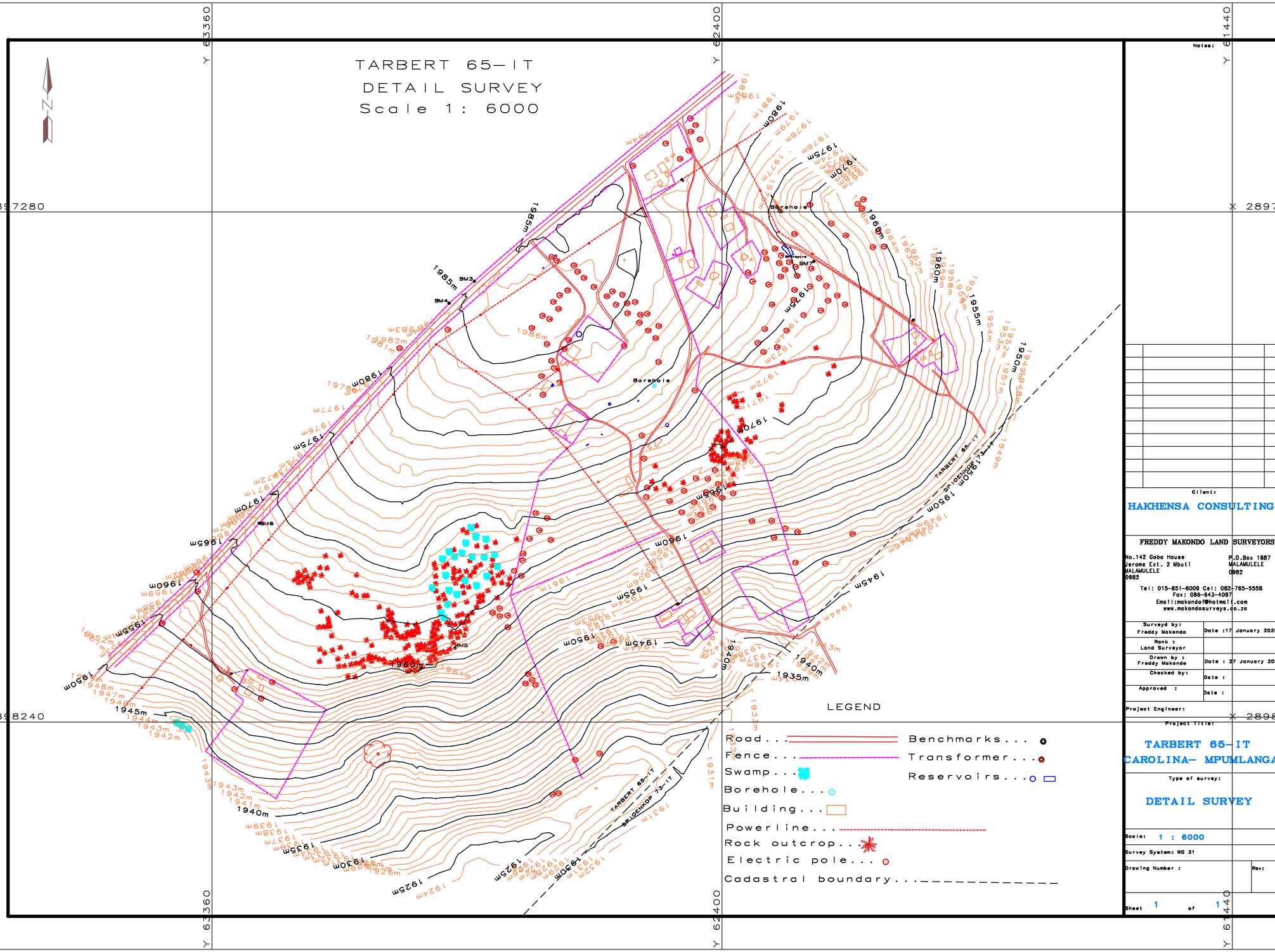

Co-Ordinates
26° 10' 54"S
30° 22' 30"E
Project Area
TO WARBURTON
TO CAROLINA
R33


TARBERT 65—IT
DETAIL SURVEY
Scale 1 : 6000
N
Y 63360
Y 62400
Y 61440
X 2897280
X 2898240
LEGEND
Road...
Fence...
Swamp...
Borehole...
Building...
Powerline...
Rock outcrop...
Electric pole...
Cadastral boundary...
Benchmarks...
Transformer...
Reservoirs...
TARBERT 65-IT
SALDENKOP 73-IT
Notes:
Client:
HAKHENSA CONSULTING
FREDDY MAKONDO LAND SURVEYORS
No.142 Goba House
Jerome Ext. 2 Mbuti
MALAMULELE
0982
P.O.Box 1687
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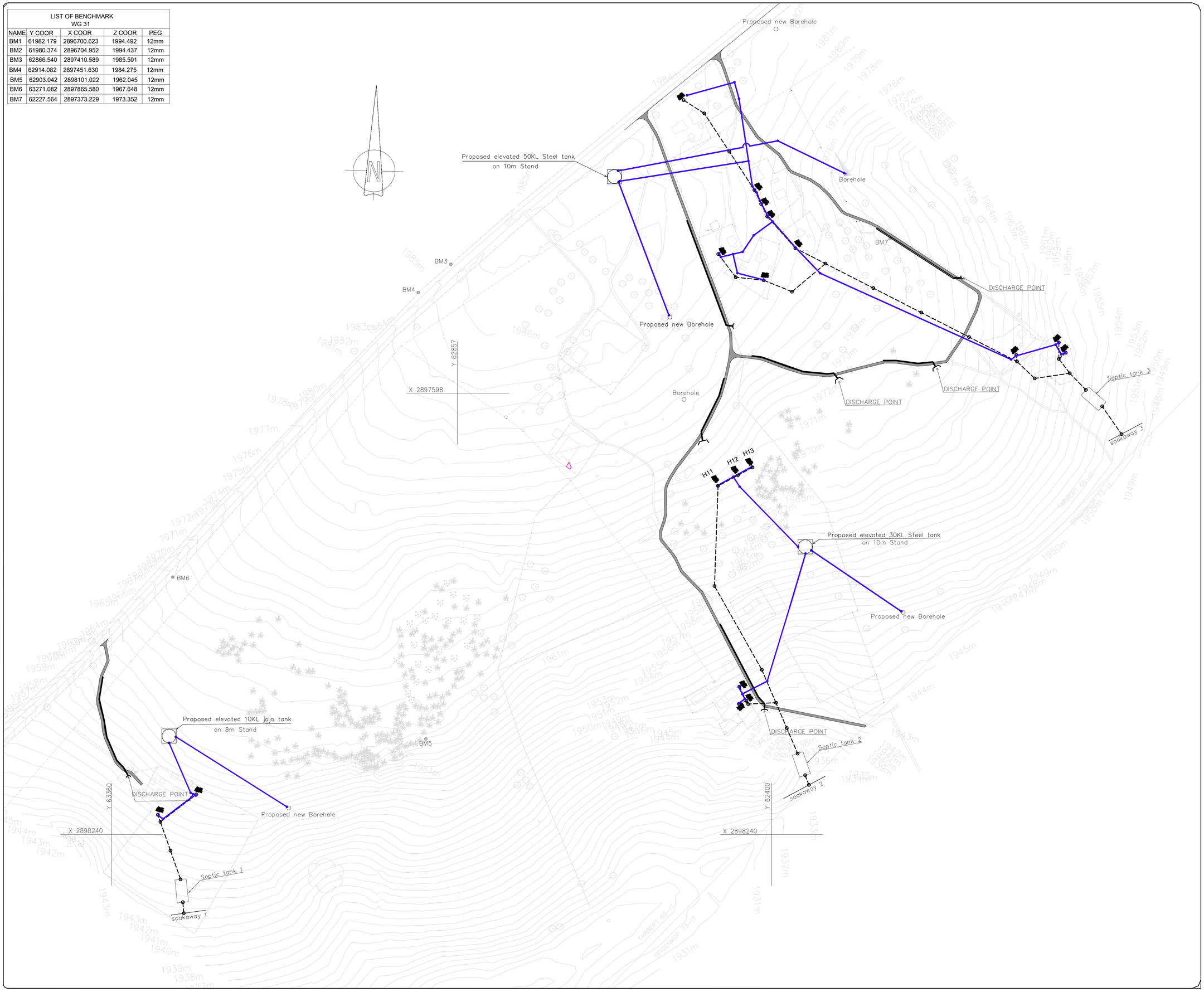
Tel: 015-851-6009 Cel: 082-765-5558
Fax: 086-643-4087
Email:makondof@hotmail.com
www.makondosurveys.co.za
Surveyed by: Freddy Makondo
Date :17 January 2025
Rank : Land Surveyor
Drawn by : Freddy Makondo
Date : 27 January 2025
Checked by:
Date :
Approved :
Date :
Project Engineer:
Project Title:
TARBERT 65—IT
CAROLINA— MPUMLANGA
Type of survey:
DETAIL SURVEY
Scale: 1 : 6000
Survey System: WG 31
Drawing Number :
Rev:
Sheet 1 of 1

LIST OF BENCHMARK
WG 31

NAME	Y COOR	X COOR	Z COOR	PEG
BM1	61982.179	2896700.623	1994.492	12mm
BM2	61980.374	2896704.952	1994.437	12mm
BM3	62866.540	2897410.589	1985.501	12mm
BM4	62914.082	2897451.630	1984.275	12mm
BM5	62903.042	2898101.022	1962.045	12mm
BM6	63271.082	2897865.580	1967.648	12mm
BM7	62227.564	2897373.229	1973.352	12mm



NOTES

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LEGEND

PROPOSED ROAD NETWORK

PROPOSED WATER NETWORK

PROPOSED STORMWATER NETWORK

PROPOSED SEWER NETWORK

PROPOSED HOUSE ALLOCATION

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
SERVICE: CIVIL
CONTRACT - SECTION: -
DISCIPLINE: Civil Engineering
WORK DESCRIPTION - SUB DIVISION: CIVIL
DRAWING DESCRIPTION: SITE DEVELOPMENT PLAN

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

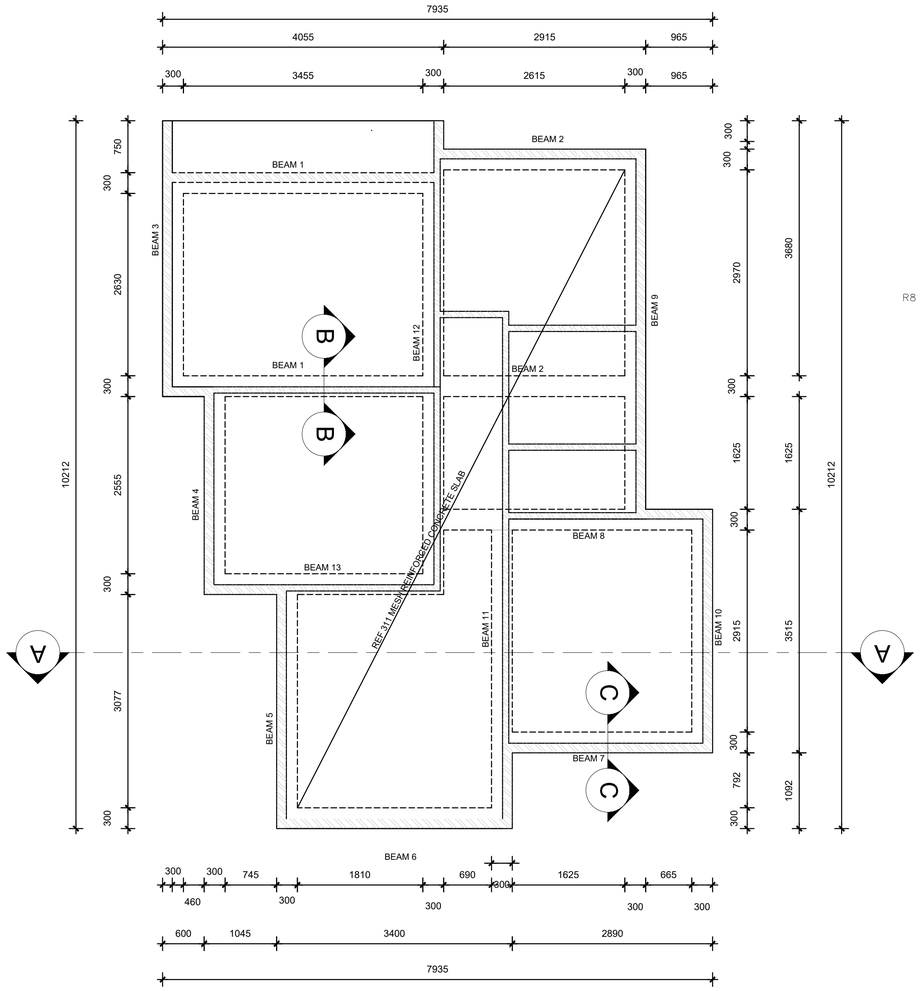
DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

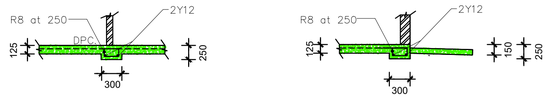
DRAWING CO-ORDINATED

CONSULTANT:
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:
N/A

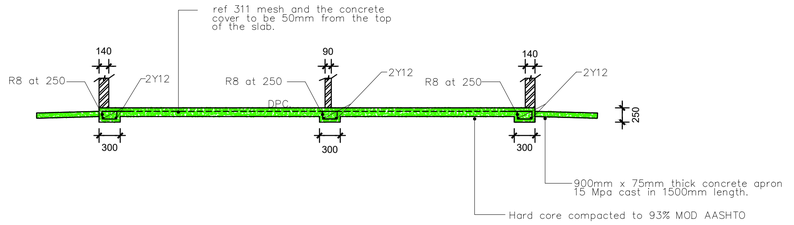
CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SDP-01		B





SECTION B-B

SECTION C-C



SECTION A-A

REIFORCEMENT BENDING SCHEDULE

MEMBER	REINFORCEMENT				BENDING DIMENSION FOR SHAPE CODES (SABS 82-1976 AS AMEMDED MARCH '84) REINFORCED CONCRETE DESIGN ON ACCORDANCE WITH SABS 0100.)					
COMPONENT LOCATION	TYPE SIZE	N0	TOTAL No	LENGTH mm	SHAPE CODE	A mm	B mm	C mm	Dmm or REV	E/R mm
BEAM 1	R8	16	32	900	60	150	200			
	Y12	2	4	4215	35	3955				
BEAM 2	R8	13	26	900	60	150	200			
	Y12	2	4	3475	35	3215				
BEAM 3	R8	16	16	900	60	150	200			
	Y12	2	2	4140	35	3880				
BEAM 4	R8	13	13	900	60	150	200			
	Y12	2	2	3315	35	3055				
BEAM 5	R8	16	16	900	60	150	200			
	Y12	2	2	4150	35	3890				
BEAM 6	R8	14	14	900	60	150	200			
	Y12	2	2	3560	35	3350				
BEAM 7	R8	13	13	900	60	150	200			
	Y12	2	2	3350	35	3090				
BEAM 8	R8	17	17	900	60	150	200			
	Y12	2	2	4340	35	4080				
BEAM 9	R8	24	24	900	60	150	200			
	Y12	2	2	6065	35	5805				
BEAM 10	R8	14	14	900	60	150	200			
	Y12	2	2	3675	35	3415				
BEAM 11	R8	20	20	900	60	150	200			
	Y12	2	2	5080	35	4820				
BEAM 12	R8	27	27	900	60	150	200			
	Y12	2	2	6995	35	6735				
BEAM 13	R8	14	14	900	60	150	200			
	Y12	2	2	3915	35	3355				

GENERAL NOTES.

THIS DRAWING TO BE READ WITH THE ARCHITECTURE'S DRAWING AND THE RELEVANT SECTIONS OF THE SITE GEOTECHNICAL REPORT. NO SCALING OF DRAWINGS ONLY FIGURED DIMENSIONS TO BE USED.

BULK EARTHWORKS

1.TOP SOIL TO BE REMOVED.

2.ALL EXPANSIVE SOIL TO BE REMOVED UP TO 350mm BELOW FOUNDATION LEVEL AND 1m BEYOND THE BUILDING PERIMETER.

3.ONLY GRANULAR MATERIAL TO BE STOCKPILED FOR REUSE; ALL CLAYEY OR EXPANSIVE SOIL TO BE REMOVED TO SPOIL.

4.CUT AND FILL SLOPE TO BE BUTTERED TO SLOPE OF 1:2

5.CONTROLLED FILL TO BE G7 OR BETTER MATERIAL COMPACTED 150mm LAYERS TO 93 % MOD AASHTO DENSITY

6.CONTROLLED FILL TO BE APPROVED BY COMPETENT PERSON BEFORE CONSTRUCTION ON IT

7.ANY LOOSE ZONES IN FOUNDATION EXCAVATIONS MUST BE COMPACTED TO 93% MOD AASHTO DENSITY PRIOR TO CONCRETE FOUNDATION CASTING

8.ALL FOUNDATION EXCAVATIONS TO BE INSPECTED BY THE ENGINEER PRIOR TO CONCRETING

CONCRETE
THE APPLICABLE STANDARD SPECIFICATION IS SABS1200 G–1982, WHICH SHOULD BE READ IN CONJUNCTION WITH THE VARIATIONS AND ADDITIONS CONTAINED IN THE PROJECT SPECIFICATION FOR CONCRETE (STRUCTURE).

CONCRETE COVER TO REINFORCEMENT AND CONCRETE STRENGTH TO BE AS INDICATED BELOW.
COVER IS GIVEN TO THE BAR NEAREST THE FACE.
MINIMUM BAR COVER TO BE MAXIMUM OF BAR DIAMETER AND AS SHOWN BELOW. SPECIFIED COVER TO BE MAINTAINED USING CEMENT MORTAR COVER BLOCKS OR APPROVED PLASTIC SPACERS.

ELEMENT	CONCRETE STRENGTH AT 28 DAYS (MPa)	COVER mm
SLABS	25	50
BEAMS	25	50
FOOTINGS	25	50

ALL CEMENT TO BE ORDINARY PORTLAND CEMENT UNLESS OTHERWISE APPROVED.
ALL CAST IN ITEMS SHALL BE FREE OF OIL, GREASE, DIRT OR ANY OTHER MATERIAL WITH MAY IMPAIR THE BOND WITH THE CONCRETE

REINFORCEMENT

FOUNDATION REINFORCEMENT TO BE APPROVED IN COMMERCIAL SIZES, CUT & BENT ON SITE TO SUIT

DRAINAGE

SUPPLY & COLLECTOR PLUMBING TO BE LOCATED OUTSIDE OF THE 1.5m DRAINAGE ZONE AROUND THE BUILDING

STORMWATER DIRVESION BERM TO BE CONSTRUCTED ABOVE BUILDING PLATFORM

CUT (1:1) AND FILL (1:2) SLOPES TO BE GRASSED FOR EROSION PROTECTION

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PROJECT STATUS

● DETAIL DESIGN STAGE ○ TENDER DRAWING ○ APPROVED CONSTRUCTION DRAWING ○ AS BUILT DRAWING

REV No	DATE :	DESCRIPTION :
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: FOUNDATION LAYOUT AND DETAILS

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

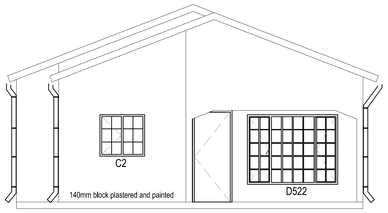
DRAWING CO-ORDINATED

CONSULTANT:

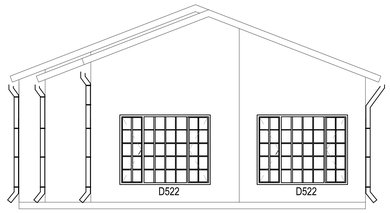
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR: N/A

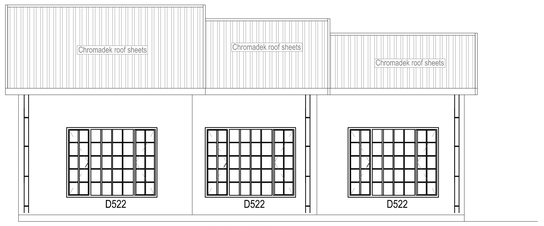
CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-FD-D1		B



ELEVATION 1
1:50



ELEVATION 2
1:50



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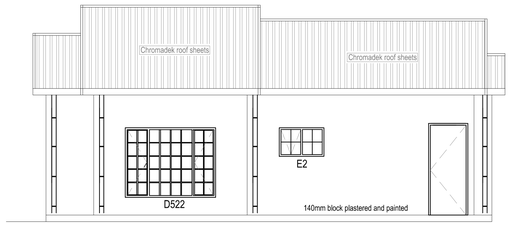

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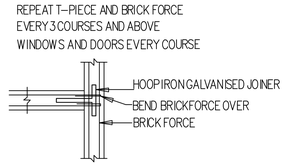
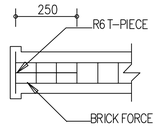
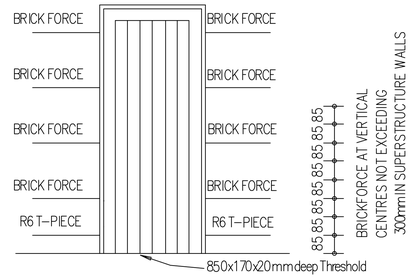


WALL JOINT DETAIL
N.T.S



DOOR FRAME FIXING DETAIL
N.T.S



TYPICAL SCREED DOOR
N.T.S

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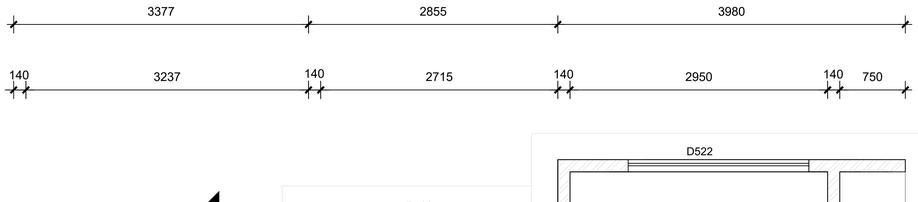
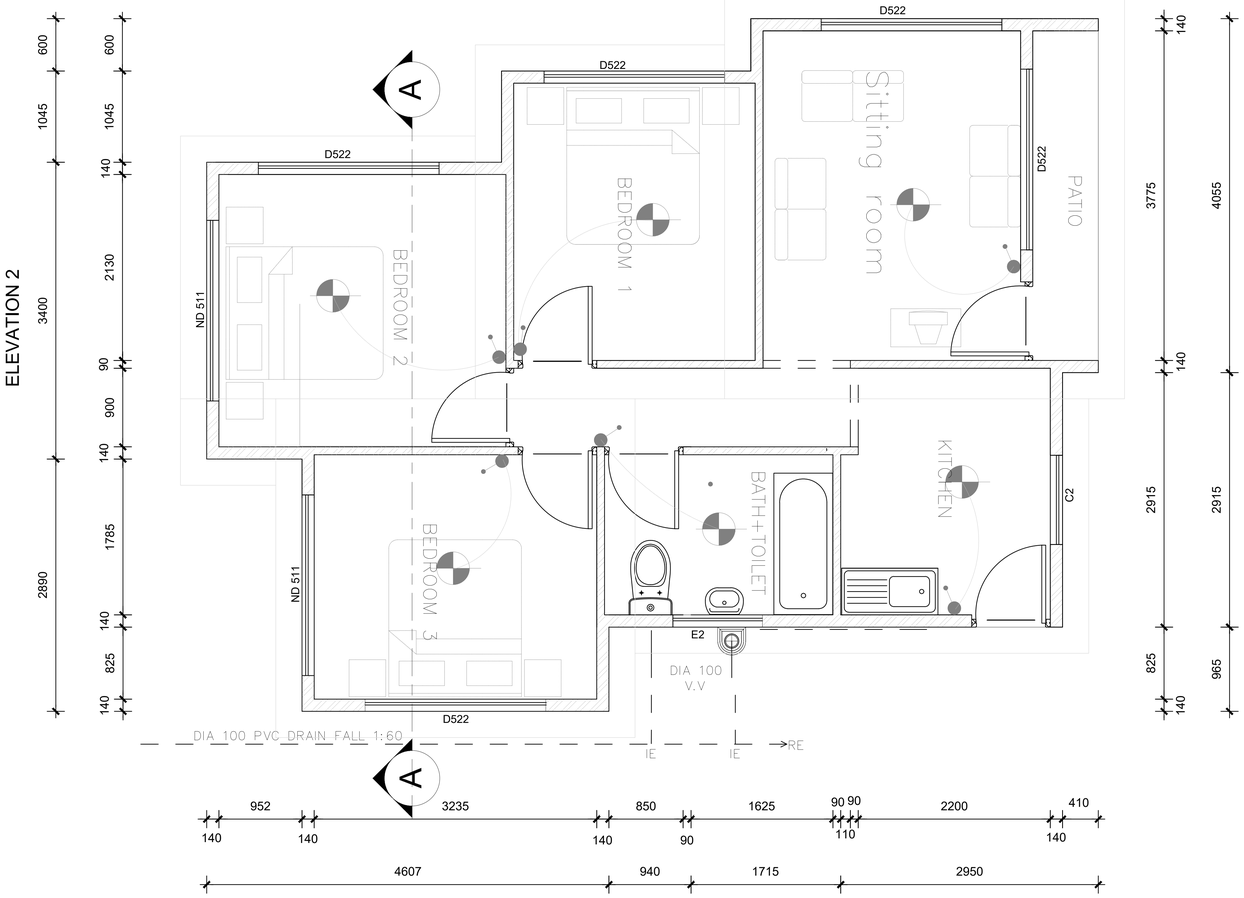
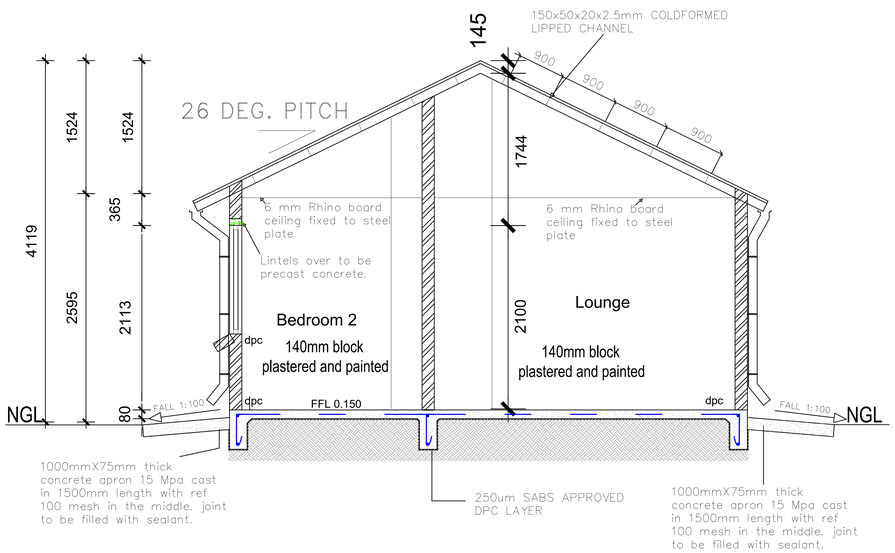
ELEVATION 4





ELEVATION 3

LAYOUT PLAN
1:40



SECTION A-A
N.T.S

WINDOW & DOOR SCHEDULE					
CATALOGUE NO:	E2	C2	D522	EXTERIOR DOOR	INTERIOR DOOR
DESCRIPTION:	Cottage clisco type window opening sections as shown, finished off in red –oxide primer undercoat and two coats of enamel paint. All glasspanels 4mm clear.	Cottage clisco type window opening sections as shown, finished off in red –oxide primer undercoat and two coats of enamel paint. All glasspanels 4mm clear.	Cottage clisco type window opening sections as shown, finished off in red –oxide primer undercoat and two coats of enamel paint. All glasspanels 4mm clear.	Combination standard 1,2mm pressed steel single rebate frame and doorcomplete. Fit 4– lever bckset. finished off in red–oxide primer undercoat and two coats of enamelpaint.	Standard 1,2mm pressed steel single rebate frame. finished off in red–oxide primer undercoat and two coats ofenamel paint. 40mm Hollow core door complete with 2–lever lockset. finished with two coats of enamelpaint
QUANTITY:	1	1	7	2	4

PROJECT STATUS

DETAIL DESIGN STAGE | TENDER DRAWING | APPROVED CONSTRUCTION DRAWING | AS BUILT DRAWING

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SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
SERVICE: CIVIL
CONTRACT – SECTION: -
DISCIPLINE: Civil Engineering
WORK DESCRIPTION – SUB DIVISION: HOUSE PLAN
DRAWING DESCRIPTION: HOUSE LAYOUT AND ELEVATIONS

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	AS-SHOWN	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.
CONTRACTOR:
N/A

CAD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-HP-01		TD

NOTES

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DRAWINGS SHOULD NOT BE SCALED, WORK TO FIGURED DIMENSIONS ONLY.
ALL DIMENSIONS AND LEVELS ARE TO BE VERIFIED ON SITE BY THE CONTRACTOR BEFORE COMMENCING ANY WORK

FOUNDATIONS

1. ALL MASS CONCRETE FOR FOOTING AND PADS IS TO HAVE MINIMUM COMPRESSIVE STRENGTH OF CLASS 25/19mm stone.
2. ALL REINFORCED CONCRETE TO HAVE A MIN. COMPRESSIVE STRENGTH OF CLASS 25/19mm. PROPOSED MIX DESIGN IS TO BE SUBMITTED AND ACCEPTED BY THE ENGINEER PRIOR TO ANY CONCRETE BEING CAST.
3. COVER TO REINFORCEMENT IS TO BE 50mm TOP AND 50mm BOTTOM AND 50mm SIDES UNLESS NOTED OTHERWISE
4. ALL REINFORCED CONCRETE PADS AND FOOTING ARE TO BE CAST UPON 50mm CONCRETE BLINDING.
5. FOUNDATION LEVELS ARE TO BE AGREED WITH THE ENGINEER ON SITE.
6. THE ENGINEER IS TO BE NOTIFIED AND GIVEN THE OPPORTUNITY TO LOOK AT THE EXCAVATIONS AND FIXED REINFORCEMENT PRIOR CONCRETING.

BRICKWORK

1. A CEMENT MORTAR SHOULD BE USED FOR BRICKWORK.
2. BRICK REINFORCEMENT TO BE USED IN EVERY COURSE OF BRICKWORK UP TO DAMP PROOF MEMBRANE.
3. BRICK REINFORCEMENT IS TO BE USED IN EVERY THIRD COURSE UP TO FIRST FLOOR LINTOL LEVEL.
4. BRICK REINFORCEMENT IS TO BE USED IN EVERY COURSE BETWEEN LINTEL AND EAVES LEVEL.
5. BRICKS ARE TO HAVE A NOMINAL STRENGTH OF 7 Mpa.

GROUND FLOOR SLAB

1. ALL VEGETATION MATERIAL BELOW SLAB IS TO BE REMOVED.
2. FILL MATERIAL FOR GRANULAR FILL BELOW GROUND BEARING SLAB IS TO BE (G7 or better) MATERIAL TO THE 14 OTHERWISE AGREED WITH THE ENGINEER FOR ACCEPTABILITY PRIOR TO COMMENCE OF FILLING.
3. ALL REINFORCED CONCRETE TO HAVE A MIN. COMPRESSIVE STRENGTH OF 25N/mm sq. (CLASS 25/20). PROPOSED MIX DESIGN IS TO BE SUBMITTED AND ACCEPTED BY THE ENGINEER PRIOR TO ANY CONCRETE BEING CAST.

1. MESH REINFORCEMENT CONCRETE COVER TO BE 25mm EXCEPT WHERE NOTED OTHERWISE.
2. JOINTS IN SLAB ARE TO BE CO-ORDINATED WITH THE ARCHITECTS FINISHES. THE JOINT IS TO BE TAKEN THROUGH BRITTLE FINISHES.
3. SAW-CUT JOINTS IN GROUND FLOORS SLABS ARE TO BE CUT WITHIN 24HOURS OF POURING THE SLAB.
4. TERMINATE PROTECTION IS TO BE APPLIED.

GUTTERS AND DOWNPIPES

1. 150x150 DOMESTIC GUTTERS

PLASTERING

1. ALL WALLS SHALL BE PLASTERED INTERNALLY AND EXTERNALLY WITH 12mm THICK PLASTER WITH STEEL FLOAT FINISH INTERNALLY AND WOOD FLOAT FINISH EXTERNALLY.

PAINTWORK

1. ALL WALLS SHALL BE PAINTED INTERNALLY AND EXTERNALLY WITH 1 UNIVERSAL ALKYD UNDERCOAT SEALER AND TWO COATS PVA ACRYLIC PAINT

CEILING

1. ALL ROOMS TO HAVE CEILING , 6mm RHINO BOARD PAINTED WITH ONE COATS OF WATER PAINT AND ONE COAT HIGH GRADE INTERNAL QUALITY PVA EMULSION PAINT COMPLETE WITH CORNICES ALONG THE WALLS.

ROOF

1. ROOF SHALL BE CHROMADEK ROOF SHEETS BOLTED TO 150 x 50 x 20 x 2.5mm COLD FORMED LIPPED CHANNEL.

PLATFORM CONSTRUCTION PROCEDURE:

1. SITE CLEARANCE AF ALL ORGANIC MATERIALS ON FOOT PRINT
2. EXCAVATE TO THE DEPTH SPECIFIED IN FOUNDATION DRAWING
3. CREATE PLATFORM TO UNDERSIDE OF FLOOR LEVEL. (COMPACT APPROVED IMPORTED MATERIAL TO BE COMPACTED TO 93% MOD AASHTO IN LAYERS OF 150mm)
4. EXCAVATE BEAMS AND PLACE REINFORCEMENT.
5. WET BEAMS TRENCHES AND PLATFORM BEFORE POURING CONCRETE.

- ALL WORK TO COMPLY WITH THE NHBRC AND S.A.B.S STANDARDS
- ALL EXCAVATIONS & REINFORCEMENT MUST BE INSPECTED AND APPROVED BY THE ENGINEER
- MINIMUM CONCRETE COVER TO ALL REINFORCEMENT TO BE 50mm
- THE CONTRACTOR MUST ENSURE THAT THE REINFORCEMENT ARE KEPT IN POSITION BEFORE & DURING THE CONCRETE BEING CAST.
- REINFORCEMENT MUST BE KEPT IN POSITION BY APPROVED S.A.B.S PLASTIC COVER CLIPS OR CONCRETE COVER BLOCK MADE OF THE SAME CONCRETE STRENGTH 25MPa
- STRENGTH OF ALL CONCRETE TO BE 25MPa
- 193 MESH TO BE USED WITH A MIN OVERLAP OF 300mm
- RAFT TO BE KEPT WET FOR 7 DAYS
- BRICKWORK ON RAFT FOUNDATION MAY ONLY COMMENCE AFTER 7DAYS SINCE THE CONCRETE WAS CAST
- MASONRY UNITS SHALL HAVE AN AVERAGE COMPRESSIVE OF 7Mpa STRENGTH AS PER NHBRC STANDARDS
- ALL MORTAR USED SHALL BE OF CLASS II
- MORTAR MIXED ON SITE SHALL BE 50kg CEMENT (1 BAG): 170 LITERS (MAXIMUM) LOOSE DAMP SAND (2.5 STD BARROWS)
- BRICK FORCE IN EACH LAYER ABOVE DOOR TOP LEVEL AND EVERY THIRD LAYER IN BETWEEN THE REST OF THE STRUCTURE WITH A MIN OVERLAP OF IN 300mm
- PRIMARY BED JOINTS ABOVE AND OPENINGS MUST BE REINFORCED WITH 2X5.6mm EXTENDING 600mm BEYOND OPENINGS
- ALL CONCRETE PRESTRESSED LINTOLS TO BE S.A.B.S 1504 (IF USED)

NOTES

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10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
	●		

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-22	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
SERVICE: CIVIL
CONTRACT - SECTION: -
DISCIPLINE: Civil Engineering
WORK DESCRIPTION - SUB DIVISION: HOUSE PLAN
DRAWING DESCRIPTION: NOTES

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	AS-SHOWN	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

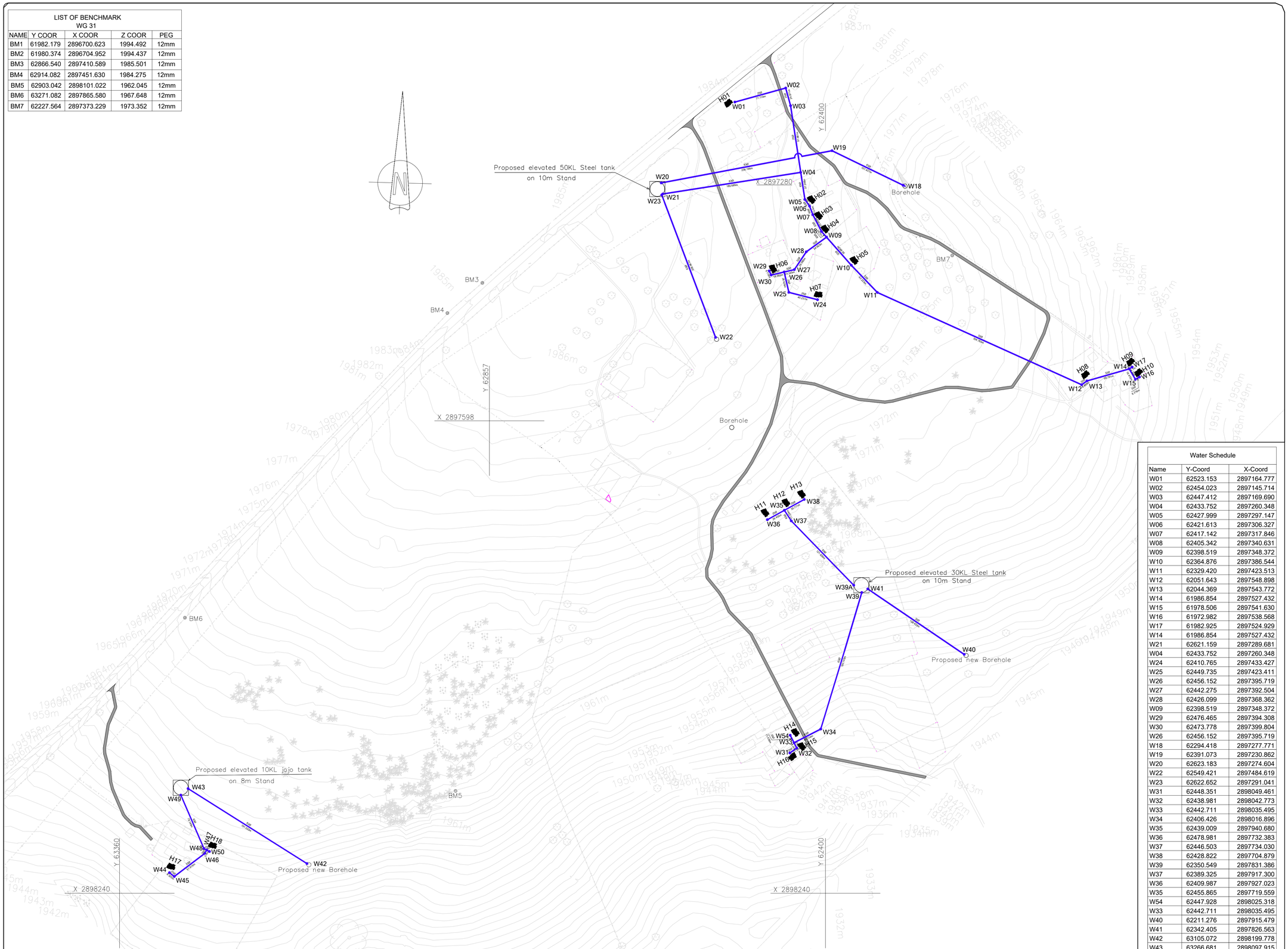
DRAWING CO-ORDINATED

CONSULTANT:
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:
N/A

CAD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-HP-02		TD

LIST OF BENCHMARK WG 31				
NAME	Y COOR	X COOR	Z COOR	PEG
BM1	61982.179	2896700.623	1994.492	12mm
BM2	61980.374	2896704.952	1994.437	12mm
BM3	62866.540	2897410.589	1985.501	12mm
BM4	62914.082	2897451.630	1984.275	12mm
BM5	62903.042	2898101.022	1962.045	12mm
BM6	63271.082	2897865.580	1967.648	12mm
BM7	62227.564	2897373.229	1973.352	12mm



Water Schedule		
Name	Y-Coord	X-Coord
W01	62523.153	2897164.777
W02	62454.023	2897145.714
W03	62447.412	2897169.690
W04	62433.752	2897260.348
W05	62427.999	2897297.147
W06	62421.613	2897306.327
W07	62417.142	2897317.846
W08	62405.342	2897340.631
W09	62398.519	2897348.372
W10	62364.876	2897386.544
W11	62329.420	2897423.513
W12	62051.643	2897548.898
W13	62044.369	2897543.772
W14	61986.854	2897527.432
W15	61978.506	2897541.630
W16	61972.982	2897538.568
W17	61982.925	2897524.929
W14	61986.854	2897527.432
W21	62621.159	2897289.681
W04	62433.752	2897260.348
W24	62410.765	2897433.427
W25	62449.735	2897423.411
W26	62456.152	2897395.719
W27	62442.275	2897392.504
W28	62426.099	2897368.362
W09	62398.519	2897348.372
W29	62476.465	2897394.308
W30	62473.778	2897399.804
W26	62456.152	2897395.719
W18	62294.418	2897277.771
W19	62391.073	2897230.862
W20	62623.183	2897274.604
W22	62549.421	2897484.619
W23	62622.652	2897291.041
W31	62448.351	2898049.461
W32	62438.981	2898042.773
W33	62442.711	2898035.495
W34	62406.426	2898016.896
W35	62439.009	2897940.680
W36	62478.981	2897732.383
W37	62446.503	2897734.030
W38	62428.822	2897704.879
W39	62350.549	2897831.386
W37	62389.325	2897917.300
W36	62409.987	2897927.023
W35	62455.865	2897719.559
W54	62447.928	2898025.318
W33	62442.711	2898035.495
W40	62211.276	2897915.479
W41	62342.405	2897826.563
W42	63105.072	2898199.778
W43	63266.681	2898097.915
W44	63292.096	2898212.193
W45	63285.536	2898217.311
W46	63244.111	2898186.014
W47	63241.538	2898181.310
W48	63245.181	2898179.316
W49	63276.603	2898106.672
W50	63237.720	2898183.398
W47	63241.538	2898181.310
W39A	62361.502	2897821.441

NOTES

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4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
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LEGEND

PROPOSED WATER NETWORK

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: WATER LAYOUT PLAN

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

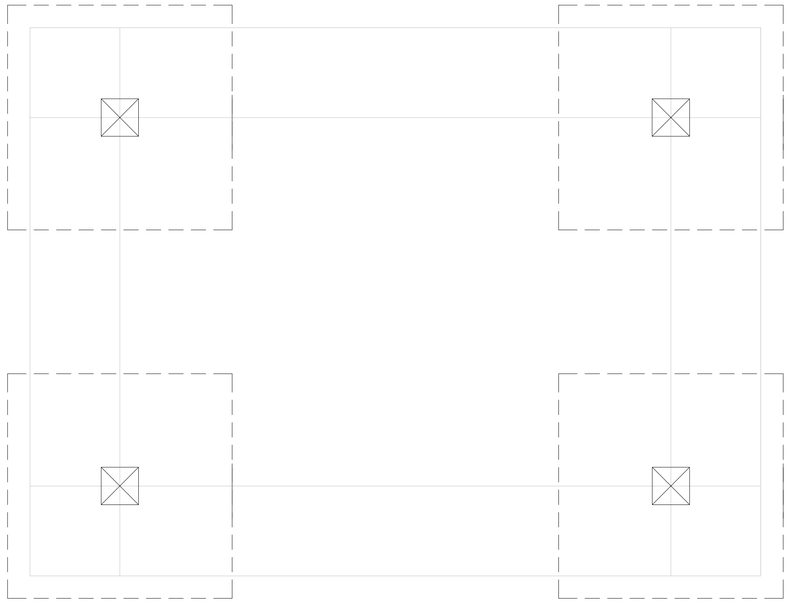
CONSULTANT:

Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

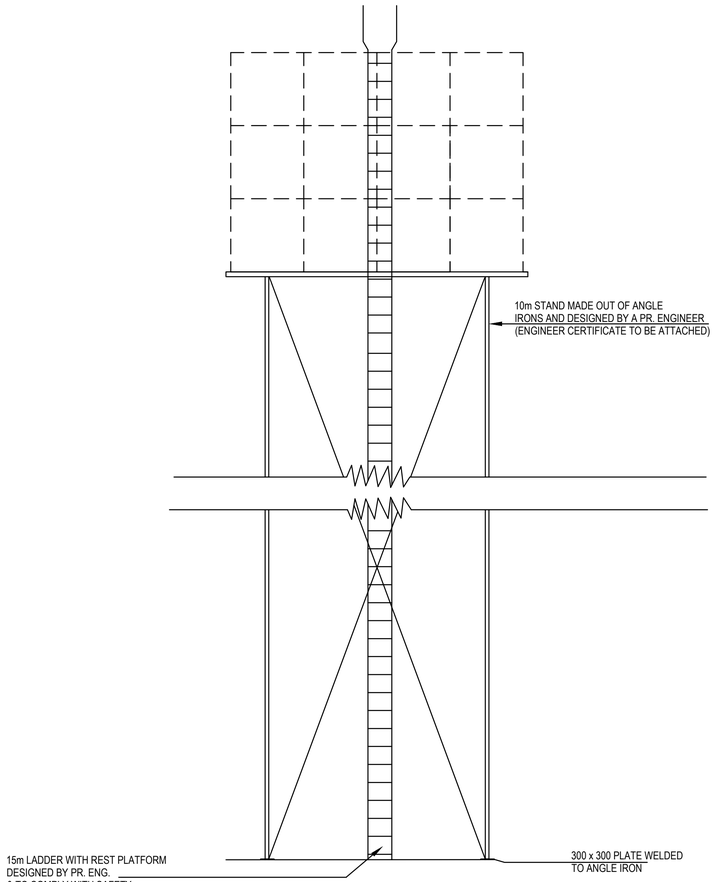
CONTRACTOR:

N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-WAT-05		TD



PLAN



TYPICAL DETAIL OF TANK & STAND
SCALE 1 : 50

NOTES

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DETAIL DESIGN STAGE | TENDER DRAWING | APPROVED CONSTRUCTION DRAWING | AS BUILT DRAWING

REV No	DATE :	DESCRIPTION :
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B	2025-04-21	ISSUED FOR APPROVAL
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REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: PROPOSED TYPICAL DETAILS OF ELEVATED TANK

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

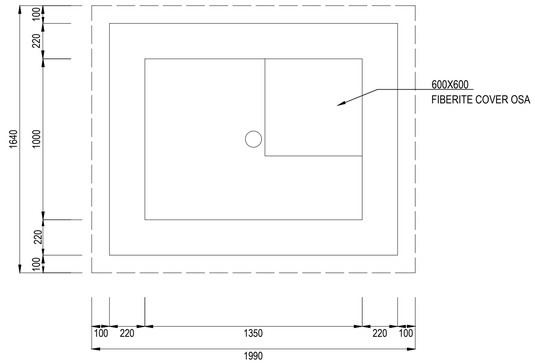
DRAWING CO-ORDINATED

CONSULTANT:

Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

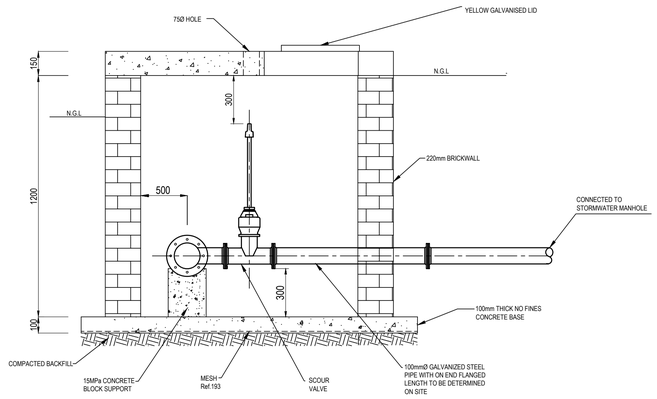
CONTRACTOR:
N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-ET-06		TD



PLAN OF SCOUR VALVE

SCALE : N.T.S



SECTION THROUGH SCOUR CHAMBER & GABION

SCALE : N.T.S

NOTES

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PROJECT STATUS

DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
○	●	○	○

REV No.	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: WATER DETAIL 1

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:

Hlakhen Consulting

11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR: N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-WAT-D1		TD

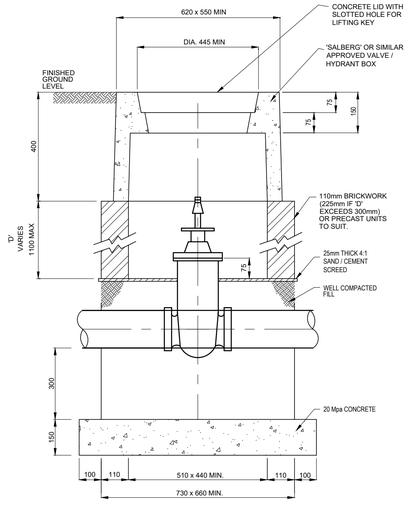
NOTES

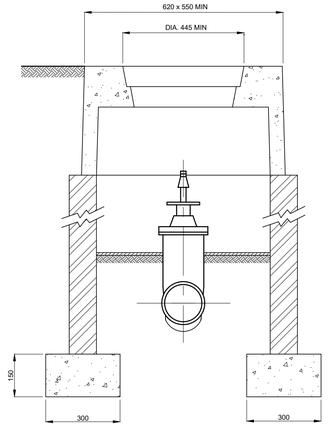
a) VALVES UP TO 300mm

1) RESILIENT SEAL GATE VALVE
2) NON RISING SPINDLE
3) ANTI CLOCKWISE CLOSING
4) A REMOVABLE COUPLING MUST BE PROVIDED AT ONE SIDE OF THE VALVE AT LEAST 500 mm FROM THE SHAFT. SPECIFICATIONS TO SABS 664

b) PRECAST SEGMENT SPECIFICATIONS

1) ALL MANHOLE SEGMENTS ACCORDING TO SABS 1294-1981
2) TOP SURFACE OF MANHOLE COVER TO BE 50 mm ABOVE THE FINISHED GROUND LEVEL EXCEPT IN PAVED AREAS
3) SEGMENTS TO BE BONDED WITH 1:3 CEMENT MORTAR TO PROVIDE A WATERTIGHT JOINT
4) DIMENSIONS OF SEGMENTS FOR VALVES BIGGER THAN 300 DIA. MUST BE ADAPTED TO FIT VALVE SIZE.



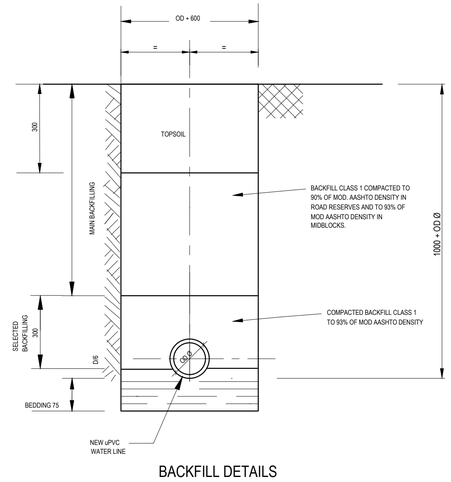


VALVE CHAMBER FOR VALVES NOT EXCEEDING 300mm N.B.

SCALE : NTS

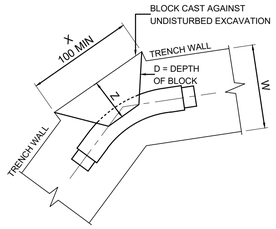
NOTES:

1. BEDDING MATERIAL
   THE BEDDING MATERIAL MUST BE SELECTED GRANULAR MATERIAL WITH PI < 6 AND MUST BE WITHOUT STONE > 20mm, ORGANIC MATTER OR LUMPS OF CLAY.
   THE BEDDING MATERIAL MUST BE COMPACTED UNDERNEATH AND ON BOTH SIDES OF THE WATER PIPE TO 93% OF MOD. AASHTO DENSITY.
2. BACKFILL CLASS I
   THE BACKFILL MATERIAL MUST BE HOMOGENEOUS, AND MUST BE COMPACTED TO 93% OF MOD. AASHTO DENSITY, IN LAYERS NOT EXCEEDING 100mm.
   THE FOLLOWING MAY NOT BE PRESENT:
   a) TREE ROOTS, BUILDING RUBBLE AND/OR ORGANIC MATTER.
   b) LUMPS OF CLAY > 75mm
   c) STONES > 150mm
3. BACKFILLING CLASS 2
   SELECTED BACKFILLING MATERIAL WITH CBR > 7 AT 93% OF MOD. AASHTO DENSITY.
   MAX. PI < 12
   MAX. LAYER THICKNESS = 100mm.
4. MINIMUM COVER - 900mm IN OPEN FIELD
   -1200mm IN ROAD CROSSING



BACKFILL DETAILS

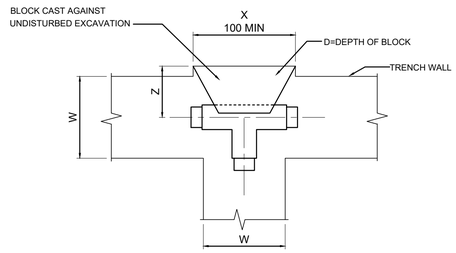
SCALE : N.T.S



THRUST BLOCK FOR 45° BEND

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE					
		900 kPa		1350 kPa		1800 kPa	
		X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)
250	450	350	0,45	600	0,67	850	0,89
150	350	150	0,16	200	0,24	350	0,32

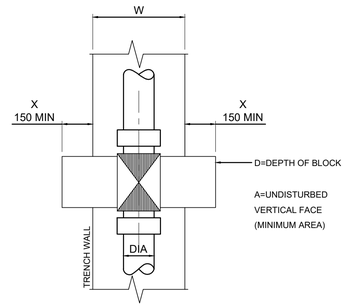
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR TEE

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE					
		900 kPa		1350 kPa		1800 kPa	
		X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)
250	450	350	0,45	600	0,67	850	0,89
150	350	150	0,16	200	0,24	350	0,32

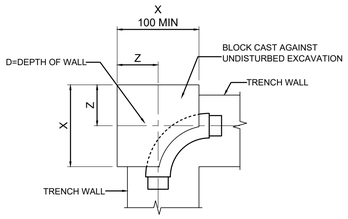
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5 KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR GATE VALVE

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE					
		900 kPa		1350 kPa		1800 kPa	
		X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)
250	450	350	0,45	600	0,67	850	0,89
150	350	150	0,16	200	0,24	350	0,32

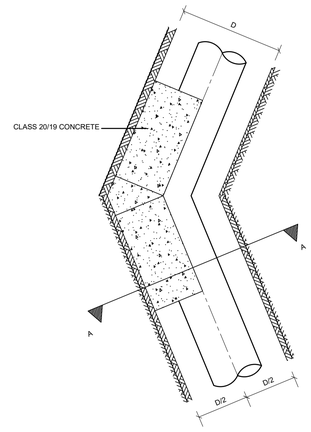
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. X - DIMENSION SHALL BE 150mm MINIMUM
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS
5 KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE



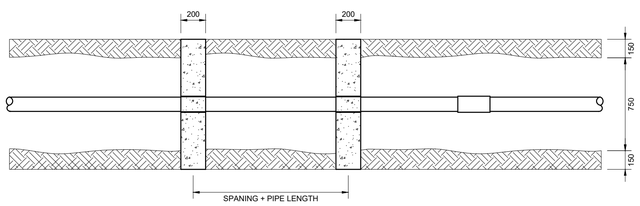
THRUST BLOCK FOR 90° BEND

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE					
		900 kPa		1350 kPa		1800 kPa	
		X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)	X (mm)	A_2 (m^2)
250	450	350	0,45	600	0,67	850	0,89
150	350	150	0,16	200	0,24	350	0,32

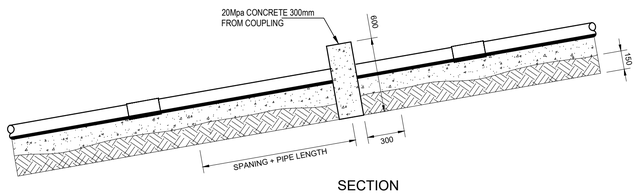
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



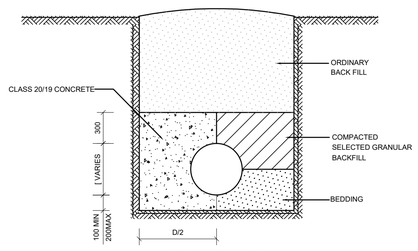
PLAN



PLAN



SECTION



SECTION A-A

ANCHOR BLOCKS AT STEEP SLOPES

CONCRETE THRUST BLOCKS AT ALL BENDS > 11.25 °
FOR PIPES > 300mm DIAMETER

NOTES

1. ALL MATERIAL AND WORKMANSHIP COMPLIED WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
2. ALL DIMENSIONS ARE IN METERS.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
5. ALL CONSTRUCTION IS DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD COT DETAIL DRAWINGS.
6. THESE DRAWINGS WERE READ IN CONJUNCTION WITH THE STANDARD DRAWINGS.(IF APPLICABLE).
7. THIS DRAWING WAS READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
8. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY DIRECTOR OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT, IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
9. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No.	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: WATER DETAIL 2

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:

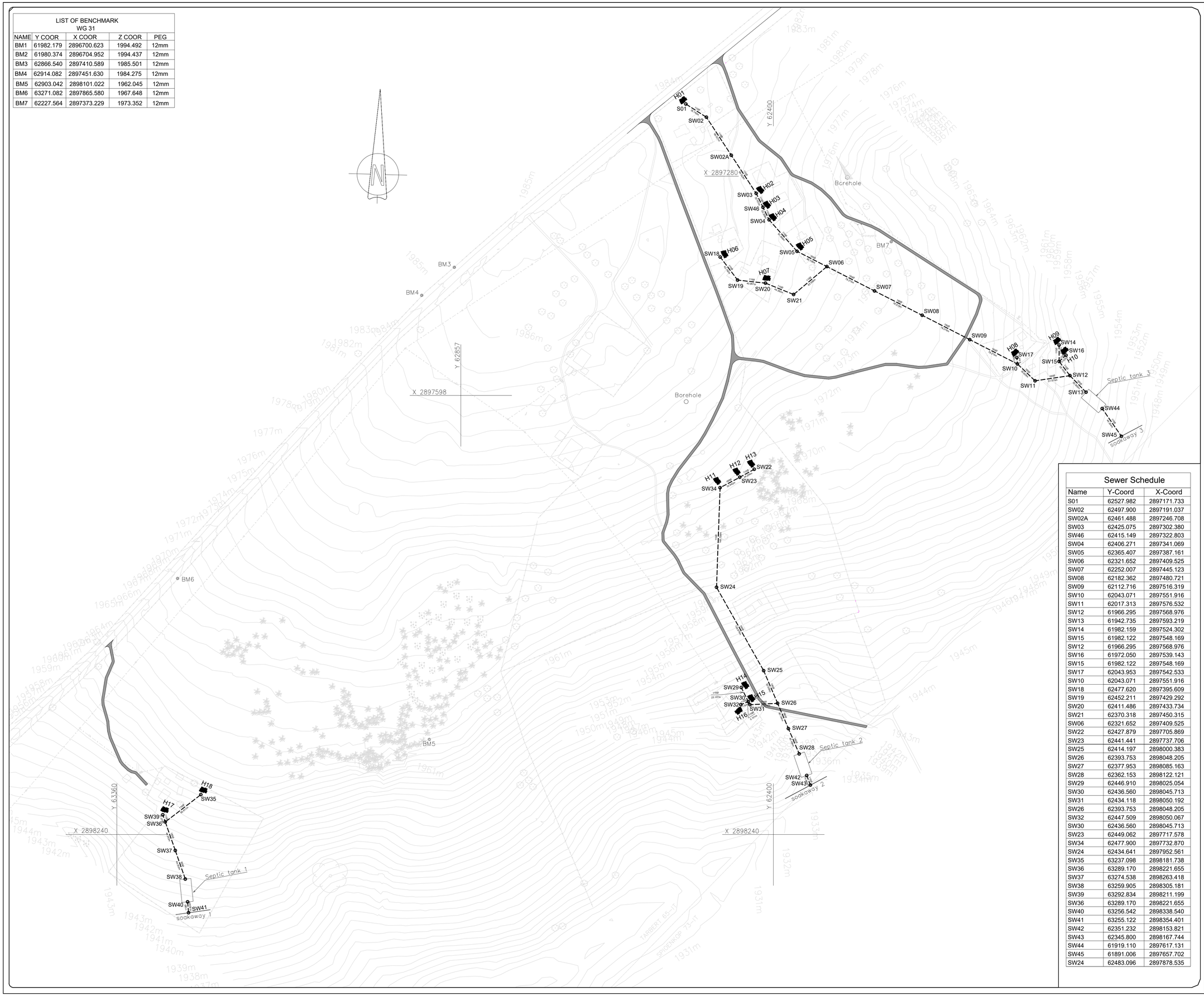
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR: N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-WAT-D02		TD

LIST OF BENCHMARK
WG 31

NAME	Y COOR	X COOR	Z COOR	PEG
BM1	61982.179	2896700.623	1994.492	12mm
BM2	61980.374	2896704.952	1994.437	12mm
BM3	62866.540	2897410.589	1985.501	12mm
BM4	62914.082	2897451.630	1984.275	12mm
BM5	62903.042	2898101.022	1962.045	12mm
BM6	63271.082	2897865.580	1967.648	12mm
BM7	62227.564	2897373.229	1973.352	12mm



Sewer Schedule

Name	Y-Coord	X-Coord
S01	62527.982	2897171.733
SW02	62497.900	2897191.037
SW02A	62461.488	2897246.708
SW03	62425.075	2897302.380
SW46	62415.149	2897322.803
SW04	62406.271	2897341.069
SW05	62365.407	2897387.161
SW06	62321.652	2897409.525
SW07	62252.007	2897445.123
SW08	62182.362	2897480.721
SW09	62112.716	2897516.319
SW10	62043.071	2897551.916
SW11	62017.313	2897576.532
SW12	61966.295	2897568.976
SW13	61942.735	2897593.219
SW14	61982.159	2897524.302
SW15	61982.122	2897548.169
SW12	61966.295	2897568.976
SW16	61972.050	2897539.143
SW15	61982.122	2897548.169
SW17	62043.953	2897542.533
SW10	62043.071	2897551.916
SW18	62477.620	2897395.609
SW19	62452.211	2897429.292
SW20	62411.486	2897433.734
SW21	62370.318	2897450.315
SW06	62321.652	2897409.525
SW22	62427.879	2897705.869
SW23	62441.441	2897737.706
SW25	62414.197	2898000.383
SW26	62393.753	2898048.205
SW27	62377.953	2898085.163
SW28	62362.153	2898122.121
SW29	62446.910	2898025.054
SW30	62436.560	2898045.713
SW31	62434.118	2898050.192
SW26	62393.753	2898048.205
SW32	62447.509	2898050.067
SW30	62436.560	2898045.713
SW23	62449.062	2897717.578
SW34	62477.900	2897732.870
SW24	62434.641	2897952.561
SW35	63237.098	2898181.738
SW36	63289.170	2898221.655
SW37	63274.538	2898263.418
SW38	63259.905	2898305.181
SW39	63292.834	2898211.199
SW36	63289.170	2898221.655
SW40	63256.542	2898338.540
SW41	63255.122	2898354.401
SW42	62351.232	2898153.821
SW43	62345.800	2898167.744
SW44	61919.110	2897617.131
SW45	61891.006	2897657.702
SW24	62483.096	2897878.535

NOTES

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LEGEND

PROPOSED SEWER NETWORK

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
SERVICE: CIVIL
CONTRACT - SECTION: -
DISCIPLINE: Civil Engineering
WORK DESCRIPTION - SUB DIVISION: CIVIL
DRAWING DESCRIPTION: SEWER LAYOUT PLAN

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

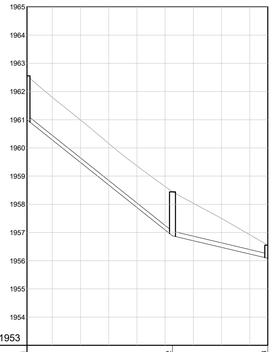
DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

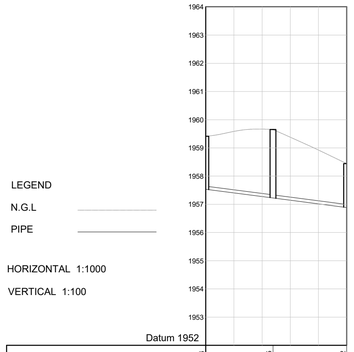
CONTRACTOR:
N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEW-04		TD



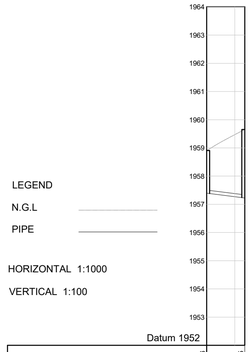
MANHOLE	SW11	SW12	SW13
CHAINAGE	0.000	51.738	85.553
GROUNG LEVEL	1962.628	1964.431	1965.022
INVET LEVEL	1961.071	1956.886 1956.886	1956.090 1956.090
DEPTH	1.557	1.557	0.462
GRADES	8%	2%	
LENGTH(m)	51.738 m	33.815 m	
PIPE DIAMETER	160 mm	160 mm	
BEDDING CLASS	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.240 l/s 53 l/s	0.300 l/s 29 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.752 m/s 2.928 m/s	0.542 m/s 1.591 m/s	

Manhole SW11 to SW13



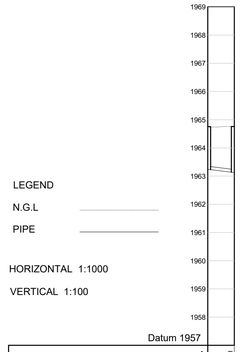
MANHOLE	SW14	SW15	SW12
CHAINAGE	0.000	23.867	50.009
GROUNG LEVEL	1959.415	1959.655	1964.431
INVET LEVEL	1957.535	1957.229 1957.229	1956.886 1956.886
DEPTH	1.880	2.426	1.557
GRADES	1%	1%	
LENGTH(m)	23.869 m	26.145 m	
PIPE DIAMETER	110 mm	110 mm	
BEDDING CLASS	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 8 l/s	0.060 l/s 8 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.235 m/s 0.915 m/s	0.284 m/s 0.925 m/s	

Manhole SW14 to SW12



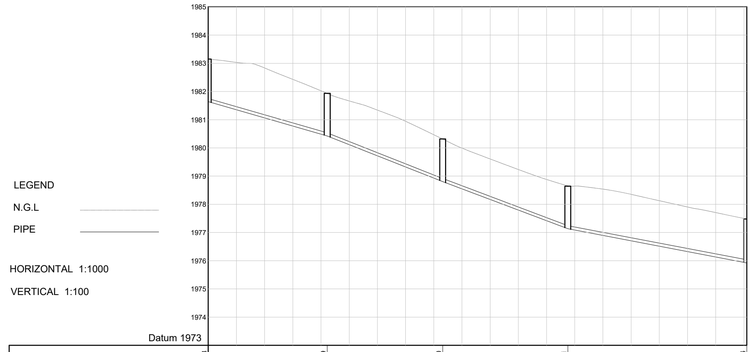
MANHOLE	SW16	SW15
CHAINAGE	0.000	13.525
GROUNG LEVEL	1959.806	1959.655
INVET LEVEL	1957.736	1957.229 1957.229
DEPTH	1.508	2.426
GRADES	1%	
LENGTH(m)	13.526 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 8 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.232 m/s 0.903 m/s	

Manhole SW16 to SW15



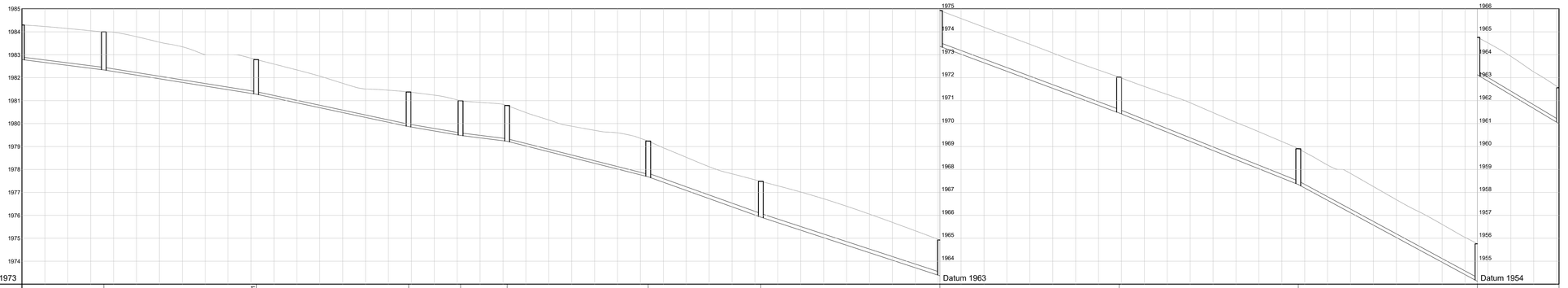
MANHOLE	SW17	SW10
CHAINAGE	0.000	9.424
GROUNG LEVEL	1964.733	1964.760
INVET LEVEL	1963.245 1963.127	1963.127
DEPTH	1.508 1.633	1.633
GRADES	1%	
LENGTH(m)	9.425 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 8 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.232 m/s 0.903 m/s	

Manhole SW17 to SW10



MANHOLE	SW18	SW19	SW20	SW21	SW06
CHAINAGE	0.000	42.192	83.158	127.540	191.040
GROUNG LEVEL	1983.150	1981.935	1980.316	1978.644	1977.492
INVET LEVEL	1981.642	1980.427 1980.427	1978.808 1978.808	1977.136 1977.136	1975.525 1975.525
DEPTH	1.508	1.508	1.508	1.508	1.557
GRADES	3%	4%	4%	2%	
LENGTH(m)	42.209 m	40.999 m	44.413 m	63.511 m	
PIPE DIAMETER	110 mm	110 mm	110 mm	110 mm	
BEDDING CLASS	Class B	Class B	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 12 l/s	0.030 l/s 14 l/s	0.060 l/s 14 l/s	0.060 l/s 10 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.352 m/s 1.371 m/s	0.412 m/s 1.606 m/s	0.403 m/s 1.568 m/s	0.318 m/s 1.116 m/s	

Manhole SW18 to SW06



MANHOLE	S01	SW02	SW02_1	SW03	SW48	SW04	SW05	SW06	SW07	SW08	SW09	SW10	SW11	
CHAINAGE	0.000	35.743	102.265	168.787	191.495	211.804	273.402	322.541	400.757	478.972	557.188	638.403	671.032	
GROUNG LEVEL	1984.298	1984.000	1985.790	1981.378	1980.993	1980.785	1979.237	1977.482	1974.925	1972.020	1969.901	1964.760	1962.598	
INVET LEVEL	1982.788	1982.341 1982.341	1981.282 1981.282	1979.898 1979.898	1979.485 1979.485	1979.231 1979.231	1977.680 1977.680	1975.925 1975.925	1973.368 1973.368	1970.463 1970.463	1967.344 1967.344	1963.127 1963.127	1961.001 1961.001	
DEPTH	1.508	1.659	1.508	1.508	1.508	1.554	1.557	1.557	1.557	1.557	1.557	1.633	1.557	
GRADES	1%	2%	2%	2%	1%	3%	4%	3%	4%	4%	5%	6%		
LENGTH(m)	35.746 m	66.530 m	66.538 m	22.711 m	20.311 m	61.618 m	49.170 m	78.257 m	78.269 m	78.278 m	78.328 m	35.692 m		
PIPE DIAMETER	110 mm	110 mm	110 mm	110 mm	110 mm	110 mm	160 mm	160 mm	160 mm	160 mm	160 mm	160 mm		
BEDDING CLASS	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B		
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 8 l/s	0.030 l/s 9 l/s	0.030 l/s 10 l/s	0.060 l/s 9 l/s	0.090 l/s 8 l/s	0.120 l/s 11 l/s	0.150 l/s 36 l/s	0.210 l/s 34 l/s	0.210 l/s 36 l/s	0.210 l/s 38 l/s	0.210 l/s 44 l/s	0.240 l/s 46 l/s		
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.232 m/s 0.903 m/s	0.262 m/s 1.020 m/s	0.302 m/s 1.178 m/s	0.307 m/s 1.049 m/s	0.318 m/s 0.903 m/s	0.443 m/s 1.282 m/s	0.503 m/s 1.959 m/s	0.531 m/s 1.874 m/s	0.551 m/s 1.998 m/s	0.563 m/s 2.070 m/s	0.618 m/s 2.407 m/s	0.668 m/s 2.532 m/s		

Manhole S01 to SW11

NOTES

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LEGEND

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE | TENDER DRAWING | APPROVED CONSTRUCTION DRAWING | AS BUILT DRAWING

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: SEWER LONG SECTION 1 OF 3

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL			
DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

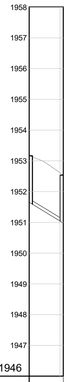
DRAWING CO-ORDINATED

CONSULTANT:

Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157,

CONTRACTOR: N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEW-L01		TD



LEGEND

N.G.L

PIPE

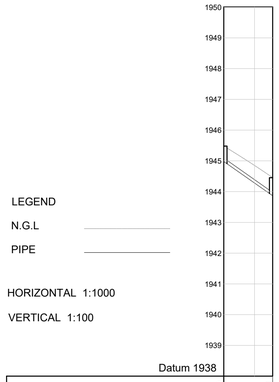
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1946

MANHOLE	SW39	SW36
CHAINAGE	0.000	11.079
GROUNG LEVEL	1953.187	1952.637
INVET LEVEL	1951.679 1951.679	1950.980 1950.980
DEPTH	1.508	1.557
GRADES	6%	
LENGTH(m)	11.100 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 17 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.513 m/s 2.000 m/s	

Manhole SW39 to SW36



LEGEND

N.G.L

PIPE

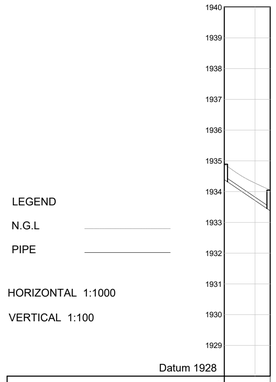
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1938

MANHOLE	SW40	SW41
CHAINAGE	0.000	15.924
GROUNG LEVEL	1946.583	1944.654
INVET LEVEL	1944.983 1944.983	1943.868 1943.868
DEPTH	0.500	0.586
GRADES	7%	
LENGTH(m)	15.963 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.000 l/s 18 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.000 m/s 0.000 m/s	

Manhole SW40 to SW41



LEGEND

N.G.L

PIPE

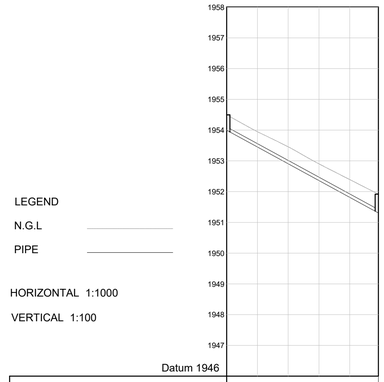
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1928

MANHOLE	SW42	SW43
CHAINAGE	0.000	14.945
GROUNG LEVEL	1934.885	1934.049
INVET LEVEL	1934.385 1934.385	1933.380 1933.380
DEPTH	0.500	0.669
GRADES	7%	
LENGTH(m)	14.979 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.000 l/s 18 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.000 m/s 0.000 m/s	

Manhole SW42 to SW43



LEGEND

N.G.L

PIPE

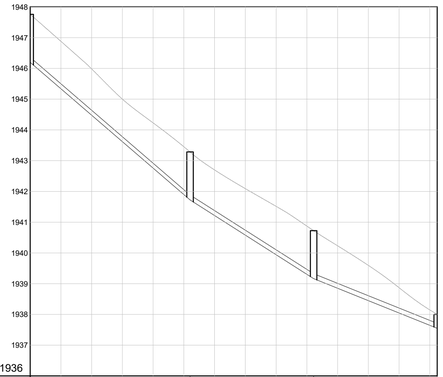
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1946

MANHOLE	SW44	SW45
CHAINAGE	0.000	49.354
GROUNG LEVEL	1954.498	1951.919
INVET LEVEL	1953.998 1953.998	1951.310 1951.310
DEPTH	0.500	0.609
GRADES	5%	
LENGTH(m)	49.427 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.000 l/s 16 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.000 m/s 0.000 m/s	

Manhole SW44 to SW45



LEGEND

N.G.L

PIPE

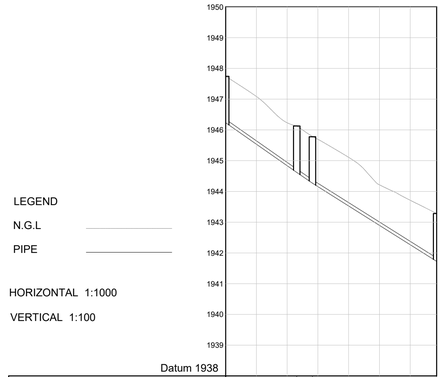
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1936

MANHOLE	SW25	SW26	SW27	SW28
CHAINAGE	0.000	52.009	92.202	132.396
GROUNG LEVEL	1947.781	1943.283	1940.723	1938.092
INVET LEVEL	1946.204 1946.204	1941.726 1941.726	1939.166 1939.166	1937.550 1937.550
DEPTH	1.557	1.557	1.557	0.452
GRADES	9%	6%	4%	
LENGTH(m)	52.201 m	40.275 m	40.226 m	
PIPE DIAMETER	160 mm	160 mm	160 mm	
BEDDING CLASS	Class B	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.000 l/s 55 l/s	0.060 l/s 48 l/s	0.060 l/s 38 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.000 m/s 0.000 m/s	0.671 m/s 2.616 m/s	0.533 m/s 2.078 m/s	

Manhole SW25 to SW28



LEGEND

N.G.L

PIPE

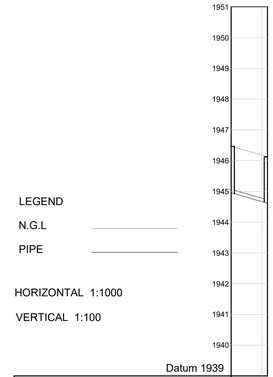
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1938

MANHOLE	SW29	SW30	SW31	SW26
CHAINAGE	0.000	23.107	29.298	68.622
GROUNG LEVEL	1947.745	1946.126	1945.778	1943.283
INVET LEVEL	1946.237 1946.237	1944.618 1944.618	1944.270 1944.270	1941.726 1941.726
DEPTH	1.508	1.508	1.508	1.557
GRADES	7%	7%	6%	
LENGTH(m)	23.163 m	5.113 m	40.494 m	
PIPE DIAMETER	110 mm	110 mm	110 mm	
BEDDING CLASS	Class B	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 18 l/s	0.060 l/s 18 l/s	0.060 l/s 17 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.549 m/s 2.139 m/s	0.542 m/s 2.110 m/s	0.520 m/s 2.027 m/s	

Manhole SW29 to SW26



LEGEND

N.G.L

PIPE

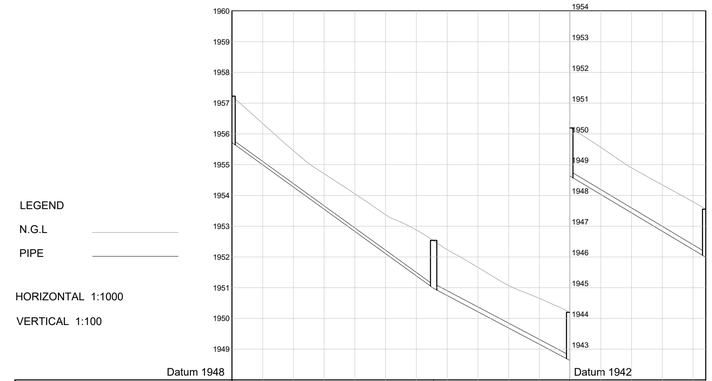
HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1939

MANHOLE	SW32	SW30
CHAINAGE	0.000	11.783
GROUNG LEVEL	1946.467	1946.126
INVET LEVEL	1944.959 1944.959	1944.618 1944.618
DEPTH	1.508	1.508
GRADES	3%	
LENGTH(m)	11.788 m	
PIPE DIAMETER	110 mm	
BEDDING CLASS	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 12 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.353 m/s 1.375 m/s	

Manhole SW32 to SW30



LEGEND

N.G.L

PIPE

HORIZONTAL 1:1000

VERTICAL 1:100

Datum 1948 Datum 1942

MANHOLE	SW35	SW36	SW37	SW38
CHAINAGE	0.000	65.611	109.863	154.116
GROUNG LEVEL	1957.226	1953.537	1950.196	1947.552
INVET LEVEL	1955.720 1955.720	1950.980 1950.980	1948.639 1948.639	1945.995 1945.995
DEPTH	1.508	1.557	1.557	1.557
GRADES	7%	5%	6%	
LENGTH(m)	65.782 m	44.314 m	44.331 m	
PIPE DIAMETER	110 mm	160 mm	160 mm	
BEDDING CLASS	Class B	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 19 l/s	0.060 l/s 43 l/s	0.060 l/s 46 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.557 m/s 2.172 m/s	0.612 m/s 2.384 m/s	0.650 m/s 2.534 m/s	

Manhole SW35 to SW38

NOTES

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LEGEND

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
○	●	○	○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: SEWER LONG SECTION 2 OF 3

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:

Hlakhen Consulting

11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:

N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEW-L02		TD

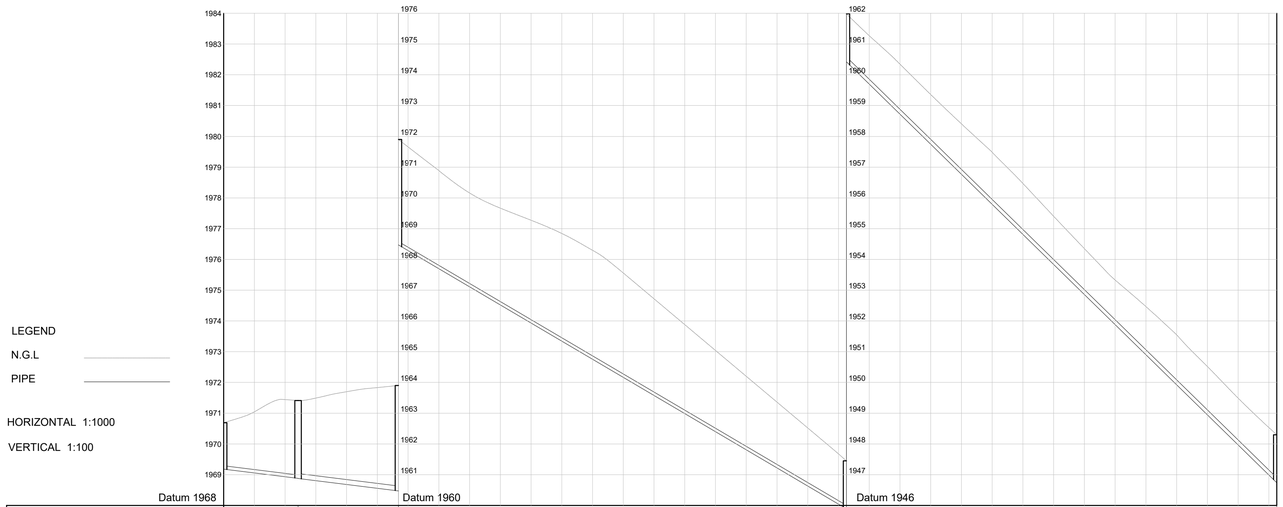
LEGEND

N.G.L

PIPE

HORIZONTAL 1:1000

VERTICAL 1:100



MANHOLE	SW22	SW23	SW24	SW25A
CHAINAGE	0.000	24.204	56.845	202.603	342.582
GROUNG LEVEL	1970.089	1971.412	1971.003	1951.449	1947.761
INVET LEVEL	1968.184 1968.881	1968.881 1968.681	1968.473 1968.473	1950.892 1950.892	1946.204 1946.204
DEPTH	1.658	2.531	3.429	1.557	1.557
GRADES	1%	1%	6%	10%	
LENGTH(m)	24.206 m	32.644 m	146.010 m	140.646 m	
PIPE DIAMETER	110 mm	160 mm	110 mm	160 mm	
BEDDING CLASS	Class B	Class B	Class B	Class B	
DESIGN FLOW (l/s) Q70 CAPACITY(l/s)	0.030 l/s 8 l/s	0.030 l/s 21 l/s	0.060 l/s 17 l/s	0.060 l/s 59 l/s	
DESIGN VELOCITY(m/s) V70 VELOCITY(m/s)	0.232 m/s 0.903 m/s	0.297 m/s 1.159 m/s	0.503 m/s 1.961 m/s	0.832 m/s 3.241 m/s	

Manhole SW22 to SW25A

NOTES

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LEGEND

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
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A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: SEWER LONG SECTION 3 OF 3

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:

Hakhen Consulting

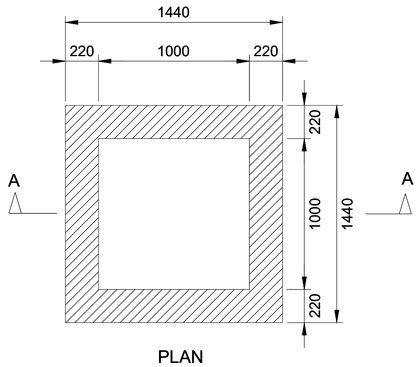
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:

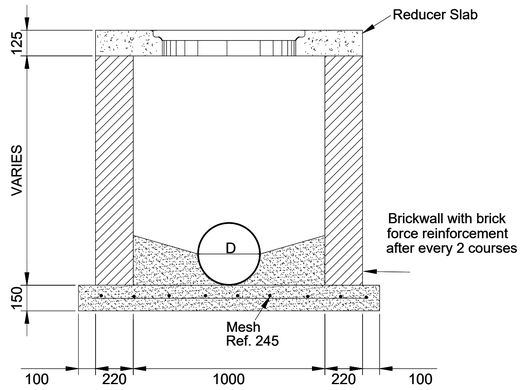
N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEW-L03		TD

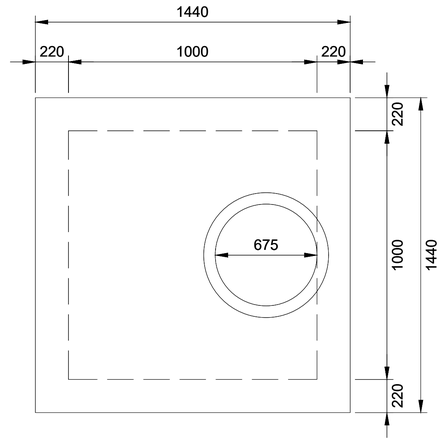
MANHOLE DETAILS



PLAN
MANHOLE
N.T.S.

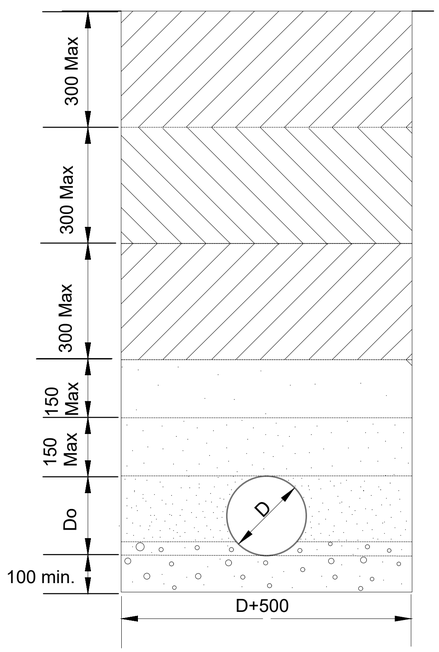


SECTION A - A
N.T.S.



COVER SLAB
N.T.S.

MANHOLE BACKFILLING



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DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
○	●	○	○

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agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION
DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE
CIVIL

CONTRACT - SECTION
-

DISCIPLINE
Civil Engineering

WORK DESCRIPTION - SUB DIVISION
CIVIL

DRAWING DESCRIPTION
SEWER DETAIL

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

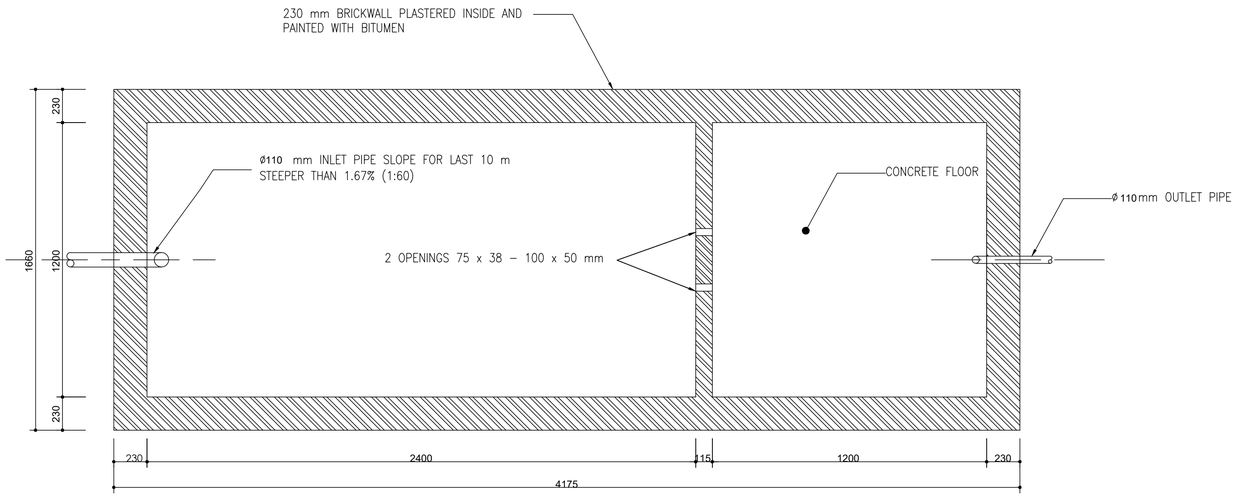
DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

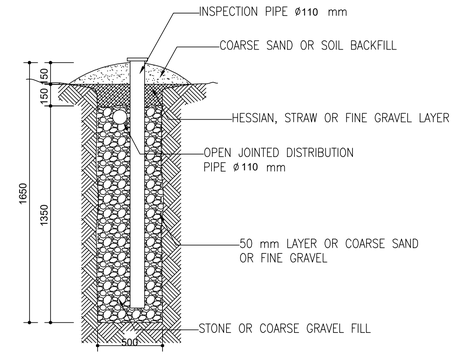
CONSULTANT:
Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:
N/A

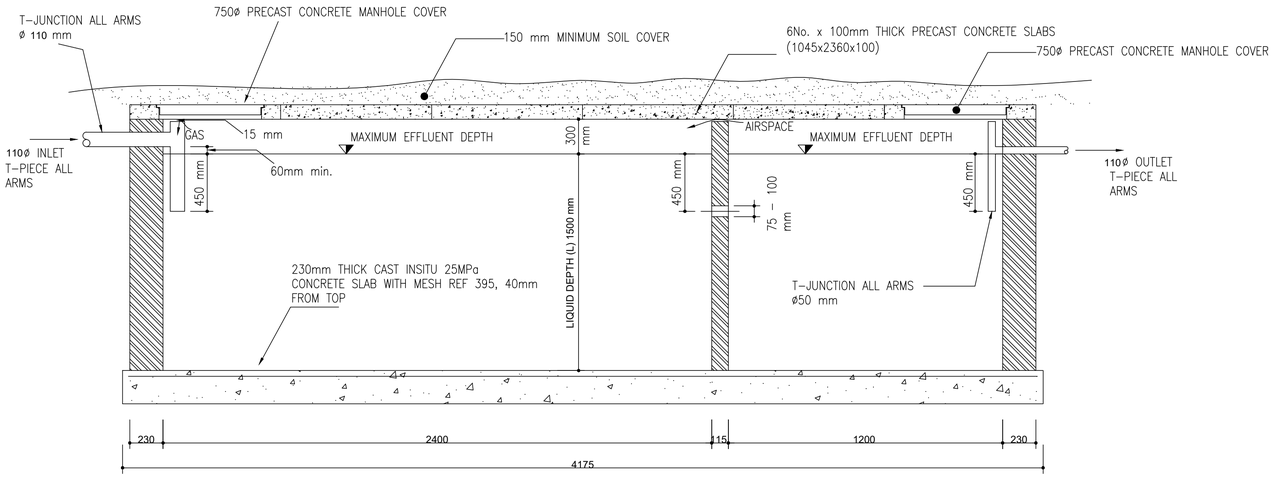
CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEW-D01		TD



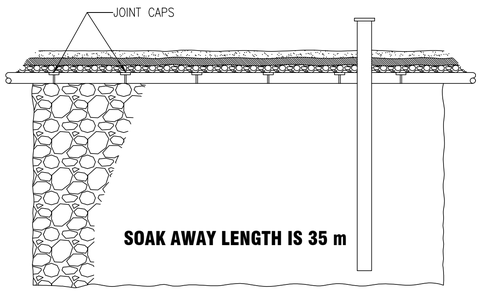
PLAN OF SEPTIC TANK
Scale 1:20



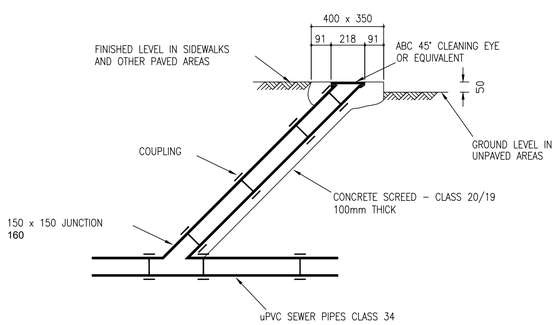
SOAK AWAY CROSS SECTION
Scale 1:20



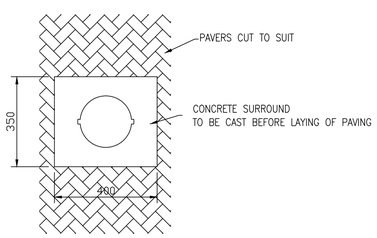
LONGITUDINAL SECTION THROUGH SEPTIC TANK
Scale 1:20



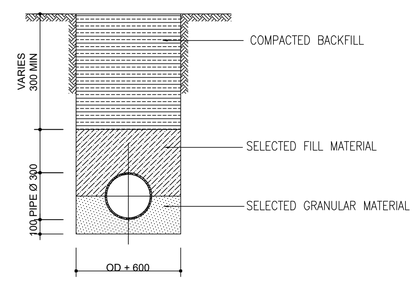
SOAK AWAY LONGITUDINAL PART SECTION
Scale 1:20



SECTION THROUGH RODDING WAY / EYE
Scale 1:20



PLAN OF RODDING WAY / EYE
Scale 1:20



CLASS 'B' BEDDING

SELECTED BACKFILL BEDDING FOR uPVC AND HDPE PIPES

NOTES:

1. SEPTIC TANKS AND SOAKAWAYS

1.1 SEPTIC TANK TO BE NO CLOSER THAN TWICE ITS DEPTH TO THE BUILDING FOUNDATION.

1.2 AFTER EXCAVATION, TRENCHES SURFACES FOR SOAKAWAY SHOULD BE ROUGHENED TO RESTORE A NATURAL INFILTRATION SURFACE.

1.3 FILLING MATERIAL FOR SOAKAWAY SHOULD BE UNIFORMLY GRADED CLEAN AND FROM 20mm TO 100mm IN DIAMETER, BUILDER'S RUBBLE IS NOT ACCEPTABLE.

1.4 EFFLUENT SHOULD BE DISTRIBUTED IN THE SOAKAWAY BY MEANS OF A SUITABLE PIPE LAID NEAR THE TOP OF GRAVEL FILL. PRIOR TO BACKFILLING. A LAYER OF POLYESTER FILTER FABRIC SHOULD BE PLACED ON TOP OF THE BED TO PREVENT SOIL FROM ENTERING THE TRENCH. A TOPSOIL COVER OF BETWEEN 100mm AND 150mm SHOULD BE PLACED ON TOP OF THE BED.

1.5 THE SIDES OF THE TRENCHES OF THE SOAKAWAY SHOULD BE LINED WITH A SUITABLE POLYESTER FILTER OR ALTERNATIVELY HAVE A LAYER OF FINE GRAVEL OR COARSE SAND AGAINST THE INFILTRATIVE SURFACE TO PROTECT IT.

1.6 WHERE TWO OR MORE SOAKAWAY TRENCHES ARE CONSTRUCTED ADJACENT TO ONE ANOTHER THEY SHOULD BE LOCATED AT A DISTANCE OF NOT LESS THAN TWICE THEIR DEPTH FROM ONE FROM ANOTHER.

2. BEDDING PIPES

2.1 SELECTED GRANULAR MATERIAL SHALL BE OF A NON–COHESIVE NATURE THAT IS SINGULARLY GRADED BETWEEN 0.6mm AND 19mm, FREE DRAINING AND HAS A COMPACTIBILITY FACTOR NOT EXCEEDING 0.4.

2.2 SELECTED FILL MATERIAL SHALL HAVE A P.I NOT EXCEEDING 6, BE FREE FROM VEGETATION, LUMPS AND STONES EXCEEDING 30mm IN DIAMETER.

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

○ DETAIL DESIGN STAGE ● TENDER DRAWING ○ APPROVED CONSTRUCTION DRAWING ○ AS BUILT DRAWING

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS
SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
SERVICE: CIVIL
CONTRACT - SECTION: -
DISCIPLINE: Civil Engineering
WORK DESCRIPTION - SUB DIVISION: SEWER
DRAWING DESCRIPTION: SEPTIC TANK

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	AS SHOWN	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		202330150 3

DRAWING CO-ORDINATED

CONSULTANT:
Htakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR:
N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-SEPIC-01		TD

LIST OF BENCHMARK WG 31				
NAME	Y COOR	X COOR	Z COOR	PEG
BM1	61982.179	2896700.623	1994.492	12mm
BM2	61980.374	2896704.952	1994.437	12mm
BM3	62866.540	2897410.589	1985.501	12mm
BM4	62914.082	2897451.630	1984.275	12mm
BM5	62903.042	2898101.022	1962.045	12mm
BM6	63271.082	2897865.580	1967.648	12mm
BM7	62227.564	2897373.229	1973.352	12mm

Road List			
Road4			
Position	SV	Y-Coord	X-Coord
PI0	0	63372.009	2897950.948
BCC1	33.168	63365.812	2897983.531
PI1	35.942	63365.284	2897986.306
ECC1	38.717	63366.050	2897989.026
BCC2	93.370	63380.861	2898041.633
PI2	96.799	63381.817	2898045.026
ECC2	100.227	63380.785	2898048.397
BCC3	184.122	63356.233	2898128.619
PI3	187.346	63355.266	2898131.779
ECC3	190.571	63352.818	2898133.998
PI4	240.073	63316.142	2898167.245
Road3			
Position	SV	Y-Coord	X-Coord
PI0	0	62593.625	2897188.865
BCC1	37.747	62569.660	2897218.028
PI1	39.716	62568.398	2897219.563
ECC1	41.685	62567.699	2897221.423
BCC2	350.903	62458.847	2897510.849
PI2	353.381	62457.962	2897513.202
ECC2	355.859	62458.096	2897515.712
BCC3	413.755	62461.181	2897573.526
PI3	416.297	62461.319	2897576.103
ECC3	418.838	62462.503	2897578.395
BCC4	515.439	62506.848	2897664.216
PI4	516.247	62507.219	2897664.935
ECC4	517.055	62507.684	2897665.597
BCC5	592.067	62550.752	2897727.013
PI5	595.038	62552.493	2897729.497
ECC5	598.009	62552.846	2897732.509
BCC6	670.253	62561.239	2897804.263
PI6	674.890	62561.806	2897809.113
ECC6	679.527	62558.826	2897812.981
BCC7	772.252	62502.239	2897886.436
PI7	773.218	62501.647	2897887.204
ECC7	774.185	62501.187	2897888.056
BCC8	954.523	62415.474	2898046.722
PI8	959.755	62412.816	2898051.642
ECC8	964.988	62407.339	2898052.771
PI9	1112.410	62262.956	2898082.547
Road1			
Position	SV	Y-Coord	X-Coord
PI0	0	62480.114	2897096.506
BCC1	83.659	62452.828	2897175.590
PI1	85.157	62452.337	2897177.014
ECC1	86.655	62451.509	2897178.272
BCC2	140.720	62421.793	2897223.439
PI2	142.322	62420.908	2897224.785
ECC2	143.923	62419.699	2897225.849
BCC3	308.731	62296.007	2897334.763
PI3	310.727	62294.495	2897336.094
ECC3	312.723	62292.631	2897336.859
BCC4	361.479	62247.523	2897355.363
PI4	362.582	62246.500	2897355.782
ECC4	363.684	62245.571	2897356.382
PI5	555.439	62084.449	2897460.353
Road2			
Position	SV	Y-Coord	X-Coord
PI0	2.506	62094.305	2897456.968
BCC1	104.417	62143.276	2897546.342
PI1	110.879	62146.720	2897552.629
ECC1	117.340	62153.888	2897552.576
BCC2	191.239	62227.785	2897552.032
PI2	192.589	62229.140	2897552.022
ECC2	193.938	62230.463	2897552.314
BCC3	282.063	62316.512	2897571.332
PI3	284.629	62319.056	2897571.895
ECC3	287.195	62321.604	2897571.351
PI4	425.657	62457.021	2897542.472



NOTES

1. ALL MATERIAL AND WORKMANSHIP COMPLIED WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
2. ALL DIMENSIONS ARE IN METERS.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
5. ALL CONSTRUCTION IS DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD COT DETAIL DRAWINGS.
6. THESE DRAWINGS WERE READ IN CONJUNCTION WITH THE STANDARD DRAWINGS.(IF APPLICABLE).
7. THIS DRAWING WAS READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
8. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY DIRECTOR OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT. IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
9. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

LEGEND

PROPOSED ROAD NETWORK

ISSUED FOR TENDER PURPOSES ONLY

Curve List						
Road4						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	12.00	0.00	0.00	2.82	2.82	26.29.38
2	12.00	0.00	0.00	3.53	3.53	32.44.31
3	12.00	0.00	0.00	3.30	3.30	30.47.24
4	0.00	0.00	0.00	0.00	0.00	0.00.00
Road3						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	12.00	0.00	0.00	1.99	1.99	18.48.04
2	12.00	0.00	0.00	2.51	2.51	23.39.56
3	12.00	0.00	0.00	2.58	2.58	24.16.17
4	12.00	0.00	0.00	0.81	0.81	7.42.53
5	12.00	0.00	0.00	3.03	3.03	28.22.07
6	12.00	0.00	0.00	4.88	4.88	44.16.52
7	12.00	0.00	0.00	0.97	0.97	9.13.52
8	12.00	0.00	0.00	5.59	5.59	49.58.08
9	0.00	0.00	0.00	0.00	0.00	0.00.00
Road1						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	12.00	0.00	0.00	1.51	1.51	14.18.23
2	12.00	0.00	0.00	1.61	1.61	15.17.37
3	12.00	0.00	0.00	2.01	2.01	19.03.39
4	12.00	0.00	0.00	1.11	1.11	10.31.48
5	0.00	0.00	0.00	0.00	0.00	0.00.00
Road2						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	12.00	0.00	0.00	7.17	7.17	61.42.08
2	12.00	0.00	0.00	1.35	1.35	12.53.05
3	12.00	0.00	0.00	2.61	2.61	24.30.06
4	0.00	0.00	0.00	0.00	0.00	0.00.00

PROJECT STATUS

CONCEPT AND VIABILITY STAGE | TENDER DRAWING | APPROVED CONSTRUCTION DRAWING | AS BUILT DRAWING

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: ROAD LAYOUT AND SETTING OUT DATA

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

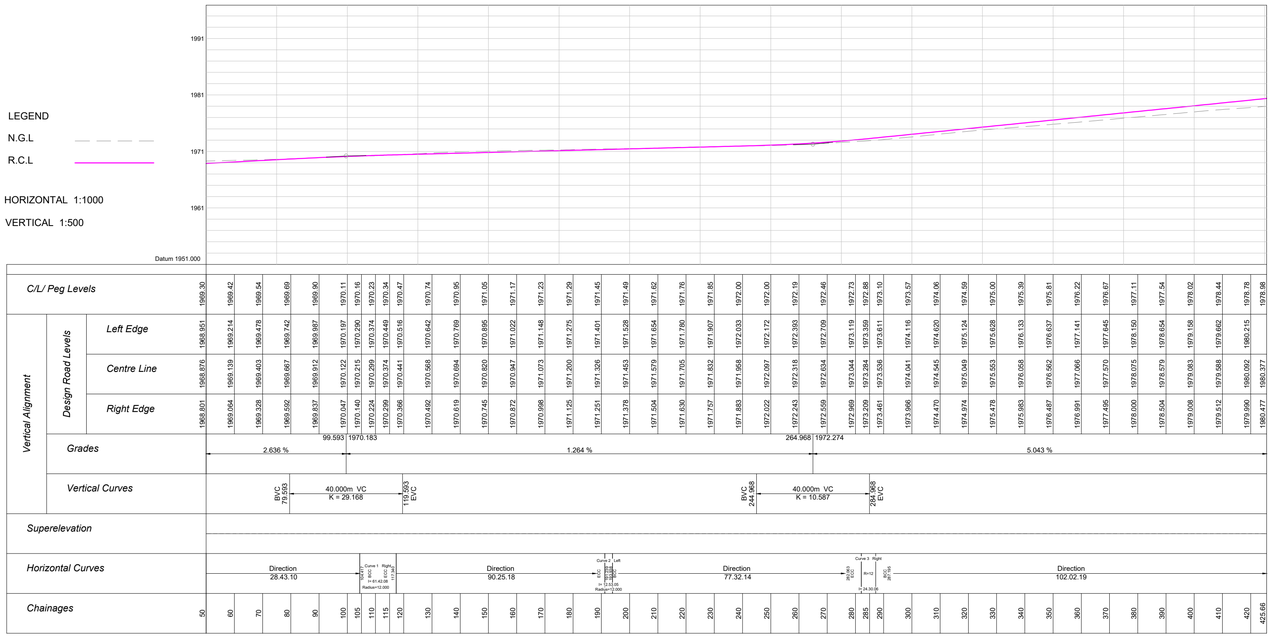
CONSULTANT:

Hlakhen Consulting

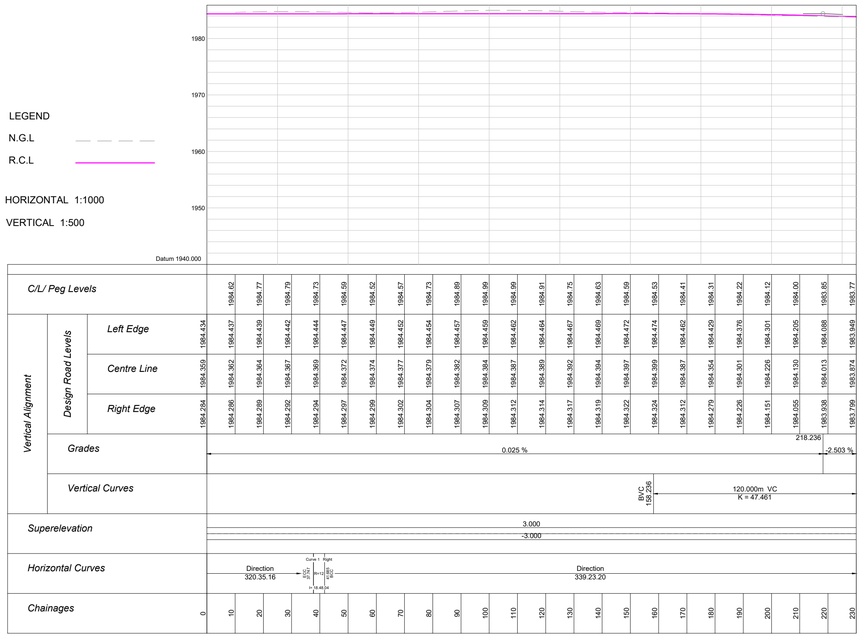
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR: N/A

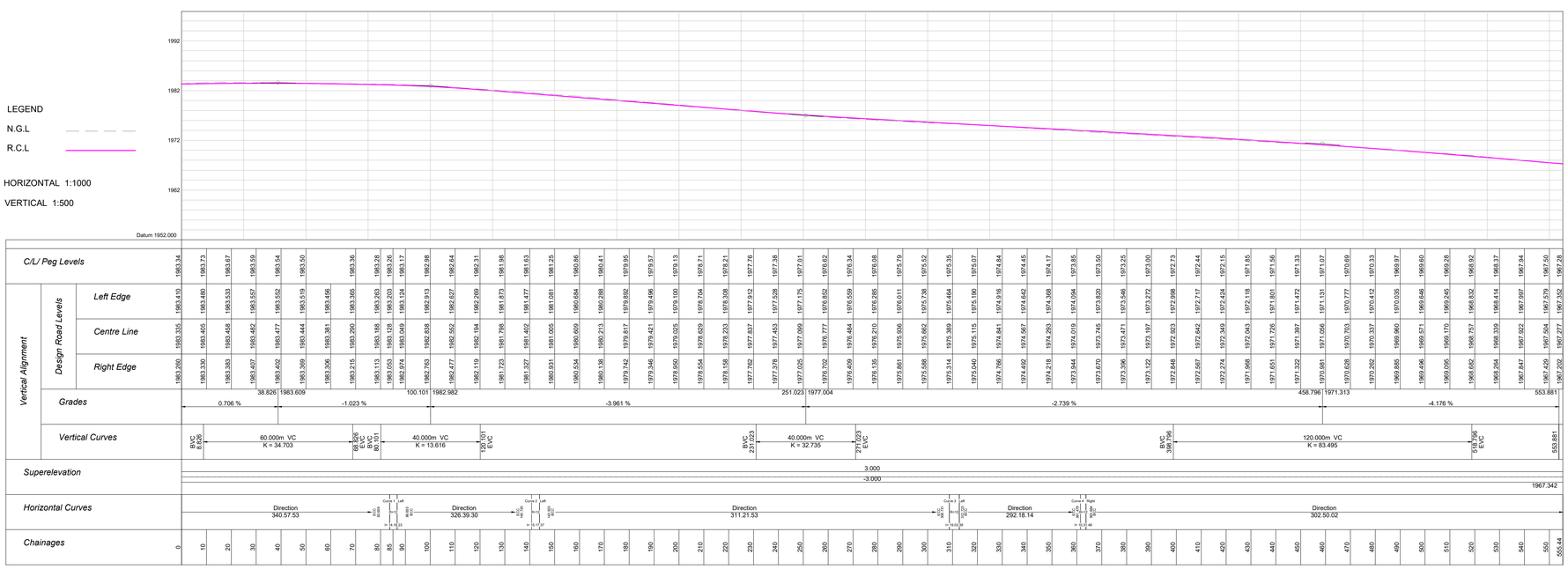
CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-RD-04		TD



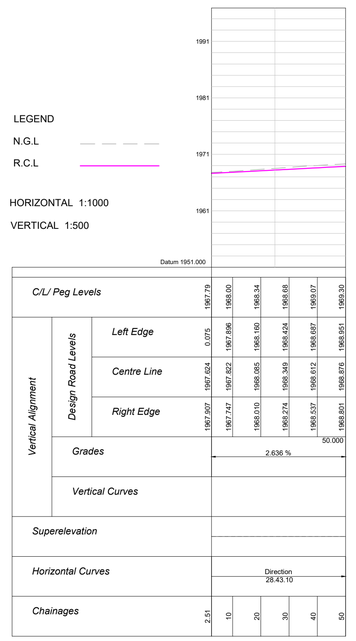
ROAD 2(1 OF 2) Longsection for 50 to 425



ROAD 3 (1 OF 3)Longsection for 0 to 230



ROAD 1 (1 OF 1) Longsection for 0 to 555



ROAD 2 (2 OF 2) Longsection for 2 to 50

NOTES

1. ALL MATERIAL AND WORKMANSHIP COMPLIED WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
2. ALL DIMENSIONS ARE IN METERS.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
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7. THIS DRAWING WAS READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
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10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
○	●	○	○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDR
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: ROAD LONG SECTION 1 OF 2

FILE No.		ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI DRAWN
SCALE	AS SHOWN	S.DUBE CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

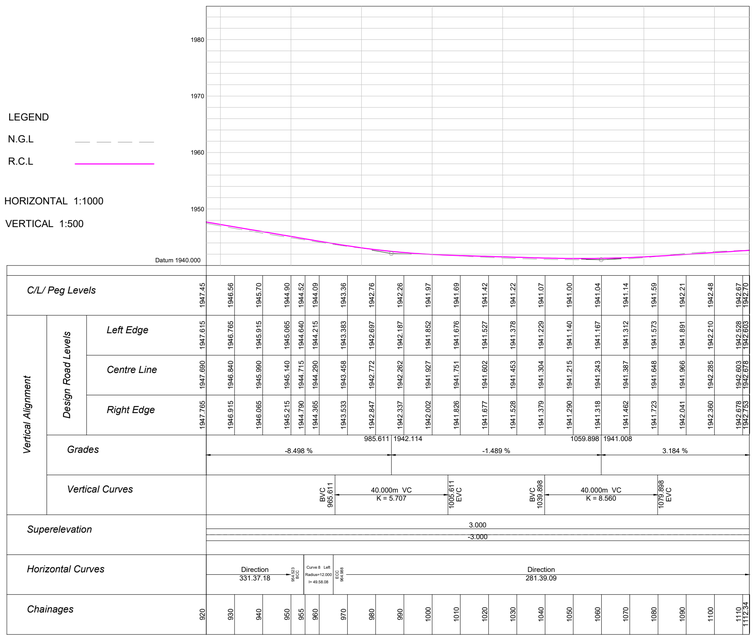
CONSULTANT:

Htakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

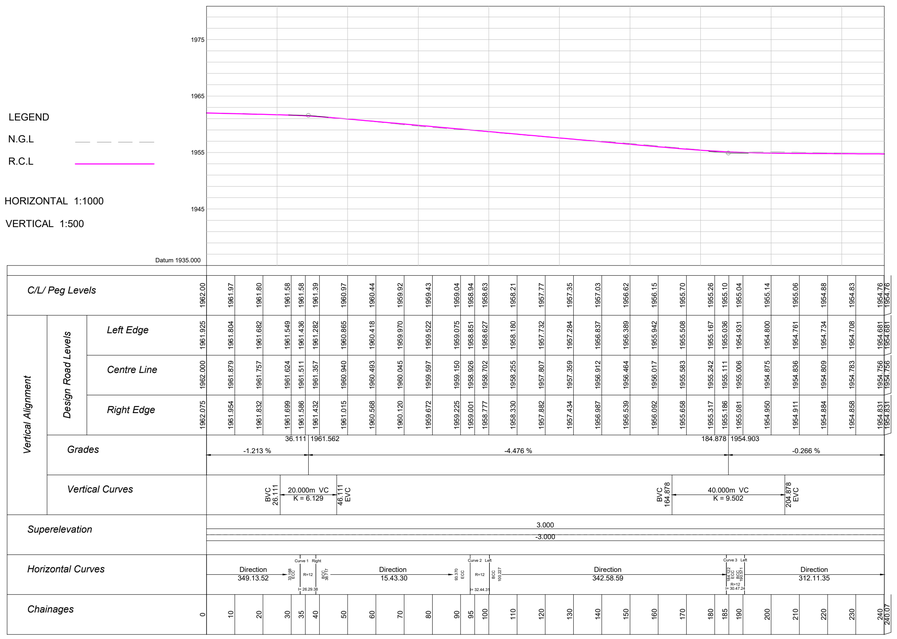
CONTRACTOR:

N/A

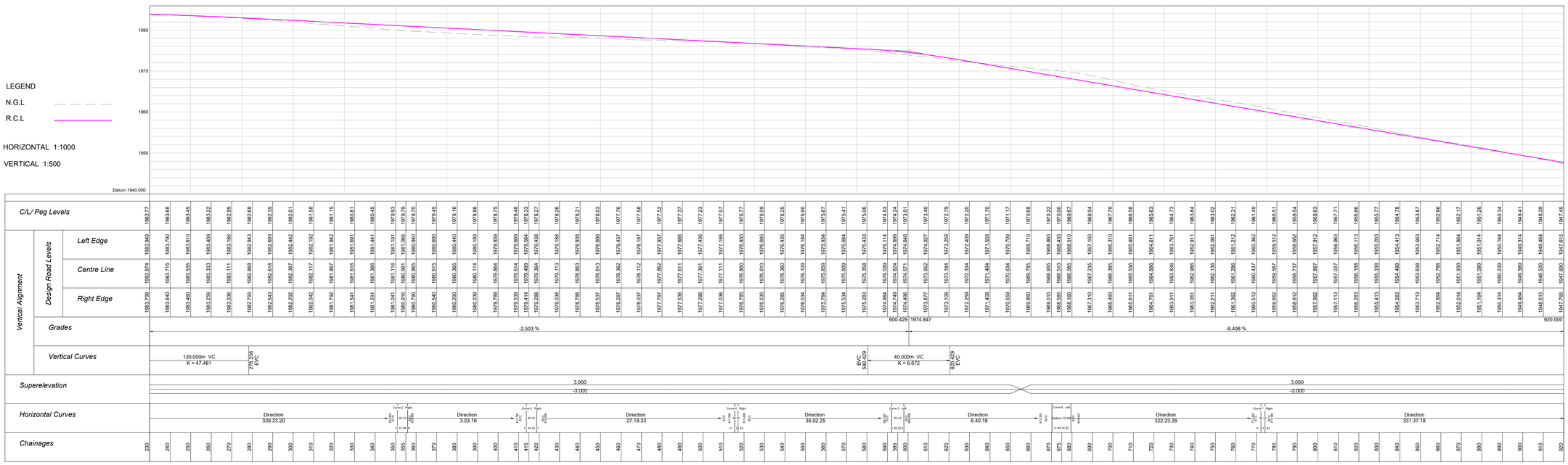
CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-RD-L01		TD



ROAD 3(3 OF 3)Longsection for 920 to 1112



ROAD 4 (1 OF 1) Longsection for 0 to 240



ROAD 3(2 OF 3)Longsection for 230 to 920

NOTES

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2. ALL DIMENSIONS ARE IN METERS.
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4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
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10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE	TENDER DRAWING	APPROVED CONSTRUCTION DRAWING	AS BUILT DRAWING
○	●	○	○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR APPROVAL
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION
DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE
CIVIL

CONTRACT - SECTION
-

DISCIPLINE
Civil Engineering

WORK DESCRIPTION - SUB DIVISION
CIVIL

DRAWING DESCRIPTION
ROAD LONG SECTION

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	AS SHOWN	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		202301503

DRAWING CO-ORDINATED

CONSULTANT:

Htakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157,

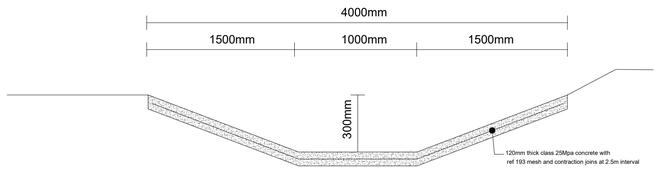
CONTRACTOR:
N/A

CAD/ SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-RD-L02		TD



LIST OF BENCHMARK WG 31				
NAME	Y COOR	X COOR	Z COOR	PEG
BM1	61982.179	2896700.623	1994.492	12mm
BM2	61980.374	2896704.952	1994.437	12mm
BM3	62866.540	2897410.589	1985.501	12mm
BM4	62914.082	2897451.630	1984.275	12mm
BM5	62903.042	2898101.022	1962.045	12mm
BM6	63271.082	2897865.580	1967.648	12mm
BM7	62227.564	2897373.229	1973.352	12mm

Stormwater Schedule		
Name	Y-Coord	X-Coord
STM01	63372.48	2898010.82
STM02	63377.72	2898042.81
STM03	63370.64	2898073.80
STM04	63366.74	2898098.09
STM05	63352.27	2898131.77
STM06	63342.46	2898142.26
STM07	63335.30	2898154.75
STM08	62247.44	2897358.94
STM09	62191.55	2897395.06
STM10	62135.66	2897431.18
STM11	62123.01	2897431.20
STM12	62237.47	2897550.06
STM13	62218.86	2897549.94
STM14	62187.32	2897554.20
STM15	62165.31	2897552.06
STM16	62161.16	2897559.20
STM17	62428.50	2897543.29
STM18	62414.46	2897545.09
STM19	62354.10	2897566.12
STM20	62319.16	2897569.29
STM21	62309.35	2897568.44
STM22	62303.49	2897576.34
STM23	62523.58	2897347.16
STM24	62504.55	2897397.99
STM25	62485.52	2897448.81
STM26	62466.49	2897499.64
STM27	62456.32	2897500.95
STM28	62469.75	2897576.12
STM29	62476.91	2897601.27
STM30	62502.87	2897653.34
STM31	62500.99	2897667.56
STM32	62474.37	2897933.96
STM33	62446.62	2897986.88
STM34	62418.87	2898039.81
STM35	62409.81	2898049.51
STM36	62409.77	2898058.14



TYPICAL DRAINAGE CROSSING THE ROAD

N.T.S

NOTES

1. ALL MATERIAL AND WORKMANSHIP COMPLIED WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
2. ALL DIMENSIONS ARE IN METERS.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. ALL DIMENSIONS WERE CHECKED AND APPROVED ON SITE.
5. ALL CONSTRUCTION IS DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD COT DETAIL DRAWINGS.
6. THESE DRAWINGS WERE READ IN CONJUNCTION WITH THE STANDARD DRAWINGS.(IF APPLICABLE).
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9. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
10. FINAL POSITION OF SERVICES WERE DETERMINED ON SITE.

LEGEND

PROPOSED STORMWATER NETWORK

ISSUED FOR TENDER PURPOSES ONLY

PROJECT STATUS

DETAIL DESIGN STAGE ○ | TENDER DRAWING ● | APPROVED CONSTRUCTION DRAWING ○ | AS BUILT DRAWING ○

REV No	DATE :	DESCRIPTION :
TD	2025-06-17	ISSUED FOR TENDER
B	2025-04-21	ISSUED FOR APPROVAL
A	2025-03-17	ISSUED FOR APPROVAL

REVISIONS

SIZE ON ORIGINAL DRAWING 100 mm

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

INSTITUTION: DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT

SERVICE: CIVIL

CONTRACT - SECTION: -

DISCIPLINE: Civil Engineering

WORK DESCRIPTION - SUB DIVISION: CIVIL

DRAWING DESCRIPTION: STORMWATER LAYOUT PLAN

FILE No.			ITEM No.
DESIGN	S. DUBE	F. MASWANGANYI	DRAWN
SCALE	1:400	S.DUBE	CHECKED

RESPONSIBLE PROFESSIONAL

DATE	NAME	SIGNATURE	PR NUMBER
28/11/2024	LJ. Boshomane		2023301503

DRAWING CO-ORDINATED

CONSULTANT:

Hlakhen Consulting
11 Hofsanger Road, Rooihuiskraal , Centurion, 0157.

CONTRACTOR: N/A

CADD SYSTEM	AUTO CAD		FILE NAME
SIZE	DRAWING NUMBER		REV
A1	VUSI-STM-03		TD