



DRAFT ENVIRONMENTAL MANAGEMENT AND MAINTENANCE PROGRAMME

In terms of the **National Environmental Management Act** (Act No. 107 of 1998, as amended) & 2014 Environmental Impact Regulations as amended for:

PROPOSED UPGRADE OF THE BAYDUNES SEWER PUMP STATION, MOSSEL BAY

DEA&DP Reference: 16/3/3/6/1/D6/1/0134/23



PREPARED FOR THE APPLICANT:

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10 NOVEMBER 2023



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STATEMENT OF INDEPENDENCE

I, **Claire de Jongh**, in terms of section 33 of the NEMA, 1998 (Act No. 107 of 1998), as amended, hereby declare that I provide services as an independent Environmental Assessment Practitioner (EAPASA Reg: **2021/3519**) and receive remuneration for services rendered for undertaking tasks required in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), and the Environmental Impact Assessment Regulations, 2014 (as amended). I have no financial or other vested interest in the project.

EAP SIGNATURE: 



ENVIRONMENTAL MANAGEMENT PROGRAMME REQUIREMENTS:

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMP). The table below serves as a summary of how these requirements were incorporated into this Environmental Maintenance Management Plan (EMMP):

(1) An EMPr must comply with section 24N of the Act and include: -

<p>(a) Details of –</p> <ul style="list-style-type: none"> • (i) The EAP who prepared the EMPr; and (ii) The expertise of the EAP to prepare an EMPr, including a curriculum Vitae; 	<p>Appendix A</p>
<p>(b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</p>	<p>Section 3 and Section 5</p>
<p>(c) a map at an appropriate scale which superimposes the proposed activity, it associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</p>	<p>Appendix C</p>
<p>(d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –</p> <ul style="list-style-type: none"> (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities; 	<p>Section 5 and Section 6</p>
<p>(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to –</p> <ul style="list-style-type: none"> (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; 	<p>Section 6 and Section 9</p>



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<p>(ii) comply with any prescribed environmental management standards or practises;</p> <p>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and</p> <p>(iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;</p>	
<p>(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</p>	Section 8 and Section 9
<p>(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</p>	Section 8 and Section 9
<p>(i) an indication of the persons who will be responsible for the implementation of the impact management actions;</p>	Section 8 and Section 9
<p>(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;</p>	Section 8 and Section 9
<p>(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</p>	Section 8 and Section 9
<p>(l) a program for reporting on compliance, taking into account the requirements as prescribed by Regulations;</p>	Section 8 and Section 9
<p>(m) an environmental awareness plan describing the manner in which –</p> <ul style="list-style-type: none"> • <p>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</p> <p>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</p>	Section 8 and Section 9
<p>(n) any specific information that may be required by the competent authority.</p>	Draft EMMP



Glossary of Terms

BAR	Basic Assessment Report – A tool used by the EAP to submit to the competent authority if listed activities is triggered in Regulations GNR 327 and GNR 324 as per NEMA to make a decision regarding a proposed development.
CBA	CBA Critical Biodiversity Area – Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.
DEA&DP	Department of Environmental Affairs and Development Planning – the provincial authority for sustainable environmental management and integrated development planning.
DFFE	Department of Forestry, Fisheries and the Environmental – the national authority for sustainable environmental management and integrated development planning.
DWS	Department of Water and Sanitation – authority for issuing water use licenses / general authorisations within regulated areas
EAP	<p>Environmental Assessment Practitioner – An EAP and a specialist, appointed in terms of regulation 12(1) or 12(2) must –</p> <ul style="list-style-type: none"> (a) be independent. (b) Have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these regulations and any guidelines that have relevance to the proposed activity. (c) Ensure compliance with these Regulations (d) Perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application. (e) Take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; and (f) Disclose to the proponent or applicant, registered and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing – <ul style="list-style-type: none"> i. Any decision to be taken with respect to the application by the competent authority in terms of these regulations; or ii. The objectivity of any report, plan or document to be prepared by the EAP or specialist, in terms of these Regulations for submission to the competent authority; unless access to that information is protected by law, in which case it must be indicated that such protected information exists and is only provided to the competent authority.



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	<p>(2) In the event where the EAP or specialist does not comply with sub regulation (1)(a), the proponent or applicant must, prior to conducting public participation as contemplated in chapter 5 of these regulations, appoint another EAP or specialist to externally review all work undertaken by the EAP or specialist, at the applicants cost.</p> <p>(3) An EAP or specialist appointed to externally review the work of an EAP or specialist as contemplated in sub regulation (2), must comply with sub regulation (1).</p>
ECO	Environmental Control Officer – A site agent who needs to ensure that all environmental authorisation and conditions are adhered to during the construction phase of the project.
EMPr	Environmental Management Programme – can be defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced”.
ESA	Ecological Support Area – Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.
GA	General Authorisations - The General Authorisations allows for users/ potential water users to do certain limited water related activities/works. No water use licence required but must be registered with DWS.
I&AP	Interested and Affected Party/ies - in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42.
MMP	Maintenance Management Plan – means a maintenance management plan for maintenance purposes defined and adopted by the competent authority
NEMA	National Environmental Management Act (Act 107 of 1998) as amended 2017 – national environmental legislation that provides principles for decision-making on matters that affect the environment.
PA	Protected Area - A protected area is an area of land or sea that is formally protected by law and managed mainly for biodiversity conservation. Protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) (hereafter referred to as the Protected Areas Act) are considered formal protected areas in the NPAES. This is a narrower definition of protected areas than the International Union for Conservation of Nature (IUCN) definition.1 The NPAES distinguishes between land-based protected areas, which may protect both terrestrial and freshwater biodiversity features, and marine protected areas.



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Contents

1. INTRODUCTION	8
2. PURPOSE OF THE EMMP	8
3. PROJECT DESCRIPTION	8
3.1 LOCATION OF EXISTING PUMP STATION INFRASTRUCTURE	8
3.2 DESCRIPTION OF UPGRADE ACTIVITIES	10
3.3 OVERVIEW OF PROJECT AREA.....	11
4. PUBLIC PARTICIPATION	14
5. PHASES OF THE PROPOSED SEWER PUMP STATION UPGRADE	17
5.1 PLANNING PHASE.....	17
5.2 PRE-CONSTRUCTION PHASE	20
5.3 CONSTRUCTION PHASE.....	20
5.4 OPERATIONAL PHASE.....	21
5.5 CLOSURE AND DECOMMISSIONING PHASE	21
6. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES.....	21
6.1 ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE UPGRADE OF BAYDUNES SEWER PUMP STATION	22
7. LEGISLATIVE REQUIREMENTS	31
7.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA, ACT 107 OF 1998)	31
7.2 NATIONAL WATER ACT (ACT 36 OF 1998)	32
7.3 OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1983).....	32
8. EMMP ROLES AND RESPONSIBILITIES.....	32
8.1 PROJECT PROPONENT.....	33
8.2 ENVIRONMENTAL CONTROL OFFICER	33
8.3 ENGINEERS AND CONTRACTORS AND SUBCONTRACTORS	34
9. ENVIRONMENTAL MANAGEMENT PROGRAMME	35
10. CONCLUSION.....	46
APPENDIX A – EAP CV	
APPENDIX B – COMMENT FROM DEDEAP	
APPENDIX C –ENVIRONMENTAL SENSITIVITY MAPS, SITE PHOTOGRAPHS & HISTORICAL IMAGERY	
APPENDIX D – DESIGNS	
APPENDIX E- METHOD STATEMENT REPORT	

1. INTRODUCTION

Eco Route Environmental Consultancy has been appointed by **SMEC South Africa (Pty) Ltd** on behalf of the **Mossel Bay Municipality** to prepare an Environmental Maintenance Management Plan (EMMP) for the activities associated with the upgrading of Baydunes sewer pump station.

Confirmation was obtained from Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) that an Environmental Maintenance Management Plan (EMMP) will be the required process to obtain authorisation from DEA&DP prior to commencement of the proposed upgrade (Refer to **Appendix C**).

The draft EMMP will be subjected to a 30-day public participation commenting period, where the draft EMMP will be circulated to Interested and/or Affected Parties and made available on **Eco Route's** Website: www.ecoroute.co.za.

The Public Participation Process will be undertaken from 10/11/2023 – 11/12/2023

All comments received will be incorporated into a Comments and Response Report and submitted as part of the final EMMP to the DEA&DP for decision making.

2. PURPOSE OF THE EMMP

The purpose of this EMMP is to ensure that the negative environmental impacts of the proposed activities are managed, mitigated, and kept to a minimum during the planning, construction and operational phases of the proposed upgrade of the pump station. The EMMP focuses on avoiding damage or loss to ecosystems and the services they provide, and to enhance positive environmental impacts where possible.

The EMMP is a living document that is flexible and responsive to new and changing circumstances; however, should a change be made within the EMMP, permission from DEA&DP must first be obtained.

Once the EMMP is approved by DEA&DP it is seen as a legal binding document on the following affected parties:

- 1 Project Proponent (Mossel Bay Municipality)
- 2 All contractors
- 3 Sub-contractors and construction staff
- 4 The appointed ECO monitoring the construction phase.

Copies of this EMMP must be kept on site and all senior personnel are expected to familiarise themselves with the content of this EMMP.

3. PROJECT DESCRIPTION

3.1 LOCATION OF EXISTING PUMP STATION INFRASTRUCTURE

The existing Baydunes pump station consists of a wet well sump and a discharge valve chamber. The pump station falls on the boundary of Road Servitude RE/68 and Erf 2683 located east of the Baydunes Private Development in the Mossel Bay Municipality, Western Cape. An existing motor control centre (MCC) kiosk is situated on Erf 2963 located approximately 34 m west of the wet well chamber.

The pump station is located approximately 7.5m above mean sea level and falls within 100 meters of the highwater mark of the sea.

Central coordinates of existing pump station: 34° 8'33.12"S; 22° 6'40.48"E.

Central coordinates of MCC: 34° 8'32.61"S; 22° 6'39.29"E

Table 1: SG Codes of existing infrastructure

Existing pump station	Erf 2683	SG Code Public Place:	C05100040000268300000
	RE/68	SG Code Street Parcel:	C05100040000006800000
MCC Kiosk	Erf 2963 -	SG Code:	C05100040000296300000

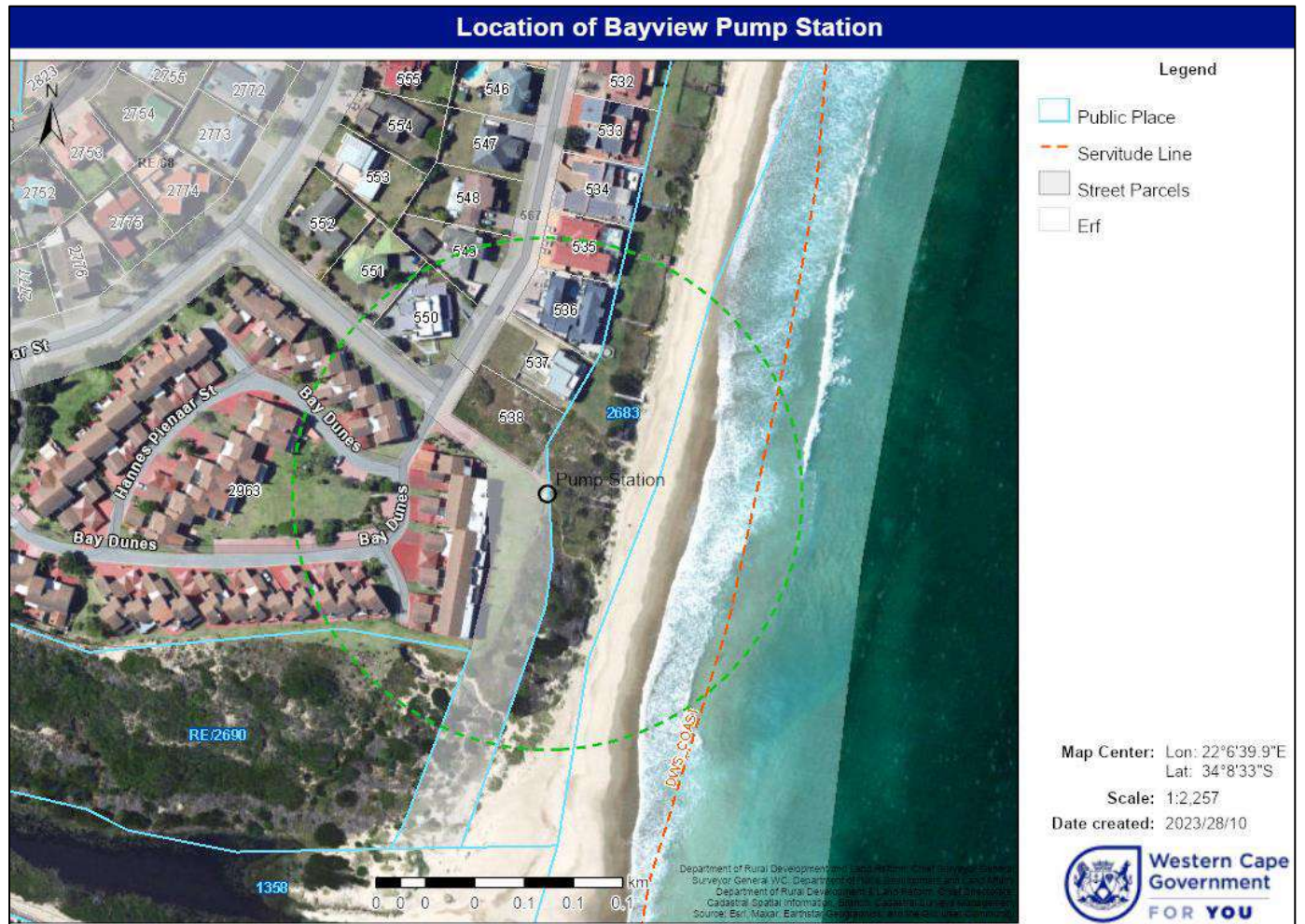


Figure 1: Location of pumpstation within 100 meters of highwater mark of the sea



Figure 2: Location of Pump station and MCC kiosk

3.2 DESCRIPTION OF UPGRADE ACTIVITIES

The need for the upgrade is due to frequent sewer blockages and spills occurring; when these sewer spills occur, it overflows directly into the ocean. It has been established that the pump intake level is higher than the gravity inflow invert level and this is the main contributor to the frequent sewage spills that occur on the upstream manholes.

The following works are proposed:

1. Convert the existing wet well sump to a sand and litter trap to increase pump efficiencies and to reduce wear and tear on pumps.
2. Construction of new wet well sump adjacent to existing sump using the caisson method to limit excavation footprint. This sump will be deeper than the existing one to allow for effective installation and operation of new pumps and to comply with the relevant standards and guidelines in terms of emergency storage capacity.
3. Install new submersible pumps to accommodate additional head and the current peak dry weather flow of 1.725 l/s. The current proposed pumps are CRi Pumps, Model MC-CC150-FD, with vortex impellers to allow for effective cleaning and solids handling inside wet well.
4. Construction of valve discharge chamber and flow meter for new wet well sump.
5. Demolish existing discharge chamber and spoil material off-site.
6. Minor repairs and upgrades will be completed on the existing electrical and communication instruments.

The existing wet well sump and new proposed wet well will have the same discharge point. The new wet well sump will be located on RE/68. Central coordinates of new wet well sump and pump station: 34° 8'33.17"S; 22° 6'40.31"E

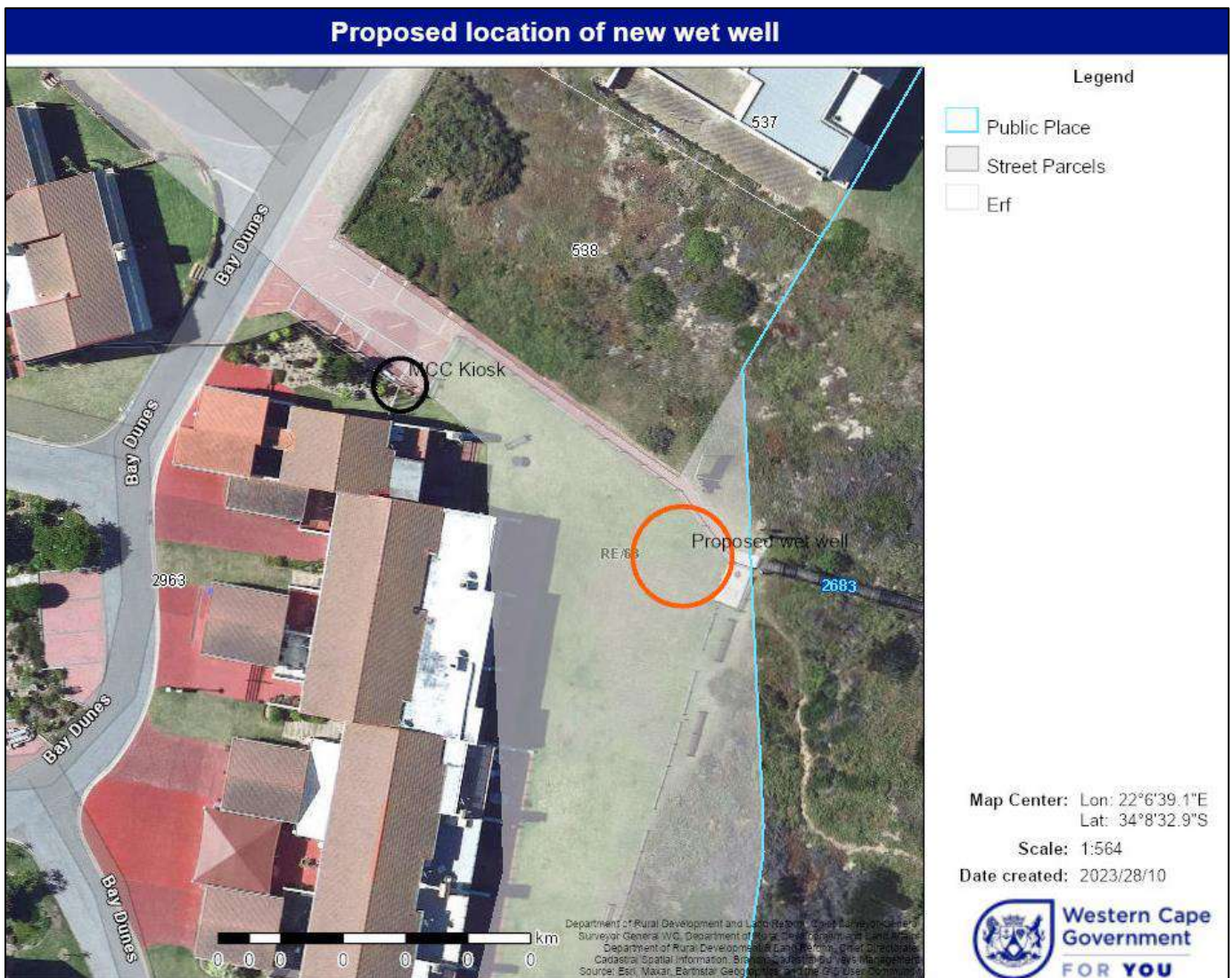


Figure 3: Location of proposed wet well adjacent to existing pump station

3.3 OVERVIEW OF PROJECT AREA

The proposed development site is located in close proximity to the beach and ocean.

In terms of the National Vegetation Map, 2012, Groot Brak Dune Strandveld is mapped on the site. In the more recent 2018 beta Vegetation Map, the vegetation on site has been remapped as Hartenbos Dune Thicket. Groot Brak Dune Strandveld has a conservation status of endangered (NBA, 2011). The proposed development site falls within a Category 1 Terrestrial Ecological Support Area (ESA) which is defined as an area not essential for meeting biodiversity targets but plays an important role in supporting the functioning of protected areas (PAs) or critical biodiversity areas (CBAs) and are often vital for delivering ecosystem services. The objective of an ESA is to *maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.*



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Figure 4: Site located in close proximity to ocean.



Figure 5: Groot Brak dune Strandveld (conservation status endangered, NBA, 2011) is historical vegetation mapped on development site (NatVeg, 2012)

In terms of watercourses, the site falls within 50 meters of NFEPA wetland. The wetland is described as a *channelled valley-bottom wetland* consisting of South Strandveld Western Strandveld wet vegetation group.



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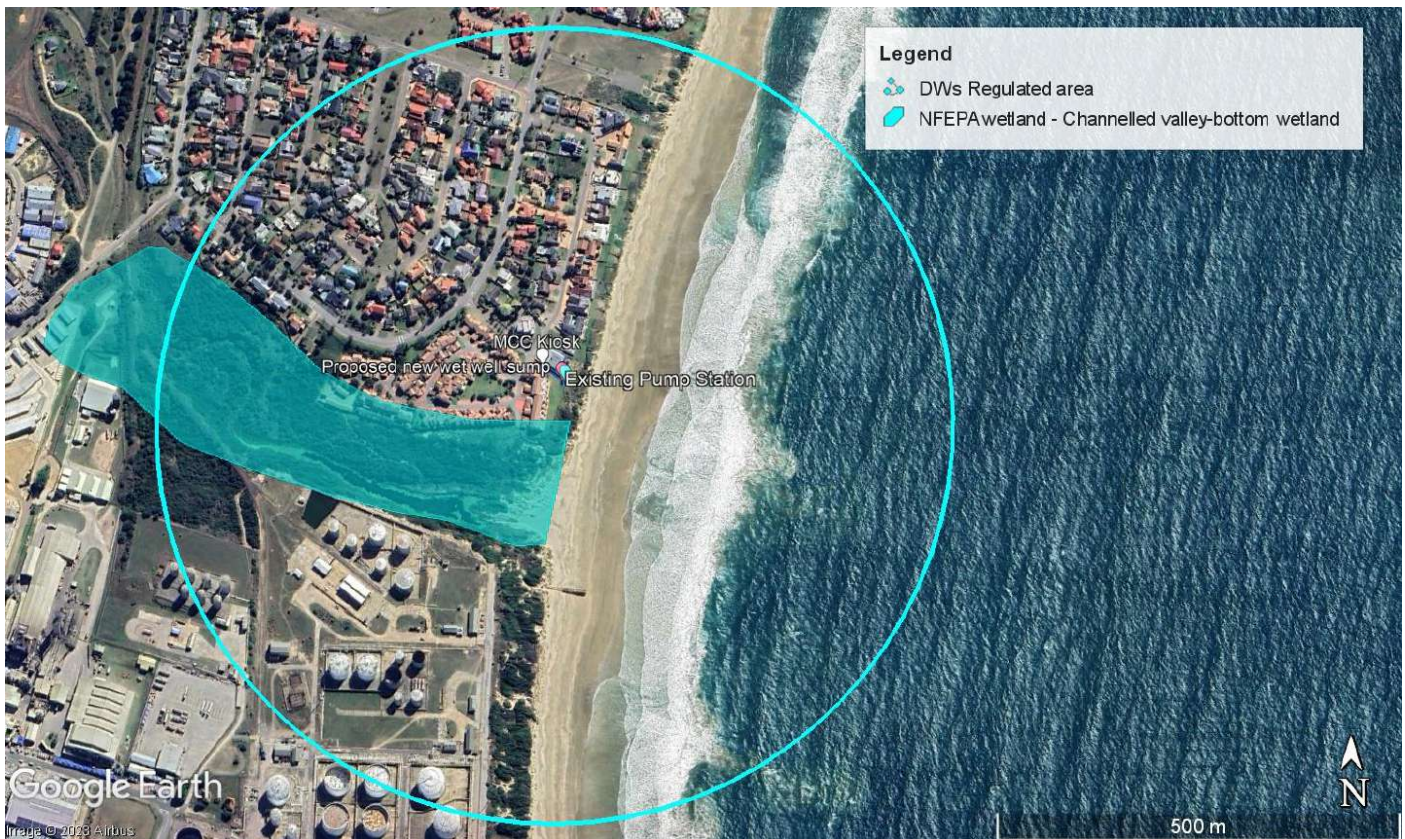


Figure 6: Site falls within 500 meters of NFEPA wetland.

A site visit has been carried out and no indigenous vegetation remains on the proposed development footprint. The proposed development footprint consists of established grass lawns. The existing gravity pipeline is located partially underneath some of the houses. The site is situated very close to a residential complex (Baydunes Development) and is located close to a walkway leading to the beach.

The vegetation occurring between the existing pump station and the beach, and, which falls outside the proposed development footprint, is representative of indigenous dune thicket and should not be disturbed by construction activities.



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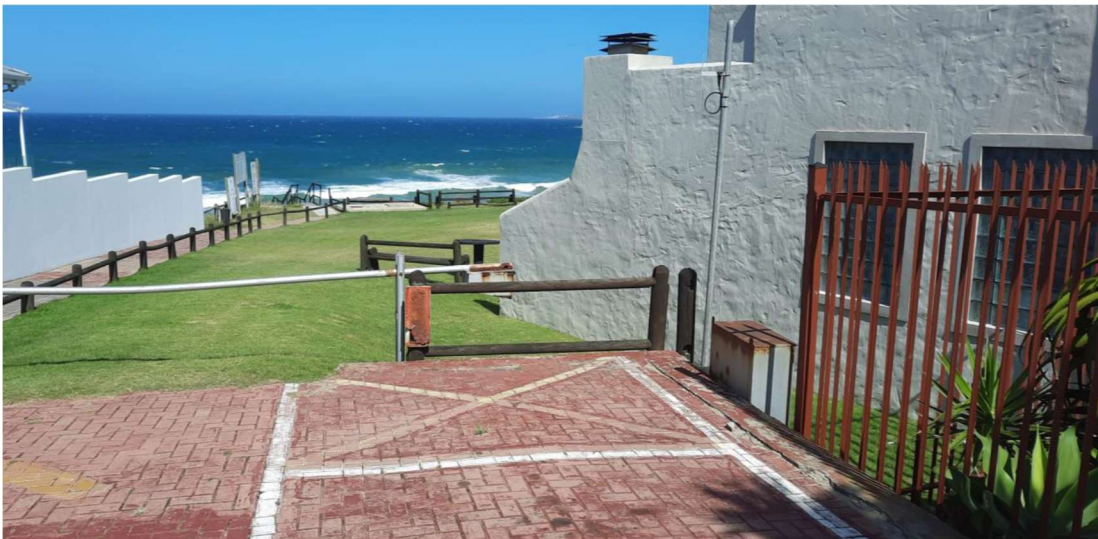


Figure 7: Site is adjacent to Bayview Development and consists entirely of landscaped grass; required electrical upgrades will be done within existing development footprint (i.e. along walkway)

4. PUBLIC PARTICIPATION

The draft EMMP will be subjected to a 30-day public participation during the planning phase to ensure that all negative environmental impacts are managed, mitigated, and avoided if possible. The draft EMMP will be circulated to State Departments, Municipalities, Organs of State and landowners and adjacent landowners for comments:

STATE DEPARTMENTS			
Name	Contact Person	Contact Details	Email
Department of Environmental Affairs and Development Planning (DEA & DP)	Danie Swanepoel Francois Naude Meryll Fredericks	Private Bag x6509, George, 6530 044 814 2013 (T)	Danie.Swanepoel@westerncape.gov.za Francois.Naude@westerncape.gov.za Meryll.Fredericks@westerncape.gov.za
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Heritage Western Cape	Noluvo Toto Stephanie Barnardt	Private Bag x9067, Cape Town, 8000 021-483 9729 (T) 021-483 9845 (F)	Noluvo.Toto@westerncape.gov.za Stephanie.barnardt@westerncape.gov.za
Transport & Public Works / Department of Infrastructure	Vanessa Stoffels	24 th Floor, 9 Lower Burg Street, Cape Town 021 483 4669 (T)	Vanessa.Stoffels@westerncape.gov.za
Department of Water & Sanitation	John Roberts	Private Bag x16, Sanlamhof, 7532 021 941 6179 (T) 021 941 6082 (F)	RobertsJ@dwa.gov.za
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DFFE: Oceans and Coast	Rueben Molale	Department of Forestry, Fisheries and the Environment (DFFE), Branch: Oceans and Coast, 2 East Pier Building, East Pier Road, Victoria and Alfred Waterfront, Cape Town, 8001.	RMolale@dfpe.gov.za OCeia@environment.gov.za



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ORGANS OF STATE

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Southern Cape Fire Protection Agency	Dirk Smit	Private Bag x12, Knysna, 6570 044 302 6912 (T) 086 616 1682 (F)	managerfpa@gmail.com
SANPARKS	Vanessa Weyer	PO Box 3542, Knysna, 6570 044 302 5600 (T) 044 382 4539 (F)	Vanessa.Weyer@sanparks.org

Mossel Bay Municipality (Applicant)

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Mossel Bay Municipality	Colin Puren Municipal Manager	044 606 5000 (T) 0446065062 (F) Postal: Private Bag X29, Mossel Bay, 6500 Physical: 101 Marsh Street, Mossel Bay	mmoffice@mosselbay.gov.za
Mossel Bay Municipality	Rushanah Carelse	044 606 5000 (T) 0446065062 (F) Postal: Private Bag X29, Mossel Bay, 6500 Physical: 101 Marsh Street, Mossel Bay	rcarelse@mosselbay.gov.za
Mossel Bay Municipality – Ward 10 Councillor	Leon van Dyk	Louis Fourie street 044 606 5159 (T)	lvandyk@mosselbay.gov.za
Garden Route District Municipality	Mr. Lusanda Menze	P.O. Box 12, George, 6530 044-8031300 (T) 0865556303 (F)	info@gardenroute.gov.za
Garden Route District Municipality	Dr. Nina Viljoen	P.O. Box 12, George, 6530 044-8031300 (T) 0865556303 (F)	nina@gardenroute.gov.za

Landowners

Farm / Erf No.	Contact Person	Postal/ Physical Address	Email
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Erf 2683 Public space Existing pumpstation	Mossel Bay Municipality Dawie Zwiigelaar	044 606 5000 (T) 044 606 5062 (F) Postal: Private Bag X29, Mossel Bay, 6500 Physical: 101 Marsh Street, Mossel Bay	dzwiigelaar@mosselbay.gov.za
Erf 2963 Baydunes MCC Kiosk	[REDACTED]		
RE/68 Road servitude Existing pumpstation Proposed pump station Sump & valve chamber	Mossel Bay Municipality Dawie Zwiigelaar	044 606 5000 (T) 044 606 5062 (F) Postal: Private Bag X29, Mossel Bay, 6500 Physical: 101 Marsh Street, Mossel Bay	dzwiigelaar@mosselbay.gov.za
Surrounding Landowners			
Farm / Erf No.	Contact Person	Postal/ Physical Address	Email
Erf 538 Adjacent north	[REDACTED]		
Erf 2963 Baydunes	[REDACTED]		
RE/ 2960 Public space Adjacent south	Mossel Bay Municipality Dawie Zwiigelaar	044 606 5000 (T) 044 606 5062 (F) Postal: Private Bag X29, Mossel Bay, 6500 Physical: 101 Marsh Street, Mossel Bay	dzwiigelaar@mosselbay.gov.za



Figure 8: Erven adjacent to project site (Cape Farm Mapper, 2023)

All comments and concerns will be addressed in a Comments and Response Report and attached to the final submission.



5. PHASES OF THE PROPOSED SEWER PUMP STATION UPGRADE

5.1 PLANNING PHASE

Design development has been carried out by SMEC on behalf of the Mossel Bay Municipality.

During the concept design phase, careful consideration was given to the following aspects:

- Overall safe and sound operation of the pump station,
- Accessibility and manoeuvrability inside the pump station wet well,
- Silt, sand, and debris build up inside the wet well,
- Safe storage and the prevention of spillages during load-shedding,
- Conformance to government regulations, environmental legislation,
- The interruption to the operations of the existing works,
- Operation and maintenance of the pump station.

An overview of the design of the project components based on the concept design report prepared by SMEC for the Mossel Bay Municipality is provided below. Designs are available in Appendix D of this draft EMMP.

1. Inlet Works

The concept design allows for the current wet well chamber to be converted into a sand trap and screening chamber which will have the following benefits:

- Effective removal of litter and debris will reduce the number of blockages in the pumps.
- Reduce the amount of sand going through pumps which will increase the service life of the pump and reduce maintenance on the pump and impeller.
- Reduced wear and tear on the impeller will ensure pumps operate at maximum efficiencies which will reduce operating costs.

2. Pumps and piping

- There will be no alterations to the existing rising main pipeline and thus the pipe length and height difference is already determined.
- To ensure constant sump level and efficient electricity consumption, Variable Speed Drives (VSD) have been included in the design. VSDs are used for adjusting flow or pressure to the actual demand. They control the frequency of the electrical power supplied to pumps and this could have significant power savings over the lifecycle of the pumps.
- The discharge chamber will be separate from wet well chamber.
- The discharge chamber will have a free draining stormwater pipe to inlet works including a Non-return valve to prevent sewage backflow into discharge chamber.
- Flow to the rising main will be controlled using isolating and non-return valves which will be placed on each of the pump discharge pipes from the inside of the wet well and will be in the discharge chamber.

3. Wet Well Infrastructure

The concept design has been based on best practices, taking into consideration the current wet well infrastructure, the current position of the existing wet well in relation to the new proposed wet well, the surrounding area which is limited in space, and the well-established lawns, geology of the area, environmental considerations, and the safest construction methods.

Discharge Chamber

- The discharge chamber will consist of a 200mm thick concrete floor, 230mm double brick walls and a 200mm thick concrete cover slab.



- The cover slab shall be fitted with a double-seal lockable manhole cover and frame.
- Pipework in the discharge chamber shall be fitted on suitable concrete pedestals.
- The discharge chamber will be sized to allow a minimum free passage for operations and cleaning and maintenance equipment.
- A flow meter will be installed inside the discharge chamber that reads the collective flow from the pump station to the discharge point.

Wet Well Sump

- The wet well sump will consist of a 300mm thick reinforced concrete floor, 2400mm internal diameter concrete rings with a 200mm wall thickness and a 200mm thick concrete cover slab.
- The cover slab shall be fitted with a double-seal lockable manhole cover and frame and two 900mm x 600mm galvanised steel lockable cover and frames.
- The wet well will be fitted with a galvanised steel cat ladder and cage.
- Pipework in the wet well shall be stainless steel 316 and secured to the concrete using stainless steel pipe brackets.
- The wet well sump will be epoxy lined using Sikaguard 720 & 63N. The epoxy lining shall be completed up to half of the sump.
- Stainless steel Air vents shall be installed on the wet well cover slab.
- The water levels in the wet well will be controlled using an ultra-sonic level controller installed on the bottom of the cover slab. It is envisaged that the existing ultra-sonic in the existing pump station to be moved to the new wet well and reconfigured. Additional float switches are also proposed to mitigate the risk should the ultra-sonic level sensor fail during pumping operations.

4. Electrical Requirements

- The feed and size of cable to the MCC kiosk and exact route of the cabling from the MCC to the existing wet well to be determined during construction phase. It is envisaged that only minor cabling will be required from the MCC to the new proposed wet well. It is further envisaged that minor repairs and updates will be required on the existing electrical and communication instruments.

5. Access to development site

Access to the site will be gained through Hannes Pienaar and Bob Boucher Cres then towards parking area in corner of Bob Boucher Cres. The construction works area will be accessed through an existing boom gate located at the end of the parking area.

6. Construction site development footprint

The total work area of the site will be approximately 503m². The work area will be completely fenced off during construction.



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Figure 9: Access and construction works footprint.



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5.2 PRE-CONSTRUCTION PHASE

The following will be required to be in place prior to the start of construction:

1. Permission from the DEA&DP
2. Registration of activity for General authorisation from the DWS for activities within 500 meters of a wetland
3. Appointment of contractor from client.
4. Appointment of Health and Safety Officer by client
5. Appointment of ECO by client
6. Health and safety file prepared and approved by appointed Health and Safety Officer.
7. Method statement and site plan approved by appointed ECO.

The following will be required to be carried out prior to the start of construction:

1. 14-day notice to the DEA&DP that construction will commence.
2. All personnel on site must be inducted by the appointed ECO.
3. All personnel on site must be familiar with the approved EMMP.

5.3 CONSTRUCTION PHASE

Construction is estimated to take no more than 4 months to complete.

The construction phase will entail the following scope of works:

1. Establishment of Contractor on-site.
2. Lift, remove and neatly stockpile existing grass for re-planting when works are finish.
3. Installation of precast concrete rings using the Caisson method.
4. Install precast concrete cover slab.
5. Construct new discharge chamber.
6. Installation of mechanical and electrical components.
7. Re-configure pipework and connect to existing rising main.
8. Refurbish existing MCC kiosk.

A method statement Report has been prepared by SMEC and attached as Appendix E.



Figure 10: General layout of construction activities

5.4 OPERATIONAL PHASE

Maintenance activities required to be carried out during the operational phase should ensure compliance with the EMP detailed in Section 9 of this EMMP.

5.5 CLOSURE AND DECOMMISSIONING PHASE

Should it be decided at some stage to decommission the infrastructure associated with the upgraded sewer pump station, the proponent is required to abide with the relevant legislations and environmental laws during that period.

6. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

An environmental impact can be defined as an effect or consequence that a development or activity will have on economic, social and ecological processes.

There are mainly three categories of environmental impacts:

Direct Impacts: These are caused by the development/activity itself on the receiving environment.

Indirect Impacts: These impacts are usually linked closely with a project and may have more profound results than the direct impacts, for example: clearing indigenous vegetation outside of the approved existing footprint as a result of the construction of the access road.

Cumulative impacts: These impacts can be defined as the ability of natural and social environments to incorporate cumulative stresses placed on them and the likelihood of negative synergistic effects. Cumulative impacts also arise when existing or future development rights set a precedent in an area. The process of cumulative impacts may arise from any of the following events:

- A single large event,
- Multiple interrelated events
- Sudden or catastrophic events or incremental change



The objectives of management of impacts are to:

- Protect the receiving environment against degradation as a result of construction and operational activities.
- Identify mitigation measures to minimize each identified impact before the impact even occurs.
- Ensure the mitigation measures are appropriate, cost effective and financially feasible.
- Avoid, minimise, or remedy adverse impacts.
- Ensure that residual impacts are within acceptable levels.
- Monitor the effectiveness of mitigation measures.
- Take action when unforeseen impacts occur.
- Have contingency plans at hand should an unforeseen event occur.

6.1 ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE UPGRADE OF BAYDUNES SEWER PUMP STATION

The proposed upgrade will take place on an existing pump, existing NCC and on a landscaped grassed area. Based on the receiving environment and project proposal the following potential impacts are identified:

Planning Phase:

- No environmental impacts are expected to occur during the planning phase of the project.

Construction and operational phase:

Construction refers to the upgrade of the sewer pump system.

Operation refer to maintenance activities required to be carried once the sewer system has been upgraded.

Potential impacts identified:

1. Disturbance to indigenous flora and fauna
2. Soil erosion and dust impacts and air quality
3. Contamination of soil, surface water and groundwater
4. Archaeology and paleontology
5. Noise impacts
6. Visual impacts
7. Traffic impacts
8. Employment creation
9. Fire risk

Decommissioning and Closure Phase:

- Should it be decided at some stage to decommission the infrastructure associated with the upgraded sewer pump station, the proponent is required to abide with the relevant legislations and environmental laws during that period.

Existing baseline impacts resulting from frequent spillages will continue to occur until the system is upgraded.



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Impact 1:	Indigenous fauna and flora																																																																																							
Nature of impact:	Direct, indirect, and cumulative																																																																																							
Description of fauna and flora	<p>The site is situated very close to a residential complex (Baydunes Development) and is located close to a walkway leading to the beach. The proposed development footprint consists entirely of established grass lawns; no indigenous vegetation remains on the proposed development footprint. The existing gravity pipeline is located partially underneath some of the houses.</p> <p>The vegetation occurring between the existing pump station and the beach, and, which falls outside the proposed development footprint, is representative of indigenous dune thicket and should not be disturbed by construction activities. Alien invasive plants and weeds must be removed on an ongoing basis during construction phase to avoid infestation and displacement of surrounding intact vegetation.</p> <p>No fauna or flora species protected under the NEMBA – Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List (14 December 2007), occur on site. No protected trees listed under the National Forests Act, 1998 (Act No. 84 of 1998) (updated 8 September 2017), occur on site. As a precautionary approach, search and rescue should be carried out at the site development footprint prior to start of construction. Protected plants and trees require permits from the relevant authorities i.e., DEA&DP and DAFF, prior to their disturbance (which includes the trimming of branches of protected trees), removal, and / or transplantation.</p>																																																																																							
Description of impact	<p>The proposed upgrade occurs within an existing development footprint and landscaped grassed area. Construction phase is unlikely to have any significant or lasting impacts on indigenous fauna and flora.</p> <p>With mitigation measures in place the impact of the proposed development on indigenous fauna and flora is expected to be very low to negligible.</p> <table border="1" data-bbox="300 891 1481 1512"> <thead> <tr> <th rowspan="2">Impact Status</th> <th colspan="2">Negative Impact</th> <th colspan="2">Negative Impact</th> </tr> <tr> <th colspan="4">Impact significance</th> </tr> <tr> <th rowspan="2">Impact Criteria</th> <th colspan="2">Without mitigation</th> <th colspan="2">With mitigation</th> </tr> </thead> <tbody> <tr> <td>Extent (Spatial)</td> <td>Site</td> <td>2</td> <td>Activity</td> <td>1</td> </tr> <tr> <td>Duration</td> <td>Very short</td> <td>1</td> <td>Very short</td> <td>1</td> </tr> <tr> <td>Frequency</td> <td>Seldom</td> <td>2</td> <td>Rare</td> <td>1</td> </tr> <tr> <td>Intensity</td> <td>Low to medium</td> <td>2</td> <td>Low</td> <td>1</td> </tr> <tr> <td>Severity (duration+frequency+intensity)</td> <td>Low</td> <td>5</td> <td>Negligible</td> <td>3</td> </tr> <tr> <td>Consequence (Severity+extent)</td> <td>Low</td> <td>6</td> <td>Negligible</td> <td>4</td> </tr> <tr> <td>Probability</td> <td>Probable</td> <td>4</td> <td>Slight</td> <td>2</td> </tr> <tr> <td>Impact Significance</td> <td>Low</td> <td>10</td> <td>Low</td> <td>6</td> </tr> <tr> <td>Mitigation</td> <td colspan="4">Possible</td> </tr> <tr> <td>Confidence</td> <td colspan="4">High</td> </tr> <tr> <td>Degree to which the impact can be reversed:</td> <td colspan="4">High</td> </tr> <tr> <td>Degree to which the impact may cause irreplaceable loss of resources:</td> <td colspan="4">Low</td> </tr> <tr> <td>Cumulative impact prior to mitigation:</td> <td colspan="4">Alien invasive plant and weed infestation can result in displacement of surrounding intact vegetation.</td> </tr> <tr> <td>Cumulative impact post mitigation:</td> <td colspan="4">Revegetation with grass to take place as soon as construction / maintenance activity is completed.</td> </tr> </tbody> </table>				Impact Status	Negative Impact		Negative Impact		Impact significance				Impact Criteria	Without mitigation		With mitigation		Extent (Spatial)	Site	2	Activity	1	Duration	Very short	1	Very short	1	Frequency	Seldom	2	Rare	1	Intensity	Low to medium	2	Low	1	Severity (duration+frequency+intensity)	Low	5	Negligible	3	Consequence (Severity+extent)	Low	6	Negligible	4	Probability	Probable	4	Slight	2	Impact Significance	Low	10	Low	6	Mitigation	Possible				Confidence	High				Degree to which the impact can be reversed:	High				Degree to which the impact may cause irreplaceable loss of resources:	Low				Cumulative impact prior to mitigation:	Alien invasive plant and weed infestation can result in displacement of surrounding intact vegetation.				Cumulative impact post mitigation:	Revegetation with grass to take place as soon as construction / maintenance activity is completed.			
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Mitigation Measures	<ul style="list-style-type: none"> As a precautionary approach, search and rescue should be carried out at the site development footprint prior to start of construction. If relevant, protected plants and trees require permits from the relevant authorities i.e., DEA&DP and DAFF, prior to their disturbance (which includes the trimming of branches of protected trees), removal, and / or transplantation. Basic environmental awareness training to be provided to contractors / sub-contractors on fauna and flora. The applicant must ensure that the construction footprint is limited to the pre-demarcated construction area. The Contractor must restrict all activities, materials, equipment, and personnel within the area specified or restricted activities to areas that are necessary to undertake the work. Surrounding vegetation in undeveloped adjacent areas may not be used as laydown areas or disturbed in any way. Compile plan of site (including map) showing various activity zones, access point, track, stockpile areas, ablution facilities, waste management area, laydown area, site office etc. Do not exceed footprint of activity with regards to vegetation removal. Vegetation disturbance is to be limited to that which is absolutely necessary. Physical damage to natural vegetation on the periphery of the construction activity is to be avoided. Lift, remove and neatly stockpile existing grass for re-planting when works are finish. Movement of workers must be limited to areas under construction. Access to surrounding coastal area is not permitted; these must be designated as no-go areas during construction. 																																																																																							



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	<ul style="list-style-type: none"> Excavated materials to be re used as far as possible (i.e. as fill material); excavation materials not re-used are to be removed as quickly as possible from the area and disposed at an appropriately licensed waste site. No dumping of any materials on surrounding vegetation is allowed. Gathering of plants on adjacent areas to the sites should not be permitted. Contractual fines to be imposed on any employee who is found attempting to remove indigenous flora from surrounding open space areas. No stockpiling to occur outside the site development footprint. No harm to fauna permitted. Alien invasive plant species and weeds occurring as a result of construction and maintenance must be carefully removed and monitored. Revegetation with grass to take place as soon as construction / maintenance activity is completed. On completion, the site must be re-vegetated with grass and monitored until 100% coverage is established. Construction and operational maintenance activities to be monitored by an ECO.
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Impact 2:	Soil erosion and dust generation																																																																																			
Nature of impact:	Direct and cumulative																																																																																			
Description of soil	The soil on the site can be described as coastal calcareous sandy soil and is therefore highly susceptible to erosion by wind and water and dust generation. The site is situated very close to a residential complex (Baydunes Development) and is located close to a walkway leading to the beach.																																																																																			
Description of impact	Removal of vegetation will expose the sandy soil increasing the likelihood of erosion and dust generation. The development footprint of the new wet well is estimated at 50m ² (including upgrading of electrical cabling if required). The construction laydown area is estimated at 500m ² . Due to the close proximity of the site to residential houses and the beach, and the high susceptibility of the area to erosion, the impact is considered to be negative of medium significance with no mitigation in place. With mitigation in place, the impact can be reduced to a low significance. The construction phase is expected to be completed within 4 months. Vegetation cover must be fully restored once construction activities are completed.																																																																																			
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Mitigation Measures	<ul style="list-style-type: none"> Basic environmental awareness training to be provided to all personnel prior to the start of construction with regards to suitable measures to be carried out to prevent dust generating and air polluting activities. The topsoil shall be stripped to a minimum depth of 150mm. The topsoil be place in a designated stockpile area. Stockpile topsoil and subsoil separately. The stockpile must be kept near optimum moisture content and should be protected from rain and flooding to remain as close as possible to optimum moisture content to ensure proper compaction without having to add water when placed. Cognisance of rainfall events should govern all operations. Construction activities should be timed to avoid periods of high rainfall and should be avoided during wet weather conditions. Appropriate stormwater management methods must be assessed prior to construction clearance and will need to take into consideration the susceptibility of the area to erosion. Stormwater management methods may include silt traps, sand bags, branch packing. 																																																																																			



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	<ul style="list-style-type: none"> Material from excavation activities will as far as possible be used on-site as fill material. Excess excavated material that cannot be used in this way will be exported from the site and used in construction activities elsewhere in the municipal area or disposed of at an appropriately licensed waste disposal facility. Any soil stockpiles should be covered and wetted and stabilised to prevent wind erosion and dust generation. As necessary, dampen exposed areas on very windy days to prevent soil erosion by wind and dust generation. A water cart or sufficient watering equipment should be available to wet soils during windy days. During strong wind conditions it may be necessary to halt operations until conditions improve. An incident/complaints register must be established and maintained on-site. Corrective action must be undertaken immediately if a complaint is received regarding dust / erosion. Once structures and infrastructure are in place, rehabilitate with grass and monitor until 100% coverage is established Construction and operational maintenance activities to be monitored by an ECO.
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Impact 3:	Contamination of soil, surface water and groundwater																																																																																							
Nature of impact:	Direct																																																																																							
Description of soil and water	<p>The upgrade will take place on existing sewer infrastructure and a new wet well and sump will be installed on an area adjacent to the existing infrastructure which consists entirely of established grass lawns. The well is proposed to be 11 meters deep. The development site falls within 500 meters of an NFEPA Channelled valley-bottom wetland occurring south west of the site and therefore falls within an area regulated by the Department of Water and Sanitation. A risk assessment matrix for the proposed upgrade has been completed by a SACNASP professional member as required in terms of GN 509 published in Government Gazette (GG) no. 40229 under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016. The upgrade taking place in the regulated zone was found to be a low-risk class activity. A general authorisation (GA) for Section 21(c) and (i) water uses will be registered with the DWS. Conditions of the GA relevant to the upgrade works will be required to be implemented.</p> <p>The site is located in very close proximity to the beach. Dune sand will be the prevailing material type with possible bedrock closer to the invert and foundation level.</p>																																																																																							
Description of impact	<p>During construction and when carrying out maintenance activities, various materials, such as diesel, oils and cement, and waste and sewage materials, could pose a threat if by chance it is dispersed onto the soil or via surface run-off into soil, water and surrounding beach environment, or are allowed to permeate through the soil.</p> <p>Without mitigation, localised contamination of soil and pollution of water is possible. Should the construction site be managed properly, the introduction of any pollutants would likely be limited. This would result in an overall low significance. Mitigation measures will need to be implemented for management of hazardous materials, waste and sewage.</p>																																																																																							
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Mitigation Measures	<ul style="list-style-type: none"> Detailed designs of all project components must be approved prior to commencement of construction. A general authorisation (GA) for Section 21(c) and (i) water uses to be registered with the DWS. Conditions of the GA relevant to the upgrade works will be required to be implemented. 																																																																																							



Eco Route

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- Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste, and contaminated waste, sewage, fuels, hazardous substances. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control.
- Contractors must provide specific detailed waste management plans to deal with all waste streams.
- Ablution and/or sanitation facilities must be provided for the workers/ contractors during construction phase and adequately secured, serviced and maintained for the duration of construction. 1 toilet for every 10 workers to be provided.
- Bins and skips must be available at the construction site for collection, separation and storage of waste streams. Where possible, construction and general wastes on-site must be reused or recycled.
- Under no circumstances may solid waste be burnt or buried on site.
- Hazardous and non-hazardous waste must be separated at source. Separate waste collection bins must be provided for this purpose. These bins must be clearly marked and appropriately covered.
- Transport of all hazardous substances must be in accordance with the relevant legislation and regulations.
- Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal. Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.
- Documentation (waste records) must be maintained detailing the quantity, nature and disposal of any hazardous waste.
- All solid waste collected must be disposed of at a registered waste disposal site. A certificate of disposal must be obtained and kept on file and be made available for review at any time.
- Emergency plans must be in place in case of spillages; any spills must receive the necessary clean-up action.
- It is recommended that bioremediation kits are kept on-site and used to remediate any spills that may occur.
- Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area.
- Appropriate arrangements to be made for appropriate collection and disposal of all cleaning materials, absorbents, and contaminated soils.
- Any hazardous materials, any flammable and combustible liquids, such as oils and fuels, used for construction must be stored safely on site in a bunded and lockable area. The storage area must be in designated areas which are impermeable, appropriately bunded, and stored in compliance with MSDS files, as defined by the SHE Representative / ECO.
- Fuel and hazardous materials storage areas must be inspected regularly to ensure bund stability, integrity and function.
- Chemical storage containers must be regularly inspected so that any leaks are detected early. Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area. The storage area must be in designated areas which are impermeable, appropriately bunded, and stored in compliance with MSDS files, as defined by the SHE Representative / ECO.
- Fuel and hazardous materials storage areas must be inspected regularly to ensure bund stability, integrity and function.
- Chemical storage containers must be regularly inspected so that any leaks are detected early.
- Spilled cement or concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site.
- Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility.
- Do not leave machinery / vehicles running unnecessarily.
- Service machines and vehicles regularly to prevent unnecessary fumes and leaks.
- Routine servicing and maintenance of vehicles is not to take place on-site (except for emergency situations).
- On site refuelling should be avoided; where remote refuelling is required, appropriate drip trays must be utilised.
- Drip trays to be placed under all equipment using fuel and standing on site.
- An incident/complaints register must be established and maintained on-site.
- Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.
- In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents.
- Upon the completion of construction, the area will be cleared of potentially polluting materials.



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	<ul style="list-style-type: none"> Hazardous substance storage and response to spills training must be carried out. Construction and operational maintenance activities to be monitored by an ECO. Once the upgrade is complete and the system is operational, it is advised that the Mossel Bay Municipality procure a suitably sized mobile diesel generator which can be connected within 1 hour from power failure to mitigate the possibility of sewage spills.
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Impact 4:	Archaeology and paleontology																																																																											
Nature of impact:	Direct																																																																											
Description of receptors	Archaeology and paleontology resources may be unearthed during excavation activities.																																																																											
Description of impact	Measures must be in place to prevent unnecessary destruction of any archaeology and paleontology resources may be unearthed during excavation activities. The development footprint is small. The impact is considered negligible with mitigation measures in place.																																																																											
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Mitigation Measures	<ul style="list-style-type: none"> Construction managers/foremen should be informed before construction starts on the possible types of archaeology and paleontology material they may encounter and the procedures to follow when they find sites. If any archaeology and paleontology resources are discovered, work must be suspended immediately, and the appropriate authorities must be contacted. Any discovered artefacts shall not be removed under any circumstances without consent from relevant authority. Examples of archaeology and paleontology material <ul style="list-style-type: none"> Fossils Fossils shell middens/ marine shell heaps Pottery/ceramics 																																																																											

Impact 5:	Noise impacts																				
Nature of impact:	Direct																				
Description of existing noise levels	The project area is located in an urban area at the end of a road, adjacent to a residential development on the west and the coastline on the east. Sources of noise includes traffic and people in the surrounding area. The ambient noise level in the area is low to fair.																				
Description of impact	Sources of noise during construction phase include construction personnel, vehicles and machinery used for clearing of vegetation, levelling, and excavation. Any noise generated is likely to be experienced by those close to the construction activity. With mitigation measures in place, the noise impacts will be short-lived and considered to be negative and of low significance.																				
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	Extent (Spatial)	Activity Specific	1	Activity Specific	1
	Duration	Very Short term	1	Very Short term	1
	Frequency	Often	5	Often	5
	Intensity	Low	1	Low	1
	Severity (duration+frequency+intensity)	Medium	7	Medium	7
	Consequence (Severity+extent)	Low	8	Low	8
	Probability	Slight	2	Slim	1
	Impact Significance	Low	10	Low	9
	Mitigation	Possible			
	Confidence	High			
	Degree to which the impact can be reversed:	High; the impact is short lived.			
	Degree to which the impact may cause irreplaceable loss of resources:	Not applicable.			
Mitigation Measures	<ul style="list-style-type: none"> No loud music to be allowed on site. All vehicles and machinery must be kept in good working condition. Working hours to be restricted to daytime hours (i.e. 7 am – 6pm) No major construction work to take place after hours or on Sundays or on public holidays. A complaints register should be kept to document complaints and the corrective action taken. Noise levels must comply to the municipal noise by laws at all times. Construction and operational maintenance activities to be monitored by an ECO. 				

Impact 6:	Visual impacts																																																																														
Nature of impact:	Direct																																																																														
Description of soil	The project site is located adjacent to the beach and Baydunes residential development. The development site is restricted in space. The development site will be completely fenced off during construction. Receptors of visual impacts during construction work includes nearby residents and users of the coastal environment.																																																																														
Description of impact	Careful site planning and good housekeeping must take place to ensure required laydown areas, storage areas, waste receptacles, ablution facilities and stockpiles are well managed. The impact is considered negative of medium significance before mitigation. Impacts can be reduced to a low significance with correct measures implemented.																																																																														
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Mitigation Measures	<ul style="list-style-type: none"> Basic environmental awareness training to be provided to all personnel prior to the start of construction to ensure personnel are aware of their individual responsibilities with regards to good housekeeping measures. Ensure good housekeeping measures on site: <ul style="list-style-type: none"> No litter Stockpiles are to be located in designated areas. Machinery and equipment are to be located in designated areas. Construction materials stored in designated areas. 																																																																														



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	<ul style="list-style-type: none"> ○ Suitable waste receptacles are provided on site for general and hazardous waste, waste receptacles are managed correctly and do not overflow. ○ Ablution facilities are stored in designated area and properly maintained. ○ Ensure any debris spilled onto roads is cleared up. <ul style="list-style-type: none"> • All construction materials, including fencing and pegs, to be removed once construction activities are completed. • On completion, the site must be re-vegetated with grass and monitored until 100% coverage is established. • Complaints register to be kept to document complaints and the corrective action taken. • Construction and operational maintenance activities to be monitored by an ECO.
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Impact 7:	Traffic impacts																																																																																			
Nature of impact:	Direct																																																																																			
Description of roads and traffic	The project area is located in an urban area at the end of a crescent and adjacent the coastline. The construction works area will be accessed through an existing boom gate located at the end of the parking area at the Baydunes residential development.																																																																																			
Description of impact	<p>The baseline traffic conditions are expected to remain the same and a low impact on traffic levels are expected during construction phase with mitigation measures in place.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="3">Impact Status</th> <th colspan="2">Negative Impact</th> <th colspan="2">Negative Impact</th> </tr> <tr> <th colspan="4">Impact significance</th> </tr> <tr> <th colspan="2">Without mitigation</th> <th colspan="2">With mitigation</th> </tr> </thead> <tbody> <tr> <td>Extent (Spatial)</td> <td>Local</td> <td>3</td> <td>Local</td> <td>3</td> </tr> <tr> <td>Duration</td> <td>Very Short</td> <td>1</td> <td>Very Short term</td> <td>1</td> </tr> <tr> <td>Frequency</td> <td>Regular</td> <td>4</td> <td>Seldom</td> <td>3</td> </tr> <tr> <td>Intensity</td> <td>Low</td> <td>1</td> <td>Low</td> <td>1</td> </tr> <tr> <td>Severity (duration+frequency+intensity)</td> <td>Low</td> <td>6</td> <td>Low</td> <td>5</td> </tr> <tr> <td>Consequence (Severity+extent)</td> <td>Medium</td> <td>9</td> <td>Low</td> <td>8</td> </tr> <tr> <td>Probability</td> <td>Probable</td> <td>4</td> <td>Slight</td> <td>2</td> </tr> <tr> <td>Impact Significance</td> <td>Medium</td> <td>13</td> <td>Low</td> <td>10</td> </tr> <tr> <td>Mitigation</td> <td colspan="4">Possible</td> </tr> <tr> <td>Confidence</td> <td colspan="4">High</td> </tr> <tr> <td>Degree to which the impact can be reversed:</td> <td colspan="4">High</td> </tr> <tr> <td>Degree to which the impact may cause irreplaceable loss of resources:</td> <td colspan="4">Low</td> </tr> <tr> <td>Cumulative impact prior to mitigation:</td> <td colspan="4">Additional local traffic impacts.</td> </tr> <tr> <td>Cumulative impact post mitigation:</td> <td colspan="4">Effective traffic controls to avoid impacts from project.</td> </tr> </tbody> </table>	Impact Status	Negative Impact		Negative Impact		Impact significance				Without mitigation		With mitigation		Extent (Spatial)	Local	3	Local	3	Duration	Very Short	1	Very Short term	1	Frequency	Regular	4	Seldom	3	Intensity	Low	1	Low	1	Severity (duration+frequency+intensity)	Low	6	Low	5	Consequence (Severity+extent)	Medium	9	Low	8	Probability	Probable	4	Slight	2	Impact Significance	Medium	13	Low	10	Mitigation	Possible				Confidence	High				Degree to which the impact can be reversed:	High				Degree to which the impact may cause irreplaceable loss of resources:	Low				Cumulative impact prior to mitigation:	Additional local traffic impacts.				Cumulative impact post mitigation:	Effective traffic controls to avoid impacts from project.			
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Mitigation Measures	<ul style="list-style-type: none"> • Ensure correct signage is in place as per Road Safety Requirements • Ensure correct protocols are in place where required to ensure minimal disturbance to surrounding road users and that these are in line with local authority requirements. • The existing access via the existing boom gate located at the end of the parking area at the Baydunes residential development will be used. • All vehicles to adhere to speed limit and traffic rules. • Care should be taken that local traffic flow patterns is not significantly disturbed. • Deliveries of materials and equipment to take place outside peak traffic conditions (i.e., after 8:30 am and before 4pm) • Ensure that materials are appropriately secured to ensure safe passage between destinations and loads. The applicant will be held responsible for any clean-up resulting from failure by the contractors or suppliers to properly secure transported material. • Tarpaulins to be used when transporting loose materials (i.e. sand, gravel) 																																																																																			

Impact 8:	Employment Creation
Nature of impact:	Direct and cumulative



Eco Route

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Description of receptors	Within the Mossel Bay Municipality, it is estimated that 52,8% of households fall within the low-income bracket, of which 17.4% have no income. An estimated 2 613 job opportunities were lost in 2020 with 332 of the job losses being within the construction industry (Mossel Bay Municipality IDP, 2022 - 2027).			
Description of impact	Limited short term employment opportunities will be created during the construction phase of the development. Employment creation and the required skills development is a positive impact on the social wellbeing of local people employed for the project.			
	Impact Status	Positive Impact		Positive Impact
	Impact Criteria	Impact significance		
		Without mitigation		With mitigation
	Extent (Spatial)	Municipal	4	Municipal 4
	Duration	Very short	1	Very short 1
	Frequency	Rarely	1	Rarely 1
	Intensity	Low	1	Low 1
	Degree (duration+frequency+intensity)	Negligible	3	Low 4
	Consequence (Severity+extent)	Low	7	Low 8
	Probability	Slight	2	Plausible 3
	Impact Significance	Low	9	Medium 11
	Management	Possible		
	Confidence	High		
	Degree to which the impact can be reversed:	NA		
	Degree to which the impact may cause irreplaceable loss of resources:	NA		
	Cumulative impact prior to mitigation:	Unrest if local labour is not used.		
	Cumulative impact post mitigation:	Short term employment; skills development		
Mitigation Measures	<ul style="list-style-type: none"> • Use local labour. • Provide appropriate job training to labour force. • Use local materials, where possible. • Do not employ persons directly on site; use a reputable agencies / avenue to screen staff employed. • Do not pay any cash wages on site. • Advertise locally making use of local resources for this purpose. • Health and safety obligations as required by applicable National regulations and municipal bylaws to be implemented 			

Impact 9:	Fire risk																																																																						
Nature of impact:	Direct																																																																						
Description of receptors	The site is adjacent to a residential development.																																																																						
Description of impact	The impact on the social and natural environment as a result of an accidental fire started during construction phase is not likely to occur with appropriate equipment and training in place. Emergency plans will also assist to ensure timely response. The impact is assessed as low with effective mitigation / prevention measures in place.																																																																						
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	Degree to which the impact may cause irreplaceable loss of resources:	Possible
Mitigation Measures	<ul style="list-style-type: none"> • Basic environmental awareness training to be provided to all personnel prior to the start of construction to ensure personnel are aware of individual responsibilities with regards to preventing fire risks on site. • An emergency fire plan must be designed and implemented during construction phase. • Job specific training to be provided to individuals responsible for dealing with fire management. • Fire-fighting equipment must be available and readily accessible on site. • No open fires permitted on construction site. • No cigarette butts or burning substances are permitted to be released into the environment. All cigarette butts to be extinguished first and then disposed of in a waste receptacle provided. • If a fire is detected it must be attended to immediately. • Health and safety obligations as required by applicable National regulations and municipal bylaws to be implemented. • Ensure all emergency numbers are in place and visible at all times. • Ensure security guard and key personnel has all emergency numbers on hand at all times • Construction and operational maintenance activities to be monitored by an ECO. 	

7. LEGISLATIVE REQUIREMENTS

The proponent, Mossel Bay Municipality, is required to comply with all necessary legislation, policies and guidelines. These include, but are not limited to:

7.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA, ACT 107 OF 1998)

The National Environmental Management Act (NEMA, Act No. 107 of 1998, as amended) embraces the notion of sustainable development as contained in the Constitution in that everyone has the right:

- to an environment that is not harmful to their health or well-being; and
- to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.

Principles contained in Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), which, amongst other things, indicates that environmental management should:

- In order of priority aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment and avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

Section 28 Duty of Care under the National Environmental Management Act (NEMA) to take reasonable measures to prevent pollution or degradation to the environment throughout all proposed project phases.

All probable listed activities have been identified; the below table indicates all listed activities associated with the proposed sewer upgrade. The table provides a description of the listed activity and the reason for the listed activity being applicable to the proposed upgrade:



Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 (GN R327)	Describe the portion of the proposed project to which the applicable listed activity relates.
19A	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—</p> <p>(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <ul style="list-style-type: none"> a) will occur behind a development setback. b) is for maintenance purposes undertaken in accordance with a maintenance c) management plan; d) falls within the ambit of activity 21 in this Notice, in which case that activity applies; e) occurs within existing ports or harbours that will not increase the development. f) footprint of the port or harbour; or <p>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>GIS mapping of the site shows that a non-perennial river occurs along the road site (see attached mapping). A site visit revealed no watercourse, and it would most likely be that water flows down the hill during extreme rainfall events.</p> <p>The proposed upgrade is located within 100 meters of the high-water mark of the sea. The proposed upgrade will require the excavation of more than 5m³ Of materials. The required upgrade is required to be carried out to prevent ongoing sewage spillages into the coastal environment in accordance with this MMP.</p>

7.2 NATIONAL WATER ACT (ACT 36 OF 1998)

The site falls within 500 meters of a NFEPA wetland and therefore falls within an area regulated by the Department of Water and Sanitation. A risk assessment matrix for the proposed upgrade has been completed by a SACNASP professional member as required in terms of GN 509 published in Government Gazette (GG) no. 40229 under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016. The upgrade taking place in the regulated zone was found to be a low-risk class activity.

A general authorisation (GA) for Section 21(c) and (i) water uses will be registered with the DWS. Conditions of the GA relevant to the upgrade works will be required to be implemented.

7.3 OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1983)

The Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. In terms of this Act, a Health and Safety Officer and Protocol must be implemented on the site during construction.

8. EMMP ROLES AND RESPONSIBILITIES

Responsibilities must be clearly identified for the different parties involved in implementing the management actions and monitoring.



The following parties play an important role in ensuring compliance to the EMMP:

1. Project Proponent – Mossel Bay Municipality
2. Engineers and Contractors and Subcontractors
3. Environmental Control Officer

All fines for non-compliance of the EMMP are to be predetermined by the Engineer, ECO and Project Proponent. This needs to be included in a method statement.

8.1 PROJECT PROPONENT

Mossel Bay Municipality is the project proponent and will be responsible for the following:

- Adhering to the approved EMMP.
- Ensure that all employed Contractors and Engineers are aware of and understand the conditions of the EMMP.
- Has the right to remove any person or appointed contractors or personnel from site if they contravene the EMMP.
- Ensure that all contracts with contractors/engineers include the authorised EMMP.
- Appoint an Environmental Control Officer.
- The project proponent (holder of the Environmental Authorisation of the EMMP) must notify the competent authority of the commencement of maintenance management activities **14 days prior to such commencement taking place.**

8.2 ENVIRONMENTAL CONTROL OFFICER

The name and contact details of the ECO must be forwarded to the DEA&DP case officer, prior to the commencement of construction activities. In the appointment, the proponent delegates authority to this Representative to oversee the environmental requirements of the project. The ECO's specific function will be to monitor the Contractor's compliance to the EMMP and the impact on the environment.

The ECO is responsible for environmental awareness training of contractors, engineers, site personnel and construction workers. All parties will receive an induction presentation on the importance and implications of the EMMP prior to commencement of the proposed upgrade. The training must include the following:

- The importance of complying with the EMMP.
- Identification of no-go areas.
- The identified negative environmental impacts and the mitigation measures.

It is envisaged that the ECO will be on site for the following periods:

- A site visit prior to the start of the project to carry out preconstruction audit.
- A site visit at the completion of the project to carry out preconstruction audit.
- The appointed ECO must conduct site visits every two weeks and submit audit reports monthly to all relevant authorities, with dated photographs and detailing compliance/non-compliance with the EMMP.
- Site visits immediately after any heavy rain, in order to assess erosion and/or sedimentation damage on site.
- Whenever there is an emergency environmental incident.
- The ECO should attend all monthly site meetings (if any).
- Inspection before, during and after maintenance activities are carried out.



The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMMP by the Contractor.

The ECO's duties in this regard will include the following:

- Assisting the Engineer in ensuring that the necessary environmental authorizations and permits have been obtained;
- Request method statements prior to construction commencement .
- Promote sustainable practices;
- Monitoring and verifying that the EMMP is adhered to at all times and taking action if the specifications are not followed;
- The ECO must keep compliance and non-compliance records and make available to the relevant authorities within 5 days of receipt of this request;
- Monitoring and verifying that environmental impacts are kept to a minimum;
- Reviewing and approving construction method statements together with the Engineer;
- Assisting the Contractor in finding environmentally responsible solutions to problems;
- Giving a report back on the environmental issues at the monthly site meetings and other meetings that may be called regarding environmental matters;
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site;
- Ordering the removal of person(s) and/or equipment not complying with the specifications.
- Issuing of fines for transgressions of site rules and EMMP;
- Suspending all environmental activities should a serious environmental transgression occur, until the transgression is fixed.
- Ensuring that activities on site comply with other relevant environmental legislation;
- Completing start-up, biweekly, monthly and site closure checklists;
- Keeping a photographic record of progress on site from an environmental perspective;
- Engage in regular discussions with relevant authorities on any significant non-compliance by the applicant and the steps to be taken to rectify this.
- Undertaking a continual internal review of the EMMP and submitting a monthly ECO Report to all relevant authorities.

8.3 ENGINEERS AND CONTRACTORS AND SUBCONTRACTORS

The responsibilities of the Engineers, Contractors and Subcontractors include but are not limited to the following:

- Adhere with the conditions and recommendations of the EMMP or any other legally binding documentation.
- Prevent actions that may cause harm to the environment;
- Be responsible for any remedial activities in response to an environmental incident within their scope of influence;
- Ensure compliance of all site personnel and / or visitors to the EMMP and any other authorisations.
- Keeping record of all activities and incidents on site in the Site Diary concerning the environment.
- Inspecting the site and surrounding areas regularly with regard to compliance with the EMMP.
- Keeping a register of complaints in the site office and recording and dealing with any community comments or issues.



9. ENVIRONMENTAL MANAGEMENT PROGRAMME

Conditions of EMP				
1	Preconstruction Requirements	Responsibility	Phase	Target
1	Permission from the DEA&DP	Proponent	Preconstruction	EMMP Approval
2	Registration of water uses for General authorisation from the DWS for activities within 500 meters of a wetland.	Proponent	Preconstruction	GA registered
3	Detailed designs of all project components must be approved prior to commencement of construction.	Proponent	Preconstruction	Approved designs
4	Appointment of contractor from client.	Proponent	Preconstruction	Appointment
5	The contractor to provide the engineer with a programme	Proponent / Contractor	Preconstruction	Construction / Maintenance Programme
6	Appointment of Health and Safety Officer by client	Proponent	Preconstruction	Appointment
7	Appointment of ECO by client	Proponent	Preconstruction	Appointment
8	Health and safety file prepared and approved by appointed Health and Safety Officer.	Proponent	Preconstruction	HS file
9	Method statement and site plan approved by appointed ECO.	Proponent / Contractor / ECO	Preconstruction	Method statements and site plan
10	14-day notice to the DEA&DP that construction will commence.	Proponent / ECO	Preconstruction	Proof 14 - day notice
11	All personnel on site must be inducted by the appointed ECO. All personnel on site must be familiar with the approved EMMP. Basic environmental awareness training to be provided to all personnel prior to the start of construction with regards to: - Fauna and flora - Dust management	Proponent / Contractor / ECO	Preconstruction	Training records



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Conditions of EMP

	<ul style="list-style-type: none"> - Stormwater management - Good housekeeping measures - Fuel and hazardous substances 			
12	Construction managers/foremen should be informed before construction starts on the possible types of archaeology and paleontology material they may encounter and the procedures to follow when they find sites.	Proponent / Contractor / ECO	Preconstruction	Overview of archaeology and paleontology provided
13	An emergency fire plan must be designed and implemented during construction phase.	Proponent / Contractor	Preconstruction	Fire plan in place.
14	Hazardous substance storage and response to spills training to be carried out.	Proponent / Contractor	Preconstruction	Training records
15	Job specific training to be provided to individuals responsible for dealing with fire management.	Proponent / Contractor	Preconstruction	Training records
16	As a precautionary approach, search and rescue should be carried out at the site development footprint prior to start of construction. If relevant, protected plants and trees require permits from the relevant authorities i.e., DEA&DP and DAFF, prior to their disturbance (which includes the trimming of branches of protected trees), removal, and / or transplantation.	Proponent / ECO / Search and Rescue specialist	Preconstruction	Search and Rescue
2	Monitoring, auditing, and record keeping	Responsibility	Phase	Target
1	Construction and operational maintenance activities to be monitored by an ECO.	Proponent / ECO	All	Audits
2	Preconstruction audit to be carried out and sent to DEA&DP	Proponent / ECO	Preconstruction	Preconstruction audit report to DEA&DP
3	ECO to carry out audit once every 2 weeks and submit audit report to DEA&DP	Proponent / ECO	Construction	Biweekly audit and monthly report to DEA&DP



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Conditions of EMP				
4	Post-construction audit to be carried out and sent to DEA&DP	Proponent / ECO	Rehabilitation	Post -construction audit report to DEA&DP
5	An incident and complaints register must be established and maintained on-site (dust, erosion, spills, noise levels, traffic)	Proponent / Contractor	Construction	Incident and complaints register in place
6	Conditions of the GA relevant to the upgrade works will be required to be implemented.	Proponent / Contractor / ECO	All	Relevant conditions of GA implemented
6	Environmental management file to be established and maintained. EMF to contain: - Environmentally related permits and authorisations - Record of site meetings, - Audit reports - Approved EMMP - Method statements - Any contingency plans	Proponent / Contractor / ECO	All	EMF in place
3	Site camp layout	Responsibility	Phase	Target
1	Identify and demarcate construction areas for general construction work and restrict construction activity to these areas.	Proponent / Contractor / ECO	Preconstruction	Demarcate areas
2	Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste, and contaminated waste, sewage, fuels, hazardous substances. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control.	Proponent / Contractor / ECO	Preconstruction	Identify laydown areas
3	Compile plan of site (including map) showing various activity zones, access point, track, stockpile areas, ablution facilities, waste management area, laydown area, site office etc.	Proponent / Contractor	Preconstruction	Site plan



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Conditions of EMP				
4	The site area is to be fenced off and secured to prevent non-construction staff entering and posing a risk to security and safety protocols	Proponent / Contractor	Preconstruction and construction	Fencing in place
4	Fauna and Flora	Responsibility	Phase	Target
1	Ensure the construction footprint is limited to the pre-demarcated construction area. The Contractor must restrict all activities, materials, equipment, and personnel within the area specified or restricted activities to areas that are necessary to undertake the work. Surrounding vegetation in undeveloped adjacent areas may not be used as laydown areas or disturbed in any way.	Proponent / Contractor	Construction	No laydown outside designated development area.
2	Do not exceed footprint of activity with regards to vegetation removal. Vegetation disturbance is to be limited to that which is absolutely necessary. Physical damage to natural vegetation on the periphery of the construction activity is to be avoided.	Proponent / Contractor	Construction	Limited vegetation clearing
3	Lift, remove and neatly stockpile existing grass for re-planting when works are finish.	Proponent / Contractor	Construction	Stockpiled grass
4	Movement of workers must be limited to areas under construction. Access to surrounding coastal area is not permitted; these must be designated as no-go areas during construction.	Proponent / Contractor	Construction	Coastal area is no go area.
5	Excavated materials to be re used as far as possible (i.e. as fill material); excavation materials not re-used are to be removed as quickly as possible from the area and disposed at an appropriately licensed waste site.	Proponent / Contractor	Construction	Excavated material stockpiled for fill material / removed offsite
6	No dumping of any materials on surrounding vegetation is allowed.	Proponent / Contractor	Construction	No dumping on surrounding area.
7	Gathering of plants on adjacent areas to the sites should not be permitted. Contractual fines to be imposed on any employee who is	Proponent / Contractor	Construction	No collecting plants; no fines



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Conditions of EMP

	found attempting to remove indigenous flora form surrounding open space areas.			
8	No stockpiling to occur outside the site development footprint.	Proponent / Contractor	Construction	No stockpiling outside designated development area.
9	No harm to fauna permitted.	Proponent / Contractor	Construction	No harm to fauna
10	Alien invasive plant species and weeds occurring as a result of construction and maintenance must be carefully removed and monitored.	Proponent / Contractor	Construction	No alien invasives and weeds.
5	Soil management	Responsibility	Phase	Target
1	The topsoil shall be stripped to a minimum depth of 150mm. The topsoil be place in a designated stockpile area.	Proponent / ECO	Construction	Separate topsoil stockpile.
2	Stockpile topsoil and subsoil separately. The stockpile must be kept near optimum moisture content and should be protected from rain and flooding to remain as close as possible to optimum moisture content to ensure proper compaction without having to add water when placed.	Proponent / ECO	Construction	Topsoil and subsoil separated.
	Cognisance of rainfall events should govern all operations. Construction activities should be timed to avoid periods of high rainfall and should be avoided during wet weather conditions.	Proponent / ECO	Construction	Rainfall monitoring
3	Appropriate stormwater management methods must be assessed prior to construction clearance and will need to take into consideration the susceptibility of the area to erosion. Stormwater management methods may include silt traps, sand bags, branch packing.	Proponent / ECO	Construction	Stormwater management in place
4	Material from excavation activities will as far as possible be used on-site as fill material. Excess excavated material that cannot be used in this way will be exported from the site and used in construction activities elsewhere in the municipal area or disposed of at an appropriately licensed waste disposal facility.	Proponent / ECO	Construction	Reuse of excavated material.



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Conditions of EMP				
5	Any soil stockpiles should be covered and wetted and stabilised to prevent wind erosion and dust generation.	Proponent / ECO	Construction	Stockpiles covered and wetted
6	As necessary, dampen exposed areas on very windy days to prevent soil erosion by wind and dust generation. A water cart or sufficient watering equipment should be available to wet soils during windy days. During strong wind conditions it may be necessary to halt operations until conditions improve.	Proponent / ECO	Construction	Exposed areas dampened on windy days
6	Waste and hazardous substances management	Responsibility	Phase	Target
1	Ablution and/or sanitation facilities must be provided for the workers/contractors during construction phase and adequately secured, serviced and maintained for the duration of construction. 1 toilet for every 10 workers to be provided.	Proponent / Contractor	Construction	Ablutions secured and maintained.
2	Bins and skips must be available at the construction site for collection, separation and storage of waste streams. Where possible, construction and general wastes on-site must be reused or recycled.	Proponent / Contractor	Construction	General waste bins, hazardous waste bins and skips on site.
3	Under no circumstances may solid waste be burnt or buried on site.	Proponent / Contractor	Construction	No evidence of burning waste.
4	Hazardous and non-hazardous waste must be separated at source. Separate waste collection bins must be provided for this purpose. These bins must be clearly marked and appropriately covered.	Proponent / Contractor	Construction	General waste bins, hazardous waste bins and skips on site. Clearly labelled and covered.
5	Transport of all hazardous substances must be in accordance with the relevant legislation and regulations.	Proponent / Contractor	Construction	Registration of hazardous waste transporters.
6	Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal. Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.	Proponent / Contractor	Construction	Registration of general waste transporters. Licensed waste facility.



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Conditions of EMP

7	Documentation (waste records) must be maintained detailing the quantity, nature and disposal of any hazardous waste.	Proponent / Contractor	Construction	Hazardous disposal records.
8	All solid waste collected must be disposed of at a registered waste disposal site. A certificate of disposal must be obtained and kept on file and be made available for review at any time.	Proponent / Contractor	Construction	General waste disposal records.
9	Emergency plans must be in place in case of spillages; any spills must receive the necessary clean-up action.	Proponent / Contractor	Construction	Emergency plan in place for spills.
10	It is recommended that bioremediation kits are kept on-site and used to remediate any spills that may occur.	Proponent / Contractor	Construction	Spill kit on site.
11	Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area.	Proponent / Contractor	Construction	Hydrocarbon waste correctly contained and stored in sealed containers on site.
12	Appropriate arrangements to be made for appropriate collection and disposal of all cleaning materials, absorbents, and contaminated soils.	Proponent / Contractor	Construction	Waste disposal records if required.
13	Any hazardous materials, any flammable and combustible liquids, such as oils and fuels, used for construction must be stored safely on site in a bunded and lockable area. The storage area must be in designated areas which are impermeable, appropriately bunded, and stored in compliance with MSDS files, as defined by the SHE Representative / ECO.	Proponent / Contractor	Construction	Fuel and hazardous materials storage area, bunded, roof, non-permeable
14	Fuel and hazardous materials storage areas must be inspected regularly to ensure bund stability, integrity and function.	Proponent / Contractor	Construction	Inspect fuel and hazard material storage area.
15	Chemical storage containers must be regularly inspected so that any leaks are detected early.	Proponent / Contractor	Construction	Inspect chemical containers.
16	Spilled cement or concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site.	Proponent / Contractor	Construction	Spilled cement / concrete
17	Do not leave machinery / vehicles running unnecessarily.	Proponent / Contractor	Construction	Vehicles and machines



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Conditions of EMP				
18	Service machines and vehicles regularly to prevent unnecessary fumes and leaks.	Proponent / Contractor	Construction	Regular servicing of vehicles.
19	Routine servicing and maintenance of vehicles is not to take place on-site (except for emergency situations).	Proponent / Contractor	Construction	Offsite servicing of vehicles.
20	On site refuelling should be avoided; where remote refuelling is required, appropriate drip trays must be utilised.	Proponent / Contractor	Construction	No refuelling / drip trays in use.
21	Drip trays to be placed under all equipment using fuel and standing on site.	Proponent / Contractor	Construction	Drip trays
22	Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.	Proponent / Contractor	Construction	Addressing leaks / spills
23	In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents.	Proponent / Contractor	Construction	Notify CA if required
24	Upon the completion of construction, the area will be cleared of potentially polluting materials.	Proponent / Contractor	Construction	All construction materials removed.
25	Once the upgrade is complete and the system is operational, it is advised that the Mossel Bay Municipality procure a suitably sized mobile diesel generator which can be connected within 1 hour from power failure to mitigate the possibility of sewage spills.	Proponent	Operations	Procurement of mobile diesel generator
7	Archaeology and paleontology	Responsibility	Phase	Target
1	If any archaeology and paleontology resources are discovered, work must be suspended immediately, and the appropriate authorities must be contacted.	Proponent / Contractor / ECO	Construction	Findings archaeology and paleontology resources; work



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Conditions of EMP

				stopped if required, authority contacted if required
2	Any discovered artefacts shall not be removed under any circumstances without consent from relevant authority. Examples of archaeology and paleontology material: fossils, fossils shell middens/ marine shell heaps, Pottery/ceramics	Proponent / Contractor / ECO	Construction	Consent form authority if required
8	Noise Management	Responsibility	Phase	Target
1	No loud music to be allowed on site.	Proponent / Contractor	Construction	No loud music.
2	All vehicles and machinery must be kept in good working condition.	Proponent / Contractor	Construction	Regular servicing of vehicles.
3	Working hours to be restricted to daytime hours (i.e. 7 am – 6pm)	Proponent / Contractor	Construction	No construction afterhours
4	No major construction work to take place after hours or on Sundays or on public holidays.	Proponent / Contractor	Construction	No construction on Sundays or public holidays
5	Noise levels must comply to the municipal noise by laws at all times.	Proponent / Contractor	Construction	Noise levels are low.
9	Housekeeping and Visual	Responsibility	Phase	Target
1	No litter	Proponent / Contractor	Construction	No litter
2	Stockpiles are to be located in designated areas.	Proponent / Contractor	Construction	Located in designated area.
3	Machinery and equipment are to be located in designated areas.	Proponent / Contractor	Construction	Located in designated area.
4	Construction materials stored in designated areas.	Proponent / Contractor	Construction	Located in designated area.
5	Suitable waste receptacles are provided on site for general and hazardous waste, waste receptacles are managed correctly and do not overflow.	Proponent / Contractor	Construction	Available and located in designated area.
6	Ablution facilities are stored in designated area and properly maintained.	Proponent / Contractor	Construction	Located in designated area and maintained.
7	Ensure any debris spilled onto roads is cleared up.	Proponent / Contractor	Construction	Debris spills cleaned up



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Conditions of EMP				
8	All construction materials, including fencing and pegs, to be removed once construction activities are completed.	Proponent / Contractor	Construction	Construction material removed offsite.
10	Traffic management	Responsibility	Phase	Target
1	Ensure correct signage is in place as per Road Safety Requirements	Proponent / Contractor	Construction	Signage in place.
2	Ensure correct protocols are in place where required to ensure minimal disturbance to surrounding road users and that these are in line with local authority requirements.	Proponent / Contractor	Construction	Protocol in place where required.
3	The existing access via the existing boom gate located at the end of the parking area at the Baydunes residential development will be used.	Proponent / Contractor	Construction	Correct access used.
4	All vehicles to adhere to speed limit and traffic rules.	Proponent / Contractor		No speeding.
5	Care should be taken that local traffic flow patterns is not significantly disturbed.	Proponent / Contractor	Construction	No incidents / complaints
6	Deliveries of materials and equipment to take place outside peak traffic conditions (i.e., after 8:30 am and before 4pm)	Proponent / Contractor	Construction	No peak traffic deliveries.
7	Ensure that materials are appropriately secured to ensure safe passage between destinations and loads. The applicant will be held responsible for any clean-up resulting from failure by the contractors or suppliers to properly secure transported material.	Proponent / Contractor	Construction	Materials secured.
8	Tarpaulins to be used when transporting loose materials (i.e. sand, gravel)	Proponent / Contractor	Construction	Tarpaulins used where required.
11	Employment	Responsibility	Phase	Target
1	Use local labour.	Proponent / Contractor	Preconstruction	Labour policy in place
2	Provide appropriate job training to labour force.	Proponent / Contractor		Training records
3	Use local materials, where possible.	Proponent / Contractor	Preconstruction	Local materials used where possible



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Conditions of EMP				
4	Do not employ persons directly on site; use a reputable agencies / avenue to screen staff employed.	Proponent / Contractor		No employment directly on site
5	Do not pay any cash wages on site.	Proponent / Contractor		No wages paid on site
6	Advertise locally making use of local resources for this purpose.	Proponent / Contractor		Advertised locally
7	Health and safety obligations as required by applicable National regulations and municipal bylaws to be implemented	Proponent / Contractor		In place
12	Fire Prevention	Responsibility	Phase	Target
1	Fire-fighting equipment must be available and readily accessible on site.	Proponent / Contractor		Fire-fighting equipment in place.
2	No open fires permitted on construction site.	Proponent / Contractor		No fires
3	No cigarette butts or burning substances are permitted to be released into the environment. All cigarette butts to be extinguished first and then disposed of in a waste receptacle provided.	Proponent / Contractor		Sand buckets provided
4	If a fire is detected it must be attended to immediately.	Proponent / Contractor		No fires
5	Health and safety obligations as required by applicable National regulations and municipal bylaws to be implemented.	Proponent / Contractor		In place
6	Ensure all emergency numbers are in place and visible at all times.	Proponent / Contractor		Emergency numbers visible
7	Ensure security guard and key personnel has all emergency numbers on hand at all times	Proponent / Contractor	Preconstruction	Emergency numbers with key personnel
13	Rehabilitation	Responsibility	Phase	Target
1	Revegetation with grass to take place as soon as construction / maintenance activity is completed.	Holder of EA	Rehabilitation / Post-construction	Revegetation taken place.
2	Once structures and infrastructure are in place, rehabilitate with grass and monitor until 100% coverage is established	Holder of EA	Rehabilitation / Post-construction	100% coverage



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10. CONCLUSION

Confirmation was obtained from Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) that an Environmental Maintenance Management Plan (EMMP) will be the required process to obtain authorisation from DEA&DP prior to commencement of the proposed upgrade. The draft EMMP will be subjected to a 30-day public participation commenting period. All comments received will be incorporated into a Comments and Response Report and submitted as part of the final EMMP to the DEA&DP for decision making.

Construction may only commence once DEA&DP has approved the EMMP.



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APPENDIX A – EAP CV

Claire De Jongh

Curriculum Vitae

Current Position	Environmental Assessment Practitioner
Current Location	Port Elizabeth, South Africa
Date of birth	13 July 1983
Year of Birth	1983
Specialisation	Environmental Management
Nationality	South African
Years of experience	15 years
HDI status and gender	White Female
Languages	English (Excellent – Reading, Writing, Speaking, Presenting) Afrikaans (Fair – Reading, Writing, Speaking)
Contact Details	+27846074743 / clairejarvis@hotmail.co.za
Career Profile	<p>Claire’s career in the environmental field spans 15 years. Her work involves:</p> <ul style="list-style-type: none">• Basic Assessment Reports• Scoping and full environmental impact assessment Reports• Waste management licences• Coastal Water Discharge Permits• Water use licence applications• Project coordination, authority liaison, specialist team management• Environmental management programmes reports• Methods statements and procedures• Environmental management systems• Environmental Auditing• Rehabilitation strategies and implementation• Aspect / impact registers and implementation of environmental management systems in line with ISO14001• Environmental training• Environmental monitoring• Environmental awareness education• Management, coordination and implementation of environmental and social development projects

Career History	<p>Environmental Assessment Practitioner and ECO (current)</p> <p>Environmental subconsultant at Eco Route Environmental Consultancy (current)</p> <p>Environmental Consultant at CEN Integrated Management Unit February 2015 to date Senior Environmental Consultant</p> <p>Ethical Exchange sustainability Services (Pty) Ltd June 2011 to January 2015 Environmental Consultant</p> <p>BSc Honours (Environmental Monitoring and Modelling) 2009 to 2011</p> <p>WESSA (BushPigs Outdoor Environmental Education Centre) 2007 to 2009 Environmental Education Programme Coordinator</p> <p>Green Gain Consulting 2005 to 2007 Environmental Consultant: Environmental Management Systems; Training</p>
Education and Courses	<p>BSc (Hons) Environmental Monitoring and Modelling, 2012.</p> <p>BSc Environmental Management: Zoology Stream, 2007.</p> <p>IEMA Accredited Environmental Auditor Training Course: Aspects International, 2011.</p> <p>Environmental Awareness and Legal Liability Course, 2006 (2 days).</p> <p>Field Guiding Association of South Africa (FGASA) Level 1.</p> <p>ICDL, 2004, (Microsoft word, excel, access, PowerPoint, outlook).</p>
Professional Affiliations	<p>EAPASA Registered EAP (Number 2021/3519)</p> <p>SACNASP: Certificated Natural Scientist (Registration 115390).</p> <p>Member of the International Association for Impact Assessment (IAIA).</p> <p>Member of the Field Guiding Association of South Africa (FGASA).</p>
Main Sectors of Expertise	<p>Waste management, Residential, Eco-tourism, Agriculture, Water Treatment, Energy, linear infrastructure</p>
Areas Worked	<p>Throughout South Africa.</p>

Professional Competency Statement:

Claire's career in the environmental consulting field spans 15 years. Claire has been involved in a number of environmental impact assessment projects. Her roles have included being the Environmental Assessment Practitioner (EAP), Project Manager and Environmental Scientist for EIA related projects. Her responsibilities have included undertaking environmental assessments, compilation of regulated EIA's (i.e. scoping reports, EIA reports, Basic assessments and Environmental Management Plans), carrying out the public participation process, compiling fauna reports, and incorporating specialists into the EIA team. Claire has been involved in environmental compliance audits and has compiled the required audit protocols and audit reports. Claire has compiled environmental management systems compliant with ISO14001.

Claire has worked extensively throughout South Africa. Claire's strengths lie with understanding and application of environmental legislation, data collection and collation, research, compilation of reports, accuracy, effective communication and effective time management.

List of Experience:

Environmental Impact Assessments and Environmental Management Programme reports

- Development of fuel storage facility: Basic assessment and EMP and EA application in Nelson Mandela Bay Municipality, Eastern Cape (2023).
- Expansion of fuel storage facility: Basic assessment and EMP and EA application in Nelson Mandela Bay Municipality, Eastern Cape (2023).
- Port Alfred Reverse Osmosis Project: Basic assessment and EMP and EA, WUL and CWDP application for 5MI reverse Osmosis project on behalf of Ndlambe Local Municipality, Eastern Cape (Current).
- Addo Lodge: Basic assessment and EMP and EA application for lodge and tented camp in Addo, Eastern Cape (2021 - 2023).
- Langkloof Bricks: Operational EMP for renewal of air emissions license application (2021)
- Somerset East Powerlines: Construction EMP for installation of H frame poles and overhead powerlines between substation and Industrial Park (2021)
- Clarkson WWTW: Integrated EA and WML and EMP for expansion of Clarkson WWTW and upgrading of sewage infrastructure (2018 – 2022)
- Farm 717, Addo: Scoping and Environmental Impact Assessment and EMP for 150 ha citrus and irrigation on behalf of Coega Kamma Citrus (2019 – current)
- Erf 168, Walker Driver: Basic Assessment and EMP for housing project on behalf of developer, Port Elizabeth (2018 – 2020)
- Oyster Bay Lodge: NEMA Section 24G Application on behalf of landowner, Eastern Cape (2018 – 2020)
- Erf 3783, Summerstrand: Basic Assessment and EMP for residential development, Port Elizabeth (2018 – 2019)
- Kwandwe Staff Village: Basic Assessment and EMP on behalf of Kwandwe, Makana Municipality, Eastern Cape (2017 - 2018)
- Feasibility study: Screening assessment of properties on behalf of NMBM (2016)
- Wells Estate Conservancy Tanks: Basic Assessment process for Expansion project on behalf of NMBM (2016)
- Driftsands Waste Water Treatment Works: Integrated Environmental and Waste Management License; Coastal Water Discharge Permit; Water Use License Application for Expansion project on behalf of NMBM (2016 - 2017)
- Sundays River Citrus Corporation: Basic Assessment process for Expansion projects at Summerville and Hermitage on behalf of SRCC (2015 – 2017)
- Walmer Cosmo/ Erf 1953: Basic Assessment process for integrated residential development on behalf of Privivox cc, Eastern Cape (2015 - 2016)
- Milkwood Gardens / Erf 1953: Amendment Application for change of ownership; update construction and environmental management programmes on behalf of Own Haven (2015 – 2017)
- Sardinia Bay: Basic Assessment process for public access facilities at Sardinia Bay on behalf of NMBM, Eastern Cape (2015 - 2016)
- Sardinia Bay Public Access Facilities: Amendment Application for change of site (2016 – current)
- Bayethe Luxury tents: Basic Assessment Process on behalf of Bayethe Lodge, Eastern Cape (2015 – 2016)
- Bayethe: NEMA 24G rectification for luxury tents on behalf of Bayethe Lodge, Eastern Cape (2015 - 2017)
- Cascades Iron Ore Mine: EIA process on behalf of Mkhombi Mining, Mpumalanga (2014).
- Zuurberg Road Upgrade: Basic Assessment process on behalf of the Department of Rural Development and Land Reform, Eastern Cape (2014).
- New Largo Colliery: EIA process, state of the environment report, closure and rehabilitation plan and waste management license on behalf of Anglo American Inyosi Coal, Mpumalanga (2011 to 2015).
- Mobile Water Treatment Plant: Waste management license for a mobile water treatment plant to supply water to the Phola-Kusile Coal Conveyor, on behalf of Anglo American Inyosi Coal, Mpumalanga I (2011 to 2015).
- Monitoring Weirs: Basic assessment process and Environmental Management Programme for monitoring weirs as part of reserve determination required by DWA, for Anglo American Inyosi Coal, Mpumalanga (2012 to 2014).
- Phola-Kusile Coal Conveyor: Environmental impact assessment and environmental management programme on behalf of Anglo American Inyosi Coal, Mpumalanga (2011 to 2014).
- St Albans: Public Participation Process carried out on behalf of Department of Public Works, Eastern Cape (2014).
- Grootegeluk Mine Backfill Conveyor System: Environmental impact assessment and EMP amendment, on behalf of Exxaro Coal, Limpopo (2011).

ECO, Monitoring, Auditing Environmental Management Systems

- Upgrading of Clarkson WWTW: ECO for construction phase (2023 – current)
- Addo Ecolodge: ECO for construction phase (2023 – current)
- Upgrading of Pumpstations, Motherwell and Stanford, NMBM: ECO for construction phase (2022 – current)
- St Francis Bay Residential Development, Kouga Local Municipality: ECO for construction phase (2022 – current)
- The Edge Hospital, NMBM: ECO for construction phase (2021 – 2022)
- River Oaks Residential Development, NMBM: ECO for construction phase (2021 – 2023)

- Coegakop Wellfield, NMBM: ECO for construction phase (2021 – current)
- Erf 3783, Summerstrand: ECO for construction phase (2019 – current)
- Sardinia Bay Public Access Facilities: ECO for construction of parking area (2018)
- Sardinia Bay Public Access Facilities: ECO for demolition of structures within 100m of HWM (2016 – 2017)
- Coega Manganese Terminal Air Quality Monitoring: Coordination of PM10, PM2.5 and dustfall baseline monitoring for the proposed Manganese Terminal at Coega, Eastern Cape (2013 - 2015).
- Tharisa Mine: External Compliance audit in terms of WUL and EA, North-West (2013).
- Formalchem: Land Contamination Monitoring and Assessment: Coordination of Land contamination Assessment for mothballed glue manufacturing company in Berlin, Eastern Cape (2012-13).
- Formalchem: Remediation plan and progress report prepared for DEA on behalf of client, Eastern Cape (2012-2014).
- Elitheni Coal Mine: Compilation of legal audit protocol (EMP, Water use license, waste management license, environmental authorisation), Eastern Cape (2013).
- Pikitup Roodepoort Waste Site: Site audit and report compilation, Gauteng (2009).
- Sun International: Compilation of aspects / impacts register and environmental management system for entire Sun International Group, all SA provinces (2006 - 2007).
- Sun International: Environmental management system training for the environmental managers, all SA provinces (2006 - 2007).
- Lonmin Platinum: Compilation of aspect impact register and environmental management system, North West (2006).

Guidelines, Environmental Awareness, Education and Training

- Part of team responsible for development of Albany Thicket Ecosystem Guidelines on behalf of SANBI (2017 – current)
- Part of team responsible for development of Savanna Ecosystem Guidelines on behalf of SANBI (2017 – current)
- Development of sustainable educational programmes (2009 - 2014).
- ZAMA: Coordination of corporate social sponsorships, Eastern Cape (2012 - 2013).
- Environmental Education: Coordination and development of environmental education programmes, Limpopo (2007-09).
- Richards Bay Minerals: Assist with basic environmental awareness training at Richards bay Minerals, kwaZulu Natal (2005).
- Tiger Brands: Environmental awareness training for employees of all Tiger brands, all SA provinces (2006 - 2007).
- Dairy Belle: Environmental awareness training for employees of all Dairy Belles, Western Cape, Eastern Cape, North-West, Free State, Gauteng, kwaZulu Natal (2006 - 2007).

Administration and engagement

- Engagement with relevant government authorities, stakeholders and clients
- Management of specialist teams
- Compilation of tenders and proposals for Environmental services
- Report writing
- GIS and map compilation
- Presentations and Training

Environmental Studies (BSc and BSc Honours)

- Undergraduate - Animal Behaviour: Behaviour of the Marsh Owl. Achieved 100 % (2003).
- Honours - The abundance of the South African Lepidopteran pest organism, *Busseola fusca*, found on genetically modified Bt maize, conventional pesticide- sprayed maize, and polyculture-farmed maize, to determine the best practice farming method with regards to pest control. Achieved 97 % (2011)



We certify that

Claire Elizabeth Jarvis

*having complied with the requirements of the Higher Education Act
and the Institutional Statute, was admitted to the degree of*

BACHELOR OF SCIENCE

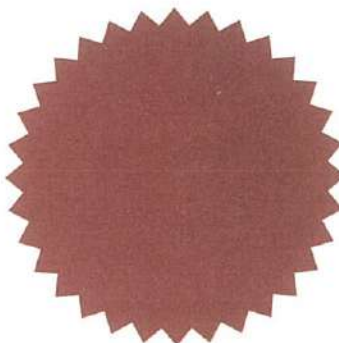
with specialisation in Environmental Management: Zoology Stream

at a congregation of the University

on 11 June 2008

Vice-Chancellor

University Registrar



Executive Dean





We certify that

CLAIRE ELIZABETH JARVIS

*having complied with the requirements of the Higher Education Act
and the Institutional Statute, was admitted to the degree of*

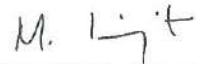
HONOURS BACHELOR OF SCIENCE
in Environmental Monitoring and Modelling

*at a congregation of the University
on 12 June 2012*



Vice-Chancellor





Executive Dean



University Registrar



**Environmental Assessment
Practitioners Association
of South Africa**



Registration No. 2021/3519

Herewith certifies that

Claire Elizabeth de Jongh

is registered as an

Environmental Assessment Practitioner

***Registered in accordance with the prescribed criteria of Regulation 15. (1)
of the Section 24H Registration Authority Regulations
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the
National Environmental Management Act (NEMA), Act No. 107 of 1998, as
amended).***

Effective: 01 March 2023

Expires: 29 February 2024

Chairperson

Registrar





herewith certifies that
Claire Elizabeth De Jongh
Registration Number: 115390
is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)
Environmental Science (Certificated Natural Scientist)

Effective 20 July 2016

Expires 31 March 2024



A handwritten signature in black ink, appearing to be 'A. V. ...', written over a horizontal line.

Chairperson

A handwritten signature in black ink, appearing to be 'N. ...', written over a horizontal line.

Chief Executive Officer





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APPENDIX B – COMMENT FROM DEDEAP



REFERENCE: 16/3/3/6/1/D6/1/0134/23

DATE OF ISSUE: 15 June 2023

The Director
Eco Route Environmental Consultancy

Attention: Ms. Janet Ebersohn

Cell: 082 557 71222

Email: janet@ecoroute.co.za

Dear Madam

PROPOSED UPGRADE OF THE BAYDUNES SEWER PUMP STATION, MOSSEL BAY

1. This above-mentioned proposal received by the Directorate: Development Management (hereinafter referred to as "this Directorate") on 19 May 2023 refers.
2. This letter serves as acknowledgment of receipt of the above-mentioned information by this Directorate.
3. It is understood from the information provided that the proposal entails the upgrading of the existing pump station at Baydunes by establishing a new pump station and using the existing pumpstation as a sump. According to the information provided, as well as the information displayed on Cape Farm Mapper, there is no indigenous vegetation that will be affected by the proposed upgrade.
4. The undertaking of the proposed upgrade will however result in the movement of more than 5 cubes of sand within 100m of the highwater mark of the sea and therefore triggers the following listed activity identified in terms of Listing Notice 1, being:

Activity Number: 19A

Activity Description:

The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—

(i) the seashore;

(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or

(iii) the sea; —

but excluding where such infilling, depositing, dredging, excavation, removal or moving—

(a) will occur behind a development setback;

(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;

(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;

(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or

(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.

5. Written authorisation is therefore required from the relevant authority (as defined in GN No R.982 of 4 December 2014), prior to the undertaking of the said activity.

6. Notwithstanding the above, the afore-mentioned activity makes provision for the **adoption of a Maintenance Management Plan (MMP) in terms of the Environmental Impact Regulations, 2014 (as amended)**.

7. In addition to the content of letter, please note that the proponent must also comply with any other statutory requirements that may be applicable to the undertaking of the activity.

8. This Department reserves the right to revise its initial comments and request further information from you based on any new or revised information received.

Yours faithfully

pp _____

**HEAD OF DEPARTMENT
ENVIRONMENTAL IMPACT MANAGEMENT SERVICES: REGION 3
DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING**

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Mossel Bay Municipality

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APPENDIX C – ENVIRONMENTAL SENSITIVITY MAPS, SITE PHOTOGRAPHS & HISTORICAL IMAGERY



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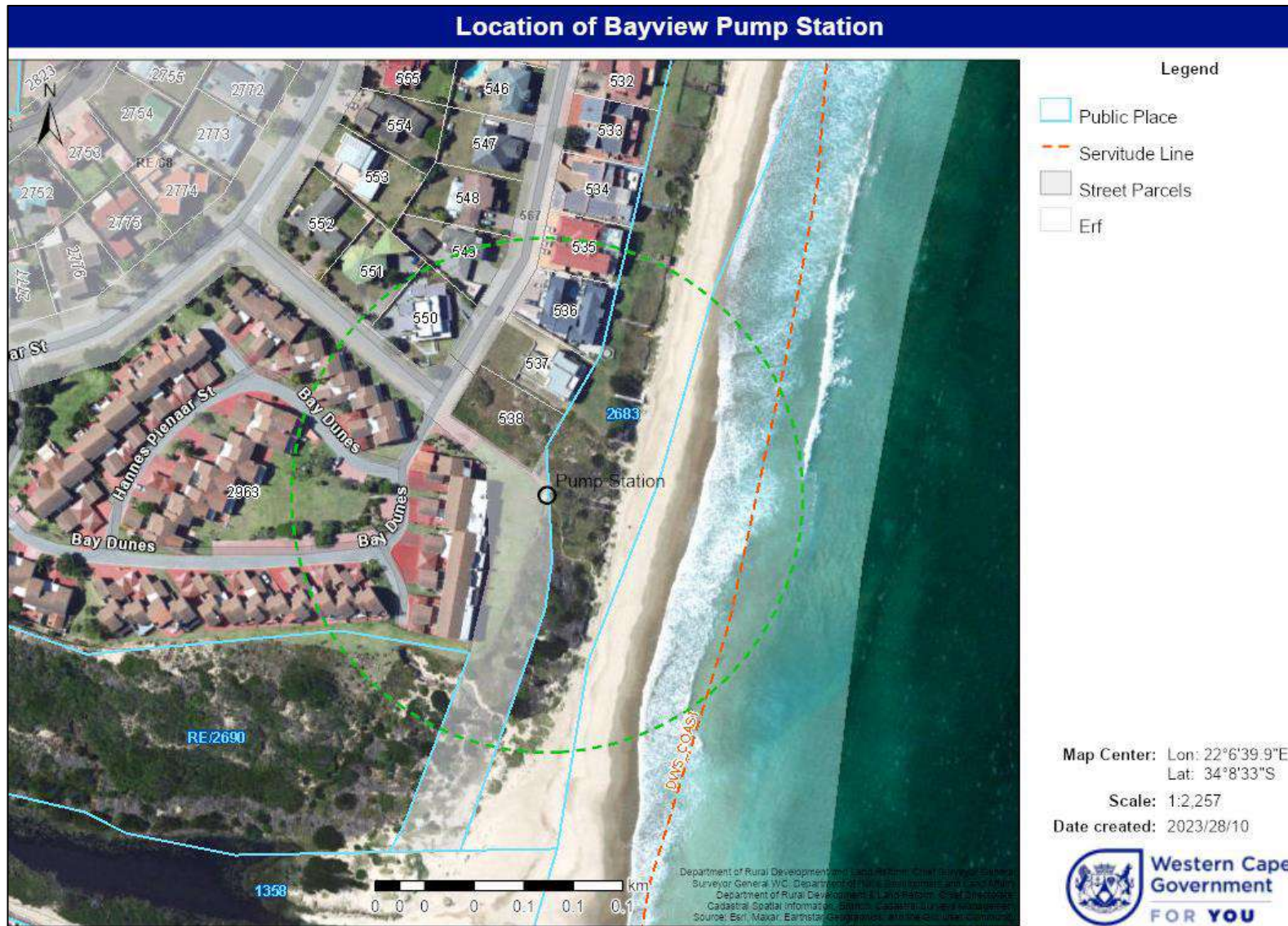


Figure 1: Location of pumpstation within 100 meters of highwater mark of the sea



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Figure 2: Site falls within 500 meters of NFEPA wetland.



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Figure 3: No go area indicated in green; construction area indicated in brown



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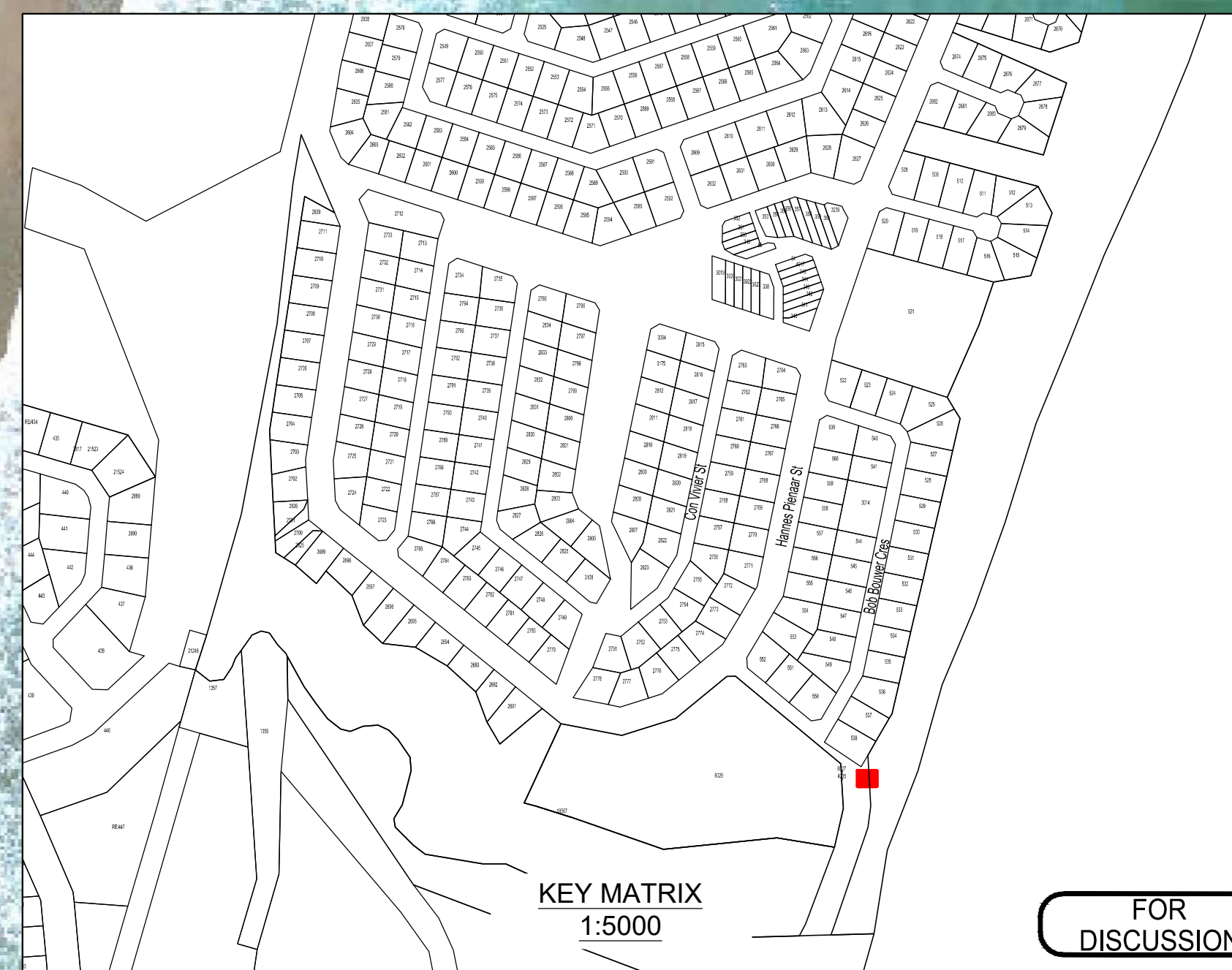
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APPENDIX D – DESIGNS

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LOCALITY PLAN
1:10 000



KEY MATRIX
1:5000

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AB00	10-03-2023	DRAWING ISSUED FOR DISCUSSION	JH

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DRAWN	S HLOMELA
CHECKED	J HOUGH

SIGNED	SMC South Africa
DATE	

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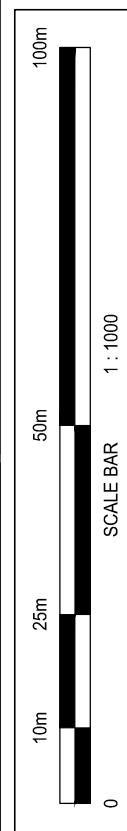
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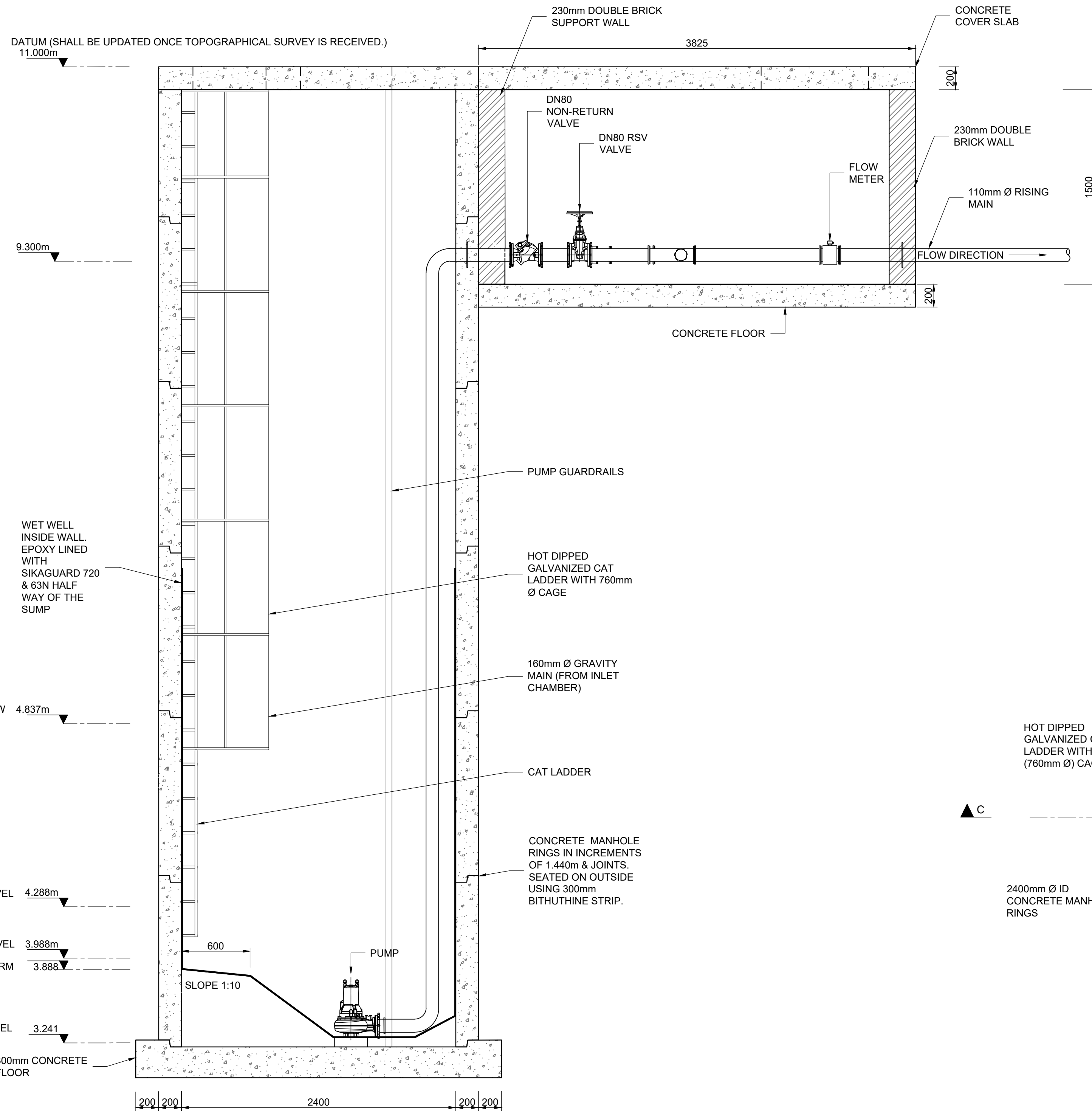
BAYDUNES SEWER PUMP STATION

LOCALITY PLAN

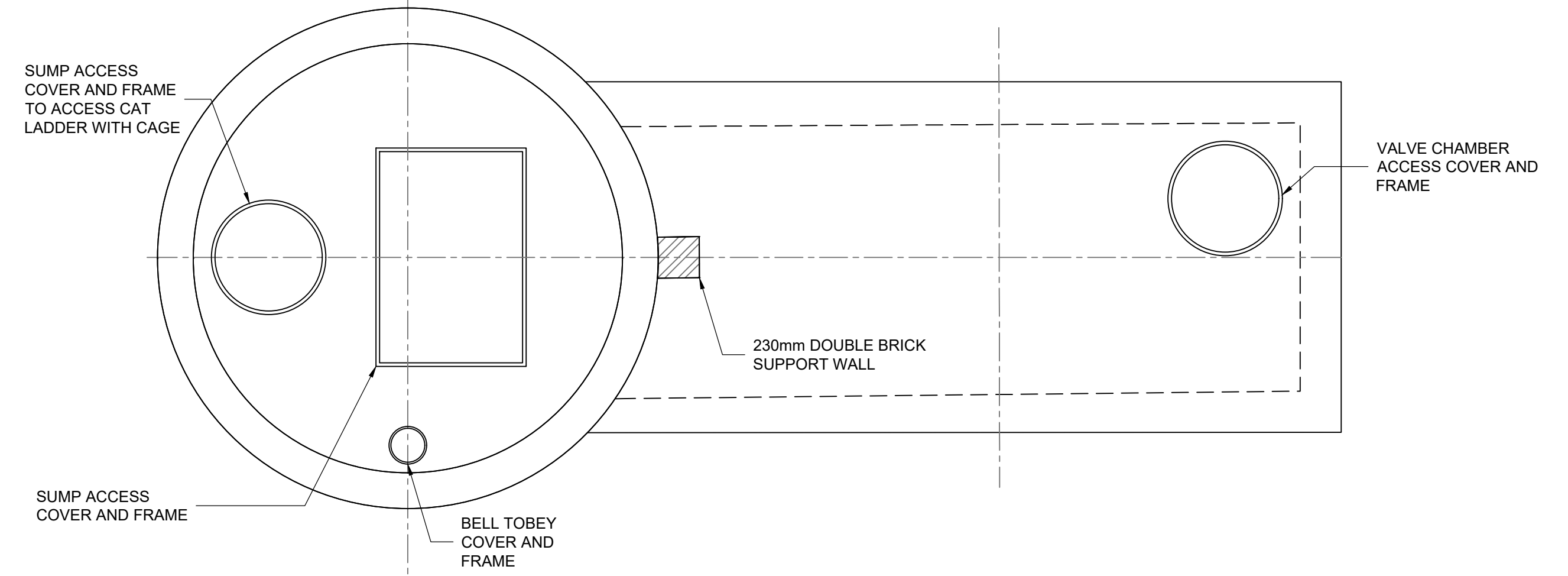
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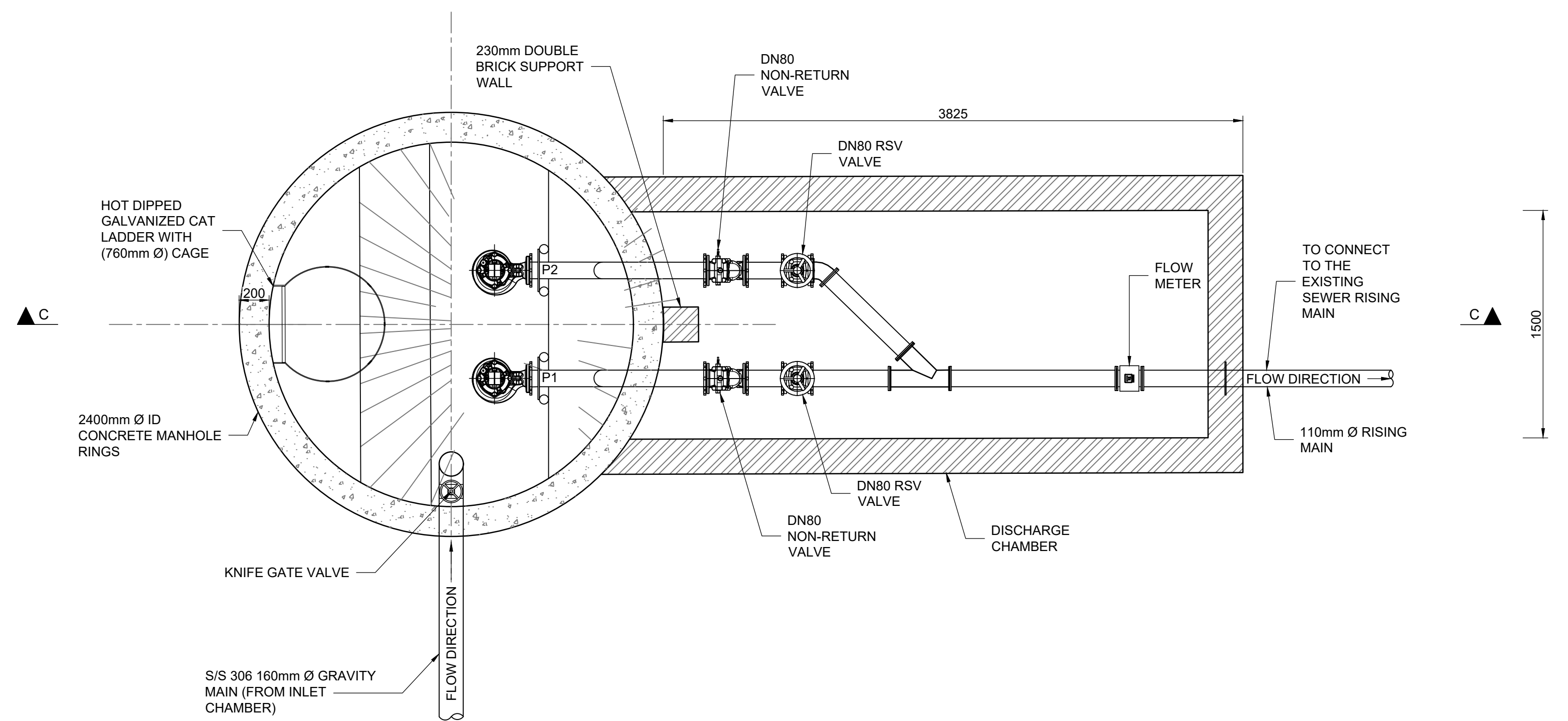
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SECTION C-C
SCALE 1:25



COVER SLAB PLAN
SCALE 1:25



SECTION PLAN VIEW
SCALE 1:25

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SIGNED	SMC South Africa
DATE	

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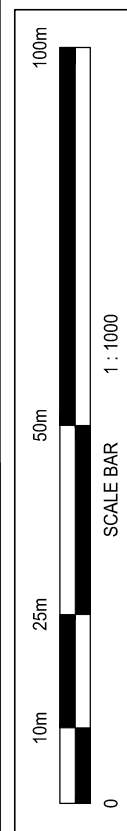
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BAYDUNES SEWER PUMP STATION

**PROPOSED PUMP STATION
SUMP AND VALVE CHAMBER DETAILS**

SIZE	A1	SCALE	AS SHOWN
PROJECT DRAWING NUMBER			
C1946 - 500 - 003			
REV	AB00	SHEET No.	01 OF 01



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PLAN VIEW
1:50

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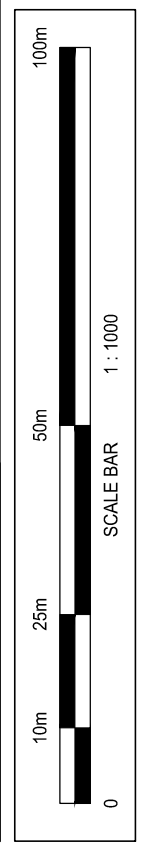
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DATE	_____	

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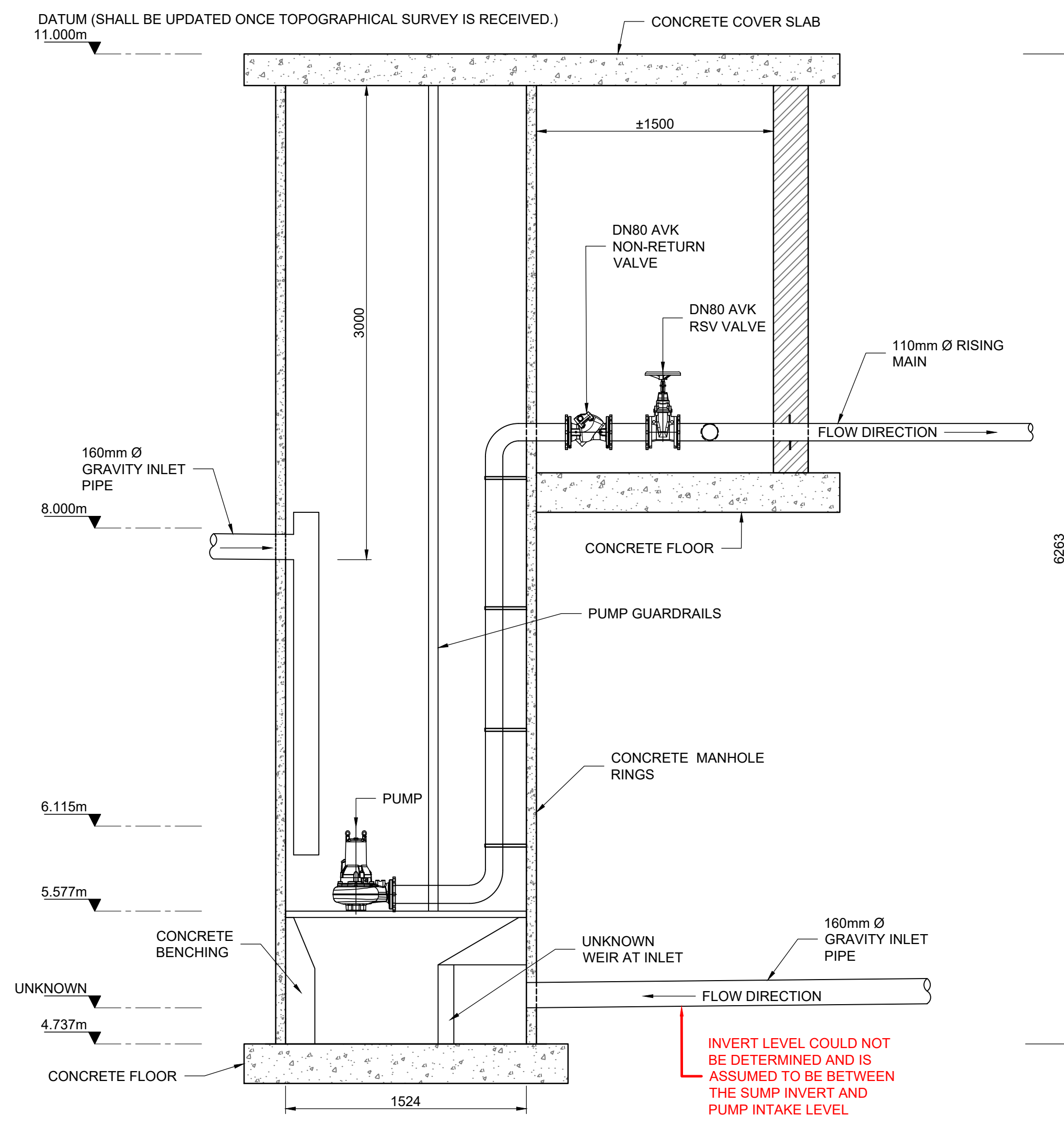
BAYDUNES SEWER PUMP STATION

**EXISTING PUMP STATION SUMP,
NEW PROPOSED PUMP STATION
AND VALVE CHAMBER**

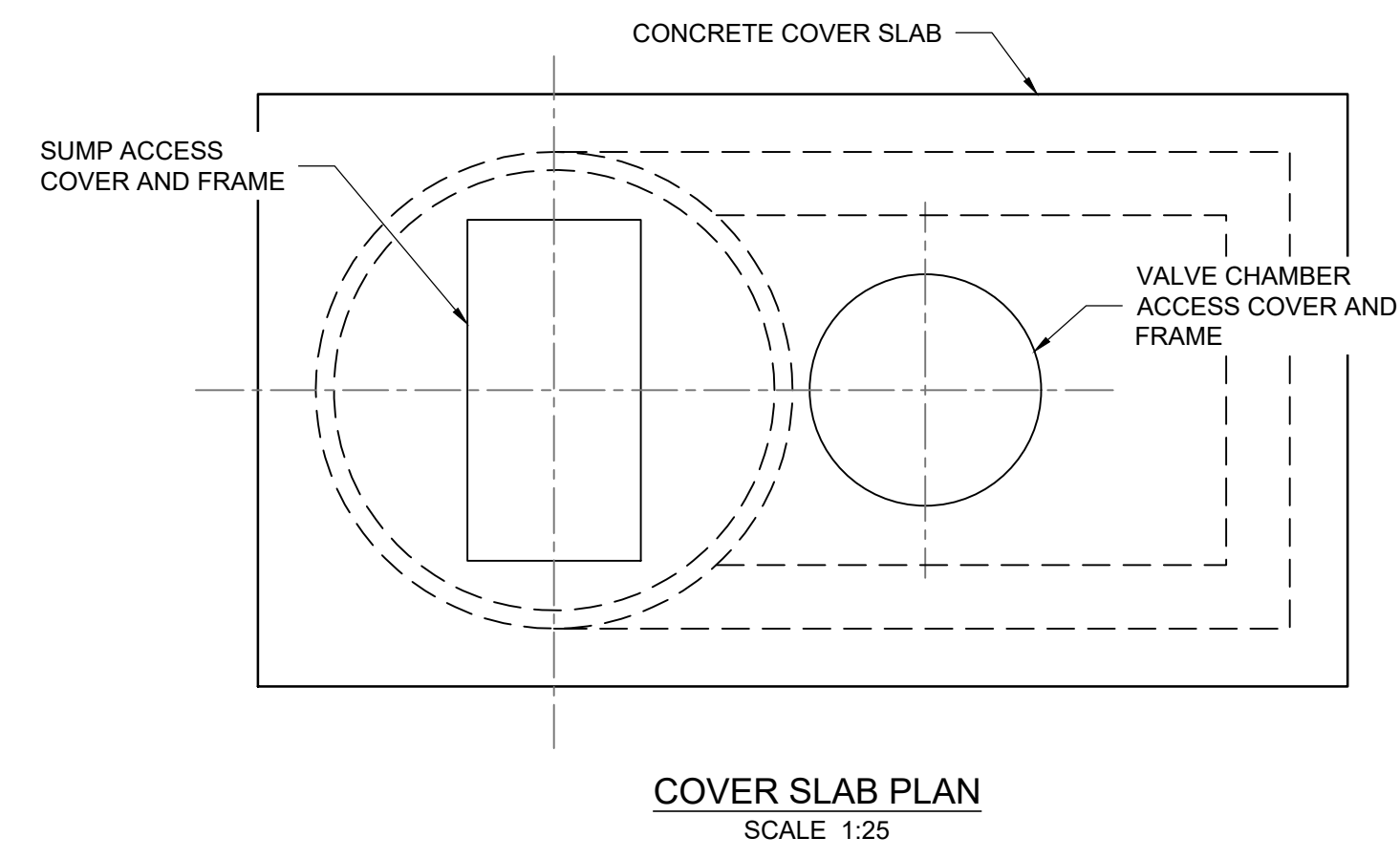
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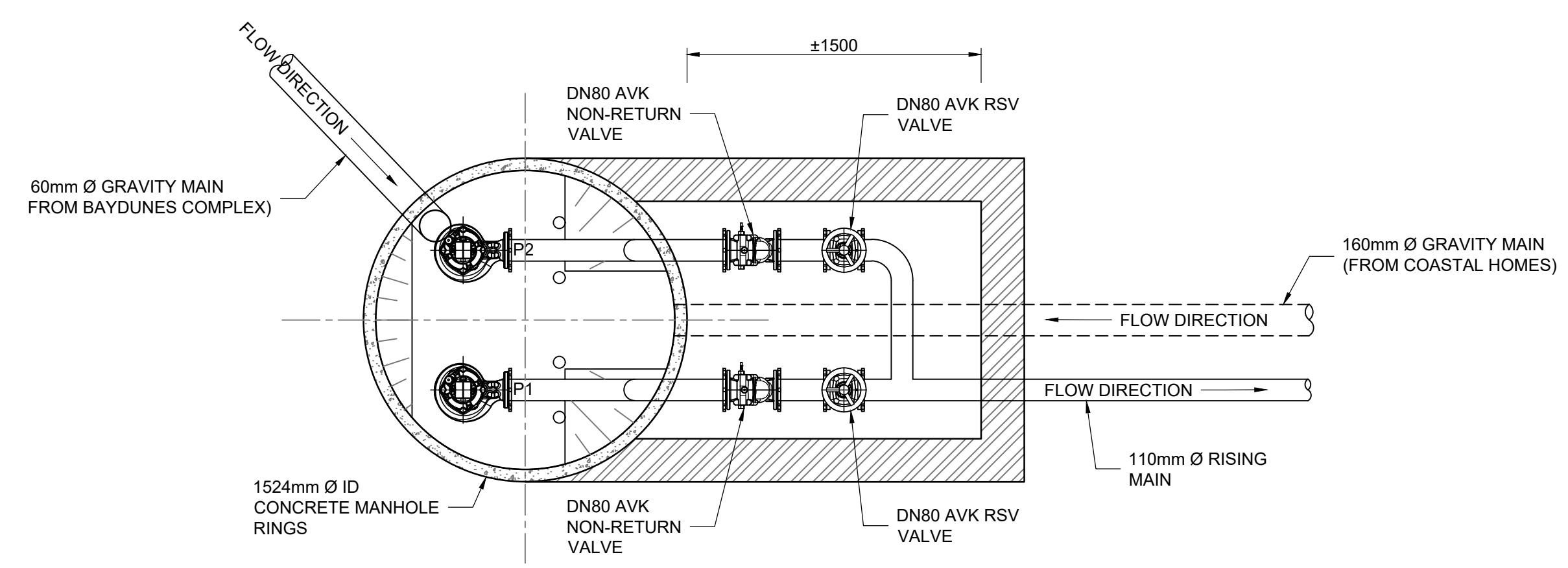
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SCALE 1:25



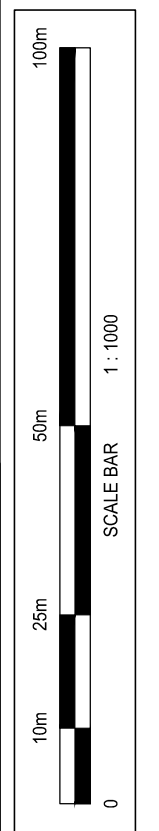
COVER SLAB PLAN
SCALE 1:25



KEY MATRIX
SCALE 1:5000



SECTION PLAN VIEW
SCALE 1:25



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CHECKED	J HOUGH

SIGNED	SMC South Africa
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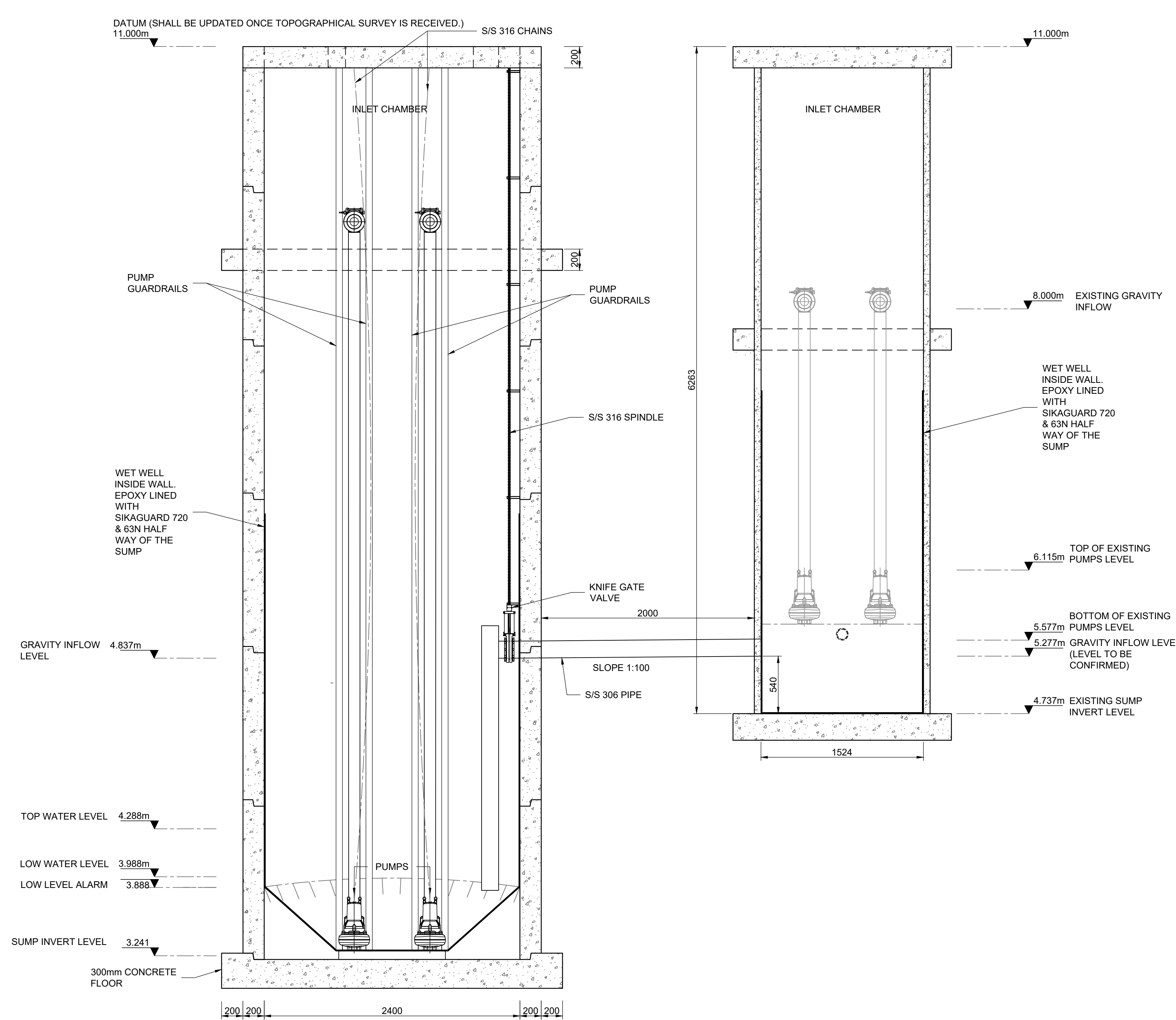
BAYDUNES SEWER PUMP STATION

**EXISTING PUMP STATION
SUMP AND VALVE CHAMBER DETAILS**

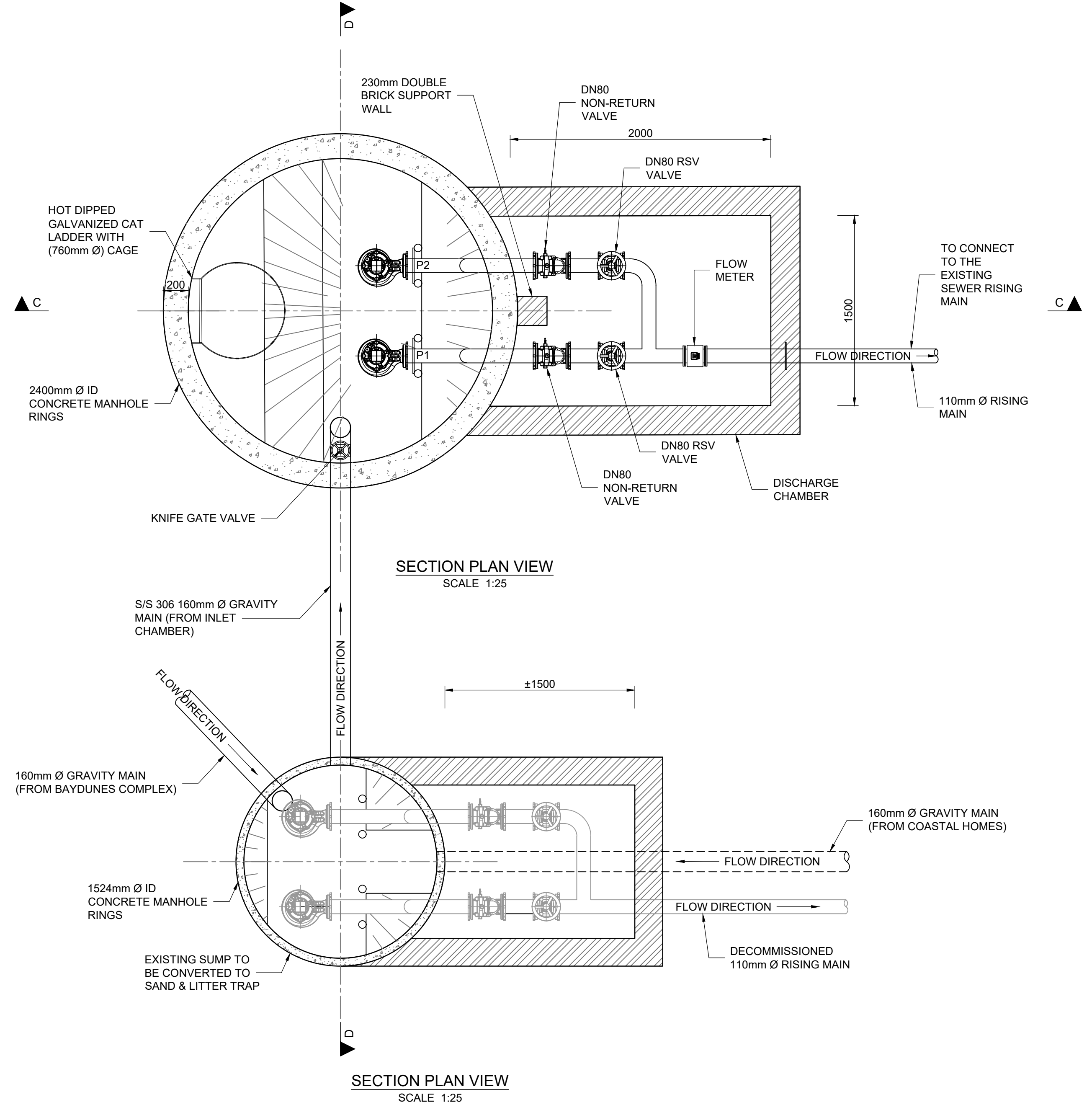
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SECTION D-D
SCALE 1:25



SECTION PLAN VIEW
SCALE 1:25

SECTION PLAN VIEW
SCALE 1:25

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DRAWN	S HLOMELA
CHECKED	AB00

SIGNED _____
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DATE _____

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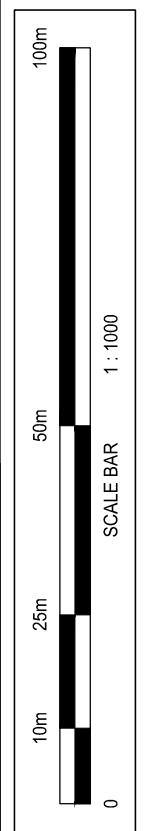
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Mossel Bay Municipality
DATE _____

BAYDUNES SEWER PUMP STATION

**EXISTING AND PROPOSED
PUMP STATION SUMP AND VALVE
CHAMBER CONFIGURATION**

SIZE	A1	SCALE	AS SHOWN
PROJECT DRAWING NUMBER			
C1946 - 500 - 002			
REV	AB00	SHEET No.	1 OF 1



FOR DISCUSSION



Eco Route

ENVIRONMENTAL CONSULTANCY

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APPENDIX E- METHOD STATEMENT REPORT



SMEC INTERNAL REF. C1946

Method Statement

Upgrading of Baydunes Sewer Pump Station, Mossel Bay

Reference No. C1946

Prepared for Mossel Bay Municipality

28 March 2023

Document Control

Document	Method Statement for Upgrading of Baydunes Sewer Pump Station
File Location	P:\C1946_Baydunes Sewer Pump Station\3_Working\Reports\Method Statement
Project Name	Upgrading of Baydunes Sewer Pump Station, Mossel Bay
Project Number	C1946
Revision Number	00

Revision History

Revision No.	Date	Prepared By	Reviewed By	Approved for Issue By
00	28/03/2023	S Hlomela	J Hough	J Hough

Issue Register

Distribution List	Date Issued	Number of Copies
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This report must be read as a whole. The executive summary is not a substitute for this. Any subsequent report must be read in conjunction with this report.

The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters which might have a material effect on its contents, or which come to light after the date of the report. SMEC is not obliged to inform you of any such event, transaction or matter nor to update the report for anything that occurs, or of which SMEC becomes aware, after the date of this report.

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DRAFT

Contents

1	Introduction	1
1.1	Problem Identification.....	1
1.2	Locality	1
	2
1.3	Scope of Work.....	2
2	Standards and Specifications	3
2.1	Occupational Health and Safety	3
2.2	Construction Works Specifications	4
2.3	Environmental Management	5
3	Plant & Equipment	7
3.1	Personnel List.....	7
3.2	Plant List	7
3.3	Equipment List.....	7
4	Methodology of Works Construction.....	8
4.1	Site Clearance	8
4.1.1	Clear and Grub	8
4.1.2	Removal of Topsoil	8
4.2	Preparation pre-shaft sinking	9
4.2.1	Dewatering	9
4.2.2	Installation of Guide block.....	9
4.2.3	Excavation of Unsuitable material	9
4.2.4	Caisson Construction Process (Ring Placement)	10
4.2.4.1	Step one: Placing the first Concrete Ring	10
4.2.4.2	Step Two: Excavation	11
4.2.4.3	Step Three: Excavation & Ring Placing.....	11
4.2.4.4	Step Four: Placing of more rings to the required Depth	12
4.2.4.5	Step Five: Excavation and placement Complete	12
4.3	Valve Chamber.....	13
4.3.1	Backfill material (Imported Fill Material or from Stockpile).....	14
4.4	Pipe & Associated Works.....	14
4.4.1	Excavations	14
4.5	Finishing.....	15
4.5.1	Kikuyu Grass Reinstatement	15
4.5.2	Paving (Block Paving)	15
5	Programme	16
6	Summary	17

List of Figures

Figure 1-1: Project Location	2
Figure 2-1: Indication of Work Areas.....	5
Figure 2-2: Site Access road	6
Figure 4-1: Type of grass found in the area of construction	8
Figure 4-2: First Concrete Ring Placement	10
Figure 4-3: Excavation within Concrete Ring.....	11
Figure 4-4: Placing Second Ring and Third Ring	11
Figure 4-5: Placing of more Concrete rings	12
Figure 4-6: A Complete Caisson method	12
Figure 4-7: Side View of Pump Station Sump & Valve Chamber	13
Figure 4-8: Plan view of the Pump Station & Calve Chamber	13
Figure 4-9: Backfill all around sump & Valve Chamber	14
Figure 4-10: Typical Pipe Cross Section.....	15

List of Appendices

Appendix A: Concept Design Drawings	18
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DRAFT

1 Introduction

SMEC South Africa was appointed by the Mossel Bay Municipality for a Multi-Year Professional Services Contract (Tender No. TDR110/2019), which includes the upgrade of Sewer Infrastructure in the Mossel Bay Municipal area.

SMEC was subsequently appointed under Order number T/30198 for the Upgrading of the Baydunes Sewer Pump Station located in Bayview, Mossel Bay.

The project was initiated due to frequent sewer blockages and spills occurring in front of the houses located on the coastline north of the pump station. When these sewer spills occur, it overflows directly into the ocean.

1.1 Problem Identification

During a site visit in October 2022 the following items was listed as the key findings of the investigation:

1. The pump station wet well diameter is 1,524m.
2. The depth of the wet well sump could not be determined due to a large volume of remaining sewage after a pump cycle.
3. 2no. submersible pumps are installed.
4. Before the pump cycle started the pumps was fully submersed.
5. The wet well was emptied until such a point when the pump had to be shut-off due to very low levels compared to pump intake.
6. At the time of shut-off the gravity inlet pipe could not be witnessed.
7. One of the gravity manholes upstream of the gravity pipeline was opened and sewage was observed standing inside the manhole and no manhole benching with laminar flow was evident.
8. The existing gravity pipeline is located partially underneath some of the houses.
9. A green patch of kikuyu grass was observed at the possible overflow point.

1.2 Locality

The sewer pump station, herein after referred to as the pump station, is located on the coastline north of the Baydunes Private Development. The pump stations global position is Latitude -34,142521 and Longitude +22,111236. The pump station is approximately 7.5m above mean sea level and consist of a wet well sump and discharge valve chamber. The pump station is operated by the Mossel Bay Municipality's Mechanical Services and Fleet Management Branch.

Refer to **Figure 1-1** for the locality of the project area.

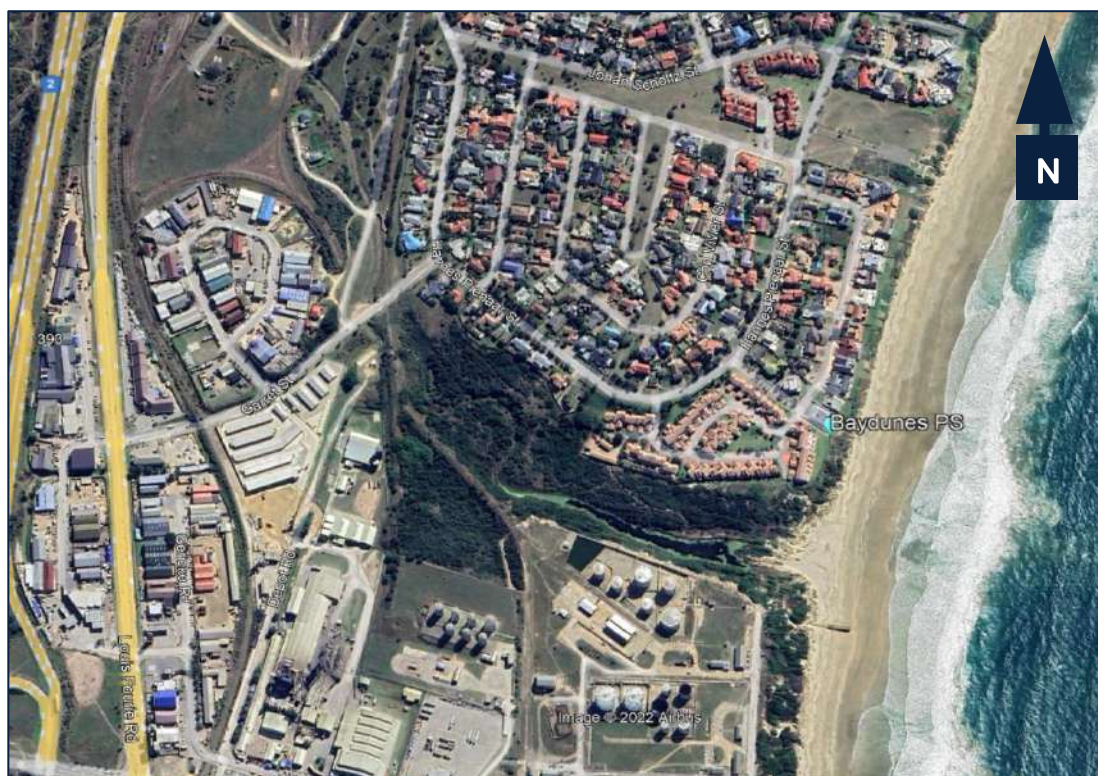


Figure 1-1: Project Location

1.3 Scope of Work

The scope of works agreed to at the Concept and Viability Report meeting is the following:

1. Establishment of Contractor on-site.
2. Lift, remove and neatly stockpile existing grass for re-planting when works are finish.
3. Installation of precast concrete rings using the Caisson method.
4. Install precast concrete cover slab.
5. Construct new discharge chamber.
6. Installation of mechanical and electrical components.
7. Re-configure pipework and connect to existing rising main.
8. Refurbish existing MCC kiosk.

For the successful implementation of this project the following items should be considered during the establishment of the proposed construction method:

- The workspace available is constraint and an open cut excavation will not be possible.
- The geotechnical properties of the prevailing in-situ material.
- The existing area consist of established grass lawns and disturbance should be kept to a minimum.
- The environmental impact on the surrounding area must also be considered.
- The proximity of the new sump to the existing pump station must be monitored to prevent settlement or canting during construction.
- The existing pump station must remain operational until such time that the connection between the sumps could take place.

Based on the above items it was established that an open caisson will be the most suitable construction method for the installation of the new wet well sump.

2 Standards and Specifications

The following specifications and legislative documentation shall apply to the scope of works to ensure that the works are executed in accordance with the design drawings, at acceptable quality and to the relevant safety standards:

- Occupational Health & Safety Specification
- Occupational Health and Safety Act 85 of 1993
- Construction Regulations 2014
- SANS 1200 Standard Specifications
- Project Specifications
- Construction Drawings
- Environmental Management Programme
- Environmental Maintenance Management Plan

2.1 Occupational Health and Safety

An Occupational Health & Safety consultant will be appointed to perform the OH&S duties on the project. The scope of works of the Client's Agent will in general cover the requirements of Section 4 (Duties of the Client) of Construction Regulations 2014. Where the consultant will be requested to compile a Baseline Risk Assessment and OHS Specifications for the scope of works.

Responsibilities, authority and accountability of the Occupational Health and Safety Consulted will include, but are not limited to, the management and review of the following:

- Designs of proposed works.
- The principal contractor shall appoint a full-time competent person as the construction manager with the duty of managing all the construction work on the Site.
- A competent safety officer to perform OHS duties on site.
- OHS file on site with all the necessary documents.
- A site-specific baseline risk assessment and hazard identification will be performed
- Toolbox talks will be carried out at the beginning of each workday with all employees prior to work commencing.
- Ensure all confined space entry works are performed safely and a Confine Space Entry permit system is implemented before entering or works start within a confined space.
- Dust masks are compulsory during dusty conditions.
- Protection around the excavations will be installed. A construction barrier nett of at least 1m high and as close to the excavations as possible will be installed. Warning signs are to be posted on these barriers.
- All employees and contractors involved in this activity are competent to do so.
- All operators must be licenced and certified. Copies of such documents will be kept on file at the Site Office.
- Ensure that environmental issues receive adequate attention in the site induction training.
- Prepare and conduct awareness training (posters and signage) for contractor's personnel on site.
- Take required corrective actions within specified time frame.
- Compilation of project environmental management file.
- Be considerate for the shaft depth as soon as it starts getting deep.

- Be aware of the risks and effects of heavy rain or floods and have flood control methods in place.

2.2 Construction Works Specifications

The standard specifications for the completion of the construction works will be the SABS1200, Standardized Specification for Civil Engineering Construction, that includes a section on Earthworks (small works), Concrete (small works) and Precast Concrete (structural) which will form the basis of the standard specifications.

Any variation to the standard specifications named above will be documented and described inside the Project Specifications which will be included in Part C3 of the Contract Document.

Further to the above the construction drawings will comply with the relevant design principles and all works shall be completed as per the dimensions, specifications and requirements set out on the construction drawings.

Where the Contractor is responsible for the design of the temporary works or permanent works, he will submit all designs, calculations and drawings to the Engineer for review, verification and approval prior to the commencement of the relevant works. The Contractor shall further ensure all design completed by him are done by a competent professional person registered with the Engineering Council of South Africa.

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2.3 Environmental Management

The environmental management on this project is taking high priority due to the location of the site being close to the ocean. The site is also close to a residential complex and near a walkway leading to the beach.

Ecosense was appointed as the Environmental Practitioner to provide environmental services. The appointed Environmental Practitioner for this project will conduct regular site visits to ensure the Contractor comply with the relevant environmental specifications and requirements as, but not limited to, the following:

- Monitor compliance with the EMP and environmental method statements.
- Maintain site documentation related to environmental management (permits, EMP, Method statements, audit reports, monitoring results, receipts of waste removal, etc.) These documents need to be stored in the relevant site Documents Control System.
- Inspect and report on environmental incidents and check corrective actions.
- Keep photographic records of all environmental incidents.
- Keep records of environmental incidents, hazardous substance register, complaints register and environmental non-compliance register.

Under the environmental management there will be demarcated NO-GO areas which will be cordoned off and protected during the construction period.

The construction work activities shall be performed within the demarcated and closed-off construction area. This will ensure construction work is carried out within an enclosed area.

The contractor will ensure the walkway is accessible throughout the construction period.

Access to the site will be gained through Hannes Pienaar and Bob Bouwer Cres then towards parking area in corner of Bob Bouwer Cres. Further, the contractor will spoil all excess material off-site and only a limited amount of material may be stockpiled on-site for re-use. Refer to **Figure 2-1** below that shows the various areas in which work will take place and **Figure 2-2** that shows the current status of the area of construction. Refer to **Appendix A** for detailed layout of work areas, etc.

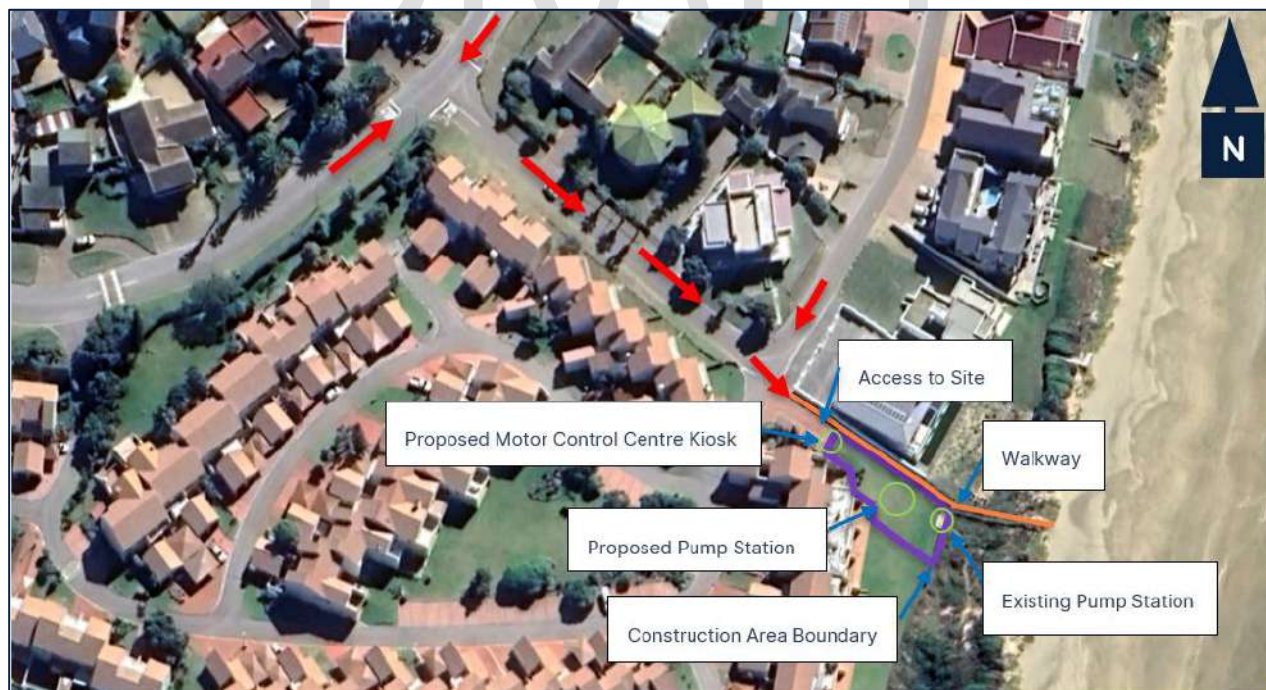


Figure 2-1: Indication of Work Areas



Figure 2-2: Site Access road

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3 Plant & Equipment

For the effective execution of each construction work activity a dedicated team of personnel, plant and equipment must be used. Below is the list of personnel, plant and equipment envisaged to be used during the construction works activities. Note that the below list could be updated without any delay when the conditions on-site change, or when it is required for more specialised plant to be utilised.

3.1 Personnel List

- Employer (Client – Mossel Bay Municipality)
- Engineer (Professional Engineering Consultant – SMEC)
- Employers Agent (Professional Engineering Consultant - SMEC)
- Assistant Employer's Agent (Professional Engineering Consultant - SMEC)
- ECO (Environmental Control Officer – Appointed Environmental Consultant)
- Contracts Manager (Appointed Contractor)
- Construction Manager (Appointed Contractor)
- Work Activity Foreman/Supervisor (Appointed Contractor)
- Drivers and Plant Operators (Appointed Contractor)

3.2 Plant List

- 30ton large excavator
- 3ton small excavator
- 4x4 Tractor Loader Backhoe (TLB)
- 8-ton Crane truck
- 10m³ Tipper Trucks
- 6000 litres water truck
- 1-ton Light Duty Vehicle (LDV)

3.3 Equipment List

- Small size 2" water pump with a pump capacity of ±12l/s
- Padfoot Rammer
- Concrete Mixer
- Concrete vibratory poker machine
- Troxler nuclear density gauge
- Safety Fencing and Netting
- Temporary construction Road signs

4 Methodology of Works Construction

The method statement below will provide a chronological methodology for the construction work activities associated with installation of the new wet well sump using precast concrete rings.

The construction activities include, but not limited to, site clearance, dewatering of the new pump area, preparatory excavations, installation of temporary guide block, installation of precast concrete shafts using the open caisson method, excavation, loading and transportation of spoil materials, installation of concrete sump plug, waste management and prescribes the plant, equipment and PPE to be used on-site when carrying out the construction activities.

4.1 Site Clearance

4.1.1 Clear and Grub

The selected area where the new pump station sump, valve chamber, pipe work will be located are cleared and grub in terms of the SABS1200C specification. The clear and grub includes removal of existing grass in the area and neatly stacking the grass for re-planting when the works are complete. The grass will later be reinstated around the chamber to ensure that the area is as it was before construction. Refer to Error! Reference source not found. below showing the type of vegetation.

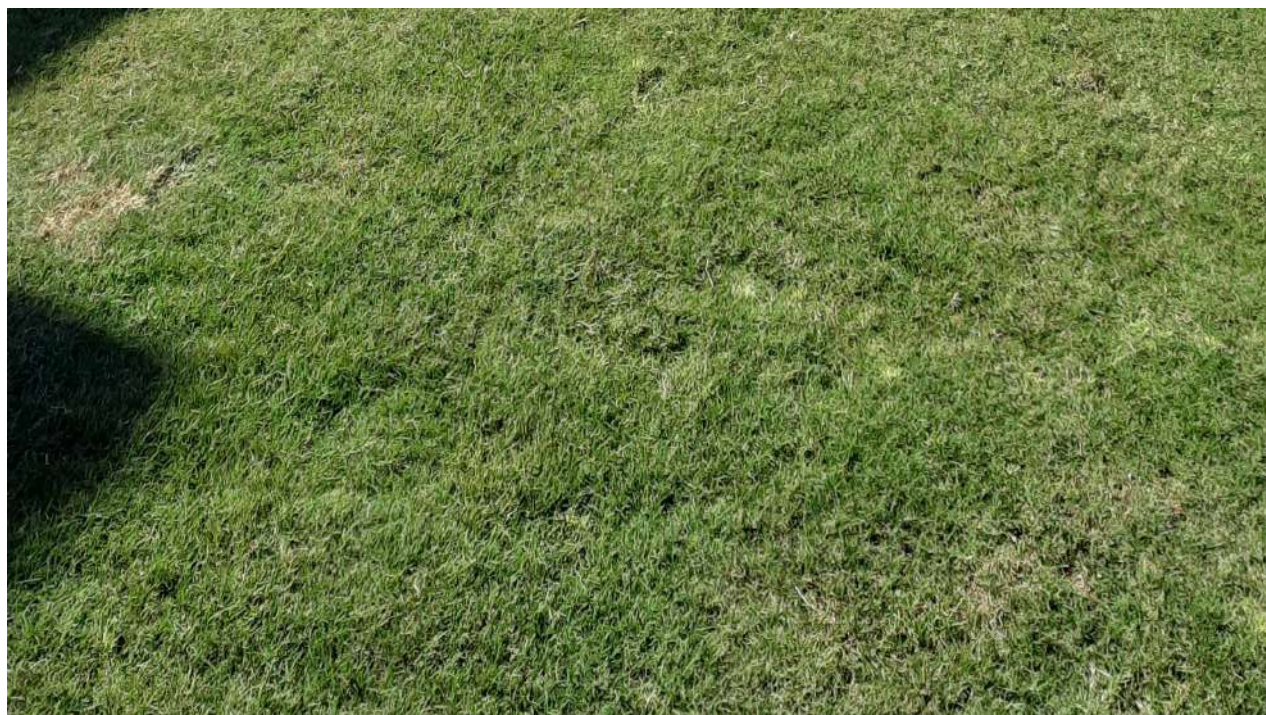


Figure 4-1: Type of grass found in the area of construction

4.1.2 Removal of Topsoil

Once the clear and grub of the work area is complete the topsoil shall be stripped to a minimum depth of 150mm. The exact depth of the topsoil stripping shall be confirmed by the Employers Agent on-site. The topsoil shall be removed with a Digger loader by scraping the required topsoil on a stockpile and loading it onto a 10m³ Tipper Truck. The topsoil material shall then be hauled to the designated stockpile area.

4.2 Preparation pre-shaft sinking

4.2.1 Dewatering

Once the topsoil has been removed the dewatering up to the depth of the sump will be installed. The dewatering will be completed by a competent service provider for the duration of the works.

4.2.2 Installation of Guide block

The installation of the guideblock could commence once the dewatering has been installed. The guide block installation shall following the following steps:

1. Level material where guide block will be positioned and compact to 95% (100% for sand) MOD AASHTO density.
2. is complete the guide block foundation will be prepared. The construction activity will be cut to spoil.

4.2.3 Excavation of Unsuitable material

- All excavations shall be carried out under supervision and the operator shall be trained with the required certifications, assessed, and deemed competent to operate the respective plant.
- The excavation shall be done with a 4x4 Tractor Loader Backhoe (TLB) and loaded on 10m³ Tipper Truck.
- The loaded material shall be hauled to the designated stockpile area and off-loaded on specifically controlled heaps (stockpiles). The stockpiles shall not be higher than 3m to ensure visibility and safety measures are adhered to.

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4.2.4 Caisson Construction Process (Ring Placement)

- Excavate an area at least 9.3 m deep and 400 mm greater than the external diameter of the shaft. (2800mm diameter Rocla concrete rings)
- Position the cutting edge accurately and level inside the excavation. Lift and fit the first one- piece ring into the cutting edge.
- Surround the base section (immediately above the cutting edge) with 10 - 15 mm thick polystyrene sheet to provide an annulus.
- Fill the area between the first ring and the outer perimeter of the excavation with concrete (min. grade 20 mPa) to form a complete concrete collar; this provides permanent support to the shaft excavation, lateral resistance to jacking forces, and acts as a guide for the shaft sinking. Once the concrete has hardened the polystyrene can be dissolved using a suitable environmentally safe solvent. The concrete is usually sufficiently hardened to allow shaft sinking to begin the next day.
- Lift and position the next ring using a leg chain and lifting clutches – fitted into the lifting anchors on the upper surface. The lower surface of the ring should be cleaned.
- Sink the rings by excavating inside the shaft using hand excavation. The shaft will sink under its own weight in very soft ground.
- Check the shaft for accuracy of sinking, by using a spirit level or plumb line; adjustments can be made by applying pressure to the high point. Selective excavation of the ground will also help to control the sinking.
- Proceed with excavation and add rings until the required depth is reached.

4.2.4.1 Step one: Placing the first Concrete Ring

Placing the first concrete ring on the prepared floor and right position as demonstrated in **Figure 4-2** below.



Figure 4-2: First Concrete Ring Placement

4.2.4.2 Step Two: Excavation

- Excavation inside or within the concrete ring as demonstrated in **Figure 4-3** below.

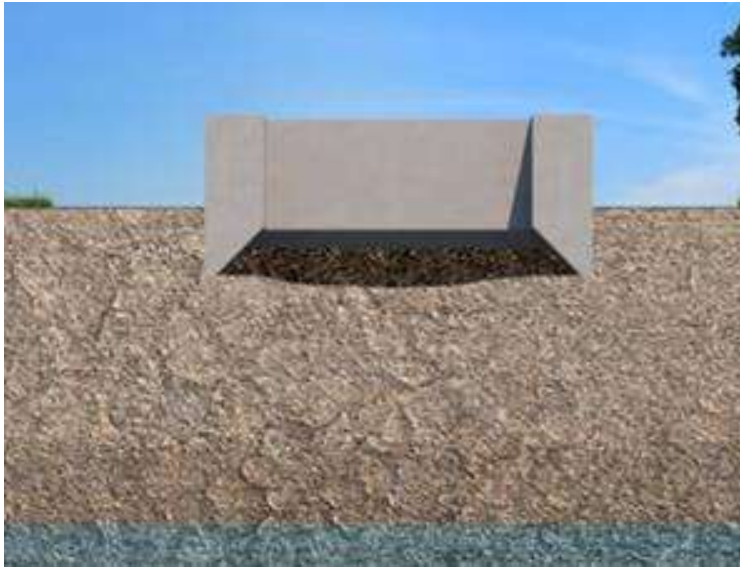


Figure 4-3: Excavation within Concrete Ring

4.2.4.3 Step Three: Excavation & Ring Placing

- Placing second then excavation within the concrete ring and placing of a third concrete ring on top of the second ring. Refer to **Figure 4-4** below for demonstration.

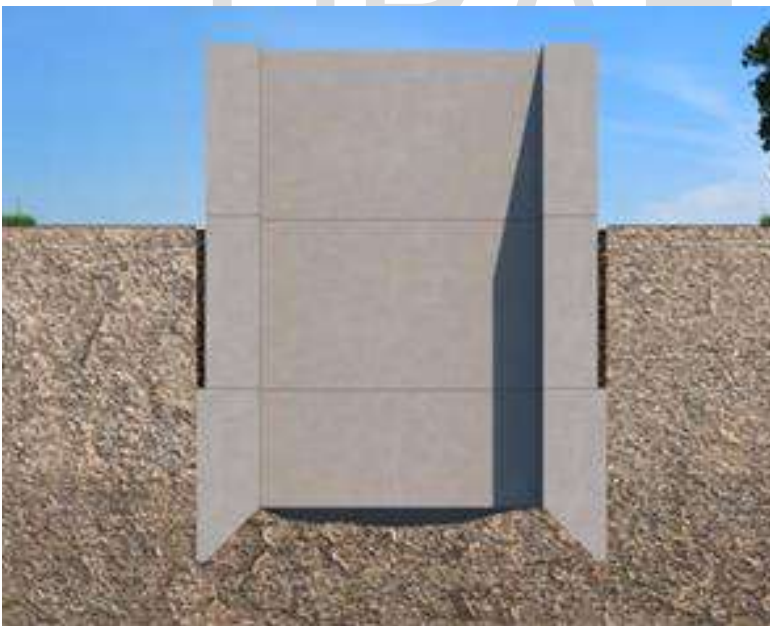


Figure 4-4: Placing Second Ring and Third Ring

4.2.4.4 Step Four: Placing of more rings to the required Depth

- The process mentioned above is repeated as requires until the required depth is reached. Refer to **Figure 4-5** below for demonstration.



Figure 4-5: Placing of more Concrete rings

4.2.4.5 Step Five: Excavation and placement Complete

- The process is carried out as many times as required to reach the required depth of 11 meters below the ground. Refer to **Figure 4-6** below for demonstration.



Figure 4-6: A Complete Caisson method

4.3 Valve Chamber

- Excavation for the new sump valve chamber next. The valve will be 1,5m deep with a 200 mm concrete floor and 200mm thick slab on top supported by a 230 double brick wall on the sides. Please Refer to **Figure 4-7** and **Figure 4-8** below.

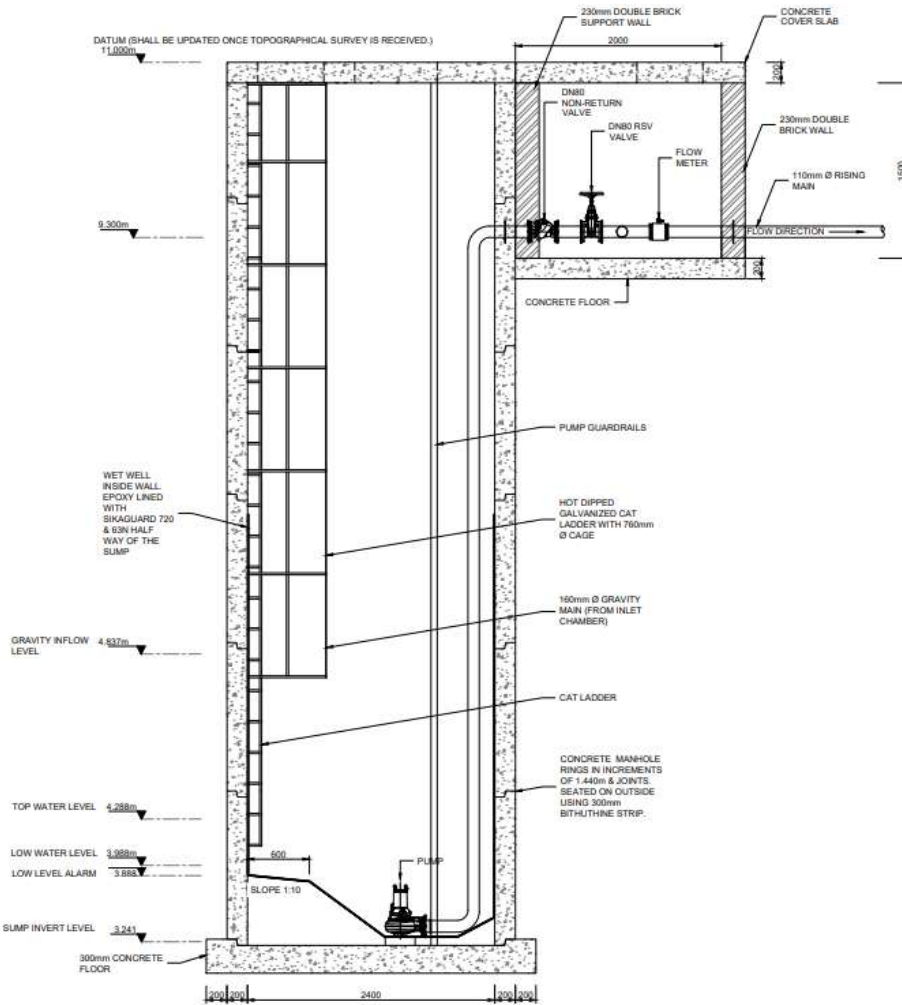


Figure 4-7: Side View of Pump Station Sump & Valve Chamber

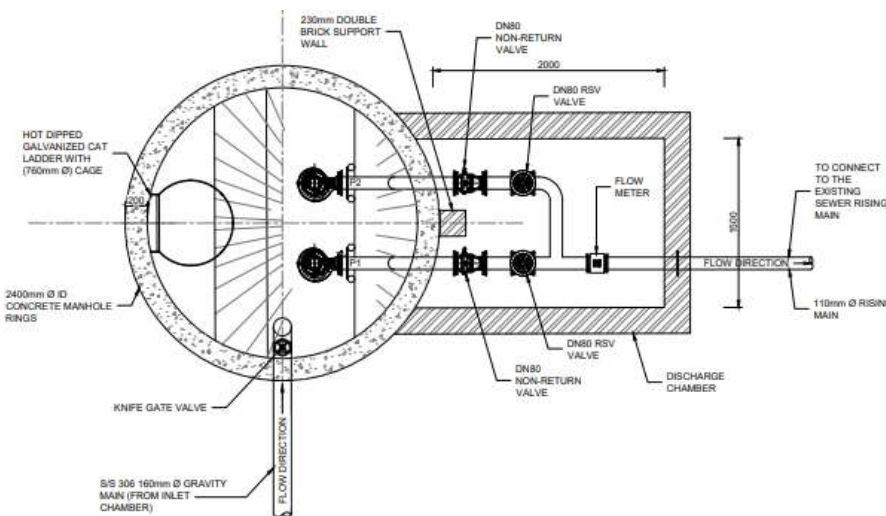


Figure 4-8: Plan view of the Pump Station & Valve Chamber

4.3.1 Backfill material (Imported Fill Material or from Stockpile)

- The material used for backfilling will be similar to material excavated from the ground, material can be from a commercial source or the stockpile. Pad-foot rammer will be used to carry out compaction during the backfill process. Backfilling around the top concrete ring depth will be up to 300mm as the ground underneath will hardly be disturbed.
- The valve chamber, a depth of 1900mm and 300mm wide will require backfilling in layers of not more than 300mm to ensure desired compaction is carried out. Refer to **Figure 4-9** shows backfill areas.

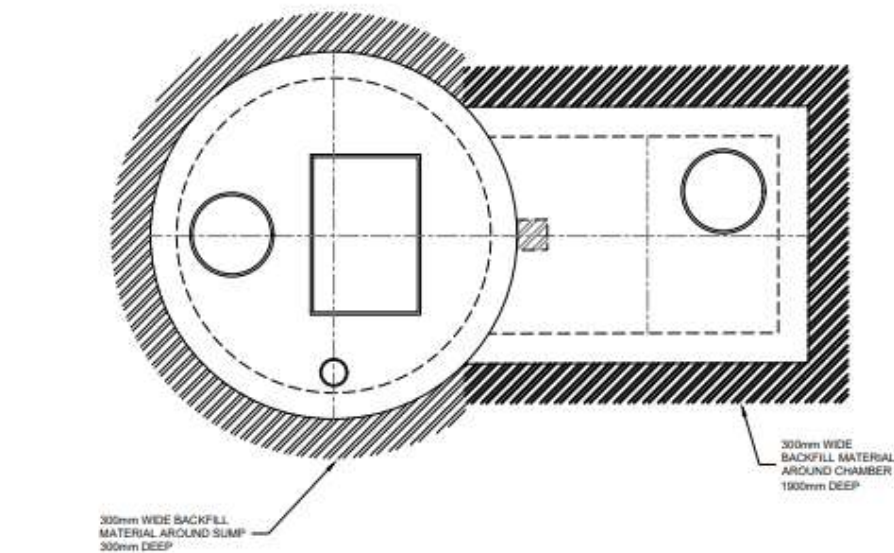


Figure 4-9: Backfill all around sump & Valve Chamber

4.4 Pipe & Associated Works

Pipe work will be conducted to connect the existing pump station to the new built pump station and sewer pipe extension from newly built pump station to the current sewer line.

4.4.1 Excavations

- The pipe trench will be excavated as per the dimensions indicated.
- All excavations shall be done with a TLB or by hand where possible.
- Disposing unsuitable material from the trench
- Once the excavations are completed the pipe trench shall be prepared and levelled with bedding material.
- The bedding layer shall be checked and approved by the assigned personnel to ensure quality work is carried out.
- After bedding preparations are complete a sewer pipes of 110mm and 160mm in diameter pipes to be laid to connect the new sump and chamber to the existing sump and sewer pipeline.
- Once the pipes are laid and connected backfilling the trench can be carried out with suitable material.

Refer to **Figure 4-10** below that shows a typical Pipe structure and backfilling.

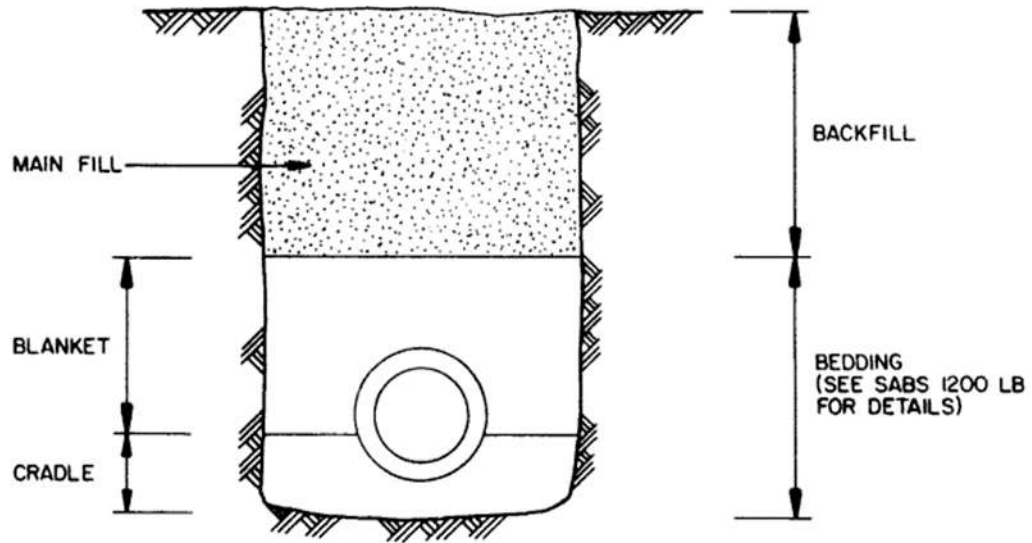


Figure 4-10: Typical Pipe Cross Section

4.5 Finishing

4.5.1 Kikuyu Grass Reinstatement

- Kikuyu grass Initially cleared for the purpose of carrying out construction of the sump, valve chamber, pipe work will be reinstated.
- This will be done through seeds or by acquiring Kikuyu grass rolls from a reputable landscaping service provider.

4.5.2 Paving (Block Paving)

- After all the backfill material layers are complete to the correct level and compaction, 20mm sand and 60mm block with similar specification will be reinstated.

5 Programme

The anticipated programme for the rehabilitation of the Botanical Garden Dam Wall is listed below in **Table 4-1**.

Table 5-1: Project Programme

No.	Stages	Anticipated Completion Date
1	Commencement Date	08 September 2022
2	Submission of Inception Report	25 October 2022
3	Topographical and land surveys	4 November 2023
4	Geotechnical Investigation	4 November 2023
5	Submission of Concept Design Report	13 December 2022
6	Submission of Detailed Design Report	02 March 2023
7	Submission Draft Tender Document	16 March 2023
8	Tender Advert	23 March 2023
9	Tender Closing	13 April 2023
10	Tender Evaluation Report	27 April 2023
11	Bid Evaluation Committee (BEC)	11 May 2023
12	Bid Adjudication Committee (BAC)	18 May 2023
13	Construction Commencement (Include 14-day appeal period)	01 June 2023
14	Construction Practical Completion	01 December 2023
15	Construction Completion	15 December 2023
16	Close-Out	12 January 2024
17	Construction Final Approval & Retention Release	13 December 2024

6 Summary

The Mossel Bay Municipality is responsible for service delivery in the Mossel Bay Municipal area and appointed SMEC South Africa (Pty) Ltd for providing professional engineering services for the Upgrading of Baydunes Sewer Pump Station.

The existing pump station wet well is composed of a well sump of 1,524 diameter with an unknown depth due as a result of large volume of sewage volume at the bottom. The problem was identified as one of the sewer pipelines that gravitates from the houses on the coastline north of the pump station to the pump station has a very flat gradient and due to flat gradient, the sewer pushes back and overflows out of a manhole located on the sewer pipeline and is causing sewer spillages in the area. The objective of the Mossel Bay Municipality is to mitigate any risks, prevent any environmental impact into the ocean due to sewer spillages and to ensure that it provides effective service to the residents of Mossel Bay affected by this problem. This will be achieved through the Upgrading of Baydunes sewer pump station in accordance to the specifications.

Specifications that include the OHS Act 85 of 1993, SANS 1200 Standard Specifications, construction drawings, project Specifications and Environment Specifications shall apply to this contract to ensure that the works are performed within the relevant safety and environmental parameters and in compliance with the design while still ensuring good quality work.

The methodology of works to be carried out involved 5 main steps:

1. Site Clearance
2. Removal of unsuitable material
3. Caisson-One-piece shafts
4. Pipework Construction
5. Finishing

The anticipated starting date for construction is 01 June 2023.

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Appendix A: Concept Design Drawings

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