Draft Environmental Management Programme for the Construction of the Trade Zone to Watson Highway Link Road, La Mercy, Durban

August 2011
J30188

Arcus GIBB (Pty) Ltd Reg. 1992/007139/07

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GLOSSARY OF TERMS, DEFINITIONS AND ABBREVIATIONS

Construction Activity
A construction activity is any action taken by the Contractor, his Sub Contractors, suppliers or personnel during the construction process.

Contractor
That main organisation appointed by the Developer, through the Project Manager, to undertake construction activities on the site.

DEA
Department of Environmental Affairs

Demolition
The tearing down of buildings and other structures: the opposite of construction.

Developer
Dube TradePort Corporation

EA
Environmental Authorisation

ECO
Environmental Control Officer
The ECO monitors compliance with the EMPr during the construction phase and advises the Project Manager on environmental matters relating to construction.

EER
Engineer’s Environmental Representative

EMPr
Environmental Management Programme
The EMPr for the project sets out general instructions that will be included in a contract document for the construction phase of the project. The EMPr will ensure the construction activities are conducted and managed in an environmentally sound and responsible manner.

The EMPr also details the organisational structure required to ensure the effective implementation of the EMPr and measures to monitor and improve the application of the EMPr.

Environment
Means 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 of a) and b) 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 Specifications
Instructions and guidelines for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these construction activities.

Method Statement
A written submission by the Contractor to the Project Manager in response to the Specification setting out the plant, materials, labour, timing and method the Contractor proposes using to carry out an activity.

The Method Statement shall cover applicable details with regard to:
• Construction procedures
• Materials and equipment to be used
• Getting the equipment to and from site
• How the equipment/material will be moved while on site
• How and where material will be stored
• The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or solid material that may occur
• Timing and location of activities
• Compliance/ non-compliance with the Specifications
• Any other information deemed necessary by the PM.

MSDS  Material Safety Data Sheet

Project  This refers to all construction activities associated with the proposed activities.

PM  Project Manager or Representative of appointed firm responsible for overall management of the construction phase of the project including the management of all Contractors.

Rehabilitation  Rehabilitation is defined as the return of a disturbed area, feature or structure to a state that approximates to the state (where possible) that it was before disruption, or to an improved state.

SHE  Safety, Health and Environment

Solid Waste  Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
1 INTRODUCTION

The Dube TradePort (DTP) proposes to construct a new 3.5 kilometre (km) long road to link the DTP Trade Zone (adjacent to the King Shaka International Airport within the DTP) to the Watson Highway (recently renamed uShukela Drive) ['hereafter referred to as 'Link Road']. The study area just north of the Dube TradePort and is approximately 34 km north of the Durban CBD, KwaZulu-Natal and falls within the jurisdiction of eThekwini Municipality.

DTP appointed Arcus GIBB (Pty) Ltd as the Environmental Assessment Practitioner (EAP) to undertake the legally required Environmental Impact Assessment (EIA) of the proposed Link Road Project. This Draft Environmental Management Programme (EMPr) is a required component of the EIA process and follows on from the Environmental Impact Assessment Report (EIR), in as much as all the measures for mitigation of impacts that were identified during the EIA are incorporated into the EMPr. The EMPr covers the pre-construction planning and design, construction, operational and decommissioning phases of the Link Road project.

This Draft Environmental Management Programme will accompany the Final EIR to the competent authority for review and approval through an Environmental Authorisation, should it be granted. It is important to note that the EMPr must be amended to incorporate any additional specifications required in terms of the Environmental Authorisation and any additional requirements the proponent may find necessary.

1.1 Objectives of the EMPr

It is imperative that the remedial and mitigation requirements identified during the EIA process are effectively realised during construction, operation through to the final decommissioning phase of the project. Accordingly, the EMPr plays a key role in the implementation of consistent and continued environmental management for the duration of the project life cycle.

Specifically, this Trade Zone to Watson Highway Link Road EMPr aims to:

- Draw attention to all the key environmental management requirements applicable to the project
- Organise environmental management requirements for the various phases of the project in a meaningful and structured way
- Provide an environmental management planning document for incorporation into construction tender and contract documents, commissioning procedures, operational Environmental Management System (EMS), decommissioning and final site remediation procedures
- Be used as an ‘environmental gate keeper’ for contractor assessment prior to appointment
- Define and outline the functions, roles and responsibilities of accountable persons for effective environmental management
- Outline mitigation measures and environmental specifications which are required to be implemented during various phases of the project, in order to minimise the extent of- and to manage- environmental impacts associated with the project through effective control
• Identify the requirements for detailed Method Statements (construction phase) and safe operating procedures (operational and decommissioning phases) for certain aspects or activities. Prevent long-term or permanent environmental degradation.
• Define requirements and procedures for monitoring.
• Outline procedures for environmental management and control, in the event of pollution or similar incidents.

1.2 Environmental Principles and Best Practice Guidelines

• The environment is considered to be composed of both biophysical and social components.
• Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment during the execution of the project to minimise the impact on affected parties.
• Minimisation of areas disturbed by construction activities (i.e. the ‘footprint’ of the construction area) should minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs.
• All relevant standards relating to international, national, provincial and local legislation, as applicable, should be adhered to. This includes requirements relating to waste generation and emissions, waste disposal practices, noise regulations, road traffic ordinances, etc.
• Every effort should be made to minimise, reclaim and/or recycle waste materials.

1.3 Details of the Project Team

This section provides details on the planning team that was involved in the development of the draft EMPr. The team includes the proponent organisation and Environmental Assessment Practitioner. Details of the contact persons are provided.

1.3.1 Details of the Proponent: Dube TradePort

<table>
<thead>
<tr>
<th>Name of Applicant:</th>
<th>Dube TradePort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Person:</td>
<td>Mr Rohan Persad</td>
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<tr>
<td>Address:</td>
<td>22 Dorothy Nyembe (Formerly Gardiner) Street, 15th Floor The Marine Building Durban 4001</td>
</tr>
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<td>Tel:</td>
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<tr>
<td>Fax:</td>
<td>031 307 2636</td>
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<tr>
<td>E-mail:</td>
<td><a href="mailto:rohan@dubetradeport.co.za">rohan@dubetradeport.co.za</a></td>
</tr>
</tbody>
</table>
1.3.2 Details of the Environmental Assessment Practitioner: Arcus GIBB

Arcus GIBB (Pty) Ltd, is a multi-disciplinary engineering and environmental consultancy organisation. Arcus GIBB’s Environmental Division has a proven track record in the planning, co-ordination, management and execution of a wide range of environmental projects, including EIAs and EMPRs.

Details of the EAP that prepared the Scoping Report are as follows:

<table>
<thead>
<tr>
<th>Name of the EAP:</th>
<th>Arcus GIBB (Pty) Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Persons:</td>
<td>Mr Russell Stow</td>
</tr>
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<td>Westville</td>
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<tr>
<td>Tel:</td>
<td>031 267 8560</td>
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<td>Fax:</td>
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<td>E-mail:</td>
<td><a href="mailto:rstow@gibb.co.za">rstow@gibb.co.za</a></td>
</tr>
</tbody>
</table>

1.3.3 The Environmental Authority: Department of Environmental Affairs

The Department of Environmental Affairs (DEA) is the designated authority responsible for authorising the EIA and this EMPR. DEA has overall responsibility for ensuring that the applicant, DTP, complies with the conditions of its Environmental Authorisation as well as this EMPR.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Ms Sandle Vilakazi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Assistant Manager: Impact Assessment</td>
</tr>
<tr>
<td>Postal Address:</td>
<td>Department of Environmental Affairs</td>
</tr>
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<td></td>
<td>Private Bag X 447</td>
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<tr>
<td></td>
<td>Pretoria</td>
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<td>Tel:</td>
<td>012 310 3891</td>
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<td>Email:</td>
<td><a href="mailto:svilakazi@deat.gov.za">svilakazi@deat.gov.za</a></td>
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1.4 Organisational Requirements

In order to ensure sound development and effective implementation of the EMPr, it is necessary to identify and define the responsibilities and authority of the various persons and organisations that will be involved in the project.

During construction, all instructions and official communications regarding environmental matters shall follow the generic organogram shown in Figure 1. The organisational structure identifies and defines the authority structure, and the communication structure for the various parties involved in the construction of the proposed development. The structure may require revision as the project unfolds.

![Organisational / Reporting Structure for implementation of the EMPr](image)

Figure 1: Organisational / Reporting Structure for implementation of the EMPr

DTP will appoint a Project Engineer (PE), who should appoint an Engineer’s Environmental Representative (EER) who will represent DTP for the proposed development. DTP will also appoint an Engineering Consultant / Contractor (hereafter ‘Contractor’) to implement the project. DTP shall require each Contractor to appoint a Project Manager (PM) to direct and monitor all contractor activities during the construction of the development.
DTP shall appoint an Environmental Consultancy to fulfil the role of Environmental Control Officer (ECO) to oversee the implementation of the construction component of the EMPr on site. It will be the responsibility of the ECO to consult with the PE and/or PM regarding instructions pertaining to contravention, corrective actions, and penalties or working methods. Except in an emergency situation, where instructions may be given directly to the Contractor’s employees and sub-contractors, all instructions given by the ECO shall go through the PE.

The EMPr will be an item of the monthly site meetings, and the ECO may attend these meetings in order to provide input with respect to compliance with the EMPr and the Environmental Authorisation (EA).

Key roles and responsibilities of each party are outlined in more detail in Section 1.5 below. It is important to note that, while parties are assigned various environmental roles and responsibilities, parties are severally and jointly responsible to ensure compliance with all environmental legislation and best practice.
## 1.5 Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
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| **1.5.1 National and Provincial Environmental Authorities** | Convey legal requirement for the EMPr and EA.  
Give directives in terms of specific requirements for EMPr specifications.  
Review draft, final and revision EMPr.  
Undertake spot inspections of the site at its own discretion.  
Review ECO Audit Reports.  
Request and view Environmental Incident Report.  
Request and view the Complaints Register.  
Issue directives, notices and/or fines for significant transgressions with the EMPr or environmental legislation. |
| **1.5.2 DTP Project Engineer** | Ensure that all designs appropriately incorporate the required environmental provisions as discussed in the Environmental Impact Report (EIR) and EMPr.  
Ensure that the EMPr is finalised and adequately describes the minimum environmental regulatory requirements at the time construction commences.  
Ensure that the final EMPr is approved by all relevant authorities.  
Ensure that the EMPr specifications are included in all tender documents issued to prospective engineering consultants/contractors for the development works and activities on site.  
Review and where necessary, revise the ‘incident and associated penalty values list’ and include the list in the tender document.  
Ensure that the prospective Tenderers/Contractors adequately provide for the provisions of the EMPr in their submissions.  
Appoint the Engineering Contractor(s) and Environmental Consultants, and through them a PM and ECO respectively, for the duration of the construction period and ensure that their scope of work sufficiently covers responsibilities that will ensure implementation and compliance with the EMPr and good environmental management throughout the project.  
Ensure that the EMPr is fully implemented and remains so, and when necessary is revised and updated. |
<table>
<thead>
<tr>
<th>Role</th>
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<tr>
<td></td>
<td>• Give instructions regarding the development and implementation of Method Statements.</td>
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<td>• Ensure that the Contractor develops and provides all required Method Statements.</td>
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<td>• Review the Method Statements, with the assistance from the Environmental Consultant/ECO, to confirm their conformance with EMPr as well as the overall EA requirements as well as with reasonable practicality and financial feasibility and provide relevant feedback to the Contractor.</td>
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<td>• Approve acceptable Method Statements and inform the Environmental Consultant/ECO of such approval.</td>
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<td>• Keep record of all Method Statements and the associated review and approval status.</td>
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<td>• Review and approve drawings produced by the Contractor in connection with, e.g. construction site layout, access/haul roads, construction stormwater management plan, etc.</td>
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<td>• Be liable / accountable, to the relevant authority, DEA, for any contravention/non-compliance by any Contractor under their supervision.</td>
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<td>• Liaise with the environmental authorities and DTP Senior Management as and when necessary.</td>
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<td>• Establish and maintain regular and proactive communications with the Consultant/PM, Contractor and Environmental Consultant/ECO.</td>
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<td>• Assist the Contractor in finding environmentally responsible solutions to problems with input from the ECO.</td>
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<td>• Undertake periodic audits, site visits and inspections to ensure that the environmental requirements are implemented.</td>
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<td>• Review and comment on environmental compliance assessments and/or reports.</td>
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<td>• Review the Complaints Register.</td>
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<td>• Give instructions on any procedures and corrective actions.</td>
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<td>• Report any significant environmental incidents or impacts to the relevant environmental authorities.</td>
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<td>• Deal with policing, fining, penalties and discrepancies.</td>
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<td>• Instruct the Contractor on the requirements and procedures in terms of environmental non-compliance ‘near misses’, incidents and public complaints recording, investigation and reporting.</td>
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<td>• Order the removal of, or issue spot fines for, person(s) and/or equipment not complying with the specifications.</td>
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<td>• Issue fines, penalties or ‘work suspend’ orders for contravention of the EMPr and give instructions regarding corrective action to the Contractor/PM.</td>
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**1.5.3 Engineering Contractor**

<p>| The Engineering Contractor’s role to implement and comply with recommendations and | • Study the EMPr and all its specifications carefully and gain a full understanding of its implications. |
|—and provide for full compliance with the EMPr and all its relevant specifications in the submitted | • Provide for full compliance with the EMPr and all its relevant specifications in the submitted |</p>
<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Contractor</td>
<td>Tender; and/or provide motivation and/or alternative specifications through Method Statement(s) for any deviation from or ‘tailor making’ of the EMPr for DTP to consider.</td>
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<td>Include all relevant EMPr specifications in the tender documents and subcontractor appointments.</td>
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<td></td>
<td>Avail him / her, as well as any employee he may identify, for induction training on the EMPr by the ECO.</td>
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<td></td>
<td>Notify the PE or EER and ECO of the anticipated programme of works and fully disclose all details of activities involved (includes off-site activities associated with the project).</td>
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<td>Prepare all the required / agreed Method Statements for submission to the PE and Environmental Consultant / ECO.</td>
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<td>Sign off on approved Method Statements.</td>
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<td></td>
<td>Provide appropriate training on the latest version of the EMPr and all approved Method Statements to all employee and sub-contractors and keep record of such training (e.g. keep record of the date of training, version of the EMPr the training was for, the employee/sub-contractor trained).</td>
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<td></td>
<td>Appoint a competent, experienced and responsible individual as PM to administer and implement EMPr with regard to engineering and construction.</td>
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<td>Ensure that the EMPr environmental specifications (of this document including any revisions, additions or amendments) and all approved Method Statements are effectively implemented.</td>
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<td>Implement on-site steps to mitigate environmental impacts.</td>
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<td>Ensure that all employees and sub-contractors employed comply with the requirements and provisions of the EMPr at all times.</td>
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<td>Report any serious environmental incidents or impacts to the DTP PE/EER and ECO.</td>
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### 1.5.4 Project Manager

The Project Manager (PM) oversees the construction programme and all construction activities performed by the contractor and as such also any EMPr implementation, EMPr compliance and environmental related activities, issues and impacts.

- Gain an in-depth understanding of the EMPr.
- Ensure implementation of all aspects and specifications of the EMPr and approved Method Statements.
- Oversee all site works.
- Enforce the implementation of and compliance with this document with Contractor and Sub-contractor employees and Sub-contractors.
- Monitor and verify that environmental impacts are kept to a minimum at all times.
- Record and inform the PE and ECO of ‘near miss’ incidents or problems arising when implementing the EMPr, including accidents and transgressions and recommend ways of improving it.
- Take action to address all EMPr, Method Statement and/or environmental legislation non-
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<th>Role</th>
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<td></td>
<td>• Report and record all accidents, incidents resulting in injury or death or significant environmental liability immediately to the PE and ECO.</td>
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<td>• Record all public complaints received and immediately inform the PE and ECO thereof.</td>
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<td>• Report progress towards implementation of and non-conformances with the latest EMPr version and approved Method Statements at site meetings with the PE and ECO.</td>
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<td>• Ensure that suitable records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for auditing by the PM or ECO at all times.</td>
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<td>• Communicate to the Contractor employees and Sub-contractors, verbally and in writing, the advice of the ECO and the content of the ECO reports.</td>
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<td>• Designate and manage the working areas as per approved construction site layout, including sensitive environments.</td>
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<td>• Issue penalties for contravention of the EMPr to Contractor Staff and Sub-contractor (as deemed necessary).</td>
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1.5.5 Environmental Control Officer

Fulfil an advisory consultancy, monitoring and reporting role with regard to overseeing the effective implementation and updating of the EMPr. Making recommendations for addressing EMPr and/or environmental legal non-compliances. Liaising with the relevant Environmental Authorities on any environmental issues to confirm their requirements, as and when required and communicating such requirement to the DTP Project Engineer and/or PM.

<p>|                                           | • Revise and update the EMPr as and when necessary and submit such updates to the PE for review.                                                                                                                |
|                                           | • Submit copies of revised EMPr to all relevant stakeholders for their information and review.                                                                                                                |
|                                           | • Advise the PE on necessary environmental authorisations and permits that would be required.                                                                                                                  |
|                                           | • Prepare EMPr introduction and environmental awareness training course material/manual and present this course to the PE, Contractor, PM and possibly sub-contractors, including any employee member they deem necessary, prior to them starting any work on site (once-off tool box talks). |
|                                           | • Keep record of everyone who attended the EMPr introduction training course.                                                                                                                                  |
|                                           | • Review and comment on all Method Statements relevant to environmental management and make recommendations to the PE on whether or not to accept the Method Statement and/or any amendments or revisions required. |
|                                           | • Make recommendations on any additional Method Statements that may be required as the construction process progresses.                                                                                      |
|                                           | • Undertake regular site inspections and liaison with the PE and/or Contractor (meetings) to monitor, audit and verify that all works comply with environmental legislation and the EMPr compliance; that environmental impacts are kept to a minimum; and ascertain the level of such compliance and |</p>
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<td>impact minimisation.</td>
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<td></td>
<td>• Keep record of EMPr implementation, monitoring and audits.</td>
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<td>• Prepare regular monitoring/audit reports which reflect the EMPr compliance status, findings, issues and recommended actions for addressing non-compliances and submit these to the project team and relevant Environmental Authorities (DEA).</td>
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<tr>
<td></td>
<td>• Review ‘near miss’ reports, incident reports and complaints register and recommend corrective actions.</td>
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<td></td>
<td>• Report any serious environmental incidents or environmental impacts immediately to the PM, PE.</td>
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<td></td>
<td>• Assist the project team in finding environmentally responsible solutions to problems.</td>
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<td>• Maintain a photographic record of the site before, during and after construction.</td>
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<td>• Issue out Non-Compliance Reports (NCRs) to non-compliant contractors and sub-contractors</td>
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<td>• Advise the PM on the removal of person(s) and/or equipment not complying with the specifications.</td>
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<td>• Make recommendations to the PE and PM on the issuing of fines for transgressions of site rules and penalties for contravention.</td>
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### 1.5.6 Sub-contractor

It is the Sub-contractor’s role to implement and comply with recommendations and conditions of the EMPr at all times.

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<tr>
<td>Study all relevant EMPr sections, specifications and approved Method Statements carefully and gain a full understanding of the implications thereof.</td>
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<tr>
<td>Prepare and provide Method Statement(s) as per the PM’s instructions.</td>
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<tr>
<td>Implement and comply with all relevant EMPr sections, specifications and approved Method Statements.</td>
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<td>The EER will be responsible for conducting regular tool box talks to employees on site for the duration of construction.</td>
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<td>Notify the PM of the anticipated programme of works and fully disclose all details of activities involved.</td>
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<td>Avail him / her, as well as any employee he may identify, for induction training on the environmental requirements as per PM’s instructions.</td>
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<td>Be responsible for Sub-contractor’s employees.</td>
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<td>Report progress towards implementation of and non-conformances with the relevant sections of the latest EMPr version and approved Method Statements to the PM.</td>
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<tr>
<td>Notify the PM of any and all ‘near misses’, incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMPr version and approved Method Statements and seek advise from the PM for required corrective actions and/or site remediation.</td>
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<td>Role</td>
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</table>
|      | • Record all incidents and the corrective actions/remedial action taken in incident report and submit these to the PM for signing off.  
• Report and record all accidents and incidents resulting in injury or death immediately to the PM.  
• Record all complaints received and immediately inform the PM thereof. |

1.5.7 Public and Authorities Acting on Their Behalf

The public, as well as the authorities responsible of acting on behalf of the public, watches over the project and reports on any non-compliances with the Environmental Authorisation and EMPr.  

• Monitor the EMPr compliance.  
• Register complaints on any EMPr or Method Statement non-conformances.
1.6 Environmental Awareness and Compliance

The philosophy adopted in this Draft EMPr is derived from the principles of the National Environmental Management Act (No. 107 of 1998) (NEMA) which states that development must be socially, economically and environmentally sustainable. Sustainable development requires that:

- The disturbance of ecosystems and loss of biodiversity are avoided (minimised or remedied)
- Pollution and degradation of the environment are avoided or minimised and remedied;
- Waste is avoided or minimised and re-used or re-cycled where possible and otherwise disposed of in a responsible manner
- A risk averse and cautious approach is applied
- Negative impacts on the environment and on people’s environmental rights be anticipated and prevented, and where they cannot altogether be prevented, are minimised and remedied.

NEMA makes provision that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.

1.7 Environmental Authorisation

(This section will be inserted once the Environmental Authorisation has been issued. It will provide a brief overview of the requirements and conditions of the authorisation and how these have been incorporated in the EMPr.)

1.8 EMPr Revisions and Authorisation

The EMPr and its associated environmental specifications may be amended at various stages of the Link Road project. Anticipated events that would ‘trigger’ the need for an update and amendment of the EMPr are as follows:

- Receipt of the Environmental Authorisation
- Significant change in applicable environmental legislation
- Instructions from DEA to do so
- Changing circumstances on site
- Changes in the project scope (which have been approved by the DEA)
- Amendments of the Environmental Authorisation by the DEA.

The EMPr may also need to be amended should relevant authorities or key EMPr role-players consider it necessary. DTP shall consult with DEA to establish whether the DEA requires approving specific EMPr amendments, and if yes, DTP shall follow due process to
gain approval for such amendments. DTP may consult with the ECO and/or another suitably experienced party to assist with and/or accept the amendment of the EMPr; and/or assist with the application for approval of the amendments.

Although the EMPr is a working and dynamic document and subject to revision from time to time, no significant amendments (relaxation or revision of any mitigation measure) may be allowed without approval from the DEA once it has been finalised after the issuing of the Environmental Authorisation for the project. Motivations for amendments to the EMPr from any party must be made to DTP who will then submit the proposed amendments to the DEA for approval.

1.9 Non-Compliance with the EMPr

Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. Penalties for non-compliance need to be discussed with the Contractor on appointment. The Contractor must make every effort to motivate staff members to comply with the EMPr, and enforce non-compliance penalties. Allowances must be made for the contractor to rectify all non-compliances, prior to DTP deciding on any penalties thereof. Failure to comply with the stipulations above could be considered a breech of the contract by the contractor.

1.10 Compliance with Other Policies and Legislation

DTP and the Contractor shall commit to complying with the relevant provisions of the applicable environmental legislation and associated regulations promulgated in terms of these laws, through all phases of the project. In order to achieve this, these parties need to acquaint themselves with relevant environmental legislation and/or seek advice from the relevant authorities and/or a suitably qualified legal specialist.

In addition to the environmental authorisation in terms of NEMA, the proposed Link Road requires permission and compliance with a number of other authorisations from various departments, such as the Department of Water Affairs (DWA) and AMAFA. Municipal bylaws of the eThekwini Municipality are also applicable.

A list of applicable legislation, not limited to the list below, includes:

1. Environment Conservation Act No. 73 of 1989
8. The National Heritage Resources Act 25 of 1999
1.11 Environmental Audits

Environmental audits must be undertaken on a regular basis during the construction phase, at predetermined intervals deemed necessary by the conditions of the Environmental Authorisation, ECO and PM.

To facilitate communication between the parties responsible for ensuring environmental compliance, it is vital that a chain of command is setup that will ensure that the ECO's recommendations have the full backing of the PM. In this way, penalties as a result of non-compliances with the EMPr by the contractor may be justified as failure to comply with instructions from the highest authority.

1.12 Training and Induction of Contractors and Workers

All parties involved in the construction of the facility are to be made aware of, and be familiar with the EMPr, EA and conditions contained therein. It is the responsibility of the contractor to ensure that training and awareness to his staff is provided in this regard.

1.13 Complaints Register and Environmental Incidents Book

The Contractor must record any complaints received from the community in a complaints register kept on-site. The lodged complaint must be brought to the attention of the PM who will respond accordingly. The following information will be recorded:

- Time, date and nature of the complaint
- Response and investigation undertaken
- Actions taken and by whom

An investigation must ensue and a response to the complainant must be provided within seven working days.

All environmental incidents occurring on the site will be recorded by the contractor and submitted to the PM and copied to the ECO. The following information will be documented:

- Time, date, location and nature of the incident
- Actions taken and by whom
- Close Out.

The PM or the EER in conjunction with the ECO will identify and authorise remediation action where necessary.
1.14 Contractual Obligation

In order to ensure that the EMPr is enforced and implemented, this document must be given legal standing. This shall be achieved through incorporating the EMPr as an addendum to the contract documents as conditions of the contract that must be met. This will ensure that the obligations are clearly communicated to Contractors and that submitted tenders have taken into account, and budgeted for the environmental requirements specified in the EMPr. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMPr becomes legally binding to the appointed contractor.
2 PROJECT CONTEXT

2.1 Brief Overview of the Proposed Project

DTP proposes to construct a new 3.5 kilometres (km) long road to link the Trade Zone at the Dube TradePort to the Watson Highway (recently renamed Ushukela Drive) (see Figure 1 - Locality Plan). The proposed project is intended to allow for northern access to the DTP via a road adjacent to the paved access road to the Herrwood Estate (610133 Street) off the Watson Highway. The proposed link road will also serve as an arterial road for developments planned for the surrounding land and will accommodate two lanes of traffic in both directions, with a road reserve approximately 54m wide.

The proposed Trade Zone to Watson Highway Link Road will include the design and construction of the road and a number of associated aspects as listed below:

- **Shallow drainage channels and infiltration trenches**: These receive road runoff and enable direct infiltration into the ground, thus enabling 'source control' of stormwater. In larger storm events, the channels will attenuate the flood peak and convey the water into the nearest wetland, but at a slower pace than traditional piped drainage systems.

- **Landscaped street furniture**: Street furniture will include street lighting, required signage and related facilities e.g. bus stops.

- **Shared footway and cycle ways**: The road design intends to cater for all users, including pedestrians, cyclists and motorised vehicles. Therefore, provision has been made for pedestrians and cyclists on a 3m wide surfaced route. This route is intended to be separated from the road to improve pedestrian safety and discourage jaywalking.

- **Services zones**: The service zone is an area that will be set aside for servitudes for bulk services, including water pipelines, electricity cables, telecommunications, etc.

- **4m wide lane reserved for future public transport**: This corridor has been reserved for a future public transport system. The mode and other details are not yet defined. It will initially be grassed. This public transport servitude is intended to continue through the Airport precinct (and the Dube TradePort in its entirety) to allow for a linkage to the South.

- **2m wide central median**: This median is for segregation of the two carriageways and for landscaping.

- **Sustainable Urban Drainage System (SUDS)**: This refers to the non-pipe drainage system described above and is generally a combination of infiltration areas, shallow trenches and constructed wetlands with suitable vegetation. Also known as 'Water Sensitive Urban Design' or 'Low Impact Design'.

- **Bulk earthworks** associated with the road construction and to allow side access and borrow and fill areas should they be required.

- **Signalised Link Road / Watson Highway Intersection**

(See Figure 2: Cross Section Sketch of the Proposed DTP Link Road)
While not expressly shown, it will become increasingly important to accommodate public transport (especially minibus-taxis) at the intersection, and this could take the form of laybys in the vicinity of the intersection. As the uShukela Highway Business Park is developed, the presence of public transport passengers boarding an alighting at this intersection (or possibly within the development itself) will become increasingly prominent. The intersection analysis undertaken as part of the TIA included pedestrian phases for this reason.
FIGURE 2: Site Locality Map and horizontal alignment for the proposed DTP Link Road
FIGURE 3: Cross Section Sketch of the Proposed DTP Link Road
2.2 Key Activities Posing Environmental Impact Risk

The activities that are undertaken during construction, maintenance and operation of the proposed road upgrade and that could potentially have an impact on the environment are listed below:

The project construction activities that may affect the environment include the following:

- Traffic congestion and disruption during construction of the new intersections and overpass
- Removal of vegetation on Erf 5333
- Use of available roads and tracks for transportation of equipment materials and for construction site access
- Use of transportation and construction vehicles and equipment
- Setting up of a construction camp site at and/or close to the proposed site
- Noisy construction activities, such as heavy vehicles, jack hammers, hoists, cranes etc.
- Refuelling and maintenance of construction vehicles and plants
- Establishment and use of concrete batching equipment and/or a concrete batching facility
- Resourcing, introduction, storage and use of construction material such as water, concrete, brick, fuel, oils, steel structures, equipment, construction wastes and litter
- Use of hazardous substances such as fuels, oils, paints, solvents, etc.
- Possible use of portaloos
- Disposal of construction rubble
- Waste management during construction
- Safety issues during construction
- Stormwater management on the construction site which could result in erosion and soil loss

2.3 Potential Environmental Impacts

The EIA compiled for the proposed project identified the following potential impacts:

2.3.1 Soil Erosion

Earth grading, vegetation clearing and soil stockpiling for site preparation, and the construction of the new link roads, access roads and off ramps may promote erosion and sedimentation particularly as much of the soil is large grained beach sand and thus easily erodible. During the operational phase of the road, soil erosion may occur from stormwater runoff onto exposed areas.

2.3.2 Soil Contamination

Soil contamination may occur during the construction phase of the road as a result of improper management and use and storage, or disposal of hazardous substances such as
fuel, oil and cement and the like. Furthermore, solid waste material generated during construction may impact on the surrounding environment if not correctly disposed of.

2.3.3 Surface and Groundwater Contamination

Groundwater contamination may occur due to poor management of hazardous substances during construction of the roads. Once constructed, previously vegetated areas will be covered by a hardstanding road surface which could result in increased runoff of stormwater from the road surface which will need to be managed and mitigated. In addition, contamination (oil and fuel spills) on the roads could potentially lead to stormwater contamination should such contaminants drain into the roads’ stormwater system. Furthermore, construction wastewater that is not correctly disposed of may contaminate surface and groundwater. Poor management of any temporary latrines used during the construction period may also result in water and groundwater contamination. Although the proposed route for the new road reserve does not cross any drainage lines there are several wetland areas in relative close proximity. Surface and stormwater runoff from the road may flow into theses areas through overland or via stormwater systems. It is for these reasons that wastewater and contaminants from the construction activities needs to be controlled to prevent any impacts on theses sensitive environments.

2.3.4 Loss of Fauna and Flora

The majority of the proposed road will be located within existing sugarcane fields, with the remaining portion of the route being in or adjacent to narrow strips of wooded vegetation that are composed of a mixture of indigenous and introduced trees, with alien species dominating the undergrowth.

The main impacts associated with the proposed road include a loss of vegetation along the avenues, wooded areas and hedgegrows along drainage lines and watercourses, as well as loss of large indigenous tree species and obstruction of corridors for both fauna and flora.

The following vegetation related impacts are likely to occur during the construction phase:

- Loss of wooded vegetation along riparian zones, avenues and hedgerows
- Loss of movement corridors through further habitat fragmentation
- Increase in alien and invasive plant species

2.3.5 Loss of wetlands (riparian and channel valley bottom)

A wetland delineation and functional assessment (Wet-Health Assessment) of the wetlands in the general vicinity of the proposed Link Road was undertaken. A total of ten wetland systems, likely to be impacted by the Link Road, were identified along the proposed route. The functional assessment determined that these wetlands are generally in a highly degraded and transformed state, and that they have a relatively low functionality due to their poor Ecological Condition (Bredin & Teixeira-Leite, 2010).

2.3.6 Stormwater Management

Unmanaged surface and stormwater runoff has the potential to impact negatively on the environment through erosion and pollution of the surrounding environment, contamination of stormwater runoff with spills, oils and fuel. Soil erosion and siltation of the stormwater system and natural drainage system could also occur to some degree. Once operational, the increased hard surfaced area will slightly increase the runoff of stormwater from the site.
2.3.7 Traffic Impacts

During the construction phase there will be an influx of construction vehicles and vehicles transporting materials in the area. This, coupled with construction activities, is likely to cause a disruption to the traffic flow for the duration of the construction period. Delays and congestion of traffic at the intersection may also occur, increasing the chance of accidents occurring.

Once construction is complete it is anticipated that the upgrade will reduce accident potential and improve safety as well as control the flow of traffic along the Watson highway.

2.3.8 Visual and Aesthetics Impacts

Visual and aesthetic impacts will result from the construction and operation of the road. Those who will be most impacted by the visual/aesthetic features are those travelling on the Watson Highway. Some of the visual and aesthetic impacts result from:

- Signage
- Construction activities
- Ineffective management of waste (littering) during construction and operation of the proposed development.

2.3.9 Noise impacts

Ambient noise levels are expected to rise during the construction and operation of the Link Road. Construction activities that may cause noise include:

- Vehicle traffic (entering and exiting the site)
- Generator noise from construction equipment
- Noise from hydraulic hammers and winches
- Construction worker voices
- General construction noise.

It is anticipated that only the noise levels during the construction phase, which will be short lived, will impact on the surrounding environment. The noise levels associated with the operational phase of the road will not increase above the current.

2.3.10 Heritage Impacts

No heritage resources are known to occur as the area has been previously disturbed and is situated within an industrial area.

However, should any heritage elements (graves, archaeological artefacts etc.) be uncovered during the construction phase, Amafa aKwaZulu Natali /Heritage KwaZulu-Natal must be contacted, and construction approved in writing, prior to works commencing.
2.4 Method Statements

1. Method Statements indicate what will be done to comply with relevant environmental specifications as set out in the EMPr.
2. Submit written Method Statements to the PM and ECO for the activities identified by the PM and/or the ECO, at least 10 working days prior to the proposed commencement of construction activities, to allow the PM (and/or ECO) time to study and approve the method statement.
3. The ECO may require changes to a Method Statement if it does not comply with the specification or if, in the reasonable opinion of the ECO, the proposal may result in, or carries a greater than reasonable risk of damage to the environment in excess of that permitted by the EMPr or any legislation.
4. Carry out the activities in accordance with the approved Method Statement.
5. Make approved Method Statements readily available on the site and communicate the content of the Method Statement to all relevant personnel.
6. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract.
7. No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a Method Statement.

2.4.1 Content of Method Statements

The Method Statement shall state clearly:

- The type of construction activity
- Locality where the activity will take place
- Timing of activities
- Materials to be used
- Equipment and staffing requirements
- Identification of activities, and resultant impacts that may result from the activity
- Methodology and/or specifications for impact prevention or containment
- The system to be implemented to ensure compliance with the specifications
- Emergency or disaster incident and reaction procedures
- Other information deemed necessary by the ECO.

The Contractor shall be responsible for the implementation of the method statements and must demonstrate that these measures are working effectively.

2.4.2 Required Method Statements

Method Statements that are initially identified and required from the Contractor in terms of this EMPr are listed in Appendix B.
3 ENVIRONMENTAL SPECIFICATIONS: PLANNING AND DESIGN PHASE

The following section details the minimum range of constraints, controls, procedures and standards that are required during the planning and design phase of the proposed Link Road development.

The key activities undertaken during this phase involve:

1. Additional specialist studies and/or investigations
2. Final planning and design of the Link Road infrastructure and micro-siting
3. Development of a set of site management master plans, e.g. for stormwater, water supply, facilities, waste, remediation, etc.
4. Tendering, adjudication and induction of Contractor/s
5. Addressing certain environmental requirements, concerns, roles and responsibilities in preparation for the construction phase; e.g. through contract negotiation.

3.1 Contractor's SHE Officer and Fire Officer

The name and letter of appointment of the Contractor's SHE Officer and Fire Officer must be given to the ECO and the terms of reference for the work to be undertaken must be detailed including time on site, roles and responsibility, interaction with the Contractor and environmental offices, etc.

3.2 Pollution Control

Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites must be identified and stated in a Method Statement. The Method Statement shall further include methods of minimising, controlling, collecting and disposing of contaminated water, and details of any hazardous substances/materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

3.3 Safety Considerations

Provide details identifying what safety precautions will be implemented to ensure the safety of all staff, and the general public at large, on site during the life of the project. This will include protective clothing requirements for all types of construction activities on site, e.g. protection against dust, noise, falling objects, work in trenches, work at heights, etc.
3.4 Emergency Procedures

Provide details regarding all relevant emergency procedures that will be implemented for fire control and accidental leaks and spillages of hazardous substances (including fuel and oil). Detail the risk reduction measures to be implemented including fire fighting equipment, fire prevention procedures and spill kits.

3.5 Waste Management Control

Provide details regarding how solid and liquid waste generated on the construction site and site camp will be collected, stored, transported and disposed off. Details of any service provider(s) appointed to manage this task must also be provided.

3.6 Stormwater and Erosion Control

Provide details of how stormwater emanating within or adjacent to the construction site may impact on construction activities. Details on how the Contractor will deal with stormwater runoff and potential erosion within the construction footprint must further be provided. Details of any service provider(s) appointed to manage this task must also be provided.

3.7 Site Layout

1. Determine the site for the construction camp in collaboration with the PM and ECO before the moving onto site, such that it is effectively isolated from the surrounding environment and takes into consideration:
   - The need to be more than 50 meters from a water body in a position that will facilitate the prevention of storm water runoff from the site from entering a water body.
   - The risk of public nuisance through, for example, noise generation, visual intrusion, light pollution or disruption to access.
   - Security implications.
2. The construction camp should also be of sufficient size to accommodate the needs of all Sub Contractors that may work on the project.
3. Submit to the engineer for his approval a site layout plan at least 7 days before construction can begin.
4. Provide the graphical representation with detailed notes of the location, layout and method of establishment of the construction camp, including the following:
   - The extent of the Contractors site camp, and other required areas if not located within the site camp;
- All Contractor’s buildings, and/or offices;
- Lay down areas;
- Vehicle and plant storage areas, including wash areas;
- Workshops and drip trays;
- Fuel storage areas (including filling and dispensing from storage tanks);
- Cement/concrete batching areas (including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete); and
- Other infrastructure required for the running of the project.
4 ENVIRONMENTAL SPECIFICATIONS: CONSTRUCTION PHASE

This section details specifications to be adhered to by the Developer / DTP Project Engineer during the Construction Phase.

4.1 Compliance Monitoring

1. The PM shall appoint a qualified and experienced ECO to ensure implementation of and adherence all parties to the EMPs.
2. The appointed ECO shall conduct a pre-construction site inspection to identify all sensitive environments, habitats, and No-Go areas.
3. The ECO shall prepare a pre-construction audit report, which will include a photographic record of the site and will report on the key features of the site. The photographic record of the site shall serve as a measuring staff against which rehabilitation will be measured later.
4. The ECO shall conduct regular audits to ensure that the system for implementation of the EMPs is operating effectively. The audit shall check that a procedure is in place to ensure that:

   - The EMPs and the Method Statements being used are the up to date versions.
   - Variations to the EMPs, Method Statements and non-compliances and corrective actions are documented.
   - Emergency procedures are in place and effectively communicated to personnel.
   - The audit programme shall consist of the following at a minimum:
     - First audit no later than 1 month after construction commences
     - Thereafter audits at monthly intervals
     - An audit one week prior to practical completion of the project is granted
     - A post construction audit within 1 week after the Contractor has moved off site. This is to ensure that the Contractor has met all his environmental obligations in terms of the EMPs as well those of the EA.

4.2 Construction Phase Specialist Environmental Specifications

4.2.1 Vegetation

(a) General Recommended Mitigation

1. The avenue for Ficus natalensis mixed with F. burkei directly to the west of the proposed route (along a 200m length starting from the Watson Highway in the north) should not be disturbed. These large trees were planted approximately 25-30 years ago, and while they are not species of conservation concern they do provide an ecological function (e.g. food source for birds in the area), and they are also aseptically pleasing. Where the disturbance of these trees is unavoidable, only the required individual should be removed. The avenue as a whole should be incorporated into the landscaping features adjacent to the link road.
1. Where the link road crosses the stream aligned with *Syzygium cordatum* (W10), a conservative approach to the removal of these trees should be adopted. The adjacent avenue of *Syzygium cordatum* trees should not be disturbed.

2. At the stream crossing (W6) a slight shift in the proposed route, to the east, should be taken into consideration. Such a shift would reduce the need to remove large indigenous tree species. The primary aim would be to identify a route that would require the least disturbance to the indigenous wooded vegetation.

3. The hedgerow along the existing farm road (in the vicinity of W4) should be incorporated into the landscaping features adjacent to the link road.

4. The final section of the link road at the southern end should be routed to the east of the sewage plant so that the wetlands to the west of the road alignment are not further impacted by construction activities.

(b) **Loss of Wooded Vegetation Along Riparian Zones, Avenues and Hedgerows**

1. The clearing of wooded / riparian vegetation at the crossing points will be unavoidable. The key mitigation will be to ensure that adequate structures are put in place to allow connection of habitats on either side of the road. Concrete portal culverts not smaller than 2X1.5m in dimension should be used.

2. Make every effort to limit the clearing of avenues and hedgerows. Instead, incorporate these into the landscaping along the Link Road (In particular the avenue of fig trees along the northern portion of the Link Road – these trees are about 25-30 years old and would add intrinsic value to the landscaping along the Link Road).

3. Indigenous vegetation must be used to landscape adjacent areas to the Link Road.

(c) **Loss of Corridors through Further Habitat Fragmentation**

1. All concrete portal culverts must not be smaller 2X1.5m and sufficient culverts should be used to stretch the entire width of the drainage line being crossed.

2. It is important for the lower end of the culvert to be flush with the surrounding terrain. Culverts are often built with a concrete pour-off and others develop a pour-off lip due to scouring action of water. A sheer pour-off of several centimetres makes it unlikely that many small mammals, snakes, and amphibians will find or use the culvert.

3. According to Cain et al. (2003) culvert usage can be enhanced by providing a natural substrate bottom, and in locations where the floor of a culvert is persistently covered with water, a concrete ledge established above water level can provide terrestrial species with a dry path through the structure.

4. The wooded and wetland habitats on either side of the Link Road should be incorporated into an Open Space Plan, which is a means of linking habitats through utilising continuous systems, such as wetlands, streams and drainage areas. Allowing movement corridors to remain open provides an opportunity for species survival at the local level. This will only be achievable through cooperation with 3rd parties involved with other (much larger) developments in the area. An open space plan for a ‘Greenbelt’ is vital for the conservation of biodiversity and wetlands in the general area.

(d) **Increase in Alien and Invasive Plant Species**

1. Where possible, cut rather than totally remove indigenous vegetation in the construction zone to facilitate more rapid re-colonization of disturbed areas.

2. Implement an integrated alien weed control programme to ensure that alien plants are eradicated from the site, with adequate follow-up measures to ensure the area remains weed-free (i.e. the control programme should continue through to the Operational phase).
3. Re-vegetation of disturbed areas with locally-common indigenous grasses and trees/shrubs should take place as soon as practically possible.

4.2.2 Terrestrial Fauna

(a) Potential Loss of Species of Conservation Concern

1. The remaining riparian and wetland habitats should be conserved to allow the systems to continue functioning, which in turn will provide an opportunity for the survival of locally occurring species.
2. The clearing of wooded vegetation at crossing points is unavoidable, however, every effort must be made to limit the construction footprint at each crossing.
3. Construction should take place during winter.
4. Suitable habitat for species should occur on both sides of all the culverts placed at crossing. Where required re-vegetation (using indigenous vegetation), of adjacent areas should be undertaken after construction.
5. Whenever practicable, suitable habitat should occur within the crossing structures, i.e. culverts.
6. Structures should be monitored during the operational phase for, and cleared of, obstructions such as detritus or silt blockages that impede movement.
7. Fencing should never block entrances to culverts but if available should be used to direct animals towards the culverts (i.e. reducing the chance of ‘road kills’).
8. Where possible sections of the road should be raised, which will discourage animals from crossing at these points. This can then be used to encourage animals to use culverts for crossing.

(b) Loss of Faunal Species through Road Kills

1. Adequate culverts must be designed for positioned so as to guide animals to these crossing points.
2. Design and implement a fencing system or an alternative barrier system (i.e. raised edges to the road, which will deter animals from crossing) which will channel animals to preferred crossing points, i.e. the culverts.

4.2.3 Agricultural Impacts

1. Ensure that adjacent strips of sugar cane are not impacted during construction.
2. Clearly demarcate the site boundary and prohibit staff from entering adjacent sugar cane plantations.
3. No fires are to be allowed on site.
4. Only use designated smoking areas on site whir risk of fires is eliminated by the strict use of ash trays.
5. Compile an Emergency Response Plan should fires break out, including the maintenance and use of fire extinguishers.

4.2.4 Birds

1. If any nesting birds are found pre construction the EKZNW must be notified for advice in dealing with these species.

4.2.5 Cultural Heritage
All human remains have high heritage significance for their social and spiritual values and may not be altered in any way without the permission of the next-of-kin and a permit from Amafa aKwaZulu-Natali. Should any heritage artefacts be uncovered during construction, eThembeni Cultural Heritage and Amafa aKwaZulu-Natali must be contacted immediately. Construction may not commence without prior approval from Amafa aKwaZulu-Natali.

4.2.6 Wetlands

(a) Loss and Fragmentation of Wetland Habitat

1. The impact of greatest concern is the unavoidable and permanent loss of approximately 1.79ha of low integrity/functionality wetland habitat wetland (across 10 effected systems). Based on best practice guidelines (Kotze, 2007), it was calculated that this area loss translates into a loss of 0.55ha of intact/functional wetland using the hectare equivalent approach. Using this value, site W6 was investigated further in terms of its rehabilitation potential.

2. Using the Wet-Health method to predict potential improvements in wetland condition following rehabilitation, it was estimated that 0.39ha of functional/intact wetland could be secured per hectare of physical wetland rehabilitated at W6. This translates into 1.4ha of wetland which will need to be rehabilitated at W6 in order to achieve the 0.55ha of intact/functional wetland to compensate for wetland losses.

3. Removal of all alien vegetation particularly herbaceous plants/shrubs along the riparian zone, including channel banks and encroaching sugarcane adjacent to the wetland.

4. Agricultural drains and erosion gullies within the wetland area will need to be plugged.

5. Excessive siltation of the river due to existing upstream development/activities will need to be addressed by removing the silt by hand and depositing above/outside the channel banks.

6. Eroded/unstable channel banks should be stabilised and protected from further erosion using necessary engineered erosion protection works.

7. The riparian zone (channel and banks) should be re-vegetated using indigenous trees common to riparian zones in the area. Locally common wetland plants such as reeds and sedges should be used to vegetate the in-channel zone.

8. A rehab-monitoring programme should be set-up to monitor the results of rehabilitation and ultimately to check whether the outcomes have been achieved or whether further rehabilitation efforts are required. The Wet-Health tool should ideally be used in this process through consultation with a qualified wetland Ecologist. This will provide a quantifiable method of evaluating whether rehabilitation goals have been achieved and what further work may be required as deemed necessary.

(b) Wetland Degradation through Pollution from Construction Activities

1. Administer the proper storage and handling of hazardous substances (hydrocarbons and chemicals)

2. Limit, as far as possible, the operation and storage of machinery and construction-related equipment within wetland areas

3. Provide appropriate solid waste disposal facilities and adequate signage on-site during construction

4. Clean up spillages immediately and ensure that contaminants are properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately.
5. Any cement batching activities should occur outside of the delineated wetland boundary. Use cement batching boards. Do not dispose of cement products/wash f into the wetlands/natural environment.

6. Provide suitable overnight facilities for vehicles, away from any areas of channelled flow. Provide drip-trays beneath standing machinery.

7. Routinely check machinery for oil or fuel leaks before construction begins.

8. Sanitation – provide portable toilets where construction is occurring and encourage workers to use these facilities and not the natural environment.

9. Clear and completely remove from site all general waste, construction plant equipment, surplus rock, and other foreign materials once construction has been completed.

(c) Wetland degradation through solid waste/litter pollution

1. Ensure that appropriate solid waste disposal facilities are provided on-site during construction and adequate signage is provided
2. No solid waste/rubble to be stored in wetland areas
3. Ensure that any rubbish is regularly cleared from the site
4. Clear and completely remove from site all general waste, construction plant equipment, surplus rock, and other foreign materials once construction has been completed.

(d) Wetland degradation through sedimentation from construction activities

1. Do not place excavated material/sediments/spoil from the construction zone (including any foreign materials) within wetlands or channels in order to reduce the possibility of material being washed downstream. Place excavated material outside of wetlands.
2. Install sediment barriers (e.g.: silt fences/sandbags/hay bales) immediately downstream of active work areas (particularly on channel banks) as necessary to trap any excessive sediments generated during construction.
3. Immediately fill any erosion gullies/channels created during construction to ensure silt does not drain into the wetland.

(e) Wetland degradation through the compaction of wetland soils

1. Where necessary, structures should be installed to stabilise locally steepened slopes
2. Construction should proceed mainly during the dry, winter months in order to minimize soil erosion linked to high runoff rates
3. Reduce servitude width in sensitive environments
4. Soil required for construction purposes must not be derived from the wetlands (i.e.: wetland soils are to be protected)
5. Employ erosion control measures where required
6. Topsoil removed should be stockpiled for rehabilitation work and maintained in a weed-free state and is not to be compacted
7. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment
8. Soils that have been compacted must be loosened to an appropriate depth to allow seed germination to occur. Rip the area once construction has been completed to reduce the bulk density of compacted areas
9. The pre-construction profile of the wetland needs to be returned to one similar as before construction, with no artificially created "ridge or channel" features present.
(f) **Wetland Degradation through Disturbance and Destruction of Wetland Vegetation**

1. Clearly demarcate the construction zone prior to the commencement of construction activities to ensure that construction vehicles do not unduly disturb the wetland areas.
2. Demarcate areas to be cleared of vegetation.
3. Site supervisors must ensure that impacts are confined to the construction zone.
4. Minimise the width of the construction zone in sensitive wetland areas.
5. Indigenous vegetation that will be destroyed should be identified, removed with their root ball intact and stockpiled prior to construction for use in future rehabilitation. Vegetation should be placed in shaded areas and kept moist.
6. Identify and relocate indigenous trees that would be destroyed along riparian zones in particular (i.e.: W6)
7. Where possible, cut vegetation to ground-level rather than removing it completely, leaving root systems intact to ensure rapid re-colonisation.
8. Topsoil removed during construction must be stockpiled separately from subsoil for rehabilitation works.
9. Rehabilitate disturbed areas as soon as practically possible.

(g) **Wetland degradation through soil erosion**

1. Construction should ideally occur during the winter months when flows are low to limit the potential for erosion.
2. Construction necessary erosion protection works for unstable banks (eg: coarse rock pack, gabions).
3. Re-instate disturbed/destroyed indigenous vegetation (grasses and indigenous trees) as soon as practically possible once construction ceases, so as to stabilise erosion-prone areas.
4. Design access routes to limit their potential impact on the environment, bearing in mind steep banks and areas that are already showing reduced groundcover and erosion.
5. Adequately maintain access roads
6. Divert stream flow away from construction activities
7. Any erosion gullies/channels created during construction should be filled and stabilized immediately to ensure sediment does not enter wetlands downstream
8. In order to reduce the possibility of material being washed downstream, do not place excavated sediments from the construction zone (including any foreign materials) within wetland areas
9. Install sediment barriers (e.g.: silt fences/sandbags/haybales) immediately downstream of active work areas (particularly on channel banks) as necessary to trap any excessive sediments generated during construction.
FIGURE 3: Cross Section Sketch of the Proposed DTP Link Road
4.2.7 Traffic and Safety

1. Liaise with the eThekwini Traffic and Transportation Department on envisaged traffic impacts
2. Train and expect construction staff to show respect to other road users and give public vehicles the right of way
3. Minimise construction activities in roads during peak hours
4. Minimise congestion and traffic obstruction e.g. by keeping lanes open and introducing traffic control measures
5. Ensure that construction vehicles keep to the speed limits on public roads
6. Ensure that all material or equipment transported on public roads are appropriately secured on the vehicle and where necessary covered, to prevent any load falling off or spilling onto public roads.

4.3 Construction Phase Environmental Specifications

4.3.1 Health and Environmental Awareness

1. Provide adequate health and environmental training.
2. Ensure that all employees undergo project induction on environmental awareness and conduct such training in the language of the employees.
3. Provide evidence that the environmental awareness induction courses have been presented.
4. Place emphasis on any (potential) environmental impacts relating to the construction activities on site and to the related environmental precautions taken to avoid or mitigate these impacts.
5. The environmental training should, as a minimum, include the following:
   - The importance of conformance with all environmental policies
   - The significance of environmental impacts, actual or potential, as a result of their work activities
   - Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements
   - The mitigation measures required to be implemented when carrying out their work activities
   - The importance of not littering
   - The need to use water sparingly
   - Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible
   - Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered
   - The procedures which should be followed should a grave be encountered, or unearthed during the construction phase
   - Details regarding fauna and flora of special concern, including protected/endangered plant and animal species, and the procedures to be followed should these be encountered during the construction phase
6. Conduct a training needs analysis in consultation with the ECO, to identify the appropriate environmental and health training programmes, and the appropriate target groups amongst the employees of the Contractor.

7. File the results of the environment and health training needs analysis with the environmental records.

8. Environmental awareness training programmes should contain the names, positions and responsibilities of personnel to be trained, the framework for appropriate training plans, and a schedule for the presentation of the training courses.

9. Maintain records of all training interventions. The ECO shall monitor the records and undertake regular follow ups.

4.3.2 Emergency Preparedness

1. Compile and maintain environmental emergency procedures to ensure an appropriate response to unexpected or accidental incidents that may cause environmental impacts.

2. Activities that may be addressed in the environmental emergency procedures include, for example, accidental exposure of employees to hazardous substances, veld fires and accidental spillage of hazardous substances.

3. These plans should include as a minimum:
   - A list of key personnel
   - Details of emergency services applicable to the various areas along the route that turbine components will need to be transported and for the site itself (e.g. the fire department, spill clean-up services, etc.)
   - Internal and external communication plans, including prescribed reporting procedures where required by legislation
   - Actions to be taken in the event of different types of emergencies
   - Incident recording, progress reporting and remediation measures required to be implemented
   - Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release
   - Training plans, testing exercises and schedules for effectiveness


5. Maintain an environmental incidents register to record incidents that occur on site as a result of the activities associated with the contract. Environmental incidents constitute all those activities and incidents that may have a negative impact on the surrounding natural environment.

6. Ensure that each environmental incident is investigated by the ECO and forward an environmental incident report to the Contractor, Proponent and relevant authority, including details on the manner in which the incident was remedied.

7. Ensure that each environmental incident report contains as a minimum, a description of the incident, a statement on the severity and significance of the impact, and actions taken to remediate the resultant damage.
4.3.3 Emergency Procedures

1. Ensure that employees and Sub Contractors on site are aware of the procedure for dealing with accidental spills and leaks.
2. Ensure that the necessary materials and equipment for dealing with the spills and leaks are available on site at all times.
3. The site shall have a supply of absorbent material readily available to absorb any accidental hydrocarbon spills. The quantity of such material shall be able to absorb/deal with a minimum of 200 litres of spill.
4. Contain any spill using sand berms, sandbags, sawdust or absorbent materials.
5. The area shall be cordoned off and secured.
6. Notify the ECO, PM/EER and relevant authorities of any spills that occur.
7. Assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures. These contact details shall be listed in English, and any other relevant language, in the site office, construction camp and any other suitable areas.
8. The treatment and remediation of areas affected by emergencies shall be undertaken to the satisfaction of the PM, EER and ECO at the cost of the Contractor where his staff have been proven to be responsible for the emergency.

4.3.4 Community Relations

1. Erect and maintain information boards in the positions, quantities, designs and dimensions required by municipal specifications. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the ECO.
2. Keep a Complaints Register on site, containing contact details of complainants, the nature of the complaint, details on the complaint itself, as well as the date and time that the complaint was made and resolved.
3. The Contractor, or if required the ECO, shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

4.3.5 Non-working Times

1. Daily timeframes for construction works is to be agreed to by the Contractor, ECO and landowners.
2. For any deviation from the ordinary working hours the written approval of the PM must be obtained before such works commences.

4.3.6 Safety at the Construction Site

1. Safety precautions must be taken to ensure that residents in the area do not come to harm. The construction site shall be off limits to the general public at all times during the construction period and during site clean-up.
2. Clearly demarcate construction areas, open sewers, trenches and other potential construction-related danger areas with hazard tape and/or appropriate fencing.
3. Erect hazard warnings and maintain in good condition warning signs in the relevant languages and at appropriate positions, warning traffic of construction activities ahead and at problem sites.
4. Ensure that all staff is compliant with the relevant safety regulations on site and wear applicable safety clothing and gear at all times while on site.
4.3.7 Social Disruption

1. Staff shall in no way be a nuisance to residents or clients seeking the services of the established businesses in the area. Any complaints received by the PM will be investigated, addressed and, if deemed necessary, the relevant persons will be suspended from the project.

2. Give at least seven days notice to the residents in the vicinity of the construction activities of his intention to begin construction activities in their area.

3. The PM may request a representative of the Contractor to be available to discuss issues raised by residents and make information available to them on construction activities.

4.3.8 Labour and Social Issues

1. The criteria for and selection of labourers, contractors and suppliers for the project should demonstrate preference for the local community. Such requirements should be included in contract documents and be monitored by DTP.

2. Contractors must ensure proper supervision of employees at all times, undertake regular inspections of the workplace, enforce the wearing of safety equipment/clothing and ensure compliance with all relevant rules and procedures.

3. Staff should be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.

4. The provision and proper utilisation, maintenance and management of toilet, wash and waste facilities for staff during construction must be ensured.

5. Machine / vehicle operators should receive clear instructions to remain within demarcated access routes.

6. Suitable control measures over the contractor’s yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.

7. Contractors must adhere to normal working hours and ensure that all machinery is in a good state of maintenance to mitigate noise.

4.3.9 Consultation with Interested and Affected Parties (IAPs)

1. Preventative measures, such as screening, muffling, dust control, timing and pre-notification of affected parties are recommended to minimise complaints regarding dust, noise and vibration nuisances.

2. Open liaison channels should be established between Contractor, the developer, the sub-contractors and IAPs such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s).

4.3.10 Working Areas and No-go Areas

1. The Construction Site shall be divided into working areas and ‘no-go’ areas and shall be marked on appropriate plans for reference. Working areas are those areas required by the Contractor to construct the works and as approved by the PM.

2. ‘No-go’ areas are generally those large areas outside the designated working areas, and may include, but not be limited to:

3. Privately owned land (unless a formal agreement has been signed for access, use or impact)

4. Watercourses

5. Any heritage sites that receives the protection from AMAFA

6. Natural or special features and Sensitive Environments
7. The Contractor shall ensure that all “no go” areas are demarcated and that no unauthorised entry, litter, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated “no go” areas.

8. Once construction within an area has been completed and the area has been rehabilitated and revegetated, it shall be considered a “no go” area.

9. In the event that any damage is caused to the ‘no-go’ areas, the Contractor will be required to repair, restore, reinstate and/or rehabilitate these areas to a standard required by the PM and at the Contractor’s cost.

10. Any deviations from the demarcated working area must be agreed upon by the Environmental Control Officer concerned, the Engineer and the Department.

4.3.11 Site Identification

1. Produce a Site Layout Plan illustrating the location and layout of the proposed site camp in each cluster and the working areas. This plan must be approved by the PM.

2. Ensure that the site camp is fenced and provided with a lockable access gate to prevent vandalism, theft and unauthorised entry by the public, where necessary.

3. Produce a photographic record of the area earmarked for the site camp prior to site establishment. This will serve as the benchmark against which rehabilitation will be measured and shall be kept in the site environmental file.

4. Ensure that the site camp is reinstated to its original condition once the project has been completed.

5. Do not use the land for the site camp for any purpose other than for the proper carrying out of the works under the contract.

4.3.12 Site Demarcation

1. Prior to construction commencing, the ECO, Contractor, and/or PM shall inspect the site and identify any sensitive environments.

2. Where necessary, demarcate the construction footprint areas using materials as specified by the PM. These may include fencing, rope, hazard tape, wire mesh, or other approved materials or means.

3. The Contractor will be required to maintain all demarcation fencing and other demarcating materials for the duration of construction activities or as otherwise instructed by the PM.

4.3.13 Vegetation Clearance

1. Vegetation clearance shall take place strictly in accordance with the Site Layout Plan developed by the Contractor.

2. Collection or wilful damage to any plants outside of the areas demarcated for clearing is not allowed.

3. Only trees and shrubs directly affected by the works may be felled or cleared, subsequent to approval from the ECO or PM in writing.

4.3.14 Protection of Natural Features

1. The Contractor shall not deface, paint, damage or mark any natural features situated in or around the Site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the ECO.
2. The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

4.3.15 Record Keeping

1. Inspect the site on a daily basis to ensure that the environmental specifications of the EMPr are adhered to.
2. Provide the PM with a verbal report, at least fortnightly, detailing compliance with the EMPr as well as environmental performance.
3. Maintain a record of incidents (spills, impacts, complaints, legal transgressions, etc.) as well as corrective and preventive actions taken, for submission to the PM at the scheduled project meetings.
4. Maintain an environmental site file containing at a minimum the following documents:
   - Final Environmental Impact Assessment Report compiled for the Link Road
   - Latest version of Environmental Management Programme
   - Final design documents and diagrams issued to and by the Contractor
   - All communications detailing changes of design/scope that may have environmental implications
   - Site monitoring reports
   - Complaints register
   - Training manual
   - Training attendance registers
   - Incident and accident reports
   - Emergency preparedness and response plans
   - Disciplinary procedures
   - Monthly site construction meeting minutes
   - All relevant permits
   - Letters or legal documents authorising identified site staff to act in a specified authoritative capacity relating to the protection and preservation of the environment, and on behalf of the Contractor
   - Environmental Authorisation on the EIA from the DEA
   - All method statements from the Contractor for all phases of the project.

4.3.16 Existing Services and Infrastructure

1. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities.
2. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the PM.
3. The repair and reinstatement of any infrastructure that is damaged or services that are interrupted during construction will be done at the expense of Contractor's and shall receive top priority over all other activities.
4. Adhere to the time limit for the repairs as stipulated in consultation with the PM.

4.3.17 Traffic

1. The movement of trucks to and from the construction site must be well coordinated by the PM together with the Contractor, so as to cause the least disruption to the residents in the area.
2. Do not leave large trucks and other heavy-duty machinery unattended outside the Contractor's site camp or designated area.
3. Erect appropriate signage indicating construction works ahead of strategic locations along the site access road(s), clearly observable by all road users by day and night. Warning signs must comply with the applicable municipal, provincial or SANRAL specifications governing road works.

4. All temporary or permanent traffic calming measures, if required, must be erected according to the appropriate municipal, provincial or SANRAL specifications governing road works.

4.3.18 Prevention of Damage to Surrounding Infrastructure

1. Be extra vigilant, during the construction activities, to prevent damage from occurring to any buildings, road furniture and motor vehicles located in the vicinity of the construction site.

2. The Contractor shall be responsible, at his own cost, for the repair and reinstatement of any damages to existing structures resulting from the construction works.

3. Investigate any complaints received from the public regarding any of the listings above. If substantiated, the above listings may result in a fine, or suspension or dismissal of the guilty party.

4.3.19 Unpleasant Visual Impact at the Construction Site

1. Keep the construction site neat and tidy at all times during the life of the project.

2. Locate the construction camp(s) inconspicuously in the landscape to reduce visual impact severity.

3. Keep signage and other infrastructure to a minimum.

4. Minimise new road construction and existing roads where possible.

5. Minimise night lighting of the construction sites within requirements of safety and efficiency.

6. Contain and store general and construction related waste, upon approval by the PM, as prescribed by relevant specifications.

7. Maintain good housekeeping on site to avoid litter and minimise waste.

8. Ensure that any lighting installed on site for his activities does not interfere with road traffic or cause an unreasonable disturbance to the surrounding community.

4.3.20 Site Maintenance

(a) General

1. The Construction Site and surrounds are to be maintained in a clean orderly and presentable condition at all times.

2. Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.

3. Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public as a whole.

4. The contractor may not cause the pollution of any surface water resource.

5. Provide a comprehensive first aid kit and make sure that there are adequate staff members who are trained in first aid.

6. Provide sufficient fire-fighting equipment at the contractor’s camp and work areas, and make sure that there are staff members who know how to use the equipment.

7. Make sure that the necessary safety equipment and protective clothing, required for specific construction work are used, and inform staff about safety procedures and possible dangerous working conditions.

8. Provide sufficient temporary ablutions facilities on site and maintain these facilities in a good working and hygienic condition.
9. An area must be designated for staff and labourers to eat during breaks.
10. No fires will be allowed on site.
11. Sufficient weather and vermin proof bins must be provided at the Contractors’ camp site.

(b) Workshop

1. If an on-site workshop is to be established for the duration of construction, obtain the approval of the PM prior to commencing activities and confine maintenance activities to the identified workshop area.
2. Ensure that there is no contamination of the soil or surface water from the on-site workshop.
3. Maintain a spill control kit and staff appropriately trained to utilise it.

(c) Equipment Maintenance and Storage

1. Keep all vehicles and equipment in good working order in the site camp or an area approved by the PM.
2. Inspect all vehicles and plant daily for leaks and spills. Log and sign off maintenance checks in a site maintenance file after each inspection.
3. Repair or remove leaking equipment from the site immediately.
4. Stationary plant must be supplied with drip trays to prevent soil contamination after hours and when not in use.

(d) Cooking Facilities

1. Designate an all weather cooking and eating area, subject to the approval of the PM.
2. Any cooking on site shall be done on either well-maintained gas cookers or by contained fires (e.g. in a drum), located away from flammable vegetation or construction materials. No fires for heating purposes shall be allowed on site.
3. Keep the cooking and eating areas kept tidy and clean at all times to prevent the luring of vermin, domesticated or wild animals.
4. Provide sufficient bins with vermin proof lids for waste disposal, within a 5 m radius of the cooking/eating area at all times.

(e) Water for human consumption

1. Water for human consumption should be available at the site offices and at other convenient locations on site.

4.3.21 Access and Traffic Control

1. The Local Traffic Department must be informed at least a week in advance if the traffic in the area is affected during construction.
2. Person and vehicle access should be restricted during construction so as to control access to otherwise potential dangerous excavations and materials.
3. Liaise with the eThekwini Traffic and Transport Department on envisaged traffic impacts. Adequate signage and warnings must be erected to control the existing traffic.
4. Train construction staff to show respect to other road users and give public vehicles the right of way.
5. Minimize construction activities inside the road during peak hours.
6. Minimize congestion and traffic obstruction e.g. by keeping lanes open and introducing traffic control measures.
7. Ensure that construction vehicles keep to the speed limits on the public roads.

### 4.3.22 Transport of Materials/Components

1. Secure and ensure safe passage for components and materials between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent it from spilling over the side of the vehicle during transit.
2. Be responsible for any clean-up resulting from the failure by staff or supplier to properly secure materials to be transported.

### 4.3.23 Soil Management

1. Stockpiled soil should be protected by erosion-control beams if exposed for a period of greater than 14 days during the wet season.
2. Soil stockpiles should be located away from drainage lines, watercourses and areas of temporary inundation.
3. All soil excavated during construction must, where practical, be separated into top- and subsoil. Subsoil must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas.
4. Where contamination of soil is expected, analysis must be done prior to disposal of excess soil to determine the appropriate disposal route. Proof from an applicable waste disposal site where contaminated soils are dumped, if and when a spillage / leakage occurs, should be forwarded to the DEA.
5. On completion of the backfilling of pipe or cable trenches, the topsoil should be replaced and the ground restored to its former condition, e.g. grass, artificial surface, etc.
6. Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil should be provided by the contractor.
7. All accumulated and surplus excavated material should be disposed of in a suitable place and manner to prevent translocation of invasive plant species, modification of drainage and contamination of surface water.
8. Wherever possible excavated material must be used as backfill.
9. Determine if soil is contaminated and dispose at an appropriate waste disposal site.

### 4.3.24 Topsoil

1. Top soil and subsoil excavated during trenching may be stockpiled next to the trench, but must be set back from the edge of the trench by a minimum distance of 1 m.
2. Topsoil can only be stripped from the following areas in or adjacent to the construction site or site camp:
   - Areas which is to be used for temporary storage of soil and/or materials
   - Areas which could be polluted by any aspect of the construction activity
   - Areas within the footprint of the proposed infrastructure to be constructed.
3. Undertake the stripping of topsoil in a manner that minimises erosion by wind or runoff.
4. Topsoil will be stripped to a depth not exceeding 150 mm from the original ground level, unless greater depth is required during the execution of the construction phase of the project.
5. Clear areas from which the topsoil is to be removed of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
6. Ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation.
7. Topsoil will be temporarily stockpiled, separately from (clay) subsoil and rocky materials.
8. Topsoil will be stockpiled in areas designated by the ECO.
9. Topsoil must not be stockpiled on drainage lines or near watercourses without proper risk assessment conducted and prior consent from the ECO.
10. Topsoil stockpiles will either be vegetated with indigenous, covered by a suitable fabric or maintained in some other suitable way approved by the PM and ECO to prevent erosion and invasion of weeds.
11. Stockpiled topsoil will not be compacted and shall not exceed 2 m in height.

4.3.25 Excavations and Stockpiling

1. The movements of the construction vehicles must be confined to the immediate vicinity of each tower location.
2. Rocks and debris are to be stockpiled separately within the immediate construction site, and used as fill where necessary.
3. Rocks can be stacked as walls to prevent the loss of top and subsoil on cut or fill banks.
4. Banks should not be steeper than 1:3 and cut back where the ECO deems necessary.
5. Berms may be specified on sloped sites, depending on the gradient and length of slope affected.
6. Soils should be exposed for the minimum time possible once cleared.
7. Any stockpiling of gravel, cut, fill or any other material including spoil shall be in areas approved by the ECO within the defined working area.
8. Ensure that stockpiled material is not lost due to exposure to the elements. If the stockpiled material is in danger of being washed or blown away, cover it with a suitable material, such as hessian or plastic. Do not cover stockpiles of topsoil with plastic.
9. Do not allow stockpiling of any material within the 100 m of any residential areas or 20 m of any “no go” area.

4.3.26 Storm Water Management and Erosion Control

1. The following areas will require appropriate erosion control measures and re-vegetation methods as these are regarded as being of high erosion risk:
   - Slopes > 20°
   - Slopes with convergent sub-surface drainage (percolines)
   - Road culverts
   - Cut and fill slopes in areas of slope instability or erodable geology.
2. Take all reasonable measures to control storm water and the erosive effects thereof and provide a Method Statement for approval by the PM and ECO.
3. Protect streams, rivers, pans, wetlands, dams, and their catchments from erosion, direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products.
4. Protect areas susceptible to erosion by installing necessary temporary or permanent drainage works as soon as possible.
5. Areas affected by construction related activities and/or susceptible to erosion must be monitored regularly for evidence of erosion.
6. Inspect storage containers regularly to prevent leaks into the aquatic system.
7. Weather forecasts of up to three days in advance must be monitored on a daily basis to avoid exposing soil or building works or materials during a storm event and appropriate action must be taken in advance to protect construction works should a storm event be forecasted.

8. On any areas where the risk of erosion is evident, special measures may be necessary to stabilise the areas and prevent erosion. These may include, but not be restricted to:
   - Confining construction activities
   - Using cut-off berms
   - Using mechanical cover or packing structures such as geo-fabric to stabilise steep slopes or hessian, gabions and mattress and retaining walls
   - Straw stabilising
   - Brush cut packing
   - Constructing anti-erosion berms.

9. The erosion prevention measures must be implemented to the satisfaction of the PM and ECO.

10. Where erosion does occur on any completed work/working areas, reinstate such areas and areas damaged by the erosion at the expense of the Contractor and to the satisfaction of the PM and ECO.

11. Restrict and control traffic and movement over stabilised areas.

12. Repair and maintain any damage to the stabilised areas to the satisfaction of the PM and ECO.

13. The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.

### 4.3.27 Concrete Batching

1. Concrete batching plants shall generally be located in an area of low environmental sensitivity, as identified by the PM (in consultation with the ECO).

2. In particular, the concrete batching plant shall be located in a low flood risk area.

3. Should the batching plant be established on ground without any hardstanding, topsoil shall be removed from the batching plant site and stockpiled as per the Environmental Specification.

4. Run-off from batching operations must be contained and not be allowed to discharge off site or into stormwater system.

5. The batching plant site shall be bunded with concrete bunds or sandbags such that runoff cannot escape from the plant site.

6. Small scale concrete mixing is to take place with the Contractor’s camp or an alternative location approved by the ECO / DTP. Concrete mixing areas need to be concentrated so that the area of contamination is minimised.

7. Ad hoc concrete mixing at the active working area should be avoided wherever possible. If small volumes are mixed (manually), mixing is to be undertaken on a hard surface covered in plastic sheeting so that concrete waste and runoff can be contained.

8. If large volumes are generated the following requirements must be met:

9. Mixing area must be underlain by an impermeable surface that is large enough to trap spillages.

10. Surface runoff from the grout mixing area is to be contained and channelled into a collection point.

11. The concrete batching works shall be kept neat and clean at all times.

12. Cement bags are to be considered “waste” and therefore stored and disposed of at a licensed waste disposal facility.

13. Concrete transportation shall not result in spillage.
14. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment.
15. Suitable screening and containment shall be in place to prevent wind blown contamination associated with any bulk cement silos, loading and batching.
16. Waste concrete and cement sludge shall be scraped off the site of the batching plant and removed to an approved disposal site.
17. All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete and disposed at an approved disposal site. Washing the remains into the ground is not acceptable.
18. All excess aggregate and sand shall also be removed.
19. After closure of the batching plant or any area where concrete was mixed, all waste concrete/cement sludge shall be removed together with any contaminated soil/sand.
20. Should any open ground be affected, the surface shall then be ripped to a depth of 150mm and the topsoil replaced evenly over the site and re-grassed as per the Environmental Specification.

4.3.28 Asphalt, Bitumen and Paving

1. Over spray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the PM.
2. When heating bitumen products, only LPG or a similar zero emission fuel shall be used and the Contractor shall take cognisance of appropriate fire risk controls.
3. Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept/raked into piles and removed to an area approved by the PM.
4. Milled or cut out bitumen shall be removed to an area approved by the PM.
5. Water quality from runoff from newly/fresh bitumen surfaces shall be monitored by the PM and remedial actions taken where necessary.
6. Drums/tanks shall be safely and securely stored.
7. Materials requiring disposal shall be disposed of at an appropriate waste facility.

4.3.29 Backfilling of Pipe or Cable Trenches

1. Backfilling of pipe trenches should commence immediately after a section of the pipework has successfully passed the tests and inspections specified.
2. On completion of the backfilling of pipe or cable trenches, the topsoil should be replaced and the ground restored to its former condition, e.g. grass, artificial surface, etc.
3. Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil should be provided.

4.3.30 Sanitation

1. Provide adequate washing and toilet facilities at the construction site camp.
2. Provide portable chemical toilets at a ratio of one toilet per 15 workers.
3. The toilet facilities must be easily accessible.
4. All temporary/portable toilets shall be secured to the ground to the satisfaction of the PM to prevent them from toppling over or being blown over by wind.
5. The type and exact location of the toilets shall be approved by the PM prior to establishment. No septic tanks are to be established.
6. Ensure maintenance of all toilets in a clean sanitary condition to the satisfaction of the PM. Toilets are to be serviced at least once per week and toilet paper shall be provided.
7. Ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site to an appropriate location/facility.
Contractor/service provider is to provide proof that the toilet contents are disposed of at an appropriate facility.

8. Discharge of waste from toilets into the environment and burial of toilet waste is strictly prohibited.

4.3.31 Waste water and Contaminated Water Management

1. Prepare a Method Statement on the control and management of waste water on site, including providing for the appropriate disposal of contaminated water.
2. No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) to adjacent or nearby water bodies shall be permitted.
3. Discharge water containing environmental pollutants into a conservancy tank, where appropriate, for removal from site.
4. Prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or stormwater infrastructure.
5. Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained.
6. Wash down areas must be approved by the PM, EER and ECO and shall not pollute the surrounding environment.
7. Notify the PM, EER and ECO of any pollution incidents on site.

4.3.32 Solid Waste Management

1. Prepare and submit a Method Statement on waste control and management at the site.
2. No burning, burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted.
3. Remove, or appoint a suitable service provider to remove solid waste from site on a weekly or fortnightly basis.
4. Solid waste must be recycled where possible and the remainder spoilt at an approved municipal landfill site or waste disposal service provider.
5. Disposal certificates for each waste removal event shall be issued and kept in the site environmental file for auditing purposes.
6. Do not allow burning of cleared vegetation on site. Chipping or composting of vegetation shall be allowed where viable.

4.3.33 Air Emissions and Odour Control

1. Ensure that all vehicles and plant used are maintained in good working order to help reduce air emissions.
2. The burning of substances that may emit foul smelling smoke or vapour, e.g. oil rags, tar paper etc., is not permitted.

4.3.34 Noise Control

1. Keep noise level within acceptable limits in compliance with all relevant guidelines and regulations.
2. All vehicles and machinery shall be fitted with appropriate silencing technology that shall be properly maintained.
3. Reverse hooters of heavy earthmoving vehicles must be set at such a level that the beeping sound does not create a nuisance to residents of nearby houses.
4. The use of all plant and machinery shall be appropriate to the task required in order to reduce noise levels and/or environmental damage.
5. Notify affected residents and ECO, should the PM approve any noisy construction activities outside of normal working hours, least 5 days in advance of the event.

4.3.35 Dust Control

1. Control dust arising from construction operations and activities, through e.g., regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff. The frequency of spraying will be agreed with the PM.
2. Avoid the excavation, handling and transport of erodible materials under high wind conditions.
3. Soil stockpiles shall be wetted and/or sheltered from the wind, as required.

4.3.36 Hazardous Substances

1. All potentially hazardous raw and waste materials are to be handled by the Contractor’s trained staff and stored on site in accordance with manufacturer’s instructions and legal requirements.
2. Provide appropriate training for the handling and use of such materials as necessary. This includes providing for any spills and pollution threats that may occur.
3. Clearly labelled products and provide symbolic safety/hazard warning signs.
4. Ensure that areas for the storage of fuel and other flammable materials comply with standard fire safety regulations.
5. Locate fuel and chemical depot(s) at least 100 m from any water body.
6. If potentially hazardous substances are to be stored on site, provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.
7. Store hazardous chemical substances used during construction in secondary containers.
8. Retain the relevant Material Safety Data Sheets (MSDS) on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.
9. Where hazardous substances is removed from site for disposal, proof of disposal for auditing purposes shall be kept in the form of disposal certificates.

4.3.37 Fuels (Petrol and Diesel) and Oil

1. Obtain all necessary approvals regarding storage and dispensing, where fuel is to be stored on site, from the appropriate authorities.
2. Ensure that the location of the fuel storage area is approved by the PM and ECO.
3. Ensure that all liquid fuels and oils are stored in tanks with lids and that these are kept firmly locked at all times. The design and construction of the storage tanks shall be in accordance with a recognised code and as approved by the PM.
4. Situate the tanks situated in a bunded area that has a volume of at least 110% of the volume of the largest tank. The floor of the bunded area must be impermeable and the bunds must be without leaks.
5. Remove storage tanks on completion of the works.
6. No smoking shall be allowed in the vicinity of the fuel storage area. Erect at least one no-smoking warning sign, which is clearly visible at the fuel storage area, to warn all staff of associated dangers.
7. Provide adequate fire fighting equipment at or close to the fuel storage and dispensing area(s).
8. Keep fuel under lock and key at all times.
9. Where reasonably practical, plant shall be refuelled at a designated refuelling area or at the workshop as applicable. If it is not reasonably practical then the surface under the temporary refuelling area shall be protected against pollution to the reasonable satisfaction of the PM prior to any refuelling activities.

10. Ensure that there is always a supply of absorbent material readily available to absorb/break down any hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 litres of hydrocarbon liquid spill. This material must be approved by the PM prior to any refuelling or maintenance activities.

11. In the case of a spill, contaminated material must be removed from the site immediately and disposed of at an appropriate hazardous waste facility.

4.3.38 Fire Prevention and Control

1. Take all reasonable and precautionary steps to ensure that fires are not started as a consequence of construction activities.

2. Ensure that there is basic fire-fighting equipment available on site. Fire-fighting equipment must be in working order and serviced to date.

3. Appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. Forward the name of the Fire Officer to the ECO for his approval within 7 days of being on site.

4. Flammable materials should be stored under conditions that will limit the potential for ignition and the spread of fires.

5. Smoking shall not be permitted in those areas where there is a fire hazard, e.g. fuel storage areas and areas susceptible to the rapid spread of fires.

6. Hold fire prevention talks with staff to create an awareness of the risks of fire.

4.3.39 Work Stoppage and Temporary Site Closure

1. The PE, in consultation with the ECO, shall have the right to order work to be stopped in the event of significant infringements of the Project Environmental Specifications until the situation is rectified in compliance with the specifications. In this event, the Contractor shall not be entitled to claim for delays or incurred expenses.

4.3.40 Rehabilitation

1. Rehabilitation shall be undertaken in line with the Rehabilitation plan developed for the project during the final design phase.

2. Rehabilitation shall be required for all specified areas disturbed by the works and site camp.

3. Rehabilitation shall ensure that all specified areas disturbed by the works are returned to a similar or better state than before the construction works commenced.

4. The Contractor shall rehabilitate all disturbed areas to the satisfaction of the PM and the ECO.

5. Implement a programme of progressive rehabilitation, i.e. rehabilitation and/or re-vegetation must commence once works are complete in a particular area with acceptable regrowth being achieved after 3 months.

6. A programme of progressive rehabilitation will provide an opportunity to assess whether or not the methods employed are suitable and successful. Where rehabilitation of an area is not successful, the Contractor will rehabilitate these areas at no additional cost to the Developer.

7. Rehabilitation includes, but is not limited to, the following activities:

   - Clearance of rubble associated with construction, including removal of surplus
materials, excavation and disposal of consolidated waste concrete and concrete wash water, litter etc.

- Removal of all soil/sand contaminated by hydrocarbons by excavation to the depth of contaminant penetration and removal to an appropriate landfill site.
- Backfilling and contouring using stockpiled subsoil removed during site clearing.
- Finishing and grading of final levels of all disturbed areas shall be consistent with the master plan for the site.
- Rehabilitation of all drainage lines affected by construction to approximately their original profile. Where this is not feasible due to technical constraints, the profile is to be agreed upon by the PM.
- Ripping along the contour of compacted disturbed areas, including stockpile areas, to a depth of 150 mm prior to the replacement of topsoil, except where otherwise specified by the PM.
- The eradication of young invasive/alien species that may have grown up during the construction period in impacted and rehabilitated areas.
- The removal of visually detracting or environmentally unacceptable piles of blast rock and boulders to an approved spoil site.

8. Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

9. Excess subsoil shall be spoiled in a pre-identified location or be used, where possible, as infill material or building material, in conjunction with the ECO's approval.

4.4 Construction Site Closure

4.4.1 Materials and Infrastructure

1. All remaining building materials must be removed from the site.
2. Residual stockpiles must be removed.
3. Disassemble all infrastructure from the working areas and Contractors’ camp, including temporary office and storage structures, containers, water pipes, water storage containers etc.
4. Drain all portable chemical toilets being careful not to spill the contents. Transfer the contents to a permitted disposal site.
5. Drain all wastewater and sewerage associated with temporary ablution facilities and transfer the waste to an appropriate permitted disposal site.
6. Disassemble all fencing around the Contractors’ camp and remove to the Contractors depot.

4.4.2 Contaminated Substrates and Pollution Control Structures

1. Excavate all areas of contaminated substrate, transfer the contaminated material to a permitted disposal site and treat the affected areas with appropriate ameliorants.
2. Remove all plastic linings used for pollution control and transfer to a permitted disposal site.
3. Break up all concrete structures that have been created (e.g. working and parking surfaces) and remove concrete waste to a permitted disposal site.
4.4.3 General

1. All areas where temporary services were installed are to be rehabilitated to the satisfaction of DTP and the ECO.

2. A meeting must be held on site between DTP, ECO and the Contractor to approve all remediation activities, and to ensure that the site has been restored to a condition approved by DTP and/or ECO.

4.4.4 Site Rehabilitation

1. Once construction is completed, the contractor must ensure that all redundant construction materials and waste are removed from site and disposed of in an appropriate manner.

2. Rehabilitation shall ensure that all specified areas disturbed by the works are returned to a similar or better state than before the construction works commenced.

3. The method of vegetation removal and establishment where required will be specified by the PM.

4. All surfaces should be re-vegetated accordingly.

5. Pack roadsides with topsoil sods where possible Hydroseed with local seed.

6. Mulch should be used to re-establish grasses.

7. Where plant material has been saved, they can be successfully planted onto the road verges.
5 ENVIRONMENTAL SPECIFICATIONS: OPERATIONAL PHASE

This section details specifications to be adhered to by the Developer / DTP Project Engineer during the Operational Phase.

5.1 Wetlands

5.1.1 Wetland Degradation through Pollution Caused by Vehicles

1. Install adequate pollution prevention infrastructure where necessary to control pollutants entering storm water.

5.1.2 Wetland Degradation through Solid Waste (litter) Pollution

1. Provide adequate solid waste/litter disposal facilities (i.e.: bins) along the road at regular intervals with adequate signage to encourage proper waste disposal.

5.1.3 Wetland Degradation through Soil Erosion Caused by Enhanced Runoff from Road Surfaces

1. Construct necessary erosion protection works for unstable banks (e.g.: coarse rock pack, gabions)
2. Immediately fill and stabilise any erosion gullies/channels leading downslope from road surfaces
3. Re-vegetate any disturbed/bare ground surfaces with suitable indigenous species (grasses and woody trees/shrubs) to stabilise soils
4. Culverts below the road surface should adequately convey water through to downstream areas without resulting in scouring of receiving wetlands. Suitable armouring of downstream areas may be required (e.g.: gabions, reno-mattresses) to protect soils downstream of piped culverts
5. Design storm water drainage systems to encourage infiltration through porous materials and mechanisms to reduce flow rate and scouring of downstream wetland soils.

5.1.4 Wetland Degradation through Direct Disturbance of Wetlands by Pedestrians

1. Fence off sensitive wetland systems to restrict access to wetlands
2. Remove any existing tracks/trails leading into wetland areas and vegetate these with indigenous grass species
3. Provide adequate pedestrian facilities alongside the road that will detract pedestrians from using wetland areas as an alternative route (i.e. the proposed shared footpath).

5.1.5 Alteration of Wetland Hydrology

1. Road development should ideally not permanently alter the surface or subsurface flow of water through wetlands. Culverts to be used at all crossing points must not be smaller than 2X1.5m in dimension.
2. Culverts below the road surface should adequately convey water through to downstream areas without resulting in scouring of receiving wetlands. Suitable
armouring of downstream areas may be required (e.g.: gabions, reno-mattresses) to protect soils downstream of piped culverts.

3. Storm water drainage systems should be designed to encourage infiltration through porous materials and mechanisms to reduce flow rate and scouring of downstream wetland soils needs to be encouraged.

5.2 Solid Waste Management

1. During the operation phase, the area of the development should be cleared of litter on a regular basis. Once collected, this litter shall be disposed of at a DEA approved waste disposal site.

5.3 Hazardous Waste

1. Hazardous materials (if any) which may be generated during the operation phase must be disposed of in a DEA approved hazardous waste landfill site.
2. The Proponent or Contractor acting on his behalf shall ensure that an emergency preparedness plan is in place for implementation in the case of a spill.

5.4 Emergency Procedures

1. The Proponent or Contractor acting on his behalf shall compile and maintain environmental emergency procedures during the operational phase of the project to ensure that there will be an appropriate response to unexpected or accidental environment-related incidents, e.g. during routine maintenance and servicing.
2. These plans should include:
   - A list of key personnel, including responsibilities, accountability and liability.
   - Details of emergency services applicable to the various areas along the route that the turbine components will need to be transported as well as for the site itself.
   - Internal and external communication plans, including prescribed reporting procedures where required by legislation.
   - Actions to be taken in the event of different types of emergencies.
   - Incident management plans for the site.
   - Incident recording, progress reporting and remediation measures required to be implemented.
   - Information on hazardous materials, including the potential impact associated with each and measures to be taken in the event of accidental release.
   - Fire fighting strategy.
   - Training plans and testing exercises and schedules for effectiveness.
### 5.5 Erosion Control

1. The various protective measures that were installed during the construction phase must be properly maintained, e.g. the vegetation of road verges and cut faces must be inspected and maintained on a regular basis.

### 5.6 Visual

1. Implement A1, which includes the SUDS that will enhance aesthetic appeal of the proposed link road
2. Ensure that vegetation selection of the SUDS is fitting with the landscape.
3. Streetlamps that direct light down rather than outwards should be installed, and where possible do not install lighting where it is not needed.
6 ENVIRONMENTAL SPECIFICATIONS: DECOMMISSIONING PHASE

The lifespan of the road cannot be defined at this stage. Due to the long term nature of the surrounding development initiatives, no tangible specifications can be made during this time. It is therefore recommended that prior to decommissioning of the road at some future date, a comprehensive decommissioning EMPr be prepared that can reassess the potential environmental and socio-economic impacts at the time. This decommissioning EMPr should be based on the construction EMPr as the impacts and mitigation measures will be very similar. Specifications applicable to the Developer and the Contractor will be defined in the decommissioning EMPr.
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(b) by release of the report to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against Arcus GIBB and Arcus GIBB, accordingly, assume no duties, liabilities or obligations to that Third Party, and  
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Appendix A
Environmental Authorisation
Appendix B
List of Applicable Legislation
ENVIRONMENTAL LEGISLATION AND POLICY

Environmental Policies and Guidelines

The Developer is required to develop an environmental management policy before commencement of the proposed works. This policy must consider:

- The Developer’s mission, vision and core values
- Guiding principles
- Requirements of, and communication with interested and affected parties (I&APs)
- The commitment to prevent pollution and ecological degradation
- The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.)
- Reference to specific local and/or regional conditions
- A commitment to comply with relevant environmental laws, regulations, by-laws.

The policy, once approved by Project Manager, EER and ECO, must be communicated to all employees and Contractors (and sub-Contractors), and made available to the public, if requested.

Legislative Framework

This EMPr informs all parties as to their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. All parties associated with the project should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

Statutory and Other Applicable Legislation and Standards

The Contractor shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the design, construction and implementation phases of the project include:

- National Environmental Management Act (Act No. 107 of 1998) (as amended)
- NEMA EIA Regulations, 2006 (GN R. 385, R. 386 and R. 387)
- NEMA EIA Regulations, 2010 (GN R. 543, R. 544 and R. 545)
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
- Environment Conservation Act (Act No. 73 of 1989)
- National Heritage Resources Act ( Act No. 25 of 1999) (NHRA)
- Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)
- Air Quality Act (Act No. 39 of 2004) (AQA)
The following permit requirements would be relevant to the proposed project:

- Water Use Licence Application from Department of Water Affairs and Forestry
- All relevant licenses from the Civil Aviation Authority
- Permit for the removal of protected plants on the site
- Approval from the South African Heritage Resources Agency (SAHRA) on cultural issues
- Hazardous chemicals permit for asphalt plants, if to be used – obtained from the Department of Water and Environmental Affairs (DWEA)
- Health permits for sanitation (Provincial health authorities)
- Fuel storage permit (temporary and permanent) – obtained from DEA
- Blasting permit – obtained from the Department of Mineral Resources (DMR), if required;

The list of applicable legislation and permits provided is intended to serve as a guideline only and is not exhaustive.
Appendix C

Construction Activities that will Initially Require Method Statements
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>SPECIFICS</th>
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</table>
| Access Routes and Roads | Upgrading and construction of access routes  
Rehabilitation of temporary access routes  
Location of proposed access routes |
| Blasting | Details of all methods and logistics associated with blasting if required |
| Excavation | Method for all excavations, including minimisation of environmental impact. |
| Bunding | Method for the bunding of static plant |
| Cement/Concrete Batching | Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete including the management of runoff water from such areas. |
| Contaminated Water | Contaminated water management plan, including the containment of runoff and polluted water |
| Drilling and Jack Hammering | Method of drill coring with water or coolant lubricants  
Methods to prevent pollution during drilling operations |
| Dust | Dust control plan |
| Earthwork, Erosion Control and Stormwater management | Method for the control of erosion during bulk earthworks operations  
Method of erosion control of spoil materials  
Method of undertaking earthworks, including hand excavation and spoil management  
Construction of earth and stormwater control berms or drainage ditches around campsites to contain dirty water |
| Emergency | Emergency response plan  
Emergency procedures must include but not be limited to electrical hazards, fires, spills, and contamination of ground and surface water, accidents to employees and damage to services |
| Environmental induction training | Ensure that all site employees are aware of, and understand the contents and conditions of the EMPr, the key environmental issues and the consequences of non-compliance |
| Fire, Hazardous and Poisonous substances Management | Handling and storage of hazardous waste in impermeable bunded areas with separate storage of incompatible substances  
Construction and location of concrete platform / bund wall to accommodate hazardous substances  
Emergency spillages procedures and compounds to be used  
Emergency procedures for fire  
Emergency remediation / clean-up procedures for spills or leaks of hazardous substances  
Location of hazardous substance storage areas  
Methods of the disposal of hazardous building materials, including asbestos, fibre claddings, refrigerants and coolants.  
Details of methods for fuel spills and clean up operations  
Rehabilitation of batching plant area at completion of construction. |
| Health and safety | Compile a Construction Health and Safety Plan  
Take all necessary precautions to effectively address any potential health and safety hazards |
<table>
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<tr>
<th>ACTIVITY</th>
<th>SPECIFICS</th>
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<tbody>
<tr>
<td>Rehabilitation</td>
<td>Rehabilitation of disturbed areas and re-vegetation after construction is complete</td>
</tr>
</tbody>
</table>
| Site Camp Establishment        | Layout and preparation of the construction camp  
Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing  
Construction camps, equipment storage sites and ablution facilities serving the construction phase should be sited a reasonable distance away from the river  
Location of storage areas for materials, equipment, plant and vehicles  
Method of vegetation clearing  
Installation of ablution facilities with chemical toilets prior to construction commencing (minimum of one toilet to 15 people) |
| Traffic                        | Any traffic diversions must be undertaken with approval of the relevant Transport Authority and in accordance with relevant legislation.       |
| Waste Control and Management   | Types of wastes generated  
Location of designated waste areas  
On-site disposal facilities  
Collection arrangements  
Disposal procedures  
Disposal site verification  
Solid waste and sewerage collection and disposal procedures |
| Water abstraction              | Water abstraction from water resources if undertaken                                                                                 |