

Northern Cape Department of Co-operative Governance, Human Settlement and Traditional Affairs

Lerato Park Integrated Housing Development

CONTRACT NUMBER 2334-10-05/ID01

Internal Civil Engineering Services: Phase 5

TENDER DRAWINGS VOLUME 2 BOOK OF DRAWINGS

APRIL 2021



Prepared for :
**Northern Cape Department of Co-operative
Governance, Human Settlement and Traditional
Affairs**

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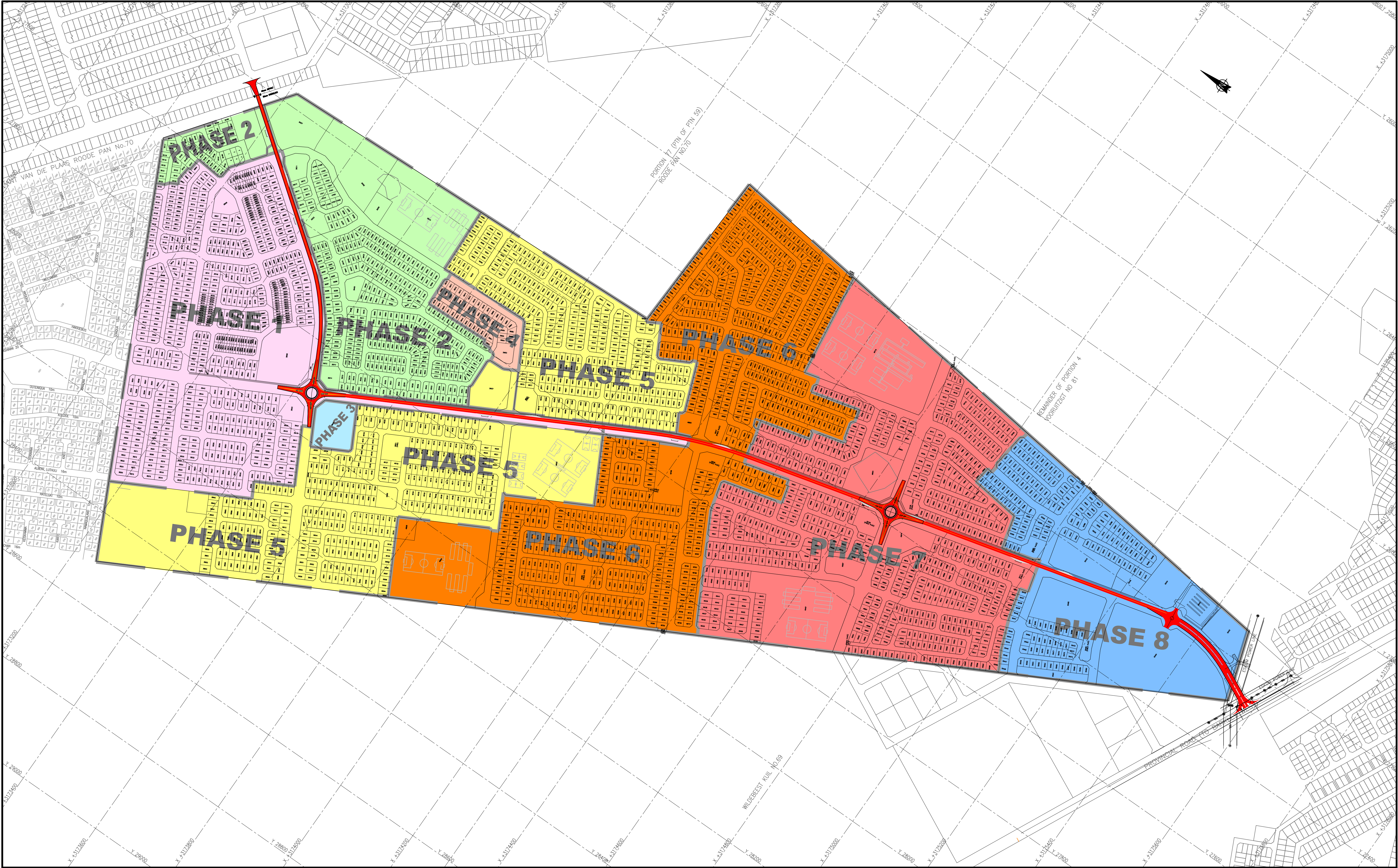


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AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2014
CERTIFIED AS-BUILT FOR CONTRACT :			
		ENGINEER	DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
7.0	02/08/2014	Phasing Revised	FJV
8.0	09/2014	Certified As Built Phase 1	FJV
9.0	09/2015	Certified As Built BULK	FJV
10.0	10/2015	Certified As Built Phase 2	FJV
11.0	12/2015	Phasing Revised	FJV
12.0	02/2016	Phasing Revised	FJV
13.0	02/2016	Phasing 1 and 2 Revised	FJV
14.0	07/2016	Phasing Revised	FJV
15.0	04/2017	Phasing Revised	FJV



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PROJECT TITLE:

**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

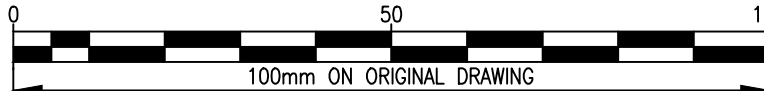
DRAWING TITLE:

PHASING LAYOUT PLAN

Sol Plaatje Municipality



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100mm ON ORIGINAL DRAWING

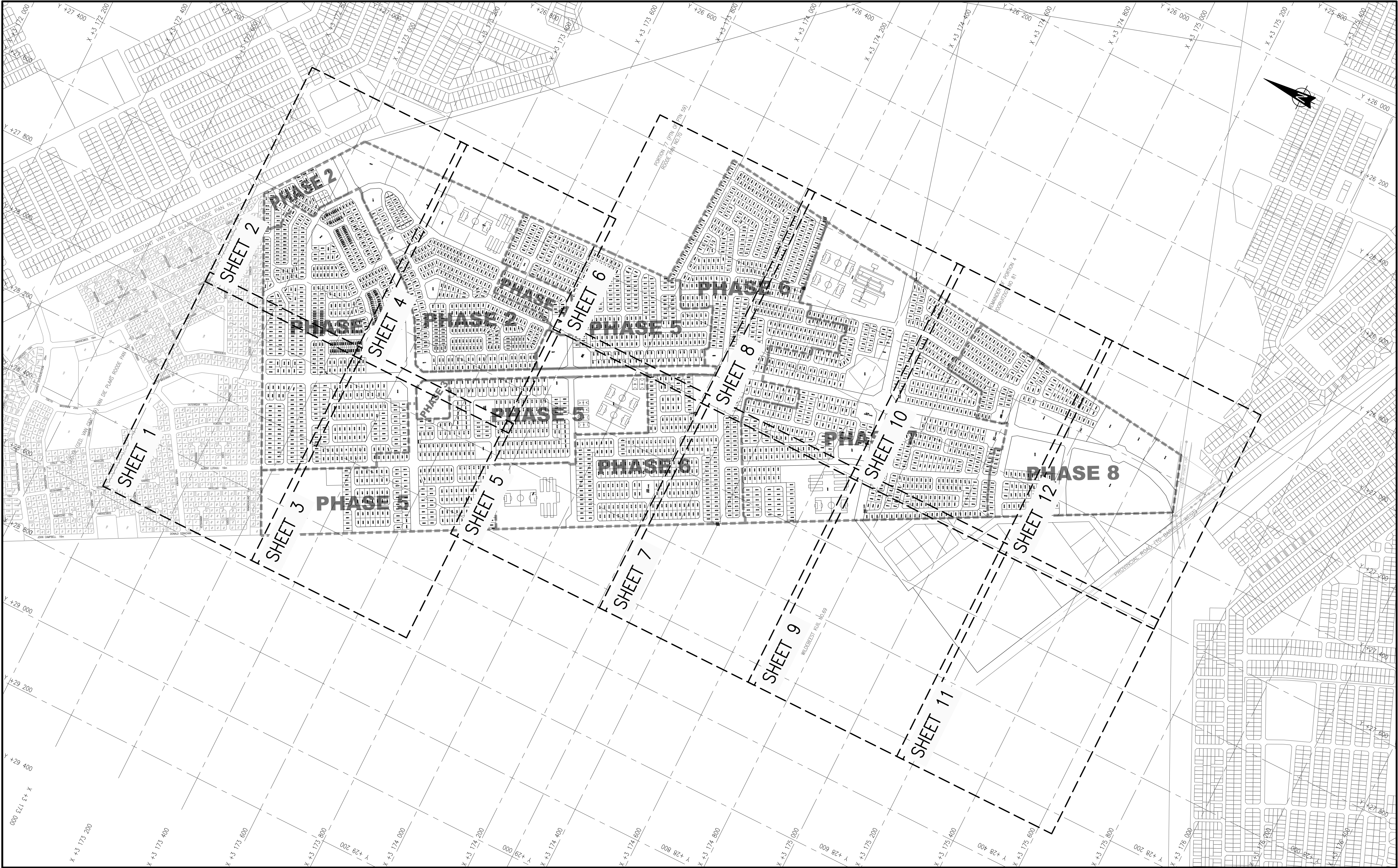
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APPROVED:

CLIENT OR ASSIGNEE: DATE: CLIENT DRAWING No.: CLIENT REF No.:

SURVEYED	DESIGNED
DRAWN	CHECKED
CO-ORDINATE SYSTEM:	DATE:
APPROVED ON BEHALF OF BIGEN:	VERSION:
ENGINEER: DATE: DRAWING No.: 1396.10.ZA.02P001	15.0

1396.10.ZA.02P001



AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	9-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
		ENGINEER	DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	9-2015	Certified As Built Phase 1	FJV
3.0	9-2015	Certified As Built Bulk	FJV



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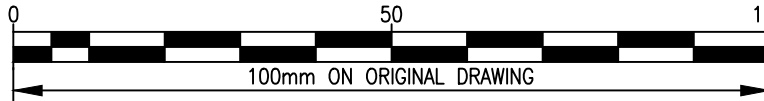
DRAWING TITLE:

KEY PLAN

Sei Plaatje Municipality



We Serve



ORIGINAL DRAWING SCALE: **1 : 5 000** ORIGINAL DRAWING SHEET SIZE: **A1**

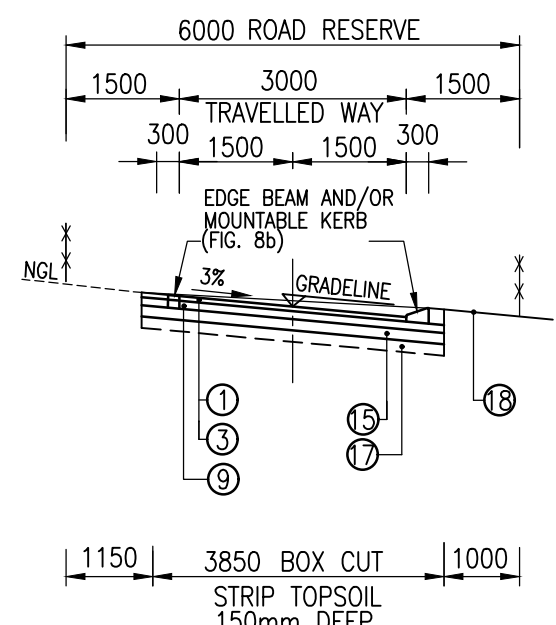
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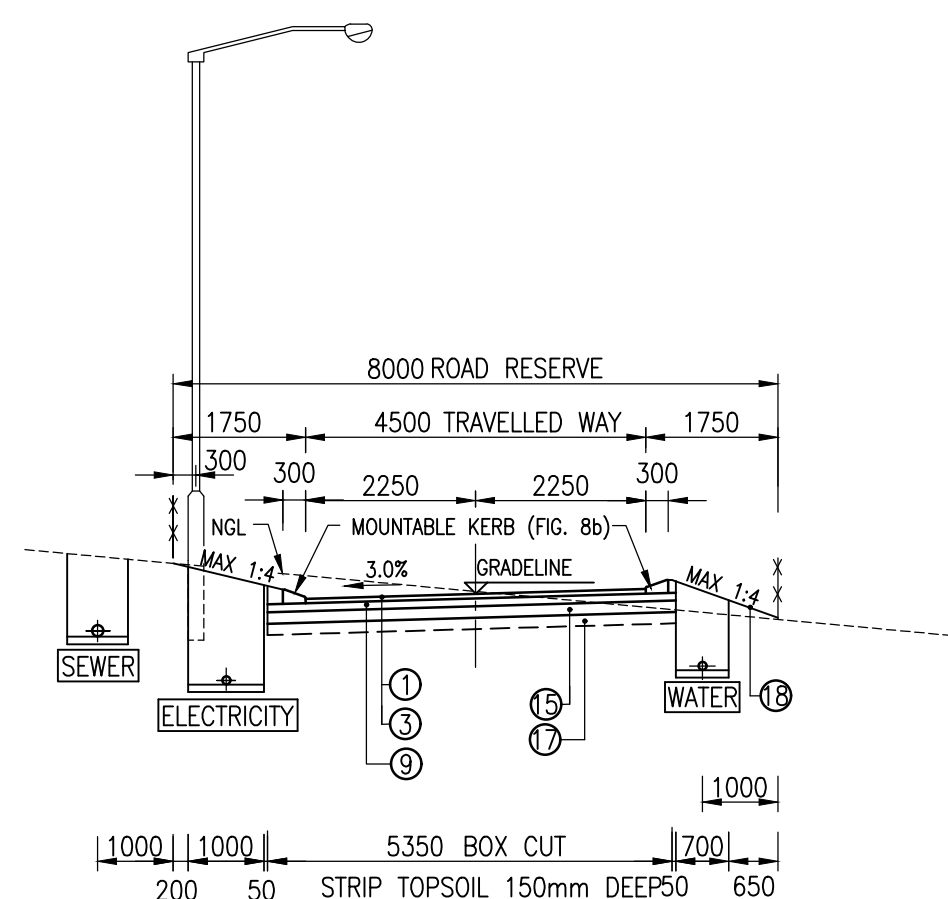
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SURVEYED	DESIGNED
DRAWN N Bester	CHECKED L Gertenbach
CO-ORDINATE SYSTEM: WG25	DATE: February 2010
APPROVED ON BEHALF OF BIGEN:	
ENGINEER: _____ DATE: _____	VERSION: 3.0
DRAWING No.: 1396.10.ZA.01S001	

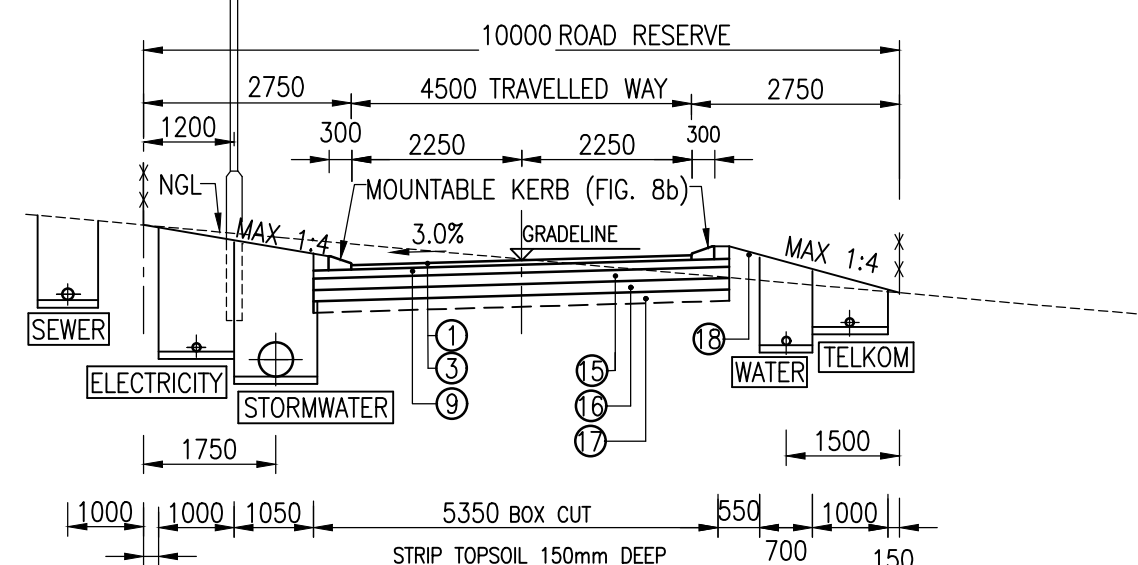
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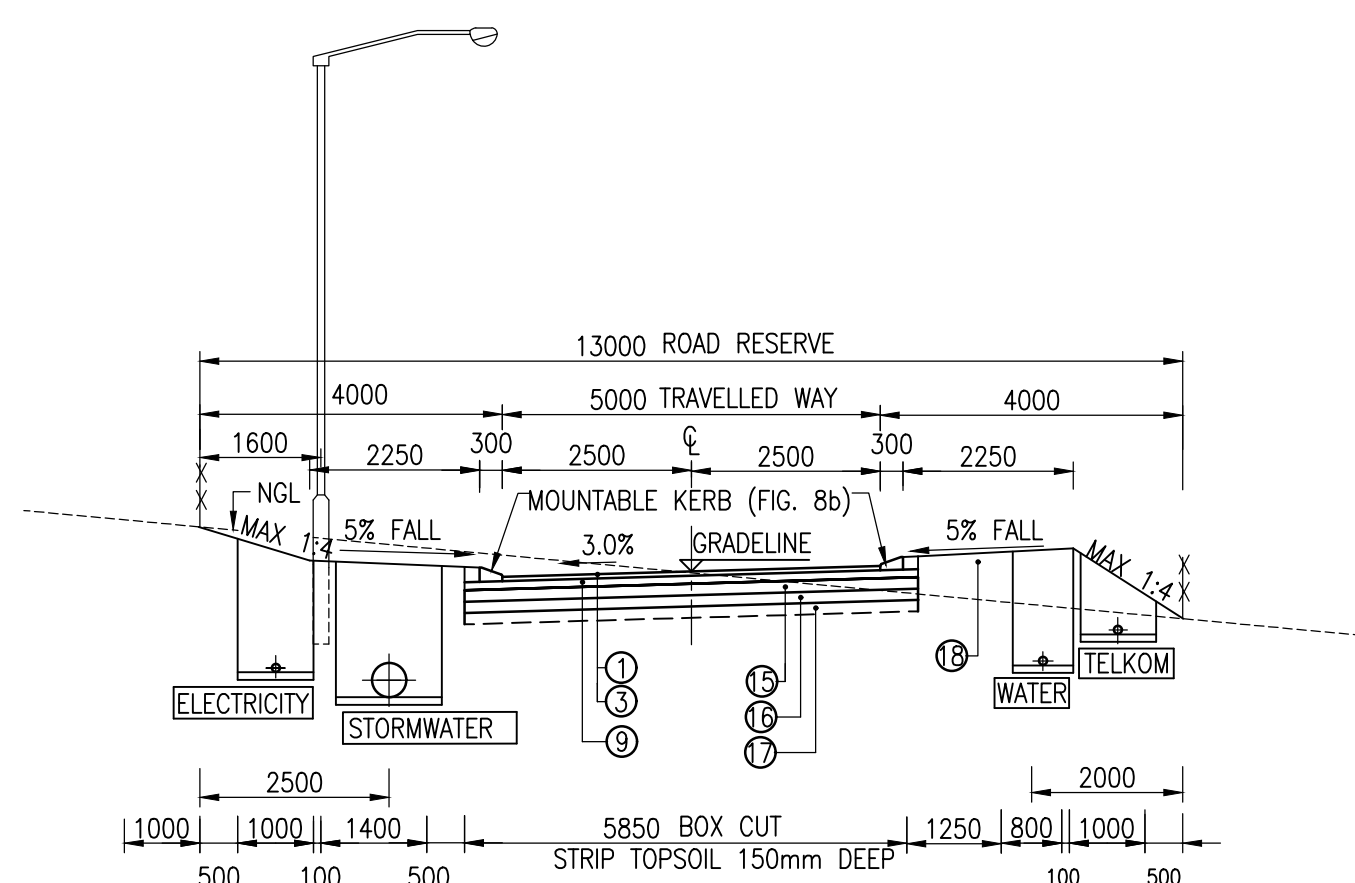
3m TRAVELLED WAY IN 6m RESERVE
SCALE 1:100



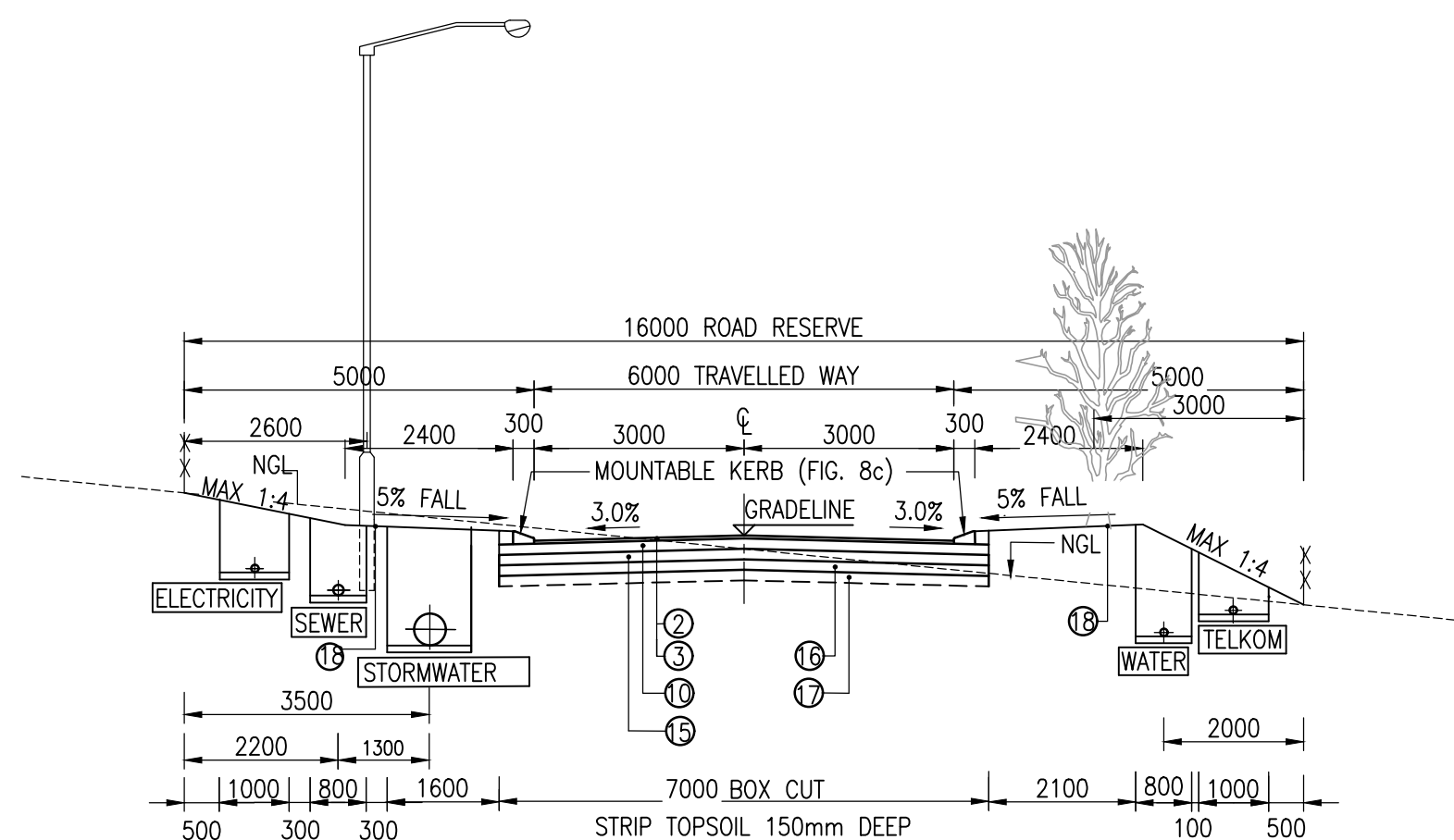
4,5m TRAVELLED WAY IN 8m RESERVE
SCALE 1:100



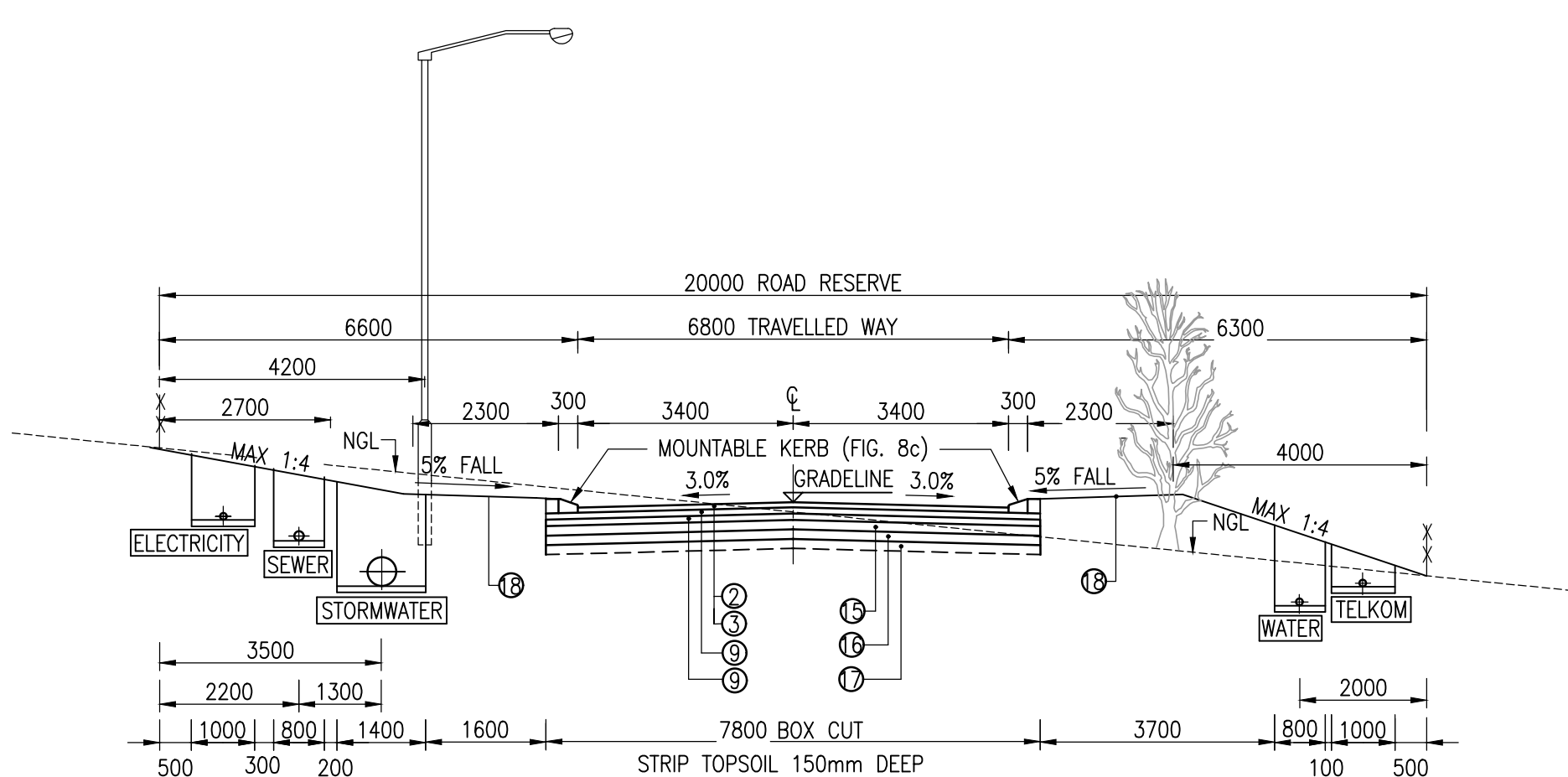
4.5m TRAVELLED WAY IN 10m RESERVE
SCALE 1:100



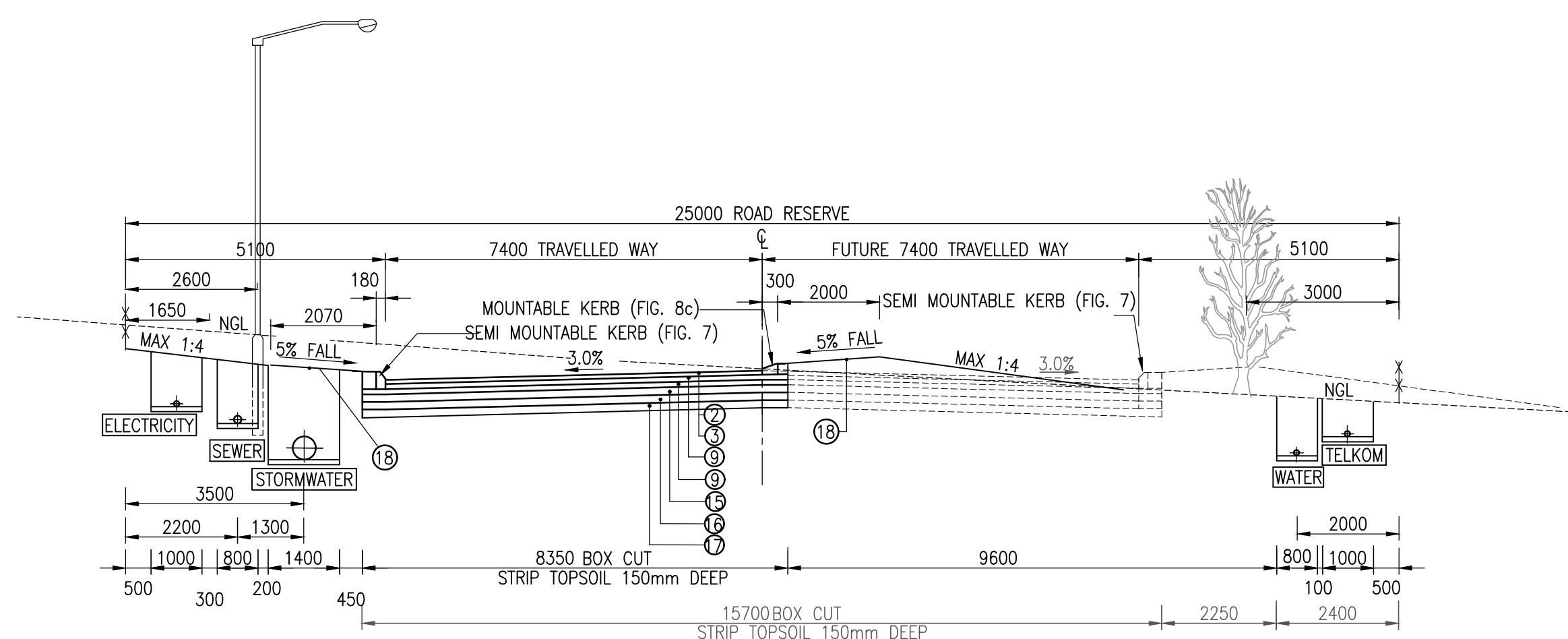
5m TRAVELLED WAY IN 13m RESERVE
SCALE 1:100



6m TRAVELLED WAY IN 16m RESERVE
SCALE 1:100



6.8m TRAVELLED WAY IN 20m RESERVE
SCALE 1:100



7.4m TRAVELLED WAY IN 25m RESERVE
SCALE 1:100

DESCRIPTION OF PAVEMENT LAYERS:

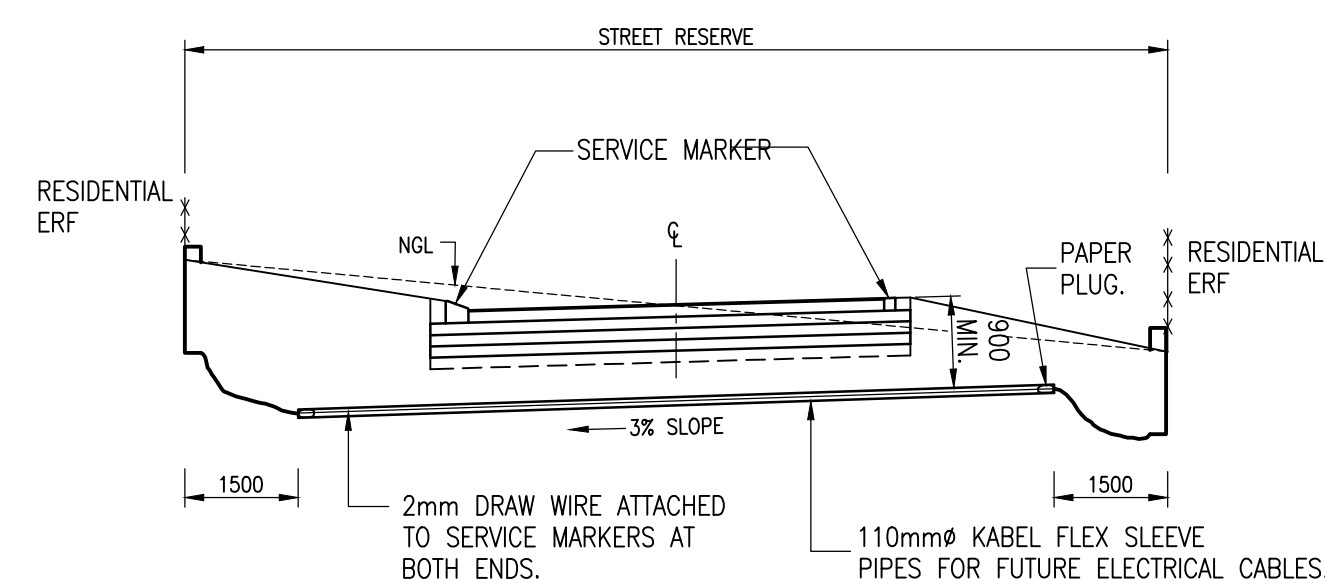
- ① 60mm INTERBLOCKS
- ② 80mm INTERBLOCKS
- ③ 20mm RIVERSAND
- ④ PRIME AS SPECIFIED IN DOCUMENT
- ⑤ 150 G1 @ 100% /GR-MF/NP : BASE
- ⑥ 150 G2 @ 100% /GR-MF/NP : BASE
- ⑦ 125 G4 @ 100% /GR-MF/NP : BASE
- ⑧ 100 G5 @ 100% /GR-MF/NP : BASE
- ⑨ 100/SG/1,5 @ 95%/1,5/SP: SUBBASE (C4)
- ⑩ 125/SG/1,5 @ 95%/1,5/SP: SUBBASE (C4)
- ⑪ 150/SG/1,5 @ 95%/1,5/SP: SUBBASE (C4)
- ⑫ 125/SG/1,5 @ 95%/1,5/SP: SUBBASE (C3)
- ⑬ 100/SG/1,5 @ 95%/1,5/SP: LOWER SUBBASE (C4)
- ⑭ 125/SG/1,5 @ 95%/1,5/SP: LOWER SUBBASE (C4)
- ⑮ 150/NG/15 @ 93%/0,75/12: USSG (G7)
- ⑯ 150/NG/7 @ 93%/0,5/-/-: LSSG (G9)
- ⑰ 150 ROADBED COMPACTED TO 93%
- ⑱ FINISHING OFF, TRIMMING AND COMPACTED TO 90% FOR SIDEWALK

LEGEND:

1. REQUIREMENTS ARE GIVEN IN THE FOLLOWING ORDER:
LAYER THICKNESS / MATERIAL / MIN STRENGTH (CBR OR UCS) @ MIN DENSITY / MIN GM / MAX PI.
2. MIN UNCONFINED COMPRESSIVE STRENGTH (UCS) IS SHOWN IN kPa.
3. MIN DENSITY IS GIVEN AS % OF MAX MODIFIED AASHTO DENSITY.
4. SG = STABILISED GRAVEL
NG = NATURAL GRAVEL
PI = PLASTICITY INDEX
NP = NON PLASTIC
SP = SLIGHTLY PLASTIC
GM = GRADING MODULUS
GR-MF = GRADING AS PER SABS 1200 MF
CG = CONTINUOUSLY GRADED
G1 = GRADED CRUSHED STONE
SSG = SELECTED SUBGRADE
GR-TR14 = GRADING AS PER TRH14

NOTES:

1. WHERE ORDERED BY THE ENGINEER, COLLAPSABLE SAND SHALL BE COMPACTED WITH AN IMPACT ROLLER. NUMBER OF PASSES TO STABILISE THE SAND SHALL BE DETERMINED ON SITE.
2. WHERE THE SUBGRADE IS TOO WET FOR THE ROADBED TO BE PROPERLY COMPACTED, THE ENGINEER SHALL ORDER THAT THE ROADBED BE SCARIFIED, LEFT TO DRY AND RECOMPACTED TO THE DENSITY SHOWN.
3. SUBGRADE LAYERS WILL BE FINALISED AFTER A DETAILED SOIL INVESTIGATION HAS BEEN DONE.
4. THE UPPER AND/ OR LOWER SELECTED LAYERS MAY BE OMITTED IF THE INSITU MATERIAL CONFORMS TO A G7 OR G9 GRADING.
5. MAXIMUM TRENCH WIDTHS ARE INDICATED. ACTUAL TRENCH WIDTHS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR THE DIFFERENT SERVICES.



TYPICAL INSTALLATION OF DUCTS
FOR ELECTRICAL CABLES
NTS

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2015
2334-10-00	CERTIFIED AS BUILT	FJV	10-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	02-2010	Mountable Kerb Type changed	FJV
3.0	02-2010	Pavement layer changed	FJV
4.0	05-2010	Lamp pole position changed	FJV
5.0	02-2011	LSSG added to 10m&13m Roadreserve	FJV
6.0	09-2015	CERTIFIED AS BUILT BULK	FJV
7.0	10-2015	CERTIFIED AS BUILT PHASE 2	FJV
8.0	05-2017	Construction SW pipe over ERF 29772	FJV



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PROJECT TITLE:

LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES

DRAWING TITLE:

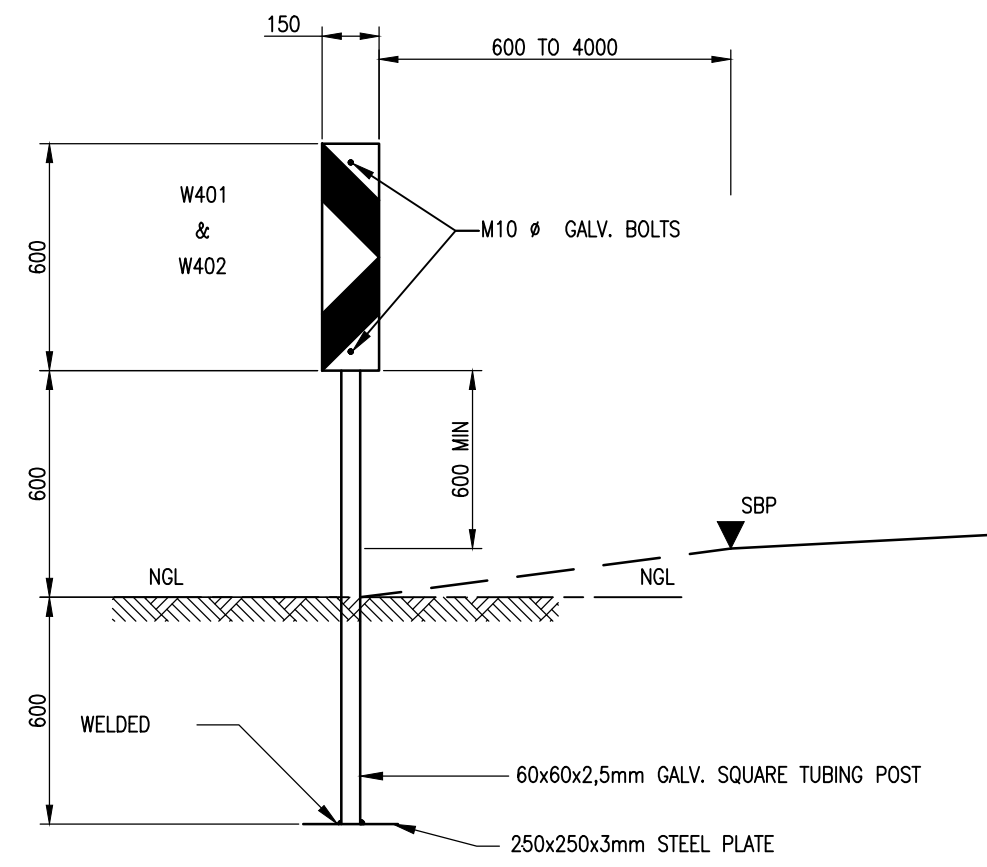
TYPICAL ROAD CROSS-SECTIONS

Sei Plaatje Municipality

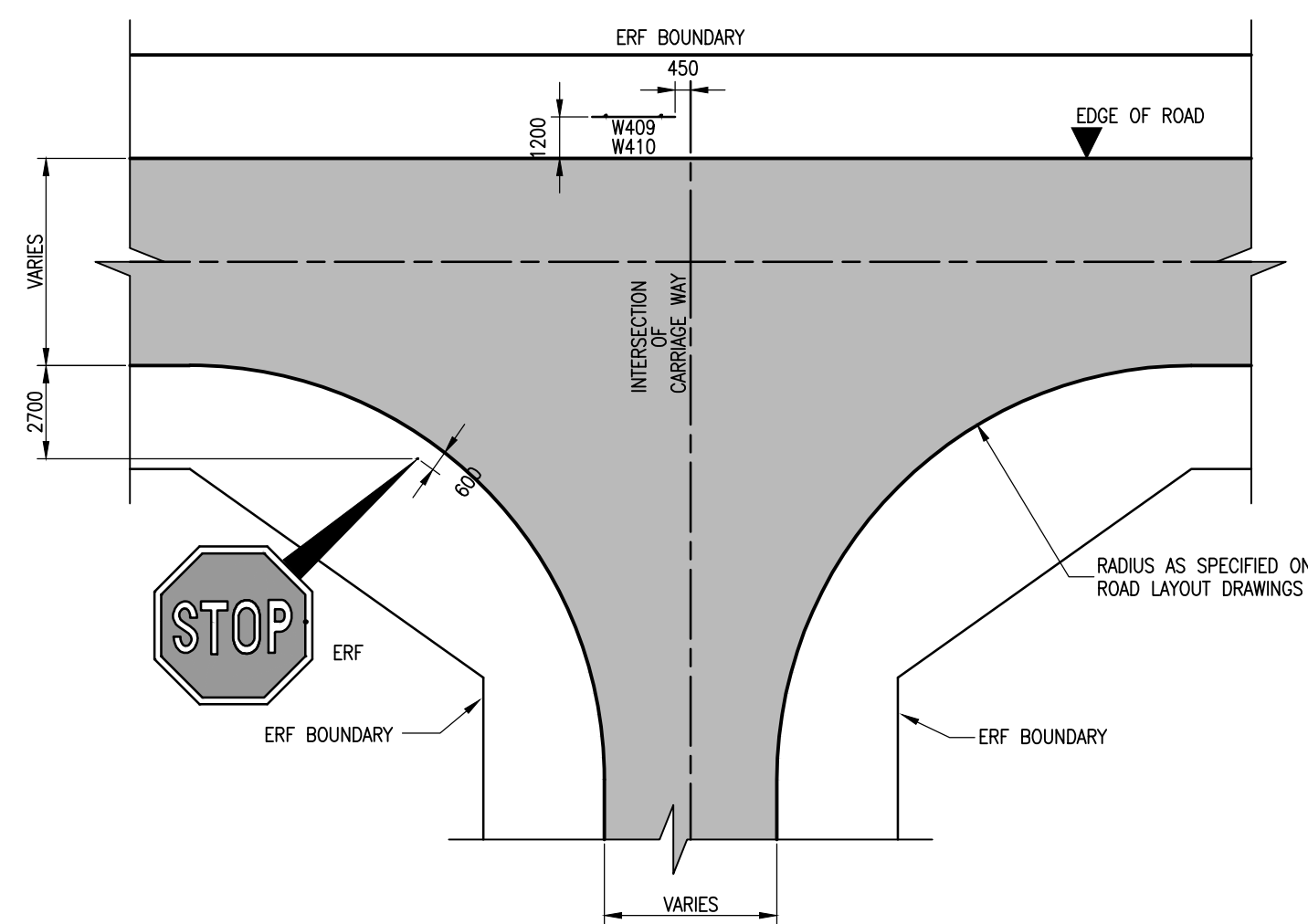


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APPROVED:		APPROVED ON BEHALF OF BIGEN:		
CLIENT OR ASSIGNEE: _____ DATE: _____		ENGINEER: _____ DATE: _____		
CLIENT DRAWING No.: _____		DRAWING No.: 1396.10.ZA.03.D001		
CLIENT REF No.: _____		VERSION: 8.0		

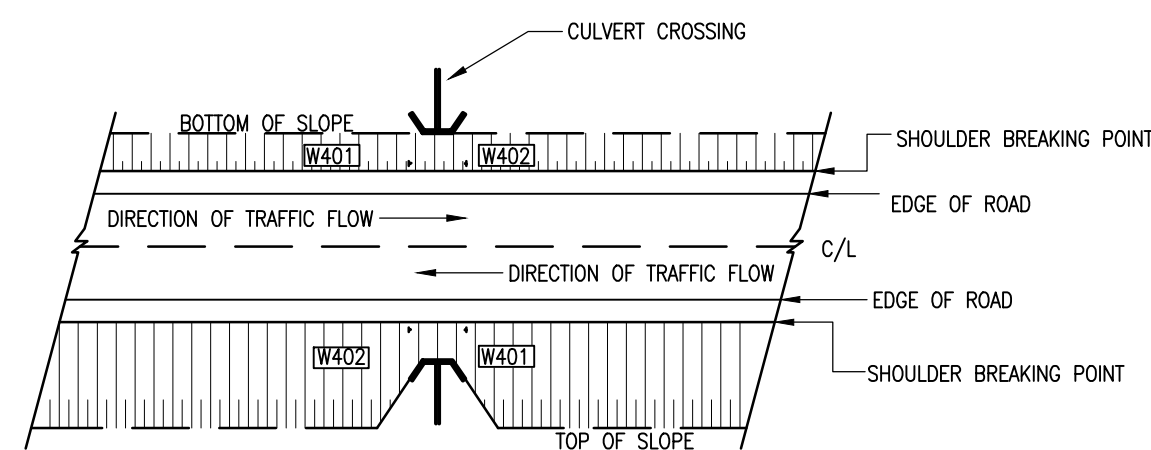
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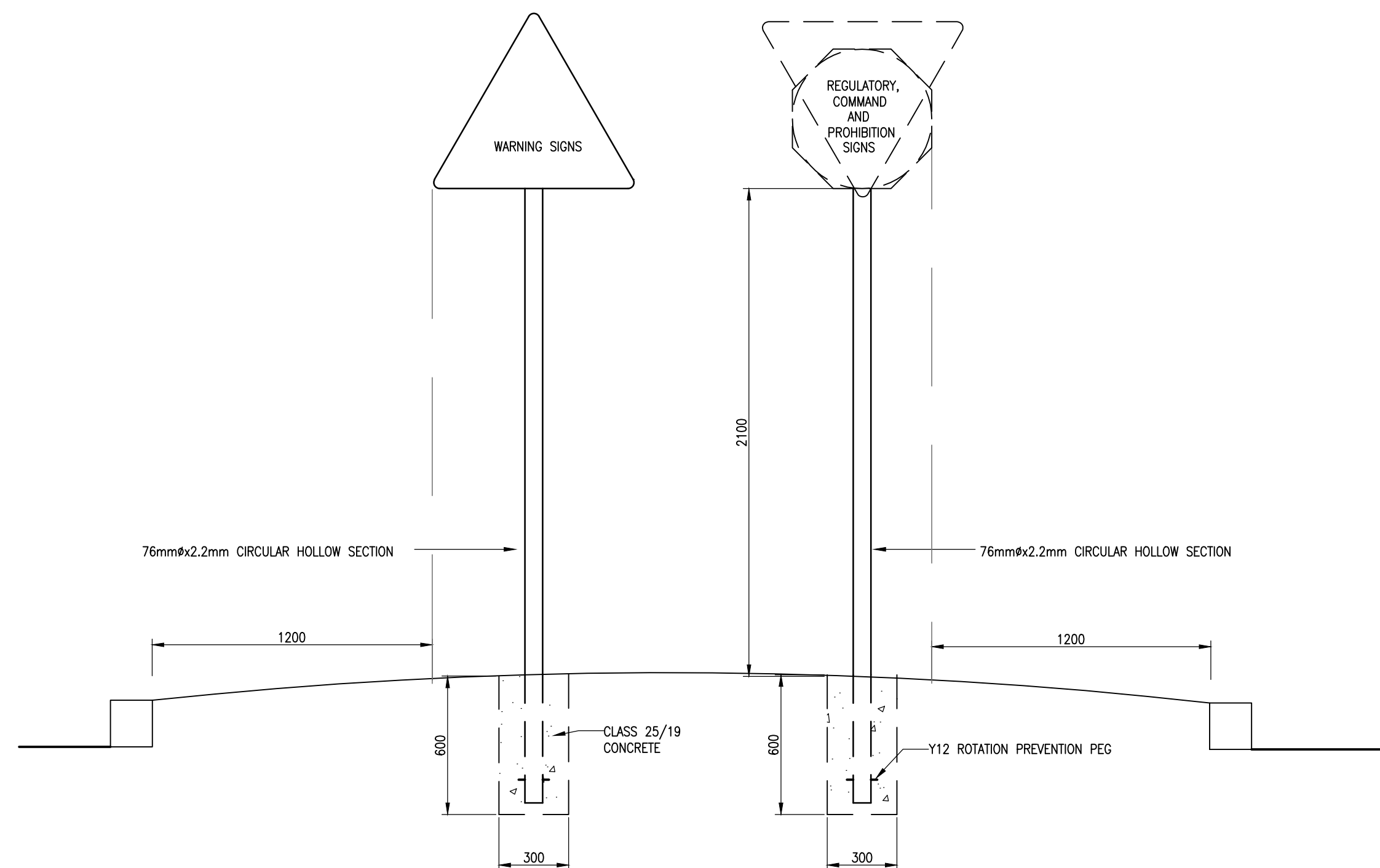
FRONT ELEVATION W401
SCALE 1:20



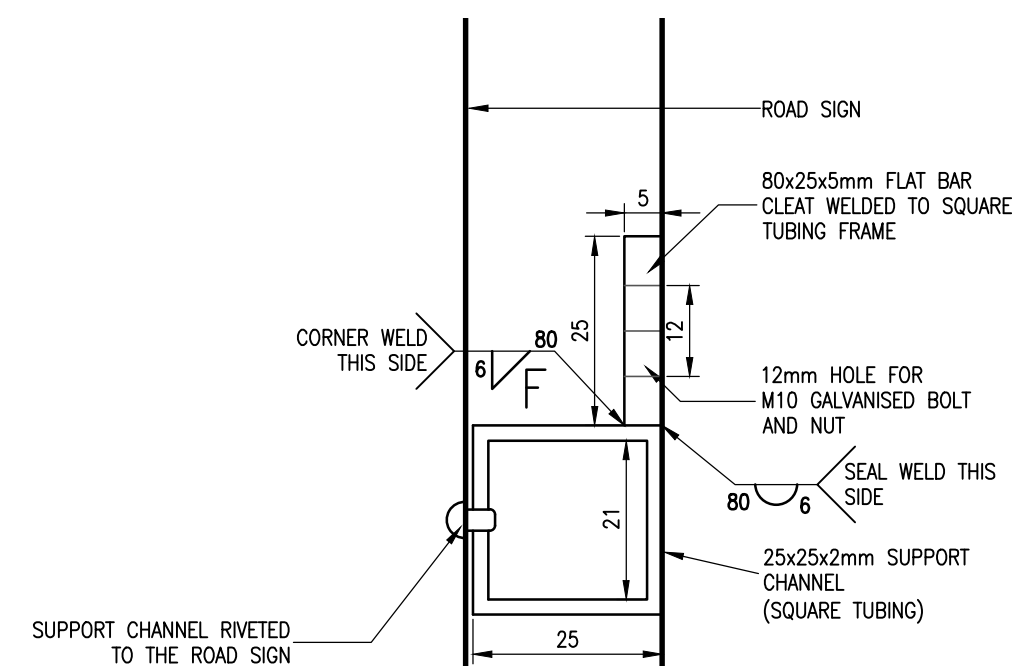
CHEVRON POSITION AT INTERSECTION
SCALE 1:200



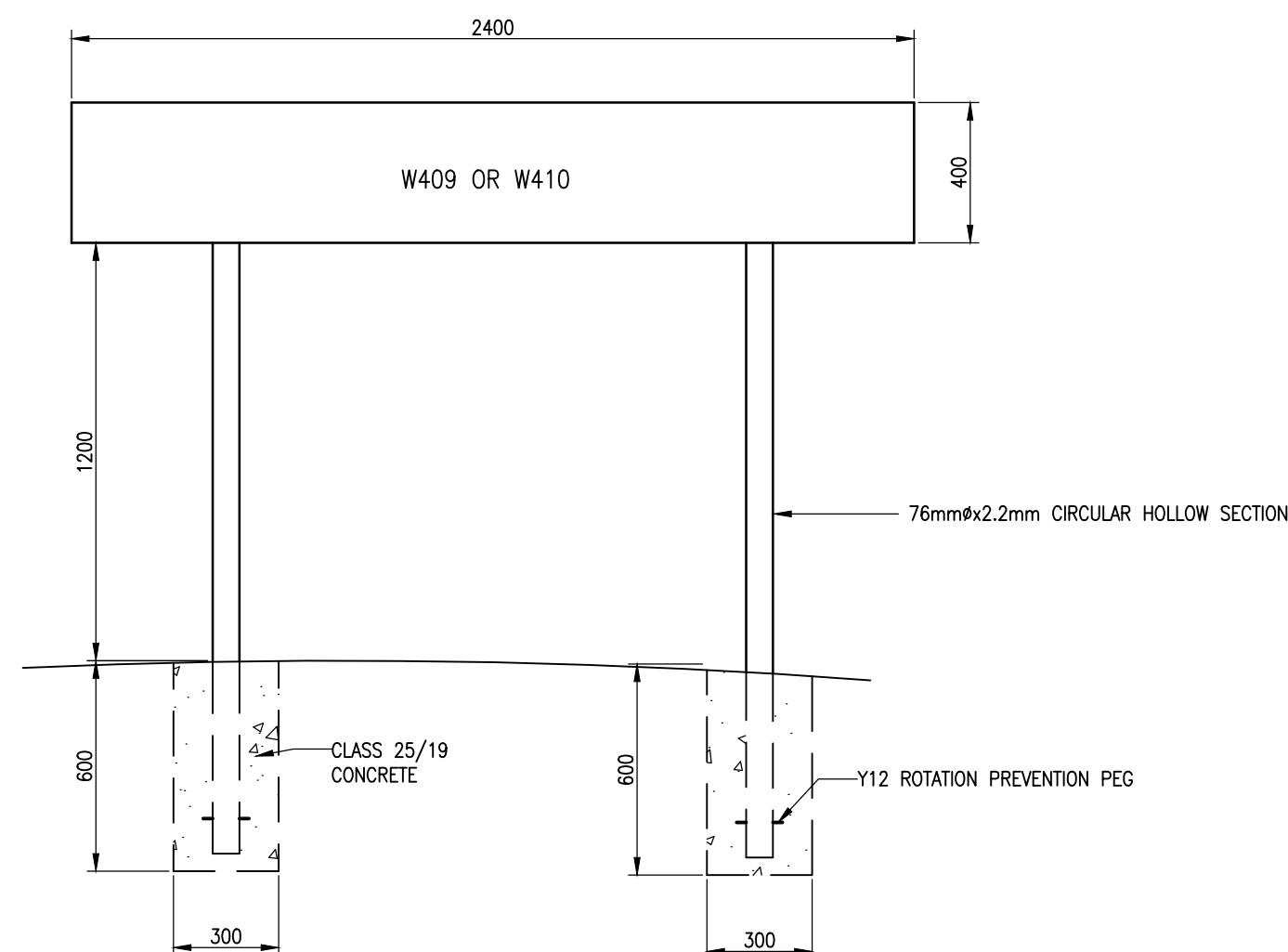
SIGN AT CULVERT
NTS



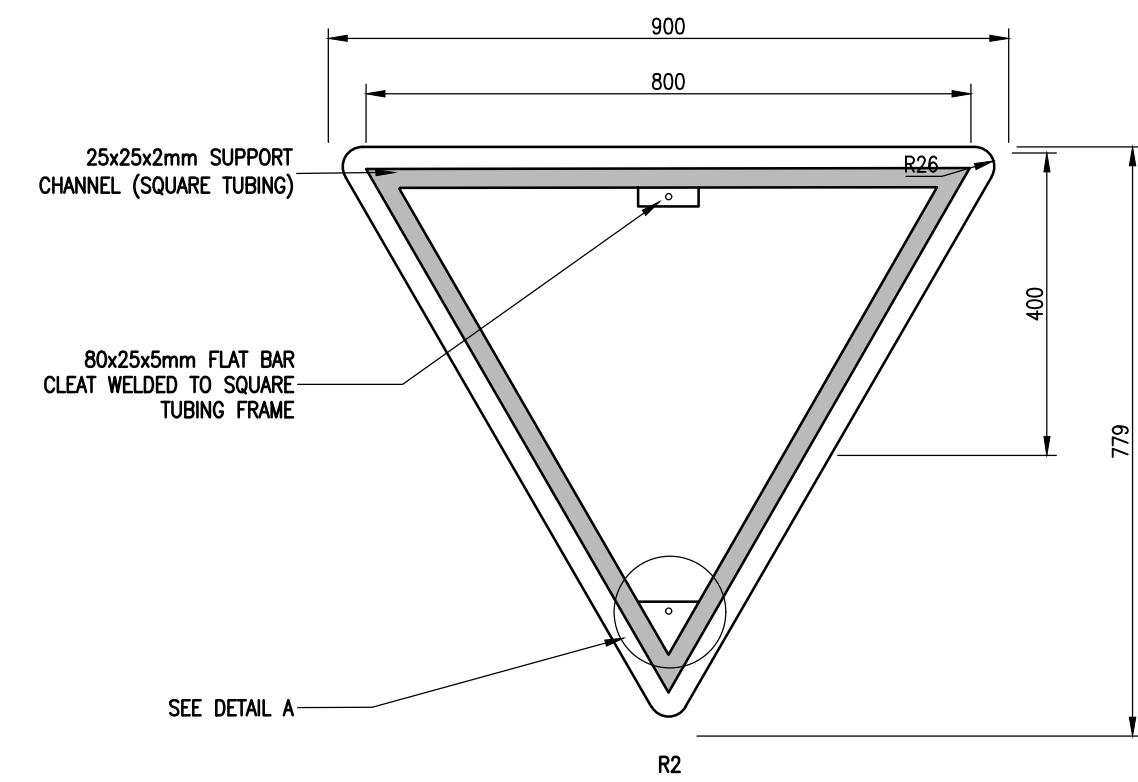
POSITIONING DETAILS
SCALE 1:20



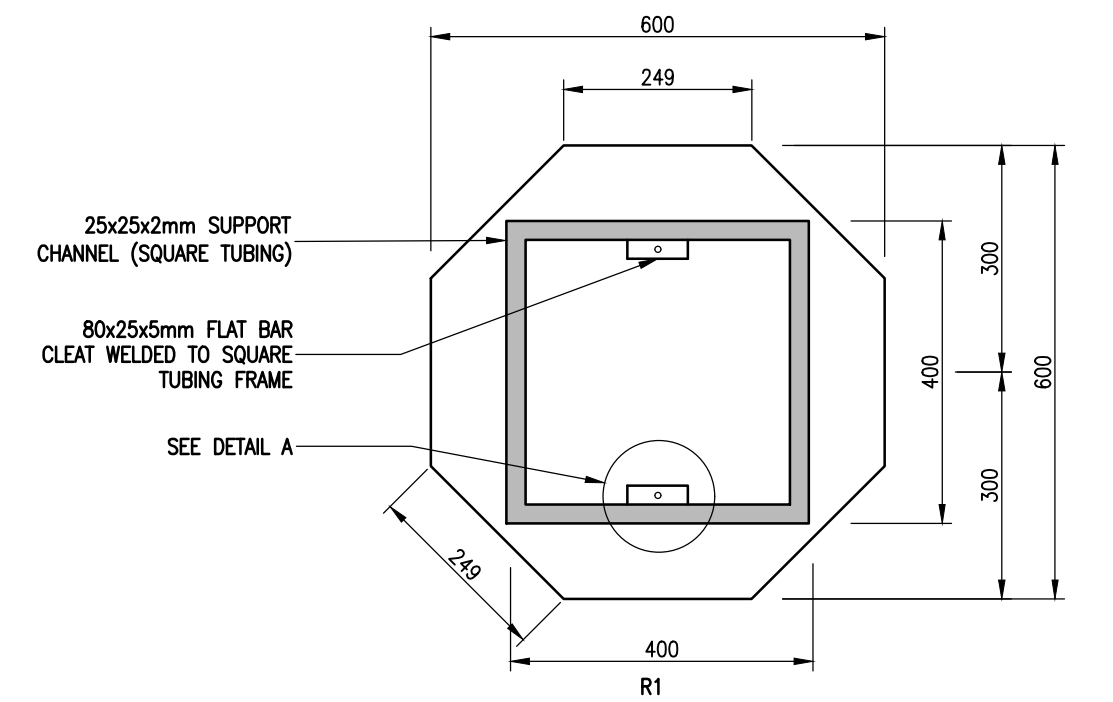
DETAIL A SECTIONAL ELEVATION
SCALE 1:1



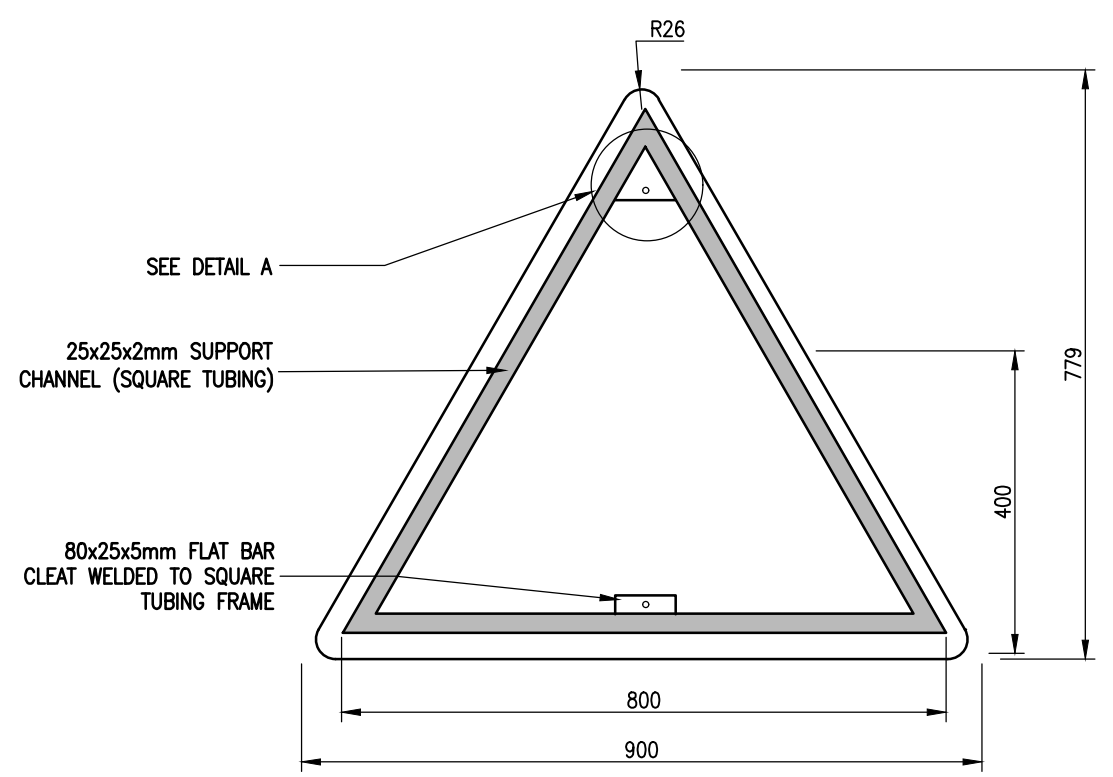
- NOTES:**
- ALL ROAD MARKINGS AND ROAD SIGNS TO BE MANUFACTURED AND CONSTRUCTED IN ACCORDANCE WITH THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL
 - ALL ROAD SIGNS TO BE PLACED AT A DEFLECTION ANGLE OF 93° WITH THE CENTRE LINE OF THE ROAD
- M10 x 90mm GALVANISED BOLTS AND NUTS FOR FIXING ROAD SIGNS TO GALVANISED STEEL PIPES
- ALL ROAD SIGNS TO BE FIXED TO SQUARE TUBING SUPPORT CHANNEL BY MEANS OF 6mmØ RIVETS AT A MAXIMUM SPACING OF 125mm c/c



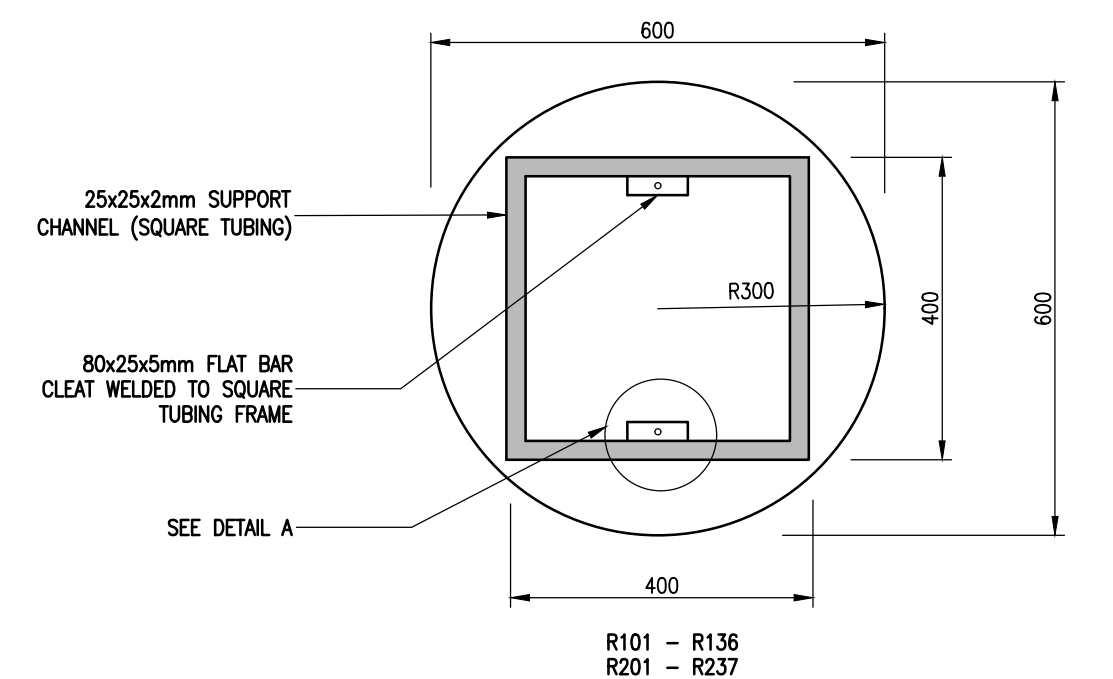
CONTROL SIGN



CONTROL SIGNS



ROAD LAYOUT AND SYMBOLIC SIGNS



COMMAND AND PROHIBITION SIGNS
FIXING AND SUPPORT DETAILS
SCALE 1:10

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
CERTIFIED AS-BUILT FOR CONTRACT :			

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY

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PROJECT TITLE:
**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

DRAWING TITLE:
**ROAD SIGN POSITIONING
& INSTALLATION DETAILS**

Sei Plaatje Municipality

0 50 100
100mm ON ORIGINAL DRAWING

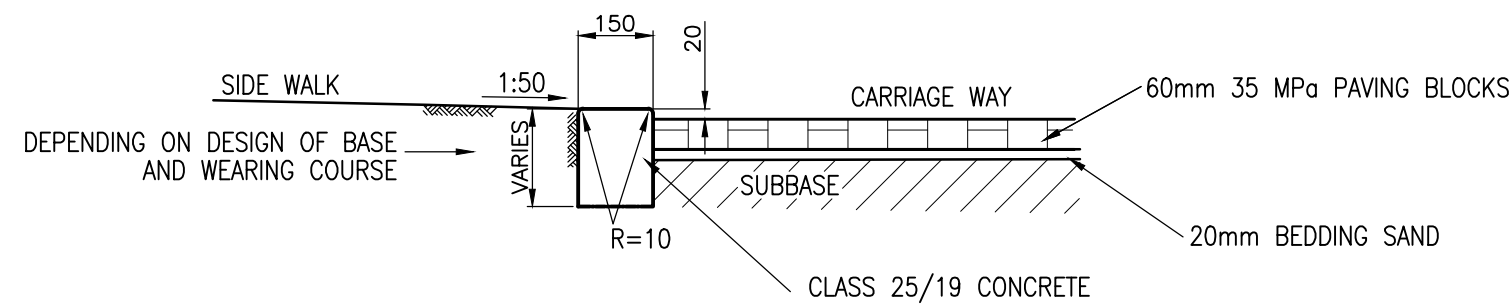
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APPROVED:
CLIENT OR ASSIGNEE: _____ DATE: _____
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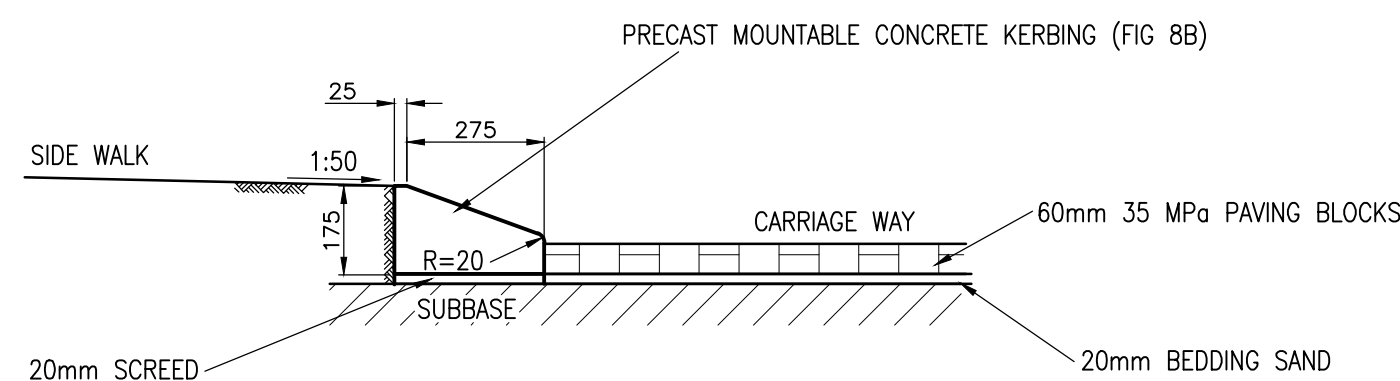
SURVEYED: _____ DESIGNED: **R vd Berg**
DRAWN: **N Bester** CHECKED: **FJ Viljoen**

CO-ORDINATE SYSTEM: **Lo25 WGS84** DATE: **February 2010**

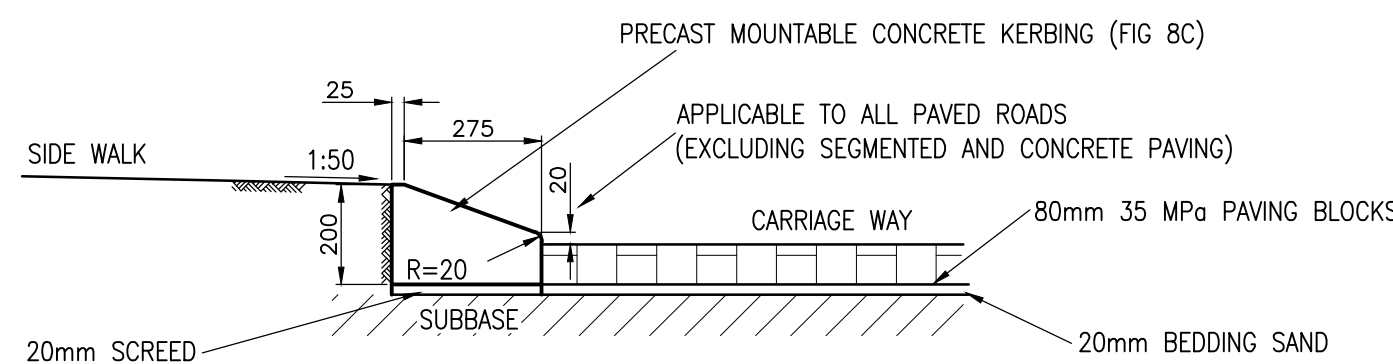
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DRAWING No.: **1396.10.ZA.03.D022** VERSION: **2.0**



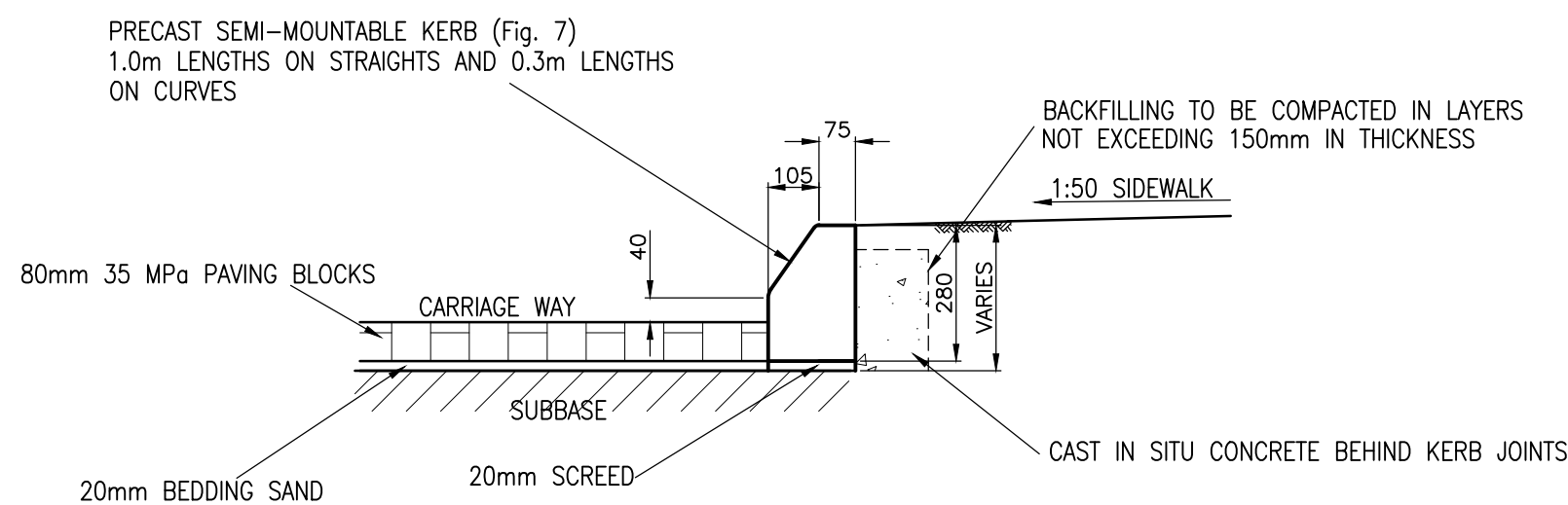
EDGE BEAM



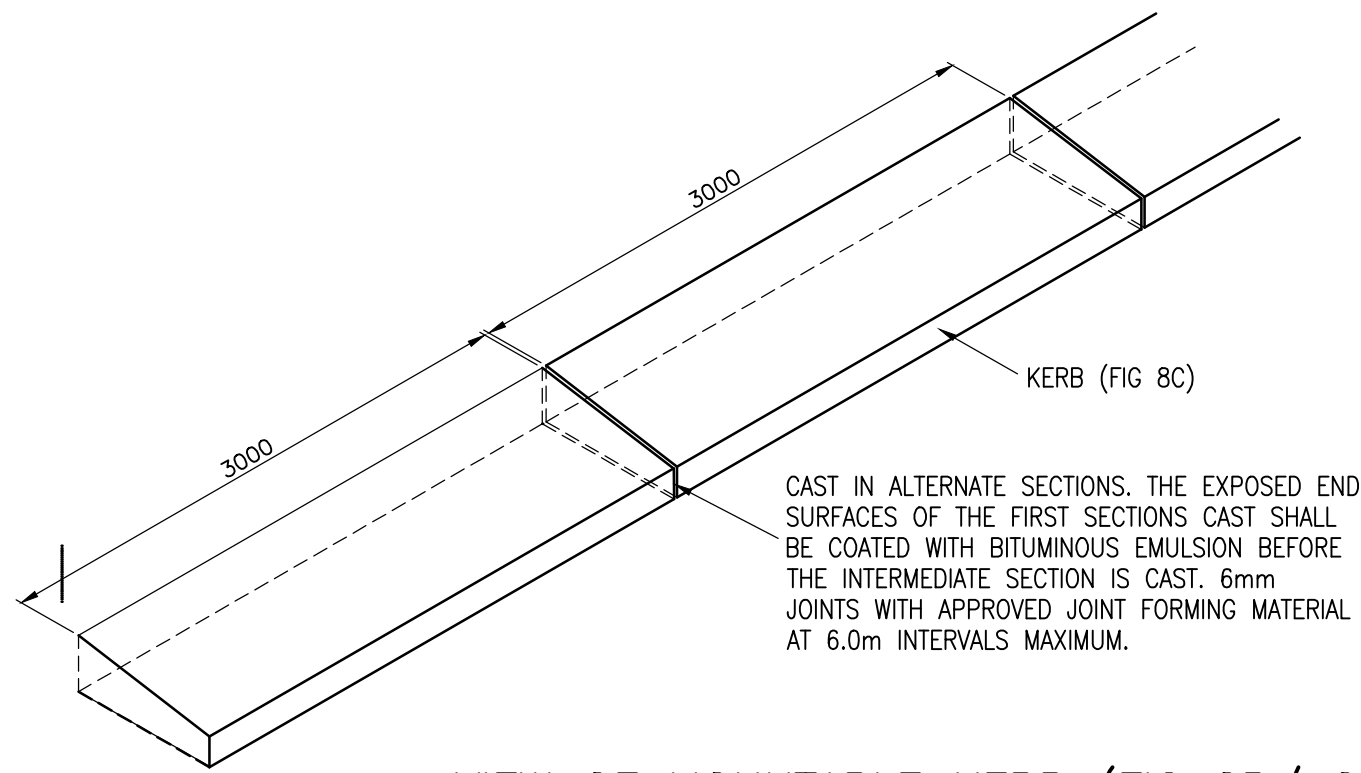
MOUNTABLE KERB (FIG 8B)
FOR ROAD WIDTH 3m; 4.5m & 5m



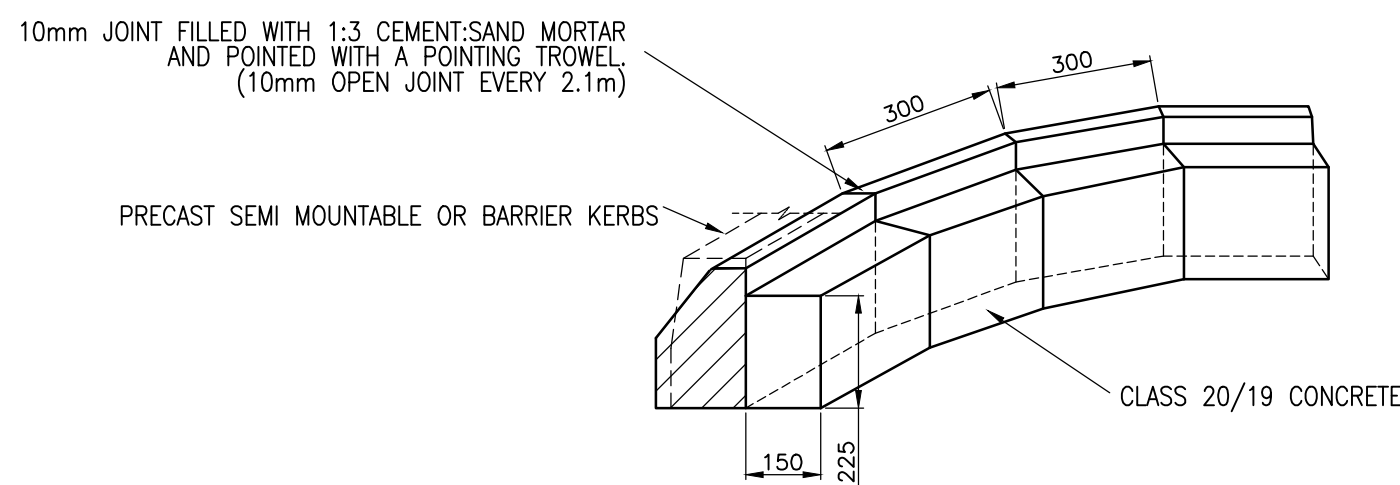
MOUNTABLE KERB (FIG 8C)
FOR ROAD WIDTH 6m; 6.8m & 7.4m



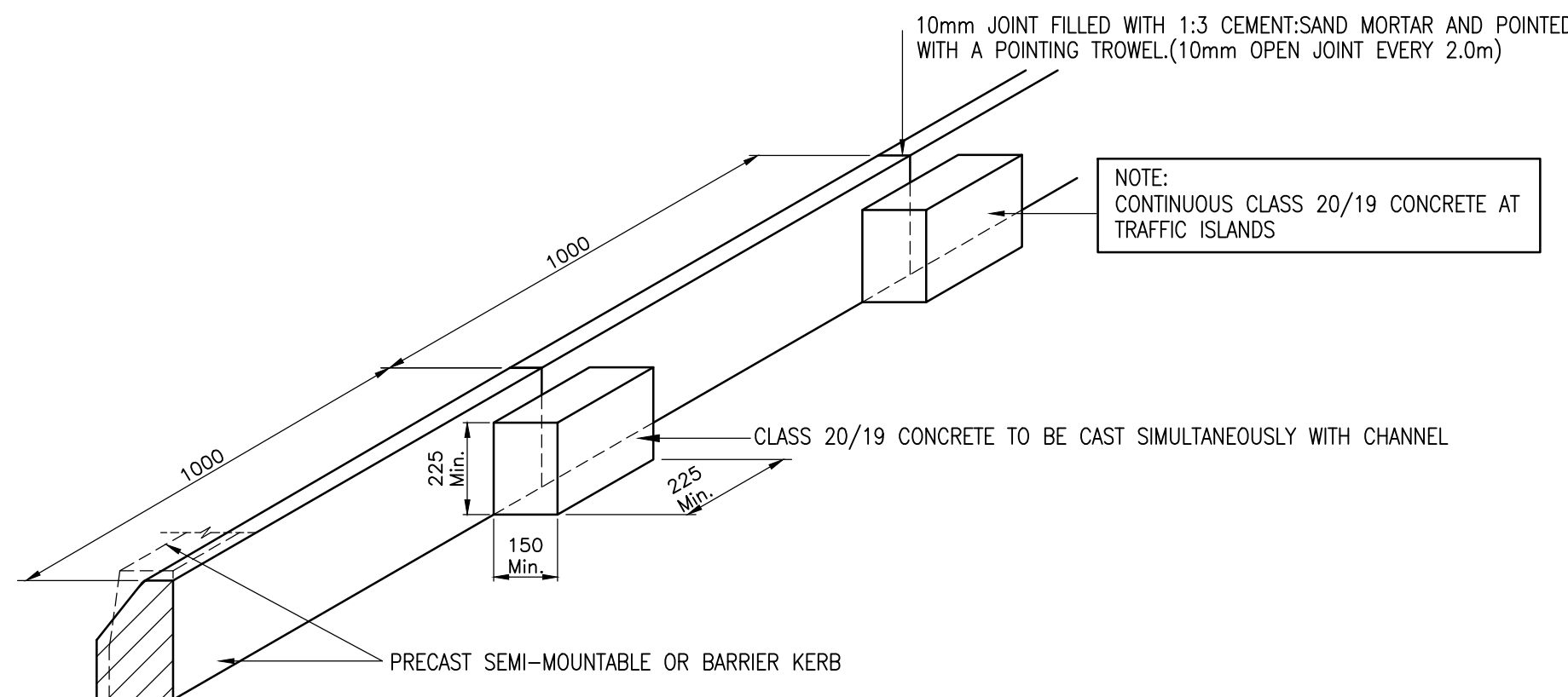
DETAIL OF SEMI-MOUNTABLE KERB (FIG7)



VIEW OF MOUNTABLE KERB (FIG 8B/ 8C)



SEMI MOUNTABLE (FIG7) / BARRIER KERBS (FIG 3) ON CURVED SECTIONS



SEMI MOUNTABLE (FIG7) / BARRIER KERBS
ALONG STRAIGHT SECTIONS (FIG3)

NOTES:

1. KERBS - GENERAL

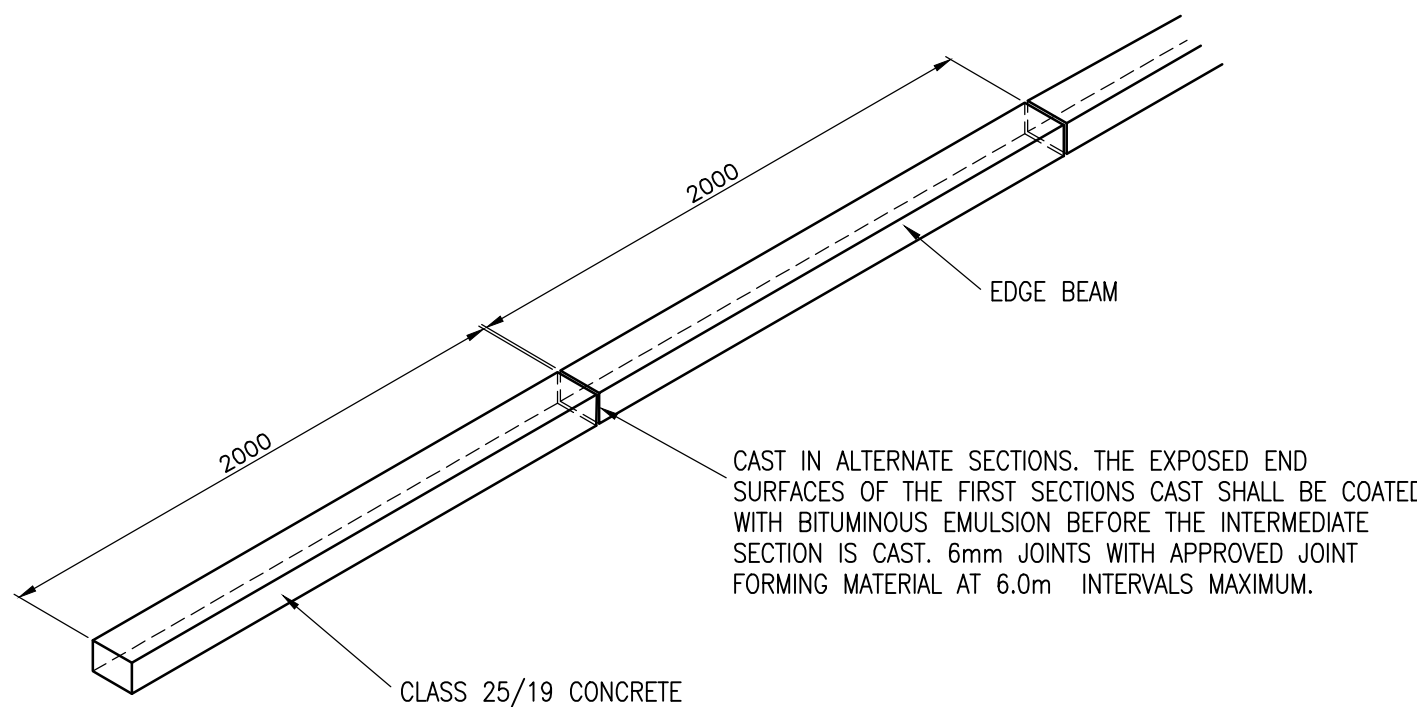
- 1.1 REFER TO TABLE A FOR THE USAGE OF KERBS
- 1.2 THE 20mm LIP ON ALL KERBS IS APPLICABLE TO ALL PAVED ROADS EXCEPT WHERE BLOCK OR CONCRETE PAVING IS USED.
- 1.3 ALL EDGES TO BE ROUNDED TO R12 UNLESS OTHERWISE INDICATED.

2. CAST IN-SITU CONCRETE HAUNCHING.

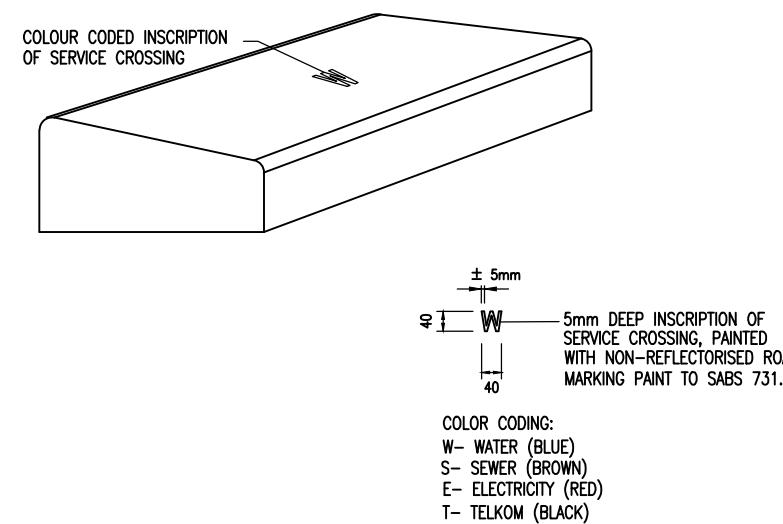
- 2.1 CONCRETE TO BE CLASS 20/19.
- 2.2 CONCRETE TO BE CURED FOR A MINIMUM PERIOD OF 7 DAYS.

3. PRECAST KERBS

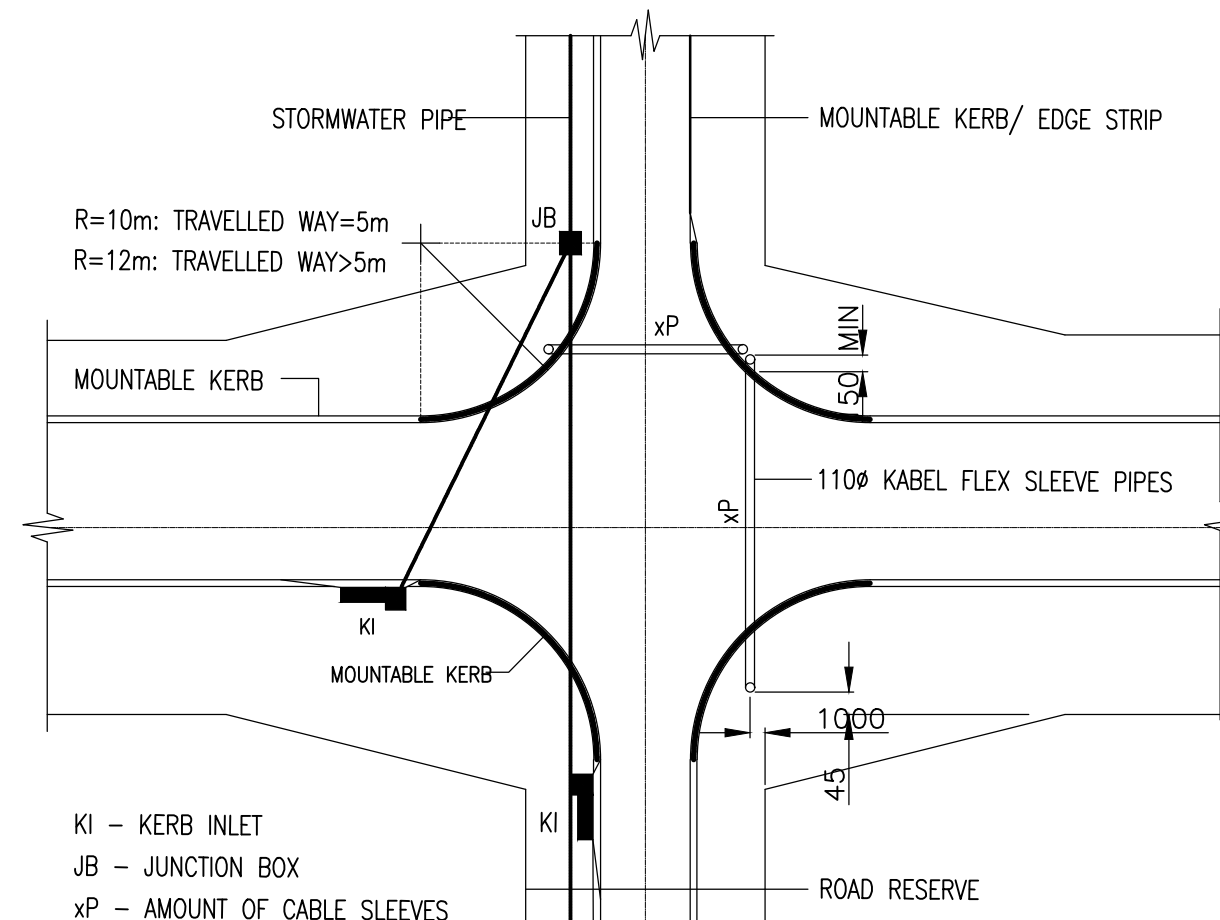
- 3.1 ALL PRECAST KERBS SHALL COMPLY WITH THE REQUIREMENTS OF SABS 927:2007.



VIEW OF EDGE BEAM



DETAIL OF INSCRIBED AND
PAINTED SERVICE MARKINGS
SCALE 1:10



TYPICAL DETAIL OF INTERSECTION
SCALE 1:500

TABLE A: KERBS TO BE USED FOR ROAD CONSTRUCTION

APPLICATION		TYPE OF KERB				
		MOUNTABLE KERB.	EDGE BEAM	SEMI-MOUNTABLE KERB (FIG.7) WITH CHANNEL	BARRIER KERB (FIG.3) WITH CHANNEL	COPING TYPE BLOCKS (SPECIAL) REFER TO NOTE 4
ROADS UP TO 5m WIDE.	STRAIGHTS AND CURVES		(SEE NOTE 1.)			
	BELLMOUTHS (SEE NOTE 2)					
ROAD WIDER THAN 5m AND UP TO 6m WIDE.	STRAIGHTS AND CURVES		(SEE NOTE 1.)			
	BELLMOUTHS (SEE NOTE 2)					
ROAD WIDER THAN 6m	STRAIGHTS AND CURVES (SEE NOTE 3)					
	BELLMOUTHS (SEE NOTE 2)					
BUS AND TAXI BAYS.						
WHERE VEHICLES CROSSING THE KERB IS DISCOURAGED.						
WHERE VEHICLES CROSSING THE KERB IS PROHIBITED.						
JOINT BETWEEN ASPHALT AND BLOCK PAVING						
TEMPORALLY EDGE RESTRAINT IN ASPHALT PAVING TO BE REMOVED WHEN ROAD IS EXTENDED.						

NOTES: 1) AN EDGE BEAM SHALL BE CONSTRUCTED ON THE HIGH SIDE OF ROADS WITH A SINGLE CROSS-FALL.

2) AT THE INTERSECTION OF ROADS WITH DIFFERENT ROAD WIDTHS, THE BELLMOUTHS SHALL BE CONSTRUCTED WITH KERBS PRESCRIBED FOR THE BELLMOUTHS OF THE WIDER ROADS.

3) FOR 7.4m ROADWIDTH ONLY
- MOUNTABLE KERBS ON HIGH SIDE OF ROAD
- SEMI-MOUNTABLE ON LOW SIDE OF ROAD

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ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
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3.0	09-2015	CERTIFIED AS BUILT BULK	FJV
4.0	10-2015	CERTIFIED AS BUILT PHASE 2	FJV



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PROJECT TITLE:

LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES

DRAWING TITLE:

MOUNTABLE- SEMI-MOUNTABLE KERBS
& EDGE BEAM DETAILS

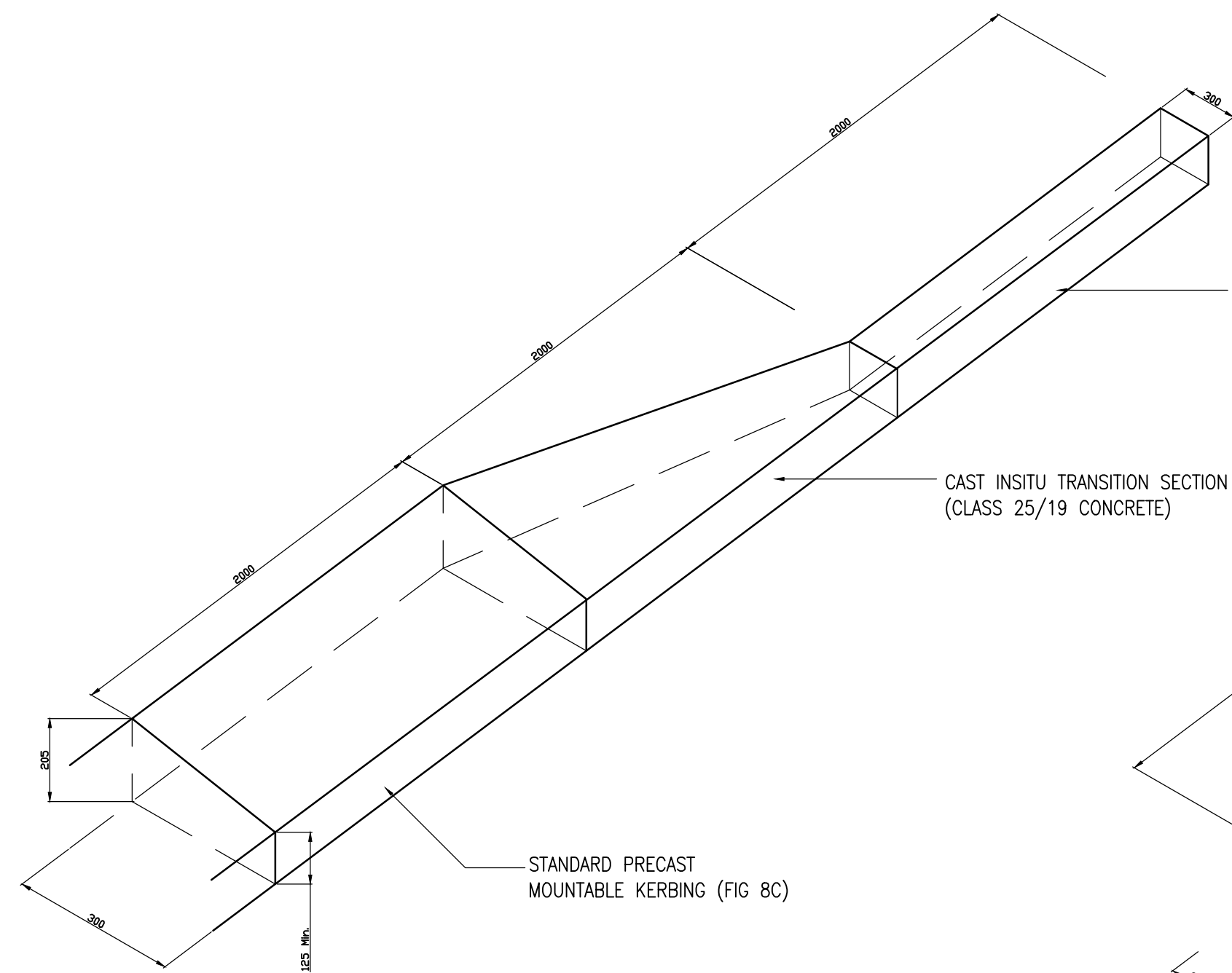
Sei Ploaie Municipality



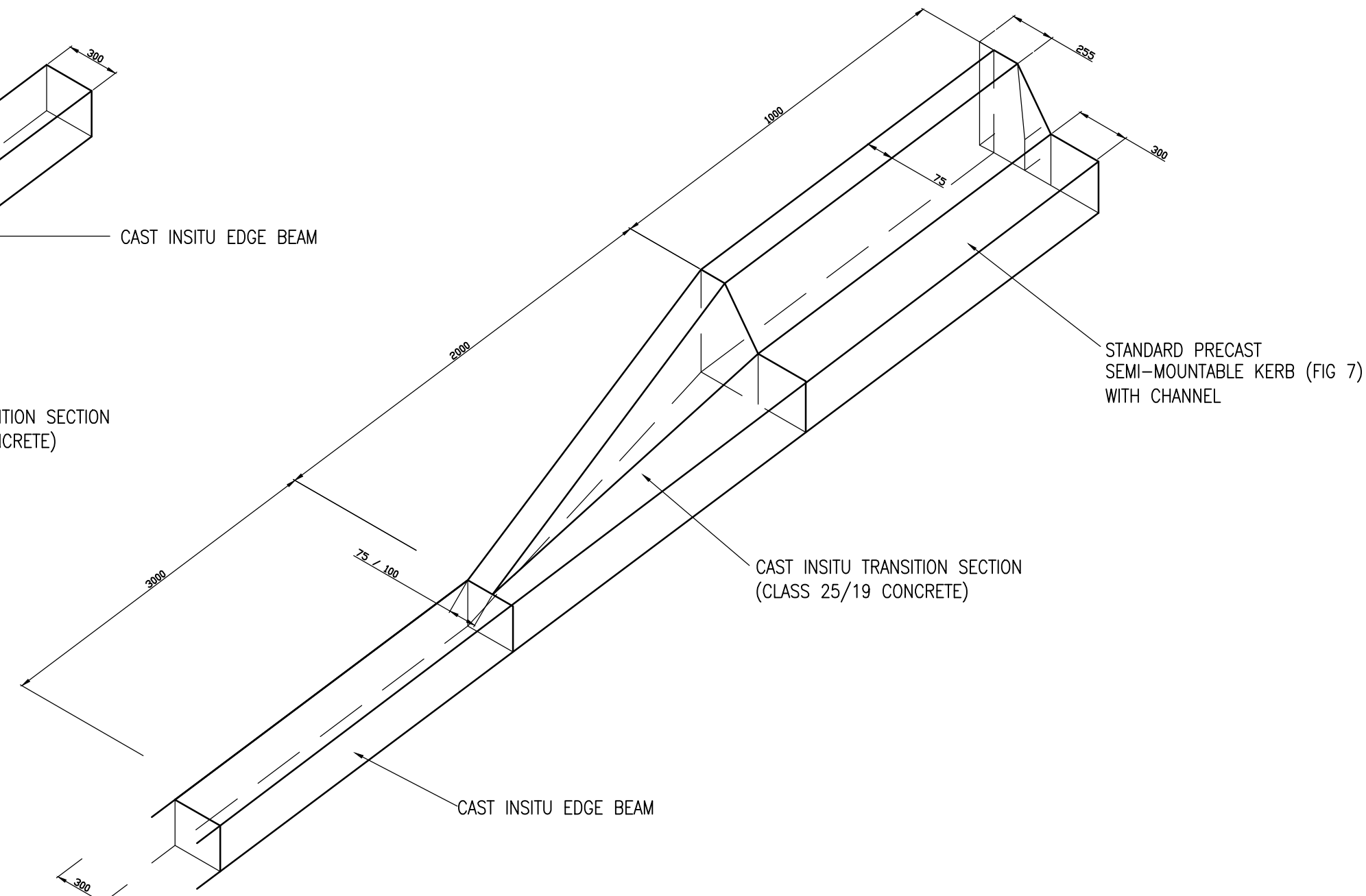
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ORIGINAL DRAWING SCALE: N.T.S.	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED:	
CLIENT OR ASSIGNEE: _____ DATE: _____	CLIENT REF No.: _____

SURVEYED	DESIGNED	R vd Berg
DRAWN	CHECKED	L Gertenboch
CO-ORDINATE SYSTEM: WC25	DATE: October 2019	
APPROVED ON BEHALF OF BIGEN:		
ENGINEER: _____ DATE: _____	DRAWING No.: 1396.10.ZA.03.D019	VERSION: 4.0

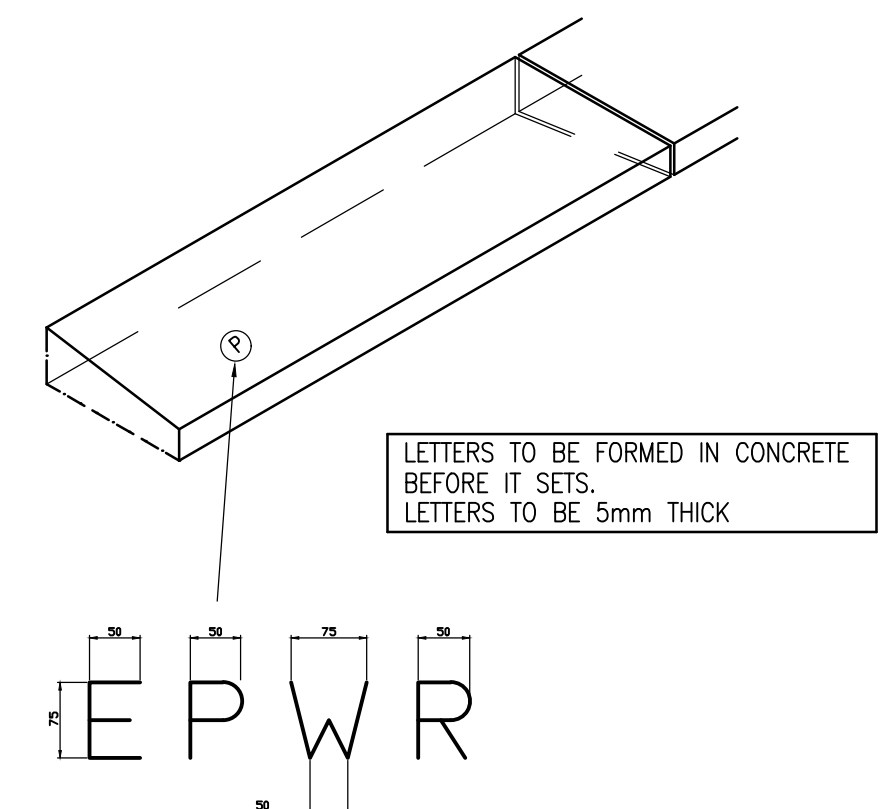
1396.10.ZA.03.D019



TRANSITION FROM MOUNTABLE KERB
TO EDGE BEAM

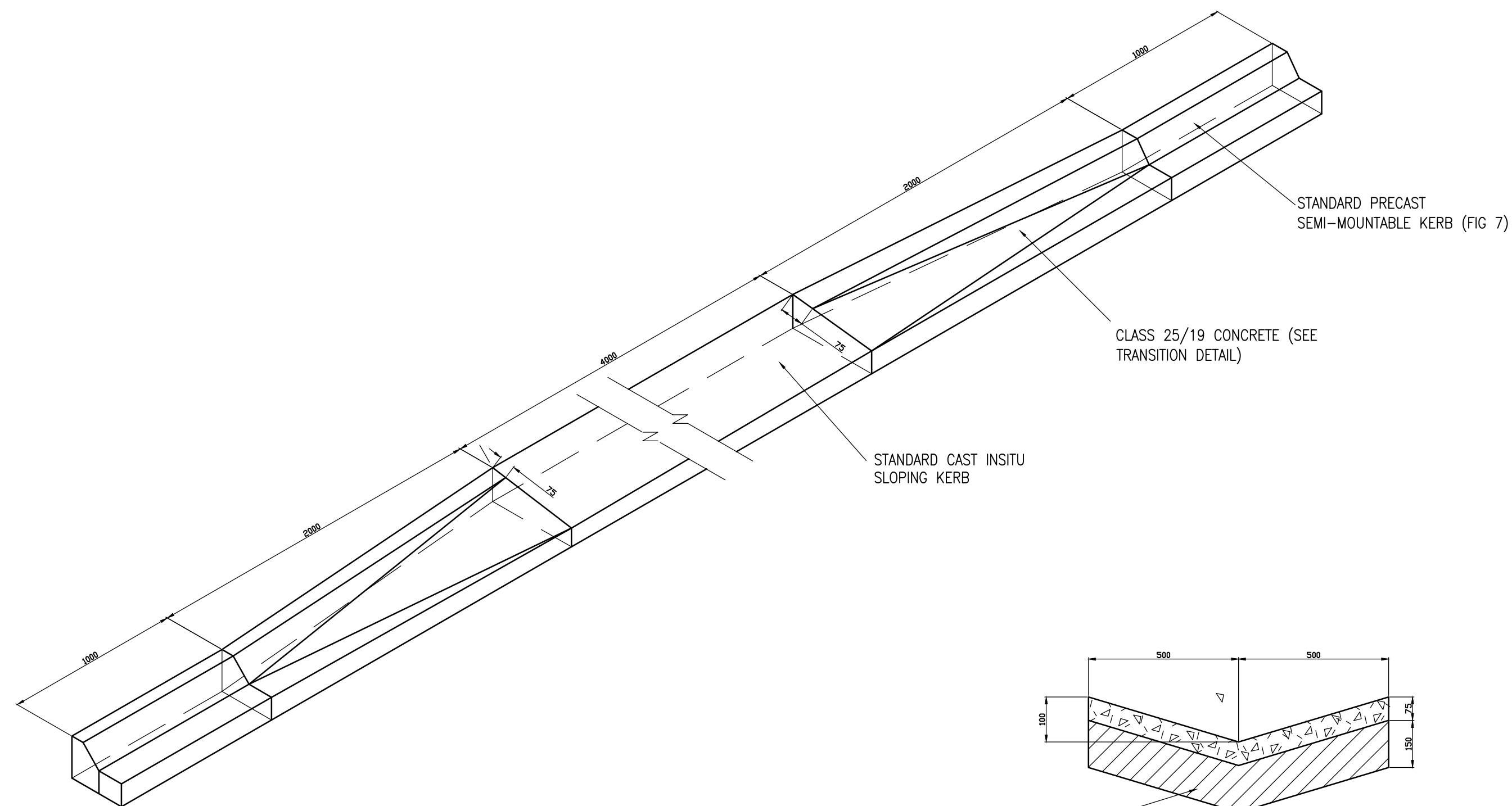


TRANSITION FROM SEMI-MOUNTABLE / BARRIER KERB
TO EDGE BEAM

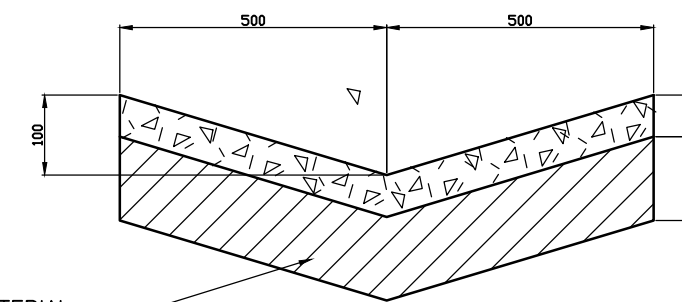


DETAIL FOR THE IDENTIFICATION OF
SLEEVE POSITIONS

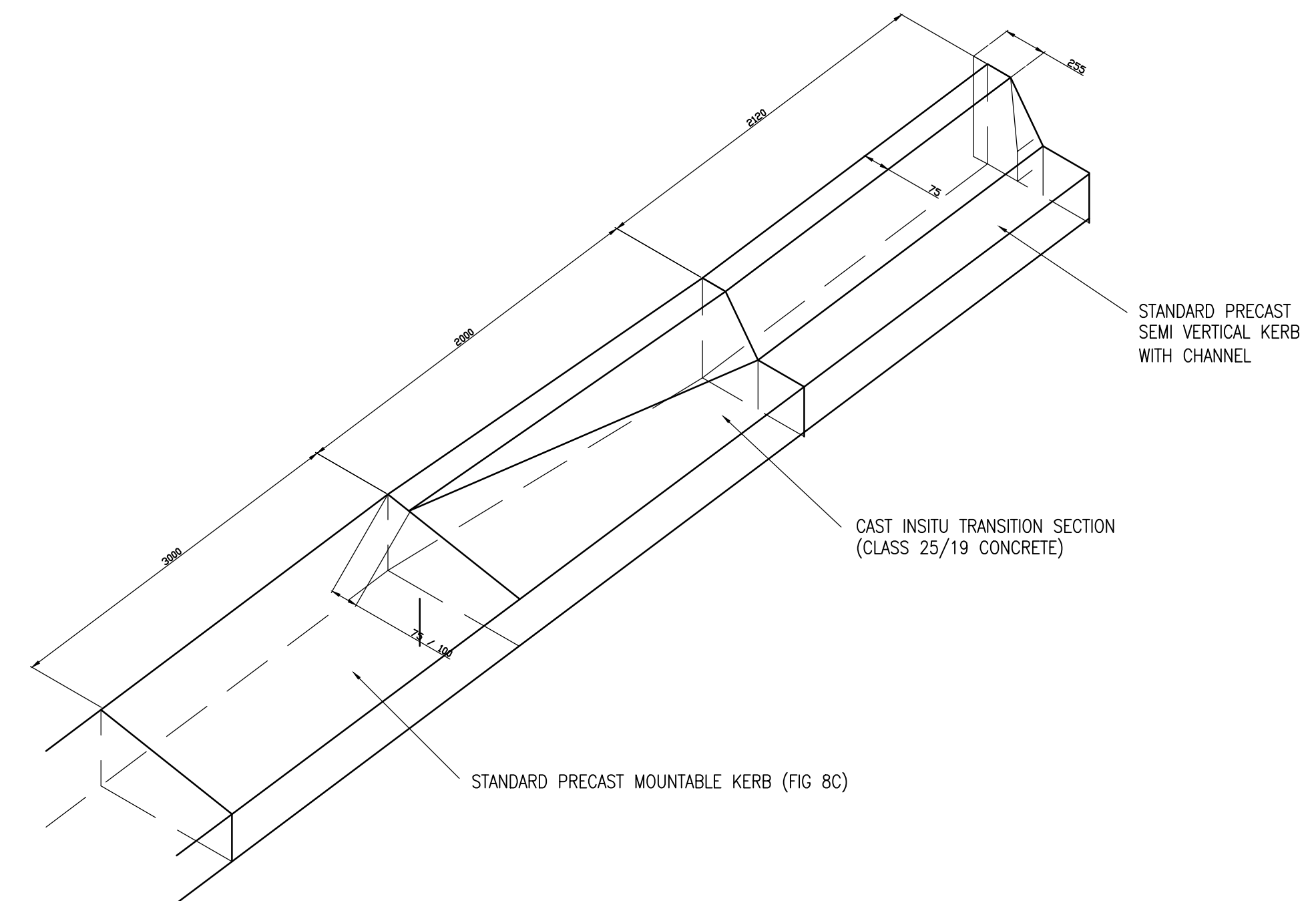
- KERBS - GENERAL
 - REFER TO TABLE A ON DWG 1396.10.ZA.03.D019 FOR THE APPLICATION OF KERBS
- CAST IN-SITU CONCRETE
 - CONCRETE TO BE CLASS 25/19.
 - CONCRETE TO BE CURED FOR A MINIMUM PERIOD OF 7 DAYS.
 - ALL CONCRETE TO BE USED FOR TRANSITION KERB SECTIONS AND OR EDGE BEAMS SHALL HAVE A SLUMP OF NOT GREATER THAN 60mm.
- PRECAST KERBS
 - ALL PRECAST KERBS SHALL COMPLY WITH THE REQUIREMENTS OF SABS 927:2007.



DETAIL OF VEHICLE ENTRANCE
IN SEMI-MOUNTABLE KERB (FIG 7)



CONCRETE GUTTER



TRANSITION FROM MOUNTABLE KERB (FIG 8C)
TO SEMI-MOUNTABLE KERB (FIG 7)

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2015
2334-10-00	CERTIFIED AS BUILT	FJV	09-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
3.0	09-2015	CERTIFIED AS BUILT BULK	FJV
4.0	09-2015	CERTIFIED AS BUILT PHASE 2	FJV



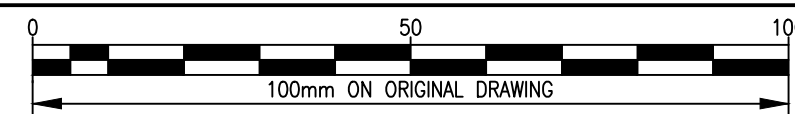
4204 Palmer Crescent
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2745
Tel: +27 (0) 18 386 2111
Fax: +27 (0) 18 386 3031
E-mail: mafikeng@bigengroup.com
www.bigengroup.com

PROJECT TITLE:
**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

DRAWING TITLE:
**KERBING DETAILS; GUTTER &
DETAIL OF SERVICE MARKERS**



Sol Plaatje Municipality
We Serve

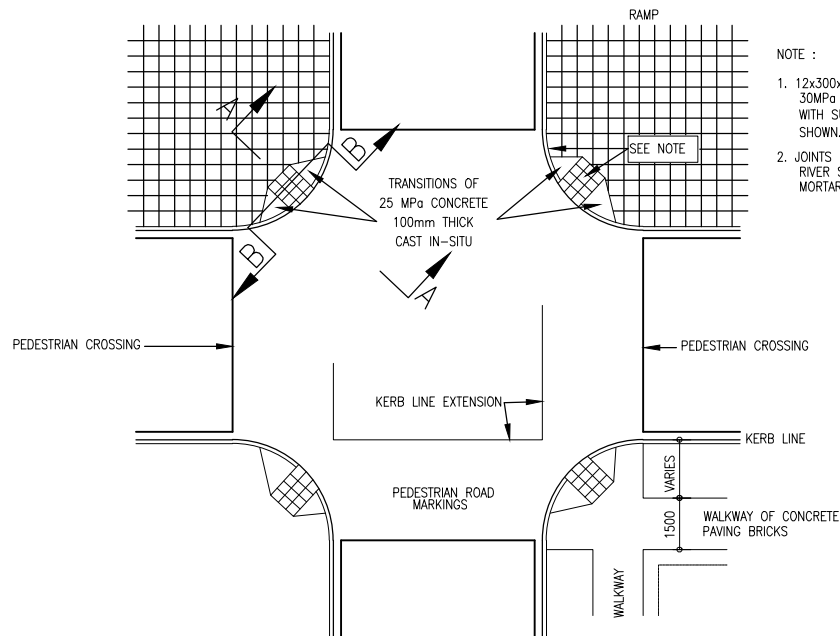


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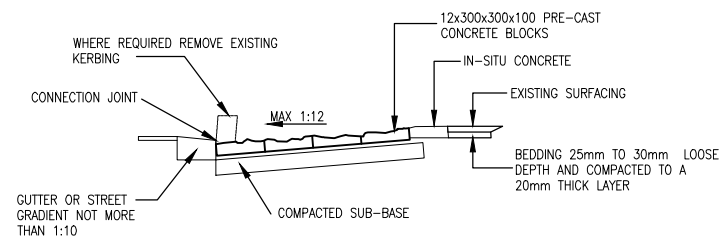
APPROVED:
CLIENT OR ASSIGNEE: _____ DATE: _____
CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED	—	DESIGNED	R vd Berg
DRAWN	N Bester	CHECKED	L Gertenbach
CO-ORDINATE SYSTEM:	WG25	DATE:	October 2019
APPROVED ON BEHALF OF BIGEN:			
ENGINEER: _____ DATE: _____		DRAWING No.: 1396.10.ZA.03.D020 VERSION: 4.0	

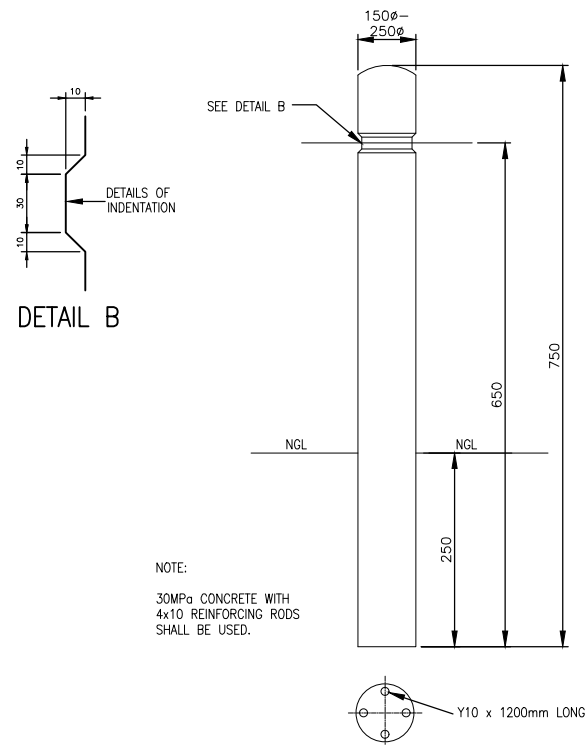
1396.10.ZA.03.D020



PLAN : TYPE 1 – PEDESTRIAN RAMPS
AT STREET CROSSINGS

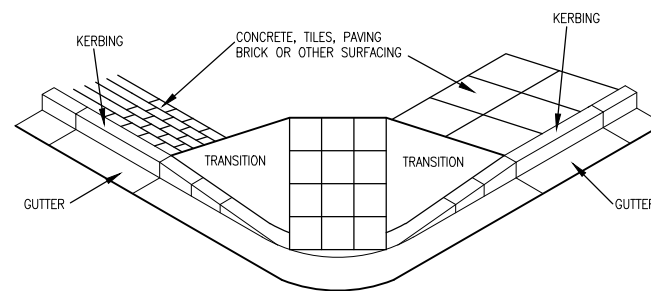


SECTION A-A

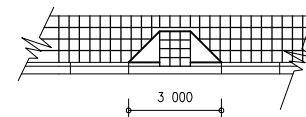


CONCRETE BOLLARD & REINFORCEMENT DETAIL

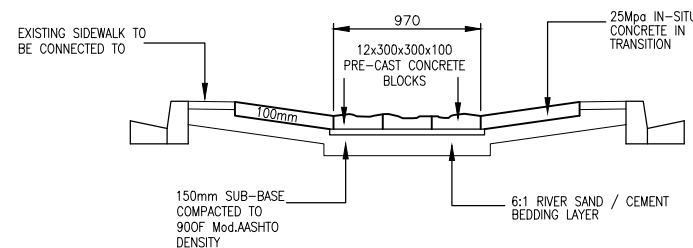
- NOTE :
1. 12x300x300x100 PRE-CAST 30MPa CONCRETE BLOCKS WITH SURFACE FINISH AS SHOWN.
 2. JOINTS FILLED WITH 3:1 RIVER SAND / CEMENT MORTAR



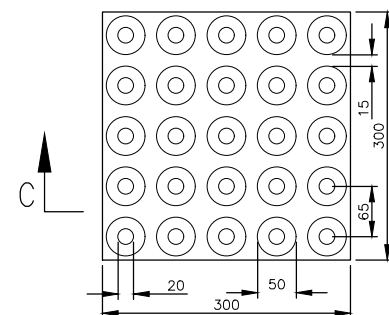
ISOMETRIC VIEW OF PEDESTRIAN RAMP



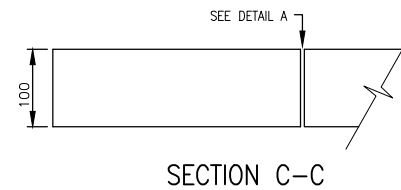
PLAN : TYPE 2 – PEDESTRIAN RAMPS
ON STRAIGHT ROADS OR AT
T – JUNCTIONS



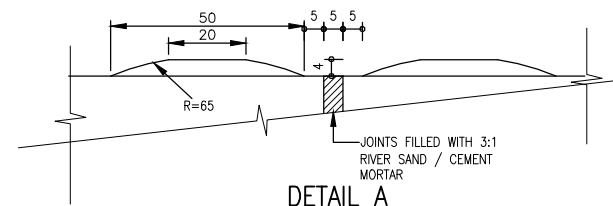
SECTION B-B



PLAN OF CONCRETE BLOCK



SECTION C-C



DETAIL A

LAYOUT AND SPECIFICATION OF PEDESTRIAN WALKWAYS AT STREET CROSSINGS

1. WALKWAYS SHALL BE BUILT WITH 30 MPa PRE-CAST CONCRETE BLOCKS: 12x300x300x100 AND THE TRANSITION SECTIONS SHALL BE CAST IN SITU WITH 25 MPa CONCRETE X 100mm THICK.
2. THE PREFABRICATED CONCRETE BLOCKS SHALL BE PLACED SO THAT THE JOINTS ARE NOT SMALLER THAN 5mm OR BIGGER THAN 10mm.
- 2.1 THE JOINTS BETWEEN THE BLOCKS SHALL BE FILLED WITH A MORTAR CONSISTING OF ONE PART CEMENT AND THREE PARTS OF APPROVED SAND MEASURED PER VOLUME.
- 2.2 THE JOINT SEAM BETWEEN THE GUTTER (EXISTING OR NEW) AND THE CONCRETE BLOCKS SHALL BE FILLED WITH A 3:1 RIVER SAND/CEMENT MORTAR. WHERE THE SPACE BETWEEN THE GUTTER AND THE CONCRETE BLOCKS IS BIGGER THAN 25mm, 25 MPa IN SITU CONCRETE MUST BE USED FOR FILLING.
3. RAMPS SHALL NOT BE BUILT WHERE MOUNTABLE KERBS (FIG 8) ARE USED OR ARE IN EXISTENCE.
4. RAMPS SHALL BE BUILT WHERE IT LINKS UP WITH NEW PEDESTRIAN CROSSINGS AS WELL AS EXISTING PEDESTRIAN CROSSINGS.
5. IN THE CASE OF NORMAL CROSSINGS, SINGLE RAMPS SHALL BE BUILT AT THE CORNER POINT OF KERBS BUT EXCEPTIONS MUST BE MADE IN SOME CASES FOR ROAD SIDE FURNITURE, SUCH AS TRAFFIC LIGHTS, POWER LINES, ETC.
6. THE RAMP SLOPE SHALL NOT EXCEED 1:12. WHERE IT DOES HAPPEN, THE SLOPE MUST BE EXTENDED TO REACH A GRADIENT OF 1:12.
7. THE CROSS FALL OF THE GUTTER AND THE KERB CONNECTING TO THE RAMP SHALL NOT EXCEED 1:12 WHERE IT IS NOT POSSIBLE WITH THE EXISTING GUTTER AND KERB, IT SHALL BE RE-BUILT OVER A LENGTH OF 3 METERS (AT LEAST) TO REACH THE EXACT GRADIENT (1:10). THIS POINT MUST BE CAREFULLY EXAMINED BEFORE THE CONSTRUCTION OF THE RAMP TO MAKE SURE THAT THE RAMP AND THE GUTTER WILL FIT EXACTLY IN THE HEIGHT NEXT TO THE JOINT LINE. CARE MUST BE TAKEN TO AVOID POSSIBLE STORMWATER PROBLEMS.
8. THE CROSS FALL OF THE RAMPS SHALL NOT BE GREATER THAN 1:50.
9. IF NECESSARY, THE PAVING OF THE PEDESTRIAN CROSSINGS NEXT TO THE RAMP MUST BE REBUILT AND MODIFIED TO AVOID SEVERE CHANGES IN SLOPES BETWEEN THE PAVING AND THE SLOPE OF TRANSITION SECTIONS.
10. THE ENGINEER MUST BE CONSULTED IN THE EVENT WHERE MULTIPLE KERBING OCCURS IN THE CONSTRUCTION OF PEDESTRIAN RAMPS.
11. ALL IN-SITU CONCRETE SHALL BE CURED AFTERWARDS FOR AT LEAST 12 HOURS TO ALLOW SUFFICIENT HARDENING BEFORE USE.
12. THE SUB-BASE SHALL CONSIST OF A 150mm LAYER OF IN SITU MATERIAL FINISHED DOWN THE CORRECT FORM AND HEIGHT TO ENSURE THAT THE BEDDING IS READY TO ACCEPT THE CONCRETE BLOCKS AND/OR THE IN-SITU CONCRETE.
13. THE BEDDING ON TO WHICH THE CONCRETE BLOCKS ARE TO BE PLACED, SHALL BE A 6:1 RIVER SAND/CEMENT MIXTURE.
14. EXISTING PAVING MUST BE CUT IN STRAIGHT LINES WITH AN APPROVED SAW.

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2015
2334-10-00	CERTIFIED AS BUILT	FJV	10-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
3.0	09-2015	CERTIFIED AS BUILT BULK	FJV
4.0	10-2015	CERTIFIED AS BUILT PHASE 2	FJV



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www.bigengroup.com

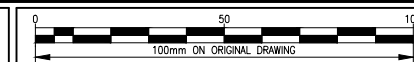
PROJECT TITLE:

**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

DRAWING TITLE:

**PEDESTRIAN RAMPS &
CONCRETE BALLARD DETAIL**

Sol Plaatje Municipality



ORIGINAL DRAWING SCALE: N.T.S. ORIGINAL DRAWING SHEET SIZE: A1

APPROVED:

CLIENT OR ASSIGNEE:

CLIENT DRAWING No.:

DATE:

CLIENT REF No.:

SURVEYED	DESIGNED	R vd Berg
DRAWN	CHECKED	L Gertenbach

CO-ORDINATE SYSTEM: WG25 DATE: October 2019

APPROVED ON BEHALF OF BIGEN:

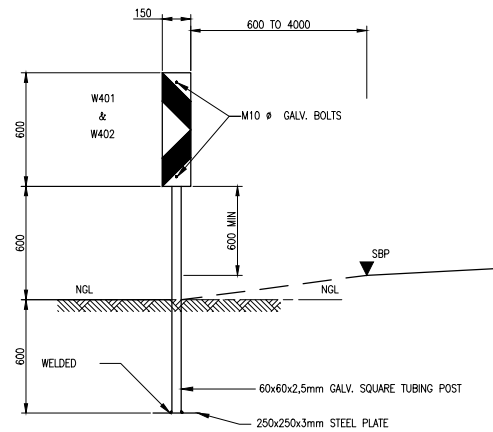
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DRAWING No.:

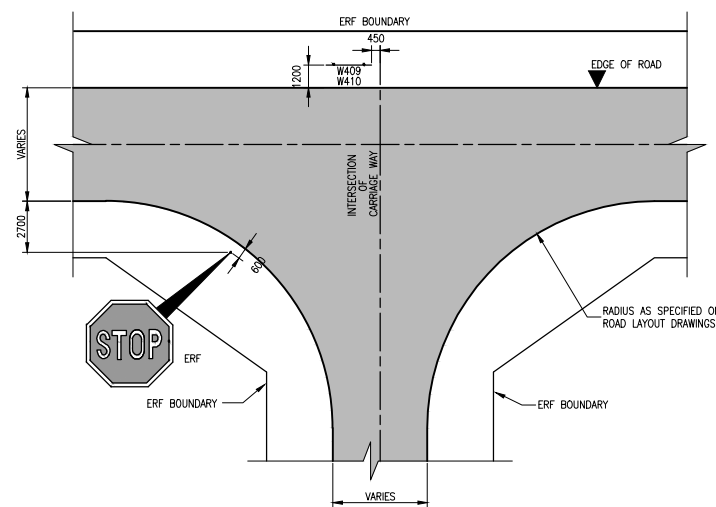
1396.10.ZA.03.D021

VERSION: 3.0

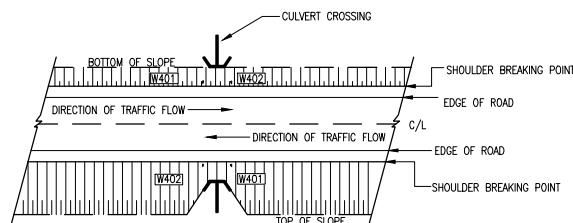
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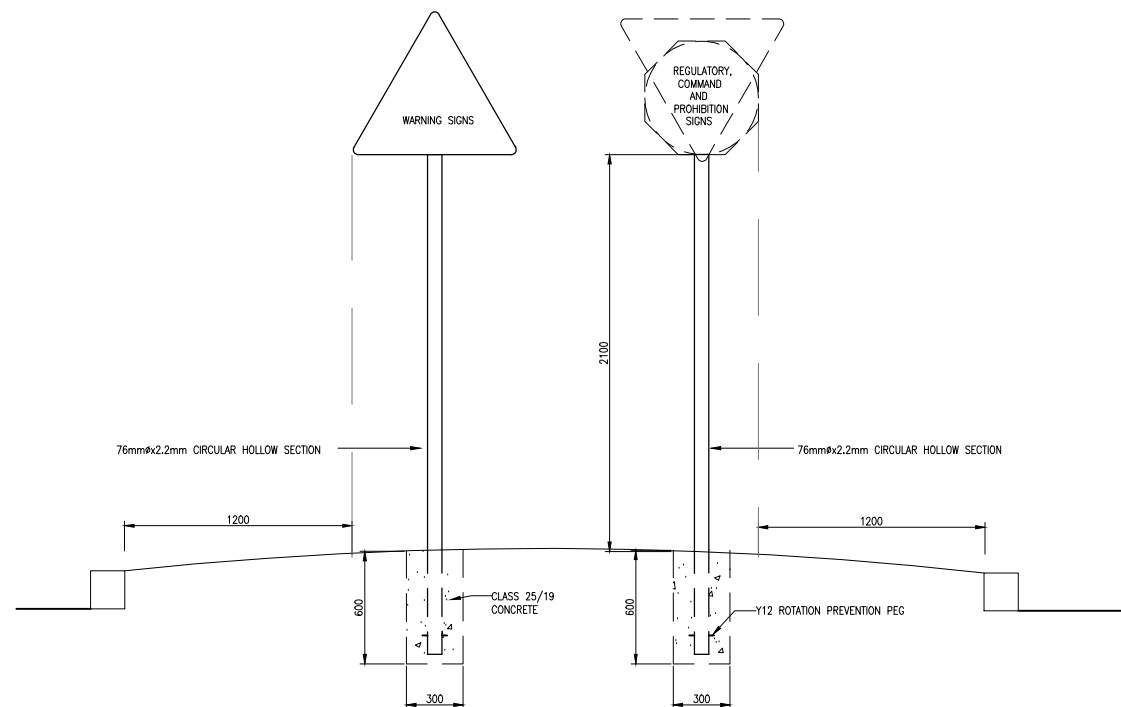
FRONT ELEVATION W401
SCALE 1:20



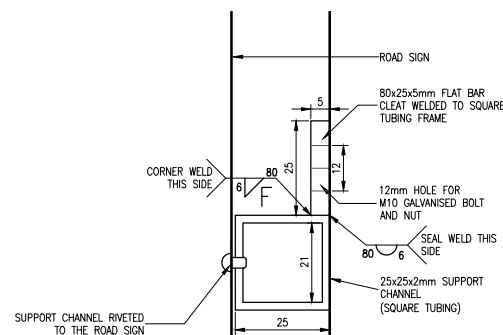
CHEVRON POSITION AT INTERSECTION
SCALE 1:200



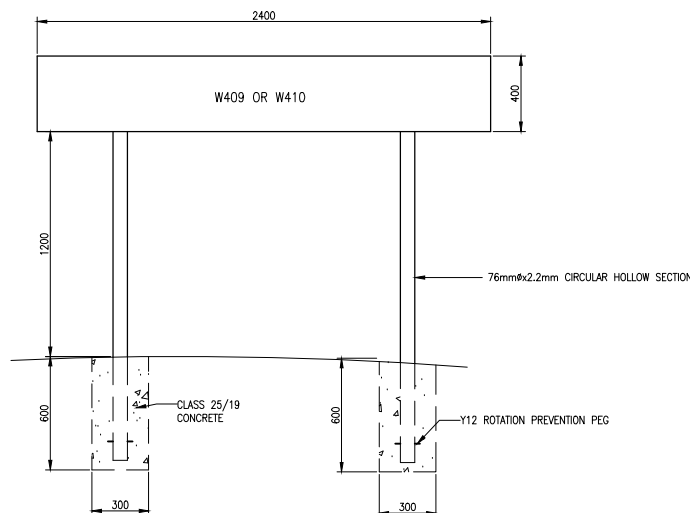
SIGN AT CULVERT
NTS



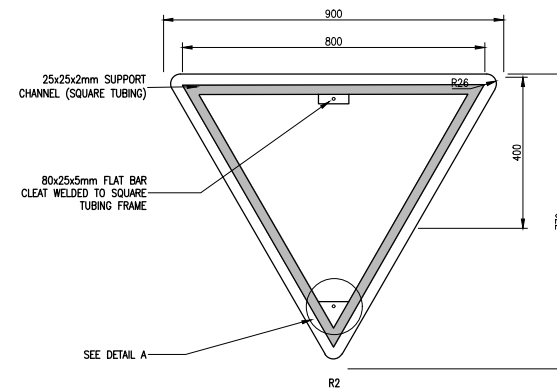
POSITIONING DETAILS
SCALE 1:20



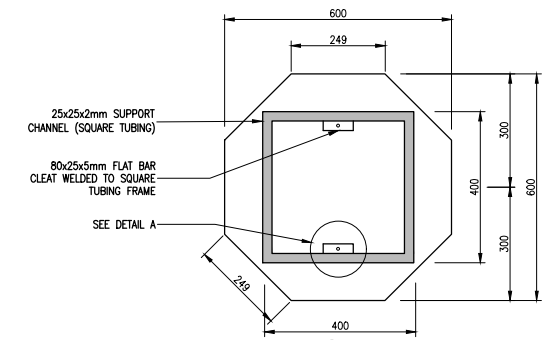
DETAIL A SECTIONAL ELEVATION
SCALE 1:1



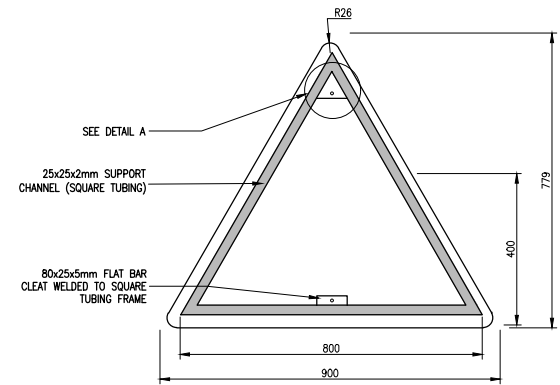
- NOTES:
- ALL ROAD MARKINGS AND ROAD SIGNS TO BE MANUFACTURED AND CONSTRUCTED IN ACCORDANCE WITH THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL
 - ALL ROAD SIGNS TO BE PLACED AT A DEFLECTION ANGLE OF 93° WITH THE CENTRE LINE OF THE ROAD
- M10 x 90mm GALVANISED BOLTS AND NUTS FOR FIXING ROAD SIGNS TO GALVANISED STEEL PIPES
- ALL ROAD SIGNS TO BE FIXED TO SQUARE TUBING SUPPORT CHANNEL BY MEANS OF 6mmØ RIVETS AT A MAXIMUM SPACING OF 125mm c/c



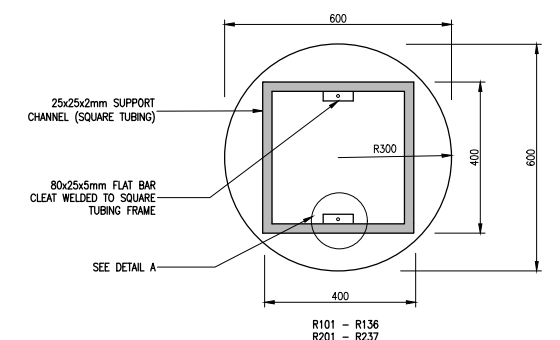
CONTROL SIGN



CONTROL SIGNS



ROAD LAYOUT AND SYMBOLIC SIGNS



COMMAND AND PROHIBITION SIGNS
FIXING AND SUPPORT DETAILS
SCALE 1:10

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2015
2334-10-00	CERTIFIED AS BUILT	FJV	10-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
3.0	09-2015	CERTIFIED AS BUILT BULK	FJV
4.0	10-2015	CERTIFIED AS BUILT PHASE 2	FJV



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E-mail: mafikeng@bigengroup.com
www.bigengroup.com

PROJECT TITLE:
**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

DRAWING TITLE:
**ROAD SIGN POSITIONING &
INSTALLATION DETAILS**



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED:	
CLIENT OR ASSIGNEE: _____ DATE: _____	CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED	DESIGNED	R vd Berg
DRAWN	N Bester	CHECKED L Gertenbach
CO-ORDINATE SYSTEM: WG25	DATE: October 2019	
APPROVED ON BEHALF OF BIGEN:		VERSION: 3.0
ENGINEER: _____ DATE: _____		DRAWING No.: 1396.10.ZA.03.D022

1396.10.ZA.03.D022

1. ON STRAIGHT SECTIONS OF 1.0m LONG A CONCRETE BACKING OF 400mm X 250mm X 225mm SHOULD BE ADDED BEHIND EVERY JOINT.(CLASS 20/19 CONC.)
2. AT ARCHED SECTIONS OF KERBING A CONTINUOUS CONCRETE BACKING 250mm X 225mm X DIST. MUST BE ADDED.
(CLASS 20/19 CONC.)
3. AT EVERY KERBING JOINT OF 12mm A 1:3 GROUT FILLING SHOULD BE APPLIED WITH AN OPEN JOINT AT EVERY 3.0m.
4. 15.0m X 1.5m X 0.1m CONCRETE PAVING SHOULD BE IN 3.m SECTIONS, WITH A BITUMEN JOINT.
5. CROSS FALL SHALL BE 3%.
6. FILL MATERIAL BEHIND BUS BAY SHOULD BE AT 90% MOD. AASHTO DENSITY.



AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1556-30-04	CERTIFIED AS BUILT	F.W.	09-2015
2334-10-00	CERTIFIED AS BUILT	F.W.	10-2015

CERTIFIED AS-BUILT FOR CONTRACT :

AS-BUILT

ENGINEER _____ DATE _____

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	15/02/2010	BUSBAY LAYOUT CHANGED	FJV
3.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
4.0	09-2015	CERTIFIED AS BUILT BULK	FJV
5.0	10-2015	CERTIFIED AS BUILT PHASE 2	FJV


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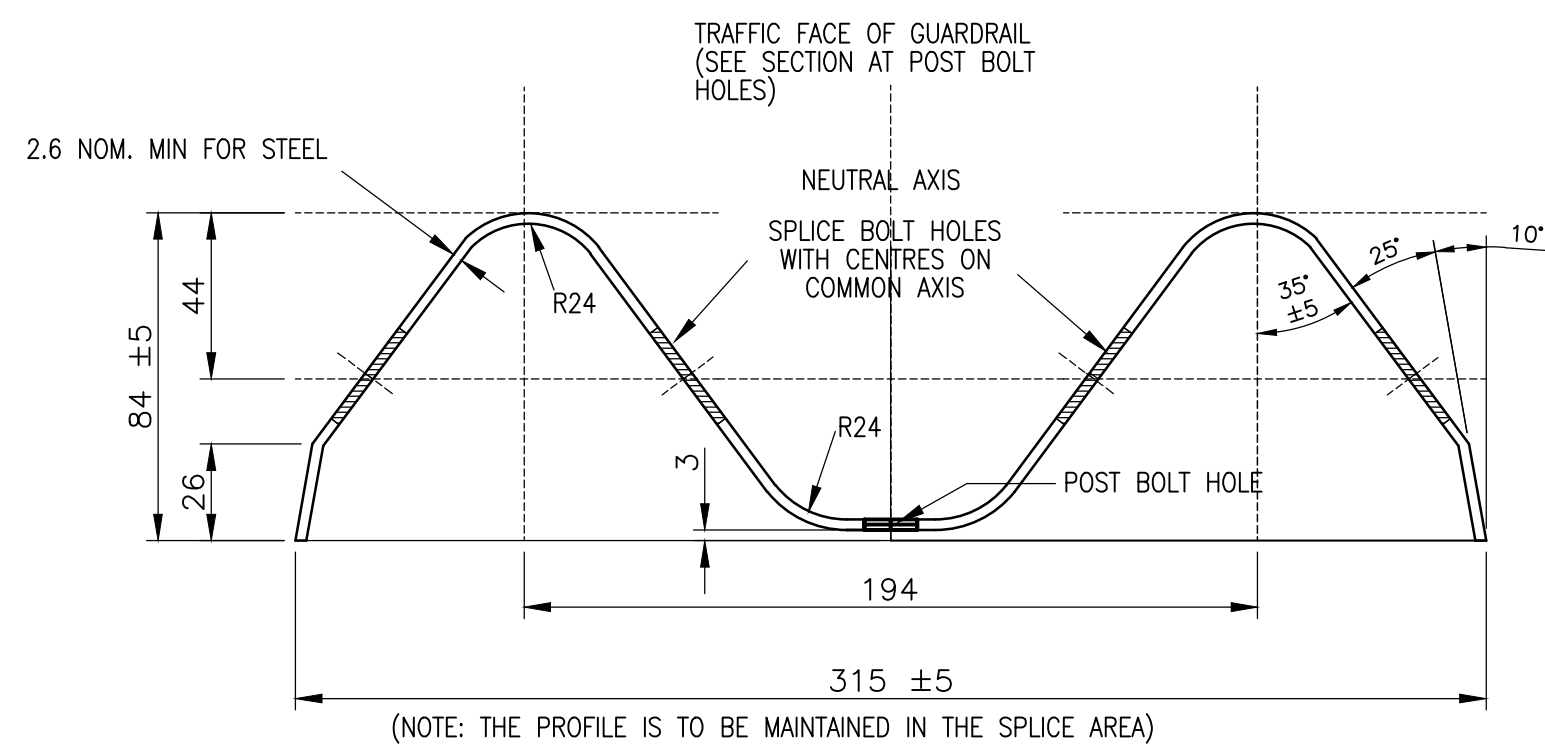
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Fax: + 27 (0) 18 386 3031
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PROJECT TITLE:	LERATO PARK INTERNAL CIVIL ENGINEERING SERVICES
DRAWING TITLE:	BUS AND TAXI BAYS: GEOMETRICAL LAYOUT AND DETAILS

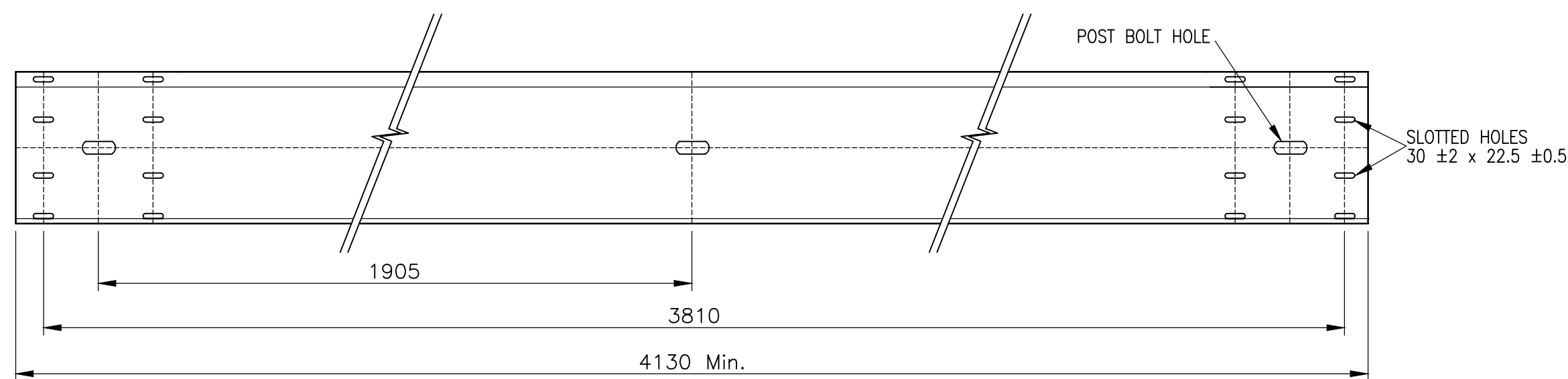
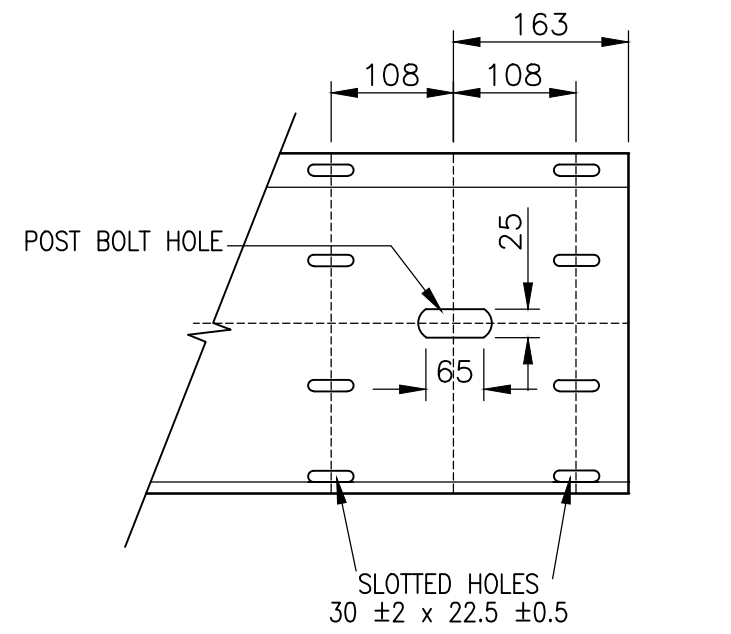
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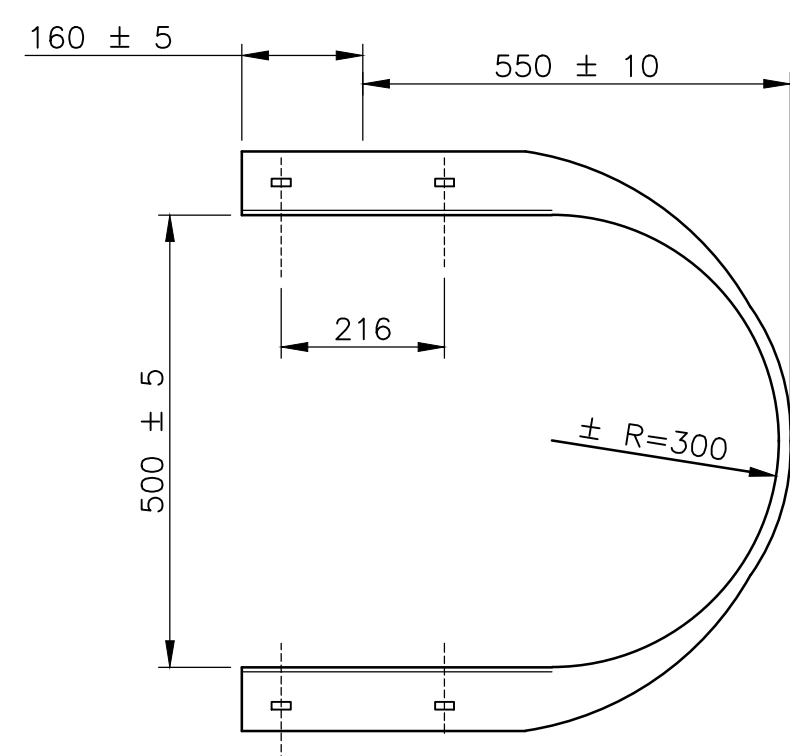
SURVEYED		DESIGNED	R vd Berg
DRAWN	N Bester	CHECKED	FJ Viljoen
CO-ORDINATE SYSTEM:	Lo25 WGS84	DATE:	February 2010
APPROVED ON BEHALF OF BIGEN:			
ENGINEER: _____		DATE: _____	
DRAWING No.:		VERSION:	
1396.10.ZA.03.D023		5.0	



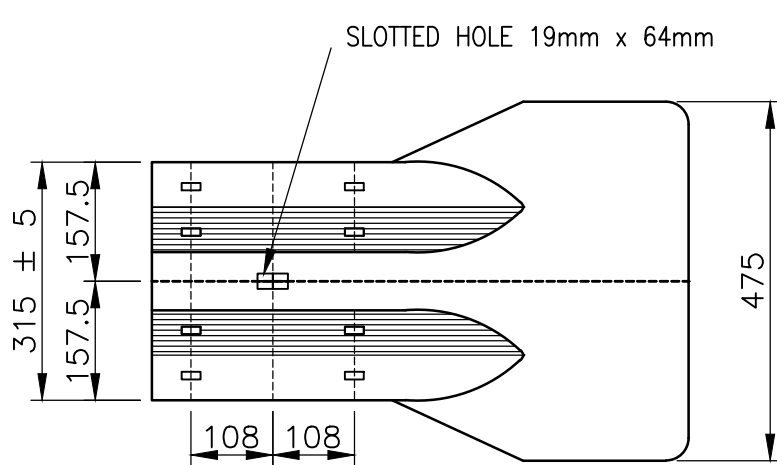
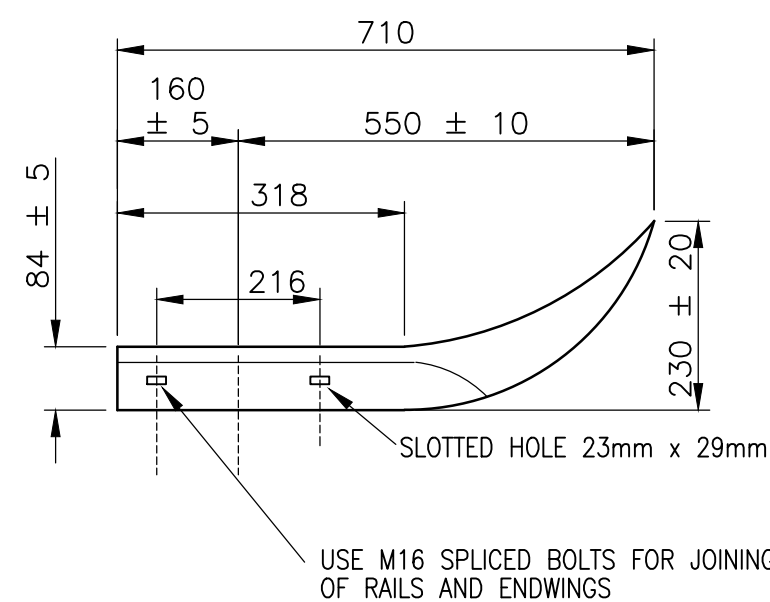
CROSS-SECTION OF GUARDRAIL
SCALE 1:2



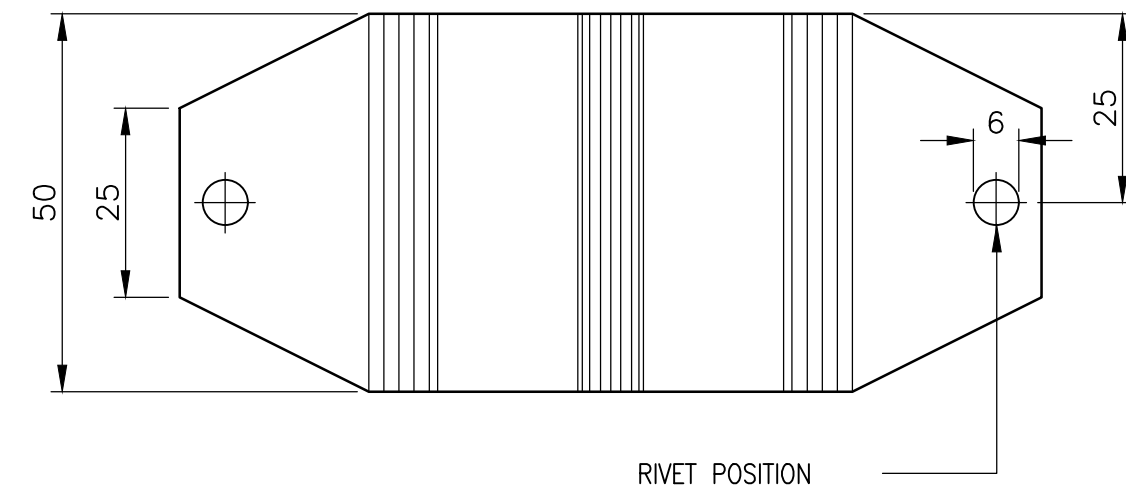
GUARDRAIL
SCALE 1:10



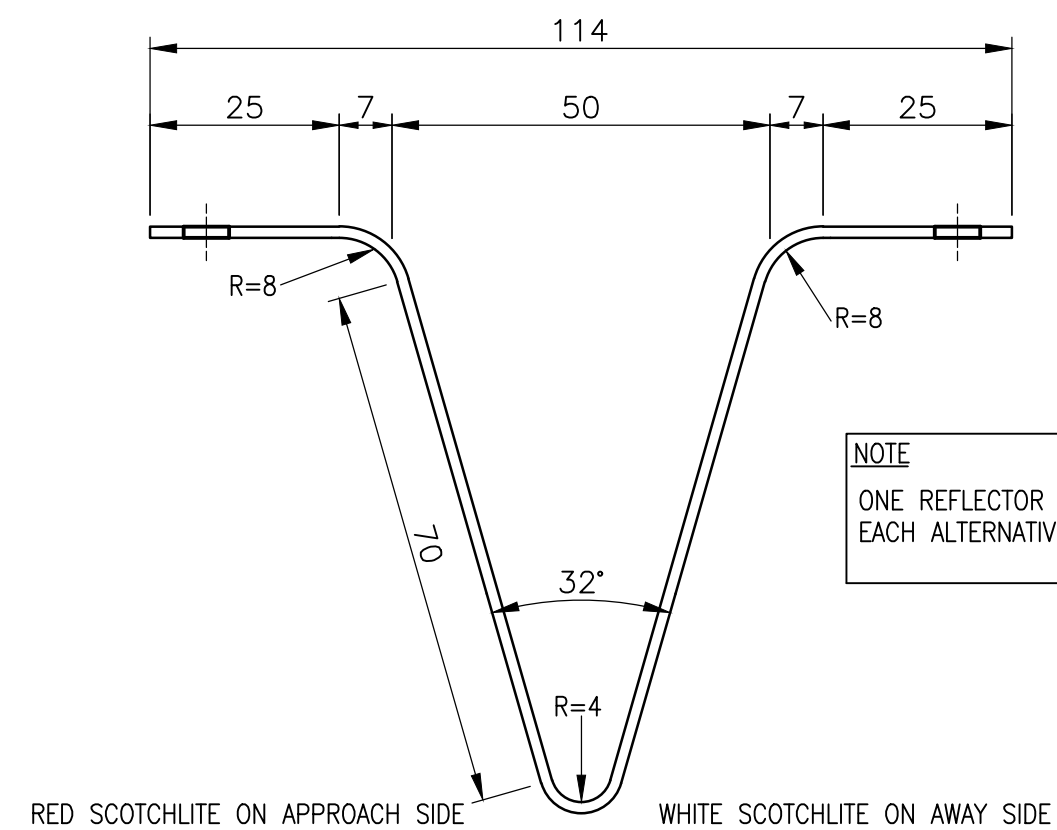
BULLNOSE ENDWING – PLAN
SCALE 1:10



STANDARD TYPICAL FLARED ENDWING
SCALE 1:10



FRONT ELEVATION
SCALE 1:1



NOTE
ONE REFLECTOR IN THE CENTRE OF
EACH ALTERNATIVE LENGTH OF 3.75m

SECTIONAL PLAN : DETAIL OF REFLECTOR PLATE
SCALE 1:1

NOTES:

GUARDRAILS ARE REQUIRED IN THE FOLLOWING CASES:

- WHERE THE FILL IS MORE THAN 4m WITH NO RECOVERY AREA
- WHERE WATER NEXT TO THE ROAD FORMATION IS DEEPER THAN 1.5m.
- AT ALL BRIDGES
- ON THE OUTSIDE OF CURVES WITH RADII LESS THAN 300mm WITHOUT RECOVERY AREAS.
- WHERE OBSTRUCTIONS ARE LESS THAN 1m FROM THE SHOULDER BREAKPOINT.
- WHERE AN OBSTRUCTION APPEARS TO MORE DANGEROUS THAN A GUARDRAIL WOULD BE.

SPECIFICATIONS

- BOLT: HIGH TENSILE STEEL 16mmØ
- WASHER: STEEL SPRING 10mm THICK.
- SPACERBLOCK: GUM OR PINE. TREATED WITH BITUMEN IN ACCORDANCE WITH SABS 05.
- POST: -150mmØ TO 230mmØ GUM OR PINE TREATED WITH BITUMEN IN ACCORDANCE WITH SABS 05
- ALL GUARDRAILS SHALL BE GALVANISED AS SPECIFIED (NOT TO BE PAINTED)

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
1555-30-04	CERTIFIED AS BUILT	FJV	09-2015
CERTIFIED AS-BUILT FOR CONTRACT :			
AS-BUILT		ENGINEER	DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
3.0	09-2015	CERTIFIED AS BUILT BULK	FJV



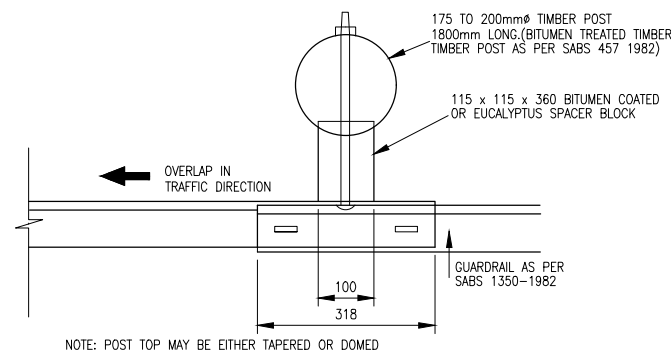
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PROJECT TITLE:	LERATO PARK INTERNAL CIVIL ENGINEERING SERVICES
DRAWING TITLE:	GUARDRAILS: CROSS SECTION, REFLECTOR PLATES & ENDWINGS

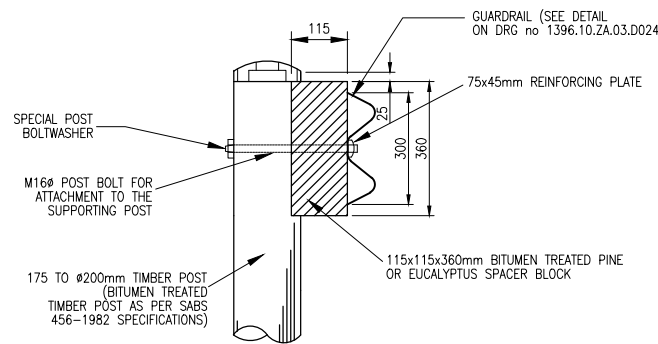


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ORIGINAL DRAWING SCALE:	AS SHOWN
ORIGINAL DRAWING SHEET SIZE:	A1
APPROVED:	
CLIENT OR ASSIGNEE:	DATE:
CLIENT DRAWING No.:	CLIENT REF No.:

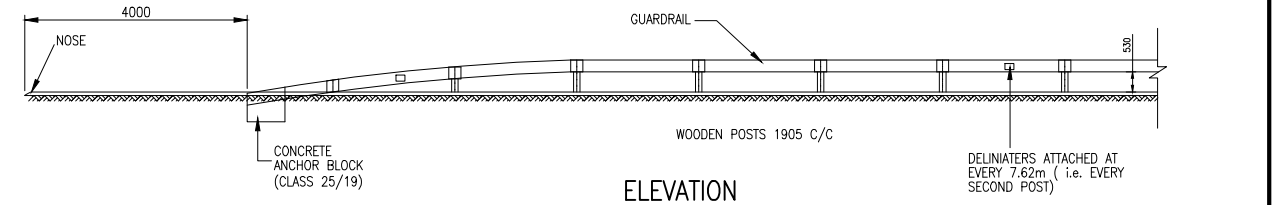
SURVEYED	DESIGNED	R vd Berg
DRAWN	CHECKED	FJ Viljoen
CO-ORDINATE SYSTEM:	Lo25 WGS84	DATE: February 2010
APPROVED ON BEHALF OF BIGEN:		
ENGINEER:	DATE:	
DRAWING No.:	VERSION:	2.0
1396.10.ZA.03.D024		



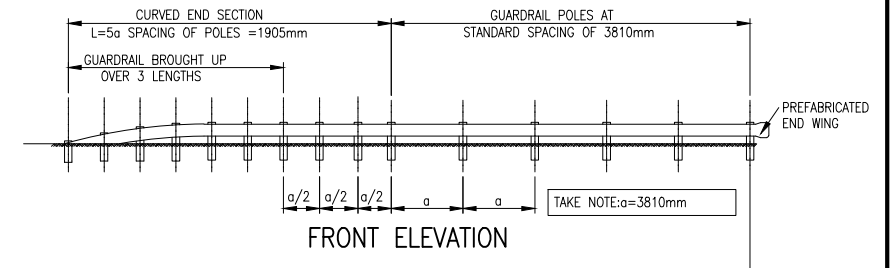
PLAN



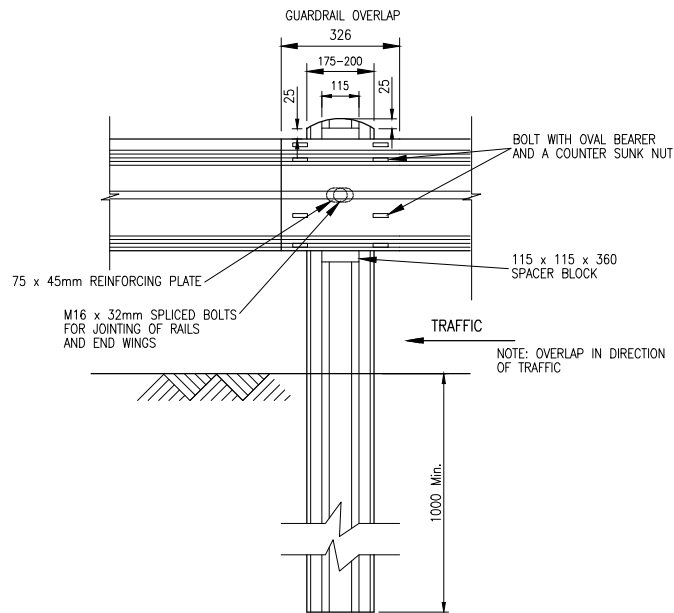
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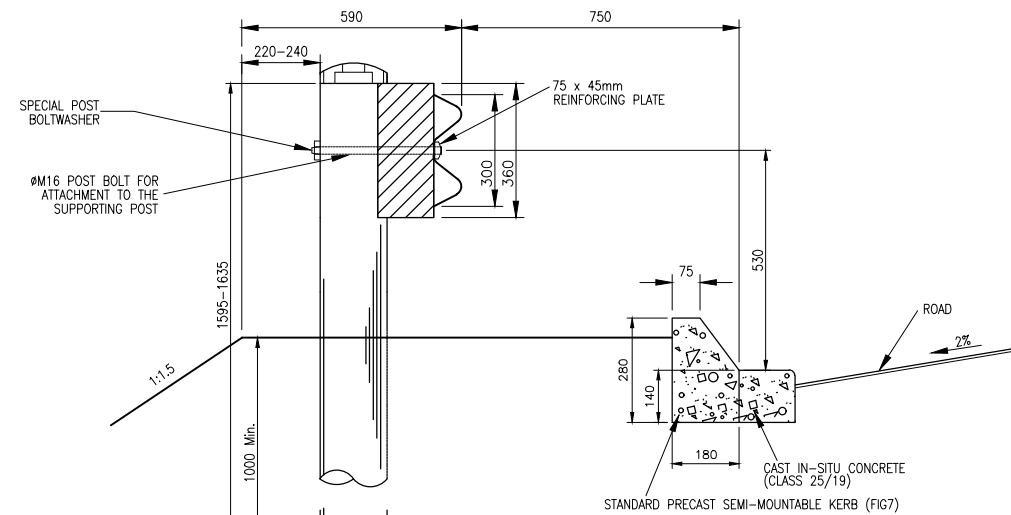
ELEVATION



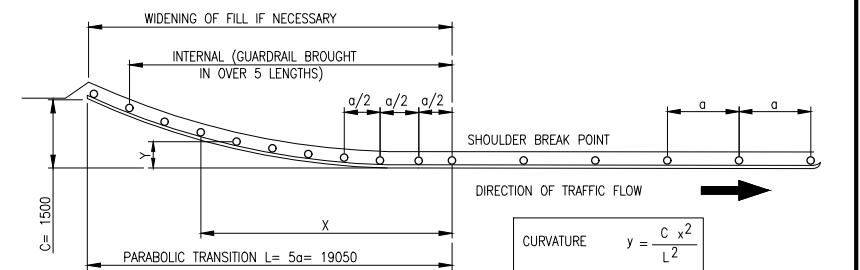
FRONT ELEVATION



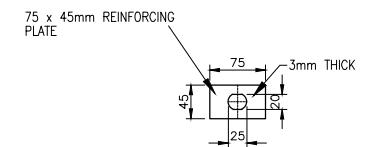
FRONT ELEVATION OF OVERLAP



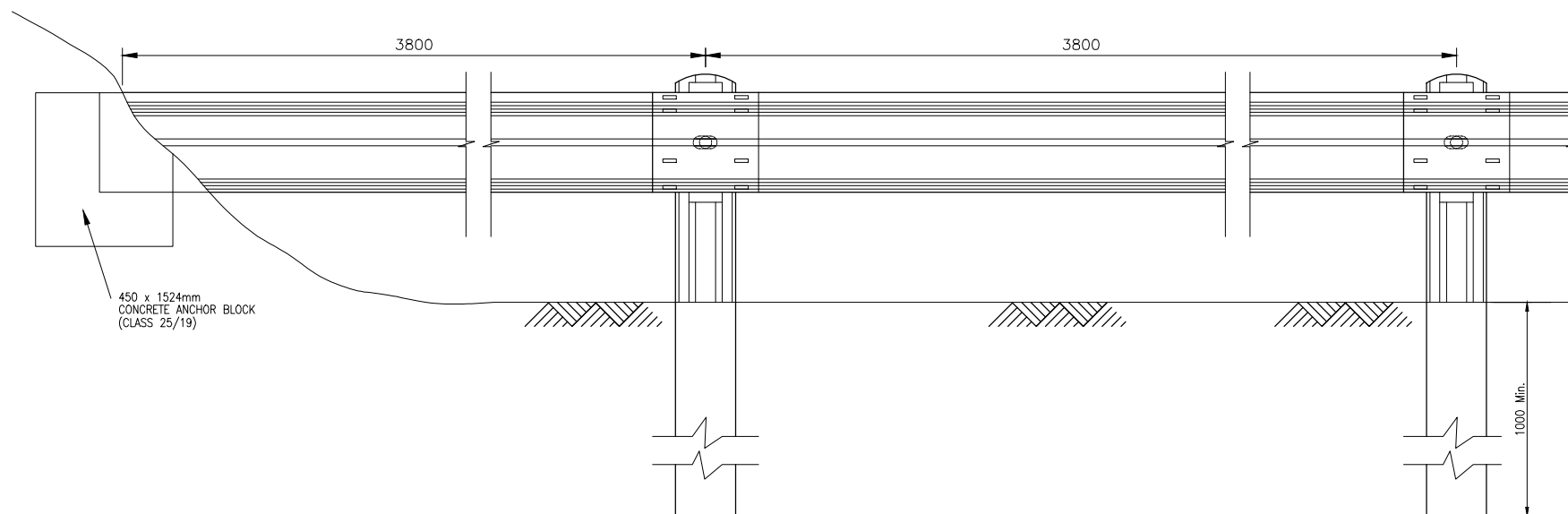
SIDE ELEVATION



TYPICAL POSITIONING OF GUARDRAILS ON HIGH FILLS



75x45mm REINFORCING PLATE



PORTION OF GUARDRAIL ANCHORED IN WALL OF EXCAVATION OR SIDE OF FILLING

GUARDRAILS ARE REQUIRED IN THE FOLLOWING CASES:

- WHERE THE FILL IS MORE THAN 4m WITH NO RECOVERY AREA.
- WHERE WATER NEXT TO THE ROAD FORMATION IS DEEPER THAN 1.5m.
- AT ALL BRIDGES.
- ON THE OUTSIDE OF CURVES WITH RADII LESS THAN 300mm WITHOUT RECOVERY AREAS.
- WHERE OBSTRUCTIONS ARE LESS THAN 1m FROM THE SHOULDER BREAKPOINT.

NOTE :

BEFORE GUARDRAILS MAY BE ERECTED APPROVAL MUST BE OBTAINED FROM THE DIRECTOR OF ROADS.

SPECIFICATIONS :

- BOLT : HIGH TENSILE STEEL 16mm
- WASHER : STEEL SPRING 10mm THICK.
- SPACERBLOCK : GUM OR PINE. TREATED IN ACCORDANCE WITH SABS 05. WITH BITUMEN
- POLE : 150mm TO 230mm GUM OR PINE TREATED WITH BITUMEN ACCORDANCE WITH SABS 05.
- ALL GUARDRAILS SHALL BE GALVANIZED AS SPECIFIED (NOT TO BE PAINTED).

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
555-30-04	CERTIFIED AS BUILT	FJV	09-2015
CERTIFIED AS-BUILT FOR CONTRACT : AS-BUILT			
ENGINEER		DATE	

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY
2.0	09-2015	CERTIFIED AS BUILT PHASE 1	FJV
3.0	09-2015	CERTIFIED AS BUILT BULK	FJV

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PROJECT TITLE:
**LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES**

DRAWING TITLE:
**GUARD RAILS: DETAILS FOR FIXING,
OVERLAP & ANCHORING**

Sel Plantje Municipality

We Serve

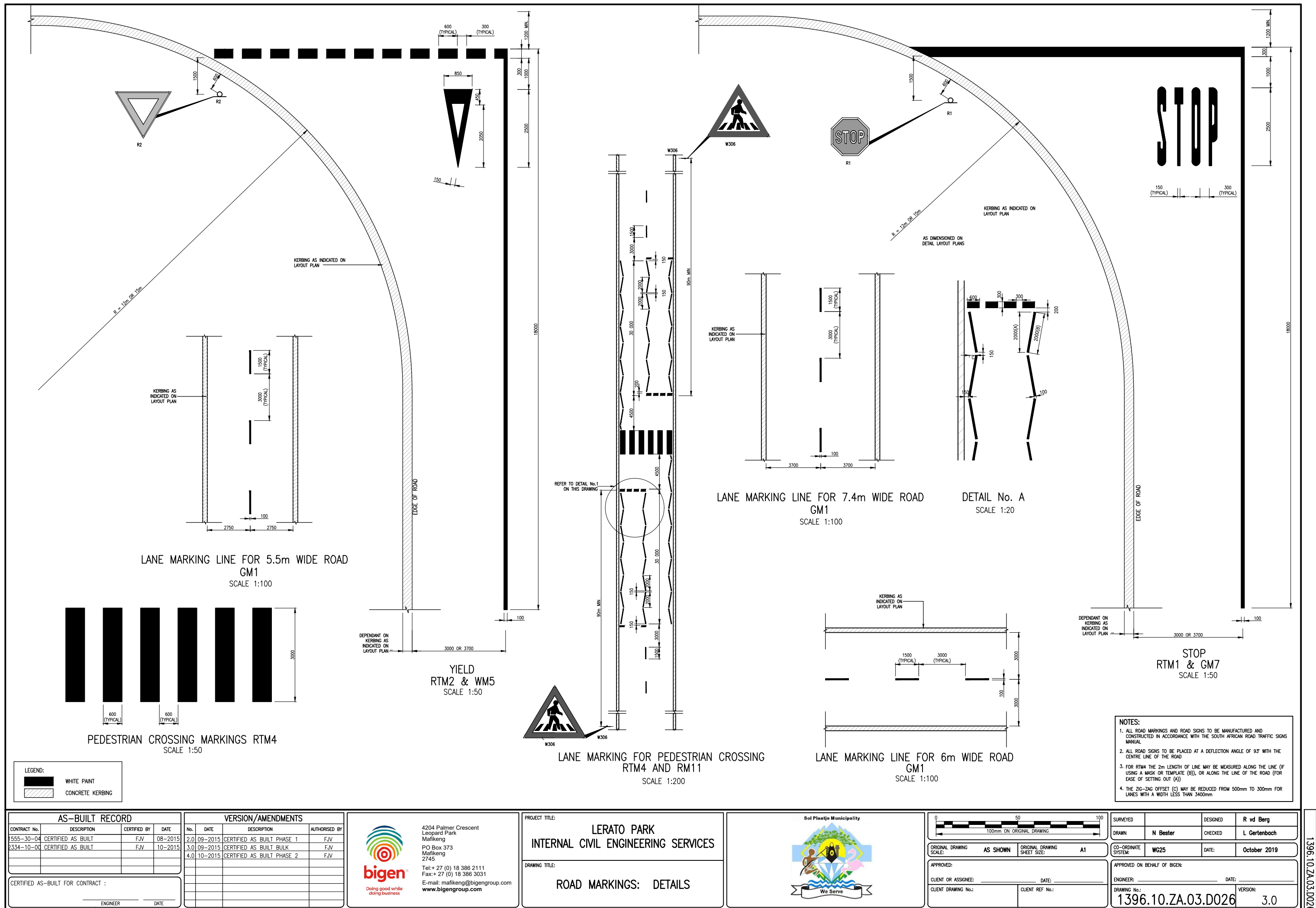
0 50 100
100mm ON ORIGINAL DRAWING

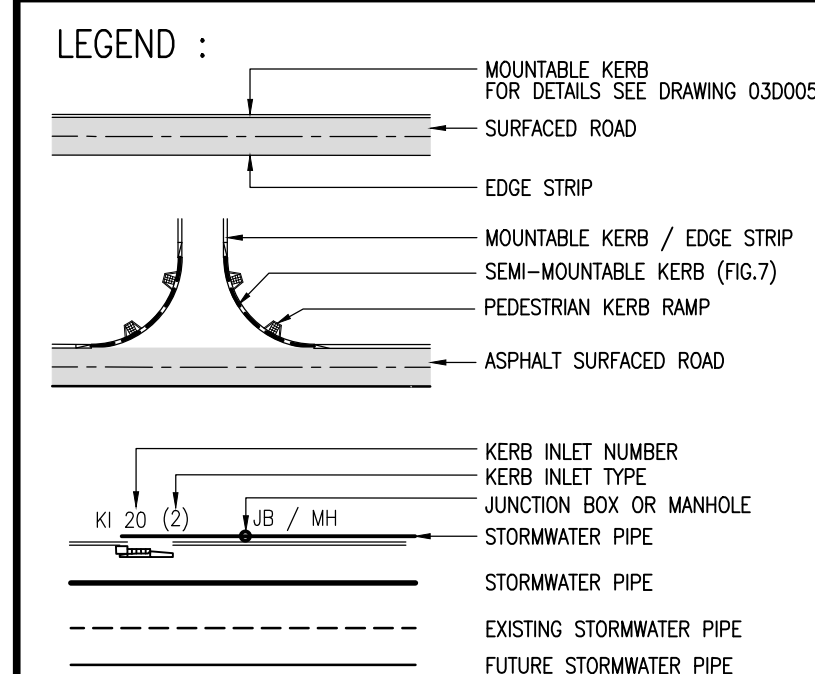
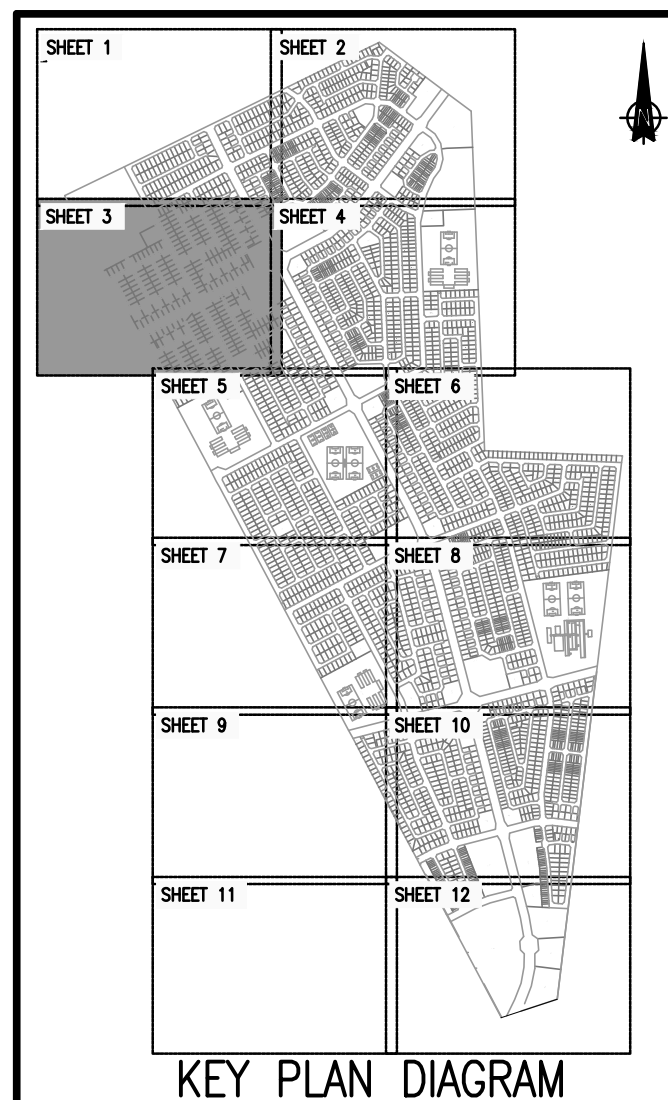
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APPROVED:
CLIENT OR ASSIGNEE: _____ DATE: _____
CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED	DESIGNED	R vd Berg
DRAWN	CHECKED	FJ Vijoen
CO-ORDINATE SYSTEM:	Lo25 WGS84	DATE: February 2010
APPROVED ON BEHALF OF BIGEN:		VERSION: 3.0
ENGINEER: _____ DATE: _____		
DRAWING No.: 1396.10.ZA.03.D025		

1396.10.ZA.03.D025





- # GENERAL NOTES
1. REFER TO DRAWINGS 1396.10.ZA.03.D0001 FOR TYPICAL ROAD RESERVE CROSS SECTIONS.
 2. BELLMOUTHS FOR FUTURE ROADS WILL NOT BE CONSTRUCTED AS PART OF THIS CONTRACT.
 3. REFER TO DRAWINGS 1396.10.ZA.03.D0119 TO D026 FOR STANDARD ROAD DETAILS.
 4. FOR HORIZONTAL SETTING OUT INFORMATION REFER TO ROAD LONGITUDINAL SECTIONS.
- ## STORMWATER/CULVERTS
1. MINIMUM PIPE DIAMETER TO BE 450mm.
 2. VERTICAL ALIGNMENT AS SHOWN ON LONGITUDINAL SECTIONS.
 3. PIPE BEDDING TO BE CLASS B UNLESS OTHERWISE SPECIFIED.
 4. ALL EXCAVATIONS AND BEDDING MUST BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE LAYING OF ANY PIPES.
 5. ALL KERB INLETS TO BE TYPE 1 UNLESS SPECIFIED ON THE DRAWING.
 6. ALL PIPES TO BE CONCRETE WITH INTERLOCKING JOINTS-SANS 677.
 7. STORMWATER JUNCTION BOXES MUST BE BUILT UP TO 300mm BELOW THE FINAL GROUND LEVEL.
 8. KERB INLET TYPES
TYPE 1 = 4:3:2
TYPE 2 = 4:6:4
X = UPSTREAM CATCHPIT TRANSITION LENGTH
Y = CATCHPIT LENGTH
Z = DOWNSTREAM CATCHPIT TRANSITION LENGTH

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
555-30-04	CERTIFIED AS BUILT	FJV	09-2015

CERTIFIED AS-BUILT FOR CONTRACT :

_____ ENGINEER _____ DATE _____

[illegible]

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Adon Ramakoa Account
Leopoldo Pallen Hub
Matikeng Pretoria

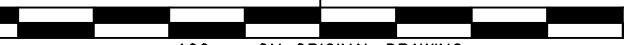
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PROJECT TITLE:

LERATO PARK
INTERNAL CIVIL ENGINEERING SERVICES

DRAWING TITLE:

ROAD AND STORMWATER LAYOUT
SHEET 3

	
ORIGINAL DRAWING SCALE: 1 : 1000	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED:	
CLIENT OR ASSIGNEE: _____	DATE: _____
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED		DESIGNED	G Thoka
DRAWN	N Bester	CHECKED	L Gertenbach
CO-ORDINATE SYSTEM:		DATE:	October 2019
APPROVED ON BEHALF OF BIGEN:			
ENGINEER: _____		DATE: _____	
DRAWING No.:		VERSION:	
1396.10.ZA.03U003		3.0	

