GEORGE
TEL: +27 (0) 44 873 4923 **FAX:** +27 (0) 44 874 5953
EMAIL: info@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Unit 17 Cathedral Square, Cathedral Street, George, 6530
PO BOX: 9087, George, 6530

CAPE TOWN
TEL: +27 (0) 21 554 5195 **FAX:** +27 (0) 86 575 2869
EMAIL: betsy@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Tableview, Cape Town, 7441
PO BOX: 443, Milnerton, 7435

DRAFT
BASIC ASSESSMENT REPORT

FOR THE

THE PROPOSED REPAIR AND REHABILITATION OF FLOOD DAMAGE ALONG THE CAMPHERSDRIFT RIVER, VAN RIEBEECK PARK, GEORGE, WESTERN CAPE.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended 7 April 2017)

PREPARED FOR: *George Municipality*
PO Box 19
George
6530

DATE: 24 July 2024

SES REF NO: 02/CD/FR/GM/11/23
DEA&DP REF.NO.: 16/3/3/1/D2/11/0022/24

Western Cape Government

Department of Environmental Affairs and Development Planning

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

APRIL 2024

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

APRIL 2024

(For official use only)	
Pre-application Reference Number (if applicable):	
EIA Application Reference Number:	
NEAS Reference Number:	
Exemption Reference Number (if applicable):	
Date BAR received by Department:	
Date BAR received by Directorate:	
Date BAR received by Case Officer:	

GENERAL PROJECT DESCRIPTION

(This must Include an overview of the project including the Farm name/Portion/Erf number)

The proposed repair and rehabilitation of flood damage along the Camphersdrift River, Van Riebeeck Park, George, Western Cape.
DEADP REF: 16/3/3/1/D2/11/0022/24

IMPORTANT INFORMATION TO BE READ PRIOR TO COMPLETING THIS BASIC ASSESSMENT REPORT

1. **The purpose** of this template is to provide a format for the Basic Assessment report as set out in Appendix 1 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended) in order to ultimately obtain Environmental Authorisation.

2. The Environmental Impact Assessment ("EIA") Regulations is defined in terms of Chapter 5 of the National Environmental Management Act, 19998 (Act No. 107 of 1998) ("NEMA") hereinafter referred to as the "NEMA EIA Regulations".

3. *Submission of documentation, reports and other correspondence:*

   The Department has adopted a digital format for corresponding with proponents/applicants or the general public. If there is a conflict between this approach and any provision in the legislation, then the provisions in the legislation prevail. If there is any uncertainty about the requirements or arrangements, the relevant Competent Authority must be consulted.

   The Directorate: Development Management has created generic e-mail addresses for the respective Regions, to centralise their administration. Please make use of the relevant general administration e-mail address below when submitting documents:

   DEADPEIAAdmin@westerncape.gov.za
   Directorate: Development Management (Region 1):
   City of Cape Town; West Coast District Municipal area;
   Cape Winelands District Municipal area and Overberg District Municipal area.

   DEADPEIAAdmin.George@westerncape.gov.za
   Directorate: Development Management (Region 3):
   Garden Route District Municipal area and Central Karoo District Municipal area

   General queries must be submitted via the general administration e-mail for EIA related queries. Where a case-officer of DEA&DP has been assigned, correspondence may be directed to such official and copied to the relevant general administration e-mail for record purposes.

   All correspondence, comments, requests and decisions in terms of applications, will be issued to either the applicant/requester in a digital format via email, with digital signatures, and copied to the Environmental Assessment Practitioner ("EAP") (where applicable).

4. The required information must be typed within the spaces provided in this Basic Assessment Report ("BAR"). The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided.

5. All applicable sections of this BAR must be completed.

6. Unless protected by law, all information contained in, and attached to this BAR, will become public information on receipt by the Competent Authority. If information is not submitted with this BAR due to such information being protected by law, the applicant and/or Environmental Assessment Practitioner ("EAP") must declare such non-disclosure and provide the reasons for believing that the information is protected.

7. This BAR is current as of **April 2024**. It is the responsibility of the Applicant/ EAP to ascertain whether subsequent versions of the BAR have been released by the Department. Visit this Department's website at http://www.westerncape.gov.za to check for the latest version of this BAR.

8. This BAR is the standard format, which must be used in all instances when preparing a BAR for Basic Assessment applications for an environmental authorisation in terms of the NEMA EIA Regulations when the Western Cape Government Department of Environmental Affairs and Development Planning ("DEA&DP") is the Competent Authority.

9. Unless otherwise indicated by the Department, one hard copy and one electronic copy of this BAR must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. Reasonable access to copies of this Report must be provided to the relevant Organs of State for consultation purposes, which may, if so indicated by the Department, include providing a printed copy to a specific Organ of State.

10. This BAR must be duly dated and originally signed by the Applicant, EAP (if applicable) and Specialist(s) and must be submitted to the Department at the details provided below.

11. The Department's latest Circulars pertaining to the "One Environmental Management System" and the EIA Regulations, any subsequent Circulars, and guidelines must be taken into account when completing this BAR.

12. Should a water use licence application be required in terms of the National Water Act, 1998 (Act No. 36 of 1998) ("NWA"), the "One Environmental System" is applicable, specifically in terms of the synchronisation of the consideration of the application in terms of the NEMA and the NWA. Refer to this Department's Circular EADP 0028/2014: One Environmental Management System.

13. Where Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA") is triggered, a copy of Heritage Western Cape's final comment must be attached to the BAR.

14. The Screening Tool developed by the National Department of Environmental Affairs must be used to generate a screening report. Please use the Screening Tool link https://screening.environment.gov.za/screeningtool to generate the Screening Tool Report. The screening tool report must be attached to this BAR.

15. Where this Department is also identified as the Licencing Authority to decide on applications under the National Environmental Management: Air Quality Act (Act No. 29 of 2004) ('NEM:AQA"), the submission of the Report must also be made as follows, for-
Waste Management Licence Applications, this report must also (i.e., another hard copy and electronic copy) be submitted for the attention of the Department's Waste Management Directorate (Tel: 021-483-2728/2705 and Fax: 021-483-4425) at the same postal address as the Cape Town Office.

    Atmospheric Emissions Licence Applications, this report must also be (i.e., another hard copy and electronic copy) submitted for the attention of the Licensing Authority or this Department's Air Quality Management Directorate (Tel: 021 483 2888 and Fax: 021 483 4368) at the same postal address as the Cape Town Office.

DEPARTMENTAL DETAILS	
CAPE TOWN OFFICE: **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 1)** (City of Cape Town, West Coast District, Cape Winelands District & Overberg District)	**GEORGE REGIONAL OFFICE:** **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 3)** (Central Karoo District & Garden Route District)
The completed Form must be sent via electronic mail to: DEADPEIAAdmin@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 1) at: E-mail: DEADPEIAAdmin@westerncape.gov.za Tel: (021) 483-5829 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 1) Private Bag X 9086 Cape Town, 8000	The completed Form must be sent via electronic mail to: DEADPEIAAdmin.George@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 3) at: E-mail: DEADPEIAAdmin.George@westerncape.gov.za Tel: (044) 814-2006 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 3) Private Bag X 6509 George, 6530

MAPS

Provide a location map (see below) as Appendix A1 to this BAR that shows the location of the proposed development and associated structures and infrastructure on the property.	
Locality Map:	The scale of the locality map must be at least 1:50 000. For linear activities or development proposals of more than 25 kilometres, a smaller scale e.g., 1:250 000 can be used. The scale must be indicated on the map. The map must indicate the following: • an accurate indication of the project site position as well as the positions of the alternative sites, if any; • road names or numbers of all the major roads as well as the roads that provide access to the site(s) • a north arrow; • a legend; and • a linear scale. For ocean based or aquatic activity, the coordinates must be provided within which the activity is to be undertaken and a map at an appropriate scale clearly indicating the area within which the activity is to be undertaken. Where comment from the Western Cape Government: Transport and Public Works is required, a map illustrating the properties (owned by the Western Cape Government: Transport and Public Works) that will be affected by the proposed development must be included in the Report.
Provide a detailed site development plan / site map (see below) as Appendix B1 to this BAR; and if applicable, all alternative properties and locations.	
Site Plan:	Detailed site development plan(s) must be prepared for each alternative site or alternative activity. The site plans must contain or conform to the following: • The detailed site plan must preferably be at a scale of 1:500 or at an appropriate scale. The scale must be clearly indicated on the plan, preferably together with a linear scale. • The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan. • On land where the property has not been defined, the co-ordinates of the area in which the proposed activity or development is proposed must be provided. • The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be clearly indicated on the site plan. • The position of each component of the proposed activity or development as well as any other structures on the site must be indicated on the site plan. • Services, including electricity supply cables (indicate aboveground or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the proposed development **must** be clearly indicated on the site plan. • Servitudes and an indication of the purpose of each servitude must be indicated on the site plan. • Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): o Watercourses / Rivers / Wetlands o Flood lines (*i.e.*, 1:100 year, 1:50 year and 1:10 year where applicable);

	○ Coastal Risk Zones as delineated for the Western Cape by the Department of Environmental Affairs and Development Planning ("DEA&DP"): ○ Ridges; ○ Cultural and historical features/landscapes; ○ Areas with indigenous vegetation (even if degraded or infested with alien species). • Whenever the slope of the site exceeds 1:10, a contour map of the site must be submitted. • North arrow A map/site plan must also be provided at an appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred and alternative sites indicating any areas that should be avoided, including buffer areas.
Site photographs	Colour photographs of the site that shows the overall condition of the site and its surroundings (taken on the site and taken from outside the site) with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached to this BAR as **Appendix C**. The aerial photograph(s) should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.
Biodiversity Overlay Map:	A map of the relevant biodiversity information and conditions must be provided as an overlay map on the property/site plan. The Map must be attached to this BAR as **Appendix D**.
Linear activities or development and multiple properties	GPS co-ordinates must be provided in degrees, minutes and seconds using the Hartebeeshoek 94 WGS84 co-ordinate system. Where numerous properties/sites are involved (linear activities) you must attach a list of the Farm Name(s)/Portion(s)/Erf number(s) to this BAR as an Appendix. For linear activities that are longer than 500m, please provide a map with the co-ordinates taken every 100m along the route to this BAR as **Appendix A3**.

ACRONYMS

DAFF:	Department of Forestry and Fisheries
DEA:	Department of Environmental Affairs
DEA& DP:	Department of Environmental Affairs and Development Planning
DHS:	Department of Human Settlement
DoA:	Department of Agriculture
DoH:	Department of Health
DWS:	Department of Water and Sanitation
EMPr:	Environmental Management Programme
HWC:	Heritage Western Cape
NFEPA:	National Freshwater Ecosystem Protection Assessment
NSBA:	National Spatial Biodiversity Assessment
TOR:	Terms of Reference
WCBSP:	Western Cape Biodiversity Spatial Plan
WCG:	Western Cape Government

ATTACHMENTS

Note: The Appendices must be attached to the BAR as per the list below. Please use a ✓ **(**tick) or a **x** (cross) to indicate whether the Appendix is attached to the BAR.

The following checklist of attachments must be completed.

APPENDIX			**✓ (Tick) or x (cross)**
Appendix A:	**Maps**		
	Appendix A1:	**Locality Map**	✓
	Appendix A2:	**Coastal Risk Zones as delineated in terms of ICMA for the Western Cape by the Department of Environmental Affairs and Development Planning**	
	Appendix A3:	**Map with the GPS co-ordinates for linear activities**	
Appendix B:	**Appendix B1:**	**Site development plan(s)**	✓
	Appendix B2	**A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;**	
Appendix C:	**Photographs**		✓
Appendix D:	**Biodiversity overlay map**		✓
Appendix E:	**Permit(s) / license(s) / exemption notice, agreements, comments from State Department/Organs of state and service letters from the municipality.**		
	Appendix E1:	**Final comment/ROD from HWC**	
	Appendix E2:	**Copy of comment from Cape Nature**	
	Appendix E3:	**Final Comment from the DWS**	
	Appendix E4:	**Comment from the DEA: Oceans and Coast**	
	Appendix E5:	**Comment from the DAFF**	
	Appendix E6:	**Comment from WCG: Transport and Public Works**	
	Appendix E7:	**Comment from WCG: DoA**	
	Appendix E8:	**Comment from WCG: DHS**	
	Appendix E9:	**Comment from WCG: DoH**	

	Appendix E10:	**Comment from DEA&DP: Pollution Management**	
	Appendix E11:	**Comment from DEA&DP: Waste Management**	
	Appendix E12:	**Comment from DEA&DP: Biodiversity**	
	Appendix E13:	**Comment from DEA&DP: Air Quality**	
	Appendix E14:	**Comment from DEA&DP: Coastal Management**	
	Appendix E15:	**Comment from the local authority**	
	Appendix E16:	**Confirmation of all services (water, electricity, sewage, solid waste management)**	
	Appendix E17:	**Comment from the District Municipality**	
	Appendix E18:	**Copy of an exemption notice**	
	Appendix E19	**Pre-approval for the reclamation of land**	
	Appendix E20:	**Proof of agreement/TOR of the specialist studies conducted.**	
	Appendix E21:	**Proof of land use rights**	
	Appendix E22:	**Proof of public participation agreement for linear activities**	✓
Appendix F:	**F1: PPP Proof** **F2: I&AP List – Only provided to DEADP (FBAR submission)** **F3: All Comments** **F4: Comments and Response Report**		✓ ✓ ✓ ✓
Appendix G:	**G1: Botanical Impact Assessment: Mark Berry Botanical Surveys** **G2: Aquatic Biodiversity Impact Assessment and Addendum: Upstream Consulting, Debbie Fordham (including WULA info)** **G3: Terrestrial Faunal and Avifaunal Species Impact Assessment: Blue Skies Research, Dr Jacobus H. Visser**		✓ ✓ ✓
Appendix H:	**EMPr**		✓
Appendix I:	**Screening tool report**		✓
Appendix J:	**J1: Engineering Concept Report: Lukhozi Consulting Engineers** **J2: Engineering Design Report: Lukhozi Consulting Engineers**		✓ ✓
Appendix K:	**Need and desirability for the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013)/DEA Integrated Environmental Management Guideline**		
Appendix…..	**Any other attachments must be included as subsequent appendices**		

SECTION A: ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall	CAPE TOWN OFFICE: REGION 1		**GEORGE OFFICE: BEGION 3**
	(City of Cape Town, West Coast District	(Cape Winelands District & Overberg District)	**(Central Karoo District & Garden Route District)**

Duplicate this section where there is more than one Proponent Name of Applicant/Proponent:	George Municipality: Civil Engineering Services Directorate		
Name of contact person for Applicant/Proponent (if other):	Johannes Franciscus Koegelenberg		
Company/ Trading name/State Department/Organ of State:	George Municipality: Civil Engineering Services Directorate		
Company Registration Number:			
Postal address:	PO Box 19		
	George		Postal code:6530
Telephone:	044 801 1565		Cell:
E-mail:	Jkoegelenberg@george.gov.za		Fax: ( )
Company of EAP:	Sharples Environmental Services cc		
EAP name:	Michael Bennett (Registered EAP) Lu-anne Beets (Candidate EAP)		
Postal address:	PO Box 9087		
	George		Postal code:
Telephone:	044 873 4923		Cell:
E-mail:	michael@sescc.net luanne@sescc.net		Fax: ( )
Qualifications:	Michael:	BSc Environmental & Geographic Sciences and Ocean and Atmospheric Science	
	Lu-anne:	BSc Zoology & Botany BSc Honours Environmental Management	
EAP registration no:	Michael: Lu-anne:	2021/3163 2024/7962	
Duplicate this section where there is more than one landowner Name of landowner:	George Municipality		
Name of contact person for landowner (if other):	Johannes Franciscus Koegelenberg		
Postal address:	PO Box 19		
	George		Postal code:6530
Telephone:	044 801 1565		Cell:
E-mail:	Jkoegelenberg@george.gov.za		Fax: ( )
Name of Person in control of the land:	Johannes Franciscus Koegelenberg		
Name of contact person for person in control of the land: Postal address:	PO Box 19		
	George		Postal code:6530
Telephone:	044 801 1565		Cell:
E-mail:	Jkoegelenberg@george.gov.za		Fax: ( )

Duplicate this section where there is more than one Municipal Jurisdiction Municipality in whose area of jurisdiction the proposed activity will fall:	George Municipality

Contact person:	Mr Dawie Adonis	
Postal address:	PO Box 19	
	George	Postal code: 6530
Telephone	044 801 9111	Cell:
E-mail:	tlduplooy@george.gov.za	Fax: ( )

SECTION B: CONFIRMATION OF SPECIFIC PROJECT DETAILS AS INLCUDED IN THE APPLICATION FORM

1.	Is the proposed development (please tick):	New		**Expansion**	✖
2.	Is the proposed site(s) a brownfield of greenfield site? Please explain.				
The existing infrastructure is considered brownfield however the eroded riverbanks are greenfield sites.					
3.	**For Linear activities or developments**				
3.1.	Provide the Farm(s)/Farm Portion(s)/Erf number(s) for all routes:				
Site 1: Remainder Erf 464, Erven 5813, 5812, 8560, 8561, Remainder of 8562 **Site 2**: Already rehabilitated under Section 30A directive **Site 3**: Remainder Erf 464 **Site 4**: Remainder Erf 464, Remainder Erf 194, Remainder Erf 3444, Erf 3366 **Site 5**: Remainder Erf 464, Remainder Erf 13405, Erf 8675 **Site 6**: Remainder Erf 464, Erf 8945 **Site 7**: Remainder Erf 464, Remainder Erf 4311, Erven 7355, 658, 3254 **Site 8**: Remainder Erf 464, Erf 6749, Erf 6237 **Site 9**: Unalienated State land ID 11111111, Remainder Erf 9077, Remainder Erf 464					
3.2.	Development footprint of the proposed development for all alternatives.				4044 m²
Site 1: 300 m² **Site 2**: - **Site 3**: 490 m² **Site 4**: 2100 m² **Site 5**: 200 m² **Site 6**: 135 m² **Site 7**: 169 m² **Site 8**: 530 m² **Site 9**: 120 m² **Total:** 4044 m²					
3.3.	Provide a description of the proposed development (e.g. for roads the length, width and width of the road reserve in the case of pipelines indicate the length and diameter) for all alternatives.				

The George Municipality experienced damage ranging from minor to extensive on infrastructure within the George Municipal Boundary during the November and December 2021 flood event. The Municipality applied for a disaster relief grant for the purposes of mitigating and responding to the severe weather event experienced to the Western Cape Government during December 2021. The funding application was successful and confirmed in a government gazette dated 03 February 2023. The funding was formally received by the municipality on 31 March 2023.

George Municipality appointed Lukhozi Consulting Engineers (Pty) Ltd (Lukhozi Consulting Engineers)) in June 2023 as their professional service provider for Project 28, Package 3 of the 2021 Municipal Disaster Recovery Grant (MDRG) projects for the flood damage repairs, rehabilitation and other mitigation measures. This specific project is in the Van Riebeek Gardens and the Camphersdrift Areas. The main focus of the project runs along the Camphersdrift River, from north-east of Camphersdrift Street, down past Davidson and CJ Langenhoven Roads, to where the river runs parallel to Belmont Street.

Scope of works

The general extent of the scope of works applicable to all areas include:

1. Refurbish / replace gabion structures;
2. Reinstatement of erosion protection structures;
3. Rehabilitation of eroded areas and implementation of erosion protection structures;
4. Stabilization of riverbanks and beds and implementation of erosion protection structures;
5. Reinstatement of retaining walls;
6. Reconstruction of stormwater pipes, outlets, headwalls, and associated erosion

The preferred method of rehabilitation is to re-instate the damaged infrastructure and further protect the structures by constructing a combination of stepped gabion baskets, reno mattresses, geofabric, riprap, concrete aprons including the toe repairs, stormwater pipes, headwalls and guardrails. The Works will be prioritised so that the most critical issues and most damaged infrastructure and areas are repaired first.

Site 1

Figure 1: Location of Site 1

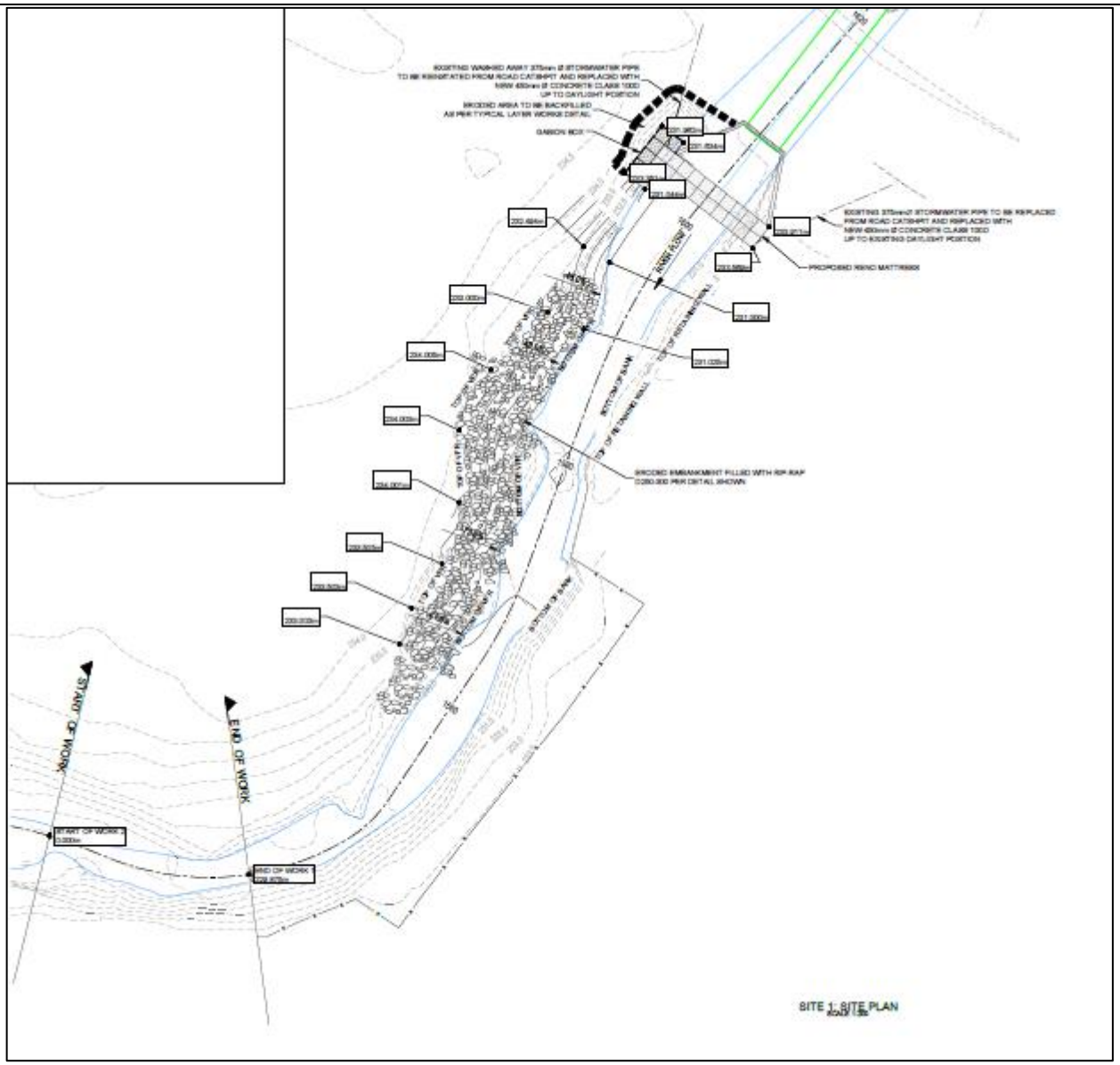

Figure 2: Site 1 site plan

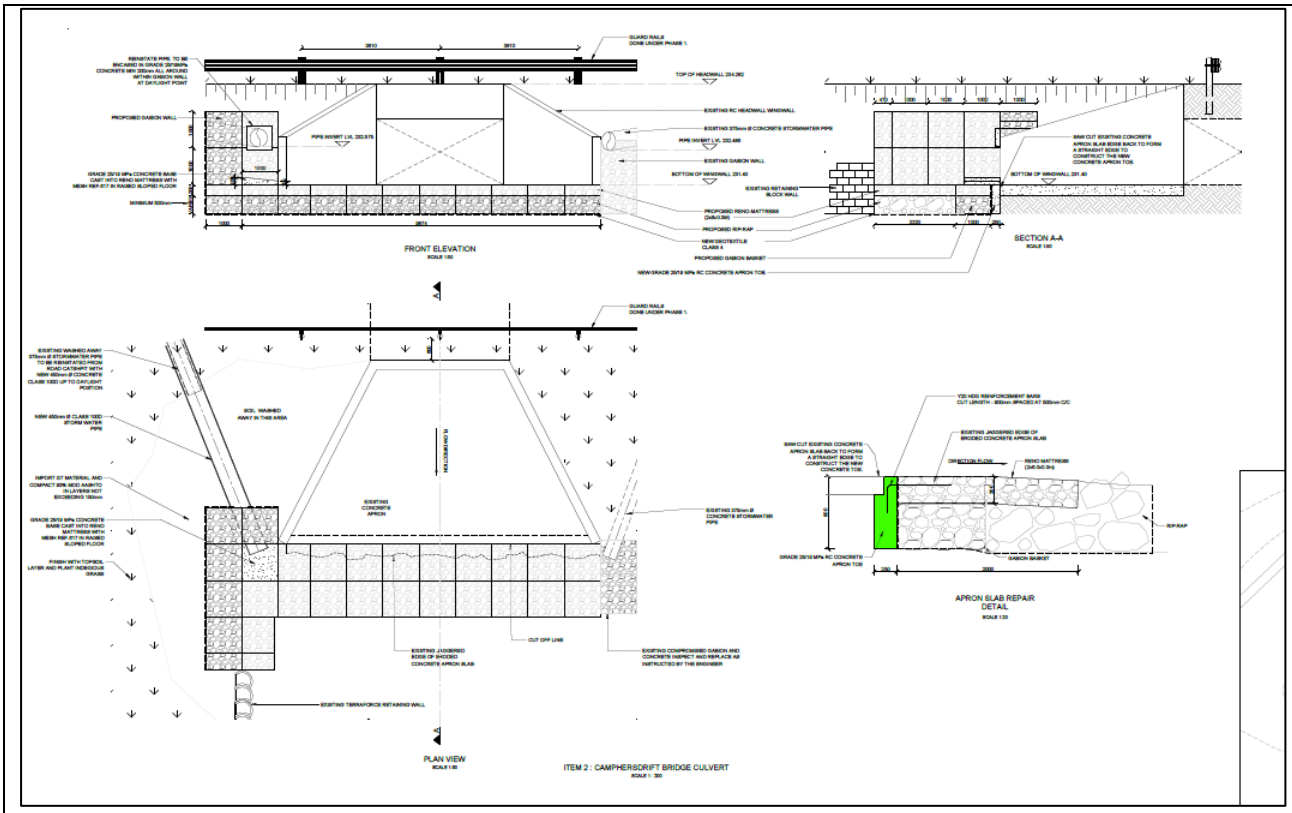

Figure 3: Site 1 site plan

Site 3

Figure 4: Location of Site 3

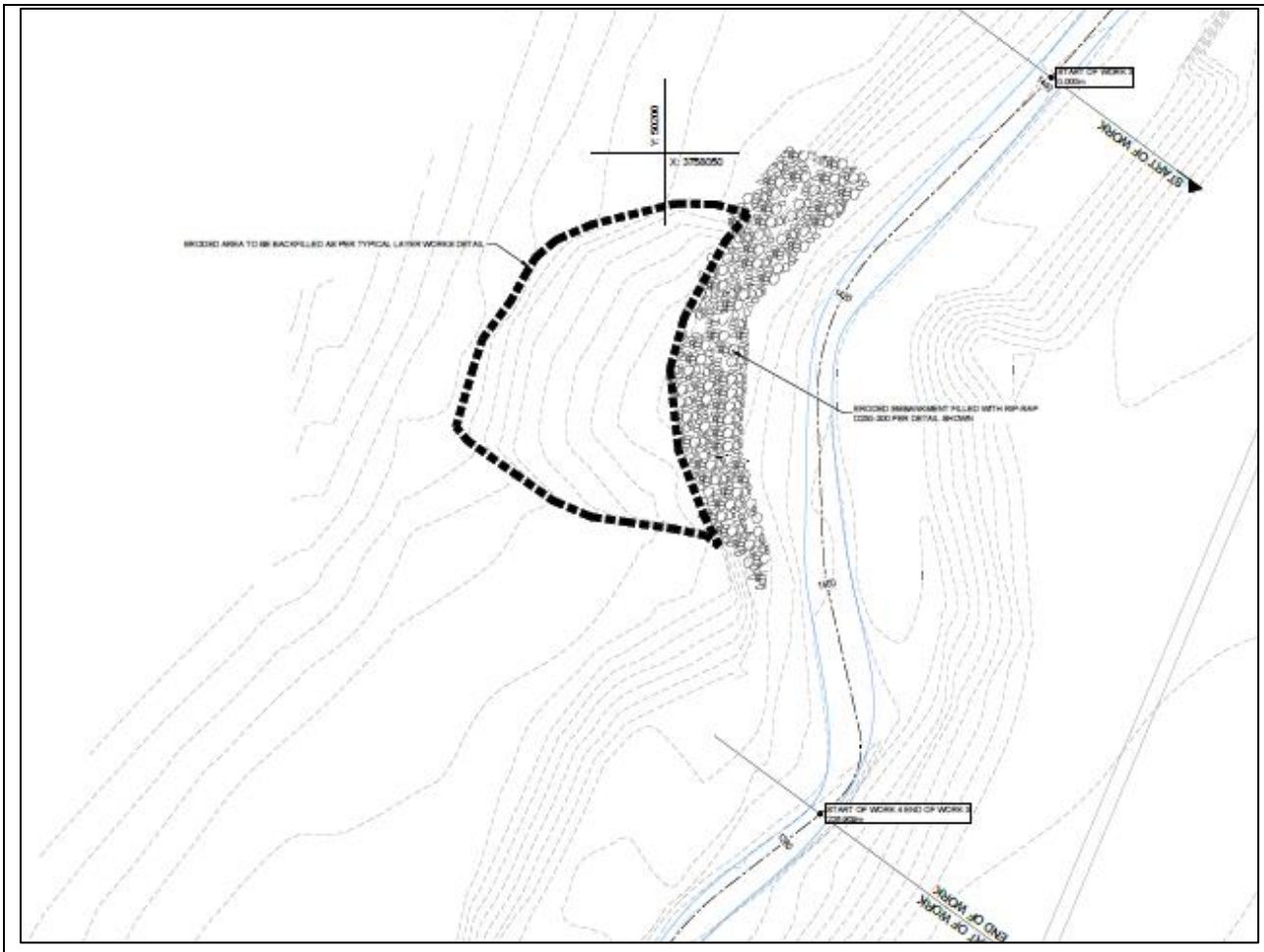

Figure 5: Site 3 Site Plan

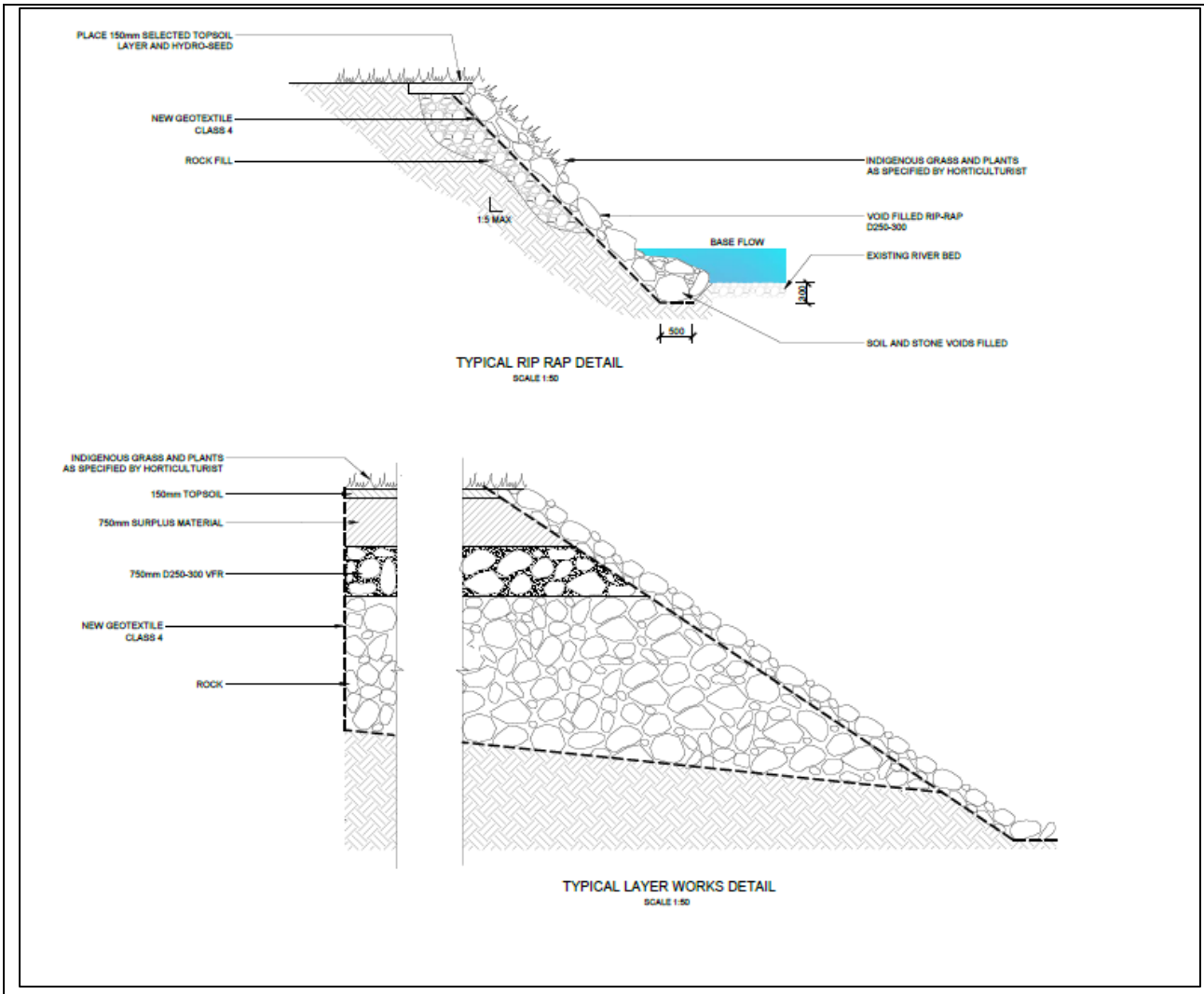

Figure 6: Site 3 site plan

Site 4

Figure 7: Location of Site 4

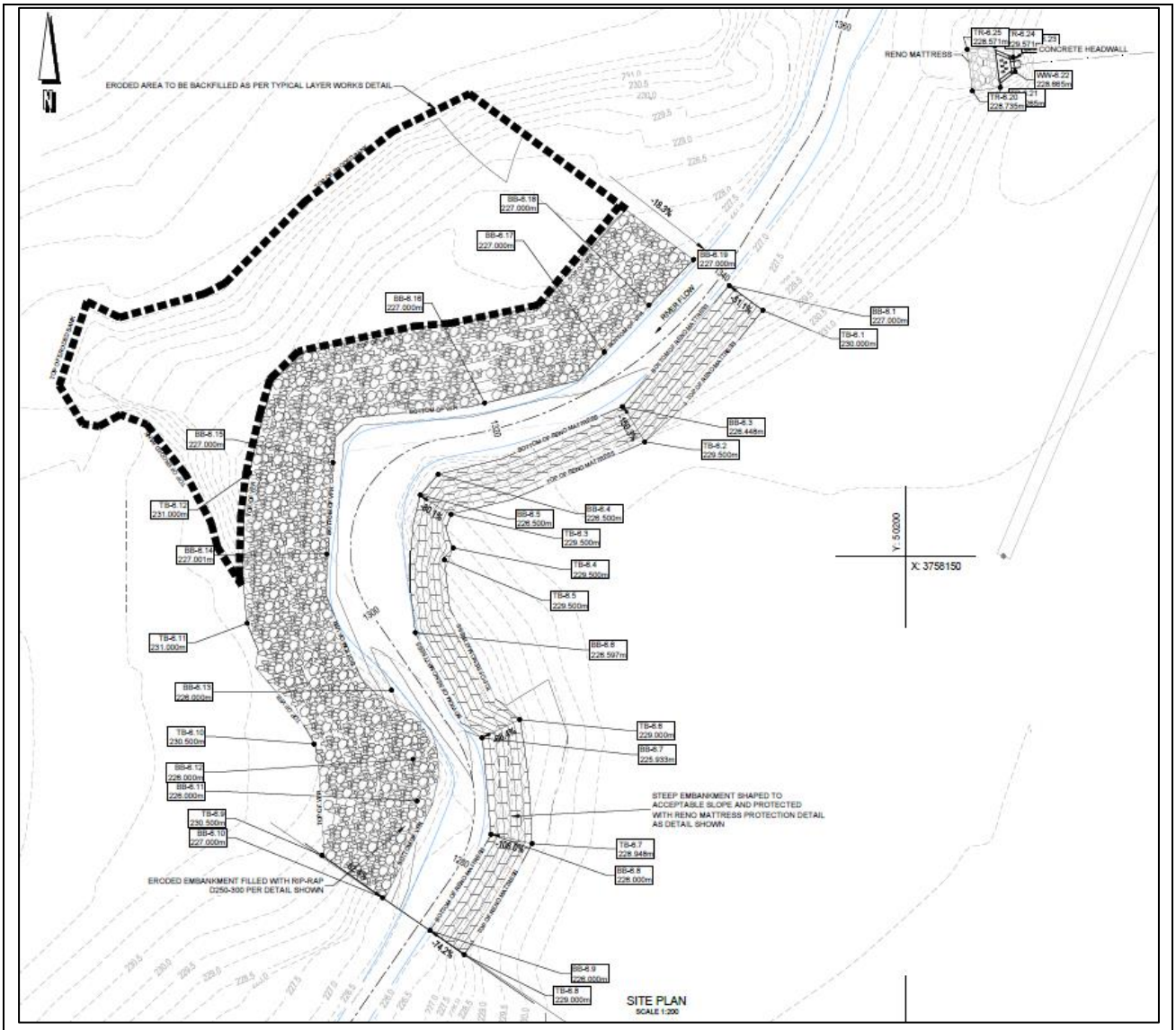

Figure 8: Site 4 site plan

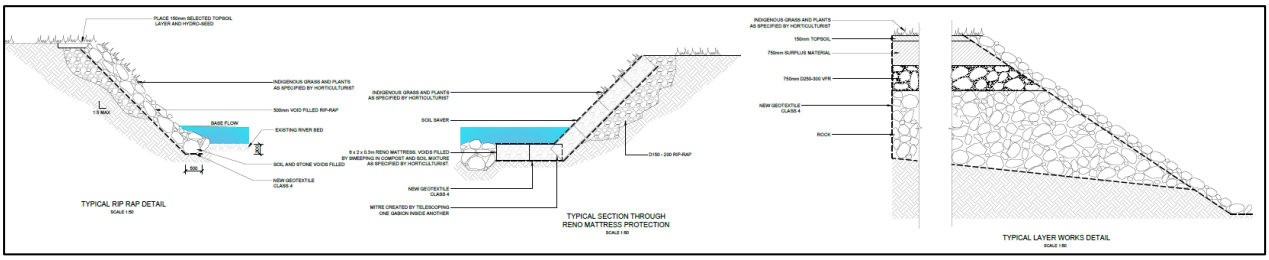

Figure 9: Site 4 site plan

Site 5

Figure 10: Location of Site 5

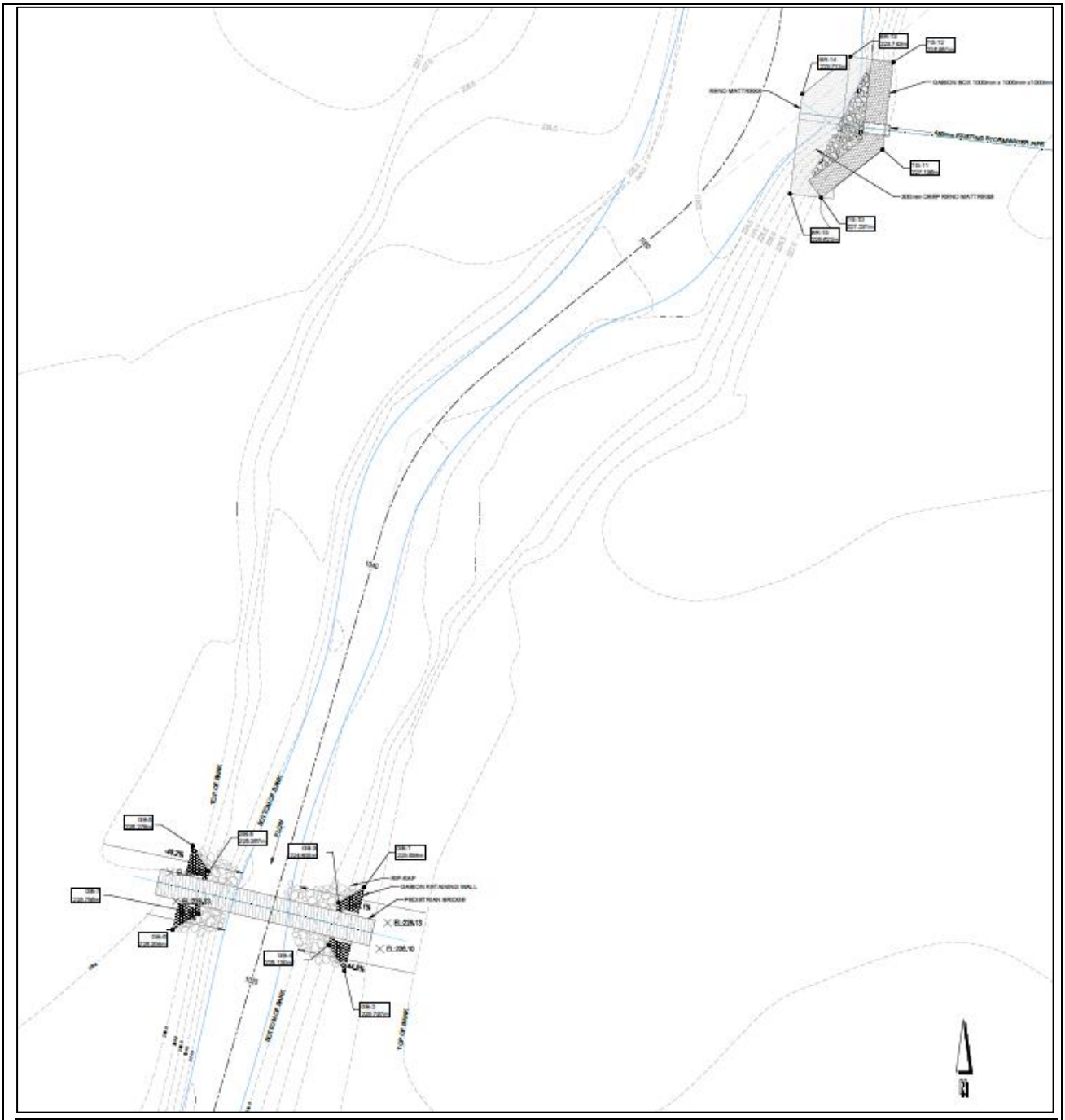

Figure 11: Site 5 site plan

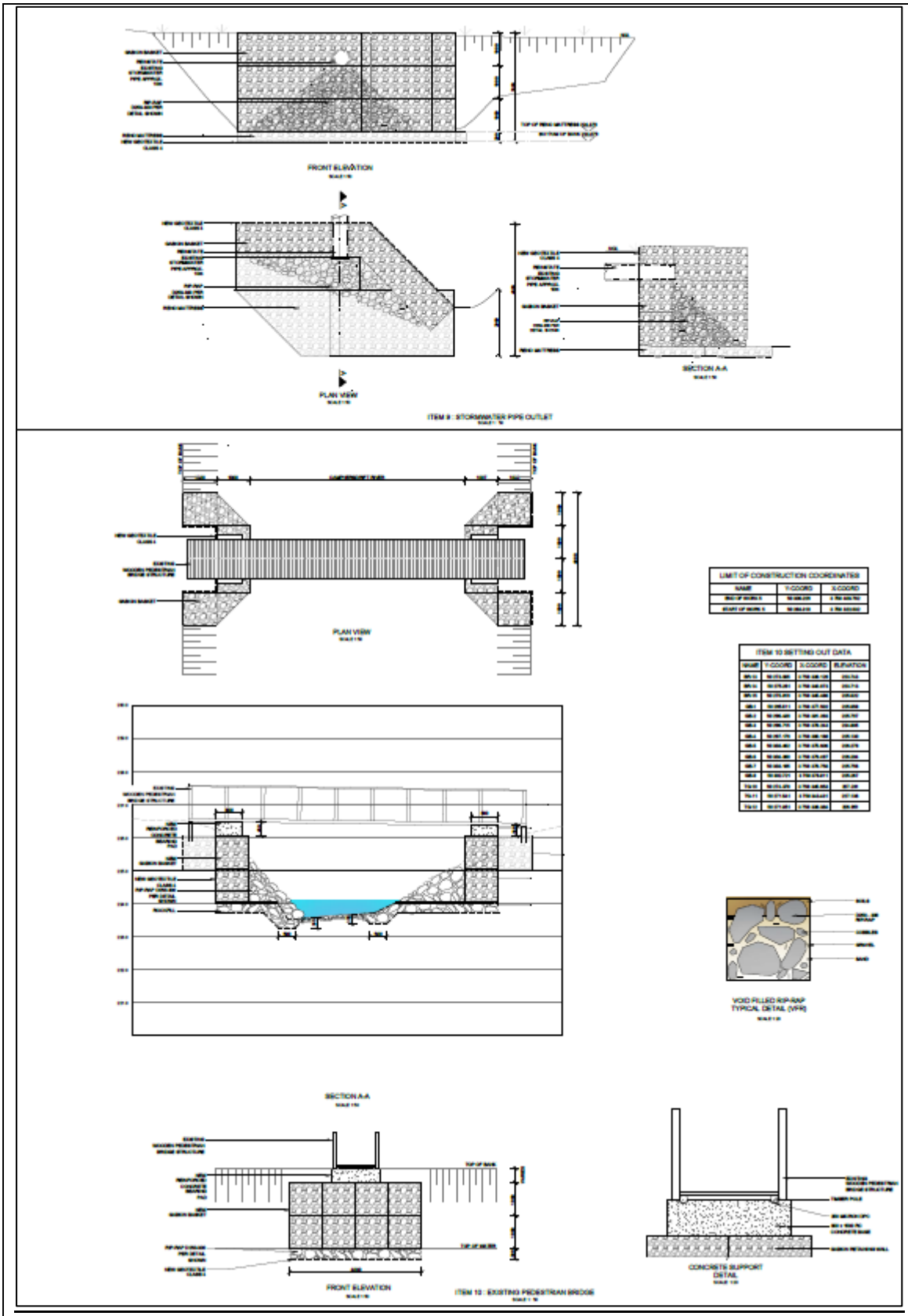

Figure 12: Site 5 site plan

Site 6

Figure 13: Location of Site 6

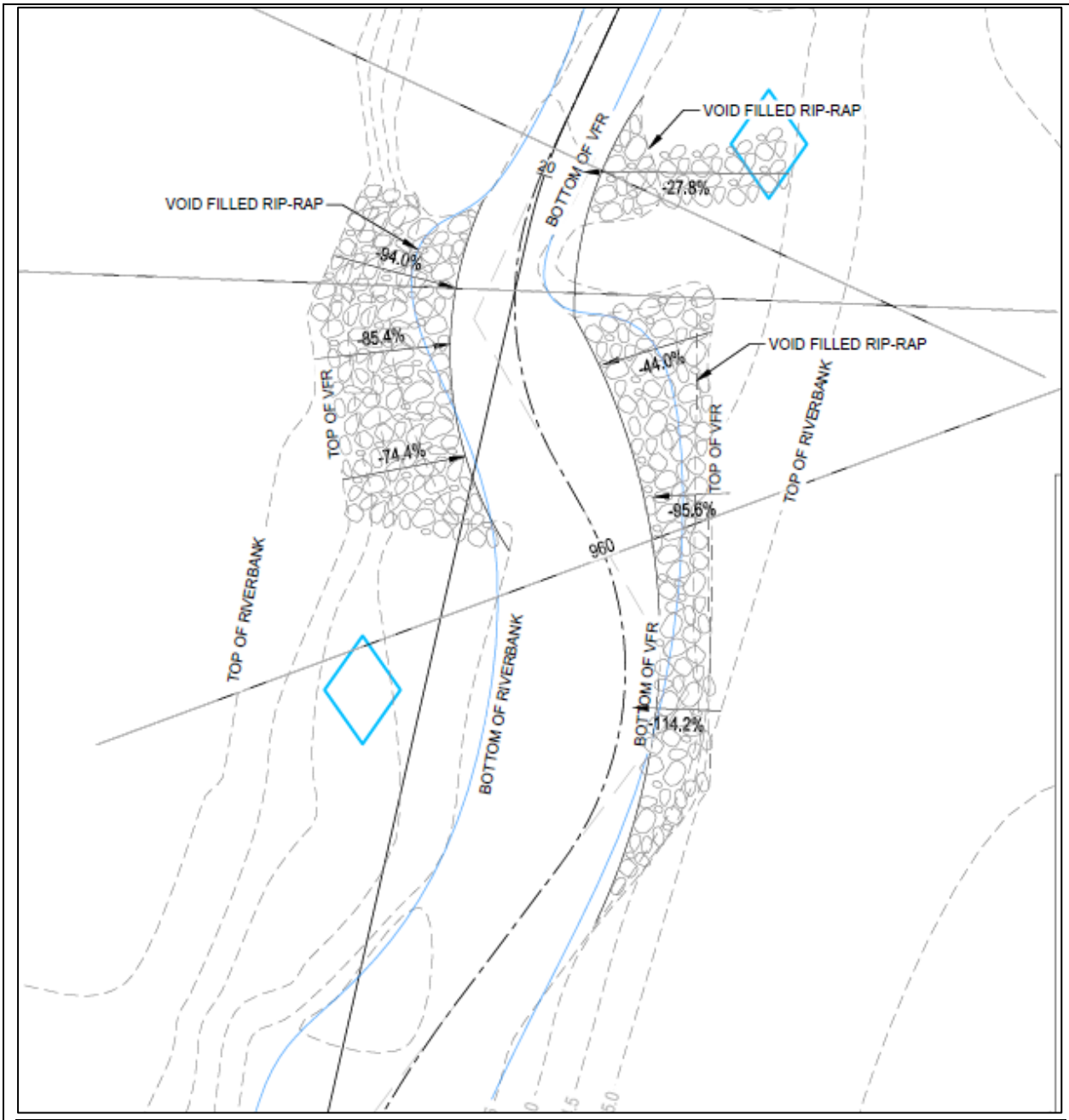

Figure 14: Site 6 site plan

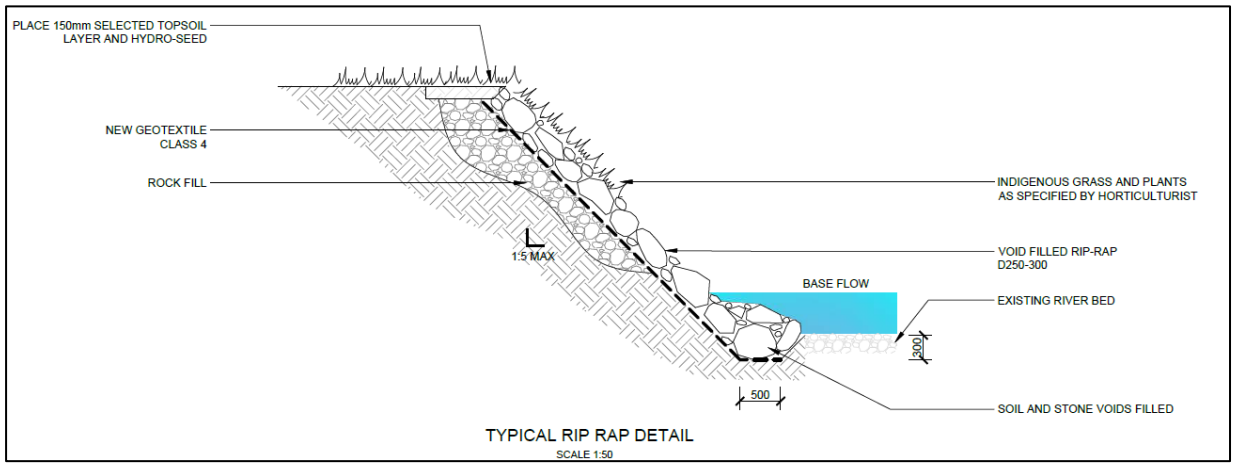

Figure 15: site 6 site plan

Site 7

Figure 16: Location of Site 7

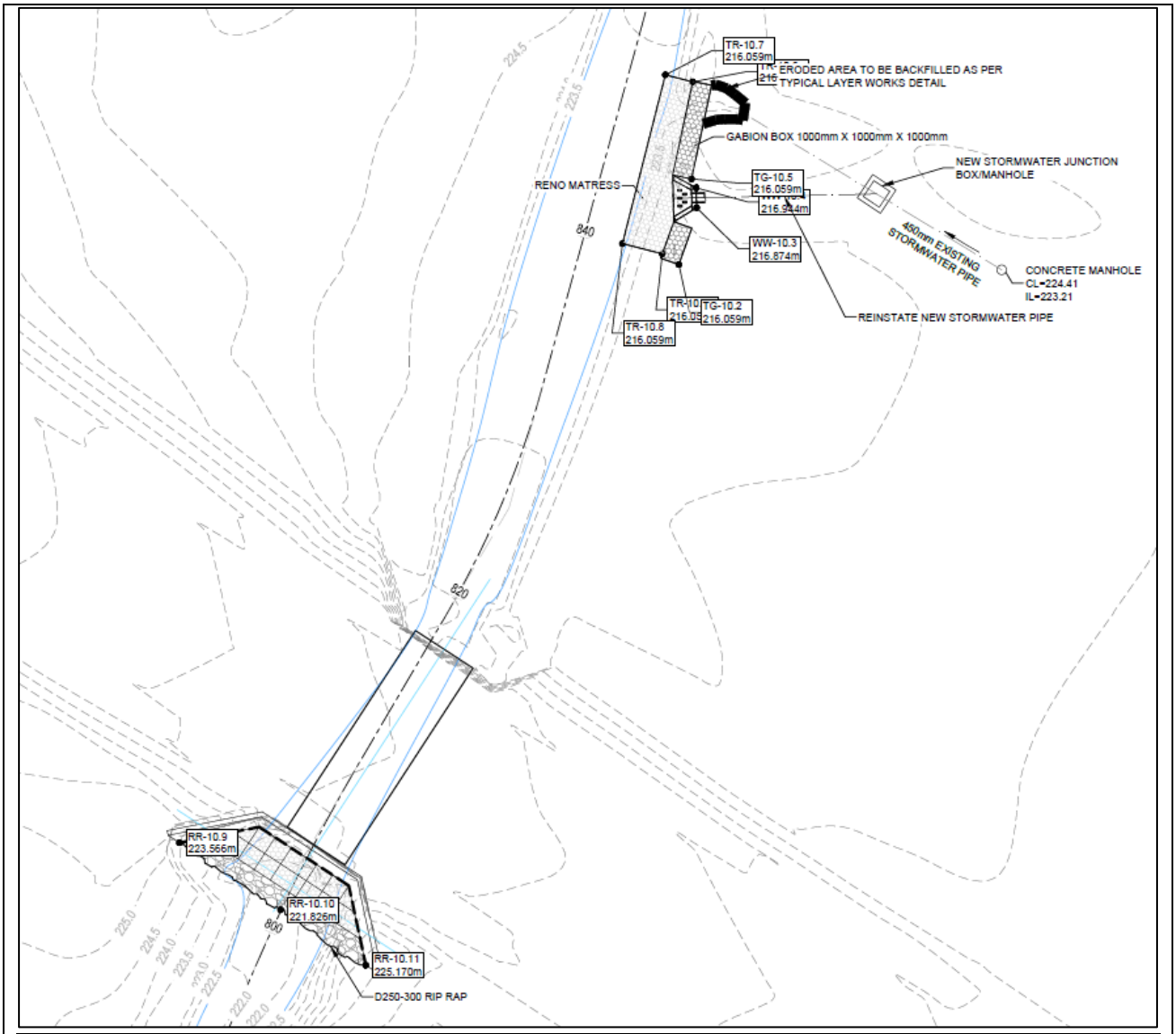

Figure 17: Site 7 site plan

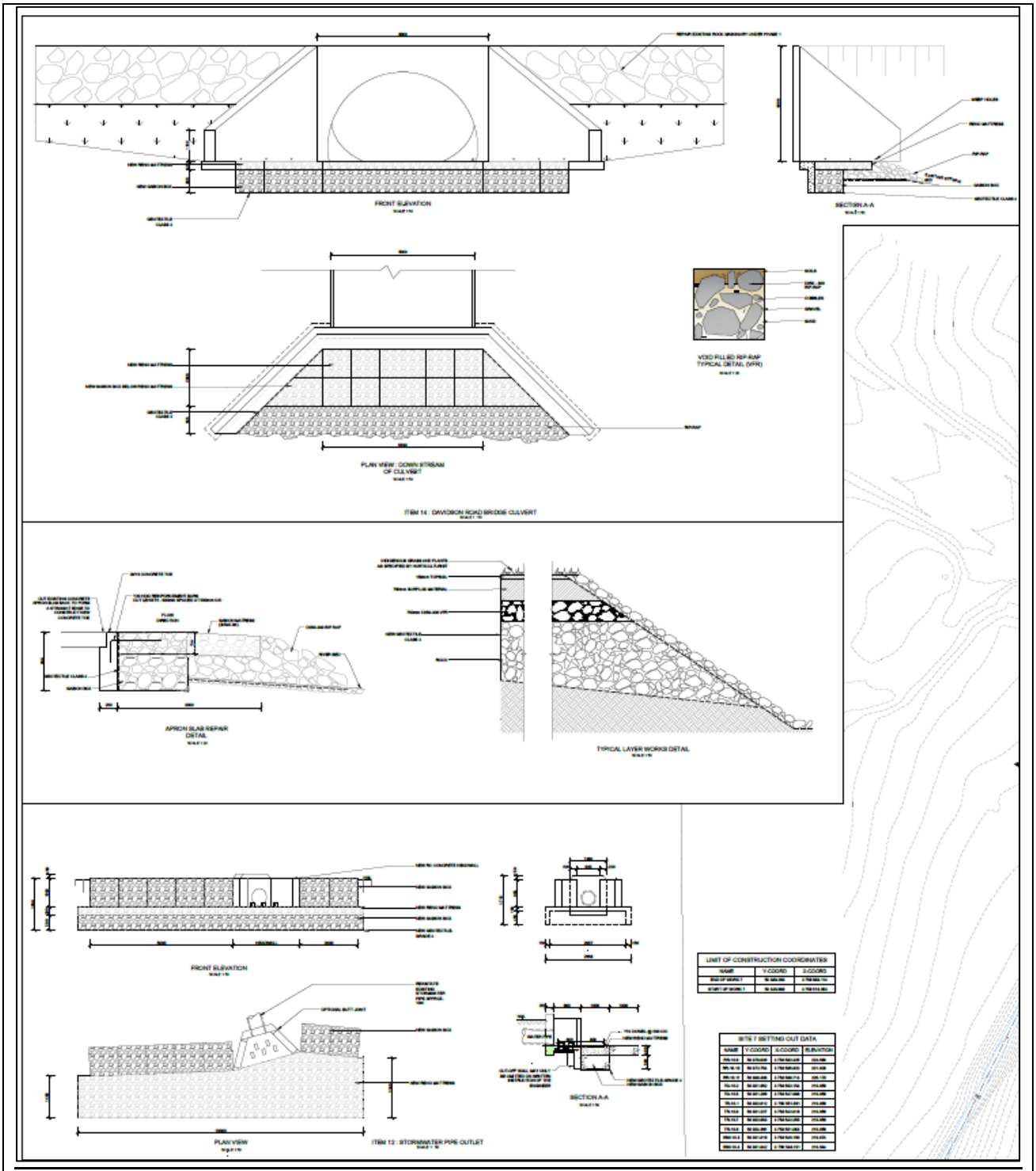

Figure 18: site 7 site plan

Site 8

Figure 19: Location of Site 8

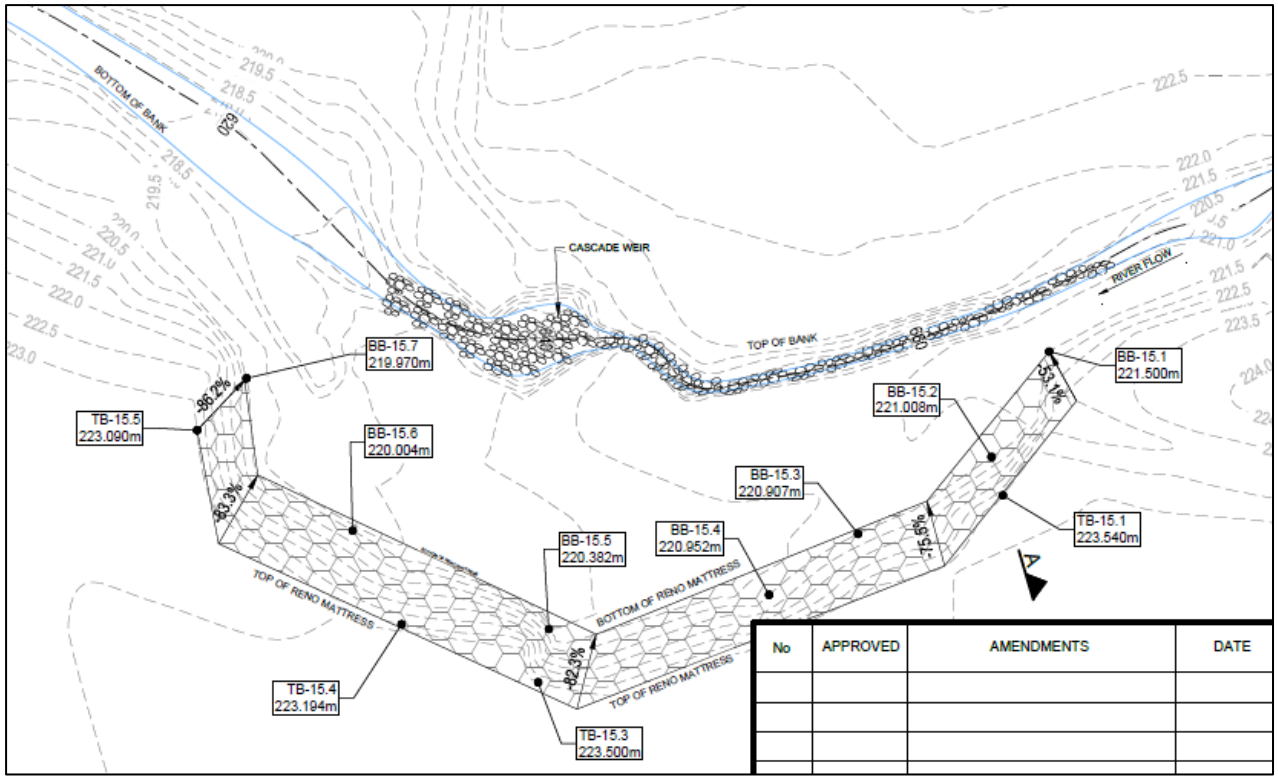

Figure 20: Site 8 site plan

Site 9

Figure 21: Location of Site 9

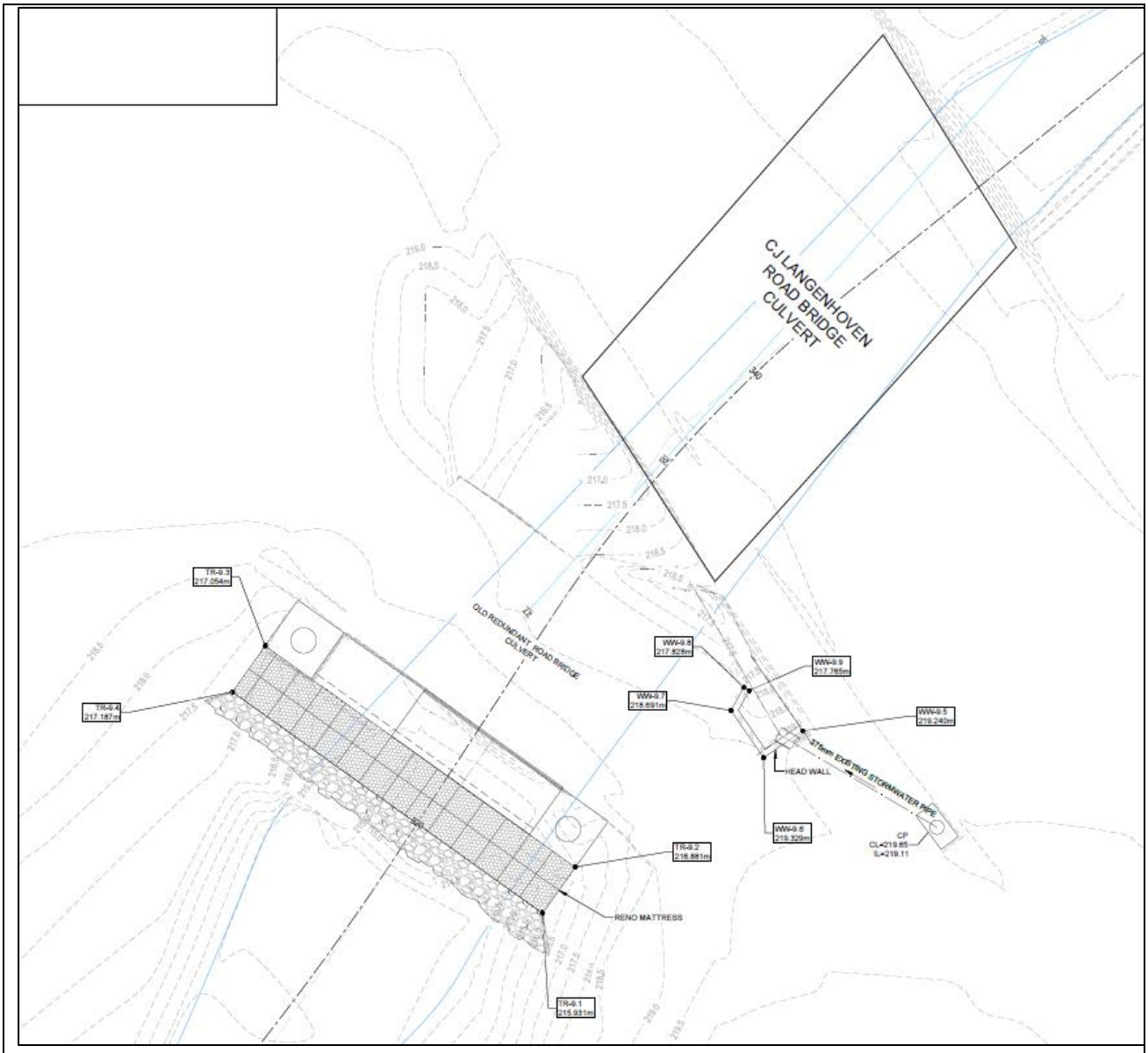

Figure 22: Site 9 site plan

3.4.	Indicate how access to the proposed routes will be obtained for all alternatives.

Directly from the riparian zones of each site.

3.5.	SG Digit codes of the Farms/Farm Portions/Erf numbers for all alternatives

Property	SG Digit codes
Remainder Erf 464	C02700020000046400000
Erf 5813	C02700020000581300000
Erf 5812	C02700020000581200000
Erf 8560	C02700020000856000000
Erf 8561	C02700020000856100000
Reminder Erf 8562	C02700020000856200000
Remainder Erf 194	C02700020000019400000
Remainder Erf 3444	C02700020000344400000
Erf 3366	C02700020000336600000
Remainder Erf 13405	C02700020001340500000
Erf 8675	C02700020000867500000
Erf 8945	C02700020000894500000
Remainder Erf 4311	C02700020000431100000

		Erf 7355	C02700020000735500000
		Erf 658	C02700020000065800000
		Erf 6237	C02700020000623700000
		Erf 3254	C02700020000325400000
		Erf 6749	C02700020000674900000
		Remainder Erf 9077	C02700020000907700000
		Unalienated State land ID 11111111	C02700021111111100000

3.6.	**Site co-ordinates**

Site	Start	Mid	End
1	33°56'49.00"S, 22°27'32.00"E	33°56'50.42"S, 22°27'31.06"E	33°56'52.40"S, 22°27'29.38"E
3	33°56'53.41"S, 22°27'26.06"E	33°56'54.12"S, 22°27'25.52"E	33°56'55.03"S, 22°27'25.44"E
4	33°56'55.03"S, 22°27'25.44"E	33°56'56.55"S, 22°27'24.02"E	33°56'58.19"S, 22°27'23.20"E
5	33°57'2.38"S, 22°27'21.73"E	33°57'3.64"S, 22°27'21.47"E	33°57'4.93"S, 22°27'20.82"E
6	33°57'5.26"S, 22°27'20.66"E	33°57'6.02"S, 22°27'20.22"E	33°57'6.94"S, 22°27'19.97"E
7	33°57'8.76"S, 22°27'19.25"E	33°57'10.63"S, 22°27'18.50"E	33°57'11.49"S, 22°27'17.90"E
8	33°57'14.10"S, 22°27'16.14"E	33°57'15.31"S, 22°27'14.25"E	33°57'18.17"S, 22°27'9.75"E
9	33°57'20.60"S, 22°27'7.25"E	33°57'21.56"S, 22°27'6.16"E	33°57'22.23"S, 22°27'5.39"E

Note: For Linear activities or developments longer than 500m, a map indicating the co-ordinates for every 100m along the route must be attached to this BAR as Appendix A3.			
4.	**Other developments**		
4.1.	Property size(s) of all proposed site(s):		
4.2.	Developed footprint of the existing facility and associated infrastructure (if applicable):		m^2
4.3.	Development footprint of the proposed development and associated infrastructure size(s) for all alternatives:		ha
4.4.	Provide a detailed description of the proposed development and its associated infrastructure (This must include details of e.g. buildings, structures, infrastructure, storage facilities, sewage/effluent treatment and holding facilities).		
4.5.	Indicate how access to the proposed site(s) will be obtained for all alternatives.		
4.6.	SG Digit code(s) of the proposed site(s) for all alternatives:		
4.7.	Coordinates of the proposed site(s) for all alternatives:		

SECTION C: LEGISLATION/POLICIES AND/OR GUIDELINES/PROTOCOLS

1. Exemption applied for in terms of the NEMA and the NEMA EIA Regulations

Has exemption been applied for in terms of the NEMA and the NEMA EIA Regulations. If yes, include a copy of the exemption notice in Appendix E18.	~~YES~~	**NO**

2. Is the following legislation applicable to the proposed activity or development.

The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) ("ICMA"). If yes, attach a copy of the comment from the relevant competent authority as Appendix E4 and the pre-approval for the reclamation of land as Appendix E19.	~~YES~~	**NO**
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA"). If yes, attach a copy of the comment from Heritage Western Cape as Appendix E1.	~~YES~~	**NO**
The National Water Act, 1998 (Act No. 36 of 1998) ("NWA"). If yes, attach a copy of the comment from the DWS as Appendix E3.	**YES**	~~NO~~
The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) ("NEM:AQA"). If yes, attach a copy of the comment from the relevant authorities as Appendix E13.	YES	**NO**

The National Environmental Management Waste Act (Act No. 59 of 2008) ("NEM:WA")	YES	**NO**
The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004 ("NEMBA").	**YES**	NO
The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) ("NEMPAA").	YES	**NO**
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). If yes, attach comment from the relevant competent authority as Appendix E5.	YES	**NO**

3. Other legislation

List any other legislation that is applicable to the proposed activity or development.

- Amended Environmental Impact Assessment Regulations, GN No. R. 324 – 327 (7 April 2017)
- The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)
- National Environmental Management Laws Amendment Act, 2022, (NEMLAA 2022)

4. Policies

Explain which policies were considered and how the proposed activity or development complies and responds to these policies.

No policies

5. Guidelines

List the guidelines which have been considered relevant to the proposed activity or development and explain how they have influenced the development proposal.

Guideline on Need and Desirability (2013)	Guideline considered during the assessment of the Need and Desirability of the proposed development project.
Guideline on Environmental Management Plans (2005)	Guideline considered in the compilation of the EMP attached to this Basic Assessment Report.
Guideline for the Review of Specialist Input into the EIA Process (2005)	Guideline considered during the review and integration of specialist input into this Basic Assessment Report
External Guideline: Generic Water Use Authorization Application Process (2007)	Guideline considered during the process of applying for the required water use authorization
Integrated Environmental Management Information Series 5: Impact Significance (2002)	Guideline considering during the identification and evaluation of potential impacts associated with the proposed development, and the reporting thereof in this Basic Assessment Report
Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Guideline considering during the assessment of the cumulative effect of the identified impacts.
Guideline on Public Participation (2013)	Guideline considered in the undertaking of the public participation for the proposed development. All relevant provisions contained in the guideline were adhered to in the basic assessment process as appropriate, except where an exemption/ deviation has been granted by the Competent Authority.
Guideline on Alternatives (2013)	Guideline considered when identifying and evaluating possible alternatives for the proposed development. Alternatives that were considered in the impact assessment process are reported on in this Basic Assessment Report (see section E)

6. Protocols

Explain how the proposed activity or development complies with the requirements of the protocols referred to in the NOI and/or application form

The following relevant protocols have been compiled with were used by the specialist to compile their respective specialists' reports:

- Terrestrial Biodiversity Assessment Protocol
- Aquatic Biodiversity Assessment Protocol
- Plant Species Assessment Protocol
- Animal Species Assessment Protocol

SECTION D: APPLICABLE LISTED ACTIVITIES

List the applicable activities in terms of the NEMA EIA Regulations

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	**The development of—** (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— **(a) within a watercourse;** (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	Some new or additional structures will have to be added to some sections along the river, such as new gabion protection baskets and reconstruction of headwalls and apron slabs. This activity is therefore triggered by the proposal.
19	**The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse;**	All proposed repair and rehabilitation activities will take place in and on the banks of the river. This will result in the potential infilling and or removal of material which will exceed 10m3. This

	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.	activity will therefore be triggered by the proposal.
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	**The clearance of an area of 300 square metres or more of indigenous vegetation** except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **i. Western Cape** **i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;** ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	Garden Route Shale Fynbos is the mapped vegetation type of the sites, and it has an ecosystem threat status of Endangered. Its is highly likely that more than 300m2 of vegetation will be removed for the rehabilitation measures and therefore this activity will be triggered by the proposal.

Note:

- The listed activities specified above must reconcile with activities applied for in the application form. The onus is on the Applicant to ensure that all applicable listed activities are included in the application. If a specific listed activity is not included in an Environmental Authorisation, a new application for Environmental Authorisation will have to be submitted.
- Where additional listed activities have been identified, that have not been included in the application form, and amended application form must be submitted to the competent authority.

List the applicable waste management listed activities in terms of the NEM:WA

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Category A**	Describe the portion of the proposed development to which the applicable listed activity relates.

List the applicable listed activities in terms of the NEM:AQA

Activity No(s):	Provide the relevant **Listed Activity(ies)**	Describe the portion of the proposed development to which the applicable listed activity relates.

SECTION E: PLANNING CONTEXT AND NEED AND DESIRABILITY

1.	Provide a description of the preferred alternative.

Please refer to the Engineering options explored for the proposed rehabilitation measures in the concept and viability report no. 1760\02: REVISION NO. 2, dated 20 September 2023 (Appendix J1). The preferred method of rehabilitation is to re-instate the damaged infrastructure and further protect the structures by constructing a combination of stepped gabion baskets, reno mattresses, geofabric, riprap, concrete aprons including the toe repairs, stormwater pipes, headwalls and guardrails. The Works will be prioritised so that the most critical issues and most damaged infrastructure and areas are repaired first.

Scope of works

The general extent of the scope of works applicable to all areas include:

1. Refurbish / replace gabion structures;
2. Reinstatement of erosion protection structures;
3. Rehabilitation of eroded areas and implementation of erosion protection structures;
4. Stabilization of riverbanks and beds and implementation of erosion protection structures;
5. Reinstatement of retaining walls;
6. Reconstruction of stormwater pipes, outlets, headwalls and associated erosion protection;
7. Isolated reconstruction of road areas; and
8. Implementation of new gabion / retaining wall structures / erosion protection structures.

Since the abovementioned concept report, Lukhozi Consulting Engineers has compiled a Design Report (REPORT NO. 1760\02: REVISION NO. 0), dated 5 June 2024 and attached as Appendix J2.

Nine (9) sites requiring protection and construction works were identified during the detail design stage. The sites form scope of works for this proposal and are listed below:

Site 1

Figure 23: Location of Site 1

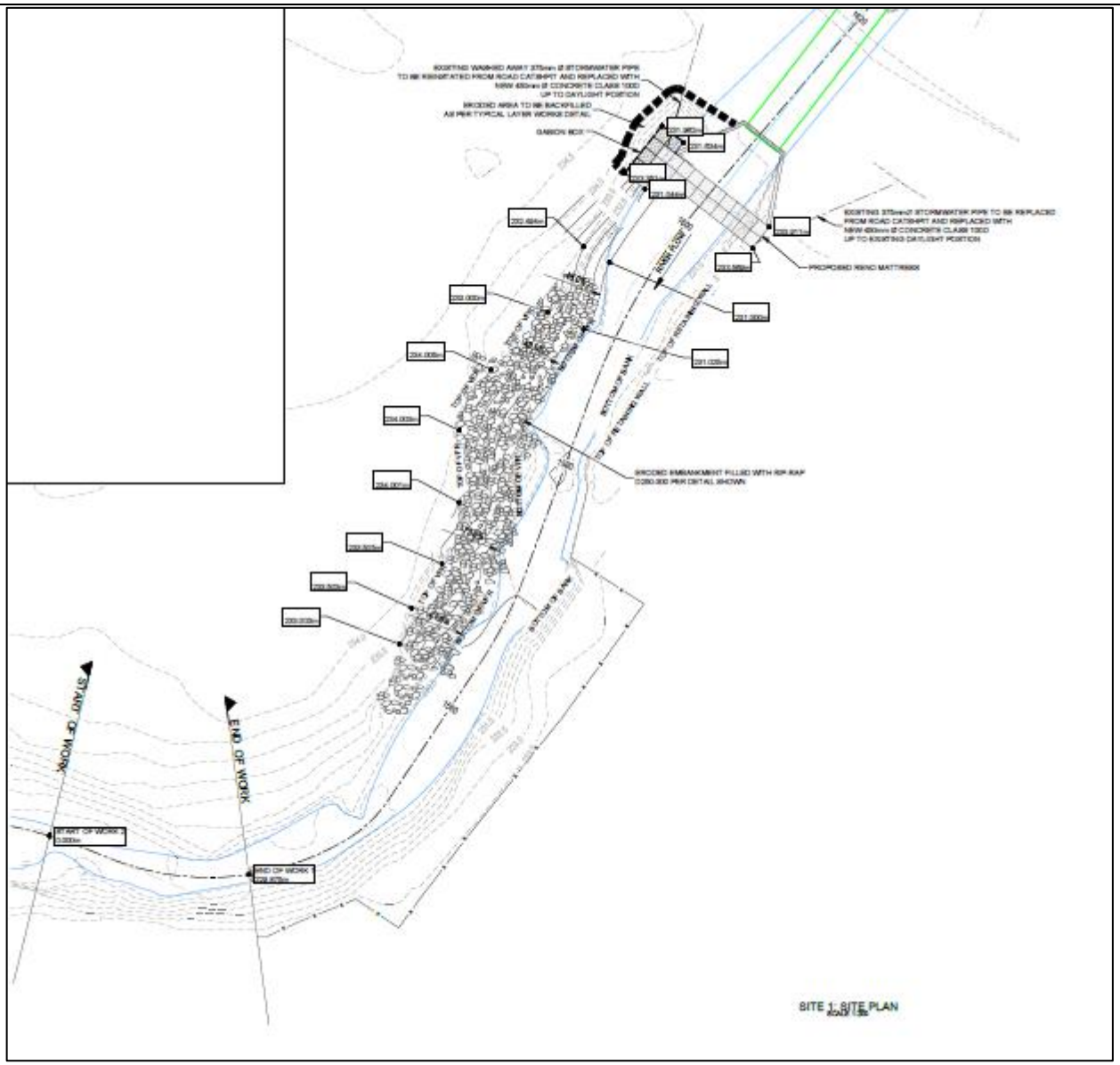

Figure 24: Site 1 site plan

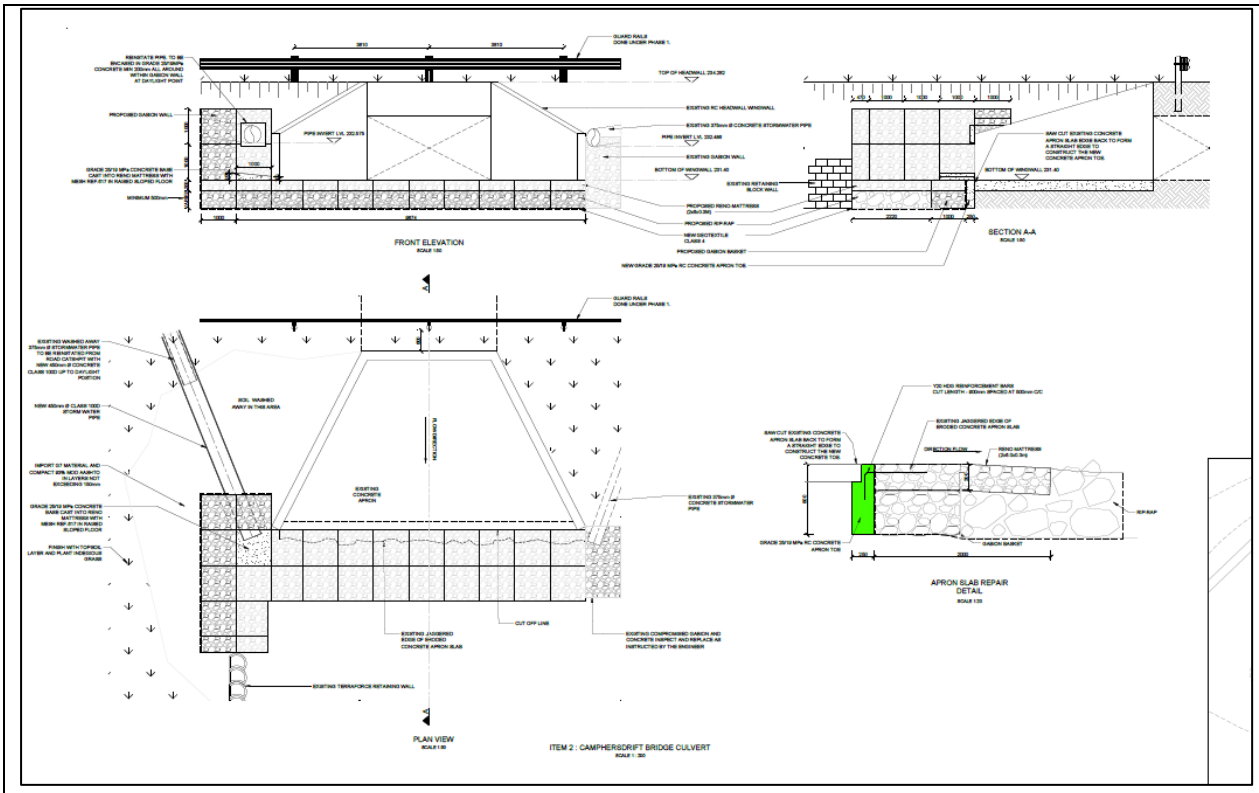

Figure 25: Site 1 site plan

Site 3

Figure 26: Location of Site 3

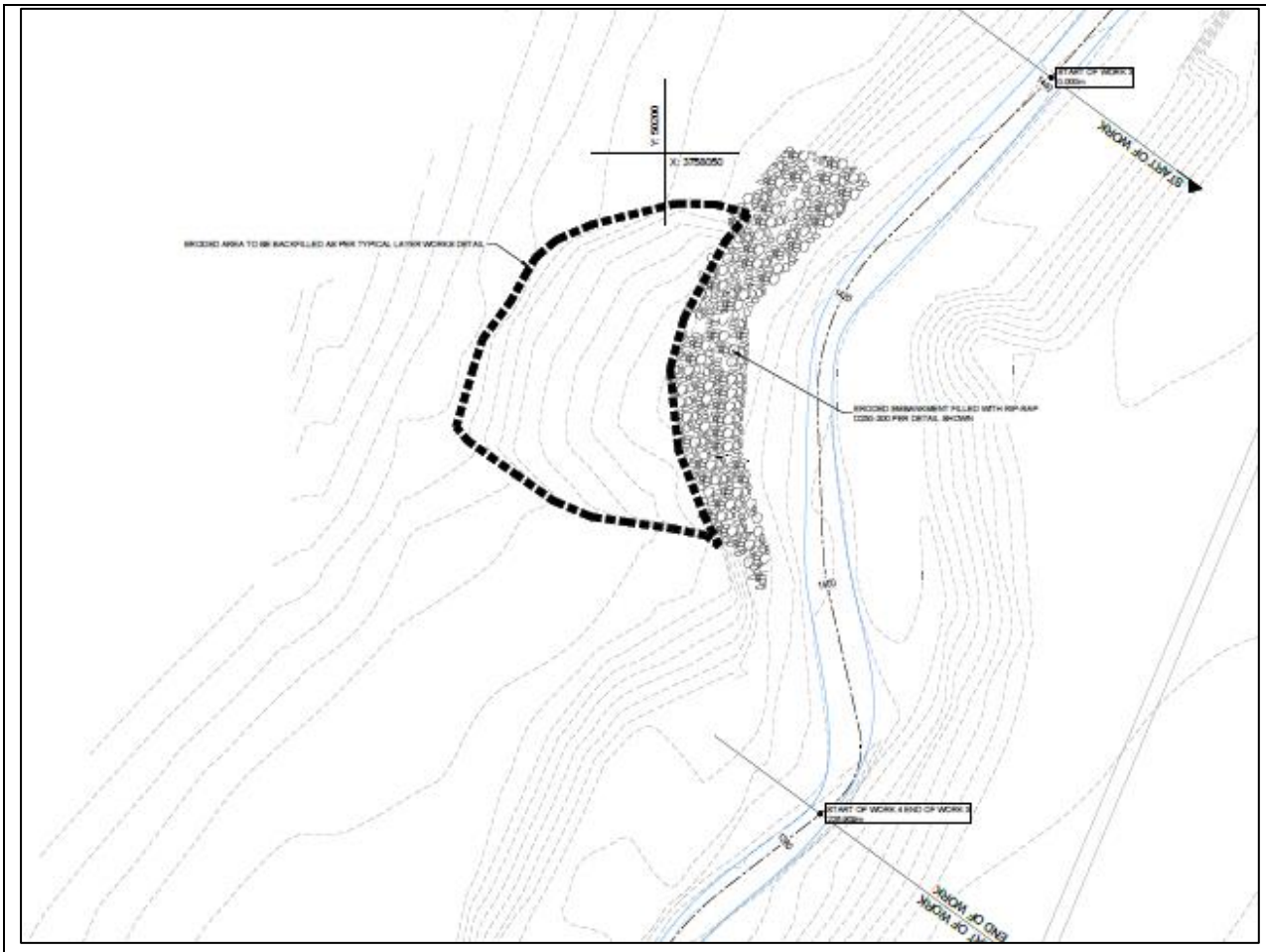

Figure 27: Site 3 Site Plan

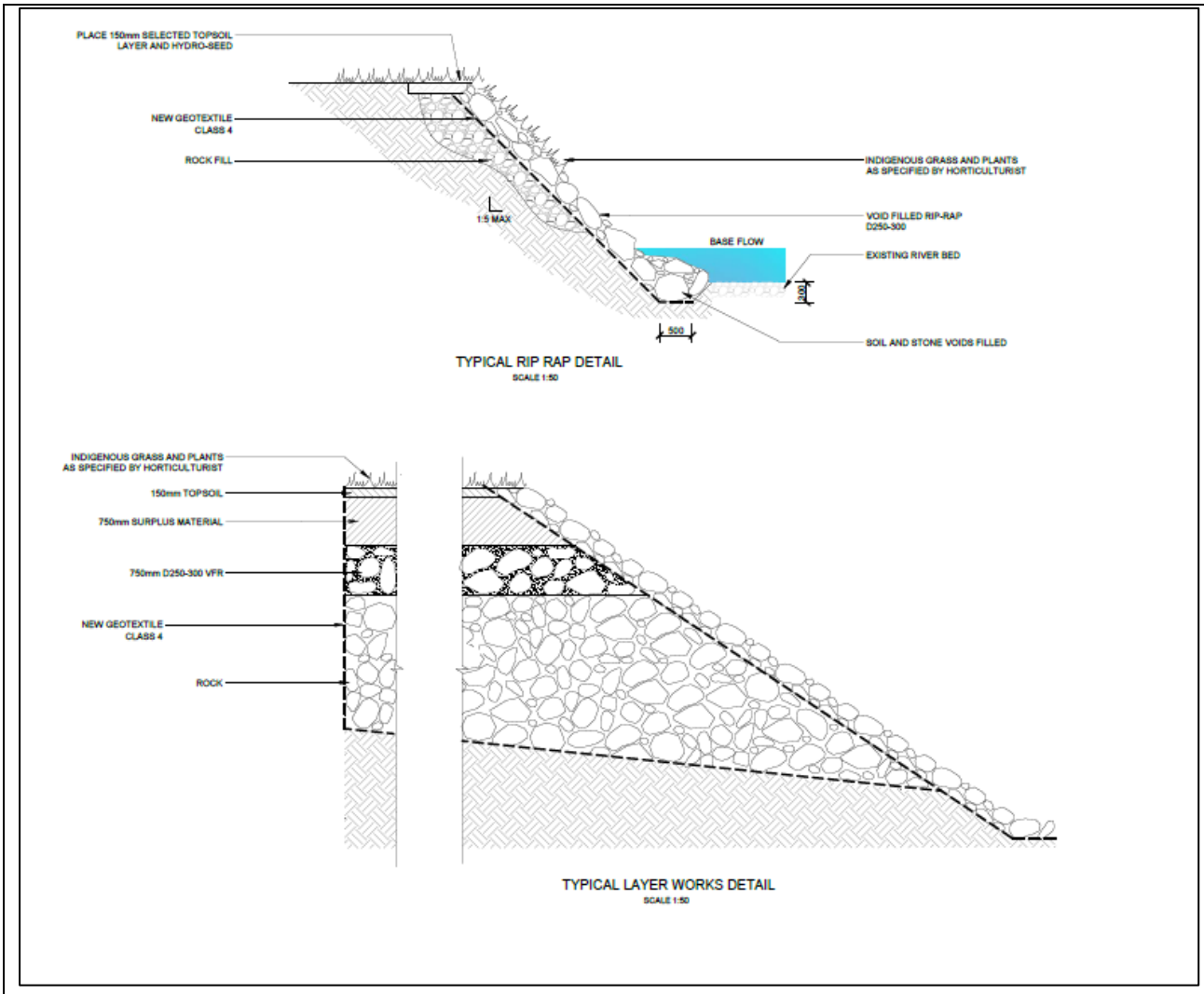

Figure 28: Site 3 site plan

Site 4

Figure 29: Location of Site 4

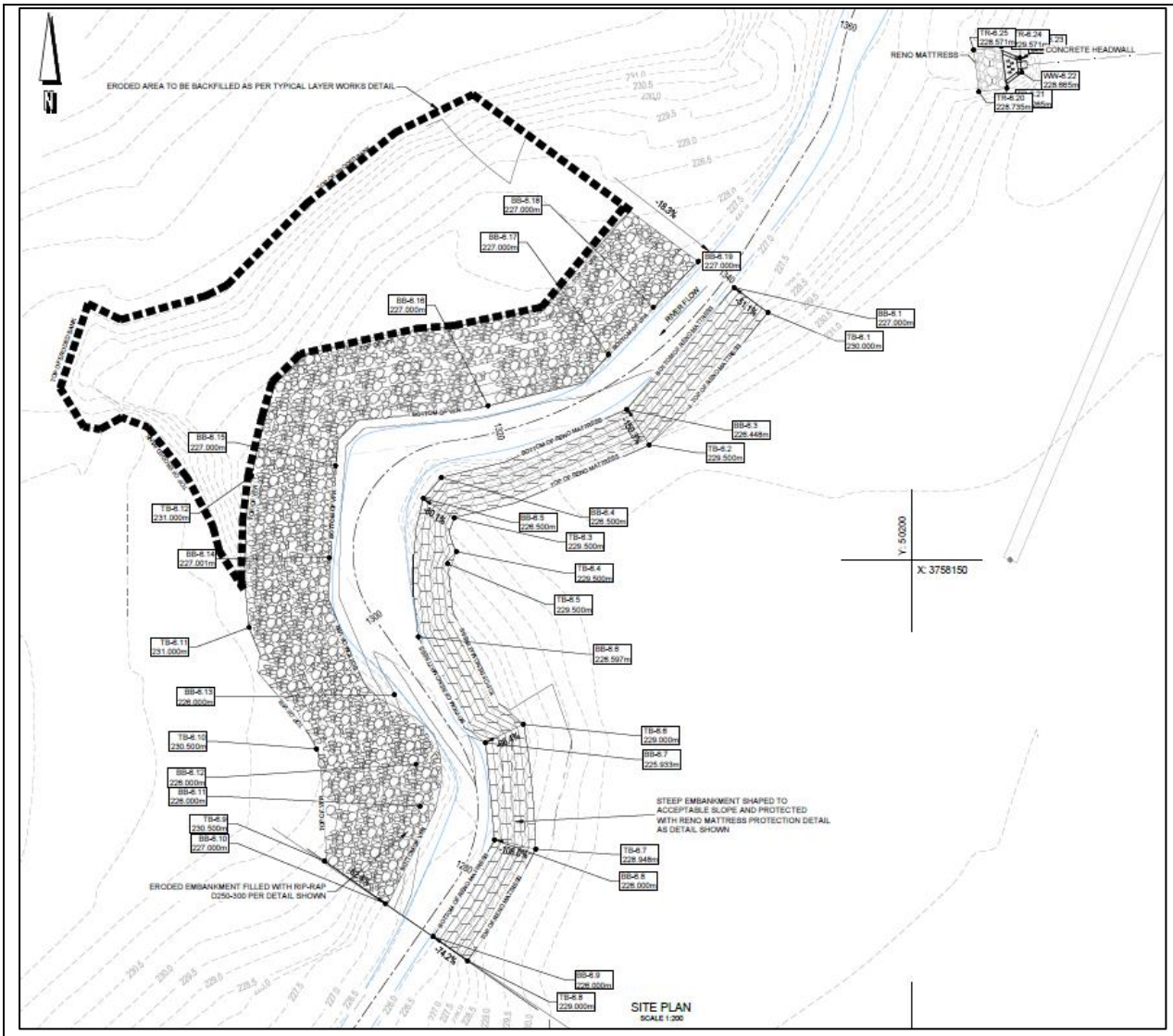

Figure 30: Site 4 site plan

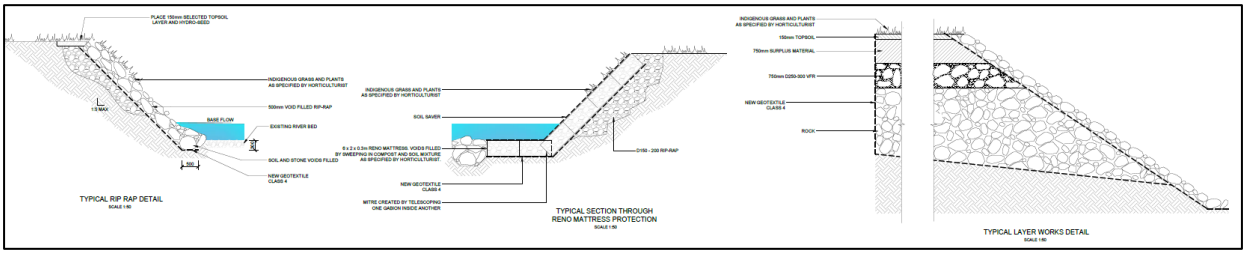

Figure 31: Site 4 site plan

Site 5

Figure 32: Location of Site 5

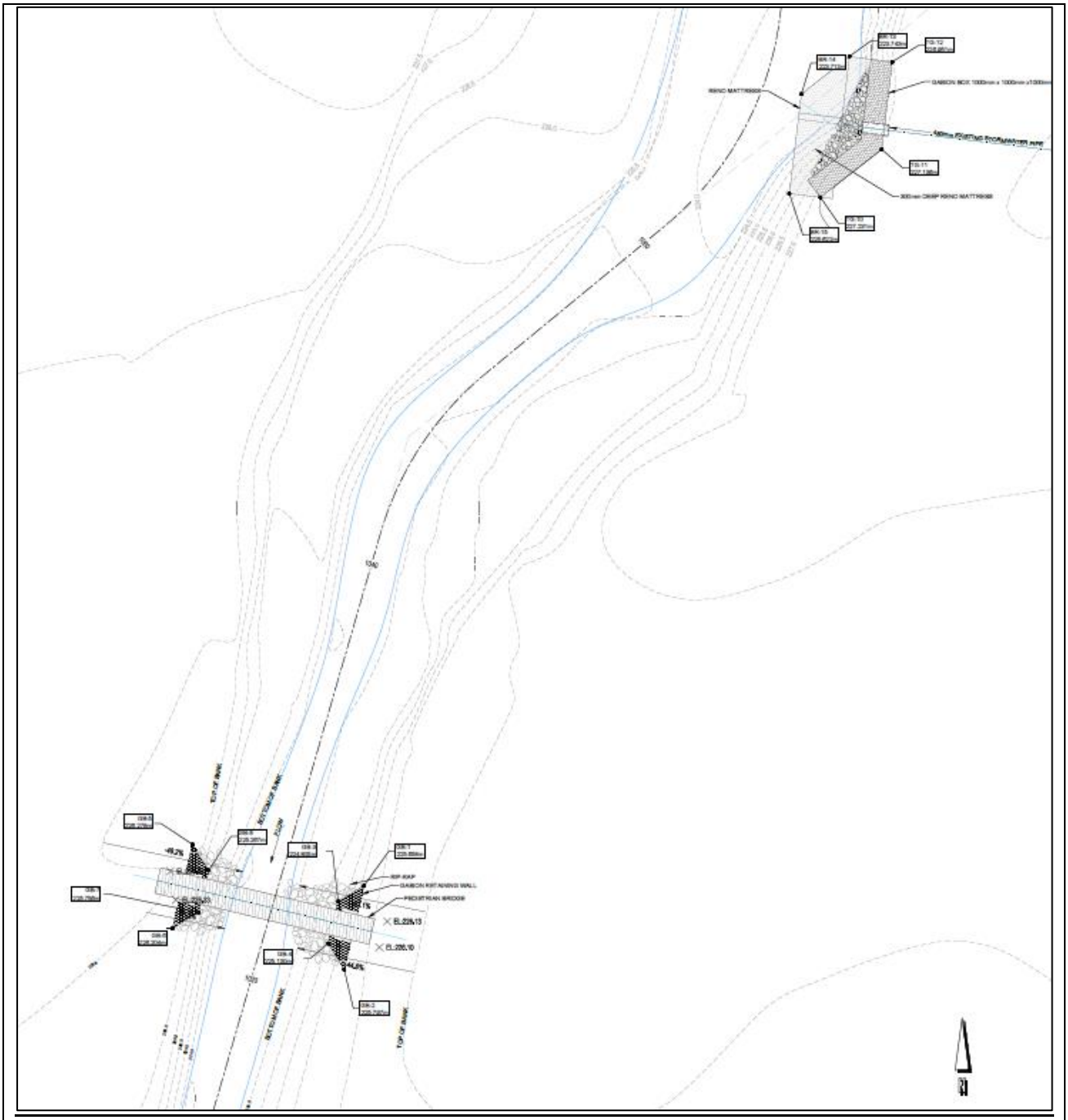

Figure 33: Site 5 site plan

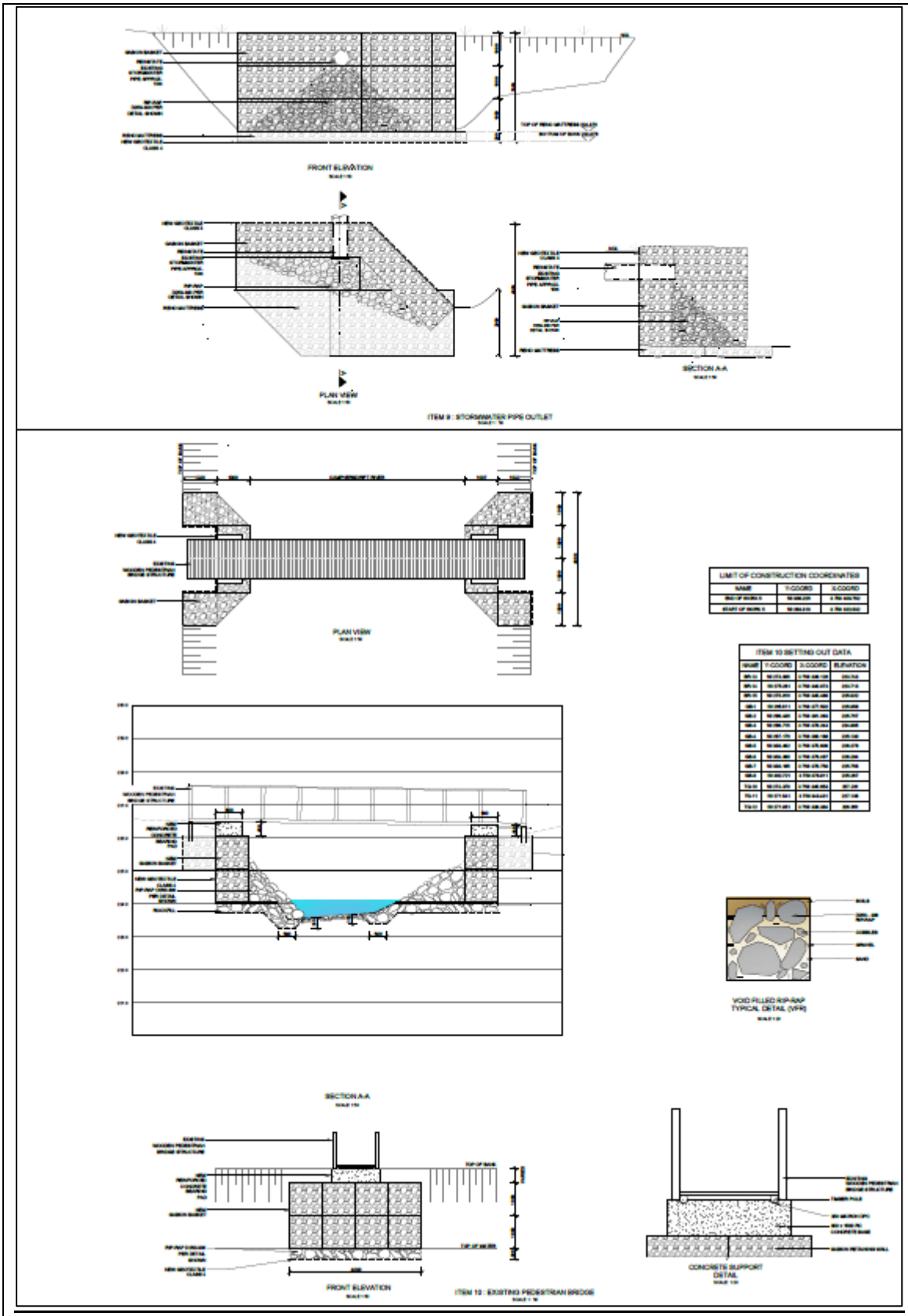

Figure 34: Site 5 site plan

Site 6

Figure 35: Location of Site 6

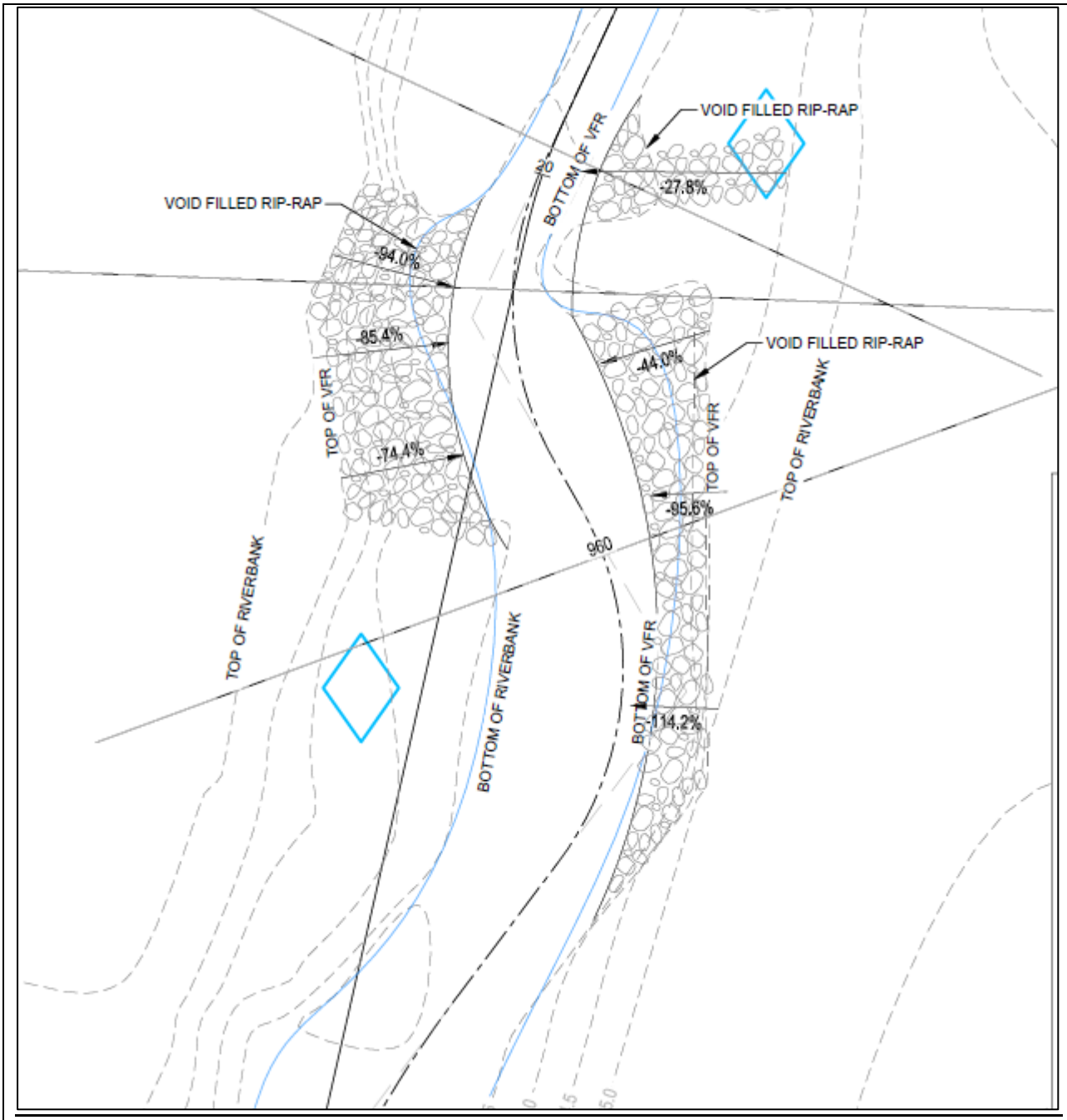

Figure 36: Site 6 site plan

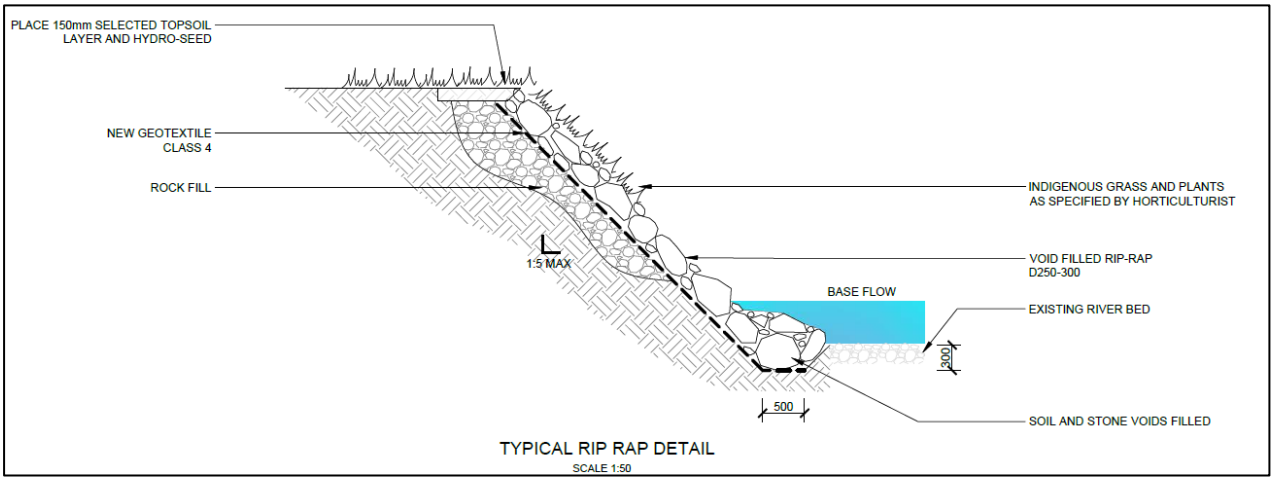

Figure 37: site 6 site plan

Site 7

Figure 38: Location of Site 7

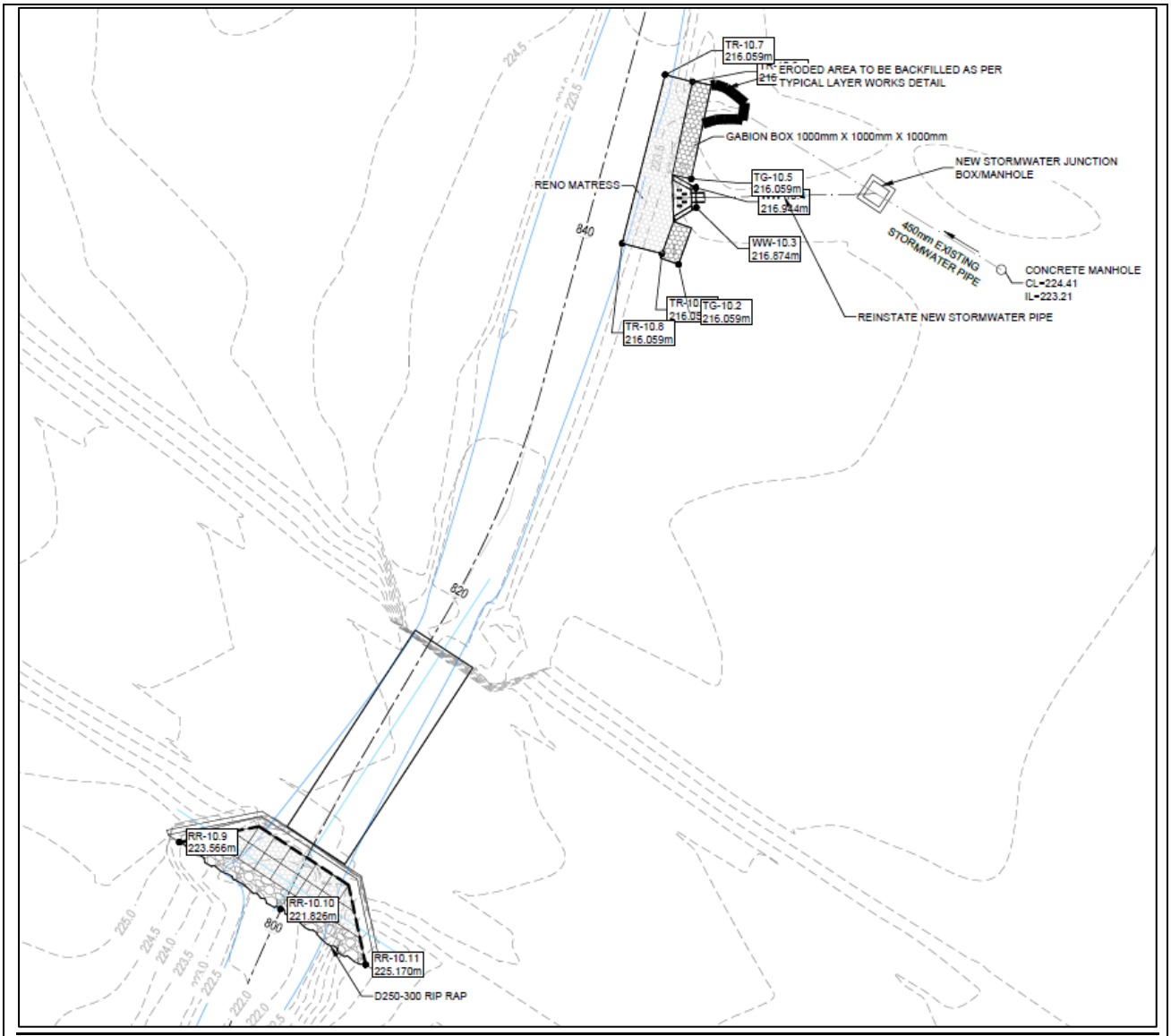

Figure 39: Site 7 site plan

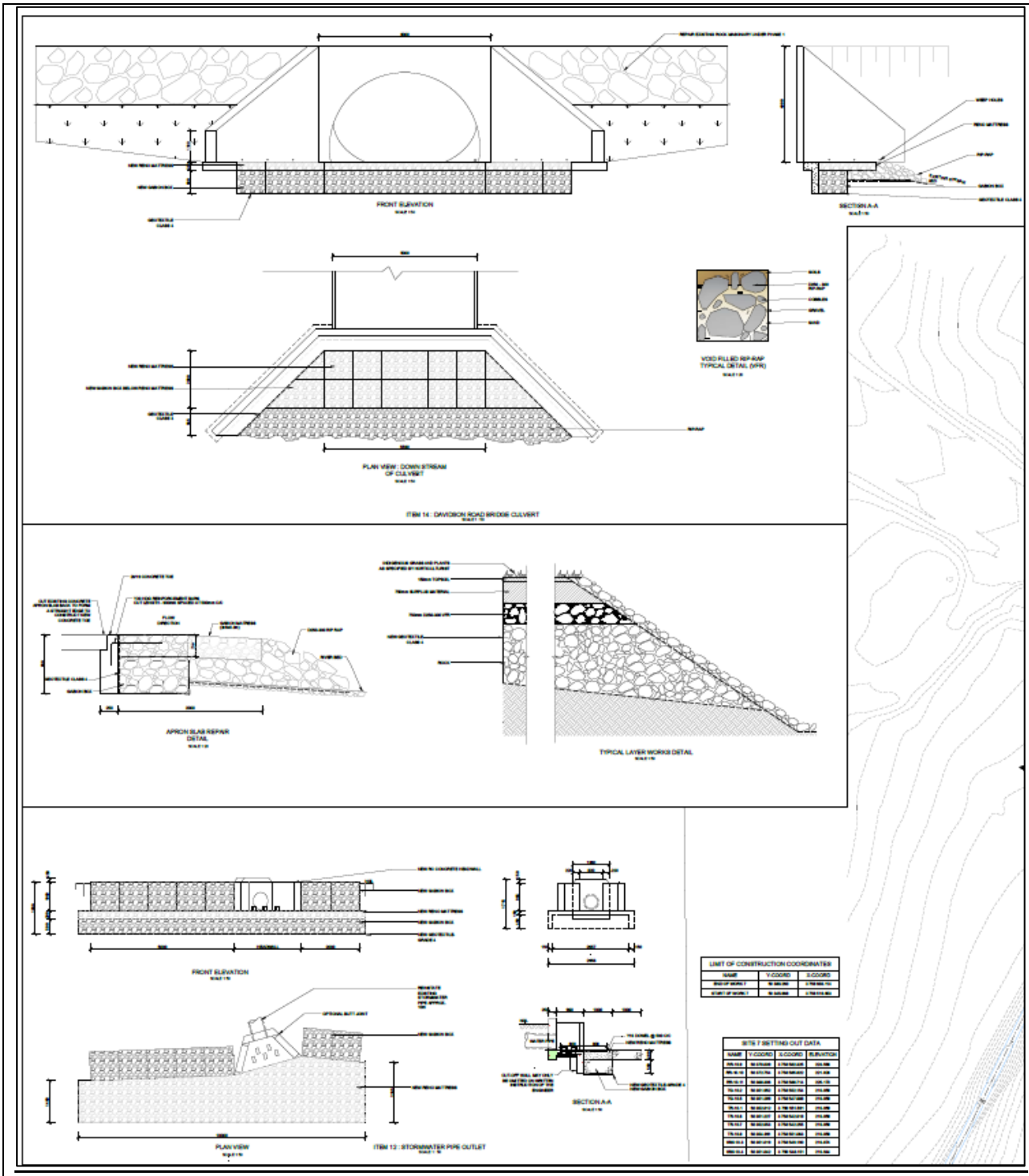

Figure 40: site 7 site plan

Site 8

Figure 41: Location of Site 8

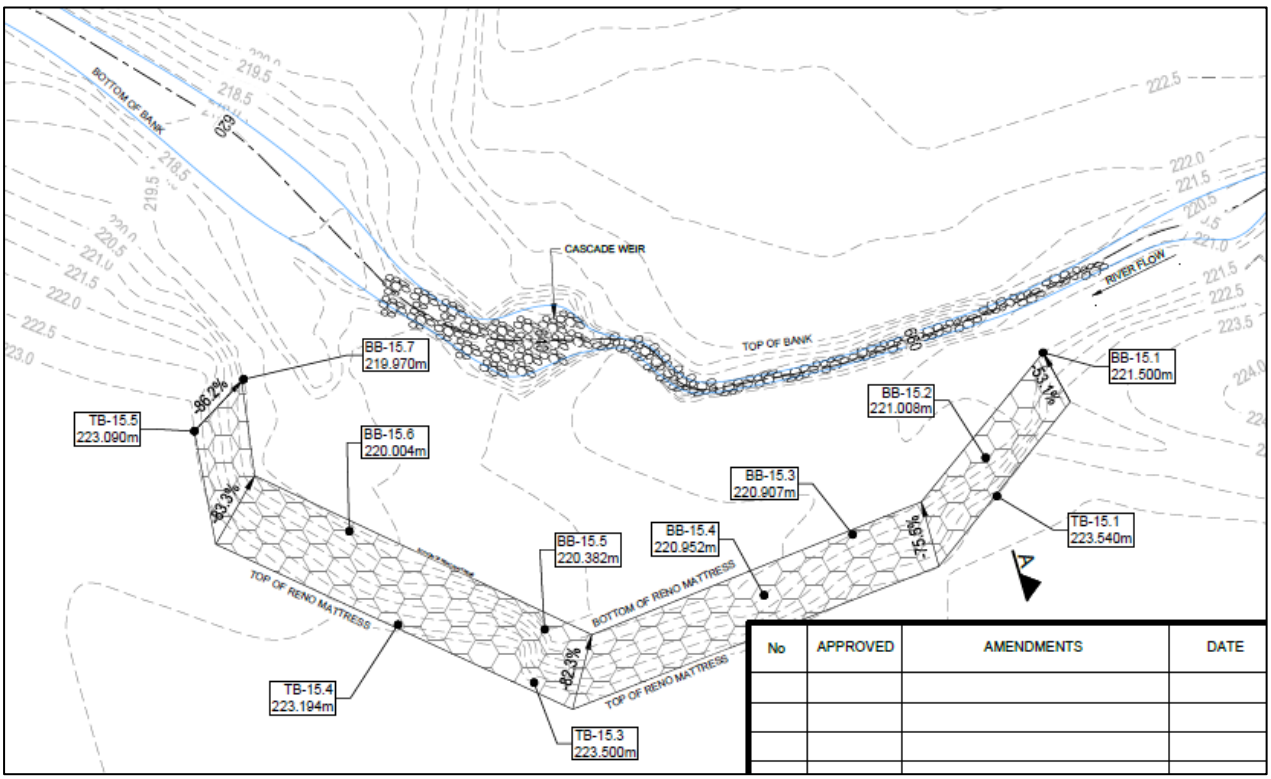

Figure 42: Site 8 site plan

Site 9

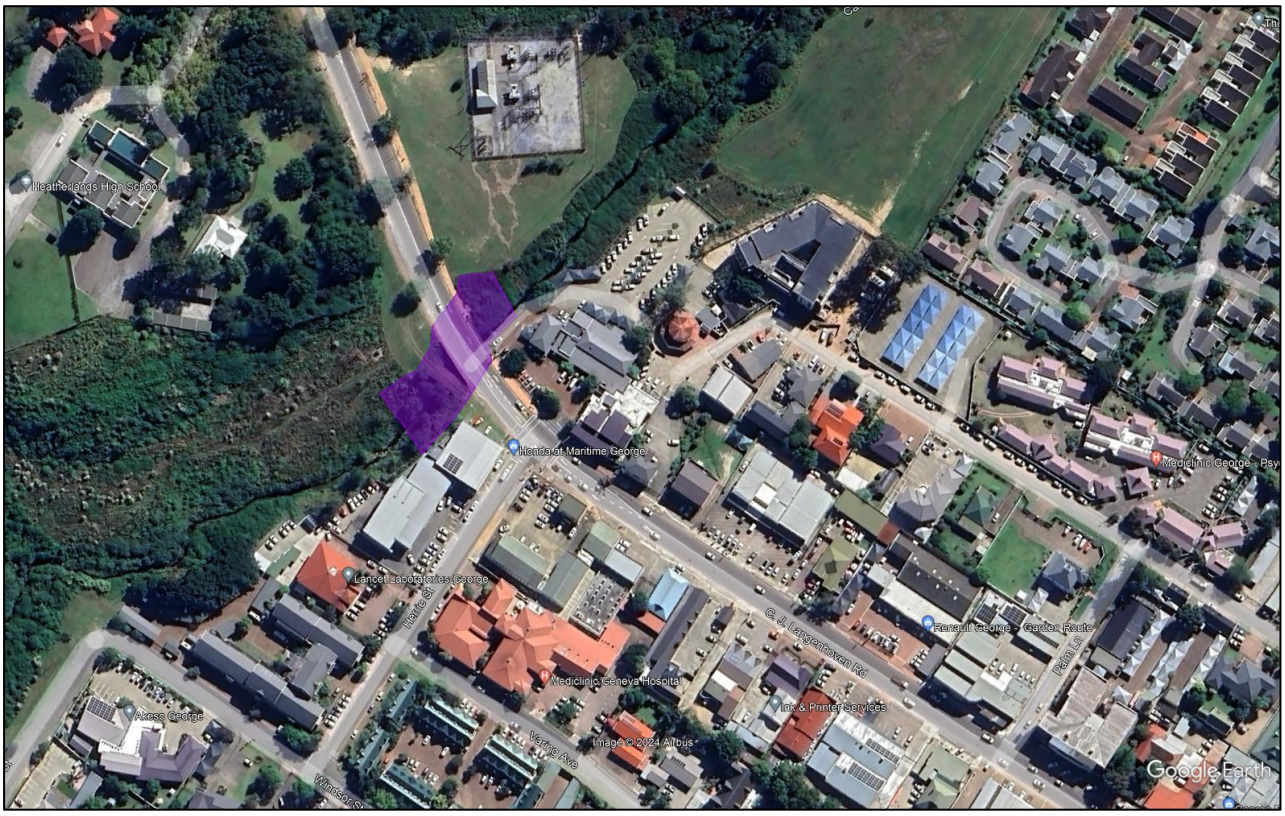

Figure 43: Location of Site 9

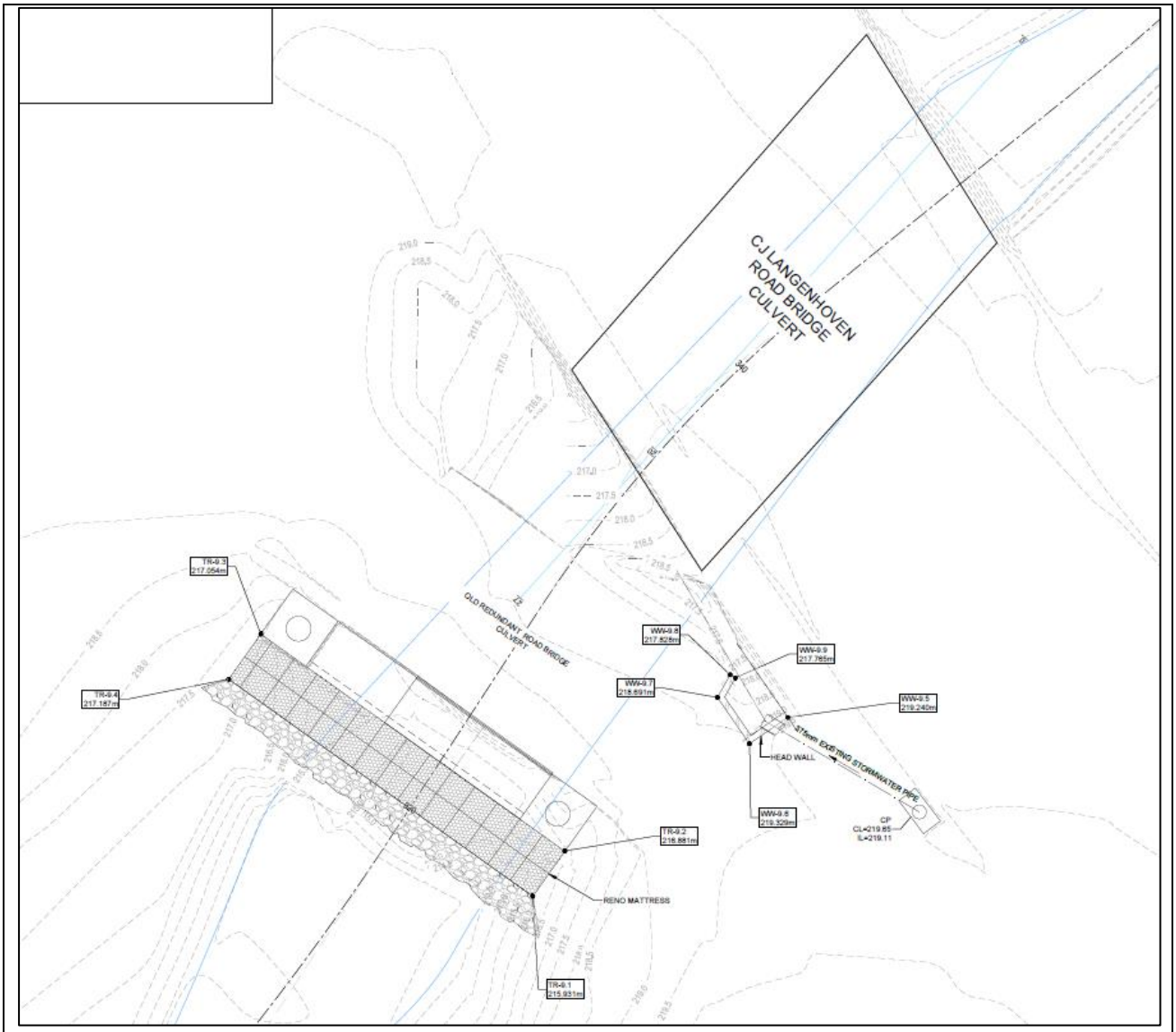

Figure 44: Site 9 site plan

2.	Explain how the proposed development is in line with the existing land use rights of the property as you have indicated in the NOI and application form? Include the proof of the existing land use rights granted in Appendix E21.
The proposal is to repair flood damaged infrastructure and stabilise eroded riverbanks on property owned and managed by the George Municipality.	
3.	Explain how potential conflict with respect to existing approvals for the proposed site (as indicated in the NOI/and or application form) and the proposed development have been resolved.
No conflicts with existing approvals.	
4.	Explain how the proposed development will be in line with the following?
4.1	The Provincial Spatial Development Framework.
N/A -The proposal only includes the repair, maintenance and rehabilitation of the banks and stormwater infrastructure within the Camphersdrift River. No new developments are proposed as part of the proposed flood repairs.	
4.2	The Integrated Development Plan of the local municipality.
N/A -The proposal only includes the repair, maintenance and rehabilitation of the banks and stormwater infrastructure within the Camphersdrift River. No new developments are proposed as part of the proposed flood repairs.	
4.3.	The Spatial Development Framework of the local municipality.
N/A - The proposal only includes the repair, maintenance and rehabilitation of the banks and stormwater infrastructure within the Camphersdrift River.	

4.4.	The Environmental Management Framework applicable to the area.
N/A – No EMF adopted for George.	
5.	Explain how comments from the relevant authorities and/or specialist(s) with respect to biodiversity have influenced the proposed development.
Please refer to the comments and responses report	
6.	Explain how the Western Cape Biodiversity Spatial Plan (including the guidelines in the handbook) has influenced the proposed development.

According to the Terrestrial Faunal and Avifaunal Species Impact Assessment Report compiled by Dr Jacobus H. Visser:
Critical Biodiversity Areas (CBAs) are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan (Purves and Holmes, 2015). Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services.

Because of their location in the Camfersdrift River drainage channel, a large number of the repair sites overlap with either terrestrial or aquatic Critical Biodiversity Areas (CBAs, Figure 45). Conversely, some of the sites overlap with a degraded Ecological Support Area located to the east of the project footprint (ESA2, Figure 46).

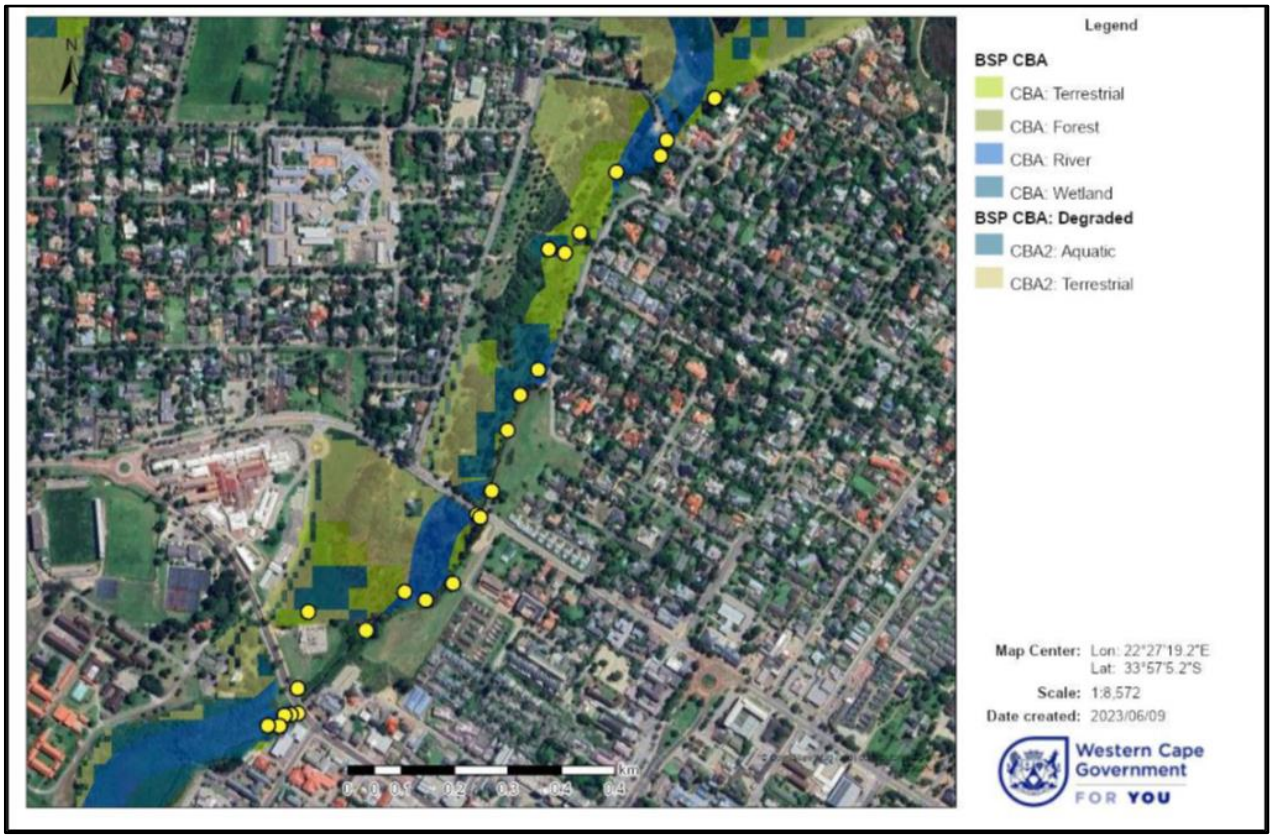

Figure 45: Spatial locations of Critical Biodiversity Areas (CBAs) overlapping with the study area (Yellow dots = Repair sites; information sourced from Cape Farm Mapper version 2.6.10, Western Cape Department of Agriculture).

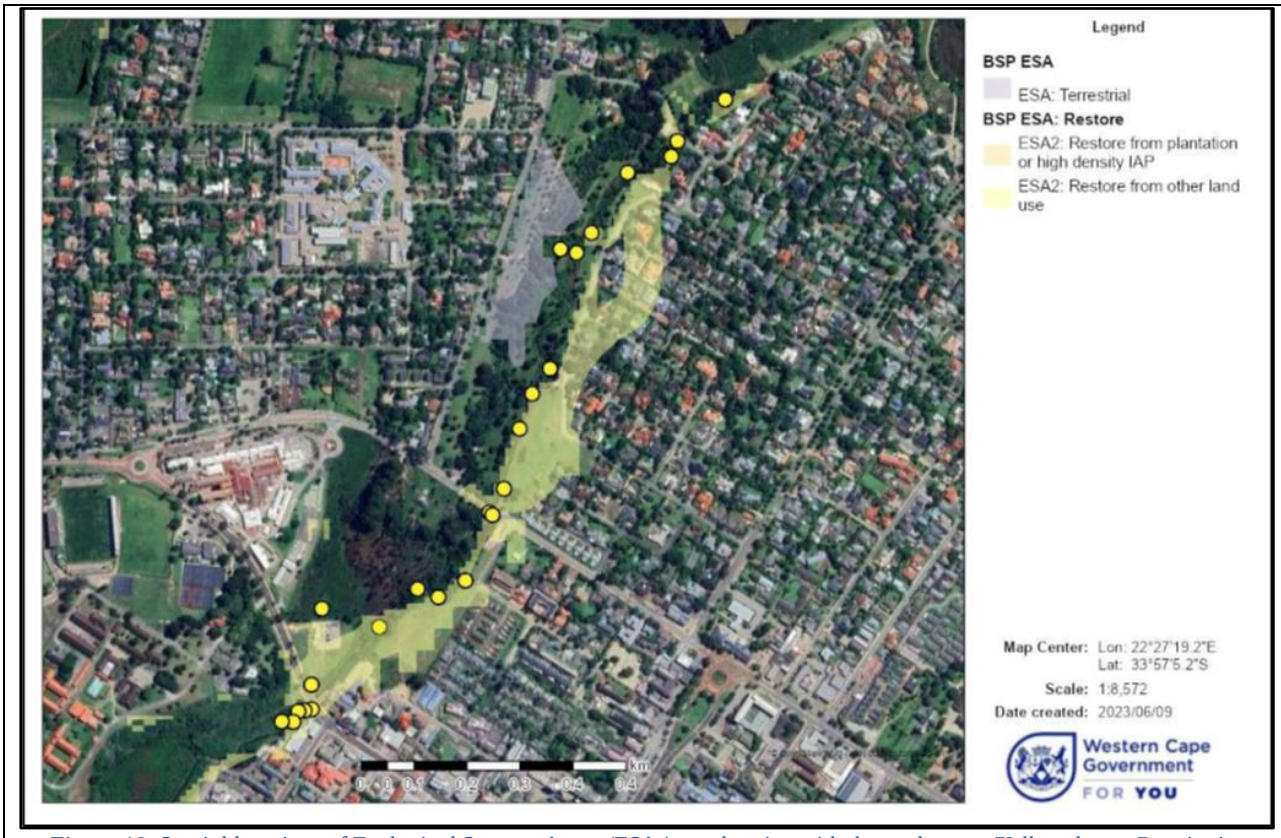

Figure 46: Spatial locations of Ecological Support Areas (ESAs) overlapping with the study area (Yellow dots = Repair sites; information sourced from Cape Farm Mapper version 2.6.10, Western Cape Department of Agriculture).

Because of their location in the Camfersdrift River drainage channel, a large number of the repair sites overlap with either terrestrial or aquatic CBA, with some of the sites overlapping a degraded ESA2 located to the east of the project footprint. Following the ground-truthing phase, it is clear that habitats within the study area are subject to high levels of daily disturbance and exist in a degraded state and in an urban setting. Notwithstanding the presence of a small subpopulation of C. duthieae therefore, the entire site may rather be classified as a degraded ESA2 which is defined as "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". Management objectives for such ESA2 include: "Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement". To this end, the repairs listed under the current project (especially the removal of alien and invasive vegetation) are in line with the suggested management objectives for this ESA2 category.

7.	Explain how the proposed development is in line with the intention/purpose of the relevant zones as defined in the ICMA.
N/A	
8.	Explain whether the screening report has changed from the one submitted together with the application form. The screening report must be attached as Appendix I.
No changes to the Screening Tool Report	
9.	Explain how the proposed development will optimise vacant land available within an urban area.
N/A	
10.	Explain how the proposed development will optimise the use of existing resources and infrastructure.
The proposal is to maintain and further protect and enhance the existing infrastructure resilience to future flood damage.	
11.	Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. (Confirmation of all services must be included in Appendix E16).
N/A	

12.	In addition to the above, explain the need and desirability of the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013) or the DEA's Integrated Environmental Management Guideline on Need and Desirability. This may be attached to this BAR as Appendix K.
Not applicable, the municipality has a responsibility to maintain its infrastructure. Motivation in terms of Need and Desirability is deemed not necessary.	

SECTION F: PUBLIC PARTICIPATION

The Public Participation Process ("PPP") must fulfil the requirements as outlined in the NEMA EIA Regulations and must be attached as Appendix F. Please note that If the NEM: WA and/or the NEM: AQA is applicable to the proposed development, an advertisement must be placed in at least two newspapers.

1. Exclusively for linear activities: Indicate what PPP was agreed to by the competent authority. Include proof of this agreement in Appendix E22.

Please refer to the PPP Plan attached as Appendix E22

2. Confirm that the PPP as indicated in the application form has been complied with. All the PPP must be included in Appendix F.

Please refer to Appendix F1

3. Confirm which of the State Departments and Organs of State indicated in the Notice of Intent/application form were consulted with.

Please refer to the I&AP register (Appendix F2, only submitted to DEADP)

4. If any of the State Departments and Organs of State were not consulted, indicate which and why.

Only relevant State departments were requested to comment.

5. if any of the State Departments and Organs of State did not respond, indicate which.

• Dr Nina Viljoen - Garden Route District Municipality • Brandon Laymen - WCG: Department of Agriculture • Megan Simons - Cape Nature • Lizelle Stroh - South African Civil Aviation Authority • Clinton Petersen - George Municipality Town Planner • Stephanie-Ann Barnardt - Heritage Western Cape – Section 38 not applicable to the proposal and as such they will not comment

6. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated into the development proposal.

Please refer to the comments and response report, Appendix F4

Note:

A register of all the I&AP's notified, including the Organs of State, and all the registered I&APs must be included in Appendix F. The register must be maintained and made available to any person requesting access to the register in writing.

The EAP must notify I&AP's that all information submitted by I&AP's becomes public information.

Your attention is drawn to Regulation 40 (3) of the NEMA EIA Regulations which states that *"Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but **must** be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority."*

All the comments received from I&APs on the pre -application BAR (if applicable and the draft BAR must be recorded, responded to and included in the Comments and Responses Report and must be included in Appendix F.

All information obtained during the PPP (the minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded) and must be included in Appendix F.

Please note that proof of the PPP conducted must be included in Appendix F. In terms of the required "proof" the following is required:

- a site map showing where the site notice was displayed, dated photographs showing the notice displayed on site and a copy of the text displayed on the notice;
- in terms of the written notices given, a copy of the written notice sent, as well as:
  - if registered mail was sent, a list of the registered mail sent (showing the registered mail number, the name of the person the mail was sent to, the address of the person and the date the registered mail was sent);
  - if normal mail was sent, a list of the mail sent (showing the name of the person the mail was sent to, the address of the person, the date the mail was sent, and the signature of the post office worker or the post office stamp indicating that the letter was sent);
  - if a facsimile was sent, a copy of the facsimile Report;
  - if an electronic mail was sent, a copy of the electronic mail sent; and
  - if a "mail drop" was done, a signed register of "mail drops" received (showing the name of the person the notice was handed to, the address of the person, the date, and the signature of the person); and
- a copy of the newspaper advertisement ("newspaper clipping") that was placed, indicating the name of the newspaper and date of publication (of such quality that the wording in the advertisement is legible).

SECTION G: DESCRIPTION OF THE RECEIVING ENVIRONMENT

All specialist studies must be attached as Appendix G.

1. Groundwater

1.1.	Was a specialist study conducted?	YES	**NO**
1.2.	Provide the name and or company who conducted the specialist study.		
1.3.	Indicate above which aquifer your proposed development will be located and explain how this has influenced your proposed development.		
1.4.	Indicate the depth of groundwater and explain how the depth of groundwater and type of aquifer (if present) has influenced your proposed development.		

2. Surface water

2.1.	Was a specialist study conducted?	**YES**	NO
2.2.	Provide the name and/or company who conducted the specialist study.		
Debbie Fordham from Upstream Consulting			
2.3.	Explain how the presence of watercourse(s) and/or wetlands on the property(ies) has influenced your proposed development.		

The proposal will be undertaken within the reaches of the Camfersdrift River and as such Upstream Consulting was appointed to undertake an Aquatic Impact Assessment of the proposed works to determine the potential impact significance and recommend mitigation measures to reduce the potential impact to that of an acceptable significance level.

According to the Aquatic Assessment (Appendix G2):

Camfersdrift River

The Camfersdrift River originates in the Outeniqua mountains and flows through the town of George before entering the Gwaiing River. The river system becomes increasingly modified as it flows through the town (PES-C/D) due to past and present impacts of human activities. In the reach assessed, it has a narrow, incised, single thread channel that is situated in a broader valley floor. It has a mixed bed alluvial channel. The valley becomes less confined downslope of the mountains and historically it is likely that the river was more sinuous in nature. Valley bottom wetland associated with the river system has experienced significant loss, but pockets do remain, largely downstream where the slope lessens.

Identified plant species include:

Isolepis digitata, Cliffortia odorata, Zantedeschia aethiopica, Pteridium aquilinum, Carpha glomerate, Wachendorphia thyrsiflora, Psoralea pinnata, Elegia capensis, Halleria Lucinda, Rapanea

melanophloeos, Isopelis prolifera, Helicrysum sp., Juncus effuses, Commelina diffusa, Cynodon dactylon, Salix mucronate.

Alien plants species density increased in a downstream direction, corresponding to the increased land disturbance, and consisted of *Callistemon viminalis* (Bottlebush), *Rubus cuneifolius* (Bramble) *Lantana camara, Eucalypstus sp.*(Gum trees), *Acacia mearnsii* (Black Wattle), *Pennisetum clandestinum* (Kikuyu grass), *Arundo donax* (Spanish reed), and *Solanum mauritianum* (Bugweed).

Present Ecological State (PES):

The Present Ecological State (PES) refers to the health or integrity of river systems and includes both instream habitat as well as riparian habitat adjacent to the main channel. The rapid Index of Habitat Integrity (IHI) tool (Kleynhans, 1996) was used to determine river PES by comparing the current state of the in-stream and riparian habitats (with existing impacts) relative to the estimated reference state without anthropogenic impacts. The depression is artificial in nature and can therefore not be assessed for PES. However, as mentioned above, this area is likely to have historically been part of the riparian system and thus forms part of the reference state of the river health assessment.

The upper and middle reaches, despite erosion, maintain ecological functioning and the wetland habitat downstream of the reach assessed is in a stable condition. However, overall, urban development (in the catchment and riparian system itself) and alien invasive plant infestation has significantly modified the river system from the natural condition. It was determined that a large loss of natural habitat, biota and basic ecosystem functions has occurred, resulting in a 'C/D' score for PES, indicating that the river is in a poor condition.

Ecological Importance and Sensitivity:

The Ecological Importance and Sensitivity (EIS) of riparian areas is a representation of the importance of the aquatic resource for the maintenance of ecological functioning, and ability to recover from disturbance (Kleynhans & Louw, 2007). The ecological importance and sensitivity category of the Camfersdrift River was determined as being 'High' (B category). It is an important longitudinal linkage between the mountains and the Gwaiing River and does contain some unique species that are sensitive to change. The river provides significant flood attenuation services and natural habitat in the urban area.

Recommended Ecological Category

The recommended ecological category (REC) is used to inform future management objective for an aquatic ecosystem. The REC can be determined by using the PES (Present Ecological State) and EIS (Ecological Importance and Sensitivity) scores of the system (see table below; DWAF 2007). The Camfersdrift River assessed has a Moderate 'C/D' PES and a High EIS, which places it in the REC 'C/D' category, which advocates for improved management of the system.

Identified Impacts

The direct and indirect impacts associated with the project are grouped into four encapsulating impact categories where associated or interlinked impacts are grouped. Therefore, the potential impacts assessed, which are direct and indirect in nature, are described below.

Disturbances/Loss of Aquatic Vegetation and Habitat

The disturbance or loss of aquatic vegetation and habitat refers to the direct physical destruction or disturbance of aquatic habitat caused by vegetation clearing, disturbance of riparian habitat, permanent infrastructure, encroachment and colonisation of habitat by invasive alien plants.

Construction Phase

The project will require areas along the river reach to be cleared of vegetation and disturbed during construction. The machinery, vehicles and workers needed to install structures will disturb areas of riparian habitat. There will be a significant amount of soil disturbance on the riverbank. The movement of topsoil and incorrectly placed stockpiles could bury aquatic habitat. Due to construction, alien invasive species may encroach further into any disturbed areas and outcompete indigenous vegetation thereby reducing aquatic biodiversity.

Operational Phase
There is potential for the structures to result in reduced physical habitat diversity due to the loss of structural complexity and limiting lateral connectivity with the floodplain. Engineered banks prevent or limit the establishment of natural riparian vegetation that provides protective cover, shading, and habitat, thereby reducing the quality of longitudinal ecological corridors along the riparian zone. The promotion of a straight single channel river reduces habitat diversity, associated ecosystem services are reduced or lost.

Localised scour around structures or instream hydraulic changes may result, and alter the natural bank and channel, channel bank stability and floodplain processes. Water deflected to the opposite bank from river obstructions caused by gabion structures can cause erosion which compromises remaining habitat. The reduction or removal of riparian vegetation cover, within rivers reduces the resistance to flow and thus increases flow velocities, directly reduces the protection of the riverbed and banks which was afforded through the vegetation cover.

The project can promote the establishment of disturbance-tolerant biota, including colonization by invasive alien species, weeds and pioneer plants within the riparian habitat. Although this impact is initiated during the construction phase it is likely to persist into the operational phase. The development and implementation of a suitable alien invasive plant control and management plan will be useful to managing the potential impact of these plants on watercourses in the long-term.

Sedimentation and erosion
Sedimentation and erosion refer to the alteration in the physical characteristics of rivers as a result of increased turbidity and sediment deposition, caused by soil erosion and earthworks that are associated with construction activities, as well as instability and collapse of unstable soils during project operation. These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.

Construction Phase
Vegetation clearing and exposure of bare soils within and upslope of the aquatic habitat during construction will decrease the soil binding capacity and cohesion of the upslope soils and thus increase the risk of erosion and sedimentation downslope. This may cause the burying of aquatic habitat and also cause aquatic faunal fatalities. The installation of permanent hard infrastructure within the river will change the instream flow hydraulics and potentially contribute to further erosion in natural, unprotected banks.

Operational Phase
The bank modification has resulted in the straightening and deepening of the channel which will increase the flood conveyance. The channel is now artificially deep and narrow channel, with an associated unnatural increase in flow velocity and sediment transport capacity. The modification to the channel geometry will cause faster flow velocities, reduce natural flood attenuation, increase sediment transportation, and consequently impact downstream reaches. The bank protection measures proposed in this project can result in increased flood damage of downstream reaches, including loss of the important wetland habitat. Where soil erosion problems and bank stability concerns initiated during the construction phase are not timeously and adequately addressed, these can persist into the operational phase of the development project and continue to have a negative impact on downstream water resources in the study area.

Water pollution
Water and/or soil pollution cause negative changes in the physical, chemical and biological characteristics of water resources (i.e. water quality). This can result in possible deterioration in aquatic ecosystem integrity and a reduction in, or loss of, species of conservation concern (i.e. rare, threatened/endangered species). The result is only disturbance tolerant species remaining. Additionally, litter indirectly decreases the aesthetic value of the aquatic habitats.

Construction Phase
During construction there are a number of potential pollution inputs into the aquatic system (such as hydrocarbons and raw cement). These pollutants alter the water quality parameters such as turbidity,

nutrient levels, chemical oxygen demand and pH. These alternations impact the species composition of the systems, especially species sensitive to minor changes in these parameters. Sudden drastic changes in water quality can also have chronic effects on aquatic biota in general and result in localised extinctions. Hydrocarbons including petrol/diesel and oils/grease/lubricants associated with construction activities (machinery, maintenance, handling) may potentially enter the system by means of surface runoff or through dumping by construction workers. Raw cement entering the systems through incorrect batching procedure and/or direct disposal.

Cumulative impacts

Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole.

The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system.

Mitigation

Mitigation measures to reduce residual risk or enhance opportunities:

- Final designs and method statements should be approved by the aquatic ecologist, together with the river engineer, prior to the commencement of construction.
- Objectives should be to halt bed incision and bank erosion from hydrological changes by improving culvert outlet designs to reduce scour, flow velocity and flow confinement and installing grade control structures to halt channel incision and upstream bank erosion due to confined flow, trap sediment, and achieve a more natural longitudinal profile. To allow, where possible, for the river channel to migrate laterally and maintain sinuosity in the valley floor. To slope and revegetate eroded banks as gently as possible, with the least amount of hard infrastructure, to reflect the channel morphology prior to downward incision and subsequent erosion.
- Interventions/ hard infrastructure must be set as far back from the channel as possible, including stormwater outlets.
- Steep channel banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity.
- Do not compromise on the extent of erosion control below culvert and pipe outlets. Where possible, install check dams/ low weirs to slow flow and widen channel.
- Where infrastructure is not at risk, to allow for natural bank collapse and reshaping, whilst the grade control structures prevent further erosion.
- Use locally indigenous vegetation to revegetate disturbed river areas, whether from search and rescue, propagation, plugs, or purchased.
- Allow for a riverbed with diversity of types, reflecting riffles and pools, as opposed to creating a plane bed. Widen and raise the channel where possible.
- Bank stabilisation structures must attempt to reflect the natural bends of the river without straightening or narrowing the channel.
- Structures must be kept largely inside the space that used to be occupied by the river bank prior to its washing away, i.e. the structures are kept within the footprint as well as the level to

which the bank existed, so as to not present more of a resistance to flow than what the previous bank did.

- A construction method statement must be compiled and available on site.
- The edges of the construction footprint must be clearly staked-out and demarcated prior to construction commencing.
- The contractor or ECO must educate all staff undertaking the work on the best practice methods and environmentally sensitive areas (general do's and don'ts).
- The specific boundaries of areas to be excavated and recontoured etc. must be clearly demarcated.
- Use the smallest possible working corridor. Outside the working corridor, all areas are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. The edges of the construction / rehabilitation zone within the vicinity of the riparian habitat must be clearly staked-out and demarcated using highly visible material (e.g. poles 5m apart) prior to construction commencing.
- The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. The cross-sectional profile of the bed and banks must be restored as far as possible.
- Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
- Access to and from the area should be either via existing roads or transformed land.
- During construction, it is important to stabilise any steep, bare areas on the slope and river banks via geotextiles and/or revegetation.
- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use.
- Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer daily.
- Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using covers, silt fences, sandbags, etc. Effective stormwater management must include effective stabilisation of exposed soil.
- All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.
- Construction must have contingency plans for high rainfall events during construction.
- The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat.
- Any potential pipeline leaks should be investigated as moisture content of the bank increases the likelihood of mass failure by increasing the weight of the soil mass and decreasing soil strength. This coupled with lateral interflow during floods will create destabilising forces. It is possible that the location of the pipeline has contributed to the extent of erosion in that upper right bank location as the substrate of the bank/ slope will have been altered for installation and altered moisture content in the soil profile. It is worth investigating other factors such as this which contributed to the bank failure in this site, not only the scour from deflected flood water.

- A monitoring programme must be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts.
- It is recommended that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including further channel and bank grade control interventions. Should this additional support be implemented successfully then there will be positive impacts. This can be compiled in the form of a river rehabilitation plan with engineering input. It can include the grade control structures to raise the incised channel and the rehabilitation of the wetland upstream of the urban area to attenuate flood waters.
- It is also important to note that bank stabilisation is a reactive measure to treat only a symptom of flood damage, and further actions focussing on addressing the causes should be investigated. For example, improving the stormwater system and culvert/pipe outlets (incorporating the principles of Sustainable Drainage Systems) to decrease the volume and slow the velocity of surface runoff entering the system during floods.
- Enhancing the aquatic buffer zone surrounding the river channel will reduce bank erosion. The are areas where cut lawn extends right up to the banks and it is recommended that,where possible, a buffer strip be adopted with higher surface roughness.

Rehabilitation

The rehabilitation will require and integrated approach and maintenance to be successful. It is important to prepare an accurate estimate of the financial costs of rehabilitation and ensure that sufficient funds are allocated to achieve a successful outcome.

It is recognised that there are areas surrounding urban infrastructure which require repair and protection with hard engineering solutions. However, where space allows, it is recommended that the rehabilitation be limited to reshaping the banks to restore channel geometry and create gentler sloping banks. It is imperative that bank reshaping be immediately followed by soil stabilisation to prevent further erosion and sedimentation (i.e., no bare soil surfaces/banks should be left without measures to prevent erosion for longer than a day). Once stabilised, the banks and entire rehabilitation zone (cleared area) must be revegetated with locally occurring vegetation. In general, this approach entails reshaping of the channel cross sectional profile so that its banks are gently sloping, to facilitate the establishment of vegetation that will contribute to bank stabilization, and the establishment of a more spatially complex marginal and riparian habitat.

Gabion structures

In areas where infrastructure repair and protect requires hard engineering interventions it is largely proposed to use gabion structures for the protection of the riverbanks. Mattresses will be used to repair and where necessary extend the revetment protection, to protect the riverbed and also the toes of the apron slabs.

It is unlikely for vegetation to establish on the gabion structures without the addition of erosion control mattresses, plant pallets or coir rolls. An erosion control blanket made from geofabric should be placed either within the gabions as a liner, to retain soil and moisture for plants, or over backfilled gabion structures. Any geofabric erosion control mat products with spacing wide enough for plants to grow between can be used, such as Enviromat® CFB-330 or Soil Saver®. Revegetation can be further accelerated using pre-planted coir mats or rolls placed upon the gabion shelves.

Typical gabions have small rooting holes which generally only support weeds and grasses. It is recommended that during construction, planting pockets be created in the gabion or reno mattress and lined with geofabric to retain the soil placed upon the slope whilst letting through water. Planting holes should ideally have a rooting space diameter of 10cm.

Re-sloping and stabilizing banks

Where there is space and infrastructure is not at risk, it is recommended that soft interventions be adopted for bank erosion rehabilitation. The riverbanks should be reshaped to provide an increased flow width and gentler slopes. Gentler slopes allow for more effective revegetation and generally

simulate natural bank structure. The banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope very slightly with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity. Banks can be terraced rather than entirely graded, with a step comprising a relatively flat shelf (approx. 1 m wide and at least 1m above the toe of the bank). Upstream and downstream extents of stabilised banks should be moulded in to remaining, unshaped banks, so that neither protrudes into the channel, where it might trigger erosion. Machinery should operate from the top of bank, rather than in-channel, to minimise disturbance and downstream sedimentation. Plants cleared must be stored and replaced. The reshaped banks must then be stabilised with a combination of vegetation, coir rolls, and or geofabric.

Measures to aid soil stability and revegetation include geotextile fibre mats or nets which may be placed on the soil surface on the re-sloped banks. These are any permeable textile material that is used to holding seed, plant plugs, and topsoil in place, or holding disturbed soil on graded sites, in order to prevent erosion. Surface preparation is important, as the soil should be relatively smooth and without humps. The mat should extend beyond the edge of the area to be covered, with the top end buried in a trench at least 10 cm deep by 20 cm wide. The mat will need to be further secured with stakes. There must be maximum soil contact to prevent erosion underneath. Ideally, vegetation is the best form of erosion control, with geotextiles only used for temporary stabilisation purposes until vegetation cover is established.

Re-vegetating riparian area

Vegetation is able to stabilise bank soil through various processes. Vegetation reduces bank erosion above ground as shoots bend and cover the surface and reduce the velocity at the soil/water interface, whilst below ground, roots mechanically restrain or hold soil particles in place preventing surface erosion.

The planting of vegetation must occur as soon as the re-shaped banks have been stabilised to prevent surface runoff from removing bank material. The banks are a priority area and rehabilitation must start closest to the river channel and move outwards until complete. Input from a botanist regarding revegetation of the banks would help to achieve an appropriate mix of locally indigenous riparian species. During site preparations, all cleared vegetation should be rescued and stored, for replacement during rehabilitation (even of dead plant material). Consideration should be given to reseeding with hardy pioneer species.

Different slopes and wetness zones support different plant species. Therefore, when replanting it is important to plant select species in the specific riverbank zone to which they belong. See Table 10 below for guidance. It is recommended that a botanist or the local botanical garden be involved during vegetation rehabilitation.

Plants should be planted randomly or staggered with gaps; they should not be planted in straight lines. As a general rule, plants should be planted into a hole which is double its size. There are products available which act as water retention substances as well as fertilisers, or in some cases just water retainers.

Maintenance of the plants will be required, such as watering, weeding, disease and insect pest control, and replacement of dead material in all planted areas. Alien invasive plant species often establish in disturbed areas and outcompete the natural vegetation. It will be necessary to manage the rehabilitated area constantly and indefinitely for alien invasive plants. Under CARA legislation (Conservation of Agricultural Resources Act No. 43 of 1983) the landowner is required to remove the alien invasive trees on the entire property. The neighbouring landowners and those upstream are also required to manage alien invasive trees on their properties. It is also recommended that the river buffer be expanded where possible by leaving a strip of the vegetation to grow rather than cutting the grass right up to the river edge.

Channel bed erosion

The project concept engineering report does mention the installation of one riverbed erosion control structure for a site in the downstream reach. It states that is to protect the riverbed from further

scouring by filling the erosion trenches with large size gabion stone and installing either cascade weirs or small gabion check dams. The structures are described as small because the vertical height will be below a metre and will not span from bank to bank. The purpose is to reduce the low flow water speed to a value which is below the scour velocity.

While not proposed in the current project scope, it is recommended that efforts be expanded to include further rehabilitation and grade control structures, like additional check dams and ground sills. The Camfersdrift River has become constricted and subjected to abnormally high flood levels and flow velocities during floods. The types of intervention that address riverbed incision directly vary in decreasing environment friendliness, from re-vegetation of the riverbed to grade control structures such as block ramps or vertical drop weirs.

Monitoring

Monitoring is required to guide the work planned on the river, evaluate progress, and gauge success in achieving the objectives. Any areas that are not progressing satisfactorily must be identified and action must be taken. Monitoring of rehabilitation activities is essential, not only because of uncertainty in terms of understanding the cause-effect relationships in river ecosystems, in underlying dynamic conditions of rivers themselves, and in the ability of selected rehabilitation options to successfully achieve the stated outcomes, but also from an adaptive management perspective, that relies on "learning by doing" development and refinement of rehabilitation practices (Day et al. 2016). Monitoring should be undertaken before and during rehabilitation and afterwards for a sufficient timescale to detect both rapid and longer-term changes. Prior to any soil movement it is recommended that the aquatic specialist and engineer visit the site and, with the objectives of the rehabilitation plan, approve the planned approach and dimensions.

The monitoring of the activities is essential to ensure the rehabilitation measures are implemented in a sensitive manner. Therefore, compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer with an appropriately timed audit report. It is recommended that monitoring by an independent ECO be conducted daily and weekly by an aquatic ecologist. Post construction rehabilitation must be deemed as sufficient by an aquatic ecologist prior to the contractors leaving site, and long term rehabilitation success must be audited by an aquatic ecologist three, six, and one year once in operational phase.

Monitoring for non-compliance must be done on a daily basis by the contractors. Photographic records of all incidents and non-compliances must be retained. Monitoring should especially focus on preventing erosion and sedimentation. Monitoring should primarily be focused towards demonstrating that the rehabilitation objectives have been achieved. Regular evaluation of your monitoring results will enable you to react to unanticipated effects of the rehabilitation. Also consult WET-RehabEvaluate (Cowden and Kotze, 2009) and the river rehabilitation manual developed by Day et al. 2016 for further information.

Water use authorization

The National Water Act (NWA), 1998 (Act 36 of 1998), aims to manage national water resources in order to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected, and integrated management of water resources takes place. Chapter 4 of the National Water Act addresses the use of water and stipulates the various types of licensed and unlicensed entitlements to the use of water.

As part of the rehabilitation process, Section 21 (c) and (i) water uses as per the National Water Act (Act 36 of 1998) will be applicable. A water use license application (WULA) or General Authorisation (GA) registration application must be submitted to the Breede Olifants Catchment Management Agency (BOCMA) which is the relevant Competent Authority.

Conclusion

The aquatic habitats within a 500 metre radius of the proposed activities were identified and mapped on a desktop level utilising available data. Following the desktop findings, the infield site assessment confirmed the location and extent of these systems. Subsequent screening provided an indication of which of these systems may potentially be impacted upon by the project. It was determined that the Camfersdrift River will be directly impacted and was assessed in detail.

The impact significance upon aquatic biodiversity for the project was determined as Medium after mitigation. It is critical that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including grade control interventions. Should this additional support be implemented then there will be High positive impacts.

The proposed project requires a Water Use License (WUL) in terms of Chapter 4 and Section 21 of the National Water Act No. 36 of 1998, prior to the commencement of activities.

Feedback after review of Engineering Design Report dated June 2024
A review of the Detailed Design Report from June 2024 indicates that many recommendations from the Aquatic Biodiversity Impact Assessment Report have been integrated into the project design. However, the project still predominantly relies on hard engineering solutions (such as gabions, reno mattresses, and riprap), with minimal emphasis on rehabilitating ecological functions, and the infrastructure has not been set back from the river channel. Consequently, while construction at certain sites, like road culverts, is expected to have very low impact significance, other sites will experience medium significance level impacts (such as permanent riverbank modifications) even after mitigation. Overall, the project was assessed, based on the latest available information, to have a potentially high impact without mitigation, which is reduced to a medium impact level after mitigation. This impact significance must be taken into account in the decision-making process.

3. Coastal Environment

3.1.	Was a specialist study conducted?	YES	**NO**
3.2.	Provide the name and/or company who conducted the specialist study.		
3.3.	Explain how the relevant considerations of Section 63 of the ICMA were taken into account and explain how this influenced your proposed development.		
3.4.	Explain how estuary management plans (if applicable) has influenced the proposed development.		
3.5.	Explain how the modelled coastal risk zones, the coastal protection zone, littoral active zone and estuarine functional zones, have influenced the proposed development.		

4. Biodiversity

4.1.	Were specialist studies conducted?	**YES**	NO
4.2.	Provide the name and/or company who conducted the specialist studies.		
Blue Skies Research - Dr Jacobus H. Visser			
4.3.	Explain which systematic conservation planning and other biodiversity informants such as vegetation maps, NFEPA, NSBA etc. have been used and how has this influenced your proposed development.		

Vegetation map: A product of The Vegetation of South Africa, Lesotho and Swaziland (VEGMAP) (Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the VEGMAP (2018). These shapefiles were used. In addition, the National Web-based Environmental Screening Tool was applied to determine the Relative Plant Species Theme Sensitivity as is required of botanical specialists.

The 2018 Vegetation Map of South Africa classifies the main vegetation types found in the area as Garden Route Shale Fynbos. Due to its transformed state, Garden Shale Granite Fynbos is currently listed as Endangered in the Revised National List of Threatened Ecosystems (DEA, 2022). It has been transformed mainly for cultivation, pine plantations and urban development (Mucina, 2006).

The vegetation across the site, as described by M. Berry (Appendix G1):
Ecosystem threat status: Informed by (1) The National List of Threatened Terrestrial Ecosystems (Government Gazette, 2011), (2) The Western Cape State of Biodiversity 2017 Report (Turner, 2017), and (3) The National Biodiversity Assessment (2018) (SANBI, 2019).

According to The National List of Ecosystems that are Threatened and Need of Protection (Government Gazette, 2011), the **Biodiversity planning**: The 2017 Western Cape Biodiversity Spatial Plan (CapeNature, 2017) GIS (Geographical Information System) shapefiles for the George Municipality is important for determining the conservation importance of the designated habitat. Ground-truthing is an essential component in terms of determining the habitat condition.

Important species: The presence or absence of threatened (i.e., species of conservation concern) and ecologically important species informs the ecological condition and sensitivity of the site. The latest conservation status of species is checked in the Red List of South African Plants (Raimondo et al. 2009) (www.redlist.sanbi.org).

Site boundary: these and other resource layers were used to define the site boundary and to compile several maps. This information is available on the CapeFarmMapper website (Department of Agriculture: gis.elsenberg.com).

4.4.	Explain how the objectives and management guidelines of the Biodiversity Spatial Plan have been used and how has this influenced your proposed development.

According to the Terrestrial Faunal and Avifaunal Species Impact Assessment Report compiled by Dr Jacobus H. Visser (Appendix G3):

Overlap with Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs):
Because of their location in the Camfersdrift River drainage channel, a large number of the repair sites overlap with either terrestrial or aquatic CBA, with some of the sites overlapping a degraded ESA2 located to the east of the project footprint. Following the ground-truthing phase, it is clear that habitats within the study area are subject to high levels of daily disturbance and exist in a degraded state and in an urban setting. Notwithstanding the presence of a small subpopulation of *C. duthieae* therefore, the entire site may rather be classified as a degraded ESA2 which is defined as "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". Management objectives for such ESA2 include: "Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement". To this end, the repairs listed under the current project (especially the removal of alien and invasive vegetation) are in line with the suggested management objectives for this ESA2 category.

4.5.	Explain what impact the proposed development will have on the site specific features and/or function of the Biodiversity Spatial Plan category and how has this influenced the proposed development.

According to the Terrestrial Faunal and Avifaunal Species Impact Assessment Report compiled by Dr Jacobus H. Visser (Appendix G3):

The impact assessment for the receiving environment in the current study was performed for the provided layout alternative of flood damage repairs (Alternative 1) considering both the construction and operational phases of the development. The project footprints (i.e., repair areas) will be of a limited spatial extent and impacts will be of a localised and very short nature (less than a year), and will cease at the end of the construction phase. To this end, no mitigation will be required as impacts on the receiving environment will result in insignificant loss or deterioration of faunal biodiversity in the receiving environment. In the case of the current assessment therefore, the "No-Go" alternative was not considered, given the low number of negative impacts from Alternative 1, and the need to balance environmental outcomes with the need for upgrading infrastructure from a municipal perspective.

4.6.	If your proposed development is located in a protected area, explain how the proposed development is in line with the protected area management plan.
N/A	
4.7.	Explain how the presence of fauna on and adjacent to the proposed development has influenced your proposed development.

<u>According to the Terrestrial Faunal and Avifaunal Species Impact Assessment Report compiled by Dr Jacobus H. Visser (Appendix G3), the following observations were made during the field survey:</u>

Mammals:

Evidence of five mammal species were recovered within the study area, four of which are currently classified as "Least concern" and one, the Duthie's Golden Mole (*Chlorotalpa duthieae*) classified as "Vulnerable" by the IUCN, and therefore representing a mammal SCC. Three individuals of this species were observed, with one individual being present in the southern part of the project footprint within the Camfersdrift River drainage channel (i.e., within the Riverine habitat), and with two individuals being resident on the lawns within the northern section outside of the study area. The population size of this species appears highly restricted and extralimital, likely given the degraded nature of habitats on the site along with high levels of daily disturbance within this urban setting.

Other mammal species on the site constitute the abundant African Mole-rat (*Cryptomys hottentotus*) which also represents a burrowing species restricted to the lawn areas around the study area. Further evidence of the presence of single individuals of the Marsh Mongoose (*Atilax paludinosus*), Cape Grysbok (*Raphicerus melanotis*) and Four-striped Grass Mouse (*Rhabdomys pumilio*) was also noted. Taken together, the site appears depauperate of mammal diversity given the urban setting, high levels of daily disturbance and degraded habitat structure. Only burrowing species are abundant in this context as they are less-easily disturbed by these above-ground impacts.

Amphibians:

Two amphibian species were recorded within the study area, both of which are currently classified as "Least concern". The Clicking Stream Frog (*Strongylopus grayii*) is the most abundant amphibian species along the Camfersdrift River drainage channel, albeit occurring as single individuals instead of colonies, likely owing to the poor water quality here. A single individual of the Boettger's Dainty Frog (*Cacosternum boettgeri*) was also observed vocalising in the wetland habitat to the south of the project footprint.

Avifauna:

33 bird species were recorded within the study area, all of which are currently classified as "Least concern" by the IUCN. All avifauna on the site constitutes common vegetation associated species, with a number of birds utilizing the invasive Brambles vegetation in the drainage channel as suitable cover or as perching opportunities. A large number of bird species also utilize the large trees along the site (especially in the northern section) as perching opportunities.

Grasshoppers:

The presence of the Yellow-winged Agile Grasshopper was evaluated based on suitable habitat (recently burnt Schlerophyll on south-facing slopes) for this species - a habitat type which is not present on the site. To this end, suitable habitat for the Yellow-winged Agile Grasshopper is not present on the site, and it is highly unlikely that this species will occur here.

Faunal and avifaunal diversity within the study area:

Faunal and avifaunal diversity in the study area is largely comprised of relatively common species of "Least Concern" (IUCN, 2021), with the notable exception of a small subpopulation of *C. duthieae* which represents a mammal SCC. Given the urban setting, high levels of daily disturbance (through vibration from vehicles and people) and degraded habitat structure (significant signs of pollution and a high incidence of alien and invasive vegetation), highly mobile avifaunal species are the most abundant faunal group, given their ability to traverse this landscape. Conversely, terrestrial fauna appears scarce with only burrowing species being abundant given that their below-ground lifestyle buffers them from the above-ground impacts. Following from this impaired faunal diversity, the site harbours little in the way of intact predator-prey dynamics (as is evidenced by a general lack of mammal and avifaunal predators), with impaired ecosystem dynamics. Even so, the site does provide a green space in an urban setting and forms a semi-functional albeit degraded ecological link in the study area landscape.

Conservation status and on-site habitats of SCC in the study area:

The only SCC confirmed within the study area landscape pertains to the Duthie's Golden Mole of which a very small subpopulation is present. Only one individual was confirmed with the Riverine habitat of the site, with two individuals retrieved in the northern lawn area outside of the study area. Although the site does harbour the loamy soils and lawns (outside of the project footprint), the high

level of disturbances, degraded nature and urban setting of the site therefore appears to preclude high population numbers. Together with this, the localised spatial extent and short nature of the impacts from the proposed repairs will have a negligible effect on this species

5. Geographical Aspects

Explain whether any geographical aspects will be affected and how has this influenced the proposed activity or development.
The bed and banks of the Camfersdrift River will be disturbed and modified to protect the infrastructure and rehabilitate sections of the river that are eroding intensely

6. Heritage Resources

6.1.	Was a specialist study conducted?	YES	**NO**
6.2.	Provide the name and/or company who conducted the specialist study.		
6.3.	Explain how areas that contain sensitive heritage resources have influenced the proposed development.		

7. Historical and Cultural Aspects

Explain whether there are any culturally or historically significant elements as defined in Section 2 of the NHRA that will be affected and how has this influenced the proposed development.
Not Applicable

8. Socio/Economic Aspects

8.1.	Describe the existing social and economic characteristics of the community in the vicinity of the proposed site.
	The site is split between Ward 3 on the West of the Camfersdrift River and Ward 19 on the East of the Camfersdrift River. According to Census 2022 the George municipality has a population of 294 929 which is the highest population in the Garden Route District municipality.
8.2.	Explain the socio-economic value/contribution of the proposed development.
The estimated costs for the proposal is R18 million excluding VAT.	
8.3.	Explain what social initiatives will be implemented by applicant to address the needs of the community and to uplift the area.
This proposal is going to address the needs of the community by protecting vulnerable infrastructure and provide jobs to locals.	
8.4.	Explain whether the proposed development will impact on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place etc) and how has this influenced the proposed development.
Temporary construction related nuisances such as noise impacts and sections of the park will resemble a construction site until the work and rehabilitation is complete, these are however minor and temporary impacts.	

SECTION H: ALTERNATIVES, METHODOLOGY AND ASSESSMENT OF ALTERNATIVES

1. Details of the alternatives identified and considered

1.1.	Property and site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.
Provide a description of the preferred property and site site alternative.	
This proposal entails the flood repair activities to structures and sections of affected banks and beds of the Camfersdrift River located in the Van Riebeek Gardens and the Camphersdrift Areas. The main focus of the project runs along the Camphersdrift River, from north-east of Camphersdrift Street, down past Davidson and CJ Langenhoven Roads, to where the river runs parallel to Belmont Street. Please refer to Figures 47 to 68 for the locality of the sites.	
Provide a description of any other property and site alternatives investigated.	
No site alternatives	

Provide a motivation for the preferred property and site alternative including the outcome of the site selectin matrix.
Not applicable
Provide a full description of the process followed to reach the preferred alternative within the site.
Not applicable
Provide a detailed motivation if no property and site alternatives were considered.
This proposal is not for a new development but rather to address flood damaged infrastructure and sections of riverbed and banks, as such the proposal can not be undertaken on alternative sites.
List the positive and negative impacts that the property and site alternatives will have on the environment.
Not Applicable

1.2.	Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred activity alternative.
Not Applicable
Provide a description of any other activity alternatives investigated.
Not Applicable
Provide a motivation for the preferred activity alternative.
Not Applicable
Provide a detailed motivation if no activity alternatives exist.
This proposal is not for a new development but rather to address flood damaged infrastructure and sections of riverbed and banks.
List the positive and negative impacts that the activity alternatives will have on the environment.
Not Applicable

1.3.	Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts

Provide a description of the preferred design or layout alternative.

The general extent of the scope of works applicable to all areas include:

1. Refurbish / replace gabion structures;
2. Reinstatement of erosion protection structures;
3. Rehabilitation of eroded areas and implementation of erosion protection structures;
4. Stabilization of riverbanks and beds and implementation of erosion protection structures;
5. Reinstatement of retaining walls;
6. Reconstruction of stormwater pipes, outlets, headwalls and associated erosion protection;
7. Isolated reconstruction of road areas; and
8. Implementation of new gabion / retaining wall structures / erosion protection structures.

Since the abovementioned concept report, Lukhozi Consulting Engineers has compiled a Design Report (REPORT NO. 1760\02: REVISION NO. 0), dated 5 June 2024 and attached as Appendix J2.

Nine (9) sites requiring protection and construction works were identified during the detail design stage. The sites form scope of works for this proposal and are listed below:

Site 1

Figure 47: Location of Site 1

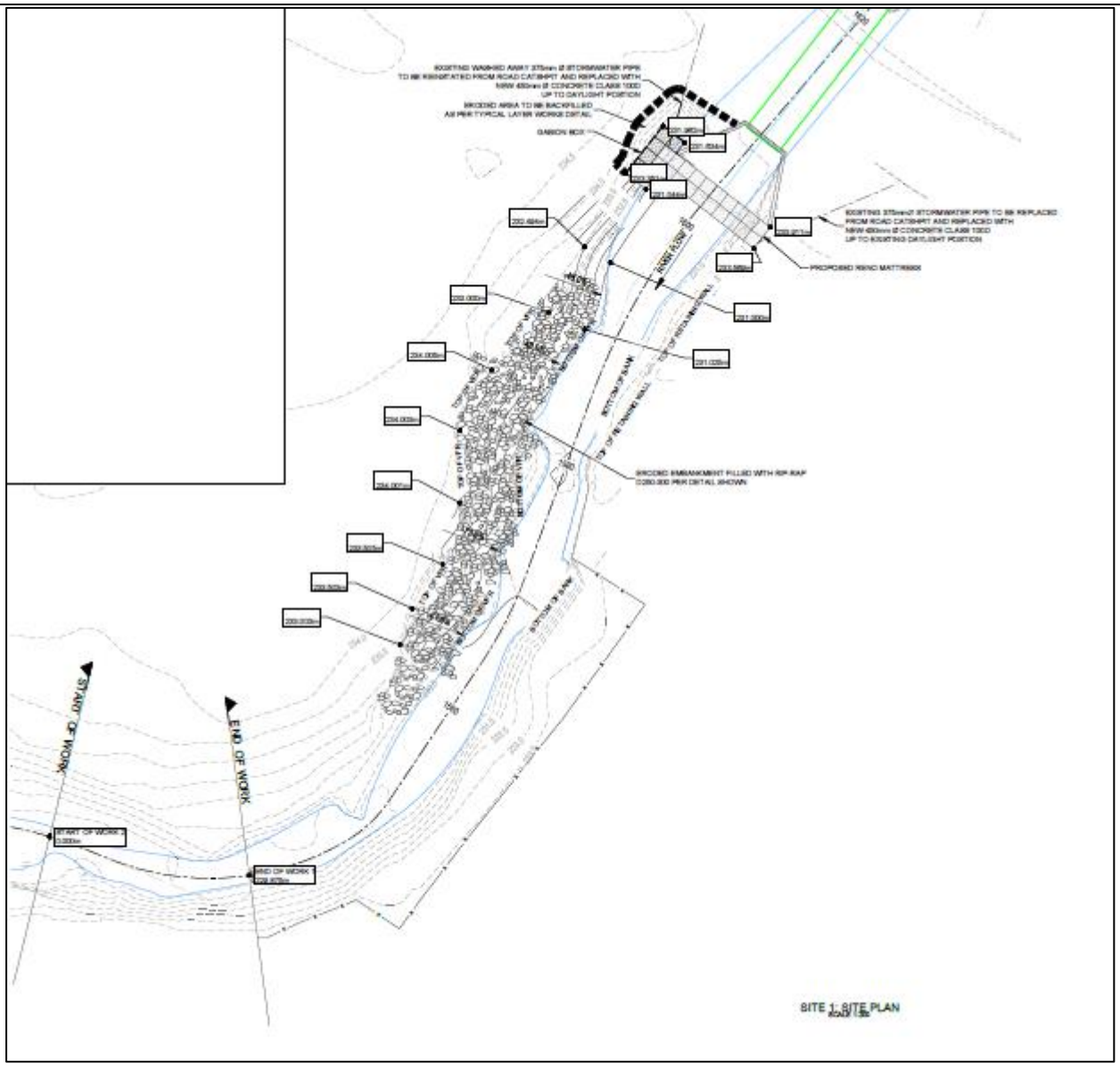

Figure 48: Site 1 site plan

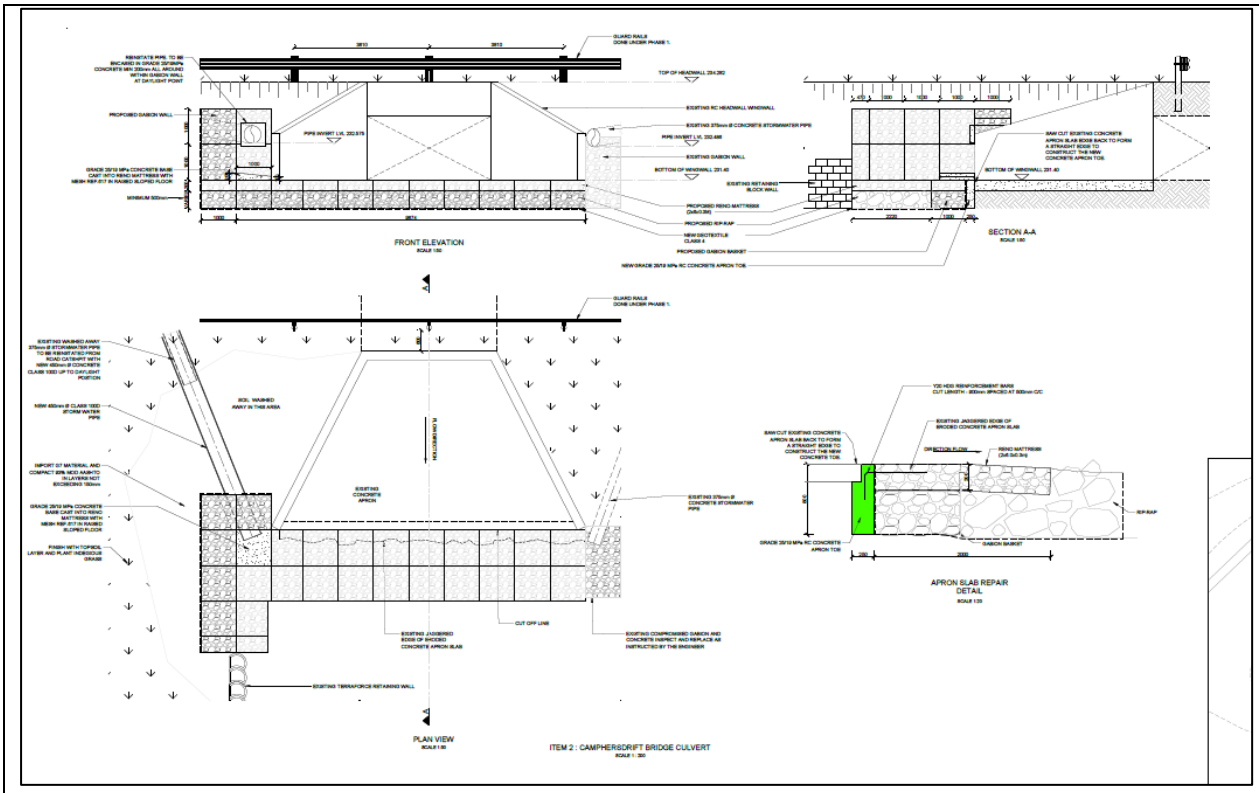

Figure 49: Site 1 site plan

Site 3

Figure 50: Location of Site 3

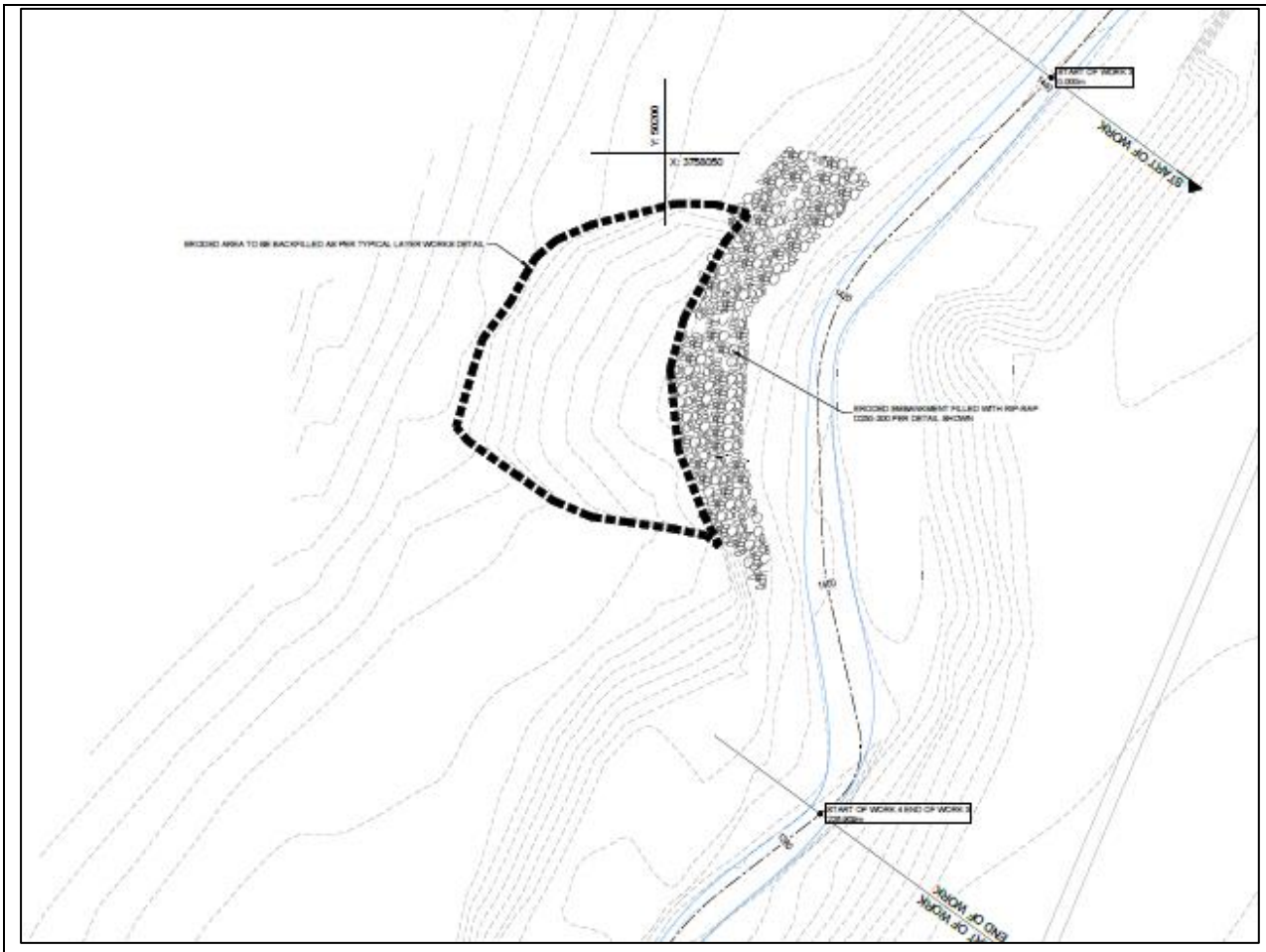

Figure 51: Site 3 Site Plan

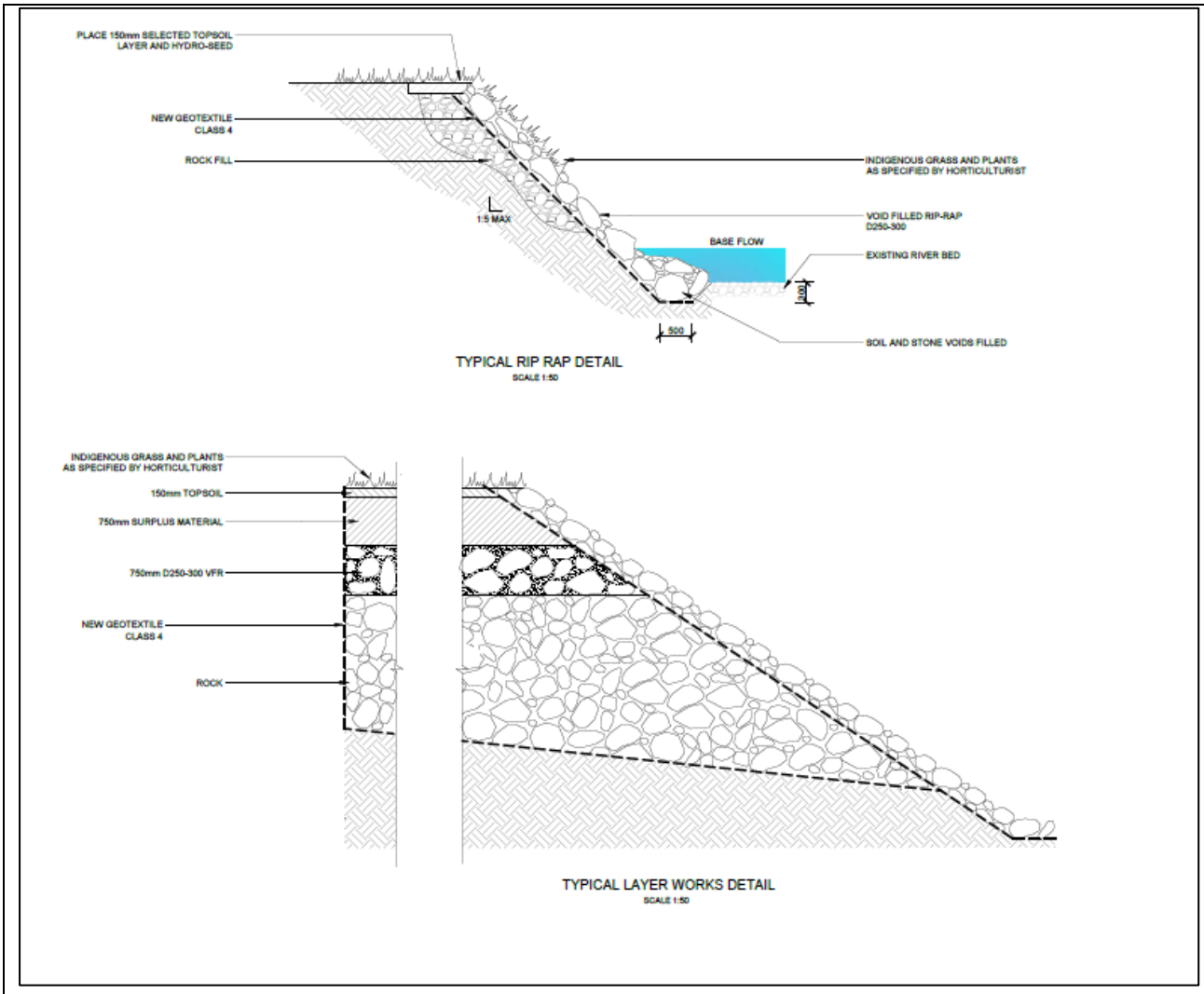

Figure 52: Site 3 site plan

Site 4

Figure 53: Location of Site 4

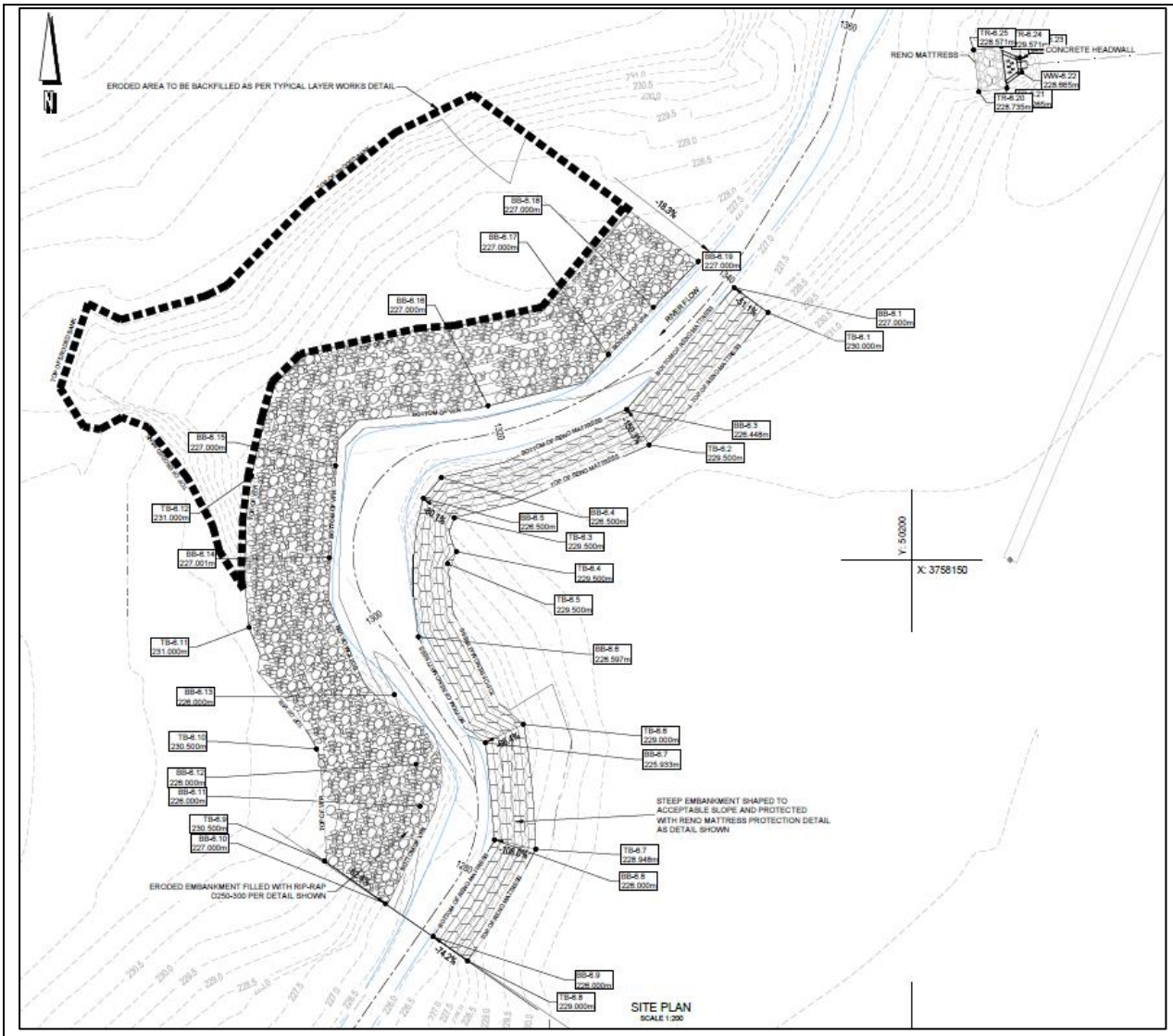

Figure 54: Site 4 site plan

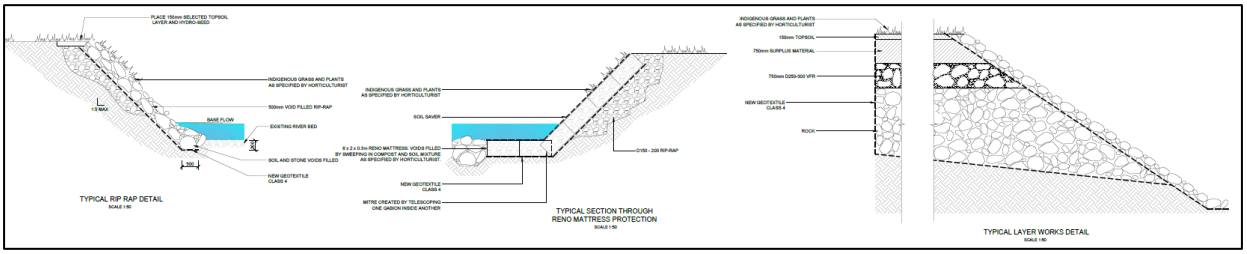

Figure 55: Site 4 site plan

Site 5

Figure 56: Location of Site 5

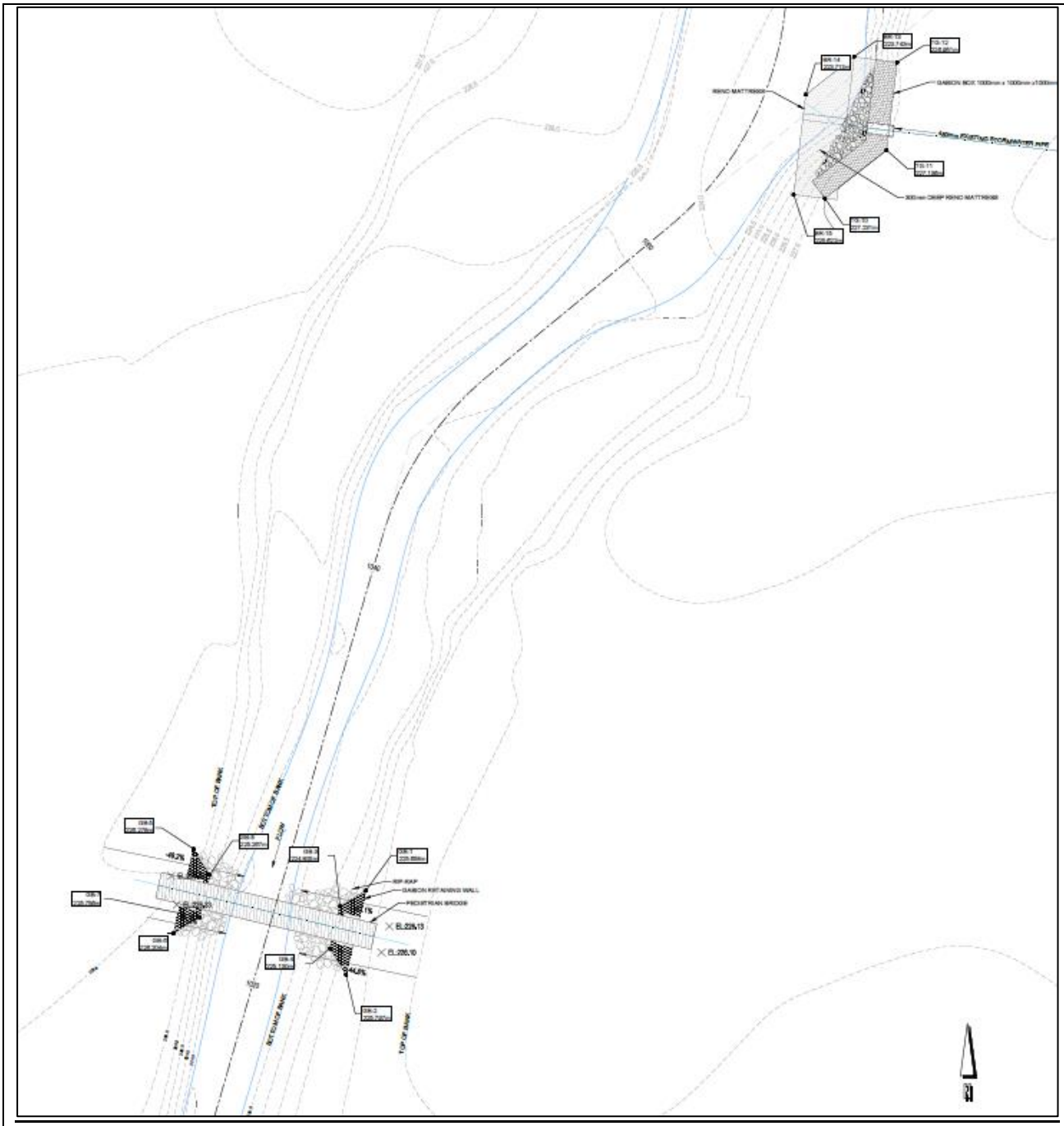

Figure 57: Site 5 site plan

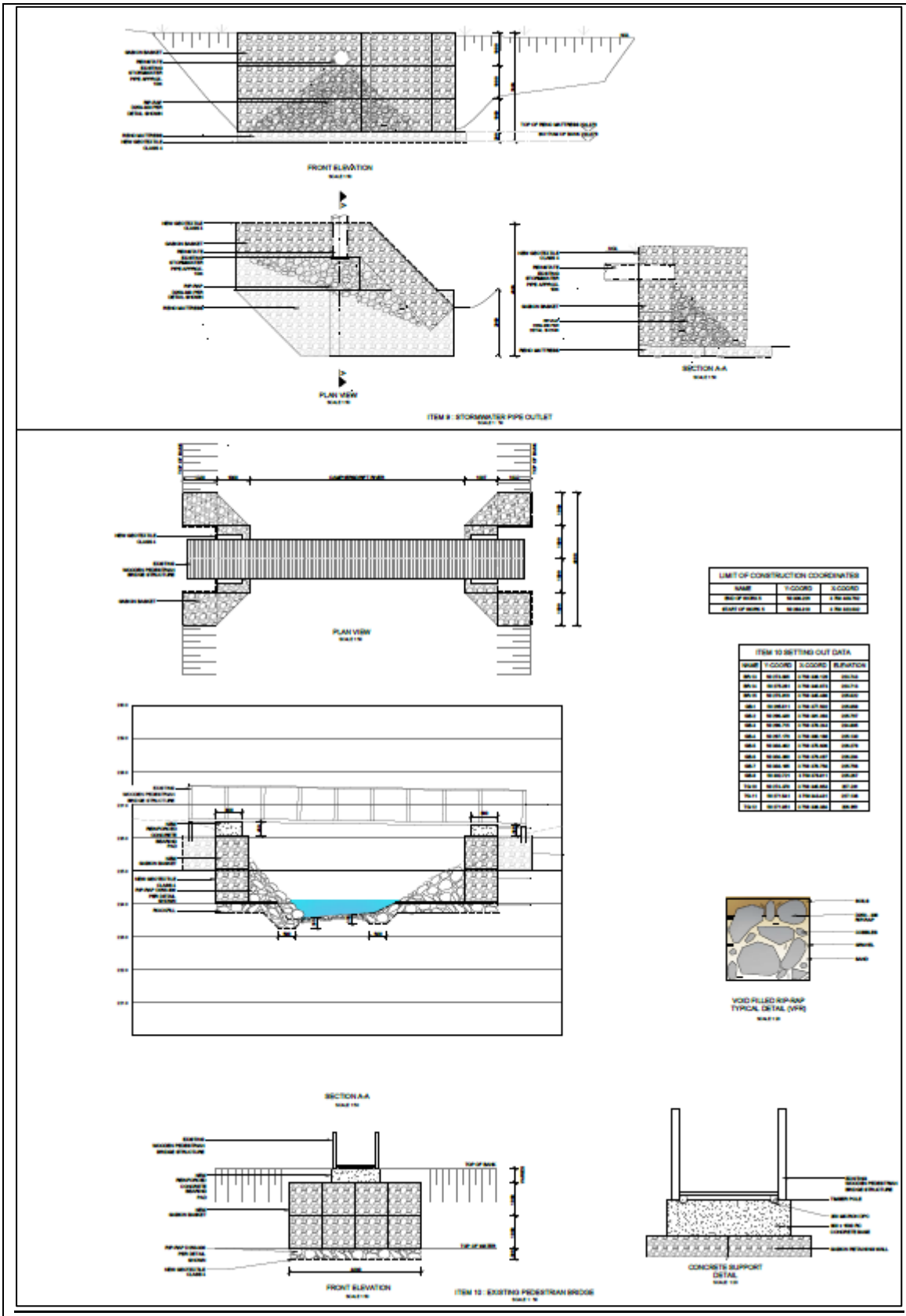

Figure 58: Site 5 site plan

Site 6

Figure 59: Location of Site 6

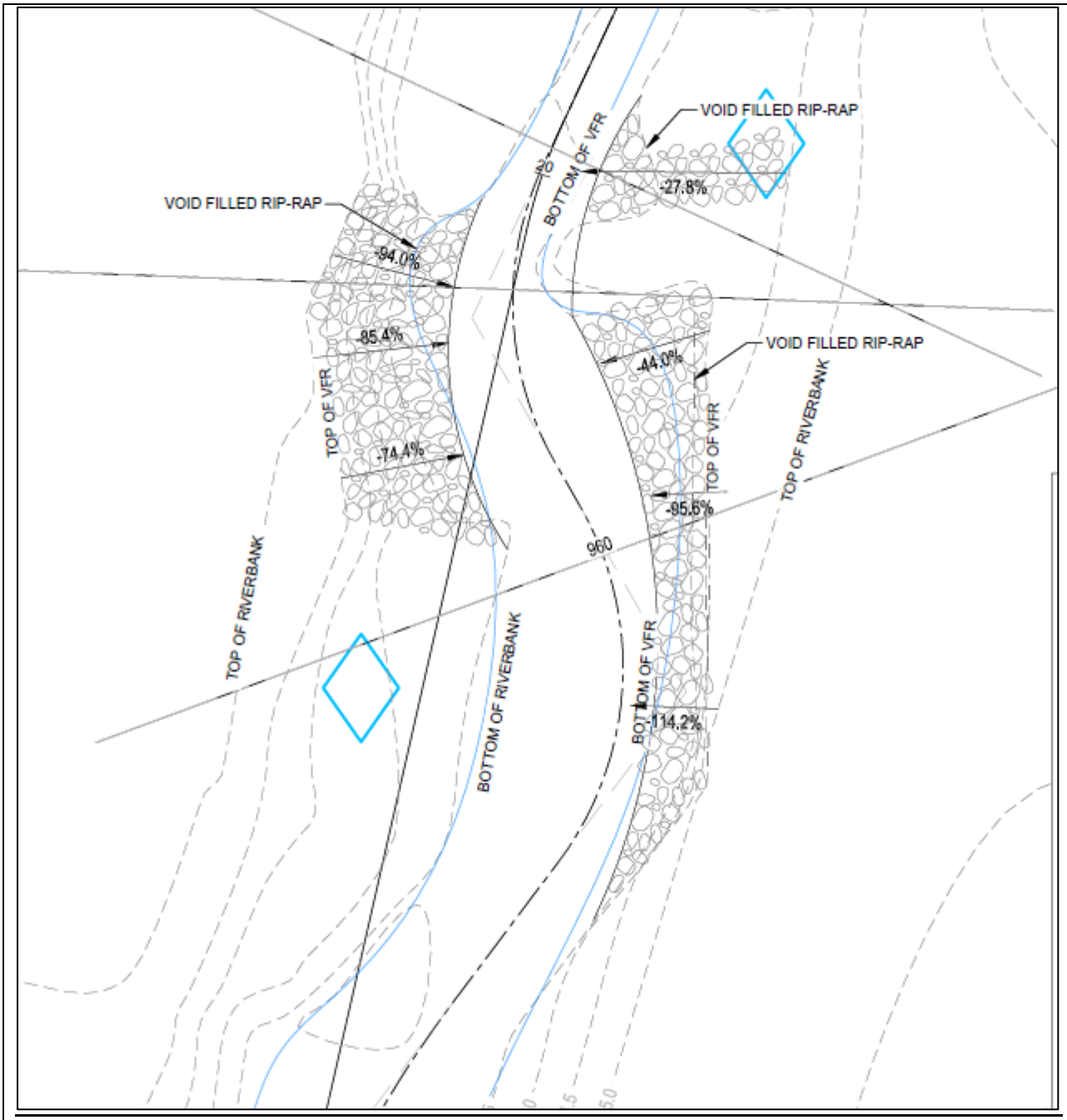

Figure 60: Site 6 site plan

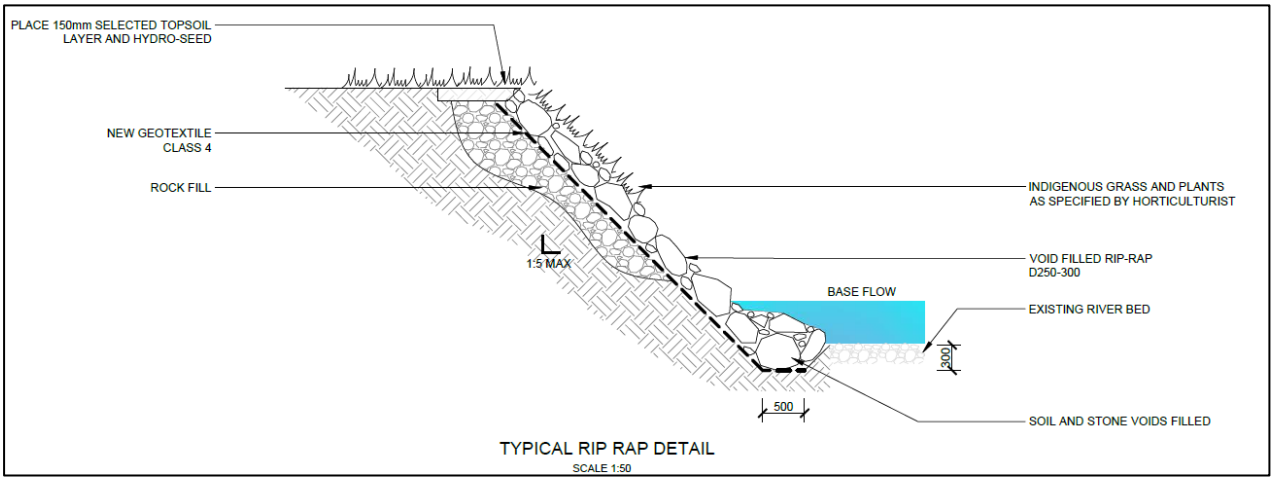

Figure 61: site 6 site plan

Site 7

Figure 62: Location of Site 7

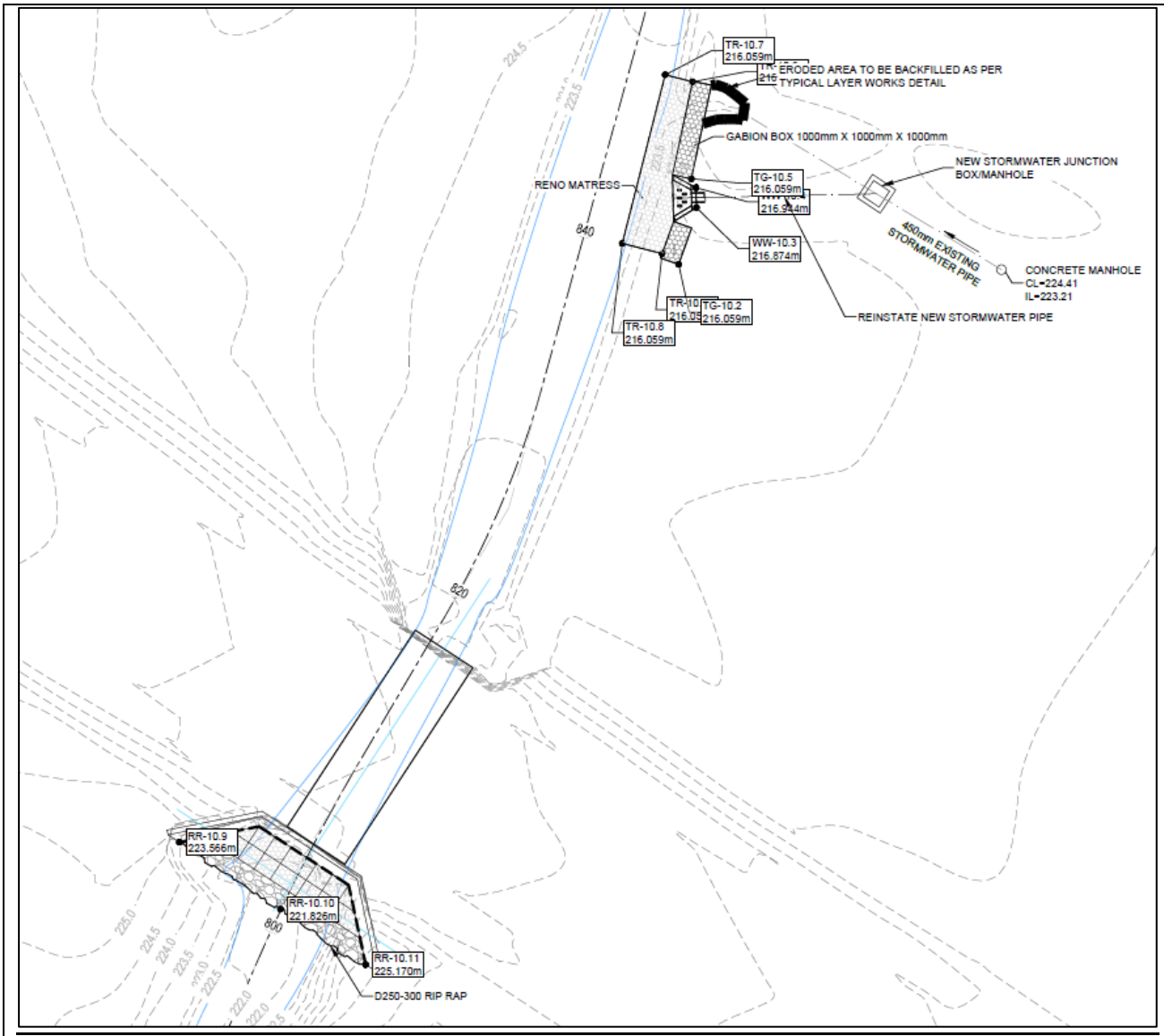

Figure 63: Site 7 site plan

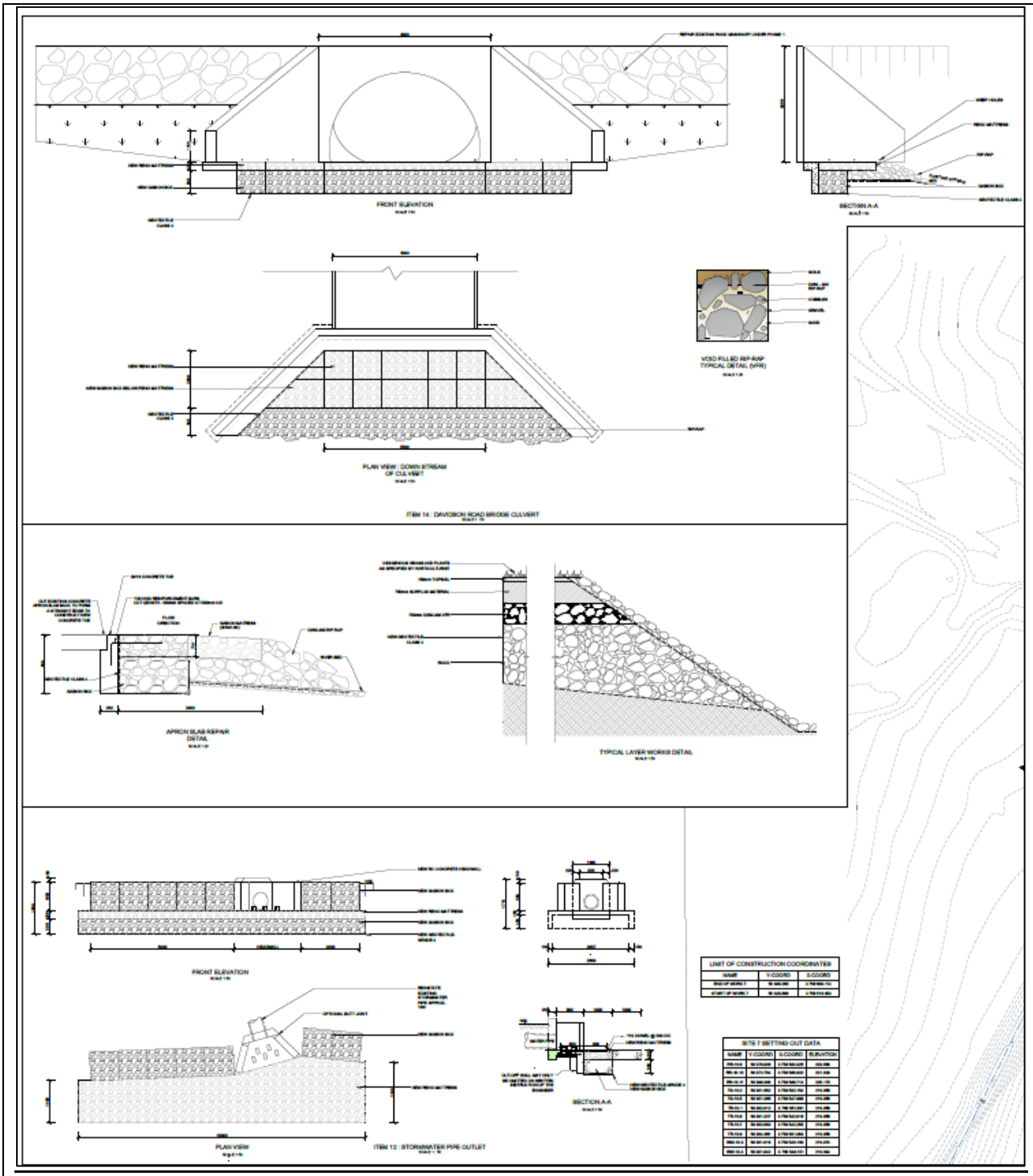

Figure 64: site 7 site plan

Site 8

Figure 65: Location of Site 8

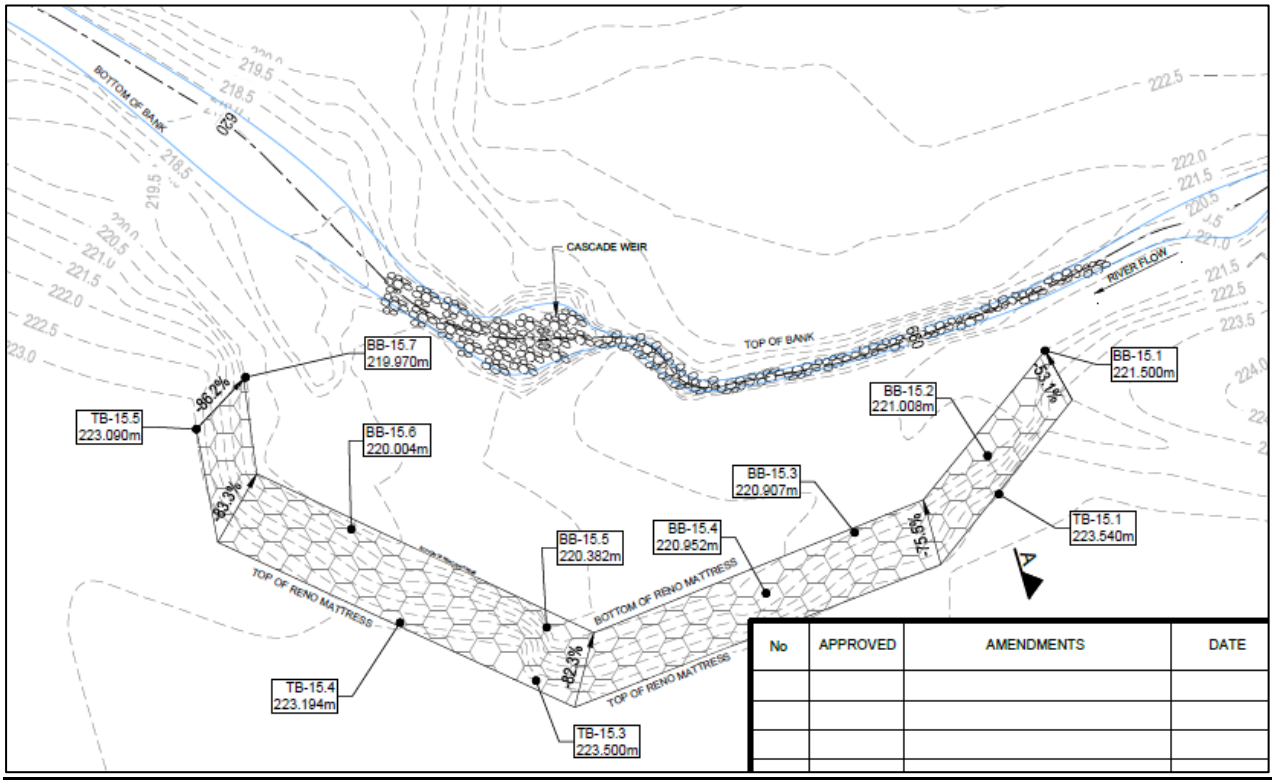

Figure 66: Site 8 site plan

Site 9

Figure 67: Location of Site 9

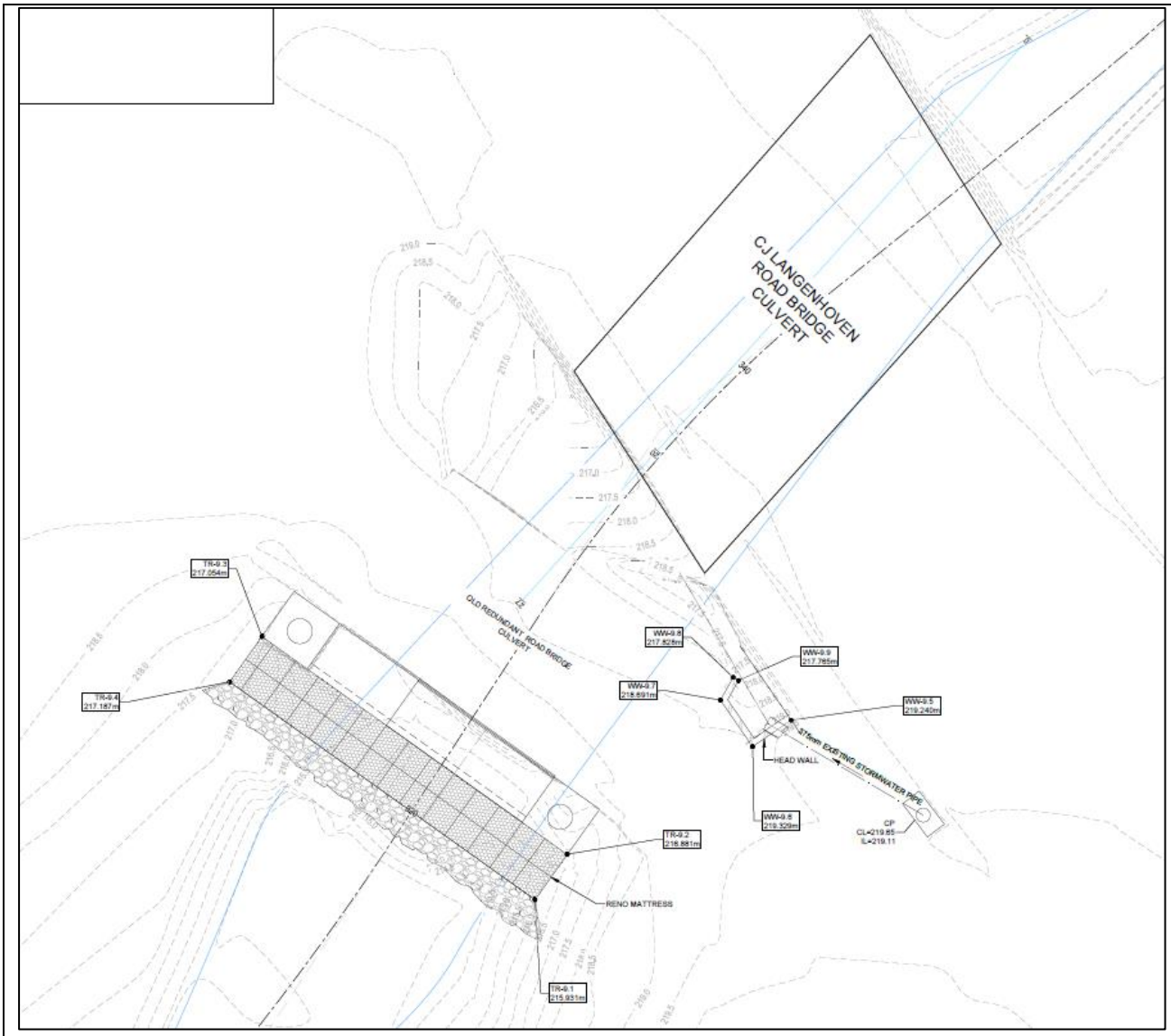

Figure 68: Site 9 site plan

Provide a description of any other design or layout alternatives investigated.
Soft structures and other forms of river rehabilitation measures were considered in the initial phase of the project however the funding obtained is to address flood damage and as such the proposal has to also align with the purpose of the funding. Additionally, there is not much space around many of the sections under investigation and as such softer measures which require larger/wider footprints are not suited to the proposal.
Provide a motivation for the preferred design or layout alternative.
The designs were compiled by the Engineer in conjunction with feedback from the Freshwater Specialist and EAP. The proposed measures are therefore the most appropriate measures for achieving the goal within the budget constraints.
Provide a detailed motivation if no design or layout alternatives exist.
More than one of the design approaches will be implemented at each site as appropriate for each affect site.
List the positive and negative impacts that the design alternatives will have on the environment.
Positive • Protect municipal infrastructure • Infill and protect riverbank erosion within a public park • Greatest use of allocated flood repair budget **Negative** • Temporary inconvenience for those that frequent the park

• Temporary disturbances to the biophysical environment	
1.4.	Technology alternatives (e.g., to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.
Provide a description of the preferred technology alternative:	
Refer to the designs alternative, the various designs and approaches to be implemented at each site are also regarded as different forms of technology	
Provide a description of any other technology alternatives investigated.	
Not Applicable, refer to designs alternatives	
Provide a motivation for the preferred technology alternative.	
Not Applicable, refer to designs alternatives	
Provide a detailed motivation if no alternatives exist.	
Not Applicable, refer to designs alternatives	
List the positive and negative impacts that the technology alternatives will have on the environment.	
Not Applicable, refer to designs alternatives	
1.5.	Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.
Provide a description of the preferred operational alternative.	
Not Applicable, refer to designs alternatives	
Provide a description of any other operational alternatives investigated.	
Not Applicable, refer to designs alternatives	
Provide a motivation for the preferred operational alternative.	
Not Applicable, refer to designs alternatives	
Provide a detailed motivation if no alternatives exist.	
Not Applicable, refer to designs alternatives	
List the positive and negative impacts that the operational alternatives will have on the environment.	
Not Applicable, refer to designs alternatives	
1.6.	The option of not implementing the activity (the 'No-Go' Option).
Provide an explanation as to why the 'No-Go' Option is not preferred.	
Not Applicable, refer to designs alternatives	
1.7.	Provide and explanation as to whether any other alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist.
Not Applicable, refer to designs alternatives	
1.8.	Provide a concluding statement indicating the preferred alternatives, including the preferred location of the activity.
Not Applicable, refer to designs alternatives	

2. "No-Go" areas

Explain what "no-go" area(s) have been identified during identification of the alternatives and provide the co-ordinates of the "no-go" area(s).
The Camfersdrift River is the most sensitive aspect of the sites, as the proposed activities are proposed to be undertaken on the bed and banks of the river it is impossible to avoid this area. As such the proposed No-Go areas will be the extent of the Camfersdrift river and its riparian zone which will not form part of the proposed sites (and a reasonable and safe working area around the sites).

3. Methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives.

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.
The assessment criteria utilised in this environmental impact assessment is based on, and adapted from, the Guideline on Impact Significance, Integrated Environmental Management Information Series 5 (Department of Environmental Affairs and Tourism (DEAT), 2002) and the Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations (DEAT, 2006).

Determination of Extent (Scale):

Site specific	On site or within 100 m of the site boundary, but not beyond the property boundaries.
Local	The impacted area includes the whole or a measurable portion of the site and property, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g., neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 8 months after the completion of the construction phase.
Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated in a period shorter than 3 years after the completion of construction activities.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures
Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible, and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible, and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

Determination of Consequence significance:

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences

4. Assessment of each impact and risk identified for each alternative

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

Alternative:	
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	IMPACT ON TERRESTRIAL BIODIVERSITY • Temporary loss of riparian vegetation and Garden Route Shale Fynbos. • Impairment of the biodiversity network. Impact on ecosystem functioning. Impact will be temporary.
Nature of impact:	Negative
Extent and duration of impact:	Local and medium term
Consequence of impact or risk:	Impairment of the biodiversity network. Impact on ecosystem functioning
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	High
Indirect impacts:	Disturbed areas become vulnerable to alien species establishment
Cumulative impact prior to mitigation:	The cumulative botanical impact of the project is expected to be equivalent to the impact on terrestrial biodiversity described above, i.e. the continued degradation of Garden Route Shale Fynbos and impairment of the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact should be negligible with mitigation. There should be no net loss if the disturbed areas are rehabilitated, and all the areas cleared of vegetation restored. The clearing of aliens along the degraded sections of the Camfersdrift River should be a positive impact as it will provide an opportunity for the establishment of indigenous growth.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium-low
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	• During the construction phase, fence off the construction areas. Restrict all construction activities, such as stockpiling, parking and cement mixing, to transformed areas away from the riparian and fynbos areas. The contractor(s) must be made aware of the sensitive surroundings. The riparian areas outside the footprints must be declared 'no-go' areas and not be disturbed in any way. • Pollutant substances brought onto site must be properly contained. Cement/concrete mixing must be contained on impervious and bunded surfaces. No cement mixing is allowed inside the riparian and fynbos areas. Cement water is highly alkaline and considered toxic.
Residual impacts:	The disturbed areas will be vulnerable to alien infestation while the areas are recovering
Cumulative impact post mitigation:	The cumulative botanical impact of the project is expected to be equivalent to the impact on terrestrial biodiversity described above, i.e. the continued degradation of Garden Route Shale Fynbos and impairment of

	the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact should be negligible with mitigation. There should be no net loss if the disturbed areas are rehabilitated, and all the areas cleared of vegetation restored. The clearing of aliens along the degraded sections of the Camfersdrift River should be a positive impact as it will provide an opportunity for the establishment of indigenous growth.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	IMPACT ON TERRESTRIAL BIODIVERSITY • Increased opportunity for alien infestation. • Erosion of the riverbanks due to poor rehabilitation and maintenance efforts.
Nature of impact:	Negative
Extent and duration of impact:	Local and Long Term
Consequence of impact or risk:	• Increased opportunity for alien infestation. • Erosion of the riverbanks due to poor rehabilitation and maintenance efforts.
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	High
Indirect impacts:	Disturbed areas become vulnerable to alien species establishment
Cumulative impact prior to mitigation:	The cumulative botanical impact of the project is expected to be equivalent to the impact on terrestrial biodiversity described above, i.e. the continued degradation of Garden Route Shale Fynbos and impairment of the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact should be negligible with mitigation. There should be no net loss if the disturbed areas are rehabilitated, and all the areas cleared of vegetation restored. The clearing of aliens along the degraded sections of the Camfersdrift River should be a positive impact as it will provide an opportunity for the establishment of indigenous growth.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium-Low
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	• Where needed, rehabilitate the disturbed surfaces after construction. Erosion prevention measures may be needed on steep riverbanks, such as logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous grass seed may also be needed. • Engage in alien clearing, focussing on invasive species such as black wattle, blackwood, gums and pines. These species are category 2 and 1b invaders that require compulsory control as part of an

	invasive species control programme. Their control will become a medium- to long-term maintenance requirement. • Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. It is recommended that a strip of at least 10 m wide around the construction areas also be monitored for aliens during the maintenance period.
Residual impacts:	The disturbed areas will be vulnerable to alien infestation while the areas are recovering
Cumulative impact post mitigation:	The cumulative botanical impact of the project is expected to be equivalent to the impact on terrestrial biodiversity described above, i.e. the continued degradation of Garden Route Shale Fynbos and impairment of the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact should be negligible with mitigation. There should be no net loss if the disturbed areas are rehabilitated, and all the areas cleared of vegetation restored. The clearing of aliens along the degraded sections of the Camfersdrift River should be a positive impact as it will provide an opportunity for the establishment of indigenous growth.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low

Alternative:	
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Direct mortality of fauna; Vibration and noise**
Nature of impact:	Negative
Extent and duration of impact:	These impacts will be site specific and largely restricted to the proposed repair areas. These impacts will also be temporary, and will cease at the end of the construction phase.
Consequence of impact or risk:	Negligible - The impact would result in negligible to no consequences
Probability of occurrence:	The possibility of the impact occurring is very low, as it will be restricted to the proposed repair areas and should not overly impinge on adjacent areas.
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource - These impacts will result in marginal loss of resources (a very small impacted area and possible destruction of single individuals of species).
Degree to which the impact can be reversed:	Completely Reversible - These impacts are reversible and will cease at the end of the construction phase.
Indirect impacts:	None identified.
Cumulative impact prior to mitigation:	Negligible - The impact would result in negligible to no cumulative effects.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	No significance - The impact is not substantial and does not require any mitigation action.
Degree to which the impact can be avoided:	N/A
Degree to which the impact can be managed:	N/A
Degree to which the impact can be mitigated:	High - Given that the proposed footprint is already relatively small, these impacts should not be severe or to the detriment of the study area landscape.
Proposed mitigation:	Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct

	mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint, but under no circumstance to an area further away. Vibration and noise through machinery, vehicles and people are unavoidable during the construction and no mitigation measures are suggested.
Residual impacts:	None identified.
Cumulative impact post mitigation:	None identified.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	No significance - The impact is not substantial and does not require any mitigation action.
OPERATIONAL PHASE	
Potential impact and risk:	None identified.
Nature of impact:	No impacts are expected during the operational phase, other than the existing impacts in the environment.
Extent and duration of impact:	None identified.
Consequence of impact or risk:	Negligible
Probability of occurrence:	Improbable
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource
Degree to which the impact can be reversed:	Completely Reversible
Indirect impacts:	None identified.
Cumulative impact prior to mitigation:	Negligible
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	No significance
Degree to which the impact can be avoided:	N/A
Degree to which the impact can be managed:	N/A
Degree to which the impact can be mitigated:	N/A
Proposed mitigation:	None identified.
Residual impacts:	None identified.
Cumulative impact post mitigation:	None identified.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	No significance

Alternative:	
Construction and Operational Phase	
Potential impact and risk:	**Disturbance of aquatic habitat and biota** • Clearance of vegetation, earthworks on the riverbanks, habitat modification, and further invasive alien plant infestation. • Direct physical destruction or disturbance which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.
Nature of impact:	Negative
Extent and duration of impact:	Site specific and medium term
Consequence of impact or risk:	further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.
Probability of occurrence:	Probable

Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	High
Indirect impacts:	further invasive alien plant infestation.
Cumulative impact prior to mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	• Final designs and method statements should be approved by the aquatic ecologist, together with the river engineer, prior to the commencement of construction. • Objectives should be to halt bed incision and bank erosion from hydrological changes by improving culvert outlet designs to reduce scour, flow velocity and flow confinement and installing grade control structures to halt channel incision and upstream bank erosion due to confined flow, trap sediment, and achieve a more natural longitudinal profile. To allow, where possible, for the river channel to migrate laterally and maintain sinuosity in the valley floor. To slope and revegetate eroded banks as gently as possible, with the least amount of hard infrastructure, to reflect the channel morphology prior to downward incision and subsequent erosion. • Interventions/ hard infrastructure must be set as far back from the channel as possible, including stormwater outlets. • Steep channel banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity.

	• Do not compromise on the extent of erosion control below culvert and pipe outlets. Where possible, install check dams/ low weirs to slow flow and widen channel. • Where infrastructure is not at risk, to allow for natural bank collapse and reshaping, whilst the grade control structures prevent further erosion. • Use locally indigenous vegetation to revegetate disturbed river areas, whether from search and rescue, propagation, plugs, or purchased. • Allow for a riverbed with diversity of types, reflecting riffles and pools, as opposed to creating a plane bed. Widen and raise the channel where possible. • Bank stabilisation structures must attempt to reflect the natural bends of the river without straightening or narrowing the channel. • Structures must be kept largely inside the space that used to be occupied by the river bank prior to its washing away, i.e. the structures are kept within the footprint as well as the level to which the bank existed, so as to not present more of a resistance to flow than what the previous bank did. • A construction method statement must be compiled and available on site. • The edges of the construction footprint must be clearly staked-out and demarcated prior to construction commencing. • The contractor or ECO must educate all staff undertaking the work on the best practice methods and environmentally sensitive areas (general do's and don'ts). • The specific boundaries of areas to be excavated and recontoured etc. must be clearly demarcated. • Use the smallest possible working corridor. Outside the working corridor, all areas are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. The edges of the construction / rehabilitation zone within the vicinity of the riparian habitat must be clearly staked-out and demarcated using highly visible material (e.g. poles 5m apart) prior to construction commencing. • The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. The cross sectional profile of the bed and banks must be restored as far as possible. • Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils. • Access to and from the area should be either via existing roads or transformed land. • During construction, it is important to stabilise any steep, bare areas on the slope and riverbanks via geotextiles and/or revegetation. • It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal

	of these species shall be undertaken in a way which infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer daily. • Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using covers, silt fences, sandbags, etc. Effective stormwater management must include effective stabilisation of exposed soil. • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable. • Construction must have contingency plans for high rainfall events during construction. • The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat. • Any potential pipeline leaks should be investigated as moisture content of the bank increases the likelihood of mass failure by increasing the weight of the soil mass and decreasing soil strength. This coupled with lateral interflow during floods will create destabilising forces. It is possible that the location of the pipeline has contributed to the extent of erosion in that upper right bank location as the substrate of the bank/ slope will have been altered for installation and altered moisture content in the soil profile. It is worth investigating other factors such as this which contributed to the bank failure in this site, not only the scour from deflected flood water. • A monitoring programme must be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts. • It is recommended that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including further channel and bank grade control interventions. Should this additional support be implemented successfully then there will be positive impacts. This can be compiled in the form of a river rehabilitation plan with engineering input. It can include the grade control structures to raise the incised channel and the rehabilitation of the wetland upstream of the urban area to attenuate flood waters. • It is also important to note that bank stabilisation is a reactive measure to treat only a symptom of flood damage, and further actions focussing on addressing the causes should be investigated. For example, improving the stormwater system and culvert/pipe outlets (incorporating the principles of Sustainable Drainage

	Systems) to decrease the volume and slow the velocity of surface runoff entering the system during floods. • Enhancing the aquatic buffer zone surrounding the river channel will reduce bank erosion. The are areas where cut lawn extends right up to the banks and it is recommended that, where possible, a buffer strip be adopted with higher surface roughness.
Residual impacts:	Temporary disturbance to aquatic habitat
Cumulative impact post mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium

Construction and Operational Phase	
Potential impact and risk:	**Hydrodynamic changes causing sedimentation and erosion.** • Vegetation clearing, earthworks, and exposure of bare soils within and upslope of the aquatic habitat. Hard infrastructure resulting in scour. • The alteration in the physical characteristics of the rivers as a result modified hydraulics causing erosion and sediment deposition, as well as instability and collapse of unstable soils during project operation. These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.
Nature of impact:	Negative
Extent and duration of impact:	Local and Long term
Consequence of impact or risk:	These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.
Probability of occurrence:	Probable
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	High
Indirect impacts:	These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.
Cumulative impact prior to mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal

	systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	• Final designs and method statements should be approved by the aquatic ecologist, together with the river engineer, prior to the commencement of construction. • Objectives should be to halt bed incision and bank erosion from hydrological changes by improving culvert outlet designs to reduce scour, flow velocity and flow confinement and installing grade control structures to halt channel incision and upstream bank erosion due to confined flow, trap sediment, and achieve a more natural longitudinal profile. To allow, where possible, for the river channel to migrate laterally and maintain sinuosity in the valley floor. To slope and revegetate eroded banks as gently as possible, with the least amount of hard infrastructure, to reflect the channel morphology prior to downward incision and subsequent erosion. • Interventions/ hard infrastructure must be set as far back from the channel as possible, including stormwater outlets. • Steep channel banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity. • Do not compromise on the extent of erosion control below culvert and pipe outlets. Where possible, install check dams/ low weirs to slow flow and widen channel. • Where infrastructure is not at risk, to allow for natural bank collapse and reshaping, whilst the grade control structures prevent further erosion. • Use locally indigenous vegetation to revegetate disturbed river areas, whether from search and rescue, propagation, plugs, or purchased.

	• Allow for a riverbed with diversity of types, reflecting riffles and pools, as opposed to creating a plane bed. Widen and raise the channel where possible. • Bank stabilisation structures must attempt to reflect the natural bends of the river without straightening or narrowing the channel. • Structures must be kept largely inside the space that used to be occupied by the river bank prior to its washing away, i.e. the structures are kept within the footprint as well as the level to which the bank existed, so as to not present more of a resistance to flow than what the previous bank did. • A construction method statement must be compiled and available on site. • The edges of the construction footprint must be clearly staked-out and demarcated prior to construction commencing. • The contractor or ECO must educate all staff undertaking the work on the best practice methods and environmentally sensitive areas (general do's and don'ts). • The specific boundaries of areas to be excavated and recontoured etc. must be clearly demarcated. • Use the smallest possible working corridor. Outside the working corridor, all areas are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. The edges of the construction / rehabilitation zone within the vicinity of the riparian habitat must be clearly staked-out and demarcated using highly visible material (e.g. poles 5m apart) prior to construction commencing. • The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. The cross sectional profile of the bed and banks must be restored as far as possible. • Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils. • Access to and from the area should be either via existing roads or transformed land. • During construction, it is important to stabilise any steep, bare areas on the slope and river banks via geotextiles and/or revegetation. • It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer daily. • Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the

	elements must include measures to protect against erosion using covers, silt fences, sandbags, etc. Effective stormwater management must include effective stabilisation of exposed soil. • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable. • Construction must have contingency plans for high rainfall events during construction. • The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat. • Any potential pipeline leaks should be investigated as moisture content of the bank increases the likelihood of mass failure by increasing the weight of the soil mass and decreasing soil strength. This coupled with lateral interflow during floods will create destabilising forces. It is possible that the location of the pipeline has contributed to the extent of erosion in that upper right bank location as the substrate of the bank/ slope will have been altered for installation and altered moisture content in the soil profile. It is worth investigating other factors such as this which contributed to the bank failure in this site, not only the scour from deflected flood water. • A monitoring programme must be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts. • It is recommended that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including further channel and bank grade control interventions. Should this additional support be implemented successfully then there will be positive impacts. This can be compiled in the form of a river rehabilitation plan with engineering input. It can include the grade control structures to raise the incised channel and the rehabilitation of the wetland upstream of the urban area to attenuate flood waters. • It is also important to note that bank stabilisation is a reactive measure to treat only a symptom of flood damage, and further actions focussing on addressing the causes should be investigated. For example, improving the stormwater system and culvert/pipe outlets (incorporating the principles of Sustainable Drainage Systems) to decrease the volume and slow the velocity of surface runoff entering the system during floods. • Enhancing the aquatic buffer zone surrounding the river channel will reduce bank erosion. The are areas where cut lawn extends right up to the banks and it is recommended that, where possible, a buffer strip be adopted with higher surface roughness.
Residual impacts:	Temporary disturbance to aquatic habitat
Cumulative impact post mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal

	systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium

Alternative:	
Construction and Operational Phase	
Potential impact and risk:	**Changes to surface water quality** • During construction there are a number of potential pollution inputs into the aquatic systems (such as hydrocarbons and raw cement). • Water and/or soil pollution cause negative changes in the physical, chemical and biological characteristics of water resources (i.e. water quality). This can result in possible deterioration in aquatic ecosystem integrity and a reduction in species.
Nature of impact:	Negative
Extent and duration of impact:	Site specific and short term
Consequence of impact or risk:	This can result in possible deterioration in aquatic ecosystem integrity and a reduction in species.
Probability of occurrence:	Low Probablity
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	High
Indirect impacts:	This can result in possible deterioration in aquatic ecosystem integrity and a reduction in species.
Cumulative impact prior to mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary

	that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Moderate
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	• Final designs and method statements should be approved by the aquatic ecologist, together with the river engineer, prior to the commencement of construction. • Objectives should be to halt bed incision and bank erosion from hydrological changes by improving culvert outlet designs to reduce scour, flow velocity and flow confinement and installing grade control structures to halt channel incision and upstream bank erosion due to confined flow, trap sediment, and achieve a more natural longitudinal profile. To allow, where possible, for the river channel to migrate laterally and maintain sinuosity in the valley floor. To slope and revegetate eroded banks as gently as possible, with the least amount of hard infrastructure, to reflect the channel morphology prior to downward incision and subsequent erosion. • Interventions/ hard infrastructure must be set as far back from the channel as possible, including stormwater outlets. • Steep channel banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity. • Do not compromise on the extent of erosion control below culvert and pipe outlets. Where possible, install check dams/ low weirs to slow flow and widen channel. • Where infrastructure is not at risk, to allow for natural bank collapse and reshaping, whilst the grade control structures prevent further erosion. • Use locally indigenous vegetation to revegetate disturbed river areas, whether from search and rescue, propagation, plugs, or purchased. • Allow for a riverbed with diversity of types, reflecting riffles and pools, as opposed to creating a plane bed. Widen and raise the channel where possible. • Bank stabilisation structures must attempt to reflect the natural bends of the river without straightening or narrowing the channel. • Structures must be kept largely inside the space that used to be occupied by the river bank prior to its washing away, i.e. the structures are kept within the footprint as well as the level to which the bank existed, so as to not present more of a resistance to flow than what the previous bank did. • A construction method statement must be compiled and available on site.

	• The edges of the construction footprint must be clearly staked-out and demarcated prior to construction commencing. • The contractor or ECO must educate all staff undertaking the work on the best practice methods and environmentally sensitive areas (general do's and don'ts). • The specific boundaries of areas to be excavated and recontoured etc. must be clearly demarcated. • Use the smallest possible working corridor. Outside the working corridor, all areas are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. The edges of the construction / rehabilitation zone within the vicinity of the riparian habitat must be clearly staked-out and demarcated using highly visible material (e.g. poles 5m apart) prior to construction commencing. • The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. The cross sectional profile of the bed and banks must be restored as far as possible. • Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils. • Access to and from the area should be either via existing roads or transformed land. • During construction, it is important to stabilise any steep, bare areas on the slope and river banks via geotextiles and/or revegetation. • It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer daily. • Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using covers, silt fences, sandbags, etc. Effective stormwater management must include effective stabilisation of exposed soil. • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable. • Construction must have contingency plans for high rainfall events during construction. • The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat.

	• Any potential pipeline leaks should be investigated as moisture content of the bank increases the likelihood of mass failure by increasing the weight of the soil mass and decreasing soil strength. This coupled with lateral interflow during floods will create destabilising forces. It is possible that the location of the pipeline has contributed to the extent of erosion in that upper right bank location as the substrate of the bank/ slope will have been altered for installation and altered moisture content in the soil profile. It is worth investigating other factors such as this which contributed to the bank failure in this site, not only the scour from deflected flood water. • A monitoring programme must be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts. • It is recommended that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including further channel and bank grade control interventions. Should this additional support be implemented successfully then there will be positive impacts. This can be compiled in the form of a river rehabilitation plan with engineering input. It can include the grade control structures to raise the incised channel and the rehabilitation of the wetland upstream of the urban area to attenuate flood waters. • It is also important to note that bank stabilisation is a reactive measure to treat only a symptom of flood damage, and further actions focussing on addressing the causes should be investigated. For example, improving the stormwater system and culvert/pipe outlets (incorporating the principles of Sustainable Drainage Systems) to decrease the volume and slow the velocity of surface runoff entering the system during floods. • Enhancing the aquatic buffer zone surrounding the river channel will reduce bank erosion. The are areas where cut lawn extends right up to the banks and it is recommended that, where possible, a buffer strip be adopted with higher surface roughness.
Residual impacts:	Temporary disturbance to aquatic habitat
Cumulative impact post mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary

	that river rehabilitation be implemented in alignment with the management objectives to improve the system
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low

Alternative:	
Construction and Operational Phase	
Potential impact and risk:	**Cumulative impact on aquatic biodiversity from flood repair activities** • Direct physical modification and disturbance of the riverbed and banks, as well as permanent changes to flow dynamics and erosion, which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services. • Clearance of vegetation, earthworks in the river channel and banks, installation of hard infrastructure, and potential further invasive alien plant infestation.
Nature of impact:	Negative
Extent and duration of impact:	Local and medium term
Consequence of impact or risk:	This can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.
Probability of occurrence:	Probable
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	Medium
Indirect impacts:	This can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Residual impacts:	Temporary disturbance to aquatic habitat
Cumulative impact post mitigation:	Cumulative impacts on the environment can result from broader, long-term changes and not only as a result of a single activity. They are rather from the combined effects of many activities overtime. Rivers are longitudinal systems where different reaches interact in a continuum along the length of the river. Activities in the upper reaches influence the processes of the lower reaches and it must therefore be viewed as a whole. The project will result in further changes to riparian vegetation, increased reaches of stabilised banks, and altered hydraulics. These negative modifications can cause long term cumulative impacts upon the entire length of the river. The Camfersdrift River channel is already artificially deeper and narrower with an unnatural increase in flow velocity and sediment transport capacity. Overtopping has been drastically reduced in the these reaches and the flow rate during high rainfall events in the downstream reaches has increased. Therefore, this proposal, may contribute to a further increase in river flow velocity and erosive power downstream. In order to mitigate against cumulative impacts, it is necessary that river rehabilitation be implemented in alignment with the management objectives to improve the system

Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium

SECTION I: FINDINGS, IMPACT MANAGEMENT AND MITIGATION MEASURES

1.	Provide a summary of the findings and impact management measures identified by all Specialist and an indication of how these findings and recommendations have influenced the proposed development.

Table 1 below summarises the potential Impacts associated with the proposal post mitigation. Please refer to the Section I (2) for the proposed mitigation measures to ensure the corresponding rating post mitigation.

Table 1: Summary of the Impacts Post Mitigation

Impact	Alternative	No-Go
Construction Phase		
Impact on terrestrial biodiversity	Low (-)	No Impact
Impact on fauna	No significance	No Impact
Disturbance of aquatic habitat and biota	Medium (-)	No Impact
Hydrodynamic changes causing sedimentation and erosion	Medium (-)	No Impact
Changes to surface water quality	Low (-)	No Impact
Cumulative impact on aquatic biodiversity from flood repair activities	Medium (-)	No Impact
Operational Phase		
Impact on terrestrial biodiversity	Low (-)	No Impact
Impact on fauna	No significance	No Impact
Disturbance of aquatic habitat and biota	Medium (-)	No Impact
Hydrodynamic changes causing sedimentation and erosion	Medium (-)	No Impact
Changes to surface water quality	Low (-)	No Impact
Cumulative impact on aquatic biodiversity from flood repair activities	Medium (-)	No Impact

CONSTRUCTION PHASE IMPACTS

Impact On Terrestrial Biodiversity
Temporary loss of riparian vegetation and Garden Route Shale Fynbos. Impairment of the biodiversity network. Impact on ecosystem functioning. Impact will be temporary.

Direct morality of fauna; Vibration and noise
These impacts will be site specific and largely restricted to the proposed repair areas. These impacts will also be temporary and will cease at the end of the construction phase.

Disturbance of aquatic habitat and biota
Clearance of vegetation, earthworks on the riverbanks, habitat modification, and further invasive alien plant infestation. Direct physical destruction or disturbance which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.

Hydrodynamic changes causing sedimentation and erosion.
Vegetation clearing, earthworks, and exposure of bare soils within and upslope of the aquatic habitat. Hard infrastructure resulting in scour. The alteration in the physical characteristics of the rivers as a result modified hydraulics causing erosion and sediment deposition, as well as instability and collapse of unstable soils during project operation. These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.

Changes to surface water quality
During construction there are a number of potential pollution inputs into the aquatic systems (such as hydrocarbons and raw cement). Water and/or soil pollution cause negative changes in the physical, chemical and biological characteristics of water resources (i.e. water quality). This can result in possible deterioration in aquatic ecosystem integrity and a reduction in species.

Cumulative impact on aquatic biodiversity from flood repair activities
Direct physical modification and disturbance of the riverbed and banks, as well as permanent changes to flow dynamics and erosion, which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services. Clearance of vegetation, earthworks in the river channel and banks, installation of hard infrastructure, and potential further invasive alien plant infestation.

OPERATIONAL PHASE IMPACTS

Impact On Terrestrial Biodiversity
Increased opportunity for alien infestation. Erosion of the riverbanks due to poor rehabilitation and maintenance efforts.

Disturbance of aquatic habitat and biota
Clearance of vegetation, earthworks on the riverbanks, habitat modification, and further invasive alien plant infestation. Direct physical destruction or disturbance which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services.

Hydrodynamic changes causing sedimentation and erosion.
Vegetation clearing, earthworks, and exposure of bare soils within and upslope of the aquatic habitat. Hard infrastructure resulting in scour. The alteration in the physical characteristics of the rivers as a result modified hydraulics causing erosion and sediment deposition, as well as instability and collapse of unstable soils during project operation. These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for aquatic dependent flora & fauna.

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Cumulative impact on aquatic biodiversity from flood repair activities
Direct physical modification and disturbance of the riverbed and banks, as well as permanent changes to flow dynamics and erosion, which can result in further deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services. Clearance of vegetation, earthworks in the river channel and banks, installation of hard infrastructure, and potential further invasive alien plant infestation.

2.	List the impact management measures that were identified by all Specialist that will be included in the EMPr

Freshwater Assessment Report Impact Management measures

- Final designs and method statements should be approved by the aquatic ecologist, together with the river engineer, prior to the commencement of construction.

- Objectives should be to halt bed incision and bank erosion from hydrological changes by improving culvert outlet designs to reduce scour, flow velocity and flow confinement and installing grade control structures to halt channel incision and upstream bank erosion due to confined flow, trap sediment, and achieve a more natural longitudinal profile. To allow, where possible, for the river channel to migrate laterally and maintain sinuosity in the valley floor. To slope and revegetate eroded banks as gently as possible, with the least amount of hard infrastructure, to reflect the channel morphology prior to downward incision and subsequent erosion.
- Interventions/ hard infrastructure must be set as far back from the channel as possible, including stormwater outlets.
- Steep channel banks should be pulled back to gradients no steeper than 1:4 and preferably much gentler, taking care to vary the position of the toe of the slope with distance along the bank, so as to create a meandering effect, and to pull the bank back coarsely, so that the final product has a natural, rough appearance, with vertical and longitudinal heterogeneity.
- Do not compromise on the extent of erosion control below culvert and pipe outlets. Where possible, install check dams/ low weirs to slow flow and widen channel.
- Where infrastructure is not at risk, to allow for natural bank collapse and reshaping, whilst the grade control structures prevent further erosion.
- Use locally indigenous vegetation to revegetate disturbed river areas, whether from search and rescue, propagation, plugs, or purchased.
- Allow for a riverbed with diversity of types, reflecting riffles and pools, as opposed to creating a plane bed. Widen and raise the channel where possible.
- Bank stabilisation structures must attempt to reflect the natural bends of the river without straightening or narrowing the channel.
- Structures must be kept largely inside the space that used to be occupied by the river bank prior to its washing away, i.e. the structures are kept within the footprint as well as the level to which the bank existed, so as to not present more of a resistance to flow than what the previous bank did.
- A construction method statement must be compiled and available on site.
- The edges of the construction footprint must be clearly staked-out and demarcated prior to construction commencing.
- The contractor or ECO must educate all staff undertaking the work on the best practice methods and environmentally sensitive areas (general do's and don'ts).
- The specific boundaries of areas to be excavated and recontoured etc. must be clearly demarcated.
- Use the smallest possible working corridor. Outside the working corridor, all areas are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. The edges of the construction / rehabilitation zone within the vicinity of the riparian habitat must be clearly staked-out and demarcated using highly visible material (e.g. poles 5m apart) prior to construction commencing.
- The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. The cross sectional profile of the bed and banks must be restored as far as possible.
- Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
- Access to and from the area should be either via existing roads or transformed land.
- During construction, it is important to stabilise any steep, bare areas on the slope and river banks via geotextiles and/or revegetation.

- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use.
- Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer daily.
- Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using covers, silt fences, sandbags, etc. Effective stormwater management must include effective stabilisation of exposed soil.
- All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.
- Construction must have contingency plans for high rainfall events during construction.
- The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat.
- Any potential pipeline leaks should be investigated as moisture content of the bank increases the likelihood of mass failure by increasing the weight of the soil mass and decreasing soil strength. This coupled with lateral interflow during floods will create destabilising forces. It is possible that the location of the pipeline has contributed to the extent of erosion in that upper right bank location as the substrate of the bank/ slope will have been altered for installation and altered moisture content in the soil profile. It is worth investigating other factors such as this which contributed to the bank failure in this site, not only the scour from deflected flood water.
- A monitoring programme must be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts.
- It is recommended that another project phase be added to improve the ecological integrity and functioning of the river, not just for the direct protection of infrastructure, but for supporting services and must including further channel and bank grade control interventions. Should this additional support be implemented successfully then there will be positive impacts. This can be compiled in the form of a river rehabilitation plan with engineering input. It can include the grade control structures to raise the incised channel and the rehabilitation of the wetland upstream of the urban area to attenuate flood waters.
- It is also important to note that bank stabilisation is a reactive measure to treat only a symptom of flood damage, and further actions focussing on addressing the causes should be investigated. For example, improving the stormwater system and culvert/pipe outlets (incorporating the principles of Sustainable Drainage Systems) to decrease the volume and slow the velocity of surface runoff entering the system during floods.
- Enhancing the aquatic buffer zone surrounding the river channel will reduce bank erosion. The are areas where cut lawn extends right up to the banks and it is recommended that, where possible, a buffer strip be adopted with higher surface roughness.

Botanical Report Impact Management measures

- During the construction phase, fence off the construction areas. Restrict all construction activities, such as stockpiling, parking and cement mixing, to transformed areas away from the riparian and fynbos areas. The contractor(s) must be made aware of the sensitive surroundings. The riparian areas outside the footprints must be declared 'no-go' areas and not be disturbed in any way.

- Search and rescue bulbs from the construction areas for replanting in the rehabilitated areas after construction. Topsoil, cuttings and seedbearing plant material can also be salvaged for this purpose. Geophytes should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. Avoid using seed-bearing alien plant material for rehabilitation purposes.
- Fence of non-invasive trees in the vicinity of the construction areas. These trees must be actively protected.
- Pollutant substances brought onto site must be properly contained. Cement/concrete mixing must be contained on impervious and bunded surfaces. No cement mixing is allowed inside the riparian and fynbos areas. Cement water is highly alkaline and considered toxic.
- Where needed, rehabilitate the disturbed surfaces after construction. Erosion prevention measures may be needed on steep riverbanks, such as logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous grass seed may also be needed.
- Engage in alien clearing, focussing on invasive species such as black wattle, blackwood, gums and pines. These species are category 2 and 1b invaders that require compulsory control as part of an invasive species control programme. Their control will become a medium- to long-term maintenance requirement.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. It is recommended that a strip of at least 10 m wide around the construction areas also be monitored for aliens during the maintenance period.

Terrestrial Faunal and Avifaunal Species Impact Assessment Report

The project footprint will be of a limited spatial extent and impacts will be of a localised and very short nature (less than a year) and will cease at the end of the construction phase. As such, this renders the entire proposed project footprint as developable from a faunal perspective without any mitigation measures being advocated. Even so, every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). Because noise and vibration is an unavoidable impact during the construction phase, no impact management actions are advocated to reduce this impact.

3.	List the specialist investigations and the impact management measures that will **not** be implemented and provide an explanation as to why these measures will not be implemented.

Not Applicable – All mitigation recommended will be implemented

4.	Explain how the proposed development will impact the surrounding communities.

During the construction phase the surrounding community will be temporarily inconvenienced by the construction noise impacts however this impact is temporary in nature. Additionally, some sections of the park will be closed off to the public during the construction phase for their safety.

5.	Explain how the risk of climate change may influence the proposed activity or development and how has the potential impacts of climate change been considered and addressed.

The municipality has been awarded funding to fix flood damage and the proposal is therefore to do just this within the allocated budget. To address the pressures of climate change and increases in flood events a far larger look at the river and drainage systems would have to be undertaken and far more funding would have to be acquired.

6.	Explain whether there are any conflicting recommendations between the specialists. If so, explain how these have been addressed and resolved.

No conflicting recommendations

7.	Explain how the findings and recommendations of the different specialist studies have been integrated to inform the most appropriate mitigation measures that should be implemented to manage the potential impacts of the proposed activity or development.

Preliminary input was obtained from the Freshwater specialist regarding the proposed options and their appropriateness. Additional recommendations were provided in the Freshwater and Botanical Assessments which have been incorporated into the EMPr and will be implemented during the construction phase.

8.	Explain how the mitigation hierarchy has been applied to arrive at the best practicable environmental option.

1	AVOID IMPACTS	The temporary impacts to the biophysical environment are unavoidable
2	MINIMISE IMPACTS	The impacts will be minimised through the implementation of the mitigation measures within the EMPr

3	RECTIFY	The disturbances created by the construction phase will be rehabilitated in accordance with the EMPR.
4	OFFSET	None necessary

SECTION J: GENERAL

1. Environmental Impact Statement

1.1.	Provide a summary of the key findings of the EIA.

As shown in Table 2, with the implementation of the proposed mitigation measures the negative impacts associated with the construction phase can see to be low to no significance for Terrestrial biodiversity and fauna however as the activities will be undertaken within the Camphersdrift River the Freshwater related impacts have low to moderate impact significance associated with the activities.

Table 2: Summary of the Impacts Post Mitigation

Impact	Alternative	No-Go
Construction Phase		
Impact on terrestrial biodiversity	Low (-)	No Impact
Impact on fauna	No significance	No Impact
Disturbance of aquatic habitat and biota	Medium (-)	No Impact
Hydrodynamic changes causing sedimentation and erosion	Medium (-)	No Impact
Changes to surface water quality	Low (-)	No Impact
Cumulative impact on aquatic biodiversity from flood repair activities	Medium (-)	No Impact
Operational Phase		
Impact on terrestrial biodiversity	Low (-)	No Impact
Impact on fauna	No significance	No Impact
Disturbance of aquatic habitat and biota	Medium (-)	No Impact
Hydrodynamic changes causing sedimentation and erosion	Medium (-)	No Impact
Changes to surface water quality	Low (-)	No Impact
Cumulative impact on aquatic biodiversity from flood repair activities	Medium (-)	No Impact

1.2.	Provide a map that that superimposes the preferred activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. (Attach map to this BAR as Appendix B2)
	The proposal will be undertaken within the sensitive feature on site and as such the watercourse and its riparian zone at each site outside of the footprint and the smallest practical working area around the footprints must be regarded as No-Go areas to avoid.
1.3.	Provide a summary of the positive and negative impacts and risks that the proposed activity or development and alternatives will have on the environment and community.

Positive

- Secure and protect municipal infrastructure
- Reinstate section of the park being washed away by erosion and protect from further erosion

- Capital injection for consultants and contractors appointed to undertake the upgrades

Negatives

- Temporary noise and construction related inconveniences.
- Temporary disturbances to the biophysical environment

2. Recommendation of the Environmental Assessment Practitioner ("EAP")

2.1.	Provide Impact management outcomes (based on the assessment and where applicable, specialist assessments) for the proposed activity or development for inclusion in the EMPr

In order to obtain/reach the impact management objects the corresponding mitigation measures prescribed in the BAR and EMPr must be implemented.

The Impact monitoring will be undertaken by an appointed and independent ECO.

The impact management outcomes will be monitored by the appointed ECO, in addition to the implementation of mitigation measures during the duration of the development, if all management mitigation measures are implemented successfully the resulting impact management outcomes will mean that the develop was undertaken with no significant or avoidable impacts to the environment.

Table 3: Impact management objectives and impact management outcomes included in the EMPr

PRE-CONSTRUCTION PHASE	
IMPACT MANAGEMENT OBJECTIVES	**IMPACT MANAGEMENT OUTCOMES**
To appoint a suitably qualified and experienced Environmental Control Officer	The conditions of Environmental Authorisation and the requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.
Identify and demarcate working areas and site facilities	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance
To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.
Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site	Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. Site facilities are appropriately located on site. Construction workers receive environmental awareness training before commencing work on site
CONSTRUCTION PHASE	
To limit the impact on terrestrial biodiversity	The disturbance to undertake the activities are limited to the footprint and a reasonable working are around the sites.
To limit direct mortality of fauna	No avoidable fauna mortality
To limit the disturbance of aquatic habitat and biota	The disturbance to undertake the activities are limited to the footprint and a reasonable working are around the sites.
To Limit hydrodynamic changes causing sedimentation and erosion	The disturbance to undertake the activities are limited to the footprint and a reasonable working are around the sites.
To limit changes to surface water quality	No pollutants enter the watercourse and modify/contaminate the surface water.
POST CONSTRUCTION REHABILITATION PHASE	

To limit the impact on terrestrial biodiversity	The disturbed areas are rehabilitated sufficiently and no alien vegetation establish in the recovering areas
To limit the disturbance of aquatic habitat and biota	Disturbed areas a sufficiently rehabilitated

2.2.	Provide a description of any aspects that were conditional to the findings of the assessment either by the EAP or specialist that must be included as conditions of the authorisation.

The EMPr must be implemented, this is however a standard condition of Environmental Authorisation. All mitigation measures from the specialists have been incorporated into the EMPr and as such are conditional to the environmental authorisation.

2.3.	Provide a reasoned opinion as to whether the proposed activity or development should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be included in the authorisation.

The proposed rehabilitation and protection of infrastructure should be authorised.

As seen in the body of this Basic Assessment Report, the negative impacts associated with the construction phase can be mitigated to that of a no significance to low significance for terrestrial biodiversity and fauna and avifauna. The impact on the watercourse will be moderate to low significance.

Proposed Conditions of Authorisation:

- The EMPr must be implemented.
- An ECO must be appointed to monitor compliance with the EMPr

2.4.	Provide a description of any assumptions, uncertainties and gaps in knowledge that relate to the assessment and mitigation measures proposed.

It is assumed that the proposed mitigation measures as listed in this report and the EMPr (Appendix H) will be implemented and adhered to as the significance of impacts ratings are conditional on implementation of the mitigation measures.

Assumptions and Limitations of the Aquatic Assessment Report

- The location of the proposed activities was provided by the client in kml. Format.
- No detailed designs of the proposed structures for each location have yet been provided, only a number of typical drawings to indicate the engineering concept. Detailed designs for each location/ activity should be compiled and approved by an aquatic specialist prior to implementation. – Please note that this was written before the design report was compiled and is no longer relevant
- 2-Dimensional hydraulic modelling was not undertaken to determine the impact of the proposed interventions. – Please note that this was written before the design report was compiled and is no longer relevant
- Aquatic ecosystems vary both temporally and spatially. Once-off surveys such as this can miss certain ecological information due to seasonality, thus limiting accuracy and confidence.
- While disturbance and transformation of habitats can lead to shifts in the type and extent of aquatic ecosystems, it is important to note that the current extent and classification is reported on here.
- All soil/vegetation/terrain sampling points were recorded using a Garmin Global Positioning System (GPS) and captured using Geographical Information Systems (GIS) for further processing.
- Infield soil and vegetation sampling was only undertaken within a specific focal area around the proposed activities, while the remaining watercourses were delineated at a desktop level with limited accuracy.
- No detailed assessment of aquatic fauna/biota (e.g. fish, invertebrates, microphytes, etc.) was undertaken, and not deemed necessary.

	• The vegetation information provided is based on observation not formal vegetation plots. As such species documented in this report should be considered as a list of dominant and/or indicator wetland/riparian species. • The scope of work did not include water quality sampling and the water quality characteristics were inferred from the biophysical characteristics of the area and catchment land uses. • All designs and recommendations in this document are conceptual in nature and need to be verified at the time of construction by a suitably qualified river engineer in order to ensure that each intervention appropriately meets the objectives as site conditions are likely to change between the time of planning and implementation. The rehabilitation recommendations must be viewed as a guideline for rehabilitation of the site which may require adaptive management. • The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological concerns arising from the field survey and based on the assessor's working knowledge and experience with similar projects. The degree of confidence is considered high. **Assumptions and Limitations of the Botanical Assessment Report** Fieldwork was carried out in spring, considered to be a suitable time for many flowering species in the Southern Cape. However, plants that only flower at other times of the year (e.g. late spring to summer), such as certain bulbs (Iridaceae and Orchidaceae), may have been missed. The overall confidence in the completeness and accuracy of the botanical findings is however considered to be good. **Assumptions and Limitations of the Terrestrial Faunal and Avifaunal Species Impact Assessment Report** • Weather conditions during the surveying period were relatively optimal for detecting a representative sample of the terrestrial faunal and avifaunal species diversity across the study area. Even so, not all species could be observed (especially cryptic species), and it is further possible that the surveying period did not correspond to the activity period or activity season of some species. Coupled to this, the thick and impenetrable nature of the Bramble vegetation in the Camfersdrift River drainage channel hampered sampling efforts as not all areas could be accessed. • Although the observed faunal composition of the study area therefore only partly reflects the species richness of, and faunal abundances within the study area, the inclusion and consideration of SCC was further based on a thorough desktop assessment for the included faunal groups (mammals, amphibians and avifauna; Appendices A to C), meaning that all possibly occurring SCC were considered in the current assessment.
2.5.	The period for which the EA is required, the date the activity will be concluded and when the post construction monitoring requirements should be finalised.
Construction is planned to commence February 2025 and continue till August 2025. Time to implement the full funding might however run out so although this planned construction phase is 7 months and not all of the work is implemented additional funding might have to be sourced and as such we appeal to your department to issue the EA for at least 5 years	

3. Water

Since the Western Cape is a water scarce area explain what measures will be implemented to avoid the use of potable water during the development and operational phase and what measures will be implemented to reduce your water demand, save water and measures to reuse or recycle water.
Water will be required for compacting ground material and concrete batching. During the operational phase the proposal will not use water.

4. Waste

Explain what measures have been taken to reduce, reuse or recycle waste.
An integrated waste management system must be adopted on site. Recyclable and reusable materials will be handled us such. Unrecyclable items will be taken to the George landfill.

5. Energy Efficiency

8.1.	Explain what design measures have been taken to ensure that the development proposal will be energy efficient.
The proposal will not use power during the operational phase. Generators will be used during the construction phase if required.	

SECTION K: DECLARATIONS

DECLARATION OF THE APPLICANT

Note: Duplicate this section where there is more than one Applicant.

I **Johannes Franciscus Koegelenberg** ID number **7906085048081** ~~in my personal capacity or~~ duly authorised thereto hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;
- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement) which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed who does meet all the requirements of Regulation 13 of the NEMA EIA Regulations;

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimately person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

2024-07-25

Signature of the Applicant: Date:

George Municipality

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I **Michael Jon Bennett**, EAP Registration number **2021/3163** as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this BAR and any other documents/reports submitted in support of this BAR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

Signature of the EAP: Date: 25 July 2024

Sharples Environmental Services cc

Name of company (if applicable):