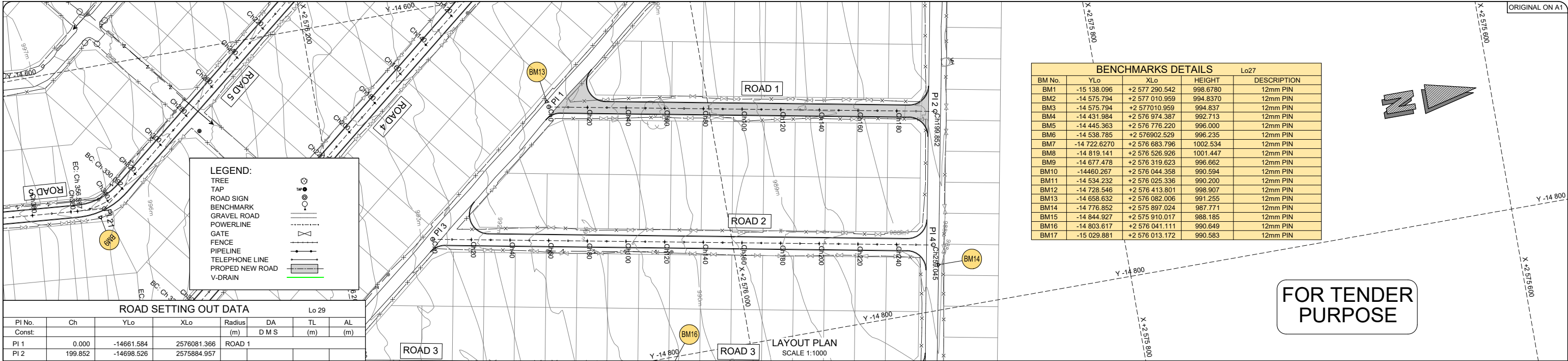


P.o.Box 2740
POLOKWANE
0700

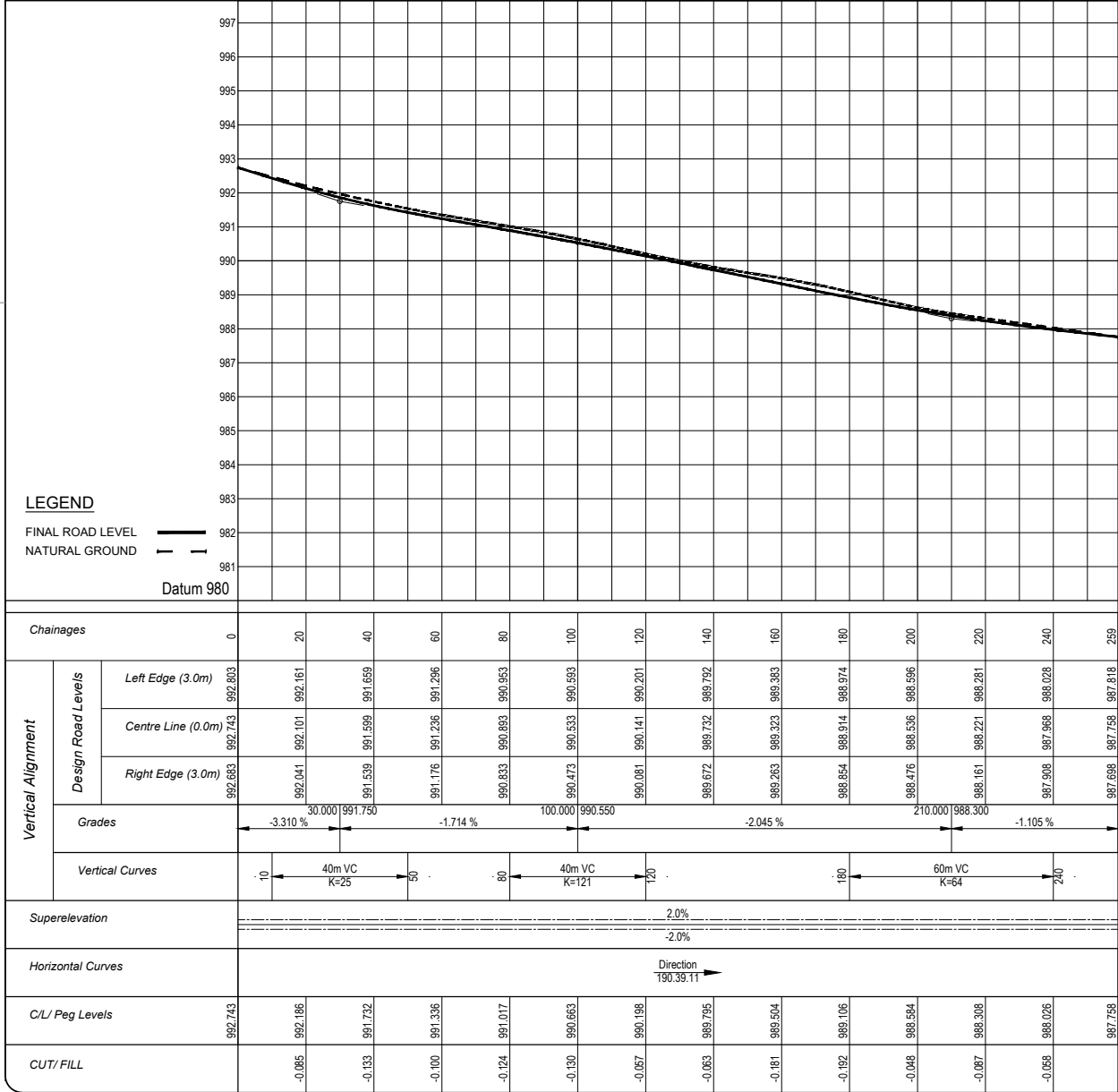
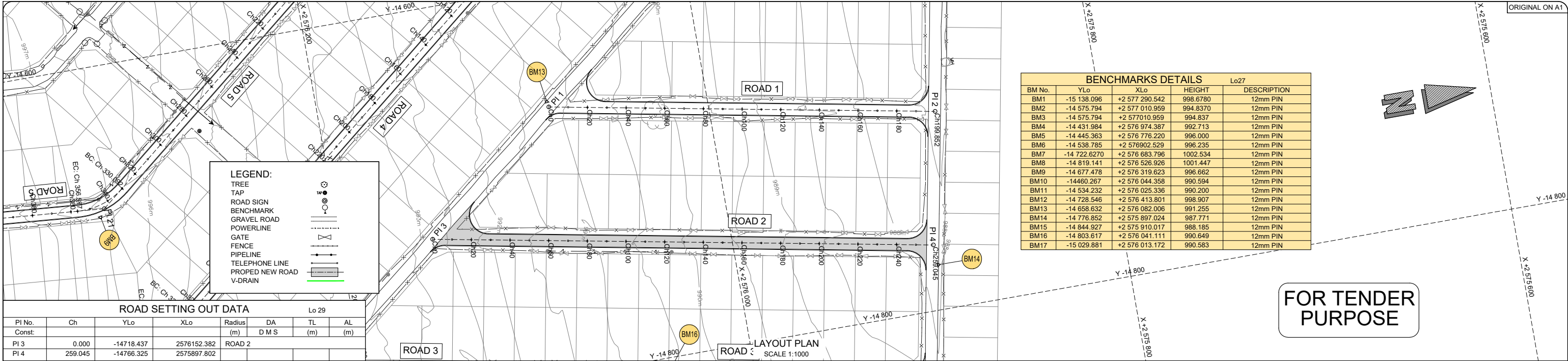
Tel: (015) 291 1161
Fax: (086) 558 6446



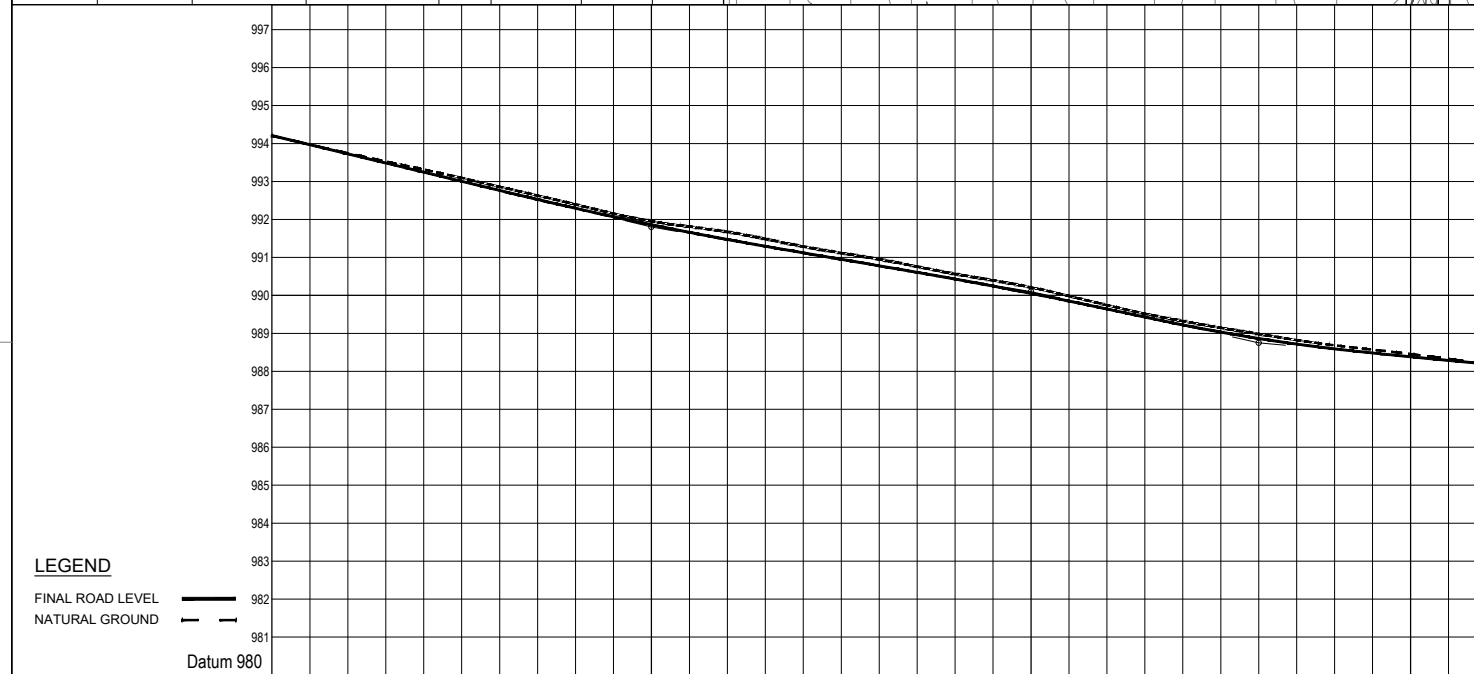
			DESIGNED BY	H.T.	 BLOUBERG MUNICIPALITY P.o. Box 1593 Senwabarwana 0790 TEL. (015) 505-7100  CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn" No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446	TENDE No.:		PROJECT STATUS: TENDER		(Full signature)		SHEET 1 OF 1	
			CHECKED BY	H.T.		SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11		SCALE 1:4000					
			DRAWN BY	F.M.		GENERAL LAYOUT PLAN		DRAWING NUMBER MC/BKM/SP11/Lp/01					
			CHECKED BY	H.T.				REVISION (A)					
01	16/11/2021	ROAD 04,05,06,07 AND ROAD 16 REMOVED			H.T.								
No	DATE	REVISION			CONSULT	DIR							

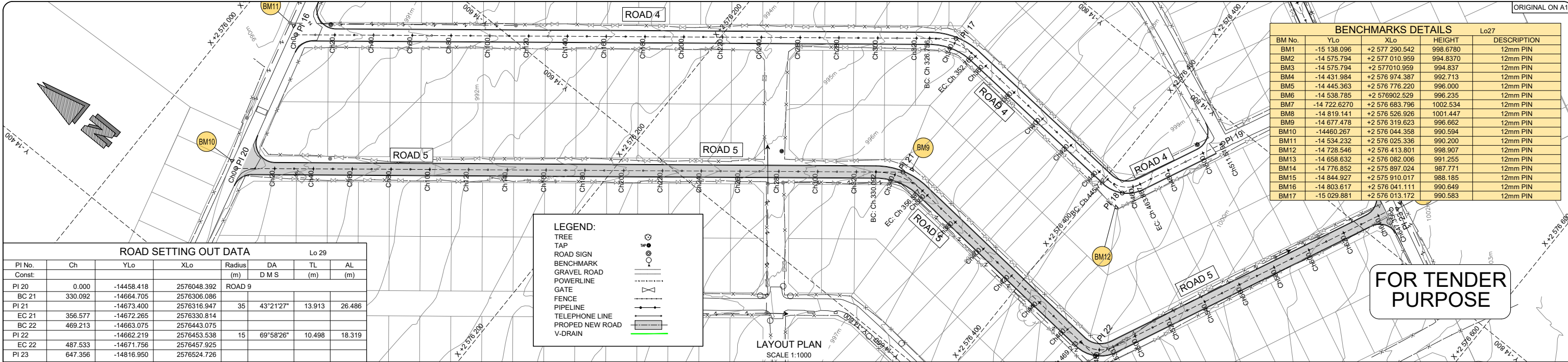


DESIGNED BY	H.T.	BLOUBERG MUNICIPALITY  P.o. Box 1593 Senwabarwana 0790 TEL. (015) 505-7100	 CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn" Tel: (072) 791 9934 Fax: (086) 558 6446	No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446	 BLM CONSULTING ENGINEER	 DATE	TENDE No.:	PROJECT STATUS: TENDER	(Full signature)	SHEET 1 OF 1
CHECKED BY	H.T.						SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11	SCALE	AS SHOWN	
DRAWN BY	F.M.							DRAWING NUMBER	REVISION	
CHECKED BY	H.T.						ROAD 1 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 199,852	MC/BKM/SP11/Ls/01	①	



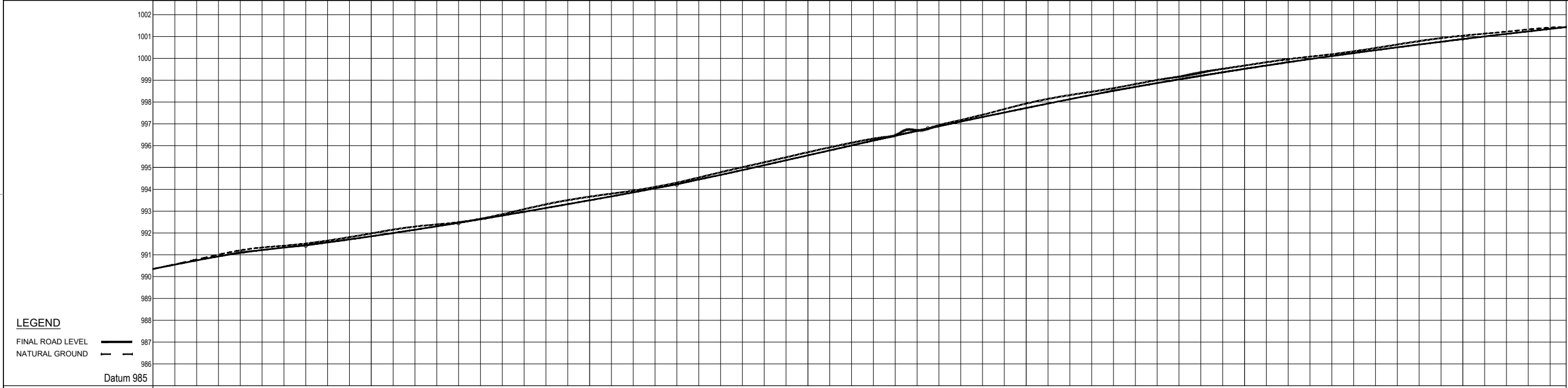
DESIGNED BY		H.T.		BLOUBERG MUNICIPALITY		No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446		TENDE No.:		PROJECT STATUS: TENDER		(Full signature)		SHEET 1 OF 1	
CHECKED BY		H.T.		BLOUBERG MUNICIPALITY		P.o. Box 1593 Senwabarwana 0790 TEL. (015) 505-7100		BLM		DATE		SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11		SCALE	
DRAWN BY		F.M.		BLOUBERG MUNICIPALITY		CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"		CONSULTING ENGINEER		DATE		DRAWING NUMBER MC/BKM/SP11/Ls/02		AS SHOWN	
CHECKED BY		H.T.		BLOUBERG MUNICIPALITY		"a new dawn"		CONSULTING ENGINEER		DATE		DRAWING NUMBER MC/BKM/SP11/Ls/02		REVISION ①	
No		DATE		REVISION		CONSULT		DIR							

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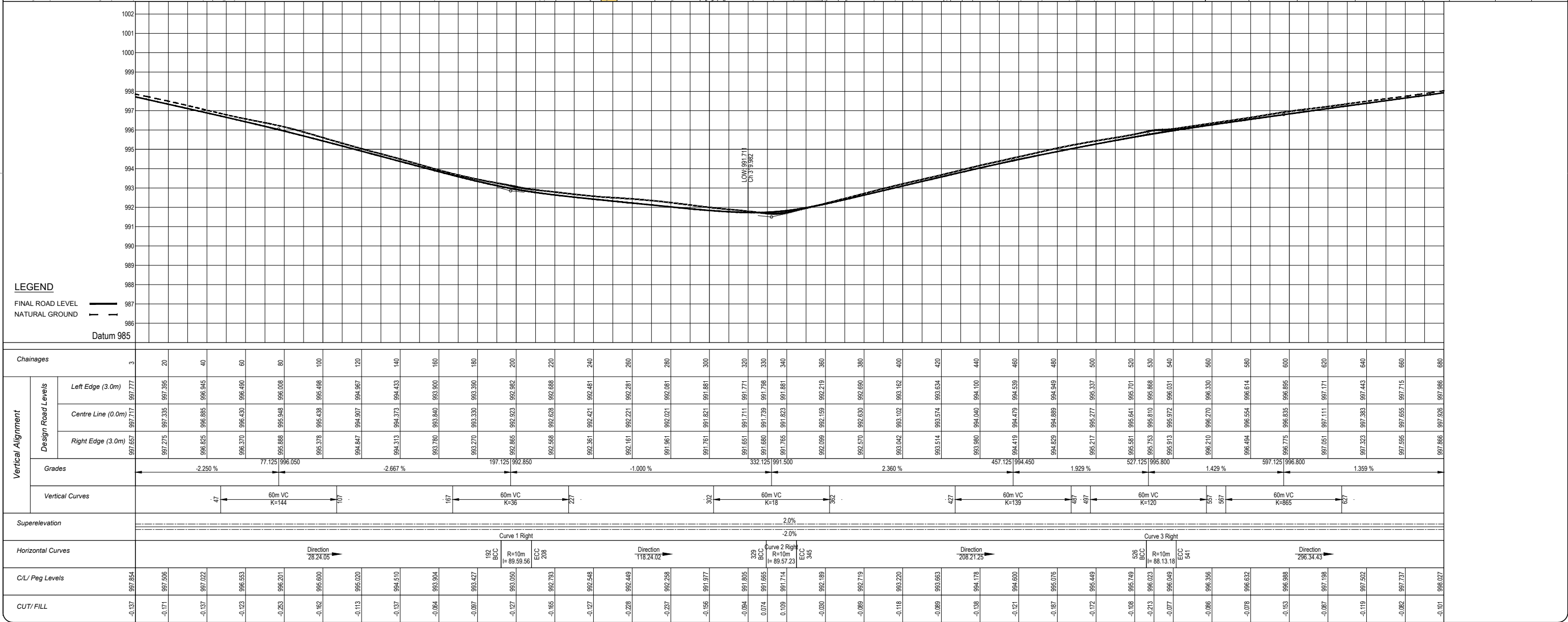
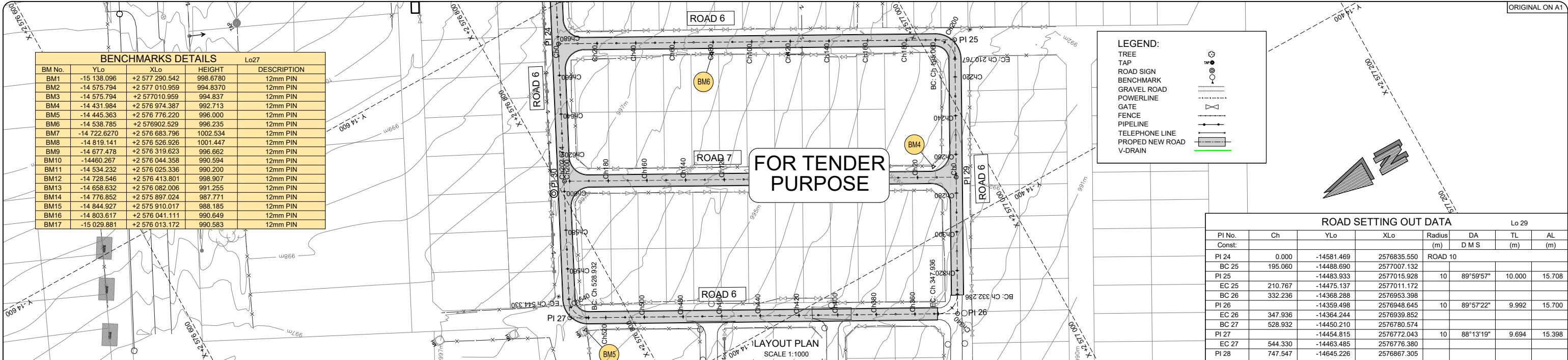


ROAD SETTING OUT DATA							
PI No.	Ch	YLo	XLo	Radius (m)	DA D M S	TL (m)	AL (m)
PI 20	0.000	-14458.418	2576048.392	ROAD 9			
BC 21	330.092	-14664.705	2576306.086				
PI 21		-14673.400	2576316.947	35	43°21'27"	13.913	26.486
EC 21	356.577	-14672.265	2576330.814				
BC 22	469.213	-14663.075	2576443.075				
PI 22		-14662.219	2576453.538	15	69°58'26"	10.498	18.319
EC 22	487.533	-14671.756	2576457.925				
PI 23	647.356	-14816.950	2576524.726				

BENCHMARKS DETAILS					Lo27
BM No.	YLo	XLo	HEIGHT	DESCRIPTION	
BM1	-15 138.096	+2 577 290.542	998.6780	12mm PIN	
BM2	-14 575.794	+2 577 010.959	994.8370	12mm PIN	
BM3	-14 575.794	+2 577 010.959	994.837	12mm PIN	
BM4	-14 431.984	+2 576 974.387	992.713	12mm PIN	
BM5	-14 445.363	+2 576 776.220	996.000	12mm PIN	
BM6	-14 538.785	+2 576 902.529	996.235	12mm PIN	
BM7	-14 722.6270	+2 576 683.796	1002.534	12mm PIN	
BM8	-14 819.141	+2 576 526.926	1001.447	12mm PIN	
BM9	-14 677.478	+2 576 319.623	996.662	12mm PIN	
BM10	-14460.267	+2 576 044.358	990.594	12mm PIN	
BM11	-14 534.232	+2 576 025.336	990.200	12mm PIN	
BM12	-14 728.546	+2 576 413.801	998.907	12mm PIN	
BM13	-14 658.632	+2 576 082.006	991.255	12mm PIN	
BM14	-14 776.852	+2 575 897.024	987.771	12mm PIN	
BM15	-14 844.927	+2 575 910.017	988.185	12mm PIN	
BM16	-14 803.617	+2 576 041.111	990.649	12mm PIN	
BM17	-15 029.881	+2 576 013.172	990.583	12mm PIN	



Chainages		0																																
Vertical Alignment	Design Road Levels	Left Edge (3.0m)																																
		Centre Line (0.0m)																																
		Right Edge (3.0m)																																
	Grades	1.995 %																																
	Vertical Curves	30 20m VC K=17 40m VC K=61 90 110 60m VC K=219 170 210 60m VC K=120 270 325 60m VC K=297 385 410 60m VC K=138 470 490 60m VC K=192 550 570 60m VC K=325 630																																
	Superelevation	2.0% 2.0%																																
Horizontal Curves		Direction 321.19.20 Curve 1 Right R=35m T= 63.21.27 ECC 357 Direction 4.40.47 Curve 2 Left R=15m T= 69.58.25 ECC 488 Direction 294.42.22																																
C/L Peg Levels		990.352 990.763 991.293 991.394 991.628 991.976 992.334 992.445 992.836 993.340 993.675 993.922 994.279 994.795 995.229 995.705 996.138 996.517 996.842 997.112 997.327 997.487 997.592 997.642 997.647 997.607 997.522 997.392 997.217 996.997 996.737 996.387 995.937 995.387 994.837 994.287 993.737 993.187 992.637 992.087 991.537 990.987 990.437 990.000																																
CUT/ FILL		-0.012 -0.172 -0.069 -0.071 -0.139 -0.189 0.016 -0.042 -0.196 -0.179 -0.070 -0.041 -0.139 -0.125 -0.148 -0.129 0.067 0.019 -0.069 -0.075 -0.240 -0.197 -0.083 -0.157 -0.112 -0.150 -0.143 -0.155 -0.067 -0.087 -0.171 -0.170 -0.084 -0.092																																



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BM4	-14 431.984	+2 576 974.387	992.713	12mm PIN
BM5	-14 445.363	+2 576 776.220	996.000	12mm PIN
BM6	-14 538.785	+2 576902.529	996.235	12mm PIN
BM7	-14 722.6270	+2 576 683.796	1002.534	12mm PIN
BM8	-14 819.141	+2 576 526.926	1001.447	12mm PIN
BM9	-14 677.478	+2 576 319.623	996.662	12mm PIN
BM10	-14460.267	+2 576 044.358	990.594	12mm PIN
BM11	-14 534.232	+2 576 025.336	990.200	12mm PIN
BM12	-14 728.546	+2 576 413.801	998.907	12mm PIN
BM13	-14 658.632	+2 576 082.006	991.255	12mm PIN
BM14	-14 776.852	+2 575 897.024	987.771	12mm PIN
BM15	-14 844.927	+2 575 910.017	988.185	12mm PIN
BM16	-14 803.617	+2 576 041.111	990.649	12mm PIN
BM17	-15 029.881	+2 576 013.172	990.583	12mm PIN

ROAD SETTING OUT DATA

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 29	0.000	-14421.484	2576982.161	ROAD 11			
PI 30	202.674	-14517.879	2576803.878				

LEGEND:

- TREE
- TAP
- ROAD SIGN
- BENCHMARK
- GRAVEL ROAD
- POWERLINE
- GATE
- FENCE
- PIPELINE
- TELEPHONE LINE
- PROPED NEW ROAD
- V-DRAIN

FOR TENDER PURPOSE

LAYOUT PLAN
SCALE 1:1000

BENCHMARK DETAILS

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ROAD SETTING OUT DATA

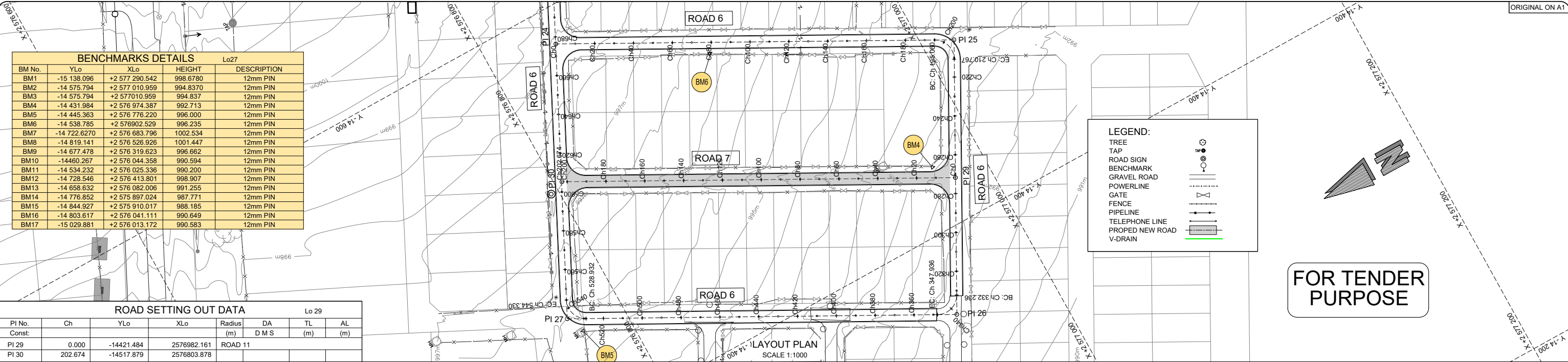
PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
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LAYOUT PLAN
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FOR TENDER PURPOSE

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SCALE 1:1000

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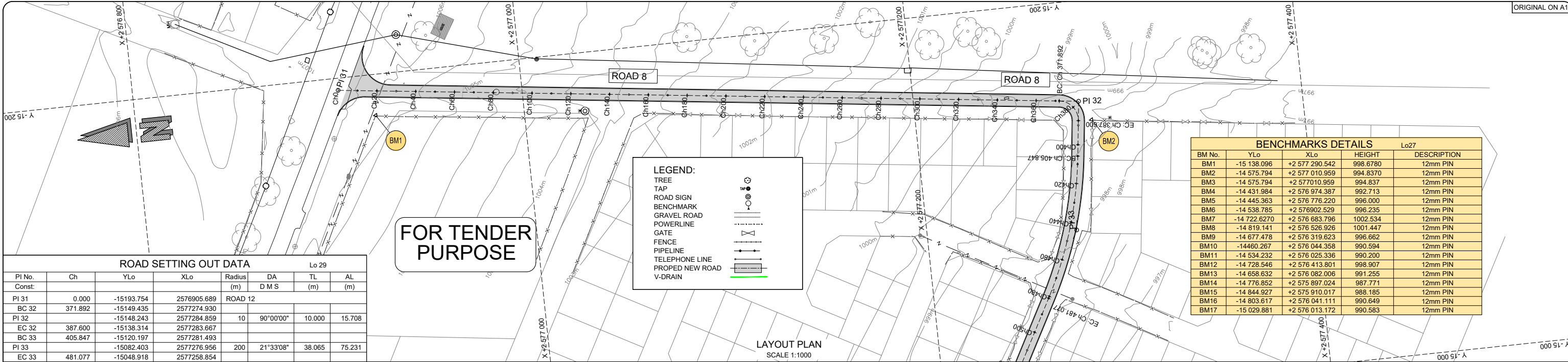
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PI 30	202.674	-14517.879	2576803.878				

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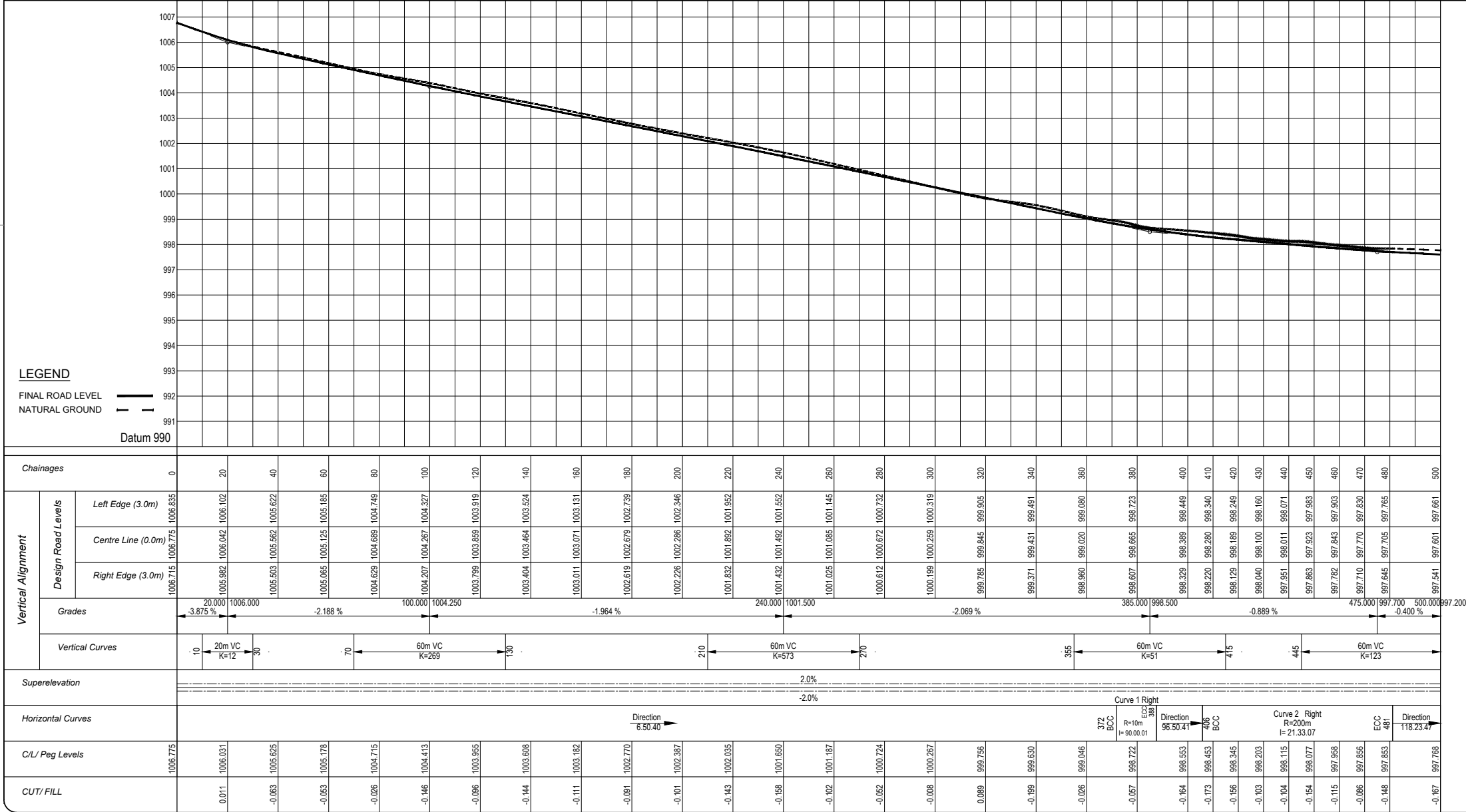
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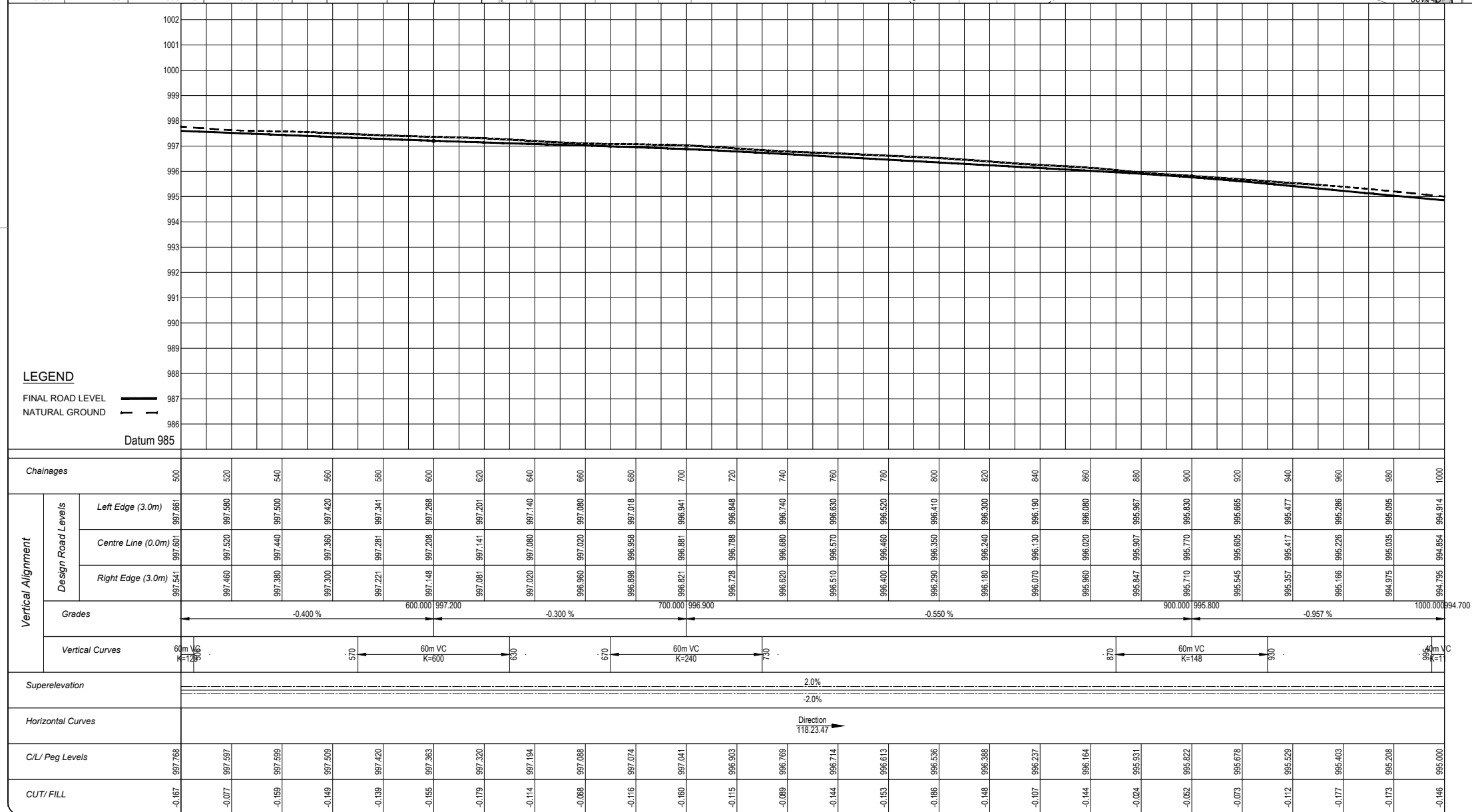
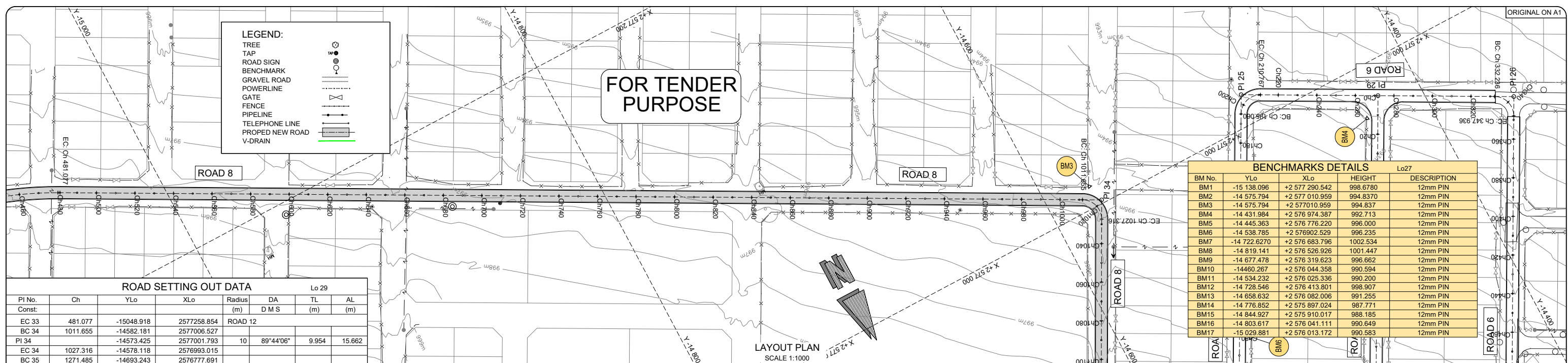
LAYOUT PLAN
SCALE 1:1000

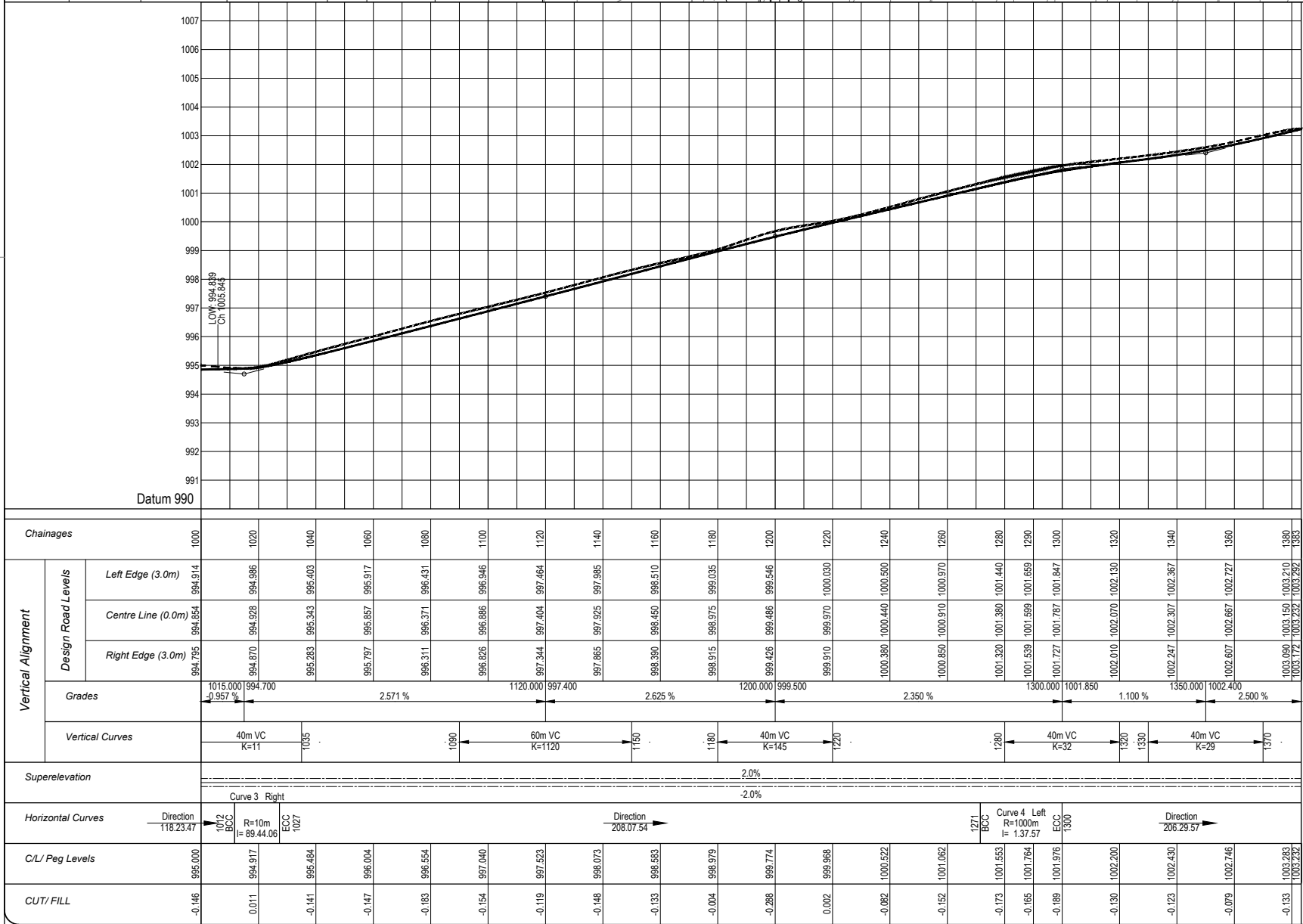
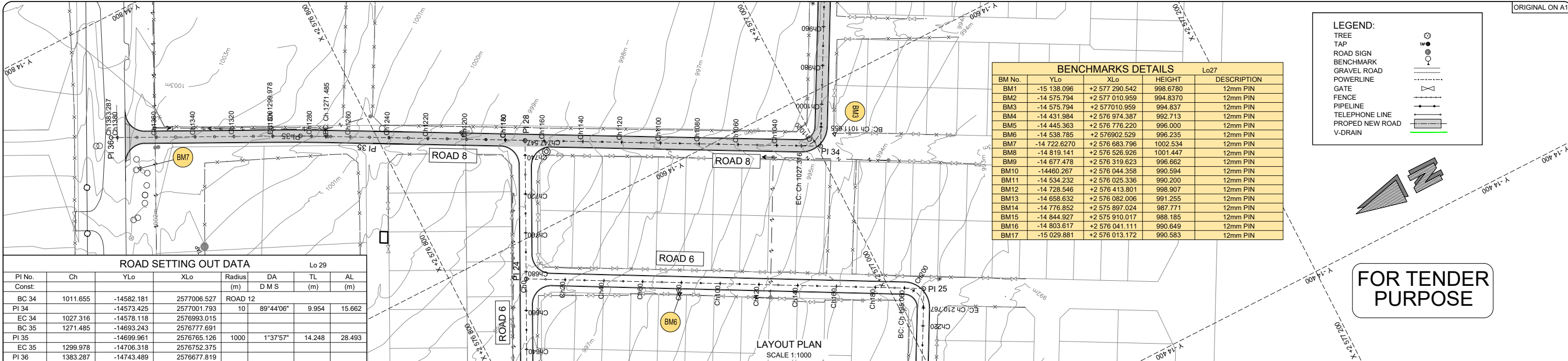


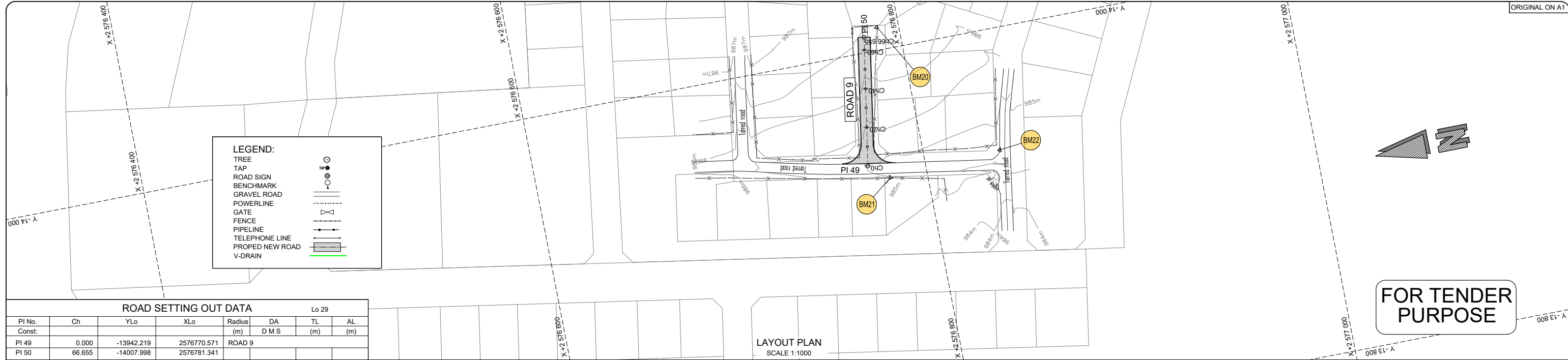
ROAD SETTING OUT DATA							
PI No.	Ch	YLo	XLo	Radius (m)	DA D M S	TL (m)	AL (m)
PI 31	0.000	-15193.754	2576905.689	ROAD 12			
BC 32	371.892	-15149.435	2577274.930				
PI 32		-15148.243	2577284.859	10	90°00'00"	10.000	15.708
EC 32	387.600	-15138.314	2577283.667				
BC 33	405.847	-15120.197	2577281.493				
PI 33		-15082.403	2577276.956	200	21°33'08"	38.065	75.231
EC 33	481.077	-15048.918	2577258.854				



DESIGNED BY H.T.				BLOUBERG MUNICIPALITY				No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446				TENDE No.:				PROJECT STATUS: TENDER				(Full signature)				SHEET 1 OF 3			
CHECKED BY H.T.												SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11												SCALE			
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CHECKED BY H.T.																								REVISION			
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																								REVISION			
																								0			

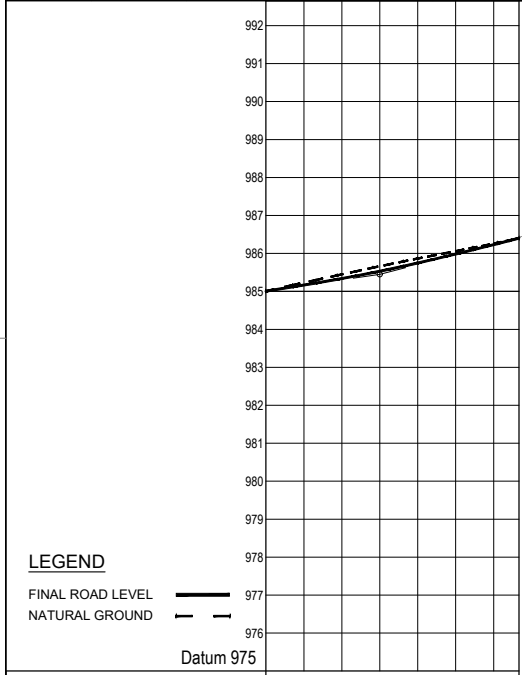
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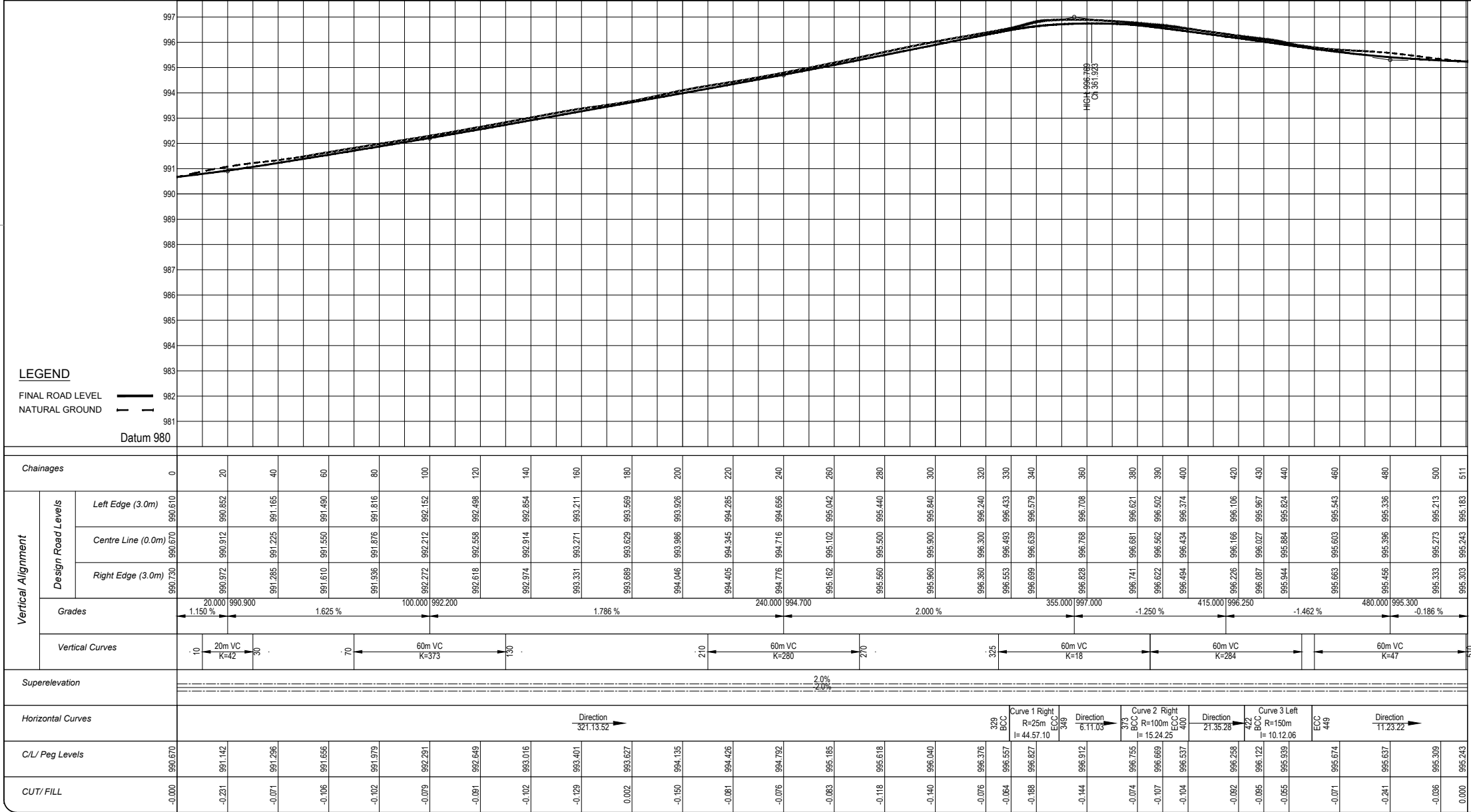
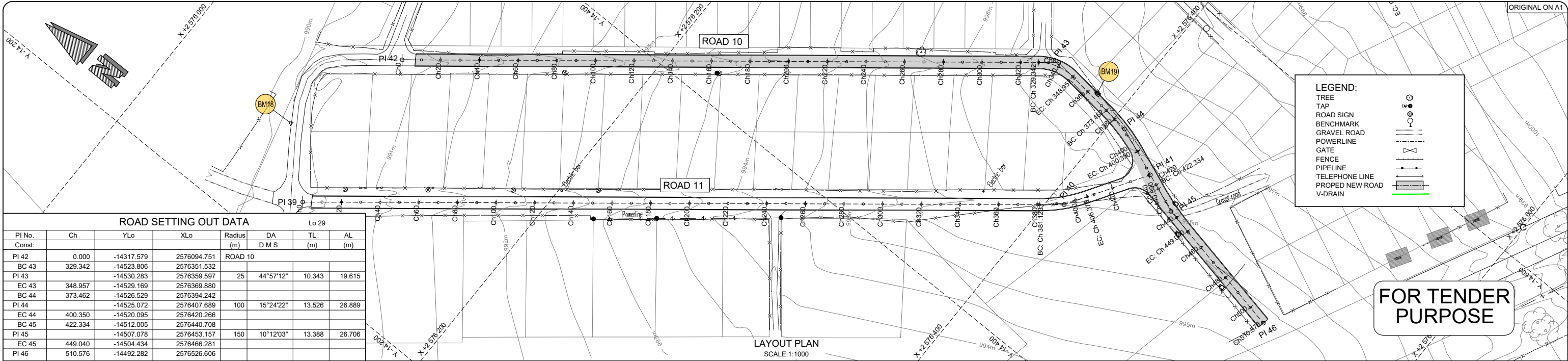


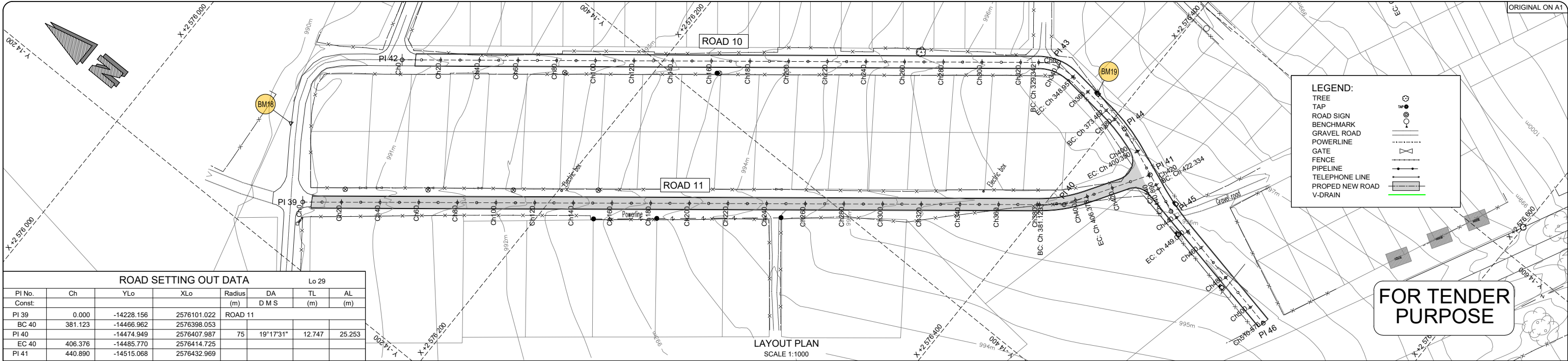
ROAD SETTING OUT DATA							Lo 29	
PI No.	Ch	YLo	XLo	Radius	DA	TL	AL	
Const:				(m)	D M S	(m)	(m)	
PI 49	0.000	-13942.219	2576770.571	ROAD 9				
PI 50	66.655	-14007.998	2576781.341					

LAYOUT PLAN
SCALE 1:1000

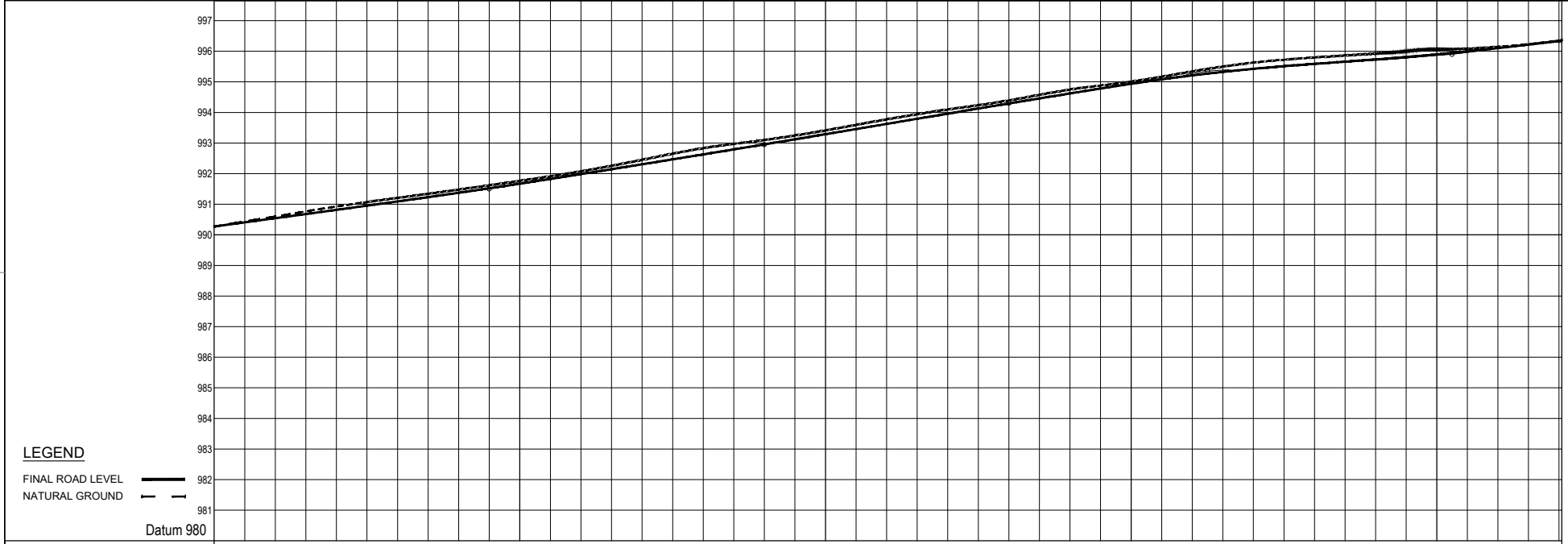


Chainages			0	20	40	60	67
Vertical Alignment	Design Road Levels	Left Edge (3.0m)	985.037	985.256	985.664	986.169	
		Centre Line (0.0m)	985.007	985.316	985.724	986.229	
		Right Edge (3.0m)	984.977	985.376	985.784	986.289	
	Grades	30.000 1.477 % 2.597 %					
	Vertical Curves	10 40m VC K=36 50					
	Superelevation	2.0% -2.0%					
Horizontal Curves	Direction 279.17.55						
C/L/ Peg Levels	985.007	985.456	985.877	986.251	986.402		
CUT/ FILL	985.007	985.316	985.724	986.229	986.402		

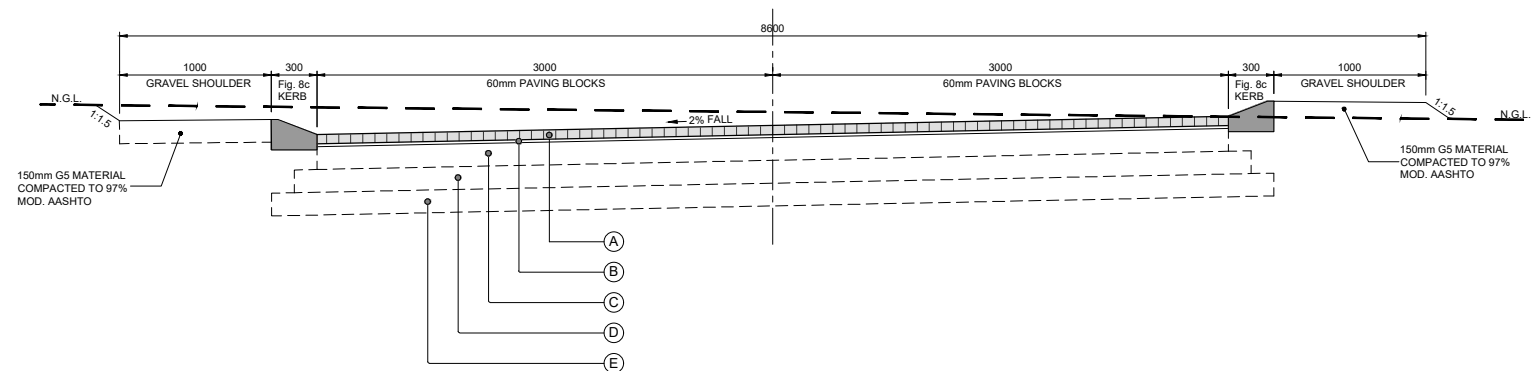




ROAD SETTING OUT DATA							
PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 39	0.000	-14228.156	2576101.022	ROAD 11			
BC 40	381.123	-14466.962	2576398.053				
PI 40		-14474.949	2576407.987	75	19°17'31"	12.747	25.253
EC 40	406.376	-14485.770	2576414.725				
PI 41	440.890	-14515.068	2576432.969				

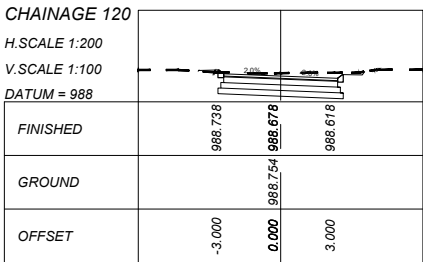
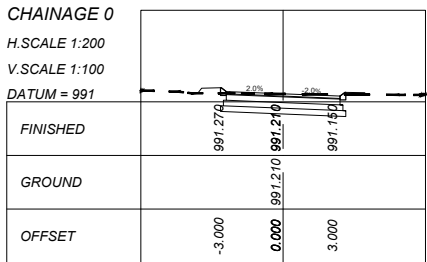
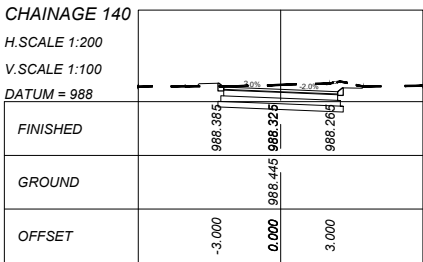
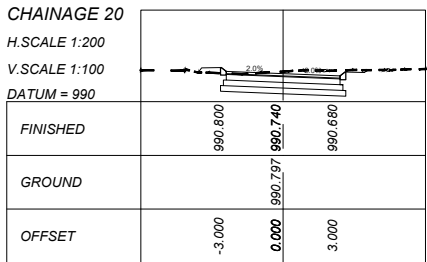
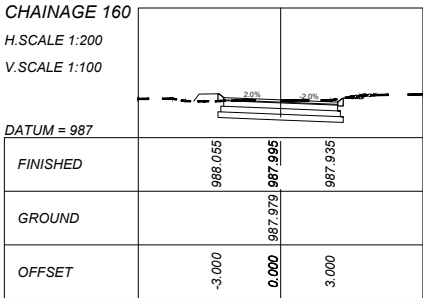
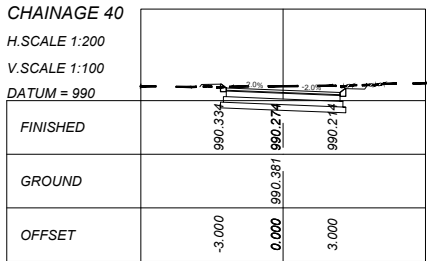
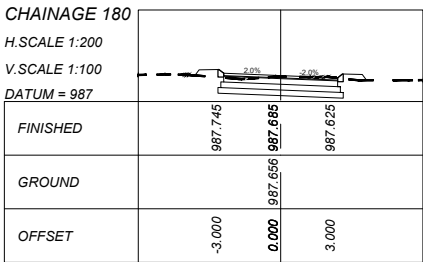
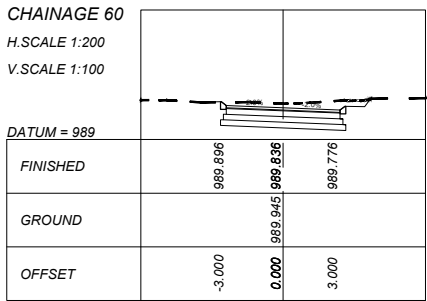
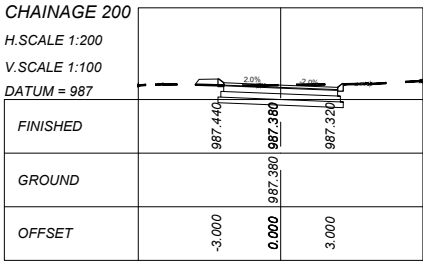
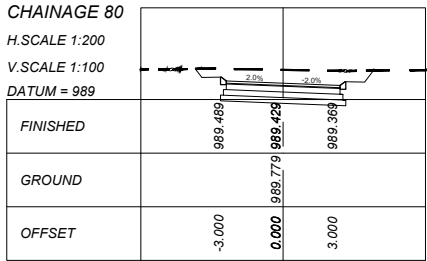
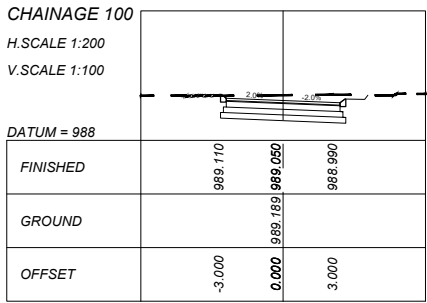


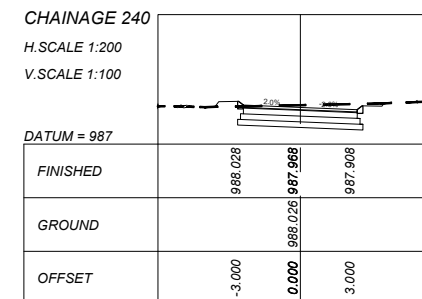
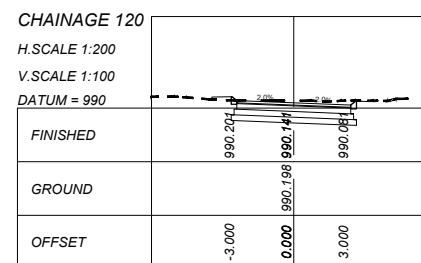
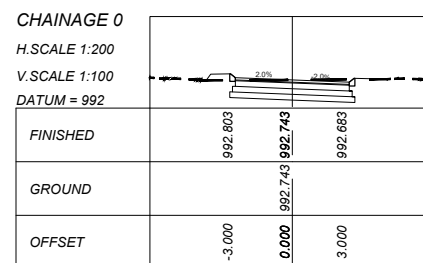
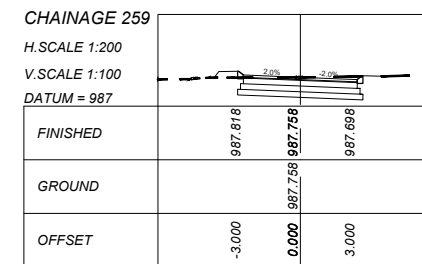
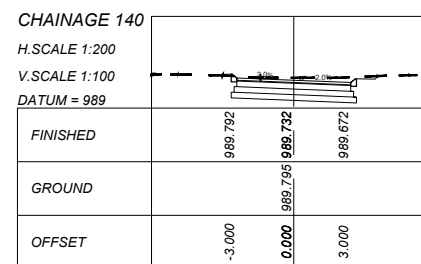
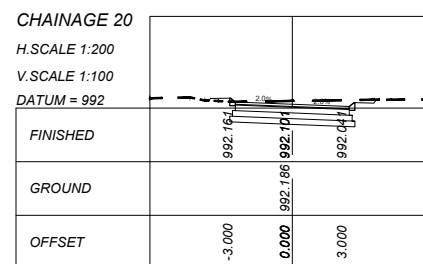
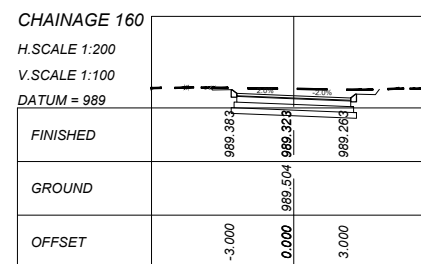
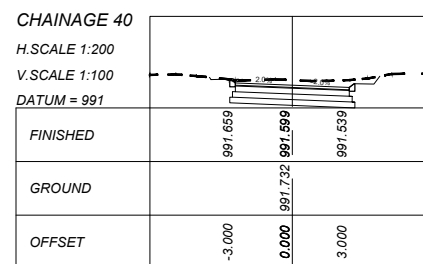
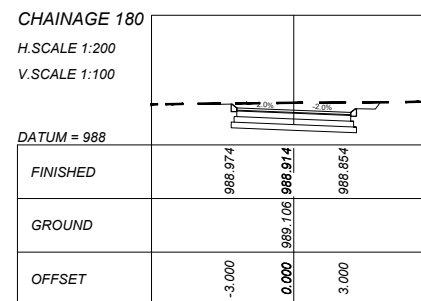
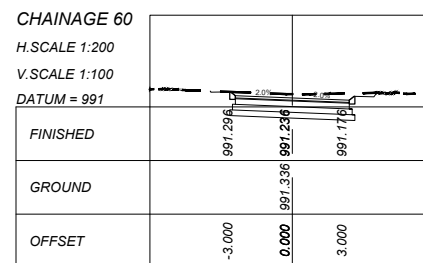
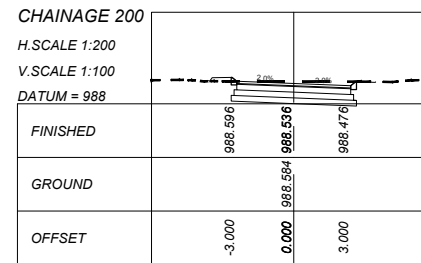
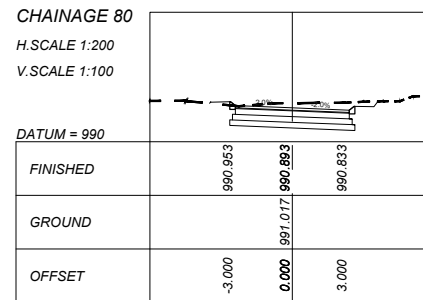
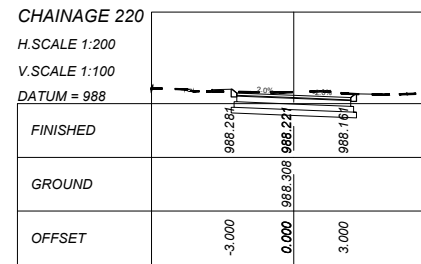
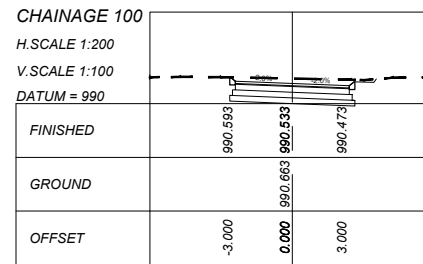
Chainages		0																							
Vertical Alignment	Design Road Levels	Left Edge (3.0m)																							
		Centre Line (0.0m)																							
		Right Edge (3.0m)																							
	Grades	1.366 %																							
	Vertical Curves	60m VC K=244																							
		60m VC K=785																							
Superelevation		2.0 %																							
Horizontal Curves		Direction 321.12.05																							
C/L Peg Levels		381 BCC																							
CUT/ FILL		Curve 1 Left R=75m T=19.17.28																							
		ECC Direction 301.54.38																							



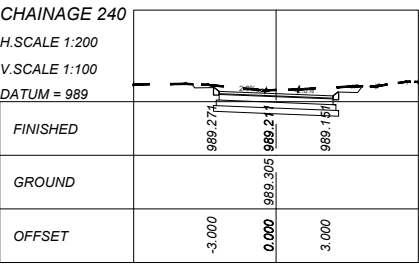
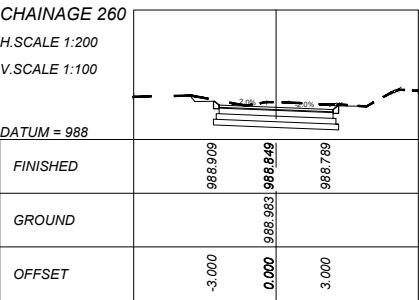
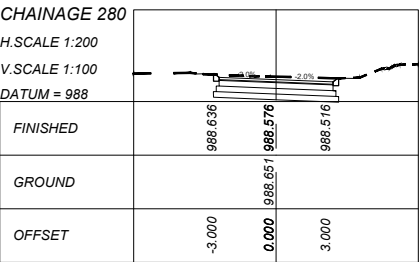
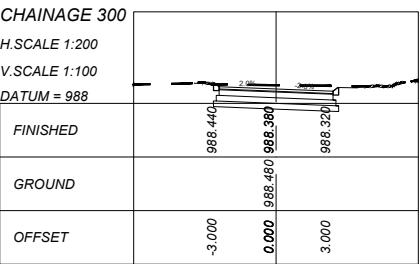
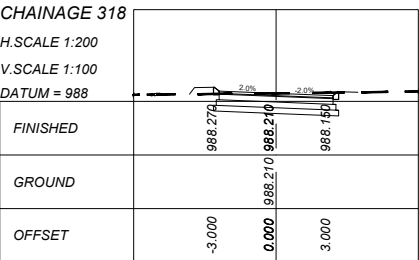
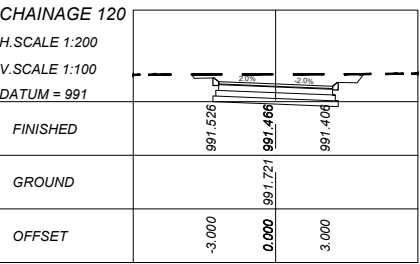
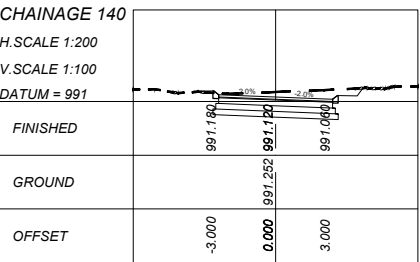
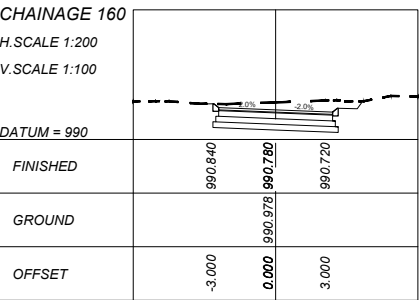
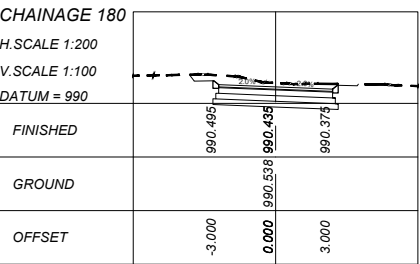
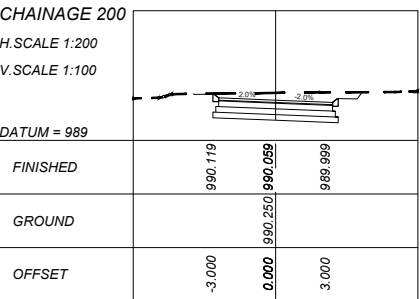
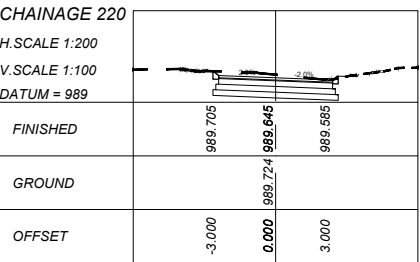
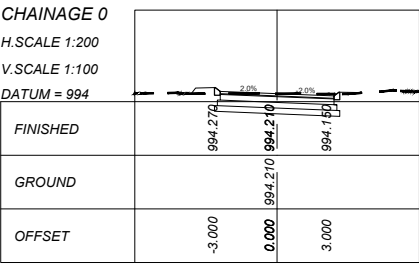
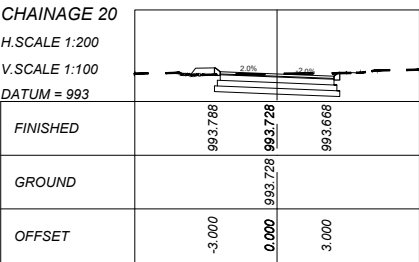
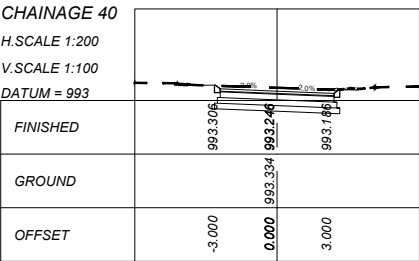
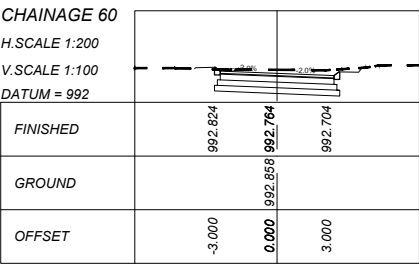
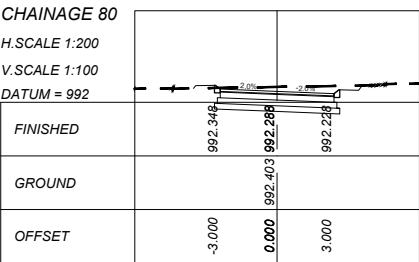
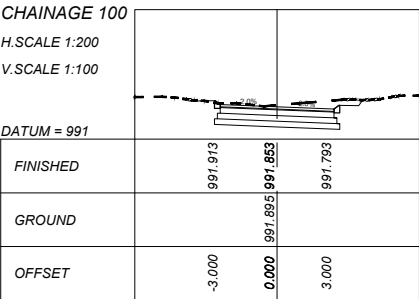
PAVEMENT LAYERS	
A	60mm THICK CONCRETE INTERLOCKING PAVING BLOCKS OF 25MPa CRUSHING STRENGTH
B	20mm THICK RIVER SAND BEDDING
C	150mm C4 BASE NATURAL GRAVEL COMPACTED TO 97% MOD AASHTO DENSITY
D	150mm G6 SUBBASE NATURAL GRAVEL COMPACTED TO 95% MOD-AASHTO DENSITY
E	150mm RIP AND COMPACT

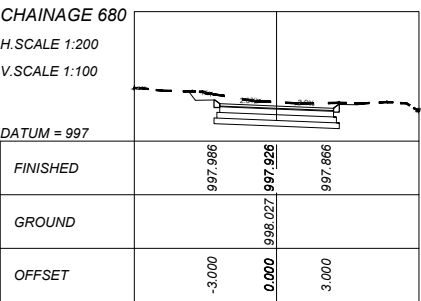
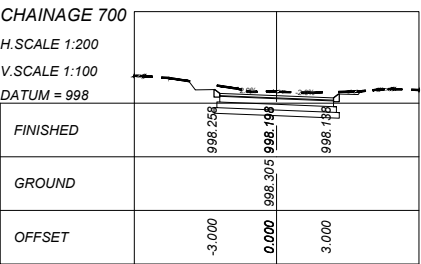
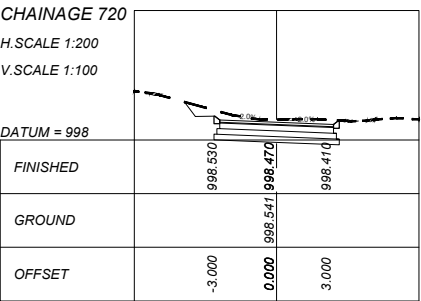
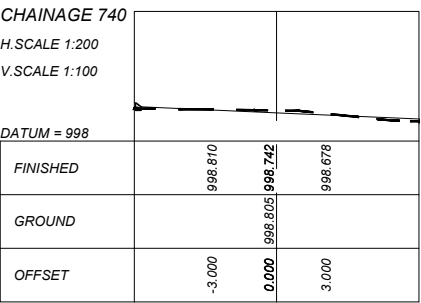
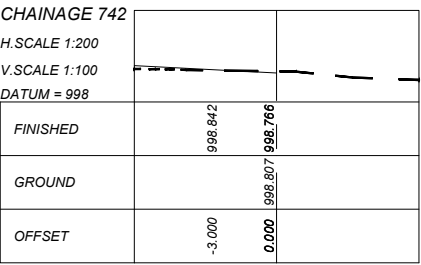
				DESIGNED BY	H.T.	 BLOUBERG MUNICIPALITY P.o. Box 1593 Senwabarwana 0790 TEL. (015) 505-7100	 CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn" No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446	 BLM DATE	TENDE No.:	PROJECT STATUS: TENDER	(Full signature) For: Consulting Engineer	SHEET 1 OF 1
				CHECKED BY	H.T.				SCALE			
				DRAWN BY	F.M.				AS SHOWN			
				CHECKED BY	H.T.				REVISION			
								SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11		DRAWING NUMBER MC/BKM/SP11/Xs/01	①	
								TYPICAL ROAD CROSS SECTIONS				

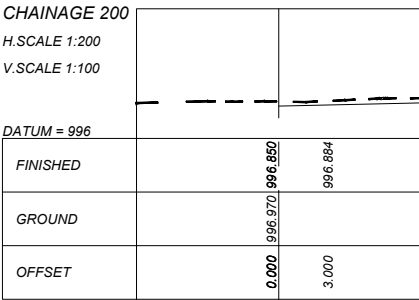
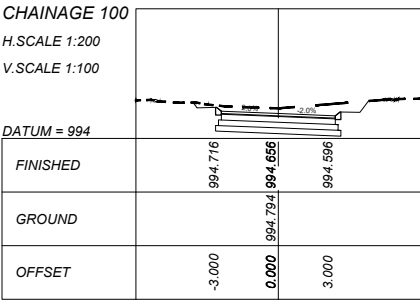
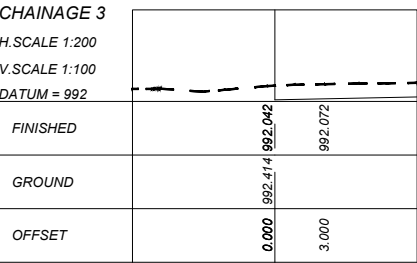
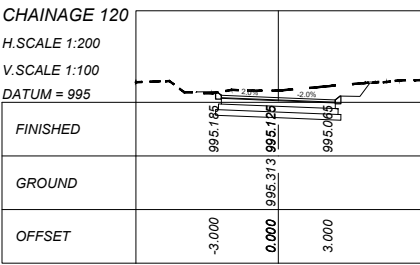
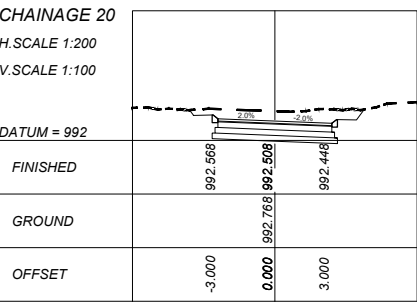
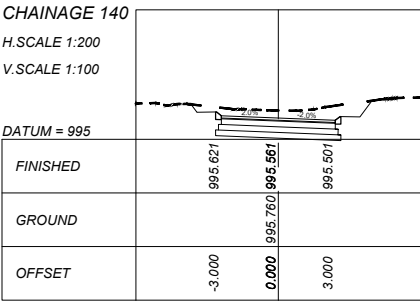
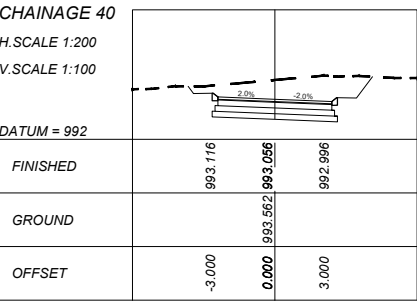
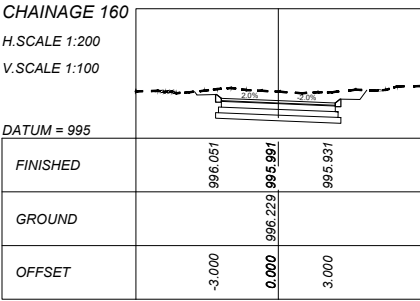
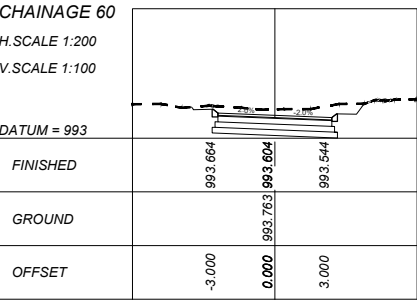
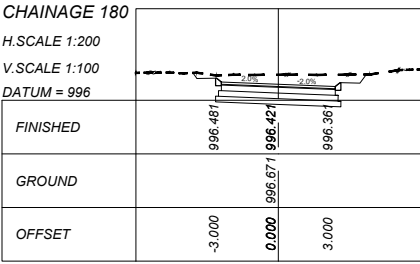
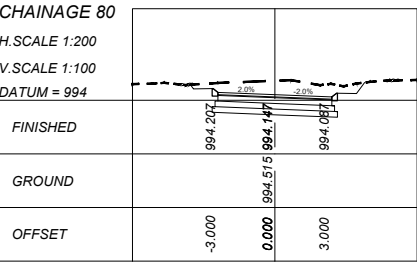


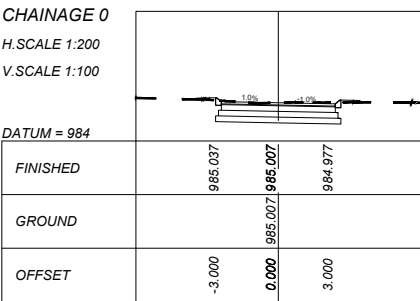
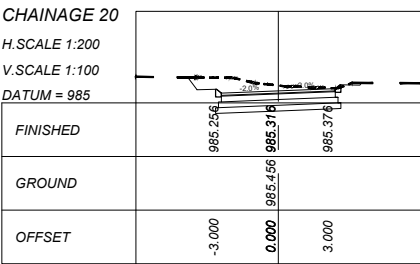
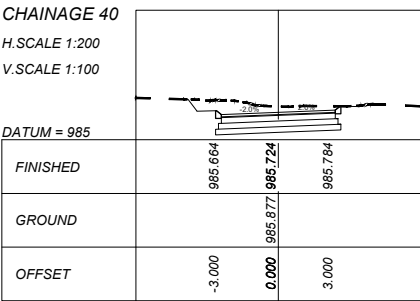
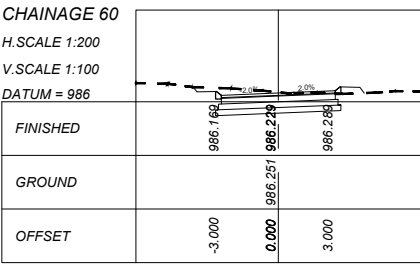
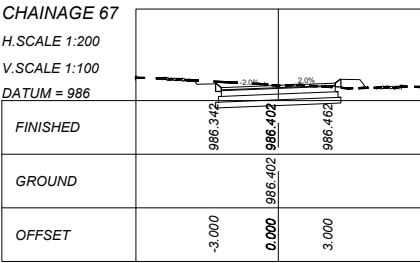


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NOTES

CONSTRUCTION METHOD: SPEED HUMPS

1. Setting out of hump - few days before construction.
2. Saw cuts one to two days before construction.

ON CONSTRUCTION DAY:

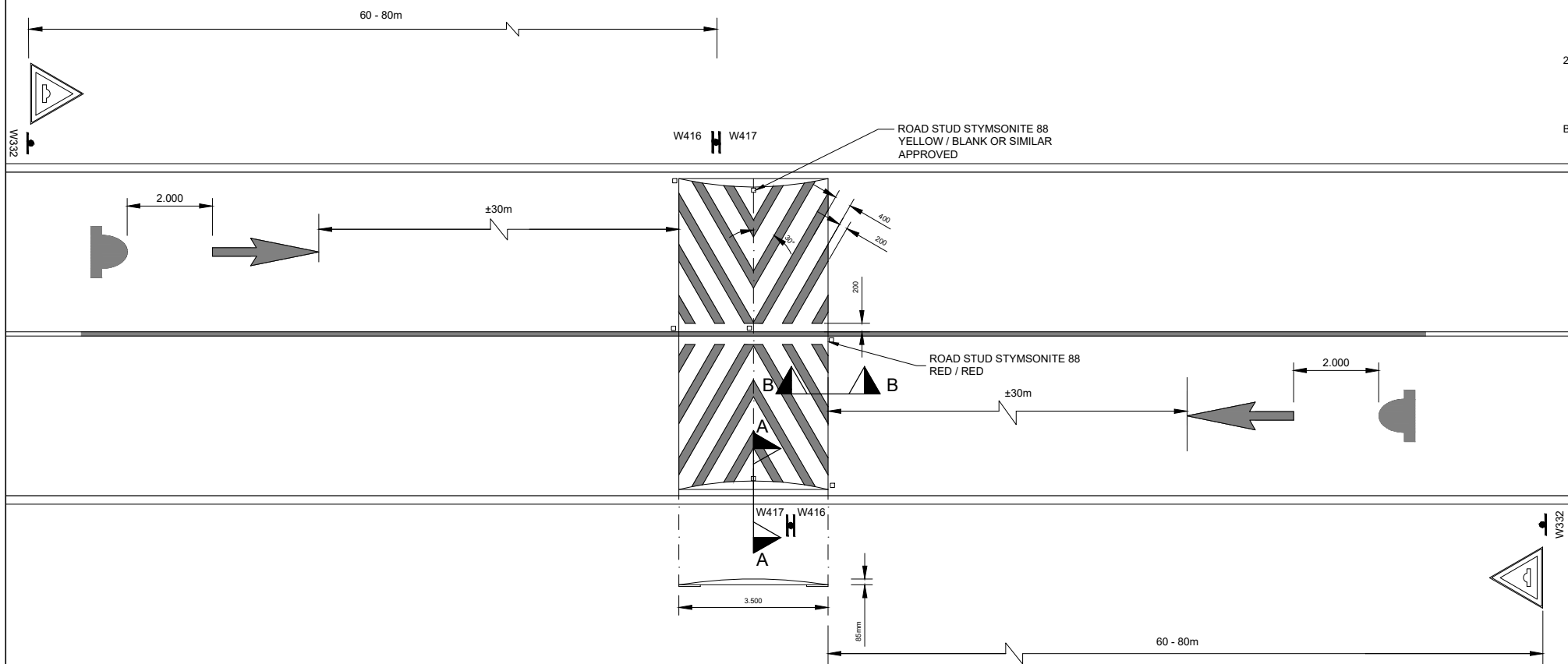
3. Remove 500 mm asphalt strips.
4. Start erecting road signs and paint warning road marking.
5. Place asphalt in strips and compact with two passes without vibrator.
6. Place templates - both sides of one lane at a time.
7. Place asphalt and rake till slightly higher than templates.
8. Shape asphalt with straight edge (channel section 6 m long).
9. Remove templates and compact without vibrator (three passes)
10. Measure profile and rectify if necessary.
11. Final compaction with three to four passes with vibrator.
12. Place road studs.
13. Paint speed hump the next day.

2. Traffic Signs:
 - 2.1 Only galvanised bolts and nuts to be used on W and R series (no uni-struts)

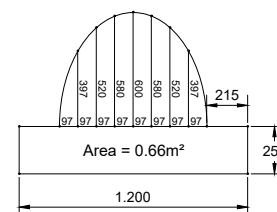
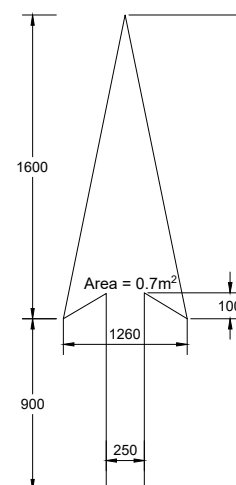
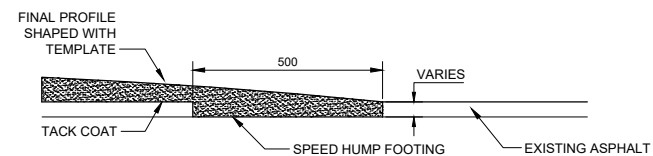
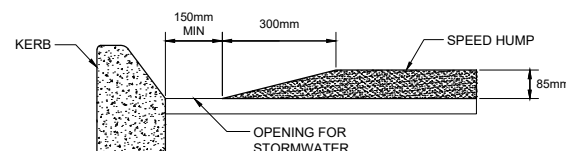
- 2.2 All signs must be according to the Road Traffic Signs Manuals but use 900Φ STOP (60km/h zone) for 3-way and 4-way stops
- 2.3 All signs excluding R1 series must have rounded edges

3. **ROADMARKINGS:**
All new road markings in thermoplastic

Colour	Paint application rate (mm)	Premix bead application rate (%)	Initial coefficient of retro-reflective (minicandelas/lux/m ²)
WHITE	1.2	35	200
YELLOW	1.2	35	135



PLAN OF SPEED HUMP



NOTE

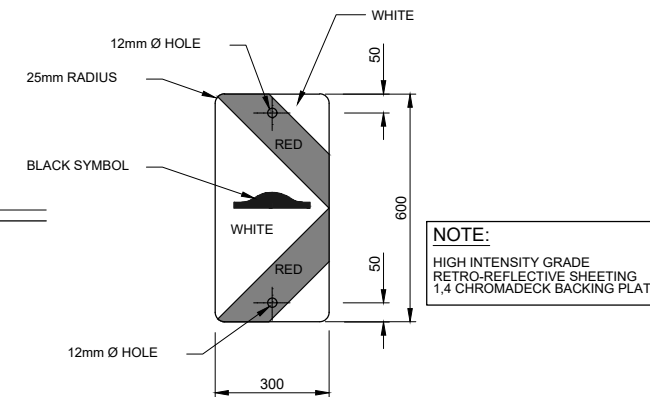
1. Traffic Signs:
 - 1.1 Only galvanised bolts and nuts to be used on W and R series (no uni-struts)
 - 1.2 All signs must be according to the Road Traffic Signs Manuals but use 900Φ STOP (60km/h zone) for 3-way and 4-way stops
 - 1.3 All signs excluding R1 series must have rounded edges
2. ROADMARKINGS:

All new road markings in thermoplastic

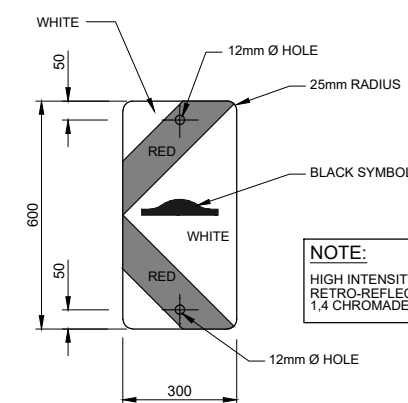
Colour	Paint application rate (mm)	Thermix bead application rate (%)	Initial coefficient of retro-reflectivity (mircandelas/m²)
WHITE	1.2	35	200
YELLOW	1.2	35	155

NOTE:

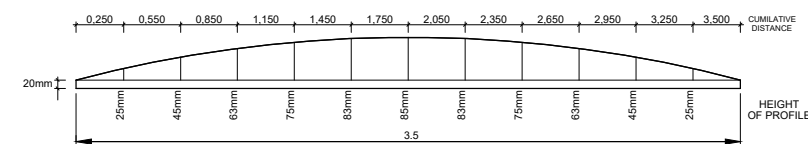
The Traffic Engineering and Operation section must always be consulted to assist with the setting out of speed humps.



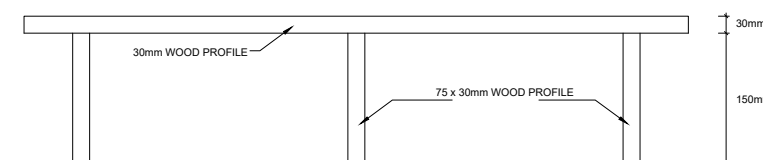
W416
SCALE 1:10



DANGER PLATE SPEEDHUMP (RIGHT)
W417
SCALE 1:10



SIDE ELEVATION



PLAN

						DESIGNED BY	H.T.	 BLOURBERG MUNICIPALITY  MORULA CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn" No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446		TENDE No.:	PROJECT STATUS: TENDER	(Full signature) BLM DATE	SHEET 1 OF 1
						CHECKED BY	H.T.		SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11		SCALE AS SHOWN		
						DRAWN BY	F.M.						
No	DATE	REVISION	CONSULT	DIR		CHECKED BY	H.T.	TYPICAL SPEED HUMP DETAIL		DRAWING NUMBER MC/BKM/SP11/SD/01	REVISION (0)		

ROAD MARKING DETAILS

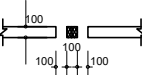
SHEET 1 OF 2

NOTES: (RURAL LONGITUDINAL LINE TYPES)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO LINE MARKING INDICATED THUS ▷ OR ◁.
2. PAINTED ISLAND MARKINGS SHALL BE USED AS A STANDARD DIVIDING MARKING ON ALL 4-LANE 2-WAY ROADWAYS. (SEE URBAN LONGITUDINAL LINE TYPES)
3. A NO OVERTAKING LINE MAY BE USED TO REPLACE A DIVIDING LINE MARKING ON MINOR ROADS OR TO MATCH PROVINCIAL ROAD MARKING POLICY ON AN INTERSECTING ROADWAY AS APPROPRIATE. A NO OVERTAKING LINE MAY BE USED IN COMBINATION WITH A LANE LINE. (NORMALLY ON A FREEWAY CARRIAGEWAY.)
4. A LEFT EDGE LINE MARKING SHALL NOT EXTEND ACROSS THE POINT OF DEPARTURE FROM A THROUGH PORTION OF ROADWAY.
5. A RIGHT EDGE LINE MARKING IS ONLY REQUIRED TO DEMARCAT AN UNKERBED MEDIAN (A MEDIAN GUARDRAIL OR CONCRETE SEPARATOR BARRIER DOES NOT CONSTITUTE A KERBED MEDIAN.)
6. THE DIVIDING LINE MARKING REPLACES THE PREVIOUS "CENTRE LINE" MARKING AND SHALL ONLY BE USED BETWEEN LANES CARRYING OPPOSING TRAFFIC FLOWS WHERE OVERTAKING IS PERMITTED.
7. A CONTINUITY LINE MAY BE SPECIFIED IN ONE OF THREE DENSITIES - 1. REDUCED 2. STANDARD OR 3. EXTRA. A CONTINUITY LINE MAY BE USED TO DEFINE THE LIMIT OF THE THROUGH PORTION OF A ROADWAY, EITHER AT A HIGH SPEED EXIT (OFF-RAMP OR SLIP ROAD), A DEDICATED EXIT LANE ON FREEWAY, OR AT-GRADE ROAD. (RIGHT OR LEFT TURN).
8. A CHANNELIZING LINE MAY BE USED AS AN EXTENSION OF A CONTINUITY LINE FOR CERTAIN APPLICATIONS ON THE APPROACH TO AN AT-GRADE SLIP ROAD GORE AREA.
9. A LANE LINE, CONTINUITY LINE OR CHANNELIZING LINE SHALL NOT BE USED BETWEEN OPPOSING TRAFFIC MOVEMENTS.
10. THE WIDTHS OF LINES SHOWN ARE RECOMMENDATIONS ONLY. (SEE LONGITUDINAL LINE COMBINATIONS.)

LEGEND:

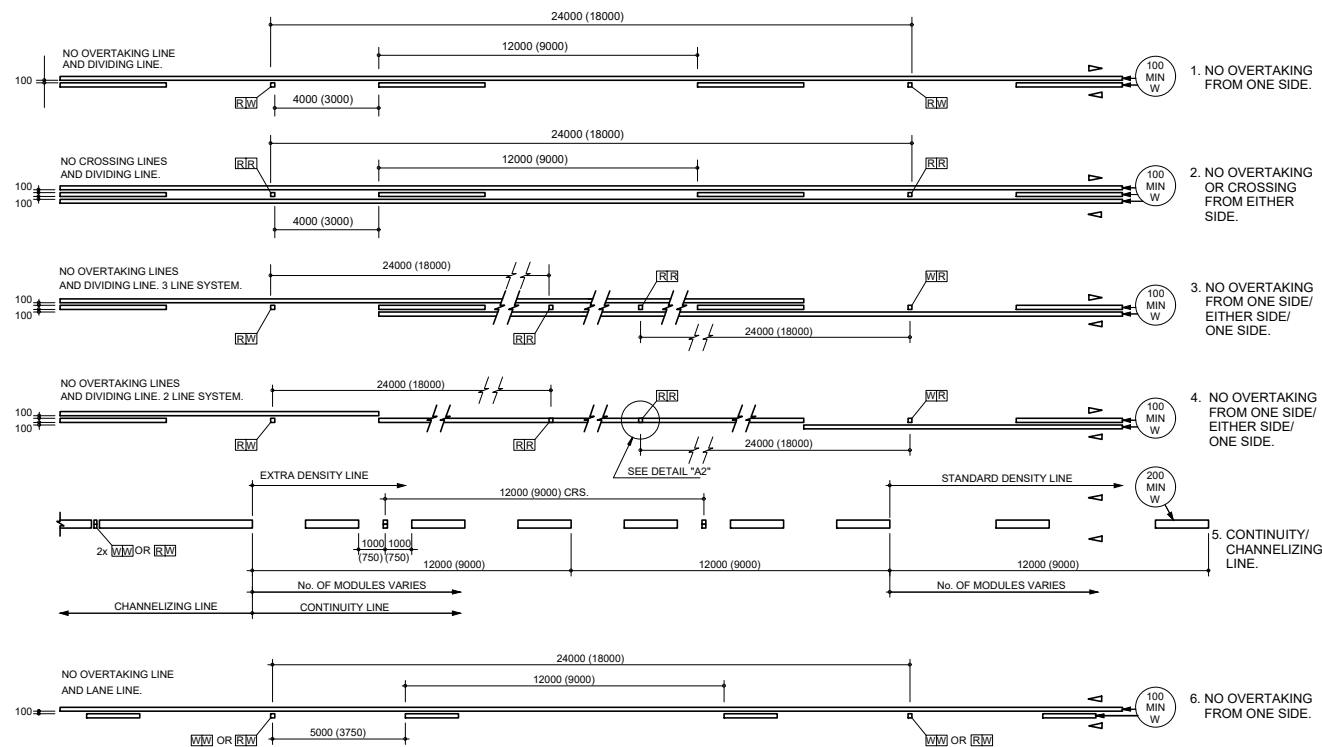
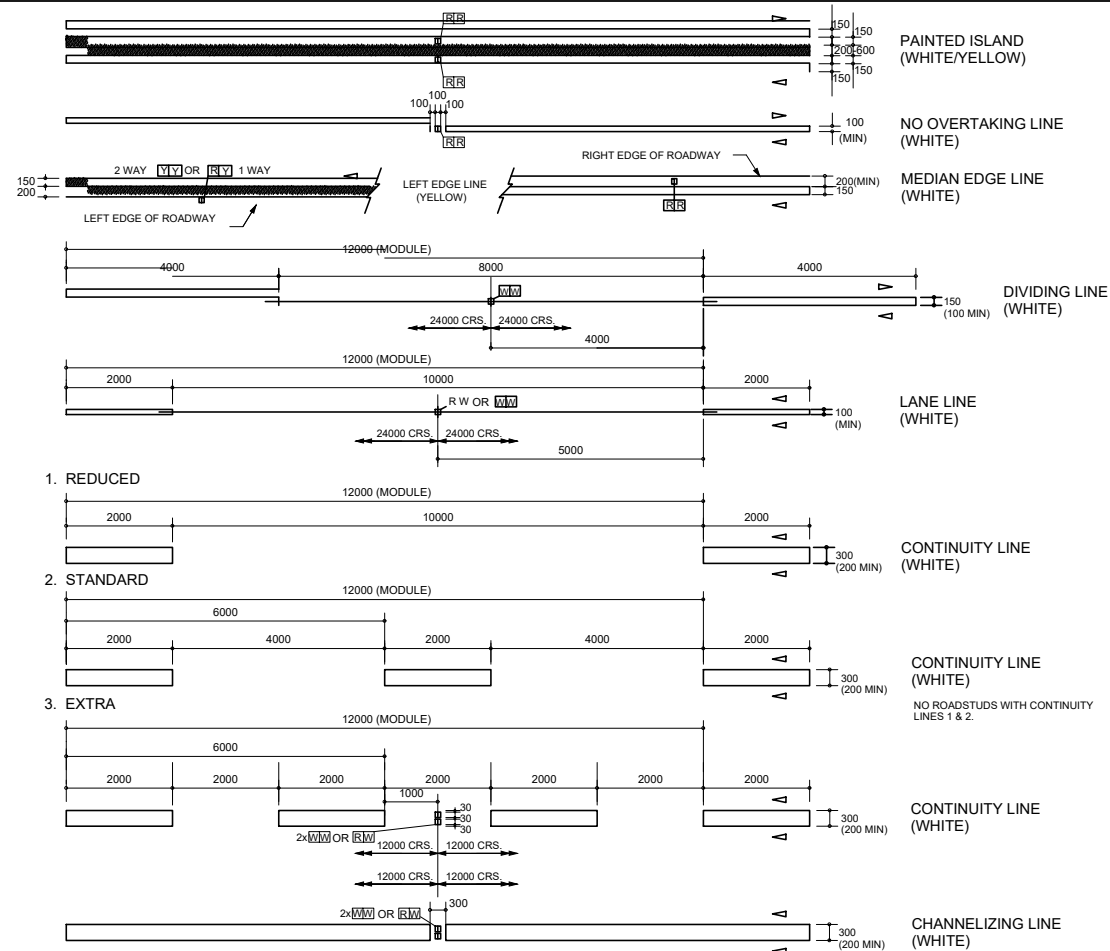
R = RED
W = WHITE
Y = YELLOW



DETAIL "A2"
SCALE: 1:25

RURAL LONGITUDINAL LINE TYPES

SCALE: 1:50

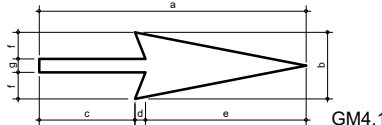
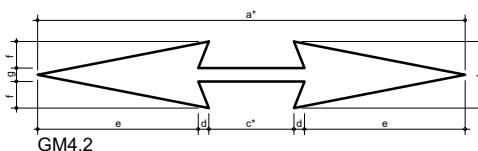


NOTES: (LONGITUDINAL LINE COMBINATIONS)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO THE MARKING INDICATED THUS ▷ OR ◁.
2. FOR FULL LONGITUDINAL DIMENSIONS OF COMPONENT MARKINGS SEE RURAL AND URBAN LONGITUDINAL LINE TYPES.
3. COMBINATION MARKING 1 TO 4 ARE FOR TWO WAY TRAFFIC AND ARE APPLICABLE TO NATIONAL NON-FREEWAY ROUTES WHICH INTERSECT FREEWAYS.
4. COMBINATION MARKING 5 SHALL BE USED TO INDICATE THE DIVISIONS BETWEEN THE THROUGH ROADWAY AND ANY EXCLUSIVE EXIT/TURN LANES. WHEREVER POSSIBLE A CONTINUITY LINE SHOULD LEAD TO, OR TERMINATE IN A CHANNELIZING LINE WHICH MAY BE SHORT. RECOMMENDED MINIMUM LENGTH IS 12m FOR RURAL AND 9m FOR URBAN APPLICATIONS.
5. FOR MARKINGS 1 TO 4 ROADSTUDS SHOULD BE LOCATED ON CENTRE LINE OF THE DIVIDING LINE (OR SINGLE NO OVERTAKING LINE MARKING 4).
6. WHERE POSSIBLE THE LENGTH OF CHANNELIZING MARKING SHOULD BE ADJUSTED SO THAT THE CONTINUITY LINE ROADSTUDS MATCH OTHER ROADSTUDS ON CROSS-SECTION AND FALL IN THE CENTRE OF A GAP IN THE CONTINUITY LINE.
7. DIMENSIONS FOR URBAN APPLICATIONS ARE INDICATED IN BRACKETS.
8. ROADSTUDS ON THE SINGLE NO OVERTAKING LINE IN MARKING 4 MAY BE COVERED DURING LINE MARKING OR PLACED AS INDICATED IN DETAIL "A2".

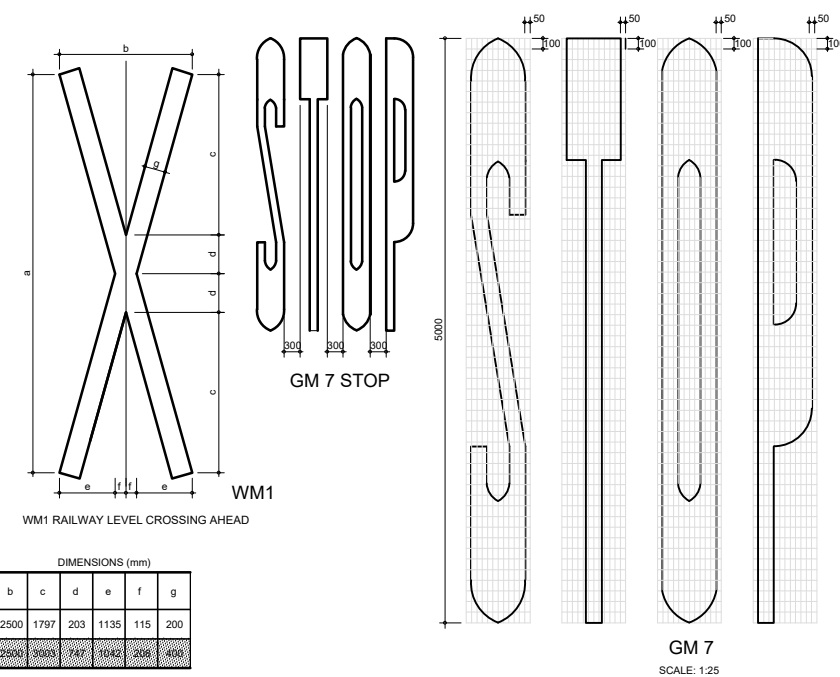
LONGITUDINAL LINE COMBINATIONS

GM4.2 REVERSIBLE FLOW ARROW / GM4.1 INFORMATION ARROW		DIMENSIONS (mm)							
Operating Speed km/h	Typical Applications	a	a*	b	c	c*	d	e	f
30 - 40	City Centre	1250	2000	1250	450	400	50	750	500
50 - 60	Urban	2500	4000	1250	900	800	100	1500	500
70 - 90	Urban Arterial/Rural Expressway	4000	6400	1250	1440	1280	160	2400	500
100 - 120	Rural and Freeway	5000	8000	1250	1800	1600	200	3000	500



Area m ²				
Marking	a	Area	a*	Area
WM1	4000	1.84		
	7500	6.00		
GM4.1/ GM4.2(a*)	1250	0.59	2000	1.05
	2500	1.17	4000	2.10
	4000	1.88	6400	3.36
	5000	2.35	8000	4.20
WM5	450	0.20		
	850	0.83		
GM7	1350	2.15		
	5500	6.90		

- NOTES:
1. THIS DRAWING DETAILS A RANGE OF GENERAL WARNING OR GUIDANCE SYMBOLS. APPLICATION SHALL BE IN ACCORDANCE WITH THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL.
 2. MARKING WM5 - YIELD CONTROL AHEAD MAY BE REPEATED 1m FROM THE YIELD LINE MARKING.



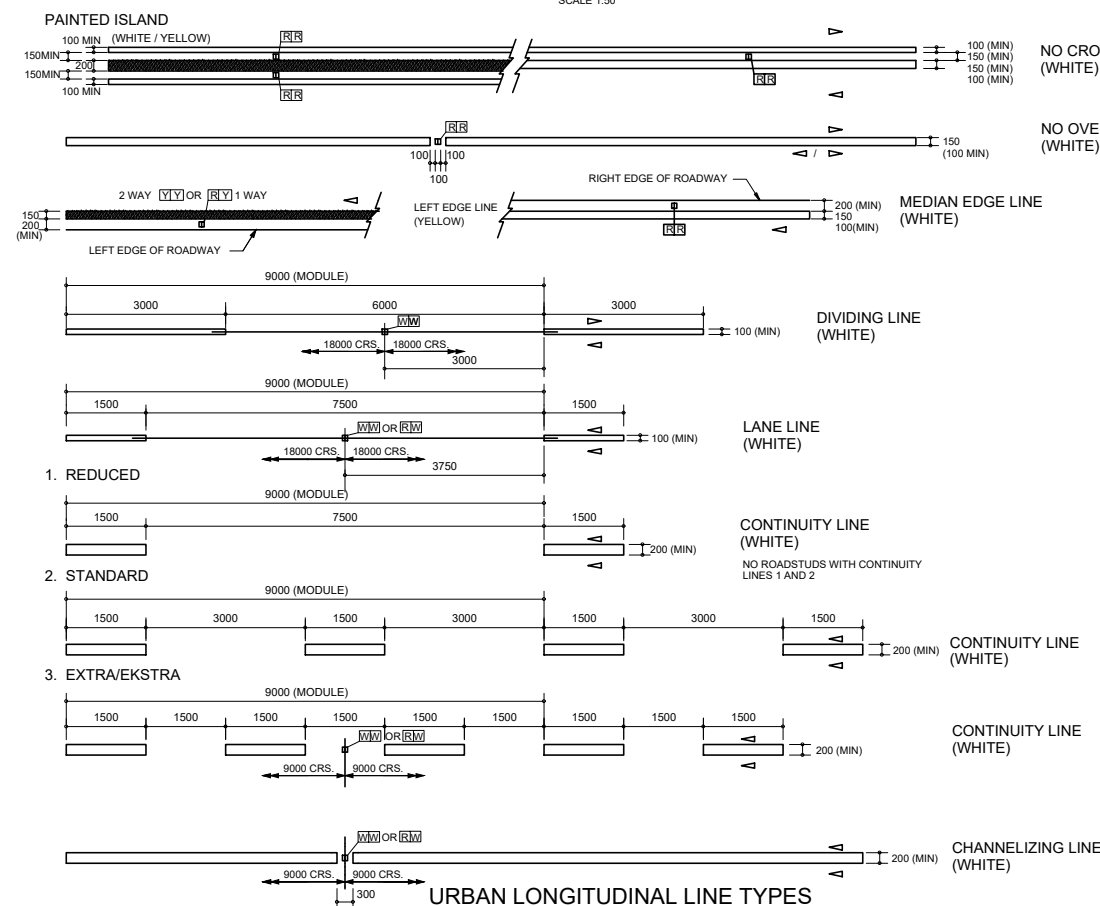
NOTES: (URBAN LONGITUDINAL LINE TYPES)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO LINE MARKING INDICATED THUS ▷ OR ◁.
2. A NO CROSSING LINE MAY BE USED AS A FORM OF DIVIDING LINE MARKING IN PLACE OF A NO OVERTAKING LINE TO PROHIBIT ACCESS TO OR FROM PROPERTIES AT THE SIDE OF AN URBAN ROAD. A PAINTED ISLAND MAY BE USED AS AN ALTERNATIVE MARKING FOR THIS PURPOSE.
3. A NO OVERTAKING LINE MAY BE USED TO REPLACE A DIVIDING LINE MARKING TO PROHIBIT OVERTAKING IN THE PATH OF ON-COMING TRAFFIC. A NO OVERTAKING LINE MAY BE USED IN COMBINATION WITH A LANE LINE.
4. LEFT EDGE LINE MARKING SHALL NOT BE EXTENDED ACROSS THE POINT OF DEPARTURE FROM A THROUGH PORTION OF ROADWAY.
5. A RIGHT EDGE LINE MARKING IS ONLY REQUIRED TO DEMARCAT AN UNKERBED MEDIAN. (A MEDIAN GUARDRAIL OR CONCRETE SEPARATOR BARRIER DOES NOT CONSTITUTE A KERBED MEDIAN.)
6. THE DIVIDING LINE MARKING REPLACES THE PREVIOUS "CENTRE LINE" MARKING AND SHALL ONLY BE USED BETWEEN LANES CARRYING OPPOSING TRAFFIC FLOWS WHEN OVERTAKING IS PERMITTED.
7. A CONTINUITY LINE MAY BE SPECIFIED IN ONE OR THREE DENSITIES 1. REDUCED, 2. STANDARD OR 3. EXTRA. THROUGH PORTION OF A ROADWAY EITHER AT A HIGH SPEED EXIT (OFF-RAMP OR SLIPROAD), A DEDICATED EXIT LANE ON A FREEWAY, OR AT-GRADE ROAD (RIGHT OR LEFT TURN).
8. A CHANNELIZING LINE MAY BE USED AS AN EXTENSION OF A CONTINUITY LINE OR INSTEAD OF A PAINTED ISLAND TO CHANNELIZE TRAFFIC MOVEMENT WHERE SPACE IS LIMITED.
9. A LANE LINE, CONTINUITY LINE OR CHANNELIZING LINE SHALL NOT BE USED BETWEEN OPPOSING TRAFFIC MOVEMENTS.
10. THE WIDTHS OF LINES SHOWN ARE RECOMMENDATIONS ONLY (SEE LONGITUDINAL LINE COMBINATIONS).

WM5 YIELD CONTROL AHEAD

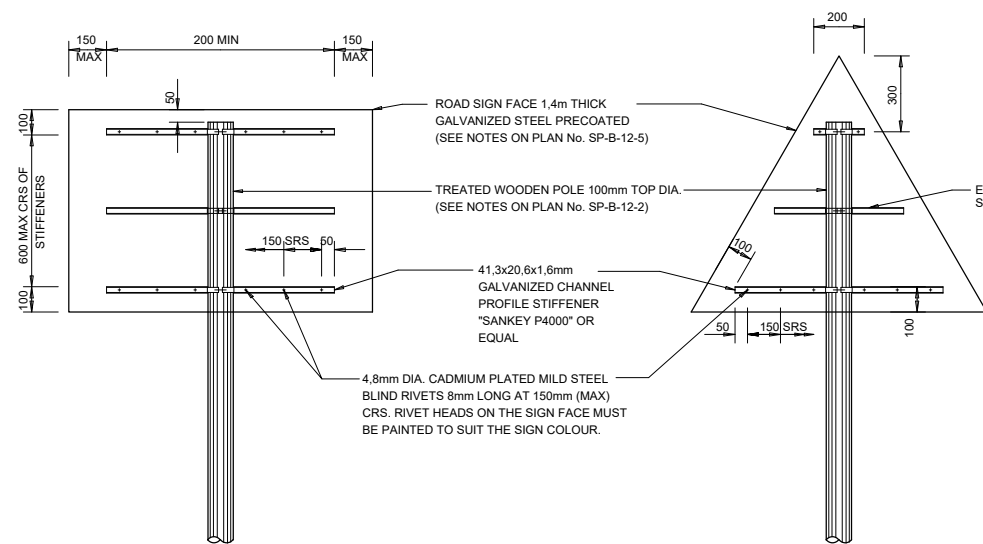
Operating Speed km/h		Typical Applications	Distance from Yield line	a	b	c	d
30 - 40		City Centre	90m	450	250	100	1250
50 - 60		Urban	120m	850	450	150	2500
70 - 120		Rural	180m	1350	700	250	4000

Typical Applications		a	b	c	d	e	f	g
Urban		4000	2500	1797	203	1135	115	200
Rural		7500	2500	3003	747	1042	206	400



URBAN LONGITUDINAL LINE TYPES

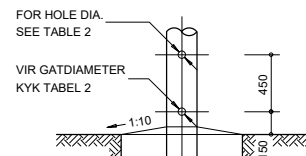
DESIGNED BY		H.T.	BLOUBERG MUNICIPALITY		No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085		TENDE No.:		PROJECT STATUS: TENDER		(Full signature)		SHEET 1 OF 2	
CHECKED BY		H.T.			Tel: (072) 791 9934 Fax: (086) 558 6446		SENWABARWANA INTERNAL STREETS AND STORMWATER PHASE 11				SCALE		AS SHOWN	
DRAWN BY		F.M.					ROAD MARKINGS: REGULARITY, WARNING AND GUIDANCE SYMBOLS				DRAWING NUMBER		REVISION	
CHECKED BY		H.T.									MC/BKM/SP11/SD/02		①	



REAR ELEVATION

TABLE 1

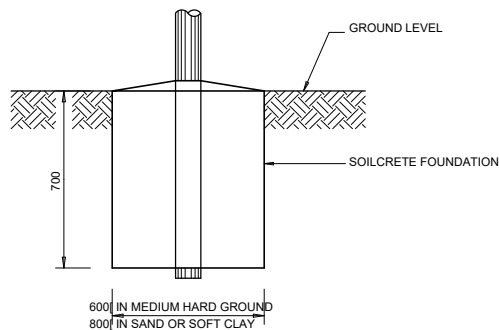
WIDTH OF SIGN W	No. OF SUPPORTS N	DIMENSIONS	
		B	C
1,2m	1	$w/2$	-
1,2m - 4,0m	2	$w/5$	$3w/5$
4,0m - 7,2m	3	$w/2N$	w/N
7,2m - 9,6m	4		
9,6 - 12,0m	5		



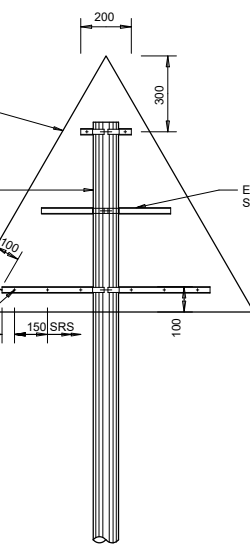
DETAIL "A"

TABEL 2

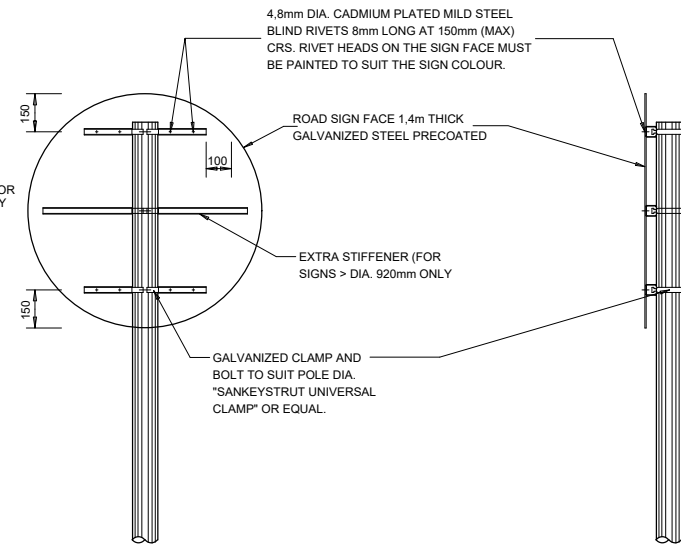
POLE DIA * (mm)	HOLE DIA (mm)
≤ 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65



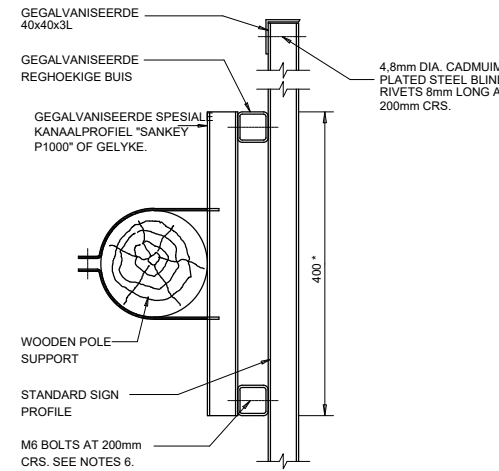
TYPICAL FOUNDATION



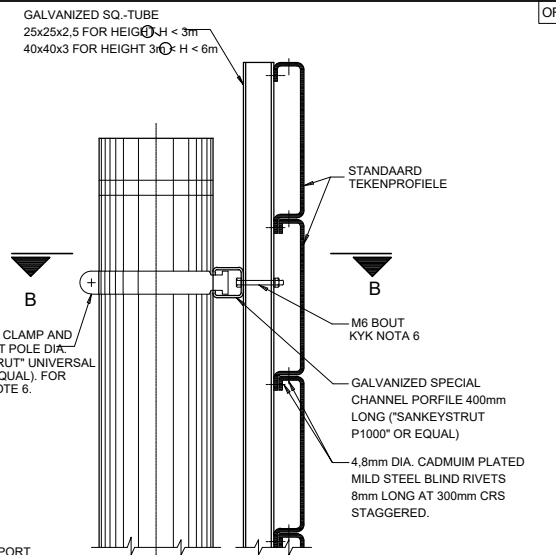
REAR ELEVATION



REAR ELEVATION

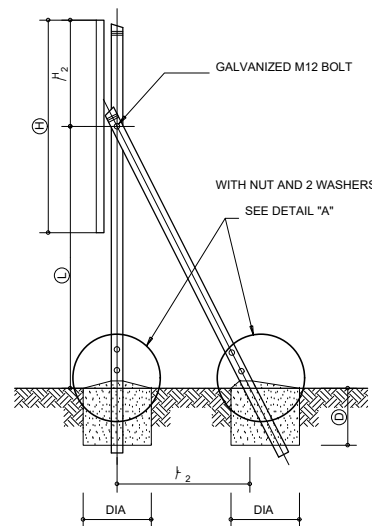


TYPICAL SIDE ELEVATION

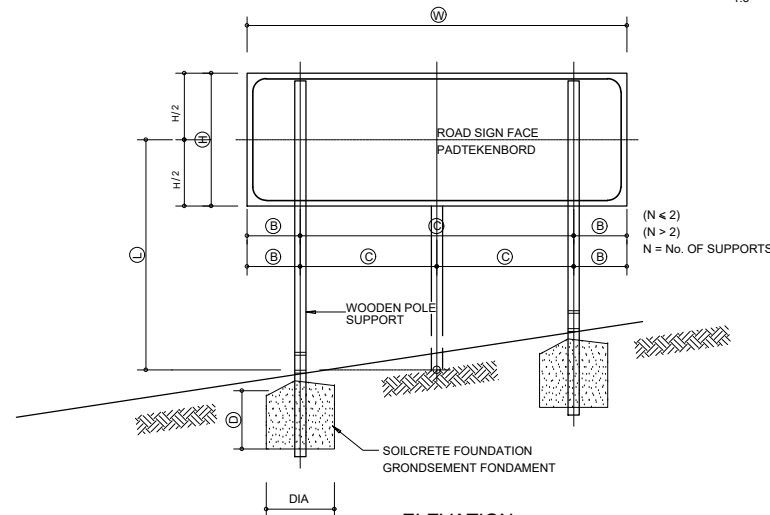
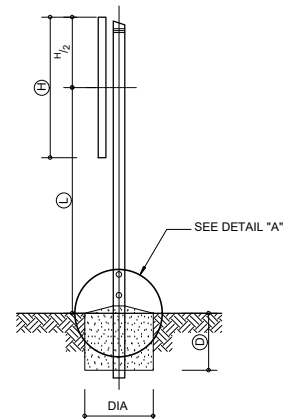


SECTION

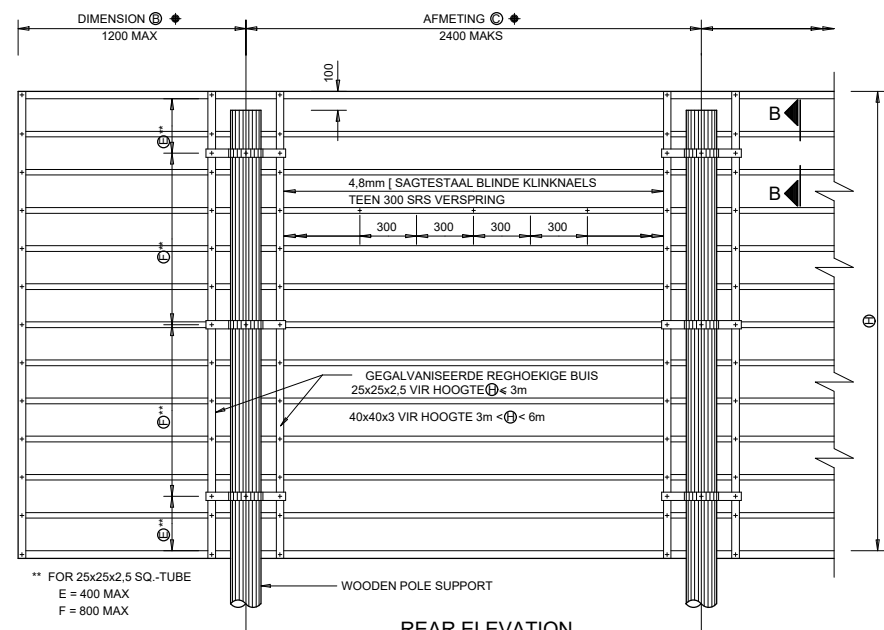
ELEVATION



TYPICAL SECTION
BRACED SUPPORT

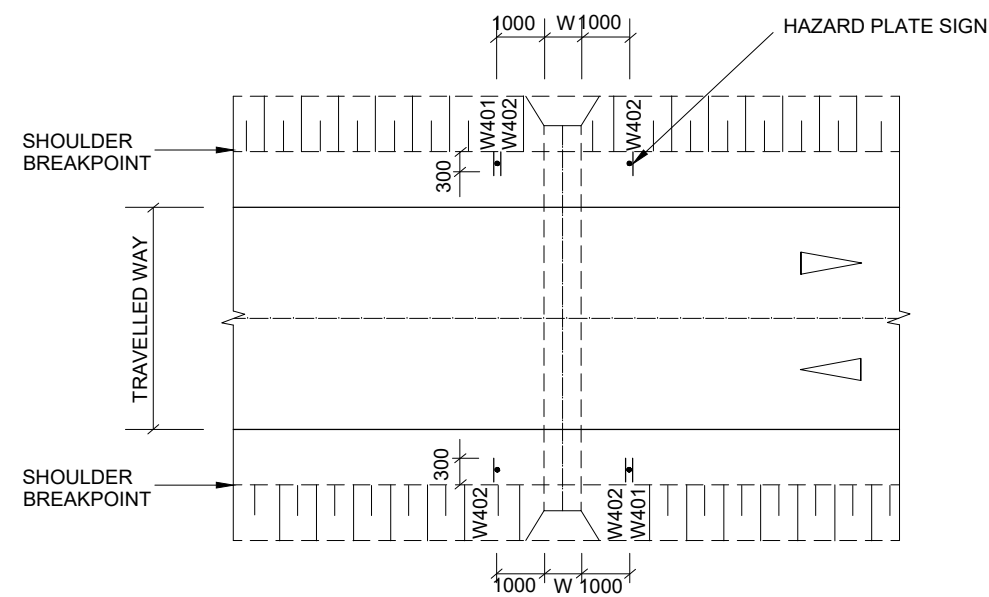
ELEVATION

TYPICAL SECTION
FREE STANDING SUPPORT

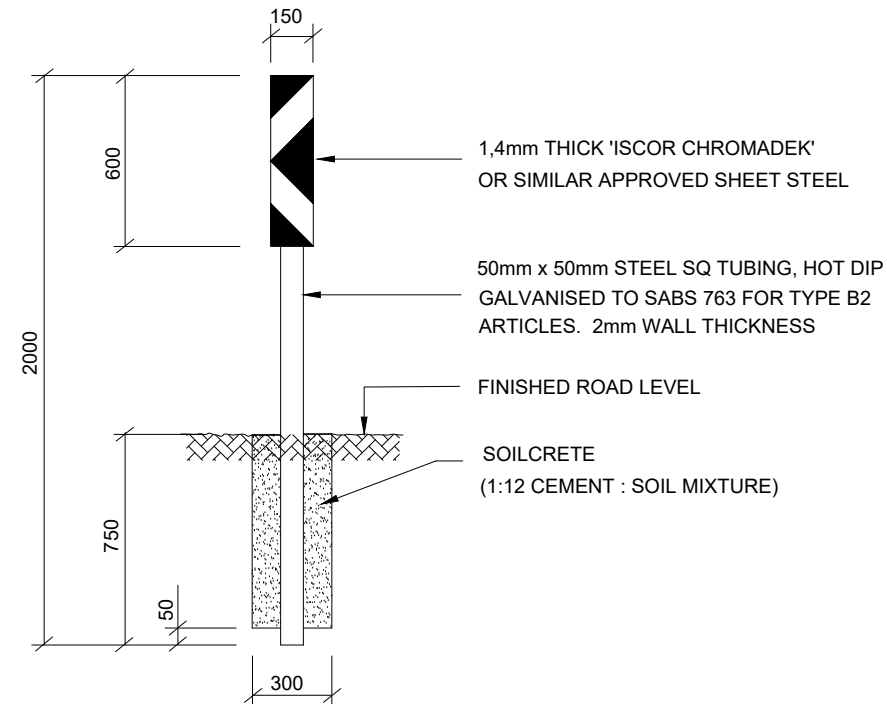


REAR ELEVATION
1:20

- | NOTES | |
|--|--|
| <p>THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE REGULATIONS AS WELL AS THE FOLLOWING REQUIREMENTS:-</p> <ol style="list-style-type: none"> SIGN FACES SHALL BE FOR TYPE "A" OR "B" EXPOSURE AS INDICATED ON THE ROAD SIGN TYPE "A": ALL CASES OTHER THAN TYPE "B".
TYPE "B": SIGN FACES FOR USE IN MARINE OR CHEMICALLY POLLUTED CORROSIVE ENVIRONMENT. THE COATING SYSTEMS FOR SIGN FACES TYPE "A" AND "B" ARE SPECIFIED ON PLAN NO. 2. THE STANDARD SIGN PROFILE SHALL BE MADE IN ACCORDANCE WITH THE DETAILS SHOWN ON PLAN NO. 3. A SIGN FACE WITH EXCEEDS 6m IN LENGTH MAY BE MANUFACTURED IN TWO SECTIONS. TYPE "A" SIGN FACES SHALL BE MANUFACTURED IN TWO SECTIONS. STRUCTURAL STEEL SECTIONS SHALL BE OF MILD STEEL CONFORMING TO THE REQUIREMENTS OF SECTION 7100 OF THE STANDARD SPECIFICATIONS. RECTANGULAR HOLLOW SECTIONS AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED. BOLTS, WASHERS AND NUTS SHALL BE AS FOLLOWS:-
TYPE "A" SIGN FACES: GALVANIZED STEEL BOLTS COMPLYING WITH THE REQUIREMENT TYPE "B" SIGN FACES: STAINLESS STEEL BOLTS GRADE 304 MANUFACTURED TO SABS 1 NUTS FOR BOTH TYPE "A" AND "B" SIGN FACES SHALL BE SELFLOCKING "NYLOC" OR EQ. BLIND RIVETS SHALL BE 4.8mm DIA CADMIUM PLATED MIL STEEL. ALL STEEL SECTIONS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CLAUSE 710 TURE. REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGN DETAIL DRAWINGS FOR DETAILS OF MEASUREMENT AND PAYMENT OF THE SIGN FACES SHALL BE IN ACCORDANCE WITH CLAUSE 09 "RATE" SHALL BE APPLICABLE FOR TYPE "B" SIGN FACES. | <p>GN DETAIL DRAWINGS OR AS DIRECTED BY THE ENGINEER. -
ANT CLAUSES OF SECTION 5600 OF STANDARD SPECIFICATIONS. ENVIRONMENTS.</p> <p>SP-B-12-5.</p> <p>ON PLAN NO. SP-B-12-5.</p> <p>HE JOINT SHALL BE MADE IN ACCORDANCE WITH DETAILS OF SECTION 7100 OF THE STANDARD SPECIFICATIONS. OF COMMERCIAL QUALITY MILD STEEL.</p> <p>S OF CLAUSE 5602(b) OF THE STANDARD SPECIFICATIONS.</p> <p>36.</p> <p>UAL APPROVED.</p> <p>5) OF THE STANDARD SPECIFICATIONS AFTER MANUFACTURE.</p> <p>OF THE SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN.</p> <p>5609 OF THE STANDARD SPECIFICATIONS. AN "EXTRA</p> |



POSITION OF HAZARD PLATES
AT CULVERTS
N.T.S.



TYPICAL DETAIL OF HAZARD PLATE
(W402 SHOWN)
SCALE 1:20

NOTES:

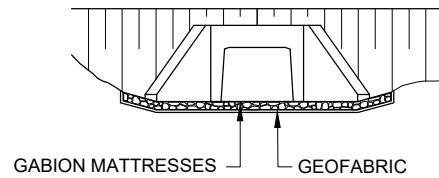
A. HAZARD PLATES

1. HAZARD PLATE SHALL BE 300mm FROM THE SHOULDER BREAKPOINT.
2. FOR WIDE CULVERT ($W > 2\text{m}$ WIDTH) SINGLE-SIDED HAZARD PLATES SHALL BE PLACED ON EACH SIDE OF CULVERT.
3. FOR NARROW CULVERTS ($W < 2\text{m}$) PLACE ONE DOUBLE-SIDED HAZARD PLATE PER DIRECTION, ON UPSTREAM SIDE OF TRAFFIC FLOW.
4. W401 AND W402 SIGNS SHALL COMPLY WITH THE LATEST EDITION OF THE SA ROAD TRAFFIC SIGNS MANUAL.

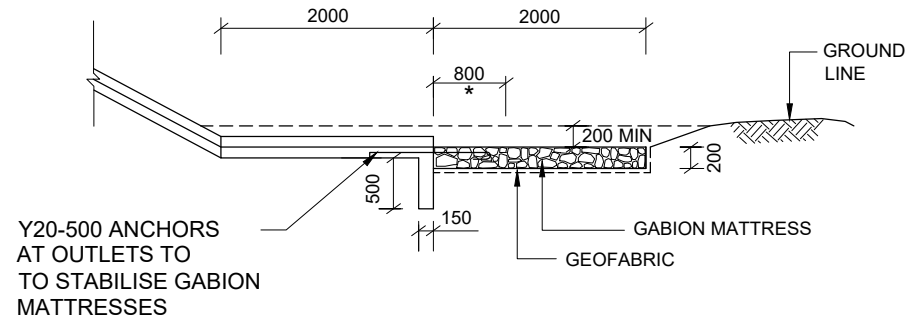
B. EMERGENCY ACCESS

1. TO BE PLACED AT SAFE LOCATIONS WHERE THERE IS NO INTERFERENCE WITH DRAINAGE.
2. ENSURE 300m SIGHT DISTANCE TO BOTH SIDES.

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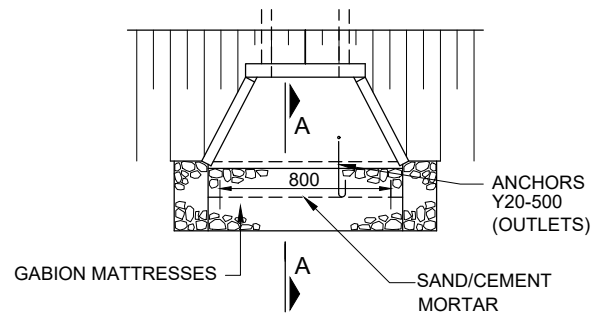
ELEVATION OF CULVERT



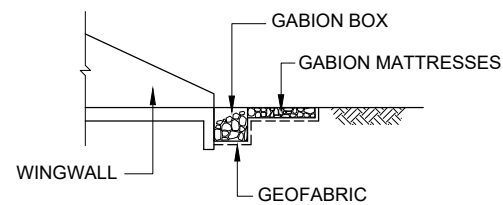
SECTION A-A

SCALE 1 : 50

* SAND/CEMENT MORTAR TO SECURE ANCHORS



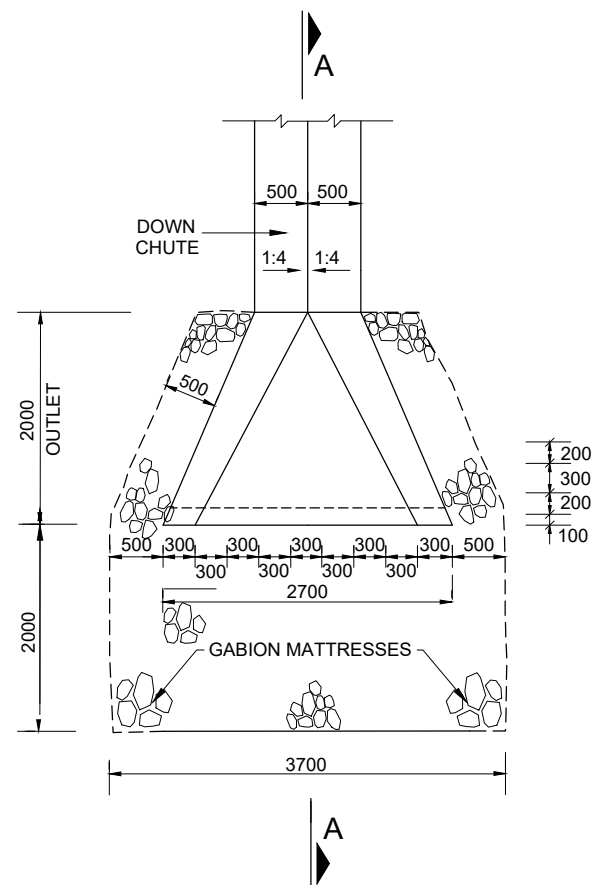
PLAN OF INLET/OUTLET



SECTION A-A

PROTECTION AT CULVERT INLETS AND OUTLETS

(WHERE NECESSARY)



PLAN

PROTECTION AT DOWN CHUTE

SCALE 1 : 50

NOTES:

GABIONS

1. ROCK DIMENSION SHALL CONFORM WITH TABLE 5202/1 IN THE SECTION 5200 OF COLTO.
2. BOX SIZE SHALL CONFORM TO CLAUSE 5203 OF COLTO
3. THE MESH SIZE SHALL BE 80mm x 100mm AND WIRE DIAMETER SHALL BE 2,7mm

No.	DATE	REVISION	CONSULT	DIR	DESIGNED BY	H.T.	BLOUBERG MUNICIPALITY	No. 1 Piedmont Road Unit 19 Piedmont Gardens Sherwood 4085 Tel: (072) 791 9934 Fax: (086) 558 6446	TENDE No.:	PROJECT STATUS: TENDER	(Full signature)	SHEET 1 OF 1
					CHECKED BY	H.T.	P.o. Box 1593 Senwabarwana 0790 TEL. (015) 505-7100	BLM			BLM	SCALE
					DRAWN BY	F.M.		CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"			For: Consulting Engineer	AS SHOWN
					CHECKED BY	H.T.					DRAWING NUMBER	REVISION
											MC/BKM/SP11/DD/02	①
											GABION PROTECTION AT CULVERT OUTLET	