

ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 11330 STELLENBOSCH



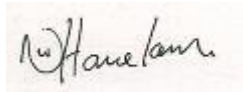
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Prepared for: Stellenbosch Municipality
PO Box 17
Stellenbosch
7600
Tel: 021 808 8111
E-mail: stellenbosch@stellenbosch.gov.za

Prepared by: Eco Impact Legal Consulting (Pty) Ltd
P.O. Box 45070
Claremont
South Africa
7735
Tel: 021 671 1660
Email: admin@ecoimpact.co.za



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		Title: THE PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 11330 STELLENBOSCH 7th Draft Environmental Management Programme		
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Carried Out By: Eco Impact Legal Consulting (Pty) Ltd P.O. Box 45070 Claremont 7735 Tel: 021 671 1660 E-mail: admin@ecoimpact.co.za		Commissioned By: ASLA Devco Karen Siebrits P.O. Box 118 Gordons Bay 7151 Tel: 021 845 8335 Fax: 021 845 8552 E-mail: karen@asla.co.za	Client: Stellenbosch Municipality PO Box 17 Stellenbosch 7600 Tel: 021 808 8111 Fax: NA E-mail: stellenbosch@stellenbosch.gov.za	
Author: Jessica Le Roux		Contact Person: Karen Siebrits (see contact details above)		
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Verification	Capacity	Name	Signature	Date
By Author	Senior EAP	Jessica Le Roux		20 August 2016
Updated and Reviewed	Director: Environmental Management; Principle EAP & Biodiversity Specialist	Nicolaas Hanekom		1 March 2019

COMMITMENT AND DECLARATION OF UNDERSTANDING BY CONTRACTOR AND DEVELOPER FOR THE PROPOSED IDAS VALLEY RESIDENTIAL DEVELOPMENT

I, the undersigned, as duly authorized by the Contractor, have studied and understand the contents of this document. On behalf of the Contractor, I confirm that the Contractor undertakes to adhere to the conditions as set out herein, unless specifically otherwise agreed to in writing.

Signed at on this Day of20.....

.....
For Contractor

I, the undersigned, as duly authorized by the Developer have studied and approve the contents of this document on behalf of the Developer, for implementation by all Contractors involved at the site.

Signed at on this day of20.....

.....
Developer's Representative

DEFINITIONS

Auditing:	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis based to a (e.g. ISO 19011:2003) standard.
Biodiversity:	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Contractor:	An employer, as defined in section 1 of the Occupational Health and Safety Act 85 of 1993, who performs construction work and includes principal contractors
Developer:	One who builds on land or alters the use of an existing building for some new purpose.
Environment:	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Evaporation:	The change by which any substance (e.g. water) is converted from a liquid state into and carried off as vapour.
Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlying soil, are saturated under pressure equal to or greater than atmospheric.
Independent:	Is independent and has no interest in any business related to the development site, nor will receive any payment or benefit other than fair remuneration for the task undertaken.
Landowner:	Holder of the estate in land with considerable rights of ownership or, simply put, an owner of land.
Monitoring:	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Natural vegetation:	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution:	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants:	Plant species officially listed under the Threatened or Protected Species regulations as well as on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Red Data Species:	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.
Rehabilitation:	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.
Site:	Property or area where the proposed development will take place

ACRONYMS

DEA&DP:	Department of Environmental Affairs and Development Planning
DWS:	Department of Water and Sanitation
ECO:	Environmental Control Officer
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EO:	Environmental Officer
ER:	Engineer's Representative
I&AP:	Interested and Affected Party
IEM:	Integrated Environmental Management
MS:	Method Statement
PM:	Project Manager
SANS:	South African National Standards

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DEVELOPER's COMMITMENT

The Stellenbosch Municipality ("SM") has committed itself to a set of values that include the maintenance of good relations and transparent communications with all stakeholders, and the dynamic engagement of the larger community.

SM undertakes to implement suitable management systems for all the areas and aspects of this operation. This will ensure that development itself and management of the project will comply with legal, technical, environmental and transformation policies and standards.

SM, in drafting this EMP for implementation, intends to enable continuous improvement in legal compliance and the sustainable operation of the site.

This EMP intends to further guide the achievement of the strategic objectives of the organization at the project site and seeks to ensure that the basic requirements of ISO 14001: 2015 are satisfactorily met.

The EMP intends to change the way in which the owners, the construction process they have commissioned and the contractor plan for and manage resources to achieve sustainability.

The satisfactory implementation of the EMP on site will require both the full support and commitment of all personnel.

CHAPTER 1

1.1. Executive Summary

This EMP has been prepared principally in compliance with the requirements of Section 24N and Section 34 of the National Environmental Management Act 107 of 1998. This document, together with the conditions in the Environmental Authorisation, must be adhered to.

The EMP must be included as part of all contract documentation for all contractors in the construction phase of the development.

The Author and Eco Impact Legal Consulting (Pty) Ltd ("Eco Impact")

Eco Impact is an independent consulting company and has no interest in any business related to the development site, nor will it receive any payment or benefit other than fair remuneration for the task undertaken, as required in terms of the NEMA Regulations.

This report has been prepared by Jessica Le Roux, of Eco Impact, an environmental consultancy, engaged in providing professional services in the field of environmental planning, -systems, -auditing and -biodiversity assessment and -management.

Jessica Le Roux has completed her professional registration in terms of section 20(3) (b) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) as a Professional Natural Scientist in the field of practice Environmental Science (Registration number 400192/16). She obtained her BSc (Honours) in Environmental and Geographical Science in 2011 from the University of Cape Town and subsequently obtained her MSc in Zoology (Applied Marine Science) in 2013.

Jessica has trained as an Environmental Assessment Practitioner since August 2013 and has been involved in the compilation, coordination and management of Basic Assessment Reports, Environmental Impact Assessments, Environmental Management Programmes, Waste Licence Applications, Water Use Licence Applications and Baseline Biodiversity Surveys for numerous clients.

1.2. Project Description

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

Layout - (dated March 2018 as amended up to and including 01 October 2018)

This layout consists of:

The construction of the following:

- 203 units of GAP and affordable housing (2.77ha);
 - 96 flat units (0.56ha) that will be located on one erf in the central region of the site; and
 - 4 public open space erven (0.95ha)
- The non-perennial river and its flood plain and buffer area will be zoned to Public Open Space. No construction will take place within the floodlines other than:
 - Two box culvert vehicle bridges consisting of: Eastern: 2 x 1 500mm x 1 200mm and Western: 2 x 1 800mm x 900mm.
 - Part of the proposed gabion wall (northern side) will be inside the floodline (embankment for the provision of the road).
 - A retaining wall will be constructed on the edge of the parking area for the flat units and on the northern side of the river. Construction of the retaining walls will be outside the floodline and river buffer areas except for the embankment for the road on the northern side.
 - The internal water reticulation system will consist of a 110mm diameter pipe and will be connected to the existing water reticulation system. There will also be a box culvert of 1.2m x 0.9m in size.
 - A detention pond will be constructed to manage storm water discharge on the site. The detention pond is centrally located on the site and covers an area of 500m².

Pond Area	500m ²
1:50 Inflow	2.602m ³ /s
1:100 Inflow	3.325m ³ /s
Max. depth (1:50)	1.240m
Max. depth (1:100)	1.500m
Pond storage volume (1:50)	386m ³
Pond storage volume (1:100)	563 ³
1:50 Outflow	2.179m ³ /s
1:100 Outflow	2.459m ³
Orifice (Pipe dia.)	1 x 675mm
1:50 Freeboard	0.360m
1:100 Freeboard	0.100m

Table 1: Proposed Detention Pond

CHAPTER 2

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

It deals with issues relating to the implementation of the EMP.

2.1 Organizational Structure

The organizational structure identifies and defines the responsibilities and authority of the various persons and organizations involved in the project. All instructions and official communications regarding environmental matters must follow the organizational structure.

The Environmental Official (EO), to whom the Engineer's Representative (ER) and/or Environmental Control Officer (ECO) must report and interact, must be the responsible client representative.

The EMP must be an agenda item at the monthly site and operations meetings and the responsible client representative(s) may attend these meetings in order to provide input with respect to compliance with the EMP.

2.2 Responsibilities and Functions of the Environmental Control Officer

The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMP and/or EA by all contractors and site management during site visits.

The ECO duties in this regard will include the following:

With the assistance, where necessary of the ER, to ensure all necessary environmental authorizations and permits have been obtained and are available and visible on site at the ER offices.

- monitor and verify that the EMP and/or EA is adhered to at all times and by taking action if the specifications are not followed;
- ensure that the initial environmental awareness training for construction employees is conducted before construction commences onsite;
- monitor and verify that environmental impacts are kept to a minimum;
- review and approve construction method statements, with input as appropriate from the ER;
- assist the contractor in finding environmentally responsible solutions to problems;
- report on the environmental issues at the site meetings and other meetings that may be called regarding environmental matters, if requested by ER;
- inspect the site and surrounding areas regularly with regard to compliance with the EMP and/or EA;
- monitor the environmental awareness training for all new personnel coming onto site;
- advise management on the removal of person(s) and/or equipment not complying with the specifications, after collaboration with the ER. Recommendations must be recorded by the ER in Site Instruction Book.
- ensure that activities on site comply with known legislation of relevance to the environment;
- recommend the issuing of penalties via the developer for contraventions of the EMP and/or EA;
- keep a photographic record of progress on site from an environmental perspective; and
- Undertake a continual internal review of the EMP and/or EA and submit a report to the developer and the responsible DEA&DP Environmental Official as according to EA conditions.

2.3 Agreed Work Plan and Site Visit Schedule of ECO

After initial construction start-up site visit it is recommended that an ECO site visit be conducted once a month during construction.

Information recording activity on site, and any guidelines or instructions emanating there from will be routinely made available electronically to the developer and applicable contractors and a copy of the report must be available at the site office.

Clearly matters of urgency or immediate action may be channelled appropriately on an urgent basis.

2.4 Site Manager

The site manager will have the following environmental control responsibilities:

- In conjunction with the ECO will present the environmental education programs to all persons employed on site.
- Consult with the ECO, landowner, developer and any contractor to resolve all environmental issues.
- Issue any instructions from the ECO to the management team via a formal site instruction book or appropriate management tool used for the purpose.
- Take responsibility for the penalty system. The ECO and developer recommendations must be considered when deciding whether or not to impose a penalty.
- The engineer will, via the ECO actions, be accountable for the overall implementation of the Environmental Management Programme.
- Keep a site diary and complaints register.

2.5 Contractors

As part of any tender, the tendering contractor must submit a first draft of a contractor's programme, to the developer which must include the environmental considerations to be followed prior to appointment.

The appointed Contractor's representative will have the following responsibilities:

- Ensure that all staff is familiar with the Environmental Management Programme, which explains the environmental policy for the project.
- Allow for sufficient time between surveying the exact locations where services will be intended and actual construction, for the ECO to facilitate and instruct for the removal of plants, seeds and cuttings if necessary.
- The contractor must keep his personnel fully aware of environmental issues and ensure they show adequate consideration to all environmental aspects.
- Establish environmental signs to be erected on the construction site at locations identified by the ECO and approved by the engineer.
- Be responsible for the cost of the restoration of any damage caused, in environmentally sensitive areas, as a result of contractor responsibility regarding negligence. This must be done in accordance with the engineer / ECO's specifications.
- Take responsibility and active steps to avoid any increase in the fire hazard.
- The contractor must take responsibility for implementing all the relevant provisions of the EMP, or if he encounters difficulties with the specifications, he must discuss alternative approaches with the ECO and engineer prior to proceeding.

Failure to comply with the EMP may result in the application of fines as set out, and any reported non-compliance may result in the suspension of work or termination of a contract.

2.6. Record keeping of activities, inclusive of recording of non-compliances and corrective actions

The ECO or ER must keep a record of all activities relating to environmental matters on site, including:

- meetings attended;
- method statements received and approved;
- issues arising on site;
- cases of non-compliance with the EMP;

- corrective action taken and penalties issued.

This information will be recorded in an appropriate manner by the ECO or ER in a site diary, registers, issues/warning book, etc.

2.7 Compliance with other legislation

It is important that all on site staff are aware of other relevant legislation that may relate to the activities taking place on site, especially local authority required compliances.

CHAPTER 3

Applicable Legislation, Policy and Environmental Principles

3.1. Applicable Legislation Identified

1. ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 OF 1940
2. BASIC CONDITIONS OF EMPLOYMENT ACT 75 OF 1997
3. COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT 130 OF 1993
4. CONSERVATION OF AGRICULTURAL RESOURCES ACT, 43 OF 1983
5. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996
6. ENVIRONMENT CONSERVATION ACT, 73 OF 1989, WESTERN CAPE NOISE CONTROL REGULATIONS
7. EMPLOYMENT EQUITY ACT, 55 OF 1998
8. ENVIRONMENT CONSERVATION ACT, 73 OF 1989
9. FENCING ACT, 31 OF 1963
10. HAZARDOUS SUBSTANCES ACT, 15 OF 1973
11. LABOUR RELATIONS ACT 66 OF 1995
12. NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 103 OF 1977
13. NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998
14. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT 39 OF 2004
15. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 10 OF 2004
16. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 59 OF 2008
17. NATIONAL FORESTS ACT, 84 OF 1998
18. NATIONAL HERITAGE RESOURCES ACT, 25 OF 1999
19. NATIONAL VELD AND FOREST FIRE ACT, 101 OF 1998
20. NATIONAL WATER ACT 36 OF 1998
21. OCCUPATIONAL HEALTH AND SAFETY ACT 85 OF 1993
22. TOBACCO PRODUCTS CONTROL ACT 83 OF 1993
23. WATER SERVICES ACT 108 OF 1997
24. STELLENBOSCH LOCAL MUNICIPALITY: BY-LAW RELATING TO THE CONTROL OF BOUNDARY WALLS AND FENCES
25. STELLENBOSCH LOCAL MUNICIPALITY: BY-LAW ON STREETS
26. STELLENBOSCH LOCAL MUNICIPALITY: COMMUNITY FIRE SERVICES BY-LAW
27. CAPE WINELANDS DISTRICT MUNICIPALITY: MUNICIPAL HEALTH BY-LAW
28. CAPE WINELANDS DISTRICT MUNICIPALITY: FIRE SAFETY BY-LAW

CHAPTER 4

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

Compliance

4.1. Monitoring and Auditing

4.1.1 Introduction

In keeping with current environmental and associated legislation, all environmental management procedures and actions must be reviewed and refined on an ongoing basis.

This is in accordance with the dynamic nature of environmental management and allows for the timely identification and mitigation of issues as they come to light.

The process of review and refinement, built into the requirements of the EMP, is known as monitoring and auditing.

4.1.2. Roles and responsibilities

Efficient implementation of the performance specifications, effective monitoring and auditing, as well as clear responsibility and accountability allocation requires that various role-players be defined for the construction implementation project.

Depending on the nature and scale of a project, implementing teams could be composed of any number of role-players, each with their own specified responsibilities.

Therefore, for the purpose of this document, the following role-players are defined, based purely on responsibility and accountability allocation. The actual designation of role-players may vary, but the responsibilities will largely remain as stated.

4.1.2.1. Developer/landowner or custodian of the land

The developer/landowner or custodian of the land is the person or organization with decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land.

4.1.2.2. Contractor

Contractors are appointed to undertake the works as specified in the contract. It is the responsibility of the contractor to do whatever is necessary from their side to ensure that he or an appointed advisor is well versed in environmental studies, so that they may accurately and efficiently carry out the requirements of the environmental specification.

The contractor is liable for any and all remedial work required in terms of the environmental specification, resulting from his environmental negligence, mismanagement and / or non-compliance.

4.1.2.3. Environmental Control Officer

An environmental control officer will manage and undertake monthly environmental inspections for the duration of the construction phase of the project as required.

The contractors or line management are answerable to the ECO for non-compliance with the performance specifications. Issues of non-compliance raised by the ECO/EO must be taken up by the project manager, and resolved as per the conditions of his contract.

Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation and not allowed for in the performance specification) must be endorsed by the project manager.

4.2. The Monitoring Procedure

Environmental monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social and economic variables associated with development impacts.

Many techniques for environmental monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance
- Satisfactory performance
- Unsatisfactory performance and
- No action taken

Completed monitoring reports will be submitted to the project engineer, developer/landowner and the contractor, who will attend to issues. These reports must be kept on file and be made available upon request by any environmental authority requesting such.

All persons employed, the contractor or his sub-contractors, must abide by the requirements of these performance specifications as they apply to the works. Any employees, the contractor or his sub-contractors found to be in breach of any of the environmental specifications, may be ordered to vacate the site forthwith and/or be subject to a disciplinary process.

The order may be given orally or in writing by the ECO. Confirmation of an oral order will be given as soon as practicable, but lack of confirmation in writing must not be a cause for the offender to remain on site, or not be subject to a disciplinary process. Supervisory staff, the contractor or his sub-contractor may not direct any person to undertake any activities which would place such person in contravention of the EMP, legislation and specifications.

The contractor and staff are deemed not to have complied with the performance specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the specification;
- There is evidence of the contractor carrying out activities not permitted in terms of the EMP, contract and / or the specification;
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment;
- Has failed to meet with the requirements of the approved schedule.

The contractor and developer/landowner will be informed via ECO monthly reports, as well as by means of direct instruction (if necessary) as to what corrective actions are required in terms of environmental compliance.

Disregard for an instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance. Non-compliance may lead to parties being penalised.

In more serious cases, the ECO may give notice, and halt operations until such a time that the corrective action is taken and the site complies with the performance specifications.

In cases of persistent non-compliance, the contractor or staff may be evicted from site after disciplinary process is followed. Only the developer/landowner may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

4.3. The Auditing Procedure

Environmental auditing is the process of comparing the impacts predicted with those which have actually occurred during implementation.

An environmental performance audit examines and assesses practices and procedures which, in the event of failure, would cause an environmental impact or result in an environmental risk. During each of the lifecycle phases, various issues will be monitored. The performance audit will ensure that the monitoring was correctly undertaken and that compliance was best achieved.

To these ends the project will be audited versus this EMP for effectiveness. ISO/SANS 19011:2013 auditing standards will be applied.

Audits will be undertaken at completion of the construction phases. Audit reports will be submitted to management, who will attend to all noted issues.

These reports must be kept on record and be made available upon request by the developer/landowner/custodian of the land and any environmental authority or I&AP requesting such.

4.4. Retentions and Penalties

It is recommended that a penalty retention system be combined with the penalty system to both motivate and compel the contractor to adhere to the EMP for the duration of the contract.

In this way incentives may be created to perform (i.e. in the form of the retention amounts that will only be paid to the contractor at the end of the contract), without creating the misunderstanding that adherence to the EMP is optional.

Persistent non-compliance will not only result in the contractor forfeiting any retention amount, but he will also be fined.

Of importance is that the contract specifies exactly how the penalty and retention system will operate, as well as how any funds resultant from retentions and penalties will be utilised.

All such funds must be used to improve environmental conditions on the site in general.

4.4.1. The Retention System

For this system, a percentage value for each of the sections priced for in the environmental bill of quantities is retained until the full completion of the contract works.

If the monitoring process reveals persistent and/or wilful non-compliance with any aspect of the environmental performance specifications, then the full retention associated with that particular item will be withheld.

The project may then apply these retained funds to rectify the problem on site possibly making use of other or alternate resources at his disposal.

At the end of the contract or action, all remaining environmental retention amounts will be paid out to the contractor or staff pending approval by the ECO, after having confirmed full compliance with the relevant performance and rehabilitation specifications.

4.4.2. Penalty System

A system of penalties will be introduced to reinforce environmentally sensitive and prudent behaviour. The maximum penalties that will be fined per incident that may be enforced are listed below. The penalty amount will be determined (inter alia) by the severity of the offence.

Non-compliance	R 5 000.00 (ex VAT) per non-compliant act, per day until compliance is achieved
Casual Litter on site resulting from operation	R250 / offence / day
Disposal of any litter or construction material in non-specified area or by non-compliant means	R5000 / m ³ /per day
Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000 per offence/day
Failure to use portable / toilets	R100 / observed incident or evidence of human excrement on site

In addition to the above, all costs incurred by the client/developer to remedy any damage will be the responsibility of the offender.

Should the monitoring process reveal acts of persistent and / or wilful non-compliance with the environmental performance specifications, then the contractor or staff member will be fined according to the specified value of that item.

4.5. Method Statements

Contractors must provide written statements for discussion with the ECO on environmentally sensitive aspects of the contract. Environmentally sensitive aspects include by example excavations, work close to sensitive areas, collection and storage of top soil and vegetation, erosion control, wash water

control, waste control, etc. These method statements must be submitted to the competent authority (DEA&DP: Development Management) and approved prior to commencement of any site clearing or construction activities.

Methods Statement (MS) Content

It is important to note that the ECO may request further methods specification, if it be deemed necessary in his view.

- MS to specify the fire drill procedure to be followed in the event of a fire.
- MS to state how pollution will be prevented from entering any environmental system. To include the methods of filtering out pollution such as oil, petrol and waste from any working areas or roads.
- MS to specify special measures that will be needed in the event of large pollution spills.
- MS to indicate the timing and sequence of events to follow in sensitive areas to give sufficient time for the ECO to survey these areas and remove plants.

The Method Statement must include a site plan, preparatory steps, materials, and supervision details.

Example of Environmental Method Statement Form:

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 attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL SITE OFFICER/ ENGINEERS REPRESENTATIVE [select correct term]

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 ECO / EO and ER will audit my compliance with the contents of this method statement

(signed)

(print name)

Dated: _____

3) APPROVING AUTHORITY (Engineer)

The works described in this method statement are approved.

(signed)

(print name)

(designation)

Dated: _____

CHAPTER 5

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

5.1. Good Housekeeping

The developer/landowner will ensure the maintenance of “good housekeeping” practices during operations.

This will help avoid several disputes regarding responsibility and will allow for the smooth running of the operation as a whole.

Good housekeeping extends beyond the environmentally sensitive construction methods to include the care for and preservation of the surrounding environment.

5.2. Record Keeping

The developer/landowner will ensure that a filing system, identifying all documentation related to the EMP, is established.

A list of reports likely to be generated during the project is set out below.

All applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Approved EMP, authorizations, licenses or permits;
- Final design documents and diagrams issued;
- All communications detailing changes of design/scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Environmental training manual;
- Environmental training attendance registers;
- Incident and accident reports;
- Evidence of all disposed contaminated products, waste or residues, which have been generated during construction;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents as part of emergency preparedness teams e.g. fire teams, etc.;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;
- All method statements for all phases of the project.

5.3 Document Control

The developer/landowner will be responsible for establishing a procedure for document control.

The document control procedure must comply with the following requirements:

Documents must be identifiable by organisation, division, function, activity and contact person; Every document must identify the person and their positions, responsible for drafting and compiling the document, for reviewing and recommending approval, and final approval of the document for distribution;

All documents must be dated, provided with a version number and reference number, filed systematically, and retained for a specified period.

The owner will ensure that documents are periodically reviewed and revised where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed. All documents will be made available to the external auditor.

5.4 Reporting Requirements

All advice and recommendations made by the ECO must with the project engineer/engineers compliance be recorded on site in the site instruction book/suitable register for his attention.

All spills will need to be documented and reported to DWA and other relevant authorities.

CHAPTER 6

6.1. Public Communication Protocols

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

The developer/landowner must be responsible for regulating public access to information and compliance reporting.

The developer/landowner must respond to third party or public queries and complaints.

The developer/landowner must also be responsible for maintaining the compliance register to record complaints received and action taken.

CHAPTER 7

This section of the report is included in compliance with Section 24 N 2 (d - g) and 3 (a - b) of the National Environmental Management Act 107 of 1998.

PRE-CONSTRUCTION/PLANNING PHASE

Introduction

In order to maintain aesthetics, standards, general appearance, security arrangements and greening processes it is necessary that contractors adhere to rules and regulations as determined by the developer.

The contractor acknowledges that he is working on an environmentally sensitive project agrees to conform to environmental controls specified from time to time.

Strict adherence to these rules in all respects is required and expected at all times.

The developer must appoint or designate a suitable, experienced and qualified ECO before commencement of any land clearing or construction activities to ensure compliance with the provisions of this EMP.

The ECO appointment contract must:

- Describe the level and type of competency required of the ECO ;
- Define and allocate the roles and responsibilities of the ECO;
- Indicate monthly frequency of ECO site visits;
- Be included in all contract documentation for the construction phase of the development.

Qualifications of Contractors

All contractors are appointed by the developer. Only solvent contractors with adequate experience and who can satisfy the developer of such prior experience should be appointed.

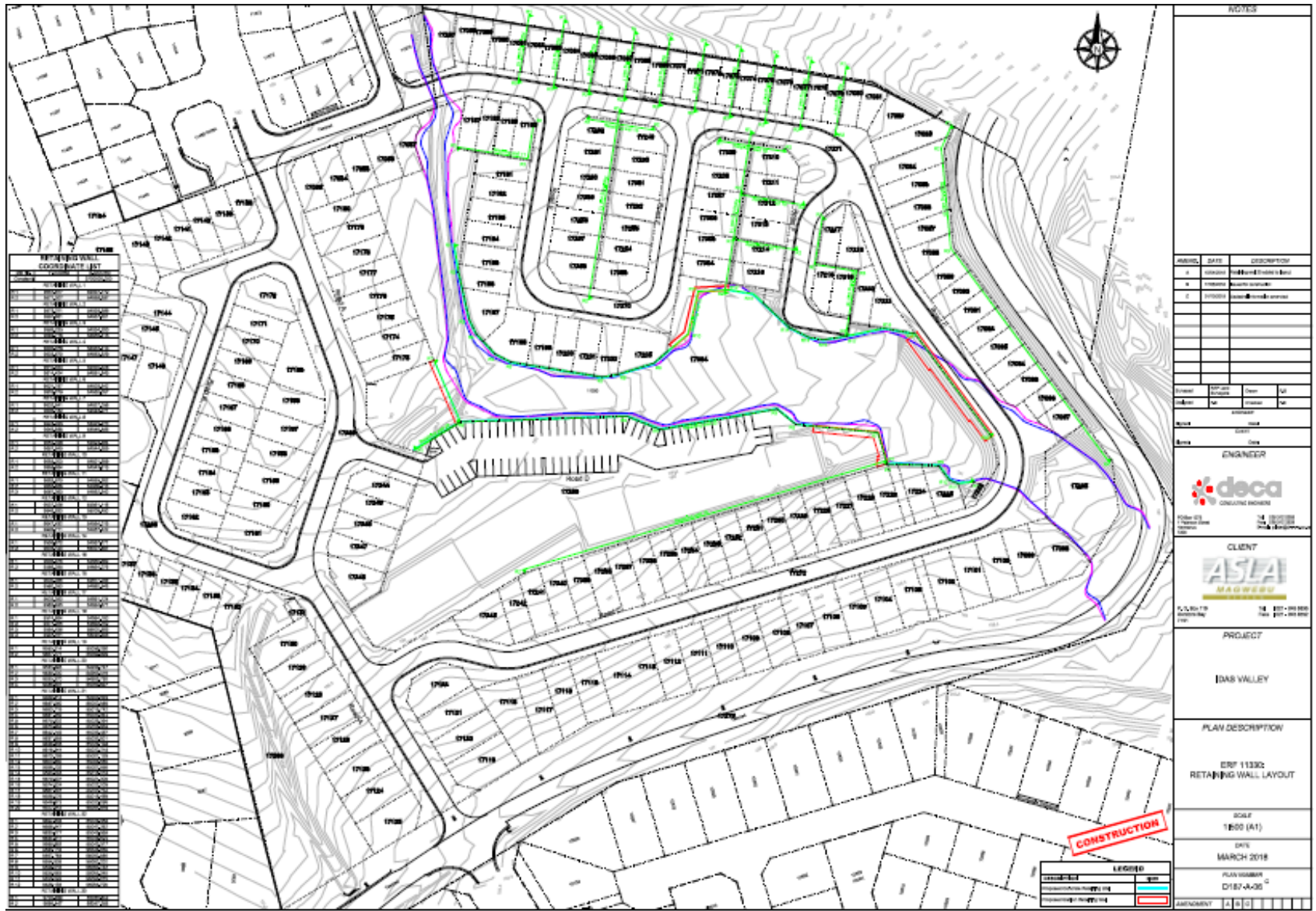
The contractors themselves must investigate and comply with all existing regulations and laws/bylaws, unless the relevant authority grants specific prior written authority waiving compliance with any legislation.

Site meeting and pre-conditions before construction activities commence

The following pre-conditions must be fully met before any construction activities may commence:

- A site meeting between the contractors and the representatives i.e. ECO of the developer must take place at least 5 days prior to commencement of construction work to:
 - Demarcate micro construction areas, services routes, construction camp, access, working boundaries and no-go areas;

The ECO must demarcate the two Public Open Space areas (which includes the non-perennial river). These areas must be demarcated as no-go areas. When construction is to take place inside the non-perennial river, the ECO must be present on site. No construction may take place inside the floodline other than construction of the vehicle bridges and road embankment on the northern side.



- Discuss methods and places for/of stockpiling (construction waste, etc.);
- Check required toilets and fire-fighting facilities to be in place;
- Discuss and agree restricted access limitations to construction site;
- Sign the Declaration of Understanding (contractors);
- Discuss and agree communication channels including provision of contact details;
- Discuss and agree areas of responsibility;
- Discuss and agree the demarcation and control of construction areas.

Minutes of this formal site meeting must be kept, and are to be distributed to all parties.

The following equipment must be on site before any construction work is due to start:

- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.
- Adequate quantity of type ABC (all purpose) 12.5 kg fire extinguishers.

Agreed Construction Areas

The contractor must ensure that a copy of the signed and approved layout plan is available at the office on site at all times for inspection by the developer or his representative(s). Any variation to the approved layout plan must be submitted to the developer for signed approval and may only be implemented once the approved variation is available to the contractor and available on site at the office. The amended layout plan may also need to be submitted to the relevant state departments and municipality for approval.

Advertising

The contractors may place no advertising material on the property unless prior written permission has been obtained from the developer.

Method Statements

As previously discussed, the contractor must provide written method statements if requested by the ECO for discussion and approval between the ER, ECO and contractor. Following consideration final approval for all environmentally sensitive aspects of the contract will be given.

This will be done prior to commencing any construction work. The contractor should note that the time and costs for the compilation and implementation of a method statement should be included in his budget.

CONSTRUCTION PHASE

Responsibility of Contractors

Contractors are at all times responsible for sub-contractors, employees, guests, invitees and agents, as well as persons making deliveries to sites within the construction areas for the contractor, the constructor's camp, or along access routes thereto on the property.

Any damage caused by any of the above persons or delivery vehicles will make the contractor liable for damage that may occur within the property. Any damages to the property including, but not limited to damaged kerbs, roads, street lights, distribution boxes, plants, irrigation, the environment and/ or damage to private property on the property caused by such persons or equipment is the responsibility of the contractor. In addition the contractor will be responsible for any damage caused to an extent to be determined by the developer.

Working Hours

Contractors may only be present on the site during the following work time hours:

	Civil Construction Sites	Residential Construction Site
Mondays to Fridays	08h00 – 17h00	08h00 – 17h00
Saturdays / Sundays / After Hours	Must be arranged and approval sought	
Public Holidays	08h00 – 17h00	08h00 – 17h00

Private time hours are 20H00 – 07H00 weekdays, and after 17h00 Saturdays, Sundays and public holidays, as well as BIFSA builder's holidays prescribed annually to their members. Should the need arise to amend these times; this must be done with 7 days' notice via the ECO to the developer for prior sanction thereto.

Security and Safety

Access to the site must be controlled. Telephone numbers of emergency services, including the local firefighting services, must be posted conspicuously in the contractor's office near the telephone. No firearms are permitted on the construction site, other than those authorised by the developer for the property security service provider. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a construction site.

An evacuation plan for personnel, describing the signals to be used for evacuation, evacuation routes in the case where the primary route could be blocked must be available on site.

Speed Limit

For security and safety reasons the speed limit on the property for all contractors' vehicles is 30 km per hour. The contractor is responsible for ensuring that all his employees, subcontractors and delivery vehicles adhere to this rule.

Contractor's Camp

The location and extent of the contractor's camp area will be discussed and approved by the developer/landowner and ECO. The contractor's camp is to accommodate the site offices, contractor stores, servicing, parking and refuelling area for vehicles and machinery, as well as adequate ablution and accommodation facilities for employees. The Contractor's camp is not to be established within 32m of a watercourse/drainage line or within a no-go area.

Storage Sheds

Contractors will be permitted to place containers within the boundaries of the construction area with the specific approval of the ECO.

Site Structures

All site establishment components (as well as equipment) will be positioned to limit the size of the area to be disturbed and be designated and approved by the ECO.

Deliveries to Contractors

Contractors will at all times be responsible for compliance by their delivery service providers. Contractors must further ensure that drivers of service providers are informed of all procedures and restrictions e.g. which access road to use, speed limits, no-go areas, demarcated construction areas, and maximum allowed vehicle mass etc., as applicable before their first visit to site. Washing of

service provider delivery vehicles and equipment will not be allowed on the property and must be carried out elsewhere.

Demarcation and Fencing

Construction areas and access routes must be clearly demarcated to restrict access/egress across such demarcated lines and minimise environmental impact. The ECO must indicate each construction site and/or access route to be demarcated and demarcation methods to be used before construction commences and construction personnel will not be allowed beyond the construction perimeter of the site. All activities including stockpiling must occur within this demarcated area. The Contractor responsible must fund reinstatement or rehabilitation of damaged areas and features.

The onus here will fall on the contractors to ensure all respect these no-go lines. Failure to ensure discipline will lead to the immediate erection of more physically challenging structures.

The Contractor must take measures to control the corrosive effects of storm-water runoff particularly in the hoarded-off areas. No run-off oil, cement, or any other building material is to be permitted, or allowed to enter the storm-water system or natural areas.

In the event that sensitive features are threatened by construction activities, the temporary fencing off of these areas or the construction area, when working in a mainly natural environment, is recommended and will be determined by the ECO.

Physical demarcation of construction sites should be at the very least via colour coded posts at least 1,5m high. Relatively small construction areas can be fenced with wooden or metal post at 3m centres with 1 plain wire strand tensioned horizontally at 900mm from ground level. Commercially available danger tape may also be wrapped around the wire strand. For large areas, these posts are to be at 15m centres with 5 equidistant easily visible lime spot markings in between.

The onus here will fall on the contractors to ensure all respect these no-go lines. Failure to ensure discipline will lead to the immediate erection of more physically challenging structures.

No-go areas/Riparian areas

When construction is to take place inside the non-perennial river, the ECO must be present on site. Special care must be taken to not interfere with the river.

In the event that sensitive features are threatened by construction activities, the temporary fencing off of these areas or the construction area, when working in a mainly natural environment, is recommended.

Note: No landscaping is planned; however, existing vegetation (other than aliens) should not be removed or disturbed.

Indigenous Fauna and Flora

Indigenous plants or wild animals including reptiles, amphibians, birds, etc. may not be damaged or harmed or interfered with. Vegetation removed as part of the legitimate development requirements is excluded. Trapping, poisoning and/or killing of animals is specifically and strictly forbidden.

Exotic Plants

The developer must implement alien clearing management on the proposed development sites and surrounds. Clearing of alien invasive species must take place, in particular gum trees (*Eucalyptus* sp.) which are prevalent upstream and can have a significant negative impact on riparian areas through inhibiting undergrowth and thereby enhancing erosion impacts. No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species must occur. They should be removed from the site and dumped at a suitable dumping site from which seed cannot escape.

Water and Soil Management

No activities, including swimming, washing, recreation, ablution, vehicle-washing, etc. will be permitted in any of the watercourses and/or the wetlands. Water is to be protected and conserved at all times.

Storm Water Management

The following storm water and runoff management measures must be adhered to during the construction phase:

- Erosion control measures such as silt fences and silt traps, energy breakers in the form of logs secured with stakes, brush-packing, mulching and re-seeding need to be implemented if erosion occurs on site. The type and extent of erosion will depend on which control measures are implemented. The sensitive drainage line areas to be demarcated by ECO before construction activities commence onsite.

An attenuation facility is proposed in the form of a detention pond with the following characteristics:

Pond Area	500m ²
1:50 Inflow	2.602m ³ /s
1:100 Inflow	3.325m ³ /s
Max. depth (1:50)	1.240m
Max. depth (1:100)	1.500m
Pond storage volume (1:50)	386m ³
Pond storage volume (1:100)	563 ³
1:50 Outflow	2.179m ³ /s
1:100 Outflow	2.459m ³
Orifice (Pipe dia.)	1 x 675mm
1:50 Freeboard	0.360m
1:100 Freeboard	0.100m

Proposed Detention Pond

This attenuation is necessary to maintain the predevelopment runoff.

Resource Conservation Measures Applicable to the Housing Units Proposed

The subsidy allocation does not provide for the funding required for Resource Conservation Measures.

Lights

The contractor must ensure that any lighting installed on the site for his activities or security purposes does not interfere with road traffic or cause a direct disturbance to nearby residents, the surrounding community or other users of the area.

Archaeology and Palaeontology Management

Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the Provincial Heritage Resource Authority of the Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999)). Heritage remains uncovered or disturbed during earthworks must not be disturbed until inspection and verified by the professional.

Diesel Fuel and Lubricant Handling Programme

Servicing of construction vehicles and machinery to take place at the contractor's camp. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies. The following conditions related to the temporary fuel tanks must be implemented:

The fuel tanks must be designed and installed in accordance with relevant Oil Industry standards and SANS codes where applicable for the aboveground storage tanks. The tanks must be located within a bund (110 % of the tanks capacity) in order to contain potential spills.

During fuel tanker delivery, the tanker driver must be present at all times during product offloading. Should an incident occur the supply vehicle emergency cut-off switch must be activated to immediately stop fuel delivery. Flexible hoses with dry-break couplings and emergency isolation must be used. All spillage incidences and actions taken consequent thereto must be reported to the ER/ECO and recorded in the site register.

All fuel and flammable liquids should be stored under secure and fenced conditions and in a banded site with the volume of the bunding capable of holding 110% of the liquid.

The applicant must ensure that effective stock inventory monitoring and regular auditing take place for the early identification of possible leaks.

The requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), must be adhered to. Within three months of the tanks ceasing to be used for the purpose for which it is now authorised, the tanks must be removed at the expense of the applicant, and the site, including all associated infrastructure must be rehabilitated to the satisfaction of the relevant authority.

Refuelling:

Refuelling of equipment must be conducted from the banded fuel tank and pump at the contractor's camp. Fuel tanks must be banded and supplied with a concrete apron. The concreted refuelling apron will be constructed with a drain along its extremities to collect any diesel contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container and process. Any spills on the concrete apron of floor below the tank are to be treated with OT8 or Spillsolve or equivalent as per the product instructions.

Where tracked or very large equipment is in use well away from the contractor's camp, use may be made of a 500 litre drawn trailer to convey diesel to the equipment for re-fuelling. Such trailer will be drawn by a specified vehicle and driver, with alternate nominated as approved by the Project Engineer. Such tow vehicle may travel at 30kms per hour maximum at any time, be clearly identifiable as such, and may only tow the diesel cart should the pre requisite drip trays and emergency equipment be on the vehicle at the time and as to be further prescribed by project engineer. In situ refuelling activity may only take place during a standard specified daily time slot as displayed in the ER office, unless specific per day permission has been given to refuel at any other time by the ER. This must be pre-recorded in the site record book. Staff will require instruction in the identification of diesel and oil leaks on the concrete apron of the fuel tank area, the operation of the oil trap (including the disposal of trapped oil) and use of Spillsolve (or equivalent) products.

On-Site emergency repairs:

Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab.

Collection of contaminated spares and waste oils:

Contaminated spares, oil filters, gaskets, water, etc. will be collected in separate holders at the designated storage facility for disposal at a licensed H:h site.

Staff will require instruction in:

- Deleterious effects of oil / fuel on the environment
- Identification of oil leaks
- Handling of oil / fuel leaks into soil
- Location and method in storage of contaminated spares
- Fire prevention and emergency drills in case of an accident

Excavations

The natural slopes in the area are relatively stable under present conditions. Excavations deeper than 1.0 m for services trenches will generally be stable but may require shoring or battered slopes in transported soils close to drainage lines.

Foundations

Fill material throughout the site is variable, contains builders rubble, refuse and is voided in places. This material is potentially highly compressible and should not be used as a founding horizon. These materials should be removed and spoiled.

Structures may be founded conventionally using strip or pad footings at a nominal founding depth, using piers and ground beams at depth or using stiffened raft foundations at nominal depth. Foundation bearing pressure vary depending on the founding substrate.

A number of foundation options are recommended in the Geotechnical Report. These are based specifically on the “site classification designation”. Some of these options will require modified normal construction techniques to be applied to cater for the predicted heave movements of up to 15 mm. Suitable measures would include additional reinforcement in brickwork in plinth walls and above doors and windows, reinforcement of surface beds, articulation of brick panels using construction joints and effective water management as outlined in Section 9 (refer also to NHBRC Home Building Manual). Based on the performance of existing houses in the area and the nature of the soils, it is our opinion that the required precautions should minimize the risk of problems associated with the identified geotechnical character of the site.

Roads

Existing access roads will be used during construction work. The contractor must ensure that access to construction sites and associated infrastructure and equipment is clearly defined and designated to be off-limits to the public at all times during construction.

Traffic safety measures must be considered and implemented in determining entry or exit points to public roads. Mud and sand deposited onto public roads by construction activities must be cleared regularly. Appropriate traffic warning signs must be maintained. .

Dust and Noise Control

The contractor is to take appropriate measures to minimise the generation of dust as a result of construction works, to the satisfaction of the landowner. Vegetation must be stripped from demarcated construction sites only shortly before commencing with the construction process. On sandy or very dusty sites, mulched vegetation, which is to be obtained from area cleared for construction and is suitable, can be used as a method of stabilisation and dust control. Anchovy net can further be used as a method of stabilising dust control on construction sites or stockpiled sites, especially on sites where no current construction equipment is working. Seed bearing material with invasive vegetation must not be used for stabilization purposes. During high velocity wind conditions, the contractor or his representative to evaluate the situation and make recommendations as to whether dust suppression measures are adequate, or whether to suspend work until wind speeds drop to an acceptable level.

Wind fencing is a suitable alternative for dust mitigation as it allows the development site to be worked without undue constraint upon the contractor, while offering protection against the movement and impact of dust. It also assists in providing a positive visual impact.

With regard to the transportation of materials by open-bodied trucks or heavy vehicles during the construction phase, all trucks and heavy machinery must at all times have a cover sheet, where practical, to prevent materials or fine particles likely to give rise to airborne dusts.

The use of potable water for dust suppression is discouraged and alternative sources of water should be considered and discussed with municipality if required.

Construction noise levels must not pose a nuisance to the surrounding communities and all construction working hours must be limited to normal working hours weekday 8h00 – 17h00 unless arranged with municipality. All machinery and construction vehicles must be serviced regularly and be in a good working condition to prevent excessive noise generation.

Anti-erosion Measures

The contractor must take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, specifically inclusive of storm water control measures, to the satisfaction of the ECO.

During construction the contractor must protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Runoff from the site will be reduced to not exceed pre-development runoff by using detention facilities in critical places. Where required erosion protection measures must be installed.

Permanent water bodies must be lined with suitable material to ensure water integrity. Aspects normally covered in construction contracts in terms of protection of works are standard and are not to be confused with those under environmental legislation.

Top Soil and Material Removal and Stockpiling

Depending on type of topsoil available on site the ECO will determine if it is required to, prior to construction or earthworks commencing, a minimum of 100 mm topsoil must be removed from demarcated construction sites and separately stockpiled (within the demarcated working area or on designated areas). Topsoil stockpiles must be convex and should not exceed 1.8 metre in height, and if required be covered by anchovy net as necessary to prevent wind erosion. Topsoil must not be compacted in any way, especially by vehicles riding over it. Surplus sub-soil that becomes available during construction work and building operations must be used as fill material on alternate designated areas.

Appropriate use of Machinery

The contractor must at all times carefully consider what machinery is appropriate to the task to minimise the extent of environmental damage. No machinery is to operate outside of any demarcated working area. Operators of machinery must be suitably qualified. All machinery and heavy vehicles to be parked at night at the defined contractor's camp. .

Eating, Washing and Resting Areas

The contractor must designate restricted places for personnel to eat, wash and rest, within the specified working areas. The contractor must provide adequate weather proof refuse bins. The feeding of, or leaving food for, animals is strictly prohibited. No persons will be permitted to live on site. Only employed security personnel will be allowed to overnight on site.

The contractor is responsible for the provision of sufficient and suitably placed chemical toilets. Toilets must be of a neat construction and must be provided with doors and locks and must be secure to prevent wind damage. The contractor must ensure that toilets are serviced and emptied when required. Waste must be removed by a reputable contractor from the construction site and disposed of at an appropriate licensed landfill facility. Sanitation provision and servicing must be to the satisfaction of the landowner.

Cleaning of vehicles / equipment

Washing of construction vehicles and equipment will only be allowed at the construction camp in bunded areas.

Waste Disposal in terms of Integrated Waste Management

The contractor will be expected to keep his construction site neat and tidy and free of litter at all times. No on-site burying or dumping of any waste materials, vegetation, litter or refuse must be allowed. The contractor must ensure that waste and surplus food, food packaging and organic waste are not disposed of by any workers anywhere on the site except in the provided removable refuse bins.

The applicant must ensure that all waste generated during the construction process be separated into the different waste streams for recycling purposes prior to removal.

Refuse bins must be weather and animal proof. Bins must not be allowed to become overfull and must be emptied on a frequent basis by the contractor. Waste storage must comply with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013, if the storage of general waste exceeds 100m³ or that of hazardous waste exceeds 80m³. The contractor must transport refuse collected from the working areas on site to a suitable waste site when required.

Refuse is deemed to include all discarded construction materials such as wire, nails, tins, and cans, drums, piping, plastic straps, bricks, waste cement or concrete, cement bags, etc. Empty paper cement bags are to be similarly disposed if the waste recycling vendor is unable to collect. The contractor must make adequate provision for the removal of construction rubble and other excess material. No material or construction rubble may be spoiled on the property.

All hazardous waste must be stored in a secured and demarcated area.

All waste that is not being recycled must be disposed of by a reputable and registered contractor from the construction site and disposed of at an appropriate licensed landfill facility.

Concrete/Cement Mixing

Any hazardous waste generated on the site during construction must be kept in a suitably bunded area and removed appropriately. All cement/concrete effluent from mixer washings and run-off from batching areas and other areas must be contained in suitable bunded areas that are adequately lined to prevent contamination of the ground. This is of particular importance in terms of drainage line and wetland areas and in preventing polluted water from the construction site from entering any area of ecological significance.

Fires

The collecting and use of vegetation for firewood on the property is prohibited. No open fires will be allowed on site unless authorised by the landowner and adequate firefighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.

Site Clean Up / Rehabilitation

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed once the project has been completed. The construction sites must be cleared, and cleaned to the satisfaction of the ECO and developer. See chapter 10 for further detail.

Construction Personnel Safety

All personnel must wear Personal Protective Equipment during the construction as required.

OPERATIONAL PHASE

This following section defines the management programme for each of the 8 identified goals during the operational phase. The programme is presented in the form of a table, which includes the components described.

The following are specified goals:

Goal 1: Waste Management

Goal 2: Pollution Control

Goal 3: Water Quality and Storm Water Management

Goal 4: Fire Management

Goal 5: Erosion Control

Goal 6: On-going Monitoring of Social Environmental Impacts

Goal 7: Vegetation Management, inclusive of Alien management

Goal 8: Riparian Zones

Primary Management Objectives

The primary management objectives of the Stellenbosch Municipality are:

- To set guidelines in a management plan for correct management procedures and methods, in such a manner that they may be flexible in as much as situations change, and as new technology and methods become available. For this reason, the Environmental Management Programme is to be updated on a 5 year cycle to provide guidance to managers, which is especially important also for continuity during any changes in management. This EMP will facilitate the manager's annual planning in terms of allocating staff, time and financial resources towards management goals and responsibilities, which can then be subject to audit by an independent office.
- To maintain a finite standard and quality finishing and of service delivery on the property to prevent degradation. This requires on-going maintenance of buildings, gardens and infrastructure and the repair of environmental damage caused by users e.g. erosion or trampling of vegetation.

Secondary Management Objectives

- Appropriate management of land use to attain the objectives based upon predicted impacts, particularly of people and the health spa operation, whilst focusing on the sustainable use of the natural environment.
- To promote an ethos of environmental education and awareness to all who live on or visit the property, focusing on the environmental management of the greater area.

Additional information, where necessary, is contained following the tables.

NOTE:

- This is not a private development.
- The applicant is a Municipality.
- The South African Constitution states that municipalities have the responsibility to make sure that all citizens are provided with services to satisfy their basic needs.
- The Municipality has a legal mandate to ensure that infrastructure development and maintenance of such infrastructure takes place to ensure the wellbeing of the communities within the municipality's area of jurisdiction.

Goal 1: Waste Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p><i>Ensure allocation of sufficient resources for on-going Integrated Waste Management e.g. staff, equipment.</i></p>	<p>Pollution and odours</p>	<ol style="list-style-type: none"> 1. No solid waste may be incinerated or dumped on the property. 2. All vehicles transporting waste must be closed to avoid possible pollution of waste on transport routes. 3. Waste needs to be sorted and recycled where necessary. 4. An integrated waste management approach must be implemented on site, based on waste minimisation, reduction, recycling, re-use and disposal where possible. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met. Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets. 2. In-house maintenance staff. 	<p>The municipality must ensure that no incineration of waste occurs on site. The municipality must ensure that waste transport vehicles are closed. The waste transporter must take immediate steps to contain waste spillages and notify the Municipality, DEA&DP and DWA should a spill occur.</p>

Waste Management

Waste is defined as any matter for which the current user has no further purpose, or any matter, gaseous, liquid, or solid or any combination thereof originating from any residential, commercial or industrial use, which has been discarded, accumulated, or stored.

It further is worth noting that on average 80% of waste management costs accrue to transport.

Principally three types of waste occur-

- | | |
|-----------------------------------|---|
| - Gaseous | Open fires |
| - High moisture (effluent) | sewerage/waste water/ petroleum products |
| - Low moisture (solid/semi solid) | glass/plastic/ cardboard/ paper/ domestic/ chemical |

Some potential consequences-

- Salination of ground/surface/ river water.
- Eutrophication (nutrient enrichment) of natural areas.
- Microbiological contamination of natural areas.
- Sediment & silt migration inflows.
- Harmful inorganic/organic compounds introduction into soil.

Chemical residues and empty containers are required as per purchase contract to be removed ex site by the original supplier. The supplier is asked to further declare that such waste is disposed of within accepted Waste Management Programs standards.

Identified Waste Streams:

Components-

Sewerage (black water)
Sewerage (grey water)
Wet refuse
Dry refuse
Bottles & glass
Tins/cans
Plastic/polypropylene
Garden refuse
General other waste

Integrated Waste Management Strategy:

Waste Avoidance-

Objective is to promote the concept of minimisation in the generation of any waste in all activities and sites.

Waste Reduction-

To promote the reduction of all waste by ensuring that nothing that can be decomposed is disposed of to waste as opposed to recycling.

Waste Recycling-

Re-using waste or selling waste to recycling companies as far as and if possible to prevent re-usable waste from going to municipal landfill site.

Waste Disposal-

To store, dispose or treat all waste that cannot be avoided, recycled, or composted at licensed facilities within regular operational and environmental monitoring and always in accordance with regulatory requirements.

Storm water Pollution Management-

Storm water and effluent systems must be separated by cut-off trenches to ensure that storm water is not contaminated by effluent water.

Goal 2: Pollution Control

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p>Ensure allocation of sufficient resources for on-going Integrated Waste and pollution control Management e.g. staff, equipment, budget.</p>	<p>Pollution and odours</p>	<ol style="list-style-type: none"> 1. Waste to be stored on the property appropriate containers or facilities as provided by the municipality. 2. All vehicles transporting waste must be closed to avoid pollution of transport routes. 3. Sewerage system should be monitored and any leakages or overflows attended to immediately. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met.</p> <p>Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets. 2. In house maintenance staff 	<p>If pollution on site is detected immediate actions must be taken to contain the pollution.</p> <p>Depending on type and extent of pollution occurred specialists may be contacted to provide specific recommendations.</p> <p>An incident report to be compiled and sent to municipal and governmental authorities.</p>

Goal 3: Water Quality and Storm Water Management Measures

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p>Ensure allocation of sufficient resources for on-going Water Quality and Storm Water Management e.g. staff, equipment, budget</p>	<p>Pollution, odours, erosion and illegal quality of waste water discharge</p>	<ol style="list-style-type: none"> 1. Ensure all infrastructure and structures are maintained and kept in good working order. 2. Ensure no pollution of any water resources, including surface water, storm water and groundwater takes place as a result of any activities on the site. 3. Ensure that no water other than storm water be discharged in the storm water system. 4. All waste within the drainage channels must be removed on a weekly basis. If any erosion and/or degradation of the channels are noticed immediate action must be taken by the municipality to rectify the situation. (Corrective and preventative measures taken will depend upon type and extent of erosion and/or degradation occurring). 5. If possible undertake development activities during the dry season when runoff from the site will be at a minimum. 6. Prevention of contamination and nutrient enrichment of the storm water should be minimized on site by control of disposal of wastewater on the sites as well as the careful use of fertilizers. 7. Litter traps should be included in the storm water distribution and management system. 8. Storm water management to take place as according to site specific storm water management plan provided. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met. Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets 2. In house maintenance staff 	<p>If pollution or erosion is detected immediate actions must be taken to contain the pollution or erosion.</p> <p>Depending on type and extent of pollution or erosion occurred specialists may be contacted to provide specific recommendations.</p> <p>An incident report to be compiled and sent to municipal and governmental authorities.</p>

Storm Water Management:

The Best Management Practices (BMPs) for storm water management usually vary from site to site; however, the basic concepts that are aimed at protecting aquatic ecosystems are the same:

- Prevent storm water impacts on the receiving freshwater ecosystem, especially pollutants.
- Mitigate pollutants that cannot be prevented through the use of buffer areas, storm water retention ponds and introducing vegetation and habitat diversity within storm water systems.
- Manage storm water as a resource.
- Sustain the hydrologic balance (quantity and quality).
- Integrate storm water into the initial site design process.
- Preserve and utilize natural systems (soil, vegetation, etc.).
- Manage storm water as close to the source as possible.
- Slow storm water flows down.
- Inspect and maintain storm water systems.

In addition to the generic BMP guidelines laid out above that would be applicable to management of storm water to minimise their impact on the receiving freshwater systems, the following mitigation measures relating to future storm water development adjacent to the stream are recommended:

- Buffer zones should be maintained on either side of the stream as described in the previous section.
- The banks of the stream should be kept clear of invasive alien plants, and if required and if at all possible the banks should be landscaped and vegetated with indigenous plants.
- Where possible, habitat variability should be maintained and environmentally acceptable materials utilised. Design of the storm water systems should also allow for flow variability.
- Litter and pollutants transported in the storm water systems should be prevented from entering the streams.

Erosion control and maintenance will be an on-going process, especially erosion developing on or as a result of roads. The commitment remains to keep to the existing standards as evident. The municipality must implement erosion control measures to ensure that no erosion occur on site. The area must also be regularly monitored and erosion maintenance measures implemented to prevent erosion.

Goal 4: Fire Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p><i>Ensure allocations of sufficient resources (e.g. staff, equipment, budget) for on-going fire management</i></p>	<p>Pollution, fire, damage to property and health risks.</p>	<ol style="list-style-type: none"> 1. Sufficient firefighting equipment to be on site. 2. Yearly pre fire season clearing and maintenance of fire breaks as and when required. 3. Yearly pre-season testing and servicing of firefighting equipment. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met. Responsibility: Management. Pre Fire Season Audits. Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets approved. 2. Maintenance staff 	<p>If a fire is detected immediate actions must be taken to contain the fire.</p> <p>Depending on type and extent of fire occurred specialists may be contacted to provide specific recommendations.</p> <p>An incident report to be compiled and sent to municipal and governmental authorities.</p>

Fire Management Legislation

Legislation applies to the open countryside beyond urban limits and puts in place a range of legal requirements.

The responsibilities of people who own or control land:

The landowner on whose land a fire may start, or from whose land it may spread across boundaries, must have in place:

- Prepared firebreaks on your boundary, if there is a reasonable risk of fire.
- Have available such equipment, protective clothing and trained personnel required to extinguishing such fire as may occur.
- Take all reasonable steps to notify the fire chief of the local authority should a fire break out.
- Do everything in their reasonable power to stop the spread of the fire.

The Act also requires that should the owner be absent, a known and identified other person responsible needs to be present on or near this land to:

- Extinguish a fire if one breaks out, or assist or instruct others to do so.
- Take all reasonable steps to alert the neighbours and Fire Chief.
- The owner may appoint an agent to act on his or her behalf to perform these duties.

Goal 5: Erosion Control

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<i>Ensure allocation of sufficient resources for on-going erosion control management (e.g. staff, equipment, budget)</i>	Erosion, sink-holes and or blocking of storm water systems. Damage to Infrastructure.	<ol style="list-style-type: none"> 1. On-going control and management of roads, roadways and areas susceptible to erosion. 2. Ensure suitable vegetation cover or surface on non-hardened surfaces. 3. Control runoff of storm water to prevent soil erosion. 4. Avoid the formation of sink-holes on sensitive soils. 5. Management and control of erosion will be an ongoing process and must be closely monitored and immediately rectified by the municipality. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met.</p> <p>Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets approved. 2. Maintenance staff 	<p>If erosion is detected immediate actions must be taken to contain the erosion.</p> <p>Depending on type and extent of erosion occurred specialists may be contacted to provide specific recommendations.</p> <p>An incident report to be compiled and sent to municipal and governmental authorities.</p>

Erosion Control

Erosion control and maintenance will be an on-going process, especially erosion developing on or as a result of roads. The municipality must implement erosion control measures to ensure that no erosion occurs on site. The area must also be regularly monitored and erosion maintenance measures implemented to prevent erosion.

Goal 6: On-going Monitoring of Social Environmental Impacts

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<i>Ensure allocation of sufficient resources for on-going monitoring of environmental impacts. (e.g. staff, equipment, budget)</i>	Pollution, nuisances and health risks.	<ol style="list-style-type: none"> 1. Annual report back to community forum. 2. Keep a complaint register and attend to issues recorded immediately. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met.</p> <p>Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets approved. 2. Maintenance staff 	<p>Remediate and improve management immediately once public complaints are recorded.</p>

Goal 7: Vegetation Management, Inclusive of Alien Vegetation

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p><i>Ensure allocations of sufficient resources (e.g. staff, equipment, budget) for on-going alien and vegetation management and indigenous vegetation rehabilitation.</i></p>	<p>Degradation and replacement of indigenous ecosystem characteristics i.e. indigenous flora and fauna. The conservation worthy area is sensitive to trampling and erosion.</p>	<ol style="list-style-type: none"> 1. On-going clearing of alien vegetation in the watercourses. 2. All alien infested areas should be cleared. 3. All areas to be kept clear of aliens including buffer areas and public open space areas. These areas must be maintained and kept neat. 4. All alien invasive trees, i.e. the large stance of cotton wood (Populus sp.), the large blue gum trees (Eucalyptus), black wattle and port jackson willow (Acacia spp.) must be eradicated from the stream and green buffer area and followed up yearly to prevent re growth. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met. Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 1. Adequate annual budgets approved. 2. Maintenance staff 	<p>No remedial actions required, only on-going alien vegetation clearing and monitoring as indicated.</p>

Goal 8: Riparian Zones

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p><i>Ensure allocations of sufficient resources (e.g. staff, equipment, budget) for on-going alien and vegetation management and indigenous vegetation rehabilitation.</i></p>	<p>Degradation of indigenous ecosystem characteristics Flooding and erosion.</p>	<ol style="list-style-type: none"> 1. Riparian zones to be kept clear of aliens including buffer areas and public open space areas. These areas must be maintained and kept neat. 2. All alien invasive trees, i.e. the large stance of cotton wood (<i>Populus</i> sp.), the large blue gum trees (<i>Eucalyptus</i>), black wattle and port jackson willow (<i>Acacia</i> spp.) must be eradicated from the stream and green buffer area and followed up yearly to prevent re growth. 3. The riparian zones must be monitored for litter. Litter must be removed on a regular basis. 4. Sandy areas and riffles must be maintained for frog habitat. 	<p>Yearly audits of operations vs. EMP to identify those requirements that are not being met. Responsibility: Stellenbosch Municipality</p>	<ol style="list-style-type: none"> 3. Adequate annual budgets approved. 4. Maintenance staff 	<p>No remedial actions required, only on-going alien vegetation clearing and monitoring as indicated.</p>

Note: No landscaping is planned; however, existing vegetation (other than aliens) should not be removed or disturbed.

CHAPTER 8

ENVIRONMENTAL REPORTING

The facility must ensure that “Any emergency incident, originating at the facility, which falls within the definition of section 30(1) a of the National Environmental Management Act (NEMA), Act of 1998, must be dealt with by the facility in accordance with Section 30 of NEMA”. In the event of any incident the facility must ensure containment by the responsible person and notify the Sub-Directorate: pollution information and chemicals management section at (021) 483 2760 / 2968.

In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting shall be undertaken:

- Incident reporting; and
- Compliance reporting

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

ENVIRONMENTAL INCIDENT REPORT

DATE:	File Ref:
NAME:	Copy to:
EXACT LOCATION OF INCIDENT:	

SECTION 1 : DESCRIPTION OF INCIDENT

SECTION 2 : REMEDIAL ACTION REQUIRED

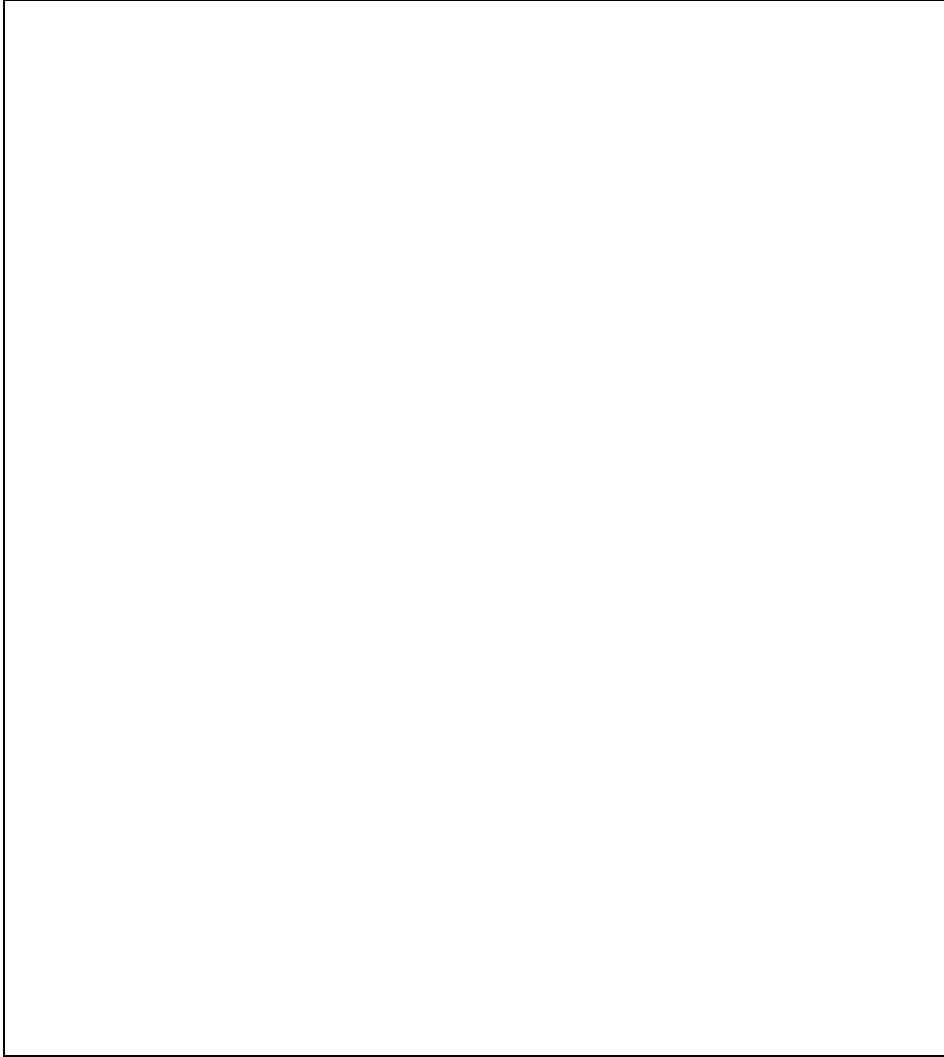
Remedial Action Due Date: _____
Confirmation of implementation: Name: _____ Date: _____

SECTION 3 : RELEVANT DOCUMENTATION

SECTION 4 : SIGNATURES

Municipal Engineer:
Name:
Date:
ECO:
Name:
Date:

SECTION 5: DRAWING/SKETCH



CHAPTER 9

DECOMMISSIONING PHASE

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project.

Closure and decommissioning impacts are likely to be similar to the construction phase impacts. The management actions and control under the construction phase EMP need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state.

A decommissioning phase is where a structure is removed or otherwise modified to make it incapable for re-use for the original design purpose.

The results of environmental monitoring during the decommissioning phase will be used to assess the impact of the decommissioning on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

- Management Principles
 - Develop monitoring procedures in accordance with standard protocols and the requirements of the environmental legislation.
 - Undertake environmental monitoring during the decommissioning phase as shown below.

Environmental monitoring during the decommission phase will include terrestrial flora rehabilitation monitoring.

CHAPTER 10

REHABILITATION SPECIFICATIONS AND SITE CLEAN-UP

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed once the project has been completed. The construction sites must be cleared, and cleaned to the satisfaction of the developer.

Stabilisation and rehabilitation must take place immediately after construction operations have been completed. No vehicles or unauthorised personnel must be allowed onto areas that have been rehabilitated.

The areas impacted during construction must be stabilised and shaped according to the natural surrounding contours. If topsoil was removed during construction the topsoil must be used to stabilise the impacted areas.

Slow flowing water and even pools can be expected during the rainy season; a likely habitat for stream dwelling frogs. Loose sandy soil can be utilised by ground nesting frogs. Provision should be made in the green zone to maintain such areas following development. As the river will be left as public open space and will be left as is and alien vegetation will be removed, the ecological support area will be able to continue functioning by providing habitat for a variety of species. It will also be continue to provide the ecosystem functions of disturbance regulation and water regulation.

The rehabilitated areas must be monitored on a monthly basis and after heavy rains for signs of erosion. If erosion occurred the ECO must be informed immediately who will then recommend erosion mitigation measures to be implemented.

Alien vegetation monitoring of the rehabilitated areas and surrounds must be conducted on an annual basis and if alien vegetation is detected the ECO must be informed immediately who will then recommend eradication methods.

CHAPTER 11

ENVIRONMENTAL AWARENESS INDUCTION COURSE MATERIAL

This section of the report is included in compliance with Section 24N (3) (c) of the National Environmental Management Act 107 of 1998.

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe

the houses



• Air, plants, cars &

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A Policy and System will be signed

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream



ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



DUST

Try to avoid producing dust



NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles



TOILETS

- Use the toilets provided
- Report full or leaking toilets



EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins



RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly



TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill



EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police: 10111



FINES AND PENALTIES

- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped



PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!



ATTENDANCE REGISTER FOR	
PLACE	TRAINER.....
NAME & SURNAME	SIGNED
SIGNED	DATE & TIME

CHAPTER 12

COMPLIANCE WITH THE ENVIRONMENTAL AUTHORISATION

All conditions of the Environmental Authorisation must be adhered to onsite during the construction-, operational-, decommissioning- and rehabilitation phases of the proposed project. A copy of the Environmental Authorisation must be available on site together with the EMP and all contractors on site must sign the Declaration of Understanding as proof of awareness and understanding of all the conditions to be adhered to on site in terms of the EA and EMP.

CHAPTER 13

UPDATING/ADAPTING THE EMP

Although care has been taken to address all known relevant environmental issues for the development, it will become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMP. Only those additions to, or amendments of, this EMP that will either improve environmental protection or can be proven not to have any negative effects would be considered to be included, and any amendments to the EMP must first be approved by the ECO and competent authority/ies i.e. DEA&DP.

The name, address and office phone number of the site supervisor must be included in the EMP once appointed by the applicant.

REFERENCES

City of Cape Town (2002) Environmental Management Programme (Version 5) for Civil Engineering Construction Activities.

DEA&DP: ENVIRONMENTAL MANAGEMENT PROGRAMME. VER 5 (04/2002). Guideline Document for the ECO / ESO and the ER

Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.

APPENDIX A

“External Stormwater Management Plan and Floodline Study for erf 11330, Idas Valley, Stellenbosch”