

**APPENDIX 9: ENVIRONMENTAL MANAGEMENT PROGRAMME**

**ENVIRONMENTAL MANAGEMENT PROGRAMME  
(EMPr) FOR THE PROPOSED CONSTRUCTION OF A  
PEDESTRIAN BRIDGE, AT TOTENHAM ROAD, WARD  
51, ETHEKWINI METROPOLITAN MUNICIPALITY,  
KWAZULU-NATAL.**



**Plate 1. A view of the proposed location for Tottenham Road Pedestrian Bridge.**

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## LIST OF TERMS

**“Construction Phase”** The period from the commencement of physical disturbance of land, excluding rehabilitation activities, until the completion of works and clearing of construction camps or work areas.

**“Construction site”** means work place where construction work is being performed whether or not there is actual physical work taking place at any given time.

**“Construction vehicle”** means a vehicle used as means of conveyance for transporting person or material, or persons and material, on and off the construction site for the purpose of performing construction work.

**“Construction work”** means any work in connection with-

- (a) the construction, erection, alteration, renovating, repair, demolition or dismay of addition to a building or any similar structure; or
- (b) the construction, erection, maintenance, demolition or dismay of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work.

**“Excavation work”** means the making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping.

**“Temporary works”** means any false work, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during construction work.

**Environmental Management Programme (EMPr):** The EMPr is a detailed plan for the implementation of the mitigation measures to minimise any potential negative environmental impacts.

**Department of Economic Development, Tourism and Environmental Affairs (EDTEA):** The Provincial Environmental Authority.

**Engineer:** Person/organization appointed to oversee the work of the Contractor.

**Environmental Control Officer (ECO):** An independently appointed professional consultant assigned to the project. The ECO will conduct audits and will be part of the Project Team and will advise the Engineer/Contractor on all environmental matters relating to the works, in terms of this management plan.

**Operational Phase:** The period following the Construction Phase, during which the proposed development will be operational or require regular maintenance.

**Planning Phase:** The period prior to the commencement of construction when a number of activities associated with the preparation for the construction will be undertaken.

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**Project Manager:** The overall Project Manager for the construction project. The Site Engineer will report to the Employer's Project Manager.

**Project Environmental Specifications (PES):** PES describes project specific standards to be met during construction, usually set in the conditions of Environmental Authorisation for the project.

**Proponent:** The proponent is the person or organisation for whom the construction is being undertaken. In this project the proponent is the eThekweni Municipality Engineering unit: Roads Provision Department, which is legally bound to ensure that all parties are in compliance with the EMPr and the Environmental Authorisation (EA).

**Rehabilitation:** Rehabilitation is defined as the return of a disturbed area to a state which approximates the state which it was before disruption i.e. post-construction reinstatement of the undeveloped part of the entire construction area. Rehabilitation for the purposes of this specification is aimed at the post-construction reinstatement of the entire construction area.

### **Abbreviations**

EA	-	Environmental Authorisation
EMPr	-	Environmental Management Programme
EDTEA	-	Department of Economic Development, Tourism and Environmental Affairs
ECO	-	Environmental Control Officer
DWS	-	Department of Water and Sanitation
PES	-	Project Environmental Specifications
EIA	-	Environmental Impact Assessment
ELO	-	Environmental Liaison Officer
E	-	Engineer
C	-	Contractor

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## 1. INTRODUCTION

This Environmental Management Programme has been compiled in accordance with eThekweni Municipality's Generic EMP, National Environmental Management Act and the Principles of Integrated Environmental Management. The main purpose for this EMPr is to provide guidelines for monitoring and management of the negative environmental impact from the proposed development of a pedestrian bridge.

According to the National Environmental Management Act, Act 108 of 1998, the proposed project is to be subjected to a Basic Assessment Process as it triggers listed activities that are contained in GNR 326 of the 2014 EIA regulations, as amended. All potential environmental impacts identified during the BA process will be addressed in this EMPr.

This EMPr covers three aspect of the development, the pre-construction, construction and post construction phases. Impacts for each phase have been identified and mitigation measures provided. It should be noted that this document is a dynamic document that needs to be regularly updated and revised to cover any major issues which may not have been foreseen. All amendments made to this document must be submitted to the competent authority for approval. Work may not commence until EDTEA has provided Environmental Authorisation.

The achievement of effective Environmental Management lies in number of things. The following have been incorporated in the report:

- Allocation of roles and responsibility of the key personnel who will be involved in the Implementation of the EMPr;
- Legal enforceability;
- Description of impacts and risk that needs to be avoided, managed and mitigated throughout the pre-construction, construction and post construction phase of the development;
- Description of the proposed monitoring programme;
- Implementation of reporting procedures; and
- Environmental awareness for the contractor and construction staff.

The provisions of this document are binding on the contractor during the construction period. The project proponent must ensure that this document is incorporated into the construction tender documentation and the contract documents so as to ensure that environmental requirements for the construction are adequately budgeted for by all contractors and sub-contractors.

The contractor and the project proponent have the responsibility to ensure that everyone who is involved in this project is familiar with requirements of the EMPr. A declaration form must be signed by the project proponent, all contractors, subcontractors and the contractor's employees as evidence that they understood and will comply with the conditions of this EMPr. Failure to comply with the conditions set out in this EMPr will result in penalties or cease of work until all non-compliance has been corrected.

## 2. DETAILS AND EXPETISE OF THE EAP WHO PREPARED THE EMPR

Table 2-1: Details of the EAPs

<b>COMPANY NAME: JG AFRIKA (PTY) LTD</b>			
<b>EAP</b>	<b>Qualifications &amp; professional affiliations</b>	<b>Experience at environmental assessments</b>	<b>Contact details</b>
<b>Mr M. van Rooyen</b> Executive Associate	MPhil (Environmental Management), Pr. Sci. Nat, IAIAsa	13 years	JG Afrika (Pty) Ltd Tel: (033) 343 6700 Email: vanrooyenm@jgafrika.com
<b>Ms R Patak</b> Environmental Assessment Practitioner	BSc Hons (Environmental Science) IAIAsa, GISSA	6 years	JG Afrika (Pty) Ltd Tel: (033) 343 6700 Email: patakr@jgafrika.com

## 3. BACKGROUND TO EMPR

The eThekweni Municipality is proposing to construct a pedestrian bridge over a tributary of the Ohlanga River. The bridge alignment will cross the Ohlanga River and will connect the suburbs of Riet Rivier (north east) with Palmview (south-west). An existing, informal footpath leads into and out of the existing river channel (i.e. watercourse). In order to cross the river channel, pedestrians have utilised unevenly and loosely placed rocks and rubble to form stepping stones across the entire watercourse, thereby connecting the two footpaths. It is proposed to construct a pedestrian bridge over the existing informal crossing in order to allow for safe passage of pedestrians.

The proposed pedestrian bridge will consist of a reinforced concrete deck which will be connected to bedrock using Continuous Flight Auger (CFA) piles and reinforced concrete columns. The proposed location of the pedestrian bridge is listed in a table below.

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**Table 3-1: Co-ordinates of the site footprint.**

<b>Point</b>	<b>Southerly co-ordinate</b>	<b>Easterly co-ordinate</b>
<b>Start</b>	29° 39' 59.166" S	31° 1' 29.085" E
<b>End</b>	29° 39' 56.472" S	31° 1' 31.519" E



T:\01 ACTIVE Projects \JG\4296 - eThekweni Floodline Delineations (FH)\03 Drawings\Working Drawings\GIS\Maps & Exports\Tottenham Road Pedestrian Bridge\Site Plan (A4).mxd



### Tottenham Road Pedestrian Bridge

#### SITE PLAN

Locality Map

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO,

#### LEGEND

- Tottenham Road Pedestrian Bridge
- Rivers

**\*Note: Bridge depicted is not to scale or any design. For illustration purposes only.**

Production Date: 20 September 2016  
Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Meters  
0 12.5 25 50 75 100

SCALE  
1:2 000

Compiled by: JG AFRIKA  
EXPERIENCE QUALITY INTEGRITY

Client: ETHEKWINI MUNICIPALITY

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

Figure 3-1: Site Plan.

#### 4. LEGAL REQUIREMENTS PERTAINING TO THIS DOCUMENT

##### 4.1 Applicable Listed Activities

In terms of the Environmental Impact Assessment (EIA) Regulations (2014), as amended, promulgated in terms of the National Environmental Management Act, (Act No. 107 of 1998) (NEMA), certain Listed Activities are specified for which either a Basic Assessment (GN R 327 and 324) or a full Scoping and EIA (GN R 325) is required. The following Listed Activities in Government Notice (GN) R 327 (Listing Notice 1) and (GN) R 324 (Listing Notice 3), requiring a Basic Assessment (BA) Process will be applicable to the proposed bridge structure.

**Table 4-1: Applicable NEMA Activities.**

<b>Government Notice Number and Activity</b>	<b>GNR 327 Activity 19</b>
	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 10 cubic metres from a watercourse.
	<i>The proposed pedestrian bridge construction will involve the excavation, infilling and / or depositing of 10m<sup>3</sup> or more of material from the banks and beds of the two unnamed tributaries of the Ohlanga River.</i>
<b>Government Notice Number and Activity</b>	<b>GNR 324 Activity 12</b>
	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 (d) in KwaZulu-Natal: iv. 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.
	<i>The clearance of vegetation for the bridge, site camp (albeit a temporary establishment), as well as the possible formalisation of the footpath to and from the bridge, will result in a cumulative removal of more than 300 square metres of predominantly indigenous vegetation which is classified as a SANBI Critically Endangered Ecosystem</i>
<b>Government Notice Number and Activity</b>	<b>GNR 324 Activity 14</b>
	The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse. d. KwaZulu-Natal vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
	<i>This Listed Activity is relevant as the proposed pedestrian bridge construction exceeds 10m<sup>2</sup> in size, and falls within a SANBI Critically Endangered Ecosystem</i>

## 4.2 Applicable Legislation, Policy and/or Guidelines

**Table 4-2: list of all applicable legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations.**

Title of legislation, policy or guideline:	Description
The South African Constitution (No 108 of 1996) Chapter 2	Bill of Rights makes provisions for Environmental rights - Section 24, Rights in property – Section 25, Administrative justice - Section 32 and Access to Information – Section 33.
National Environmental Management Act (Act 107 of 1998) – for its potential to cause degradation of the environment (Section 28).	NEMA contains a set of principles that govern environmental management, and against which all environmental management plans and actions are measured.  Sustainable development requires the consideration of all relevant factors.
Environmental Conservation Act (Act 73) – for potential environmental degradation.	Department of Environmental Affairs 1989
National Water Act (Act 36 of 1998)	The National Water Act (No 36 of 1998) makes provisions for the protection of surface water and groundwater resources and their sustainable management for the prevention and remediation of the effects of pollution, and for the control of emergency occurrences.
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	The main focus of this act is upon agricultural resources but it has an indirect implication for rivers and provides for the protection of agricultural land while regulations provides for the implementation of control measures for alien and invasive plant species.
National Environmental Management: Air Quality Act (No 39 of 2004)	Provides for the control of dust, noise and offensive odours 1970.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) – for protection of biodiversity.	Makes provisions for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory.
The Protected Areas Act (No 57 of 2003)	Aims to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.
The Occupational Health and Safety Act (No 85 of 1993)	Makes provisions in regulations Section 8 for the general duties of employers to their employees. Section 9 of the Regulations make provisions for general duties of employers and self-employed persons to persons other than their employees.

Title of legislation, policy or guideline:	Description
The Waste Act (Act 59 of 2008),	Law regulating waste management in order to protect health and the environment providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.
The Integrated Coastal Management Act (Act 36 of 2014),	The Act aims to establish a system of integrated coastal and estuarine management in the Republic, including norms, standards and policies, in order to promote the conservation of the coastal environment, and maintain the natural attributes of coastal landscapes and seascapes, and to ensure that development and the use of natural resources within the coastal zone is socially and economically justifiable and ecologically sustainable.
The National Heritage Resources Act (Act No 25 of 1999 as amended) – for the identification and preservation of items of heritage importance.	The Act aims to identify and preserve items of heritage importance.

## 5 MANAGEMENT AND IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

### 5.1 Organisational Structure, Roles and Responsibilities.

The organisational structure identifies and defines the responsibilities and authority of the various organisations involved in the project. All instructions and official communications regarding environmental matters must follow the organisational structure. All instructions that relate to the EMPr will be given to the Contractor via the Employer's Construction Manager. In an emergency situation, however, the Employer's Environmental Officer may give an instruction directly to the Contractor. Site Environmental Management will be an item on the agenda of the monthly site meetings, and the Employer's Environmental Officer will attend.

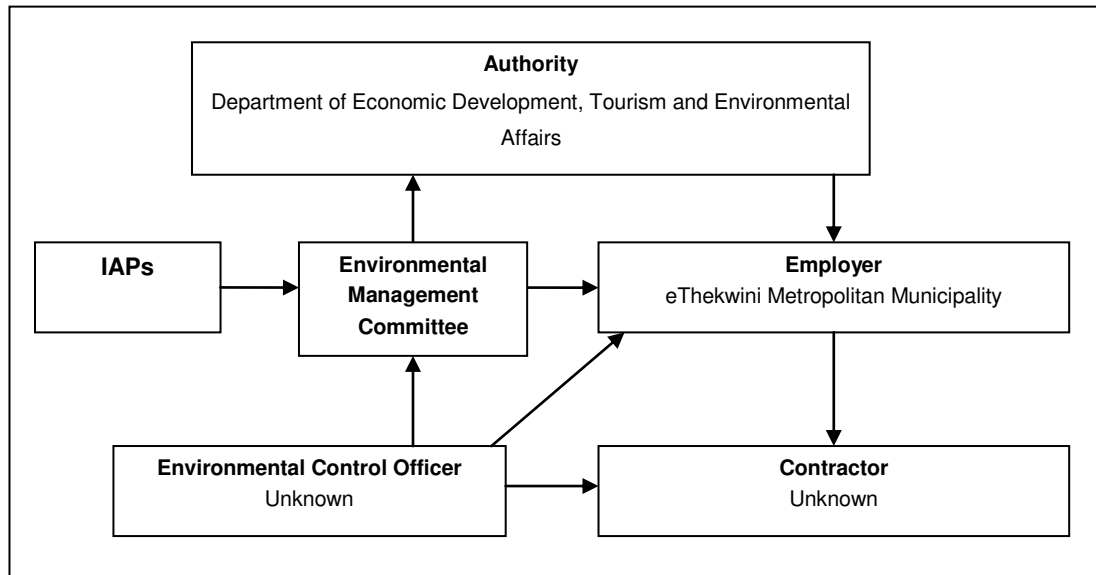


Figure 5-1: EMPr implementation organisational structure.

## 5.2 Roles and Responsibilities

Supervision and monitoring are vital to the successful implementation of an EMPr. The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase.

Table 4: Roles and Responsibilities

Responsible Party	Roles and Responsibilities
The Project Manager (eThekweni Local Municipality)	<ul style="list-style-type: none"> <li>• The project manager (PM) is responsible for ensuring that the tenders/contractors adequately provide for the provision of the EMPr in submissions.</li> <li>• Ensuring that all necessary permits are obtained prior to commencement of the construction activities.</li> <li>• The PM is responsible for ensuring that the implementation of this EMPr complies with the relevant legislation and the conditions of the EA.</li> <li>• Appointing a Principal Contractor who has the necessary competence and resources to carry out the construction work safely.</li> <li>• Where more than one principal contractor is appointed, the PM must take reasonable steps to ensure cooperation between all principal contractors and other contractors in order to ensure compliance with the EMPr.</li> <li>• Stop any contractor from executing activities which pose any threat to health and safety of person.</li> <li>• Contracting a suitably experienced and independent Environmental</li> </ul>

	<p>Control Officer (ECO);</p> <ul style="list-style-type: none"> <li>• Ensuring the implementation of environmental monitoring and audits during planning, construction and rehabilitation;</li> <li>• Ensuring that compliance and non-compliance records are maintained; and</li> <li>• Ensuring that Environmental Audit Reports are submitted to EDTEA.</li> <li>• The principal contractor will be contracted by the PM to undertake the detailed design and supervision of the project.</li> </ul>
The Principal Contractor	<ul style="list-style-type: none"> <li>• The principal contractor must appoint a full-time competent person as the construction manager with the duty of managing the construction work, including the duty of ensuring compliance with the environmental authorisation and EMPr.</li> <li>• A principal contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with the EMPr.</li> <li>• Ensuring that the necessary environmental authorisations and permits have been obtained.</li> <li>• Reviewing and approving the Contract's Method Statements with input from the ECO where necessary.</li> <li>• Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO and EMC where necessary</li> <li>• Stop any contractor from executing work which is not in accordance with EMPr specifications. Issuing fines for transgressions of site rules and penalties for contravention of the EMPr.</li> <li>• Providing input into the ECO's ongoing internal review of the EMPr, which is submitted as a report to the Employer.</li> </ul>
The Contractor	<p>The responsibility of the contractor includes:</p> <ul style="list-style-type: none"> <li>• Familiarising himself/herself with the requirements of the EMPr and EA and be available for induction training;</li> <li>• Preparing method statements and providing environmental method statements as required by the EMPr and per the developer's instruction;</li> <li>• Implementing the approved method statements in accordance with the requirements of the environmental authorisation;</li> </ul>

	<ul style="list-style-type: none"> <li>• The implementation, recommendations and actions required in this EMPr; and Environmental Authorisation;</li> <li>• To follow the spirit of good environmental management and best practise</li> </ul>
The Environmental Control Officer	<ul style="list-style-type: none"> <li>• The ECO appointed will monitor and review the on-site environmental management and implementation of this EMPr by contractor(s).</li> <li>• Assisting the Contract Manager and the Principal Contractor in ensuring that the necessary environmental authorisation and permit have been obtained prior to construction commencing.</li> <li>• Reviewing the contractor's construction Method Statements together with the Principal Contractor.</li> <li>• Monitoring and verifying adherence of the EMPr, EA and Approved Method Statements at all times.</li> <li>• Reporting transgression and any serious environmental incident or impact.</li> <li>• Monitor the undertaking of the environmental awareness training by the contractor for all new personnel coming onto site.</li> <li>• Compile monthly audit reports for submission to the Project Manager.</li> <li>• Prepare an environmental snag-list and close out report after construction and rehabilitation phase has been completed.</li> </ul>
Contractor's Environmental Liaison Officer	<ul style="list-style-type: none"> <li>• The appointed Contractor will be required to appoint a competent individual as the Contractor's on-site Environmental Liaison Officer (ELO)</li> <li>• He/she will be required to sign the register confirming his/her familiarity with the EMPr document.</li> <li>• The ELO will be responsible for overseeing the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to.</li> <li>• The contractor provides a programme for site establishment to the construction manager and ECO prior to commencement.</li> <li>• Conducting environmental toolbox talks to employees for the duration of the construction.</li> <li>• Keep details of all environmental incidents and complaints from IAPs and site staff.</li> </ul>

## 6. COMPLIANCE WITH THE EMPR

### 6.1 Environmental File

The Contractor must ensure that the following documentation is kept on site at all times during the construction period:

- Copy of the Environmental Management Programme
- Copies of the relevant permits/Licence
- Copies of the monthly environmental audit reports
- Environmental method statements
- Incident reports
- Complaints register
- Rehabilitation plan (if available)
- Awareness training material (toolbox talks, inductions)
- Service receipts for disposal of hazardous waste.

## 6.2 Environmental Method Statements

The contractor is required to have method statements for each of the construction activities to be carried out on site. The written method statements must be submitted to the Engineer for approval. On receipt of the Method Statements the Engineer shall forward a copy to the ECO. The Engineer and the ECO shall review the Method Statement between two to three weeks prior to the intended date of commencement of the activity. Once the Method Statement is approved it is binding the contractor to ensure that all activities are carried out accordingly. The method statement submitted must have the following information:

- The proposed activity, materials and equipment's to be utilised, labour and the construction procedure;
- Timing and location of the activity;
- Transportation of the equipment's and to and from site;
- How and where the material will be stored;
- Description of the potential negative impacts, risk associated with the activity and how they will be managed;
- Emergency procedures in case of any reasonably potential accident/incident which would occur during the procedure;
- The relevant environmental standards to be met;
- Environmental monitoring to be undertaken and records to be maintained

As per requirements of this EMPr, the following method statements are required and must be provided by the contractor as part of any tender documents which are to be issued:

**Table 6-1: Method statements required.**

<b>Methods statements</b>	
<b>MS1:</b> Site clearing	<b>MS7:</b> Solid waste management and removal from site
<b>MS2:</b> Site layout and establishment	<b>MS9:</b> Hydrocarbon spills contingency plan
<b>MS3:</b> Environmental induction and training	<b>MS13:</b> Stockpiling



<b>MS4:</b> Dust mitigation	<b>MS16:</b> Erosion remediation and stabilisation
<b>MS5:</b> Cement and concrete batching	<b>MS18:</b> Vegetation Rehabilitation Plan
<b>MS6:</b> Traffic accommodation	<b>MS19:</b> Stormwater Management

### 6.3 Incident reports

Any incident that took place on construction site must be reported. The location, cause of incident, extent of the impact and actions taken to prevent the incident from happening again must be stated in the incident report. Accidents that are most likely to occur on sites are:

- Accidental spillage for hazardous substances (petrochemicals, diesel and oil);
- Accidental waste water discharged into land and watercourse;
- Accidental fires; and
- Environmental and ecosystem effects from incidents.

The contractor must have the Environmental Emergency Preparedness Plan in place to deal with the environmental incidents that have the potential to occur on site. The plan must include the following information:

- Training of employees in term of dealing with incidents and responding to emergencies.
- Responsibility and accountability and liability of the key personnel;
- A list of the key personnel and their contact numbers;
- Information on hazardous material, potential impacts associated and measure to be taken in the event of different types of emergency and accidental release.
- Incident recording and remediation measures required to be implemented

### 6.4 Complaints register

The contractor must ensure that a complaints register is available on site throughout the construction period. The nature of complaint, the individual who is responsible for complaint as well as the correspondence and the action taken to address the complaint and prevent further occurrence of the complaint must appear in the register. The time taken and the person responsible for taking the corrective actions must be specified.

### 6.5 Awareness training

The Contractor together with the Environmental Liaison Officer (if available) shall arrange adequate environmental awareness training for construction staff. They must ensure that all construction workers are familiar with the specifics of the EMPr. The presentation shall be conducted, as far as possible, in the employees' language of choice.

As a minimum, training shall include:

- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.

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The contractor shall keep records of all environmental training sessions, including names, dates and the information presented. These records will be presented at the EMC meetings and to the ECO on request during his/her fortnightly audits. Where necessary, the contractor should make provision for weekly training or Toolbox Talks.

## **6.6 Reporting and Auditing**

The appointed ECO shall undertake monthly site audit to monitor all activities and the level of compliance with the conditions outlined in this Environmental Management Programme. The Environmental Audit Report must contain remedial actions for each non-compliance identified on site, and time frames must be provided for the rectification of such non-compliance issues. The environmental audit report must be submitted to the proponent for reviewing prior to the following site audit. Photographic records of progress on site must be kept.

The ECO has the responsibility to report failure of the contractor to implement the corrective actions for non-compliance that are deemed to have serious negative impact on the environment resulting from the project activities to the EDTEA: Compliance and Monitoring Unit, the Department of Water and Sanitation, and eThekweni Municipality.

A final inspection must be undertaken by the project engineer and the ECO to ensure that all structural interventions prior to signoff and any deviation should be addressed prior to completion.

## **7. NON-COMPLIANCE**

In the event where a notice of non-compliance has been issued to the contractor, the contractor must act immediately to correct the non-compliance within the specified timeframes. All actions taken by the contractor to mitigate its effect and the expected result must be recorded and submitted to the Project Manager. A copy of must be provided to the ECO. Failure of the Contractor to address the cause of non-compliance within the specified timeframe will constitute a breach of contract.

The Employer's Project Manager, at his own discretion, has the power to remove any person from site who is in contravention of the EMP, and if necessary, the Employer's Construction Manager can suspend part or all of the works.

## 8. DETAILED ENVIRONMENTAL MANAGEMENT PROGRAMME

The construction of the Pedestrian Bridge can be divided into three Phases:

Phase A - Preliminary Activities and Site Establishment (Planning Phase)

Phase B - Construction Activities and Workforce Management (Construction Phase)

Phase C – Post Construction Rehabilitation Activities (Operational Phase)

### 8.1. Specialist Recommendations

Issue	Management and mitigation guidelines
<b>Geotechnical Assessment</b>	<ul style="list-style-type: none"> <li>• Deep alluvial sediments, comprising clays, silts, sands and potentially boulders, must be expected.</li> <li>• The most suitable foundations comprise a piled solution socketed into bedrock.</li> <li>• All construction materials will need to be imported from a commercial source.</li> </ul>
<b>1:100 Year Floodline and Stormwater Management Plan Study</b>	<ul style="list-style-type: none"> <li>• To limit soil erosion, construction activities (more specifically clearing of land) should be limited to the dry season (May to October) as far as possible.</li> <li>• Construction activities should be limited to areas outside of the delineated floodlines as far as possible.</li> <li>• Berms should be constructed above and below the construction site during the preconstruction and construction phases of the project. Upstream diversions will ensure limited surface flows through construction areas. Downstream berms will ensure that sediments eroded from within the construction site will be trapped, therefore reducing the impact to the downstream receiving environment. It is recommended that the berms are constructed out of a non-erodible material, such as sand bags with plastic liners.</li> <li>• Materials excavated during the construction phase should be deposited in areas outside of drainage lines and stormwater channels. This will ensure minimal contact between concentrated stormwater runoff and the excavated materials.</li> <li>• Machinery used during the construction process should be regularly (at least daily) checked for oil leaks. During periods where the machinery is not in use, drip trays should be placed under the machinery to contain any spillages.</li> </ul>

	<ul style="list-style-type: none"> <li>Fuels and hydrocarbon stores used during the construction phase should be lined and bunded such that spills from the store areas will not enter the receiving environment.</li> <li>Water downstream of the proposed bridge site should be monitored before and during construction to ensure no degradation of water quality occurs.</li> <li>Clearing of vegetation for construction purposes should be undertaken in accordance with a method statement. The method statement must include the method of clearing, recovery of and disposal of vegetation.</li> </ul>
<b>Wetland and Vegetation Assessment</b>	<ul style="list-style-type: none"> <li>No soil or other material may be stockpiled within 15 m on either side of the active river channel;</li> <li>No soil or other material may be spoiled within the 1:100 year floodline;</li> <li>The river banks must be properly stabilised at the end of the construction phase. Well-anchored gabion baskets are supported, however, open stone packs are not recommended as they will be prone to erosion by floods.</li> <li>If coffer dams are used for the construction of the bridge piers, they must be kept as small as possible and must not be angled so as to direct water currents in a way which will cause the banks to scour.</li> <li>Great care must be taken to ensure that uncured cement and concrete are not allowed to spill or be placed into the water. These substances are highly toxic to aquatic organisms. Care must be taken to ensure that no tools or plant are washed anywhere that might allow the effluent to run to the watercourse.</li> <li>No waste materials or debris of any sort may be allowed to enter the watercourse.</li> <li>The construction site camp must be located outside the 1:100 year floodline area.</li> </ul>

ECO = Environmental Control Officer; E = Engineer C = Contractor

<b>8.2. Phase A - Site Establishment and Preliminary Activities</b>			
<b>Issue</b>	<b>Management and mitigation guidelines</b>	<b>Monitoring</b>	<b>Frequency</b>
<b>A 1. Compliance</b>	<ul style="list-style-type: none"> <li>The contractor must ensure that all necessary permits/Licences are obtained prior to commencement of construction: <ul style="list-style-type: none"> <li>Environmental Authorisation</li> </ul> </li> </ul>	C, ECO	Prior to construction

## 8.2. Phase A - Site Establishment and Preliminary Activities

	<ul style="list-style-type: none"> <li>- Water Use Licence from Department of Water and Sanitation.</li> <li>- Should any indigenous protected vegetation require movement or removal from site, a tree permit must be obtained from the Department of Agriculture, Forestry and Fisheries prior to clearing or removing the vegetation.</li> <li>• No construction work may be commenced or carried out before the necessary permits/licence have been issued and assigned.</li> <li>• Commencing construction activities without necessary permit can lead to legal actions or stopping of the project.</li> <li>• All persons employed by the eThekweni Municipality or the contractors for the project shall abide by the requirements of the EMPr.</li> <li>• Failure to abide with the specification of the EMPr will be considered as a breach of contract. This may result in personnel of the construction operation being ordered to leave the site.</li> <li>• Should the abovementioned issue occur, the Authorisation holder/ECO/Engineer shall verbally or in writing instruct the responsible Contractor regarding corrective and/or remedial actions required, specify a timeframe for the implementation of these actions. It must be noted that should the non-compliance continue, work will be suspended.</li> </ul>		
<p><b>A 2. Source of Material</b></p>	<ul style="list-style-type: none"> <li>• The contractor shall ensure that materials to be used during the construction are legally sourced.</li> <li>• The contractor shall prepare a statement of source indicating the source of all materials (including topsoil, sand, natural gravels and crushed stones) and submit these to the project manager and ECO for approval prior to commencement of any work</li> </ul>	C	Prior to construction

## 8.2. Phase A - Site Establishment and Preliminary Activities

	<ul style="list-style-type: none"> <li>Where applicable, a signed document from the supplier of natural materials should be obtained. It must indicate that the materials were sourced and extracted in a sustainable manner and in compliance with the relevant legislation.</li> </ul>		
<b>A 3. Appointing the ECO</b>	<ul style="list-style-type: none"> <li>The principal contractor must appoint an ECO who will be responsible for monitoring compliance with the conditions of the EMPr and the relevant authorisation.</li> <li>The ECO must assist the principal contractor in obtaining the necessary permit/licences.</li> </ul>	C	Prior to construction
<b>A 4. Management plans</b>	<ul style="list-style-type: none"> <li>The contractor must submit the site layout plans and the written Method Statements as per requirements of this EMPr to the Engineer and the ECO for approval prior to commencement of Construction.</li> <li>Environmental Awareness Plan for the Contractor's Employees.</li> </ul>	C, E & ECO	Prior to construction
<b>A 5. Site Establishment</b>	<ul style="list-style-type: none"> <li>The construction camps should at minimum comprise the following: <ul style="list-style-type: none"> <li>A site office;</li> <li>Formal ablution facilities (chemical toilet);</li> <li>A designated first aid area;</li> <li>A designated eating area;</li> <li>Designated general and hazardous material storage areas;</li> <li>Designated waste storage area;</li> <li>Designated smoking area;</li> <li>Adequate ablution facilities;</li> <li>Fire precautions;</li> <li>Formalised and appropriate refuelling area; and</li> <li>Designated maintenance area.</li> </ul> </li> <li>The camp site must not be located in 32m of a watercourse or within the 1:100</li> </ul>	C, E & ECO	Prior to construction

## 8.2. Phase A - Site Establishment and Preliminary Activities

	<p>year floodline or any other sensitive environmental feature or steep areas. The location must preferably be located in some of previous disturbed areas.</p> <ul style="list-style-type: none"> <li>• Berms should be constructed above and below the construction site during the preconstruction and construction phases of the project. Upstream diversions will ensure limited surface flows through construction areas. Downstream berms will ensure that sediments eroded from within the construction site will be trapped, therefore reducing the impact to the downstream receiving environment. It is recommended that the berms are constructed out of a non-erodible material, such as sand bags with plastic liners.</li> <li>• The Electricity Department (MV) must be informed if there are any services that needs relocating prior to construction.</li> </ul>		
<p><b>A 6. Clearing of vegetation for construction activities</b></p>	<ul style="list-style-type: none"> <li>• Prior to clearing the contractor must submit a method statement for site clearing.</li> <li>• Clearing of vegetation for construction purposes should be undertaken in accordance with a method statement. The method statement must include the method of clearing, recovery of and disposal of vegetation.</li> <li>• The clearing should be limited to areas that would be used for construction activities.</li> <li>• To limit soil erosion, construction activities (more specifically clearing of land) should be limited to the dry season (May to October) as far as possible.</li> <li>• Alien vegetation within the construction footprint must be removed prior to commencement of construction activities.</li> <li>• All alien vegetation shall be removed from the watercourse.</li> <li>• The contractor may not deface, paint or otherwise mark and/ or damage natural features/vegetation on site, unless agreed with the ECO.</li> <li>• Erosion control measures must be implemented to prevent silt and soil from</li> </ul>	<p>C &amp; ECO</p>	<p>Prior to construction</p>

## 8.2. Phase A - Site Establishment and Preliminary Activities

	<p>washing into the watercourse.</p> <ul style="list-style-type: none"> <li>The top soil should be kept for rehabilitation activities.</li> </ul>		
<b>A 7. Safety and security</b>	<ul style="list-style-type: none"> <li>The camp should be secured to minimise the opportunity for criminal activities occurring.</li> <li>All hazardous material stored on site must have appropriate signage and must have the necessary firefighting and spill containment, and clean-up equipment in case of emergency situations.</li> <li>Any deep excavations or dangerous areas must be adequately demarcated and sign posed with safety warning signage.</li> </ul>	C	On-going
<b>A 8. Environmental Awareness</b>	<ul style="list-style-type: none"> <li>Adequate environmental awareness must be provided for construction staff and the delivery or supplies.</li> <li>The induction training must include the following topics: <ul style="list-style-type: none"> <li>Explanation of what is meant by “environment” and why the environment needs to be protected and conserved;</li> <li>How construction activities can impact on the environment, and what measures can be taken to mitigate against these impacts;</li> <li>Awareness of emergency and hazardous spills response provisions;</li> <li>Prevention of pollution and litter control and the minimization of disturbance to sensitive areas;</li> <li>Social responsibility during construction. This entails being considerate to local land owners;</li> <li>Construction workers need to be made aware that they are not to make excessive noise (e.g. shouting/hooting);</li> <li>The need for a “clean site” policy also needs to be conveyed to construction workers</li> </ul> </li> </ul>	C & ECO	On-going



### 8.2. Phase A - Site Establishment and Preliminary Activities

	<ul style="list-style-type: none"> <li>All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibility by signing an induction attendance record.</li> <li>The contractor is expected to have “tool box” talks. Proof of these talks must be kept on the environmental file.</li> </ul>		
<b>A 9. Workers’ conduct on site</b>	<p>Worker conduct on site which encompasses a general regard for the social and ecological wellbeing of the site and adjacent areas. Workers need to be made aware of the following general rules of behaviour:</p> <ul style="list-style-type: none"> <li>No alcohol / drugs to be present on site and no firearms permitted on site or in vehicles transporting staff to / from site, (unless used by security personnel);</li> <li>Prevention of noise and unsocial behaviour.</li> <li>No collection of indigenous animals may take place.</li> <li>The feeding, or leaving of food, for animals in the area must be strictly prohibited.</li> </ul>	C	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

Issues	Management and Mitigation Guidelines	Monitoring	Frequency
<b>B. 1. Environmental File</b>	<p>The following documentation must be available on site in order to ensure compliance with the specifications of the EMPr.</p> <ul style="list-style-type: none"> <li>Copy of the EMPr;</li> <li>Copy of all other permits /licenses;</li> <li>Approved Environmental Method statements;</li> <li>Stormwater Management Plan;</li> <li>Copy of all rehabilitation plans (if available);</li> </ul>	C & ECO	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>• Audit reports;</li> <li>• Copies of Incident reports;</li> <li>• Receipts of waste disposal;</li> <li>• Proof of chemical toilet cleaning;</li> <li>• Records of complaints, attendance register for induction and toolbox talks.</li> </ul>		
<b>B 2. Access to site</b>	<ul style="list-style-type: none"> <li>• The contractor must establish appropriate warning signage along the roads warning both pedestrians and vehicles of the proposed development.</li> <li>• Construction vehicles and staff may only utilise the existing paths and road to gain access to construction site.</li> <li>• Construction activities must ensure the safety of the passing pedestrians and vehicles, as this is an existing and active path and road.</li> <li>• Construction vehicles must adhere to the speed limit of 25km/h</li> <li>• Unnecessary compaction of soil on site by heavy vehicles must be avoided as far as possible and construction vehicles need to be restricted to demarcated access and turning areas</li> <li>• The contractor must identify the location of all underground and overhead services and servitudes and demarcate them.</li> <li>• The contractor must ensure that all construction vehicles and mobile plants left unattended at night, adjacent to the public road in normal use or adjacent to construction areas where work is in progress, have appropriate light or reflectors or barricade equipped with appropriate lights or reflectors and drip trays underneath to contain any potential leak.</li> </ul>	C & ECO	On-going
	<p><b>Road maintenance</b></p> <ul style="list-style-type: none"> <li>• The access road must be monitored regularly and maintained in good working</li> </ul>		

### 8.3. Phase B - Construction Activities and Workforce Management

	<p>condition by attending potholes, corrugations and storm water damage.</p> <ul style="list-style-type: none"> <li>• If necessary, the contractor must order the construction staff to clean dust and material silt on public and access road.</li> <li>• The contractor must ensure that the road is retained to a state not worse than prior to construction commencing.</li> </ul>		
<b>B 3.Dust/Air pollution</b>	<ul style="list-style-type: none"> <li>• Cleared area must be dampened especially in dry and windy conditions to avoid excessive dust</li> <li>• Vehicles on site must adhere to the speed limit of 25km to avoid the generation of dust.</li> <li>• No burning of waste shall be permitted on site.</li> </ul>		
<b>B 4. Biodiversity</b>	<ul style="list-style-type: none"> <li>• Care must be taken to ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase;</li> <li>• Alien vegetation must be removed on site using the appropriate methods</li> <li>• Indigenous vegetation must be demarcated and set as no go area.</li> <li>• No natural vegetation may be cleared during construction without the prior permission of the Implementing Agent and ER.</li> <li>• Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported material as it may contain an alien seed bed.</li> <li>• Monthly alien invasive plant management and removal must be undertaken by the contractor in all areas which are disturbed by construction activities. This must continue during the defects liability period.</li> </ul>	C& ECO	On-going
<b>B 5. Safety and security</b>	<ul style="list-style-type: none"> <li>• The construction camp must be secured and access on site should be strictly controlled by a security company to prevent criminal activities.</li> </ul>	C	construction

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>All excavation work must be carried out under supervision.</li> <li>Deep Excavation or dangerous areas must be adequately demarcated and be sign-posted with safety warnings</li> <li>All hazardous material storage area must have appropriate signage and the necessary firefighting equipment's and spill containment and clean-up equipment's in case of emergency situations.</li> <li>No person may enter the site unauthorised</li> <li>A speed limit of 25km for all vehicles entering the site must be maintained.</li> <li>The contractor must ensure that all vehicles are road worthy</li> <li>No loose materials may be transported onto or off to site without the load be secured.</li> </ul>		
<b>B 6. Water Provision</b>	<ul style="list-style-type: none"> <li>Safe drinking water must be provided to all construction workers.</li> <li>Construction workers are to be discouraged from drinking directly from the watercourse.</li> </ul>	C	On-going
<b>B 7. Eating Areas</b>	<ul style="list-style-type: none"> <li>Temporary eating areas with shade shall be provided to ensure that the construction workers do not move off site to eat.</li> <li>Litter from eating areas must be collected on daily basis and placed on the provided bins.</li> <li>Watercourses shall not be used for washing dishes.</li> </ul>	C	On-going
<b>B 8. Smoking areas</b>	<ul style="list-style-type: none"> <li>No person may smoke in any place in which flammable liquid is used or stored, and the contractor must affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking.</li> </ul>	C	On-going
<b>B 9. Noise control</b>	<p><u>Noise control</u></p> <ul style="list-style-type: none"> <li>Excessive noise (from vehicles heavy equipment and machinery, and also from people shouting and radios turned up too loud) should be controlled.</li> </ul>		

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>• The contractor must ensure that vehicles are maintained regularly to reduce noise level.</li> <li>• Construction work shall be limited to normal hours between 08h00 to 05h00.</li> <li>• If necessary, construction vehicles should be fitted with standard silencers to reduce noise.</li> </ul>		
<b>B 10. Ablution Facilities</b>	<ul style="list-style-type: none"> <li>• Adequate ablution facilities must be provided for construction workers at least 1 per 20 workers.</li> <li>• The location of the ablutions must be agreed to prior to the commencement of the construction. In all cases these facilities should be not be so remote as to discourage their use by workers.</li> <li>• The location of the toilets must be outside 1:100 year floodline, and steep areas should be avoided.</li> <li>• The use of the ablution facilities must not cause pollution to any watercourse. The contractor shall be held responsible for cleaning, maintenance and servicing of the toilets.</li> <li>• Weekly servicing of the ablution facilities must be undertaken by the service provider and all service records are to be kept on site office.</li> <li>• The individual undertaking the servicing of the ablution facilities must ensure that there is no spillage when the ablution facilities are cleaned.</li> <li>• Ablutions must be secured with pegs and wires to prevent toppling during strong winds.</li> </ul>	C	On-going
<b>B 11. Excavations</b>	<ul style="list-style-type: none"> <li>• Excavation which is accessible to the public or which is adjacent to public roads must be adequately protected by a barrier or fence as close to the excavation as is</li> </ul>		

### 8.3. Phase B - Construction Activities and Workforce Management

	<p>practicable.</p> <ul style="list-style-type: none"> <li>Warning signs or other clearly visible boundary indicators must be positioned next to the excavation at night or where visibility is poor.</li> <li>No materials, or plant or equipment's may be stockpiled near the edge of the excavation.</li> </ul>		
<b>B 12. Material handling, use and storage.</b>	<p><u>Stockpile</u></p> <ul style="list-style-type: none"> <li>Imported material shall be indicated and demarcated on the site plan submitted in writing to the Employer for approval.</li> <li>No soil or other material may be stockpiled within 15 m on either side of the active river channel.</li> <li>No soil or other material may be spoiled within the 1:100 year floodline.</li> <li>Material stockpiles, must be stable and well secured to avoid collapse and potential injury to site workers and/or local residents. Obstruction to drivers' line of site due to stockpiles and stacked materials must be avoided, in particular at intersections and sharp corners.</li> <li>Any topsoil stockpiles must be kept separate from other stockpiled materials for later use in rehabilitation requirements.</li> <li>If topsoil or subsoil stockpiles are exposed to windy conditions or heavy rain, they could either be protected by vegetation using an indigenous grass seed mix or cloth, depending on the duration of the time which the stockpiles will remain.</li> </ul>	C	On-going
	<p><u>Hazardous Material</u></p> <ul style="list-style-type: none"> <li>The contractor must ensure that all personnel on site are trained in the proper use, handling and disposal of hazardous substances.</li> </ul>	C	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

- All fuel and chemicals (e.g. drums of fuels, grease, oil, hydraulic fluid) required on site are to be stored away from the watercourse, at the contractor's camp within an adequately bund wall (110% of the total volume of the tanks) and that has an impermeable base.
- The ECO must ensure that the capacity of the bund wall is adequate to cope with a spillage/ leak of the fuel storage container;
- If additional areas are required for the storage and handling of hazardous substances, they must be assessed and approved by the ECO;
- No possible spillages or accumulated stormwater within the bunded area will be allowed to be flushed from the bund into the surrounding areas. All fluids accumulated within the bund area shall be removed by a registered service provider and disposed of at a permitted disposal site;
- Any contaminated soil or water must be removed and stored in skips for later disposal at a permitted landfill site;
- The contractor shall ensure that there is an emergency procedure in place to deal with accidents and incidents (e.g. spills) arising from hazardous substances and ensure that all employees are aware of such procedure. The ECO must be notified in the event of a spill. A record must be kept of all spills and the corrective action be taken.
- Waybills shall be sourced from the service provider and be kept on site for inspection by the ECO during his/her audits
- Machinery used during the construction process should be regularly (at least daily) checked for oil leaks. During periods where the machinery is not in use, drip trays should be placed under the machinery to contain any spillages.

### 8.3. Phase B - Construction Activities and Workforce Management

	<p><u>Cement and concrete mixing</u></p> <ul style="list-style-type: none"> <li>• Concrete mixing directly on the ground shall not be permitted. All mixing shall take place on impermeable surface so that concrete waste and runoff can be contained. A board or other suitable platforms/surface is to be provided onto which the mixed concrete can be deposited prior to placing.</li> <li>• Concrete mixing shall not take place on the banks of the river.</li> <li>• All visible remains of excess concrete must be physically removed on completion of the concrete pour section and deposited in a designated area prior to removal to a permitted landfill site</li> <li>• No washing of the excess concrete shall occur on site.</li> <li>• Unused cement bags shall be stored out of the rain where runoff won't affect them.</li> <li>• Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent wind-blown cement dust and water contamination. Used cement bags shall be disposed of on a regular basis at a registered landfill site.</li> <li>• Great care must be taken to ensure that uncured cement and concrete are not allowed to spill or be placed into the water. These substances are highly toxic to aquatic organisms. Care must be taken to ensure that no tools or plant are washed anywhere that might allow the effluent to run to the river.</li> </ul>	C	On-going
<p><b>B13 Servicing and Re-fuelling of construction equipment's</b></p>	<ul style="list-style-type: none"> <li>• All vehicles operating on site must be inspected for oil and leaks on regular basis.</li> <li>• Leaking vehicles maintenance and repair work must be carried out at the construction camp within an area designated for this purpose, equipped with necessary pollution containment measures.</li> <li>• No vehicles may be repaired in any place other than in the maintenance yard.</li> </ul>	C	On-going



### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>• Drip trays must be used to capture any spills. Drip trays must be emptied on regular basis.</li> <li>• Drip trays must be present under all stationary plant on site;</li> <li>• Any major spills near a watercourse must be reported to the Department of Water and Sanitation, EDTEA: Monitoring and Compliance Unit, and the eThekweni Municipality.</li> <li>• Refuelling of vehicles shall only take place within a designated area where adequate pollution prevention measures are in place.</li> <li>• Washing of vehicles is prohibited near watercourse and must be done at the Construction Camp and Vehicles Maintenance yard;</li> <li>• Spill kits must be available on site to deal with spills immediately;</li> <li>• The contractor must ensure that there are emergency procedures in place to deal with accidents and incidents arising from hazardous substances and must ensure that all employees are aware of such procedures.</li> <li>• A record must be kept of all spills (date, cause and action taken) in the Environmental Incident Record book.</li> </ul>		
<b>B14 Waste management</b>	<u>General waste</u> <ul style="list-style-type: none"> <li>• Litter should be collected daily in all construction sites as well as the contractor's campsite.</li> <li>• Sufficient waste bins/skips must be available at different locations around the construction camp and work site for storing all domestic refuse and litter.</li> <li>• The bins must be secured and have lids to prevent their content blowing out and to exclude animals that may be attracted to the waste.</li> </ul>	C	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>The contractor shall arrange for the waste receptacles to be emptied on a regular basis;</li> <li>All waste must be removed from site and transported to permitted landfill site at least twice a week or when needs be.</li> <li>No burning, on-site burying or dumping of waste shall be allowed.</li> <li>The excavation and the use of rubbish pits on site is forbidden.</li> <li>Waybills for waste disposal must be kept on site for inspection by the ECO</li> </ul>		
	<p><u>Hazardous waste</u></p> <ul style="list-style-type: none"> <li>All hazardous waste shall be disposed of at the permitted landfill site. The contractor shall provide the Engineer's Representative with appropriate waybills for record keeping.</li> <li>Used oil and grease shall be removed from site and dispose of at permitted landfill site.</li> <li>No hazardous waste may be disposed within the watercourse.</li> </ul>	C	On-going
	<p><u>Construction rubble</u></p> <ul style="list-style-type: none"> <li>All construction rubble generated on site must be disposed into a permitted landfill site.</li> </ul>	C	On-going
	<p><u>Wastewater</u></p> <ul style="list-style-type: none"> <li>No waste water shall be disposed of directly into the watercourse.</li> <li>Discharge of waste water from temporary ablution facilities into the ground shall be prohibited.</li> <li>Wastewater from the cement mixing area shall not be allowed to enter the river, control measures must be in place to deal with such issues</li> </ul>	C	On going
<b>B15 Soil management</b>	<u>Topsoil</u>	C	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>• The contractor is required to strip topsoil from all areas where permanent or temporary structures are located and access road are to be constructed.</li> <li>• The topsoil must be kept aside for rehabilitation activities on a later stage.</li> <li>• Topsoil stockpiles are to be maintained in a weed free condition</li> <li>• The soil stockpiles should not exceed 2 metres in height. Construction vehicles should not drive over stockpiles.</li> <li>• Traffic and movement over stabilised areas shall be restricted and controlled.</li> </ul>		
	<p><u>Spoil material</u></p> <ul style="list-style-type: none"> <li>• The contractor must ensure that spoil material does not blow or wash away.</li> </ul>	C	On-going
	<p><u>Erosion and sediment control</u></p> <ul style="list-style-type: none"> <li>• Berms should be constructed above and below the construction site during the preconstruction and construction phases of the project. Upstream diversions will ensure limited surface flows through construction areas. Downstream berms will ensure that sediments eroded from within the construction site will be trapped, therefore reducing the impact to the downstream receiving environment. It is recommended that the berms are constructed out of a non-erodible material, such as sand bags with plastic liners. The site should be monitored weekly for any signs off-site siltation.</li> <li>• Minimise the amount of land disturbance and implement erosion and dust control practises and rehabilitation activities of the exposed areas as soon as practically possible.</li> <li>• Sediment trapping, erosion and stormwater control must be addressed by a civil engineer in a detailed stormwater management plan.</li> <li>• Protect banks that susceptible to erosion</li> </ul>	C	On-going

### 8.3. Phase B - Construction Activities and Workforce Management

	<ul style="list-style-type: none"> <li>Repair all erosion damages as soon as possible to allow for sufficient rehabilitation</li> </ul>		
<b>B16. Stormwater Management</b>	<ul style="list-style-type: none"> <li>The Contractor must prepare a stormwater management controls to ensure that all construction methods used site do not cause soil erosion.</li> <li>Where necessary, the temporary storm water cut-out drains must provided</li> <li>Stormwater contaminated with hazardous chemicals or petrochemicals must be treated and disposed of by a licenced service provider and waybills must be filed at the site office</li> </ul>	C & E	On going
<b>B17. Invasive Species Management</b>	<ul style="list-style-type: none"> <li>The contractor must develop an Invasive Species Management Programme. The eradication of invasive species must be in accordance with such programme.</li> <li>All disturbed areas must be monitored for any new establishing invasive plants</li> <li>Cleared invasive species may not be discharged of or disposed into the river.</li> <li>Should the contractor decide to use herbicide to remove alien plants on site the following precautions must be followed:               <ul style="list-style-type: none"> <li>Only registered herbicides may be used to treat/remove alien plant species</li> <li>The contractor must follow the instructions provided on the herbicide's container when applying it to alien vegetation</li> <li>Selective herbicide may be used where there is a mixture of indigenous vegetation in order to avoid killing the indigenous plants.</li> <li>Herbicides should not be applied during windy conditions and when there is rain.</li> <li>Unused herbicides and empty herbicide containers must not be disposed of on site, but be collected, stored at a point on site approved by the Employer and disposed of by a registered service provider at a registered landfill site</li> </ul> </li> </ul>	C & ECO	On going

### 8.3. Phase B - Construction Activities and Workforce Management

	<p>capable of receiving hazardous materials.</p> <ul style="list-style-type: none"> <li>- Waybills must be collected and provided to the employer for record keeping.</li> <li>- Herbicides are to be kept within the Hazardous Materials Storage Area.</li> <li>- No contamination of the watercourse may be tolerated.</li> </ul>		
<b>B 18. Fire precaution</b>	<ul style="list-style-type: none"> <li>• The contractor shall take reasonable measures to ensure that fires are not started as result of negligence of contractor's employees.</li> <li>• Collection of firewood and lighting of open fires are not permitted.</li> <li>• No fuels or chemical may be stored under trees.</li> <li>• Suitable and sufficient fire-extinguishing equipment must be placed in strategic locations or as recommended by the fire chief or local authority concerned, and such equipment is maintained in a good working order.</li> <li>• A sufficient number of workers must be trained in the use of fire-extinguishing equipment.</li> <li>• Smoking is prohibited, and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials.</li> <li>• The contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire.</li> <li>• The contractor must ensure that all site personnel are aware of the procedure to be followed in the event of fire.</li> <li>• No open fires for heating or cooking will be permitted on site.</li> <li>• The Contractor must ensure that the telephone number of local fire and emergency Service are displayed at the site offices.</li> </ul>	C	On-going
<b>B 19. Water Quality</b>	<ul style="list-style-type: none"> <li>• Construction workers shall not be permitted to take water from the watercourse or any other natural water sources for the purposed of bathing, washing of clothing for</li> </ul>	C & ECO	On going

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	<p>any construction related activities.</p> <ul style="list-style-type: none"> <li>• Appropriate stormwater/ surface water management measures must be put in place before construction commence and maintained through the lifetime of the development;</li> <li>• All watercourses shall be protected from erosion and direct or indirect spills of pollutants, e.g. sediment, refuse, sewage, cement, fuels, chemicals, wastewater and bitumen;</li> <li>• Drip trays shall be used for all pumps, generators or other stationery equipment that will be used in watercourses in order to prevent water contamination as result of fuel spillages or leaks;</li> <li>• Appropriate silt control mechanism must be installed around excavated areas to prevent silt from entering the surrounding watercourses;</li> <li>• Should any excavation require dewatering, this is to occur through an adequately designed silt trap prior to discharge. All traps are to be regularly monitored and maintained to ensure efficient and effective use.</li> <li>• Water both upstream and downstream of the proposed bridge site should be monitored before and during construction to ensure no degradation of water quality occurs.</li> </ul>		
<p><b>B 20. Heritage</b></p>	<ul style="list-style-type: none"> <li>• Amafa should be contacted if any heritage objects are identified during earthmoving activities and all development should cease until further notice;</li> <li>• Sources of all natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt, etc.) must be obtained in a sustainable manner and in compliance with the heritage legislation.</li> </ul>	<p>C, E, ECO</p>	<p>On going</p>

#### 8.4. Phase C- Post Construction and Rehabilitation Activities

Issues	Management and Mitigation Guideline	Monitoring	Frequency
<b>C1. Construction camp</b>	<ul style="list-style-type: none"> <li>• All temporary storage areas, site camp, etc. must be rehabilitated. This includes construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing shall be removed from site.</li> <li>• The site must be checked for erosion damage and rehabilitation must be undertaken.</li> <li>• The contractor must have identified spills and ensure that they are cleaned up prior to moving out of the construction site.</li> <li>• All rubble is to be removed from the site to a permitted disposal site or as approved by the Engineer. Burying of rubble on site is prohibited.</li> <li>• All leftover building materials must be removed from the site.</li> <li>• In areas where natural vegetation may be impacted upon / disturbed by construction activities, these areas are to be top soiled and re-planted with locally occurring indigenous species and managed until vegetation has become established</li> <li>• It is advisable that any vegetation rehabilitation activities undertaken by the Contractor be overseen or undertaken by a suitably experienced specialist to ensure successful establishment of vegetation.</li> <li>• A meeting must be held on site between the Engineer, Contractor and ECO to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer.</li> <li>• Upon completion of the rehabilitation activities, the ECO must compile a close out audit report and submit it to the EDTEA: Compliance Section.</li> </ul>	C, E & ECO	Post construction
<b>C2. Rehabilitation</b>	<ul style="list-style-type: none"> <li>• The area must be left with a well-established vegetation cover at the end of the construction phase. The vegetation to be used may be grasses but Kikuyu Grass may not be used. Instead a mix of grasses which are indigenous to the area must be planted. Tufted species which are palatable to livestock are not recommended while the use of</li> </ul>	C, E & ECO	Post construction

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	<p><i>Cynodon dactylon</i>, and <i>Stenotaphrum secundatum</i> is recommended. There is no need to plant trees or shrubs since these will seed themselves.</p> <ul style="list-style-type: none"> <li>The river banks must be properly stabilised at the end of the construction phase. Use may be made of structures such as well-anchored gabion baskets but open stone packs are not recommended as they will be prone to erosion by floods.</li> </ul>		
<b>C3. Monitoring</b>	<ul style="list-style-type: none"> <li>The site and its surrounds must be monitored for at least two years after construction is completed. It is recommended that the monitoring period be six monthly, and that the following items be checked: <ul style="list-style-type: none"> <li>River banks. The river banks must be checked for any signs of new erosion.</li> <li>Vegetation cover. The whole project area must be checked to see that an appropriate vegetation cover has been established.</li> </ul> </li> <li>If any issues are found by the monitoring, they are to be brought to the attention of the eThekweni Municipality and are to be rectified within two months provided that further planting of grass or other plants may be leftover until the start of the following growing season.</li> </ul>	ECO, E	Post construction



<b>9. Contact Numbers</b>	
<b>General Numbers</b>	
eThekwini Police	031 361 0000 (Emergencies) 031 300 3399 (General Enquiries)
eThekwini Fire Department	031 361 0000 (Emergencies)
eThekwini Electricity	0801 313 111 (Help Line)
eThekwini Water	0800 323 235 (Help Line)
eThekwini Waste Water	0800 323 235 (Help Line)
eThekwini Environmental Management Branch	031 300 2517
eThekwini Municipality - Water and Sanitation	080 13 13 013 (24 hours)
Abzorbit (24 hour response for oil and chemical spills on land or water, bioremediation, distributors of PEAT SORB)	0800 303 303 (24 hr emergency response) 083 269 8790 (Doug) 083 253 6618 (Gerald)
FFS Refiners (for the free collection of used lubricating oil)	031 465 1466
ROSE Foundation (for the free collection of used lubricating oil)	0800 107 107

<b>Waste Management Contact Details</b>	
Durban Solid Waste (DSW) Disposal Branch – Help Line (Contact for locations and facilities offered at refuse sites within the eThekwini Municipality)	031 263 1371 031 263 1310 (Fax)
DSW Business Branch (Contact for arranging refuse collection from the construction site)	031 302 4825 031 263 1122 (Fax)

<b>Permitted Hazardous Waste Sites &amp; Hazardous Waste Contractors</b>	
Bulbul Drive, Chatsworth (Waste Services) This site handles general and low hazardous waste.	031 460 4600 (Tel: Waste Services)

<b>DSW Permitted General Waste Sites (for all Non-Hazardous Waste)</b>	
Bisasar Road (Springfield)	031 263 1371
La Mercy	083 469 8034
Mariannahill	031 700 8929
Kwamgenwa (South Coast)	031 462 5320 (Morgan Nadasen)