



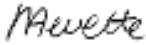
**ETHEKWINI MUNICIPALITY ENGINEERING UNIT:  
ROADS PROVISIONS DEPARTMENT**

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**DM/0039/2014: PROPOSED  
EMANSOMINI PEDESTRIAN  
BRIDGE**

**Environmental Management Programme**

**Date:** 16<sup>th</sup> February 2016  
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**ETHEKWINI MUNICIPALITY ENGINEERING UNIT: ROADS  
PROVISIONS DEPARTMENT**

**PROPOSED CONSTRUCTION OF THE EMANSOMINI PEDESTRIAN  
BRIDGE**

**EIA REF. NO: DM/0039/2014**

**ENVIRONMENTAL MANAGEMENT PROGRAMME**

**CONTENTS**

<b>1.</b>	<b>DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)</b> .....	<b>1</b>
<b>2.</b>	<b>INTRODUCTION</b> .....	<b>1</b>
<b>3.</b>	<b>DESCRIPTION OF DEVELOPMENT</b> .....	<b>2</b>
<b>3.1.</b>	<b>Background</b> .....	<b>2</b>
<b>3.2.</b>	<b>Location</b> .....	<b>2</b>
<b>3.3.</b>	<b>Key Findings from Basic Assessment Report</b> .....	<b>2</b>
<b>4.</b>	<b>AIM AND OBJECTIVES OF THE EMPR</b> .....	<b>3</b>
<b>5.</b>	<b>COMPLIANCE WITH APPLICABLE LAWS</b> .....	<b>4</b>
<b>5.1</b>	<b>Compliance with the EMPr</b> .....	<b>4</b>
<b>6.</b>	<b>DUTIES OF ROLE PLAYERS</b> .....	<b>5</b>
<b>6.1</b>	<b>Developer (DEV)</b> .....	<b>5</b>
<b>6.2</b>	<b>Engineer (E)</b> .....	<b>5</b>
<b>6.3</b>	<b>Environmental Control Officer (ECO)</b> .....	<b>6</b>
<b>6.4</b>	<b>Contractor (C)</b> .....	<b>6</b>
<b>7.</b>	<b>PRE-CONSTRUCTION PLANNING PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS</b> .....	<b>6</b>
<b>7.1</b>	<b>Permits / Licenses</b> .....	<b>6</b>
<b>7.1.1</b>	<b>Licenses/Permits</b> .....	<b>6</b>
<b>7.1.2</b>	<b>Required Management plans</b> .....	<b>6</b>
<b>7.2</b>	<b>Source of Materials</b> .....	<b>7</b>
<b>8.</b>	<b>SITE ESTABLISHMENT AND SETUP PHASE</b> .....	<b>7</b>
<b>8.1</b>	<b>Demarcation of sensitive environmental areas</b> .....	<b>7</b>
<b>8.2</b>	<b>Stormwater, Erosion and Soil Management</b> .....	<b>7</b>
<b>8.3</b>	<b>Establishment of equipment lay-down and storage areas (where applicable)</b> .....	<b>8</b>
<b>8.4</b>	<b>Conservation of Natural Resources</b> .....	<b>8</b>
<b>8.5</b>	<b>Security Fencing and Lighting</b> .....	<b>8</b>
<b>8.6</b>	<b>Visual Impacts</b> .....	<b>9</b>

8.7	Environmental education and awareness and worker conduct .....	9
8.1.1	ENVIRONMENTAL AWARENESS .....	9
8.1.2	CULTURAL HERITAGE ENVIRONMENT .....	9
8.1.3	WORKER CONDUCT ON SITE .....	9
9.	CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS .....	10
9.1	Environmental Management File .....	10
9.2	Maintenance of access and haulage roads .....	10
9.3	Maintenance of the Construction Camp .....	10
9.4	Traffic Impact .....	11
9.5	Ablution Facilities .....	11
9.6	Visual Impacts .....	11
9.7	Staff Conduct .....	11
9.8	Air Pollution .....	11
9.9	Noise Pollution .....	12
9.10	Alien invasive management .....	12
9.11	Vegetation .....	12
9.12	Floodplain, Wetlands and Watercourses .....	13
9.13	Soil Erosion & Stormwater Control .....	14
9.14	Handling of hazardous materials .....	15
9.15	Waste Management .....	16
9.16	Social Impacts to the Adjacent Landowners .....	16
9.17	Fire Control .....	17
10.	POST CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS .....	17
10.1	Construction Camp .....	17
10.2	Waste Disposal .....	17
10.3	Alien control & eradication .....	17
10.4	Rehabilitation .....	18
11.	OPERATIONAL PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS .....	18
11.1	Alien control .....	18
11.2	Stormwater Control .....	18
12.	COMPLIANCE MONITORING .....	18
12.1	Construction Phase .....	18
12.2	Operational Phase .....	19
13.	AMENDMENTS TO THE EMPR .....	19

## **Appendices:**

Appendix A:	Environmental Authorisation (to be added)
Appendix B:	Alien Invasive Management Plan
Appendix C:	Approved Layouts

## **Tables:**

Table 1:	Details of EAP who prepared the EMPr
Table 2:	Specialist Findings and Recommendations

## **Abbreviations**

C	Contractor
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
DEV	Developer
DAFF	Department of Agriculture, Fisheries and Forestry
DWA	Department of Water Affairs
E	Engineer
EA	Environmental Authorisation (formerly known as RoD – Record of Decision)
ECO	Environmental Control Officer
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
I&AP's/IAPs	Interested and Affected Parties
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act
NFPA	National Fire Protection Association
SABS	South African Bureau of Standards
SANS	South African National Standards
SM	Site Manager

## **List of Terms Used**

### **Construction Phase:**

The activities pertaining to the preparation for and the physical construction of the proposed development.

### **Contractor:**

Persons/organisations contracted by the Developer to carry out parts of the work for the planned development. This includes the main contractor engaged and any additional sub-contractors appointed for the project.

### **Developer (DEV):**

The Developer is the eThekweni Municipality.

### **Engineer (E):**

Person/organisation appointed by the Client to oversee the work of all consultants, sub-developers, contractors, residents and visitors.

### **Environment:**

The environment is defined in terms of the National Environmental Management Act, No 107 of 1998, as the surroundings within which humans exist and that are made up of – the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination thereof and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

### **Environmental Control Officer (ECO):**

Person/organisation appointed by the Developer who will provide direction to the Engineer concerning the activities within the Construction Zone, and who will be responsible for conducting the environmental audits of the project during the construction phase of the project according to the provisions of the Environmental Management Plan.

### **Environmental Management Programme (EMPr):**

The EMPr is a detailed plan for the implementation of the mitigation measures to minimise negative environmental impacts during the life-cycle of a project. The EMPr contributes to the preparation of the contract documentation by developing clauses to which the contractor must adhere for the protection of the environment. The EMPr specifies how the construction of the project is to be carried out and includes the actions required for the Post-Construction Phase to ensure that all the environmental impacts are managed for the duration of the project's life-cycle.

### **Neighbours:**

Considered to be the properties adjoining the proposed site.

### **Operational Phase (Post Construction):**

The period following the Construction Phase, during which the proposed development will be operational.

### **Pre-Construction Phase:**

The period prior to commencement of the Construction Phase, during which various activities associated with the preparation for the Construction Phase will be undertaken.

### **Rehabilitation:**

Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

### **Site Manager:**

The person, representing the MAIN CONTRACTOR, responsible for all the Contractor's and Sub-contractors activities on the site including supervision of the construction staff and activities associated with the Pre-construction and Construction Phase. The Site Manager will liaise with the Engineer in order to ensure that the project is conducted in accordance with the Environmental Management Plan.

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**ENVIRONMENTAL MANAGEMENT PROGRAMME**

**1. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

This Environmental Management Programme has been prepared by SiVEST (PTY) Ltd and will be submitted to the Department of Agriculture, Environmental Affairs & Rural Development (EDTEA) for consideration.

**Table 1: Details of EAP who prepared EMPr**

<b>Name</b>	<b>Role</b>	<b>Qualifications</b>	<b>Experience</b>
Michelle Nevette	Project Leader	M. Sc (Env. Mgt.)	14
Luvanya Naidoo	Project Consultant	<i>OHSP</i> B. Sc (Env Sci) - current	5

**2. INTRODUCTION**

This EMPr serves as an environmental management tool by providing a generic structured plan of mitigation measures, which serves as a guide to assist in minimising the potential environmental impact of the activities that may arise during the pre-construction, construction and operational phases of this development.

This EMPr provides a set of guidelines for the environmental management of all works executed by the Developer, Engineer, Contractor and Subcontractor/s to have a minimum impact on the environment in accordance with all relevant legislation, policies and standards.

In this context it must be viewed as a dynamic or 'living' document, which may require updating, or revision during the life-cycle of the development to address new circumstances as the need arises. It is essentially, a written plan of how the environment is to be managed in practical and achievable terms.

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor and Sub-contractors. It is further assumed that compliance with the EMPr will be monitored and audited on a regular basis as set out in the EMPr and contractual clauses.

### 3. DESCRIPTION OF DEVELOPMENT

#### 3.1. Background

The eThekweni Municipality, Procurement and Infrastructure Department proposes the construction of a Pedestrian Bridge crossing the Mbokodweni River between Umlazi and Emansomini.

Residents crossing the river between Umlazi Y Section and Emansomini currently make use of a poorly constructed and unstable wooden bridge that crosses the river. This make-shift structure is highly dangerous and the height of the water during storms and after storms makes the bridge somewhat inaccessible for pedestrians trying to cross the river. The high water level is also evident by the damage to embankments and planted crops. Therefore, a structure for pedestrian traffic is of high importance in this area.

The bridge will be a reinforced concrete structure. It will span approximately 90m and have piled foundations. The bridge deck will be 2m wide.

#### 3.2. Location

The proposed location of the pedestrian bridge is between the Umlazi Y Section and Emansomini districts in Umlazi, within the jurisdiction of eThekweni Municipality.

The geographical coordinates of the site are as follows:

- South (Longitude): 30°0'30.17"
- East (Latitude): 30°52'26.97"

#### 3.3. Key Findings from Basic Assessment Report

**Table 1: Specialist Summaries**

Environmental Parameter	Summary of Major Findings
Wetland Assessment	Mr Ryan Edwards of GCS conducted a wetland delineation and functional assessment for the site. The riverine system was assessed as being of moderate ecological importance and sensitivity despite the moderately-high level of modification due to the moderate value of the riverine system in terms of refuge value and moderate sensitivity to flow changes. It is also important to note that the riverine system is important in terms of ecological connectivity between upstream and downstream reaches and is currently included in D'MOSS. The floodplain wetland was assessed as being of moderate functional importance due largely to the moderate level at which flood attenuation, sediment trapping and water quality enhancement services are being provided as well as large size of the wetland's catchment. In terms of potential impacts, the development of a new pedestrian bridge is expected to result in a number of potential direct and indirect impacts to the Mbokodweni River instream and riparian habitat and floodplain wetland habitat during the construction and operational phases. However, with the implementation of the mitigation measures recommended by the Wetland specialist, minimized impacts may be achieved. Recommendations from the specialist study is included in <b>Section 9.12</b> below.
Flood Assessment	Mr Leon Hellberg of SiVEST Civil Engineering Division conducted the Floodline assessment for the site. The study revealed that the water surface elevation during a 100 year flood was estimated to increase by 0.09 metres which is considered a negligible value. The construction of the proposed pedestrian bridge as designed would therefore not impose any significant impacts on the flow of the river.



Environmental Parameter	Summary of Major Findings
Vegetation Assessment	Mr David Styles conducted the Vegetation Assessment for the site. The assessment concluded that the site is situated within a vegetation type designated as Kwazulu-Natal Coastal Belt Grassland (Scott-Shaw & Escoott 2011) corresponding with the Kwazulu-Natal Coastal Belt of Mucina & Rutherford (2006). This vegetation type is seen as <b>Critically Endangered</b> . The site also falls within a Critically Endangered listed ecosystem namely, Interior South Coast Grasslands, KZN 7 (SANBI 2009) and falls within Category F. This ecosystem is situated within the Kwazulu-Natal Coastal Belt and is an amalgam of six vegetation types including Kwazulu-Natal Sandstone Sourveld, Ngongoni Veld, Kwazulu-Natal Coastal Belt, Pondoland Scarp Forest, Pondoland Ugu Sandstone Sourveld. <b>One protected tree, <i>Millettia grandis</i></b> , was observed in a patch of woody vegetation. The removal of this tree must be avoided. Should this not be possible, a permit must be obtained from Ezemvelo KZN Wildlife. A large amount of alien vegetation was also observed within close proximity to the river. The proposed construction will destroy, damage or alter some vegetation. As such, the mitigation measures must be implemented. Recommendations from the specialist study is included in <b>Section 9.11</b> below.
Heritage Assessment	Mr F Prins of Active Heritage was appointed to assess the site in order to establish whether the proposed development would impact on any features of heritage significance. The Heritage Specialist confirmed that no aspects of heritage value were found on the site.

#### 4. AIM AND OBJECTIVES OF THE EMPR

This EMPr provides a set of guidelines for the environmental management of all works executed by the Developer, Project Engineer, Contractor and Subcontractor/s to have a minimum impact on the environment in accordance with all relevant legislation, policies and standards. The EMPr has been prepared as per the requirements outlined in Section 33 of the NEMA EIA Regulations (GN No. R 543 of 18 June 2010).

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor and Sub-contractors. It is further assumed that compliance with the EMPr will be monitored and audited on a regular basis as set out in the EA and contractual clauses.

The aim of the EMPr is to:

- Identify those construction activities identified for the proposed development that may have a negative impact on the environment;
- Outline the mitigation measures that will need to be taken and the steps necessary for their implementation;
- Describe the reporting system to be undertaken during construction.

The objectives of the EMPr are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential adverse impacts to minimal or insignificant levels.
- Provide a pro-active and practical working mechanism to enable the measurement and monitoring of environmental performance on site, i.e. to provide guidance for the environmental auditing of the project.
- Provide management structures that address the concerns and complaints of IAPs pertaining to the development.
- Ensure that the environmental specifications are identified, effective and contractually binding so as to enable compliance on site.

## 5. COMPLIANCE WITH APPLICABLE LAWS

The supreme law of the land is “The Constitution of the Republic of South Africa”, which states: “Every person shall have the right to an environment which is not detrimental to his or her health or well-being”. Laws applicable to the protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to:

- Animals Protection Act , Act No. 71 of 1962
- Atmospheric Pollution Prevention Act, No. 45 of 1965
- Conservation of Agricultural Resources Act, No. 43 of 1983
- Environmental Planning Act, Act No. 88 of 1967
- Forest Act, No. 122 of 1984
- Forest and Veld Conservation Act, Act No. 13 of 1941
- KwaZulu-Natal Heritage Act, Act No. 4 of 2008
- Hazardous Substances Act, No. 15 of 1973
- Land Survey Act, No. 9 of 1921
- Minerals Act, No. 50 of 1991
- National Building Regulations Standards Act, Act No. 103 of 1977
- National Environmental Management Act, Act No. 107 of 1998
- National Environmental Management: Air Quality Act, Act No. 39 of 2004
- National Environmental Management: Biodiversity Act, Act No. 10 of 2004
- National Environmental Management: Environment Conservation Act Amendment, No. 50 of 2003
- National Environmental Management: Waste Act, Act No. 59 of 2008
- National Heritage Resources Act, No. 25Act of 1999
- National Water Act, Act No. 36 of 1998
- Occupational Health and Safety Act, Act No. 85 of 1993
- Provincial and Local Government Ordinances and Bylaws
- Soil Conservation Act, Act No. 76 of 1969
- Tourism Act, Act No. 72 of 1993
- Water Services Act, Act No. 108 of 1997

### 5.1 Compliance with the EMPr

A copy of the EMPr must be kept on site during the construction period at all times. The EMPr will be made binding on all contractors operating on the site and will be included within the Contractual Clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance with the Environmental Authorisation to be issued by EDTEA. It must be noted that in terms of Section 28 of the National Environmental Management Act (NEMA) Act No. 107 of 1998, those responsible for Environmental Damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage. (The polluter pays principle).

The Contractor is deemed not to have complied with the EMPr if:

- Within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of clauses;
- If environmental damage ensues due to negligence;
- The contractor fails to comply with corrective or other instructions issued by the ECO or Engineer within a specified time,
- The Contractor fails to respond adequately to complaints from the public.

The Developer is deemed not to have complied with the EMPr if:

- Within the boundaries of the site there is evidence of contravention of clauses;
- If environmental damage ensues due to negligence;
- They fail to respond adequately to complaints from the public.

Application of a penalty clause will apply for incidents of non-compliance. The penalty imposed will be per incident and the actual cost of repair and rectification will be recovered from the contractor for the following:

- Failure to demarcate wetland buffers
- Failure to demarcate construction/working areas
- Working outside of the demarcated construction/working area without prior permission from the EDTEA
- Failure to strip topsoil and stockpile separately from subsoils
- Failure to stockpile materials in designated areas
- Failure to provide adequate sanitation to workers
- Failure to provide adequate onsite waste disposal facilities and services
- Nuisance to neighbours by Construction staff
- Failure to control stormwater run-off within the construction site
- Failure to establish erosion control measures
- Failure to rehabilitate disturbed areas within the specified time-frame
- Any other contravention of project specific specification
- Any other contravention of particular environmental specification
- Second offence or more to any of the non-compliances above

## **6. DUTIES OF ROLE PLAYERS**

### **6.1 Applicant/Developer (DEV)**

- Complies with all applicable legislation and is conversant with the requirements of the Environmental Management Programme and Environmental Authorisation;
- The Applicant will be held responsible for any non-compliance of the EMPr and Environmental Authorisation by the Contractor and sub-contractor.
- Assesses all activities requiring special attention as specified and/or requested by the E and/or ECO for the duration of the Contract;
- Ensures that the Contractor conducts all activities in a manner that minimises disturbance to directly affected residents and the public in general, as advised by the E and/or ECO;
- May, on the recommendation of the E and/or ECO, order the Contractor to suspend any or all works on site if the Contractor or his subcontractor/ supplier fails to comply with the said environmental specifications.

### **6.2 Engineer (E)**

- Complies with all applicable legislation and is conversant with the requirements of the Environmental Management Programme (EMPr);
- Arranges information meetings for and consults with I&AP's about the impending construction activities;
- Maintains a register of complaints and queries by members of the public at the site office. This register is forwarded to the ECO a bi-monthly basis.
- Enforces and monitors compliance the requirements of the EMPr on site;
- Assesses the Contractor's environmental performance in consultation with the ECO;
- Documents in conjunction with the Contractor, the state of the site prior to construction activities commencing.

### 6.3 Environmental Control Officer (ECO)

- Briefs the Contractor about the requirements of the Environmental Specification and/ or Environmental Management Programme, as applicable;
- Advises the E about the interpretation, implementation and enforcement of the Environmental Specification and other related environmental matters;
- Monitors and reports on the performance of the contractor/project in terms of environmental compliance with the EMPr to the E and Developer and the assessing authority (if applicable);
- Provides technical advice relating to environmental issues to the E;

### 6.4 Contractor (C)

- Complies with all applicable legislation, is conversant with the requirements of the Environmental Management Programme, and briefs staff about the requirements of same;
- Ensures any sub-contractors/ suppliers who are utilised within the context of the contract comply with the environmental requirements of the EMPr and Environmental Authorisation.
- Supplies method statements for all activities requiring special attention as specified and/or requested by the E or ECO during the duration of the Contract;
- Provides environmental awareness training to staff and sub-contractors as specified;
- Bears the costs of any damages/ compensation resulting from non-adherence to the EMPr or written site instructions;
- Conducts all activities in a manner that minimises disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment.
- Ensures that the E is timeously informed of any foreseeable activities that will require input from the ECO.

## 7. PRE-CONSTRUCTION PLANNING PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS

Pre-Construction Planning EMPr activities are those relating to obtaining the necessary permits or approvals and management plans prior to the start of the Construction Phase.

### 7.1 Permits / Licenses

#### 7.1.1 Licenses/Permits

- A copy of the environmental authorization must be kept by the authorization holder and made available to any official of the Department on request.
- A water use license must be obtained before construction commences for any areas where there will be impeding and/or diversion of water courses as well as infilling of any wetlands or as required by the Department of Water Affairs.
- Should any protected indigenous vegetation be removed, cut or pruned, to accommodate the development, a permit must be obtained from the Department of Agriculture, Fisheries and Forestry (DAFF) and/or Ezemvelo KwaZulu-Natal (EKZNW) prior to such vegetation being removed, cut or pruned.
- The protected tree, *Milettia grandis*, was observed in a patch of woody vegetation. The removal of this tree must be avoided. Should this not be possible, a permit must be obtained from Ezemvelo KZN Wildlife and DAFF.
- The South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act No 4 of 2008) requires that operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.

#### 7.1.2 Required Management plans

- The contractor must submit a clearing and earthworks plan to the appointed Environmental Control Officer (ECO) for approval prior to construction commencing. This plan must indicate how clearing and earthworks are going to progress across the site in a phased manner.
- The contractor must submit an environmental awareness plan to the appointed Environmental Control Officer (ECO) for approval prior to construction commencing. This plan must indicate how the contractor will educate his staff on environmental issues and aspects.
- Method Statements for working in the river and floodplain must be submitted to the ECO for approval.

## **7.2 Source of Materials**

- The contractor must compile a source statement showing the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc.) and submit these to the Project Engineer for approval prior to commencement of any work. This must be submitted on award of the contract.
- A signed document from the supplier of natural materials must be obtained, confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation. Where materials are borrowed (mined), evidence must be provided of authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Minerals and Energy.

## **8. SITE ESTABLISHMENT AND SETUP PHASE**

Pre-Construction EMP activities are those relating to the preparation of the site prior to the start of the Construction Phase.

*It is important that all of the listed mitigation measures are costed for in the construction phase financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.*

### **8.1 Demarcation of sensitive environmental areas**

- Any sensitive areas around the site must be fenced off using stakes and orange 'snow' fencing during the construction phase and considered a "no-go" zone for the duration of the construction phase. The buffer fencing must be approved by the ECO and established prior to construction commencing.
- No development is permitted or allowed outside the approved development area.
- During the construction phase, the edge of the active channel, macro channel and artificial wetland depression must be clearly demarcated using danger tape and stakes.

### **8.2 Stormwater, Erosion and Soil Management**

- The Contractor must ensure that wind screening and stormwater management controls be undertaken to prevent soil loss during site establishment.
- Clearing activities should only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected clearing activities should be put on hold.
- The contractor must attend to drainage of the camp site to avoid standing water (ponding) and/or rill erosion.
- The time that stripped areas are exposed must be minimized wherever possible. Care must be taken to ensure that lead times are not excessive.
- Procedures that are in place to conserve topsoil during the construction phase are to be applied during the site establishment phase. i.e. topsoil is to be conserved while providing access to the site and setting up the camp.
- Prior to Site establishment the Contractor must strip and stockpile all soil within the works area for possible subsequent use. Stockpiled soil must not be in excess of 2m in height, and must be protected from wind and rain with the use of tarpaulins where necessary. The area stripped

of soil is to be surfaced, and it is unlikely that the stripped soil will be required for rehabilitation purposes.

### **8.3 Establishment of equipment lay-down and storage areas (where applicable)**

- Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general onsite topography and water erosion potential of the soil.
- An impervious hardened surface should be constructed on which equipment and/or hazardous substances can be stored/handled/used. The surface should be graded to the centre so that spillage may be collected and satisfactorily disposed of.
- Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by children and animals.
- Fire prevention facilities must be present at all storage facilities.
- Hazardous storage and refuelling areas must be placed outside the 1:100 year floodplain and bunded prior to their use on site during the construction period. The bund wall must be high enough to contain at least 110% of any stored volume.
- These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.
- Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected.
- Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.
- Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The contractor must ensure that their staff is made aware of the health risks associated with any hazardous substances used and have been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.
- Drip trays should be utilised at all dispensing areas or a biddum and stone-chip hazardous materials filling and handling area should be established adjacent to the bund.
- An appropriate number of 44-gallon drums must be kept on site to collect potential and contaminated soil.

### **8.4 Conservation of Natural Resources**

- No natural vegetation may be cleared during the site establishment (or construction) without the prior permission of the Project Engineer and Environmental Control Officer. The ECO must be given an opportunity to mark vegetation such as indigenous trees and/or wetland areas that are to be conserved before the Contractor starts to clear the site.
- 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.
- Alien clearing must be undertaken within the entire development zone in accordance with the approved Alien Invasive Management Plan guideline document prepared by the Environmental Planning and Climate Protection Department, EtheKwini Municipality (refer to Appendix C).

### **8.5 Security Fencing and Lighting**

- During site establishment the site camp must be secured if necessary to minimize the opportunity for criminal activity. The site camp must be fenced and manned on a 24 hour basis.

## 8.6 Visual Impacts

- Storage facilities, elevated tanks and other temporary structures on site should be located such that they have as small as possible visual impact on adjacent land uses. The site should be screened with the use of shade cloth prior to the start of construction. Screening of highly reflective material should be given particular attention.

## 8.7 Environmental education and awareness and worker conduct

### 8.1.1 Environmental Awareness

- All staff and contractor(s)/subcontractors/suppliers/service providers must be provided with environmental awareness, occupational safety, and/or legal information training on the approved EMPr and environmental authorization. The training shall ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and the training must take into account language and literacy requirements as well as measures to determine the effectiveness of training. Proof of this training must be included in the environmental file.
- The contractor must ensure that formal environmental induction of the appointed construction personnel will take place through a presentation to staff on environmental awareness.
- The contractor must ensure that environmental site procedures relevant to the project must be communicated to staff on a weekly basis – method statements can be used as part of awareness training material.
- The contractor must ensure that environmental matters will be discussed during toolbox talks.
- The Contractor must ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and have a basic level of environmental awareness training.
- The need for a 'clean site' policy must be explained to the construction workers.

### 8.1.2 Cultural Heritage Environment

- Before construction starts, all staff need to know what possible archaeological or historical objects of value may resemble and to notify the Project Engineer/Contractor should such an item be unearthed.
- AMAFA Akwazulu-Natali and the ECO must be contacted if any heritage resources, objects or features and sites be identified during construction. All construction activities must cease until further notice from Amafa.
- It should also be pointed out that the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act No 4 of 2008) requires that operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.

### 8.1.3 Worker conduct on site

In general, regard for the social and ecological well-being of the site and adjacent areas are expected of the site staff. Workers need to be made aware of the following general rules:

- No alcohol / drugs to be present on site.
- Prevent excessive noise.
- Construction staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility are forbidden).
- No fires to be permitted on site. Encourage the use of gas operated cookers for food preparation on site.
- Trespassing on private / commercial properties adjoining the site is forbidden.
- No hunting or poaching of animals or birds is allowed on site or in the surrounding area.
- Other than pre-approved security staff, no workers must be permitted to live on the construction site.

- Staff operating equipment (such as excavators, loaders, etc.) must be adequately trained and sensitised to any potential hazards associated with their tasks.
- No operator must be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.

## 9. CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS

Construction EMPr activities are those relating to the Construction Phase as defined. The **contractor** is responsible for the implementation of activities within this phase.

The development activity must comply with the approved Layout Plan attached as **Appendix D**.

### 9.1 Environmental Management File

- An environmental management file shall be opened and maintained on site. The file must always be up-to-date with the following documentation:
  - Copy of Environmental Authorisation
  - Copy of EMPr
  - Copy of Approved Layout
  - Monthly Environmental Audits Reports
  - Spill Contingency Plan
  - Personnel Register
  - Complaints Register
  - Incidents Register
  - Correspondence with ECO
  - Correspondence with I&APs/stakeholders/surrounding areas
  - Proof of Waste Disposal
  - Proof of chemical toilet cleaning
  - Proof of raw material sourcing
  - Approved method statements

[Proof of chemical toilet cleaning must also be submitted to eThekweni Health Department, South 2 Area, Amanzimtoti.](#)

### 9.2 Maintenance of access and haulage roads

- Movement of construction vehicles potentially impacting on urban infrastructure must be mitigated through the use of appropriate warning signs, and not entering or leaving the site during peak traffic hours
- Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damages as soon as these develop.
- The deployment of staff to clean surfaced roads adjacent to the construction site where materials have been spilt needs to be undertaken as necessary
- Unnecessary compaction of soils by heavy vehicles must be avoided. Construction vehicles must be restricted to demarcated access, haulage routes and turning areas.
- Machine / vehicle operators should receive clear instructions to remain within demarcated access routes. Movement of heavy-duty vehicles and vehicles not connected with work in progress must be restricted to the construction zone in order to control related impacts such as compaction of soil, damage to vegetation and noise pollution.

### 9.3 Maintenance of the Construction Camp

- This covers various areas for inspection on a regular basis.
- The Contractor must monitor and manage drainage and runoff from the camp site to avoid standing water and soil erosion.



- The Contractor must ensure that all litter is collected daily from the work and camp areas. Similarly, all bins and/or skips must be regularly emptied and their waste disposed of at a registered landfill site.
- All waybills are to be kept in the environmental file.
- The Contractor must ensure that the camp site, working & eating areas are maintained in a clean, hygienic and orderly state.

#### **9.4 Traffic Impact**

- Construction signs must be established warning traffic of the construction activities.
- If necessary speed limits must be reduced and alternative routes provided.

#### **9.5 Ablution Facilities**

- The Contractor shall make adequate provision for temporary chemical toilets for the use of their employees during the Construction Phase. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced. They shall be positioned out of the 1:100 year floodline.
- The location of the toilet facilities shall be agreed to prior to the commencement of construction and shall be agreed in conjunction with the ECO.
- The location and use of the toilets during construction must not cause pollution to the water resources and neither must it be a health hazard to the general public.
- An adequate number of self-contained chemical toilets must be established on site – at least one toilet for every 15 workers.
- Toilets on site need to be kept in a clean and hygienic state.
- Weekly servicing of the chemical toilets on site needs to be undertaken by the supplier and service records are to be kept in the environmental file.
- Contractors must ensure that no spillage occurs when chemical toilets are cleaned and that the contents are properly stored and removed off-site.
- The contractor must ensure that sufficient potable water is made available for the labourers at all times.

#### **9.6 Visual Impacts**

- Storage facilities, elevated tanks and other temporary structures on site must be located in such a way that they have as small as possible visual impact on adjacent land uses. The site must be screened with the use of shade cloth prior to the start of construction. Screening of highly reflective material must be given particular attention.

#### **9.7 Staff Conduct**

- The Contractor must monitor the performance of workers to ensure compliance with good environmental practices and general conduct as received earlier during site set-up phase, and during their environmental awareness induction training.

#### **9.8 Air Pollution**

- Ensure compliance with the Atmospheric Pollution Prevention Act and the Air Quality Bill.
- Dust generating construction activities must be avoided during strong winds.
- Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction must be carefully controlled and managed.
- Suitable dust suppression measures must be implemented if dust levels rise above acceptable levels, either water or commercial dust suppressants.
- Soil loads in transit must be kept covered or wetted.
- Stockpiles of soil must be kept covered or have suitable dust palliative applied such as water or commercial dust suppressants.

- Servicing of vehicles must occur off site to limit gaseous emissions.
- Burning of waste on site or adjacent is forbidden.

## 9.9 Noise Pollution

- Noisy activities must be kept to a minimum and conducted simultaneously at the start of construction if possible.
- Machinery and vehicles must be kept in good working order for the duration of the project to minimize noise nuisance to neighbours.
- Noise levels must be kept within acceptable limits. All noise and sounds generated must adhere to SABS 0103 specifications for maximum allowable noise levels for residential areas. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies.
- Use of noisy equipment and noisy activities such as piling needs to be contained to normal working hours only determined by Noise Control Regulations in terms of section 25 of the Environment Conservation Act (Act no. 73 of 1989).
- Measures must be implemented at the site to minimize the potential impacts by informing surrounding land users of unusually noisy activities
- Should the contractor want to work at night or weekends, surrounding residents/businesses must be adequately informed.
- Surrounding residents/businesses must be warned of particularly noisy activities by way of flyers or letters.
- A complaints register must be kept on site at all times.
- Construction staff must be provided with training regarding noise prevention and anti-social behaviour/conduct.

## 9.10 Alien invasive management

- Patches of alien invasive vegetation that colonise parts of the site or its surroundings must be removed immediately. This should be done on a continual basis.
- All alien vegetation that has colonized the fill embankments or any other areas within the construction site must be removed. The contractor should consult the ECO and undertake the process in accordance to the Alien Invasive Management Plan guideline document prepared by the Environmental Planning and Climate Protection Department, Ethekwini Municipality attached as **Appendix B**, regarding the method of removal.

## 9.11 Vegetation

- The protected tree, *Millettia grandis*, was observed in a patch of woody vegetation. The removal of this tree must be avoided. Should this not be possible, a permit must be obtained from Ezemvelo KZN Wildlife and DAFF.
- Alien vegetation during and post-construction must be destroyed for radius of approximately 30 metres from the site.
- All refuse and litter must be removed from in and around the site.
- Before clearing, indigenous plants suitable for rescue are to be relocated to a temporary holding area by a vegetation specialist / botanist. Indigenous plants suitable for rescue include small ingenious shrubs and trees (saplings) and grass clumps.
- Before stripping, all vegetation within the wetland and riparian areas must be chopped down by hand prior to more intensive clearing and alteration. Any fauna encountered during the clearing process must be relocated to the adjacent habitats under the supervision of the ECO.
- Thereafter, the working servitude is to be stripped of topsoil and vegetation to a nominal depth and this top soil placed at a temporary stockpile area and maintained for re-use.
- Soil stockpiles must be located outside of the demarcated active and macro channel banks. The location of these soil stockpiles must be agreed upon by the ECO prior to construction commencing.
- Topsoil and subsoil must be stored separately.

- Wherever possible, excavations within the watercourses should be undertaken by hand.
- If this is unfeasible for sound reasons, a small excavation vehicle may be used.
- Once the bridge is completed, the running track must be removed by hand wherever possible.
- Once completed, the disturbed bed and banks of the streams and wetlands must be reshaped under the supervision of the ECO.
- Compacted riparian soils along the running track must be ripped to a depth of 30cm.
- Once the riparian areas are re-shaped and the compacted soils are ripped, topsoil from that particular area must be reinstated to the satisfaction of the ECO.
- The prepared soils along the construction corridor must be re-vegetated via hand broadcasting and plugs by a professional. For un-shaded areas, the seed mix should comprise an indigenous grass mix comprising of 'runner' grasses like *Cynodon dactylon* var. Sea Green. If the construction corridor is shaded, the grass mix should comprise shade tolerant species. In addition, the rescued indigenous plants must also be replanted within the construction corridor by a professional.
- The banks must be armoured against erosion using biodegradable geofabrics to facilitate establishment of vegetation e.g. Geojute®. *C. dactylon* var. Sea Green plugs should be planted on the unshaded banks.
- The areas to be hand broadcasted must be lightly watered before planting to ensure that the seed material does not come into contact with dry ground.
- The seed mixture must be evenly broadcasted over the entire surface of the construction corridor. In this regard, a mechanical seeding device may be used in order to ensure a uniform distribution of grass seed over the area to be rehabilitated.
- The grass seed must be lightly worked into the upper topsoil layer by means of hand labour (using a rake).
- The seeded area must be watered daily until planting has been completed.
- The soil must be kept moist for the first two weeks after hand broadcasting to ensure seed germination. Thereafter irrigation should be applied weekly until reasonable groundcover is obtained.
- Watering should be gentle so that rill erosion is avoided and minimised.
- Any erosion damage resulting from watering/irrigation must be repaired immediately.
- The disturbed area should be monitored for erosion and alien plant encroachment weekly for a month, and monthly for 3 months.
- Alien plants within the rehabilitated area must be eradicated immediately. The alien plant species should be removed by hand-pulling where possible. Herbicides should be utilised where hand pulling is not possible.
- ONLY herbicides which have been certified safe for use in watercourses by independent testing authority to be used.
- The ECO must undertake a close-out audit after the monitoring period and sign-off on the success of the rehabilitation.
- A detailed method statement for the bridge crossing must be submitted to the ECO by the contractor for approval prior to construction commencing.

## 9.12 Floodplain, Wetlands and Watercourses

### Timing:

- Construction should be undertaken in the winter months between the months of April and August.
- A photographic record of the state of the riparian areas prior to construction must be compiled for reference and rehabilitation purposes.

### Right of Way (ROW) Construction Areas

- Disturbance to the delineated riparian areas along the bridge route should be restricted to a one-way construction right-of-way (ROW) corridor. The width of the ROW corridor should be as narrow as practically possible and should be demarcated and fenced off during the site setup phase to the satisfaction of the ECO.

- Once the construction ROW is established, all areas outside of the demarcated ROW must be considered no-go areas. Encroachment into no-go areas without prior approval from the ECO must be penalised with a fine.
- The construction ROW should comprise a one-way running track of a maximum width of 4m.
- Wherever possible, the running track should not be established within the active channel and should extend into the riparian areas from each valley side to the furthest pier construction site.
- Where a running track across the active channel is necessary, the running track must be established on top of either a berm of sandbags or imported rock. The running track across the active channel should be as narrow as possible and must be strictly one way.
- Flow should be diverted through the running track berm using short flume pipes established during the running track establishment or using the coffer dam method whereby the running track is only established from one side to the plinth/pier site.
- Erosion control must be established at flume pipe or coffer dam diversion outlets.
- If dewatering is required, a dewatering area must be designated on the floodplain 20m from the edge of the active and macro-channels. The pumped water should be discharged into discharge areas comprising haybales.

### **9.13 Soil Erosion & Stormwater Control**

- Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.
- Measures must be implemented such that erosion is minimized during construction and after construction, in accordance with the approved EMP. These measures may include:
  - The suitable use of sand bags or Hessian sheets;
  - The prompt rehabilitation of exposed soil areas with indigenous vegetation to ensure that soil is protected from the elements;
  - The removal of vegetation, only as it becomes necessary for work to proceed; therefore the full length of the works shall not be stripped of vegetation prior to the commencing of other activities. Rather clearing should take place as required; and
  - Prevent the unnecessary removal of vegetation especially on steep areas.
- Roughen the surface of all exposed slopes to retain water, increases infiltration and facilitate re-vegetation.
- Where indigenous vegetation has been cleared beyond the construction footprint, top-soiling and re-vegetation with locally appropriate indigenous species should be undertaken by the contractor.
- Re-vegetation of the site and areas outside of the site should be undertaken immediately after the completion of an activity in that area.
- Construction activities should be scheduled to minimise the duration of exposure to bare soils on site (no unnecessary removal of groundcover vegetation). The full length of works shall NOT be stripped of vegetation prior to commencing other activities. This plan must indicate how clearing and earthworks are going to progress through the site in a phased manner.
- If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, rows of straw, hay or cut bundles of vegetation should be dug into the soil in contours and/or sand bags or silt fences must be established along the contours at regular intervals to slow runoff and capture eroded soil.
- Effort must be made to ensure that the stormwater system including pipes, drains, headwalls and Reno-mattresses are not silted up during the construction phase.
- After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gulleys must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until grass has re-colonised the rehabilitated area.

## 9.14 Handling of hazardous materials

- Handling, storage and disposal of excess or containers of potentially hazardous materials shall be in accordance with the requirements of current Regulations and Acts in force.
- Every precaution must be taken to ensure that any chemicals or hazardous substances do not contaminate the soil or groundwater on site. For this purpose the Contractor must:
  - Ensure that all materials must be stored out of the 1:100 year floodline.
  - Ensure that potentially harmful materials are properly stored in a dry, secure environment, with concrete or sealed flooring. The Contractor must ensure that materials storage facilities are cleaned/maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil or surface water. The management of such storage facilities and means of securing them shall be agreed.
  - Ensure that hazardous substances must be stored in the construction camp under lock and key;
  - Ensure that storage and utilization of potentially hazardous materials such as diesel, petrol, oils and/or lubricants do not result in any form of soil and water contamination.
  - Control the use and storage of fuels and chemicals that could potentially leach into the ground. Adequate spillage containment measures shall be implemented, such as cut off drains, etc.
  - Ensure that chemical storage areas must be protected by bunded areas of a volume equal to 110% of the volume of the container storing the substance. Bunded areas must be constructed of concrete blocks lined with suitably dense plastic sheeting.
  - Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity.
  - Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity.
  - Any oils, fuels and spilled substance must be removed and recycled or disposed of at a licensed waste disposal facility able to accommodate such waste. Proof of waste disposal must be kept in the environmental file; and
  - Ensure that the mixing /decanting of all chemicals and hazardous materials should take place on a tray or impermeable surface.
  - Chemical/hazardous waste generated during mixing/decanting should then be disposed of at a registered landfill site.
  - Ensure that the storage of petrol and diesel must not cause a risk to surrounding environment and monthly checks must be undertaken.
  - Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented.
  - Municipal water or another source approved by the Engineer should be used for all activities such as washing or equipment or disposal of any type of waste, dust suppression, concrete mixing and compacting.
- In the event of a spillage/incident that cannot be contained and which poses a potential threat to the local environment, the following Departments must be informed of the incident within 48 hours and in accordance with Section 30 of the National Environmental Management Act, Act 107 of 1998:
  - The Local Authority, eThekweni Municipality;
  - Department of Water Affairs (DWA)
  - Department of Agriculture and Environmental Affairs (Pollution and Waste Management, eThekweni District, Private Bag X54321, Durban, 4000);
  - The local Fire Department; and
  - Any other mandated authority.
- Should there be any soil and groundwater contamination, the Control Environmental Officer: Pollution and Waste Component as per contact details specified in above must be informed within immediately.
- In the event of this occurring, the necessary clean up measures must be undertaken immediately.

- Any soil/groundwater contaminated during construction must be removed, stored in sealed container and disposed thereof at a licensed facility. Proof of safe disposal must be kept in the environmental file.
- Appoint appropriate contractors to remove any residue from spillages from site.
- Ensure that used oils/lubricants are not disposed of on/near the site, but at a permitted landfill and that contractors purchasing these materials understand the liability under which they must operate. The Environmental Control Officer will be responsible for reporting the storage/use of any other potentially harmful materials to the relevant authority.

### **9.15 Waste Management**

- For the purposes of this EMP, waste includes all construction rubble, debris and waste (e.g. food waste, vegetation and tree stumps, building rubble, etc.), including hazardous waste (e.g. oils).
- Bins and/or skips need to be supplied at convenient intervals within the site for disposal of waste within the construction camp. The bins must have liner bags for easy control and safe disposal of waste. There must be recycling of waste practiced with separate drums provided for paper and cardboard; glass; plastics; metals and organic waste.
- The Contractor must ensure that all litter is collected from the work and camp areas daily.
- Bins and/or skips must be emptied regularly and waste must be disposed of at a registered landfill site. Waybills for all such disposals are to be kept by the Contractor for review by the Engineer/ECO. This is required for all waste disposed of.
- A registered chemical waste company is to be used to remove waste from the chemical toilets on site.
- The excavation and use of rubbish pits on site is forbidden.
- The burning of waste is forbidden.
- The area demarcated for the sorting and disposal of waste needs to be fenced off. The provision of separate skips for different waste types (i.e. "household" type refuse; building rubble) needs to be provided.
- Construction rubble must be disposed of in a pre-agreed demarcated spoil dumps that have been approved by the Engineer and ECO before it can be taken to a registered disposal site.
- Hazardous waste such as fuel, oils and chemicals must be disposed of at a licensed hazardous waste disposal site with proof of disposal kept in the environmental file.
- The Contractor must keep the site clean, tidy and litter free at all times. Strict control of the management of the waste generated by the employees, such as in the eating areas, must be enforced. The Contractor must take steps to ensure that littering by construction workers does not occur and persons must collect litter from the site and immediate surroundings, including litter accumulating at fence lines.

### **9.16 Social Impacts to the Adjacent Landowners**

- The regular and ongoing communication between the ECO, Contractor, Engineer and the IAPs is important for the duration of the contract and would have been started during the Site Establishment/pre-Construction Phase. The Engineer and Contractor are responsible for ongoing communication with the IAPs. A Complaint's register must be kept at the site office. This must be in a duplicate format, with numbered pages. The IAPs need to be made aware of the register and the methods of communication available to them. The Contractor needs to appoint a staff member(s) to act as liaison officer for formal consultation with I & AP's in order to handle questions and explain the construction process and what it will entail. This register is to be tabled during monthly site meetings. Any queries or complaints that arise need to be handled by following a set protocol.
- There are a number of areas that need to be monitored in this respect:
  - The disruption and safety of access for the local residents must be minimized at all costs and have the Project Engineer's permission.
  - The Contractor is to inform the neighbours in writing of disruptive activities at least 24 hours beforehand.

- It is important that the Contractor's activities and movement of staff are restricted to the designated construction areas.
- Notice of particularly noisy activities such as jackhammers, blasting, drilling must be given to residents adjacent to the construction site at least 24 hours prior to the activity taking place.
- Noisy activities must be restricted to the times given in the project specification or General Conditions of Contract.

### **9.17 Fire Control**

- All fire requirements must be carried out as contained in the National Building Regulations SABS 0400 and the safety code of the N.F.P.A.
- The Contractor must take all reasonable and active steps to avoid increasing the risk of fire through their activities on site. The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Fire Services. The Contractor must ensure that all the correct fire-fighting equipment is available on site and within easy access.
- No fires for heating or cooking must be permitted.
- The disposal of any matter by burning is prohibited.

## **10. POST CONSTRUCTION PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

This relates to the activities that occur once construction is completed and the construction camp is dismantled and the site rehabilitated. It is important that a meeting is held on site between the Engineer, EDTEA, ECO and the Contractor to approve all the remediation measures and to ensure that the site has been restored to a condition that is approved by the ECO and Principal Agent.

### **10.1 Construction Camp**

- All structures comprising the construction camp are to be removed from site.
- The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc., and these must be cleaned up.
- All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area must be top-soiled and re-vegetated if appropriate.
- The Contractor must arrange the cancellation of all temporary services.

### **10.2 Waste Disposal**

- The developer and contractor must ensure that no construction material foreign to the site, including construction debris, is left unattended after construction activities have ceased/completed
- All construction materials including rubble, cement bags, chemicals, fuels and oils must be safely stored in appropriate containers and disposed of at a licensed waste facility in accordance with the approved EMPr.
- No remaining rubble is to be buried on site.
- The site is to be free of litter and surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Project Engineer.

### **10.3 Alien control & eradication**

- Patches of alien invasive vegetation that colonise the site should be removed immediately.
- Indigenous landscaping and rehabilitation of all affected areas must be carried out once construction is complete.

- The contractor must also ensure that all alien invasive vegetation has been removed.

#### **10.4 Rehabilitation**

- The applicant is responsible for compliance with the provision for Duty of Care and Remediation of Damage in accordance with Section 28 of the NEMA. Determination of damage vests with EDTEA.
- All damaged areas shall be rehabilitated upon completion of the contract
- Rehabilitation must take place in a phased approach as soon as possible.
- Re-vegetation of the disturbed areas is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction or disturbance.
- Rehabilitation process must make use of species indigenous and endemic to the area. Seeds from surrounding seed banks can be used for re-seeding.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- Planting of indigenous tree species in areas not to be built upon must be encouraged.
- The site must be checked for erosion damage and rehabilitation must be undertaken immediately. Erosion rills and gulleys must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until grass has re-colonised the rehabilitated area.
- The contractor must undertake any maintenance that may be required as a result of erosion control measures not functioning correctly, and where vegetation has not taken to reseed these areas to prevent further environmental degradation
- A meeting is to be held on site between the Engineer, ECO and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer. A representative of EDTEA must be present at the final meeting or when the site is handed over on completion of construction.

### **11. OPERATIONAL PHASE ACTIVITIES AND ASSOCIATED ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

#### **11.1 Alien control**

- The applicant needs to ensure that ongoing maintenance of the removal of alien invasive vegetation is undertaken within the site vicinity.

#### **11.2 Stormwater Control**

- The community and stakeholders must be made aware of the estimated 1:10 year, 1:20 year, 1:50 year and 1:100 year floodlines and flood levels.
- The watercourses must be reanalysed if any changes occur in the geometric configuration of the river or additional infrastructure or/and controls are introduced into the systems.

### **12. COMPLIANCE MONITORING**

#### **12.1 Construction Phase**

The developer will undertake to appoint an Environmental Control Officer (ECO) to monitor the performance of contractor and developer in ensuring that the conditions and measures within the EMP are adhered to:

- The Site Manager, who must report to the ECO, must monitor the Construction Phase of the project to ensure compliance with the Environmental Management Programme.



- The ECO must undertake the auditing of the Construction Phase and must audit the activities once month (or as required by the EDTEA), and will conduct a final close out audit once the construction activities have ceased onsite and the construction camp cleared.
- This Environmental Management Programme will be included in the contract documentation of all contractors who will work on the site.

## **12.2 Operational Phase**

The developer will be ultimately responsible for ensuring that the conditions and measures within the EMPr are adhered to during the operational phase.

## **13. AMENDMENTS TO THE EMPr**

Any major issues not covered in the EMPr as submitted must be addressed as an addendum to the EMPr, submitted for approval prior to implementation.



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