Transnet SOC Ltd
Registration No.
1990/000900/30

TRANSNET PORT TERMINALS

To	To all tenderers
From	Nonhlanhla Mafoko
Date	9 February 2022
Subject	Addendum 6
Pages	116

www.transnet.net

TENDER NO: TPT/2021/12/2/RFP

DESCRIPTION OF WORKS: FOR THE PROVISION OF OFFICES FOR TRANSNET PORT TERMINALS AT 202 ANTON LEMBEDE STREET, DURBAN FOR TRANSNET SOC LTD (REG NO. 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED AS "TPT").

1. **Revised Works Information and Drawings: Please find revised works information and drawings to phase the construction of the 2nd floor.**

Attached for your attention is a copy of Addendum 6 dated 11 February 2022

Endorsement should be made on the tender that Addendum 6 dated 11 February 2022 has been received and taken into account in submitting your tender.

*****Please acknowledge receipt of this Addendum before the closing date of tender.

Regards

Nonhlanhla Mafoko
Sourcing Specialist

TRANSNET SOC LTD

TENDER NO: TPT/2021/12/2/RFP

DESCRIPTION OF WORKS: FOR THE PROVISION OF OFFICES FOR TRANSNET PORT TERMINALS AT 202 ANTON LEMBEDE STREET, DURBAN FOR TRANSNET SOC LTD (REG NO. 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED AS "TPT").

ADDENDUM 6 **Date: 11 February 2022**

1. **Revised Works Information and Drawings: Please find revised works information and drawings to phase the construction of the 2nd floor.**

The following information is furnished in addition to, in amplification and substitution of, matters contained in the tender documents issued in respect of the above-mentioned work.

TRANSNET SOC LTD

TENDER NO: TPT/2021/12/2/RFP

DESCRIPTION OF WORKS: FOR THE PROVISION OF OFFICES FOR TRANSNET PORT TERMINALS AT 202 ANTON LEMBEDE STREET, DURBAN FOR TRANSNET SOC LTD (REG NO. 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED AS "TPT").

ADDENDUM 6 **Date: 11 February 2022**

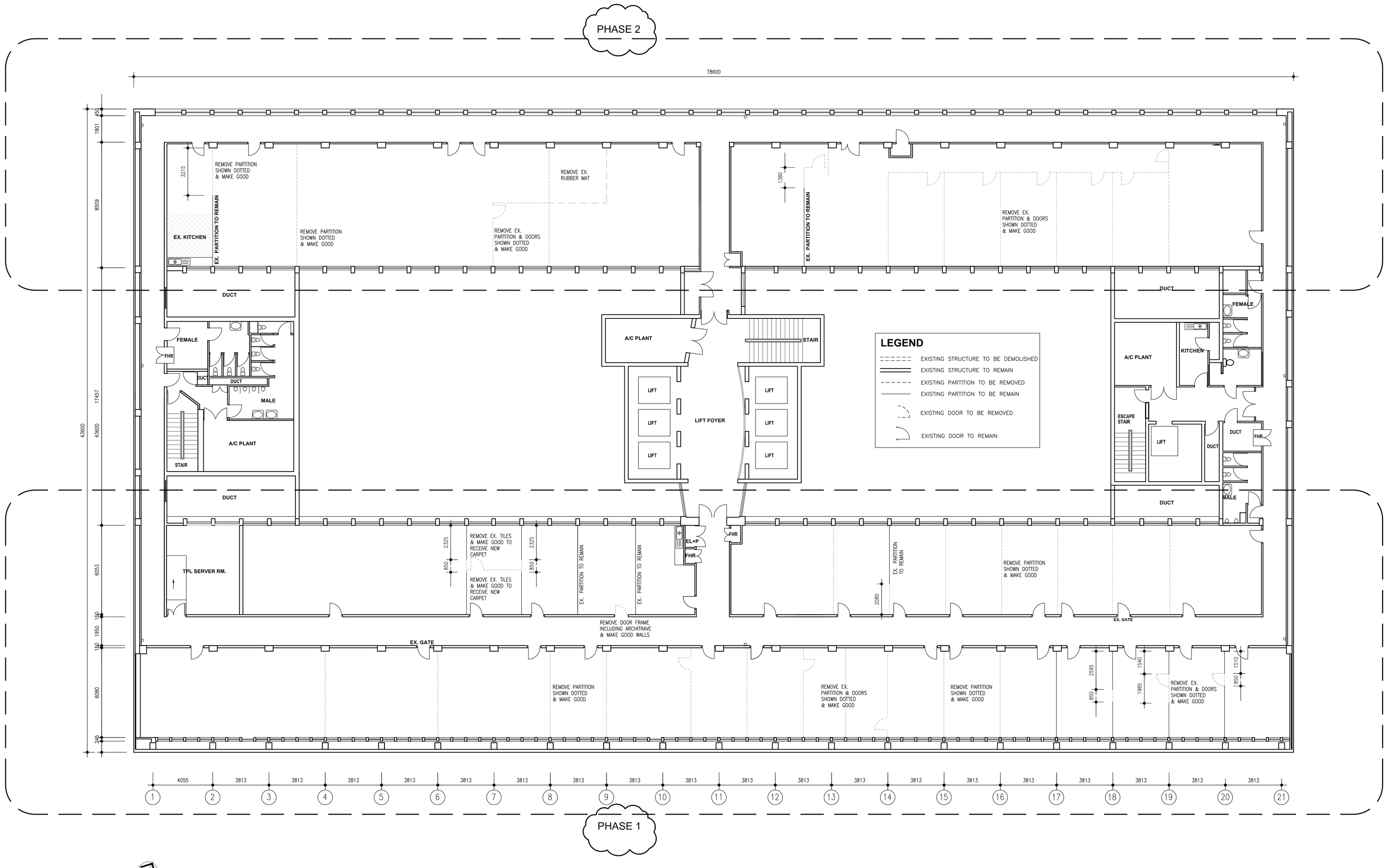
This is to certify that we _____

have received Addendum 11 dated 11 February 2022

_____
TENDERER

DATE: _____

WITNESSES:1. _____



LAYOUT PLAN - 2ND FLOOR 1 : 100

DRAWING NO.	REFERENCE

REFERENCE DRAWINGS

NOTES

1. DO NOT SCALE DRAWING - ONLY DIMENSIONS SHOWN TO BE USED.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS, DIMENSIONS AND LEVELS ON THE SITE AND NOTIFY THE NEC SUPERVISOR OF ANY VARIATIONS BEFORE CONSTRUCTION.

REVISIONS

NO.	DESCRIPTION	BY	CHKD	APPD	DATE
OB	PHASING ADDED	ID	KB	SN	03.02.22
OA	ISSUED FOR TENDER	ID	KB	SN	16.09.21

CONTRACTOR / CONSULTANT			
TITLE	NAME	SIGN	DATE

OPERATING DIVISIONS			
TITLE	NAME	SIGN	DATE

TRANSNET PORT TERMINALS			
TITLE	NAME	SIGN	DATE
DRAWN	ID		03 02 22
CHECKED	KB		
DESIGNED	ID		03 02 22

PR.ENG. / PR.TECH./PR. ARCH		
NAME	ISMAIL DINDAR	DATE
SIGNATURE		03 02 22
REG. NUMBER ST 1570		
SCALE : 1:100		A0

Transnet Port Terminals
TRANSNET LTD : REG. NO. 1960/000933/30
TRANSNET PORT TERMINALS BUILDING
KINGSMEAD OFFICE PARK
STALWART SIMELANE STREET, DURBAN
TEL: 031 308 8333

TRANSNET PORT TERMINALS

PROPOSED TPT
OFFICE RELOCATION TO
202 ANTON LEMBEDE STREET
DURBAN
2ND FLOOR DEMOLITION LAYOUT PLAN

PROJECT NUMBER	OO	FBS	DIS	TYPE	DRAWING NO.	SHEET	REV	ID
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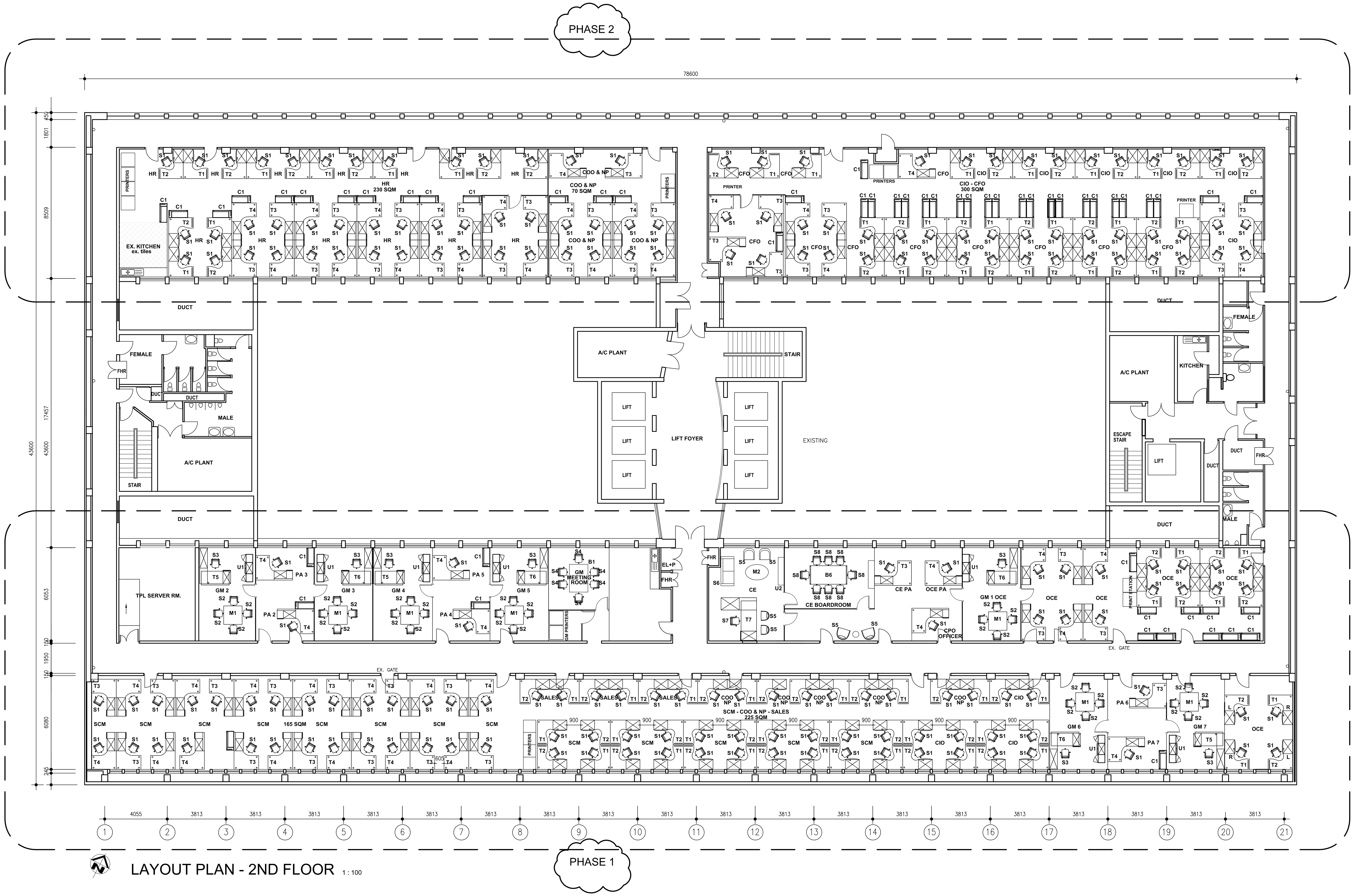

LAYOUT PLAN - 2ND FLOOR

1 : 100

DEPARTMENT	FLOOR	PERMANENT	HOT - DESKS
OCE & CE	2ND	08	12
SCM	2ND	27	20
CFO	2ND	09	25
CIO	2ND	04	20
HR	2ND	20	15
COO & NP	2ND	10	09
GM'S	2ND	07	00
PA'S to the GM'S	2ND	07	00
VIP / CPO	2ND	01	00
SALES	2ND	00	06
TOTAL		93	107

CODE	FURNITURE TYPE	QTY
T1	TYPE 1 HOT DESK RIGHT HANDED	53
T2	TYPE 2 HOT DESK LEFT HANDED	54
T3	TYPE 3 PERMANENT DESK RIGHT HANDED	42
T4	TYPE 4 PERMANENT DESK LEFT HANDED	43
T5	TYPE 6 GM DESK RIGHT HANDED	03
T6	TYPE 6 GM DESK LEFT HANDED	04
T7	CE DESK	01
S1	STANDARD WORKSTATION CHAIRS	192
S2	GM MEETING TABLE CHAIRS	28
S3	GM CHAIR	07
S4	GM BOARDROOM CHAIRS	06
S5	CE SINGLE SEATER COUCH	06
S6	CE DOUBLE SEATER COUCH	01
S7	CE CHAIR	01
S8	CE BOARDROOM CHAIRS	08
C1	FILING CABINET / CREDENZA	54
U1	GM WALL UNIT	07
U2	CE FLOOR UNIT	02
U3	SIDE UNIT	01
M1	GM MEETING TABLE 4 SEATER	07
M2	CE MEETING TABLE	01
B1	BOARDROOM TABLE 6 SEATER	01
B6	CE BOARDROOM TABLE 8 SEATER	01
W1	WORKSTATION WASTE BINS	200
W2	OFFICE RECYCLING BIN	10
SC1	DESK SCREEN 1900 X 500	63
SC2	DESK SCREEN 1600 X 500	84
SC3	DESK SCREEN 2400 X 500	47
SC4	DESK SCREEN 1200 X 500	76

REFERENCE DRAWINGS

DRAWING NO.	REFERENCE
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TRANSNET PORT TERMINALS

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NAME ISMAIL DINDAR — DATE
SIGNATURE — 03 02 22
REG. NUMBER ST 1570
SCALE : 1:100

Transnet Port Terminals
TRANSNET LTD : REG. NO. 1990/000900/30
TRANSNET PORT TERMINALS BUILDING
KINGSMEAD OFFICE PARK
STALWART SIMELANE STREET, DURBAN
TEL: 031 308 8333

TRANSNET

TRANSNET PORT TERMINALS

PROPOSED TPT
OFFICE RELOCATION TO
202 ANTON LEMBEDE STREET
DURBAN
2ND FLOOR FURNITURE LAYOUT

PROJECT NUMBER	OD	FBS	DIS	TYPE	DRAWING NO.	SHEET	REV	ID
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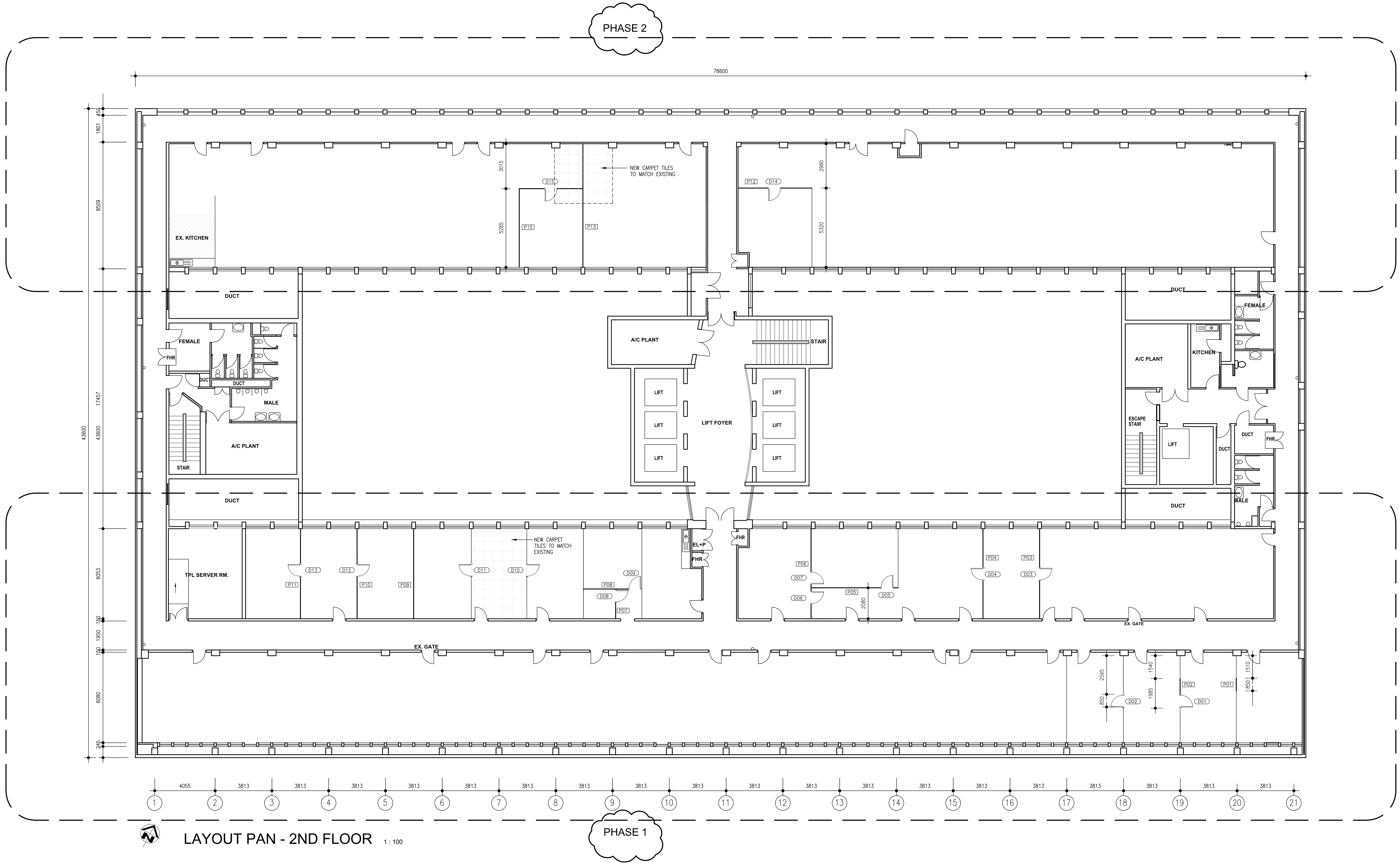

LAYOUT PAN - 2ND FLOOR 1 : 100

NOTES

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REFERENCE DRAWINGS

DRAWING NO.	REFERENCE
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REVISIONS

NO.	DESCRIPTION	BY	CHKD	APPD	DATE
OB	PHASING ADDED	ID	KB	SN	03.02.22
OA	ISSUED FOR TENDER	ID	KB	SN	16.09.21

CONTRACTOR / CONSULTANT

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OPERATING DIVISIONS

TITLE	NAME	SIGN	DATE

TRANSNET PORT TERMINALS

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DRAWN	ID	[signature]	03 02 22
CHECKED	KB		
DESIGNED	ID	[signature]	03 02 22

PR.ENG. / PR.TECH./PR. ARCH

NAME ISMAIL DINDAR — DATE
SIGNATURE [signature] 03 02 22
REG. NUMBER ST 1570
SCALE : 1:100
A0

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TRANSNET

TRANSNET PORT TERMINALS

PROPOSED TPT
OFFICE RELOCATION TO
202 ANTON LEMBEDE STREET
DURBAN
2ND FLOOR LAYOUT PLAN

PROJECT NUMBER	OD	FBS	DIS	TYPE	DRAWING NO.	SHEET	REV	ID
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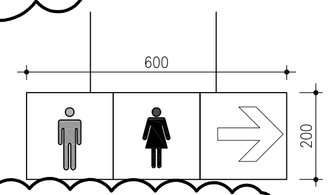

3 x T-INT-20 per sign, double sided and joined together. Sign to be suspended with clear nylon cables with ceiling mounting brackets.

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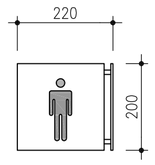

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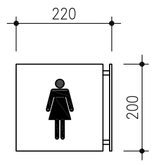

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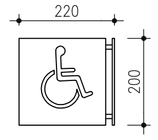

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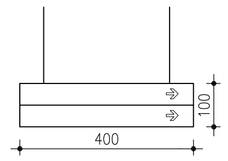

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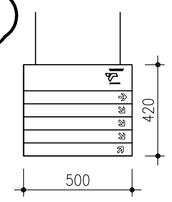

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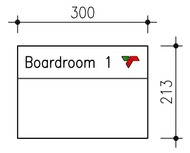

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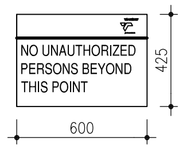

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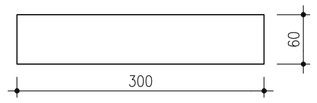

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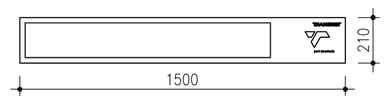

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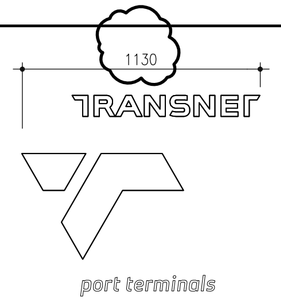

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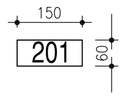

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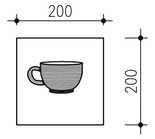

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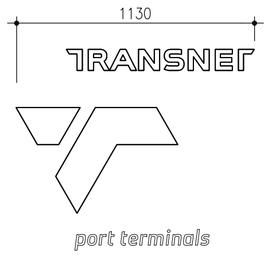

GENERAL NOTES

ALL SIGNAGE AS PER TRANSNET BRAND GUIDELINES (REFER TO SIGNAGE KIT OF PARTS AND SPECIFICATIONS DOCUMENT)

ALL UNSPECIFIED SIGNAGE TAGS TO BE CONFIRMED ON SITE

ALL HEIGHTS TO BE CONFIRMED ON SITE

ALL SUSPENDED SIGNS TO BE DOUBLE SIDED

DRAWING NO.	REFERENCE
.	.

REFERENCE DRAWINGS

NOTES

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NO.	DESCRIPTION	BY	CHKD	APPD	DATE
OB	ISSUED FOR TENDER	ID	KB	SN	01.02.22
OA	ISSUED FOR TENDER	ID	KB	SN	16.09.21

REVISIONS

CONTRACTOR / CONSULTANT			
TITLE	NAME	SIGN	DATE
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OPERATING DIVISIONS			
TITLE	NAME	SIGN	DATE
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TRANSNET PORT TERMINALS			
TITLE	NAME	SIGN	DATE
DRAWN	ID		01 02 22
CHECKED	KB		. . .
DESIGNED	ID		01 02 22
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PR.ENG. / PR.TECH./PR. ARCH	
NAME ISMAIL DINDAR	DATE
SIGNATURE	01 02 22
REG. NUMBER ST.1570	
SCALE : 1:100	A0

Transnet Port Terminals
TRANSNET LTD ; REG. NO. 1990/000900/30
TRANSNET PORT TERMINALS BUILDING
KINGSMEAD OFFICE PARK
STALWART SIMELANE STREET, DURBAN
TEL: 031 308 8333

TRANSNET PORT TERMINALS

PROPOSED TPT
OFFICE RELOCATION TO
202 ANTON LEMBEDE STREET
DURBAN
SIGNAGE SCHEDULE ALL FLOORS

PROJECT NUMBER	OD	FBS	DIS	TYPE	DRAWING NO.	SHEET	REV	ID
. . . . .	1	000	A	SC	0007	01	OB	TD

SUBJECT : TPT MOVE TO 202 ANTON LEMBEDE STREET

DOCUMENT NO. : SCOPE OF WORK

REVISION NO. : 01

DATE OF ISSUE : FEB 21

AMMENDMENT RECORD		
Rev	Section	Description of Change
00	n/a	FOR APPROVAL
01	3.1, PAGE 13	Add item `n'

	APPROVAL				
	Name	Department	Title	Signature	Date
Compiled	Ketan Bindapersad	ECPOT	*Project Manager*	K.Bindapersad	09.02.22
Reviewed	Muziwokuthula Ntuli	ECPOT	Principal *Project Manager*		09/02/2022
Reviewed	Shepherd Nkosi	Facilities Management	Facilities Manager		10/02/2022
Approved	Makhosini Shongwe	ECPOT	General Manager	PP: Akil Maharaj (Acting GM)	10/02/2022

PART C3: SCOPE OF WORK

Document reference	Title	No of page
	This cover page	1
C3.1	*Employer's Works* Information	2 - 105
	Total number of pages	**105**

C3.1 *EMPLOYER'S WORKS* INFORMATION

Contents

SECTION 1

1 Description of *The Works*

1.1 Executive overview

The Works that the *Contractor* is to perform involve electrical, mechanical, ICT, security, civil and general building works for the Provision of Offices for Transnet Port Terminals at 202 Anton Lembede Street, Durban.

The offices will be located on the following floors at 202 Anton Lembede Street and *The Works* is limited to these particular floors:

- A portion of the Ground Floor
- The 2nd Floor
- A portion of the 3rd Floor
- A portion of the 4th Floor
- A portion of the 5th Floor
- A portion of the 9th Floor

The scope of *The Works* includes but is not limited to the following:

- General building work including demolition, stripping, tiling, painting and carpeting where required.
- Supply and installation of shop fittings/ partitions for new closed offices and boardrooms where required.
- Creation of a new mezzanine floor on the Ground Floor
- Building of a new ablution facility on the Ground Floor
- The supply, delivery, installation and commissioning of distribution boards, power skirting, plug and LAN points for desks.
- Supply new and install or remove and replace light switches and light fittings
- Design of modification of HVAC ductwork, diffusers, air distribution on the ground, 2nd, 3rd, 4th, 5th and 9th floors to comply with National Building Regulations.
- Detail design, supply and installation of suitable standalone HVAC system to service the canteen and boardroom on the Ground floor
- Supply and installation/modification of plumbing work in the female ablution, male ablution, paraplegic ablution facilities on the ground floor and new kitchen on the 4th floor.
- Installation of trunking and access routes for ICT and security installation
- Transportation, delivery and installation of existing furniture in the relevant areas, including installation of power supply/plug points and LAN points to desks, offices and boardrooms.
- Design supply and installation of signage where required.

1.2 *Employer's* objectives

The Employer's objective is to provide office accommodation for Transnet Port Terminals staff at 202 Anton Lembede Street on specifically allocated floors within the existing building.

In addition to the above, *The Employer's* objectives are to achieve Completion of *The Works* by meeting the Completion Date whilst still maintaining the highest environmental, quality and safety standards and whilst minimising disruptions to on-going operations and the operations and activities of other stakeholders who currently occupy the building.

1.3 Terminology

The following abbreviations are used in this *Works* Information:

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

PLA	Project Labour Agreements
PSIRM	Project Site Industrial Relations Manager
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager
ProgEM	Programme Environmental Manager
ProjEM	Project Environmental Manager
QA	Quality Assurance
R&D	Research and Development
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Co-ordinator
SIP	Site Induction Programme
SMP	Safety Management Plan
SSRC	Site Safety Review Committee
SCADA	Supervisory Control And Data Acquisition
TPT	Transnet Port Terminals
TP	Transnet Property
TPL	Transnet Pipelines
ISPS	International Ship and Port Facility Security
PSIRA	Private Security Industry Regulatory Authority.
TGC	Transnet Port Terminals

2 Engineering and the *Contractor's* design

2.1 *Employer's* design

The Employer's design for *The Works* is:

a) **Electrical**

The Employer has carried out adequate detailed designs of the Electrical scope to be carried out by the *Contractor* in the respective different floors. This include modifications and additions to the existing electrical distribution boards, lighting and power circuits as detailed on the drawings. The *Contractor* shall however be responsible for the Ground Floor new Distribution Board detailed drawing as per the Single Line diagram with the final approval of the shop drawings being approved by *The Employer* prior to fabrication.

b) **Mechanical**

The Employer has carried out an adequately detailed design of multiple HVAC modifications which needs to be carried out on various floors as mentioned earlier in the document and as indicated on the design drawings. It is however the responsibility of the HVAC contractor to do the detailed design shop drawings for the system. *The Employer* has also carried out a design of a modification of a plumbing system on the ground floor in the male, female and paraplegic ablution facilities as well as a small plumbing modification to feed water from a nearby room adjacent to the Canteen area on the ground floor in order to feed water to the canteen facility

c) **Architectural**

The Employer has carried out adequately detailed design layouts of the offices, ablutions, canteen, filing room, furniture and Think tank as we as detail ironmongery, door, shopfront, partition and finishing schedules.

d) **ICT**
The Employer has carried out adequately detailed design layouts of the offices, boardrooms and all other areas where ICT is required.

e) **Structural**
The Employer has carried out adequately detailed design layouts of the mezzanine floor.

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

2.2 Parts of *The Works* which the *Contractor* is to design

All designs undertaken by the *Contractor* as per the below clauses are required to be endorsed by an ECSA Registered Professional Engineer/Professional Technologist suitably experienced in the relevant discipline.

The *Contractor* is to design the following parts of *The Works* and will be responsible in his design for the overall integration of the design of *The Works* with the designs of *The Employer*.

a) All supporting infrastructure required to implement all of *The Employer*s' designs. These may include, but is not necessarily limited to, cableways, cable support systems, conduit systems and arrangement, piped systems and pipe support systems, and the selection of fasteners and fastening systems for these items, where not specified, referenced or detailed by *The Employer*.

b) All detailed designs of all LV distribution panels and electrical kiosks. The detailed Earthing and Lightning Protection design in accordance with *The Employer*'s high level designs and minimum requirements and specifications.

c) The *Contractor* is also to do the detail design and shop drawings of all the HVAC and Plumbing systems with all of the HVAC system supports, supports structures, fasteners and any other related detail. The *Contractor* shall also be responsible for detailed shop drawing of all HVAC system ductwork and pipework, etc. The *Contractor* shall make use of *The Employer*'s HVAC and plumbing designs as a basis for their detail designs and shop drawings which needs to be submitted to the *Project Manager* for approval.

d) The *Contractor* shall submit shop drawings, for both *Contractor*'s designs and *Employer*'s designs, to the *Project Manager* for acceptance by *The Employer*'s Engineers.

e) All and any equipment, formwork, and temporary work associated with the provision of *The Works*.

f) Lighting designs where the *Contractor* has suggested alternative luminaires. The *Contractor* shall undertake these designs in compliance with SANS 10389-1.

g) Unless expressly stated to form part of the design responsibility of *The Employer* as stated under *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*.

h) The *Contractor* shall engage the services of ECSA registered Engineers and/or Technologists for all aspects of *The Works* for which the *Contractor* is to design as per Clauses 2.2.1 above.

i) The *Contractor* shall thus be wholly accountable and responsible for all aspects of his designs, including the implementation of all Statutory Safety, Health and Environmental Regulations of

South Africa and the particular requirements, specifications, and regulations of *The Employer* pertaining to Health and Safety, Environment, Quality and Engineering.

j) The *Contractor* shall be wholly accountable and responsible for the implementation of the aspects of his designs including commissioning, putting into service, and handover of his constructed designs to *The Employer*, and his duly appointed ECSA registered Engineers shall be held accountable and responsible for these aspects of *The Works* for the lifetime duration of *The Works*.

k) Acceptance of documentation by the *Project Manager* will in no way relieve the *Contractor* of is responsibility for the correctness of information, or conformance with his obligation to Provide *The Works*. This obligation rests solely with the *Contractor*.

l) 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.

m) The *Contractor* shall allow the *Project Manager* 2 weeks (unless otherwise stated and agreed) to review and respond to the *Contractor*'s submission of their documentation, i.e. from time of receipt by the project to the time of despatch. 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*.

n) 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.

o) 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.

p) The *Contractor* is required to incorporate Environmental Design Criteria and requirements into their designs, procedures; ensure environmental screening and sustainability analysis is incorporated into the project detailed design options and undertake design safety reviews with the *Project Manager* the NEC Supervisor, *The Employer*'s Engineer's and Professional team, *The Employer*'s Health and Safety Officers, *The Employer*'s Environmental Officers, *The Employer*'s Quality Assurance and Quality Control Officers and any other Specialists and/or Subject Matter Experts (SME) as deemed by *The Employer* necessary for the provision of *The Works*.

q) Detailed shop drawings based on *The Employer*s detail drawings for all shopfronts and joinery for *The Employer*s approval.

r) Detailed shop drawings based on *The Employer*s signage schedule for *The Employer*s approval.

s) Detailed shop drawings based on *The Employer*s detail drawings for the mezzanine floor and signed off by a competent ECSA registered engineer.

2.3 Other requirements of the *Contractor's* design

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

a) All Statutes, Standards, Specifications, Policies, Conventions, Requirements as referenced in Paragraph 4 of this document and all Statutes, Standards, Specifications, Policies, Conventions, Requirements as referenced in any Annexures thereto.

b) The *Contractors* Drawings to become the property of Transnet. The *Contractor* to allow in their price for submitting to the Engineer a hard copy and soft copies in PDF and Native AutoCAD (DWG-format).

2.4 Use of *Contractor's* design

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*.

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* as follows:

All supporting infrastructure required to implement all of *The Employer*s' high level designs. These may include, but is not necessarily limited to, cableways, cable support systems, conduit systems and arrangement, piped systems and pipe support systems, and the selection of fasteners and fastening systems for these items, where not specified, referenced or detailed by *The Employer*.

All detailed designs of all LV distribution panels. The detailed Earthing and Lightning Protection design in accordance with *The Employer*'s high level designs and minimum requirements and specifications.

All and any equipment, formwork, and temporary work associated with the provision of *The Works*.

Concrete mix designs, descriptions and properties for wearing and levelling courses

All and any equipment, formwork, and temporary work associated with the provision of *The Works*.

All lighting designs where the *Contractor* has suggested alternative luminaires.

2.5 Design of Equipment

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

- Any formwork required to Provide *The Works*
- Temporary electrically powered compressed air systems and pneumatic equipment that may be required to Provide *The Works*
- Small electrically powered equipment
- Equipment designed for the lifting of personnel to access any areas necessary to Provide *The Works*, which are not at ground level.
- Equipment designed for the lowering of personnel to access any areas necessary to Provide *The Works*, which are below ground level.
- The following 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:
- Temporary petrol or diesel powered compressed air systems and pneumatic equipment that may be required to Provide *The Works*
- Small petrol or diesel powered equipment
- Specialist Equipment required to Provide *The Works*
- Rigging platforms and specialised rigging Equipment that may be required by the *Contractor* to Provide *The Works*.
- Temporary access platforms, ladders, walkways, scaffolds, and any other temporary structures required to provide *The Works*.
- All lighting designs where the *Contractor* has suggested alternative luminaires.

- The design of Equipment is considered in terms of this contract as *Contractor*'s design and any and all applicable requirements of 2.2, 2.3, 2.4, and 2.5 of this document shall apply.

2.6 Equipment required to be included in *The Works*

Any shuttering/formwork that is left in-situ as required by the design of *The Works*, notwithstanding it be *Employer's* Design or *Contractor*'s design, and necessary for the provision of *The Works*.

3 Construction

3.1 Temporary *Works*, Site services & construction constraints

The *Contractor* shall comply with the requirements of *The Employer* with regard to site entry, security control, permits, and site regulations.

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

a) The *Contractor* shall attend all necessary Safety Inductions and ensure that all personnel engaged in the provision of *The Works* are inducted as directed by the *Project Manager*, NEC Supervisor.
b) The *Contractor* and all personnel engaged in the provision of *The Works* shall attend all Safety and environmental Inductions as required by the Transnet Officer as directed through the *Project Manager*
c) The *Contractor* and all personnel engaged in the provision of *The Works* shall attend all Safety and environmental Inductions as required by *The Employer*'s Safety Officer, *Employer*'s Environmental Officer, *Employer*'s Electrical Engineer and/or as directed by the *Project Manager*.
d) All work carried out on roadways or adjacent to railway lines shall require necessary permits or occupation.
e) The *Contractor* shall make arrangements for the Transnet official (TPT/TPL manager) to arrange for the necessary permits or occupations with TPL or eThekwini Municipality during the execution of *The Works*.
f) The *Contractor* shall obtain access permits from the TPL Security Office, and the TPT Safety Officer before accessing the sites.
g) The *Contractor* shall obtain the relevant work permits from *The Employer*'s Safety Officer and Environmental Officer before performing any work.
h) The Safety Inductions, Environmental inductions, Access Permits and Work Permits are part of this contract and the *Contractor* shall make allowance for it in his Price and Programme.
i) The *Contractor* shall ensure that all relevant safety and environmental inductions and access permits are obtained well before the Site Access Date as reflected in the Contract Data.
j) 202 Anton Lembede Street is a designated Transnet Security Area, and in terms of this, all access into the building will be strictly controlled. Compliance to these security requirements, including labour transport and access requirements, obtaining and maintaining access cards for the *Contractor*'s personnel on Site is part of this contract, and the *Contractor* shall make allowance for it in his *Price* and *Programme*.
k) The *Contractor* shall obtain the necessary TPL entry permits for all of the *Contractor*'s personnel working within 202 Anton Lembede Street in accordance with the access control requirements of the TPL and the *Contractor* shall make allowance for it in his *Price* and

Programme. The *Contractor* is also required to obtain the relevant permits for his Sub-*Contractor*s and all suppliers. The *Contractor* is required to make applications for these permits on behalf of his workers, suppliers and Sub- *Contractor*s, and is to nominate a single person to liaise with the relevant TPT and TPL authorities. The *Contractor* shall make allowance for it in his *Price* and *Programme*.

l) The *Contractor* shall provide all staff working within 202 Anton Lembede Street with *Contractor* identification cards which detail the person's name, identity number and the foreman / engineer responsible. The provision of construction personnel with ID cards is considered part of this contract and shall be made by the *Contractor* to a standard acceptable to the *Project Manager* and the *Contractor* shall make allowance for it in his *Price* and *Programme*.

m) The *Contractor* is to be in constant consultation and cooperation with the building's security operations to ensure compliance with all the required security procedures and the *Contractor* shall make allowance for it in his *Price* and *Programme*.

n) The Contractor shall be required to construct the 2nd floor in 2 phases. The Employer will occupy Phase 2 while the Contractor works on Phase 1. When Phase 1 is completed, the Employer will move into Phase 1. Once the Employer has moved into Phase 1, the Contractor can commence work on Phase 2 of the 2nd floor. The Contractor must ensure the construction area is adequately cordoned off from the Employers work area during to construction of both phase.

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

3.2.1. Access route to the 202 Anton Lembede Street

a) All vehicles are subject to security checks and all Plant and Equipment brought into the building and leaving the building are required to be security cleared by the relevant authorities (*Project Manager* and TPL Security Manager) before access or exit is granted, as the situation may require.

b) The *Contractor* is required to arrange for the clearing of the items with the *Project Manager* and the TPL Security Manager well in advance of the access or exit requirement to avoid delays in the provision of *The Works*.

c) The *Contractor* ensures that any of his staff, labour and Equipment moving outside of his allocated Sites and Working Areas does not obstruct *The Employer's* and Others operations. To this end access routes are allocated and co-ordinated by the *Contractor* in liaison with the *Project Manager*.

d) The *Contractor* ensures the safe passage of traffic, to and around the various sites and Working Areas at all times. This includes providing flagmen, protective barriers, signage, etc. for protection, direction and control of traffic within the building and on Anton Lembede Street.

e) The *Contractor* shall provide designated, signed and demarcated walkways for all personnel who are required to traverse between the different working areas at the various sites. Personnel outside of the designated walkways/working areas are required to be conducting work activities, and when traversing, are required to use the designated walkways.

f) The *Contractor* plans and organises his work in such a manner so as to cause the least possible disruption to *The Employer's* operations.

3.2.2. Barricades and fencing around sites

a) The *Contractor* shall be responsible for providing a temporary barricade between the existing office operations (per floor), roadway and the construction sites where necessary and maintaining, providing, and/or relocating the barricades, if required for construction purposes,

to ensure the boundary is continuous, and the *Contractor* shall make allowance for it in his *Price* and *Programme*.

b) The *Contractor* shall ensure that his site office where equipment may be stored, prepared or refurbished has an access gate, is secured and is manned 24hrs a day for the duration of *The Works* and over any builder's breaks, by a Security Provider acceptable to the *Project Manager* and registered with the PSIRA and the *Contractor* shall make allowance for it in his *Price and Programme*.

3.2.3. Restrictions to access on Site/s

a) The *Contractor* is prohibited from entering *The Employer*'s and Others Operational Areas, unless authorised to do so.

b) The *Contractor* plans and organises his work in such a manner so as to cause the least possible disruption to *The Employer*'s and Others' operations.

c) The *Contractor* ensures that all his construction staff, labour, and Equipment remains within his allocated and fenced off or designated construction areas.

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

a) 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.

b) The *Contractor* complies with a nine (9) hour a day, five (5) day a week standard work day/week for all activities to be undertaken by his people (including Sub-*Contractor*s) employed on site.

c) Work times (i.e. start and end times within a standard work day) shall be as mutually agreed with the *Project Manager*.

d) In the event that the *Contractor* requests to work overtime to make up for time lost due to his own delays, the *Contractor* will be liable for the supervision cost required from *The Employer*'s team during *The Works*.

e) The *Contractor* keeps daily records of his people, Plant and equipment engaged on the Site and Working Areas (including Sub-*Contractor*s) with access to such daily records available for inspection by the *Project Manager* at all reasonable times

f) Minimum requirements of people employed on the Site are as follows:

g) South African identity document or passport/ visa and work permit for foreign nationals;

h) Employment of local labour only for unskilled and semi-skilled job categories as per PIRPMP;

i) Secondment of skilled core/ permanent employees if skills are not locally available;

j) Pre-employment medical examinations; and

k) Induction in IR matters and conditions of employment on the Project.

l) The *Contractor* complies with the requirements of the IRCC involving the engineering construction *Contractor*s engaged (including all future *Contractor*s) by *The Employer*.

3.2.5. Health and safety facilities on Site

a) The *Contractor* is referred to the Health and Safety specifications: HAS-PHSS-0001 Rev 0 as contained in the List of Annexures of this document.

b) The *Contractor* complies with the requirements stated under paragraph entitled "Safety Risk Management" of *The Employer*'s Works Information.

c) Environmental controls, fauna & flora, dealing with objects of historical interest, etc.

d) The *Contractor* is referred to the Standard Environmental Specification (SES) and Construction Environmental Management Plan (CEMP) as contained in the List of Annexures.

e) The *Contractor* complies with the CEMP, SES and Project Environmental Specification (PES) in the construction of *The Works*, all as described under paragraph "Environmental constraints and management" of *The Employer's Works* Information.

3.2.6. Title to Materials from demolition and excavation

a) The *Contractor* has no title to any materials arising from excavation and demolition in the performance of *The Works* with title to such materials remaining with *The Employer*. The *Contractor* informs the *Project Manager* immediately upon encountering any such materials who shall then instruct the *Contractor* how to label, mark, set aside and/or dispose of such materials for the benefit of *The Employer* in accordance with ECC3 Clause 73.1

3.2.7. Cooperating with and obtaining acceptance of Others

The *Contractor* performs *The Works* and co-operates with:

a) *The Employer* (including the agents of *The Employer*) who operate on Site during the entire duration of the Contract period.
b) The TPL/TPT manager and agents of the TPL, as directed by the *Project Manager*, who operate on Site during the entire duration of the Contract period.
c) Of whom the *Contractor* is to be notified once appointed by *The Employer*, who operate on Site during the entire duration of the Contract period.

3.2.8. Publicity and progress photographs

a) The *Contractor* shall obtain the permission and approval of the *Project Manager* before erecting any notice boards, using the details of the contract in any advertising media or revealing any details of the contract to the public.
b) 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*.
c) The *Contractor* provides a notice board showing *The Employer*'s details, The *Project Manager*'s details and the *Contractor*'s details at the various Sites.
d) The *Contractor* shall submit the graphic design and the structural support designs of the notice board to the *Project Manager* for acceptance before fabricating or erecting it.
e) The *Contractor* provides progress photographs at monthly intervals in digital format as part of the *Contractor*'s monthly programme narrative report. The photos shall include detailed, close up photos of construction activities.

3.2.9. *Contractor*'s Equipment

a) 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.
b) The *Contractor* complies with the following permissions and restrictions in the use of Equipment as required by *The Employer*:
c) Equipment used by the *Contractor* to Provide *The Works* shall be prepared, painted, assembled and disassembled within the *Contractor*'s Work Area and Site boundaries or lay-down areas as authorised by the *Project Manager*.
d) The *Contractor* is required to remove all equipment that is not part of *The Works* from site after completion of *The Works* and before de-establishment of the site.
e) All and any equipment used by the *Contractor* for the provision of *The Works* shall comply to *The Employer*'s SHEQ regulations and restrictions, or any other statutory Health and Safety requirements as directed by the *Project Manager* in liaison with *The Employer's* Engineers or *The Employer*s Consultants.

3.2.10. Equipment provided by *The Employer*

a) *The Employer* shall not provide any Equipment to the *Contractor* for the purposes of this contract.

3.2.11. Site services and facilities:

a) *The Employer* provides the following facilities for the *Contractor*:

For the duration of the Contract, the *Project Manager* will provide an area, free of charge, for the *Contractor* to establish his offices, lay down areas, stores, preparation and painting area, workshops, and other *Contractor*'s Equipment.

The locations of the potential lay down areas will be identified at the site clarification meeting. The *Contractor* may establish a site camp anywhere within the boundary of this area that does not impede the provision of *The Works*.

The *Contractor* shall ensure that the area used has a suitable continuous security fence and the necessary access gates.

All preparation and fencing, etc. shall be done by the *Contractor* and shall be allowed for in his Price, this includes clearing away and leaving clean and clear at Completion.

The *Contractor* shall provide everything else necessary for providing *The Works*.

3.2.12. Connections to services for *Contractor*'s use:

a) Supply point for potable water on Site and the *Contractor* will have to make his own arrangements to bring the water to the point of *The Works*.

b) A connection for electricity is available on site and the *Contractor* will have to make his own arrangements to bring the electricity to the point of *The Works*.

c) Toilets are available on site and the *Contractor* to arrange with the *Project Manager* for exclusive use by the *Contractor*

d) No connection to a sewer system will be made available and thus the *Contractor* will have to make provision for the containment and disposal of foul water from toilets, ablutions, basins, etc. that the *Contractor* provides over and above the provisions made by *The Employer*

e) The *Contractor* shall provide everything necessary for providing *The Works* in accordance with this contract and attached Annexures.

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

3.2.13. Facilities provided by the *Contractor:*

a) The *Contractor* ensures that the site establishment area is compliant with the relevant safety and environmental regulations and restrictions, is clearly sign posted, and has a suitable security fence, lighting and the necessary access control gates.

b) All costs for preparation of the site establishment area are to be allowed for in the *Contractor's* Price.

c) The *Contractor* submits details of the layout of his site establishment to the *Project Manager* for his acceptance.

d) The *Contractor* installs a metering device, which is acceptable to the *Project Manager* and *The Employer*'s Engineers, immediately downstream at each of *The Employer*'s connections (if applicable in the context of this contract) from where he draws services. The *Contractor* provides the *Project Manager* details of his monthly consumption of potable water and power.

e) The *Contractor* is responsible for his own connection to *The Employer*'s services and for the reticulation of his services from the connection point. The cost of meters, connections, reticulation and all other usage costs associated with the provision of services are included in Price.

f) The *Contractor* provides the *Project Manager* with a "Certificate of Compliance" (COC), by an "Accredited" Person as defined by the OHS Act, in respect of his Construction Power electrical installation. The *Project Manager* only makes construction power available upon receipt of the COC.

g) The Supervisor (or his nominated representative) conducts routine inspections of the *Contractor*'s construction power reticulation and power tools. If found to be un-safe and / or non-compliant with statutory requirements, the electrical power supply is disconnected until the *Contractor* rectifies all defaults.

h) The *Contractor* shall be responsible for providing water and power for all other Working Areas where not provided by *Employer.*

i) The *Contractor* provides, at his cost, a sufficient number of toilets and maintains them in a clean and sanitary working condition (as per the environmental and safety specification).

j) The *Contractor* provides temporary lighting and fencing around every section occupied by him during the construction of *The Works*.

k) Such fencing demarcates and secures the construction area. The fencing is erected before any work starts and is removed only upon completion of the work in that area.

l) The *Contractor* includes for all costs for such lighting and fencing, including access control into and out of these restricted areas.

m) 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, 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 before construction or better, upon dismantling of such facilities and items of Equipment.

n) Upon Completion the *Contractor* completely removes from the Site and Working Areas all his Equipment, including the foundations of any structures, stores, office accommodation or any other asset belonging to him, and leaves the Site and Working Areas in a tidy condition to the satisfaction of the *Project Manager*.

o) No excess or discarded materials or equipment may be buried or dumped within the site.

p) Demolition of all temporary structures surfaces etc. shall be first approved by the *Project Manager* prior to the work being carried out.

q) *The Employer* does not provide any security for the Site and Working Areas. The *Contractor* provides same and indemnifies and holds indemnified the *Project Manager* and *Employer* against any claims and actions that may arise out of Site and Working Area security.

r) No housing is available for the *Contractor*'s employees. The *Contractor* makes his own arrangements to house his employees and transports them to Site in a closed vehicle specifically designed for passenger transport (bus or similar) accepted by the *Project Manager*.

s) Wherever *The Employer* provides facilities for the *Contractor*'s use 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 before construction or better upon dismantling of such facilities and hand-back to *The Employer*.

t) The *Contractor* shall provide, maintain and remove lockable portable chemical type toilets.

u) The *Contractor* shall provide a suitably sized construction power supply by means of either municipal supply, or Generation Plant equipment, as required.

v) The *Contractor* shall be wholly responsible for the provision of this power supply and shall make all the necessary arrangements for the supply, and the maintenance of the supply for the duration of *The Works*.

w) The *Contractor* shall provide the following facilities for the *Project Manager* and Supervisor:

i. NONE REQUIRED

x) Unless explicitly stated as a responsibility of *The Employer*, Site services and facilities, connections to Services for *Contractor*s' use and 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*.

3.2.14. Existing premises, inspection of adjoining properties and checking work of Others

a) The *Contractor* will be held responsible for any damage to the existing structures and surfacing caused by the *Contractor* during the execution of this contract; fair wear and tear excluded, and shall repair it to the satisfaction of the *Supervisor* on conclusion of *The Works*.

3.2.14.1. For this purpose, a joint inspection with the *Supervisor* will be carried out prior to occupation of the site(s) and any existing damage noted.

3.2.14.2. The *Contractor* is required to forward a photographic report following the inspection to the *Project Manager* for record purposes.

b) The *Contractor* inspects and surveys following areas adjacent to the Site in accordance with this Works Information and in conjunction with the *Project Manager*:

c) The access road and parking areas used exclusively by the *Contractor* and *The Employer*s' Personnel involved in the provision of *The Works* or the administering of the contract. Access roads that are used by both the *Contractor* and TPT for their operations are excluded from this requirement.

3.2.15. Survey control and setting out of *The Works*

The Employer provides the following information and survey controls for the *Contractor*:

a) Survey control points for the setting out of *The Works*. The *Contractor* will be responsible for the setting out of *The Works*.

b) The *Contractor* validates the information provided by the *Project Manager* and records all existing and final levels on a drawing and presents this to the *Project Manager* for acceptance.

3.2.16. Excavations and associated water control

The *Contractor* complies with the following requirements:

a) Where applicable, the *Contractor* protects all excavations against any water ingress whether by seepage, rains, storms, floods or any other means.

b) Where applicable, the *Contractor* immediately removes any water found in the excavation by pumping and / or bailing provided the removal of water complies with the National Water Act (Act 36 of 1998) and provides all necessary Equipment (pumps, pipes, etc.) to do so.

c) In the event where the pumped water will be discharged into a watercourse, the pumping out of water must conform to the provisions contained in the Coastal Water Discharge permit – refer to list of Annexures National Water Act 36 of 1998.

d) Water is cleared in such a way that it cannot seep or flow back into the excavations.

e) The *Contractor* shall install shoring where necessary, and in all deep excavations to ensure that the sides of the excavation does not collapse.

f) The *Contractor* shall comply with *The Employer*'s SHEQ policy in all respects for the Provision of *The Works* involving deep excavations.

g) All activities related to excavations and water control forms part of this contract, and the *Contractor* shall make allowance for these activities in his Price and Programme.

3.2.17. Underground services, other existing services, cable and pipe trenches and covers

Where the *Contractor* encounters existing underground services or existing service cables, the *Contractor* undertakes the following:

a) The *Contractor* is required to liaise with the *Project Manager*, and the Supervisor and *The Employer*'s Engineers, and establish as accurately as possible the location of the various existing services situated within the Work Area and record all such information on a suitable "marked-up" drawing for reference at all times.

b) In addition to the above, the *Contractor* shall consult the *Project Manager*, the Supervisor and *The Employer*'s Engineers, prior to undertaking any excavation work.

c) Where the *Contractor* encounters existing underground services / existing services cables / pipe trenches, the *Contractor* is to notify the *Project Manager*, the Supervisor and *The Employer*s Engineers.

d) Where the encountered services are causing a delay in the provision of *The Works*, the *Contractor* shall approach the *Project Manager*, the Supervisor and *The Employer*'s Engineers for a decision by submitting a Field Engineering Query (FEQ), including his recommendations.

e) The *Contractor* shall then provide the solution described in the answered FEQ.

f) The *Contractor* must thereafter exercise due care and attention in carrying out the agreed excavation Works and any Works as may be directed by the *Project Manager* to avoid damage or disruption to existing services.

g) The *Contractor* shall be liable for all claims arising out of any damage caused by such excavation if the *Contractor* fails to exercise the requisite care and attention in carrying out the excavation.

h) The cost of locating and protecting, if necessary, services shall be included in the rates for the services intersecting and adjoining the trenches.

i) A group of cables intersecting or adjoining a trench will be regarded as one service.

j) The existing services shall be protected when excavating.

k) The costs of protecting these services shall be included in the rates for excavation and compaction.

l) All existing services shall be treated as in service and "live". All necessary Safety Instructions of *The Employer* and statutory requirements as per the OHS Act and its Regulations shall be complied with in the handling of the "live" service.

m) In the case of electrical services, the *Contractor* shall trace, locate and identify all cables within the service and record the information as per this Works Information above.

n) The *Contractor* shall also comply with all of the relevant *Employer*'s Specifications in Section 4 below and any annexed thereto in the reinstatement of the services

3.2.18. Control of noise, dust, water and waste

The *Contractor* complies with the following:

a) Before moving Equipment onto the Site and Working Areas and commencing *The Works*, the *Contractor* submits his proposed methods of construction which demonstrate the measures taken to avoid and or reduce any environmental and health issues arising from dust, noise and vibration for acceptance by the *Project Manager*.

b) The *Contractor* shall comply with the requirements of "Environmental constraints and management" of Section C3.1 *Employer*'s Works Information.

c) The *Contractor* shall comply with the requirements of "Safety risk management" of Section C3.1 *Employer*'s Works Information.

d)

e) The *Contractor* is to provide dust suppression as per the CEMP, PES and SES documents to ensure that dust levels resulting from the *Contractor*'s construction traffic are kept to the required safety and environmental standards as specified in the relevant project environmental specifications.

3.2.19. Sequences of construction or installation

The *Contractor* complies with the following:

a) The *Contractor* is hereby informed of the requirements of maintaining the continuity of supply to the Building, and is required to arrange and sequence his Works so as to ensure that there is no disruption/minimal disruption to the existing TPL and TP employees who occupy the building.

b) Should it be impossible to avoid a disruption as described in (a.1) above, the *Contractor* shall notify the *Project Manager*, Supervisor and *The Employer*s Engineers 21 days before the anticipated disruption and request authorization to commence with the aspect of *The Works* that will cause the disruption. The *Contractor* shall not proceed without said authorization to proceed.

3.2.20. Giving notice of work to be covered up

a) The *Contractor* notifies the Supervisor in writing of any elements of *The Works* which are to be covered up. This notification is given not less than 48 (forty-eight) hours prior to the proposed covering up.

b) The *Contractor* shall not cover *The Works* without the authorization of the Supervisor.

c) The *Contractor* shall make the *Project Manager* and Supervisor aware of any tests and inspections required by *The Employer*'s Quality Management Procedures. Notification of required test and/or *The Employer*s Engineers inspections to be given 24 (twenty-four) hours in advance.

3.3 Completion, testing, commissioning and correction of Defects

a) The *work* to be done by the Completion Date

On or before the Completion Date or Sectional Completion Date, the *Contractor* shall have done everything required to Provide *The Works* including removal of his establishment and equipment from the respective sites but excluding the work listed below which may be done after the Completion Date but in any case before the dates stated.

The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects, which would have, in his opinion, prevented *The Employer* from using *The Works* and Others from doing their work.

Item of work	**To be completed by**
Submission of all data packs, quality assurance records and as-built drawings	30 days after Completion

The *Contractor* shall not be permitted to carry out any *works* after Completion has been certified.

b) Use of *The Works* before Completion has been certified

The Employer uses the following part / parts of *The Works* before Completion is certified by the *Project Manager* which do not constitute take over by *The Employer* for the reason(s) stated:
Areas that are ready for handover and occupation by TPT staff

3.3.1. Materials facilities and samples for tests and inspections

The *Contractor* provides *The Employer* with the following materials, facilities and samples during the provision of *The Works*, as per ECC Clause 40.2:

a) The *Contractor* is required to provide all materials, facilities and samples for any tests required in Section 4 Plant and Material Standards and Workmanship below.
b) The *Contractor* shall furnish samples of any Plant and Materials that is other than, or different to, that specified by *The Employer's* Engineers, to the *Supervisor* for Acceptance by *The Employer's* Engineers. The *Contractor* is prohibited from installing said Plant without the required prior authorization from *The Employer*s Engineers.
c) The *Contractor* shall furnish samples of any Plant and Materials that is other than, or different to, that required by *The Employer's* Engineering Specifications, that shall be utilised in the *Contractor*'s Designs, to the *Supervisor* for Acceptance by *The Employer's* Engineers. The *Contractor* is prohibited from installing said Plant without the required prior authorization from *The Employer's* Engineers.
d) The *Contractor* shall furnish samples of any Plant and Materials that is proposed to be used in the *Contractor*'s designs, to the *Supervisor* for Acceptance by *The Employer's* Engineers. The *Contractor* is prohibited from designing with, and subsequently installing said Plant and Materials without the required prior authorization from *The Employer's* Engineers.
e) Samples, tests and inspections required of the *Contractor*, shall be as specified in Section 4 of C3.1 or any other standards, specifications or statutory requirements referred to therein or annexed thereto.
f) The *Contractor* shall give notice to the *Supervisor* of the required inspection not less than 48 hours before the inspection is required.
g) *The Employer* will not provide any materials or facilities for the use of the *Contractor*, to perform tests and inspections.

3.3.2. Take over procedures

The *Contractor* provides the following assistance to *The Employer*:

a) The *Contractor* ensures that all the required documentation as described in *The Works* Information is presented to the *Project Manager* before Completion.
b) The *Contractor* ensures that the *Project Manager* has a full and accurate dossier f As-built documents that represent the completed *Works* for Electrical, General Layouts and Detail Drawings to present to *The Employer*.
c) The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of Maintenance and Operating Manuals that represent the completed *Works* for Electrical, General Layouts and Detail Drawings prior to take-over or Completion.
d) Where the *Contractor* has presented Maintenance and Operating Manuals that represent the Lighting, Switchgear, Services and systems (lighting control systems) that reflect the status of the completed *Works* for Electrical, General Layouts and Detail Drawings to the *Project Manager* at take-over, the *Contractor* modifies and updates As-built documents as necessary prior to Completion.

3.3.3. Access given by *The Employer* for correction of Defects

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

a) Access into areas already handed over by the *Contractor* for correction of any defect shall be subject to the approval of TPT Operations, and these times shall be communicated to the *Contractor* by the *Project Manager*.

b) The areas required by the *Contractor* will need to be temporarily barricaded by the *Contractor* before the *Contractor* commences with any corrective work.

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 as required by *The Employer*.

3.3.4. Performance tests after Completion

The *Contractor* performs the following performance tests after Completion of *The Works*:

a) The *Contractor* shall be required to measure and record the lighting levels at all zones to the satisfaction of *The Employer's* Engineers. The lighting level shall be measured in a 5m x 5m matrix format.

b) The *Contractor* shall be responsible for the entire commissioning and testing of all mechanical HVAC and Plumbing systems after the installation and powering of the relevant plant and equipment of the specific system. The *Contractor* shall ensure that the entire system is properly balanced and tuned to its required performance.

4 Plant and Materials Standards and Workmanship

4.1 Plant and Materials

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

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

No Plant or Materials will be provided "free issue" by *The Employer*

The *Contractor* provides all Plant and Materials necessary for *The Works*.

The *Contractor* supplies all certification including test certificates, user manuals, maintenance manuals and data books with respect to Plant and Materials procured for *The Works*:

4.2 Investigation, Survey and Site Clearance

The *Contractor* will be responsible for setting out *The Works*.
The *Contractor* validates the information provided by the *Project Manager* and records all existing and final levels on a survey drawing and presents this to the *Project Manager* for acceptance.
Prior to commencing *The Works,* the *Contractor* records any defects or inaccuracies related to the existing structures, paving, etc. and presents this record to the *Project Manager* for acceptance. Only items recorded in this manner will be accepted as having pre-existed *The Works* and the remedying of all other damage will be the *Contractor's* responsibility and for his cost.

4.3 Building Works

4.3.1. Building description

The building is an existing multi-storey office block. It is a concrete framed structure with brick infill. It serves as an office block and commercial outlet and the usage will remain the same. The purpose of the project is to create additional capacity for workstations, boardrooms, canteen, and ablutions facilities within the existing confines of the existing building envelope.

4.3.2. Building *works*

The Model Preamble for Trades as published by the Association of South African Quantity Surveyors Model Preamble for Trades 2008 shall be applicable to all the building *works* associated with this contract. The following interpretations and meanings shall apply:

In case of any conflict in interpretation, ambiguity or discrepancy between the Model Preamble for Trades 2008, (any standard or written particular project specification) contained in *The Works* Information and the conditions of contract, the conditions of contract shall take precedence.

In case of any conflict in interpretation, ambiguity or discrepancy between the Model Preamble for Trades 2008 contained in this paragraph 4.3 of C3.1 *Employer*'s Works Information and specific statements contained elsewhere in C3.1 *Employer*'s Works Information, the specific statements contained elsewhere shall prevail, without prejudice to the *Project Manager*'s express duty to resolve any ambiguity or inconsistency in *The Works* Information under ECC3 Clause 17.1.

Within the Model Preambles for Trades 2008, the following amendments and interpretations shall apply

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

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

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

Where the Model Preambles for Trades 2008 mention "rates" for measured work and any contractual statements relating to payment, all such statements shall be discounted, with the ECC3 conditions of contract taking precedence.

Within the Model Preambles for Trades 2008, A. GENERAL, the following amendments and interpretations shall apply:

Where the word or expression "bills of quantities" is used, this shall be discounted for the purposes of *The Works* Information. The ECC3 Contract Data Part One states the main option to apply within the ECC3 Contract between the Parties.

Within the Model Preambles for Trades 2008, B. ALTERATIONS, B.2 MATERIALS FROM THE ALTERATIONS, CREDIT, ETC and C. EARTH*WORKS*, C1.4 Materials from demolitions shall not apply. C3.1 *Employer's* Works Information paragraph 3.1.4 states details of the *Contractor's* title (if any) to Materials arising from excavations and/or demolitions and how such Materials are either to be disposed of or re-used in *The Works*.

Within the Model Preamble for Trades 2008 Q. PLUMBING AND DRAINAGE, Q.24 TESTS shall be deemed to be included within paragraph 3.2 of C3.1 *Employer*'s Works Information.

Within the Model Preamble for Trades 2008 U. EXTERNAL WORKS, U.3.8 Process control tests shall be deemed to be included within paragraph 3.2 of C3.1 *Employer*'s Works Information.
The principles, meanings and interpretation stated and established within paragraphs 2.2.8 to 4.2.1 with respect to the Model Preambles for Trades 2008 apply equally to other references used within C3.1 *Employer's* Works Information.

4.3.3. Specifications provided by *The Employer*.

The application of the National Building Regulations (SANS 10400) is to be strictly adhered to.

4.3.4. Manufacturer's instructions and specifications

All materials and products shall be used and installed in strict accordance with the manufacturer's instructions and specifications.

4.3.5. Use of locally manufactured materials and products

Materials and products manufactured in South Africa shall be used in carrying out the work to which this specification refers, unless an imported product is prescribed specifically, or when no suitable locally manufactured product for the specific use is available.

4.3.6. Samples

The *Contractor* shall furnish samples and/or certificates as called for or may be called for by the *Supervisor* / *Project Manager*. Materials and/or workmanship not corresponding with approved samples may be rejected. Samples for approval shall be required for paint colours, joinery with associated finishes, furniture, wall finishes, ceiling finishes, floor finishes, windows and shopfronts. These approved samples shall remain on Site for the duration of *The Works*.

4.3.7.Signage

The *Contractor* will be responsible for design, supply and installation of signage based on Transnet guidelines as outline as per Annexure - Signage kit of parts and specifications. The *Contractor* will be responsible for producing shop drawings for *The Employer*s approval.

4.3.8. Transport, dis-assembling, assembling and positioning of furniture and artworks.

All furniture and artworks will be a free issue to the *Contractor*. The furniture and artworks are currently in use at *The Employer's* office at North Tower Kingsmead Office Park, Durban or in *The Employer's* storage facility in Mobeni, Durban. The *Contractor* will be responsible for the transport of furniture and artworks to 202 Anton Lembede Street, dis-assembly, assembly, and positioning of all furniture and artworks on site. The storage location for collection of furniture and artworks will be confirmed by *The Employer* during construction.

4.3.9. Protection of *works*

The *Contractor* shall provide all necessary dust sheets, hoarding, etc. and shall exercise all necessary care to prevent marking surfaces, walls, floors, glass, electrical fittings, etc. and shall keep all parts of *The Works* perfectly clean and free at all times from spotting, accumulation of rubbish, debris of dirt arising from the operations. Any surface disfigured or otherwise damaged shall be completely renovated or replaced as necessary by the *Contractor* at his own expense to the *Supervisor's* approval. The premises shall be left clean and fit for occupation at completion of the work.

4.4 Structural Works

4.4.1. Governing Codes and Standards

ANSI/AWS D1.1:	Structural Welding Code - Steel
BS-EN 287 Part 1:	Approval testing of welders/fusion welding
BS-EN 288 Part 3:	Specification and approval of welding procedures for metallic materials
BS 5135:	Metal arc welding of carbon and carbon manganese steels
BS 4360/SANS 50025:	Weldable structural steel
BS 2573 Part 1:	Classification, stress calculations and design of structures
BS 3923:	Methods for ultrasonic examination of welds
BS 2600:	Radiographic examination of fusion welded butt joints in steel
DIN 1026	Metric channels
ISO R657	Angles
SANS 10094	The use of high strength friction grip bolts and nuts
SANS 135	ISO metric bolts, screws and nuts (hexagon and square) (coarse thread free fit series)
SANS 136	ISO metric precision hexagon-head bolts and screws, and hexagon nuts (coarse thread medium fit series)
SANS 435	Mild steel rivet

4.4.2. Structural Steelwork

The design of all structural steelwork shall be such as to provide a robust and rigid structure requiring the minimum of maintenance and providing a long service life.

In the design of steel structures, due cognisance shall be taken of environmental and wind load conditions as specified in the main specification.

Due to the highly corrosive conditions experienced in South African Ports, the permissible stresses shall not exceed those set out in British Standard No. 2573. Punching of holes over and above that permitted in BS 2573, shall not be permitted. Other structural steel shall be of not less than 6 mm thickness.

The design of mobile structures shall be such that the induced von Mises stress (effective stress in triaxial loading) will not exceed 90% of the elastic limit strength of the steel when the equipment is travelling at maximum speed and colliding with either other stationary equipment or fixed stop blocks. In calculating von Mises stresses, due cognisance must be taken of stress concentrations. If the elastic limit strength of the steel is not known, it will be determined by using a 0.5% strain offset on the stress-strain curve of the material.

Where applicable, the design may be in bolted, riveted or welded box construction except that no site welding will be permitted in the final erection at the port except with the approval of Engineer. Alternatively, a welded hollow section lattice type structure will be acceptable, subject to the following requirements:

a) The members must be structural sections made from BS 4360/SANS 50025 grade S355JR / 43C weldable structural steel - welded for sizes up to and including 110mm outside diameter (BS 1775 HFW) - seamless for sizes over 110mm outside diameter (BS 1775 HFS).

b) Tube wall thickness must not be less than 6mm.

c) All joints must be completely seal welded in accordance with BS 5135. Special care must be taken to prevent the ingress of moisture into hollow section members by ensuring that each member is airtight.

d) Bolted or screwed attachments which require drilled holes through a hollow section will not be permitted.

e) Non-hollow structural sections and plate used on the structure, in conjunction with the hollow section framework, must comply with the relevant requirements of this specification.

f) All steel sections shall be manufactured in accordance with the following standards: -

Weldable structural steel:	BS 4360/SANS 50025
I and H sections:	BS 4 Part 1
Metric channels:	DIN 1026
Structural steel, hot rolled sections:	BS 4 Part 1
Angles: I	SO - R657
Hot finished hollow sections:	BS 4848 Part 2
Cold formed sections:	BS 6363
Forgings:	BS 29
Steel castings:	BS 3100
Cast iron:	BS 1452

All steel plates and rolled steel sections used in the construction of the structures shall be of steel made by the open hearth process (acid or basic) and shall comply in every respect with BS 4360, "A" quality Structural Steel for Bridges and General Building Construction, Grade 43A or Grade 50B

or SANS 50025 grade S355JR, where sections sizes allow. That is, the percentage of phosphorous and sulphur shall not exceed 0,06.
The above is laid down as a standard, but tenders will also be considered for rolled steel not conforming strictly to the above standard. Full particulars of the guaranteed properties of the steel tendered for should in this case be furnished, i.e. chemical composition, tensile strength, yield point, reduction in area, bend tests, etc.
Forgings and drop forgings shall be free from flaws and surface defects of any kind and be accurately finished to the prescribed dimensions.
Steel castings shall be sound, clean and free from all defects and distortion of any kind and should, except where otherwise specified, conform with the conditions and tests specified in B.S. No. 3100/Latest Edition, for grades A, B and C according to requirements. They shall be thoroughly annealed and all working parts and bearing surfaces shall be machined and turned accurately with correct finish.
Cast iron used throughout must be close grained, tough and free from all defects, and shall conform to the conditions and tests specified in B.S. 1452/Latest Edition, for grades 12 to 14 according to requirements.
This applies to functional components only. A lower grade is acceptable for portal and machinery house ballast. Tenderers to state grade of cast iron proposed.
The dimensional and out-of-square tolerance as specified in the above Standards shall also apply to built-up components. Edge preparations, welding techniques, straight beds and material fit-up shall be considered when welded joints are designed.
The shape of all members and connections must allow easy accessibility for maintenance painting of all surfaces. No members shall comprise a double member which cannot be painted and maintained.
Structural details must be so designed as to eliminate or seal off any cavities or pockets where water or condensation could collect and promote corrosion. Horizontal members with upstanding flanges require special drainage.
All hollow sections shall be completely closed and airtight, and all welding is to be of such size and quality as to ensure complete airtightness. No tapping or drilling of holes into sealed sections will be permitted.

4.4.3. Welding

All the provisions of BS 5135 shall be complied with as far as applicable.
Design of weld joints shall be such that crevices, overlaps, pockets, arc strikes, and dead ends do not exist.
All joints shall be completely seal welded in accordance with BS 5135. Special care must be taken to prevent the ingress of moisture into the tubular members by ensuring that each such tubular member is airtight. "Stitch" welding will not be permitted. Only continuous welding will be accepted.
Weld cracks, undercut, or pock marks will not be accepted.
All welds on the load bearing frame structure, containers, piping, pipeline flanges, etc., shall be continuous and shall be visually inspected for cracks and other discontinuities.
Welds on the main chords must be tested ultrasonically in accordance with BS 3923 or X-rayed in accordance with BS 2600 and those on minor joints by the dye-penetrant method. The

equipment required for these tests must be supplied by the *Contractor* and the testing done at his cost.

Steel, except in minor details, which has been partially heated, shall be properly annealed (Electrically welded structural members exempted).

All brackets, clamps, lugs, straps, suspenders, etc. required for attaching mechanical and electrical equipment must be welded on prior to erection and special precautions must be taken not to damage welds or puncture tubes during erection.

The welding of all rails shall be done by an approved method.

Welding shall only be carried out by a coded welder according to SANS 10044, BS-EN 287 Part 1 and BS-EN 288 Part 3 or ANSI/AWS D1.1.

All parts to be welded shall be thoroughly cleaned and dried before welding. The welding will only be done in dry surroundings and all steps taken to prevent hydrogen embrittlement.

Where materials of different compositions are joined by welding, especially carbon steel to chrome steel, the filler welding method and post welding treatment shall be such that embrittlement and other degradation of both steel and filler is prevented.

It must be ensured that welded joints are ductile.

4.4.4. Fasteners

All bolts, nuts and rivets shall be manufactured in accordance with the following standards: -

Commercial bolts and nuts Grade 4.6:	SANS 135
Precision bolts and nuts Grade 8.8:	SANS 136
Friction Grip Bolts and nuts Grade General:	SANS 10094
Rivets:	SANS 435

a) All friction grip fasteners shall be hot dip galvanised, including high tensile bolts (and their nuts and washers), structural rivets and Huck bolts.

b) All holding down bolts and nuts and brackets, as well as all fixing bolts, studs, nuts and washers shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.

c) Bolts and set screws shall be locked in an approved manner and shall not be stressed in tightening to beyond the recommended loads.

d) The quality of friction grip bolts, nuts and washers, bolt lengths, sizes of holes, tightening standards, surface condition of clamped components, shop and site assembling, and acceptance inspection of friction grip joints shall comply with the latest edition of SANS 10094. Certificates shall be supplied for all bolts of grade 8.8 and 10.9.

e) All bolt and rivet holes must be accurate to size and location, the centres of holes shall not be placed nearer the edge of a plate than 1,5 diameters with an extra allowance of 3mm for sheared edges. All holes in the structural work shall be drilled or otherwise punched to a diameter not exceeding 1,5mm less than the diameter of the finished hole on the die side, and afterward reamed out to the exact size.

f) Where possible the adjoining parts forming a connection shall be drilled or reamed together, with holes not exceeding 1,5 mm diameter the rivet or bolt for which it is made. No rough or broken edge shall be left around any of the holes.

g) For turned and fitted bolts, the holes shall be accurately drilled or reamed; the diameter of the hole shall not exceed the finished diameter of the bolt by more than 0,25mm.

h) The holes, after assembly of the parts, shall be true throughout the thickness of all the parts and perpendicular to the axis of the member.

i) Bolts shall be of such a length as to accommodate a full nut when tightening up, and project at least two thread pitches beyond the nut. Excessive projection of threads beyond the nuts should be avoided.

j) All bolts having countersunk heads shall have strong feathers forged on the neck and head to prevent turning and the bolt holes shall be cut to receive same. All nuts and bolts (excluding countersunk bolts) shall be furnished with circular washers of sufficient thickness, the outside diameter being at least twice the nominal diameter of the bolt, and washers fitted correctly.

k) Where bolt heads or nuts are seated on bevelled surfaces of beams or channel flanges, bevelled washers must be inserted.

4.4.5. Joints and Mating Surfaces of Members

a) Mating surfaces of members to be joined by high tensile steel bolts in friction grip shall be cleaned and primed as specified for the rest of the steelwork. Mating surfaces shall lay flat against each other to eliminate gaps which may allow ingress of water. After joining, the edges shall be sealed with an approved brand of Butyl/ Rubber sealing compound by means of a suitable caulking gun or shall be seal welded.
b) Other joints shall be formed by one of the following methods:
c) The mating surfaces of members shall be blast cleaned, primed and protected prior to sub-assembly by the liberal application of caulking compound. While the compound is still wet, the members shall be bolted together and caulking compound which is squeezed out shall be completely removed.
d) The mating surfaces shall be protected with the full corrosion protection system as specified, the surfaces joined together and the joint so formed shall be sealed with butyl rubber sealer.
e) After being cleaned and primed the surface shall be joined together and the joint so formed shall be seal welded.
f) The primer coating on mating surfaces must be applied not more than 4 hours after cleaning and the edges must be sealed within 3 weeks of assembly of the part.

4.4.6. Fabricated Parts

a) All fabricated parts shall be properly fitted during assembly to result in properly aligned equipment having a neat appearance. Fabrications of load bearing members shall have no abrupt changes in cross section and regions of severe stress concentration. All sharp corners accessible by personnel during erection or operation shall be ground, rounded, or removed by other methods. Burrs, welding spatter and stubs of welding wire shall be removed.

4.4.7. Corrosion Protection (SPECIFICATION HE9/2/8 - [Version 16] - July 2002)

Refer to Annexure – EEAM-Q-008 Specification for corrosion

a) Scope

Structural steelwork in coastal area (within 10km from coast):
Structural steelwork is to be protected against corrosion as follows:

This specification covers requirements for protective coating of iron and steel structures, electrical motors, gear boxes etc. against corrosion and must be read in conjunction with the main specification as well as the following (latest editions):-
SANS 10064 "Preparation of steel surfaces for coating"
SANS 121"Hot-dip (galvanized) zinc coatings"
SANS 1091 "National colour standards for paint"
BS 5493 "Code of practice for protective coating of iron and steel
Structures against corrosion"

b) Types of Corrosion Protection to Be Used

- The coatings specified in this specification are chosen according to BS 5439, Table 3, part 9, to ensure that the condition of the surface will be at least RE2 on the European scale of degree of rust, after 10 years in an environment of frequent salt spray, chemicals and polluted coastal atmosphere. During the 10 years, the normal maintenance painting will be done.
- The paint manufacturer shall guarantee the paint for at least 10 years.
- Should a tenderer wish to offer coating systems other than those specified, as an alternative, he shall submit full technical details and a list comparing all appropriate details of the alternatives proposed, with the original specified.
- Tenderers must ensure that the different coats they offer in their tenders are compatible with each other.
- The coating of proprietary items must be done according to Clause 3.
- All galvanized components including bolts and nuts but excluding walkway gratings, must be painted with the specified system, unless otherwise approved.
- The coating systems to be used must be as per Annexure – EEAM-Q-008 Specification for Corrosion Protection.

- The paint manufacturer's recommendations for the application of the different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.
- Paint *Contractor*s must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.
- Galvanizing shall be done to SANS 121 heavy duty hot dip galvanizing to a thickness of at least 85· m. Electroplated components in zinc or cadmium are not acceptable.
- All mounting bolts, nuts, washers and brackets as well as all fixing bolts, studs nuts and washers shall be of stainless steel.
- High tensile bolts for friction grip joints must be hot dip galvanized and painted. High tensile bolts must be certificated after galvanizing.
- The full paint system shall be applied to all surfaces which are to be covered with wear pads, linings etc.
- For steelwork which will be transported over long distances and erected on site the two pack epoxy primers is preferred.

c) Surface Preparation

- All steel surfaces shall be detergent washed and fresh water rinsed to remove all oil, grease and surface contaminates before shot blasting.
- Sharp edges shall be radioed, and major roughness of welds shall be removed by grinding. Welding spatter and flux shall be removed.
- Components manufactured from hot rolled steel sections and steel plate shall be blast cleaned to base metal in accordance with SANS 10064 grade SA2½ - very thorough blast cleaning, to remove all mill scale, rust, weld spatter etc.
    - "Sharp" chilled iron shot, chilled iron grit, or granular abrasive slag is to be used to produce a proper degree of surface roughness.
    - Blast profile shall be determined by micrometre profile gauge, Keane-Tator surface profile comparator or Testex press-o-film.
    - The profile height shall be between 40 and 50· m at any point.
- Good quality blast cleaning and spray-painting equipment shall be used. Air used for spraying and blast cleaning shall be free from all traces of oil, water and salinity. Water and oil traps must be fitted to all equipment.
- Wheel abrading equipment shall not be used unless an angular profile the same as clause 4.4.3 is achieved.
- When wet blasting is done the primer shall be applied before oxidization starts or surface contamination occurs.
- Components manufactured from 3CR12 steel shall be lightly abraded. The components shall then be passivized by using a mixture of 10 - 15% nitric acid in water which is rinsed off after 10 - 15 minutes. The surface shall be neutralized to pH 7 before it is coated.
- Hot-dip galvanized components, galvanized bolts and nuts etc. shall be lightly abraded with a galvanizing pre-cleaner. The components shall then be washed with detergent and water and washed down with clean water until a water break free surface is achieved. Allow to dry thoroughly.

d) Joints and Mating Surfaces of Members

- Mating (faying) surfaces of members which have to be joined by high tensile steel bolts in friction grip shall be cleaned according to Clause 4 and painted with primer only.
    - After being assembled joints so formed shall be seal welded and painted or after the intermediate coat was applied the edges shall be sealed with an approved brand of paintable flexible sealant or mastic (e.g. Butyl rubber, polyurethane sealer or two component epoxy), by means of a suitable caulking gun.
- All rivets, bolts, welds, sharp edges etc. must be covered with a "stripe coat" of the primer or intermediate coat specified to ensure the correct dry film thickness on sharp edges, as well as sealing of bolt threads to head etc.
- All other mating surfaces must be sealed with an approved brand of flexible Butyl rubber, paintable Silicone, polyurethane sealer or two component epoxy sealer, and joined while still wet. All excess compounds must be completely removed.

4.4.8. PAINTING PROCEDURES

a) Directly before the application of paint, the area to be painted shall be degreased with a suitable degreaser and left to dry.

b) Paint shall only be applied under the following conditions: -

There is adequate light.

The steel temperature is between 5 and 50°C and at least 3°C above the dew point of the air.

The relative humidity of the air is between the limits specified by the paint supplier.

Wind does not interfere with the method used and sand and dust cannot be blown onto wet paint.

c) Steelwork shall be supported on trestles, at least 900 mm off the ground for painting purposes.

d) An adequate number of test readings shall be taken per square meter in order to determine the dry film thickness.

- The paintwork shall be acceptable if the average of the test readings taken falls within or exceeds the ranges given.
- Paintwork shall not be acceptable if any single test reading is less than the specified minimum thickness.

e) An ultrasonic or electronic magnetic flux thickness measurement gauge shall be used, but in case of dispute, destructive testing shall be applied. The painted steelwork shall present a clean, neat appearance of uniform colour and gloss as applicable to the paint used. Each coat of paint shall be applied as a continuous, even film of uniform thickness. More than one application of paint may be required to achieve the dry film thicknesses specified or to obliterate the colour of the previous coating.

f) The use of thinners or solvents at any stage of the work is prohibited, unless specified by the paint manufacturer.

g) Precautions shall be taken to prevent coatings from being applied to equipment nameplates, instrument glasses, signs etc.

4.4.9 Colour Codes

Machinery and equipment shall be painted in the following final colours: -

NB: Use colours relevant to the structural elements or equipment of the project and ignore others.

	Area	Colour	Code No. [SANS 1091 and International No's]
	Mobile equipment (cranes, loaders etc.)		
	a) Structure, machinery and electrical houses, operator's cabins, chutes, hoppers etc.	Transnet White	RAL 9016
	b) Undercarriage, travel bogies, rubber tyred rims	Transnet dark grey	RAL 7024 (Graphitgrau) SANS 1091 GO4 (Blue grey) BS 381C-633
	Industrial buildings, conveyor structures		
	a) Roofs and canopies	Pantone cool grey 10	RAL 7037 (Staubgrau)
	b) Painted walls	Pantone cool grey 3	RAL 7035 (Lightgrau) or SANS 1091 G62 (Pale grey)
	Steel columns, rafters, trusses	Pantone cool grey 5	RAL 7004 (Signalgrau)
	General		
	a) Guards	Golden yellow	SANS 1091-B49 RAL 1003
	b) Sheaves	Orange	RAL 2008

	c) Cable reels (Stainless steel	Orange	RAL 2008
	Machine buffers and parts of machine which could constitute a serious hazard	Golden Yellow (High Gloss) with Luminous green stripes in chevron pattern	SANS B49 and Luminous green

	Area	Colour	Code No. [SANS 1091 and International No's]
	e) Any exposed rotating part of machinery, electrical Switch-gear (other than starting and stopping devices and emergency stop control), electrical services e.g. conduit and allied fittings	Light Orange (High Gloss)	SANS 1091 B26 BS 381C-557
	f) Low voltage switchgear panels where orange is not aesthetically acceptable	Light grey	SANS 1091-G29 BS 381C-631
	g) Medium voltage cable trays, switchgear and motors (3,3 kV and up)	Oxford Blue	SANS FO2 BS 381C-105 RAL5003
	h) Starting devices, low voltage cable trays and switchgear	Mid Brunswick green (high gloss)	BS 381C-228 SANS1091-EO4 RAL6005
	i) Parts of stationary machinery (Electrical, motors, gearboxes, brakes, transformers, etc.])	Light Grey	SANS G29 BS 381C-631
	j) Hand levers, hand wheels, oiling points, handrails on walkways, ladders	Golden Yellow (High Gloss)	SANS 1091 B49 BS 381C-356
	k) Stopping devices, grease points , motor fan covers and danger signs (not symbolic safety signs for which see SANS 1186)	Signal red (High Gloss)	SANS 1091 A11 BS 381C-537 RAL3001
	l) Walkways (non-slip surfaces) (galvanized gratings not to be painted)	Shop floor green	
	m) Informative signs and notices (not symbolic safety signs for which see SANS 1186)	White on Emerald Green (High Gloss)	White on SANS 1091 E14 BS 381C- 228

	Area	Colour	Code No. [SANS 1091 and International No's]
	Pipelines		
	a) Reclaim water piping	Aluminium	
	b) Slurry pipelines	Dark admiralty grey	SANS 1091-G12
	c) Fire protection piping	Signal red	SANS 1091-A11
	d) Wash water drainpipes	Light grey	SANS 1091-G29
	e) Instrument air	White with Strong blue band	White and SANS 1091-F11
	f) Plant air	White with Flag blue band	White and SANS 1091-FO4
	g) Potable water	Grass green	SANS 1091-D14

4.4.10 Field Touch-up Painting

a) Damaged and unpainted areas, fasteners, welds, etc. shall be cleaned by wire brushing with allowed. Rust spots shall be cleaned to bright metal. Thick edges of old paint abutting on bare metal surfaces shall be feathered by scraping and sanding.

b) Where welding is required on areas already coated with the coating system, the coat should be stepped back for ± 30mm around the weld area.

c) The paint shall be applied to match the original coats in accordance with the manufacturer's recommendations for the specific paint system.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

d) Areas of damaged galvanizing shall be repaired with an approved cold galvanizing product or metal sprayed by the wire spraying process with Zinc, and then touched up with the specific paint system.

4.4.11 General

a) All walkways, floors, maintenance platforms etc. must be painted with a durable, non-skid coating of the appropriate colour.

b) Exposed machined surfaces must be coated with a strippable corrosion inhibitor (e.g. Tectyl).

c) Where different materials will be in contact with each other and galvanic corrosion can occur the contact areas of the materials must be isolated from each other or the joints made waterproof to prevent ingress of moisture.

d) All components must be designed with corrosion prevention in mind and specifically the following:-

- No entrapment of dirt, product, moisture etc.
- No areas must be inaccessible for maintenance such as too narrow gaps etc.
- Large flat areas rather than complicated shapes and profiles.
- No sharp corners and discontinuous welds.

e) Parts of equipment which are exposed to high temperatures must be coated as per Annexure EEAM-Q-008 Specification for corrosion protection

4.4.12 Maintenance Painting of Structures

a) Areas which are only lightly corroded must be cleaned by means of high-pressure water blasting or wire brushing by power tool as per Annexure – EEAM-Q-008 Specification for corrosion

b) Alternatively, the Noxyde paint system can be used, consisting of two to three coats of water based Noxyde paint to achieve a DFT of 350 to 400 microns. Where the Noxyde system is used on areas other than slightly corroded structural areas, the following additional requirements must be observed:

c) Very smooth surfaces (e.g. 3CR12, stainless steel or hot-dip galvanized components, bolts, nuts and fittings, and HT bolts): Parts must be thoroughly degreased using OptiDegreaser, washed down with potable water, and immediately when dry, a single coat of OptiPrimeAqua applied.

d) Paintable flexible sealant/mastic: Only sealant approved by the paint manufacturer may be used, and an initial coat of OptiPrimeAqua applied over it before the further coats of Noxyde are applied.

e) Bolted/riveted connections: After blasting or and/or cleaning as required, apply a coat of OptiPrimeAqua and an additional stripe coat of Noxyde, in contrasting colour, to all bolt/nut and plate edges and crevices.

f) The adhesion of old coatings must be verified by doing a crosscut adhesion test on selected areas.

g) The compatibility of the new paint system on the old coating must be tested and guaranteed in writing by the paint supplier.

h) The work and coating system must be guaranteed for a minimum of 12 months.

i) All heavily corroded areas must be shot blasted to minimum SA2 and the three-coat system indicated in clause 2.6 applied.

j) Areas where the old coating is still sound need only be high pressure cleaned with a suitable solvent and coated with one of the primers suggested in clause 10.2 (as tie coat) and then with one of the top coats suggested in clause 2.6 to get the appropriate colour and finish. The minimum dry film thickness of this tie coat must be 75 microns and topcoat must be 50 microns, but the previous coating colour shall be completely obliterated to present a uniform colour.

- Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

4.5 Electrical Engineering Works

4.5.1 Executive overview

The purpose of this document is to detail the electrical *works* to be undertaken by the *Contractor* in relation to the refurbishment or additions and alterations of the existing ground; second; third and fifth floors, at 202 Anton Lembede Street, Durban. Within this document, *The Works* detailed to be undertaken by the *Contractor* include but not limited to:

a) Dismantling and stripping of existing electrical infrastructure including lighting and associated electrical installation accessories.

b) Relocation of existing power poles comprising of power socket outlets and LAN points.

c) Supply and installation of cabling/wiring, a distribution board, wire ways and associated accessories which include PVC conduiting and metal trunking installations.

d) Supply and installation of new distribution board.

e) Modifications to existing distribution boards

f) Supply and installation of new interior lighting including light switches and occupancy sensors.

g) Supply and installation of new surface mounted three compartment power skirting.

h) Supply and installation of ICT & Security ducting / conduiting.

i) Provision of power supply points for ICT & security services.

j) Supply and installation of general and dedicated socket outlets into new and in the existing power skirting.

k) Testing and commissioning of the entire installation and hand over to *The Employer*.

Where required, the *Contractor* may have to undertake designs and submit them to *The Employer's* responsible personnel for approval. The high-level designs by *The Employer*, which illustrates the overall design methodology, is detailed and shown on the drawings and specifications accompanying this document. The *Contractor* shall read this document in conjunction with all the drawings and the specifications mentioned herein this document.

4.5.2 Standard of Work, Equipment and Materials

The electrical installation shall conform to the requirements of the latest edition and amendments of SANS 10142-1 Code of Practice for the Wiring of Premises and any additional requirements thereto, described in this specification.

All equipment and material used shall be of high quality, SABS approved, and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by experienced and competent officers.

All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply, it shall be submitted to the *Project Manager* for approval.

All installations and testing must be approved by the Transnet Engineer prior to commissioning.

4.5.3 Service Conditions

The equipment shall be designed and rated for continuous operation under the following conditions: -

4.5.3.1 Ambient/Environment Conditions:

All equipment offered shall be rated for continuous operation under the following conditions:

- Altitude : 0 to 1800m Above Sea Level.
- Ambient temperature : -5°C to +40°C (daily average +35°C).
- Relative humidity : As high as 96%.
- Lightning conditions : Severe, with a maximum lightning ground flash density of 11 flashes per km² per annum.
- Atmosphere : Salt laden and corrosive industrial chemical and dust laden nature. Frequent heavy rains driven by wind reaching speeds of 100 Km/h and above.

4.5.3.2 Electrical Conditions:

- The Low voltage supply will be three phase, 4 wire, 50 Hz alternating current with earthed neutral at a nominal voltage of 400 / 231V.
- The voltage may vary within the range of 95% to 105% of the nominal and all equipment installed shall be suitably rated.

4.5.3.3 Lightning conditions

All lightning protection equipment offered shall be rated to withstand the following conditions:

- Current : The peak lightning current and its rate of rise shall be regarded as severe when i_{max} = 200kA.
- Voltage : The highest cloud potential shall be assumed to be more that 100MV, where; Q = CV, where Q is assumed at 100C and C to be 10^{-7} F.

4.5.4 Governing Codes, Standards and Specifications

4.5.4.1 SANS Standards

All *Design's* undertaken, *Plant's* and *Materials* supplied, *Equipment* to be used by the *Contractor*, in agreement with *The Employer*, with the intention to execute *The Works* detailed in this document, shall comply as a minimum, to the requirements of the SANS/IEC standards listed in the table below. Where reference is made to a standard, the reference shall be taken to mean the latest edition of the standard, supplements, and revisions thereto.

Standard No.	**Description**
SANS 767 - 1	Fixed earth leakage protection circuit-breakers
SANS 950	Unplasticized chloride rigid conduit and fittings for use in electrical installations
SANS 1063	Earth rods, couplers and connections
SANS 1085	Wall outlet boxes for the enclosure of electrical accessories
SANS 1091	National colour standards for paint
SANS 1213	Mechanical cable glands
SANS 1433 - 1	Electrical terminals and connectors Part 1 terminal blocks having screw and screw less terminals
SANS 1433 - 2	Electrical terminals and connectors Part 2: Flat push-on connector
SANS 1507 (part 1 – 4)	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300V) Part 1 - 4

SANS 60669 - 2 - 1	Switches for household and similar fixed electrical installations Part 2-1: Particular requirements - Electronic switches
SANS 60669 - 2 - 4	Switches for household and similar fixed electrical installations Part 2-4: Particular requirements - Isolating switches
IEC 60998 - 2 -1	Connecting devices for low-voltage circuits for household and similar purposes Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units

4.5.4.2 Codes of Practice

All *Design's*, *Construction* works, *installation* works to be undertaken by the *Contractor*, in agreement with *The Employer*, with the intention to execute *The Works* detailed in this document, and shall adhere to as a minimum, the requirements of the *Codes of Practice* listed in the table below. Where reference is made to a *Code of Practice*, the reference shall be taken to mean the latest edition of the *Code of Practice*, including latest amendments, supplements and revisions thereto.

Standard No.	**Description**
OHS Act 1993	Occupational Health and Safety Act (Electrical Installation regulations)
SANS 10142-1	Code of Practice for the Wiring of Premises Part 1 Low Voltage Installations.
SANS 10114-1	Interior Lighting Part 1 The artificial lighting of Interiors
SANS 10114-2	Interior Lighting Part 2: Emergency Lighting
SANS 10313	Code of Practice for protection of buildings against lightning

4.5.4.3 Transnet Specifications

All *Design's* undertaken, *Plant's* and *Materials* supplied by the *Contractor* in agreement with *The Employer*, with the intention to execute *The Works* detailed in this document, shall comply in general with all associated Transnet Specifications listed below. It is understood that Transnet Specification requirements are more stringent than the SANS requirements, the *Contractor* is required to fully comply with the Transnet Specifications. In the case where SANS is stringent than Transnet Standard, the *Contractor* shall comply with SANS.

Specification No.	**Description**
TPD-001-EL&PSPEC	Technical specification for electrical installations to building other than dwelling houses
TPD-002-DBSPEC	Technical specification for low voltage distribution boards
TPD-003-CABLESPEC	Technical specification for the installation of medium and low voltage cables.

TPD-004-EARTHINGSPEC	Technical specification for the earthing and protection of building and structures against lightning.

4.5.5 WORKS INFORMATION

4.5.5.1 Ground Floor

This works information shall be read in conjunction with the drawings listed in section 6.4.6, SANS standards, codes of practice, bill of quantities and Transnet specifications listed herein this document.

All works to be carried out shall be performed with full adherence to safe practice of electrical installations as stipulated in SANS 10142-1 and OHS Act 85 of 1993 (Electrical Installation Regulations).

4.5.5.1.1 DISTRIBUTION BOARDS

a) The *Contractor* shall supply and install a new 320A, 4Pole, 25kA Moulded Case Circuit breaker into the existing Ground floor distribution board. The new circuit breaker shall be installed/housed in a metal box sized to accommodate the new circuit breaker and be securely mounted inside the existing Ground Floor Distribution board-B.

b) The *Contractor* shall supply and install a new three phase surface mounted distribution board as per drawing: 001-E-LA-0008-01-0A. The distribution board shall be fabricated in accordance with TPD-002DBSPEC Technical specification for low voltage distribution boards.

4.5.5.1.2 CABLE AND CABLE/WIRE WAY SYSTEMS

a) The *Contractor* shall supply and install a new surface mounted cableway in a form of a hot deed galvanised steel cable ladder. This works shall be inclusive of the splices; 40x40mm supporting channels; bolts, nuts and washers, Straight, Horizontal bends, internal/external bends, Tees and 4Way pieces. This cable ladder shall be run from the existing Ground Floor Distribution board to the proposed ground floor canteen area proposed Distribution board via the passageway and the ceiling void as shown on drawing: 001-E-LA-0008-01-0A. The installation shall be in accordance with TPD-001-EL&PSPEC Technical specification for electrical installations to building other than dwelling houses.

b) The *Contractor* shall supply and install a new surface mounted in ceiling void cableway and in the floor in a form of pre-galvanised OL2000 metal trunking with pre-galvanized covers, inclusive of elbows, tees, channel hangers, endcaps, 4way pieces and other mounting accessories as shown on drawing: 001-E-LA-0008-01-0A. The installation shall be in accordance with TPD-001-EL&PSPEC Technical specification for electrical installations to building other than dwelling houses.

c) The electrical *Contractor's* scope of work shall include provision of wireways (conduiting/PVC ducting) for other services such as ICT and Security systems. The security/access control ducting

shall be installed from the existing control box located at the Ground Floor passageway to the proposed access control points as shown on 001-E-LA-0002-01-0A. The electrical *Contractor* shall also provide wireways / conduiting for ICT services.

d) Supply and installation of a new 120mm² PVC insulated PVC bedded SWA PVC sheathed 600/1000V 4Core coper cable. The cable shall be terminated at both the existing ground floor distribution board, securely ran on the cable ladder and at the ground floor boardrooms and canteen area proposed Distribution board as shown on drawing: 001-E-LA-0002-01-0A. The installation shall be carried out in accordance with the TPD-003-CABLESPEC Technical specification for the installation of medium and low voltage cables.

4.5.5.1.3 LIGHTING INSTALLATION

a) The *Contractor* shall supply and install luminaries as shown on 001-E-LA-0002-01-0A. *Contractor* shall design, supply, and install SABS approved PVC conduiting system for linking lighting to the main OL2000 wireways. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system. The luminaires shall be the plug-in type and be provided with +/- 2-meter 220V rod, 220V plug tops and 5A unswitched socket outlets mounted onto the OL2000 in the ceiling void.

b) The *Contractor* shall supply, and install SABS approved PVC insulated house wire for all lighting circuits as shown on 001-E-LA-0002-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC.

c) The light switch boxes and the conduit droppers if required shall be recessed into the wall, unless otherwise stated. All conduit terminations to light switch boxes shall be done using a PVC male adaptor and a suitable PVC washer.

d) All luminaires shall be installed according to SANS 10142-1 and specification No. TPD-001-EL&PSPEC Specification for electrical installations to buildings other than dwelling houses.

e) The *Contractor* shall supply and install occupancy sensors as detailed in drawing: 001-E-LA-0002-01-0A. The time delay DIP switch setting on the occupancy sensors shall be set at thirty (30) minutes.

f) All electrical works pertaining to the electrical lighting should be done in accordance with the referenced drawing, if clarity is needed in any regard the electrical engineer should be contacted prior to any commencement of work.

4.5.5.1.4 POWER INSTALLATION

a) The *Contractor* shall supply and install switched socket outlets, isolators and floor boxes as shown on 001-E-LA-0002-01-0A.

b) The conduit droppers and the socket outlet boxes if required shall be cast into concrete and built

into brick walls. All conduit terminations to socket outlet boxes shall be done using a PVC male adaptor and a suitable PVC washer. All PVC conduits, couplers, male adaptors, boxes, and PVC adhesives shall be SABS approved.

c) All socket outlets shall be installed according to SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

d) The *Contractor* shall ensure that the socket outlets are mounted on the electrical services part of the power skirting and shall comply with the requirements mentioned above.

e) The *Contractor* shall supply and install flush mount, double pole, single phase switched disconnector (isolators) as shown on drawing: 001-E-LA-0002-01-0A. The isolators shall be installed at various heights as shown on drawing number 001-E-LA-0002-01-0A

f) The *Contractor* shall design, supply, deliver and install SABS approved, 20mm outer diameter and 32mm outer diameter, PVC conduits flush mounted in the wall/ground. The PVC conduit shall be used as a wireway, linking all isolators and socket outlets to the proposed new distribution board. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure safe neat linkages for the conduit system.

g) The *Contractor* shall supply and install SABS approved PVC insulated house wire for all isolator and socket outlets circuits as shown on drawing: 001-E-LA-0002-01-0A. The PVC insulated wire and the installation shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduits or the specified wireways accordingly.

4.5.5.2 Second Floor

4.5.5.2.1 DISTRIBUTION BOARD

The *Contractor* shall supply and install new additional power circuits in the existing distribution boards (DB - B, C & D) as indicated on drawing: 001-E-LA-0008-01-0A. This shall include provision and installation of new miniature circuit breakers matching the existing specification.
The Works shall be carried out in accordance with SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

4.5.5.2.2 LIGHTING INSTALLATION

Existing lighting to remain and replacement of the lamps or damaged light fittings shall only be done by the *Contractor* where required by instruction. This shall be agreed between the *Contractor* and the *Project Manager*.

4.5.5.2.3 POWER INSTALLATION

The *Contractor* shall supply and install switched socket outlets, isolators and floor boxes as shown on drawing: 001-E-LA-0003-01-0A. All socket outlets shall be installed according to SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

a) The *Contractor* shall ensure that the socket outlets are mounted on the electrical services compartment of the power skirting and shall comply with the requirements mentioned above.

b) The *Contractor* shall supply and install SABS approved PVC insulated house wire for all isolators and socket outlets circuits as shown on drawing: 001-E-LA-0003-01-0A. The PVC insulated wire and the installation shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduits or the specified wireways accordingly.

4.5.5.2.4 CABLE/WIRE WAYS SYSTEM

The *Contractor* shall supply and install new PVC three compartment power-skirting similar to the existing specification. The power-skirting shall be securely installed onto the existing brick walls and artificial diving walls. The new supply circuits from the distribution boards to the new power-skirting shall be ran into the existing wireways in ceiling voids.

4.5.5.3 Third Floor

This works information shall be read in conjunction with the drawings listed in section 6.4.6, SANS standards, codes of practice, and Transnet specifications listed herein this document.

All works to be carried out shall be performed with full adherence to safe practice of electrical installations as stipulated in SANS 10142-1 and OHS Act 85 of 1993 (Electrical Installation Regulations).

4.5.5.3.1 DISTRIBUTION BOARDS

The *Contractor* shall supply and install new additional circuits in the existing distribution board (DB-D) as indicated on drawing: 001-E-LA-0004-01-0A. *The Works* shall be carried out in accordance with SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

4.5.5.3.2 POWER INSTALLATION

a) The *Contractor* shall supply and install switched socket outlets, isolators and floor boxes as shown on drawing: 001-E-LA-0004-01-0A. in accordance with SANS 10142-1 and specification No. TPD:

001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

b) *The Works* include installation of new miniature din rail circuit breakers into the existing distribution board. The *Contractor* and the engineer onsite shall agree on the exact phase/s to install new circuits without or with minimal interruptions to the existing operations.

c) The *Contractor* shall supply and install SABS approved PVC insulated house wire for all isolator and socket outlets circuits as shown on drawing: 001-E-LA-0004-01-0A. The PVC insulated wire and the installation shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduits or the specified wireways accordingly.

4.5.5.3.3 LIGHTING INSTALLATION

Existing lighting to remain and replacement of the lamps or damaged light fittings where applicable shall be done by the *Contractor* when instructed onsite. This shall be agreed between the *Contractor* and the *Project Manager*.

4.5.5.4 Fourth Floor

4.5.5.4.1 DISTRIBUTION BOARD

a) The *Contractor* shall supply and install new additional power circuits in the existing distribution boards (DB – D) as indicated on drawing: 001-E-LA-0005-01-0A. This shall include finding space (spare space), supply and installation of new miniature circuit breaker matching the existing specification.

4.5.5.4.2 LIGHTING INSTALLATION

a) The *Contractor* shall supply and install new 600x600mm LED office lighting as indicated on drawing: 001-E-LA-0005-01-0A**.** The lighting works may include modifications/relocation of the existing lighting and associated accessories.

4.5.5.4.3 POWER INSTALLATION

a) The *Contractor* shall supply and install switched socket outlets, isolators and floor boxes as shown on drawing: 001-E-LA-0005-01-0A in accordance with SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

b) *The Works* include installation of new miniature din rail circuit breakers into the existing distribution board. The *Contractor* and the engineer onsite shall agree on the exact phase/s to

install new circuits without or with minimal interruptions to the existing operations.

c) The *Contractor* shall supply and install SABS approved PVC insulated house wire for all isolator and socket outlets circuits as shown on drawing: 001-E-LA-0005-01-0A. The PVC insulated wire and the installation shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduits or the specified wireways accordingly.

4.5.5.4.4 CABLE/WIRE WAYS SYSTEM

The *Contractor* shall supply and install new PVC three compartment power-skirting similar to the existing specification. The power-skirting shall be securely installed onto the existing brick walls and artificial diving walls. The new supply circuits from the distribution boards to the new power-skirting shall be ran into the existing wireways in ceiling voids.

4.5.5.5 Fifth Floor

4.5.5.5.1 DISTRIBUTION BOARD

b) The *Contractor* shall supply and install new additional power circuits in the existing distribution boards (DB – D/DB1 and C) as indicated on drawing: 001-E-LA-0008-01-0A. This shall include finding space (spare space), supply and installation of new miniature circuit breaker matching the existing specification.

4.5.5.5.2 LIGHTING INSTALLATION

b) *The Works* include but not limited, safe striping of the existing lighting at the "Think Tank "and return to the *Project Manager*. This shall be carried out without damaging the existing wiring and lighting circuits. The *Contractor* shall then supply and install new 600x600mm LED office lighting as indicated on drawing: 001-E-LA-0006-01-0A.

c) Supply and installation of three new 36W,1200mm x 3tube light fittings at the Energy/Fleet/Facilities office workstations (similar to the existing specification).

4.5.5.5.3 POWER INSTALLATION

a) Power installation works shall include supply and installation of new wiring and circuiting from the existing distribution boards via ceiling void to the proposed power points as shown on drawing: 001-E-LA-0006-01-0A. Safe removal and reinstating of the existing power poles. The two off existing power poles each of them comprising of 6 x SSO's, 6xDedicated SSO and 6x LAN points shall be re-routed from the power-skirting along the wall.

4.5.5.6 Ninth Floor

4.5.5.6.1 DISTRIBUTION BOARD

c) The *Contractor* shall supply and install new additional power circuits in the existing distribution boards (DB – D) as indicated on drawing: 001-E-LA-0008-01-0A. This shall include finding space (spare space), supply and installation of new miniature circuit breaker matching the existing specification.

4.5.5.6.2 LIGHTING INSTALLATION

d) The *Contractor* shall supply and install new 600x600mm LED office lighting as indicated on drawing: 001-E-LA-0007-01-0A. The lighting works may include modifications/relocation of the existing lighting and associated accessories.

4.5.5.6.3 POWER INSTALLATION

d) The *Contractor* shall supply and install switched socket outlets, isolators and floor boxes as shown on drawing: 001-E-LA-0007-01-0A in accordance with SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

e) *The Works* include installation of new miniature din rail circuit breakers into the existing distribution board. The *Contractor* and the engineer onsite shall agree on the exact phase/s to install new circuits without or with minimal interruptions to the existing operations.

f) The *Contractor* shall supply and install SABS approved PVC insulated house wire for all isolator and socket outlets circuits as shown on drawing: 001-E-LA-0007-01-0A. The PVC insulated wire and the installation shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduits or the specified wireways accordingly.

4.5.6 CABLE/WIRE WAYS SYSTEM

The *Contractor* shall supply and install new PVC three compartment power-skirting similar to the existing specification. The power-skirting shall be securely installed onto the existing brick walls and artificial diving walls. The new supply circuits from the distribution boards to the new power-skirting shall be ran into the existing wireways in ceiling voids.

4.5.7 Testing and Commissioning

a) Where necessary, the *Contractor* shall conduct a Factory Acceptance Test (FAT) for all equipment to be installed as part of *The Works* to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the *design* Engineer. The legal transfer of ownership from the plant's supplier to the *Contractor* shall be held by the *Contractor* until the Plant is fully

installed, tested commissioned at the designated site.

b) The *Contractor* shall conduct a Site Acceptance Test (SAT) for all Plant's supplied where required (this shall be agreed between onsite between the *Contractor* and the design engineer). The SAT shall be conducted in the presence of *The Employer's* Engineer. The legal transfer of ownership from the Plant's supplier to the *Contractor* shall be held by the *Contractor* until the Plant is fully installed, tested commissioned on *The Employer's* designated site.

c) The *Contractor* shall test the entire installation, LV installation and the lighting installation in the presence of Transnet's Engineer as per SANS 10142-1 and hand over all relevant test certificates to *The Employers Project Manager* for acceptance. The *Contractor* shall hand over the certificate of compliance as per the OHS Act of 85 and SANS 10142-1 for the installation.

4.6 Mechanical

4.6.1. Scope of Work

The purpose of this document is to detail the mechanical *works* to be undertaken by the *Contractor* in relation to the refurbishment or additions and alterations of the existing ground; second; third, fourth fifth and ninth floors, at 202 Anton Lembede Street, Durban. The Mechanical scope to be carried out by the *Contractor* shall include but not be limited to the following:

a. The Design, Manufacture, Supply, Delivery, Removal, Re-use, Erection, Wiring, Commissioning, Testing, Handing over in complete working order ready for immediate use an subsequent maintenance for a period of twelve (12) months of all plant equipment necessary for the installations described herein and as indicated on the accompanying drawings, of which:

b. The words "handing over in complete working order" in the clause above shall mean not only the major items of plant and equipment covered by the Specification but also the incidental sundry component's necessary for the complete execution of the work and for the proper operation of the installation.

c. The words "subsequent maintenance for a period of twelve months" in the clause above, shall mean that such period shall commence from the date the installations are accepted and after "practical completion" has been confirmed in writing by the Engineer.

d. The words "described herein" in the clause above shall mean all sections or part of this Specification and drawings".

Where required, the *Contractor* have to undertake detail designs and submit them to *The Employer's* responsible personnel for approval. The high-level designs by *The Employer*, which illustrates the overall design methodology, is detailed and shown on the drawings and specifications accompanying this document. The *Contractor* shall read this document in conjunction with all the drawings and the specifications mentioned herein this document.

4.6.2. Principal Items of Work

4.6.2.1. Ground Floor

4.6.2.1.1. New Boardroom / Canteen Area / Waiting Area

- Removal of all existing ductwork, air terminals, diffusers, HVAC sensors, HVAC control panels in the ceiling void of the existing "Top Cars" space in the building which will be repurposed to host a canteen area, waiting area and a number of boardrooms. The removal of the existing ceiling panels, in order to be able to access the existing ceiling void in the space provided as described above, shall be the responsibility of the main construction *Contractor*.

4.6.2.1.2. New Plant / Equipment

- Thirteen (13) Split Type Fan Coil Cassette air-conditioner units including all associated insulated drain piping, insulated refrigerant piping, remote air-cooled condensers and wiring between the outdoor and indoor units with hard wired remote controllers suitable for boardrooms and cafeteria area.
- One (1) externally mounted, Split Type Condenser air conditioning unit installed outside on a suitable plinth onto which all the thirteen (13) Split-type fan coil units mentioned above will be connected.
- One (1) standalone packaged refrigerant-based air conditioner which will precool and deliver the required amount of outdoor air (fresh air) to all the relevant airconditioned spaces which constitutes the cafeteria area, wating area and all boardroom areas on the ground floor. The packaged unit air conditioner unit shall be based on R407c refrigerant. This packaged unit shall be mounted with the relevant fixing attachments and anti-vibration mountings on a plinth which shall be constructed to the specification required by the packaged AC unit manufacturer in the outdoor eastern courtyard of the relevant building as indicated on the relevant drawing. Exact plinth dimensions to be provided by the Air Conditioning contractor to the main building *Contractor* as the main building *Contractor* shall be responsible for the construction of the plinth.

- All outdoor air (fresh air) ductwork including bends and elbows, transition duct pieces and supply feeds, feeding outdoor air from the outdoor air packaged unit through the ceiling void space to the various areas required. All outdoor-air ductwork installed on outside and inside of the building to be adequately covered with external duct insulation and ducts insulation of ducts on the outside of the building to be cladded on outside with associated smooth hot dipped galvanized cladding.
- All outdoor air ductwork support structures/stands, hanger supports which supports the ductwork which runs vertically upwards and horizontally across the outdoor concrete roof structure and horizontally in the ceiling void all the way from the packaged air conditioner unit throughout the ceiling void on the inside of the building. All details and specifics of the ductwork supports, ductwork support structures as well as the relevant fastener and attachment positions shall be detailed in the shop drawings which shall be produced by the relevant HVAC contractor.
- All duct support hangers and support members to suspend ductwork in exact positions in the horizontal plane. All galvanized threaded bar hanger connections for supporting duct work and fan coil units.
- All airflow control dampers indicated as well as all circular balancing dampers provided on HVAC branch ducts as indicated by the relevant drawings.
- Interconnected refrigerant copper piping from Split Type Condenser to all indoor Split Type Fan Coil units including all valves, fittings, y-branches, headers, etc as specified in the relevant HVAC drawings. All refrigerant and condensate drainpipe hangers and supports as well as all core drilling through walls for the routing of refrigerant pipework, condensate pipework, wiring conduits. Sealing of all openings created through building envelope with high expansion density foam.
- Insulated drain piping from all air conditioning fan coil units and air handling units, cooling coil drip trays, etc and connecting thereof to the nearest storm water drain or nearest storm water down pipes.
- All refrigerant piping and drain piping to be suitably insulated with the required insulation material as specified on the drawings.

4.6.2.1.3. Male, Female and Paraplegic Ablution Facility

- Removal of all the existing ductwork, ductwork dampers and any associated fixing brackets and fasteners / attachment present in the existing ceiling void of all the above-mentioned ablutions areas if any.

- Installation of Ablution facility air extraction system which includes an extraction fan with relevant fan base support brackets, fan sound attenuators, uninsulated round sheet metal ventilation extraction duct systems with relevant supports including flexible duct connections, air balancing dampers, extraction disc valves.

- Air filtration equipment comprising washable filters, bag type filters and ducted particulate filters. Air diffusion equipment including ceiling diffusers with and without heaters, door grilles, return air grilles, wire mesh screens and louvers and all other associated fixing and mounting components.

- All galvanized threaded bar hanger connections for supporting duct work and fan coil units etc. All vibration isolators, supports, hangers, brackets and associated accessories in order to complete installations as specified

- Miscellaneous air extract system including fans, sound attenuators, etc.

- Temperature control system including safety controls, etc.

- Electrical work including wiring between switchboards, motors, electric heaters and unit mounted thermostats/sensors, control devices, etc., and wiring between controllers and remote sensors, remote set point adjusters and wiring between room thermostat and air diffusers.

- All potable water plumbing works for the 3 mentioned ablution facilities as per the relevant drawing in accordance with the technical specification in accordance with SANS 10152.

- Painting of plant and equipment

- As-built CAD drawings (hard copy as well as in electronic DWG native AutoCAD format and PDF format), framed wiring and control diagrams, framed layout drawings, operating and maintenance manuals properly indexed to differentiate between plant components and systems.

- Commissioning and testing of the installations herein specified

- Maintenance and guarantee for twelve (12) months after “practical completion” date of the completed installation, or sections thereof. This is the date confirmed in writing by the *Engineer*.

- Training of *The Employer’s* maintenance staff in the operation and maintenance of equipment installations during the contractual twelve (12) month maintenance and guarantee period.

4.6.2.1.4. Office/bookstore space

- Mechanical work which needs to be carried out on the ninth floor, shall include but will not be limited to the following work items but may include actions/items which need to be carried out in order to execute the mechanical work which might not have been described in this section of *The Works*:
- The work to be performed below has bearing on the designated part of the ninth floor as indicated on the relevant HVAC drawing. The work which needs to be carried out, includes the existing bar area facility, the adjacent kitchen, and the existing office spaces as indicated. The spaces which forms part of the scope of work has now been repurposed as a thinktank creative facility, the existing kitchen and a waiting area on the outside of the think tank room as well as a new boardroom.

- The scope of work on the ninth floor includes the removal of all existing split type air conditioning units and their existing components (in the areas identified on the drawing) which includes all ceiling cassette split type and mid-wall split type units, under-ceiling split type units, all associated hanger supports, all and any ductwork components in the ceiling voids of the each of the abovementioned ceiling voids. All existing air conditioning refrigerant pipework together with their insulation, AC condensate pipework together with insulation shall also be removed as well as all the outdoor air conditioning condenser units which are connected to the indoor evaporator ac units. The outdoor air conditioning units which are to be removed are situated on the cantilever roof structure on the outside of the building on the ninth floor. All associated insulation, fresh air ductwork as well as all the

4.6.2.2. Second Floor

4.6.2.2.1. HVAC Equipment Removal / Disposing work

- The work to be performed below for the second floor includes the entire second floor which consists of a passageway on the northern side of the building with offices and a passageway on the southern side of the building with offices on both sides (north and south of corridor). These passageways are both connected by a passageway on the eastern side and passageway on the western side of the building where air handling plant rooms and ablutions facilities are located.

4.6.2.2.2. **Second Floor Eastern Plantroom Installation and Ductwork for Eastern Passageway and Northern Passageway**.

- Mechanical work which needs to be carried out on the second floor shall include but will not be limited to the following work items but may include actions/items which need to be carried out in order to execute the all the mechanical HVAC work which might not have been described in this section of *The Works*:

- The work which needs to be carried out will involve all of the existing duct work and air handling units in the air handling unit (AHU) plant rooms on the eastern side, western side and the central plantrooms in the lift lobby as well as all the ductwork which runs in the ceiling voids of the northern, southern, eastern and western passage ways with all of its associated ductwork hanger supports as well as all the branch ductwork, balancing dampers, flexible ductwork, diffusers in all the office spaces associated with the ductwork together with all its ductwork support hangers.

- The scope further includes the disconnecting of all the existing chilled water pipework which is connected to the main chilled water risers and each of the 3 (three) existing AHU's in each of the 3 plant rooms.

- Disposal of all the existing dismantled air handling unit components', valves, relevant pipework components, chilled water pipework insulation material, main ductwork runs, branch ducts, duct hangers, balancing dampers and main duct dampers, terminal ductwork, ductwork insulation, flexible ductwork leading to air diffusers and air diffusers and all associated support hanger components and materials which will be removed together with all the associated components.

- All existing openings in brickwork in the ceiling void through which the branch ductwork is fed to the ceiling void of the office space which is found to not be needed for the new installation, shall be closed up with similar brickwork. This brickwork described above and the disposal of removed brickwork shall be the responsibility of the main construction *Contractor*. The HVAC contractor shall be responsible for the marking up of the locations on the wall where the brickwork work needs to be carried out.

- The removal of all the existing suspended ceiling panels as well as the suspended ceiling frameworks on the mentioned spaces which needs to be removed in order for the new ductwork to be installed, shall be the responsibility of the main construction *Contractor*.

4.6.2.2.3. HVAC Equipment Installation Work

- All design drawings from the mechanical design engineer shall be used by the HVAC contractor as a basis to create shop drawings from of the final components, structures, detailed ductwork to be manufactured and exact positioning of equipment and plant which needs to be installed which shall be subject to the mechanical engineer's approval before ordering of equipment and installation work may commence.

- All new HVAC equipment, plant, components and materials shall be provided by the HVAC contractor.
- Assembling of the components of each of the three (3) new air handling units as well as the positioning and fixing of each of these air handling units in their respective plant rooms in the spaces provided. Connection of each of the three (3) new air handling units' chilled water pipework to the existing chilled water main pipework risers in each of the plant rooms in the eastern plant room including all new associated valves and associated piping components, etc.
- Insulation of new chilled water pipework installed between the main chilled water risers and the newly installed air handling units. Installation of chilled water pipe supports, support brackets to position pipework in the positions required. It shall be the responsibility of the HVAC contractor to confirm the exact location of the chilled water pipework main risers in each of the AHU plant rooms. Detail design, manufacturing and installation of new ductwork riser from each of the air handling units, rising into the ceiling void running from the eastern plant room in the eastern passageway into the ceiling void of the northern passageway ceiling void. Installation of flexible ducting connection between the ductwork connection and air handling unit supply opening. This scope includes all the installation of all threaded ductwork support hangers.

- Replacement of each of the wall mounted washable pleated panel filters through which outdoor air is being introduced into the air handling unit plant rooms with similar new washable pleated panel filters.

- Installation of all branch ductwork running from main ductwork into the office space through the divider walls between the passageway ceiling void and the office space ceiling void. Insulation of all branch ductwork in the office space ceiling void, installation of all flexible ductwork to all HVAC ceiling diffuser units in the office space ceiling layouts provided as per the drawings. Installation of all branch ductwork balancing dampers as indicated on drawings. Installation of all ductwork support structures, and duct hangers supported as specified on drawing.

- Installation of new main HVAC duct dampers in each of the HVAC plantrooms as well as all the dampers of all the relevant branch ducts and terminal branches.

- Exact, final ceiling tile positioning of all HVAC diffuser to be determined by HVAC contractor in conjunction with the electrical *Contractor*'s light fitting locations in ceiling tile layout.
- Installation of all additional HVAC wall louvers situated in the divider wall between the office space and the passageway if required.

- Installation of relevant HVAC pressure and temperature sensors in order to enable the HVAC system to function properly and efficiently.
- The manufacturing / Construction and Installation of all ductwork to be carried out in accordance with SANS 1238.

- Installation of all door grilles and undercutting of doors for HVAC ventilation where specified on drawings.

- Installation of extractor fans and all associated ductwork, flexible ductwork, ductwork support hanger's ductwork support bracket members and associated wall louvers as indicated on the HVAC drawings.

- All builders work required for the creating of openings through the ceiling void divider wall (in ceiling void) through which the branch ducts will run to the office ceiling void space, shall be the responsibility of the main building *Contractor*. The final positioning of these openings shall be determined and marked up by the mechanical *Contractor*. All other builders work openings in any walls and facades of the building shall also be the responsibility of the main construction *Contractor*.

- All installation of temperature sensors in the ductwork at the relevant locations.

- Installation of all extractor fans as indicated on the HVAC drawings

4.6.2.3. Third Floor, Fourth Floor and Fifth Floor – Scope of Work

4.6.2.3.1. HVAC Equipment Removal / Disposing work

- The work to be performed below has bearing on each of the third floor, fourth and fifth floors. The work which needs to be carried out on each of the respective floors entails the same location/area on each floor work on the same areas on each of the three floors as described below. The areas on each of these floors includes the eastern air handling unit plant room, and all the associated ductwork connected to it in the eastern passageway and the northern passageway as well as limited work which needs to be carried out in the each of the 2 male, 2 female and 2 paraplegic ablution facilities.

- These passageways are both connected by a passageway on the eastern side and passageway on the western side of the building.

- Mechanical work which needs to be carried out on the third, fourth and fifth floor, shall include but will not be limited to the following work items but may include actions/items which need to be carried out in order to execute the mechanical work which might not have been described in this section of *The Works*:

- The work which needs to be carried out on each of the third, fourth and fifth floors will include the dismantling and removal of each of the existing air handling units (AHU) situated in the individual eastern AHU plant rooms, the removal of all the associated main ductwork from the eastern passageway and the northern passageway and the removal of all the associated branch ductwork on each of the of the existing duct work including balancing dampers, flexible ductwork and diffusers with all associated ductwork hanger supports.

- The scope further includes the disconnection and reconnection of all the existing chilled water pipework connections between the main chilled water risers and each of the existing AHU's in each of the individual eastern plant rooms. Insulation of all the newly installed chilled water piping connections and pipework shall also be carried out.

- Disposal of all the existing dismantled air handling units' components, valves, relevant pipework components, chilled water pipework insulation material, main ductwork runs, branch ducts, balancing dampers and main duct dampers, terminal ductwork, ductwork insulation, flexible ductwork leading to air diffusers and air diffusers and all associated threaded support hangers and relevant duct support brackets and components and materials which were removed together with all the associated components.

- All existing openings in brickwork in the ceiling void through which the branch ductwork is fed to the ceiling void of the office space which is found to not be needed for the new installation, shall be closed up with similar brickwork. This brickwork required to close up the existing openings in the individual divider walls in the ceiling void and the disposal of removed brickwork shall be the responsibility of the main construction *Contractor*.

- The removal of all the existing suspended ceiling panels as well as the suspended ceiling frameworks on the mentioned floors which needs to be removed in order for the new ductwork to be installed shall be the responsibility of the main construction *Contractor*.

4.6.2.3.2. HVAC Equipment Installation Work

- All design drawings from the mechanical design engineer shall be used by the HVAC contractor a basis to create basic shop drawings of the final components to be manufactured and exact/final positioning of equipment and plant which needs to be installed which shall be subject to the mechanical engineer's approval before ordering of equipment and installation work may commence.

- All new HVAC equipment, plant, components and materials shall be provided by the HVAC contractor.
- Assembling of the components of each of the three (3) new air handling units as well as the positioning and fixing of each of these air handling units in their respective plant rooms in the spaces provided. Connection of each of the three (3) new air handling units' chilled water

pipework to the existing chilled water main pipework risers in each of the plant rooms in the eastern plant room including all new associated valves and associated piping components, etc.

- Insulation of new chilled water pipework installed between the main chilled water risers and the newly installed air handling units. Installation of chilled water pipe supports, support brackets to position pipework in the positions required. Installation and connection of new ductwork risers to each of the air handling units, rising into the ceiling void running from the eastern plant room in the eastern passageway into the ceiling void of the northern passageway ceiling void. Installation of flexible ducting connections between the ductwork connections and each of the air handling unit supply openings.

- Replacement of each of the wall mounted washable pleated panel filters (situated in plant room on each of the floors) through which outdoor air is being introduced into the air handling unit plant rooms with similar new washable pleated panel filters.

- Installation of all branch ductwork running from main ductwork into the office space through the divider walls between the passageway ceiling voids and the office space ceiling voids. Insulation of all branch ductwork in the office space ceiling voids, installation of all flexible ductwork to all HVAC ceiling diffuser units in the office space ceiling layouts provided as per the drawings. Installation of all branch ductwork balancing dampers as indicated on drawings. Installation of all ductwork support structures, threaded bar ductwork hangers and duct hangers supported as specified on drawing.

- Installation of new main HVAC duct dampers in each of the HVAC plantrooms.

- Exact, final ceiling tile positioning of all HVAC diffusers to be determined by HVAC contractor in conjunction with the electrical contractor light fitting locations in ceiling tile layout.

- Installation of all additional HVAC wall louvers situated in the divider wall between the office space and the passageway if required.

- Installation of relevant HVAC pressure and temperature sensors as indicated on the HVAC drawings. The manufacturing / Construction and Installation of all ductwork to be carried out in accordance with SANS 1238.

- Installation of all door grilles and undercutting of doors for HVAC ventilation where specified on drawings.

- Installation of extractor fans and all associated ductwork, flexible ductwork, ductwork support hanger's ductwork support bracket members and associated wall louvers as indicated on the HVAC drawings.

- All builders work required for the creating of openings through the ceiling void divider wall (in ceiling void) through which the branch ducts will run to the office ceiling void space, shall be the responsibility of the main building *Contractor*. The final positioning of these openings shall be determined and marked up by the mechanical contractor. All other builders work openings in any walls and facades of the building shall also be the responsibility of the main construction *Contractor*.

- All installation of temperature sensors in the ductwork at the relevant locations.

- Installation of all extractor fans as indicated on the HVAC drawings

4.6.2.4. Ninth Floor – Scope of Work

- Mechanical work which needs to be carried out on the ninth floor, shall include but will not be limited to the following work items but may include actions/items which need to be carried out in order to execute the mechanical work which might not have been described in this section of *The Works*:

4.6.2.4.1. HVAC Equipment Removal / Disposing work

- The work to be performed below has bearing on the designated part of the ninth floor as indicated on the relevant HVAC drawing. The work which needs to be carried out, includes the existing bar area facility, the adjacent kitchen, and the existing office spaces as indicated. The spaces which forms part of the scope of work has now been repurposed as a thinktank creative facility, the existing kitchen and a waiting area on the outside of the think tank room as well as a new boardroom.

- The scope of work on the ninth floor includes the removal of all existing split type air conditioning units and their existing components (in the areas identified on the drawing) which includes all ceiling cassette split type and mid-wall split type units, under-ceiling split type units, all associated hanger supports, all and any ductwork components in the ceiling voids of the each of the abovementioned ceiling voids. All existing air conditioning refrigerant pipework together with their insulation, AC condensate pipework together with insulation shall also be removed as well as all the outdoor air conditioning condenser units which are connected to the indoor evaporator ac units. The outdoor air conditioning units which are to be removed are situated on the cantilever roof structure on the outside of the building on the ninth floor. All associated insulation, fresh air ductwork as well as all the

4.6.2.4.2. HVAC Equipment Installation Work

- This scope entails the following system with all of its components. 1(one) x Split type direct expansion(dx) fan coil ceiling cassette unit in the new boardroom and 2(two) x Split type dx ceiling cassette fan-coil units in the new thinktank room. 1(one) x Split type dx outdoor processing air unit above the think tank area. 1(one) x Split type dx condenser unit onto which all the dx fan coil are connected. The dx condenser unit shall be mounted on the cantilever overhang roof which shall be subject to a structural assessment for the fi

4.7 Guarantee

- The *Contractor* shall guarantee *The Works* against defects for a period of 1 (one) year from date of practical completion.
- The guarantee shall cover all the defects to *The Works* and shall provide for the replacement or the repair of all components that become defective during the guarantee period, consumable components are excluded from the guarantee.

4.8 Shop drawings

These shall be based on the general arrangement drawings and shall show in details the construction of all the parts of *The Works*, method of assembly where applicable, erection and construction, materials and connections, welds, gaskets, sealants, fastenings, reinforcing and all other necessary detail.

4.8.1. As-Built drawings and wiring diagrams

These are up-to-date approved drawings at the completion of the contract. Tenderers shall allow in their price for submitting to the Engineer a hard copy and soft copies in PDF and Native AutoCAD (DWG-format).

4.8.2. Alternative Manufacture and Pricing

Should the *tenderer* wish to offer alternative equipment. The details shall be submitted to the *Project Manager* in letter format which shall clearly state the quality, performance equal or better than what was proposed by *The Employer's* design as well as the advantages of the proposed plant/equipment.

4.8.3. Approved Manufacturers

All equipment offered must adhere to the minimum requirements as specified in the technical specifications section of the document. It shall be required from all *Contractor*s to submit datasheets and brochures including all technical specifications to the *Project Manager* at the tender stage as well as prior to ordering.

4.8.4. Allocated Space

The physical sizes of the equipment offered shall be suitable for the locations shown on the drawings and shall be positioned in such a manner to ensure reasonable access all around the equipment for the maintenance purposes and as may be recommended by the suppliers of the equipment.

4.8.5. Testing and Commissioning

Testing and Commissioning shall include the following actions but shall not be limited to these actions as it shall be the responsibility of the HVAC engineer to be ensure that all items specified shall perform and deliver as per their capacity and that the system is properly balanced in order to provide the required performance as specified in the design of the system.
Duct pressure testing to be carried out to SANS 10173.

4.8.6. Training

The *Contractor* shall include for the training of 5 personnel of the End User client on the functioning and operation of all HVAC equipment and components which were installed.

4.8.7. Handover Pack

4.8.7.1. The *Contractor* shall include as part of the HVAC handover pack all of the following information in the specified amount of copies:

4.8.7.2. Two (2) hard copies and 2 electronic copies (on USB Flash drives) handover packs shall be provided at the HVAC contractor's cost and shall contain following documentation:

- On the cover of the file – Title of file, HVAC and floor numbers on which work was carried out as well as the date at which the handover occurred
- All HVAC equipment / plant operations manuals and component manuals of new installation which were carried out
- All HVAC Shop drawings in hard copy files as well as in electronic native AutoCAD dwg. Format.
- All HVAC equipment / plant full service and maintenance schedules
- All HVAC equipment warranty schedules
- Contact list of all the suppliers / manufacturers from which the plant / equipment was sourced which shall include the following details:
  - Full name of company
  - Name and contact details of contact person at the company through which the equipment was sourced
  - Full contact details including email addresses and telephone number
  - Full street address of company

4.8.7.3. A list of all the names, emails and telephone numbers of the End User Client personnel who has attended the training of how to operate the system.

4.8.8. Standard of Work, Equipment and Materials

4.8.8.1. All equipment and material used shall be of high quality, SABS approved, and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by experienced and competent officers.

4.8.8.2. All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply, it shall be submitted to the *Project Manager* for approval.

4.8.8.3. All installations and testing must be approved by the Transnet Engineer prior to commissioning.

4.8.9. Service Conditions

The equipment shall be designed and rated for continuous operation under the following conditions:

4.8.10. Ambient / Environment Conditions

All equipment offered shall be rated for continuous operation under the following conditions:

- Altitude : 0 to 1800m Above Sea Level.
- Ambient temperature : -5°C to +40°C (daily average +35°C).
- Relative humidity : As high as 96%.
- Lightning conditions : Severe, with a maximum lightning ground flash density of 11 flashes per km² per annum.
- Atmosphere : Salt laden and corrosive industrial chemical and dust laden nature. Frequent heavy rains driven by wind reaching speeds of 100 Km/h and above.

4.8.11. Governing Codes, Standards and Specifications

All *Design's* undertaken, *Plant's* and *Materials* supplied, *Equipment* to be used by the *Contractor*, in agreement with *The Employer*, with the intention to execute *The Works* detailed in this document, shall comply as a minimum, to the requirements of the SANS/IEC standards listed in the table below. Where reference is made to a standard, the reference shall be taken to mean the latest edition of the standard, supplements, and revisions thereto.

Item	Document Number	Description
[1]	SANS 62-1	Part 1: Steel Pipes – Pipes suitable for threading and of nominal size not exceeding 150mm
[2]	SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods
[3]	SANS 193	Fire Dampers
[4]	SANS 460	Plain-ended solid drawn copper tubes for potable water
[5]	SANS 543	Fire Hose Reels (with semi rigid hose)
[6]	SANS 1091	National colour standard
[8]	SANS 1128-2	Firefighting Equipment Part 2: Hose couplings, connectors, and branch pipe and nozzle connections

[9]	SANS 1186-1	Symbolic safety signs Part 1: Standard signs and general requirements
[10]	SANS 1186-3	Symbolic safety signs Part 2: Internally illuminated signs
[11]	SANS 1186-5	Symbolic safety signs Part 2: Photoluminescent signs
[12]	SANS 1238	Air-conditioning ductwork
[13]	SANS 1700	Fasteners
[14]	SANS 1808	Water supply and distribution system components
[15]	SANS 10139	Fire detection and alarm systems for buildings – System design, installation and servicing
[16]	SANS 10173	The installation, testing and balancing of air-conditioning ductwork
[17]	SANS 10252-1	Water supply and drainage for buildings – Part 1: Water supply installations for buildings
[18]	SANS 10287	Automatic sprinkler installations for firefighting purposes
[19]	SANS 10400-A	The application of the National Building Regulations – Part A: General principles and requirements
[20]	SANS 10400-O	The application of the National Building Regulations – Part O: Lighting and ventilation
[21]	SANS 10400-T	The application of the National Building Regulations – Part T: Fire protection
[22]	SANS 10400-XA	The application of the National Building Regulations – Part XA: Energy usage in buildings

4.9. Technical Requirements

4.9.1. Erection of Equipment

- The *Contractor* shall allow for a complete installation, including the provision of mobile cranes, air compressors, lifting tackle, measuring equipment, precision levels, and all other special or regular tools and equipment that may be needed to complete the entire installation in accordance with the specification.
- The *Contractor* will be responsible for any damage caused to buildings, equipment, etc. during the course of the erection of the equipment.

4.9.2. Equipment Plinths

- Plinths as specified hereunder shall not be confused with any form of inertia or anti-vibration base.

- Plinths shall be provided for all floor standing mechanical equipment. Plinths cast on concrete surfaces shall protrude at least 100mm above floor levels and depending on the position of the vibration mountings.
- Plinths for equipment which do not need inertia bases or plinths for inertia bases with recessed vibration mountings shall be of the same size as the equipment or bases mounted on top.
- The Plinths shall be designed to be able to support the weight of the equipment being fixed on them and the surface shall be completely horizontal and even.

4.9.3. Holding Down Bolts and Bolts for Equipment

- The *Contractor* shall be responsible for the supply of all necessary holding down bolts for the machines supplied by him. He shall also supply all bolts necessary for assembling all the equipment supplied by him.
- Holding down bolts shall preferably be cast into concrete bases when the bases are being cast. All bolts shall, in this instance, be provided with hot dip zinc galvanised sheet metal sleeves approximately three times the diameter of the bolt and projecting a minimum of four-bolt diameters below the surface of the concrete. This sleeve must be kept free of concrete until the final grouting takes place.
- Where galvanised bolts are called for, they shall be fully galvanised all over. No re-cutting of threads will be permitted after galvanising. All nuts must run freely on the threads.

4.9.4. Bed Plates

- All bedplates shall be of fabricated hot dip zinc galvanised mild steel with surfaces on which the pumps, motors, heat exchangers etc. are mounted.
- All bedplates shall be stress relieved after welding but before machining. Each bedplate shall be provided with approximately eight horizontal jacking screws with locknuts for each unit mounted thereon to assist in aligning the pumps and motors, etc.
- It will not be necessary to dowel equipment in place, provided the jacking screws specified above are fixed and locked.

4.9.5. Packing of Equipment

- All base plates and steel work shall be suitably packed with steel packs to ensure that they are true to level, line and grade. The thickness of packing shall be such as to allow for not less than 25mm, and not more than 50mm of grout under all base plates or steel work. Packings shall be of suitable size to support the base plates and one pack must be situated immediately on each side of each holding down bolt

as well as in any position as may be required in order to adequately support the base plates and its superimposed load.

- All packs shall be as near as possible to the exact height in one thick piece. Thinner shims may be used for final adjustments, but large piles of thin shims will not be accepted. All packs must be of parallel shims. Taper packs or wedges will not be accepted. Packs must be bedded on a flat and smooth area on the surface of the concrete foundation. Packs resting on rough concrete will be rejected.
- After final levelling and lining up, it is essential that all packs are tight. Loose packs will be rejected.
- No shims will be permitted between a machine base and plate and the machine's feet except as mentioned hereinafter.

4.9.6. Alignment of Equipment

- Bedplates:

  Where equipment is delivered completely assembled on a bedplate, these items of equipment shall be removed from the bedplate prior to installation. The bedplates shall first be installed, levelled, lined up and packed to ensure that there is no twist or distortion therein. The machines shall then be installed on their bedplates and the final alignment carefully checked and adjusted until it is completely level.

  Minor corrections to the alignment of machines may be carried out using thin shims between the machinery feet and the machined surface of the bedplate. This applies particularly to electric motors.

- Couplings:

  The alignment of all couplings must be carefully checked for both the parallelism and eccentricity of their shafts. Alignment must be carried out to the manufacturer's tolerances.

  In any event, a misalignment of more than 0,05mm will not be permitted for either parallel or eccentric misalignment as measured at the periphery of the couplings. It is essential that a dial micro meter is used to set the final alignment, which must be witnessed by the *Project Manager*'s Representative.

4.9.7. Assembly of Components

- It is essential that all mating components such as couplings, taper lock bushes, machined faces, etc., be thoroughly cleaned with a suitable solvent before assembly. All surfaces must be free from burrs or irregularities, which may prevent the correct mating of the surfaces.
- A molybdenum-disulphide lubricant similar or equivalent to Mobil-grease Super shall be used on the threads of all bolts and between the mating surfaces of all parts

closely fitted together, such as shafts and couplings, keys and base plates. PTFE tape shall be used in all screwed pipe connections.

4.9.8. Welding

- Welding shall be carried out in accordance with the current edition of SANS 10044 where applicable.
- All welded filler or butt joints shall be free from porosity, cavities and entrapped slag.
- The joints in the weld run, where welding has been recommended, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with reinforcement of not more than 3mm in the case of butt welds. The weld face shall be uniform in appearance throughout its length.
- Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to the latest edition of SANS 2560.
- Only welders in possession of a valid approved competence certificate shall be employed.
- All welds must show proper fusion.

4.9.9. Galvanising

- All fabricated mild steel sections, pipework, fixtures and fittings shall be hot dip zinc galvanised to comply with SANS 62 and SANS 1182:2013 and shall be of minimum mean coating thickness 170µm.
- Items to be galvanised shall be entirely prefabricated and then dismantled in sections for galvanising. No cutting of threads or welding will be accepted after galvanising.
- Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanising. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- Welding flux shall be chipped away, and all welds wire brushed before galvanising.

- The surface to be galvanised shall be free from paint, oil, grease and similar impurities.
- All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.
- The *Project Manager* reserves the right to inspect all steel components before galvanising and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- The hot dip galvanizing bath shall primarily contain molten zinc. The total of the other elements (as identified in ISO 752, EN 1179 or EN 13283, excluding tin and iron) in the molten zinc shall not exceed 1,5% by mass.
- The significant surface(s) of all the hot dip galvanized article(s), when first examined by normal or corrected vision from a distance of not less than 1 m, shall be free from nodules, blisters (i.e. raised areas without solid metal beneath), roughness and sharp points (if either can cause injury) and uncoated areas. Flux residues shall not be permitted. Lumps and zinc ash shall not be permitted where they might affect the intended use of the hot dip galvanized article or its corrosion resistance requirement.
- Articles that fail visual inspection of the galvanising shall be renovated according to the criteria mentioned in clause 6.3 of SANS 121:2011

4.9.10. Vibration Control

- **Vibration Isolation**

  Proper provisions shall be made in the foundations and mountings of all equipment capable of transmitting vibration forces to its environment, whether local or remote, (as is the case with pipes) for vibration isolation.
  Selection of vibration isolation equipment and in particular, mountings for equipment and machines, shall be done with due regard to the forcing frequency of the driven machinery and the mounted natural resonant frequency of the machine.
  In the case of installation of equipment on upper floors, suspended floors, roofs etc. it is of prime importance that floor stiffness, floor deflection and natural frequency of the floor be taken into consideration to ensure that resonant conditions cannot occur.
  Driven machinery and isolator deflections shall be carefully selected in these applications.
  Should added mass inertia blocks be required to comply with these vibration isolation requirements, proper provision shall be made at tender stage for the provision of such.

- **Damping**

  Where static deflections in excess of 8mm are indicated, steel springs shall be employed incorporating acoustic sound pads in series with the spring.
  The horizontal stiffness of the springs shall not exceed that in the vertical, in particular for systems mounted at vertical frequencies below 5Hz.
  Low frequency mounts shall incorporate rubber snubbers to accommodate extreme horizontal or vertical motions such as can occur near resonance during start up.
  The snubbers shall however not be relied upon to provide the necessary horizontal stability of the machine in normal operational conditions. Spring layouts and inertia blocks shall be employed to avoid this situation.
  For static deflections below 8mm, rubber in sheer mounts may be used provided the frequency is above 6Hz.
  For small static deflections less than 4mm and particularly for high-speed machines and general acoustic isolation, ribbed rubber neoprene composite pads may be employed subject to the specified requirements.
  Sufficient stability and damping shall be incorporated in the mountings to minimise the movement of the machine during start up or changes in the operating conditions.
  The selection of mounts shall take proper cognisance of unequal distribution of the mounting weight of equipment and rotational and/or pressure forces acting thereon.

4.9.11. Painting

- The paint colour scheme shall comply fully with the SANS 10140 requirements.
- All steel surfaces that need to be painted shall be prepared as per SANS 8501-3 and SANS 10322.
- All exposed portions of hot water tanks, heat exchangers, cylinders, etc. shall be properly cleaned, primed and painted two coats of heat resistant paint.
- All other exposed metal parts such as pumps, belt guards, all piping, pipe lagging, fittings, dampers, fans, coils, motors shall me painted
- Packaged units, control panels, steelwork, exposed ducts and lagging, expansion tanks, make-up tanks, cooling tower, unit shelters, etc. shall be cleaned, primed, undercoated and finished in a high-quality gloss paint of approved colour.
- All external equipment exposed to the weather must be cleaned, primed and painted with two coats of epoxy paint.

- The lagged surface of calorifiers, headers and pipes shall be primed, undercoated and finished in a high-quality gross of approved colour. Unlagged steam piping shall be painted with heat resistant paint.
- Machinery, Structural Steelwork Colours:

Checker plates, Pipe supports, Handrails, Base plates	Yellow
Body portions of machines	Olive Green
All machinery external to the building (except piping. valves and fittings)	Dove Grey
All moving parts which are visible when operating In-side surfaces of all machine guards, belt guards etc	Orange
All handles, levers, handwheel centres adjustment knobs, etc	Yellow
All lagging on boilers, calo-rifiers, tanks, cylinders etc. except on piping and pump sets and ducting)	Aluminium
Electrical distribution boards (except where transparent covers are used)	Light Grey
Control panels and Indicator panels, Water treatment plant (except on piping), Air Conditioning plant (except on piping)	Light Blue
All points which constitute a physical hazard, e.g. (stay-wires, low pipes, access areas)	Yellow and Black
Doorways, Cross Hatch, Drainage piping	Black

- **Piping, Pumps, Valves, Fittings, etc.**
  - All unlagged black piping, holder bolts, supports anchors fittings, etc. shall be painted in accordance with British Standard Specification No. BS 1710.
  - Except where otherwise specified all piping on surfaces shall be painted with a primer, an undercoat and a finishing coat in approved high-quality gloss paint to the colour indicated in the schedule. This also applies to all holder bolts, supports, anchors, fittings and valves.
  - Pump sets, valves, fittings, etc. shall be painted the same basic colour as the pipelines, except those of firefighting services, which shall be painted red.
  - Were bands are painted for identification purposes over a base colour, the length of the band shall be same as the final pipe diameter, but not less than 100 mm.

Where three strips are required per band, each strip shall be one third of the final pipe diameter but not less than 35 mm.

- The direction of flow shall be indicated with a 25 x 100 mm long black arrow at intervals of approximately 4 m and at valves and junctions. Flow lines shall be marked with an F and return lines with an R at each arrow.
- Where outlets require identification the colour identification shall take the form of coloured centre pieces on hand wheels or cocks, and/or other suitable approved marking on the neck of the outlet fittings as specified. The colour shall primarily be that of the pipe colour and where banding is used, the colour shall be that of the band and stroke.
- All radiators, pipes, fittings etc. in finished areas such as wards, offices, passages, etc. shall be cleaned, primed, undercoated and finished in a high gloss paint to match the existing finish.
- Identification Colours:

	Basic Pipe Colour	Banding Colour
Drinking Water	Brilliant Green (D10)	Cornflower (F29)
Condenser Water	Brilliant Green (D10)	White
Boiler Feed Water	Brilliant Green (D10)	Crimson(A03)/white/crimson(A03)
Boiler Condensate	Brilliant Green (D10)	Crimson(A03)/Emerald Green(A14)
Chilled Water lines	Brilliant Green (D10)	White/Emerald Green(A14)
Domestic Hot Water	Brilliant Green (D10)	Crimson(A03)/Cornflower(F29)
Fire Fighting Mains	Signal Red (A11)	

4.9.12. Mechanical Equipment

- The mechanical equipment designed, supplied and installed by the *Contractor* shall comply with the requirements set out in this document as well as all relevant SANS requirements.

4.9.13. Type Air-conditioning Units

- The main system would be the chilled water type which will have the plant located on the ground floor level and chilled water pipes to each individual indoor, in ceiling type units. The chilled water pump will be installed into chiller unit to distribute the chilled water to the respective indoor units as per demand

requirements. There are two types of indoor unit applications, with one being the ducted fan coil units and cassette fan coil units

- The units shall be of a specification equal or similar accepted to that provided in Appendix 1.
- It is essential that the acoustical characteristics of the units are considered during selection and that they are installed to ensure compliance with the noise criteria laid down. The sound pressure level from these machines shall be within the set criteria throughout the frequency range.

- The indoor fan coil unit shall be ceiling cassette mounted and a ceiling ducted type. Ceiling units shall be properly insulated, particularly where exposed to high roof or lighting heat loads.
- The indoor units shall be equipped with a suitable and easily accessible adjustable intake damper, control thermostat, drain pan and drain piping, cooling coil, controls and control panel and complete wiring, including interlocking with outdoor unit.
- The outdoor units shall contain the matching compressor unit, air-cooled condenser, condenser fan within a waterproof painted and corrosion protected casing.
- The indoor/outdoor units shall be interconnected with refrigerant piping (separately insulated suction and delivery piping for reverse cycle units), electric wiring and interlocking control cabling. Where visible and/or exposed to the weather or possible mechanical damage refrigerant piping and cabling shall be run inside galvanised sheet steel trunking, neatly erected and painted as specified.
- Provision shall be made in all cases for the drainage of excessive condensate to the nearest building drain by means of uPVC tubing.
- For reverse cycle heating units, including split type units, a proper drip-pan with drainage piping as above shall be provided for the outdoor units where dripping can create unacceptable conditions.
- Where drainage piping is required to be installed flush mounted, positioning and chasing shall be done in good time to meet construction programmes.
- All panels shall be neat fitting with hardwearing exposed surfaces of baked enamel or equal finish of approved colour.

4.9.14. Fans

- The fans shall be of a specification equal or similar accepted to that provided in Appendix 1. The fans shall be selected to comply with the ventilation requirements of SANS 10400.
- All fans shall be selected for the highest possible efficiency and comply with the noise criteria specified.

- Fans shall be installed with anti-vibration mountings to match the fan characteristics.
- Where fan noise characteristics cannot meet the requirements of this specification such fans shall be replaced, or other approved steps taken by the *Contractor* at his own expense until the installation meets the requirements.
- Fans shall be selected for the highest possible efficiency with the lowest possible blade tip speed.
- Fans shall be fitted with manufacturer's nameplates permanently fixed to the casing in a prominent position clearly indicating manufacturer, model number, maximum operating speed, maximum power absorbed, size and serial number for larger fans.
- Indicating arrows for both direction of rotation and direction of airflow shall be provided on fan casings.
- Fans shall be of the aerofoil type with non-overloading characteristic with peak power requirements occurring in normal operating pressure range and motor rating exceeding this requirement.
- The complete fan unit shall be statically and dynamically balanced to ISO 1940 G6,3.
- Fan performance shall be based on tests carried out in accordance with BS 848: Part 1 as amended.
- Fan motors shall be totally enclosed squirrel cage induction type with protection to IP 55.
- Fans shall be suitable for continuous operation in high humidity conditions.
- All fan Casings and fasteners shall be hit dip zinc galvanised steel.

4.9.15. Sound Attenuators

- Where required, in order to comply with the noise and vibration criteria already laid down, or where specified in the drawings, sound attenuators shall be provided for ventilation, air conditioning and all other equipment (Duct mounted and/or as applicable).
- The attenuators selected shall match the specific fan or plant characteristics to ensure the correct insertion loss to meet the sound criteria laid down.
- Unless otherwise specified, sound attenuators shall be installed with flexible connections at the inlet and outlet connections.

- The sound attenuators shall in addition be selected to produce the minimum pressure loss across the attenuator coupled to the least re-generated noise level produced by the flow through the attenuator.
- Unless otherwise specified, air path sound attenuators shall be manufactured from galvanised sheet steel with the sound absorption material moisture repellent and erosion resistant up to 20 m/s air speed, and preferably flange connected.
- Wherever possible attenuators shall be proprietary type supplied by the same manufacturer as the equipment manufacturer to ensure complete compatibility.
- The internal free area of sound absorbers shall be not less than the cross-sectional area of the connecting duct as indicated on the drawings

4.9.16. Air Filters

- Air filters shall be provided on all air inlet points in order to maintain good air quality in the facilities.
- Filter efficiency and arrestance shall be in accordance with ASHRAE Test Standard 52-76.
- Construction and manufacture of all components shall be such that under no circumstances any unfiltered air can by-pass filters or filter banks.
- Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing.
- Tubes for the measuring of the pressure drop across each filter bank shall be fitted as standard to enable connecting a manometer or other instrument as specified.
- All filters shall be fitted with inclined pressure differential manometer gauges, clearly marked with filters clean (green) and filters dirty (red) indicators of a permanent type.
- Fan and system selection shall allow for expected final filter resistance to ensure a supply air quantity in excess of 90% of design air quantity immediately prior to filter replacement.
- Filter duct casings shall be made of galvanised sheet steel with de-contaminable powder coating RAL 9010
- The filter duct casing shall ensure precise fitting of the filter elements.

4.9.17. Grilles/Diffusers

- Grilles/diffusers (except door grilles) shall be manufactured of stamped, extruded or rolled galvanised steel sections, finished as specified and mounted in a neat frame.

- Each diffuser shall be selected in accordance with the manufacturer's recommendations to be capable of passing the specified air quantity without creating excessive resistance, noise or local draughts.
- Door grilles shall be manufactured from aluminium extruded sections, natural anodised (9E6-C-0)

4.9.18. Ductwork

- Sheet metal ductwork shall be manufactured in accordance with SABS 1238 : 1979 as amended and installed, balanced and tested as set out in SABS 0173 : 1980, as amended.
- Ductwork layouts, dimensions etc. shall be as indicated on drawing
- Unless otherwise specified ductwork shall be manufactured of galvanised sheet steel.
- Flexible joints shall be provided between all fans, air handlers, vibration inducing equipment, etc. and ducting.
- Flexible joints exposed to weather shall be provided with protecting galvanised sheet steel cover strips.
- Flexible connections shall be made of fireproof fabric reinforced airtight material attached both sides with approved galvanised steel collars or frames.
- Flexible ducting shall comply with local fire codes, NFPA Bulletin 90A and SABS 0400 fire resistance requirements.
- Flexible ducting shall be supported with sufficient and correct brackets that will ensure maintenance of shape.
- Duct joints shall be welded flanges or male/female socket type welded all-round.
- Unless otherwise specified the total ductwork, installation shall be tested for leakage as per SABS0173.

4.9.19. Louvres

- Weather louvers shall be finished in natural anodised aluminium, powder coated or painted is specified. (E6-C-0)
- Weather louvers shall be watertight even with nominal air velocity up to 3,0m/s.
- Weather louvers shall in all cases be selected with free air passage areas not less than that indicated on the drawings.

4.9.20. Pumps

- All pumps shall comply with the requirements already laid down for noise vibration and noise criteria.

- Each pump motor shall be sized so that it will not overload.
- The *Contractor* shall provide raised concrete plinths of the appropriate structural integrity to hold the weight of each pump. A single plinth may be provided for pumps which are located next to each other. The plinth surfaces must be completely horizontal and even.
- Each pump baseplate shall be hot dip zinc galvanised to a minimum mean coating thickness of 200µm.
- A low flow switch shall protect the pump from damage due to closure of valves in the pumping circuit.
- Each pump shall be mounted on a concrete inertia base which shall include Mason Industries (or other accepted) spring mounts selected by the suppliers of the pumps.
- All pumps shall have mechanical seals of types to suit the service application and as recommended by the pump manufacturer. The seals shall be guaranteed by the pump manufacturer for the service intended.
- Provide an emergency latching type stop button adjacent and within reach of the respective pump motor.
- When connecting the pump to the piping, the pump should not be used as an anchorage point for the piping. The pipelines shall be anchored in close proximity to the pump and connected without transmitting any stresses or strains. The forces exerted at the pump nozzles shall be kept below the maximum permissible forces as per the pump manufacturer's directions.
- The suction lift line shall be laid with a rising slope and the suction headline with a downward slope towards the pump.
- In order to stabilise the flow before entering the pump, the suction piping entering the pump shall have a straight length equivalent to at least two and a half times the diameter of the suction flange.
- Before installing the pump in the piping, remove the flange covers on the suction and discharge nozzles of the pump to check that the inside of the pump is free from any foreign objects.
- The pump and motor shafts shall be aligned to prevent damage to the pump.

4.9.21. Water Pipework and Fittings

- Full radius bends and sweep fittings must be used wherever possible. Elbows may only be used under exceptional conditions and only with written permission of the

Department. Where it is necessary to reduce pipes in size, reducing sockets only shall be used and not bushes.

- Piping shall not be bent or formed in any manner during installation.
- In horizontal runs of piping, where there is only a slight fall, eccentric fittings are to be used.
- Under no circumstances shall any piping be directly connected to noise generating equipment such as pumps, heat pumps etc. Connections to such equipment shall be made with correctly selected flexible rubber type connectors of the spherical type.
- Where tubing passes through walls or ceilings, etc., neat PVC sleeves shall be used. The inside diameter shall be such that the insulated piping can pass through the sleeves. Gaps between the insulation and PVC sleeves must be sealed with anon-hard setting putty
- All underground piping shall be HDPE Class 12 unless otherwise indicated.
- All above ground pipework shall be Class 1 copper and shall comply with the minimum standard when tested in accordance with the latest edition of SANS 6509.
- All solder, fluxes and the method of soldering shall comply with the latest edition of SANS 460.
- All fittings shall comply with the requirements of the latest edition of SANS 1067, as relevant.
- All pipework shall operate effectively under all normal conditions likely to be experienced when the water installation is in service.
- All cold-water pipework shall be able to withstand up to 40 °C water temperature.
- All hot water pipework shall be able to withstand up to 100 °C water temperature.
- Piping shall be supported (unless otherwise indicated on the drawings) as per figure 3 below:

DIAMETER	MAXIMUM SUPPORT SPACING METERS
15mm	1,8
22 – 28mm	2,4
34 – 54mm	3,0
76 – 108mm	3,6

Figure 3

- All supports and anchors shall compensate for thermal expansion of the piping. Pipe supports fixed to sensitive building elements shall not be permitted.

- Fittings shall be ANSI (ASA) B16.9 standard thickness with table flanges up to 1000kPa.
- All butterfly type valves shall include for spool pieces to enable removal of equipment.
- Before piping is installed the internal surfaces shall be cleaned of all mill scale and oil to prevent the clogging of strainers, plate heat-exchangers, control valves and constant flow valves.
- Before any pump is operated, thoroughly flush out piping systems and remove, clean and reinstall all strainers elements and built-in strainer elements of water balancing valves. Repeat periodically until all water circulating systems specified herein are completely free of foreign matter.
- In order to avoid clashing of services and unnecessary disputes the Selected subcontractor shall liaise with the Plumbing, Electrical and Fire Services subcontractors with regard to piping, ducting, cable trays, cable racks, etc., routes shown on the drawings and co-ordinate the installations with them.
- All low points in the water circuit shall have drain points to allow the circuit to be drained.
- All high points in the water circuit shall have automatic air purge valves to allow for purging of air.
- Stop valves shall be installed close to the entering and leaving water connections to the Heat Pumps.
- All rubber components that are in contact with potable water, such as joint rings, tap washers and flange packings, shall, in order to control the multiplication of *Legionella pneumophila* bacteria in water installations, be of a composition that will not promote microbiological growth. Rubber joint rings shall comply with the relevant requirements of the latest edition of SANS 4633.

4.9.22. Strainers

- Water strainers shall be of the pot or angle type. Strainers shall be designed for not less than 1000kPa or 1,5 times the maximum system working pressure whichever is the greatest. Strainer screens shall be of bronze or stainless steel and shall have maximum perforation as per Figure 4 below.

Strainer Size mm	Perforation Size mm
2 – 50	0,8
65 – 150	1,6
200 – 300	3,2
over 300	6,4

Figure 4

- The effective free area of the screen shall in all cases be not less than 3 times the cross-sectional area of the inlet opening.
- Strainers shall be installed in accessible positions where the strainers can be easily removed and cleaned.

4.9.23. Pressure Gauges and Thermometers

- Pressure gauges shall have at least a 100mm dial and be calibrated in kPa with the maximum range not exceeding 1,5 times the system working pressure. Forged brass or gunmetal gauge cocks must be fitted with each pressure gauge.
- Thermometers shall be of the replaceable glass type with bronze casings, fitted into pockets for removal without draining the system. The thermometers shall be calibrated in °C and the scale length shall be at least 170mm. Pockets shall be of brass, filled with oil and shall be installed vertically. On pipes smaller than 50mm diameter, pipe sizes must be increased locally to install the sockets.

4.9.24. Air Release Valves

- Automatic air release valves shall be provided where shown on the drawings but shall in addition also be fitted to piping at all high points and other places where air may accumulate. As these points depend on the installation of the system, full responsibility for fitting these valves rests with the *Contractor*.
- Valves shall have either integral shut-off valves or be preceded by a lock shield valve.
- Connections to the service pipe shall be made at the highest point to ensure complete venting. Valves shall be mounted with the inlet connection exactly vertical.

4.9.25. Valves

- All valves shall comply with the regulations of the latest version of SANS 1808.
- Drain valves shall be fitted to all low points in the installation to ensure full draining of the system.

- Diaphragm type valves and gate valves shall not be used for balancing or throttling purposes.

4.9.26. Insulation

- General
  - Insulation shall in all instances be applied by specialist contractors and be of the highest standard. Any section not installed to the approval of the Engineer shall be re-done at the *Contractor*'s expense.
  - Data sheets for all insulation and accessories shall be submitted to the engineer for acceptance that they meet the requirements listed.
  - Material shall be delivered in non-broken, factory furnished packaging and stored in a clean, dry indoor space that provides protection against the weather.
  - Progressive testing of the systems to be insulated shall have been completed, inspected and approved by the owners' representative before the insulation is applied.
  - Insulation shall not be applied until all surfaces are clean, dry, and free of dirt, dust, grease, frost, moisture and other extraneous elements.
  - Insulation, cladding and vapour barriers shall be painted as specified.
  - All items of plant likely to operate at temperatures below the surrounding ambient dew point shall be insulated and provided with a vapour barrier.

4.10. ICT

4.10.1. Network

All floors switching network equipment to be connected via fibre uplink, and all Power over Ethernet (POE) ready devices.

CAT6/CAT6e physical cabling from network equipment to terminating LAN ethernet network points.

Segmented VLAN's for Video Conferencing at designated boardrooms with room for mini cabinets in each boardroom.

User of existing fibre route for connectivity into the Transnet MPLS network – SAP, email, Active Directory etc.

4.10.2. Wireless

High penetration full wireless access points – 2 per floor to extend full coverage from end to end on each floor.

5. Drawing List

Drawings issued by *The Employer*

This is the list of drawings issued by *The Employer* at or before the Contract Date and which apply to this contract.
Note: Some drawings may contain both *Works* Information and Site Information.

Drawing number	Revision	Title
0000000-1-000-E-LA-0001-01	0A	Ground Floor Wireways Layout
0000000-1-000-E-LA-0002-01	0A	Ground Floor EL&P Layout
0000000-1-000-E-LA-0003-01	0A	Second Floor EL&P Layout
0000000-1-000-E-LA-0004-01	0A	Third Floor EL&P Layout
0000000-1-000-E-LA-0005-01	0A	Fourth Floor EL&P Layout
0000000-1-000-E-LA-0006-01	0A	Fifth Floor EL&P Layout
0000000-1-000-E-LA-0007-01	0A	Ninth EL&P Layout
0000000-1-000-E-LA-0008-01	0A	Distribution Boards Layouts
0000000-1-000-S-DE-0001-01	0A	Mezzanine Floor Layout, Section & Details
0000000-1-000-M-LA-0001-01	0A	HVAC Layout Ground Floor & Mezzanine
0000000-1-000-M-LA-0002-01	0A	HVAC Layout Second Floor
0000000-1-000-M-LA-0003-01	0A	HVAC Layout Third Floor
0000000-1-000-M-LA-0004-01	0A	HVAC Layout Fourth Floor
0000000-1-000-M-LA-0005-01	0A	HVAC Layout Fifth Floor
0000000-1-000-M-LA-0006-01	0A	HVAC Layout Ninth Floor
0000000-1-000-M-LA-0007-01	0A	Potable Water Layout Ground Floor

0000000-1-000-A-LA-0001-01	0A	Ground Floor Demolition Layout
0000000-1-000-A-LA-0002-01	0A	Ground Floor Plan Layout
0000000-1-000-A-LA-0003-01	0A	Second Floor Demolition Layout Plan
0000000-1-000-A-LA-0004-01	0A	Second Floor Plan Layout Plan
0000000-1-000-A-LA-0005-01	0A	3RD & 5TH Floor Layout Plan
0000000-1-000-A-LA-0006-01	0A	4TH Floor Layout Plan
0000000-1-000-A-LA-0007-01	0A	Ground Floor Mezz & 9TH Floor Layout Plan
0000000-1-000-A-SC-0001-01	0A	Ground Floor Partition Layout
0000000-1-000-A-SC-0002-01	0A	Ground Floor Furniture Layout
0000000-1-000-A-SC-0003-01	0A	Second Floor Partition Layout
0000000-1-000-A-SC-0004-01	0A	Second Floor Furniture Layout
0000000-1-000-A-SC-0005-01	0A	Door Schedule All Floors
0000000-1-000-A-SC-0006-01	0A	4TH & 9TH Floor Partition Schedule
0000000-1-000-A-SC-0007-01	0A	Signage Schedule All Floors
0000000-1-000-A-SC-0008-01	0A	Furniture Schedule 01
0000000-1-000-A-SC-0009-01	0A	Furniture Schedule 02

SECTION *2*

6. Management and start up

6.1. Management meetings

It is *The Employer's* specific intention that the Parties and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro-actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises for both parties.

Depending on the size and complexities of *The Works*, it is probably beneficial for *The Employer* to hold a weekly risk reduction meeting (Clause 16.2). This could be used to discuss safety, environmental, compensation events, subcontracting, overall co-ordination and other matters of a general nature. Separate meetings for specialist activities such as programming, engineering and design management, may also be warranted.

6.2. Types of Management Meetings

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Risk register and compensation events	4 hours Weekly on (or at shorter intervals if required)	On site	*Project Manager, Supervisor, Contractor* and appropriate key persons
Overall contract progress and feedback	3 hours Every two weeks	On site	*Employer, Project Manager, Supervisor, Contractor* and appropriate key persons
Technical Meetings	1-hour Weekly	On site	*Project Manager, Supervisor, Contractor* and appropriate key persons
SHE meetings	2 hours Every two weeks	On site	Appointed *Contractor* and appropriate key persons
Safety and environmental review meetings	1-hour Weekly	On site	Appointed *Contractor* and appropriate key persons

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.

The *Contractor* attends management meetings at the *Project Manager's* request as set out in the table above. At these meetings the *Contractor* presents all relevant data including safety, health and environmental issues, progress reports, quality plans, subcontractor management reports, as may be required.

6.3. 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*.

The *Contractor* Documentation Schedule (CDS) is as contemplated in DOC-STD-0001 – Rev 03, as contained in the List of Annexures.

All contract correspondence is issued through document control. All communication to be submitted electronically and is to be addressed to the *Project Manager* and CC doc Control mailbox at all times email : DBNDocControl@transnet.net

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.

Should any change be made to documentation or data, which has already been submitted to the Project, then new or revised documentation or data shall be issued to replace the out-dated information.

All drawings supplied shall comply with the CAD Standards, i.e. ENG-STD-0001, contained in the List of Annexures.

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.

The *Contractor* is to ensure that the latest version of the required application software and a suitable 'IT' Infrastructure is in place to support the electronic transmission of documentation.

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.

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.

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.

The *Contractor* shall apply "wet signatures" to the original Documentation before scanning the signed original and prior to formal submission to the Project.

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.

The *Contractor* shall ensure adequate resources are available to manage and execute the Document Control function as per the requirements of the Project. (*The Contractor* shall ensure that a dedicated Document Controller is available for the Project)

6.4. Procedure for Submission and Acceptance of *Contractor's* Design

The *Contractor*'s documentation shall be issued to the *Project Manager* under cover of the *Contractor*'s Transmittal Note indicating all Contract references (i.e. Project No, Contract No, etc.) as well as the *Contractor*'s 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*.

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

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

Acceptance of documentation by the *Project Manager* will in no way relieve the *Contractor* of him 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 within the Annexures (Refer DOC-STD 0001 Rev 03).

6.5. As-built Drawings, Operating Manuals and Data Packs

The *Contractor* provides the following:

Red Line/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 the Annexures (Refer DOC-STD-0001 Rev 03).
- All Red Line information to be signed off by the *Contractor*'s responsible Professional/Technologist before issuing to TPT.

Installation, Maintenance and Operating Manuals and Data Books

6.5.1. 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.

6.5.2. Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.

6.5.3. The *Contractor* submits the draft Table of Contents to the *Project Manager* for acceptance prior to the compilation and official submittal of the manuals.

6.5.4. 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.

6.5.5. The address, phone numbers, fax numbers and reference numbers of all Sub-*Contractor*s is provided

6.5.6. 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*.

6.5.7. All electronic copies (pdf) of Data Packs to be properly indexed.

6.5.8. A typical example of what the binder/file (s) shall be marked with on the spine and the front cover is as follows: -

- Project No./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

6.5.9. 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)
- 3 x CD ROMS with Adobe Acrobat (.pdf) and "Native" formats

7. Safety risk management

7.1. Health and Safety Standard

- The *Contractor* must comply with the requirements of the Project Health and Safety Specification – PHSS-0001 and OHS Act No. 85 of 1993 and its applicable Regulations.
- The *Contractor* must comply with Post COVID-19 Lockdown Construction Site Health and Safety Guidelines- TGC-IMS-HS-SOP-009.001 and Disaster Management Act: Regulations relating to COVID-19.
- The *Contractor* must comply with SOP COVID-19 Health Care Waste Management on Construction sites – TGC-IMS-ENV-SOP-009.001

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

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

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

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

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

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

7.3. *Contractor's* Health and Safety Management

The *Contractor* must prepare, implement and maintain a project-specific Health and Safety Management Plan. The plan must be based on the requirements set out in this Project Health and Safety specification as well as all applicable legislation. It must cover all activities that will

be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

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

- A copy of the *Contractor's* Health and Safety Policy; in terms of the OHS Act section 7;
- Procedures concerning Hazard Identification and Risk Assessment, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable Legal and Other Requirements, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning Health and Safety Objectives – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning Resources, Accountabilities and Responsibilities – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a *Project Manager*, Health and Safety Officers, *Supervisors*, Health and Safety Representatives, and First Aiders;
- Details concerning Competence, Training and Awareness – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- Communication, Participation and Consultation arrangements concerning health and safety, including Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- Documentation and Document Control – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining Operational Control, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- Emergency Preparedness and Response procedures;
- Management of Change – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- Sub-contractor Alignment procedures – a process must be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- Measuring and Monitoring plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. noise, dust, etc.) in order to determine the effectiveness of control measures;
- Incident Reporting and Investigation procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- Non-conformance and Action Management procedures concerning the management of corrective actions;

- Performance Assessment and Auditing procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the Management Review process followed to assess the effectiveness of health and safety management efforts. Site Supervision
- The *Contractor* shall comply with OH&S Act – Section 8, 9, 13 and 16 and the Construction Regulations 2014.
- The *Contractor* must nominate and appoint a responsible person on site to whom the *Project Manager* may refer in connection with *The Works*. Persons are nominated for all shifts worked or whilst any activity relating to the Contract is being performed on site and must have the authority to bind the *Contractor* with respect to the Contract. (OH&S Act - 16 Section (2)).
- The *Contractor* must ensure that the performance of all specified *works* is supervised throughout by a sufficient number of qualified and competent appointed representatives of the *Contractor*, who have experience in the type of work specified. (OH&S Act – Construction Reg. 8 (1) and 8 (2.)
- Note: No work may commence and or continue without *Supervisor*y Appointees present on site. The *Contractor's* Site *Supervisor* must be equipped with a mobile telephone with message bank and/or pager or an equivalent communication device so that communication throughout the Contract can be maintained at all times.
- The *Contractor's* Site *Supervisor* must provide a list of names and contact telephone numbers of all contractors and sub-contractor's contact persons on Site. This list is updated as a new contractor or sub-contractor employee commences on Site.
- The *Contractor's* Site *Supervisor* must keep a record of all employees, including date of induction, relevant skills and licences, and be able to produce this list at the request of the *Supervisor*.
- The *Contractor's* Site *Supervisor* must complete manning sheets describing the day's activities, labour numbers and classifications and issue these to the *Supervisor* prior to 9.00 am on a daily basis.
- The *Project Manager's* Site Safety Representative is notified of any new starter with evidence of induction and site-specific induction prior to commencement of work.

7.4. *Contractor's* Safety Officer

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

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

The *Contractor* Health and Safety Officer shall be responsible for:

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

- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

The *Contractor* must ensure that they have made adequate provision of safety officers as per *The Works* Information. The *Contractor* must ensure that the Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be provided with the following:

- A computer with access to all necessary systems, including access to e-mail and the internet;
- A mobile telephone on contract or with adequate pre-paid airtime; and
- A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).
- A Health and Safety Officer must be computer literate, fluent in English, and must have the following minimum qualifications, training and experience:
- At least 5 years' experience as a Health and Safety Officer on construction, electrical and mechanical projects;
- SAMTRAC or NEBOSH or Modern SHEQ Risk Management training course as a minimum qualification;
- Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard;
- Experience and appropriate training with regard to construction related hazard identification and risk management processes;
- Competence, experience and relevant training with regard to incident investigation procedures and causation analysis;
- Health and safety auditing experience and training;
- A valid First Aid certificate of competency;
- Fire prevention and protection training; and
- A valid Driving Licence (light motor vehicle).
- Registered as a Health and Safety Officer with SACPCMP depending on the size of the project and on the risk.
- Before placing a Health and Safety Officer on the project site(s), the *Contractor* must forward a copy of the person's CV to the nominated project management representative or to the Programme Health and Safety Manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and/or qualification requirements, or due to poor work performance on previous projects.

7.5. *Contractor's* Safety Manual

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

The *Project Manager* may require the *Contractor* from time to time to supplement its safety manual, policies and procedures with guidelines and/or operating standards provided to the *Contractor* by the *Project Manager*. The *Contractor* must comply with such requests where the

request is consistent with the requirements of the Contract. The *Contractor* must give prompt written notice to the *Project Manager* of any objection to the requested supplement, including the reasons for objection. The *Project Manager's* rights under this Clause are not intended, and must not be construed, to relieve the *Contractor* from any obligations to ensure compliance with all provisions of this Contract.

7.6. Performance Measurement and Reporting

7.6.1. Health and Safety Statistics

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

7.6.2. Safety Management Records

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

7.6.3. Field Technical/Safety Audit by the *Project Manager*

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

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

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

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

The *Project Manager* or the *Project Manager's* nominated Representative will establish a schedule of regular field safety audits which will be based on an audit tool aligned to the *Contractor* Safety Management Plan and site operations and activities. The *Contractor* audit conformance will be assessed as a percentage and where conformance is better than 90% it will be considered satisfactory and the *Contractor* must develop and implement an action plan within 4 weeks, to be reviewed at the next regular audit. Where the *Contractor* level of conformance is between 80 – 90%, a corrective action plan will be required to be developed and implemented within 2 weeks, and a follow up audit will be carried out. Where the *Contractor* conformance is less than 80% the *Contractor* must stop work until an investigation of the cause/s has been completed and corrective actions have been developed and implemented by the *Contractor*.

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

7.6.4. Unsafe Act/Condition Auditing

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

All such observations must be recorded and delivered to the TPT Health and Safety Manager.

7.6.5. Involvement, Communication and Motivation

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

7.6.6. Safety Meetings

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

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

Such meetings should at least address:

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

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

7.6.7. Pre-Start Safety Briefings

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

- The *Contractor's* Site Manager and a Site Safety Representative must take part in weekly safety review meetings between the *Contractor* and the *Project Manager* or the *Project Manager's* nominated Representative.
- The *Contractor* must attend all project safety meetings as outlined in the Project Safety Management Plan.

7.6.8. Site Safety Review Committee

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

7.6.9. HAZOP Review

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

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

7.6.10. Job Safety Analysis

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

7.6.11. Lines of Communication

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

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

7.7. Roles and responsibilities

- The roles and responsibilities of the various personnel acting on behalf of the *Project Manager* with respect to the SMP and health and safety issues are as stated in the paragraphs following:
- Construction Manager
- The CM is responsible (in the context of the SMP only) for health and safety on the Site and Working Areas and reports to the *Project Manager*.
- The CM specific tasks (in the context of the SMP) are:
- Implement the safety management system
- Monitor compliance to the established safety management system
- Ensure risk is at an acceptable level
- Ensure Consultant Construction Management Team are competent
- Provide for:
- Planning, organisation, leadership and control
- Particular technical competencies for critical work
- Supervision and control on each shift
- Regular monitoring and assessment
- Workplace inspections
- Project Site Safety Manager
- The PSSM is responsible for ensuring that the *Contractor* complies with the SMP. The PSSM acts on behalf of the *Project Manager*.
- The PSSM specific tasks (in the context of the SMP) are:
- Define, in accordance with the HSSP, the:
- Safety program (instructions, training, meetings, inspections, incentive)
- Health and medical program

- Checks that *Contractors* have issued their Health and Safety plans, PPSPS and procedures before the beginning of work
- Organizes safety awareness campaigns
- Promotes communication on all health and safety matters (awards, incentives, meeting/inspections/audits reports)
- Checks conformance of equipment to technical requirements and regulations.
- Issues and address the site EHS activities reports
- Promotes everybody's best efforts to keep accident frequency and severity ratios at their lowest level
- Promotes a proper and continuous housekeeping of Plant and temporary facilities in order to create the most suitable conditions for workers to wok and to be encouraged to follow HSE requirements
- Conducts *Works*ite EHS walks with all *Contractors*, and directs appropriate corrective actions
- Monitors that all factors likely to improve health and safety are taken into consideration, particularly those which lead to:
- Promoting personnel protection as an absolute requisite
- Investigating, identifying and neutralizing potential hazards
- Close coordination with all parties involved in construction in order to avoid overcrowded areas and dangerous operations
- Thorough preparation of work critical phases
- Close contacts to local EHS authorities
- Continuous follow-up in order to correct immediately unsafe acts and situations
- In case of accident, he takes actions necessary to:
- Initiate quick interventions of the emergency means.
- Check that first aid and evacuation of injured persons are properly carried out.
- Obtain a clear accident report from the sub-contractor concerned.
- Report immediately to the Construction Manager.
- Investigate to identify the root causes of all incident and near misses.

7.8. Commissioning Safety Study

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

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

- Electrical integrity systems are in place (e.g. equipment tests and inspections of critical equipment, quality control procedures, etc.) which will confirm that construction, equipment and materials are in accordance with design specifications
- Formal hazard analyses for pre-commissioning and commissioning activities have been completed, appropriately documented and communicated, and are available to all personnel.

- Punch-list work has been sufficiently completed so that installations are safe to apply hazardous energy.
- Documentation relevant to any modifications has been created/updated.
- Safe operating, maintenance and emergency procedures are in place.
- Operating and maintenance manuals are available, and training of commissioning employees has been completed.
- As Built drawings are available.
- A Commissioning Permit (to apply hazardous energy) is developed and implemented.

The *Project Manager* will ensure that after commissioning there is a formal documented hand over to operations and maintenance personnel and others who will be impacted by hazards that have been identified during project activities. This will involve communication of any changes to the process hazards, procedures and operating philosophy. Safe systems of work will be established and updated throughout the Project. Safe systems of work will be subject to on-going review to ensure their effectiveness. Site-wide Permits to Work will be used as the basis of safe systems of work for specified hazardous activities.

7.9. Working at Nights

A site-specific health and safety management plan should be well documented and structured so that both *Employer*s and employees can benefits from its use. The following are recommended components of a safety management plan for nighttime and working extended hours or weekend *Works*.

7.9.1. Site personnel responsibility

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

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

7.9.2. Permission to work at night

The *Contractor* shall apply in writing for permission to work at night and should be obtained from the relevant authority in this case TPT *Project Manager*, before construction *Works* at night is carried out. The *Contractor* should submit their application for work at night permit to TPT Client representative and it is advisable to follow all requirements enforced by the authority to executing nighttime construction *Works*. It is recommended that TPT representative should also notified TPT responsible personnel about intended night shift work.

7.9.3. Housekeeping

Accidents can occur as a result of poor housekeeping. Hazards at construction site are the same for both day and night shift while the risks of injury are much higher during night *Works* because of the inherent poor illumination. It is essential that the workplace is kept clean and tidy to ensure safety and prevent accidents.

7.10. Emergency Preparedness and Response (EPR)

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

7.10.1. Public safety

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

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

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

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

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

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

7.10.2. Types of Risks and factors affecting night-time work

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

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

The *Contractor* must ensure that they implement the following step in an effective risk management program as to identify possible risks. Specific concerns related to night time work zones include poor visibility and work quality, staffing issues, unwanted noise and glare, decreased worker and driver alertness, impaired drivers, higher vehicle speeds, increased labour costs, materials and traffic control, and problems in logistics and supervision. These risks are categorized broadly as safety, cost/production and schedule, quality, organizational relationships, technical, construction, economic and environmental.

7.10.3. Risk

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

7.10.4. Document Control

All safety documents shall comply with the Project Document Control Procedures.

7.10.5. Medicals

Pre-employment medicals, including chest X-ray examinations, specific for the Contract will be required for all employees working on the Site regardless of duration spent on Site. Exit medicals, including chest X-ray examinations will be required at the end of the Contract. These medical examinations must be carried out by a registered Occupational Health Practitioner.

The *Contractor* must ensure that budget provision for SHE requirements are in place

8. Environmental constraints and management

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, municipal bylaws i.e. schedule trade and occupations bylaws as well as the accepted environmental good practice.

All aspects of *The Works* must comply with the Transnet Standard environmental specification, waste management, spill control procedure, statutory requirements and regulations made by relevant authorities and the *Contractor* must ensure compliance of Site activities.

All required licences and permits must be obtained from relevant authorities prior to the commencement of project activities.

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

- Environmental Baseline Report: TPT HQ move – 202 Anton Lembede Street
- Environmental Risk Assessment: TPT HQ move – 202 Anton Lembede Street
- Integrated Management System Management Procedure TRN-IMS-GRP-PROC-001
- Transnet Integrated Management System (TIMS) Policy Commitment Statement
- Integrated Management System Policy Commitment Statement Procedure TRN-IMS-GRP-PROC-002
- Standard Environmental Specification (ENV-STD-02 Rev 04).
- Construction Environmental Management Plan (ENV-STD-01 Rev 04).
- COVID 19 Post Lockdown Construction Site Health and Safety Guidelines

The *Contractor* must also comply with the following documents:

- EThekwini Municipality *Schedule Trades and Occupations Bylaws*
- EThekwini Municipality *Interim Code relating to fire prevention and Flammable liquids and substances*

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 CEMP and SES as well as the environmental baseline report.

The CEMP describes the main 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.

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

The above requirements shall be applicable to the main *Contractor*, its service providers and suppliers. The *Contractor* must comply with all the requirements of the CEMP, SES and PES as mentioned in section 5.6.3 above.

The *Contractor* must sign the declaration of understanding as a commitment to abide with TPT Environmental Governance Framework, Project Environmental Specification, COVID 19 Post Lockdown Construction Site Health and Safety Guidelines and COVID-19 Health Care Waste Management on construction sites. Sufficient environmental budget must be allocated to meet all the project environmental requirements for the duration of the contract.

The *Contractor* must appoint a Safety, Health & Environmental Officer (SHEO) to monitor and manage compliance to Environmental Specification and all applicable environmental legislation. The SHEO must as a minimum have at least 3~~5~~ years work experience in environmental management within the civil/structural and/or demolition construction projects.

Construction environment. The roles and responsibilities of the *Contractor*'s SHEO are stated in CEMP. The *Contractor*'s SHEO must be 100% full time on site during working hours.

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*.

The overarching obligations of the *Contractor* under the CEMP before construction activities commence on the Site and/or Working Areas is to provide environmental method statements (as contained under section 5.5 of the CEMP) 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 SES document are achieved. The method statements will be prepared in accordance with the requirements set out in the CEMP. 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.

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 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*.

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

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

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 cleaning all areas to the satisfaction of the TPT Environmental Manager or Environmental Officer as detailed in the SES. Sufficient environmental budget must be allocated to achieve this including all environmental requirements for the project for the duration of the contract.

The *Contractor* must ensure that its subcontractors comply with the Environmental Specification.

The *Contractor* must appoint the waste removal Service Providers who ~~is~~ are licenced to operate within the Transnet properties.

The *Contractor* or sub-contractors must be in possession of eThekwini Municipality's Schedule Trade and Occupations permit if they are to be engaged in any of the activities contained under eThekwini Municipality Scheduled Trade and Occupations.

The *Contractor* must comply with Transnet Asbestos Management Plan should asbestos contamination be uncovered during excavation and/or demolition.

9. Quality assurance requirements

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

The *Contractor's* Quality Management System shall conform to International Standard ISO 9001 (or an equivalent standard acceptable to the *Project Manager*) and as a minimum to the requirements of specification QAL-STD-0001, General Quality requirements for Suppliers and contractors as contained in the Annexure to this *Works* Information.

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:

- Typical Project Quality Plan (PQP) for the contract;
- Valid ISO 9001Certificate
- Index/List of Procedures/Method statement to be used
- Qualification and experience of Quality personnel
- Project specific Quality Control Plan
- Typical Quality Data book Index

The *Contractor's* PQP includes or references to the quality plans of his Sub-contractors and Suppliers.

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.

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

The Project Quality Plan means the *Contractor*'s statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that *The Works* meet the standards stated in *The Works* Information. Site Access will not be granted unless the PQP has been accepted by *The Employer.*

The Quality Control plans shall identify all inspection, test and verification requirements to meet Contractual obligations, specifications, drawings and related details including destructive, non-destructive testing, witness and hold points. The *Contractor* shall not commence fabrication or manufacture prior to review and acceptance of the applicable QCP's by *The Employer*.

The Index of Procedures means the *Contractor's* system for management of:

- Documentation Control
- Design Control
- Procurement

The Inspection and testing means:

- Quality Control Plans
- Inspection Points
- Schedule of Inspections
- Field Inspection Checklists
- Inspection Notification
- Inspection release
- Inspection and testing
- Special processes
- Welding Procedures
- Material traceability and certification

10. Planning Constraints

The *Contractor*'s construction programme shall correspond with *The Employer's* objectives as stipulated in Section 1 Clause 1 of *The Employer's Works* Information.

The *Contractor*'s construction programme shall correspond with the stipulations included in under Section 1 Clauses 3 and 4 of *The Employer's Works* Information, which details the minimum construction constraints to be considered in providing *The Works*.

The *Contractor*'s construction programme shall comply with the stipulations included in Section 2 Clause 5.6 of *The Employer's Works* Information, which details the minimum Environmental Management constraints as imposed on the provision of *The Works*.

The *Contractor*'s construction programme shall comply with the stipulations included in Section 2 Clause 5.5 of *The Employer's Works* Information, which details the minimum Health & Safety constraints as imposed on the provision of *The Works*.

The *Contractor*'s construction programme shall comply with the stipulations included in Section 2 Clause 5.7 of *The Employer's Works* Information, which details the minimum Quality Assurance constraints as imposed on the provision of *The Works*.

The *Contractor*'s construction programme shall include any reasonable foreseen and unforeseen constraints, assumptions and conditions which may arise in line with the overall scope as outlined under but not limited to Sections 1 and 2 of *The Employer's Works* Information.

The *Contractor*'s construction programme shall be aligned with the specific stipulations and constraints pertaining to construction as stipulated under Section 1 Clause 3 and 4 of *The Employer's Works* Information, and shall be in line with the overall scope, *Works* Information, specifications and any other documentation as annexed to this contract.

Access to site will be issued in accordance with the dates stipulated within *Contract Data Part One*; pending approval of *Project Manager*.

Completion as detailed in the relevant section of *The Works* Information will be in accordance with the dates stipulated within *Contract Data Part One*; pending approval of *Project Manager*.

The *Contractor* shall comply with the provisions of NEC ECC Clauses 25.1, 27.1 and 27.2 when providing occupations to the Working Areas to allow for potential *works* to be undertaken by *Others*.

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.

11. Programming constraints

The *Contractor's* construction WBS 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*.
- *Contractor's* design as a well as associated procedure for *Contractor's* design submission and acceptance of any portion of *The Works* and/or approval of Plant as stipulated under Sections 1 Clause 2 of *The Works* Information in accordance with the stipulations for submission, acceptance and approval as stipulated under the relevant section(s) of *The Employer's Works* Information*;* including any other additional design requirements, interfacing and or alterations in existing design which may stem from the aforementioned.
    - Manufacturing and or Fabrication both on and off-site which may include but is not limited to; Plant, equipment, materials and any other resources, as required to provide both temporary and permanent *works*.
    - Preparation and Approvals of Health & Safety, Environmental and Quality Documentation.
    - Approval of any applicable permits, permissions and licenses, including inductions

The *Contractor's* construction programme shall correspond with the *Contractor's* Method Statements, Quality Control Plans and Risk Assessments, as drafted in line with *The Employer's* stipulations.

The *Contractor* uses Primavera Professional version 19.12 for his programme submissions, or similar approved software with the prior written consent of the *Project Manager*. In the event that the *Contractor* will be using earlier or later versions of the software, the onus is on the *Contractor* to ensure that a conversion is done in order for the XER file to be compatible with Primavera Professional version 19.12.

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.

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* and/or during the contract period as stipulated in this *Works* Information.

Others operate on *Site* during dates or timings when the *Contractor* has completed certain elements of *The Works* as stipulated in this *Works* Information.

The *Contractor's* first programme submitted for accepted shall 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).

The *Contractor* complies with *The Employer's* high-level programme when he submits his first programme for acceptance.

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

The *Contractor* shows on his programme submitted for acceptance and all subsequently revised programmes, the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.

The *Contractor*'s programme shows duration of operations in working days as per the stipulated definition of the work days and hours in *The Employer's Works* Information.

Each programme submitted by the *Contractor* to the *Project Manager*, is fully Cost and Resource Loaded (People, Equipment, Plant, Materials & Other Resources) with the exception of the *Contractor's* tender programme submission.

The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements as listed in the NEC 3, ECC, Clause 31.2.

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; monitoring, control and reporting requirements; proposed templates and planning/scheduling procedures to be complied with for the duration of the project.

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 spread sheet identifying instances of resource over-allocation and/or conflicts, accompanied by proposed resolutions.

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

- Level 1 Master Schedule – defines the major operations and interfaces between engineering design, procurement, fabrication and assembly of Plant and Materials, transportation, construction, testing and pre-commissioning, commissioning and Completion.
- Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below.
- Level 3 Project Schedule – detailed schedules generated to demonstrate all operations identified on the programme from the starting date to Completion. Individual operations will be assigned a code. *The Employer* notifies any subsequent layouts and corresponding filters on revised programmes.
- Level 4 Project Schedule –detailed discipline/speciality level schedule decomposed to the 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.
- A narrative status report, which includes but is not limited to status and performance of operations on the *Site* and Working Areas; status and performance of operations outside the Working Areas; manpower histograms; S-curve of overall progress; critical action items (top 10) and deviations from the Accepted Programme and action plan to rectify.
- Basis of Programme/Schedule document detailing but not limited to the following minimum requirements:

- Basis of latest accepted programme, including an overview of assumptions, constraints, specific and quantified resource allocations, productivity assumptions and basis of calculation, identification and justification of general scheduling provisions such as calendars and working times, lags, date constraints, activity durations longer than one reporting period, etc.
- Description of network logic and sequencing.
- Description of general construction approach.
- Description of approach to allocation, use and management of all resources dedicated to the project.
- Description of and trend analysis of critical risks as identified through schedule risk analysis and included in schedule contingency and or Time Risk Allowance provisions.
- Discussion regarding the basis, method of calculation and validity of the critical path and near critical paths, (interrogate longest path and total float as contained in the programme).
- Reporting on change management, i.e. identify and record any deviations/changes that have taken place within the previous reporting cycle, and their resultant impact on the remaining *works* and as identified and highlighted in the current revision of the programme for acceptance.
- Identification critical activities, as well as top 10 near critical activities and undertake tends analysis on such activities with the aim of identify any deviations from planned performance.

12. Reporting and Monitoring

The *Contractor* attends meetings as included but not limited to Section 2 Clause 5 of *The Employer's Works* Information.

The *Contractor* attends weekly planning meetings. Meeting agenda to include progress reporting as detailed under Section 2 Clause 5.10 of *The Employer's* Works Information, recovery/optimisation, contractual matters in line with NEC ECC core clauses 31, 32 and main option clause, Option B.

The *Contractor* submits programme narrative report to the *Project Manager* at weekly intervals in addition to the intervals for submission of revised programmes stated under *Contract Data Part One*. The *Contractor* also submits fortnightly expediting report and monthly programme narrative report to *Project Manager*.

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 action to rectify deviations.

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*.

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".

The *Contractor*'s **weekly** project progress report (narrative report) includes but is not limited to:

- Level 4 Project Schedule – showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.

- 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 activities, progress and any deviations from planned performance in this regard.
- 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.
- 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 3-week Look Ahead Schedule.
- 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*.
- Manpower Histogram – reflecting actual, forecasted and planned activities.
- Plant and Equipment Histogram – reflecting actual, forecast and planned activities.
- S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract.
- Identification critical activities, progress and any deviations from planned performance.
- Adherence and actual performance achieved with regards to Environmental, Health & Safety and Quality Management.

The *Contractor's* **fortnightly** expediting report includes but is not limited to:

- The *Contractor* shall submit to the *Project Manager*, a bi-weekly report on progress of any off-site manufacturing activities undertaken during the previous half-month.
- Based on the Accepted Programme/ latest programme submitted for acceptance the *Contractor* submits a cash flow forecast report that details the anticipated monthly cash flow, represented by the expected assessment of the amounts due, to the *Project Manager*. The cash flow forecast is to be extrapolated from the latest Accepted Programme through the mechanism of the cost loaded schedule or other similar methodologies with the prior approval of the *Project Manager*.

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

- Monthly, the *Contractor* completes an assessment of all activities in progress and to completion, and accordingly revises and submits the updated programme for acceptance and cash flow forecast report detailing any variances and proposes remedial actions to rectify deviations.
- The *Contractor*'s 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.
    - 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 spread sheet detailing specific over-allocation and/or conflicts in allocation of resources.
- *Contractor's* Plant and equipment histograms, including a control spread sheet detailing specific over-allocation and/or conflicts in allocation of resources.
- S-curves of overall progress.
- Critical action items list (top 10).

13. Other Conditions

The *Contractor* shall comply with the specific provisions of NEC 3 ECC Clauses 24.1 when supplanting any planning resources previously appointed in line with the provisions of this contract. Appointment shall follow upon written approval of the *Project Manager*.

The Employer (including the agents of *The Employer*), reserves the right to exercise the provisions of NEC 3 ECC Clause 24.2, where deemed necessary in order to meet *The Employer's* objectives as stipulated in Section 1 Clause 1.2 of *The Works* Information.

14. *Contractor*'s management, supervision and key people

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.

The *Contractor* employs full time, fully qualified and experienced key persons who have been delegated sufficient authority to manage the contract efficiently on-Site during completion of *The Works* including and not limited to:

- Contracts Manager
  - The Contracts Manager should at least have a minimum qualification of a BSc. Eng./ B.Tech./ National Diploma in Electrical Engineering and a ECSA/SACPCMP registration as Pr. Eng/Pr. Tech. Eng./ Pr. Cert Eng./ Pr. CPM with at least 10 years of experience in Electrical LV projects. The Contracts Manager must have experience working with the NEC3 Engineering and Construction Contract in at least 3 separate projects.

- Construction Manager X 1
  - The Construction Manager should at least have a minimum qualification of a B.Tech/National Diploma in Electrical Engineering and a ECSA/SACPCMP registration as Pr. Eng/ Pr. Tech. Eng./ Pr. Cert Eng./ Pr. CM with at least 10 years of experience in LV and area lighting construction projects. The Construction Manager must have experience working with the NEC3 Engineering

and Contract in at least 1 project in excess of R25m in electrical works (LV switchgear, high mast lighting and street lighting) component value.

- Installation Electrician/Mechanical X 2
    - The Installation Electrician must have at least 10 years of experience in Low Voltage (LV) installations and be registered with Department of Labour as an installation electrician.

- Foremen
    - Foreman (Electrical LV/ Mechanical HAC) x 2
        - The Electrical/Mechanical Foreman must have a minimum of NTC 4 Trade Certificate in Electrical Engineering with at least 10 years of experience in Electrical LV Projects and be registered with Department of Labour as an installation electrician.
- Planner X 1,
    - The planner should at least have 5 years of experience working in building and civil projects as planner.
- Quality Assurance Officer X 1,
    - Quality Assurance officer should have a Diploma or Certified qualification in quality systems with relevant quality experience in construction. At least 5 years of experience in a quality systems environment and relevant experience in electrical/civil construction projects is required.
- Safety, Health & Environmental Officer X 1,
    - SHEO should have ~~a~~ at least SAMTRAC or equivalent with a minimum of 3 years work experience in civil/structural and/or demolition construction projects. The officer must be registered with SACPCMP as a Construction Health and Safety Officer. The SHEO must also have undergone Environmental awareness and short courses.
- Document Controller X 1,
    - Document controller should have at least 5 years of experience working in construction and experience working with the NEC3 Engineering and Construction Contract Option chosen for this contract.

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.

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 2.5 of C3.1 *Employer's Works* Information.

15. Training Workshops

The *Contractor* facilitates the following requirements for training workshops:

- The *Contractor* will be required to provide training in the use of the plant to the responsible staff of *The Employer*.
- On completion, each delegate to be given a handbook that covers the training undertaken.
- A safety pre-mobilisation workshop.

- Contractor employee safety training programme.
- The *Contractor* shall utilise local people for staffing up some of his requirements and shall ensure that there is adequate skills transfer taking place.
- Any other training as required by law or specifications referred to in this document

16. Insurance provided by *The Employer*

The insurance that will be provided by *The Employer* is as per the procedure manual contained in the List of Annexures.

The procedure manual further details the cover to be arranged by the *Contractor* and subcontractor as well as exclusions and deductibles.

The *Contractor* liaises with *The Employer* and the *Project Manager* at the Contract Date to declare the ECC3 contract details to *The Employer's* insurance brokers, Willis Towers Watson.

Where *The Works* involve the assembly, erection and installation of Plant, the *Contractor* declares the full replacement value and not the value included in the ECC3 contract.

The *Contractor* liaises with *The Employer* and the *Project Manager* when a claim is made and assists in completing the Claims Advice Forms that shall be provided. Contract change management

No additional requirements apply to ECC Clause 60 series.

17. Contract change management

For ease of communication standard templates shall be used for contract change management. The *Contractor* forwards all correspondence with respect to contract change management, i.e. Early Warnings and notifications of Compensation Events, on the standard templates provided.

18. Provision of bonds and guarantees

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

The *Contractor* provides a bond or guarantee as required by the conditions of contract concurrently with the execution by the Parties of the form of agreement for the ECC contract.

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

The *Contractor* keeps the following records available for the *Project Manager* to inspect:

- Records of design employee's location of work or professional engineers engaged by the *Contractor*
- Records of people and Equipment within the Working Areas
- Records of Equipment used, and people employed outside the Working Areas
- Records of quotations, invoices and pay slips.

20. Procurement

20.1. Code of Conduct

The Employer aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy. Underpinning our process are several acts and policies that any supplier dealing with *The Employer* must understand and support. These are:

- The Transnet Detailed Procurement Procedure (DPP);
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (BBBEE); and
- The Anti-Corruption Act.

This code of conduct has been included in this contract to formally apprise *The Employer* Suppliers of *The Employer's* expectations regarding behaviour and conduct of its Suppliers.

20.2. Prohibition of Bribes, Kickbacks, Unlawful Payments, and Other Corrupt Practices

The Employer is in the process of transforming itself into a self-sustaining State-Owned Enterprise, actively competing in the logistics industry. Our aim is to become a world class, profitable, logistics organisation. As such, our transformation is focused on adopting a performance culture and to adopt behaviours that will enable this transformation.

1 *The Employer will not participate in corrupt practices and therefore expects its suppliers to act in a similar manner.*

- *The Employer* and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with and payments to our suppliers.
- Employees must not accept or request money or anything of value, directly or indirectly, to:
  - Illegally influence their judgement or conduct or to ensure the desired outcome of a sourcing activity;
  - Win or retain business or to influence any act or decision of any decision stakeholders involved in sourcing decisions; or
  - Gain an improper advantage.
- There may be times when a supplier is confronted with fraudulent or corrupt behaviour of *The Employer* employees. We expect our Suppliers to use our "Tip-offs Anonymous" Hot line to report these acts (0800 003 056).

2. *The Employer is firmly committed to the ideas of free and competitive enterprise.*

- Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust.
- *The Employer* does not engage with non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting)

3. *The Employer's relationship with suppliers requires us to clearly define requirements, exchange information and share mutual benefits.*

- Generally, Suppliers have their own business standards and regulations. Although *The Employer* cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
  - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
  - Collusion;
  - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
  - Corrupt activities listed above; and
  - Harassment, intimidation or other aggressive actions towards *The Employer* employees.
- Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted, and the supplier is expected to participate in an honest and straight forward manner.
- Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

Conflicts of Interest

1. *A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of The Employer.*
   - Doing business with family members
   - Having a financial interest in another company in our industry

21. The *Contractor's* Invoices

When the *Project Manager* certifies payment (see NEC3 ECC Clause 51.1) following an assessment date, the *Contractor* complies with *The Employer's* procedure for invoice submission.

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

Invoices must be submitted by the 18th of the month forecasted to the 25th of the month.

The invoice states the following:

- Invoice addressed to Transnet Limited;
- Transnet Limited's VAT No: 4720103177;
- Invoice number;
- Registered name of the *Contractor*;
- Address (Physical and Postal) of the *Contractor*;
- The *Contractor's* VAT Number; and
- The Contract number : 2127737-797

The invoice contains the supporting detail:

- The amount paid to date;
- Amount for payment (excluding VAT);
- VAT amount;
- Amount for payment (including VAT);
- Any retention monies to be deducted from the invoice;

- Any interest payable;
- Escalation formula used where applicable;
- Settlement discount;
- Proof of ownership of Materials supplied;
- A statement is to accompany each invoice

The invoice is submitted, on the 18th of the month and forecasted to the 25th, either by post or by hand delivery of the assessment month. Statements must accompany invoices.

Invoices submitted by post are addressed to:

Transnet Port Terminals North Tower Building

Kingsmead Office Park

Stalwart Simelane Street

Durban

4001

For the attention of The Lead Contracts Administrator

Invoices submitted by hand are presented to:

Transnet Port Terminals North Tower Building

Kingsmead Office Park

Stalwart Simelane Street

Durban

4001

For the attention of The Lead Contracts Administrator

The invoice is presented as an original.

The *Contractor* ensures that *The Employer* has his correct banking information to make the electronic payment transfer.

All payments are provisional and subject to audit. The *Contractor* preserves his records for such a period of time as legislation requires, but in any event not less than five (5) years.

The Employer deducts any amount owed by the *Contractor* to *The Employer* from any amount payable by *The Employer* to the *Contractor*.

22.Subcontracting

The *Contractor* shall not appoint or bring subcontractors onto Site without the prior acceptance of the *Project Manager*, and all subcontractors will be required to conform to the requirements as set out herein as if they were employees of the *Contractor*.

The *Contractor* shall not deviate from an approved subcontractors list without prior acceptance of the *Project Manager*

Subcontract documentation, and assessment of subcontract tenders:

22.1. The *Contractor* is required to appoint his subcontractors under the NEC3 Engineering Contract Sub Contract unless accepted otherwise by the *Project Manager*, and all subcontractors will be required to conform to the requirements as set out herein as if they were employees of the *Contractor*.

22.2. The *Contractor* shall ensure that the quality assurance, health and safety, industrial relations, environmental, documentation control and all other requirements placed on him under this contract are transferred into any subcontracts.

22.3. The *Contractor* **shall not** subcontract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level of contributor than the person concerned, unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract.

23. List of Annexures

All the annexures listed hereunder shall be deemed to form part of *The Works* Information.

The Annexures listed in the Table below are available **only** in the soft copy format (CD).

Annexure	Description / Discipline	Document No(s)
A	Drawings	As per list in 5
B1	Technical specification for electrical installations to building other than dwelling houses	TPD-001-EL&PSPEC
B2	Technical specification for low voltage distribution boards	TPD-002-DBSPEC
B3	Technical specification for the installation of medium and low voltage cables.	TPD-003-CABLESPEC
B4	Technical specification for the earthing and protection of building and structures against lightning.	TPD-004-EARTHINGSPEC
C	Project Health and Safety Specification	PHSS-0001
D	Site Emergency Management	HAS-P-0001 - Rev 0
E	Occurrence Reporting and Investigation	HAS-P-0002 - Rev 0
F	Guidelines for Managing Common Hazardous Activities and Tasks	HAS-GN-0001 rev 0
G	CAD Standards	ENG-STD-0001
H	Construction Environmental Management Plan (CEMP)	ENV-STD-001 Rev 04
J1	Standard Environmental Specifications (SES)	ENV-STD-002 Rev 04

J2	List of Schedule Trades	
J3	*Contractor* Documentation Submittal Requirements	DOC-STD-0001 rev 3
K	General Quality Requirements for Suppliers and *Contractor*s	QAL-STD-0001 rev 0
L	Certificate of Insurance: Transnet (SOC) Limited-Principal Control Insurance	
M	Health & Safety Questionnaire	T2.2-XX
N	Post COVID-19 Lockdown Construction Health and Safety Guidelines	TGC-IMS-HS-SOP-009.001
P	Baseline Risk Assessment	
Q	TIMS Policy Commitment Statement	IMS-GRP-GDL-0002.1
R	Signage Kit of Parts and Specifications	
S	Specification for Corrosion	EEAM-Q-008
T	Asbestos Management Procedure	009-TRN-CLO-SUS-8848
U	Policy Management Procedure	TRN-IMS-GRP-PROC-002
V	Environmental Baseline Report – 202 Anton Lembede Street	
W	Environmental Risk Assessment report – 202 Anton Lembede Street	