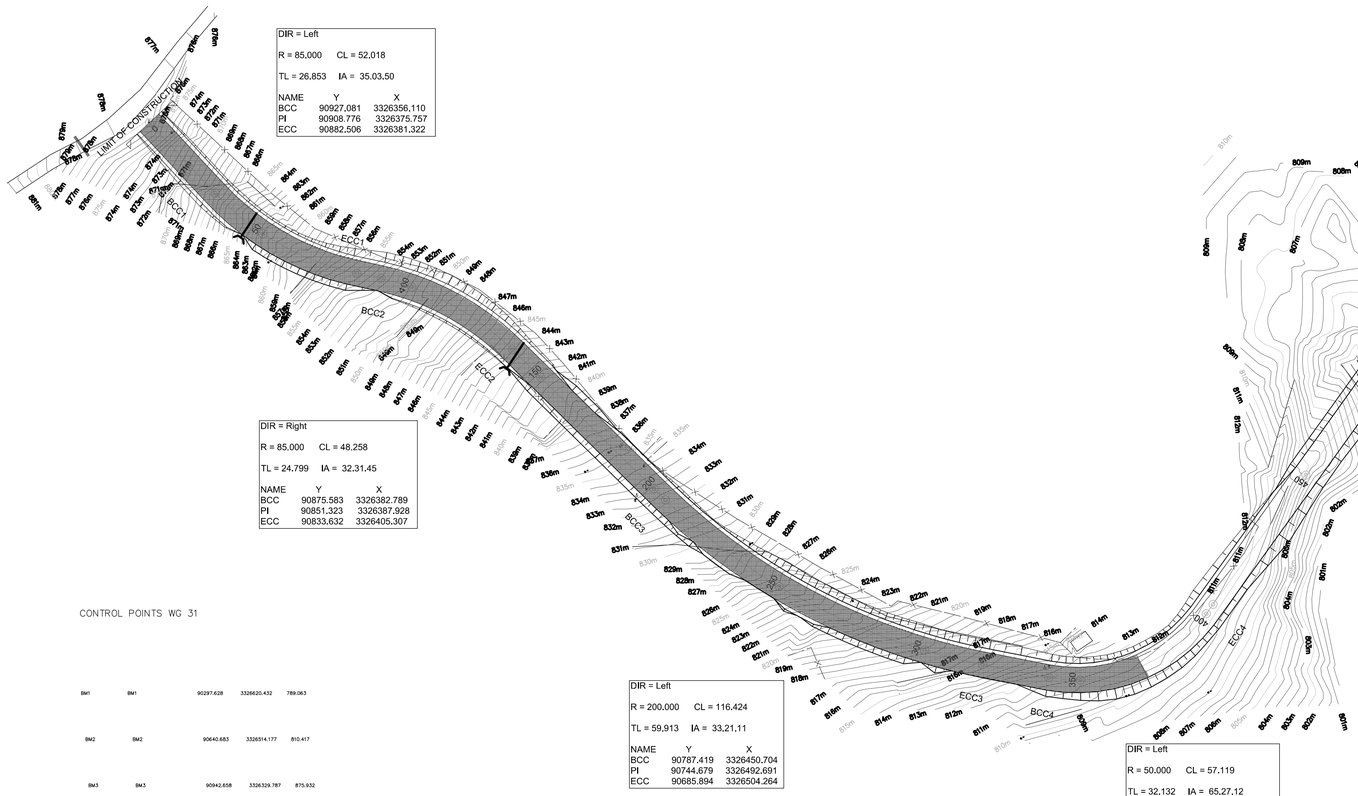
CLIENT

UBUHLEBEZWE LOCAL MUNICIPALITY

NTAKAMA ACCESS ROAD
DRAWING BOOKLET

ZIINZAME CONSULTING ENGINEERS (PTY) LTD
56 RIDGE ROAD,
SCOTTSVILLE, PIETERMARITZBURG
Tel : +27 33 342 3278



DIR = Left

R = 85,000 CL = 52,018

TL = 26,853 IA = 35.03.50

NAME	Y	X
BCC	90927.081	3326356.110
PI	90908.776	3326375.757
ECC	90882.506	3326381.322

DIR = Right

R = 85.000 CL = 48.258

TL = 24.799 IA = 32.31.45

NAME	Y	X
BCC	90875.583	3326382.789
PI	90851.323	3326387.928
ECC	90833.632	3326405.307

DIR = Left

R = 200.000 CL = 116.424

TL = 59,913 IA = 33,21,11

NAME	Y	X
BCC	90787.419	3326450.704
PI	90744.679	3326492.691
ECC	90685.894	3326504.264

DIR = Left

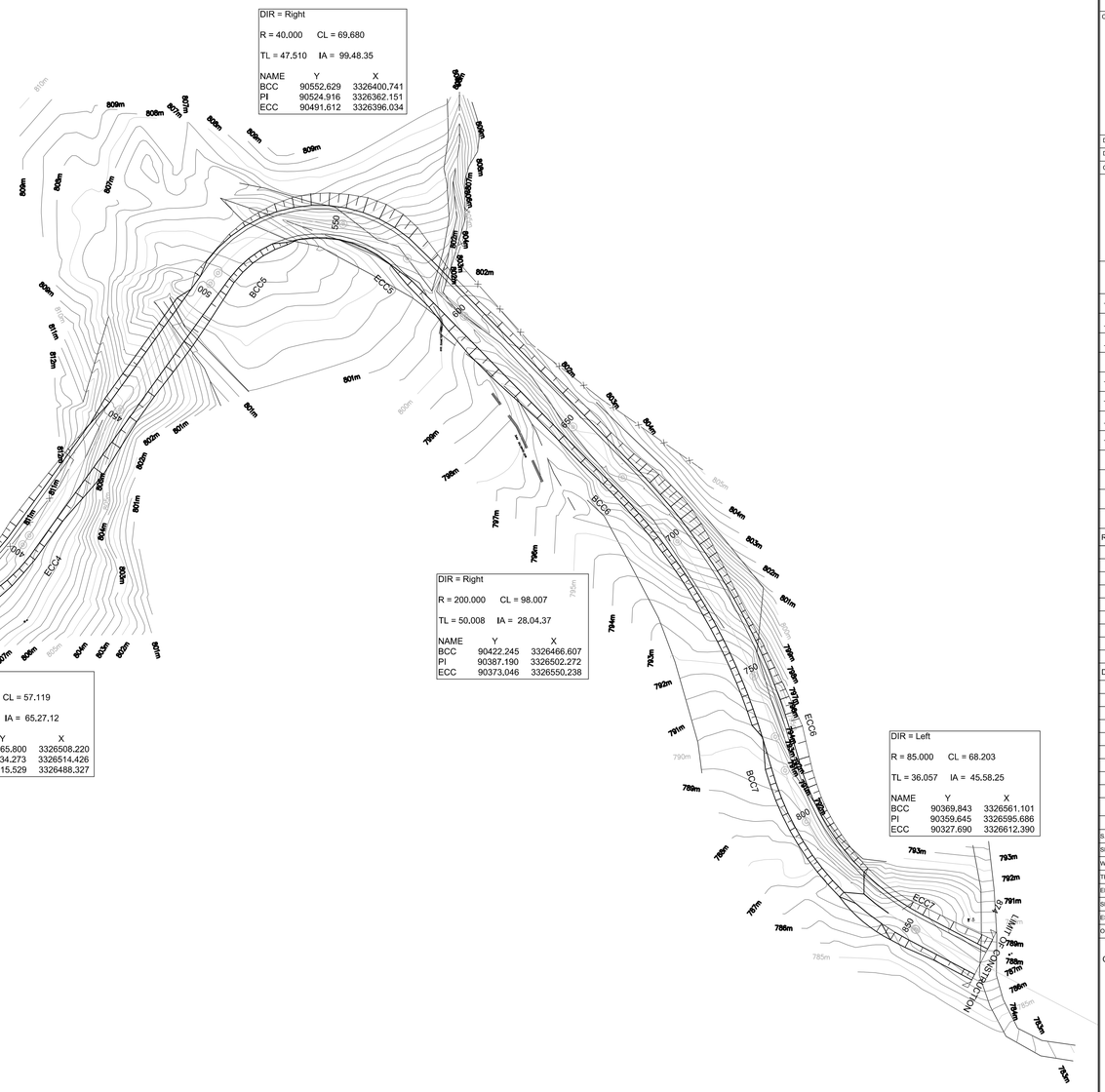
R = 50.000 CL = 57.119

TL = 32.132 IA = 65.27.12

NAME	Y	X
BCC	90665.800	3326508.220
PI	90634.273	3326514.426
ECC	90615.529	3326488.327

CONTROL POINTS WG 31

BM1	BM1	90297.628	3326620.432	789.063
BM2	BM2	90640.683	3326514.177	810.417
BM3	BM3	90942.658	3326329.787	875.932



DIR = Right

R = 40,000 CL = 69,680

TL = 47,510 IA = 99.48.35

NAME	Y	X
BCC	90552.629	3326400.741
PI	90524.916	3326362.151
ECC	90491.612	3326396.034

DIR = Right

R = 200.000 CL = 98.007

TL = 50,008 IA = 28.04,37

NAME	Y	X
BCC	90422.245	3326466.607
PI	90387.190	3326502.272
ECC	90373.046	3326550.238

DIR = Left

R = 85.000 CL = 68.203

TL = 36.057 IA = 45.58.25

NAME	Y	X
BCC	90369.843	3326561.101
PI	90359.645	3326595.686
ECC	90327.690	3326612.390

NOTES:

1. ALL LEVELS, DIMENSIONS AND SETTING OUT DETAILS ARE TO BE VERIFIED BY ENGINEER ON SITE PRIOR TO CONSTRUCTION.
2. EXISTING SERVICES AFFECTED BY THE NEW WORKS TO BE PROVEN PRIOR TO CONSTRUCTION.
3. CULVERT INVERTS ARE TO BE DETERMINED BY THE ENGINEER ON SITE UNLESS OTHERWISE SHOWN.
   MIN. COVER = 600mm. MIN. SLOPE = 2%
4. PIPE CULVERTS ARE TO BE LAID IN ACCORDANCE WITH THE RELEVANT STANDARD DETAILS.
   MIN. DIA. = 450mm FOR MINOR ACCESS ROAD AND ACCESS BELLMOUTHS AND MIN. DIA. = 600mm FOR MAJOR ROAD CROSS DRAINAGE.
5. FOR EROSION CONTROL CEMENT GROUTED STONE PITCHING OR GABION MATTRESSES ARE RECOMMENDED AT CULVERT INLETS AND OUTLETS.
6. EARTH BERMS ARE TO BE CONSTRUCTED AT CULVERT INLETS TO DIRECT STORMWATER INTO CULVERTS WHERE NECESSARY.
7. SUBSOIL DRAINS ARE TO BE INSTALLED ONLY WHERE DIRECTED BY ENGINEER ON SITE.
8. WHERE SURFACE RUNOFF IS TOWARDS THE ROAD, CATCHWATER BANKS ARE TO BE PROVIDED TO DIVERT STORMWATER TO MAJOR CROSS DRAINAGE STRUCTURES.
9. NEW FILLS AND EXPOSED CUTTINGS ARE TO BE TOPSOILED AND VEGETATED IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
10. ALL NEW ROAD SIGNS AND ROADMARKING REQUIREMENTS ARE TO CONFORM TO THE SOUTH AFRICAN DEVELOPMENT COMMUNITY ROAD TRAFFIC SIGNS MANUAL (SADC-RTSM).
11. GUARDRAILS ARE TO BE INSTALLED AS SHOWN ON THE DRAWINGS OR WHERE FILL EMBANKMENTS EXCEED 3m IN HEIGHT.

CONSULTANT

Ziinzame Consulting Engineers (Pty) Ltd.
Reg No. 2013/054838/07

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Cell : 083 297 2098
Email : admin@ziinzame.co.za

DESIGNED	V. GUBEKA	CHECKED	W.NJOMI
DRAWN	V. GUBEKA	CHECKED	T.NGCONGO
CONSULTANT DRAWING No:	PRJ 067/ZCE/FT/001		

FOR TENDER

DATE : _____

SIGNED BY : _____

CONSULTING ENGINEER

LEGEND

	BOUNDARY
Valve W FH	EXISTING WATER MAINS
MH S	EXISTING SEWERS
MH CP	EXISTING STORMWATER
E	ELECTRICITY
T	TELKOM PIPES AND CABLES
Valve FH	PROPOSED WATER MAINS
	PROPOSED SEWERS
MH CP	PROPOSED STORMWATER

REV	DESCRIPTION	MADE BY	DATE

DRG. NO.	REFERENCE DRAWINGS

UNDERGROUND SERVICES CHECKED

SERVICE	DATE	SIGNATURE
S.W. DRAINS		
SEWER		
WATER MAINS		
TELKOM CABLES		
ELECT CABLES		
SPOORNET CABLES		
ESKOM CABLES		
OIL PIPE LINE		

CLIENT:

UBUHLEBEZWE MUNICIPALITY

PROJECT TITLE:

NTAKAMA ACCESS ROAD

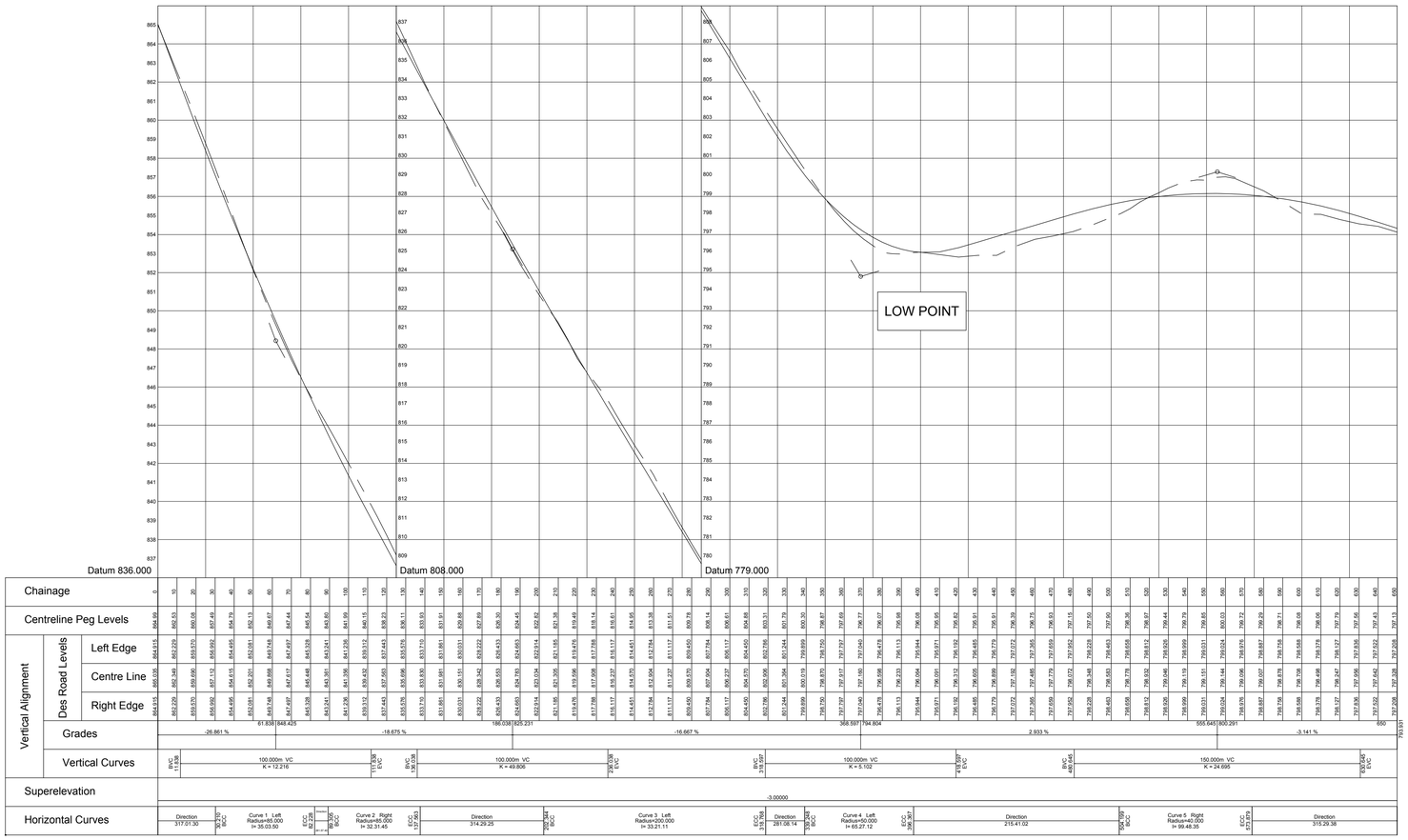
PROPOSED ROAD LAYOUT

SCALES: AS SHOWN

DESIGN					
DRAWN					
CHECKED					
DATE					

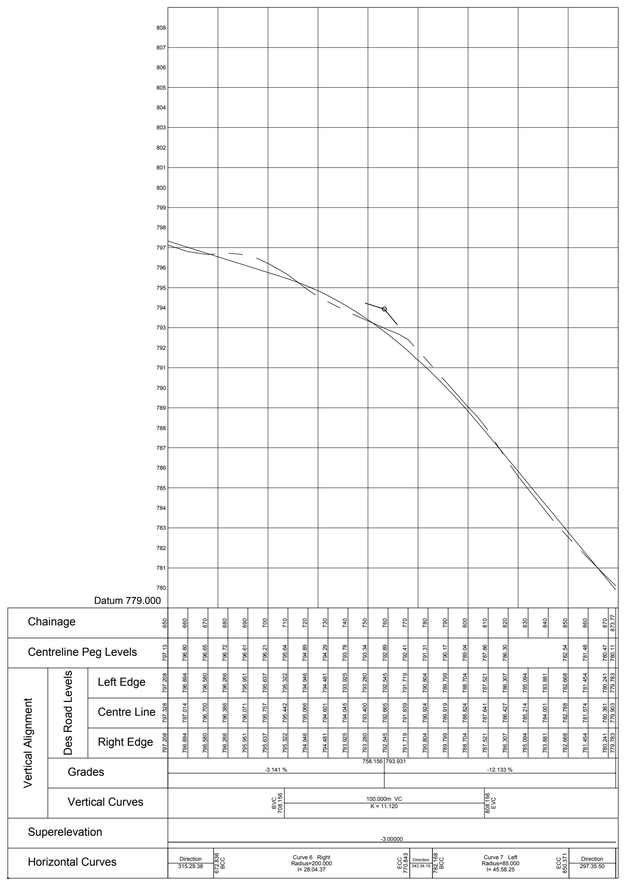
MUNICIPALITY DRAWING NO.

REVISION 0



Longsection for 0 to 650

HORIZONTAL SCALE: 1000
VERTICAL SCALE :100



Longsection for 650 to 873

NOTES:

1. ALL LEVELS, DIMENSIONS AND SETTING OUT DETAILS ARE TO BE VERIFIED BY ENGINEER ON SITE PRIOR TO CONSTRUCTION.
2. EXISTING SERVICES AFFECTED BY THE NEW WORKS TO BE PROVEN PRIOR TO CONSTRUCTION.
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CONSULTANT

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DESIGNED	V. GUBEKA	CHECKED	W.NJOMI
DRAWN	V. GUBEKA	CHECKED	T.NGCONGO
CONSULTANT DRAWING No:	PRJ 067/ZCE/FT/002		

FOR TENDER

DATE : _____

SIGNED BY : _____
CONSULTING ENGINEER

LEGEND

	BOUNDARY
Valve, W, FH	EXISTING WATER MAINS
MH, S	EXISTING SEWERS
MH, CP	EXISTING STORMWATER
E	ELECTRICITY
T	TELKOM PIPES AND CABLES
Valve, FH	PROPOSED WATER MAINS
	PROPOSED SEWERS
MH, CP	PROPOSED STORMWATER

REV.	DESCRIPTION	MADE BY	DATE

DRG. NO.	REFERENCE DRAWINGS

UNDERGROUND SERVICES CHECKED

SERVICE	DATE	SIGNATURE
S.W. DRAINS		
SEWER		
WATER MAINS		
TELKOM CABLES		
ELECT CABLES		
SPOORNET CABLES		
ESKOM CABLES		
OIL PIPE LINE		

CLIENT:

UBUHLEBEZWE MUNICIPALITY

PROJECT TITLE:

NTAKAMA ACCESS ROAD

LONG SECTIONS

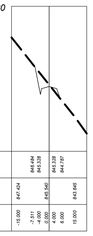
SCALES: AS SHOWN

DESIGN					
DRAWN					
CHECKED					
DATE					

MUNICIPALITY DRAWING NO. | REVISION 0

CHAINAGE 80

H.SCALE 1:1000
V.SCALE 1:100

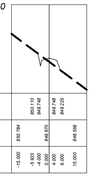


DATUM = 842

FINISHED		845.484	845.328	845.328	845.321
GROUND		845.424	845.345	845.323	845.045
OFFSET	-15.000	-7.811 -5.000 -2.000	0.000	2.000 5.000 8.000	15.000

CHAINAGE 60

H.SCALE 1:1000
V.SCALE 1:100

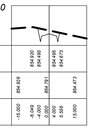


DATUM = 848

FINISHED		850.110 849.748		849.748 849.722	
GROUND		850.784	848.570	848.570	848.096
OFFSET	-15.000	-5.833 -3.000 -1.000	0.000	1.000 3.000 5.833	15.000

CHAINAGE 40

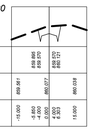
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 854



FINISHED		854.520 854.495		854.495 854.473	
GROUND		854.582	854.791	854.473	
OFFSET	-15.000	-9.949 -5.000 -2.000	0.000	2.000 5.000 9.949	15.000

CHAINAGE 20

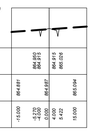
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 859



FINISHED		859.986 859.970		860.071 860.058	
GROUND		859.981	860.077	860.058	860.028
OFFSET	-15.000	-5.860 -5.000 -2.000	0.000	2.000 5.000 8.000	15.000

CHAINAGE 0

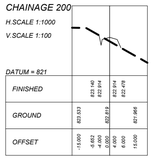
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 864



FINISHED		866.993 866.915		866.915 866.916	
GROUND		864.481	867.487	866.916	865.594
OFFSET	-15.000	-9.770 -5.000 -2.000	0.000	2.000 5.000 9.770	15.000

CHAINAGE 200

H.SCALE 1:1000
V.SCALE 1:100

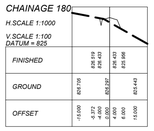


DATUM = 821

FINISHED		823.140 822.914		822.914 822.476	
GROUND	823.033		822.974		821.966
OFFSET	-15.000	-5.852 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 180

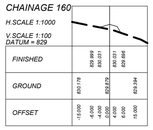
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 825



FINISHED		828.519 828.420		828.420 828.404	
GROUND	825.705		825.267		825.443
OFFSET	-15.000	-5.372 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 160

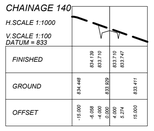
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 829



FINISHED		829.999 829.931		829.931 829.868	
GROUND	829.178		829.579		829.394
OFFSET	-15.000	-5.000 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 140

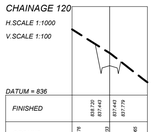
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 833



FINISHED		834.139 833.710		833.710 833.712	
GROUND	834.448		833.926		833.411
OFFSET	-15.000	-5.698 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 120

H.SCALE 1:1000
V.SCALE 1:100

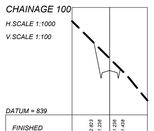


DATUM = 836

FINISHED		838.720 837.443		837.443 837.418	
GROUND	838.178		838.393		837.996
OFFSET	-15.000	-7.754 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 100

H.SCALE 1:1000
V.SCALE 1:100

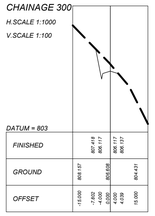


DATUM = 839

FINISHED		842.823 841.206		841.206 841.458	
GROUND	844.479		841.985		844.377
OFFSET	-15.000	-9.374 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 300

H.SCALE 1:1000
V.SCALE 1:100

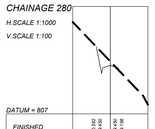


DATUM = 803

FINISHED		807.418 806.117		806.117 806.117	
GROUND	803.137		803.858		804.431
OFFSET	-15.000	-7.802 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 280

H.SCALE 1:1000
V.SCALE 1:100

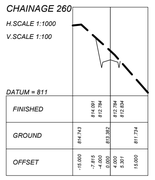


DATUM = 807

FINISHED		810.042 809.450		809.450 809.416	
GROUND	811.566		809.784		808.213
OFFSET	-15.000	-7.423 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 260

H.SCALE 1:1000
V.SCALE 1:100

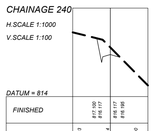


DATUM = 811

FINISHED		814.081 812.784		812.784 812.754	
GROUND	814.143		813.361		811.734
OFFSET	-15.000	-7.815 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 240

H.SCALE 1:1000
V.SCALE 1:100

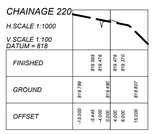


DATUM = 814

FINISHED		817.100 816.117		816.117 816.106	
GROUND	817.283		816.614		815.100
OFFSET	-15.000	-7.064 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 220

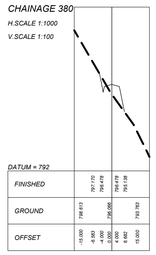
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 818



FINISHED		819.869 819.476		819.476 819.473	
GROUND	819.780		819.485		819.837
OFFSET	-15.000	-9.449 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 380

H.SCALE 1:1000
V.SCALE 1:100

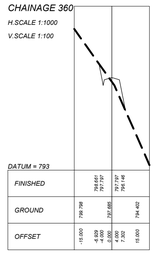


DATUM = 792

FINISHED		797.170 795.478		795.478 793.138	
GROUND	798.613		796.986		793.783
OFFSET	-15.000	-5.983 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 360

H.SCALE 1:1000
V.SCALE 1:100

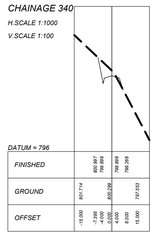


DATUM = 793

FINISHED		798.651 797.797		797.797 797.178	
GROUND	798.790		797.885		794.402
OFFSET	-15.000	-6.939 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 340

H.SCALE 1:1000
V.SCALE 1:100

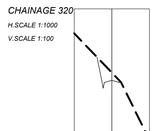


DATUM = 796

FINISHED		800.997 799.899		799.899 799.864	
GROUND	801.714		800.28		797.533
OFFSET	-15.000	-7.395 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 320

H.SCALE 1:1000
V.SCALE 1:100

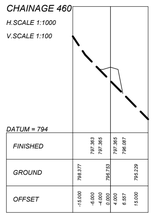


DATUM = 799

FINISHED		804.158 802.798		802.798 802.746	
GROUND	804.477		803.312		802.746
OFFSET	-15.000	-7.891 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 460

H.SCALE 1:1000
V.SCALE 1:100

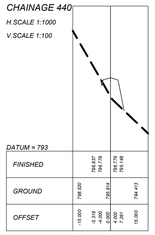


DATUM = 794

FINISHED		797.383 797.364		797.364 797.329	
GROUND	798.377		797.723		798.229
OFFSET	-15.000	-6.650 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 440

H.SCALE 1:1000
V.SCALE 1:100

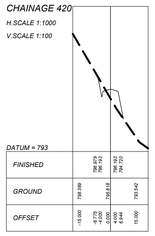


DATUM = 793

FINISHED		798.837 798.179		798.179 798.147	
GROUND	798.920		798.524		794.413
OFFSET	-15.000	-5.318 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 420

H.SCALE 1:1000
V.SCALE 1:100

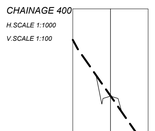


DATUM = 793

FINISHED		798.979 798.952		798.952 798.922	
GROUND	799.348		798.818		793.542
OFFSET	-15.000	-6.775 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 400

H.SCALE 1:1000
V.SCALE 1:100

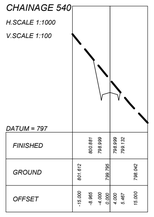


DATUM = 793

FINISHED		797.182 796.944		796.944 796.912	
GROUND	799.232		795.882		793.932
OFFSET	-15.000	-7.878 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 540

H.SCALE 1:1000
V.SCALE 1:100

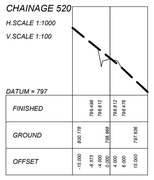


DATUM = 797

FINISHED		802.691 799.999		799.999 799.910	
GROUND	801.612		799.795		798.002
OFFSET	-15.000	-8.995 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 520

H.SCALE 1:1000
V.SCALE 1:100

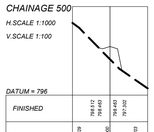


DATUM = 797

FINISHED		799.498 799.412		799.412 799.410	
GROUND	800.178		798.885		797.606
OFFSET	-15.000	-8.613 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 500

H.SCALE 1:1000
V.SCALE 1:100

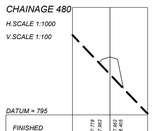


DATUM = 796

FINISHED		798.612 798.603		798.603 798.602	
GROUND	799.429		797.895		796.703
OFFSET	-15.000	-8.690 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 480

H.SCALE 1:1000
V.SCALE 1:100

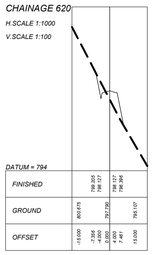


DATUM = 795

FINISHED		797.778 797.602		797.602 797.603	
GROUND	798.721		797.145		795.577
OFFSET	-15.000	-8.939 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 620

H.SCALE 1:1000
V.SCALE 1:100

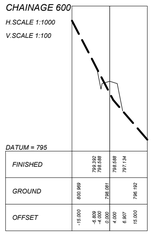


DATUM = 794

FINISHED		799.203 798.977		798.977 798.355	
GROUND	800.673		797.230		795.137
OFFSET	-15.000	-7.264 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 600

H.SCALE 1:1000
V.SCALE 1:100

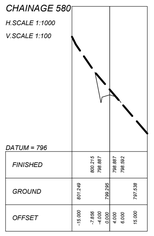


DATUM = 795

FINISHED		799.322 799.048		799.048 799.018	
GROUND	800.989		798.861		796.182
OFFSET	-15.000	-8.809 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 580

H.SCALE 1:1000
V.SCALE 1:100

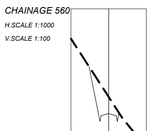


DATUM = 796

FINISHED		802.215 799.867		799.867 799.862	
GROUND	802.249		799.225		797.538
OFFSET	-15.000	-7.888 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 560

H.SCALE 1:1000
V.SCALE 1:100

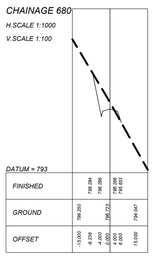


DATUM = 797

FINISHED		801.638 799.429		799.429 799.377	
GROUND	802.244		800.028		797.545
OFFSET	-15.000	-10.429 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 680

H.SCALE 1:1000
V.SCALE 1:100

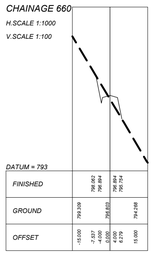


DATUM = 793

FINISHED		799.264 798.386		798.386 795.603	
GROUND	799.250		798.721		796.047
OFFSET	-15.000	-7.313 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 660

H.SCALE 1:1000
V.SCALE 1:100

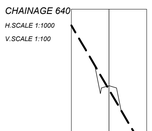


DATUM = 793

FINISHED		798.842 798.804		798.804 795.754	
GROUND	799.009		798.803		794.988
OFFSET	-15.000	-7.017 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 640

H.SCALE 1:1000
V.SCALE 1:100

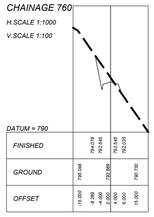


DATUM = 794

FINISHED		798.129 797.903		797.903 796.341	
GROUND	799.081		797.426		794.865
OFFSET	-15.000	-7.253 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 760

H.SCALE 1:1000
V.SCALE 1:100

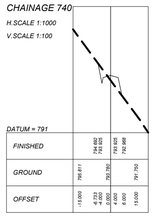


DATUM = 790

FINISHED		793.475 792.145		792.145 792.025	
GROUND	795.048		792.889		790.750
OFFSET	-15.000	-7.264 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 740

H.SCALE 1:1000
V.SCALE 1:100

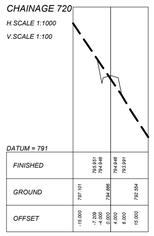


DATUM = 791

FINISHED		794.682 793.405		793.405 793.368	
GROUND	796.611		795.252		791.750
OFFSET	-15.000	-8.233 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 720

H.SCALE 1:1000
V.SCALE 1:100

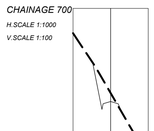


DATUM = 791

FINISHED		794.640 794.618		794.618 793.991	
GROUND	797.101		794.886		792.594
OFFSET	-15.000	-7.308 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 700

H.SCALE 1:1000
V.SCALE 1:100

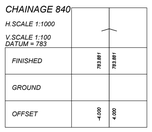


DATUM = 792

FINISHED		797.931 795.637		795.637 795.177	
GROUND	799.841		795.512		793.652
OFFSET	-15.000	-8.000 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 840

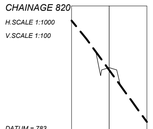
H.SCALE 1:1000
V.SCALE 1:100
DATUM = 783



FINISHED		783.981		783.981	
GROUND					
OFFSET		-5.000		-5.000	

CHAINAGE 820

H.SCALE 1:1000
V.SCALE 1:100

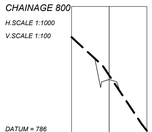


DATUM = 783

FINISHED		787.314 787.267		787.267 787.473	
GROUND	794.214		790.252		794.234
OFFSET	-15.000	-7.100 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 800

H.SCALE 1:1000
V.SCALE 1:100

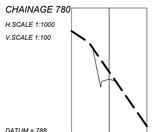


DATUM = 786

FINISHED		790.54 789.254		789.254 789.199	
GROUND	790.617		789.254		789.793
OFFSET	-15.000	-7.000 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 780

H.SCALE 1:1000
V.SCALE 1:100

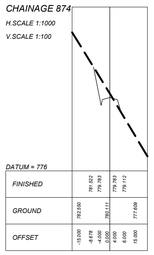


DATUM = 788

FINISHED		792.074 790.904		790.904 790.847	
GROUND	793.153		791.73		789.149
OFFSET	-15.000	-6.979 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 874

H.SCALE 1:1000
V.SCALE 1:100

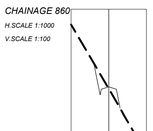


DATUM = 776

FINISHED		781.533 779.783		779.783 779.712	
GROUND	782.350		780.11		777.609
OFFSET	-15.000	-5.000 -5.000 -2.000	0.000	2.000 5.000	15.000

CHAINAGE 860

H.SCALE 1:1000
V.SCALE 1:100



DATUM = 778

FINISHED		782.533 781.464		781.464 780.481	
GROUND	784.031		781.43		779.887
OFFSET	-15.000	-5.000 -5.000 -2.000	0.000	2.000 5.000	15.000

NOTES:

1. ALL LEVELS, DIMENSIONS AND SETTING OUT DETAILS ARE TO BE VERIFIED BY ENGINEER ON SITE PRIOR TO CONSTRUCTION.
2. EXISTING SERVICES AFFECTED BY THE NEW WORKS TO BE PROVEN PRIOR TO CONSTRUCTION.
3. CULVERT INVERTS ARE TO BE DETERMINED BY THE ENGINEER ON SITE UNLESS OTHERWISE SHOWN.
   MIN. COVER = 600mm. MIN. SLOPE = 2%
4. PIPE CULVERTS ARE TO BE LAID IN ACCORDANCE WITH THE RELEVANT STANDARD DETAILS.
   MIN. DIA. = 450mm FOR MINOR ACCESS ROAD AND ACCESS BELLMOUTHS AND MIN. DIA. = 600mm FOR MAJOR ROAD CROSS DRAINAGE.
5. FOR EROSION CONTROL CEMENT GROUTED STONE PITCHING OR GABION MATTRESSES ARE RECOMMENDED AT CULVERT INLETS AND OUTLETS.
6. EARTH BERMS ARE TO BE CONSTRUCTED AT CULVERT INLETS TO DIRECT STORMWATER INTO CULVERTS WHERE NECESSARY.
7. SUBSOIL DRAINS ARE TO BE INSTALLED ONLY WHERE DIRECTED BY ENGINEER ON SITE.
8. WHERE SURFACE RUNOFF IS TOWARDS THE ROAD, CATCHWATER BANKS ARE TO BE PROVIDED TO DIVERT STORMWATER TO MAJOR CROSS DRAINAGE STRUCTURES.
9. NEW FILLS AND EXPOSED CUTTINGS ARE TO BE TOPSOILED AND VEGETATED IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
10. ALL NEW ROAD SIGNS AND ROADMARKING REQUIREMENTS ARE TO CONFORM TO THE SOUTH AFRICAN DEVELOPMENT COMMUNITY ROAD TRAFFIC SIGNS MANUAL (SADC-RTSM).
11. GUARDRAILS ARE TO BE INSTALLED AS SHOWN ON THE DRAWINGS OR WHERE FILL EMBANKMENTS EXCEED 3m IN HEIGHT.

CONSULTANT

Ziinzame Consulting Engineers (Pty) Ltd.
Reg No. 2013/054608/07

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Tel : 047 537 0269
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Cell : 083 297 2098
Email : admin@ziinzame.co.za

DESIGNED	V. GUBEKA	CHECKED	W.NJOMI
DRAWN	V. GUBEKA	CHECKED	T.NGCONGO
CONSULTANT DRAWING No:	PRJ 067/ZCE/TR/FT/003		

FOR TENDER

DATE : _____

SIGNED BY : _____
CONSULTING ENGINEER

LEGEND

	BOUNDARY
Valve W FH	EXISTING WATER MAINS
MH S	EXISTING SEWERS
MH CP	EXISTING STORMWATER
E	ELECTRICITY
T	TELKOM PIPES AND CABLES
Valve FH	PROPOSED WATER MAINS
	PROPOSED SEWERS
MH CP	PROPOSED STORMWATER

REV	DESCRIPTION	MADE BY	DATE

DRG. NO.	REFERENCE DRAWINGS

UNDERGROUND SERVICES CHECKED

SERVICE	DATE	SIGNATURE
S.W. DRAINS		
SEWER		
WATER MAINS		
TELKOM CABLES		
ELECT CABLES		
SPOORNET CABLES		
ESKOM CABLES		
OIL PIPE LINE		

CLIENT:

UBUHLEBEZWE MUNICIPALITY

PROJECT TITLE:

NTAKAMA ACCESS ROAD

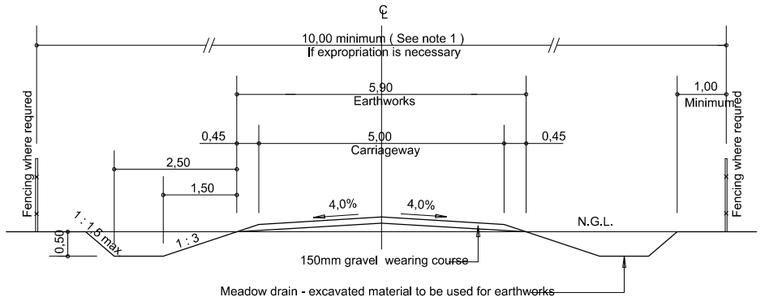
CROSS SECTIONS

SCALES: AS SHOWN

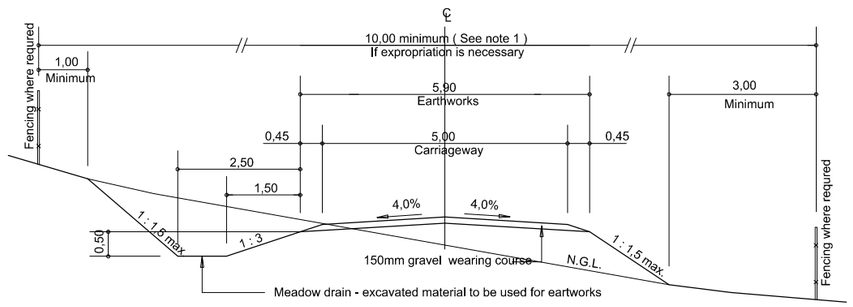
DESIGN					
DRAWN					
CHECKED					
DATE					

MUNICIPALITY DRAWING NO.

REVISION 0



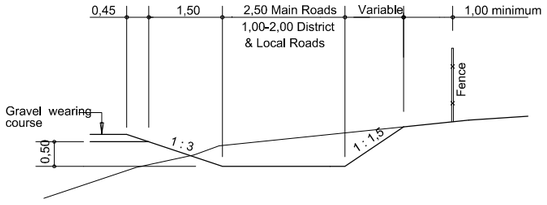
TYPE 7A LOCAL ROAD OR BY-ROAD
(FLAT TERRAIN)



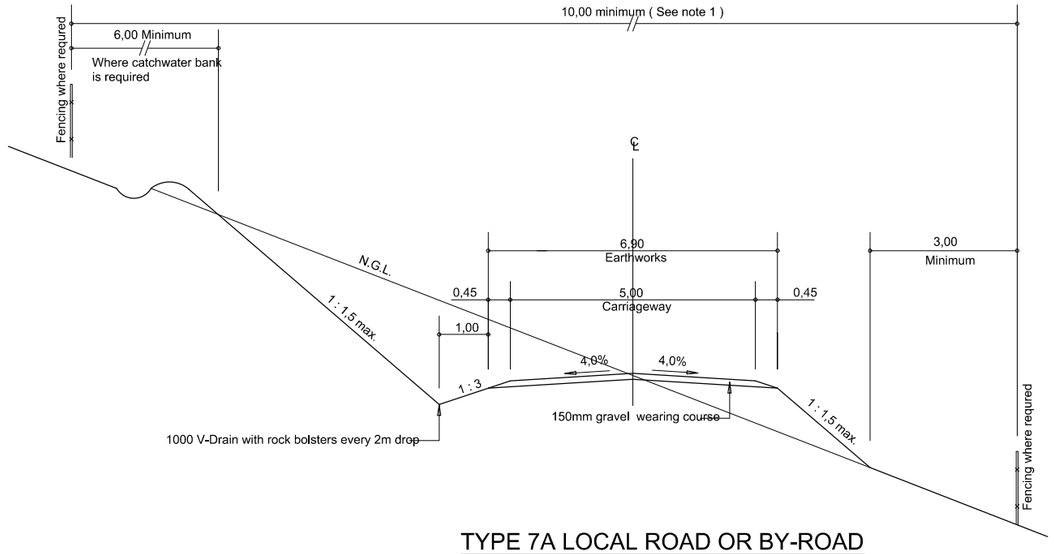
TYPE 7A LOCAL ROAD OR BY-ROAD
(ROLLING TERRAIN)

NOTES :

1. For Type 7A roads where it is envisaged it will become a district road in the future, a 20m road reserve shall be taken.
2. Cut slopes may be increased to 1:1 in hard material.



MEADOW-DRAIN



TYPE 7A LOCAL ROAD OR BY-ROAD
(MOUNTAINOUS TERRAIN)

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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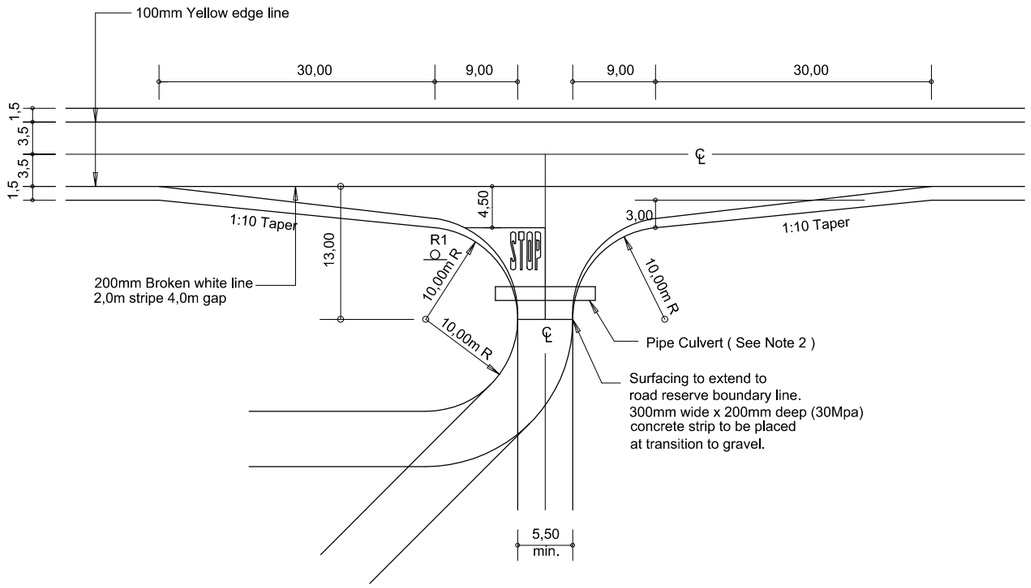
	RESPONSIBLE PERSON	DATE
DESIGNED	V.GUBEKA	08-06-2020
CHECKED	T.NGCONGO	08-06-2020
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
TYPICAL CROSS SECTIONS
TYPE 7A LOCAL GRAVEL ROAD

DRAWING NUMBER
PRJ 067-FT-004

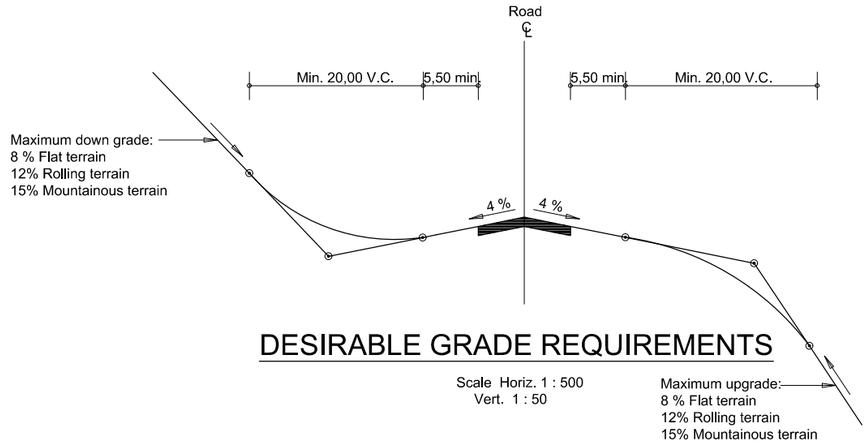
SHEET SIZE
A3

REVISION
0



TYPE B1 ACCESS

Not to scale



DESIRABLE GRADE REQUIREMENTS

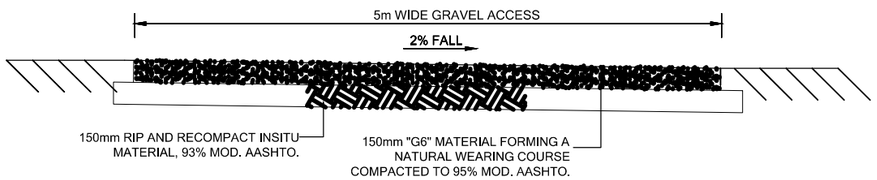
Scale Horiz. 1 : 500
Vert. 1 : 50

USAGE	MIN. WIDTH (W)	DESIRABLE WIDTH (W)
Predominantly light vehicles < 10vpd.	3,00	5,00
Predominantly light vehicles > 10 vpd.	5,00	7,00
Predominantly heavy vehicles < 10vpd.	5,00	8,00
Predominantly heavy vehicles > 10vpd.	7,00	10,00

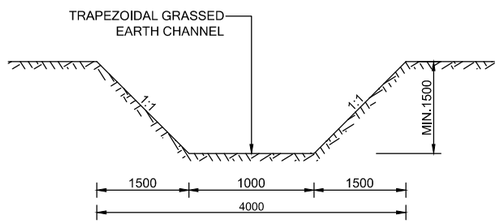
TABLE 1: DESIRABLE USAGE AND DIMENSIONS FOR TYPE B1 ACCESS

NOTES:

1. Type B accesses are recommended for secondary and tertiary road intersections and roads serving minor developments.
2. Pipe culverts are to be provided when necessary to maintain longitudinal drainage. The pipe shall be manufactured of concrete or galvanised metal with a minimum diameter of 450mm. The pipe shall be sufficiently long to clear the fill slopes.
3. The access bellmouth shall be designed and constructed such that stormwater from the access will not run onto or across the road surface.
4. The pavement layers shall be constructed as directed by the Engineer.
5. Gravel surfacing is only permited in isolated areas where the cost of surfacing would be unreasonably high. A concrete wedge 1,5m wide shall then be provided to protect the pavement edge.
6. Where two roads intersect, the numerical difference of the gradients (roll over) should not exceed 10% with a maximum super of 6% on the main road.
7. Maximum approach gradient to be 4% upgrade and 6% down grade.



TYPICAL SECTION THROUGH 5m WIDE
GRAVEL ROAD (CROSSFALL)
SCALE :DIAGRAMITIC



TYPICAL SECTION THROUGH MODIFIED
EARTH FORMED CHANNEL (TRAPEZOIDAL)
SCALE 1: 25

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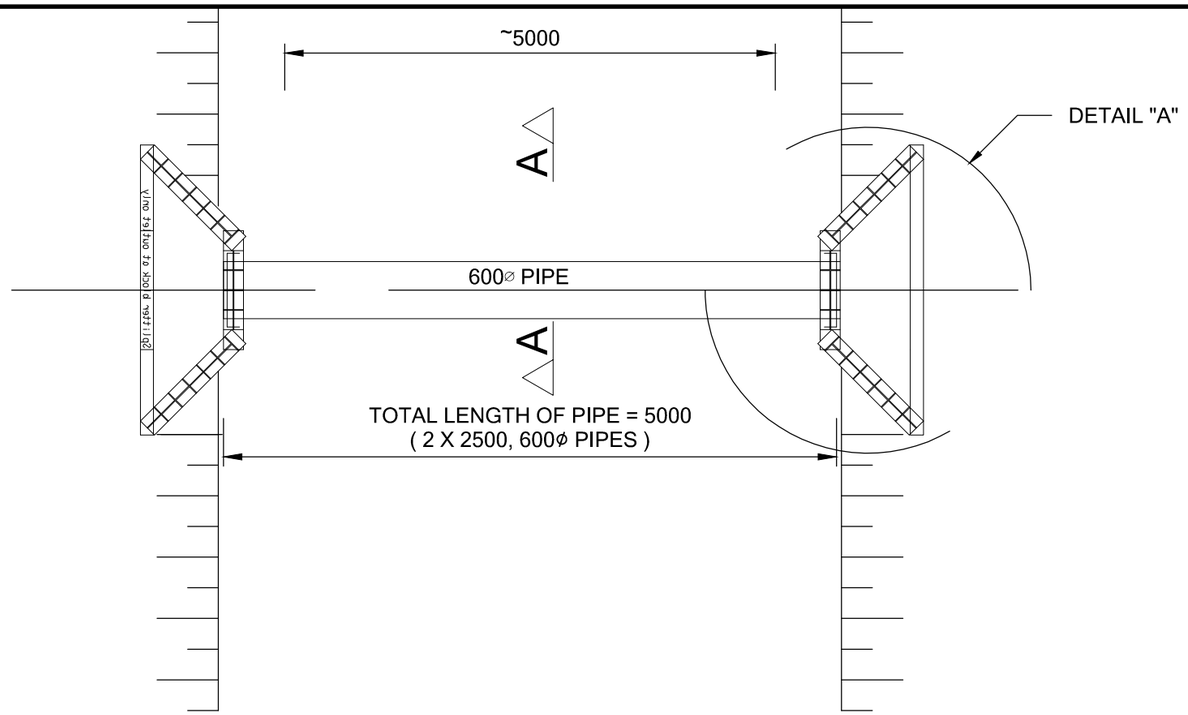
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
TYPE B1 ACCESS DETAIL

SHEET SIZE
A3

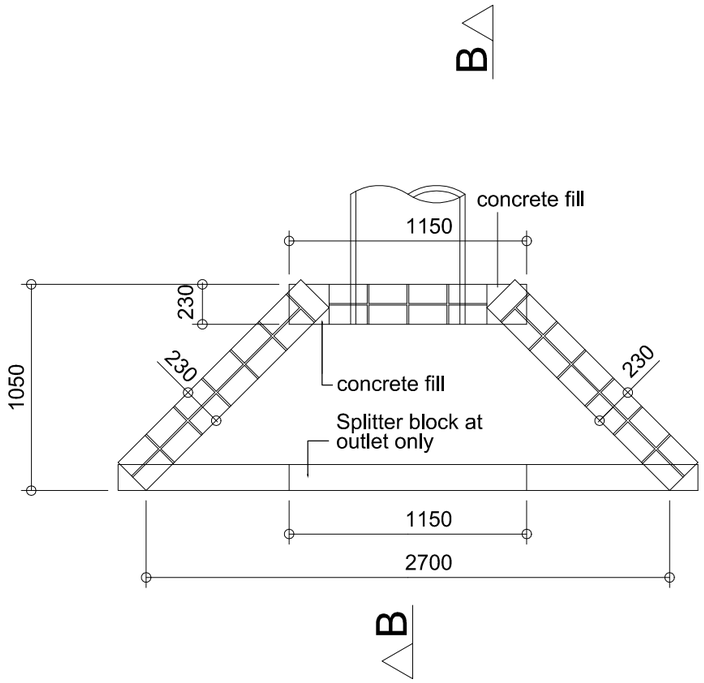
REVISION
0

DRAWING NUMBER
PRJ 067-FT-005

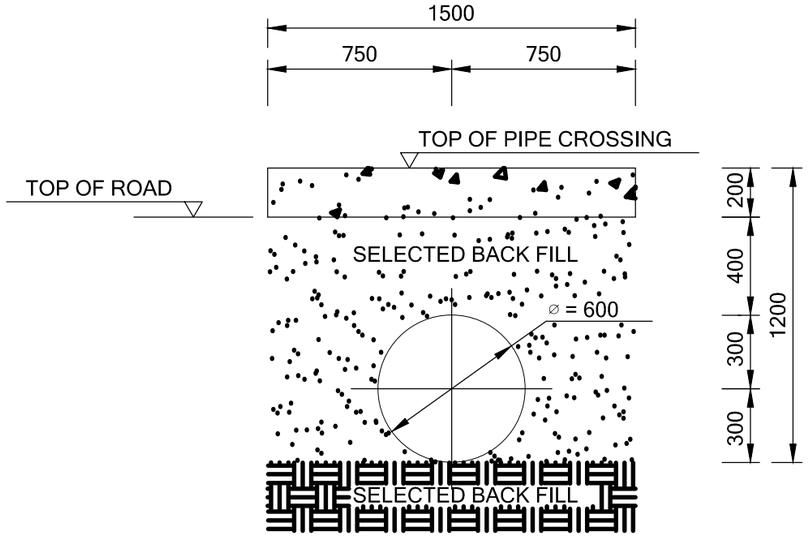


TYPICAL LAYOUT PIPE CROSSING WITH DOUBLE HEAD WALL

SCALE 1 : 50

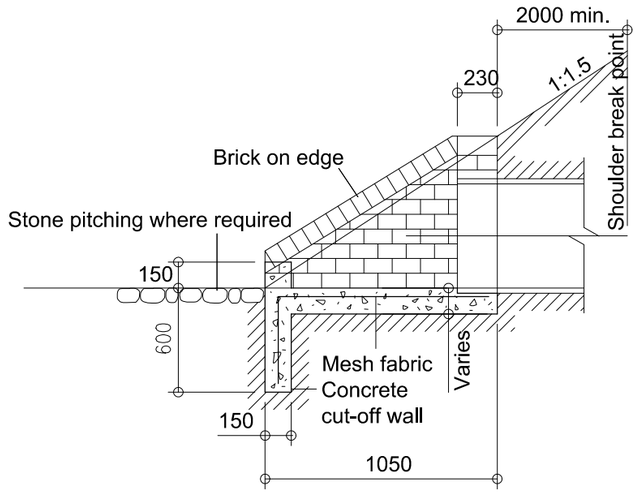


DETAIL A



SECTION A-A

SCALE 1 : 25



SECTION B-B

SCALE 1 : 25

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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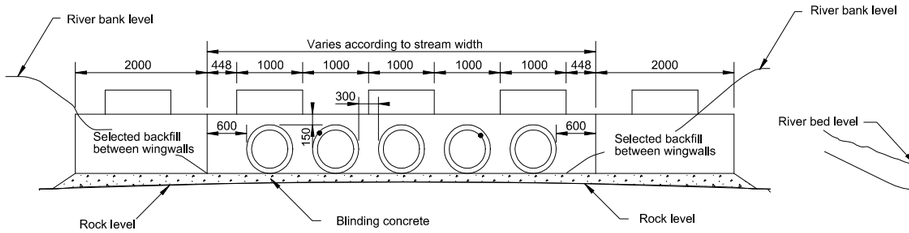
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
DOUBLE HEADWALL WITH SINGLE PIPELINE

SHEET SIZE
A3

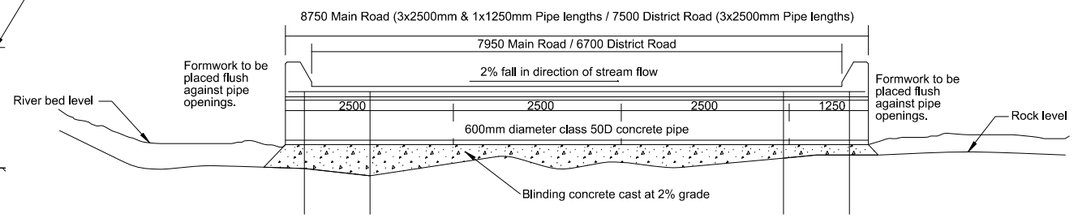
REVISION
0

DRAWING NUMBER
PRJ 067-FT-006



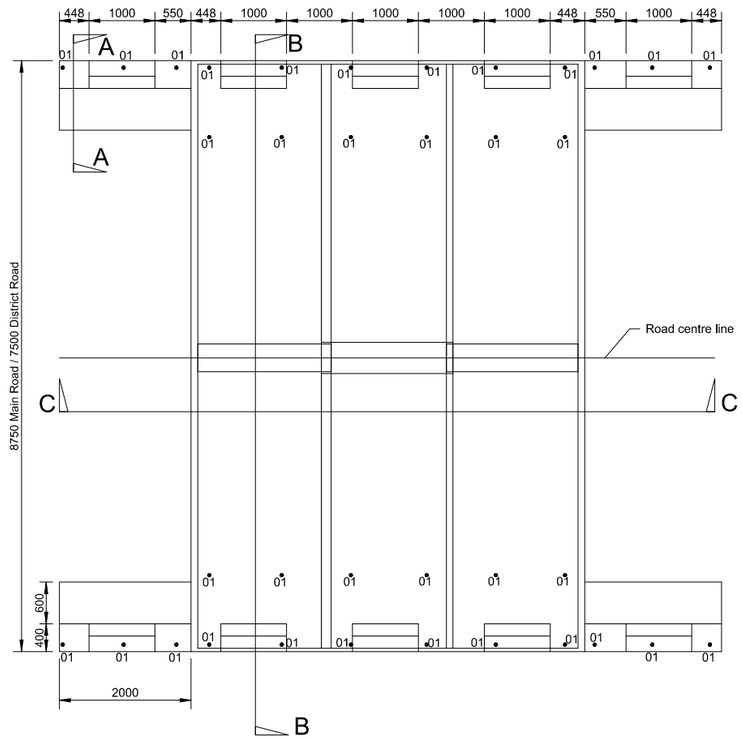
STREAM CENTRELINE ELEVATION

Scale 1:50



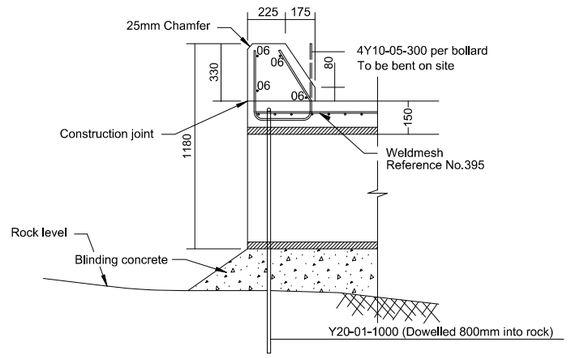
LONG SECTION B-B THROUGH CAUSEWAY

Scale 1:50



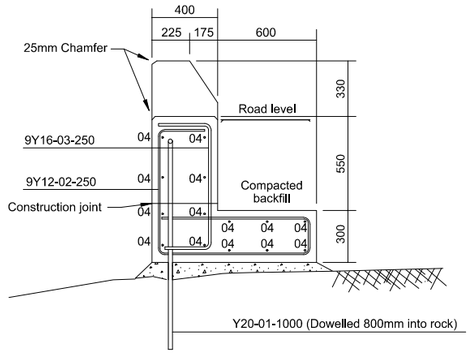
PLAN OF CAUSEWAY

Scale 1:50



DETAIL THROUGH BOLLARD

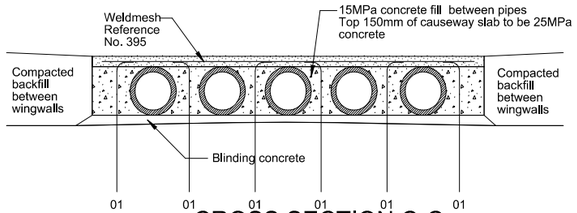
Scale 1:20



SECTION A-A THROUGH WINGWALL

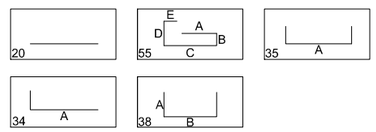
Scale 1:20

TYPE AND SIZE	BAR MARK NO.	NO. OF UNITS	NO. PER UNIT	TOTAL NO. BARS	BAR CUT LENGTH	SHAPE CODE	A	B	C	D	E	F	TOTAL Y-BAR MASS	TOTAL WELD-MESH
Y20	01	1	28	28	2110	34	1810	Dowels into Rock					146	
Y12	02	4	9	36	3000	55	920	220	920	770			96	
Y16	03	4	9	36	1410	38	320	770					91	
Y12	04	4	14	56	1920	20							96	
Y10	05	10	4	40	1000	35	320						25	
Y10	06	10	4	40	940	20							23	
Ref. 395		1	6	6	2000 x 4400 Weldmesh sheets					Causeway top slab				210
										TOTAL (Kg)			477	210



CROSS SECTION C-C

Scale 1:50



GENERAL NOTES

1. CONCRETE

a) Concrete mix: 25/19 (25MPa) - Wingwalls and causeway.
b) Concrete cover to reinforcement:
(i) Against earth - 60mm
(ii) Other - 40mm

c) Concrete finish:
(i) Formed surfaces - class F1 (rough) - all concealed surfaces
class F2 (smooth) - all exposed surfaces
(ii) Unformed surfaces - class U1 (screeded) - Top of topslab
class U2(wood floated) - Top of base slab

All sharp edges to have 25mm chamfers unless otherwise specified.

All surfaces permanently buried shall receive two coats of an approved bituminous water proofing paint and shall be prepared and primed in accordance to the instructions of the manufacturer.

2. REINFORCEMENT

a) High tensile steel is indicated with the prefix 'Y', and shall be Type C, class 2, grade 1 to SABS 920.

b) Mild steel is indicated with the prefix 'R', and shall be Type A round bars to SABS 920.

c) Reinforcement to be bent in accordance with SABS 82(1976).

d) Bar notation: 20Y16-111-200

No of Bars	Bar Diameter	Bar Mark	Spacing
20	Y16	111	200

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DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE

NTAKAMA ACCESS ROAD
STANDARD PIPE CAUSEWAY
(FOR ROCK FOUNDATION ONLY)

DRAWING NUMBER

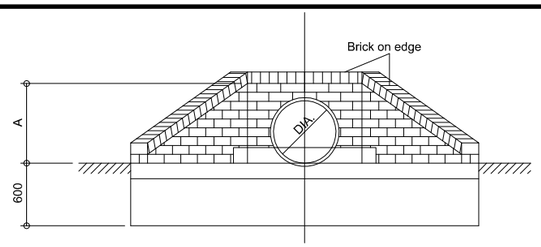
PRJ 067-FT-007

SHEET SIZE

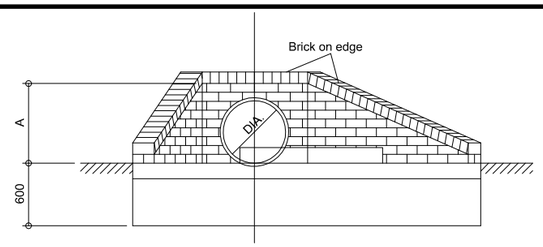
A3

REVISION

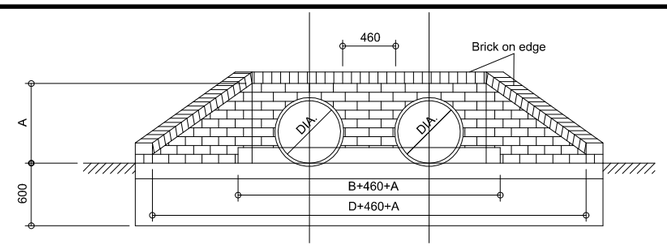
0



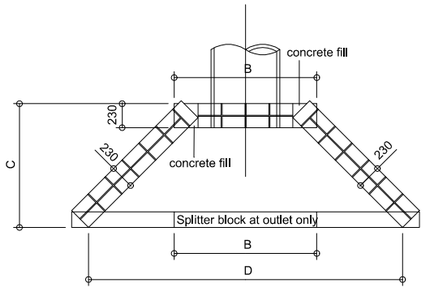
FRONT ELEVATION - SINGLE PIPE



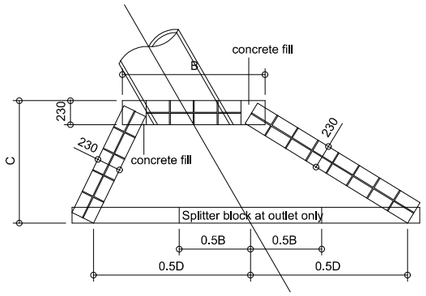
FRONT ELEVATION - SKEW PIPE



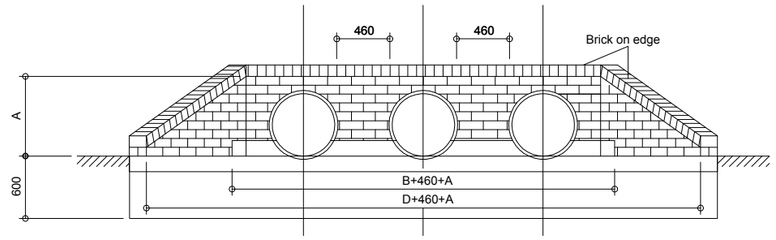
FRONT ELEVATION - DOUBLE PIPE



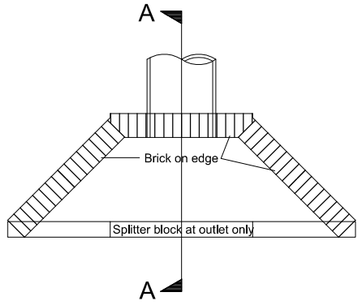
LAYOUT OF BRICKWORK



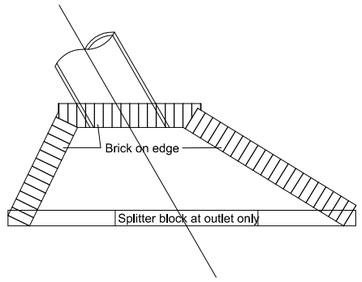
LAYOUT OF BRICKWORK



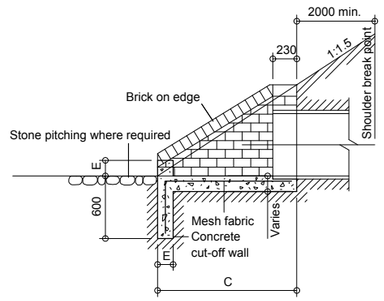
FRONT ELEVATION - TRIPLE PIPE



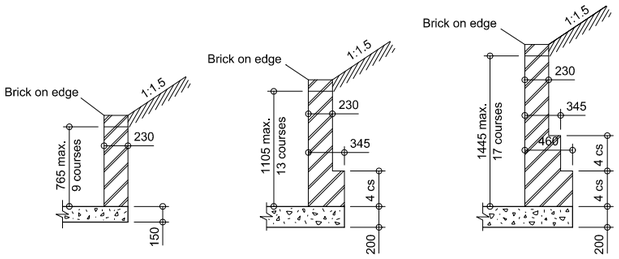
PLAN



PLAN OF SKEW CULVERT



SECTION A-A



TYPICAL RETAINING WALL DETAILS

Dimensions (mm)					
Nominal Dia.	A	B	C	D	E
450	595	1 150	1 050	2 700	150
600	765	1 380	1 200	3 000	150
750	935	1 610	1 350	3 300	150
900	1 105	1 840	1 500	3 600	230
1 050	1 275	2 070	1 750	3 900	230
1 200	1 445	2 300	1 900	4 200	230

NOTES :

1. Splitter block and pitching to be provided at all outlets where erosion is likely to occur.
2. Splitter block may be omitted if discharge velocity is less than 0.9 m/s.
3. Cut-off walls may be omitted if structure is founded on rock.
4. For multiple pipe culverts increase dimensions 'E' and 'F' by (n-1)(A+460)mm : Where n = number of pipes and A = nominal diameter of pipes
5. Pipes to be cut flush with headwall.
6. For skew pipe culverts the headwall shall be parallel to the centre line of the road.
7. If corrugated metal pipes are used 4x20mmx150mm long galvanised anchor bolts in the hollows of the corrugation are to be used.
8. All concrete is to be 20MPa.
9. Square mesh fabric (Reference S.M.F.193) is to be placed 50mm from top in all apron slabs and centrally in cut-off walls.
10. Brickwork is to consist of good quality burnt clay common bricks in accordance with SABS 227 Specification, or cement bricks in accordance with SABS 987 Specification, uniform in size and shape layed in stretcher bond style with the skins tied together with galvanised crimped wire wall ties.
11. Brickforce is to be placed every 4th course.
12. Jointing on all visible faces to be pointed
13. No in-fill shall be larger than a half standard brick size unless 15MPa concrete is used.

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CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE

NTAKAMA ACCESS ROAD

PIPE CULVERT HEADWALL (MASONRY)

DRAWING NUMBER

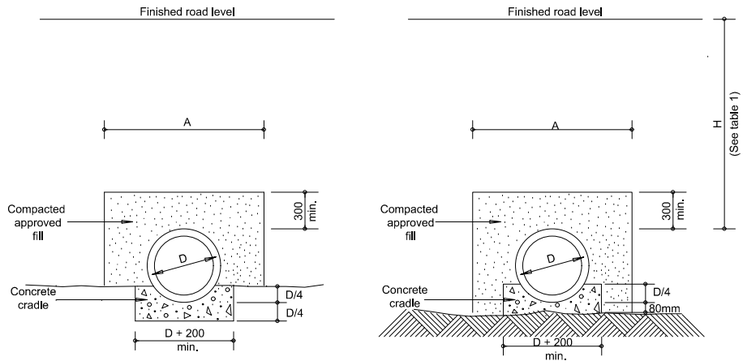
PRJ 067-FT-008

SHEET SIZE

A3

REVISION

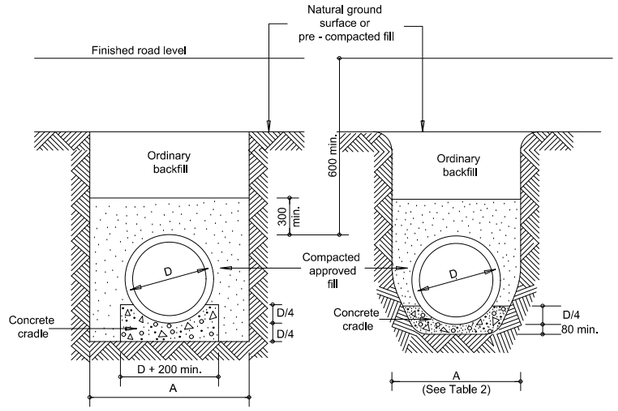
0



PIPE CULVERT ON SOIL

PIPE CULVERT ON ROCK

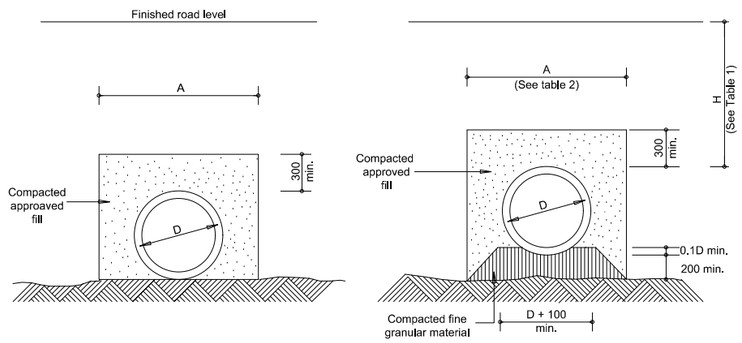
CLASS A BEDDING
(EMBANKMENT CONDITION)



TRENCH IN SOIL

TRENCH IN ROCK

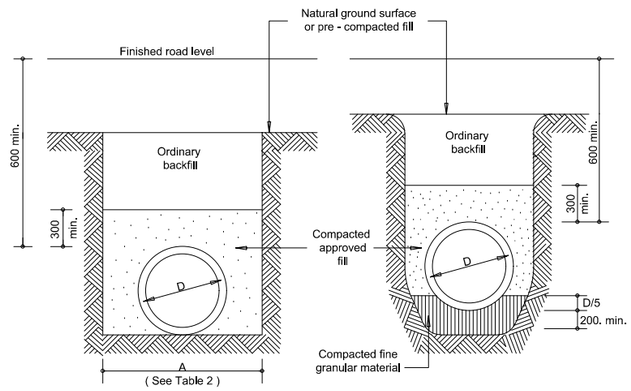
CLASS A BEDDING
(TRENCH CONDITION)



PIPE CULVERT ON SOIL

PIPE CULVERT ON ROCK

CLASS C BEDDING
(EMBANKMENT CONDITION)



TRENCH IN SOIL

TRENCH IN ROCK

CLASS C BEDDING
(TRENCH CONDITION)

NOTES:

1. When possible pipes shall be laid by first constructing the required compacted fill to allow a pipe trench to be excavated into it, thereby satisfying requirements for negative projecting pipeline.The recommended trench widths are listed in Table 2. The maximum trench widths apply to deep trenches where shoring is required.
2. All pipes shall comply with SABS 667-1986, "Standard specifications for concrete non-pressure pipes", and shall be installed in accordance with SABS 0102-1987, "Code of practice for design and installation of precast concrete pipes."
3. Joints shall either be spigot and socket with rubber ring, ogee with rubber collar or modified ogee with rubber ring seal.
4. In selecting the type and class of pipe it is generally preferable to use the stronger class of pipe with a class C bedding rather than the lower strength pipe with a class A bedding.
5. Actual internal diameter of heavy duty pipes are to be checked against waterway requirements.
6. For fill heights exceeding 10m or pipeline length exceeding 40m a mimimum nominal pipe diameter of 900mm is recommended.
7. Construction joints in concrete cradle to coincide with pipe joints. All insitu concrete shall be 15MPa
8. The following minimum nominal pipe diameters shall apply : 450mm for minor access roads and bellmouths. 600mm for other roads.
9. The minimum cover over any pipe culvert shall be 600mm. In exceptional cases pipes may be encased in concrete and the cover reduced to 200mm.
10. All pipe lifting holes must be plugged to the satisfaction of the Engineer.
11. Pipes to be laid to a minimum grade of 2%.

'D' Load	Permissible Maximum Height (H) of Fill in metres	
	Class A Bedding	Class C Bedding
25 D	3.0	1.5
50 D	6.0	3.0
75 D	9.0	4.5
100 D	12.0	6.0
125 D	15.0	7.5
150 D	18.0	9.0
200 D	24.0	12.0

TABLE 1

Trench width		
Norminal Pipe Diameter (D) (mm)	Recommended Dimension (A)(mm)	Maximum Trench Width (mm)
450	1100	1100
600	1300	1300
750	1500	1500
900	1600	1700
1050	1800	2200
1200	2000	2400

TABLE 2

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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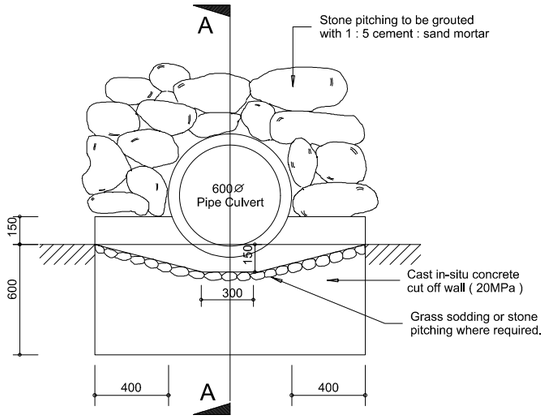
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
CONCRETE PIPE CULVERT BEDDING

SHEET SIZE
A3

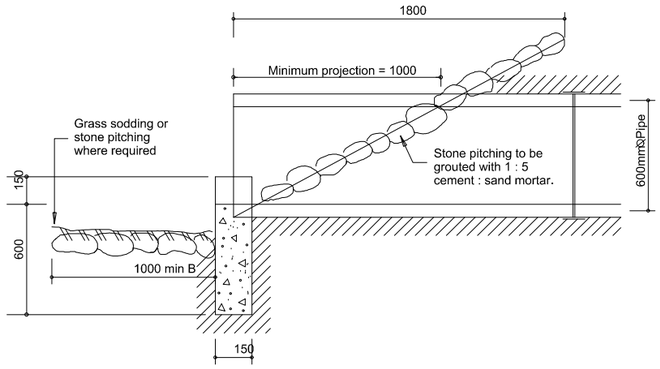
REVISION
0

DRAWING NUMBER
PRJ 067-FT-009

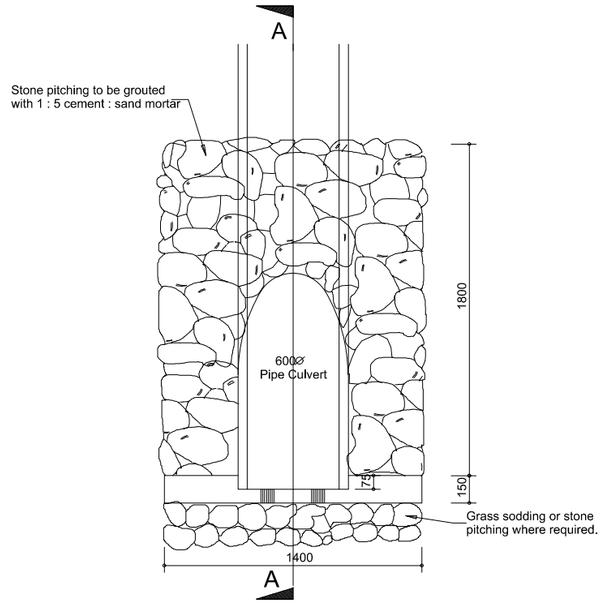


FRONT ELEVATION OF STONE PITCHED HEADWALL

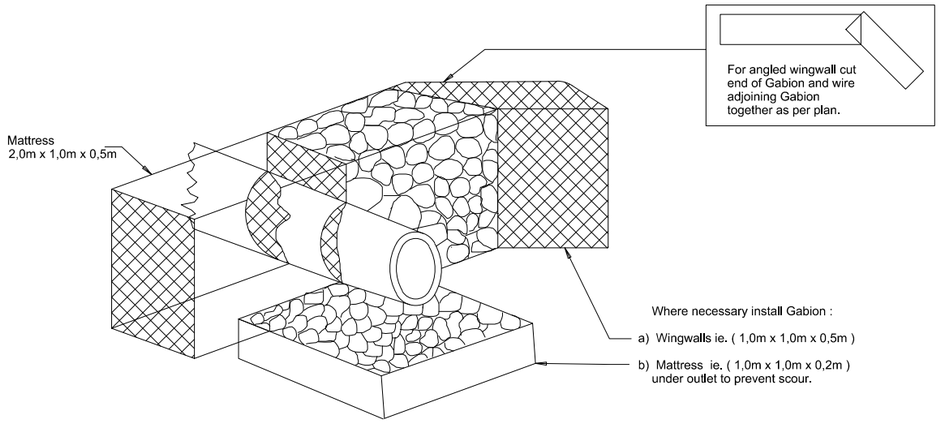
NOTE
Stone pitched or gabion headwalls are to be used in conjunction with pipe culvert up to a maximum size of 600Ø where specified.



SECTION A - A



PLAN OF STONE PITCHED HEADWALL



GABION HEADWALL

NOTES :

1. Generally gabion mattresses are recommended in catchment areas of less than 3ha for headwalls and wingwalls but where more stability is required use baskets (2,0m x 1,0m x 1,0m).

2. Gabion headwalls are to be laid parallel to the road edge and are to be backfilled on the road side by earth or gravel layers.

3. Under damp conditions the use of filter fabric behind the gabion is recommended.

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0	06/20	FOR TENDER	DG	VM

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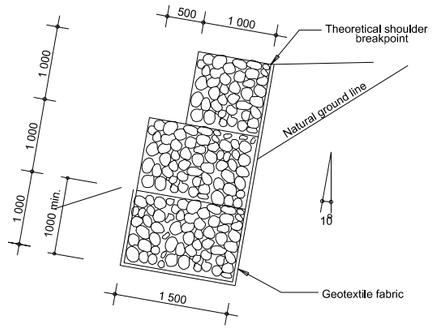
CHECKED	T.NGCONGO	08-06-2020
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
600mmØ PIPE CULVERT HEADWALLS
(CONCRETE) (GABION / PITCHED)

DRAWING NUMBER
PRJ 067-FT-010

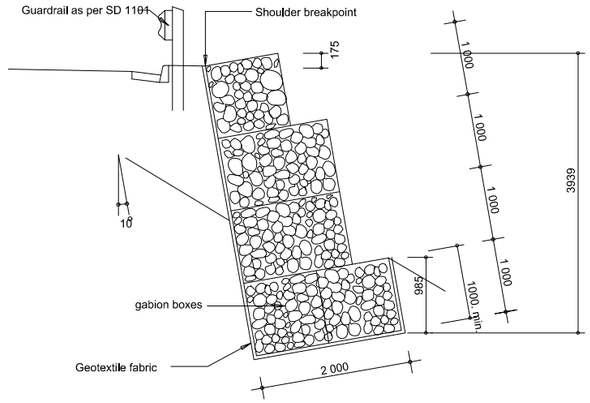
SHEET SIZE
A3

REVISION
0



3m GABION RETAINING WALL

Scale 1 : 50



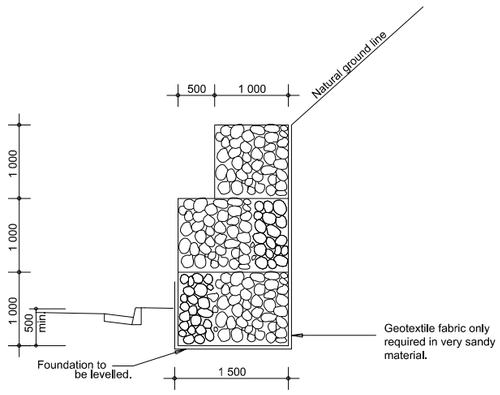
4m GABION RETAINING WALL

Scale 1 : 50

FILL CONDITION

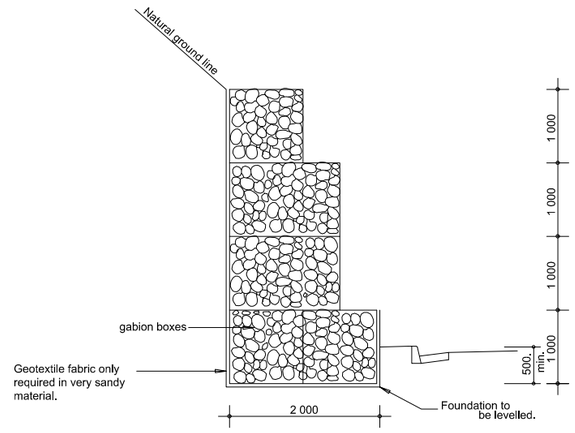
NOTES:

1. The gabion design shown is typical. Each application of gabion boxes shall be designed by the planning or bridge Engineer to suit the specific conditions prevailing.
2. Foundations to be stepped and prepared as instructed by the Engineer.
3. Geotextile fabric to be grade C or similar as instructed by the Engineer.
4. All wire used in the making of gabions shall be galvanised in accordance with the provisions S.A.B.S. 1580:1993 for Class A heavy galvanised mild-steel wire.
5. The standard sizes of gabions are as follows :
   Length : 1,0m , 2,0m , 3,0m & 4,0m
   Width : 1,0m 1,5m.
   Depth : 0,5m & 1,0m
   Diaphragm spacing : 1,0m
6. Lacing and bracing to be done in accordance with manufactures recommendations.



3m GABION RETAINING WALL

Scale 1 : 50



4m GABION RETAINING WALL

Scale 1 : 50

Depth of gabion (m)		Nominal mesh dimensions (mm)		Nominal wire diameter (mm)	
Exceeding	Not exceeding	Cross dimension b Tolerances: -2 +5	Long dimension l Tolerances: ±25	Mesh wire	Selvedge
-	0,3	80	100	2,5	3,0
0,3	1,0	80	100	2,7	3,4

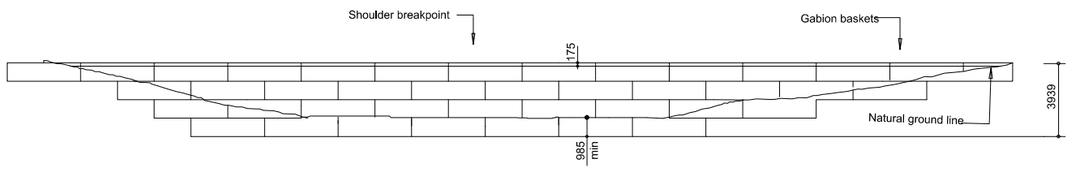
(As per SABS 1580 / 1993)

Depth of cage (m)	Rock size according to the largest dimension of rock	
	Minimum (mm)	Maximum (mm)
0,2	100	125
0,3	100	200
0,5	100	250
1,0	100	250

CUT CONDITION

Nominal diameter of wire mm		Minimum mass of zinc coating per unit area (g/m²)
Exceeding	Not exceeding	
2,40	2,50	260
2,51	3,50	275
3,51	5,00	290

(As per SABS 1580 / 1993)



TYPICAL SIDE ELEVATION IN FILL CONDITION (4,0m WALL)

Scale 1 : 200

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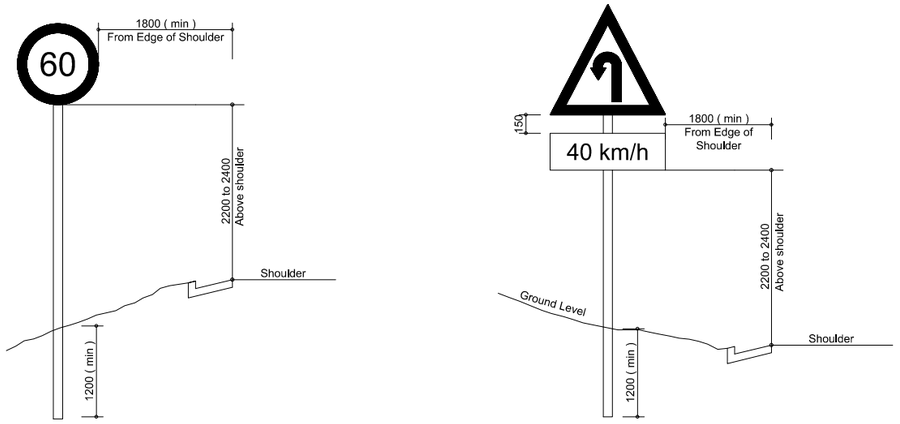
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE: NTAKAMA ACCESS ROAD
GABION RETAINING WALL

DRAWING NUMBER: **PRJ 067-FT-011**

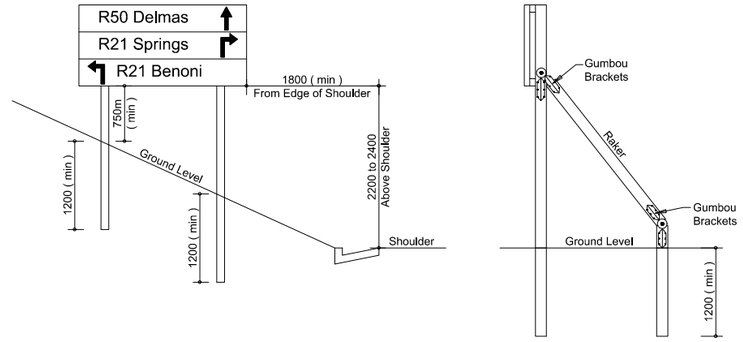
SHEET SIZE: A3

REVISION: 0



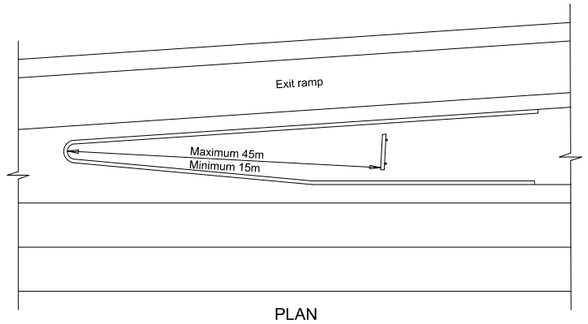
TYPICAL SIGNPOSTING ERECTION DIMENSIONS
REGULATORY AND WARNING SIGN

N.T.S

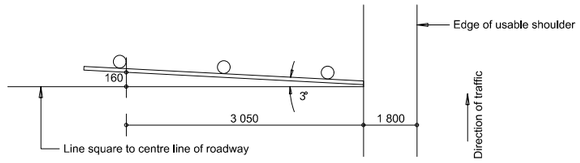


TYPICAL SIGNPOSTING ERECTION DIMENSIONS
SINGLE GROUND MOUNTED SIGN

Scale 1 : 50

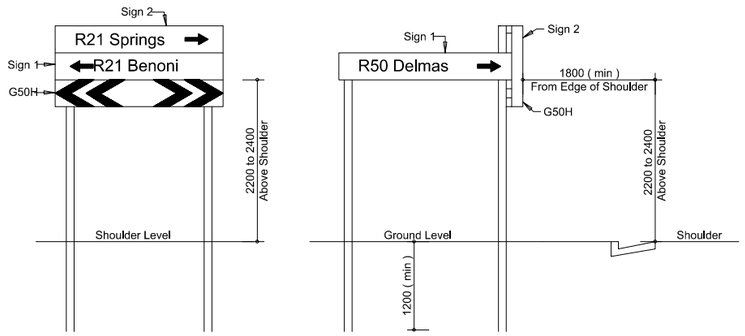


GROUND MOUNTED GORE SIGN



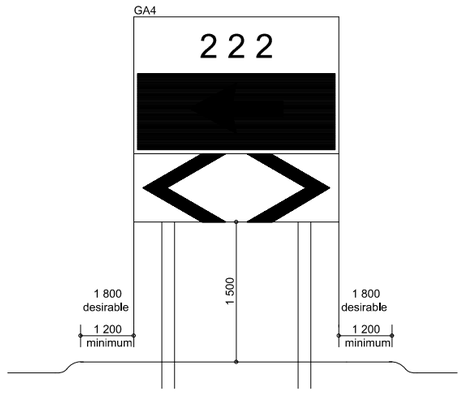
NOTE : 2 x 25m holes are to be drilled perpendicular to the traffic flow direction at 75mm and 600mm above ground level, in all creosoted wooden poles, to faciliate breakaway in the event of impact.

GROUND MOUNTED SHOULDER SIGN



TYPICAL SIGNPOSTING ERECTION DIMENSIONS
T - JUNCTION BOX

Scale 1 : 50



ELEVATION

GROUND MOUNTED GORE SIGN

N.T.S

NOTES:

1. Signs to be placed at the positions indicated on the design drawings.

2. Ground mounted shoulder signs :
2 200mm is minimum - 2 200mm to 2 400mm is desirable for height clearance.
1 800mm is minimum from edge of shoulder.

3. Ground mounted gore signs :
1 200mm is minimum - 1 800mm from edge of shoulder is desirable.

4. 3 degrees offset of signs to be adjusted to suit horizontal curves.

5. All signs to be in accordance with the latest South African Roads Traffic Signs manual.

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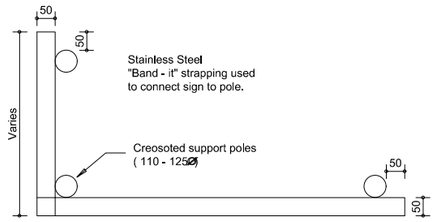
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
POSITIONING OF SIGNS

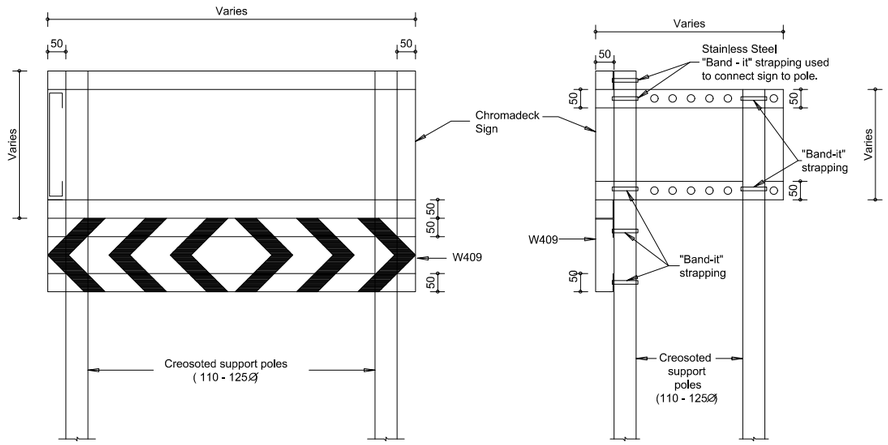
SHEET SIZE
A3

REVISION
0

DRAWING NUMBER
PRJ 067-FT-012

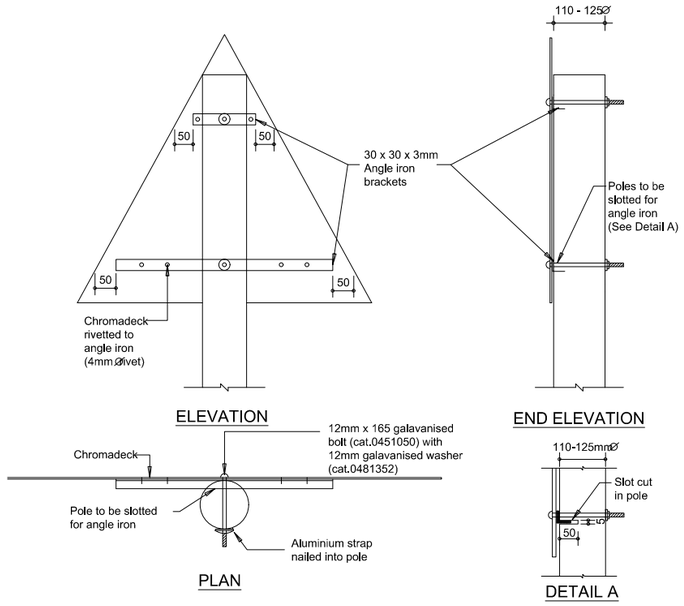


PLAN



FRONT ELEVATION

SIDE ELEVATION



ELEVATION

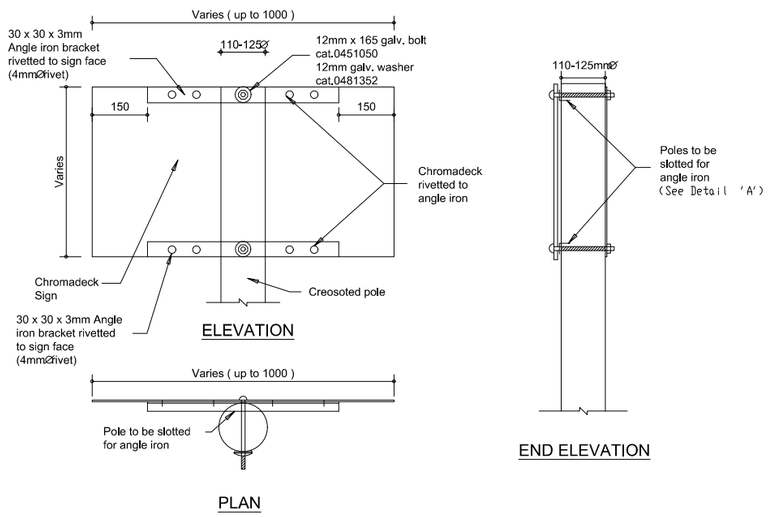
END ELEVATION

PLAN

DETAIL A

FIXING OF STOCK TYPE SIGNS ON SINGLE SUPPORT POLES

NOTE : 2 x 25m holes are to be drilled perpendicular to the traffic flow direction at 75mm and 600mm above ground level, in all creosoted wooden poles, to faciliate breakaway in the event of impact.

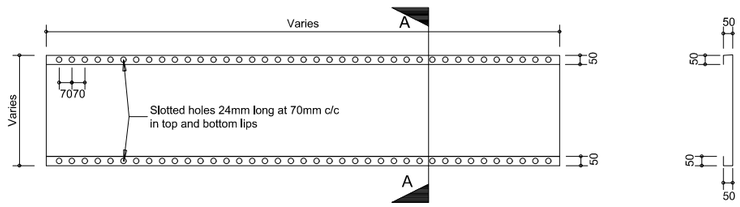


ELEVATION

PLAN

END ELEVATION

FIXING OF SIGNS OF 1 METRE AND LESS ON ONE SUPPORT POLE



VIEW ON BACK ON SIGN PANNEL

FIXING OF STACK TYPE SIGNS

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0	06/20	FOR TENDER	DG	VM

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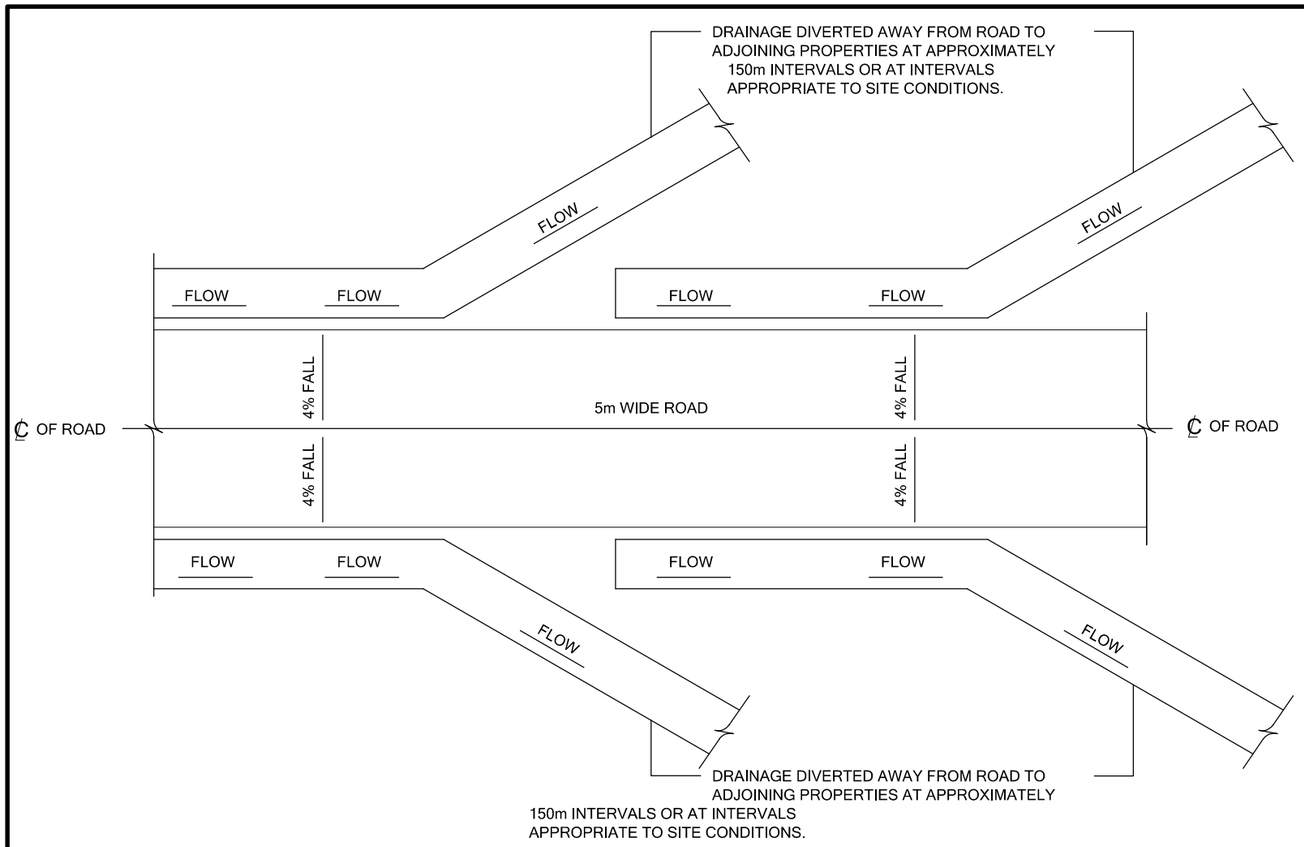
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
ERECTION OF METAL SIGNS ON CREOSOTED POLES

DRAWING NUMBER
PRJ 067-FT-013

SHEET SIZE
A3

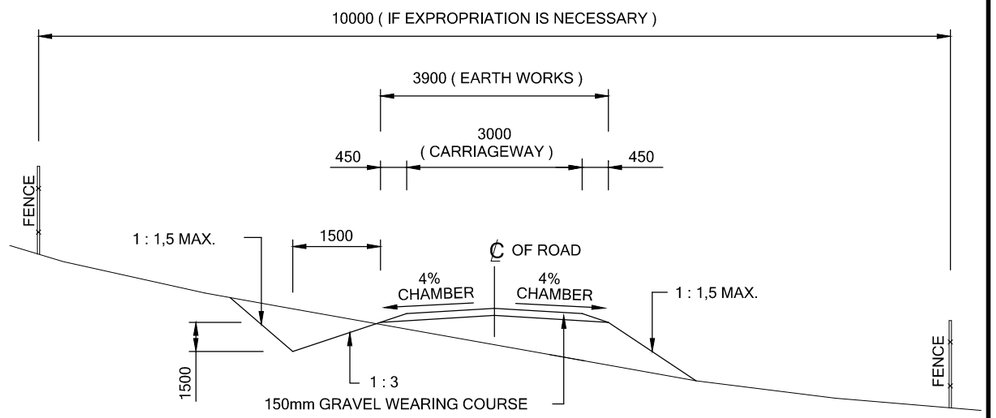
REVISION
0



NOTE :

ROAD MAY FALL IN ONE DIRECTION
IN SOME PLACES TO SUIT SITE CONDITIONS

PART PLAN OF ROAD
TYPICAL DETAIL OF EARTH DRAINS
(DIAGRAMMATIC REPRESENTATION)



TYPE 7 BY ACCESS ROAD
(DIAGRAMMATIC REPRESENTATION)

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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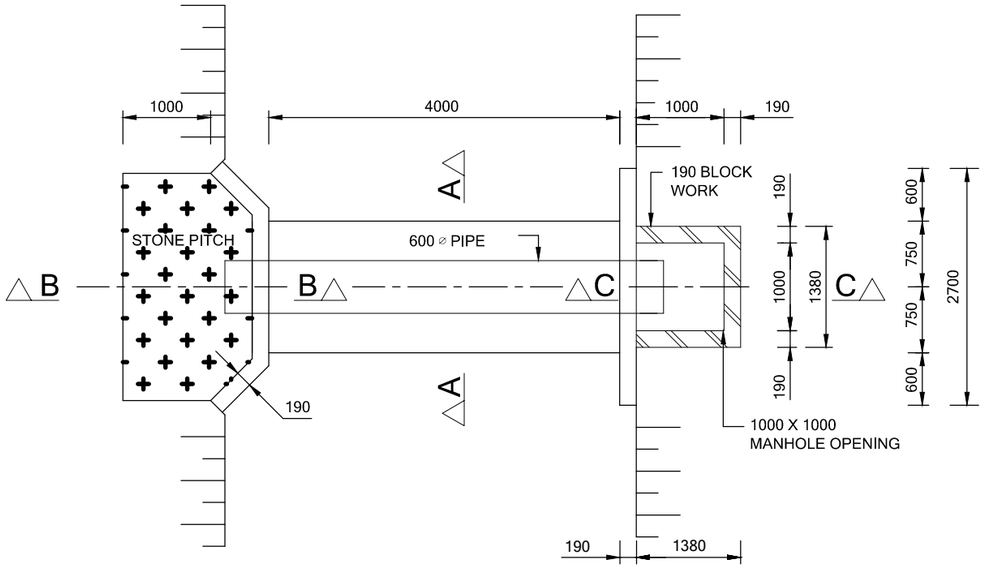
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
TYPICAL PLAN AND SECTION OF ROAD AND DRAINAGE

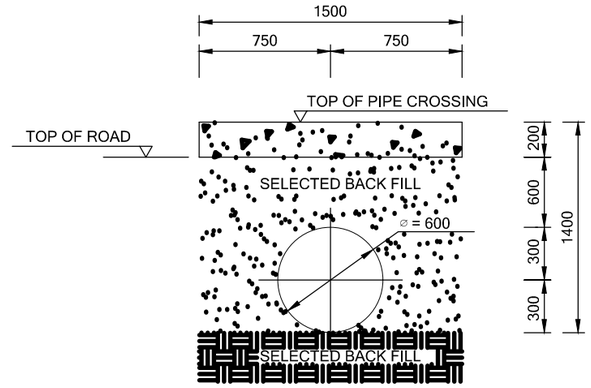
SHEET SIZE
A3

REVISION
0

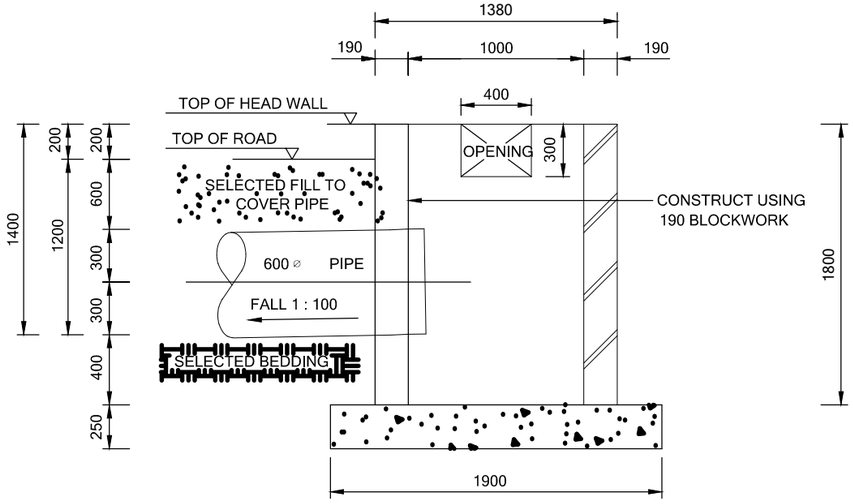
DRAWING NUMBER
PRJ 067-FT-014



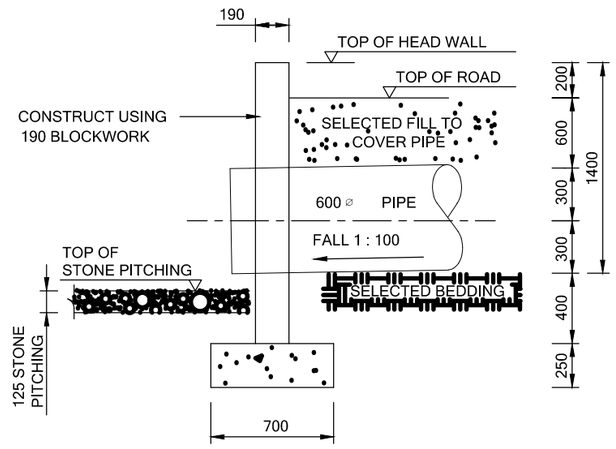
TYPICAL LAYOUT OF
SINGLE PIPE CROSSING
SCALE 1 : 50



SECTION A-A
SCALE 1 : 25



SECTION C-C
SCALE 1 : 25



SECTION B-B
SCALE 1 : 25

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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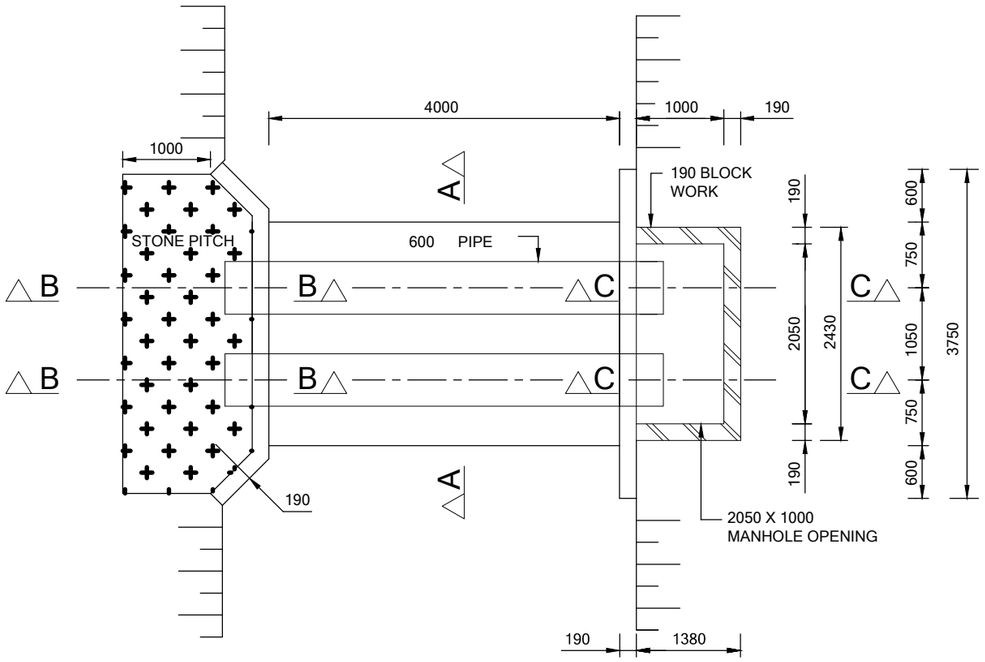
SCALES		

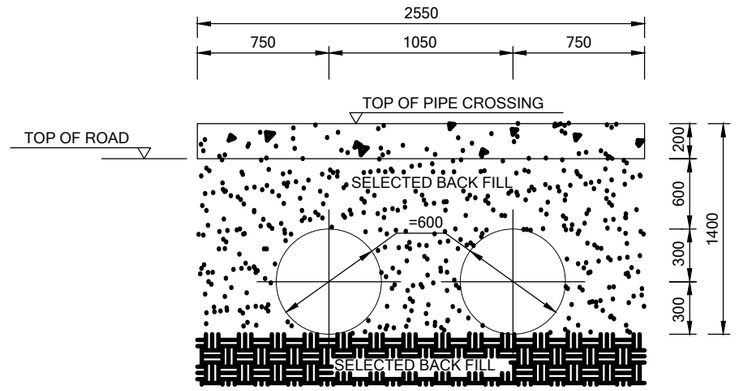
DRAWING TITLE
NTAKAMA ACCESS ROAD
SINGLE HEAD WALL AND MANHOLE WITH
SINGLE PIPELINE (600 Ø PIPE 75D)

DRAWING NUMBER
PRJ 067-FT-015

SHEET SIZE
A3

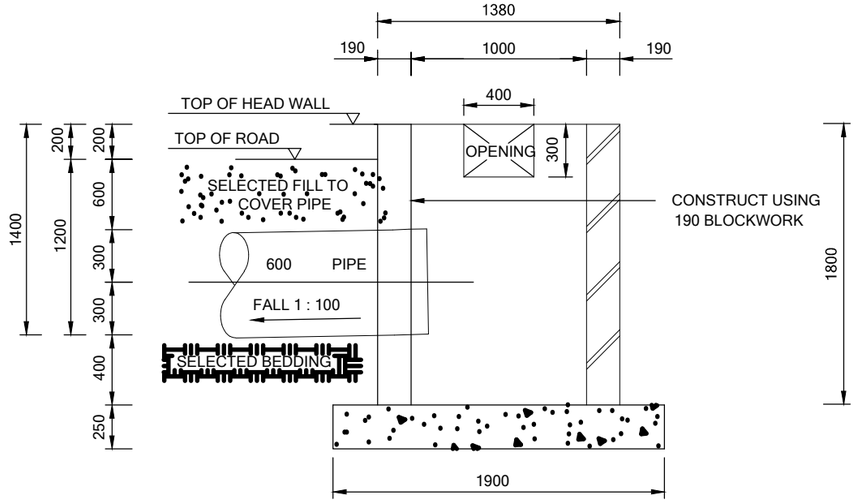
REVISION
0





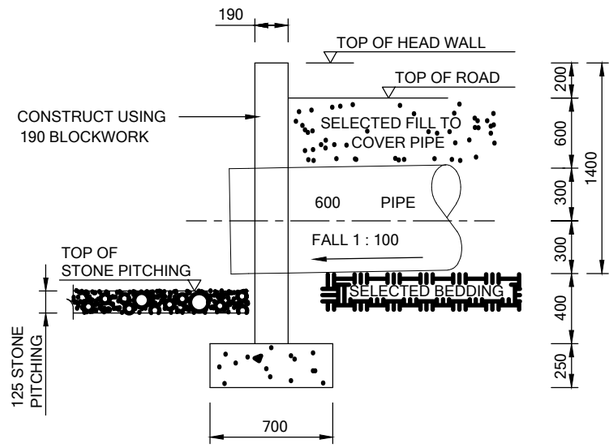
SECTION A-A

SCALE 1 : 25



SECTION C-C

SCALE 1 : 25



SECTION B-B

SCALE 1 : 25

REV	DATE	DESCRIPTION	BY	CHK
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CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE

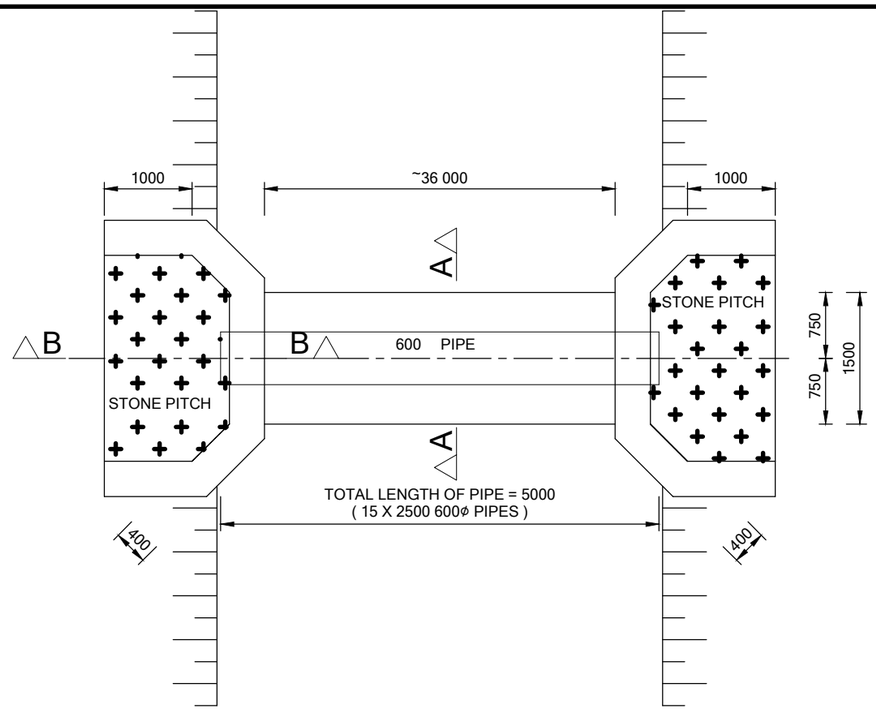
NTAKAMA ACCESS ROAD
SINGLE HEAD WALL AND MANHOLE WITH DOUBLE PIPELINE (600 Ø PIPE 75D)

DRAWING NUMBER

PRJ 067-FT-016

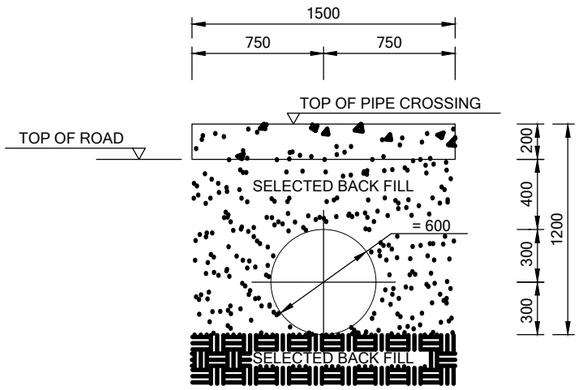
SHEET SIZE: A3

REVISION: 0



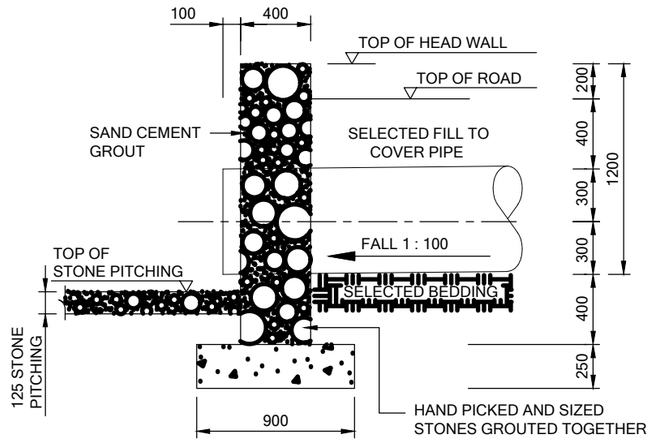
TYPICAL LAYOUT PIPE CROSSING WITH DOUBLE HEAD WALL

SCALE 1 : 50



SECTION A-A

SCALE 1 : 25



SECTION B-B

SCALE 1 : 25

REV	DATE	DESCRIPTION	BY	CHK
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CHECKED	T.NGCONGO	08-06-2020
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE

NTAKAMA ACCESS ROAD

DOUBLE HEAD WALL WITH SINGLE PIPELINE

(600 Ø PIPE 75D)

DRAWING NUMBER

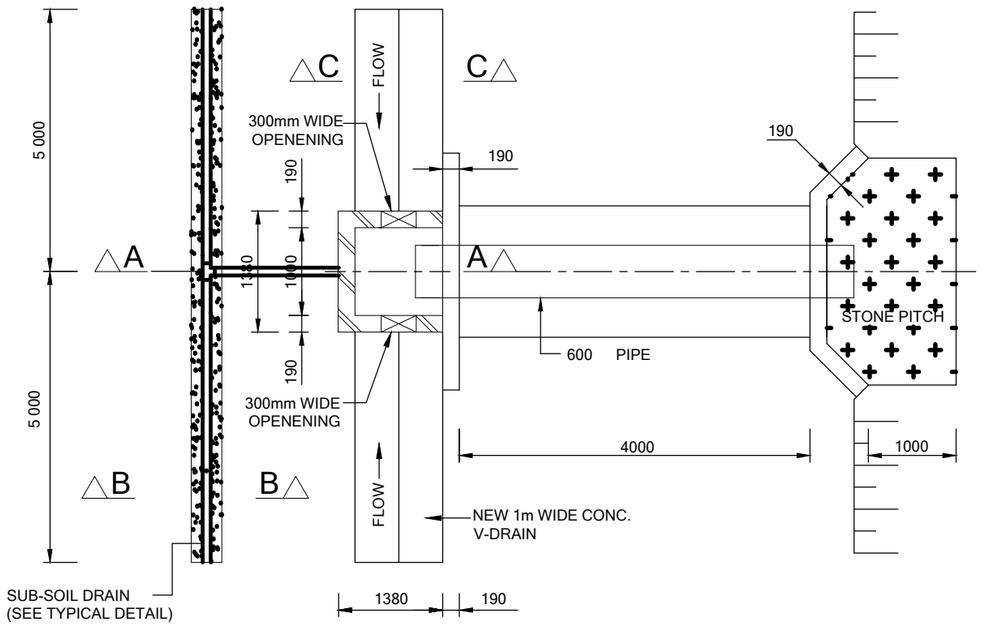
PRJ 067-FT-017

SHEET SIZE

A3

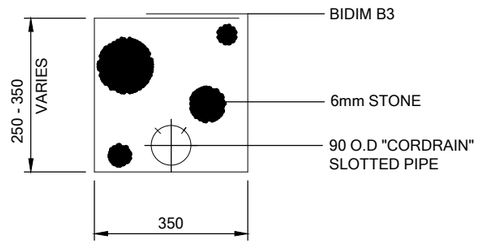
REVISION

0



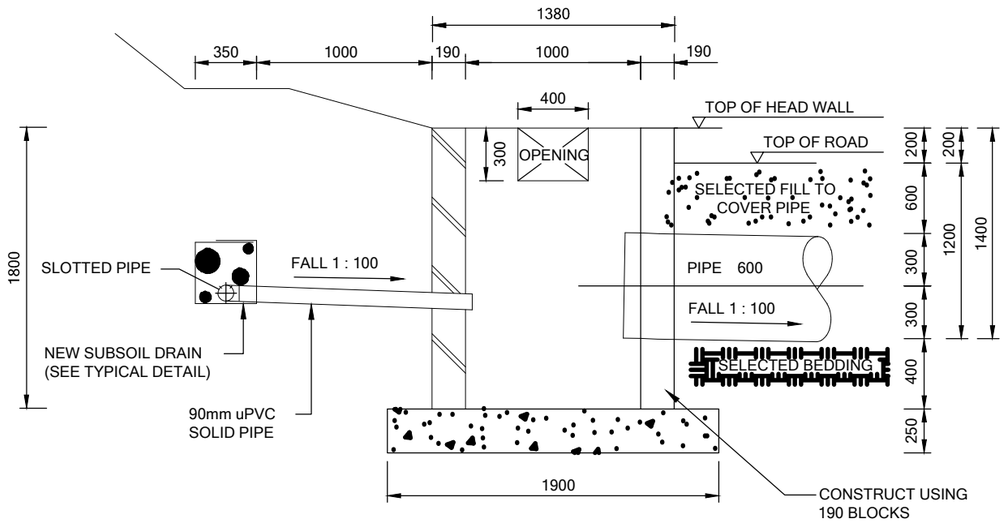
TYPICAL LAYOUT SHOWING POSITION OF SUBSOIL DRAIN & NEW CONCRETE V-DRAIN

SCALE 1 : 50



SECTION B-B
THROUGH SUBSOIL DRAIN

SCALE : 1 : 10



SECTION A-A

SCALE 1 : 25

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

Ziinzame Consulting Engineers (Pty) Ltd.
Reg No. 2013/054699/07

25 Falcon Street
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	RESPONSIBLE PERSON	DATE
DESIGNED	V.GUBEKA	08-06-2020
CHECKED	T.NGCONGO	08-06-2020
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE

NTAKAMA ACCESS ROAD
SINGLE HEAD WALL AND MANHOLE WITH SINGLE PIPELINE AND SUB SOIL (600 Ø PIPE 75D)

DRAWING NUMBER

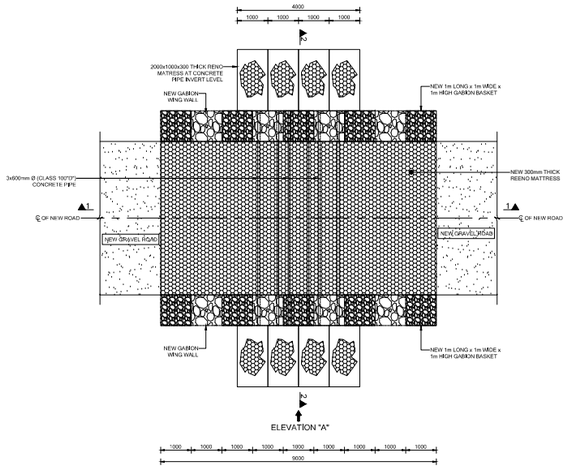
PRJ 067-FT-018

SHEET SIZE

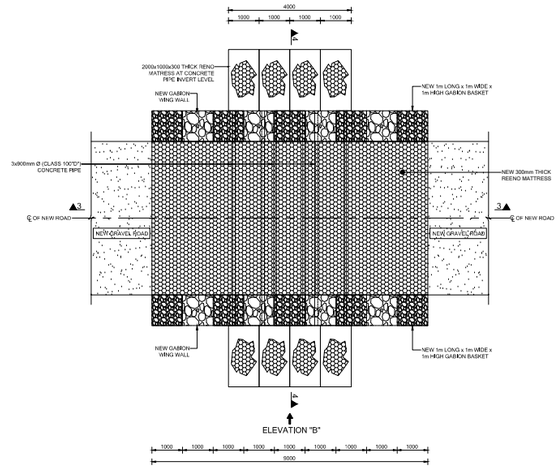
A3

REVISION

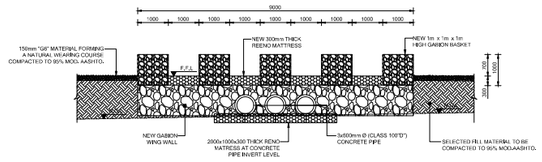
0



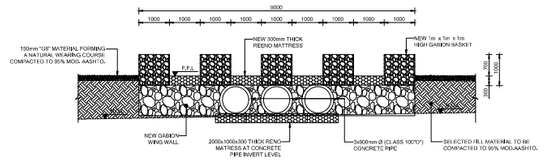
LAYOUT OF GABION CAUSEWAY "1"
(3 x 600mm ϕ PIPES)
SCALE 1:100



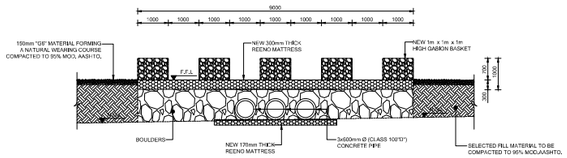
LAYOUT OF GABION CAUSEWAY "2"
(3 x 900mm ϕ PIPES)
SCALE 1:100



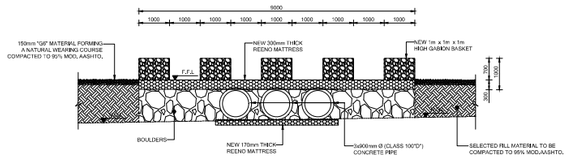
ELEVATION "A"
SCALE 1:100



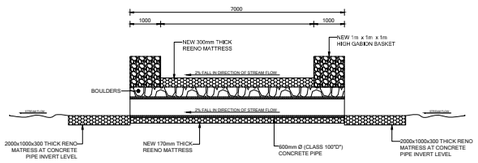
ELEVATION "B"
SCALE 1:100



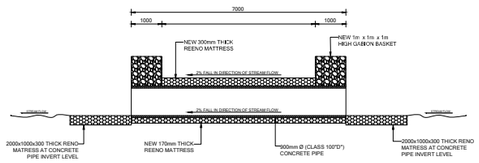
SECTION 1-1
SCALE 1:100



SECTION 3-3
SCALE 1:100



SECTION 2-2
SCALE 1:25



SECTION 4-4
SCALE 1:25

REV	DATE	DESCRIPTION	BY	CHK
0	06/20	FOR TENDER	DG	VM

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Reg No. 2013/054699/07

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	RESPONSIBLE PERSON	DATE
DESIGNED	V.GUBEKA	08-06-2020
CHECKED	T.NGCONGO	08-06-2020
DRAWN	D.GENGAN	08-06-2020
CHECKED	V.MWAFUKA	08-06-2020
SCALES		

DRAWING TITLE
NTAKAMA ACCESS ROAD
TYPICAL SECTIONS THROUGH GABION FORMED CAUSEWAYS (600mmØ AND 900mm Ø CONCRETE PIPE)

DRAWING NUMBER
PRJ 067-FT-019

SHEET SIZE
A3

REVISION
0