CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Environmental Management Programme

City of Cape Town

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List of Terminology and Definitions

Terminology	Explanation
Activity	Any action needed for the design, construction and completion of a development.
Alien species	• species that is not an indigenous species; or • an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention;
Best practicable environmental option	The option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.
City of Cape Town	The Client / Employer
Communication register	A register aimed at tracking all communication activities within the development.
Competent Authority (as defined in the NEMA (Act 107 of 1998), as amended)	In respect of a listed activity or specified activity, means the organ of state charged by the Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity;
Contaminated water	Water contaminated by pollutants from on- or off-site activities; e.g. concrete-laden water and runoff from plant / personnel wash areas. Contaminated water must be treated to ensure that water released into the receiving environment meets minimum standards and guidelines. Treated water should be recycled where possible (e.g. used for dust suppression).
Construction	The building or erection of structures or infrastructure.
Department of Environmental Affairs & Development Planning	Provincial Authority responsible for approval of Impact Assessments and associated EMPr's.
Department: Mineral Resources	The authority responsible for mineral and petroleum resource management.
Department of Water and Sanitation	The authority responsible for water management.
Design	Drawing or plan to show layout or plan of the development.
Development (as defined in the NEMA EIA Regulations, 2014, as amended)	The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Emergency situation	A situation posing an immediate risk to health and safety; environment and property.
Environment	The surroundings in which humans exist and which comprise: • the land, water and atmosphere of the earth; • micro-organisms, plant and animal life; • any part or combination and interrelationships; and

	• the physical, chemical, aesthetic, historical, cultural and economic properties and conditions of the foregoing that can influence human health and wellbeing.
Environmental aspect	A product's or production process's environmental impact or important issues in the environment that an organisation should take into consideration
Environmental audit	Systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of the Environmental Management Programme and is complying with statutory requirements and the organisation's Environmental Policy.
Environmental Authorisation	The authorisation by a competent environmental authority for commencement of listed activities in terms of the National Environmental Management Act (Act 107 of 1998).
Environmental Compliance Review	Due diligence review of the environmental authorisation, EMPr and other applicable permits / licenses in relation to evolving engineering design, to determine continued applicability of assessed impacts / permits / licenses; and possible identification of new impacts / permits / licenses.
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially that results from an organisation's environmental aspects.
Environmental Impact Assessment	The process of collecting, organising, analysing, interpreting and communicating information in accordance with the environmental legal requirements set out in the Environmental Impact Assessment Regulations (as amended), promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998), for the purposes of obtaining an Environmental Authorisation in accordance with Chapter 5 of the National Environmental Management Act.
Environmental Management Inspector	A person designated as an environmental management inspector in terms of Section 31B or 31C of the National Environmental Management Act (Act 107 of 1998).
Environmental Management Programme	A tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
Environmental objectives	The overall environmental goal arising from the Environmental Policy that an organisation sets itself to achieve, and is quantified where practicable.
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fire danger index	A relative number denoting an evaluation of rate of spread or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.
Fire hazard	The relative combination of fuel, oxygen and heat that will lead to the start and spread of a potential fire.
Fire Protection Association	An association registered in terms of the National Veld and Forest Fire Act for the purposes of predicting, preventing, managing and extinguishing veld fires.
Flood line	The line or mark to which a flood could rise every 50 (1:50 year flood line) or 100 (1:100 year flood line) years.
Flora	All living plants, grasses, shrubs, trees, etc. that are typically

	incapable of easy natural motion and capable of photosynthesis.
Groundwater	Water that fills the natural openings in below-surface rock or unconsolidated sands.
Hazardous waste	Waste that, because of its chemical reactivity, toxic, explosive, corrosive, radioactive or other characteristics, causes danger or is likely to cause danger to health or the environment.
Heritage resources	Any place or object of cultural, archaeological or paleontological significance in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).
Induction training	The training provided to new / existing employees to (re)acquaint them with the company structure, their specific job requirements, practical or organisational issues and occupational health, safety and environmental considerations required on the development.
Integrated Environmental Management	• the promotion of the integration of the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998) in making decisions that may have a significant effect on the environment; • the identification, prediction and evaluation of the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts and maximising benefits; • ensuring that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them; • ensuring an adequate and appropriate opportunity for public participation in decisions that may affect the environment; • ensuring the consideration of environmental attributes in management and decision making, which may have a significant effect on the environment; and • identifying and employing the modes of environmental management best suited to ensure that a particular activity is pursued in accordance with the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998).
Interested and Affected Parties (I&AP) / Stakeholder	Any person or group of people concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, customers and consumers, environmental interest groups, and the general public (after the Environmental Impact Assessment Regulations of September 1997 and Guideline Document: Environmental Impact Assessment Regulations of April 1998).
Key Performance Indicator	A quantifiable measure that demonstrates how effectively the Contractor is achieving prescribed outcomes.
Land Use	The arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. This definition establishes a direct link between the land cover and the actions of people in their environment.
Materials	All kinds of items (other than Plant) intended to form or forming part of the permanent Works and temporary works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
Mitigate	The implementation of practical measures to reduce any adverse

	impacts or to enhance the beneficial impacts of an action.
No-go area	An area where construction activities are prohibited.
Non-conformance	Failure to comply with the requirements of *inter alia* the EMPr and environmental authorisation.
Non-conformance report	A report outlining a deviation from process, procedure or compliance specifications.
Operation	The act of controlling a function / system.
Outcome	Specific result to be achieved within a prescribed timeframe and with available resources.
Planning	Defining the scope of the development.
Plant	The apparatus, machinery and vehicles used during the Permanent Works.
Pollution	Any change in the environment caused by substances or noise, malodours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
Potentially hazardous substance	A substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances, published in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).
Precautionary principle	The basic principle that, when in doubt or when there is insufficient or unreliable information, actions must be undertaken that have minimum risk.
Pre-construction	Activities associated with the period preceding construction.
Programme	A deliverable from the Contractor to the Employers Representative as part of the documents required before commencement of the Works. An initial programme of carrying out the works in order to meet the Due Completion Date.
Quality management system	A set of interrelated or interacting elements that organisations use to direct and control how quality policies are implemented and quality objectives are achieved.
Rehabilitation	Re-establishment or restoration to a healthy sustainable capacity or state.
Resource recovery	Recycling of waste, water or the recovery of energy.
Sensitive receptors	Locations or areas that are likely to experience an impact more than other locations or areas; for example, schools and residential areas.
Site clearance	Clearing and grubbing activities.
Solid waste	All solid waste, including construction debris, chemical waste, excess cement / concrete, wrapping materials, timber, steel, drums, wire, nails, food and domestic waste (e.g. plastic bags and wrappers).
Target	The detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental outcomes and that needs to be set and met in order to achieve those outcomes.
Waste minimisation	The reduction of the volume of waste during construction by means of different processes or clean technology.

Waste prevention	The prevention and avoidance of the production of a waste.
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Water resource	Includes a watercourse, surface water, estuary, or aquifer.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which in normal circumstances supports, or would support, vegetation that is typically adapted to live in saturated soil (as defined in the National Water Act (Act 36 of 1998)).
Works	Means the Permanent Works and the Temporary Works, or either of them as appropriate.

List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
CAR	Corrective Action Request
CLO	Community Liaison Officer
DEA&DP	Department of Environmental Affairs and Development Planning
DOL	Department of Labour
DMR	Department: Mineral Resources
DW&S	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ECO	Environmental Control Officer
EMD	Environmental Management Department, City of Cape Town
EO	Environmental Officer
EMPr	Environmental Management Programme
ESMP	Environmental and Social Monitoring Programme
FDI	Fire Danger Index
FPA	Fire Protection Association
GCC	General Conditions of Contract
HDI	Historically disadvantaged individuals
H:WC	Heritage Western Cape
I&AP(s)	Interested and Affected Party(ies)
IMS	Integrated Management System
ISO	International Organisation for Standardisation
MSDS	Material Safety Data Sheet
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NCR	Non-Conformance Report
NEMA	National Environmental Management Act (Act 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA	National Water Act, 1998 (Act 36 of 1998)
PCO	Pest Control Officer
PPE	Personal Protective Equipment
PSEM	Performance Specifications: Environmental Management
PSP	Professional service provider
QA/QC	Quality Assurance and Quality Control
QMS	Quality Management System
RAM	Responsibility assignment matrix
SAHRA	South African Heritage Resource Agency

SANAS	South African National Accreditation System
SAQA	South Africa Qualifications Authority
SEMP	Site Environmental Management Plan

1. Structure and Purpose of the Report

1.1. Background

The City of Cape Town utilises a generic Environmental Management Programme (EMPr) to inform the management and mitigation of potential impacts. The City's last generic EMPr (Version 7:2012) has had to be updated due to changing legislation and approaches to environmental management and monitoring.
The National Environmental Management Act (NEMA) (Act No 107 of 1998) Environmental Impact Assessment (EIA) Regulations, 2014, as amended, prescribes *inter alia* that the EMPr be audited by an independent Environmental Auditor; and that the EMPr contain impact management outcomes.
Consequently, the requirement that an EMPr be developed and enforced for developments within the City of Cape Town is indicative of the City's support for adherence to regulatory requirements and best construction practice, which includes ensuring environmental damage during all phases of a development be minimised.
Therefore, in order to best align with the regulatory requirements, the evolving industry, and address concerns raised by environmental practitioners within the local environmental fraternity, the City of Cape Town has revised and released this EMPr as its current version.
Accordingly all developments within the City of Cape Town that require an environmental impact assessment (EIA) process; or within sensitive environments; or at the City's discretion, shall necessitate the environmental assessment practitioner (EAP) / Environmental Planner to make use of this EMPr to manage and mitigate potential impacts.

Due to the generic nature of the EMPr, additional information derived from *inter alia* the EIA process shall need to be incorporated within the body of text.
This shall be identified through: ➡ "Note to Compiler" prompts.
It is incumbent upon the Compiler to ensure the EMPr is made **site** and **development** specific, as the use of a generic EMPr for a development where an environmental authorisation was obtained may result in unnecessary audit findings, when audited by the independent Environmental Auditor. Should these findings be substantive, they may require a Part 2 amendment process which may negatively impact upon the Contractor's programme.

The City of Cape Town has adopted an outcomes based approach for this EMPr as it believes there are various ways in achieving good environmental outcomes. This approach allows the setting of outcomes based conditions, against which the development is to achieve compliance, without prescribing how that outcome is to be achieved. However, outcomes-based conditions do not mean that actions with unacceptable impacts will be approved. Outcomes required as conditions of approval shall be achievable and measurable to provide certainty for the City of Cape Town, the Competent Authority and the community.

Outcomes based conditions allow the Contractor to innovate; draw on company expertise; and consider site specific conditions when planning how task / activity specific methods shall be undertaken in order to achieve the outcome. Consequently greater emphasis shall be upon Employers Agent (with support from the ECO) to review and

approve Contractor's method statements; and ECO verification whether actions proposed provide suitable mitigation to achieve the desired outcome.

Developments not complying for the use of this EMPr shall utilise either the CIDB Environmental Management Specifications or site EMPr (SEMP). Please note that neither the CIDB nor SEMP EMPs meet all the EMPr content requirements as set out in Appendix 4 of the NEMA EIA Regulations, 2014, as amended.

The broad structure of the report is as set out below.

1.2. Structure and Purpose of the Report

This EMPr consists of eight Sections, each of which groups aspects related to addressing specific elements; namely: Structure of Report, Introduction, Project Description, Management, Monitoring, Assurance, and Performance Specifications. These Sections are supported by eighteen Annexes.
The body of text contains hyperlinks for ease of reference.

1.3. Introduction

This Section provides the background, scope and outcomes of the EMPr.
This Section also points out the continuous improvement approach that forms the basis of the environmental management approach. Such reiterative actions inform the adaptive management strategy and amendment processes.

1.4. Project Description

This Section provides a detailed project background and description, together with associated drawings.
Please note all developments within the City of Cape Town that require an environmental impact assessment (EIA) process; or within sensitive environments; or at the City's discretion, shall necessitate the EAP / Environmental Planner to include the relevant description and drawings.

1.5. Management

This Section describes activities associated with the management of the development. It informs the staffing roles and responsibilities; provides communication lines; mechanisms to prevent, control, manage, correct and mitigate development related activities; and training related thereto.

1.6. Monitoring

This Section describes the actions undertaken to monitor the efficacy of measures implemented to mitigate impacts / risks. It further provides for a quality control system with which the City of Cape Town can assure itself that the work is being, and has been adequately performed.

1.7. Assurance

The Section describes governance actions undertaken to inform stakeholders of the efficiency of the mechanisms implemented in compliance of its obligations.

1.8. Performance Specifications: Environmental Management

This Section identifies management activities that form part of the development, detailing key performance indicators and targets, which when implemented, confirm compliance to the outcomes of the EMPr. This Section is auditable by the Environmental Control Officer (ECO) and Environmental Auditor, aligns with the Annexure 7 – Environmental Best Practicable Options; or can be used as stand-alone Performance Specifications with tender documents.

1.9. Annexures

The Section provides further detail on aspects contained within the main body of the EMPr.

Annexure 1 - Details of Author(s) and related expertise
Annexure 2 - Legislation, Permits, Standards and Guidelines
Annexure 3 - City of Cape Town By-Laws
Annexure 4 - Potential Authorisations / Permits / Licences Required Prior to Construction Commencement
Annexure 5 - Environmental Authorisation / Water Use License
Annexure 6 - City of Cape Town Environmental Policy
Annexure 7 - Environmental Best Practicable Options
Annexure 8 - Site Plan
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Annexure 13 - Environmental Monitoring of Noise
Annexure 14 - General Conditions of Contract
Annexure 15 - Bill of Quantities
Annexure 16 - EMPr Alignment with NEMA Sec 24N
Annexure 17 - Typical Aspects and Impacts Table
Annexure 18 - Site Environmental Management Plan

2. Introduction

2.1. Background and Scope of the EMPr

An EMPr is a proactive environmental management tool used to prescribe management methods to prevent or reasonably avoid adverse environmental impacts, and strengthen the positive environmental benefits of a development. It also places a Duty of Care on those who cause, have caused or may in future cause significant pollution or degradation of the environment. This requirement is according to Section 28 (1) of the National Environmental Management Act (Act No. 107 of 1998) (NEMA).
Furthermore, this EMPr is drafted in compliance with NEMA Section 24N (Environmental Management Programme) requirements and the scope is to set conditions for the implementation of the environmental management component for all personnel involved with the development. As such, the EMPr outlines how the development will be managed through its planning, design, pre-construction, construction, rehabilitation and decommissioning lifecycle and is designed to mitigate negative environmental impacts; whilst enhancing positive impacts.
This EMPr must form part of the tender documentation to the Contractor(s) and becomes legally binding on the Contractor(s) and anyone acting on behalf of the Contractor(s) or the City of Cape Town during the development life-cycle process activities.

2.2. Outcomes of the EMPr

This EMPr covers systems, strategies and procedures to ensure proposed developments within the City of Cape Town meet the environmental outcomes and targets as prescribed herein.
The below outcomes, targets and execution are to ensure the development is undertaken in an environmental responsible manner (please refer to Table 1).

Table 1: EMPr Outcomes

Outcomes	Targets	Execution
Compliance with legislative requirements	100% compliance with all requirements	Review of audit reports
Compliance with Competent Authority conditions	100% compliance with all requirements	Review of audit reports
Avoidance of environmental harm	Compliance with EMPr, environmental authorisation and best practicable environmental option	• Implementation of development based environmental management system • Implementation of monitoring environmental controls • Environmental reporting, auditing and recording • Awareness training
Conformance with best practicable environmental option	• Conduct environmental inductions (at development commencement and every six months thereafter) and provide	• Training of personnel in EMPr measures • Environmental monitoring and audits • Review of non-conformance register

Outcomes	Targets	Execution
	for weekly environmental toolbox talks • Achieve performance indicators and targets • Undertake environmental inspections • Undertake environmental audits as per prescribed audit schedule • Report and record all environmental incidents and non-conformances • Assign and complete corrective actions within the prescribed timeframes	• Review of environmental reports
Maintain commitments to stakeholders and community	• Minimal grievances • Respond to all grievances within the prescribed timeframes	Review of Communications Register

2.3. Adaptive management and review of EMPr

As part of an adaptive management strategy, this EMPr is a "living" document that shall be reviewed prior to each development phase to ensure appropriateness and applicability. This approach shall allow for:

- *monitoring data gathered being used to evaluate impact management and mitigation;*
- *assumptions being tested and uncertainties reduced; and*
- *EMPr efficacy being determined and whether reviews are required.*

Such review can provide for:

- *revision of monitoring because of iterative learning;*
- *the determination of performance indicators and target success; and*
- *revision of performance targets and target actions.*

Therefore the EMPr may be revised due to:

- *policy change;*
- *management review;*
- *audit recommendations;*
- *grievances or non-conformance reports; and*
- *legislative changes.*

Please note the requirements associated with Regulations 29 and 31 of the EIA Regulations, 2014 (as amended), relating to the amendment processes.

Part 1 Amendment (Regulation 29) shall be undertaken when there is:

- *no change in scope of a valid environmental authorisation;*
- *no increase in level or nature or assessed impact; and*

- *a change of ownership, or transfer of rights and obligations.*

The amendment shall require no formal submission of the EMPr to the Competent Authority; and no public participation. The amended EMPr shall however be submitted to the Competent Authority for record keeping.

Part 2 Amendment (Regulation 31) shall be undertaken when there is:

- *a change to the scope of a valid environmental authorisation;*
- *an increase in level of or change in the nature of assessed impact; and*
- *inclusion of an activity not considered within the initial application for environmental authorisation or the environmental authorisation itself*.

Furthermore, a Part 2 Amendment shall be applicable when the length of the construction period exceeds the period specified in the environmental authorisation when no operational aspects are applicable (please refer to Regulation 26 (d) (ii) of the EIA Regulations, 2014, as amended).

The amendment shall require a formal submission of the EMPr to the Competent Authority; together with a public participation process.

A Part 2 Amendment process may negatively impact upon the Contractor's programme.

3. Project Description

Note to Compiler: Please insert detailed project description for the development.

Note to Compiler: Please provide detailed site layout and locality drawings.

4. Management

4.1. Leadership by Senior Management

Leadership by senior management is essential in developing a culture that values health, safety and environmental protection. Therefore, senior managers shall be required to demonstrate their commitment in their actions and decisions.
The City of Cape Town aims to create and sustain a culture within both the development; and all role players, to drive the commitment of zero harm to all people, to protect the environment and enhance the local communities.
To achieve this aim, personnel in leadership roles shall be suitably qualified and competent to provide leadership in health, safety and environmental management and will be required to:

- *know and understand the health, safety and environmental risks associated with their specific activities, how these risks are managed, and the corrective actions to mitigate them;*
- *visibly demonstrate health, safety and environmental management leadership through measurable actions (e.g. communicating the Health, Safety and Environmental Management Policy and Standards, undertaking health, safety and environmental worksite visits, engaging personnel and Contractors, and leading or participating in health, safety and environmental activities e.g. audits, investigations and campaigns;*
- *motivate, coach and develop personnel in effective health, safety and*

environmental management by acting as a role model for compliance and reporting of issues and incidents, and encourage personnel to do the same; provide constructive health, safety and environmental feedback and celebrate success including health, safety and environmental management behaviours and performance in staffing decisions; and develop the team's health, safety and environmental management competencies;

- *ensure that all relevant personnel have undertaken induction training prior to working on site;*
- *hold individuals accountable for their health, safety and environmental management behaviours and performance by insisting on compliance with applicable laws, regulations and development commitments; and*
- *apply consistent consequence management to those who breach Health, Safety and Environmental Standards and procedures whilst rewarding correct health, safety and environmental behaviours.*

4.2. Legislation, Permits, Standards and Guidelines

The development shall be implemented within the framework of the NEMA and other relevant environmentally related legislation, including national acts, provincial ordinances, municipal by-laws and/or guideline documents as referenced in Annexures 2, 3 and 4.

4.3. Staffing

4.3.1 Organisational chart of City of Cape Town, Employers Agent, Contractor Roles and responsibilities

➡ Note to Compiler: Please insert organizational chart for the development.

4.3.2 Institutional and Functional Arrangements

The institutional and functional arrangements indicate the role players and institutional linkages involved in the development. The arrangement is dictated by the contract with the City of Cape Town.

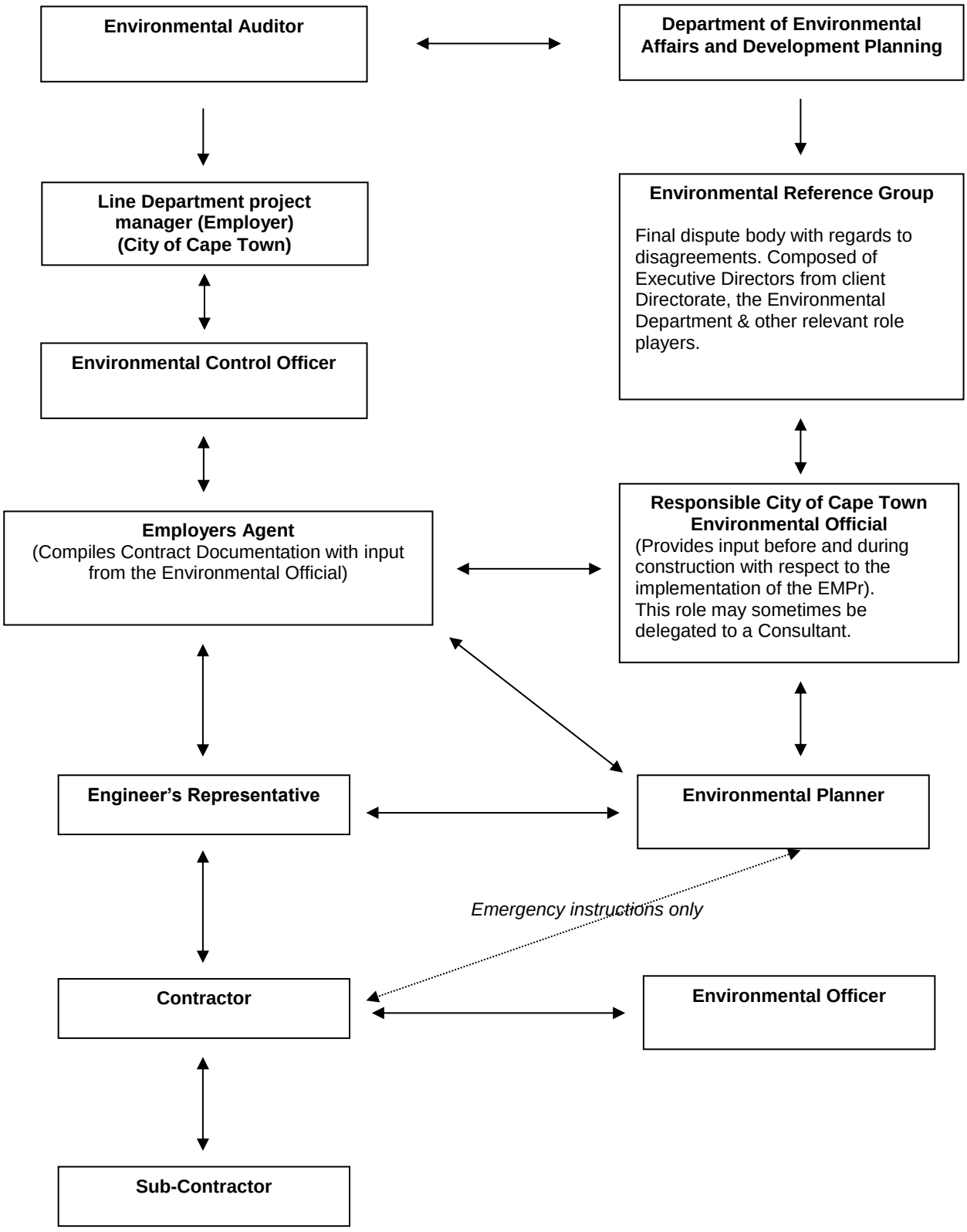

Figure 1: Typical Environmental Staffing Arrangement

4.3.3 Roles and Responsibilities

4.3.3.1 City of Cape Town

The City of Cape Town shall be responsible for overall environmental control during all development phases.
Consequently the City of Cape Town's responsibilities shall include:

- *internal consultation with EMD regarding changes in the development that results in significant environmental impacts;*
- *ensuring appropriate environmental resources are assigned to each development phase;*
- *being fully familiar with the EMPr;*
- *forwarding audit reports (prepared by the Environmental Auditor) to the Competent Authority;*
- *notifying the Competent Authority of changes in the development that results in significant environmental impacts;*
- *notifying the Competent Authority within 30 days of change of ownership or as the Environmental Authorization/Permit requirement;*
- *notifying the Competent Authority of any change of address of the owner;*
- *the overall implementation of the EMPr;*
- *implementing corrective and preventive actions, where required;*
- *preventing pollution and actions that will harm or may cause harm to the environment;*
- *notifying the Competent Authority within 30 days that construction activity will commence, or as the Environmental Authorization/Permit requirement;*
- *notifying the Competent Authority in writing within 24 hours if any condition in the EMPr cannot be or is not adhered to; and*
- *notifying the Competent Authority 14 days, or as the Environmental Authorization/Permit requirement prior to commencement of the operational phase.*

4.3.3.2 Employers Agent / Engineer

The Employers Agent reports to the City of Cape Town and is responsible for the day-to-day management of environmental performance on the development. The Employers Agent is ultimately accountable for the implementation of the requirements contained within this EMPr.
The Employers Agent is responsible for:

- *assisting in the preparation of the EMPr;*
- *instructing development personnel on how to comply with environmental policy and procedures;*
- *ensuring the Engineer's Representative is aware of and complies with the environmental obligations as detailed within this EMPr;*
- *ensuring that employees, Contractors and Sub-contractors are aware of, and comply with, the conditions of approval and requirements of the EMPr relevant to their respective activities;*
- *arranging periodic monitoring and inspection by suitably trained personnel;*
- *regular site inspections and the active pursuit of opportunities to enhance environmental outcomes;*
- *tracking and reporting environmental performance;*

- *tracking and compliance against the conditions of approval for the scope of works being performed;*
- *monthly evaluation of how effectively environmental controls are performing;*
- *initiating remedial measures when environmental deficiencies are observed or in response to grievances;*
- *restriction of construction activities affected by an environmental deficiency until remedial action has been taken;*
- *maintaining environmental performance records;*
- *engaging consultants where required to provide support in relation to implementing the EMPr; and*
- *investigating any incidents or grievance and ensuring necessary corrective action is implemented (in consultation with City of Cape Town for significant incidents / grievances).*

4.3.3.3 Designer

The Designer is involved during the planning and design phase of the development and shall ensure that relevant environmental planning and design considerations are taken into account during these phases. In this respect, the Designer shall work in close conjunction with the Environmental Planner.

4.3.3.4 Engineer's Representative

The Engineer's Representative is responsible for construction site supervision and quality control during Construction.
In some instances the Engineer's Representative may also assume the responsibilities of the Employers Agent.
On very large developments, the Engineer's Representative may have one or more dedicated Site Supervisors, each responsible for a section of the works (e.g. reservoirs, pipelines, water treatment works etc.).
The Engineer's Representative shall report to the Employers Agent and be responsible for:-

- *managing employees / Contractors and construction activities on a daily basis to ensure the appropriate environmental controls are implemented and maintained in accordance with the requirements of the EMPr;*
- *ensuring all staff are inducted into the site and undertake daily tool box talks;*
- *undertake daily site inspections of environmental controls and maintain records of environmental actions;*
- *reporting any environmental management concerns or incidents immediately to the Employers Agent;*
- *recommending improvements to the EMPr to the Employers Agent; and*
- *implementing any corrective actions issued as a result of any site inspections, audits or meeting.*

4.3.3.5 Contractor

The Contractor is the successful tenderer, appointed by the City of Cape Town to undertake the Works as specified in the Contract. It is the responsibility of the Contractor to do whatever is necessary from his side to ensure that he or an appointed advisor is well versed in environmental studies so that he may accurately and efficiently carry out the requirements of the Environmental Specification.

The Contractor shall be liable for any and all remedial work required in terms of the Environmental Specification, resulting from his environmental negligence, mismanagement and / or non-conformance.
The Contractor will:

- *be responsible for the construction related activities for the duration of the contract (so will Sub-Contractors and contract workers);*
- *be responsible for ensuring work conducted is done within the framework of the environmental authorisation, EMPr and applicable legislation;*
- *ensure that all Sub-Contractors have a copy of and are fully conversant with the contents of the EMPr;*
- *be required to provide Method Statements setting out, in detail, how management actions contained in the EMPr will be implemented;*
- *be required to monitor construction related impacts upon the surrounding environment; and*
- *appoint an Environmental Officer (EO) and Community Liaison Officer (CLO).*

4.3.3.6 Environmental Assessment Practitioner

The Environmental Assessment Practitioner (EAP) shall be appointed during the project planning phase of the development to determine likely effects which the development may have upon the environment and community.
The EAP shall work with the Environmental Planner in determining potential impacts; and shall be responsible for submitting applications in terms of the EIA process to the relevant Competent Authority.

4.3.3.7 Environmental Planner (Environmental Manager)

The Environmental Planner shall either be a City of Cape Town official or a member of the Employer Agents' professional team.
The Environmental Planner shall only be required at the City of Cape Town's discretion; on large scale infrastructure developments; or within sensitive environments, to analyse and minimise environmental impacts of the proposed development; consider best practicable environmental options; and make sure the development complies with prevailing regulatory requirements.
The Environmental Planner shall therefore work closely with the Designer to ensure detailed designs are aligned with EIA conclusions, regulatory requirements and best practicable environmental options. The Environmental Planner shall provide guidance, assistance and input as required during the life-cycle phases of the development; be called upon to resolve conflicts and disputes; and act as liaison between the environmental assessment practitioner and Employers Agent.

Furthermore, the Environmental Planner shall generate risk registers, master plans, management programmes; and tender documentation.

4.3.3.8 Environmental Auditor

An Environmental Auditor is an unaffiliated party who shall undertake environmental compliance audits at prescribed timeframes for the duration of construction related activities.
The Environmental Auditor shall present environmental audit reports in compliance with Regulation 34 of the EIA Regulations, 2014 (as amended).

Please note that not all developments require an Environmental Auditor as the inclusion of such an appointment shall only be required where an environmental authorisation has been issued.

4.3.3.9 Environmental Control Officer

An Environmental Control Officer (ECO) shall be appointed by the City of Cape Town for the duration of construction related activities.
The primary role of the Environmental Control Officer shall be to act as quality controller regarding all environmental concerns. In this respect, the Environmental Control Officer shall conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise.
The Environmental Control Officer shall be required to conduct compliance audits and verify the monitoring reports submitted by the Environmental Officer.
The Environmental Control Officer shall provide feedback to the Employers Agent, who in turn reports back to the City of Cape Town and stakeholders, as required. Issues of non-conformance raised by the Environmental Control Officer shall be taken up by the Employers Agent, and resolved with the Contractor as per the conditions of his contract.
Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Employers Agent.

4.3.3.10 Environmental Officer

The Environmental Officer (EO) shall be responsible for managing the day-to-day on-site implementation of the Performance Specifications, and for the compilation of regular Monitoring Reports. In addition, the Environmental Officer shall act as liaison and advisor on all environmental and related issues, seek advice from the Environmental Control Officer or Environmental Planner when necessary and ensure that any complaints received from the public are duly processed and addressed and that conflicts are resolved in an acceptable manner.
The Environmental Officer shall:

- *be well versed in environmental studies;*
- *understand the relevant environmental legislation and processes;*
- *understand the hierarchy of Environmental Compliance Reporting, and the implications of non-conformance;*
- *know the background of the development and understand the implementation programme; and*
- *be able to resolve conflicts and make recommendations on site in terms of the requirements of the Performance Specifications.*

4.3.3.11 Community Liaison Officer

The Community Liaison Officer (CLO) shall be appointed by the Contractor and shall be responsible for representing the community in order to assist the Contractor with communication between the two parties.

The Community Liaison Officer shall:

- *assist with managing community communication in various forums;*
- *plan, design, develop and carry out assigned public outreach and awareness;*

- *participate in activities aligned with community outreach strategy;*
- *develop relationships with key networks within local communities;*
- *identify possible labour disputes, unrest, strikes, etc., in advance and assist in their resolution;*
- *inform local labour of their conditions of temporary employment, to ensure their timeous availability and to inform them timeously of when they will be relieved; and*
- *ensure that all labour involved in activities when tasks have been set, are fully informed of the principle of task based work.*

4.4. Communications & Liaison

4.4.1 Contractual

The communication protocol shall be determined by contractual requirements. Such protocol shall be agreed to at the inception meeting where a responsibility assignment matrix (RAM) will be developed detailing the main communications or actions and the authorized staff responsibilities for initiation, preparation, review, approval and issue.

4.4.2 Local Government & Public Liaison

The Contractor shall direct all communication via the City of Cape Town; or as directed by the Employers Agent.

4.5. Identification of development Aspects, Impacts and Risk Assessment

This EMPr provides a system and set of procedures to ensure that the City of Cape Town establishes and maintains sound and effective controls to manage potential environmental impacts throughout the development, and wherever practicable, realise opportunities for enhanced environmental outcomes.
Therefore, for environmental management to be effective, it needs to be proactive rather than reactive. Environmental risk(s) associated with large scale developments shall be identified and assessed during the environmental impact assessment process; whereas the Contractor shall identify environmental risk(s) as part of its health and safety assessment; and method statement compilation.
The assessment shall identify the significance of environmental risks and potential impacts using the following four-step approach:

i. identify each **element** with the potential to interact with the environment (e.g. characteristics and sensitivity of the environment);
ii. determine the potential **impacts** resulting from the activity including their duration, intensity and degree to which they can be **mitigated**;
iii. **rank risks** based on the likelihood of adverse impacts and the severity of the consequence, using the 'worst case scenario', as defined by the 'likelihood and consequence probability' risk matrix ; and
iv. identify the level of mitigation required for each environmental aspect (e.g. the higher the potential severity of adverse environmental effects and the greater the consequence of those unmanaged effects the higher the degree of environmental management required).

Typical aspects include: aesthetics, dust, earthworks, erosion, flora and fauna, fire, hazardous substances, heritage, land owner liaison, noise, rehabilitation, social, soil, sustainability, traffic, training, waste and water.

Please refer to Annexure 17 - Typical Aspects and Impacts Table associated with the development.

4.6. Emergency Preparedness and Incident Management

'Incidents' are defined as unplanned events with undesirable consequences. The consequences of such incidents may result in human injury, environmental damage or asset loss. 'Near misses' are extraordinary events that could have reasonably resulted in an incident.
Using an Impact/Aspect Risk register, the Contractor shall identify the types of environmental incidents that are likely to occur on site and ensure measures are put in place to prevent or mitigate the effects of such incidents.
Consequently the Contractor shall submit an Emergency Preparedness and Incident Management Plan for approval to the Employers Agent prior to the commencement of construction related activities. This shall be reviewed and up dated annually.

The Emergency Preparedness and Incident Management Plan shall ensure that:

- *construction employees are adequately trained in terms of incidents and emergency situations;*
- *details of the organisation (manpower) and responsibilities, accountability and liability of personnel are recorded;*
- *a list of key personnel and contact numbers are provided;*
- *details of emergency services (e.g. the fire department, spill clean-up services) are listed;*
- *internal and external communication plans, including prescribed reporting procedures are provided for;*
- *actions to be taken in the event of different types of emergencies are described;*
- *incident recording, progress reporting and remediation measures to be implemented are prescribed;*
- *information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release are described; and;*
- *significant risks using the aspect & impact register are identified and addressed.*

All incidents that occur during construction related activities shall be recorded and managed in accordance with the Contractors Emergency Preparedness and Incident Management Plan. All environmental incidents and near misses shall be reported to the Employers Agent, particularly:

- *any loss of containment incidents or releases of liquids, solids, or gas;*
- *any dangerous goods or hazardous substance spills (any volume or weight);*
- *complaints by regulatory authorities;*
- *regulatory breaches – directives, fines, breaches of authorisation / licence conditions;*
- *stakeholder complaints;*
- *all incidents of third party property damage or loss; and*
- *any loss or damage to flora and fauna of significance that has not been previously approved.*

The Employers Agent shall then report these incidents to the City of Cape Town who in turn shall notify any relevant government authority, if required.

4.6.1 Incident Reporting

Once the incident has been stabilised and initial notifications have been issued to the relevant parties, a full incident investigation shall be required with detailed corrective and preventative measures. A formal report shall be submitted within seven days to the Employers Agent, including all remediation measures undertaken to repair any damage caused and to prevent the incident from re-occurring.
Information recorded for all incidents shall include:

- *nature of incident;*
- *damages, injuries or fatalities sustained and the parties involved;*
- *any risks such incident poses;*
- *toxicity of the substances involved;*
- *steps taken to avoid or minimise the effects of the incident and any future incidents / re-occurrence; and*
- *clean-up procedures, remedial actions and assessment of immediate and long term effects.*

4.6.2 Reportable Environmental Incidents

Reportable incidents are those:

- *that cause substantial damage to the environment, or*
- *that have significant potential impact on the environment.*

These can include:

- *any spill to a watercourse, including drains as defined under relevant legislation;*
- *loss of hydrocarbons or chemicals greater than 20L in volume to land;*
- *spills or releases, including soil movement, which has moved offsite and has a negative impact;*
- *death or injury of livestock, wildlife or fauna of any kind caused by the construction activities;*
- *interference with any previously undetected sites of cultural significance without obtaining the appropriate approval;*
- *transfer of known alien invasive vegetation and diseases as a result of construction related activities;*
- *fires;*
- *traffic incident;*
- *damage to property outside the development footprint;*
- *unresolved landowner issues whereby agreement cannot be reached;*
- *an incident that is likely to cause regional or widespread negative publicity;*
- *serious environmental damage or imminent risk of serious environmental damage;*
- *significant environmental degradation, pollution or non-conformance of this EMPr or any other legislative requirement.*
- *Exceedances of prescribed dust fall standards where dust fall monitoring is required.*

Key incident reporting numbers relevant to the project shall be provided as per Section 4.6.4 below.

4.6.3 Emergency Response Procedure

Appropriate risk management and the prevention of emergency situations is fundamental to all construction related activities and the implementation of the EMPr is aimed at anticipating, preventing and mitigating foreseeable risks associated with the

development. Part of the risk management strategy is to ensure that in the event of an emergency situation, plans have been developed so that pre-planned response, notification and recovery activities can be initiated.
The Contractor's Emergency Preparedness and Incident Management Plan shall establish the structures of emergency teams, the communication processes and the resources, which may be required for managing the emergency. The Emergency Preparedness and Incident Management Plan shall therefore comprise the following:

- *general responsibilities;*
- *incident management and notification structure;*
- *event classification and notification; and*
- *resources and training requirements.*

The objectives of the Emergency Preparedness and Incident Management Plan shall be to:

- *decrease the level of risk to life, property and the environment;*
- *describe how an emergency response is initiated and how the emergency teams are activated;*
- *specify command, control and communication arrangements between the City of Cape Town, Employers Agent, Contractor, external response and government authorities;*
- *identify the roles and responsibilities of all personnel likely to be at the location of the emergency or involved in the response;*
- *identify emergency response equipment required;*
- *identify training requirements for response personnel; and*
- *provide the basis for training of all people who could be involved in an emergency.*

4.6.4 Contact Information

The following key incident reporting numbers relevant to construction related activities shall be included within the Emergency Preparedness and Incident Management Plan:

- *City of Cape Town Representative;*
- *Employers Agent;*
- *Engineers Representative;*
- *Construction Contractor;*
- *Construction Manager;*
- *Environment Control Officer;*
- *Health and Safety Manager;*
- *Environmental Officer;*
- *Community Liaison Officer;*
- *24 hour Grievance Contact;*
- *Fire Department;*
- *Hospitals / clinics;*
- *South African Police Services;*
- *Air Quality Officer;*
- *Disaster Management;*
- Director: Development Management (Region 1): Dep*artment of Environmental Affairs and Development Planning;*
- *Department of Water and Sanitation;*
- *City of Cape Town*
    - *Environmental Health Department;*

- *Water Demand Management;*
- *Environmental and Heritage Management*

4.7. Method Statements

It is a statutory requirement to ensure the wellbeing of employees and of the environment. Therefore, the Contractor shall submit method statements to the Employers Agent for approval prior to the commencement of construction related activities.
The Contractor shall be required to undertake various tasks / activities in order to fulfil the conditions as stipulated in the contract. Therefore, in order for the Employers Agent to be satisfied that the Contractor has a comprehensive understanding of the requirements of the task / activity, the Contractor shall submit method statements to the Employers Agent for approval prior to the commencement of the activity. The method statement is a dynamic document integrating all facets of the activity, thereby ensuring the reader a comprehensive understanding of the actions associated with implementing the activity.
The method statement shall be submitted to the Employers Agent for approval at the agreed timeframe prior to the commencement of the activity. During this period, the Employers Agent shall consult with other members of the project management team to ascertain the Contractors knowledge and understanding of the requirements. Should the Employers Agent ascertain that the detail of the method statement is not sufficient, the method statement shall be returned to the Contractor for review and re-submission.
Upon acceptance of the method statement, both the Employers Agent and the Contractor shall sign the method statement denoting mutual agreement that the contents thereof meet the minimum requirements to successfully complete the activity. By signing the method statement, the Contractor commits to working in accordance with the agreed method.
Due to the method statement being a dynamic document, regular amendments may be required to ensure the implementation thereof corresponds with how the task / activity is actually being implemented; and in accordance to potentially changing requirements.
The following method statements are considered typical for every development and shall thus be submitted to the Employers Agent prior to commencement of construction related activities:

- *Concrete management*
- *Dust management*
- *Environmental awareness training*
- *Site camp layout*
- *Traffic management*
- *Waste management*
- *Water management*

Please refer to Annexure 8 – Method Statement for a complete list of potential method statements.

Method Statements may also be reviewed by the City of Cape Town Environmental Management Department: Environment and Heritage Management Branch.

4.8. Planning & Design

4.8.1 Planning

Planning is typically undertaken by the City of Cape Town at development outset and sets out prescriptive measures to achieve desired results. These measures are typically conceptual at this stage and become more refined with time.
The City of Cape Town typically calls for detailed (engineering) designs and appoints an environmental assessment practitioner (EAP) to undertake the EIA process. This process may contribute to the determination of feasibility, but does not do so exclusively.

4.8.2 Design

As the design shall lay the groundwork for the future operation of the development, the environmental authorisation conditions and EIA specialist recommendations shall inform the design. Furthermore, due to the evolving nature of the development, it is incumbent upon the City of Cape Town / Employers Agent that an Environmental Planner be appointed as part of the City of Cape Town / Employer Agents' team to *inter alia* determine regulatory process requirements that inform the evolving designs.

4.9. Implementation of Controls & Mitigation Measures

The City of Cape Town has adopted an outcomes based approach for this EMPr as it believes there are various ways to achieve good environmental outcomes. This approach allows the setting of outcomes based conditions, against which the development is to achieve compliance, without prescribing how that outcome is to be achieved.

4.9.1 Why outcomes based conditions?

According to the 'Outcomes-based conditions policy—Draft, Commonwealth of Australia July 2015', it provides "Flexibility" "*in the methods used to deliver those outcomes is both necessary and desirable to:*

- *focus the developments resources on achieving outcomes rather than complying with prescriptive requirements;*
- *encourage innovation in environmental management strategies;*
- *enhance transparency of outcomes being sought;*
- *focus regulatory effort on verifying that the development is achieving environmental compliance;*
- *build public trust and confidence in environmental regulation;*
- *acknowledge good environmental and regulatory compliance records to foster behaviour changes;*
- *streamline assessment and approval processes; and*
- *improves knowledge and data about matters of environmental significance".*

Outcomes-based conditions do not mean that actions with unacceptable impacts will be approved. Outcomes required as conditions of approval shall be achievable and measurable to provide certainty for the City of Cape Town, the Competent Authority and the community.

Outcomes based conditions allow the Contractor to innovate; draw on company expertise; and consider site specific conditions when planning how task / activity specific methods shall be undertaken in order to achieve the outcome. Consequently greater emphasis shall be upon Employers Agent (with support from the ECO) to review and

approve Contractor's method statements; and ECO verification whether actions proposed provide suitable mitigation to achieve desired outcome.

4.9.2 Outcomes

The outcomes contained within Section 7 Performance Specification Environmental Management tables prescribe the "what" that shall be achieved; and shall therefore drive the auditing process.

These outcomes shall be auditable.

4.9.3 Performance Indicators & Targets

The Performance Indicators contained within Section 7 Performance Specification Environmental Management tables, prescribe specific targets which the Contractor shall attain. The Contractor shall be cognisant of both the outcomes and targets when compiling method statements. Complying with the Environmental Specification Targets shall ensure compliance to the EMPr Outcomes.
These targets shall be auditable.

4.9.4 Mitigation measures

The Risks / Impacts contained within Annexure 7 – Environmental Best Practicable Options may be managed by the proposed mitigation measures proffered, and are thus not auditable. These mitigation measures shall merely guide the Contractor towards achieving the prescribed outcomes as contained within Section 7 Performance Specifications Environmental Management.

The Contractor's attention however shall be drawn to their responsibility to provide appropriate management measures to adequately mitigate any potential risk / impact.

These mitigation measures **shall not** be auditable.

4.9.5 Failure to Comply

Should the Contractor fail to comply with achieving the prescribed targets, the Employers Agent shall instruct the Contractor to do so. Failure to comply or adequately rectify the non-conformance shall result in the Employers Agent retaining five percent (5%) of the payment certificate amount until such rectification has been achieved, where after payment shall be effected. Non-compliance by the Contractor is the sole responsibility of the Contractor and the City of Cape Town shall not be jointly & severally liable.

4.10. Corrective & Preventive Measures (follow-up on monitoring and audits)

The Contractor shall initiate a process to correct and prevent future occurrences occurring.

Table 2: Correction Action

Corrective action(s)	Action	Timeframes	Responsibilities
	Initiate corrective and preventative measures	Immediate	City of Cape Town, Employers Agent /

	Control source and or reduce impact upon the environment / community.	Within 1 day of occurrence being identified	Engineer and Contractor
	Manage incident / accident / grievance in accordance to approved procedure.	Within 3 days of occurrence being identified	
	Monitor to verify no further occurrence takes place.	Within 5 days of occurrence being identified	
	Re-train all staff to prevent future re-occurrence.	Within 7 days of occurrence being identified	

4.11. Training

Environmental responsibility requirements for all role players are contained within the respective Position Descriptions. Consequently all recruitment shall be undertaken with the aim of engaging personnel with the appropriate levels of competency and experience. Furthermore, all personnel shall receive environmental training of the type and level appropriate to their role and responsibility.

The Contractor's environmental awareness training programmes shall be targeted at the two levels of employment: management and labour.
The Contractor shall manage and implement all the requirements associated with presenting the training programme before the Commencement Date.
The Contractor shall be required to initiate Environmental Awareness Training within 7 days of construction commencing. Staff shall be trained prior to commencement of working.
Proof of training shall be submitted to the Employers Agent.
The Contractor may be requested to provide additional training (in the trainee's first language) on-site regarding environmental aspects that are unclear to the construction personnel. A translator may be required and requested to assist in this additional training. The cost for the translator will be borne by the Contractor. The Contractor shall implement the training programme at own cost.
All staff shall:

- *be inducted prior to commencing work;*
- *receive task based / skills training;*
- *receive weekly environmental toolbox talks;*
- *undergo six monthly refresher (environmental) training; and*
- *be retrained as per corrective action outcome(s).*

The Contractor shall keep records of personnel experience, qualifications and training undertaken, including inductions, in a training register. The training register shall include the following details:

- *who was trained;*
- *when the training took place;*
- *name of the trainer;*
- *a general description of the content of the training; and*
- *effectiveness of training programmes.*

4.12. Grievance procedure (Social)

A grievance procedure is a management tool used to prescribe management mechanisms or methods to address grievances arising from affected stakeholders on a development.
The Contractor shall adhere to the grievance management procedures as agreed with the Employers Agent.

4.13. Resource Allocations

Financial implications for items and activities prescribed in the EMPr shall be recognised by the Contractor (for the construction phase) and provision for these costs shall be made. Such costs can include (but may not be limited to) mitigation actions, environmental awareness training, monitoring and auditing requirements and measures for rectification and rehabilitation, management of archaeological / heritage findings unearthed during construction, including any equipment or specialists required for these items.

5. Monitoring

5.1. Monitoring Approach

Monitoring shall be carried out by the respective environmental representative from the City of Cape Town, Employers Agent and Contractor.

5.2. Inspections

Site inspections shall be carried out on a daily basis by the Contractor's Environmental Officer to ensure measures implemented are effective in mitigating impacts.

The ECO shall undertake, as a minimum, fortnightly (or as prescribed in the conditions of authorisation) in order to provide an account of environmental compliance with the EMPr during construction.

The Contractors Environmental Officer / Community Liaison Officer shall undertake receptor monitoring to verify that construction related activities are not negatively impacting upon the environment; health of employees and members of the surrounding community; nor local economy (e.g. farming).

5.3. Compliance monitoring

The Contractors Environmental Officer or professional service provider shall undertake compliance monitoring to verify construction related activities are not exceeding prescribed thresh holds.

The Contractor shall submit environmental compliance monitoring data to the Employers Agent on a monthly basis.

5.4. Auditing (internal and external)

The ECO shall undertake monthly internal audits to verify the measures implemented by the Contractor to suitably mitigate identified risks / impacts.

The Environmental Auditor shall undertake external audits at the frequency prescribed by the relevant Competent Authority.

5.5. Time Programme

All monitoring shall be undertaken as per the monitoring programmes, where prescribed either by law or by the Employers Agent.

5.6. Quality control system (for monitoring)

Quality Assurance and Quality Control (QA/QC) addresses both the management of construction related activities and the "development" being constructed. QA includes the documented processes required to ensure that the development satisfies the needs for which it was undertaken; and will meet the development specifications and data quality outcomes. It also includes all activities of the overall management function that are required in meeting the outcomes of the development including planning, QC elements and any scope changes. The overall QA/QC program of the development shall be the foundation upon which the City of Cape Town can assure itself that the work is being, and has been adequately performed.

The Contractor shall develop and maintain an integrated management system (IMS) made up of both a quality management system (QMS) based on ISO 9001; and an environmental management system based on ISO 14001.

All environmental / social monitoring shall follow accepted monitoring protocols / norms and standards; and shall be informed by the outcomes of any baseline studies.

All analysis of samples shall be done at a SANAS 17025 accredited laboratory; unless specified in the Contractors method statement and approved by the Employers Agent.

Furthermore, the Contractor shall submit detailed terms of reference for the appointment of a professional service provider (PSP) to undertake the environmental monitoring programme for water and sediment quality, dust and noise monitoring. The PSP shall meet minimum professional requirements for:

- *qualifications;*
- *professional registration;*
- *experience and track record;*
- *demonstrated proficiency in use of relevant monitoring and sampling equipment;*
- *equipment requirements and tolerances for detection limits;*
- *reporting and analysis; and*
- *confirmation of laboratory accreditation, capacity, delivery and performance within reasonable timeframes.*

6. Assurance

6.1. Reporting

Reporting is the process of measuring actual performance or how well the mitigation measures have been implemented, including the format, timing and responsibility for reporting.

6.1.1. General Reporting

Reporting by the various role players shall be undertaken in accordance to the table below.

Table 3: Periodic Reporting

Report	Timing	Prepared by	Reviewed by
Weekly	On the first day of the following week	Environmental Officer	Employers Agent with support of the ECO
Monthly	Within 7 days of completion of reporting period	Environmental Officer	Employers Agent with support of the ECO
Change Management	Whenever required	ECO / Environmental Auditor	Employers Agent / Competent Authority
Close-out Report	Within 30 days of completion of construction related activities	Environmental Officer	Employers Agent in support of the ECO
Audit Report - Internal	Within 7 days of completion of reporting period	ECO	Employers Agent
Audit Report - External	Within 7 days of completion of reporting period	Environmental Auditor	Competent Authority
Grievance	Within 7 days of grievance	Environmental Officer / Community Liaison Officer	Employers Agent with support of the ECO
Management Review	Within 7 days of management review	Contractors Senior Management	Employers Agent

6.1.2. Incident Reporting

The Contractor shall undertake incident reporting in accordance to the below table. Please note that NEMA Section 30 and 30A have prescriptive timeframes in which a Competent Authority is to be notified.

Table 4: Incident Reporting

Reporting	Action	Responsibility	Timeframe
	Report incident to Employers Agent / Engineer	City of Cape Town, Employers Agent / Engineer and Contractor	Immediate notification
	Incident report submitted to the Employers Agent / Engineer		Within 7 days of incident
	Contractor to select appropriate remedy to rectify non-conformance and provide revised method statement to the Employers Agent for approval.		Within 10 days of incident

6.2. Implementation (Contractor)

6.2.1. Weekly environmental and social monitoring reports[1];

The Contractor shall undertake daily site inspections, the outcomes of which shall be submitted in a weekly report to the Employers Agent. Such reports shall include:

- *a summary of the results of the daily and weekly inspections;*
- *any non-conformances and corrective actions taken;*
- *work status and tasks to be completed;*
- *environmental activities undertaken;*
- *environmental incidents or grievances;*
- *environmental monitoring;*
- *consultation undertaken;*
- *progress of reinstatement; and*
- *results of any audits undertaken.*

6.2.2. Monthly environmental and social audit reports;

The Contractor shall submit a consolidated and detailed monthly report to the Employers Agent.

6.3. Supervision (Engineer)

6.3.1. Corrective Action Requests

A Corrective Action Request (CAR) shall be issued to the Contractor instructing the initiation of corrective action. The Contractor shall initiate an investigative process to determine root cause, thereby preventing future recurrence, within the timeframe prescribed by the Employers Agent.

Follow up actions shall be assessed by the ECO to verify implementation of approved corrective actions, recommendations and their effectiveness in preventing re occurrence.

6.3.2. Non-Conformance Report

Preceding the issuing of the Non-Conformance Report (NCR), the Contractor shall be presented with an opportunity to rectify the outstanding issue (via a CAR). Should this issue not be corrected or completed to the satisfaction of the Employers Agent, the issue shall be escalated to an NCR.

An NCR shall be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. The Employers Agent shall issue the NCR to the Contractor in writing.

Should the ECO assess an incident / issue and find it to be significant (e.g. non-repairable damage upon the environment), it shall be reported to the authorities and immediately escalated to the level of an NCR. This shall be done in consultation with the Employers Agent.

The following information should be recorded in the NCR:

[1] Please note that small developments may substitute the weekly report in lieu of a monthly report. The Employers Agent shall determine reporting frequency.

- *details of non-conformance;*
- *any plant or equipment involved;*
- *any chemicals or hazardous substances involved;*
- *work procedures not followed;*
- *any other physical aspects; and*
- *nature of the risk.*

Actions agreed by all parties following consultation shall adequately address the identified non-conformance. This shall take the form of specific control measures and take the hierarchy of controls into account. This shall accompany the NCR for filing purposes.

The agreed timeframe by which the Contractor shall have implemented the actions shall be documented in the NCR.

All NCR's shall be tracked and managed according to the development's quality control protocols.

The Employers Agent shall verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the Employers Agent and Contractor shall sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

6.4. Audits (ECO and Environmental Auditor)

In addition to the prescribed monitoring undertaken by the Contractor, comprehensive audits shall be undertaken to determine the efficacy of the management measures implemented to manage and mitigate impacts.

6.4.1. Internal Audits

Detailed audit reports shall be drafted by the ECO indicating system deficiencies, non-conformances and adverse or potentially adverse environmental conditions arising from construction related activities.

The audit reports shall provide verifiable findings on the level of performance compliance; the ability to sufficiently provide for the avoidance, management and mitigation of environmental impacts; and levels of compliance with the EMPr and any other regulatory requirement. The audit reports shall me made available to the external Environmental Auditor.

All ECO audit reports shall be submitted to the Employers Agent.

Audit reports for developments, where an EIA process has been undertaken, shall be submitted to the Employers Agent (City of Cape Town) for review prior to their submission to the relevant Competent Authority.

6.4.2. External Audits

External audits shall be undertaken by an independent Environmental Auditor, at the timeframes as prescribed by the Competent Authority. These environmental audit reports shall comply with the requirements as prescribed in Regulation 34 of the EIA Regulations, 2014, as amended.

All environmental audit reports shall be submitted to the City of Cape Town for review prior to their submission to the relevant Competent Authority.

6.5. Evaluation of Performance

6.5.1. Identify Trends

The Contractor shall analyse data obtained from monitoring programmes / audits to determine underlying patterns of performance in relation to time. Such outcomes shall aid the Contractor in implementing corrective actions, thereby pre-empting future possible environmental degradation or pollution.

6.5.2. Measure Progress

The Contractor shall monitor efficacy of mitigation measures implemented; and continually strive to improve the manner in which it protects the environment.

6.6. Review by Senior Management

The Contractor shall undertake periodic reviews by its senior management to evaluate efficacy of on-site environmental management systems in delivering the desired environmental, health, safety and social protection.

These reviews shall be undertaken at intervals dictated by the current life-cycle stage; efficacy of EMPr implementation; level of compliance to internal and external audits and level of risk posed by upcoming activities.

A report containing management review recommendations shall be submitted to the Project Management. The Employers Agent shall track the implementation of the recommendations.

The Employers Agent shall reserve the right to issue a Corrective Action Request should the Contractor fail to adequately address issue at hand.

7. Performance Specifications: Environmental Management

The Performance Specifications: Environmental Management Tables prescribe specific targets which the Contractor shall attain. The Contractor shall be cognisant of both the outcomes and targets when compiling method statements. These Performance Specifications may be used as stand-alone environmental specifications in tender documents, where required.

The mitigation measures proposed within Annexure 7 – Environmental Best Practicable Options may be used by the Contractor towards attaining targets prescribed within the Performance Specifications: Environmental Management Tables. However, compliance to the mitigation measures does not constitute compliance with the Performance Specifications: Environmental Management Tables.

Please note the Performance Specifications: Environmental Management Table numbering aligns with the Bill of Quantities.

These tables shall be audited by the ECO / Environmental Auditor.

Planning

Not applicable to Contractor appointment

PSEM4 Planning	
Outcomes	Identify and proposing suitable development options resulting from strategic needs assessment, from where single option is selected.
Responsibilities	Employer Agents' professional team / City of Cape Town
Timeframes	On-going during planning
Performance Indicator	Target
1) Specialist input	a) Include all possible / associated triggered activities within EIA process.
2) Identifying and assessing al impacts	a) Include Engineer and construction experienced Environmental Planner to inform EIA process.
3) Scope definition	a) Consider potential associated activities which may trigger an EIA process and include these in the authorisations process. b) Consider potential Contractor requirements within EIA process. e.g. site camp locality and possible lay down areas.
4) Sustainability	a) Planning shall emphasise sustainable development, local procurement and jobs.

Design

Not applicable to Contractor appointment

PSEM5 Design	
Outcomes	Integrating environmental and sustainable requirements within the design to an extent that environmental protection and sustainable development are assured.
Responsibilities	Employer Agents' professional team / City of Cape Town
Timeframes	On-going during design
Performance Indicator	Target
1) Compliance Review	a) Undertake an environmental compliance review if the EIA process was undertaken by an external third party.
2) Inform Design	a) Ensure EIA outcomes, EMPr, environmental authorisation and any other approval requirement are obtained and inform the design
3) Reviews of designs	a) The Environmental Planner, where applicable, shall review the final designs.
4) Aesthetics	a) Design shall restrict sky glow, light spill and glare.
5) Air quality	a) Design shall enable compliance with National Ambient Air Quality Standards, City of Cape Town Air Quality Management By-law and National Dust Control Regulation requirements, as amended.
6) Noise control	a) Design shall enable compliance with Western Cape Noise Control Regulation requirements, as amended.
7) Water quality and quantity 8) Water efficiency	a) Design shall enable compliance with all applicable water quality and quantity regulatory requirements, as amended. b) All designs to comply with Construction Regulations 10400XB. c) Installation of solar water heaters.
9) Energy efficiency	a) All designs to comply with Construction Regulations 10400XA. b) Installation of photo-voltaic panels.
10) Waste	a) Design shall reduce waste generation whilst promoting re-use and recycling.

PSEM5 Design	
management	
11) Transit-oriented development	a) Design shall address densification, location and access to public transport.

Pre-construction

Mitigation measures proffered within Annexure 7.3 Pre-Construction: Environmental Best Practicable Options merely guide the Contractor towards achieving the below prescribed outcomes.

PSEM6 Pre-Construction	
Outcomes	Finalisation of relevant appointments / activities to an extent that development commencement is assured.
Responsibilities	Contractor to draft Method Statement(s) and implement; Employers Agent to approve and supervise; and Independent ECO to audit. City of Cape Town District Environmental & Heritage management department to be requested which Method Statements they wish to review and given the opportunity to do so.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Search and Rescue	a) The Contractor shall undertake all activities associated with the search and rescue operation and have these completed prior to the commencement of construction related activities.
2) Alignment to engineering requirements	a) All EIA outcomes, EMPr, Environmental Authorisation and any other regulatory requirement shall be aligned with engineering requirements.
3) Budget	a) The Contractor shall make provision for adequate budget for construction site environmental management requirements.
4) Tender review	a) The Employers Agent shall ensure an environmental review of all tender submissions is undertaken.

5) Approvals	a) The Employers Agent shall ensure all approvals have been obtained.
6) Environmental Compliance Monitoring	a) The City of Cape Town shall appoint a competent and knowledgeable ECO; and where required, an Environmental Auditor.
7) Contractors Environmental Officer	a) The Contractor shall appoint a competent and knowledgeable Contractors Environmental Officer.

Construction

Mitigation measures proffered within Annexure 7.4 Construction: Environmental Best Practicable Options merely guide the Contractor towards achieving the below prescribed outcomes.

PSEM7 Aesthetics Management	
Outcomes	Preserve aesthetics of the surrounding environment to assure the development does not become a nuisance to local communities; or negatively impacts upon the environment.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Dust levels	a) Dust generation shall not exceed the regulated dust thresholds.
2) Rehabilitation of impacted works areas.	b) All areas impacted upon through construction related activities shall be rehabilitated.

3) Stockpile management	a) Stockpiles are not to be higher than 2m. b) Stockpiles shall be stabilised with no evidence of erosion.
4) Visual impact of works areas on surrounding environment	a) No grievances from stakeholders. b) Maintain good housekeeping practices.
5) Light pollution	a) No light shining into surrounding properties. b) No grievances from stakeholders.
6) Litter	a) Record of daily litter clean up. b) No litter to be found on site. c) No grievances from stakeholders.

PSEM8 Dust Management	
Outcomes	Preserve air quality levels to an extent that public health; safety and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Monitoring	a) Identify all dust sources. b) Assess effectiveness of dust control measures. c) Provide suitable data to demonstrate compliance with regulatory requirements. d) Ensure all monitoring equipment is calibrated as per manufacturer's specifications. e) Ensure all monitoring is undertaken by suitably qualified and competent individuals. f) Dust fall out monitoring shall be undertaken along the perimeter fence and aligned with prevailing wind directions.
2) PM10 inhalable particulates only	a) PM10 monitoring shall be in accordance with GNR 1210, National Ambient Air Quality Standards, of 24 December 2009, as amended.

monitored upon City of Cape Town instruction.	b) PM10 shall be monitored at sensitive (rural) receptors when construction related activities occur within 250 m of the receptors. c) PM10 shall also be measured at active construction related areas and at additional sites indicated by the Employers Agent. d) Monitoring shall be conducted/undertaken as per the regulated frequencies. g) PM10 levels shall not exceed the prescribed levels. h) PM10 monitoring shall be undertaken within work areas aligned with prevailing wind directions.
3) Dust nuisance levels.	a) Suspended (actual) dust levels shall not exceed 600 mg/m^2/day. b) The Contractor shall respond to all grievances relating to dust and air quality.
4) Dust fallout.	a) Indicative dust fallout (i.e. suspended dust concentrations that will result in fallout) shall be monitored in terms of the GNR 827, National Dust Control Regulations of 1 November 2013, as amended. b) Actual dust fallout shall be verified through sampling at sites as prescribed by the Employers Agent.

PSEM9 Earthworks Management	
Outcomes	Maintain earth works practices in a manner that public health; safety and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Topsoil and subsoil handling and management.	a) Soil horizons stockpile separately. b) Stockpiles no higher than 2 m and kept weed free.
2) Water resource management	a) Water resources shall not be negatively impacted upon through sedimentation / contamination.
3) Prevention of contamination.	a) Stockpiles shall be kept free of contamination by oils/fuels and other harmful substances.

4) Reinstatement of previous land use practices.	a) No complaints from stakeholder's. b) No erosion.
5) Placement of stockpiles within specifically demarcated areas.	a) No stockpiles within the 1:20 flood line of a watercourse or within 50m of delineated wetland. b) No stockpile outside of areas indicated in the construction drawings.
6) Spoil disposal.	a) No spoil disposed of anywhere other than designated spoil areas or at a registered landfill site as identified by the Employers Agent. b) Contractor shall attain prescribed waste targets.

PSEM10 Erosion Management	
Outcomes	Preserve soil and vegetation cover to an extent that minimal loss of soil through erosion can be assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Erosion prevention.	a) All gradients > than 1:2 (vertical: horizontal) stabilised within one week of their exposure. b) Formalised storm water structures must be designed and implemented along roads susceptible to erosion. c) Slopes > 1:1 must have additional anti-erosion mechanisms (berms, silt fences or geo-textiles). d) No evidence of erosion or damage to erosion control devices. e) No collapse/subsidence of banks at water crossings or steep slopes. f) No significant changes to ground level, drainage patterns or vegetative cover as a result of erosion or sedimentation.
2) Control alien invasive species.	a) Records of monthly alien invasive species clearing. b) The Contractor shall keep the development footprint free of alien invasive species.

3) Existing land use protection.	a) No evidence of disturbance outside of development footprint area.
4) Rehabilitation of impacted areas.	a) The Contractor shall attain rehabilitation targets.
5) Water quality as indicator of levels of soil erosion.	a) The Contractor shall attain prescribed water quality targets.
6) Storm water	a) Monitor and maintain storm water infrastructure and review storm water management initiatives, where applicable.

PSEM11	**Fauna and Flora Management**
Outcomes	Preserve the environment to an extent that fauna and flora are protected; and prevention of alien invasive species infestation can be assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Reduction of extent of impacts.	a) No evidence of disturbance outside of the approved development footprint.
2) Identification and protection of ecologically sensitive areas.	a) All sensitive environments shall be identified and afforded appropriate protection. b) No go areas are clearly demarcated and adhered to.
3) Identification and protection of species.	a) Proof of training of staff for identification and rescue and relocation of known conservation worthy species. b) No unauthorised collection of or disturbance to fauna and flora. c) Search and rescue operations shall include consultation with the City of Cape Town's Biodiversity Management Branch.

4) Landowner requirements	a) No grievances from landowners. b) Each indigenous tree, shrub or bulb removed through search and rescue operations shall be replanted in the area from where it came or in an area as advised by the City of Cape Town Biodiversity Management Branch.
5) Wildlife and livestock management.	a) Access to individual land portions shall be controlled through the appropriate use of gates. b) All livestock injuries or fatalities shall be investigated, recorded and reported to the Employers Agent and the respective landowner. c) The Contractor shall restrict vehicle speeds within the development footprint to prevent faunal fatalities.
6) Management of alien invasive species.	a) Proof of scheduled removal of alien invasive vegetation. b) Chemical control of invasive species to be undertaken under the auspices of a Department of Agriculture, Forestry and Fisheries (DAFF) authorised Pest Control Officer (PCO). c) No alien invasive vegetation growth within development footprint.

PSEM12 Fire Management	
Outcomes	Prevent and control fires to an extent that public health; safety; property and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Number of fires.	a) Zero (0) fires.
2) Emergency preparedness.	a) Proof of annual update and approval of the fire management response plan. b) Proof of management review of fire preparedness and response before onset of fire season. c) Proof of six-monthly fire and emergency drills every six months and effectiveness thereof audited. d) Emergency response plan implemented. e) Safety management plan implemented.
3) Adequate fire protection measures.	a) Proof of Municipal Fire Chief being informed. b) Compliance with SANS 10131. c) Fire-fighting equipment shall be available at all high risk or points of storage of flammable products.

	d) STP Dry Powder Fire Extinguishers shall be used and at least one shall be provided per 50m^2 of industrial floor surface area. e) Proof of examination of fire extinguishers on a continual basis. f) All activities undertaken shall be managed to mitigate risk of fire.
4) Compliance with regulatory and procedural requirements.	a) Storage of hazardous/flammable materials and substances to comply with national, provincial and local regulatory requirements. b) Proof of reporting of fire incidences to authorities. c) No uncontrolled fires within the development footprint. d) No build-up of flammable material on or adjacent to the development footprint.
5) Adequate fire protection measures in place in rural areas.	a) Fire breaks in place, in consultation with respective landowners, the width of which to be determined by the Fire Protection Association (FPA). b) Proof of membership/registration with the local FPA. c) Presentation of the Fire Danger Index (FDI) for the area.

PSEM13 Hazardous Substance Management	
Outcomes	Preserve the receiving environment, well-being of staff and local communities through appropriate hazardous substance storage, handling, disposal and pollution prevention.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Adequate measures implemented for the containment of hazardous substances.	a) All hazardous substance storage areas shall be equipped with appropriate spill kits and fire-fighting equipment. b) All hazardous substances shall be stored in well ventilated secondary (impermeable) containers / bunds capable of 110% of the volume of the container. A tap-off system shall be installed through which leakages and spills can be removed. c) All staff required to handle and use such hazardous substances shall receive adequate training. d) All necessary approvals with respect to hazardous substances shall be obtained from the appropriate authorities and shall comply with standard fire safety regulations.

	e) All chemicals shall be stored in specifically designed, lockable storage areas where reactive substances are classed and segregated. Storage shall comply with the manufacturers Material Safety Data Sheet (MSDS) and local and national legislative requirements. f) Hazardous waste and waste fuels and oils shall be stored in appropriate containers that will not corrode or leak. These containers shall be properly marked to indicate contents.
2) Hazardous substance management.	a) All hazardous substances stored on site shall be recorded within a checklist. b) All hazardous substances shall be labelled according to the chemical hazard rating and adequate signage be displayed indicating the appropriate management measures to be implemented in the event of a spill/fire. c) Only specifically trained personnel shall be permitted to use and handle the hazardous substances. Certificates of training shall be provided to the Employers Agent for final approval. d) Substances used shall be the least environmentally harmful chemical available for the undertaking of specific duties/requirements.
3) Incident management	a) Ensure that the necessary materials and equipment for dealing with oil, fuel and hazardous substance spills, leaks and fires are available on site and up to date at all times. b) The following symbolic safety signs shall *inter alia* be depicted: "No Smoking", "No Naked Lights" and "Danger". c) These signs shall conform to the requirements of SANS 1186-1 and are to be prominently displayed in and around the storage area. d) The volume and contents of the tanks shall be displayed using the emergency information system detailed in SANS 10232-1. e) Signage containing clearly displayed emergency contact numbers shall be provided.
4) Fire fighting	a) Suitable fire-fighting equipment shall be stored in close proximity and all personnel be made aware of the dangers of burning chemicals/smoke inhalation.
5) Personnel protection	a) No smoking shall be permitted in the vicinity of the store/s and adequate fire-fighting equipment shall be provided at hazardous substance storage and dispensing areas. b) All staff working with hazardous substances shall wear PPE.
6) Sewage management	a) No environmental contamination due to sewage management.
7) Cement / Concrete management	a) Cement / concrete shall only to be mixed within Employers Agent approved localities. b) Waste cement / concrete shall only be disposed of at Employers Agent approved localities. c) Facilities used to wash plant / equipment used in the mixing / transporting / placement of concrete shall be Employer Agent approved.

PSEM14 Heritage Management	
Outcomes	Preserve heritage resources to an extent that no loss, defacement or damage thereof can be assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Protection of heritage resources.	a) No removal, damaging or alteration to heritage resources, unless proof of consultation with a heritage specialist and approval from H:WC is in place. b) All buildings and or structures older than 60 years shall require a permit should they be changed or demolished.
2) Management of chance finds.	a) Records of chance findings shall be kept. b) Where chance finds are unearthed, proof of work being stopped and proof of consultation with heritage specialist and H:WC shall be kept on site. c) The unearthing of graves must immediately be reported to the Employers Agent, the South African Police Service and H:WC. An archaeologist shall be notified and the area shall be cordoned off from all works until the archaeologist has completed an investigation and proposed recommendations, in consultation with H:WC.

PSEM15 Land Owner Liaison	
Outcomes	Preserve the rights of affected landowners to an extent that no significant grievances are raised.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Communication with landowners.	a) Communications register (for grievances) shall be kept at the site office. b) No reports of complaints not being dealt with promptly.

	c) Minutes of meetings held with local community members and other stakeholders. d) Notify landowners in advance in the event of construction related activities likely to cause disruptions to current land use practices.
2) Safety of the work environment.	a) PPE is available and worn by staff and visitors. b) The site, together with all excavations shall be safe guarded. In addition, barriers and warning signs shall be placed around all excavations. c) Site boundary fence shall display relevant signage. d) Demarcate "no-go" areas and restrict access.
3) Gates.	a) Maintain status of gates (keep "closed" gates closed; and "open" gates open).
4) Landowner database.	b) Maintain a database of landowners contact details. c) New landowners shall be briefed on the construction programme.
5) Provision of skills training.	a) Provide suitable training to all employees to ensure no grievances lodged.
6) Site camp.	a) The site camp shall obtain all relevant approvals prior to establishment.
7) Working hours	b) No work before 7 am and after 6 pm Monday to Saturday, nor on Sundays/Public Holidays,

PSEM16 Noise Management	
Outcomes	Preserve noise levels to an extent that public health; safety and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Notification of sensitive receptors.	a) Sensitive receptors shall be notified of the timing and duration of the construction related activities and the potential noise nuisance it may cause. b) Respond to all noise related grievances received and implement mitigation measures.

2) Noise levels.	a) Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements.
3) Deviations from normal construction related activity conditions.	a) All construction related works shall be undertaken during normal prescribed / agreed daylight hours. b) All works that deviate from normal construction related conditions shall be reported and actions initiated to mitigate against recurrence of the incident.
4) Vibration	a) Vibration monitoring shall be in compliance with regulatory requirements (BS 7385-2 (ISO 4866) Evaluation and measurement for vibration in buildings – Part 2: guide to damage levels from ground-borne vibration).

PSEM17 Rehabilitation Plan	
Outcomes	Reinstate impacted areas to an extent that agricultural; commercial, and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Restoration of soil profile at disturbed areas.	a) Where restoration of indigenous vegetation is to take place, topsoil and surface management needs shall be in accordance with a restoration plan as agreed with the City of Cape Town's Biodiversity Management Branch
2) Rehabilitation of steep slopes.	a) Stabilisation of steep slopes shall be a priority, with engineered solutions being investigated to ensure slope stabilisation.
3) Removal of alien invasive vegetation species.	a) Proof of scheduled removal of alien invasive species re-establishing on cleared areas, stockpiles and throughout rehabilitation shall be undertaken
4) Site specific rehabilitation	a) Proof of discussions with landowners about specific rehabilitation requirements. All vegetative matter removed during the search and rescue operation shall be replanted in the area that they were rescued from or in an area determined in

requirements.	consultation with the City of Cape Town Biodiversity Management Branch.
5) Reinstatement of watercourse soils.	a) The final placement of layers of soil on the watercourse bed shall match the pre-disturbance profile. b) Replaced soil shall be compacted and at the same level as adjacent soil. c) Water resistant layers must be determined before disturbance shall be reinstated.
6) Appropriate re vegetation with correct seed mix.	a) The seed mix for use in rehabilitation shall be an approved mix of indigenous species common to the area. The Tender Data shall indicate the approved seed mix guideline. The seed mix shall contain pioneer, sub-climax and climax species. Contractor shall inform the Employers Agent to deviations from this seed mix prior to the purchase of seed. The City of Cape Town Biodiversity Management Branch shall be consulted with regard to seed mixes and restoration methodologies where indigenous vegetation is to be re-established.
7) Timing of rehabilitation actions.	a) Seeding operations shall coincide with rainfall events or as part of a managed watering programme.
8) Vegetated cover of rehabilitated areas shall correlate with the cover of the surrounding natural vegetation.	The below targets only applicable where grass cover is prescribed: a) A 50% grass cover shall be achieved within 1 month of the onset of the next growing season following hydro seeding and 80% cover within 2 months thereafter. Minimum of 60% mature vegetation cover being achieved during the first growth season. Minimum of 80% mature vegetation cover achieved at the end of the maintenance period. Canopy cover shall be used to determine ground cover percentage. b) Grass shall set seed over a minimum of two seasons.

PSEM18 Social Aspect	
Outcomes	Preserve good relations with neighbouring communities to an extent that maximum social benefits, and minimum negative impacts are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.

Performance Indicator	Target
1) Communication with local community and stakeholders.	a) Communications register shall be kept on site. b) No reports of grievances not being dealt with promptly. c) Minutes of meetings held with local community members and other stakeholders.
2) Representative workforce/equitable procurement.	a) Employ a "local first" employment policy. b) Procurement policy targets provided by the Employers Agent shall be met.
3) Safety of the work environment.	a) Personal Protective Equipment (PPE) is available and worn by staff and visitors.
4) Exit Strategy.	a) Proof of training for skills required in the greater area that can be used after construction related activities have ended. b) Report detailing intentions for materials (for example wood and other building material) or structures no longer required that can be donated to the local community, with the approval of the Employers Agent.

PSEM19 Soil Management	
Outcomes	Preserve soil to an extent that erosion and contamination prevention is achieved; and topsoil volumes for rehabilitation can be assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Topsoil and subsoil handling and management.	a) Soil horizons (stockpile separately) b) Stockpiles shall be no higher than 2 m and kept weed free. c) Prevent erosion of soil.
2) Prevention of contamination.	a) Stockpiles free of contamination by oils/fuels and other harmful substances.

3) Reinstatement of land use practices.	a) Reinstate land use to former land use practise.
4) Placement of stockpiles within specifically demarcated areas.	a) No stockpiles within the 1:20 flood line or within 50 meters of delineated wetlands. b) No stockpile outside of areas indicated in the construction diagrams.
5) Spoil disposal.	a) No spoil disposed of anywhere other than designated spoil areas or at a registered landfill.
6) Construction programme	a) In the event construction occurs during the rainfall season, measures shall be implemented to minimise disruption of the soil profiles. These shall be removed and impacted areas re-vegetated.

PSEM 20 Sustainable Management	
Outcomes	Preserve critical resources to an extent that the optimisation of energy-use; protection and conservation of water can be assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Energy efficient construction site office building design 2) Electricity conservation	a) The Contractor shall ensure site offices and associated buildings comply with Construction Regulations 10400XA.
3) Water	a) The Contractor shall ensure all facilities comply with Construction Regulations 10400XB.

conservation	
4) Dust suppression	a) The Contractor shall implement dust suppression measures using non potable water.

PSEM21 Traffic Management	
Outcomes	Preserve road traffic levels to an extent that public health; safety and environmental protection are assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Traffic management.	a) No accidents or incidents. b) No complaints from the public.
2) Landowners have access to properties.	a) The City of Cape Town to supply all landowners with access to their properties via agreed temporary servitudes, where applicable.
3) Road traffic safety.	a) Road condition shall be retained in an acceptable condition on all routes. b) Appropriate signage provided, where applicable.
4) Prevention of environmental degradation.	a) No new roads constructed outside of the development footprint. b) No new roads constructed without the approval of the Employers Agent within the development footprint. c) No evidence of disturbance by vehicles outside of the development footprint. d) No environmental degradation due to storm-water run-off from access and temporary roads. e) Dust entrainment shall comply with prescribed dust regulations. f) The width of the access and temporary servitude roads shall be kept to a minimum.

PSEM22 Training Programme	
Outcomes	Foster skills transfer, environmental awareness, health and safety awareness and materials and equipment skills.

Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Provision of effective training.	a) All employees shall receive general construction related work skills training required to enable them to work safely and effectively, including: • Basic Environmental Awareness Training. • Spill and emergency management. • Health and safety. • Emergency drills. • Fire-fighting. • Disaster management. • Heritage resource and grave identification.
2) Training.	a) All staff shall: • be inducted prior to commencing work; • receive regular task based / skills training; • receive weekly environmental toolbox talks; • undergo six monthly refresher (environmental) training; and • be retrained as per corrective action outcome(s). b) Records to be retained indicating attendance and content c) Regular refresher course to be presented to all staff d) Demonstrate effectiveness of training presented e) All incidents to be reported

PSEM23 Waste Management	
Outcomes	Embrace waste hierarchy principles to an extent that waste generation is reduced; reuse and recycling is promoted; all waste streams receive responsible treatment; and safe disposal is assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO

	to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Proper waste disposal.	a) Proof of waste generated, reused, recycled and disposed of, including disposal certificates, shall be kept on site. b) No contamination of soil, air and water due to inappropriate waste management. c) Disposal of hazardous waste shall be conducted by a licensed contractor / professional service provider. d) Store and handle all hazardous materials and waste in accordance to their respective material safety data sheets. e) Waste to be disposed of at registered landfill site. f) No build-up / accumulation of waste permitted. g) The waste manifest shall be kept on record for auditing purposes.
2) Waste reduction.	a) Reduce disposal of recyclable or reusable materials to landfill sites by 50%. Such recyclable and reusable material shall include: • steel; • aluminium; • paper; • plastic; and • oil. b) An approved recycling company shall be appointed to manage the respective collection and recycling and or re use of waste materials.
3) Environmental contamination.	a) All waste streams stored in appropriately marked containers. b) Containers of hazardous waste and waste oils shall be stored in a bunded, weatherproof area. c) No evidence of contamination by waste. d) All spills to be reported and included within reports to be submitted to the Employers Agent.
4) Good housekeeping.	a) Weather and scavenger proof bins provided at all points where waste is to be generated. b) No evidence of litter. c) Chemical ablution facilities at a ratio of 1:15 shall be placed within 50 m of all work areas. d) Chemical ablution facilities not within 32 m of a watercourse. e) Chemical ablution facilities kept in clean user friendly state. f) Chemical ablution facilities shall be secured.

PSEM224 Water Management	
Outcomes	Preserve water quality levels and quantity used / discharged to an extent that the integrity of affected water resources is assured.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target
1) Watercourse water quality. 2) Variables and frequencies to be monitored as per regulated prescribed minimum requirements.	a) Less than 10% change between values measured 300 m upstream and within 50m downstream of where construction related activities are to occur. b) Water quality monitoring during period when contaminated water is being released into a watercourse / environment.
3) Contaminated water monitoring. 4) Variables and frequencies to be monitored as per regulated prescribed minimum requirements.	a) Values for variables measured shall fall below the specific limits indicated in regulated prescribed minimum requirements, before release into the receiving environment.
5) Water management.	a) No storm water flowing through site (unless in a dedicated storm water channel). b) No storm water flowing onto areas of low / poor stabilisation.

	c) Control erosion on all construction areas. d) Prevent contamination of water resources. e) Obtain necessary regulatory approvals prior to commencement of works. f) Introduction of formalised anti erosion and storm water management works within areas susceptible to erosion. These works shall be properly maintained. g) Construction related activities within, across, under or immediately adjacent to watercourses, wetlands; and areas subject to flooding, are to be programmed to occur during the dry months. h) No handling of hazardous substances without necessary personal protective and spill containment equipment and procedures in place. i) Volumes of both water abstraction and use shall be recorded and reported upon. j) Clean water and dirty water systems shall be managed independently and kept separate. k) No water shall be discharged into the municipal storm water system without prior authorisation and compliance with regulated prescribed minimum requirements. l) Non potable water shall be used for all construction related activities, unless approved by the Employers Agent.

Decommissioning

Mitigation measures proffered within Annexure 7.5 Decommissioning: Environmental Best Practicable Options merely guide the Contractor towards achieving the below prescribed outcomes.

PSEM25 Decommissioning	
Outcomes	Perform decommissioning activities in a manner which is legally compliant; does not impact the health and well-being of the environmental and local community.
Responsibilities	Contractor to draft Method Statement and implement; Employers Agent to approve and supervise; and Independent ECO to audit.
Timeframes	Method statement compiled and approved prior to commencement of activity. Implementation and compliance to be undertaken continuously.
Performance Indicator	Target

1) Environment	a) The Contractor shall prevent adverse environmental and community impacts from decommissioning activities. b) The Contractor shall prevent loss of soil and creation of dust. c) The Contractor shall minimise any degradation of the quality of water leaving the site. d) The Contractor shall minimise the generation of excessive construction waste, including litter. e) Minimise contamination of the environment from dust.
2) Contamination	a) The Contractor shall minimise the risks to the environment and human health as a result of decommissioning activities. b) The Contractor shall ensure construction workers engaged in earthworks or demolition activities or off-site disposal of waste are aware of potential contamination issues through site inductions, environmental training and at daily toolbox meetings, and undertake these activities in accordance with applicable regulatory requirements. c) The Contractor shall ensure that all earthworks, construction and demolition activities which could intercept or expose contaminants of potential concern are managed to prevent storm water or dust discharge.
3) Noise	a) The Contractor shall use of lowest practicable noise emitting equipment and plant; noise levels will be considered in the selection of all plant and equipment, including the use of bored piles rather than driven piles where appropriate. b) The Contractor shall inspect all equipment to ensure that any noise mitigation (e.g. mufflers) is suitable.
4) Traffic	a) The Contractor shall prevent vehicle accidents and protect life and property. b) The Contractor shall avoid or minimise environmental damage and visual and noise disturbance due to vehicular traffic.
5) Construction Timing and Impacts	a) The Contractor shall provide appropriate mechanisms for the collection, treatment, recycling, reuse and disposal of construction waste and litter. b) The Contractor shall prevent environmental degradation caused by the inappropriate disposal of construction waste and litter. c) The Contractor shall provide for the environmentally responsible disposal of all construction wastes and litter. d) The Contractor shall conserve resources and maximise the recovery of reusable materials. e) The Contractor shall formulate and implement a waste minimisation strategy.
6) Budget	a) The Contractor shall make provision for adequate budget for site environmental management requirements.
7) ECO	a) The City of Cape Town shall appoint a competent and knowledgeable ECO; and where required, an Environmental Auditor.
8) Contractors Environmental Officer	a) The Contractor shall appoint a competent and knowledgeable Contractors Environmental Officer

Annexures

Guidelines

The Contractor is advised to include these Annexures within their on-site Environmental File. They are to be used to inform "how" the EMPr is to be implemented during construction related activities.

Annexure 1: Provision of details of the author(s) and related expertise

Provision of details of the author(s) and related expertise, as per requirements contained within Annexure 16 EMPr Alignment with NEMA Sec 24N

Annexure 2 - Legislation, Permits, Standards and Guidelines

Provides Legislation, Permits, Standards and Guidelines against which the Contractor is to adhere during the development.

Annexure 3 - City of Cape Town By-Laws

Provides City of Cape Town by-laws

Annexure 4 - Potential Authorisations / Permits / Licences Required Prior to Construction Commencement

Due to the evolving nature of developments; regulatory changes; and Contractor requirements, additional authorisations / permits / licenses may be required to augment those already obtained. This Annexure provides a summary to potential further regulatory requirements.

Annexure 5 – Environmental Authorisation / Water Use License

The Contractor is advised that developments which trigger an EIA / WUL may place further Conditions on the Contractor against which compliance is required. The Contractor is advised to be cognisant of these additional requirements and price accordingly.

Annexure 6 - City of Cape Town Environmental Policy

Provides the City of Cape Town's Environmental Policy

Annexure 7 - Environmental Best Practicable Options

Provides for Environmental Best Practicable Options which the Contractor may use to achieve compliance to the Outcomes contained within the Performance Specifications: Environmental Management. The Contractor should note that not all proffered mitigation measures will be suitable for all circumstances. The mitigation measures merely provide possible mechanisms to resolving risks / impacts. These mitigation measures do not absolve the Contractors from identifying appropriate mitigation measures for risks / impacts.

These are not auditable.

Annexure 8 – Site Plan

Provides further details relating to the Site Plan.

Annexure 9 - Method statement

This Annexure provides the Contractor with the minimum requirements to be included within the method statement.

It is incumbent upon the Contractor to provide a task or activity focussed method statement, providing the Employers Agent a holistic overview of all aspects associated with undertaking of the task / activity.

A method statement template has specifically not been provided to ensure that the method statement submitted by the Contractor aligns with Contractor QMS requirements.

Annexure 10 - Sensitivity Mapping

Provides for sensitivity mapping of "no-go" areas where the Contractor's activities are to be restricted.

Annexure 11 – Environmental Monitoring of Water

Provides for the monitoring of waste water generated due to construction related activities; and its discharge into a water resource, as per regulatory requirements.

Annexure 12 – Environmental Monitoring of Dust

Provides for the monitoring of dust generated due to construction related activities, as per regulatory requirements.

Annexure 13 – Environmental Monitoring of Noise

Provides for the monitoring of noise generated due to construction related activities, as per regulatory requirements.

Annexure 14 - General Conditions of Contract

Provides for references relate to the SAICE General Conditions of Contract 2015 (GCC).

Annexure 15 - Bill of Quantities

Provides for a mechanism in assisting the Contractor to accurately price for works to be undertaken.

Annexure 16 – EMPr Alignment with NEMA Sec 24N

Provides for a cross link to ensure EMPr contents complies with NEMA Section 24 N, together with Appendix 4 of GNR 982 the EIA Regulations, 2014, as amended.

Annexure 17 - Typical Aspects and Impacts Table

Provides for typical aspects and impacts generally associated with the various life cycle phases of a development. In the absence of an EIA Aspects and Impact Table, this table shall prompt the Contractor in the anticipation of possible risks. The Contractor is to use the Tables as a guideline in assessing risks / impacts when compiling method statements.

Annexure 18 – Site Environmental Management Plan

Small construction related activities not triggering an EIA process and not taking place in a sensitive environment (e.g. biodiversity areas, watercourses or wetlands and the coastal zone) may be governed by the SEMP.

Annexure 1 - Details of Author(s) and related expertise

Declaration

I ……, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
    - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
    - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- am aware that a false declaration is an offence in terms of regulation 48 of the NEMA EIA Regulations, 2014, as amended.

Note: The terms of reference of the review specialist must be attached.

Signature of the specialist:

Name of company:

Date:

Qualifications	
Expertise	

Annexure 2 - Legislation, Permits, Standards and Guidelines

Table 5: List of Applicable Legislation and Guidelines

Legislation	Sections	Relates to
The Constitution Act (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
	Section 25	Rights in property
	Section 32	Administrative justice
	Section 33	Access to information
National Environmental Management Act (No 107 of 1998) as amended	Section 2	Defines the strategic environmental management goals, principles and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	Duty of care and remediation of environmental damage. The scheme owner has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care. The duty of care has been amended to include significant pollution or degradation that occurred before the commencement of NEMA that arises or is likely to arise at a different time from the actual activity that caused the contamination or that arises through an act or activity of a person that results in a change to pre-existing contamination. A criminal sanction may be imposed on the responsible person for failure to comply with the reporting requirements and obligations to address the Duty of Care.
	Section 30	Control of emergency incidents. Responsible person's duties relating to reporting and remediation actions regarding emergency incidents. A criminal sanction may be imposed on the responsible person for failure to comply with the reporting requirements and obligations to address any emergency incidents.
Environment Conservation Act (No 73 of 1989) and regulations	The Act has been substantially repealed by NEMA. However, there are certain regulations under the Act which are still in operation such as the National Noise Control Regulations.	
National Environmental Management: Waste Act (No 59 of 2008) (NEMWA)	Section 16	General duty in respect of waste management
	Section 17	Reduction, re-use, recycling and recovery of waste
	Section 26	Prohibition of unauthorised disposal of waste.
	Section 27	Littering

Legislation	Sections	Relates to
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA)	Sections 65-69	These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species
	Sections 71 and 73	These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.
National Environmental Management: Air Quality Act (No 39 of 2004) and Regulations	Section 22A	Section 22A Consequences of unlawful conduct of Listed Activity
	Section 23	Controlled Emitters
	Section 32	Control of dust National Dust Control Regulations National Ambient Air Quality Standards
	Section 34	Control of noise
	Section 35	Control of offensive odours
	Schedule 2	Ambient air quality standards
	Section 21(1)b	GN 893. Listed Activities and Minimum Emission Standards
National Environmental Management: Integrated Coastal Management Act (No 24 of 2008) (NEMICMA)	Section 58	Duty to avoid causing adverse effects on coastal environment
	Section 60	Repair or removal of structures within coastal zone
	Section 63	Environmental authorisations for coastal activities
	Section 69	Discharge of effluent into coastal waters
	Section 70	Prohibition of incineration or dumping at sea
	Section 71	Dumping permits
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations	Sections 3 to 10	Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard. Workers handling these remedies must also be registered in terms of the Act.
Conservation of Agricultural Resources Act (No 43 of 1983) and regulations	Section 5, 6	Implementation of control measures for alien and invasive plant species.
National Heritage Resources Act (No 25 of	Section 34	No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Legislation	Sections	Relates to
1999)	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA), or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
	Section 38	This section provides for Heritage Impact Assessments (HIAs), which are not covered under the NEMA. The HIA will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA.
Occupational Health and Safety Act (No 85 of 1993) and regulations	General Administration Regulations GN R1449 (Section 7)	Material Safety Data Sheets must be made available at the request of any interested or affected person.
	Section 8	General duties of employers to their employees.
	Section 9	General duties of employers and self-employed persons to persons other than their employees.
		Asbestos Regulations
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution of a water body.
	Section 20	Control of emergency incidents
	Section 21	General principles for regulating water use
	Chapter 4	Use of water and licensing.
Hazardous Substances Act (No 15 of 1973) and regulations	Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	
Minimum requirements for storage, handling and disposal of Hazardous Waste, DWAF guidelines, 1998	Section 10	Temporary hazardous waste storage: time, volume and other requirements.
National Road Traffic Act (No	Section 54	Transportation of dangerous goods.

Legislation	Sections	Relates to
93 of 1996) and regulations		
Fencing Act (No 31 of 1963)	Section 17	Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to the protection of flora.
National Veld and Forest Fires Act (No 101 of 1998)	Chapter 2	Promotes and regulates the formation of fire protection associations which aim to manage and coordinate fire protection and fire services in an area.
	Chapter 4, 5	Organizations are required to make and maintain firebreaks and fire-fighting equipment and personnel should a risk exist that a fire may start or spread from the premises.
Construction Regulations (GnR 84 of 2014)	Regulation 2 (1)	Provides for Regulations which are applicable to all persons involved in construction work.
DEA Integrated Environmental Management	DEA Integrated Environmental Management Information Series: Environmental Management Plans: DEA Guideline on compiling EMPs.	
SANS 10103	The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.	
SANS 10128	Bunding of fuel storage tanks.	
SANS 10232	Transportation of dangerous goods	
SANS 10400	The application of the National Building Regulations	
SANS 1072	Safe Handling of Pesticides	
SANS 1089: Part 1	The petroleum industry: storage of petroleum products in aboveground bulk installations	
SANS 10228	The identification and classification of dangerous substances and goods	
SANS 10103	South African National Noise Standard	
SANS 4866; SANS 7631: Part 1	Mechanical vibration and shock	
SANS 10328	Methods for environmental noise impact assessments	
SANS 1186	Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger".	
SANS 10083	The measurement and assessment of occupational noise for hearing conservation purposes	

Annexure 3 - City of Cape Town By-Laws

The City of Cape Town by-laws that may be applicable to the proposed development are listed below.

Table 6: Applicable By-laws

CoCT By-Laws	Section	Relates To
CoCT Air Quality Management By-law 2016 as amended	Section 4	**Duty of Care** This section calls upon everybody to exercise duty of care to prevent air pollution from occurring. Pollution must be mitigated to remedy air pollution. Failure to do this may empower the Council to take serious actions against that person.
	Section 8	**Declaration of Air Pollution Control Zone** The whole area within the jurisdiction of the Council is declared an air pollution control zone. The Council has power within the control zone to issue notices in the provincial gazette to prohibit and restrict activities that may pollute air.
	Chapter 5	**Smoke emissions from premises other than dwellings** Dark smoke may not be emitted for an aggregate period exceeding three minutes during a continuous period of 30 minutes. Installation, alteration, extension or replacing of fuel burning equipment must be authorised by the Council. Operation of fuel burning equipment without the Council's authorisation is an offence. The owner or occupier of premises may be required to install at own costs, the obscuration measuring equipment. Records and monitoring results must be kept and maintained.
	Chapter 7	**Emissions caused by open burning** Open burning of any material without a written authorisation from the Council is an offence.
	Chapter 8	**Emissions from compressed ignition powered vehicles** Vehicles using compressed ignition power and emitting dark smoke may not be used.
	Chapter 9	**Emissions that cause a nuisance** Emissions that cause a nuisance are an offence. A compliance notice may be served on any person who is or is likely to cause air pollution to abate the nuisance, prevent it and comply with conditions

CoCT By-Laws	Section	Relates To
		set in the notice.
CoCT Water By-law, 18 February 2011	Section 8	**Duties of the public** All members of the public, upon becoming aware of any emergency or situation that may give rise to wastage of water or water pollution must, immediately inform the Director: Water.
	Section 12	**Unauthorised use of water** No person may use water from the water supply system without an agreement with the municipality and only through a communication pipe and metered water supply point installed by the municipality.
	Section 36	**Water restrictions** Whenever there is scarcity of water available to it for distribution and supply to consumers, or for any other good cause prohibit or restrict the consumption of water in the whole or part of the City; in general or for specified purposes; and in a specified manner.
	Section 37	**Wastage of water** No person may cause or permit the wastage of water such as permitting leaking pipes or insufficient use of water.
	Section 38	**Water conservation and demand management** All consumers of water must comply with good water conservation and demand management practices.
	Section 54	**Prevention of pollution of water** An occupier of premises must prevent the entry of any substance which may be a danger to health or adversely affect the potability of water into the water supply system or any part of the water installation on his/her property.
	Section 58	**Wells, wellpoints, boreholes and excavations** An owner of premises on which there is a well, wellpoint, borehole or any other excavation must ensure that it does not create a health nuisance or is filled in a way or with material which may cause an adjacent well, borehole or underground source of water to become polluted.
	Section 59	**Supply of non-potable water by the municipality**

CoCT By-Laws	Section	Relates To
		Non-potable water supplied by the municipality may not be used for domestic purposes or any other purpose which may give rise to a health hazard.
	Section 61	**Warning notices** Sources of non-potable water must be clearly marked with a weatherproof notice.
Community Fire Safety By-Laws, as amended	Section 26	Combustible waste and refuse
	Section 34	Combustible material fire hazards
	Section 37	Storage and use of flammables
	Section 48	Reporting of accidents
CoCT Environmental Health By-Laws, LA13333, 30 June 2003		• Land open to the public may not be used for the purpose of storing and stacking or for keeping any material likely to cause a health nuisance. • No premises may be allowed to be overgrown with bush, weeds or grass to such an extent that it may be used as a shelter by vagrants, wild animals or vermin which may threaten public health or safety. • The sanitation system on any premises may not be of such nature or condition that it may cause a health nuisance. • No person may commit any act which may cause a public health nuisance. • No person shall occupy any premises for habitable purposes so as to be a health nuisance. • No factory or trade premises may cause or give rise to smells that will cause a health nuisance. • The occupier of premises must take all possible measures to prevent the occurrence of mosquitoes, flies, fleas, bugs, cockroaches or other vermin or pests. • Filth, rubbish, refuse, manure or any material likely to be a health nuisance may not be kept or deposited on any premises. • Any person who fails to comply with or contravenes any provision of Section 1 of these by-laws will be guilty of an offence and may be liable to a fine. • Medical waste must be handled and stored in a safe manner that poses no threat to human health or the environment. • Any person convicted of an offence under these by-laws shall be liable to a penalty.
CoCT Stormwater		**Prohibited discharges**

CoCT By-Laws	Section	Relates To
Management By-Laws , LA 31420, 23 September 2005	Section 3	No person may discharge anything but stormwater into the storm water system without written consent from the Council.
	Section 4	**Protection of storm water system** No person may commit any act which may damage, endanger or destroy the stormwater system or interfere with the operation thereof or contaminate or pollute the water therein without written consent from the Council.
	Section 5	**Prevention of flood risk** No person may undertake any activity which may cause an increase in flood levels or create a potential flood risk without written consent from the Council.
	Section 6	**Studies and assessments** The City may impose terms: for the establishment of flood lines; impact assessment; and environmental impact studies.
	Section 7	**Water pollution incidents** Should a stormwater pollution incident occur, the owner of the property on which the incident took place or the person responsible for the incident must inform the Council of the incident immediately and take all reasonable measures to minimise the effects of the pollution.
	Section 8	**Storm water systems on private land** No owner of property on which a private stormwater system is located may carry out an activity which may cause the system not to function properly. The owner must also keep such stormwater system functioning properly.
	Section 11	**Offences and penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a penalty.
CoCT Public Places and Nuisances By-Laws	Section 2	**Prohibited behaviour** No person may intentionally block or interfere with the safe and free passage of a pedestrian or vehicle.
	Section 6	**Trees causing an interference or obstruction**

CoCT By-Laws	Section	Relates To
		The City may give notice to the owner or occupier of any property on which a tree or other growth which interferes with overhead wires or is a source of danger or nuisance to persons using a public road to prune or remove the tree or growth.
	Section 8	**Goods, building materials, motor vehicle wrecks and dangerous objects** No person may cause any broken glass or other potentially dangerous objects to be placed in a public place.
	Section 23	**Offences and penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a fine.
CoCT Wastewater and Industrial Effluent By-Laws GN 6378, 1 September 2006	Section 2	**Duties of owners of properties** Owners of premises must construct their own private sewer installations on their premises.
	Section 3	**Protection of municipal sewers** No person may interfere with the municipal sewer system in any way or discharge into the system any substance other than sewage without the approval of the council.
CoCT Integrated Waste Management By-Law, 2009	Section 4	**Obligations of Waste Generators** A waste generator must: • "avoid the generation of waste or where it cannot be avoided minimise the toxicity and amounts of waste generated"; • "re-use, recycle or recover waste where possible"; • "manage waste so that it does not endanger health or the environment or create a nuisance"; • "maintain suitable cleanliness and hygiene standards on their premises as required by the City's Environmental Health By-law"; • "conclude a contract with the City, its service provider or an accredited service provider, as the case may be, for the storage and collection of waste". A waste generator generating industrial waste shall submit an integrated waste management plan to the City and comply with the terms and conditions set out by the City for the generation, minimisation, storage, recycling, collection and

CoCT By-Laws	Section	Relates To
		disposal of such waste. Any person who directly or indirectly generates building waste or the owner of the property on which such building waste is generated shall not store such waste in containers provided by the City for residential waste and shall remove and dispose of it at a licensed crushing plant or landfill site or any other licensed building waste disposal facility. The waste generator or the owner of the property on which waste is generated who deposits or stores waste on property of the City may be fined for failure to have or produce a permit for such deposit or storage.
	Section 7	**Priority Waste** Where special measures are required for management of waste because it poses a significant threat to health or the environment, it is not biodegradable, contains or could foster pathogens or communicable diseases or has been declared a priority waste in terms of other applicable legislation it can be prioritised according to this By-law.
	Section 12	**Storage and Transportation of Waste** Any person who stores or transports waste must ensure that: • "suitable measures are in place to prevent accidental spillage or leakage"; • "the waste cannot be blown away"; • "nuisances such as odour, visual impacts do not arise"; and • "pollution of the environment and harm to health are prevented".
		Prohibition of Unauthorised Disposal of Waste No person may: • Dispose of waste in a manner likely to cause pollution or have a negative impact on the environment or to be harmful to health; • Dispose of waste other than in accordance with this By-law or National and Provincial legislation; • Burn waste, especially hazardous waste except in approved incinerators; • Deal with waste in a manner that causes dust, spillage or litter.

Annexure 4 - Potential Authorisations / Permits / Licences Required Prior to Construction Commencement

The below provides information on additional activities which may require authorisations / permits / licences from relevant government departments. The Contractor is to ensure that prior to the commencement of works, these authorisations / permits / licences have been obtained.

Table 7: Activities that could require an authorisation / permit / licence

Activity	Type of authorisation / permit/ license required	Requiring institution
Obstacle Application Form	Permit	Civil Aviation Authority
Obstacle Application Form	Permit	Air Traffic and Navigation Services Company
Use of treated wastewater (dust suppression)	Approval	Department of Health
Application for a licence regarding activities in state forest	Licence	Department of Agriculture, Forestry and Fisheries
Search and Rescue	Permit	CapeNature
Veld and Forest Fire	Requirement for a fire management plan	Department of Agriculture, Forestry and Fisheries
Archaeological and paleontological sites and meteorites	Permit	Heritage Western Cape
To destroy, damage, deface, alter, remove from its original position, subdivide or change the planning status of a National Heritage Site	Permit	Heritage Western Cape
Burial grounds and graves	Permit	Heritage Western Cape
Way leave applications for accesses to the provincial roads	Approval	Department of Transport and Public Works
Health permits for hostels and sanitation	Permit	Department of Health
Commencement of Construction Activities	Notify one week before commencement	Department of Environmental Affairs and Development Planning
Radio Equipment Licence	Site radio submission	ICASA
Outdoor advertising of Activities	South African Manual for Outdoor Advertising Control	Department of Environmental Affairs and Development Planning

Activity	Type of authorisation / permit/ license required	Requiring institution
Site Establishment Sewage Disposal	Approval	City of Cape Town
Site Establishment storm water & pollution control	Separate report	City of Cape Town
Fuel storage	Permit	Department of Environmental Affairs and Development Planning / City of Cape Town
Hazardous material route	Approval	Department of Environmental Affairs and Development Planning /DOT
Other Hazardous substances	Permit	Department of Environmental Affairs and Development Planning
Project construction commencement	Notify	DOL
Land use outside current zoning	Special consent approval (LUPA)	City of Cape Town
Detail design (water, wastewater, roads design)	Approval	City of Cape Town
Way leave applications – design	Approval	SANRAL
Installation of fuel burning equipment	Approval	City of Cape Town
Authorisation of spray booths	Approval	City of Cape Town
Open burning application	Approval	City of Cape Town
Noise impact assessments	Approval	City of Cape Town
Installation of fuel burning equipment	Approval	City of Cape Town
Temporary work within a National Park	Approval	SANParks

Annexure 5 – Environmental Authorisation / Water Use License

Note to Compiler: Please insert Environmental Authorisation / Water Use License

Annexure 6 - City of Cape Town Environmental Policy

Note to Compiler: Please insert Clients Environmental Policy

Annexure 7 - Environmental Best Practicable Options

Planning

Not applicable to Contractor appointment

Design

Not applicable to Contractor appointment

Pre-construction

	DESCRIPTION			
Possible source of potential impact	• Clearing of vegetation • Poor housekeeping	• Dust • Noise	• Fires	• Alien vegetation
Risks/impact	Risk / impact:	Mitigation measures		
	1) Search and Rescue	i. The Contractor shall undertake all activities associated with the search and rescue operation and have completed these prior to the commencement of construction related activities.		
	2) Alignment to engineering requirements	i. All EIA outcomes, EMPr, Environmental Authorisation and any other regulatory requirement shall be aligned with engineering requirements.		
	3) Budget	i. The Contractor shall make provision for adequate budget for construction site environmental management requirements.		
	4) Tender review	i. The Environmental Planner shall undertake an environmental review of all tender submissions.		
	5) Approvals	i. The Environmental Planner shall ensure all approvals been obtained.		
	6) Environmental Compliance	i. The City of Cape Town shall appoint a competent and knowledgeable ECO; and where required, an Environmental Auditor.		
	7) Contractors Environmental Officer	i. The Contractor shall appoint a competent and knowledgeable Contractors Environmental Officer		

Construction

DESCRIPTION	Aesthetics Management			
Possible source of potential impact	• Clearing of vegetation • Poor housekeeping • Dust	• Stockpile • Waste • Vehicles	• Security lighting • Odour • Fires	• Poor rehabilitation • Alien vegetation • Noise
Risks/impact	Risk / impact:	Mitigation measures		
	1) Unsightly camps or construction areas.	i. Equipment and material to be neatly stored. ii. All site offices are to be matt toned single storey buildings that emit no glare. iii. No natural features may be defaced. iv. Shade-cloth shall be placed on perimeter fencing to reduce visual impact of the camp site. v. Waste should be removed regularly to registered landfill		
	2) Dust generation.	i. Dust suppression (wetting with non-potable water or other best practicable environmental option e.g. mulching, chemical dust suppression etc) shall be used in and around the construction area, along haul roads, at stockpiles and any additional area indicated by the Employers Agent. ii. Dust generating materials to be transported must be covered when transported. iii. All vehicles shall travel at speeds that will not generate dust.		
	3) Scarring of landscape.	i. Vegetation shall only be cleared where and when necessary, with the required approvals (e.g. in heritage protection overlay zones and for protected vegetation) ii. Rehabilitation / reinstatement to occur as soon as construction related activities are complete.		
	4) Insufficient soil stabilisation and rehabilitation resulting in erosion and subsidence.	i. Work straw bales into the topsoil at an application rate of one per 25 m^2.		
	5) Infestation of alien invasive species because of disturbances.	i. Contractor shall ensure all imported material is free of alien invasive seeds / propagules. ii. All alien invasive vegetation shall be cleared from within all areas impacted through construction related activities.		

DESCRIPTION	Aesthetics Management	
	6) Spread of litter	i. Conduct daily litter patrols at all areas impacted through construction related activities. ii. Provide for waste collection and containment facilities within the Contractors camp.
	7) Light pollution	i. Lighting must face down, not into surrounding environment, to provide adequate lighting for Health and Safety requirements. ii. Lights should not be mounted higher than 3m off ground level.
	8) Stockpile management	i. Stockpiles must be regularly and neatly maintained. ii. Stockpile heights to be kept to a minimum.
	The Contractor shall develop and implement an aesthetics management method statement.	
Top Tip(s)	• Do not use hay bales for soil stabilisation, as hay contains seed which may result in the spread of agricultural weeds. • Ensure mobile toilets are enclosed within a shade cloth enclosure. This will not only reduce visual impact, but also the temperature within the toilets – thus limiting odours.	

DESCRIPTION	Dust Management			
Possible source of potential impact	• Vehicular movement on unpaved roads	• Material handling, storage and transportation of materials	• Wind erosion from stockpiles	• Excessive vegetation clearance
Risks/Impacts	Risk/Impact:	Mitigation measure		
	1) Potential loss of agricultural value due to dust settlement on plants.	i. Clearance of indigenous vegetation shall be kept to an absolute minimum. Immediate rehabilitation of disturbed areas.		
	2) Impacts on biological functioning and	i. Monitoring of dust fall out shall be conducted as prescribed in the National Dust Control Regulations.		

DESCRIPTION	Dust Management	
	productivity of vegetation.	
	3) Potential health and nuisance impacts. 4) Safety risks due to reduced visibility. 5) Delays in construction related activities due to unsafe visual conditions.	i. Stockpile heights shall be reduced where dust entrainment has been noted to be high. ii. Dust suppression (wetting or other best practicable environmental option) shall be used in and around the construction area, along haul roads, at stockpiles, and any additional area indicated by the Employers Agent. iii. Dust generating materials to be transported shall be covered when transported. iv. All vehicles shall travel at speeds that will not generate dust. v. Strict dust control to limit impacts on sensitive receptors vi. Monitoring of dust shall be conducted as per the regulated frequencies at areas where dust is being generated. Dust mitigation is required to prevent dust levels exceeding 600 mg/m^2/day. vii. Monitoring of particulate matter and dust fall as prescribed in the National Dust Control Regulations shall be conducted
	The Contractor shall develop and implement a dust management method statement. Where required, a dust management plan shall be developed in terms of the National Dust Control Regulations.	
Top Tip(s)	• Dust monitoring method (e.g. dust nuisance vs dust fall-out) to be undertaken using correct monitoring protocols – e.g. do not use dust nuisance monitoring techniques to determine dust fallout levels. • Monitoring stations to be placed within path of dust emission. • Perimeter dust fall monitoring is recommended where off-site impacts need to be assessed. • Alternatives to wetting include chemical dust suppressants, mulching, planting vegetation in windows etc. Chipped material from vegetation clearing operations can be used to bind the soil, thereby reducing dust levels during rehabilitation / reinstatement works. Alien vegetation should not be used as mulch if it is in seed.	

DESCRIPTION	Earthworks Management	
Possible source of potential impact	• Dust • Clearing of vegetation • Wind erosion from stockpiles • Vehicular movement on unpaved roads	
Risks / Impacts	Risk/Impact	Mitigation measures
	1) Loss of soil through contamination, wind and water erosion and inadequate stockpile handling.	i. Topsoil shall be stockpiled separately from subsoil with all soils being reinstated in the reverse order to that in which they have been removed in order to initiate rehabilitation. All stockpiles shall be stabilised, not be higher than 2m, and blend in with the surrounding topography. ii. Stockpiles shall be kept weed-free for the duration of construction related activities. iii. Should additional material or backfill be required, only material from an approved source free of alien invasive fauna and flora shall be used. iv. Topsoil only to be handled during removal and reinstatement activities.
	2) Impacts on water resources.	i. All works shall take cognisance of potential impacts upon water resources. ii. Use non-potable water sources for dust suppression.
	3) Disruption of natural areas and land use practices.	i. Topsoil removed from all areas impacted upon shall be stockpiled for rehabilitation. ii. Soil horizons (e.g. topsoil, subsoil, bedrock and other layers such as clays etc) to be kept separate during removal, stockpiling and reinstatement. iii. Topsoil removed from agricultural lands shall be collected and stockpiled. All stones and rocks greater than 150 mm diameter shall be removed from the reinstated topsoil in agricultural areas. iv. All stockpiles shall be located within designated areas outside the 1:20 year flood line of rivers and streams and not within 50m of delineated wetlands.
	4) Prevention of soil contamination.	i. Refuelling and other activities with the potential to cause pollution shall not be allowed on or adjacent to a stockpile.
	5) Excess material requiring spoiling.	i. Undertake Inventory of topsoil requirements and reserve extra 10% of topsoil for rehabilitation requirements. ii. Spoil shall be used as backfill to rehabilitate areas impacted upon by earthwork activities. iii. Excess spoil material shall be disposed of at the nearest registered landfill site as identified by the Employers Agent.

DESCRIPTION	Earthworks Management	
		iv. In the event that the volume of spoil generated for disposal outside of a registered landfill site is greater than the thresholds stipulated within GNR 921, (National Environmental Management: Waste Act (Act 59 of 2008) List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment, of 29 November 2013), the City of Cape Town shall be notified that a Waste License will need to be applied for.
	The Contractor shall develop and implement an earthworks management method statement.	
Top Tip(s)	• Ensure suitable locality for topsoil storage is in place prior to the commencement of earthworks. • Cover stockpiles with permeable / breathable fabrics instead of plastic sheets.	

DESCRIPTION	Erosion Management	
Possible source of potential impact	• Site preparation • Civil works • Dewatering • Vegetation clearance	
Risks/Impacts.	Risk/Impact:	Mitigation measure
	1) Contamination of water resources through increased sediment load. 2) Reduction in soil productivity due to loss of topsoil. 3) Increased soil deposition to adjacent areas. 4) Dust generation.	i. Changes in natural gradients due to construction activities shall be avoided where possible or mitigated by levelling the slope to the original gradient. ii. Access and servitude roads shall be designed to drain efficiently through formalised storm water crossings comprising inter alia an earth berm and causeway. The placement of these shall be assessed per road portion. Storm water shall be directed to areas of high stability with the ability to reduce storm water velocity. iii. Where the above is not possible, exposed slopes steeper than 1:2 (vertical: horizontal) shall be stabilised and drainage directed to engineered structures. iv. Exposed areas shall be stabilised within one week of their exposure. v. Where slopes created are steeper than 1:1, additional anti-erosion mechanisms shall be implemented (such as knocking in stakes, installing gabions, geo textiles or similar). vi. Monthly clearance of alien vegetation re-growth at disturbed areas shall be conducted as per the requirements of the Conservation of Agricultural Resources Act (Act 43 of 1983) and National Environmental Management: Biodiversity Act's (Act 10 of 2004) Alien Invasive Species Regulations,

DESCRIPTION	Erosion Management	
		as amended until rehabilitation in the area is initiated. vii. No disturbance of soil shall occur outside the construction footprint boundaries. viii. Suspended solids within water leaving the footprint area shall not contain significantly higher levels of suspended solids (>10%) than water within locally occurring water resources.
	The Contractor shall develop and implement an erosion management method statement.	
Top Tip(s)	• Only clear vegetation where required. • Ensure storm water planning is finalised prior to commencement of earthworks.	

DESCRIPTION	Fauna and Flora Management	
Possible source of potential impact	• Site preparation • Civil works • Dewatering • Vegetation clearance	
Risks/Impacts	Risks/Impacts	Mitigation Measures
	1) Disturbance, degradation and pollution of the environment. 2) Removal of vegetation and thus loss of habitat and biodiversity. 3) Disturbance to or removal of agricultural capacity.	i. Reduce construction related activities and vegetation clearance within the development where logistically possible. ii. No construction related activities to impact upon areas outside of the development footprint. iii. A search and rescue operation to collect species for rehabilitation shall be conducted, where feasible, prior to the commencement of construction related activities and these shall be kept alive in a nursery for rehabilitation purposes. iv. Each indigenous tree or shrub removed through search and rescue operations shall be replanted in the area it came from or in an area as advised by the City of Cape Town Biodiversity Management Branch.
	4) Negative impacts on sensitive environments and rare/threatened/endangered species.	i. All areas where rare and/or endangered species could occur are to be identified and avoided where possible. ii. No unauthorised clearing of vegetation. iii. No introduction of alien invasive vegetation species as a result of construction related

DESCRIPTION	Fauna and Flora Management	
		activities. iv. Progressive rehabilitation of all disturbed areas to a state similar to the surrounding landscape. v. Rescued specimens are to be stored and cared for in a temporary nursery, and replanted once construction related activities have been completed. vi. All disturbed areas shall be rehabilitated with special attention paid to identified sensitive areas. vii. Rescued fauna relocated to approved locality.
	5) Damage and/or death of rescued specimens due to ineffective search and rescue operations.	i. The Contractor shall maintain the nursery to ensure survival of collected species. Individuals that die in the nursery shall be replaced from a commercial source by the Contractor. If the species that die were intended to be placed in biodiversity areas in the City – the Biodiversity Management Branch shall be consulted with regard to the acceptability of utilising commercially obtained replacement plants prior to purchase.
	6) Unauthorised collection of fauna and flora for food, firewood, "muthi" or other uses.	i. No unauthorised collection of fauna and flora.
	7) Incorrect operation of gates thereby allowing free movement of livestock and game.	i. The Contractor shall manage gates in accordance to the requirements of the Fencing Act (Act 31 of 1963), whereby open gates shall be left open and closed gates be kept closed. ii. The Contractor shall inform all landowners in the event of livestock movement into agricultural lands due to incorrect gate usage.
	8) Animals becoming trapped in construction areas and/or falling into excavations due to ineffective exclusion mechanisms (fencing, cattle grids etc.).	i. Open excavations shall be adequately fenced to prevent access by wildlife or livestock. ii. Corridors across any servitude for the passage of animals shall be provided at appropriate sites determined by the Contractor and approved by the Employers Agent.

DESCRIPTION	Fauna and Flora Management	
	9) Spread of alien invasive species.	i. Monthly removal of alien invasive vegetation from all impacted areas. ii. Herbicide use for the control of invasive species shall be at supplier recommended application rates, and in accordance to the regulatory requirements (Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947)). Herbicides used shall be biodegradable where possible.
	10) Fauna management	i. No harming/killing/trapping/hunting of animals is allowed. ii. No domestic animals are allowed on site. iii. Qualified person(s) to be contacted to remove wildlife and snakes which do not want to move on their own. iv. Areas of vegetation must not be avoided but rather cordoned off and marked as no-go areas. v. City of Cape Biodiversity Branch should be contacted on 021 514 4189 for assistance, where required.
	The Contractor shall develop and implement a fauna and flora method statement.	
Top Tip(s)	• Undertaking a search and rescue operation where rescued flora is propagated in a nursery may provide a cheaper alternative than procuring commercial nursery bought flora. Furthermore, this approach allows containment of unique endemic genetic variations.	

DESCRIPTION	Fire Management			
Possible source of potential impact	• Site preparation	• Civil works	• Fires	• Vegetation clearance
Risks/Impacts	Risk/Impact	Mitigation measures		

DESCRIPTION	Fire Management	
	1) Loss of fauna and flora and destruction of natural habitat. 2) Loss of grazing lands and crops. 3) Damage or destruction to infrastructure. 4) Injury and/or death of humans and animals.	i. Join the local Fire Protection Association (FPA). ii. Perimeter boundaries shall have fire breaks in place. iii. The daily Fire Danger Index (FDI), calculated in terms of the National FDI (www.weathersa.co.za), shall be displayed prominently at all times. iv. Fire extinguishers shall be available at all points of storage of flammable products. v. STP Dry Powder Fire Extinguishers shall be used and at least one shall be provided per 50 m^2 floor surface area. vi. The fire extinguishers shall be checked on a monthly basis to ensure they have not been used/exceeded their yearly service intervals. vii. Basic fire-fighting equipment shall be kept and maintained at all construction fronts at all times. Basic fire-fighting equipment shall not be restricted to fire extinguishers, but shall take cognisance of site specific conditions. viii. All staff are to undergo basic fire-fighting training. ix. Basic fire-fighting equipment shall be checked prior to the commencement of the winter fire season. x. The Contractor shall assign the position of Fire Officer to one of its senior staff members who shall be competent and adequately trained to fulfil the position of Fire Officer. xi. The Fire Officer 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. The Fire Officer shall be responsible for contacting emergency services for assistance. xii. Any fires that occur shall be reported to the Employers Agent immediately and reported in turn to the relevant authority (district / local municipality, the local FPA and the Department of Agriculture, Fisheries and Forestry). xiii. Provision of formal training to all members of staff, who shall be able to attend to fire fighting in the event of a fire, until emergency services arrive. xiv. All other staff shall receive training on fire prevention and fire-fighting and safety in the event of a fire, as a part of the site induction training by Contractor before commencing work. Annual refresher courses shall be presented to all staff. xv. Ensure that the necessary materials and equipment for dealing with oil, fuel and hazardous substance spills and leaks are available on site and up to date at all times.

DESCRIPTION	Fire Management	
		xvi. No open fires shall be permitted on or off-site, except for activities authorised by the Employers Agent and the FPA. All authorised fires shall occur at designated fire places, which shall be suitably resourced to contain and suppress any potential run away fire. xvii. No on-site burning of any waste materials, vegetation, litter or refuse shall be permitted. xviii. The disposal of cigarette butts into the surrounding environment shall not be permitted. xix. Grass and other vegetation in the vicinity of infrastructure shall be cut at regular intervals to reduce fuel load and fire hazards xx. Annual updating and approval of the fire management response plan before onset of fire season. xxi. Conduct management review of fire preparedness and response before onset of fire season. xxii. Conduct fire and emergency drills every six months with one coinciding with the onset of the fire season.
	The Contractor shall develop and implement a fire management method statement.	
Top Tip(s)	• Consider using haul roads as fire breaks. These shall be agreed upon with neighbouring landowners, the FPA and recorded within agreements and management plans; and updated annually.	

DESCRIPTION	Hazardous Substance Management	
Possible source of potential impact	• Fuel dispensing • Reactive chemical storage • Chemical cleaning • Plant maintenance	
Risks/Impacts	Risks/Impacts	Mitigation measures
	1) Contamination of the receiving environment	i. All hazardous substances shall be kept under lock and key in a bunded impermeable weather and fire proof facility. ii. All staff to be trained in the safe handling and spill management of all substances used on site. iii. Drip trays to be provided and used for all mobile plant, maintenance and refuelling activities. iv. Sufficient number and type of spills kits to be provided at all work fronts. v. The Contractor shall prevent the discharge of any pollutants, such as bentonite, cements,

DESCRIPTION	Hazardous Substance Management	
		concrete, lime, chemicals and fuels into any water resource.
	2) Spills	i. Spills to be contained and removed by suitably trained staff. ii. Contaminated material to be disposed of registered hazardous waste landfill facility.
	3) Incorrect use of herbicide and pesticides.	i. All herbicides and pesticides to be used under the supervision of a Pest Control Officer (PCO), in terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and its regulations.
	4) Threat of fires	i. All reactive hazardous substances to be labelled and stored separately. ii. Suitable fire-fighting equipment shall be stored in close proximity and all personnel be made aware of the dangers of burning chemicals/smoke inhalation.
	5) Temporary storage	i. No temporary storage of hazardous substances, storing 80m³ or more or 30m³ within 200m from the high-water mark of the sea or within 100m from the edge of a watercourse
	6) Personal injury	ii. All staff shall be trained in the management of hazardous substances. iii. All staff shall be provided with appropriate Personal Protective Equipment (PPE).
	7) Asbestos management	i. Should any asbestos waste material be discovered on site, rehabilitation of the site should be conducted in consultation with the National Department of Labour and in accordance with the Asbestos Regulations, as amended.
	8) Cement / concrete management	i. Cement shall be stored within weatherproof facilities / covered to prevent environmental contamination. ii. The Contractor shall ensure that concrete is mixed in appropriate structures to prevent the contamination of the surrounding environment. All visible remains are to be removed and disposed of as waste and all surplus material is to be removed. Plastic sheets and the bare ground shall not to be used for mixing purposes. iii. All visible remains of excess concrete shall be physically removed and disposed of on completion of construction. iv. Concrete spoil from foundation pours, shall not be discarded into the surrounding environment. Excess concrete and wash water from the concrete truck's drum shall be disposed of at Employer

DESCRIPTION	Hazardous Substance Management	
		Agent approved locality.
	The Contractor shall develop and implement a hazardous substance management method statement.	
Top Tip(s)	• Hot water geyser drip trays are not suitable for use in the containment of hazardous substances. These drip trays are not UV, nor chemically stabilized and easily bend when warm (in the sun) thereby increasing risk of spillage. Of greater concern is that should the spilt contents ignite, the plastic will increase the fire severity. Such trays therefore not only pose an environmental threat, but a health and safety threat too. • Please note the above is also applicable to the use of plastic sheets (damp course) as bunding. • Bund walls should preferably be of reinforced concrete as brick walls tend to crack; joints are not adequately sealed; and do not interface well with the concrete base. • Concrete is not impermeable and should thus be sealed with a chemical sealant (or similar) prior to the storage of hazardous substances.	

DESCRIPTION	Heritage Management	
Possible source of potential impact	• Asbestos waste • Chance human remains • Demolished buildings • Dust	
Risks/Impacts	Risks/Impacts	Mitigation measures
	1) Damage to known heritage resources.	i. All heritage resources encountered shall be avoided and protected unless otherwise instructed by the Employers Agent (in consultation with a heritage specialist). Approval from Heritage: Western Cape (H:WC) must be attained prior to the removal, damaging or alteration of any heritage resource.
	2) Damage or destruction of chance finds.	i. Personnel shall be informed of what chance finds may be and what they may look like and instructed to be on the lookout for these items during excavation operations. ii. In the event of a chance find, work at the find shall be stopped. iii. A heritage specialist shall be called in to investigate the find. The heritage specialist shall provide management measures for the protection or removal of the find in consultation with H:WC. iv. Work shall only recommence in area of the find once written permission from the H:WC, heritage specialist and the Employers Agent has been obtained.
	3) Heritage watching brief	i. A heritage specialist shall be appointed to undertake a "watching brief" in the event of finds.
	4) Heritage Authority details.	i. The Contractor shall ensure the below Competent Authority contact details are kept on file on site. SAHRA: 021 462 4502 HWC: 021 483 9598 CCT: 021 487 2038
	The Contractor shall develop and implement a heritage management method statement.	
Top Tip(s)	• Ensure an archaeologists contact details are kept on file in the event of a chance find. This may expedite timeframes associated with work cessation at point of chance find. • Undertake site walk through prior to construction related activities commencing to ground truth no graves were omitted during planning and design phases.	

DESCRIPTION	Land Owner Liaison	
Possible source of potential impact	• Dust • Water contamination • Noise Waste	
Risks / Impacts	Risks / Impacts	Mitigation measures
	1) Animosity of community members affected by construction related activities.	Landowners shall be actively engaged and be kept informed of new developments. Effective communication channels shall be established and maintained.
	2) Incident reporting structures	i. Initiate incident reporting structures. ii. Contractor shall adhere to the following timeframes for dealing with Landowner concerns, unless otherwise approved by the Employer: • Record concern within the Communications Register and verbally notify the Employer – immediate. • Respond to the concern – within 1 day of concern being raised – this includes consulting with the Landowner. • Rectify/mitigate concern – within 3 days of concern being raised. • Respond in writing to landowner on "close out" of concern – within 5 days of concern being raised. • Submit to the Employer a detailed report – within 7 days of concern being raised.
	3) Construction programmes.	i. Where practical, construction related activities shall be programmed to lessen impacts upon existing land use practices.
	4) Site creep	i. All development foot prints shall be surveyed and pegged prior to the commencement of construction related activities.
	5) Land access protocols	i. Basic Environmental Awareness Training to all employees with annual refresher courses. ii. Access to the site by people other than staff or those with construction related business shall be limited.

DESCRIPTION	Land Owner Liaison	
	6) Site Camp	i. The Contractor shall require a site office / yard for the duration of the contract period. The Contractor's site office shall be located within the development footprint, or on a site appropriately zoned and/or authorised for such use by the Competent Authority and approved by the Employers Agent (in consultation with the ECO). The Contractor shall select a location that has easy access and which has already been cleared or disturbed by previous human activity (e.g. previous construction camps or stockpile areas). All construction activities, materials, equipment and personnel shall be restricted to within the area specified. The Contractor shall inform the Employers Agent of the site camp localities prior to the commencement of construction related work.
	The Contractor shall develop and implement a land use management method statement.	
Top Tip(s)	• Engage with land owners prior to undertaking construction related activities and ensure all concerns / requirements are agreed upon. This will prevent possible future claims, grievances and animosity towards the development.	

DESCRIPTION	Noise Management			
Possible source of potential impact	• Blasting • Machinery and equipment	• Demolition • Heavy duty vehicles	• Maintenance	• Hours of operation
Risks/Impacts	Risk/Impact	Mitigation measure		
	1) Hearing loss through exposure to extended and or high noise levels. 2) Disruption of sense of place due to noise nuisance. 3) Noise nuisance to sensitive receptors.	i. Construction site yards, workshops, concrete batching plants and other noisy fixed facilities may not be located in close proximity to sensitive receptors, unless with the approval of the Employers Agent. In such cases, the Contractor shall notify affected parties prior to the commencement of the noisy activity. ii. Employees shall be provided with adequate PPE. iii. All construction related vehicles, plant and equipment shall be properly maintained to avoid creation of unnecessary additional noise. iv. Where possible, sensitive receptors shall be forewarned before noisy operations commence. v. Maintenance activities are to be contained to reasonable hours during the day. vi. Where possible, noisy operations shall be combined so that they occur concurrently.		

DESCRIPTION	Noise Management	
		vii. Strict control of blasting operations, if required, with regard to the size and timing of explosions in order to minimise noise. The number of blasts per day shall be limited, blasting shall be undertaken at the same times each day and no blasting shall be allowed at night. Affected parties shall be notified of blasting events.
	4) Vibration	i. All buildings within Employer Agent approved radius shall be inspected pre and post blasting to determine structural integrity. ii. Records (containing photographs) of inspections shall be submitted to the Employers Agent. iii. All blasts shall be monitored to determine blast related vibration. iv. Compliance with regulatory requirements (BS 7385-2 (ISO 4866) Evaluation and measurement for vibration in buildings – Part 2: guide to damage levels from ground-borne vibration).
	The Contractor shall develop and implement a noise management method statement.	
Top Tip(s)	• Engage with affected stakeholders well in advance should excessively noisy operations be anticipated. Provide continued feedback and address associated grievances as timeously as possible. An informed stakeholder is less likely to raise a grievance. • Apply for noise exemptions in terms of the Western Cape Noise Control Regulations where required e.g for night time work.	

DESCRIPTION	Rehabilitation Plan			
Possible source of potential impact	• Dust • Erosion	• Excess spoil	• Alien invasive plants	• Demolished temporary works
Risks/Impacts	Risks/Impacts	Mitigation Measures		
	1) Reduction in species diversity after works.	i. Prior to site clearance activities a search and rescue operation for naturally occurring plant species shall be conducted, if feasible for the vegetation type. ii. Individuals removed during search and rescue operations shall be relocated to a nursery and kept alive and replanted in the area from which they were removed or in an area as advised by the City of Cape Town Biodiversity Management Branch. iii. The Contractor shall obtain the necessary permits for the collection, transportation and possession of		

DESCRIPTION	Rehabilitation Plan	
		the collected species. These shall be obtained from the provincial conservation department. i. Disturbed areas shall be reseeded using the approved seed mix. The Biodiversity Management Branch must be consulted with regard to any rehabilitation in biodiversity areas.
	2) Incorrect placement of topsoil and reseeding with the incorrect species resulting in poor vegetation establishment and regeneration of vegetation and visual scarring of the landscape. Dust generation and erosion due to exposed surfaces. 3) Loss of agricultural productivity due to poor vegetation establishment	ii. After construction related activities have ceased, the site shall be cleared of equipment and any other materials emanating from the works. iii. Top and sub soil shall be replaced in the order they were removed. iv. Disturbed areas shall be ripped and / or scarified to a depth of 450 mm. v. Topsoil shall be reinstated at the minimum depths of 150 mm. vi. Topsoil shall be placed such that the disturbed area is at a slightly higher level than the surrounding undisturbed soil to account for soil settlement. vii. All disturbed areas shall be re-vegetated using an approved seed mix. viii. Landowners should be consulted to determine specific rehabilitation requirements.
	4) Reduction in soil productivity due to the mixing of soil horizons during soil stripping, which causes dilution of fertility in topsoil's.	i. Topsoil stored for longer than 6 months, shall be vegetated with an approved seed mix. ii. In cases like this, the biological viability of topsoil stockpiles shall be tested before placement during rehabilitation; and where necessary amelioration such as microbial supplementation may be required.
	5) Infestation by alien invasive plant species.	i. Monthly removal of alien invasive species re-establishing on cleared areas, stockpiles and throughout rehabilitation shall be undertaken.

DESCRIPTION	Rehabilitation Plan	
	6) Drainage	i. All drainage lines shall be reinstated. ii. All disturbed areas shall be re-profiled to original contours. iii. Soils within drainage lines shall be stabilised to ensure no loss of capacity. iv. Permanent erosion and sediment control measures shall be reinstated.
	7) Loss of watercourse integrity and functioning	i. Anti-erosion measures shall be implemented to stabilise beds and banks of watercourses where these are disturbed. These measures should preferably be temporary in nature so they can be removed at a point where rehabilitation has been deemed to be successful. Permanent structures shall be approved by the Employers Agent before construction. ii. The soil profile (type and thickness of soil) of rivers and wetlands shall be recorded prior to excavations in these areas. iii. Topsoil and soils removed from watercourses shall be stockpiled separately. iv. Replacement of soil types shall be done so as to match the baseline soil profile as closely as possible. v. Re vegetation: Indigenous species that were originally present in the watercourse shall preferably be replanted in the watercourse vi. Careful attention to this detail is required in order to restore the water resistant layers that help *inter alia* wetlands retain water, as well as to restore other wetland functions.
	8) Erosion and wash-outs from disturbances on undulating terrain.	i. Minimal clearance of vegetation shall be permitted and plants shall be re-established as soon as possible. ii. Anti-erosion measures to be implemented as a priority on all areas which feature undulating terrain. iii. Formalised storm-water crossings shall be placed on all roads on undulating terrain. iv. Storm-water shall be directed to an area capable of dissipating the energy of the water.
	The Contractor shall develop and implement a rehabilitation management method statement.	
Top Tip(s)	• All vegetation cleared through site clearance activities should be chipped to provide mulch for soil stabilisation requirements. Such mulch shall be left to compost for six months. • Alien invasive plant parts which are in seed, shall not be composted. • Work mulch into the top layer of soil, where after hydro-seeding can take place.	

DESCRIPTION	Social Aspect	
Possible source of potential impact	• Noise • Dust • Soil on public roads at site access • Waste	
Risks/Impacts	Risks/Impacts:	Mitigation measures
	1) Animosity of community members affected by the project.	i. Stakeholders shall be actively engaged and be kept informed regarding construction related progress, requirements and meetings. ii. Ensure effective social and environmental monitoring. iii. The Contractor shall adhere to the following timeframes for dealing with landowner and stakeholder concerns, unless otherwise approved by the Employers Agent: • Record the concern within the Communications Register and verbally notify the Employers Agent and CLO immediately. • Respond to the concern – within 1 day of the concern being raised – this includes consulting with the stakeholder. • Rectify/mitigate the concern – within 3 days of the concern being raised. • Respond in writing to the stakeholder on "close out" of the concern – within 5 days of the concern being raised. • Submit to the Employers Agent a detailed report – within 7 days of the concern being raised.
	2) Cultural conflicts as a result of an influx of diverse population groups.	i. No accommodation at camp sites shall be allowed. ii. During work hours the Contractor shall be vigilant of potentially negative interactions between staff and the surrounding communities. iii. Trespassing on land adjacent to the project area is not allowed. iv. Access by people not involved in the project shall be controlled.
	3) Marginalisation of historically disadvantaged individuals (HDI's) due to inequitable employment. Economic impact of project	i. Procurement policies specified in the tender documents must be adhered to, including (but not limited to): • Employment of HDIs. • Use of local labour. • Use of local services.

DESCRIPTION	Social Aspect	
	closure.	
	4) Potential increase in environmental degradation as a result of the influx of employees and potential work seekers.	i. Basic Environmental Awareness Training to all employees with six monthly refresher courses. ii. Access to the site by people other than staff or those with project related business shall be limited.
	5) Neglect for worker health and safety, employment conditions. Poor skills development and training.	i. Safety training shall be provided to all staff and visitors. ii. Personal protective equipment (PPE) shall be provided to all staff and visitors. The Contractor shall ensure that the PPE is worn on site at all times. iii. The Contractor shall ensure a safe clean working environment, including (but not limited to): • Sufficient and clean toilet and ablution facilities. • Comfortable eating areas. • Safe transport. iv. Liaise with local emergency and health services on emergency response and preparedness procedures. v. Up-to-date contact list of all emergency services. vi. Co-ordinate emergency evacuation procedures with the local emergency services, and conduct regular emergency drills (as per the requirements of the health and safety plan). vii. Ensure compliance with the Occupational Health and Safety Act and Regulations.
	The Contractor shall develop and implement a social management method statement.	
Top Tip(s)	• The Contractor shall not enter into agreements with stakeholders or undertake work on private property in lieu of favours, payment or any other means where either party may benefit from the activities / permissions of the other party.	

DESCRIPTION	Soil Management			
Possible source of	• Stockpiles	• Dust	• Water contamination	• Excess spoil

DESCRIPTION	Soil Management	
potential impact		
Risks/Impacts	Risk/Impact	Mitigation measures
	1) Loss of soil through contamination, wind and water erosion and inadequate stockpile handling.	i. All stockpiles shall be stabilised, not be higher than two meters and blend in with the surrounding topography. ii. Stockpiles shall be kept weed free for the duration of the construction related activities.
	2) Loss of biological viability of stockpiled topsoil due to poor handling.	i. Topsoil shall only to be handled during removal and reinstatement. ii. Soil horizons (e.g. topsoil, subsoil, bedrock etc) to be kept separate during removal, stockpiling and reinstatement. iii. All soils shall be reinstated in the reverse order to that in which they have been removed.
	3) Disruption of natural areas and land use practices.	i. Topsoil removed from riparian, wetland and grassland areas shall be removed and kept in separate stockpiles for rehabilitation. ii. Soil horizons (e.g. topsoil, subsoil, bedrock and other layers such as clays etc.) to be kept separate during removal, stockpiling and reinstatement. iii. Topsoil removed from agricultural lands shall be collected and stockpiled. All stones and rocks greater than 150 mm diameter shall be removed from the reinstated topsoil in agricultural areas. iv. All stockpiles shall be located within designated areas outside the 1:20 year flood line of rivers and streams and not within 50 meters of delineated wetlands. v. Topsoil shall be windrowed along servitudes.
	4) Prevention of contamination.	i. Refuelling and other activities with the potential to cause pollution shall not be allowed on or adjacent to a stockpile.
	5) Excess material requiring spoiling.	i. Inventory of topsoil requirements with extra 10% topsoil kept in reserve. ii. Spoil shall be used as backfill to rehabilitate areas impacted upon by construction activities. iii. Excess spoil material shall be disposed of at locations as identified by the Employers Agent.

DESCRIPTION	Soil Management
	The Contractor shall develop and implement a soil management method statement.
Top Tip(s)	• Consider the use of excess spoil for the creation of earth berms. This will reduce costs associated with transport and disposal. The berms can be vegetated and will provide a noise and visual barrier. Trees planted may assist in off-setting the developments carbon footprint. • Do not provide landowners with excess spoil where this may be used for the construction of dams, shooting ranges etc. Excess spoil may however be given, with the Employer Agents approval, where this will be used for erosion control or rehabilitation of disused quarries / borrow pits, and in accordance with respective EMPr.

DESCRIPTION	Sustainable Management	
Possible source of potential impact	• Electricity generation • Generator exhaust emissions • Dust • Water contamination • Excess spoil	
Risks/Impacts	Risk/Impact	Mitigation measures
	1) Increased costs associated with providing; and availability of electricity to site offices	i. The Contractor shall use appropriate materials and design for construction of buildings that assist in reducing heating/cooling demands. ii. The Contractor's site offices shall take solar altitudes into account and appropriate awnings be fitted above the windows to prevent excessive amounts of sun entering the buildings. iii. The design of buildings shall take the insulating properties of the materials used in their construction into account. Energy efficient building materials shall be used. iv. Trees located in the site camp shall not be removed without the approval of the Employers Agent. v. The Contractor shall implement measures to conserve energy, which may include solar panels, "energy-saving" bulbs automatic timers on light switches, solar geysers and point of source geysers. vi. The Contractor shall implement energy saving measures to result in a 20% saving in electricity consumption.
	2) Increased costs associated with	i. The Contractor shall ensure all facilities are provided with low water flow systems and that the

DESCRIPTION	Sustainable Management	
	providing; and availability of water to site offices	toilets are fitted with a dual flush toilet and waterless urinal systems. ii. The Contractor shall install "grey-water" systems to allow for the re-use of water. iii. Rain water tanks shall be installed to collect all the runoff from the roofed buildings on site. This water shall be reused for *inter alia* irrigation purposes. iv. The Contractor shall ensure all water pipes remain leak free for the duration of construction related works.
	3) Increase in dust due to non-availability of potable water	i. The Contractor shall implement dust suppression measures using non potable water or other best environmental practicable option.
	The Contractor shall develop and implement a sustainability management method statement.	
Top Tip(s)	• Use water from excavation dewatering operations for dust suppression • Use chipped material from site clearance activities as ground cover (for dust suppression). Alien vegetation that is in seed should not be used for any purpose.	

DESCRIPTION	Traffic Management	
Possible source of potential impact	• Noise • Vehicle emissions • Maintenance • Refuelling	
Risks/Impacts	Risks/Impacts	Mitigation measures
	1) Degradation of existing road conditions due to the use by construction vehicles.	i. Roads shall be maintained in an acceptable condition for the safe travel of the public and project personnel. ii. Access shall only be for activities essential for the continued safe construction activities. Access for the general public shall not be permitted.
	2) Degradation of the surrounding environment.	i. No new roads constructed outside of the development footprint. ii. All vehicles shall remain on designated routes. iii. No soil compaction, erosion and sedimentation to land and water. iv. Minimise disturbances to water resources flora and fauna.

DESCRIPTION	Traffic Management	
		v. Manage hydrocarbon spills from vehicles
	3) Dust generation as a result of vehicle entrainment.	i. The Contractor shall ensure dust entrainment does not exceed prescribed dust regulations ii. Manage vehicle speeds on site.
	4) Increase in safety risks due to presence of additional vehicles and equipment on the local road network. 5) Inconvenience and delays caused during road and or lane closures and traffic flow diversions.	i. The travelling public shall have the right of way on public roads. ii. No heavy vehicles shall be allowed on public roads between the hours of 06H00 to 08H00 and 16H00 to 18H00. iii. Full closure of existing roads shall not be allowed. iv. Where access to properties needs to be closed, alternative access for the duration of the closure shall be provided. The Contractor shall notify affected parties 48 hours before closure. v. Flagmen shall be provided at partial road closures and other traffic disruptions to ensure the safety of the public vi. Any accidents or incidents shall be recorded and the Employers Agent notified immediately. Investigation into the causes must be done.
	The Contractor shall develop and implement a traffic management method statement.	
Top Tip(s)	• Undertake a photographic survey of all roads to be impacted upon by construction related activities prior to the commencement of construction. Where private roads are to be used, engage road owner on specific requirements / conditions. This will negate costly disputes over road repair or maintenance.	

DESCRIPTION	Training Programme			
Possible source of potential impact	• Litter due to poor training	• Dust due to poor training	• Noise due to poor training	• Water contamination due to poor training
Risks/Impacts	Risks/Impacts	Mitigation Measures		
	1) Risks to quality of	i. All employees shall receive general construction related work skills training required to enable		

DESCRIPTION	Training Programme	
	workmanship. Private property and the health and safety of workers and the surrounding communities due to lack of skills and training. 2) Risk of environmental degradation due to workers being uninformed about the potential impacts of the development.	them to work safely and effectively, including: • Basic Environmental Awareness Training. • Spill and emergency management. • Health and safety. • Emergency drills. • Fire-fighting. • Disaster management. • Heritage resource and grave identification. ii. Specific task-related skills training shall be SAQA accredited. iii. A system of evaluation of the effectiveness of training shall be developed by the Contractor.
	The Contractor shall develop and implement a training management method statement.	
Top Tip(s)	• Use familiar examples within training programmes. • Speak to the level of the audience.	

DESCRIPTION	Waste Management			
Possible source of potential impact	• Blasting • Clearing	• Excavations • Civil works	• Maintenance • Temporary facilities	• Canteen • First aid
Risks/Impacts	Risk/Impact	Mitigation measure		
	1) Reduced capacity at local landfill sites that needs to accept waste generated by the development.	i. Wherever possible, materials shall be reused or recycled to reduce amounts of waste that need to be disposed of at a landfill.		
	2) Spoil material volumes exceeding regulated threshold	i. In the event that the volume of spoil generated for disposal outside of a registered landfill site is greater than the thresholds stipulated within GNR 921, (National Environmental Management: Waste Act (Act 59 of 2008) List of Waste Management Activities that have, or are likely to have a		

	limits	detrimental effect on the environment, of 29 November 2013), as amended, the Employers Agent shall be notified that a Waste License will need to be applied for. ii. No spoiling shall occur until the waste license has been obtained.
	3) Soil and water resource contamination due to incorrect storage of waste and illegal dumping.	i. General waste shall be stored separately from hazardous waste. General waste shall be stored in weather and vermin proof bins or skips or similar containers only. ii. Hazardous waste shall be stored in a bunded weatherproof area. Water from the bund shall be collected and disposed of at an appropriate landfill. iii. General waste that is not reused or recycled can only be disposed of at a registered landfill. Hazardous waste shall be disposed of at a hazardous waste landfill. iv. Overburden/spoil shall be disposed of at a registered landfill or at spoil areas authorised by the Competent Authority and approved by the Employers Agent. v. Record shall be kept of all waste generated and what proportions are being reused or recycled. Records of waste disposed at landfills or spoil areas shall also be recorded. Disposal certificates / receipts shall be obtained from landfill sites to document waste delivered to the landfill. vi. No septic tanks (French drains) shall be used. All sewage shall be removed to the municipal waste water treatment works; and proof of each disposal shall be retained and submitted to the Employers Agent.
	4) Nuisances (litter, odours and aesthetics).due to poor housekeeping.	i. The development foot print shall be kept clean and waste removed to the waste storage facility daily. ii. Daily litter patrols shall be conducted at the site camp and within the construction footprint. iii. Vermin and weather proof bins shall be provided.
	The Contractor shall develop and implement a waste management method statement.	
Top Tip(s)	• Cut up a long spill sock into 20 – 30 cm lengths and place these into each drip tray. This will absorb spilt hydro carbons and prevent over-topping in the event of inclement weather. Many spill socks are designed to absorb anything between 7 – 25 times their weight. Furthermore, many can be wrung out and re-used. The use thereof does however not absolve the Contractor in preventing spills and subsequent environmental contamination. • Assign a dedicated (and approved) area where empty cement bags can be soaked and allowed to dry. This alters the chemical nature of the cement with the resultant inert cement bags being suitable for disposal at registered (general	

	waste) landfill site(s).

DESCRIPTION	Water Management	
Possible source of potential impact	• Site office • Civil works • Stockpiles • Excavations and dewatering • Hydro carbon spills • Access and haul roads • Waste water • Water use	
Risks/Impacts	Risks/Impacts	Mitigation measures
	1) Destabilisation of watercourse channel and loss of habitat due to alteration of the bed or banks of the watercourse. These actions could result in changes to watercourse functioning.	i. Watercourse crossings shall be formalised in order to protect the beds and banks of watercourses. ii. Evaluation of watercourse soils shall be done before construction related activities commence to verify wetness zones and soil profiles in order to reinstate original conditions during rehabilitation. iii. Stabilisation mechanisms and anti-erosion measures required as and where required. iv. Protection of fauna and flora. v. Rehabilitation as per prescribed measures. vi. During construction, all topsoil and subsoil stockpiles shall be stored outside of wetland and riparian zones. A minimum distance of 100 m shall separate the stockpiles with the start of the wetland and riparian zone. vii. Construction related activities may require regulatory approvals to be obtained prior to the commencement of works within water courses.
	2) Pollution or loss of water due to construction related activities interfacing with ground water (ingress of ground water into trenches, thereby requiring dewatering) and unmanaged runoff of	i. Water impacted upon by construction related activities shall not be released directly into the environment. ii. Water shall only be released into the surrounding environment with the approval of the Employers Agent and once it meets the regulated prescribed minimum requirements. iii. A storm water management plan shall be developed to prevent erosion and the contamination of water; and deal with storm water release into the environment. iv. Storm water shall be directed towards stabilised areas which can dissipate the energy of the water flow. No ponding shall be permitted.

DESCRIPTION	Water Management	
	surface water through unstabilised areas.	v. Prevention of water contaminated through storm water attenuation works discharging into any storm water drain or watercourse. vi. No handling of hazardous substances within close proximity to water resources and storm water drains.
	3) Decreased watercourse / wetland water quality and increased water quantity used.	i. Water quality upstream and downstream of where construction related activities are to occur, shall be monitored in terms of the variables and frequencies prescribed in the regulated minimum requirements, before, during and after construction related works. ii. Waste water shall be reused wherever possible. Water to be reused shall be tested for water quality (in terms of the variables and limits in regulated prescribed minimum requirements) and treated where necessary before reuse. iii. All construction related activities shall be excluded from watercourses, wetlands, riparian ecosystems and all sensitive areas, unless authorised so and approved by the Employers Agent. iv. During all works, no activity such as ablution, disturbance of natural habitat, storing of equipment or waste disposal may be permitted within any wetland, riparian zone. v. Implementation of anti-erosion and storm water works in areas susceptible to erosion.
	4) Non-conformance with regulatory requirements	i. Water use license may be required for watercourse crossings by service roads. Water use licenses shall be required for the discharge of the effluent if it is discharged to a water resource.
	The Contractor shall develop and implement a water management method statement.	
Top Tip(s)	• Straw bales (and not hay bales) may be used for bank stabilisation and sediment settlement. • Geotextile material should be placed parallel to the watercourse bank. The first row should be placed adjacent to the bank, with subsequent rows overlapping. Vertical placement results in erosion runnels.	

Decommissioning

DESCRIPTION	Decommissioning

DESCRIPTION	Decommissioning	
Possible source of potential impact	• Dust • Noise • Asbestos • Rubble stockpiles • Excavations and dewatering • Hydro carbon spills • Access and haul roads • Rupturing underground tanks • Waste water • Water use	
Performance indicators / Targets.	Performance Indicator	Target
	1) Environment	a) The Contractor shall prevent adverse environmental and community impacts from construction. b) The Contractor shall prevent loss of soil and creation of dust. c) The Contractor shall minimise any degradation of the quality of water leaving the site. d) The Contractor shall minimise the generation of excessive construction waste, including litter. e) Minimise contamination of the environment from dust.
	2) Contamination	a) The Contractor shall minimise the risks to the environment and human health as a result of decommissioning activities. b) The Contractor shall ensure construction workers engaged in earthworks or demolition activities or off-site disposal of waste are aware of potential contamination issues through site inductions, environmental training and at daily toolbox meetings, and undertake these activities in accordance with applicable regulatory requirements. c) The Contractor shall ensure that all earthworks, construction and demolition activities which could intercept or expose contaminants of potential concern are managed to prevent storm water or dust discharge.
	3) Noise	a) The Contractor shall use of lowest practicable noise emitting equipment and plant; noise levels will be considered in the selection of all plant and equipment, including the use of bored piles rather than driven piles where appropriate. b) The Contractor shall inspection all equipment to ensure that any noise mitigation (e.g. mufflers) is suitable.
	4) Traffic	a) The Contractor shall prevent vehicle accidents and protect life and property. b) The Contractor shall avoid or minimise environmental damage and visual and noise disturbance due to vehicular traffic.
	5) Construction Timing and Impacts	f) The Contractor shall provide appropriate mechanisms for the collection, treatment, recycling, reuse and disposal of construction waste and litter.

DESCRIPTION	Decommissioning	
		g) The Contractor shall prevent environmental degradation caused by the inappropriate disposal of construction waste and litter. h) The Contractor shall provide for the environmentally responsible disposal of all construction wastes and litter. i) The Contractor shall conserve resources and maximise the recovery of reusable materials. j) The Contractor shall formulate and implement a waste minimisation strategy.
	1) Budget	a) The Contractor shall make provision for adequate budget for site environmental management requirements.
	2) ECO	a) The City of Cape Town shall appoint a competent and knowledgeable ECO; and where required, an Environmental Auditor.
	3) Contractors Environmental Officer	a) The Contractor shall appoint a competent and knowledgeable Contractors Environmental Officer

Annexure 8 – Site Plan

Annexure 9 - Method statement

Purpose

The purpose of the method statement is to:

- *Outline the safe manner in which the task / activity is to be undertaken*
- *Provide induction material for all undertaking the task / activity to understand*
- *Meet legal requirements – hazard identification and control*
- *Provide a programme against work, material, time, staff and anticipated problems are to be managed*
- *Act as a tool in quality assurance*

Scope

A method statement describes the scope of the intended task / activity in an easy to understand step – by – step manner. This is particularly important to reduce potential confusion and ambiguity of the contents by those personnel required to implement it.

The method statement should clearly indicate:

- *What – a brief concise description of the task / activity to be undertaken;*
- *Who – a brief concise description of the personnel involved with undertaking the task / activity;*
- *When - a brief concise description of the sequence of actions with due commencement and completion dates of the task / activity to be undertaken;*
- *Where - a brief concise description and map / drawing of the locality of the task / activity to be undertaken;*
- *Why - a brief concise description of the importance and requirement of the task / activity to be undertaken; and*
- *How - a brief concise description of the methods to be implemented, materials and equipment to be used for the task / activity.*

Language use

The method statements shall be written in plain English so that they are understood by all. Therefore a well thought through and well written method statement providing clear and concise specific work plans, can save much time and money and potentially prevent the occurrence of incidents and accidents.

The implementation of the method statements shall be audited by the ECO. Consequently the method statements shall contain sufficient information and detail to satisfy the Employers Agent and ECO that the works will be implemented correctly and that potential incidents / accidents shall mitigated and managed.

Please remember to:

- *Consider the reader;*
- *Communicate a clear message;*
- *Use clear and concise language; and*
- *Consider how the information is portrayed.*

Site Specific Requirements

The method statement shall be site and development specific. Method statements copying information contained within the EMPr, specifications or other documents shall not be considered as they do not indicate to the person responsible for approving the document, that the Contractor has a clear understanding of what is required.

Minimum Requirements

The method statement should as a minimum address the following:

- ***Description***
  - *Provide a brief and concise description of the work to be undertaken;*
  - *Personnel Qualifications and Experience;*
  - *List all the details of qualifications and experience required for the completion of the task; and*
  - *Experience may cover previous work done in the area that may not require certificates or licences.*
- ***Personnel, Duties and Responsibilities***
  - *Give details of the duties and specific responsibilities of supervisors and other personnel. For example, describe such things as daily toolbox talks and guidance provided by the Environmental Officer;*
  - *Training required to complete work; and*
  - *Make sure that all workers and their Supervisors are trained in the procedures needed to complete the job safely and in an environmentally responsible way, especially when undertaking tasks for the first time or where new or changed work methods are utilised.*
- ***Programme***
  - *Provide a clear and concise programme indicating all phases and time frames associated with the task.*
- ***Construction sequence and method***
  - *Indicate all steps associated with task at hand. This shall be done in a manner which is easily understandable and leaves no uncertainties to staff that are required to implement the task in the field.*
- ***Possible Hazards***
  - *Include all possible hazards such as:*
  - *Hazardous substances, explosives, dust, etc ;*
  - *Hazards to others in area ; and*
  - *Rubbish, electrical, fills.*
- ***Resources/Plant/Equipment***
  - *List resources, plant and equipment that you will use on the job, e.g. ladders, scaffold etc.*
- ***Environmental***
  - *Indicate environmental management responsibilities ;*
  - *Provide aspects and impacts associated with the activity;*
  - *Provide environmental guidelines; and*

- *Specify employee training and involvement.*

Indicate the following:

- *Material consumption;*
- *Energy consumption;*
- *Water consumption;*
- *Waste management and reduction;*
- *Buildings, machinery, soil;*
- *Residual materials and waste;*
- *Atmospheric emissions, noise and odour pollution;*
- *Wastewater;*
- *Accidents and accident prevention; and*
- *Transport*

- ***Health and Safety***
  - *List all safety controls such as MSDS;*
  - *Warning Signs;*
  - *Personal protective equipment;*
  - *Storage of materials and equipment;*
  - *Fellow workers/public safety provisions; and*
  - *Housekeeping*

- ***Monitoring Systems***

The Contractor shall develop a strategy and programme to monitor and verify its proposed mitigation measures are functioning.

This shall set out:

- *performance outcomes in respect of the potential negative environmental and social effects:*
- *mitigation measures to assist in achieving performance outcomes;*
- *a programme for monitoring negative environmental and social effects to ensure that mitigation measures are meeting performance outcomes; and*
- *a contingency plan to be implemented should monitoring reveal that mitigation measures have failed.*

All work undertaken by the Contactor shall align to best practicable environmental options; complies with relevant regulatory requirements and satisfies the provisions prescribed within the EMPr.

Methodology

The outcome of all monitoring is to provide information to inform whether the prescribed outcomes are being met. Consequently the inclusion of monitoring within the method statements is to:

- *inform the detection of potential unwanted environmental and social situations from developing, in order to provide timeous implementing of appropriate control measures;*
- *define the roles of all parties associated with the monitoring process and provide them with clear responsibilities; thus allowing for improved and clear lines of communication;*
- *identify monitoring parameters and define the mechanisms for monitoring;*

- *provide mechanisms for the evaluation of monitoring efficiency and efficacy in relation to the management and mitigation measures prescribed in the EMPr;*
- *provide for measures to improve management actions associated with the mitigation of potential impacts;*
- *prescribe monitoring frequency; and*
- *allow for iterative learning.*

Environmental Monitoring

Environmental monitoring techniques shall include:

- *Emission monitoring:*
  Emission monitoring shall entail the gathering of samples of all construction generated emissions for the purposes of characterising and quantifying contaminants; providing mechanisms to control emission release at point of discharge; and demonstrating compliance with prevailing regulatory requirements, accepted norms and standards.

  This could include dust fall out monitoring in terms of the National Dust Control Regulations and emissions in terms of the City of Cape Town Air Quality Management By-law, as amended.

- *Environmental surveillance:*
  The collection and analysis of dust, noise, soil and water samples within the development footprint to determine compliance with prevailing regulatory requirements; and accepted norms and standards.

- *Meteorological monitoring:*
  The collection of meteorological data to inform how prevailing conditions impact upon environmental surveillance activities.

- *Photographic Record*
  The Contractor shall compile a photographic record of all activities on site prior to construction related activities commencing, during the construction process and on completion of construction related works.

Social Monitoring

Social Monitoring shall:

- *determine relevant stakeholder groups;*
- *monitor mechanisms to pro-actively manage influx of work-seekers, including health aspects;*
- *determine efficacy of addressing and provide mitigation for social issues experienced due to construction related activities;*
- *monitor delivery of services to a level associated with pre-construction conditions; and*
- *determine efficacy of economic inclusion of local community.*

- ***Emergency/disaster incident and reaction procedures***

- *Procedures must be included indicating how incidents/accidents will be dealt with and what steps are in place to prevent such an incident/accident from occurring.*

- ***General***
  - *Explanation of important technical/environmental terms*

The Contractor shall be accountable for all actions taken in non-conformance of the accepted Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor shall be required to submit, the method statements listed in the table below as identified in the contract, for approval by the Employers Agent prior to the start of construction related activities.

Table 8: Method Statements could include the following Aspects.

Method Statement	Key information required	Target
Site Establishment and Layout	– Site establishment methodology – Site layout drawing – Gates and fencing – Aesthetics and housekeeping – Laydown areas – Workshops – Wash bays	No damage to existing gates and fences. All gates equipped with locks to prevent unauthorised access. No complaints about open gates. No complaints from landowners No damage to private property No unplanned disturbance due to construction related activities.
Cement Mixing / Concrete Batching / Bentonite Mixing / Soilcrete mixing	– Mixing and batching methodology – Plant drawings – Monitoring of stockpiles, materials, water etc.	All cementitious mixing to occur within demarcated localities. No indiscriminate spoiling of cementitious products in non-designated areas. No impacts upon receiving water resources.
Water Management	– Grey water management – Sewerage water management – Industrial waste water management – Stormwater/runoff management – Water monitoring	All waste water to be monitored and comply with regulatory requirements. Stormwater to be managed to ensure no environmental degradation occurs.
Dust Management	– Dust generating activities – Weather influences – Dust management strategies – Dust monitoring	No complaints from stakeholders. Dust emissions to be monitored and comply with regulatory requirements.
Environmental Monitoring	– Monitoring of dust, noise, water etc.	Compliance with regulatory requirements: • Dust: NEM AQA Air Quality Regulations;

Method Statement	Key information required	Target
		• Noise: Western Cape Noise Control Regulations; and • Water: NWA Water Quality Guidelines. Ensure no incidents or accidents occur which negatively impact upon the surrounding environment.
Erosion control	– Erosion controls to be implemented across the site – Corrective actions for occurrence of erosion	Slopes > 1:1 must have additional anti-erosion mechanisms. No evidence of erosion. No evidence of disturbance outside of project area.
Fire	– Fire breaks – Fire extinguishers – Hot works – Policy on open fires	Zero (0) fires.
Fuel storage and Refuelling	– Bulk fuel storage – Bulk fuel storage schematics – Bowsers (refuelling and storage) – Jerry Can (refuelling and storage)	All refuelling to occur within designated areas. All hydrocarbons to be contained within approved bunded facilities. Identified staff to undergo suitable spill clean-up training.
Heritage	– Archaeological finds – Heritage resources	No damage to heritage structures, unless proof of consultation with a heritage specialist and approval from the H:WC is in place. Records of chance finds must be kept. Where chance finds are unearthed, proof of work being stopped immediately and proof of consultation with a heritage specialist and the H:WC must be kept on site.
Noise	– Limits to be adhered to – Monitoring information	Noise levels shall be monitored to ensure they comply with regulatory requirements. Noise generating activities shall not exceed the criteria prescribed in the Western Cape Noise Control Regulations. No complaints relating to noise from the stakeholders.

Method Statement	Key information required	Target
Rehabilitation	– Areas identified for rehabilitation	Reinstatement of areas affected through construction related activities. The final placement of layers of soil on disturbed areas must match the pre-construction profile or as prescribed on construction drawings.
Solid and Liquid Waste Management	– Implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency. – The method statement shall reflect the principles of integrated waste management as contained within the NEM: WA. – Hazardous and general waste management measures – Recyclable waste management	Ensure all waste products are disposed of at a registered waste landfill site designed to cater for said waste product. Proof of waste generated, reused, recycled and disposed of, including disposal certificates, must be kept on site. Contain all waste within approved designated areas and stored in marked containers. Containers of hazardous waste and waste oils shall be stored in a bunded, covered area. No evidence of contamination by waste. Bins provided at regular intervals. No evidence of litter.
Earthworks	– Manage the removal and stockpiling of subsoil during the contract for use during rehabilitation.	Soil horizons (stockpile separately). Stockpiles shall not be higher than 2 m. Stockpiles shall be kept free of alien invasive species. No stockpiles shall be located outside of areas indicated in the construction diagrams.
Traffic	– Minimise the impacts and extent of construction related traffic on the surrounding road network and environment, whilst maximising road user safety.	No accidents or incidents. No complaints from the public. Proof of notification of landowner for closure of access roads. Alternative access roads always provided at partial road closures and other traffic disruptions. Compliance with regulatory requirements.

Method Statement	Key information required	Target
Training	– Foster construction related skills transfer, environmental awareness, health and safety awareness, and materials and equipment skills.	Proof of training provided, including training materials that meet the requirements of the Employers Agent. Proof of attendance of staff at training. Records of training evaluation results. Results must reflect that training has been effective.
Wash Areas	– To ensure plant and equipment used on site are kept clean whilst containing and preventing the release of potential contaminants into the receiving environment.	No contamination of the receiving environment through the washing and cleaning of equipment and plant. Compliance with regulatory requirements.
Hazardous Materials Management	– Storage of Hazmat – Transportation of Hazmat – Use of Hazmat – MSDS	No contamination of the environment through use of hazardous materials.
Flora and Fauna	– Procedure when encountering protected flora – Procedure for removal of all flora during clearing activities – Fauna protection measures	No damage to protected species. Safe translocation of encountered flora / fauna
Site Closure	– Temporary (during holidays) and permanent closure procedures – Removal of site infrastructure – Removal of plant and equipment	Temporary site closure without incidents. Permanent site closure where all infrastructure, plant and equipment is removed without incident.

Annexure 10 - Sensitivity Mapping

Note to Compiler: Please insert Sensitivity Mapping associated with development footprint

Annexure 11 – Environmental Monitoring of Water

In terms of Government Notice R 665 (Government Gazette 36820 of 2013, as amended), the wastewater limit value (General) indicated below refers to "the mass expressed in terms of the concentration and/or level of a substance, which may not be exceeded at any time. Wastewater limit values shall apply at the last point where the discharge of wastewater enters into a water resource, dilution being disregarded when determining compliance with the wastewater limit values. Where discharge of wastewater does not directly enter a water resource, the wastewater limit values shall apply at the last point where the wastewater leaves the premises of collection and treatment".

Table 9: Wastewater limit values applicable to discharge of wastewater into a water resource

Parameters and Variable	DWS "General Limits"
COD (mg/l)	75
Dissolved Arsenic (mg/l)	0.02
Nitrate and nitrite (mg/l)	15
Ammonia as N	6
Orthophosphates (mg/l)	10
Suspended Solids (TSS) (mg/l)	25
Soaps, oil and grease (mg/l)	2.5
Free & Saline ammonia (mg/l)	6
Faecal Coliform bacteria (CFU per 100ml)	1000
Boron (mg/l)	1
Total Cadmium (mg/l)	0,005 or at detection limit of laboratory
Dissolved Copper (mg/l)	0,01 or at detection limit of laboratory
Hexavalent chromium (mg/l)	0,05
Dissolved Lead (mg/l)	0,01 or at detection limit of laboratory
Dissolved Manganese (mg/l)	0,1
Total Residual Cl2 (mg/l)	0.25
Total Selenium (mg/l)	0,02
Dissolved Zinc (mg/l)	0,1
Fluoride (mg/l)	1
Dissolved Iron (mg/l)	0.3
Mercury (mg/l)	0.005

Colour, odour and taste	No change
Conductivity (mS/m)	50 to 150
pH	5,5 – 9,5
Turbidity (NTU)	10
Dissolved oxygen (% saturation)	Min 75%
Temperature	25° C max
Total hardness as CaCO3	650

Annexure 12 – Environmental Monitoring of Dust

PM10 monitoring shall be in accordance with GNR 1210, National Ambient Air Quality Standards, of 24 December 2009, as amended.

Table 10: PM10 Monitoring Levels

Substance	Notation	Averaging Period	Concentration ($\mu m/m^3$)	Frequency of Exceedance per annum	Compliance Date
Particulate Matter	PM10	24 hours	75	4	1 Jan 2015
		1 year	40	0	1 Jan 2015

Indicative dust fallout (i.e. suspended dust concentrations that will result in fallout) shall be monitored in terms of the GNR 827, National Dust Control Regulations of 1 November 2013, as amended.

Actual dust fallout shall be verified through sampling at sites where such dust is generated and shall not exceed the below limits.

Table 11: Indicative Dust Fallout Levels

Restriction Areas	Dustfall rate (D) (mg/m2/day, 30-days average)	Permitted frequency of exceeding dust fall rate
Residential area	D < 600	Two within a year, not sequential months.
Non-residential area	600 < D < 1200	Two within a year, not sequential months.

Annexure 13 – Environmental Monitoring of Noise

The Noise Control Regulations P.N. 200/2013 Dated 20 June 2013 made under Section 25 of the Environmental Conservation Act (Act 73 of 1989) prescribes:

Table 12: Definitions of Disturbing Noise and a Noise Nuisance

DEFINITIONS OF DISTURBING NOISE AND A NOISE NUISANCE	
Disturbing Noise	Noise Nuisance
"disturbing noise" means a noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dBA or more;	Means any sound, which disturbs or impairs or may disturb or impair the convenience or peace of any person.
Ambient sound level means the reading on an integrating impulse sound level meter taken in the absence of any alleged disturbing noise.	PN200/2013: "ambient noise"- means the all-encompassing sound in a given situation, measured as a reading on an integrated impulse sound level meter for a total period of at least 10 minutes.
Noise level means the reading taken at a measuring point in the presence of any alleged disturbing noise at the end of a total period of at least ten minutes after such meter was put into operation, and, if the alleged disturbing noise has a discernable pitch, for example, a whistle, buzz, drone or music, to which 5 dBA is added.	PN200/2013: "residual noise"- means the all-encompassing sound in a given situation at a given time, measured as a reading on an integrated impulse sound level meter for a total period of at least 10 minutes, excluding noise alleged to be causing a noise nuisance or disturbing noise.

Annexure 14 - General Conditions of Contract

Listed below are issues pertaining to the environment that form part of the Contract Document. The clause references relate to the SAICE General Conditions of Contract 2015 (GCC). They are listed here to emphasise that they form part of the environmental considerations and requirements for this project.

Any additional conditions are presented in the Additional Conditions of Tender in Tender Data section of the Contract.

Engineer's authority to delegate

In terms of Subclause 3.3.4 the Employers Agent has the authority to appoint a representative to act as the Environmental Planner for the Contract. The Planner shall be responsible for monitoring compliance with the EMPr, and may be the Employers Agent's Representative or any other person responsible to the Employers Agent.

Compliance with the Employers Agent's Instructions

Subclause 4(2) requires that the Contractor comply with the Employers Agent's instructions on any matter relating to the Works. Moreover, Subclause 4.2.2 ensures that the Contractor only takes instructions from the Employers Agent, the Employers Agent's Representative or other person authorised by the Employers Agent in terms of Subclause 3.3.4.

Access to the Works

Subclause 7.3 makes provision for the Employers Agent to authorise access to the Works by the Environmental Planner.

Copy of Documents on Site

Clause 13 requires the Contractor to keep a copy of all documents constituting the Contract (including the performance specifications) available on Site.

Method Statements and Programme

Subclause's 12(2) and 12(3) make provision for the Employers Agent to request documents concerning the Contractors arrangements and methods of carrying out the Works. In the case of the performance specifications, these would be submitted as Method Statements.

Subclause 5.6 also makes provision for the Employers Agent to request the programme for carrying out the Works.

Compliance with other legislation

Subclause 4.3.1 requires that the Contractor comply with all applicable laws in the performance of the Contract.

Health and Safety

Subclauses 4.3.2 of GCC remind the Contractor of his obligations in terms of the Occupational Health and Safety Act, No. 85 of 1993.

Subclause 5.7 of SANS 1200A reinforces these requirements through the observation of proper and adequate safety arrangements.

Monitoring

Subclause 2(1) – 2(3) makes provision for the Employers Agent to undertake such duties and functions as are required in terms of the Contract, including the monitoring of any environmental variables.

Public Nuisance, and Pollution

Subclauses 8.1.2 of GCC requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary noise or pollution, or to interfere unnecessarily or improperly with public services, or the access to, use and occupation of public or private roads and footpaths or properties.

Subclause 5.6 of SANS 1200A further requires the Contractor to minimise dust nuisance and pollution of streams and inconvenience to or interference with the public.

Dust

Subclause 17(1) requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary air pollution.

Subclause 5.6 of SANS 1200A requires that the Contractor take all reasonable measures to minimise any dust nuisance.

Noise

Subclause 8.1.2 of GCC requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary noise pollution.

Subclause 4.1 of SANS 1200A requires that when working in built-up areas, the Contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant that would otherwise cause a noise level exceeding 85dB.

Protection of Archaeological/ Palaeontological remains

Clause 15(1) requires the Contractor to take reasonable precautions to prevent any person from removing or damaging any archaeological or palaeontological artefact, or other articles of value and requires that he inform the Employers Agent and follow any instructions issued in this regard.

Hours of Operation

Subclause 38.1.1 – 38.1.4 restricts the Contractors hours of operation to between sunrise and sunset from Monday to Saturday unless otherwise approved by the Employers Agent.

Subclause 40(2) further requires that in the event that permission is granted for night working then such work will be carried out without unreasonable noise and disturbance.

Housing, Food and Transport

Subclause 20(1) requires the Contractor to provide adequate payment, housing, feeding and transport for his employees on Site.

Subclause 4.2 of SANS 1200A further requires that facilities provided comply with local authority regulations and are maintained in a clean and sanitary condition.

Protection of Existing Environment

Subclause 17(2) requires that the Contractor uses every reasonable means to prevent damage to roads and bridges communicating with or in the vicinity of the Site.

Removal from Site

Clause 4.11.2 makes provision for the Employers Agent to instruct the removal of any persons who in his opinion is guilty of misconduct; or is incompetent, negligent, or constitutes an undesirable presence on site.

Subclause 23(2) requires that all Plant be in good working order. Accordingly, the Employers Agent may order that any Plant not complying with the performance specifications be removed from Site.

Competence

Subclause 4.11 requires that all persons employed on site are careful, competent, and efficient. These attributes embrace knowledge of the environmental matters and issues dealt with in the EMPr.

Reinstatement

Clauses 33 makes provision for the Contractor to make good any damage, due to negligence on the part of himself or his employees, to the satisfaction of the Employers Agent, and bear any costs associated with such reinstatement.

Suspension of Works

Subclause 5.11 enables the Employers Agent to suspend the progress of the Works or any part thereof as a result of some default or breach of the Contract on the part of the Contractor.

Site Clean Up

Subclause 5.15.1 requires that as part of the completion of the Works or any portion thereof, the Contractor shall clear away and remove from the Site all Construction Plant, surplus materials, rubbish and Temporary Works of every kind and leave the whole Site and Permanent Works clean and tidy. If the Contractor fails to comply, the Employer may have the site cleared and recover the cost from the Contractor.

Annexure 15 - Bill of Quantities

Tenderers shall price this strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this and the Specifications, the Specifications shall take precedence. Tenderers shall price to provide the complete Works

Where reference is not made to a standardized or a particular SANS 1200 clause, the descriptions included in the bill of quantities shall be read in conjunction with the relevant drawings and specifications and the item shall be priced accordingly. The tendered rate shall also, for each item, include the supply of materials, installation and construction, testing and commissioning, all as required to render the works complete and fully functional in every aspect upon final handover.

All works shall be performed to the specified standards or consistent with recognized, good industry norms and practices, to provide the works in a complete, fully functional, operable and compliant manner.

PSEM1 Environmental Monitoring

A Provisional Sum shall provide for the cost of monitoring and sampling air quality, noise and water quality by an independent professional service provider(s) to be selected and appointed by the Contractor. The Contractor shall submit detailed Terms of Reference for these professional service providers within six weeks of appointment, for approval by the Employers Agent. The Terms of Reference shall specify at least the following:

- *qualifications;*
- *professional registration;*
- *experience and track record;*
- *demonstrated proficiency in use of relevant monitoring and sampling equipment;*
- *equipment requirements and tolerances for detection limits;*
- *reporting and analysis; and*
- *confirmation of laboratory accreditation, capacity, delivery and performance within reasonable timeframes.*

The rate tendered shall include full compensation for all the Contractor's costs in complying with the requirements of PSEM8, PESEM16 and PSEM24 including the measurement, monitoring, management and provision of sampling equipment and quality control.

PSEM2 Environmental Officer

The tendered rate shall include full compensation for the supply of an Environmental Officer for the duration of the contract. The Environmental Officer shall be appointed within two weeks of acceptance of Appointment Letter and shall remain employed until after the rehabilitation has been completed. The rate shall cover the services of a full time suitably experienced and qualified person.

PSEM3 Community Liaison Officer

The tendered rate shall include full compensation for the supply of a Community Liaison Officer for the duration of the contract. The Community Liaison Officer shall be appointed within two weeks of acceptance of Appointment Letter and shall remain employed until

after the rehabilitation has been completed. The rate shall cover the services of a full time suitably experienced and qualified person.

PSEM4 Planning

Not applicable to Construction related activities

PSEM5 Design

Not applicable to Construction related activities

PSEM6 Pre-construction

The rate tendered shall include full compensation for all the Contractor's costs in complying with all requirements including the measurement, monitoring, management and provision of sampling equipment and quality control.

PSEM7 Aesthetics Management

The Contractor to price for the aesthetics management activities as a time related P&G item.

PSEM8 Dust Management

The Contractor to price for the dust management activities as a time related P&G item.

PSEM9 Earthworks Management

Please refer to the Technical Specification and Scope of Work

PSEM10 Erosion Management

The Contractor to price for the erosion management activities as a time related P&G item.

PSEM11 Fauna and Flora Management

The Contractor to price for the fauna and flora management activities as a time related P&G item

PSEM12 Fire Management

The Contractor to price for Fire Management activities as a time related P&G item.

PSEM13 Hazardous Substance Management

The Contractor to price for the hazardous substance management activities as a time related P&G item.

PSEM14 Heritage Management

The Contractor to price for the heritage management activities as a time related P&G item.

PSEM15 Landowner Liaison

The Contractor to price for the land use management activities as a time related P&G item.

PSEM16 Noise Management

The Contractor to price for his Noise Management activities as a time related P&G item.

PSEM17 Rehabilitation Plan

The Contractor to price for rehabilitation activities on a per m^2 basis.

PSEM18 Social Aspect

The Contractor to price for the social management activities as a time related P&G item.

PSEM19 Soil Management

The Contractor to price for the soil management activities as a time related P&G item.

PSEM20 Sustainability Management

The Contractor to price for the sustainability management activities as a time related P&G item.

PSEM21 Traffic Management

The Contractor to price for the traffic management activities as a time related P&G item.

PSEM22 Training Programmes

The Contractor to price for the training programmes as a time related P&G item.

PSEM23 Waste Management

The Contractor to price for the waste management activities as a time related P&G item.

PSEM24 Water Management

The Contractor to price for water management activities as a time related P&G item.

PSEM25 Decommissioning

The Contractor to price for decommissioning activities as a time related P&G item.

Annexure 16 – EMPr Alignment with NEMA Sec 24N

In order to ensure legal compliance, this EMPr is to comply with the requirements of the NEMA Section 24 N, together with Appendix 4 of GNR 982 the EIA Regulations, 2014, as amended.

GNR 982 Appendix 4: Content of Environmental Management Programme, as amended.	Cross linking with the EMPr
1. (1) An EMPr must comply with section 24N of the Act and include-	
(a) details of	
(i) the EAP who prepared the EMPr; and	Annexure 1 - Details of Author(s) and related expertise
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Annexure 1 - Details of Author(s) and related expertise
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 7. Performance Specifications: Environmental Management Annexure 17: Typical Aspects and Impacts Table
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Annexure 8 – Site Plan
(d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 2.2 Outcomes of the EMPr
(i) planning and design;	Section 7. Performance Specifications: Environmental Management Annexure 7.1 Planning Annexure 7.2 Design
(ii) pre-construction activities;	Section 7. Performance Specifications: Environmental Management Annexure 7.3 Pre-construction

(iii) construction activities;	Section 7. Performance Specifications: Environmental Management Annexure 7.4 Construction
(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 7. Performance Specifications: Environmental Management
(v) where relevant, operation activities;	n/a
(e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7. Performance Specifications: Environmental Management
(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and	Section 7. Performance Specifications: Environmental Management Annexure 7 - Environmental Best Practicable Options
(e) will be achieved, and must, where applicable, include actions to:	
avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 7. Performance Specifications: Environmental Management Annexure 7 - Environmental Best Practicable Options
comply with any prescribed environmental management standards or practices;	Section 7. Performance Specifications: Environmental Management Annexure 7 - Environmental Best Practicable Options
comply with any applicable provisions of the Act regarding closure, where applicable; and	Section 7. Performance Specifications: Environmental Management Annexure 7 - Environmental Best Practicable Options
comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Section 7. Performance Specifications: Environmental Management Annexure 7 - Environmental Best Practicable Options
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5 Monitoring
(h) the frequency of monitoring the implementation of the impact management	Section 5.5 Time Programme

actions contemplated in paragraph (f);	
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 7 Performance Specifications: Environmental Management
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7 Performance Specifications: Environmental Management
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 5 Monitoring
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 6 Assurance
(m) an environmental awareness plan describing the manner in which-	Section 4.11 Training
the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Annexure 17: Typical Aspects and Impacts Table
risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Annexure 7 - Environmental Best Practicable Options
(n) any specific information that may be required by the Competent Authority.	➡ Note to compiler: Please include additional information as may be required.

Annexure 17 - Typical Aspects and Impacts Table

The below risk assessment identifies typical risks and uses qualitative measures to estimate the consequences or impact of the event, together with the estimate of its likelihood.
Each potential risk is to be investigated to determine the consequence and likelihood of the hazard occurring. A simple assessment of L (Low), M (Medium) and H (High) is used for the assessment consequence. The occurrence potential of each hazard is also assessed using the simple assessment of L (Low), M (Medium) and H (High).

Table 13: Predicted Level of Risk

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
A (almost likely)	L	M	H	H	H
B (likely)	L	M	H	H	H
C (moderate)	L	M	H	H	H
D (unlikely)	L	L	L	M	H
E (rare)	L	L	L	M	M

Planning

Table 14: Typical Aspects and Impacts associated with the Planning Phase

System Element	Aspect	Impacts	Risk
Conceptual Design	Development scope	Significant possible changes required due to limited information.	High

Design

Table 15: Typical Aspects and Impacts associated with the Design Phase

System Element	Aspect	Impacts	Risk
Design	Development scope	All impacts and risks not adequately identified and assessed due to evolving design	High
	Environmental considerations	Not holistically included within the Engineering Design	High

Pre-Construction

Table 16: Typical Aspects and Impacts associated with the Pre-construction Phase

System Element	Aspect	Impacts	Risk
Tender	Environmental Specifications	Not aligned with EMPr and EIA outcomes.	High
	Bill of Quantities	Environmental considerations not adequately costed for.	High
	Tender valuation and moderation	Inaccurate Contractor submission scoring	High
Approvals	Permits / licenses / authorisations	Not all approvals are timeously obtained	High

Construction

Table 17: Typical Aspects and Impacts associated with the Construction Phase

System Element	Aspect	Impacts	Risk
Aesthetics	Nuisance factor through construction related activities	Dust generation Noise generation Visual impact	High
Dust	Unprotected surfaces	Dust generation	Low
Earthworks	Contaminated spoil	Ecological off-site impacts of contamination	Low
Erosion	Construction related works that require excavations	Unstable embankments along work phase and groundwater seepage	High
Fauna and flora	Alien invasive plant control and removal	Spread of alien invasive plants.	Low
	Loss of biodiversity	Loss of indigenous vegetation	Low
Fire	Restricting activities with a high fire risk	Loss of infrastructure, property or life.	Low
Hazardous substances	Containment of hazardous waste and spills	Soil, groundwater and aquatic contamination	High
	Accidental hydro carbon spillage		
	Uncontrolled use of hydrocarbons	Uncontrolled fires	High
Heritage	Excavation of soils / dredging	Impact on artefact materials	Low
		Damage to chance finds	
Land use	Damage to utility services	Disruption to service	Medium
	Topsoil destabilisation and loss	Incorrect storage and rehabilitation	Low
	Open trenches	Safety of personnel and affected property owners	Medium

System Element	Aspect	Impacts	Risk
	Civil works	Works resulting in excess dust, noise and erosion.	Medium
	Contractors Camp	Unauthorised placement of / activities undertaken at camp	
	Flora and fauna	Disturbance	
Noise	Impact on aesthetics	Increase in noise levels than 7dB above ambient noise levels	Low
	Prohibition of nuisance noise	No person shall generate noise which may cause a noise nuisance.	
Rehabilitation	Not completing rehabilitation works after soil disturbance activities	Loss of species diversity	Low
		Dust generation Erosion	
Soil	Incorrect removal and storage of soil profiles	Poor vegetation regrowth	Low
	Soil loss	Wind and water erosion	
Traffic	Temporary road works	Delays, detours and restricted access	Low
	Dust entrainment	Impacts relating to health and safety	
	Noise	Impacts relating to health and safety	
	Poor or incorrectly maintained plant	Hydro carbon spill	Medium
	Vehicle emissions	Release of noxious gases	Medium
Training	Lack of and / or incorrect training	Potential injuries and / or loss of life and / or property	Low
Waste	Incorrect use, handling, storage and disposal of hydro carbons	Release of hydro carbons in the receiving environment	Medium
	Waste management	Incorrect disposal of waste	Low
		Inefficient resource utilisation	
	Collection of waste across construction footprint	Pollution of the environment through *inter alia* incorrect disposal	
Water	Stabilisation of soil stockpiles	Increased erosion and sedimentation of water resources	Low
	Incorrect re-internment of backfill	Water erosion	
	Ecological functioning of aquatic environment	Potential of hydro carbon leakages and increased sedimentation levels	Medium
	Development within the sea, 100m of the high-water mark of the sea or coastal public property	Seabed alteration / increase in turbidity	Low
		Loss or damage to littoral zone or dune system.	Medium

Decommissioning

Table 18: Typical Aspects and Impacts associated with the Decommissioning Phase

System Element	Aspect	Impacts	Risk
Aesthetics	Nuisance factor through decommissioning related activities	Dust generation Noise generation Visual impact	High
Dust	Unprotected surfaces	Dust generation	High
Earthworks	Contaminated spoil	Ecological off-site impacts of contamination	Low
Erosion	Decommissioning related works that require excavations	Unstable embankments along work phase and groundwater seepage	High
Fauna and flora	Alien invasive plant control and removal	Spread of alien invasive plants.	Low
Fire	Restricting activities with a high fire risk	Loss of infrastructure, property or life.	Low
Hazardous substances	Containment of hazardous waste and spills	Soil, groundwater and aquatic contamination	High
	Accidental hydro carbon spillage		
	Uncontrolled use of hydrocarbons	Uncontrolled fires	High
Noise	Impact on aesthetics	Increase in noise levels than 7dB above ambient noise levels	Low
	Prohibition of nuisance noise	No person shall generate noise which may cause a noise nuisance.	
Rehabilitation	Not completing rehabilitation works after soil disturbance activities	Loss of species diversity	Low
		Dust generation Erosion	
Soil	Soil loss	Wind and water erosion	Low
Traffic	Temporary road works	Delays, detours and restricted access	Low
	Dust entrainment	Impacts relating to health and safety	
	Noise	Impacts relating to health and safety	
	Poor or incorrectly maintained plant	Hydro carbon spill	Medium
	Vehicle emissions	Release of noxious gases	Medium
Training	Lack of and / or incorrect training	Potential injuries and / or loss of life and / or property	Low
Waste	Incorrect use, handling, storage and	Release of hydro carbons in the receiving environment	High

System Element	Aspect	Impacts	Risk
	disposal of hydro carbons		
	Waste management	Incorrect disposal of waste	Low
		Inefficient resource utilisation	
	Collection of waste across construction footprint	Pollution of the environment through *inter alia* incorrect disposal	
Water	Stabilisation of soil stockpiles	Increased erosion and sedimentation of water resources	Low
	Incorrect re-internment of backfill	Water erosion	
	Ecological functioning of aquatic environment	Potential of hydro carbon leakages and increased sedimentation levels	Mediu m

Annexure 18 – Site Environmental Management Plan

Given below is an example of a generic Site Environmental Management Plan.

Site EMPs should only be used where the site and associated project is small and not located in or immediately adjacent to a sensitive environment (such as dunes, wetlands, watercourses, biodiversity areas (including nature reserves) and the coast).

The SEMP does not meet the NEMA requirements for an EMPr.

SITE ENVIRONMENTAL MANAGEMENT PLAN
ERF X, AREA DATE XX-XX-XXXX

1. Construction site access
- Access routes to the site shall be clearly demarcated.
- All vehicle access to the site shall be restricted to the designated access routes.
- Any damage caused to municipal roads and services shall be repaired at the cost of the contractor.

2. Site demarcation
- The boundaries of a site shall be demarcated and secured to prevent access to the site by unauthorised personnel and to deter site staff from accessing adjacent properties.
- Where possible, permanent boundary fencing shall be constructed before the commencement of any other construction activities on site. If this is not possible, temporary fencing shall be installed.
- All plant, waste and materials shall remain within site boundaries.
- The site must be locked and secure after hours.

3. Site establishment
- The site camp, materials storage area, waste management area, batching area, toilet facilities, eating area and equipment washing area shall be located in consultation with the ECO in order to mitigate any exposure.
- The areas shall be fenced off or visually screened.

4. Housekeeping and waste management
- The site shall be kept neat and tidy at all times.
- A sufficient number of weather and scavenger-proof waste bins shall be provided on site.
- Wherever possible, waste shall be separated on site for recycling.
- Bins shall not be allowed to become overfull and shall be removed from site on a regular basis.
- Municipal roads used for access shall be swept daily and kept clear of mud and other materials.

5. Water management
- Water wastage practices on site shall be avoided.
- All water sources shall be kept leak free and shall be monitored on a regular basis.
- Where possible, waste water shall be collected and reused.

6. Cement works
- Unused cement shall be stored in a weather-proof container.
- Cement mixing shall only take place on mixing trays, or other impermeable surfaces.
- All visible cement and concrete spillage shall be removed and disposed of immediately.
- Empty cement bags shall be stored in a weather proof container and be removed regularly off site.

7. Erosion and dust suppression
- The excavation, handling and transport of any erodible material during heavy wind conditions shall be avoided.
- Soil stockpiles shall be located in sheltered areas and shall not exceed 2m in height.
- Dust suppression methods such as dust-dampening or straw stabilisation must be employed. No potable water shall be used.

8. Storm water management
- Adequate control measures to prevent erosion and damage on site and to neighbouring properties resulting from the diversion and/or increase in the flow of storm water caused by the construction works shall be employed.
- No foreign substances including cement, soil, contaminated water, oil, fuel and paint, enters the stormwater system.

9. Hazardous substances
- Fuel, oil, paint and detergents shall be stored in sealed drums in a locked storage room.
- To prevent spillage, drip trays shall be used at all times when hazardous substances are in use on site.
- Waste disposal of substances shall occur at an approved waste disposal site.

10. Health, safety and emergency procedures
- Health and safety: The contractor shall ensure the application of all Occupational Health and Safety Regulations. All site staff shall wear the necessary protective clothing. Emergency contact numbers shall be made visible and accessible to all site staff.
- Fire control: Firefighting equipment shall be made visible and accessible to all site staff. No smoking shall be allowed on site, except in designated areas. No open flames shall be allowed at site with no exceptions. In the case of a fire, the contractor shall alert the relevant authority as soon as possible. All site staff shall be made aware of the relevant procedure to be followed.
- Hydrocarbon spill control: Hydrocarbon absorbent products, such as Enretech and Spillsorb, shall be available on site at all times. In the case of a hydrocarbon spill, the spill shall be contained as far as possible and the source of the spill shall be terminated. Thereafter, the relevant products and materials shall be used to control, confine and remove the contaminated material to an approved waste disposal site.

11. Toilet facilities
- Toilets, toilet paper and hand washing facilities shall be provided for all staff, not more than 30m from construction works. A minimum of 1 chemical toilet shall be provided per 15 site personnel and 1 flushing toilet shall be provided per 30 site personnel.
- Toilets shall be secured to prevent them from blowing over, visually screened, serviced regularly and kept in a hygienic state.

12. Noise
- Construction activities shall only take place between 07H00-18H00 during the week and 08H00-17H00 on Saturdays.
- No construction activities shall take place on Sundays and public holidays.
- Construction vehicles shall be serviced regularly to prevent unnecessary noise.
- The use of heavy construction vehicles shall be restricted on main public roads between 06H00-08H00 and 16H00-18H00 during the week.

13. Flora and fauna
- No domestic animals shall be allowed on site.
- No flora and fauna shall be harmed, removed or killed.
- Fauna that do not move off site on their own accord shall be reported to the ECO, who shall then get help from experienced personnel from the City of Cape Town's (CCTs) Biodiversity Branch

SITE PLAN

14. Archaeological and Paleontological remains
- Archaeological and paleontological remains shall not be disturbed, removed or destroyed.
- Any suspected artefacts that are uncovered shall be reported to the ECO and construction works are to be halted immediately.
- The South African Heritage Resources Agency (SAHRA) (Tel: 021 462 4502), and the local police, (in the case of human burials or remains) shall be notified.

15. Site clean-up and rehabilitation
- All temporary structures, equipment, materials, waste and facilities shall be removed from site upon completion of construction.
- The site clean-up shall be to the satisfaction of the ECO.
- If required, all repairs and/or rehabilitation of any structures, areas and services damaged by construction activities shall be completed. This will be done at the cost of the contractor.

16. Monitoring
- The SEMP is to be kept on site at all times.
- The contractor shall notify the ECO of the commencement of works on site.
- The ECO shall undertake an environmental awareness training session with all site personnel to communicate the purpose of the SEMP.
- The contractor shall be responsible for the implementation of the SEMP on site.
- Routine inspections shall be undertaken by the contractor to ensure compliance with the SEMP.
- The ECO shall carry out site inspections once every 2weeks to monitor compliance with the SEMP, and advise on remedial actions if necessary.

17. Non-compliance
- An NCR shall be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the SEMP. The NCR shall be issue to the Contractor in writing by the delegated City of Cape Town official / representative

18. Failure to comply
- Should the Contractor fail to comply with achieving the prescribed targets, the Employers Agent shall instruct the Contractor to do so. Failure to comply or adequately rectify the non-conformance shall result in the Employers Agent retaining five percent (5%) of the payment certificate amount until such rectification has been achieved, where after payment shall be effected. Non-compliance by the Contractor is the sole responsibility of the Contractor and the City of Cape Town shall not be jointly & severally liable.