

Johannesburg Water (SOC) Ltd



CONTRACT JW14466R

**OLIFANTSVLEI WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
REFURBISHMENT OF VAN WYKS Rust PUMP STATION**

VOLUME 3

**OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL
SPECIFICATION AND ENVIRONMENTAL MANAGEMENT
PROGRAMME**

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

VOLUME 3

Occupational Health & Safety Specification

JW 14466

RENEWAL OF VAN WYKSRUST PUMP STATION

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General Notification

This document forms an integral part of the Contract Specification and, in particular, shall constitute the Client's (Johannesburg Water SOC Ltd.) Occupational Health & Safety (OHS) Specification, as required by the Construction Regulations, 2014, as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993). The Specification shall furthermore be applied for the management of Mandatories performing activities for or on behalf of Johannesburg Water SOC Ltd, irrespective whether the contract work constitutes construction work or not.

The Contract Specification is contained in Volume 1 of the contract documents in Part 3: Scope of Work.

Acknowledgements

This Occupational Health & Safety (OHS) Specification was developed by the internal OHS Department for the sole use by Johannesburg Water SOC Ltd. The issue date of this OHS Specification is September 2016.

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ABBREVIATIONS

Abbreviation	Description
CR	Construction Regulations
COID	Compensation for Occupational Injuries and Diseases
DoL	Department of Labour
GAR	General Administrative Regulations
GMR	General Machinery Regulations
GSR	General Safety Regulations
HCS	Hazardous Chemical Substances
HIRA	Hazard Identification and Risk Assessment
JW	Johannesburg Water (SOC) Ltd
SDS	Safety Data Sheet
OHS	Occupational Health and Safety

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PPE	Personal Protective Equipment
PER	Pressure Equipment Regulations
SANS	South African National Standards
SABS	South African Bureau Standard
SOC	State Owned Company

DEFINITIONS

Word / Phrase	Definition
“WCL 1”, “WCL 2” and “WCL 22”	Means the prescribed forms for reporting of incidents and occupational diseases referred to in the Compensation for Occupational Injuries and Diseases Act.
Competent Person	A person who has in respect of the work or task to be performed the required knowledge, training, experience and, where applicable, qualifications specific to that work or task: provided that where appropriate, qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act 67 of 2000).
Construction work	Any work in connection with: a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure b) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work
Contractor (inclusive of Principal Contractor)	Any organization, person, entity performing activities for or on behalf of Johannesburg Water SOC Ltd.
Corrective Action	Action to eliminate the cause of a detected nonconformity or other undesirable situation.
Employee	Any person who is employed by or works for an employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person
Employer	Any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him, but excludes a labour broker as defined in section 1 (1) of the Labour Relations Act, 1956 (Act No. 28 of 1956)
Hazard	Means a source of or exposure to danger.
Hazard identification	The identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed.
Incident	Means an incident as contemplated in section 24 (1) of the OHS Act 85 of 1993.
Machinery	means any article or combination of articles assembled, arranged or connected and which is used or intended to be used for converting any form of energy to performing work, or which is used or intended to be used, whether incidental thereto or not, for developing, receiving, storing, containing, confining, transforming, transmitting, transferring or controlling any form of energy
Mandatory	Includes an agent, a contractor or a subcontractor for work, but without derogating from his status in his own right as an employer or a user
Medical surveillance	Means a planned programme or periodic examination (which may include clinical examinations, biological monitoring or medical tests) of employees by an occupational health practitioner or, in prescribed cases, by an occupational medicine practitioner.
Method Statement	A document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment.
Principal Contractor	Any employer who performs work and is appointed by the Client to be in overall control and management of the contract work (inclusive of Mandatories).

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SHE File	A file or other record in permanent form, containing the information required as contemplated in the S.H.E Specification Document and legal requirements applicable to work activities.
SHE Plan	A documented plan which seeks to address all hazards identified means and ways to control and eliminate such to ensure compliance to the S.H.E Specification.
Workplace	Any physical location in which work related activities are performed under the control of the organization.

1. Introduction

In terms of Section 37 of the Occupational Health and Safety Act (Act no. 85 of 1993), Johannesburg Water SOC Ltd is required to control persons/organizations conducting activities for or on their behalf (Mandatories) and the Construction Regulations promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993), is requiring Johannesburg Water SOC) Ltd. to compile an occupational health and safety specification for any intended project classified as construction work and to provide the specification to prospective tenderers / Mandatories.

The dual objective of this specification is to ensure that the Mandatories and Principal Contractors (herein after called Principal Contractor (including Mandatories)) entering into a contractual agreement/relationship with Johannesburg Water SOC Ltd. achieves and maintains an acceptable level of occupational health, safety and environmental performance whilst conducting activities to perform the contract work.

This document forms an integral part of the Contract Specification and, in particular, shall be the OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION FOR CONSTRUCTION WORK. The Contract Specification is contained in Volume 1 of the contract documents. The principal and other contractors shall ensure that this specification is included with any contract/s that they may have with other contractors and/or suppliers that are engaged for the provision of labour, goods or services for this project. The Principal Contractor and its Contractors shall furthermore implement any reasonable practicable means to ensure compliance to this Occupational Health & Safety (OHS) Specification and any other applicable legislation on their organization and/or activities performed by or for them. This OHS Specification will be read in conjunction, where issued and applicable, with the Environmental Specification issued for listed activities requiring environmental authorization by a relevant authority.

Compliance with this OHS specification does not absolve the Principal Contractor from complying with any other applicable minimum legal requirement and the Principal Contractor remains responsible for the sustainable integrity of the environment and the health and safety of its employees, mandatories as well as any persons affected by activities conducted for or on behalf of Johannesburg Water SOC Ltd (SOC) Ltd..

1.1 Johannesburg Water SOC Ltd's commitment to Occupational Health, Safety & Environmental (SHE) Management

Johannesburg Water SOC Ltd is committed to responsible occupational health, safety and environmental management. This commitment is essential to protect the environment, employees, Mandatories, visitors and provide a work environment conducive to health and safety. Principal Contractors and their Contractors shall demonstrate their commitment and concern by:

- Ensuring that decisions and practices affecting occupational health, safety and environmental performance are consistent with the issued SHE specification;
- Ensuring adequate resources are made available for the effective implementation of occupational health, safety and environmental control and mitigation measures;
- Participating in hazard identification and risk assessments and design safety reviews;
- Communicating occupational health, safety and environmental management processes, strategies and control measures with all levels of employees, contractor and/or visitors;
- Ensuring visible leadership at all sites;
- Promoting and enforcing the use of correct types of Personal Protective Equipment (PPE);
- Reporting and investigation of incidents and accidents and ensuring actions are identified and implemented to prevent similar types of incidents reoccurring;

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- Participating in Client audits and meetings and ensuring required actions are implemented within reasonable time frames on the site/project;
- Recognizing and commending safe work practices and coaching employees who require guidance;
- Applying and enforcing consequence management from deviations and transgressions of/from compliance to this SHE Specification noted and/or observed, where applicable;
- Carrying out safety observations, implement corrective and preventative actions and giving immediate feedback;
- Encouraging employee participation in the formulation of work instructions and safety rules.

1.2 Scope of Occupational Health, Safety and Environmental (SHE) Specification

The scope of this Occupational Health, Safety and Environmental (SHE) Specification is to address the reasonable and foreseeable aspects of occupational health, safety and environmental management, which will be affected by the contract work.

The specification will provide the requirements that the Principal Contractor and other Contractors shall comply with in order to reduce the risks associated with the contract work, and that may lead to incidents causing injury and/or ill health or degradation of the environment, to a level as low as reasonably practicable and possible.

In particular, Johannesburg Water SOC Ltd will ensure that it shall not appoint any Principal Contractor unless it is reasonably satisfied that the contractor which it intends to appoint has the necessary competencies and resources to carry out the work safely.

1.3 Omissions from SHE Specification

Where any omission from the SHE Specification is identified, applicable legal requirements will constitute the minimum standard for compliance to the relevant omission. The responsibility will be on the Principal Contractor to provide assurance to Johannesburg Water SOC Ltd on compliance to the applicable legal requirements related to the activity / task / process.

1.4 Change management

Whenever Johannesburg Water SOC Ltd identifies the need to change or review the SHE Specification, approved changes and revisions will be communicated to the Principal Contractor. A cost analysis on the implementation of the proposed changes / revisions will be calculated through a collaborative processes between Johannesburg Water SOC Ltd and the Principal Contractor – where the approved changes and/or revisions has no cost implication for the Principal Contractor the Principal Contractor will be required to accept the approved changes / revisions and ensure implementation within the SHE Plan / File framework.

2 Overview of contractor management process

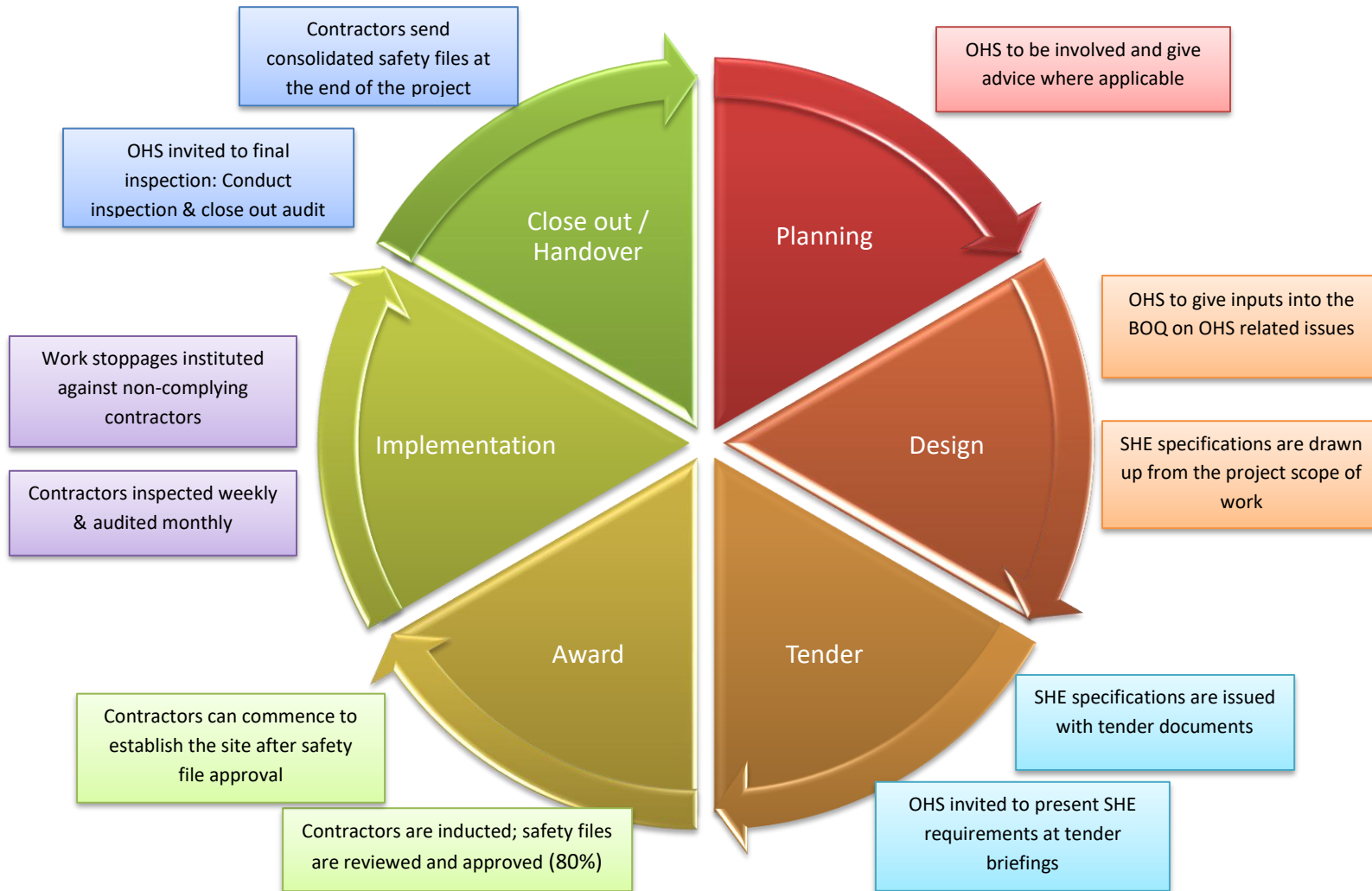
The contractor management process consists of the following phases:

- Tender briefing and tender documentation;
- Competency evaluation of Principal Contractors (integrated into Supply Chain Management processes);
- Appointed contractor to attend SHE system induction;
- Preparation of SHE File by Principal Contractor;
- Evaluation of SHE File;
- Principal Contractor engagement phase;
- Project close-out and submission of consolidated Health & Safety File.



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2. SHE DOCUMENTATION

2.1 Safety file

The Principal Contractor will prepare a SHE File containing the processes / procedures and templates to be applied during the project period for the scope of work. The Principal Contractor will be evaluated during the contract period against the submitted SHE File. The contractor is required to obtain a minimum of 80% for the file to be approved. Construction may only commence after the file is approved.

At a minimum the SHE File will contain the following documentation:

- Notification of construction work to the relevant Department of Labour (stamped on each page)
- Scope of work to be performed;
- Personnel list (Principal Contractor employees);
- OH&S / SHE Policy and other Policies;
- Updated copy of the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations; COIDA Act.
- Proof of valid registration and good standing with the Compensation Commissioner or another licensed Insurer;
- SHE Plan agreed with Johannesburg Water SOC Ltd.
- Approved risk assessments, review and monitoring plans and safe work procedures (method statements);
- A list of contractors (sub-contractors) including copies of the agreements between the parties and the type of work being done by each contractor;
- All written designations and appointments for project scope of work (CV and competency copies);
- Management structure (inclusive of OH&S responsibility & meeting structure);
- Induction training and site SHE rules;
- Occupational health and safety training matrix / plan;
- Arrangements with contractors and/or mandatories;
- Description of security measures;
- The following registers (as applicable to contract scope of work):
 - Accident and/or incident notifications, investigation & control register;
 - Occupational health and safety representatives inspection register;
 - Template for entry into confined space;
 - Toolbox talks pro-forma;
 - Fall protection inspections template;
 - First-aid box content template;
 - Record of first-aid treatment template;
 - Fire equipment inspection and maintenance template;
 - Ladder inspection template;
 - Machine safety inspections template (including machine guards, lock-outs etcetera);
 - Inspection templates for lifting machines and –tackle (including daily inspections by drivers/operators);
 - Inspection templates of scaffolding;
 - Inspections templates of structures;
 - Templates of issuing of Personal Protective Equipment;
 - Monthly reporting and recording of statistics templates;
 - Keeping of any other record in terms of applicable legislation falling within the scope of SHE Legislation applicable to the project and the Principal Contractor / Contractor's activities and organization.
- Emergency preparedness and response programmes;
- Medical examination tests
- Vaccination

2.2 Principal contractor appointment

- The principal contractor will be appointed in terms of Construction Regulations 2014, Reg 5(1) k
- All responsibilities imposed on the contractor by the Regulations will be applicable

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- The duties will include:
 - a) Prepare a site specific SHE file based on client SHE specification and project scope.
 - b) Have an updated Letter of Good standing.
 - c) Ensure the necessary legal appointment letters are compiled and signed by affected parties.
 - d) Ensure SHE file submitted before work commences to Johannesburg Water for evaluation and approval.
 - e) Must ensure an organizational medical programme for its employees is in place. This must address pre-employment, periodic examination, and exit examinations.
 - f) Ensure all employees undergo medical examination and are declared fit for the job they are employed for by a Medical Practitioner.
 - g) All employees undergo his control undergo company specific induction and Johannesburg water induction.
 - h) Ensure before work commences employees are trained on the health and safety risks associated with the work they are conducting.
 - i) Ensure employees are trained on company procedures, policies, method statements and informed of the Johannesburg Water SHE requirements as per the specification.
 - j) Ensure legislative requirements are complied with during the duration of the contract and ensure that their employees comply also.
 - k) Sign the 37 (2) Agreement between Johannesburg Water and themselves before any work commences and kept on their SHE file.
 - l) Ensure that 37(2) Agreement(s) are signed between themselves and their sub-contractors.
 - m) Ensure that sub-contractors have valid Compensation Commissioner Letter of Good Standing.
 - n) Have a disciplinary procedure to address those found to be transgressing requirements of SHE specification, SHE plan, site rules or any other OHS act and its Regulation requirement.
 - o) Prevent any employee or visitor who is under the influence of any alcohol or drugs (in state of intoxication) from being allowed to site.
 - p) Ensure the safety of employees who are taking legal medication.
 - q) Must hand over a consolidated SHE file at the end of the contract.
 - r) Stop his/her employees who are doing unsafe acts or who are creating an unsafe environment.
 - s) Investigate all incidents and report to Johannesburg water and ensure all reportable incidents as per the legislative requirement are complied with.
 - t) Ensure work is supervised by competent personnel and that work is done by competent employees.
 - u) Ensure pre-task risk assessment is done by a competent person and that employees are informed of the pre-task risks and the risk control measures.
 - v) Ensure tool box talks are conducted to communicate SHE issues in connection to the work being done and any other aspects.
 - w) Ensure that appointed personnel as per the SHE file are executing their duties as per the legal appointment.
 - x) Ensure first aid kit is made available in case of any emergency.
 - y) Ensure that housekeeping is maintained in good condition and that materials are store/stacked properly in designated areas.
 - z) Have sufficient waste receptacles and ensure the correct disposal of the different wastes.
 - aa) Proof of hazardous waste disposal to be requested from disposal site and to be kept inside SHE file.
 - bb) Take reasonable steps to ensure that each appointed sub-contractor health and safety plan is implemented and maintained on the site and SHE File documentation is up to date.
 - cc) Stop any work from being executed which is not in accordance with the client's health and safety specification and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons.
 - dd) Must maintain an up to date list of all the sub-contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done; and
 - ee) Ensure that all his or her employees have a valid medical certificate of fitness.

2.3 37.2 Agreement

- Johannesburg Water will enter into a 37(2) Agreement with all the appointed contractors
- A copy of the 37(2) Agreement must be kept in the SHE file of the contractor at all times.

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- It is the responsibility of the contractor to ensure that there are 37(2) agreements between themselves and all their appointed sub-contractors.

2.4 SHE Plan

- The contractor shall prepare a SHE plan to address and manage all applicable sources of risk that are identified during the execution of the project. The SHE plan shall incorporate the requirements as listed in the SHE specification.
- A copy of the SHE plan shall be submitted together with SHE file for review and approval.
- It is the contractor responsibility to ensure they sub-contractor compiles a SHE plan that in line with the SHE specification requirement of Johannesburg Water.

2.5 Legislative framework

All contractors shall comply with legislation pertaining to this contract, including but not limited to:

- Constitution of the Republic of South Africa
- Occupational Health and Safety Act and its associated Regulations
- National Environmental Management Framework Legislation
- National Road Traffic Act
- Applicable South African National Standards (SANS)
- Compensation of Occupational Injuries and Diseases Act (COID)
- Local by-laws and provincial ordinances

2.6 SHE Policy

A SHE policy is a statement of intent and a commitment by the organization Chief Executive or Managing Director (OHS Act 16(1) appointee) in relation to requirements applicable to their Safety, Health and Environmental legal obligation, relevant SHE roles and responsibilities, and contractual obligations to the Client.

The contractor and their sub-contractor companies shall each have a documented SHE Policy authorized by their Chief Executive/Managing Director (OHS Act Section 16 (1) Appointee). The SHE Policy must meet the following minimum requirements;

- Organizational Mission and Goal.
- State the overall SHE objectives within the project.
- Show commitment to the prevention of injuries and ill-health.
- Show commitment to the protection of environment and the conservation of natural resources.
- Must be reviewed at predetermined intervals, or when there is change in work process, serious incident occurs.
- The SHE Policy must be in line with ISO 45001 and ISO 14001 requirements and guidance documentation.
- Must be authorized by contractor CEO.

2.7 Appointments and competencies

- The contractor and all their appointed sub-contractor must make the relevant legislative and non-statutory appointments, which must be maintained valid for the entire contract duration.
- All appointees shall be suitably trained and certified competent for the responsibilities they are assigned for.
- Copies of all relevant appointments and the relevant competence certificates must be kept in the relevant SHE file.
- All changes in personnel shall be communicated to the Client and new personnel approved prior to starting on site.

2.8 Supervision of construction work

- The principal contractor shall ensure that the construction manager and construction health and safety officer are appointed for a **single site** on a full time basis.
- Where the total number of employees on site exceeds **75**, the contractor shall appoint **2 Safety Officers and an Assistant Construction Manager**.

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- In the event that the appointed Safety Officer / Construction Manager cannot come to work for more than 5 days, the contractor must ensure that a substitute is appointed until they are back on site.
- JW should be informed in writing of the absence of the above-mentioned on site.

Appointment index

Appointment	Legislative Ref	Competency requirements (Min)
Alternate Construction Manager	CR 8.1	N.Dip Eng + 4yrs exp
Assistant Construction Manager	CR 8.2	N.Dip Eng + 4yrs exp
Assistant Construction Supervisor	CR 8.8	-
Bulk mixing plant	CR 20	Certificate
Confined Space Supervisor	GSR 5	Certificate + Proven experience
Construction Manager	CR 8.1	N.Dip Eng + 4yrs exp Full time on site
Construction Health , Safety & Environmental Officer	CR 8.5 & JW Requirement	N.Dip Safety + 2yrs exp; OR N.Dip Enviro + 3yrs exp; OR NEBOSH / SAMTRAC + 4yrs exp Full time on site Experience in enviro / certificate Fully registered with SACPCMP as CHSO
Construction supervisor	CR 8.7	3 yrs experience
Construction vehicle & mobile plant supervisor	CR 23.1	Certificate
Electrical installation and appliances inspector	CR 24	
Emergency, security and fire coordinator	CR 29	Certificate
Excavation supervisor (including piling)	CR 13	3yrs exp / N.Dip building
Fall protection supervisor	CR 10.1	Certificate
First-aiders	GSR 3	Certificate
Fire fighting equipment inspector	CR 29	Certificate
General Machinery Supervisor	GMR 2.1/7	GCC (GMR 2.1)/ 3yrs exp (GMR 2.7)
Temporary work supervisor (Formwork)	CR 12.2	N.Dip building + 4yrs exp
Hazardous chemical substances supervisor	HCS Regs	Certificate
Incident investigator	GAR 9.2	Certificate
Ladder inspector	GSR 13A	-
Lifting machines and equipment inspector	DMR 18.5	Certificate + 3yrs experience
Materials hoist inspector	CR 19.8	Certificate
Occupational health and safety committee	OHS Act 19	-
Occupational health and safety representatives	OHS Act 17	Certificate
Risk assessor	CR 9.1	Certificate
Stacking and storage supervisor	CR 28	Certificate

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Structures supervisor	CR 11.2	N.Dip building + 4yrs exp
Suspended platform supervisor	CR 17.1	Certificate
Welding supervisor	GSR 9	Certificate
Security Officer	PSIRA NKP Act	Certificate

2.9 Insurances

- The principal contractor and all his appointed contractors shall be registered with an appropriate compensation commissioner and have available a valid letter of good standing at all times.
- The obligation lies with the contractor to ensure that the Letter of Good Standing remains valid throughout the entire duration of the project.
- A copy of the said letter must be filed in all SHE files and made available during inspections and audits.

2.10 Costing for SHE

The contractor is responsible for ensuring that SHE costing is taken into consideration for the entire project/contract as this will ensure they comply with the SHE legislative requirements.

2.11 Sub-contractors

- Whenever the Principal Contractor appoints contractors or sub-contractors, it is a requirement that an Occupational Health and Safety Act (Act no. 85 of 1993) Section 37(2) agreement (i.e. Agreement with Mandatory) is entered into between the Principal Contractor and Contractors.
- The Principal Contractor will ensure that all appointed contractors comply with the Johannesburg Water SOC Ltd SHE Specification requirements.
- The Principal Contractor will establish a procedure on sub-contractor management and assurance on compliance to the established procedure will be provided to Johannesburg Water SOC Ltd on a monthly basis.
- Principal Contractors are required to formally notify Johannesburg Water SOC Ltd before appointing subcontractors.
- Johannesburg Water SOC Ltd shall approve all specialist subcontractors to be appointed and/or engaged by the Principal Contractor.

The Principal Contractor shall:

- Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- Appoint each contractor in writing for the part of the project on the construction site;
- Take reasonable steps to ensure that each contractor's health and safety plan is implemented and maintained on the construction site;
- Ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
- Stop any contractor from executing construction work which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;
- Include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done; and
- Ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

2.12 Notification of construction work

- There will not be a requirement for submitting a notification of construction work to Department of Employment and Labour.
- The Construction Work Permit will be applicable instead.

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2.13 Construction work permit

- There will be a requirement for a construction work permit for this based on the number of days on site as well as project value.
- The permit can only be applied for after a contractor has been appointed, and the process will take approximately 30 days or more if requirements are not met.
- The Client will appoint a PrCHSA (Professional Construction Health and Safety Agent) registered with the SACPCMP to oversee the permit application process, and the contractor will be required to provide supporting documents for the application of the permit.

3. ORGANISATIONAL STRUCTURE

- The contractor shall develop and submit together with SHE file an organizational organogram related to the contractor, listing all the levels of responsibility from the Chief Executive down to the supervisor(s) responsible for the project.
- The organogram diagram must list all relevant positions, names of appointees and legal appointments.
- The contractor is responsible for updating the organogram timeously when there are changes to the appointments.
- All appointed sub-contractors are also required to compile their own organograms.

4. COMMITMENT TO SHE

- Visible commitment is essential to providing a safe working environment.
- Managers, supervisors and employees at all levels must demonstrate their commitment by being proactively involved in the day to day SHE operations.
- Legislation requires that each employee takes reasonable care of themselves and their fellow workers

5. HIRA

Annexure 1: List of possible hazards emanating from projects and activities conducted for or on behalf of Johannesburg Water SOC Ltd includes an assessment of site specific health and safety hazards and risks and environmental aspects and impacts that have been identified by Johannesburg Water SOC Ltd as possibly applicable to the contract work for this project. It is by no means exhaustive and is offered as assistance to the tenderers and contractors.

Development of risk assessments

Every Contractor performing construction work shall, before the commencement of any construction work or work associated with the construction work, and during construction work, ensure that a risk assessment is undertaken by a competent person, appointed in writing, and the risk assessment shall form part of the SHE plan to be applied on the site. Risk assessments shall identify occupational health and safety hazards and risks and environmental aspects and impacts emanating from the activity to be performed by the Principal Contractor / Contractor.

The risk assessment (inclusive of impact assessment) shall include (at a minimum):

- Identification of the relevant Johannesburg Water SOC Ltd Project with regard to JW Number, Project name and area;
- Date on which risk assessments were conducted / reviewed;
- The identification of the risks / hazards and aspects / impacts to which persons may be exposed to per activity;
- The analysis and evaluation of the risks / hazards and aspects / impacts identified;
- Existing control measures and proposed corrective measures;
- A plan to review the risk assessments as the work progresses and changes are introduced;
- Identification of significant risks (e.g. high; exceeding 75%);
- A documented plan of Safe Working Procedures (SWP)', and its relevance to the risk assessment, inclusive of method statements, to mitigate, reduce or control the risks and hazards that have been identified;
- A plan to monitor the application of the Safe Working Procedures (SWP);
- Signature of appointed competent person conducting risk assessment; and
- Signature of approval by Principal Contractor management and employees involved in risk assessment.

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Based on the risk assessments, the Principal Contractor must develop a set of site-specific occupational SHE rules that will be applied to regulate the health, safety and environmental hazards/aspects of the construction work.

The risk assessments, together with the site-specific occupational health and safety rules, must be submitted to Johannesburg Water SOC Ltd before mobilisation on site commences. These will be included in the SHE plan. The Contractor shall ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented:

- **Eliminate** - The complete elimination of the hazard.
- **Substitute** - Replacing the material or process with a less hazardous one.
- **Redesign** - Redesign the equipment or work process.
- **Separate** - Isolating the hazard by guarding or enclosing it.
- **Administrate** - Providing control such as training, procedures etc.
- **Personal Protective Equipment (PPE)** - Use of appropriate and properly fitted PPE where other controls are not practical. (PPE as the last resort)

The Principal Contractor will be required to carry out the following three forms of risk assessment:

- Baseline risk assessment;
- Issue based risk assessment;
- Continuous risk assessments.

Baseline risk assessments

The Principal Contractor is required to develop a baseline risk assessment taking the resources, competency levels, nature and scale of their organization into consideration for submission during SHE File evaluation phase. The hazards and risks to which persons, plant, vehicles and facilities may be exposed during the construction should be identified and evaluated. The aspects and impacts resulting in environmental pollution or degradation should also be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

Issue based risk assessments

The Contractor will be required to carry out separate risk assessments during construction of the project when methods and procedures are varied, for example when:

- Designs are amended;
- New machines are introduced;
- Plant is periodically cleaned and maintained;
- Plant is started-up or shut-down;
- Systems of work change or operations alter;
- Indents or near-misses occur; or
- Technological developments invalidate prior risk assessments.

Continuous risk assessments

The Occupational Health and Safety Act (Act no. 85 of 1993) specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk free environment on an on-going basis. This is achieved by continuous risk assessments, a form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Maintaining general hazard awareness, and
- Pre-work risk assessments / Daily Safety Task Instructions.

Occupational health and safety risks or environmental impacts that are identified during the risk assessment process shall be communicated before the commencement of the said activity to every employee whose work is associated

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with the risk. Each employee shall sign to confirm understanding of the safety, health or environmental risks in the tasks.

Review of risk assessments

The Principal Contractor is required to review the hazards identified, the risk assessments and the Safe Work Procedures as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and/or processes. Revisions to the approved risk assessments and Safe Work Procedures will be presented at each production planning and progress meeting.

Risk assessments are to be reviewed whenever there is change on the scope of work, process, and accidents or when required by Johannesburg Water SOC Ltd

The Principal Contractor must provide Johannesburg Water SOC Ltd, other contractors and all other concerned or affected parties with copies of any changes, alterations or amendments to risk assessments and Safe Work Procedures within 14 days of such changes.

OH&S improvement programmes

The Principal Contractor is required to establish Safety Improvement Programmes for all significant (high) risks determined in the baseline risk assessment to improve on risk management performance. Safety Improvement Programmes shall include:

- SHE Objective and targets to be achieved;
- Actions to be taken to reduce potential exposure to risk during the construction period;
- Personnel responsible for implementation of action;
- Target date / Time Frame for action to be completed.

Safety Improvement programmes shall be reviewed whenever there is changes on the scope of work, significant risk profile, process, and incident/accident outcomes or when required by Johannesburg Water SOC Ltd Implementation of Safety Improvement Programmes must be monitored and reported on a monthly basis; records of implementation must be maintained and reviewed / revised as and when necessary.

6. SAFE WORK PROCEDURES / METHOD STATEMENTS

Method statements or written safe work procedures shall be documented for all high risk activities:

- Design change or scope change/addition
- Change in job or task
- Introduction of new machinery, equipment or substance.

Method statements or written safe work procedures shall identify following:

- Tasks that are to be undertaken
- The hazards and associated risks of the task(s)
- The control measures for the task(s)
- The equipment and substances that are associated with task(s)
- Any training or qualification needed to do the task
- Personal protective equipment to be worn.

7. INCIDENT MANAGEMENT

7.1 Reporting of accidents and incidents

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he:

- Dies
- Becomes unconscious

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- Loses a limb or part of a limb
- Is injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he was usually employed

Or where -

- A major incident occurred
- The health or safety of any person was endangered
- Where a dangerous substance was spilled
- The uncontrolled release of any substance under pressure took place
- Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- Machinery ran out of control

to Johannesburg Water SOC Ltd within two days and to the Provincial Director of the Department of Labour within seven days from date of incident (Section 24 of the Occupational Health and Safety Act (Act no. 85 of 1993) and General Administrative Regulations), except that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both Johannesburg Water SOC Ltd and the Provincial Director of the Department of Labour forthwith by telephone, telefax or e-mail.

- All other reports required by this specification must also be completed. Reporting of accidents / incidents to Johannesburg Water SOC Ltd will be on the prescribed format.
- The Principal Contractor is required to provide Johannesburg Water SOC Ltd with copies of all statutory reports required in terms of the Occupational Health and Safety Act (Act no. 85 of 1993) within 7 days of the incident occurring.
- The Principal Contractor is required to provide Johannesburg Water SOC Ltd with copies of all internal and external accident/incident investigation reports, within 7 days of the incident occurring.

7.2 Accident and incident investigation

- The Principal Contractor is responsible for the investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that they had to receive medical treatment other than first aid.
- The results of the investigation are to be entered into the accident and/or incident register. The Principal Contractor is responsible for the investigation of all incidents, including those described in Section 24 (1) (b) and (c) of the Occupational Health and Safety Act (Act no. 85 of 1993) and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future.
- The Principal Contractor is responsible for the investigation of all road traffic accidents, related to the construction activities, and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future.
- Johannesburg Water SOC Ltd reserves the right to hold its own investigation into an incident or call for an independent external investigation.

7.3 Close out

- All incident investigation reports will be closed out once all the recommendations to prevent further incidents have been implemented.
- A copy of the investigation report must be handed to JW Safety Officer conducting the investigation.

8. MEDICAL SCREENING REQUIREMENTS

- The Principal Contractor shall ensure that a medical surveillance programme is implemented for all employees.
- An initial health evaluation shall be carried out by an occupational health practitioner immediately, before after a person commences employment, where any exposure exists or may exist, which comprises:

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- an evaluation of the employees medical and occupational history;
- a physical examination; and
- any other essential examination which in the opinion of the occupational health practitioner is desirable in order to enable the practitioner to do a proper evaluation.
- Medical surveillance and immunisation shall be done accredited at / by institutions or occupational health personnel, including, but not limited to:
 - Audiograms.
 - A cardio-respiratory examination / Lung function test;
 - Chest X-rays
 - Eye/ sight tests.
 - A general physical examination;
 - A review of previous medical history.
 - Glucose levels
 - Blood pressure
- An entry medical certificate shall be obtained for all workers prior to commencing with site activities from approved medical institution. Copies of all medical certificates shall be retained in the SHE File prior to site establishment and before an employee is allowed to come onto site.
- Specific attention shall be given to the physical and psychological fitness of people who will be required to work in elevated positions and operators of mobile machinery.
- An exit medical certificate shall be obtained for all workers at the end of the contract and for all workers who leave the employment of the Contractor before the end of the Project. Copies of all exit medical certificates shall be submitted to the Johannesburg Water SOC Ltd Project Specialist or Appointed OHS Agent.

Hazardous Biological Agents

An employer shall, before any employee is exposed or may be exposed to HBA and after consultation with the health and safety committee established for that section of the workplace, ensure that the employee is adequately and comprehensively informed and trained, on both practical aspects and theoretical knowledge with regard to-

- The contents and scope of the Hazardous Biological Agents Regulations;
- the potential risks to health caused by the exposure;
- the measures to be taken by the employer to protect an employee against any risk of being exposed;
- the importance of good housekeeping at the workplace and personal hygiene requirements;
- the precautions to be taken by an employee to protect him- or herself against the health risks associated with the exposure, including the wearing and use of protective clothing and respiratory protective equipment;
- the necessity, correct use, maintenance and potential of safety equipment, facilities and engineering control measures provided;
- the necessity of medical surveillance;
- the safe working procedures regarding the use, handling, storage, labelling, and disposal of HBA at the workplace;
- the procedures to be followed in the event of exposure, spillage, leakage, injury or any similar emergency situation, and decontaminating or disinfecting contaminated areas; and the potential detrimental effect of exposure on the human reproductive process. The drivers of vehicles carrying HBA must be given instructions in writing on these procedures.
- Health risk assessments should be conducted for all employees within periods not exceeding 2 years

The employer shall introduce appropriate work procedures that employees must follow where materials are used, processes are carried out, or incidents might occur that could give rise to the exposure of an employee to HBA, and such procedures shall include written instructions to ensure-

- the safe handling, use and disposal of HBA;

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- the proper use and maintenance of process machinery, installations, equipment, tools and local extraction and
- general ventilation systems;
- the regular cleaning of machinery and work areas by vacuum cleaners fitted with a suitable filter that prevents
- contamination of the environment; and

If it is not reasonably practicable to ensure that the exposure of an employee is adequately controlled by either engineering or administrative controls, the employer shall in the case of -

- (a) Airborne HBA, provide the employee with suitable respiratory protective equipment and protective clothing; and
- (b) HBA that can be absorbed through the skin, provide the employee with suitable impermeable personal protective equipment.

9 EMERGENCY MANAGEMENT

The Principal Contractor must appoint a competent person to act as emergency controller and/or coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He must then develop detailed contingency plans and emergency procedures, taking into account any emergency plan that Johannesburg Water SOC Ltd may have in place.

In the event where a contractor incorporates the services of a 3rd party service provider for the provision of Emergency Response Services, the following criteria must be met:

- Identification of 3rd party emergency response services (organization & contact details);
- Notification of contractor to 3rd party emergency response service of incorporation of services into contractor's emergency response plan (written agreement / signed letter).

The Principal Contractor and the other contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarise employees with them.

First-aid

The Principal Contractor must provide first-aid equipment (including a stretcher) and have qualified first-aiders on site as required by General Safety Regulations promulgated in terms of the Occupational Health and Safety Act (Act no. 85 of 1993).

The contingency plan of the Principal Contractor must include arrangements for the speedy and timeous transporting of injured and/or ill person(s) to a medical facility or of getting emergency medical aid to person(s) who may require it.

The Principal Contractor must have written arrangements in place with his other contractors regarding the responsibility of the other contractors towards their own injured and/or ill employees.

10 SHE TRAINING

All employees in jobs requiring training in terms of the Occupational Health and Safety Act (Act no 85 of 1993) and any other applicable legislative requirements are to be in possession of valid proof of training. Other occupational health, safety and environmental training requirements of the Occupational Health and Safety Act (Act no 85 of 1993) and Construction Regulations can include:

- General induction;
- Site and job specific induction, including visitors;
- Occupational health and safety representatives;
- Training of the legal and nominated appointees;
- Operators and drivers of construction vehicles and mobile plant;
- Basic fire prevention and protection;
- Basic first-aid;

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- Storekeeping methods and safe stacking; and
- Emergency planning and coordination
- Incident investigation
- Risk Assessment
- Planned job observations (supervisors)
- Emergency planning and coordination
- Incident investigation
- Risk Assessment
- Formwork
- Steel fixing
- Working at heights
- Confined space entry
- Fall protection planning

All operators, drivers and users of construction vehicles, mobile plant and other equipment are to be in possession of valid proof of training and, where applicable, valid licenses.

10.1 General Job training

The contractor is required to ensure that before an employee commences work their direct supervisor or line manager who is responsible for the employee has informed the employees of his scope of authority, hazards and risks associated with the work to be performed as well as the safety control measure(s). This will involve discussion in connection with any work standard, job description or company policy or procedure.

10.2 Awareness and promotion

The Principal Contractor is required to have a promotion and awareness programme in place to create an occupational health and safety culture within employees. The following are some of the methods that may be used:

- Toolbox talks;
- Posters;
- Videos;
- Competitions;
- Suggestion schemes;
- Participative employee activities such as “occupational health and safety circles”.

The Principal Contractor is, at a minimum, required to provide awareness programmes to employees on the following:

- General Health and Safety Awareness
- Environmental Awareness;
- HIV / AIDS awareness.

10.3 General competence requirement

The Principal Contractor shall ensure that his personnel and other contractors' personnel are trained and competent to carry out work safely and without risk to health has been completed before work commences. The Principal Contractor shall ensure that follow-up and refresher training is conducted as the work progresses and whenever the scope or nature of the work changes.

A “**competent person**” in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995), these qualifications and training shall be deemed to be the required qualifications and training. It is the responsibility of the

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Contractor to determine whether any appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act.

Records of all training must be kept in the SHE File. The contents of the file will be audited from time to time.

At a minimum, the Principal Contractor will provide training on Safe Work Procedures / Safe Operating Standards to personnel responsible for performing the related task. Records of training on Safe Work Procedures / Safe Operating Standards will be retained. Competence and skill levels by the employees responsible for performing the task on the implementation of the Safe Work Procedures / Safe Operating Standards will be measured through Planned Job Observations.

Consultation, communication and participation

MEETING	FREQUENCY	OBJECTIVE
Project Progress Meeting	Monthly	Reporting of compliance standing to project team
Non-compliance meeting	As and when required	Consultative between the contractors and Johannesburg Water SOC Ltd to discuss poor performance
OHS Committee Meeting	Monthly	Where 2 more Safety Representatives are required by law and appointed on site to discuss health and safety related issues.

10.4 Site-specific induction training

The Principal Contractor will be required to develop a project specific induction-training course based on the baseline risk assessment for the contract work. He will ensure that all his employees and other contractors and their employees have received training on the submitted induction-training programme.

All employees of the principal and other contractors are to be in possession of proof (on person) that they have attended a site-specific occupational health and safety induction-training course.

No contractor shall allow or permit any employee, visitor or any other person to enter the site, unless such employee or person has undergone health, safety and environmental induction training pertaining to the hazards prevalent on the site at the time of entry.

Where the Principal Contractor is required to operate within Johannesburg Water SOC Ltd Depot's the Principal Contractor will ensure that all employees undergo the Johannesburg Water SOC Ltd induction.

11. PPE REQUIREMENTS

- The Principal Contractor is required to continuously identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.
- The Principal Contractor will establish a Personal Protective Equipment Policy and a Personal Protective Equipment study will be conducted to determine the types of Personal Protective Equipment (PPE) to be supplied related to the hazards and risks emanating from the tasks.
- Cognisance shall be given to the gender of individuals required to where PPE; size required by the employee and size issued.
- Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.

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- Where it is not possible to create an absolutely safe and healthy workplace the Principal Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.
- It is a further requirement that the Principal Contractor maintains the equipment, instructs and trains the employees in the use of the equipment and ensures that the employees use the prescribed equipment.
- Employees do not have the right to refuse to use and/or wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear the prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition(s) for which the equipment was prescribed. An alternative solution has to be found that may include relocating the employee.
- The Principal Contractor may not charge any fee for protective equipment prescribed by him but may charge for equipment under the following conditions:
 - Where the employee requests additional issue in excess of what is prescribed;
 - Where the employee has patently abused or neglected the equipment leading to early failure; and
 - Where the employee has lost the equipment.

All employees shall, as a minimum, be required to wear the following personal protective equipment on any of Johannesburg Water SOC Ltd's projects:

- Protective overalls with reflective strips;
- Safety boots (Steel toe cap with steel midsole or equivalent)
- Safety vests
- Protective headwear; and
- Eye, face and ear protection.
- Safety harness
- Gloves
- NO SHORTS OR DRESSES WILL BE ALLOWED ON SITE!!!

All Personal Protective Equipment will clearly display the branding components of the Principal Contractor's organization (e.g. Name of Organization, logo).

12. DISCIPLINARY PROCESSES

- The contractor is required to implement disciplinary process in order to enforce compliance with requirements.
- All sub-contractors are required to have the same.

13. SITE RULES

- The Principal Contractor must develop a set of site-specific OH&S rules that will be applied to regulate the Health and Safety Plan and associated aspects of the construction.
- When required for a site by law, visitors and non-employees upon entering the site shall be issued with the proper Personal Protective Equipment (PPE) as and when necessary.

Alcohol, Drugs and Other Intoxicating Substances and Weapons

- The contractor shall ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance.

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- Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.
- A drugs and alcohol testing program must be implemented. Persons entering the site must be randomly tested.
- Any person who tests positive for alcohol or drug consumption must be subject to disciplinary action and be dealt with in accordance with the contractor's drug and alcohol / substance abuse policy.
- Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee must be removed from the site. This may be done without testing. Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.
- Firearms, Ammunition and Offensive Weapons Firearms, ammunition, and offensive weapons of any kind are strictly prohibited. No person shall be permitted to enter the site carrying any such item.

14. PUBLIC HEALTH AND SAFETY

The Principal Contractor is responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from the construction work as well as the precautionary measures to be observed to avoid or minimise those dangers. This includes:

- Non- employees entering the site for whatever reason;
- The surrounding community; and
- Passers-by the site.
- The Principal Contractor shall organize the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage.
- Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times.
- All non-employees entering the site must receive induction into the hazards and risks of the site and the control measures to be observed.
- The Stakeholder Relations Specialist will be the link between Johannesburg Water SOC Ltd and the community to ensure relevant responsibilities are fulfilled and positive relationships with the community are maintained.
- Where activities are performed close to public routes, the Principal Contractor will establish a traffic management plan incorporating the requirements of relevant by-laws. At a minimum, barricading, warning signage and flagmen will be provided to ensure the protection of workers from vehicles in transit. Where required, the Principal Contractor will interact with the local traffic department to establish minimum requirements to be implemented on public routes.
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15. REFUSAL TO WORK

- Section 14 of the OHS Act states that employees shall carry out any lawful orders given to them, suggesting that they have the right to refuse to obey any unlawful order or work instruction.
- In terms of legal and JW requirements, if an employee has reasonable belief that the work to be carried out is likely to endanger themselves or other persons in any way, he/she has the right to refuse to work.
- An employee may also refuse to work in term of Section 29 of NEMA, if the work would result in imminent and serious threat to the environment.
- All contractors shall ensure that their employees are conversant with hazards associated with their work and work environment, and be aware of the precautionary measures to take.
- The contractor must ensure that all refusals to work are investigated promptly and resolved timeously.

16. SECURITY

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The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of security rules and procedures and maintain these throughout the construction period.

The Principal Contractor shall:

- Provide a guardhouse for security personnel. The guardhouse should be in good condition and at-least meet minimum requirements as per Environmental Regulations for Workplaces as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993).
- Supply an access card containing the name, surname, employee number and photograph for all appointed employees (full or part time) for the site.
- Ensure that no person enters the construction site without wearing the necessary Personal Protective Equipment (PPE).
- Ensure that no children are allowed on the construction site.
- Ensure that no family members are sleeping over on the construction site.
- Ensure that no pets are allowed on the construction site.

Visitors

- Visitors (including reps and suppliers) must be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and must arrive with all of this PPE.
- All visitors must sign in the visitors register and undergo a visitor induction briefing before entering the site.
- A visitor access card must be issued to each visitor on conclusion of the induction briefing. Whilst on site, visitors must be accompanied at all times by an appropriately senior employee who has been inducted fully.
- When leaving the site, each visitor must return his or her visitor access card to the security personnel posted at the entrance / exit.
- A visitor will not be permitted to leave the site until he or she produces the access card that was issued.
- Any request (typically made by a government official) to carry out a site inspection must be referred to the Project Manager / Engineer / Safety Agent.
- The contractor must not arrange any such inspection without prior approval from the Client's representatives

17. ACCOMMODATION ON SITE

No employees shall be accommodated on site.

18. WELFARE FACILITIES

The provision of toilets for each sex is required in terms of the National Building Regulations and Construction Regulation 28. Chemical toilets are allowed instead of the water borne sewerage type. Toilets have to be provided at a ratio of 1 toilet per 30 workers. The Principal Contractor shall provide flushing toilets on the construction premises.

- At least cold-water showers for each sex have to be provided at a ratio of 1 shower per 15 workers.
- Some form of screened off changing facility must be provided separately for each sex.
- Some form of eating facility sheltered from the sun, wind and rain must be provided.

The employer needs to provide his employees with the following:

- Potable water for drinking;
- Water and soap for hand washing
- Toilet paper

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19. COMPLIANCE MONITORING

19.1 Inspections

- Contractors will be inspected at least once per week by the JW Project Inspectors.
- Feedback of the inspections will be issued immediately on work instructions, and a formal report sent within 7 days of conducting the inspection to all relevant stakeholders.
- Johannesburg Water SOC Ltd. reserves the right to conduct other ad-hoc assessments and inspections as deemed necessary.
- This may include, amongst other measures, site safety walks. Corrective actions will be identified by Johannesburg Water SOC Ltd. and the Principal Contractor's representative and implemented by the Principal Contractor (at no cost to Johannesburg Water SOC Ltd.) to ensure SHE Performance improvement.

19.2 Monthly audits

- Monthly audits will be conducted within periods not exceeding 30 days.
- The Principal Contractor is to conduct his own monthly internal audits and inspections to verify compliance with his own occupational health and safety plan and management system as well as compliance with the requirements of the Johannesburg Water SOC Ltd. SHE Specification.
- The Principal Contractor will also assess and inspect the compliance of other contractors under its control. Management members of the Principal Contractor will be involved in the internal assessments and inspections.

19.3 Monthly compliance rating

A monthly compliance rating will be calculated for each Principal Contractor as per a formula determined by Johannesburg Water SOC Ltd focussing on or incorporating outcomes of assurance (e.g. monthly audit), operational (e.g. behavioural based safety inspection) assessments and other requirements, as necessary. Johannesburg Water SOC Ltd reserves the right to adjust the monthly compliance calculation formula as and when required – each revision of the monthly compliance calculation formula will be communicated to the Principal Contractor before implementation.

Each Principal Contractor is required to maintain a minimum compliance rating of 93% (Ninety Three Percent).

Scoring	Classification	Classification description
93% -100%	Good	Substantial compliance
80% -92%	Average	Compliance status needs to be improved
60% - 79%	Poor	Methods to ensure compliance require substantial improvement - operations with substantial non-compliance risks
<60%	Very poor	Methods to ensure compliance failed completely - troubled operation with severe non-compliance risks

19.4 Work stoppages

Work stoppages will be identified for 2 (two) types of work stoppages to be implemented:

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- Overall work stoppage – the Principal Contractor and its Contractors are not allowed to continue with any type of construction / site work up until the work stoppage has been closed-out;
- Activity work stoppage – The Principal Contractor and its Contractors are not allowed to continue with the specific activity / task / job up until the work stoppage has been closed-out.

Overall work stoppages will be issued where non-conformances are identified against the criteria in the following table.

NR	DESCRIPTION OF AUDIT NON-CONFORMANCE / NON-COMPLIANCE
1	NOTIFICATION OF CONSTRUCTION WORK
1.1	Local Department of Labour not notified of construction work before commencement of construction activities
1.2	Notification of construction work not stamped by local Department of Labour (no faxed copies)
1.3	Copy of notification of construction work not available on site
2	PROOF OF REGISTRATION WITH COMPENSATION COMMISSIONER
2.1	Proof of registration with Compensation Commissioner or other insurer not available
2.2	Registration with Compensation Commissioner or other insurer not valid and up-to-date
3	POLICY COMMITMENT & SHE SPECIFICATION
3.1	SHE Plan not compiled, approved by contractor management and available on site
4	SECTION 37(2) AGREEMENT
4.1	Signed section 37(2) Agreement not signed and available on site
5	RISK ASSESSMENTS
5.1	Risk assessments not developed/ not applicable to scope of work issued by Client
6	CONSTRUCTION MANAGER
6.1	No construction manager appointed / available on site
6.2	Appointed construction manager does not meet requirements
6.3	Proof of competency not available on-site
7	SITE SAFETY OFFICER
7.1	No safety officer appointed/ available on site
7.2	Safety officer does not meet requirements
8	SHE FILE
8.1	No file on site

Activity work stoppages will be issued where non-conformance are identified per activity where the health and safety of employees or the public is compromised.

19.5 Non-compliance management process

The following actions will be instituted where non-conformances are identified in terms of compliance to relevant legislative requirements and the Johannesburg Water SOC Ltd SHE Specification.

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CRITERIA	ACTION TO BE INSTITUTED	RESPONSIBLE PARTY
Compliance rating: 93-100%	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: 80-92%	Letter of compliance improvement to Principal Contractor	Johannesburg Water SOC Ltd
	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: 60-79%	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: <60%	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x Work stoppages	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x Non-conformance to <93% monthly compliance rating	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x consecutive repeat findings	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Escalation to SCMU & CAPEX	Johannesburg Water SOC Ltd

20. OPERATIONAL REQUIREMENTS

20.1 EXCAVATIONS

- Where excavations will exceed 1.5 m in depth the contractor will be required to submit a method statement to Johannesburg Water SOC Ltd for approval before commencing with the excavation and Johannesburg Water SOC Ltd will issue a permit to proceed once the risk assessment and method statement is approved.
- Excavations must be limited to 100m per day, or equated to the amount of work to be done for the day.

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- All open excavations shall be closed within 3 days of excavation. No excavation will remain open beyond 3 days or during holidays.
- Excavation work must be carried out under the supervision of a competent person, who has been appointed in writing, with at least two years' experience in excavation work. Before excavation work begins the stability of the ground must be evaluated.
- Whilst excavation work is being performed, the contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material.
- No person may be required or permitted to work in an excavation that has not been adequately shored or braced.
- Where the excavation is in stable material and where the sides of the excavation are sloped back to at least the angle of repose of the excavated material, shoring or bracing may be left out but only after written permission has been obtained from the appointed competent person.
- Shoring and bracing must be designed and constructed to safely support the sides of the excavation.
- Where uncertainty exists regarding the stability of the soil the opinion of a competent professional engineer or professional technologist must be obtained whose opinion will be decisive. The opinion must be in writing and signed by the engineer or technologist as well as the appointed competent person.
- No load or material may be placed near the edge of an excavation unless suitable shoring has been installed to be able to carry the additional load.
- Neighbouring/adjoining buildings, structures or roads that may be affected or endangered by the excavation must be suitably protected.
- Every excavation must be provided with means of access that must be within 6 metres of any worker within the excavation.
- The location and nature of any existing services such as water, electricity, gas etc. must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for workers in the excavation.
- The appointed competent person must inspect every excavation, including the shoring and bracing or any other method to prevent collapse, as follows:
 - Daily before work commences
 - After every blasting operation
 - After an unexpected collapse of the excavation
 - After substantial damage to any supports
 - After rain
- The results of any inspections must be recorded in a register kept on site and in the safety file.
- Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced to at least one meter high and as close to the excavation as practicable, regardless of the depth of the excavation.
- Every excavation must be provided with warning lights or visible boundary indicators after dark or when visibility is poor.
- Upon entering an excavation the requirements of General Safety Regulation 5, work in confined spaces, must be observed:
- Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture.
- The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes.
- The safe atmosphere must be maintained and, where necessary.
- Employees are to be provided with breathing apparatus and must wear a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space.

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- Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space.
- Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes.
- All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage.
- The employer must ensure that all employees have left the confined space after the completion of work.
- Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.
- Excavations and other openings must be provided with sufficient barriers to prevent construction vehicles and mobile plant from falling into them.
- Excavations left open for extended periods of time (exceeding 48 hours) must be approved the relevant Engineer / Construction Supervisor.

20.2 EXISTING SERVICES

- The Contractor shall note that although the drawings have been prepared using available information they show only the approximate positions of existing services where applicable.
- The information is supplied in good faith but shall be used as a guide only and does not relieve the Contractor of his responsibility to exercise due caution when working in areas where existing services can reasonably be expected, nor his obligation to liaise with the authorities in this regard and the obtaining of the necessary work permits and wayleaves.
- The Contractor shall be responsible to locate and safeguard any existing service he may encounter during construction. The Contractor shall be responsible for any damage to such existing services and works in the execution of this contract and shall reimburse the Employer, authority or the owner concerned for any repairs required following damages due to the Contractor's negligence.
- The Contractor shall be responsible for immediately notifying the Engineer and the authorities concerned regarding any damage caused to public services and existing works.
- Any alterations to public services shall be carried out by the Authority concerned unless the Contractor is instructed otherwise.

20.3 SETTING OUT OF WORKS

- Reference and level beacons will be shown to the Contractor by the Engineer at the commencement of the Contract and the Contractor will be responsible for transferring the datum to the Site of Works.
- The Contractor shall check the condition and accuracy of all reference and level beacons and satisfy himself that they have not been disturbed and are true with regard to position and level. A beacon that has been disturbed shall not be used until its true position and level have been re-established and the new values have been certified by the Engineer. The Contractor shall thereafter be held entirely responsible for the protection of all reference and level beacons.
- The Contractor shall employ a capable surveyor to set out the Works to the required lines and levels. The Engineer shall be informed immediately should any discrepancy be discovered between the levels or dimensions obtained by the Contractor and those shown on the drawings.
- Where a beacon is likely to be disturbed during construction operations, the Contractor shall establish suitable reference beacons at locations where they will not be disturbed during construction. No beacons shall be covered over, disturbed or destroyed before accurate reference beacons have been established and details

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of the positions and levels of such beacons have been submitted to the Engineer. The Contractor's reference beacons shall be of at least the same accuracy and sturdiness of construction as the existing beacons.

- The Contractor shall submit the method of setting out he proposes to employ to the Engineer. Accurate control of line and level shall be provided by the Contractor at all stages of construction.
- Work set out by the Contractor may be checked by the Engineer and any errors found shall be rectified by the Contractor at his own expense. The Contractor shall supply any instrument, equipment, material and labour required by the Engineer for this survey work. Any assistance, including checking given to the Contractor by the Engineer or any setting out done by the Engineer for Contractor shall not be held as relieving the Contractor of his responsibility for the accurate construction of the Works.
- The Contractor's survey instruments and survey equipment shall be suitable for the accurate setting out of the Works and shall be subject to the approval of the Engineer. They shall furthermore be checked and correctly adjusted by the authorized agents before the commencement of the contract and subsequently when required by the Engineer and when otherwise necessary.
- Survey work shall not be measured and paid for directly and compensation for the work involved in setting out shall be deemed to be covered by the rates tendered and paid for the various items of work included under the contract.

20.4 CONFINED SPACE ENTRY

- Enclosed space work necessitates a Confined Space Permit. This may only be obtained from the authorized person nominated in writing.
- The responsibility for safe procedure, both at the time of entry and during the entire operation of entering and working in confined spaces, rests with the Contractor.
- The Contractor shall be sure that adequate steps have been taken to eliminate or control hazards.
- Before working in an area that contains dust, the area is to be ventilated and hosed down to settle and dampen the dust.
- The Contractor shall provide all necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like).
- The Contractor shall ensure all persons working in a confined space or managing entry to a confined space are appropriately trained.
- Compulsory - Continuous monitoring, trained rescue teams, radio communication & adequate ventilation.

Pump sumps & valve chambers

Ventilation

- All available manholes or ventilation covers must be removed and the compartment ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the compartment.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any sump or compartment, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the sump or compartment by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the sump or compartment is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register each time he visits a site to ensure that the atmosphere is continuously being monitored.

Entering sump

- When entering a sump the person entering the sump must wear the safety harness, gas detector as well as a self-rescuer.

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- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the sump.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.
- In no circumstance shall any person remain within a sump for a period of more than one hour at a time.
- A five-minute rest on the surface must be taken after this period before re-entering.
- No naked lights, smoking or unprotected electrical apparatus which may cause sparks, shall be permitted in any sump or in their vicinity.

Confined spaces & water chambers

General

- All employees working in confined spaces or sewer manholes must be issued with gas monitoring equipment and safety harnesses and self- rescuers where applicable.
- All these employees must be trained in their use.
- Where over pumping between manholes is involved, only leakage free pumping machines and conveyance tubes will be allowed.
- Under no circumstances may any confined space be entered unless it has been certified safe to work in.
- Safety harnesses and attachments must be checked for damage to webbing, metal fittings and ropes on a monthly basis and the findings recorded in a register.
- Should a harness be damaged, it must be reported to the construction supervisor immediately.

The following records shall be taken and maintained by the Principal Contractor:

- Confined space entry permits
- Confined space entry registers
- Safety harness registers

Ventilation

- All available manholes or ventilation covers must be removed and the chamber ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the chamber.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any chamber, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the chamber by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the area is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register every time he visits the site to ensure that the atmosphere is continuously being monitored.
- Fumes must be extracted from the chamber while welding.

Entering chamber

- When entering a chamber the person entering the chamber must wear a safety harness as well as the gas detector.
- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the manhole.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- In no circumstances shall any person remain within a chamber for a period of more than one hour at a time. A five-minute rest on the surface must be taken after this period before re-entering.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.

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- When the activity to undertake inside the pipeline includes the use of any hazardous chemical substances or substances, which might cause hazardous fumes or gasses the contractor, must comply with 5.24 Hazardous Chemical Substances.

Safety equipment

- All teams must be issued with gas monitoring equipment and safety harnesses and self-rescuers where applicable.
- All employees must be trained in the use thereof.

20.5 BARRICADING

- Barricading plans are to be presented by the Principal Contractor for any major operations involving site works for approval by Johannesburg Water SOC Ltd. Where areas are unsafe, they should be enclosed with barricading. Examples are people working overhead, welding splatter etc.
- Where there is a risk of injury, the area should be barricaded off with secure solid barricades.
- Barricading for the prevention of access into areas with a potential risk of injury shall as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.
- Appropriate signage shall be affixed to the barricade indicating the risk associated (i.e. deep excavation, lifting operations etc.) and the responsible Supervisor and contact details shall be displayed. All barricading shall have a "No Entry" signs on all sides and at each change of direction. Signage shall be placed at 20 m intervals where lengths exceed. All signage shall be a minimum size of 290 mm x 290 mm.
- Danger tape shall not be utilised to prevent personnel from entering into areas.
- Where no risk exists of injury to personnel such as stacking and storage areas, the use of wire for hand and knee rails netting shall be acceptable to demarcate the area.
- All barricades will have a dedicated entrance where it is required that personnel enter the areas.
- Appropriate signage shall be placed at the entrance indicating which Contractor has right of entry.
- It is the Contractor's responsibility to remove all redundant barricades directly after use. The Contractor's Safety Officers will maintain a marked-up site plan indicating where barricades are erected.
- It will be a requirement that the contractor protects employees against contact with exposed rebar and poles by the installation of rebar-caps on all exposed areas where there is a potential that an employee could be injured.

20.6 SYMBOLIC SIGNAGE

Contractors shall use mandatory and prescribed symbolic safety signs at their lay down and site areas. The display of the following signs is mandatory:

- "Radio-Active Material" symbolic signs at radioactive storage areas.
- "Eye Protection" symbolic signs shall be displayed at all grinding machines and at any area where it is mandatory to wear eye protection or where there is danger of an eye injury being sustained.
- "Ear Protection" symbolic signs shall be displayed at all areas where there is a danger of noise induced hearing loss being sustained.
- Every separate room of a workplace shall be consecutively numbered.
- All toilets or urinals shall be marked in a conspicuous place with painted or stencilled letters to indicate the sex for which they are intended.
- The location of every first aid box is to be clearly indicated by means of a sign.
- In any room, cabinet or enclosure where flammable substances are used or stored shall be fixed a suitable and conspicuous sign prohibiting smoking or the use of naked flames in the area.
- At the entrance to premises where machinery is used
- Restricted access on "Authorised Person Only" signs on entry. "No person shall enter the workplace or premises without the permission of the employer or user of the machinery".
- At every place where machinery is used a notice (English & Pictograms) shall be posted.

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- Explosive Power Tool shall have a sign warning people when it is in use.
- Electrical Control Gear. A notice shall be posted so as to warn against the re-closing of a switch of control gear whilst a person is working on such equipment.
- Emergency contact telephone numbers.
- Adequate scaffolding signs. (When applicable).
- Adequate fire fighting equipment signs.
- Speed limit signs.
- Warning notices at openings through which people may fall.
- Risk based signage depending on the task being performed e.g.:
 - "Men working above", "Men working below", "Road closed – detour", "Excavation in progress", "No walkway" etc.;
- No-entry signs to incomplete platforms

The Principal Contractor shall install a notification board indicating the following information at the site entrance:

- Johannesburg Water SOC Ltd project number;
- Principal Contractor identification details (name, telephone number)
- Name and contact details of Construction Supervisor;
- Name and contact details of site safety officer;
- Monthly compliance rating;
- Lost Time Injury Rate;

The Principal Contractor will ensure that information on the notification board is kept up-to-date.

20.7 USE AND STORAGE OF FLAMMABLES

The Principal Contractor to ensure that:

- No person is required or permitted to work in a place where there is the danger of fire or an explosion due to flammable vapours being present unless adequate precautions are taken;
- No flammable material is used or applied e.g. in spray painting, unless in a room or cabinet or other enclosure specially designed and constructed for the purpose unless there is no danger of fire or explosion due to the application of adequate ventilation;
- The workplace is effectively ventilated. Where this cannot be achieved:
 - Employees must wear suitable respiratory equipment
 - No smoking or other source of ignition is allowed in the area
 - The area is conspicuously demarcated as "flammable"
- Flammables stored on a construction site are stored in a well-ventilated, reasonably fire-resistant container, cage or room that is kept locked with access control measures in place. Sufficient fire fighting equipment is installed and fire prevention methods practiced. Proper housekeeping may achieve this;
- Flammables stored in a permanent flammable store are stored so that no fire or explosion is caused.
- Stored in a locked and well-ventilated reasonably fire resistant container, cage or room conspicuously demarcated as "Flammable Store – No Smoking or Naked Lights"
- The flammables store to be constructed of two-hour fire retardant walls and roof and separated from adjoining rooms or workplaces by means of a two-hour fire retardant fire wall
- Adequate and suitable fire fighting equipment installed around the flammables store and marked with the prescribed signs
- All electrical switches and fittings to be of a flameproof design
- Any work done with tools in a flammable store or work areas to be of a non-sparking nature
- No Class A combustibles such as paper, cardboard, wood, plastic, straw and the like to be stored together with flammables
- The flammable store to be designed and constructed such that in the event of spillage of liquids the store is able to contain the full quantity + 10% of the liquids stored
- A sign indicating the capacity of the store to be displayed on the door
- Only one day's quantity of flammable is to be kept in the workplace;

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- Containers (including empty containers) to be kept closed to prevent fumes/vapours from escaping and accumulating in low lying areas;
- Metal containers to be bonded to earth whilst decanting to prevent build-up of static forces; and
- Welding and other flammable gases to be stored segregated according to the type of gas and empty and full cylinders.

20.8 HAZARDOUS CHEMICAL SUBSTANCES

The Principal Contractor must ensure that:

- Employees receive the necessary information and training to be able to use and store hazardous chemical substances safely;
- Employees obey lawful instructions regarding:
 - The wearing and use of protective equipment
 - The use and storage of hazardous chemical substances
 - The prevention of the release of hazardous chemical substances
 - The wearing of exposure monitoring and measuring equipment
 - The cleaning up and disposal of materials containing hazardous chemical substances
 - Housekeeping, personal hygiene and the protection of the environment
- The risk assessments required in terms of Construction Regulation include employee exposure to hazardous chemical substances and that the necessary measures be taken to protect persons from being detrimentally affected by hazardous chemical substances present or used in the workplace;
- Suppliers provide the necessary information in the form of a material safety data sheet regarding a hazardous chemical substances required to ensure the safe use and storage of that substances;
- An up-to-date list is kept on site of hazardous chemical substances stored and used together with the material safety data sheet of the hazardous chemical substances;
- Hazardous chemical substances containers be clearly marked with the contents and main hazardous category e.g. "Flammable" or "Corrosive" and the reference number of the hazardous chemical substances on the list indicated above;
- Hazardous chemical substances, for example asbestos dust, are not cleared by using compressed air but should be vacuumed;
- No person eats or drinks in a hazardous chemical substances workplace; and
- Hazardous chemical substances waste is disposed of safely in terms of hazardous waste disposal requirements.
- MSDS's to be in 16 point format- available on site

20.9 FIRE PREVENTION AND PROTECTION

The Principal Contractor must ensure that:

- The risk of fire is avoided;
- Sufficient and suitable storage for flammables is provided;
- Sources of ignition are removed wherever flammable or highly combustible material is present in the workplace, for example:
 - Notices prohibiting smoking are displayed and enforced
 - Welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
 - Only spark-free hand and power tools are used
 - No grinding, cutting and shaping of ferrous metals is allowed using electrically driven power tools that produce sparks
 - Flameproof switches and fittings are to be used in the flammable atmosphere
 - Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles
 - Adequate ventilation is maintained
 - Adequate and suitable fixed and portable fire fighting equipment is provided and maintained in good working order.
- Maintenance must include:

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- Regular inspection of fire equipment by a competent person appointed in writing and keeping a register
- Annual inspection and service by an accredited service provider
- All employees are instructed in the use of the fire fighting equipment and know how to attempt to extinguish a fire;
- A sufficient number of employees are appointed and trained to act as an emergency team to deal with fires and other emergencies;
- Employees are informed regarding emergency evacuation procedures and escape routes;
- Emergency escape routes are kept clear at all times and clearly marked;
- Evacuation assembly points are demarcated;
- Evacuation is practiced to ensure that all persons are evacuated timeously;
- Roll call is held after evacuation to account for all personnel and ensure that no-one has been left behind; and
- A siren or alarm is fitted which is clearly audible to all persons on site.

20.10 STACKING AND STORAGE

The Principal Contractor must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site;
- Adequate storage areas are provided and demarcated;
- The storage areas are kept neat and under control;
- The base of any stack is level and capable of sustaining the weight exerted on it by the stack;
- The items in the lower layers can support the weight exerted by the top layers;
- Cartons and other containers that may become unstable due to wet conditions are kept dry;
- Pallets and containers are in good condition and no material is allowed to spill out;
- The height of any stack does not exceed 3 times the base unless stepped back at least half the depth of a single container at least every fifth tier or the approval of an inspector has been obtained to build the stacks higher with the aid of a machine. The operator of the machine must be protected against items falling from overhead off the stack and no items may overhang;
- The articles that make up a single tier are consistently of the same size, shape and mass;
- Structures for supporting stacks are structurally sound and able to support the mass of the stack;
- No articles are removed from the bottom of the stack first but from the top tier first;
- Anybody climbing onto a stack must do it in a safe manner, taking reasonable safety precautions, and ensuring that the stack is stable and capable of supporting him or her
- Stacks that are in danger of collapsing are broken down and restacked;
- Stability of stacks are not threatened by vehicles or other moving plant and machinery;
- Stacks are built in a header and stretcher fashion and that corners are securely bonded;
- Stacks are stepped back at least half the depth of a single container at least every fifth tier; and
- Persons climbing onto stacks do not approach unguarded moving machinery or electrical installations.
- Laydown area is allocated for Contractor-supplied items.
- At all times, the Contractor shall be responsible for the safe and adequate storage of all materials and equipment on site which he is to install, whether they are supplied by himself or others.
- The safe handling, unloading and loading of material receipts and dispatches at site or storage areas shall be the Contractors' responsibility.

The Contractor shall provide a suitable and adequate lock-up store for the storage of items of equipment and material, which would be damaged or pilfered if stored in the open. The Principal Contractor shall provide all facilities required for weather-proofing, dust proofing or vermin proofing.

The Contractor is responsible for the proper storage and maintenance of all equipment until issue of the Certificate of Practical Completion.

All equipment and materials will be stored on suitable wood poles or pallets which will not protrude more than a meter from any of the stored material. Safe access ways shall be maintained between all stored items preventing employees from having to climb over or under equipment to retrieve the necessary.

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20.11 HOUSEKEEPING

The Principal Contractor to ensure that:

- Housekeeping is continuously implemented and maintained;
- Materials and equipment are properly stored;
- Scrap, waste and debris is removed regularly;
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to the free-flow of pedestrians and vehicular traffic;
- Waste and debris not to be removed from heights by throwing but rather by chute or crane;
- Where practicable, construction sites are fenced off to prevent entry of unauthorised persons;
- Catch platforms or nets are erected over entry and exit ways or over places where persons are working to prevent them being struck by falling objects;
- An unimpeded work space is maintained for every employee;
- Every workplace is kept clean, orderly and free of tools, materials and the like that are not required for the work being done;
- As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials;
- The walls and roof of every indoors workplace sound and leak-free; and
- Openings in floors, hatchways, stairways and open sides of floors or buildings are barricaded, fenced, boarded over or provided with protection to prevent persons from falling.

20.12 HAND TOOLS

The Principal Contractor must inspect all hand tools before it is brought onto the site.

- As far as possible all hand tools must be numbered and placed on register to be inspected monthly by a person designated to do so.
- Any tools found to be in an unsafe condition must immediately be removed from service and either discarded or rectified.
- No chisels with “mushroomed” heads must be used.
- No hammer shall be used with a cracked or damaged handle.
- All files must be fitted with handles.
- All trolleys, pushcarts, etc. used on site must be identifiable, placed on register and inspected at least once every month.
- Non-sparking tools must be used in areas where the risk of fire or explosion is present.
- No homemade hand tools are allowed on the project.
- All tools shall be attached to a suitable lanyard when utilised in elevated positions

20.13 PORTABLE ELECTRICAL EQUIPMENT

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 ampere plug point and is moved around for use in the workplace for example; drills, saws, grindstones, portable lights, etcetera. Other electrical appliances such as fridges, hotplates, heaters, and etcetera must be inspected and maintained to the same standards as portable electrical tools and appliances.

The use, inspection and maintenance of portable electrical tools and equipment shall be as follows:

- Periodical inspections must be carried out by a competent person appointed in writing;
- Inspection results must be recorded in a register;
- Only competent authorised persons are allowed to use portable electrical tools and equipment; and
- The correct protective equipment must be worn or used whilst operating portable electrical tools and equipment.

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This equipment:

- Must be maintained in good condition at all times to prevent an electrical shock to the user;
- The main power source should incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such; and
- All equipment must be fitted with a switch to allow for safe and easy starting and stopping.

The following requirements apply to portable lights:

- Must be fitted with a robust non-hygroscopic non-conducting handle;
- Live metal parts or parts which may become live must be protected against contact;
- The lamp must be protected by a strong guard;
- The cable lead-in must withstand rough handling;
- Inspections must be undertaken that concentrate on plug, cord, switch and any obvious faults;
- A register be kept for each piece of equipment with findings of regular inspections undertaken to evaluate the condition of these lights; and
- When used in wet/damp/metal container conditions, the lamp must be protected.

20.14 LIFTING EQUIPMENT & MACHINERY

Lifting equipment must be designed and constructed in accordance with the manufactures/designers specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the of Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act (Act no 85 of 1993).

The Driven Machinery Regulations requires that:

- Lifting equipment is clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. When the MML varies with the conditions of use a table showing the maximum mass load with respect to every variable condition shall be posted up by the user in a conspicuous, place easily visible to the operator and the table shall be used by the driver/operator;
- Each winch on a lifting machine must at all times have, at least, three full turns of rope on the drum when the winch has been run to its lowest limit;
- Lifting equipment shall be fitted with a brake or other device capable of holding the MML. This brake or device shall automatically prevent the downward movement of the load when the lifting power is interrupted;
- Lifting equipment shall be fitted with a load limiting device that automatically arrest the lift when the load reaches its highest safe position or when the mass of the load is greater than the MML;
- Every chain or rope on a lifting machine that forms an integral part of the machine must have a factor of safety as prescribed by the manufacturer of the machine. Where no standard is available the factor of safety must be:
 - chains – 4 (four)
 - steel wire ropes 5 (five)
 - fibre ropes- 10 (ten)
- Every hook or load attaching device must be designed to prevent the load from slipping off or disconnecting;
- Every lifting machine must be inspected and load tested by a competent person every time it has been dismantled and re-erected and every 12 months after that. The load test must be in accordance with the manufacturer's requirements or to 110% of the MML. In addition, all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine must be inspected every 6 months by a competent person;
- All maintenance, repairs, alterations and inspection results must be recorded in a log book and each lifting machine must have its own log book; and
- No person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by the inspector of the Department of Labour.

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General requirements for cranes and lifting equipment

All documentation must be provided to the Johannesburg Water SOC Ltd Project Engineer prior to mobilisation. Failure to do so and the resulting cost of any delays and/or remedial activities will be for the Contractor's account.

All crane operators must be authorised by the relevant Engineer before they may operate a crane or lifting machine. The Load charts must be displayed at the crane.

Daily pre-use inspections of the cranes must be done and be kept on the file. The inspections must be logged in a logbook. The area in which a lift is performed must always be barricaded to prevent employees from entering.

A crane or lifting machine must not be left unattended and the keys may never be left in the ignition when the operator is not present. Properly constructed out rigger pads must be used when soil is uneven or unstable. (Only sleepers or appropriately designed steel plate pads may be used for this purpose).

Only a competent rigger may direct a lift of any kind unless the following requirements are met. Rigger assistants used for performing lifting operations shall be limited to lifts with all of the following requirements:

- Lifts lower than 5 tons
- Easy lifts that does not require the load to be lifted over structures, equipment or machinery
- Equipment that is not critical
- Rigging configuration that requires the attachment of several parts of lifting equipment such as chain blocks to adjust the angle of loads.
- All safety devices on a crane or lifting machine must be functional.

Certification will be required for record purpose, and shall cover the following:

- A Brake or other device capable of holding the maximum mass should the power fail, or which is such that it shall automatically prevent the uncontrolled downward movement of the load when the raising effort is interrupted; and
- A Limiting device which shall automatically arrest the driving effort when:
- The Hook or Load attachment point of the Power Driven lifting machine reaches its highest safe position; and
- In the case of a Winch Operated lifting machine with a lifting capacity of 5000kg or more, the load is greater than the rated mass load of such machine.

The user shall ensure that every lifting machine is operated by an Operator specifically trained for a particular type of lifting machine; the user shall not require or permit a person to operate such lifting machine unless the operator is in possession of a certificate of training, issued by an accredited person or organisation.

No Crane shall be used at arrival on site before copies of all documentation have been handed over to the Johannesburg Water SOC Ltd and the Crane have been checked by a person duly authorised and signed off as acceptable. Copies of all documentation shall be kept in the SHE File at all times.

No Crane shall be used without a pre-use check and findings entered on an approved checklist. Before any cranes are established on site the following must be inspected and approved:

- Operator's licences
- Training certificates
- Medical fitness certificate.
- The cranes load test certificate.
- Rope test certificates including Mill / Destructive test.
- The lifting gear load test certificates.
- The load limiting device calibration certificate.
- Proof that the hooks have been measured for spreading.
- The service inspection history.
- Monthly comprehensive inspection certificate
- Operation and maintenance Manuals and crane condition.

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Cranes and Lifting Machines

A contractor shall ensure that where tower cranes are used:

- Account is taken of the effects of wind forces on the structure;
- Account is taken of the bearing capacity of the ground on which the tower crane is to stand;
- The bases for the tower cranes and tracks for rail-mounted tower cranes are firm and level;
- The tower cranes are erected at a safe distance from excavations;
- There is sufficient clear space available for erection, operation and dismantling;
- The tower crane operators are competent to carry out the work safely; and
- The tower crane operators are physically and psychologically fit to work in such an environment by being in possession of a medical certificate of fitness."

No user shall use or permit any person to use a Jib-Crane with a lifting capacity of 5000kg or more at a minimum Jib radius, unless it is provided with:

- A load indicator that shall indicate to the operator of the Jib-Crane the mass of the load being lifted, provided that such a device shall not require manual adjustment from the application of the load, to the Jib-Crane, until the release of the load.
- A Limiting Device, which shall automatically arrest the driving effort whenever the load is lifted, is greater than the rated mass load of the Jib-Crane.

Mobile Crane near Power Lines

No mobile cranes are to be used near overhead power lines until the Johannesburg Water SOC Ltd representative has been notified and provided safe access conditions and a valid permit to work is obtained. Mobile cranes shall be effectively earthed when working in the vicinity of electrical wires. Assume that all electrical equipment and wires are live and avoid them.

Lifting tackle

The following requirements will apply to lifting tackle:

- Manufactured of sound material, well-constructed and free from patent defects;
- Clearly and conspicuously marked with an identity number;
- MML factor of safety:
 - Natural fibre ropes - 10(ten)
 - Man-made fibre ropes and woven webbing - 06(six)
 - Steel wire ropes – single rope - 06(six)
 - Steel wire ropes – combination slings - 08(eight)
 - Mild Steel chains - 05(five)
 - High tensile/alloy steel chains - 04(four)
- Steel wire ropes must be examined by a competent person every three months and the results recorded in a designated logbook. The ropes must be discarded (not used any further for lifting purposes) when wear and corrosion is evident.

20.16 LADDERS

The following requirements for ladders will apply:

- All ladders used on the site shall be constructed and used in compliance with the OH&S Act and Regulations.
- Ladders, which provide access to a working platform, shall extend one metre above the platform where it provides access, and shall be secured to prevent slipping.
- Timber ladders shall not be painted other than with clear preserving oils, clear varnishes or clear plastics.
- Ladders, which are in a damaged condition, shall not be used and shall be labelled accordingly and removed from the Premises.
- All Ladders shall be numbered, logged in a register, and inspected monthly.
- A ladder in use shall be held by an assistant and/or properly tied down in position.
- Only ladders that do not conduct electricity shall be used in live electrical sub-stations and switching rooms.
- Ladders shall be removed after use and stored in an appropriate facility as to not expose them unnecessarily to the elements or potential damage by surrounding activities.

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20.17 CONSTRUCTION VEHICLES AND MOBILE PLANT

Johannesburg Water SOC Ltd will inspect construction vehicles and mobile plant prior to being allowed on a project site. Suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the Occupational Health and Safety Act (Act no. 85 of 1993) and Regulations.

Construction vehicles and mobile plant to be:

- Of acceptable design and construction;
- Maintained in good working order;
- Used in accordance with their design and intention for which they were designed;
- Operated and/or driven by trained, competent and authorised operators/drivers. No unauthorised persons are to be allowed to drive construction vehicles and mobile plant;
- Provided with safe and suitable means of access;
- Fitted with adequate signalling devices to make movement safe including reversing;
- Provided with roll-over protection (where applicable);
- Inspected daily before start-up by the driver, operator and/or user and the findings recorded in a register/log book;
- Fitted with two head and two tail lights that are in good working condition and must be used whilst operating under poor visibility conditions;
- When used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported.

Operators and drivers of construction vehicles and mobile plant must be in possession of a valid medical certificate declaring the operator and/or driver physically and psychologically fit to operate or drive construction vehicles and mobile plant.

No loose tools, materials etc. are allowed in the driver and/or operators compartment/cabin or in the compartment in which any other persons are transported.

No person shall ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose. Employees shall only be transported if provision for seating and safety belts has been provided with an adequate canopy or rollover protection.

All construction vehicles and mobile plant left unattended at night, adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, must have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant.

Bulldozers, scrapers, loaders, and other similar mobile plant must, when being repaired or when not in use, be fully lowered or blocked with controls in a neutral position, motors stopped and brakes set.

Self-Propelled Mobile Machinery

All Self-Propelled Mobile Machinery must be inspected daily and the findings recorded in a register. Pre-use inspection checklist shall identify critical items that would stop the operator from operating machinery should a defect be detected.

All operators shall be tested on their ability to operate machinery and equipment inspected prior to be used on any of the premises by the Johannesburg Water SOC Ltd Project Inspectors and Responsible Engineer. Relief drivers shall be made available for mobile machinery where there is a need for on-going operations and the contractor shall establish a rotation schedule.

All Drivers/Operators shall be appointed under the applicable legislation prior to operating any type of mobile equipment or machinery:

- If Driver/Operator does not adhere to the rules and regulations his appointment as operator shall be cancelled and he shall not be able to carry on with his duty.

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- No Driver/Operator shall be appointed without proof of training, driver's licence or letter of competency.
- No training of Drivers/Operators on Site.
- No passengers on dump truck, Loaders or Excavators.
- No eating or drinking allowed while operating equipment.
- No vehicle shall be left unattended with engine running or key in ignition.
- Drivers may use no cellular phones during operations.

Equipment Approval

Authorization for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Minimum two lights in front and rear of vehicle
- Communications system (where required);
- Reflective Taping;
- First-aid kit, fire-fighting equipment and emergency roadside triangles;
- Tyres in good condition;
- Windscreen clear of cracks;
- Safety belts fitted for all occupants;
- Signage for clear identification;
- Windscreen wipers;
- Warning hooter and reverse alarm;
- Rotating warning lights (where applicable);
- Maximum number of persons indicated;
- Equipment free of oil and other leaks;
- Maintenance/Service & Equipment manuals available;

Operator Approval

Authorization for operators for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Operator's Certificate (accredited training organisation);
- Operators Licence appropriate to the nature of the Mobile equipment;
- Operator's knowledge tested and familiar with the controls for the vehicle;
- Public driver's permit where required;
- Medical fitness certificate.

20.18 Fall protection (Working in elevated positions)

- A pre-emptive risk assessment will be required for any work to be carried out above **two metres** from the ground or any floor level. This work will be classified as "work in elevated positions".
- As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if he is working at ground level. Whilst working in this position he shall be wearing a single belt with lanyard to prevent the person falling from the platform, ladder or other device. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length and strength that the person will not be able to move over the edge.
- Alternatively, any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with suitable guard rails at two different heights as prescribed in the relevant South African National Standard for the design, erection, use and inspection of access scaffolding.
- Where the requirement in the paragraph above is not practicable, the person will be provided with a full body harness that will be worn at all times and shall be attached above the wearer's head at all times. The lanyard must be fitted with a shock-absorbing device or the person must be attached to a fall arrest system (anchorage connector; body wear; and connecting device) approved by Johannesburg Water SOC Ltd.
- Where the requirements in the paragraph above are not practicable, a suitable catch net must be erected.
- Employees working in elevated positions must be trained to work without risk to their health and safety or to the health and safety of others and be declared medically and psychologically fit to perform work at elevated positions.

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- Where work on roofs is carried out, the risk assessment must take into account the possibility of persons falling through fragile material, i.e. skylights and openings in the roof.

Access scaffolding

- Access scaffolding must be erected, used and maintained safely in accordance with Construction Regulations and relevant SA Bureau of Standards Code of Practice.
- Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. Sufficient material must be available to erect the scaffolding properly.
- Scaffolding must only be erected, altered or dismantled by persons who have adequate training and experience and are competent in this type of work and under the continuous supervision of such a person.

20.19 Structures

The Principal Contractor must ensure that:

- Only skilled employees are allowed to erect structures and that the skills of these employees are verified at regular intervals.
- Steps are taken to ensure that no structure becomes unstable or collapses due to construction work being performed on it or in the vicinity of it.
- No structure is overloaded to the extent that it becomes unsafe.
- He has received from the designer the following information:
 - Information on known or anticipated hazards relating to the construction work and the relevant information required for the safe execution of the construction work.
 - A geo-scientific report (where applicable).
 - The loading the structure is designed to bear.
 - The methods and sequence of the construction process.

All drawings relating to the design are on site and available for inspection.

20.20 Explosive powered tools

Every explosive powered tool must be:

- Provided with a guard around the muzzle to confine flying fragments or particles; and
- Must be fitted with a firing mechanism that will prevent the explosive powered tool from firing unless it is pushed against the surface and at the right angle. Where the explosive powered tool is fitted with an intermediate piston between the charge and the nail this requirement is waived.

The Principal Contractor or user must ensure that:

- Only the correct type of cartridge is used;
- The explosive powered tool is cleaned and inspected daily before use by an appointed competent person. The competent person will keep a register with the findings of his inspection and the details of cleaning, service and repairs;
- The safety devices are in good working order before the explosive powered tool is used;
- When the explosive powered tool is not being used it is stored in an unloaded condition together with the cartridges in a safe and secure place inaccessible to unauthorised persons;
- A warning notice is displayed at the point where the explosive powered tool is in use;
- The issue and return of cartridges must be by issue/returns register signed by both issuer and user and empty cartridge cases must be returned with unspent cartridges;
- Users and operators of the explosive powered tool have received the necessary training and has been authorised as competent to use/operate the explosive powered tool; and

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- Users and operators must wear the prescribed personal protective equipment whilst using and/or operating the tool.

20.21 Bulk mixing plants (Batch plants)

- All contractors shall ensure that all bulk mixing plants are operated and supervised by a competent person who has been appointed in writing.
- All contractors shall ensure that the placement and erection of a bulk mixing plant complies with the requirements set out by the manufacturer and that such plant is erected as designed.
- All contractors shall ensure that all devices to start and stop a bulk mixing plant are provided and that these devices are:
 - Placed in an easily accessible position; and
 - Constructed in such a manner as to prevent accidental starting.
- The contractor shall ensure that the machinery and plant selected is suitable for the task and that all dangerous moving parts of a mixer are placed beyond the reach of persons by means of doors, covers or other similar means.
- No person shall be permitted to remove or modify any guard or safety equipment relating to a bulk mixing plant, unless authorized to do so by the appointed person.
- The contractor shall ensure that all persons authorized to operate the bulk mixing plant are fully aware of all the dangers involved in the operation thereof and conversant with the precautionary measures to be taken in the interest of health and safety.
- No person supervising or operating a bulk mixing plant shall authorize any other person to operate the plant, unless such person is competent to operate machinery.
- The contractor shall ensure that all precautionary measures as stipulated for confined spaces in "good safe practices" are adhered to when entering any silo.
- The contractor shall ensure that a record is kept of any repairs or maintenance to a bulk mixing plant and that it is made available, on site, to an inspector, client, client's agent or employee upon request.
- The contractor shall ensure that all lifting machines and lifting tackle used in the operation of a bulk mixing plant complies with the requirements of the Regulations promulgated.
- The contractor shall ensure that all precautionary measures are adhered to regarding the usage of electrical equipment in explosive atmospheres, when entering a silo, as contemplated in the Regulations.

20.22 Working in proximity to Eskom power lines

- No mechanical equipment, including mechanical excavators, may be used under or in close proximity to Eskom's services without the prior approval of Eskom's authorized representatives. No excavations may be executed closer than 3 meters from any of Eskom underground electric power cables and 10 meters from Eskom overhead electrical power lines unless Eskom authorized representative is on site.
- No excavations may take place closer than 5m from any overhead line infrastructure (poles and stays and only excavation by hand will be allowed. Only excavation by hand will be allowed on the same route and in close proximity to the Eskom's 132 kV cables.
- The use of explosives of any type within 500 meters of Eskom's services shall only occur with Eskom's previous written permission. If such permission is granted the applicant must give at least fourteen working days prior notice of the commencement of blasting. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued in terms of the blasting process.
- The contractor shall be liable for any death or injury to any person or for the loss of or damage to any property caused in whatsoever manner by the contractor, his employees, agents or sub-contractors. The contractor's attention is drawn to section 27(3) of the Electricity Act 1987.
- The contractor is advised to negotiate a proper route with the CNC (Customer Network Centre. Lat Long co-ordinates of all proposed routes to be provided on site and during the application process. The contractor is required to provide the same to the CNC on site during the signing of the Stakeholder On-Site Risk Identification Form.

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- Parallel encroachment into overhead power line servitudes is limited to one meter from the boundary of the servitude. (Where applicable for underground pipelines only.)
- All Eskom servitudes to be kept clear of any obstacles and other services. No dumping, manholes and illegal structures whether occupied by equipment or humans, shall be allowed directly underneath or within Eskom servitude areas.
- Eskom Overhead Lines, Cables and Eskom Plant to be adequately protected against other services and water sources.
- Adequate protection fence should be installed around all Eskom Overhead Structures. The type of fence will be proposed and approved by Eskom CNC / Engineering as listed above.
- Interlocking bricks to be used along all roads and reserves as to ensure Eskom cables could be easily accessed for maintenance and repair / emergency purposes. No roads should be tarred with Eskom cables within the road.
- For developer projects and other works that might affect access to Eskom mini-sub, an appropriate fence with access / gate as approved by the CNC should be installed on street front side.
- The applicant shall ensure that the existing natural ground level is maintained within the Eskom servitude area and where Eskom cables are affected. Should there be a need for the lifting of lines and / or replacement of existing structures / cables and application should be made via **Eskom Customer Services**.
- The vertical clearance required between the road surface and the 11kV / 22kV power-lines shall be at least 6.4m. (Where applicable.)
- Eskom Plant and Cables to be protected from proposed landscaping i.e. no big trees and large plants / scrubs (large roots.) to be planted in close proximity to Eskom services.
- Construction / Amendment of boundary wall/s / fences to be closely monitored with guidance from the CNC – where walls / fences are in close proximity of Eskom Plant.
- At all entrances and road crossings, corrosion-free sleeves must be installed at least 600 mm below undisturbed ground level to provide for existing and future installation of Eskom cables. (Where applicable.)
- Cross trenches by hand need to be done for each road crossing on both sides of the road before the services are installed, to ensure Eskom services do not get damaged during drilling operations. For installations where the service will be installed parallel to Eskom services, cross trenches need to be done by hand at regular intervals, which is to be determined by site conditions and the Eskom PPM cables representative.
- The contractor must inform and update Eskom PPM cables on a weekly basis of the on-site work being planned and performed.
- Equipment shall be regarded electrically live and therefore dangerous at all times.
- Eskom may stipulate any additional requirements to illuminate any possible exposure to Customers or Public to coming into contact or be exposed to any dangers of Eskom plant.
- Security must be on-site 24/7 when trenching and working in close proximity to the Eskom 132 kV cables
- Extra care must be taken when working in close proximity to the 132 kV cables. (Eskom's PPM cables can assist in identifying these cables on-site.)
- The contractor in charge of the construction or maintenance work on site must at all times be in possession of the Approved Wayleave letter of the affected Eskom services, as well as all plans related to the wayleave application. This should be available upon the request of any Eskom and Municipal official, during site visits. If no approval is presented, then the Eskom Official(s) can order that all work to be ceased until approval can be presented.

20.23 Slip lining

- All slip lining work shall be carried out under the supervision of a competent person.
- All employees involved in slip lining shall be adequately trained.
- A risk assessment as well as a method statement for slip lining shall be compiled and submitted for approval by the Client.

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- Contractor will submit specifications on directional boring equipment to be used to ensure that the equipment will be adequate to complete the project. Spares inventory shall be included
- The directional boring equipment shall consist of a directional boring rig of sufficient capacity to perform the bore and pullback the pipe, a boring fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations and trained and competent personnel to operate the system.
- All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.
- The directional boring machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head.
- The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing.
- The hydraulic power system shall be self-contained with sufficient pressure and volume to power boring operations.
- Hydraulic system shall be free of leaks.
- Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations.
- The rig shall be grounded during boring and pull-back operations.
- Sufficient spares shall be kept on hand for any break-downs which can be reasonably anticipated.
- The Guidance System shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system.
- The Operator shall be aware of any magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.
- The Engineer must be notified 48 hours in advance of starting work.
- The Directional Bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made.
- The Engineer approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.
- It shall be the responsibility of Engineer to provide inspection personnel at such times as appropriate without causing undue hardship by reason of delay to the Contractor.

20.24 WATER ENVIRONMENTS

- The contractor must ensure that where construction work is done over or in close proximity to water, provision is made for—
 - preventing persons from falling into water; and
 - the rescuing of persons in danger of drowning.
- The contractor must ensure that where a person is exposed to the risk of drowning by falling into the water, the person is provided with and wears a lifejacket.

20.25 Electrical installations

The installation of temporary electricity for construction shall be in accordance with Construction Regulations and the Electrical Installation Regulations. The Principal Contractor must ensure that:

- Existing services are located and marked before construction commences and the markings maintained during construction;
- Electrical installations and -machinery are sufficiently robust to withstand normal working conditions on site;
- Temporary electrical installations must be inspected at least once a week by a competent person and a record of the inspections kept in the SHE File;

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- Electrical machinery used on a construction site must be inspected daily before start-up by the competent driver/operator or any other competent person and a record of the inspections kept in the SHE File; and
- A competent person appointed in writing must control and be responsible for all temporary electrical installations.
- An employer or user shall provide free of charge and maintain in good condition such protective equipment as may be necessary to prevent incidents, for use by persons engaged in working on or in close proximity to live electrical machinery or dead electrical machinery which may become live.

20.25.1 Electrical control gear

- The contractor shall ensure that all electrical machinery are provided with controlling apparatus and protective devices which shall, as far as is reasonably practicable, be capable of automatically isolating the power supply in the event of a fault developing on such machinery.
- The contractor shall place a switch, circuit breaker or fuse in the neutral conductor of a polyphase alternating current or three-wire direct current distribution system unless such switch, circuit breaker or fuse is so arranged as to isolate all phase conductors and the neutral conductor simultaneously: Provided that this shall not include an isolating link on the neutral conductor installed for test purposes or to prevent circulating currents.
- The contractor shall, whenever reasonably practicable, provide switchgear with an interlocking device so arranged that the door or cover of the switch cannot be opened unless the switch is in the 'off position and cannot be switched on unless the door or cover is locked.
- The contractor shall mark or label all controlling apparatus permanently so as to identify the system or part of the system or the electrical machinery which it controls, and where such control apparatus is accessible from the front and the back these markings shall be on both the front and the back.
- The contractor shall post a notice at switchgear or control gear which has been switched off or locked out to enable persons to work on electrical machinery or other machinery operated by electricity and controlled by. Such switchgear or control gear, warning against reclosing such switchgear or control gear.

20.25.2 Work on disconnected electrical machinery

- Without derogating from any specific duty imposed on employers or users of machinery by the Act, an employer or user shall, whenever work is to be carried out on any electrical machinery which has been disconnected from all sources of electrical energy, but which is liable to acquire or to retain an electrical charge, as far as is practicable, cause precautions to be taken by earthing or other means to discharge the electrical energy to earth from such electrical machinery or any adjacent electrical machinery if there is danger there from before it is handled and to prevent any electrical machinery from being charged or made live while persons are working thereon

20.25.3 Portable electric tools

No person shall use or permit the use of a portable electric tool with an operating voltage that exceeds 50 V to earth unless-

- It is connected to a source of electrical energy incorporating an earth leakage protection device, the construction of which meets the requirements of the relevant health and safety standard incorporated into these Regulations under section 44 of the Act; or
- It is connected to a source of electrical energy through the interposition between each tool and the source of an individually double-wound isolating transformer, the secondary winding of which is not earthed at any point and the construction of which meets the requirements of the relevant health and safety standard incorporated into these Regulations under section 44 of the Act; or
- It is connected to a source of high frequency electrical energy derived from a generator which is used solely for supplying energy to such portable electric tool and which arrangement is approved by the chief inspector; or it is clearly marked that it is constructed with double or reinforced insulation.

No person shall sell a portable electric tool constructed with double or reinforced insulation unless-

- It is clearly marked that it is constructed with such insulation; and Its insulation is constructed in accordance with the relevant health and safety standard incorporated into these Regulations under section 44 of the Act.
- No employer or user shall use or permit the use of a portable electric tool which is not fitted with a switch to allow for easy and safe starting and stopping of the tool.

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- The employer or user shall maintain every portable electric tool, together with its flexible cord and plug, in good working order.

20.25.4 Switchboards

The contractor shall ensure that an unobstructed space for operating and maintenance staff is provided at the back and front of all switchboards, and the space at the back shall be kept closed and locked except for the purpose of inspection, alteration or repair: Provided that the requirements of this regulation with respect to the unobstructed space at the back of the switchboard shall not apply in the case of-

- switchboards which have no uninsulated conductors accessible from the back;
- switchboards, the switchgear of which is of a totally enclosed construction;
- switchboards, the backs of which are only accessible through an opening in the wall or partition against which they are placed, such openings being kept closed and locked; and
- switchboards which can be safely and effectively maintained from the front and which have all parts accessible from the front.

20.25.5 Electrical machinery in hazardous locations

- No person may use electrical machinery in locations where there is danger of fire or explosion owing to the presence, occurrence or development of explosive or flammable articles, or where explosive articles are manufactured, handled or stored, unless such electrical machinery, with regard to its construction relating to the classification of the hazardous locations in which it is to be used, meets the requirements of a safety standard incorporated for this purpose in these regulations under section 36 of the Act.
- Every user of electrical machinery shall be in possession of a certificate in a form acceptable to the chief inspector which has been issued by an approved inspection authority, in which it is certified that the electrical machinery has been manufactured and tested for the groups of dangerous articles in terms of the safety standard which has been incorporated in these regulations for this purpose under section 36 of the Act: Provided that in lieu of such certificate an inspector may approve permanent labeling on such machinery which contains all the relevant information.
- When diverse items of electrical machinery such as motors, cables and control apparatus are used together to form an electrical installation, the user shall ensure that the selection, arrangement, installation, protection, maintenance and working thereof results in no less a degree of safety than when the individual items of such machinery are used separately.
- The user shall use electrical machinery to which this regulation applies only under such conditions and in such surroundings as are prescribed in the safety standard incorporated in these regulations for this purpose under section 36
- No person shall effect repairs or adjustments to or otherwise work on electrical machinery under conditions (bullet 1) unless such machinery has been rendered dead and effective measures have been taken to ensure that such machinery remains dead.
- Wherever there is a possibility of the formation of static electricity under working conditions, the user shall earth all metallic structures, machine parts, pneumatic conveyor ducts and pipelines conveying flammable articles and the like, or take such other measures as may be necessary to effectively prevent the formation of electric sparks.
- The user shall cause all electrical machinery to which this regulation applies to be examined and tested at intervals not exceeding two years by a person who is competent to express an opinion on the safety thereof.
- The person carrying out the examination shall enter, sign and date the results of each such examination in a record book which shall be kept by the user for this purpose: Provided that where such machinery is subject to adverse climatic or physical conditions the frequency of such examinations shall be increased to intervals of no longer than one year or such shorter period as circumstances may necessitate.

20.25.6 Design and construction

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- No person shall authorize, design, install or permit or require the installation of an electrical installation, other than in accordance with a health and safety standard incorporated into these regulations under section 44 of the Act: Provided that the components within an electrical installation shall comply with the standards referred to in the incorporated standard and proof of compliance shall be identifiable on the components or certification shall be available from the supplier or manufacturer of the components: Provided further that items of an electrical installation not covered by such incorporated safety standard, and the conductors between the point of supply and the point of control, shall be installed in accordance with the by-laws or regulations of the supplier concerned.
- A registered person shall exercise general control over all electrical installation work being carried out, and no person shall allow such work without such control: Provided that where the voltage exceeds 1kV, the installation shall be designed and supervised by a person deemed competent in terms of paragraphs (b), (c) or (d) of the definition of a competent person in regulation 1 of the General machinery Regulations, 1998.
- No supplier shall restrict the application of a health and safety standard referred to in sub-regulation (1) when an electrical installation is installed, except where the distribution system of the supplier may be adversely affected by the application thereof.

20.25.7 Electrical contractor

- Any person, including a juristic person, who intends to do installation work as an electrical contractor shall register annually with the chief inspector in the form prescribed in annexure 1 of the Electrical Installations Regulations.

20.25.8 Commencement and permission to connect installation work

- No person shall commence with installation work which would require a new supply or an increase in electricity supply capacity unless the supplier has been notified thereof in the form of Annexure 3: Provided that the supplier may waive this requirement in respect of such types of work as it may specify.
- No person shall connect or permit the connection of any completed or partially completed electrical installation to the electricity supply unless it has been inspected and tested by a registered person and a certificate of compliance for that electrical installation has been issued: Provided that the supplier may on request connect the supply to the installation for the purpose of testing and completion of the certificate of compliance by a registered person: Provided further that this sub-regulation shall not apply in the case where the electricity was disconnected for the non-payment of the electricity account or where there has been a change of tenant but not of ownership.
- Where the supply to an electrical installation is 25kVA or above, the user shall appoint an approved inspection authority or a competent person who shall ensure the compliance from the commencement to the commissioning of the installation.

20.25.9 Issuing of certificate of compliance

Only registered person may issue a certificate of compliance in the form of annexure 4 and which shall be accompanied by a test report in the format approved by the chief inspector, after having satisfied himself or herself by means of an inspection and testing that—

- a new electrical installation complies with the provisions of regulation 7 (1) of the Electrical Installation Regulations (EIR); or
- an electrical installation which existed prior to the publication of the current edition of the health and safety standard incorporated into these regulations in terms of regulation 7 (1) (EIR), complies with the general safety principles of such standard; or
- an electrical installation which existed prior the publication of the current edition of the health and safety standard incorporated into these regulations in terms of regulation 7 (1) and to which extensions or alterations have been affected, that—

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- ting part of the installation, complies with the general safety principles of such standard and is reasonable safe, and
- extensions or alterations affected comply with the provisions of regulation 7 (1) of the Electrical Installation Regulations (EIR).
- If at any time prior to issuing a certificate of compliance any fault or defect is detected in any part of the installation, the registered person shall refuse to issue such certificate: Provided that if such fault or defect in the opinion of the registered person constitutes an immediate danger to persons in the case where electricity is already supplied, he or she shall forthwith take steps to disconnect the supply to the circuit in which the fault or defect was detected and notify the chief inspector.
- Any person who undertakes to do electrical installation work shall ensure that a valid certificate of compliance is issued for that work.

No person shall amend a certificate of compliance issued by a registered person

20.26 Welding, flame cutting, soldering and similar operations

1. No contractor shall require or permit welding or flame cutting operations to be undertaken, unless -

- the person operating the equipment has been fully instructed in the safe operation and use of such equipment and in the hazards which may arise from its use;
- effective protection is provided and used for the eyes and respiratory system and, where necessary, for the face, hands, feet, legs, body and clothing of persons performing such operations, as well as against heat, incandescent or flying particles or dangerous radiation;
- leads and electrode holders are effectively insulated; and
- the workplace is effectively partitioned off where practicable and where not practicable all other persons exposed to the hazards contemplated in bullet two are warned and provided with suitable protective equipment.

2. No contractor shall require or permit welding or flame cutting operations to be undertaken in a confined space, unless:

- effective ventilation is provided and maintained; or
- masks or hoods maintaining a supply of safe air for breathing are provided and used by the persons performing such operations.

3. No contractor shall require or permit electric welding to be undertaken in wet or damp places, inside metal vessels or in contact with large masses of metal, unless --

- the insulation of the electrical leads is in a sound condition;
- the electrode holder is completely insulated to prevent accidental contact with current-carrying parts;
- the welder is completely insulated by means of boots, gloves or rubber mats; and
- at least one other person who has been properly instructed to assist the welder in case of an emergency is and remains in attendance during operations: Provided that the provisions of this sub-regulation shall not apply to a welding process where the maximum voltage to earth does not exceed 50 volts.

4. No contractor shall require or permit welding, flame cutting, grinding, soldering or similar work to be undertaken in respect of any tube, tank, drum, vessel or similar object or container where such object or container --

- is completely closed, unless a rise in internal pressure cannot render it dangerous; or
- contains any substance which, under the action of heat, may --

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- (i) ignite or explode; or
- (ii) react to form dangerous or poisonous substances,

unless a person who is competent to pronounce on the safety thereof has, after examination, certified in writing that any such danger has been removed by opening, ventilating or purging with water or steam, or by any other effective means.

(5) Where hot work involving welding, cutting, brazing or soldering operations is carried out at places, other than workplaces which have been specifically designated and equipped for such work, the employer shall take steps to ensure that proper and adequate fire precautions are taken.

20.27 Tunnelling

No person may enter a tunnel, which has a height dimension of less than 800 millimetres.

20.28 Asbestos work

- If asbestos is identified on site, then the contractor must ensure that any asbestos work is carried out by an Asbestos Contractor registered with the Department of Employment and Labour.
- All work must be halted and the area where asbestos identified demarcated.
- In the case of type 2 and type 3 asbestos work, the registered asbestos contractor must:
 - undertake only the type of asbestos work for which they are registered by the chief inspector;
 - appoint an occupational health and safety representative.
 - Obtain an up-to-date inventory of asbestos prior to asbestos work taking place from the Client
- Before commencement of any asbestos work and during such work, the registered asbestos contractor must ensure that—
 - a risk assessment is performed that includes—
 - (i) identification of the hazards to which persons may be exposed;
 - (ii) an assessment of the risks related to the hazards based on a documented method; and
 - (iii) documented control measures to mitigate the risk;
 - the risk assessment) is reviewed—
 - (i) at regular documented intervals;
 - (ii) when an incident has occurred; and
 - (iii) when the scope of work changes; and
 - (iv) an up-to-date copy of the risk assessment is made available at the relevant asbestos work site.
- The registered asbestos contractor must—
 - ensure that the approved plan of work is submitted to the Chief Director: Provincial Operations at least seven days prior to commencement of asbestos work;
 - appoint in writing an asbestos removal supervisor for each asbestos work site, who must ensure—
 - (i) occupational health and safety compliance on the asbestos removal site;
 - (ii) compliance with safe asbestos removal or repair procedures;
 - (iii) the correct use of personal protective equipment; and

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- (iv) proper decontamination and waste disposal;
- adhere to the repair or removal methodology and associated control measures provided in the plan of work approved for that specific asbestos work;
- ensure that the employee medical and training records are available on site for inspection and validation;
- ensure that at least the following information for every employee is recorded and kept for a minimum period of 50 years-
 - (i) Physical address of every asbestos work project; and
 - (ii) names and identification numbers of employees potentially exposed;
- before commencement of asbestos work, ensure that—
 - (i) an approved inspection authority has been appointed in writing by the asbestos client; and
 - (ii) the registered asbestos contractor is registered and in good standing with the Compensation Fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993; and
- where a fatality or permanent disabling injury occurs during asbestos work, ensure that a report about the fatality or injury is provided to the Chief Director: Provincial Operations, and that the report includes the measures that the contractor intends to implement to ensure safe asbestos work.

20.29 Earthing

18. The contractor shall ensure that -

- roofs, gutters, downpipes and waste pipes on premises to which electrical energy is supplied to be earthed, except -
 - where the operating voltage does not exceed 50 V;
 - roofs made of non-conductive material or metal roofs covered by non-conductive material;
 - gutters, downpipes and waste pipes made of non-conductive material or gutters and downpipes attached to a metal roof which is covered by non-conductive material;
 - roofs, gutters, downpipes and waste pipes on premises which receive electricity by means of underground service connections:

Provided that the connection is to the conductive structures;

- all accessible metallic parts of electrical machinery that, though normally not forming part of an electrical circuit, may become live accidentally, to be protected by an insulating covering or to be otherwise enclosed or to be earthed and the resistance of the earth continuity path shall not exceed 0,2 ohm, except-
 - metal in earth-free situations, other than runs of metal wireway, and the close-fitting metal sheathing and armouring of cables;
 - short separate lengths of heavy-gauge metal wireway used for the mechanical protection of cables where such cables are not used in the secondary circuits of discharge luminaire installations;
 - short, unexposed separate lengths of metal wireway used for the mechanical protection of insulated wiring passing through walls, floors, partitions or ceilings;
 - metalwork of fixed electrical machinery where such metalwork is more than 2.4 m above the floor: Provided that this exception shall not apply where such metalwork is situated in any position likely to become damp, or in an elevator shaft, or near rotating machinery, or in contact with a wall, ceiling or other support constructed of or covered with conducting material;
 - metal parts of electrical machinery where such parts are enclosed or shrouded by insulating material so that such metal parts cannot be touched;
 - cleats, clips, saddles, clamps of other devices for fixing wireways and cables;
 - shades, reflectors and guards supported on lamp holders or discharge luminaires;
 - lamp caps;

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- metal parts of or screws in or through non-conducting materials which are separated by such materials from current-carrying parts and from earthed non-current-carrying parts in such a way that in normal use they cannot become live or come into contact with earthed parts.

20.30 Noise

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan.

- Proof of training with regards to these regulations.
- That monitoring carried out by an AIA and done according to SABS 083.
- Medical surveillance programme is established and maintained for the necessary employees.
- Control of noise by means of:
 - Engineering methods considered
 - Admin control considered
 - Personal protective equipment considered/decided on
 - Describe how records are going to be kept for 40 years.

20.31 Demolition

- The contractor must appoint a competent person in writing to supervise and control all demolition work on site.
- The contractor must ensure that before any demolition work is carried out, and in order to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed by that person.
- During a demolition, the competent person must check the structural integrity of the structure at intervals determined in the method statement, in order to avoid any premature collapses.
- Prior to demolition, the contractor must take steps to ensure that—
 - no floor, roof or other part of the structure is overloaded with debris or material in a manner which would render it unsafe;
 - all reasonably practicable precautions are taken to avoid the danger of the structure collapsing when any part of the framing of a framed or partly framed building is removed, or when reinforced concrete is cut; and
 - precautions are taken in the form of adequate shoring or other means that may be necessary to prevent the accidental collapse of any part of the structure or adjoining structure;
- Ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced;
- Ensure that any support, shoring or bracing is designed and constructed so that it is strong enough to support the overhanging material;
- Where the stability of an adjoining building, structure or road is likely to be affected by demolition work on a structure, take steps to ensure the stability of such structure or road and the safety of persons;
- Ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and must before the commencement of demolition work that may affect any such service, take the steps that are necessary to render circumstances safe for all persons involved;
- Cause every stairwell used and every floor where work is being performed in a building being demolished, to be adequately illuminated by either natural or artificial means;
- Cause convenient and safe means of access to be provided to every part of the demolition site in which persons are required to work; and erect a catch platform or net above an entrance or passageway or above a place
- Where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe where there is a danger or possibility of persons being struck by falling objects.
- The contractor must ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.
- No person may dispose of waste and debris from a high place by a chute unless the chute—

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- is adequately constructed and rigidly fastened;
 - if inclined at an angle of more than 45 degrees to the horizontal, is enclosed on its four sides;
 - if of the open type, is inclined at an angle of less than 45 degrees to the horizontal; where necessary, is fitted with a gate at the bottom end to control the flow of material; and discharges into a container or an enclosed area surrounded by barriers.
- The contractor must ensure that every chute used to dispose of rubble is designed in such a manner that rubble does not free-fall and that the chute is strong enough to withstand the force of the debris travelling along the chute.
- A contractor must ensure that no equipment is used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed loads.
- Where a risk assessment indicates the presence of asbestos, the contractor must ensure that all asbestos related work is conducted in accordance with the latest version of Asbestos Regulations,
- Where a risk assessment indicates the presence of lead, a contractor must ensure that all lead related work is conducted in accordance with the latest version of the Lead Regulations,
- Where the demolition work involves the use of explosives, a method statement must be developed in accordance with the applicable explosives legislation, by an appointed person who is competent in the use of explosives for demolition work and all persons involved in the demolition works must adhere to demolition procedures issued by the appointed person.
- The contractor must ensure that all waste and debris are as soon as reasonably practicable removed and disposed of from the site in accordance with the applicable legislation.

20.32 Occupational Hygiene

- The contractor must ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.
 - Noise;
 - Thermal stress (heat and cold);
 - Particulates (dust);
 - Silica (free crystalline silica);
 - Asbestos;
 - Gases or vapours;
 - Lead;
 - Chemicals;
 - Vibration (hand / arm vibration and whole body vibration);
 - Ergonomics; and
 - Illumination.
- A baseline survey must be carried out by an Approved Inspection Authority: A plan for measuring and monitoring occupational exposure must be developed by the contractor. All monitoring results obtained must be analysed on a regular basis to:
 - Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
 - Identify inconsistent or unusual results;
 - Evaluate the effectiveness of existing control measures;
 - Measure performance against stated objectives; and Identify continual improvement opportunities.
Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented

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21. Monthly reporting

- The Principal Contractor is required to provide Johannesburg Water SOC Ltd. with a monthly report in the format provided on the last working day of the month.
- The report will include the monthly man-hours, incidents, training, inductions, audits, etc

22. Project close out

- Upon completion of the project, the contractor is required to hand over a consolidated project file to the Client with all the working documents for retention.
- The contractor shall also ensure that the site is left in a safe manner that cannot cause injury or harm to JW employees or third parties.

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ANNEXURE 1: **BASELINE RISK ASSESSMENT**



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BASELINE RISK ASSESSMENT



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ACTIVITY: TRANSPORTATION OF MATERIALS TO SITE

Task	Hazard	Risk	Consequence	Rating	Controls
Transportation of material to site	✓ Unsafe road conditions ✓ Un-road worthy vehicles ✓ Equipment and material not safely secured ✓ Incompetent drivers ✓ Driving under the influence of alcohol ✓ Inclement weather ✓ Speeding ✓ Slippery road	✓ Overturning vehicles ✓ Vehicle collisions ✓ Bumping pedestrians / employees	✓ Injuries ✓ Property damages ✓ Third party liability	M	✓ Adherence to the speed limit ✓ Only competent/ authorised drivers should operate the vehicle ✓ Inspection of vehicles ✓ Equipment and material to be properly secured ✓ Alcohol testing to be done ✓ The road to be paved to prevent accidents ✓ Traffic control to be implemented to avoid collisions
Offloading of material	✓ Faulty lifting machinery & equipment ✓ Suspended load ✓ Poor housekeeping	✓ Malfunctioning ✓ Falling on employees ✓ Obstructed walkways by materials	✓ Injuries	M	✓ Inspect lifting equipment prior to use. ✓ Ensure the safe working load prior to use ✓ Train the employees in manual lifting ✓ Ensure proper housekeeping ✓ The correct PPE must be worn ✓ Designate the stacking areas and put signs ✓ Stacking and storage inspector must be appointed and in charge



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ACTIVITY: SITE ESTABLISHMENT

Task	Hazard	Risk	Consequence	Rating	Controls
Site establishment	✓ Sharp objects/ wires ✓ Uneven surface ✓ Faulty connection ✓ Poor ergonomics ✓ Falling objects ✓ Inadequate security services ✓ Not enough welfare facilities e.g. toilets, change rooms and lockers	✓ Cuts ✓ Slips and trips ✓ Damage to services ✓ Using the environment as ablution facilities	✓ Injuries ✓ Back strains and injuries ✓ Crime, theft, fights ✓ Contracting of communicable diseases ✓ Soil, water pollution	M	✓ Supervisors to plan during site set up and induct employees ✓ A competent electrician must be appointed to connect electrical wires to the site offices and Distribution Board. ✓ Ensure there are welfare facilities on site for health and hygiene purposes ✓ Awareness on hygiene and use of ablution facilities ✓ Detailed Risk Assessment must be drawn before any work commences on site.
Installing containers	✓ Using lifting equipment ✓ Faulty equipment ✓ Faulty slings / chains	✓ Wind ✓ Incompetent personnel ✓ Heavy load ✓ Failing of lifting equipment	✓ Serious injuries ✓ Property damage	H	✓ Check wind speed prior to using the crane. ✓ Inspect the crane, slings and chains before use. ✓ Load test the crane before use ✓ Only carry loads certified to be carried by the crane
Entry and exit	✓ No access control	✓ Unauthorised entry into the construction site	✓ Injuries ✓ Theft	M	✓ Appoint a full time, registered security guard on site



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: SITE ESTABLISHMENT

Task	Hazard	Risk	Consequence	Rating	Controls
Electrical installation	✓ Electricity ✓ Incompetent personnel ✓ Wrong tools ✓ Damaged cables	✓ Contact with live electricity ✓ Incompetent person connecting electricity ✓ Electric shocks	✓ Electrocution ✓ Serious injuries	H	✓ Follow lock out procedure ✓ Ensure that equipment are earthed to an approved earthing point ✓ Ensure a zero potential test is performed for electricity is isolated ✓ Inspect all tools ✓ Use correct tools for the job ✓ Appoint a competent electrician/ technician ✓ Wear task specific PPE ✓ Ensure that there are no exposed wires on the cables
Stacking and storage	✓ Unsafe stacks of materials or pallets	✓ Falling of pallets and material on employees	✓ Injuries ✓ Property damage	H	✓ Supervision of all stacking of materials on site ✓ Materials of same base and heights stacked together ✓ Barricade the stacking area ✓ Unsafe stacks to be removed immediately ✓ Never stack materials during knocking off time or late at night. ✓ Use task specific PPE ✓ Stacking and storage supervisor to be appointed in writing.

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: SITE ESTABLISHMENT					
Task	Hazard	Risk	Consequence	Rating	Controls
					✓ Monthly inspections to be conducted on stacking and storing on site.
	✓ Substandard housekeeping	✓ Trip and falls	✓ Incidents / accidents	L	✓ High standards of housekeeping to be maintained.
	✓ Exposed material / equipment	✓ Theft	✓ Financial losses	M	✓ Ensure that there is sufficient security on site 24/7. ✓ The site camp should fence should be covered with netting such that people outside cannot see what is inside. ✓ Other materials should be safety stored in lockable storerooms



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: WORKING NEAR UNDERGROUND AND OVERHEAD SERVICES

Task	Hazard	Risk	Consequence	Rating	Controls
Working close to Eskom line	✓ High voltage	✓ Electrocution	✓ Fatalities ✓ Power cuts ✓ Property damages	H	✓ Proper scanning of services prior to starting with excavations ✓ Obtain wayleaves from Eskom prior to starting with work ✓ Do not use lifting equipment in close proximity to power lines unless authorized to do so. ✓ Appoint an OHRVS to supervise all work done in close proximity to power lines ✓ Contact Eskom if services are identified for isolation ✓ Develop a method statement and risk assessment ✓ Train employees in the method statement as well as risk assessment ✓ Develop emergency response procedures for explosions
Working close to gas lines	✓ Gas leaks	✓ Explosion ✓ Suffocation ✓ Inhalation	✓ Fatalities ✓ Property damages		✓ Proper scanning of services prior to starting with excavations ✓ Obtain wayleaves from service provider prior to starting with work ✓ Develop a method statement and risk assessment ✓ Develop emergency response procedures for leaks and explosions

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: EXCAVATION

Task	Hazard	Risk	Consequence	Rating	Controls
Excavation	✓ Deep excavations ✓	✓ Collapse ✓ Falling ✓ Unsafe entry and exit	Fatalities	H	✓ Recommendations from the Geotech survey should be followed. ✓ Shoring of the excavation ✓ No unauthorised entry into the project site. ✓ Fencing off of the excavation and prompt supervision of the area. ✓ Full time security on site to monitor entry and exit. ✓ Safe method of entry and exit to be provided for employees ✓ Spoil material to be stored at least 2m away from the excavation ✓ Signage to be displayed indicating deep excavations ✓ Tracked excavator to be used where shallow soft rock is found
	✓ Incompetent operator ✓ Faulty excavator	✓ Overturning ✓ Bumping against people	✓ Serious injuries	H	✓ Only competent personnel may operate the excavator ✓ All excavators must be inspected prior to use



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: EXCAVATION

Task	Hazard	Risk	Consequence	Rating	Controls
Mechanical excavation	✓ Ignition on	✓ Accidental movement	✓ Fatalities ✓ Property damages	H	✓ Operators should ensure that the ignition is off prior to leaving the plant. ✓ Keys should be removed from the ignition and returned to the office for safekeeping,
Deep excavation	✓ Lack of safety signage	✓ Employees / passersby falling into excavations	✓ Fatalities	H	✓ Ensure that deep excavation signage is placed and visible. ✓ Deep excavations must be fenced off and access controlled.
	✓ Spoil material	✓ Collapse of excavation walls. ✓ Entrapment	✓ Fatalities	H	✓ Excavated soil to be placed at least 2m away from the excavation wall.
	✓ Underground service	✓ Contact with plant	✓ Injuries ✓ Property damages ✓ Electrocutation	H	✓ All underground services to be identified and marked prior to excavation. ✓ Wayleaves from all service providers to be obtained prior to starting with excavations.
	✓ Unsafe access and exit	✓ Falling	✓ Injuries	H	✓ TLB / Excavator may not be used by employees to access and exit the excavation

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: EXCAVATION					
Task	Hazard	Risk	Consequence	Rating	Controls
	✓ High water table	✓ Water ingress	✓ Drowning		✓ Continuous dewatering should be done where groundwater is encountered. ✓ Trenches should not be opened for longer periods, except with prior written consent ✓ Excavations must be inspected periodically and results recorded in an inspection checklist. ✓ Where there is uncertainty about the safety of the excavation, the declaration shall be made by a registered Engineering Technologist on the safety of the excavation. ✓ Backfilling should be done as per the relevant SANS code. ✓ If saturation of the trench occurs, sidewalls should be either battered or supported laterally.
	✓ Open excavations	✓ Falling of employees ✓ Collapse	✓ Injuries		✓ Trenches should not be opened for more than 3 days to prevent deterioration in trench stability and to reduce the risk of persons and motorists falling inside.

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: BRICKWORK, PLASTERING & COATING					
Task	Hazard	Risk	Consequence	Rating	Controls
Brick laying	✓ Dust from cutting bricks - Unsecured bricks	✓ Inhalation of dust ✓ Falling on employees	✓ Respiratory problems ✓ Injuries	M	✓ Employees should wear dust masks ✓ Wear hand protection ✓ Employees to exercise caution when handling bricks.
Cutting	✓ High Noise Levels ✓ Cutting Grinder/Disc	✓ Vibration ✓ Cutting edges ✓ Eye penetration ✓ Finger cuts ✓ Expose to high noise level area ✓ Uncontrolled disc ✓ Electrical equipment failure ✓ Sharp edges	✓ Damaged hearing ✓ Carpal tunnel syndrome ✓ Cuts/ injuries ✓ Eye irritation / blindness ✓ Injuries ✓ Eye injuries	M	✓ Use hearing protection when exposed to excessive noise levels (greater than 85 dB over an 8-hour work period) ✓ Rotate tasks to minimize worker exposure to equipment vibration. ✓ Assess manual guide carefully to ensure correct usage of portable electrical devices. ✓ Ensure all grinders and connections are inspected ✓ Ensure that safety guards are in place on the grinder ✓ Handle and switch of the grinder should be inspected and tested prior to use. ✓ Only trained employees may use grinders ✓ Proper PPE to be used ✓ Inspect cutting disc prior to use
Concrete works	✓ Moving bucket	✓ Hitting employees	✓ Injuries	M	✓ Workers to stand clear of the path of the bucket. ✓ Banksman to direct the loading and offloading activities

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: BRICKWORK, PLASTERING & COATING

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Concrete splashing	✓ Skin contact	✓ Dermatitis ✓ Skin burns	M	✓ Use of skin protection ✓ Provide gloves and safety boots ✓ Have MSDS
	✓ Concrete splashing	✓ Eye contact	✓ Eye injuries	M	✓ Provide safety goggles
	✓ Manual handling of chutes	✓ Incorrect handling	✓ Injuries	M	✓ Training in correct handling methods ✓ Provide employees with gloves ✓ Provide leather gloves for concrete chute
Painting	✓ Paint fumes	✓ Inhalation	✓ Respiratory illness	L	✓ Provide employees with masks ✓ Provide MSDS
	✓ Paint	✓ Skin contact	✓ Skin reaction	L	✓ Provide employees with gloves and overalls ✓ Provide MSDS
Paint tins	✓ Heavy material	✓ Falling	✓ Damages ✓ Injuries	L	✓ Proper lifting of material ✓ Develop SOP
	✓ Spillages	✓ Trip and falls	✓ Injuries	L	✓ Provide drip trays
Storage and usage of HCS	✓ Burning or fires on site ✓ Improper labelling of chemical containers	✓ Property damage ✓ Accidental consumption of flammable liquids	✓ Serious injuries ✓ Illnesses	M	✓ A well ventilated cage may be used for storage of all the HCS and flammables ✓ HCS supervisor must record all quantities on a register. ✓ Label containers correctly ✓ Display HCS signage

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: CONCRETE WORKS					
Task	Hazard	Risk	Consequence	Rating	Controls
Concrete works	✓ Moving bucket	✓ Hitting employees	✓ Injuries	M	✓ Workers to stand clear of the path of the bucket ✓ Banksman to direct the loading and offloading activities
	✓ Working at heights	✓ Falls from heights	✓ Injuries	H	✓ Only work on platforms that are fully boarded and handrails installed
	✓ Concrete splashing	✓ Skin contact	✓ Dermatitis ✓ Skin burns	M	✓ Use of skin protection ✓ Provide gloves and safety boots ✓ Have MSDS
	✓ Concrete splashing	✓ Eye contact	✓ Eye injuries	M	✓ Provide safety goggles
Operating concrete truck	✓ Incompetent operator	✓ Hitting employees; ✓ Bumping vehicles and properties	✓ Injuries ✓ Property damages	M	✓ Only trained, competent and appointed operators may operate a concrete truck ✓ Flagman to be posted to direct the operator
	✓ Speeding	✓ Hitting employees; ✓ Bumping vehicles and properties	✓ Injuries ✓ Property damages	M	✓ Site speed limits to be adhered to at all times
	✓ Manual handling of chutes	✓ Incorrect handling	✓ Injuries	M	✓ Training in correct handling methods ✓ Provide employees with gloves. ✓ Provide leather gloves for concrete chute
Pouring concrete with a bucket by	Incompetent operator	✓ Hitting employees; ✓ Bumping vehicles and properties	✓ Injuries ✓ Property damages	M	✓ Only trained, competent and appointed operators may operate a concrete truck. ✓ Flagman to be posted to direct the operator

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: CONCRETE WORKS					
Task	Hazard	Risk	Consequence	Rating	Controls
means of a mobile crane	Unauthorised / unsuitable crane	✓ Hitting employees; ✓ Collapse of material	✓ Injuries ✓ Property damages	M	✓ Crane to be inspected by a competent person prior to use. ✓ Unsuitable crane to be tagged and locked out
Crane parking	Unstable ground	✓ Crane overturning	✓ Injuries ✓ Property damages	M	✓ Crane to be established on solid ground with outriggers fully extended and pads in place



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: PLUMBING, TILING

Task	Hazard	Risk	Consequence	Rating	Controls
Cutting and drilling	✓ Drilling	✓ Vibration	✓ Damaged hearing	M	✓ Use hearing protection when exposed to excessive noise levels (greater than 85 dB over an 8-hour work period)
	✓ Drill bit	✓ Cutting edges	✓ Carpal tunnel syndrome		✓ Assess noise level with sound level meter if possibility exists that level may exceed 85dB.
	✓ Drill sharp metal fibres	✓ Eye penetration	✓ Cuts/ injuries		✓ Rotate drilling tasks to minimize worker exposure to equipment vibration.
	✓ High Noise Levels	✓ Finger cuts	✓ Eye irritation / blindness		✓ Use right size of a drill to drill different layers of the ground
	✓ Cutting Grinder/Disc	✓ Expose to high noise level area	✓ Injuries		✓ Assess manual guide carefully to ensure correct usage of portable electrical devices.
Use of hand tools	✓ Repetitive movements	✓ Improper bending	✓ Back pains	L	✓ Training in correct posture during shovelling
	✓ Distance between employees	✓ Hitting each other with tools	✓ Injuries	M	✓ Ensure safe distance between employees
	✓ Damaged hand tools	✓ Contact with skin	✓ Injuries	L	✓ Inspect tools prior to use ✓ Provide employees with gloves
	✓ Loss of grip of tools	✓ Hitting other employees	✓ Injuries	M	✓ Train employees on the use of tools ✓ Provide gloves
Use of cement	✓ Cement dust	✓ Inhalation	✓ Respiratory problems	L	✓ Provide employees with dust masks



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wykstrust Pump Station

ACTIVITY: GENERATOR USAGE

Task	Hazard	Risk	Consequence	Rating	Controls
Fueling the generator	Spillages	Slips, trips, falls	✓ Injuries	L	✓ Prevent spillages ✓ Use drip trays ✓ Use funnels for fueling
	Spillages	Fire	✓ Injuries	M	✓ No smoking allowed near the generator
	Diesel fumes	Inhalation	✓ Respiratory problems	L	✓ Provide employees with respirators
	Fuel	Skin contact	✓ Skin irritation	L	✓ Provide employees with gloves, safety boots and overalls
	Running engine	Explosion	✓ Injuries	M	✓ Switch engine off before refueling and make sure fuel cap is replaced. ✓ No smoking allowed near the generator
Running the engine	Noise	Over-exposure	✓ Noise-induced hearing loss	M	✓ Provide employees with hearing protection ✓ Provide rest periods for employees
	Vibration	Over exposure	✓ Raynaud's Syndrome	L	✓ Provide employees with vibration gloves. ✓ Rotate employees or provide rest periods.
	Fumes	Inhalation	✓ Respiratory problems	L	✓ Provide employees with respirators. ✓ Never use indoors



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: MCC & TRANSFORMER INSTALLATION

Task	Hazard	Risk	Consequence	Rating	Controls
Lifting using a crane	✓ Overhead lines	✓ Contact with crane	✓ Electrocution ✓ Property damages	H	✓ All lifting activities to be planned at least 2m away from overhead lines ✓ Obtain wayleaves from Eskom ✓ Appoint ORHVS
	✓ Wind / Unfavourable weather	✓ Deflection ✓ Loss of control	✓ Injuries ✓ Property damages	H	✓ Do not use during unfavourable weather conditions
	✓ Incompetent operator	✓ Loss of control ✓ Hitting structures and people	✓ Injuries ✓ Property damages	H	✓ Only trained and competent operators may operate the crane
	✓ Overloading	✓ Collapse of material	✓ Injuries ✓ Property damages	H	✓ Display safe working load on the crane
	✓ Faulty crane	✓ Malfunctioning	✓ Injuries ✓ Property damages	H	✓ Cranes to be inspected by competent persons prior to being used ✓ All faulty cranes to be tagged and locked out
	✓ Incorrect slinging	✓ Employees struck by swinging load	✓ Injuries	H	✓ Slinging to be done by competent persons ✓ Employees to stand clear of lifting operations
	✓ Incorrect / damaged lifting tackle	✓ Load falling on employees	✓ Injuries		✓ Inspect all lifting tackle prior to use



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PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

WORKING INSIDE CONFINED SPACES

Task	Hazard	Risk	Consequence	Rating	Controls
Entry inside MCC rooms / pump station	✓ Slippery steps	✓ Falling	✓ Injuries	M	✓ Inspect the steps prior to entering
	✓ Poor lighting	✓ Falling	✓ Injuries	M	✓ Ensure that there is sufficient lighting in the confined space
	✓ Overhead structures	✓ Bumping against overhead structures	✓ Injuries	M	✓ Train employees in confined space entry / techniques ✓ Ensure that there is sufficient lighting ✓ Provide employees with safety boots and hard hats
	✓ Limited working space	✓ Falls on equipment	✓ Injuries	M	✓ Train employees in confined space entry / techniques ✓ Ensure that there is sufficient lighting ✓ Provide employees with safety boots and hard hats
	✓ No fire detection and suppression system	✓ Fire	✓ Fatalities ✓ Damage to property	H	✓ Ensure that there is a method in place for detection and suppression of fire. ✓ Ensure that fire fighting equipment is serviced and relevant for the type of fires prevalent in the pump station and MCC room
	✓ Poor / No ventilation	✓ Continued exposure to oxygen-deficient air	✓ Suffocation	H	✓ Ensure that there is mechanical / natural ventilation
	✓ Noise	✓ Over-exposure	✓ Noise-induced hearing loss	M	✓ Provide employees with hearing protection ✓ Provide rest periods for employees



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PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: ELECTRICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
Electrical works	✓ Live electric cables	✓ Electric Shock	✓ Serious injuries	H	✓ Ensure that electricity supply is switched off during installation ✓ Implement lockout procedures
	✓ Inadequate wiring	✓ Electric fault ✓ Fire	✓ Serious injuries ✓ Property damages	H	✓ Only competent persons to do the electrical work
	✓ Use of faulty cables	✓ Fire ignition	✓ Burns/ damages	M	✓ Visual inspection of cable before use
Cabling	✓ Cutting	✓ Eye penetration	✓ Eye injuries/ blindness	M	✓ Safety goggles shall be worn by employees when cutting steel
	✓ Unit activation	✓ Struck by equipment	✓ Injuries	M	✓ Lock out/ Tag out
	✓ Live Yard	✓ Electrocution Injury ✓ Working unauthorized ✓ Miscommunication between employees	✓ Injury or death	H	✓ Obtain a permit ✓ Follow cardinal rules ✓ Strict supervision ✓ Fire extinguisher must always be on site ✓ Obtain a permit and follow all procedures listed ✓ Strict supervision ✓ Competent technician operation ✓ Issue test certificate for every testing and inspection done



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: ELECTRICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Electrical connection ✓ Extension cords	✓ Explosion ✓ Faulty cord failure	✓ Injuries / damage to equipment ✓ fire	L	✓ Emergency stop button must always be serviceable ✓ Fire extinguishers must always be kept on site
	✓ Electrical equipment ✓ Portable electrical appliances	✓ Use of faulty electrical equipment; ✓ Faulty equipment could also start a fire.	✓ fatal shocks or burns. ✓ Electric shock/ burns ✓ injuries	M	✓ All tools to be checked and tagged before bringing onto site; ✓ Portable electrical appliances examined and where necessary, tested by a competent person within the recommended time limit; ✓ Defective appliances and leads are removed from use and kept secured until they can be repaired or removed from the site; ✓ Electric tools and installations to be in good condition; ✓ Inspect electric tools before use; ✓ Do not use electric tools in wet / damp conditions; ✓ Use personal protective equipment such as insulated gloves.
✓ Testing ✓ Inspection		✓ Electrocution ✓ Injury /Damage to equipment ✓ Chocking ✓ Electrocution Injury	✓ Fatalities ✓ Property damages	H	✓ Authorized person with COC must do all the installation ✓ Emergency stop button must always be serviceable ✓ Ensure communication between employees ✓ Technical Skills

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	PROJECT NUMBER:	JW 14466R
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	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: ELECTRICAL WORKS					
Task	Hazard	Risk	Consequence	Rating	Controls
		✓ Working unauthorized ✓ Miscommunication between employees			✓ Fire extinguisher must always be on site ✓ Implement lockout procedure ✓ Strict supervision ✓ Competent technician operation



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: MECHANICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
Installation of pumps and valves	Heavy pumps and valves	Falling	✓ Injuries ✓ Property damages	M	✓ Use proper lifting equipment ✓ Ensure that only the relevant people are in the work area. ✓ Ensure that lifting equipment is load tested. ✓ Only competent personnel to undertake this task
Lubricating of parts	✓ Oils	✓ Contact with skin	✓ Burns ✓ Dermatitis	L	✓ Provide employees with gloves ✓ Provide SDS for the oil used
Cutting and drilling	✓ Drilling ✓ Drill bit ✓ Drill sharp metal fibres ✓ High Noise Levels ✓ Cutting Grinder/Disc ✓	✓ Vibration ✓ Cutting edges ✓ Eye penetration ✓ Finger cuts ✓ Expose to high noise level area ✓ Uncontrolled disc ✓ Electrical equipment failure ✓ Sharp edges	✓ Damaged hearing ✓ Carpal tunnel syndrome ✓ Cuts/ injuries ✓ Eye irritation / blindness ✓ Injuries ✓ Eye injuries	M	✓ Use hearing protection when exposed to excessive noise levels (greater than 85 dB over an 8-hour work period) ✓ Assess noise level with sound level meter if possibility exists that level may exceed 85dB. ✓ Rotate drilling tasks to minimize worker exposure to equipment vibration. ✓ Use right size of a drill to drill different layers of the ground ✓ Assess manual guide carefully to ensure correct usage of portable electrical devices.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wykstrust Pump Station

ACTIVITY: MECHANICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Welding equipment	✓ Poor maintenance ✓	Injuries	M	✓ Welding equipment is visually checked before each use;
	✓ Welding	✓ Sparks	Fire	H	✓ Welding screens to be used
	✓ Welding	✓ Sparks	Burns	L	✓ Fire resistant overalls and apron to be worn. ✓ Develop method statement for welding inside the pipe
	✓ Welding	✓ Glare	Arc eyes	M	✓ Welding glasses to be used
	✓ Confined space	✓ Entrapment ✓ Inability to move	✓ Injuries Suffocation	H	✓ Develop method statement for welding inside the pipe. ✓ Ensure that the welder is able to fit in properly inside the pipe and move with ease ✓ Use a different method of welding where the pipe's internal diameter is less than 800mm.
Installation of fire systems and servicing of ventilation units	✓ Heights ✓ Unfit employees ✓ Using hand tools ✓ Unsecured tools and equipment	✓ Falls ✓ Equipment falling onto employees	✓ Injuries	M	✓ Employees to use proper PPE including safety harnesses when working at heights. ✓ Inspect all tools prior to use. ✓ Provide training for using safety harnesses correctly. ✓ Employees working at heights must be certified fit to work. ✓ Hand tools must be attached to lanyards when working at heights. ✓ Use tool bags

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	PROJECT NUMBER:	JW 14466R
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	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: MECHANICAL WORKS					
Task	Hazard	Risk	Consequence	Rating	Controls
					✓ Use netting system below each level. ✓ No work should be done on the ground when work at heights is in progress. ✓ Proper signage to be displayed.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: WORKING NEAR A WETLAND

Task	Hazard	Risk	Consequence	Rating	Controls
Working near a stream	✓ Water	✓ Drowning	✓ Fatality	H	✓ Provide employees with life jackets where activities will take place in close proximity to the stream / wetland ✓ Barricade the area ✓ Develop a method statement and a risk assessment for working near a stream
	✓ Snakes	✓ Bites ✓ Poisoning	✓ Fatalities	H	✓ Inspect the area before and while working ✓ Look around the surroundings for snakes ✓ Train employees in snake awareness ✓ Provide employees with lashers



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: PIPELINE REPLACEMENT / REPAIRS

Task	Hazard	Risk	Consequence	Rating	Controls
Excavation	✓ Deep excavations	✓ Collapse ✓ Falling ✓ Unsafe entry and exit	✓ Injuries	M	✓ Shoring / bracing / sloping of the excavation if deeper than 1.5m ✓ No unauthorised entry into the project site. ✓ Fencing off of the excavation and prompt supervision of the area. ✓ Full time security on site to monitor entry and exit. ✓ Safe method of entry and exit to be provided for employees ✓ Spoil material to be stored at least 2m away from the excavation. ✓ Signage to be displayed indicating deep excavations
Pipe laying	✓ Exposed hands	✓ Rough edges ✓ Heavy pipe ✓ Hit by pipe	✓ Injuries	M	✓ Provide gloves to employees ✓ Heavy pipes to be lifted mechanically
	✓ Raw sewer	✓ Skin contact ✓ Ingestion ✓ Splashing into eyes	✓ Waterborne diseases	H	✓ Provide employees with proper PPE, and ensure that the mouth, nose and eyes are covered. ✓ Vaccinate employees and ensure that they are medically fit to work in confined spaces.
	✓ Live sewer	✓ Drowning	✓ Fatalities	E	✓ Sewer over-pumping ✓ Ensure that the line is isolated and there is no flow of sewer in the line.

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wykrust Pump Station

ACTIVITY: PIPELINE REPLACEMENT / REPAIRS					
Task	Hazard	Risk	Consequence	Rating	Controls
					✓ Ensure that several manholes are opened at a time to ensure that there is sufficient exits. ✓ Ensure that there is a trained first aider competent in resuscitation, and there is equipment for rescuing employees in cases of emergencies. ✓ Diversion of the line while working
Backfilling	✓ Soil	✓ Entrapment	✓ Serious injuries	M	✓ Backfilling to be done by mechanical means where excavations are deep ✓ No unauthorized entry ✓ The correct types of backfilling material to be used for backfilling
	✓ Unstable ground	✓ Excavation collapse	✓ Serious injuries ✓ Fatalities	H	✓ Ensure that backfilling is done according to relevant standards. ✓ Ensure that the area is well barricaded. ✓ Compaction tests to be done ✓ Put relevant signage ✓ No unauthorized entry to the construction site
Compacting	✓ Compactor ✓ Noise ✓ Dust ✓ Vibration	✓ Overexposure to noise and vibration ✓ Collapsing excavation wall ✓ Inhalation of dust	✓ Noise induced hearing loss ✓ Raynaud's Syndrome ✓ Injuries ✓ Respiratory problems	M	✓ Use of earmuffs by compactor operator ✓ Dust mask to be worn by compactor operator ✓ Compactor operator to be declared competent before using the machine ✓ Provide operator with anti-vibration gloves and provide rest periods in between.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: JETTING THE LINE

Task	Hazard	Risk	Consequence	Rating	Controls
Jetting	✓ Pressurized water ✓ Pipe moving uncontrollably	✓ Hitting employees ✓ Burst	✓ Injuries	M	✓ Develop a method statement ✓ Inspect the jetting truck prior to operation ✓ Clear the area while jetting is performed ✓ The operators of High-Pressure jetting systems must be trained to use the equipment that they will operate ✓ Don't exceed pipe operating pressure, ensure pipe is correct diameter and is not damaged. ✓ Hoses should be tested when they have been repaired, or when they have been re-ended. ✓ Hoses must be visually inspected at regular intervals defined by the Operational Unit, not exceeding 6 months. This requirement must be integrated into an operational procedure (and included in operators training). ✓ Employees must be provided with proper PPE ✓ Work activities should be planned to provide safe access to the equipment and item or surface being jetted. ✓ Overhead work should be avoided where possible, as this may cause unstable worker positioning and increase the risk of musculoskeletal disorders.

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: JETTING THE LINE					
Task	Hazard	Risk	Consequence	Rating	Controls
					✓ Operators using manually operated jetting systems should be in a safe and well-balanced position before starting jetting operations. ✓ Jetting operations should not be performed from ladders or other surfaces not intended for use by workers, as this can lead to loss of control of the jetting equipment. ✓ Operators should check there is no interruption or interference to the release mechanism of any hand or foot controls that could stop the equipment operating safely and consistent with the manufacturer's specifications. ✓ Jetting systems should be depressurised and secured when: not in use and left unattended, and components are being replaced or repairs are being made to the system.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
Scaffold work	Improper erection	✓ Collapse ✓ Falling of employees and equipment	✓ Property damages ✓ Fatalities	H	✓ Only a competent scaffold erector may erect a scaffold. ✓ Scaffold to be erected on firm, stable base ✓ Check the stability of the scaffold prior to allowing employees to climb on them. ✓ Mobile scaffolds must have their wheels locked before any person is allowed to climb on them. ✓ All parts of the work platform and scaffold must have safe means of access ✓ Unattended or incomplete scaffold should be prevented against unauthorized access. ✓ Suitable access ladder must be provided ✓ A fall arrest harness must be worn. ✓ Never use worn out fall arrest equipment. ✓ Suitable equipment for rescue must be available ✓ Proper bracing of the scaffold ✓ Scaffold to be securely tied to a structure
	Overloading	✓ Collapse	✓ Property damage ✓ Fatalities	H	✓ Display the safe working load of the scaffold ✓ Never exceed the SWL of the scaffold

OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
		✓ Falling of employees and equipment			
	Overhead lines	✓ Contact with overhead lines ✓ Contact with employees	✓ Property damages ✓ Electrocutation	H	✓ Erect the scaffold away from power lines ✓ Keep tools away from overhead lines ✓ Fall arrest equipment to be attached
	Unstable ground conditions	✓ Collapsing of scaffold	✓ Injuries ✓ Property damage	H	✓ Ensure that the foundation / footing of the scaffold is stable and levelled ✓ Only trained and competent persons may erect a scaffold
	Non-compliant scaffolding	✓ Collapsing of scaffold	✓ Injuries ✓ Property damage	H	✓ All platforms to be fully boarded and boards used to comply with SANS 085 ✓ All components of the scaffold must comply with SANS 085
Work platform	Inadequate space	✓ Falling persons and objects	✓ Fatalities ✓ Property damages	H	✓ Work platform should be at least 1m wide and capable of carrying the load that the type of work carried out may require ✓ To prevent persons from falling from the outside edges of work platforms, guardrails and mid-rails must be fitted. ✓ If loose objects or other materials may be present on the platform, edge protection/ toe boards must be provided on work platforms.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
Edge protection	Working close to edges	✓ Falling	✓ Fatalities	H	✓ To prevent persons from falling, edge protection must be erected around the perimeter of the work. This must comprise the guardrail and mid-rail designed to withstand any reasonable force, which is expected to fall against it. ✓ Only a competent person may erect an edge protection system ✓ Edge protection can be in the form of hook on boards used as toe boards
Working at heights	✓ Heights ✓ Unfit employees ✓ Using hand tools ✓ Unsecured tools and equipment	✓ Falls ✓ Falling onto employees	✓ Injuries	M	✓ Employees to use proper PPE including safety harnesses when working at heights. ✓ Inspect all tools prior to use. ✓ Provide training for using safety harnesses correctly. ✓ Employees working at heights must be certified fit to work. ✓ Hand tools must be attached to lanyards when working at heights. ✓ Use tool bags ✓ Use netting system below each level. ✓ No work should be done on the ground when work at heights is in progress. ✓ Proper signage to be displayed.



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: GENERAL ACTIVITIES ON SITE

Task	Hazard	Risk	Consequence	Rating	Controls
✓ Working on site	✓ Unhappy community	✓ Community coming to survey site ✓ Violence against employees	✓ Property damages ✓ Serious injuries	H	✓ Develop an emergency response procedure ✓ Meet with the community and all stakeholders prior to commencement of the project ✓ Have the contact details of the nearest police station / JMPD offices
	✓ Unfavourable weather conditions	✓ Exposure to temperature extremes	✓ Heat exhaustion ✓ Frost bite	M	✓ Provide employees with water for cooling down. ✓ Provide employees with warm jackets and gloves during winter ✓ Provide 5-minute rest periods for every 30 minutes of exposure to temperature extremes. ✓ No work to be undertaken in rainy conditions
	✓ Housekeeping	✓ Trips and falls	✓ Injuries	M	✓ Ensure that proper housekeeping is maintained on site at all times.
✓ Working near open spaces	✓ Snakes	✓ Bites ✓ Poisoning	✓ Fatalities ✓ Serious injuries	H	✓ Inspect the area for snakes prior to entering ✓ Conduct snake awareness training ✓ Know the do's and don'ts of what to do when coming across snakes
	✓ Bees	✓ Bites	✓ Allergic reaction	M	✓ Inspect the area for bees / wasps prior to entering ✓ Conduct bees awareness training ✓ Know the do's and don'ts of what to do when coming across bees



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14466R
PROJECT LOCATION:	Olifantsvlei WWTW
PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: GENERAL ACTIVITIES ON SITE

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Sharp objects	✓ Getting pricked by sharp objects	✓ Tetanus ✓ Injuries	M	✓ All employees to get Tetanus vaccination. ✓ Provide employees with proper safety boots
	✓ Criminals	✓ Getting mugged	✓ Loss of personal possession	M	✓ Personal belongings such as phones and car keys to be safely put in pockets while working. ✓ Employees to report any suspicious activities to the local police. ✓ Equipment to be safely stored while not in use
	✓ Criminals	✓ Employees being attacked	✓ Injuries ✓ Fatalities	H	✓ Ensure that employees do not work in isolation. ✓ Employees to report any suspicious activities to the local police. ✓ Develop an emergency response procedure
✓ Working on site	✓ Open excavations (other works)	✓ Falling inside	✓ Injuries	M	✓ Employees to be vigilant while working on site
	✓ Water bodies / channels	✓ Falling inside	✓ Serious injuries ✓ Fatalities	H	✓ Employees to be vigilant while working on site ✓ Emergency procedures to be developed
	✓ Rotating equipment	✓ Entrapment ✓ Getting caught by	✓ Serious injuries ✓ Fatalities	H	✓ Ensure that machinery is isolated or locked out while working on it.
	✓ Wastewater	✓ Skin contact ✓ Ingestion	✓ Waterborne diseases	H	✓ Provide employees with proper PPE, and ensure that the mouth, nose and eyes are covered.

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: GENERAL ACTIVITIES ON SITE					
Task	Hazard	Risk	Consequence	Rating	Controls
		✓ Splashing into eyes			✓ Vaccinate employees and ensure that they are medically fit to work in confined spaces.
Working near roads inside the Works	✓ Moving vehicles and pedestrians ✓ Speeding ✓ No signage ✓ Improperly placed signage	✓ Road accidents ✓ People getting knocked down by cars	✓ Fatalities ✓ Serious injuries ✓ Property damages	M	✓ Adhere to traffic management procedures ✓ Ensure good communication between flagmen ✓ Obey speed limits ✓ Display correct road signage ✓ Employees should wear reflective PPE . ✓ Keep area clean & clear of obstacles.
Using hand tools and portable equipment	✓ Improper placing ✓ Unstable footing	✓ Falling on employees	✓ Injuries	L	✓ Provide employees with proper safety shoes. ✓ Ensure that the equipment is properly placed and balanced
Use of hand tools	✓ Repetitive movements	✓ Improper bending	✓ Back pains	L	✓ Training in correct posture during shovelling
	✓ Distance between employees	✓ Hitting each other with tools	✓ Injuries	M	✓ Ensure safe distance between employees
	✓ Damaged hand tools	✓ Contact with skin	✓ Injuries	L	✓ Inspect tools prior to use ✓ Provide employees with gloves
	✓ Loss of grip of tools	✓ Hitting other employees	✓ Injuries	M	✓ Train employees on the use of tools ✓ Provide gloves
General activities on site	✓ New employees / untrained employees	✓ Workers not informed of hazards and risks	✓ Injuries	H	✓ Site specific Induction training to be conducted on all personnel prior to commencing work.

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
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	PROJECT DESCR:	Renewal of Van Wyksrust Pump Station

ACTIVITY: GENERAL ACTIVITIES ON SITE					
Task	Hazard	Risk	Consequence	Rating	Controls
		associated with tasks			
	✓	✓ Workers exposed to unknown / unidentified hazards	✓		✓ Appointed Risk Assessor to be in possession of a HIRA certificate (Hazard Identification and Risk Assessment). ✓ Task specific risk assessments to be carried out. ✓ Employees to be trained in the content of the risk assessments. ✓ Attendance registers to be in place
	✓ Community members and passersby	✓ Unauthorised entry	✓ Injuries	M	✓ Camp area to be fenced off to prevent unauthorised entry. ✓ Unauthorised entry and general warning signs to be displayed. ✓ Security guard to patrol the site.

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT	
	PROJECT NUMBER:	JW 14466R
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RISK ASSESSMENT MATRIX

Likelihood	Consequences				
	Insignificant (minor problem easily handled by normal day to day processes)	Minor (Some disruption possible e.g., damage equal to R150k)	Moderate (significant time / resources required. E.g., damage equal to R500k)	Major (Operations severely damaged. E.g., damages equal to R1m)	Catastrophic (business survival is at risk. Damage equal to R5m – 10m)
Almost certain (90% chance)	High	High	Extreme	Extreme	Extreme
Likely (between 50-90%)	Moderate	High	High	Extreme	Extreme
Moderate (between 10-50%)	Low	Moderate	High	Extreme	Extreme
Unlikely (between 3-10%)	Low	Low	Moderate	High	Extreme
Rare (<3%)	Low	Low	Moderate	High	High

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION	
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ANNEXURE 2:

MEDICAL SCREENING POLICY

JOHANNESBURG WATER (SOC) LTD

MEDICAL SCREENING POLICY

**JW 14466R: OLIFANTSVLEI WASTEWATER TREATMENT
WORKS INFRASTRUCTURE RENEWAL PLAN
REFURBISHMENT OF VAN WYKSRUST PUMP STATION**

NOTICE

It is the Contractor's responsibility to ensure that medical surveillance requirements specified in the Occupational Health and Safety Act (85/1993) and Regulations and any other applicable legal and Johannesburg Water's requirements are fully complied with.

This document is meant to facilitate the Contractor's compliance to applicable requirements and does not replace the applicable legal requirements.

This document may be revised at any time to include applicable legal requirements not currently included that may come to the attention of Johannesburg Water in future. The Contractor will accordingly be responsible to comply with the revised requirements as might be necessary.

Where methods to ensure legal compliance have been specified in this document, Contractors may submit alternative detailed method statements for consideration and approval by Johannesburg Water. Johannesburg Water may, at its sole discretion, reject or accept such alternative methods.

1 PURPOSE OF THE MEDICAL SURVEILLANCE REQUIREMENTS PROCEDURE

The purpose of this Medical Surveillance Requirements Procedure is to facilitate the achievement of legal compliance relating to medical surveillance by all Consultants, Contractors, Subcontractors and suppliers that will be working on the Johannesburg Water project and to ensure that employees are fit to work in the roles that they have been employed to execute and remain so for their duration on the project site.

This document represents the minimum requirements for medical surveillance and does not replace applicable legal requirements.

2 MEDICAL SURVEILLANCE OBJECTIVES

The Johannesburg Water main objectives for medical surveillance are:

- a) To ensure compliance with all applicable medical surveillance legal requirements.
- b) To ensure compliance with all Johannesburg Water's requirements regarding medical surveillance.
- c) To ensure that employees are fit to execute the work for which they have been employed.
- d) To prevent employees from acquiring occupational diseases or illnesses.
- e) To ensure early detection and treatment of occupational diseases and to prevent the aggravation of existing medical conditions.
- f) To ensure that employees on departure from the project have not contracted any occupational diseases and to enable any such condition that arises to be suitably addressed.

All contractors are required to demonstrate total commitment towards the achievement of these objectives.

3 GENERAL REQUIREMENTS

- 3.1 The Principal Contractor shall ensure that a medical surveillance programme is implemented for all employees.
- 3.2** An initial health evaluation shall be carried out by an occupational health practitioner immediately after a person commences employment, where any exposure exists or may exist, which comprises:
- an evaluation of the employees medical and occupational history;
 - a physical examination; and
 - any other essential examination which in the opinion of the occupational health practitioner is desirable in order to enable the practitioner to do a proper evaluation.
- 3.3 Medical surveillance & Immunization shall be done accredited institutions or occupational health doctor, including, but not limited to:
- a) Audiograms.
 - b) A cardio-respiratory examination, including full size chest x-rays (If lung function tests are abnormal)
 - c) Lung function tests.
 - d) Eye/ sight tests.
 - e) A general physical examination.
 - f) A review of previous medical history.
 - g) Blood pressure tests
 - h) Glucose tests

Copies of all medical certificates shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent to prior to site establishment and before an employee is allowed to come onto site.

Specific attention shall be given to the physical and psychological fitness of people who will be required to work in elevated positions and operators of mobile machinery.

An exit medical certificate shall be obtained for all workers at the end of the contract and for all workers who leave the employment of the Contractor before the end of the Project. Copies of all

exit medical certificates shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent.

Medical surveillance shall address all occupational health risks to which the employee is exposed, identified through the risk assessment referred to in section 4 below.

Retention monies will be withheld if the exit medical is not complete for all employees.

The cost of all medical examinations will be borne by the Contractor as provision is made on the bill of quantities.

4 OCCUPATIONAL HEALTH RISK ASSESSMENT

4.1 The Contractor shall conduct an occupational health risk assessment prior to site establishment.

4.2 The Contractor shall ensure that, as far as is reasonably practicable, ergonomic related hazards are analyzed, evaluated and addressed in the risk assessment.

4.3 The methodology used by the contractor to assess occupational health risks associated with their activities shall be submitted to Johannesburg Water for approval by the Johannesburg Water Project Specialist or Appointed OHS Agent prior to site establishment. The methodology should take the following into consideration, among others:

- a) Legal requirements.
- b) Normal activities undertaken by the contractor.
- c) Abnormal situations (e.g. unanticipated breakdown of equipment etc).
- d) Emergency situations (e.g. fires, exposure to chemicals).
- e) Changes in work procedures and methods.
- f) Previous experience.

4.4 A risk register that will include the following shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent before site establishment.

a) All occupational health risks identified during the occupational health risk assessment.

~~b) A list of the occupational health risks that have been identified as being significant.~~

- c) Reference to the method statements, measures or procedures that will be followed to either eliminate or reduce the significant risks to tolerable levels.

4.5 The Contractor shall, in writing, clearly explain how each occupational health risk assessed to be significant will be addressed to eliminate or reduce it to a tolerable level and submit it for approval by the Johannesburg Water Project Specialist or Appointed OHS Agent before site establishment. This may be through method statements or written operational control procedures. Associated responsibilities and authorities shall be clearly defined. All method statements shall reflect at least:

- a) When the activities relating to the method statement will be conducted (timing).
- b) Materials to be used.
- c) Equipment and staffing requirements.
- d) The proposed construction procedure designed to implement the relevant requirements.
- e) The system to be implemented to ensure compliance with the method statement.
- f) Any other information deemed to be necessary by the Johannesburg Water Project Specialist or Appointed OHS Agent and/or the contractor's responsible person.

4.6 For significant occupational health risks identified after site establishment, method statements shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent at least 10 working days before the start of the associated activity, when possible.

4.7 All changes to approved method statements or procedures shall be approved in writing by the Johannesburg Water Project Specialist or Appointed OHS Agent.

4.8 The contractor's Responsible Person shall retain records of any amendments and shall ensure that only the most current approved version of any method statement or procedure is used.

4.9 Every occupational health risk that is identified during the risk assessment process shall be conveyed to every employee whose work is associated with the risk. This may be done in the form of a toolbox talk but does not replace the toolbox talk entirely. Each employee shall sign to confirm an understanding of the occupational health risks in the tasks.

-
- 4.10 Occupational health risk assessments may be combined with safety and environmental risk assessments, but the consideration of occupational health issues shall be clearly reflected in the records generated and maintained.
- 4.11 The occupational health risk assessment process and effective implementation of measures to eliminate or reduce identified risks is the responsibility of the Contractor. Johannesburg Water will closely monitor the effectiveness of implemented measures.

Acknowledgement of JW Medical Screening Policy

Name of Contractor

I, the undersigned, hereby acknowledge that I have obtained copies of JW Medical Screening Policy and confirm that I fully understand them and the consequences of non-compliance.

Signed at on this Day of 20.....

Signature of Contractor / Mandatory

Date

Signature of 16.2 / Construction Manager

Date

Witness 1

Witness 2

	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION	
	PROJECT NUMBER:	JW14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump station

ANNEXURE 3:

SIGN OFF FORM

OHS CONTRACTORS' MANAGEMENT SYSTEM

TENDER DOCUMENT SHE SPECS SIGN-OFF FORM



REQUESTED BY

Mammoko Mohloki

DATE _____

02-02-2026

JW 14466R

**JW 14466R: OLIFANTSVLEI WASTEWATER TREATMENT WORKS
INFRASTRUCTURE RENEWAL PLAN
REFURBISHMENT OF VAN WYKS Rust PUMP STATION**

LIST OF SHE SYSTEM ATTACHED TO THE TENDER DOCUMENT

SHE SYSTEM ATTACHED	Y/N	VERSION	NO PAGES	REMARKS
Volume 2 OHS Specification & Acknowledgement Form	Y	V2 – 09/16	58	For info
Baseline Risk Assessment	Y	V01 – 05/15	41	For info
Medical Screening Policy	Y	V01 – 05/15	8	For info
Returnable Annexure A	Y	V02 - 02/20	1	Return with tender document



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION

PROJECT NUMBER:	JW14466R
PROJECT LOCATION:	Olifantsvlei WWTW
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ANNEXURE 4: ENVIRONMENTAL MANAGEMENT PROGRAMME



NTC Environmental

**THE PROPOSED OLIFANTSVLEI WASTEWATER TREATMENT WORKS INFRASTRUCTURE
RENEWAL PROJECT IN THE CITY OF JOHANNESBURG IN GAUTENG PROVINCE.**

ENVIRONMENTAL MANAGEMENT PROGRAMME

October 2024

GDARDE REF NO.:



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ABBREVIATIONS and TERMS

BAR	Basic Assessment Report
BPEO	Best Practicable Environmental Option
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMS	Environmental Management Service
GDARDE	Gauteng Department of Agriculture, Rural Development and Environment
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
IAP	Interested and Affected Party
km	Kilometre
m ³	Cubic Metre
ML	Mega Litre
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management: Biodiversity Act
NEM: WA	National Environmental Management: Waste Act
NWA	National Water Act
OHS	Occupational Health and Safety
PHRAG	Provincial Heritage Resource Authority of Gauteng
SAHRA	South African Heritage Resources Agency

DEFINITIONS

Term	Meaning
Affected environment	Those parts of the socio-economic and biophysical environment impacted on by the development
Alternatives	A possible course of action, in place of other, that would meet the same purpose and need. A possible course of action, in place of other, that would meet the same purpose and need. In terms of the 2017 EIA Regulations, alternatives refer to the different means of meeting the general purpose and requirements of the activity, which may include alternatives to: • property or location where the activity is proposed to be undertaken. • type of activity to be undertaken. • design or layout of the activity. • technology to be used in the activity; or • operational aspects of the activity. And includes the option of not implementing the activity.
Archaeological	The National Heritage Resources Act means: material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures. rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency, and which is older than 100 years, including any area within 10m of such representation. wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; and • features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found;

Auditing	A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems
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.
Cultural Significance	Aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance
Cumulative Impact	An action that itself is not significant but is significant when added to the impact of other similar actions. In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.
Development	The act of altering or modifying resources to produce potential benefits. The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Disposal (waste)	Burial, deposit, discharge, abandoning dumping, placing or release of any waste into, or onto, any land.
Diversion	A channel made to divert the flow of water from one course to another or to direct the flow of water draining from a piece of ground
EMS representative	Shall mean the Environmental management section (EMS) manager, his / her representative or environmental control officer (ECO).

	Means the surroundings within which humans exist and that are made up of: • Micro - organisms, plant and animal life. • The land, water, and atmosphere of the earth. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well - being.
Environmental Impact	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
Environmental Impact Assessment-(EIA)	Refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures
Environmental Management Program report (EMPr)	A system which provides a structured process for continual improvement, and which enables an organization to achieve and systematically control the level of environmental performance that it sets itself. In general, this is based on a dynamic cyclical process of "plan, implement, check and review ". The EMPr aims at • Minimizing impacts by limiting aspects of an action. • Minimizing impacts by optimizing processes, structural elements and other design features. • Avoiding impacts by not performing certain actions. • Compensating for impacts by providing substitute resources or environments Any part or combination of the above and the inter - relationships among and between them.
Environmental Resources	Goods, services or environmental conditions that have the potential to enhance social well - being".
Impacts	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space. The outcome of an action, whether considered desirable or undesirable".

Interested and Affected Parties (I&APs)	Individuals and groups directly or indirectly affected by the proposed project. These include the authorities, local communities, investors, workforce, customers and consumers, environmental interested groups, and the public.
Fence	A physical barrier in the form of posts and barbed wire and / or “Silex” or any other concrete construction, (“palisade”- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts
Object	The National Heritage Resources Act states any movable property of cultural significance which may be protected in terms of any provisions of this Act, including— • any archaeological artefact. • palaeontological and rare geological specimens. • meteorites; and other objects referred to in section 3.
Palaeontological	The National Heritage Resources Act states any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance
Place	The National Heritage Resources Act includes— • a site, area or region. a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure. a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures. • an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place;

Plan	A purposeful, forward - looking strategy or design often with coordinated priorities, options and measures that elaborates and implement policy
Policy	A general course of action or proposed overall direction that is being pursued and which guides ongoing decision - making.
Pollution	Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity where there is an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future. Furthermore, pollution can also be regarded as an undesirable state of the natural environment being contaminated with harmful substances because of human activities.
Pre- cautionary Principle	"This involves applying a risk -averse and cautious approach that recognises the limits of current knowledge about the environmental consequences of decision making or action."
Programme	"A coherent, organised agenda or schedule of commitments, proposal instruments and activities that elaborate and implement policy ". • Provide ongoing monitoring and management of environmental impacts of a development and documenting of any digressions / good performances. • Rectifying impacts through rehabilitation, restoration, etc. of the affected environment. The EMPr is a legally binding document that all parties involved in the project must be aware of.
Rehabilitation-	Is defined as the return of a disturbed area to a state which approximates the state, as far as possible, which it was before disruption. Rehabilitation should aim to accelerate the natural succession processes so that the plant community develops in the desired way.
Reinstatement	Is defined as the initial soil works that replaces soil levels back to the original state as far as possible. It may include an initial light temporary grassing.
Registered Interested and Affected Part:	In relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42 of the 2017 EIA Regulations.

Significant Impact	An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.
Specialist	A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.
Waste	The National Environmental Management Waste Act definition of waste is— any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste— once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered. • where approval is not required, once a waste is, or has been re-used, recycled or recovered. where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste. <u>General Waste under NEM: WA Schedule 3 means:</u> <i>“general waste” means waste that does not pose an immediate hazard or threat to health or to the environment, and includes—</i> • <i>domestic waste.</i> • <i>building and demolition waste.</i> • <i>business waste.</i> • <i>inert waste; or</i> <i>any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes</i> <u>Hazardous Waste under NEM: WA Schedule 3 means:</u>

	<i>any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.</i>
Water course	A water course as defined in the National Water Act means: • A river or spring • A natural channel in which water flows regularly or intermittently • A wetland, lake or dam in which or from which, water flows; and • Any collection of water which the minister may, by notice in the Gazette, declare to be a water course, and a reference to a watercourse includes, where relevant, its bed and banks. <i>The National Environmental Management Act further add that wetlands as defined below fall within the “water course” definition.</i>
Wetlands	Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in a saturated soil.

1. CONTEXT AND INSTITUTIONAL MATTERS

1.1. Introduction

Johannesburg Water SOC LTD (JW) is proposing implementation of the Infrastructure Renewal Plan (IRP) at the Olifantsvlei Wastewater Treatment Works (WWTW). Recognizing that essential equipment and infrastructure have reached their end of service life, the project focuses on repairing and replacing key components, specifically addressing critical issues such as vandalism at the Van Wykrust pump station. The project area is situated in Region G of the City of Johannesburg Metropolitan Municipality, Gauteng Province.

The project scope includes the following activities:

- Replacement of existing screens and compactor at Van Wykrust pump station
- Replacement of the Van Wykrust pump station pump set
- Replacement of medium voltage (MV) cables and switchgear
- Repairs to the existing Van Wykrust rising main/s
- Repairs to the existing building structure
- Security measures upgrade
- Additional of mechanical screens
- Reinstatement and expansion of the screening's facility
- General civil services (terracing, finishing, stormwater, etc)
- Investigations for Contract 2 design input
- Upgrade of the MV Reticulation
- Network and Communication System
- New concrete bypass facility.
- Construction of a precast concrete manhole.
- Construction of a new subsoil drainage system (Including an approximately 7 m deep drain)

1.2. Project Locality

The proposed project falls under the jurisdiction of the City of Johannesburg Metropolitan Municipality within the Gauteng Province. The Olifantsvlei WWTW project route can be accessed from the following roads: N12 highway and R553 Golden Highway well as various tertiary roads surrounding the area. The project area falls on the remainder of Portion 02 of farm Olifantsvlei 316 IQ and Portion 02 of farm Rietfontein 301 IQ. Figure 1 below illustrates the locality of the proposed site where the project will take place.

Province	Gauteng Province	
District Municipality	City of Johannesburg Metropolitan Municipality	
Local Municipality/ies	City of Johannesburg Metropolitan Municipality	
Ward numbers	Ward 119	
Nearest Town	Johannesburg	
Current Zoning	Settlement – Residential Area	
Current Land Use	Settlement – Residential Area	
Access Roads	The project area can be accessed via the following roads: N12 highway and R553 Golden Highway well as various tertiary roads surrounding the area.	
Affected Properties: Farm name(s), number(s), portion numbers and SG 21 Digit Code (s)	Portion 02 of farm Olifantsvlei 316 IQ	T0IQ00000000031600002
	Portion 02 of farm Rietfontein 301 IQ	T0IQ00000000030100002
Co-ordinates - Start	26°19'40.89"S	27°53'33.20"E
Middle	26°19'20.58"S	27°53'43.57"E

End	26°19'10.13"S	27°53'47.61"E
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1.3. Project Motivation

The motivation for the proposed project at the Olifantsvlei Wastewater Treatment Works (WWTW) stems from the critical need to address aging infrastructure and enhance the operational reliability of wastewater treatment processes in Johannesburg. With many components of the existing infrastructure having reached the end of their expected useful life, the Infrastructure Renewal Plan (IRP) presents a timely and necessary intervention to ensure the efficient and safe treatment of wastewater. This project not only aims to restore operational functionality but also emphasizes the importance of environmental safety and public health by preventing potential system failures that could lead to unsanitary conditions or environmental damage. By systematically replacing and refurbishing essential equipment, such as the Van Wyksrust pump station and related systems, this initiative aligns with broader municipal goals to maintain sustainable urban water management and protect local water resources.

In addition to enhancing the operational capacity of the Olifantsvlei WWTW, the project is driven by the recognition of urgent risks posed by factors such as vandalism, which has rendered some critical infrastructure, like the Van Wyksrust pump station, non-operational. The urgency of this need escalates the project's significance, as prompt action is required to prevent further service disruptions and ensure compliance with regulatory standards. By engaging comprehensive engineering consultancy services to oversee design, tender preparation, and construction supervision, the project not only ensures technical excellence but also fosters stakeholder collaboration and transparency throughout the implementation process. Overall, this initiative represents a commitment to modernizing essential public services, safeguarding the environment, and enhancing the overall resilience of Johannesburg's wastewater management systems.

1.4. Purpose of the EMPr

The purpose of the Environmental Management Programme (EMPr) is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. The EMPr provides the management measures that must be implemented by Engineers and Contractors to ensure that the potential impacts of a proposed development are minimized throughout the implementation of the construction and post-construction phases.

The use of this EMPr does not exempt the relevant activity or project from having the correct legal licenses and authorizations.

1.5. Legislative Context

This EMPr has been compiled in terms of the EIA Regulations, published in GNR 982 (as amended), which provides a framework for the content and intent of an Environmental Management Programme. The EMPr follows the rationale of the ISO 14001: Environmental Management System international standard.

1.5.1 Conditions of Environmental Authorisation

The Environmental Authorisation for the proposed Olifantsvlei infrastructure replacement and upgrade will include conditions which apply to the project applicant and contractor. The implementation of this EMPr is legally enforced by the Environmental Authorisation, if authorized by GDARDE.

1.5.2 Non-Compliance with Conditions of Environmental Authorisation

Failure to comply with the conditions of the Environmental Authorisation may result in, *inter alia*:

- The Department withdrawing the authorisation.

- The Department issuing directives to address the non-compliance (including an order to stop construction).
- The Department instituting criminal and/or civil proceedings to enforce compliance and can report the matter to the Director of Public Prosecutions.

Any person subsequently convicted of an offence is liable to:

- Pay a fine not exceeding R5 million, or
- Imprisonment for a period not exceeding ten (10) years, or
- To both pay the fine and imprisonment.



Figure 1: Locality Map

2 ROLES AND RESPONSIBILITIES

2.1 Engineer

JW are themselves the Engineer and is therefore responsible for the design of the pipelines. It will be the responsibility of the Engineer to oversee the overall implementation of the project as well as the compliance to the EMPr and incorporate any potential environmental aspects mentioned into the design.

2.2 Environmental Control Officer

The Environmental Control Officer (ECO) is the person responsible for monitoring of the implementation of the EMPr and is a JW appointment. The ECO may not be appointed by the Contractor, and will report to JW, GDARDE and the External Auditor only. The ECO have the authority to stop any works if, in their opinion, there is or may be a serious threat to or impact on the environment; caused directly by the contractor's actions or activities during the construction phase. In all such work stoppage situations the ECO is to inform the Contractor of the reasons for the stoppage within 24 hours. All ECO reports will be sent monthly to the external auditor to monitor the compliance on site.

Upon failure by the Contractor, or his employees, to show adequate consideration to the EMPr, the ECO may recommend to the Contractor to have the Contractor's representative, or any employee(s) removed from the site, or work suspended until the matter is resolved.

2.2.1 Environmental awareness training

Prior to construction all contractor teams involved in work on the project are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr. It is recommended that the briefing take the form of an on-site talk and demonstration by the ECO. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A register should be taken as proof of attendance.

2.2.2 Site Instruction Entries

The Site Instruction Book entries will be used for the recording of general site instructions as they relate to the works on site and the measures of the EMPr. It will also be used for the issuing of stop orders by the ECO for the purpose of immediately halting any activities of the Contractor or his employees *in lieu* of the environmental risk that they may pose.

2.2.3 ECO Diary Entries

The purpose of these entries will be to record the comments of the ECO as they relate to activities on the site including infringements, possible changes to the EMPr or work stop orders, daily.

2.2.4 Bi-weekly Audit Reports

The ECO will be required to complete bi-weekly audit reports with details of each infringement, indicating photographic details and position of the infringement and date and time of the finding.

The report should identify corrective measures to be taken to remediate the infringement as well as the date by which measures should be implemented. The report will be signed by the Contractors Environmental Representative (CER) as acceptance and understanding of the measures to be implemented and as an undertaking to implement these measures timeously and correctly.

2.2.5 Monthly Audit Reports

Monthly reports will be compiled by the Environmental Control Officer (ECO) for study by the external

environmental auditor and could be presented at the Site Meetings. Monthly reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor and will serve as evidence in the event of penalties being evoked.

The Monthly report should also reflect when the remedial measures have been implemented timeously and to the satisfaction of the ECO.

2.2.6 Environmental Completion Statement

An Environmental Completion Statement will be prepared by the ECO for submission to the GDARDE indicating completion of the project and compliance with the EMP conditions. This statement will be prepared after the final audit on completion of the construction and rehabilitation phase.

2.3 Environmental Liaison Officer (ELO) or Environmental Officer

The role of an Onsite Environmental Liaison Officer or Environmental Officer is vital for managing a construction project's environmental obligations. By adhering to these responsibilities, this position helps to minimize adverse environmental impacts while promoting compliance and sustainability throughout the project lifecycle.

2.3.1 Regulatory Compliance

Ensure the construction project complies with all relevant environmental laws, regulations, and permits. Maintain up-to-date knowledge of environmental policies and guidelines.

2.3.2 Environmental Management System (EMS)

Implement and monitor the Environmental Management Plan (EMP) for the project.

Conduct regular reviews and updates of the EMP to reflect any changes in project scope or regulations.

2.3.3 Monitoring and Reporting

Conduct regular site inspections and audits to monitor environmental performance.

Collect and analyse data related to air, water, soil, and noise pollution.

Prepare and submit environmental reports to management and regulatory authorities as required.

2.3.4 Environmental Training and Awareness

Provide training and orientation for site personnel on environmental procedures and issues.

Promote environmental awareness among all workers on site, including subcontractors.

2.3.5 Waste Management

Oversee waste disposal and recycling processes to ensure proper handling of hazardous and non-hazardous materials.

Maintain records of waste generated and disposed of in accordance with regulations.

2.3.6 Incident Management

Respond to environmental incidents or non-compliance issues on site.

Investigate incidents, document findings, and recommend corrective actions to prevent recurrence.

2.3.7 Biodiversity and Habitat Protection:

Identify and protect environmentally sensitive areas on and around the construction site.

Implement measures to minimize the impact on local wildlife and plants.

2.3.8 Dust and Erosion Control

Monitor dust generation and implement dust suppression measures and control soil erosion and sediment runoff from the site.

2.3.9 Public Interaction

Serve as a point of contact for community members or stakeholders regarding environmental concerns.

Address public inquiries about the project's environmental impact and mitigation measures.

2.3.10 Collaboration

Work closely with project managers, engineers, and health and safety officers to integrate environmental considerations into project planning and execution.

Collaborate with external consultants or regulatory agencies when necessary.

2.3.11 Documentation and Record-Keeping

Maintain accurate records of environmental assessments, compliance checks, training sessions, and incident reports.

Ensure all documentation is organized and accessible for audits and inspections.

2.3.12 Continuous Improvement

Identify opportunities for enhancing environmental performance and sustainability practices on the project.

Participate in initiatives promoting innovative environmental solutions and technologies.

2.4 Contractor

The Contractor will be responsible for the overall implementation of the EMP. The Contractor will nominate a representative on site as his environmental representative, known as the Contractor's Environmental Representative (CER). The Contractor and/or JW Site Manager must issue site instructions to rectify any environmental non-compliance, based on the CER's and/or ECO's findings.

2.4.1 Site Meetings

Regular site meetings will be held between the Contractor, Site Manager, ECO and JW. The purposes of the meetings shall be:

- To establish the suitability of the Contractor's methods and machinery to lower the environmental, social and health risk involved.
- To discuss non-conformance to environmental legislation / policies of the EMP.
- To assess the general state of the environment on site and discuss any environmental problems which may have arisen.
- To act as a forum for input into the construction works by the ECO and external environmental auditor; and
- To accommodate all stakeholders in the decision – making process regarding social and environmental issues.

2.4.2 Method Statements

A method statement describes the scope of the intended work in a step – by – step description for the ECO to understand the Contractor's intentions. It enables the ECO to assist in devising mitigation measures to be implemented, which would minimise environmental impacts during these tasks as well as act as a measure against which the contractor's performance could be measured. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format should clearly indicate the following:

- **What** - a concise, description of the task / work to be undertaken.
- **How** - a detailed description of the process of work, methods, materials and mitigation strategies.
- **Where** - a description / sketch map of the locality of work (if applicable); and
- **When** - the sequencing of actions with due commencement dates and completion date estimates.

A method statement forms the baseline information on which work in sensitive areas occurs and thus is considered a “live” document in that modifications can be negotiated between the Contractor and the ECO if or as required. The Contractor must submit the method statement 14 days before any activities are due to start. The method statements must be included in the rehabilitation of the footprint area.

Work may not commence until the method statement has been accepted by the ECO and clearly communicated to the Contractor’s employees.

All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

2.4.3 Complaints register

The Contractor shall assist the Engineer with responding to queries and complaints from the public regarding the construction activities by documenting the details of such communications and submitting the information to the Engineer for inclusion in the complaints register; bring any such matters to the attention of the Engineer immediately when they arise as well as taking any remedial action as per the Engineers instruction.

2.4.4 Contractor Environmental Representative

The CER will be responsible, on behalf of the contractor, to ensure that the EMPr is implemented on site daily. The CER will liaise with the ECO in all matters relating to the implementation of the EMPr. The CER need not be qualified in the environmental field.

2.4.5 Communication Procedures on site

Copies of all documentation described in the EMPr must be maintained on site and made available to the Site Manager, ECO, stakeholders or the authorities for inspection as requested. The minutes of the monthly progress meetings must reflect all environmental queries, agreed actions and dates of eventual compliance. These minutes will form part of the official record.

2.4.6 Record Keeping

A photographic record must be taken of the site prior to, during and immediately after construction activities and rehabilitation as visual reference. These photographs should be stored with related documents and other records related to this EMPr.

2.5 External Auditor

JW must appoint an external auditor to conduct quarterly audits or three audits at the beginning, middle and end of the project to ensure compliance of the EMPr on site. These audit reports will be maintained on site with the ECO diary and should be submitted to the GDARD: Environmental Compliance Section.

2.6 Organisational and Institutional Arrangements

Any changes to the EMPr or conditional requirements of the Environmental Authorisation must be communicated to GDARDE within one week (five working days). A provisional reporting and

communications structure is indicated in **Figure 2** below.

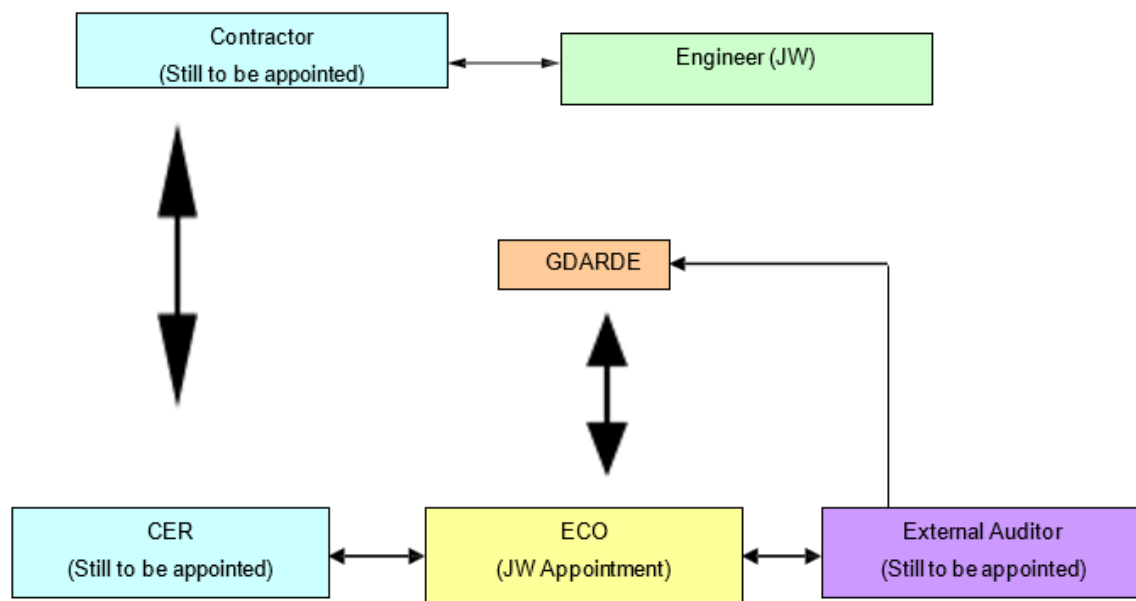


Figure 2: Proposed Organisational Structure

2.7 Monitoring and Auditing Framework

2.7.1 Monitoring Programme

The purpose of the monitoring programme is to ensure that mitigation measures identified and described in the EMPr are implemented. Construction activities will be monitored and recorded by the ECO and audited against the EMPr every second week except for sewer pipeline replacement and upgrade where monitoring will occur daily. A report must be submitted at the end of each month prior to the progress meetings where they will form part of the agenda. The ultimate target is to achieve 100% compliance with the EMPr.

2.7.2 Penalties

The Contractor will comply with the environmental management requirements of this EMPr on an on-going basis. Any failure on their part to do so will entitle the Project Manager (PM), in consultation with the ECO, to certify the imposition of a fine. The value of the fine will be agreed between the PM and ECO based on the nature, extent and duration of the offence and subsequent environmental damage. Such penalties shall be payable in addition to any remediation costs for correction of environmental damage because of non-compliance to this EMPr. Time penalties may also be awarded by the contracts manager where the contractors do not comply. These details are to be included into the contracts.

Note that the following is applicable:

- In terms of the Conventional Penalties Act (1962) a creditor is not entitled to recover both the penalty and damages,
- Accordingly, where a Contractor causes damage, JW can either enforce a penalty or make the

Contractor make good the damage, but not both.

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

- Within the boundaries of the site, site extensions and access roads there is evidence of contravention of the requirements of the EMPr.
- Environmental damage ensues due to negligence.
- The Contractor fails to comply with corrective or other instructions issued within a specific time.
- The contractor fails to comply with a site instruction given from the Engineer based on the ECO report.
- The Contractor fails to respond adequately to complaints from the public.
- Legal action is instituted against the developer in terms of Environmental laws.
- Payment of any fines in terms of the contract will not absolve the offender from being liable to prosecution in terms of any law.

3. DESCRIPTION OF ACTIVITIES

The activities to be conducted involve, but are not limited to:

3.1 Pre-Construction and Construction Phase

- Induction.
- Environmental Awareness Training.
- Demarcation and fencing of the site.
- Clearing the proposed site of any vegetation if required.
- Removal and stockpiling of topsoil.
- Pipeline replacement and upgrade below ground level.
- Backfilling of trenches.
- Handling and disposal of construction waste.

3.2 Rehabilitation Phase

- Removal of all construction, hazardous and domestic waste.
- Rehabilitation of the disturbed area(s) because of construction works.

4. SUMMARY OF IMPACT AND ASSOCIATED MITIGATION MEASURES

This chapter covers the predicted impacts that will occur during the replacement of the Olifantsvlei Infrastructure project. The following sections will consider the expected on-site impacts during the different phases of the project, as well as the mitigation measures and environmental management procedures required to manage the expected impacts.

Section 5: Construction Site Environmental Management

Section 6: Materials

Section 7: Waste

Section 8: Flora, fauna, air quality, noise, water and other Section 9: Construction Techniques and processes Section 10: Operational Phase

Section 11: Rehabilitation

5. PRE-CONSTRUCTION AND CONSTRUCTION SITE ENVIRONMENTAL MANAGEMENT PROGRAMME

Activity	Aspect	Potential Impact	Mitigatory Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Engineering Design	All the aspects listed in the EMP	Design incompatible with environment Development of sinkholes.	Objective: To ensure the design considers the environment Target: - Assimilate requirements of the EMP in the design and construction management. - Pressure loss or leak detection systems are critical in terms of risk management. - An emergency shutdown system must be in place for sectional shut down where pressure loss is detected. - All flange fittings are to be in water/liquid retaining manholes that can tolerate differential movements. - All manholes should be placed on minimum 500mm thick soil concrete bedding layer placed on an undisturbed base extending 500mm beyond the manhole footprint. - JW should require that the resident engineer, design engineer and contractor complete a certificate of compliance confirming that the contents of the Dolomitic report have been considered. - The Local Authority should be requested	Design meets objectives and does not degrade the environment	Engineering Design Consultant	Contract	During Tender Design & Design Review Stage	Engineering design consultant	Design Phase

			to report any current ground movement events within 100m of the pipeline, twice a year.						
Establishment of the construction camp site and laydown areas.	Construction camp	Damage or loss of existing vegetation. Loss of soil fertility.	Objective: To prevent and mitigate the damage or loss of natural vegetation by minimising the footprint of disturbance thereby preventing the degradation and loss of topsoil. Target: • No contractor laydown or camp establishment is permitted within project site. Temporary use and storage of vehicles and equipment during active construction should be implemented with nightly lock-up and removal to offsite camps undertaken. • The planning and design for the construction camp must ensure that there is a minimum impact on the environment. • Invite the Environmental Officer/ECO for the site assessment of proposed site camp prior establishment. • Contractors must as far as possible only use existing tracks and roads. • A site plan of the construction camp must be provided indicating waste areas, storage areas and placement of ablution facilities. • As far as possible the construction camp must be placed on already disturbed land.	• Submit a method statement for Site Camp establishment for review by JW Environmental Officer and approval by the ECO prior commencement of works.	Contractor, CER.	Contract	Pre-construction. Establishment of Site	ECO	Once off

			• The construction camp should be fenced off to limit the removal of unnecessary vegetation. • Fences and security access must be maintained, throughout the project. • All fences removed to facilitate access will be replaced by the contractor once machinery and personnel have been removed from the site to the satisfaction of all the relevant parties. • Emergency and contact numbers of the contractors must be available and prominently displayed on a signage board that is clearly visible. • No labourer is allowed to reside on site. • Allowance for two contractors camp along the alignment. • Once the site has been cleared of vegetation, the topsoil should be stripped. • Topsoil must be stored in a demarcated area which is protected from wind and rain. • Stockpiles should either be sprayed with water or covered with suitable cover as approved by the ECO. • The topsoil stockpiles must not exceed 2 m in height. • The area must be rehabilitated once the construction camp has been decommissioned. • The clearing for fencing shall be limited to the removal of shrubs within 1 metre if the fence line. • Fencing around the construction camp shall be suitably secured.						
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			• Fencing shall be always kept neat. Breaches to the fencing must be immediately repaired. • All grass and other vegetation should be left on the topsoil stockpiles so that they colonize the area after construction. • Photographic records must be kept of topsoil's stockpiles. • The area must be rehabilitated once construction is complete. <u>Site Specific Requirements:</u> No construction camps, stockpiles or hazardous materials should be located within the 32m of a river/stream and 100m buffer zone of the wetland.						
Closure of the construction camp.	Construction camp.	Potential impacts associated with the closure of the construction camp	Objective(s): To limit potential impacts on the environment for a period for which the construction camp is closed. Target: Should the construction camp be closed for a period of more than one week, a report on compliance will be lodged with the Contractor, Engineer and Project manager confirming the following: - • No persons allowed on site other than project employees. • Minimal materials will be stored. • Materials will be stored in leak-proof, sealable containers or packaging. • The store area will be secure and locked. • Fire extinguishers will be serviced and accessible (At least 2 all – purpose 12.5kg extinguishers). • The area will be secure from accidental damage	Closure of the construction camp in line with the requirements of the EMP.	Engineer, Contractor and CER	Contract	Closure of camp	Engineer ECO	Whenever the construction camp is closed for longer than a week.

			through vehicle collision, etc. • Emergency and contact numbers of the contractor will be available and prominently displayed. • Chemical toilets will be empty and secured. • Refuse bins will be empty and secured. All waste will be collected and disposed of at a registered waste disposal site. Proof of this must be provided to the ECO. • Minimal hazardous material which has the potential to catch fire may be stored onsite. 24-hour security will be on site during this period.						
Construction of site buildings	Site buildings materials.	Soil pollution and permanent alternation to the natural environment.	Objective(s): To ensure the material for site buildings are recyclable and to minimise the impacts of the construction of the buildings on the environment. Target: • No permanent structures will be permitted at the contractor's camp. • Temporary structures shall be founded on a platform, either subsoil or screed slab. • Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. • All temporary structures must be soundly built and not pose a danger to workers. • Containers are to be used for the storage of materials which have the potential to release pollutants into the environment. • All structure footprints to be rehabilitated and re-vegetated after construction • is complete.	On site buildings constructed according to the requirements of the EMP.	Contractor and CER.	Contract	Pre-construction, Establishment of site.	ECO	Once off

Site demarcation .	Demarcation of the site.	Unnecessary removal of vegetation. Loss of topsoil. Safety Loss of soil fertility	Objective(s). The environmental objective when establishing the site is to minimise the footprint of disturbance, the extent of soil erosion, loss of vegetation and the potential for the pollution of soils. Target: - The Contractor's right to access any portion of the site is governed by the terms and conditions of the contract. - The construction sites must be demarcated as indicated in the EMP using danger tape with steel droppers or other methods approved by the ECO. - The width of the construction footprint must be agreed upon by the ECO and the Engineer and as far as possible must be kept to a minimum. - Pre-construction environmental induction must be conducted to all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to conservation and importance of provincially protected plants, protected trees and medicinal plants. - The ECO should provide supervision and oversight of vegetation clearing activities. - No personnel or construction materials will be allowed to move outside the designated/demarcated site. - Do not perform any activities or operations that are likely to adversely affect the aesthetic quality of the environment.	The site is demarcated according to the requirements of this section of the EMP.	Contractor and CER.	Contract	Construction sites must be fenced off along the alignment before site clearance.	Engineer, ECO.	As construction proceeds along the alignment.
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			- Do not paint or mark any natural feature. Marking for surveying and other purposes must be done using pegs, beacons or rope and droppers. <u>Site Specific Requirements:</u> - No danger tape or plastic or any, materials hazardous to wildlife will be used on site. - Fencing and barriers will be in place in accordance with Occupational Health and Safety Act (Act No. 85 of 1193) - The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the pre-and construction phases. - Vehicles must adhere to the set speed limit. - All construction vehicles must use designated access roads. Off-road driving should be strictly prohibited. - Fauna (mammals and reptiles) that become trapped in any excavation or in any construction related activity, may not be harmed and must be rescued and relocated by suitably qualified personnel. - Any fauna threatened by the construction activities should be removed to safety by the ECO or any s Alien invasive plants (listed in this study) can be removed manually or with the help of simple tools. This entails damaging or removing the plant by physical action. Different techniques could be used, e.g., uprooting, ringbarking or bark stripping. These control options are only really feasible in sparse infestations or on small scale, and						
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			for controlling species that do not coppice after cutting. It would be preferable to uproot alien vegetation to limit regrowth after cutting. - It should be noted that all infestations cannot be cleared at once, as these plant species do currently play a role in stabilising soils and therefore, the sequence of alien plant removal should be planned, along with re-vegetation of the cleared areas. - Regular monitoring for alien invasive plants within the study area as well as adjacent areas which receive runoff as there are also likely to be prone to invasion problems.						
Cooking of food	Cooking facilities	Type and placement of cooking facilities used, and how they will be used.	Objective(s): To ensure that environmentally friendly cooking facilities are used on site. Target: - The contractor must supply gas cooking facilities for the labourers at the construction camp. - If gas cooking facilities are not available fires (for the purposes of cooking) will be allowed in a demarcated area that has been cleared of any combustible materials. - Firewood, or other suitable fuels, must be supplied by the Contractor. - No vegetative matter may be removed from the area for firewood. - After use, all cooking fires must be extinguished. No fires must be left unattended during the night.	Evidence of presence of gas cooking facilities and/or demarcated area for cooking with fire.	Contractor	Contract	Pre-construction, Establishment of site.	ECO	Once off.

Operation of the sanitation system(s).	Inadequate number of latrines on site. Position of latrines and shower systems. Bad management of wastewater.	Bad odours on site. Surface water contamination. Soil contamination. Spread of disease.	Objective(s): To ensure good sanitation system and management throughout the construction period. Targets: - Adequate chemical toilets must be provided for all staff. Alternatively, existing ablution facilities on site can be utilised if available. - Chemical toilets must be emptied / serviced on a regular basis to prevent them overflowing. Proof of this must be provided to the ECO. - A minimum of one toilet must be provided per 11 persons at each working area within 100m from worker activity. - Should, for some reason, shower facilities be provided for use by staff the following must be imposed: - Positioning of the showers, specifically the discharge point, must be placed in a way to ensure that erosion and build-up of detergents does not occur. - All discharge from the shower and other washing facilities must pass through a suitable filter to reduce the load of detergents to the environment. - Mechanisms must be investigated to ensure that water is evenly dispersed. - Use of the shower facilities must be limited to staff or authorised persons only.	Adequate toilets and showers will be positioned at the right places as per the EMP and ECO. Absence of odours, erosion and build-up of detergents.	Contractor	Contract	Pre-construction, Establishment of site.	ECO	Once off
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Site Security	Security at the Construction Camp and along the alignment .	Theft and Vandalism of machinery and private properties.	Objective(s): To ensure that machinery and equipment at the construction camp are not stolen or vandalised as well ensure the safety of property owners and their properties along the alignment as construction progresses. Targets: - Security personnel will be briefed and have access to facilities to contact relevant management and emergency personnel. - No unauthorised firearms or weapons of any kind will be permitted onsite. - Independent site security must be provided by the contractor at the construction camp during hours of darkness, and if possible, during the day at temporary access points and construction risk areas. 24-hour security must be appointed by the Contractor in dangerous areas along the alignment.	Site security will be always organised by the contractor and present on site.	Contractor	Contract	Throughout construction	ECO	Throughout construction
Vehicle parking area. Storage of equipment.	Vehicle and plant parking area(s). Storage of equipment. Disturbance of soils due parking of vehicles outside of designate	Soil contamination Surface water contamination	Objective(s): To ensure vehicles are parked according to the specifications in the EMP and that equipment is handled appropriately. Target: - Vehicles and equipment must be checked on a regular basis for fuel and oil leaks. - Vehicles and equipment which leak oil must be removed from site. - The refuelling of vehicles must take place off site. - Generators may only be refuelled on an impermeable surface.	Drip trays must be provided and placed under vehicles and equipment which are not being utilised on site.	Contractor and CER.	Contract	Throughout the construction period.	ECO	Whenever there are stationary vehicles or equipment present on site.

	d areas.		- No storage of vehicles or equipment will be allowed outside of the designated area. - Vehicles stored on site must be stored over a concrete slab or drip trays. - Ensure that all vehicles and equipment are always in good working order.						
Servicing and washing of vehicles and machinery	Service area / wash bay	Soil contamination. Surface water contamination	Objective(s): To ensure that the environment is not polluted by ensuring that service areas and wash bays for vehicles and machinery are made available and utilised. Target: - Due to the proximity to existing servicing and washing facilities in the development area, no washing or regular maintenance of vehicles will be permitted at the construction camps. - The contractor will remove all machinery or equipment requiring routine maintenance from site to an existing servicing facility. - The contractor must ensure that drivers are supervised during off-loading, by a person knowledgeable of the requirement. - Should emergency repairs be necessary, drip trays or tarpaulins must be utilised to ensure the collection of the oil. The area for emergency repairs should be identified by ECO. - The contractor must ensure that delivery drivers and plant operators	Evidence of prescribed servicing and washing services.	Contractor , CER.	Contract and allowance in P&G's	During construction.	ECO	Whenever servicing or maintaining of vehicles or equipment throughout the construction period.

			are informed of all relevant procedures and restrictions required ensuring compliance with this document. • All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages. • No washing of vehicles will be allowed on site. • No planned normal or regular maintenance will be conducted on site. Vehicles and equipment will be removed from site for routine maintenance. • In the event of emergency repairs maintenance must be conducted over a drip tray or tarpaulin.						
Personnel conduct.	Personnel	Infringement of the EMP requirements by personnel	Objective(s): To ensure that personnel are adhering to the EMP requirements. Target: • The Contractor will adhere to all requirements of the Occupational Health and Safety Act (Act 56 of 2004), including the drafting of a suitable Health and Safety Plan which will be implemented during the construction phase. • The Contractor shall comply with all safety regulations regarding electricity supply and shall take every precaution to ensure the safety of all people on site. • Working hours: 06h30 to 17h30 Monday to Friday. No work will occur on weekends or public holidays.	Personnel wearing proper safety uniform. Absence of trespassers on site.	Contractor and labourers.	Contract	Approved PPE must be issued to all employee's pre-construction but must be used for the duration of the construction period.	ECO	Throughout construction period.

			• The Contractor will have to negotiate alternative work times with the ECO, Site Manager and residents affected. • Should blasting be necessary along the alignment, blasting will only be allowed between 10h00 and 12h00, after the proper notification of affected persons. • All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • JW induction must be attended by all parties involved in the construction. • Toolbox talks to include aspects of the EMP. Labourers associated with the contractor must be easily recognizable (i.e. company issued overalls with company name/logo etc.), and no non- labourer will be allowed within the construction camp at any time. • The Contractor shall take all necessary precautions against trespassing on private properties. • Warning signs must be placed on and around the site as per the Occupational, Health and Safety requirements. • Adequate first aid services must be provided by the contractor at the contractor's camp. • The contractor will be responsible for his own security arrangements and shall comply with all site security instructions. • Basic firefighting equipment must be available on site.						
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			• PPE to be provided and well maintained at contractor's camp. • All incidents should be reported to ECO, investigated, documented and kept in safety file. • No smoking on any sites is allowed. The Contractor is to provide a designated safe smoking area. • Wherever possible, employment opportunities shall be created for local labour.						
Protection and handling of fauna on site.	Protection of fauna.	Intentional or unintentional killing of fauna on site. Loss of fauna due to habitat disturbance.	Objective(s): To ensure that fauna found on site are protected and removed from site. Target: To limit the impact on the fauna around the site Site Specific Requirements: • Animals residing within the designated area shall not be unnecessarily disturbed. • No hunting, trapping, killing of any animal should be permitted. • Snake and or animal handling should be strictly limited to qualified staff or a dedicated external snake handler. • When accessing the site, vehicles are to utilise the existing roads. • Ensure that no unnecessary clearing of faunal habitat occurs during maintenance activities. • No fires by maintenance personnel are allowed. • No wild animal may be fed on site. • Ensure that the site is kept clean, tidy and free of rubbish that would attract animal	No evidence of domestic animals on site. The site is kept clean and does not attract fauna.	Contractor , CER.	Contract	Throughout the construction and post construction period.	ECO	On-going

			pests. • All vehicles accessing the site should avoid collisions with susceptible species such as snakes and small rodents. • All waste generated at the facility should be kept in scavenger proof bins and removed from site at regular intervals.						
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6. MATERIALS

Activity	Aspect	Potential Impact	Mitigation Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Transportation of material.	Material transport.	Traffic congestion. Dust during transportation. Excessive noise.	Objective(s) To ensure that when material is transported, it is not able to do harm to the surrounding environment. Target: The contractor should note that existing roads are sufficient to facilitate access to the alignment of the pipeline, but the following should be adhered to: - Existing roads are sufficient to facilitate access to the alignment of the pipeline in various areas. - No temporary access roads will be permitted, unless negotiated with the ECO, Site Manager and affected persons. - Access to privately owned land will be arranged with the various landowners along the alignment by the contractor. - Adequate and appropriate traffic warning signage must be erected where applicable, along transport routes and access roads. - The Contractor shall take preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties, especially when entering residential areas) to minimise complaints regarding noise and vibration nuisance from sources). - Fine materials (such as sand) must be covered during transportation. - The Contractor shall remedy, at his own	Mufflers and silencers fitted to construction vehicles and equipment. Covering of material during transportation. Emergency reaction plan (for spills/accidents) must always be readily available on site.	Contractor and CER	Contract	Prior to construction start.	ECO	Throughout construction period or as required by the ECO.

			expense, dust generation and spillage where it occurs to an acceptable level along the transport routes. • The Contractor shall protect all areas susceptible to erosion by installing all necessary temporary and permanent drainage works. • Appropriate response plans must be prepared by Contractors to ensure the fastest possible reaction to spills or accidents. • Deliveries must be scheduled for off-peak hour traffic times. • All trucks and vehicles removing spoil from the site must have load areas and must be covered by a tarpaulin to prevent rocks and spoil falling onto the road surfaces. • Vehicle speeds on site should not exceed 20km/hr. • All drivers are to have licences for driving and moving of plant on site. • All road vehicles to be road worthy.						
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Storage of Hazardous Material	Hazardous Material storage.	Contamination of soil by hazardous material. Inadequate remediation measures for spills.	Objective(s): To ensure adequate protection of soil and soil remediation measures in case of spills. Target: - Hazardous materials – such as paint, cement, fuels, bitumen or detergents – must be stored in sealed, lockable containers when not in use. This area must be approved by the ECO. - No decantation into unmarked containers or containers with irrelevant labels. - No decanted fuel to be left unattended in the sun to avoid fire. - All flammable and hazardous substances stored on site must comply with legislation and by-laws. MSDS (Material Safety Data Sheets) are to be kept on site with relevant copies on location where the substance is being stored. - All reasonable care must be taken to prevent spills of any hazardous material when in use. - Drip trays and Spill Kits must be present. - All spills (minor and major) must be cleaned and remediated to the satisfaction of the ECO and CER within 24 hours of occurrence. - The contractor must ensure that there is a supply of absorbent material (e.g. Drizit) and clean up materials readily available to absorb, breakdown and, where possible, encapsulate minor hazardous material	Storage of hazardous materials in sealed and lockable containers. No evidence of spills on site. Absorbent and clean-up material readily available on site.	Contractor and CER.	Contract	Construction period	ECO	For the duration of the construction period dependent on the presence of hazardous material on site.
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			spillages. - No material may be stacked higher than 2m. - An incompatibility study of chemicals that cause fires when stored to close to each other must be included in the safety file. Warning signs of potential reactive chemicals must be displayed where applicable						
Storage of Fuel	Storage areas.	Contamination of soil by fuel. Inadequate remediation	Objective(s): To ensure that there is optimum environmental protection (especially soil) from fuel spills. Target: - Fuel must be stored in above ground storage tanks or sealed containers, contained within a bunded area with sump drainage. - Fuels for vehicles are not allowed to be stored on-site. - All bunds must be designed to contain at least 110% of the tank or drum storage capacity (this shall apply to above ground storage, and include fuels, welding equipment and oxyacetylene cutting equipment). - No drainage from fuel storage areas shall be permitted. - Any other hazardous substances stored in bulk will require bunding. - Fuel for vehicles must be sourced off site.	Established fuel storage areas in compliance with the objectives of the EMP.	Contractor and CER.	Contract	Pre-construction, Establishment of site.	ECO	Once off

			- No refuelling, maintenance operations or fuel storage will be allowed within 50 m of watercourses or water resources. - Refuelling or maintenance by nominated personnel only, who will be specifically trained in the relevant procedures.						
Use of cement.	Cement.	Contamination of soil and surrounding environment by cement. Cement dust can decrease the	Objective(s): To ensure that the environment is protected from cement that will be used on site. Target: - Cement must be delivered in sound and properly secured bags or in approved bulk containers. - All cement products present on site must be sealed in bags and stored in storage containers to be provided at the construction camp and should only be opened when needed. - The storage facility and surrounding area must be swept and cleaned regularly as required to ensure that cement products do not pollute the surrounding environment. - Cement bags are not to be burnt on site but should be disposed of at a registered	Cement delivery, storage and use will be in line with the EMP requirements.	Contractor and CER.	contract	Construction period.	ECO	If cement is in use on site.

			hazardous waste disposal site. Cement batching must take place on an impermeable surface						
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7. WASTE

Activity	Aspect	Potential Impact	Mitigation Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Storage, removal, and disposal of construction waste.	Construction waste.	Land pollution. Compaction of soil by rubble. Decreased aesthetic integrity of the site.	Objective(s): To ensure that waste is correctly stored and disposed of, decreasing the visual impact during the construction and post construction period. Targets: - Bins and containers must be made available by the contractor for the storage of construction waste. - Temporary storage of construction waste will take place within the site, and within areas designated by the ECO and the Contractor. - Construction waste will not be stored on site for longer than the time agreed upon by the Contractor and ECO.	Construction waste stored, collected, and disposed of as per the requirements of this EMP. - Example of Monthly Safe disposal certificate/Weighbridge slips - Transporter certificate of	Contractor and CER	Contract	Waste bins/skips must be available prior to construction. Removal of waste throughout the construction period.	ECO	The ECO will determine the frequency of waste removed from site.

			- The Contractor will be responsible to remove and transport all construction waste material off site to a registered waste disposal facility (proof of this as well as a copy of the sites Registration Permit, must be provided by the Contractor to the ECO). - No burning of waste permitted on site. - Any old oil/grease will be stored separately in sealable containers prior to removal from site.	registration with Provincial Department (GDARD/GWIS) - Agreement with the Waste Facility - Transport Permit from City of Johannesburg - Proof of Reporting Waste Quantities to COJ (Waste Hub)					
Storage, removal, and disposal of domestic waste.	Domestic waste.	Land pollution. Bad odours. Decreased aesthetic integrity of the site. Disease	Objective(s) To ensure that waste is correctly stored and disposed of, decreasing the visual impact during the construction and post construction period. Target: - The Contractor must supply sealable waste bins at the construction camp for the storage of domestic waste. - Clearly marked waste bins are to be provided for the separation of waste. - Recyclable waste, including glass, paper and plastic must be separated at the construction camp, stored and recycled, where economically feasible. - Personnel must be informed about the	Evidence of domestic waste stored, removed, and disposed of according to the requirements indicated in this EMP.	Contractor and CER	Contract	The waste bins/ skips must be available prior to construction. Removal of waste throughout the construction period.	ECO	The ECO will determine the frequency of waste removal from site.

			necessity of using the waste drums. - The Contractor must do site clean-ups of litter other than construction waste daily and dispose of it in the designated refuse bins provided at the Contractor's Camp. - The Contractor must ensure that general site-wide litter clean-up will occur at least once a week. - No burning of waste permitted on site. - Sealable waste drums should be provided at least every 100m along the construction of the pipeline. - Waste must be regularly removed from site, frequency and amount as determined by the Contractor and ECO. The contractor must provide proof of this to the ECO in the form of a safe disposal certificate.						
Storage, removal and disposal of hazardous waste.	Hazardous waste.	Soil contamination.	Objective(s): To ensure that soil and the rest of the surrounding environment on site is protected from hazardous waste. Target: - The Contractor is required to refer to the Hazardous Substances Act No 15 of 1973 act to determine whether any substance (new or waste) stored on site is subject to controls contained within the act. - All hazardous waste must be stored in sealed and suitably marked containers for removal to a registered hazardous waste disposal facility. - Any oil spillage on site will be excavated to a depth of 150 mm and disposed of for	All mitigation measures with regards to Hazardous waste mentioned in the EMP are implemented. - Wastewater Treatment Agreement (WwTW) - Example of Monthly Safe disposal	Contractor and CER.	Contract	Hazardous Wastes must be collected in sealable, safe containers. Removal of hazardous waste throughout the constructi	ECO	Old hydrocarbons and other hazardous materials must be removed every 7 days.

			removal to a registered hazardous waste disposal site. Excavated areas are to be refilled with suitable replacement material. Alternative in-situ remediation techniques could be used, if approved by the ECO. - Wastewater must be stored in sealable containers and discharged with another wastewater to a registered wastewater disposal site. - Time intervals for the removal of hazardous waste must be agreed upon by the Contractor and ECO before the commencement of construction. <u>Site Specific Requirements:</u> <u>Asbestos Requirements:</u> - Certified copy of registration with department of labour to handle asbestos. - Copies of medical fitness certificates for all team members who will be dealing with asbestos issued by occupational medical practitioner. - Transporting certificate for asbestos (registered with the Department of Gauteng Department of Agriculture Rural Development) - Waste disposal agreement and permit for the landfill site where asbestos will be disposed. - Weighbridge certificate and Safe disposal certificate accompanied by proof of waste quantities submitted to Gauteng Information Centre. - Method of disposal (Asbestos Removal Plan/ Method statement for handling and removing	certificate/Weighbridge slips - Transporter certificate of registration with Provincial Department (GDARD/GWIS) (it must be written Hazardous) - Agreement with the Waste Facility - Emergency Preparedness Plan - Risk Assessment for dealing sewage sludge spillages. - Proof of Reporting Waste Quantities to Gauteng Waste Information System (GWIS) if disposing outside			on process.		
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			asbestos). • PPE and specification of the type of equipment that will be used must be included. • Certificate of competency from the supplier's personnel. • Risk assessment for dealing with asbestos. • Specialized bins for asbestos. • Letter of good standing (COIDA or FEMA)	Gauteng. • Access route map						
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8. FLORA, FAUNA, AIR QUALITY, NOISE, WATER & OTHER

Activity	Aspect	Potential Impact	Mitigation Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
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Removal of flora.	Conservation and protection of flora.	Unnecessary removal of flora. Removal of vegetative matter for firewood.	Objective(s): To minimise the extent of removal of vegetation. Target: - Any shrubs or trees to be protected (as indicated by the Estate Superintendent / Environmental Assessor or specified on the recommendations of the environmental assessment) shall be fenced-off with a minimum perimeter equivalent to the drip line of the shrub or tree. All interventions to these no-go areas must be approved by the ECO. - No construction or heavy machinery movement will be allowed outside of the demarcated work area. - The footprint of disturbance should be kept to a minimum (a working strip of approximately 20 m). - Plants outside of the construction area are not to be disturbed, destroyed or removed. - The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement. - No vegetative matter may be removed for firewood. - No open fires permitted near trees. - No material storage or lay down is permitted under trees. - All woody material is to be chipped and used back on site for rehabilitation. - Where sensitive Flora exists on site, pictures	No unnecessary loss of vegetation.	Contractor and CER.	Contract	During the establishment of the construction sites along the alignment.	ECO	Vegetation will be cleared as construction proceeds along the alignment.
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			of the relevant species will be provided on digital format. The Contractor must display this information in prominent relevant places and staff must be made aware of these species. • In wetland areas leave as much natural vegetation as possible to help with the stability of the watercourse as well as the ability to trap sediment. • Species rescue preferably to occur at the end of the growing season, and plants stored on site in a temporary nursery. • Areas where plants are to be relocated to must be prepared beforehand. • Small trench to be hand excavated around the plant to be rescued (approximately 30cm from plant for herbaceous and 1.5 m for woody species). • Remaining soil mass to be wrapped in hessian sacking or similar prior to moving of plant. • Wrapped plant mass to be moved to relocation site. • Penalties should be imposed for transgressions of the EMP as agreed between JW and the appointed Contractor before the commencement of construction. • Highly sensitive areas to be surveyed and indicated by markers prior to establishment of site. • Plant rescue should be followed as described						
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			in the specialist reports.						
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Removal and control of alien vegetation	Alien vegetation.	Introduction of alien plants/seeds on site.	Objective(s): To prevent alien plants/ seeds from being introduced on site. To remove alien plants where possible, from site Targets: • All sites disturbed by construction activities must be monitored for exotic or invasive plant species and weeds. • Chemical removal shall be used in accordance with manufacturer's specification. • The type of chemical to be utilised must be approved by the ECO. • Any eradicated exotic/invasive plant or weed vegetation must be removed from site and disposed of at an approved waste disposal facility. • Operator, if not a JW employee, must have a Pest Control Operators licence. • A maintenance schedule is to be provided after reinstatement is completed as that alien vegetation is prevented from using the disturbed line as a corridor. An alien eradication programme must be implemented. • JW will be responsible for the implementation of the maintenance schedule.	Decrease of alien plants on site.	Contractor, Labourers, CER.	Contract	For the duration of the construction period.	ECO	On-going, as alien vegetation is identified on site.
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Protect ion and handlin g of fauna on site.	Protectio n of fauna.	Intentional or unintentional killing of fauna on site. Loss of fauna due to habitat disturbance.	Objective(s) To ensure that fauna found on site are protected and removed from site. Target: • All activities should be strictly restricted to demarcated work areas. • Where sensitive species occur, these shall be translocated by the relevant conservation authority. All relocations are to be reported and photographed. • The contractor must ensure that the site is kept clean and free of rubbish that could potentially attract animal pests, and that rubbish bins are scavenger proof. • The Contractor must regularly undertake checks of the surrounding natural vegetation, in fence and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps on or adjacent to the site. • The movements of animals trying to flee must not be disturbed. • The contractor must report problem animals or vermin to the ECO. • Ensure that domesticated animals belonging to the local community are kept away from the construction works. • The contractor may under no circumstances make use of pesticide or poison to control unwanted animals. • Workers should be educated so as not to kill any fauna found onsite. • The footprint of disturbance should be kept to	No evidence of domestic animals on site. The site is kept clean and does not attract fauna.	Contractor, CER	Contract	Throughout the construction and post construction period.	ECO	On-going
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			a 20 m corridor. • All activities should be restricted to the demarcated works area. • No hunting or trapping is permitted along the alignment. Access roads should be planned so that only minimum linear distances are developed. • Trenches must be checked daily for any signs of wildlife which may have fallen in. • The open end of the pipe that has been laid should be blocked at overnight to prevent animals from entering and becoming trapped. • Installation should be carried out as rapidly as possible. • Where sensitive fauna exists on site, pictures of the relevant species will be provided on digital format. The Contractor must display this information in prominent relevant places and staff must be made aware of these species. • The site foreman responsible for overseeing onsite activities must be present at all compliance meetings. • Issues which lead to difficulties in complying with the EMPr must be communicated to the ECO before any action is taken. • Storm water runoff must be adequately managed. • Topsoil must be cleared from one end of the site towards the other.						
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			- Remove all excess materials and remaining soil stockpiles during and after construction. - Installation must be carried out as rapidly as possible. Rehabilitation must commence as soon as the pipe is covered with soil.						
Use of construction vehicles and equipment.	Noise	Noise and vibration.	Objective(s): Reduction in the amount of noise on site. Target: - Construction along the pipeline may only take place during recognised work hours. - Should construction have to continue after hours, all residents affected must be notified. - All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems. - Keep a record of the condition of all existing structures around the blasting area, before and after blasting. - The Contractor will be held responsible for the damage to structures as result of blasting. - Blasting Plan to be approved by the Engineer.	Construction vehicles and machinery fitted with mufflers silencers. Working hours are adhered to.	Contractor and CER.	Contract	The vehicles and machinery must be fitted with mufflers prior to the commencement of construction. Work hours, unless otherwise permitted, must be adhered to through the construction period.	ECO	On-going

Protection of archaeological sites	Archaeology	Destruction of graves and other sites of archaeological interest.	Objective(s): To make sure that sites of archaeological interest are preserved. Target: - The pipeline should be constructed as proposed. - Any sites of cultural or heritage significance unearthed during construction must be cordoned off. - A qualified and registered archaeologist must be appointed and consulted at such a finding to appropriately excavate any artefacts in agreement with the Gauteng Province Heritage Resources Agency (GPHRA) and the South African Heritage Resources Agency (SAHRA).	No places of archaeological interest are being disturbed or affected due to the replacement and upgrade of the sewer pipelines.	Contractor, CER.	Contract	For the duration of the construction period.	ECO	On-going
Water Management: Sediment Load Modification	Water Resources	Erosion Deposition of sediment	Objective(s): Prevention of erosion and increased sediment deposition within surface watercourses. Target: - Do not strip wetland and river crossings of topsoil and vegetation. - Store topsoil and subsoil stockpiles from the trench outside of buffered watercourses. - Implement silt traps and grips/ berms across the cleared servitude (Right of Way) on upslope approaches located adjacent to watercourse. More silt traps and grips/ berms should be implemented on longer and steeper slopes. - Wrap temporary running tracks across watercourses with geotextile and/ or	Limited sediment deposition within the surface watercourse	Contractor	Contract	In areas where construction occurs within proximity to a water course.	ECO	On-going

			sandbags to help reduce the release of fine sediment into watercourses from runoff. • Dewatering from trenches during the pipe implementation phase should not be discharged directly into wetland or river systems. Dewatering discharge must be routed through properly constructed silt traps. • These dewatering silt traps should be located outside of the buffered watercourse areas and be frequently monitored to ensure they remain effective. • All construction areas should be monitored for aggravated or initiated erosion damage during construction and the recovering phase. Baseline and construction photographs must be taken of all identified surface watercourses as part of monitoring efforts. • Soil removed from the spread must be placed outside of the riparian zone. • If erosion is noted, then immediate efforts to prevent the erosion should be made.						
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Water Management: Flow Modification	Water Resources	Alteration of surface flows. Modification of groundwater flows. Erosion caused by storm water.	Objective(s): Limit the alteration in surface and ground water flows. Target: - Construct temporary running tracks on raised material (rocks and/or subsoil material) on top of geotextile in wetland and river crossings across the entire width of the delineated watercourse. - Pipes(flumes) should be implemented along the entire width of the wetland channel or river channel to allow dispersed pattern of surface flow. - Flumes should be partially embedded in the channel bed to allow habitat connectivity for aquatic fauna dispersal. - Flume outflows should be buffered by embedded rip rap material (large rocky clasts) on the channel bed and banks during the construction process to prevent scouring. - Unchanneled wetlands such as hillslope seepages and unchanneled valley bottoms should be crossed with larger rocky clast material in the seasonal and permanent zones of wetness to ensure diffuse flow in a low energy environment. - Care should be taken not to concentrate surface flow through temporary crossings and to avoid erosion. - Watercourse crossings and pipeline implementation should be completed in the shortest time possible and should ideally not	Limited disturbance to surface and ground water flow.	Contractor	Contract	In areas where construction occurs within proximity to a water course.	ECO	On-going
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			exceed four consecutive days of trenching, pipe lowering and trench closure. • Reinstatement and rehabilitation should proceed directly thereafter, although re-vegetation may have to be postponed to the onset of the growing season. • It is recommended that watercourse crossings and pipe implementation should be conducted during the dry season (winter) to help reduce the risk of flooding damage following rainfall events. • Sections of pipeline within identified watercourses and on the adjacent approaches should be targeted for trench-breaker construction. • Trench-breakers should contain material such as clays with a low hydrological conductivity that could isolate coarser padding material around the pipe. • The positioning of these trench-breakers at specific distances will help prevent the pipe from functioning as a preferential underground drain. • It is recommended that a hydrogeologist, experienced pipeline civil engineer or hydrologist be involved to help determine the amount and positioning of these trench-breakers. • A surface watercourse (wetland and river) rehabilitation plan should be compiled that links in with the construction reinstatement phase.						
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Water Management: Water Quality	Water Resources	Pollution of water resources.	Objective(s): Prevent the pollution of the water resources. Target: - Site staff shall not be permitted to use any stream, river, other open water body or natural water source adjacent to or within the designated area for purposes of bathing, washing of clothing or vehicles nor for the disposal of any type of waste. - Streams, rivers, wetlands and other open water bodies or natural water sources adjacent to or within the designated area shall not be used for construction activities such as washing of equipment or disposal of any type of waste. - No pollution of water is allowed. - Limit the presence of the temporary running track in wetland and river areas to the shortest possible time and utilize the narrowest width of the servitude allowable (i.e. not the entire servitude width). - Portable toilets must be located outside of buffered surface watercourses. - It is recommended that the surface water quality monitoring (parameters measured in this report) be conducted daily during the construction phase and one construction bio-monitoring survey be conducted during the course of construction. - Only allow the refuelling of vehicle and machinery outside of the buffered	Water quality within baseline standards.	Contractor	Contract	In areas where construction occurs within proximity to a water course.	ECO	On-going
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			watercourses. Drip trays should be used. • Limit the presence of the temporary running track in wetland and river areas to the shortest possible time and utilize the narrowest width of the servitude.						
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9. CONSTRUCTION TECHNIQUES & PROCESS

The following restrictions will be enforced: -

- All cut/excavated material must be used on site as far as possible as fill material.
- Noise reduction and dust suppression must be incorporated in all construction activities.
- The ECO and a representative of the construction company will traverse the proposed alignment before the commencement of any sections of construction. The construction footprint will be agreed upon in accordance with this EMPr and the footprint classes indicated on the design drawings.
- No moving or removal of stones, plants or any other natural specimens will be allowed outside the authorised alignment.
- The Contractor will have to submit Environmental Method Statement, appropriate accident plan, soil conservation and stockpiling plan as well as proof of environmental awareness training for the approval by the ECO.
- In the event of a change or alteration of the alignment during construction within terrestrial biodiversity sensitive areas, a detailed ecological survey will be conducted by a specialist approved by the ECO along the proposed pipeline route. Should any Red Data Species be found, the Applicant (in consultation with GDARDE and the specialist) will either make provision for the relocation of the red data species out of the proposed alignment area, or to amend the alignment to avoid the species.
- All manholes and other structure above ground must not exceed a height of 200mm above ground level so that these structures will be hidden by the grasses.
- All manholes and other structures above ground must be spaced so that they are close to the boundary of the Reserve close to the Delmas road.
- All conditions mentioned in the servitude agreement between landowner and JW must be adhered to.

Activity	Aspect	Potential Impact	Mitigation Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Excavation of the ground	Trenching.	Animals that may fall into the trenches. Disturbance of sites not earmarked for pipeline alignment.	Objective(s): To ensure that the environment and animals are protected during trenching. Target: - Existing services must be identified before trenching commences. - The total length of an open trench will not exceed 100m. - Open trenches must be checked daily for any wildlife that may have fallen into them. - All trenches and work areas are to be well demarcated by hazard barriers and signage. - The width and depth of the trench, as well as the working place (footprint) adjacent to the trench must be specified in the form of a method statement that will have been approved by the ECO - Disturbance of the area for the servitude must not exceed specifications. The footprint area must be kept to a minimum of 20m. - Filling of the open trench with subsoil and topsoil to a minimum of 300 mm above ground level to allow for subsidence. - Drainage lines are not to be altered and these areas should be level with the surrounding land once subsidence has occurred. - Shaping of the disturbed areas to blend with the surrounding landscape.	Trenching is in line with the recommendations made in the EMPr.	Contractor, CER, Engineer.	Contract	During the construction period	ECO	During the excavation and backfilling of trenches.

10. OPERATIONAL PHASE

Activity	Aspect	Potential Impact	Mitigatory Measure (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Sewer Pipeline operational	Pipeline	Sewer Pipeline failure	Objective(s): Minimal impact on groundwater due to sewer pipeline failures. Target: • An emergency reaction procedure must be developed. • An internal Dolomitic risk manager must be appointed. • A system must be in place so that sudden pressure fluctuations can be detected. • Leaks detected in high-risk areas should have the shortest response time. • The crew must be equipped with sufficient supplies in the stock yard to handle any pipe failure at any time. • The following should be logged in a logbook at the time of the call out: ➢ Position of problem ➢ Cause ➢ Modus operandi for repair work ➢ What follow up work must be undertaken. ➢ Recommendations for upgrading where necessary. • The area affected by the leak should be cordoned off. • The appropriate Local Authority should be				Continuous		

			contacted.						
Sewer Infrastructure Preventive Maintenance and Sewer Overflow Response Plans	Pipeline	Sewer Pipeline failure	Objectives: Reducing public health hazards, protecting the environment, ensuring regulatory compliance, and minimizing Sanitary Sewer Overflows (SSOs). Operations and Maintenance: The City aims to provide uninterrupted sewer service, sustain aging infrastructure, and implement effective asset management. Customer Service A system for managing complaints is in place, where issues can be reported through various channels. Complaints are logged, assigned, investigated, and resolved, with results documented in an SAP database. Cleaning, Inspection, and Assessment Program: This program aims to assess the sewer collection system's condition over ten years. Key elements include: • Cleaning: Maintenance activities are categorized into priority, intermediate, and long-term schedules based on known problem areas. • Inspection: Regular use of CCTV to assess and document the conditions of sewer lines, manholes, and associated structures. • Data Management: Results from inspections and cleanings are recorded to prioritize maintenance activities and determine necessary repairs or replacements. Preventive and Corrective Maintenance A structured program includes hydro-cleaning, regular maintenance hole inspections, and root control measures. This plan is designed to minimize system	Proactive maintenance, effective customer service, and rapid response to emergencies to ensure public health and environmental protection			Continuous		

		stoppages, odours, and lift station failures. Reactive Maintenance Procedures are established to address unplanned or emergency maintenance needs without leading to overflow events. This includes identifying repair requirements during routine inspections and maintaining an emergency response protocol for sewer overflow events, including immediate action steps. Overflow Response Plan The Overflow Response Plan outlines the procedures to confirm and report overflows, manage environmental impacts, and communicate with affected stakeholders. The plan includes specific actions for various overflow types, including: • Sewage Overflow Reports: Detailed documentation is required within 24 hours of overflow confirmation. • Emergency Procedures: Steps involve assessing the situation, setting up containment measures, and conducting repairs. • Monitoring and Assessment: Post-incident evaluations to track effectiveness and compliance with established protocols. Staffing and Training Johannesburg Water has defined responsibilities for personnel within the maintenance program. The training program focuses on expanding technical skills related to operation and maintenance, safety procedures, and emergency responses.						
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11. REHABILITATION

Rehabilitation must be carried out as soon as possible after the construction is completed. All rehabilitation is to be done with the approval of JW environmental management. Consent must be given in writing to the EMS section for rehabilitation.

a) Rehabilitation of Construction Camps

The removal of all construction facilities and materials from the construction camp will be required, and rehabilitation will have to be carried out, including the removal of the following:

- Concrete and compacted earth platforms.
- Fuel storage tanks; and
- Chemical toilets.

Access roads will need to be rehabilitated according to the requirements below.

Any contaminated material or soil must be removed to a registered hazardous waste disposal facility and the prescribed re-vegetation process must then be followed thereafter.

b) Eradication of Alien Vegetation

All alien vegetation spread over the entire construction footprint must be removed, irrespective of its existence prior to construction. Chemical removal shall be used in accordance with manufacturer's specification for weeds. All chemicals used must be approved by the ECO. Once the weeds have perished, they shall be removed mechanically by use of an offset disk plough thereby digging up the vegetation including the root ball.

Control of Alien Vegetation

The remainder of the site including the revegetated areas shall be kept free of weeds and alien vegetation.

c) Rehabilitation

- Ensure that landscaping specialist is appointed to undertake the rehabilitation as per JW internal requirements.
- Ensure that JW EO, ECO and Site Environmental Officer is invited for the practical inspection and completion inspection after the completion of the rehabilitation on site.
- The snag list is to be compiled and accepted by all parties (JW CAPEX Representatives, JW environmental section, ECO and appointed Contractor) All responsible personnel including Environmental representatives sign both practical and final completion letter.
- Filling of the open trench with subsoil and topsoil to a minimum of 300 mm above ground level to for subsidence.
- allow Shaping of the disturbed areas to blend with the surrounding landscape.
- Placing of topsoil on all disturbed areas (minimum depth 150 mm).
- Organic fertilizers must be added to the topsoil prior to seeding (if required).
- Revegetation of all areas where topsoil is placed using a mixture of indigenous grasses and bushes.
- Maintenance of these areas until an acceptable cover has been established. Acceptable cover shall mean 75% basal cover with no gaps exceeding 500 mm. Maintenance may include watering, mowing and weeding as well as preventing the development of erosion channels or, backfilling where they have occurred.

Environmental Management Programme: Olifantsvlei Wastewater Treatment Works Infrastructure
Renewal Project

Appendix A: Maps and Sensitivity Maps

Appendix B: Standard Method Statement

(If the space provided is insufficient then attach additional sheets)

WHAT:	Subject of M/Statement				
WHO:	Site Foreman/contact person:				
	Submitted to (e.g. ESA):		Approved by:		
	Date Submitted on:		Date Approved:		
WHEN:	Date works start		Date works complete		
	Rehabilitation period:		Programme restrictions (critical path, season restrictions etc.)		
	Split work Phasing:	Item	start date		end date
	Phase 1				
	Phase 2				
WHERE	Area of works – submit plan or sketch if appropriate – stockpile, detention ponds, boundaries / restriction of works, special features or mitigation works landscape specials etc.:				
HOW:	Route/site layout pegged:	Date available to inspect	Inspection required:		persons
	Landscape concerns: (Specify items not covered in EMPr. Refer to EMPr items if required.)				
	Existing features & services affected (e.g. paths, curbing, irrigation etc.)				
	Trees (protection or removal methods).				



	Special vegetation
	Reinstatement methods
	Maintenance
	Exclusion areas
HOW	General Environmental: (specify items not covered in EMP. Refer to EMP items if required.)
(cont.)	Access:
	Machinery:
	Earthworks & dust control:
	Concrete works:

	Storm-water control:
	Stockpiles:
	Refuse/rubble:
	Water quality – pumping, source & discharge points, settlement, filtration, duration etc.:
	Hydrocarbon control measures:
	I&AP notifications:
	Fire/emergency contingencies:
	Special conditions / mitigation measures (e.g. stream crossings, live sewer proximity etc.):

Comments:

Appendix C: EAP TEAM CV's

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION	
	PROJECT NUMBER:	JW14466R
	PROJECT LOCATION:	Olifantsvlei WWTW
	PROJECT DESCR:	Renewal of Van Wyksrust Pump station

ANNEXURE 5:

JW 6.4 (RETURNABLE ANNEXURE A)

 Johannesburg Water	OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION	
	TENDER NUMBER:	JW 14466R
	PROJECT LOCATION:	Olifantsvlei Wastewater Treatment Works
	PROJECT DESCRIPTION:	OLIFANTSVLEI WASTEWATER TREATMENT WORKS INFRASTRUCTURE RENEWAL PLAN REFURBISHMENT OF VAN WYKSRUST PUMP STATION

Returnable Annexure A: Acknowledgement of SHE Specification & Annexures

DECLARATION BY CONTRACTOR

I, the undersigned, and representing the tenderer as indicated hereby acknowledge that I have obtained copies of the following listed documentation and confirm that I fully understand the contents thereof and confirm compliance thereto in the event of being successful:

- OHS Specification (Volume 2)
- Annexure 1: Baseline Risk Assessment
- Annexure 2: Medical Screening Policy
- Annexure 3: Sign off form
- Annexure 4: Environmental Management Plan

We furthermore commit to:

- Comply with all applicable SHE related legal and other requirements.
- Inform all staff of their role in managing environmental impacts and safety hazards on site.

Signed at on this Day of 20.....

Name of tenderer	
Name of Authorized person	
Authorized Signature*	

**Signature must be as per form T2.12 as applicable*