

**Appendix H:
Draft Environmental Management Program (EMPr)**

**PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be
situated on A PART OF THE REMAINDER OF THE FARM
SOWETO 387 IQ (City of Johannesburg - Gauteng)**

Draft Environmental Management Program

January 2022



ENVIRONMENTAL ASSESSMENT PRACTITIONER:

ecologic AFRIKA
Contact person: PIERRE JOUBERT
15 Marikana street
Wierda Park Extension 2
Centurion, 0157
Cell: (072) 821 4982
Email: pierre.joubert.larchitect@gmail.com

APPLICANT: CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY
P.O. Box 31926, JOHANNESBURG, 2017
Tel: +27 (0)10 219 9000
Cell: +27 (0)83 511 0939
Fax: +27 (0)10 219 9400
Email: SimphiweNt@Joburg.org.za
Contact Person: Mr. Simphiwe Ntuli

PROJECT DETAILS:

TITLE : Draft Environmental Management Program

AUTHORS : *ecologic AFRIKA*

CLIENT :

PROJECT NAME: PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng).

REPORT STATUS : Draft

REPORT REF. NO : ZOLA-X3-EMPr/01/2022

.....
PIERRE JOUBERT
Practitioner: ecologic AFRIKA.

This report is to be referred to in bibliographies as: ecologic AFRIKA: Pierre Joubert (2022). Draft Environmental Management Program for the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on A PART OF THE REMAINDER OF THE FARM SOWETO 387 IQ (City of Johannesburg - Gauteng.): No.: ZOLA-X3-EMPr/01/2022.

CONTENTS:

Project details	3
Contents	4
Abbreviations.....	6
Acronyms & Definitions.....	6
1 Overview	9
1.1 Purpose of the EMPr.....	9
1.2 Legal requirements of Environmental Management Plans.....	9
1.3 Structure of the EMPr.....	11
1.4 Expertise of Environmental Assessment Practitioners	11
1.5 ROLE PLAYERS	11
1.5.1 Developer	11
1.5.2 Contractor	11
1.5.3 Environmental Control Officer (ECO)	12
2 Planning and design	13
2.1 Assessment of alternatives & Preferred Proposal	13
2.2 Layout & Design Proposal of Township.....	13
2.3 Planning & Design of Township.....	19
3 Construction Phase EMPr.....	30
3.1 Objectives of the CEMPr.....	30
3.2 Components of the CEMPr.....	30
3.3 IMPLEMENTATION OF THE CEMPr.....	30
3.3.1 INTRODUCTION.....	30
3.3.2 ROLES AND RESPONSIBILITIES.....	31
3.3.2.1 The Developer.....	31
3.3.2.2 The Engineer.....	31
3.3.2.3 The Contractor.....	32
3.3.2.4 Environmental Control Officer.....	32
3.3.3 COMMUNICATION STRUCTURES ON SITE.....	33
3.3.3.1 Site Meetings.....	33
3.3.3.2 Environmental Education Programme.....	34
3.3.3.3 Method Statements.....	34
3.3.3.4 ECO Diary Entries.....	35
3.3.3.5 Site Memo Entries.....	35
3.3.4 LEGISLATIVE FRAMEWORK.....	35
3.3.5 DISPUTE RESOLUTION.....	35
3.3.6 COMMUNITY RELATIONS.....	36
3.3.7 SOCIAL RESPONSIBILITIES.....	36
3.3.8 RECYCLING.....	36
3.4 ENVIRONMENTAL SPECIFICATION.....	37
3.4.1 SCOPE.....	37
3.4.2 APPLICATION.....	37
3.4.3 METHOD STATEMENTS.....	37
3.4.3.1 Site camp and site division (Clause 3.4.4.1 and 3.4.4.2).....	37
3.4.3.2 Vegetation clearing (Clause 3.4.4.3a).....	37
3.4.3.3 Access/haul routes (Clause 3.4.4).....	37
3.4.3.4 Fuel storage and use (Clause 3.4.5.2).....	38
3.4.3.5 Solid waste management (Clause 3.4.5.3).....	38
3.4.3.6 Contaminated water (Clause 3.4.5.7).....	38
3.4.3.7 Hazardous substances (Clause 3.4.5.8).....	38
3.4.3.8 Cement and concrete batching (Clause 3.4.5.18).....	38
3.4.3.9 Emergency procedures (Clause 3.4.5.19).....	38
3.4.3.10 Drilling and Blasting (Clause 3.4.5.32).....	39
3.4.3.11 Safety.....	39

3.4.3.12 Security.....	39
3.4.3.13 Community Relations.....	39
3.4.4 SITE ESTABLISHMENT.....	39
3.4.4.1 Site division.....	39
3.4.4.2 Site demarcation.....	40
3.4.4.3 Construction Areas.....	40
3.4.4.4 Site Clearance.....	40
3.4.4.5 Access routes/ haul roads.....	41
3.4.5 GENERAL REQUIREMENTS.....	41
3.4.5.1 Materials handling, use and storage.....	41
3.4.5.2 Fuel (petrol and diesel) and oil.....	41
3.4.5.3 Solid waste management.....	42
3.4.5.4 Ablution facilities.....	43
3.4.5.5 Eating areas.....	44
3.4.5.6 Drinking water.....	44
3.4.5.7 Contaminated water.....	44
3.4.5.8 Hazardous substances.....	45
3.4.5.9 Site structures.....	45
3.4.5.10 Lights.....	45
3.4.5.11 Workshop, equipment maintenance and storage.....	45
3.4.5.12 Noise.....	45
3.4.5.13 Environmental awareness training.....	46
3.4.5.14 Contractor's Environmental Officer.....	47
3.4.5.15 "No go" areas.....	47
3.4.5.16 Construction personnel information posters.....	47
3.4.5.17 Fire control.....	47
3.4.5.18 Concrete and Cement Work.....	47
3.4.5.19 Emergency procedures.....	48
3.4.5.20 Safety.....	48
3.4.5.21 Security.....	48
3.4.5.22 Community relations.....	48
3.4.5.23 Protection of natural features.....	49
3.4.5.24 Protection of flora and fauna.....	49
3.4.5.25 Erosion and sedimentation control.....	49
3.4.5.26 Aesthetics.....	49
3.4.5.27 Pollution.....	49
3.4.5.28 Archaeology and Palaeontology.....	50
3.4.5.29 Working Hours.....	50
3.4.5.30 Excavation and Trenching.....	50
3.4.5.31 Temporary site closure.....	51
3.4.5.32 Drilling & Blasting.....	51
3.4.6 SPECIFIC REQUIREMENTS.....	52
3.4.6.1 Landscaping.....	52
3.4.6.2 Rehabilitation.....	53
3.4.7 SITE CLEAN UP AND REHABILITATION.....	53
3.4.7.1 Site Clean Up.....	53
3.4.7.2 Rehabilitation.....	53
3.4.8 PENALTIES AND BONUSES.....	54
3.4.9 TOLERANCES.....	55
3.4.10 TESTING.....	55
3.4.11 MEASUREMENT AND PAYMENT.....	55
3.4.11.1 Basic principles.....	55
3.4.11.2 Scheduled items.....	56
4 Operational Framework EMPR.....	75
5 Decommissioning	93
6 Conclusion	94

List of Figures:

Figure 1: Existing Water Infrastructure Map.....	15
Figure 2: Existing Sewer Infrastructure Map.....	15
Figure 3: Typical Communications and Reporting Structure.....	31

List of Tables:

Table 1: Environmental management programme contemplated in regulations 19 and 23 of the NEMA EIA 2014 Regulations: Appendix 4 - listing the requirements of an EMPr.....	10
Table 2: SECTION 2: PLANNING & DESIGN PHASE PROJECT SPECIFICATIONS EMPr TABLE.....	22
Table 3: SECTION 3: CONSTRUCTION PHASE SPECIFICATIONS EMPr TABLE.....	57
Table 4: SECTION 4: OPERATIONAL FRAMEWORK EMPr TABLE.....	76

List of Appendices:

Appendix 1: Locality, Site & Facility Illustration Layout Plans.....	95
Appendix 2: Method Statement Template.....	99
Appendix 3: <i>Curriculum Vitae</i> of Environmental Assessment Practitioner.....	103

ABBREVIATIONS:

BA	Basic Assessment
BAR	Basic Assessment Report
COA	Conditions of Authorisation
CEMPr	Construction Phase Environmental Management Programme
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
NEMA	National Environmental Management Act (No. 107 of 1998)
OHS	Occupational Health and Safety Act (No. 85 of 1998)
NWA	National Water Act (No. 36 of 1998)
OEMP	Operational Phase Environmental Management Programme
SAHRA	South African Heritage Resources Agency

ACRONYMS & DEFINITIONS:

- Bund:** Enclosure under / around a storage facility to contain any spillage.
- Batch plant:** Site for the large-scale mixing and production of concrete or plaster, and associated equipment and materials.
- Contractor:** The principal persons /company undertaking the construction of the development.
- The main contractor as engaged by the Developer;
 - Selected subcontractors; and
 - Any other contractor from time to time engaged by the Developer directly in connection with the construction part of the Works.
- Contaminated water:** Means water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.
- Construction camp:** Means the area designated for all temporary site offices, storage sheds and areas, parking areas, maintenance workshops, staff welfare facilities, accommodation, etc.
- Construction Environmental Management Program (CEMPr):**
The construction phase Environmental Management Plan for this Proposed Residential Development, but specifically section 3 of the CEMPr, containing the Environmental Specifications for Civil and Building Works, also forming part of the civils and building contract documentation.
- Engineer:** A person representing the Developer on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an architect or project manager, authorized by the Developer to fulfill this role.

Environment: Means the surroundings within which humans exist and that are made up of -

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of the above and the interrelationships among and between them; - and,
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Education Programme:

An environmental education course for the Contractor's management staff and labour force, which informs them of the requirements of the CEMP. The ECO will present and co-ordinate courses.

Environmental Control Officer (ECO):

The individual or company appointed by the developer to ensure the implementation of the CEMP and suitable environmental management practices on site for the duration of the construction phase of the project.

Method Statement:

A written submission by the Contractor to the Engineer and ECO in response to the Specifications or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- construction procedures,
- materials and plant to be used,
- getting the plant to and from site,
- how the plant/ material will be moved while on site,
- how and where material will be stored,
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- timing and location of activities,
- compliance/ non-compliance with the Specifications,
- any other information deemed necessary by the Engineer.

No Go Areas: Areas identified as being environmentally sensitive in some manner and delineated on plan, and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.

Potentially hazardous substance:

Is a substance which, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment.

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management plans" (both as defined in the National Environmental Management Act (No 107,1998)).

Site: The boundary and extent of development works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the development to proceed successfully.

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

Specification: A technical description of the standards of materials and workmanship that the Contractor is to use in the Works to be executed, the performance of the Works when completed and the manner in which payment is to be made.

Works: The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc, in connection with the execution and carrying to completion of the development.

Top material: This refers to any surface material in the construction area, whether it be soil, fine material or stones including vegetation.

Topsoil: Means the top 100 mm of soil and may include vegetation and rocks.

1 OVERVIEW

This document represents the Draft Environmental Management Programme (EMPr) for the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with related Civil services.

1.1 PURPOSE OF THE EMPr

The EMPr has been included in the Basic Assessment Report (BAR) in order to provide a link between the impacts identified in the Basic Assessment (BA) process and the actual environmental management on the ground during project implementation and operation.

The purpose of this document is to provide for environmental management throughout the various life-cycle stages of the proposed development. The following stages are included:

- Planning and design,
- Pre-construction and construction,
- Operation, and
- Closure.

Furthermore, this EMPr aims for alignment and optimisation of environmental management processes with conditions of authorisation that may arise, thereby ensuring that identified environmental considerations are efficiently and adequately taken into account during all stages of development.

1.2 LEGAL REQUIREMENTS OF ENVIRONMENTAL MANAGEMENT PROGRAMMES

Environmental Impact Assessment (EIA) Regulations were promulgated in terms of the National Environmental Management Amendment Act (as amended) ("NEMA") (Act 107 of 1998) Amendment of the Environmental Impact Assessment Regulations 2014, GNR: 324-327, 7 April 2017.

The proposed project could possibly trigger listed activities in terms of the following listing notices i.e:

1. GN. R327, 7 April 2017: Listing notice 1 i.e:

(12). 'The development of—

- ...; or—
- infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs—

(a) within a watercourse;

(b) ...; or

(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse'.

(19). 'The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse'.

(27) 'The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous Vegetation...';

- and also,

2. GN. R324, 7 April 2017: Listing notice 3 i.e:

(12). 'The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

c. Gauteng

i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;

- ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or -
- iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning’.

(14). ‘The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—

- (a) within a watercourse;
- (b) ...; or
- (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

c. Gauteng

- i. A protected area identified in terms of NEMPAA, excluding conservancies;
- ii. National Protected Area Expansion Strategy Focus Areas;
- iii. Gauteng Protected Area Expansion Priority Areas;
- iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;
- v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);
- vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;
- vii. Sites or areas identified in terms of an international convention;
- viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;
- ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or
- x. Sites zoned for conservation use or public open space or equivalent zoning’.

- thereby requiring the submission of a BAR for Environmental Authorisation (EA) to GDARD.

As such the applicant is required to submit an Environmental Management Programme (EMPr) that complies with regulations 19 and 23 of the NEMA EIA 2014 Regulations: Appendix 4, as well as the Department’s Guideline for Environmental Management Programmes to be included with the BAR for the proposed activity. The EMPr must address the potential environmental impacts of the proposed activity on the environment throughout the project i.e. impacts in respect of planning and design, preconstruction and construction activities, operation of the activity, rehabilitation of the environment and closure/decommissioning (if applicable). Table 1 underneath lists the requirements of an EMPr as stipulated in the Regulations.

Table 1: Environmental management programme contemplated in regulations 19 and 23 of the NEMA EIA 2014 Regulations: Appendix 4 - listing the requirements of an EMPr.

Content of environmental management programme (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
 - (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
 - (b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
 - (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 should be avoided, including buffers;
 - (d) a description of the impact management outcomes, 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-
 - (i) planning and design;
 - (ii) pre-construction activities;
 - (iii) construction activities;
 - (iv) rehabilitation of the environment after construction and where applicable post closure; and
 - (v) where relevant, operation activities;
 - (f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -
 - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) comply with any prescribed environmental management standards or practices;
 - (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
 - (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
 - (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
 - (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- an indication of the persons who will be responsible for the implementation of the impact management actions;

- (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
 - (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
 - a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;
 - (m) an environmental awareness plan describing the manner in which-
 - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
 - (n) any specific information that may be required by the competent authority.
- (2) Where a government notice *gazetted* by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.

The legislation hereby aims to ensure that effective environmental management is implemented throughout the project via the translation of EIA management actions into the EMPr.

This DRAFT EMPr aims to meet the EMPr requirements as legislated by the NEMA Regulations. It should however be noted that no guideline or guidance exists in terms of best practice approach to EMPr's. This document should thus be seen in an iterative context allowing for amendments throughout the project, allowing for adjustments as new information is made available.

1.3 STRUCTURE OF THE EMPr

As discussed above, the EMPr aims to address environmental management throughout the project, from planning and design, through construction, to operation and potential decommissioning. The EMPr has been structured to include the following sections:

1. Discussion summarising environmental management influencing the planning and design of the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with related Civil services (Chapter 2);
2. Construction EMPr based on identified impacts and mitigation measures from the BAR(Chapter 3);
3. Operational Framework based on identified impacts and mitigation measures from the BAR (Chapter 4); and –
4. Decommissioning Framework providing guidance on key considerations to be considered during decommissioning/closure (Chapter 5).

1.4 EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONERS

The NEMA 2014 EIA Regulation requires that a draft Environmental Management Programme must include the details of the person(s) who prepared the EMPr, and the expertise of that person to prepare an EMPr. In this regard, the *Curriculum Vitae* of the Environmental Assessment Practitioners who compiled the EMPr are included in *Appendix B*.

1.5 ROLE PLAYERS

1.5.1 Developer

The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.

The developer must ensure that the EMPr is included in the tender documentation (i.e. if any) so that the contractor who is appointed is bound to the conditions of the EMPr. The developer must appoint an independent Environmental Control Officer (ECO) during the planning phase to oversee all the environmental aspects relating to the development.

1.5.2 Contractor

The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer and is responsible for ensuring that she/he adheres to all the conditions of the EMPr. The contractor must thoroughly familiarise him/herself with the EMP requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

1.5.3 Environmental Control Officer (ECO)

Prior to the commencement of construction, a suitably qualified and experienced Environmental Control Officer (ECO) shall be appointed by the proponent to ensure that the mitigation rehabilitation measures and recommendations referred to in the Environmental Authorisation are implemented and to ensure compliance with the provisions of the EMPr.

Roles and responsibilities

The role of the ECO is to oversee and monitor compliance with and implementation of the construction phase EMPr, which includes compliance with the relevant conditions contained in the Environmental Authorisation. The ECO is responsible for:

- i) Liaison with the Client, engineer and Environmental Authorities.
- ii) Monitoring of all of the Contractor's activities for compliance with the various environmental requirements contained in this Specification.
- iii) Monitoring of compliance with the Environmental Authorisation issued by GDARD as well as other relevant environmental legislation.
- iv) Reviewing of the Contractor's environmental Method Statements.
- v) Ensuring that the requisite remedial action is implemented in the event of noncompliance.
- vi) Ensuring the proactive and effective implementation and management of environmental protection measures.
- vii) Ensuring that a register of public complaints is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed.
- viii) Routine recording and reporting of environmental activities on a weekly and monthly basis.
- ix) Recording and reporting of environmental incidents.

Site visits and reporting:

The ECO shall visit the site a minimum of once every two weeks. More frequent visits may be required if the situation requires it.

Monthly compliance reports shall be submitted to the engineer and the proponent and distributed as desired. The compliance report shall speak to the requirements of the EMPr and the project specifications as well as other issues of compliance in terms of the Environmental Authorisation.

2 PLANNING AND DESIGN

This section has been divided into subsections which outline how environmental considerations have informed and been incorporated into the planning and design phases of the proposed pullet farm. Detailed design is usually undertaken as part of the pre-construction phase as it is a costly undertaking which is generally only costed for once all required authorisations have been obtained. Thus, the planning and design phases discussed are limited to those associated with the pre-authorisation phases.

2.1 ASSESSMENT OF ALTERNATIVES & PREFERRED PROPOSAL

The Basic Assessment Process for the proposed project forms an integral component of the planning and design phase for the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with related Civil services.

The reason for selecting the preferred proposal, is as follows:

1) Please note that there are no ACTIVITY or SITE alternatives proposed, since:

- The proposed activity (i.e. PUBLIC TRANSPORT FACILITY – TAXI RANK) was and is the applicant's (i.e. CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY) preferred and only choice due to the constraints imposed by the i.e:- type of activity (i.e. informal TAXI rank) which was already prevalent on site for many years – and,
- the site available, since an informal TAXI rank have been fully functioning on that specific site for many years and needed legal formalization (i.e. rezoning) in order to continue as a legally recognized activity. It would thereby also provide a much needed and improved facility (i.e. PUBLIC TRANSPORT FACILITY – TAXI RANK) to the SOWETO EMDENI and ZOLA community i.e. the applicant has identified land parcels which are currently being utilized informally by the taxi industry, thus giving rise to the need to formalize the sites and provide infrastructure towards the proposed taxi rank development for holding, loading purposes, as well as the associated ancillary uses that complement the development.

2) However, **TWO (2) Proposed LAYOUT PLAN Alternatives** are presented underneath due to certain environmental constraints present on site as set out in more detail underneath.

2.2 LAYOUT & DESIGN PROPOSAL of the TOWNSHIP

The proposed activity involves the following i.e:

PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with related Civil services.

Description:

1.0 LOCALITY

The site is formally known as the RE 387 - IQ, Soweto and is located on a portion of the Farm 387 Soweto, adjacent to the eastern boundary of the Zola Township in Region D of the City of Johannesburg Municipal Area.

The site is situated in Ntshunyana street (Jabavu road) i.e. on the eastern side of Ntshunayana street which is 50 metres south-south-east of the Maholwane street (Bandile road) and Ntshunyana street T-junction in ZOLA, Soweto, Gauteng – South Africa. PLEASE SEE LOCALITY PLANS attached in APPENDIX A [i.e. in the BASIC ASSESSMENT REPORT (BAR) and/or upon request from the EAP].

2.0 PROPOSED DEVELOPMENT:

The City of Johannesburg through the Johannesburg Development Agency has identified land parcels which are currently being utilized informally by the taxi industry, thus giving rise to the need to formalize the sites and provide infrastructure towards the proposed taxi rank development for holding, loading purposes, as well as the associated ancillary uses that complement the development and therefore it is proposed to establish i.e. develop, **ZOLA EXTENSION 3 TOWNSHIP** to be situated on **A PART OF THE REMAINDER** of the **FARM SOWETO 387 IQ** (City of Johannesburg, Gauteng).

It is the intention to utilize the said portions of land, measuring in total $\pm 1,3178$ ha (i.e. 1,2476 hectare Municipal Land + 0,0702 hectare Public road), for the proposed Emdeni-Zola Public Transport Facility.

The site is formally known as the RE 387 - IQ, Soweto and is located on a portion of the Farm 387 Soweto, adjacent to the eastern boundary of the Zola Township in Region D of the City of Johannesburg Municipal Area – and the proposed development on the land will consist of the following as also indicated graphically (i.e. visually) in more detail on the

attached LAYOUT PLAN in APPENDIX C [i.e. in the BASIC ASSESSMENT REPORT (BAR) and/or upon request from the EAP].

DEVELOPMENT FOOTPRINT: [10 631.30 m²]

- 40 TAXI RANKING AREA BAYS
- 4 DROP-OFF AREA BAYS
- 30 TAXI HOLDING BAYS
- 10 ADMINISTRATION PARKING BAYS
- 6 TRADING KIOSKS
- 3 ABLUTION BLOCKS
- SECURITY OFFICE
- ADMINISTRATION OFFICE BLOCK + ADMIN SQUARE
- REFUSE AREA
- RECREATIONAL AREA
- PUBLIC SQUARE & STAGE
- DRIVEWAY & 10 PUBLIC PARKING BAYS
- PAVED WALKWAYS (including covered Walkways)
- STORMWATER ATTENUATION PONDS
- SOFT LANDSCAPING AREAS
- CIVIL SERVICES INFRASTRUCTURE (i.e. stormwater channels, palisade fences, water pipes, sewer pipes, manholes, electricity cables etc)

WETLAND & WETLAND BUFFER AREAS: (excluded from proposed development footprint) [1 852.70 m²].

EXISTING PUBLIC ROAD AREA: [694 m²].

It is the intention to utilize the said portion of land, measuring, ± 1,3178 ha, for the proposed Emdeni-Zola Public Transport Facility.

3.0 ZONING, LAND USE & SURROUNDING LAND USES

The present 'use zone' of the land is 'undetermined'.

The site is vacant and used as an informal taxi rank. The site is located in a township area, surrounded by a residential area.

The surrounding land uses are as follows:

- North: Shops and Residential Houses
- East: Vacant land
- South: Sports Fields
- West: Residential Houses

4.0 CIVIL INFRASTRUCTURE ANALYSIS

A detailed Civil Outline Scheme Report has been prepared by *CSM Consulting Engineers*. The findings of the report are briefly as follows (i.e. Roads, Stormwater, Water & Sewer). Please see the full report attached in APPENDIX G [i.e. in the BASIC ASSESSMENT REPORT (BAR) and/or upon request from the EAP].

5.1 ROADS

PLEASE see TRAFFIC under item 6.0 underneath for more detail.

5.2 STORMWATER INFRASTRUCTURE

Executive Summary:

Johannesburg Development Agency (JDA) plans to develop 1.18 ha portion of land located in Zola, on farm Soweto No 387-IQ as a Public Transportation Facility. The project is referred to as Emdeni/Zola Public Transportation Facility. The conveyance and storage systems that the Stormwater Management Plan is recommending is based on topographical survey data and integrated with the proposed site layout and topography. All the proposed stormwater conveyances systems are gravity driven. Rainfall intensity-duration-frequency data are source from "Rainfall Statistics for Design Flood Estimation in South Africa" (WRC Project K5/1060). The

Stormwater Management Plan methodology is based on a pre – and post development scenario, and hydrological and runoff specifications as specified by JRA. Runoff flowrates for the 1:5, 1:25 and 1:50 year storm events are determined by application of the Rational Method. Attenuation volume is established by application of the Modified Rational Method. The pre-development time of concentration are 7.7 minutes, and the post development time of concentration are 4.7 minutes. Attenuation volume requirements, however, are dictated by the critical storm duration of 44 minutes. A series of vegetated attenuation ponds with a total minimum storage volume of 338 m³ with dual outlets and an overflow weir will be provided. The three ponds will be trapezoidal shape with base areas of 145 m², 135 m² and 220 m², respectively. Two staggered NB150 pipes will discharge attenuated 1:5 and 1:25 year stormwater runoff from the pond via a channel to the nearest natural drainage causeway. Each pond will have a designated outlet with no provision made for overflow from one pond to another. Overflowing of the attenuation pond will be prevented by provision of a weir at grade with the expected maximum attenuation depth. A maximum 1:5 discharge rate of 78.05 l/s (less than the pre-development 1:5 peak runoff of 115.63 l/s) and 1:25 discharge rate of 128.52 l/s (less than the pre-development 1:25 peak runoff of 171.58 l/s) will be released into a tributary of Klipspruit via a rock lined channel.

5.3 WATER INFRASTRUCTURE (Summary - the full report is available in APPENDIX G underneath [i.e. in the BASIC ASSESSMENT REPORT (BAR) and/or upon request from the EAP]).

Existing Water Infrastructure:

The information obtained from Johannesburg Water, Figure 1, indicates that there is a 300mm asbestos cement water reticulation line running along Ntshunyana/Jabavu Street. The water reticulation system adjacent to the proposed site is part of the Avalon Depot and feeds from Zondi Reservoir. This proposed connection system has a flow of 26.19l/s, a velocity of 0.37m/s with an average residual head of 35.00m.

Water Reticulation Design:

The internal water system is modelled with a single connection to the external bulk network along Ntshunyana Street, which will be formalized with a flow meter, strainer and shut off valve assembly as per Johannesburg Water standards. Hydraulic analysis of the pipeline using EPANET Software was based on the Darcy-Weisbach equations for turbulent flows, with the estimated flows through the internal network based on terminal water fitting demand which are obtained from the Architect's sanitary schedule. The minimum pressure of 3 bars for reticulation mains is considered at the connection point to the JW infrastructure when conducting the analysis. The hydraulic analysis reveals that the average pressure available at each node connection is at least 1.5 bars which is sufficient as it exceeds the minimum pressure requirements. The primary network is preliminary designed as a 75mm uPVC Class 16 pipe. The minimum cover is taken as 1.0m in all trafficked areas with increased installation depth in areas with other pipelines (sewer or stormwater) that are either in close proximity or crossing the water pipeline for additional protection.

5.4 SEWER INFRASTRUCTURE

Existing Sewer Infrastructure:

The information obtained from Johannesburg Water, indicates that there is an existing 250mm clay sewer pipe crossing the outside borders of the site on which the sewer connection is proposed. The collective system is part of the Avalon Depot and collects to the Naledi system. This system has a full flow capacity of 57.09 l/s, a full velocity of 1.16m/s and a spare capacity of 77.46%.

Sewer Reticulation Design:

The internal network is designed to have 110DN uPVC Class 34 main line with minimum gradient of 1:85 while ensuring that the maximum flow depth does not exceed the stipulated 67% at peak discharge and the design velocity ranges from 0.7 to 3m/s. The internal reticulation network connects to an existing manholes invert levels of 1627.45m.

5.5 ELECTRICAL INFRASTRUCTURE

[Electrical services report summary underneath and the full report is attached in APPENDIX G i.e. *PROJECT: EMDENI PUBLIC TRANSPORT FACILITY DOCUMENT NAME: ELECTRICAL PDR DOCUMENT REFERENCE: EMDENI-ELEC-S2 RPT-01-02 prepared by 'POLYGON PROJECT ENGINEERS date: 04/03/2021'*.

Electrical Power Supply:

The Electrical Power Supply application shall be submitted to City Power, requesting a dedicated 83KVA, 120 A, 400 V supply which will cater for whole facility. This was based on calculations for the various spaces within the project area. Provision has not been made for back-up power.

UPDATE 4 March 2021:

Enquiries were re-initiated with Eskom in 2021, with reference number 405198152. Indications are that power is available and a quotation will be sent through during the course of March 2021.

Building Services :

The following areas will be deemed as buildings for this project, namely:

- Block A: Guardhouse
- Block B: B1-B8 Kiosks
- Block C: Refuse Areas
- Block D: Ablutions
- Block E: Ablutions
- Block F: Admin Offices
- Block G: Ablutions

The site also comprises of the driveways, a Ranking Area and a Recreational Area.

Power Reticulation:

Cabling:

- All cables are sized according to voltage drop over the length of the cable, electrical load requirement, estimated fault level and de-rating factors in accordance with SANS 10142-1 and SANS 1507-3.
- Distribution boards shall be manufactured according to SANS 10142-1 and specified in the electrical drawings and Bill of Materials
- Cables shall be routed either by burying in the ground or by running through walls and ceilings. At all times, all cables shall be protected by PVC conduits and sleeves.
- Electrical cables will have dedicated conduits and will not share conduits with data or telecommunications cabling to limit electronic interference and reduce the potential for damage caused by multiple contractors working in the same space.
- All cabling related to the Fire detection and suppression systems shall be distributed within steel bosal conduit.

Metering, Main Switchboard and Distribution Boards:

The Main Switchboard shall be housed in an LV/Telkom room adjacent to the Guard house.

The Main switchboard will comprise of the following switchgear:

- The main incomer,
- A feed to each Kiosk,
- Admin Office sub DB,
- General areas.

The Admin Office sub DB will house switchgear to feed the following distribution boards;

- Block D,
- Block E,
- Block G,
- Recreational area,
- General Areas.

Lighting Design:

- Energy efficient luminaires and fixtures shall be specified for both internal and external lighting. Only luminaires that are commonly available shall be specified to optimize spares availability and derive cost savings during both the construction and operational phases of the project.
- Consideration has been taken of the lighting requirements of critical task areas, such as office desks and emergency lighting.
- Internal lighting shall be controlled using conventional wall switches, except for refuse and ablution areas, where motion sensors shall be used.
- External lighting such as wall mounted lighting and parking area lighting shall be controlled by means of photocells.
- The driveways shall be lit using streetlights on GRP poles.
- Post top lamps shall be used to light up the general site areas.
- All luminaires shall bear a SABS stamp to ensure compliance with local standards and conditions.
- All switches shall be specified as the CRABTREE Classic range.
- All equipment shall bear an SABS stamp.

Small Power Design:

- All socket outlets shall be specified as 3-pin, 16A, 220V deemed sufficient for small appliances, computers and other equipment utilizing 220V AC. All sockets shall include the now compulsory SANS 164-2 (ZA plug).
- All sockets shall be specified as the CRABTREE Classic range.
- Power skirting shall be used for the Admin Offices and the Guard-House buildings.

Earthing and Lightning Protection:

Earthing and Lightning Protection will be required across the site.

- Earthing shall be achieved by means of interlinked earth mats located at various points around the development, arranged in such a manner to comply with SANS 10142-1.
- Lightning protection shall use the Rolling-Ball method of calculating the lightning rod coverage. A specialist contractor shall complete the installation according to SANS 10313 and provide the necessary compliance documentation.

Water Heating:

- Hydroboils will be used for water heating in areas where required, typically at the kiosks and office block.
- The ablution blocks will not be equipped with water heating equipment.

Space Heating and Cooling:

- Air conditioning will NOT be installed in the office areas.
- Ceiling fans will be provided in common areas where a roof or ceiling is available to provide cooling.

Electronics:

Telecommunication -

- A Telkom room shall be established next to the Guard house.
- Sleeving for telephone reticulation shall be provided for from the Telkom room to the guard house and the administrative offices.
- Telephone outlets shall be provided for in the Admin offices and the Guard-House.
- Fibre ducting shall be allowed for from the Telkom room to the guard house and the administrative offices.

Security Installation

- CCTV – a CCTV system shall be installed.
 - o Low light, fixed-type, IP cameras shall be used to minimize wiring and installation costs.
 - o Cameras shall be housed in tamper proof housings to mitigate the theft risk.
 - o 22" Viewing screens shall be installed in the guard house, each display capable of monitoring eight (8) cameras shall be installed in the Guard House.
 - o The DVR and related recording equipment shall be housed in the Telkom room.
- Access Control of The Guard House, Administrative offices and Telkom room shall be fitted with keypad type access control systems to limit entry to authorized personnel only. Other options such as key tags or biometric scanners may be used but required a dedicated person to manage the system. If / when this person leaves, the system becomes unusable and is usually bypassed, thereby defeating the original purpose.
 - o The access control system shall be intelligently linked to the site security system to alert for intruder activity.
- Intruder Alarms
 - o The Guard House, Administrative offices and Telkom room shall be fitted with intruder detection systems.
 - o Control keypads will be installed in each area. Each space shall be operated independently.
 - o All systems shall be linked to an emergency response centre.
 - o At this stage of the design process, it is not known if the Guard house will be manned 24/7. It is envisaged that the guard house will be manned from 4AM to 9PM – typical travel hours for taxis.
 - o Kiosks and ablution blocks will not be fitted with intruder detection systems.
 - o Driveway gates shall not be automated but will be installed for security purposes.

Fire detection:

- Fire detection equipment (smoke and heat detectors) shall be allowed for in the ablution blocks, Guard House, Telkom room and the administration offices.
- Control panels shall be installed in the Guard House.

IT Installation:

- Provision shall be made for the installation of IT hardware.
- Two tier power skirting shall be used to allow for the reticulation of IT cabling.
- CAT-6 cabling shall be used.
- All power skirting lengths shall be linked to the server room (location to be determined) via 25mm diameter PVC conduit.
- Wifi hotspots shall be installed throughout the facility to provide internet connectivity for all commuters.

Solar PV System (Optional)

- The site has the advantage of a north facing roof, with ample available roof space of approximately 2360 m² to accommodate a solar PV system.
- A solar PV system to provide for the power across the whole site, of capacity 83 kVA will cost approximately R1.6 million.
- At full utilization, it would be possible to pay off this investment within 5 years. With current equipment life expectancy projections, the system would operate for at least 20 years.
- The proposed system would be grid-tied, thus drawing any shortfall in power from the Eskom grid.
- Rising electricity prices would mean reduced operational costs for this transport hub.
- The site is envisaged to enjoy good security thus adding to the attraction of this system.

6.0 TRAFFIC

6.1 A Site Traffic Assessment has been undertaken by Ajayi Jantjies Adams and Associates – Report AJA 007/R003 – 28 February 2018. Please see the full report attached in APPENDIX G [i.e. in the (BAR) and/or upon request from the EAP].

6.2 Extracted from the report attached and mentioned above the following details are pertinent:

Adjacent Road Network

The Soweto Highway (M70) via Vincent Street (M72) and Chris Hani Road (M68) via Koma Street (M72) provide primary routes for commuters between Emdeni and Johannesburg CBD. In terms of Public Transport, the area is currently serviced by buses and taxis.

Other Capital Investment projects planned for the area include:

- improvement of public transport facilities at Merafe and Naledi rail stations;
- Development of a public square and taxi facilities at Merafe and Naledi rail stations;
- Upgrading of Naledi rank;
- Upgrading of Zola office rank;
- Upgrading of Zola Library rank; and
- Improvement of access to stations via connecting roads and pedestrian link bridges of railway lines (City of Jamesburg, 2010).

Adcock Street (R558) runs in the north-south direction some 2km west of Emdeni. The Moroka Bypass (N12) runs in the east-west direction some 6km south of Emdeni. Class Roads surround the Emdeni and provide connectivity with higher order roads. Steve Kgane Road runs in the eastwest direction some 1km north of the proposed site, and Bolani Road is approximately 750m south of the proposed site.

Access to the site

The access to the proposed site is via Ntshunyana Street, approximately 80m south of the intersection of Ntshunyana and Maholwane Streets. Ntshunyana Street is a Class 4 road that is connected to a Class 3 road (Bolani Road) approximately 750m south of the intersection of Ntshunyana and Maholwane Streets. This collector road predominantly serves residential traffic and public transport. Ntshunyana Street carries less than 10 000 vehicles per day and less than 1 000 vehicles in the peak hour.

Bolani Road is a Class 3 road which links Ntshunyana Street with Koma Street to the east, another Class 3, which in turn connects with Chris Hani Road (M68) to the south, a Class 2 metropolitan motorway.

RECOMMENDATIONS

Given the findings in the report, the following recommendations are made:

1. The proposed Site Development Plan should be considered favourably from a traffic engineering point of view by the relevant authorities, given the proposed road upgrades in this report.
2. Detailed designs for the proposed improvements should be undertaken by a professional engineer / technologist with suitable road design experience.
3. Sidewalks of a minimum of 2m wide should be implemented on all site frontages as.

□ See Annexure J: Site Traffic Assessment

7.0 GEOTECHNICAL CONDITIONS

A geotechnical investigation of the site has been undertaken by *Mshandukani Holdings (Pty) Ltd* - Report Number MS201714 – August 2017. Please see the full report attached in APPENDIX G [i.e. in the (BAR) and/or upon request from the EAP].

7.1 Based on the results of the investigation, the site can be classified into two site designation zones (class 'R' and 'H'), as set out in the NHBRC (1999) guideline document of which the appropriate tables have been included in Appendix G [i.e. in the (BAR) and/or upon request from the EAP].

7.2 The impact of the geotechnical constraints on developments may be evaluated according to Table 1 below, which is a summary of the general geotechnical constraints relevant to developments (Partridge, Wood and Brink, 1993). The Class column indicates the severity of the specific constraints for this site.

Foundation Design

The geotechnical investigation was carried for the proposed construction of a public transport facility on Erf Re/7/239-IQ in Emdeni, Soweto, Gauteng. It should be borne in mind that the geotechnical boundaries are inferred. So, some variations to the reported conditions should be expected. The site predominantly falls within NHBRC Site Soil Class R-H1; P (Imported Fill) (7.5-15 mm estimated total settlements) and the proposed structure should be founded on:

□ Normal Reinforced Strip Footing foundation it is therefore recommended for the ablution block building where In-situ reconstruction or ripping is done at an average depth of 0.4m below surface on residual material of Basaltic lava.

Proper compaction should be adhered to while back filling the trenches and foundations with G5 material and should be compacted to 95% MODAASHTO at 150mm intervals.

□ Pad or Spread Footing foundation is therefore recommended (for the steel columns that will carry the roof structure) at an average depth of 0.4m on Residual material of Basaltic lava.

□ Pavement recommendations: In-situ ripping should be at an average depth of at 0.4m on residual material Basaltic lava. The estimated traffic or vehicle per day is <75 vehicles and <5 heavy vehicles per day with a total loading traffic of <0.3x10⁶ E80s per lane (Guideline for human settlement planning and design Vol.2).

□ Surface: Pavement bricks can be placed on the surface for walking lanes, and asphalt concrete can be used for a smooth finish along the taxi parking lanes. The binder content present with asphalt acts as a lubricant when hot and as an adhesive and water proofing when cold.

□ Base (~150mm): G5 material should be compacted to 95% MOD AASHTO density.

□ Sub-base (~250mm): G3 material should be compacted to 98% MOD AASHTO density at 150mm interval.

Proper compaction should be adhered to while back filling the trenches and foundations with G5 material and should be compacted to 95% MODAASHTO at 150mm interval. Damp proof membrane / course should be able to inhibit the ingress of moisture. Dewatering holes should be commissioned to relieve pore pressure at foundation level.

Based on the seepage encountered on site this is however recommended: A detailed geohydrological analysis should be carried out to gain a good understanding on the transmissivity and porosity of the bedrock (aquifer testing). Monitoring holes on the upstream and downstream of the structure should be constructed in order to monitor ground water levels in all seasons.

Exterior drainage and foundation wall damp-proof coatings; Capillary breaks at footings and at the top of the foundation wall, Insulation, air barrier and water vapor control, air barrier and thermal insulation systems should be installed to prevent groundwater water from infiltrating; such an impermeable layer can assist as a sealing layer.

Strip footing supports a load bearing wall and transfers the load of a structure directly to the underlying soil (Knappett and Craig, 2012).

The two main objectives (limit states) that foundations need to satisfy are:

□ The capacity or resistance of the foundation should be adequate enough to support the applied loads and;

□ Foundations should prevent excessive deformation under the applied loads.

□ See Annexure J : Geotechnical Report – Africa Exposed CC.

8. FLOODLINE PLAN & CERTIFICATE:

Please see the FLOODLINE MAP & CERTIFICATE for the said site attached in APPENDIX G [i.e. in the BASIC ASSESSMENT REPORT (BAR) and/or upon request from the EAP].

2.3 PLANNING & DESIGN OF TOWNSHIP

The design for the proposed development should respond to the identified environmental constraints and opportunities. This is achieved via the following mechanisms:

- 1) Consider design level mitigation measures recommended especially with respect to impact on natural resources (water), waste management, minimisation of energy requirements.
- 2) Balance technical and financial considerations against environmental constraints and opportunities in finalising the design of key elements.

The EIA process is in the process of identifying the significant environmental issues and addressing them since the **Public Participation Process is in the process of being conducted**. The process is engaging with stakeholders and the specialist input has assisted in identifying and assessing some of the potential impacts. **The Public Participation Process is currently in the process of being conducted and the result of the final outcome of it will be assessed and recommendations resulting from it included in the FINAL BASIC ASSESSMENT REPORT as well as any Special Considerations.**

The implementation of the above mitigation measures aims to ensure that the design meets the objectives and does not degrade the environment and that the design and layout respond to the mitigation measures and recommendations in the BAR and conditions of the Environmental Authorisation.

ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, we provided an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Preferred Layout Proposal:

This Draft Basic Assessment Report (dBAR) for the proposed PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on A PART OF THE REMAINDER OF THE FARM SOWETO 387 IQ with associated Civil Services infrastructure, has been undertaken in accordance with the National Environmental Management Amendment Act (as amended) ("NEMA") (Act 107 of 1998) Amendment of the Environmental Impact Assessment Regulations 2014, GNR: 324-327, 7 April 2017.

The PUBLIC PARTICIPATION PROCESS is currently being conducted, and the findings will be included in the FINAL BASIC ASSESSMENT REPORT – and, the following preliminary findings is herewith presented i.e:

The EIA process has so far succeeded in identifying the significant environmental issues and addressing them adequately. The process is currently and have engaged with stakeholders and the specialist's input has assisted in identifying and assessing the potential impacts.

This draft BAR provides an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed ZOLA EXTENSION 3 TOWNSHIP construction.

The EIA process has been adequately rigorous in identifying various issues especially related to the socio-economic, biophysical-ecological (i.e. vegetation, wetland, aquatic, hydrogeological, soil & hydrogeology), health & safety, traffic, air quality, noise and visual impacts with regard to the planning and design phase, the construction phase, operational phase as well as the decommissioning phase (i.e. in some instances).

The results of the specialist studies undertaken indicate that the proposed development is likely to yield both potentially low to minor negative and some minor, low to medium positive socio-economic & visual impacts. However, the positive socio-economic & visual aspects outweigh the negative impacts, expect that there is one impact which cannot be mitigated i.e. *SOIL & HYDROPEDOLOGY: Soil - Complete cease of the soil's productive capability, since the soil's surface being covered by concrete, tar and paving. The soil's productive capability will not be destroyed but will cease permanently or until the structure is removed completely.*

Except for the one impact which cannot be mitigate, the proposed project would result in only low to minor negative impacts on the biophysical-ecological environment (i.e. vegetation, wetland, aquatic & geohydrological, soil & hydrogeology) during the construction & operational phase if the recommended mitigation measures were implemented. The professional ecological, biodiversity, aquatic, hydrogeological, soil & hydrogeological consultants also SUPPORTS the proposed development's approval subject to the implementation of their prescribed mitigation measures, predominantly since the preferred layout proposal does not fall within the WETLAND BUFFER areas and/or the WETLAND.

Other various potential construction related impacts were assessed, in general, to be of low to very low negative significance, due to their local to site nature and short-term durations. Impacts would decrease to lower levels of significance with the implementation of the recommended mitigation measures. During the operational phase, the impacts relating to the contamination of the surrounding area through operational activities was found to be of medium to low significance, however through the implementation of the recommended mitigation measures these could be reduced to low negative impact significance.

Irrespective that one impact cannot be mitigated, the environmental practitioner is satisfied that an adequate understanding is achieved of the nature and extent of the issues and how to mitigate the negative impacts and enhance potential benefits.

The above-mentioned must be considered by the Department in its evaluation of the environmental authorisation application.

No-go alternative (compulsory)

The no-go option is not preferred as the economic and social challenges related to the ZOLA-EMDENI area in SOWETO and its immediate surrounding areas will continue.

It is further anticipated that maintaining the status quo could have potentially direct, indirect & cumulative negative impacts on the environment - due to:

Direct Impacts:

- the likelihood of rehabilitation of the biophysical environment to occur i.e. especially the wetland, is highly unlikely should no facilities be allowed to be developed – since the cost of rehabilitation would outweigh the anticipated benefits. This implies that this area could become a neglected valley-bottom wetland area which has potential to be rehabilitated and potentially adding value to the Visual and Biophysical environment.
- The applicant would not be able to meet the long overdue need as identified i.e. the City of Johannesburg (CoJ) through the Johannesburg Development Agency has identified land parcels which have are currently being utilized informally by the taxi industry, thus giving rise to the need to formalize the sites and provide infrastructure towards the proposed taxi rank development for holding, loading purposes, as well as the associated ancillary uses that complement the development.
- The current site will remain under-utilised, and this will not be in line with the overall planning within the Johannesburg Metropolitan Municipal area - especially considering that the PUBLIC TRANSPORT sector provides much critically required viable transport for many individuals to and from their employment (i.e. jobs) of the local municipality area and is a good contributor to the local economy.

Indirect impacts:

- No stimulus of the local economy.
- The lack of the following i.e. the presence of a public transport facility may cause a minor or perceived increase in property values in the adjacent area. The reverse is that the amenity benefit may be attractive to some neighbouring occupiers. The in-filling of such areas with appropriate commercial development also accords with urban planning principles.
- The settlement of potential illegal squatters i.e. informal settlers, which could also potentially cause a more insecure, unhealthy and aesthetically unpleasing environment by indirectly allowing crime and illegal dumping and health hazards to potentially ensue.

Cumulative impacts:

- Risk of increased litter generation.
- No Increased wealth in the community and trading opportunities created by the Proposed Development.
- No Skills development (minor).
- In a minor way, the public transport sector will remain economically static in that area with little to no potential for increased effective transport of individuals to the employment places and/or provision of additional employment opportunities. In view of the fact the site is located directly opposite other residential developments & is mainly an open vacant area, which is difficult and costly to maintain, it could in future also have a negative indirect impact on the safety i.e. security, of the area.

SECTION 2: PLANNING & DESIGN PHASE PROJECT SPECIFICATIONS EMPr TABLE (Table 2)

IMPACTS/ISSUES	ACTION / MITIGATION	RESPONSIBILITY	FREQUENCY
1. Documentation	Contract documents to include EMPr as part thereof i.e. the final EMPr (i.e. which includes <i>Appendix 3: Operational EMPr General Specifications – Basic</i>) must be made binding to the main contractors as well as individual contractors and should be included in documentation for the construction contract. The contractors must also ensure that the construction crew is aware of the requirements set out in the EMPr for this development prior to commencing activities on site.	Developer and consultants	Prior to construction starting.
2. Liaison with Authorities	Liaison with the City of Johannesburg Metropolitan Municipality.	Developer, ECO, Contractor	Once off
3. EMPr Specifications, Legislation, Guidelines, Regulations, Codes of Practice, Standards, By-laws etc.	<p>All National, Provincial and Local laws and regulations and relevant guidelines & International Standards need to be adhered to.</p> <p>Obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation (i.e. the National Environmental Management Act (#107 of 1998) and in terms of amendments to the Particular Conditions of Contract that pertain to this project.</p> <p>The requirements of this EMPr do not release the Developer from the requirements of any legislation that may be applicable to the project. A list of Legislation applicable to the project (although not limited to those listed) has been provided below for guidance and does not substitute any regulatory requirements and should where applicable, be read and applied in conjunction with all relevant laws, by-laws, regulations and compulsory specifications including the following:</p> <ul style="list-style-type: none"> • <i>National Environmental Management Biodiversity (Act 10 of 2004);</i> • <i>Hazardous Substances Act (#63 of 1977);</i> • <i>National Health Act (Act 62 of 2003);</i> • <i>DEAT (2005) Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria;</i> • <i>DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria; DEAT (2005) Guideline 4: Public Participation, in Support of the EIA Regulations, 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria;</i> 	Developer, ECO, Contractor	Prior to construction starting & continuous.

- National Environmental Management Act 107 of 1998;
- Environmental Impact Assessment Regulations 2014;
- National Heritage Resources Act, 1999 (Act no.25 of 1999);
- Occupational Health and Safety Act (Act No. 85 of 1993);
- The National Water Act (Act No. 36 of 1998);
- Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986);
- The Constitution Act (108 of 1996);
- Spatial Planning and Land Use Management Act 2013 (SPLUMA);
- Department of Environmental Affairs, 1992. The Integrated Environmental Management Procedure;
- NEMA (Act 107 of 1998) Amendment of the Environmental Impact Assessment Regulations 2014, 7 April 2017 [GN. R327, 7 April 2017: 1.(27) - The clearance of an area of 1 hectares or more, but less than 20 hectares...”
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004);
- GAUTENG SPATIAL DEVELOPMENT FRAMEWORK 2011;
- GAUTENG PLANNING AND DEVELOPMENT ACT, 2003;
- The Constitution Act (108 of 1996);
- Gauteng Conservation Plan 3.3;
- Gauteng Environmental Management Framework, THE DEVELOPMENT OF THE PROVINCIAL ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF) FOR GAUTENG - Draft Environmental Management Framework Report August 2014 - Produced by the Environomics Project Team, including: Environomics MetroGis EnviroGIS David Hoare Consulting NRM Consulting;
- DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT BIODIVERSITY MANAGEMENT DIRECTORATE GDARD REQUIREMENTS FOR BIODIVERSITY ASSESSMENTS VERSION 3;
- GAUTENG SUSTAINABLE DEVELOPMENT GUIDELINE: Adapted form the Version: H (Internal) of 2010 Sustainable Development Criteria Guideline – A condensed version: 1 of 2016.
- *NATIONAL DEVELOPMENT PLAN, 2030;*
- *CITY OF JOHANNESBURG The Spatial Development Framework – 2040;*
- *CITY OF JOHANNESBURG SPATIAL DEVELOPMENT FRAMEWORK (i.e. Regional Spatial Development Framework:(RSDF 2010/2011);*
- *National Spatial Development Perspective (NSDP);*
- *Gauteng Spatial Development Perspective (GSDP).*

4. Site Preparation <i>Sound environmental principles need to be adopted in the preparation of the site.</i>	i. The development footprint must be clearly marked prior to construction activities in order to ensure that the construction site and any construction activities do not encroach on surrounding operations.	Contractor	Once-off
	ii. Do not use the site for any other purpose other than for the proper carrying out of the Works under the Contract.	Contractor	Once-off
	iii. Marking for surveying and other purposes must be done using pegs, beacons or rope and droppers i.e. Corner pegs and servitudes to be clearly demarcated.	Contractor	Continuous
	iv. Utilise the method of de-bushing most appropriate for the environment and species in question. Favour mechanical rather than chemical methods wherever possible.	Contractor	Continuous
	v. No vegetation on neighbouring properties may be damaged or utilized	Contractor	Once-off
	vi. Exotic flora to be removed from the site; a weed control program implemented and spread of exotic species to be controlled.	Contractor/ECO	Once-off
	vii. Before any construction, borrowing and/or quarrying, the entire available topsoil layer has to be stripped. Ensure that it is stockpiled separately from subsoil and rocky material.	Contractor/ECO	Continuous
	viii. In the absence of a recognisable topsoil layer, strip the upper most 300mm of soil.	Contractor/ECO	Continuous
	ix. Co-ordinate excavation to limit unnecessarily prolonged exposure of stripped areas and stockpiles. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. All vegetation to be retained to be clearly marked.	Contractor/ECO	Once-off
	x. Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil.	Contractor	Once-off
	xi. Do not strip topsoil when it is wet.	Contractor	Once-off
	xii. Store stripped topsoil in an approved location and in an approved manner for later re-use in the rehabilitation process.	Contractor	Once-off
	xiii. Check site conditions and contract document prior to commencement of construction.	Contractor	Once-off
	xiv. Specialist to be appointed to execute – if required e.g. Historical/archaeological	Developer	Once-off
	xv. Finalise appointment of ECO.	Developer	Once-off
	xvi. Developer to take responsibility to implement EMPr and to appoint ECO.	Developer	Once-off
	xvii. Reasonable hours to be defined, 7h00-18h00 week, 8h00-14h00 Saturday.	Developer	Once-off
	xviii. Familiarise with necessity and benefit of Environmental awareness.	Developer	Continuous

<p>5. Construction site <i>Careful planning of the Construction site can ensure that time and costs associated with environmental management and rehabilitation are reduced.</i></p>	<p>1. Structures and accommodation</p> <p>i. Erect all temporary buildings and structures, including offices, workshops, and stores, within predetermined zones as per the approved site plan.</p>	Contractor	Initial set-up (Is)
	<p>ii. Ensure that essential services (including sanitation and drinking water facilities) are provided for all contract staff.</p>	Contractor	Initial set-up
	<p>iii. Maintain essential services in a functional state. These may not be overloaded. Defects and inadequacies must be rectified immediately.</p>	Contractor Project manager	Initial set-up Continuous
	<p>iv. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.</p>	Contractor/ Project manager	Initial set-up
	<p>2. Storage areas</p> <p>i. A suitable and safe area for storage of the construction material is to be provided.</p>	Contractor	Initial set-up
	<p>ii. Storage areas must be designated, demarcated and fenced if necessary.</p>	Contractor/Project mnger	In stp/Cntns
	<p>iii. Storage areas should be secure so as to minimise the risk of crime. They should also be safe from access by children/ animals etc.</p>	Contractor	Continuous
	<p>iv. Hazardous materials such as fuel, oil, paint, herbicide and insecticides shall be stored in bermed areas or under lock and key, as appropriate, in well ventilated areas.</p>	Contractor/ Project manager	Initial set-up
	<p>v. Definitions of hazardous substances / materials are those that are potentially: poisonous, flammable, carcinogenic or toxic.</p>	Contractor	Initial set-up & Continuous
	<p>vi. Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.</p>	Contractor	Continuous
	<p>vii. Fire prevention facilities must be present at all storage facilities.</p>	Contractor/Project manager	Continuous
	<p>viii. Sufficient care must be taken when handling these materials to prevent pollution.</p>	Contractor	Continuous
	<p>3. Roads and Access</p> <p>i. Choice of access routes should take into account minimum disturbance to public and neighbours in close proximity to the site.</p>	Contractor	Continuous
<p>ii. Wherever possible existing roads should be used to avoid the disturbance of other areas.</p>	Contractor	Initial set-up	
<p>iii. Runoff from roads must be managed to avoid erosion and pollution problems.</p>	Contractor	Continuous	

<p>6. VISUAL IMPACT: The construction phase (site offices, temporary fencing, storage of building material, excavations etc) will have a direct visual impact.</p> <p>‘Genius Loci The spirit, or sense, of place is that quality imparted by the aspects of scale, colour, texture, landform, enclosure, and in particular, the land use. According to K. Lynch (1992) <i>“it is the extent to which a person can recognise or recall a place as being distinct from other places as having a vivid, or unique, or at least a particular, character of its own.”</i></p> <p><u>The site without the proposed development:</u> The visual and aesthetical environment impact caused by the potential lack of adequate (i.e. sensitive, appropriate, in-context with the local surroundings and visual qualities of the site and other related visual aspects) – town planning, urban planning/design, architectural, landscape architectural design of facilities and site – and, the full implementation of the proposed mitigation measures. The applicant has appointed such specialists as indicated above and therefore</p>	<p>Effective mitigation is not always possible in the short term when construction takes place e.g. screening of construction site with shade netting & keeping building site clean & neat. Please refer to the Construction EMPr underneath.</p> <p>Planners, Architects & Landscape Architects and any other related professional, project managers and/or building contractor to plan, design and implement in the development proposal in such a sensitive manner which would be aesthetically pleasing and visually uplifting in it’s current township setting e.g. sympathetic materials and colours with the surrounding environment like hues of brown, grey etc; all yards and storage areas to be enclosed by masonry walls or screens which is screened by indigenous local biodiversity vegetation; external lighting should be confined to essential areas; lights should be low-level, where possible, and fitted with reflectors to avoid light spillage; lights and signage should be fixed to buildings or walls, where possible, to avoid unnecessary masts and visual clutter; other corporate or advertising signage and flags should be avoided or restricted etc. The visual and aesthetical environment impact caused by the potential lack of adequate (i.e. sensitive, appropriate, in-context with the local surroundings and visual qualities of the site and other related visual aspects) – town planning, urban planning/design, architectural, landscape architectural design of facilities and site – and, the full implementation of the proposed mitigation measures. The applicant has appointed such specialists as indicated above and therefore employed sufficient measures (mitigation) i.e. as far as possible, to make the proposed development an attractive and visually uplifting improvement on the site and aesthetically appealing towards the directly adjacent township environment.</p> <p>The relevant professionals i.e. Architect, Civil engineers, Landscape Architect etc, should be appointed by the developer to implement the final construction and planting plans & drawings which at least complies with the above-mentioned mitigation measures.</p>	<p>Developer, Contractor</p>	<p>Planning & Initial set-up (Is)</p>
---	---	------------------------------	---

<p>employed sufficient measures (mitigation) i.e. as far as possible, to make the proposed development an attractive and visually uplifting improvement on the site and aesthetically appealing towards the directly adjacent township environment.</p> <p><u>The site with the Proposed Development:</u></p> <p>The presence of the proposed facilities [i.e. proposed Public Transport Facility] which is an essential and long overdue formalised basic services (transport) amenity, in the midst of a township (i.e. Emdeni & Zola in SOWETO) with a plethora of mixed uses, facilities, activities and elements (i.e. litter and refuse dumping) which is currently in general a visual 'confusion' of disconnectedness (i.e. not integrated in a sensitive cohesive way visually and aesthetically) and gross unpleasantness to the urban-township, remaining heavily impacted (i.e. totally transformed, compromised and <i>Seriously</i> modified ecosystem state) natural environment (i.e. wetland within a valley bottom system with shallow water and no</p>			
---	--	--	--

<p>distinct riparian zone) and other surrounding land uses in that area (e.g. fuel station etc), with no visual 'theme' or specific architectural and/or landscape architectural style or character which unifies the visual 'landscape' as a whole] - will have a minor positive visual impact in the area, particularly for the directly adjacent land occupiers and users, public transport vehicle users and drivers, motor vehicle drivers and/or pedestrians - especially if the landowner/developer will develop the proposed facilities in a visual sensitive way which responds positively to its natural and surrounding built-up environment and rehabilitates the wetland and stream and maintain it a good condition. The applicant has appointed such specialists as indicated above and therefore employed sufficient measures i.e. as far as possible, to make the proposed development an attractive and visually uplifting improvement on the site and aesthetically appealing towards the directly adjacent township environment. This proposed development (i.e. facilities, infrastructure, landscaping,</p>			
---	--	--	--

<p>attenuation ponds etc) however, calls for and would require as an essential part of the successful functioning of the facilities and maintaining the original visual character and aesthetical appeal of it - a highly efficient maintenance and effective full time management program.</p>			
<p>7. VISUAL IMPACT: <u>Impact on Sense of Place:</u> i.e. Planning/design phase could potentially ignore importance of quality of visual / aesthetical appeal/relevance in context of environment e.g. contextual appeal of proposed buildings, structures & landscape.</p>	<p>1. the longer-term visual impact of the proposed development could only be mitigated effectively and could become a positive Visual asset to its environment subject to the appointment of a professional Architect and Landscape Architect - and compliance to all of their planning, design and construction recommendations and plans - who should take into consideration all aspects of design and layout in it's current and futuristic context i.e. biophysical, ecological, visual, cultural etc.</p>	Developer and consultants	Prior to construction
<p>8. ACCESS ROADS: New access roads and haulage routes could impact on areas of sensitivity (fauna and flora, wetlands, spruit etc.).</p>	<ol style="list-style-type: none"> 1. Temporary access and haulage routes must be designed prior to construction commencing to ensure that the most preferable access and haulage routes has been identified. Provision made for the erection of appropriate warning signs. 2. Road safety must be taken into account when planning access to the site. 3. Use should be made of existing roads as far as possible. 4. Strict adherence to EMPr. 	Developer and consultants	Prior to construction

3 CONSTRUCTION PHASE EMPr

3.1 OBJECTIVES OF THE CEMPr

The aim of a CEMPr is to facilitate appropriate environmental input during the construction phase of a project and it aims to address mitigation measures pertaining to the construction phase as identified during the course of the Basic Assessment. To achieve this, the CEMPr must specify the limitations the contractor must abide by during construction, detail the issues that he should take cognisance of and indicate specific actions he must and must not undertake so as to ensure that the environment is not unnecessarily damaged. The CEMPr thus specifies the framework within which the contractor must carry out his operations.

In addition, the CEMPr provides a clear indication of the environmental management requirements of each of the role players involved during the construction phase of the development. Guidance for the implementation of the CEMPr is provided including guidance regarding method statements which are required to be implemented to achieve compliance with the Environmental Specifications. Corrective actions and/or penalties in the event of non-compliance with the CEMPr are also defined.

3.2 COMPONENTS OF THE CEMPr

The CEMPr consists of the following components:

1. Implementation of the CEMPr: Roles and responsibilities, organisational and communications structures;
2. Environmental Specifications: Detailed environmental requirements and standards for the construction phase.

3.3 IMPLEMENTATION OF THE CEMPr

3.3.1 INTRODUCTION

This document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised during the construction phase of this project. The CEMPr is applicable to all works comprising the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with associated Civil Services infrastructure.

This includes works outside of the site boundaries that form part of the project works. It is an open-ended document implying that information gained during construction activities and/or monitoring of procedures on site could lead to changes in the CEMPr.

The appointed ECO (Environmental Control Officer) will monitor compliance with the CEMPr and other Conditions of Approval as they relate to environmental matters. This CEMPr gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties and/or corrective actions are described in this CEMPr and are thus to be included into the official contract documentation. The Contractor is obliged to inform the ECO immediately of events that may cause serious environmental damage or breach the requirements of the CEMPr. The ECO in turn will immediately inform the Engineer and Developer and, if necessary, the Local Authority, of such events.

3.3.2 ROLES AND RESPONSIBILITIES

The key role-players during the construction phase of the development, for the purposes of environmental management on site include, but are not limited to: the Developer, the Engineer, the main Contractors (An Environmental Liaison Officer should be appointed by the main contractor and should represent the contractor & contact directly with ECO. Direct contractor appointments includes: civil works contractor, building contractor, Landscape Contractor etc.) and the Environmental Control Officer (ECO). There may also be representatives of the relevant Authority/ies if required.

Details of the responsibilities of each of the key role-players have been provided underneath. Lines of communication and reporting between the various parties are illustrated in **Figure 3** below.

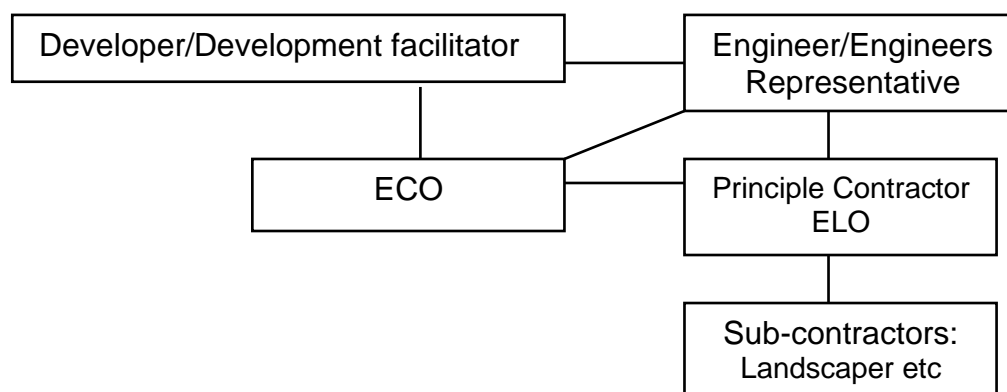


Figure.3: Typical communication and reporting structure

3.3.2.1 The Developer

The Developer refers to the relevant current owner and/or the future owner to which the current owner of the PROPOSED ZOLA EXTENSION 3 TOWNSHIP to be situated on a Part of the REMAINDER of the FARM SOWETO 387 IQ (City of Johannesburg - Gauteng) with associated Civil Services infrastructure will legally sell (i.e. transfer ownership) or rental of the said property too and its appointed facilitators, to whom permission has been granted to proceed with the development, and who is thus ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority.

With respect to the construction phase of the Development, the Developer is to:

- ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site;
- ensure that GDARD have been notified of the date on which construction activities will be starting, prior to commencement of the activity;
- ensure that construction activities start prior to the expiration date of the Record of Decision issued by GDARD, failing which the approval of the development by this department will lapse;
- appoint a suitably qualified or experienced Environmental Control Officer prior to the start of construction activities on site, and for the duration of the construction phase.

3.3.2.2 The Engineer

For the purposes of this document “The Engineer” refers to the engineer for the development, or any other person authorised by the Developer, to be responsible for the technical and contractual implementation of the works to be undertaken.

The responsibilities of the Engineer are to:

- ensure that the requirements as set out in this CEMPr and by the relevant Authorities are adhered to and implemented;
- assist the ECO in ensuring that the conditions of the CEMPr are being adhered to and promptly issuing instructions requested by the ECO, to the Contractor. All site instructions relating to environmental matters issued by the Engineer are to be copied to the ECO;
- assist the ECO in making decisions and finding solutions to environmental problems that may arise during the construction phase;
- reviewing and approving construction method statements with input from the ECO;
- ordering the removal of person(s) and/or equipment not complying with the specifications (as required by the ECO or otherwise);
- issuing of penalties and/or corrective actions for transgressions of Environmental Specifications;
- providing input into the ECO's ongoing internal review of the EMPr.

3.3.2.3 The Contractor

For the purposes of this document "The Contractor" refers to any directly appointed (by the Developer) company or individual undertaking the implementation of the works.

The Contractor (i.e. the ELO taking on the responsibilities & executing them) is to:

- ensure implementation of all applicable Environmental Specifications, including all additional requirements related with approved method statements, during all works on site, failing which penalties and/or corrective actions, as outlined in the Environmental Specifications may be imposed by the ECO via the Engineer;
- ensure that all of its sub-contractors', employees, suppliers, agents or servants etc. are fully aware of the environmental requirements detailed in the Environmental Specifications;
- liaise closely with the Engineer and the ECO and ensure that the works on site are conducted in an environmentally sensitive manner;
- inform the Engineer as well as the ECO should environmental issues on site go wrong, e.g. dumping, pollution, littering and damage to vegetation;
- carry out instructions issued by the Engineer, on request of the ECO, required to fulfil his/her compliance with the CEMPr.

3.3.2.4 Environmental Control Officer

During the construction phase of the project, the ECO is to:

- ensure that the Contractor has a copy of the CEMPr and all agreed method statements;
- undertake weekly site inspections (frequency may change as required) to audit compliance of all parties with the requirements of the CEMPr;
- advise/recommend on actions or issues impacting on the environment to the Engineer, who shall issue any required Site Instructions to the Contractor;
- to environmentally educate and raise the awareness of the Contractor and his staff as to the sensitivity of the Site and to facilitate the spread of the correct attitude during works on Site;
- reviewing and approving construction and/or landscaping method statements together with the Engineer and/or Landscape Architect;
- assisting the Contractor in finding environmentally responsible solutions to problems;
- recommend to the Engineer the issuing of a penalty for any environmental damage caused on site, or non-compliance with the Environmental Specifications;

- recommend to the Engineer the removal of person(s) and/or equipment not complying with the Specifications;
- act as the contact person between the Developer, GDARD and the public with regard to environmental matters;
- keeping a register of complaints and recording and dealing with any community comments or issues, having reported these first to the Engineer;
- undertake photographic monitoring of the construction site (if required);
- keep records of all activities/ incidents on Site in a Site Diary concerning the environment (if required);
- completing temporary and permanent site closure checklists (if required);
- to take immediate action on Site to stop works where significant and irreparable damage is being inflicted on the environment, and to inform the Engineer immediately of the occurrence and action taken;
- undertaking a continual internal review of the EMPr and making recommendations to the Engineer and Developer.

The ECO has the authority to recommend to the engineer and the local authority that works be stopped, if in his/her opinion serious harm to, or impact on, the environment is imminent, is likely to occur or has occurred and such actual or potential harm or impact is in contravention of this CEMPr, and which is, or may be, caused by construction, or related works.

Upon failure by the Contractor or contractor's employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Engineer and the project management team to have the Contractor's representative, or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

The ECO shall keep a site diary in which events and concerns of environmental significance are to be recorded. The ECO will compile a monthly report of such events, concerns and general compliance of the Contractor with the CEMPr (if required). This report will be submitted to the Engineer. The ECO is also required to attend regular site meetings of the project management team to report on environmental issues and minute requirements.

The ECO will be responsible for the compilation of a final closure checklist for the project, completed when all works related to the project have been completed and the site has been cleared of all construction related debris, materials or equipment not forming part of the permanent works.

3.3.3 COMMUNICATION STRUCTURES ON SITE

3.3.3.1 Site Meetings

The ECO is required to attend regular site meetings (no more than once every 2 weeks and no less than once a month) of the project management team to facilitate the transfer of information and to update all parties on the environmental compliance of the project as a whole and minute requirements.

The ECO will present a summary report outlining the main construction activities that relate to the environment, at this meeting (if required – to be arranged with Engineer and Contractor on a monthly basis).

The minutes of these meetings will form part of the CEMPr records. These minutes will reflect environmental queries, agreed actions and dates of eventual compliance by the Contractor.

The following people should attend these meetings:

- Developer's Representative;
- Engineer;
- Architect,
- Landscape Architect (when applicable);
- The ECO;
- Contractor(s) representative (ELO).

3.3.3.2 Environmental Education Programme

The Contractor (ELO) in consultation with the ECO shall arrange for a presentation to site staff to familiarise them with the environmental aspects of the CEMPr within seven days from the Commencement Date. This presentation should take cognizance of the level of education, designation and language preferences of the staff. General site staff would commonly receive a basic environmental awareness course highlighting general environmental "do's and don'ts" and how they relate to the site. Management on site e.g. site agents and foremen, who require more detailed knowledge about the environmental sensitivities on site and the contents and application of the CEMPr document itself, will benefit from a separate presentation dealing with these issues.

3.3.3.3 Method Statements

The Contractor (ELO) shall provide Method Statements for approval by the ECO and the Engineer prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the CEMP, when called upon to do so by the Engineer or ECO.

A Method Statement is a "live document" in that modifications are negotiated between the Contractor and the ECO/project management team, as circumstances unfolds. All Method Statements will form part of the CEMPr documentation and are subject to all terms and conditions contained within the CEMPr.

Note that a Method Statement is a 'starting point' for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk of harm to the environment.

Changes to, and adaptations of, Method Statements can be implemented with the prior consent of all parties.

A Method Statement describes the scope of the intended work in a step-by-step description in order for the ECO and the Engineer to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks. For each instance where it is requested that the Contractor submit a Method Statement to the satisfaction of the Engineer and ECO, the format should clearly indicate the following:

- What - a brief description of the work to be undertaken;
- How - a detailed description of the process of work, methods and materials;
- Where - a description/sketch map of the locality of work (if applicable); and
- When - the sequencing of actions with due commencement dates and completion date estimates.
- Who – The person responsible for undertaking the works described in the Method Statement;
- Why – a description of why the activity is required.

All Method Statements are to be to the satisfaction of the ECO, Engineer and, where practical and deemed necessary, should be endorsed as being acceptable by the environmental representative of the Relevant Authority.

A list of some of the Method Statements that the Contractor may need to submit during the course of the construction contract has been provided in Section 3, along with an indication of those which the ECO may require the Contractor to provide prior to the start of works on site (see **Appendix 2** for a Method Statement Template).

3.3.3.4 ECO Diary Entries

The ECO will maintain a site diary that relates to environmental issues as they occur on site for record keeping purposes (if required). Comments from this diary will form part of reports presented at site meetings by the ECO.

3.3.3.5 Site Memo Entries

Site memo's, stipulating recommended actions required to improve compliance with the CEMPr by the contractor, will be issued by the ECO to the Engineer, who in turn will ensure that the Contractor is informed of the said instruction.

Comments made by the ECO in the Site Memo book are advisory and all Site Instructions required may only be issued by the Engineer. Site Memo's will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activity(ies) of the Contractor deemed to pose immediate and serious risk of unnecessary damage to the environment.

3.3.4 LEGISLATIVE FRAMEWORK, GUIDELINES & INTERNATIONAL STANDARDS

Obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation (i.e. the National Environmental Management Act (#107 of 1998) and in terms of amendments to the Particular Conditions of Contract that pertain to this project.

The requirements of this EMPr do not release the Developer from the requirements of any legislation that may be applicable to the project. A list of Legislation applicable to the project (although not limited to those listed) has been provided below for guidance:

- *National Environmental Management Act (#107 of 1998);*
- *National Environmental Management Biodiversity (Act 10 of 2004);*
- *National Heritage Resources Act (#25 of 1999);*
- *National Water Act (#36 of 1998);*
- *Occupational Health and Safety Act (#85 of 1993);*
- *Hazardous Substances Act (#63 of 1977);*
- *National Health Act (Act 62 of 2003);*
- *National Environmental Management Biodiversity (Act 10 of 2004);*
- *National Heritage Resources Act (#25 of 1999);*
- *National Water Act (#36 of 1998);*
- *Cleaning Chemicals for Use in the Food Industry (SANS 1828);*
- *SANS 10131:2004 (i.e. Edition 1 ISBN 0-626-15187-2 SOUTH AFRICAN NATIONAL STANDARD Above-ground storage tanks for petroleum products Published by Standards South Africa 1 dr Iategan road groenkloof private bag x191 pretoria 0001. Tel: 012 428 7911 fax: 012 344 1568 international code + 27 12 www.stansa.co.za © Standards South Africa 2004).*

3.3.5 DISPUTE RESOLUTION

Any disputes or disagreements between role players on Site (with regard to environmental management) will be referred to the Engineer.

Where a dispute then still persists, this shall be referred for arbitration to a panel of persons made up of one specialist environmental consultant, one qualified engineer, one official of the local authority and one legal practitioner of no less than 4 years experience in environmental issues whose decision by simple majority will be final and binding on the parties. This arbitration will be informal (“the informal arbitration”) and will be finalised within a period of 48 hours from the date of the ruling of the ECO, the purpose being to ensure that disagreements are rapidly resolved and thereby to limit any prejudice to the contractor or the other parties to this agreement in the construction process. In the event of a deadlock in the aforesaid panel, the legal practitioner forming part of the panel will have a casting vote.

3.3.6 COMMUNITY RELATIONS

The Developers shall be responsible for responding to third party or public queries and/or complaints relating to operations. In addition, the Developers shall be responsible for dissemination of information to the community and the media (press releases, notice boards, etc) if required.

The Contractor shall notify the ECO and the Engineer of any complaints lodged. The Contractor shall be responsible for maintaining a Complaints Register to record complaints received and action taken. This register will be made available to the ECO, the Engineer and the relevant Authority.

3.3.7 SOCIAL RESPONSIBILITIES

The Developer and Contractors shall encourage and implement wherever possible the procurement of locally based labour, skills and materials.

3.3.8 RECYCLING

Wherever possible, materials used or generated by construction shall be recycled. Containers for glass, paper and metals shall be provided separate to general waste bins. Office and camp areas are particularly suited to this form of recycling process. Where possible and practical, such as at stores and offices, waste shall be sorted for recycling purposes. Recycling protocols shall sort materials into the following categories:

- Paper / cardboard
- Aluminium
- Metals (other than aluminium)
- Organic waste
- Glass

**Recycling ensures that we do not waste valuable resources.
Recycling can also create employment opportunities.**

3.4 ENVIRONMENTAL SPECIFICATION

3.4.1 SCOPE

This Specification covers the requirements for controlling the impact on the environment of construction activities.

3.4.2 APPLICATION

This Specification contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment. The roles and responsibilities in terms of the application and implementation of this Specification have been outlined in Section 2 above.

3.4.3 METHOD STATEMENTS

Any Method Statement required by the Engineer, Architect and/or any other delegated professional - or the Environmental Specification, shall be produced within such reasonable time as the Engineer shall specify or as required by the Specification. The Contractor shall not commence the activity until the Method Statement has been approved and shall, except in the case of emergency activities, allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be withheld.

The Engineer may request a Method Statement for any activity he believes may impact on the environment. The Engineer may also require changes to a Method Statement if the proposal does not comply with the Specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the Specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

The following Method Statements shall be provided by the Contractor and submitted to the ECO at least 7 working days before site establishment:

3.4.3.1 Site camp and site division (Clause 3.4.4.1 and 3.4.4.2)

The location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project)

3.4.3.2 Vegetation clearing (Clause 3.4.4.3a)

Method of vegetation clearing during site establishment and disposal procedure for cleared material.

3.4.3.3 Access/haul routes (Clause 3.4.4)

Details, including a drawing, showing where and how the access points and routes will be located and managed, including traffic safety measures.

3.4.3.4 Fuel storage and use (Clause 3.4.5.2)

The design, location and construction of the fuel storage area, service areas as well as for the filling and dispensing from storage tanks and management of drip trays.

3.4.3.5 Solid waste management (Clause 3.4.5.3)

Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites. Include details of the proposed recycling program.

3.4.3.6 Contaminated water (Clause 3.4.5.7)

Methods of minimizing, controlling, collecting and disposing of contaminated water.

3.4.3.7 Hazardous substances (Clause 3.4.5.8)

Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

3.4.3.8 Cement and concrete batching (Clause 3.4.5.18)

Cement powder has a high pH. Spillage of dry cement powder and concrete slurry will affect both soil and water pH adversely. Careless handling of cement products resulting in spillage can have detrimental effects on the surrounding environment.

The permitted location of the batching plant (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the ECO. A Method Statement indicating the layout and preparation of this facility is required in this regard.

3.4.3.9 Emergency procedures (Clause 3.4.5.19)

The Contractor shall submit Method Statements covering the procedures for the following emergencies:

a) Fire

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedure to be followed in the event of a fire.

b) Accidental leaks and spillages

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured.

Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil) should include details of risk reduction measures to be implemented including firefighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

Other Method Statements required by the Engineer and ECO during the course of construction are to be provided by the Contractor a minimum of 14 working days prior to commencement of the works or activities to which they apply (these activities may not commence on site before these Method Statements have been approved except in the case of emergency activities).

3.4.3.10 Drilling and Blasting (Clause 3.4.5.32)

The Contractor shall submit Method Statements covering the procedures, materials, safety precautions, programme and any other relevant information required by Law, the Engineer, ECO, GDARD and/or any other Authority for Drilling and Blasting.

3.4.3.11 Safety

The Contractor shall at all times observe proper and adequate safety precautions on the Site. Telephone numbers of emergency services, including the local firefighting service, shall be posted conspicuously in the Contractor's office near the telephone.

No unauthorised firearms are permitted on Site.

The Occupational Health and Safety Act (Act 85 of 1993) and in particular the requirements of the Construction Regulations issued in July 2003, must be complied with.

3.4.3.12 Security

With the possible exception of any security staff who may be required to stay overnight at the Contractor's Camp, no personnel will be permitted to live on site. Security staff must be provided with heating and cooking facilities (in order that they do not need to light fires) access to toilet facilities and communication equipment.

Any security lighting at the Contractor's Camp is to be placed in such a way as to not cause a nuisance to residents of the area and traffic on adjacent roads.

3.4.3.13 Community relations

The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer. The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself.

3.4.4 SITE ESTABLISHMENT

3.4.4.1 Site division

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified.

A Method Statement detailing the layout and method of establishment of the construction camp (including all buildings, hostels, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) shall be submitted.

3.4.4.2 Site demarcation

The Contractor shall erect and maintain permanent and/ or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

3.4.4.3 Construction areas

The minimum practical area outside of the Building Zone within which construction activity can take place must be identified and marked. This is called the construction space and must be clearly marked for each site, or wherever infrastructure construction activity is to take place, (i.e. the road reserves.) This will include the area of the actual structure - the 'building footprint,' and the 'building zone,' the area within which proposed residences (houses) and infrastructure may be built.

The 'construction space' is a clearly defined area within which all construction activity, scaffolding, storage of building materials etc. is to be confined.

This area will be smaller than the site size, i.e. the whole site is not allowed to be used as a working area.

These 'construction spaces' are to be determined on the site by the Engineer, the ECO in conjunction with the landscape rehabilitation contractor or specialist. The 'construction space' (i.e. its size and shape) will be informed by the slope of the erf and the position and shape of the proposed building.

All areas outside the 'construction space' are to be cordoned off by danger tape wrapped around at least one strand of galvanized wire and construction crews are to be forbidden access to these areas.

The contractor must store any building rubble in a suitable area designated by the site agent and should ideally be removed from site on a weekly basis, if such waste material is not to be used as fill.

No reshaping of the land outside the 'construction space' is allowed.

The above applies to all POS areas as well where the natural existing shape of the landscape is to be preserved.

The ECO, Engineer & contractor must ensure that green areas are off limits to construction crews, vehicles and earth moving machinery.

Where excavation or construction work for the infrastructure temporarily requires extra room, the need is to be discussed with the Engineer and ECO and an agreed area marked off for use.

All open excavations must be protected with danger tape or fencing where construction staff or the public may have access to such areas.

3.4.4.4 Site Clearance

a) Vegetation

A landscape rehabilitation plan and/or specification should be drawn up and/or compiled by a Landscape Professional (e.g. Landscape Architect or Landscape Technician) and/or Landscape Contractor that specializes in rehabilitation work prior to any construction work.

- should it be required. This Landscape Rehabilitation Plan and/or Specification should be compliant to / adhere to any further recommendations, mitigation measures and/or recommendations of the Landscape Architect for this proposed development - should it be required. This landscape rehabilitation plan and/or specification should be obtained from the Developer prior to construction and strictly adhered to throughout the construction phases - should it be required.

b) Topsoil

Topsoil / top material shall be removed from all areas cleared of vegetation and retained for future landscaping use, where feasible. Top material should exclude litter, building rubble, alien plant material or any other waste.

Topsoil shall be stored in areas demarcated by the ECO and Engineer and in piles not higher than 2 m. The stockpiles shall not be compacted or disturbed and shall be domed at the top to promote runoff. Should significant erosion (e.g. through rain or wind) of the stockpiled material occur, the stockpiles should be covered with shade cloth or Geotech fabrics or similarly suitable material to prevent such erosion e.g. mulched indigenous waste plant material.

3.4.4.5 Access routes/ haul roads

The Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of 45 km/h.

3.4.5 GENERAL REQUIREMENTS

3.4.5.1 Materials handling, use and storage

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

All manufactured and/ or imported material shall be stored within the Contractor's camp. All lay down areas outside of the construction camp shall be subject to the Engineer's approval.

3.4.5.2 Fuel (petrol and diesel) and oil

All fuel is to be stored within a demarcated area in the Contractor's Camp. No refueling of vehicles or machinery is to take place outside of this demarcated area unless authorised by the Engineer. The Engineer shall be advised of the area that the Contractor intends using for the storage of fuel.

The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in tanks with lids, which are kept firmly shut. Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.

Tanks containing fuels shall be situated on a smooth impermeable surface (plastic or concrete) base with a bund (if plastic it must have sand on top to prevent perishing) to contain any possible spills and prevent infiltration of fuel into the ground. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% x the total capacity of all the storage tanks.

The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel to be removed. An *Enretech* or similar hydrocarbon absorption/remediation product approved by the ECO shall be installed in the sump to reduce the risk of pollution. Bulk fuel storage and bunded areas shall have overhead cover to prevent rain from entering the bunded area.

The Contractor shall keep fuel under lock and key at all times.

If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use.

During fuel tanker delivery, the tanker driver must be present at all times during offloading of product. An emergency cut off switch must be installed to immediately stop fuel delivery should an accident occur. An anti-flash nozzle must be installed at the end of the vent pipe with a fuel dispenser equipped with an automatic cut off switch to prevent fuel tank overfills.

Vehicles using the temporary fuel storage tanker must be located on a concrete hard standing area for fuel containment.

No smoking shall be allowed in the vicinity of the stores. Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" are to be provided, and are to conform to the requirement of SABS 1186. The volume capacity of the tank shall be displayed. The product contained within the tank shall be clearly identified; using the emergency information system detailed in SABS 0232 part 1. Any electrical or petrol-driven pump shall be equipped and positioned, so as not to cause any danger of ignition of the product.

Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of the Municipal Fire Prevention Officer.

The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

Where reasonably practical, plant shall be refueled at a designated re-fuelling area or at the workshop as applicable. If it is not reasonably practical then the surface under the temporary refueling area shall be protected against pollution to the reasonable satisfaction of the Engineer prior to any refueling activities. The Contractor shall ensure that there is always a supply of appropriate material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200l of hydrocarbon liquid spill. This material must be approved by the Engineer prior to any refueling or maintenance activities.

3.4.5.3 Solid waste management

For the purposes of these Environmental Specifications, solid waste includes all debris and waste (e.g. litter, food waste, cable pieces, vegetation and tree stumps, building rubble, etc), including hazardous waste (e.g. oils).

The Contractor shall be responsible for the establishment of a waste control system that is acceptable to the Engineer and ECO, and a method statement is required in this regard.

NO REFUSE OR WASTE MATERIAL WILL BE DISPOSED OF BY BURYING.

a) Refuse Control

The Contractor shall provide labourers to clean up the Contractor's camp and working areas at least once a week.

Litter and waste materials (excluding rubble and hazardous waste materials) shall be disposed of into scavenger- and weather-proof bins. The Contractor shall provide sufficient bins with lids on Site to store the waste produced on a daily basis. Bins shall not be allowed to become overfull and shall be emptied a minimum of once daily. The waste may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer has approved. The Contractor shall then remove the refuse collected from the working areas, from Site at least once a week. Refuse must be disposed of at a site approved by the Engineer and Local Authority.

The Contractor shall ensure that waste and surplus food, food packaging and organic waste are not deposited by employees anywhere on the site except in refuse bins.

b) Empty Cement Bags

Empty cement bags must be collected from the construction area by the end of every day and before rain events and shall be stored in bins that are either placed under cover or have been fitted with lids. This prevents the bags getting wet and the cement powder leaching into the environment.

c) Hazardous Waste

Petroleum, chemical, harmful and hazardous waste is to be stored in an enclosed and bunded area. The location of these sites is to be approved by the Engineer and the ECO. This waste shall be disposed of at a hazardous waste disposal site as approved by the Local Authority. The Contractor shall submit copies of receipts from such waste disposal sites to the Engineer and ECO as proof of proper disposal. Storage and disposal etc is also controlled through other relevant legislation which must be complied with e.g. Occupational Health & Safety Act.

d) Builders' rubble

The Contractor shall provide labourers to clean up the Contractor's camp and working areas of rubble generated in the course of construction work at least once a week.

Rubble shall be temporarily stockpiled in a waste skip or a central stockpile and shall be removed from site to an approved landfill site as soon as it constitutes a practical load for removal and before temporary closure of the site. No plastics, shrink wrap, paint buckets or any other debris that does not constitute clean building rubble, shall be stored at such stockpile sites.

3.4.5.4 Ablution facilities

Washing, whether of the person or of personal effects and acts of excretion and urination are strictly prohibited other than at the facilities provided.

Latrine and ablution facilities and first-aid services shall comply with the regulations of the local authority concerned and shall be maintained in a clean and sanitary condition to the satisfaction of the Engineer.

The Contractor shall provide suitable sanitary arrangements at the Contractor's Camp and approved points around the designated work area to allow easy access to all employees on site. No staff is permitted to commence with work on a site without suitable toilet

facilities available for them. Sanitary facilities shall be located within 100 m from any point of work, but not closer than 50 m to any water body. One chemical toilet is to be provided on site for every 15-contract personnel at each working area. These toilets must have doors and locks and shall be secured to prevent them blowing over. Toilet paper shall be provided.

The Contractor shall ensure that suitable sanitation facilities are provided for or by all his sub-contractors on site.

Toilets are to be emptied prior to builders' holidays. The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

The Contractor shall keep the toilets in a clean, neat and hygienic condition. If the Contractor fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the Engineer may order the Contractor to suspend any or all work on the site until these requirements are met. No payment shall be made for any delays or disruption of the Works caused thereby nor shall extensions of time be granted for such delays.

3.4.5.5 Eating areas

The Contractor shall designate eating areas to the approval of the Engineer which shall be clearly demarcated. Sufficient bins, as specified shall be present in this area. Any cooking on Site shall be done on well-maintained gas cookers with fire extinguishers present.

3.4.5.6 Drinking water

The Contractor shall ensure that drinking water is available for all staff on site. If no potable water source is available on site then the Contractor shall import drinking water to the site.

3.4.5.7 Contaminated water

Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained, and the water table not endangered. Water containing such pollutants as cements, concrete, lime, chemicals, fuels and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to water emanating from concrete batching plants and concrete swills, and to runoff from fuel depots/workshops/truck washing areas.

Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Contractor shall notify the Engineer immediately of any pollution incidents on Site.

A Method Statement shall be required for all wash areas where hydrocarbon and hazardous materials, and pollutants are expected to be used. This includes, but is not limited to, vehicle washing, workshop wash bays and paint equipment cleaning. Wash areas for domestic use shall ensure that the disposal of contaminated "grey" water is sanctioned by the Engineer.

3.4.5.8 Hazardous substances

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS's shall be followed in the event of an emergency situation.

If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/ materials to be used, together with the storage, handling and disposal procedures of the materials.

No paint products and chemical additives and cleaners such as thinners and turpentine may be disposed of on Site. Brush / roller wash facilities shall be established to the satisfaction of the Engineer. A Method Statement, approved by the Engineer, is required.

3.4.5.9 Site structures

The Contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection.

3.4.5.10 Lights

The Contractor shall ensure that any lighting installed on the site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.

3.4.5.11 Workshop, equipment maintenance and storage

Where practical, all maintenance of plant on Site shall be performed in the workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing activities.

The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable floor either constructed of concrete or thick plastic covered with sufficient sand to protect the plastic from damage. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages of substances (e.g. oil). A Method Statement detailing the design and construction of the workshop must be submitted.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles).

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in the workshop or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate and nitrate containing and low sudsing-type detergents.

3.4.5.12 Noise

The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). When working in built-up areas, or any areas within audible distance of residents whether in urban, peri-urban or rural 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 85 dB(A) during excavations and other work.

Appropriate directional and intensity settings are to be maintained on all hooters and sirens.

No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

The Contractor's attention is drawn to the Noise Regulations as promulgated in terms of the Environment Conservation Act and relevant Local Authority bylaws.

3.4.5.13 Environmental awareness training

Environmental awareness training courses shall be run for all personnel on site. Two types of course shall be run, one for the Contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the Engineer.

Contractor general site staff are to attend an initial presentation of approximately 45 minutes, and approximately half an hour a month thereafter for the duration of the contract shall be allowed for employees to attend any follow-up lectures, should such follow-up lectures be deemed necessary by the ECO. In addition, all new staff and sub-contractors employees that spend more than 1 day a week or four days in a month to attend the environmental education program within 1 (one) week of commencement of work on site. The Contractor shall supply the ECO with a monthly report indicating the number of employees that will be present on site during the following month and any changes in this number that may occur during the month.

No more than 30 people shall attend each course and the cost, venue and logistics for this/ these course/s shall be for the Developer's responsibility. The ECO shall keep a register of all personnel attending the Environmental Education Program.

Notwithstanding the specific provisions of this clause it is incumbent upon the Contractor to convey the sentiments of the EMP to all personnel involved with the works.

a) Training course for management and foremen

The environmental awareness training course for management shall include all management and foremen. The course, which will be presented by the Engineer or ECO, will be of approximately one-hour duration. The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

b) Training course for site staff and labour

The environmental awareness training course for site staff and labour shall be presented by the Engineer or ECO. The course will be approximately 45 minutes long. The course shall be run not more than 7 days after commencement of work on site with sufficient

sessions to accommodate all available personnel. Subsequent courses shall be held as and when required.

3.4.5.14 Contractor's Environmental Officer

The Contractor shall appoint an Environmental Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with this Specification. The Contractor shall submit the name of the Contractor's Environmental Officer to the Engineer for his approval seven days prior to the date of the environmental awareness training course.

3.4.5.15 "No go" areas

If "no-go areas" are defined, the Contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or material enters the "no go" areas at any time.

3.4.5.16 Construction personnel information posters

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters shall be erected at the eating areas and any other locations specified by the Engineer.

3.4.5.17 Fire control

No fires may be lit on site. Any fires, which occur, shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame. In terms of the Atmospheric Pollution Prevention Act, burning is not permitted as a disposal method.

The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Contractor shall forward the name of the Fire Officer to the Engineer for his approval seven days prior to the date of the environmental awareness training course.

The Contractor shall ensure that there is basic fire-fighting equipment available on site at all times.

3.4.5.18 Concrete and Cement Work

Cement powder has a high pH. Spillage of dry cement powder and concrete slurry will affect both soil and water pH adversely. Careless handling of cement products resulting in spillage can have detrimental effects on the surrounding environment.

The permitted location of the batching plant (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the ECO. A Method Statement indicating the layout and preparation of this facility is required in this regard.

Cement is to be stored in a secure weatherproof location to avoid contamination of the environment.

All runoff from batching areas shall be strictly controlled so that contaminated water does not enter stormwater, or groundwater. Dagma boards and mixing trays should be used at all mixing and supply points. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment:

Suitable screening and containment shall be in place to prevent windblown contamination associated with bulk cement silos, loading and batching.

All visible remains of excess concrete shall be physically removed to an approved Municipal waste site on completion of the plaster or concrete pour section and disposed of. Used cement bags are to be stored in a wind and rainproof container for disposal. Used bags may not lie around on site nor may they be burnt on site.

3.4.5.19 Emergency procedures

The Contractor shall submit Method Statements covering the procedures for the following emergencies:

a) Fire

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedure to be followed in the event of a fire.

b) Accidental leaks and spillages

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured.

3.4.5.20 Safety

The Contractor shall at all times observe proper and adequate safety precautions on the Site. Telephone numbers of emergency services, including the local firefighting service, shall be posted conspicuously in the Contractor's office near the telephone.

No unauthorised firearms are permitted on Site.

The Occupational Health and Safety Act (Act 85 of 1993) and in particular the requirements of the Construction Regulations issued in July 2003, must be complied with.

3.4.5.21 Security

With the possible exception of any security staff who may be required to stay overnight at the Contractor's Camp, no personnel will be permitted to live on site. Security staff must be provided with heating and cooking facilities (in order that they do not need to light fires) access to toilet facilities and communication equipment.

Any security lighting at the Contractor's Camp is to be placed in such a way as to not cause a nuisance to residents of the area and traffic on adjacent roads.

3.4.5.22 Community relations

The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself.

3.4.5.23 Protection of natural features

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations or trees etc.) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

3.4.5.24 Protection of flora and fauna

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted.

Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

Where the use of herbicides, pesticides and other poisonous substances has been specified, the Contractor shall submit a Method Statement.

3.4.5.25 Erosion and sedimentation control

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Engineer.

The use of water on the site (especially at concrete batching plants and access road construction where large water bouwsers are used), must be carefully monitored to ensure that the start of erosion on steep slopes does not take hold. The soils of the site are highly erodible, initially starting with rill erosion, followed by donga erosion. Once some vegetation has been removed, wind erosion (blow-outs) quickly takes place which, together with water erosion (from construction activities or rainfall), exacerbates the whole erosion cycle.

3.4.5.26 Aesthetics

The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

3.4.5.27 Pollution

The Contractor shall take all reasonable measures to minimize any dust nuisance, pollution of streams and inconvenience to or interference with the public (or others) as a result of the execution of the Works. A method statement may be required in this regard as determined by the Engineer and ECO.

3.4.5.28 Archaeology and Palaeontology

All artifacts over 50 years of age and all fossils are protected by law. Should anything of an archaeological nature be found on site by the Contractor (or any other party), e.g. stone hand tools, remnants of old structures not previously visible, old ceramic shards etc, work is to be stopped in the area immediately, and the ECO/Engineer notified. Failure to notify ECO of a find will result in a penalty.

The ECO will advise on demarcation of this area, and notify a relevant specialist to view material and ascertain whether further study of the area is required. .

Should a specialist confirm a genuine artifact and recommend further study of the area, work in the area of any artifact or fossil is to cease until further notice and the South African Heritage Resources Agency (SAHRA) is to be informed forthwith by the ECO. The contact details for the SAHRA are as follows:

SATELLITE OFFICE – GAUTENG, Satellite Office – Pretoria.

<u>Physical Address</u> South African Heritage Resources Agency Office 101, 1st Floor, Suncardia Mall, 541 Madiba Street, Pretoria.	<u>Postal address</u> P.O. Box 4637 CAPE TOWN 8000	<u>Tel. & Email Contact:</u> Tel: 012 320 8490 Fax: 012 320 8486 Email: info@sahra.org.za
--	---	--

Or HEAD OFFICE: 111 Harrington Street, Cape Town, 8001, P O Box 4637, Cape Town, 8000, Tel: (021) 462 4502, Fax: (021) 462 4509, Email: info@sahra.org.za

- alternatively, the Provincial Heritage Resources Authority Gauteng (PHRAG) could be contacted at i.e: Email: Tebogo.Molokomme@gauteng.gov.za / noluthando.cembi@gauteng.gov.za; Surrey House 35 Rissik Street Johannesburg.

3.4.5.29 Working Hours

If works are to take place outside of normal working hours, the ECO and the Engineer are to be notified and disturbance to the surrounding residents or land users is to be prevented. The Engineer will, where required, in turn notify the Relevant Authority of work done outside of normal working hours i.e. from 08h00 to 17h00 only during the week and NOT during weekends and/or public holidays.

3.4.5.30 Excavation and Trenching

During excavation and trenching activities, care is to be taken to ensure that the stockpiling of top material is kept separate from sub-soils. Top material thus saved is to be replaced as top material and is to be the final layer when back-filling. The Contractor shall reinstate all working areas to the satisfaction of the Engineer.

Areas opened for trenching should be restricted to the minimum required to be worked in and closed up in a working day or as dictated by technical requirements such as length of pipe or cable, in order to prevent them from posing safety hazards to people, traffic and animals and to prevent rainwater erosion. Trenches shall be re-filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion. Excess soil shall be stockpiled in an appropriate manner.

In the event of material removed during trenching being excessive after backfilling or being unsuitable as overburden, the excess material must be removed from the construction site to a site agreed upon by the Engineer and, where applicable, the Local Authority

3.4.5.31 Temporary site closure

If the Site is closed for a period exceeding one week, a checklist procedure shall be carried out by the Contractor in consultation with the ECO.

Contractor's Safety Officers (in terms of the Occupational Health and Safety Act) are to check site and report to the Engineer regarding the following:

Fuels / flammables / hazardous materials stores:

- Ensure fuel stores as low in volume as possible;
- No leaks;
- Outlet secure / locked;
- Bund empty;
- Fire extinguisher serviced and accessible;
- Secure area from accidental damage e.g. vehicle collision;
- Emergency and Management telephone numbers to be available and displayed;
- Adequate ventilation.

Other:

- All trenches and manholes secured.
- Fencing and barriers in place per the Occupational Health and Safety Act (No. 85 of 1993).
- Notice boards applicable and secured.
- Security persons briefed and have facility for contact.
- Night hazards checked e.g. reflectors, lighting, and traffic signage.
- Fire hazards identified – local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpile wedged / secured.
- Scaffolds secure.
- Inspection schedule and log by security or contracts staff.

The ECO is to check and report to the Engineer:

- Wind and dust mitigation in place e.g. straw, brush packs, irrigation.
- Slopes and stockpiles at stable angle.
- Landscape areas watering schedules & supply secured.
- Fuels/hazardous substances stores secure.
- Cement and materials stores secured
- Toilets empty and secured
- Refuse bins empty and secured (lids)
- Bunding clean and treated e.g. Spill Sorb or Enretech #1 powder
- Drip trays empty & secure (where possible)
- Structures vulnerable to high winds secure.

The Contractor is to ensure that all temporary closure requirements are met before leaving the site.

3.4.5.32 Drilling and Blasting

Should blasting be required, it is the Contractors' sole responsibility to obtain a blasting permit, and must abide by all the conditions of the Explosives Act and the Inspector of Explosives.

Blasting will only be permitted at such times as agreed with the PM and ECO, and in consultation with the Contractors. Blasting must preferably occur at the same time every day (i.e. between 10h00 and 15h00). During overcast/cloudy days, the ECO and/or Engineer will advise on whether or not blasting can take place.

Charge sizes will be set to ensure no damage to surrounding structures. The Contractors must ensure that ground monitoring equipment is available on the site at all times during blasting operations and must make provision for this in their budgets. Apart from legal requirements, record keeping when doing controlled blasting is of vital importance, since it is useful to have on record in the event of any claims arising.

The contractor is to schedule an approved written blasting programme with any relevant conditions in conjunction with and from GDARD and the Local Authority. This written blasting programme should be made available to the Developer, Engineer, ECO, GDARD and any other Authorities that may request it, and strictly adhered to. If amendments are required to be made to the blasting programme, it should be done in conjunction with and made available to the above-mentioned parties timeously.

A current and valid authorisation shall be obtained from the relevant authorities and copied to the Engineer prior to any blasting activity. A Method Statement shall be required for any blasting related activities. All Laws and Regulations applicable to blasting activities shall be adhered to at all times. A qualified and registered blaster shall supervise all blasting and rock splitting operations at all times.

1. The Contractor shall ensure that appropriate pre-blast monitoring records are in place (i.e. photographic and inspection records of structures in close proximity to the blast area). The Contractor shall allow for good quality vibration monitoring equipment and record keeping on Site at all times during blasting operations.
2. The Contractor shall ensure that emergency services are notified, in writing, a minimum of 24 hours prior to any blasting activities commencing on Site.
3. The Contractor shall take necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly-rock. Environmental damage caused by blasting / drilling shall be repaired at the Contractors expense to the satisfaction of the Engineer.
4. The Contractor shall use blast mats for cover material during blasting – whenever and if required. PLEASE NOTE: Topsoil or any other material may not be used as blast cover!
5. All debris and loose rock is to be removed from the site by the contractor to an approved dumping site.

Appropriate blast shaping techniques shall be employed to aid in the landscaping of blast areas (if required), and a Method Statement to be approved by the Engineer, shall be required in this regard.

3.4.6 SPECIFIC REQUIREMENTS

3.4.6.1 Landscaping

The Engineer is to arrange (in conjunction with the main contractor) for all necessary and required equipment and mark out the exact location of the construction activities (prior to the commencement of any construction activities) in order to assist the Landscape Professional and/or Landscape Rehabilitation contractor in determining the exact extent of the landscaping work required, as well as provide ample opportunity to perform any search and rescue exercises of any plant material considered as rehabilitable and/or retainable – should it be required?

A landscape rehabilitation plan and/or specification should be drawn up and/or compiled by a Landscape Professional (e.g. Landscape Architect or Landscape Technician) and/or

Landscape Contractor that specializes in rehabilitation work prior to any construction work. - should it be required. This Landscape Rehabilitation Plan and/or Specification should be compliant to / adhere to any further recommendations, mitigation measures and/or recommendations of the Landscape Architect for this proposed development - should it be required. This landscape rehabilitation plan and/or specification should be obtained from the Developer prior to construction and strictly adhered to throughout the construction phases - should it be required?

3.4.6.2 Rehabilitation

The main contractor should stockpile and reinstate topsoil according to the general requirements as specified above.

The Engineer is to arrange (in conjunction with the main contractor) for all necessary and required equipment and mark out the exact location of the construction activities (prior to the commencement of any construction activities) in order to assist the Landscape Rehabilitation contractor in the search and rescue exercises of retainable and/or rehabilitable vegetation - should it be required?

A landscape rehabilitation plan and/or specification should be drawn up and/or compiled by a Landscape Professional (e.g. Landscape Architect or Landscape Technician) and/or Landscape Contractor that specializes in rehabilitation work prior to any construction work. - should it be required. This Landscape Rehabilitation Plan and/or Specification should be compliant to / adhere to any further recommendations, mitigation measures and/or recommendations of the Landscape Architect for this proposed development - should it be required. This landscape rehabilitation plan and/or specification should be obtained from the Developer prior to construction and strictly adhered to throughout the construction phases - should it be required?

3.4.7 SITE CLEAN UP AND REHABILITATION

3.4.7.1 Site Clean Up

The Contractor shall ensure that all temporary structures, equipment, materials, waste and facilities used for construction purposes are removed upon completion of the project. The site cleanup shall be to the satisfaction of the Engineer and the ECO.

Ensuring that building material and rubble does not lay around in areas will help to restrict the spread of invasive alien Argentine ants.

3.4.7.2 Rehabilitation

Where appropriate, the contractor shall employ a suitably qualified person to rehabilitate areas damaged by construction activities during the course of the project. The Contractor shall be responsible for rehabilitating areas identified by the ECO and the Engineer. The Contractor's procedure for rehabilitation shall be approved by the ECO and the Engineer and where required, the Local Authority environmental representative.

The rehabilitation programme, to be instituted by the contractor, must also entail the following general measures:

- backfilling of trenches with the required compaction to prevent the subsidence of filled material in the future (particularly after rains that result in natural compaction of unconsolidated horizons);
- small earth berms could be provided across the alignment of any pipelines on any possible slopes at pre-determined intervals to break the velocity of run-off and prevent run-off erosion from taking within the filled trenches;

- remove any excess fill material to appropriate dumping areas;
- a thin covering of the topsoil must be spread over the disturbed area along the alignment of the pipelines. The stockpiled brushwood and topsoil can be hand-placed over the disturbed area along the alignment of the pipelines. Any large shrubs removed can be placed over the disturbed area;

3.4.8 PENALTIES AND BONUSES

Where the Contractor inflicts damage upon the environment or fails to comply with any of the Environmental Specifications contained within this EMP, he shall be liable to pay a penalty for breach of the conditions of the Environmental Specifications which form part of the works contract.

The Contractor is deemed NOT to have complied with this Specification if:

- within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the Specification
- environmental damage ensues due to negligence
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time
- the Contractor fails to respond adequately to complaints from the public

Penalties shall be issued per incident and per individual for the Contractor's responsibility. The amount of the penalty shall be determined by the Engineer, in consultation with the ECO. The Engineer shall inform the Contractor of the contravention and he shall notify the consulting quantity surveyor to deduct such a penalty from monies due under the Contract prior to the issuing of the monthly payment certificates.

Payment of any penalties in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The following penalties (not an exclusive list) shall be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specification and shall be imposed by the Engineer on the Contractor for contraventions of the Environmental Specifications by individuals or operators employed by the Contractor and/or his Sub-contractors. Where there are ranges, the amount shall depend on the severity and extent of the damage done to the environment:

a.	An individual entering a "no-go" area by foot (without Engineer's/ ELO's / ECO's permission)	R100
b.	An individual failing to adhere to speed limit	R 100
c.	An individual driving a vehicle in a no-go area	R500 – 2000
d.	An individual driving any earthmoving plant in a no-go area	R500 – 5000
e.	A plant operator ignoring a verbal warning to have an oil leak from his machinery repaired	R 200
f.	An individual littering on site	R20
g.	An individual not making use of the ablution facilities	R50
h.	An individual making an illegal fire on site	R200 – 10 000
j.	An individual causing unnecessary damage to flora and fauna on site	R100 – 2000
j.	An individual/team wasting water	R100 - 2000
k.	An individual not reporting a suspected archaeological find to the ECO	R200 – 2000

For each subsequent similar offence committed by the same individual, the penalty shall be doubled in value to a maximum value of R10 000.

The following penalties are suggested for transgressions where damage has been done to the environment:

a.	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
b.	Oil spills	A penalty equivalent in value to the cost of clean up operation plus 20%
c.	Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%.
d.	Damage to archaeological finds	A penalty to a maximum of R 100 000 shall be paid for any damage to any archaeological sites/finds.
e.	Damage or Destruction to and Possible indigenous Fauna	A penalty to a maximum of R 100 000 shall be paid for any damage or destruction of any Marine Life.

All monies collected through penalties shall be held an environmental fund by the Developer and be accounted for. A summary page is to be included with the monthly payment certificates as a record of penalties issued to date. A portion of these funds may be used for token monetary bonuses to individual site staff members that have shown exceptional diligence in applying good environmental practice on the site. The remaining funds shall be allocated for the purposes of contributing to environmental education efforts in the local community e.g. for environmental books for the library, posters, excursions or trees for the local school or environmental resource material for the local public library. The Developer, in consultation with the ECO, Engineer and possibly the local Authority, will make a final decision regarding the precise allocation of all penalty funds.

3.4.9 TOLERANCES

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a fine subject to the details set out in the Environmental Specification.

3.4.10 TESTING

Void

3.4.11 MEASUREMENT AND PAYMENT

3.4.11.1 Basic principles

Except as noted below and as Scheduled Items, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

Some of the important cost items have been listed below to assist the contractor in making provision for implementation of the Specifications:

a) Protection of stock piles from blowing or washing away: The spraying or covering of stockpiles, including the supply of the spray or cover material, as required.

- b) Storage of fuel and oils:** The supply, construction, installation, transport, upkeep and removal of all facilities required for storage and management of fuel and oils.
- c) Cement laden water management:** The supply, construction, installation, transport, upkeep and removal of all facilities required for the management of wastewater from concrete operations.
- d) Contaminated water management:** The supply, construction, installation, transport, upkeep and removal of all facilities required for managing contaminated water.
- e) Storm water and flood management:** The supply, construction, installation, transport, upkeep and removal of all facilities required for managing storm water run-off from the site and protection of works from flooding.
- f) Bunding and management of run-off from workshop areas and supply of drip trays for stationary and “parked” plant:** The supply, construction, installation, transport, upkeep and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required.
- g) Dust management:** The supply, application, transport, upkeep and removal of all materials required to ensure that dust is adequately controlled.
- h) Solid waste management:** The supply, application, transport, upkeep and removal of all materials required to ensure that solid waste is adequately controlled (including a recycling program).
- i) Fire Control:** The supply, transport, upkeep and removal of all material required for fire control.
- j) Eating areas:** The supply, construction, installation, transport, upkeep and removal at the end of the construction of all eating areas structures.
- k) Ablutions:** The supply, maintenance, regular emptying and removal of toilets.
- l) Site demarcation:** The supply, installation and removal at the end of the construction of all temporary fences.
- m) Tree protection:** The supply, installation and removal at the end of the construction of all tree protection fences.

3.4.11.2 Scheduled items.

a) Provision of venue and staff attendance at the environmental awareness training course

The provision of a venue and attendance at the environmental training course will be measured as a lump sum. The sum shall cover all costs incurred by the Contractor in providing the venue and facilities and in ensuring the attendance of all relevant employees and sub-contractors, at the training.

b) Method Statements: Additional Work

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with GCC 90 Clause 40. A stated sum should be provided in the Schedule of Quantities to cover payment for such additional work.

SECTION 3: CONSTRUCTION PHASE SPECIFICATIONS EMPR TABLE (Table 3)			
IMPACTS/ISSUES	ACTION / MITIGATION	RESPONSIBILITY	FREQUENCY
<p>1. Maintenance of Construction site</p> <p><i>Conscientious maintenance of the Construction site can ensure that time and costs associated with environ-mental management and rehabilitation are reduced.</i></p>	<p>1.1 Maintenance of Access</p> <p>i. Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and storm water damage as soon as these develop.</p> <p>ii. If necessary, staff must be employed to clean surfaced roads adjacent to construction sites where materials have been spilt.</p>	Contractor	Weekly inspection
	<p>1.2 Surfaces</p> <p>i. The Contractor must monitor and manage drainage of the camp site to avoid standing water and soil erosion.</p> <p>ii. The construction site must be fenced off and demarcation of material lay down areas must precede all activities on site.</p> <p>iii. Run-off from the camp site must not discharge into neighbouring properties or adjacent river(s) and/or irrigation canals and/or boreholes and/or wetlands.</p> <p>iv. Cement mixing shall only occur in areas demarcated by the Engineer, in consultation with the ECO. Cleaning of cement mixing and handling equipment shall only be done using proper cleaning trays. All empty containers shall be removed from the site. Any spillage shall be reported to the ECO for cleanup instructions.</p>	Contractor	Continuous
	<p>1.3 Ablutions</p> <p>i. An adequate number of portable/ chemical toilets shall be supplied (1 toilet per 15 users is the norm).</p> <p>ii. The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility.</p> <p>iii. Regular inspections shall be carried out to ensure toilets are kept in a hygienic state.</p> <p>iv. Toilet paper shall be supplied to all toilets. Combine drinking water facilities with hand washing facilities near site toilets.</p> <p>v. Toilet facilities will be screened and put as far away from the neighbours and roads as possible.</p>	Contractor	Initial set-up period
		Contractor	Weekly
		Contractor	Weekly
		Contractor	Monitor daily
		Contractor	Initial set-up period
	<p>1.4 Camp/site Waste Disposal</p> <p>i. Refuse generated from the campsite, construction area, storage area or any other area shall be collected and placed in suitable covered refuse bins on a daily basis. A litter patrol around the construction camp is to take place every day to collect any litter that may have been strewn around.</p>	Contractor/ Project manager	Once-off, monitor daily

	<p>ii. Bins and/or skips should be emptied regularly and waste should be disposed of at a registered landfill site.</p> <p>iii. All refuse containers are to be covered at all times.</p> <p>iv. More Waste handling specifics:</p> <ul style="list-style-type: none"> • Where possible construction waste on site should be recycled or reused. • Waste will be temporarily stored on site (less than 90 days) before being disposed of appropriately. • General waste should be placed in a water tight container and disposed of on a regular basis. • Records of all waste being taken off site must be recorded and kept as evidence. • Evidence of correct disposal must be kept. • Construction rubble will be disposed of at an appropriate site. • Burning of waste material will not be permitted. • Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site, and must be disposed of accordingly at a hazardous waste landfill. • Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin. • The storage area for hazardous material must be concreted, bunded, covered, labeled and well ventilated. • Provide employees with appropriate PPE for handling hazardous materials. <p>All hazardous waste will be disposed of in a registered hazardous waste disposal facility.</p> <p>1.5 Provision of Water</p> <p>i. Sufficient potable water shall be provided for drinking, cooking and ablutions.</p> <p>ii. Water will not be abstracted from the boreholes without the appropriate permission.</p> <p>iii. Great care is to be taken that the water supply is not contaminated in any way.</p> <p>1.6 Provision of Food preparation and eating areas.</p> <p>i. Provide a designated place for food storage, preparation and consumption. Food storage must be separate from waste storage areas.</p>	<p>Contractor/ Project manager Contractor Contractor</p> <p>Contractor Contractor Contractor</p> <p>Contractor</p>	<p>Weekly Daily Daily to weekly</p> <p>As required Initial set-up period Daily</p> <p>Initial set-up period</p>
--	---	--	---

	<p>ii. Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.</p> <p>iii. All litter throughout the site should be picked up and placed in the bins provided.</p> <p>iv. Open fires should not be allowed. Fires for cooking should be limited to fireplaces designed for the purpose. Gas is more preferable.</p> <p>1.7 Health and Safety and Security</p> <p>i. Health and Safety officer to be appointed and all health and safety precautions and legislation to be adhered to.</p> <p>1.8 Pollution</p> <p>i. Oil/petrol/diesel/cement spills to be contained, reported and to be cleaned up immediately.</p> <p>ii. Builder’s rubble to be removed monthly from site.</p> <p>iii. No concrete to be dumped on site.</p> <p>1.9 Vehicles</p> <p>i. Fuelling and servicing of vehicles shall be done off –site. In the event of a breakdown immediate steps shall be taken to prevent any spillage. If spillage occurs, it shall be reported to the ELO immediately, and it shall be contained and cleaned up.</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor/ELO/ ECO</p> <p>Contractor</p> <p>Contractor Contractor</p> <p>Contractor</p>	<p>Daily</p> <p>Daily</p> <p>Daily</p> <p>Initial set-up period</p> <p>As required</p> <p>Monthly Daily</p> <p>As required</p>
<p>2. Staff conduct</p>	<p>2.1 Environmental Education and Awareness</p> <p>i. Ensure that all site personnel have a basic level of environmental awareness training.</p> <p>ii. It is the Contractor’s responsibility to provide the site foreman with no less than 1 hour’s environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p> <p>iii. Translators are to be used where necessary.</p> <p>iv. The need for a “clean site” policy also needs to be explained to the construction workers.</p> <p>2.2 Worker conduct on site</p> <p>i. A general regard for the social and ecological well-being of the site and adjacent areas, is expected of the site staff.</p> <p>ii. Workers need to be made aware of the following general rules:</p> <p>a) No alcohol / drugs to be present on site.</p> <p>b) No firearms allowed on site or in vehicles transporting staff to / from site, (unless used by security personnel).</p> <p>c) Prevent excessive noise.</p>	<p>Project manager / ECO</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Project manager /ECO Project manager</p>	<p>During staff induction & ongoing Prior to moving onsite</p> <p>Continuous Continuous</p> <p>During staff induction & ongoing During staff induction & monitored on an ongoing basis</p>

	<p>d) Prevent unsocial behaviour. e) Bringing pets onto the site is forbidden. f) No harvesting of firewood from the site or from the areas adjacent to it. g) Construction staff are to make use of the facilities provided for them, as opposed to adhoc alternatives. (e.g.: fires for cooking; the use of surrounding bush as a toilet facility; are forbidden). h) Trespassing on private / commercial properties adjoining the site is forbidden i) Driving under the influence of alcohol is prohibited.</p> <p>2.3 Fauna and Flora i. Capture/snaring of fauna is strictly prohibited. ii. Anyone found doing the above-mentioned will be prosecuted or disciplined. iii. Faunal species found should be translocated. iv. No vegetation on neighbouring properties is to be used for firewood.</p>	<p>Contractor/ ECO Contractor ECO Contractor/ ECO</p>	<p>Continuous As necessary As necessary Continuous</p>
<p>3. Dust/Air pollution Main causes of air pollution are dust from vehicle movements and stockpiles, vehicle emissions and fires.</p>	<p>i. If necessary, the construction site shall be watered (or an appropriate alternative method used) to control possible dust fallout. ii. Vehicles travelling to and from the construction site must adhere to speed limits so as to avoid producing excessive dust. iii. Vehicles and machinery are to be kept in good working order and to meet manufacturer's specifications for safety, fuel consumption etc. iv. No fires are allowed on site unless first cleared with the ECO and Project Manager. v. Stockpiles may cause dust and so must be managed in accordance with the guidelines in <i>Section 4: Soil Erosion</i> underneath.</p>	<p>Contractor Contractor Contractor Contractor / ECO Contractor</p>	<p>Monitor daily Continuous Weekly As necessary Daily</p>
<p>4. Soil Erosion</p>	<p>4.1 Topsoil stripping and stockpiling i. Once an area has been cleared of vegetation, the top layer (nominally 150mm) of soil should be removed and stockpiled in a designated area. Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level. ii. Should there be a need to stockpile soil; those stockpiles must be covered in excessively windy conditions. iii. No stockpiles or construction materials may be stored or placed within any drainage line (including the river and irrigation canals) on site or in close proximity to storm water drains. iv. Position topsoil stockpiles on the higher side of a disturbed area. v. Ensure that all topsoil is stored in such a way and in such a place that it will not cause the damming up of water, erosion gullies, or wash away itself.</p>	<p>Contractor Contractor Contractor Contractor Contractor</p>	<p>Once-off, monitor regularly As required Once-off, monitor regularly Once-off, monitor regularly Once-off, monitor regularly</p>

	<p>vi. Do not stockpile topsoil in heaps exceeding 2m in height. vii. Protect topsoil stockpiles from erosion. viii. Remove exotic / invasive plants and broad leaf weeds that emerge on topsoil stockpiles. ix. Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation. x. The Contractor will be held liable for the replacement of any topsoil rendered unsuitable for use during rehabilitation, for reasons due to his negligence or mismanagement on site.</p> <p>4.2 Exposed surfaces</p> <p>i. The time that stripped areas are exposed shall be minimised wherever possible. ii. Top soiling and revegetation shall commence immediately after the completion of an activity and at an agreed distance behind any particular work front. iii. Storm water control (See 5) and wind screening should be undertaken to prevent soil loss from the site. iv. Side tipping of spoil and excavated materials shall not be permitted – all spoil material shall be disposed of as directed by the contractor.</p> <p>4.3 Surface water management</p> <p>i. No water may be abstracted from any surface water body without necessary permission for the purpose of construction unless permitted in terms of the Contract. ii. Monitor water consumption and ensure that all possible use is accounted for and areas of waste are identified (i.e. water used for surface wetting, for potable supply etc.). iii. Repair identified leaks and address issues of water wastage as soon as these are identified. iv. Where possible, recycle water on the construction site. v. Avoid over-wetting, saturation and unnecessary runoff during dust control activities and irrigation.</p>	<p>Contractor Contractor Contractor Contractor Contractor Contractor Contractor Contractor Contractor Contractor Project manager Contractor Contractor Contractor</p>	<p>Continuous Continuous Continuous Continuous Continuous Monitor regularly Monitor regularly As each activity is completed Continuous Continuous Prior to construction starting Monitor daily Whenever identified Monitor daily</p>
<p>5. Storm water <i>Construction activities frequently result in diversions of natural</i></p>	<p>5.1 General Principles</p> <p>i. Do not drain, fill or alter in any way, any water course (e.g. Rivers, irrigation canals, wetlands, streams etc.). ii. Do not allow surface water or storm water to be concentrated, or to flow</p>	<p>Project manager Contractor</p>	<p>Monitor weekly Monitor daily</p>

<p><i>water flow resulting in concentration of flow and an increase in the erosive potential of the water. Measures in this section are aimed at reducing the erosive potential of storm water.</i></p>	<p>down, cut or fill slopes without erosion protection measures being in place.</p> <p>iii. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water pathways over the site. i.e.: these materials must not be placed in storm water channels, drainage lines or the irrigation canals.</p> <p>iv. Line overflow and scour channels with stone pitching along their length and at their points of discharge to prevent soil erosion. The point of discharge must be at a point where there is dense natural grass cover.</p> <p>v. Ensure that channels do not discharge straight down the contours. These must be aligned at such an angle to the contours that they have the least possible gradient.</p> <p>vi. Locate any point of overland discharge at least 50m away from any rivers, streams and/or irrigation canals.</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>Continuous</p> <p>Continuous</p> <p>When the need arises</p> <p>Whenever the need arises</p>
<p>6. Various other Construction-related Activities: (i.e. only those that are applicable or relevant)</p> <ul style="list-style-type: none"> - Foundations in clay area - Excavation/trenching in surface rock - Blasting - Geotechnical precautions - Access to the site - Increase in traffic 	<p>Foundations and reinforcing according to geotechnical report;</p> <p>Soft rock excavations, jack hammering, pop blasting, drilling and maybe blasting.</p> <p>Community within a 2km radius must be notified prior to blasting. Requirements of the Explosives Act shall be adhered to. Blasting to be done at appropriate times to minimize disruption. Any damage resulting from blasting to be repaired at own cost.</p> <p>All precautions in geotechnical report to be adhered to.</p> <p>Access from Provincial and/or Municipal road at one dedicated point to be demarcated in consultation with ECO and/or traffic engineer (if required).</p> <p>Upgrading of intersections of proposed internal roads as well as Provincial and/or Municipal access roads where and if required.</p> <p>The Contractor should ensure that traffic on the local roads is disrupted as little as possible which should include measures for the optimization of the amount of travel on the local roads, thereby reducing impacts.</p> <p>The delivery of construction equipment and material should be limited to hours outside peak traffic times (including weekends).</p> <p>Where obvious damage to the road infrastructure has occurred as a result of</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor/ECO/ELO</p> <p>Developer/Contractor</p>	<p>As required</p> <p>As required</p> <p>As required</p> <p>As required</p> <p>When the need arises</p> <p>When the need arises</p>

<ul style="list-style-type: none"> - Delivery of materials - Storage of materials and goods - Historical / archaeological finds - Materials and workmanship - Weather conditions - Records 	<p>the project, repairs should be undertaken in accordance with the relevant authority's specifications and requirements.</p> <p>Co-ordination of movement of vehicles on and off site to reduce risks and prevent congestion on roads in the vicinity of the site.</p> <p>No vehicles or machinery should be serviced or refuelled onsite.</p> <p>Peak traffic hours should be avoided.</p> <p>Large vehicle turning must take place onsite and not in the adjacent roads.</p> <p>In cases where activities may obstruct traffic, local traffic officials must be contacted.</p> <p>Controlled access to the site. Care to be taken not to clear areas of trees (for storage) which could be retained.</p> <p>Toxic/dangerous material to be stored separate from others, under lock and on impenetrable surface. Wet and dry materials to be stored separately.</p> <p>Dangerous and toxic materials, such as fuel/oil/paint and herbicides shall be stored under key in well-ventilated areas. Sufficient precautions shall be taken during handling to prevent any pollution. Any spillage shall be reported to the ECO for cleanup instructions.</p> <p>Any excavation/uncovering of human, historical, or archaeological nature shall be reported immediately and all work shall be stopped and reported to SAHRA (South African Heritage Resource Agency).</p> <p>All work to be done in accordance with national and local laws and regulations, and to proper workmanship and finishes. All work to be done in accordance with contract documents. All procedures, service connections, levies, tests, inspections, records, and payments in accordance with contract, legislation, NBR, NHBRC, SABS, supplier and manufacturer specifications and local regulations.</p> <p>All weather conditions shall be recorded – precipitation, temperature, wind etc.</p> <p>Daily records to be kept on site to conform to the EMPr. Records to be submitted to the relevant Provincial Government Authority monthly and/or as required.</p>	<p>Contractor</p> <p>Contractor/ECO</p> <p>Contractor/ECO/ ELO</p> <p>Contractor</p> <p>ELO ELO/ECO</p>	<p>Daily</p> <p>As required</p> <p>When the need arises</p> <p>Daily</p> <p>Daily Daily</p>
<p>7. VISUAL IMPACTS</p>	<p>Limit dust and screen construction from viewers along adjacent road with strips of shade cloth; the construction site, material stores, stockpiles and lay-down area should be kept tidy; measures to control wastes and litter should be included in the contract specification documents; wind-blown dust from stockpiles and construction activities, should be controlled; an environmental management program (EMPr) should be prepared and an environmental control officer (ECO) employed for the duration of the construction.</p>	<p>Contractor/ECO/ELO</p>	<p>When the need arises</p>

<p>8. NOISE</p>	<ul style="list-style-type: none"> • Construction activities should be limited to normal working hours (08:00 – 17:00) and limited to weekdays. • No work should occur on weekends or on public holidays. • The contractor will adhere to local authority by-laws relating to noise control. • Mechanical equipment with lower sound power levels must be selected to ensure that the permissible occupation noise-rating limit of 85 dBA is not exceeded. • Equipment must be fitted with silencers as far as possible to reduce noise. • All equipment to be adequately maintained and kept in good working order to reduce noise. • Neighbouring landowners should be informed prior to the initiation of noisy activities e.g. high intensity drilling. A grievance procedure will be established whereby noise complaints can be received, recorded and responded to appropriately. • All construction workers and personnel must wear hearing protection during working hours. • Noise levels must comply with the SANS 100103 – 0994 (recommended noise levels). 	<p>Contractor/ECO/ELO</p>	<p>As required / Continuous</p>
<p>9. TERRESTRIAL VEGETATION & FLORA BIODIVERSITY, SEASONAL FLOODPLAIN WETLAND & SPRUIT of the NATURAL ENVIRONMENT:</p> <p>Potential Impacts on the VEGETATION, FLORA BIODIVERSITY & WETLAND.</p> <p>1. Potential Direct & Indirect Impacts on the wetland habitat, species composition and functions.</p> <p>The loss of wetland habitat</p>	<ul style="list-style-type: none"> • The unauthorised trespassing of visitors and staff onto the adjacent properties should be prohibited and monitored closely – and, fencing around the proposed development should be well maintained to prevent persons trespassing onto the adjacent areas. The fences should be frequently checked to ensure that they are properly sealed off and inaccessible to people. Strict adherence to EMPr. <p>Consult and implement the full BIODIVERSITY ASSESSMENT and especially the <i>Vegetation Categories</i> and <i>Ecological Sensitivity</i> Maps of the site which was compiled for the site (i.e. from the specialist report contained in APPENDIX G – ‘<i>A vegetation assessment of the site proposed for development of the Emdeni Public transport Facility in Soweto</i> - by G.J. Bredenkamp - Commissioned by Pierre Joubert Landscape Architect and Environmental Planner [Eco-Agent CC; PO Box 23355; Monument Park; 0181. Tel 012 3463180 / Fax 012 460 2525 / Cell 082 5767046]. December 2021.’ – and, ‘<i>A wetland assessment of the site proposed for development of the Emdeni Public transport Facility in Soweto</i>’ - by G.J. Bredenkamp & CE Venter (Commissioned by Pierre Joubert Landscape Architect and Environmental Planner [Eco-Agent CC; PO Box 23355; Monument Park; 0181. Tel 012 3463180 / Fax 012 460 2525 / Cell 082 5767046]. December 2021.’ - upon which the following mitigation measures applies</p>	<p>Consultants, contractor, ECO, ELO, project mngr</p>	<p>Initial set-up, Continuous, Monitor weekly</p>

<p>and functions due to the development of a taxi rank on site. The wetland adjacent to the site is the most altered of all the habitat units and largely dominated by alien species, mainly Kikuyu (<i>Pennisetum clandestinum</i>).</p> <p>i. Loss of indigenous plant species, wetland habitat and habitat for species of conservation importance</p> <p>Several actions related to construction activities may result in a loss of wetland habitat and functioning, including construction activities within wetlands, vehicle movement and roads through wetland areas, dumping and temporary storage of materials in wetlands, clearing of vegetation and removal of soil.</p> <p>Alterations to the hydrology and geomorphology of the wetland and wetland catchment may result in changes to the wetland habitat and species composition as well. This includes increased areas bare of vegetation and sealed surfaces, resulting in increased runoff from the catchment area. The runoff from the development must</p>	<p>i.e:</p> <p><u>Terrestrial Vegetation & Flora Biodiversity:</u></p> <ul style="list-style-type: none"> Remove and control all alien woody plant species that may appear during construction and operational phases. <p><u>Wetland:</u></p> <ul style="list-style-type: none"> The wetland and open space area must be clearly demarcated on site, preferably with a fence. No construction activities may take place in these areas, including the temporary storage of materials, location of the construction camp and location of temporary ablution facilities. No vehicle movement or clearing of vegetation may take place in these areas. Construction must take place in the winter season when rainfall on site is unlikely. The long-term weather prediction for the site must be consulted for the site prior to the commencement of construction of the stormwater system in the wetland buffer. Do not proceed if there is a likelihood of rain. All mitigation measures included in this report must be adhered to, including the recommendations with regard to stormwater management and to control erosion and sedimentation. Adhere to all requirements and recommendations included in the ecological stormwater and rehabilitation plan compiled for the site by Habitat Landscape Architects. Include soft structures in the design of the stormwater system. Use permeable surfaces wherever possible. Securely fence the site to prevent trampling of the wetland area by persons trying to take short-cuts to the site. The only access point must be from the road. Compile an alien and invasive species control and monitoring plan. Populations of invasive species on site must be controlled, during the construction and operational phases. The spread of invasive and weedy species from the site must be prevented. Several alien and invasive species resemble indigenous species, especially as seedlings. Care must be taken not to control indigenous species during the control of invasive species. Construction must take place during the winter season to limit the risk of erosion on site and sedimentation in the wetland. 		
--	--	--	--

<p>be controlled in a sufficient stormwater management plan for the site, or it may result in a slight increase in the erosion and sedimentation in the wetland. This is of particular importance during the construction phase.</p> <p>The proposed stormwater attenuation ponds are located inside the 19m wetland buffer and is present almost up to the edge of the wetland. Due to the location of the proposed stormwater attenuation ponds the construction impacts have a medium risk. The portion of the wetland located adjacent to the site is however the most degraded portion of the wetland and approximately 40cm of imported sediment is present across most of this wetland unit. In addition, the construction impacts will be a short-term impact, whereas the installation of the proposed stormwater attenuation system will result in an overall improvement to the site. The assessed risk during the construction phase has therefore been lowered to a low risk, as per professional</p>	<ul style="list-style-type: none"> • Ensure that no sediment-laden stormwater enter the wetlands directly. • Stabilise and revegetate all areas bare of vegetation as soon as possible. • Monitor the entire site for signs of erosion throughout the construction and operational phases of the project. This may take place as part of the regular inspections for maintenance on site. • All erosion features must be rehabilitated as soon as possible. • Implement erosion control measures where necessary. • Implement sediment fences around erosion prone areas. • Adhere to all requirements and recommendations included in the ecological stormwater and rehabilitation plan compiled for the site by Habitat Landscape Architects. • Storm water may not enter the watercourses directly, it must be attenuated before exiting the storm water system. <p><u>General mitigation:</u></p> <ul style="list-style-type: none"> • The construction camp and all associated facilities must be located outside the wetland and wetland buffer and outside all designated open space areas. • Adhere to all other mitigation measures in this report. <p><u>Mitigation for littering:</u></p> <ul style="list-style-type: none"> • Sufficient rubbish bins must be provided on site and cleared on a regular basis. • Rubbish must be disposed of at a registered landfill. • Rubbish may not be dumped on site or allowed to spread from the rubbish bins on site. <p><u>Mitigation for pollution by petrochemicals:</u></p> <ul style="list-style-type: none"> • Refuelling and maintenance must preferably take place off-site. • Refuelling may only take place at a registered fuel depot. • The vehicles must be inspected for oil leaks etc. regularly and any observed leaks must be repaired as soon as possible. • Any spillages of hydrocarbon fuels must be cleaned up immediately. • All regulations etc. included in the waste act must be adhered to. <p><u>Mitigation for temporary ablution facilities:</u></p> <ul style="list-style-type: none"> • The wetland and wetland buffer zone must be clearly demarcated on site and no construction activities may take place in these areas, including the temporary storage of materials and location of temporary ablution facilities. • Sufficient temporary ablution facilities must be provided for the workers 		
--	---	--	--

<p>opinion. This has been lowered in consultation with a second wetland specialist and the aquatic specialist.</p> <p>ii. Infestation by invasive plant species</p> <p>Invasive plant species tend to establish in and around disturbed areas. A few alien and invasive species were observed on site during the site visit. These species may become established in disturbed areas on site and several other species may also be present. Several invasive species may become established on site during the construction or operational phases of the project. These species are most likely to become established in areas disturbed areas.</p> <p>iii. Stormwater management</p> <p>The increase of impermeable surfaces on site, with the associated increase in runoff from the site may result in a slight alteration to the hydrology and geomorphology of the site. Increased flow may result in erosion in the wetland or wetland catchment, with associated sedimentation in the</p>	<p>during the construction phase.</p> <ul style="list-style-type: none"> Any portable toilets must be cleaned regularly to prevent overflow and spillages. <p>NOTE: A registered ecologist and professional landscape architect with adequate experience should be appointed to assist with, plan, design and enforce, monitor and audit the planning, design, implementation and operational phases of the conservation of the sensitive ecological areas on site.</p>		
--	---	--	--

<p>downstream wetland areas. The areas cleared of vegetation is also more likely to be eroded until the stormwater system is in place and stabilised. This is especially true of the attenuation pond located on the edge of the wetland. There is no buffer between the wetland and the attenuation pond. The construction activities are highly likely to cause damage to the wetland unit. Sedimentation is highly likely to take place in the wetland.</p> <p>2. Potential Direct & Indirect Impacts on the wetland due to sedimentation and erosion. The loss of wetland habitat due to sedimentation and erosion. Sedimentation and erosion is a risk on site in the absence of a sufficient stormwater plan, but can be mitigated with an appropriate management plan.</p> <p>i. Clearing of vegetation from the site and increased runoff on site may result in a slight increase in the erosion on site and in the downstream wetland areas. This may potentially cause damage to the wetland systems on site and downstream of the site.</p>			
---	--	--	--

<p>An increased sediment load in the water on site may result in excess sedimentation in downstream areas or in depression wetlands.</p> <p>The portions of the project located outside the wetland buffer is unlikely to have an adverse impact. The attenuation pond for the site is however located on the edge of the wetland, and completely inside the wetland buffer. The attenuation pond will attenuate flow entering the wetland, but the construction of the attenuation pond may result in damages to the wetland, including some erosion and sedimentation in the wetland. Since no buffer is present between the attenuation pond and the wetland, the impacts will affect the wetland directly.</p>			
<p>10. AQUATIC ASPECTS of the BIOPHYSICAL ENVIRONMENT:</p> <p>1. Potential Direct & Indirect Impacts on the Hydrology.</p> <p>The Construction activity will involve some vegetation clearing and topsoil removal in the area adjacent to the</p>	<p>Consult and implement the full specialist report contained in APPENDIX G i.e: 'Aquatic Ecology Specialist Study for the ZOLA-EMDENI PUBLIC TRANSPORT FACILITY SOWETO, Gauteng'. Prepared By: Ecotone Freshwater Consultants Suite 342, Private Bag X1, Florida Hills, 1716 Cell: +27 84 585 7479. Tel: +27 (11) 672 1375 Fax: 088 011 673 1192. contact@ecotone-sa.co.za www.ecotone-sa.co.za Prepared For: Larchitect Pierre Joubert pierre.joubert.larchitect@gmail.com Reference: Larchitect_ Zola-Emdeni_Public_Transport_Facility_Soweto_Aquatic_January_2022_Final Date: January 2022 Version: Final].</p> <ul style="list-style-type: none"> • Limit the extent of vegetation clearing and site preparations to the authorised footprint. • Limit the extent and movement of heavy machinery to the authorised footprint only. • Avoid in channel construction activity and any flow diversions. • No water abstraction or discharge of any water should occur into the drainage line during the construction phase. • Accidental spillage should be prevented always. This will require suitable chemical storage 	<p>Consultants, contractor, ECO, ELO, project mngr</p>	<p>Initial set-up, Continuous, Monitor weekly</p>

<p>drainage line (site Z1) which will result in the alteration of the surface runoff characteristics, which in turn will affect the hydrology of the downslope area. The development area already has a compacted soil surface, so the impact on the hydrology during the construction phase will be low.</p> <p>2. Potential Direct & Indirect Impacts on surface water quality. During the construction phase water quality deterioration will result because of increased sediment loads within the drainage lines and through pollutants derived from spillage, leakage and incorrect disposal of hazardous substances on site. Incorrect waste management and disposal is also likely to contribute further to water quality</p>	<p>and refuelling practices.</p> <ul style="list-style-type: none"> • Accidental spills or any contaminated water should be isolated and treated as soon as possible. An emergency spill procedure should be drafted, and the construction team should be versed in identifying and responding to accidental spill events. • Changing of oil, refuelling and lubricating of equipment should not be carried out near the drainage lines to minimize the potential for water pollution. • If oil storage and workshop areas are needed on-site, they should be surrounded by a bund wall to contain spillages. In the case where soil becomes contaminated with oil, it must be removed for proper disposal or treatment. • No dumping of any building rubble, soil, litter, organic matter or chemical substances should occur within the drainage line. Dumping and temporary storage of the above should only occur at predetermined locations. • In the case of dewatering a construction site, water should be treated, and all suspended particles should be removed. Water removed from a construction site should not be released directly in the water course. Discharge should occur into a sump to aid settling of suspended particle or into a well vegetated area which will help trap sediment and residual contaminants. • Contaminated or potentially contaminated water or runoff should be managed in a controlled way. • Sediment and erosion control measures should be in place and maintained prior to, and during, construction activities. • <i>In situ</i> water quality should be monitored at all three sites associated with the construction activity. • Erosion and silt control mechanisms must be in place prior to the onset of construction activities. This includes the management of surface flow through the construction site. • It is recommended that construction activities should make use of the dry seasonal construction window. This will further reduce the risk associated with erosion/siltation. • Clearing of vegetation needs to be limited in order to limit erosion and should only take place immediately before construction commences. • Sumps or spoil berms need to be constructed to contain excavated spoil/topsoil so that sediment-laden runoff does not enter the drainage lines. • A team of two or three labourers should be trained in the identification and control of key invasive alien species already in the area or highly likely to occur once construction is underway. • The team should be provided with the correct equipment (e.g. knapsack sprayers) and correct herbicides, which should be stored in a secure facility each day. • Regular monitoring of all areas of exposed soil should take place during Construction 		
--	---	--	--

<p>deterioration.</p> <p>3. Potential Direct & Indirect Impacts related to erosion and sedimentation.</p> <p>The disturbance of vegetation and soil during construction will pose the risk of erosion.</p> <p>Eroded soils are likely to increase sedimentation which will lead to changes in vegetation composition and aquatic fauna.</p> <p>Erosion is likely to be highest during the summer months due to increased precipitation.</p> <p>4. Potential Direct & Indirect Impacts related to increase alien/pioneer vegetation in disturbed areas.</p> <p>The disturbed areas may temporarily provide the opportunity for alien and invasive species to establish.</p> <p>The area is already impacted on my alien vegetation so the</p>	<p>Phases.</p>		
--	----------------	--	--

<p>further impact due to the construction of the transport facility is considered low.</p>			
<p>11. HYDROGEOLOGICAL ASPECTS of the BIOPHYSICAL ENVIRONMENT:</p> <p>1. Potential Direct & Indirect Impacts on the Groundwater:</p> <p>i. Hydrocarbon contamination is possible due to the presence of heavy machinery on site. Spillages may occur which may impact both the soil and groundwater environment. The impacts are costly and difficult to clean up, however, only small amounts are envisaged to be stored on site. The magnitude of said impacts are however of lesser significance given that hydrocarbon contamination has already been identified within the groundwater</p>	<p>Consult and implement the full specialist report contained in APPENDIX G i.e: ‘Hydrogeological Investigation – Proposed Emdemi Public Transport Facility. Report Version – 1 22. 14 December 2021. Urban Innovate. GCS Project Number: 19-075’. Prepared by GCS Water and Environment (Pty) Ltd (GCS): 63 Wessel Road Rivonia 2128 PO Box 2597 Rivonia 2128 South Africa Telephone: +27 (0)11 803 5726 Facsimile: +27 (0)11 803 5745 Web: www.gcs-sa.biz].</p> <ul style="list-style-type: none"> • The mitigation measures would include containing the contaminated groundwater within the appropriate areas and preventing such water from entering the wetland and associated streams. • In addition, ensure clean up protocols are in place and followed. Additionally, the municipality should be informed that up-gradient activities are affecting the groundwater quality at the site prior to construction. 	<p>Consultants, contractor, ECO, ELO, project mngnr</p>	<p>Initial set-up, Continuous, Monitor weekly</p>

<p>on site. ii. Given that there is shallow, hydrocarbon-impacted groundwater at the site and that soil will be excavated during the construction phase (which could potentially expose the contaminated groundwater), a potential pathway between the groundwater and off-site wetland with associated streams has been identified.</p>			
<p>12. SOCIO-ECONOMIC ASPECTS of the ENVIRONMENT:</p> <p>Job Creation:</p> <ul style="list-style-type: none"> The construction of the proposed development may create approximately 100 employment opportunities during the construction phase. <p>Local Economic Growth:</p> <ul style="list-style-type: none"> New construction activity will create minor capital investment that will in turn benefit the local economy 	<ul style="list-style-type: none"> Prerequisites that need to be considered i.e. in order for surrounding areas to capitalise optimally on the development there are certain aspects which will have certain minor positive implications on the surrounding areas: <ul style="list-style-type: none"> Invest in education, i.e. expand and strengthen educational opportunities and programmes, especially relating to the CONSTRUCTION (i.e. buildings/facilities/infrastructure), TRANSPORT & INFORMAL TRADING industries; Promote and implement skills development and social upliftment interventions; Local opportunities need to be enhanced by means of preferential procurement and local labour promotion; Local labour should be employed as far as possible during both construction and operations of the proposed development. The following steps/programmes are some aspects to consider, in ensuring the maximum benefit of the proposed development within the local economy even if it is minor in it's effect i.e: <ul style="list-style-type: none"> Expanding and Strengthening Educational Programmes and Opportunities Education remains one of the key challenges within South Africa, which leads to 	<p>Consultants, contractor, ECO, ELO, project mngr</p>	<p>Initial set-up, Continuous, Monitor monthly.</p>

<p>in a minor way.</p> <p>Infrastructure Investment & Development</p> <ul style="list-style-type: none"> This proposed Public Transport Facility which is an essential and long overdue formalised basic services (transport) amenity, would not only be compatible with its environment but is a low asset to the local economy in various ways. 	<p>skills shortages and therefore hinders jobseekers to be gainfully employed and as a result be able to contribute to economic development and growth.</p> <p>The key, and starting point in creating sustainable job opportunities, lies with investment in education and skills development. Investments in education foster opportunities for developing a skilled labour force. Education allows the youth to acquire the necessary skills to take on higher quality jobs, and those jobs in turn promote economic development and growth.</p> <p>The following paragraphs describe some programmes and initiatives that can be implemented to increase economic and employment opportunities.</p> <ul style="list-style-type: none"> Local Labour Promotion The unemployment rate within the immediate market catchment area is lower compared to the national average. However, job creation and skills development remain high on the national agenda. In the context of the above the proposed development will not only fulfil an important support function but will also assist in creating job opportunities along certain critical segments of the economic value chain. Skills development and training is one of the most important instruments to address structural unemployment. Skills and Education Training Skills development and training is one of the more important requirements for people to get employed. Throughout South Africa the need for skills in the marketplace is one of the obstacles preventing higher economic growth. The provision of skills and training to the unemployed would assist in enabling people to apply for jobs and to be able to execute their responsibilities. 		
--	--	--	--

4 OPERATIONAL FRAMEWORK EMPR

The potential positive and negative operational phase impacts identified and mitigation as part of the EIA include (i.e. as taken from the BAR) and are indicated underneath in Table 4.

Refer to Section E of the BAR for further details on the impacts and assessment methodologies.

The information is summarised in tabular format illustrating the activity, aspect, impact, mitigation measure, performance indicators, resources, schedule and verification. These criteria are listed and explained below:

The following components are identified/ described:

- **Activity:** component/ activity of the project for which the impact has been identified;
- **Aspect:** the aspect of the above activity which will be impacted;
- **Impact:** the environmental impact identified and to be mitigated;
- **Mitigation measure:** measures identified for implementation in terms of environmental management to reduce, rectify or contain the identified environmental impact – mitigation is divided into the following:
 - **Objective:** desired outcome of mitigation measure,
 - **Mechanism:** method of achieving the objective;
- **Performance indicators:** outcomes that will indicate achievement of objective/s;
- **Responsibility:** party or parties identified for implementation of mitigation measure/s;
- **Resources:** available resources to aid implementation of mitigation;
- **Schedule:** timeframe in which identified impact and mitigation measure is anticipated to occur; and
- **Verification:** party or parties identified as responsible for review and assessment of final outcome.

The complete *Operational EMPr General Specifications* have been included above in **SECTION 3** and includes the following sections:

- Dust Management
- Noise Management
- Drainage Water Movement
- Chemical Management
- Community Liaison
- Complaints Record Sheet
- Complaints Register
- Climate Records

The following section provides the Draft Operational EMPr Project Specification Data which, should be included in all contract documentation associated with the Proposed TOWNSHIP ZOLA EXTENSION 3 to be situated on a Part of the Remainder of the FARM SOWETO 387-IQ (City of Johannesburg - Gauteng) with associated Civil Services infrastructure, and will accordingly be binding on the Contractor and Developer.

This section contains the Operational Framework EMPr table and it is important to note that this Framework Outlines the mitigation measures for the Operational Phase to be contained in the required authorisation of the proposed project and will be updated to include the conditions of authorisation that will be issued before any construction and/or operation of the development could occur:

SECTION 4: Operational Framework Environmental Management Programme Table (Table 4)

ACTIVITY	ASPECT	IMPACT	MITIGATION MEASURE: (Objective & Mechanism)	PERFORMANCE INDICATOR	RESPONSIBILITY	RESOURCE	SCHEDULE	VERIFICATION
All Activities & Facilities	Environmental management documentation and procedures Monitoring and enforcement of specified environmental management requirements as well as specifically the relevant Waste Management Procedure.	No framework within which to locate the management of the operational and decommissioning phases. No procedures against which to assess environmental performance and waste management safety during the operational and decommissioning phases and thus no measure of compliance.	Objective: To ensure that the operation of the activities and facilities does not result in avoidable impacts on the environment, and that any impacts that do occur are anticipated and managed. Mechanism: 1) Incorporate as part of the duties of the managers of the facilities & activities to monitor compliance which includes food safety. 2) Develop and implement an internal environmental auditing system for the operational phase which includes food safety. A registered, qualified and experienced company should be appointed on a permanent basis to compile, implement, monitor & audit a legally compliant WASTE MANAGEMENT PROCEDURE. 3) Audit the compliance with the requirements of the environmental - tal specification contained within the OEMP which includes waste management safety.	Environmental impacts effectively monitored and managed during the operational phase with no residual impacts on the environment and food safety aspects. Comprehensive record of compliance and remedial actions available to the Owner and/or Management Company and the authorities.	Owner & Facilities Managers	City of Johannesburg – ‘ENVIRONMENTAL MANAGEMENT PROCEDURES (i.e. which includes monitoring and enforcement)’ – and, which also includes ‘WATER & WASTE MANAGEMENT PROCEDURES’ – <u>and/or</u> , a site/facility specific – ‘ENVIRONMENTAL MANAGEMENT PROCEDURES (i.e. which includes monitoring and enforcement)’ – and/or ‘INTEGRATED WATER & WASTE MANAGEMENT PLAN’ to be compiled by the relevant professionals.	During operation	Owner and/or Management Company and the authorities.
All Activities & Facilities	Environmental management of the operational phase	Negative impacts on environment during operation	Objective: To ensure that the operation of the activities and facilities does not result in avoidable impacts on the environment, and that any impacts that do occur are anticipated and managed. Mechanism:	Environmental impacts effectively monitored and managed during the operational phase with no residual impacts on the environment. Comprehensive record of compliance and remedial actions	Owner & Facilities Managers	Environmental Management Procedure OEMP and the inspections of the consulting ecologist and/or relevant professional environmental	During operation	Owner and/or Management Company and the authorities.

			1) Implement the operational phase management procedures outlined in the OEMP Framework. 2) Comply with all requirements of all permits, authorisations and/or licenses received.	available to Owner and/or Management Company and the authorities.		consultant and/or landscape architect on a regular basis.		
All Activities & Facilities	Site management ~ NOISE:	Impact due to the noises that may be associated with a public transport facility may include loud music, shouting and vehicles revving as they leave the premises.	Objective: To minimise the impact of noise from vehicles - by implementation of mitigation measures. Mechanisms: • A grievance procedure will be established whereby noise complaints can be received, recorded and responded to appropriately. • Equipment such as mechanical equipment etc - that are fitted with noise reduction facilities (e.g. side flaps, silencers etc.) must be used as per operating instructions and maintained properly. • Noise levels should comply with the SANS Code of Practice 100103 – 0994 (recommended noise levels). • Local by-laws for noise levels must be adhered to.	No noise or low levels of noise experienced by surrounding communities.	Owner & Facilities Managers	OEMP and the inspections of the professional environmental consultant.	During operation.	Owner and/or Management Company and the authorities.
All Activities & Facilities	Site management ~ SAFETY:	Impact due to: <i>i.</i> Open and/or unattended fires in unallocated (i.e. undesignated areas) for heating and/or cooking purposes is considered potentially dangerous, especially in the informal trade areas. Therefore, there is a minor risk of fire on site,	Objective: To minimise the impact of noise from vehicles - by implementation of mitigation measures. Mechanisms: • Fire extinguishers and sandbags must be readily available onsite and easily accessible. • Fire-fighting equipment must comply with SANS 1151 (Portable rechargeable fire extinguishers - Halogenated hydrocarbon type extinguishers) and must be inspected	No open fires – and/or the absence of 'TAXI' war, feuds and/or violence experienced by the taxi owners, users and surrounding communities.	Owner & Facilities Managers	OEMP and the inspections of the City of Johannesburg delegated officials, South African Police Services – and/or Private Safety & Security Company .	During operation.	Owner and/or Management Company and the authorities.

		<p>which could pose a minor threat to on-site employees and surrounding land users and occupiers.</p> <p><i>ii.</i> Potential TAXI 'fighting or wars', feuds and/or violence between competing factions i.e. taxi associations, groups etc. – could pose an enormous safety risk for not only the taxi customers and drivers of the taxis, but also the surrounding / adjacent land occupiers and also the passers-by.</p>	<p>regularly.</p> <ul style="list-style-type: none"> • Appropriate health and safety signage must be displayed on site. • An Emergency Response Plan must be in place for the site, this must clearly describe emergency procedures and include emergency contact numbers. • Staff must be trained adequately so as to identify potential high-risk situations and implement the Emergency Response Plan. • The local municipality (i.e. the applicant) should have an ANTI-TAXI WAR POLICY and IMPLIMENTATION STRATEGY PLAN compiled and enacted, which should include at least the assistance of the SOUTH AFRICAN POLICER SERVICES, the employment of a full time SAFETY & SECURITY COMPANY SERVICES – and, the official agreement and active participation of all the TAXI ASSOCIATIONS and/or GROUPS to maintain peace and mutual respect etc. 					
All Activities & Facilities	Site management ~ Odour	Impact due to odour from general waste & waste from any kitchen, informal trade kiosks or similar facility.	<p>Objective: To minimise the impact of odour from general waste & waste from any facility e.g. kitchen, informal trade kiosks - by implementation of mitigation measures.</p> <p>Mechanisms:</p> <ol style="list-style-type: none"> 1) All waste shall be regularly removed from site by an independent third party i.e. commercial entity / contractor and/or dedicated staff of/on site; 2) the floors/ paving where waste 	No odour or low levels of odour experienced by surrounding communities.	Owner & Facilities Managers	OEMP and the inspections (i.e. with the resulting reports re: sewerage removal etc.) of the consulting local health inspector.	During operation.	Owner and/or Management Company and the authorities.

			skips would be located inside and outside of the facilities in which the waste is collected, shall be washed down with high pressure water regularly i.e. minimum of once a week. Most of the runoff wash water should preferably not soak away into the surrounding soil but be drained to the stormwater attenuation ponds on site, and/or drain into the municipal sewerage system.					
All Activities & Facilities	Site management ~ Health	Health risks to site staff and surrounding communities due activities on site.	<p>Objective: Manage and mitigate health impacts on site and to surrounding community</p> <p>Mechanisms:</p> <ol style="list-style-type: none"> 1) Waste and all litter shall be regularly removed from site by a third independent party i.e. commercial entity / contractor and/or dedicated staff of/on site. 2) No solid waste shall be stored on site. 3) Solid waste shall be collected and taken to a registered landfill site and/or buried in an appropriate way and place on the farm. 4) the floors/ paving where waste skips would be located inside and outside of the facilities in which the waste is collected, shall be washed down with high pressure water regularly i.e. minimum of once a week. Most of the runoff wash water should preferably not soak away into the surrounding soil, but be drained to the conservancy/septic tanks on site, which should be collected and removed from site by a contractor and/or drain into the municipal sewerage system. 5) The facilities's water runoff management plan (i.e. to be compiled by a professional) 	Health impacts effectively monitored and managed during the operational phase and Regular removal of solid waste by manager.	Owner & Facilities Managers	OHS OEMP and the inspections (i.e. with the resulting reports) of the consulting local health inspector. The water runoff management plan should be compiled by a professional e.g. civil engineer.	During operation Every second month	Owner and/or Management Company and the authorities.

			should take into account measures which prevents and reduces the risk of erosion.					
All Activities & Facilities	Site management ~ Employment Impacts	Impact of proposed job creation, capacity building and skills transfer on the surrounding community.	<p>Objective: To ensure employment opportunities are provided to locals.</p> <p>Mechanisms: 1) Provisions to provide jobs to local workers should be maximised. 2) Preferential procurement and hiring practices shall be implemented and monitored as part of Owner and/or Management Company's management activities.</p>	Employment provided to locals and previously disadvantaged individuals.	Owner & Facilities Managers	OEMP	During operation	Owner and/or Management Company and the authorities.
All Activities & Facilities	Site management ~ Natural Resources: Hydrogeological Aspects.	Negative impact on and/or loss of natural resources on site especially the: Potential Direct & Indirect Impacts on the Groundwater: <i>i.</i> Impacts to the soil and groundwater environment may result from the release of potentially impacted stormwater into the adjacent stream or from faulty stormwater infrastructure. On-site stormwater will be managed via drainage into the proposed attenuation dam (located in the south-east corner of the site	<p>Objective: Avoid or minimise impact on natural resources on site – reduce significance</p> <p>Mechanisms:</p> <ul style="list-style-type: none"> • It is recommended that the attenuation dam be sampled on a monthly basis to ensure that the system is functioning, and that no contamination is released into the associated wetland. Samples should also be collected from down- and up-gradient of the attenuation dam to assess the impact the dam has on the water quality of the nearby wetland. • To mitigate the identified risks a series of ecological attenuation dams that would serve to reduce any potentially hazardous substances present in surface run-off (a plan depicting the layout of said dams is provided in Appendix D) has been included in the facility design. In particular, the stormwater will be intercepted and routed to flow through a 	Environmental impacts effectively monitored and managed during the operational phase – Comprehensive record of aspects as listed in Hydrogeological report.	Owner & Facilities Managers & environmental Professional e.g. ecologist and/or landscape architect.	OEMP	During Operation	Owner and/or Management Company and the authorities.

		<p>boundary), prior to being drained out into an adjacent stream located to the east. Given that the proposed site is a transport facility minor hydrocarbon impacts may result from leaking vehicles on-site that will be collected by the stormwater system. If the potentially contaminated stormwater is released into the wetland, or if the associated infrastructure of the dam becomes impaired (e.g. leaking of underground pipes), the soil and groundwater environment would be negatively impacted. However, to mitigate the identified risks a series of ecological attenuation dams that would serve to reduce any potentially hazardous substances present in surface</p>	<p>series of retention ponds, attenuation dams and bioswales. A 30m wetland buffer was also included in this design to reduce the probability of potentially contaminated surface run-off reaching the wetland. Included in this design is re-vegetating each section of the series through a targeted mixture of various plant species selected to aid in reducing/eliminating dissolved phase chemicals of potential concern (refer to the March 2020 report prepared by Habitat Landscape Architects for the list of proposed plant species).</p> <ul style="list-style-type: none"> • Further mitigation measures would include the implementation of the groundwater monitoring program (detailed in Section 9) for the site and surrounding area whereby the dam water and adjacent streams are monitored and sampled on a regular basis. This would allow for the early detection of water quality deterioration associated with the site. Maintenance and in-house inspections of the attenuation dam system should be undertaken regularly. • Groundwater monitoring should be conducted on a bi-annual basis for inorganic and hydrocarbon constituents and a trend analysis should be compiled to ensure the facility does not have any detrimental effect on the groundwater environment i.e. time-series data should be presented via trend 					
--	--	--	--	--	--	--	--	--

		<p>run-off (a plan depicting the layout of said dams is provided in Appendix D) has been included in the facility design. In particular, the stormwater will be intercepted and routed to flow through a series of retention ponds, attenuation dams and bioswales. Included in this design is re-vegetating each section of the series through a targeted mixture of various plant species selected to aid in reducing/eliminating dissolved phase chemicals of potential concern (refer to the March 2020 report prepared by Habitat Landscape Architects for the list of proposed plant species). <i>ii.</i> Impacts to the soil and groundwater environment may result from the release of potentially impacted leaking vehicles.</p>	<p>analyses after each sampling event to determine if the facility has any detrimental effects on the water resources and to assess for increasing concentrations of targeted contamination compounds and relevant inorganic indicators. It is recommended that access and approval for off-site sampling be obtained from the landowner.</p> <ul style="list-style-type: none"> • The groundwater monitoring plan should commence once the site is operational. It is recommended that the attenuation dam and associated infrastructure are installed according to regulations stipulated in the National Water act 36 of 1998: Regulations regarding the safety of dams in terms of section 123(1) of the National Water Act, 1998 (act no. 36 of 1998). 					
--	--	---	--	--	--	--	--	--

		Hydrocarbon impacts associated with leaking vehicles may also affect the soil and groundwater environment through leakages entering the subsoils. iii. Impacts to the soil and groundwater environment may result from the release of potentially impacted on-site sewer system i.e. leaks or other inadequacies resulting from the sewer system may negatively impact the soil and groundwater environment.						
All Activities & Facilities	Site management ~ <i>Natural Resources:</i> Aquatic Aspects.	Negative impact on and/or loss of natural resources on site especially the: Potential Direct & Indirect Impacts on the Hydrology: 1. The impermeable surface of the transport facility and additional impacts to surface runoff rates may impact on the hydrology of the receiving aquatic system during the	Objective: Avoid or minimise impact on natural resources on site – reduce significance Mechanisms: • The storm water system should be designed with sufficient attenuation capacity to compensate for the loss in permeable surfaces associated with the footprint of the development. This may be achieved through the incorporation of bio-swales or other ecological engineering structures. • The general design should aim to maximise permeability and water retention on site. This will include measures to increase	Environmental impacts effectively monitored and managed during the operational phase – Comprehensive record of aspects as listed in Aquatic report.	Owner & Facilities Managers & environmental Professional e.g. ecologist and/or landscape architect.	OEMP	During Operation	Owner and/or Management Company and the authorities.

		operational phase. 2. Storm water runoff may be polluted with hydrocarbons and other hazardous substances from parking areas and impermeably surface. This may result in a decrease in water quality within the receiving watercourses. 3. Inappropriate storm water releases may lead to erosion and downstream sedimentation. 4. Under baseline conditions the drainage lines have high cover and abundance of alien and invasive species. It is possible that disturbed areas can provide a longer-term source of encroachment if not managed.	the general surface roughness of paved areas and measures to effectively dissipate runoff energy. <ul style="list-style-type: none"> • Runoff from the parking area should go through a litter, sediment and oil trap prior to release into the environment. • Use environmentally friendly solvents and paints during routine maintenance. This will aid in preventing water pollution during the operational phase. • Design runoff control features to minimize soil erosion and avoid placement of infrastructure and sites on unstable slopes and consider conditions that can cause slope instability, such as groundwater aquifers, precipitation and slope angles. • Areas where storm water is released should be well armoured against erosion and regularly inspected for stability. • Areas exposed to a higher erosion risk include storm water releases. These areas should be protected against erosion and regularly inspected. • The storm water system should be designed with sediment trapping abilities, these should regularly be inspected and manually emptied. • The areas that have been decommissioned during the Operational Phase (such as the construction camp) should also be monitored for invasive alien species. 					
All Activities & Facilities	Site management ~ VISUAL & AESTHETIC	Negative impact on and/or loss of ORIGINAL VISUAL	Objective: Avoid or minimise impact on natural resources on site – reduce significance Mechanisms:	Environmental impacts effectively monitored and managed during the	Owner & Facilities Managers, Architect & landscape architect.	OEMP	During Operation	Owner and/or Management Company and the authorities.

	<p>ASPECTS of FACILITIES.</p>	<p>CHARACTER & QUALITY of FACILITIES: The presence of the proposed facilities [i.e. proposed Public Transport Facility which is an essential and long overdue formalised basic services (transport) amenity, in the midst of a township (i.e. Emdeni & Zola in SOWETO) with a plethora of mixed uses, facilities, activities and elements (i.e. litter and refuse dumping) which creates in general a visual 'confusion' of disconnectedness (i.e. not integrated in a sensitive cohesive way visually and aesthetically) and gross unpleasantness to the urban-township, remaining heavily impacted (i.e. totally transformed, compromised and <i>Seriously</i> modified ecosystem state)</p>	<ul style="list-style-type: none"> • Install landscaping and rehabilitation as soon as possible. • Litter and waste should be effectively managed to avoid visual problems in the area; • buildings and landscaping and rehabilitation should receive on-going maintenance to avoid visual decay; • lights should be low-level, where possible, and fitted with reflectors to avoid light spillage; • lights and signage should be fixed to buildings or walls, where possible, to avoid unnecessary masts and visual clutter. • This proposed development (i.e. facilities, infrastructure, landscaping, attenuation ponds etc) however, calls for and would require as an essential part of the successful functioning of the facilities and maintaining the original – and/or enhancing the visual character and aesthetical appeal of it - a <u>highly efficient maintenance and effective full time management program</u>. 	<p>operational phase – Comprehensive record of aspects relating to the Maintenance of Facilities in order to maintain and/or improve to it's original VISUAL & AESTHETIC appeal.</p>				
--	--------------------------------------	---	--	--	--	--	--	--

		<p>natural environment (i.e. wetland within a valley bottom system with shallow water and no distinct riparian zone) and other surrounding land uses in that area (e.g. fuel station etc), with no visual 'theme' or specific architectural and/or landscape architectural style or character which unifies the visual 'landscape' as a whole] - will have a minor positive visual impact in the area, particularly for the directly adjacent land occupiers and users, public transport vehicle users and drivers, motor vehicle drivers and/or pedestrians - especially if the landowner/developer will develop the proposed facilities in a visual sensitive way which responds positively to its natural and surrounding built-up environment</p>						
--	--	---	--	--	--	--	--	--

		and rehabilitates the wetland and stream and maintain it a good condition. The applicant has appointed such specialists as indicated above and therefore employed sufficient measures i.e. as far as possible, to make the proposed development an attractive and visually uplifting improvement on the site and aesthetically appealing towards the directly adjacent township environment.						
All Activities & Facilities	Site management ~ Natural resources Potential loss of mentionable Terrestrial Vegetation & Flora Biodiversity & WETLAND.	Negative impact on and/or loss of natural resources on site especially the: Stormwater management - Development on site results in a significant increase in sealed surfaces in the wetland catchment. This will in turn result in increased runoff, which increase the risk of erosion and sedimentation on	Objective: Avoid or minimise impact on natural resources on site – reduce significance Mechanisms: 1) Water used for drinking purposes, evaporative cooling and facilities washing purposes should be used sparingly and effectively i.e. high-pressure washing apparatus. 2) Water for washing purposes should be minimized and made environmentally non-hazardous i.e. friendly, through the use of appropriate biodegradable detergents and sanitizers with high-pressure nozzles to assist in cleaning. 3) Dimmable energy-saving bulbs	Environmental impacts effectively monitored and managed during the operational phase – Comprehensive record of water use, minimisation of waste – and, aspects as listed in the Wetland report.	Owner & Facilities Managers & environmental Professional e.g. ecologist and/or landscape architect.	OEMP	During Operation	Owner and/or Management Company and the authorities.

		<p>site and in the wetland units.</p>	<p>are being tried experimentally. 4) Extra heating would only occur when needed in extreme winter conditions as well as cooling when needed in extreme summer conditions i.e. electricity should be used for heating & cooling purposes in a responsible way in only extreme circumstances. 5) Alternative Energy systems should be explored and implemented e.g. Solar panels for electricity generation could be installed and used to reduce the reliance on electricity from Eskom / Municipality. 6) the proposed facilities should limit their activities strictly to the proposed new footprints. The unauthorised trespassing of visitors and staff onto the adjacent farmlands should be a concern and monitored closely. 7) Consult and implement the full VEGETATION ASSESSMENT & WETLAND ASSESSMENT REPORTS of the site which was compiled for the site (i.e. from the specialist report contained in APPENDIX G of the BAR – 1. ‘A vegetation assessment of the site proposed for development of the Emdeni Public transport Facility in Soweto - by G.J. Bredenkamp & CE Venter - Commissioned by Pierre Joubert Landscape Architect and Environmental Planner [Eco-Agent CC; PO Box 23355; Monument Park; 0181. Tel 012 3463180 / Fax 012 460 2525 / Cell 082 5767046]. December 2021.]) – and, 2. ‘A wetland assessment of the site proposed for development of the Emdeni Public transport Facility in Soweto - by G.J. Bredenkamp</p>					
--	--	---------------------------------------	--	--	--	--	--	--

		<p>& CE Venter (Commissioned by Pierre Joubert Landscape Architect and Environmental Planner [Eco-Agent CC; PO Box 23355; Monument Park; 0181. Tel 012 3463180 / Fax 012 460 2525 / Cell 082 5767046]. December 2021.)'. - which includes the following mitigation measures i.e:</p> <p><u>Terrestrial Vegetation & Flora Biodiversity:</u> Remove and control all alien woody plant species that may appear during construction and operational phases.</p> <p><u>Wetland:</u></p> <ul style="list-style-type: none"> • The wetland and open space area must be clearly demarcated on site, preferably with a fence. No construction activities may take place in these areas, including the temporary storage of materials, location of the construction camp and location of temporary ablution facilities. • No vehicle movement or clearing of vegetation may take place in these areas. • Construction must take place in the winter season when rainfall on site is unlikely. • The long-term weather prediction for the site must be consulted for the site prior to the commencement of construction of the stormwater system in the wetland buffer. Do not proceed if there is a likelihood of rain. • All mitigation measures included in this report must be adhered to, including the 					
--	--	---	--	--	--	--	--

			<p>recommendations with regard to stormwater management and to control erosion and sedimentation.</p> <ul style="list-style-type: none"> • Adhere to all requirements and recommendations included in the ecological stormwater and rehabilitation plan compiled for the site by Habitat Landscape Architects. • Include soft structures in the design of the stormwater system. • Use permeable surfaces wherever possible. • Securely fence the site to prevent trampling of the wetland area by persons trying to take short-cuts to the site. The only access point must be from the road. • Compile an alien and invasive species control and monitoring plan. • Populations of invasive species on site must be controlled, during the construction and operational phases. • The spread of invasive and weedy species from the site must be prevented. • Several alien and invasive species resemble indigenous species, especially as seedlings. Care must be taken not to control indigenous species during the control of invasive species. • Construction must take place during the winter season to limit the risk of erosion on site and sedimentation in the wetland. • Ensure that no sediment-laden stormwater enter the wetlands directly. 					
--	--	--	--	--	--	--	--	--

		<ul style="list-style-type: none"> • Stabilise and revegetate all areas bare of vegetation as soon as possible. • Monitor the entire site for signs of erosion throughout the construction and operational phases of the project. This may take place as part of the regular inspections for maintenance on site. • All erosion features must be rehabilitated as soon as possible. • Implement erosion control measures where necessary. • Implement sediment fences around erosion prone areas. • Adhere to all requirements and recommendations included in the ecological stormwater and rehabilitation plan compiled for the site by Habitat Landscape Architects. • Storm water may not enter the watercourses directly, it must be attenuated before exiting the storm water system. <p><u>General mitigation:</u></p> <ul style="list-style-type: none"> • The construction camp and all associated facilities must be located outside the wetland and wetland buffer and outside all designated open space areas. • Adhere to all other mitigation measures in this report. <p><u>Mitigation for littering:</u></p> <ul style="list-style-type: none"> • Sufficient rubbish bins must be provided on site and cleared on a regular basis. • Rubbish must be disposed of at a registered landfill. • Rubbish may not be dumped on site or allowed to spread from the rubbish bins on site. <p><u>Mitigation for pollution by</u></p>					
--	--	--	--	--	--	--	--

		<p><u>petrochemicals:</u></p> <ul style="list-style-type: none"> • Refuelling and maintenance must preferably take place off-site. • Refuelling may only take place at a registered fuel depot. • The vehicles must be inspected for oil leaks etc. regularly and any observed leaks must be repaired as soon as possible. • Any spillages of hydrocarbon fuels must be cleaned up immediately. • All regulations etc. included in the waste act must be adhered to. <p><u>Mitigation for temporary ablution facilities:</u></p> <ul style="list-style-type: none"> • The wetland and wetland buffer zone must be clearly demarcated on site and no construction activities may take place in these areas, including the temporary storage of materials and location of temporary ablution facilities. • Sufficient temporary ablution facilities must be provided for the workers during the construction phase. • Any portable toilets must be cleaned regularly to prevent overflow and spillages. <p>NOTE: A registered ecologist and professional landscape architect with adequate experience should be appointed to assist with, plan, design and enforce, monitor and audit the planning, design, implementation and operational phases of the conservation of the sensitive ecological areas on site.</p>					
--	--	---	--	--	--	--	--

5 DECOMMISSIONING

It is highly unlikely that decommissioning should be proposed in the near future.

However, should decommissioning of the proposed township be proposed the following minimum measures should be implemented i.e.

1. Areas and routes should be demarcated where demolishing and other vehicles may move in order to minimise impact on surrounding natural veldt. Care should be taken to avoid disturbance to any potential riparian or wetland areas.
2. A soil and vegetation rehabilitation specialist should be appointed to recommend the best rehabilitation methodology and provide supervision.
3. After the removal of the facilities, foundations and concrete slabs, the underlying compacted soil should be ripped, and the stockpiled topsoil replaced.
4. Seed from the surrounding natural veldt areas should be collected, treated and sown onto the area, together with a non-invasive annual plant such as oats, in order to provide some protection to germinating seed.
5. Materials will be recycled where appropriate and any hazardous substances e.g asbestos must be removed and disposed of following the requirements of relevant legislation.
6. Materials used and its associated infrastructure would need to be disposed of at an approved landfill site.
7. The construction site must be fenced off to prohibit unauthorised access and site access must be strictly controlled.
8. All employees, contractors and sub- contractors to wear appropriate PPE.
9. Open excavations must be clearly marked.
10. All employees, contractors and sub- contractors must comply with the relevant Health and Safety Policy.
11. Fire safety should be considered, and all vehicles should have fire extinguisher.
12. Employees should be trained on fire safety.
13. Local emergency fire brigade number should be known to everybody.
14. Appropriate health and safety signage must be displayed on site.
15. The contractor will adhere to local authority by-laws relating to noise control.
16. Decommissioning activities will be restricted to regular working hours, i.e. Monday to Friday (08:00 – 17:00).
17. Mechanical equipment with lower sound power levels will be selected to ensure that the permissible occupation noise-rating limit of 85 dBA is not exceeded.
18. Equipment will be fitted with silencers as far as possible to reduce noise.
19. The Contractor should ensure that traffic on the local roads is disrupted as little as possible which should include measures for the optimization of the amount of travel on the local roads, thereby reducing impacts.
20. The delivery of construction equipment and material should be limited to hours outside peak traffic times (including weekends).
21. Where obvious damage to the road infrastructure has occurred as a result of the project, repairs should be undertaken in accordance with the relevant authority's specifications and requirements.
22. Co-ordination of movement of vehicles on and off site to reduce risks and prevent congestion on roads in the vicinity of the site.
23. No vehicles or machinery should be serviced or refueled onsite.
24. Peak traffic hours should be avoided.
25. Large vehicle turning must take place onsite and not in the adjacent roads.
26. In cases where activities may obstruct traffic, local traffic officials must be contacted.
27. Dust suppression methods, such as wetting or laying straw, should be applied where there are large tracks of exposed surfaces.
28. Stockpiles and soil heaps must be covered with tarpaulins or straw to prevent fugitive dust.
29. All construction vehicles must be appropriately maintained to minimise exhaust emissions.

6 CONCLUSION

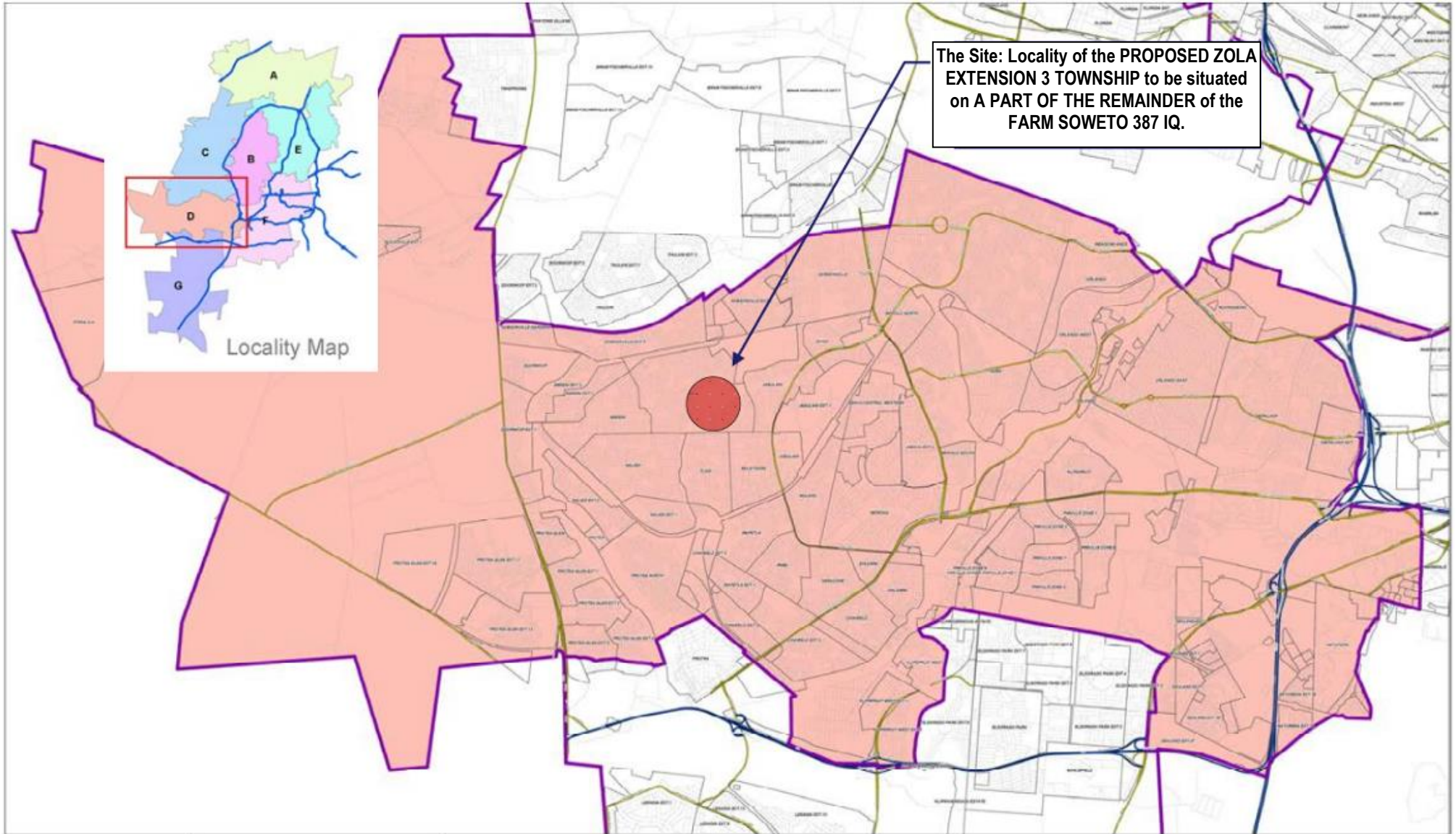
In conclusion it should be noted that the EMPr should be regarded as a living document and changes should be made to the EMPr as required by project evolution while retaining the underlying principles and objectives on which the document is based.

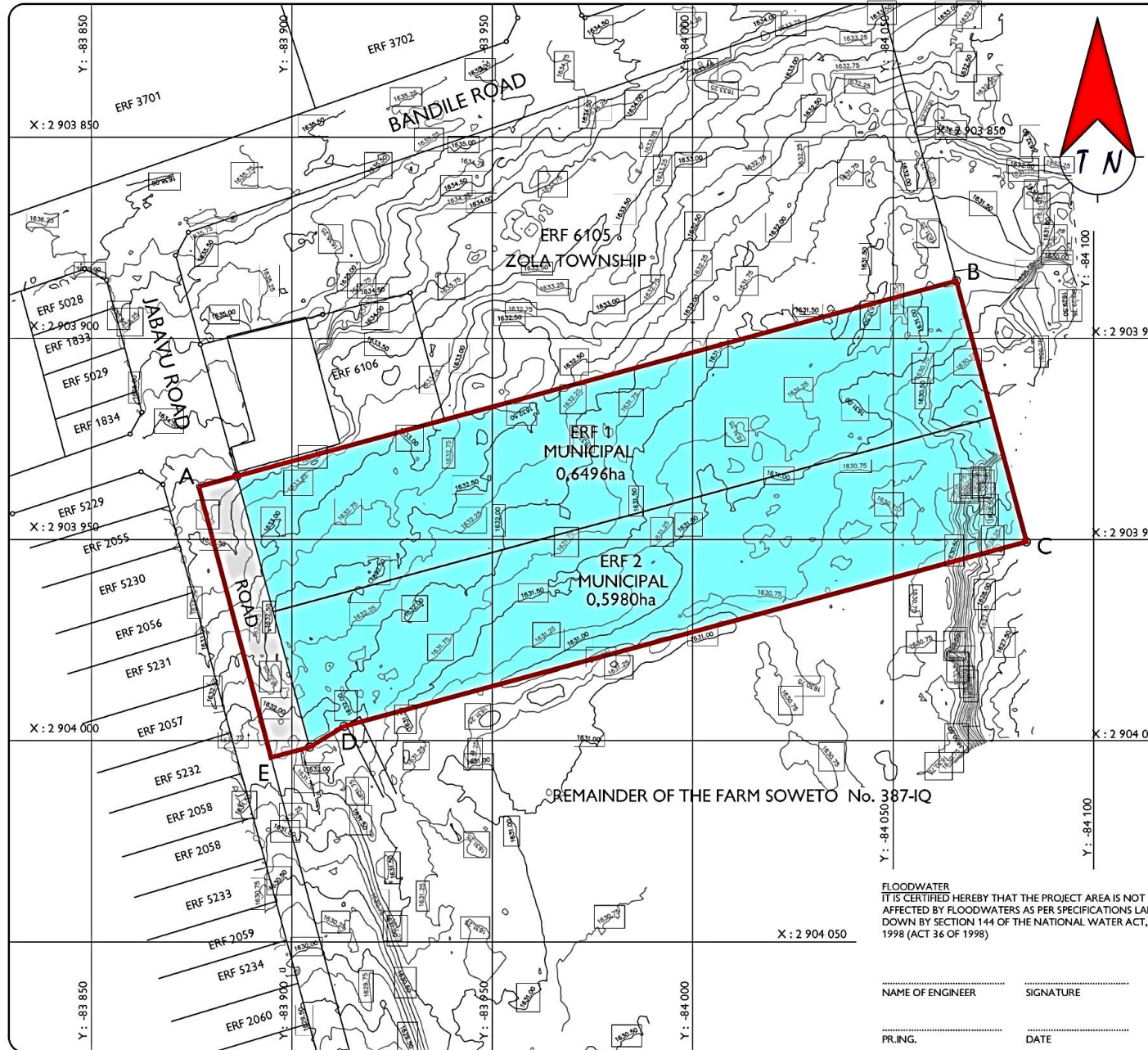
The compilation of the EMPr has incorporated impacts and mitigation measures from the Proposed TOWNSHIP ZOLA EXTENSION 3 to be situated on a Part of the Remainder of the FARM SOWETO 387-IQ (City of Johannesburg - Gauteng) BAR as well as incorporating principles of best practice in terms of environmental management.

By identifying the impacts, mitigation measure, performance indicators, responsibilities, available resources, potential schedule, and verification responsibility the EMPr has provided a platform on which both the construction phase and the operational phase EMPr's can be founded.

The EMPr has ensured that the individual EMPr's will be able to incorporate mitigation measures based on the project in its entirety as opposed to phase specific measures.

APPENDIX 1: LOCALITY PLAN, SITE PLAN & FACILITY ILLUSTRATION





PROJECT

**PROPOSED TOWNSHIP
ZOLA EXT.3
SITUATED ON A PART OF THE
REMAINDER OF THE FARM
SOWETO 378 I.Q**



LAND USE TABLE

LAND USE	NO. OF STAND	AREA	%
MUNICIPAL	2	1,2476	94,76
PUBLIC ROAD		0,0702	5,24
TOTAL	2	1,3178ha	100%

FIGURE A - E REPRESENTS PROPOSED TOWNSHIP ZOLA EXT.3 SITUATED ON A PART OF THE REMAINDER OF THE FARM SOWETO 378 I.Q

ERF 1 & 2 TO BE CONSOLIDATED AFTER PROCLAMATION

CLIENT

JDA
Johannesburg Development Agency

DESIGNED	HT	APPROVED		SCALE	1:1000 (A3)
DRAWN	ET	DATE	APRIL 2019	COPYRIGHT	RESERVED

DRAWING No. B1901K / SOWETO / 1

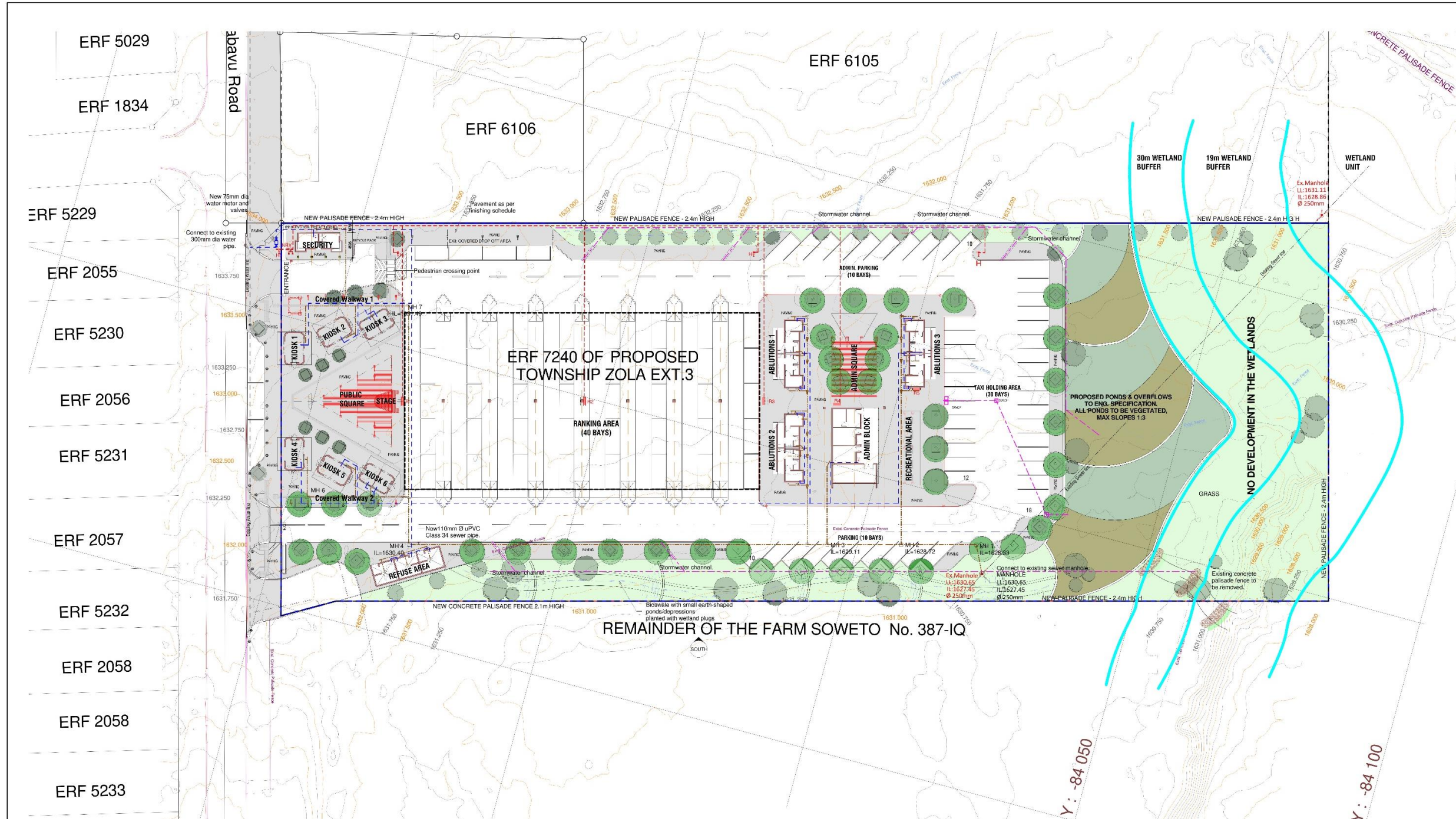
53 Conrad Street
Florida North
E - mail :
khare.inc@iafrica.com
Tel no :
(011) 472 - 5665
Fax : 086 645 3444

KHARE Inc
DEVELOPMENT FACILITATORS

FLOODWATER
IT IS CERTIFIED HEREBY THAT THE PROJECT AREA IS NOT AFFECTED BY FLOODWATERS AS PER SPECIFICATIONS LAID DOWN BY SECTION 144 OF THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998)

NAME OF ENGINEER SIGNATURE

PR.ING. DATE



GENERAL NOTES:

1. THE DRAWING IS NOT TO BE SCALE. FIGURE DIMENSIONS TO BE USED ALL THE TIME.

2. CONTRACTOR IS RESPONSIBLE FOR CORRECT DETAILING OF THE FOLLOWING: ALL EXISTING AND PROPOSED STRUCTURES AND PARTICULAR REFERENCE TO FOUNDATIONS, E.G. DRAIN PIPES ETC.

3. CONTRACTOR TO VERIFY ALL LEVELS, HEIGHTS AND DIMENSIONS SHOWN IN THIS DRAWING.

4. CONTRACTOR TO CHECK AND VERIFY ALL LEVELS, HEIGHTS AND DIMENSIONS ON THE GROUND BEFORE ANY WORK COMMENCES AND REPORT TO THE ENGINEER PRIOR TO START OF WORKS OR BEFORE THE START OF EACH PHASE.

5. THE CONTRACTOR IS TO BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, APPROVALS AND NOTICES FROM THE APPLICABLE AUTHORITIES PRIOR TO THE START OF WORKS AND TO KEEP THE APPLICABLE AUTHORITIES ADVISED OF ANY CHANGES TO THE WORKS AND TO OBTAIN APPROVALS FOR ANY SUCH CHANGES.

6. CONTRACTOR TO OBTAIN APPROVALS FROM THE APPLICABLE AUTHORITIES FOR THE PROPOSED PONDING AND OVERFLOW AREAS AND TO OBTAIN APPROVALS FOR THE PROPOSED WETLAND BUFFER AREAS.

7. CONTRACTOR TO OBTAIN APPROVALS FROM THE APPLICABLE AUTHORITIES FOR THE PROPOSED WETLAND BUFFER AREAS AND TO OBTAIN APPROVALS FOR THE PROPOSED WETLAND BUFFER AREAS.

8. CONTRACTOR TO OBTAIN APPROVALS FROM THE APPLICABLE AUTHORITIES FOR THE PROPOSED WETLAND BUFFER AREAS AND TO OBTAIN APPROVALS FOR THE PROPOSED WETLAND BUFFER AREAS.

9. CONTRACTOR TO OBTAIN APPROVALS FROM THE APPLICABLE AUTHORITIES FOR THE PROPOSED WETLAND BUFFER AREAS AND TO OBTAIN APPROVALS FOR THE PROPOSED WETLAND BUFFER AREAS.

10. CONTRACTOR TO OBTAIN APPROVALS FROM THE APPLICABLE AUTHORITIES FOR THE PROPOSED WETLAND BUFFER AREAS AND TO OBTAIN APPROVALS FOR THE PROPOSED WETLAND BUFFER AREAS.

ISSUED FOR INFORMATION

SERVICES LEGEND:

COLOR	DISCIPLINE
Blue	STORMWATER
Orange	SEWER
Red	FIRE
Green	DOMESTIC WATER

REVISIONS

NO.	DATE	DESCRIPTION
A	2021/11/18	REV. ALTERNATIVE OPTION SUBMITTED FOR APPROVAL.
B	2021/11/18	REV. GENERAL LAYOUT USED FOR APPROVAL PRESENTATION.
C	2021/11/18	REV. UPDATE UNDER DEVELOPMENT TO REFLECT CHANGES AND REVISIONS.

SCHEDULE OF RIGHTS

PROPERTY DESCRIPTION	PERMISSIBLE	CONTROL COVERAGE	HEIGHT	ACTUAL
ERF NO.: 7240 (PROPOSED)	To the satisfaction of LA	22%	1 STOREY	22%
TOWNSHIP SCHEME: PROPOSED TOWNSHIP ZOLA EXT. 3 ANNEXURE F	N/A	0.22	FAR DENSITY	N/A

ZONING INFORMATION

USE ZONE (CURRENT)	USE ZONE (PROPOSED)
MUNICIPAL UNDETERMINED/AGRICULTURAL	MUNICIPAL PURPOSES AND TRANSPORT FACILITIES

SITE AREA: 12 484 m²

BUILDING LINES: TO THE SATISFACTION OF THE LOCAL AUTHORITY

STATUS OF ERF NO.:

THE FOLLOWING REFERS WITH ERF NO.:

- THE SITE IS CURRENTLY LOCATED ON REMAINDER OF THE FARM SOWETO NO. 387-IQ
- CURRENTLY THE ESTABLISHMENT OF NEW TOWNSHIP IS IN PROGRESS, ZOLA EXT. 3 WITH ERF 7238 & 7239
- ONCE THE TOWNSHIP IS ESTABLISHED THE ABOVE ERF TO BE CONSOLIDATED TO ERF 7240.

PARKING:

RANKING AREA	= 40 Bays
DROP-OFF AREA	= 4 Bays
ADMIN. PARKING	= 10 Bays
TAXI HOLDING	= 30 Bays
OVERALL TOTAL	= 84 Bays

DEVELOPMENT CONTROL MEASURES

PERMISSIBLE	CONTROL COVERAGE	HEIGHT	ACTUAL
To the satisfaction of LA	22%	1 STOREY	22%
N/A	0.22	FAR DENSITY	N/A

BUILDING AREA SCHEDULE

BLOCK	AREA (m ²)
BLOCK A: GUARD-HOUSE	22.54m ²
BLOCK B: BI-KIOSKS	125.18m ²
BLOCK C: REFUSE AREA	51.19m ²
BLOCK D: ABLUTIONS	34.19m ²
BLOCK E: ABLUTIONS	34.19m ²
BLOCK F: ADMIN OFFICES	118.83m ²
BLOCK G: ABLUTIONS	34.19m ²
RANKING AREA	2375.37m ²
RECREATIONAL AREA	54.20m ²
TOTAL: BUILDING AREA	2849.77m²

DRIVEWAY & PARKING: 2 724.35m²

PAVED WALKWAYS: 2 505.74m²

SOFT LANDSCAPING: 1 341.24m²

ATTENUATION PONDS: 1 210.20m²

TOTAL: DEVELOPMENT FOOTPRINT: 10 631.30m²

WETLAND BUFFER AREAS: 1 852.70m²

TOTAL: SITE AREA: 12 484.00m²

CLIENT

JDA
Johannesburg Development Agency

IMPLEMENTING AGENT

ARCHITECT

digit
architects

PROJECT

PROPOSED NEW ZOLA EMEINI PUBLIC TRANSPORT FACILITY

PROJECT ADDRESS

ERF 6105, 6106 ZOLA TOWNSHIP SOWETO

BUILDING (CLUSTER):

DRAWING TITLE

PROPOSED PREFERRED LAYOUT PLAN

DATE: 21.05 **DRAWN**: [Name] **SCALE**: [Scale] **ISSUED BY**: [Name] **SHEET NO.:** AO

PROJECT NO.: [Number] **DRAWING NO.:** [Number] **REVISION**: [Number]

SCALE 1:250

NORTH



LEGEND	
	TAXI RANK AREA
	CHANNELLED VALLEY BOTTOM (No-Go Zone)
	CULTIVATED SEEP
	SEEP (No-Go Zone)
	SHALLOW INFILL
	ARTIFICIAL CANALS
	19m WETLAND BUFFER (No-Go Zone)
	30m WETLAND BUFFER (No-Go Zone)
	PROPOSED ATTENUATION POND
	FLOODLINE 1 IN 100 YEARS

FOR INFORMATION

DRAWING TYPE		INFORMATION DRAWINGS		DRAWN BY		S. Shako		CONSULTANTS		AJA CONSULTING CIVIL ENGINEERS		CLIENT		JOHANNESBURG DEVELOPMENT AGENCY		FILE No		TYPE OF PLANNING	
DRAWING APPROVAL				DRAWING CHECKED		S. Mathebula		AJA CONSULTING CIVIL ENGINEERS		P O Box 3990 FAIRIE GLEN 0043		P O Box 61973 MARSHALLTOWN 2107		ZOLA EMDENI PUBLIC TRANSPORT FACILITY		AGREEMENT No		INFORMATION DRAWINGS	
M. JANTJIES				DESIGNED BY		S. Mathebula		Tel: (011) 991 1993 Fax: (011) 991 3944 info@ajace.co.za www.ajace.co.za		Tel: (011) 688 7851 info@jda.org.za www.jda.org.za		ZOLA EMDENI PUBLIC TRANSPORT FACILITY		ROAD No.s		SCALE		CONTRACT No	
DATE: JAN 2022		ECSA Pr No: 200870199		DATE		26/01/2022		ISSUED FOR INFORMATION		JDA		ZOLA EMDENI PUBLIC TRANSPORT FACILITY		DISTRICT		AS INDICATED		N/A	
				DATE		AMENDMENTS						JOHANNESBURG						REVISION	
																		0	
																		DWG No	
																		2021-013-PD-RD-001	

APPENDIX 2: METHOD STATEMENT TEMPLATE

METHOD STATEMENT

CONTRACT: **DATE:**

PROPOSED ACTIVITY (give title of method statement and reference number from the EMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

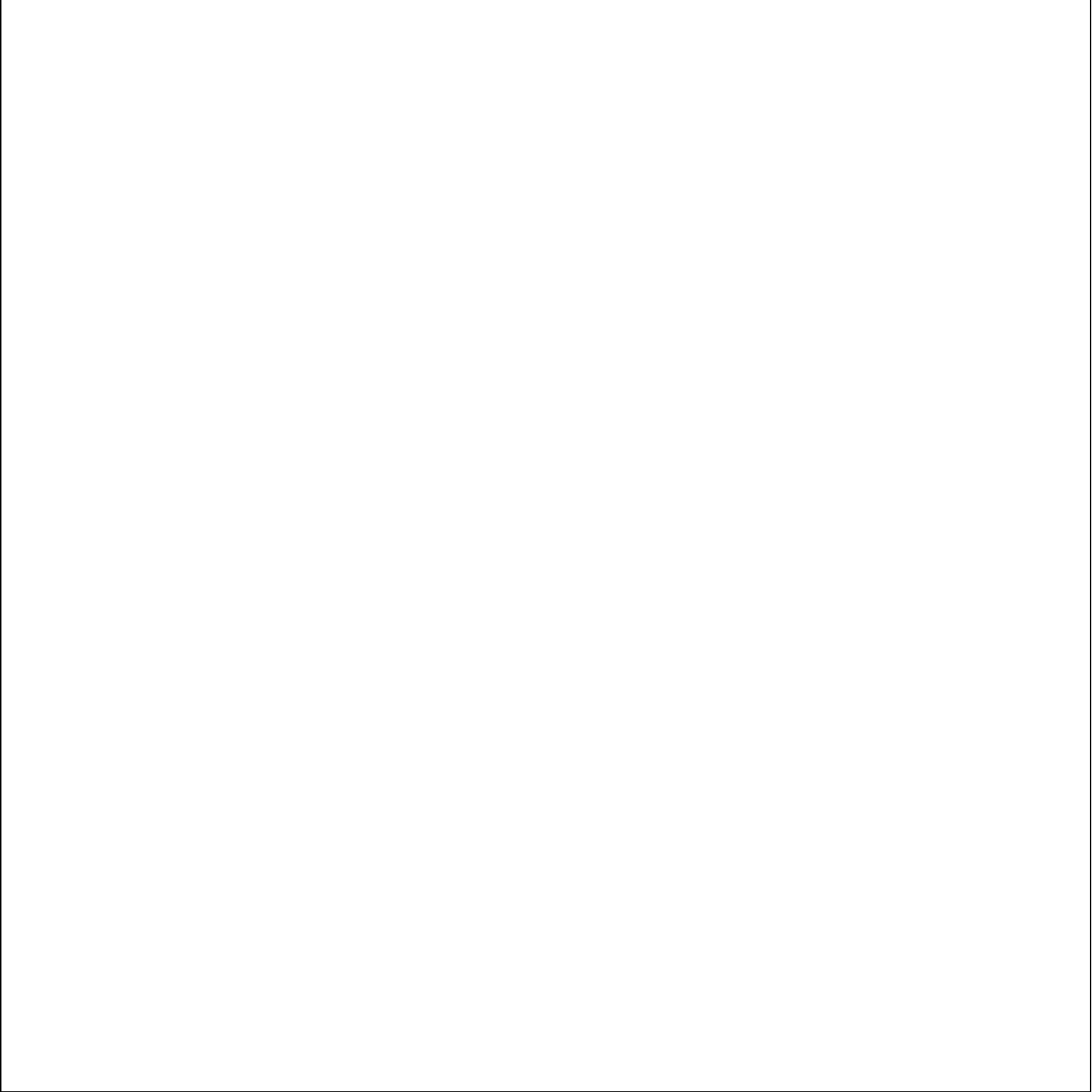
WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):



** Note: please give too much information rather than too little. Please ensure that issues such as emergency procedures, hydrocarbon management, wastewater management, access, individual responsibilities, materials, plant used, maintenance of plant, protection of natural features etc are covered where relevant*

DECLARATIONS

1) RESPONSIBLE OFFICER (EO/ ESO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed)

(print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the EO/ ESO will audit my compliance with the contents of this Method Statement. I understand that this method statement does not absolve me from any of my obligations or responsibilities in terms of the Contract.

(signed)

(print name)

Dated: _____

3) EMPLOYER (i.e. ASSOCIATION/ Owner)

The works described in this Method Statement are approved.

(signed)

(print name)

(designation)

Dated: _____

APPENDIX 3: *Curriculum Vitae* of Environmental Assessment Practitioner