

PART C3: SCOPE OF WORK

Document reference	Title	No of page
C3.1	This cover page <i>Employer's Works Information</i>	1 49
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C3.1 EMPLOYER’S WORKS INFORMATION

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SECTION 1

1 Description of the works

1.1 Executive overview

The Port of Richards Bay is located in northern Kwa-Zulu Natal and has access to a well-established rail network with direct links to hinterlands and mines. The Port consists of a Dry Bulk Terminal that is located between two Multi-Purpose Terminals (6 & 7 Series) operating as a single terminal. The port handles a mix of over thirty (30) commodities including Break-bulk and mineral products such as magnetite, ferrochrome, woodchips etc.

The Port of Richards Bay imports Coking Coal and Alumina from Berths 609 and 701/2 via a series of conveyor galleries to a Wagon loading station and a back of Port facility, South32. The Wagon loading station is utilised to direct load rail wagons and is fed by the G02 conveyor. On October 6th and 13th 2021, a fire broke out on the G02, H01, H03, H05, H06, V01&02 & V51 galleries respectively, causing catastrophic failure of the galleries.

Provide no

Below routes have been damaged and operationally affected;

- Import Sulphur route H02 and H05 to Foskor
- Export coal route utilized by Richards Bay Terminals Grindrod (RBTG) H03
- Coking coal import route H00, H01, V1, V2, G02 and the Bateman Tower
- Transfer house damaged supporting these conveyors GH, UH, HV and HBI

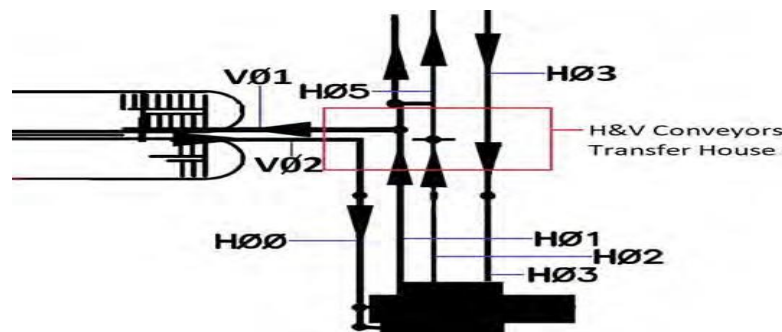


Figure 1 - Plant Layout

The works that the Contractor is required to is to assess, investigate, design, construct, test, commission, and handover all infrastructure associated with the, AMSA coking coal route infrastructure which includes but is not limited to:

- H00 – Coking coal export conveyor.
- H01- Coking coal import conveyor.
- V02- Coking coal reclaim conveyor.
- V01 – Coking coal stacking conveyor.
- V51 – Coking coal conveyor.
- All transfer points and infrastructure.

1.2 Employer's objectives

Immediately after the fire interim solutions for the export of coal, import of coal and sulphur were implemented and came with many challenges:

- Additional road infrastructure maintenance costs as well as early and increased rehabilitation capex requirements.
- Higher probability of incidents due to the high traffics volumes and exhaust fumes.
- Augmented environmental impact: cargo spillages, coal dust emissions, noise,
- Increased cost of doing business due to higher operational costs to handle,
- Lower productivity rates resulting in longer vessel stays at quayside, higher demurrage costs incurred:

The *Employers* objective is to reinstate and recommission all fire damage infrastructure associated to the AMSA Coking Coal Route in accordance with all relevant statutory codes and standards.

The employer is looking for Contractors that are registered with the Construction Industry Development Board (CIDB) as a Mechanical Contractor and be able to handle contracts that are grade 8 and above. Bidder CIDB validity, stage will be confirmed during tender evaluation with CIDB and joint ventures calculation will also be verified with CIDB.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
AIA	Authorized Inspection Authority
AMSA	Arcelor Mittal South Africa
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CRL	Contractor Review Label
CSHEO	Contractor Safety, Health and Environmental Officer
CM	Construction Manager
DTI	Department of Trade and Industry
DWG	Drawings
EC&I	Electrical Control and Instrumentation
ECC	Engineering and Construction Contract
ECSA	Engineering Council of South Africa
EO	Environmental Officer
HAW	Hazard Assessment <i>Workshop</i>
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	<i>Contractor</i> 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
Prog EM	Programme Environmental Manager
Proj EM	Project Environmental Manager
QA	Quality Assurance
R&D	Research and Development
SANS	South African National Standards
SACPCMP	South African Council for the Project and Construction Management Professions
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
TIMS	Transnet Integrated Management System
RBTG	Richards Bay Terminals – Grindrod (Pty) Ltd

2 Engineering and the *Contractor* design

2.1 *Employer's* design

- 2.1.1 The *Employer's* design for the *works* is: None
- 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* obligation under paragraph 2.2 of the *Employer's* Works Information) ONLY.
- 2.1.3 Unless expressly stated to form part of the design responsibility of the *Employer* as stated under 2.1 *Employer's* design above and whether specifically stated to form part of the design responsibility of the *Contractor*, all residual design responsibility and overall responsibility for the total design solution for the *Works* rests with the *Contractor*.

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*:

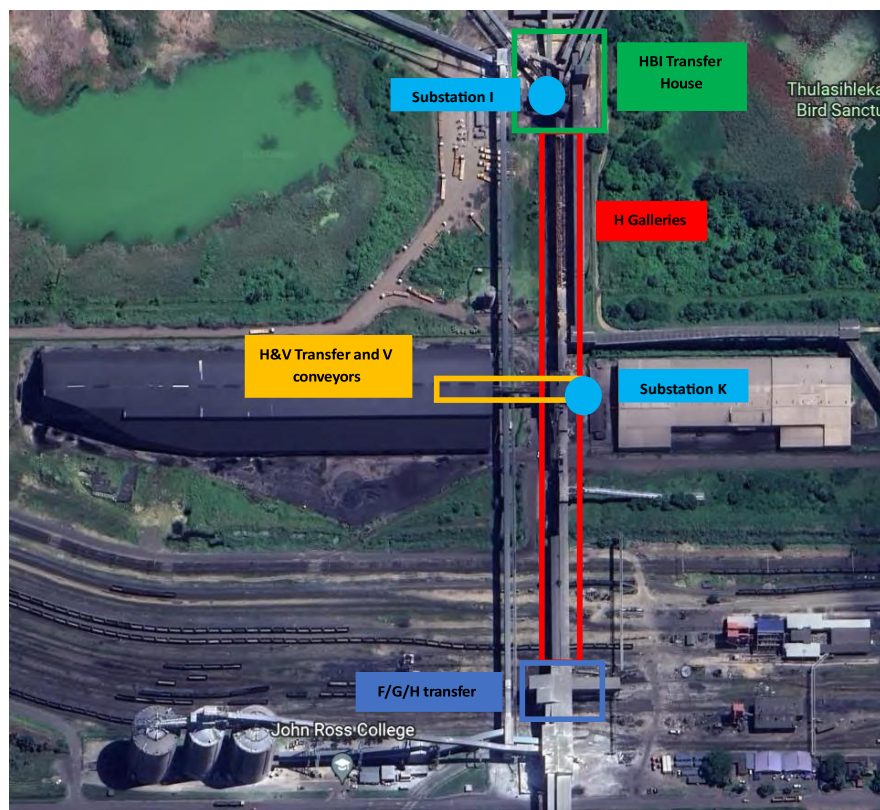


Figure 2 - Aerial Image

The area and battery limits for the *works* are illustrated in the Aerial Image above. Aerial Image 1 shows the F/G/H transfer house, H and V conveyors, HV transfer house and HBI transfer points.

The *Contractor* is to assess, investigate, design, construct, test, commission, and handover all infrastructure within these areas as well as service infrastructure, required outside the area e.g. Sub Stations to ensure successful reinstatement of operations. This includes all preliminary *works* such as condition assessments, surveys, geotechnical *works*, and any related *works* required for the *Contractor* to successfully submit a complete *works*. This also includes all services required to ensure successful completion of *works*, such as but not limited to, electrical, instrumentation, fire, wash water, etc.

The Scope of Work covered by this Works Information shall include, but not be limited to the discreet element analyses (material flow) of transfer chutes structural design, mechanical design, electrical design, control and instrumentation design, detail draughting, shop detail, procurement, manufacture, paint, touch-up paint, pre-assemble in shop, test, delivery to Transnet Port Terminals Richards Bay including off-loading of equipment and structures, erection, site pre-commissioning and commissioning of the complete conveyor network as mentioned above and illustrated in the Aerial Image.

The *Contractor* is to provide the following parts of the Engineering Services and construction activities for all areas of *works*, in accordance with all applicable statutes, regulations and standards as appropriate to the scope of *works*, including any normative references contained in the aforesaid statutes, regulations and standards:

- Detailed investigations, assessments, design, construction, commissioning, testing, and handover of all infrastructure.
- Any modifications required to existing infrastructure to ensure completion of project and to ensure compliance.
- Design and Construction integration with *works* done by *Others*
- Spatial considerations and allowance for conveyors joining into the HV transfer house
- The design of a complete fire system for all new and modified infrastructure, turnkey fire design to ensure full protection
- Detail design of all required temporary construction *works*,
- Development of all required specifications, datasheets, lists, schedules, and other documents required to deliver the *works*
- Project documentation in line with Transnet requirements

The scope of *works* includes that the *Contractor* is responsible to undertake all residual designs required to complete the *works*.

All *Works* is applicable to the following conveyors and their associated galleries, transfer points and substations, namely:

- H00 – Coking coal export conveyor
- H01- Coking coal import conveyor
- V02- Coking coal reclaim conveyor
- V01 – Coking coal stacking conveyor
- V51 – Coking coal conveyor
- All transfer points and infrastructure
- Sub Stations K and I

- 2.2.2 The *Contractor* is to design the following parts of the *works*, for acceptance by the *Project Manager*:
- Shop detail drawings for the construction of the conveyor belts, pylon supports, portal structures, fire systems, electrical, water lines and pumps.
 - Other drawings, specifications and reports for equipment that the *Contractor* is responsible for
 - 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*: None
- 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*.
- 2.2.4 Any design development that the *Contractor* may formulate to ensure the correct execution of the *works* unless expressly stated to form part of the design responsibility of the *Employer* as stated under the *Employer's* design above and whether or not specifically stated to form part of the design

responsibility of the *Contractor* under this paragraph, all residual design responsibility and overall responsibility for the total design solution for the *works* rests with the *Contractor*.

2.2.5 All design and construction work within this project are to be conducted by:

- ECSA Professionally Registered (Pr. Eng/Pr. Tech Eng.) personnel with experience in Design, fabrication and construction of Bulk Material Handling Infrastructure and all associated infrastructure such as galleries, services, hazardous area classification, conveyor and gallery fire protection, electrical, substations, control and instrumentation.

2.2.6 the *Contractor* to Issue a certificate of compliance for the completed *works*.

2.2.7 The *Contractor* shall follow the below, a typical design workflow process. The *Contractor* shall develop and submit their own project specific design workflow process for acceptance by the *Employer*.

Design Development Stages

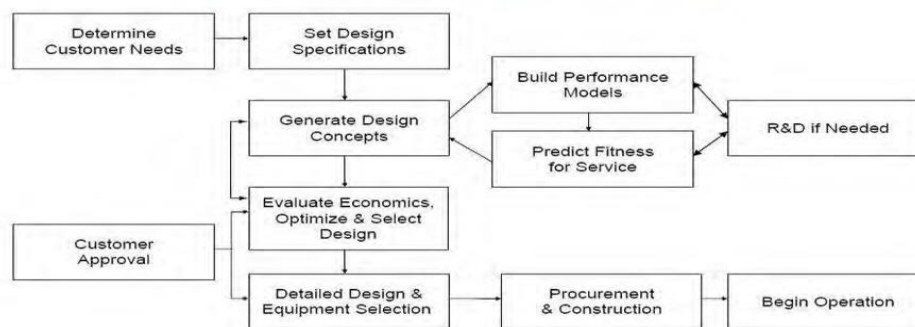


Figure 3 - Design Development stages guideline

2.3 Procedure for submission and acceptance of *Contractor* design

2.3.1 The *Contractor* undertakes design safety reviews with the *Project Manager*, Safety Manager and other relevant personnel as determined by the *Project Manager*.

2.3.2 *Contractor* may not proceed with these *works* until written approval or acceptance is obtained from the *Project Manager*

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

- All relevant equipment selection and sizing calculations, equipment specifications and datasheets.
- All fire protection and wash water, potable water system sizing calculations, equipment specifications and datasheets.
- All mechanical building services system sizing calculations, equipment specifications and datasheets.
- The principal Equipment categories deployed for the *Contractor* to provide the *Works* require its design to be accepted by the *Project Manager* under ECC Clause 23.1:

2.3.4 The *Contractor* documentation shall be issued to the *Project Manager* under cover of the *Contractor* Transmittal Note indicating all Contract references (i.e. Project No, Contract No, etc.) as well as the *Contractor* Project Document Number, Revision Number, Title and chronological listing of transmitted documentation. Formats of *Contractor* data submitted is dependent on the project procedure and shall be specified by the *Project Manager*, upon the notified request of the *Contractor*.

2.3.5 The *Contractor* shall deliver both hard copies and electronic media copies (CD Rom/memory stick) to the *Project Manager* either at the address stated within the Contract Data or at the Project site office.

2.3.6 All electronic documentation shall be submitted by the *Contractor* in Adobe Acrobat (.PDF) and native file format.

- 2.3.7 Acceptance of documentation by the *Project Manager* will in no way relieve the *Contractor* of its responsibility for the correctness of information, or conformance with his obligation to provide the *Works*. This obligation rests solely with the *Contractor*.
- 2.3.8 After review, a copy of the original reviewed/marked-up drawing/document, with the *Project Manager's* consolidated comments and document status marked on the *Contractor* Review Label, is scanned and the copy shall be returned to the *Contractor* under cover of the project's Transmittal Note for revision or re- submittal as instructed.
- 2.3.9 The *Contractor* shall allow the *Project Manager* 2 weeks (unless otherwise stated and agreed) to review and respond to the *Contractor* submission of their documentation, i.e. from time of receipt by the project to the time of despatch.
- 2.3.10 However, work shall proceed without delay in the event of late return of the documentation by the *Project Manager* with prior notification in writing by the *Contractor*.
- 2.3.11 On receipt of the reviewed documentation the *Contractor* shall make any modifications requested/marked-up and resubmit the revised documentation to the *Project Manager* within 2 weeks. Queries regarding comments/changes should be addressed with the *Project Manager* prior to re-submittal with adequate reasons.
- 2.3.12 Any re-submittals, which have not included the changes/comments identified, will be returned to the *Contractor* to be corrected. The *Contractor* shall re-issue the revised documentation incorporating all comments and other specified details not included in the previous issue within 2 working days of receipt of the marked-up document.
- 2.3.13 In undertaking the *works* (including all incidental services required), the *Contractor* shall conform and adhere to the requirements of the *Contractor* Document Submittal Requirements Standard included in Annexure 16 (Refer DOC- STD 0001 Rev 03).

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* all documentation requirements for the *works* shall be dealt with in accordance with document DOC-STD-0001 – Rev03 (*Contractor* Documentation Submittal Requirements). The control, maintenance and handling of these documents and drawings, using a suitable document control system, remain the sole responsibility of the *Contractor*.

Other requirements of the *Contractor* design

- 2.4.1 The *Contractor* design complies with the following:
- All international, national legislation and Transnet specifications. Where there is a duplication of specifications, the most stringent shall apply.
 - In the design of the fire protection systems, the design code shall be followed which is most suitable for the application and which needs to be approved by the relevant insurance parties from which Transnet has taken out insurance cover.

2.5 Use of *Contractor's* design

- 2.5.1 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, re-construction, 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*.
- 2.5.2 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*.

2.6 As-built drawings, operating manuals and maintenance schedules

2.6.1 The *Contractor* provides the following:

- All as-built drawings on completion of installation, construction.
- All operating manuals for equipment, infrastructure and devices
- All maintenance manuals/schedules
- All data books
- Training manuals for all *Works*
- The *Contractor* provides manuals in an A4 hard covered, red, grease and waterproof binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.
- Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.
- The *Contractor* submits the draft Table of Contents to the *Project Manager* for acceptance prior to the compilation and official submittal of the manuals.
- The originals of all brochures shall be issued to the *Project Manager*. When a general brochure is applicable to a range of equipment, then the specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.
- The address, phone numbers and reference numbers of all *Sub-Contractors* is provided.
- Where manuals include drawings that still need to be revised to "As-Built" status, and such manuals are required prior to 'As-Built' status, the manual will not be considered to be in its final form until the "As-Built" version of each such drawing has been incorporated
- The required number of copies of the manual (s) shall be as specified by the *Project Manager* and submitted per type or model number of equipment included in the contract or as specified by the *Project Manager*.
- A typical example of what the binder/file (s) shall be marked with on the spine and the front cover is as follows: -
 - Project Name
 - Manual Title, e.g. Installation, Maintenance and Operating Manual FBS No. and Title
 - Manual Numbering (e.g. Volume 1 of 2, etc.) Contract Number
 - *Contractor* Name
- Unless otherwise stated in the CDS, the required number of copies of all As- Built/Final/Data Packs shall be:
 - 3 x hard copies (Full size)
 - Memory stick with Adobe Acrobat (.pdf) and "Native" formats

2.6.2 As-Built/Final Documentation

In undertaking the *works* (including all incidental services required), the *Contractor* shall conform and adhere to the requirements of the *Contractor* Document Submittal Requirements Standard included in Annexure 16 (Refer DOC-STD-0001 Rev 03).

2.6.3 Installation, Maintenance and Operating Manuals and Data Books

In undertaking the '*Works*' (including all incidental services required), the Supplier shall conform and adhere to the requirements of the 'Data Books and Manuals' Standard included in Annexure 10 Refer DOC-STD-0001 Rev 03) and the '*Contractor* Documentation Submittal Requirements' Standard included in Annexure 16 (Refer DOC-STD-0001 Rev 03)

3 Construction

3.1 General

- 3.1.1 This section deals with general construction constraints relating to site wide activities. Construction constraints relating to specific activities are provided in the technical, environmental, health and safety specifications, quality and programming requirements and specifically those clauses in the technical specification relating to construction included in annexures attached to the Works Information. In executing the *works*, the *Contractor* abides by all policies, procedures, standards, codes, specifications, regulations, acts and laws of the Republic of South Africa
- 3.1.2 Prospective *Contractors* shall visit the Site of the proposed *Works* and acquaint themselves with the nature of the *works*, the conditions under which the work is to be performed, the means of access to the site, any and in general with all matters that may influence or affect the contract.
- 3.1.3 *Contractors* shall be deemed to have allowed in their tender for any additional cost to be involved due to the foregoing, as no claims for any extras in connection with the position or nature of the work will be entertained.

3.2 Temporary *works*, Site services & construction constraints

- 3.2.1 *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 organize 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* 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* 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.
- 3.2.2 Restrictions to access on Site, roads, walkways and barricades

Contractor 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.

3.2.3 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.

3.2.4 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.

3.2.5 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 OHS Act and Regulation (85 of 1993, CR 2014).

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

3.2.7 The *Contractor* to comply with the Transnet Integrated Management System (TIMS) H&S Contractor Specification Guideline Annexure - 11

3.2.8 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* to comply with TIMS Environment and Sustainability Contractor Specification Guideline Annexure - 10

3.2.9 The *Contractor* complies with the CEMP, SES and PES in the construction of the *works*, all as described in the *Employer's Works Information*.

3.2.10 Title to Materials from demolition and excavation

3.2.11 The *Contractor* has title to all Materials arising from excavation and demolition in the performance of the *works* with the exception of:

- Electrical and mechanical components that are in a working condition
- 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.

3.2.12 Cooperating with and obtaining acceptance of others

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

- During the course of the *works*, 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
- 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
- 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

3.2.14 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.

No photographs are to be taken unless the photographer is in possession of a camera permit issued by the TNPA Chief Security Officer, Port of Richards Bay. 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*.

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

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

3.2.15 The *Contractor* provides a notice board with the project details at the site location

3.2.16 The *Contractor* provides progress photographs at weekly intervals in JPEG Format

3.2.17 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*.

3.2.18 *Contractor* 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.
- The *Contractor* shall keep daily records of all Equipment used on Site and the Working Areas with access to such daily records available for inspection by the *Project Manager* at all reasonable times.
- All Equipment necessary for the *Works* shall be provided and allowed for by the

3.2.19 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.

3.2.20 No Equipment is provided by the *Employer*

3.2.21 Wherever the *Employer* provides facilities (including, *inter alia*, temporary power, water, waste disposal, telecommunications etc) for the *Contractor* 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*. These facilities will need to be documented, including condition and agreed upon and signed off, to ensure facilities are returned to the right state upon handover from the Contractor.

Facilities provided by the *Contractor*:

- 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 closer to the site will be made available to the *Contractor*, but the *Contractor* is responsible for connecting up to the electrical point, cabling in the working area and Certificate Of Compliance (COC).
- A potable water supply point closer to the site will be made available to the *Contractor* at this site, but the *Contractor* is responsible for connecting up to the water supply point to the working area.
- The *Contractor* shall make his own arrangements for the supply of other services for site establishment 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.
- Wherever the *Employer* provides facilities for the *Contractor* 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*.

3.2.22 The *Contractor* provides the following facilities for the *Project Manager* and *Supervisor*:

- 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 Port 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 wastewater. 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.
- 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*.

3.2.23 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.

- 3.2.24 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*.
- 3.2.25 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 authorized.
 - 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.
 - Special site inspection is required for proof trenching to ascertain cables and location thereof under the close supervision of the Transnet representative.
- 3.2.26 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* 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 finalized with the *Project Manager* prior to final design of the equipment.
- 3.2.27 The *Employer* provides the following information and survey controls for the *Contractor*: None
- 3.2.28 Excavations and associated water control
- All excavations to have compulsory site visit by Transnet staff prior to approval of proof trenching and final digging.
 - 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*.
 - Underground services, other existing services, cable and pipe trenches and covers
 - The *Contractor* must, in collaboration with the *Supervisor*, 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 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.

3.2.29 Where the *Contractor* encounters existing underground services / existing services cables / pipe, the *Contractor* should notify the *Project Manager*.

3.2.30 Control of noise, dust, water and waste

- All Site activities must comply with the relevant parts of legislation. Key Dates, Completion, testing, commissioning and correction of Defects

3.2.31 *Key Dates & Employer's Timelines*

The *Contractor* shall plan his *works* according their approach paper and method statements to meet the *Employer's* timelines as defined in the table below and elsewhere in this documented, the following Key dates will also be defined for the contract –

Key date	Item	Timelines
1	Completion of condition assessments	To be achieved no later than 10 working days from award or to which ever period later amended.
2	Completion of engineering	To be achieved no later than 30 working days from award or to which ever period later amended.
3	Completion of off-site fabrication and delivery of lead items	To be achieved no later than 120 working days from award or to which ever period later amended.
4	Site Establishment Complete	To be achieved no later than 40 working days from award or to which ever period later amended.
5	Completion of Coking Coal Infrastructure (Feed restored and operational)	To be achieved no later than 110 working days from Site Establishment or to which ever period later amended.
	Completion of the <i>works</i>	See item below

Table 1 - Key Dates

3.2.32 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. Completion is to be achieved no later than 160 working days from award or to which ever period later amended.

Item of work	To be completed by
Training & technology transfer per paragraph 6.12 under C3.1 <i>Employer's Works Information</i>	Prior to commencement of commissioning
Performance testing of the <i>works</i> in use as specified in paragraph 3.6.8 of this Works Information and aligned to requirements of EEAM-Q-013 – Commissioning and Handover	Prior to Completion.

Table 2 - Work to be completed by Completion Date

3.2.33 The *Contractor* is permitted to carry out the following *works* after Completion:

Item of work	To be completed by
Submission of all data packs, quality assurance records and as-built drawings	No more than 10 working days after completion

Table 3 - Work to be completed after Completion.

3.2.34 Use of the *works* before Completion has been certified.

In the event of the *Works*, not being completed by the completion date, the *Employer* reserves the right to make use of the part/s of the *works*, without the *Contractor* having the benefit of final acceptance.

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

3.2.35 The *Contractor* ensures that all documentation as described in the Works Information is presented to the *Project Manager* before Completion.

3.2.36 The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of As-built documents that represent the status of the completed *works* (to include Plant within the *works*) to present to the *Employer*.

3.2.37 The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of Maintenance and Operating Manuals at the earlier of take-over or Completion.

3.2.38 Where the *Contractor* has presented As-builts, Data Packs, Maintenance and Operating Manuals to the *Project Manager* at take-over, the *Contractor* modifies and updates As-built documents as necessary prior to Completion.

3.2.39 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.

3.2.40 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 *Employer's* work specifications

4.1 Investigation, Survey and Site Clearance

4.1.1 The *Contractor* carries out the following investigations and surveys at the Site:

- Detailed condition assessment and investigation to accurately, more than 90% accurate, to determine constructions *work* and cost.
- All required and additional preliminary *works* such as surveys, scanning, geotechnical investigations, testing, etc. to ensure completion of the *Contractors* *works* within the project timelines.

4.2 The Civil scope of *Works* shall include, but not limited to:

4.2.1 Galleries and Transfer Houses

The civil scope includes but not limited to, design, supply, and installation of two systems, namely the Belt Washing Effluent Disposal System and Stormwater Management System:

- a) Design, supply and install belt washing effluent disposal system to effectively convey effluent water away from the belt washing site using appropriate conveyance systems.
- b) The *Contractor* is to design, supply and install the effluent disposal system to tie into the existing water wash plant system according to the specific needs of the Terminal including, but not limited to:
 - Operational requirements
 - Effluent contamination or toxicity relating to commodities handled on respective belts.
 - Site conditions
 - Environmental regulations where necessary
 - Safety regulations where necessary
- c) Effluent water from the belt washing system to be appropriately handled and collected as per required environmental and safety regulations.
- d) The *Contractor* to design and detail a Management and Maintenance Plan for the belt washing effluent disposal system.
- e) The *Contractor* to propose alternative effluent disposal and/or recycling concept designs, clearly highlighting advantages and disadvantages of each concept to the Client for approval.
- f) The *Contractor* will be required to:
 - Complete a desk top study of the available information as well as review any assessments and reports undertaken post the fires.
 - Undertake a site investigation and produce a detailed assessment report of all belt washing system sites in order to accurately inform the extent of the design, supply and installation costs of the effluent disposal system.
 - Design, supply and construct the *works* in accordance with Transnet's Requirements and processes, industry best practices and latest statutory codes and standards.
 - The design shall comply with the requirements of the South African National Standards (SANS) codes and standards as well as any local, regional and national laws and bylaws.
 - The design must take into account all operational and maintenance requirements and tie into the current infrastructure.
 - Issue a certificate of compliance for the completed *works* if required.

- g) The *Contractor* shall design, supply and install appropriate stormwater systems at the H&V Galleries to promote effective drainage of the site and discharging to existing stormwater system.
- h) Design, supply and installation of stormwater system to include considerations required to protect stormwater and surrounding environment from contamination by commodities handled in the terminal.
- i) Stormwater infrastructure is to be designed according to the specific needs of the Terminal including, but not limited to:
- Operational requirements
 - Effluent contamination or toxicity relating to commodities handled on respective belts – protection of stormwater.
 - Site conditions
 - Environmental regulations where necessary
 - Safety regulations where necessary
- j) *Works* shall include for the delivery to site, off-loading and storage on-site, setting out, execution of the *works*, testing, commissioning and handing over of all new stormwater drainage infrastructure and connecting to all relevant existing *networks*.
- k) The *works* for the Stormwater drainage shall be completed according to SANS 1200 LE and shall include the following where required:
- Excavation, layer *works* bedding and backfill for stormwater infrastructure.
 - Supply, lay and construct stormwater infrastructure.
 - The onus is on the *Contractor* to identify all existing services.
 - And any other work arising out of or incidental to the above or required of the *Contractor* for the proper completion of the *works*.
- l) The *Contractor* will be required to:
- Complete a desk top study of the available information as well as review any assessments and reports undertaken post the fires.
 - Undertake a site investigation and produce a detailed assessment report for all required stormwater systems in order to accurately inform the extent of the design, supply and installation costs.
 - Perform a survey to appropriately inform stormwater designs.
 - Design, supply and construct the *works* in accordance with Transnet's Requirements and processes, industry best practices and latest statutory codes and standards.
 - The design shall comply with the requirements of the South African National Standards (SANS) codes and standards as well as any local, regional and national laws and bylaws.
 - The design must take into account all operational and maintenance requirements and tie into the current infrastructure.
 - Issue a certificate of compliance for the completed *works* where required.
- m) Final deliverables for respective belt washing effluent disposal system design and stormwater system design includes:
- Approved for Construction (AFC) Drawings
 - Environmental Licenses – if any
 - Stormwater Management and Maintenance Plan
 - Effluent Disposal System Management and Maintenance Plan

4.3 The Structural scope of *Works* shall include, but not limited to:

4.3.1 Galleries and Transfer Houses

- a) Structural design and replacement of all the structural steel and concrete elements damaged in the fire. The scope for the reinstatement extends from F/G/H Transfer through to HV Transfer and into the coking coal via the V01 and V02 conveyors. The conveyors are enclosed by clad steel portal structures and a composite floor slab supported on reinforced concrete piers and piled foundations.

- The portal enclosure also provides supports to the electrical, mechanical, fire, ICT and other associated infrastructure.
- b) The *Contractor* will be required to:
- Complete a desk top study of the available information as well as review any assessments and reports undertaken post the fires.
 - Undertake a site investigation and produce a detailed assessment report for the entire length of the superstructure in order to accurately inform the extent of the design and reconstruction.
 - Testing, scanning, surveys etc to be undertaken to assess the integrity of the current infrastructure.
 - Design, supply and construct the *works* in accordance with Transnet's Requirements and processes, industry best practices and latest statutory codes and standards.
 - Issue a certificate of compliance for the completed *works*.
- c) The design must take into account all operational and maintenance requirements and tie into the current infrastructure. The design will be required to incorporate all applied loads and necessary fixings and supports to ensure safe installation of associated infrastructure and equipment. A drainage system will need to be provided in the floor, with suitable falls and outlets to ensure efficient and effective drainage of the wash water. Provision is to be made for the downpipes and associated fixtures. The floor design must incorporate all necessary safety access and exit points.
- d) The reconstructed reinforced concrete pier is to match the existing infrastructure. Provision is to be made for the support of any drainage downpipes. The reinforced concrete pier is assumed to be supported on a piled foundation. The *Contractor* will be required to undertake a geotechnical study to confirm the founding requirements.
- e) The *Contractor* will also be required to conduct a detailed assessment of current design, construction and condition of the existing foundation and advise on its suitability to be incorporated in the current *works*.
- f) All structures shall be designed to ensure that noise, vibration, temperature and dust levels are kept within acceptable limits to provide proper operating conditions for the plant, which is to be installed, and a comfortable working environment for the owner's operations and maintenance staff throughout the year. The construction of all structures shall take into account the need to achieve all specified and regulatory noise restrictions. The design methodology include safety in all aspects of the construction phase and building lifecycle.
- g) Provision shall be made in the designs for the maintenance of all high-level structures, internally and externally.
- h) Structures shall be designed to comply with the relevant parts of the international or national regulations covering fire precautions in the design and construction of buildings.
- i) Design calculations and analyses shall consider the most unfavourable combination of static, dynamic, erection and lay-down loads and loads due to temperature and shrinkage effects, to which the structure or component part may be subjected, both for the serviceability and ultimate limit states. Methods of computation and magnitude of loads shall be in accordance with the relevant standards and codes of practices.
- j) The design shall be carried out according to the current construction standards and according to the elements and the documentation provided by the owner (concerning the functional, engineering, structural, geotechnical aspects, etc.).
- k) The *Contractor* shall undertake all necessary designs, remediation, and reconstruction to ensure the structural stability of the galleries, transfer houses and enclosures for the extent of the *works*. The *Contractor* is required to issue a letter of stability for the entire extent of the galleries, transfer houses and other associated infrastructure within the battery limits of the project.
- l) All existing structural steelwork, whose integrity has not been compromised by the fire, must be treated for corrosion protection and reinstated in accordance with EEAM specifications.
- m) The *Contractor* is to make provisions in his designs and his construction methodology for undertake construction *works* under live operational conditions or working around other *Contractors*

4.4 The Mechanical scope of *Works* shall include, but not limited to:

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

The Scope of Work covered by this Works Information shall include, but not be limited to the discreet element analyses (material flow) of transfer chutes, conveyor and associated infrastructure design, structural design, mechanical design, including fire, potable water, wash water and mechanical building services for substations and new control room, electrical design, control and instrumentation design, detail draughting, shop detail, procurement, manufacture, corrosion protection, touch-up paint, pre-assembly in shop, test, delivery to Transnet Port Terminals Richards Bay including off-loading of equipment and structures, erection, storage, site pre-commissioning and commissioning of the complete conveyor network as mentioned and illustrated in the Aerial Image shown in 2.2.1 .

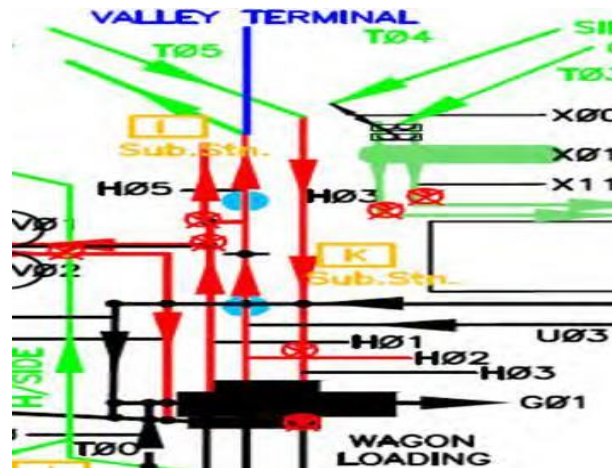


Figure 4 - H and V Conveyors and Transfer Points

The scope of work shall include, but not be limited to:

4.4.1 Bulk Material Handling Services

a) Conveyors, Galleries and Transfer Houses

- Perform detailed condition assessment, investigations, and testing to determine condition and advise on use of existing infrastructure and equipment.
- Detailed design of all conveyors, galleries, and all supporting infrastructure and services in line with relevant codes and standards (ISO, SANS, etc.) as well as Transnet specifications
- Material Testing and Material Test Report inclusive of sample collection and transportation for coking coal (wet and dry) and magnetite.
- Discrete element modelling and analyses of all receiving and transfer chutes,
- Design to consider latest technology and operational improvements.
- Detail draughting and shop detailing,
- Reinstatement and construction of all designed elements,
- The complete investigation, assessment, design, construct and commission of entire conveyor systems.
- The *Contractor* to guide on the use of undamaged infrastructure/equipment/components from a spares holding capacity point of view with undamaged components and placed in the *Employer's* spares inventory
- All new control systems need to be integrated into existing control and communication infrastructure i.e. provide feedback and interlock to DBT plant SCADA within CCR
- The construction of new conveyors, galleries, and supporting infrastructure
- All required and additional preliminary *Works* such as surveys, scanning, testing, etc. to ensure completion of the *Contractors Works*.
- Ensure design engineering integration with all equipment and infrastructure.

- Prepare detailed calculations for items such as commodity flow, power supply requirements and feeder configuration,
- Perform detailed transfer chute design and discrete element modelling with analyses of transfer chutes to ensure fit-for-purpose design based on various load scenarios.
- Ensure all impact zones are lined appropriately with liner options presented to the *Employer* for acceptance prior to procurement and use.
- Ensure the conveyor design is focused on maintenance access, maintainability, and minimizing downtime and spillages,
- Design and implementation of dust mitigation measures to prevent contamination.

b) General Requirements

- All conveyors and their component parts, including electrical motors and equipment, shall be suitable for operation in a highly abrasive dust laden marine atmosphere and shall be resistant to maintenance and cleaning activities.
- All Belt Conveyors shall comply with the requirements of ISO 5048/5049 as well as Transnet project specific requirements.
- Any base components and/or sub-components not covered in the above documents shall be according to the Manufacturer's standards for the specific application. Full details shall be supplied. The Contractor is granted certain liberties to demonstrate superior knowledge of design, construction, quality, and performance.
- Conveyor drives shall be able to start, operate, and stop smoothly and safely under normal and emergency conditions without over-stressing the conveyor belting, components, structures, or associated systems. Conveyor to be designed to start under load. Variable Speed Drives (VSD's) will be used.
- No torque arm arrangements to be used. Floor mounted drives preferred.
- At loading and impact areas, *Contractor* to align to Transnet specifications.
- No tubular idler frames to be used.
- Conveyors shall be designed to operate properly and track without the need to skew or tilt idler frames to control the side-to-side movement of the conveyor belting.
- Conveyors shall be capable of operating safely and smoothly without the conveyor belting lifting, flapping, vibrating, or running out of alignment under all operating conditions with maximum speed wind acting from any direction.
- Where conveyor elevation is equal to or greater than two (2) meters above ground level, the conveyor shall have a walkway on both sides, unless otherwise specified.
- Maintenance platform around all pulleys and take-ups shall be provided.
- Maintenance platforms around chutes with inspection covers must be provided.
- Wherever possible, equipment and components shall be standardized to the maximum extent possible to keep spare parts to a minimum.
- The entire installation shall conform in all respects to environmental standards, and occupational safety and health standards for air emissions and exposure limits.
- The following shall be included on *Contractor* documentation or drawings: all material specifications, dimensions, tolerances, and fits for proper design, supply, manufacture, and assembly of conveyor components. Changes to above shall be approved by Transnet Port Terminals.
- Field assembly shall be minimum required where practically possible.
- The noise level measured 1 meter away from anywhere around the conveyor shall not exceed 85 dB.
- Safety guards shall be provided for all rotating or moving parts such as drive couplings and pulleys.
- Chutes should be designed not to spill and overflow on belt stop sequences and to ensure steady efficient flow through to receiving chute and conveyor with minimal dust generation.

- Relevant dust skirts and mitigations to prevent cargo contamination to be investigated, designed and implemented.
- Conveyor belting shall meet the necessary requirements as to grade, strength, troughability, load support and flexing over pulleys and idlers as per ISO 5048 and relevant National and Transnet specifications. The belting shall be free of defects and have the minimum number of splices.
- Concepts and options are to be presented to the *Employer* in all areas of *works* prior to any engineering development and fabrication.

Building Services and Fire

c) Conveyors, galleries, transfer houses and substations

All fire protection, fire water, wash water, potable water design and associated infrastructure,

- All fire deluge and fire protection systems to be interlocked with existing conveyor belt PLC and SCADA systems including fire monitoring.
- Allow for detail design and integration into existing control room as well as provision for relevant control system license/s.
- All complete fire protection, and all relevant mechanical building services design including HVAC and suitable gaseous fire detection and suppression system in line with ASIB, SANS and other relevant codes and standards.
- All new control and monitoring systems need to be integrated into existing control and communication infrastructure i.e. provide feedback and interlock to DBT plant SCADA within CCR
- Detail draughting, design, calculations and shop detailing,
- Reinstatement and construction of all designed elements,
- The complete investigation, assessment, design, construct and commission of entire conveyor systems.

d) General Requirements

- All wash water, fire protection system components which shall include but not be limited to fire hose reels, hydrants, extinguishers, all fire water piping, valves, sprinklers, deluge nozzles, flanges, gaskets, bolting, clamps, pipe supports, fire detection systems, panels, gauges, controls, instrumentation, communications and all associated components and signage shall be such that it can operate in a highly abrasive dust laden marine atmosphere.
- All mechanical building services required which shall include but will not be limited to HVAC, fire protection inclusive of fire gas suppression and all other relevant emergency signage shall be such that it can operate in a highly abrasive dust laden marine atmosphere.
- HVAC system shall be of positive pressurized type in order to prevent ingress of dust into the substation(s).
- All new control systems need to be integrated into existing control and communication infrastructure i.e. provide feedback and interlock to DBT plant SCADA within CCR
- Conveyor galleries to have fire sprinklers at roof level and fire deluge system on conveyor belt itself.
- Fire detection system needs to transmit/communicate a signal and display to the existing CCR (Central Control Room).
- The BVI Fire Gap Analysis reports conducted on these routes will be issued for information. It shall however be up to the *Contractor* to ensure compliance with statutory requirements and Transnet insurance requirements.

4.4.3. The *Contractor* areas of Services and deliverables shall include but not be limited to:

- Prepare detailed calculations, computer simulations on all mechanical engineering elements in line with Transnet specifications, to include, but not limited to, the following:
 - Conveyor belt design width of 1350mm and Class 1000 where applicable based on *Contractor* assessment and investigation,

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- Conveying design rate of 2500tph and 1900 kg/m³ for worse case design of magnetite. This is to be verified by material test data. Coal shall be modelled to establish design throughput. (Refer to 4.5.2 Electrical Scope for Galleries and Transfer House for requirements that prescribes the maximum speed for capability requirements of the drive units and electrical system) Belt class, grade, and type selection,
 - Design of conveyors take-ups,
 - Design of pulleys and shafts,
 - Idler selection and spacing (with recommendations if solution differs from current TPT standards),
 - Belt cleaning devices,
 - Design of new travelling carriages (flopper chutes, moving heads, tripper cars etc.), rack and pinion system preferred for moving heads,
 - Design for maintenance, ease of access and walkways,
 - Drive system and configuration,
 - Electrical load calculations,
 - Braking calculations/modelling,
 - Drive selection (Refer to Electrical requirements for maximum speed for capability requirements of the drive units and electrical system),
 - Flow modelling to for all commodities
 - Conveyor guarding in line with International, National and Transnet standards and requirements.
 - Structural design of all conveyor and bulk material handling elements and
 - Design for Health and Safety as per OHS Act
 - Prepare reports at the various stages of the projects to the professional team and other relevant stakeholders,
 - Undertake concept and detail fire design for detection and suppression,
 - Prepare concept and detail drawings for all mechanical, fire, mechanical building services, civil, structural, electrical, and control & instrumentation elements of the new conveyors and associated infrastructure to detailed Approved for Construction design, to include, but not limited to, the following:
 - General Assemblies,
 - Layouts,
 - Detailed Mechanical Elements,
 - Process Flow Diagrams,
 - Process and Instrumentation Diagrams,
 - Pneumatic and hydraulic drawings
 - Piping ISO drawings
 - Pipe route drawings
 - Data sheets,
 - Detailed structural connections,
 - Single line diagrams,
 - Cable routing,
 - Pipe routing
 - Process and instrumentation diagrams and
 - Shop detail drawings.
 - Prepare a detailed conveyor specification referring to detail design which includes fabrication, testing, supply, installation and commissioning of conveying equipment. This will include for, but not be limited to:

- Belting,
- Idlers,
- Pulleys,
- Winches
- Drives and
- Installation specification of the above.
- Prepare construction methodology and installation procedures for all infrastructure and equipment, modularization, and pre-assembly to be detailed.
- Providing and signing-off the critical hold points for all design critical construction and fabrication *works*,
- Performing all quality checks and approvals of fabrication, installation, and
- equipment (inclusive of FAT's, SAT's),
- Respond to field engineering queries,
- Engineering changes and updates to drawings,
- Issue of design certification (construction alignment to design)
- Mechanical completion and commissioning
- Issuing Certificate of compliance for all infrastructure, equipment, and processes
- Perform all commissioning and testing in accordance with international, national and Transnet standards and requirements.

The Electrical scope of Works shall include, but not limited to:

- e) The Electrical Scope covers and not limited to, the refurbishment, design, manufacture, supply, installation, construction and commissioning of the electrical infrastructure related to the routes as described above.
- f) The *work* entails the furnishing of all plant, labour and materials, construction plant, temporary *works*, equipment, auxiliaries and accessories, special tools, spare parts and operation occupation arrangements.
- g) The consultant/*Contractor* shall provide all engineering deliverables to the *Employer* for acceptance. The expected Electrical and Instrumentation deliverables are but not limited to the following list:
 - Design Criteria with the details of all the applicable design standards and plant specifications.
 - Technical reports with all the calculations and studies which includes but are not limited to illumination, load flow, fault level, protection, earthing and lightning protection.
 - The consultant/*Contractor* shall undertake the required power system studies for the entire electrical network of the Port of Richards Bay using the latest version of the ETAP simulation software. The consultant/*Contractor* shall be in possession of the software.
 - Plant/Equipment list.
 - Plant/Equipment data sheets and layout drawings.
 - MV and LV Single line drawings.
 - Electrical Lighting and Power layout drawings.
 - Schematic diagrams.
 - Cable route drawings and electrical raceway/cable management drawings.
 - Loop drawings
 - P&IDs
 - As-Built Drawings
 - CoCs
- h) Conduct a zone classification study for the impacted route.
- i) ~~Design, and build a new substation to replacement of both substation K & I into a new combined substation.~~

- j) ~~The decommissioning of the existing substation K and I.~~
- k) The design, supply, installation and commissioning of the SCADA ~~for the network to SANS 61850 for the substation and the SCADA~~ for the BMH plant.
- l) The integration of the new SCADA component to the existing SCADA in the Port of RCB. All the required interfaces for the integration and the required upgrades shall form part of the scope of *works* of this contract.
- m) Cold and hot commissioning.
- n) During construction, Transnet's Port electrical appointed personnel shall perform all the required switching and control work permits.
- o) The *Contractor* shall submit a notification of switching to the *Project Manager* two weeks prior to the required work being performed.

4.4.2 Electrical Scope for Galleries and Transfer House (Excluding substation K and I *works*)

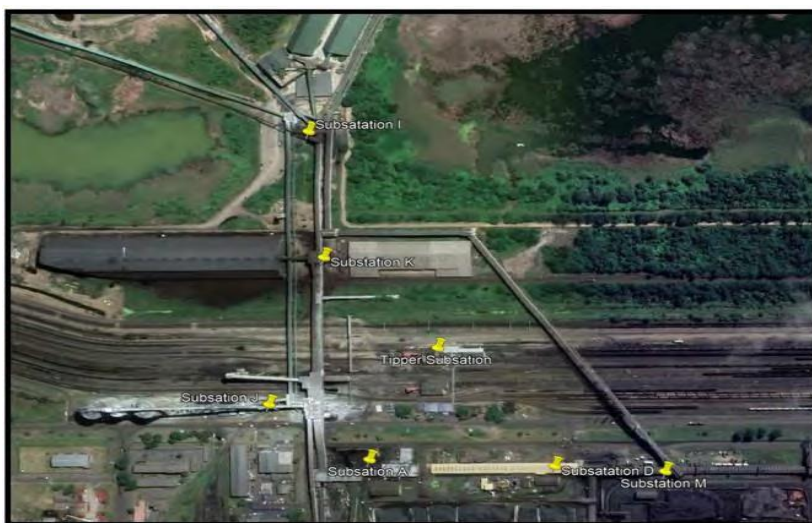


Figure 5 - Aerial Image 2: Substations Area View

- a) The *Contractor* shall study and understand the "investigation for the catastrophic failure of the h00, h01, h02, h03, h05, h06, v01&2 and v51 conveyor galleries and associated infrastructure in the port of Richards Bay report" also issued as an annexure of this Works Information. This conditional Assessment report shall serve as a guide that was used in the development of the Electrical Scope and shall be considered as a reference. It is advised that the *Contractor* reads the scope of work in conjunction with the referenced conditional assessment report, but it should be noted that in other items, the approach required by the *Employer* is different from the proposal of the conditional assessment.
- b) The *Contractor* shall undertake a zone classification study in accordance with SANS 10108. The designs, selection of plant, installation and commissioning *Works* of this contract shall be in accordance with the classified hazardous zone or explosive atmosphere.
- c) The *Contractor* shall select the suitable ingress protection for the electrical plant considering the environment impacting the installation.
- d) For pricing, all plant/equipment to be installed shall be assumed to be suitable for a hazardous zone 20. The design is expected to optimise this requirement depending on the outcome of the zone classification study that will be a deliverable during execution. All optimisation to be workshopped with the employer's engineer for acceptance.
- e) The *Contractor* shall test, refurbish and issue back to TPT all the reusable plant/equipment that was or is to be recovered from the installation to be replaced. See the conditional assessment report for recommendations of what is still reusable. Such plant that is still reusable and is to be refurbished will be stored as spares and to be reused for this project.

- f) The refurbished drives shall conform to the requirements of the zone protection study. This is to say, the frames of the existing drives to be reused as spares shall be upgraded to have an explosive atmosphere rating that is assumed to be a Zone 21ATEX rating for pricing.
- g) The main point of supply in this contract shall ~~be the new substation K and all cable routes from the field shall be routed to the new substation.~~ be the existing substation K and all cable routes from the field shall be routed to the existing substation
- h) The *Contractor* shall design, select, supply and install the electrical installation from the point of supply to the consumption unit. All the requirements for design shall include the consumption unit. This is to say, the installation for the four impacted conveyors shall be completely new designs.
- i) Loads such as the HVAC and drives that also appear as part of the mechanical engineering scope of this contract. Such loads shall not be duplicated in the electrical scope when pricing. Such loads shall be considered in the Electrical Engineering scope requirements but shall only be priced in the mechanical engineering scope pricing schedule.
- ~~j) ——— The design from all drive units complete with the electrical power systems for these respective conveyor belts shall be designed to enable a belt maximum speed of 4.5m/s. This is to say, the drive unit size, cables, and switchgear shall be designed for nominal current at a conveyor speed of 4.5m/s.~~
The design from all drive units complete with the electrical power systems for these respective conveyor belts shall be designed to enable a belt maximum speed of 4.5m/s. This is to say, the drive unit size, cables, and switchgear shall be designed for nominal current at a conveyor speed of 4.5m/s. The prospective short circuit current for a DOL feeder shall be used for cable selection design."
- k) The *Contractor* shall design the cable routes/management for the electrical reticulation of the supply circuits of the conveyor belt drives and for all the required electrical reticulation that forms part of the electrical scope.
- l) The Contractor is required to carry out the cleaning of the existing substation K 3.3kV and LV switchgear associated with Electrical Infrastructure that forms part of the Electrical Scope. The Contractor shall make use of a similar or approved technology to the Nano-Material Solution for cleaning electrical plant whilst it is live. The Nano-material cleaning agent used must comply with ISO 9001, ISO 14001, and ISO 45001 standards. A proposal for this specialised electrical cleaning is provided as an annexure of this scope of Work). The contractor shall submit the specification, and ISO certifications of the cleaning agent to be used for acceptance before commencement of the works. The cleaning work shall be done in the presence and to the satisfaction of the employer's engineer.
- ~~m) ——— The Contractor shall design, select, supply, and install from the drive unit to the new substation plant all the feeding circuits for all the conveyor belt drives to be replaced as per the *Works* of this contract.~~
The Contractor shall design, select, supply, and install from the drive unit to the existing substation plant all the feeding circuits for all the conveyor belt drives to be replaced as per the Works of this contract
- n) The existing single line diagram for the electrical network and the condition assessment report shall be issued as Annexures – 15 of this Works Information. Information in these references provides guidance for the electrical design parameters. For estimation purposes, the positions of the loads that depends on the mechanical engineering designs shall be assumed to be the same as the positions of the collapsed installation. The drawings of the previous designs shall be issued as part of the annexures.
- o) The *Contractor* shall design, select, install, and commission the lighting, small power, cable management, lighting, earthing, and bonding of the electrical scope related all to the structures per section as seen in the illustration.
- p) The *Contractor* shall design, supply, and install all the complete controls and instrumentation requirements complete with junction boxes for the operation of the infrastructure. The contractor to allow for 2xPLC panels for the conveyor plant SCADA inside the substation.
- q) This is a design and build solution, all design requirements encompassed are the responsibility of the *Contractor*.
- r) The *Contractor* shall test and commission the entire Electrical and Instrumentation installations.

4.5 Deliverables shall include but not be limited to:

- Prepare detailed calculations, computer simulations on all engineering elements in line with Transnet specifications.
- Prepare reports at the various stages of the projects to the professional team and other relevant stakeholders,
- Undertake concept and detail fire design for detection and suppression,
- Prepare concept and detail drawings for all mechanical, fire, mechanical building services, civil, structural, electrical, and control & instrumentation elements of the new conveyors and associated infrastructure to detailed Approved for Construction design, to include, but not limited to, the following:
 - General Assemblies,
 - Layouts,
 - Detailed Mechanical Elements,
 - Process Flow Diagrams,
 - Process and Instrumentation Diagrams,
 - Pneumatic and hydraulic drawings
 - Piping ISO drawings
 - Pipe route drawings
 - Data sheets,
 - Detailed structural connections,
 - Single line diagrams,
 - Cable routing,
 - Pipe routing
 - Process and instrumentation diagrams and
 - Shop detail drawings.
- Prepare a detailed specifications referring to detail design which includes fabrication, testing, supply, installation and commissioning all designs.
- Prepare construction methodology and installation procedures for all infrastructure and equipment, modularisation, and pre-assembly to be detailed.
- Providing and signing-off the critical hold points for all design critical construction and fabrication *works*,
- Performing all quality checks and approvals of fabrication, installation, and
- equipment (inclusive of FAT's, SAT's),

- Respond to field engineering queries,
- Engineering changes and updates to drawings,
- Issue of design certification (construction alignment to design)
- Issuing Certificate of compliance for all infrastructure, equipment, and processes
- Perform all commissioning and testing in accordance with international, national and Transnet standards and requirements.

5 List Of Drawings and Reports

5.1 Drawings, Illustrations, Reports issued by the *Employer*.

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

Notes:

- Some drawings may contain both Works Information and Site Information.
- Where drawings and documentation refer to other Operational Division and Company names, it should be read as Transnet Port Terminals
- All information issued i.e. drawings, illustrations, reports etc is for information only can be found in the Annexures -
 - CV H00 Coking Coal Export Conveyor
 - CV H01 Coking Coal Export Conveyor
 - CV H02 Sulphur Import Conveyor
 - CV H05 Sulphur Import Conveyor
 - V01 Coking Coal Shed Stacking Conveyor
 - V02 Coking Coal Shed Stacking Conveyor
 - H&V Transfer House
 - BVI Fire Assessment Reports
 - Bosch Fire Damage Assessment Reports
 - Existing power System switching single line diagram
 - Sub Station K & I Condition Assessment Report

6 List of specifications

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

Title	Description
SANS	All relevant SANS specifications and requirements
ISO	All relevant ISO specifications and standards
TIMS	Transnet Construction Environmental Management Plan_Rev04
TIMS	Transnet Standard Environmental Specification_Rev04
TIMS	Contractor SHE Specifications
TIMS	TIMS Contractor Health and Safety Specification Guideline
DBT Plant	Conveyor Technical Data

DBT Plant	Electrical Network
EEAM-Q-001	Belt Conveyors and Associated Equipment
EEAM-Q-002	Specifications Hydraulic Equipment
EEAM-Q-003	General - Specification for Steel Wire
EEAM-Q-004	Gear, Shaft & Bearing Brake
EEAM-Q-006	Structural steel Work
EEAM-Q-008	Corrosion Protection
EEAM-Q-009	Quality Management
EEAM-Q-010	Specification for reinforced Concrete and Structural
EEAM-Q-011	Maintenance of Cranes and Hoist
EEAM-Q-012	General Electrical Equipment - Revised 10-Sep-12
EEAM-Q-013	Punch List Specification
EEAM-Q-014/015	Electrical Motors and generators-
EEAM-Q-014/016	Electrical Motors and generators
EEAM-Q-015	Elec Tech Data Sheet
EEAM-Q-016	General Requirements and Conditions
EEAM-Q-017	Medium voltage switchgear and control
EEAM-Q-018/021/030	Specification for Electrical Equipment
EEAM-Q-019	Cable reel Systems
EEAM-Q-020	Tests on Electrical Equipment
EEAM-Q-021	Specification for Electrical Equipment
EEAM-Q-021	Electronic Equipment
EEAM-Q-028-M	Specific requirements-Mech Equip-Richards Bay
EEAM-Q-028-E	Specific requirements-Elec Equip-Richards Bay
EEAM-Q-030	(Elec Equip Supply- PORTS HE8-2-12Ver1)
TPD	High Level Commissioning Plan
TPD	TPD-001-EL&PSPEC
TPD	TPD-002-DBSPEC (2)
TPD	TPD-003-CABLESPEC
TPD	TPD-004-EARTHINGSPEC
TPD	TPD-005-FIRESPEC
TPD	TPD-007-MVSWITCHSPEC
TPD	TPD-008-MINISUBSPEC
TPD	TPD-010A-HIGHMASTSPEC-A
TPD	TPD-010B-HIGHMASTSPEC-B
TPD	TPD-011-UPSSPEC
TPD	TPD-012-ACCESS CONTROL
TPD	TPD-012-POWER FACTOR CORRECTION
TPD	Trenching Manhole spec

Table 4 - List of Specifications

SECTION 2

7 Management and start up

7.1 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 and compensation events)	Every 2 weeks	TPT Richards bay offices	CM, <i>Project Manager</i> , <i>Supervisor</i> , <i>Contractor Project Manager</i> , Project Team
SHE meetings	Weekly	On-Site	CSHEO, CM, <i>Project Manager</i> , SHEC, ProjEM, <i>Contractor Project Manager</i> , Project Team
Safety Action Meetings	Weekly	On-Site	CM, <i>Project Manager</i> , HSR, <i>Contractor Project Manager</i> , Project Team
SHE Pre-mobilization Meeting	Within 1 week prior to site establishment by <i>Contractor</i>	On-Site/ TPT Richards bay offices	CM, <i>Project Manager</i> , HSR, EO, ProjEM, CSHEO, <i>Contractor Project Manager</i>
Stakeholder Engagement Meetings	Monthly	TPT Richards bay office	Client, CM, <i>Project Manager</i> , HSR, <i>Contractor Project Manager</i> , Project Team

Table 5 - Management meetings

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.

7.2 Documentation Control

In undertaking the *works* all documentation requirements for the *works* shall be dealt with in accordance with document DOC-STD-0001 – Rev03 (*Contractor* Documentation Submittal Requirements). The

control, maintenance and handling of these documents and drawings, using a suitable document control system, remain the sole responsibility of the *Contractor*.

- 7.2.1 The *Contractor* Documentation Schedule (CDS) is as contemplated in DOC-STD- 0001 – Rev 03, as contained in Annexure 16.
- 7.2.2 The *Contractor* documentation "Starter kit", as contemplated in DOC-STD-0001 – Rev 03, will be issued at the kick-off meeting following award.
- 7.2.3 All contract correspondence is issued through document control. All hardcopy communication will be delivered to the *Employer* via the Document Controller at the Project site-office document control department. All electronic communication to be transmitted to **RBayDocControl@transnet.net**. and relevant Document Controller copied in.
- 7.2.4 Each supplier of documentation and data to the Project is responsible for ensuring that all documentation and data submitted conforms to the Project Standards and data Quality requirements in terms of numbering, uniqueness, quality, accuracy, format, completeness and currency of information. Data not meeting the Project Standards and data Quality requirements will be cause for rejection and returned to the *Contractor* for corrective action and re-submission.
- 7.2.5 Should any change be made to documentation or data, which has already been submitted to the Project, new or revised documentation or data shall be issued to replace the outdated information.
- 7.2.6 It is the responsibility of all Project participants undertaking work on the Project to ensure they obtain and comply with the relevant requirements to suit their deliverables and Scope of Work.
- 7.2.7 The *Contractor* is to ensure that the latest versions of the required application software and a suitable 'IT' Infrastructure is in place to support the electronic transmission of documentation.
- 7.2.8 Electronic files submitted to the Project shall be clear of known viruses and extraneous "macros". The supplier of documentation is required to have, at all times, the latest generation of virus protection software and up-to-date virus definitions.
- 7.2.9 The *Contractor* shall be responsible for the supply of all Sub-Supplier/*Contractor*/ Manufacturer, etc documentation and data related to their package of work, and shall ensure that these Sub-Suppliers have the capability to supply the necessary documentation and data in the required time-frame and quality as outlined in the specified standards prior to awarding sub-orders.
- 7.2.10 All drawings supplied shall comply with the CAD Standards, i.e. ENG-STD-0001
- 7.2.11 The required number of copies shall as a minimum be three (3) (1x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.
- 7.2.12 The required number of copies of documentation and data shall be specified in the '*Contractor* Documentation Schedule' (CDS). The required number of copies shall as a minimum be three (3) (1 x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.
- 7.2.13 The *Contractor* shall apply "wet signatures" to the original Documentation before scanning the signed original and prior to formal submission to the Project Manager.
- 7.2.14 Final issues of all documentation shall be supplied to the Project in "wet signature" format along with the associated corresponding electronic 'native files and PDF renditions.
- 7.2.15 The *Contractor* shall ensure adequate resources are available to manage and execute the Document Control function as per the requirements of the Project.

7.3 HEALTH AND SAFETY MANAGEMENT

- 7.3.1 Health and Safety Requirements
 - a) The *Contractor* shall comply with the requirements of the Transnet Port Terminal, Projects Site Specific Health and Safety Specification, HAS-SP-0001.

- b) *Contractor* shall comply with the following guidelines:-
- -IMS-ENV-SOP-009.01 – HEALTH CARE WASTE MANAGEMENT ON CONSTRUCTION SITES
 - -Contractor General Requirements for Health and Safety for the Fire Rebuild Project
- c) The *Contractor* shall comply with all applicable legislation, regulations issued in terms thereof and Transnet's safety rules which shall be entirely at the *Contractor* cost and which shall be deemed to have been allowed for in the rates and prices.
- d) The *Contractor* will be required to submit SHE COMPLIANCE FILE/as per the OHS Act of, 1993 (Act 85 of 1993) and its Construction Regulation 2014, as well as the Transnet Site Specification. Requirements of the *Employer*, if any, will be made known on award of the contract.
- e) The *Contractor* is solely responsible for the delivery of the services 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 comply with Asbestos Abatement Regulations, 2020, as framed under the OHS Act, 1993 (Act 85 of 1993) during preparations of the health and safety plan, Risk Assessment, including handling and removal of construction material.
- f) 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.
- g) 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.
- h) The Principal *Contractor* must prepare, implement and administer the Health and Safety Management Plan (HSMP) based on the Health and Safety Specifications. The Health and Safety Management Plan must provide a systematic method of managing hazards and implementing control measures.
- i) All method statements, Risk assessments and transit plans will be included within the *Contractor* Method Statements and will form part of the on-site documentation (all documents must be compiled by competent personnel to avoid delays and unnecessary back and forth approval process.
- j) The *Contractor* shall ensure compliance to Construction Regulation 2014, under the Occupational Health and Safety Act, Act 85 of 1993 by appointing a Health and Safety Construction Agent if required/if the project triggers the permit requirement, this person must a competent, registered with the SACPCMP as CHS Agent. This person will facilitate and create all necessary documents for construction work permit to the Department of Labour. The Agent shall be available for presentation of documents to Transnet, attending meetings and doing full Agent duties as prescribed by the regulation.
- k) All Safety officers appointed by the Principal *Contractor* and *Contractors* shall be registered with the SACPCMP and shall have a minimum of 5 years' experience on similar projects.
- l) All equipment, services shall be designed for safety and demonstrate safety aspects considered: by producing Design for health and Safety document by the designers. Demonstration of health and safety features considered during design stage must be presented and involvement of Construction Health and Safety Agent personnel during design stage must be evident. Hazorp and Hazcon studies must be conducted as required and be presented to the client (Transnet Port Terminal)
- m) The Plant shall be designed and built to ensure reasonable safety and comfort of the operator, maintenance personnel and people in the area in accordance with the relevant Project Specific Specifications.
- n) At all times during the manufacture, construction, erection and testing of the Plant the *Contractor* will be responsible for the safety of all persons on the site and the Plant will be in full compliance with the requirements of the South African Occupational Health and Safety Act, Act 85 of 1993, and Transnet Health and Safety Management Plan.
- o) Necessary registers, accident books, diary, time book, test certificates, method statement, risk assessment, health and safety plan etc will be kept on site under the control of the Site Supervisor

and can be inspected at any time. All accidents are to be reported to and entered in the site accident book.

- p) At all times the *Contractors* staff will ensure a high standard of Health and Safety is carried out at all times on site.
- q) All operatives on site must wear full PPE in accordance with Transnet Port Terminals HSE requirements including safety boots, hard hats and a high visibility vests or coat and LEP (Light Eye Protection) as standard.
- r) The 'no smoking on site' policy will always be adhered to, smoking will only take place in the site designated area.
- s) Asbestos/ possibility contact and removal (Please note these Asbestos requirements will only apply if there is a possibility of Asbestos material on site)
- t) In case the *Contractor* discovers asbestos A Pre-Demolition and Refurbishment or removal of asbestos survey will be done by the *Contractor* and submit for approval, and a copy of a Plan will be done in accordance with Asbestos Legislation.
- u) A suitably approved licensed Asbestos Removal *Contractor* will be appointed to carry out the removal of all asbestos containing products including the asbestos cement based corrugated sheets and rainwater down pipes and gutters.

7.3.2 Cost for Health and Safety

Health and safety cost must be demonstrated as guided/Shown on the example of the cost for Health and Safety sheet. All the cost must be added on the sheet.

7.4 TIMS ENVIRONMENT AND SUSTAINABILITY SPECIFICATION GUIDELINES

7.4.1 The All work is to be conducted in accordance with the principles of the National Environmental Management Act, 1998 (Act no 107 of 1998) but not limited to other applicable regulations as well as the accepted environmental good practice. In addition, the Contractor is expected to comply with all applicable uMhlathuze Municipal bylaws.

The following documents, included in the Works Information, provide the minimum acceptable standards that shall be adhered to:

- Transnet Integrated Management System (TIMS) Policy Commitment Statement.
- Contractor Environmental and Sustainable Specifications Guidelines (TRN-IMS-GRP-GDL-014.4).
- the Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP) (009-TCC-CLO-SUS-11386)
- Transnet Asbestos Management Procedure

7.4.2 The Contractor must comply with all the requirements of the CEM SOP and CESSG as mentioned above. The above requirements shall be applicable to the main Contractor and its service providers.

7.4.3 The Contractor must sign the declaration of understanding as a commitment to abide with Transnet Environmental Governance Framework and Project Environmental Specification. Sufficient environmental budget must be allocated to meet all the project environmental requirements for the duration of the contract.

7.4.4 The Contractor shall perform 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 CEM SOP and CESSG. The CEM SOP describes in detail the roles and responsibilities of the project team with respect to Environmental Management. In addition, it describes the main requirements that the Contractor must comply with during the construction phase to ensure that the environment is considered, negative impacts are avoided/minimised and positive impacts are encouraged.

- 7.4.5 The CESSG describes the minimal acceptable standards for environmental management for a range of environmental aspects commonly encountered on construction projects and sets environmental objectives and targets, to which the Contractor observes and complies.
- 7.4.6 The contractor must appoint a fulltime Environmental Officer (EO)/Safety, Health and Environmental (SHE) Officer to monitor and manage compliance to Environmental Specification and all applicable environmental legislation. The EO/SHE officer should have relevant environmental qualifications and experience, and this must be approved by TPT before commencement of work on site.
- 7.4.7 The contractor will be required to submit an environmental file to TPT post award of tender. Particular requirements of the Employer will be made known on award of the contract. Site access certificate shall not be granted until the environmental file has been approved by the Employer.
- 7.4.8 The The overarching obligations of the Contractor under the CESSG before construction activities commence on the Site and/or Working Areas is to provide environmental method statements for all construction operations at the Site and/or Working Area by the Contractor and where requested by the CM and to comply with the following:
- The Contractor shall identify the kinds of environmental impacts that will occur as a result of their activities and accordingly prepare separate method statements describing how each of these impacts will be prevented or managed so that the standards set out in the CESSG document are achieved. The method statements will be prepared in accordance with the requirements set out in the CESSG. These method statements shall form part of the environmental file. The Contractor shall ensure that his management, foremen and the general workforce, as well as all suppliers and visitors to Site have attended the Environmental 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 Environmental Induction Programme and are made aware of the environmental specifications on Site.
- 7.4.9 The Contractor shall ensure that all salvageable items not required for re-use in the project must be delivered to Amafa Conservation Materials Bank at the Contractor costs when required.
- 7.4.10 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*.
- 7.4.11 During the construction period, the Contractor complies with the following:
- A copy of the CEM SOP and CESSG 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.
 - Method statements need to be compiled by the Contractor throughout the Construction and Commissioning phase of the project. These Method Statements must be approved by the TPT Construction Manager and TPT Environmental Manager or Environmental Officer. Approval must at least be two weeks 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 TPT Environmental Manager or Environmental Officer.
 - 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 be responsible for rehabilitating and or re-vegetating all areas to the satisfaction of the TPT Environmental Manager or Environmental Officer as detailed in the CESSG.
 - The Contractor must ensure that its Subcontractors comply with the Environmental Specification.

7.5 Quality assurance requirements

7.5.1 General

The *Contractor* is responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract and shall manage and coordinate all Quality aspects of the Work in accordance with the requirements of this Specification, together with the *Contractor* PQP and QCPs once reviewed and accepted by TRANSNET.

The *Contractor* shall execute the *works* in accordance with the project specification "General Quality Requirements for *Contractors* and Suppliers" - QAL-STD-0001 included in Annexure 17 of the Works Information.

Applicable Codes and Standard Documents

- EEAM-Q-009 Quality Management Specification for Supplier/Construction
- ISO 9001: 2015 International Standard Series Quality Systems
- ANSI/AWS D1.1 Structural Welding Code -Steel
- SANS1200 Standardised Specifications for Civil engineering Construction
- SANS 10160 General Procedures and Loadings (Design of Buildings)
- SANS 10162 Structural Use of Steel
- SANS 1200H Structural Steelwork
- SANS 1200HC Corrosion Protection of Steelwork
- SANS 1200HB Cladding and Sheeting
- SANS 10100 Structural Use of Concrete
- SANS 1200G Concrete (Structural)
- SANS 1200D Earthworks

7.5.2 The *Contractor* shall have, maintain and demonstrate its use to the *Project Manager* (and/or the *Supervisor* as appropriate) the documented Quality Management System to be used in the performance of the *works*. The

7.5.3 *Contractor* Quality Management System shall conform to International Standard ISO 9001:2015 (or an equivalent standard acceptable to the *Project Manager*).

7.5.4 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:

- Project Specific Quality Plan for the contract
- ISO 9001:2015 certification
- Index of Quality procedures / Method statements to be used during the contract.
- Quality Control Plan (QCP's) for each discipline (Civil & Structural, Mechanical and Electrical)
- A signed Quality Policy based on International Organisation for Standardisation (ISO 9001:2015) that displays the five key policy requirements.

7.5.5 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.

7.5.6 The *Project Manager* indicates those documents required to be submitted for either information, review or acceptance and the *Contractor* indicates such

7.5.7 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*.

- 7.5.8 The Quality Plan means the *Contractor* 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.
- 7.5.9 Where specified, the *Contractor* shall submit a project quality plan to Transnet Port Terminal within 14 working days after the Contract start date. The quality plan shall detail how the *Contractor* Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:
- Satisfying the technical and quality requirements of the *Contractor* Scope of Work, and relevant elements of the applicable ISO 9001:2015 standard
 - Include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements.
 - List of all applicable codes, standards and specifications
 - Include a listing of all special processes (e.g. welding and non-destructive testing, cube testing etc.) envisaged for use, including confirmation of personnel certification as required.
 - Include all proposed method statements (for site-based work activities)
 - Include a description of the *Contractor* project organization, with key positions and responsibilities identified and individuals named. The organization structure shall also indicate the resources committed to the management/coordination of QA/QC activities.
 - Include a listing of all Quality Control Plans (QCP's), and associated Field.
 - Inspection Checklists (FIC's), as applicable
 - Identify in the Project Quality Plan any Sub-*Contractor* work.
 - Include the proposed Authorized Inspection Authority (where applicable - for pressurized equipment and systems)
 - Include a schedule / index of proposed quality records.
- The Project Quality Plan shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.
- 7.5.10 The Quality Policy mean the overall intentions and directions of the *Contractor*.
- 7.5.11 related to quality as formally expressed by top management.
- 7.5.12 The Index of Procedures means a list or schedule of the *Contractor* Quality Control procedures that will be employed during the contract.
- 7.5.13 The *Contractor* shall provide material certificates for all materials supplied under this contract, in addition test certificates for all lifting and rigging equipment which is part of the gravity take up unit shall be provided. Certificates recording the balancing of the pulleys shall be provided.
- 7.5.14 The *Contractor* complies with the requirements of QAL-STD-0001 Quality Requirements for *Contractors* and Suppliers contained in Annexure 17 Quality Control Plans
- 7.5.15 The *Contractor* prepares and submits QCPs to TRANSNET for review in accordance with the requirements of the Contract and PQP.
- 7.5.16 QCPs must clearly identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.
- 7.5.17 The *Contractor* shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by TRANSNET.
- 7.5.18 QCPs shall include reference to all tests specified in the Works Information.
- 7.5.19 Inspection Points

- The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. These points are denoted by the following inspection codes:
- a) Hold Point (H)
Inspection points in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Hold points require written notification to TRANSNET.
- b) Witness Point (W)
An inspection point in the manufacturing cycle that will be witnessed or verified. If TRANSNET confirms it is unable to attend after being provided with the written notification, then manufacture may proceed. Witness points require written notification to TRANSNET.
- c) Review Point (R)
A point at which products and quality records are verified and endorsed. Review points are not point that require notification to TRANSNET.
- d) Surveillance (S)
An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.
The *Contractor* maintains the status of testing and inspection by progressively having the QCPs signed off.
- 7.5.20 Specific Responsibility and Authority *Contractor* has the overall authority in the determination of all matters affecting the implementation and operation of quality practices on the project. *Contractor* is responsible for:
- Identifying resource/s and equipment for project quality purposes
 - Ensuring that Quality personnel are suitably qualified.
- 7.5.21 Quality personnel assigned must have attended ISO 9001:2015 training and must have a minimum of three years in the field on Quality Assurance and Control.

7.6 Programming constraints

- 7.6.1 The *Contractor* construction programme shall correspond with the *Employer's* objectives of the *Employer's Works Information*.
- 7.6.2 The *Contractor* construction programme shall correspond with the stipulations included in the *Employer's Works Information*, which details the minimum construction constraints to be considered in providing the *Works*.
- 7.6.3 The *Contractor* construction programme shall comply with the stipulations included in the *Employer's Works Information*, which details the minimum Environmental Management constraints as imposed on the provision of the *Works*.
- 7.6.4 The *Contractor* construction programme shall comply with the stipulations included in the *Employer's Works Information*, which details the minimum Health & Safety constraints as imposed on the provision of the *Works*.
- 7.6.5 The *Contractor* construction programme shall comply with the stipulations included in the *Employer's Works Information*, which details the minimum Quality Assurance constraints as imposed on the provision of the *Works*.
- 7.6.6 The *Contractor* construction programme shall include any reasonable foreseen and unforeseen constraints, assumptions and conditions which may arise in line with the overall scope as outlined in the *Employer's Works Information*.
- 7.6.7 The *Contractor* shall comply with the provisions of NEC ECC Clauses 25.1, 27.1 and 27.2 among others, when providing occupations to the *Working Areas* to allow for *works* which will be undertaken by *Others*.

- 7.6.8 Key Dates are detailed in the relevant section(s) of the Works Information will be in accordance with the dates stipulated within *Contract Data Part One*; pending approval of *Project Manager* and subject to the requirements as stipulated in NEC ECC Clause 25.3.
- 7.6.9 The *Contractor* is required to comply with the *Employer's* stipulations regarding all required approvals, permissions, licences and permits, prior to commencing *works* and or specific activities.
- 7.6.10 The *Contractor* construction WBS shall correspond with the client's Pricing Data. As a minimum shall include but not be limited to the following WBS Elements:
- Procurement and delivery of all long lead items necessary to provide the *Works* in line with the stipulations of the *Employer's* Works Information.
 - Long lead items include but are not limited to; plant, equipment, materials and any other resources, as required to provide both temporary and permanent *works*.
 - Procedure for *Contractor* design submission and approval any portion of the *works* and/or plant and equipment as stipulated in the Works Information in accordance with stipulations for submission, acceptance and approval as stipulated in the Works Information; including any other additional design requirements and or alterations in existing design which may stem from the aforementioned.
 - Correction of Defects, testing and commissioning, as-built, hand-over and close-out procedures in accordance the Works Information.
 - All Trades & Headings from the Bill of Quantities or Activity Schedules are to be captured in the WBS.
- 7.6.11 The *Contractor* uses Primavera P6 for his programme submissions or similarly approved that is fully compatible with prior written approval from the *Employer*. In the event that the *Contractor* will be using earlier or later/more recent versions of the software, the onus is on the *Contractor* to ensure that a conversion is done in order for Primavera P6 XML file (soft copy) submissions to be compatible with Primavera P6 version 21.
- 7.6.12 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements of the [CEMP, SES, PES and SMP] as described under the relevant sections of the Works Information, together with the associated environmental method statements.
- 7.6.13 The *Contractor* ensures his programme complies with industry best practices and project management methodologies.
- 7.6.14 The *Contractor* will make use and comply to a 14-Point Assessment Metrics as a benchmark to check programme quality and health metrics. The metrics used is aligned to the DCMA 14-Point Assessment Metrics. Programmes are to pass with a minimum of 75% to be considered acceptable. The following metrics will apply.

Ref #	Schedule Quality Metric	Target	Explanation
1	Logic (logic missing)	<5%	A core schedule quality check. In theory, all activities should have at least one predecessor and one successor associated with it. Failure to do so will impact the quality of results derived from a time
			analysis as well as a risk analysis. Note that links will need to be independently verified to ensure they make sense.

2	Leads	0%	Any task that has a lead (negative lag) in its predecessor
3	Lags	<5%	Any task that has a lag in its predecessor
4	Finish to Start (FS) relationships	>90%	Any relationship type that is Finish-to-Start
5	Hard Constraints	<5%	An incomplete task that has any type of constraint
6	High Float	<5%	An incomplete task with float greater than 44 working days
7	Negative Float	0%	An incomplete task with float less than 0 working days
8	High Duration	<5%	Any incomplete task that has a duration greater than 44 working days (2 Months) * <i>calendar dependant</i>
9	Invalid Dates	0%	Any task that has a forecast start/finish date prior to the project schedule status date or an actual start/finish date beyond the project schedule status date
10	Resources	100%	Any incomplete task that has resources (quantity/hours/currency) assigned
11	Missed Tasks	<5%	Tasks that are supposed to have been completed (prior to the status date) with actual or forecast finishes after the baseline date OR have finished variances >0
12	Critical Path Test	Pass	A delay test activity is inserted into the CPM schedule in order to test if the critical path behaves as it should. This results in a pass or fail.
13	Critical Path Length Index (CPLI)	> 0.95	The Critical Path Length Index (CPLI) is a measure of the relative efficiency required to complete a milestone on time, or how close a critical path is to the project target completion date.

14	Baseline Execution Index (BEI)	> 0.95	An indication of the efficiency with which actual work has been accomplished when measured against the baseline. The more activities that are completed either on time or ahead of the baseline schedule will reflect a BEI of 1 or more. Conversely, a BEI of less than 1 reflects less than forecasted schedule execution.
	Overall	> 75%	11 out of 14 metrics passed

Table 6 - Programme Quality Metrics

- 7.6.15 The *Employer* (including the agents of the *Employer*) operates on Site during dates or timings when the *Contractor* has completed certain elements of the *Works*.
- 7.6.16 Others operate on Site during dates or timings when the *Contractor* has completed certain elements of the *Works*.
- 7.6.17 The *Contractor* first accepted programme may be agreed during the pre- contract negotiation period, and no later than the period stipulated under Contract Data Part One (2 weeks after the Contract Date).
- 7.6.18 The *Contractor* complies with the *Employer's* programme, if provided, when he
- 7.6.19 submits his first programme.
- 7.6.20 The *Contractor* shows on his Accepted Programme and all subsequently revised programmes the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.
- 7.6.21 The *Contractor* presents all programme submissions including but not limited to his tender programme, first programme and all subsequently revised programmes (see ECC Clauses 31.2 and 32.1) in hard copy and soft copy format; with the programme model being a Level 4 project schedule – decomposed to appropriate levels of detail in order to accurately substantiate activity duration estimates.
- 7.6.22 The *Contractor* shows on his Accepted Programme and all subsequently revised programmes showing the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.
- 7.6.23 The *Contractor* programme shows duration of operations in working days as per the stipulated definition of the workdays and hours under C3.1 *Employer's* Works Information.
- 7.6.24 Each programme submitted by the *Contractor* to the *Project Manager*, is fully Cost and Resource Loaded (People, Equipment, Plant, Materials & Other Resources).
- 7.6.25 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements as listed in the NEC3, ECC, Clause 31.2.
- 7.6.26 The *Contractor* attends, participates in and makes a meaningful contribution to, planning initiation & set-up meetings held during the pre-contract negotiation period and no later than the period stipulated under Contract Data Part One (2 weeks after the Contract Date); to agree and set-up - including but not limited to - the first schedule for acceptance; methodology for calculation of physical progress percentage for the project, monitoring, control and reporting requirements; proposed templates and planning/scheduling procedures to be complied with for the duration of the project.
- 7.6.27 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*, including a spreadsheet identifying instances of resource over-allocation and/or conflicts, accompanied by proposed resolutions.

7.6.28 The *Contractor* programme shows the following levels:

- a) 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.
- b) Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below
- c) 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 *Employer* notifies any subsequent layouts and corresponding filters on revised programmes. Activities at this level should not be longer than one update cycle unless exceptional circumstances exists justifying longer durations.
- d) Level 4 Project Schedule – detailed discipline/speciality level schedule decomposed to appropriate levels of detail in order to accurately substantiate activity scope and activity duration estimates; developed and maintained by the *Contractor* relating to all operations identified on the programme representing the daily activities by each discipline, with activities and operations adequately decomposed in order to accurately represent the effort required to execute said activity/operation and support accurate duration estimates.

7.6.29 The *Contractor* submits progress updated programmes to the *Project Manager* at least 1 (one) full working day prior to progress meetings at fortnightly intervals in addition to the intervals for submission of revised programmes stated under Contract Data Part One.

7.6.30 The following submission cycle will apply –

Item	Programme/Report	Due
1	first programme for acceptance	Latest 2 weeks after award
2	Fortnightly progress updated programme & project progress report	Fortnightly, 1 (one) full day prior to progress meetings. Note: Where fortnightly and monthly reports and updates clashes/aligns in cycle only the monthly report will take precedence.
3	monthly progress updated programme & project progress report	Monthly, submitted a week before the last Friday of each month
4	revised programmes (for acceptance)	Any time as requested by <i>Employer</i> and/or anytime material changes to the scope justifies a need and supported by the <i>Employer</i> or at the intervals as indicated in the Contract Data
5	Occupation programme &/or tracking sheets	Daily, issued after morning work planning meetings, for the duration of each occupation period.

Table 7 - Programme submission cycle

- 7.6.31 A Basis of Programme/Schedule document is provided with each revised programme submission which will define in writing how the programme was developed at the point in time with a focus on detailing changes in future iterations, The key objective of the document is to document the detailed assumptions, exclusions and/or qualifications known at the time that the programme was developed, it will include topics but is not limited to them:

INDEX
1. Executive Summary
1.1. Purpose of this Document
1.2. Overall Schedule Information
1.2.1. Schedule Version
1.2.2. Software Used
1.2.3. Work Breakdown Structure
1.2.4. Milestone Summary
1.3. Analysis of the Critical Path and Near-Critical Paths
1.4. Analysis of Risks
1.5. Key Assumptions, Allowances, and Exclusions
2. Current Project Status
2.1. Overview
2.2. Milestone Status
2.3. Permitting Status
2.4. Engineering Status
2.5. Procurement Status
2.6. Construction Status
2.7. Commissioning and Start-up
2.8. Tie-in Status
2.9. Change Request Status
2.10. Risk Register Status
3. Basis of Schedule
3.1. General Issues
3.1.1. Owner Reviews and Approvals
3.1.2. Basis of Durations
3.1.3. Use of Constraints
3.1.4. Float Utilization
3.1.5. Schedule Calculation Mode (Retained logic vs progress override)

3.1.6. Roll-up of detail
3.1.7. Resource Loading and Equipment Utilization
3.2. Engineering Basis
3.2.1. Assumptions and allowances
3.2.2. Exclusions
3.2.3. Basis of Durations
3.3. Procurement Basis
3.3.1. Long Lead Items
3.3.1. Assumptions and allowances
3.3.2. Exclusions
3.3.3. Basis of Durations
3.4. Fabrication Basis (if applicable)
3.4.1. Assumptions and allowances
3.4.2. Exclusions
3.4.3. Basis of Durations
3.5. Transportation Basis (if applicable)
3.5.1. Bulk Materials and Equipment
3.5.2. Customs Clearance
3.5.3. Assumptions and allowances
3.5.4. Exclusions
3.5.5. Basis of Durations
3.6. Construction Basis
3.6.1. Camp Facility Analysis
3.6.2. Heavy Lifts
3.6.3. Scaffolding
3.6.4. Assumptions and allowances
3.6.5. Exclusions
3.6.6. Basis of Durations
3.7. Project Calendars
3.7.1. Work Calendars
3.7.2. Holidays
3.7.3. Inclement Weather Calendars
3.7.4. Assumptions and allowances
3.7.5. Exclusions

3.8. Duration Contingencies
3.8.1. Assumptions and allowances
3.8.2. Exclusions
3.9. Change Request Impacts
3.9.1. Assumptions and allowances
3.9.2. Exclusions
3.10. Concerns and Other Issues
4. Risk Analysis
4.1. Approach and Methodology
4.1.1. Qualitative Risk Assessment
4.1.2. Quantitative Risk Assessment
4.2. Analysis Results and Comparisons
4.3. Assumptions and allowances
4.4. Exclusions
5. Appendices

Table 8 - Basis of Programme Index

7.7 Reporting and Monitoring

- 7.7.1 The *Contractor* attends meetings as included but not limited to those defined in the *Employer's Works Information*.
- 7.7.2 The *Contractor* submits programme narrative report to the *Project Manager* at fortnightly intervals as well as status/target sheets detailing planned/targeted activities and actuals at in addition to the intervals for submission of revised programmes stated under Contract Data Part One.
- 7.7.3 The *Contractor* completes an assessment of all activities in progress and to completion to determine physical percentage complete, forecasted completion dates, deviations from the Accepted Programme and proposes remedial actions to rectify deviations.
- 7.7.4 The *Contractor* submits the programme narrative report detailing the status and performance of operations on the site and working areas status and performance of operations outside the Working Areas, man-power histograms, plant and equipment histograms, S-curve of overall progress, and critical action items (top 10). Report shall indicate "progress this period" and "progress to date".
- 7.7.5 The *Contractor* fortnightly project progress reports (narrative report) includes but is not limited to:
- Level 4 Project Schedule – decomposed to appropriate levels of detail in order to accurately substantiate activity duration estimates and showing two separates
 - Bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted programme.
 - Progress Spreadsheet detailing actual progress achieved (target/planned quantity versus actual quantity) on current (critical) activities for the previous week, planned progress for the current week, deviations and proposed recovery for each activity in question. A 1-week Look Ahead Spreadsheet in line with the aforementioned stipulations to be included. Priority to be given to identification of critical and near critical activities, progress and any deviations from planned performance in this regard.

- d) 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.
- e) Dependencies/Deliverables matrix detailing interim approvals and/or any other inputs/requirements from *Employer/Supervisor/Project Manager/Others* or any other project stakeholder in line with the activities identified in the 1 and 3- week Look Ahead Schedules.
- f) Interfacing Matrix, detailing timeous identification of any requirements for providing the *Works* and/or *works* to be executed by *Others* and any other *Stakeholders* party to this contract in line with the stipulations of the Works Information.
- g) Manpower Histogram – reflecting actual, forecasted and planned activities
- h) Plant and Equipment Histogram – reflecting actual, forecast and planned activities.
- i) S-curves – reflecting the actual physical percentage complete versus the planned physical percentage for the overall contract.
- j) Identification critical activities, progress and any deviations from planned performance.
- k) Adherence and actual performance achieved with regards to Environmental, Health & Safety and Quality Management.

7.7.6 The *Contractor* **monthly** project progress report includes but is not limited to:

- a) Monthly, the *Contractor* completes an assessment of the physical progress of all activities in progress and to completion, accordingly, calculates physical progress complete for the project overall (represented as a percentage) in line.
- b) with the methodology and resultant tools agreed in Section 2.7.3; revises and submits the updated programme for acceptance and cash flow forecast report; detailing any variances and proposes remedial actions to rectify deviations.
- c) The *Contractor* monthly programme narrative report is submitted a week before the last Friday of each month, or as required by the *Project Manager*. The report shall indicate "progress this period" and "progress to date" and shall include, but is not limited to, the following:
 - Summary of progress achieved during the reporting period.
 - Latest Accepted Programme submitted for approval.
 - Deviations from the current Accepted Programme and action plans to rectify.
 - Project milestones table – planned versus actual and forecast.
 - Status and performance of operations on the site and working areas.
 - Status and performance of operations outside working areas.
 - Cash flow forecast report.
 - Digital photographic record of the progress of the *works*
 - Manpower histograms, including a control spreadsheet detailing specific current and future over-allocation and/or conflicts in allocation of resources.
 - *Contractor* plant and equipment histograms, including a control spreadsheet detailing specific current and future over-allocation and/or conflicts in allocation of resources.
 - S-curves of overall progress
 - Critical action items list (top 10)
 - Identified Risks (top 10)
 - Earned value summary report detailing SPIt, SVt, EVt, PVt, EACt and resultant earned values. (Alternately Earned Schedule Analysis may be used)

7.7.7 Facility Breakdown Structure including asset classifications and cost coding.

The *Contractor* will develop, maintain and provide a Facility Breakdown Structure that will record all costs and details associated with the project down to assets class level that can easily be used (aligned to the *Employers* SAP data, asset classifications, coding, etc). The *Contractor* will be responsible with developing the FBS model, cost coding, obtaining approval thereof, maintaining it through

monthly reporting of an Asset View Report during the course of the contract and at the time end of the *works* provide a complete an integrated facility breakdown of the assets along with their costs and details

to enable accurate capitalisation of the *works* and loading of maintenance requirements and data on the *Employers* SAP system.

7.8 Contractor management, supervision and key people

- 7.8.1 The *Contractor* shall make an adequate, experienced and stable project team available for the duration of the contract. Every effort must be exercised by the *Contractor* to minimise the replacement of project team members in order to ensure optimum contract management continuity and efficiency.
- 7.8.2 The contractor shall have resource for each line item and resources can not be repeated or shared per discipline. Resources professional registration will be verified from the professional bodies that they are registered with to confirm validity of registration.
- 7.8.3 The *Contractor* employs full time, fully qualified and experienced key persons under ECC clause 24.1 who have been delegated sufficient authority to manage the contract efficiently on-Site during completion of the *works* including and not limited to:

Profession	Experience in Years	Professional Registration
Project Manager	5 to 10	SACPCMP – Pr CPM - PMP
Mechanical Engineer (Bulk material handling)	5 to 10	ECSA - Pr Eng / Pr Tech Eng
Mechanical Engineer (Fire and Building Services)	5 to 10	ECSA - Pr Eng / Pr Tech Eng
Electrical Engineer	5 to 10	ECSA - Pr Eng / Pr Tech Eng
Civil Engineer (Civil)	5 to 10	ECSA - Pr Eng / Pr Tech Eng
Civil Engineer (Structural)	5 to 10	ECSA - Pr Eng / Pr Tech Eng
Quantity Surveyor	5 to 10	SACQSP – P. QS
Health and Safety Officer	5 to 10	SACPCMP
Environmental Officer	5 to 10	
Construction Manager	5 to 10	
Document Controller	5 to 10	
Project Planner	5 to 10	

Table 9 - Key Persons, Experience and Registrations

- 7.8.4 The *Contractor* employs personnel listed above but not limited to those mentioned in order to perform the functions of key persons under NEC3 ECC Clause 24.1. These appointments shall have the necessary experience and be suitably qualified.
- 7.8.5 The *Contractor* provides an Organogram of all his key people (both as required by the *Employer* and as independently stated by the *Contractor* under Contract Data Part Two) and how such key people communicate with the *Project Manager* and the Supervisor and their delegates all as stated at paragraph 6.5 of C3.1 *Employer's* Works Information.

8 Annexures

- Annexure 1: CV H00 Coking Coal Export Conveyor
- Annexure 2: CV H01 Coking Coal Import Conveyor Drawing register
- Annexure 3: CV V01 Coking Shed Stacking Conveyor
- Annexure 4: V02 Coking Shed Reclaim Conveyor
- Annexure 5: H&V Transfer House
- Annexure 6: BVI Fire Assessment Reports
- Annexure 7: Bosch Fire Damage Assessment Reports
- Annexure 8: EEAM specifications
- Annexure 9: Transnet Construction Environmental Management Plan
- Annexure 10: Transnet Standard Environmental Specification
- Annexure 11: Contractor SHE Specifications
- Annexure 12: TPD Specification
- Annexure 13: Conveyor Technical Data
- Annexure 14: DBT Electrical Network
- Annexure 15: DOC-STD-0001 Rev 3 Contractor Documentation Submittal Requirements
- Annexure 16: QAL-STD-0001 General Quality Requirements for *Contractors* and Suppliers