ERF 974-1

MISTY CLIFF

CIVIL ENGINEERING

SERVICES REPORT

Rev 0

OCTOBER 2025

SKYSOL

CIVIL ENGINEERING SERVICES REPORT

ERF CA 974-1 MISTY CLIFF

TABLE OF CONTENTS

ITEM **PAGE**

CIVIL ENGINEERING SERVICES REPORT

ERF CA 974-1 MISTY CLIFF

1. INTRODUCTION

This report is prepared as part of the Environmental Report submission to the Department of Environmental Affairs and Development Planning. The environmental report covers various aspects of the proposed development of a residential house on the above-mentioned erf.

This civil engineering services report will focus on the proposed Roads, Sewer, Water, and Stormwater services for the proposed development. The report will provide a high-level indication and guidelines of what will be developed further in the detailed engineering design phase of the project.

1.1 Site Location

Erf CA 974-1 Misty Cliff is located at 46 Main Road in Misty Cliff.. The total area of the Erf is approximately 15.28 ha. The locality sketch is included in Appendix A.

1.2 Topography

The erf is located on a steep mountainous terrain and falls in the southwest direction. The average gradient across the is erf is approximately 31%.

1.3 Current Erf utilisation

The erf is uninhabited, and there is no activity taking place.

1.4 Geotechnical Investigation

No geotechnical investigation has been undertaken at this stage. The Geotechnical Investigation is planned for the detailed design phase of the project.

2. PROPOSED DEVELOPMENT

The owner of the erf intends to construct a residential building on the property.

3. EXISTING SERVICES

3.1 Roads

There is no formal access road to the property.

3.2 Municipal water supply

The property does not have a municipal water connection.
The city has confirmed that there is a Ø225mm Asbestos Cement reticulation water main crossing the Erf. See Appendix B for correspondence with the City water officials.

3.3 Municipal Foul sewer

The property is not serviced by a municipal foul sewer system. City officials indicated that there is no formal municipal sewer system in the vicinity of the erf. See Appendix C for correspondence with the City sewer officials.

3.4 Stormwater

3.4.1 Varingkloof Stream

The architectural drawings indicate that the Varingkloof stream and the Stream seep area run through the uppermost section of the erf, with the stream buffer abutting the northern end of the proposed building. The delineation of the above stream features is sourced from the report prepared by the Freshwater Specialist.

The proposed residential building does not impact the Varingkloof stream and the stream seep areas.

3.4.2 Surface runoff

It is anticipated that there will be some form of stormwater surface runoff from the mountain slope, considering the steep slopes.

3.4.3 Ground water

The report from the Freshwater specialist indicates that the average depth of the groundwater table is 6.7m below the existing ground level.

3.4.4 Stormwater channel

There is an existing open stormwater channel running along Main Road. There is no other formal underground stormwater infrastructure in the vicinity of the site.

4. PROPOSED INFRASTRUCTURE

The section below provides an overview of the proposed infrastructure for the development. The proposed infrastructure takes into consideration the sensitive environment within which the works will be undertaken.

Design stage and Detail level

The design of the civil engineering elements is still at the conceptual stage, except for the road design, which has been done up to the preliminary design level. Therefore, the elements proposed for the civil services infrastructure are presented in their conceptual form.

4.1 Bulk earthworks

Bulk earthworks excavations will be required for the building platform and roadway. The cut on the building platform will vary depending on the location of the platform.

4.1.1 Rock Blasting

It is anticipated that rock blasting might be necessary to create the platforms and box out the roadway.

4.1.2 Material utilisation

There is a possibility that material excavated to construct the building platforms and box cut for the road could be used to fill the proposed gabion retaining structures on the development.

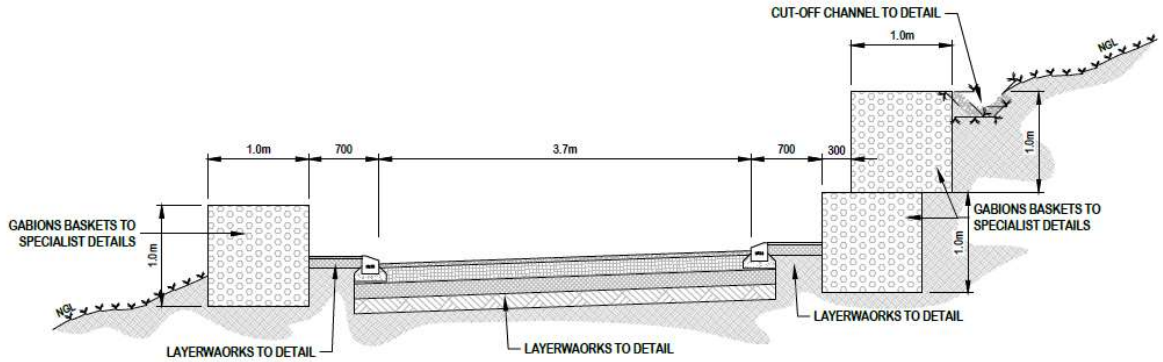
4.2 Road Access

4.2.1 Road layout

An 8-meter-wide carriage way is proposed as road access off the main road. The carriageway narrows down to a 3.7m wide main vehicle lane leading to the house. The curves on the road are widened to accommodate the turning circle of a passenger vehicle. In addition 0.5m wide apron has been provided between the road edge and the retaining structures. This apron is to accommodate the overhang from the vehicles and provide a buffer between the trafficked way and the retaining structures.
The road layout drawing is included in Appendix E.

4.2.2 Cut Depth

The bulk of the road is in cut with an average cut depth of 2 meters and a maximum cut depth of approximately 6.3m at the garage level on the first Storey. Gabion baskets are proposed as retaining walls along the road edge. Refer to the layout drawing in Appendix D for typical sections across the road. A typical section is shown below.



SECTION B-B

SCALE 1:25

4.2.3 Road layer works Material.

The road layerworks will consist of pavers / concrete surface placed on G5 granular base material. The G5 subbase will be placed on the insitu material. Pavers or concrete will be placed at the road curves.

4.2.4 Gabion retaining walls

Gabion baskets will be used to retain the road cut slopes. It is anticipated that the material for the Gabion Baskets will be obtained from the road and building platform excavation.

4.3 Water connection

4.3.1 Municipal Potable water connection

The existing Ø225mm Asbestos Cement reticulation water main crossing the Erf is the nearest potable water line to the proposed development. An application will be submitted to council to allow for 1 x Ø25mm potable water + 1 x Ø40mm fire water connection for the house. Firewater connection pipe size to be confirmed by the fire engineer. Refer to Appendix D for the proposed location of the municipal connections.

There is approximately a 23-meter elevation between the approximate position of the existing water pipe and the building. A water pressure test will be required to ascertain the pressures attainable at the building level. The level difference is calculated assuming that the existing pipe is 1m deep + 18m ground difference + 4m allowance for storey levels.

4.3.2 Diversion of Asbestos water pipe

Preliminary indication from the city is that the existing water pipe is made of Asbestos material. This pipe is crossing the proposed access road to the house. Depending on its depth, it might be necessary to modify the vertical alignment of this water pipe.

The procedures as stipulated by the AIA and Asbestos approved contractor might be required to undertake the water connections and realignment of the pipe.

4.4 Fire-fighting water

The firefighting requirements will be determined by a fire engineer.

4.5 Foul sewer

4.5.1 Municipal sewer connection

There is no formal municipal sewer reticulation system in the vicinity of the erf.

4.5.2 Conservancy tank

The City accepts the use of conservancy tanks in instances where the properties cannot be connected to the municipal sewer infrastructure. We engaged with the city officials, who confirmed that the conservancy tank would be the most suitable option for the proposed development. Refer to Appendix C for the relevant correspondence.

The conservancy tank will be positioned close to the carriageway crossing to facilitate easy access by the emptying tank. Refer to Appendix D for the proposed location of the conservancy tank.

4.6 Stormwater management

The City of Cape Town has a stormwater management policy that requires developments greater than 4000m^2 to consider and implement measures to control the rate and quality of storm runoff from the development. The following policies will be adhered to

a. Management of Urban Stormwater Impacts Policy, approved by Council: 27 May 2009
b. Floodplain and River Corridor Management Policy, approved by Council: 27 May 2009
c. By-Law Relating to Stormwater Management, approved by Council: 30 August 2005

The Conceptual Stormwater Management measures described in this report are aimed at highlighting how the policy requirements will be met. A layout drawing is included in Appendix E.

4.6.1 Preliminary Calculations

Preliminary calculations indicate that the attenuation and water quality volumes are in the order of magnitude summarised in the table below. A detailed stormwater management report will be prepared for council approval at the detailed design stage.

Order of Magnitude Volume Calculations		
Item No	**Description**	**Volume (m^3)**
1	Attenuation 1:10 yr	18.0
2	Attenuation 1:50 yr	24.3
3	Water Quality Volume	66.2

The following sections highlight key pertinent information related to the management of stormwater runoff from the development.

4.6.2 Natural Area Conservation

The building has been located within an ecologically less sensitive area of the erf. It is away from the Varingkloof stream and stream seep areas highlighted in the Freshwater specialist area. This aspect of the building location fulfils one of the requirements of good stormwater management, which encourages the conservation of the natural state of the site and consideration of features such as streams.

4.6.3 Green roofs

The architectural plans show a green roof on a section of the building. Green roofs are pervious surfaces that allow for the absorption and infiltration of rainwater. These processes reduce the rate of stormwater runoff and enable the natural cleaning of the stormwater, reducing the Total Phosphates.

The green roof will be a low-maintenance feature with about 150mm of single-layer free-draining medium/soil designed to support plant growth. The underside of the growth medium will be lined with the appropriate waterproofing.

4.6.4 Lawns

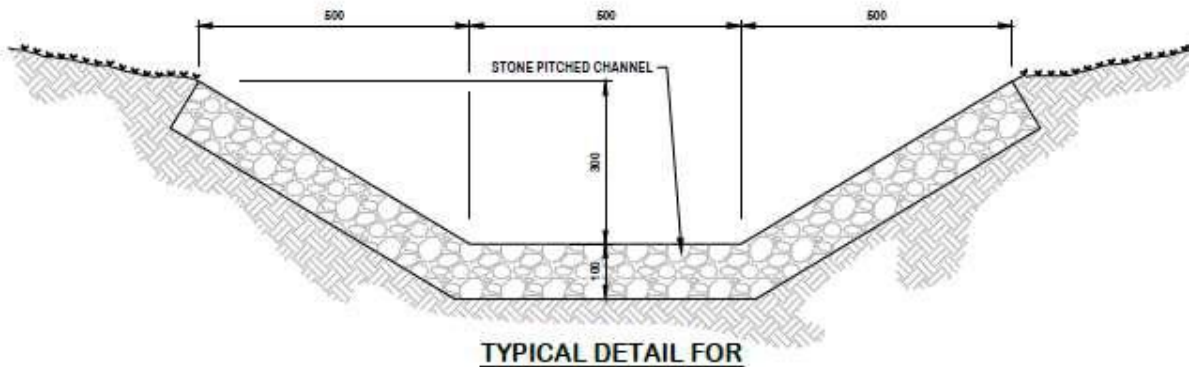
The architectural plans also include good stormwater management design practice by incorporating lawns. Lawns allow for the infiltration of rainwater and also serve to disconnect the impervious surfaces.

4.6.5 Rainwater harvesting

Excess runoff from the roof will be harvested via Jojo tanks. The harvested rainwater can be used for irrigation and cleaning of exterior surfaces.

4.6.6 Stormwater cutoff trenches

The civil site layout introduces stormwater cutoff trenches around the buildings and roads. The cut-off trenches divert any surface runoff around the buildings and road and discharge this towards the surrounding natural vegetation.



TYPICAL DETAIL FOR
CUT-OFF CHANNEL

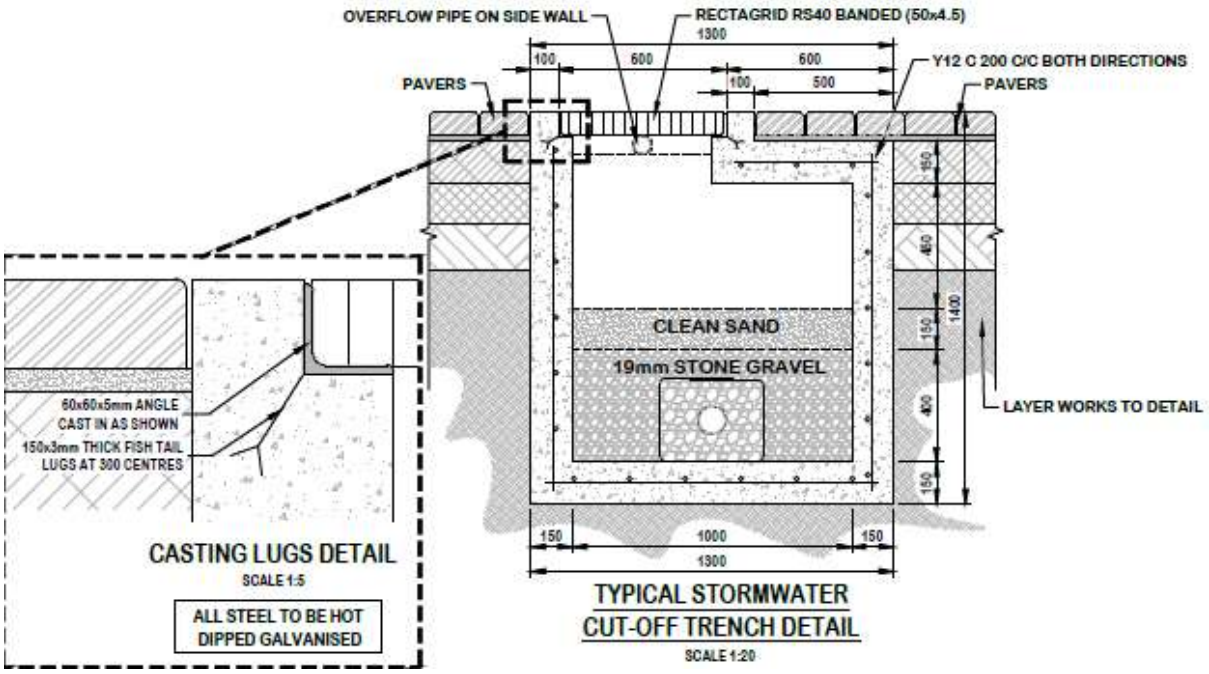
4.6.7 Erosion protection and Silt trap

A slightly depressed section constructed out of stone riprap will be placed at the outlet of the headwalls and cutoff channels. The purpose of the depression will be to slow down the stormwater runoff and disperse it over a wider area, thus minimising the erosion.

In addition, the depressed zone will allow for the trapping of silt.

4.6.8 Road cut-off trench

A cut-off tench is proposed at the low point of the new access road close to Main Road. This cut-off trench will collect any stormwater runoff from the road. The cut-off trench will contain sand and subsoil drain to assist in filtering the stormwater runoff before discharging into the existing roadside channel.



4.6.9 Attenuation of Stormwater

The preliminary calculations indicate that the development needs to attenuate an equivalent of 18.0m^3 for the 1:10yr and 24.3m^3 for the 1:50yr return intervals. This is equivalent to 3 x 10,000 litre Jojo tanks.

4.6.10 Water Quality Volume

The calculated water quality volume of 66.2m^3 will be treated using a combination of the cutoff trenches and Jojo tanks. The Cuttoff trenches have a capacity of +/- 33m^3. The balance of +/- 33.2m^3 will be treated using Jojo Tanks. An additional 3 x 10,000 litre Jojo tanks will be required for this purpose.

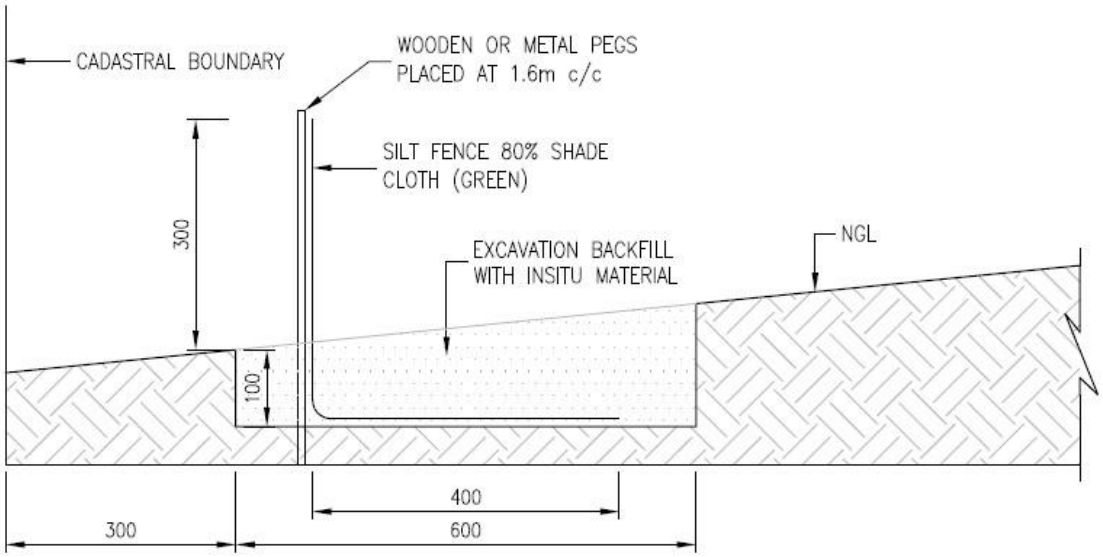
4.6.11 Connection to the Existing Stormwater

Any surface runoff from the site will be discharged into the existing open stormwater channel that runs along Main Road.

4.7 Construction phase

During construction, any stormwater surface runoff will need to be managed properly to prevent erosion and runoff onto the main road. To achieve this, the contractor will need to implement the following measures at the appropriate location on site.

1. Use of sandbags to slow down the runoff and allow for the collection of sediment behind the bags.
2. Use of silt fences to retain sediment within the site. A typical detail is shown below.



SILT FENCE DETAIL

5. CONCLUSION

The following is a summary of the key aspects with respect to the various services.

5.1 Roads

- A carriageway crossing will be constructed off Main Road.
- The access road to the house will be 3.7m wide.
- Gabion baskets will be used as retaining structures.

5.2 Water supply

- There is an existing Ø225mm Asbestos Cement reticulation water main crossing the Erf.
- An application will be submitted to council to allow for 1 x Ø25mm potable water + 1 x Ø40mm fire water connection for the house. Firewater connection pipe size to be confirmed by the fire engineer.
- The existing water pipe crosses the access road. Depending on its depth, it might be necessary to modify the vertical alignment of this water pipe.

5.3 Foul sewer discharge

- There is no formal municipal sewer reticulation system in the vicinity of the erf.
- A conservancy tank will be provided to deal with the foul sewer from the property.

5.4 Stormwater

- There is an existing open stormwater channel running along Main Road.
- There is no other formal underground stormwater infrastructure in the vicinity of the site.
- The architectural plans have made provision for a Green roof and lawns.
- Rainwater harvesting is proposed for the purposes of attenuating the stormwater runoff. 3 x 10,000 Litre Jojo tanks are proposed for this purpose.
- Stormwater Cutoff trenches are provided on the site to divert surface runoff around the building.
- A stormwater road cut-off trench with a subsoil drain is proposed to capture the stormwater runoff from the road.
- A slightly depressed section constructed out of stone riprap will be placed at the outlet of the headwalls and cutoff channels. This will assist in trapping sediment and discharging the stormwater runoff over a wider area, thus mitigating against erosion.
- The water quality volume will be treated using a combination of the stormwater cutoff trenches and jojo tanks. An additional 3 x 10,000 Litre Jojo tanks will be required for this purpose.
- A total of 6 x 10,000-litre Jojo tanks are proposed for the development.
- During construction, the contractor will need to implement erosion control measures that include, amongst others, the use of sandbags and silt fences.

Prepared by: SKYSOL CONSULTING ENGINEERS

Signature: A'kamps

Name: Emmanuel Akampurira Pr Eng

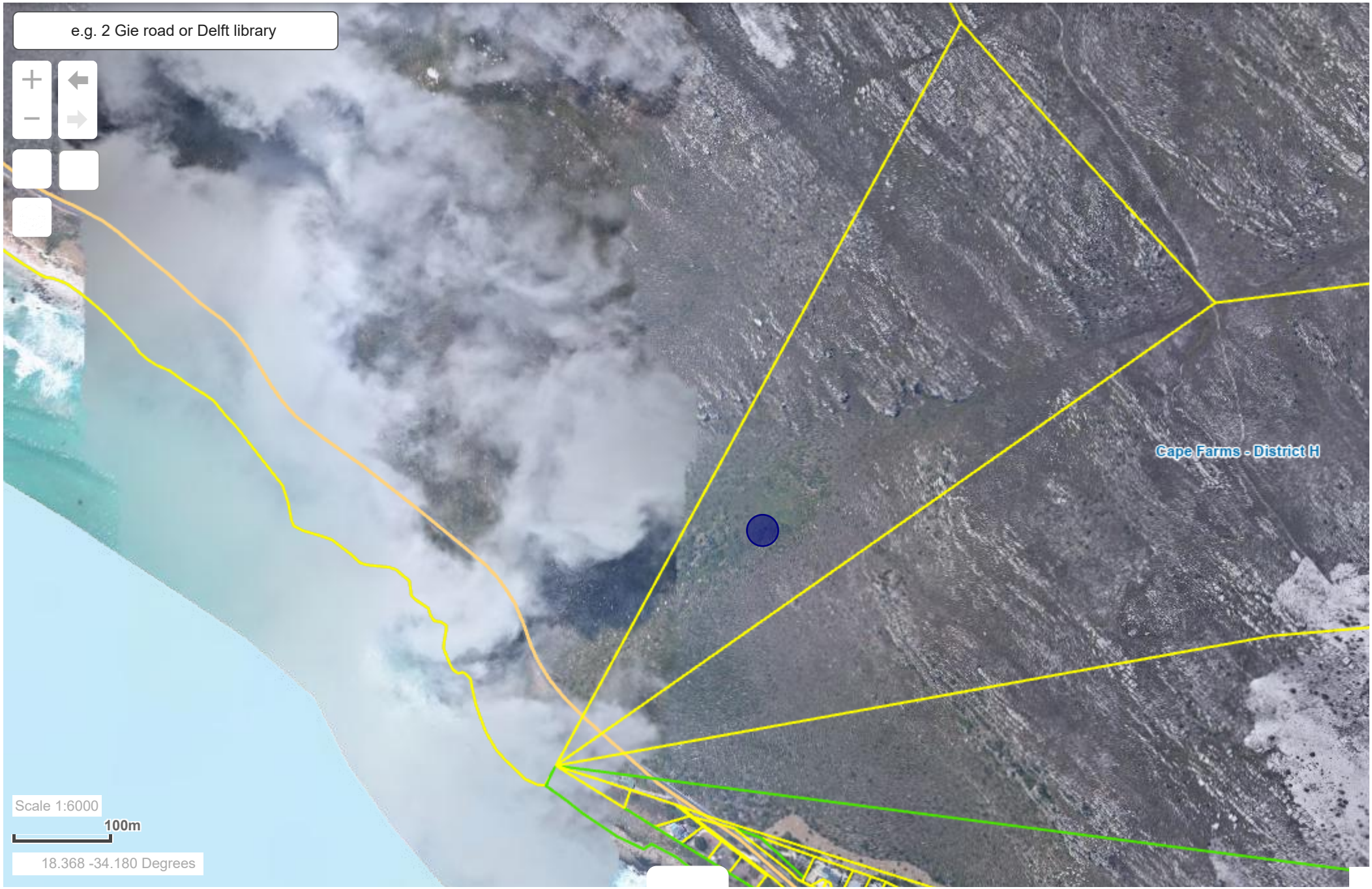
Designation Civil Engineer

Date: 27 October 202

APPENDIX

APPENDIX A
SITE LOCALITY SKETCH

City of Cape Town Map Viewer



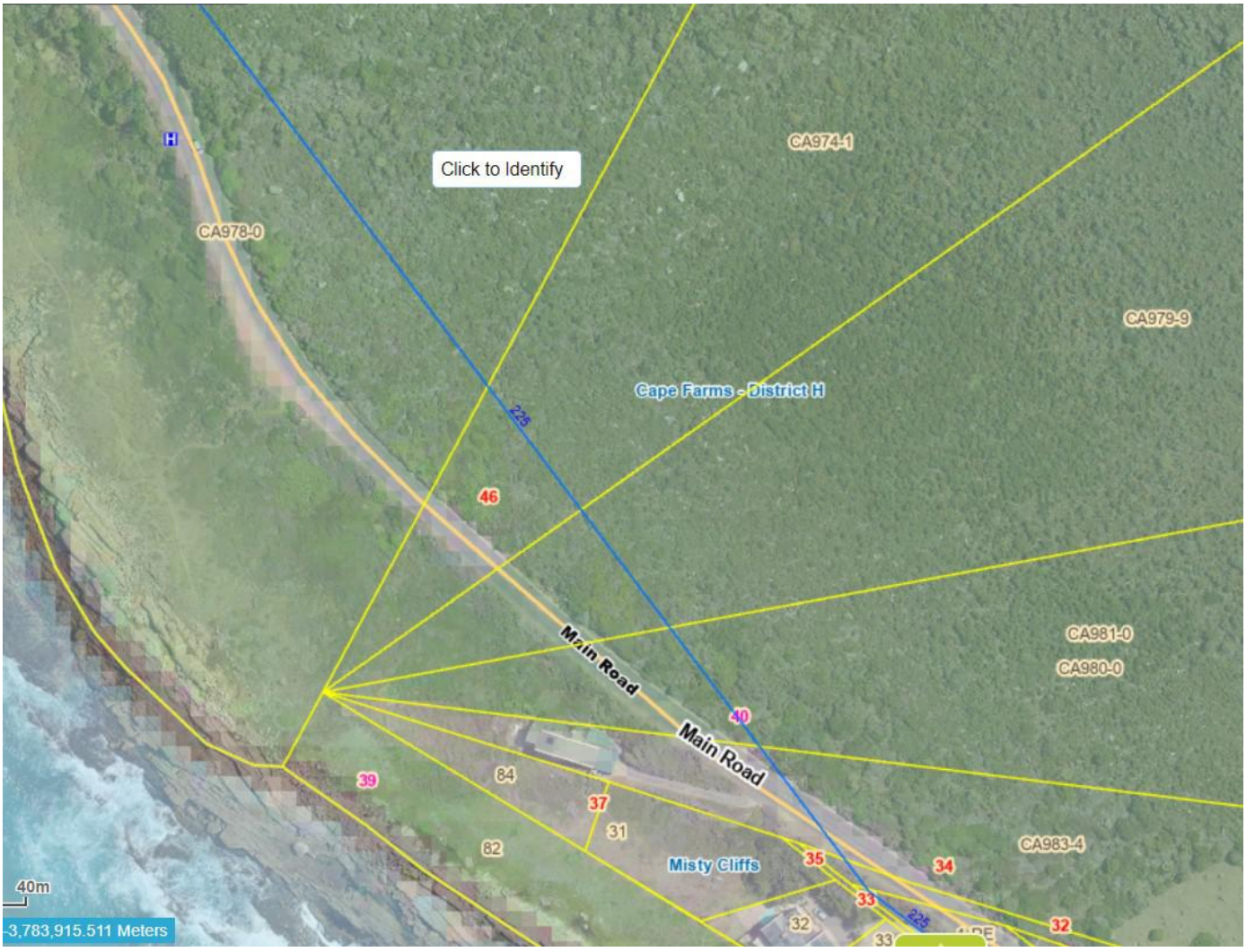
APPENDIX B
COCT WATER CORRESPONDENCE

Emmanuel Akampurira

From: Eva Muinamia <Eva.Muinamia@capetown.gov.za>
Sent: Thursday, 09 October 2025 13:21
To: Emmanuel Akampurira
Subject: RE: Erf CA974-1 Misty Cliff - Water Pipeline

Afternoon Emmanuel,

Our records indicate there is a 225mm Asbestos Cement crossing that area belonging to Reticulation, see snippet below:



We do not typically allow for any permanent structures to be built on top of the pipeline unless it is allowed for in the development approvals. There aren't any other smaller reticulation lines in the area.

Kind regards,

Eva Muinamia ***PrEng (Civil)***
Principal Professional Officer: Water Distribution – Region 1, Reticulation, Distribution Services, Water and Sanitation
Tel: 021 444 3608

From: Emmanuel Akampurira <Emmanuel@skysol.co.za>
Sent: Wednesday, October 8, 2025 8:26 AM
To: Eva Muinamia <Eva.Muinamia@capetown.gov.za>
Subject: Erf CA974-1 Misty Cliff - Water Pipeline

Good morning Eva

I am hoping one of you can assist or direct me to the right person.

We are in the early planning stages for a proposed residential house on the above erf.

There is a bulk water meter line that apparently runs through the property.

See the attached sketch.

1. Is it possible to confirm if this is a reticulation line or a bulk water line and the pipe diameter?
2. Would we be allowed to lower the line should the design require it? We will obtain permits and undertake exploratory excavations to determine the existing depth of the line.
3. Do you know what the pipe material is?
4. Do you know if you have a reticulation pipeline close to the site? We are trying to determine where we could obtain an erf connection for the house.
5. Is it possible to assist me with a screenshot of the GIS water services in the area?

Look forward to your guidance.

Regards
Emmanuel Akampurira *Pr Eng*
Director | Civil Engineer
SkySol Consulting Engineers
Cell: +27 76 934 8886
Tel: +27 64 545 0102
Email: emmanuel@skysol.co.za
Web: www.skysol.co.za

APPENDIX C
COCT SEWER CORRESPONDENCE

Emmanuel Akampurira

From: Chad Snell <Chad.Snell@capetown.gov.za>
Sent: Wednesday, 08 October 2025 08:38
To: Emmanuel Akampurira; Sewer Enquiries R1 Sewer
Cc: Andrew Taylor
Subject: RE: Erf CA974-1 Misty Cliff
Attachments: Erf CA974-1 Misty Cliff

Good morning Emmanuel,

Since we have do not have gravity services in the area our comment will state as such. COCT does service conservancy tanks as septic tanks are no longer supported.
Conservancy tank is private and to be maintained privately. COCT does offer a service request for this, but clients may use private services for disposal at their discretion.

The approval you need comes from:

1. BDM (building plan approval which will circulate to us for comment as our comment will be as stated above.
2. WPC (Water pollution control to comment on the below in support)

General guidelines in Conservancy tanks are as follows:

Conservancy Tanks

Installation to comply with conditions

The tank shall have a capacity of not less than-

I. 5400 litres, or

II. The maximum amount of sewage likely to be discharged into it over a period of 2 days, whichever of these figures is greater: provided that the capacity of the tank shall be an exact multiple of 5400 litres

The owner of the property served by such tank shall provide and maintain at his own expense a suitable road or other means of access to enable the vehicle used by the Council to empty such tank to reach and empty such tank, and any person contravening the provisions of this sub-regulation shall be guilty of an offence.

The tank shall not be less than 2m from the property boundary or any other structure.

NB. Suction hose max of 25m ie. Between truck and conservancy tank or suction point

Trust this answers the questions posed below.

Kind Regards,

Chad Snell
Regional Operations Manager Region 1: Reticulation (Sewer Infrastructure), Distribution Services, Water and Sanitation

Tel: 021 400 6608 | **Email:** chad.snell@capetown.gov.za | **Website:** www.capetown.gov.za
CCT Contacts | **Report Sewer Related Faults:** Water@capetown.gov.za | **WhatsApp**: 060 018 1505 | **Call Center:** 0860 103 089 | **SMS:** 31373

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD
Making progress possible. Together.

From: Emmanuel Akampurira <Emmanuel@skysol.co.za>
Sent: Wednesday, 08 October 2025 08:13
To: Chad Snell <Chad.Snell@capetown.gov.za>
Cc: Andrew Taylor <Andrew.Taylor@capetown.gov.za>
Subject: Erf CA974-1 Misty Cliff

Good morning Chad and Andrew

I am hoping one of you can assist.

We are in the early planning stages for a proposed residential house on the above erf.

As far as we know, there is no formal sewerage reticulation in the area.

We are planning to make allowance for a conservancy tank.

See attached sketch.

1. Please assist and let me know if this is appropriate for this area. In case I have missed a sewer in the area.
2. Secondly, are there any specific requirements from your department with regard to specifying a conservancy tank for the area?
3. Third – Do you know if the area is serviced by the CoCT cesspool tank services? The Conservancy tank will be located on the lower section of the property next to the road for ease of access.

Look forward to your guidance.

Regards
Emmanuel Akampurira *Pr Eng*
Director | Civil Engineer
SkySol Consulting Engineers
Cell: +27 76 934 8886
Tel: +27 64 545 0102
Email: emmanuel@skysol.co.za
Web: www.skysol.co.za

APPENDIX D
FOUL SEWER AND WATER LAYOUT

NOTES:

1. ALL LEVELS ARE IN METERS AND ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL MANHOLE COVERS TO BE CONSTRUCTED TO CONFORM TO ROAD OR WALKWAY LEVELS AND SLOPES.
3. POSITIONS AND LEVELS OF MANHOLES TO BE CONFIRMED ON SITE PRIOR CONSTRUCTION.

GENERAL NOTES:

1. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND LEVELS ON SITE AND TO CHECK THESE AGAINST THE DRAWINGS BEFORE PUTTING ANY WORK IN HAND.
2. ANY ERRORS, DISCREPANCIES OR OMISSIONS ARE TO BE REPORTED TO THE ENGINEER'S OFFICE IMMEDIATELY.
3. THE CONTRACTOR IS TO ENSURE THAT ALL WORK IS IN COMPLIANCE WITH THE RELEVANT AUTHORITIES REGULATIONS AND BYE-LAWS.
4. THE CONTRACTOR IS TO ENSURE THAT ALL MATERIALS AND WORKMANSHIP IS IN COMPLIANCE WITH THE RELEVANT SABS 1200 STANDARDS AND THE CONTRACT SPECIFICATIONS.
5. LEVELS BASED ON MSL DATUM.
6. CO-ORDINATES BASED ON WGS84 SYSTEM.
7. LOCATION OF MARKER POSTS FOR MAIN SERVICES TO BE DETERMINED ON SITE.
8. POSITION OF BENCHMARKS WILL BE INDICATED ON SITE.

FOR DISCUSSION ONLY

REV	DESCRIPTION	DR.	DATE
A	ISSUED FOR DISCUSSION	MJ	21 OCT 2025

CLIENT:
OWNERS ERF 974-1

PROJECT TITLE :
NEW DWELLING ERF 974-1
FARVIERN CAPE FARM

DRAWING TITLE :
FOUL SEWER AND WATER LAYOUT
OPTION 2

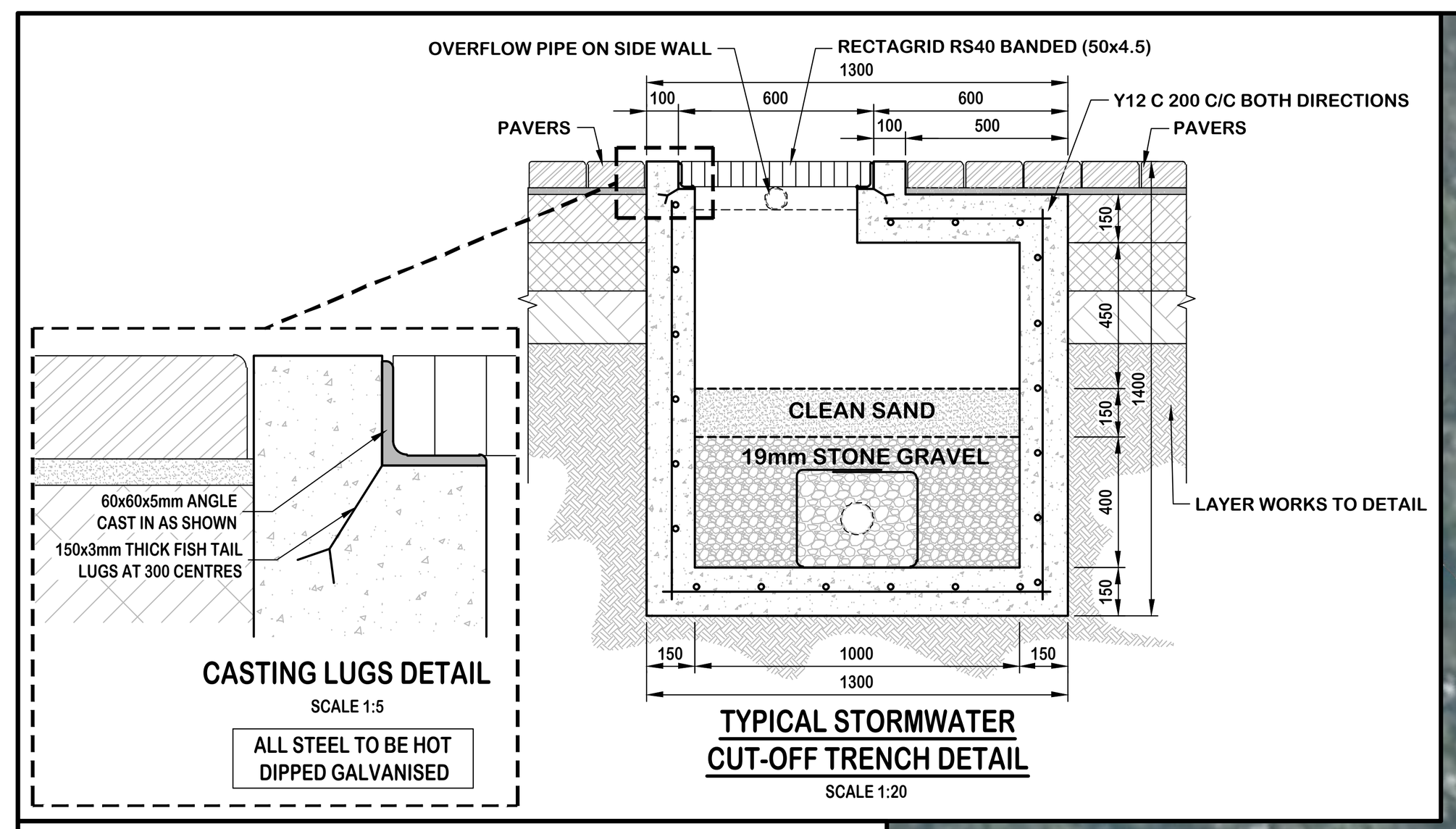
DESIGNED	DRAWN	CHECKED	APPROVED	DATE ISSUED
SvR	MJ	EA	EA	2025-10-21

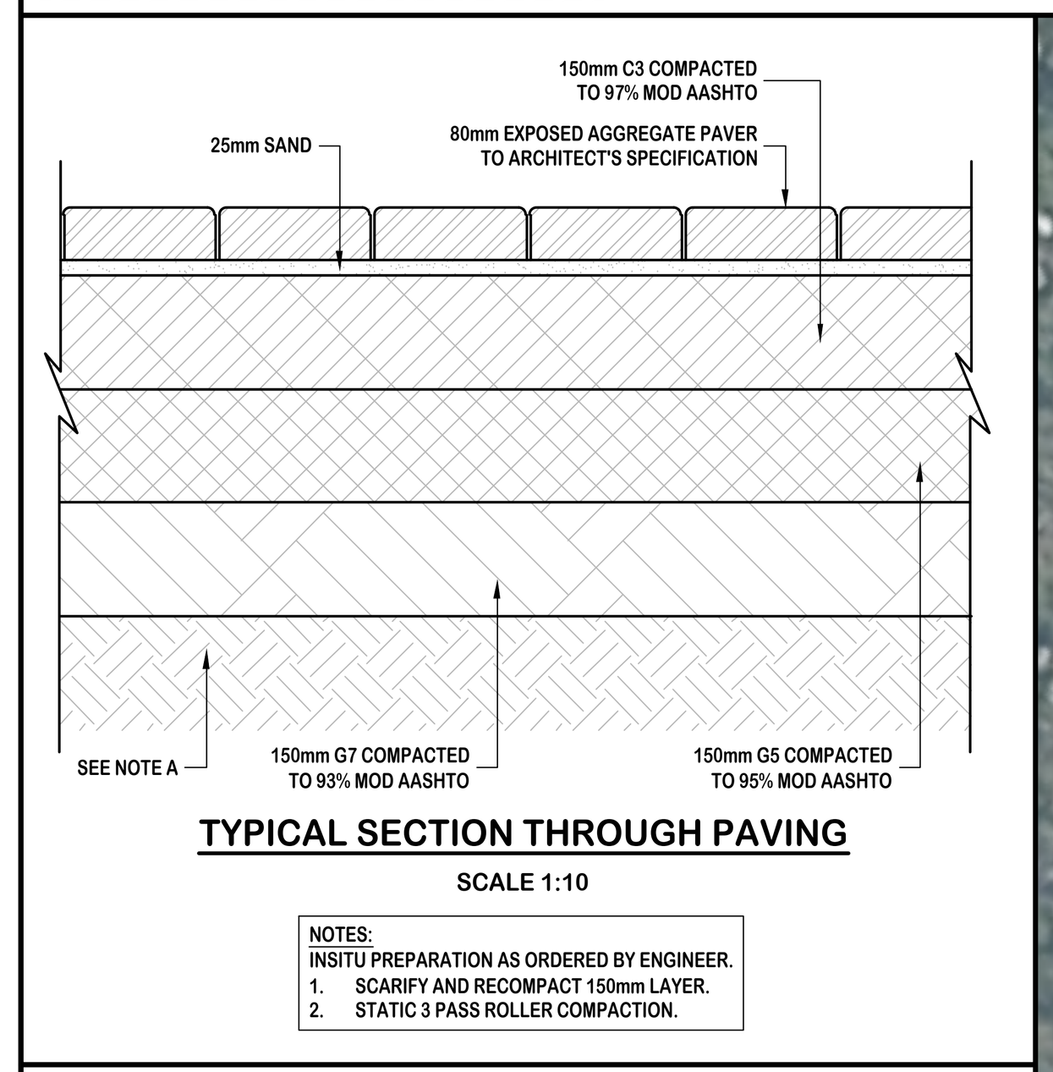
SKYSOL
CIVIL AND STRUCTURAL CONSULTING ENGINEERS
WE EXCEL WORKING TOGETHER

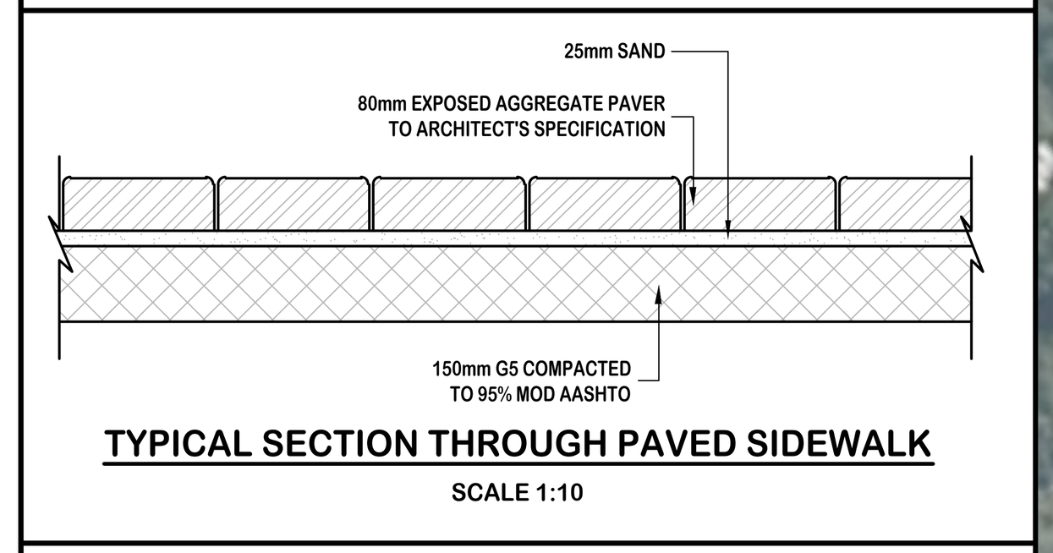
SCALE	DATE	SIZE
1:200	AUGUST 2024	A0

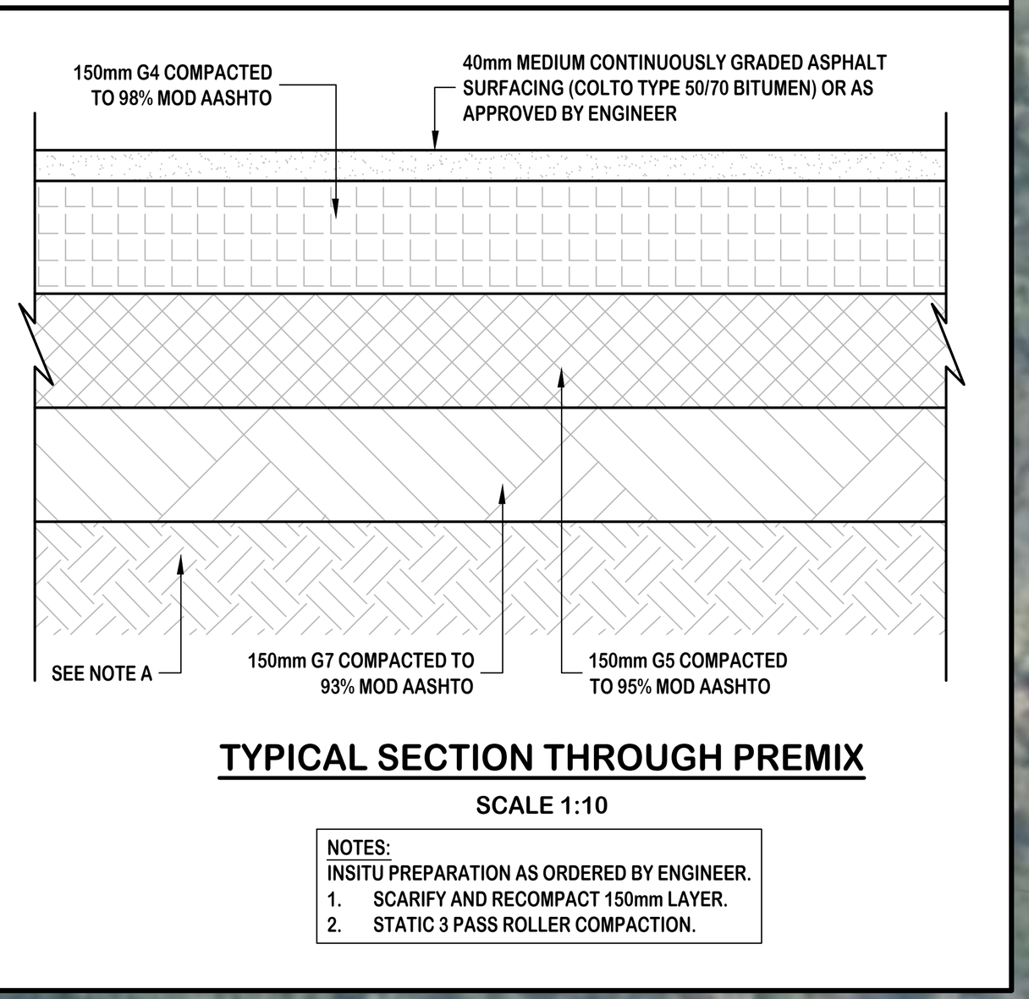
DRAWING NUMBER	REV
169-SS-210	A

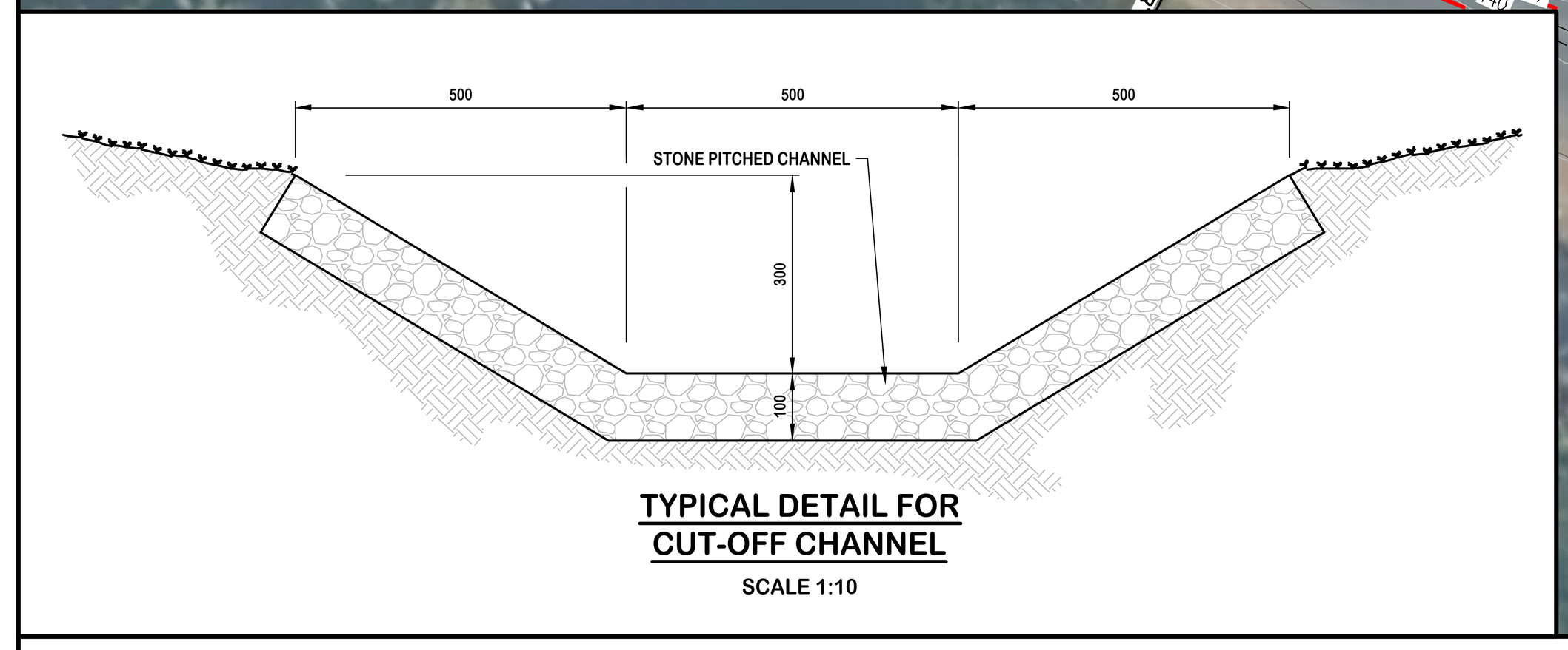
APPENDIX E
ROADS AND STORMWATER LAYOUT

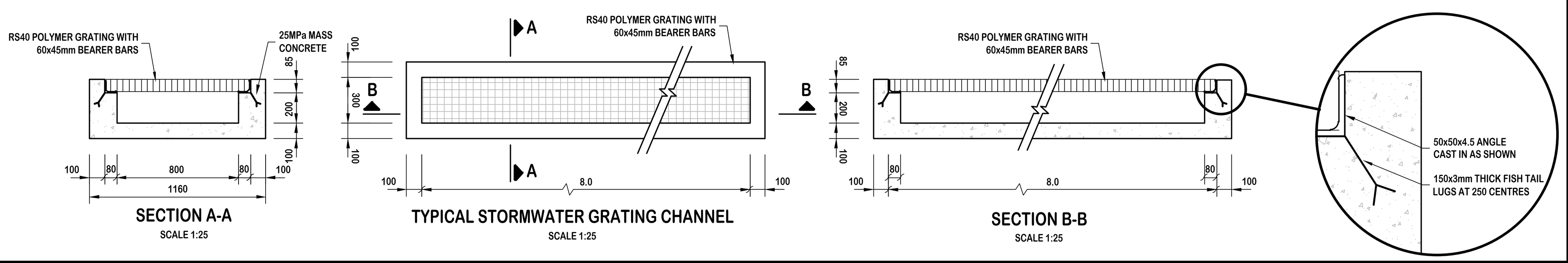












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8. POSITION OF BENCHMARKS WILL BE INDICATED ON SITE.

FOR DISCUSSION ONLY

REV	DESCRIPTION	DR.	DATE
A	ISSUED FOR DISCUSSION	MJ	21 OCT 2025

CLIENT: OWNERS ERF 974-1

PROJECT TITLE: NEW DWELLING ERF 974-1 FARVIERN CAPE FARM

DRAWING TITLE: ROAD AND STORWATER LAYOUT OPTION 2

DESIGNED	DRAWN	CHECKED	APPROVED	DATE ISSUED
SvR	MJ	EA	EA	2025-10-21

SKYSOL
CIVIL AND STRUCTURAL CONSULTING ENGINEERS
WE EXCEL WORKING TOGETHER

SCALE	DATE	SIZE
1:200	AUGUST 2024	A0

DRAWING NUMBER	REV
169-SS-208	A

REFER TO DRAWING 169-SS-206 FOR CROSS SECTION LAYOUT