Note:

This form is to be accompanied by scope of work document.
Procurement process must not proceed without this approved document.

C3: Scope of Work: Service Information

PART C3: SCOPE OF WORK

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3.1 *EMPLOYER'S* WORKS INFORMATION

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SECTION 1

1 Description of the *works*

1.1 Executive overview

The Salt River Precinct is a Transnet owned property located in Cape Town. The precinct is leased out to multiple external tenants. The tenants utilise the space for various operations such as;

- Storage of rigging equipment
- Film props storage
- Parking of Trucks (horse and trailers)
- Furniture manufacturing
- Container stacking
- Welding and hot works
- Café and Office block

The roads and surface area within the yard are predominantly utilized by heavy duty trucks and passenger vehicles that frequent the site to do deliveries or pickup cargo daily for operations within the precinct. The asphalt road is badly damaged, and the temporary repairs have become ineffective as the subbase and underlying layers are negatively affected. The precinct also requires functional additional sewer, storm water drainage network to improve and sustain the condition of the roads operational area. In addition, a new fire main must be installed for the sprinkler system.

The are unpaved container stacking areas as well as uneven concreted surfaces which must be demolished and new heavy duty interlocking pavers including asphalt surfaces constructed.

The Promat Building office block portion on the ground floor was burned, currently it is condemned due to the risk of the fire damaged first floor slab collapsing. There is no proper access control point, therefore new boom gates need to be installed complete with a surveillance system.

1.2 *Employer's* objectives

The *Employer*'s objectives is to address roads, water reticulation and storm water infrastructural issues within the Salt River Precinct The works to be perform include.

- Underground services:

Installation of new storm water network.

Installation of new fire and domestic water main.

Replacement of aged sewer line.

- Paving:

  Rehabilitation of damaged uneven concrete paving, which must be broken down and replaced with interlocking pavers and asphalt surfaces. The extension of paved area where there's currently no paving.

- Roads:

Rehabilitation of the existing road network within the yard by replacing the damaged layers and resurfacing the affected areas. Design asphalt road using reclaimed layers to form part of the road formation of the truck exit road via Loco road.

- Access Control:
  Installation of access control boom gates complete with surveillance cameras and a sliding gate with a motor.
- Promat Building:
  Repair of fire damaged rooms, waterproofing walls and windows as well as the refurbishment of the building. The upgrade of the building's reception area, the repairs to the palisade fence /boundary wall and painting of parking bays.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
AIA	Authorised Inspection Authority
BBBEE	Broad Based Black Economic Empowerment
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CRL	Contractor Review Label
CSHEO	Contractor's Safety, Health and Environmental Officer
CM	Construction Manager
DTI	Department of Trade and Industry
DWG	Drawings
EO	Environmental Officer
HAW	Hazard Assessment Workshop
HAZOP	Hazard and Operability Study
HSSP	Health and Safety Surveillance Plan
INC	Independent Nominated Consultant
IP	Industrial Participation
IR	Industrial Relations
IPP	Industrial Participation Policy
IPO	Industrial Participation Obligation
IPS	Industrial Participation Secretariat
IRCC	Industrial Relations Co-ordinating Committee
JSA	Job Safety Analysis
CIRP	Contractor's Industrial Relations Practitioner
Native	Original electronic file format of documentation
PES	Project Environmental Specifications
PHA	Preliminary Hazard Assessment
PIRM	Project Industrial Relations Manager
PIRPMP	Project Industrial Relations Policy and Management Plan
PLA	Project Labour Agreements
PSIRM	Project Site Industrial Relations Manager

PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager
ProgEM	Programme Environmental Manager
ProjEM	Project Environmental Manager
QA	Quality Assurance
R&D	Research and Development
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Co-ordinator
SIP	Site Induction Programme
SMP	Safety Management Plan
SSRC	Site Safety Review Committee

2 Engineering and the *Contractor's* design

2.1 *Employer's* design

2.1.1 The *Employer*'s design for the *works* is: Works Information, Technical specifications, Bill of quantities and General Arrangement Drawings. The drawings for providing the *Works* are listed in this Works Information

2.1.2 The *Employer* grants the *Contractor* a licence to use the copyright in design data presented to the *Contractor* for the purpose of the *works* (and the *Contractor*'s obligation under paragraph 2.2 of the *Employer's Works* Information) ONLY.

2.2 Parts of the *works* which the *Contractor* is to design

2.2.1 The *Contractor* is to design the following parts of the *works*:

- Underground water, stormwater and sewer networks.
- Design road surfaces and pavement finished levels to allow water to flow into existing storm water networks.
- Provide slope protection or soil retaining solutions where necessary.
- Temporary works during the duration of the contract.

2.2.2 The *Contractor* is responsible in his design for the overall integration of the design of the *works* with the design of the *Employer* as stated under 2.1 *Employer*'s design above for the following parts of the *works*:

- Existing underground water, stormwater and sewer networks.
- Existing road surface and interlocking paving.

2.2.3 Unless expressly stated to form part of the design responsibility of the *Employer* as stated under 2.1 *Employer's* design above and whether or not specifically stated to form part of the design responsibility of the *Contractor* under this paragraph 2.2, all residual design responsibility and overall responsibility for the total design solution for the *works* rests with the *Contractor*.

2.3 Procedure for submission and acceptance of *Contractor's* design

2.3.1 The *Contractor* shall address the following procedures:

- Submit designs in electronic native and PDF format to the Project Manager for review and approval as per consulting engineers or technologist's designs.
- Contractor may not proceed with these works until written approval is obtained from the Project Manager

2.3.2 The Contractor undertakes design safety reviews with Project Manager and/or Risk Manager

2.3.3 Documentation Submission

In undertaking the 'Works' (including all incidental services required), the Supplier shall conform and adhere to the requirements of the 'Contractor Document Submittal Requirements' Standard

2.4 Review and Acceptance of *Contractor* Documentation

The *Contractor* submits documentation as the '*Works* Information' requires to the *Project Manager* for review and acceptance.

In undertaking the '*Works*' (including all incidental services required), the Supplier shall conform and adhere to the requirements of the '*Contractor* Document Submittal Requirements' Standard

2.5 Other requirements of the *Contractor's* design

2.5.1 The *Contractor*'s design complies with the following:

The relevant SANS standards and guard house plan must be approved by the local municipality.

2.6 Use of *Contractor's* design

2.6.1 The *Contractor* grants the *Employer* a licence to use the copyright in all design data presented to the *Employer* in relation to the *works* for any purpose in connection with the construction, reconstruction, refurbishment, repair, maintenance and extension of the *works* with such licence being capable of transfer to any third party without the consent of the *Contractor*.

2.6.2 The *Contractor* vests in the *Employer* full title guarantee in the intellectual property and copyright in the design data created in relation to the *works*.

2.7 Design of Equipment

2.7.1 The *Contractor* submits his design details for the following categories of his proposed principal Equipment to the *Project Manager* for his information only:

Nil

2.8 Equipment required to be included in the *works*

2.8.1 None

2.9 As-built drawings, operating manuals and maintenance schedules

2.9.1 The *Contractor* provides the following:

As built drawings after the completion of the works.

2.9.2 As-Built/Final Documentation

2.9.3 Installation, Maintenance and Operating Manuals and Data Books

3 Construction

3.1 Temporary *works*, Site services & construction constraints

3.1.1 *Employer*'s Site entry and security control, permits, and Site regulations

The Site is located within an operational area of the Employer, and the Contractor shall ensure the safe passage of traffic to and around the Site at all times. This shall entail the provision of flagmen, protective barriers, lanterns, signs, etc. for protection, direction and control of traffic.

The Contractor shall organise the work to cause the least possible inconvenience to other construction activities or operations at the Site. Access for Others to adjacent areas shall be maintained at all times.

The Site is located within a designated Secure Area, and accordingly all access into the area will be through a gate with access control.

The Contractor shall obtain the necessary entry permits for all staff working within the area in accordance with the access control requirements of the Employer and shall issue each personnel member with an appropriate identification card.

All costs incurred in providing construction personnel with ID cards and access permits shall be borne by the Contractor.

The site establishment area shall be clearly sign posted and be compliant with the relevant safety regulations and restrictions that might be in place until the Contractor has de-established from site and comply with OHS Act 85 of 1993.

The Contractor is responsible for the security of the Works until completion and hand-over, and must make his own arrangements for security and the safekeeping of his property. The Contractor's watchmen are allowed on Site for this purpose.

If the working area is situated within a Customs controlled area, the Contractor and his people shall observe all Customs regulations.

The fullest collaboration between the Contractor, the Employer's Operations Manager and the Project Manager is essential in regard to the continued operations of the Employer.

Housing of the Contractor's people on site is not permitted.

All work on, over, under or adjacent to railway lines and near high voltage equipment shall comply with Transnet SOC Limited codes of conduct.

3.1.2 The *Contractor* complies with the following requirements of the *Employer*:

As per paragraph 3.1.1 above.

3.1.3 Restrictions to access on Site, roads, walkways and barricades

People restrictions on Site; hours of work, conduct and records:

The working hours shall be in accordance with the requirements of the Department of Labour or with the agreement of the relevant trade unions. This information relating to working hours shall be supplied to the Project Manager prior to commencement of the proposed working hours.

Contractor's staff shall be confined to the working area and defined access routes and shall not be allowed to be present in other areas of the Employer. Contractor staff found disobeying this instruction will be subject to disciplinary action.

3.1.4 The The Contractor keeps daily records of his people engaged on the Site and Working Areas (including Subcontractors) with access to such daily records available for inspection by the Project Manager at all reasonable times.

3.1.5 The *Contractor* complies with the requirements stated under paragraph 2.3 of C3.1 *Employer*'s Works Information.

3.1.6 Health and safety facilities on Site

At all times during construction the *Contractor* is responsible for the safety of all persons on the Site and on the equipment and shall have the necessary systems and procedures in place to effectively manage this in relation to H & S requirements in addition to those of the OHSA Act and Regulation (85 of 1993, CR 2014).

3.1.7 Environmental controls, fauna & flora, dealing with objects of historical interest. The *Contractor* shall perform the *Works* and all construction activities within the Site and Working Areas having due regard for the environment and environmental management practices.The *Contractor* complies with the CEMP, SES and PES in the construction of the *works*, all as described under paragraph 2.4 of C3.1 *Employer*'s Works Information.

3.1.8 Title to Materials from demolition and excavation

Clause 73.2 states that the Contractor has title to Materials from excavation and demolition only as stated in the Works Information.

3.1.9 The *Contractor* has title to all Materials arising from excavation and demolition in the performance of the *works* with the exception of: Train railway lines and sleepers

with title to such Materials (as referenced above) remaining with the Employer. The Project Manager shall instruct the Contractor how to label, mark, set aside and/or dispose of such Materials for the benefit of the Employer in accordance with ECC Clause 73.1.

3.1.10 Cooperating with and obtaining acceptance of others

During the course of the contract, departments of Transnet and other Contractors may be working in the general area surrounding the working area. The Contractor must make allowance for the necessity to interface with the activities of others, and to allow for safe access and working conditions.

3.1.11 The *Contractor* performs the *works* and co-operates with:

Trenching and excavation work to obtain strict supervision of local signals department and in certain instance may require preparation work of the signal's Contractor. Reroute cables or boxes or decommission certain elements. Local signals to verify existing signal or VIS elemwnts in vicinity. No new signal works required.

At least some of the Site work may take place while the adjacent areas will be in operation. The Contractor shall take all necessary steps for his Works not to interfere with operations and to ensure that normal traffic flow of the operational terminal is not obstructed.

The success of the project depends on the effective co-operation of all Contractors on site, and the Contractor, if necessary, must discuss his programme on a day to day basis with the Project Manager to ensure effective co-ordination.

3.1.12 Publicity and progress photographs

The Contractor treats all information gained through his appointment on this project as strictly confidential. The Contractor is not allowed to prepare or present any paper, publish any article in a technical journal, or derive publicity for his business which makes any reference to any aspect of the work on this project unless the Employer grants special permission, in writing, for the purpose.

Photographs are to be taken for record purposes only.

The Contractor provides a comprehensive photographic record of the progress of the Works by taking photographs at weekly intervals. The initial photographs are to be taken at the start of the project, immediately prior to the commencement of any work. As far as possible each set of photographs shall be taken from the same locations as the previous set.

The areas to be photographed and the quantity of photographs in each area will be determined by the Project Manager.

3.1.13 The *Contractor* provides a notice board: Not a requirement

3.1.14 Progress photographs of all manufacturing work carried out off-site are also required.

3.1.15 Photographs are to be submitted in JPEG format, with a minimum resolution of 1200 x 800. Each set of photographs must be accompanied by an index showing:

- Contract reference
- Photograph file reference
- Date of Photograph
- Subject matter

3.1.16 The *Contractor* does not advertise the contract or the project to any third party, nor communicate directly with the media (in any jurisdiction) whatsoever without the express written notification and consent of the *Project Manager*.

3.1.17 *Contractor*'s Equipment

All Equipment supplied and used by the Contractor on Site shall be selected and operated in such a way that design loadings of the particular areas are not exceeded and that damage to all

existing surfaces and services are avoided. The Contractor will be required to repair, at his own cost and to the satisfaction of the Project Manager, any such damage caused by him.

All Equipment necessary for the Works shall be provided and allowed for by the Contractor.

3.1.18 All Equipment necessary for the Works shall be provided and allowed for by the Contractor. The *Contractor* keeps daily records of his Equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.

3.1.19 Equipment provided by the *Employer*

No Equipment will be provided by the Employer.

3.1.20 Site services and facilities:

When required in terms of the delivery methodology, a Site will be made available to the Contractor as erection Site and for all his Working Areas.

An electric supply point is available to the Contractor at this site, but the Contractor is responsible for connecting up and for cabling in the working area.

A potable water supply point is available to the Contractor at this site, but the Contractor is responsible for connecting up in the working area.

The Contractor shall make his own arrangements for the supply of other services such as ablutions, fire protection, lighting and all other services required for undertaking the Works. The Contractor shall provide, maintain and finally remove proper portable latrines of sufficient number at his cost. Latrines shall be properly constructed and placed in suitable positions and maintained in a clean and sanitary working condition.

3.1.21 Wherever the *Employer* provides facilities (including, *inter alia*, temporary power, water, waste disposal, telecommunications etc) for the *Contractor's* use within the Working Areas and the *Contractor* adapts such facilities for use, then the *Contractor* makes good and provides full reinstatement to the land (including all apparatus of the *Employer* and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the *Employer*.

3.1.22 Facilities provided by the *Contractor:*

The Contractor submits the following drawings to the Project Manager for acceptance before commencing with the establishment of the site facilities:

Location drawing showing the area to be occupied by the Contractor in relation to the site infrastructure.

Layout drawing of the proposed facilities.

The Contractor must ensure that the working area is well lit at night and that all the fences, obstacles and hazards are marked.

Project Manager's approval must be obtained for the use of any temporary lighting on the Site due to the impact that this may have on surrounding operations.

The Contractor must maintain the working area in a neat and tidy condition to the satisfaction of the Project Manager.

The Contractor must make his own arrangements for the disposal of sewerage and waste water. Sewerage may not be disposed of on site. Transnet facilities may not be used.

The Contractor must make his own arrangements for telecommunication facilities, if required, for his use during the execution of the Works.

The Contractor, within fourteen days after completion, must completely remove from site all his plant, materials, Equipment, stores and temporary accommodation or any other asset belonging to him and leaves the site in a tidy condition to the satisfaction of the Project Manager. No excess or discarded materials, plant or stores may be buried or dumped within the Employer's boundaries.

3.1.23 Unless expressly stated as a responsibility of the Employer, Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the Contractor to Provide the Works remains the responsibility of the Contractor.

3.1.24 Wherever the *Contractor* provides facilities (either his own or for the *Project Manager* and/or *Supervisor*) and all items of Equipment, involving, *inter alia*, offices, accommodation, laboratories, Materials storage, compound areas etc, within the Working Areas, then the *Contractor* makes good and provides full reinstatement to the land (including all apparatus of the *Employer* and Others in, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.

3.1.25 Unless expressly stated as a responsibility of the *Employer* as stated under 5.1.11 Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the *Contractor* to Provide the *Works* remains the responsibility of the *Contractor*.

3.1.26 Existing premises, inspection of adjoining properties and checking work of Others

The Contractor will be held responsible for any damage to existing structures and services caused by him during the execution of this Contract, fair wear and tear excluded and shall repair damage to the satisfaction of the Project Manager before completion of the Works.

For this purpose, a joint inspection with the Project Manager and the Contractor will be carried out prior to occupation of the Works and any existing damage noted. Repair work to damaged existing structures and services may be carried out during the contract period or during the defect correction period if so authorised. The Contractor will be required to conduct a photographic site survey of the occupied area showing existing structures and services. This report must be submitted to the Project Manager for approval and will be used in assessing the damages to structures and services if applicable. The Contractor the work of with which the works interfaces in conjunction with the Project Manager:

3.1.27 Survey control and setting out of the *works*

Immediately after the starting date, and prior to final design, the Contractor shall survey the complete site of final operation of the equipment or, if the site of final operation is not completed yet, obtain the necessary site arrangement and interface drawings from the Project Manager. This survey serves to confirm dimensions and relative positions of all things, existing or to be supplied by others that will interface with the equipment, for example location of electrical power supply points.

It is the Contractor's responsibility to ensure that the equipment supplied in terms of the contract interfaces successfully with all existing infrastructure.

Any deviation from the data supplied by the Employer in the Works Information must be brought under the attention of the Project Manager and discussed and finalised with the Project Manager prior to final design of the equipment.

3.1.28 Excavations and associated water control

All excavations deeper than 1.0m below ground level or as otherwise indicated by the Employer's Safety Officer and Supervisor in terms of the current Construction Regulations, shall either be fully shored or the sides shall be battered back to a safe angle as determined by the strength of the soil and approved by the Supervisor.

Shallow ground water may be encountered in the excavations. Where this occurs, the Contractor is to provide suitable de-watering equipment. The discharge from the dewatering equipment must be controlled in accordance with the requirements of the Standard Environmental Specification and Construction Environmental Management Plan. Discharge directly into the storm water drainage system or into the sea is not permitted. All excavations deeper than 1.0m below ground level or as otherwise indicated by the Employer's Safety Officer in terms of the current Construction Regulations, shall either be fully shored or the sides shall be battered back to a safe angle as determined by the strength of the soil and approved by the Supervisor.

3.1.29 Underground services, other existing services, cable and pipe trenches and covers

The Contractor must, in collaboration with the Supervisor, ascertain whether the service is live. The Contractor shall not uplift any such service unless he is instructed to do so.

The Contractor shall be held responsible for any damage to known services, and he shall take all necessary measures to protect them. In the event of a service being damaged, the Contractor shall immediately notify the Supervisor. The Contractor shall not repair any such service unless he is instructed to do so.

3.1.30 Where the *Contractor* encounters existing underground services / existing services cables / pipe trenches, the *Contractor* undertakes the following:

The contractor must mark them on as built drawings and on site. The contractor must ensure that they are safe and protected from damage during the construction if any relocation of such services is required, the Project manager must be notified and grant the necessary approval.

3.1.31 Control of noise, dust, water and waste

All Site activities must comply with the relevant parts of legislation and OSH Act 85 of 1993.

3.1.32 The *Contractor* notifies the *Project Manager* three days in advance of the elements of the *works* which are to be covered up.

3.2 Completion, testing, commissioning and correction of Defects

3.2.1 The *work* to be done by the Completion Date

On or before the Completion Date the Contractor shall have done everything required to Provide the Works including the work listed below which is to be done before the Completion Date and in any case before the dates stated. The Project Manager cannot certify Completion until all the work listed below has been done and is also free of Defects, which would have, in his opinion, prevented the Employer from using the works and Others from doing their work.

Item of work	To be completed by
As built drawings of the completed work	Within 30 days of Completion

3.2.2 Use of the *works* before Completion has been certified

In terms of Clause 35.2 in ECC the Employer may use any part of the works before Completion has been certified.

3.2.3 Access given by the *Employer* for correction of Defects

Clause 43.4 requires that the Project Manager arrange for the Employer to allow the Contractor access to and use of a part of the works, which has been taken over if needed to correct a Defect. After the works have been put into operation, the Employer may require the Contractor to undertake certain procedures before such access can be granted.

3.2.4 The *Contractor* complies with the following constraints and procedures of the *Employer* where the *Project Manager* arranges access for the *Contractor* after Completion:

Where the Contractor has to return to Site after Completion to rectify notified Defects, the Employer may either impose the same Site access / egress restrictions as communicated elsewhere under C3.1 Employer's Works Information at the starting date / access date stated under Contract Data - Part One, or as the works are now in use or the Employer's occupation of the Site may be incrementally or substantially changed post Completion, there may be further access / egress restrictions stated here at paragraph 3.2.13 of C3.1 Employer's Works Information.

4 Plant and Materials Standards and Workmanship

4.1 Investigation, Survey and Site Clearance

4.1.1 The *Contractor* shall obtain as built information of the site from Transnet Property prior to any construction. It is also the responsibility of the *contractor* to verify existing services and notify the *Project Manager* if any existing unforeseen services are encountered.

4.1.2 The *Contractor* shall survey the existing invert levels of stormwater networks and sewer networks which the new networks will be connected into.

4.1.3 The *Contractor* shall survey the existing water network which the new network will be connected into.

4.1.4 Remove stockpiled non contaminated G5 material to be used as base material for parallel parking bays and excess material on the road surface and sidewalks, dispose spoil at a register municipal dumping site.



Fig 1. Stockpiled G5 material to be reused and spoil disposed off site.

4.1.5 The *Contractor* shall clear the site of any rubble and vegetation before commencement of construction to be dumped at a registered municipal dumping site.



Fig 2. Typical rubble and vegetation to be removed off site.

4.2 Building works

4.2.1 Where the Association of South African Quantity Surveyors Model Preamble for Trades 1999 are used within the Works Information, the following interpretations and meanings shall apply:

4.2.2 In case of any conflict in interpretation, ambiguity or discrepancy between any Model Preamble for Trades 1999 (whether standard or written as a particular project specification) contained in the *Works* Information and the *conditions of contract*, the *conditions of contract* take precedence within the ECC Contract.

4.2.3 In case of any conflict in interpretation, ambiguity or discrepancy between any Model Preamble for Trades 1999 (whether standard or written as a particular project specification) contained in this paragraph 4.2 of C3.1 *Employer*'s Works Information and specific statements contained elsewhere in C3.1 *Employer*'s Works Information, the specific statements contained elsewhere shall prevail, without prejudice to the *Project Manager's* express duty to resolve any ambiguity or inconsistency in the *Works* Information under ECC Clause 17.1.

4.2.4 Within the Model Preambles for Trades 1999, the following amendments and interpretations shall apply:

Where the word or expression "Principal Agent" is used, read "*Project Manage*r" or "*Supervisor*" as the context requires.

Where the word or expression "*Contractor*" is used, read "*Contractor*".

Where the word or expression "Engineer" is used, read "*Project Manager*" or "*Supervisor*" as the context requires.

Where the Model Preambles for Trades 1999 mention "rates" for measured work and any contractual statements relating to payment, all such statements shall be discounted, with the ECC *conditions of contract* taking precedence.

4.2.5 Within the Model Preambles for Trades 1999, A. GENERAL, the following amendments and interpretations shall apply:

Where the word or expression "bills of quantities" is used, this shall be discounted for the purposes of the *Works* Information. The ECC Contract Data - Part One states the main option to apply within the ECC Contract between the Parties.

4.2.6 Within the Model Preambles for Trades 1999, B. ALTERATIONS, B.2 MATERIALS FROM THE ALTERATIONS, CREDIT, ETC and C. EARTHWORKS, C1.4 Materials from demolitions shall not apply. C3.1 *Employer's* Works Information paragraph 3.1.6 states details of the *Contractor's* title (if any) to Materials arising from excavations and/or demolitions and how such Materials are either to be disposed of or re-used in the *works*.

4.2.7 Within the Model Preamble for Trades 1999 Q. PLUMBING AND DRAINAGE, Q.24 TESTS shall be deemed to be included within paragraph 3.2.1 of C3.1 *Employer's* Works Information.

4.2.8 Within the Model Preamble for Trades 1999 U. EXTERNAL WORKS, U.3.8 Process control tests shall be deemed to be included within paragraph 3.2.1 of C3.1 *Employer's* Works Information.

4.3 Civil Engineering and Structural Works

4.3.1 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in the *Works* Information and the conditions of contract, the conditions of contract take precedence within the ECC contract.

4.3.2 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in this paragraph 4.3 of the *Employer*'s *Works* Information and specific statements contained elsewhere in C3.1 *Employer*'s *Works* Information, the specific statements contained elsewhere shall prevail, without prejudice to the Project Manger's express duty to resolve any ambiguity or inconsistency in the *Works* Information under ECC Clause 17.1.

4.3.3 Within SANS 1200 A: GENERAL, the following amendments and interpretations shall apply:

Where the word or expression “Employer” is used, read “*Employer*”;

Where the word or expression “Contractor” is used, read “*Contractor*”;

Where the word or expression “Engineer” is used, read “*Project Manager*” or “Supervisor” as the context requires;

Where the word or expression “schedule of quantities” is used, this is deleted in entirety. Assessment and payment is in accordance with the *conditions of contract* (and the ECC main and secondary options stated therein);

4.3.4 Within SANS 1200 A: GENERAL 2.3 DEFINITIONS, the following apply:

“Acceptable. Approved (Approval)” is interpreted as either a *Project Manage*r or a *Supervisor* communication or instruction in relation to Works Information compliance, consistent with the *conditions of contract* as the context requires;

“Adequate” is deleted. The *Project Manager* notifies the *Contractor* where the *Contractor* has not complied with the *Works* Information;

“Measurement and payment” and the further definitions contained within 6.3 c) are deleted. Assessment and payment is in accordance with the conditions of contract (and the ECC main and secondary options stated therein);

4.3.5 Within SANS 1200 A: GENERAL 2.6 APPROVAL, the following applies:

“Approval” by either the *Project Manager* and/or the *Supervisor* is without prejudice to ECC Clause 14.1 and, inter alia, ECC Clauses 13.1, 14.3 and 27.1.

4.3.6 SANS 1200 A: GENERAL 2.8 ITEMS IN SCHEDULE OF QUANTITIES, is deleted in entirety. Assessment and payment is in accordance with the *conditions of contract* (and the ECC main and secondary options stated therein).

4.3.7 SANS 1200 A: GENERAL 3.2 STRUCTURES AND NATURAL MATERIAL ON SITE, applies only to the extent that it is consistent with paragraph 3.1.6 of C3.1 *Employer*’s Works Information.

4.3.8 Within SANS 1200 A: GENERAL 7.1 PLANT, the following applies:

Where the word or expression “Plant” is used, read “Equipment”.

4.3.9 SANS 1200 A: GENERAL 7.2 *CONTRACTOR*’S OFFICES, STORES AND SERVICES, applies but the *Project Manager* resolves any inconsistency with statements included within paragraph 3.1.12 of C3.1 *Employer*’s Works Information.

4.3.10 SANS 1200 A: GENERAL 3.1 SURVEY, applies only to the extent that it is consistent with paragraph 3.1.14 of C3.1 *Employer*’s Works Information.

4.3.11 Within SANS 1200 A: GENERAL 3.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS, the following applies:

Where the word or expression “specification” is used, read “Works Information”.

4.3.12 SANS 1200 A: GENERAL 3.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES applies only to the extent that it is consistent with the specific statements made elsewhere in C3.1 *Employer’s* Works Information and in any case and at all times consistent with the *conditions of contract*.

4.3.13 Within SANS 1200 A: GENERAL 5 TESTING, the following applies:

Where the word or expression “Engineer” is used, read “*Supervisor*”.

4.3.14 SANS 1200 A: GENERAL 8 MEASUREMENT AND PAYMENT, is deleted in entirety. Assessment and payment is in accordance with the conditions of contract (and the ECC main and secondary options stated therein).

4.3.15 The principles, meanings and interpretation stated and established within paragraphs 6.3.1 to 6.3.15 with respect to SANS 1200 series and to SANS 1200 A: GENERAL equally apply to the other SANS 1200 specification references [state particulars of SANS 1200 used] used within this paragraph 6.3 of C3.1 *Employer’s* Works Information.

4.3.16 left behind in the *works*, then please read this term as “Plant” for ECC defined term compliance.

4.. Earthworks, Layer works and Surfacing

4.4.. Scope of work

The works for the site clearance, earthworks and layer works as per bill of quantities include the following:

a. Clearing of site

b. Demolition of concrete aprons, walls and channels.

c. Bulk excavation and treatment of in-situ material.

d. Ripping and re-compaction of subbase course.

e. Construction of bitumen treated base and cement stabilised base course.

f. Construction of asphalt surfaces, inter-locking pavements, bases and V-channels.

g. Construction of storm water, water and sewer system to be incorporated into the existing network.

h. Repair of damage sections of damaged concrete.

i. Installation of electrical sleeves complete with draw pits.

And any other work arising out of or incidental to the above or required of the *Contractor* for the proper completion of the works.

4.4.. Supporting Specifications

This section, "Site Clearance, Earthworks and Layer works", shall be read in conjunction with the following SANS and Transnet standard specifications.

SANS Specifications	
SANS 1200 A	General
SANS 1200 AB	Engineer's office
SANS 1200 C	Site Clearance
SANS 1200 D	Earthworks
SANS 1200 DB	Earthworks (Pipe Trenches)
SANS 1200 DM	Earthworks (roads, sub grade)
SANS 1200 G	Concrete
SANS 1200 GM	Concrete (small works)
SANS 1200 L	High pressure pipelines
SANS 1200 LB	Bedding (Pipes)
SANS 1200 LC	Cable ducts
SANS 1200 LD	Sewers
SANS 1200 LE	Stormwater Drainage
SANS 1200 LF	Erf Connections
SANS 1200 M	Roads (General)
SANS 1200 ME	Subbase

SANS 1200 MF	Base
SANS 1200 MH	Asphalt base and surfacing
SANS 1200 MJ	Segmented paving
SANA 1200 MK	Kerbs and Channels
SANS 1200 MM	Ancillary roadworks
SANS 3000	Requirements for systemic engineering and operational safety standards - Track and associated civil infrastructure and installations

4.4.. Earthworks (SANS 1200D)

4.7.4.. Classification (Sub-clause 3.1)

Notwithstanding the provisions of sub-clause 3.1, the materials excavated will not be classified for the purposes of measurement and payment. The unit rate for excavation shall cover excavation in all materials other than hard rock.

4.7.4.. Removal of Topsoil

Topsoil shall be stockpiled such that the stockpile shall not be disturbed during the construction of other services. Only topsoil that will be required for banks and sidewalks must be stripped and stockpiled to dedicated temporary area for re-use.

4.7.4.. Exposing existing services

Services are known to exist within the construction area. Where services are positively identified and location known, these will be pointed out to the *Contractor* by the by the *Project Manager*.

The *Contractor* shall plot and identify all services located and record these on the "As-built" copy of the Services Plan.

The *Contractor* shall assist when required where alterations to services are required by providing labour, plant and material to carry out the necessary work as instructed by the *Project Manager*.

4.7.4.. Materials

4.4.3.4.1. Bulk Excavation

If any of the excavated material is considered re-usable, The existing layers excavated shall be carted to a spoil site to be identified adjacent to the works.

4.4.3.4.2. Disposal of material

All vegetation, trees, etc. resulting from site clearance shall be removed off site to a designated dump site. Haulage and disposal to this site shall be included in the rates. Burning of materials on site is not permitted.

4.7.4.. Testing

4.4.3.5.1. Checking

The *Contractor* shall carry out sufficient checks to satisfy himself that the materials used and the workmanship (construction, tolerances and strength) attained comply consistently with the specified requirements. The *Supervisor* will carry out checks and the result made available to the *Contractor*.

4.4.3.5.2. Quality Control

Workmanship, tolerances and frequency of testing (ie. Layer works compaction tests) shall be in accordance with the relevant specifications.

4.4.. Method statement

The *Contractor* shall submit a detailed method statement setting out what quality control procedures will be implemented with respect to quality assurance. The *Contractor* shall indicate what certification, if any, they have in terms of SANS or Investigative service provider (ISP) quality assurance schemes.

Procedures, methods and plant for the transportation of hot asphalt to site.

Procedures, methods and plant to be used for placing and compacting asphalt on site.

4. Demolition

4.5.. Scope of work

This part covers the demolition of the existing storm water manholes, concrete bases, pipes, walls and buildings as per bill of quantities.

a. Mini Electrical kiosk building to be demolished all the live electrical cable fitted into a new mini kiosk weatherproof Box / cabinet complete with new DB board and all accessories.



Fig 3. Existing Mini Kiosk to be demolished.

b. Demolition existing damaged brick and concrete ablution block including foundations



Fig 4. Damaged ablution block to be demolished

c. Allow for the demolition of 139 m long, 250 mm thick and 3m high reinforced concrete walls used as sand bins including footings and dispose all the sand and vegetation at a designated municipal dump site. All the electrical wiring an water pipes mounted on the wall to be relocated and made safe prior to demolition.



Fig 5. Sand bins to be demolished

d. Removal and stockpiling of 60 kg/m rails out of the including the concrete and wooden sleepers to be stockpiled on site for Transnet's scrap bank. Rail sections to be pointed out on site by Project Manager.



Fig 6. Typical rail to be cut and lifted out of the ground.

e. Railway line stop Block to be removed at reinstalled at a new location as pointed out by the Project Manager.

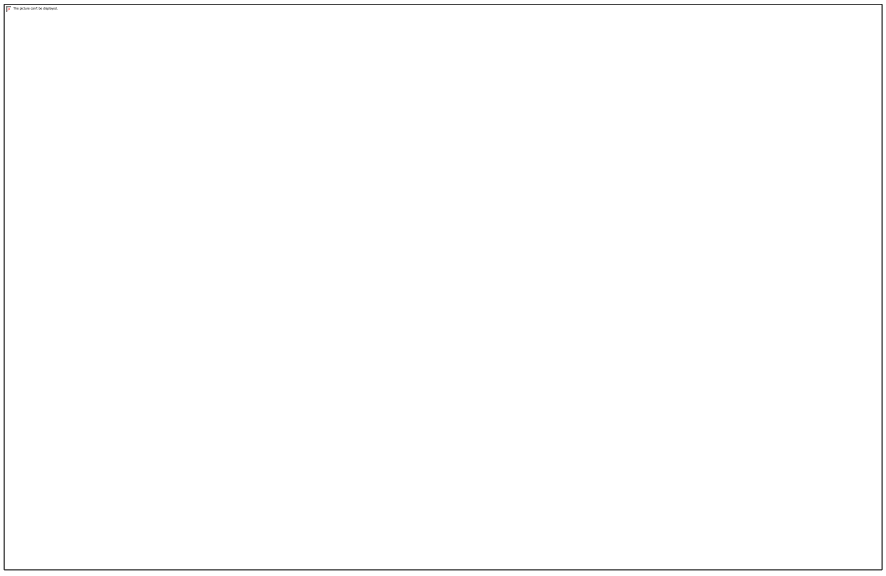


Fig 7. Typical rail stop block to be relocated.

f. Demolition of floor slab to be made level with the finished road surface.

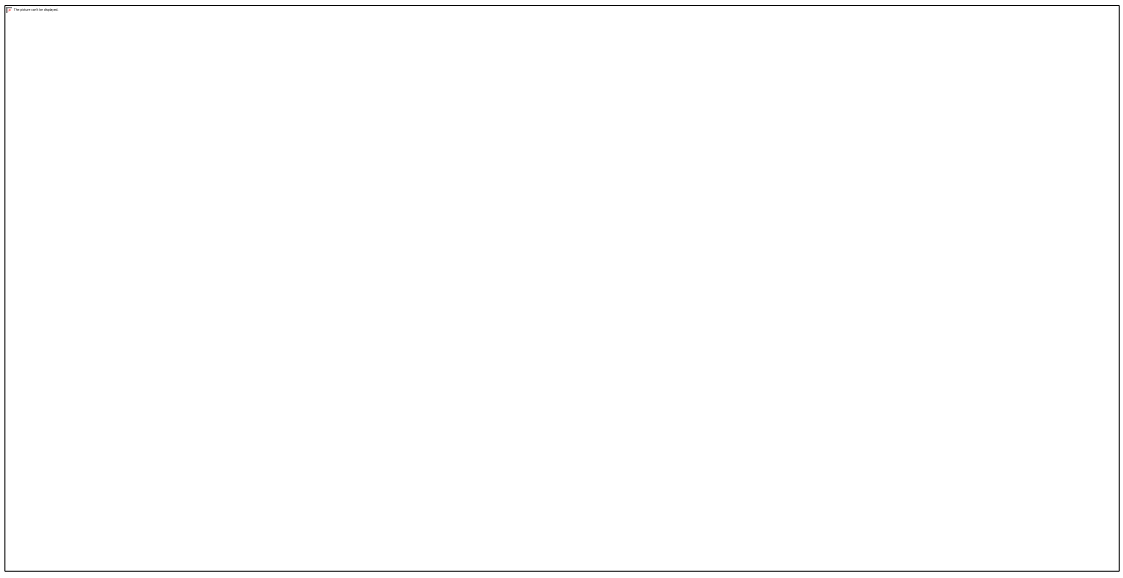


Fig 7. Concrete flow slab to be demolished.

g. Demolition of reinforced concrete base, ground beams and concrete brick stormwater man-hole wall at Area K.



Fig 7. Typical bases, ground beams and brick wall to be demolished

4.5.. Supporting Specifications

This specification must be read in conjunction with the following specifications:

SANS Specifications	
SANS 10400 Part E & F	Building Regulations
SANS 1200 DA	Earthworks (small works)
SANS 1200 DB	Earthworks (pipe trenches)
SANS 1200 M	Roads General
SANS 1200 ME	Subbase
SANS 1200 MF	Base
SANS 1200 MFL	Base (light pavement structures)

4. Existing services

All known services are provided on the drawing, however, due to the lack of adequate as-built records, the *Contractor* will be required to prove services prior to removal. The *Contractor* shall take the necessary precautions to ensure that the services are not damaged.

As soon as any underground service not shown on the drawings is discovered, it shall be brought to the attention of the *Project Manager*. The *Contractor* must in collaboration with the *Project Manager*, ascertain whether or not the service is live. The *Contractor* shall not uplift any such service unless he is instructed to do so.

The *Contractor* shall be held responsible for any damage to known services (i.e. services that are within the site of the works and are shown on the drawing) and he shall take all necessary measures to protect them. In the event of a service being damaged, the *Contractor* shall immediately notify the Technical Officer. The *Contractor* shall not repair any such service unless he is instructed to do so.

4. Stormwater Drainage, water mains and sewer line

4.11.. Scope of Work

The scope of work for the construction of a storm water drainage, water mains and sewer system required for this project shall include for the delivery to site, off-loading and storage on-site, setting out, execution of the works, testing, commissioning and handing over as per bill of quantities.

The works for the Storm water drainage include the following:

a. Excavate, supply, bed, lay class 34 uPvc 250mm diameter storm water pipe and tie into existing outlet headwall and/or discharge into earth drain.
b. Construction of a storm water manholes and inlets.
c. Construction of a concrete V-drain.
d. Design and construction of heavy duty precast concrete U-channel drains complete with grid inlet drains.
e. Design and construct storm water outflow connection at Area P complete with customised grating to prevent debris and rubble from clogging the outflow. Re-route electrical cables through a sleeve above the outflow channel.

The works for the water mains include the following:

f. Excavate, supply, bed, lay class 12 uPvc 160mm diameter and 110mm diameters sprinkler and fire/domestic water mains. Pressure test and disinfect pipes according to applicable SANS standards.
g. Pressure test and disinfect existing new pipelines before connecting them with the newly installed mains.
h. Installation of underground fire hydrants to replace existing standpipes.
i. Connect the new water mains to existing sprinkler, underground fire hydrants and buildings domestic supply.
j. Installation of isolation valves.
k. Installation of anchor blocks on existing and new pipelines.

The works for the sewer mains include the following:

l. Installation of new 110mm diameter uPvc class 34 sewer line at Area N to allow for future toile connection complete with manholes.
m. Repair damaged 60mm diameter erven ware pressurised sewer pipe.

And any other work arising out of or incidental to the above or required of the *Contractor* for the proper completion of the works.

4.11.. Equipment

The *Contractor* shall ensure that only equipment suitable for working in the confined limits of the site of works and able to obtain the required specification of layer works is used.

4.11.. On-site Storage

The *Contractor* shall be allocated a storage area on site and shall be responsible for all materials stored on site until such time that the water main has been tested and handed over to the *Employer.*

4.11.. Construction

4.7.4.. **Brickwork manholes, headwalls and catch pits.**

All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement mortar as specified.

4.7.4.. Preparation of Trench Bottom

All trench bottoms shall be prepared in accordance with SANS 1200 DB clause 5.5.

4.11.. Supporting Specifications

This specification must be read in conjunction with the following specifications:

SANS Specifications	
SANS 10252	Water supply and drainage
SANS 1200L	PSL medium pressure pipelines
SANS 2001-DP2:2010	Medium pressure pipelines

4. Additional works

The *Contractor* shall execute all work as per Bill of quantities.

a. The painting of the security guardhouse walls
b. Supply and install guardhouse office counter including 4 office chairs
c. Install remote operated high volume boom gates.
d. Installation of a surveillance camera system
e. Installation of main sliding gate including the modification of the perimeter vibracrete slab as well as a pedestrian gate.
f. Refurbishment existing street lighting, fitted with energy saving LED light fittings



Fig 8. Streetlights to be refurbished.

g. The refurbishment of the existing communal toilet.



Fig 9. Existing communal toilet to be refurbished.

h. The replacement of damaged sewer pumphouse door.

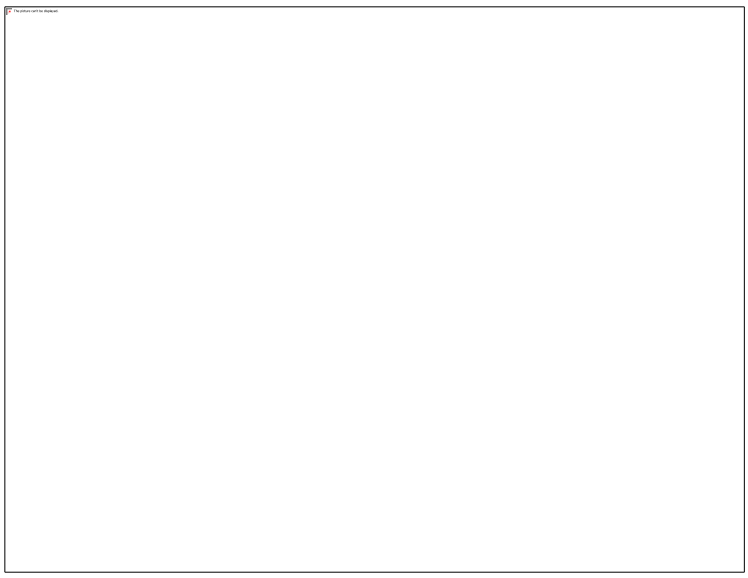


Fig 9. Damaged sewer pump house door,

4. Road marking

The *Contractor* shall provide all equipment required to execute the *works*. All paint shall conform to SANS 731-1.

The following must be noted by the *Contractor* in terms of SANS 731-1:

a. The paint shall be a Type 2 Paint

b. The paint shall be suitable for use in a parking area on a segmented concrete surface

c. Drying time classification shall be Class 1

The colours required for the completion of the contract shall be:

d. White

e. Red

f. Golden Yellow (BS381C-356 or CKS 279 – D26)

All the above colours to meet classifications according to SANS 1091

Special care to be taken with regard to level crossing workings if necessary.

4. Promat Building

All work to be done as per bill of quantities.

a. The demolition of damaged concrete slab as instructed by structural Engineer or Technologist.

b. The repair of concrete floor as per structural engineer or Technologist's recommendations.

c. The refurbishment of the building by painting after the building has been fully water proofed and replacing carpets, doors and broken windowpanes.

d. Installation of damaged electrical wiring and fittings complete with a CoC.

e. Waterproofing the entire building's face brick walls

f. Painting of all burglar doors and windows.
g. Installation of a door closer at the main entrance.
h. Replacement of the main entrance damaged tiles and painting of the floor.
i. Replacement of office door.
j. Installation of a surveillance system.
k. Installation of a sliding gate motor.
l. Installation of a fire escape door with a fire alarm sensor and break glass for keys.
m. Repair the damage palisade and brick perimeter fence.
n. Paint parking's including two People with Disability bays Infront of the building.
o. Remove all the weeds on the paving and apply herbicide.
p. Repair damaged concrete apron.
q. Reinstate removed interlocking pavers on the sidewalk.

4. Concrete Works

4.11.. Scope of Work

The scope of work for the construction of concrete manholes, channels and concrete panels shall include for the delivery to site of all materials necessary to complete the works, off-loading on site, storage on-site, setting out, installation and tie in.

The works includes for the following:

a. Construction of concrete slabs / apron around the fuel station
b. Construction of concrete channels
c. Construction of concrete stormwater manhole base.
d. Earthworks, including excavation, dewatering, preparation of base and foundations
e. Reinforcing and formwork
f. Casting of concrete

And any other work arising out of or incidental to the above or required of the *Contractor* for the proper completion of the works.

4.11.. Particular Specifications

This section, "Concrete Works", must be read in conjunction with the following specifications:

SANS Specifications	
SANS 1200 G	Concrete
SANS 1083:1994	Aggregates from natural sources
SANS 10100-2:1992	The Structural use of concrete – Part 2 : Materials and execution of work
SANS 50197-1	Cement – composition, specifications and conformity criteria. Part 1: Common cements
SANS 1491-1	Portland cement extenders – Part 1 Ground granulated blast furnace slag
SANS 1491-2	Portland cement extenders – Part 2 Fly ash.

SANS 1491-3	Portland cement extenders – Part 3 Condensed Silica Fume

5 List Of Drawings

5.1 Drawings issued by the *Employer*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Description		
Drawing No.	Revision	Description
SRX0150m	9	Roads and Repairs upgrades
108981-S01	1	Floor Slab Layout, Sections and Details
108981-F01	1	Plan, Elevation and Section Layouts
108981-D01	1	Door, Window and Burglar bar schedule
108981-E-01	1	Ground & First Floor Lighting & Power Layout
108981-E-02	1	Single Line Diagram DB-1, DB-2
T-SEC10		Freestanding pole sign (10 Slat)

SECTION *2*

6 Management and start up

6.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Contract Management (overall contract progress and feedback, including risk register)	Every week	On-Site/ TP offices	*Project Manager*, *Supervisor / Risk manager,* Contractor's Project Manager/Construction Manager, Project Team
SHE meetings	Weekly	On-Site	CSHEO
Safety Action Meetings	Weekly	On-Site	CSHEO
SHE Pre-mobilisation Meeting	Within 1 week prior to site establishment by Contractor	TP offices	Project Manager, HSR, EO, PCSHEO, Contractor's Project Manager / Construction Manager
Stakeholder Engagement Meetings	Monthly	On-Site/ TP offices	Client, Project Manager Contractor's Project Manager/ Construction Manager

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings are to be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.
All meetings are to be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register are not to be used for the purpose of confirming actions or instructions under the contract as these are to be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

6.2 Documentation Control

In undertaking the '*Works*' (including all incidental services required), the *Contractor* shall conform and adhere to the requirements.
The *Contractor* is to ensure that the latest versions of the required application software and a suitable 'IT' Infrastructure are in place to support the electronic transmission of documentation.

6.3 Safety risk management

6.3.1. Health and Safety Standard

The *Contractor* shall comply with the requirements of the Occupational Health and Safety Act.

6.3.2. *Contractor's* General Requirements for Health and Safety

The *Contractor* is solely responsible for carrying out the work under the Contract having the highest regard for the health and safety of its employees, Transnet's employees and persons at or in the vicinity of the Site, the Works, temporary work, materials, the property of third parties and any purpose relating to the *Contractor* carrying out its obligations under this Contract.

The *Contractor* must initiate and maintain safety precautions and programs to conform to all applicable Health and Safety laws or other requirements, including requirements of any applicable government instrumentality and client corporate, business unit and site requirements. The *Contractor* must, at its own cost, erect and maintain safeguards for the protection of workers and the public. The *Contractor* must manage all reasonably foreseeable hazards created by performance of the work. The *Contractor* must:

- Provide all things and take all measures necessary for maintaining proper personal hygiene, ensuring safety of persons and property and protecting the environment at or near the Site.
- Avoid unnecessary interference with the passage of people and property at or near the Site.
- Prevent nuisance and excessive noises and unreasonable disturbances in performing the Services.
- Be responsible for the adequacy, stability and safety of all of its site operations, of all its methods of design, construction and work and be responsible for all of the work.

Costs for the above are borne by the *Contractor.*

The *Contractor* must comply and is responsible for ensuring that all of its Sub-contractors comply with the relevant legislation(s) and statutory regulations for health and safety, the Transnet Health and Safety requirements included in the Contract and other document pertaining to health & safety contained in the Programme Health & Safety Management System and include standards, policies, procedures, guidelines and safe work instructions.

6.3.3. *Contractor's* Health and Safety Management Plan

The *Contractor* must prepare, implement and maintain a project-specific Health and Safety Management Plan. The plan must be based on the requirements set out in this specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan must demonstrate the *Contractor's* commitment to health and safety and must, as a minimum, include the following:

- A copy of the *Contractor*'s Health and Safety Policy; in terms of the OHS Act section 7;
- Procedures concerning Hazard Identification and Risk Assessment, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable Legal and Other Requirements, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning Health and Safety Objectives – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;

- Details concerning Resources, Accountabilities and Responsibilities – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;
- Details concerning Competence, Training and Awareness – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- Communication, Participation and Consultation arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- Documentation and Document Control – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining Operational Control, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- Emergency Preparedness and Response procedures;
- Management of Change – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- Sub-contractor Alignment procedures – a process must be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- Measuring and Monitoring plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. noise, dust, etc.) in order to determine the effectiveness of control measures;
- Incident Reporting and Investigation procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- Non-conformance and Action Management procedures concerning the management of corrective actions;
- Performance Assessment and Auditing procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the Management Review process followed to assess the effectiveness of health and safety management efforts.

6.3.4. Site Supervision

The *Contractor* shall comply with OH&S Act – Section 8, 9, 13 and 16 and the Construction Regulations 2014.

The *Contractor* must nominate and appoint a responsible person on site to whom the *Project Manager* may refer in connection with the *Work*s. Persons are nominated for all shifts worked or whilst any activity relating to the Contract is being performed on site, and must have the authority to bind the *Contractor* with respect to the Contract. (OH&S Act - 16 Sections (2)).

The *Contractor* must ensure that the performance of all specified Works is supervised throughout by a sufficient number of qualified and competent appointed representatives of the *Contractor*, who have experience in the type of work specified. (OH&S Act – Construction Reg. 8 (1) and 8 (2.)

Note: No work may commence and or continue without supervisory Appointees present on site. The *Contractor's* Site Supervisor must be equipped with a mobile telephone with message bank and/or pager or an equivalent communication device so that communication throughout the Contract can be maintained at all times.

The *Contractor's* Site Supervisor must provide a list of names and contact telephone numbers of all *Contractors* and Sub-Contractor's contact persons on Site. This list is updated as a new Contractor or Sub-Contractor employee commences on Site.

The *Contractor's* Site Supervisor must keep a record of all employees, including date of induction, relevant skills and licences, and be able to produce this list at the request of the *Supervisor*.

The *Contractor's* Site Supervisor must complete manning sheets describing the day's activities, labour numbers and classifications and issue these to the *Supervisor* prior to 9.00 am on a daily basis.

The *Project Manager's* Site Safety Representative is notified of any new starter with evidence of induction and site specific induction prior to commencement of work.

6.3.5. *Contractor's* Health and Safety Manager

The *Contractor's* Health and Safety Manager specific tasks are

- Design the health and safety management systems specific to the need of the project, organisational and specific construction project management system.
- Facilitate and coordinate the preparation of a site specific construction health and safety plan.
- Manage the process for the assessments and approval of sub-contractors health and safety plan in line to the Client requirements.
- Facilitate monthly health and safety meetings.
- Ensure identification of the hazards and risks relevant to the construction project through regular coordinated site inspections.

- Attend and participate in all project meetings
- Use of trends analysis to identify systems deficiencies and incident trends, outline relevant improvements
- Manage the necessary changes to the health and safety plans
- Manage the reporting and investigation of project related incidents
- Manage and maintain health and safety and communication structures and systems, distribution of health and safety specific documents to contractors
- Monitor, measure and report on health and safety system performance through facilitating compliance health and safety audits
- Analysing of audit results and trends to ensure continual improvement
- Evaluate the levels of compliance of *contractors* to the project health and safety plan and Transnet site specific health and safety specifications.
- Manage and evaluate processes for reporting of non-compliance issues and implementation of identified appropriate corrective and preventative action
- Manage site health and safety during defects liability period
- Prepare a health and safety close-out report as per Client requirements

Health and Safety Manager must register with SACPCMP to be allowed to practise construction safety in this project.

Before placing a Health and Safety Manager on the project site(s), the *Contractor* must forward a copy of the person's CV to the nominated project management representative for review and acceptance. A proposed candidate may be rejected should he/she not meet the experience and / or qualification requirements, or due to poor work performance on previous projects.

6.3.6. *Contractor's Safety Officer*

The *Contractor* must appoint a full-time Health and Safety Officer for the duration of the contract that is registered with the SACPCMP (The South African Council for Project Construction Management Professions). If more than 100 employees are deployed on the project site(s) (directly or through sub-contractors), at least two full-time Health and Safety Officers must be appointed, with an additional Health and Safety Officer appointed for every 100 additional employees thereafter.

The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-contractors) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the *Contractor* must make provision for an additional Health and Safety Officer.

Each *Contractor's* Health and Safety Officer shall be responsible for:

- Reviewing all applicable legal and project health and safety requirements and providing guidance to *Contractor* and sub-contractor personnel (particularly the *Contractor's* Project Manager) to help ensure compliance at all times;
- Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the *Contractor*;
- Participating in the Baseline Risk Assessment for the *Contractor's* scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the *Contractor* and ensuring that identified control measures are implemented;
- Conducting *Contractor's* health and safety induction training for all *Contractors* and sub-contractors personnel;
- Compiling and maintaining all health and safety related documents and records required of the *Contractor;*
- Communicating relevant health and safety information to *Contractor* and sub-contractor personnel (e.g. incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);
- Carrying out Safety Observations and Coaching (one per day);
- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the *Contractor's* appointed supervisors, and attending at least one DSTI each day;
- Attending monthly *Contractor* and Site Health and Safety Meetings;
- Assisting with the implementation of the *Contractor's* Health and Safety Management Plan and associated Safe Work Procedures;
- Carrying out Planned Task Observations on an ad hoc basis;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all *Contractor* and sub-contractor activities;
- Responding to workplace incidents (as appropriate);
- Participating in incident investigations;
- Maintaining accurate health and safety statistics (for the *Contractor* and all sub-contractors), and compiling health and safety performance reports as required;

- Auditing the health and safety management system and workplace activities of the *Contractor* and each sub-contractor on a monthly basis to assess compliance with the project health and safety requirements; and
- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).
- The *Contractor* must ensure that they have made adequate provision of safety officers as per the works information works packages i.e (construction of mechanical and electrical works) Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Before placing a Health and Safety Officer on the project site(s), the *Contractor* must forward a copy of the person's CV to the nominated project management representative or to the Programme Health and Safety manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and/or qualification requirements, or due to poor work performance on previous projects.

6.3.7. *Contractor's* Safety Manual

The *Contractor* must provide a hard copy of its safety manual, policies and procedures to the *Project Manager* for acceptance prior to the commencement of any site work. The *Contractor* must ensure that his personnel, at all times, strictly observe and comply with the procedures set out therein. The *Project Manager* or the *Project Manager's* nominated Representative may from time to time request safety procedures applicable to the area of operations. The *Contractor* must forward to the *Project Manager* any updates or revisions to its safety manuals, policies or procedures as soon as practicable following revision or update.

The *Project Manager* may require the *Contractor* from time to time to supplement its safety manual, policies and procedures with guidelines and/or operating standards provided to the *Contractor* by the *Project Manager*. The *Contractor* must comply with such requests where the request is consistent with the requirements of the Contract. The *Contractor* must give prompt written notice to the *Project Manager* of any objection to the requested supplement, including the reasons for objection. The *Project Manager's* rights under this Clause are not intended, and must not be construed, to relieve the *Contractor* from any obligations to ensure compliance with all provisions of this Contract.

6.3.8. Performance Measurement and Reporting

a) Health and Safety Statistics

The *Contractor* and each of its Sub-contractors must complete and submit Health and Safety statistics to the *Project Manager* or the *Project Manager's* nominated representative, or as amended by the *Project Manager*, before mid-day on the Friday of each week. The *Contractor* must submit monthly Health & Safety Statistics before mid-day on the last day of each month to the *Project Manager's* nominated representative.

b) Safety Management Records

The *Contractor* must submit to the *Project Manager* for acceptance a schedule of the specific Health and Safety records it intends to maintain for the Contract. As a minimum, such records are as specified by applicable legislation. Copies are provided to the *Project Manager* or the *Project Manager's* nominated Representative if requested.

c) Field Technical/Safety Audit by the *Project Manager*

The *Project Manager* or the *Project Manager's* nominated Representative has the right to conduct audits/inspections of the Consultant, Professional Service Provider (PSP) and *Contractor* Safety Management Plan implementation, operations, equipment, emergency procedures, etc., at any time, and the *Contractor* must fully cooperate with the *Project Manager* or the *Project Manager's* nominated Representative during such audits/inspections. The *Project Manager's* rights under this clause does not, must not and will not relieve the Consultant, Professional Service Provider (PSP) and *Contractor* of its own obligations to conduct audits and reviews of its own Health and Safety performance.

Where such audits/inspections reveal deficiencies in the *Contractor* procedures, drills, training or equipment, or non-conformities with the *Contractor* accepted project Safety Management Plan, of a minor nature (Risk Rating of 6 or less), the *Contractor* must investigate the cause of the nonconformity and initiate corrective and preventive action to rectify such deficiencies and non-conformities and prevent recurrence as soon as practicable.

Where such audits/inspections reveal deficiencies of a major nature (Risk rating of 7 or greater), the *Contractor* must stop work on the operation/activity concerned, immediately investigate the cause of the nonconformity, and initiate corrective actions to rectify such deficiencies and non-conformities and to prevent recurrence. These corrective action plans is submitted to the *Project Manager* for review and comment within 24 hours of the audit finding.

Where such deficiencies include an unsafe practice or a breach of the statutory or the Contract's requirements, the *Project Manager* or the *Project Manager's* nominated Representative may in accordance with the General Conditions of Contract suspend the work associated with the unsafe practice or breach until the deficiency is rectified.

The *Project Manager* or the *Project Manager's* nominated Representative will establish a schedule of regular field safety audits which will be based on an audit tool aligned to the *Contractor* Safety Management Plan and site operations and activities. The *Contractor* audit conformance will be assessed as a percentage and where conformance is better than 90% it will be considered satisfactory and the *Contractor* must develop and implement an action plan within 4 weeks, to be reviewed at the next regular audit. Where the *Contractor* level of conformance is between 75 – 90%, a corrective action plan will be required to be developed and implemented within 2 weeks, and a follow up audit will be carried out. Where the *Contractor* conformance is less than 75% the *Contractor* must stop work until an investigation of the cause/s has been completed and corrective actions have been developed and implemented by the *Contractor.*

The *Contractor* must provide to the *Project Manager* or the *Project Manager's* nominated Representative, at a time to be agreed, but not to exceed monthly intervals, a regular status report on all outstanding corrective actions until they are successfully closed out.

d) Unsafe Act/Condition Auditing

The *Contractor* must implement a system to recognize, correct, and report unsafe acts/conditions (Unsafe Act/Condition Auditing) associated with all Site activities.

All such observations must be recorded and delivered to the Project Manager.

6.3.9. Involvement, Communication and Motivation

The *Contractor* and subcontractor's workforce must, through their supervision, safety notice boards, toolbox meetings and daily pre-start meetings be kept aware of safety related matters.

a) Safety Meetings

The *Contractor* must implement and comply with OH&S Act, Section 19

The *Contractor* must conduct weekly safety meetings with his employees to foster safety awareness. Copies of minutes and action items arising from such Toolbox meetings is submitted or otherwise made available for review by the *Project Manager* or the *Project Manager's* nominated Representative.

Such meetings should at least address:

- Accident / safety incidents
- Hazardous conditions
- Hazardous materials / substances
- Work procedures
- Protective clothing / equipment
- Housekeeping
- General safety topics
- Job or work look-ahead issues
- Safety statistics
- Significant Safety Occurrences (SSO)

The *Contractor* must conduct at least one formal safety meeting per month and must maintain appropriate records of attendance and meeting content. Such records are made available to the *Project Manager's* Representative. In addition to Daily Safe Task Instructions, the *Contractor* must conduct at least weekly "tool box" meetings to discuss safety issues and procedures.

b) Pre Start Safety Briefings

The *Contractor* must hold documented Daily Safe Task Instructions with each work team before the start of each shift. Attendance records and brief topic notes is kept for auditing and record purposes.

c) Safety Review Meetings

The *Contractor`s* Site Manager and a Site Safety Representative must take part in weekly safety review meetings between the *Contractor* and the P*roject Manager* or the *Project Manager's* nominated Representative.

The *Contractor* must attend all project safety meetings as outlined in the Project Safety Management Plan.

d) Site Safety Review Committee

The *Contractor* complies with the requirements of the SSRC with respect to his own activities and others on the Site and Working Areas.

e) HAZOP Review

The *Contractor* participates in HAZOP reviews upon the instruction and direction of the *Project Manager.*

The reviews may include, but not be limited to, studies to ensure that the plant is built and operated as designed and that personal safety, employee health and environmental protection systems conform to the *Employer's* and legislative requirements.

f) Job Safety Analysis

The *Contractor* completes a JSA prior to carrying out any operation on the Site and/or Working Area to the approval of the *Project Manager*.

g) Lines of Communication

The following personnel act on behalf of the *Project Manager* and may communicate directly with the *Contractor* and his key persons with respect to the SMP:

- Construction Manager (CM)
- Project Site Safety Manager (PSSM)

6.3.10. Roles and responsibilities

The roles and responsibilities of the various personnel acting on behalf of the *Project Manager* with respect to the SMP and health and safety issues are as stated in the paragraphs following:

a) Construction Manager

The CM is responsible (in the context of the SMP only) for health and safety on the Site and Working Areas and reports to the *Project Manager*.

The CM specific tasks (in the context of the SMP) are:

- Implement the safety management system

- Monitor compliance to the established safety management system
- Ensure risk is at an acceptable level
- Ensure Consultant Construction Management Team are competent
- Provide for:
- Planning, organisation, leadership and control
- Particular technical competencies for critical work
- Supervision and control on each shift
- Regular monitoring and assessment
- Workplace inspections

b) Project Site Safety Manager

The PSSM is responsible for ensuring that the *Contractor* complies with the SMP. The PSSM acts on behalf of the *Project Manager.*

The PSSM specific tasks (in the context of the SMP) are:

Define, in accordance with the HSSP, the:

- Safety program (instructions, training, meetings, inspections, incentive)
- Health and medical program
- Checks that *Contractors* have issued their Health and Safety plans, PPSPS and procedures before the beginning of work
- Organizes safety awareness campaigns
- Promotes communication on all health and safety matters (awards, incentives, meeting/inspections/audits reports)
- Checks conformance of equipment to technical requirements and regulations.
- Issues and address the site EHS activities reports
- Promotes everybody's best efforts to keep accident frequency and severity ratios at their lowest level
- Promotes a proper and continuous housekeeping of plant and temporary facilities in order to create the most suitable conditions for workers to wok and to be encouraged to follow HSE requirements
- Conducts worksite EHS walks with all Contractors, and directs appropriate corrective actions

- Monitors that all factors likely to improve health and safety are taken into consideration, particularly those which lead to:
  - Promoting personnel protection as an absolute requisite
  - Investigating, identifying and neutralizing potential hazards
  - Close coordination with all parties involved in construction in order to avoid over-crowded areas and dangerous operations
  - Thorough preparation of work critical phases
  - Close contacts to local EHS authorities
  - Continuous follow-up in order to correct immediately unsafe acts and situations
- In case of accident, he takes actions necessary to:
  - Initiate quick interventions of the emergency means.
  - Check that first aid and evacuation of injured persons are properly carried out.
  - Obtain a clear accident report from the sub-contractor concerned.
  - Report immediately to the Construction Manager.
  - Investigate to identify the root causes of all incident and near misses.

6.3.11. Commissioning Safety Study

The *Project Manager*, through his Construction Management Team, will facilitate and coordinate a formal Commissioning Safety Study and ensure that required procedures are prepared prior to the commencement of the commissioning phase.

The Commissioning Safety Study will provide a final checkpoint for the completed work and is part of the process for ensuring that all necessary actions have been completed. The elements to be considered include:

- Mechanical and electrical integrity systems are in place (e.g. equipment tests and inspections of critical equipment, quality control procedures, etc.) which will confirm that construction, equipment and materials are in accordance with design specifications
- Formal hazard analyses for pre-commissioning and commissioning activities have been completed, appropriately documented and communicated, and are available to all personnel.
- Punch-list work has been sufficiently completed so that installations are safe to apply hazardous energy.
- Documentation relevant to any modifications has been created/updated.

- Safe operating, maintenance and emergency procedures are in place.
- Operating and maintenance manuals are available and training of commissioning employees has been completed.
- Red Line drawings are available.
- A Commissioning Permit (to apply hazardous energy) is developed and implemented.
- The *Project Manager* will ensure that after commissioning there is a formal documented hand over to operations and maintenance personnel and others who will be impacted by hazards that have been identified during project activities. This will involve communication of any changes to the process hazards, procedures and operating philosophy. Safe systems of work will be established and updated throughout the Project. Safe systems of work will be subject to on-going review to ensure their effectiveness. Site-wide Permits to Work will be used as the basis of safe systems of work for specified hazardous activities.

6.3.12. Working at Night

A site specific health and safety management plan should be well documented and structured so that both employers and employees can benefit from its use. The following are recommended components of a safety management plan for night time works.

a) Site personnel responsibility

It should be determined and stated clearly in the site specific health and safety management plan the responsibility of each individual at construction site for night time works. *Project Manager,* Engineers, Designers, Safety Officer and Site Supervisors as well as workers each have their specific responsibility to make sure the highest level of priority are given towards safety and health issues.

The *Contractor* must ensure adequate provision of safety officer personnel are present whenever working at night activities are taking place.

b) Permission to work at night

The *Contractor* shall apply in writing for permission to work at night and should be obtained from the relevant authority in this case *Project Manager*, before construction works at night is carried out. The *Contractors* should submit their application for work at night permit to Client representative and it is advisable to follow all requirements enforced by the authority to executing night time construction works.

c) Housekeeping

Accidents can occur as a result of poor housekeeping. Hazards at construction site are the same for both day and night shift while the risks of injury are much higher during night works because of the inherent

poor illumination. It is essential that the workplace is kept clean and tidy to ensure safety and prevent accidents.

d) Emergency Preparedness and Response (EPR)

Contractor should develop and implement the EPR that is specifically night time environment and submit for approval before work at night is carried out. A well-established EPR can help both *Contractors* and employees to prepare; response and recover should a disaster occurs.

e) Public safety

When construction works involves public area, it is important to make sure the safety of the public. The *Contractor* must consider the following when planning for night time work; identify the hazards for example construction vehicle movement or too much glare from lighting equipment and plan for vehicular movement to not interrupt peak hours and make sure adequate supervision is provided for such movement.

Contractor must provide sufficient signage to warn the public and put barriers at a safe distance to keep the public away.

Set up a safe walk ways where it is unavoidable to work near or in public vicinity.

Arrange noisy equipment or machinery at farthest point from the public or adopt an engineering control to reduce the noise.

When overhead crane is operating near the public, clear off the area and make sure adequate supervision is in place.

Schedule for daily cleaning of the adjacent public road and filling up holes as well as uneven surfaces.

f) Types of Risks and factors affecting night time work.

In order to decide when to conduct night time work, factors (parameters) affecting night time work must be identified. The *Contractor* must ensure the following factors are identified:

- Risk
- Illumination
- Nuisances
- Productivity
- Cost
- Safety

The *Contractor* must ensure that they implement the following step in an effective risk management program as to identify possible risks. Specific concerns related to night time work zones include poor visibility and work quality, staffing issues, unwanted noise and glare, decreased worker and driver alertness, impaired drivers, higher vehicle speeds, increased labor costs, materials and traffic control,

and problems in logistics and supervision. These risks are categorized broadly as safety, cost/production and schedule, quality, organizational relationships, technical, construction, economic, and environmental.

g) Risk

Night time construction introduces numerous risks to a construction project. One clear set of examples is driver and worker fatigue and reduced visibility, which are factors that could increase safety risks. Other major factors contributing to the risks of night time work are human factors such as sleep, stress, work, social or domestic issues, and psychological characteristics, such as appetite and safety. Additional factors associated with the risks of night time construction work zones are reduced work space for machinery and equipment movement, inadequate lighting, high speed of traffic during the night, and long working hours. Working at night does not supersede the Health and Safety requirements that enforces compliance during day shift.

6.4 Environmental constraints and management

6.4.1 The *Contractor* complies with the following ENV-STD-001 Rev01 (CEMP):

The *Contractor* performs the *works* and all construction activities within the Site and Working Areas having due regard to the environment and to environmental management practices as more particularly described within the SES and PES.

The SES describes the minimal acceptable standard for environmental management for a range of environmental aspects commonly encountered on construction projects and sets environmental objectives and targets, which the *Contractor* observes and complies.

The PES may require higher minimal standards than those described in the SES as may be required by the *Project Manager* or Others.

The overarching obligations of the *Contractor* under the CEMP before construction activities commence on the Site and/or Working Areas is to provide an environmental method statement for a particular construction operation at the Site and/or Working Area by the *Contractor* and where requested by the CM and to comply with the following:

Where relevant, method statements, as detailed in the SES and PES, shall be provided by the *Contractor*. These include, but are not limited to, the following where applicable:

- Establishment of construction lay down area
- Hazardous and non-hazardous solid waste management
- Storm water management
- Contaminated water management
- Prevention of marine pollution
- Hydrocarbon spills
- Diesel tanks and refuelling procedures
- Dust control
- Spoil dumping
- Sourcing, excavating, transporting and dumping of fill material
- Noise and vibration control
- Removal of rare, endemic or endangered species
- Removal and stockpiling of topsoil
- Rodent and pest control
- Environmental awareness training

- Site division
- Emergency procedures for environmental incidents
- *Contractor's* SHE Officer
- Closure of construction laydown area

The *Contractor* shall ensure that his management, foremen and the general workforce, as well as all suppliers and visitors to Site have attended the Induction Programme prior to commencing any *work* on Site. If new personnel commence work on the Site during construction, the *Contractor* shall ensure that these personnel undergo the Induction Programme and are made aware of the environmental specifications on Site.

Where applicable, the *Contractor* ensures that he appoints a suitably qualified Subcontractor, to be approved by the *Project Manager*, to undertake the "Removal of rare, endemic or endangered species". This appointment must be completed at least three weeks before commencement of any other work on Site.

The Protection of the Environment Form shall be signed and submitted to the CM within 14 days after the Contract Date.

Where required, one of the first actions to be undertaken by the *Contractor* shall be to erect and maintain a temporary fence along the boundaries of the Site and Working Areas as applicable, and around any no-go areas identified on the layout plans, to the satisfaction of the *Project Manager*.

The plant search and rescue (if applicable) must be undertaken and completed prior to any Site clearance or any other construction activity that may damage the vegetation can commences on Site.

The *Contractor* must appoint a sufficient number of named assistants to the CSHEO to monitor environmental issues e.g. litter, spills, illegal activities, fence patrol, dust etc. These appointments, along with details of the individuals being appointed and job descriptions, must be sent to the *Project Manager* for his approval.

During the construction period, the *Contractor* complies with the following:

A copy of the SES, and the relevant PES shall be available on Site, and the *Contractor* shall ensure that all the personnel on Site (including Subcontractors and their staff) as well as suppliers are familiar with and understand the specifications contained in the SES (as amended by the PES).

Method statements that are required during construction must be submitted to the *Project Manager* for approval at least 20 days prior to the proposed commencement of the activity. Emergency construction activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the *Project Manager*.

Where applicable, the *Contractor* shall provide job-specific training on an *ad hoc* basis when workers are engaged in activities, which require method statements.

The *Contractor* shall ensure that any Materials delivery drivers are informed of all procedures and restrictions (e.g. which access roads to use, no go areas, speed limits, noise, etc) required by the CEMP before they arrive at Site and off load any Materials.

The *Contractor* shall be responsible for rehabilitating and re-vegetating all areas to the satisfaction of the *Project Manager* as detailed in the SES and PES.

The *Contractor* shall clear and clean the Site and Working Areas and ensure that everything not forming part of the *works* is removed from the Site and Working Areas and that all rehabilitation has taken place in accordance with the PES. An Environmental Closure Certificate] has been issued by the SHEO and signed off by the *Project Manager*.

The Contractor complies with environmental inspections and audits .

The *Contractor* makes copies of the CEMP, SES and PES available at the offices of the *Contractor* on Site. The *Contractor* ensures that all personnel on Site (including Subcontractors) are familiar with and understand the requirements of the CEMP.

6.5 Quality assurance requirements

6.5.1 The *Contractor* shall have, maintain and demonstrate its use to the *Project Manager* (and/or the *Supervisor* to satisfy the requirements of paragraphs 7.4, 7.5, 3.2.1 and 3.2.8 as appropriate) the documented Quality Management System to be used in the performance of the *works*. The *Contractor*'s Quality Management System shall conform to International Standard ISO 9001 (or an equivalent standard acceptable to the *Project Manager*).

6.5.2 The *Contractor* submits his Quality Management System documents to the *Project Manager* as part of his programme under ECC Clause 31.2 to include details of:

- Quality Plan for the contract;
- Quality Policy
- Index of Procedures to be used; and
- A schedule of internal and external audits during the contract

6.5.3 The *Contractor* develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan.

6.5.4 The *Project Manager* indicates those documents required to be submitted for either information, review or acceptance and the *Contractor* indicates such requirements within his register of documents. The register shall indicate the dates of issue of the documents with the *Project Manager* responding to documents submitted by the *Contractor* for review or acceptance within the *period for reply* prior to such documents being used by the *Contractor*.

6.5.5 The Quality Plan means the *Contractor*'s statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that the *works* meet the standards stated in the *Works* Information

6.6 Programming constraints

6.6.1 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements of the CEMP, SES, PES and SMP as described under paragraph 2.4 of the Works Information, together with the associated environmental method statements.

6.6.2 The *Contractor* shows on each programme he submits to the *Project Manager,* the requirements as outlined in the ECC (Clause 31 and associated contract specific clauses). Additionally the *Contractor* shows on each programme he submits all internal procurement activities conducted by himself as well as associated works and/or deliveries of materials and/or services the *Contractor* procured via external parties.

6.6.3 The *Contractor* complies with the *Employer*'s programme when he submits his first programme.

6.6.4 The *Contractor* presents his first programme and all subsequently revised programmes (see ECC Clauses 31.2 and 32.1) in hard copy format and in soft copy format .

6.6.5 The *Contractor* uses Microsoft Project for his programme submissions or a similar programme software package subject to the prior written notification and acceptance by the *Project Manager*.

6.6.6 The *Contractor* shows on his Accepted Programme and all subsequently revised programmes schedules showing the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.

6.6.7 The *Contractor's* programme shows duration of operations in working days. A normal working week comprises five working days, each of eight working hours. Alternative working hours are to be submitted to the *Project Manager* for approval.

6.6.8 The *Contractor*'s programme shows the following levels:

- Level 1 Master Schedule – defines the major operations and interfaces between engineering design, procurement, fabrication and assembly of Plant and Materials, transportation, construction, testing and pre-commissioning, commissioning and Completion.
- Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below
- Level 3 Project Schedule – detailed schedules generated to demonstrate all operations identified on the programme from the starting date to Completion. Individual operations will be

assigned a code The *Project Manager* notifies any subsequent layouts and corresponding filters on revised programmes

- Level 4 Project Schedule – detailed discipline speciality level developed and maintained by the *Contractor* relating to all operations identified on the programme representing the daily activities by each discipline

6.6.9 The *Contractor* shows on each revised programme he submits to the *Project Manager* a resource histogram showing planned progress versus actual, deviations from the Accepted Programme and any remedial actions proposed by the *Contractor*.

6.6.10 The *Contractor* submits programme report information to the *Project Manager* intervals in addition to the intervals for submission of revised programmes stated under Contract Data Part One.

6.6.11 The *Contractor*'s weekly programme narrative report includes:

- Level 4 Project Schedule – showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted programme.
- 3-week Look ahead Schedule - showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted programme.
- Manpower Histogram – reflecting actual, forecasted and planned activities
- S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract utilising the earned values as calculated by the detailed progress report.

6.6.12 The *Employer* (including the agents of the *Employer*) operates on Site during [either state specific calendar dates or timings when the *Contractor* has completed certain elements of the *works* etc].

6.6.13 Others [state specific third parties] operate on Site during [either state specific calendar dates or timings when the *Contractor* has completed certain elements of the *works* etc].

6.7 Contractor's management, supervision and key people

6.7.1. *Contractor's* Project Manager

- The *Contractor* employs a Project Manager (CPM) as a key person under ECC3 Clause 24.1.

- The CPM is employed on a full-time basis and shall be site-based for the duration of the construction activities.

- The CPM must be familiar with, and have a solid understanding of, the operation of the NEC3 ECC and will have at least eight years' experience gained in a similar position on projects operating the NEC3 suite of contracts. Where the CPM cannot demonstrate the required level of experience in the NEC3 suite of contracts, the *Contractor* arranges for training to be given by an experienced independent trainer in the understanding and application of those management procedures contained in the NEC Contracts.

6.7.2. *Contractor's* Safety Health and Environmental Officer

- The *Contractor* employs a CSHEO as a key person under ECC Clause 24.1

- The CSHEO reports to the SHEC on the Site. The CSHEO ensures that the works (to include any part thereof) are subject to a prior environmental method statement(s) approved by the Construction Manager and ensures that the CEMP is implemented by the *Contractor* in a timely and proper manner. The CSHEO provides the *Project Manager* with all environmental method statements.

6.7.3. The CSHEO tasks are:

- Daily, weekly and monthly inspections of the Site and Working Areas. The *Contractor is* referred to Annexure 1 and 3 of the CEMP.
- Monitor compliance with the CEMP (to include the SES and PES) and the environmental method statements submitted to the *Project Manager*
- Reporting of an environmental incident (as defined in paragraph 6.4 of the CEMP) to the *Project Manager.*
- Attendance at all SHE meetings, toolbox talks and induction programmes as envisaged in the Standard Environmental Specification.
- Litter control and ensuring the *Contractor* clears litter from the Site and Working Areas and ensuring that environmental signage and barriers are correctly placed.

The CSHEO submits daily, weekly and monthly checklists to the SHEC. Report templates are included in the Starter Pack issued to the Contractor at the Kick-off Meeting hours, conditions of employment, work permits, etc. The Contractor shall further adhere to the requirements of any Industrial Relations Policy of the Employer applicable to the particular area, detail of which would be made available by the Project Manager when requested.

6.8 Insurance provided by the Employer

6.8.1 Insurance provided by the *Employer* is contained in the Contract Data – Part 1.

6.9 Contract change management

6.9.1 No additional requirements apply to ECC Clause 60 series.

6.10 Provision of bonds and guarantees

6.10.1 The form in which a bond or guarantee required by the conditions of contract (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

6.11 Records of Defined Cost, payments & assessments of compensation events kept by *Contractor*

6.11.1 The *Contractor* keeps the following records available for the *Project Manager* to inspect:
- Records of design employees location of work (if appropriate); and

6.11.2 The *Contractor* keeps the following records available for the *Project Manager* to inspect:
- Records of design employees location of work (if appropriate);
- Records of Equipment used and people employed outside the Working Areas (if applicable); and

6.12 The *Contractor's* Invoices

6.12.1 When the *Project Manager* certifies payment (see ECC Clause 51.1) following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice submission.

6.12.2 The invoice must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.

6.12.3 The invoice states the following:

Invoice addressed to Transnet SOC Ltd;

Transnet SOC Limited's VAT No: 4720103177;

Invoice number;

The *Contractor*'s VAT Number; and

The Contract number

The invoice contains the supporting detail

6.12.4 The invoice is presented either by post or by hand delivery.

6.13 People

6.13.1 The *Contractor* complies with the following PIRPMP

7.3.2.1 **CONTRACTOR LIABILITY**

1.1. The *Contractor* warrants that it will be liable to Transnet for any loss or damage caused by strikes, riots, lockouts or any labour disputes by and/or confined to the C*ontractor's* employees, which loss will include any indirect or consequential damages;

1.2. The *Contractor* warrants that no negotiations or feedback meetings by the *Contractor's* employees shall take place on Transnet premises, whether owned or rented by Transnet.

1.3. *The* Contractor shall give notice to Transnet of any industrial action by the *Contractor's* employees immediately upon becoming aware of any actual or contemplated action that is or may be carried out on Transnet's premises, whether owned or rented, and shall notify Transnet of all matters associated with such action that may potentially affect Transnet.

1.4. The *Contracto*r is responsible for educating its employees on relevant provisions of the Labour Relations Act which deal with industrial action processes, and the risks of non-compliance.

1.5. The *Contractor* is required to develop a Contingency Strike Handling Plan, which plan the *Contractor* is obliged to update on a three monthly basis. The *Contractor* must provide Transnet with this plan and all updates to the Plan. The *Contractor* is responsible to communicate with its employees on site details of the plan.

2. **INDUSTRIAL ACTION BY CONTRACTOR EMPLOYEES**

2.1. In the event of any industrial action by the Contractor's employees, the Contractor is required to provide competent contingency resources permitted in law to carry out any of the duties that are or could potentially be interrupted by industrial action in delivering the Service.

2.2. The Contractor warrants that it will compensate Transnet for any costs Transnet incurs in providing additional security to deal with any industrial action by the Contractor's employees.

2.3. In the event of any industrial action by the Contractor's employees, the Contractor is obliged:

2.3.1. To prepare and deliver to Transnet, within two (2) hours of the commencement of industrial action an Industrial Action Report. If the industrial action persists the Contractor is required to deliver the report at 8h30 each day.

2.3.2. The Industrial Action Report must provide at least the following information:

2.3.2.1. Industrial incident report,

2.3.2.2. Attendance register,

2.3.2.3. Productivity / progress to schedule reports,
2.3.2.4. Operational contingency plan,
2.3.2.5. Site security report,
2.3.2.6. Industrial action intelligence gathered.

2.3.3. The final Industrial Action Report is to be delivered 24 hours after finalisation of the industrial action.

2.3.4. The management of the Contractor is required to hold a daily industrial action teleconference with personnel identified by Transnet to discuss the industrial action, settlement of the industrial action, security issues and the impact on delivery under the contract.

2.4. The resolution of any disputes or industrial action by the Contractor's employees is the sole responsibility of the Contractor.

2.5. Access to Transnet premises by the Contractor and its employees is only provided for purposes of the Contractor delivering its services to Transnet. Should the Contractor and its employees not, for any reason, be capable of delivering its services Transnet is entitled to restrict or deny access onto its premises and unless otherwise authorized; such person will deemed to be trespassing.

6.13.2 The *Contractor* complies with the requirements of the IRCC involving the engineering construction *Contractor*s engaged (including all future *Contractor*s) by the *Employer* [include details as appropriate ex:

6.13.3 The roles and responsibilities of the various personnel acting on behalf of the *Project Manager* with respect to IR issues are stated in the paragraphs following:

The PIRM is responsible for ensuring that the Contractor complies with the PIRPMP. The PIRM acts on behalf of the *Project Manager*.

6.14 Plant and Materials

6.14.1 The *Contractor* provides Plant and Materials for inclusion in the *works* in accordance with SANS 1200A sub-paragraph 2.1, unless otherwise stated elsewhere in the *Works* Information provided by the *Employer*. All Plant and Materials are new, unless the use of old or refurbished goods and/or Materials are expressly permitted as stated elsewhere in this *Works* Information or as may be subsequently instructed by the *Project Manager*.

6.14.2 Where Plant and Materials for inclusion in the *works* originate from outside the Republic of South Africa, all such Plant and Materials are new and of merchantable quality, to a recognised national standard, with all proprietary products installed to manufacturers' instructions.

6.14.3 The *Contractor* replaces any Plant and Materials subject to breakages (whether in the Working Areas or not) or any Plant and Materials not conforming to standards or specifications stated and notifies the *Project Manager* and the *Supervisor* on each occasion where replacement is required.

6.15 Tests and inspections before delivery

The *Supervisor* may, at his discretion, perform surveillance inspection at the *Contractor's* premises, Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections the *Supervisor* may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The *Contractor* shall ensure free entry and access is given to the *Supervisor* (or his representative), certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and

quality records at all parts of the *Contractor's* and Sub- Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The *Contractor* shall provide the Supervisor with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

Where the *Supervisor* cannot easily visit the *Contractor's* or Sub-contractor's premises for any reason, the *Supervisor* may direct that the tests and inspections be undertaken by an approved inspection authority or independent nominated consultant.

Where inspections and test are carried out by such inspection authority, the *Contractor* submits to the *Supervisor* details to certify that tests and inspections have been carried out on Plant and Materials by Others.

6.16 *Contractor's* Equipment (including temporary *works*).

The *Contractor* provides all Equipment necessary to provide the works in a safe and efficient manner.
The *Contractor* keeps daily records of his Equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.
The *Contractor* shall notify the PSSM 24 hours in advance prior to bringing any new mobile equipment on site. All required documentation and certificate of fitness (COF) issued by a competent person shall accompany the equipment.
The *Contractor* shall inspect Equipment on a daily basis prior to use in accordance with statutory regulations and legislation.
The *Contractor* shall ensure that all Equipment complies with statutory requirements (Construction Regulations / Occupational Health and Safety Act) and with the Health and Safety Standards.

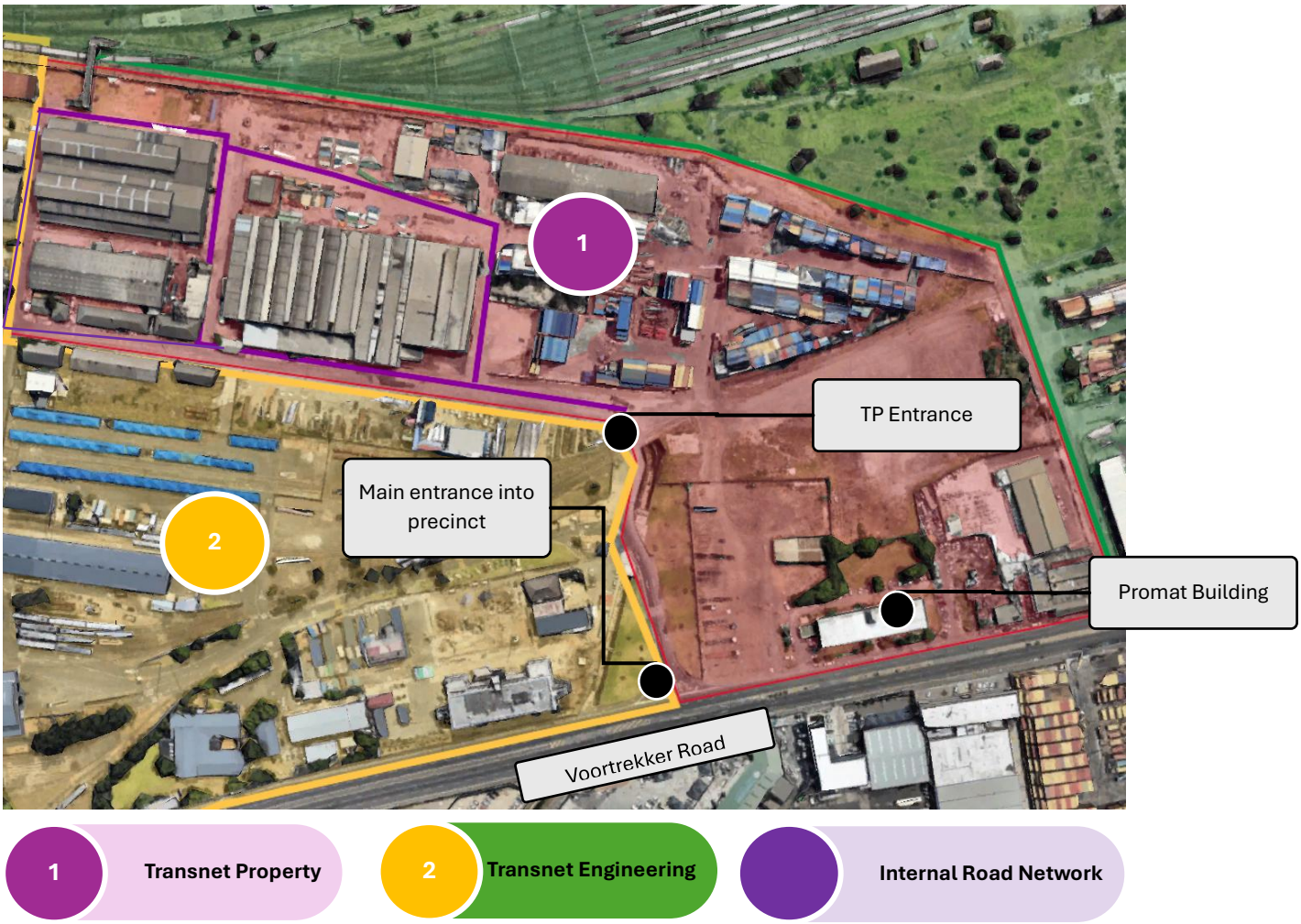
7 Annexures

Annexure 1 Site Layout

Annexure 2 Base line Risk assessment

ANNEXURE 1

SITE LAYOUT



ANNEXURE 2

BASELINE RIKS ASSESSMENT (REFER TO ATTACHED ANNEXURE 2)

Client: 0
Project & Phase: :
Document No: 0
Revision No: 0
Revision Date:

RISK CRITERIA

Rating

Likelihood	Consequences				
	1 Minor	2 Moderate	3 Significant	4 Major	5 Catastrophic
5 Almost Certain	Moderate 11	High 16	High 20	Extreme 23	Extreme 25
4 Likely	Moderate 7	Moderate 12	High 17	High 21	Extreme 24
3 Possible	Low 4	Moderate 8	Moderate 13	High 18	High 22
2 Unlikely	Low 2	Low 5	Moderate 9	Moderate 14	High 19
1 Rare	Low 1	Low 3	Moderate 6	Moderate 10	High 15

Likelihood

Rating	*Probability (Likelihood) Description and Indicative Frequency*	Indicative Probability
Almost Certain	Very high probability of occurrence could occur several times per year. Has occurred several times on similar projects at this location.	>80%
Likely	High probability, likely to approximately once per year. Similar event has occurred several times per year on similar projects for this organisation.	50 – 80%
Possible	Possible, reasonable probability that it may occur at least once in a 1 to 10 year period. A similar event has occurred at some time on other similar projects for this organisation	10 – 50%
Unlikely	Plausible, unlikely to occur during the project, could occur over the next 10 to 40 years. A similar event has occurred on other similar projects in this industry	2 -10%
Rare	Very low likelihood but not impossible, unlikely to occur during the next 40 years. A similar event has occurred elsewhere in the world in this industry.	<2%

Impacts

Rating	*Minor*	*Moderate*	*Significant*	*Major*	*Catastrophic*
Project Cost	Less than 0.5% Within budgeted costs (Project cost overrun < R100M)	0.5% to 5% overrun (R100M>= project cost overrun < R500M)	6% to 15% cost overrun (R500M>= project cost overrun < R1000M)	16% to 30% cost overrun (R1000m>= project cost overrun < R2000M)	Greater than 30% cost overrun (>=R2000m overrun)
Project Schedule	Less than 2.5% delay (Project completion delay < 2 month)	2.5% to 10% delay in the completion of the project (2 month>= project completion delay < 6 month)	10% to 20% delay in completion of the project (6 month>= project completion delay < 9 month)	20% to 50% delay in project completion (9 month>= project completion delay < 12 month)	Greater than 50% delay in project completion (>=12 month completion delay)
Technical Performance	Minor Difficulties	Cannot achieve 100% design capacity without some capital expenditure. <10% increase in	Cannot achieve 100% design capacity without significant capital expenditure 10% to 30% increase in operating costs	Cannot achieve 80% of design capacity without significant capital expenditure Increase in operating costs	60% of design capacity not achieved Increase in operating costs
Operational costs & revenue	<= 2.5%	>2.5 <10% >2.5 < 7.5	>10 <20% >7.5 < 15	>20% <40% >15 <30	Increase of 40% to costs and/or decrease of 30% to revenue
Health & Safety	First Aid Injury	Medical Treatment Injury	Lost Time Injury	Fatality Injury relating in permanent disabilities	Multiple fatalities
Reputation	No media attention Issue raised by workers	Adverse local media coverage Report to Board Shareholder concerns raised Complaints by customers and/or suppliers	Adverse media coverage Board involved Significant decrease in Shareholder support Significant complaints by customers and/or major supplier	Adverse national media coverage Govt inquiry Senior mgt changed Significant shareholder support Loss of customer support and/or major supplier support	Adverse global media coverage Govt inquiry Major public concerns Major loss of shareholder support Loss of Major customer support
Legal/Regulatory	Low level legal or approval issue	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible	Major breach of regulation. Major litigation	Significant fines and prosecution. Very serious litigation, including limited class actions	Very significant fines and prosecutions Multiple litigations including class actions
Environment	Negligible environmental impact, managed within budgets	Short term (<1 yr) environmental damage requiring up to R5m to remediate, study and/or penalties	Short-term < 10 year environmental damage requiring up to less than R50m	Long term harm - 10 years or more to remediate environmental damage requiring R50 - 100m	Permanent environmental harm and/or > R100M closure liability and/or penalties and fines

Control Effectiveness

Description	Control Effectiveness
Just getting started, a lot of work still to be done	20 - 40%
About half way there	40 - 60%
Most things in place and working, but some more sti	60 - 90%
Nothing more to be done except review and monitor	>90%

Risk Control Effectiveness is defined as the actual level of control that is currently present and effective, expressed as a percentage of that reasonably achievable for that particular risk issue

Note: This scale can change and be customised as required for the analysis. The consequence types should be established and agreed as the critical success factors to achieve the business and project objectives. The above consequence types are reasonably typical of most projects.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
1	Site establishment	Survey Activities/ Clear and grub - bush clearing including roads by means of HME (Heavy Mobile Equipment)	Snakes bites	Lost Time Injury	3 - Significant	1 - Rare		Employees awareness training, clear and grub done with machinery and employees removed from the area. Dedicated and trained snake handler, remover. On site dedicated paramedic services for the project.
			Exposure to high temperatures may cause dehydration and heat stress	Lost Time Injury	3 - Significant	1 - Rare		Awareness Training of proper hydration symptoms. Provide sufficient drinking water at the place of work. Provide sufficient rest places with drinking water at he place of work. Monitoring of daily temperatures and warning when high temperatures are predicted.
			Incompetent person operating HME (Heavy Mobile Equipment)	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Ensure operator is competent - competency certificate available and that his employee dossier was approved as indicated in the H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access.
			Pedestrian contact with HME (Man / machine interface)	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Dedicated pedestrian walk ways where practical, strictly controlled speed limits set on site, awareness training, spotters and flagmen used where needed and at crossings. Reverse alarms on all construction vehicles. Implementation of the 5 meter rule from andy operating HME. Ensure detailed traffic management plans are available and included in DSTI's where applicable. Ensure driver and operator competency and random drug and alcohol testing is done. Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard and H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			HME Operators expose to high levels of noise	Lost Time Injury	3 - Significant	3 - Possible		Enclosed HME cabins where possible. Hearing protection where enclosed cabins are not possible. Perform and record noise level survey. Where noise levels are above the legal noise limits (85Db) approved hearing protection must be worn. Where possible remove persons from area for the duration of the task or rotate the persons to manage exposure time.
			HME not in safe and serviceable condition	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Inspection by competent inspector prior to site mobilization. Pre-start inspections by Operators. Random Verification and validity of Operator competencies. Compliance H339473-0000-01-240-0004 Occupational H&S Equipment Dossier Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
		Earthworks by means of HME (Heavy Mobile Equipment)	HME may come in contact with existing OHTE	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No work may be conducted closer that 3m to existing rail lines. Occupation Certificates must be obtained where there is a potential to come in contact with OHTE. Level Crossings have been fitted with heights gauges to prevent contact with OHTE of High Vehicles. The Responsible C-Green supervisor will sign the occupation register when witnessing the isolation and earthing of the OHTE. Overhead conductors that have the potential to come in contact indicated. Minimum clearances for the movement of vehicles under and in the vicinity of overhead power lines shall be 2.3 meters for 11KV power lines and 2.5 meters for 66 KV power lines. 3 meter rule and earthing of HME applied to existing TFR OHTE. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Collision between HME and Light Vehicles	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Activity Specific Traffic Management Plan indicated on DSTI's. Communication of Activity Specific Traffic Management Plans with teams. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Collision between HME and HME	Lost Time Injury	3 - Significant	2 - Unlikely		Activity Specific Traffic Management Plan indicated on DSTI's. Communication of Activity Specific Traffic Management Plans with teams. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
		Fencing	Pinch points - wire cutters, pliers etc.	First Aid Injury	1 - Minor	3 - Possible		Correct tools for the job and correct use of the tools - competency / training and experience. Gloves mandatory. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Sharp edges/wires	First Aid Injury	1 - Minor	3 - Possible		Correct tools for the job and correct use of the tools - competency / training and experience. Gloves mandatory. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Falling from ladders	Lost Time Injury	3 - Significant	3 - Possible		Assistant employee to hold ladder. 3 Point contact is required at all times when accessing any ladder. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard which includes safe of of ladders.
			Sub-standard equipment being used e.g. Ladders, hand tools	Lost Time Injury	3 - Significant	3 - Possible		All tools and equipment to be inspected at least monthly by a competent person and placed on a register. Ladders to be inspected as indicated in the H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
		Placement of containers / offices	Incompetent Crane Drivers/Operators and Riggers performing lifting activity	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Ensure Crane operator and rigger competency - certificate available and that his employee dossier was approved as indicated in the H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard. Lifting sturdy done for any lift in excess of 5t. Ground stability and placement of outriggers considered. Outriggers used with designed base plates at all times. All employees removed from the slew radius and drop zone during the lift - guide ropes fitted and used. Compliance with H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access, H339473-0000-01-240-0002 Occupational H&S Cranes and Lifting Equipment Standard.
			Mobile Cranes not in safe and serviceable condition	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Inspection by competent inspector prior to site mobilization. Pre-start inspections by Crane Operators. Mobile Cranes will be inspected and tested annually as per the requirements of Driven Machinery regulations. Random Verification and validity of Operator competencies. Inspections will be recorded and available at the crane for auditing purposes. Compliance H339473-0000-01-240-0004 Occupational H&S Equipment Dossier Standard.
			Sub-standard Lifting tackle equipment being used may cause loads to fall	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Lifting Tackle will be load tested as per the requirements of the relevant SANS standard and Driven Machinery Regulations. Lifting Tackle will be visually inspected by a competent person (LMI) every 3 months. Lifting Tackle will be inspected by a rigger or responsible person monthly for visible damage. Lifting Tackle will be inspected pre-use by the user. Inspections will be recorded and LMI certificates in place Equipment selection to be done by competent person. Lifting study to be completed and submitted if the load exceeds 5 ton for review. A competent qualified rigger / engineer to manage the lift and placement. Containers to be empty, no contents allowed in the containers whilst lifting. All employees removed from the slew radius and drop zone during the lift. Guide ropes fitted and used. Compliance with H339473-0000-01-240-0002 Occupational H&S Cranes and Lifting Equipment Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
			Incorrect use of Lifting tackle may cause load to fall	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Lifting tackle will only be used by personnel trained and competent in the use of such lifting tackle. SWL of the lifting tackle will not be exceeded. Lifting tackle will only be used as per the intended design of such lifting tackle. Compliance with H339473-0000-01-240-0002 Occupational H&S Cranes and Lifting Equipment Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Use of Mobile Cranes in high wind conditions	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Mobile Cranes will not be used in wind conditions exceeding 35K/hr. Mobile crane operations may be suspended during low wind conditions dependant on type of load and nature of wind. w radius and drop zone during the lift - guide ropes fitted and used. Compliance with H339473-0000-01-240-0002 Occupational H&S Cranes and Lifting Equipment Standard.
			Mobile Cranes may come in contact with OHTE and high voltage power lines	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Overhead services considered. Mobile Cranes will not be used near Live Electrical Conductors where the crane have a potential of coming closed than 20 m to the overhead conductor. Work within the 20 m shall be approved by the Transnet/ EPCM Project Manager 16.2 based on a risk assessment and proper controls. Lifting, rigging plan in place with task specific risk assessments. Only competent trained personnel used, verification and proof available on site. Equipment service and relevant inspections in date. No work closer than 3 meters to any OHTE or other overhead services. Height gauges and barriers to be used as appropriate. Spotters used to ensure 3m rule is maintained at all time. All employee removed from the slew radius and drop zone before and during lifts. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Falling from top of containers	Lost Time Injury	3 - Significant	3 - Possible		Where needed use of fall restraint harness to prevent employee falling off the container. Slings to be fitted from the centre, stay away from edge of the container and ensure 100% tie off with safety harness.
			Falling from ladders	Lost Time Injury	3 - Significant	3 - Possible		Assistant employee to hold ladder. 3 Point contact is required at all times when accessing any ladder. Ladders to be at least 1 meter above container height. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard which includes safe of of ladders.
			Pinch Points	Lost Time Injury	3 - Significant	1 - Rare		Task specific risk assessment to be done, ground stability and placement of jacks with base plates crucial. No employee in the drop zone or close to the jacks. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
2	**Installation of services**	**Excavation & Trenching**	Incompetent person operating Excavator	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Ensure operator competent - competency certificate available and that his employee dossier was approved as indicated in the H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard and H339473-0000-01-240-0005 Occupational H&S Excavation and Trenching Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Pedestrian contact with Excavator (Man / machine interface)	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Dedicated pedestrian walk ways where practical, strictly controlled speed limits set on site, awareness training, spotters and flagmen used where needed and at crossings. Reverse alarms on all construction vehicles. Implementation of the 5 meter rule from andy operating HME. Ensure detailed traffic management plans are available and included in DSTI's where applicable. Ensure driver and operator competency and random drug and alcohol testing is done. Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard, H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard and H339473-0000-01-240-0005 Occupational H&S Excavation and Trenching Standard..
			Excavator Operators expose to high levels of noise	Lost Time Injury	3 - Significant	3 - Possible		Enclosed HME cabins where possible. Hearing protection where enclosed cabins are not possible.
			Excavators not in safe and serviceable condition	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Inspection by competent inspector prior to site mobilization. Pre-start inspections by Operators. Random Verification and validity of Operator competencies. Compliance H339473-0000-01-240-0004 Occupational H&S Equipment Dossier Standard.
			Unprotected Excavations	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Excavations will be barricaded by means of solid barricading. Berms may be used where there is no risk of pedestrian traffic of vehicle traffic to fall into excavations. Ensure a trained competent signal person is present. The Supervisor should inspect the excavation on a daily basis for defects and fallen material. The barricading must remain in place for as long as the hazard (i.e. the excavation) exists. Solid barricading for all excavations capable of withstanding 110Kg direct impact to prevent people falling into excavations. Compliance to H339473-0000-01-240-0005 Occupational H&S Excavation and Trenching Standard and to Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
			Unsafe Access and Egress into and from excavations	Lost Time Injury	3 - Significant	2 - Unlikely		Access into excavations will be provided by means of handrails, ladders, or scaffold structures at intervals not exceeding 15 meters. No employee may work in an excavation where the access point is more than 7.5 meters away from his point of work to ensure escape during emergencies. Inspections of excavations by competent and appointed persons to ensure compliance.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Unstable Excavation Walls (even after inclement weather)	Lost Time Injury	3 - Significant	3 - Possible		Excavations will be inspected by appointed and competent person prior to access into or close to excavations after inclement weather. Daily inspections of excavations to ensure wall stability. Provision for safe excavating during excavating activity. Inspections by safety personnel to ensure adherence to requirements. Competent appointed persons responsible for excavations shall conducted daily inspections. Shoring & battering done as appropriate per excavation to prevent collapse of excavation walls and fall of material into excavations. A record of each inspection (including date, time, findings, and signature of the Excavation Supervisor who carried out the inspection) must be captured in the excavations register. Each inspection record must include a declaration as to whether the excavation is safe to work in or not. Excavators / TLB used for deep excavations, used. Competent and certified operators. Excavation inspector appointed and responsible for excavations in terms of barricading - solid barricading only able to withstand 110kg impact, safe access and egress points for all excavations, shoring and battering as needed. In bad weather conditions excavation inspector, construction manager to determine if excavations are safe, any signs of flooding or deterioration in ground stability must result in work stop. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
			Loose Objects on the side walls of excavations	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Loose Objects and Excavation Material will be moved at least 2 meters from the edge of the excavation. Competent appointed persons responsible for excavations shall conducted daily inspections.
			Slips / Trips	Lost Time Injury	3 - Significant	3 - Possible		Keep walkway clear of debris Dedicated access an egress points into excavations and maintain walkways, stairs and step off points. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
			Underground services being struck / damaged	Medical Treatment Injury	2 - Moderate	4 - Likely		Drawings of existing services to be available and communicated. Detection to be conducted where uncertainty exists. The Supervisor should establish and locate all underground services prior to use of any mechanical excavation equipment. The Supervisor must where possible have underground services isolated. Observe the excavated material and stop all excavation work at the first visible sign of foreign material (e.g. electric cable sheath, PVC piping material). Compliance to H339473-0000-01-240-0005 Occupational H&S Excavation and Trenching Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Excavators may come in contact with OHTE and high voltage power lines	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No work may be conducted closer that 3m to existing rail lines. Occupation Certificates must be obtained where there is a potential to come in contact with OHTE. Level Crossings have been fitted with heights gauges to prevent contact with OHTE of High Vehicles. The Responsible C-Green supervisor will sign the occupation register when witnessing the isolation and earthing of the OHTE. Identification of overhead power lines in area through DSTI (Daily Safe Task Inductions) Designated restricted areas identified. Adhere to traffic management plan. Adhere to traffic signs. Ensure HME accompanied by escort vehicle for long distance travel on site. Ensure HME accompanied by signal person for short distance travel on site. Compliance to H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
		Cable Work and Electrical Installations	Incompetent persons doing electrical installations	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Competencies will be verified prior to site access authorization. Only Trained and Competent Electricians to conduct electrical installations. Compliance to H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard and H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Contact with live electrical conductors may cause injury	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Competent certified electricians, must be on site at all times. Electrical tie ins done under strict permitting conditions. No live work allowed. Electrical Conductors will be isolated in line with Isolation and lockout procedures. Electrical Conductors will be tested for zero potential prior to commencement of any work. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Potential for fire exists during commissioning of incorrectly constructed installations	Lost Time Injury	3 - Significant	1 - Rare		All personnel involved in commissioning will be trained in the Isolation and Lockout Procedures. All conductors will be tested and zero tolerance proven prior to commencement of any activity. Only competent personnel will be allowed to participate in commissioning activities. Where possible personnel involved in commissioning activities will be limited to those performing switching. Where possible switching will be done remotely. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Commissioning of electrical installations outdoor during rain may cause injury	Lost Time Injury	3 - Significant	1 - Rare		Weather will be assessed during commissioning by competent person to determine activities that may or may not proceed.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Substandard Electrical Tools (e.g. Portable Electrical Grinders, Drills) being used	Lost Time Injury	3 - Significant	3 - Possible		All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Verified competency training for any person operating electrically driven tools and equipment with proof of competency testing against the relevant unit standard. Task specific risk assessment to be in place and communicated. All tools to be inspected and checked before use, including use of correct cutting disk and backing plates. Grinders may only be used on solid surface, no working from ladders allowed. All electrically driven tools must be double insulated and must have a dead man switch fitted, it must not be possible to lock the equipment in the on position. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Unauthorized Access to electrical conductors	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Equipment where a potential of contact exist will be identified at engineering phase. Inspection and checking to ensure that locks are in position and effective. Competent and appointed person to control keys to live electrical panels and keys. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Failure to adhere to Isolation and Lockout procedures	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Identify activities where isolation and lockout will be required. Communicate these requirements to all project employees. Include isolation and lockout in permit conditions for activities where the potential of contact with conductors exist. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Hand and finger injuries	Medical Treatment Injury	2 - Moderate	3 - Possible		Gloves must be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
3	**Security**	**Guarding services**	Slips / Trips	Lost Time Injury	3 - Significant	3 - Possible		Keep walkway clear of debris Dedicated access an egress points into excavations and maintain walkways, stairs and step off points. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
			Violent Crime	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Radio contact with guards at all times during the shifts with specific check in times, supervisor patrols during shifts. Specific link into police and reaction services in the area.
			Fatigue	Lost Time Injury	3 - Significant	2 - Unlikely		12 hour shift restriction i.e. no work longer than 12 hours. Where shift relief does not show up security management to ensure alternate arrangements are made. Guards to be subject to normal pre-employment medicals. With supervisor roaming patrols ensure supply of hot drinks / cold drinks (water) in summer and winter.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Exposure to high temperatures may cause dehydration and heat stress	Lost Time Injury	3 - Significant	1 - Rare		Awareness Training of proper hydration symptoms. Provide sufficient drinking water at the place of work. Provide sufficient rest places with drinking water at he place of work. Monitoring of daily temperatures and warning when high temperatures are predicted.
4	Civil works	**Earthworks by means of HME (Heavy Mobile Equipment)**	Incompetent Operators operating Mobile equipment - ADT / Dozers / Excavators / TLB / Graders/ Compactors	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Ensure operator is competent - competency certificate available and that his employee dossier was approved as indicated in the Compliance to H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access and H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Pedestrian contact with HME (Man / machine interface)	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Dedicated pedestrian walk ways where practical, strictly controlled speed limits set on site, awareness training, spotters and flagmen used where needed and at crossings. Reverse alarms on all construction vehicles. Implementation of the 5 meter rule from andy operating HME. Ensure detailed traffic management plans are available and included in DSTI's where applicable. Ensure driver and operator competency and random drug and alcohol testing is done. Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard and H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			HME Operators expose to high levels of noise	Lost Time Injury	3 - Significant	3 - Possible		Enclosed HME cabins where possible. Hearing protection where enclosed cabins are not possible. Contractor to ensure all equipment with noise levels in excess of 85dBA are identified and zoned. Distance from heavy mobile equipment at which the use of hearing protection would be required must be specified. Vehicles with cabs and air conditioners must be maintained to ensure operators can close and seal the cabins. Vehicle with no cabins the use of hearing protection to be implemented with a detailed hearing protection program
			HME not in safe and serviceable condition	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Inspection by competent inspector prior to site mobilization. Pre-start inspections by Operators. Random Verification and validity of Operator competencies. Compliance H339473-0000-01-240-0004 Occupational H&S Equipment Dossier Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			HME may come in contact with existing OHTE	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No work may be conducted closer that 3m to existing rail lines. Occupation Certificates must be obtained where there is a potential to come in contact with OHTE. Level Crossings have been fitted with heights gauges to prevent contact with OHTE of High Vehicles. The Responsible C-Green supervisor will sign the occupation register when witnessing the isolation and earthing of the OHTE. Overhead conductors that have the potential to come in contact indicated. Minimum clearances for the movement of vehicles under and in the vicinity of overhead power lines shall be 2.3 meters for 11KV power lines and 2.5 meters for 66 KV power lines. 3 meter rule and earthing of HME applied to existing TFR OHTE. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Collision between HME and Light Vehicles	Fatality Injury relating in permanent disabilities	4 - Major	2 - Unlikely		Activity Specific Traffic Management Plan indicated on DSTI's. Communication of Activity Specific Traffic Management Plans with teams. Heavy mobile vehicles to have right of way. No light vehicle to approach within 50m of heavy machinery without ensuring positive visual and radio contact is made. Use of buggy whips and rotating lights as appropriate for the site. Ensure no red rotating lights or buggy whips is used next to or in proximity to operating railway lines. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Collision between HME and HME	Lost Time Injury	3 - Significant	2 - Unlikely		Activity Specific Traffic Management Plan indicated on DSTI's. Communication of Activity Specific Traffic Management Plans with teams. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
		Civil works	Inhalation of Dust	Medical Treatment Injury	2 - Moderate	1 - Rare		Use of cement powered on site limited (pre-mix). Respiratory protection issued and used where the use of cement powder is required. Personnel trained in the correct and safe use of respiratory protection. Nuisance dust control. Watering of gravel roads during construction to control dust and ensure adequate visibility on gravel roads at all times. Contractors to supply speed control signs within there areas of responsibility on roads. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Contact with Hazardous Chemical Substances	Lost Time Injury	3 - Significant	1 - Rare		Personnel using hazardous substances trained in the MSDS of the specific hazardous substance. Proper PPE as per the recommendation in the MSDS provided to personnel. Personnel Trained in the correct and safe use of respiratory protection.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Incorrect use of ladders and scaffolding	Lost Time Injury	3 - Significant	3 - Possible		Scaffolding only erected and dismantled by competent personnel. Scaffolding erected under supervision of trained and competent scaffold supervisor. Personnel trained in fall protection plan. Height work conducted under supervision of trained and competent supervisor. All employees working at heights to be competent and trained in working at heights.
			Vibration	Medical Treatment Injury	2 - Moderate	1 - Rare		Ensure adequate maintenance on heavy mobile equipment, specifically related to absorption seating and Vibrating Machines, specifically related to placing of concrete activities. Contractor to implement exposure monitoring where appropriate. H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Exposure to high temperatures may cause dehydration and heat stress	Lost Time Injury	3 - Significant	1 - Rare		Awareness Training of proper hydration symptoms. Provide sufficient drinking water at the place of work. Provide sufficient rest places with drinking water at he place of work. Monitoring of daily temperatures and warning when high temperatures are predicted.
		Scaffolding erecting, modifications and dismantling	Incompetent Scaffold Erectors and Inspectors	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Only Appointed and competent Scaffold Erectors to build scaffolding. Ensure Scaffold Supervisors, Erectors and Inspectors are competent - competency certificate available and that his employee dossier was approved as indicated in the H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access and ensure compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
			Substandard Scaffolding Structures	Multiple fatalities	5 - Catastrophic	1 - Rare		Scaffolding only erected and dismantled by competent personnel. Scaffolding erected under supervision of trained and competent scaffold supervisor. Scaffolding to comply with SANS 085 Standard.
			Objects, Tools and Equipment falling from heights	Lost Time Injury	3 - Significant	3 - Possible		All tools and equipment to be fitted with lanyards when working at heights. Area below overhead work barricaded. Staggered personnel during passing of material to higher levels. Work supervised by competent and appointed supervisor. All tools being used in elevated positions to be fitted with Lanyards. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Personnel falling from heights	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Personnel performing elevated work trained in use of fall protection systems. Fall Protection Plan implemented. Attachment points must be clearly identified on the construction site, 100% attached at all time when working at heights. Medical screening to include check for epilepsy or any other condition that could place employee at risk. Employer to define and declare job descriptions before medicals - part of the employee dossiers Planned Task Observations conducted on personnel working at heights. Planned Task Observations conducted on personnel working at heights. Employees to wear/ use Safety Harnesses. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
		Formwork and Support Work for Civil Construction	Accessing Structures during inclement weather	Multiple fatalities	5 - Catastrophic	2 - Unlikely		Lightning Detectors. Lightning Notifications. No access onto structures during rain. Re-inspection prior to access after inclement weather.
			Objects may fall from higher elevations where higher support work is being erected	Lost Time Injury	3 - Significant	3 - Possible		All tools and equipment to be fitted with lanyards when working at heights. Area below overhead work barricaded. Staggered personnel during passing of material to higher levels. Work supervised by competent and appointed supervisor. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
			Personnel may fall from heights during the erection of support work	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Personnel performing elevated work trained in use of fall protection systems. Fall Protection Plan implemented. Planned Task Observations conducted on personnel working at heights. Employees to wear/ use Safety Harnesses. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
5	**Drilling & Blasting**	**Drilling work in preparation for blasting**	Incompetent Operators operating Drill Rigs	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Dedicated, controlled traffic access to and from areas. Operators competency checked and verified - Employee Dossier in place and singed off. Compliance to H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access and H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Contact with Moving / rotating machinery parts of Drill Rig (Man / machine interface)	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No employees to approach operating drill rigs, clear boundaries to be established and enforced. No employees not directly involved in drilling activities allowed within 50m of operating drill rigs. Clear method statement in terms of working distances and supervision at all times to ensure adherence to requirements. Isolation of drill rig prior to work being performed on drill rig. Awareness Training. Reverse alarms on all construction vehicles. Implementation of the 5 meter rule from andy operating HME. Ensure detailed traffic management plans are available and included in DSTI's where applicable. Ensure driver and operator competency and random drug and alcohol testing is done. Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard and H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard.
			Objects becoming dislodged from drill rig during normal operation	Lost Time Injury	3 - Significant	3 - Possible		No employees to approach operating drill rigs, clear boundaries to be established and enforced. No employees not directly involved in drilling activities allowed within 50m of operating drill rigs. Isolation of drill rig prior to work being performed on drill rig. Compliance to H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard and H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard
			Failure to Isolate Drill Rig when not used or during maintenance	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Supervision to be present at drill rig. Training of Operator and support personnel on SWP of drill rig. Identify activities where isolation and lockout will be required. Communicate these requirements to all project employees. Include isolation and lockout in permit conditions for activities where the potential of contact with conductors exist. Compliance to H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Persons exposed to high levels of noise	Lost Time Injury	3 - Significant	3 - Possible		High noise levels, possible temporary or permanent threshold shift may occur. Noise zone / demarcation around the drilling operation to be clearly defined and no employee allowed to enter without appropriate hearing protections. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
		Blasting Work	Incompetent Blaster performing blasting activity	Multiple fatalities	5 - Catastrophic	1 - Rare		Blaster competency checked and verified - Employee Dossier in place and singed off. Compliance to H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Detonation of Explosives during charging of blast	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Strict control with competent certified blasters with adequate and proven track record. Blasting only done under strict permit conditions, with field check before any blast. Blast warning sirens, notification to adjacent communities etc. Only explosives needed ordered and used, no explosive storage on site. DOL and required approvals as appropriate. Competent Blaster to ensure blasting area is demarcated and evacuated and also that no Miss fire explosives is left unattendent on site. Minimum Personnel in blast area during charging Charging to be done under supervision of Blaster at all times Identification and removal of detonation sources prior to commencement of activity.
			Personnel handling explosives may come into contact with explosives which may have negative health effects	Lost Time Injury	3 - Significant	1 - Rare		Personnel handling explosives to be trained in the safe use of explosives Personnel handling explosives to be trained in the correct use and discarding of PPE. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Detonation of explosives by lightning during charging of blast	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Lightning Detectors. Lightning Notifications. No explosives handling when inclement weather is forecasted
			Detonation of explosives during the placement of cover	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Cover placement under the supervisor of competent blaster Soft Material without rocks used for cover
			Unauthorized personnel in blast area during charging of blast	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Area demarcated with flagman at access points to ensure that unauthorized personnel do not enter area Charging done under supervision of competent Blaster Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard
			Theft of Explosives during charging operation	Lost Time Injury	3 - Significant	1 - Rare		All explosives not in use to be locked-up in safe storage on vehicle of blaster Explosives in use under the direct supervision of competent Blaster
			Blast explosion are not cleared of personnel prior to blast	Multiple fatalities	5 - Catastrophic	1 - Rare		Inspection of Blast area by H&S Department and Blaster prior to blast detonation Sirens used to warn of blasting 30 minutes in advance of blast detonation Re-Inspection of work area prior to blast if not sure or where visual inspection is limited (vegetated areas) Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard
			Damage to hearing as a result of blast activity	Lost Time Injury	3 - Significant	2 - Unlikely		500m exclusion zone from all blast activities Compliance to blasting distances as indicated in the OHS Act.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Exposure to dust that can not be controlled during blasting (Dust - Silica and possible Asbestos)	Lost Time Injury	3 - Significant	2 - Unlikely		500m exclusion zone from all blast activities Worst case scenario with dusts containing free crystalline silica. This must be sampled and tested on site. Contractor to employ occupational hygiene services for determination. Drill rigs to be equipped with extraction ventilation to control dusts, water to be used where possible. Cabins of drill rigs to be closed and under positive pressure. Employees to stay away from dust plumes during drilling. PPE to be used where appropriate, at least FFP2 type.
			Personnel entering the blast area prior to all clear by blaster	Multiple fatalities	5 - Catastrophic	1 - Rare		Access control will be maintained by Blaster, site security until all clear by competent blaster. Compliance to H339473-0000-01-240-0001 Occupational H&S Barriers and Barricades Standard.
6	**Construction of guard house**	**Manual Handling (Trenching - manual labor, picks, shovels etc.)**	Incorrect Manual handling Techniques (Lifting, carrying, Pushing, pulling,)	Medical Treatment Injury	2 - Moderate	1 - Rare		Depending on the task to be undertaken, a Risk Assessment is required. If the assessed risk is too great, use mechanical aids or seek assistance. Adopt a stable foot position when conducting manual lifting activities. Grip the load firmly and keep it close to your body. Use the strong muscles of your legs to lift., and not your back. (Aim to maintain the natural curves of your spine, thereby lessening the chance of injury to disks) Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Ergonomics (Bending, twisting, Prolonged, frequent, repetitive movements.)	Medical Treatment Injury	2 - Moderate	1 - Rare		Avoid extreme positions including bending, twisting and excessive reaching.
			Substandard Hand tools being used	Medical Treatment Injury	2 - Moderate	3 - Possible		Appropriate tools used for the activity and training in correct use in place. All tools and equipment to be inspected at least monthly. Daily Pre-use inspections done by Competent Supervisor on DSTI's of his work crew. Continuous supervision in place.
		Brickwork	Incorrect Manual handling Techniques (Lifting, carrying, Pushing, pulling,)	Medical Treatment Injury	2 - Moderate	1 - Rare		Think and plan lifting activities before commencing. (Depending on the task to be undertaken, a Risk Assessment is required). If the assessed risk is too great, use mechanical aids or seek assistance. Adopt a stable foot position when conducting manual lifting activities. Grip the load firmly and keep it close to your body. Use the strong muscles of your legs to lift., and not your back. (Aim to maintain the natural curves of your spine, thereby lessening the chance of injury to disks) Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Ergonomics (Bending, twisting, Prolonged, frequent, repetitive movements.)	Medical Treatment Injury	2 - Moderate	1 - Rare		Avoid extreme positions including bending, twisting and excessive reaching.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Personnel falling from scaffolding/ Relay Room roofs	Lost Time Injury	3 - Significant	3 - Possible		Personnel performing elevated work trained in use of fall protection systems. Fall Protection Plan implemented. Attachment points must be clearly identified on the construction site, 100% attached at all time when working at heights. Medical screening to include check for epilepsy or any other condition that could place employee at risk. Employer to define and declare job descriptions before medicals - part of the employee dossiers Planned Task Observations conducted on personnel working at heights. Employees to wear/ use Safety Harnesses. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
			Falling from ladders	Lost Time Injury	3 - Significant	3 - Possible		Assistant employee to hold ladder. 3 Point contact is required at all times when accessing any ladder. Ladders to be at least 1 meter above container height. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard which includes safe of of ladders.
			Substandard Hand tools being used	Medical Treatment Injury	2 - Moderate	3 - Possible		Appropriate tools used for the activity and training in correct use in place. All tools and equipment to be inspected at least monthly. Daily Pre-use inspections done by Competent Supervisor on DSTI's of his work crew. Continuous supervision in place.
			Substandard Electrical Tools (e.g. Portable Electrical Grinders, Drills) being used	Lost Time Injury	3 - Significant	3 - Possible		All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Verified competency training for any person operating electrically driven tools and equipment with proof of competency testing against the relevant unit standard. Task specific risk assessment to be in place and communicated. All tools to be inspected and checked before use, including use of correct cutting disk and backing plates. Grinders may only be used on solid surface, no working from ladders allowed. All electrically driven tools must be double insulated and must have a dead man switch fitted, it must not be possible to lock the equipment in the on position. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
		Scaffolding erecting, modifications and dismantling	Incompetent Scaffold Erectors and Inspectors	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Only Appointed and competent Scaffold Erectors to build scaffolding. Ensure Scaffold Supervisors, Erectors and Inspectors are competent - competency certificate available and that his employee dossier was approved as indicated in the H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard prior to granting site access and ensure compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Substandard Scaffolding Structures	Multiple fatalities	5 - Catastrophic	1 - Rare		Scaffolding only erected and dismantled by competent personnel. Scaffolding erected under supervision of trained and competent scaffold supervisor. Scaffolding to comply with SANS 085 Standard.
			Objects, Tools and Equipment falling from heights	Lost Time Injury	3 - Significant	3 - Possible		All tools and equipment to be fitted with lanyards when working at heights. Area below overhead work barricaded. Staggered personnel during passing of material to higher levels. Work supervised by competent and appointed supervisor. All tools being used in elevated positions to be fitted with Lanyards. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
			Personnel falling from heights	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Personnel performing elevated work trained in use of fall protection systems. Fall Protection Plan implemented. Attachment points must be clearly identified on the construction site, 100% attached at all time when working at heights. Medical screening to include check for epilepsy or any other condition that could place employee at risk. Employer to define and declare job descriptions before medicals - part of the employee dossiers Planned Task Observations conducted on personnel working at heights. Employees to wear/ use Safety Harnesses. Compliance to H339473-0000-01-240-0010 Occupational H&S Working at Heights Standard.
		Cable Work and Electrical Installations	Incompetent persons doing electrical installations	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Competencies will be verified prior to site access authorization. Only Trained and Competent Electricians to conduct electrical installations. Compliance to H339473-0000-01-240-0003 Occupational H&S Employee Dossier Standard and H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Contact with live electrical conductors may cause injury	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Competent certified electricians, must be on site at all times. Electrical tie ins done under strict permitting conditions. No live work allowed. Electrical Conductors will be isolated in line with Isolation and lockout procedures. Electrical Conductors will be tested for zero potential prior to commencement of any work. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
			Potential for fire exists during commissioning of incorrectly constructed installations	Lost Time Injury	3 - Significant	1 - Rare		All personnel involved in commissioning will be trained in the Isolation and Lockout Procedures. All conductors will be tested and zero tolerance proven prior to commencement of any activity. Only competent personnel will be allowed to participate in commissioning activities. Where possible personnel involved in commissioning activities will be limited to those performing switching. Where possible switching will be done remotely. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Commissioning of electrical installations outdoor during rain may cause injury	Lost Time Injury	3 - Significant	1 - Rare		Weather will be assessed during commissioning by competent person to determine activities that may or may not proceed.
			Substandard Electrical Tools (e.g. Portable Electrical Grinders, Drills) being used	Lost Time Injury	3 - Significant	3 - Possible		All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Verified competency training for any person operating electrically driven tools and equipment with proof of competency testing against the relevant unit standard. Task specific risk assessment to be in place and communicated. All tools to be inspected and checked before use, including use of correct cutting disk and backing plates. Grinders may only be used on solid surface, no working from ladders allowed. All electrically driven tools must be double insulated and must have a dead man switch fitted, it must not be possible to lock the equipment in the on position. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.
			Unauthorized Access to electrical conductors	Fatality Injury relating in permanent disabilities	4 - Major	1 - Rare		Equipment where a potential of contact exist will be identified at engineering phase. Inspection and checking to ensure that locks are in position and effective. Competent and appointed person to control keys to live electrical panels and keys. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard.
			Failure to adhere to Isolation and Lockout procedures	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Identify activities where isolation and lockout will be required. Communicate these requirements to all project employees. Include isolation and lockout in permit conditions for activities where the potential of contact with conductors exist. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Hand and finger injuries	Medical Treatment Injury	2 - Moderate	3 - Possible		Gloves must be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness. Compliance to H339473-0000-01-240-0008 Occupational H&S Personal Protective Equipment Standard.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

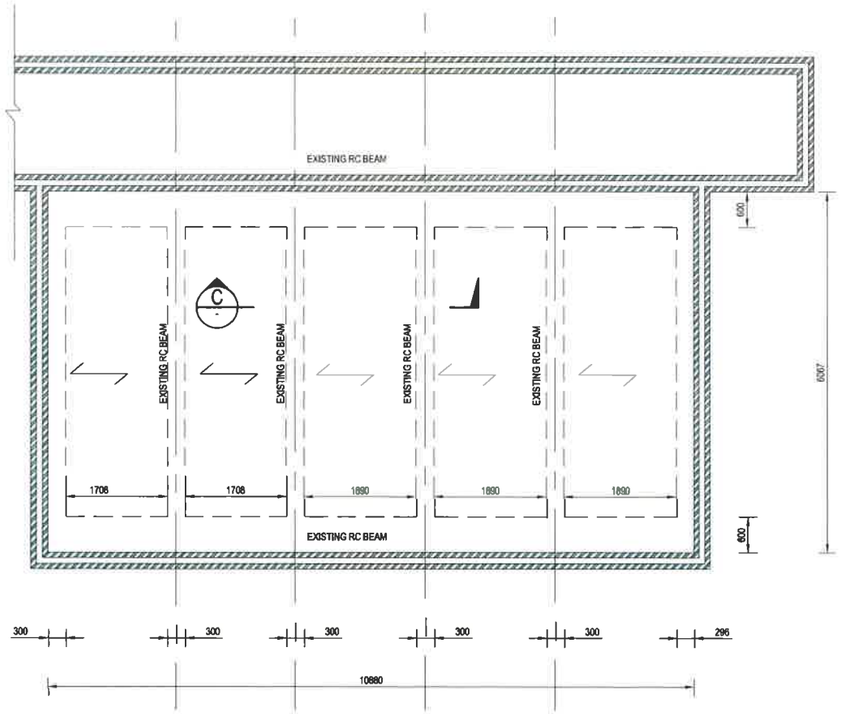
Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
7	**Work in close proximity to existing services**	**Rail lines**	Unauthorized Personnel on Rail Trucks struck by (Moving trains)	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		Personnel working next to existing and operational rail lines require a access certificate from the relevant Depot Engineer TFR. White flags will be placed 1000 meter from the place of work. No work may conducted closed than 3 meter to any operational rail line. Awareness training and strict supervision, employees to stay with work crews and within dedicated construction areas at all times. Spotters and flag men to assist with checking and warning. Ensure adequate spotter and flag men are placed with every crew. Ensure employees does not wear "RED" or "GREEN" color clothing next to railway lines. No work closer than 3 meters to any OHTE or other overhead services. Compliance to H339473-0000-01-240-0009 Occupational H&S Vehicles and Driving Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard.
			Damage to existing rail infrastructure as result of project activities	Lost Time Injury	3 - Significant	1 - Rare		No work may be conducted near or on rail lines without a Occupation Certificate. Where there is a possibility to damage existing rail lines a Occupation Certificate must be obtained.
			Incorrect signals to rail bound traffic may result in production loss	Lost Time Injury	3 - Significant	1 - Rare		No red or green lights or clothing may be worn nest to editing or operational rail lines. No obstructions may be placed on the rail line or near the rail line that may influence to rail traffic. Centralized Train Control must be notified of incidents or obstructions on or near rail lines immediately.
			Contact with OHTE	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No work may be conducted closer that 3m to existing rail lines. Occupation Certificates must be obtained where there is a potential to come in contact with OHTE. Level Crossings have been fitted with heights gauges to prevent contact with OHTE of High Vehicles. The Responsible C-Green supervisor will sign the occupation register when witnessing the isolation and earthing of the OHTE.

Risk Rating	Risk Level	Score Indicator
23 to 25	Extreme	
15 to 22	High	
6 to 14	Moderate	
1 to5	Low	

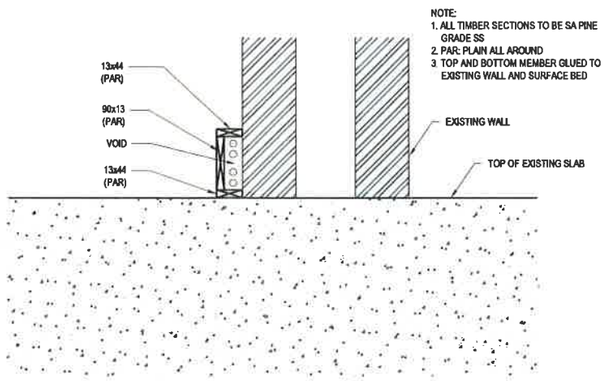
Item	FBS	Task or Activity	Energy / Hazard / Risk (Potential Danger)	Possible Consequence	Initial Risk Score			Existing and proposed control measures
					Consequence	Likelihood	Risk Rating	
		Overhear Power lines	Contact with live high electrical conductors may cause injury	Fatality Injury relating in permanent disabilities	4 - Major	3 - Possible		No person will be allowed to work closer than 20 meters to any overhead electrical conductor. Work closer than 20 meters to any overhead conductor will be approved by the EPCM appointed Project Manager 16.2 Appointee. All electrical equipment to be inspected by a competent person monthly and also daily in pre-use inspections. Competent certified electricians, must be on site at all times. Electrical tie ins done under strict permitting conditions. No live work allowed. Electrical Conductors will be isolated in line with Isolation and lockout procedures. Electrical Conductors will be tested for zero potential prior to commencement of any work. Compliance to H339473-0000-01-240-0011 Occupational H&S Electrical Standard and H339473-0000-01-240-0007 Occupational H&S Permit to Work, Isolation and Lockout Standard
		Telecommunication lines	Contact with telecommunication line may result in service interruption of telecoms	Lost Time Injury	3 - Significant	3 - Possible		Overhead telecoms lines will be regarded as overhead conductors. Where Telecoms lines cross roads height gauges will be placed to indicate minimum height.

NOTE:
For all controls the appointed contractor must complete a task specific risk assessment and ensure all employees performing work is familiar with the hazards as well as the agreed control measures. DSTI's are done before every activity and before any shift starts to communicate and verify identified hazards and controls.
Dedicated, fully equipped and mobile paramedics deployed strategically on site to ensure adequate response to any emergency.

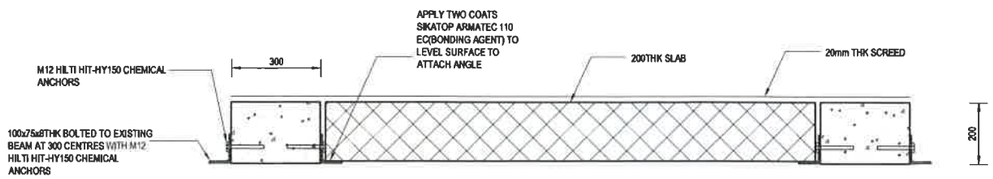
Annexure 3



FIRST FLOOR SLAB LAYOUT
1:50



DETAIL 01
1:5
(SKIRTING DETAIL)



SECTION C
1:10

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REV	DATE	REVISION DETAILS	APPROVED
A	6/6/13	ISSUED FOR PRICING	
1	6/6/13	ISSUED FOR CONSTRUCTION	

DRAWN	DESIGNED
L. GANESAN	G. FREDERICKS

CHECKED
G. FREDERICKS

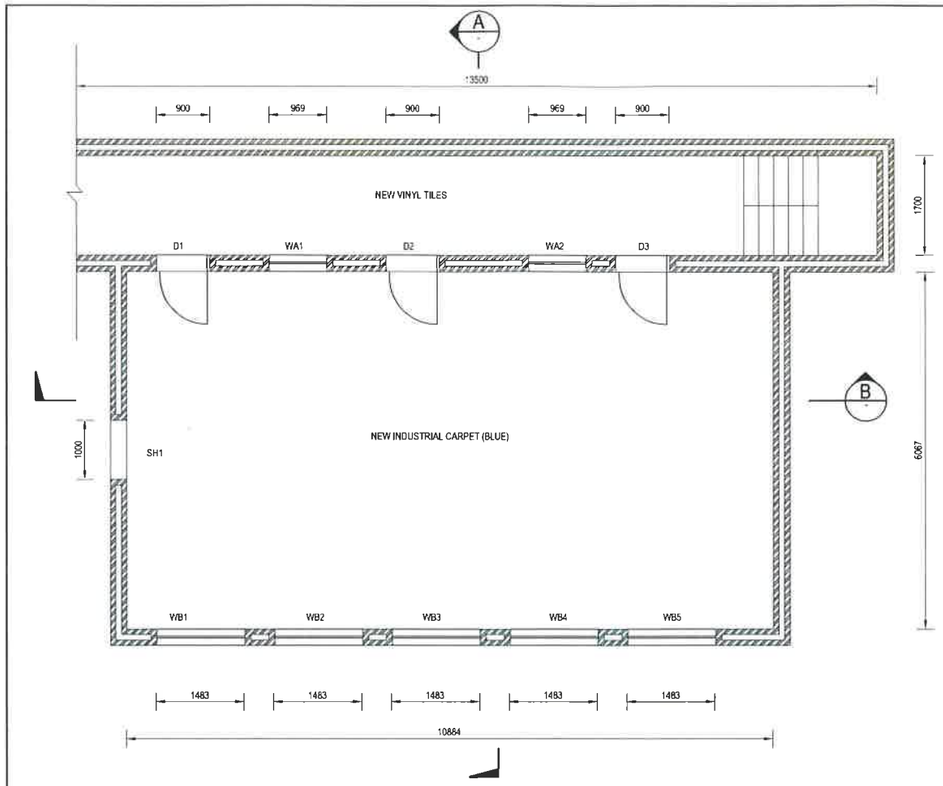
APPROVED
DATE
06/06/2013

PROJECT
TRANSNET: PROMAT BUILDING

TITLE
FLOOR SLAB LAYOUT, SECTIONS AND DETAILS

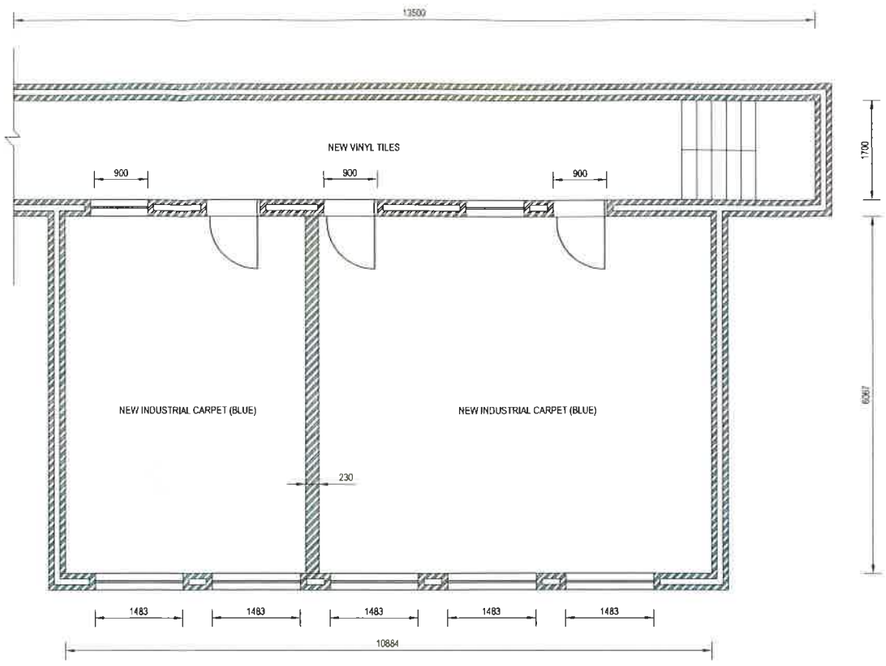
FOR CONSTRUCTION

PROJECT No.	
108981	
SCALE	SIZE
VARIES	A1
DRAWING No.	REV
108981-S01	1



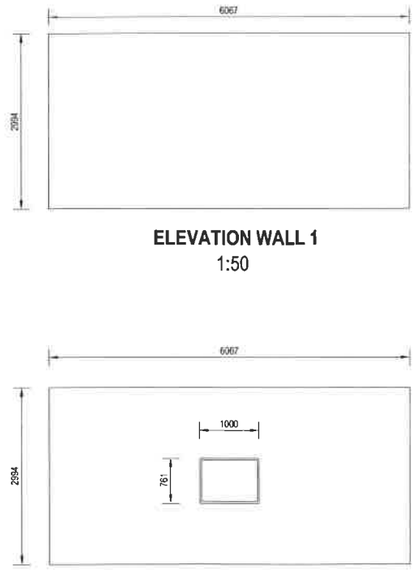
TYPICAL GROUND FLOOR PLAN LAYOUT

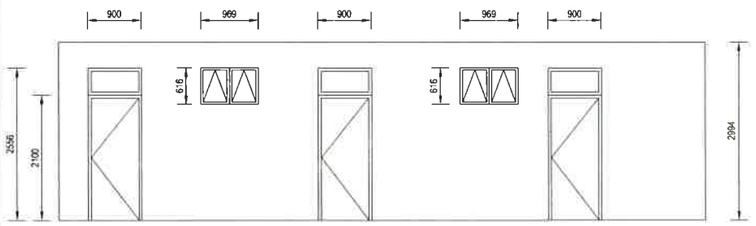
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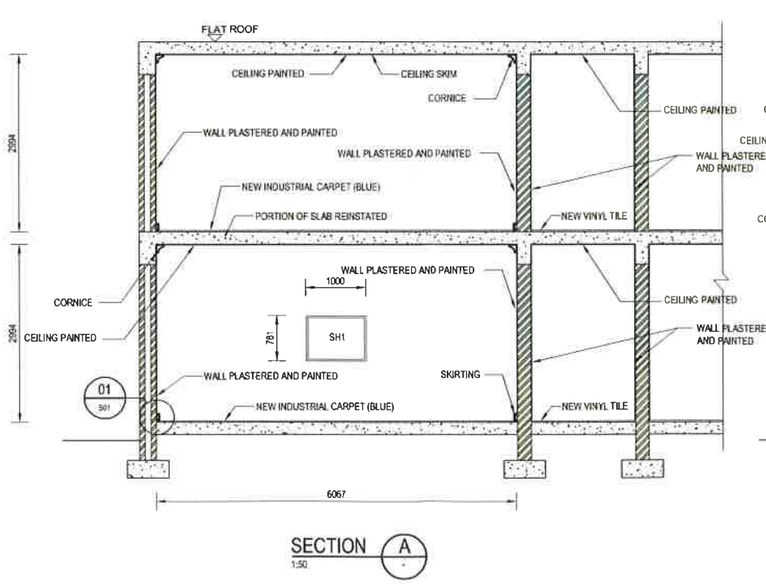


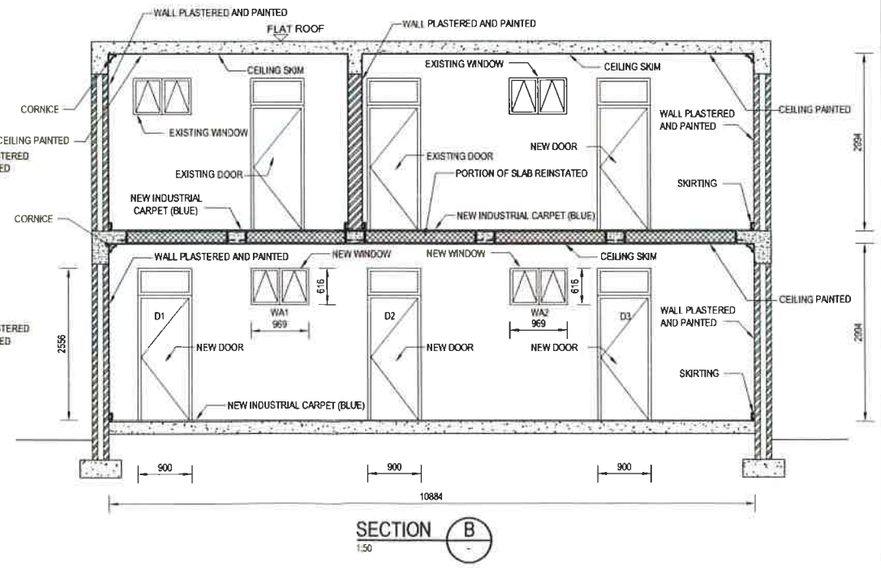
TYPICAL FIRST FLOOR PLAN LAYOUT

1:50









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REV	DATE	REVISION DETAILS	APPROVED
A	6/6/13	ISSUE FOR PRICING	
A	6/6/13	ISSUED FOR CONSTRUCTION	

DRAWN	DESIGNED
L. GANESAN	G. FREDERICKS

CHECKED
G. FREDERICKS

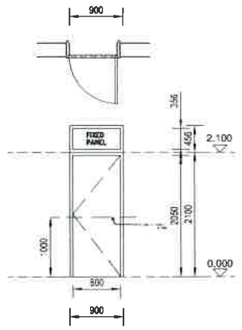
APPROVED
DATE
06/06/2013

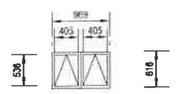
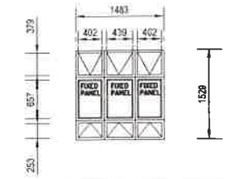
PROJECT
TRANSNET: PROMAT BUILDING

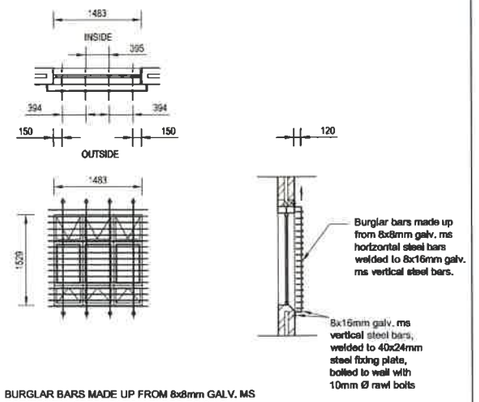
TITLE
PLAN; ELEVATION AND SECTION LAYOUTS

FOR CONSTRUCTION

PROJECT No.	
108981	
SCALE	SIZE
1:50	A1
DRAWING No.	REV
108981-F01	1

DOOR SCHEDULE		
		
TYPE	D	
TYPE DESCRIPTION	Solid Hardwood Doors	3
DOOR	Swartland or similar 136 approved, 44mm thick PD1 framed,ledged and battened open back hardwood door,size 813x 2032mm high(code PD1), sealed with linseed oil based transit stabilizing sealer.Sand down timber surface to a fine finish and apply three coats Swartland Maxicare quality timber sealant prior to installation, all in accordance with manufacturer's recommendations, all in accordance with Aurecon drawing 104474/HAN_B/226	
FRAME	70x70mm Hardwood single rebated door frame. Frame to be built into walls with standard frame anchors or lugs Frame to be painted same color as door	
FIRE RATING		
IRONMONGERY HANDLES	UNION aluminium Sable handles on 150x150 Oval backplate AL6SA20-13AS, escutcheons included with anodized silver finish. PWO Reference - SN-132(a)	
LOCKS	UNION Oval Double Cylinder 2X88C. UNION Oval Cyclinder Upright lock case. Commercial Quality - L-2241-78es. SABS approved. Dpw Hardware Sample List. Ref No. - SN - 6	
HINGES	1,5 Pair of 100mm Aluminium Butt Hinges to door leaf	
CLOSER	777 Regular Arm overhead door closer as per UNION - Size En 2-4	
OTHER	AL6730AS Aluminium door stop as per UNION	

WINDOW SCHEDULE	NB - ALL DIMENSIONS TO BE VERIFIED ON SITE AND SPECIALIST SHOP DRAWINGS TO BE SUBMITTED FOR APPROVAL TO ARCHITECT PRIOR TO MANUFACTURE NOTE - ALL SECTIONS SIZES SHOWN ARE PROVISIONAL & SUBJECT TO FINAL RECOMMENDATION	
		
TYPE	WA	WB
WINDOW NUMBERS	WA1 TO WA2	WB1 TO WB5
NUMBER REQUIRED	2	5
DESCRIPTION	OPENING SECTION : PURPOSE MADE ALUMINIUM SECTION AS PER MANUFACTURERS SPECIFICATION. FRAME : ALUMINIUM FRAME AS PER MANUFACTURERS SPECIFICATION	OPENING SECTION : PURPOSE MADE ALUMINIUM SECTION AS PER MANUFACTURERS SPECIFICATION. FRAME : ALUMINIUM FRAME AS PER MANUFACTURERS SPECIFICATION
FINISH	POWDER COATED, COLOUR PLASCON EXPRESSIONS E-29-6 BOVINE	POWDER COATED, COLOUR PLASCON EXPRESSIONS E-29-6 BOVINE
IRONMONGERY	AS PER MANUFACTERERS SPECIFICATION TO CLIENTS APPROVAL	AS PER MANUFACTERERS SPECIFICATION TO CLIENTS APPROVAL
GLAZING	INTRUDER PROOF, CLEAR FLOAT, SAFETY GLASS. ALL GLAZING TO COMPLY WITH NATIONAL BUILDING REGULATIONS SANS 10400	INTRUDER PROOF, CLEAR FLOAT, SAFETY GLASS. ALL GLAZING TO COMPLY WITH NATIONAL BUILDING REGULATIONS SANS 10400
VENTILATION	AS INDICATED	AS INDICATED
WINDOW SEALING	NOISE AND DUST SEALERS TO BE SUPPLIED AND INSTALLED	NOISE AND DUST SEALERS TO BE SUPPLIED AND INSTALLED

BURGLAR BAR SCHEDULE	NB - ALL DIMENSIONS TO BE VERIFIED ON SITE AND SPECIALIST SHOP DRAWINGS TO BE SUBMITTED FOR APPROVAL TO ARCHITECT PRIOR TO MANUFACTURE NOTE - ALL SECTIONS SIZES SHOWN ARE PROVISIONAL & SUBJECT TO FINAL RECOMMENDATION
	 BURGLAR BARS MADE UP FROM 8x8mm GALV. MS HORIZONTAL STEEL BARS WELDED TO 8x16mm GALV. MS VERTICAL STEEL BARS.
TYPE	B
NUMBER REQUIRED	1
DESCRIPTION	BURGLAR BARS MADE UP FROM 8X8MM GALV. MS HORIZONTAL STEEL BARS WELDED TO 8X16MM GALV. MS VERTICAL STEEL BARS. 8X16MM GALV. MS VERTICAL STEEL BARS, WELDED TO 40X24MM STEEL FIXING PLATE, BOLTED TO WALL WITH 10MM Ø RAWL BOLTS
FINISH	GALV. MS BARS TO BE TREATED PRIOR TO FINAL COAT AS PER PLASCON SPECIFICATION OR EQUAL AND APPROVED - COLOR PLASCON EXPRESSIONS E-29-6 BOVINE

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REV	DATE	REVISION DETAILS	APPROVED
	6/6/13	ISSUE FOR PRICING	
	6/6/13	ISSUE FOR CONSTRUCTION	

DRAWN: L. GANESAN | DESIGNED: G. FREDERICKS
CHECKED: G. FREDERICKS
APPROVED: DATE 06/06/2013

PROJECT: TRANSNET: PROMAT BUILDING

TITLE: DOOR; WINDOW AND BURGLAR BAR SCHEDULE

FOR CONSTRUCTION
PROJECT No. 108981
SCALE 1:50 | SIZE
DRAWING No. 108981-D01 | REV 1

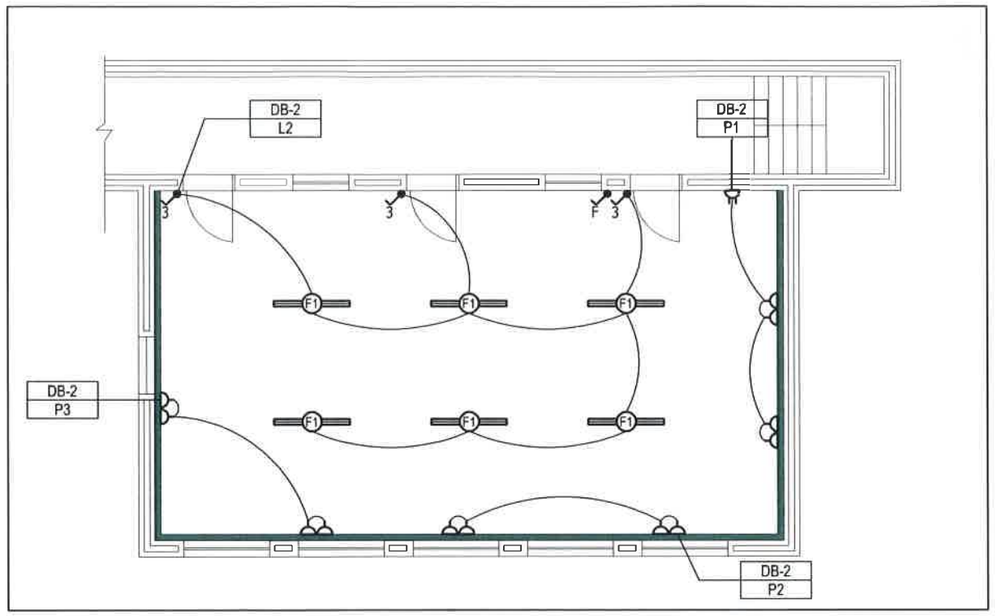
SECTION 4:

ELECTRICAL DESIGN DRAWINGS AND SPECIFICATIONS

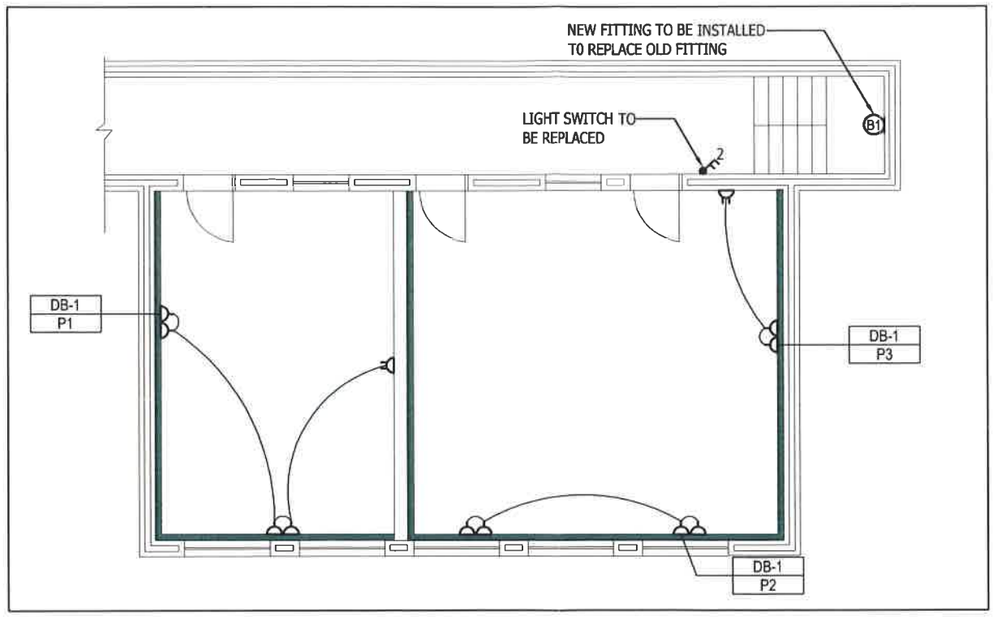
DRAWING TITLE	**DRAWING No.**
GROUND & FIRST FLOOR LIGHTING AND POWER LAYOUT	108981-E01 REV1
SINGLE LINE DIAGRAM DB-1,DB-2	108981-E02 REV1
SMALL POWER AND LIGHTING	DETAIL SHEET NO 1
LUMINAIRE SCHEDULE	DETAIL SHEET NO 2

LEGEND:

- 2 LEVER-2 WAY LIGHT SWITCH
- 1 LEVER 3 WAY SWITCH
- FAN CONTROL
- DOUBLE DATA AND TELEPHONE PORT
- DOUBLE COMPARTMENT POWERSKIRTING
- 2x54W T5 OPEN CHANNEL LIGHT FITTING
- 2x26W CFL BULKHEAD 'WALL MOUNTED'
- SINGLE NORMAL SSO IN POWERSKIRTING
- DOUBLE NORMAL SSO MOUNTED @1200mm AFFL



GROUND FLOOR
SCALE 1:100



FIRST FLOOR
SCALE 1:100

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REV	DATE	REVISION DETAILS	APPROVED
1		ISSUED FOR CONSTRUCTION	
A		FOR INFORMATION	

DRAWN	DESIGNED
F PRETORIUS	H KADADA

CHECKED: J ALLEN

APPROVED

DATE: 03-06-2013

PROJECT: SALT RIVER

TITLE: GROUND & FIRST FLOOR LIGHTING & POWER LAYOUT

FOR CONSTRUCTION

PROJECT No.: 108981

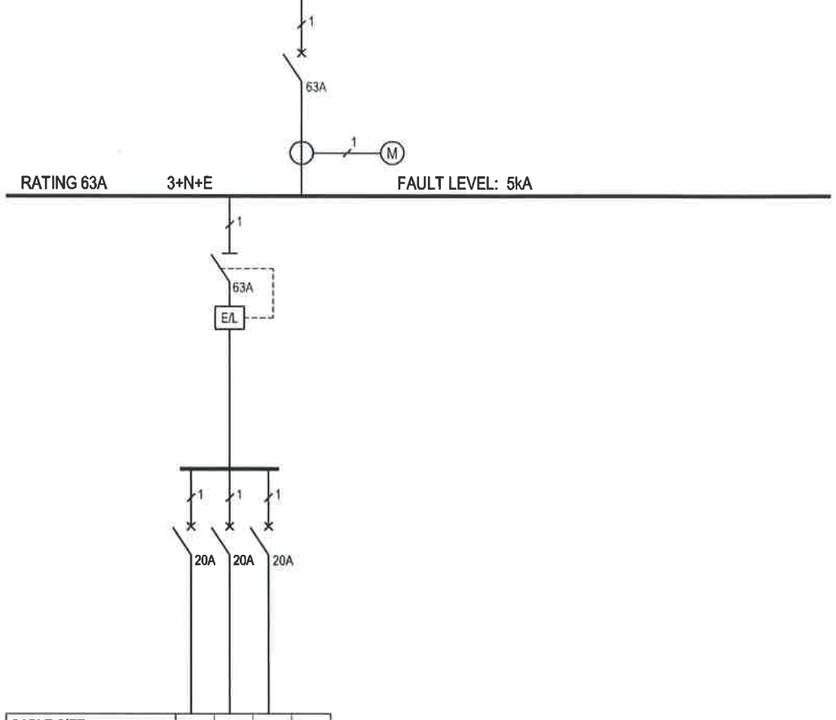
SCALE: AS SHOWN

SIZE: A3

DRAWING No.: 108981-E-01

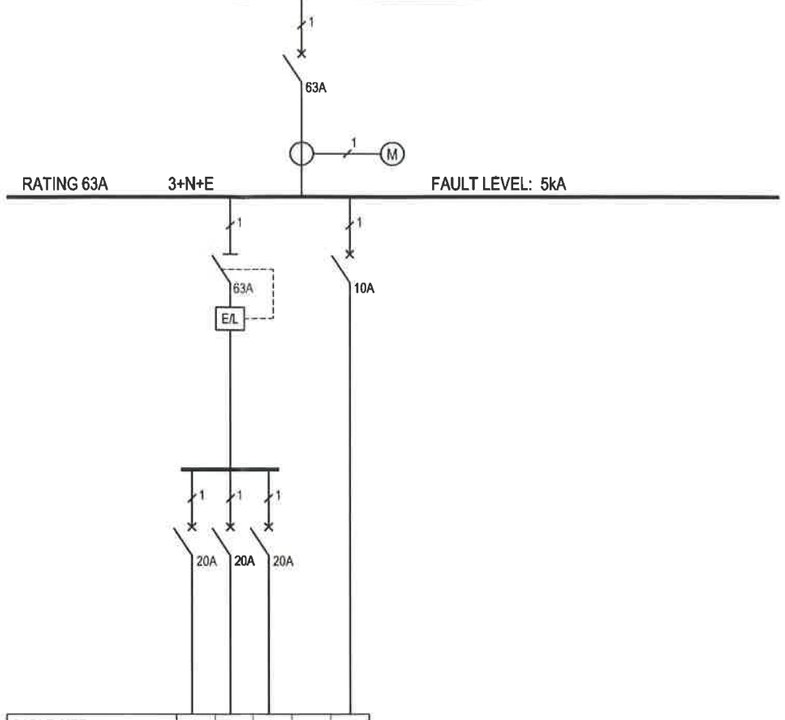
REV: 1

DB NUMBER	DB-1 (EXISTING)
SUPPLY FROM	---
UPSTREAM C/B SIZE	---
CABLE SIZE	---
EARTH CABLE	---



CABLE SIZE	4	4	4	
EARTH WIRE	2.5	2.5	2.5	
CIRCUIT DESIGNATION	P1	P2	P3	
DESCRIPTION	PLUGS	PLUGS	PLUGS	

DB NUMBER	DB-2 (EXISTING)
SUPPLY FROM	---
UPSTREAM C/B SIZE	---
CABLE SIZE	---
EARTH CABLE	---



CABLE SIZE	4	4	4		2.5
EARTH WIRE	2.5	2.5	2.5		2.5
CIRCUIT DESIGNATION	P1	P2	P3		L1
DESCRIPTION	PLUGS	PLUGS	PLUGS		LIGHTS

DISTRIBUTION BOARD SPECIFICATION

METHOD OF INSTALLATION		ACCESS REQUIREMENTS		CONSTRUCTION DATA		COMPARTMENTS		CABLE ENTRY		FINAL FINISH		ELECTRICAL DATA		SPARE SPACE		PREFERRED EQUIPMENT	
FLOOR STANDING		OPEN CONSTRUCTION		MILD STEEL 1,6mm		INCOMER SECTION		TOP	●	EPOXY POWDER COATED	-	MAIN BUSBAR RATING	-	3 POLE	-	AIR CIRCUIT BREAKER	
WALL MOUNTED	●	DOORS		MILD STEEL 2,0mm		NORMAL SECTION		BOTTOM		DB COLOUR	WHITE	VOLTAGE RATING	230V	3 POLE MCB	-	CIRCUIT BREAKERS	
FLUSH		LOCKABLE DOORS		ELECTRO GALVANIZED		EMERGENCY SECTION		REAR		NORMAL SECTION	-	SUB BUSBAR FAULT LEVEL	-	1 POLE MCB	-	SURGE ARRESTERS	-
PEDESTAL MOUNTED		FRONT ACCESS	●	STAINLESS STEEL		UPS SECTION		SIDE		EMERGENCY SECTION	-	CONTROL VOLTAGE	230V	TABULAR COMPONENTS	-	CONTACTORS	
KIOSK		REAR ACCESS		3CR12		TABULAR CONSTRUCTION		NEUTRAL / EARTH		UPS SECTION	-	FREQUENCY	50Hz			CONTROL RELAYS	
ARCHITRAVE		REMOVABLE GLAND PLATES		FIBRE GLASS		METERING / INDICATION		FULL NEUTRAL				SURGE ARRESTOR RATING	-			TERMINALS	
OVER TRENCH		DOOR INTERLOCK		IP65		CONTROL TRANSFORMER		HALF NEUTRAL				POWER FACTOR CORRECTION	-			INDICATING LAMPS	
SURFACE								EARTH BAR								INSTRUMENTS	
								EARTH STUD								PFC CONTROLLER	
								INSULATED EARTH									

Legend

- CIRCUIT BREAKER
- SWITCH - DISCONNECTOR
- CONTACTOR
- EARTH LEAKAGE (CIRCUIT BREAKER TYPE) — E/L
- EARTH LEAKAGE (ISOLATOR TYPE) — E/L
- PHOTOCELL WITH BYPASS SWITCH — BYPASS
- SURGE ARRESTOR (COMBINED CLASS I AND CLASS II, FUSED)
- METER (VOLTAGE/CURRENT/POWER/PF) — M
- DENOTES SLOW CURVE FOR MOTOR START — SC

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REV	DATE	REVISION DETAILS	APPROVED
		FOR CONSTRUCTION	
A	04/06/13	FOR INFORMATION	

PROJECT
SALT RIVER
ENGINEERING BUILDING

TITLE
SINGLE LINE DIAGRAM
DB-1, DB-2

DRAWN	DESIGNED	
F PRETORIUS	H KADADA	FOR CONSTRUCTION
CHECKED		PROJECT No.
J ALLEN		108981
APPROVED		SCALE / SIZE
DATE		N.T.S. / A3
		DRAWING No. / REV
		108981-E-02 / 1

DETAIL SHEET NO 1

SMALL POWER AND LIGHTING

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
	LOW VOLTAGE COMPONENTS AND EQUIPMENT			
1	**POWER OUTLETS**			
1.2	Industrial Switched Socket Outlets			
1.2.1	Manufacturer			
1.2.2	Type			
1.2.3	Faceplate Colour		White	
1.2.5	Mounting	*Flush/recessed in power skirting*	Various	
2	**MINIATURE CIRCUIT BREAKERS**			
2.1	Manufacturer		ABB or similar and approved	
2.2	Type			
2.3	Model			
2.4	Overcurrent Rating	*A*	Various	
2.5	Fault Level Rating	*kA*	5	
2.6	Tripping Curve			
3	**TELEPHONE AND DATA OUTLETS**			
3.1	*Note*		***Data cables and outlets shall be supplied and installed by others***	***Data cables and outlets shall be supplied and installed by others***
4	**LIGHT SWITCHES**			
4.1	1-Lever, 3-way light switch, Flush mounted			
4.1.1	Manufacturer			
4.1.2	Type			
4.2	2-Lever, 2-way light switch, Flush mounted			
4.2.1	Manufacturer			
4.2.2	Type			
5	**CEILING FAN**			
5.1	Manufacturer		Eurolux or similar and approved	
5.2	Type			
5.3	No. of blades	*No.*	3	
6	**WIREMESH CABLE TRAY**			
6.1	Manufacturer		CABSTRUT or similar and approved	
6.2	Range			
7	**TRUNKING**			
7.1	Manufacturer			
7.2	Range			
8	**POWERSKIRTING**			
8.1	Manufacturer		CABSTRUT or similar and approved	
8.2	Range			
9	**SUPPLEMENTARY DETAILS**			

Signature_____ Date_____

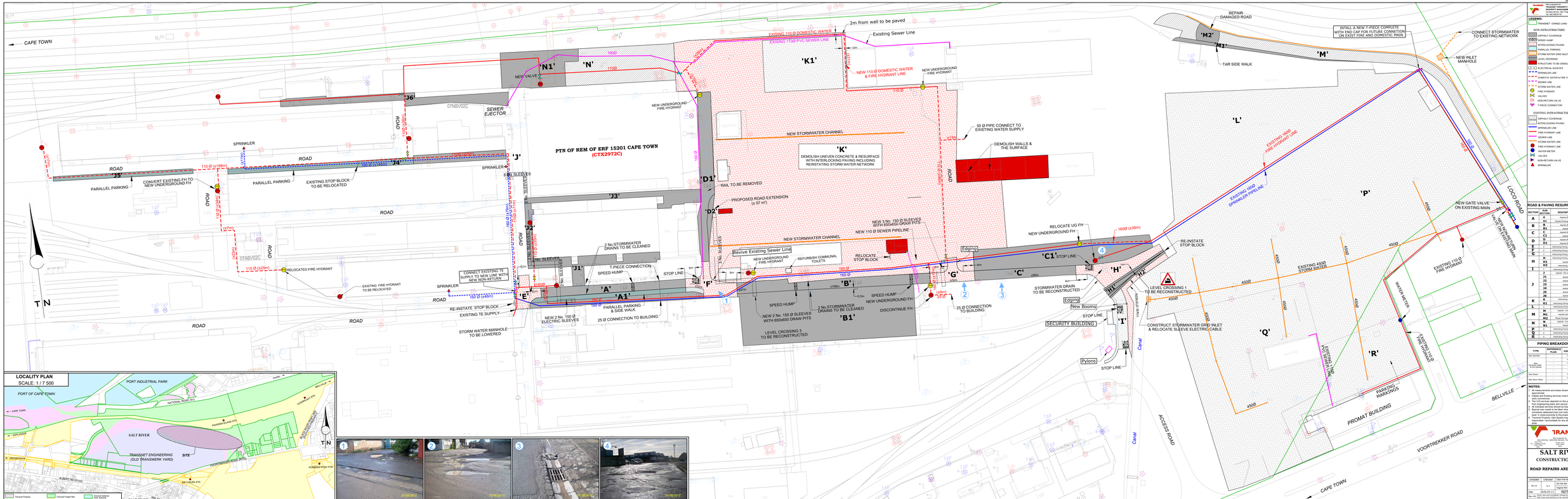
DETAIL SHEET NO 2

LUMINAIRE SCHEDULE

	LUMINAIRE / DEVICE TYPE:	DESCRIPTION	SUPPLIER / MANUFACTURER OR SIMILAR AND APPROVED:	PRODUCT NAME / CODE OR SIMILAR AND APPROVED:	LOCATION	LAMP TYPE:	BALLAST TYPE:	PLUG / LEAD TYPE:
		LUMINAIRE SCHEDULE						
1		LIGHTING						
1.1	B1	Wall Mounted indoor Bulkhead C/W 2X26W CFL Lamp and mounting	PROVINCE LIGHTING	PBH9-226	Stairwell	26W CFL	High Frequency Electronic	N/A - Hard wired
1.2	F1	Ceiling Mounted Luminaire C/W 2 x54W T5 lamp	PROVINCE LIGHTING	POC1-254	Office	28W T5 HE	High Frequency Electronic	N/A - Hard wired

Signature_____ Date_____

ANNEXURE "A"



LEGEND:

- TRANSNET OWNED LAND
- NEW INFRASTRUCTURE:
- ASPHALT COVERAGE
- SPEED HUMP
- INTERLOCKING PAVING
- PARALLEL PARKING
- STORM WATER GRID INLET
- LEVEL CROSSING
- STRUCTURE TO BE DEMOLISHED
- ELECTRICAL SLEEVES
- SPRINKLER LINE
- DOMESTIC WATER & FIRE HYDRANT LINE
- SEWER LINE
- STORM WATER LINE
- FIRE HYDRANT
- VALVES
- NON-RETURN VALVE
- T-PIECE CONNECTOR
- EXISTING INFRASTRUCTURE:
- ASPHALT COVERAGE
- INTERLOCKING PAVING
- SPRINKLER LINE
- FIRE HYDRANT LINE
- SEWER LINE
- STORM WATER LINE
- FIRE HYDRANT LINE
- WATER METER
- VALVES
- NON-RETURN VALVE
- SPRINKLER

ROAD & PAVING RESURFACING TABLE

SECTION	SUB SECTION	DESCRIPTION	APPROX AREA
A	A	Asphalt (Road)	1,280 m²
	A1	Asphalt (Parking & Walkway)	1,500 m²
B	B	Asphalt (Road)	4,380 m²
C	C	Asphalt (Road)	1,200 m²
	C1	Asphalt	11,000 m²
D	D	Asphalt (Road)	1,280 m²
	D1	Asphalt (Road)	1,57 m²
E	-	Interlocking Paving (Intersection)	1,500 m²
F	-	Interlocking Paving (Intersection)	1,500 m²
G	-	Interlocking Paving (Intersection)	1,500 m²
H	H	Interlocking Paving (Intersection)	1,500 m²
	H1	Asphalt	1,747 m²
	H2	Interlocking Paving	1,380 m²
I	-	Interlocking Paving - Completed	-
J	J	Asphalt	1,500 m²
	J1	Asphalt	1,422 m²
	J2	Asphalt	1,722 m²
	J3	Asphalt	1,497 m²
	J4	Asphalt	1,379 m²
	J5	Asphalt	1,464 m²
	J6	Asphalt	1,500 m²
K	K	Interlocking Paving	1,500 m²
L	-	Interlocking Paving - Completed	-
M	H	Asphalt	1,500 m²
	M1	Asphalt (Walkway)	1,130 m²
	M2	Asphalt (Intersection)	1,497 m²
N	N	Asphalt (Intersection)	1,500 m²
	N1	Asphalt	1,760 m²
P	-	Interlocking Paving - Completed	-
Q	-	Interlocking Paving - Completed	-
R	-	Interlocking Paving - Completed	-

PIPING BREAKDOWN TABLE

TYPE	REFERENCE PLAN	PIPE SIZE	APPROX LENGTH
New Sprinkler	—	160 Ø	1,500 m
New Sleeves	—	160 Ø	1,500 m
New Domestic Water & Fire Hydrant	—	110 Ø	1,500 m
	—	50 Ø	1,710 m
New Sewer	—	110 Ø	1,500 m
New Storm Water	—	160 Ø	1,500 m
New Storm Water	—	160 Ø	1,500 m

NOTES:

1. All measurements and areas shown on this plan are approximate.
2. Cables and Existing services must be detected before any excavation.
3. The UG services depicted on this plan have been sourced from engineering plans and various other sources.
4. Transnet Property, Gau-Spatial may not be held responsible / accountable for any discrepancies that may occur.
5. Special care needs to be taken when work commences, as unmarked cables/services (not indicated on this plan) may be encountered. Trial holes may be excavated by hand.
6. Transnet Property, Geo-Spatial may not be held responsible / accountable for any discrepancies that may occur.

TRANSNET

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SALT RIVER

CONSTRUCTION PLAN

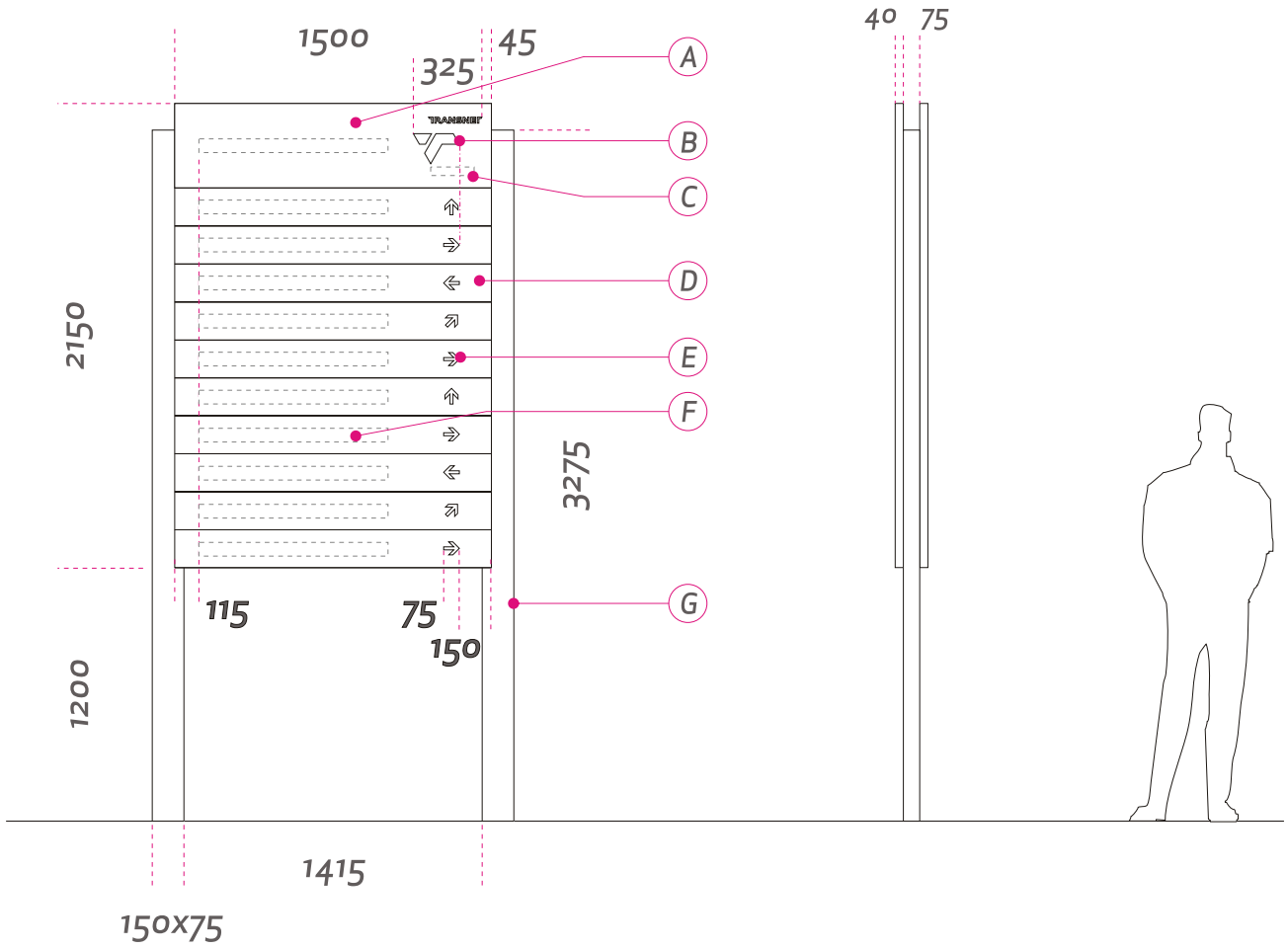
ROAD REPAIRS AND UPGRADES

Completed	Checked	Client File Ref:	
M L N	K T	SS File Ref:	
		Original Ref:	15192/2,3&4
Date:	2026-03-11	Scale:	NOT TO SCALE
Rev. No:	00	Date:	2026-03-11
Rev. Dtl:	Draft issue with comments for client review		

PLAN No. **SRX 0150m/09**

Size: A0 - 1189mm x 840mm

T-SEC 10



- (A) *Sign face header - fabricated alumnium boxed sign face spray painted white with black depot/department vinyl sticker.*
- (B) *TRANSNET C.I. - opaque vinyl logo sticker applied to sign face.*
- (C) *TRANSNET Division descrptor - relevant division vinyl sticker applied to face.*
- (D) *Directional graphics slats - fabricated alumnium boxed sign face coated in relevant division colour.*
- (E) *Directional arrows - white vinyl stickers.*
- (F) *Directional type - white vinyl stickers. 65mm font.*
- (G) *Sign poles - rectangular aluminium 'legs' spray painted in the relevant division's colour.*

Notes:

1. *All TRANSNET C.I. Logo graphics are to follow the constraints described in the logo data sheet.*
2. *All vinyl, perspex and paints specs are to be adhered to, as shown in the specification table.*
3. *All vinyl, perspex and paints specs are to be adhered to, as shown in the specification table.*
4. *All lighting, if applicable, must follow the specifications shown in the lighting sheet.*

	TRANSNET SIGNAGE PROGRAMME		
	Secondary Exterior Signage - Large Info/Directional signage		
	Freestanding pole sign (10 slat)	Sign No. T-SEC 10 Scale Scale 1 : 25 DRAWN v1• 08•2007	TRANSNET