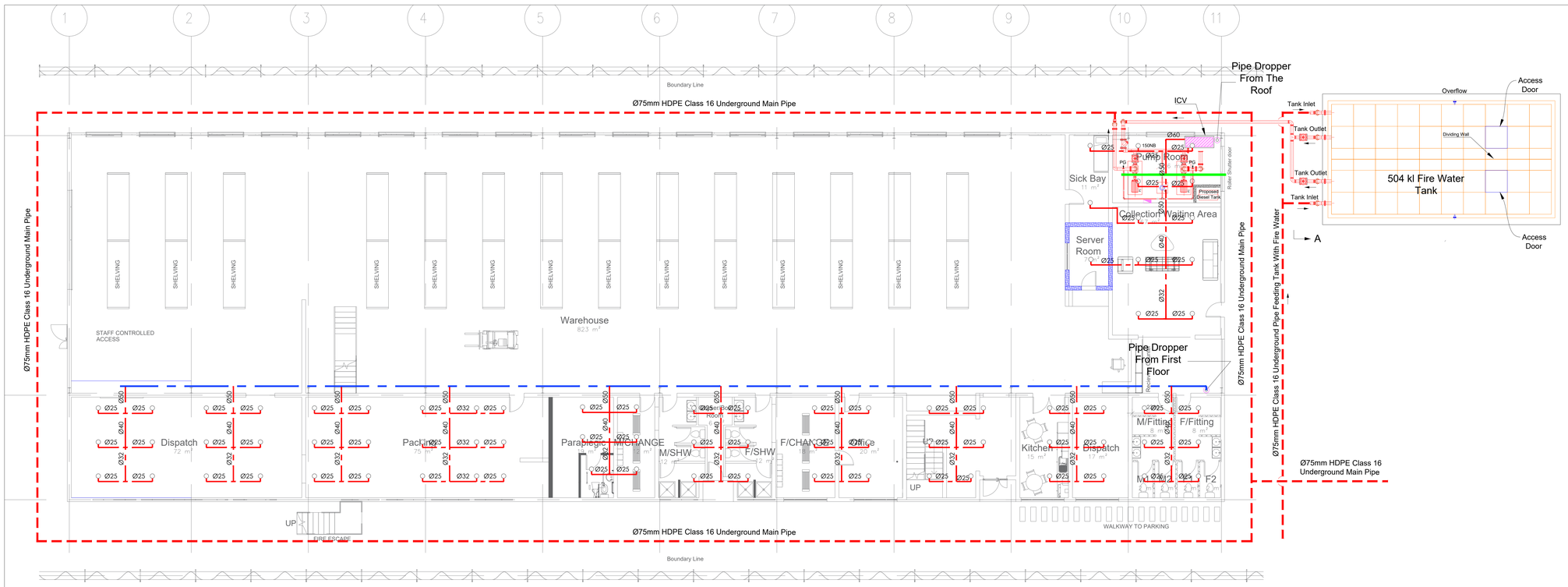
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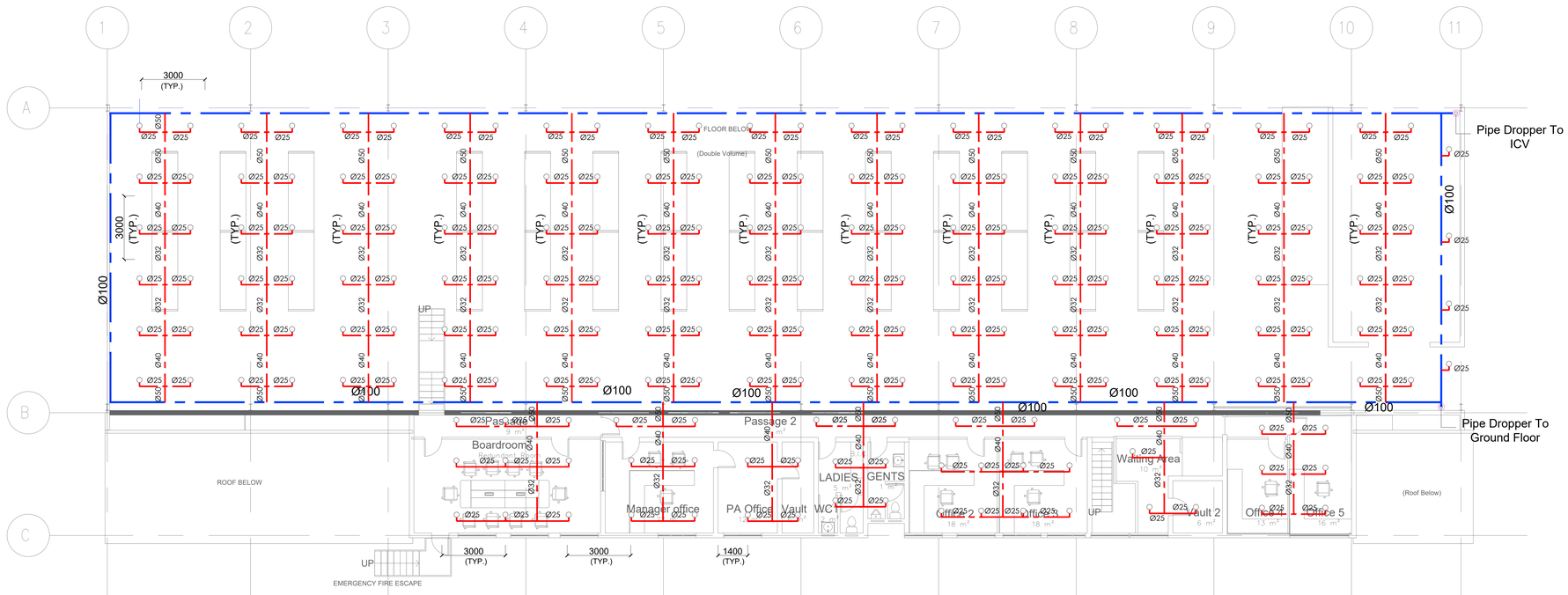
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Annexures A – Drawings

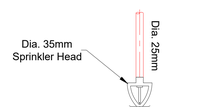
Annexures A1



1 Ground Floor
1 : 130



1 First Floor
1 : 125



SPRINKLER HEAD DETAIL

FIRE LEGEND

SYMBOL	ABBR	DESCRIPTION
	DCP	- 4.5 kg DCP FIRE EXTINGUISHER
	DCP	- 9 kg DCP FIRE EXTINGUISHER
A		- CLASS A 60min SELF CLOSING FIRE DOOR
B		- CLASS B 120min SELF CLOSING FIRE DOOR
L		- 2 HOUR FIRE RATED LIFT DOOR WITH SMOKE SEAL BETWEEN LEAVES
	FHR	- 30m PVC FIRE HOSE REEL
		-SMOKE CURTAIN WITHIN CEILING VOID
		-FIRE WALL (3O MINUTES)
		-FIRE WALL (6O MINUTES)
		-FIRE WALL (120 MINUTES)
		-CLEAR PATH OF ESCAPE
BG		- BREAK GLASS UNIT
		- MANUAL CALL POINT
		- FIRE PIPING ABOVE GROUND
		- FIRE PIPING UNDERGROUND
		- PIPE RISER/PIPE CUT
		- PIPE DROPPER
		- REDUCER
		- ELBOW
		- TEE
		- CROSS
	FH	- 65mm RIGHT-ANGLE FIRE HYDRANT
	FP	- BOOSTER CONNECTION
		SPRINKLER HEAD Dia. 25mm

COUNCIL STAMP AND COMMENTS

SIGNATURE

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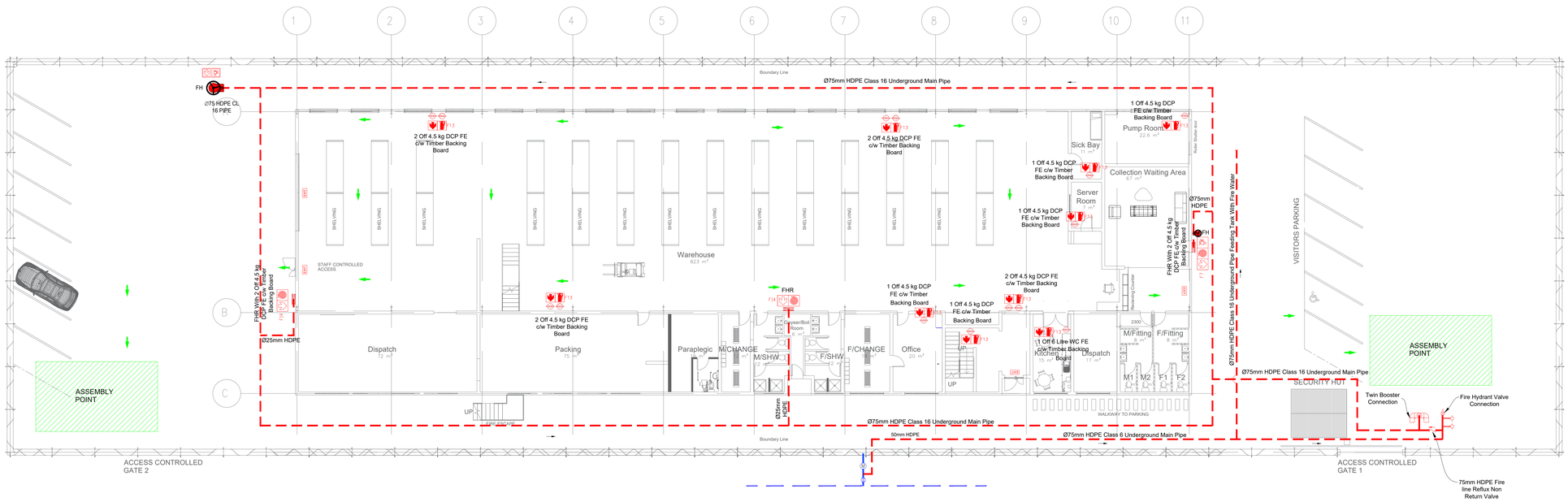
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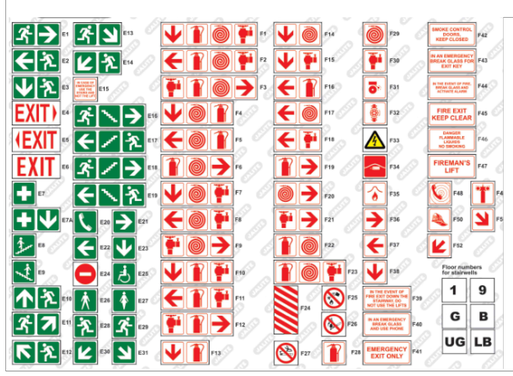
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DESIGN BY:		SHEET SIZE:	A1
DWG NUMBER:	NT2137-249-500	REVISION NR :	REV:05
		DATE :	10-09-2024

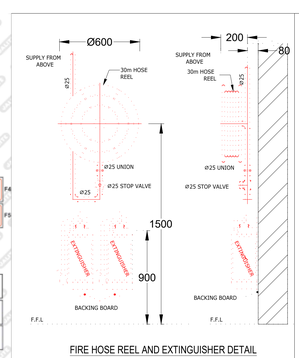
Annexures A2



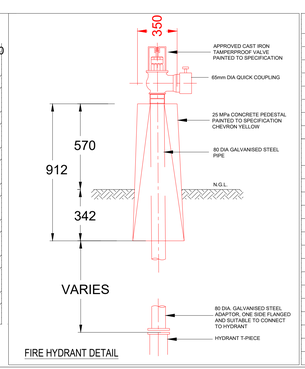
FIRE LEGEND

SYMBOL	ABBR	DESCRIPTION
	DCP	- 4.5 kg DCP FIRE EXTINGUISHER
	DCP	- 9 kg DCP FIRE EXTINGUISHER
A		- CLASS A 60min SELF CLOSING FIRE DOOR
B		- CLASS B 120min SELF CLOSING FIRE DOOR
L		- 2 HOUR FIRE RATED LIFT DOOR WITH SMOKE SEAL BETWEEN LEAVES
	FHR	- 30m PVC FIRE HOSE REEL
		-SMOKE CURTAIN WITHIN CEILING VOID
		-FIRE WALL (30 MINUTES)
		-FIRE WALL (60 MINUTES)
		-FIRE WALL (120 MINUTES)
		-CLEAR PATH OF ESCAPE
BG		- BREAK GLASS UNIT
		- MANUAL CALL POINT
		- FIRE PIPING ABOVE GROUND
		- FIRE PIPING UNDERGROUND
		- PIPE RISER/PIPE CUT
		- PIPE DROPPER
		- REDUCER
		- ELBOW
		- TEE
		- CROSS
	FH	- 65mm RIGHT-ANGLE FIRE HYDRANT
	FP	- BOOSTER CONNECTION





FIRE HOSE REEL AND EXTINGUISHER DETAIL



FIRE HYDRANT DETAIL

FIRE EXTINGUISHER SCHEDULE

MAKE	FIRECHECK OR SIMILAR APPROVED
FIRE XTINGISHER TYPE	DRY CHEMICAL POWDER
APPROXIMATE WEIGHT	4.5 kg
QUANTITY	12
MATERIAL	ALUMINIUM
SUPPORT ASSEMBLY	TIMBER BACKING BOARD
MOUNTING	SURFACE MOUNTED ON THE WALL
MOUNTING HEIGHT	900 mm AFFL

HOSE REEL SCHEDULE

MAKE	FIRECHECK OR SIMILAR APPROVED
FIRE HOSE REEL TYPE	30m x 19mm FIRE HOSE REEL
MINIMUM INLET PRESSURE	220 kPa
MAXIMUM INLET PRESSURE	1000 kPa
APPROXIMATE WEIGHT	22 kg
QUANTITY	2
FRONT AND BACK PLATE	STEEL SIGNAL RED
SUPPORT ASSEMBLY	MILD STEEL ZINC PLATED
GUIDE ARM	SWIVEL ZINC PLATED
BALL VALVE ASSEMBLY	ZINC COATED BRASS
NOZZLE	TWISTED ACTION BRASS
GASKET	RUBBER
CABINET	STEEL SIGNAL RED
MOUNTING	SURFACE MOUNTED ON THE WALL
MOUNTING WEIGHT	1500 mm AFFL

FIRE HYDRANT SCHEDULE

MAKE	STORZ OR SIMILAR APPROVED
FIRE XTINGISHER TYPE	WET CHEMICAL FIRE EXTINGUISHER
QUANTITY	1
MATERIAL	STEEL
MOUNTING HEIGHT	1500 mm AFFL
MAKE	STORZ OR SIMILAR APPROVED
FIRE XTINGISHER TYPE	DRY CHEMICAL POWDER
QUANTITY	2
MATERIAL	STEEL
MOUNTING HEIGHT	1500 mm AFFL

FIRE NOTES

OCCUPANCY CLASSIFICATION - A1
SANS 10400-A:2016

1. SAFETY DISTANCES - 4.2
2. DIVISION AREA - 4.3
3. FIRE PERFORMANCE - 4.5
4. FIRE RESISTANCE OF OCCUPANCY AND DIVISION SEPARATING ELEMENTS AS PER 4.6
5. STRUCTURAL ELEMENTS AND COMPONENTS TO COMPLY WITH 4.8
6. PARTITIONS AND PARTITION WALLS-4.9
7. PROTECTION OF OPENINGS - 4.10
8. ROOF ASSEMBLIES AND COVERINGS - 4.12
9. CEILINGS TO COMPLY WITH 4.13
10. SEPARATION IN ROOF VOID TO COMPLY WITH 4.13.2
11. FLOOR COVERINGS AS PER 4.14
12. WALL FINISHES AS PER 4.15
13. PROVISION OF ESCAPES TO COMPLY WITH 4.16
14. EXIT DOORS TO COMPLY WITH 4.17
15. LOCKS TO ESCAPE AND ACCESS DOORS TO COMPLY WITH 4.19
16. EMERGENCY ROUTES AS PER 4.19
17. DIMENSION OF COMPONENTS OF ESCAPE ROUTES TO 4.20
18. WIDTH OF ESCAPE ROUTES TO 4.21
19. STAIRWAYS AND OTHER CHANGES OF LEVELS TO 4.23
20. VENTILATION OF STAIRWAYS IN EMERGENCY ROUTE TO 4.24
21. EXTERNAL STAIRWAYS AND PASSAGES TO 4.27
22. EMERGENCY LIGHTS TO COMPLY WITH 4.30
22. MARKINGS AND SIGNPOSTING AS PER 4.32
23. FHR'S TO COMPLY WITH 4.33
24. HYDRANTS TO BE PROVIDED IN ACCORDANCE WITH 4.35
25. PORTABLE FIRE EXTINGUISHERS TO COMPLY WITH 4.38
26. SERVICES IN STRUCTURAL OR SEPARATING ELEMENTS TO 4.40
27. SMOKE CONTROL 4.42
28. AIR-CONDITIONING AND VENTILATION SYSTEM TO 4.43
29. ACCESS FOR FIRE FIGHTING & RESCUE PURPOSE TO 4.54
30. WATER RETICULATION FOR FIRE TO COMPLY WITH 10400W

GENERAL NOTE

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2. RING MAIN WATER SUPPLY PIPE TO BE Ø75 HDPE CLASS 16.
3. TAP OFFS TO FIRE HOSE REELS TO BE Ø25 HDPE CLASS 16.
4. TAP OFFS TO FIRE HYDRANT SET TO BE Ø75 HDPE CLASS 16.
5. FIRE FIGHTING SYSTEM TO BE INSTALLED BY A S.A.Q.C.C. CERTIFIED INSTALLER.

FIRE SIGNAGE NOTES

1. FIRE SIGNAGE SHALL COMPLY WITH THE REQUIREMENTS CONTAINED IN SABS 1186
2. MINIMUM FIRE SIGNAGE SIZE = 150MM
3. ALL FIRE SIGNAGE TO BE PHOTO ILLUMINESCENT.
4. THE FIRE SIGNAGE IS INDICATIVE ONLY, ACTUAL DIRECTIONS/ ORIENTATIONS ETC. TO BE DETERMINED ON SITE
5. ILLUMINATED EXIT SIGNS BY ELECTRICAL ENGINEER
6. D/S = DOUBLE SIDED
7. S/S = SINGLE SIDED

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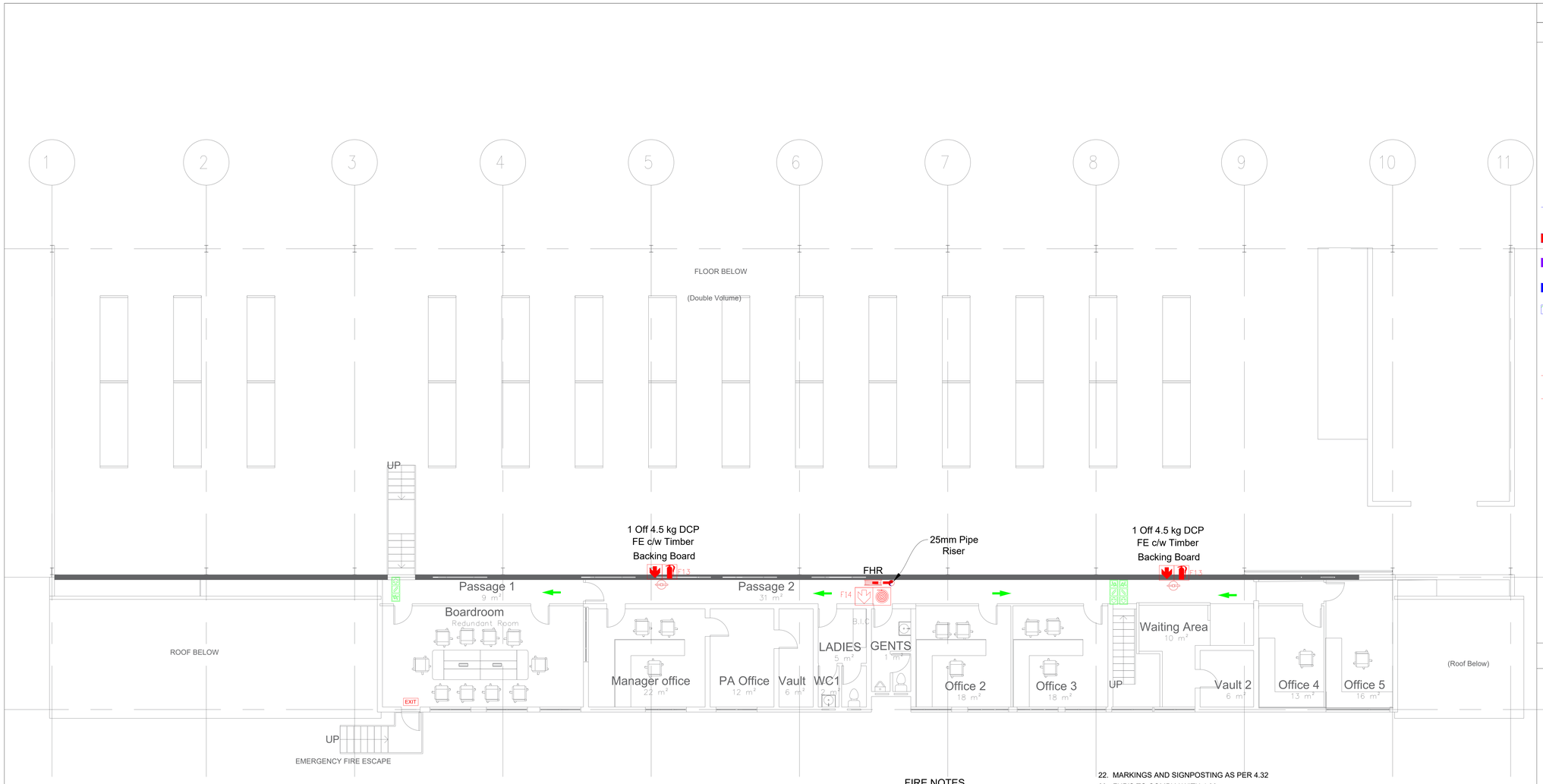
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DWG TITLE: GROUND FLOOR FIRE PROTECTION LAYOUT

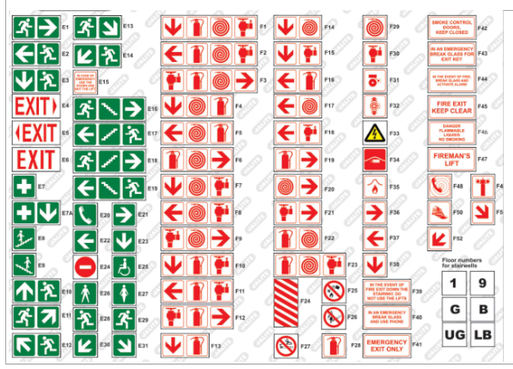
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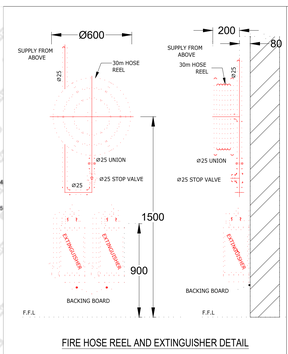
Annexures A3



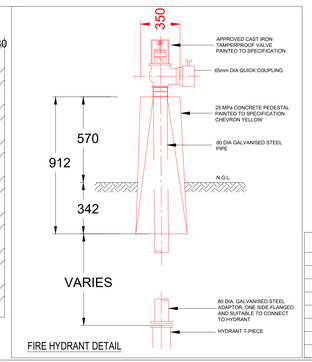
FIRE LEGEND

SYMBOL	ABBR	DESCRIPTION
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	DCP	- 9 kg DCP FIRE EXTINGUISHER
A		- CLASS A 60min SELF CLOSING FIRE DOOR
B		- CLASS B 120min SELF CLOSING FIRE DOOR
L		- 2 HOUR FIRE RATED LIFT DOOR WITH SMOKE SEAL BETWEEN LEAVES
	FHR	- 30m PVC FIRE HOSE REEL
		-SMOKE CURTAIN WITHIN CEILING VOID
		-FIRE WALL (30 MINUTES)
		-FIRE WALL (60 MINUTES)
		-FIRE WALL (120 MINUTES)
		-CLEAR PATH OF ESCAPE
BG		- BREAK GLASS UNIT
		- MANUAL CALL POINT
		- FIRE PIPING ABOVE GROUND
		- FIRE PIPING UNDERGROUND
		- PIPE RISER/PIPE CUT
		- PIPE DROPPER
		- REDUCER
		- ELBOW
		- TEE
		- CROSS
	FH	- 65mm RIGHT-ANGLE FIRE HYDRANT
	FP	- BOOSTER CONNECTION





FIRE HOSE REEL AND EXTINGUISHER DETAIL



FIRE HYDRANT DETAIL

FIRE NOTES

OCCUPANCY CLASSIFICATION - A1
SANS 10400-A:2016

1. SAFETY DISTANCES - 4.2
2. DIVISION AREA - 4.3
3. FIRE PERFORMANCE - 4.5
4. FIRE RESISTANCE OF OCCUPANCY AND DIVISION SEPARATING ELEMENTS AS PER 4.6
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26. SERVICES IN STRUCTURAL OR SEPARATING ELEMENTS TO 4.40
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28. AIR-CONDITIONING AND VENTILATION SYSTEM TO 4.43
29. ACCESS FOR FIRE FIGHTING & RESCUE PURPOSE TO 4.54
30. WATER RETICULATION FOR FIRE TO COMPLY WITH 10400W

FIRE EXTINGUISHER SCHEDULE

MAKE	FIRECHECK OR SIMILAR APPROVED
FIRE XTINGISHER TYPE	DRY CHEMICAL POWDER
APPROXIMATE WEIGHT	4.5 kg
QUANTITY	12
MATERIAL	ALUMINIUM
SUPPORT ASSEMBLY	TIMBER BACKING BOARD
MOUNTING	SURFACE MOUNTED ON THE WALL
MOUNTING HEIGHT	900 mm AFFL

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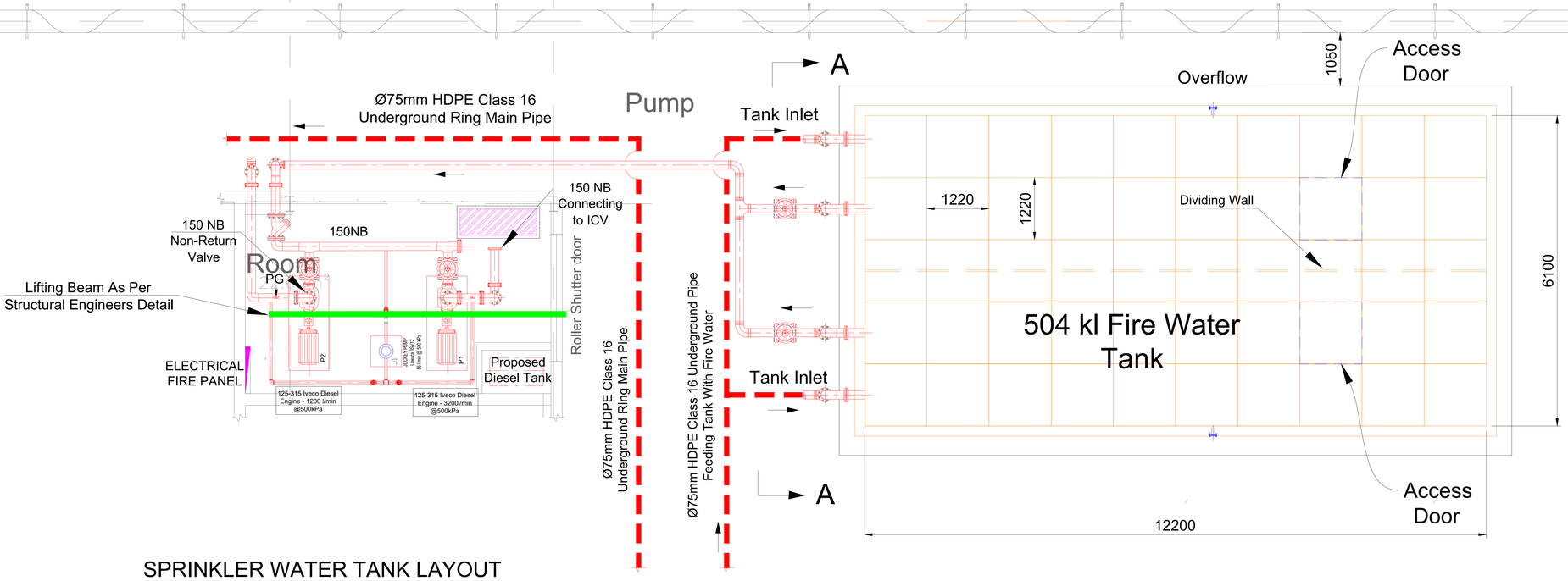
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DWG TITLE: FIRST FLOOR FIRE PROTECTION LAYOUT

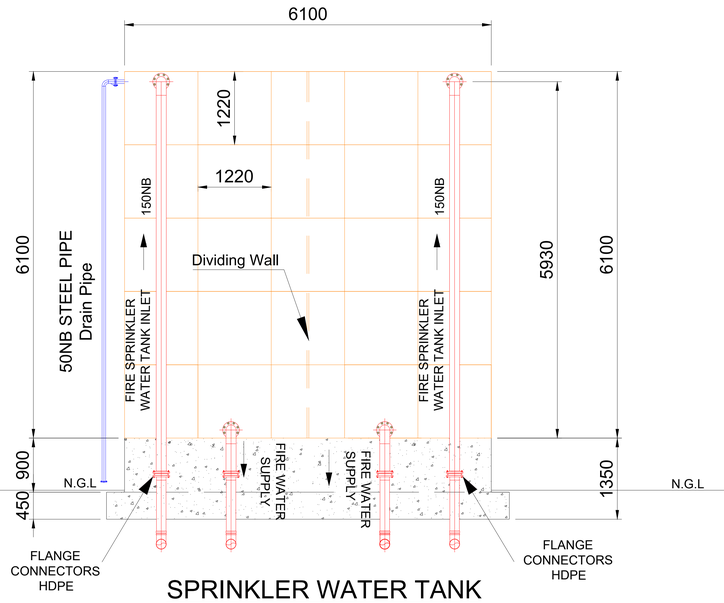
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DESIGN BY:		SHEET SIZE:	A1
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		DATE :	30-07-2024

Annexures A4

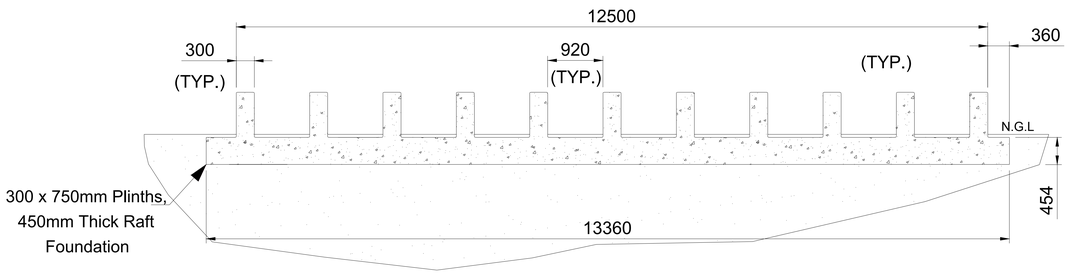
PUMP SCHEDULE						
CODE	Model	NO-OFF	Power Input	POWER REQUIRMENTS		
				Hz	PHASE	VOLTAGE
P - 01	125-315 Iveco Diesel Engine,3200L/min @ 500 kPa	1	DIESEL UNIT			
P - 02	125-315 Iveco Diesel Engine,1200L/min @ 500 kPa	1	DIESEL UNIT			
J - 01	Lowara 3SV12 ,32 L/s @ 500 kPa	1	1.12 kW	50 Hz	3ph	380 V



SPRINKLER WATER TANK LAYOUT



SPRINKLER WATER TANK
SIDE VIEW



SLAP SECTION

SIGNATURE

OWNER

ENGINEER

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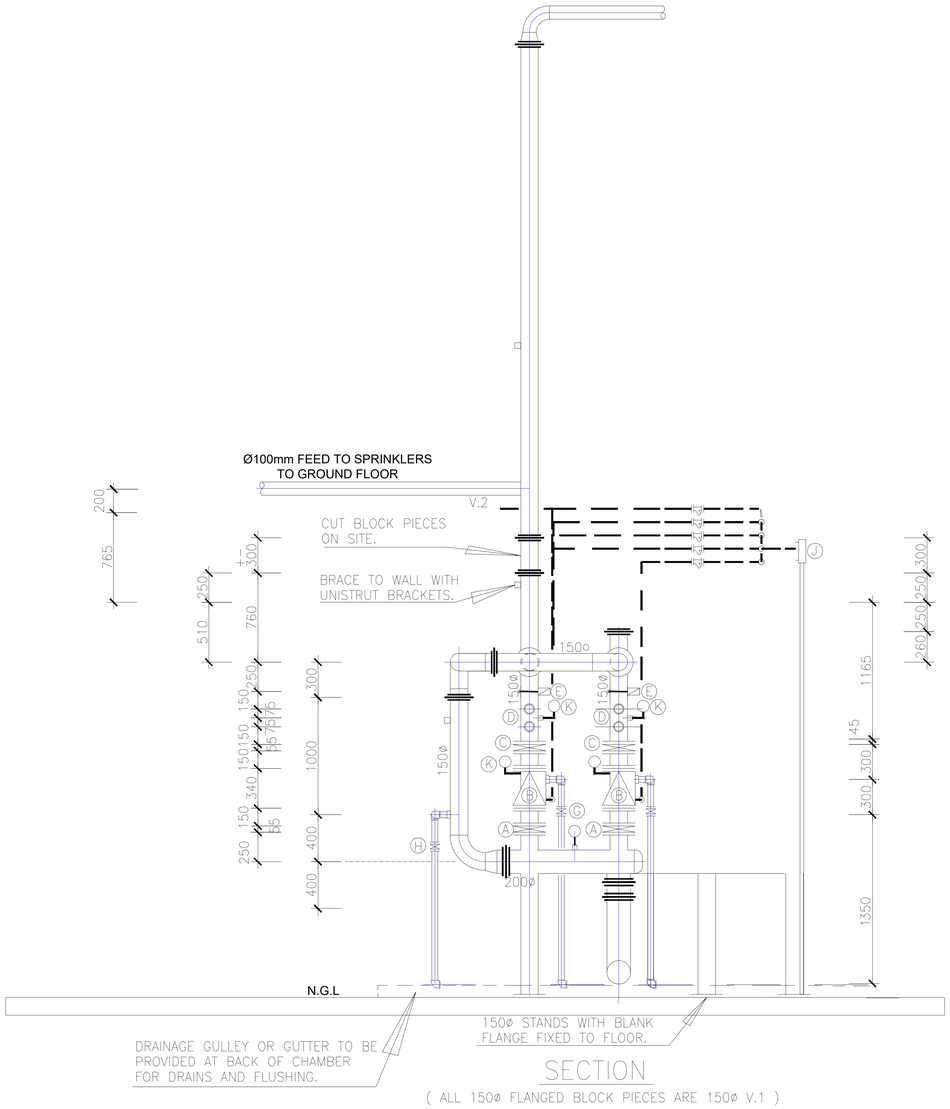
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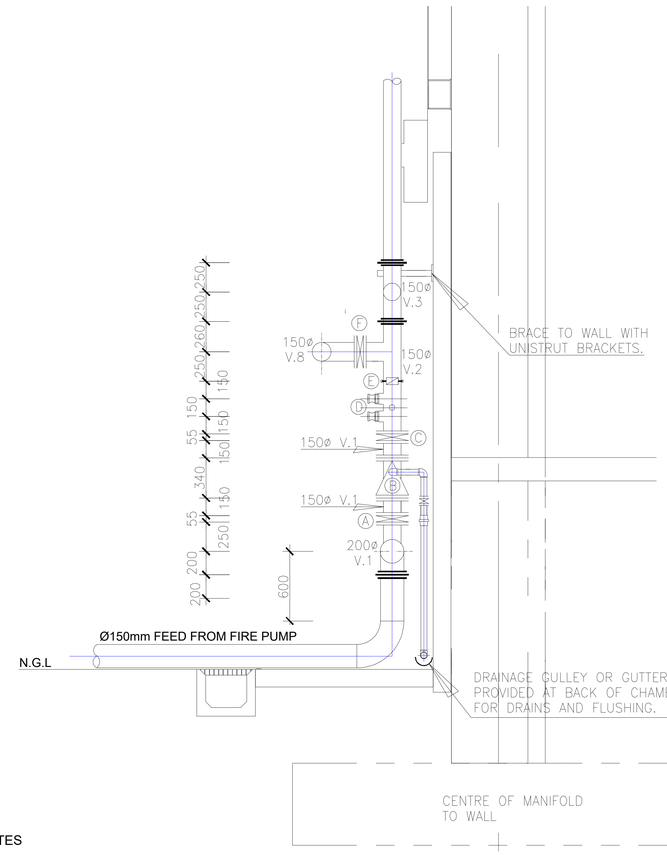
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DATE:	06-08-2024	DRAWN BY:	S.C.N
DESIGN BY:	C. DUBE	SHEET SIZE:	A1
DWG NUMBER:	NT2137-249-510	REVISION NR :	REV:02
		DATE :	10-09-2024

Annexures A5

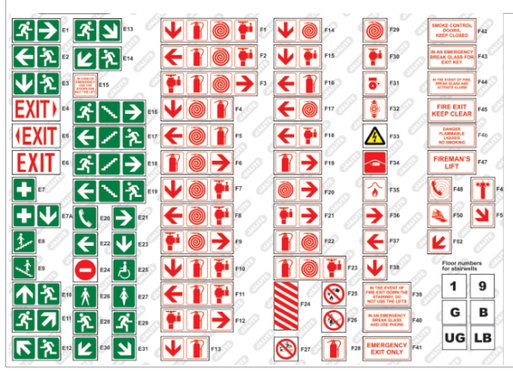


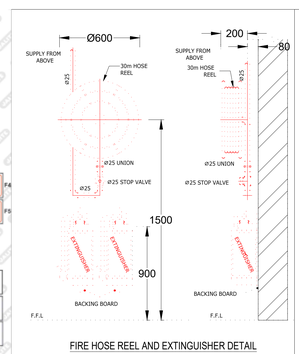
SECTION

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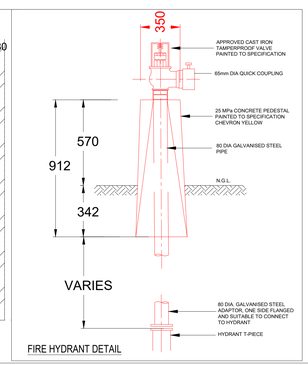


SECTION





FIRE HOSE REEL AND EXTINGUISHER DETAIL



FIRE HYDRANT DETAIL

FIRE NOTES

OCCUPANCY CLASSIFICATION - A1
SANS 10400-A:2016

1. SAFETY DISTANCES - 4.2
2. DIVISION AREA - 4.3
3. FIRE PERFORMANCE - 4.5
4. FIRE RESISTANCE OF OCCUPANCY AND DIVISION SEPARATING ELEMENTS AS PER 4.6
5. STRUCTURAL ELEMENTS AND COMPONENTS TO COMPLY WITH 4.8
6. PARTITIONS AND PARTITION WALLS-4.9
7. PROTECTION OF OPENINGS - 4.10
8. ROOF ASSEMBLIES AND COVERINGS - 4.12
9. CEILINGS TO COMPLY WITH 4.13
10. SEPARATION IN ROOF VOID TO COMPLY WITH 4.13.2
11. FLOOR COVERINGS AS PER 4.14
12. WALL FINISHES AS PER 4.15
13. PROVISION OF ESCAPES TO COMPLY WITH 4.16
14. EXIT DOORS TO COMPLY WITH 4.17
15. LOCKS TO ESCAPE AND ACCESS DOORS TO COMPLY WITH 4.19
16. EMERGENCY ROUTES AS PER 4.19
17. DIMENSION OF COMPONENTS OF ESCAPE ROUTES TO 4.20
18. WIDTH OF ESCAPE ROUTES TO 4.21
19. STAIRWAYS AND OTHER CHANGES OF LEVELS TO 4.23
20. VENTILATION OF STAIRWAYS IN EMERGENCY ROUTE TO 4.24
21. EXTERNAL STAIRWAYS AND PASSAGES TO 4.27
22. EMERGENCY LIGHTS TO COMPLY WITH 4.30
22. MARKINGS AND SIGNPOSTING AS PER 4.32
23. FHR'S TO COMPLY WITH 4.33
24. HYDRANTS TO BE PROVIDED IN ACCORDANCE WITH 4.35
25. PORTABLE FIRE EXTINGUISHERS TO COMPLY WITH 4.38
26. SERVICES IN STRUCTURAL OR SEPARATING ELEMENTS TO 4.40
27. SMOKE CONTROL 4.42
28. AIR-CONDITIONING AND VENTILATION SYSTEM TO 4.43
29. ACCESS FOR FIRE FIGHTING & RESCUE PURPOSE TO 4.54
30. WATER RETICULATION FOR FIRE TO COMPLY WITH 10400W

GENERAL NOTE

THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS & LEVELS ON SITE BEFORE COMMENCING WORK OR PRODUCING SHOP DRAWINGS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.
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Clement Dube, PrTechEng
ECSA Practice No. 200970140

PIPEWORK NOTES

1. UNLESS STATED OTHERWISE ALL FIRE WATER RETICULATION PIPING TO BE BLACK MILD STEEL.
2. RING MAIN WATER SUPPLY PIPE TO BE Ø75 HDPE CLASS 16.
3. TAP OFFS TO FIRE HOSE REELS TO BE Ø25 HDPE CLASS 16.
4. TAP OFFS TO FIRE HYDRANT SET TO BE Ø75 HDPE CLASS 16.
5. FIRE FIGHTING SYSTEM TO BE INSTALLED BY A S.A.Q.C.C. CERTIFIED INSTALLER.

FIRE SIGNAGE NOTES

1. FIRE SIGNAGE SHALL COMPLY WITH THE REQUIREMENTS CONTAINED IN SABS 1186
2. MINIMUM FIRE SIGNAGE SIZE = 150MM
3. ALL FIRE SIGNAGE TO BE PHOTO ILLUMINESCENT.
4. THE FIRE SIGNAGE IS INDICATIVE ONLY, ACTUAL DIRECTIONS/ ORIENTATIONS ETC. TO BE DETERMINED ON SITE
5. ILLUMINATED EXIT SIGNS BY ELECTRICAL ENGINEER
6. D/S = DOUBLE SIDED
7. S/S = SINGLE SIDED

FIRE LEGEND

SYMBOL	ABBR	DESCRIPTION
	DCP	- 4.5 kg DCP FIRE EXTINGUISHER
	DCP	- 9 kg DCP FIRE EXTINGUISHER
A		- CLASS A 60min SELF CLOSING FIRE DOOR
B		- CLASS B 120min SELF CLOSING FIRE DOOR
L		- 2 HOUR FIRE RATED LIFT DOOR WITH SMOKE SEAL BETWEEN LEAVES
	FHR	- 30m PVC FIRE HOSE REEL
		-SMOKE CURTAIN WITHIN CEILING VOID
		-FIRE WALL (30 MINUTES)
		-FIRE WALL (60 MINUTES)
		-FIRE WALL (120 MINUTES)
		-CLEAR PATH OF ESCAPE
BG		- BREAK GLASS UNIT
		- MANUAL CALL POINT
		- FIRE PIPING ABOVE GROUND
		- FIRE PIPING UNDERGROUND
		- PIPE RISER/PIPE CUT
		- PIPE DROPPER
		- REDUCER
		- ELBOW
		- TEE
		- CROSS
	FH	- 65mm RIGHT-ANGLE FIRE HYDRANT
	FP	- BOOSTER CONNECTION

SIGNATURE

OWNER

TRANSNET

ENGINEER

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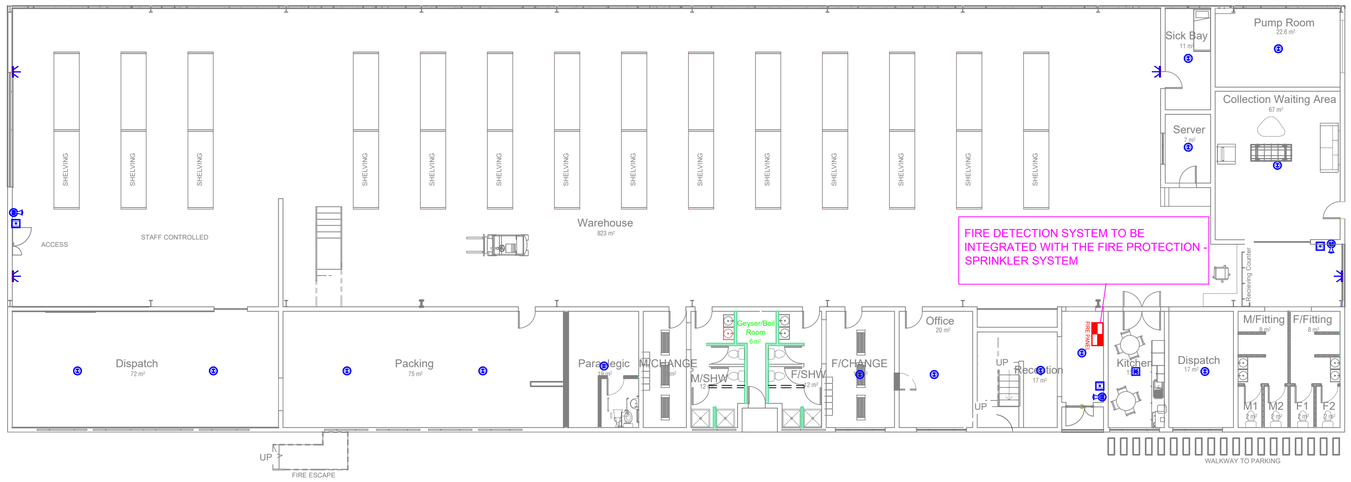
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DESIGN BY:	C. DUBE	SHEET SIZE:	A1
DWG NUMBER:	NT2137-249-509	REVISION NR :	REV:00
		DATE :	30-07-2024

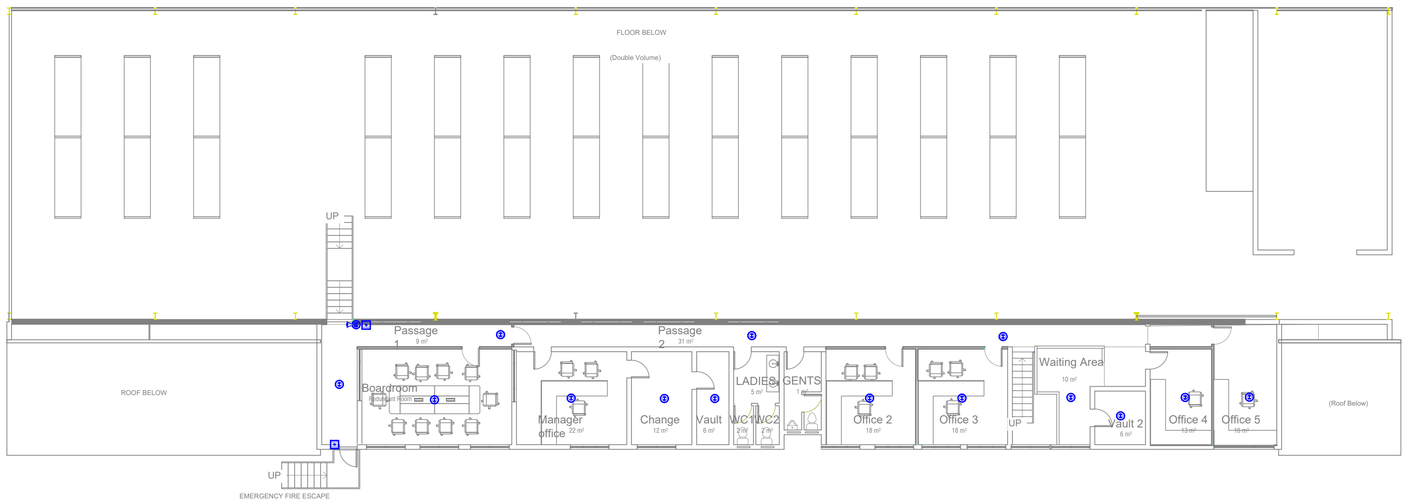
Annexures A6

FIRE DETECTION LEGEND	
	BREAK GLASS FIRE
	THERMAL DETECTOR
	SMOKE DETECTOR
	SOUNDER
RFP	REMOTE FIRE PANEL
	MAIN FIRE PANEL
	SMOKE DETECTION OPTICAL REFLECTIVE BEAM



Ex Bund Wall
Proposed
Water Tank

GROUND FLOOR



FIRST FLOOR

NOTES

1. All work to comply with Municipal By-laws.
2. All work to comply with SANS 10142-1 &2 and OHS Act.
3. Lightning protection to comply with SANS 10313.
3. The Contractor shall check the GA drawings and report any discrepancies to the Engineer.

CLIENT DEPARTMENT SIGNATURES

Facility Stamp:

Facility Manager:

Infrastructure Manager:

Revisions

Rev no	Date	Description	Rev by
A	08/06/24	Base date drawing	LS

Checked by Professional Consultant

Name: B.M. Ngcamu Pr Eng

Signature:

Date:

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TRANSNET

FERRANTI PROJECTS

DURBAN

Project:

BAYHEAD WAREHOUSE REFURBISHMENT

Drawing Description:

Fire Detection Layout

Drawn: DvW Date: 2024/09/16

Scale:

1:100 (A0)

Consultant Drawing Number:	Rev:
28008E4000	B
DOPW Drawing Number:	Rev:
WIMS NO 019569	

Stamped by Plans Approval Committee

Annexures B

Annexures B1 - Transnet Integrated Management System Policy Commitment Statement

TRANSNET

Transnet Integrated Management System (TIMS)
POLICY COMMITMENT STATEMENT

Transnet is a State-Owned Company that operates as an integrated freight transport company. It is structured around six core Operating Divisions, namely Transnet Freight Rail (TFR), Transnet Engineering (TE), Transnet National Ports Authority (TNPA), Transnet Port Terminals (TPT), Transnet Pipelines (TPL) and Transnet Property (TP) as well as the Transnet Academy, a specialised unit, a skills development provider in the transportation, freight, maritime, logistics and associated industries.

Transnet has developed and implemented a Transnet Integrated Management System (TIMS) programme, which sets out Systems, Policies, Procedures and Processes, providing a foundation and framework for conducting its core business. We are committed to **transporting freight, passengers and providing excellent customer service** to our customers along the key transport corridors. Our aim is to **competitively grow our business, enhance customer satisfaction** and ensure **sustainable business development** for the benefit of the South African economy.

TIMS is established, implemented, and maintained in accordance with recognised best practices that will enable us to:

- Incorporate and comply with applicable **legislation, regulations, codes, standards, protocols, best practices and customer requirements** to which we subscribe, in order to achieve our business objectives.
- Set and achieve **objectives and targets** that address significant enterprise-wide **strategic, tactical, and operational risks, opportunities and mitigate the consequences** thereof.
- Proactively implement **strategies** to prevent **environmental degradation, protect ecosystems and drive climate change mitigation and adaptation.**
- Continually promote the prudent and **sustainable** use of **energy and natural resources.**
- Provide **quality products** and **services** to meet our customers' requirements.
- Create a **safe and secure environment** for our employees and stakeholders.
- Carry out our business in a manner which **protects our assets and information** and **prevents injuries and ill health** to our employees and stakeholders.
- Promote **safe operational principles** during operations to minimise occurrences.
- Strategically **source our contractors** through fair, equitable and transparent processes.
- Provide **socio-economic development** as a good corporate citizen.
- Uphold **food safety practices** in our food preparation and handling environments.
- Ensure **proficiency and preparedness** to deal with and **effectively recover** from any **emergency situations.**
- **Develop, train and manage our employees** through inspirational leadership, providing the necessary **organisational information, knowledge and resources** to achieve the intention of this policy statement.
- Build relationships based on care, openness, mutual trust and involvement while protecting **personal and confidential information** of internal and external stakeholders. **Communicate, engage, support** and promote TIMS risk awareness culture.
- Allocate **responsibilities** and **accountabilities** to meet the requirements of the TIMS Policy Statement. Drive an **integrated assurance management programme** to ensure **continual improvement** of TIMS.

The TIMS Policy Commitment Statement shall be **reviewed every three (3) years** or **as circumstances dictate** to ensure that it remains **current and relevant**. Our progress on the achievement of the policy statement commitments shall be reported to the respective Governance Structures. Transnet Leadership, employees and stakeholders have a role to play in delivering on the commitment set out in this policy statement. The TIMS Policy Commitment Statement can be made available to external stakeholders on request.

Group Chief Executive

Date: 10/05/24

Next Review Date: 31 May 2027

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Annexures B2 - Standard Operating Procedure Construction Environmental Management

STANDARD OPERATING PROCEDURE

CONSTRUCTION ENVIRONMENTAL MANAGEMENT

Document number	009-TCC-CLO-SUS-11386
Version number	1.0
Classification	Unclassified
Effective date	01 October 2023
Review date	30 September 2028

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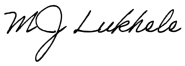
SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New Procedure		

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	**Senior Specialist: Environmental Compliance and Permitting**		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Sponsor:	**General Manager: Corporate Sustainability**		01/10/2023
Approves document for use. Comments:			

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TRANSNET

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1. PURPOSE

1.1 The purpose of this Standard Operating Procedure (SOP) is to define how environmental management will be practiced on any construction project under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are optimized and/or enhanced throughout the lifecycle of the asset.

1.2 It further defines environmental management responsibilities for key stakeholders involved in the construction management process.

1.3 It must be read in conjunction with the Contractor Environmental and Sustainability Specification Guidelines (CESSG) and the Project Environmental Specification (PES) relevant to the project.

1.4 In this document, unless the context clearly indicates otherwise:

- Words importing any one gender shall include the other gender.
- The singular shall include the plural and vice versa; and
- Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

2.1 The SOP applies to any construction project under the management of Transnet SOC Ltd or its Construction Agent.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24 (a) right to an environment that is not harmful to health or wellbeing Section 24(b) (i) right to have environment protected for current and future generations through legislation and measures that prevents pollution and ecological degradation.
Capital Governance and Assurance Policy	Entire document
Capital Governance and Assurance Framework	Entire document
Capital governance and Assurance Manual	Entire document.
PLP Manual – Execution	Entire document
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles (4) (viii), (e), (h), (j) and (p).
National Water Act, 36 of 1998	Section 164, Permissible Water Use Section 19
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10 (a) and (b) Scheduled 3, Defined Wastes Category B: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001 Government Notice R155 in Government Gazette 23108 of February 2002

Name	Applicable Section
	General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15
Integrated Management System – Policy Statement Procedure (TRN-IMS-GRP-PROC-002)	Whole document
Integrated Management System – Competency, Awareness and Training Procedure	Whole document
Integrated Management System[1] – Document, Data and Record Management Procedure (TRN-IMS-GRP-PROC-010)	Whole document
Integrated Management System – Occurrence and Non-Conformance Management Procedure (TRN-IMS-GRP-PROC-013)	Whole document
Transnet Environmental Risk Management Strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

[1] Management of certain documents, data and records will be in accordance with NEC3 – Engineering and Construction Contract prescripts

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4. DEFINITIONS AND ABBREVIATIONS

4.1 DEFINITIONS

Compliance	The action or fact of complying with legislation or regulations.
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Contractor	The **Principal Contractor** as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.
Contractor Environmental and Sustainability Specification Guidelines (CESSG)	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Corrective Action	It is generally a reactive process used to address problems after they have occurred. Corrective action may be triggered by a variety of events, e.g. Non-conformance to documented procedures and work instructions, non-conformances raised through internal audits, unacceptable monitoring and measurement results, internal & external SHEQ complaints, etc.
Emergency	Sudden unforeseen event needing immediate or prompt action.

Environment	Surroundings in which the Contractor operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment
Environmental Authorisation (EA)	Environmental Authorisation is the authorisation granted by a competent authority of a listed activity or specified activity in terms of National Environmental Management Act 107 of 1998 (as amended).
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects
Environmental Management Plan (EMP)	A plan generated by the Contractor describing the relevant roles and responsibilities and how potential environmental risks will be assessed and managed including the monitoring and recording thereof.
Environmental Management Programme (EMPr)	A programme that has been approved by the Competent Authority in terms of NEMA, 107 of 1998 stipulating information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment

Incident/Occurrence	An undesired event occurring at work that results in physical harm to a person or death, or damage to the environment, plant and/or equipment, and/or loss of production.
Non-conformance	An action or situation that does not conform to Transnet's SHEQ standards, procedures or legislative requirement(s) and that can be, or lead to, an unacceptable SHEQ incident.
Non-compliance	Contravention to environmental legislative requirements.
Project Environmental Specification (PES)	Describes standards specific to a particular project. Variations and additions to the MESC are set out in this PES. These would include the EA issued to the project or elements generally drawn from the EA or permits for that project or from specific requirements set by the Transnet Operating Divisions. The PES may also require a more stringent standard to that described in the MESC if required by the EA or a particular industry code to which Transnet subscribes including any environmental constraints at a construction site.
Sub -Contractor	A person or organisation who has a contract with the contractor to - Construct or install part of the contractors work. - Provide a service necessary to provide the works; or - Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.

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4.2 ABBREVIATIONS

Acronym	Meaning in Full
CESSG	Contractor Environmental and Sustainability Specification Guidelines
CM	Construction Manager
CV	Curriculum Vitae
CEM	Construction Environmental Management
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EO	Environmental Officer
EMI	Environmental Management Inspectorate
NCR	Non-conformance Report
NEMA	National Environmental Management Act 107 of 1998 (as amended)
PER	Project Environmental Resource
PES	Project Environmental Specification
PLP	Project Life-cycle Process
PM	Project Manager

Acronym	Meaning in Full
SAHRA	South African Heritage Resources Agency
SOP	Standard Operating Procedure
SHEQ	Safety, Health, Environment and Quality
Transnet	Transnet SOC Ltd

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5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

5.1 Transnet Procurement Department

5.1.1 Ensures that this SOP (and relevant associated environmental specifications) is included in any construction-related request whether open market, quotation or confinement process.

5.1.2 The Procurement Department shall further ensure that the relevant environmental personnel are consulted during tender review, tender evaluation and contract award.

5. Transnet Project Manager (PM)

5.2.1 Takes overall accountability for the project including ensuring that this SOP is implemented by all relevant stakeholders.

5.2.2 The specific tasks during construction will include:

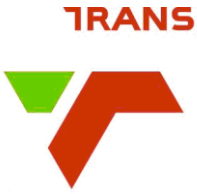
- Appointment of the Transnet Environmental Resource/s;
- Certifying site access to the Contractor;
- Giving instructions to the Contractor on recommendation from the Transnet Environmental Resource/s (e.g. defects, non-conformances etc.); and
- Certifying site closure to the Contractor.

5.3 Transnet Project Environmental Resource

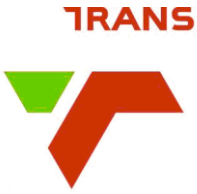
5.3.1 The Transnet Project Environmental Resource (PER) will be responsible for ensuring that this SOP and associated specifications or requirements are complied with. The Transnet PER will report functionally to the relevant PM.

5.3.2 The specific tasks will include:

- Preparation of the PES;
- Tender evaluation, development of environmental criteria and adjudication thereof;
- Liaison with the relevant environmental Competent Authorities;



- Review and approve site layout plan including any subsequent revisions thereof;
- Environmental Induction of Contractor's staff;
- Generate an inspection checklist prior to construction commencement;
- Review and Sign off Method Statements prepared by Contractor;
- Prepare environmental monitoring protocols/checklists to be used during construction;
- Prepare monthly conformance audit reports, including sign-off on Monthly Inspection Reports;
- Conduct monthly observation & inspections of all work places based on the approved inspection checklist;
- Audit conformance to Method Statements;
- Monitor the Contractor's compliance with this SOP and any other environmental requirements relevant to the site;
- Develop an Audit Finding and Close out Register that documents all audit findings, close out actions and the time frame allowed for in order to close the finding/s;
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules;
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.);
- Attendance at scheduled SHE meetings, as and when required, and project coordination meetings;
- Ensure that site documentation (permits, licenses, EA, EMPr, SOP-CEM, method statements, audit reports, waste disposal slips etc.) related to environmental management is maintained on the relevant Document Control System;
- Inspect and report on environmental incidents and check corrective action;
- Keep a photographic record of all environmental incidents;



- Environmental incident management as required by Transnet policies and procedures;
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings;
- Management of complaints register;
- Conduct any environmental incident investigations;
- Coordinate and/or facilitate any environmental monitoring programmes e.g. EMI Inspections, ECO Audits, Transnet Environmental Assurance Audits etc.
- Collate information received, including monitoring results into a monthly report that is supported with photographic records to the Transnet CM and Transnet PM showing progress against targets; and
- Report environmental performance of the project on a monthly basis through relevant governance channels.

5.3.3 The tasks stipulated above may be conducted by one or more Project Environmental Resource, depending on the scale, complexity and sensitivity of the environment. Discretion to be taken by the Environment Lead within the area of control of the project site.

5.4 Transnet Construction Manager (CM)

5.4.1 The Transnet Construction Manager (CM) has overall responsibility for environmental management on site and reports to the Transnet PM. The Transnet CM is supported by the Transnet PER.

5.4.2 The specific tasks during the construction stage will include:

- Reviewing the monthly reports compiled by the Transnet PER;
- Approving method statements prepared by the Contractor;
- Communicating directly with the Contractor on environmental issues observed on-site; and
- Escalating any relevant environmental matters to the Transnet PM.

5.6 Environmental Control Officer

5.6.1 The Environmental Control Officer is an independent person legally appointed to monitor compliance of construction related activities with the conditions of the Environmental Authorisation. The ECO fulfils an autonomous role and submits reports to the Competent Authority at timeframes specified in the Environmental Authorisation.

5.6.2 The Environmental Control Officer will conduct the following tasks:

- Monitors compliance to the conditions of the EA, Environmental Management Programme (EMPr) and can include permits and licences applicable to a project;
- Attends project meetings as and when required;
- Conducts audits at a frequency stipulated on the EA/EMPr; and
- Compiles audit reports and submits them to relevant authorities.

5.7 Contractor's Environmental Officer

5.7.1 The Contractor's Environmental Officer (EO) must ensure implementation of the requirements of this SOP on site.

5.7.2 The Contractor's EO will liaise with the Transnet PER on site. It will be the responsibility of the Contractor's EO to ensure that all work is conducted according to the approved Method Statements and that the Contractor team's roles and responsibilities as set out in this document are fulfilled.

5.7.3 The Contractor EO's tasks will include:

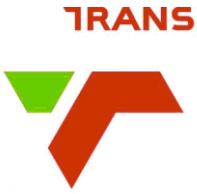
- Developing an appropriate environmental file for approval by the Transnet PER prior to site access, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):
  - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals;

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- Contractors commitments to comply with this SOP and associated documents as signed during tender;
- The Contractor's EMP;
- His/her CV;
- An organogram indicating reporting lines of all Contractor's staff (with names included);
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's CM; Contractor's EO; all relevant emergency personnel;
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels;
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheet (MSDS); quantity on site; storage method; transport method to site; period to be used on site (all substances listed must have an MSDS on site in the environmental file);
- Site Layout Plan indicating but not necessarily limited to, access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled;
- A site establishment method statement (for more details on what method statements should entail the Contractor must refer to the Minimum Requirements for Construction Environmental Management)

- Conducting an activity-based environmental risk assessment based on the Contractor's scope of work;
- Agreeing on an appropriate inspection schedule with the Transnet PER (either daily or weekly);



- Ensuring that all required Contractor staff attends the environmental induction to be given by the Transnet PER (any Contractor's staff, sub-contractors or visitors to site must subsequently be inducted by the Contractor's EO);
- Inspection of the work area(s) as per schedule or authorised through written instruction by Transnet PER;
- Preparing activity-based Method Statements that indicate how environmental risks will be managed on site OR ensuring that the necessary environmental information is included in the Contractor's method statements (all method statements must be maintained in the Contractor's Environmental File);
- Identify local, provincial and national environmental legislation that applies to the Contractor's activities;
- Conduct ongoing Environmental Awareness Training of the Contractor's site personnel;
- Reporting, investigating and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors and visitors;
- Close out of environmental incidents;
- Attendance at all SHE meetings and induction programmes, and toolbox talks where required
- Monitor Waste Management;
- Monitor Water Management;
- Monitor Energy Management;
- Ensure that environmental signage and barriers are correctly placed;
- Taking required corrective action within specified time frame and close out of non-conformances; and
- Maintain site documentation related to environmental management on site.

5.7.4 The Contractor's EO will be expected to submit reports to the Transnet PER on a daily/weekly basis.

5.8 The Contractor

5.8.1 The Contractor shall comply with the requirements of this SOP and abide by the Transnet PM's instructions regarding the implementation of this SOP.

5.8.2 The Contractor must confirm that he will conform to the requirements of this SOP and any other documents provided to him by Transnet during tender.

5.8.3 The Contractor must recommend a suitably qualified, competent person to fulfill the role of the Contractor's EO at tender and if accepted by Transnet this person must be appointed when the Contract is awarded for the duration of construction. Should this person be replaced for whatever reason, the Contractor shall ensure that a person of similar qualification and competency is appointed in his/her place before the previous incumbent vacates his/her position.

5.8.4 The Contractor must obtain any relevant environmental approvals required by his activities that have not been obtained by Transnet e.g. permits for the destruction of protected plant species; grave relocation permits etc.

5.8.5 The Contractor shall have overall accountability for environmental compliance on site and will be held liable for any non-compliance with environmental statutes or non-conformances with this SOP due to his negligence.

5.9 Reporting Lines

5.9.1 The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure shown in Figure 1.

5.9.2 All instructions that relate to the SOP will still be given to the Contractor via the Transnet PM. In an emergency situation, however, the Transnet PER may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings, and the Transnet PER will attend these meetings on request by the contractor. If at any time the Transnet

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PM is uncertain in any way with respect to an environmentally related issue or specification in the SOP, he will consult with the Transnet PER .

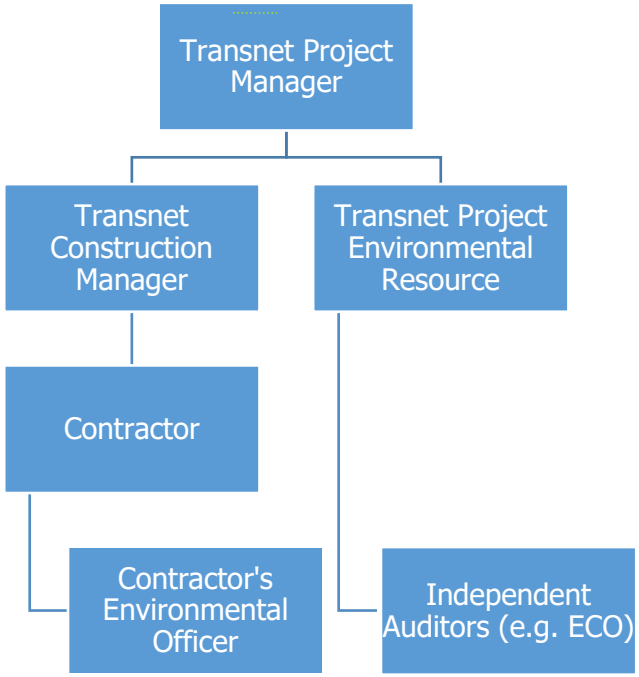


Figure 1: Typical Transnet Organogram for Construction Environmental Management[2]

6. STANDARD OPERATING PROCEDURE

6.1 Tender Stage (prior to Contract Award)

- The Transnet PM appoints or assign a Project Environmental Resource/s[3].
- The Transnet PER requests the draft tender from the Transnet Procurement Department
- Transnet Procurement routes the draft tender to the Transnet PER

[2] Structure dependent on OD own structure and organizational operating model

[3] Project complexity will determine the final environmental management structure on the project.

- The Transnet PER ensures the tender includes all relevant environmental documents and signs the routing slip.
- The Transnet Procurement Department issues the tender to prospective Contractor(s).
- The Contractor submits his bid which MUST include: a commitment to conform to this SOP signed by the duly delegated person; recommendation of a suitably qualified, competent person to fulfill the role of the Contractor's EO; Environmental Policy; and EMP
- After submission the Transnet Procurement Department will invite the Transnet PER to evaluate tender submissions (environmental section);
- The Transnet PER evaluates the prospective Contractor's environmental submission.
- The Contract is awarded to the successful bidder.

6.2 Construction Stage (prior to Site Access)

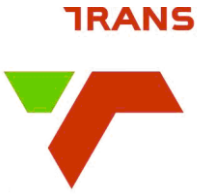
- The Contractor appoints the Contractor's Environmental Officer (EO) accepted by Transnet SOC Ltd.
- The Contractor provides his EO with all documents submitted during tender, including but not necessarily limited to:
  - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals etc;
  - commitment to conform to this SOP; and
  - The EMP.
- The Contractor's EO conducts an activity-based environmental risk assessment;
- The Contractor's EO develops an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to all the documents specified in Section 5.7 above (the environmental file must always be available and up to date on the construction site);
- The Contractor's EO submits the environmental file for acceptance to the Transnet PER;

- Once accepted, the Transnet PER recommends that site access be granted to the Transnet PM; and
- The Transnet PM issues the Contractor with a Site Access Certificate

6.3 Construction Stage (post Site Access)

- The Transnet PER inducts all Contractor's staff on the environmental requirements of the site;
- The Transnet PER has an inception meeting with the Contractor's EO on site where the following is agreed:
  - The contents of the contractor's environmental file (in addition to what was approved prior to granting site access). This will include but not necessarily be limited to: a list of interested and affected parties that may be impacted by construction e.g. surrounding landowners, nearby communities etc.; energy consumption information; water use information; environmental induction and awareness information; activity-based environmental method statements; complaints records; record of external communications; environmental incident reports; minutes of contractors environmental meetings.
  - The composition of the Project Environmental Specification (PES) and how it will be implemented. This will include but may not necessarily be limited to: Environmental Approvals (e.g. Environmental Authorisations, Water Use Licenses, Waste Management Licences, Atmospheric Emissions Licences etc.); Environmental Management Programmes/Plans approved by external parties/authorities; and any third party auditors/monitoring specialists (e.g. Environmental Control Officers; Independent Auditors; Transnet Environmental Assurance Specialists; Water Quality Monitoring experts etc.) that have a bearing on the contractor's scope of work.
  - The frequency of inspections to be conducted by the Contractor's EO (e.g. daily, weekly etc.)
  - The frequency of inspections to be conducted by the Transnet PER (e.g. daily, weekly and/or monthly). Notwithstanding that the frequency of

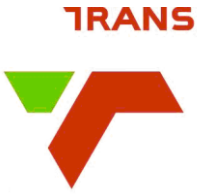
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Transnet PER inspections will be agreed, the Contractor may never refuse the Transnet PER

- The format used and elements to be checked during Contractor's inspections
- Reporting frequency and requirements
- The process to be followed in handling Environmental Occurrences and – Non-conformances

- **Note:** All the aforementioned agreements will be formalized in the form of minutes which the Transnet - and Contractor's EO must sign and must subsequently be approved by the Transnet Project Environmental Resource.
- The Transnet PER reviews the Contractor's activity-based environmental risk assessment and instructs the Contractor's EO to submit activity-based method statements for construction activities that may pose an environmental risk (for more details on what method statements should entail the Contractor must refer to the Minimum Environmental Requirements for Construction). Only once a method statement has been approved by the Transnet PER and Transnet CM and ECO (where relevant) may the Contractor execute the relevant activity.
- The Contractor's EO submits the method statements to the Transnet PER for approval (these must also be approved by the Transnet CM);
- The Transnet PER compiles a site audit checklist (covering all environmental compliance and conformance requirements) for approval by the Transnet Project Environmental Manager
- Whilst the Contractor executes the work in terms of the requirements of the Contract, the Contractor's EO and Transnet PER execute their monitoring functions as per this SOP and other monitoring stakeholders/auditors as per the PES.
- The Transnet PER shall submit monthly reports to the Transnet CM and PM indicating the following:
  - Date of the inspection(s);
  - Details and expertise of the Transnet PER;



- Scope and purpose for which the report was prepared;
- Description of the methodology used during the inspection and report compilation;
- Compliance and/or conformance status of all relevant/individual elements as per the inspection checklist culminating in an overall compliance/conformance percentage for the project;
- Assumptions;
- Description of consultation processes undertaken during the inspection(s) with a summary and associated records of such consultations;
- Environmental incidents and non-conformances;
- Photos of pertinent construction and environmental matters that occurred on site;
- Water abstracted/withdrawn during the month (in kiloliters) as well as an indication of the source;
- Water recycled and/or reused during the month (in kiloliters);
- Waste water discharged (in kiloliters);
- Waste (both general and hazardous) disposed (in tonnages) with an indication of waste type;
- Waste recycled (in tonnages);
- Alien invasive species eradicated (in hectares);
- Number of listed species safely relocated;
- Environmental Fines, Non-Compliances or Directives issues by authorities;
- Any NEMA Section 30 or NWA Section 19 incidents;
- Environmental Grievances;
- Rehabilitated Land (in hectares);
- Number of graves and/or heritage artifacts moved;
- Energy consumption for the project [Electricity(kWh); Gas (GJ); Oil(l); Diesel(l); Petrol(l); LPG(GJ)];
- Status of previous findings and/or observations; and
- Recommendations for improvement.

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6.4 Post Construction

- The Contractor's EO submits a rehabilitation and site closure method statement for approval by the Transnet PER and Transnet CM.
- Once approved, the Contractor implements the rehabilitation method statement accordingly.
- The Contractor's EO submits a site close-out report for acceptance by the Transnet PER and CM.
- Post rehabilitation, the Transnet PER conducts a site closure inspection to ensure all requirements of the rehabilitation method statement have been met.
- Once rehabilitation has been accepted by the Transnet PER, the Contractor's EO sends the Transnet PER a copy of the entire environmental file (original to be handed over to Transnet as per document handover requirements of the Contract).
- On receipt of the environmental file, the Transnet PER recommends that a site closure certificate can be issued to the Transnet PM.
- The Transnet PM issues the Contractor with a Site Closure Certificate.

7. RECORDS

7.1 The responsibility for maintaining all records required by this SOP shall rest with the Contractor's EO; Transnet PER as specified below:

Record	Maintained By
1. Transnet PER Appointment Letter	Transnet PER
2. Signed Tender Routing Slip	Transnet PER
3. Contractor's Confirmation to conform to this CEM SOP	Transnet PER; Contractor's EO
4. Recommendation of Contractor's EO	Transnet PER

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Record	Maintained By
5. Contractor's Environmental Policy	Transnet PER; Contractor's EO
6. Contractor's Environmental Management Plan	Transnet PER; Contractor's EO
7. Tender Evaluation Records from Transnet PER	Transnet PER
8. Contract	Transnet PER
9. Contractor EO's Appointment Letter and CV	Transnet PER
10. Activity-Based Environmental Risk Assessment	Transnet PER; Contractor's EO
11. Contractor's Organogram	Transnet PER; Contractor's EO
12. Contractor's Contact Information	Transnet PER; Contractor's EO
13. List of Contractor's Plant and Equipment	Contractor's EO
14. List of Hazardous Substances used by Contractor	Contractor's EO
15. Material Safety Data Sheets	Contractor's EO
16. Site Layout Plan	Transnet PER; Contractor's EO
17. Site Establishment Method Statement	Transnet PER; Contractor's EO
18. Minutes of Transnet PER – Contractor's EO Inception Meeting	Transnet PER; Contractor's EO
19. Environmental Induction Attendance Register (including material used during induction)	Transnet PER; Contractor's EO
20. Activity-based Method Statements	Transnet PER; Contractor's EO

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Record	Maintained By
21. Contractor's Inspection Reports	Transnet PER; Contractor's EO
22. Transnet PER Inspection Reports	Transnet PER
23. List of Local, Provincial and National Environmental legislation applicable to the site	Contractor's EO
24. Environmental Awareness Attendance Registers (including material used)	Contractor's EO
25. Environmental Incident Reports	Transnet PER; Contractor's EO
26. Minutes of SHE Meetings	Transnet PER; Contractor's EO
27. Waste Records	Transnet PER; Contractor's EO
28. Water Records	Transnet PER; Contractor's EO
29. Energy Records	Transnet PER; Contractor's EO
30. Non-Conformance Records	Transnet PER; Contractor's EO
31. Approval of Contractor's Environmental File	Transnet PER
32. Site Access Certificate	Transnet PER
33. Approved Transnet PER Checklist	Transnet PER
34. Transnet Monthly PER Reports	Transnet PER
35. Rehabilitation Method Statement	Transnet PER; Contractor's EO
36. Contractor's Site Close-Out Report	Transnet PER; Contractor's EO
37. Transnet PER Site Closure Report	Transnet PER
38. Contractor's Environmental File Handover Transmittal	Transnet PER; Contractor's EO
39. Site Closure Certificate	Transnet PER

8. ANNEXURES

8.1 List of Construction Environmental Management Templates, Forms and Guidelines

8.2 009-TCC-CLO-SUS-TMP-11386.22 - Construction Environmental Management File Index

8.3 009-TCC-CLO-SUS-TMP-11386.23 - *Construction Environmental Management Process Flow*

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Annexure 8.1 List of Construction Environmental Management Templates, Forms and Guidelines

No	Item Description	Document No
1.	Construction Environmental Management File Index	009-TCC-CLO-SUS-TMP-11386.1
2.	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
3.	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
4.	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
6.	Schedule of Contractor's Construction Plant and Equipment	009-TCC-CLO-SUS-TMP-11386.6
7.	Hazardous Substances Register	009-TCC-CLO-SUS-TMP-11386.7
8.	Emergency Contacts Register	009-TCC-CLO-SUS-TMP-11386.8
9.	Energy Consumption Register	009-TCC-CLO-SUS-TMP-11386.9
10.	Water Usage Register	009-TCC-CLO-SUS-TMP-11386.10
11.	Project Start-Up Checklist	009-TCC-CLO-SUS-TMP-11386.11
12.	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
13.	Method Statement Register	009-TCC-CLO-SUS-TMP-11386.13
14.	Method Statements	009-TCC-CLO-SUS-TMP-11386.14
15.	Waste Disposal Register	009-TCC-CLO-SUS-TMP-11386.15
16.	Daily Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.16
17.	Weekly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.17
18.	Monthly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.18

No	Item Description	Document No
19.	Public Complaints Register	009-TCC-CLO-SUS-TMP-11386.19
20.	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
21.	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
22.	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22
23.	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
24.	Basic Environmental Rules for Contractors	009-TCC-CLO-SUS-GDL-11386.24
25.	Basic Site Procedure	009-TCC-CLO-SUS-GDL-11386.25
26.	Contractor Environmental and Sustainability Specification Guidelines (CESSG)	TRN-IMS-GRP-GDL-014.04

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Annexure 8.2 Construction Environmental Management File Index

No	Item Description	Document No
1	Transnet Integrated management System (TIMS) Policy Statement	-
2.1	Standard Operating Procedure (SOP) - Construction Environmental Management (CEM)	009-TCC-CLO-SUS-11386
2.2	Environmental and Sustainability Specification Guidelines	TRN-IMS-GRP-GDL-014.04
3	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
4	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
5.1	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.2	Contractor's Environmental Policy	-
5.3	Contractor's Organogram	-
5.4	Contractor's Environmental Management Plan	-
5.5	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
6	Schedule of Contractor's Construction Plant and Equipment	009-TCC-CLO-SUS-TMP-11386.6
7	Hazardous Substances Register	009-TCC-CLO-SUS-TMP-11386.7
8	Emergency Contacts Register	009-TCC-CLO-SUS-TMP-11386.8
9	Energy Consumption Register	009-TCC-CLO-SUS-TMP-11386.9
10	Water Usage Register	009-TCC-CLO-SUS-TMP-11386.10
11	Training Attendance Register	TIMS Procedure
12	Project Start-Up Checklist	009-TCC-CLO-SUS-TMP-11386.11
13	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
14	Method Statement Register	009-TCC-CLO-SUS-TMP-11386.13

No	Item Description	Document No
15	Method Statements	009-TCC-CLO-SUS-TMP-11386.14
16	Waste Disposal Register	009-TCC-CLO-SUS-TMP-11386.15
17.1	Daily Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.16
17.2	Weekly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.17
17.3	Monthly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.18
17.4	Environmental Inspection Findings Close-out Register	TIMS Procedure
18	Public Complaints Register	009-TCC-CLO-SUS-TMP-11386.19
19	Occurrence Register	TIMS Procedure
20	Transnet Occurrence Notification Report	TIMS Procedure
21.1	Environmental Occurrence Technical Form	TIMS Procedure
21.2	On-site Investigation Form – Incident Commander Report	TIMS Procedure
21.3	Investigation Form Report for Level 3 & 4 Occurrences	TIMS Procedure
21.4	Incident Commander Appointment Letter	TIMS Procedure
22	Non-Conformance Register	TIMS Procedure
23	Non-Conformance Report Form	TIMS Procedure
24	Non-Compliance Stop Certificate	TIMS Procedure
25	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
26.1	Site Closure Inspection Form	TIMS Procedure
26.2	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
26	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22

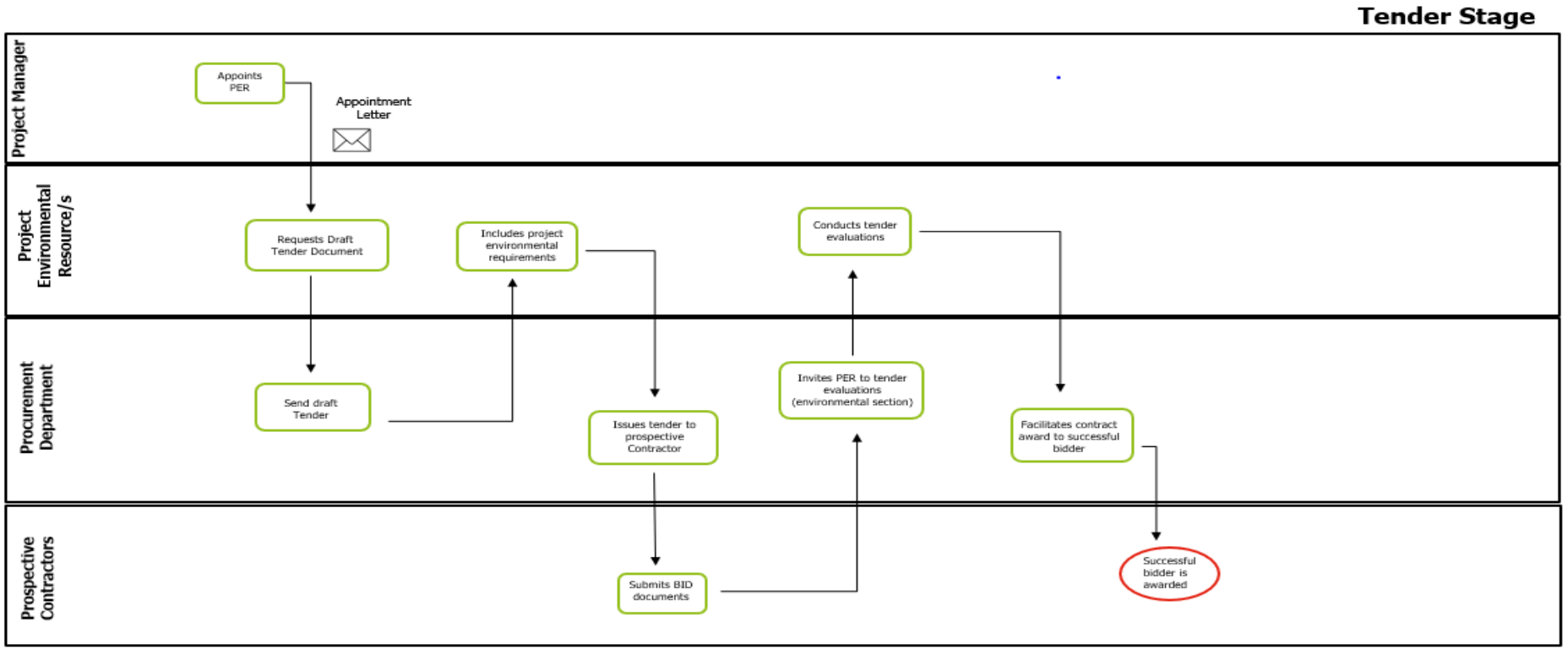
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No	Item Description	Document No
27.1	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
27.2	Basic Environmental Rules for Contractors	009-TCC-CLO-SUS-GDL-11386.24
27.3	Basic Site Procedure	009-TCC-CLO-SUS-GDL-11386.25

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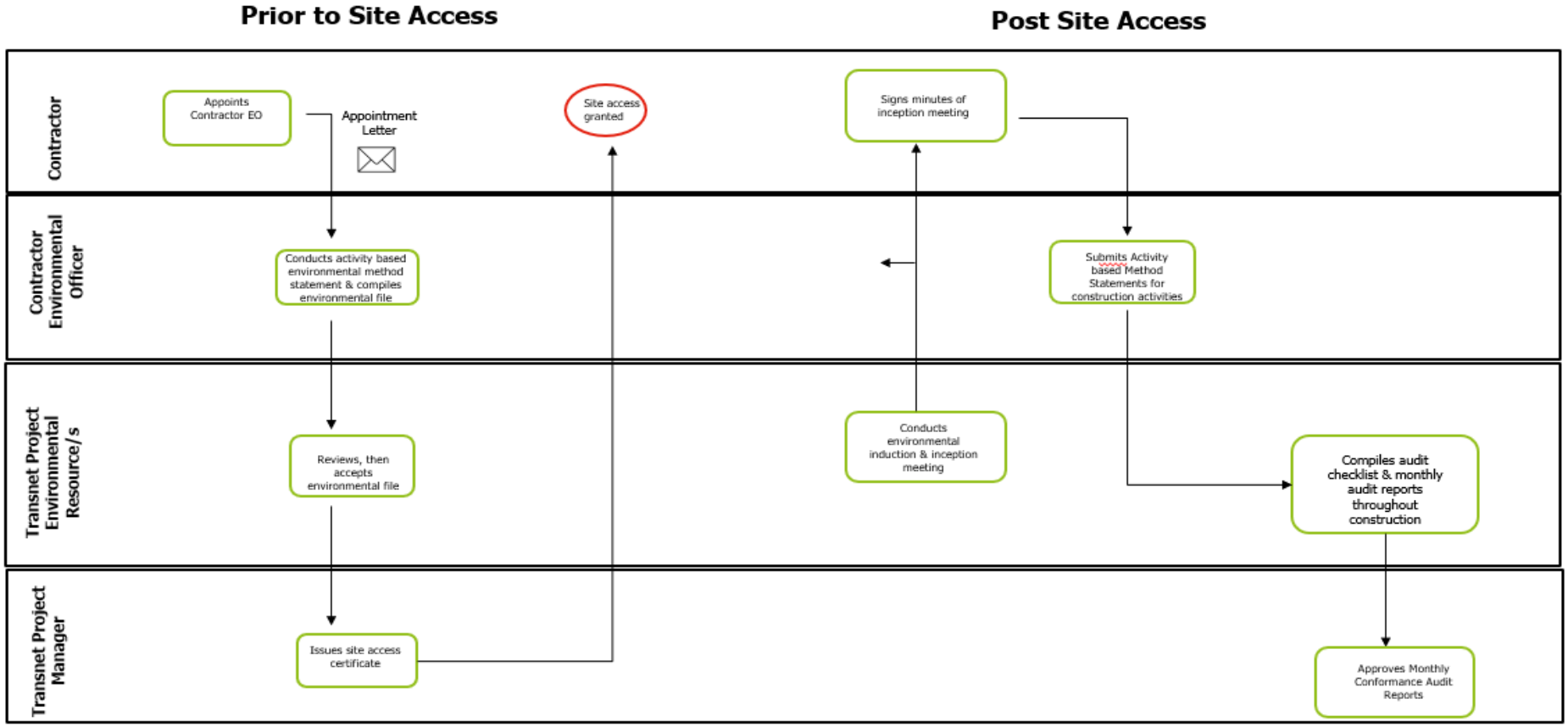
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Annexure 8.3 Construction Environmental Management Process Flow



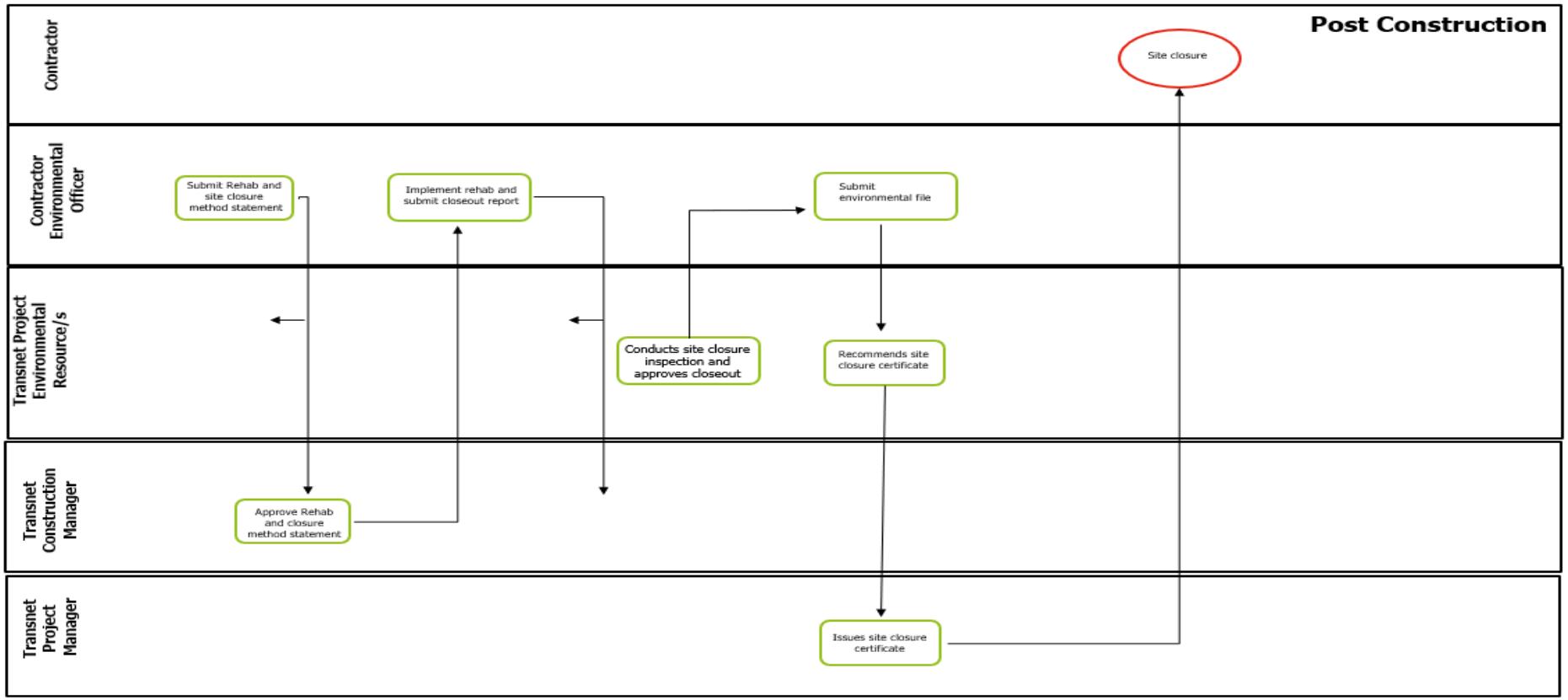
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Post Construction
Contractor
Site closure
Contractor Environmental Officer
Submit Rehab and site closure method statement
Implement rehab and submit closeout report
Submit environmental file
Transnet Project Environmental Resource/s
Conducts site closure inspection and approves closeout
Recommends site closure certificate
Transnet Construction Manager
Approve Rehab and closure method statement
Transnet Project Manager
Issues site closure certificate

Annexures B3 - Contractor Environmental and Sustainability Specification Guidelines

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CONTRACTOR ENVIRONMENTAL AND SUSTAINABILITY SPECIFICATION GUIDELINES

Document number	TRN-IMS-GRP-GDL-014.4
Version number	3.0
Classification	Unclassified
Effective date	01 October 2023
Review date	30 September 2028

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
3.0	• Addition of reference documents (section 3) • Inclusion of additional definitions • Removal of DEA and replacing it with DFFE • Removal of Transnet EO and replacing with Transnet Environmental Resource (PER) • Inclusion of additional abbreviations • Inclusion of minimum environmental requirements for construction (section 5) • Inclusion of details of site inspections/audits (table 1) • Inclusion of Records Management	6-7 7-10 11 12 12-23 23 45	June 2023

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

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DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	**Senior Specialist: Environmental Risk and Compliance**		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	**GM: Corporate Sustainability**		01/10/2023
Approves document for use. Comments:			

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1. PURPOSE

This document describes the minimum requirements for environmental management to which Contractors must comply. This document must be read in conjunction with the Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP).

In this document, unless the context clearly indicates otherwise:

- Words importing any one gender shall include the other gender;
- The singular shall include the plural and vice versa; and
- Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

This standard applies to Contractors that work on site under the authority of Transnet SOC Ltd.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles
National Water Act, 36 of 1998	Section 164, Permissible Water Use
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10 (a) and (b) Schedule 3, Defined Wastes Category A: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001

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Name	Applicable Section
	Government Notice R155 in Government Gazette 23108 of February 2002 General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15, Appendix 4
Transnet Environmental Risk Management strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Compliance — Meeting of all the organization's regulatory requirements

Conformance — The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.

Construction Environmental Management Standard Operating Procedure — Is a document which is used to define how environmental management will be practiced on any construction site under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are enhanced.

Contractor — The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.

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Contractor Environmental and Sustainability Specification Guidelines	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment.
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment.
Fauna	A group of animals specific to a certain region or time period.
Flora	A group of plants specific to a certain region or time period.
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment; and includes:- (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste;
Indigenous vegetation	Plants that naturally occur in an area.
Liquid waste	Waste that appear in liquid form such as used oil, grease and/or contaminated water or waste water.

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Method statement	A document that describes how the Contractor will apply environmental management measures associated with a particular activity during construction.
Monitoring	Determining the status of a system, a process or an activity
Natural Vegetation	All existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Responsible Authority	A Responsible Authority, according to the National Water Act 36 of 1998, relates to specific power or authority in respect of water uses that is assigned by the Minister to a Catchment Management Agency or to a Regional Office.
Rehabilitation	Refers to measures that must be put in place to restore the site to its pre-construction or enhanced state, subsequent to construction taking place.
Scope of Work	The construction work for which the Contractor has been appointed in terms of the Contract with Transnet.
Sensitive area	Any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (e.g. archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of sensitive social receptors etc. As a minimum, habitats that fall under this definition include: mountain catchments, Ramsar wetland sites, coastal shores, estuaries and endangered ecosystems.
Solid waste	All solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

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Spoil	Excavated material which is unsuitable for re-use as material in the Works or any other use; or is material which is surplus to the requirements of the Works.
Sub -Contractor	is a person or organisation who has a contract with the contractor to: Construct or install part of the contractor's work. Provide a service necessary to provide the works; or Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.
Temporary Storage	A once-off storage of waste for a period not exceeding 90 days.
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.
Wastewater	means water containing waste, or water that has been in contact with waste material
Watercourse	Refers to - a river or spring; a natural channel in which water flows regularly or intermittently;

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	a wetland, lake or dam into which, or from which, water flows; and any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

4.2 Abbreviations

Acronym	Meaning In Full
CEM SOP	Construction Environmental Management Standard Operating Procedure
CM	Construction Manager
CV	Curriculum Vitae
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
CESSG	Contractor Environmental and Sustainability Specification Guidelines
EO	Environmental Officer

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Acronym	Meaning In Full
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EGF	Environmental Governance Framework
NEMA	National Environmental Management Act 107 of 1998
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NWA	National Water Act 36 of 1998
PER	Project Environmental Resource
PES	Project Environmental Specification
PM	Project Manager
SAHRA	South African Heritage Resource Agency
SDS	Safety Data Sheet
SHEQ	Safety, Health, Environment and Quality
TRANSNET	Transnet SOC Ltd

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5. MINIMUM ENVIRONMENTAL REQUIREMENTS FOR CONSTRUCTION

5.1 Tender Documents

Any construction-related tender issued to the market must include:

- Transnet Integrated Management System Policy Statement;
- The Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP);
- The Contractor Environmental & Sustainability Specification Guideline; and
- The Project Environmental Specification (PES).

Any construction-related tender must be recommended for issue by the Transnet Project Environmental Resource/s before it is released to the market.

5.2 Project Environmental Specification (PES)

Must incorporate all relevant recommendations of the Environmental Impact Assessment (EIA) and other environmental studies for the project and the relevant conditions of the EA and/or other applicable environmental permit(s) and licence(s), and the Transnet Operating Division's Environmental Management requirements (where applicable) into an environmental performance specification for implementation during the construction phase of the project.

The PES need not be a separate document; however it can be in a format of an appendix/addendum making reference to environmental authorisation(s), permit(s) or licence(s) applicable to the project. In cases where the project does not trigger any of the NEMA listed activities or any permit(s)/licence(s); the PES may be compiled to prescribe additional environmental management measures over and above the measures stipulated in the MERC.

5.3 Contractor's Environmental Policy

The Contractor's Environmental Policy must be signed and dated by Top Management.

The content of the Contractor's Environmental Policy must:

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- be appropriate to the purpose and context of the Contractor's organization, including the nature, scale and environmental impacts of its activities, products and services;
- provide a framework for setting environmental objectives;
- include a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the Contractor's organization;
- include a commitment to fulfil compliance obligations; and
- include a commitment to continual improvement of the Contractor's environmental management system to enhance environmental performance

5.4 Contractor's Environmental Management Plan (EMP)

The Contractor's EMP must include:

- the name of the person who compiled the EMP;
- the expertise of the person who compiled the EMP, including a CV;
- a description of the Contractor's scope of work;
- a detailed description of the environmental aspects related to the Contractor's scope of work;
- a map at an appropriate scale which depicts all construction activities including associated structures, and infrastructure and environmental sensitivities affected by the construction footprint , as well as no go-areas and associated buffers;
    - The map must include the following:
    - an accurate indication of the project site position as well as the positions of the alternative sites, if any;
    - road names or numbers of all the major roads as well as the roads that provide access to the site(s)
    - a north arrow;
    - a legend;
    - the prevailing wind direction;
    - site sensitivities, including but not limited to vegetation, wetlands, watercourses, heritage sites, critical biodiversity area/s, World Heritage Site, etc. and it must be overlaid by the study area; and

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  - GPS co-ordinates (Indicate the position of the proposed activity with the latitude and longitude at the centre point for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should be to at least three decimal places. The projection that must be used in all cases is the WGS-84 spheroid in a national or local projection).
- a description of the impacts and risks that need to be avoided, managed and mitigated during the execution of the Contractor's scope of work including (as relevant);
  - planning and design;
  - pre-construction activities;
  - construction activities;
  - rehabilitation; and
  - operation of Transnet assets.
- a description and identification of impact management outcomes required for the identified aspects;
- a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved, and must, where applicable, include actions to:
  - avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - comply with any prescribed environmental management standards or practices; and
  - comply with any applicable local, provincial and national legislation.
- the method of monitoring the implementation of the impact management actions contemplated above;
- the frequency of monitoring the implementation of the impact management actions contemplated above;
- an indication of the persons who will be responsible for the implementation of the impact management actions;
- the timeframe within which the impact management actions contemplated above must be implemented;
- the mechanism for monitoring compliance with the impact management actions contemplated above;

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- a program for reporting on compliance, taking into account the requirements of this document;
- an environmental awareness plan describing the manner in which:
    - the Contractor intends to inform his employees of any environmental risk which may result from his scope of work; and
    - risks must be dealt with in order to avoid pollution or the degradation of the environment.
- any specific information that may be required by Transnet.

5.5 Contractor's Environmental Officer (EO)

The Contractor's EO should have relevant environmental qualifications and experience required for the project. The level of qualifications and experience must be in line with the complexity of the Contractor's scope of work coupled with the sensitivity of the site. The level of competency will be determined by Transnet during tender.

5.6 Management of Sub-Contractors

The Contractor must ensure that all his sub-contractors comply with this document in so far as it relates to their specific scope of work or services.

5.7 Pre-Site Access Environmental Governance

The Contractor must appoint the EO recommended in his tender proposal. Should the EO no longer be available, the Contractor must submit a CV of an alternative EO with similar or better qualifications and experience for approval by the Transnet PM and PER. The same principle will apply if the Contractor's EO is replaced for whatever reason at any stage. No construction may take place without a duly appointed Contractor's EO.

The Contractor must provide his EO with all environmental documents provided by Transnet during tender and submitted as a part of the Contractor's proposal.

The Contractor must obtain the contact details of the responsible Transnet PER and Transnet PER and provide these details to his EO.

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The Contractor's EO must develop an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):

- Documents from the tender as described above.
- His CV.
- An organogram indicating reporting lines of all Contractor's staff (with names included).
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's Construction Manager (CM); Contractor's EO; and all relevant emergency personnel.
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels.
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheets (MSDS)/ Safety Data Sheet (SDS); quantity on site; storage method; transport method to site; and period to be used on site. All substances listed must have MSDS/ SDS on site in the environmental file.

The MSDS/ SDS should contain the following minimum requirements:

- Section 1: Product and company name
- Section 2: Hazard identification
- Section 3: Composition/information on ingredients
- Section 4: First aid measures
- Section 5: Fire fighting measures
- Section 6: Accidental release measure
- Section 7: Handling storage
- Section 8: Exposure controls/personal protection
- Section 9: Physical and chemical properties
- Section 10: Stability and reactivity
- Section 11: Toxicological Information
- Section 12: Ecological Information
- Section 13: Disposal Consideration

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  - Section 14: Transportation
  - Section 15: Regulatory Information
  - Section 16: Other Information
- Photographic pre-construction report that details the site before any activities commence.
- Site Layout Plan indicating but not necessarily limited to,: access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled.
- A site establishment method statement (minimum requirements for method statements are described below in this document).
- Environmental Induction Material to be used to educate site staff and visitors (minimum requirements for environmental induction are described below in this document).
- An activity-based environmental risk assessment.

The Contractor's EO must submit the environmental file for acceptance to the Transnet PER.

The Contractor must obtain a Site Access Certificate from the Transnet PM before accessing the site.

5.8 Safety Data Sheets

Each hazardous substance used on site must have a valid SDS. The SDS must comply with the requirements of the Occupational Health and Safety Act, 85 of 1993.

5.9 Environmental Induction

The Contractor will ensure that all management, foremen and the general workforce, as well as all sub-contractors, suppliers and visitors to site have attended the Transnet Environmental Induction Programme prior to commencing any work on site. Where new personnel commence work on site during the construction period, the Contractor will ensure that these personnel also undergo the Transnet Environmental Induction Programme and are made aware of the environmental specifications on site.

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The Contractor must ensure that all of his personnel understand the requirements of the CEM SOP; MERC; EA, EMPr, relevant permits and licences and PES as relevant to their scope of work.

5.10 Environmental Method Statements

- Environmental Method Statements as identified by the Transnet PER based on the Contractor's activity-based environmental risk assessment will be written submissions by the Contractor to the Transnet CM and PER describing:
- The proposed activity, setting out the plant, equipment, materials, labour and method the Contractor proposes using to carry out an activity;
- The environmental management of site conditions – waste management, housekeeping, site establishment etc;
- Transportation of the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Description of potential positive and negative environmental impacts and how they will be managed;
- Conformance/ non-conformance with this document and any other statutory and best practice standards;
- Monitoring and reporting requirements;
- Records Management; and
- Any other information deemed necessary by the Transnet CM and Transnet PER as well as ECO where applicable.

The Environmental Method Statements will enable the potential positive and negative environmental impacts associated with the proposed construction activity to be identified and mitigation measures put in place. All method statements must be signed by the Contractor, Transnet CM and PER, with the addition of the ECO on authorized projects, thereby indicating that the works will be carried out according to the methodology described therein.

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Activities may only commence once the Environmental Method Statements have been approved by the Transnet CM, Transnet PER and ECO (where relevant). In some instances, local authorities may also need to approve the method statements. This will be highlighted in the Project Environmental Specification, where applicable.

All changes to the original Environmental Method Statements must be approved by the Transnet PER and Transnet CM prior to implementation.

To enable timely approvals, the environmental method statements will be submitted to the Transnet CM and Transnet PER for review two (2) weeks prior to the intended date of commencement of the activity, or as directed by the Transnet Project Manager/CM.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the CM and PER or ECO.

NOTE: No advice, approval of method statements or any other form of communication from Transnet will be construed as an acceptance by Transnet of any obligation that indemnifies the Contractor from achieving any required level of performance. Further, there is no acceptance of liability by Transnet which may result from the Contractor failing to comply with the specifications, i.e. the Contractor remains responsible for achieving the required performance levels.

5.11 Environmental Occurrences (Incidents)

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental occurrences during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

In the event of an environmental occurrence, the Contractor must, as soon as is reasonably practicable:

- classify an environmental occurrence in line with the Transnet Environmental Management Occurrence process flow;

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- take all reasonable measures to contain and minimise the effects of the occurrence, including its effects on the environment and any risks posed by the occurrence to the health, safety and property of persons;
- undertake cleanup procedures;
- remedy the effects of the occurrence; and
- assess the immediate and long-term effects of the occurrence on the environment and public health

5.12 Environmental Non-Conformances (Defects)

Environmental Non-Conformances shall be handled as per the terms and conditions of the Contract.

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental non-conformances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

The Transnet Project Manager shall ensure that all Non-conformances are appropriately closed out within the timeframe specified in the Non-Conformance Report.

Any environmental non-conformance will be dealt with similarly to a Defect as defined in the Contract. A defect is due to non-compliance with the Works Information and it is the responsibility of the Contractor to correct the defect in order to ensure that the work takes place in accordance with the Works Information. Similarly, non-conformance/non-compliance with any other permit or licence will be regarded as a non-conformance with the Works Information. The Contractor is responsible for rectifying any defect (non-conformance) as defined above promptly.

The Contractor's EO shall be responsible to search for and identify non-conformances with the environmental specifications at inspection intervals agreed to with the Transnet PER. The Transnet PER shall also undertake such inspections on a monthly basis. If such monthly inspections indicate that any part of the Contractor's work is non-conformant with the environmental requirements, the Transnet PER shall advise the Transnet PM to issue a Defects Notification to the Contractor accordingly. The Contractor shall correct the non-

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conformance (defect) within the timeframes specified in the report and notification and submit proof of such correction to the Transnet PER.

The Transnet PER shall not recommend that a Site Closure Certificate be issued to the Contractor if any non-conformances have not been properly closed out. In such an event, the Transnet Project Manager may also make use of any reasonable contractual means to rectify the non-conformance(s) as allowed by the Contract (retention moneys etc.).

5.13 Community Grievances (Public Complaints)

The Transnet PER shall provide the Contractor with the procedure to follow in managing community grievances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

5.14 Environmental Inspections and Audits

Environmental inspections and audits may be conducted using five basic techniques:

- Interviews with Contractor's staff including Sub-contractors and suppliers;
- Document review;
- Observations;
- Monitoring; and
- Measurement and verification.

Table 1 sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such inspections/audits, the inspector/auditor and the inspected party/auditee. It should be noted that the list is not exhaustive and that each site will have specific issues that will need to be inspected/audited.

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Table 1: Details on Environmental Inspections/Audits (where Transnet is the Inspected Party/Auditee, respective Contractors must give full cooperation).

Place	**Inspector/Auditor**	**Inspected Party/ Auditee**	**Inspection/audit frequency**
Construction Site	Contractor's Environmental Officer	Contractor	Daily/Weekly Inspection
Project (including all construction sites).	Transnet Project Environmental Resource/Project Environmental Manager	Contractor	Monthly Inspection
Project (including all construction sites)	Transnet Environmental Specialist: Assurance	Transnet Project Environmental Resource	As stipulated on the annual audit plan
Project (as defined in Environmental Authorisation)	Environmental Control Officer	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Environmental Authorisation
Project (as defined in Water Use Authorisation)	Independent Auditor	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Water Use Authorisation

The Contractor's EO will be required to conduct inspections of all work areas for which the Contractor is responsible, at intervals agreed to with the Transnet PER. Monitoring shall

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be conducted as per the Contractor's approved EMP and all required records shall be maintained by the Contractor.

The Transnet PER will be required to conduct inspections of all work areas for which the Contractor is responsible on a monthly basis or at intervals agreed to with the Transnet Project Environmental Manager. Monitoring shall be conducted as per the Project Environmental Specification. The Inspection Checklist to be used shall be approved by the Transnet PER prior to each inspection.

5.15 Contractor's Environmental Performance

The Transnet PER will explain how the Contractor's performance will be scored during pre-site access governance to the Contractor's EO. The standard/minimum requirement for all environmental inspections will be 90%.

5.16 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, eating areas and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas; the buffer to be determined by the ecological requirements of the fauna/flora found on-site.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from any watercourse.

5.16.1 Site Layout Plan

The Site Layout Plan must as a minimum include but not limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas;
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluent;
- Proposed areas for the stockpiling of topsoil and excavated spoil material;
- Demarcation of the construction footprint including areas not to be disturbed by the development;

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- Location of sewage and sanitary facilities at the site offices and staff accommodation at all localities where there will be a concentration of labour.

Any changes to the location of the facilities and site activities as per the approved site layout plan shall be re-submitted to the Transnet CM and Transnet PER for approval prior to implementation.

The Contractor may be required to submit a separate layout plan dealing only with his site camp. If so this will be specified in the PES.

5.16.2 Identification and Establishment of Suitable Access Routes/Roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimize erosion and dust generation.

5.16.3 Demarcation of Site Limits

Prior to the commencement of construction, the site must be clearly demarcated by means of visible barriers. Vegetation within the demarcated zone may be cleared only upon obtaining approval from the Transnet PER. No activities are allowed outside of the approved footprint on the Site Layout Plan.

5.16.4 Eating Areas

The Contractor is responsible for providing adequate eating facilities within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags/bins must be provided at all established eating areas and when full it should be disposed of appropriately.

5.16.5 Liquid Waste Management

Liquid waste water from site shall be stored on-site in a properly designed and constructed system, situated so as not to adversely affect water courses. Only domestic type wastewater, i.e. toilet, shower, basin, kitchen water shall be allowed to enter the designated system.

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5.17 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities including toilets, toilet paper, wash basins etc. to all workers on site and for enforcing the proper use of these facilities.

Toilet facilities shall be serviced regularly and the waste material generated from these facilities shall be disposed of at a registered waste water treatment works/macerator and relevant permits for transportation of waste and proof of servicing and disposal shall be maintained.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on site, and away from sensitive areas. Use of open areas (i.e. the veld) is not allowed. For projects of high mobility a mobile toilet facility shall be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. Toilets must not be placed in areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet CM.

5.18 Waste Management

Waste shall be grouped into "**general**" or "**hazardous**", depending on its characteristics. The classification shall determine handling methods and the ultimate disposal of material.

General waste which is likely to be generated on site during construction include but not limited to the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel;
- Uncontaminated construction debris such as used wood and scrap metal; and
- Uncontaminated soil and non-hazardous rubble from excavation or demolition.

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The Contractor shall classify all waste expected to be generated during the construction period. Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

Waste	Classification	
	Hazardous	**General**
Aerosol containers	**X**	
Batteries, light bulbs, circuit boards, etc.	**X**	**X**
Clean soil		**X**
Construction debris contaminated by oil or organic compounds	**X**	
Domestic waste		**X**
Empty drums (depends on prior use)	**X**	**X**
Empty paint and coating containers		**X**
Explosive waste	**X**	
PCB waste	**X**	
Rubble (not contaminated by oil or organic compounds)		**X**
Waste Cable		**X**
Waste plastic		**X**
Waste paint and/or solvent	**X**	
Waste oil	**X**	
Waste concrete		**X**
Waste cement powder	**x**	
Waste empty cement bags (must be thoroughly decanted)		**x**
Waste containing fibrous asbestos	**X**	
Waste timber		**X**
Sewerage sludge	**X**	
Scrap metal		**X**

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Waste	Classification	
	Hazardous	General
Chemically-derived sanitary waste	X	

Waste will be managed in accordance with the Waste Management Hierarchy depicted in Figure 1 below:

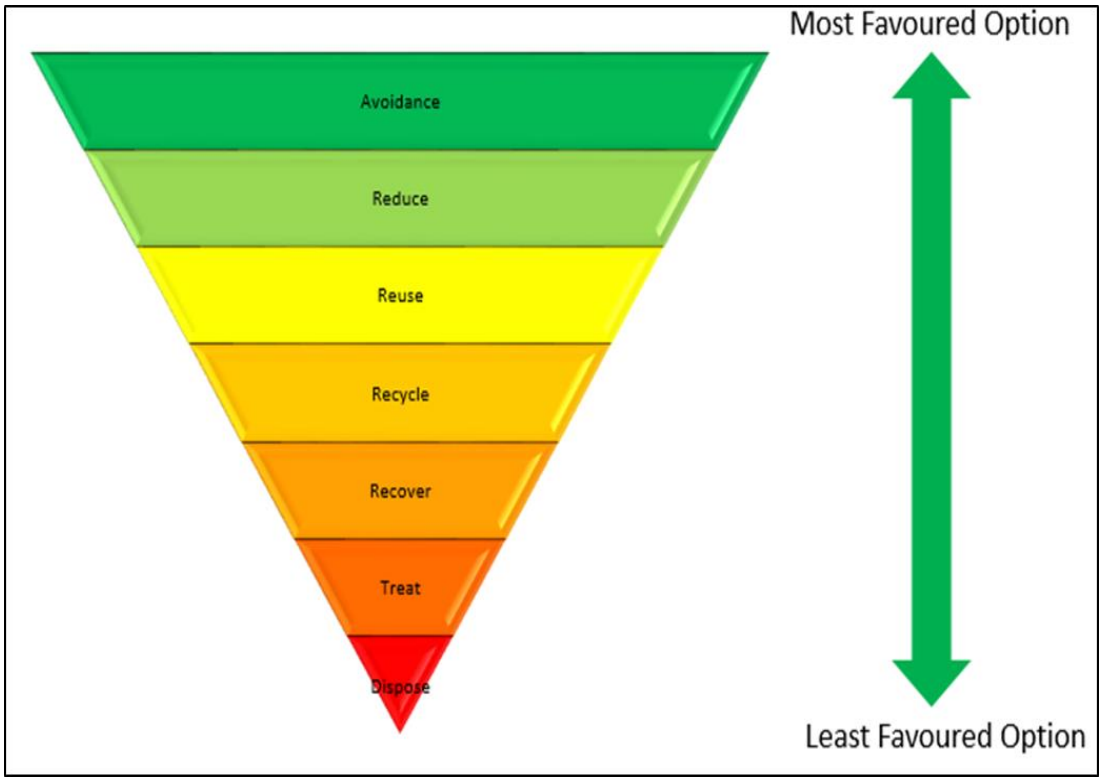


FIGURE 1: THE WASTE MANAGEMENT HIERARCHY

(Transnet Environmental Risk Management strategy and Framework, 2015:42)

1. **Avoidance/Prevention:** using goods in a manner that minimises their waste components
2. **Reduction/Minimisation:** reduction of the quantity and toxicity of waste generated during construction
3. **Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties

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4. **Recycling:** separating articles from a waste stream and processing them as products or raw materials
5. **Recovery:** reclaiming particular components or materials, or using the waste as a fuel
6. **Treatment:** processing of waste by changing its form or properties in order to reduce toxicity and quantity
7. **Disposal:** burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste generated from site. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: http://sawic.environment.gov.za/).

The Contractor shall manage **GENERAL WASTE** that is anticipated to be generated by operations as follows:

- Notify waste hauler when container is full so that it can be removed and replaced with an empty container/skip;
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor;
- Provide documented evidence of proper disposal of waste (Waste Disposal Certificate)

The Contractor shall recycle **GENERAL WASTE** (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them at secure designated locations on site:
  - Office Waste;
  - Aluminium;
  - Steel;
  - Glass;
  - Ferrous Metals;

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- Non Ferrous Metals; and
- Waste Timber

- Establish recycled material collection schedule;
- Arrange for full bins to be hauled away;
- Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling; and
- No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall manage **HAZARDOUS WASTE** anticipated to be generated by his operations as follows:

- Obtain and provide an acceptable container with correct and visible classification label;
- Place hazardous waste material in allocated container;
- Inspect the container on a regular basis as per the Contractor's EMP;
- Track the accumulation time for the waste, haul the full container to the registered hazardous disposal site;
- Notify the waste hauler when container is full so that it can be removed and replaced with an empty container/skip; and
- Provide documented evidence of proper waste disposal of the waste (Waste Disposal Certificate).

The Contractor shall maintain the following waste records for submission to the Transnet PER on request:

- Date of waste management activity;
- Activity Type (reuse, recycle, recover, treat, dispose);
- Description (e.g. contaminated soil, medical waste, tyres, plastic, domestic waste etc.)
- Classification (General/Hazardous);
- Estimated Quantity in kilograms
- Disposal Site Name and Reference Number (where relevant);
- Method of Transport; and
- Signed Collection or Disposal Records

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5.19 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refueling of plant on site must be done at designated locations approved on the Site Layout Plan. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities.

All machinery servicing areas must be bunded. Stationary plant that leak harmful substances shall not be permitted on site. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided and the wastewater should be disposed of appropriately in accordance with its waste classification.

5.20 Vehicle and Equipment Refueling

5.20.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refueled on site except at designated servicing or refueling locations included on the approved Site Layout Plan.

The Contractor shall provide details of his refueling activities in his EMP or Refueling Method Statement. Facility design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

5.20.2 Mobile Refuelling

In certain circumstances, the refueling of vehicles or equipment in a designated area is not a viable/practicable option and refueling has to be done from a tank, truck, bowser or container moved around on site. In such circumstances, the Contractor may request approval from the Transnet CM to conduct mobile refueling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.

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- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refueling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refueling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling equipment must be stored in areas where they are not susceptible to collisions.
- Mobile refueling operations shall not take place within 30 meters of any watercourses or 7.5 meter from other structures, property lines, public ways or combustible storage.

All mobile refueling tanks are to be properly labelled and fire extinguishers with valid service dates shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

5.21 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental features.

The Contractor shall have an approved Spill Response Plan, either in his EMP or in the form of a method statement approved by the Transnet CM and Transnet PER.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- All plants to be inspected daily to ensure that they are in good condition;
- Immediately repair all leaks of hydrocarbons or chemicals;
- Take all reasonable measures to prevent spills or leaks;
- Do not allow sumps receiving oil or oily water to overflow;
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals; and
- Do not discharge oil or contaminants into storm water or sewer systems.

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill;

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- Contain the spill;
- Recover the spilled product;
- Remediate the site;
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water; and
- Manage the contaminated material in accordance with Waste Management requirements in this document.

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it;
- Notify the appropriate on-site authorities;
- Implement actions necessary to prevent the spread of the contamination by deploying appropriate absorbent material;
- Recover the spilled product; and
- Manage the contaminated material in accordance with Waste Management requirements in this document. Water samples to be taken downstream from where the spill took place to trace the extent of pollution.

All spills must be recorded as occurrences and managed in accordance with the requirements for Occurrences in this document.

5.22 Spray Painting and Sandblasting

Spray painting and sandblasting must be kept to a minimum. All painting must, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or as per the approved EMP or Method Statement.

The relevant Contractor will inform his EO when and where spray painting or sandblasting will be carried out prior to commencement of work. The Contractor's EO will monitor these activities to ensure that adequate measures are taken to prevent contamination.

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Sand may only be acquired from approved commercial sources and in instances where sand is collected from the natural surrounds, such collection must be approved by the Transnet PER.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval by the Transnet PER.

5.23 Dust Management

The usage of water for dust management will be minimized as far as practically possible. Discretion must be applied in this regard especially relating to drought conditions. Only water from approved sources may be used. Dust control measures must be approved by the Transnet PER prior to commencement of the Works.

The following minimum dust management practices must be implemented on site:

- Vehicles must be operated within speed limits, where no speed limit has been specified, the limit shall be 40km/h;
- Haulage distances must be minimized as far as reasonable practicable;
- Where water suppression is insufficient or impractical, environmentally friendly soil stabilizers must be used;
- Stockpiles and open areas that may cause dust must be stabilized and vegetated where required;
- Dust suppression measures must be implemented on inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more);
- Disturbance of natural vegetation must be minimized to reduce potential erosion, runoff, and air-borne dust;
- Material in transit must be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage or creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin;

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5.24 Storm Water and Dewatering Management

Apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertilizer from rehabilitated areas, etc.

Discharges to controlled waters such as the sea, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established and maintained on site during the construction period until permanent drainage is in place. Secondary drainage that prevents erosion must be provided, where necessary.
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- Stagnant water shall be cleared at a frequency approved by the Transnet PER.
- Any surface water flows off-site must be approved by the Transnet PER. Where necessary, silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- The removal from groundwater is defined as a water-use under the National Water Act 36 of 1998. Therefore, it must be ensured that the project has been authorised by the Responsible Authority to remove and discharge groundwater prior to dewatering taking place. If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities.
- On-site drainage shall be accomplished in accordance with a plan approved by a suitably qualified civil engineer.

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5.25 Erosion Control

Erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include, but not limited to the following:

- Activities must be scheduled to minimise the extent of disturbance of an area at any one time;
- Re-vegetation must be implemented as early as feasible;
- Construction traffic must be properly managed and controlled;
- Areas must be graded to the extent feasible at drainage ditches;
- Loose soil will be compacted as soon as possible after excavation, grading, or filling;
- Silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins must be used;
- The transport of sediment must be minimised;
- An erosion and sedimentation control plan must be developed, approved by the Transnet PER and communicated to staff; and
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

5.26 Noise Management

- The following specific measures are required:
- Keep all equipment in good working order;
- Operate equipment within its specification and capacity and don't overload machines;
- Apply regular maintenance, particularly with regards to lubrication;
- Operate equipment with appropriate noise abatement accessories, such as sound hoods;
- Relevant stakeholders shall be notified of any excessive noise-generating activities that could affect them;
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, so that it will not produce excessive or undesirable noise when released;

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- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, for construction plant noise generation
- Contractor's vehicles shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road.
- If on-site noise control is not effective, protect the victims of noise by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

5.27 Protection of Heritage Resources

5.27.1 Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Transnet CM and Transnet PER of such a discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority is to be contacted and will appoint an Archaeologist to investigate the find. Work may only resume once clearance is given in writing by the Archaeologist.

5.27.2 Graves

If a grave is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the grave shall be stopped and the Transnet CM and PER informed of the discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

5.28 Fire Prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose.

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A firebreak shall be cleared and maintained around the perimeter of the camp and office sites where and when necessary. In cases where construction is taking place in a Critical Biodiversity Area as listed under NEM:BA; it must be ensured that the requirement of a firebreak is screened against the NEMA Listing Notice 3 to confirm legislative requirements.

All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

5.29 Water Protection and Management

No water shall be abstracted from any water course (stream, river, or dam) without the expressed permission of the Transnet CM and Transnet PER. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

Method Statement(s) must be prepared by the Contractor for the various water uses. The Contractor shall keep a record of the quantities of water used on-site during construction (including use by sub-contractors), irrespective of the purpose of use.

5.30 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site, an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

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The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

5.31 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the Contractor's EO for a solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis (depending on project requirements) and keep record of all the environmental related training of the personnel.

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5.32 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet CM and Transnet PER.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts. Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab. Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. It is acknowledged that all waste water will evaporate; it must be ensured that the remaining water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste at an authorised hazardous waste management facility.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the approved washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated and approved by the Transnet CM and PER for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and

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must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a relevant registered disposal facility and SDCs kept on the file. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained by the Contractor and filed in the Green file.

5.33 Stockpiling, Soil Management and Protection of Flora

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated. Sensitive areas shall be cordoned off and avoided in this regard.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible when and where necessary. The detail of vegetation clearing shall be subject to the Transnet CM's approval and shall occur in consultation with the Transnet PER.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials. Stockpiled soil shall be protected by adequate erosion-control measures. Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation. Stockpiles containing topsoil shall not exceed 2m in height unless otherwise permitted by Transnet.

Topsoil shall be stockpiled separately from other materials and prevented from movement. Excavated subsoil, where not contaminated, must be used for backfilling, if possible, and topsoil for landscaping and rehabilitation of disturbed areas. Where topsoil

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has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

No vegetation located outside the construction site shall be destroyed or damaged. As far as is reasonably practicable, existing roads must be used for access to the site. Before site clearance takes place, vegetation surveys must be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities. The development of new embankments or fill areas must be undertaken in consultation with the Transnet PER.

No dumping of solid waste or refuse shall be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

5.34 Traffic Management

Vehicles usage is permitted only on access roads. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint.

The Contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

5.35 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the SOP CM and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover, where ADTs are not utilised, to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

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5.36 Borrow Pits and Quarries

The Contractor shall ensure that suppliers of rock and sand raw materials are in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless the borrow pit has a valid permit, he has obtained written approval from the Transnet CM and Method Statement has been submitted and approved. The Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, rehabilitation, safety and noise levels).

5.37 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet SOC Ltd in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet CM.

No activity on private property shall be allowed without written consent by the relevant landowner and Transnet CM/Transnet PER.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet CM, the Transnet PER and the land-owner.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site and signs reflecting such shall be displayed on the notice boards.

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5.38 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Kilowatt Hours)
- Fuel consumption (to be measured in liters)

5.39 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced, bunded and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet CM and PER.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area.

Hazard signs indicating the nature and volume of the stored materials shall be displayed on the storage facility or containment structure.

Weigh bills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet PER.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

Information on each hazardous substance will be available to all persons on site in the form of MSDS/SDS. Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's EO must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

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5.40 Housekeeping

The Contractor must ensure proper housekeeping of the site for the duration of the project. If practical the contractor shall amongst construction personnel, assign one to be responsible for good housekeeping

Materials shall be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

5.41 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. Where applicable, rehabilitation must be in line with the measures outlined in the Project Environmental Specification. A rehabilitation plan will be submitted to the Transnet CM and PER for approval at least six weeks before project completion. The following, but not limited are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use;
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified Botanist/Horticulturist should be sought in developing this list;
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc.);
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful); and
- Procedures for the prevention of the establishment and spread of alien invasive species.

5.42 Documentation and Records Management

The Contractor's EO will complete and maintain copies of all documents and records and ensure that these documents and records are kept up to date.

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The Contractor's EO will submit these documents to the Transnet PER on a frequency as agreed to with the Transnet PER, except where documents have remained unchanged in which case written notification to this effect must be provided to the Transnet PER. The Contractor's EO must ensure that electronic copies of these documents are saved on the Transnet system.

Once the construction activities have been completed and the Transnet PER has conducted a site closure inspection and notified the Contractor that site closure will be granted, all documents described above must be handed over to Transnet after which a Site Closure Certificate will be issued by the Transnet Project Manager.

NOTE: All documents/records are to be retained, within the Transnet Document Control System, for a period of 10 years. In the event of environmental documentation/record being lost before receiving a Site Closure Certificate, the Contractor will be penalised according to the specifications laid down in the Contract.

6. RECORDS

Refer to CEM SOP.

7. ANNEXURES

None.

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Annexures B4 - Standard Generic EMPr DBN

Project Name: **Port of Durban**
Minor Works for maintenance of Port structures, infrastructure, services and equipment

Specification Title: **Standard Environmental Maintenance Management Programme for Maintenance Works**

Prepared by: Vusumzi Sihawu (TNPA Environmental Specialist) — 05 Nov 2015

Reviewed by: Bonga Sithole (TNPA Environmental Specialist) — 05 Nov 2015

Approved by: Simphiwe Mazibuko (TNPA Environmental Manager

Approved by: Nelson Mbatha (TNPA National Environmental Manager) — 5-11-2015

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List of Terminology and Definitions

Terminology	Explanation
Activity	Any action needed for the design, construction, maintenance and completion of a project.
Alien species	A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities.
Environmental aspect	A product's or production process's environmental impact or important issues in the environment that an organisation should take into consideration
Communication register	A register aimed at tracking all communication activities within the project.
Contaminated water	Water contaminated by pollutants from on- or off-site activities; e.g. cement-laden water and runoff from plant / personnel wash areas. Contaminated water must be treated to ensure that water released into the receiving environment meets minimum standards and guidelines. Treated water should be recycled where possible (e.g. used for dust suppression).
National Department of Environmental Affairs	The authority responsible for the review and/or approval of an Environmental Management Programme.
Department: Mineral Resources	The authority responsible for mineral and petroleum resource management.
Department of Water and Sanitation	The authority responsible for water management.
Employer	Transnet SOC (LTD)
Environment	The surroundings in which humans exist and which comprise: the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination and interrelationships; and the physical, chemical, aesthetic, historical, cultural and economic properties and conditions of the foregoing that can influence human health and wellbeing.
Environmental Audit	Systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of the Environmental Management Programme and is complying with statutory requirements and the organisation's Environmental Policy.
Environmental Authorisation	The authorisation by a competent environmental authority for commencement of listed activities in terms of the National Environmental Management Act (Act 107 of 1998).
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially that results from an organisation's environmental aspects.
Environmental Impact Assessment	The process of collecting, organising, analysing, interpreting and communicating information in accordance with the environmental legal requirements set out in GNR. No 982, GNR. 983, GNR. 984 and GNR 985 as published in Government Gazette No. 38282 of 4 December 2014 (as amended), promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998), for the purposes of obtaining an Environmental Authorisation in accordance with Chapter 5 of the National Environmental Management Act.
Environmental Management Inspector	A person designated as an environmental management inspector in terms of Section 31B or 31C of the National Environmental Management Act (Act 107 of 1998).

Environmental Management Programme	A tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
Environmental objectives	The overall environmental goal arising from the Environmental Policy that an organisation sets itself to achieve, and is quantified where practicable.
Ergonomic	Defined as the design; making usable, user-friendly; or comfortable and safe to minimize physical effort and discomfort, thereby maximizing efficiency
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fire danger index	A relative number denoting an evaluation of rate of spread or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.
Fire hazard	The relative combination of fuel, oxygen and heat that will lead to the start and spread of a potential fire.
Flood line	The line or mark to which a flood could rise every 50 (1:50 year flood line) or 100 (1:100 year flood line) years.
Flora	All living plants, grasses, shrubs, trees, etc. that are typically incapable of easy natural motion and capable of photosynthesis.
Groundwater	Water that fills the natural openings in below-surface rock or unconsolidated sands.
Hazardous waste	Waste that, because of its chemical reactivity, toxic, explosive, corrosive, radioactive or other characteristics, causes danger or is likely to cause danger to health or the environment.
Heritage resources	Any place or object of cultural, archaeological or paleontological significance in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).
Induction training	The training provided to new / existing employees to (re)acquaint them with the company structure, their specific job requirements, practical or organisational issues and occupational health, safety and environmental considerations required on the project.
Integrated Environmental Management	• the promotion of the integration of the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998) in making decisions that may have a significant effect on the environment; • the identification, prediction and evaluation of the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts and maximising benefits; • ensuring that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them; • ensuring an adequate and appropriate opportunity for public participation in decisions that may affect the environment; • ensuring the consideration of environmental attributes in management and decision making, which may have a significant effect on the environment; and • identifying and employing the modes of environmental management best suited to ensure that a particular activity is pursued in accordance with the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998).
Interested and Affected Parties	Any person or group of people concerned with or affected by an activity and its consequences. These include the authorities, local communities,

(I&AP)	investors, work force, customers and consumers, environmental interest groups, and the general public (after the Environmental Impact Assessment Regulations of September 1997 and Guideline Document: Environmental Impact Assessment Regulations of April 1998).
Land Use	The arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. This definition establishes a direct link between the land cover and the actions of people in their environment.
Maintenance	Actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint. It does not include an increase in the footprint or throughput capacity. It includes reconstruction, if on the same location, capacity and footprint. (e.g. replacing like for like).
Materials	All kinds of items (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
Mitigate	The implementation of practical measures to reduce any adverse impacts or to enhance the beneficial impacts of an action
No-go area	An area where construction and maintenance activities are prohibited.
Non-compliance	Failure to comply with the requirements of the EMPr.
Non-conformance report	A report outlining a deviation from process, procedure or compliance specifications.
Plant	The apparatus, machinery and vehicles used during the Permanent Works.
Pollution	Any change in the environment caused by substances or noise, malodours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future
Potentially hazardous substance	A substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances, published in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).
Precautionary principle	The basic principle that, when in doubt or when there is insufficient or unreliable information, actions must be undertaken that have minimum risk.
Quality management system	A set of interrelated or interacting elements that organisations use to direct and control how quality policies are implemented and quality objectives are achieved.
Rehabilitation	Re-establishment or restoration to a healthy sustainable capacity or state.
Resource recovery	Recycling of waste or the recovery of energy.
Sensitive receptors	Locations or areas that are likely to experience an impact more than other locations or areas; for example, schools and residential areas.
Solid waste	All solid waste, including construction / maintenance debris, chemical waste, excess cement / concrete, wrapping materials, timber, steel, drums, wire, nails, food and domestic waste (e.g. plastic bags and wrappers).
Target	The detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Waste minimisation	The reduction of the volume of waste during maintenance by means of different processes or clean technology.

Waste prevention	The prevention and avoidance of the production of a waste.
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Water resource	Includes the sea, a watercourse, surface water, estuary, or aquifer.
Works	Means the Permanent Works and the Temporary Works, or either of them as appropriate.

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	**Explanation**
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EMPR	Environmental Management Programme
EO	Environmental Officer
FDI	Fire Danger Index
I&AP(s)	Interested and Affected Party(ies)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:ICMA	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act, 1998 (Act 36 of 1998)
PCO	Pest Control Officer
PEM	Project Environmental Manager
PPE	Personal Protective Equipment
SAHRA	South African Heritage Resource Agency
SANS	South African National Standard

1. Background and Introduction

The Port of Durban is located in the East coast of Southern Africa, 680 nautical miles Northeast of Cape Agulhas at Latitude -29.869175°, Longitude 31.034514°. Durban is South Africa's premier container port (59% of South Africa's container traffic) and the principle port serving the KwaZulu-Natal province and the Gauteng region as well as the Southern African hinterland. On average, the Port handles 45 million tons of bulk cargo (including SBM crude oil imports) and 2.75 million Twenty Foot Equivalent Unit Containers TEUs (59% of the total TEUs handled in SA). During the 2014/2015 financial year, the Port of Durban handled a total of 3,960 sea-going ships with a total gross tonnage of over 138 million.

The port is protected by the north and south breakwaters which are 500m and 700m long respectively. The water surface is 892 hectares at high tide and 679hectares at low tide. The harbour entrance depth is 19 metres in the approach channel decreasing to 16 metres within the harbour. The new navigation width is 220 metres. The port has a total of 59 effective berths excluding those used by fishing vessels and ship repair.

The port offers diversified cargo handling facilities for automotives, containers, bulk liquids, dry bulk, and general breakbulk, free flowing grains and general breakbulk. The port also provide a passenger terminal at N-berth on the T-Jetty for the convenience of cruise ships. In addition to these facilities, the port caters for the ship repair industry with a Drydock having a total length of 352.04m and a width of 33.52m at the top. The emerging demand for ship repair facility in the shipping industry has also become a significant factor for the port's repair and maintenance facilities in the port of Durban.

As a consequence, import / export and demand for ship repair facility, repair and maintenance activities are exacting a heavy toll on the port infrastructure. Additionally, the harsh marine environment has a negative corrosive and chemical reactive effect upon various structures, infrastructure and facilities within the Port. Regular maintenance activities are therefore required to counter the afore-mentioned effects. Most equipment pivotal to sustain port business and services is old and require replacement. In the Drydock facility, much of maintenance work is required as part of Operation Phakisa.

According to NEMA: EIA Regulations 2014 "maintenance means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint". Maintenance in the regulations refers to activities performed to keep a structure or system functioning or in service by reconstruction on the same location, same capacity and footprint, and replacing like for like. Maintenance does not include an increase in the footprint, capacity or throughput capacity

Some of the required maintenance activities within the Port of Durban may require infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-within a 100m of the high water mark of the sea. The Department of Environmental Affairs has indicated

that Activity 19 of Listing Notice 1, GNR 983 of the EIA Regulations 2014 will not be triggered where activities are undertaken for maintenance purposes in accordance with a management plan *agreed to by the relevant competent environmental authority*.

Activity No.	Triggered Activity	Applicability
19	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater **but excluding where such infilling, depositing , dredging, excavation, removal or moving-** (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or	Applicable

This Environmental Management Programme has been developed in line with this requirement to govern activities undertaken for maintenance purposes and must be approved by DEA prior to implementation.

All activities to be undertaken in terms of this Environmental Management Programme (EMPr) have been aligned with the definition of maintenance and will not increase the capacity or footprint of the Port or the individual components requiring maintenance.

Typical maintenance activities will include:

- refurbishment of roads and associated infrastructure, stacking areas and berth top surfaces;
- refurbishment of buildings (to adequately provide support services to port maintenance operations);
- repair to ageing services and / or alignment of such services to new and improved technologies;
- consolidation and or reconstruction of services / facilities / infrastructure / structures;
- implementing measures to align with current regulatory and / or best management practices; and
- improvement of ergonomic approach to optimize human well-being and overall system performance.
- repair of jetties, quay walls and break water infrastructure
- replacement of aging port equipment and rails

- maintenance dredging

2. Purpose of Document

The EMPr describes environmental management requirements for activities associated with maintenance of services, equipment, structures, infrastructure and facilities within the Port of Durban.

Compliance with the environmental management requirements of this EMPr is compulsory for all Transnet personnel and representatives, contractors and sub-contractors that may be involved with these works.

3. Environmental Management Objective

The main objective of the EMPr is to ensure the implementation of environmental practices that are aimed at the best form of environmental protection. The aim is to ensure that Transnet takes reasonable measures to protect the environment and to remedy impacts to the environment as required by the Duty of Care principle as stated in Section 28 of the National Environmental Management Act, 107 of 1998, as amended (NEMA). The EMPr also takes specific recognition of the monitoring, auditing and corrective actions needed when activities are undertaken under this EMPr. Therefore, the other objectives[1] of the EMPr are to:

- Avoid, minimize or correct the disturbance of ecosystems and loss of biodiversity;
- Avoid, minimize or correct pollution and degradation of the environment;
- Avoid or minimize waste, to reuse or recycle waste where possible and to dispose of waste in a responsible manner;
- Apply a risk-averse and cautious approach; and
- Anticipate and prevent negative impacts on the environment and on people's environmental rights. Where impacts cannot be prevented, such impacts must be minimized and mitigated.

4. Description of Typical Maintenance Project

Maintenance activities that may be required at the Port of Durban from time-to-time are provided below:

4.1 Refurbishment of Roads, car parking areas and associated infrastructure

Excavations and infilling will be required for the refurbishment of existing roads within the port. Some of the roads and associated infrastructure within the Port of Durban have deteriorated with increased road use frequency and vehicle cargo weight and require urgent maintenance work to

[1] As defined by the National Environmental Management Act (No. 107 of 1998).

be undertaken. As such, existing road layers will be removed and replaced with new layer works and surfacing that incorporates a suitable top layer.

Additionally, further excavations and infilling may also be required for the removal, replacement and/or placement of *inter alia* storm water infrastructure. Such infrastructure may include v-drains, culverts, manholes, outlet structures and others that are required to protect the roads, services and infrastructure from possible flood damage.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.2 Refurbishment of Quay pavement surfaces, stacking areas, berth top surfaces and other surfaces

Top and pavement surfaces have, at various localities, reached the end of their useful design life and have consequently deteriorated making the use of heavy port equipment unsafe. The objective is to remove the old pavement surface; together with its associated pavement layers in order to provide a safe working environment for the operational staff at the Port.

The proposed activity will entail:

- Excavation of the existing concrete / asphalt surfacing, underlying granular pavement layers and fill material to the bottom of the new, proposed pavement structure.
- Selection and stockpiling of material from the existing pavement that can be re-used.
- Removal of the existing services.
- Spoiling of materials that will not be re-used.
- Replacement of jointed reinforced concrete track slabs.
- Placing of the replacement services.
- Replacement of the pavement layer-works including a 400 mm thick plain jointed concrete pavement.
- Tie into the existing asphalt surfacing by using asphalt wearing course infill layer where there are level differences.

The final level of concrete pavement and track slab will tie in with the existing adjoining asphalt surfacing, concrete quay wall and crane rail beam. The levels were designed with a fall towards the quay wall edge for storm water management purposes.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.3 Refurbishment of ageing equipment

The refurbishment of existing system components and equipment may require the replacement of old components and equipment with new components and equipment of a similar nature to perform a similar function. The placement of the components and equipment may require excavations for *inter alia* foundation placement, for example replacement of rails. This is required as replacement components and equipment may not have the same foundation footings as the existing components and equipment requiring replacement.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs. An example is the.

4.4 Repair or replacement and installation of services including telecoms, high masts electricity cables, water and sewer pipelines and product pipelines

Activities include the replacement of existing services that will be impacted on by the proposed maintenance activities.

The activity may include the excavation of trenches for the removal of existing services. Structures such as culverts and pipe sleeves may be placed wherein the services will be reinstalled. These structures provide effective protection against potential damage; and allow maintenance crews ease of access to remove portions of the services without the need for further excavations. The trenches (containing buried services) will then be backfilled with selected fill, where-after the top surfaces will be re-instated.

The replacement of sewer and product pipelines will only commence once the pipe contents have been removed from the pipe and the pipe is secured. Typically a temporary by-pass pipeline will be placed to redirect pipe contents, prior to pipe replacement, to prevent potential leaks. This has an added benefit of allowing the service capacity to be maintained during maintenance work.

Where required, the placement of maintenance services for the continued operation of existing infrastructure will be included.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs. An example is the routine maintenance of various services.

4.5 Refurbishment of structures and infrastructure including reconstruction

Several structures and infrastructure have been identified to be ageing / no longer fit for purpose / defective and require intervention to ensure a continued service life. Additionally, improvements to the ergonomic approach (to optimize human well-being) and overall system performance may be required.
Refurbishment may entail the excavation of foundations or infilling of the excavation footprint, earthworks, rock revetment, scour protection, concrete and formwork reinforcement, masonry,

waterproofing, ceilings, partitions and flooring, floor covering, wall lining, glazing, ironmongery, plastering and paintwork, electrical - and plumbing work.

Where no further maintenance works can be implemented, demolition and removal from site may be an option. In the event of demolition, reconstruction of functionally similar structures and infrastructure will be undertaken.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.6 Refurbishment of Various Buildings

Various buildings within the port require refurbishment in order to *inter alia* ensure these meet prevailing Environmental Health and SANS 10400 X and XA (The application of the National Building Regulations Part X: Environmental sustainability Part XA: Energy usage in buildings) requirements. Additionally, the Port wishes to reconfigure and refurbish existing identified buildings to improve the security and aesthetics to comply with Transnet's corporate identity. The scope to be executed involves the re-design, refurbishment and re-construction of various facets of the identified buildings.

The proposed work will include:

- The internal configuration to be restructured to provide better flow and use of space.
- External alterations to existing buildings
- Provision of new finishes.
- Lighting and electrical to be improved.
- Toilets to be upgraded.
- Signage to be upgraded.
- Fire detection/suppression to be upgraded.
- Emergency lighting to be installed.
- Air conditioning to be upgraded.
- Improvement of ergonomic approach to optimize human well-being and overall system performance.

Refurbishment may entail the excavation of foundations or infilling of excavation footprints, earthworks, concrete and formwork reinforcement, masonry, waterproofing, ceilings, partitions and flooring, floor covering, wall lining, glazing, ironmongery, plastering and paintwork, electrical and plumbing work.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.7 Maintenance Dredging

The maintenance dredging in Port of Durban includes periodic removal of sedimented sand from existing navigational channels and berths to maintain an appropriate safe depth of water for navigation and operations. Maintenance dredging is done annually and falls within the maintained navigable areas. Maintenance Dredging also include dredging for maintenance of infrastructure such as breakwater structure or quay wall structure.

The propose scope of works will include:

- Maintenance of depth on entrance channel,
- Maintenance of depth on turning basin and
- Maintenance of depth alongside of the berths, navigable waterways or channels

The maintenance dredging works are considered to be maintenance and fall within the definition of maintenance as provided by the Department of Environmental Affairs.

5. Project Area Description

The development of the city of Durban has long been centred on the establishment and expansion of the economically highly important harbour. The Port of Durban is the busiest of all Southern African ports and handles 32% of the ships calling at South African ports. The Port is surrounded on all frontages by the sprawling City of Durban, which forms part of the eThekwini Municipality, which is one of South Africa's fastest growing regional economies. The city of Durban has developed around Durban Bay (29°52' S; 31°4' E) beginning in the 1800s and has long been centred on the establishment and expansion of an economically highly important, regional harbour. The estuary that is the Bay has a catchment area of approximately 264 sq. km, 70% of which is highly transformed by urban development.

The port of Durban was little more than a sandy lagoon until the mid-1800s; however, by the early twentieth century it had become the leading port in South Africa through utilisation of modern dredging techniques that made sufficient inroads into the narrow, silted up entrance of the port to allow larger vessels through. As a results of dredging activities and port infrastructure development, much of the sand has been compromised leaving a sand bank in the heart of the harbour. Durban Bay has important environmental and historical role, regionally and nationally, it is the only sheltered, marine dominated, permanently tidal sandbank habitat in the central KwaZulu-Natal region. The intertidal zone provides a nursery for a range of fish species and. The port is a functioning estuary that has three major rivers flowing into the southwestern section or silt canal area of the Bay; the uMbilo, uMhlatuzana and aManzimnyama. The Bay also acts as a major recipient of run-off and a flood water shock absorber for the surrounding urban, commercial and industrial areas.



Figure 1: Locality Map of the Port of Durban

6. Applicable Legislation

Transnet will ensure that all relevant environmental legislation is complied with during maintenance works. This will include ensuring:

- The principles as outlined in section 2 of NEMA are implemented as and where applicable;
- Responsible waste management including measures to avoid or reduce waste generation, encouraging re-use, ensure appropriate disposal and prevent littering; and
- Disturbance of marine life is avoided.

6.1 National Environmental Management Act

The proposed works do not require an Environmental Authorization in terms of Section 24 of NEMA and the associated EIA Regulations, as amended. The EIA Regulations provides for the development of an EMPr *in lieu* of a formal EIA process where listed activities are undertaken for maintenance purposes. The EMPr is subject to approval by the relevant authority (DEA).

Section 28(1) of NEMA prescribes that a Duty of Care be bestowed upon those who cause, have caused or may in future cause pollution or degradation of the environment. Non-compliance with this Section (Duty of Care) is a criminal offence and may lead to criminal prosecution.

6.2 National Heritage Resources Act

The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) directs the protection and management of heritage resources in South Africa. An application to demolish or alter structures older than 60 years will be submitted to the KwaZulu Natal Amafa Heritage in terms of Section 34 of the NHRA, where proposed maintenance activities require such submission. The maintenance work is expected to have an impact on heritage resources, for example maintenance activities taking place in the Drydock may require further permits or approvals from the Provincial Heritage Authority.

6.3 National Environmental Integrated Coastal Management Act

All maintenance work will comply with the relevant requirements of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (NEM: ICMA). As such, no maintenance related activities shall be permitted to impact upon the marine environment.

6.4 Applicable By-laws

Due consideration shall be given to all By-laws of EThekwini Municipality that may be relevant and applicable to this Project.

The EThekwini Municipality by-laws that may be applicable to the Project are listed in Table 1 below.

Table 1: Applicable By-laws

EThekwini BY-LAWS	SECTION	RELATES TO
Public Places and Nuisances By-Laws	12. Obstructing, blocking or disturbing of traffic and pedestrians	1) No person may– (a) in a public place, intentionally block or interfere with the safe or free passage of a pedestrian or motor-vehicle, unless to the extent authorised by law; 2) Any person, who unlawfully blocks, occupies or reserves a public parking space, or begs, stands, sits, lies in a public place, or does anything which hinders or disturbs the flow of pedestrian or road traffic must immediately cease to do so when directed by an authorised official.
	22. Penalties	1) Any person who is convicted of an offence under this By-law is be liable to a fine of an amount not exceeding R40 000 or to imprisonment for a period not exceeding 2 years, or to both such fine and imprisonment.
Solid Waste Disposal By-Law	Duty of Care	Every person has a duty to manage any waste generated by his activities or the activities of those persons working
	2. Collection and removal of refuse	1) The occupier of every premises upon which refuse is generated or, in the case of premises which are occupied by more than one person, the owner of such premises, shall in compliance with these bylaws make provisions for the temporary storage of such refuse and for its collection and removal therefrom, either by the Council or, subject to subsections (2), (8) and (11), by a refuse removal contractor approved in terms of subsection (3), and failure to do so shall be a contravention of these bylaws. 2) The service provided by the Council for the collection and removal of refuse shall be used in respect of premises on which domestic refuse or both domestic and trade refuse is generated and such service may be used in respect of premises on which trade refuse or industrial refuse is generated; provided that the Council shall not be obliged to collect and remove industrial refuse and the

EThekwini BY-LAWS	SECTION	RELATES TO
		Head of Department may by written notice to the occupier of premises give directions as to its disposal. 3) Subject to the provisions of subsection (2), trade refuse and industrial refuse may be collected and removed from premises by a contractor approved in writing by the Head of Department for the purpose, which approval may be withdrawn by the Head of Department at any time. Application for approval as a refuse removal contractor shall be made to the Head of Department on the form prescribed by him. 11) Notwithstanding anything in these bylaws to the contrary, the occupier of premises may himself remove or cause to be removed by his employees industrial refuse generated thereon to a disposal site.
	Responsibility for builder's refuse 10	1) The owner of premises on which builder's refuse is generated and the person engaged in the activity which caused such refuse to be generated shall ensure that a) such refuse is disposed of in terms of section 11 within a reasonable time after the generation thereof; and b) until such time as builder's refuse is disposed of in terms of section 11 and subject to the provisions of section 37 of the Council's Building Bylaws, such refuse together with the containers used for the storing or removal thereof, is kept on the premises on which it was generated. 2) Builder's refuse may be removed by the builder himself or by a contractor approved by the Head of Department in terms of section 2(3)
	14. Disposal of builder's refuse	1) Any person removing or conveying any refuse or other offensive matter or any builder's refuse shall remove the same by means of a properly constructed and enclosed vehicle and in such manner as will prevent any nuisance arising from such conveyance or the escape of the contents therefrom; provided that no refuse shall be conveyed from any premises along a street or public place in order to gain access to a refuse storage area located elsewhere on the same premises except in the case of premises in respect of which the plan or plans approved in terms of the Building Bylaws prior to the date of promulgation of these bylaws reveals that the only possible means of gaining access to the said refuse storage area is along a street or public place.

EThekwini BY-LAWS	SECTION	RELATES TO
	23. Offences and penalties	1) Any person who – a) contravenes or fails to comply with any provision of these bylaws; or b) contravenes or fails to comply with any conditions imposed upon the granting of any application, consent, approval, concession, relaxation, permit or authority in terms of these bylaws; or c) fails to comply with the terms of any notice served upon or given to him in terms of these bylaws; shall be guilty of an offence and liable for a fine or imprisonment for a period not exceeding six months or for both such fine and imprisonment.

7. EMPr Framework

7.1 Institutional and Functional Arrangements

During maintenance works it is Transnet's responsibility to ensure that the all parties involved in maintenance related activities receive a copy of the EMPr and ensure compliance with it. The EMPr is to be included as part of all contract documents. The appointed Contractor will be required to comply with the management regulations set out in this EMPr. The Contractor will be responsible for ensuring that all contracting staff adheres to the EMPr specifications. A copy of the EMPr will be kept on site at the Contractor's site office and made available to all Contractor staff, regulatory authorities, port users and tenants upon request.

7.2 Environmental Management: Roles and Responsibilities

7.2.1 Transnet Environmental Manager (EM)

The Transnet EM will be responsible for ensuring that the EMPr and associated specifications or requirements are complied with during construction. The Transnet PEM will report functionally to the Transnet National Environmental Manager and relevant Project Manager.

The specific tasks during the maintenance will include:

- Liaison with the authorities
- Preparation of the Project Environmental Specification (PES)
- Tender evaluation, development of environmental criteria and adjudication thereof

- Review all reports from the Environmental Specialist/Officer, including sign off on Method Statements
- Conduct any environmental incident enquiries
- Identify, with support from the Project Manager, the need for corrective or remedial measures with regard to proposed works
- Ensure induction material includes project appropriate environmental issues
- Approve training programmes and other awareness initiatives
- Coordinate or facilitate internal environmental audits
- Prepare environmental monitoring protocols (if monitoring to be done by Environmental Specialist and not an outside consultant)

The Transnet EM may delegate part or all of these responsibilities to the Transnet Environmental Officer (EO), based on the merits of the particular project at hand.

7.2.2 Transnet Project Manager

The Transnet Project Manager has overall responsibility for environmental management on site which includes the implementation of the EMPr, permits and licenses and reports to the Project Manager. The Project Manager is supported by the Transnet PEM.

The specific environmental tasks during the construction phase will include:

- Reviewing the monthly reports compiled by the Transnet Environmental Officer
- Communicating directly with the Contractors
- Issuing non-conformance notification to Contractors that do not comply with the requirements of the EMPr and associated requirements or documents, including EA, EMP, permits and licenses
- The Transnet Project Manager may delegate some responsibilities to the Transnet Construction Manager

7.2.3 Transnet Environmental Specialist

The role of the Transnet Environmental Specialist is essentially the same as that of an Environmental Control Officer (ECO) but with some additional responsibilities. In instances where the EA requires an independent ECO, an outside consultant will be contracted to undertake the environmental audits of the project. The Transnet Environmental Specialist functionally reports to the Transnet National Environmental Manager, and provides mainly quality assurance with respect to the implementation of the overall environmental governance framework during construction. The Transnet Environmental Specialist will conduct audits on projects periodically. The scope of these audits will include both conformances to the Transnet Environmental Governance Framework, as well as legal compliance.

7.2.4 Transnet Environmental Officer

The Transnet Environmental Officer (EO) reports functionally to the Transnet Project Manager and Transnet PEM and is responsible for conducting the tasks required to ensure that the EMP, including permits and licenses are implemented on the construction site.

The Transnet Environmental Officer will conduct the following tasks:

- Ensure that environmental issues receive adequate attention in the Transnet SHE induction training
- Request awareness training (e.g. tool box talks, signage) from the contractor through the SHE File approval process
- Conduct monthly observation & inspections and audit of all work places
- Monitor the Contractor's compliance with the EA, EMPr and any permits and licences on site
- Conduct monthly observations and environmental audits of all Contractor's and work areas
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc when specified) are carried out according to protocols and schedules
- Measurement of completed work (e.g. areas topsoiled, re-vegetated, stabilised etc.)
- Maintain site documentation related to environmental management (permits, CEMP, method statements, EA, reports, audits, monitoring results, receipts for waste removal etc.). Documentation to be maintained on the relevant site Document Control System
- Inspect and report on environmental incidents and check corrective action
- Keep a regular photographic record of all environmental incidents
- Management of complaints register
- Review and Sign off Method Statements prepared by Contractor's
- Audit Environmental Method Statements

The key deliverables will include the compilation of:

- Monthly inspection/environmental audit report
- Monitoring results
- Site close-out reports
- Incident reports
- Environmental Incident Register
- Environmental Non-Conformance Register
- Complaints Register
- Site Close Out Inspection

7.2.5 Contractor's Environmental Officer

The Contractor will appoint an Environmental Officer whose role is to ensure implementation of the EMPr, where applicable. The Contractor will submit the name and CV of the Environmental Officer as well as an Environmental Management Plan detailing

roles and responsibilities with their tender submission. This will be for Transnet's approval and no work can commence on site if this has not been done.

The Contractor's Environmental Plan will include, but not be limited to:

- Description of environmental management responsibilities of the Contractor's Project Manager, Contractor's Site Manager and the Contractor's Environmental Officer
- Organisational Environmental Policy
- Environmental Method Statements
- EMPr

The Contractor's Environmental Officer will liaise with the Transnet Environmental Officer on site. It will be the responsibility of the Contractor's Environmental Officer to ensure that all work is conducted according to approved Environmental Method Statements and that the roles and responsibilities as set out in this document are fulfilled. The Contractor's Environmental Officer tasks will include:

- Daily, weekly and monthly inspections of the work area(s) as per schedule or authorise through written instruction by Transnet PEM or Environmental Officer. The Contractor is referred to Section 8.4 for an example of the items that will need to be inspected and which items will be audited by the Transnet Environmental Officer
- Prepare activity/aspect based Environmental Method Statements
- Identify local, provincial and national environmental legislation that applies to the Contractor's activities
- Monitor compliance with the EMPr and Environmental Method Statements
- Ongoing Environmental Awareness Training of the Contractor's site personnel
- Reporting, investigating and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors
- Close out of environmental incidents
- Attendance at all SHE meetings and induction programmes, and toolbox talks where possible
- Waste Management
- Project Start Up Checklist
- Method Statements Register
- Hazardous Substances Register
- Ensure that environmental signage and barriers are correctly placed
- Taking required corrective action within specified time frame

The Contractor's Environmental Officer will be expected to submit daily, weekly and monthly checklists to the Transnet Environmental Officer.

Should the Contractor's Environmental Officer change from that person identified during either tender stage, or construction period, the Contractor will submit a CV of a replacement Environmental Officer for approval by the Transnet Environmental Officer

and Construction Manager. No work can proceed until the replacement Environmental Officer has been approved.

7.3 Organisational structure

The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure shown in **Figure 2**.

All instructions that relate to the CEMP will still be given to the Contractor via the TNPA Project Manager. In an emergency situation, however, the TNPA Environmental Officer may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings, and the Transnet Environmental Officer will attend these meetings. If at any time the Transnet Project Manager is uncertain in any way with respect to an environmentally related issue or any specification in the CEMP, he will consult with the Transnet Environmental Manager.

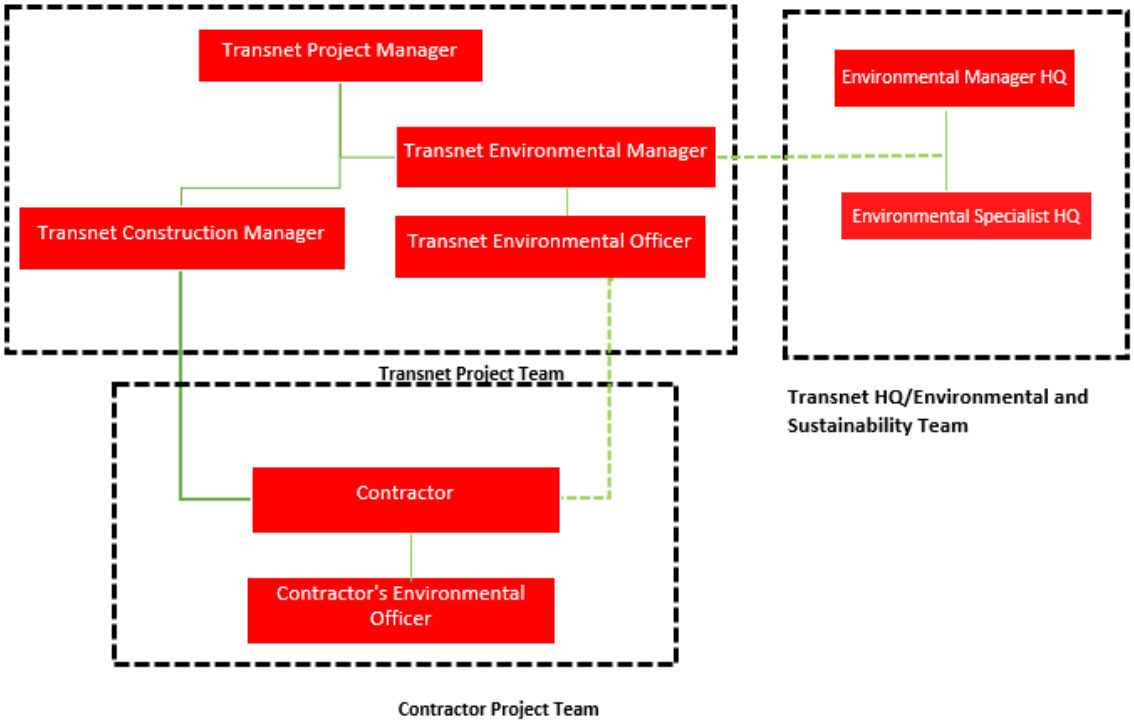


Figure 2: Typical Organogram for Construction

7.4 The Contractor

The Contractor will comply with the requirements of the EMPr and abide by the Transnet Construction Manager's instructions regarding the implementation of the EMPr.
The contractor must prior commencement of construction provide a well-documented EMP based on Transnet Environmental Specification. The Contractor EMP will be reviewed and approved by Transnet Environmental Officer.

8. Environmental Documentation, Reporting and Compliance

8.1 Prior to Commencement

The Transnet Project Manager must ensure that the requirements below are requested of the Contractor in the Project Construction Contract Document, the Letter of Appointment and any other relevant correspondence with the Contractor prior to the start of works, as relevant.

8.1.1 Declaration of Understanding (DoU)

The Declaration of Understanding in the Contractor's Guideline Document will be signed and provided by the Contractor as part of his Tender Document. The signed DoU is a written confirmation by the Contractor that the requirements of the CEMP are understood and will be complied with for the duration of their works on site.

The pro forma DoU to be signed by the Contractor has been included as **Annexure C.**

8.1.2 Appointment of Contractor's Environmental Officer

The Contractor will appoint an Environmental Officer or assign to a competent person roles and responsibilities for environmental management during construction. The Contractor will forward details of the appointment to the Transnet Project Manager and Transnet Environmental Officer for their review and approval. Should the Contractor's Environmental Officer or the person originally assigned with responsibilities for environmental management change from that person identified during either the tender stage, or the construction period, the Contractor will submit the details of such appointment or assignment for the Transnet Project Manager's approval. No work will proceed until the new Environmental Officer is assigned or appointed.

The pro forma appointment letter for the Environmental Officer to be appointed by the Contractor has been included as **Annexure D.**

8.1.3 Environmental Management Plans and Method Statements

It is a statutory requirement to ensure the wellbeing of employees and of the environment. Therefore, the Contractor must submit a method statement to the Transnet Project Manager and the Transnet Environmental Officer for approval prior to the commencement of construction related activities.

A method statement is a document detailing how a particular process will be carried out. It should detail the possible dangers/risks associated with the particular part of the project and the methods of control to be established and to show how the work will be managed in a safe and environmentally responsible manner. The method statement shall also include the following applicable information:

- the type of construction activity;
- timing and location of the activity;
- construction procedures;
- materials and equipment to be used;
- transportation of the equipment to and from site;
- how the equipment/material will be moved while on site;
- location and extent of construction site office and storage areas;
- identification of impacts that might result from the construction activity;
- population impacts;
- community/institutional arrangements;
- conflicts between local residents and newcomers;
- individual and family level impacts;
- community infrastructure needs;
- intrusion impacts;
- methodology and/or specifications for impact prevention or containment and for environmental monitoring;
- emergency/disaster incident and reaction procedures (required to be demonstrated); and
- rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor will be required to submit, the applicable method statements listed in Table 2 as identified in the contract, for approval by the Transnet Project Manager and the Transnet Environmental Officer prior to the start of construction activities. Please note these are typical method statements associated with the works proposed within this EMPr. Therefore not all the method statements may be applicable to each specific maintenance project. The Transnet Project Manager, Transnet Environmental Officer and the Contractor are to assess which are applicable for submission.

Table 2: List of Method Statements required prior to Construction

Method Statement	Objective	Target	Criteria
Access	To institute adequate access agreements and measures to ensure the safety of landowners and integrity of the gates/fences.	No damage to existing gates and fences. All gates equipped with locks to prevent unauthorised access. No complaints about open gates. Compliance with regulatory requirements.	Access agreements between Contractor and landowner. Implementation of suitable access and fencing requirements.
Aesthetics	Reduce construction impacts upon the aesthetics of the surrounding environment.	No complaints from I&APs.	Implementation of measures to reduce impacts upon the aesthetics of the surrounding landscape.
Bunding	To contain and manage all hazardous substance releases into the environment.	Zero spills No environmental pollution occurring. Management according to agreed procedures.	Method of bunding and covering for static and mobile plant
Construction Site and Office / Yard Establishment	To ensure site infrastructure, plant, materials and equipment are contained within a suitably secure locality that is adequately zoned and authorised in terms of regulatory requirements.	No complaints from landowners No damage to private property Compliance to regulatory requirements. No unplanned disturbance to construction related activities.	Site office/yard layout and preparation Method of installing fences required for no-go areas, working areas and construction areas Preparation of the working area Removal of vegetation
Cement Mixing / Concrete Batching / Bentonite Mixing	Provide measures to contain cementitious products impacting upon the surrounding environment.	All cementitious mixing to occur within demarcated localities. No indiscriminate spoiling of cementitious products in non-designated areas. No impacts upon receiving water resources.	Location, layout and preparation of cement / concrete batching facilities, including the methods employed for mixing concrete and the management of run-off water from such areas.
Contaminated Water	Ensure no contamination or pollution of water impacted upon by construction related activities.	All waste and contaminated water must be monitored and comply with regulatory requirements.	Contaminated water management, including the containment of run-off and polluted water

Dust	Reduce construction related dust impacts on the surrounding environment. Prevent dust nuisance and health impacts on people and animals in the area.	No complaints from I&APs. Dust emissions must be monitored and comply with regulatory requirements.	Dust control and monitoring measures
Environmental Monitoring	Implement a programme whereby impacts upon the surrounding can be monitored and implement measures to mitigate such impacts.	Compliance with regulatory requirements: • Dust: NEM AQA Air Quality Regulations; • Noise: NEM: AQA Air Quality Regulations; and • Water: NWA Water Quality Guidelines. Ensure no incidents or accidents occur which negatively impact upon the surrounding environment.	Monitoring construction-related impacts upon the surrounding environment is kept within the environmental specifications and applicable legislation. The following variables are to be monitored: • Dust (e.g. by using reused water) • Noise (increase of 7dB above ambient is considered disturbing noise) • Contaminated water (through dewatering operations, etc) • Waste: waste manifests for waste disposal including waste sent for recycling
Erosion control	Prevent erosion and reduce potential impacts upon the surrounding environment.	Slopes > 1:1 must have additional anti-erosion mechanisms. No evidence of erosion. No evidence of disturbance outside of project area.	Method(s) of erosion control, including erosion of spoil material
Fire, Hazardous and Poisonous Substances	Impose a "no fire" rule on the entire project unless otherwise indicated in writing by the Transnet Project Manager. Reduce potential impacts in the event of a fire incident. To manage, mitigate and control the potential occurrence of an incident / accident involving hazardous and poisonous substances.	Zero (0) fires. Proof of annual update and approval of the fire management Method Statement. Proof of management review of fire preparedness and response before onset of the fire season. Storage of hazardous/flammable materials and substances to comply with national, provincial and local regulatory requirements	Handling and storage of hazardous substances Emergency spillage procedures and compounds to be used Fire management plan and emergency procedures in case of fire Use of herbicides, pesticides and other poisonous substances Methods for the disposal of hazardous

			building materials Material Safety Data Sheets to be included where applicable
Flora and Fauna	Preserve fauna and flora through control of construction activities, particularly in sensitive environments, and through search and rescue operations. Reduce the impact of the project on the surrounding vegetation during construction. Prevent infestation of alien species during construction.	No evidence of disturbance outside of project area. All sensitive environments are to be demarcated as no-go areas unless otherwise indicated by the Transnet Project Manager. No construction related activities or facilities allowed within sensitive environments, unless prior approval is attained from the Transnet Project Manager. Proof of monthly removal of alien invasive species.	Implementation of measures to protect the flora and fauna identified within the project footprint.
Fuels and Fuel Spills	Manage and contain all refuelling activities to prevent and mitigate potential impacts.	All refuelling to occur within designated areas. All hydro carbons to be contained within approved bunded facilities. Identified staff to undergo suitable spill clean-up training.	Methods of refuelling vehicles Details of methods for fuel spills and clean-up operations
Heritage	Limit and mitigate potential heritage impacts on chance findings should they occur.	No damage to heritage structures, unless proof of consultation with a heritage specialist and approval from the SAHRA is in place. Records of chance finds must be kept. Where chance finds are unearthed, proof of work being stopped immediately and proof of consultation with a heritage specialist and the SAHRA must be kept on site.	Measures to be implemented to identify, manage and protect "chance finds" and known items of historical or cultural value.
Noise	Reduce construction related noise affecting the surrounding environment.	Noise levels shall be monitored to ensure they comply with regulatory requirements. Noise generating activities shall not increase by more	Implement measures to reduce noise impacts generated through construction related

		than 7dB above ambient noise levels. No complaints from I&AP's	
Rehabilitation	To rehabilitate impacted areas to a suitable land capability class similar to that of the surrounding environment. Rehabilitation will take existing land uses into consideration. Rehabilitation should start on sections immediately after work is completed.	Reinstatement of areas affected through construction related activities. Proof of monthly removal of alien invasive species re-establishing on cleared areas. The final placement of layers of soil on disturbed areas must match the pre-construction profile. Minimum of 60% mature vegetation cover being achieved during the first growth season. Minimum of 80% mature vegetation cover achieved at the end of the maintenance period.	Rehabilitation of disturbed areas and re-vegetation after completion of construction related activities.
Solid and Liquid Waste Management	Implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency. The method statement must reflect the principles of integrated waste management as contained within the NEM: WA.	Ensure all waste products are disposed of at a registered waste landfill site designed to cater for said waste product. Proof of waste generated, reused, recycled and disposed of, including disposal certificates, must be kept on site. Contain all waste with in approved designated areas and stored in marked containers. Containers of hazardous waste and waste oils must be stored in a bunded, covered area. No evidence of contamination by waste. Bins provided at regular intervals. No evidence of litter.	Solid and liquid waste control and removal of waste from site. Methods for the disposal of vegetation, paper and plastics and/or building materials Methods for the recycling of oils etc.

Social	Maximise social benefits and minimise negative social impacts	No complaints from affected landowners No project delays due to landowner interference All landowners signing release forms within 1 month of completion of the contract.	Methods for avoiding danger and causing the least possible inconvenience to the public (including pedestrians), traffic and vehicle traffic
Sources of Materials	Source materials which have been legally mined or manufactured.	Provision of all Material Safety Data Sheets (MSDSs) for all products used on site.	Details of materials imported to the site. MSDS are to be included.
Topsoil and Subsoil Management	Manage the removal and stockpiling of topsoil and subsoil during the contract for use during rehabilitation.	Soil horizons (stockpile separately). Stockpiles should not be higher than 2 m. Stockpiles will be kept free of alien invasive species. No stockpiles shall be located within the 1:100 floodline. No stockpiles shall be located outside of areas indicated in the construction servitude diagrams.	Removal of topsoil and subsoil. Storage of topsoil and subsoil, including erosion prevention methods
Traffic	Minimise the impacts and extent of construction related traffic on the surrounding road network and environment, whilst maximising road user safety.	No accidents or incidents. No complaints from the public. Proof of notification of landowner for closure of access roads. Alternative access roads always provided at partial road closures and other traffic disruptions. Compliance with regulatory requirements.	To ensure construction related transport activities do not impact upon landowners and the surrounding environment. Activities associated with the transport of materials and staff are not negatively upon by construction related requirements.

Training	Foster construction related skills transfer, environmental awareness, health and safety awareness, and materials and equipment skills.	Proof of training provided, including training materials that meet the requirements of the Transnet. Proof of attendance of staff at training. Records of training evaluation results. Results must reflect that training has been effective.	Logistics for the environmental awareness course for all of the Contractor's employees and temporary labour, as well as for the Contractor's management staff.
Wash Areas	To ensure plant and equipment used on site are kept clean whilst containing and preventing the release of potential contaminants into the receiving environment.	No contamination of the receiving environment through the washing and cleaning of equipment and plant. Compliance with regulatory requirements.	Location, layout, preparation and operation of all wash areas, including vehicle washing, workshop washing, paint washing and clearing Method for the treatment of wastewater prior to discharge

Where relevant Environmental Method Statements will be provided by the Contractor as part of their Tender. Required method statements will be specified in the Quality Criteria of the tender.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the Transnet Project Manager and Transnet Environmental Officer.

8.2 Documentation

The following documentation must be kept on the project site for the full duration of the contract:

- Environmental Management Programme;
- Environmental Policy of the Contractor;
- Environmental Method Statements compiled by the Contractor;
- Daily, weekly and monthly environmental monitoring reports;
- Minutes and record of attendance of all environmental meetings;
- Environmental Incident Book;
- Communications Register;
- Register of audits;
- Contractor registers (awareness training, waste disposal etc.);
- Non-conformance reports;
- Waste manifests; and
- Relevant legislation.

8.3 Responsibility Matrix and Organogram

The Contractor must develop a Responsibility Matrix and Organogram which must be approved by the Transnet Project Manager and displayed in an appropriate location. This will identify responsible parties, their contact details, and highlight their roles and responsibilities. This document must be updated on a regular basis to ensure that information is correct.

8.4 Environmental Inspections and Audits

Audits will be conducted by the Transnet Environmental Officer to monitor compliance with the requirements of the EMPr. Photographic records of the site will support the visual assessment. The Transnet Environmental Officer will submit all audits to the Transnet Project Manager. These findings will be kept on file on the project site.

External auditing may take place at unspecified times by the DEA and/or other relevant authorities. The DEA may, from time to time, also ask to view copies of audit reports drafted by the Transnet Environmental Officer.

Environmental inspections and audits are conducted using five basic techniques:

- Interviews with Contractor's staff including Sub-contractors and suppliers

- Document checks
- Observations
- Monitoring
- Measurement and verification

This document sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such audits, the auditor and auditee.

It should be noted that these lists are not exhaustive and that each site will have specific issues that will need to be audited.

For each construction project, the auditor and auditee are as follows:

Place	**Inspector/Auditor**	**Auditee**	**Inspection/audit frequency**
Work places	Contractor's Environmental Officer	Contractor's team	Daily/Weekly Inspection
Construction site	Transnet Environmental Officer	Contractor's Environmental Officer	Monthly Audit
Construction site (entire area)	Environmental Specialist: Assurance	Entire Project	As required

8.5 Work Place Inspection

The Contractor's Environmental Officer will be required to conduct weekly inspections of all work places for which the Contractor is responsible, including but not limited to the following:

- Contractor's camp, recreational and canteen facilities
- Material lay down areas
- Liquid and solid waste storage facilities (general, hazardous, recycling and scrap)
- Workshops
- Oil traps
- Wash bays
- Construction work area
- Spray Booths
- Haul roads
- No-go areas
- Storm water drains
- Any other construction area for which the SHE Officer is responsible

At each of these sites, the Contractor's Environmental Officer will be required on a daily basis to check for the following, where relevant:
By observation:

- Litter
- Separation of solid waste as per system
- Hydrocarbon spills

- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Water use and wastage
- Pollution of rivers and sea
- Provision and use of toilet facilities
- Any other illegal activities

By document check:

- Removal of oil for recycling as per schedule
- Removal of packaging as per agreements with suppliers
- Removal of hazardous waste by specialist Contractors as per schedule
- Correct placement of environmental signage and posters
- Document board listing emergency numbers, hazmat info sheets, etc.

The following records must also be kept up to date (information must include that of sub-contractors where relevant):

- Fuel consumption for entire contract measured in litres (including plant, generators, other equipment, vehicles etc.)
- Electricity consumption for entire contract measured in Watt hours
- Quantities of general waste submitted for recycling measured in kilograms
- Quantities of general waste disposed of to landfill measured in kilograms
- Quantities of hazardous waste submitted for recycling measured in kilograms
- Quantities of hazardous waste disposed of to landfill measured in kilograms
- Water consumption, including water used for construction and human consumption measured in litres

8.6 Construction Site Audit

The Transnet Environmental Officer will be required to conduct monthly inspections of the entire construction site, which may involve more than one Contractor and may include, but not be limited to the following:

- Entire site
- Fencing
- Environmentally sensitive areas
- Contractor's camp, recreational and canteen facilities
- Material lay down areas
- Scrap yard
- Workshops
- Oil traps
- Wash bays
- Sewage plant
- Quarries and borrow pits used for fill and construction material
- Spoil dumping areas
- Solid waste disposal areas
- Liquid waste disposal areas

- Bioremediation site
- Area for the temporary storage of hazardous waste
- Fuel depot and hydrocarbon storage areas
- Construction work area
- Concrete batching plant
- Spray booths
- Haul roads
- No-go areas
- Storm water drains
- And any other construction areas not listed

At each of these sites, the Transnet Environmental Officer will be required to check for the following, where relevant:

By observation:

- Litter
- Separation of solid waste as per system
- Hydrocarbon spills
- Use of bunding, hard standing and other protection measures
- Illegal dumping
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Illegal use of tracks and off-road driving in no-go areas
- Correct procedures are followed for topsoil removal and stockpiling
- Effectiveness of erosion protection measures
- Excess noise and vibration
- Water use and wastage
- Pollution of rivers and sea
- Provision and use of toilet facilities
- Any other illegal activities

By document check:

- All receipts for the collection of old oil, general recycled waste and hazardous waste
- Correct placement of environmental signage and posters
- Document board listing emergency numbers, hazmat info sheets, etc.
- Complete and accurate record of Contractor's Environmental File

By measurement:

- Amount of water used by each Contractor (where practical)
- Amount of topsoil removed and stockpiled
- Amount of land stabilisation completed
- Area re-vegetated
- Amount of waste recycled, sent to scrap yard or disposed in dump
- Amount of material treated in the bioremediation site

By monitoring:

- Effectiveness of dust control systems
- Effectiveness of pollution control systems
- Effectiveness of rehabilitation and re-vegetation programmes
- Effectiveness of erosion control methods
- Effectiveness of noise control barriers

A site-specific inspection checklist will be provided to the Transnet Environmental Officer prior to site establishment.

8.7 Construction Site and Documentation Compliance Audit

The Transnet Environmental Specialist: Assurance will conduct quarterly audits of the entire construction site and documentation system, which may include, but not be limited to the following:

- Site entrance
- No-go areas
- Environmentally sensitive areas
- All work areas
- Liquid and Solid waste storage facilities
- All workshops
- Refuelling depots
- Contractor's camp area and lay down place
- Any other place which needs to be audited

By observation:

- Litter
- Liquid and Solid waste storage facilities
- Hydrocarbon spills
- Use of bunding, hard standing and other protection measures
- Illegal dumping
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Illegal use of tracks and off-road driving in no-go areas
- Correct procedures are followed for topsoil removal and stockpiling
- Effectiveness of erosion protection measures
- Excess noise and vibration
- Water use and wastage
- Pollution of rivers and sea
- Provision and use of toilet facilities
- Any other illegal activities

By document check:

- Complaints register is available and up to date

- Method Statements are filed correctly and up to date
- All environmental permits are available
- Copy of the EA is available on site
- Copies of the CEMP, SES and PES are available on site
- Copies of all daily, weekly inspections and audits, monthly reports, minutes, incident reports and corrective action reports are filed correctly
- Copies of all close-out reports are available
- The monitoring programme is being adhered to and the monitoring results are no more than one month late
- Chains of custody for samples can be provided on request
- Sampling protocols are followed
- Emergency numbers and procedures are clearly displayed
- Photographic record
- Records of Environmental Awareness Training of Contractor's staff
- Any other documentation necessary to ensure effective environmental management of the site

By verification (if necessary):

- Spot samples to check water quality (e.g. storm water runoff)
- Map/plan measurements to check areas disturbed/re-vegetated
- Check dust collection buckets are working
- Check oil separators
- Any other aspect which gives cause for concern

By interview:

- Transnet Environmental Officer
- Contractor's Environmental Officer
- Contractor's staff at random

A specific site audit protocol will be formulated prior to the first audit and sent to the TCP PEM two weeks in advance of the quarterly audit.

8.8 Weekly Environmental Monitoring Report

The Contractor's Environmental Officer will be required to provide the Transnet Project Manager with a weekly environmental monitoring report covering the events of the past week. This will highlight key performance areas and provide feedback on corrective and preventive actions taken. The Contractor's Environmental Officer will have the weekly reports signed off by the Contractor's Manager prior to submission to the Transnet Project Manager.

8.9 Environmental Site Meetings

Environmental Site Meetings shall take place as per the schedule contained within the Tender Data. These meetings shall be chaired by a Senior Site Representative with the Transnet Project Manager, Contractor(s) and the Contractor's Environmental Officer('s) in attendance.

8.10 Non-conformance Report

The following information should be recorded in the NCR:

- details of non-conformance;
- any plant or equipment involved;
- any chemicals or hazardous substances involved;
- work procedures not followed;
- any other physical aspects; and
- nature of the risk.

Actions agreed to by all parties following consultation should adequately address the identified non-conformance. This may take the form of specific control measures and should take the hierarchy of controls into account. This must accompany the NCR for filing purposes.

All parties must agree on the timeframe by which the Contractor should have implemented the actions. The Transnet Project Manager should verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the Transnet Project Manager and Contractor should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

In the event of an environmental incident, the Contractor will follow the following procedure:

- Step 1: Immediately take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;
- Step 2: Notify the Transnet Environmental Officer in writing including the following information: the nature of the incident and initial classification; substances involved with quantities; initial measures taken to minimise impacts; causes of the incident; measures taken and proposed to avoid the reoccurrence of the incident;
- Step 3: Include the incident on the Transnet Environmental Incident Register Step 4: Undertake clean-up procedures;
- Step 5: Remedy the effects of the incident; and
- Step 6: Assess the immediate and long-term effects of the incident on the environment and on public health;

In the event of any Level 1 or 2 environmental incidents, the Contractor's Environmental Officer must complete a Transnet Environmental Incident Report

In the event of any Level 1 or 2 environmental incidents, the Transnet Environmental Officer will:

- Ensure that an Incident Report has been compiled and that it contains the necessary information;
- Ensure that Contractor has complied with Transnet Occurrence Reporting and Investigation Procedure; and

- Report, record, investigate and analyse the incident and communicate the required action plans to be implemented to the Transnet Construction Manager as specified the procedure in the above-mentioned procedure.

An environmental incident is classified under four levels: 1, 2, 3 and 4. They are defined as follows:

8.10.1 Level 1 Environmental Incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A significant impact on the physical or biological environment (air, ground, water and habitat) with extensive or long term impairment of ecosystem function or surface and ground water resources.
- An inconvenience/ disturbance/disruption/annoyance (including odour, dust, noise, traffic problem, loss of water supply) of a long duration or with a long term impact on interested and affected parties. A release of material (gas, liquid, solid) or energy that will cause chronic illness, permanent lost time injury, fatality or extensive property damage experienced by interested and affected parties.
- Irreparable damage to highly valued structures and sacred locations.
- Public or national / international media outcry
- Instances where inspections undertaken by or for the regulator to check legal compliance, were found to be outside the permitted limits and have resulted in prosecution.
- Any incident with NEMA section 30(1) – and/or NWA section 20(1) reporting requirements (In the even where all administrative requirements have been complied with and the incident has been closed out by the authorities, it may be re-classified as a Level 2 environmental incident)

Where the environmental impact of a Level 2 environmental incident is still present 120 days after occurrence, the incident will be reclassified as a Level 1 incident.

NOTE: A Level 1 environmental incident usually should be reported to the authorities, usually result in a significant pollution and may entail risk of public danger. Level 1 environmental incidents usually cause an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc.

8.10.2 Level 2 Environmental incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A moderate impact on the physical or biological environment (air, ground, water or habitat) with limited impairment of ecosystem function and/or surface and ground water resources.

- An inconvenience disturbance/ disruption/annoyance (including odour, dust, noise, traffic problems, loss of water supply) of moderate or with medium effect on interested and affected parties.
- A release of material (gas, liquid, solid) or energy that causes severe but reversible illness, non-lost time injury or moderate property damage experienced by interested and affected parties.
- Damage to rare structures of cultural significance or significant infringement of cultural values / sacred locations.
- Attention from local media or widespread complaints
- Instances where inspections undertaken by or for the regulator to check legal compliance have been outside the permitted limits and an official pre-directive or directive was issued.
- Inability of Contractors to close out corrective actions in an NCR without proper reason

Where the environmental impact of a Level 3 environmental incident is still present 3 days after occurrence, the incident will be reclassified as a Level 2 incident.

NOTE: A Level 2 environmental incident may be reported to the authorities, can result in significant pollution or my entail risk of public danger. The impact of Level 2 environmental incidents should be reversible within a short to medium term with or without intervention.

8.10.3 Level 3 Environmental incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A minor impact on the physical or biological environment (air, ground, water or habitat), with no significant or long-term impairment to the ecosystem function or surface/ground water resources.
- An inconvenience / disturbance / disruption / annoyance (including odour, dust, noise, traffic problems, loss of water supply) of short duration and with no long-term effect on the employees and the community.
- A release of material (gas, liquid, solid) or energy that has the potential to cause illness, or that causes short term discomfort or reversible health effect to interested and affected parties.
- Isolated complaints by interested and affected parties.
- Instances where inspections undertaken taken by or for the regulator to check for legal compliance, have been outside the permitted limits and a non-compliance notice was issued.
- Blatant negligence of EMPr leading to the issuing of an NCR

NOTE: A Level 3 environmental incident is not reportable to authorities, should not result in pollution and may not have a risk of public danger. The impact of Level 3 environmental incidents should be insignificant immediately after occurrence and/or once-off intervention on the day of occurrence.

8.10.4 Level 4 Environmental incident

A minor incident with lesser significance that did not necessarily result in damage or injury but that had the potential to cause damage to the environment, including:

- Could result in service disruption with a lesser significance
- Did not necessarily result in damage
- Had the potential , under different circumstances, to cause major damage to the environment

or:

- Instances where inspections undertaken internally by Transnet to check for conformance with the Transnet Environmental Governance Framework have been outside the required limits (e.g. an environmental compliance score of less than 80%).

8.10.5 Non-Conformances

A non-conformance may be issued to the Contractor by the Transnet Project Manager/Environmental Officer where:

- The incident response procedure described above (including administrative requirements) were not successfully implemented; or
- There are repeated incidents because of inadequate environmental practices on site;
- Documentation required to comply with the EMPr is not prepared or maintained adequately on site; or
- Any non-compliances with the requirements of the Environmental Authorisations, the EMPr and Environmental Specifications are identified

The following information should be recorded in the NCR:

- details of non-conformance;
- any plant or equipment involved;
- any chemicals or hazardous substances involved;
- work procedures not followed;
- any other physical aspects; and
- nature of the risk.

Actions agreed to by all parties following consultation should adequately address the identified non-conformance. This may take the form of specific control measures and should take the hierarchy of controls into account. This must accompany the NCR for filing purposes.

All parties must agree on the timeframe by which the Contractor should have implemented the actions. The Transnet Project Manager should verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the Transnet Project

Manager and Contractor should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

8.11 Environmental Emergency Response

The Contractor's environmental emergency procedures must ensure that there will be an appropriate response to unexpected or accidental actions or incidents that could cause environmental impacts. Such incidents may include:

- accidental discharges to water (i.e. into the sea) and land;
- accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- accidental toxic emissions into the air; and
- specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding to environmental incidents and must ensure and include the following:

- all employees shall be adequately trained in terms of incidents and emergency situations;
- details of the organisation (manpower) and responsibilities, accountability and liability of personnel;
- a list of key personnel and contact numbers;
- details of emergency services (e.g. the fire department, spill clean-up services) shall be listed;
- internal and external communication plans, including prescribed reporting procedures;
- actions to be taken in the event of different types of emergencies;
- incident recording, progress reporting and remediation measures to be implemented; and
- information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor(s) will comply with the environmental emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act (Act No. 85 of 1993), the National Environmental Management Act (Act No. 107 of 1998), the National Water Act (Act No. 36 of 1998), and/or any other relevant legislation listed in Section 6.

8.12 Incident Management

Using the Impact/Aspect Risk register, the Contractor must identify the types of environmental incidents that are likely to occur on site and ensure measures are put in place to prevent or mitigate the effects of such incidents. The Contractor is required to put in place an effective management system that will prevent or mitigate the occurrence of an incident. The method statement for this must be submitted to the Transnet Project Manager for approval prior to the commencement of works. This method statement must be reviewed and up dated on a six monthly basis.

All the Environmental, Health and Safety incidents must be reported to the Contractor. The Contractor shall immediately report the incident to the Transnet Project Manager and put into place management mechanisms to deal with the incident as quickly as possible. A formal report

must be submitted within seven days to the Transnet Project Manager, including all remediation measures undertaken to repair any damage caused and to prevent the incident from re occurring.

Once the incident has been stabilised and initial notifications have been issued to the relevant parties, a full incident investigation is required complete with detailed corrective and preventive measures. The Contractor is required to provide an incident report to the Transnet Project Manager, which, as a minimum, must include the following:

- Nature of incident.
- Damages, injuries or fatalities sustained and the parties involved.
- Any risks such incident poses.
- Toxicity of the substances involved.
- Steps taken to avoid or minimise the effects of the incident and any future incidents.
- Clean-up procedures, remedial actions and assessment of immediate and long term effects.

8.13 Environmental Method Statements

The Contractor must submit environmental method statement to the Transnet Manager for approval prior to the commencement of maintenance related activities.

A method statement is a document detailing how a particular process will be carried out. It should detail the possible dangers/risks associated with the particular part of the project and the methods of control to be established and to show how the work will be managed in a safe and environmentally responsible manner. The method statement shall also include the following information (where applicable):

- the type of maintenance activity;
- timing and location of the activity;
- maintenance procedures;
- materials and equipment to be used;
- transportation of the equipment to and from site;
- how the equipment/material will be moved while on site;
- location and extent of Contractors site office and storage areas;
- identification of impacts that might result from the maintenance activity;
- population impacts;
- community/institutional arrangements;
- conflicts between local residents and newcomers;
- individual and family level impacts;
- community infrastructure needs;
- intrusion impacts;
- methodology and/or specifications for impact prevention or containment and for environmental monitoring;
- emergency/disaster incident and reaction procedures (required to be demonstrated); and
- rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor will be required to submit method statements for approval by the Transnet Project Manager prior to the start of maintenance activities. Method statements that are required during maintenance must be submitted to the Transnet Project Manager for approval at least 14 days prior to the proposed commencement of the activity. Emergency maintenance activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the Transnet Project Manager.

8.14 Communications Register

All complaints or communications that are received from port users and tenants or any other stakeholder must be recorded in a Communications Register. These complaints and communications will be brought to the attention of the Transnet Project Manager, whereupon it will be investigated and a response to the Complainant will be given within 10 days. The Communications Register shall include the following information:

- Record the time and date of the complaint/communication;
- A detailed description of the complaint/communication;
- Action and resources used to correct the complaint;
- Photographic evidence of the complaint (where possible);
- A written response to the Complainant indicating rectification of the complaint; and
- Information regarding the relevant authority that was contacted or notified in writing (person, time and date).
- The relevant authorities include:
    - Department of Water and Sanitation (e.g. for any incidents involving the contamination of water resources);
    - Department of Environmental Affairs (competent authority for government departments);
    - Department of Environmental Affairs and Development Planning (DEA&DP) (e.g. for any significant incident of pollution of the soil and air);
    - Department of Agriculture, Forestry and Fisheries (e.g. uses of appropriate herbicides for eradication of alien invasive species);
    - Department of Health (e.g. for incidents such as contamination of water resources, accidental spill of hazardous substances);
    - Department of Transport and Public Works (e.g. for the diversion of traffic due to construction activities);
    - Department of Labour (e.g. for labour disputes);
    - KwaZulu Natal: Department of Agriculture;
    - Amafa KwaZulu Natal Heritage
    - EThekwini Municipality Disaster Management Services (e.g. for fire prevention);
    - EThekwini Environmental Health Department (e.g. for control of nuisances);
    - EThekwini Municipality: Electricity Department (e.g. impacts upon electricity provision);

- EThekwini Municipality: Environmental Resources Management (e.g. issues pertaining to environmental management);
- EThekwini Municipality: Catchment, Stormwater and River Management (e.g. issues pertaining to drainage and stormwater management);
- EThekwini Municipality: Transport (e.g. road closures and diversions);
- EThekwini Municipality: Solid Waste Management (e.g. waste derived from demolition activities); and
- EThekwini Municipality: Water and Sanitation (e.g. impacts pertaining to reticulation services).

8.15 Photographic Record

The Construction Manager and Contractor's Environmental Officer will be required to compile a photographic record of all activities on site prior to maintenance related activities starting, during the maintenance process and on completion of maintenance related works. This will include photographs for:

- Monthly environmental audit reports;
- Weekly environmental monitoring reports;
- Corrective action;
- Progress of environmental works; and
- Non-conformance reports.

8.16 Waste Manifests

The Contractor shall ensure that all solid (including any hazardous) waste removed from site is disposed of at a registered landfill site or nearby waste transfer station with capacity to accept the project generated waste. The waste manifest shall be kept on record for auditing purposes.

8.17 Good Housekeeping

The Contractor is to practice good housekeeping throughout the maintenance works. This should eliminate disputes about responsibility and facilitate efficient and timeous running of the project. Over and above practicing accepted construction methods in accordance with SANS 10120, this should include measures to preserve the environment inside the work area. Records of such actions taken to ensure the maintenance and management of housekeeping must be recorded.

8.18 Management and Control

The Contractor is to implement environmental management in a reasonable manner and should such management not prove effective, shall implement measures to the satisfaction of the Transnet Project Manager.

Appropriate measures shall include:

- Appointment of necessary resources to monitor and manage environmental requirements.

- Implement aspect-specific method statements to deal with emergency situations.
- Provision of adequate emergency response equipment to mitigate and manage an incident or emergency.
- Provision of specific training related to implementation of environmental management requirements.

8.19 Recording and Reporting

The Contractor shall maintain detailed records of parameters monitored. These detailed records shall demonstrate the effectiveness of the management actions implemented to mitigate potential environmental impacts. The Contractor shall submit a monthly database/report of management works implemented to the Transnet Project Manager, as part of the Contractor's monthly report.

8.20 Monitoring

The Contractor shall submit an Environmental Monitoring Method Statement which details the scope, nature, process, schedule and templates for environmental monitoring. The monitoring results shall be used to determine the effectiveness of the management programme. All complaints, compliments or other comments relating to environmental management parameters are to be recorded by the Contractor and reported to the Transnet Environmental Officer.

Monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractors Monthly Report. The daily and weekly reports (as required) are to detail observations and information relating to requested management actions and their effectiveness. The Contractor shall monitor and maintain *inter alia* the following on an on-going basis:

- Fire management requirements associated with maintenance related activities
- Stormwater systems
- Soil and backfill volumes
- Access road condition
- Dust
- Noise
- Water quality and quantity
- Spoil management

Site clearance monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractor's Monthly Report.
The weekly report and daily reports are to detail observations and information relating to requested management actions and their effectiveness.

8.21 Final Environmental Compliance Report

A Final Environmental Compliance Report will be compiled by the Transnet Environmental Specialist for submission to Transnet at the end of maintenance works. The report will include details of:

- the completion of all environmental conditions and mitigation measures listed in the EMPr;
- all environmental incidents and completed corrective actions;
- the findings of the Environmental Audits;
- conclusions as to whether environmental constraints, guidelines, norms and stipulations have been met and, if not, reasons why they have not been met;
- an indication of the outcomes of the environmental monitoring conducted;
- all Monthly Environmental Monitoring Reports (as an attachment);
- a copy of all Method Statements (as an attachment);
- a copy of the environmental Incident Book (as an attachment); and
- a copy of the Communications Register.

9. Training and Induction of Employees

The Contractor is to take responsibility for the management of staff on the project site during the maintenance related works and supervise them closely at all times. The onus is on the Transnet Project Manager and the Contractor to make sure that all staff and Sub-Contractors fully comprehend the contents of the EMPr. The environmental awareness training programmes should, therefore, be targeted at the two levels of employment: management and labour. Environmental awareness training programmes need to be formulated for these levels and must comprise:

- A record of all names, positions and duties of staff to be trained;
- A framework for the training programmes;
- A summarised version of the training course(s); and
- An agenda for the delivery of the training courses.

Such programmes will set out the training requirements which need to be conducted, prior to any construction works and will include:

- Acceptable behaviour with regard to flora and fauna;
- Management and minimising of waste, including waste separation;
- Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, cement, mortar and other chemicals;
- Responsible handling of chemicals and spills;
- Environmental emergency procedures and incident reporting; and
- General code of conduct towards port users and tenants.

The Transnet Environmental Officer may be requested to provide additional training (in a first language) on-site regarding environmental aspects that are unclear to the personnel. A translator may be required and requested to assist in this additional training. The cost for the translator will be borne by the Contractor. The Contractor shall implement the training programme at own cost. Training shall be undertaken prior to the commencement of maintenance related activities and on a six monthly follow up roster thereafter.

10. Suspension of Works

If the Contractor has not complied with one or more of the clauses of the EMPr, the Transnet Project Manager may order the suspension of works. This may be conducted after having served the Contractor with a NCR / Project Managers Instruction (PMI) and until the Contractor complies with the clauses of the EMPr. All delays resulting from such suspension shall be at the Contractor's expense.

11. Implementation of the EMPr

The EMPr provides an integrated approach to environmental management. This approach is designed to guide the appropriate allocation of human resources, assign responsibilities, develop procedures and ensure project compliance with regulatory and best practice requirements.

Where conflict exists between this and any other document / specification, the following shall apply in descending order of applicability:

- DEA authorized EMPr;
- Transnet Environmental Management. Construction Environmental Management Plan (CEMP) and
- Standard Environmental *Specifications*

The Standards for Environmental Management below describes the aspect-specific requirements for achieving environmental best practice.

11.1 Standards for Environmental Management

The Contractor shall identify the potential environmental impacts that may occur as a result of his/her 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 this document are achieved. These method statements will be prepared in accordance with the requirements set out in the EMPr.

The Contractor will comply with the standards described below.

11.2 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, staff accommodation and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas.

11.2.1 Site plan

Before the onset of construction, the Contractor shall submit to the Transnet Project Manager for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the Contractor proposes to put in place.

The Site Plan must as a minimum include but not be limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluents
- Proposed areas for the stockpiling of topsoil and excavated spoil material
- Demarcation of the construction footprint including areas not to be disturbed by the development
- Location of sewage and sanitary facilities at the site offices and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the Construction Manager.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from the sea as possible.

11.2.2 Identification and establishment of suitable access routes/roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to within the development footprint to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimise erosion and dust generation.

11.2.3 Demarcation of site limits

Prior to the commencement of construction, the actual site to be developed must be clearly demarcated by means of highly visible barriers such as fences and orange snow netting. Vegetation within the demarcated zone may be cleared. Disturbance of vegetation outside of the demarcated development footprint is not permitted.
All plant, material and equipment required for construction must be located within the designated areas. Laydown areas must be clearly demarcated within the site limits. No activities are allowed outside of the demarcated development footprint.

11.2.4 Eating Areas

The Contractor is responsible for providing temporary weatherproof and shaded areas within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags must be provided at all established eating areas.

11.2.5 Effluent Management

All effluent water from site shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water resources. Only domestic type wastewater shall be allowed to enter the designated system.

11.3 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities to all workers on site and for enforcing the proper use of these facilities. Safe and effective sewage treatment will require one of the following sewage handling methods: conservancy tanks or the use of chemical toilets which are supplied and maintained by a suitably qualified sub-contractor. The type of sewage treatment will depend on the location of the site and the surrounding land uses, the duration of the contract and proximity (availability) of providers of chemical toilets.

Toilets shall be easily accessible and shall be positioned within walking distance (*viz* 50 m) from wherever employees are employed on the works. Use of open areas (i.e. the veld) shall not, under any circumstances, be allowed.

Chemical toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed in areas protected from flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet Project Manager.

The Contractor shall ensure that there are separate toilet facilities for male and females on site at a ratio of one facility for every 10 employees.

11.4 Waste Management

Waste is grouped into "general" or "hazardous", depending on its characteristics. The classification determines handling methods and the ultimate disposal of the material.

General waste to be expected during construction includes the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel
- Uncontaminated construction debris such as used wood and scrap metal
- Uncontaminated soil and non-hazardous rubble from excavation or demolition

Hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to its inherent physical, chemical characteristics, such as toxic, ignitable, corrosive, carcinogenic or other properties or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

The Contractor shall classify all wastes expected to be generated during the construction period.

Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

WASTE	**CLASSIFICATION**	
	HAZARDOUS	**GENERAL**
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste Cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X
Chemically-derived sanitary waste	X	

A hierarchical control approach to waste management is encouraged. Waste should preferably be managed in the following order of preference:

1. **Avoidance:** using goods in a manner that minimises their waste components
2. **Reduction:** reduction of the quantity and toxicity of waste generated during construction
3. **Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties

4. **Recycling:** separating articles from a waste stream and processing them as products or raw materials
5. **Recovery:** reclaiming particular components or materials, or using the waste as a fuel
6. **Treatment**: processing of waste by changing its form or properties in order to reduce toxicity and quantity
7. **Disposal**: burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste from site generated through the Contractors activities. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: **www.sawic.org.za**).

The Contractor shall manage HAZARDOUS WASTE anticipated to be generated by his operations as follows:

- Characterise the waste to determine if it is general or hazardous
- Obtain and provide an acceptable container with correct classification label
- Place hazardous waste material in allocated container
- Inspect the container on a regular basis as prescribed by the Contractor's waste management plan
- Track the accumulation time for the waste
- Haul the full container to the disposal site
- Provide documentary evidence of proper disposal of the waste

The Contractor's Environmental Officer will work in conjunction with the Contractor's construction safety and industrial hygiene personnel to create a Hazardous Materials Management Program. This program will establish the necessary protocol for proper handling and removal of hazardous materials on the site.

Information on each hazardous substance will be available to all persons on site in the form of Material Safety Data Sheets (MSDS). Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's Environmental Officer must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

The Contractor shall manage GENERAL WASTE that is anticipated to be generated by operations as follows:

- Determine if waste is non-hazardous and obtain containers for waste storage
- Notify waste hauler when container is full so that it can be removed and replaced with an empty
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor
- Provide documentary evidence of proper disposal of waste

The Contractor shall recycle GENERAL WASTE (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them within temporary office building and trailers:
  - Office Waste;
  - Aluminum;
  - Steel;
  - Glass;
  - Ferrous Metals;
  - Non Ferrous Metals; and
  - Waste Timber
- Establish recycled material collection schedule
- Arrange for full bins to be hauled away

Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling.

No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall quantify all waste disposed of, whether general or hazardous (including waste disposed of by any sub-contractors) and keep record of these quantities on site.

11.5 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refuelling of plant on site must be done at designated locations at workshop areas. These designated areas must be agreed with the Transnet Project Manager and Transnet Environmental Officer. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities. All machinery servicing areas must be (impermeable) bunded. Drip trays should be used to collect used oil, lubricants and other during maintenance. Drip trays must be provided for all stationary plant. The use of "geyser drip trays" will not be permitted. Steel drip trays shall be of the appropriate size with sufficiently high side walls to contain a spill. Handles shall be placed on each of the four corners to provide safe handling. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided.

11.6 Vehicle and Equipment Refuelling

11.6.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refuelled on site except at designated servicing or refuelling locations. No oil or lubricant changes shall be made except at designate locations, or in case of breakdown or emergency repair.

The Contractor shall store fuel and oil at a secure area, which shall be bunded to contain 110% of the total volume within the bund and designed with an impervious layer or liner to prevent spillage from entering the ground. The bund shall not be constructed from bricks and mortar.

The Contractor shall provide details of its proposed fuel storage and fuelling facility to the Transnet Environmental Officer for approval. The design shall comply with the regulations of the National Environmental Management Act (Act 107 of 1998), National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), and the Occupational Health and Safety Act, (Act 85 of 1993), Construction and Hazardous Chemical Substances Regulations and applicable SANS standards..

11.6.2 Mobile Refuelling

In certain circumstances, the refuelling of vehicles or equipment in a designated area is not a viable/practicable option and refuelling has to be done from a tank, truck or container moved around on site. In such circumstances, the Contractor may request approval from the Construction Manager to conduct mobile refuelling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.
- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refuelling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refuelling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling tanks must be stored in an area where they are not susceptible to collisions. The fuel storage area must be located away from drainage channels.
- Mobile refuelling operations shall not take place within 7.5 meter from structures, property lines, public ways or combustible storage.
- All mobile refuelling tanks are to be properly labelled and fire extinguishers shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

11.7 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental attributes.

The Contractor shall provide details for approval by the Transnet Project Manager of its spill response plan in the event of any spills of fuel, oils, solvents, paints or other hazardous materials. The plan will show measures to be taken in removing contaminated material from site and demonstrate complete removal of contamination.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- Immediately repair all leaks of hydrocarbons or chemicals
- Take all reasonable means to prevent spills or leaks
- Do not allow sumps receiving contaminated water to overflow
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals
- Do not discharge oil or contaminants into storm water or sewer systems

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill
- Contain the spill
- Recover the spilled product
- Remediate the site
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water
- Dispose of contaminated material to a location designated thereto

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it
- Notify the appropriate on-site authorities
- Implement actions necessary to prevent the spread of the contamination by deploying booms and/or absorbent material
- Recover the spilled product
- Properly dispose of spilled material

11.8 Spray Painting and Sandblasting

Spray painting and sandblasting should be kept to a minimum. All painting should, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or by an approved procedure. A Method Statement shall be submitted to the Transnet Environmental Officer for approval.

The relevant Contractor will inform his Environmental Officer of when and where spray painting or sandblasting is to be carried out prior to commencement of work. The Environmental Officer will monitor these activities to ensure that adequate measures are taken to prevent contamination of the soil.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval.

11.9 Dust Management

Material in transit should be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage onto the roads and the creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin to prevent dust.

Dust is to be controlled on unpaved access roads and site roads using sprayed water. Contractors are responsible for managing dust generated as a result of their activities.

Some dust control measures which are normally applied during maintenance are presented in this section for inclusion by the Contractor in his Dust Control Method Statement:

- Operate vehicles within speed limits, where no speed limit has been specified the limit shall be 20km/h
- Wash paved surfaces within the works area twice a week
- Minimise haulage distances
- Apply water to gravel roads with a spraying truck when required
- Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas
- Dust suppression measures will also apply to inactive works areas.
- Building material being transported by trucks must be suitably moistened or covered to prevent dust generation
- Minimise disturbance of natural vegetation during right-of-way maintenance (e.g. transmission lines and erection of fences) to reduce potential erosion, runoff, and air-borne dust
- Implement a system of reporting excessive dust conditions by maintenance personnel (as instructed through Environmental Awareness Training)

Water for dust control shall only be taken from approved sources.

11.10 Storm water and Dewatering Management

The Contractor shall be aware that, apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and that contaminants during maintenance may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertiliser from rehabilitated areas, etc.

The Contractor shall take note that discharges to controlled waters such as the sea, groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established on site during the maintenance period until permanent drainage is in place. Contractors are responsible for maintaining the temporary drainage in their areas. Contractors must provide secondary drainage that prevents erosion
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water
- The Contractor shall clear stagnant water
- The Contractor shall ensure that no contaminated surface water flows off-site as a result of Contractor operations. Silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities. The dewatering water shall be contained within the site boundaries by sequentially pumping or routing water to and from sub-areas within the site as the construction activities proceed. No discharge/dewatering to off-site land or surface water bodies will be allowed
- On-site drainage shall be accomplished through gravity flow. The surface drainage system shall consist of mild overland slopes, ditches, and culverts. The graded areas adjacent to buildings shall be sloped away with a 5% slope. Other areas shall have a minimum slope of 0,2% or as otherwise indicated
- Ditches shall be designed to carry a 25-year storm event with velocities in accordance to minimise erosion. Erosion protection shall consist of suitable stabilising surfaces in all ditches
- Culverts shall be designed to ensure passage of the 50-year storm peak runoff flow

11.11 Erosion Control

Both structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include the following:

- Scheduling of activities to minimise the amount of disturbed area at any one time

- Implementation of re-vegetation as early as feasible
- Limiting traffic and/or avoidance thereof on access roads and areas to be graded to the extent feasible at drainage ditches
- Compacting loose soil as soon as possible after excavation, grading, or filling
- Using silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins, and gravelled roads to minimise transport of sediment
- Implementing the erosion and sedimentation control plan and ensuring that construction personnel are familiar with and adhere to it
- Managing runoff during construction
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls

11.12 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. A rehabilitation plan will be submitted to the Construction Manager for approval at least six weeks before completion. The following are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified botanist should be sought in developing this list
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc).
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful)
- Procedures for the prevention of the establishment and spread of alien invasive species.

11.13 Noise Management

- Keep all equipment in good working order
- Operate equipment within its specification and capacity and don't overload machines
- Apply regular maintenance, particularly with regards to lubrication
- Operate equipment with appropriate noise abatement accessories, such as sound hoods
- Sensitive social receptors shall be notified of any excessive noise-generating activities that could affect them.

- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, *SANS 10103:2004*, so that it will not produce excessive or undesirable noise when released
- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, *SANS 10103:2004*, for construction plant noise generation
- All the Contractor's vehicles shall be fitted with effective exhaust silencers and shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road
- If on-site noise control is not effective, protect the victims of noise (e.g. ear-plugs) by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

11.14 Protection of heritage resources

11.14.1 Archeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such a discovery. The South African Heritage Resources Agency (SAHRA) is to be contacted and will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist.

11.14.2 Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the graves/middens shall be stopped and the Transnet Project Manager informed of the discovery. The SAHRA should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

11.15 Fire prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites. All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

11.16 Water Protection and Management

No water shall be abstracted from any water resource (stream, river, or dam) without the express permission of the Construction Manager. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water Affairs and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

The Contractor shall keep record of the quantities of water used during construction (including use by sub-contractors), irrespective of the purpose of use.

All water released into the receiving environment and potentially containing contaminants shall be monitored to ensure compliance with the requirements of the National Water Act. All samples monitored shall be sent to a SANS 17025 certified laboratory.

11.17 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

11.18 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the EMPr for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.

- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the proper person for solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis and keep record of all the environmental related training of the personnel.

11.19 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet Construction Manager.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts.

Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab.

Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. Water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and Aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a registered disposal facility. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained.

11.20 Stockpiling, Soil Management and Protection of Flora

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Sensitive areas shall be avoided in this regard.

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated.

Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible.

The detail of vegetation clearing shall be subject to the Construction Manager's approval and shall occur in consultation with the Transnet Environmental Officer.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials.

Stockpiled soil shall be protected by adequate erosion-control measures.

Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation.

Topsoil shall be stockpiled separately from other materials and kept moist.

Excavated subsoil, where not contaminated, must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas.

Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

Stockpiles (excluding ballast stockpiles) shall not exceed 2m in height unless otherwise permitted by Transnet.

No vegetation located outside the construction site shall be destroyed or damaged.

As far as is reasonably practicable, existing roads must be used for access to site and right of way.

Before site clearance takes place, vegetation surveys will be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities.

The development of new embankments or fill areas must be undertaken in consultation with the Transnet Environmental Officer.

No dumping of solid waste or refuse shall not be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

11.21 Traffic Management

Vehicles are not permitted to leave access roads.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint

The contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

Vehicles should only be parked within designated parking areas as demarcated on the site layout plan

11.22 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the EMPr Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

11.23 Borrow Pits and Quarries

The contractor shall make use of commercial suppliers for all rock and sand raw materials.

The Contractor shall ensure that any supplier is in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless he has obtained written approval from the Construction Manager and Method Statement has been submitted and approved.

The abovementioned Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, safety and noise levels).

11.24 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet Project Manager.

No activity on private property shall be allowed without written consent by the relevant landowner and the Transnet Project Manager.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet Construction Manager.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site.

11.25 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Watt Hours)
- Fuel consumption (to be measured in litres)

The Contractor shall utilize energy saving lights / devices within all buildings under his control.

11.26 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet Project Manager.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No possible spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area. All fluids accumulated within the bunded area shall be removed and disposed of in accordance with Section 13.4.

Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure.

Weighbills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet Environmental Officer.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

12. References

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ANNEXURE A:

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMPr

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMPr

PRIOR TO COMMENCEMENT

Method Statements

The Contractor shall submit project and task specific method statements to the Transnet Construction Manager within 14 days of receipt of the Letter of Acceptance.

Activities shall only be allowed to commence once the method statements have been approved by the Transnet Construction Manager.

Environmental Management Plans

The Contractor shall submit an EMP for approval to Transnet Construction Manager before commencement of activities.

Environmental Awareness Training preparation

The Contractor shall be required to present the Environmental Awareness Training to all personnel within 7 days of the project commencing. The Contractor shall manage and implement all the requirements associated with the presenting of the training programme with the Transnet Construction Manager before the Commencement Date.

TWO WEEKS AFTER COMMENCEMENT

Demarcation of the Site

The Contractor shall be required to establish a site office within the project footprint or alternatively at a locality appropriately zoned and/or authorised for such use and approved by the Transnet Construction Manager. The Contractor shall be required to erect and maintain a temporary fence along the boundary perimeter and at all sites identified as "no-go" areas, to the satisfaction of the Transnet Construction Manager.

The Contractor shall select a location that has easy access and which has already been cleared or disturbed by previous human activity (e.g. previous Contractor camps or stockpile areas). All maintenance activities, materials, equipment and personnel will be restricted to within the area specified.

Environmental Awareness Course

The Contractor shall ensure all staff members attend the environmental awareness training to be held in or before the first week after the commencement date.

FOLLOW-ON FROM THE ENVIRONMENTAL AWARENESS COURSE

The contractor shall be responsible for presenting follow up training on a six monthly basis.

During maintenance, if new personnel come onto site, the Contractor shall be responsible for providing awareness training and thus ensure these personnel are aware of the environmental specifications on site.

Method statement awareness

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

Emergency preparedness

The Contractor shall ensure all measures required to prevent, mitigate, manage and control an emergency situation are implemented. This activity shall require regular review during maintenance.

DURING CONSTRUCTION

Contractor Familiarisation Of The EMPr

The Contractor shall ensure a copy of the EMPr and its relevant Project Specification clauses are available on Site, and shall ensure that all the personnel associated with the project (including sub-contractors and suppliers), are familiar with and understand the specifications contained in the EMPr.

Method Statements

All other task specific method statements, required during the course of maintenance, shall be submitted to the Transnet Construction Manager for approval 14 days prior to the proposed commencement of the activity.

Site Security

The Contractor shall, where applicable, ensure that measures are implemented to secure the site during all nonworking hours, including public holidays.

Materials Handling, Use and Storage

The Contractor shall ensure all materials delivered, handled, used or stored are done in compliance with the requirements of the EMP. Additionally, the Contractor shall ensure all measures are in place to manage, mitigate and control an emergency situation should one arise.

The Contractor shall ensure all staff members are adequately trained in all elements pertaining to such materials.

AFTER CONSTRUCTION-RELATED ACTIVITIES ARE COMPLETE

Site Clean up

Within 7 days of the completion of maintenance related activities, the Contractor shall commence with the clearing and cleaning of the site, ensuring everything not forming part of the permanent works is removed from site.

ANNEXURE B:

BASIC ENVIRONMENTAL AWARENESS TRAINING

DO'S AND DON'T'S



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



Do not swim in the sea
Do not throw oil, petrol, diesel, concrete or rubbish in the sea
Do not work in the sea without direct instruction



Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site



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



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



Try to avoid producing dust – wet dry ground & soil



Do not make loud noises around the site
Report or repair noisy vehicles



Use the toilets provided
Report full or leaking toilets



Only eat in demarcated eating areas
Never eat near the sea
Put packaging & leftover food into rubbish bins



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



Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill



Know all the emergency phone numbers



Spot fines of between R20 and R2000
Removal from site
Construction may be stopped



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

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie in die swem nie.
Moenie olie, petrol, diesel, sement of rommel in see gooi nie.
Moenie in die see werk sonder direkte instruksie nie.



Beskerm diere op die konstruksieterrein.
Vra u toesighouer of Kontrakbestuurder om diere van die terrein te verwyder.



Gooi sigaretstompies in 'n asblik.
Moenie rook naby gas, verf of petrol nie.
Moenie sonder toestemming enige vure maak nie.
Weet waar brandbestrydingstoerusting gestoor word
Meld alle vure onmiddelik aan.
Moenie rommel verbrand sonder toestemming.



Werk slegs in gemerkte areas met petrol, olie & diesel nie.
Meld alle petrol, olie en diesel lekkasies aan.
Gebruik 'n drupbak onder voertuie en masjienerie.
Maak drupbakke leeg na reën, maar nie in riviere nie



Probeer om nie stof te maak nie.
Maak droë grond nat met water.



Moenie harde geluide maak op die terrein nie, veral naby skole en huise.
Meld raserige voertuie aan of herstel dit.



Gebruik die toilette wat voorsien is.
Meld vol of lekkende toilette aan.



Eet slegs in gemerkte gebiede.
Moenie naby riviere of strome eet nie.
Gooi verpakking en orige kos in vullisblikke.



Moenie vullis rondstrooi nie - gooi alle vullis (veral sementsakke) in vullishouers.
Mel vol vullishouers aan by u toesighouer.
Vullishouers moet gereeld leeggemaak word.



Moet nooit die spoedperk oorskry nie.
Bestuurders - gaan voertuie na en meld lekkasies of rokerige voertuie aan.
Maak seker dat alle vragte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnommers ken.



Boetes tussen R20 en R2000
Verwydering vanaf die konstruksieterrein.
Konstruksie mag gestop word.



Meld alle brekasies, vure, vloede, lekkasies en beserings aan by u toesighouer.
Vra vrae!

EMAZENZIWE NE MAZINGENZIWA



Abasebenzi nezixhobo abazisebenzisayo mabangaphumi nazo ngaphaya kwesayiti



Sukuqubha okanye usele amanzi omlambo
Sukugalela ioil, petrol, diesel, concrete okanye inkukuma emlanjeni
Sukonakalisa iindonga (zomlambo) okanye izintyalo



Khusela izilwanyana ezilapho esayitini
Xelela isupervisor ukuba zimkiswe ezozilwanyana



Ungonakalisi okanye ugawule imithi ngaphandle kwemvume
Sukwemba izityalo
Xa ugqibile ukutshayo galela emgqomeni (izitompi zecuba)



Sukutshaya kufuphi negesi, ipeyinti ne petroli
Sukubasa umlilo ngaphandle kwemvume
Zazi izicima mlilo apho zikhoyo
Sukutshisa inkunkuma naaphandle kwemvume



Sebenzisa ipetrol, oil ne diesel endaweni yayo
Faka isitya sokukhongozela phansi kwemashini
Ungagaleli oil emlanjeni



Zama ungenzi uthuli fefa ngamanzi emhlabeni



Sukwenza ingxolo eshayitini ngakumbi kufuphi nesikolo nezi ndlu
Yazisa ulungise isithuthi esonakeleyo



Sebenzisa itoilet (izindlu zangasese)
Xela xa zizeleyo



Tyela kwindawo eyenzelwe oko
Sukutyela kufuphi nomlambo
Lahla emgqomeni yonke inkukuma



Sulahla inkukuma phantsi
Galela emgqomeni yonke inkukuma xela xa izele imigqomo
Xela xa umgqomo uzele



Gcina isantya
umqhubi makayilungise inqwelo xa yonakele
Qononondisa umthwalo ubotshiwe enqweleni



Zazi inombolo zengozi



Intlawulo ngokwaphula umthetho yi R20 - R2000
Okanye ugxothwe emsebenzini
Contract leyo imiswe



Ripota wonke umanakalo ofana nokuqhekeza, isiphango umlilo, ukuvuza kwemashini nengozi kwi supervisor
Buza xa unombuzo

ANNEXURE C:

DECLARATION OF UNDERSTANDING

ANNEXURE D:

CONTRACTOR'S ENVIRONMENTAL OFFICER

Annexures B5 - TNPA Asbestos Management Plan



TRANSNET NATIONAL PORTS AUTHORITY

ASBESTOS MANAGEMENT PLAN

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GLOSSARY OF TERMS:

Asbestos: Chrysotile, Amosite, Crocidolite

AAIA: Approved Asbestos Inspection Authority – Approved by the Department of Labour.

ACW: Asbestos Containing Waste

AMP: Asbestos Management Plan.

Capped: A site will be deemed capped if appropriately covered in one or a combination of the following ground coverings: Crusher-run, Premix, Rail Ballast, Geosynthetic fabric in combination with clean soil and vegetation, Pavers, concrete and Tiles. The Capping material must be of an appropriate thickness (to be advised on merit) and prevent the erosion of soil.

Clean Soil: Non-asbestos contaminated soil.

Contaminated Soil: Asbestos contaminated or suspected asbestos contaminated soil.

Contaminated Site: TNPA site identified as containing asbestos contaminated soil.

DoL: Department of Labour.

DWAF: Department of Water Affairs and Forestry.

Environmental Covenant: An environmental covenant is an administrative device that restricts activities of tenants and contractors on sites where some asbestos contaminated soil remains in place. It is intended to limit potential future occupational and environmental liability for residual asbestos contaminated soil.

TNPA Listed Sites: TNPA sites identified as having asbestos contaminated soil and as such the restrictions of an Environmental Covenant apply.

TNPA: Transnet National Ports Authority (TNPA).

Off Site: Not on Transnet National Ports Authority (TNPA) property.

SHE: Safety Health and Environment.

1. INTRODUCTION

This Asbestos Management Plan is intended to impose strict controls on work practices undertaken within:

a) Asbestos contaminated sites currently listed as **Environmental Covenants**.
b) Asbestos contaminated sites currently listed as **Low level Contamination Sites.**

See attached Appendix I and II.

This means that site specific health requirements such as strict controls on future work methods and the use of respiratory protection, will be required of tenants, contractors or TNPA employees who intend on undertaking any soil disturbing activities on asbestos contaminated sites. In addition, there are strict controls regarding the movement of asbestos contaminated soil within these sites and removal off-site.

2. BACKGROUND INFORMATION

Historically, raw asbestos was transported in open rail wagons from regions such as the Northern Cape and Zimbabwe, to the Port of Durban for export. Over many years (time frame could not be established), bags of raw mined asbestos fell off the wagons into rail marshalling yards (predominantly Kings Rest), sidings and connecting lines (particularly arrival and departure lines).

In the past the health risks of asbestos were relatively unknown / underestimated and therefore these bags were often left lying near the rail track or buried in shallow holes dug in the soil. Broken bags were left to disperse their contents throughout the yards and connecting lines. To further exacerbate the problem, the derailment of wagons, either containing or not containing asbestos, replacement of sleepers and ballast as well as general track maintenance work, all tended to further mix the asbestos into the soil.

A study commissioned by Transnet National Ports Authority (TNPA) on asbestos contamination in soil, identified the various sites throughout the Port of Durban where asbestos has either previously or recently been found. These sites have been indicated on attached Appendix I. The sites listed under paragraphs 3 below, have been identified as being moderately to highly contaminated and therefore pose a potential health risk to any persons undertaking work involving the disturbance of soil.

The asbestos likely to be encountered on these sites today may vary as follows:

a) Large buried stockpiles consisting of several bags of raw asbestos buried up to depths of approximately 1.5 metres.
b) Loose clumps of either buried or surface asbestos, which generally tend to range in size from about the size of a person's hand to small barely visible pieces of a few millimetres in length.
c) Clumps of asbestos that have been mixed within soil (soil that has been handled many times) to a point where the asbestos has separated literally into millions of small fibres that are invisible to the naked eye.

3. ENVIRONMENTAL COVENANT

An environmental covenant is an administrative device that restricts tenants, contractors or any other persons activities on sites where some asbestos contaminated soil remains in place. It is intended to limit potential future liability for residual asbestos contaminated soil by ensuring that:

1. The existence of asbestos-contaminated soil is fully disclosed.
2. It is not inadvertently disturbed.
3. Any engineering controls such as caps are maintained.
4. Any future soil disturbing activities are undertaken in accordance with specific health and environmental controls.

While the general goal of most asbestos cleanups is to return a site to a condition where it can be safely used for any purpose (rehabilitation), this is not always technically possible or economically practicable. Restrictions limit use to ***safe* use**. These restrictions are necessary to protect human health and the environment from the potential of inadvertent exposures to residual contamination while encouraging economic development.

Environmental covenants are used by TNPA to document and enforce the use of restrictions necessary to maintain the integrity of the "cap" and ensure that contaminated soil remains beneath the protective cap. Asbestos-contaminated soil may pose little risk if it is covered with an appropriate material e.g. Crusher-run, Premix, Rail Ballast, a Geosynthetic fabric of suitable gauge in combination with clean soil and vegetation, Pavers, concrete and Tiles. The Capping material must be of an appropriate thickness (to be advised on merit) and ensure that asbestos is adequately contained and does not infiltrate or is transported by rainfall run-off, wind or other type drainage into surrounding environments.

Restrictions imposed by an Environmental Covenant include strict controls on future work methods and the implementation of health requirements e.g. controlling the movement of contaminated soil within the off-site and the strict use of respiratory protection, when a tenant or contractor intends on undertaking any soil disturbing activities on a Listed Site.

The current Listed Sites (Environmental Covenants) are provided as follows:

1. Y Site
2. Kings Rest Rail Marshalling Yard
3. The Hump (connecting line from Kings Rest to Pier 1)
4. Truck Staging area
5. NPA Stockpile 206 (located between the Natural Heritage Site and DCT Pier 2)
6. DCT Expansion Site (Pier 2)

4. ASBESTOS RELATED HEALTH RISKS

The US Environmental Protection Agency (EPA) as well as the International Agency for Research on Cancer of the World Health Organization has declared asbestos as a human carcinogen. Specifically, in studies of occupational exposure, inhalation of asbestos fibres has been shown to cause asbestosis (pulmonary fibrosis), pleural or peritoneal mesothelioma, and bronchial carcinoma.

Asbestos fibres are basically chemically inert. They do not evaporate, dissolve, burn or biodegrade in the environment. However, single fibres and clumps of fibres may be released in the air as dust as a result of wind erosion and other types of activities that generate dust. Once inhaled, fibres may be deposited and retained in the airways and lung tissue. Because asbestos fibres remain in the body, each exposure to asbestos increases the likelihood of developing an asbestos related disease. Many of these diseases caused by asbestos (asbestosis, mesothelioma, lung cancer) take between 15 and 40 years to be diagnosed.

The human respiratory system is assumed to accumulate fibres linearly with concentration. For this reason alone, the cumulative nature of asbestos in the lungs be it in small doses over long periods of time or a single large dose over a few hours or days, the health risks posed to potentially exposed employees should not be underestimated.

5. PURPOSE

The Asbestos Management Plan (AMP) is intended to guide the actions of all persons on every occasion where:

- Identified asbestos contaminated soils on pre-identified sites are likely to be disturbed.
- Repair, maintenance and dismantling of asbestos cement products on any TNPA owned land.
- TNPA staff required to undertake maintenance work on rail infrastructure.

Essentially, tenants, contractors and TNPA employees occupying or working on asbestos contaminated land will need to submit site specific Safe Work Procedures to TNPA's Legal & Compliance and Environmental Management Departments, before undertaking any work involving soil disturbance on any of the listed asbestos contaminated sites as well as maintenance and dismantling of asbestos cement products on any TNPA owned land

Tenants and contractors may be held accountable to commitments made in their Safe Work Procedures. These Approved Safe Work Procedures may be referred to during audits conducted by TNPA's Legal & Compliance and Environmental Management Departments. Approved Safe Work Procedures compliance is a mechanism for self-regulation and does not replace the need for contractors or tenants to be compliant with occupational health & safety and environmental legislation.

This AMP is designed to:

a) Provide guidance for tenants who are currently occupying or who may take occupation of land identified as Asbestos Contaminated.

b) Provide Principal Contractors and all sub-contractors with guidance regarding the Occupational and Environmental Management of asbestos contaminated soil whilst undertaking work on Asbestos Contaminated Sites.

c) Assist with keeping to a minimum or preferably prevent the release of asbestos fibres into the environment as well as protect employees and public health.

d) To ensure compliance with the requirements of the Occupational Health and Safety Act 85 of 1993, Asbestos Regulations 2001, Environmental Conservation Act 73 of 1989 and National Environmental Management Act 107 of 1998.

e) Provide guidance to TNPA Track maintenance personnel on asbestos management and monitoring programmes.

6. SCOPE OF APPLICATION

This AMP shall apply to any Transnet employees, tenants, contractors or persons on any TNPA property where:

a) undertaking or intending to undertake work within known asbestos contaminated sites (e.g. work involving soil excavations, rail tracks, grading, excavating for pipe and cable trenches or light mast foundations and excavating for sewerage and storm water lines or any task involving the handling of soil within or from the listed asbestos contaminated sites),

b) who may have (as insulating material) asbestos containing products on their site,

c) who may have asbestos cement products (e.g. roofs, side cladding, gutters, fascia boards and down pipes).

7. DOCUMENTATION REQUIREMENTS - PROJECTS

7.1 PROJECTS ON SITES DESIGNATED AS ENVIRONMENTAL COVENANTS SITES AND LOW LEVEL CONTAMINATION SITES

Table 1 provides a summary of the documentation required by TNPA Programme Managers / Representative. This information will need to be compiled by any Tenant, Principal Contractor, Sub-Contractor or any other person's activities on sites where some asbestos contaminated soil remains in place.

Table 1: Summary of the required SHE documentation for Tender Documents

ITEM No	DOCUMENTATION	TIMING	LEGAL REF:
1	Appointment of an Approved Asbestos Inspection Authority AAIA (To provide guidance on legal requirements and the requirements of this AMP).	Before starting the contract	Asbestos Regulations, 2001. Regulation No 21 and 16.
2	Copy of an Approved **Asbestos Work Plan**, (Approved by an AAIA and forwarded to the	Before starting the	Asbestos Regulations,

	Department of Labour – Provincial Director).	contract	2001. Regulation No 21 and 16.
3	Copy of Approved **Safe Work Procedures**, (Approved by an AAIA).	Before starting the contract	Asbestos Regulations, 2001. Regulation No 21 and 16.
4	Proof of employee Training and Information (Asbestos) e.g. certificates.	Before starting the contract	Asbestos Regulations, 2001. Regulation No 5 and 16.
5	Proof of Medical Surveillance, both lung function and x-rays. (for all employees working on an asbestos contaminated site-site)	Before starting the contract	Asbestos Regulations, 2001. Regulation No 9 and 16.
6	Provide a report on air monitoring results (asbestos), whilst undertaking work on a contaminated site.	Upon termination of the contract.	Asbestos Regulations, 2001. Regulation No 8. and16.
7	Where applicable, provide all Certificates of Safe Disposal and / or Waste Manifest documentation for any asbestos contaminated soil removed from a contaminated site.	Upon termination of the contract.	TNPA requirement.
8	Where applicable, provide details e.g. a register or inventory of quantities and locations (GPS co-ordinates of the removal and final storage sites) of any **clean soil removed from any TNPA owned site**. This soil must be declared clean by an AAIA before being transported off-site. In addition, provide details e.g. a register or inventory of quantities and locations (GPS co-ordinates of the removal and final storage sites) of any **asbestos contaminated soil transferred within any TNPA owned site.**	Upon termination of the contract.	TNPA requirement.
9	Letter from TNPA Legal & Compliance and Environmental Departments stating the site has been adequately capped or otherwise rendered in an acceptable condition regarding asbestos contaminated soil.	Upon termination of the contract.	TNPA requirement.

8. ASBESTOS THAT FORMS PART OF STRUCTURE OF BUILDING OR PREMISES

8.1 ASBESTOS CEMENT PRODUCTS

All tenants on TNPA property shall make and maintain a written asbestos inventory of the location of asbestos in their place of work, building, plant and / or premises (Regulation 14(b), Asbestos Regulations 2001.). A copy of this inventory is to be forwarded to the **TNPA Property Manager.**

8.2 HANDLING OF ASBESTOS CEMENT PRODUCTS

In order to ensure that the handling, altering, cleaning, preparation for painting or removal of any asbestos cement products, is carried out in a safe, uniform and appropriate manner as required by the Asbestos Regulations 2001, framed under the Occupational Health and Safety Act (Act No. 85 of 1993) and the Environment Conservation Act, 1989 (Act No 73 of 1989). The Tenant will either:

a) Acquire the services of an AAIA in order to train their employees and draw up Asbestos Safe Work Procedures (in-house) or alternatively,

b) Acquire the services of a Registered Asbestos Contractor (out of house). Proof of training will be kept in the site Health and Safety files which will be handed over to the **TNPA Property Manager** upon completion of the work / contract.

8.3 DOCUMENTATION REQUIREMENTS – ASBESTOS CEMENT PRODUCTS

Both tenants and contractors undertaking the handling, altering, cleaning, preparation for painting or removal of any asbestos cement products whilst on TNPA property, must ensure that they provide the designated TNPA Programme Managers/Property Managers with the following documentation:

i. Proof (certificates) that employees handling asbestos cement products have been adequately and comprehensively informed and trained in this regard.

ii. Provide current Asbestos Safe Work Procedures showing that the asbestos cement materials were handled in a safe, uniform and appropriate manner. Asbestos Safe Work Procedures must be drawn up by an AAIA.

iii. Provide an updated version of the Site's written asbestos inventory.

9. SITE ACCESS

It is essential that where any work involving soil disturbing activities on an Asbestos Contaminated Site (Environmental Covenant Sites only), access to that site will need to be strictly controlled for the duration of the activities. This measure is necessary to:

- Assist with the enforcement in the use of respiratory protective equipment by any person entering the site.
- Prevent exposures to unsuspecting persons passing through the site (e.g. taking short cuts through the site).

10. ROLES AND RESPONSIBILITIES

The Tenant, Contractor or TNPA employee, where applicable, must provide TNPA's Legal & Compliance and Environmental Management Departments with a SHE File containing the name of a person (to be shown in the Approved Safe Work Procedures) responsible for the:

1) Implementation of and adherence to the Safe Work Procedures.
2) Maintenance of records / documentation such as Air monitoring reports, employees medicals, proof of employee asbestos training and information, proof of certificates of safe disposal (where applicable) and documenting the movement of soil within and off-site (quantities and locations).

11. TENANT CLOSURE

If a tenant decides or is instructed to terminate a lease agreement with TNPA, the tenant is responsible for ensuring that any soil disturbing activities that may have been undertaken on their site, that was previously capped, is not left uncapped (ref. capped. Definitions), prior to termination of the lease.

12. CONTRACTORS CLOSURE

The Principal Contractor must provide a description of the intended final state of the site's surface before and upon completion of the contract e.g. Crusher-run, Premix, concrete, paving, planting of vegetation or exposed soil. TNPA Legal & Compliance and Environmental Management Departments will conduct an asbestos site audit during and before termination of the contract.

13. ANNUAL REVIEW

For 2008 there have been a significant number of developments occurring throughout the Port of Durban. In particular there are two sites, namely the Truck Staging area and the DCT Expansion site (additional Gantry Crane). The asbestos contaminated soil on both these sites has been capped with Premix and Concrete respectively and therefore categorised as Environmental Covenant sites. The Truck Staging area currently contains a contaminated soil stockpile located outside the eastern boundary of the site adjacent to the Silt Channel (north). This is in the process of being capped as per TNPA requirements and is included with the Truck Staging area as an Environmental Covenant site. During the latter part of this year and early 2009, TNPA's Asbestos Working Group (AWG) undertook a costing exercise for the rehabilitation of the sites listed on page 6. The AWG is currently waiting for feedback from Transnet.

For 2009, it is anticipated the completion of workshops and stores for Y Site will see the importation of clean aggregate with a cap of G Block paving. Any remaining uncapped areas will need to be dealt with upon completion of all construction. Y Site is categorised as an Environmental Covenant site.

The remainder of the lines and yards deemed as low level contaminated sites have been earmarked for clean-up during the first quarter of this year (2009).

This document will be revised annually with this copy (Rev: 3) being the first edition released by TNPA.

14. CONTACT DETAILS

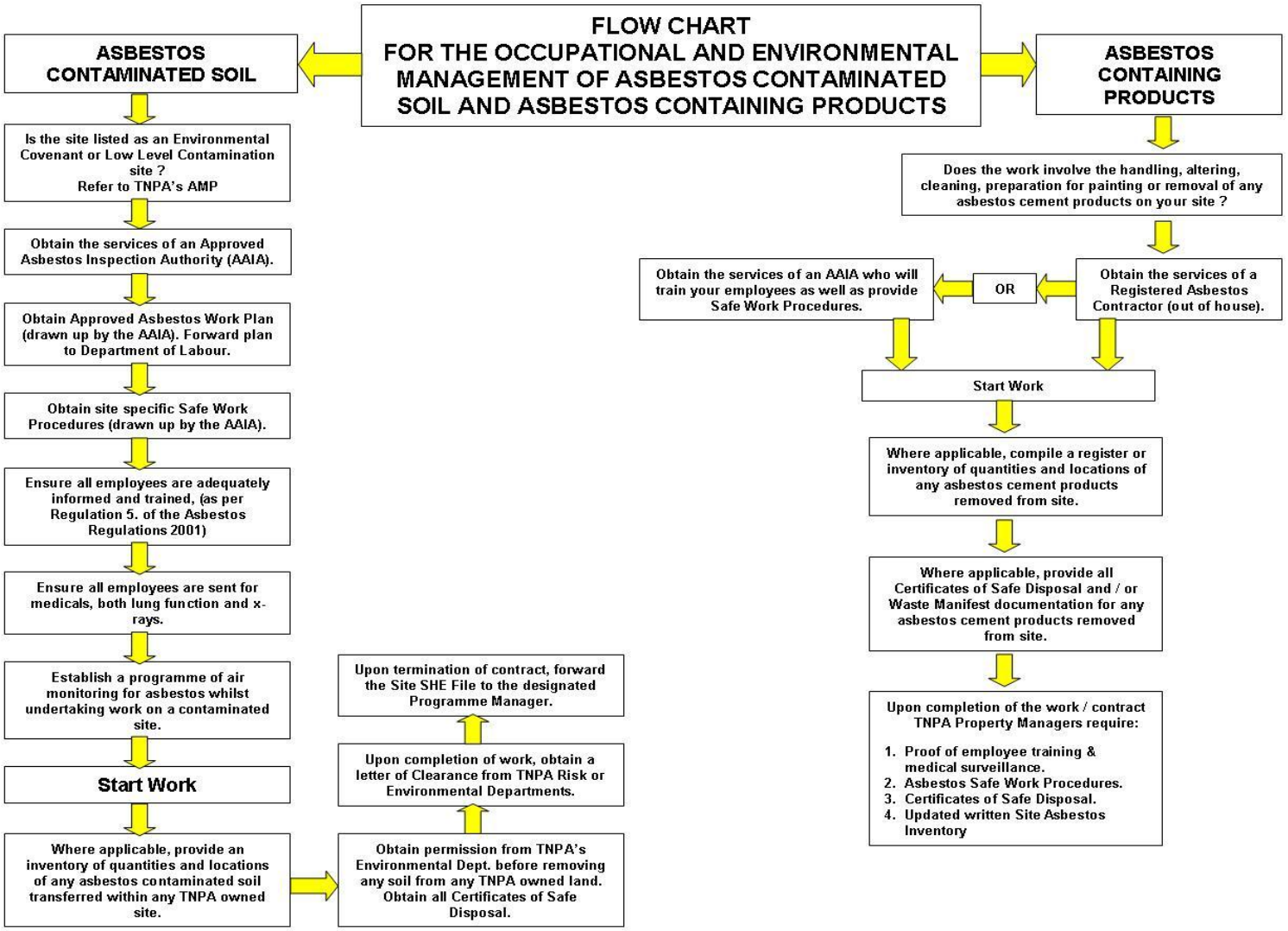
For further information on the implementation of this Asbestos Management Plan kindly contact the following:

Company Name:	**TNPA – Legal and Compliance Department**
Contact person:	Mr. Anesh Harisinker
Address:	Room 244B, Ocean Terminal Building, Port of Durban
Tel/Cell no:	(031) 361 8323 / 0833036097

Company Name:	**TNPA – Environmental Department**
Contact person:	Mr. Jeffrey Madingani
Address:	Room 243, Ocean Terminal Building, Port of Durban
Tel/Cell no:	(031) 361 8547 / 082 267 2995

Company Name:	**Apex Environmental (AAIA)**
Contact person:	Robert Randolph
Address:	Unit No 4, 40 Beechgate Crescent, Southgate Business Park, Umbogintwini
Tel/Cell no:	(031) 914 1004 / 082 784 2909

ASBESTOS MANAGEMENT PLAN					
Approved by	Legal & Compliance Manager	Date:	06.04.09	Page No	16 of 17
Authorised by	Port Manager	Amendment	00	Procedure	



ASBESTOS MANAGEMENT PLAN					
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Annexures B6 - Fire Prevention and Flammable Liquids and Substances.

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

[MUNICIPAL NOTICE NO. 27 OF 2000.]
[DATE OF COMMENCEMENT: 23 MARCH, 2000.]

These By-laws were published in *Provincial Gazette* No. 5417 dated 23 March, 2000.

DURBAN METROPOLITAN UNICITY MUNICIPALITY

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

Notice is hereby given in terms of section 162 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) that, at its meeting held on 1 March 2000, the Durban Metropolitan Council, acting under and in terms of section 156 (2) of the said Constitution, adopted the following Interim Code Relating to Fire Prevention and Flammable Liquids and Substances and which Code shall come into effect on the date of publication of this notice.

E. W. H. MORTON
Chief Executive Officer
CITY HALL
DURBAN

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CHAPTER I
DEFINITIONS

1. (1) For purposes of this Code unless the context indicates otherwise—

"Approved" means approved by a Chief Fire Officer;

"Basement" means that part of a **Building** which is below the ground floor storey;

"Building" includes—

(*a*) any other structure, whether of a temporary or permanent nature and irrespective of the materials used in the erection thereof, erected or used for or in connection with:

(i) the accommodation or convenience of human beings or animals;

(ii) the manufacture, processing, storage, display or sale of goods;

(*b*) any wall, swimming bath, swimming pool, reservoir or bridge or any other structure connected therewith;

(*c*) any fuel pump or any tank used in connection therewith;

(*d*) any part of a building, including a building as defined in paragraph (*a*), (*b*) or (*c*);

(*e*) any facilities or system, or part or portion thereof, within or outside but incidental to a building, for the provision of a water supply, drainage, sewerage, storm water disposal, electricity supply or other similar service in respect of the building;

"Bulk Depot" means any **Premises** defined as such in **S.A.B.S Code of Practice** 089: Code of Practice of the Petroleum Industry, Part I: The Handling, Storage and Distribution of Petroleum Products, that is, **Premises** that normally receive supplies from a refinery or installation by road, rail, water, or pipeline or by a combination of these methods, and from which the products are delivered directly to consumers;

"Bus" means a bus as defined by the Road Traffic Act, 1989;

"Certificate of Competence" means a **Certificate of Competence** issued in terms of section 8;

"Certificate of Registration" means a certificate contemplated by section 23;

"Chief Executive Officer" means the statutory "Chief Executive Officer" of the **Municipality r**eferred to in section 10B of the Local Government Transition Act, 1993 (Act No. 209 of 1993);

"Chief Fire Officer" means the **Director: Fire** of the **Municipality** or any officer of the **Municipality** appointed to act as such either substantively or in an acting capacity and includes a Deputy Chief Fire Officer and any other officer of the **Municipality** to whom a function assigned to that position under this Code has been delegated;

"Container" means any vessel used or intended to be used for the holding of **Flammable Liquids**, but shall not include the fuel tank of any motor **Vehicle** or stationary internal combustion engine in normal use as such;

"Class O Flammable Liquid" means **Liquefied Petroleum Gas**;

"Class I Flammable Liquid" means a liquid that has a closed cup **flash point** below 21°C;

"Class II Flammable Liquid" means a liquid that has a closed cup **flash point** from 21 °C up to and including 55°C;

"Class III Flammable Liquid" means a liquid that has a closed cup **flash point** from 55°C up to and including 100°C;

"Director: Fire" means the head of the Metropolitan Fire and Emergency Services Department and includes any Acting Director: Fire;

"Dry Cleaning Machinery" means any machinery used or intended to be used for the cleaning or treatment of garments or textiles with the aid of **Flammable Liquids**;

"Dry Cleaning Room" means that portion of any **Premises** used or intended to be used for the cleaning or treatment for gain or reward of garments or textiles with the aid of **Flammable Liquids** in which the dry cleaning process is carried out and which has been Approved for the purpose;

"Earth", **"Earthed"** or **"Earthing"** in relation to electricity means connected to the general mass of **Earth** in such a manner as will ensure at all times an immediate discharge of electrical energy without danger;

"Executive Director: Durban Electricity" means the head of the Metropolitan Electricity Service Unit and includes any Acting Executive Director: Durban Electricity;

"Fire Alarm System" means any system installed within a **Building** and so designed as automatically to operate when subjected to a predetermined degree of heat or smoke density, or any other **Approved** installation which may be manually activated;

"Fire Brigade" means the **Municipality's** Fire Brigade Service executing the function referred to in paragraph 3 (14) of Proclamation 38 of 1996 (KwaZulu-Natal);

"Fire Fighting Equipment" means any fire fighting equipment required by any law to be provided on any **Premises**;

"Fire Official" means any **Chief Fire Officer** and any official of the **Fire Brigade** who has been duly appointed as such by a **Chief Fire Officer** to undertake or perform any of the functions of a **Fire Official** under this Code;

"Flame and Vapour Proof" when applied to apparatus denotes that the containing case or other enclosure is certified by its supplier or manufacturer to, and can withstand without injury an application to it of a flame under practical conditions of operation and

will prevent the transmission of flame, sparks and flashes such as would ignite **Flammable Liquid** or gas and the transmission of vapour;

"Flammable Liquid" means any liquid or gas falling within the classifications **Class O, Class I, Class II and Class III Flammable Liquid**;

"Flammable Liquid or Substance" means any substance that is readily ignited or any **Flammable Liquid**;

"Flash Point" means the lowest temperature at which a substance gives off sufficient flammable vapour to produce a momentary flash on the application of a small flame;

"Habitable room" means a room constructed or adapted to be used as living room or work room, and includes a shop, workshop and office;

"Holder" in relation to a **Certificate of Registration** or competence means the **Person** to whom such certificate has been issued;

"Liquefied Petroleum Gas" means a mixture as defined in the **S.A.B.S Code of Practice** No. 087. Part I: Consumer **Liquefied Petroleum Gas** Cylinder Installations;

"Local Council" means any local council established under Proclamation 80 of 1996 or its authorised delegate;

"Metropolis" means the area of jurisdiction of the **Municipality**;

Municipality: The Durban Transitional Metropolitan Council established under Proclamation LG 123 of 1995 (KwaZulu-Natal) or its successor in law;

"Non-Combustible" in relation to **Building** materials means Non-Combustible when tested in accordance with **S.A.B.S Code of Practice** 0177: Part V — Non-combustibility at 7500C of **Building** Materials;

"Non-Flammable" means not capable of burning with a flame;

"Occupier" includes any **Person** in actual occupation of **Premises**, without regard to the title under which he occupies;

"Owner" means—

(*a*) the **Person** in whom from time to time is vested the legal title to the **Premises**;

(*b*) in a case where the **Person** in whom the legal title is vested is insolvent or dead, or is under any form of legal disability whatsoever, the **Person** in whom the administration and control of his property is vested as curator, trustee, executor, administrator, judicial manager, liquidator or other legal representative;

(*c*) in any case where the **Municipality** is unable to determine the identity of such **Person**, a **Person** who is entitled to the benefit of the use of the **Premises** or a **Building** or **Buildings** thereon;

(*d*) in a case where such **Premises** has been leased for a period of 30 years or longer, the lessee thereof;

(*e*) in relation to—

(i) a piece of land delineated on a sectional plan registered in terms of the Sectional Titles Act, 1986, the developer or the body corporate in respect of the common property; or

(ii) a section as defined in such Act, the **person** in whose name such section is registered under a sectional title deed, and includes the lawfully appointed agent of such a **person**;

(*f*) in relation to a piece of land occupied in terms of Zulu law, the holder of a permission to occupy certificate;

(*g*) the Person who—

(i) holds tenure in terms of the Black Administration Act, 1927;

(ii) is the leaseholder in terms of the Black Communities Development Act, 1984;

(iii) holds any land tenure right as contemplated in the Upgrading of Land Tenure Rights Act, 1991; and

(*h*) the head of any department of State (including a Provincial Administration) where the National or Provincial Government respectively has the ownership of any land or **Premises**;

and includes the lawfully appointed agent of any such **Person**;

"Person" means any natural or juristic person;

"Portable Fire Extinguisher" means an extinguisher complying with the requirements of one of the following standard specifications, depending upon the type required by this Code or **Approved** by the **Chief Fire Officer**:

S.A.B.S. 810: Portable Fire Extinguishers (dry chemical (dry powder) type)

S.A.B.S.889: Portable Fire Extinguishers (water types)

S.A.B.S. 1151: Portable Fire Extinguishers of the Halogenated Hydrocarbon Type,

"Premises" means any piece of land the external surface boundaries of which are delineated on—

(*a*) a general plan or diagram registered in terms of the Land Survey Act, 1997 or in terms of the Deeds Registries Act, 1937; or

(*b*) a sectional plan registered in terms of the Sectional Titles Act, 1986;

"Protected Work" means any **Building** used or intended to be used or available for use for human habitation or public assembly, and shall include a school, club and similar institution and any animal stable, but shall not include any administrative office, change room or mess room in a **Bulk Depot**;

"Pump" means a pump used or intended for use for the supply, delivery, propulsion or pumping of **Flammable Liquid or Substances**, and includes all apparatus, pipes and appliances used for or in connection therewith, but shall not include pumps in **Bulk Depots** unless such pumps are used or intended to be used for the sale of such substances by retail;

"Recharge" means to condition or recondition a **Portable Fire Extinguisher** so as to render it capable of use in the manner intended;

"Registered Premises" means **Premises** in respect of which a **Certificate of Registration** has been issued;

"Road Tank Waggon" means a **Vehicle** intended for the purpose of conveying **Flammable Liquid** in a tank constructed as part of, and firmly attached to such **Vehicle**;

"S.A.B.S. Code of Practice" means the version of any S.A.B.S. Code of Practice applicable at the time of promulgation of this Code;

"Spraying Booth" means any subdivision of or compartment in a spraying room when such subdivision or compartment is used or intended to be used for the purpose of spraying **Vehicles** or articles;

"Spraying Room" means any room or structure used or intended to be used for the purpose of spraying **Vehicles** or articles;

"Storage Tank" means a metal tank of adequate strength used or intended to be used for the storage or conveyance of **Flammable Liquids** or substances;

"Underground Storage Tank" means a **Storage Tank** which is wholly sunk below ground level;

"Vehicle" means a contrivance that is equipped with wheels or revolving runners on which it moves or is moved and includes—

(*a*) a self-propelled vehicle;

(*b*) a trailer;

(*c*) a hand-drawn or propelled vehicle;

"Vent Pipe" means a pipe so constructed and so installed as to allow the escape of vapour from **Flammable Liquids** into the atmosphere.

(2) In this Code a reference to an S.A.B.S. Specification or Code of Practice shall be deemed to be a Standard Specification or Code of Practice of the South African Bureau of Standards referred to in section 2 of the Standards Act, 1982 (Act No. 30 of 1982).

CHAPTER II
FIRE PREVENTION

2. (1) **A Fire Official** may as often as may be deemed necessary or desirable—

(*a*) enter any **Premises** for the purpose of identifying any hazardous condition, circumstance or practice which may result in a fire or of inspecting hazardous manufacturing processes, and the storage facilities pertaining to and any installation in which is used acetylene or other gases, chemicals, oils, explosives, **Flammable Liquids or Substances** and other hazardous liquids or substances or any fire alarms and sprinkler systems and **Fire Fighting Equipment**;

(*b*) inspect any **Premises** (except the interior of private dwellings) for the purpose of identifying any defective **Fire Fighting Equipment** and any condition liable to cause or to facilitate the spread of fire; and

(*c*) take such steps as he may consider necessary in the circumstances to prevent any injury to **Persons** or damage to property through fire which may arise from a condition, circumstance or practice referred to in (*a*) or (*b*) above, and he may make such orders as he deems necessary for the safeguarding of life and the protection of property from fire.

(2) Whenever an officer referred to in subsection (1) finds on any **Premises** combustible or explosive matter or any accumulation of rubbish or of waste paper, boxes, shavings, sawdust or any other **Flammable Liquids or Substances** in circumstances which are likely to or may result in a fire hazard and so endanger human life or property, or finds obstruction to or on fire escapes, stairs, passages, doors, windows or vestibules which are liable to interfere with the operation of the **Fire Brigade** or the egress of **Persons** in case of fire, or finds any obstructed or defective fire fighting equipment (whether portable or otherwise) he shall make such order as he deems necessary to remedy the situation.

(3) Any order referred to in this section shall be in writing and shall be served upon the **Owner** or **Occupier** or **Person** having the charge, or control of the Premises at the time of the order or upon two or more such **Persons**.

3. (1) A member of the **Fire Brigade** may enter into or upon any **Premises** or any other property and take such action as he may deem expedient for the purpose of extinguishing a fire or preventing it from spreading.

(2) Any cost incurred or charges prescribed by the **Municipality**, in respect of any action taken as contemplated in sub-section (1) above may be recovered from the **Owner** or **Occupier** of any such Premises or other property regardless of where the fire originated.

4. Whenever in the opinion of a **Fire Official** any tree, bush, weed, grass, or any other substance or other matter situated on any **Premises**, constitutes or is likely to constitute a threat of fire or is likely to further the spread of fire he may cause a notice to be served on the **Owner** or **Occupier** of such **Premises** calling on him to remedy such conditions within a specified period.

5. (1) No **Person** shall bum or set alight to any rubbish, tree, weeds or grass or any other substance or matter outside the confines of a **Building** except with the prior consent of the **Chief Fire Officer** and a **Person** to whom such consent has been given shall Personally supervise the act of burning or setting alight and shall take all precautions necessary to avoid the fire from spreading.

(2) The **Chief Fire Officer** in granting consent in terms of subsection (1) may impose such conditions as he thinks fit; provided that no authority granted shall be in conflict with any of the provisions of the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965).

CHAPTER III
CONTROL OF FIRE FIGHTING EQUIPMENT

6. Repairing, Servicing and Installation of Fire Fighting Equipment.—No **Person** shall cause or permit **Fire Fighting Equipment** on any Premises to be dismantled, **Recharged**, disconnected, serviced or repaired or sold or any new, serviced or repaired equipment to be installed, housed or placed on any Premises except by or under the control and supervision of a **Holder** of a **Certificate of Competence** issued or recognised in terms of this Code.

7. Mode of Application for Certificate of Competence.—Every application for a **Certificate of Competence** shall be submitted to the **Chief Fire Officer** on the form prescribed in the First Schedule.

8. Applicants to be examined.—(1) When so required by the **Chief Fire Officer**, an applicant for a **Certificate of Competence** shall submit himself for test at the **Fire Brigade** headquarters.

(2) Upon passing the test referred to in subsection (1), if required, an applicant shall subject to the provisions of section 9 be issued with a **Certificate of Competence** in the form prescribed in the Second Schedule.

9. When Certificate of Competence is not to be issued.—The **Chief Fire Officer** shall not sanction the issue of a **Certificate of Competence** if, in his opinion, the applicant—

(1) does not possess a general knowledge of the construction and design of all types of **Portable Fire Extinguishers**;

(2) does not possess a satisfactory knowledge of the use to which the several types of **Fire Fighting Equipment** can most effectively be put; or

(3) does not appear to be otherwise suitably qualified or competent to possess a **Certificate of Competence** in the interests of public safety.

10. Certificate of Competence and identity document.—(1) Every **Certificate of Competence**, once issued, shall be valid for the **Person** named thereon until cancelled by the **Chief Fire Officer** in terms of section 15 and such certificate shall not be transferable from one **Person** to another.

(2) Upon the issue of a **Certificate of Competence** there shall be issued to the **Holder** thereof an identity document in the form **Approved** by the **Chief Fire Officer** which shall bear a photograph of the **Holder** and which the **Holder** shall produce on demand to any **Fire Official** and to any **Person** in authority on the **Premises** on which the Holder is to carry out any examination or other function in terms of this Code.

11. Recognition of certificates issued by other authorities.—Upon production to him by the **Holder** thereof of a **Certificate of Competence** issued by another fire authority in terms of By-laws applying to the area of jurisdiction of such authority and having the same or similar provisions as this Code, which authority has been **Approved** by the **Chief Fire Officer** for the purpose, the **Chief Fire Officer** may recognise such certificate as being acceptable for the purpose of this Code and if he does so he shall endorse such certificate accordingly and enter the particulars of the **Holder** and the certificate in the register kept in terms of section 14 as if the certificate had been issued in terms of section 8 and thereupon the **Holder** of the certificate shall for all purposes of this Code be deemed to be the **Holder** of a certificate issued in terms thereof.

12. Recognition of a certificate in terms of section 11 may at any time be withdrawn by the **Chief Fire Officer** upon production of proof to his satisfaction that the **Holder** of the certificate has been guilty of any act referred to in section 15, whereupon paragraphs (2) and (3) of that section shall *mutatis mutandis* apply and the **Chief Fire Officer** shall cancel his endorsement on the certificate and notify the issuing authority in writing of the action taken by him and the reasons therefore.

13. Replacement of certificates of competence.—(1) A **Person** whose **Certificate of Competence** is lost, destroyed or damaged shall forthwith apply to the **Chief Fire Officer** on the prescribed form for the replacement of such certificate.

(2) An application in terms of subsection (1) shall be accompanied by an affidavit as to the circumstances in which the certificate was lost or destroyed. or the damaged certificate, as the case may be, and the prescribed fee.

14. Register of Holders of certificates of competence.—(1) The **Chief Fire Officer** shall maintain a register of **Holders** of **Certificates of Competence** issued in terms of section 8 or recognised in terms of section 11 setting forth full particulars of such Holders and the certificates issued them or recognised.

(2) The register shall be available for inspection of the **Fire Brigade** head quarters at time during normal working hours.

15. Cancellation of Certificate of Competence.—(1) If any **Holder** of a **Certificate of Competence**—

(*a*) has given false information on an application form submitted in terms of section 7;

(*b*) has willfully or negligently made an incorrect or false statement in a label affixed by him in terms of section 17;

(*c*) has committed a breach of or failed to comply with any provision of this Code;

(*d*) performs any act or duty under this Code in a negligent manner,

the **Chief Fire Officer** may cancel his **Certificate of Competence**.

(2) A **Holder** shall, within 7 days of being notified in writing of the cancellation of his **Certificate of Competence**, surrender his certificate to the **Chief Fire Officer**.

(3) If the **Chief Fire Officer** cancels a **Certificate of Competence** he shall not consider an application for a new certificate from the **Holder** of such certificate until a period of 12 months has elapsed since such cancellation.

16. Examination of fire-fighting equipment.—The **Owner** or **Occupier** of any **Premises** in which any **Portable Fire Extinguisher**, sprinkler system or other **fire-fighting equipment** or any **Fire Alarm System** has been installed in terms of this Code shall cause such extinguisher, equipment or system to be examined at least once every calendar year by a Holder of a certificate of competence.

17. Report on condition of fire-fighting equipment.—The **Person** carrying out the examination of the equipment referred to in the preceding section shall cause a label to be securely affixed thereto in a prominent position on which shall be written in ink—

(1) the name of the **Person** conducting the examination;

(2) the number of his **Certificate of Competence**;

(3) the date of the examination;

(4) the condition of the equipment,

and if any defect is discovered during the examination, he shall inform the **Owner** or **Occupier** of the **Premises** thereof in writing and deliver a copy of such report to the **Chief Fire Officer**.

18. Restrictions on removal, alteration and installation of fire-fighting equipment.—(1) No **Portable Fire Extinguishers** shall temporarily be removed from any **Premises** for servicing or repair unless such appliances are temporarily replaced by similar serviceable equipment.

(2) No **Fire Fighting Equipment** shall permanently be removed from any **Premises** or rendered unserviceable without due notice in writing being given to the Chief Fire Officer.

(3) No **Fire Fighting Equipment** shall be installed, changed or added to without authority of the **Chief Fire Officer**.

19. Portable Fire Extinguishers to be periodically pressure tested.—In addition to the examination of **Fire Fighting Equipment** referred to in section 16 hereof, every **Portable Fire Extinguisher** shall be subject to servicing and pressure testing in accordance with **S.A.B.S. Code of Practice** 1475: The Production of Reconditioned Fire Fighting Equipment, Part 1: Portable Rechargeable Fire Extinguishers.

20. Second-hand fire fighting equipment to be Approved by Chief Fire Officer.—No second-hand **Fire Fighting Equipment** shall be placed or installed in any **Premises** where such is required in terms of this Code unless and until such equipment has been examined, pressure tested and serviced in accordance with the Code of Practice referred to in section 19 above.

CHAPTER IV
FLAMMABLE LIQUIDS AND SUBSTANCES

21. No **Person** shall manufacture, store, convey, sell, use or handle **Flammable Liquids** or substances except in accordance with the provisions of this Code.

22. Application to existing premises.—The provisions of sections 54, 55, 56, 60 and 63 of this Code shall not apply to **Storage Tanks** which were lawfully installed prior to the date of coming into effect of this Code, so as to require such tanks to be altered or added to, but where such tanks are altered or added to, such work shall be carried out in conformity with the provisions of this Code; provided, however, that within six months of a change of **Ownership** of the **Premises** the **Storage Tanks** in question shall be brought into full compliance with the said sections and if at the end of that period they do not comply with their provision, the **certificates of registration** issued in respect of the **Premises** concerned shall be deemed to be suspended and none of the acts referred to in section 21 may be performed on such **Premises** until the non-compliance has been remedied to the satisfaction of the **Chief Fire Officer**.

23. Certificate of registration to be obtained.—(1) No **Person** shall—

(*a*) use any **Premises** as a **Spraying Room** or **Spraying Booth** or as a **Dry Cleaning Room**;

(*b*) store, manufacture, sell, use or handle any **Flammable Liquids** or substances on any **Premises** in excess of the following quantities:

(i) **Class I Flammable Liquid**, 200 ℓ, or in the case of **Liquefied Petroleum Gas**, 48 kg;

(ii) **Classes II and III Flammable Liquids**, 400 ℓ;

(iii) **flammable substances**, a quantity specified by the **Chief Fire Officer**;

(*c*) transport or convey any **Flammable Liquid**, substance or **Liquefied Petroleum Gas** or vapours by means of any **Vehicle** within the **City**, save as is provided in section 91, unless he is in possession of a **Certificate of Registration** in respect of such **Premises** or of such **Vehicle**; provided, however, that nothing in this Code contained shall relieve any **Person** from the obligation to take out any licence which may be necessary in terms of any other law.

(2) For the purpose of subsection (1), any **Container** for **Liquefied Petroleum Gas** found on any Premises shall be deemed to be full until the contrary is proved.

24. Application for certificate of registration.—(1) An application for a **Certificate of Registration** in respect of **Premises** shall be submitted to the **Chief Fire Officer** on the form prescribed in the Third Schedule to this Code and shall be accompanied by—

(*a*) a plan of the **Premises** in respect of which the certificate is required, drawn to a scale of not less than one in a hundred (1: 100), which shall indicate the proposed installation or room in which the **Flammable Liquid or Substance** is to be stored, used or handled, describe the material with which such installation or room is or is to be constructed, and indicate the position of any **Pump**, **Storage Tank**, store, pipeline, **Dry Cleaning Machinery**, **Spraying Room**, **Spraying Booth** or ventilating equipment;

(*b*) a block plan of such **Premises**, drawn to a scale of not less than one in five hundred (1:500) which shall specify—

(i) the **Buildings** in relation to adjoining subdivisions, and the materials of which such **Buildings** are constructed or to be constructed;

(ii) the subdivisions and lots immediately adjoining the **Premises** giving their street, block and postal numbers;

(iii) names of any streets on which the **Premises** abut;

(iv) the north point.

(2) Where the plan relates to existing **Premises** in respect of which a **Certificate of Registration** has been issued and wherein it is proposed to make alterations or additions to any **Building** or equipment or apparatus lawfully used or intended to be used thereon for the storage or handling of a **Flammable Liquid or Substance**, a ground plan only need be submitted for approval. Such ground plan shall be drawn to a scale of not less than one in a hundred (1:100) and shall show such additions or alterations in relation to the existing Buildings or equipment or apparatus.

(3) All plans shall be—

(*a*) signed by the applicant or his agent;

(*b*) drawn in Indian ink on tracing linen or be clear prints on cloth with white back ground or on drafting paper which is acceptable to the **Chief Fire Officer**;

(*c*) coloured with fixed colours, as follows—

(i) Block plan

Proposed **Buildings**: red:

existing **Buildings**: grey or neutral tint;

open spaces: uncoloured;

(ii) Other plans

Ventilation ducts, trunks or enclosures: blue;

Storage Tanks, **Pumps**, pipelines, **Dry Cleaning Machinery** and **Spray Booths**: red;

Buildings in which the **Flammable Liquid or Substance** is to be stored, used or handled: uncoloured;

existing Buildings where required to be shown: grey or neutral tint.

(4) Every application for a **Certificate of Registration** for purposes of the conveyance of **Flammable Liquids or Substances** shall be submitted to the **Chief Fire Officer** on the form provided in the Fourth Schedule to this Code.

25. Issue of certificates of registration.—(1) No **Certificate of Registration** shall be issued until the **Premises** or the **Vehicle** in respect of which it is issued, as the case may be, complies with the requirements of this Code; provided, however, that in the case of a **Vehicle** no certificate shall be issued until such Vehicle has been made available for examination at such place as the **Chief Fire Officer** may direct and has been **Approved** by him.

(2) A **Certificate of Registration** may be issued subject to such conditions as deemed necessary by the **Chief Fire Officer**, having regard to the circumstances of each application, to prevent danger to life and property and taking into account the maximum amount of each class of **Flammable Liquid** or **Substance** which may be manufactured, stored, used, sold or handled and the number of Pumps, Storage Tanks and stores permitted on the **Premises** and, in the cas of Vehicles, the maximum quantity and class of Flammable Liquid or Substance which such Vehicle shall be permitted to carry.

(Editorial Note: Wording as per original *Provincial Gazette*. It is suggested that the word "cas" is intended to be "case".)

(3) A **Certificate of Registration**, once issued, shall be valid until cancelled or revoked in terms of section 32.

(4) If alterations and additions are **Approved** in terms of section 24(2) and the work has been executed in accordance with the ground plan **Approved** under that subsection, a new **Certificate of Registration** shall be issued in respect of the **Premises** and the old certificates shall be deemed to have been cancelled.

(5) All certificates issued in terms of this Code, shall be substantially in the form prescribed in the Fifth Schedule.

26. Recognition of certificates issued by other authorities.—(1) Upon production to him by the **Holder** thereof of a **Certificate of Registration** issued by another fire authority in terms of By-laws applying to the area of jurisdiction of such authority and having the same or similar provisions as this Code, which authority has been **Approved** by the **Chief Fire Officer** for the purpose, the **Chief Fire Officer** may recognise such certificate as being acceptable for the purpose of this Code and if he does so he shall endorse such certificate accordingly and enter the particulars of the **Holder** and the certificate in the register kept in terms of section 30 as if the certificate had ben issued in terms of section 25 and thereupon the **Holder** of the certificate shall for all purposes of this Code be deemed to be the **Holder** of a certificate issued in terms thereof.

(Editorial Note: Wording as per original *Provincial Gazette*. It is suggested that the word "ben" is intended to be "been".)

(2) Recognition of a certificate in terms of subsection (1) may at any time be withdrawn by the **Chief Fire Officer** upon production of proof to his satisfaction that the **Holder** of the certificate has been guilty of any act referred to in section 32, and the **Chief Fire Officer** shall cancel his endorsement on the certificate and notify the issuing authority in writing of the action taken by him and the reasons therefor.

27. Conditions for certificate of registration.—(1) (*a*) No **Person** shall on any Premises manufacture, store, use or handle or cause or permit to be manufactured, stored, used or handled—

(i) any quantity of **Flammable Liquid or Substance** in excess of the amount stated on the **Certificate of Registration** relating to such **Premises**;

(ii) any **Flammable Liquid or Substance** of a class other than the class or classes specified on the **Certificate of Registration** relating to such **Premises**;

(iii) any **Flammable Liquid or Substance** in a manner other than the manner stated on the **Certificate of Registration** relating to such **Premises**;

(*b*) No **Person** shall in any **Premises** install or erect a greater number of **Pumps**, **Storage Tanks** or stores than is specified on the Certificate of Registration relating to such **Premises**.

(*c*) No **Person** shall on any **Vehicle** carry or permit or cause to be carried—

(i) any quantity of **Flammable Liquid or Substance** in excess of the amount stated on the **Certificate of Registration** relating to such **Vehicle**;

(ii) any **Flammable Liquid or Substance** of a class other than the class or classes specified on the **Certificate of Registration** relating to such **Vehicle**.

(2) A **Holder** of a **Certificate of Registration** may make written application to the **Chief Fire Officer** for the amendment of the certificate whether as to the total

quantity or class of **Flammable Liquid or Substance** stated in such certificate or otherwise which application shall only be granted if the proposed amendment is in conformity with this Code.

(3) If an application has been granted in terms of subsection (2), such Person shall surrender the **Certificate of Registration** to the **Chief Fire Officer** for amendment.

28. Display of certificate of registration.—Every **Person** to whom a **Certificate of Registration** has been issued shall cause such certificate to be affixed and displayed in a conspicuous position on the **Registered Premises** or on the **Vehicle**, as the case may be, and he shall ensure that the said certificate is, at all times, legible.

29. Supply of flammable liquids or substances.—(1) No **Person** shall supply or deliver or cause or permit any **Flammable Liquids or substances** to be supplied or delivered at anyone time to any **Premises** or **Vehicle** in excess of the quantities specified in section 23, unless the **Occupier** or **Person** having control of such **Premises** or **Vehicle**, as the case may be, is in possession of a **Certificate of Registration** issued in terms of section 25 in respect of the said **Premises** or **Vehicle**.

(2) No **Person** shall receive or accept delivery or cause or permit any **Flammable Liquids or substances** to be received at any one time—

(*a*) in excess of the quantities specified in section 23, at any **Premises** or **Vehicle** the **Occupier** or **Person** having control of which, as the case may be, is not in possession of a **Certificate of Registration** issued in terms of section 25 in respect of the said **Premises** or **Vehicle**;

(*b*) at any **Premises** or in or on any **Vehicle** in excess of the amount specified on the **Certificate of Registration** relating to such **Premises** or **Vehicle**.

30. Register of certificates of registration.—The **Chief Fire Officer** shall maintain a register in which he enters full particulars of the **Premises** and any **Vehicle** in respect of which he has issued a certificate and the names and addresses of the **Person** to whom it has been issued and the date of issue, as well as the date of any transfer, cancellation or suspension.

31. Exemptions.—Notwithstanding anything contained in this Code, **Flammable Liquid** shall be deemed not to be stored or conveyed or transported when contained in the fuel tank of a motor **Vehicle** or stationary engine in normal use.

32. Suspension or cancellation of certificates of registration.—Where a **Holder** of a **Certificate of Registration** has been convicted for a contravention of this Code on two or more occasions, the **Chief Fire Officer** may either cancel the **Certificate of Registration** or may suspend it for such period as he may decide and during the period of suspension the **Holder** shall not do anything which the certificate otherwise authorises him to do; provided, however, that the powers conferred by this section shall not be exercised unless and until fourteen (14) days' written notice has been given to the **Holder** by the **Chief Fire Officer** of his intention to cancel or suspend the certificate. The **Holder** may within the said period of fourteen (14) days submit written representations for consideration.

33. Transfer of certificate of registration.—(1) A **Certificate of Registration** may be transferred from one **Person** to another but no **Certificate of Registration** shall be transferred from one **Premises** to another or from one **Vehicle** to another.

(2) The **Person** desiring such transfer shall make application in writing to the **Chief Fire Officer** on the form prescribed in the Sixth Schedule to this Code. Such application shall be accompanied by the **Certificate of Registration** relating to the **Premises** or **Vehicle** in respect of which such transfer is desired.

34. Storage.—(1) (*a*) No **Person** shall store or cause or permit to be stored Class III **Flammable Liquid** in any room or **Building** except in sealed **Containers**.

(*b*) No more than 5 kℓ of Class III Flammable Liquid may be stored in a room or store unless—

(i) such room or store is constructed of **Non-Combustible** material;

(ii) **fire-fighting equipment** is installed to the satisfaction of the **Chief Fire Officer**.

(*c*) Not more than 20 kℓ of **Class III Flammable Liquid** may be stored in anyone room or store.

(2) The **Chief Fire Officer** may in writing exempt from the provisions of sections 23 and 24 of this Code, for such period as he may deem necessary, any **Person** wishing to store more than 200 ℓ of **Class I Flammable Liquid**, more than 400 ℓ of **Class II Flammable Liquid** and 2.3 kℓ of **Class III Flammable Liquid** required for or in connection with any excavation, **Building** or road making work of a temporary nature, provided, however, that—

(*a*) application is submitted, in writing, to the **Chief Fire Officer**;

(*b*) suitable provision has been made to surround the **Storage Tank** or **Containers** in which such **Flammable Liquid** is stored by walls or bunds of such a character that such **Flammable Liquid** cannot escape from such walls or bunds either under the action of fire or otherwise;

(*c*) at least one efficient chemical fire extinguisher of a type to be **Approved** by the **Chief Fire Officer** has been provided as set out in section 46 of this Code.

(3) Any **Person** to whom an exemption has been granted in terms of this section shall ensure that at all relevant times—

(*a*) all reasonable precautions are taken to prevent any fire, flame or other agency likely to ignite **Flammable Liquid or Substance** or flammable vapour being brought into contact with such **Flammable Liquid** or its vapour;

(*b*) such **Flammable Liquid or Substance** is not placed within 4,5 m of any **Protected Work** or public thoroughfare;

(*c*) the provision of paragraphs (*b*) and (*c*) of subsection (1) hereof are observed.

35. Inspection of premises and installations.—The **Person** responsible for the installation or erection of any **Pump**, **Storage Tank**, filling device, **Dry Cleaning Room**, store, **Spraying Room** or other equipment or **Premises** intended for the storage. Use or handling of **Flammable Liquid or Substance**, shall notify the **Chief Fire Office**r in writing upon completion of installation or erection.

36. Removal and dismantling of installation for Flammable Liquid or Substance.—(1) Every **Person** who intends to remove or cause or permit to be removed any **Pump**, **Storage Tank**, filling device or other equipment used or intended for the use for the handling, storage or use of **Flammable Liquids or Substances** from any fixed position on **Registered Premises** other than refineries and bulk storage depots or who intends to resite the same within the **Premises** shall give prior written notice of such removal or resiting to the **Chief Fire Officer**.

(2) The removal of any such **Pump**, tank, filling device or equipment shall *ipso facto* cancel that portion of the **Certificate of Registration** in so far as it refers to such **Pump**, tank or filling device or equipment, as the case may be, as well as any exemption granted under this Code and a further certificate shall be sought and issued and no such

Pump, tank, filling device or equipment shall be re-erected or re-installed on that site unless and until a new. **Certificate of Registration** has been obtained in the manner provided for in this Code: provided, however; that the provisions of this subsection shall not apply in respect of any such **Pump**, tank, filling device or equipment which is temporarily removed for the purpose of effecting repairs thereto or which, being worn out, is replaced by a similar unit, having, in the case of a tank, the same capacity.

37. Storage, use and handling on Registered Premises prohibited in certain circumstances.—Except as otherwise provided in this Code, no **Person** shall store, use or handle or permit or cause to be stored, used or handled any **Flammable Liquid** or **Substance** on any **Registered Premises**—

(1) in circumstances that such **Flammable Liquid or Substance**, or its vapour comes or is likely to come into contact with any fire, flame, naked light or other agency likely to ignite such **Flammable Liquid or Substance** or its vapour;

(2) unless such **Premises** are situated or constructed or so protected by surrounding walls or bunds so as adequately to protect adjoining **Premises** or part thereof from the risk of danger from fire;

(3) as to prevent, or impede the escape of any **Person** or animal;

(4) unless all equipment used in such **Premises** for the storage, use and handling of **Flammable Liquid or Substance** is maintained in good and proper order and free from leakage of **Flammable Liquid or Substance**;

(5) unless such **Person** has taken all due precautions for the prevention of accidents by fire or explosion on such **Premises** and for the prevention of unauthorised Persons obtaining access to the **Flammable Liquid or Substance** kept thereon.

38. Prohibited acts: Notices.—(1) Whenever so directed by the **Chief Fire Officer** in writing the **Occupier** of any **Premises**, whether registered in terms of this Code or not upon which **Flammable Liquids or Substances** are stored, used or handled shall post and keep posted in a conspicuous position or positions in such **Premises** or part thereof, as the **Chief Fire Officer** shall specify a sign or signs conforming to signs PV1 and PV2 described in S.A.B.S Specification No. 1186 1978: Symbolic Safety Signs prohibiting smoking or the use or causing of fire or an open name on such **Premises** or part thereof.

(2) Any **Person** who, upon **Premises** on which **Flammable Liquids or Substances** are stored, used or handled who does, or causes or permits to be done, any act which tends or is likely to cause a fire or explosion or who smokes or uses an open flame in contravention of a notice posted in terms of subsection (1) and any **Occupier** of **Premises** who fails to post or keep posted any notice in terms of a direction given under subsection (1) shall be guilty of an offence.

39. Notice to discontinue dangerous method.—(1) Where on inspection of any **Premises** it appears that any degree, manner or method of storage, use, transport or handling of **Flammable Liquids or Substances** which is in conflict with the provisions of this Code or any act or omission which constitutes a contravention of this Code, is calculated to endanger the safety of **Persons** or property, any **Fire Official** may require the immediate discontinuance, of such degree, manner or method or the removal of the **Flammable Liquid or Substance** to a place of safekeeping.

(2) A **Person** who fails to comply with an instruction given in terms of subsection (1) shall be guilty of an offence.

40. Sewers and drains.—(1) No **Person** shall cause, permit or allow a **Flammable Liquid or Substance** to enter any waste or foul water or storm water sewer or drain whether underground or on the surface.

(2) Any **Person** having charge or control of any **Premises or Vehicle** and any **Person** who is in the **Person's** employ who becomes aware of any escape, whether accidental or otherwise, of any quantity of **Flammable Liquid or Substance** likely to constitute a fire hazard from such Premises or Vehicle into any sewer or drain or any inlet or drain communicating with any sewer or drain, shall report such escape to the **Chief Fire Officer** forthwith.

41. Prohibition against devices and pumps in Basements.—No **Person** shall use or cause or permit the use in any **Basement** of any device for spraying **Flammable Liquid** or any **Pump** or other device for the issue or transfer of any **Flammable Liquid** to **Vehicles** or **Containers**.

42. Filling operations.—(1) No **Person** shall transfer any **Flammable Liquid** from or to any **Road Tank Waggon** at a place other than a **Bulk Depot** unless such transfer is carried out under seal and the engine of such waggon is not running. During filling operations the fire extinguisher provided on such **Vehicl**e in terms of section 87 hereof shall be removed from the **Vehicle** and kept ready for use in an easily accessible place, and prohibitory notice conforming to signs PV1 and PV2 described in the S.A.B.S. Specification referred to in section 38 (1) shall be conspicuously displayed at access points to the **Premises** concerned.

(2) Any **Person** responsible for the filling of a tank mounted on a **Road Tank Waggon** carrying **Liquefied Petroleum Gas** and any **Person** having control of such a **Vehicle** shall ensure that such filling is effected in accordance with the requirements of **S.A.B.S. Code of Practice** 087, Part IV: Transportation of **Liquefied Petroleum Gas** in Bulk by Road.

43. Filling on or across public sidewalks.—No **Person** shall—

(1) take on or across any public sidewalk or cause or permit to be so taken the hose of a **Pump** for the purpose of replenishing any **Vehicle** or **Container** with **Flammable Liquid**;

(2) so replenish or cause, allow or permit to be so replenished any **Vehicle** or **Container** which is standing on any public sidewalk.

44. Replenishing of fuel tanks.—No **Person** shall—

(1) upon any **Registered Premises** strike a match or smoke a pipe, cigar, or cigarette or have in his possession a lighted pipe, cigar or cigarette or ignite a petrol lighter or other similar device or approach which any fire, flame, naked light or other agency likely to ignite **Flammable Liquid or Substance** or its vapour within a distance of 3 m of any fuel tank of any motor **Vehicle** whilst such fuel tank is being replenished or is unsealed;

(2) replenish or cause or permit to be replenished any such fuel tank while the engine or such motor **Vehicle** is in motion.

45. Replenishing of bus.—No **Person** shall replenish or cause or permit to be replenished the fuel tank of any Bus or carry or cause or permit to be carried any **Flammable Liquid** in or on any **Bus** except in the fuel tank thereof whilst any **Person** other than the driver or **Person** responsible therefor is within or upon such **Bus**.

46. Fire fighting equipment.—(1) Except where otherwise provided in this Code, the **Holder** of a **Certificate of Registration** shall install or cause to be installed in all Premises to which such certificate refers, **Approved** fire extinguishers in an easily accessible and visible position in accordance with the following scale and provisions:

(*a*) for each **Underground Storage Tank** on the **Premises** to which the **Certificate of Registration** refers, two (2) fire extinguishers;

(*b*) for each **Dry Cleaning Room** on the **Premises** three (3) fire extinguishers;

(*c*) for each **Spraying Room** two (2) fire extinguishers; and every such fire extinguisher shall be installed, maintained and serviced in accordance with **S.A.B.S Code of Practice** 1475: The Production of Reconditioned Fire Fighting Equipment, Part I: Portable Rechargeable Fire Extinguishers.

(2) The **Person** to whom a **Certificate of Registration** has been issued in terms of this Code shall maintain at all times on the premise or **Vehicle** to which such certificate refers—

(*a*) all **Fire Fighting Equipment** and **Fire Alarm Systems** in accordance with the provisions of this Code;

(*b*) all such equipment in good order and ready for immediate use.

47. Examination of fire fighting equipment.—(1) Where, in terms of this Code, any fire extinguisher or other **Fire Fighting Equipment** or a **Fire Alarm System** has been installed on any **Premises,** the **Occupier** of such **Premises** shall cause such equipment or alarm system to be examined once every twelve (12) months by a **Holder** of a **Certificate of Competence**.

(2) Every such extinguisher, equipment and alarm system shall bear a label, on which the **Person** examining it shall endorse his name, the date of examination and the condition, in his opinion, of the extinguisher, equipment or alarm at that date.

48. Reporting of fires and accidents.—The **Occupier** of any **Premises** shall immediately report to the **Chief Fire Officer**, any fire or accident involving **Flammable Liquid or Substance** that has occurred on or in connection with any such **Premises**, where such fire or accident has resulted in damage to any property or injury to any **Person**.

49. Rules to be observed on unregistered Premises.—(1) No **Person** shall store, use or handle or cause, allow or permit to be stored, used, or handled any **Flammable Liquid or Substance** on any un**Registered Premises** unless such **Flammable Liquid or Substance** is stored, used or handled in such a position or in such a manner that—

(*a*) no **Flammable Liquid or Substance** or its vapour accidentally comes or is likely to come into contact with any fire, flame or naked light or other agency likely to ignite such **Flammable Liquid or Substance** or its vapour;

(*b*) in the case of fire, the escape of **Persons** or animals will not be prevented or impeded.

(2) No **Person** shall use or handle or cause, allow or permit to be used or handled any **Flammable Liquid or Substance** on un**Registered Premises**, except in such a place in the open air as will prevent the accumulation of vapour or its ignition or in a room with ventilation which is adequate to remove the fumes therefrom and effectively prevent the accumulation of fumes therein.

(3) No **Person** shall store or issue or permit **Flammable Liquids** or substances to be stored except in a substantial **Container** which shall be kept securely closed when not in immediate use.

50. Inspection of premises.—(1) Any **Fire Official** may, for any purpose related to compliance with or the application of this Code enter upon any **Premises** whatsoever, and make such examination and enquiry thereon as he may deem necessary.

(2) The **Owner** or **Occupier** of **Premises** or in their absence, any other **Person** employed thereon, shall upon demand, disclose to a **Fire Official** the presence of any **Flammable Liquid or Substance** in or upon such **Premises** and shall answer all enquiries relating either to the observance of this Code or to any condition connection with the Certificate of Registration in respect of the **Premises**.

51. Taking of samples.—Upon inspection of any **Premises** by a member of the police or a **Fire Official** such **Person** may take samples for the purpose of analysis or examination of any **Flammable Liquid or Substance** or of any liquid or substance suspected of being flammable which is found upon such **Premises**; provided, however, that—

(1) any sample so taken shall be taken in the presence of the **Owner**, **Occupier** or other **Person** in charge, as the case may be;

(2) the **Owner**, **Occupier** or other **Person** in charge may require the member or servant taking the sample to divide it into two parts and to mark each and deliver to him one such part.

CHAPTER V
STORAGE TANKS, PUMPS AND CONTAINERS

52. Storage Tanks in Basement.—A **Basement Storage Tank** authorised in terms of subsection (1) shall have a capacity not exceeding 1 500 litres and the **Person** to whom authority has been given under that subsection shall comply with all conditions subject to which such authority has been given.

53. Capacity of Underground Storage Tanks.—The capacity of any **Underground Storage Tank**, if not within a **Bulk Depot** or an aerodrome or landing ground used by aircraft, shall be in accordance with **S.A.B.S Code of Practice** 089: Code of Practice of the Petroleum Industry, Part I: The Handling, Storage and Distribution of Petroleum Products.

54. Ventilation of underground Storage Tanks.—The **Holder** shall ensure that every **Underground Storage Tank** installed on the **Premises** in respect of which a **Certificate of Registration** has been issued has a ventilation pipe in accordance with **S.A.B.S Code of Practice** 089: The Petroleum Industry, Part 1: The Handling, Storage and Distribution of Petroleum Products.

55. Abandoned tanks.—(1) Before any **storage tank** which is no longer required for use as such is removed, the following steps shall be carried out successively:

(*a*) all **Flammable Liquid** shall be removed from the tank and from connecting pipes;

(*b*) the suction, filler, vent and dipping hole pipes shall be disconnected;

(*c*) the tank shall be rendered thoroughly airtight after disconnecting all pipes by blanking off all flanges and screwing in metal gas plugs onto any sockets in the tank. All leakage holes shall be plugged with lead or hardwood plugs.

(2) If an **Underground Storage Tank** which is no longer required for use as such is not to be removed in terms of subsection (1), the **Owner** of such tank shall cause it to be filled with sand. liquid concrete or such other substance as may be **Approved** by the **Chief Fire Officer**.

(3) If a tank is to be disposed of as scrap, it shall before disposal be retested for explosive vapours and, if necessary, rendered gas-free and a sufficient number of holes or openings shall be made in such tank so as to render it unfit for future use.

56. Entering of Storage Tanks.—No **Person** shall—

(1) enter or cause or permit any **Person** to enter any **Storage Tank** which has contained **Flammable Liquid** before such tank has been certified by a competent **Person** who has the necessary qualifications and training to give such certificate that it is free from any **Flammable Liquid** vapour, unless such **Person** is wearing an **Approved** gas mask;

(2) enter any **Storage Tank** at any time unless he is bound to a lifeline which is under the control of a **Person** who is continuously responsible for the safety of the **Person** in the **Storage Tank** and who is outside the tank and, in the case of an **Underground Storage Tank**, is at surface level.

57. Position of pumps.—(1) No **Pump** or other device used or intended to be used for the issue or transfer of **Flammable Liquid** to or from any **Vehicle** shall be erected or situated in such a position that the hose thereof can be used for the issue or transfer of **Flammable Liquid** on or across any public street or public place.

(2) No **Person** shall cause, allow or permit the issue or transfer of **Flammable Liquid** to or from a **Vehicle** by means of a **Pump** or other device except while within the **Premises** on which the **Pump** or device is situated.

58. Pumps on ramps.—**Pumps** or other devices used or intended to be used for the issue of **Flammable Liquid** to motor **Vehicles** or **Containers** shall not be erected on any ramp or within 6 m of the beginning or top of the ramp and shall in all cases be erected on level ground.

59. Dipping sticks.—Dipping sticks shall be made only of wood or brass or other non-ferrous metal or alloy.

60. Pump hoses.—No **Person** shall deliver **flammable liquid** or permit it to be delivered from any **Pump** to the fuel tank of any **Vehicle** except through sound hose having an **Earthing** wire in its construction which is effectively attached to the metal of the **Pump** and to the metal hose nozzle and, except at an aerodrome or landing ground used by air crafts, no hose attached to any such **Pump** shall exceed 4.5 m in length when measured from the Pump to the tip of the nozzle.

61. Situation of pumps and their filling pipes.—Every filling pipe inlet and every **Pump**, except where used for manufacturing purposes, shall be—

(*a*) at surface level;

(*b*) installed in such a position that it will not impede the escape of any **Person** or animal from the **Premises** in the case of fire;

(*c*) so situated or protected by surrounding walls as not to expose adjoining property to the risk of danger from fire during filling operations or otherwise.

62. Naked lights and electrical apparatus.—(1) No **Person** shall install or take or cause, allow or permit to be installed or taken within 3 metres of any **Pump**, any fire, flame, naked light or other agency likely to ignite **Flammable Liquids** or its vapour.

(2) No **Person** shall install any electrical switch, fuse, motor or other device or cause, allow or permit the same to be installed within a distance of 3 metres of any **Pump** unless such switch, fuse, motor or device is of **Flame and Vapour Proof** construction.

(3) The electrical wiring between the distribution board or junction box and the Pumps shall where possible, be in one continuous length of wire, provided, however, that where this is not possible, **Flame and Vapour Proof** junction boxes shall be used.

63. Maintenance of tanks, pipelines, pumps and other equipment and fittings.—(1) The **Holder** shall ensure that in respect of the **Premises** for which a **Certificate of Registration** has been issued to him all **Storage Tanks**, pipelines, **Pumps**, machinery and other equipment and fittings for the storage, use or handling of **Flammable Liquid or Substance** are—

(*a*) of sound and proper construction;

(*b*) so installed and fixed as not to be unnecessarily exposed to damage;

(*c*) effectively electrically **Earthed**;

(*d*) free from leakage of **Flammable Liquids** and, as far as is reasonably possible, free from leakage of **Flammable Liquid** vapour, except by means of a **Vent Pipe**;

(*e*) maintained in good and proper order and are at all times in accordance with the provisions of this Code.

(2) All pipelines between a **Storage Tank** and a **Pump** shall be below ground level.

(3) All electrical **Earth** connections required under this Code shall be examined once every twelve months by a qualified **Person**, who shall enter in a suitable log book. supplied by the **Occupier** of the **Premises** and kept solely for that purpose, the effectiveness and conditions of such **Earth**, his name and address and the date of examination. All such entries shall be signed by such qualified **Person**.

(4) All work on **Flammable Liquid** installations is to be carried out by a qualified **Person** as defined in the applicable **S.A.B.S Code of Practice**.

64. Construction of portable Containers.—No **Person** shall store or convey or cause or permit to be stored or conveyed **Class I Flammable Liquid** in *any* quantity *except in a Container constructed in accordance with the requirements of SABS 0229* or Liquefied Petroleum Gas except in a Container constructed in accordance with the requirements of SABS Code of Practice 019: Portable Metal Containers for Compressed Gases.

[R. 64 substituted by MN 22 of 2004.]

65. Filling of Containers.—(1) No **Person** shall fill a **Container** with **Class O** or **Class I** or **II Flammable Liquid** other than in a room or Building constructed of **Non-Combustible** materials and used solely for such purpose, which room or **Building** shall be adequately ventilated or in the open air at a distance of not less than 15m from any fire, name, naked light. or other agency likely to ignite **Flammable Liquid** or its vapour.

(2) No **Person** shall fill a **Container** with **Class O Flammable Liquid** or cause or permit it to be filled except in accordance with the requirements of **S.A.B.S Code of Practice** 087, Part VII: Retail Outlets and Similar LP Gas Gillings Sites for Small Containers.

(3) A **Person** who fills a **Container** with **Class O**, **I** or **II Flammable Liquid** shall ensure that both it and the Container from which it is filled are properly **Earthed**.

66. Quantity in Containers.—No Container shall be filled with **Flammable Liquid** to more than ninety seven and a half per cent (97,5%) of its capacity; provided that in the case of **Liquefied Petroleum Gas**, **Containers** shall not be filled more than eighty percent of their capacity.

67. Containers after delivery.—No **Person** who has taken delivery of any **Flammable Liquid in Containers** in excess of the quantity stated in section 23 shall cause or permit such **Containers** to remain unattended in any place other than a store for a longer period than may reasonably be necessary. In the case of portable **Containers**

filled with **Liquefied Petroleum Gas** which are stored for the retail market, the Holder of a Certificate of Registration in respect of **Premises** shall ensure that storage of such **Containers** complies with the requirements of Part VII of the **S.A.B.S. Code of Practice** referred to in section 65.

68. Storage and handling of Liquefied Petroleum Gas.—(1) No **Person** shall store or handle **Liquefied Petroleum Gas** or construct or assemble an installation for the storage and distribution of **Liquefied Petroleum Gas** except in accordance with the requirements of Part VII of the **S.A.B.S. Code of Practice** referred to in section 65 and in accordance with the provisions of **S.A.B.S. Code of Practice** 019: Portable Metal Containers for Compressed Gases: Basic Design Criteria, Use and Maintenance.

(2) No **Person** shall cause or allow more than 19 kg of **Liquefied Petroleum Gas** to be kept or stored in any **Building** and for the purpose of this provision any **Container** for **Liquefied Petroleum Gas** found in any **Building** shall be deemed to be full until the contrary is proved.

69. Storage of empty Containers.—(1) No **Person** shall place or keep any used empty **Container** or cause or permit any used empty **Container** to be placed or kept in any part of any **Premises** other than a store; provided, however, that—

(*a*) such a **Container** may be stored in the open air at a distance of not less than 6 m from any fire, flame, naked light or other agency likely to ignite **Flammable Liquid** or its vapour;

(*b*) no **Person** shall cause or allow any used empty **Container** to remain in or on any public street or public place.

(2) The **Person** who stores used empty **Containers** in terms of subsection (1) shall at all times ensure that they are securely closed with a bung or other suitable stopper.

(3) The **Holder** of a **Certificate of Registration** in respect of any **Premises** shall ensure that the storage of filled **Liquefied Petroleum Gas Containers** and empty cylinders shall be in accordance with the requirements of Part VII of the **S.A.B.S. Code of Practice** referred to in section 65.

70. Repair of Containers.—No **Person** shall carry out or permit to be carried out any repair or alteration of or perform any work on any used **Container** until all **Flammable Liquid** and **Flammable Liquid** vapours have been removed from such **Container**; provided that in the case of faulty **Liquefied Petroleum Gas** cylinder, no attempt at repair shall be made and the **Owner** or the **Person** having possession of the cylinder shall ensure that it is treated as described in **S.A.B.S. Code of Practice** 019: Portable Metal **Containers** For Compressed Gases: Basic Design Criteria, Use and Maintenance.

71. Marking of Containers.—No **Person** shall supply or deliver to any **Person** any **Class I Flammable Liquid** in any **Container** unless such **Container** bears in conspicuous letters the words "FLAMMABLE/VLAMBAAR" or a sign conforming to sign W W 2 described in S.A.B.S. Specification 1186: Symbolic safety signs and the marking of **Liquefied Petroleum Gas Containers** is in accordance with the requirements of the **S.A.B.S. Code of Practice** referred to in section 65.

CHAPTER VI
TIMBER AND FLAMMABLE SUBSTANCES

72. Storage of flammable substances near furnaces.—It shall not be lawful for any **Person** to pile, stack or store cut or uncut timber, lathwood, firewood, casks, barrels,

boxes or cases or other flammable substances in the same yard or **Premises**, or in any part of the same **Premises** where any furnace is situated, except—

(*a*) where the furnace is enclosed in a **Building** or chamber constructed of fire-resisting material; or

(*b*) where there is a distance of not less than 7,7 m between the furnace and the pile, stack or store of timber, or other flammable substances.

73. Piling, stacking or storing of timber and other flammable substances.—(1) It shall not be lawful for any **Person** to pile, stack or store timber or any other flammable substance to a height exceeding 4m from the level of the ground, and every **Person** who shall pile, stack or store any such substance as aforesaid shall pile, stack or store the same in a safe, compact and proper manner.

(2) (*a*) (i) Timber and other flammable substances shall be piled, stacked or stored 200 mm off the ground within stack areas 6 m by 3 m by 4 m high to the satisfaction of the **Chief Fire Officer**.

(ii) Each stack shall be separated from adjoining stacks by an unobstructed pathway not less than 2 m in width.

(iii) Stacks shall be a minimum of 3 m from any boundary wall and 6 m from any **Building**.

(iv) Individual stacks shall be stacked in a compact and proper manner to the satisfaction of the **Chief Fire Officer**.

(*b*) The entire site shall be enclosed with a brick or pre-cast concrete wall not less than 2,4 m in height.

(*c*) The area between the stacks and boundary wall shall be kept entirely free of any obstruction.

(*d*) The entire site shall be kept free of unkempt and overgrown vegetation.

(3) No **Person** shall pile, stack or store timber or any other flammable substance on sites subject to flooding unless a permit is granted by the **Local Council** based on the fact that the area to be utilised is above the 1 in 50 year flood occurrence level as determined by the **Local Council**. The sites subject to flooding shall be those sites as determined from time to time by the **Local Council**.

74. Room or chamber prohibited in a timber stack.—It shall not be lawful for any **Person** to form in any pile, stack or store of timber or any other flammable substance any room, chamber or space (other than a passage) to be used for any purpose whatever.

CHAPTER VII
STORES

75. Provisions of stores.—(1) When deemed necessary by the **Chief Fire Officer**, having regard to the nature and quantity of **Flammable Liquids** or substances to be stored, the nature and proximity of adjacent **Buildings** and other attendant risks, the **Occupier** of the **Premises** shall provide thereon a store in accordance with the requirements of this Code for the storage of such liquids or substances.

(2) No **Person** who is the **Holder** of a **Certificate of Registration** shall store in any store provided in terms of this Code any greater quantity of **Flammable Liquids** or substances than is permitted by the **Certificate of Registration** issued in respect of that store and in the case of the storage of **Liquefied Petroleum Gas** at retail outlets the **Holder** shall ensure that the requirements of Part VII of the **S.A.B.S Code of Practice** referred to in section 65 are complied with.

76. No **Person** shall use or permit the use of a store for the purpose of storing **Flammable Liquid or Substance**, unless it complies with the requirements of this Code and until warning notices conforming to sign W W 2 described in S.A.B.S. Specification 1186: Symbolic Safety Signs are legibly painted or otherwise displayed on the outer face of the door of such store and such notices shall at all times be maintained in such position and in a legible condition.

77. Construction and situation of store.—(1) Every store shall be constructed in accordance with the following requirements—

(*a*) The walls shall be constructed of brick or concrete, the floor of concrete or other impervious material and the roof of reinforced concrete; provided, however, that the roof may be constructed of other **Non-Combustible** material where such store is not likely to endanger any room, **Building** or adjoining **Premises** in case of fire.

(*b*) The store shall be fitted only with a hardwood door or doors, suitably covered with metal of not less than 1 mm thickness and carried on a metal door frame, or a well-fitted metal door of not less than 4 mm thickness, carried on an angle frame and having an all-round overlap of not less than 50 mm. Such doors shall open outwards and be fitted with a substantial lock.

(*c*) All window frames shall be constructed of metal and glazed with wire-woven glass and all windows shall be so constructed and secured as to be incapable of being opened and as to prevent the escape of vapours.

(*d*) A store shall be constructed in such manner that the **Flammable Liquid** therein cannot escape therefrom with sills at every doorway so as to form a well of sufficient capacity to contain the maximum liquid capacity of the store, plus ten (10) per cent thereof.

(*e*) The store shall be, ventilated by an **Approved** ventilation system of such design, construction and capacity as will prevent the accumulation of **Flammable Liquid** vapour within the store and will discharge such vapour into the open air at a point or points where such vapour is not likely to come into contact with any fire, flame, open light or other agency likely to ignite such vapour; provided, however, that where for any reason such ventilation can only be secured by means of a mechanical system of ventilation, such system shall conform to the provisions of section 107.

(*f*) All ventilating openings which are fitted into walls shall be set in iron frames and fitted tightly to the interior faces of the walls. The low ventilating openings shall be installed as near to the level of the well, referred to in (*d*) above, as possible, but shall be above such level.

(*g*) The openings shall be protected by non-corrodible wire gauze of not less than eleven (11) meshes to the linear centimetre.

(*h*) A store shall not be situated in such a position that it will impede the escape of any **Person** or animal from the **Premises** or any part thereof or endanger any room, **Building** or **Premises** in the case of fire.

(*i*) A store with a floor area in excess of 10 m^2 shall be provided with at least two doors, complying with paragraph (*b*) hereof and situated at such a distance from each other as to allow the free and unimpeded escape of **Persons** within the store from either door in case of fire or other danger.

(2) Every store shall be maintained at all times so as to comply with the provisions of this section.

78. Lighting of store.—All lights installed shall be of the incandescent electric type, which shall be enclosed in an outer **Flame and Vapour Proof** fitting, and all wiring shall be armoured cable or enclosed in seamless metal tubes, the junctions of which are screwed together. All switches, junction boxes, fuses and other electrical equipment shall be outside the store.

79. Use of store.—No **Person** shall, without the prior written authority of the **Chief Fire Officer**—

(1) use any store or cause or permit such store to be used for any purpose other than the storage of **Flammable Liquids** or substances and their **Containers**;

(2) be present in or cause or permit any other **Person** to be present in any store unless all doors of the store are fully open and kept entirely unobstructed.

80. Unauthorised Persons entering store.—No **Person** shall enter any store or cause or permit any store to be entered without the express permission of the **Occupier** of the **Premises** or other responsible **Person** in charge of such store.

81. Storage in open air.—No **Person** shall store **Flammable Liquid** outside a **Building** or elsewhere in the open air except in accordance with the following requirements:

(1) The **Flammable Liquid** may only be stored in sealed **Containers** which shall be staked to a height not exceeding three **Containers**;

(2) No **Flammable Liquid** or drum shall be nearer than—

(*a*) 3 m from any boundary of the **Premises** or any drain;

(*b*) 6 m from any **Building** on the **Premises**;

(*c*) 15 m from any **Building** on adjacent **Premises**;

(3) the area in which storage takes or is to take place shall, if required by the **Chief Fire Officer**, be bunded to his satisfaction;

(4) signs prohibiting smoking and naked flames conforming to prohibitory signs PV 1 and PV2 as described in S.A.B S. Specification 1186: Symbolic Safety Signs, shall at all times be displayed so as to be visible to all **Persons** approaching the storage area.

CHAPTER VIII
BULK DEPOTS

82. The **Person** who is the **Holder** of a **Certificate of Registration** in respect of a **Bulk Depot** shall ensure that its establishment, maintenance and control is accordance with the requirements and recommendations of S**.A.B.S. Code of Practice** 089, Part 1: The Handling, Storage and Distribution of Petroleum Products.

83. Construction, use and maintenance of vehicles used for conveyance of flammable liquids.—(1) Every **Person** who—

(*a*) uses a **Road Tank Waggon** for the purpose of conveying **Class I or Class II Flammable Liqu**id shall ensure that such waggon is constructed in accordance with the specifications of S.A.B.S. Specification 1398: Road Tank Vehicles for Flammable Liquids;

(*b*) uses a **Road Tank Waggon** for the purpose of conveying **Flammable Liquid** shall ensure that in its use and maintenance all the requirements and recommendations of **S.A.B.S. Code of Practice** 0189: The Operating, Handling and Maintenance of Road Tank Vehicles for Flammable Liquids

and **S.A.B.S. Code of Practice** 0230: Transportation of Dangerous Goods: Inspection Requirements for Road Vehices are complied with.

(Editorial Note: Wording as per original *Provincial Gazette*. It is suggested that the word "Vehices" is intended to be "Vehicles".)

(2) Every **Person** who uses or causes, allows, permits or suffers to be used a **Road Tank Waggon** for the purpose of conveying **Class III Flammable Liquid** or a **Vehicle** used for the conveyance of **Flammable Liquids** or **Substances** other than a **Road Tank Waggon** shall ensure that such waggon or **Vehicle** is—

(*a*) of adequate capacity and construction to convey safely the quantity of **Flammable Liquid or Substance** which is or is to be conveyed on such **Vehicle**;

(*b*) equipped with at least four (4) wheels; provided, however, that a trailer forming a portion of an articulated **Vehicle** shall for the purposes hereof be deemed to be equipped with four wheels;

(*c*) so constructed and equipped as not to cause **Flammable Liquid** which may be conveyed in or on such **Vehicle** to be ignited;

(*d*) fitted with a means of cutting off manually the electrical current close to the battery by a double pole switch or other suitable method;

(*e*) securely fitted with raised sides at least 800 mm in height; provided that a length of chain may be fitted across the rear of the **Vehicle** in place of a tailboard;

(*f*) equipped either with "No Smoking — No Naked Lights" signs of 150 mm red lettering on white background or with signs conforming with signs PV1 and PV2 as described in S.A.B.S. Specification 1186: Symbolic Safety Signs and fitted as follows—

(i) One of each such sign on each side of the **Vehicle**; or

(ii) one of each such sign across the top of the **Vehicle** or above its cab and in either case parallel to the length of the **Vehicle** with lettering or pictograms on both sides and clearly visible when the **Vehicle** is carrying the permitted load;

(*g*) fitted with two 9 kg dry chemical powder type fire extinguishers.

(3) No **Person** shall drive, or cause or permit or allow to be driven any **Road Tank Waggon** within the area of the **City** described in the Eighth Schedule between the following hours except with prior written permission of the **Chief Executive Officer**:

Mondays to Fridays	06:30 to 17:30
Saturdays	06:30 to 13:30

(public holidays excluded in each case).

84. Maintenance of vehicle.—No **Person** shall use or cause or allow to be used in any public place any **Vehicle** for the transport of **Flammable Liquid** other than in the fuel tank of the **Vehicle** unless such **Vehicle** is maintained in good condition and in proper working order.

85. Openings to tank.—All openings to the tank of any **Vehicle** used for the transport of **Flammable Liquids** shall be kept securely and effectively closed at all times when not in use.

86. Supervision of waggon by responsible Person.—Every **Road Tank Waggon** shall be under the constant supervision of the Person having charge and control of such waggon during the period that it is in use as such outside a **Bulk Depot**.

87. Position of Road Tank Waggon during delivery operations.—No **Person** shall—

(1) cause or permit a **Road Tank Waggon** to stand on or across any public footpath during delivery operations;

(2) place the hose or cause or permit the hose to be placed across such footpath during such operations;

(3) cause or permit a **Road Tank Waggon** to face in any direction other than toward the exit during such operation.

88. Fire extinguishers.—(1) No **Person** shall use or cause or permit to be used any **Road Tank Waggon** conveying **Flammable Liquid**, unless such waggon is provided with at least two dry chemical powder type fire extinguishers each having a capacity of not less than 9 kg dry chemical powder.

(2) Such extinguishers shall be carried on the **Road Tank Waggon** in such a position and shall be attached to the **Road Tank Waggon** in such a manner as to be readily and easily accessible in the case of fire.

89. Agencies likely to ignite flammable liquid.—No **Person** shall—

(1) bring or cause to be brought any fire, naked light, flame or other agency likely to ignite **Flammable Liquid** or its vapour within 3 m of any **Vehicle** in which **Flammable Liquid** is transported;

(2) carry or permit to be carried any matches, cigarette lighter or similar contrivance on any **Vehicle** used for the transport of **Flammable Liquid**;

(3) smoke or be in possession of a lighted cigarette, cigar or pipe or permit any other **Person** to smoke or be in possession within 3 m of a **Vehicl**e in use for the transport of **Flammable Liquid** or during the filling of such **Vehicle** with **Flammable Liquid** or the discharge of such liquid therefrom;

(4) smoke or be in possession of a lighted cigarette, cigar or pipe within 3 m of such **Vehicle** during the filling of such **Vehicle** with **Flammable Liquid** or the discharge of such liquid there-from or while in attendance thereon permit any other **Person** so to smoke or be in possession.

90. Precautions.—Every **Person** responsible for or concerned in the conveyance of **Flammable Liquid** or **Substance** shall take all reasonable precautions for the prevention of accidents by fire or explosion and for the prevention of access by any unauthorised **Person** to any **Vehicle** or **Container** whilst in transit.

91. Restriction of scope of certain sections relating to transport of flammable liquid.—The provisions of section 23 and 24 of this Code shall not apply to the conveyance of **Flammable Liquid** on a **Vehicle**, not being a **Road Tank Waggon**—

(1) of a quantity not exceeding 200 ℓ of **Class I Flammable Liquid** or 400 ℓ of **Class II Flammable Liquid** or 600 ℓ of **Class III Flammable Liquid** in securely closed metal Containers of a capacity not exceeding 200 ℓ; or

(2) of a quantity of **Class 0 Flammable Liquid** in **Containers** not exceeding 90 litres in total capacity, provided that the **Person** who so coneys such liquid shall ensure that such **Containers** are of substantial construction and are packed in such a manner as to prevent leakage from and damage to the **Containers** in the course of conveyance, and provided, further, that any **Container** for **Liquefied Petroleum Gas** found on a **Vehicle** shall be deemed to be full until the contrary is proved.

(Editorial Note: Wording as per original *Provincial Gazette*. It is suggested that the word "coneys" is intended to be "conveys".)

CHAPTER IX
DRY CLEANING ROOMS

92. Dry-cleaning rooms.—The **Person** who is the **Holder** of a **Certificate of Registration** in respect of a **Dry Cleaning Room** shall ensure that the provisions of sections 92 to 109 are complied with and no **Person** shall use a **Dry Cleaning Room** for any purpose other than that of dry-cleaning and purposes reasonably incidental thereto.

93. Installation of machinery.—(1) No **Person** shall instal or cause or permit to be installed any **dry-cleaning machinery** elsewhere than in a **Dry Cleaning Room**.

(2) All machinery shall be properly electrically **Earthed**.

(3) All electrical **Earth** connections shall be examined and entered in a log book as required under section 65.

94. Boilers.—No boiler or chimney of a boiler shall be installed within 6 m of a **Dry Cleaning Room**; provided, however, that a boiler may be installed not nearer than 3 m to a **Dry Cleaning Room** where there is an unbroken brick or concrete wall between such boiler or its chimney and such room of a height of not less than 450 mm above the top of the boiler and its chimney and of not less than 2 m above the floor of the **Dry Cleaning Room**.

95. Draining of dry-cleaning machinery.—All **dry-cleaning machinery** on or above floor level shall be drained immediately after the termination of cleaning operations each day.

96. Electrical equipment.—No **Person** shall instal or cause or permit to be installed in or near a **Dry Cleaning Room** or in any position which comes or is likely to come into contact with **Flammable Liquid** or its vapour any electrical equipment other than—

(1) an incandescent electric light enclosed in a **Flame and Vapour Proof** or other **Approved** fitting;

(2) electric wires protected throughout by seamless metal tubes, the junctions of which are screwed together, or armoured or lead-covered cable, **Approved** by the **Executive Director**: Durban Electricity; provided, however, that, with the written permission of the **Local Council** concerned, other types of cables may be installed where the use of such cable is unlikely to cause danger to **Persons** or property from fire;

(3) one electrical push button switch of **Flame and Vapour Proof** construction which is designed for use to stop all machinery in an emergency and which is situated not less than 1 35 m above the level of the floor;

(4) electric motors of **Flame and Vapour Proof** construction.

97. Handling of flammable liquid.—The **Storage Tank** shall be connected to the **dry-cleaning machinery** and no **Flammable Liquid** shall be handled during any cleaning process; provided, however, that a total quantity not exceeding 101 at any time may be handled in one or more **Containers** for the purpose of hand washing or spotting.

98. Notice of Danger at entrance.—**Approved** signs prohibiting smoking and naked flames or signs conforming to prohibitory signs PV1 and PV2 as described in S.A.B.S. Specification 1186: Symbolic Safety Signs shall be prominently displayed at each entrance to a **Dry Cleaning Room** and within such room to the satisfaction of the **Chief Fire Officer**.

99. Removal of foreign matter and metallic substances from garments.—No **Person** shall dry-clean or cause, allow. permit or suffer to be dry-cleaned any article of

clothing or other textiles unless and until such article has been thoroughly examined and all object such as matches, metallic substances, metal buttons and other items which are liable to cause sparks have been removed therefrom.

100. Instructions to employees.—The **Person** having charge or control of the business conducted on the Premises shall cause all **Persons** employed in the **Dry Cleaning Room** to be thoroughly instructed as to the hazards involved in the use of **Flammable Liquids** and in the handling and method or usage of all **Fire Fighting Equipment** required by this Code to be on the **Premises**, and shall repeat such instructions quarterly.

101. Unauthorised Persons and unlawful acts.—(1) No **Person** other than a Person lawfully employed on the **Premises** or a **Fire Official** shall enter any **Dry Cleaning Room** without the express permission of the **Occupier** or **Person** in charge.

(2) No **Person** shall commit any act which is liable or calculated to cause fire, explosion or other danger to a **Dry Cleaning Room** or its contents or any **Person** therein.

102. Position of machinery.—All **dry-cleaning machinery** shall be situated as near as reasonably possible to the exhaust ventilation ducts required by section 108.

103. Power shafts.—Where any machinery is driven by means of a shaft from motive power outside the **Dry Cleaning Room**, the driving shaft shall pass through a gas-proof wall box which shall be installed at the point where such shafting enters such **Dry Cleaning Room**.

104. Scouring or brushing table.—Every table used for washing or brushing any material with **Flammable Liquid** shall—

(1) be provided with a liquid-tight top with a curb on all sides not less than 25 mm high;

(2) have a top which is so pitched as to ensure thorough draining by a pipe of not less than 25 mm diameter directly connected to an underground tank trough a trap preventing the return of vapour and which, in the case of a metal top, is electrically **Earthed**;

(3) be secured to the floor or wall so as not to disturb the electrical **Earth** and drain connections.

105. Portable lamps and trolleys.—No **Person** shall take or cause, allow, permit or suffer to be taken any flash lamp or any other light or lamp into any **Dry Cleaning Room** except an incandescent electrical light or safety lamp which has been fitted with an outer **Flame and Vapour Proof** fitting, and no **Person** shall use any handtruck or any trolley for the conveyance of any material, clothing or liquid unless it is equipped with hard rubber tyres and non-ferrous edges, so as to prevent sparks arising from accidental contact with any other metal surface.

106. Construction of Dry Cleaning Rooms.—(1) Every **Dry Cleaning Room** in which **Class I Flammable Liquids** are used shall be constructed and maintained in accordance with the following requirements—

(*a*) The walls shall be constructed of brick or concrete or similar **Non-Combustible** material, the floor of concrete or other impervious material and the roof of reinforced concrete;

(*b*) all windows shall be glazed with wire-woven shatterproof glass and shall be of the closed or fixed type;

(*c*) all doors shall be of hardwood, suitably covered with metal of not less than 1 mm in thickness and shall be carried on metal door frames and fitted with automatic closing devices;

(*d*) a sill of concrete at least 150 mm in height shall be erected across all door openings at surface level or the floor of the room shall be 150 mm below the adjacent surface level;

(*e*) the **Dry Cleaning Room** shall be situated not closer than 1,5m to any public thoroughfare or adjacent **Building** unless the wall or walls which face such thoroughfare or **Building** are constructed without openings whether glazed or otherwise; provided, however, that not more than two sides of any **Dry Cleaning Room** shall be without such openings;

(*f*) there shall be provided at least two (2) doors opening outwards directly into the open air. Such doors shall be so situated and at such a distance from each other as to allow the free and unimpeded escape of **Persons** within the **Dry Cleaning Room** through either of such doors in the case of fire or other danger;

(*g*) no **Dry Cleaning Room** shall have any opening into any other room or **Building**, provided, however, that, subject to compliance with the conditions hereunder set out, any room used or intended to be used solely for the purposes of drying garments or materials which have been cleaned or treated with **Flammable Liquid** may have direct access to the **Dry Cleaning Room**:

(i) Such drying room shall be separated from the **Dry Cleaning Room** by a wall constructed of **Non-Combustib**le material; and

(ii) the entrance to such drying room shall be provided with a door of hardwood which is covered with metal of not less than 1 mm in thickness and which is carried on a metal door frame and fitted with an automatic closing device.

107. Steam pipes.—(1) Every **Dry Cleaning Room** in which **Class I Flammable Liquids** are used shall be fitted with at least one steam pipe not less than 25 mm in diameter. Every such pipe shall be provided with—

(*a*) perforation or jets of at least 6,3 mm in diameter and so spaced as to give as near as practicable an equal distribution of steam in such a manner that such room can immediately be flooded with steam in case of fire;

(*b*) a steam trap or other effective means of preventing the accumulation of water within such pipe.

(2) A steam supply for such pipe or pipes shall be maintained continuously while any **Flammable Liquid** is contained in any **dry-cleaning machinery**.

(3) Such steam supply system shall be provided with a valve placed in the service line and situated outside the **Building** in any easily accessible position; provided that the **Chief Fire Officer** may authorise the installation of alternative **Fire Fighting Equipment** where in his opinion the circumstances warrant it.

108. Ventilation of Dry Cleaning Room.—(1) Every **Dry Cleaning Room** in which **Class I Flammable Liquids** are used shall be ventilated with a mechanical system of exhaust and inlet ventilation of such design, construction and capacity as will remove **Flammable Liquid** vapour from such room and discharge such vapour into the open air at a point which is above the roof of such room and more than 5 m from any opening to any **Building**.

(2) Such system of ventilation shall cause the air in the **Dry Cleaning Room** to be changed at least thirty (30) times in every hour.

(3) The blades of all ventilating fans shall be made of non-ferrous metal.

(4) All exhaust ventilation ducts shall be of **Non-Combustible** material and shall be installed—

(*a*) as near ground level as practicable; provided, however, that where any such duct or any portion thereof is situated at a level which is less than 150 mm above the level of the **Dry Cleaning Room** floor adequate provision shall be made to prevent the escape of **Flammable Liquid** therefrom in the case of fire or otherwise;

(*b*) as near as practicable to the parts of the **dry-cleaning machinery** from which the **Flammable Liquid** vapour is emitted.

(5) Any **Person** discovering a fire in any **Dry Cleaning Room** shall immediately take all reasonably possible steps to shut down the exhaust ventilating system.

109. Construction of Dry Cleaning Room.—Every **Dry Cleaning Room** in which **Class II Flammable Liquids** are used shall be constructed and maintained in accordance with the following requirements:

(1) The walls shall be constructed of brick or concrete or other similar **Non-Combustible** material and the floor of concrete or other impervious material and the room of **Non-Combustible** material.

(2) A sill of concrete at least 150 mm in height shall be erected across all door openings at floor surface level or the floor of the room shall be 150 mm below the adjacent surface level.

(3) There shall be provided at least two (2) doors opening outwards one of which shall lead directly into the open air. Such doors shall be so situated and at such a distance from each other as to allow free and unimpeded escape of **Persons** within the **Dry Cleaning Room** through either of such doors in the case of fire or other danger.

(4) No **Dry Cleaning Room** shall be situated below or above any other room or other part of the **Building**; provided, however, that a room or **Building** may be constructed above a **Dry Cleaning Room** if such room or **Building** is not used as a **Habitable room** and is provided with adequate means of escape to the satisfaction of the **Chief Fire Officer**.

110. Ventilation of Dry Cleaning Room.—Every **Dry Cleaning Room** in which **Class II Flammable Liquids** are used shall be ventilated by a system of ventilation of such design, construction and capacity as will adequately prevent the accumulation of **Flammable Liquid** vapours within any portion of such room and will discharge such vapour into the open air at a point or points where such vapour is not likely to come into contact with any fire, flame, open light or other agency likely to ignite such vapour; provided, however, that where for any reason such ventilation can only be secured by means of a mechanical system of ventilation, such mechanical system shall conform to and comply with the provisions of section 108.

CHAPTER X
SPRAYING ROOMS

111. Duties of Holder.—A **Person** who is the **Holder** of a **Certificate of Registration** in respect of a **Spraying Room** shall ensure that every **Spraying Room** shall be constructed in accordance with the following requirements:

(*a*) The walls shall be constructed of brick or concrete, the floor of Concrete or other impervious material, the roof of reinforced concrete. The doors (one of which shall be an escape door) shall be of hardwood suitably

covered with metal of not less than 1 mm in thickness and shall be carried on metal door frames opening outwards and fitted with automatic closing devices: provided, however, that modifications in the construction of the **Spraying Room** may be permitted if, in the opinion of the **Chief Fire Officer**, such modifications will not endanger any room, **Building** or adjoining **Premises** in the case of fire.

(*b*) There shall be installed a mechanical system of exhaust and inlet ventilation such as will remove vapour from and be capable of changing the air in the **Spraying Room** at least thirty (30) times in every hour.

(*c*) Where a **Spraying Room** is subdivided into **Spraying Booths**, each booth shall be ventilated in accordance with subsection (b) hereof.

(*d*) A **Spraying Booth** shall be constructed of metal or **non-combustible** material.

(*e*) All exhaust vents leading from **Spraying Rooms** or **Spraying Booths** shall be so designed and constructed that all vapours are expelled into the open air at a point not less than 4 m above the floor level and at a distance of not less than 5 m from the opening to any **Building** and such vent shall be constructed of **Non-Combustible** material; provided, however, that the **Chief Fire Officer** may permit vapours to be expelled into the open air at a lesser distance than 4 m from the floor level when such vapour is not likely to be ignited from an external source.

(*f*) All ventilation inlets and outlets shall be so placed as to effect a continuous and complete change of air within any such **Spraying Room** or **Spraying Booth** and the ventilation inlets shall be substantially equivalent to the exhaust capacity required in terms of this section.

(*g*) The ventilation system shall be so installed that all **Flammable Liquid** vapours shall pass as near as reasonably possible from the area where spraying takes place directly into the ventilation outlets.

(*h*) The blades of any fan used in the **Spraying Room** shall be of non-ferrous metal.

(*i*) No electrical equipment shall be installed in the **Spraying Room** other than—

(i) incandescent electric lights enclosed in outer **Flame and Vapour Proof** or other fittings **Approved** by the **Executive Director**: **Durban Electricity**;

(ii) electric wires protected throughout by seamless metal tubes, the junctions of which are screwed together, or armoured or lead-covered cable, **Approved** by the **Executive Director**: **Durban Electricity**; provided, however, that, with the written permission of the **Local Council** concerned, other types of cables may be installed where the use of such cable is unlikely to cause danger to **Persons** or property from fire;

(iii) electrical apparatus of **Flame and Vapour Proof** construction used for ventilating purposes or other equipment **Approved** by the **Executive Director: Durban Electricity**.

(*j*) **Approved** signs warning of danger and prohibiting smoking and naked flames or signs conforming to prohibitory signs PV1 and PV2 and warning sign WW1 as described in S.A.B.S. Specification 1186: Symbolic Safety Signs shall be displayed prominently at each entrance to a **Spraying Room**.

112. When permit is not required.—Nothing contained in section 111 shall prohibit the spraying with **Flammable Liquid** of any **Vehicle** or article in the open air if such spraying is not within a distance of 15 m from any fire, flame, open light, or other agency likely to ignite such **Flammable Liquid** or its vapour and is not likely to impede the escape of **Persons** or animals in the case of fire.

113. Inspection of premises.—(1) The **Chief Fire Officer** shall on behalf of the **Municipality** arrange for the periodic inspection by a **Fire Official** of all **Premises** in respect of which a **Certificate of Registration** has been issued in terms of this Code in order to ensure that he provision, of this Code are being complied with and that all equipment, apparatus and appliances are provided and maintained in accordance therewith.

(2) **Premises** referred to in subsection (1) shall be inspected at least once during the period 1 January to 31 December in each and every year and a record of all inspections carried out shall be kept.

CHAPTER XI
GENERAL

114. Presumptions.—In addition to the **Person** by whose act or omission any contravention of or failure to comply with a provision of the Code is actually committed, the **Owner** of the **Vehicle** in respect of which the offences is committed or the **Owner** of the **Premises** on which the offence is committee or, if the **Premises** are occupied by a **Person** other than such **Owner**, the **Occupier** thereof, shall be presumed also to have committed such contravention or to have so failed to comply unless it is proved to the satisfaction of the court that he has taken all reasonable steps to have prevented such a contravention or failure to comply by any other **Person**; provided that the fact that such **Owner** or **Occupier** issued instructions forbidding any such act or omission shall not of itself be accepted as sufficient proof that such **Owner** or **Occupier** took all reasonable steps to prevent such a contravention or failure to comply by such other **Person**.

115. Penalties.—Any **Person** who—

(*a*) contravenes any provision of this Code; or

(*b*) contravenes any conditions impose upon the granting of any application, consent, approval, concession, relaxation, certificate, permit or authority in terms of this Code; or

(*c*) fails to comply with the terms of any order given to or notice served upon him in terms of this Code, shall be guilty of an offence and liable, upon conviction, to a fine or imprisonment for a period not exceeding two years.

116. Repeals and Savings.—(1) The following By-laws and all amendments thereto are hereby repealed—

(*a*) By-laws relating to Fire Prevention and Matters Incidental thereto of the former Borough of New Germany (as amended) published in Official Gazette No 4332 dated 6 January 1983;

(*b*) By-laws relating to Fire Prevention and Matters Incidental thereto of the former Borough of Pinetown (as amended) published in Official Gazette No 4332 dated 6 January 1983;

(*c*) By-laws relating to Fire Prevention and Flammable Liquids and Substances (as amended) of the former City Council of the City of Durban published in Official Gazette No 4532 dated 29 May 1986;

(*d*) Any Standard By-laws relating to Fire Brigade Services adopted by any local government body dissolved or disestablished by Proclamation LG123 of 1995 published in Official Gazette No 5044 dated 31 May 1995.

(2) Anything done or deemed to have been done under any provision of the By-laws repealed by subsection (1) and which is capable of being done under any provision of this Code shall be deemed to have been done under the last mentioned provision.

FIRST SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

For office use only:

No: .....

Date and time of test: .....

.....

To the Chief Fire Officer, Durban Metropolitan Council

APPLICATION FOR CERTIFICATE OF COMPETENCE

Full name of applicant (in block letters) .....

Postal address .....

Age .....

Length of residence in Durban .....

Name of Employer .....

Period of service with present employer .....

Address of Employer .....

Brief details of experience in the use and construction of fire extinguishing appliances .....
.....

…….....

Signature of Applicant

SECOND SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

CERTIFICATE OF COMPETENCE

This is to certify that the Person named hereunder passed a test carried out by me the .....
.....

in regard to his knowledge in the construction, use and purpose of fire fighting equipment, and having satisfied the requirements of this Department is entitled to this Certificate of Competence.

1. Person .....
2. Postal address .....
3. Signature of Holder .....

Date of issue ..... Certificate No .....

.....

Signature of examining officer

(Note: This certificate is not transferable).

THIRD SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE BY-LAWS RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

APPLICATION FOR CERTIFICATE OF REGISTRATION (PREMISES)

Date ..... 19 .....

Application for a Certificate of Registration for premises under the Interim Code relating to Fire Prevention and Flammable Liquids and Substances.

This form must be completed and forwarded to the Chief Fire Officer and accompanied by a plan of the premises, in terms of the Code.

Full name of applicant; if a company, the name of company and its secretary

(Write in block letters):

Name of applicant .....

Trading as .....

Name of Secretary .....

State the address of the premises to be registered and the name of the Owner thereof:

Name of Owner .....

Subdivision ..... Lot…....

Street No..... Block.....

Street .....

State class of business

…….....

Give a full description of existing and proposed buildings .....

…….....

How many Spraying Rooms are there on the premises?

…….....

If this application is for additional storage, state the number of extra litres

…….....

How many flammable liquid tanks are there on the premises?

…….....

State total storage capacity of flammable liquid tanks on the premises (in litres).

Litres .....

State the type and number and date of issue of any mineral oil and/or trading licence issued for these premises. If no licence has been granted. please state date of application therefor.

…….....

How many flammable liquids stores are there on the premises?

Number of stores .....

State capacity of stores in litres.

Capacity ..... Litres

State total quantity in litres proposed to be kept on the premises

Class 0 .....

Class I .....

Class II .....

Class III .....

How many flammable liquid Pumps are there on the premises? .....

How many fire extinguishers are there on the premises? State the capacity and make of each.

Maker's name .....

Number on premises .....

Capacity of each .....

Signature of applicant .....

Capacity of signatory .....

Address .....

Phone ..... P.O. Box No .....

FOURTH SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

APPLICATION FOR CERTIFICATE OF REGISTRATION (VEHICLE)

Date ..... 19 .....

Application for a Certificate of Registration for a vehicle under the Interim Code relating to Fire Prevention and Flammable Liquids and Substances. This form must be completed and forwarded to the Chief Fire Officer.

Full name of applicant. If a company, the name of company and its secretary.

(Write in block letters).

Name of applicant .....

Trading as .....

Name of secretary .....

Details of the vehicle for which a Certificate of Registration is required.

Type or class of vehicle .....

(trolley/waggon/van/lorry/tanker/etc)

Registration No .....

Tare ….....

Load .....

Make.....

Number of Containers or tanks .....

Capacity of Containers or tanks .....

Year of manufacture .....

Engine No .....

Chassis No .....

Quantity of liquid of flammable substances to be conveyed.

Class O ..... litres

Class I ..... litres

Class II ..... litres

Class III ..... litres

Manner in which it is proposed to convey the liquid .....

Number of Containers or tanks .....

Capacity of Containers or tanks .....

Signature of applicant .....

Capacity of signatory .....

Phone ..... P.O. Box No .....

FIFTH SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

CERTIFICATE OF REGISTRATION
(PREMISES)

This is to certify that the premises situated at .....

…….....

occupied by .....

and used as a .....

have been duly registered by the Chief Fire Officer under the said Code. The maximum quantity of flammable liquids and substances kept or handled at this address shall not exceed—

Flammable liquids

Class O ..... litres

Class I ..... litres

Class II ..... litres

Class III ..... litres

Flammable substances .....

(Specify types) ..... kgs

This certificate is issued subject to the following conditions:

…….....……..…….....……

…….....

…….....

…….....

Chief Fire Officer

Date .....

This Certificate of Registration must be displayed in a conspicuous position on the Registered Premises.

SIXTH SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

CERTIFICATE OF REGISTRATION
(VEHICLES)

This is to certify that the vehicle, particulars of which are given below, has been examined and found to comply with the prescribed structural requirements as contained in the Municipality's Interim Code relating to Fire Prevention and Flammable Liquids and Substances for the conveyance of .....

1 of Class O/Class I/ Class II/ Class III * flammable liquids in tanks/Containers each of a capacity .....

litres within the limits of the municipal area and subject to all By-laws for the time being in force.

Registration No ..... Make .....

Type of vehicle .....

Owner's name .....

Address .....

This Certificate of Registration is not a warranty of fitness of the vehicle herein described and any Owner, driver or other Person interested should satisfy himself as to the construction and condition of the said vehicle.

…….....

Chief Fire Officer

Date .....

This Certificate of Registration must be displayed in a conspicuous position on the vehicle.

* *Delete whichever is not applicable.*

SEVENTH SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

APPLICATION FOR TRANSFER OF CERTIFICATE OF REGISTRATION (PREMISES)

I hereby apply for the Certificate of Registration No. .....

issued on ..... (date)

in respect of the premises situate at .....

used as .....

or in respect of the vehicle with the registration no .....

Make .....

Type ..... to be transferred to:

NAME .....

ADDRESS .....

The reason for this application to transfer the Certificate of Registration from one Person or firm to another Person or firm is because .....

…….....…….....

…….....

…….....

….....……..……

Date .....

Signature of applicant .....

Address .....

Phone ..... P.O. Box No .....

EIGHTH SCHEDULE

DURBAN METROPOLITAN COUNCIL

INTERIM CODE RELATING TO FIRE PREVENTION AND FLAMMABLE LIQUIDS AND SUBSTANCES

ROAD TANK WAGGONS RESTRICTED AREAS

The area bounded by and including Aliwal Street, Victoria Embankment, Russell Street and Commercial Road, Central Durban.

The area bounded by and including Ireland Street, Dore Street, Wick Street, Moss Street, Starr Street and Todd Street, Verulam.

The R102 (MR2) from Coronation Street to Dores Lane/Victory Avenue, Tongaat.

The area bounded by and including Crompton Street, Kings Road, that portion of Glenugie Road between Kings Road and Roselle Road, and Anderson Road, Pinetown."

Annexures B7 - Scheduled Trades

SCHEDULED TRADES AND OCCUPATIONS

[PROVINCIAL NOTICE NO. 134 OF 1979.]
[DATE OF COMMENCEMENT: 22 MARCH, 1979.]

These By-laws were published in *Provincial Gazette* No. 40991 dated 22 March, 1979.

CITY OF DURBAN

SCHEDULED TRADES AND OCCUPATIONS BY-LAWS

(Editorial Note: The Scheduled Trades and Occupations By-laws have been extended to the whole area of jurisdiction of the eThekwini Municipality by MN 70 of 22 December 2005.)

The Administrator has been pleased, in terms of section 270 of the Local Authorities Ordinance, 1974 (Ordinance No. 25 of 1974), as amended, to approve of the following By-laws made by the City Council of the City of Durban: The City Council of the City of Durban has in terms of section 268 of the Local Authorities Ordinance, 1974 (Ordinance 25 of 1974); made the following By-laws—

1. No person shall erect, extend, alter or add to any building, plant or works used, or for the purpose of using them, in connection with, or shall commence to carryon, or cause or permit to be carried on, in any premises or vehicle or elsewhere in the City any of the trades, businesses, occupations or callings listed in Schedule A of these By-laws, without the written permission of the Medical Officer of Health being first obtained therefor; provided that any permission issued in terms of the Offensive Trade Regulations for the Borough of Durban, promulgated under Government Notice No. 2014 published on 15 December 1921 which permission was in effect at the date of promulgation of these By-laws shall be deemed to have been issued hereunder; and provided further that the requirements of this By-law shall not apply to buildings, plants, or works used for any such purpose and lawfully established before the promulgation of these By-laws or the aforesaid Regulations and which were utilised or carried on as at the time of such promulgations without extension, alteration, or addition.

1A. Nondiscrimination.—(1) Subject to the provision of subsection (2) hereof, no provision of these By-laws shall be applied so as to discriminate between persons on the grounds of race, religion or gender nor shall it be so construed as to have the effect of authorising such discrimination.

(2) Notwithstanding the provisions of subsection (1) hereof, discrimination on the grounds of gender may expressly be authorised in terms of any provision of these By-laws which prescribes the wearing of appropriate apparel in a public place or imposes a restriction upon the entry of persons into public ablution, toilet and changeroom facilities or prescribes different standards for such facilities.

[R. 1A inserted by MN 43 of 1992.]

2. Every person desiring such permission shall apply to the Medical Officer of Health and, unless he otherwise allows, shall submit with such application—

(1) a block plan, drawn to a scale not smaller than 1:1 000 showing the position of the premises, and all dwellings, factories and other premises within 100 metres of the boundary of the proposed premises and the use to which any such premises are put;

(2) a plan and sections to scale of 1:100 of the building proposed to be erected and used;

(3) particulars as to the nature of the trade, business, occupation or calling to be conducted; the raw materials to be dealt with; the processes to be carried on; the products thereof; and the volume, composition, and nature of all production wastes requiring disposal;

(4) particulars of the plant to be installed and the vehicles or other means of transportation to be used, including the transportation of waste materials;

(5) particulars, with any necessary explanatory drawings of the means proposed to be adopted for the disposal of, and to prevent nuisance arising from, atmospheric pollutants, effluent, stormwater, waste material, insect infestation, refuse, abnormal ,working environment, noise or vibrations;

(6) particulars of any circumstance which could cause a hazard to employees or the public;

(7) any further particulars, plans, or drawings which the Medical Officer of Health may require.

3. Except when otherwise permitted by the Medical Office of Health, the applicant shall cause a notice substantially in the form approved by the Medical Officer of Health to be published at least once in each of the official languages in English and Afrikaans language newspapers circulating in Durban; such publication shall be made during the period of 14 days immediately preceding the date on which the application is lodged and the complete page of the newspaper containing the notice shall accompany the application.

4. (1) The Medical Officer of Health after considering any objection lodged and if satisfied that no nuisance or danger to the health of the public or employees is likely to arise and that the storage, composition, transportation and disposal of all waste, either solid or liquid is acceptable to the City Engineer, may give written permission (subject to such conditions or restrictions as he may determine) for the erection or use of the buildings, plant or works and for the conduct of the trade, business, occupation or calling for the purposes set forth in the application; or he may refuse such application; such permission may be granted for an indefinite or specified period and in the latter case may on application be renewed from time to time.

(2) If requested in writing within 14 days from the date notified of the decision of the Medical Officer of Health, by an applicant whose application has been refused or an objector whose objection has been overruled, the Medical Officer of Health shall forward the relevant documents, together with his report thereon, to the Town Clerk for consideration by the Council or any Committee thereof to which this function has been delegated, which body shall have the power to direct that the application be granted or refused.

5. (1) The granting of permission under these By-laws shall in all cases be conditional on the proper construction, maintenance and use of the buildings and works and the plant and apparatus therein and on the effective prevention of any nuisance, or danger to the health of the public or employees.

(2) At any time after the granting of such permission the Medical Officer of Health or City Engineer, if satisfied that any conditions or restrictions are not being properly observed or complied with may, by notice in writing, call upon the owner, occupier or person in charge of the premises upon which the trade, business, occupation or calling is carried on to observe or comply with the aforesaid conditions or restrictions or forthwith remedy any unsatisfactory condition specified in the notice and in the event of his failing to do so or in the event of a recurrence of the nuisance or of other default, the Medical Officer of Health may suspend or withdraw any permission granted in terms of these By-laws.

6. (1) In the case of any trade, business, occupation or calling mentioned in Schedule A and established before the promulgation of these By-laws or the aforesaid Regulations, as the case may be, the Medical Officer of Health if satisfied that any nuisance or any danger to the health of the public or employees is being caused thereby may, by notice in writing, call upon the aforementioned owner, occupier or person in charge forthwith to carry out any repair or alteration, or remedy any unsatisfactory condition for the purpose of preventing a nuisance, or danger to the health of the public or employees.

(2) In the event of failure to comply with a notice, or in the event of a recurrence of the nuisance or danger as aforesaid the Medical Officer of Health may serve notice upon such owner, occupier or person requiring him within the time specified therein to discontinue the trade, business, occupation or calling.

7. If the aforementioned owner, occupier or person in charge, refuses to carry out measures for the abatement of a nuisance or condition dangerous to the health of the public or employees specified in a note under these By-laws or fails to do so within the time specified; the Medical Officer of Health may arrange for such measures to be carried out and the expenses incurred in so doing shall be recoverable by the Council from the person on whom the notice was served.

8. Any person who—

(*a*) contravenes any provision of these By-laws; or

(*b*) contravenes any conditions imposed upon the granting of any application, consent, approval, concussion, relaxation, permit or authority in terms of these By-laws; or

(*c*) fails to compy with the terms of any notice served upon him in terms of these By-laws.

shall be guilty of an offence and liable, on conviction, to the maximum penalty prescribed for the offence by section 266 (7) (*a*) of the Local Authorities Ordinance, No. 25 of 1974.

(2) Failure to comply with the terms of any condition or notice referred to in subsection (1) (*b*) or (*c*) above shall constitute a continuing offence and a person failing to comply with the terms of such condition or notice shall be guilty of a separate offence for each day during which he fails to comply with such terms.

[R. 8 substituted by PN 366 of 1983.]

SCHEDULE A

TRADES, BUSINESSES, OCCUPATIONS OR CALLINGS

Acid works

Alkali works

Ambulance service, and removal of human remains

Ammonia works and bulk transportation

Animal and fish products processing, including the manufacture of meal for animal feeding

Asbestos transportation, handling and storage, and the manufacture and bulk-storage of products containing asbestos

Asphalt plant, permanent and mobile

Battery manufacturing, reconditioning and servicing

Bitumen works, including the transportation and operation of mobile bitumen kettles

Brick and tile works

Building services contractor (as defined in the Licences and Business Hours Ordinance, No. 11 of 1973) in respect of the base premises

Carbon black manufacture

Cement products and pre-mixing works

Ceramic works

Chemical product processing, including any process involving a chemical reaction

Container washing and reconditioning works

Crematoria

Chrome and chromate works

Coal bulk-storage and handling

Distillery

Engineering works

Food manufactory

Fungicide manufacture, and bulk-handling, storage and commercial usage of fungicides

Furniture manufacture and re-conditioning

Gas works

Glass-fibre manufacture, storage, moulding and finishing

Glass works

Hazardous substances (as defined in the Hazardous Substances Act, No. 15 of 1973) manufacture and bulk-blending, transportation and storage

Herbicide manufacture, and bulk-handling, storage and commercial usage of herbicides

Hide and skin processing

Marine food processing

Mattress-maker

Metal products manufacture

Metal buffing, electroplating, enamelling and galvanising

Milling

Offensive trades (as defined in the Licences and Business Hours Ordinance, No. 11 of 1973)

Ore processing works, or handling and storage of ores

Pesticides manufacture, and bulk-handling, storage and commercial usage of pesticides

Pigment works

Plastics products works

Quarrying

Refining

Refuse collection, storage, removal, processing or disposal

Rubber moulding or vulcanising

Sand and shot blasting

Sandwinning (as defined in the Licences and Business Hours Ordinance, No. 11 of 1973)

Sewage treatment, transportation or disposal

Scrap yard

Ship building

Sludge works

Spraypainting

Stone crushing and dressing works

Stone masonry

Tannery

Teasing or shredding works dealing with coir, flock or textiles

Timber yard and works

Upholsterer

Undertaker as defined in the Licences and Business Hours Ordinance, No. 11 of 1973)

Vegetable oil extraction or processing

Waste material salvaging, collecting, sorting, storing, treating, processing or recycling/reclaiming

Welding works

Wood pulping

Yeast manufacture.

Annexures B8 - Standard Operating Procedure: Minimum Environmental Management Specifications (MEMS)

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MINIMUM ENVIRONMENTAL STANDARDS FOR CONSTRUCTION

FINAL

Document number	009-TCC-CLO-SUS-GDL-11385.26
Version number	1.0
Classification	Unclassified
Effective date	01 April2023
Review date	31 March 2025

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SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New Document		

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

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I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	**Senior Specialist: Environmental Risk and Compliance**		
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	**GM: Corporate Sustainability**		
Approves document for use. Comments:			

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1. PURPOSE

This document describes the minimum requirements for environmental management to which Contractors must comply. This document must be read in conjunction with the Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP).

In this document, unless the context clearly indicates otherwise:

- Words importing any one gender shall include the other gender;
- The singular shall include the plural and vice versa; and
- Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

This standard applies to Contractors that work on site under the authority of Transnet SOC Ltd.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles
National Water Act, 36 of 1998	Section 164, Permissible Water Use
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10 (a) and (b) Schedule 3, Defined Wastes Category A: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001

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Name	Applicable Section
	Government Notice R155 in Government Gazette 23108 of February 2002 General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15, Appendix 4
Transnet Environmental Risk Management strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Contractor	The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor
Compliance	Meeting of all the organization's regulatory requirements
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Construction Environmental Management Standard Operating Procedure	Is a document which is used to define how environmental management will be practiced on any construction site under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are enhanced

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Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment
Fauna	A group of animals specific to a certain region or time period.
Flora	A group of plants specific to a certain region or time period.
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment; and includes:- (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste;
Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Incidence/Occurrence	An undesired event occurring at work that results in physical harm to a person or death, or damage to the environment, plant and/or equipment and/or loss of production.

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Indigenous vegetation	Plants that naturally occur in an area.
Liquid waste	Waste that appear in liquid form such as used oil, grease and/or contaminated water or waste water.
Method statement	A document that describes how the Contractor will apply environmental management measures associated with a particular activity during construction.
Monitoring	Determining the status of a system, a process or an activity
Natural Vegetation	All existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Responsible Authority	A Responsible Authority, according to the National Water Act 36 of 1998, relates to specific power or authority in respect of water uses that is assigned by the Minister to a Catchment Management Agency or to a Regional Office.
Rehabilitation	Refers to measures that must be put in place to restore the site to its pre-construction or enhanced state, subsequent to construction taking place.
Scope of Work	The construction work for which the Contractor has been appointed in terms of the Contract with Transnet.
Sensitive area	Any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (e.g. archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of sensitive social receptors etc. As a minimum, habitats that fall under this definition include:

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	mountain catchments, Ramsar wetland sites, coastal shores, estuaries and endangered ecosystems.
Solid waste	All solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Spoil	Excavated material which is unsuitable for re-use as material in the Works or any other use; or is material which is surplus to the requirements of the Works.
Sub -Contractor	is a person or organisation who has a contract with the contractor to: Construct or install part of the contractors work. Provide a service necessary to provide the works; or Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.
Temporary Storage	A once-off storage of waste for a period not exceeding 90 days.
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.

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Wastewater	means water containing waste, or water that has been in contact with waste material
Watercourse	Refers to - a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

4.2 Abbreviations

Acronym	Meaning In Full
CEM SOP	Construction Environmental Management Standard Operating Procedure
CM	Construction Manager
CV	Curriculum Vitae

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Acronym	Meaning In Full
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EO	Environmental Officer
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EGF	Environmental Governance Framework
MERC	Minimum Environmental Requirements for Construction
NEMA	National Environmental Management Act 107 of 1998
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NWA	National Water Act 36 of 1998
PEM	Project Environmental Manager
PES	Project Environmental Specification
PM	Project Manager
SAHRA	South African Heritage Resource Agency

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Acronym	Meaning In Full
SDS	Safety Data Sheet
SHEQ	Safety, Health, Environment and Quality
TRANSNET	Transnet SOC Ltd

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5. MINIMUM ENVIRONMENTAL REQUIREMENTS FOR CONSTRUCTION

5.1 Tender Documents

Any construction-related tender issued to the market must include:

- Transnet Integrated Management SystemS Policy Statement;
- The Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP);
- The Transnet Minimum Environmental Requirements for Construction (MERC); and
- The Project Environmental Specification (PES).

Any construction-related tender must be recommended for issue by the Transnet Project Environmental Manager/Transnet Environmental Officer before it is released to the market.

5.2 Project Environmental Specification (PES)

Must incorporate all relevant recommendations of the Environmental Impact Assessment (EIA) and other environmental studies for the project and the relevant conditions of the EA and/or other applicable environmental permit(s) and licence(s), and the Transnet Operating Division's Environmental Management requirements (where applicable) into an environmental performance specification for implementation during the construction phase of the project.

The PES need not be a separate document; however it can be in a format of an appendix/addendum making reference to environmental authorisation(s), permit(s) or licence(s) applicable to the project. In cases where the project does not trigger any of the NEMA listed activities or any permit(s)/licence(s); the PES may be compiled to prescribe additional environmental management measures over and above the measures stipulated in the MERC.

5.3 Contractor's Environmental Policy

The Contractor's Environmental Policy must be signed and dated by Top Management.

The content of the Contractor's Environmental Policy must:

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- be appropriate to the purpose and context of the Contractor's organization, including the nature, scale and environmental impacts of its activities, products and services;
- provide a framework for setting environmental objectives;
- include a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the Contractor's organization;
- include a commitment to fulfil compliance obligations; and
- include a commitment to continual improvement of the Contractor's environmental management system to enhance environmental performance

5.4 Contractor's Environmental Management Plan (EMP)

The Contractor's EMP must include:

- the name of the person who compiled the EMP;
- the expertise of the person who compiled the EMP, including a CV;
- a description of the Contractor's scope of work;
- a detailed description of the environmental aspects related to the Contractor's scope of work;
- a map at an appropriate scale which depicts all construction activities including associated structures, and infrastructure and environmental sensitivities affected by the construction footprint , as well as no go-areas and associated buffers;
  - The map must include the following:
  - an accurate indication of the project site position as well as the positions of the alternative sites, if any;
  - road names or numbers of all the major roads as well as the roads that provide access to the site(s)
  - a north arrow;
  - a legend;
  - the prevailing wind direction;
  - site sensitivities, including but not limited to vegetation, wetlands, watercourses, heritage sites, critical biodiversity area/s, World Heritage Site, etc. and it must be overlaid by the study area; and

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  - GPS co-ordinates (Indicate the position of the proposed activity with the latitude and longitude at the centre point for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should be to at least three decimal places. The projection that must be used in all cases is the WGS-84 spheroid in a national or local projection).
- a description of the impacts and risks that need to be avoided, managed and mitigated during the execution of the Contractor's scope of work including (as relevant);
  - planning and design;
  - pre-construction activities;
  - construction activities;
  - rehabilitation; and
  - operation of Transnet assets.
- a description and identification of impact management outcomes required for the identified aspects;
- a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved, and must, where applicable, include actions to:
  - avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - comply with any prescribed environmental management standards or practices; and
  - comply with any applicable local, provincial and national legislation.
- the method of monitoring the implementation of the impact management actions contemplated above;
- the frequency of monitoring the implementation of the impact management actions contemplated above;
- an indication of the persons who will be responsible for the implementation of the impact management actions;
- the timeframe within which the impact management actions contemplated above must be implemented;
- the mechanism for monitoring compliance with the impact management actions contemplated above;

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- a program for reporting on compliance, taking into account the requirements of this document;
- an environmental awareness plan describing the manner in which:
    - the Contractor intends to inform his employees of any environmental risk which may result from his scope of work; and
    - risks must be dealt with in order to avoid pollution or the degradation of the environment.
- any specific information that may be required by Transnet.

5.5 Contractor's Environmental Officer (EO)

The Contractor's EO should have relevant environmental qualifications and experience required for the project. The level of qualifications and experience must be in line with the complexity of the Contractor's scope of work coupled with the sensitivity of the site. The level of competency will be determined by Transnet during tender.

5.6 Management of Sub-Contractors

The Contractor must ensure that all his sub-contractors comply with this document in so far as it relates to their specific scope of work or services.

5.7 Pre-Site Access Environmental Governance

The Contractor must appoint the EO recommended in his tender proposal. Should the EO no longer be available, the Contractor must submit a CV of an alternative EO with similar or better qualifications and experience for approval by the Transnet PM and PEM. The same principle will apply if the Contractor's EO is replaced for whatever reason at any stage. No construction may take place without a duly appointed Contractor's EO.

The Contractor must provide his EO with all environmental documents provided by Transnet during tender and submitted as a part of the Contractor's proposal.

The Contractor must obtain the contact details of the responsible Transnet PEM and Transnet EO and provide these details to his EO.

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The Contractor's EO must develop an appropriate environmental file for approval by the Transnet EO, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):

- Documents from the tender as described above.
- His CV.
- An organogram indicating reporting lines of all Contractor's staff (with names included).
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's Construction Manager (CM); Contractor's EO; and all relevant emergency personnel.
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels.
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheets (MSDS)/ Safety Data Sheet (SDS); quantity on site; storage method; transport method to site; and period to be used on site. All substances listed must have MSDS/ SDS on site in the environmental file.

The MSDS/ SDS should contain the following minimum requirements:

- Section 1: Product and company name
- Section 2: Hazard identification
- Section 3: Composition/information on ingredients
- Section 4: First aid measures
- Section 5: Fire fighting measures
- Section 6: Accidental release measure
- Section 7: Handling storage
- Section 8: Exposure controls/personal protection
- Section 9: Physical and chemical properties
- Section 10: Stability and reactivity
- Section 11: Toxicological Information
- Section 12: Ecological Information
- Section 13: Disposal Consideration

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  - Section 14: Transportation
  - Section 15: Regulatory Information
  - Section 16: Other Information
- Photographic pre-construction report that details the site before any activities commence.
- Site Layout Plan indicating but not necessarily limited to,: access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled.
- A site establishment method statement (minimum requirements for method statements are described below in this document).
- Environmental Induction Material to be used to educate site staff and visitors (minimum requirements for environmental induction are described below in this document).
- An activity-based environmental risk assessment.

The Contractor's EO must submit the environmental file for acceptance to the Transnet EO.

The Contractor must obtain a Site Access Certificate from the Transnet PM before accessing the site.

5.8 Safety Data Sheets

Each hazardous substance used on site must have a valid SDS. The SDS must comply with the requirements of the Occupational Health and Safety Act, 85 of 1993.

5.9 Environmental Induction

The Contractor will ensure that all management, foremen and the general workforce, as well as all sub-contractors, suppliers and visitors to site have attended the Transnet Environmental Induction Programme prior to commencing any work on site. Where new personnel commence work on site during the construction period, the Contractor will ensure that these personnel also undergo the Transnet Environmental Induction Programme and are made aware of the environmental specifications on site.

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The Contractor must ensure that all of his personnel understand the requirements of the CEM SOP; MERC; EA, EMPr, relevant permits and licences and PES as relevant to their scope of work.

5.10 Environmental Method Statements

- Environmental Method Statements as identified by the Transnet EO based on the Contractor's activity-based environmental risk assessment will be written submissions by the Contractor to the Transnet CM and EO describing:
- The proposed activity, setting out the plant, equipment, materials, labour and method the Contractor proposes using to carry out an activity;
- The environmental management of site conditions – waste management, housekeeping, site establishment etc;
- Transportation of the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Description of potential positive and negative environmental impacts and how they will be managed;
- Conformance/ non-conformance with this document and any other statutory and best practice standards;
- Monitoring and reporting requirements;
- Records Management; and
- Any other information deemed necessary by the Transnet CM and Transnet EO as well as ECO where applicable.

The Environmental Method Statements will enable the potential positive and negative environmental impacts associated with the proposed construction activity to be identified and mitigation measures put in place. All method statements must be signed by the Contractor, Transnet CM and EO, with the addition of the ECO on authorized projects, thereby indicating that the works will be carried out according to the methodology described therein.

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Activities may only commence once the Environmental Method Statements have been approved by the Transnet CM, Transnet EO and ECO (where relevant). In some instances, local authorities may also need to approve the method statements. This will be highlighted in the Project Environmental Specification, where applicable.

All changes to the original Environmental Method Statements must be approved by the Transnet EO and Transnet CM prior to implementation.

To enable timely approvals, the environmental method statements will be submitted to the Transnet CM and Transnet EO for review two (2) weeks prior to the intended date of commencement of the activity, or as directed by the Transnet Project Manager/CM.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the CM and PEM, ECO or EO.

NOTE: No advice, approval of method statements or any other form of communication from Transnet will be construed as an acceptance by Transnet of any obligation that indemnifies the Contractor from achieving any required level of performance. Further, there is no acceptance of liability by Transnet which may result from the Contractor failing to comply with the specifications, i.e. the Contractor remains responsible for achieving the required performance levels.

5.11 Environmental Occurrences (Incidents)

The Transnet EO shall provide the Contractor with the procedure to follow in managing environmental occurrences during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet EO and maintain required records thereof.

In the event of an environmental occurrence, the Contractor must, as soon as is reasonably practicable:

- classify an environmental occurrence in line with the Transnet Environmental Management Occurrence process flow;

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- take all reasonable measures to contain and minimise the effects of the occurrence, including its effects on the environment and any risks posed by the occurrence to the health, safety and property of persons;
- undertake cleanup procedures;
- remedy the effects of the occurrence; and
- assess the immediate and long-term effects of the occurrence on the environment and public health

5.12 Environmental Non-Conformances (Defects)

Environmental Non-Conformances shall be handled as per the terms and conditions of the Contract.

The Transnet EO shall provide the Contractor with the procedure to follow in managing environmental non-conformances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet EO and maintain required records thereof.

The Transnet Project Manager shall ensure that all Non-conformances are appropriately closed out within the timeframe specified in the Non-Conformance Report.

Any environmental non-conformance will be dealt with similarly to a Defect as defined in the Contract. A defect is due to non-compliance with the Works Information and it is the responsibility of the Contractor to correct the defect in order to ensure that the work takes place in accordance with the Works Information. Similarly, non-conformance/non-compliance with any other permit or licence will be regarded as a non-conformance with the Works Information. The Contractor is responsible for rectifying any defect (non-conformance) as defined above promptly.

The Contractor's EO shall be responsible to search for and identify non-conformances with the environmental specifications at inspection intervals agreed to with the Transnet EO. The Transnet EO shall also undertake such inspections on a monthly basis. If such monthly inspections indicate that any part of the Contractor's work is non-conformant with the environmental requirements, the Transnet EO shall advise the Transnet PM to issue a Defects Notification to the Contractor accordingly. The Contractor shall correct the non-

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conformance (defect) within the timeframes specified in the report and notification and submit proof of such correction to the Transnet EO.

The Transnet EO shall not recommend that a Site Closure Certificate be issued to the Contractor if any non-conformances have not been properly closed out. In such an event, the Transnet Project Manager may also make use of any reasonable contractual means to rectify the non-conformance(s) as allowed by the Contract (retention moneys etc.).

5.13 Community Grievances (Public Complaints)

The Transnet EO shall provide the Contractor with the procedure to follow in managing community grievances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet EO and maintain required records thereof.

5.14 Environmental Inspections and Audits

Environmental inspections and audits may be conducted using five basic techniques:

- Interviews with Contractor's staff including Sub-contractors and suppliers;
- Document review;
- Observations;
- Monitoring; and
- Measurement and verification.

Table 1 sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such inspections/audits, the inspector/auditor and the inspected party/auditee. It should be noted that the list is not exhaustive and that each site will have specific issues that will need to be inspected/audited.

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Table 1: Details on Environmental Inspections/Audits (where Transnet is the Inspected Party/Auditee, respective Contractors must give full cooperation).

Place	Inspector/Auditor	Inspected Party/ Auditee	Inspection/audit frequency
Construction Site	Contractor's Environmental Officer	Contractor	Daily/Weekly Inspection
Project (including all construction sites).	Transnet Environmental Officer/Project Environmental Manager	Contractor	Monthly Inspection
Project (including all construction sites)	Transnet Environmental Specialist: Assurance	Transnet Project Environmental Manager	As stipulated on the annual audit plan
Project (as defined in Environmental Authorisation)	Environmental Control Officer	Transnet (represented by Transnet Environmental Officer)	As stipulated in the Environmental Authorisation
Project (as defined in Water Use Authorisation)	Independent Auditor	Transnet (represented by Transnet Environmental Officer)	As stipulated in the Water Use Authorisation

The Contractor's EO will be required to conduct inspections of all work areas for which the Contractor is responsible, at intervals agreed to with the Transnet EO. Monitoring shall be

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conducted as per the Contractor's approved EMP and all required records shall be maintained by the Contractor.

The Transnet EO will be required to conduct inspections of all work areas for which the Contractor is responsible on a monthly basis or at intervals agreed to with the Transnet Project Environmental Manager. Monitoring shall be conducted as per the Project Environmental Specification. The Inspection Checklist to be used shall be approved by the Transnet PEM prior to each inspection.

5.15 Contractor's Environmental Performance

The Transnet EO will explain how the Contractor's performance will be scored during pre-site access governance to the Contractor's EO. The standard/minimum requirement for all environmental inspections will be 90%.

5.16 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, eating areas and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas; the buffer to be determined by the ecological requirements of the fauna/flora found on-site.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from any watercourse.

5.16.1 Site Layout Plan

The Site Layout Plan must as a minimum include but not limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas;
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluent;
- Proposed areas for the stockpiling of topsoil and excavated spoil material;
- Demarcation of the construction footprint including areas not to be disturbed by the development;

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- Location of sewage and sanitary facilities at the site offices and staff accommodation at all localities where there will be a concentration of labour.

Any changes to the location of the facilities and site activities as per the approved site layout plan shall be re-submitted to the Transnet CM and Transnet EO for approval prior to implementation.

The Contractor may be required to submit a separate layout plan dealing only with his site camp. If so this will be specified in the PES.

5.16.2 Identification and Establishment of Suitable Access Routes/Roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimize erosion and dust generation.

5.16.3 Demarcation of Site Limits

Prior to the commencement of construction, the site must be clearly demarcated by means of visible barriers. Vegetation within the demarcated zone may be cleared only upon obtaining approval from the Transnet EO. No activities are allowed outside of the approved footprint on the Site Layout Plan.

5.16.4 Eating Areas

The Contractor is responsible for providing adequate eating facilities within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags/bins must be provided at all established eating areas and when full it should be disposed of appropriately.

5.16.5 Liquid Waste Management

Liquid waste water from site shall be stored on-site in a properly designed and constructed system, situated so as not to adversely affect water courses. Only domestic type wastewater, i.e. toilet, shower, basin, kitchen water shall be allowed to enter the designated system.

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5.17 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities including toilets, toilet paper, wash basins etc. to all workers on site and for enforcing the proper use of these facilities.

Toilet facilities shall be serviced regularly and the waste material generated from these facilities shall be disposed of at a registered waste water treatment works/macerator and relevant permits for transportation of waste and proof of servicing and disposal shall be maintained.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on site, and away from sensitive areas. Use of open areas (i.e. the veld) is not allowed. For projects of high mobility a mobile toilet facility shall be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. Toilets must not be placed in areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet CM.

5.18 Waste Management

Waste shall be grouped into "**general**" or "**hazardous**", depending on its characteristics. The classification shall determine handling methods and the ultimate disposal of material.

General waste which is likely to be generated on site during construction include but not limited to the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel;
- Uncontaminated construction debris such as used wood and scrap metal; and
- Uncontaminated soil and non-hazardous rubble from excavation or demolition.

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The Contractor shall classify all waste expected to be generated during the construction period. Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

Waste	Classification	
	Hazardous	**General**
Aerosol containers	**X**	
Batteries, light bulbs, circuit boards, etc.	**X**	**X**
Clean soil		**X**
Construction debris contaminated by oil or organic compounds	**X**	
Domestic waste		**X**
Empty drums (depends on prior use)	**X**	**X**
Empty paint and coating containers		**X**
Explosive waste	**X**	
PCB waste	**X**	
Rubble (not contaminated by oil or organic compounds)		**X**
Waste Cable		**X**
Waste plastic		**X**
Waste paint and/or solvent	**X**	
Waste oil	**X**	
Waste concrete		**X**
Waste cement powder	**x**	
Waste empty cement bags (must be thoroughly decanted)		**x**
Waste containing fibrous asbestos	**X**	
Waste timber		**X**
Sewerage sludge	**X**	
Scrap metal		**X**

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Waste	Classification	
	Hazardous	**General**
Chemically-derived sanitary waste	**X**	

Waste will be managed in accordance with the Waste Management Hierarchy depicted in Figure 1 below:

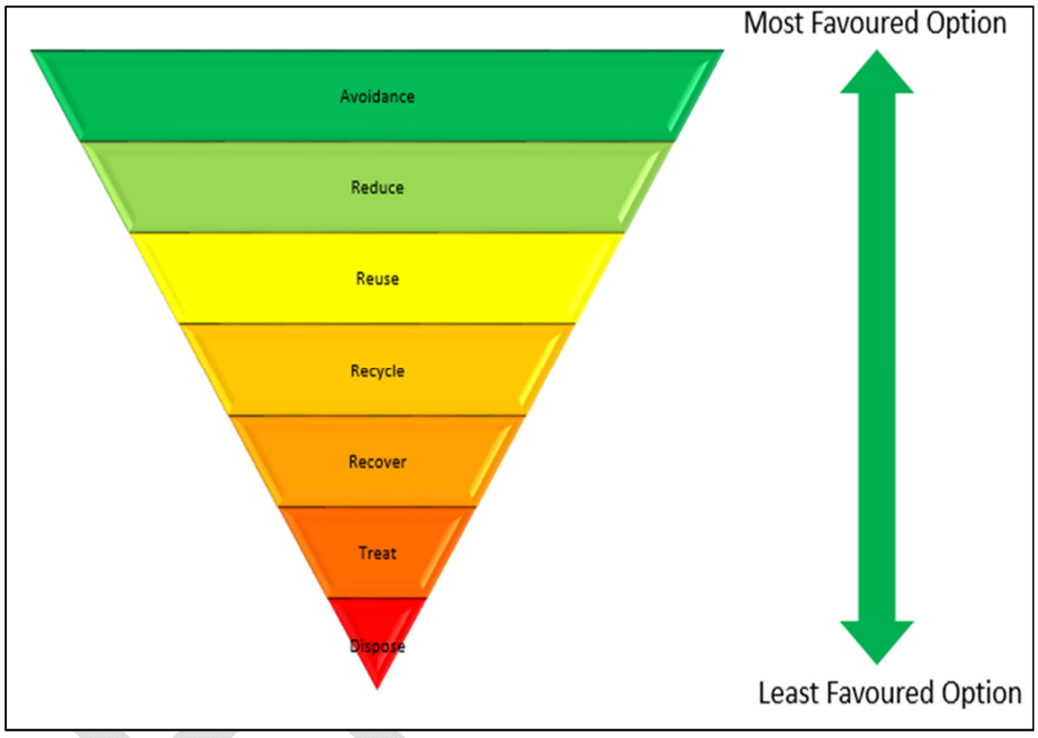


FIGURE 1: THE WASTE MANAGEMENT HIERARCHY

(Transnet Environmental Risk Management strategy and Framework, 2015:42)

1. **Avoidance/Prevention:** using goods in a manner that minimises their waste components
2. **Reduction/Minimisation:** reduction of the quantity and toxicity of waste generated during construction
3. **Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties

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4. **Recycling:** separating articles from a waste stream and processing them as products or raw materials
5. **Recovery:** reclaiming particular components or materials, or using the waste as a fuel
6. **Treatment:** processing of waste by changing its form or properties in order to reduce toxicity and quantity
7. **Disposal:** burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste generated from site. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: http://sawic.environment.gov.za/).

The Contractor shall manage **GENERAL WASTE** that is anticipated to be generated by operations as follows:

- Notify waste hauler when container is full so that it can be removed and replaced with an empty container/skip;
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor;
- Provide documented evidence of proper disposal of waste (Waste Disposal Certificate)

The Contractor shall recycle **GENERAL WASTE** (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them at secure designated locations on site:
  - Office Waste;
  - Aluminium;
  - Steel;
  - Glass;
  - Ferrous Metals;

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  - Non Ferrous Metals; and
  - Waste Timber
- Establish recycled material collection schedule;
- Arrange for full bins to be hauled away;
- Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling; and
- No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall manage **HAZARDOUS WASTE** anticipated to be generated by his operations as follows:

- Obtain and provide an acceptable container with correct and visible classification label;
- Place hazardous waste material in allocated container;
- Inspect the container on a regular basis as per the Contractor's EMP;
- Track the accumulation time for the waste, haul the full container to the registered hazardous disposal site;
- Notify the waste hauler when container is full so that it can be removed and replaced with an empty container/skip; and
- Provide documented evidence of proper waste disposal of the waste (Waste Disposal Certificate).

The Contractor shall maintain the following waste records for submission to the Transnet EO on request:

- Date of waste management activity;
- Activity Type (reuse, recycle, recover, treat, dispose);
- Description (e.g. contaminated soil, medical waste, tyres, plastic, domestic waste etc.)
- Classification (General/Hazardous);
- Estimated Quantity in kilograms
- Disposal Site Name and Reference Number (where relevant);
- Method of Transport; and
- Signed Collection or Disposal Records

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5.19 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refueling of plant on site must be done at designated locations approved on the Site Layout Plan. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities.

All machinery servicing areas must be bunded. Stationary plant that leak harmful substances shall not be permitted on site. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided and the wastewater should be disposed of appropriately in accordance with its waste classification.

5.20 Vehicle and Equipment Refueling

5.20.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refueled on site except at designated servicing or refueling locations included on the approved Site Layout Plan.

The Contractor shall provide details of his refueling activities in his EMP or Refueling Method Statement. Facility design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

5.20.2 Mobile Refuelling

In certain circumstances, the refueling of vehicles or equipment in a designated area is not a viable/practicable option and refueling has to be done from a tank, truck, bowser or container moved around on site. In such circumstances, the Contractor may request approval from the Transnet CM to conduct mobile refueling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.

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- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refueling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refueling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling equipment must be stored in areas where they are not susceptible to collisions.
- Mobile refueling operations shall not take place within 30 meters of any watercourses or 7.5 meter from other structures, property lines, public ways or combustible storage.

All mobile refueling tanks are to be properly labelled and fire extinguishers with valid service dates shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

5.21 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental features.

The Contractor shall have an approved Spill Response Plan, either in his EMP or in the form of a method statement approved by the Transnet CM and Transnet EO.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- All plants to be inspected daily to ensure that they are in good condition;
- Immediately repair all leaks of hydrocarbons or chemicals;
- Take all reasonable measures to prevent spills or leaks;
- Do not allow sumps receiving oil or oily water to overflow;
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals; and
- Do not discharge oil or contaminants into storm water or sewer systems.

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill;

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- Contain the spill;
- Recover the spilled product;
- Remediate the site;
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water; and
- Manage the contaminated material in accordance with Waste Management requirements in this document.

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it;
- Notify the appropriate on-site authorities;
- Implement actions necessary to prevent the spread of the contamination by deploying appropriate absorbent material;
- Recover the spilled product; and
- Manage the contaminated material in accordance with Waste Management requirements in this document. Water samples to be taken downstream from where the spill took place to trace the extent of pollution.

All spills must be recorded as occurrences and managed in accordance with the requirements for Occurrences in this document.

5.22 Spray Painting and Sandblasting

Spray painting and sandblasting must be kept to a minimum. All painting must, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or as per the approved EMP or Method Statement.

The relevant Contractor will inform his EO when and where spray painting or sandblasting will be carried out prior to commencement of work. The Contractor's EO will monitor these activities to ensure that adequate measures are taken to prevent contamination.

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Sand may only be acquired from approved commercial sources and in instances where sand is collected from the natural surrounds, such collection must be approved by the Transnet EO.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval by the Transnet EO.

5.23 Dust Management

The usage of water for dust management will be minimized as far as practically possible. Discretion must be applied in this regard especially relating to drought conditions. Only water from approved sources may be used. Dust control measures must be approved by the Transnet EO prior to commencement of the Works.

The following minimum dust management practices must be implemented on site:

- Vehicles must be operated within speed limits, where no speed limit has been specified, the limit shall be 40km/h;
- Haulage distances must be minimized as far as reasonable practicable;
- Where water suppression is insufficient or impractical, environmentally friendly soil stabilizers must be used;
- Stockpiles and open areas that may cause dust must be stabilized and vegetated where required;
- Dust suppression measures must be implemented on inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more);
- Disturbance of natural vegetation must be minimized to reduce potential erosion, runoff, and air-borne dust;
- Material in transit must be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage or creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin;

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5.24 Storm Water and Dewatering Management

Apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertilizer from rehabilitated areas, etc.

Discharges to controlled waters such as the sea, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established and maintained on site during the construction period until permanent drainage is in place. Secondary drainage that prevents erosion must be provided, where necessary.
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- Stagnant water shall be cleared at a frequency approved by the Transnet EO.
- Any surface water flows off-site must be approved by the Transnet EO. Where necessary, silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- The removal from groundwater is defined as a water-use under the National Water Act 36 of 1998. Therefore, it must be ensured that the project has been authorised by the Responsible Authority to remove and discharge groundwater prior to dewatering taking place. If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities.
- On-site drainage shall be accomplished in accordance with a plan approved by a suitably qualified civil engineer.

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5.25 Erosion Control

Erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include, but not limited to the following:

- Activities must be scheduled to minimise the extent of disturbance of an area at any one time;
- Re-vegetation must be implemented as early as feasible;
- Construction traffic must be properly managed and controlled;
- Areas must be graded to the extent feasible at drainage ditches;
- Loose soil will be compacted as soon as possible after excavation, grading, or filling;
- Silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins must be used;
- The transport of sediment must be minimised;
- An erosion and sedimentation control plan must be developed, approved by the Transnet EO and communicated to staff; and
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

5.26 Noise Management

- The following specific measures are required:
- Keep all equipment in good working order;
- Operate equipment within its specification and capacity and don't overload machines;
- Apply regular maintenance, particularly with regards to lubrication;
- Operate equipment with appropriate noise abatement accessories, such as sound hoods;
- Relevant stakeholders shall be notified of any excessive noise-generating activities that could affect them;
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, so that it will not produce excessive or undesirable noise when released;

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- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, for construction plant noise generation
- Contractor's vehicles shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road.
- If on-site noise control is not effective, protect the victims of noise by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

5.27 Protection of Heritage Resources

5.27.1 Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Transnet CM and Transnet EO of such a discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority is to be contacted and will appoint an Archaeologist to investigate the find. Work may only resume once clearance is given in writing by the Archaeologist.

5.27.2 Graves

If a grave is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the grave shall be stopped and the Transnet CM and EO informed of the discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

5.28 Fire Prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose.

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A firebreak shall be cleared and maintained around the perimeter of the camp and office sites where and when necessary. In cases where construction is taking place in a Critical Biodiversity Area as listed under NEM:BA; it must be ensured that the requirement of a firebreak is screened against the NEMA Listing Notice 3 to confirm legislative requirements.

All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

5.29 Water Protection and Management

No water shall be abstracted from any water course (stream, river, or dam) without the expressed permission of the Transnet CM and Transnet EO. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

Method Statement(s) must be prepared by the Contractor for the various water uses. The Contractor shall keep a record of the quantities of water used on-site during construction (including use by sub-contractors), irrespective of the purpose of use.

5.30 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site, an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

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The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

5.31 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the Contractor's EO for a solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis (depending on project requirements) and keep record of all the environmental related training of the personnel.

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5.32 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet CM and Transnet EO.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts. Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab. Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. It is acknowledged that all waste water will evaporate; it must be ensured that the remaining water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste at an authorised hazardous waste management facility.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the approved washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated and approved by the Transnet CM and EO for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and

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must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a relevant registered disposal facility and SDCs kept on the file. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained by the Contractor and filed in the Green file.

5.33 Stockpiling, Soil Management and Protection of Flora

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated. Sensitive areas shall be cordoned off and avoided in this regard.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible when and where necessary. The detail of vegetation clearing shall be subject to the Transnet CM's approval and shall occur in consultation with the Transnet EO.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials. Stockpiled soil shall be protected by adequate erosion-control measures. Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation. Stockpiles containing topsoil shall not exceed 2m in height unless otherwise permitted by Transnet.

Topsoil shall be stockpiled separately from other materials and prevented from movement. Excavated subsoil, where not contaminated, must be used for backfilling, if possible, and topsoil for landscaping and rehabilitation of disturbed areas. Where topsoil

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has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

No vegetation located outside the construction site shall be destroyed or damaged. As far as is reasonably practicable, existing roads must be used for access to the site. Before site clearance takes place, vegetation surveys must be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities. The development of new embankments or fill areas must be undertaken in consultation with the Transnet EO.

No dumping of solid waste or refuse shall be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

5.34 Traffic Management

Vehicles usage is permitted only on access roads. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint.

The Contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

5.35 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the SOP CM and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover, where ADTs are not utilised, to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

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5.36 Borrow Pits and Quarries

The Contractor shall ensure that suppliers of rock and sand raw materials are in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless the borrow pit has a valid permit, he has obtained written approval from the Transnet CM and Method Statement has been submitted and approved. The Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, rehabilitation, safety and noise levels).

5.37 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet SOC Ltd in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet CM.

No activity on private property shall be allowed without written consent by the relevant landowner and Transnet CM/Transnet EO.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet CM, the Transnet EO and the land-owner.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site and signs reflecting such shall be displayed on the notice boards.

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5.38 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Kilowatt Hours)
- Fuel consumption (to be measured in liters)

5.39 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced, bunded and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet CM and EO.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area.

Hazard signs indicating the nature and volume of the stored materials shall be displayed on the storage facility or containment structure.

Weigh bills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet EO.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

Information on each hazardous substance will be available to all persons on site in the form of MSDS/SDS. Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's EO must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

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5.40 Housekeeping

The Contractor must ensure proper housekeeping of the site for the duration of the project. If practical the contractor shall amongst construction personnel, assign one to be responsible for good housekeeping

Materials shall be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

5.41 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. Where applicable, rehabilitation must be in line with the measures outlined in the Project Environmental Specification. A rehabilitation plan will be submitted to the Transnet CM and EO for approval at least six weeks before project completion. The following, but not limited are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use;
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified Botanist/Horticulturist should be sought in developing this list;
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc.);
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful); and
- Procedures for the prevention of the establishment and spread of alien invasive species.

5.42 Documentation and Records Management

The Contractor's EO will complete and maintain copies of all documents and records and ensure that these documents and records are kept up to date.

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The Contractor's EO will submit these documents to the Transnet EO on a frequency as agreed to with the Transnet EO, except where documents have remained unchanged in which case written notification to this effect must be provided to the Transnet EO. The Contractor's EO must ensure that electronic copies of these documents are saved on the Transnet system.

Once the construction activities have been completed and the Transnet EO has conducted a site closure inspection and notified the Contractor that site closure will be granted, all documents described above must be handed over to Transnet after which a Site Closure Certificate will be issued by the Transnet Project Manager.

NOTE: All documents/records are to be retained, within the Transnet Document Control System, for a period of 10 years. In the event of environmental documentation/record being lost before receiving a Site Closure Certificate, the Contractor will be penalised according to the specifications laid down in the Contract.

6. RECORDS

Refer to CEM SOP.

7. ANNEXURES

None.

FINAL

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Annexures C - Contractor Documentation Submittal Requirements

Transnet National Ports Authority
Contractor Documentation Submittal Requirements
DOC-STD-0001

Prepared By:	Janine Petersen Lead Document Controller	01.04.2025 Date
Reviewed By:	Cliff Phakathi Acting Executive Manager Technical Support Services	07 May 2025 Date
Approved By:	Thamsanqa Kunene Acting General Manager Infrastructure	08 May 2025 Date

00	20/02/2025	For Use
A	08/10/2024	For Internal Review

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1. Purpose

This standard outlines the documentation requirements that are to be implemented by the *Contractor* for the preparation, submission, receipt, review, and collection of Technical and (or) Deliverable Documentation, as detailed in the Contractor Documentation Register (CDR).

Contractor documentation is of the utmost importance for all project activities as the information contained in the *Contractor's* documentation interfaces with several other disciplines for the project, e.g., Quality, HS, ENV, Construction, Engineering..

The supply of high-quality documentation within the time required as defined in the '*Works Information'*, Contractor Documentation Register (CDR), and *Contract* must be considered as one of the main objectives by the *Contractor*.

2. Scope

This scope defines the *Contractor's* responsibilities in terms of the preparation of all the *Contractor* Deliverables required for each *Contract*.

3. References

- ISO 9001:2015 - Quality Management Systems Requirements
- SANS 10111 - Code of Practice for Engineering Drawings
- SANS 10143 - Building Drawing Practice
- DOC-FAT-0004 - Contractor Documentation Register (CDR)
- DOC-FAT-0002 - Squad Check Form

4. Definitions / Abbreviations

4.1 Definitions

'As-Built' Document	Is a final record of what was actually installed / constructed according to the Fabrication / Construction *Contractor*, and includes all deviations or changes from the approved AFC document(s). As-Built document(s) are required to reflect the same degree of detail as the original document(s). As-Built document(s) shall be done by all *Contractors*.
Contract	Formal document evidencing agreement between *Employer* and *Contractor* for supply of on site or off site services (generic term used for Purchase Orders, Contracts and Service Orders in this Procedure).
Contractor	The party to a contract that provides services to the *Employer* (generic term used for Vendors, Suppliers, Contractors, Consultants, etc.).
Controlled Document	Any document where its revision and distribution are recorded to ensure that Project Team Members holding a copy of the document have the current revision, and will receive future revisions, subject to a formal review and approval process.
Documentation	Collective term used to describe drawings and documents, e.g., letters, faxes, drawings, specifications, reports, manuals, standards, publications, software, etc.
Document Control	The function that ensures systematic registration, distribution, retrieval, status reporting, and storage of revision controlled documentation, typically Technical and (or) Deliverable documentation.
Document Management	Is the over-arching term used to describe the management of documentation on a Project.

Employer	The party to a Contract or Purchase Order to whom the goods are supplied or for whom the work or services are performed. For this project Transnet Capital Projects is the *Employer.*
Employer's Documentation	Shall mean all documentation issued to *Contractors* by the Project.
Engineering Deliverables	Technical documentation generated by Engineering, i.e. drawings, drawing registers, Engineering Document Registers, calculations, requisitions, equipment lists, design specifications, etc.

4.2 Abbreviations

AB	As-Built / Recorded Documentation
AFC	Approved For Construction
CDR	Contractor Documentation Register
DC	Document Control
DCIS	Document Control Instruction Sheet
EDMS	Electronic Document Management System
FN	Final
RE	Responsible Engineer

5. Responsibilities

5.1 *Contractor*

The *Contractor* is responsible for submitting all documentation, required by the Contract, via Document Control to the relevant *Project Manager*, to comply with the requirements of this standard.

The *Contractor* is responsible for setting up and maintaining his own internal Document Control Process to ensure traceability and accountability for all information submitted to the *Project Manager*, and all information issued to Sub-Contractors.

5.2 *Sub-Contractors*

The *Contractor* is responsible for providing the *Sub-Contractors* with all the relevant information, and for ensuring that the *Sub-Contractors* applies the Standard, and submit their data via the *Contractor* for formal submission to the *Project Manager*. (If the *Contractor* sub-contracts work, he is responsible for providing the Works as if he had not sub-contracted.

6. Procedure

6.1 Documentation to be Submitted

6.1.1 Contractor Deliverable Register (CDR) – (DOC-FAT-0004)

The CDR states the Employer's requirement.

The *Project Manager* completes the Contractor Documentation Register (CDR) and includes it with the Enquiry and Contract as an attachment / annexure to the 'Works Information' document. The *Contractor* submits documentation as required by the Contractor Documentation Register (CDR), within the time specified in the Contract. All documentation shall be submitted according to the dates specified in the Contractor Documentation Register (CDR).

The Contractor Documentation Register (CDR) is a list of documentation that the Contractor is to submit in accordance with the Contract.

The CDR will include the documentation deliverables to be submitted by the Contractor as per the agreed submission dates.

The title of the documentation shall adequately define and describe the facility and equipment where applicable. The Contractor Documentation Register (CDR) must be submitted within 2 weeks of the *Contract* kick-off meeting, unless otherwise indicated in the kick-off meeting. Once the Contractor Documentation Register (CDR) is submitted, the Document Control assigns document numbers to each document. The Contractor Documentation Register (CDR) is reviewed and returned to the *Contractor* as defined elsewhere in this Standard. The *Contractor* is to use the exact document numbers and titles as provided and listed on the Contractor Documentation Register (CDR), on each of the documents.

The Contractor Documentation Register (CDR) is a 'live' document that shall be updated and re-submitted by the *Contractor* as agreed at the kick-off meeting to reflect any changes made, e.g., updated planned / actual submission dates or addition of new documents requiring new numbers. Changes to a row(s) of the register shall be highlighted in colour across the entire row(s).

The Contractor Documentation Register (CDR) shall be submitted in Excel (electronic format) upon each submission to the Project, and shall also be submitted with the final documentation, unless otherwise agreed.

The forecast and actual submission dates shall reflect the dates of the next issue of the documentation, and once this submission reaches conclusion the dates are to be updated to reflect the next issue, i.e., the as-built documentation submission dates.

6.2 Format in which Documentation is to be submitted

This Standard is to encourage all documentation to be managed and submitted electronically, with the exception of any provisions highlighted in the works information. The *Contractor* can apply to the *Project Manager* to have these requirements changed to accept paper copies of all documentation.

6.2.1 Documentation with Multiple Sheets

6.2.1.1 Drawings

If a series of drawings of a particular area is produced by the *Contractor* (e.g., loop diagrams which may have fifty (50) or more sheets) one sequential drawing number shall be used with a series of sheet numbers.

Where more than one sheet is used, the first sheet (numbered 01) shall incorporate an index for all the other sheets in the series, including their current revision status and date.

6.2.1.2 Documents

The *Contractor's* documents with several sheets (e.g., data sheets, reports, etc.) shall be compiled as sets, i.e., a multi sheet document identified as a single document with a single document number. Thus, each sheet is identified individually, e.g., "sheet 10 of 15" and all documents shall be numbered from page 2 onwards.

Each set shall include a Table of Contents and the identification data shall as a minimum contain the following, i.e., the document number, revision number, page number and continuation information shall appear on every page of the multiple page documents. The front sheet of each document shall be page 1; however the number or wording "page 1" is not shown on the first page.

6.2.2 Details Required on Documentation

Each drawing and document shall be identified with the following information, i.e.,

- Project Name and Number
- Contract Number
- Equipment Tag Number(s) (if applicable)
- Manufacturer's model / type (if applicable)
- Official Name of *Contractor's* Company
- *Contractor's* Reference Number
- Project Document or Drawing Number
- Electronic File Name (identical to the *Employer's* Document or Drawing Number and not the *Contractor's* Document or Drawing Number)

- Identification and signature of Originator, Checker, Approver, PR Eng, etc.
- Complete Descriptive Title
- Revision
- Date

6.3 Electronic Documentation Requirements

No "Protection" or "password" will be placed on electronic files.

Electronic submissions shall conform to the minimum quality standard as listed below i.e.,

- File Formats to be submitted
- All deliverables submitted by the *Contractor* must be supplied in the formats listed below, and be editable using the software listed in Table 1. Only exceptions that have prior approval from the *Project Manager* will be accepted. Software used shall be the latest generation, and where appropriate, shall be regularly upgraded**.**

Note:

All electronic documents shall be submitted in Adobe Acrobat (PDF) format and the 'Native' file shall be included as per contract.

6.3.1 Table 1: Acceptable File Formats

Document Type	Description
Drawings	Native: AutoCAD (DWG)
	Published In: Adobe Acrobat (PDF) version 7 or later
Data Sheets (other than instrumentation)	Native: MS Excel 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
Data Sheets (Instrumentation)	Native: As per software used or as otherwise specified in Contract
	Published In: Adobe Acrobat (PDF) version 7 or later
Engineering Data Lists	Native: MS Excel 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
Calculation Outputs / Results	Native: As per software used or as otherwise specified in Contract

	Published In: Adobe Acrobat (PDF) version 7 or later
Document Viewers – Redlining	Adobe Acrobat v7 minimum with "Comments" enabled
All Reports	Native: MS Word 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
Report supporting Data including: Calculations, Charts,	Native: As per software used or as otherwise specified in Contract

Graphs, Indexes, etc.	Published In: Adobe Acrobat (PDF) version 7 or later
Manuals	Native: MS Word 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
General Documents	Native: MS Word 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
Presentations	Native: MS PowerPoint 2003 or later
	Published In: Adobe Acrobat (PDF) version 7 or later
Colour Photographs / Scanned Images	Native File format: JPG Compression level 1%
Graphic Imagery	Published images in: TIF uncompressed or WMF
	Native image format: Corel Draw 7 CDR file
	Adobe Photoshop 7.0 PSD
	PowerPoint 2000 PPT file
Project Schedules	Native: Primavera P6 (preferred)
	Native: MS Project
	Published In: Adobe Acrobat (PDF) version 7 or later
Databases (preferred)	MS SQL Server 2000
Databases (non-preferred)	ODBC compliant
	Microsoft Access 2003
Data Compression	Software: WinZip 8.0
Other General Project Data	Native: Microsoft Office 2003 application or later
	Published In: Adobe Acrobat (PDF) version 7 or later

6.3.1.1 Native File

Native files shall be clean of all extraneous fonts, formats and styles to ensure inadvertent reformatting and format adjustments or difficulties that do not result in downstream handling of documents.

6.3.1.2 Adobe Acrobat (.PDF) Files

PDF files shall be of a high quality and without dark background shading as definition may otherwise become lost.

The quality of Adobe Acrobat (.PDF) files shall be such that a hardcopy of a laser printed A1 Adobe Acrobat (.PDF) drawing can clearly be read in A3 size. Similarly A3 and A4

Adobe Acrobat (.PDF) file quality shall be such that hardcopy of a laser printed A3 or A4 Adobe Acrobat (.PDF) document can clearly be read in A4 size.

The Contractor shall physically test and confirm this prior to transmitting Adobe files. PDF files shall be saved as "Reader Extent" to make provision for the use of electronic signatures. PDF files shall be "Optimized" to improve Quality and then "Reduce File Size" through Adobe.

6.3.1.3 Databases

Databases shall be presented in compatible format via a share link. Multi format documents (created from several files) shall be combined and submitted as a single Adobe Acrobat (.PDF) file.

6.3.1.4 Drawing Files

These shall be submitted in Adobe Acrobat (.PDF) and the 'Native' file format shall be submitted on the final submission unless otherwise specified. 'Native' files shall include reference / border files, etc.

A single file shall be submitted per document, i.e., under no circumstances shall different drawings with different numbers appear on one sheet under one file name, nor shall a drawing with multiple sheets be saved into one electronic file.

All CAD drawings shall be contained in one single merge file, any form of ex Ref or Reference File will not be accepted.

6.3.1.5 Sketches

These shall be A3 or A4 size scanned as Adobe Acrobat (.PDF) file.

6.3.1.6 Text Documents

Each page of a single document shall be collated into one file. (The "wet" signature

Squad Check coversheet, where required, is inserted at the beginning of the document prior to review).

6.3.1.7 Tables / Diagrams

These shall be A4 and A3 size only.

6.3.1.8 Reports

Reports containing Word, Excel, DGN, DWG, brochures, etc., shall be compiled as one Adobe Acrobat (.PDF) file.

Note:

Original colour hardcopies shall be scanned in colour to ensure all details of paper documents.

6.3.1.9 Photo's / Video's

Prints should be submitted of conventional photographs or prints and digital files of electronic images, or as specified by the Project Manager.

6.3.2 Security

Files shall be clear of known viruses and extraneous (irrelevant) macro's. The *Contractor* shall at all times have the latest version of virus protection software. The *Contractor* shall ensure appropriate security systems are in place to prevent unauthorized electronic distributions and (or) unauthorized editing or manipulation of electronic files.

6.3.3 Scanning Requirements

Where possible 'native' files shall be converted to PDF rather than scanned from hardcopy.

Where this cannot be done all drawings and documents shall be manually scanned in colour.

The settings below should be adhered to where possible and may vary depending on scanning software used. Where images rendered with these settings are unreadable, operators shall use their discretion, and adjust colour depth and resolution accordingly.

6.3.3.1 Scan Settings

- Resolution:-

Black and White - 200 dpi Colour
- 100 dpi
Fine Line Drawings - 300 dpi

- Image Type:-

  Black and White - 1 Bit

  Colour Line Drawings - 8 Bit (256 colours) minimum
  Colour photos and rendered images - 24 Bit
  Use automatic threshold to determine the white and black points

- Other Criteria to Adhere to:-

  Rotate to correct reading (i.e., viewable at correct orientation)
  De-skew (i.e., straighten if on a slant)

  De-speckle (i.e., remove background dirt)
  Optimized (i.e., reduce file size)

Note:

When a scanned drawing is printed to be re-scanned, subsequent to, e.g., mark-ups or signatures, then it shall be scanned at a setting of 400 dpi.

6.4 Documentation Numbering

Once the Contractor Documentation Register (CDR) has been submitted by the *Contractor*, Document Control will allocate the *Employer's* documentation numbers on the Contractor Documentation Register (CDR) and return it to the *Contractor*.

A unique sequence number is allocated to each document and remains the same for each submittal of that specific document.

The *Contractor* shall use the *Employer's* document numbers and titles exactly as per the Contractor Documentation Register (CDR) on all documentation submitted.

Electronic file names for all documentation shall be exactly as per the *Employer's* documentation numbers, including the revision number.

7. Revising Documentation

All documentation carries a revision block, which must be completed in full before submitting to the *Project Manager*, and typically denotes the following:

- REVISION NUMBER - Revision Number, e.g., 00, 01, etc.

- DESCRIPTION - Describes the status, e.g., Issued for Tender and a brief description of the changes made.
- REVISED BY - Person responsible for revising the document
- CHK'D - Person responsible for checking the revised document
- APP'D - Person responsible for approving the revised document
- DATE - Date of the revised document

7.1 Revision Notes

The revision block should record each change in revision with a brief but specific description of the changes made.

Terms such as "Minor Revision" or "General Revisions" shall be avoided in favour of a more specific notation. More than one line may be used but only the revision number and date together with the relevant initials shall appear in the top line.

7.2 Indicating Revisions

Revisions shall be clearly identified by placing a revision triangle with the correct revision number in the right hand column in the case of documents, and is adjacent to the area on the document that has been changed.

All revisions made on drawings shall be enclosed by a cloud except in cases where to add a cloud detracts from the readability of the drawing. At subsequent revisions all clouds and revision triangles from the previous formal revision shall be removed from the drawing.

7.3 As-Built / Final Revisions

As built drawings: ZZ (it is to be noted that revisions numbers may vary subject to the project and/or Transnet drawing number).

All drawings shall have the revision raised to the next applicable revision reference which shall be inserted in the revision box of the drawing title block before any drafting is started.

8. Documentation Submission

8.1 Documentation Submission Format

All documentation shall be submitted under cover of a *Contractor's* Transmittal Note.

8.2 *Electronic Transmission*

The Contractor Documentation Register (CDR) defines which documentation shall be transmitted electronically. All electronic documentation shall be transmitted via email or a shared link.

Note:

Per e-mail - the file size may not exceed 6 MB and the Transmittal Note shall be attached.

When sending an e-mail the *Contractor* shall ensure that the subject field of the e-mail is completed as follows, i.e.,

- Contract number, contract description and description of documentation transmitted.

8.3 *Hard Copy Transmission*

Where applicable documentation shall be submitted in printed hard copy format unless otherwise stated on the Contractor Documentation Register (CDR).

8.4 *Transmittal Notes (Annexure A)*

All documentation shall be submitted under cover of the *Contractor's* Transmittal Note indicating all *Contract* references (i.e., Project No, *Contract* No, etc.), Project Documentation Number(s), Revision Number, Title and Chronological listing of transmitted documentation.

The *Contractor's* Transmittal Note shall state the purpose / issue reason of the documentation submission.

Documentation for different purposes must be sent on separate *Contractor* Transmittal Notes. The *Contractor* shall note that documentation will be rejected if this requirement is not met.

The *Contractor* Transmittal shall be signed, dated and returned to the *Contractor* by Document Control.

8.5 *Formats and Quantities of Documentation*

The required number of copies and formats of documents / drawings shall be specified in the Contractor Documentation Register (CDR).

A typical example of quantities and formats would be as follows:-

- Pre-Construction – Hard copy and PDF (to be specified in 'CDR')
- Construction – Hard copy and PDF (to be specified in 'CDR')
- As-Built – Red Lined – Hard copies (Normally 3 off) (to be specified in CDR')
- Certified As-Built / Final – Hard copies (full size) and via shared link containing PDF and 'Native' file formats (to be specified in 'CDR')

8.6 Address for Submission

The address of submission will be as specified in the *Contract* and all submissions will be identified with the Contract Number, and the responsible *Project Manager*. All deliveries will be made to Document Control who will distribute the documentation to the relevant *Project Manager*.

9. Review and Acceptance of Contractor Documentation

The *Contractor* submits documentation as the *Contract* requires to the *Project Manager* via Document Control for review and acceptance.

9.1 Squad Check Form – (DOC-FAT-0002)

The purpose of the Squad Check Form is for the Project Manager to assign a review code to the reviewed documentation denoting the status of the documentation after consolidation of comments. The Squad Check Form is to be inserted by the Contractor as follows:,

9.1.1 First Submission of Documentation

The first revision is revision '00', with subsequent revisions '01', '02', '03', etc.

9.1.2 Review of Documentation

Acceptance of documentation by the Project will in no way relieve the *Contractor* of their responsibility for the correctness of information, or conformance with the requirements. This responsibility rests solely with the *Contractor*.

Once documentation has been reviewed by the Project, all comments are consolidated and a review code is assigned on the Squad Check Form to the original reviewed / marked-up

drawing / document by the *Project Manager*.

9.1.2.1 Review Codes for Contractor Documentation

The Review Code resulting from the review is as follows, i.e.,

- Code C1 – Accepted

  The *Contractor's* design / submission of documentation is accepted and the *Contractor* only needs re-submit documentation only if major changes have been made. The next submission will be the for Approval of "Redline" and / or "Final " documentation.

- Code C2 – Accepted with Comments. Revise and Resubmit

  In the event that the Project returns documentation with comments noted, the *Contractor* shall, within the '*period of reply'* as defined in the *Contract Data*, make the required changes and submit the revised documentation for further review on the next revision.

- Code C3 – Rejected

  In the event that the Project returns documentation with "Not Accepted, Revise and Re-submit" the *Contractor* , within the '*period of reply'*, make the required changes and re-submit the revised documentation on a new revision for further review. Should these revisions necessitate changes in other related documentation, the *Contractor* shall make the appropriate changes and re-submit all the revised related documentation for further review. The *Contractor* shall not proceed with any activities controlled by the *Contractor's* documentation until it has been re-submitted and acceptance indicated.

  The *Contractor* revises and re-submits documentation but on the next revision until a review code 'C1' is achieved. This review process shall not entitle the *Contractor* to submit any claims due to time loss.

- Code C4 – Information

  Documentation signed at "Code C4" level is considered to be for information only and does not require further submission, and shall not be returned to the *Contractor*. However, Document Control shall issue a Transmittal only to the *Contractor* in this regard as notification.

9.1.2.2 Return of Reviewed Documentation

The original reviewed / marked-up drawing / document is scanned to PDF format and a copy is returned to the *Contractor* indicating the *Project Manager's* further instructions.

Return of the reviewed documentation is issued via shared link, email or hard copy (where applicable).

9.1.3 Review Period

The Contractor shall provide the Project Manager with a "reply period" to review and respond to submitted documentation, which begins upon receipt by the Project Manager and ends upon their response. However, if the Project Manager returns the documentation late, the Contractor may proceed with the work without delay, provided prior written notice is given by the Contractor.

9.1.4 Revised Documentation

On receipt of the reviewed documentation the *Contractor* shall make any modifications requested / marked-up and re-submit the revised documentation within *'the period of reply'* on the Contractor Documentation Register (CDR). Queries regarding comments / changes should be addressed with the *Project Manager* prior to re-submittal.

Any re-submittals, which have not included the changes / comments identified, will be marked with the applicable review code and returned to the *Contractor* to be corrected and re-submitted. The *Contractor* shall re-issue the revised documentation incorporating all comments on a new revision and other specified details not included in the previous issue within *'the period of reply'* of receipt of the marked-up documentation.

All revised data shall be submitted in its entirety and shall reflect the revision control numbers, and shall also indicate which documentation the revised documentation supersedes, if applicable.

In the case of drawings every sheet has its own revision number and is revised as an individual document.

In the case of documents all sheets under cover of one document number shall be under the same revision number and be re-submitted, even if the revision is a minor one.

10. As-Built / Final Documentation

This is Certified 'As-Built / Final Accepted' documentation or documentation for which no further review is required. The final documentation shall form part of the final *Contractor* Manual(s) or Data Packs

Contractors shall provide the 'As-Built' documentation that form part of the Operating, Instruction and Maintenance Manuals that were issued and accepted prior to 'As-Built' conditions for inclusion in these types of manuals by the *Project Manager*.

10.1 Definition of Final and As-Built Status of Documentation

10.1.1 "Final" Documentation

This applies to "As Manufactured and Delivered to Site".

Documentation submitted subsequently by the *Contractor* once "Final" status is reached shall be indicated as such in the Revision Notes Block as "Final" and shall also reflect the New Revision Number on the document in the revision block provided.

10.1.2 "As-Built" Documentation

This applies to "As Constructed or As Installed".

The Contractor Documentation Register (CDR)) shall indicate the documents which are to be brought to "As-Built" status, and must be submitted only after practical completion when the documentation qualifies for "As-Built" status, and the period after completion by which they must be finalized.

10.2 Preparation of As-Built Documents

10.2.1 Transnet National Ports Authority Documents

The *Contractor* responsible for completing the construction / installation works shall prepare three (3) marked up hard copies of the applicable documents to represent the As- Built condition(s). The mark-ups shall be in RED pencil or pen and be complete and accurate.

Once prepared the As-Built mark-up documentation is transmitted to Transnet Capital Projects for updating of the original design documentation.

Documents / drawings updated with information known by the *Project Manager* and as provided by *Contractors* at the completion of their *Contracts* is utilized by the *Project*

Manager to update Engineering Deliverables / drawings to this status, i.e., "For Record Purposes".

Note:

File naming convention on drawings / documents shall be in accordance with the Project numbers assigned on the Contractor Documentation Register (CDR).

10.2.2 Design, Supply and Install Contractor Documents

Contractors responsible for the design, supply and installation of equipment are responsible for producing As-Builts of their own documentation.

The *Contractor* shall prepare three (3) marked up hard copies of the applicable documents

to represent the As-Built condition(s). The mark-ups shall be in RED pencil or pen and be complete and accurate.

Once prepared the As-Built mark-up documentation is transmitted to the *Project Manager* for Approval through the normal process. Once approved C1 the *Contractor* can proceed to update his drawings and submit as part of the final package

The mark-ups are returned to the *Contractor* so that they can produce the As-Built revisions.

11. Installation, Maintenance and Operating Manuals and Data Books

These shall be supplied by the *Contractor* as manuals in an A4 hard covered, red, grease and waterproof binder using two (2) ring type binders.

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

Manuals shall be well indexed and user friendly. Manuals shall include a summarized Table of Contents and in manuals comprising a number of files / volumes there should be one summarized Table of Contents in each of the files / volumes. The draft Table of Contents shall be submitted for review to the Project Manager prior to the compilation and official submittal of the manuals. The technical content of manuals shall be specified by the *Project Manager.*

The originals of all brochures shall be issued to the *Project Manager*. When a general brochure is applicable to a range of equipment, then the specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.

The address, phone numbers, fax numbers and reference numbers of all *Sub-Contractors* shall be provided.

Where manuals include drawings that still need to be revised to "As-Built" status, and such manuals are required prior to 'As-Built' status, the manual will not be considered to be in its final form until the "As-Built" version of each such drawing has been incorporated.

The required number of copies of the manual(s) shall be as specified by the *Project Manager* and submitted per type or model number of equipment included in the contract, or as specified by the *Project Manager*.

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

- Project Name
- Manual Title, e.g., Installation, Maintenance and Operating Manual
- FBS No. and Title
- Manual Numbering (e.g., Volume 1 of 2, etc.)
- Contract Number
- Contractor Name

12. Cancelling and Superseding Documentation

The Document Control Procedure for cancelling and superseding is as follows:-

12.1 Superseding

If the document / drawing has been transmitted anywhere and is to be replaced by a different document number / drawing number, then it is superseded. The superseded item should go up a revision and always have the new drawing or document number written across it, as the normal practice.

The Document Controller is to check that this has been done on the drawing or document,

and the revision title block should be preceded with:-

- e.g. "SUPERSEDED by 222057-2-211-M-GA-0030 ....."

12.2 Cancelling

If the item is to be cancelled, it means the item has been previously transmitted and it is not being replaced by another drawing number / document number. In this case the Document Controller should check that the revision has gone up, the word "CANCELLED" is written across the drawing / document and the word "CANCELLED" is placed at the beginning of the revision title block.

13. Procedure Maintenance

Any deviation from this procedure should be discussed with the applicable department manager. Such discussion should be documented, using the Document Change Request Form, DOC-FAT-0006, detailing the reason for the deviation as well clear instructions of the alternative process to follow. The applicable department manager or designated person is to review the proposed changes and approve or reject the alternative process.

14. Records/ Archiving

All documentation generated within TNPA Infrastructure will be subjected to the criteria for retention as specified in the "Archiving Procedure" DOC-P-0007 and in line with Transnet Policies.

Annexure A – Typical Transmittal Note

TRANSNET

Document Transmittal Note

TO :	DATE :
LOCATION :	FROM : DOCUMENT CONTROL
ATTENTION :	ORIGINATOR :
	PROJECT No :
	TRANSMITTAL NO. :

PURPOSE OF ISSUE *(indicate with an "X" in the appropriate block)*

☐ APPROVED FOR CONSTRUCTION	☐ FOR APPROVAL	☐ AS - BUILT
☐ APPROVED FOR DESIGN	☐ FOR INFORMATION ONLY	☐ FINAL HANDOVER
☐ FOR TENDER PURPOSES / ENQUIRY	☐ FOR REVIEW / COMMENTS	☐ OTHER (please specify)
☐ FOR CONTRACT / PURCHASE / SERVICES	☐ RETURN OF DOCUMENTATION	

ADDITIONAL REMARKS BY ORIGINATOR *(if applicable)*

DOCUMENT NUMBER	REV.	DESCRIPTION	COPY QTY	FORMAT E or H

DISTRIBUTION :

NAME

E = Electronic
H = Hardcopy

Sent by : _____ Received by : _____ Date : _____

Signature : _____ Signature : _____

PLEASE CONFIRM RECEIPT BY SIGNING ONE COPY OF THE TRANSMITTAL AND RETURN TO DOCUMENT CONTROL AS SOON AS POSSIBLE

Annexure B – Typical Example of CDR (can be supplied electronically)

TRANSNET NATIONAL PORTS AUTORITY
DOC-FAT-0004 Rev 00

CONTRACTOR DELIVERABLE REGISTER

PROJECT NO.		CONTRACT NO.	
PROJECT TITLE		CONTRACT TITLE	
DOCUMENT NO.		CONTRACTOR NAME	
DOCUMENT REV.		DATE PREPARED	

TNPA Document Number	Discipline	Document Type	Qty Sheets	Document / Drawing Description	Contractor Document Number	Rev	Planned Submission Date	Actual Submission Date	Format	Reason for Issue

DESIGNATION / APPROVAL

PROJECT MANAGEMENT	CONTRACTOR MANAGEMENT	DOCUMENT CONTROL
NAME:	NAME:	NAME:
SIGNATURE:	SIGNATURE:	SIGNATURE:
DATE:	DATE:	DATE:

DOC-FAT-0004 Rev 00

Annexures D - General Quality Requirements for Suppliers and Contractors

TRANSNET

GENERAL QUALITY REQUIREMENTS FOR CONTRACTORS AND SUPPLIERS

Document Number	TNPA-QUAL-REQ-014.1
Version Number	02
Classification	Unclassified
Effective date	01 September 2023
Review date	31 August 2026

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1	Replacing Transnet Group Capital with Transnet		11/08/2020
2	Updated with ISO 9001:2015 referencing and adding clause numbering against requirements,		01/09/2023
2	Document number changed from QAL-STD-0001 to TNPA-QAL-REQ-014.1		01/09/2023

Note: Only the latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner	**Quality Manager**		01/09/2023
Accepts document for adequacy and practicability. Comments:			

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1. Purpose

This Specification outlines the minimum requirements to ensure that products and services supplied to TRANSNET are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

2. Definitions / Abbreviations

Term, Abbreviation	Meaning
Contract:	Formal document evidencing agreement between *Employer* and *Contractor* for supply of on site or off-site services (generic term used for Purchase Orders, Contracts and Service Orders in this Standard).
Contractor:	The party to a *contract* that provides services to the *Employer* (Generic term used for Vendors, Suppliers, Contractors, Consultants, etc.).
Contractor Documentation Schedule (CDS)	A schedule specifying the *Employer's* requirements for the document types to be submitted by the *Contractor* at various stages of the *Contract* and the timing of the submissions.
Data:	All drawings/documents/data/information/DPs and IOMs required to be supplied under the *Contract*.
Data Pack (DP):	A compilation of manufacturing data, certification, inspection and testing records prepared by the *Contractor* to verify compliance with the Contractual requirements.
Employer:	The party to a *Contract* or Purchase Order to whom the goods are supplied or for whom the work or services are performed. In the context of this document, Transnet Capital Projects is the *Employer*.
Field Inspection Checklist (FIC):	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre-commissioning of the equipment
Inspection Release Report (IRR):	A document issued to the *Contractor* by TRANSNET advising release of materials for shipment. This does not relieve the *Contractor* of its obligations in accordance with the Terms and Conditions of the *Contract*.
Inspection Waiver Report (IWR):	A document issued to the *Contractor* by TRANSNET advising that TRANSNET has waived final inspection for the materials listed in this document. The issue of this report does not preclude further inspections by TRANSNET. It is issued without prejudice and does not relieve the *Contractor* from the guarantees and obligations included in the *Contract*.
Installation and Operating Manual (IOM):	A document prepared by the *Contractor* providing relevant information applicable to the installation and maintenance of the specific equipment, including data relating to consumables (e.g., Oils, etc.)
ISO 9001:2015 terms	"shall" indicates a requirement
Non-Conformance (NC)	Material, product or workmanship which is not in accordance with the requirements of the *Contract.*
Non-Conformance Report (NCR):	A document initiated by either TRANSNET or the *Contractor* advising that certain materials/products/workmanship provided by the *Contractor* do not conform to the required standards and specifications.
Project Quality Plan (PQP):	A document that outlines the *Contractor's* strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the *Contract* drawings, codes and standards.

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Term, Abbreviation	Meaning
Quality Assurance (QA):	A formal methodology designed to assess the quality of products or services provided.
Quality Control (QC):	A set of activities intended to ensure that quality requirements are being met.
Quality Control Plan (QCP):	A document outlining specific manufacturing/construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.
Technical Query Note (TQN):	A document used by the *Contractor* to formally clarify a Technical Query related to the scope of supply. This should not be used where a Non-Conformance Report has already been initiated.
TRANSNET:	Transnet SOE Limited
Works Information:	Refers to the *Works Information* as defined in the *Contract*

3. Applicable Documents

3.1 General

All work performed shall comply with the requirements of this Specification, the documentation referenced in the *Contract* and the latest revision/edition of the relevant Codes and Standards referenced herein.

3.2 Statutory Regulations

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

3.3 Codes; Standards and Procedures

Document No.	Title
ISO 9001: 2015	Quality management systems – Requirements
ISO 10005:2018	Quality Management systems- Guidelines for Quality plans
PROCEDURE 014	Contractor Management

4. Quality System

4.1 General

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

4.2 Contractor Quality System Requirements

4.2.1 The *Contractor* shall have and maintain a documented Quality Management System. The *Contractor* may be required to demonstrate its use to TRANSNET. The *Contractor's* Quality Management System should be in accordance with the requirements of *International Standard ISO 9001:2015 Clause 4.4.1 Quality Management System and its process.*

4.3 Kick Off Meeting

4.3.1 After the *Contract* start date, and prior to manufacture or construction activities, TRANSNET will require a Kick-Off Meeting with the *Contractor* to discuss fully the importance of meeting TRANSNET's quality requirements. This meeting may be held as part of the *Contract* kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when Sub-Contractors of key equipment are engaged.

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 8.4.3

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4.4 Contractor / *Supplier* Documentation Submittal Requirements

4.4.1 The *Contractor sha*ll make a formal submission of his Quality Documentation on award of the *Contract* and at the times defined in the *Contractor's* Documentation Schedule, included in the *Works Information* for the *Contract*.

4.4.2 The Contractor's responsibilities are defined in terms of *DOC-STD-0001* which outlines the standard requirements for preparation, submission, receipt, review, and collection of Technical and (or) Deliverable Documentation, as detailed in the Contractor Documentation Schedule (CDS).

4.4.3 TRANSNET uses the *Contractor's* Documentation Schedule (CDS), included in the *Works Information* for the *Contract*, to indicate those documents required to be submitted for information/review and/or acceptance.

4.4.4 The *Contractor* shall develop and maintain a comprehensive register of documents (*Contractor's* Documentation Register – CDR) that will be generated throughout the project. The CDR includes all quality-related documents. The CDR is a 'live' document and is submitted to TRANSNET for review following each revision by the *Contractor*. The CDR indicates the dates of issue of the documents considering sufficient time to allow for the TRANSNET review/acceptance cycle prior to the document being required for use. A sample of a CDR (DOC-FAT-0002) is issued by TRANSNET at the start of every *contract.*

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8.4.3 Information for external providers

4.5 Project Quality Plan

4.5.1 Where specified, the *Contractor* submits a PQP to TRANSNET within the period stated in the CDS and in any event not later than 28 days after the *Contract* start date. The PQP details how the *Contractor's* Quality System will be applied to the Scope of Work specified in the *Contract*, and shall address the following:

a) Satisfying the technical and quality requirements of the Contractor's Scope of Work, and relevant elements of the applicable ISO 9001:2015 standard and should be developed with the reference to ISO 10005:2013 Guidelines.
b) Include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls, objectives, and records used to control and verify compliance with the specified Contractual requirements.
c) Include a listing of all special processes (e.g., welding and non-destructive testing, cube testing etc.) envisaged for use, including confirmation of personnel certification as required.
d) Include all proposed method statements (for site-based work activities).
e) Include a description of the Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management and coordination of QA / QC activities.
f) Include a listing of all Quality Control Plans (QCPs), and associated Field Inspection Checklists (FICs), as applicable.
g) Identify in the PQP any Sub-Contractor/Sub-Supplier work. Sub-Contractor/Sub-Supplier plans are approved by the Contractor, and a copy forwarded to TRANSNET for information.
h) Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems).
i) Include proposed quality records.

4.5.2 The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the *Contract* duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the *Contractor* is required to provide a PQP, no work shall commence until the PQP is accepted by TRANSNET.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8 Operations

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4.6 Procedures

4.6.1 The *Contractor's* PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

4.6.2 Where specified, the *Contractor* shall submit copies of Quality Procedures for review. In addition, the *Contractor* shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TRANSNET at each work location.

4.6.3 These will include, as applicable, the following:

a) Document Control, the *Contractor's* PQP shall provide a description of how documents provided by TRANSNET to the *Contractor* are to be managed. The description shall address as a minimum:
- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications
- Internal review and approval routines and authorities
- How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 7.5 Documented Information

b) Design Control procedure, where the *Contractor* is responsible for any aspect of design related to the Scope of Work, the Quality Plan shall describe the *Contractor's* methods and procedures for the control of these design activities.

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 8.3 Design and development of products and services

c) Procurement procedure, where the *Contractor* is responsible for any aspect of procurement related to the Scope of Work, the Quality Plan shall describe the *Contractor's* methods and procedures for the control of these activities.

5. Quality Audits

5.1 Contractor Audits

5.1.1 The *Contractor* shall Carry out audits in accordance with its Quality System at its own and Sub-Contractor's facilities to ensure project quality requirements are being achieved.

5.1.2 The *Contractor* shall include a QA Audit Schedule in the *Contractor* PQP submitted to TRANSNET prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the *Contractor* and Sub-Contractor during the execution of the *Contract*.

5.1.3 The *Contractor* shall, where stipulated in the *Contract*, perform an audit within three months after the *Contract* start date and thereafter at a minimum frequency of three months. Audit reports are submitted to TRANSNET at the completion of each Audit. Where unsatisfactory performance is evident, TRANSNET will direct the *Contractor* to perform additional audits.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 9.2 Internal Audit

5.2 Transnet Audit

5.2.1 Upon the appointment of the Contractor, the project Quality Officer will schedule and conduct the QMS Audit at the contractor's head office to assess the *Contractor's* ISO 9001:2015 Quality Management System status.

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5.2.2 TRANSNET reserves the right to perform quality audits or participate as an observer in *Contractor* audits to verify compliance with the Contractual requirements. The *Contractor* shall, within the time frame as agreed upon, correct any adverse audit finding advised by TRANSNET.

5.2.3 The *Employer* may, at own discretion, require a Quality Audit of sub-contractor(s) to ensure that the sub-Contractor(s) have the necessary management, facilities, skilled staff, and quality control facilities to carry out the Works to ensure compliance with the Works Information.

6. Quality Control Plans

Note the of requirements of 6.1 to 7.7 9must be applied in conjunction with ISO 9001:2015 Clause 8.5 Production and Service; ISO 10005:2018

6.1 Quality Control Plans

6.1.1 The *Contractor* shall prepare and submit QCPs to TRANSNET for review in accordance with the requirements of the Contract and PQP.

6.1.2 QCPs must clearly identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, acceptance criteria, witness and hold points.

6.1.3 The *Contractor* shall NOT commence fabrication or manufacture prior to review and approval of the applicable QCP by TRANSNET.

6.1.4 QCPs shall include reference to all tests specified in the *Works Information*.

A typical format for a QCP is shown in Appendix 1. The *Contractor* may use its own format providing all information shown in the sample in Appendix 1 is included.

6.2 Intervention Points

6.2.1 The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. These points are denoted by the following inspection codes:

a) Hold Point (H)	Inspection points in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Hold points require written notification to TRANSNET.
b) Witness Point (W)	An inspection point in the manufacturing cycle that will be witnessed or verified. If TRANSNET confirms it is unable to attend after being provided with the written notification, then manufacture may proceed. Witness points require written notification to TRANSNET.
c) Review Point (R)	A point at which products and quality records are verified and endorsed. Review points are not points that require notification to TRANSNET.
d) Surveillance (S)	An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

6.3 Field Inspection Checklists

6.3.1 For site installation and construction activities, the *Contractor* shall prepare Field Inspection Checklists (FICs) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCPs.

6.3.2 FICs are used to record the results of inspection and testing (where applicable). On completion, FICs are submitted to TRANSNET to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

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7. Inspection and Testing

7.1 General

7.1.1 Inspection means all activities such as measuring, examining, testing, gauging one or more characteristics of material or service and comparing these with specified requirements to determine conformity.

7.1.2 TRANSNET may, at its discretion, perform surveillance inspections at the *Contractor's* premises, the premises of any Sub-Contractor or at the location of the Scope of Work.

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

7.1.4 The Contractor shall ensure free entry and access is given to TRANSNET, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the *Contractor's* and Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

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

7.1.6 While TRANSNET is at the *Contractor's* premises, the *Contractor* shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

7.1.7 The *Contractor* shall provide written notice within a time frame as agreed upon, to allow the attendance of TRANSNET and other representatives at nominated witness and hold points.

7.2 Schedule of Inspection

7.2.1 The *Contractor* shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TRANSNET to show the current inspection and test status.

7.3 Contractor's Inspection

7.3.1 The Contractor shall, as a minimum, carry out the inspections as detailed in the Quality Control Plan and maintain the required records for verification by the Employer and/or Third-Party Inspection Authority.

7.3.2 For sub-contracted material or services, the Contractor shall ensure that controls are effective, including, where necessary, monitoring of the Subcontractor's works and retention of the necessary records.

7.3.3 Signing-off of the Quality Control Plan progressively by all relevant parties is a mandatory requirement following the indicated inspection activity.

7.4 Readiness for Inspection

7.4.1 Material or services shall be deemed ready for inspection by the Employer and/or Project Manager only when:

a) The Contractor has firstly carried out his own inspection at the stage identified on the relevant Quality Control Plan and is satisfied that material, workmanship and services meet the specified requirements. Documented evidence shall be maintained by the Contractor including signing-off the Quality Control Plan.
b) The Contractor shall ensure that the latest revisions of approved drawings and/or procedures with evidence of acceptance by Transnet, his nominated representative or Third-Party Inspection Authority are available.

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7.5 Inspection Notification

7.5.1 The *Contractor* shall notify TRANSNET in writing for inspections or tests within the country, arrangements are confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements are confirmed at least seven working days before the event.

Inspection notifications include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the *Contractor's* Representative.

7.6 Cancellation of Inspection

7.6.1 Contractors are advised that it is a condition of Purchase / Contract that all costs of Employer's representative and/or Third-Party Inspection Authority will be passed on to the Contractor for cancellation of inspection visits.

7.6.2 A visit is considered cancelled if:

a) The Contractor advises "readiness" for inspection and upon arrival of Employer's representative or Third-Party Inspection Authority, the material, or Services and/or the associated documentation is not ready; or
b) If Employer's personnel identify that material or services are to specification such that the Contractor's Inspector should have identified the non-conformity prior advising readiness for Employer's or Third-Party Inspection Authority inspection.

7.7 Inspection Waiver

7.7.1 Any Employer's Witness, or review or Hold point may, at the sole discretion of Employer, be waived, which will be followed by an inspection waiver report.

8. Fabrication Process and Factory Acceptance Test

8.1 Fabrication Process

8.1.1 It is the *Contractor's* responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins at the manufacture's premises. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. When such procedures are requested, no work shall commence at the manufacturer's premises until procedures are approved by TRANSNET.

8.1.2 It is the *Contractor's* responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the *Contractor* and made available to TRANSNET when requested.

8.1.3 Records of qualification of procedures and processes shall be maintained by the *Contractor* in accordance with the applicable procedure or code.

8.1.4 The Employer's representatives are also required to do inspections during fabrication to ensure that the fabrication process is in accordance with the designs, specifications, and standards to ensure the work meets the requirements specified in the Contract.8.1.1 Welding Procedures

8.1.5 Where the *Contractor's* Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the *Contractor's* Scope of Work. The procedure shall only be submitted to TRANSNET when requested in the *Contract*.

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8.1.6 WPS includes all welding essential and non-essential variables for each process used, including appropriate test results. WPS comply fully with the standard or code pertaining to welding required in the execution of the *Contractor's* Scope of Work.

8.1.7 When requested in the *Contract*, a suitably marked "weld map" is completed by the *Contractor* for all items to be fabricated. A summary of WPS is prepared and, when used, is identified on the weld map.

8.1.8 Where TRANSNET approval is required, fabrication is not to commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the *Contractor*. No welding fabrication will be accepted that is not covered by a TRANSNET approved WPS/WPQR.

8.1.9 Welding Procedure Qualification (WPQ) tests may be witnessed by TRANSNET and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests is carried out by an approved testing laboratory, independent of both TRANSNET and the *Contractor*. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

8.1.10 Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information is taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

8.1.11 Welders/welding operators are qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualification (WQ) records will be reviewed by TRANSNET in the *Contractor's* works and should NOT be submitted for review.

8.1.12 A register of welders qualified to work shall be maintained by the *Contractor*.

8.2 Material Traceability

8.2.1 Where, and to the extent that material traceability is required, the *Contractor* shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stenciling as appropriate shall be defined and agreed with the *Employer*.

8.2.2 Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP.

8.2.3 The *Contractor* shall prepare a schedule of materials and equipment that are subject to traceability requirements.

8.3 Material Certification

8.3.1 Where specified in the Contract the following certificates shall be provided to TRANSNET and included in the DP.

a) *Type A:* A *Contractor's* certificate of compliance with the *Contract*. This certifies that the goods or services are supplied in compliance with the *Contract* without mention of any test results (EN10204 certificate 2.1).
b) *Type B:* A certificate issued by a laboratory or test facility independent of the *Contractor's* works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code, etc., has been complied with. (EN10204 certificate 3.1B).
c) *Type C:* The same as Type B, the tests are to be witnessed by a third party (EN10204 certificate 3.1C).

8.4 Factory Acceptance Test

8.4.1 The factory acceptance test (FAT) is a process that evaluates the equipment during and after the assembly process by verifying that it is built and operating in accordance with design specifications.

8.4.2 The Contractor shall conduct a Factory Acceptance Test for all Plant's to be installed as part of the Works to be executed in this Contract prior to delivery to site. The Factory Acceptance Test shall be conducted in the presence of the Employer's representatives (Quality, Engineering and/or the Third-Party Inspection Authority).

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8.5 Inspection Release

8.5.1 At completion of the Scope of Work, either in total or in phases, TRANSNET may issue an Inspection Release Report (IRR) or an Inspection Waiver Report (IWR).

8.5.2 The issue of either an inspection release or waiver of inspection does not relieve the *Contractor* of its obligations under the *Contract*. The *Contractor* ensures that a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the *Contract.* Items delivered to TRANSNET without a copy of these documents may not be accepted.

8.5.3 A copy of the inspection release or waiver of inspection is included in the DP.

9. Non-Conforming Products

9.1 General

Note the requirements of 9.1 to 9.3 must be applied in conjunction with ISO 9001:2015 Clause 10.2 Nonconformity and Corrective action

9.1.1 The *Contractor* shall establish and maintain procedures to control material or products that do not meet the specified requirements.

9.1.2 All Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

a) If the *Contractor* discovers material or product which is not in accordance with the requirements of the *Contract*, i.e., a non-conformance, the *Contractor* shall immediately initiate the non-conformance procedure in terms of the *Contractor's* Quality Management System, advise TRANSNET promptly, and provide a copy of the non-conformance report (NCR) to TRANSNET
b) If TRANSNET or its agent identifies a non-conformance, a TRANSNET NCR may be raised.

9.1.3 Originals of all closed out NCRs shall be included in the DP.

9.2 Defects

9.2.1 The project Quality officer will notify the NEC supervisor / Construction Manager of any defects observed and long them on the snag list.

9.3 Corrective and Preventative Action

9.3.1 If the Contractor proposes a disposition of any non-conforming materials or product which varies from the requirements of the Specification or *Contract*, such a proposal shall be submitted in writing to TRANSNET whose decision on the proposal shall be obtained in writing before the non-conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

9.3.2 The disposition of non-conformances which do not vary the requirements of the *Contract*, specification or drawings may be approved by the *Contractor* following discussion and agreement with TRANSNET.

10. Concession Requests and Technical Queries

10.1 Concession Requests

10.1.1 Where a *Contractor* requests a Concession to deviate from the requirements of the *Contract* or specified requirements, the *Contractor* raises the request with TRANSNET using the format as shown in Appendix 2.

10.1.2 The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

10.1.3 Completed original Concession Requests shall be included in the DP.

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Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8.7 Control of Non-Conforming outputs

10.2 Technical Queries

10.2.1 For clarification of technical issues (only), the *Contractor* may submit a Field Engineering Query (FEQ) to TRANSNET in accordance with the *Contract*.

10.2.2 The FEQ shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original FEQ's shall be included in the DP.

11. Inspection, Measuring and Test Equipment

Note the requirements of 11.1 to 11.3 must be applied in conjunction with ISO 9001:2015 Clause 7.1.5.1 &7.1.5.2 General and Measurement traceability

11.1 Calibration

11.1.1 The *Contractor*, including its Sub-Contractors/Sub-Suppliers, shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant *Contractor* procedures and/or the equipment manufacturer's specifications.

11.1.2 Where calibration is required by an external laboratory, the *Contractor* shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

11.1.3 The Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

11.2 Use of Inspection, Measuring and Test Equipment

11.2.1 The *Contractor* shall ensure that authorized equipment users:

a) Use the equipment in accordance with manufacturer's instructions, and accepted industry practices
b) Ensure the equipment is covered by a current calibration certificate
c) Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
d) Prior to commencement of each inspection or test activities:
   - Identify the measurements to be made
   - Determine the accuracy required
   - Select the appropriate inspection, measuring or test equipment for the scope of work.

11.3 Verification of Previous Test Results

11.3.1 Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to *Contractor's* Quality System procedures. The *Contractor* shall then arrange for either in-house or external calibration, and:

a) review all previous test results associated with the suspect equipment;
b) identify the inspections, measurements or tests required to re-validate the results;
c) ensure that suitable re-testing is performed with calibrated equipment;
d) record the results of the re-testing on the respective inspection and test documentation.

12. Quality Personnel Qualifications

12.1.1 The contractor shall nominate/appoint a Quality officer with minimum experience and qualifications specified in the Tender documents.

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12.1.2 The Contractor shall submit the CV and relevant qualifications of its nominated/appointed quality representative for the Project Manager's review and approval.

12.1.3 Should the approved qualify officer be no longer available, the contractor will notify the Project Manager in writing and upon agreement the contractor will provide the CV and qualifications of the proposed resource that is equivalent to the previously approved.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 7.2 Competence

13. Quality Records

13.1.1 *Contractors* shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work.

13.1.2 All Quality Records, including original source material test certificates and non-destructive test reports, shall be retained by the *Contractor* during the project, and be provided to TRANSNET at the times, and in the quantities specified in the *Contract*.

13.1.3 The *Contractor* shall collate all quality records in the Data Pack (DP) and submit the DP to TRANSNET in accordance with the *Contract* and all referenced standards and specifications. This DP shall be compiled progressively and shall be available for review at all phases of manufacture or construction activities.

13.1.4 The Scope of Work shall not be complete until the *Contractor's* DP, including the quality records from Sub-Contractors/Sub-Suppliers, has been reviewed and accepted by TRANSNET.

13.1.5 The *Contractor* compiles the DP progressively during the execution of the Scope of Work and makes the DP available for review by TRANSNET as required.

13.1.6 The *Contractor* shall retain a copy of all Quality documentation generated during the *contract*, including a copy of the complete DP, for his own records for a minimum period of five years after the completion of the work.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 7.5.3 Control of Documented Information

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Annexures E - Principal Controlled Insurance

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Web www.maksure.co.za

1 April 2025

To Whom It May Concern,

CERTIFICATE OF INSURANCE: TRANSNET (SOC) LIMITED – PRINCIPAL CONTROLLED INSURANCE

In our capacity as Insurance Brokers to the Transnet Group of Companies, we hereby certify that the undermentioned insurances are currently in place:

INSURED:	Transnet (SOC) Limited
PERIOD:	1 April 2025 to 31 March 2026 (Both days inclusive)
DIVISION:	Transnet Freight Rail, Transnet Engineering, Transnet Properties, Transnet Pipelines, Transnet National Ports Authority and Transnet Port Terminals
THE INSURED'S VAT NO:	4720103177
THE INSURED'S COMPANY REGISTRATION NO:	1990/000900/30
POSTAL ADDRESS (Head Office)	Carlton Centre, 150 Commissioner Street, Johannesburg, 2001

CONTRACT WORKS INSURANCE

Cover Provided :	Contract Works - Physical loss or damage to the Property Insured which being materials, plant and other things for incorporation into the permanent works.
Insurer :	Mirabilis (Santam Limited)
Policy Number :	MZAR35023-CAR
The Contract Site :	Any location within the Territorial Limits upon which The Insured Contract is to be executed or carried out as more fully defined in The Insured Contract documents together with so much of the surrounding area as may be required or designated for the performance of The Insured Contract.
Territorial Limits :	The Republic of South Africa.
Additional Co-Insureds:	
The Contractor:	All Contractors undertaking work in connection with The Insured Contract including the Employer to the extent that the Employer undertakes work in connection with The Insured Contract;
Sub-Contractors:	All Sub-Contractors employed by the Contractor and all other Sub- Contractors (whether nominated or otherwise) engaged in fulfilment of The Insured Contract; and to the extent required by any contract or agreement; transporters, suppliers, manufacturers, vendors, other persons, persons providing storage facilities, plant

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owners and/or operators in respect of liability loss or damage arising out of The Insured Contract; project managers, architects, land surveyors, quantity surveyors, engineers and other advisors or consultants or sub-consultants appointed in the performance of the Insured Contract activities arising at the Contract Site provided always that any such person shall not be insured hereunder in respect of liability loss or damage arising out of such person's error or omission in the performance of the professional services for which he was appointed;

Provincial & Government:

any Local Provincial or Government Department with which the Insured enters into any contract or agreement for the performance of The Insured Contract; all for their respective rights and interests.

Insured Contracts :

All Contracts (including any undertaking awarded or commenced prior to Inception of the Period of Insurance) involving design, construction, Performance Testing and Commissioning in respect of the Works and shall Include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation, retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **excluding;**

a) contracts which at award stage have a value in excess of R 1,000,000,000;

b) contracts with an estimated construction period exceeding 48 months but increasing to 60 months in respect of rail maintenance contracts and Transnet Freight and Rail contracts for logistical support for inline inspections and identification of defects over a 5 year period in respect of Transnet's pipeline assets (excluding Defects Liability/Maintenance period); c) contracts involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured;

d) contracts in or on any aircraft;

e) Off-shore contracts;

f) Wet Risk Contracts which at award exceeds R500,000,000;

g) Dam Contracts

h) Tunnel contracts which at award exceeds R50,000,000;

i) Tunnel contracts using tunnel boring machines;

j) Underground Mining Contracts;

k) Horizontal Directional Drilling Contracts which at award exceeds R50,000,000;

l) Horizontal Directional Drilling Contracts where total drilling exceeds 1 km;

m) Horizontal Directional Drilling Contracts for pipe diameters greater than 76 cm.

Definitions

1. *"Off-shore contracts" means all works and installations in the sea or on the seabed including dredging which are accessible only by ship boat barge or helicopter and do not constitute normal wet works like harbours moles bridges wharves or sewage or cooling water intake or outlet facilities. "OffShore Contracts" shall include oilrigs and oil platforms (but not including oil platforms when connected to the land on completion). The term shall not*

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apply to pre-fabrication works on land associated with an Off-Shore Contract.

2 *"Wet Risk Contracts" shall mean any Contract and/or Works where more than thirty-five (35) percentile of its value is in a permanent body of water or is below the high water mark of any tidal body of water. The term shall include contracts for the construction of wharves, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected directly to on-shore facilities and canal developments. Wet Risks shall exclude Off- Shore Contracts;*

3 *"Dam Contracts", which term shall include weirs and hydroelectric projects involving the construction of dams or weirs;*

4 *"Horizontal Directional Drilling Contracts", means micro-tunnelling work for the construction of tunnels utilising surface based horizontal directional drilling equipment.*

5 *Tunnels" means Tunnels (Including declines) involving all of the following;*
- *(a)* Works below ground level; and
- *(b)* Tunnelling machinery below ground level; and
- *(c)* A tunnelling crew operating the machinery below ground level;
- *(d)* But shall not include Horizontal Directional Drilling Contracts

6 *"Horizontal Directional Drilling Contracts", means micro-tunnelling work for the construction of tunnels utilising surface based horizontal directional drilling equipment.*

7 *"Underground Mining Contracts", which shall mean any contract involving underground mining.*

Testing Period: 120 Days not consecutive.

Maintenance Period : 12 Months

Main Policy Extensions :

- Costs & Expenses - Limited to a maximum of R50,000,000.
- Expediting Measures – Limited to a maximum of R50,000,000.
- Professional Fees In Reinstatement Of Property Insured - Limited to a maximum of R50,000,000.
- Costs & Expenses For Removal Of Debris No Damage - Limited to a maximum of R50,000,000.
- Surrounding Property in care custody or control of the contractor – Limited to a maximum of R55,000,000.
- Fire Brigade & Public Authorities - Limited to a maximum of R10,000,000.
- Public Authority Reinstatement Costs - Limited to a maximum of R20,000,000

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- Public Relationship Costs - Limited to a maximum of R1,000,000. Records - Limited to a maximum of R2,000,000.
- Removal to Gain Access - Limited to a maximum of R20,000,000
- Road Reserve and Servitude Extensions - Limited to a maximum of R10,000,000

- Search & Locate Costs - Limited to a maximum of R20,000,000.
- Borrowing Of Plant For Commissioning Purposes - Limited to a maximum of R10,000,000
- Escalation during Construction – 30%
- Marine Contribution Clause
- Claim Preparation Costs – Limited to a maximum of R10,000,000

Main Policy Exclusions :

- War
- Nuclear Energy Risks
- Terrorism
- Computer Loss General Exception
- DE4 (All types of Works) for defective material workmanship design plan or specification.
- LEG 3 (Mechanical or Electrical Engineering Works only) for defective material workmanship design plan or specification. Limited to maximum of 10% of the total estimated contract value in the aggregate.
- Loss or damage arising during air transit or any ocean voyage or whilst in storage thereafter.
- Occurring during any defects/maintenance period unless cause occurred prior to such defects/maintenance period
- Disappearance or by shortage revealed during routine inventory or periodic stocktaking.
- Consequential loss of whatsoever nature.
- Normal wear and tear, normal atmospheric conditions, rust, erosion, corrosion or oxidisation.
- Due to its own explosion breakdown or derangement occurring after the Testing Period which has operated under load conditions.
- Second hand property due to its own electrical or mechanical breakdown or explosion.
- Cyber and Data
- Beneficial Occupation – 12 months
- Risk Mitigation – Safety Measures with Respect to Precipitation, Flood and Inundation – 10 years return period

Deductibles:

In respect of loss or damage:

Major Perils shall mean damage caused by storm, rain, tempest, wind, flood, theft, malicious damage, subsidence, collapse, earthquake, testing or commissioning and

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the consequences of defective design, specification, materials or workmanship (DE4).

Minor Perils shall mean damage caused by a peril not defined as Major Perils defined above.

Contracts with a contract value :	Major perils	Minor perils
0 to R100,000,000	R25,000	R15,000
R100,000,001 to R250,000,000	R50,000	R15,000
R250,000,001 to R500,000,000	R100,000	R25,000
R500,000,001 to R1,000,000,000	R150,000	R25,000

Minimum wet risk deductible of R100,000 per occurrence to apply.

Electrical Cables, Wiring and Accessories 10% of claim minimum R100,000

LEG 3 Deductible (Only in respect of Mechanical and Electrical contracts);

Contracts with a contract value	Deductible
0 to R500,000,000	R1,000,000 per occurrence
R500,000,001 to R1,000,000,000	R1,500,000 per occurrence

PUBLIC LIABILITY

Cover Provided : Contract Works Public Liability – cover the Insured's legal liability in respect of loss or damage or injury to third parties arising out of work performed in respect of the Insured Contracts.

Insurer : Stalker Hutchinson (Santam Limited)

Policy Number: 6000/132335

Territorial Limits : The Republic of South Africa.

Insured Contracts: All contracts (including any undertaking awarded or commenced prior to inception of the period of Insurance) involving design, construction, performance testing and commissioning in respect of the works and shall include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation, retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **Excluding**:

a) Contracts which at award stage have a value in excess of R 1,000,000,000.
b) Contracts with an estimated construction period at award exceeding 48 months but 60 months in respect of contracts awarded prior to 1 April 2020 for rail maintenance contracts For Transnet Freight & Rail and for Transnet Pipeline's logistical support for inline inspections and identification of defects in respect of Transnet's pipeline assets (all excluding Defects Liability/Maintenance period).

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c) Contracts with a Contractual Defects Liability Maintenance Period exceeding 24 months.

d) Contracts involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured.

e) Contracts in or on any aircraft.

f) Off-shore contracts - “Off-shore contracts” means all works and installations in the sea or on the seabed and do not constitute normal Wet Risk Contracts like harbours, moles, bridges, wharves or sewage or cooling water intake or outlet facilities, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected directly to onshore facilities and canal developments. "Off-Shore contracts" shall include oilrigs and oil platforms.

Policy Limits:

Contractors Public Liability	R100,000,000 any one occurrence / unlimited during the Period of Insurance
Contractors Negligent Removal or weakening of Support	R100 000 000 any one occurrence and R100,000,000 per site in the aggregate during the Period of Insurance.
Statutory Legal Defence Costs	*R5 000 000 in the aggregate during the Period of Insurance.
Arrest / Assault / Defamation	*R5 000 000 in the aggregate during the Period of Insurance.
Prevention of Access	*R5 000 000 in the aggregate during the Period of Insurance.
Trespass / Nuisance	*R5 000 000 in the aggregate during the Period of Insurance.
Claims Preparation Costs	R5 000 000 any one occurrence

*Where the limits are noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.

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Deductible(s) : R50,000 per occurrence but increased to R5,000,000 in respect of Spread of Fire and/or Hot Works and R250,000 in respect of Sudden and Accidental Pollution and/or Goods on the Hook and/or R150,000 in respect of Developers Removal of Support.

General Policy Exclusions :

The policy does not cover:-

- deliberate, conscious and intentional disregard to take reasonable precautions. fines, penalties, punitive and exemplary damages.
- Pollution unless caused by a sudden, unintended and unexpected occurrence.
- cost of removing, nullifying or cleaning up the effects of pollution unless caused by a sudden, unintended and unexpected occurrence.
- the hazardous nature of asbestos.
- War And Terrorism Risks.
- Nuclear Risks.
- Actual or alleged unlawful competition, unfair practices, abuse of monopoly power, cartel activities

- Compulsory Insurance
- Loss or damage and any consequence therefrom to any Data. •
- Sanctions Exclusion Grid Failure

PROFESSIONAL INDEMNITY

Cover Provided : Professional Indemnity

a) In respect of damages which the Insured shall become legally liable to pay in consequence of neglect, error or omission by or on behalf of the Insured in the conduct or execution of their Professional Activities and Duties as defined.

b) Prior To Handover/Rectification - against loss arising out of any defect in the works discovered prior to the issue of any practical completion or take-over certificate provided that any such defects are caused by a negligent breach of a Professional Activity or Duty by the Insured in consequence of neglect, error or omission by or on behalf of the Insured.

Insurer : Stalker Hutchinson (Santam Limited)

Policy Number: 6000/132337

Jurisdiction : Worldwide excluding North America

Insured Contracts: All contracts (including any undertaking awarded or commenced prior to inception of the period of Insurance) involving design, construction, performance testing and commissioning in respect of the works and shall include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation,

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retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **Excluding**:

a) Contracts which at award stage have a value in excess of R 1,000,000,000.
b) Contracts with an estimated construction period at award exceeding 48 months (excluding Defects Liability/Maintenance period).
c) Contracts with a Contractual Defects Liability Maintenance Period exceeding 24 months.
d) Contracts involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured.
e) Contracts in or on any aircraft.
f) Off-shore contracts - "Off-shore contracts" means all works and installations in the sea or on the seabed and do not constitute normal Wet Risk Contracts like harbours, moles, bridges, wharves or sewage or cooling water intake or outlet facilities, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected directly to onshore facilities and canal developments. "Off-Shore contracts" shall include oilrigs and oil platforms.

Limit Of Indemnity:	Professional Indemnity - *R100,000,000 in the aggregate during the policy period of insurance. *Where the limit is noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.
Policy Extension Limits Of Indemnity:	Claims Preparation Costs - *R7,500,000 in the aggregate during the policy period of insurance. Loss of Documents - *R2,000,000 in the aggregate during the policy period of insurance. Statutory Defence Costs - *R5,000,000 in the aggregate during the policy period of insurance. Defamation - *R5,000,000 in the aggregate during the policy period of insurance. Infringement of Copyright - *R5,000,000 in the aggregate during the policy period of insurance. *Where the limits are noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.
Deductibles:	R5,000,000 each and every but R10,000 in respect of Claims Preparation Costs, Loss of Documents, Statutory Defence Costs, Defamation and Infringement Of Copyright.

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Policy Special Conditions :

Condition precedent to liability that the Insured is fully qualified and registered with the relevant Industry Body/Association in terms of legislation as applicable.

Prior to hand over/rectification – the insured must give prior written notice to the Insurers of the intention to take remedial action to rectify such defect and obtain the Insurers' written agreement to such action being taken and the costs and expenses expected to be expended.

Policy Main Exclusions:

- Excludes all consequential loss other than cost of re-design, rectification and replacement as a consequence of the defect.
- Excludes Supervision.
- Excludes liability arising out of environmental impairment / pollution
- Excludes the cost of removing, nullifying or cleaning-up the effects of environmental impairment/ pollution.
- Excludes war, invasion, acts of foreign enemies, hostilities or warlike operations (whether war be declared or not), civil war, rebellion, revolution, insurrection, civil commotion assuming the proportions of or amounting to an uprising, military or usurped power, any act of terrorism and nuclear risks.
- Excludes fines, penalties, punitive and exemplary damages, multiplication of compensatory damages and/or any other noncompensating damages of any kind.
- Excludes liability from the hazardous nature of asbestos.
- Excludes medical malpractice.
- Excludes failure to meet contractual requirements relating to efficiency, output or durability.
- Excludes failure to meet completion dates
- Excludes the estimation of probable costs other than cost advice and cost planning services normally provided by a Quantity Surveyor or Project manager.
- Excludes incorrect authorisation of payment.
- Excludes breach of any statutory regulation.
- Excludes liability from the insolvency, liquidation or judicial management of the Insured.
- Excludes the certification of value of work executed by any contractor where the Insured has an equity interest in such contractor;
- Excludes liability due to unlawful competition, unfair practices, abuse of monopoly power, cartel activities or breach of a competitions ac
- Sanctions Exclusion
- Grid Failure

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This certificate of the insurance cover arranged is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies issued by Insurers.

Langa Sigodi



Account Executive: Corporate and Global Markets

Annexures F

Annexures F1 - Health & Safety Pricing Schedule

TNPA Estimate Health and Safety Cost Breakdown

Tenderer (Company)	Responsible Person	Designation	Date
Project/Tender Title	**Project/Tender No.**	**Project Location / Description**	

#	Cost element	Unit Cost (R)	# of Units	Total Cost (R)
1.	Human Resources			
2.	Systems Documentation			
3.	Meetings & Administration			
4.	H&S Training			
5.	PPE & Safety Equipment			
6.	Signage & Barricading			
7.	Workplace Facilities			
8.	Emergency & Rescue Measures			
9.	Hygiene Surveys & Monitoring			
10.	Medical Surveillance			
11.	Safe Transport of Workers			
12.	HazMat Management (e.g., asbestos /silica)			
13.	Substance Abuse Testing (3 kits @R500 pm)			
14.	H&S Reward & Recognition			

Total Health and Safety Estimate (R)	
Total Estimate Value (R)	
H&S Cost as % of Tender value	

Annexures F2 - Health and Safety Management

Transnet National Ports Authority

Health and Safety Management

Mechanical Equipment Installation 06 Toulon Road Building at Bayhead Precinct Port of Durban Project Health and Safety Specification

TNPA/2025/02/0012/90062/RFP

Prepared by:  08/04/2025

Lee Matthys
Health and Safety Practitioner

Date

Approved by:  08/04/2025

Ntombozuko Xama
Act. Health & Safety Manager

Date

Accepted by:  09/04/2025

Sanelisiwe Shozi
Project Manager

Date

Rev No	Date	Revision Details
00	2025-04-08	Issue for Review
01	2025-04-08	Issue for Approval

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1. Purpose

This Health and Safety Specification has been compiled to provide the Principal Contractor and contractors working on the Mechanical Works Installation at 06 Toulon Road Building at Bayhead Precinct in the Port of Durban with the relevant health and safety information to be taken into consideration during the execution of the Mechanical Works Installation at Of 06 Toulon Road Building at Bayhead Precinct in the Port of Durban Project, the Principal Contractor shall conduct a health & safety risk assessment specific to the project and specific to the scope of work for the construction. All applicable requirements must be addressed in the Contractor's Health and Safety Management Plan.

All Contractors and service providers must take careful note of the requirements specified in this project health and Safety Specification and must ensure adequate health and Safety Provision has been made to ensure compliance.

This Health and Safety Specification will be periodically reviewed and updated (if necessary) to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

1.1 Basic Project Information:

Project Number:	TBC
Description:	Mechanical Works Installation at 06 Toulon Road Building
Client:	TNPA (06 Toulon Road Building)
TNPA Project Manager:	Sanelisiwe Shozi

2. Scope

This Project health & safety specification applies to the Mechanical Works Installation at 6 Toulon Road Building at Bayhead Precinct in the Port of Durban Project and to all persons working on or visiting this project. The works that the Contractor is to perform are the Mechanical Works Installation at 06 Toulon Road Building at Bayhead Precinct in the Port of Durban which is part of the Durban Harbour.

The major activities of the works include:

The work to be carried out under this contract shall include, but not be limited to the following:

a) Conventional fire water system including landing valves and fire hose reels inside the building.
b) Portable fire extinguishers.
c) Central fire water pump installation caring SANS approval, consisting out of the following:

- Two (2) Main fire pump sets - one diesel driven main pump
- One (1) electrical driven main pump
- Jockey pump set -one electrical driven jockey pumps.
- Electrical control panels including electric, diesel, jockey pumps and annunciator control panels.
- All Sprinklers and all associated pipework (supply and installation of the conventional fire protection systems
- All electrical controls and cabling, including the pipework supports, tanks and pump supports.
- Fire water storage tanks ancillary equipment, including vortex inhibitors, cat ladders, level indicators, tank fill points and tank suction points, automatic fill valves and associated pipe work to and from reinforced concrete fire water storage tanks.
- Flow switches and supervisory switches.
- Flashing strobe and siren.

d) Fire hoses and streamers.
e) Testing of the complete fire water systems including fire pump room installation.
f) Co-ordination of the complete fire water system relative to other services including the mechanical, electrical and plumbing services, as well as the structure.
g) Painting of all fire water piping and equipment.
h) Fire stopping devices.
i) Statutory fire signage as indicated on the relevant drawings.
j) Installation and shop drawings for approval by the Engineer and Local Authority.

k) Certification of the complete installation as complying with Local Authority requirements and all relevant codes and regulations as highlighted in this document.

l) Supplying of operating and maintenance manuals for all systems and components of this installation.

m) Training of client's maintenance and operating personnel in operating, servicing and maintaining the systems and components forming part of this installation.

n) Commissioning and handing over of complete systems to the satisfaction of the Engineer.

o) Maintaining and servicing of complete installations during the warranty period.

3. Definitions

Acceptable Risk
A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)
The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

Applicant (Permit to Work)
A person requesting permission to perform work for which a Permit to Work is required. Applicants must be authorised (in writing) to receive (or accept) Permits to Work and must be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to issue Permits to Work within the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade
A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Battering
Sloping the sides of an excavation to a predetermined angle (usually less than the natural angle of repose) to ensure stability.

Benching
The creation of a series of steps in the sides of an excavation to prevent collapse.

Consequence
The outcome of an event expressed qualitatively or quantitatively.

Contractor

An employer performing construction work, or providing related or supporting services, on a project site,) Includes organisations and or self-employed person that contracts with a client, principal contractor, or a contractor to carry out construction work.

Competent Person
means a person who— (a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2008 (Act No.67 of 2008), those qualifications and that training must be regarded as the required qualifications and training; and (b) is familiar with the Act and with the applicable regulations made under the Act; Notes: a) An all-inclusive assessment should be on all four components knowledge, training and experience, and where appropriate qualifications exist in relation to the work to be performed. b) Part (b) of the above definition is best reflected through demonstration of understanding of the OSH Act and its various applicable regulations

Clearance Certificate
A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Construction Work Permit
A client who intends to have construction work carried out, must at least 30 days before that work is to be carried out apply to the provincial director in writing for a construction work permit to perform construction work.

Discipline Lock (many locks with a restricted number of identical keys)
Attached at a Lockout Station or at a Local Isolation Point in order to lock out a system, plant or equipment. A Discipline Lock (e.g. a Low Voltage Electricity Discipline Lock) is owned by an Isolation Officer who has been authorised in writing to isolate and lockout a particular hazard (e.g. low voltage electricity).

Equipment Lock (many locks with one unique key)
Attached directly to pieces of equipment in order to lock them out. Equipment Locks may only be used by Isolation Officers who have been authorised in writing to perform isolation and lockout procedures. The key must have a solid key ring that fits over an Isolation Bar.

Excavation
Any man-made cut, cavity, pit, trench, or depression in the earth's surface formed by cutting, digging or scooping.

First-Aid Injury (FA)

A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner .First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief). The following procedures are generally considered first aid treatment:

- Application of Antiseptics.

- Application of Butterfly adhesive dressing or sterile strips for cuts and lacerations.
- Administration of tetanus shot(s) or booster(s). However, these shots are often given in conjunction with more serious injuries, consequently injuries requiring these shots may be recordable for other reasons.
- Application of bandages during any visit to medical personnel.
- Application of ointments to abrasions to prevent drying or cracking.
- Inhalation of toxic or corrosive gas, limited to the removal of the employee to fresh air or the one time administration of oxygen for several minutes.
- Negative X-Ray diagnosis.
- Removal of foreign bodies not embedded in the eye if only irrigation is required.
- Removal of foreign bodies from a wound if procedure is uncomplicated, for example by tweezers or other simple technique.
- Treatment for first degree burns.
- Use of non-prescription medications and administration of single dose of prescription medication on first visit for any minor injury or discomfort.

Hazard
A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls
A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.
- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. prevent contact with the hazard).

Isolation and Lockout Procedure
A plant or equipment-specific procedure that describes the method, and sequence to be followed, for rendering equipment, plant and systems safe to work on.

Incident
An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood
A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more. If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTIs multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
  - The vehicle's manufacturer; or
  - An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (SUVs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition must be considered mobile equipment.

Medical Treatment Injury (MTI)

A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. stitches, removal of foreign body).

The following procedures are generally considered medical treatment:

- Application of sutures (stitches).
- Cutting away dead skin (surgical debridement).
- Loss of consciousness due to an injury or exposure in the work environment.
- Positive X-Ray diagnosis (fractures, broken bones etc.).
- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from the wound by a physician due to the depth of embedment, size or shape of object or the location wound.
- Reaction to a preventative shot administered because of an occupational injury.
- Sprains and strains - series (more than one) of hot and cold soaks, use of whirlpools, diathermy treatment or other professional treatment.
- Treatment of infection.

- Treatment for second or third degree burns
- Use of prescription medications (except a single dose administered on first visit for minor injury or discomfort.)

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competency.

Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, telehandlers, drill rigs, buses and road-going trucks.

Near Hit
An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Personal Lock
A single lock with one unique key controlled by the owner. Used for personal protection.

Risk
A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment
A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management
The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

4. Health and Safety Management Plan, CR 7(1)a

The Principal Contractor shall provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan based on this project health and safety specifications and all applicable legislations. The Principal Contractor shall implement and maintain this plan for the duration of the project. The Project Health and Safety Management plan shall cover all activities that will be carried out on the project site from mobilisation and set up through to rehabilitation and decommissioning.

The plan shall demonstrate the contractor's commitment to health and safety and shall, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**; in terms of the OHS Act section 7
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;

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

Prior to mobilisation, the Health and Safety Management Plan must be forwarded electronically, and as a hard copy, to the appointed Health & Safety Agent/Manager for review and approval. Work may not commence until the plan has been accepted. Once the plan has been accepted, the contractor must action and resolve any issues within 30 days from the start of work. If the issues requiring corrective action are not resolved within this 30 day period, the contractor will be required to stop any work related to the outstanding actions until they have been resolved. Any proposed amendments or revisions to the contractor's Health and Safety Management Plan must be submitted to the appointed Health and Safety Agent for approval.

5. Health and Safety Policy (Section 7)

The Contractor must develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety. These values and objectives must be endorsed by the contractor's management representatives and must be consistent with those adopted for the project. (OHS Act 7 sub regulation 3)The policy must be signed and dated, and must be reviewed annually.

The policy must commit to:

- Compliance with all applicable legal requirements;
- The effective management of health and safety risks;
- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents; and
- Achieving continual improvement with regard to health and safety performance.

The principal contractor employees shall be made aware of this health and safety policy. A copy of the policy must be displayed in each meeting room and on each notice board.

6. Hazard Identification and Risk Assessment (OHS Act, Constr. Regulations 9)

Detailed hazard identification and risk assessment processes must be followed for all work to be performed as well as for all associated equipment and facilities.

The client will provide a baseline risk assessment informing contractor on the hazards and risks on site. Contractor must ensure that effective procedures and risk assessment systems are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

The risk assessment processes must be applied to:

- The full life cycle of the project;
- Routine and non-routine activities;
- Planned or unplanned changes (refer to Section 15);
- All employees, sub-contractors, suppliers and visitors; and
- All infrastructure, equipment and materials.

The risk assessment processes and methodologies must be appropriate for the nature and scale of the risks, and must be implemented by competent persons.

The process of analysing and managing risk must include the following:

- Establishing the context of the risk assessment;
- Identifying hazards and determining possible risk scenarios (unwanted events);
- Evaluating risks and assigning ratings (classification);
- Recording the risk analysis in a risk register;
- Managing risks according to their classification (prioritising for action);
- Identifying and implementing control measures (through the application of the Hierarchy of Controls) to ensure that risks are managed to levels that are as low as is reasonably practicable (ALARP);
- Developing action plans for reducing risk levels (where possible);
- Verifying the completion of actions;
- Re-evaluating the risks and classifications as appropriate; and
- Reviewing and updating the risk register.

6.1 Baseline Risk Assessment

As per Construction Regulation 2014, regulation 5(1)a. A baseline risk assessment foreseeing hazards and risk scenarios pertaining to the has been developed. The risk assessment has been reviewed and approved by the Professional Health and Safety Manager (CHSM).When carrying out a Risk Assessment or a Task-Based Risk Assessment (refer to Section 6.2), Hazard (Energy) Types must be specified in accordance with the categorisation detailed in Table 6-1. Risk scenarios must be described indicating the manner in which a person may come into contact with, or be exposed to, a specific hazard.

An initial risk rating must be assigned to each risk scenario without taking any control measures into consideration. Control measures for managing the risks to levels that are as low as is reasonably practicable must then be identified for implementation on the project, and a residual risk rating must be assigned to each risk scenario taking the identified control measures into consideration.

Ratings must be assigned qualitatively using TNPA consequence and likelihood scales and descriptors (i.e. TNPA 5x5 qualitative risk matrix). Refer to Tables 6-2, 6-3 and 6-4.

Table 6-1: Hazard (Energy) Types

Gravitational							
Falling or Rolling Object	Person Falling from Height	Slip, Trip or Fall (Same Level)	Collapsing Structure	Collapsing, Slumping or Flowing Material or Substance			
Mechanical							
Moving Component of Fixed Machinery	Moving Component of Powered Tool	Projectile	Moving Hand Tool	Sharp Object	Moving Mobile Equipment or Light Vehicle	Moving Person	Moving Object (Mechanically or Manually)
Elastic							
Object under Tension or Compression				Compressed Fluid (Gas or Liquid)			
Acoustic							
Noise							
Vibrational							

Hand / Arm Vibration			Whole Body Vibration				
Electrical							
Electricity			Electro-Magnetic Field				
Radiation							
Ionising Radiation			Non-Ionising Radiation				
Illumination							
Lighting							
Thermal							
Heat			Cold				
Fire							
Fire							
Explosion							
Explosion							
Particulates and Aerosols							
Dust	Fibres		Fume	Spray		Mist	Smoke
Chemical							
Corrosive Substance	Irritant	Asphyxiant	Narcotic / Anaesthetic	Poison	Allergen / Sensitizer	Carcinogen	Teratogen / Mutagen	Venom
Microbiological							
Virus		Bacterium		Parasite		Fungus	
Weather							
Lightning		High Wind		Flooding		Hail	
Physiological							
Stress			Fatigue				
Ergonomic							
Exertion		Repetitive Movement		Awkward Posture		Awkward Movement	

Table 6-2: Consequence Descriptors

Consequence	Insignificant	Minor	Moderate	Major	Catastrophic
Health	Reversible health effects of little concern, requiring first aid treatment at most.	Reversible health effects of concern that would typically result in medical treatment.	Reversible health effects of concern that would typically result in a lost time illness.	Single fatality, or irreversible health effects or disabling illness.	Multiple fatalities or permanent disabling illness to multiple people.
Safety	Low-level, short-term subjective inconvenience or symptoms. Typically a first aid case requiring no medical treatment.	Reversible injury requiring treatment, but not leading to restricted duties. Typically a medical treatment case.	Reversible injury or moderate irreversible damage or impairment. Typically a lost time injury.	Single fatality, or considerable irreversible damage or impairment.	Multiple fatalities or permanent disabling injury to multiple people.

Table 6-3: Likelihood Descriptors

Likelihood	Likelihood Description	Frequency	Substance Exposure
Almost Certain	Recurring event during the life-time the project.	Typically occurs more than twice per year.	Frequent (daily) exposure at > 10 x OEL.
Likely	Event that may occur frequently during the life-time of the project.	Typically occurs once or twice per year.	Frequent (daily) exposure at > OEL.
Possible	Event that may occur during the life-time of the project.	Typically occurs once in 5 years.	Frequent (daily) exposure at > 50% of OEL. Infrequent exposure at > OEL.
Unlikely	Event that is unlikely to occur during the life-time of the project.	Typically occurs once in 10 years.	Frequent (daily) exposure at > 10% of OEL. Infrequent exposure at > 50% of OEL.
Conceivable but improbable	Event that is very unlikely to occur during the life-time of the project.	Typically occurs once in 100 years.	Frequent (daily) exposure at < 10% of OEL. Infrequent exposure at > 10% of OEL.

Table 6-4: Risk Matrix

Risk Calculator		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood		1	2	3	4	5
Almost Certain	5	Moderate (5)	High (10)	High (15)	Extreme (20)	Extreme (25)
Likely	4	Low (4)	Moderate (8)	High (12)	Extreme (16)	Extreme (20)
Possible	3	Low (3)	Moderate (6)	Moderate (9)	High (12)	High (15)
Unlikely	2	Low (2)	Low (4)	Moderate (6)	Moderate (8)	High (10)
Conceivable but improbable	1	Low (1)	Low (2)	Low (3)	Low (4)	Moderate (5)

A Risk Register comprised of all significant risks (i.e. risks rated as major or catastrophic) identified for the project will be compiled using the information contained in the project Baseline Risk Assessment as well as the contractor's Baseline Risk Assessment. Key control measures for managing each of these risks will be specified in the register.

For the significant risks in particular, action plans will be developed for reducing the risk levels (where possible).

The project Risk Register will be reviewed and, if necessary, updated:

- On a quarterly basis during construction;
- When changes are made to a design and / or the construction scope, schedule, methods, etc. that result in a change to the risk profile; and
- Following an incident.

The contractor must ensure that the hazards, risk scenarios and control measures identified in the contractor's Baseline and Task-Based Risk Assessments are taken into consideration when developing, implementing and maintaining the various elements of the contractor's health and safety management system for the project (e.g. competence, training and awareness requirements).

All persons potentially affected must be made aware of the hazards, risk scenarios and control measures identified in the contractor's risk assessments. This must be done through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

6.2 Task-Based Risk Assessments

The contractor must carry out detailed project-specific Task-Based Risk Assessments which must be reviewed and approved by the Project Health and Safety Manager and Project Construction Manager prior to the commencement of any work. The risk assessment process must be facilitated by a competent person who has been appointed in writing. The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined must participate in the risk assessment process. An attendance register must be completed and retained.

Please Note: Under no circumstances may a Contractor Health and Safety Officer perform a risk assessment in isolation. The active participation of all persons referred to above is mandatory.

A Task-Based Risk Assessment must at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner);
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment must be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement; and
- Following an incident.

6.3 Pre-Task Hazard Assessments

A pre-task hazard assessment must be completed whenever a change is identified while carrying out an activity. Any deviation from what was discussed during the Daily Safe Task Instruction (prior to the activity commencing), or anything that was not discussed, constitutes a change.

6.4 Continuous Risk Assessment / DSTIs

A Daily Safe Task Instruction (DSTI) is a simple and effective tool for the management of hazards and risks within the workplace. It enables Supervisors, work teams and individual employees to quickly assess a situation for hazards and to introduce controls to make the situation safe. A DSTI is based on a simple checklist / evaluation tool that is completed prior to commencing work. It can be made task specific, rather than using a generic one for all activities.

The DSTI shall be completed in the presence of the entire team on a daily basis prior to commencing work related tasks as well as at the end of the shift to record any incidents, changes that occurred during the shift, and lessons learnt.

Due consideration must be given to changes in the work environment e.g. terrain, weather and health hazards when conducting the DSTI's.

Where a DSTI identifies a hazard or risk not previously identified in a risk assessment, the Supervisor or nominated person shall ensure the existing risk assessment is amended and revised as necessary. All visitors to a particular work area must also sign the DSTI(s) for that area as acknowledgement of identified hazards.

6.5 Issue based Risk Assessment .

An issue-based risk assessment will be conducted as soon as an issue arise. They are appropriate for the management of change in the workplace, for example:

- When a near-miss incident occurred
- New machinery / equipment is introduced into the workplace
- Processes or procedures change
- New knowledge regarding a chemical substance comes to light, to name a few.
- The same technique and approach is applied as when task specific risk assessments are conducted. The outcomes of all issue-based assessments will be incorporated into the baseline risk assessment. Relevant task specific risk assessments need to be drafted or updated where relevant.

6.6 Risk Assessment Review

Each Principal Contractor shall conduct and document risk reviews to support their planning process. Planned review dates can be included in the Risk Assessment Register.

6.7 Method Statement and Safe Work Procedures

The Principal Contractor shall compile method statements and submit to nominated project management representative for review 10 days prior to work commencement. Method statements shall be developed for all high risk and non-routine tasks. Method statements shall include:

- Specific sequential steps / instructions on how to perform the task
- Reference to required plant, tools and equipment
- Potential hazards
- Control measures relating to hazards
- Reference to safe work procedures for that specific task

- Reference to applicable legal appointments

The Principal Contractor shall compile safe work procedures and submit same to the nominated project management representative for review 10 days prior to work commences.

Safe work procedures shall include reference to:

- The specific method statements
- Control measures to mitigate or reduce risk
- Supervisory requirements, including level and frequency
- Responsibilities of competent persons
- Responsibilities of legal appointees
- Required personal protective equipment
- Required plant, tools and equipment
- Inspection regime relating to plant, tools and equipment
- Medical certificates of fitness
- Relevant risk assessments
- Emergency management procedure, and any special arrangements required for the task

7. Legal and Other Requirements

The Contractor must comply with the requirements of all applicable health and safety legislation as well as Transnet NPA and project-specific standards and procedures.

The Contractor must compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register must be updated regularly to ensure that it remains relevant.

Applicable laws and standards must be appropriately communicated to all employees of the contractor (as well as the employees of any sub-contractors that may be appointed by the contractor) through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

8. Health and Safety Objectives

In order to drive continual improvement, the contractor must set project-specific health and safety objectives, and must develop improvement action plans to achieve these objectives. The contractor's objectives must be aligned with the objectives set for the project as a whole as required by the construction regulation 2014, Regulation 7.

Eliminating health and safety hazards, minimising health and safety risks, preventing incidents, injuries and illnesses, and ensuring legal compliance must be the primary considerations for setting objectives.

When setting objectives, consideration must be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;

- Lagging indicators (i.e. incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is "no harm".

The objectives must be specific and measurable. The improvement action plans must specify the resources (both human and financial) required to achieve the objectives, the persons responsible, and realistic timeframes for completion. The contractor must ensure that adequate resources are allocated and that progress towards meeting the objectives is monitored regularly.

The objectives and associated improvement action plans must be documented and must be communicated to all contractor employees. Furthermore, to ensure that the objectives remain relevant, they must be reviewed on a quarterly basis and whenever significant change has taken place on the project (i.e. changes to activities, scope of work, operating conditions, etc.).

Each contractor employee must have a personal health and safety plan or must be part of a team plan with documented objectives that support the contractor's Health and Safety Management Plan and the project-level objectives.

Performance reviews must be carried out at quarterly intervals to assess and document performance against these personal or team objectives.

If a reward or incentive scheme is introduced, it must be designed in such a manner that health and safety performance is not compromised in order to maximise financial reward.

9. Resources, Accountabilities and Responsibilities

The Contractor must appropriately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the contractor's health and safety management system on the project.

For each role that carries health and safety accountability and / or responsibilities (including legislative requirements), a role description detailing the accountability and / or responsibilities must be documented.

All health and safety appointments (i.e. the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements) must be done in writing. Documented proof of each appointment (i.e. a signed appointment letter) must be retained.

No discharged of responsibilities to employees who are not appointed in writing.

The contractor must comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the project.

A health and safety organisational chart specific to the project must be documented and maintained. All roles that carry health and safety accountability and / or responsibilities must be included, and all individuals that carry health and safety appointments must be clearly identified.

The provision of dedicated health and safety professionals on the project must be appropriate for the nature and scale of the work to be carried out.

The contractor is solely responsible for carrying out the work under the contract whilst having the highest regard for the health and safety of all persons on the project site(s).

Health and safety is the responsibility of each and every individual on the project site(s), but in particular, it is the responsibility of the contractor's management team who must set the tone.

Visible commitment is essential to providing and maintaining a safe workplace. The contractor's managers and supervisors at all levels must demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals must consistently take immediate and firm action to address violations of health and safety rules, and must actively participate in day to day activities with the objective of preventing harm.

The contractor's management representatives are responsible and accountable for health and safety performance on the project. Key responsibilities include the following:

- Preparing, implementing and maintaining a risk-based Health and Safety Management Plan specific to the work that will be carried out (refer to Section 4);
- Establishing, implementing and maintaining health and safety programmes and procedures to ensure that all work is carried out in compliance with the requirements of this specification, the contract, and all applicable legislation;
- Establishing, implementing and maintaining effective hazard identification and risk management processes and procedures to ensure that all reasonably foreseeable hazards are controlled in order to minimise risk (refer to Section 6);
- Providing the resources necessary to meet the requirements of this specification (refer to Section 9);
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety, and that these responsibilities are clearly communicated and understood (refer to Section 9);
- Establishing, implementing and maintaining a system for ongoing training and assessment of skills and competence (refer to Section 10);
- Establishing, implementing and maintaining procedures to ensure that only qualified and competent personnel are permitted to work on the project site(s) (refer to Section 10);
- Establishing, implementing and maintaining effective communication and consultative processes concerning health and safety for the duration of the contract (refer to Section 11);
- Maintaining operational control for the protection of all persons on the project site(s) as well as the public (refer to Section 13);
- Establishing, implementing and maintaining effective emergency preparedness and response procedures (refer to Section 14);
- Establishing, implementing and maintaining effective management of change processes and procedures (refer to Section 15);
- Establishing, implementing and maintaining effective incident reporting and investigation processes and procedures (refer to Section 18);
- Establishing, implementing and maintaining effective auditing and inspection processes and procedures (refer to Section 20); and
- Formally reviewing the contractor's Health and Safety Management System annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements (refer to Section 21).

All costs associated with meeting these responsibilities shall be borne by the contractor.

Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

9.1 Contractor Construction Manager CR 8(1)

The contractor shall appoint a competent construction manager who shall responsible for the successful and the safe completion of all the works to be carried out by the contractor as required by the Construction Regulation 2014 sub regulation 8.1, also be registered with the SACPCMP (The South African Council for Project Construction Management Professions) as Pr. Construction Manager.

The contractor construction manager shall be responsible for

- Ensuring that a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety on the project is in place and is communicated to all contractor and sub-contractor employees;
- Ensuring that all applicable legal and project health and safety requirements are identified and complied with at all times;
- Ensuring that effective hazard identification and risk management processes are established and implemented 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);
- Participating in (and approving) all Task-Based Risk Assessments conducted for the work to be carried out by the contractor;
- Driving the achievement of agreed health and safety objectives;
- Ensuring that the necessary resources are made available for the effective implementation of the contractor's Health and Safety Management Plan;
- Ensuring that all work is adequately and competently supervised;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety (assigned in writing), and that these responsibilities are clearly communicated and understood;
- Ensuring as far as is reasonably practicable that each contractor and sub-contractor employee is competent to perform his role, and has received appropriate workplace health and safety training and instruction;
- Managing all appointed sub-contractors with regard to health and safety performance;
- Establishing and maintaining effective communication and consultative processes to ensure that all contractor and sub-contractor employees are kept up to date with regard to health and safety information (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.) And that feedback is provided promptly regarding issues and / or concerns raised;

- Participating in the project's Visible Felt Leadership (VFL) programme;
- Chairing monthly Contractor Health and Safety Meetings and attending monthly Site Health and Safety Meetings;
- Implementing programmes that encourage continual improvement and providing recognition for suggestions made by contractor and sub-contractor employees;
- Implementing the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Acting consistently and strictly against any contractor or sub-contractor employee who transgresses a health and safety rule or requirement;
- Ensuring that an effective management of change process is in place;
- Implementing, testing and maintaining an effective Emergency Response Plan for all contractor and sub-contractor activities, and ensuring that the plan is adequately resourced;
- Ensuring that workplace exposure of contractor and sub-contractor employees to hazardous substances or agents is measured and monitored to determine the effectiveness of controls and compliance with legal (and project) requirements;
- Ensuring that all incidents are reported without delay and are investigated thoroughly;
- Participating in investigations into significant incidents;
- Ensuring that accurate health and safety statistics are maintained, and that health and safety performance reports are compiled as required;
- Providing the necessary resources for regular health and safety audits and inspections to be conducted, and supporting the auditing process;
- Participating in health and safety audits, and carrying out workplace inspections;
- Ensuring that corrective actions (arising from incident investigations, audits, inspections, etc.) Are implemented, and that adequate resources are provided for this purpose; and
- Participating in an annual review of the contractor's Health and Safety Management System.

9.2 Contractor Health and Safety Officers CR 8(5)

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).

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

Each Contractor 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;

- Participating in the Baseline Risk Assessment & Task Based Risk Assessment for the contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Conducting contractor health and safety induction training for all contractor and sub-contractor personnel;
- 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 VFL's(one per day);
- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the contractor's appointed supervisors, and attending at least one DSTI each day;
- Attending monthly Contractor and Site Health and Safety Meetings;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all contractor and sub-contractor activities;
- Participating in incident investigations;
- Maintaining accurate health and safety statistics on a weekly (Friday 12:00 PM) basis submit to TNPA nominated representative (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 each 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 projects;
- National Diploma in safety management /Environmental Health,SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider 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 Agent/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.

9.3 Contractor Construction Supervisor CR 8.7

The Contractor shall ensure that all project and / or construction works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience in the type of work being carried out as required by the construction regulations 2014.

No work may be carried out without an appointed supervisor being physically present in the work area and daily safety task instruction.

Each Contractor Supervisor shall be responsible for:

- Ensuring that all work carried out under his supervision is done so in accordance with the requirements of all applicable legislation, rules, standards, specifications, plans and procedures;
- Participating in Baseline and Task-Based Risk Assessments;
- Ensuring that all employees under his supervision are made aware of the hazards, risk scenarios and control measures identified in relevant risk assessments;
- Ensuring that all employees under his supervision conduct pre-task hazard assessments when necessary;
- Ensuring that all employees under his supervision attend all required training;
- Ensuring that no employee carries out any work that he is not competent to perform or has not been appointed to perform;
- Carrying out VFL's(one per day);
- Conducting a weekly Toolbox Talk with his team;
- Leading a Daily Safe Task Instruction discussion with his team;
- Attending Health and Safety Meetings as required;

- Maintaining discipline and taking the necessary action whenever an employee under his supervision does not adhere to a rule or requirement;
- Carrying out Planned Task Observations (one per day);
- Reporting all incidents immediately, participating in incident investigations, communicating the lessons learnt to all employees under his supervision, and implementing corrective actions where required; and
- Carrying out workplace health and safety inspections.

Each supervisor must accept these responsibilities in writing as part of his appointment.

Each supervisor must be equipped with a mobile telephone to ensure that effective communication can be maintained for the duration of the contract.

9.4 Health and Safety Representatives

The team on site must have a health and safety representative deployed on the project site(s), a Health and Safety Representative must be elected and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of Health and Safety Representatives (at a minimum ratio of one Health and Safety Representative per 50 employees) are elected and appointed to effectively represent all site personnel.

Each Health and Safety Representative must attend an accredited training course for health and safety representatives. The cost of this training shall be for the contractor's account.

The contractor must make the necessary allowances for the Health and Safety Representatives to carry out their duties as specified in the applicable legislation.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each Health and Safety Representative for identification purposes.

9.5 Temporary Works Designer CR 12

All the structures and temporary works shall be implemented in compliance with Construction Regulation 11 & 12 respectively. Contractor also must comply with the specification which covers the Employer's requirements for all structural concrete work

9.6 First Aiders

If 10 or more employees are deployed on the project site(s), at least one trained and competent First Aider must be in place and must be appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of First Aiders (at a minimum ratio of one First Aider per 50 employees) are in place and have been appointed to administer first aid treatment should this be required.

First Aid training must be done through an accredited training institution. The cost of this training shall be for the contractor's account.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each First Aider for identification purposes.

9.7 Other obligatory legal appointments to ensure compliance if applicable

OHS Act Section/Regulation	Subject	Responsibilities
Section 16(2)	Assigned duties (Managers)	Responsibility of complying with the OHS Act assigned to other person/s by the CEO
Section 19(3)	Health and Safety Committee member/s	Responsibilities as outlined in Section 20 of the OHS Act.
GAR 9(2)	Incident Investigator	Responsibilities of investigating incidents as outlined in GAR 8 &9, and section 24.
GSR 9(1)	Welding, flame cutting operator	To ensure compliance with requirements of GAR 9.
GSR 13A(1)	Ladder Inspector	To ensure compliance with requirements of GSR 13A
Construction Reg 12(1)	Temporary works designer	To design, inspect and approve temporary works prior use.
Construction Reg 12(2)	Temporary works supervisor	To ensure temporary works operations are carried out under supervision.
Construction Reg 23(1)(d)(i)	Construction vehicle and mobile plant operator	Operate vehicles and mobile plant.
Construction Reg 24(1)(c)	Temporary electrical installations controller	Control temporary installations on construction site.
Construction Reg 24(1)(d)	Temporary electrical installations inspector	Inspect temporary electrical installations at least weekly.
Construction Reg 28(a)	Stacking and storage supervisor	Supervise stacking and storage on site.

10. Competence, Training and Awareness

Each employee (including sub-contractor employees) must be suitably trained and competent, and must understand the health and safety hazards, risks and control measures associated with his work.

The contractor must implement systems and procedures to ensure that:

- The necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) must be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis must be carried out based on the competency profiles and a training matrix must be developed for the project.

- The effectiveness of training is reviewed and evaluated.

Prior to the commencement of any work, including mobilisation and site set-up activities, the contractor must provide, to the satisfaction of the nominated project management representative, current documentation verifying that the contractor's employees, as well as the employees of any appointed sub-contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

Please Note: Only certified copies of certificates, licences, etc. will be accepted.

The contractor must provide proof that the training institutions and trainers that are used are appropriately registered with a governing authority (a trainer's registration certificate or registration number alone will not be adequate). The following must be made available for verification purposes:

- Proof of registration of the training institution including the training programmes that the institution is accredited to provide; and
- For each trainer, proof of competency and registration for the specific training programmes presented.

Foreign qualifications held by employees in health and safety critical roles must be verified against the requirements of local legislation.

10.1 Health and Safety Induction Training

Each employee must attend all mandatory Health and Safety Induction Training applicable to the project. No employee will be permitted to enter any project work site until he has attended this training. Each employee must carry proof that he has completed the induction training and may be removed from a site if such proof cannot be produced on request.

Furthermore, employees must attend Area-Specific Health and Safety Induction Training pertaining to the particular hazards identified in the area where the employees will be working (Port of Durban). No employee will be permitted to enter a work area until he has attended the relevant area-specific training. Induction cards will be compiled and issued by the TNPA representative.

All visitors must receive a visitor induction briefing before entering any project work site. However, this induction does not permit a visitor to enter a site unescorted. Visitors must be accompanied at all times by an appropriately senior employee who has been fully inducted Specific Training and Competency Requirements.

The following specific training and competency requirements must be complied with.

Please Note: An employee must be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

Table 10-2.1: Specific Training and Competency Requirements

Training	Applicable To
Health and Safety Induction	All employees
VFL's(Safety Interactions)	All employees
Risk Assessment	All managers and supervisors
Incident Investigation	All managers and supervisors
Safety Leadership	All managers and supervisors
Legal Liability*	All managers and supervisors
Health and Safety Rep*	All elected Health and Safety Representatives
First Aid Levels 1, 2 and 3*	All nominated First Aiders
Fire Fighting (Fire Extinguisher Use)*	All employees
Working at Height*	All employees using a safety harness
Working adjacent to water	All personnel working or visiting site
Permit to Work	All Authorised Persons (i.e. permit issuers) and all Applicants (i.e. employees who will be applying for permits)
Isolation and Lockout	All Authorised Persons (i.e. persons who authorise work that requires Isolation and Lockout), all Isolation Officers, and all Applicants (i.e. persons who request permission to work on systems or equipment requiring Isolation and Lockout)
Mobile Equipment Site Licence	All mobile equipment operators
Dredging and profiling	Dredging team
Demolition	Demolition contractor
Lifting and rigging	Lifting team
Electrical Installation	Electrician

Training requirements marked with an * must be arranged through accredited external training institutions by the contractor. All other training will be provided by Transnet NPA at the Port of Durban.

11. Communication, Participation and Consultation

The Contractor must establish and maintain effective communication and consultative processes (allowing for a two-way dialogue) for the duration of the project to ensure that:

- All personnel are kept up to date with regard to health and safety matters (e.g. hazards and risks, incidents and lessons learnt, leading practices, performance against objectives, etc.);
- General health and safety awareness levels are kept high;
- Prompt feedback is given to personnel with regard to health and safety issues or concerns that they raise; and
- Relevant, and often critical, health and safety related information (e.g. design changes, instructions, reporting of hazardous conditions or situations, etc.) is effectively disseminated.

This must be achieved as follows:

11.1 Visible Felt Leadership (VFL)

The Contractor's supervisory personnel (i.e. managers and supervisors) must participate in the project's Visible Felt Leadership (VFL) programme. The intention of this programme is to encourage interaction between supervisors and workers concerning health and safety matters in order to:

- Reinforce behaviours consistent with standards, procedures and management system requirements;
- Correct behaviours inconsistent with standards, procedures and management system requirements; and
- Verify whether employees have the necessary training, certification, equipment, etc. to perform the work that they are carrying out.

Each manager and each supervisor must carry out at least one VFL per day. Transnet NPA Safety VFL template will be provided for this purpose. All VFL's that are recorded must be submitted to the nominated project management representative on a weekly basis.

The information that is gathered must be analysed and any trends that are identified must be acted on to correct unsafe behaviour or conditions.

11.2 Toolbox Talks

The Contractor must prepare a Toolbox Talk on a weekly basis and must share it with all personnel for which the contractor is responsible (including all sub-contractors). Toolbox Talks must address health and safety issues that are relevant to the work performed on the project site(s) and must include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records must be kept and maintained in the contractor's health and safety file.

11.3 Health and Safety Suggestions

All employees must be encouraged to submit suggestions to enhance health and safety management on the project site. A process must be in place for documenting, evaluating, implementing (as appropriate), archiving and recognising the improvement ideas.

11.4 Health and Safety Meetings

11.4.1 Contractor Health and Safety Meetings (OHS Act Section 19)

The contractor must schedule and consistently hold monthly health and safety meetings. These meetings must be chaired by the contractor's Project Manager and the following persons must be in attendance:

- Contractor and sub-contractor management representatives;
- Contractor and sub-contractor supervisors;
- Contractor and sub-contractor appointed Health and Safety (Employee) Representatives;
- Contractor and sub-contractor Health and Safety Officers; and
- The relevant Project Health and Safety Advisor

The meeting must address the following as a minimum:

- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- VFL's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections (including H&S Rep inspections) or site visits carried out;

- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;

The contractor must compile minutes of each meeting and attendance records must be kept. These records must be maintained in the contractor's health and safety file.

11.4.2 Site Health and Safety Meetings

In addition to the Contractor Health and Safety Meetings, the Project will schedule monthly Site Health and Safety Meetings that the contractor must attend. These meetings will be chaired by the Project Construction Manager and the following persons must be in attendance:

- Contractor management representatives;
- Contractor Health and Safety Officers;
- The Project Health and Safety Manager;
- Client representatives (ad hoc).

The meeting will address the following as a minimum:

- Feedback from the contractor concerning health and safety performance for the period;
- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- VFL's,PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. that are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

11.5 Health and Safety Performance Boards

The Contractor must provide and maintain a Health and Safety Performance Board to be approved by the nominated project management representative and to be positioned at the entrance to the contractor's site office area. This board must display the following information as a minimum:

- The Contractor's logo;
- Current manpower (heads) on site;
- Man-hours worked for the current month and project to date;
- Lost Time Injury Frequency Rate (LTIFR);
- Dates of last injuries (FAI, MTI and LTI);
- Number of hours worked since the last recorded LTI; and
- Names and contact telephone numbers for the appointed Project Manager and the Health and Safety Officers.

11.6 Health and Safety Management Information Notice Boards

The Contractor must provide, for each appointed supervisor, a portable Health and Safety Management Information Notice Board to be placed in the work area. The following information and documentation, as a minimum, must be posted on these boards:

- The relevant Method Statements, Risk Assessments and Safe Work Procedures for the work that is being performed that day;
- The DSTI for the day;
- The most recent Toolbox Talk;
- Where applicable, all required permits and permissions for the work that is being performed;
- Safety data sheets (SDS's) for any chemical substances being used;
- The health and safety objectives for the work team;
- Details of the last incident involving the work team;
- The most recent weekly health and safety report (refer to Section 20);
- Emergency procedures;
- A site plan indicating evacuation routes and emergency assembly point locations;
- First Aider names and contact telephone numbers; and
- The appointed supervisor's contact details.

11.7 Involvement (Other)

The participation of all contractor (and sub-contractor) employees in activities that promote improvements in health and safety performance must be encouraged. In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determining control measures;
- Incident investigation; and
- Reviewing policy and objectives.

All regulations, instructions, signage, etc. must be communicated in a language understood by all employees.

Health and safety personnel must be actively involved in planning activities so that they have the opportunity to highlight hazards and risks associated with upcoming work well in advance to ensure sufficient time to arrange and / or implement the necessary control measures.

12. Documentation and Document Control

The Contractor must develop and maintain project-specific documentation required for the effective management of health and safety on the project.

All documents related to the contractor's health and safety management system must be effectively controlled.

The document control process must:

- Provide for the review, revision and version control of documents;
- Uniquely identify documents (as appropriate) to control their use and function;
- Require approval of the documents for adequacy prior to issue;
- Clearly identify changes and record the status of any revisions to documents; and
- Provide for the effective distribution of documents to, and where necessary the timely removal of obsolete documents from, all points of issue and use.

The contractor must establish a process for the systematic control of health and safety records and related data. Controls must be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.

Each record must be legible, identifiable and traceable, and must contain adequate information and data for its purpose.

The confidentiality and security of records and data must be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

Personal information originating from medical surveillance and occupational hygiene monitoring must be reported in a form that respects the privacy of the individual, but enables management to fulfil their duty of care obligations to employees. The names of individuals must not be disclosed without their written authorisation.

Retention periods for all records (based on legal requirements and / or knowledge preservation considerations) must be established and documented.

12.1 Contractor Health and Safety File Requirements

The Contractor must compile and maintain a file containing all necessary health and safety related documentation. The contents of the file will be audited by a Project Health and Safety Agent on a monthly basis.

Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Workman's Compensation Commissioner (where applicable) must have DoEL stamp; Current one, All correct FEM claim forms and claim number
- Proof of Public Liability Insurance;
- Scope of Work under the contract;
- List of Contacts and their Telephone Numbers;
- Health and Safety Policy;
- Health and Safety Management Plan;
- Legal Register;
- Organisational Chart for the project;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress;

- Baseline and Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- Fall Protection Plan (for work at height);
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;
- Inspection Registers, Forms and Checklists (e.g. for portable electrical tools, ladders, safety harnesses, light vehicles, mobile equipment, lifting equipment and lifting tackle, first aid boxes, fire extinguishers, etc.);
- PPE Issue Registers;
- Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing:
  - A copy of the employee's Identity Document or Passport;
  - Certificate of Fitness (Pre-Employment Medical Examination);
  - Proof of Induction Training;
  - Other Training Records;
  - Copies of Qualification Certificates and / or Certificates of Competency; and
  - Copies of Licences;
- Health and Safety Meeting Minutes;
- Health and Safety Performance Reports;
- Copies of Inspection and Audit Reports; and
- Daily Safe Task Instructions (DSTI's) and Toolbox Talks.

The contractor must ensure that an equivalent file is compiled and maintained by each appointed sub-contractor.

13. Operational Planning and Control

Refer to Transnet Operational Planning and Control procedure IMS TRN-IMS-GRP-PROC-009.

13.1 Project-Specific Health and Safety Standards

Project-specific health and safety standards, incorporating leading practices, legal requirements, and client requirements will be developed and implemented to manage critical risks on the project.

The contractor must comply fully with the requirements of these standards.

The Safe Work Procedures required of the contractor must be aligned with the requirements of these standards.

13.2 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;
- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an iPod (or similar) whilst working on site;
- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and
- Pouring / pumping / flushing any substance (chemical / hydrocarbon / waste water) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the nominated project management representative shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

Neither Transnet NPA nor Project will get involved in contractor disciplinary rules and procedures. The contractor will simply be informed (with reasons) that the offending employee(s) will be denied access to the project site. Once the contractor has been informed, the employee(s) must be removed from the site immediately.

13.3 Site Access and Security

The contractor may not hire any security services for the project site unless authorisation has been obtained in writing from a nominated project management representative.

13.3.1 Access Control

The Contractor must comply with all access control policies, procedures and systems applicable to the project site.

The construction site falls inside the area controlled by Transnet (NPA) and access to the site and access control shall be established as part of site establishment after consultation with the client representative.

A security contractor shall be appointed to handle access control to and from construction site areas. The security personnel shall also conduct alcohol testing as part of access control.

Failure to comply with these requirements will be viewed as a serious safety breach and may result in the permanent removal of the individual(s) / contracting company from site or suspension without payment.

Access cards will be issued as follows:

- One day access (visitor access card) – these cards will be issued at the Security Office;
- Five day access – these cards will only be issued in special circumstances, with conditions, and with a detailed motivation to the nominated project management representative for approval;
- Contract period access – an access card valid for the full contract period will be issued to an individual once the following requirements have been met:
  - Completion of a pre-employment medical examination;
  - Completion of all required project induction training;
  - Completion of special training / licensing if applicable (e.g. driving/operating licence); and
  - Provision of proof of job / trade-specific qualifications, licences, training, experience and competency (as required).

Note: No access card will be issued unless proof of identification is provided (i.e. an identity document or a valid passport). For foreign labour, an access card will only be issued if a valid work visa is produced.

Note: A driving licence will not be accepted as proof of identification.

13.3.2 Trespassing

The Contractor must ensure that no employee (including sub-contractor employees) trespasses on any land lying beyond the boundaries of the project site.

If instructed by a nominated project management representative to do so, the contractor must remove any employee who fails to comply with this requirement from the project.

The contractor's activities must be confined to the specified construction areas, and access to these areas may only be by means of specified routes.

All required barricading (fencing) must be erected and maintained by the contractor.

13.3.3 Visitors

Visitors (including reps and suppliers) must be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and must arrive with all of this PPE. Upon arrival, all visitors must report to the Security Office where they must sign in.

All visitors must undergo a visitor induction briefing before entering the site.

A visitor access card will be issued to each visitor on conclusion of the induction briefing.

Whilst on site, visitors must be accompanied at all times by an appropriately senior employee who has been inducted fully. The visitor(s) must be met at the Security Office, and when the visit is over, must be escorted back to the Security Office.

When leaving the site, each visitor must return his or her visitor access card to the security personnel posted at the entrance / exit. A visitor will not be permitted to leave the site until he or she produces the access card that was issued.

Note: Visitors are not permitted to perform any work on site.

Note: Any request (typically made by a government official) to carry out a site inspection must be referred to the nominated project management representative. The contractor must not arrange any such inspection without prior approval from the nominated project management representative.

13.3.4 Alcohol, Drugs and Other Intoxicating Substances

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

Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.

A drugs and alcohol testing program will be implemented. Persons entering the site will be randomly tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person have the opportunity to rather report that he/she is under the influence before accessing the project site – in these case the employee may only be send home for the day by the responsible project manager representative but will then be tested for the following five days (each day) on his return to the project site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the project site. It shall be the responsibility of the nominated project management representative to take disciplinary action and remove such a person's form the project site.

Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee must be removed from the site. This may be done without testing.

Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.

13.3.5 Vehicles

All vehicles brought onto site must meet the safety requirements stipulated in Section 13.6.

Each vehicle to be used on site must be inspected and approved by the nominated project management representative before a site access permit will be issued for the vehicle / equipment.

No vehicle will be permitted to enter the site unless it is carrying a valid access permit (sticker affixed to the inside of the windscreen). Access permits are vehicle-specific and may not be transferred between vehicles.

The contractor must allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises.

The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.

All road-going vehicles used by the contractor on the site must be roadworthy and registered with the relevant traffic authority.

A vehicle will not be permitted to enter the site in an un-roadworthy condition. Access will be denied if, for example:

- The vehicle has a defective exhaust system;
- A serious oil or fuel leak is evident;
- The vehicle has unsafe bodywork or is carrying an unsafe load;
- The vehicle is fitted with extraneous or non-standard equipment;
- Passengers are not seated properly;
- The vehicle is not fitted with a seat belt for each occupant; or
- The vehicle has any obvious mechanical defect;
- Pre-inspection requirements are not met.

Overloaded vehicles will not be permitted to enter the site.

The driver / operator of any vehicle / mobile equipment must carry a copy of his appointment with him at all times.

Each driver / operator must:

- Comply with all site / project rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
- Obey all road signs;
- Obey all instructions given by security or emergency services personnel;
- Remain within the boundaries of the site; and
- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.

When not in operation, the contractor's vehicles / mobile equipment must be parked within the boundaries of his lay-down area or yard.

Parking is only permitted in designated parking areas.

All cars are parked on site at the owner's risk.

In the event of a vehicle accident on site, the driver(s) must report the incident immediately and must remain at the scene until a nominated project management representative arrives, or until a nominated project management representative authorises him to leave (unless, of course, the driver requires medical attention).

13.4 Mobile Equipment and Light Vehicles

A site specific traffic management plan must be compiled and submitted to the nominated project management representative for approval, the plan must include, but not limited to, the following;

- Each vehicle to be used on site must be inspected and approved by the nominated project management representative before a site access permit will be issued for the vehicle / equipment.
- No vehicle shall be permitted to enter the site unless it is duly authorised. Access permits are vehicle-specific and may not be transferred between vehicles.
- The contractor must allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises.
- The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.
- All vehicles entering the site must be roadworthy and registered with the relevant traffic authority.
- A vehicle will not be permitted to enter the site in an un-roadworthy condition. Access will be denied if, for example:
  - The vehicle has a defective exhaust system;
  - A serious oil or fuel leak is evident;
  - The vehicle has unsafe bodywork or is carrying an unsafe load;
  - The vehicle is fitted with extraneous or non-standard equipment;
  - Passengers are not seated properly;
  - The vehicle is not fitted with a seat belt for each occupant; or
  - The vehicle has any obvious mechanical defect;
  - Pre-inspection requirements are not met.
- Overloaded vehicles will not be permitted to enter the site.
- The driver / operator of any vehicle / mobile equipment must carry a copy of his appointment with him at all times. Each driver / operator must:
  - Comply with all site / project rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
  - Obey all road signs;
  - Obey all instructions given by security or emergency services personnel;
  - Remain within the boundaries of the site; and

- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

- In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.
- When not in operation, the contractor's vehicles / mobile equipment must be parked within the boundaries of his lay-down area or yard.
- Parking is only permitted in designated parking areas.
- All cars are parked on site at the owner's risk.
- In the event of a vehicle accident on site, the driver(s) must report the incident immediately and must remain at the scene until a nominated project management representative arrives, or until a nominated project management representative authorises him to leave (unless, of course, the driver requires medical attention).

13.4.1 Light Vehicles

All Contractors must ensure that Light vehicles have the following minimum safety features:

- Fixed seats and suitable seat (safety) belts for all occupants (i.e. driver and all passengers);
- Roll-over protection for all vehicles intended to be driven on dirt or steep roads;
- Cargo barriers and load restraints for all vehicles designed for carrying loads (other than passengers), or that are unable to have cargo separated from the occupant-carrying space of the vehicle; and
- An air bag on the driver's side, and where available as a manufacturer fitted item, a passenger's air bag;
- A Reverse Alarm.

All Contractors must ensure that Light vehicles that interact with mobile equipment are equipped or fitted with:

- Systems that enable positive communication with the equipment operators (e.g. a two-way radio);
- A high visibility flag (e.g. a whip flag or buggy whip);
- An amber flashing light (revolving or strobe);
- Reflective taping; and
- High visibility signage (i.e. vehicle call numbers) facilitating easy and positive identification from a reasonable distance.

Note: Call number signs and reflective tape (magnetic or adhesive) must be applied to the front, back and sides of each vehicle.

All Contractors must ensure that Light vehicles carry:

- Emergency roadside triangles or beacons (three of either);
- Chock blocks for preventing uncontrolled movement of the vehicle when parked;
- A flashlight;

- A fire extinguisher (2.5kg DCP);
- A first aid kit; and
- Survival or emergency equipment (e.g. a vehicle recovery kit) suitable for the operating environment.

A change management process must accompany all vehicle modifications, including the attachment of any equipment. Examples of changes or modifications include, but are not limited to, any change or modification:

- Made to the overall structure or design of the vehicle body;
- Made to the original manufacturer-fitted type of tyres or wheels;
- Made to the suspension system of the vehicle;
- Made to the mechanical system of the vehicle;
- That may adversely alter the centre of gravity of the vehicle;
- That alters the load carrying capacity of the vehicle; and

- That may affect the ability of the vehicle to withstand a crash (e.g. the fitment of a "bull bar").

Vehicle selection must be based on a risk assessment where consideration is given to the tasks, the application, the environment, roll-over protection and the rating of sturdiness in the event of a crash.

All Contractors must have a formal inspection and preventative maintenance system in place to ensure that vehicles are maintained in a safe and roadworthy condition at all times and, as a minimum, are serviced in line with the vehicle manufacturer's service schedule. Should any safety critical feature be defective or damaged, the vehicle must be withdrawn from service until it has been fully repaired. Inspection and maintenance must be undertaken on critical features such as:

- Wheels and tyres (including the spare);
- Steering, suspension and braking systems;
- Seats and seat belts;
- Lights, indicators and reflectors;
- Windscreen and windows, including windscreen wipers and washers;
- The vehicle structure itself; and
- Other safety-related items on the vehicle body, chassis or engine, including instrumentation.

Persons may only be transported in vehicles equipped with manufacturer fitted or approved seats and seat belts.

Seat belts must be worn by all occupants of a light vehicle (i.e. the driver and all passengers) at all times.

Only the driver and one passenger are permitted in the cab (front) of a light delivery vehicle.

No personnel may be transported in the load-bin of a light delivery vehicle, even if the vehicle is fitted with a canopy. Only tools and equipment may be transported in the load-bin. Furthermore, no persons may be transported in a trailer behind a vehicle.

A pre-operation vehicle safety check and familiarisation system must be in place and must be used by the driver. An approved checklist must be used. All vehicle faults that are recorded must be attended to immediately.

All Contractors must have systems in place to ensure that risks associated with vehicle journeys are managed and controlled. The systems must include, but not be limited to:

- Formulation of journey management plans prior to the commencement of new or changed travel activities;
- Identification and monitoring of the risks associated with the various routes, intersections, etc. in order to minimise the overall exposure;
- Assessment and communication of changed environmental and road conditions at the time of travel;
- Outlining of actions required in the event of an emergency (e.g. collision or breakdown); and
    - Provision to manage driver fatigue.

    Light vehicle running lights (low-beam headlights) must be switched on at all times when the vehicle is in operation.

    All Contractors must have a system is in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely. As a minimum, training must include:

    - Behaviour-based defensive driving principles;
    - Vehicle familiarisation, taking into account the handling dynamics of the vehicle, maximum number of passengers, load limits and various features;
    - Loading and restraining principles where the vehicle to be operated is designed for carrying cargo loads;
    - Education and awareness concerning driving and travel risks that may be encountered within the environment where the vehicle may be operated or driven, and the requirements pertaining to traffic rules and speed limits;
    - Securing (locking) equipment to prevent unauthorised use;
    - Emergency crash and breakdown procedures; and
    - Basic mechanical principles, including how to change a tyre and perform an adequate pre-operation check.

A system must be in place to ensure that persons operating any equipment associated with a light vehicle (e.g. vehicle-mounted cranes and winches) are suitably trained and competent.

13.4.2 Mobile Equipment

All Contractors must ensure that Mobile equipment have the following minimum safety specifications:

- Fixed seats and seat belts for all occupants;
- Adequate lighting, including headlights, tail, turn and brake lights, and an amber flashing light (revolving or strobe);
- An identified isolation and lockout point;

- Adequate walkways, railings, steps and grab handle combinations, and boarding facilities including an alternative path of disembarking in the event of an emergency;
- Collision-avoidance technology and / or procedures;
- A reversing alarm or warning device;
- Chock blocks for preventing uncontrolled movement of rubber-tyred equipment when parked;
- A horn;
- Effective windscreen wipers;
- Effective guarding on accessible moving parts;
- A speedometer (if the mobile equipment is capable of exceeding the lowest applicable speed limit);
- High visibility signage (i.e. mobile equipment call numbers) facilitating easy and positive identification from a reasonable distance; and
- A security system to prevent unauthorised operation.

Mobile equipment must have the following minimum safety specifications, unless a risk assessment stipulates otherwise:

- Approved or certified roll-over protection;
- Fail-to-safe brakes;
- A fire detection and suppression system capable of being activated from both ground level and cabin level (for certain types of mobile equipment, a suitably sized fire extinguisher may be adequate);
- A non-handheld two-way radio or another form of communication;
- Falling object protection (a protective structure over the operator cabin);
- An enclosed and tight-sealing air-conditioned cabin with suitable protective glass; and
- A means of moving supplies and personal items into and out of the operator cabin that enables an operator to continuously maintain three points of contact while boarding and disembarking the equipment (e.g. a backpack or shoulder strap bag).

When purchasing or hiring equipment, the ergonomics of the cabin must be considered, specifically with regard to the seating, operator controls and retrofitted devices.

Fleet and control consistency must be considered in order to minimise the possibility of operator error when changing machines.

For all new (to site) and modified mobile equipment, a formal risk-based selection and acceptance process must be followed prior to the equipment being used on site.

Selection of equipment, and any modification, must be subject to a rigorous change management process.

An inspection and maintenance programme must be in place for all mobile equipment.

A procedure and checklist system, including a brake functionality test, must be in place for pre-operation inspection by the operator. Registers must be maintained and audited, and must be kept on the machine.

Procedures must be in place to ensure that mobile equipment is only operated on sufficiently stable surfaces and on gradients that are within the limits of safe operation.

Seat belts must be used in all cases, by all occupants. Apart from the driver or operator, only an appointed flagman may be transported in mobile equipment (with the exception of buses) and **only if** the equipment is fitted with a passenger seat. No passengers are permitted on a lift and carry crane (or mobi-lift), mobile crane, forklift, mobile elevating work platform (e.g. a cherry picker), tractor, dozer, dump truck, grader, excavator, loader, back-actor, drill rig, or similar.

Risk assessments must be carried out as part of the planning process for mobile equipment operations and associated activities, and must consider the following:

- Maintenance activities;
- Risks associated with loading, unloading, towing and recovering mobile equipment; and
- The risk of fire.

Procedures must be in place for the safe isolation and lockout of mobile equipment.

Where two or more items of mobile equipment must be operated in proximity to each other, or where an item of mobile equipment must be operated in proximity to persons on foot, a risk assessment involving all persons who will be working in the area must be conducted prior to the work commencing. The risk assessment must be approved by the nominated project management representative. In such a work area:

- No item of mobile equipment may be driven to within 5 metres of another item of mobile equipment without the operator first making eye contact with, and signalling his intentions to, the other operator who must acknowledge that he understands and that it is safe to proceed.
- No person on foot may work or be positioned within 5 metres of an item of mobile equipment that is in operation. Before approaching mobile equipment on foot, a person must make eye contact with, and clearly signal his intentions to, the operator of the equipment. The operator must cease to operate the equipment, and must indicate that he understands and that it is safe to approach.

In certain circumstances (determined through risk assessment), mobile equipment may only move and operate with dedicated flagmen in place:

- Where flagmen are used, it must be ensured that the flagmen, mobile equipment operators, and all other personnel working in the vicinity of the mobile equipment, receive suitable training with regard to signals and signalling to ensure effective communication. The training must be formal and recorded, and competency must be tested.
- A flagman and the mobile equipment operator that he is directing must maintain eye contact. The flagman must never position himself where the equipment operator cannot see him.
- Should a mobile equipment operator lose sight of his flagman, he must stop his activities immediately until contact has been re-established.

A tyre management system must be in place to address issues including fire, heating, explosion, electrical contact, separations, maintenance, tyre changes, etc. (refer to Section 13.6.4).

Site-specific induction must be carried out prior to a mobile equipment operator starting work on site. Area-specific induction must be carried out prior to an operator starting work in a new area on site.

Operators must report conditions and practices that do not conform to procedure.

13.5 Signs and Notices

The contractor must ensure that all required safety signs and notices are prominently displayed in accordance with the applicable legislation and good safety practice.

Signs and notices must be in English as well as any other language(s) commonly spoken on the project site.

All symbolic signs must comply with the applicable national standards.

No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

13.6 Construction Vehicles and Mobile Plant

The Contractor shall ensure that all plant and equipment brought onto the site are in compliance with construction regulation 23 and the following:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.

The contractor must supply, at his cost, all items of plant and equipment necessary to perform the work and must maintain all items in good working order.

Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the contractor must, on instruction from the nominated project management representative, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the nominated project management representative.

Items of plant or equipment brought onto site by the contractor or his sub-contractors may be inspected by a nominated project management representative. Should the nominated project management representative determine that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, the contractor must, on instruction from the nominated project management representative, immediately remove the item from the site and replace it with a safe and adequate substitute. In such a case, the contractor or his sub-contractor shall not be entitled to additional payments or deadline extensions in respect of any delay caused.

13.7 Barricading

All applicable legislation concerning barricading must be complied with at all times.

Each contractor required to erect barricading on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the barricading requirements illustrated in this document.

Barricading must be erected to:

- Prevent persons from making contact with an identified hazard;
- Provide warning of the existence of a hazard;
- Prevent unauthorised access (by people, vehicles and mobile equipment) into an area where a hazard exists or where a hazardous activity is being carried out;
- Define the boundaries of a hazardous location and / or restricted area; and
- Allow a work team to perform hazardous tasks without persons unfamiliar with the hazard(s) accessing the area.

Although not limited to these situations, barricading must be erected or installed:

- Around excavations (trenches, pits, etc.)
- To prevent access into areas where overhead work is in progress;
- To route vehicles safety through (or around) construction areas; and
- To protect members of the public who may be in the vicinity of a work or construction site (by preventing access).

In all cases, the erection of barricading must be a temporary measure. It must only remain in place until the hazard is eliminated or the potentially dangerous situation is rectified.

A barricade must present a sturdy physical barrier to entering an area. Therefore, plastic cones, post and chain systems, "danger tape" and "snow netting" will not be accepted as barricading and may only be used for the purposes of low risk demarcation. For example, snow netting may be used for the demarcation of lay down areas.

Acceptable forms of barricading include:

- Hoarding panels (no less than one metre in height) that can be securely fastened together to form a fence line may be used. Hoarding panels may be constructed from a variety of materials (e.g. wooden board, steel sheeting, wire mesh on a steel frame, etc.)
- Wire mesh fencing (no less than one metre in height with sturdy posts spaced at intervals of no more than 3 metres) may be used in certain circumstances, e.g. around excavations
- Sturdy, rigid, and securely fixed (i.e. bolted, welded, clamped, etc.) metal guard rails may be used, particularly for protecting openings, holes and edges associated with floors, platforms, walkways, etc. The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided
- Concrete Jersey barriers must be used for the routing of traffic and when work is being conducted in or alongside a roadway.

Regardless of the type of barricade used, the following requirements must be met:

- The installation, alteration and removal of barricades must be supervised by a competent person
- The barricading must be uniformly and intelligently configured
- The barricading must be stable, conspicuous and effective
- The barricading must completely surround the work or hazardous area
- General access requirements around the work or hazardous area (such as pedestrian walkways, operational access, or general thoroughfares) must be taken into consideration when erecting a barricade
- The extent of the area that is barricaded must be kept to a minimum so as not to unnecessarily restrict access to other areas. If access routes to other areas are blocked by the barricade, alternative routes must be identified and signposted
- All barricaded areas must have properly designated points of entry and exit for persons and / or vehicles. Each pedestrian access point must be fitted with a self-closing gate. A sign indicating, "DESIGNATED ACCESS POINT – AUTHORISED PERSONNEL ONLY", must be fitted to each gate
- Additional signage providing warning of specific hazards (e.g. falling objects, electricity, etc.) including, "NO UNAUTHORISED ENTRY", must be attached to all gates and, where required, to the barricading itself. The signage must be visible from all angles and must be large enough to be read from a distance of 10 metres
- Barricading must be clearly visible at all times (day and night). If necessary, flashing warning lights must be used
- Tags must be attached to the barricading displaying the name and cell phone number of the person responsible for the barricade, and specifying the reason for the barricading and the date on which it is scheduled to be removed
- Should a person require access to a barricaded area, authorisation must be obtained from the person responsible for the erection of the barricade. The hazards that are present and the Personal Protective Equipment that must be worn within the barricaded area must be communicated to the person seeking access
- Each barricade must be listed in a register, and each must be inspected daily to ensure that it is still intact and that its positioning is still effective
- All barricades must be properly maintained and repaired as required
- When the work has been completed and the hazard has been eliminated, all barricading must be removed without delay. A barricade may not be left in place if no hazard exists
- Before a barricade is removed (allowing general access), the area must be inspected by the person responsible for the work that was carried out, to ensure that the area is once again safe. If applicable, the person accepting the area back for general use shall do so on completion of his own safety inspection
- Authorisation to remove (or modify) a barricade may only be granted by the person responsible for the erection of the barricade.

13.8 Excavations

All applicable legislation concerning excavation work must be complied with at all times.

Each contractor carrying out excavation work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this specifications.

All excavation work must be properly planned. Site-specific conditions and hazards must be considered, including traffic, overhead and buried utilities, proximity to nearby structures, soil properties, presence of surface and / or ground water, position of the water table, and weather conditions.

Excavation work may only be carried out under the personal supervision of a competent Excavation Supervisor who has been appointed in writing.

Before any excavation work is carried out, a Permit to Work authorising the activities must be.

Before issuing a Permit to Work for excavation works, the Authorised Person (i.e. permit issuer) must verify that:

- A detailed Risk Assessment has been conducted for the work to be performed;
- A Safe Work Procedure is in place; and
- No buried services are present in the area where the excavation works are to be carried out.

As a minimum, the Risk Assessment must consider hazards and risks associated with:

- A person being trapped or buried as a result of an excavation collapsing;
- A person being struck by an object falling into an excavation;
- A person falling into an excavation;
- A person being exposed to a hazardous atmosphere within an excavation (i.e. an oxygen deficiency, explosive or flammable gases, and / or harmful concentrations of a contaminant);
- Contact with belowground services; and
- Mobile equipment and / or light vehicle movement in proximity to an excavation.

If an excavation is more than 1.2 metres deep and people have to enter it, then the sides of the excavation must be suitably battered, benched, or shored, unless a registered professional geo-technical engineer confirms in writing that there is no risk of the excavation collapsing (i.e. that the sides of the excavation are stable without battering, benching or shoring).

- A support system (designed by a registered professional geo-technical or structural engineer) is provided, such as underpinning; or
- A registered professional geo-technical engineer determines that the structure is far enough away from the excavation that no hazard exists.

To prevent persons and / or mobile equipment from accidentally falling into an excavation and to prevent unauthorised entry into an excavation, rigid barricading must be erected around every excavation that is deeper than 500mm. Warning signage must be prominently displayed and, if necessary, flashing warning lights must be used at night.

A register of all excavations must be compiled and maintained.

A competent person (i.e. an appointed Excavation Supervisor) must inspect each excavation as well as the areas around it:

- At the start of each day (or shift) before work commences within the excavation;
- After any alteration is made to the excavation or shoring;
- After rainfall;
- After any blasting activity carried out in the vicinity of the excavation; and

13.9 Cranes and Lifting Equipment

All applicable legislation concerning cranes and lifting equipment must be complied with at all times.

Each Contractor carrying out lifting operations on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this specification.

The Contractor must submit the crane site establishment document and rigging and/or crane study prior to commencement of any rigging activities.

13.9.1 Design, Manufacturing and Safety Features

Before any crane or hoist is operated on the project premises (i.e. new to site), it must be formally accepted (authorised) by the nominated project management representative. The acceptance process must be based on an inspection and risk assessment, and must take the crane's or hoist's safety features and cabin ergonomics (if applicable) into account. The same process must be followed before any crane or hoist is returned to service following any modification or repair.

Note: An Equipment Profile (dossier) must be compiled for each crane.

As a minimum, the design and manufacturing of each crane or hoist used on the project premises must comply with the requirements of the relevant ISO standard. In countries where the requirements of a national standard are more stringent than the requirements of the relevant ISO standard, the national standard must apply.

The Safe Working Load (SWL) must be clearly indicated on each crane, hoist, and item of lifting equipment.

If the safe working load (rated capacity) of a crane varies with the conditions of use (i.e. varies with the angle of the boom and the boom length) then the manufacturer's load chart(s) indicating the crane's rated capacity at various boom lengths and angles must be available in the crane cabin. If the crane has a single load chart, it must be displayed in a position visible to the crane operator. If the crane has numerous load charts, they must be easily accessible to the operator.

For each crane or hoist, the manufacturer's operating manual must be available to the operator.

The load chart(s) and operating manual for a crane or hoist must be in a language understood by the operator.

All lifting hooks must be fitted with a safety latch to prevent the load from accidentally detaching.

Each crane or hoist must be fitted with a load cell (with the mass of the load displayed in the visual range of the operator) and a load limiting device to prevent the crane or hoist from being operated outside of its safe working limits.

Where practicable, each crane must be equipped with an upper hoist limit switch (or anti two-block device) to prevent the hook block from colliding with the drum, and a lower hoist limit switch to prevent the rope on the drum from unwinding completely. These systems must provide both a visual and an audible alarm to the operator.

Under no circumstances may any limit switch or warning device be bypassed, disconnected, or adjusted in order to lift a load higher (or to lower a load lower) than the respective switches allow. Limit switches MAY NOT be adjusted to stop the hoist at a particular height under normal operating conditions – these are safety devices, and as such, should not be used as operating tools.

Under no circumstances may a load limiting device be bypassed or disconnected in order to lift a load that exceeds the rated capacity of the crane. Load limiting devices **MAY NOT** be used to "measure" or "test" the mass of a load – these are safety devices, and as such, should not be used as operating tools.

Each overhead travelling crane (including cranes operated using a manual chain drive) must be fitted with an audible travel alarm or an equivalent warning device.

Anti-collision devices must be fitted to prevent motorised overhead travelling cranes from colliding with each other (where two or more cranes run on the same track) and from colliding with the track end stops or other structures.

For a vehicle-mounted crane, the operator control station must be located in a position protected from swinging loads and from the crane jib.

A fall protection system must be provided for the assembly, dismantling, operation, maintenance and inspection of any crane where falling from height is identified as a hazard.

Each crane should be fitted with a stability monitoring device to prevent it from toppling over.

Only items of lifting equipment (tackle) that have been designed and manufactured with adequate factors of safety may be used on site. The following minimum factors of safety (with respect to the Safe Working Load) must be met:

- Ten (10) for natural-fibre ropes;
- Six (6) for synthetic-fibre ropes or woven webbing;
- Six (6) for steel-wire ropes;
- Five (5) for steel chains; and
- Four (4) for high-tensile or alloy steel chains.

Note: An excavator may not be used to lift a load unless all of the requirements of this specification (as would apply to a crane) have been met, and authorisation has been granted by the relevant Project Manager and Health and Safety Manager.

The lift plan for a critical lift must include:

- General Information – crane manufacturer, crane model, items to be lifted, and reason for lift;
- Lift Data – load weight, lifting block and hook weight, hoist rope weight, rigging weight, total weight, height of lift, radius of lift, surface area of load, and centre of gravity of load;

- Rigging Data – sling material (chain, wire rope, or synthetic), sling diameter, sling length, sling configuration, sling capacity, hook type, shackle size and capacity;
- Lift Computation – boom length, jib length, radius of lift, crane capacity as configured, size of outrigger footplates, and wind speed;
- Proximity to Power Lines and Process Areas – mobile cranes working in proximity to energised power lines must operate under a Permit to Work, which must define exclusion zones and spotter duties;
- Local Hazards and Controls – including the route for the crane, ground stability, proximity of people or equipment, and agreed communication method; and
- Diagrams (sketches) – a rigging diagram, and a crane set-up diagram illustrating the positioning of the crane(s) in relation to surrounding structures and the initial and final positions of the load (including crane boom movement).

Lifts that are not subject to detailed lift plans (i.e. lifts that are not considered critical) must nevertheless be subject to a risk assessment, and be properly planned and executed.

Cranes used to lift or suspend personnel must be approved as suitable for this purpose.

If a crane must be operated in proximity to energised overhead power lines (or any other exposed electrical conductors) then minimum clearance distances (specified by the electrical power utility or the nominated project management representative) must be observed. Whenever possible, power lines must be de-energised and isolated while lifting operations are carried out safely.

13.9.2 Operation

At the start of every day or shift, the operator of a crane, tubular piling equipment or hoist must carry out a pre-operation safety check using a prescribed checklist.

The specific requirements of the pre-operation safety check (and associated checklist) must be based on:

- A risk assessment that addresses all aspects of safe operation of the crane or hoist; and
- The inspection recommendations of the manufacturer.

As a minimum, the pre-operation safety check must include:

- A thorough visual inspection of all wire ropes, chains, hooks and safety latches, hook blocks, sheaves, hydraulic hoses, electrical cables, and the general condition of the crane or hoist;
- Checks to confirm the serviceability of the operating controls;
- Tests to confirm the correct operation of all limit switches, emergency shutdowns, load indicators, alarms and other safety devices; and
- A thorough visual inspection of all lifting equipment (tackle) to be used.

The operator must:

- Check for any loose or missing parts;
- Make sure that the wire rope (or chain) of the hoist is properly seated in its drum and sheave grooves without any slack or overlapping;

- Operate each control to make sure it functions properly, releases immediately, and does not stick. Each control must be labelled to indicate its function;
- Listen for any unusual mechanical noises and look for any jerky movements while operating the crane and / or hoist several feet in each direction that it travels;
- Check the functionality of the upper and lower hoist limit switches (if applicable) by slowly raising and then lowering the block to trip the respective switches;
- Check all hooks. Hooks must not be cracked, stretched, bent or twisted. Each hook must have a safety latch that automatically closes the throat of the hook. If the latch is bent, has a broken spring, or is otherwise damaged, it must be repaired before use. Hooks must rotate freely in the block assembly without any "grinding" felt or heard;
- Check the wire rope by lowering the block to its lowest level and looking for the following signs of damage:
  - Reduced rope diameter. This may indicate that the rope has been stretched, has lost its inner core support, or has worn outside wires;
  - Broken wire strands (any number);
  - Kinked, crushed, cut, or "bird caged" wiring, or wiring with heat damage.
- Check all chains for damage including wear at contact points, cracks, or distorted links (bent, twisted or stretched). All mechanical coupling links must be inspected to ensure that the linking pins are secure and in good condition. The capacity rating of each chain must be adequate for the load and the attachment method;
- Check the condition and capacity of wire rope and synthetic web slings. Capacity ratings must be legible on the manufacturer's label. The capacity of the sling being used must be adequate for the load and the attachment method. A sling must be replaced immediately if it is excessively worn.

The operator must report any fault, defect or damage to his supervisor immediately.

A crane or hoist must not be operated if any safety device is out of order or defective, or if any rope, chain, hook or other component is worn or damaged.

Completed checklists must be made available (on request) for inspection by the nominated project management representative. Wherever possible, these checklists must be kept with the crane or hoist.

All lifting operations must be supervised by suitably qualified, competent and experienced supervisors.

An effective method of communication between the crane operator and those assisting with the lift must be in place. This must be documented and approved by the nominated project management representative.

Documented Safe Work Procedures must be in place to ensure the following:

- Access into an area where lifting operations are being carried out must be restricted. Such an area (i.e. where there is a risk of a load falling and striking a person) must be barricaded and only authorised persons may enter (i.e. those directly involved with the lifting operations). Warning signage must be conspicuously displayed;

- Where a load is being moved from one location to another (i.e. the lifting operations are not being carried out in a discrete area that can be barricaded), measures must be taken to ensure that all persons in the path of the suspended load are made aware of the approaching hazard and that they move, and remain, well clear of it. All persons potentially affected must be given warning before the load is lifted;
- A lift must be directed and controlled by a single person (a suitably qualified, competent and experienced rigger);
- Dedicated spotters must be in place during lifting operations to observe and provide warning (if necessary) to prevent incidents and ensure that safety protocols are adhered to;
- Before commencing with a lift, it must be verified that the load being lifted is both within the rated capacity of the crane (or hoist) and lifting equipment and within the limits set out in the lift plan and / or risk assessment. The rated load capacities of the crane, hoist, rope, chains, slings or other components may never be exceeded;
- Only certified lifting equipment (tackle) may be used to lift a load;
- No equipment (tackle) that has been used for towing may be used for lifting operations;
- Only an approved material box (skip box) may be used for lifting loose items or materials;
- Before commencing with a lift, it must be verified that no safety devices (including load limiting devices) have been bypassed, overridden or disconnected;
- To prevent the load from swinging as it is lifted, the hoist must be centred over the load (when using slings or chains) or positioned directly above the lifting point of the load;
- Hoisting ropes must be kept vertical. No side loading of a crane boom is permitted (i.e. a crane may not be used to make a side pull);
- Two full wraps of rope must remain on the hoisting drum at all times. If a lower hoist limit switch has been fitted, and it is working correctly, it should not be possible to lower the block below the point where less than two full wraps of rope are on the drum;
- Before commencing with a lift, it must be verified that all rigging connections are correct and secure. Slings, chains, or other lifting devices must be fully and securely seated in the saddle of the hook;
- Slack must be removed from the slings, chains and / or hoisting ropes before lifting the load. It must be ensured that multiple lines are not twisted around each other and that the hoist rope is not wrapped around the load;
- To ensure that the load is properly secured and balanced, it must initially only be lifted a few centimetres. Slings must be repositioned if required;
- Before moving a suspended load, it must be lifted high enough to clear all obstructions. The load must only be lifted to the height necessary to clear obstructions, and no higher;
- Directional movement must be made smoothly and deliberately (there must be no sudden acceleration or deceleration of the moving load). Abrupt, jerky movements of the load in any direction must be avoided;
- Tag lines must be used in situations where a load needs to be steadied or guided while suspended;

- When using tag lines to steady or guide a suspended load that is being moved using a mobile crane, personnel on foot must remain in sight of and in communication with the crane operator at all times, must never walk between the crane and the load, and must remain clear of the load and the crane at all times (at least 5 metres). The load must be moved at a slow walking speed;
- A suspended load must be monitored closely at all times;
- If a crane operator's view of a suspended load is unavoidably obscured (completely or partially), or if a suspended load is unavoidably obscuring (completely or partially) a crane operator's view, then suitably positioned spotters must be in place to provide guidance to the crane operator;
- A load **MAY NOT** be moved over, or be suspended above, any person or any occupied building. No person may walk beneath, or position himself below, a suspended load;
- No person may pass or work beneath the boom of a crane;
- No person may be positioned between a suspended load and a solid object where there is a risk of being crushed should the load swing;
- No person may be positioned within the radius of the boom of a crane unless directly involved with the lift;
- Under no circumstances may any person ride on a crane's hook or on a load;
- No load may be left suspended unless the operator is at the controls and is monitoring the load. In such a situation, the load must be kept as close as possible to the ground or floor to minimise the possibility of injury should the load drop;
- The controls of a crane or hoist may never be left unattended while a load is suspended. If it becomes necessary to leave the controls, the operator must lower the load to the ground or floor;
- With the exception of pick-up and carry operations, no lifting may be carried out using a mobile crane unless the outriggers have been deployed and are locked in position;
- Load spreaders or packing under the outriggers must be used irrespective of the underfoot conditions;
- Before a mobile crane is moved into position to carry out a lift, the area must be inspected by a suitably qualified person who must verify that the underfoot conditions are satisfactory;
- When using a mobile crane, slewing to test the effectiveness of the outriggers must be carried out prior to commencing with a lift;
- Slew pins must be securely in place while a mobile crane is travelling;
- Unauthorised use of a crane or hoist must be prevented by removing the keys, locking the cabin, isolating the controls, etc. when lifting operations have been completed;
- When not in use, lifting equipment must be stored off the ground and must be protected from the elements (rain, harsh sunlight, etc.) and contamination (dust, solvents and other chemicals) in order to prevent damage and / or deterioration.

A crane or hoist or an item of lifting equipment may only be used for the purposes for which it was designed.

13.9.3 Inspection, Testing and Maintenance

Any crane, tubular piling equipment & hoist brought onto the project premises must have a current test certificate and record of inspection as well as a suitable checklist (derived from the crane or hoist manufacturer's inspection recommendations) for use by the operator(s) when carrying out pre-operation safety checks.

An Equipment Profile (dossier) must be compiled for each crane.

A register of all cranes, hoists and lifting equipment (tackle) brought onto the project premises must be compiled and maintained.

Each crane, hoist and item of lifting equipment must have a unique identification code or number, which must be referenced in the register.

For each crane, hoist and item of lifting equipment, the following documentation must be kept on site and must be made available (on request) to the nominated project management representative for inspection:

- Test records and certificates;
- Inspection records;
- Maintenance records; and
- Details of any modifications or repairs made.

All cranes, hoists and lifting equipment must be inspected, tested and confirmed fit for purpose (i.e. safe for use):

- Before being operated or put into service;
- Before being returned to service following any repair or modification; and
- Periodically as follows (unless local regulations require examination more frequently):
    - Each crane or hoist (including all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices that form an integral part of the crane or hoist) must be thoroughly examined by a competent, experienced and appointed person every 6 months;
    - Each crane or hoist must be subjected to an annual performance test (i.e. a load test) by a competent, experienced and appointed person; and
    - All lifting equipment (tackle) must be thoroughly inspected by a competent, experienced and appointed person every 3 months.
    - The system of inspection and testing must provide verification that each crane or hoist is able to function to its design specifications, and must verify the integrity of:
- Mechanical and electrical components;
- Controls;
- Cables and all lifting attachments;
- Structural components including boom, hoist, brakes, wheels, hooks, baskets, out-riggers, hook-blocks and rails; and

- Load limiting devices, hoist limit switches, alarms or warning devices, and other safety devices and control systems (including independent fail-safe braking systems, devices to stop the crane or hoist such as a dead man's switch, and emergency shut-off switches).

A preventative maintenance system must be in place to ensure that all cranes and hoists are maintained in a safe and serviceable condition.

For any crane or hoist, all inspections, testing, maintenance and repairs must, as a minimum, be carried out in compliance with the requirements and specifications of the manufacturer as well as all applicable regulatory requirements (in terms of both the frequency of inspection, testing and maintenance, and the physical condition of the crane or hoist).

Repairs to a crane or hoist may only be carried out by competent persons. After repairs have been made, the crane or hoist must be tested and recertified fit for purpose (unless the repairs did not affect the integrity of the lifting mechanism).

Any modification to a crane or hoist must be subject to the approval of the original equipment manufacturer and a rigorous change management process.

Each item of lifting equipment (tackle) must be tagged following each quarterly (3-monthly) inspection. Details of these inspections must be recorded in the lifting equipment register which must be made available to the nominated project management representative on request.

The following colour coding system must be used for the tagging of all lifting equipment:

Table 13-9. Colour Coding System for Lifting Equipment

Quarter	Tag Colour
January – March	Blue
April – June	Red
July – September	Green
October – December	Yellow

The tag placed on an item of lifting equipment must be traceable to an entry in the lifting equipment register where the following information concerning the inspection of that item of equipment must be recorded:

- Item description;
- Unique item identification code or number;
- Item owner;
- Item location;
- Date of inspection;
- Name and signature of competent person who carried out the inspection; and
- Any comments concerning the inspection.

Any item of lifting equipment that is found to be damaged or defective must be removed from service (and tagged, "Out of Service") immediately and must then either be repaired and recertified (if possible) or destroyed to prevent further use.

Similarly, any lifting equipment that is known (or is suspected) to have been overloaded must be removed from service immediately and destroyed to prevent further use.

If an item of lifting equipment is removed from service or destroyed (scrapped), this must be indicated in the lifting equipment register.

Any item of lifting equipment without a tag or with an out-of-date inspection may not be used.

13.9.4 Training and Competency

Only suitably trained, competent and experienced persons who have been authorised in writing by the contractor's Project Manager are permitted to:

- Evaluate and plan critical lifts;
- Supervise lifting operations;
- Operate cranes and hoists;
- Use lifting equipment, and rig (sling) loads;
- Provide signals for controlling lifts; and
- Inspect, maintain or test cranes, hoists and lifting equipment.

Each operator must meet the competency requirements for the particular class or type of crane or hoist to be operated. Depending on the project location and applicable legislation, operators may need to hold a certificate of competency issued by a recognised training institution.

13.10 Working at Heights

All applicable legislation concerning work performed from an elevated position must be complied with at all times.

Fall prevention or fall protection measures must be in place whenever the potential exists for a person to fall 2 metres or more.

13.10.1 Fall Prevention

Work Platforms

Wherever practical, a safe working area must be provided in the form of a work platform with fixed edge protection. This may include:

- A permanent work platform or walkway (i.e. a fixed steel structure);
- A fixed or mobile scaffold (refer to Section 13.10.3.); or
- An Elevating Work Platform (EWP) such as a scissor lift, man lift, boom lift or cherry picker (refer to Section 13.10.3.)

All work platforms and walkways elevated one metre or more must have complete floors, and edge protection must be in place in the form of toe boards and sturdy guard rails properly secured (i.e. bolted, welded, clamped, etc.) to prevent accidental displacement. Safe means of access and egress must be provided.

Guard rails must be capable of withstanding a force of at least 100 kilograms applied in any direction at any point.

The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.

Floor Openings, Holes and Edges

Any opening or hole (temporary or permanent) in a floor, platform or walkway must be protected by sturdy guard rails (removable if required) or a cover to prevent a person from stepping into or

falling through the gap. Covers must be strong enough to support the loads that will be imposed on them and must be secured to prevent accidental displacement.

Ladder way floor openings and platforms must be protected by guard rails of standard construction and toe boards must be fitted along all edges, except at the entrance to an opening where a gate must be installed and so arranged that a person cannot walk directly into the opening.

When open, hatchways and floor openings must be protected by removable guard rails and toe boards of standard construction. When these openings are not in use, covers of adequate strength must be put in place and must be secured to prevent accidental displacement.

Where doors or gates open directly onto a stairway, a platform must be provided and the swing of the door or gate must not reduce the effective width of the platform to less than 500mm.

13.10.2 Fall Protection

Whenever there is a risk of falling 2 metres or more, whenever there is a risk of falling onto dangerous equipment or machinery even if the potential fall distance is less than 2 metres, or whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall, no work may commence unless:

- A Fall Protection (and Rescue) Plan is in place (prepared by a competent person, approved by the project management representative, and implemented by the contractor);
- A detailed task-specific Risk Assessment has been carried out;
- A Safe Work Procedure is in place for the task to be performed;
- A Permit to Work has been obtained; and
- Each person has been provided with suitable fall protection equipment.

Fall protection equipment (either fall restraint or fall arrest equipment) must be used at all times whilst the work is being carried out.

To prevent persons from falling, fall restraint equipment must be used whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall.

Fall arrest equipment must be used whenever the potential exists for a person to fall 2 metres or more.

A person has been provided with suitable fall protection equipment if he is secured by means of an approved full body harness (well fitted) with two shock absorbing lanyards or an inertia reel (when fall arrest equipment is required) or two short restraining lanyards (when fall restraint equipment is required), double or triple action snap hooks (or karabiner type rings), and secure anchorage points (a person's lanyard may be attached either directly to an anchorage point or indirectly through the use of a variety of systems that incorporate a lifeline).

A dual lanyard system must be used to ensure that at least one connection point is maintained at all times.

Note: When selecting fall arrest equipment, care must be taken to ensure that the potential fall distance is greater than the height of the person plus the length of the lanyard with its shock absorber deployed (taking the height of attachment into account).

Anchorage points must, where practical, be above the head of the person, and must ensure that in the event of a fall the person will neither swing nor touch the ground.

All permanent anchorage points must be designed and approved by a professional structural engineer.

All anchorage points must be periodically inspected and tested by a competent person to ensure that they are secure and can support the required load. A system must be in place to identify anchorage points as authorised for use.

Temporary anchorage points (and lifeline systems) may only be used if a competent person has certified them safe to use.

If an elevating work platform is used, such equipment must be fitted with a fixed anchorage point for the attachment of fall protection equipment.

The use of fall protection (fall restraint or fall arrest) systems must be avoided wherever and whenever possible through design, the installation of physical barriers that protect persons from falling, and employing alternative methods of working.

Only if physical barriers protecting against free falls cannot be installed must fall protection equipment be used.

Fall protection (fall restraint or fall arrest) systems are items of personal protective equipment and, if required, must be purchased, installed and provided to employees.

Prior to commencing with any work at height, an assessment must be conducted to determine if the work requires the use of fall protection equipment, and if so, which fall protection system is the most appropriate for the work.

There must be a system for ensuring that fall protection equipment is:

- Tested and certified for use;
- Inspected by the user before use; and
- Destroyed following a fall or where inspection has shown evidence of excessive wear or mechanical malfunction.

All persons that are required to work at height (in order to carry out routine or non-routine tasks) must first be trained and certified competent to do so. Furthermore, each person must be in possession of a valid medical certificate of fitness specifically indicating that the person is fit to work at height.

All persons required to use personal fall protection equipment must be trained and certified competent in the correct selection, use, maintenance and inspection of such equipment.

All fall protection equipment must be thoroughly inspected on a monthly basis by competent persons appointed in writing and each item of equipment must be tagged to show when it was last inspected. All inspections must be recorded in a register. On finding defective or damaged equipment, appropriate action must be taken by the competent person (i.e. the destruction of the equipment to prevent further use).

Persons making use of personal fall protection equipment must do so in strict accordance with the instructions or requirements specified by the manufacturer or supplier of the equipment or system.

Specific pre-use inspection, maintenance and fitting protocols must be established in accordance with the manufacturer's requirements or guidelines and these protocols must be followed by all users of the fall protection equipment.

Solvents may not be used to clean fall protection equipment. Only manufacturer-approved cleaning solutions may be used.

No person required to use personal fall protection equipment may work in isolation (a minimum of two persons working together is required).

Competent supervision must be in place at all times for all work carried out at height. Supervisors must be appointed in writing.

Emergency response (rescue) procedures for the rapid retrieval of suspended persons in the event of a fall from height must be prepared and tested.

Note: Even though there is no risk of free fall, fall protection equipment may be required in situations where there is a risk of falling, slipping or sliding down a slope of more than 45 degrees.

Note: The maximum service life of fall protection equipment manufactured of synthetic fibre shall be 5 years from the date of first use and / or manufacture unless otherwise specified by the manufacturer.

A person may climb or descend a ladder without fall protection provided that he is able to use both hands and legs to do so, faces the ladder, and uses one step at a time. The ladder must be tied off or supported at its base (refer to Section 13.10.1).

Prior to any roof work being performed, or prior to persons accessing a roof, a structural engineer must verify that the roof is of sound construction and that it is capable of supporting the weight of the persons as well as any equipment that may be required. Should the engineer's findings be to the contrary, alternative methods of performing the work must be found. Particular care must be taken when work is carried out on an asbestos cement roof or a fibreglass roof.

13.10.3 Scaffolding

Training, Competency and Supervision

Scaffolding may only be erected, maintained, altered or dismantled under the strict personal supervision of a competent Scaffolding Supervisor (or Scaffolding Inspector) who has been appointed in writing.

Scaffolding may only be erected, maintained, altered or dismantled by competent and appointed Scaffolding Erectors (or Scaffolding Builders). It is the Scaffolding Supervisor's responsibility to ensure that all persons carrying out such work are suitably trained and experienced.

A certificate of competency issued by a reputable (i.e. accredited and approved) training provider must be produced for each Scaffolding Supervisor and each Scaffolding Erector.

Erection and Dismantling of Scaffolding

Only approved scaffolding components may be used to erect a scaffold. Scaffolding must be erected, modified and used in accordance with the manufacturer's guidelines or recommendations, and in strict compliance with all applicable legislation and standards.

A free-standing scaffold must not exceed a height of three times the smallest dimension of its base.

Scaffolds with a height to base width ratio of more than 3:1 must be restrained from tipping over by guying, tying, or bracing. Guy wires and ties prevent scaffolding from tipping away from the building or structure, and braces are rigid supports that prevent the scaffolding from tipping into the building or structure.

Scaffolding must be secured to the structure every 6 metres vertically and every 9 metres horizontally (as a minimum). Adequate underpinning, sills or footplates must be provided for scaffolds erected on filled or otherwise soft ground (including sand or gravel).

If the scaffolding is to be load bearing (i.e. other than normal access and workplace storage) then full calculations and a design must be prepared and authorised in writing by a structural engineer. The load limits specified by the scaffolding manufacturer may not be exceeded under any circumstances.

Scaffolds must be plumb and level at all times.

All scaffolding components must be in good condition (i.e. undamaged and free of corrosion).

All scaffolding components must be properly connected or secured and scaffolding must be effectively braced (diagonal bracing).

Each person erecting, maintaining, altering or dismantling scaffolding must use fall protection at all times (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks). The work must be planned to enable every Scaffolding Erector to be securely anchored at all times. A suitable lanyard length (not exceeding 2 metres) must be selected taking the potential fall distance and height of attachment (height of anchorage point) into account. If the lanyard is too long or the anchorage point is too low, the person may hit the ground, a platform, or objects below him before the lanyard is able to break his fall.

The area around the base of a scaffold must be barricaded to prevent unauthorised access into the work area. When scaffolding is erected or dismantled on a level, platform, or floor lying above ground level and the potential exists for components to fall to levels below the level on which the scaffolding is positioned, then the area directly below the scaffolding on each of those levels must also be barricaded. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Hoists, lifts and approved material baskets must be used (where available) to lift scaffolding components to elevated positions.

Where components are passed from hand to hand during the erection or dismantling of a scaffold, each Scaffolding Erector must always stand on three boards and not directly above the person below him. During this process, each Scaffolding Erector must remain within the confines of the scaffold and must expose as little of his body as possible to minimise the risk of being struck by a falling component. Good communication between team members must be maintained at all times.

No scaffolding components, tools, or any other material may be dropped from height or thrown from one level to another. Components, tools and materials must be lowered or lifted in a controlled manner. Use may be made of a chute.

Each tool must be secured to the wrist, harness or structure by means of a lanyard. A tool bag (around the waist or over the shoulder) may be used for carrying tools up and down a scaffold structure. Tools or equipment may not be carried by hand up or down a structure, as both hands must be used for climbing. If necessary, a rope must be used for lifting or lowering tools or equipment.

While a scaffold is being erected or dismantled, no scaffolding components may be stacked on the scaffold structure unless it has been designed for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

For special scaffolding, a design must be prepared by the appointed Scaffolding Supervisor and this design must be authorised in writing by a structural engineer before the scaffolding is erected.

Scaffolding may not stand on steel grating unless the grating is adequately supported from below. Scaffolding must rather stand on the structure that supports the grating.

Empty drums, crates or bricks may not be used to prop up, support or anchor scaffolding.

Before scaffolding is erected in close proximity to an electrical installation or live conductors, an electrical engineer (employed by Project or the client) must inspect the area and determine whether or not the scaffolding must be earthed. Should the scaffolding require earthing, this must be done as soon as possible while the scaffolding is being erected.

Scaffolding may not be erected if it is raining or in winds stronger than 32 km/h.

A green tag (displaying the words, "Scaffold Safe for Use") or a red tag (displaying the words, "Danger: Do Not Use Scaffold") must be prominently displayed on each scaffold at all times. The tag must be positioned close to the base of the ladder or staircase provided for safe access. The wording on the tags must be in English and any other language commonly used on site.

As a minimum, a green tag must display the Scaffolding Supervisor's name, the date that the scaffold was erected, and the date that the scaffold was last inspected.

Only an appointed Scaffolding Supervisor may attach, change, update the information on, or remove these tags.

Scaffolding must not be:

- Left partially erected or partially dismantled except for normal work stoppages (for example, over weekends);
- Left in an unsafe condition (if scaffolding is unavoidably in an unsafe condition, barricading must be in place to prevent unauthorised access and the required red tags must be prominently displayed on the scaffold structure); or
- Moved or altered while work is in progress.

Mobile scaffolding must be equipped with brakes, which must be engaged at all times when the scaffolding is in use. A scaffold may not be moved if any person is on the structure.

Safe Access

Safe and convenient access must be provided to every scaffold platform by means of properly installed ladders or approved stairways, which must remain unobstructed at all times. Climbing up or down a scaffold on the braces or ledgers is forbidden.

All ladders used to access scaffolding must be securely attached to the scaffold structure.

Hook-on and attachable ladders must be specifically designed for use with the type of scaffolding being used.

If a ladder is used to access a scaffold platform at a height greater than 1.5 metres above the ground, then the ladder must be secured internally (i.e. within the scaffold structure) and there must be an opening (closed with a trap-door) in the platform at the top of the ladder.

If the scaffold platform is at a height of less than 1.5 metres above the ground, then the ladder may be attached externally provided the guard rails around the platform are modified to allow access (the opening in the guard rails must be kept closed using a self-closing gate). No person may climb over or through the guard rails to gain access to a platform.

If a vertical ladder used on scaffolding is more than 5 metres in length it must be equipped with a ladder cage extending from a point 2 metres from the base of the ladder to a height of 1 metre above the platform (or the uppermost platform) that the ladder is providing access to.

Circular ladder cages must have an internal diameter of no more than 700mm. Square ladder cages must have internal dimensions of no more than 700mm by 700mm.

The requirement for a ladder cage may be waived if platforms are provided at height intervals not exceeding 4 metres, with the vertical ladder secured on the inside of the scaffolding framework and an opening (closed with a trap-door) in each platform.

Vertical ladders must be braced at three metre intervals (as a minimum) to prevent undue movement.

All vertical ladders providing access to a platform must be left in place for as long as the scaffold remains in place and must be inspected as part of the scaffold structure.

Any deviation from the requirements stipulated above must be subjected to a risk assessment and the nominated project management representative must authorise the deviation in writing.

Scaffolding Platforms

Safe work platforms must be provided.

Every work platform must be complete (i.e. from ledger to ledger and from transom to transom without any gaps) in order to prevent personnel, materials, tools, etc. from falling through the platform.

Every work platform must be constructed from manufactured steel scaffold boards (planks) of equal thickness (height). Timber boards are not permitted under any circumstances.

Each steel scaffold board must be securely hooked (fastened) onto the ledgers or transoms that support it.

On all sides except the one facing the structure, every scaffold platform must be provided with:

- Sturdy guard rails positioned 500mm above the platform floor (the mid rail) and 1000mm above the platform floor (the top rail); and
- Steel toe boards that are at least 150mm high and securely attached such that no gap exists between the toe boards and the platform floor.

Note: Wire mesh infill panels incorporating a toe board may be used instead of a mid-rail.

Scaffold platforms must be as close to the structure as is practicable (but not closer than 75mm) except where personnel need to sit on the edge of the platform while they work in which case the distance may be increased to no more than 300mm.

Scaffold platforms must, at all times, be kept free of waste, protruding objects, and any other obstructions. Platforms must be cleaned if necessary to ensure that they are maintained in a non-slip state.

Inspection of Scaffolding

Every scaffold structure must be inspected by a competent Scaffolding Supervisor:

- Prior to use after erection, and at least weekly thereafter;
- After inclement weather (heavy rain, strong winds, etc.);
- After any incident resulting in jarring, tilting or overloading;
- After any alteration is made; and
- Before being dismantled.

On completion of an inspection, the Scaffolding Supervisor must update the information on the scaffold tag.

A record of each inspection (date and time of inspection, location of scaffolding, findings, etc.) must be captured in a register. The register(s) must be maintained by the Scaffolding Supervisor(s) carrying out the inspections.

Using Scaffolding

The user of a scaffold (i.e. the responsible supervisor) must inspect the erected structure prior to acceptance and must ensure, as far as is reasonably possible, that the scaffold is safe and fit for purpose before allowing his team to make use of the scaffold.

In particular, the user must ensure that:

- The scaffold and the platforms have been constructed to meet the loading requirements of the work that is to be carried out (the Scaffolding Supervisor must be consulted in this regard);
- The Scaffolding Supervisor has checked that adequate ties and braces are in place;
- The work platforms are in the correct positions and are complete with toe boards and guard rails;
- Safe and convenient access has been provided (ladders and / or stairways); and

- A green ("Scaffold Safe for Use") tag has been attached to the scaffold by the Scaffolding Supervisor.

Use of an incomplete or unsafe scaffold is prohibited.

Unsteady or non-rigid scaffolds must not be used and inadequacies must be reported to, and rectified by, the responsible Scaffolding Supervisor.

The user of a scaffold must ensure that every person in his team is aware that no alterations to the scaffold may be made by the team during the course of their work, and that if any alterations are required, they must be made by competent Scaffolding Erectors under the supervision of an appointed Scaffolding Supervisor.

A scaffold may not be used:

- If a red tag is displayed indicating that the scaffold is not safe to use; or
- During inclement weather, defined as wind speeds greater than 40km/h, thunderstorms, or heavy rain (in excess of 40mm/h).

Note: With due consideration of possible educational limitations, the contractor must ensure that all persons understand what green and red tags mean.

The area around the base of a scaffold must be appropriately barricaded to prevent unauthorised access into the work area. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Loose tools and / or materials on scaffold platforms must be secured using lanyards, wire or fibre rope, or must be placed in secured containers.

Where deemed appropriate, "catch nets" may be installed as an additional safety measure to prevent materials or tools from falling to the ground.

The storage or placement of materials on scaffolding platforms must be kept to a minimum. Debris as well as tools and materials that are no longer required must be removed from all working platforms at least once per day.

Scaffolding platforms must be cleaned regularly.

A heavy load may not be placed on a scaffolding platform unless the scaffold has been designed and constructed specifically for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

Scaffolds may not be used as hoisting towers or to support piping or equipment.

Each person working from scaffolding must wear fall protection (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks) and must be securely anchored at all times (refer to Section 13.13.2).

All work must be carried out from properly constructed work platforms. Standing on railings or braces in order to perform work is forbidden.

Drums, boxes and other makeshift substitutes for scaffolding may not be used under any circumstances.

Where work on an electrical system is to be undertaken from a scaffold, an electrical engineer (employed by Project or the client) must determine whether or not the scaffolding structure

requires bonding and earthing. The scaffolding may not be used until this has been determined, and if required, until the structure has been bonded and earthed.

Identification and Inspection of Scaffolding Components
All scaffolding components belonging to a contractor must be properly marked or uniquely coloured to enable positive identification.

Prior to erecting a scaffold, all scaffolding components must be carefully inspected by a competent Scaffolding Supervisor.

Components found to be defective during an inspection must be conspicuously marked and removed to a suitably demarcated quarantine area for destruction, repair, refurbishment or removal from site. Deformed and bent wedges must be straightened and inspected for cracks before being put back into service.

Storage of Scaffolding Components
All scaffolding components must be stored in a demarcated storage area in such a manner that they are not exposed to environmental extremes and will not cause injury to persons. Suitable barricading or fencing must be erected and warning signage must be posted (e.g. No Unauthorised Entry).

Within a storage area, scaffolding components must be stacked such that pathways (750mm in width) are maintained between the stacks. Each stack must be stable and components must be neatly placed to ensure that no ends protrude into any pathway. The various components must be stacked separately.

The weight of scaffolding components must be considered when stacking them in elevated positions.

Any storage area for scaffolding components must be positioned such that it will not interfere with any onsite activity (including the operation of any plant or equipment), block any access way, or obstruct access to any plant or equipment. Before establishing a storage area, the location must be agreed with the nominated project management representative.

Ladders

All ladders used on site must be of sound construction and adequate strength.

Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

The use of makeshift ladders is forbidden.

All ladders must be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register).

Before using a ladder, the user must inspect it for damage.

Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used.

A damaged ladder must be removed from service (and tagged, "Out of Service") without delay and must then either be repaired (if possible) or destroyed to prevent further use.

Persons must receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.

All portable ladders must be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet must always be placed (stand) on a firm level surface.

The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited.

Ladders may not be placed on movable bases such as boxes, tables, trucks, etc.

The base or foot of a ladder must always be secured to prevent it from slipping. The ladder must be held by an assistant if the base cannot be secured in any other way (e.g. tied off).

A straight ladder must extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder must be tied off (or otherwise secured to its support) to prevent accidental movement.

A straight ladder must be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder must be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder must be opened fully and the spreaders must be locked securely.

When using an extension ladder, at least four rungs must always overlap at the centre of the ladder.

Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) must be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded.

When a ladder is used near an entrance or exit, the base of the ladder must be barricaded.

Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person must always face the ladder and use both hands (i.e. maintain three points of contact).

Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools must always be properly secured. This can be achieved by attaching them to the wrist using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.

Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person must climb down and reposition the ladder.

No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.

All ladders must be properly maintained and cared for.

Ladders must be stored under cover and should be hung in a horizontal position from several brackets.

No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it.

No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings.

Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders.

Ladders must be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person must make an effort to remove mud, oil, grease, etc. from his boots.

13.11 Permit to Work

All personnel must comply with the Permit to Work system applicable to the project.

A Permit to Work must be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at heights;
- A critical lift;
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

Note: A Permit to Work may only be issued by an Authorised Person, and may only be received (or accepted) by an appointed Applicant (see Definitions).

Each Permit to Work that is issued must make reference to an approved Task-Based Risk Assessment for the work that is to be carried out.

The Permit to Work system that is employed must incorporate the following basic procedures:

- Prior to meeting with the Authorised Person, the Applicant must familiarise himself with all of the hazards associated with the system, plant, equipment, structure or area on or in which the work must be performed. He must also consider the risks that may arise as a result of the tasks that will be carried out. A Task-Based Risk Assessment must be in place;
- The Applicant must then request permission to carry out the work and must meet with the Authorised Person to discuss and document the scope of the work as well as the hazards, risks and associated control measures. Isolation and lockout requirements must be identified (if applicable). The isolation and lockout process must be initiated by the Authorised Person who must contact the necessary Isolation Officers.

Note: The Applicant must ensure his own safety and that of his team, and has the right to accompany the Isolation Officers to verify that all of the necessary locks have been fitted to all of the isolation and lockout points in accordance with the applicable plant or equipment-specific Isolation and Lockout Procedure.

- Once all of the necessary isolations have been completed and the necessary Clearance Certificates have been issued by the Isolation Officer(s) (if applicable), and the Authorised Person is satisfied that the system, plant, equipment, structure or area is safe to work on or in provided all identified precautions are observed by the Applicant, then he must issue (sign) the Permit to Work to the Applicant;
- The Applicant must accept (sign) the Permit to Work. If equipment has been isolated, the Applicant must attach his Personal Lock to the relevant Isolation Bar (or Local Isolation Point) and must ensure that every other person working on the isolated equipment also attaches his or her Personal Lock to the Isolation Bar (or Local Isolation Point) before starting any work;
- Before commencing with any work, the Applicant must discuss the hazards, risks, control measures, precautions and limitations as stated in the Permit to Work (and associated Task-Based Risk Assessment) with all personnel who will be carrying out the work. A register must be kept and all persons must sign the register once they have been briefed by the Applicant;
- The work performed must be limited to what is described in the Permit to Work;
- When a particular employee has completed his work, he must sign the personnel register to this effect and (if applicable) must remove his Personal Lock from the Isolation Bar (or Local Isolation Point);
- Once all work is complete, the Applicant must:
  - Ensure that all machine guards have been replaced;
  - Ensure that all tools and materials have been removed from the work area;
  - Ensure that the work area is clean and tidy;
  - Ensure that all Personal Locks (including his) have been removed from the Isolation Bar or Local Isolation Point (if applicable);
  - Inform the Authorised Person that the work has been completed; and
  - Sign off the Permit to Work.
- Once the work is complete and the Applicant has signed off the Permit to Work, the Authorised Person must:

- Ensure that the relevant Isolation Officers perform all of the necessary de-isolations (if applicable);
- On completion of the de-isolations, sign off the Permit to Work accepting the system, plant, equipment, structure or area back for service; and
- Inform all relevant personnel that the system, plant, equipment, structure or area is ready to use.
- Where the work must continue over more than one shift, the Permit to Work must be reviewed at every shift change by an Authorised Person. If the scope of work has changed, the permit must be cancelled and a new permit must be issued.

If any of the original conditions or precautions pertaining to the work is not being complied with, is no longer adequate or is no longer applicable, the Authorised Person must cancel the Permit to Work and must ensure that all work stops until full compliance with either the original or amended (as required) conditions and precautions is achieved and a new permit has been issued.

The Applicant must ensure that the Permit to Work (including the personnel register) is kept where the work is being carried out (i.e. posted on a portable Health and Safety Management Information Notice Board) and that the work is monitored against the permit conditions.

All Permit to Work records must be retained and must be made available for inspection when required.

The implementation of the Permit to Work system applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

Note: In addition to obtaining Permits to Work as and when required for specific hazardous activities, each contractor must obtain a General Work Authorisation from a nominated project management representative on a monthly basis. A General Work Authorisation is valid for one calendar month and authorises the contractor's planned work activities. In order to obtain a General Work Authorisation, the contractor must provide a documented work plan for the month together with the necessary Task-Based Risk Assessments.

13.12 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, must be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures must be strictly enforced.

All personnel must comply with the isolation and lockout system and procedures applicable to the project.

All Isolation and Lockout Procedures must incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks (see Definitions), and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;

- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and
- Methods to test the effectiveness or completeness of the isolation.

Note: No work may commence on a system, plant or equipment until a Permit to Work has been issued by an Authorised Person.

Note: A Permit to Work may only be issued by an Authorised Person once all required Clearance Certificates have been issued by appointed Isolation Officers.

The isolation and lockout system that is employed must incorporate the following basic procedures:

- In accordance with a system, plant or equipment-specific Isolation and Lockout Procedure, an appointed Isolation Officer(s) must isolate all points that need to be isolated in order to render the system, plant or equipment safe to work on. An Equipment Lock (and a suitable, highly visible warning tag) must be attached to each isolation point;
- On completion of an isolation (and lockout), the Isolation Officer must clear the area of all persons and must then carry out tests to ensure that the isolation is effective. This may be done by pressing a start button or by asking a control room operator to try to start the equipment. Special care must be taken to ensure that the attempted starting of the equipment has not been deactivated by another interlock forming part of the system, or by a different up-stream isolation. Alternatively, appropriate equipment may be used to test for energy (e.g. voltage verification or continuity tests).

Note: In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer must place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and must then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock must remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) must be keyed-alike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline. This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

Note: Local isolations do not require the use of Equipment Locks (a Discipline Lock may be attached to the Local Isolation Point by the Isolation Officer, followed by the necessary Personal Locks).

Note: For local isolations, if the Isolation Officer is the only person who will be working on the isolated equipment, then he must attach his Personal Lock to the Local Isolation Point.

- Once all required Discipline Locks are in place (i.e. attached to the Isolation Bar) and all Clearance Certificates have been issued, the Permit to Work may be issued by the Authorised Person;

- Each person who will be working on the isolated system, plant or equipment must then attach his or her Personal Lock to the Isolation Bar before starting any work (including the Isolation Officer, if he intends to work on the isolated unit);
- The attachment of a Personal Lock to the Isolation Bar prevents the removal of the key to the Equipment Locks even if the Discipline Lock is removed;
- When called (by an Authorised Person) to de-isolate the system, plant or equipment (on completion of the work under the Permit to Work), the Isolation Officer must ensure that all Personal Locks have been removed from the Isolation Bar before removing the Discipline Lock and the key to the Equipment Locks;
- Before removing the Equipment Locks and de-isolating the energy source, the Isolation Officer must inspect the system, plant or equipment that was worked on to ensure that it is safe to perform the de-isolation. This includes guard inspections, housekeeping, ensuring that all doors and covers are in place, and most importantly, ensuring that no persons are present;
- Once all Equipment Locks have been removed and the system, plant or equipment is safe for use, the Isolation Officer must cancel the Clearance Certificate and inform the Authorised Person that the unit has been de-isolated.

Where a system, plant or equipment is sequence interlocked and a hazard could be created through the inadvertent start up or shut down of a system, plant or equipment lying before or after the unit to be worked on, then that system, plant or equipment must also be isolated and locked out.

Redundant or out of service equipment must, in addition to being isolated and locked out using the relevant Discipline Lock, be fitted with a tag indicating why it is out of service, who performed the lockout, and the hazards associated with that equipment.

Where it is necessary to work on live equipment for the purposes of commissioning, testing, adjusting and sampling, such work must be carried out in accordance with a written Safe Work Procedure and controls must be in place to prevent unauthorised access into the work area.

The implementation of the isolation and lockout system and procedures applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

13.12.1 Personal Locks

A Personal Lock must be such that it can only be unlocked by the person to whom it belongs. Combination locks may not be used.

A Personal Lock, as well as the key(s) to the lock, must be kept under the exclusive control of the person to whom the lock belongs.

A Personal Lock must be issued to each person who requires one, and the person's details must be clearly and permanently engraved directly onto his Personal Lock. Alternatively, a thick durable plastic identification tag may be used that clearly displays the company's name, the employee's name, the employee's company number, and a contact telephone number (the tag must be securely fastened to the Personal Lock). Where the above is hand written, it must be done using a permanent marker pen and it must be legible.

Each person issued with a Personal Lock must be trained and certified competent in the correct use of such a lock.

A Personal Lock may NEVER be removed by anyone other than the person to whom it belongs, except if the removal (cutting) of the lock is authorised by the nominated project management representative (in the absence of this person, authorisation can only escalate upwards). Furthermore, the removal of the lock must be done under the personal supervision of the nominated project management representative, and in accordance with a written procedure. The removal (cutting) of a Personal Lock may be required if the person who applied the lock is unable or unavailable to remove it on completion of the work (e.g. lost his key, failed to remove his lock before going home, etc.).

13.13 Electrical Safety

All electrical work including400V cable reticulation from existing Mini Substations to the new low voltage distribution kiosk. The contractor must comply with Electrical Works Information and must be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the project.

Each contractor carrying out electrical work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements.

All persons who will be carrying out electrical work must be certified against the requirements of job and equipment-specific electrical competency standards for the project, which must address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards must receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training must address the equipment and conditions specific to the area where the individual will be working. The training material must be documented and training records must be kept.

13.13.1 Electrical Installations

Each electrical installation (temporary or permanent) installed or worked on by a contractor must be inspected by a nominated project management representative to ensure that the installation complies with all statutory requirements, codes, design criteria and safety standards applicable to the project.

A TPT project management representative must approve all electrical work before the installation is energised. Any installation deemed unsatisfactory by a nominated project management representative must be removed, repaired or modified by the contractor at his expense.

For every permanent or temporary electrical installation, a certificate of compliance must be issued by a competent and appropriately qualified electrician. These certificates must be available for inspection.

Single line diagrams (with supporting documentation) must be produced and maintained for all electrical installations. This information must include system fault calculations, equipment details, electrical protection discrimination curves, and cable ratings.

Work on electrical installations (new installations, and modifications or repairs to existing installations) may only be carried out by qualified and authorised personnel (i.e. electricians).

Electrical safety devices (specifically, earth leakage protection and overcurrent protection) must be installed on all distribution circuits and the settings must be established by suitably qualified personnel.

A suitable numbering and / or labelling system must be used so that each circuit breaker or earth leakage device can be clearly and readily matched with the outlet or equipment that it protects.

To ensure the safety of the user, each distribution panel must be completely enclosed, must be of the dead-front type, and must be properly constructed and earthed.

All electrical cabling must be covered (e.g. in cable trenches) or elevated (in cable trays) to protect it from damage and to eliminate tripping hazards.

All permanent and temporary electrical installations (cabling, sockets, distribution panels, transformers, switchgear, etc.) must be inspected and tested by a competent and suitably qualified electrician on a monthly basis. The testing must include a grounding (earthing) continuity test and testing of the electrical safety devices. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

A rigorous Isolation, Lockout and Permit to Work system must be applied to all electrical work (i.e. work on electrical installations, machinery or equipment). All personnel must comply with the system and procedures applicable to the project.

Before any work on an electrical installation or equipment is carried out, the installation or equipment must be de-energised.

No electrical work may be performed live, regardless of the voltage, unless written approval is obtained from the nominated project management representative (a justification as to why it is necessary for the work to be carried out with the equipment in an energised state must be provided). For all energised electrical work, a Safe Work Procedure must be in place and, with the exception of voltage testing and where no tools are used, a Permit to Work (specifically authorising energised electrical work) must be issued. When carrying out any energised electrical work, approved electrically insulated gloves, blankets, mats and other protective equipment must be used.

Control centres, switchgear rooms, substations, generators, transformers, capacitor banks, and other similar electrical plant and equipment must be appropriately guarded and labelled and, with the exception of emergency shut-off mechanisms, must be made inaccessible to unauthorised personnel (i.e. plant or equipment of this nature must be positioned within rooms or fenced enclosures which must be kept locked). Appropriate warning signage must be prominently displayed within, and at all entrances to, these rooms or enclosures. The signage must indicate that unauthorised persons are prohibited from entering, that unauthorised persons are prohibited from handling or interfering with any electrical plant or equipment, the procedure to be followed in the event of a fire, and the first aid procedure to be followed should a person suffer electric shock. Suitable fire-fighting equipment must be provided in all such rooms or enclosures.

All electrical panels must be kept locked (using keyed-alike padlocks). Keys may only be issued to authorised personnel.

All un-insulated (bare) or partially insulated conductors must be enclosed and protected to prevent accidental contact therewith. Measures must be taken to prevent unauthorised access and appropriate warning signage must be conspicuously displayed.

Only authorised persons may enter rooms or enclosures housing electrical plant or equipment, and only authorised persons may access electrical panels or cabinets, and cable ducts or trenches. If any work must be carried out in such an area or on such equipment, a Permit to Work must first be obtained from the nominated project management representative.

No connection to any electrical system may be made without prior approval and a valid Permit to Work from the nominated project management representative.

No electrical equipment or apparatus may be modified without written authorisation from the nominated project management representative.

Conductive ladders may not be used in proximity to non-insulated electrically energised lines or equipment.

All permanent and temporary electrical cables, whether energised or not, must at all times be handled as if they are energised.

Only appropriately certified intrinsically safe electrical equipment may be used in flammable or potentially explosive atmospheres such as in confined spaces.

Any equipment or structure on which electric charges may accumulate (such as storage tanks) must be grounded (earthed).

Lightning protection must be provided on all tall structures and buildings.

Grounding (earthing) and lightning protection systems and devices must be designed, engineered, selected and installed based on site-specific requirements.

Before carrying out any excavation work, a Permit to Work (specifically authorising the excavation activities) must be obtained from the nominated project management representative. Such a permit must not be issued until it has been verified that no buried hazards or services exist where the excavation work is to be carried out.

13.13.2 Portable Electrical Equipment

Prior to site establishment, each contractor must provide a complete inventory of all portable electrical equipment that he and his sub-contractors intend to use on the site (including plant, machines, appliances, generators, hand tools, lighting, extension cords, etc.). The nameplate data for each item of equipment must be included.

All portable electrical equipment to be used on the site must be supplied and maintained in a serviceable condition.

Any electrical equipment that is in poor condition or is not in proper operating order may not be used. Any electrical equipment that a nominated project management representative deems to be unsafe or unsuitable must be removed from site.

Electrical repair work or diagnostic work on electrical equipment may only be performed by personnel who are competent and authorised to perform this work (i.e. qualified electricians).

With the exception of double-insulated equipment, all electrical equipment must have an equipment grounding (earthing) conductor that connects the frame of the equipment being utilised to the grounding (earthing) conductor of the electricity supply system.

All electrical equipment and all electricity supply systems used (including generators) must be inspected and tested by a registered and competent electrician to ensure that all equipment is properly grounded (earthed).

All electrical equipment used on site must be supplied electricity through (i.e. must be protected by) an approved and tested residual current device (or earth leakage device or unit). If a socket outlet does not have a residual current device in the circuit, a portable residual current device must be used. Outlets without residual current device protection must be labelled as such.

Any electrical equipment that causes an earth leakage device to trip or deactivate the circuit may not be used again until an electrician has inspected and tested the equipment and has recorded in a register that the equipment is safe to use.

Interlocks may never be removed or modified, and fuse terminals may never be bypassed to keep current flowing in any circuit.

All generators must be fitted with suitable overcurrent protective devices (i.e. circuit breakers or fuses).

All generators must be used in compliance with the manufacturer's requirements. Any proposed modification to a generator must be authorised in writing by the manufacturer prior to the modification being made.

Each welding machine used on site must be fitted with a Voltage Reduction Device (VRD). If this is not practical (i.e. for arc welding processes other than stick welding), a dead man's (isolation) switch in the electrode circuit (operated by a trained observer) may be used as an alternative. All welding machines must be properly grounded (earthed).

All portable electrical hand tools used on the site must be double-insulated.

Electrical equipment must be disconnected or unplugged when not in use.

Portable lights must be stable and each light bulb must be protected by a substantial guard.

Temporary festoon lighting must be double-insulated and must be supported at least 2.5 metres above the floor, if possible.

Handheld lights must be of the all-insulated type and must be extra low voltage (i.e. not exceeding 32V). 120V or 240V handheld lights are not permitted.

Any lighting used in hazardous locations (i.e. potentially explosive atmospheres, confined spaces, and damp or wet areas) must be operated at a maximum of 32 volts, unless earthed and protected by earth leakage devices.

No person may wear a watch or any jewellery, or carry any metal objects such as a lighter or keys, while working on any electrical system or equipment.

No person may work on or use electrical equipment if his clothing is wet or any part of his body is in contact with water.

No person may handle electrical equipment, equipment cords or extension cords with wet hands or if the floor or ground surface is wet.

Fire extinguishers filled with carbon dioxide must be used to fight electrical equipment fires (water may never be used). If possible, the electrical equipment should be de-energised before fire-fighting activities commence.

When cleaning or performing maintenance work on an item of electrical equipment, the equipment must be unplugged.

Equipment may not be unplugged while that equipment is switched on. Nor may equipment be plugged into a receptacle (socket) with the equipment's switch turned on.

Electrical equipment that has a defective plug or wiring may not be used. Repair work to defective or damaged electrical equipment may only be carried out by a qualified electrician.

Extension cords may be used for temporary applications only. Permanent cabling must be installed for long-term needs.

Extension cords may not be run through doors, windows, ceilings or holes in walls.

An extension cord must be uncoiled completely before it is used.

An extension cord must be of sufficient current-carrying capacity to power the equipment that it is supplying electricity to. Cords must not be overloaded.

Extension cords must be unbroken and continuous (i.e. no joins or splices in the cord are permitted).

Extension cords may not be daisy-chained (i.e. one extension cord plugged into another extension cord).

Extension cords and equipment cords may not be modified to fit a receptacle (socket).

Two-conductor extension cords may not be used. A three-conductor extension cord (i.e. a grounded or earthed cord) must be used even if the equipment that it is supplying electricity to uses a two-prong plug.

Extension cords that are frayed, have insulation tears, cracks or abrasions, have exposed conductors, or have bent, broken or "spread" plug prongs may not be used.

Extension cords that will be used outdoors must have heavy duty insulation and must be weather and UV resistant.

All electrical equipment cords and extension cords must be covered or elevated to protect them from damage and to eliminate tripping hazards.

Each contractor is responsible for protecting his electrical equipment from the weather and from possible mechanical damage.

All portable electrical equipment (including generators) must be inspected, tested and tagged by a competent and appropriately qualified electrician on a monthly basis. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

The inspection and testing must include a continuity test of the grounding (earthing) conductor (as applicable) and a complete examination of the equipment or system to assure safe use.

The following colour coding system must be used for the tagging of all electrical equipment:

Table 13-1 Colour Coding System for Electrical Equipment

Month	Tag Colour	Month	Tag Colour
January	Red	July	Red
February	Blue	August	Blue
March	Orange	September	Orange
April	Green	October	Green
May	White	November	White
June	Yellow	December	Yellow

The tag placed on a piece of equipment must be traceable to an entry in a register where the following information concerning the inspection and testing of that piece of equipment must be recorded:

- Date of inspection and testing;
- Equipment description;
- Equipment owner;
- Equipment location;
- Name, signature and licence number of the electrician who carried out the inspection and testing; and
- Comments concerning the inspection and testing, and details of any repair work carried out or required.

Any item of electrical equipment that does not pass an inspection or test must be removed from service (and tagged, "Out of Service") immediately and must then either be repaired (if possible) or removed from site.

Any item of electrical equipment without a tag or with an out-of-date inspection or test may not be used.

Any item of electrical equipment found without a tag or with an out-of-date inspection or test must be removed from service until it has been inspected and tested. If it is found that more than one item of equipment being used by a contractor has not been inspected and tested as required, all work with electrical equipment must be stopped until it can be demonstrated to the satisfaction of the nominated project management representative that the contractor's systems and controls are adequate and fully implemented.

In addition to the formal monthly inspections and testing carried out by an electrician, electrical equipment (particularly extension cords, portable hand tools, welding machines, compressors and pumps) must be visually inspected by the user on a daily basis prior to use. Users must be trained to look for cracks in casings, loose casings, outer cord sheathing that is not being held firmly in position at the equipment, cuts or cracks in cord or cable insulation, exposed conductors, damaged plugs or sockets, and missing covers. Damage and / or defects must be reported immediately.

Personnel must immediately stop using and report any electrical equipment or machinery that is shocking, sparking, overheating or smoking. Corroded outlets, switches and junction boxes must also be reported.

13.14 Compressed Gas Cylinders

The contractor must establish a suitable storage area for oxygen, acetylene, LPG and argon cylinders in compliance with the following requirements:

- The storage area must be located at least 10 metres away from any building, and must be well ventilated;
- The storage area must have a concrete floor;
- The storage area must be enclosed using wire mesh fencing (as this will ensure adequate ventilation). This enclosure must be kept locked. Access into the storage area must be limited and controlled;

- A protective covering or roof must be fitted to the enclosure to provide shade;
- The enclosure may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials at all times;
- Appropriate warning signage (i.e. "No Smoking" and "No Naked Flames") must be prominently displayed on the enclosure;
- A 9kg dry chemical powder fire extinguisher must be mounted near the entrance to the enclosure
- If electrical lighting is required, it must be of an approved intrinsically safe type;
- Oxygen, acetylene, argon and LPG cylinders must be stored separately in the enclosure. Furthermore, full and empty cylinders must be separated. Separate storage sections must be clearly designated within the enclosure for the different gas types, and for full and empty cylinders, i.e. oxygen – full, oxygen – empty, acetylene – full, acetylene – empty, etc.;
- When a cylinder is empty, the cylinder cap must be replaced to protect the valve. Empty cylinders must be clearly marked (there must be no need to open valves to check if cylinders are full or empty);
- All cylinders must be stored in an upright position and must be secured in this position by chaining, strapping or clamping them individually to a wall, a cylinder trolley, rack or carrier, or some other rigid structure;
- Cylinders must be stored in rows (when necessary due to the number of cylinders) with aisles between the rows to facilitate easy and rapid removal in the event of a fire;
- Oxygen cylinders may never be stored near highly combustible materials, particularly oil and grease, or near fuel gas cylinders. When in storage, oxygen cylinders must be separated from fuel gas (LPG and acetylene) cylinders by a distance of 6 metres or by a 2 metre high wall made of fire-resistant material;
- The total quantity of gases stored on site must be limited to a 2 week supply.

Compressed gas cylinders must always stand upright (i.e. when being used, stored or transported) and must be properly and individually secured to prevent them from falling over.

Cylinders must be protected from flame, heat and from being struck by moving equipment and falling objects.

When handling gas cylinders (whether full or empty), care must be taken to prevent sudden impacts.

Whenever a cylinder is not in use, the protective cap must be in place to prevent the valve from being damaged.

Gas cylinders may not be carried, dragged, rolled or slid across a floor or surface.

When gas cylinders are to be moved / used, they must be placed in a proper cylinder trolley fitted with a 1.5kg dry chemical powder fire extinguisher.

Gas cylinders may not, under any circumstances, be used as rollers or work supports.

If transported by crane, hoist or derrick, compressed gas cylinders must be placed in a suitable cradle, net or skip box. Cylinders may NEVER be lifted using wire rope, fibre rope, a web sling or a chain sling. Before moving / transporting a gas cylinder, the regulator must be removed and the

protective valve cap must be replaced. Gas cylinders may not be taken into a confined space. Gas hoses that are run into a confined space must be removed during breaks.

Gas cylinders may not be placed on scaffolding.

Cylinder valve keys must be in place. If no suitable valve key is available then the cylinder may not be used. Nothing but the manufacturer-supplied key may be used to open the valve.

A flashback arrestor and a check valve (non-return valve) must be installed between the regulator and the hose and between the hose and the torch on the oxygen line and on the fuel (acetylene) line.

Connection fittings may not be forced and safety devices associated with cylinder valves or regulators may not be altered / tampered with.

Gas hoses may not be joined. Only approved hose connectors of the crimp type are permitted. Wire and jubilee clamps are prohibited.

Only high quality ancillary equipment may be used. This includes flashback arrestors, hoses, clamps, spindle keys, nozzles and torches.

Only trained and competent personnel may operate gas welding / cutting equipment and appliances.

When an employee opens the valve to a cylinder, he must stand to one side and open it slowly. Valves may never be left partly open – they must either be closed or be opened fully.

Leaking cylinders must immediately be removed from service and the workplace (if it is safe to do so).

Suitable firefighting equipment must be at hand wherever gas cylinders containing oxygen and / or fuel gas are being used.

Gas cylinders must be prevented from coming into contact with electrical circuits, e.g. welding leads. Never strike an arc on a cylinder.

Oxygen may only be used for the purpose for which it is provided. Do not use oxygen in pneumatic tools or tyres, as an explosion may occur.

Empty cylinders must immediately be marked as such and must be removed to the cylinder storage area at the end of each day / shift.

13.15 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., must be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools must be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools must not be used for hoisting or lowering of the tool.

Loose clothing, jewellery or gloves that could get caught in the tool must not be worn when operating powered tools. Operators of powered tools who have long hair must keep their hair tied up.

The power source must be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

13.15.1 Angle Grinders

The following personal protective equipment must be worn when using angle grinders:

- Safety helmet;
- Gloves;
- Safety glasses (or safety goggles) and a full face shield (i.e. double eye protection);
- Overalls with long sleeves and long pants, avoid any form of loose clothing;
- Safety boots with steel toe protection;
- Hearing protection;
- Breathing apparatus where dust or fumes may be generated;
- Where grinding machines are used, a face shield is to be worn as extra protection to the safety glasses; and
- Certain tasks may require the use of a leather apron as determined by a risk assessment.

A 230mm angle grinder may not be used for free cutting purposes. Exceptions may be approved only if alternative methods evaluated proved more hazardous or no alternative exists. The risk assessment for the task must then specifically include mitigating measures to ensure the safest possible way of performing the task.

The use of 230mm angle grinders for grinding purposes is acceptable, however should this form of grinding be required, the 115mm or 125mm grinders would be preferable.

All angle grinders must have a dead man switch incorporated, with a pressure switch in the handle.

A 230mm electrical angle grinder unit must incorporate a soft start to reduce the starting strain and a braking system to reduce run on after the unit has been switched off.

All angle grinders must have a spindle lock to assist with changing the disc or grinding wheel.

Anti-vibration handles are recommended to further reduce the stress if used for extended periods.

Angle grinders must be equipped and operated with disc guarding at all times.

Angle grinder must not be stored with fitted discs, as this will lead to damaging of the discs.

Before use and mounting of discs it is essential to check the safety codes and specifications printed on the upper side of the disc. Such specifications include the following:

- Revolutions per minute (RPM). The allowable speed of the disc must be equal to or greater than the maximum achievable speed of the grinder;
- Physical dimensions of the disc must meet grinder specification; and
- The disc must be suitable for the material type to be cut / ground as indicated on the disk. Cutting discs must never be used for grinding and vice versa.

It is critical that the correct disc mounting procedure is followed:

- Check that the machine is plugged out;
- Check the machine spindle, backup washer and thread;

- Check the condition of spindle nut - ensure spanner drive holes are not elongated;
- Ensure spindle nut spanner is the tool recommended by machine manufacturers;
- Do not use a hammer, pipe or chisel to tighten the nut, or apply additional mechanical advantage to nut torque. A firm "nip" is sufficient to retain the disc;
- Ensure the spindle diameter is suited to disc bore. Excessive clearance will cause the machine to vibrate due to eccentricity;
- Check to see that the nut and backup washer do not "bottom out". This will result in the disc not being correctly clamped on the spindle;
- Ensure the spindle speed is marked on the grinder and that it is less than the allowable disc speed; and
- Fit the disc, with the metal ring or writing to the nut side.

13.16 Fuel Powered Tools and Equipment

Fuel powered tools must be shut down and allowed to cool before being refuelled, serviced, or maintained. Fuel must be transported, handled, and stored in approved fuel containers. Where possible, diesel driven engines must be used in preference to petrol driven engines. All fuel powered tools must be included on the contractor's Equipment Register and the register must be submitted to the nominated project management representative prior to the relevant work commencing.

When fuel powered tools are used in enclosed spaces, the space must be ventilated and the atmosphere monitored to measure toxic gas concentrations. Persons in the space must wear the necessary personal protective equipment. Confined Space Entry clearance may apply. This type of activity must only be undertaken in exceptional circumstances and requires the approval of the nominated project management representative.

13.17 Hand Tools

Employees required to use hand tools must receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment must be worn when using hand tools.

Wrenches, including adjustable, pipe, end, and socket wrenches, must not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins, wedges and chisels, must be kept free of mushroomed heads. The wooden handles of tools must be kept free of splinters or cracks.

Adjustable wrenches must not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the nominated project management representative. Wherever possible, ring spanners must be used in preference to open end spanners.

Correct hand tools for the job must be used, e.g. screwdrivers must not be used as chisels, pliers must not be used as hammers.

All wedges and drifts that may spring, fly or fall to lower levels upon impact must be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

All hand tools used in elevated areas, that may be dropped or fall to lower levels must be fitted with safety lanyards and attached to solid structures or in the case of podges, scaffold keys etc., attached by wrist lanyard to the user.

Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the nominated project management representative.

13.18 Inspection of Equipment and Tools

All tools must be inspected by the user before, during and after use. If any faults are identified, the tool must be taken out of service and not used until repaired. Faulty tools that are not able to be repaired must be tagged "out of service" and removed from site.

13.19 Manual Handling and Vibration

Any handling or lifting task that can only be done manually must be planned and rehearsed before the task is done.

If more than one person is involved in a task a communication procedure must be agreed in advance. Lowering the load must be done in a controlled manner. Dropping a load is dangerous and must be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load must be mitigated to assure minimal potential for any injury.

When mechanical lifting aids are provided, they should be used.

Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance.

Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

The following should be considered with conducting the Risk Assessment with regards Manual Handling and also take into consideration the task factors, physical demands and tools involved in the task:

- Load weight/frequency;
- Hand distance from lower back;
- Asymmetrical trunk/load;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors;
- Carry distance; and
- Obstacles en route.

Team Manual Handling:

- Load weight;
- Hand distance from lower back;
- Vertical lift region;
- Trunk twisting/sideways bending;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors; and
- Communication, co-ordination and control.

As far as possible, exposure to vibration must be eliminated. However, if this is not possible, short-term solutions to decrease exposure include:

- Reducing the vibration levels;
- Removing the person from the vibrating equipment / tools;
- Reducing the period of time that the person works with the vibrating equipment / tools (at least 40 minutes break after 20 minutes working with a machine that vibrates excessively).

In order to reduce exposure to vibration:

- Consider buying equipment that operates effectively at lower speeds;
- Buy equipment with built-in damping materials;
- Buy lighter tools if they are available - they require less of a grip;
- Maintain the equipment;
- Make sure equipment is balanced and there are no worn parts;
- Use remote controls when they are available;
- Reduce your grip on the equipment when it is safe. The less time you actually have your hands on the equipment the better. Relax your hands during these brief breaks;
- Take scheduled breaks; and
- Do other tasks that allow you to move away from vibrating tools and equipment.

The workplace must be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

Quantitative evaluations of vibration produced by specific equipment must include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

Employees and contractors must be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.

Workplace vibration sources that could contribute to the exceedance of an Occupational Exposure Limit (hence potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.

Manual handling tasks assessed as having the potential to cause a Lost Time Injury (i.e. with potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.

Workplace manual / materials handling tasks risk rated as "significant" must be assessed and recorded to include biomechanical factors (e.g. posture, bending, twisting, repetitive motions, working overhead, and exerting force away from the body).

13.20 Personal Protective Equipment

All applicable legislation concerning Personal Protective Equipment (PPE) must be complied with at all times.

As a minimum, the following PPE must be worn by all persons (including visitors) at all times whilst on a project site:

- Safety footwear with steel toe protection;
- Safety glasses (individuals who wear prescription spectacles must be provided with either over-spec safety glasses or prescription safety glasses);
- Safety helmet (hard hat); and
- High visibility protective clothing with reflective taping (long trousers and long-sleeved shirts with collars and cuffs).
- Additional PPE requirements must be determined through hazard identification and risk assessment. This hazard-specific PPE (such as hand protection, hearing protection and respiratory protection) must be worn as required (e.g. when in a certain area, when performing a certain task, or when working with a certain substance);
- The correct PPE must always be worn:
- In accordance with site requirements (as indicated at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises);
- In zoned areas (e.g. noise zones and respirator zones); or
- As required by a Safe Work Procedure, a risk assessment, or a Safety data sheet (SDS).

Each contractor must provide each of his employees with all required PPE (at no cost to the employee). The specific PPE that is provided to a particular employee must be based on the nature of that employee's work and the location in which the work is performed (i.e. must be based on the hazards to which the employee is exposed). PPE requirements for a particular job or for a particular area must be determined through a risk assessment for that job or area.

Any employee who does not have all of the PPE that is required for him to perform his duties safely will not be permitted to work.

Each employee must care for his PPE, maintain it in good condition, and inspect it on a daily basis.

If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced by the contractor.

PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

Each employee must receive training in the use, maintenance and limitations of the PPE that is provided to him, and must be made aware of why the PPE is necessary as well as the consequences of not wearing it as instructed (i.e. the potential for injury and / or disciplinary action). Training records must be retained.

Any person who refuses to wear PPE as required must be removed from the site.

Symbolic signs indicating mandatory PPE requirements must be prominently displayed at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard (if one exists).

Each contractor must appoint an employee to:

- Control the issuing and replacement of PPE;
- Keep an up-to-date register as proof that items of PPE have been issued to individuals (an employee must sign for the items that he receives);
- Ensure that there is an adequate supply of all required PPE (i.e. maintain PPE stock levels on site); and
- Carry out regular inspections to ensure that PPE is being used correctly, is being maintained in a good, serviceable and hygienic state, and is not being shared between employees.

13.20.1 Electrical Protective Equipment

To reduce the risk of electric shock, electrical insulating equipment appropriate for the voltage that may be encountered must be worn when working on energised electrical installations and when working within two metres of exposed energised conductors.

All rubber electrical insulating equipment (including gloves, sleeves, matting, covers, blankets, and line hoses) must be inspected for damage prior to and after each use, and immediately following any incident that can reasonably be suspected of having caused damage.

Rubber insulating equipment with any of the following defects and / or damage may not be used:

- A cut, rip, tear, hole, or puncture;
- Ozone cutting or ozone checking (i.e. the cutting action of ozone on rubber under mechanical stress causing a series of interlacing cracks);
- An embedded foreign object;
- Chemical deterioration (texture changes) such as swelling, softening, hardening, or becoming sticky or inelastic; or
- Any other defect that damages the insulating properties.

Rubber insulating gloves must be electrically tested before first issue and every 12 months thereafter as a minimum. Insulating gloves must also be given an air test along with the daily inspection. Essentially, this involves filling a glove with air and checking for any holes or leakage.

Insulating equipment that fails an inspection or electrical test may be repaired only as follows:

- Rubber insulating line hose may be used in shorter lengths with the defective portion(s) cut off;
- A rubber insulating blanket may be repaired using a compatible patch that results in the patched area having electrical and physical properties equal to those of the blanket;
- A rubber insulating blanket may be salvaged by cutting the defective area off the undamaged portion of the blanket;
- Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by applying compatible patches. The patched areas must have electrical and physical properties equal to those of the surrounding material. **Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.**

Repaired insulating equipment must be retested before it is put back into use.

Insulating equipment must be cleaned as required to remove foreign substances (using a mild detergent).

Insulating equipment must be stored in such a location and in such a manner so as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

Leather protective gloves must be worn over rubber insulating gloves to provide mechanical protection against cuts, abrasions, and punctures.

Suitable arc flash PPE (e.g. voltage rated gloves, fire retardant clothing, arc rated face shield, arc flash hood, arc flash suit, etc.) must be worn whenever an employee is potentially exposed to an arc flash hazard. The appropriate level of PPE must be worn depending on the task and the potential energy exposure. These PPE requirements must be clearly specified as part of a project-specific arc flash protection programme.

13.20.2 Task-Specific PPE

In addition to the standard PPE required for a project site (including a safety helmet, safety glasses, safety boots, and high visibility protective clothing), the following task-specific PPE must be used as a minimum by any person carrying out or assisting with such a task:

- Arc Welding – safety glasses and welding helmet (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather welding gloves, leather apron, leather spats, leather yoke (for work above shoulder height), and knee pads for welders in kneeling positions;
- Gas Welding, Cutting or Brazing – gas cutting or welding goggles with shade 4 filter lenses and full face shield (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather gloves (long cuff for welding and cutting, short cuff may be used for brazing), leather apron, leather spats, and leather yoke (for work above shoulder height);
- Grinding – safety glasses or goggles and full face shield (i.e. double eye protection), hearing protection, respiratory protection where dust or fumes may be generated, leather gloves, leather apron, and leather spats;
- Abrasive Blasting – respiratory protection (air-supplied hood), hearing protection, leather gloves, and leather apron;

- Spray Painting – respiratory protection (air-supplied hood for confined spaces), safety goggles (if the respirator design does not provide this protection), hearing protection (where air compressors are used), chemical resistant gloves, and chemical resistant disposable coveralls.

13.21 Sun Protection

The contractor must ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, brims to safety helmets and UV factored sunscreen. Shade structures must also be made available to all employees.

The contractor must conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

13.22 Fuel / Flammable Liquid Storage and Refuelling

No fuel (diesel, petrol, paraffin, etc.) or any other flammable liquid (paints, solvents, etc.) may be stored on site unless approved in writing by the nominated project management representative.

If the on-site storage of a fuel or a flammable liquid is approved, the contractor must ensure the following:

- The quantity of fuel / flammable liquid to be stored on site must be kept to the minimum that is required;
- The storage area must be located in a well ventilated area at least 10 metres away from any building, drain, boundary or any combustible material;
- If more than 200 litres of fuel / flammable liquid is to be stored, the tank must be installed / the containers must be positioned within a bund (see Definitions);
- If the fuel / flammable liquid are to be stored in bulk tanks / vessels, then the minimum capacity of the bund must be 110% of the volume of the largest tank / vessel. If many small containers (e.g. 210 litre drums) are to be stored, the bund must be able to contain 25% of the total volume of the stored products;
- The bund must be impermeable. It must have a solid concrete floor and the walls must be constructed out of brick and must be plastered on the inside;
- The bund must be fitted with a lockable drain valve (for draining away rainwater), which must remain locked in the closed position. The valve may only be opened under supervision and in accordance with a written procedure;
- The fuel / flammable liquid storage area may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials (including rubbish, brush and long grass) at all times;
- Access to the storage area must be controlled (wire mesh fencing and gate);
- Appropriate warning signage (i.e. "Flammable Liquid", "No Smoking" and "No Naked Flames") must be prominently displayed at the storage area. The contents and volume of each tank must be indicated;
- In order to contain spillages, the offloading / refuelling bay at the fuel / flammable liquid storage area must have a solid concrete base surrounded by bund walls, ramps or humps and / or spill trenches (covered with steel grating) that lead into a sump;

- Fuel dispensing pumps must be protected against impact damage;
- All fuel / flammable liquid storage tanks and dispensing equipment must be electrically bonded and properly earthed;
- All electrical installations and fittings must be of an approved intrinsically safe type;
- Two 9kg dry chemical powder fire extinguishers must be mounted in an easily accessible position near the entrance gate to the fuel / flammable liquid storage area. Depending on the size of the storage area, additional fire extinguishers may be required to ensure that an extinguisher is no further than 15 metres away from any point on the perimeter of the storage area;
- A fire extinguisher must be at hand wherever refuelling is carried out;
- Smoking or open flames within 10 metres of a fuel / flammable liquid storage / refuelling area is strictly prohibited;
- No petrol or diesel powered vehicle or equipment may be refuelled while the engine / motor is running;
- Cellular phones must be switched off in fuel / flammable liquid storage / refuelling areas;
- Spill clean-up kits (containing a suitable absorbent fibre product) must be provided;
- Any spillages must be cleaned up immediately and all contaminated cleaning materials must be disposed of in accordance with the applicable legislation;
- If a flammable liquid is spilt or is leaking from a container / vessel, the area must be cordoned off and appropriate warning signage must be displayed to keep unauthorised personnel away from the affected area. Every effort must be made to contain the spillage. All hot work in the vicinity must be stopped immediately. If the spilt product is volatile and the possibility exists that a vapour cloud may form, or if the leak or spillage cannot be contained or stopped, then appropriate emergency response procedures must be activated (refer to Section 14) including the evacuation of all persons in the vicinity. Suitable firefighting equipment must be positioned ready for use should the spilt product ignite;
- The manual decanting of fuel or a flammable liquid from a large container should only be done using a stirrup pump (or similar) or a purpose-made frame which allows the container / drum to tilt for decanting and then return to the upright position;
- Drip trays must be used wherever required;
- All tanks, drums, cans, etc. containing flammable liquids must be tightly closed and properly sealed except for when a container is being filled or when a product is being decanted;
- The transport or storage of corrosive or flammable liquids in open containers is strictly prohibited
- Daily-use quantities of fuel (up to a maximum of 20 litres) must be handled in an approved safety can with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire;
- Where safety cans may be impracticable, only approved metal containers with screw caps may be used. Each container must be clearly labelled to indicate its contents;

- Only small quantities of flammable liquids (paints, solvents, etc.) may be stored within a building. Each product must be kept either in its original container or in an approved container which must be properly sealed. Each container must be clearly labelled to indicate its contents. When not in use, all such containers must be stored in a well-ventilated steel cabinet which must be kept locked to prevent unauthorised access;
- Not even small quantities of flammable liquids may be stored or dispensed in buildings or places of public assembly, in general warehouses, or in buildings containing sources of ignition such as space heaters, cooking devices, open electric motors, motor vehicles, or where welding, cutting, or grinding activities are being carried out;
- Safe Work Procedures must be compiled for the transportation (including delivery), offloading, storage, handling and use of any fuel / flammable liquid on site;
- All personnel that will be required to work with or may come into contact with a flammable liquid must be made aware of the hazards associated with the product and must be thoroughly trained in the safe transportation, use, handling and storage thereof.

13.23 Fire Protection and Prevention

The contractor must compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The contractor must assess / survey his area of responsibility and identify locations where the risk of fire is high. Cognisance must be taken of the fact that certain locations may need to be designated as high risk due to the presence of large quantities of flammable or combustible materials / substances. For all high risk areas, the contractor must ensure that additional precautions are taken to prevent fires and strict control is exercised over any hot work (i.e. welding, cutting, grinding, etc.) that is carried out.

The contractor must supply and maintain all required firefighting equipment. The type, capacity, positioning, and number of firefighting appliances must be to the satisfaction of the nominated project management representative and must meet the requirements of the applicable legislation. Fire mains, hydrants and hose reels will rarely be available on site, so use must primarily be made of portable fire extinguishers.

Firefighting equipment, fixed and portable, must be strategically located with a view to being able to rapidly deploy the equipment in order to bring potentially dangerous and destructive fires under control while still in their infancy.

All fire extinguishers (and any other firefighting equipment) placed on site must be:

- Conspicuously numbered;
- Recorded in a register;
- Visually inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register and the competent person must sign off on the entries made); and
- Inspected and serviced by an accredited service provider every six months (the nominated project management representative may require that this frequency be increased depending on the environmental conditions (e.g. high dust levels, water, heat, etc.) to which the fire extinguishers are exposed).

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage must be sent to an accredited service provider for repair and / or recharging. Details must be recorded in the register.

Firefighting equipment may not be used for any purpose other than fighting fires. Disciplinary action must be taken against any person who misuses or wilfully damages any firefighting equipment.

Access to firefighting equipment, fixed or portable, must be kept unobstructed at all times.

Approved signage must be in place to clearly indicate the location of each permanently mounted fire extinguisher, fire hose reel, etc.

The contractor must ensure that all persons working in / entering his area of responsibility are made aware of where all firefighting appliances and alarm points are located.

The contractor must ensure that his employees (and those of any appointed sub-contractors) are trained in firefighting procedures and the use of firefighting equipment.

The contractor must compile an emergency response procedure detailing the actions that must be taken in the event of a fire or a fire / evacuation alarm (see Section 14). All personnel working within the contractor's area of responsibility must be trained, and all visitors must be instructed, on this procedure. Copies of the procedure must be prominently displayed in the workplace in all languages commonly used on the site.

A person discovering a fire must extinguish the fire if he can do so safely, and then immediately report the incident to his supervisor. If the person cannot extinguish the fire, he must raise the nearest alarm and then report the fire as quickly as possible to his supervisor, the person responsible for the area, and / or Security.

On hearing a fire / evacuation alarm, all persons must make any operational plant or equipment safe, and then proceed to the nearest emergency assembly point and await instructions.

All incidents of fire (including the use or misuse of any firefighting equipment) must be reported to the nominated project management representative immediately. Used fire extinguishers must be replaced by the contractor without delay.

No hot work (i.e. welding, cutting, grinding, etc.) or any other activity that could give rise to a fire may be performed outside of a designated workshop without a Permit to Work having been issued.

Wherever hot work is being carried out, a fire extinguisher must be at hand. Where the risk assessment determents that it is necessary, a fire watch must be stationed.

Supervisors must carry out workplace inspections regularly to ensure adherence to fire prevention measures and procedures.

At the end of every working period (i.e. before each tea / lunch break and at the end of every shift / day), the workplace must be thoroughly inspected to ensure that no material is left smouldering and no condition / situation exists that could give rise to a fire.

The contractor must ensure that all supervisors and all employees carrying out or assisting with any hot work or any other activity that could give rise to a fire have been trained in firefighting procedures and the use of firefighting equipment. The training must be conducted by an accredited training provider.

When using electrical equipment, all cables must be in good condition and the nearest convenient socket must be used.

No power socket may be loaded beyond its rated capacity through the use of adaptors, etc.

Makeshift electrical connections are not permitted under any circumstances.

Water-based firefighting equipment must not be used on electrical equipment or burning liquids.

Refer to Section 13.16 – Electrical Safety.

Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine must be fitted with a permanently mounted fire extinguisher.

Smoking is only permitted in designated smoking areas. Cigarette ends / butts must be properly stubbed out in the ashtrays provided and never thrown into waste bins.

Refer to Section 13.34 – Smoking.

The contractor must ensure that good housekeeping practices are enforced, as this is crucial to the prevention of fires.

All combustible waste materials must be removed from the workplace on a daily basis (at the end of each shift) and placed in waste receptacles located at least 5 metres away from any structure.

The accumulation of waste materials in out-of-the-way places is prohibited.

Offices, desks, cabinets, etc. must always be kept tidy and uncluttered. Waste paper bins must be emptied regularly.

The storage of combustible materials under stairways or in attics is prohibited.

The storage of any materials against the exterior of a building or any other structure is prohibited.

All walkways, passages and stairways must be kept clear (i.e. must be unobstructed) at all times, as they may need to be used as a means of escape.

The areas around and the routes to all exits, fire escape doors, fire hydrants, fire hose reels and fire extinguishers must be kept clear (i.e. must be unobstructed) at all times.

"No Smoking" signs must be conspicuously displayed in and around all storage areas / rooms.

Waste may not be burned under any circumstances.

No flammable liquid (such as petrol, acetone, alcohol, benzene, etc.) may be used for starting fires or as a solvent for cleaning clothes, tools, equipment, etc. Only solvents approved by the nominated project management representative may be used for cleaning purposes.

Whenever any work is carried out involving the use of a flammable substance / material, the area must be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") must be displayed.

Refer to Section 13.32 – Fuel / Flammable Liquid Storage and Refuelling.

13.24 Smoking

The contractor must not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area must be clearly demarcated and the required signage must be displayed.

Any person found smoking or discarding a cigarette butt outside of a designated smoking area may be removed (temporarily or permanently) from site.

In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) must be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials must not be emptied into rubbish bins or any other container holding combustible materials.

"No Smoking" signs must be strictly observed.

13.25 Housekeeping

The contractor must maintain all work areas in a tidy state, free of debris and rubbish. Unless directed otherwise, the contractor must dispose of all debris, rubbish, spoil and hazardous waste off site in a designated and authorised area or facility. The contractor must familiarise himself with the waste management plan for the site including collection and disposal arrangements, and must align his waste management activities accordingly.

In cases where an inadequate standard of housekeeping has developed and compromised safety and cleanliness, a nominated project management representative may instruct the contractor to cease work until the area has been tidied up and made safe.

Neither additional costs nor contract deadline extensions will be allowed as a result of such a stoppage. Failure to comply will result in a clean-up being arranged through another service provider at the cost of the non-complying contractor.

The contractor must carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The contractor must document the results of each inspection. These records must be maintained and must be made available to the nominated project management representative on request.

The contractor must implement a housekeeping plan for the duration of the contract ensuring that the site housekeeping is maintained. Furthermore, at the end of every shift, the contractor must ensure that all work areas are cleaned, all tools and equipment are properly stored, and construction rubble is removed.

Where the contractor fails to maintain housekeeping standards, the nominated project management representative may instruct the contractor to appoint a dedicated housekeeping team for the duration of the project at the contractor's expense.

Littering is prohibited.

13.26 Waste Management

Waste may not be disposed of unless the disposal of that waste is authorised by law. The contractor must therefore ensure that all waste that is generated is handled, stored, transported and disposed of in accordance with the requirements of the applicable legislation / local authority.

No waste may be removed from the project site to a waste storage or disposal facility unless that facility has been approved for use by the nominated project management representative.

An adequate number of waste bins and skips must be provided by the contractor and suitable arrangements must be made to ensure that these bins and skis are emptied regularly.

Hazardous wastes must be kept separate from general wastes.

Waste disposal service providers must be approved by the nominated project management representative before any waste is removed from site. These service providers must be audited on a two-yearly basis (or more frequently if deemed necessary based on risk) in order to ensure compliance with legislation and to help ensure that no liabilities accrue to the project.

13.27 Stacking and Storage

All irregular shaped items will be stacked at floor / ground level in designated stacking areas on a level, firm base capable of withstanding the weight of the commodities being stacked and stacked in such a manner that the items do not topple over or change position due to subsidence or weight transfer when being moved.

Where these commodities are stacked on shelves or racks, the shelves or racks must be designed to carry the weight of the commodity being stacked.

All racks or shelves where heavy material or commodities are stacked will have a weight carrying limitation clearly marked on the structure and have a safety factor of at least +10% of maximum total carrying capacity.

All materials, commodities or articles, which could be damaged due to inclement weather, must be stored under cover.

Waste material that is combustible must not be allowed to accumulate in sufficient quantities to create a hazard.

No commodities or equipment may be stacked or stored within 500mm of rolling stock tracks or where mobile equipment travels.

The storage of material, small equipment, tools, files and general items in cupboards and on shelves must be neat and controlled at all times. Incompatible substances must not be stored in or on the same cupboard or shelf.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

13.28 Demarcation

No demarcation of floors is required inside offices, training centres and the like.

Where it is impractical to paint floors, yellow lines will be deemed adequate e.g. where heavy traffic necessitates the continual painting of floors.

Temporary demarcation in the form of hazard tape (red and white) may be used to demarcate areas where there is, for relatively simple reasons, restricted access.

Where hazards exist and entry must be specifically excluded for safety or health reasons, hazard tape in any form must not be used in isolation. A robust and substantial barrier of timber, rope or other material must be used in conjunction with barrier tape, to prevent entry to unauthorised persons.

Outside storage areas where it is impractical to use floor demarcation, demarcation may take the form of creosote poles and wire rope or similar. Spans between uprights should be painted yellow.

13.29 Facilities

Sanitary conveniences must be provided and maintained at a rate of at least one shower facility for every 30 workers, at least one toilet facility for every 20 workers, separate male and female changing facilities and sheltered eating areas.

Where chemical toilets are provided, one toilet for every twenty five employees must be allocated.

All toilets must be cleaned daily, disinfected and provided with toilet paper.

All employees making use of these facilities have the responsibility to help keep the facilities neat, clean and hygienic.

Washing facilities, including soap and towels, must be made available for use by the contractor's employees.

Drainage from all washing / toilet facilities must be properly designed and constructed to prevent employee exposure to waste water (and the associated biological hazards). Waste water may not accumulate or stand in pools at any location on the project site.

Change rooms must be provided and must be kept clean and free from odours at all times.

No chemicals, except those normally used for domestic cleaning of these facilities, may be stored in the facilities.

No equipment or items (other than those normally associated with hygiene facilities) may be stored in the facilities.

All entrances must be constructed in a way to afford privacy to users.

Drinking water must be provided.

A sheltered (covered) area must be set aside on site to be used as a dining facility (eating area). Adequate seating must be provided for the maximum number of employees. The facility must be kept clean and tidy.

A suitably sized, impervious receptacle (bin) must be provided for the disposal of waste food and other refuse generated at the dining facility. This bin must be emptied and cleaned regularly (i.e. promptly after meal times).

Food may only be consumed in authorised sheltered areas.

Adequate refrigerated storage must be provided to the contractor's employees for the storage of food and drinks. Fridges must not be overstocked and must maintain sufficiently low temperatures.

13.30 Occupational Hygiene

The contractor must ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured (a baseline survey must be carried out by an Approved Inspection Authority - this services to be provided by TNPA):

- Noise;
- Thermal stress (heat and cold);
- Particulates (dust);
- Silica (free crystalline silica);

- Asbestos;
- Gases or vapours;
- Lead;
- Chemicals;
- Ionising radiation;
- Non-ionising radiation;
- Vibration (hand / arm vibration and whole body vibration);
- Ergonomics; and
- Illumination.

If it is determined that exposure levels for a particular stressor are unacceptable, then a monitoring and control plan must be implemented to manage any risk of overexposure.

Note: Where chemical substances are to be used as part of the construction process, the contractor must ensure that the chemical composition of each substance is known (refer to Section 13.44). Carcinogenic (cancer-causing) ingredients must be specifically identified with due understanding that no chemical known to cause cancer will be permitted for use on site (an alternative will need to be sourced).

13.31 Lighting

For all work areas and access ways, if the natural lighting available is inadequate it must be supplemented by artificial lighting to meet the minimum levels required.

A lighting survey to determine luminance must be conducted for all work areas, at least once every two years and prior to work commencing for the first time in any area.

Emergency lighting must be provided in all indoor workplaces that do have adequate natural lighting or in which persons work at night. The emergency sources of lighting that are provided must be such that, when activated, an illuminance of not less than 0.3 lux is obtained at floor level, to enable employees to evacuate safely.

Where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance must be not less than 20 lux.

Windows and translucent sheeting must be kept adequately clean and clear of obstructions as far as reasonably practicable. Light fittings, i.e. lenses and reflectors must be kept clean.

If a light intensity meter is used, a valid calibration certificate must be available.

Neon lights must not be installed in areas where moving parts of machinery or equipment cannot be fully guarded, i.e. lathes, bench grinders, etc. in order to eliminate the stroboscopic effect.

No person may use a portable electrical light where the operating voltage exceeds 50 volts, unless:

- It is fitted with a non-hydroscopic, non-conducting handle;
- All metal parts which may become live are protected against accidental contact;
- The lamp is protected by means of a guard firmly attached to the handle; and

- The cable can withstand rough use.

No person may use a portable electric light in damp or wet conditions or in closely confined spaces, inside metal vessels or when in contact with large masses of metal, unless:

- The lamp is connected to a source incorporating an earth leakage; and
- The operating voltage of the lamp does not exceed 50 volts.

13.32 Hearing Conservation

A hearing conservation program must be implemented and protection against the effects of noise exposure must be provided when the noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-weighted scale of a standard sound level meter at slow response.

For the hearing conservation program to be effective it must include as a minimum:

- Monitoring of the workplace to determine the representative exposure of employees to excessive noise levels;
- An audiometric testing program for employees, which must include:
  - A baseline audiogram for all employees exposed to noise levels equal to or in excess of the standard;
  - Annual audiograms for each overexposed employee;
  - Analysis of audiogram results with retesting and/or referral to an otolaryngologist or qualified physician when a significant threshold shift (STS) occurs; and
  - Written employee notification of the STS.
- A training program for all employees exposed to noise;
- Provision of personal protective equipment to all affected employees when administrative or engineering controls fail to reduce sound levels to within the levels of the standards.

Monitoring of employee exposures to noise shall be conducted by an Approved inspection Authority.

The monitoring requirement may be met by either area monitoring or personal monitoring that is representative of employee exposures. Personal monitoring is preferred, and may be required based on the type(s) of noise sources.

For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with local legislation.

A person-task specification shall be available for every job category and shall be submitted with an employee for audiometric testing.

Audiometric testing and an annual audiogram shall be provided as part of the regular medical examinations.

Audiometric test results obtained from the pre-employment medical examination for a new employee shall be used as the baseline audiogram.

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

Hearing protectors shall not be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

Employees shall be notified of the need to avoid high levels of non-occupational noise exposure during this 14-hour period.

Record-keeping for the audiogram shall include:

- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer;
- Employee's most recent noise exposure assessment.

Audiometric test results shall be maintained in the employee's medical file.

To control noise exposure, its three basic elements shall be examined, i.e. source of the sound, travel path, and effect on receiver or listener. Solution of a given noise problem might require alteration or modification of any or all of these three basic elements.

1) Controlling noise at the noise source can be achieved by the following:
   - Select quiet equipment initially. In selecting quiet equipment the following features shall be considered:
     - Low-noise certification;
     - Advertisement of "quiet" operation, evidence of noise control design;
     - Evidence of "lower" and "slower" operating characteristics;
     - Side-by-side noise testing of equipment; and
     - "On-site" or "in operation" inspection of mechanical equipment before purchase.
   - Reduce operating noise by considering the following control measures:
     - Reduce impact or impulse noise by reducing weight, size, or height of fall of impacting mass;
     - Reduce speed in machines and flow velocities and pressure in fluid systems;
     - Balance rotating parts – to control machinery noise and vibration of fans, fly wheels, pulleys, cams, etc.
     - Reduce frictional resistance between rotating, sliding or moving parts in mechanical systems: frequent lubrication, proper alignment of moving parts; static and dynamic balancing of rotating parts; correction of eccentricity or "out-of-roundness" of wheels, gears, rollers, pulley, etc.;
     - Reduce resistance in air or fluid systems: use of low flow velocities, smooth boundary surfaces of duct or pipe systems, and long-radius turns and flared sections in pipes, etc., to reduce turbulence noise;
     - Isolate vibration elements in machinery; install motors, pumps, etc. on most massive part of machine; use belt or roller drives in place of gear trains; use flexible hoses and wiring instead of rigid piping and stiff wiring, etc.

- Apply vibration damping materials such as liquid mastic; pads of rubber, felt, foam or fibrous blankets; or sheet metal visco-elastic laminates or composites to vibrating machine surfaces; and;
- Reduce noise leakage from the interior of machines such as compressors by sealing or covering all openings or applying acoustical materials to machine interiors.

2) Controlling noise in the transmission path can be achieved by the following:
   - Separate the noise source and receiver as much as possible;
   - Use sound-absorbing materials on ceiling, floor or wall surfaces as close to the machine as possible;
   - Use sound barriers and deflectors in the noise path;
   - Use acoustical lining on inside surfaces of such passageways as ducts, pipe chases, or electrical channels;
   - Use mufflers, silencers or snubbers on all gasoline or diesel engines, regardless of size; and particularly on equipment when large quantities of high-pressure, high-velocity gases, liquids, steam or air are discharged into the open air; and
   - Use vibration isolators and flexible couplers where the noise transmission path is structure borne in character.
3) Protection for the receiver – when engineering controls fail to reduce the levels to within the levels specified in local legislation, the following measures shall be implemented:
   - Personal protective equipment shall be provided and replaced as necessary at no cost to employees;
   - Supervisors shall ensure that hearing protective devices are worn by all employees who are exposed to a time-weighted average of 85 decibels or greater and who have experienced a significant threshold shift;
   - Employees shall be given the opportunity to select their hearing protectors from a variety of suitable protectors; and
   - Noise zones shall be indicated my means of signs at every entrance to such zones.

   When noise levels exceed 100 dB(A), a combination of earplug and earmuff may be required to achieve protection of the worker.

   It is important to note that using double protection will add only 5 to 10 dB of extra attenuation above that of a single Hearing Protection Device.

   Where an earmuff and earplugs are used together, OSHA recommends using this simple calculation: Take the higher rating of the two devices, and add five.

   Hearing Protection Devices should be worn for the full noise exposure period.

   Where an audiometry programme is required, it must meet the following standards:
   - All testing must be by pure tone audiometry in an audiometry booth or quiet room, with measured noise levels less than 40 dB(A);

- The initial audiogram must be taken prior (minimum of 24 hours) to exposure to significant noise. Further audiograms must be taken periodically; annually where exposures are over 85 dB(A) Leq or where continued deterioration to hearing is occurring;
- Testing must be performed by trained and competent personnel;
- Audiometers must be calibrated according to the manufacturer's guidelines. As a minimum these will be a weekly biological calibration using an employee unexposed to noise, or a bio-acoustic simulator, and an annual quantitative check. All results must be documented; and
- Audiograms must be read by trained persons who will identify any increasing hearing loss and then determine if this is noise induced. Any employee with a significant downward shift in one or both ears (measured as an average non age-adjusted loss from baseline of 10 dB at 2, 3 or 4 kHz) must be retested following removal from noise for a minimum of 24 hours, usually after a days-off period. If the downward shift persists the employee must be reviewed by a physician and improved hearing protection considered.

13.33 Hazardous Chemical Substances

No chemical substance may be brought onto site unless it has been approved for use by the nominated project management representative and it appears on the Approved Chemical Substances Register which will be made available to all contractors.

The register will contain the following information:

- Trade name / product name of substance;
- Manufacturer / supplier of substance;
- Maximum inventory;
- Storage requirements and precautions;
- Inventory of special emergency items held for handling spillages, fires, etc. (e.g. reagents to neutralise spillages, firefighting foam, etc.); and
- Approved disposal methods.

If the contractor wishes to make use of a chemical substance that does not appear on the register, then the contractor must provide the following information to the nominated project management representative for review PRIOR to bringing the substance onto site:

- A detailed 16-point Safety data sheet (SDS) issued by the manufacturer / supplier of the substance;
- The reason for wanting to bring the substance onto site (i.e. the intended use of the substance);
- The proposed method of transportation;
- The proposed arrangements for the safe storage of the substance;
- The quantity to be stored on site;
- The proposed methods for handling / using the substance (including PPE);
- The proposed method of disposal of the waste;

- Proof that the contractor is able to readily provide the necessary first aid measures as specified in the SDS; and
- A risk assessment covering the transportation, use, handling, storage and disposal of the substance with specific reference to the substance's compatibility with other chemicals.

This information must be provided at least five (5) working days prior to the date on which the contractor intends to bring the substance onto site for use.

Any chemical substance brought onto site without adherence to the requirements stipulated above shall be removed from site immediately.

If the nominated project management representative approves the substance for use, the contractor must ensure that all necessary precautions are taken concerning the transportation, use, handling, storage and disposal of the substance, and that all required PPE and first aid materials / equipment (as stipulated in the SDS) are readily available on site.

The contractor must ensure that a Safety data sheet (SDS) is obtained for each chemical substance brought onto site. A file, or files, containing all of the SDS's must be maintained and must be readily available to all personnel on site (particularly first aiders) as well as other potentially affected parties (e.g. emergency services personnel, persons from the local community, etc.). The SDS's must be in the language(s) commonly used on site.

The contractor must appoint a trained and competent Hazardous Chemical Substances Coordinator who understands and is able to evaluate the risks associated with a wide variety of substances. This person shall be responsible for:

- Assessing the hazardous properties and risks associated with all chemical substances brought onto site by the contractor and appointed sub-contractors (using the SDS's);
- Determining precautions and safe practices for transportation, use, handling, storage and disposal (including PPE requirements) (using the SDS's);
- Determining first aid and emergency response requirements / procedures (using the SDS's);
- Maintaining the SDS file;
- Managing and monitoring the consumption of inventory; and
- Providing an "as needed" service to site personnel and suppliers.

The risks associated with the transportation, use, handling, storage and disposal of all hazardous chemical substances brought onto site must be assessed and managed by the contractor through a process that incorporates risk reduction using the hierarchy of controls as described in Section 6.

Whenever a task-based risk assessment is carried out, consideration must be given to the use of chemical substances (e.g. greases, solvents, etc.).

The contractor must provide Safe Work Procedures for the transportation, use, handling, storage and disposal of all hazardous chemical substances to be used on site.

The contractor must provide his employees with all of the Personal Protective Equipment that is necessary to prevent exposure / injury while handling / using the hazardous chemical substances that they will be required to work with. Appropriate PPE must be selected with consideration given to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

The contractor's employees must be trained in the safe transportation, use, handling, storage and disposal of the hazardous chemical substances that they will be required to work with or may come into contact with. The training must specifically address PPE requirements (including the correct selection, fitment and use thereof). All personnel must be trained to understand the potential health effects associated with exposure to hazardous chemical substances and therefore the importance of Safe Work Procedures and PPE. All personnel must be trained on emergency response procedures and first aid measures.

Behaviour-based observations and coaching must include the use / handling of hazardous chemical substances.

An appropriate occupational exposure monitoring and medical surveillance programme must be in place for all personnel potentially exposed to hazardous chemical substances which have the potential to cause immediate or long-term harm.

Emergency showers and eyewash stations must be provided where required by law, or where a risk assessment indicates a need. The emergency showers and eyewash stations must be appropriately located, signposted, and regularly tested and maintained. Employees must receive training on the location and use of the showers / eyewash stations.

An emergency response plan for incidents involving hazardous chemical substances must be in place. Regular and appropriately staged emergency drills (possibly involving external spill response and ambulance support services) must be held and lessons learnt must be incorporated into the emergency response plan.

The contractor must provide appropriate storage facilities for all hazardous chemical substances to be used on site. The storage facilities must be secure and protected from damage. They must also be designed for easy access for firefighting purposes. Where applicable, the storage facility must protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

The inventory of hazardous chemical substances stored on site must be kept to a minimum. The quantity of each chemical stored must be justifiable.

Storage and segregation requirements for all hazardous chemical substances to be used on site must be based on:

- The quantities of the substances stored;
- The physical state of the substances (solid, liquid or gas);
- The degree of incompatibility; and
- The known behaviour of the substances.

Access to areas where hazardous chemical substances are stored and handled must be limited and controlled.

Every chemical substance container must be adequately and clearly labelled to identify its contents, to indicate precautionary requirements for the substance, and to indicate the date of expiry (if applicable). Pipes used to transfer / convey / distribute chemical substances must be clearly identified (e.g. colour coding). Directional flow must be indicated where practical.

Before any item, equipment or empty container containing a chemical residue is disposed of as general waste, it must be properly decontaminated (where applicable). Before being disposed of,

empty chemical containers must also be rendered unusable for carrying water (by puncturing, cutting or crushing them).

Hazardous chemical substance waste (i.e. redundant / expired hazardous chemical substances, containers containing residues, contaminated items / materials, etc.) must be disposed of in accordance with the applicable legislation.

Maintenance, inspection and testing schedules and procedures must be in place for critical equipment associated with hazardous chemical substances.

A system must be in place to ensure that the risks are assessed before any changes are made to equipment and / or processes for the transportation, storage, handling, use or disposal of a hazardous chemical substance.

A programme must be in place to continually investigate possibilities / opportunities for replacing hazardous substances with safer alternatives.

13.34 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs must be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatisation period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

13.35 Fitness for Work

The contractor must develop and implement a programme to manage employee fitness for work. All employees working on site for whom the contractor is responsible (i.e. direct employees of the contractor as well as the employees of any appointed sub-contractors) must be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) must be identified and the risks associated with reduced fitness for work in these roles must be assessed.

A programme to manage these risks must be implemented, and it must include:

- Mechanisms for managing fatigue, stress and lack of fitness;
- An alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing;
- An Employee Assistance Programme providing confidential access to resources and counsellors; and
- Training and awareness programmes.

Each employee has an obligation to present himself fit for work at the start of the day / shift, and to remain fit for work throughout the work period. Reporting for work under the influence of alcohol or any other intoxicating substance will not be tolerated. Any transgression concerning the alcohol and other drugs policy applicable to the project may result in the offending employee's access to the project premises being temporarily or permanently withdrawn.

Alcohol and drug testing on the project premises will be carried out randomly (as employees report for duty and during the course of the day / shift), following significant incidents (all

persons involved), and whenever there is reasonable suspicion. Alcohol and drug testing may also be carried out as part of a Pre-Employment Medical Examination.

Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours;
- The impact on sleep cycles of activities such as commuting to and from site; and
- The monitoring and control of working hours.

The contractor is responsible for the administration of the working hours of his employees as well as the employees of any appointed sub-contractors. The maximum working hours per day and the minimum rest times between shifts must be specified in the contractor's Health and Safety Management Plan and must comply with all applicable legislation.

All employees engaged in safety critical jobs must undergo fitness assessments (medical examinations) which must be carried out prior to the commencement of employment on the project, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the project:

- Pre-Employment Medical Examination – to assess the physical suitability of the person for the role and environment in which he will work (carried out prior to the commencement of employment on the project and prior to induction);
- Periodic (Surveillance) Medical Examination – to assess the ongoing physical condition of an employee to determine if his role is impacting on his health and whether the employee's fitness level is still adequate for the role he holds (these medical examinations are "risk driven" – the specific protocol followed and the frequency of the examinations will depend on the applicable legal requirements and the employee's individual risk profile as determined by his personal fitness, the nature of his role / duties, and the environment in which he works / occupational health hazards to which he is exposed). The periodic medical assessment programme must include:
  - The identification of modifiable risk factors that may impact fitness for work;
  - Education and support to maintain health or address identified risk factors; and
  - Education and support to help employees regain their fitness for work.
- Role Change Medical Examination – to assess an employee's physical suitability for a different role and work environment (carried out prior to a change in role / duties);
- Exit (Post-Employment) Medical Examination – to determine the total physical impact of the work the employee performed (carried out on termination of employment on the project if the employee worked on the project site for more than six months).

Note: The results of an Exit Medical Examination from previous employment will not be accepted as a Pre-Employment Medical Examination.

Note: The medical examinations described above may only be carried out by an occupational medical practitioner (i.e. a medical doctor who holds a qualification in occupational medicine).

A detailed job (role) description and an exposure profile (noise, dust, heat, fumes, vapours, etc.) must be provided for each employee or group of employees. The medical examinations that an employee undergoes must be based on (i.e. the employee's fitness must be assessed against) the information contained in these documents as well as the baseline risk assessment for the work. This information must be made available to the occupational medical practitioner performing the medical examination.

For each role, the medical criteria for fitness must be documented and these must be based on an evaluation of the physical and medical requirements for the role.

Depending on the circumstances, certain vaccinations may need to be provided to employees.

The medical examinations carried out for all drivers and operators must include testing / assessment for medical conditions that could affect the safe operation of vehicles or equipment. Specific testing / questioning must be carried out to determine if an individual:

- Suffers from epilepsy or any other medical condition deemed to be a risk by the occupational medical practitioner;
- Makes use of chronic medication that could affect performance;
- Is colour-blind; or
- Has poor day or night vision.

The medical examinations carried out for employees that are required to work at height must include testing / questioning to determine if an individual suffers from epilepsy, hypertension (high blood pressure) or any other medical condition deemed to be a risk (with regard to working at height) by the occupational medical practitioner.

Electricians must be tested for colour-blindness.

With regard to the placement of new employees:

- Prospective employees must be referred to a suitable occupational medical practitioner (doctor) for a "Pre-Employment Medical Examination";
- If an individual is found to be medically "unfit for placement", the doctor will indicate which work activities cannot be performed by the person;
- The individual may still be employed on the project if his medical restrictions can be accommodated and provided that no legislation is transgressed.

A process must be established to manage medical restrictions that may be placed on an employee. For every employee with a medical restriction, regular follow up visits with the occupational medical practitioner must be arranged to ensure that each case is proactively managed.

An employee in a safety critical job must report (to his supervisor) any condition that might impair his ability to safely perform the duties associated with his role. A mechanism must be in place for such reports to be referred to an occupational medical practitioner to determine if the employee is fit to continue with his work.

Proof of all medical examinations (i.e. certificates of fitness signed by an occupational medical practitioner) must be kept on site and these records must be readily available for inspection by the nominated project management representative.

An employee's certificates of fitness must be included in his Personal Profile (dossier). If an Employee Personal Profile (dossier) hasn't already been compiled for a particular employee, then this must be done without delay following the employee's Pre-Employment Medical Examination.

No employee in a safety critical role may commence work on site without proof that he has undergone a Pre-Employment Medical Examination.

Occupational medical examinations and data interpretation may only be carried out by medical practitioners that are appropriately qualified and certified to do so.

Occupational medical data contained in reports to management must be grouped and summarised to ensure that the confidentiality rights of each individual employee are maintained.

All occupational medical data and records must be retained for at least 40 years.

14. Emergency Preparedness and Response

The contractor must develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the contractor's team and work activities. The plan must be risk-based and must detail the procedures that must be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The contractor's Emergency Response Plan must be aligned with the Emergency Response Plan developed for the project.

Potential off-site emergency scenarios must be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

Consideration must be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers must be included.

The Emergency Response Plan must satisfy and comply with all applicable legal requirements.

The plan must be adequately resourced to ensure effective implementation. These resources must include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices must be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan must be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan must be established. The roles and responsibilities of each team member must be clearly defined in the plan. Each team member must receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting must be incorporated into the Emergency Response Plan. The responsible person(s) must be clearly identified, and the protocols for communicating with internal and external stakeholders must be defined.

Emergency evacuation procedures must be developed and included in the Emergency Response Plan.

A copy of the plan must be provided to the nominated project management representative for approval prior to site establishment.

The Emergency Response Plan must be formally reviewed (and amended if necessary) on at least an annual basis, and following any emergency situation, to ensure that it remains appropriate and effective.

At each project work site:

- A suitable evacuation alarm (siren) must be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the contractor must be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded must respond to it immediately.
- Suitable fire-fighting equipment must be provided and maintained, and personnel must be trained in fire-fighting procedures and the use of fire-fighting equipment (refer to Section 14.1 and 13.33).
- Suitable first aid equipment and supplies must be provided and maintained, and an adequate number of appropriately trained First Aiders must be in place (refer to Section 14.2).
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment must be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) must assemble and be accounted for at these emergency assembly points.
- All personnel must receive awareness training on the applicable emergency response procedures, and all visitors entering the site must be properly instructed in these procedures.
- The emergency response procedures must be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) must be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.
- An up-to-date list of emergency telephone numbers must be compiled and maintained. A copy of this list must be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills must be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills must include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios must be tested including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill must be carried out one month after site establishment and six-monthly thereafter. Each drill must be monitored and the outcomes (highlights and shortcomings) must be documented. Corrective actions must be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures must be amended as required.

  Refer to the Transnet NPA Health and Safety Management Site Emergency Managements HAS-P-0001.

14.1 Fire Fighting

The contractor must ensure that Fire Fighting requirements are met as described in (Section 13.33)

15. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the contractor must develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process must take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process must aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;
- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised;
- The right people are involved in the change process; and
- All statutory requirements are met.

All risks associated with a proposed change must be evaluated and ranked. The risks that are ranked as moderate or higher must be managed to prevent serious injury or illness.

It must not simply be assumed that a change will not result in significant risks. All proposed changes must be formally evaluated. The evaluation or review must include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

16. Sub-contractor Alignment

Processes must be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications must be in place. A prospective sub-contractor's health and safety management expertise, experience and capability (including previous health and safety performance) must be formally assessed prior to any contract or purchase order being awarded.

Each appointed sub-contractor must develop and implement a detailed Health and Safety Management Plan based on the requirements of the contractor's Health and Safety Management

Plan and the Health and Safety Specification for the project. This plan must be reviewed and approved by the contractor prior to the commencement of any work.

The properties of all materials provided to the project must be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, must be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all sub-contractor personnel must receive comprehensive orientation and induction training (refer to Section 11).

All work carried out by a sub-contractor must be managed (activity supervised) throughout the contract period and performance must be reviewed (audited) on a regular basis (refer to Section 21).

17. Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to hazardous substances or agents must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.

All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.

All monitoring results obtained must be analysed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and
- Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

18. Incident Reporting and Investigation

The Contractor must comply with TIMS – TRN-IMS-GRP-PROC-013 Occurrence and Non-conformance procedure for the management of all health and safety incidents. This procedure must define the responsibilities, methoDoELogies and processes that must be followed for:

- Reporting an incident;
- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

Please Note: Arrangements must be in place to ensure that proper medical care is provided to any contractor (or sub-contractor) employee that suffers an occupational injury or illness (refer to Section 15). These arrangements must be described in the contractor's Health and Safety Management Plan.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome must be evaluated. Each impact must be evaluated independently, with the most significant classification forming the primary rating of the incident.

A Near Hit is an incident. All Near Hits must be reported.

Using the defined consequence scales contained in TNPA 5x5 qualitative risk matrix, the Actual Consequence of each impact must be categorised as:

- A Near Hit;
- Insignificant (Level 4; as per TNPA incident level classification guidance);
- Minor (Level 3; as per TNPA incident level classification guidance);
- Moderate (Level 2; as per TNPA incident level classification guidance);
- Major (Level 1; as per TNPA incident level classification guidance); or
- Catastrophic (Level 1; as per TNPA incident level classification guidance).

The Maximum Reasonable Outcome (MRO) is based on a risk evaluation of the maximum reasonable consequence of an impact and the likelihood of the event occurring again given a

reasonable failure of existing controls. Using the matrix referred to above, each impact must be evaluated and classified as:

- Low;
- Moderate;
- High; or
- Extreme.

An incident must be reported on the same work day or shift on which it occurs and preliminary details must be recorded and a TNPA Incident Flash Report must be completed within 24 hours.

Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties must be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work must cease and must only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence. Work must only be permitted to recommence once formal authorisation has been granted by the Project Construction Manager. In the case of incidents with an Actual Consequence of Major or Catastrophic, work must not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Project Construction Manager must ensure that an investigation is completed for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations must be facilitated by competent and experienced persons who have been trained in the appropriate methoDoELogy. (i.e. TCAM – Transnet Causal Analysis MethoDoELogy)

All significant incidents (i.e. incidents with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Outcome of High or Extreme must be investigated using TCAM (the approved Transnet investigation methoDoELogy). Such an investigation must be facilitated by a trained project representative within 14 calendar days.

For all other incidents (i.e. incidents with an Actual Consequence of Insignificant or Minor, or a Maximum Reasonable Outcome of Low or Moderate other methoDoELogies approved by the Project Health and Safety Manager must be used.

Each incident (including Near Hits) must be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident.

Each incident must be analysed to determine the root cause, and corrective actions must be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing incidents) must be monitored and reported on. The implementation of corrective actions must be verified during monthly audits by the Project Health

and Safety Advisors but also no later than 30 calendar days after the conclusion of the incident investigation.

The contractor must document the results of each investigation and a report must be submitted to the nominated project management representative within five working days of the incident occurring.

As a minimum, each incident report must include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);
- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident must be summarised for its lessons learnt following the investigation. This information must be reviewed by the contractor's Project Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

Refer to the TIMS – TRN-IMS-GRP-PROC-013 Occurrence and Non-conformance procedure for the management of all health and safety incidents.

19. Non-conformance and Action Management

The contractor must comply with TIMS 013 – Occurrence reporting and Non-conformance a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- VFL's(safety interactions).

The contractor must establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;

- Tracking and reporting on implementation status; and
- Monitoring and verifying the effectiveness of the actions.

20. Performance Assessment and Auditing

The contractor must establish and maintain programmes for measuring and monitoring health and safety performance on a regular basis. Metrics must include leading and lagging indicators, and be based on qualitative and quantitative data.

20.1 Reporting on Performance

Reports summarising the contractor's health and safety performance on the project must be compiled on a weekly and a monthly basis.

The contractor must be prepared to discuss the content of these reports at scheduled health and safety meetings.

The reports must contain the following information:

- Number of contractor and sub-contractor employees on site;
- Total hours worked on site by contractor and sub-contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;
- Details of all health and safety training carried out during the reporting period;
- Number of VFL's (Safety Observations and Coaching) carried out during the reporting period;
- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);
- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;

- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) must be analysed, and any negative trends identified with regard to unsafe behaviour or conditions must be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) must be investigated in detail to determine the root causes. Corrective actions must be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

20.2 Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the contractor will be audited by a Project Health and Safety Advisor to assess compliance with the project health and safety requirements. Any deviation from these requirements (i.e. non-conformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the contractor must identify and implement appropriate corrective actions. For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing non-conformances) must be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

Should it be determined that the contractor's level of compliance is unsatisfactory, all work being performed by the contractor on the project site may be stopped (at the contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Project Health and Safety Advisor, the contractor must carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the contractor's Health and Safety Management Plan). Furthermore, the contractor must ensure that each appointed sub-contractor is audited and measured to the same standard. Copies of these audit reports must be submitted to the Project Health and Safety Advisor on a monthly basis.

The contractor must carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections must be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections must be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

21. Management Review

A review of the Contractor's Health and Safety Management System must be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

The review must evaluate if there is any need for change and must identify actions to improve the system.

The review must be led by senior management and the following must be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;
- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the contractor's scope, schedule, designs, etc.;
- Changes to the contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review must be retained and it must include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.

22. MEASURING AND MONITORING

Put this topic as a sub-heading under occupational hygiene (13.40).

Replace hazardous substance or agents with Occupational Health stressors.

23. PROJECT CLOSE-OUT

The project close out must be an on-going process, the contractor must not wait until the end of the project to proceed with the close-out. This must be part of their monthly internal audit. A medical spreadsheet must be maintained by the contractor throughout the duration of the project so that all personnel coming in and out of the project are recorded. Failure to produce exit medicals will result in sanctions.

24. Reference Documents

Table 24-1: Reference Documents

Document Identification	Document Title
TIMS Procedure 014	Contractor Management
TIMS Procedure 013	Occurrence and Non-Conformance Management
Occupational Health and Safety Act, 85 of 1993	Occupational Health and Safety Act, 85 of 1993 and Regulations
Construction Regulation 2014	Construction Regulation 2014
Operational Control and Planning	TRN-IMS-GRP-PROC-009

Annexures F3 - Health and Safety Baseline Risk Assessment

Transnet National Ports Authority

Health and Safety Management

Mechanical Equipment Installation 06 Toulon Road Building at Bayhead Precinct Port of Durban Project

Baseline Risk Assessment

Prepared by:		08/04/2025
	Lee Matthys Health & Safety Practitioner	Date
Approved By:		08/04/2025
	Ntombozuko Xama Health & Safety Manager	Date
Accepted by:		09/04/2025
	Sanelisiwe Shozi Project Manager	Date

Rev No.	Date	Revision Details
00	08/04/2025	Issue for Approval
01	08/04/2025	Issue for Approval

1. Project Scope and Description

1.1 Executive overview

Transnet has adopted a new approach to strategic thinking, Segment Strategy, to drive SA's trade competitiveness. The Segment Strategies represent a fundamental change for Transnet, away from a divisional, modal service offering strategic participation and structured collaboration in integrated commodity supply chains. In responding to the Segment Strategy as contemplated by Transnet SOC Ltd, Transnet National Ports Authority (TNPA) formulated the KZN Ports Master Plan Strategy which is underpinned by *inter alia,* positioning the Port of Durban as a premier Automotive Terminal and Container hub.

This scope is part of the relocation work packages and shall solely focus on the Mechanical Works Installation at 06 Toulon Road Building at Bayhead precinct in the Port of the Durban. This project is initiated to accommodate the newly upgraded TNPA's clothing store.

The benefits of this installation at 06 Toulon Road building at Bayhead precinct in the Port of the Durban are as follows:

- Providing a safe working environment for TNPA employees
- Adherence to the National Building Regulations

General description of the works :

Primarily, the scope of works includes the Fire Protection and Detection System Installation at the Toulon Road Building

a) Conventional fire water system including landing valves and fire hose reels inside the building.
b) Portable fire extinguishers.
c) Central fire water pump installation caring SANS approval, consisting out of the following:

- Two (2) Main fire pump sets - one diesel driven main pump
- One (1) electrical driven main pump
- Jockey pump set -one electrical driven jockey pumps.
- Electrical control panels including electric, diesel, jockey pumps and annunciator control panels.
- All Sprinklers and all associated pipework (supply and installation of the conventional fire protection systems
- All electrical controls and cabling, including the pipework supports, tanks and pump supports.
- Fire water storage tanks ancillary equipment, including vortex inhibitors, cat ladders, level indicators, tank fill points and tank suction points, automatic fill valves and associated pipe work to and from reinforced concrete fire water storage tanks.
- Flow switches and supervisory switches.
- Flashing strobe and siren.

d) Fire hoses and streamers.
e) Testing of the complete fire water systems including fire pump room installation.
f) Co-ordination of the complete fire water system relative to other services including the mechanical, electrical and plumbing services, as well as the structure.
g) Painting of all fire water piping and equipment.
h) Fire stopping devices.
i) Statutory fire signage as indicated on the relevant drawings.
j) Installation and shop drawings for approval by the Engineer and Local Authority.
k) Certification of the complete installation as complying with Local Authority requirements and all relevant codes and regulations as highlighted in this document.
l) Supplying of operating and maintenance manuals for all systems and components of this installation.
m) Training of client's maintenance and operating personnel in operating, servicing and maintaining the systems and components forming part of this installation.
n) Commissioning and handing over of complete systems to the satisfaction of the Engineer.
o) Maintaining and servicing of complete installations during the warranty period.



Baseline Risk Assessment

Risk Assessment Title	Mechanical Equipment Installation 06 Toulon Road Building at Bayhead Precinct in the Port of Durban

Risk Assessment Team				
	Name	Designation	Contact Number	E-mail
Facilitator	Lee Matthys	Health &Safety Practitioner	031 361 2177	lee.matthys@transnet.net
Team Member 1	Ntombozuko Xama	Health and Safety Manager	011 308 2142	ntombozuko.xama@transnet.net
Team Member 3	Sanelisiwe Shozi	Project Manager	031 361 6720	sanelisiwe.shozi@transnet.net

Option/Activities Covered
This baseline risk assessment focusses on the high-level Health and Safety risks anticipated during construction taking into consideration all construction methods. • Access to site • Site establishment • Fencing • Pipe Works • Installation of Valves • Installation of fire hoses • Installation of fire pumps • Electrical • Painting • Plumbing • Cleaning and waste removal • Working at Heights

Scope of Risk Assessment

The risks identified on the Mechanical Equipment Installation 06 Toulon Road Building at Bayhead Precinct is based on the option explored by the Transnet (NPA) project team.

The *Employer's* project specific 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 any disruptions.

Emphasis is placed on the Employer's commitment to environmental management and safety and their objective of Zero Harm and the Employer's objective of achieving a zero LTI and zero environmental legal contravention during the construction contract.

This is a legal and a live document which will be timeously updated as the study progresses.

Geographical location:

The geographical location of the intended construction work is 06 Toulon Road Building at Bayhead Road Precinct.

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
Access into the Site	• **Driving under the influence of alcohol and drugs.**	• **Injury to persons and property damage. (Reckless and Negligent driving)**	• **The contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996) and Regulations thereto or otherwise.**	**HIGH**
	• **Non-Compliance to the Speed Restrictions**	• **Accidents leading to Injury to persons and property damage.**	• **All drivers shall abide by the speed limit of 30km/h whilst inside the site area.** • **The contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996).** • **Adherence to Site specific Rules.**	**MEDIUM**
	• **Heavy vehicles/Congested roads**	• **Incidents/accidents taking place due to inpatients drivers**	• **Trips to be planed ahead of time** • **Adherence to the Road Traffic Act.**	**MEDIUM**
	• **Parking in areas not designated for parking**	• **Obstruction to the road and lead to injury to persons/ property damage.**	• **Contractor shall ensure that all their drivers' park in designated areas to avoid obstruction on the road due to high vehicle movement.** • **Contractor's employees must ensure they adhere to rules and regulations as per the site and use the respective walkways and routes to minimise /eliminate any incidents or accidents.** • **Contractor must ensure that a traffic management plan is developed and**	**MEDIUM**

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			implemented when activities affect road traffic.	
Site Establishment/ Loading and offloading of containers and materials	• **No designated eating area.**	• **Employees contracting diseases due to eating at hazardous areas on site.**	• **Contractor to adhere to OHSACT ACT 85 of 1993 and Facilities Regulations of 1994.**	**MEDIUM**
	• **Substandard electrical installations**	• **Electrocution and property damage.**	• **Electrical installation must be done as per the Electrical installation regulation.**	**HIGH**
	• **No ablution facilities.**	• **Communicable disease due to lack of hygiene.**	• **Contractor to adhere to OHSACT ACT 85 of 1993 and Facilities Regulations of 1994, Health and Safety Project specification.**	**LOW**
	• **Unstable Fencing Condoning the site area**	**Fencing falling over could lead to incidents/accidents and injuries by moving adjacent vehicles and persons**	• **Layout drawings to be submitted for approval** • **Contractor to ensure solid fencing is installed and proper supports to avoid any falling fencing and Jersey barriers in front of fencing for re enforcement.**	**HIGH**
	• **Incompetent Drivers transporting containers and equipment to site area**	• **Property Damage and Injuries to employees**	• **Contractors to ensure all drivers are competent prior to them appointing these employees as drivers**	**HIGH**
	• **Substandard rigging and lifting practices.**	• **Injuries and property damage.**	• **Contractor must develop the rigging study as per driven machinery regulation.**	**HIGH**

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
		• Suspended load falling/swinging causing injuries	• Competent riggers to be appointed, and proof of competency and previous experience be provided	
	• Using drinking water from un-identified source/connection.	• Sickness of employees resulting from drinking water from unsafe sources.	• Drinking water must only be sourced from a connection identified as safe for drinking.	HIGH
	• Uneven Surfaces and poor ground stability •	• Injuries to persons, possible fatalities and property damage	• Contractor to ensure level ground Stability and adhere to geotech studies	MEDIUM
	• Moving plant and equipment	• Accidents • Traffic Congestion • Injury to persons	• Contractor to develop traffic manage plan • Contractor to comply with health and safety site specification.	HIGH
	• Incompetent rigger and crane operator.	• Loads falling causing injuries and property damages. • Loads swinging causing injuries and property damages.	• Competent operator and riggers with previous experience and competencies must be appointed. • Contractor to comply with Driven Machinery regulations,2015 and 18 (11) • Guide ropes to be used to control load.	MEDIUM
	• Employees working under suspended loads	• Loads falling causing injuries and possible fatalities	• Contractor to ensure that no person always walks or works under suspended loads. • Contractor to ensure area is barricaded where suspended loads will be moving	HIGH
	• Incorrect manual Handling.	• Back injuries. • Pinch points.	• Contractor to ensure employees are trained on correct manual lifting techniques. • Contractor to ensure ergonomics procedure is in place as per manual handling and employees shall adhere to	LOW

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			this procedure when manual handling materials on site	
	• High wind speeds	• Loads falling causing injuries and property damages. • Loads swinging causing injuries and property damages.	• Contractor to take note of the weather prior to any lifting activities. • Contractor to ensure that no lifting must take place when there is inclement weather and or the wind speed is equal or more than 30km/h	HIGH
Installation of foundations for Pumps, and concrete slabs	• Exposure to noise	• Noise induced hearing loss	• Contractor to comply with Noise induced Hearing Loss regulations,2024	MEDIUM
	• Exposure to dust	• Respiratory diseases caused by dust inhalation.	• Contractor must comply with Hazardous Chemical Agents Regulations and ensure dust suppression	LOW
	• Incompetent jack hammer operators	• Injuries • Property damage	• Only competent operators will operate the jack hammer.	LOW
	• Vibration	• Hand arm vibration syndrome due to excessive vibration.	• Rotation of operators as and when (to reduce exposure time) required. • Maintenance and care of equipment • Training - ensure that employees are trained to recognise the signs and symptoms of • Appropriate PPE?	LOW
	• Defective jack hammer	• Injuries to operator or fellow co-workers	• Serviced and well-maintained jack hammer must be used. • Inspection of jack hammer and other tools must be done before use.	LOW

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			• Defective jack hammer must be removed from site.	
	• Using of plant close to the other existing structures	• Possible fire • Property damage	• The acceptable working distance of the plant must be always monitored closely.	HIGH
Installation of pipes and Valves	• Moving plant and equipment	• Accidents • Traffic Congestion • Injury to persons	• Contractor to develop traffic manage plan • Contractor to comply with health and safety site specification.	HIGH
	• Uneven Surfaces and poor ground stability	• Injuries to persons, possible fatalities, property damage	• Contractor to ensure level ground Stability and adhere to geotech studies	MEDIUM
	• Moving of machinery	• Machinery knocking employees resulting in injuries	• Employees to be aware and stay clear of moving machinery. • Reverse sound to be fitted on moving machinery. • Only competent and experienced operator shall operate machinery. • Contractor to comply with Driven Machinery regulations,2015 and 18(11)	MEDIUM
	• Existing services, Damage to electrical cables, water services, communication cables disruption	• Damage to cables and services results in disruption to operations, services and electrocution	• Hand excavation mandatory • Permit system must be followed • Survey • Detection equipment • Existing undergrounds services plans.	HIGH
	• Incorrect use of hand tools	• Injuries to employees	• Contractor to ensure inspection of all equipment including hand tools	LOW

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	• Exposure to noise	• Noise induced hearing loss	• Contractor to comply with Noise induced Hearing Loss regulations,2024	MEDIUM
	• Exposure to dust	• Respiratory diseases caused by dust inhalation.	Contractor must comply with Hazardous Chemical Agents Regulations and ensure dust suppression	LOW
	•	• Injuries • Property damage	• Only competent operators will operate the jack hammer.	LOW
	• Vibration	• Hand arm vibration syndrome due to excessive vibration.	• Rotation of operators as and when required. • Contractor to comply with Occupational Health Risk assessment.	LOW
	• Defective hand tools	• Injuries to operator or fellow co-workers	• Serviced and well-maintained tools must be used. • Inspection of all tools must be done before use. • Defective tools must be removed from site.	LOW
	• Using of plant close to the other existing structures	• Possible fire • Property damage	• The use of the plant from the barge or berth must not pose a risk to hitting or coming into contact with any structures by ensuring there is a flag man in place to guide the competent operator whilst performing his task at hand • The acceptable working distance of the plant must be always monitored closely.	HIGH

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
Refurbishment of existing Concrete Slabs and removal of existing debris works from site.	• **Structure stability**	• **uncontrolled collapse**	• **Structure stability to be assessed as part of the method statement before and during demolition.** • **Area to be barricaded to avoid any employees walking/working in proximity of the structure** • **Continuous assessment of the structure and monitoring of employees not to work close to unstable structure**	**HIGH**
	• **Improper disposal of waste materials**	• **Injuries and illness to employees.** **Work stoppage.**	• **Contractor to ensure they comply to the approved EMP.** **Contaminated materials must be disposed at an approved disposal site.**	**MEDIUM**
	• **Open excavations**	• **Injury to people.**	• **Contractor must ensure they comply with the excavation permit.** **Contractor to comply with geotech controls.**	**MEDIUM**
	• **Damage to underground services during excavation**	• **Injury to persons when damaging underground services**	• **Contractor to ensure that underground services are identified and avoided during excavation.** • **Contractor to apply for excavation permit prior to all excavation activities.**	**MEDIUM**

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	• Poor Ingres & egress to the excavation	• Employees sustaining injuries due to poor access to the trench.	• For each excavation more than 1.2 metres deep, a safe means of access and egress (e.g., Ladders, steps or ramps) must be provided for persons working in the excavation. • Safe entry and exit points must be located i.e., an exit point must not be more than 6 metres away from any person working in the excavation.as per CR 13	HIGH
	• Excavation collapsing	• Employees being buried in deep excavations	• Contractor to ensure that deep excavations are controlled as per cr13.	HIGH
	• Contaminated material exposed during excavation	• Possible contamination to the environment	• Contractor to ensure compliance to geotech risk controls.	HIGH
	• Dust generated when back filling with sand.	• Respiratory diseases caused by dust inhalation.	• Contractor to develop the safe work practices. And to ensure compliance to the Construction Regulations.	HIGH
	• Vibration	• Collapse of open excavations and could lead to injuries and burying of employees	• Contractor to comply to excavation permit conditions and develop method statement and safe work procedure.	MEDIUM
	• Erection of temporary works from Unapproved Drawings	• Injury to persons and employees • Fatilities	• Contractor to ensure compliance to CR 12 Adherence to SANS CODE 10085	MEDIUM

TRANSNET

Baseline Risk Assessment

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
Layer works	• **Defective tools used to place formwork**	• **Injuries to employees**	• **Contractor to ensure inspection of all equipment including hand tools**	**LOW**
	• **Incorrect use of hand tools**	• **Injuries to employees**	• **Contractor must ensure that employees are using the correct type of tool for the activity.**	**LOW**
	• **Manual handling of reinforcement material**	• **Back injuries** • **Musculoskeletal disorders**	• **Employees not to lift material heavier than 20kg alone.**	**LOW**
	• **Manual handling of formwork material**	• **Injuries to employees when lifting material in awkward position**	• **Contractor to ensure that employees are trained to not handle materials in awkward positions though Risk assessments, DSTI and toolbox talks. (Ergonomics training)** • **Employees not to lift material heavier than 20kg alone.** **Contractor to ensure usage of appropriate gloves.**	**MEDIUM**
	• **Incorrect stacking of bricks**	• **Stacking collapsing injuring employees**	• **Contractor to appoint a stacking supervisor to supervise all stacking activities.** **Bricks must be stacked on a levelled surface.**	**LOW**



Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
Installation of steelwork	• **Undertaking hot work without a hot work permit in place.**	• **Work stoppages** • **Time Delays**	• **The contractor shall apply for a hot work permit prior to commencement of the task.** • **Permits and warning signs are to be displayed at entry points to hot work areas.** • **Permits must be valid at the time work is being undertaken.**	**HIGH**
	• **Exposure to UV, IR Radiation**	• **Arc-eye** • **loss of vision**	• **Contractor to comply with section 9 of General Safety Regulations** • **Contractor to ensure operators are trained in safe work practices** • **The contractor shall compile a comprehensive risk assessment prior to commencement of task.** • **Contractor to ensure that welders are trained, competent and experienced.**	**LOW**
	• **Hot works**	• **Possible fire** • **Burns to employees**	• **Contractor to comply with section 9 of General Safety Regulations** • **Warning signs shall be posted around and at each level below the area of each overhead welding or burning operation. Fire extinguishers shall be available and fire blankets shall be used for protection.** • **The contractor to ensure appropriate screening is in place to protect the surrounding workspace.**	**MEDIUM**

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			• Ensure operator has been trained in safe work practices	
	• Defective machinery	• Injuries to employees and possible property damage	Contractor to ensure the inspection of hot work equipment by a competent person.	LOW
Fencing- Fence line to be set out	• Underground services e.g. Electricity cables, sewer /water pipes to be detected prior to excavation	• Employees may be electrocuted, Injury to employees. Fatality	• Adherence to Electrical Installation Regulations, under the Occupational Health & Safety Act, Act 85 of 1993. • Contractor must adhere to SANS 10142	
	• Incorrect use of hand tools	• Injuries to employees	• Contractor must ensure that employees are using the correct type of tool for the activity.	
	• Manual handling of other supporting materials	• Injuries to employees when lifting material in awkward position	• Contractor to ensure that employees are trained to not handle materials in awkward positions though Risk assessments, DSTI and toolbox talks. (Ergonomics training) • Employees not to lift material heavier than 20kg alone. • Contractor to ensure usage of appropriate gloves.	
	• Contaminated material exposed during excavation for fencing poles	• Possible contamination to the environment	• Contractor to ensure they comply to the approved EMP. • Contaminated materials must be disposed at an approved disposal site.	

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	• **Unstable Fencing once erected**	• **Fencing falling over could lead to incidents/accidents and injuries by moving adjacent vehicles and persons**	• **Layout drawings to be submitted for approval** • **Contractor to ensure solid fencing is installed and proper supports to avoid any falling fencing and Jersey barriers in front of fencing for re enforcement.**	
Working in Elevated Positions	• **Working at Heights.**	• **Falling from heights, sustaining injuries such as loss of limbs and possible fatalities**	• **Contractor to consider the weather when working at heights.** • **Contractor must ensure that working at heights activities do not take place in inclement weather and or when the wind speed is high.** • **Fall protection plan to be developed by appointed competent person and implemented** • **Demarcation of areas where there is work at heights** • **The Contractor must ensure that all employees working at heights undergo Medical Surveillance to ensure fitness for duty.** • **Contractor to ensure that employees are trained and found competent to work at heights and proof of training must be provided.** • **Contractor to ensure that employees are trained and found competent to use double lanyard safety harness.** • **Contractor to comply with section 10 of Construction Regulations, 2014**	**HIGH**

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	• High wind speeds	• Loads falling causing injuries and property damages. • Loads swinging causing injuries and property damages.	• Contractor to take note of the weather prior to any lifting activities. • Contractor to ensure that no lifting must take place when there is inclement weather and or the wind speed is equal or more than 30km/h	HIGH
	• Defective ladder used	• Employee falling from a ladder sustaining injuries	• Contractor to ensure ladder inspection is done before use. • Contractor to ensure that employees are trained on the safe use of a ladder.	HIGH
Handling, Storage & Disposal of Hazardous Chemical Agents.	• Incorrect storage and handling of hazardous waste	• Contamination of receiving environment.	• Waste storage as per project EMP requirements • Cradle-to-grave approach to be followed. • Contractor to adhere to the OHSACT and HCA Regulations, when dealing with Hazardous Chemical Agents. • Waste to be transported and disposed of as per National and Local Regulations • Licenced waste contractor to be appointed. • All painters must be trained, and proof of competency and previous experience be provided. • Correct PPE to be worn for the task SDS's to be read and adhered to when using Hazardous Chemical Agents.	HIGH
Working in confined spaces	• Unauthorised entry	• Physical Injuries / death	• The confined space is to be manned by a competent and trained safety watch	HIGH

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			preventing unauthorised entry into the area. • All employees must be trained and found competent before entering confined space. • Air monitoring to be conducted prior to entering the confined space, and throughout the duration of the task. • Contractor to apply for confined space entry permit before going inside confined space.	
	• Insufficient oxygen levels	• Respiratory illnesses due to suffocation	• Contractor to comply with Section 5 of General safety regulations.	HIGH
Electrical installations	• Isolation and lock out procedure not followed during installation	• Electrocution • Possible fatality • Physical damage to structures.	• Adherence to Electrical Installation Regulations, under the Occupational Health & Safety Act, Act 85 of 1993. • Contractor must adhere to SANS 10142	HIGH
	• Working in awkward positions	• musculoskeletal disorders	• Contractor to ensure that employees do not stay in awkward positions for a long time.	HIGH
	• Manual handling	• Hand and back injuries	• Contractor to ensure employees are trained on correct manual lifting techniques. • Employees to use appropriate gloves when doing manual handling. • Employees not to lift material heavier than 20kg alone.	LOW

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
External environmental conditions not associated with any activities	• **Working in the sun without drinking liquids**	• **Dehydration**	• **Provide cool water in the workplace and encourage workers to drink it frequently in small amounts before, during and after working.**	**HIGH**
	• **Open excavation/trenches** • **Use of defective tools and equipment (spades and forks)**	• **Employee falling into excavation and or excavation full of water during rainy periods** • **Injuries (cuts, abrasion etc)**	• **Method statement for drainage of excavations, adequate drainage procedure, daily inspections, and inspections after inclement weather, monitor weather forecasts, ensure correct batter angles, shoring to prevent collapse** • **Contractor to ensure employees are trained on safe use of hand tools.** • **Pre-inspections of tools by Contractor** • **Contractor to ensure appropriate PPE is always worn.**	**HIGH**
	• **High wind speeds**	• **Loads falling causing injuries and property damages.** • **Loads swinging causing injuries and property damages.**	• **Contractor to take note of the weather prior to any lifting activities.** • **Contractor to ensure that no lifting must take place when there is inclement weather and or the wind speed is equal or more than 30km/h**	**HIGH**
	• **Exposure to cement dust**	• **Inhalation of dust which may lead to respiratory illnesses**	• **Contractor must comply with Hazardous Chemical Agents Regulations**	
	• **Extreme weather conditions**	• **The contractor may expose employees to risks associated with hot and cold thermal stress (e.g., heat stress and**	• **Requirements for Thermal Stress to be included onto Health and Safety Plan**	

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
		dehydration)		
	• Inadequate lighting	• Insufficient light - not enough (too little) light for the need. • Glare - too much light for the need. • Improper contrast. • Poorly distributed light. • Flicker.	• Contractor must conduct Lighting survey before initiating night work. • Contractor to ensure the site is well lit at night as workers should not be allowed to work in the dark.	
Installation of electrical works	• No lockout procedure in place. • Incorrect placement/use of equipment • Working at heights Use of hand tools (drill machine, multimeter, spanners)	• Unauthorised equipment • operation, equipment starting unexpectedly • Electric shock • Fires • Property damage • Hand injuries, cuts, and abrasions	• Lockout/tag out procedure • Train employees on Lockout procedure • SOP • Competent Electrician • COC certificate • PPE • EIR 6 (Electrical Contractor) • EIR 9 (Issuing of certificate of competence) • CR 9 (Risk assessment for construction work) • Contractor must adhere to SANS 10142 • Contractor to ensure ladder inspection is done before use. • Contractor to ensure that employees are trained on the safe use of a ladder.	
Painting	• Manual handling • Working @ Heights • Handling of hazardous materials	• Musculoskeletal disorders like backaches, from twisting and lying at	• Appropriate PPE including gloves • Only experienced and qualified employees to use power tools	HIGH

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	• Chemical Fumes from paint • Paint coming into contact with the skin	awkward angles to access restricted areas • Falling from heights, sustaining injuries such as loss of limbs and possible fatalities • Skin irritation and Exposure to solvent vapours may result in a number of health effects, e.g. the central nervous system, respiratory system. • Respiratory illnesses	• Contractor to consider the weather when working at heights. • Contractor must ensure that working at heights activities do not take place in inclement weather and or when the wind speed is high. • Fall protection plan to be developed by appointed competent person and implemented • Demarcation of areas where there is work at heights • The Contractor must ensure that all employees working at heights undergo Medical Surveillance to ensure fitness for duty. • Contractor to ensure that employees are trained and found competent to work at heights and proof of training must be provided. • Contractor to ensure that employees are trained and found competent to use double lanyard safety harness. • Contractor to comply with section 10 of Construction Regulations, 2014 • Contractor to adhere to the OHSACT and SDS Regulations, when dealing with Hazardous Chemical Agents.	
Manual and mechanical Demolition of adjacent building	• Debris falling onto employees; Debris /	• Debris could fall through openings or over edges onto employees causing multiple	• All areas where debris can possibly fall from heights to lower levels must be barricaded and controlled.	

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
	Building material laying all over • **Weakened structures falling over onto employees.** • **Exposure to excessive noise during demolition.** • **Possible exposure to live electricity.** • **Possible exposure to sewage system.**	**injuries; Employees could trip and fall sustaining multiple injuries.** • **Multiple injuries / death** • **Excessive noise could cause hearing loss over a period.** • **Employees could be shocked or electrocuted by live electrical cables.** • **Employees can be exposed to health hazards, Ground or water contamination.** • **Dust pollution**	**Housekeeping must be done daily, and access ways kept clear from obstructions. Appropriate and safe methods of removing the material should be followed (rubble chute)** • **Overalls, hardhats, safety boots, eye protection, ear protection and dust masks must be worn by employees.** • **Watering down of the area is also required to minimize dust clouds created on site** • **Competent person appointed in writing to supervise demolition work.** • **Snow netting must be used to barricade demolition area with signage posted up in strategic positions to ensure no unauthorised entry, Supervision must be present at all times to ensure that employees work according to the method statement drawn up for the specific demolition; Any unstable walls need to be covered with timber sheets and propped to ensure that it does not fall over onto employees; Props / supports may only be removed on the Site Managers / Engineers instruction; Demolition must take place under strict supervision and management's instruction Correct and safe to use tools**	

Options and activities				
Options and Activity, step or action step	**Hazards**	**Associated risk event**	**Risk controls**	**Risk Rating**
			to be used; Employees must be trained in the use of these tools; • **Competent person appointed in writing to supervise demolition work.** • **The area must be declared a noise zone and appropriate signage must be erected. All services and their locations must be identified and blanked off or de-energised before demolition may commence.** • **All services and their locations must be identified and blanked off before demolition may commence.** • **Survey to be carried out to determine if there is any asbestos present anywhere in or on the structure to be demolished;** • **If there is any doubt regarding the contents of the materials i.e. cement based roofing sheeting, piping insulations etc., samples to be send away for analysis;** • **No demolition of the structure to take place until it is declared safe** • **Compliance with the OHSA**	

Annexure 1 – Risk Matrix and Descriptions

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Critical
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	High	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Low	Medium

Assessed Risk Level	Description of Risk Level	Action Required
Low	If an incident were to occur, there would be little likelihood that an injury would result	Undertake the activity with the existing controls in place
Medium	If an incident were to occur, there would be some chance that an injury requiring First Aid would result	Additional controls may be needed
High	If an incident were to occur, it will be likely that an injury requiring medical treatment would result	Controls will need to be in place before the activity is undertaken

Extreme	If an incident were to occur it, it would be likely that a permanent or death would result	Consider alternatives to doing the activity. Significant control measures will need to be implemented to ensure safety

Likelihood	Desciption of Likelihood		Consequence	Description of Consequence
1. Rare	Will only occur in exceptional circumstances		1. Insignificant	No treatment required
2. Unlikely	Not likely to occur within the foreseeable future, or withing the project lifecycle		2. Minor	Minor injury requiring First Aid treatment (e.g. minor cuts, bruises, bumps)
3. Possible	May occur within the foreseeable future, or within the project lifecycle		3. Moderate	Injury requiring medical treatment or lost time
4. Likely	Likely to occur within the foreseeable future, or within the project lifecycle		4. Major	Serious injury (injuries) requiring specialist medical treatment or hospitalisation
5. Almost Certain	Almost certain to occur within the foreseeavle future or within the project lifecycle		5. Critical	Loss of life, permanent disability or multiple serious injuries

Annexures G - Technical Specification for Design, Supply, Delivery, Installation and Commissioning of Fire Detection system

REPORT	
For:	Technical Specification for Design, Supply, Installation, Test, Commission and Handover Fire Sprinkler Systems
Project Name:	Mechanical Equipment Installation at 06 Toulon Road Building
Project Number:	XNDE.0039
Author:	Khauli Nthebe
Owner:	Transnet
Client:	Transnet National Port Authority
Project Sponsor:	Transnet National Port Authority
Project Manager:	Saneliswe Shozi
Revision Number:	0A
Approved by:	Aslam Haffejee
Release Date:	20/08/2025
Print Date:	20/08/2025
Template Date:	01/05/2012
Document No:	XNDE.0039-SP-001

Distribution	
Name	Title
N/A	Engineering Manager

DOCUMENTATION DISTRIBUTION, REVISION AND APPROVAL HISTORY

REVISION NUMBER	DATE	DISTRIBUTION/ REVISION	PREPARED BY	REVIEWED BY	APPROVED BY
0A	20/08/2025	CLIENT REVIEW	K.N	A.H	A.H

Prepared by: K.Nthebe — 21-08-2025

Khauli Nthebe (Engineer) — Date

Reviewed by: — 21/08/2025

Aslam Haffejee (Senior Engineer) — Date

Approved by: — 21/08/2025

Aslam Haffejee (Senior Engineer) — Date

ADDITIONAL SIGNATORIES:

Accepted by:

(Eng. Manager) — Date

Accepted by:

(Project Manager) — Date

ADDITIONAL SIGNATORIES (TNPA):

Accepted by:

Date

Accepted by:

Date

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1 Scope and Objectives

This specification defines the requirements for the design, installation, testing, commissioning, and maintenance of automatic fire sprinkler systems. The sprinkler system must be designed and installed in strict accordance with the latest ASIB Rules and relevant SANS standards, particularly SANS 10287, to ensure comprehensive fire protection for all areas classified under different hazard levels, including Ordinary and High Hazard classes. The ASIB rules shall take precedence over the SANS 10287 code for the design and sizing of the system.

The sprinkler system shall be designed to provide adequate fire suppression coverage for all identified areas, incorporating appropriate water supply, pumping arrangements, sprinkler heads, control valves, and necessary components. The system is to be installed to achieve optimal fire safety and meet both life safety and property protection requirements.

1.1 The *Contractor's* scope includes:

- Confirmation and validation of the existing fire sprinkler system design
- Detailed hydraulic calculations for determining pipe sizes, sprinkler placement and system requirements to ensure compliance with ASIB and SANS standards utilizing an approved sprinkler design software (Canute or similar approved).
- Develop a design report detailing all calculations, assumptions, and designs developed.
- Develop detailed workshop drawings for review and approval prior to Construction.
- Submit the designs to the Municipal and TNPA fire departments for approval.
- The supply and installation of all materials and plant, including sprinkler heads, pipes, fittings, pumps, tanks, valves, alarms, and monitoring systems.
- Develop redline drawings after installation showing all site changes.
- Full testing and commissioning of the system to verify performance and compliance.
- Develop detailed As-Built drawings of the complete systems.
- Provision for ongoing maintenance, inspection, and testing schedules to maintain system integrity.
- Provision of detailed Operation and Maintenance Manuals.
- Provision of training of Employers Staff in the operation and maintenance of all systems.

1.2 The objectives of the fire sprinkler system include the following:

- Life Safety: To protect the lives of building occupants by controlling or suppressing a fire in its early stages, allowing for safe evacuation.
- Property Protection: To minimize property damage by containing and extinguishing fires effectively, thereby reducing the spread of flames, heat, and smoke.
- Compliance: To ensure compliance with ASIB and SANS standards as well as any local authority requirements to meet legal obligations related to fire protection systems.

- System Reliability: To provide a reliable, effective, and fully operational sprinkler system that performs as designed under all expected conditions, including variations in water supply and building usage.

- Water Supply Adequacy: To design and install a water supply that ensures adequate pressure and flow for the sprinkler system, meeting the demands of Ordinary or High Hazard areas, with appropriate redundancy and reliability.

- Comprehensive Coverage: To provide sprinkler protection that accounts for all hazard classes, storage configurations, and building types present, including specific high-risk zones such as storage areas, high-piled racks, and areas with hazardous materials.

- Testing and Maintenance: To facilitate regular testing, inspection, and maintenance to ensure the system remains in compliance with standards and is capable of functioning effectively when required.

The fire sprinkler system's design, installation, and operational capabilities shall be documented and reviewed to align with the *Employer's* expectations and ensure the highest standards of fire protection are achieved.

2 List of Abbreviations:

- AHJ - Authority Having Jurisdiction
- ASIB - Automatic Sprinkler Inspection Bureau
- CPVC - Chlorinated Polyvinyl Chloride
- ECSA - Engineering Council of South Africa
- ESFR - Early Suppression Fast Response
- FDC - Fire Department Connection
- FM - Factory Mutual
- IE3 - International Efficiency 3 (for electric motors)
- ISO - International Organization for Standardization
- kPa - Kilopascals
- K-Factor - Flow coefficient for sprinklers
- LPCB - Loss Prevention Council Board
- NBR - National Building Regulations
- NFPA - National Fire Protection Association
- NPSH - Net Positive Suction Head
- OS&Y - Outside Screw and Yoke (valve type)
- SABS - South African Bureau of Standards
- SANS - South African National Standards

- SIN - Sprinkler Identification Number
- UL - Underwriters Laboratories

3 Design Requirements

3.1 Design Standards:

- The sprinkler system shall be designed in accordance with the latest ASIB Rules, SANS 10287, and any additional requirements specified by local authorities.
- Additional applicable standards include:
    - **SANS 10252**-1: Water supply and drainage for buildings.
    - **SABS 62-1 (SANS 62-1):** Components for water supply, pipes, fittings, and valves.
    - **SABS 62-2 (SANS 62-2):** Water supply and distribution systems.
    - **SANS 121 (ISO 1461):** Hot-dip galvanized coatings
    - **SABS 763 (SANS 32):** Performance requirements for pipes.
    - **SABS 064 (SANS 10064):** Installation, maintenance, and use of fire protection systems.
    - **SABS 0140-3 (SANS 10140-3):** Occupational health and safety signage.
    - **SANS 1186-5:** Symbolic safety signs for use in the occupational environment.
    - **SANS 10064:** Installation maintenance and use of fire protection systems
    - **SANS 10140-3:** Identification of Installations—Fire Protection Installations
    - **SANS 121 (ISO 1461):** Hot-dip galvanized coatings
    - **SANS 10177:** Fire Testing of Materials Components and Elements Used in Buildings
    - **ISO 9606 Part 1:** Welder qualification
    - **SANS/ISO 15614 SET:** Welding procedures
    - **NFPA 20:** Standard for the Installation of Stationary Pumps for Fire Protection (2022 Edition)
    - **SANS 10400 T:** Fire Protection
- The design shall also comply with any applicable municipal bylaws and regulations.
- Design documentation shall include detailed hydraulic calculations, equipment specifications, and layout drawings, all prepared and certified by a competent person registered with the Engineering Council of South Africa (ECSA).
- All components, equipment, and materials used in the sprinkler system must be approved by ASIB and listed by a recognized authority, such as the Loss Prevention Council (LPCB) or Factory Mutual (FM).

- The sprinkler system must be designed and installed by a company with proven experience in the interpretation and application of sprinkler rules, codes, and standards, as well as the design, fabrication, and erection of all types and hazard classes of sprinkler systems. The design cannot be done by a company without a proven minimum of 5 years fire sprinkler design experience with a minimum of 5 completion certificates for fire sprinkler systems of similar project value.

- The design must incorporate provisions for the control of fire water run-off, where the release of such water may result in damage to the environment. An assessment of the possible environmental impact of a fire shall be carried out.

3.2 **Hazard Classification:**

- The sprinkler system shall be designed based on the specific hazard classification of each area, as defined in ASIB Rules

- The hazard classes include Ordinary Hazard and High Hazard and risks have been subdivided into four categories according to the severity of hazards of the stock.

- The hazard classification shall be determined by a competent person, considering the occupancy, contents, processes, and fire load of each area.

- The design shall specify the required design densities, area of operation, and system types (e.g., wet pipe, dry pipe, pre-action) appropriate for each hazard classification.

- For storage areas, special considerations such as the use of Early Suppression Fast Response (ESFR) sprinklers, in-rack sprinklers, or control mode density/area (CMDA) design shall be made in accordance with ASIB Rules.

3.3 **Area of Operation:**

- The system shall be designed to provide adequate coverage and performance in both the hydraulically most unfavorable (remote) area and the hydraulically most favorable area, as required by ASIB Rules and SANS 10287.

- The minimum design area of operation shall be determined based on the hazard classification, as specified in ASIB Rules.

- Hydraulic calculations shall be performed for both the most remote area and the most favorable area to ensure that the system meets the required flow and pressure demands throughout.

- The design shall account for building features such as ceiling heights, obstructions, and compartmentation that may affect sprinkler performance.

3.4 **Sprinkler Spacing and Location:**

- Sprinkler spacing and location shall comply with ASIB Rules, ensuring complete coverage of the protected areas without obstructions to discharge patterns.

- The maximum allowable distance between sprinklers, distance from walls, and minimum clearances below ceilings shall be in accordance with ASIB Rules for the specific hazard classification.

- Sprinklers shall be installed so that the maximum floor area protected by any one sprinkler does not exceed the limits specified in ASIB Rules.

- Special attention shall be given to ceiling configurations, such as slopes, beams, and soffits, to ensure proper sprinkler placement.

- Sprinklers shall be located to avoid obstructions that may interfere with spray patterns, maintaining required clearances from structural elements, lighting fixtures, air diffusers, and other obstructions.

- Sidewall sprinklers, extended coverage sprinklers, or other special sprinklers shall be used only where permitted by ASIB Rules and approved for the specific application.

3.5 Pipework Design:

- All pipework shall be designed and installed in accordance with ASIB Rules and relevant SANS standards.

- Pipes shall be sized based on detailed hydraulic calculations, hydraulic model (Canute or similar approved), ensuring that water flow, pressure, and velocities are sufficient for effective fire suppression without exceeding allowable limits.

- Water velocities in the pipework shall not exceed:

    - 6.0 meters per second at any valve, multiple-jet-control, or flow monitoring device.

    - 8.0 meters per second at any other point in the system.

- Suction pipes shall be sized to maintain velocities not exceeding:

    - 1.8 meters per second under positive suction head conditions.

    - 1.5 meters per second under suction lift conditions, with the suction lift not exceeding 3.0 meters.

- Pipe supports and hangers shall be designed and installed in accordance with ASIB Rules, providing adequate support under both static and dynamic conditions.

- Flexible connectors may be used only to connect individual sprinklers to distribution pipes with a minimum diameter of 32 mm. They shall:

    - Be listed or approved for fire sprinkler use.

    - Be installed only in accessible locations (not above plasterboard or inaccessible ceilings).

    - Comply with ASIB Rules and manufacturer's installation instructions.

- The design shall include all necessary drain valves, test points, and auxiliary drains as required by ASIB Rules.

- The pipework shall be arranged to minimize the risk of air pockets and ensure proper drainage.

- All deviations from the specified pipe materials or arrangements must be approved in writing by the *Employers* engineer.

3.6 Pump Design:

- Fire pumps shall be designed and installed in accordance with ASIB and NFPA20 standards to ensure adequate water supply pressure and flow for the sprinkler system.

- The pump selection shall consider the system demand, including the required flow rate and pressure for the most hydraulically demanding areas.

- Where a single pump is required and this constitutes the primary supply, the prime mover shall be a diesel engine. Electric motor driven pumps may not be used as a primary supply unless it constitutes a duplicate water supply whereby the second pump is diesel engine driven.

- Include provisions for jockey pumps to maintain system pressure and prevent false pump starts. The jockey pump must be sized to prevent it from maintaining one sprinkler in operation without the main fire pump starting.

- Ensure that all pumps are installed with appropriate control valves, pressure gauges, and test connections.

- Pump curves, including the system curve overlay, shall be provided for review and approval to confirm compliance with design requirements.

- Pump Runout Compliance Requirements:

    - The fire pump shall be designed to ensure the flow at 110% of the pump duty point (Qmax) is achievable.

    - Qmax Compliance: Designers must ensure that the pump duty point represents the intersection of the calculated flow and pressure of the favorable area of operation against the pump flow and pressure curve. This point shall pass to the left of the pump runout point. The favorable area of operation is defined as the area with the highest flow and lowest pressure against the intersect point of the pump and system curve.

    - Pmax Compliance: Designers must ensure that the pump duty point represents the intersection of the calculated flow and pressure of the remote area of operation against the pump flow and pressure curve. This point shall also pass to the left of the pump runout point. The remote area of operation is defined as the area with the lowest flow and highest pressure against the intersect point of the pump and system curve.

- The pump room shall be designed to provide adequate access, ventilation, lighting, drainage, and protection from environmental conditions, in compliance with ASIB Rules and relevant SANS codes.

- All control panels, alarms, and indicators shall be installed and configured in accordance with ASIB Rules, with appropriate supervisory signals.

- The contractor shall provide factory test certificates and on-site performance test results for the pumps, witnessed by the *Employers* engineer and relevant authorities.

- Any deviations from the specified pump requirements must be approved in writing by the *Employers* engineer.

- The pump room temperature must be maintained at a minimum of 10°C for diesel engine operation.

- The pump and driver must be mounted on a common base plate and fixed to a reinforced concrete foundation.

3.7 Valve Design

- All valves used in the sprinkler system shall be of types approved for fire protection service and shall comply with ASIB Rules.

- The following valve types shall be used as specified in the design drawings and calculations:
    - Alarm Valves: Initiate a water motor alarm or an electronic signal upon water flow in the system.
    - Stop Valves: Used to isolate specific sections of the sprinkler system for maintenance or repairs.
    - Main Stop Valves: Enable isolation of the entire sprinkler system, typically installed near the water source.
    - Subsidiary Stop Valves: Allow for isolating smaller sections or zones within the system for maintenance.
    - Pressure Reducing Valves: Installed where lower water pressures are needed in parts of the system to maintain proper discharge without over-pressurization.
    - Deluge Valves: Control the water flow in deluge systems, releasing water quickly to cover large areas in the event of a fire.
    - Pre-Action Valves: Control water supply in pre-action systems, typically used in areas where accidental discharge could cause damage.
    - Non-Return Valves: Prevent backflow and ensure water flows in the intended direction within the system.
- All valves shall be installed in accessible locations, clearly identified with durable signage indicating their function and area controlled.
- Valves controlling water supplies to sprinklers shall be supervised (monitored) or locked in the open position to prevent unauthorized closure.
- Pressure reducing valves shall be of types specifically approved for fire protection use and shall be set and secured to prevent tampering.
- Pump suction stop valves shall be of the Outside Screw and Yoke (OS&Y) gate valve type to minimize turbulence and reduce the risk of blockages. Gear-operated butterfly valves may be used only where permitted by ASIB Rules.
- Valves shall be sized to minimize pressure drops and ensure efficient water flow, with sizing determined by hydraulic calculations.
- All valve installations shall include provisions for drainage and testing as required.
- Any deviations from the specified valve types or arrangements must be approved in writing by the engineer.

3.8 Water Supply and Storage

- The water supply for the sprinkler system shall be reliable and capable of providing the required flow and pressure under all design conditions, in compliance with ASIB Rules and SANS 10287.
- Acceptable water supply sources include:
    - Municipal (Town) Mains: Provided they are reliable and approved by the local authority, and capable of supplying the required flow and pressure. Backflow prevention devices shall be installed where required.

- Dedicated Fire Water Reservoirs or Tanks: Where municipal supplies are inadequate or unreliable.
- Combination of Municipal Supply and Tanks: To ensure redundancy and adequate supply.

- The capacity and arrangement of the water supply shall meet the minimum requirements for the hazard classification, including required durations.

3.9 Water Storage Tanks (if required):

- Water storage tanks shall be designed, constructed, and installed in accordance with ASIB Rules and SANS guidelines.
- The required water storage capacity shall be calculated based on the system demand and hazard classification, with minimum durations as follows:
  - Ordinary Hazard Systems: The tank must store at least 60 times the flow demand (Qmax) as determined by the system curve for the most unfavorable operation area.
  - High Hazard Systems: The tank must store at least 90 times the flow demand (Qmax).
  - ESFR Systems: The tank must store at least 60 times the flow demand (Qmax).
  - Enhanced Protection Systems: The tank must store 30 times the flow demand (Qmax).
- Tanks shall be constructed of materials suitable for potable water storage and shall be protected against corrosion.
- Tanks shall be provided with suitable access for inspection and maintenance, including manholes and ladders where required.
- The inflow to the tank shall be sufficient to fill the tank within a reasonable period, typically not exceeding 36 hours, with the automatic fill line not less than 100 mm in diameter.
- Each tank shall be equipped with level indicators, overflow protection, venting, and anti-vortex devices as required.
- Tanks must be subdivided into two equal divisions to provide 50% redundancy in the event of maintenance or failure of one section.
- Each suction tank, where 50% units are installed or each section where a combined tank is split into 50% portions, must be provided with a plate issued by the approving company stating the following:
  - The tank approval number.
  - Name of the company that supplied the tank(s).
  - Date of installation.
  - The type of tank (e.g., welded steel, sectional steel, bladder tank).
  - Whether or not a vortex inhibitor has been installed.

- Required service/refurbishment or inspection interval (usually a 3-yearly inspection interval).

- Any deviations from the specified tank requirements must be approved in writing by the *Employers* engineer.

3.10 **Combined Sprinkler and Hydrant Systems:**

- Combining sprinkler and hydrant systems is permissible only under conditions specified in ASIB Rules, and with approval from the relevant authorities.

- The combined system must meet the following requirements as per the ASIB rules:

  - The quantity of stored water for the hydrants is not less than that stated in column 3 of Table 202.

  - The flow of the pump shall be increased in accordance with column 4 of Table 202.

  - Any hydrant shall be fed upstream of the installation control valve assemblies.

  - A duplicate water supply is provided.

  - The reticulation feeding the combined system shall, where possible, be fed from a ring or looped main reticulation and sized in a manner whereby should one leg or portion of the reticulation be isolated, the combined flow and pressure of the simultaneous operation of hydrants, hose reels, and sprinkler system will not be compromised upstream or downstream of the isolated portion.

- Detailed hydraulic calculations shall be provided to demonstrate compliance with these requirements.

3.11 **Auto-Start Arrangement Design:**

- The automatic starting and stopping of pumps shall be controlled by pressure switches installed in accordance with ASIB Rules

- The jockey or make-up pump shall be set to start automatically when the pressure in the system has fallen to a value of not less than 90% of the churn pressure of the primary pump and to shut off automatically when the system pressure has reached either the churn pressure of the primary pump or 1,200 kPa, whichever is the lesser.

- The automatic starting device for pumps shall be of an approved pattern and set to operate the primary pump when the pressure in the trunk main has fallen to a value not less than 80% of the pressure in the trunk main when the pump is churning or 100 kPa below the duty pressure of Pmax if this is above or equal to 80% of the churn pressure.

- The second pump of a duplicate pump system shall be set to start when the trunk main falls to a value of 100 kPa below the cut-in pressure of the primary pump but not less than 60% of the churn pressure of the primary unit.

- The second pump of a three-half capacity pump system shall be hardwired to start automatically within 30 seconds of the primary pump coming into operation.

- Two pressure switches shall be provided to start a diesel engine-driven pump. The second pressure switch shall be set to operate at not less than 20 kPa and not more than 50 kPa beneath the starting pressure of the primary switch. They shall be connected in parallel such that closing the contacts of either switch will start the pump with normally open contacts.

- When the pressure switch is fitted directly onto a tee, a sludge trap is required. When the pressure switch is fitted onto a 100 mm sprig, a sludge trap is not required.
- Means shall be provided for manual starting by reproducing the pressure reduction. Once started, the pump must run continuously until stopped manually.
- Provision must be made for two separate methods of engine starting. Two separate batteries of adequate capacity must be provided for automatic and manual starting of the engine.
- A direct connection, without isolating facilities, for the starting mechanism must be taken from downstream of the delivery stop valve and shall be not less than 20 mm in diameter.
- Means must be provided to reduce the applied water pressure to the jockey or make-up pump starting device to simulate the conditions of automatic starting and stopping at the requisite pressures.
- Any deviations from the specified auto-start arrangements must be approved in writing by the *Employer's* engineer.

4 Components and Materials

4.1 Sprinklers:

4.1.1 Sprinkler Approvals:

- All sprinkler heads must be UL or FM approved and listed for use in fire protection systems, ensuring compliance with ASIB and SANS standards.
- Certificates of approval must be provided for each type of sprinkler head, demonstrating compliance with relevant fire safety standards.
- The manufacturer shall provide performance data, including K-factor, flow characteristics, and temperature rating.
- All sprinklers shall be new, unused, and of the highest quality for fire protection purposes.
- No alterations, painting, or modifications to the sprinklers shall be permitted after they leave the manufacturer's facility.
- The Contractor shall submit sprinkler test certificates and installation records to the Engineer for review and approval.

4.1.2 Sprinkler Types:

- The design shall specify the types of sprinklers to be used in each area, considering the environment and fire hazard classification. The primary types include:
    - Conventional Sprinklers: Suitable for general-purpose protection in areas with exposed steelwork or combustible ceilings.
    - Spray Sprinklers: Designed for protection beneath smooth flat ceilings or roofs and for in-rack or in-shelf applications.
    - ESFR (Early Suppression Fast Response) Sprinklers: Required for high-hazard storage areas where rapid suppression is essential.

- Sidewall Sprinklers: For use along walls in corridors, offices, and other areas classified as Ordinary Hazard.
- Intermediate-Level or In-Rack Sprinklers: To be used where additional levels of protection are required within storage racks.
- Dry-Pendant or Upright Sprinklers: Suitable for areas where freezing conditions are possible or where ceiling height restricts traditional pendant installations.

4.1.3 Sprinkler Temperature Ratings:

- Sprinkler heads shall be available in a range of temperature ratings suitable for the environmental conditions of their installed location.
- Each sprinkler head must be color-coded according to its temperature rating as per ASIB standards for easy identification.
- The specific temperature ratings must be selected based on the design criteria to ensure proper activation during fire conditions.

4.1.4 Sprinkler K-Factor:

- Each sprinkler shall be equipped with an appropriate K-factor as defined in the design documents and hydraulic calculations.
- K-Factors must be selected to achieve the required flow rate and discharge density for the fire hazard classification and the hydraulic needs of the system.
- Sprinklers with K-Factors shall align with ASIB rules for specific applications, including coverage for both Ordinary Hazard and High Hazard classes.

4.1.5 Sprinkler Head Protection:

- During transportation, handling, and installation, sprinklers must be protected against damage using manufacturer-recommended head protection devices.
- Sprinkler head protection devices shall remain in place until the sprinkler is fully installed in its intended location and the final fit-off is complete.
- Any damaged sprinklers shall be immediately replaced to maintain the integrity of the fire protection system.

4.1.6 Finish and Coating

- Sprinkler heads shall have a corrosion-resistant finish suitable for the environment in which they are installed (e.g., chrome-plated for general areas, wax-coated for corrosive or wet environments).
- Finish options must be specified based on the area of installation, ensuring durability and longevity.
- All protective coatings must be factory-applied, with no field modifications allowed.

4.1.7 Sprinkler Guards and Escutcheon Plates:

- Sprinklers in areas where they are liable to mechanical damage shall be protected with approved sprinkler guards.

- Sprinklers installed under suspended ceilings shall be fitted with escutcheon plates that cover the gap between the sprinkler and the ceiling.
- Sprinkler guards and escutcheon plates shall be compatible with the sprinkler type and shall be installed in accordance with the manufacturer's instructions.
- All guards and escutcheon plates shall be corrosion-resistant and comply with the relevant SANS standards for durability in the installed environment.

4.1.8 Packaging and Identification:

- Sprinkler heads must be individually packaged to prevent damage during transit and storage.
- Each package must be clearly labelled with the following information:
  - Sprinkler type and model number.
  - Temperature rating.
  - K-factor.
  - UL or FM approval mark.
  - Manufacturer's name and date of manufacture.
- Packaging must ensure that the sprinkler heads remain free from contaminants and damage until installation.

4.1.9 Sprinklers in Areas with High Dust Content:

- Sprinklers in areas with high dust content shall be protected with cellophane bags or other approved methods to prevent dust accumulation.
- Protective coverings shall be replaced periodically to ensure proper sprinkler operation.

4.1.10 Sprinklers under Suspended Ceilings:

- Sprinklers installed under suspended ceilings shall be of the spray pattern type and shall be fitted with escutcheon plates.
- The escutcheon plate shall not protrude beyond the top of the visible portion of the sprinkler heat-sensitive element.

4.1.11 Sprinklers in Concealed Spaces:

- Sprinklers in concealed spaces shall be installed in accordance with ASIB rule 3017.
- Sprinklers shall be fed by separate pipework from that feeding the sprinklers in the room below.
- The water requirement of the concealed sprinklers shall be considered in the hydraulic calculations.

4.1.12 Replacement Stock:

- The *Contractor* shall supply a replacement stock of sprinklers as per ASIB rule 4023.

- Replacement stock shall include spare sprinklers of each type and temperature rating installed in the system.
- Spare sprinklers shall be kept in cabinets located in a central, prominent, and easily accessible location.
- The cabinets shall be adequately protected from environmental conditions and damage.

4.2 **Valves:**

4.2.1 Valve Approvals:

- All valves must be UL or FM approved for fire protection use and comply with ASIB standards.
- Valves shall be supplied with certification and test certificates demonstrating compliance with relevant fire safety and performance standards.
- The manufacturer must provide evidence of compliance with ASIB requirements for each valve type, including performance data.

4.2.2 Size and Connection Type:

- Valve sizes must be specified in the design documentation, ensuring compatibility with the pipework and flow requirements.
- Connection types, such as flanged, threaded, or grooved, must be selected to match the pipework specifications and installation conditions.
- Valves must be supplied with all necessary fittings, gaskets, and hardware for proper installation

4.2.3 Operation and Indicators:

- Valves must include indicators (e.g., position indicators) to clearly show whether the valve is in the open or closed position.
- Gear-operated valves (e.g., butterfly valves) must have a manual override feature to allow manual operation in case of failure.
- Alarm valves shall be equipped with a water motor gong or an electronic alarm device to provide an audible or visual indication of water flow.

4.2.4 Valve Materials:

- Valves must be constructed from corrosion-resistant materials, such as brass or stainless steel, suitable for the intended application and environmental conditions.
- Valve bodies, seats, and discs must be designed to withstand the pressures and flows typical of fire protection systems.
- All valves must be rated for the system pressure, with a minimum working pressure of 1200 kPa or as specified in the design documentation.
- Zinc base alloys are not permitted for valves in sprinkler installations.

4.2.5 Finish and Coating:

- All valves exposed to the environment must be supplied with a corrosion-resistant coating to prevent rust and degradation.
- Coatings must be applied by the manufacturer and comply with relevant standards for fire protection equipment.

4.2.6 Flow Switches:

- Flow switches shall be installed to monitor the flow in various zones and provide signals to the building's fire alarm system.
- The calibration and testing of flow switches must ensure that they respond accurately to changes in water flow as specified in the ASIB rules.

4.2.7 Alarm Valve Signalling Devices:

- Alarm valves shall be fitted with appropriate signalling devices to provide local and remote alerts in case of sprinkler system activation.
- Signalling devices shall include a water motor alarm and gong, as well as any required electrical alarm switches or pressure switches.
- Alarm signals shall be transmitted to a constantly attended location, such as a central alarm station or fire department.

4.2.8 Pressure Reducing Valves:

- Pressure reducing valves shall be set and tested to ensure consistent system performance across different pressure zones.
- The controlling mechanism for the valve shall be operated from the low-pressure side.

4.2.9 Packaging:

- Valves must be packaged to prevent damage during transportation and storage.
- Packaging must ensure that all components remain free of contaminants and ready for installation.

4.3 **Pipework:**

4.3.1 Pipe Materials and Standards:

- All pipes used in the sprinkler system must comply with ASIB and SANS 10287 standards.
- Pipe materials shall be:
    - Galvanized Steel: For general use in dry indoor environments where ambient humidity is consistently below 80%.
    - Stainless Steel: Grade 316L for areas with high moisture or corrosive environments, specifically including but not limited to:
        - Cooling towers
        - Food processing areas
        - Areas with Humidity consistently above 80%

- Areas with exposure to corrosive chemicals

- CPVC: For use in corrosive environments where steel is unsuitable, and areas where lightweight material is advantageous.

- All pipe materials must meet the following standards:
  - SANS 10252-1: Water supply and drainage for buildings.
  - SABS 763 (SANS 32): Performance requirements for pipes.
  - SANS 10064: Installation, maintenance, and use of fire protection systems.
  - SANS 62: Steel Pipes
  - SANS 719: Electric welded low carbon steel pipes for aqueous fluids (large bore)

4.3.2 Pipe Sizing:

- Pipe sizes must be specified in the design documentation, ensuring compatibility with system flow requirements and hydraulic calculations.
- Minimum Pipe Sizes: No pipe may be less than 25mm in diameter.

4.3.3 Pipe Coating and Protection:

- Coating Standards: Hot dipped galvanised to SANS 121 for interior pipework and corrosion coating (epoxy or similar) to ISO C5 standard for exterior pipework.
- Underground Protection: Polyethylene encasement or bituminous coating.
- All exterior coatings shall be UV stable to prevent degradation.

4.3.4 Pipe Fittings and Connections:

- Fitting Standards: SANS 10254 for threaded fittings.
- Galvanic Corrosion: Dielectric unions or compatible fittings must be used to prevent galvanic corrosion.

4.3.5 Flexible Connectors:

- Flexible connectors may be used for connecting single sprinkler heads to the distribution pipe.
- Flexible connectors must be a minimum of 32 mm in diameter and must comply with ASIB guidelines.
- Only UL or FM-approved flexible connectors shall be used, and they must be suitable for accessible installations (not for concealed installations like above plasterboard ceilings).

4.3.6 Packaging and Identification:

- Pipes and fittings must be delivered to the site in a manner that prevents damage, contamination, or corrosion during transportation and storage.
- Each pipe and fitting must be clearly labeled with the following information:

- Manufacturer's name.
- Pipe size and material.
- UL or FM approval mark.
- Pressure rating.

- All items must be packaged to prevent contact with water or other corrosive substances during storage.

4.4 **Pumps:**

4.4.1 Pump Types:

- The following types of pumps are required for the fire protection system, meeting ASIB and SANS 10287 standards:
  - Main Fire Pump: Provides the required flow and pressure for the entire sprinkler system during a fire event.
  - Jockey Pump: Maintains system pressure to prevent frequent starts of the main fire pump due to minor pressure drops.
  - Diesel Engine Driven Pump: Required as the primary pump, ensuring functionality during power outages.
  - Electric Motor Driven Pump: Permitted as a secondary pump in a dual-pump configuration, with the primary pump being diesel-driven. An electric motor may be used as the primary pump with a secondary diesel pump if a suitable standby power supply is provided.

4.4.2 Approvals and Certifications:

- All fire pumps must be UL or FM approved for fire protection use and comply with ASIB standards.
- The pumps shall be designed to NFPA 20 (2022 Edition) standards.
- Pumps must be supplied with certification and test certificates that verify compliance with fire safety standards and performance requirements.
- The manufacturer must provide performance data for each pump, including flow rates, pressure curves, and NPSH (Net Positive Suction Head) requirements.
- Pumps must be approved by the local Authority Having Jurisdiction (AHJ).

4.4.3 Construction and Material:

- Pumps shall be constructed from materials suitable for fire service, including duplex stainless steel for the casing and impellers.
- All components, including seals, bearings, and impellers, must be of high quality to ensure durability and reliability under fire conditions.
- The impeller shall be of a closed type for efficient operation.

4.4.4 Pump Capacity and Ratings:

- The pump's rated capacity shall be based on the system demand, ensuring sufficient flow and pressure to meet the requirements of the most hydraulically demanding areas.
- Each pump must be capable of delivering 110% of its rated flow at a reduced pressure without exceeding the design limits.
- Pump duty points must be selected to ensure stable operation at both the most favorable and most unfavorable hydraulic points.
- The pump shall be capable of withstanding a churn test (running against a closed valve) at its rated speed for a minimum of 15 minutes without damage (ASIB Rule 2025).

4.4.5 Diesel Engine Driven Pump Requirements:

- Starting Methods: Diesel engine-driven pumps shall be equipped with two independent starting methods, one electric and one manual. The electric starter shall be powered by two independent batteries.
- Fuel Tank: The diesel engine shall include a fuel tank sized to provide at least 6 hours of continuous operation at full load. The fuel tank shall be constructed of steel and located within a dedicated, bunded enclosure to prevent spills.
- Cooling Systems: The diesel engine cooling system shall be a closed-loop, water-cooled system with a heat exchanger. The cooling system shall be sized to maintain the engine temperature within the manufacturer's recommended operating range.
- Exhaust Systems: The diesel engine exhaust system shall be constructed of corrosion-resistant materials (e.g., stainless steel) and routed to a safe discharge location outside the building.
- Ventilation: The pump room ventilation shall be designed in accordance with ASIB rules to prevent overheating and ensure safety.
- Engine Rating: The diesel engine shall have a continuous duty rating and comply with local emissions regulations.

4.4.6 Electric Motor Driven Pump Requirements:

- Power Supply: The electric motor-driven pump shall have a reliable power supply, with appropriate backup power in case of a power outage.
- Motor Enclosure: The motor shall be housed in a suitable enclosure with a minimum IP55 rating to protect it from environmental conditions and damage.
- Overload Protection: The motor shall have overload protection to prevent damage in case of excessive load.
- Motor Efficiency: The motor shall have a minimum IE3 efficiency rating (SANS 1804-2).

4.4.7 Pump Accessories

- Pumps must include the following standard features:
    - Automatic Start Mechanism: To initiate pump operation when system pressure drops below a set point.
    - Pressure Gauges: Mounted on the suction and discharge sides for monitoring pressure levels.

- Test Connections: To facilitate testing of pump performance without discharging water into the system.
- Control Panels: For monitoring and controlling pump operation, equipped with alarms for pump faults and status indicators.
- Cooling Systems: Diesel pumps must be fitted with suitable cooling systems to prevent overheating during prolonged operation.
- Pressure Relief Valve: A pressure relief valve shall be installed on the pump discharge to protect the system from overpressure.
- Vibration Isolation: The pump shall be mounted on vibration isolation mounts to minimize noise and vibration transmission.
- Flow Meter: A flow meter shall be installed on the pump discharge to provide accurate monitoring of the pump flow rate.

4.4.8 Finish and Coating:

- All pumps and related components must be finished with a corrosion-resistant coating suitable for the environment where they will be installed.
- The coating must be factory-applied and must meet or exceed the ASIB and SANS requirements for fire protection equipment.

4.4.9 Packaging:

- Pumps must be packaged to prevent damage during transport and storage, with all components properly secured.
- Packaging must ensure that pumps remain free from dust and contaminants until installation.
- The pump shall be preserved with a suitable rust inhibitor during storage.

4.5 **Tanks:**

4.5.1 Storage Tank Specifications:

- Tanks shall be designed and constructed in accordance with ASIB and SANS 10287 guidelines, ensuring compatibility with the fire protection system.
- Tanks must be UL or FM approved for use in fire protection systems, and they must meet all requirements for fire water storage.
- The tank must be fabricated from corrosion-resistant materials, such as galvanized or stainless steel, suitable for long-term water storage.
- The tank type (e.g., welded steel, sectional steel, bladder tank) and construction method shall be specified in the tender documentation.
- The internal surfaces of welded steel tanks shall be treated with an anti-corrosive coating, including:
- Sand-blasting or grit-blasting to Sa 3 (white metal cleaned) per SANS 10064.
- Application of a primer coat of at least 25 µm dry film thickness.

- Subsequent protective coatings of 225 µm total dry film thickness using epoxy tar paint, vinyl resin-based coating, or an equivalent.

4.5.2 Tank Capacity:

- The capacity of the tank shall be determined based on the specified requirements for the fire hazard classification, as calculated by the hydraulic design.

4.5.3 Tank Features:

- Tanks must include the following features:
  - Vortex Inhibitors: To prevent air ingress into suction pipes.
  - Level Indicators: To provide a clear reading of the water level.
  - Inlet and Outlet Connections: Sized according to ASIB standards, including a 100 mm nominal diameter for the automatic fill line.
  - Drainage Outlets: For complete drainage during cleaning or maintenance.
  - Inspection Hatch: To allow access for internal inspection.
- All fittings, connections, and accessories shall be compatible with the tank material and suitable for fire protection purposes.

4.5.4 Delivery and Handling:

- Tanks must be delivered to the site in accordance with the contractor's logistics plan, with proper handling procedures to prevent damage during transport.
- All tanks and components must be packaged to prevent corrosion or physical damage during transit and storage.
- The contractor shall ensure that tanks are inspected upon delivery, and any damaged components are promptly replaced.

4.6 Control Panels

4.6.1 Control Panel Types:

- The following types of control panels are required for the fire protection system, each meeting ASIB and SANS 10287 standards:
  - Fire Pump Control Panels:
    - Automatic and manual starting and stopping of fire pumps.
    - Monitoring of pump status (running/stopped, fault conditions).
    - Control of pressure regulation valves.
    - Alarm acknowledgment and silencing.
    - Integration with pressure sensing devices.
  - Jockey Pump Control Panels:
    - Automatic operation to maintain system pressure within defined limits.

- Manual override for testing and maintenance.
- Integration with pressure sensing devices.

- Sprinkler System Control Panel:
  - Monitoring of sprinkler system status (flow, pressure, valve position).
  - Deluge valve control and monitoring.
  - Pre-action system control and monitoring.
  - Alarm signaling and transmission.
- Alarm and Monitoring Panels:
  - Real-time status and alarm indications for system faults.
  - Display of flow activation, pressure variations, and valve positions.
  - Integration with fire pump and sprinkler control panels.

4.6.2 Approvals and Certifications:

- The manufacturer must provide documentation confirming that all components within the control panels are suitable for fire protection use and meet the specified environmental conditions.
- Control panels must be approved by the local Authority Having Jurisdiction (AHJ).

4.6.3 Enclosure and Construction:

- Control panels must be housed in enclosures rated at least IP54 for indoor use and IP65 for outdoor installations to ensure protection against dust and water ingress.
- The enclosure must be constructed from 1.5mm thick, 304 stainless steel with a polyester powder coating with a minimum thickness of 60 microns.
- Panels must include lockable doors to prevent unauthorized access and must be clearly labeled for identification.
- Enclosures intended for outdoor use must be NEMA 4X rated for corrosion resistance and UV protection.
- Enclosures must meet seismic requirements as per SANS 10160-11 for installation in earthquake-prone areas.
- The control panels will be installed in an environment with a temperature range of 5°C to 40°C and a humidity range of 10% to 90% (non-condensing).

4.6.4 Electrical Requirements:

- Control panels must be compatible with the site's power supply, 380-415 V, 3-phase, 50Hz for fire pumps and 220-240V, single-phase, 50Hz for jockey pumps.
- The panels must accommodate voltage fluctuations within ±10% of the nominal voltage.

- Panels must include internal circuit breakers, fuses, or overload protection devices for safe operation.
- Wiring and terminals within the control panels must be clearly labeled, and all internal components must meet ASIB and SANS requirements for fire protection control systems.
- Surge protection devices (SPDs) are required for all control panels.
- The minimum Short Circuit Current Rating (SCCR) for the control panels is 20kA.
- Cable entry points must be sealed with IP68 rated cable glands.

4.6.5 Monitoring and Alarm Features:

- Control panels must include visual indicators (LEDs) and audible alarms for the following conditions:
  - Pump running and stopped.
  - Low pressure and high pressure.
  - Pump fault conditions (e.g., motor or engine failure, low fuel level for diesel pumps).
  - Flow switch activation and water flow.
- Audible alarms must have a sound intensity of at least 75 dBA at 1 meter.
- Critical alarms must be indicated by red LEDs and a continuous siren.
- Warning alarms must be indicated by amber LEDs and an intermittent siren.
- Supervisory alarms must be indicated by yellow LEDs and a single audible alert.
- The control panels must be capable of transmitting alarms and status signals to a central fire alarm system or remote monitoring location.
- The panels must have an event logging capacity of at least 1000 events and store historical data for at least 90 days.

4.6.6 Auto-Start and Manual Operation:

- Fire pump control panels must be equipped with automatic starting features to activate the pump when system pressure drops below a preset threshold.
- Manual operation switches must be provided for testing and emergency operation of fire pumps and jockey pumps.
- Panels must include a means of simulating pressure drops to test the automatic starting mechanism.
- The automatic starting mechanism test must include verification of the pressure drop range (100 kPa to 200 kPa) and the time delay (5 seconds to 15 seconds).
- All control panels must be equipped with an Emergency Power Off (EPO) button.

4.6.7 Finish and Coating:

- All control panel enclosures must be finished with a corrosion-resistant coating, suitable for the intended installation environment.
- The coating must be factory-applied and meet the relevant ASIB and SANS standards for durability and longevity (SANS 10064 for surface preparation and SANS 10252-1 for coating application).

4.6.8 Packaging:

- Control panels must be packaged to prevent damage during transportation and storage, with all components securely fastened within the enclosure.
- Packaging must ensure that control panels remain free from dust and moisture until installation.
- The packaging must include clear handling and storage instructions.

4.7 **Pressure Gauges:**

4.7.1 Pressure Gauge Types:

- Pressure gauges required for the fire protection system shall include:
  - Standard Pressure Gauges: For measuring system pressure at key points, such as pump discharge, pump suction, and system risers.
  - Liquid-Filled Pressure Gauges: Recommended for use in areas prone to vibration to ensure accurate readings.
- Gauges shall be provided at a minimum at the following locations:
  - On each pump suction line.
  - On each pump discharge line.
  - Before and after each alarm valve and main stop valve.
  - At the end of each dry pipe system, above the dry pipe valve clapper.
  - On each tail-end dry pipe system, above the tail-end valve clapper.
  - At the top of each sprinkler riser.
  - At the end of each floor main.
  - At the end of each distribution pipe.
  - At the infill connection to each suction tank.

4.7.2 Approvals and Certifications:

- The manufacturer must provide documentation confirming that pressure gauges are suitable for use in fire protection systems and meet accuracy requirements.
- Gauges must be calibrated and supplied with a calibration certificate traceable to a national standard (SANS 10375).
- Gauges must comply with all local authority regulations.

4.7.3 Gauge Specifications:

- Pressure gauges must have a measurement range suitable for the fire protection system, typically:
    - 0-2500 kPa (0-25 bar) for pump discharge and system riser locations.
    - 0-1000 kPa (0-10 bar) for jockey pump control and suction side measurements.
- Gauges must have an accuracy of at least ±1.0% of full scale (Class 1.0 as per EN 837-1) to ensure precise pressure readings.
- The dial size shall be a minimum of 100 mm (4 inches) in diameter for easy readability.
- Gauges must have a response time of not more than 2 seconds.
- Units of measurement must be in kPa (kilopascals).

4.7.4 Material and Construction:

- Pressure gauges must be constructed with 316L stainless steel cases for durability and corrosion resistance.
- The internal mechanism of the gauges shall be made from brass or stainless steel to withstand the system's operating pressure.
- Gauges must be equipped with a tempered glass or polycarbonate lens to resist impact and provide clear visibility.
- Gauges must have built-in overpressure protection to 1.5 times the full-scale pressure.
- Gauges intended for outdoor use must be NEMA 4X rated.

4.7.5 Connection and Mounting:

- Pressure gauges must have 1/4-inch or 1/2-inch NPT threaded connections, as specified in the design documents.
- Gauges must be supplied with suitable mounting hardware, including gauge cocks or needle valves for isolation during maintenance or replacement.
- Liquid-filled gauges must be pre-filled with glycerin to dampen needle movement in high-vibration environments.
- All gauges must be installed with a ball valve for isolation.
- The preferred mounting orientation is vertical.
- The appropriate thread sealant must be used for all threaded connections (e.g., PTFE tape for NPT threads).

4.8 **Flow Switches:**

4.8.1 Flow Switch Types:

- Flow switches required for the fire protection system must be suitable for detecting water flow in the sprinkler system, activating alarms, and providing signals to the control panel.

- Flow switches shall be paddle-type or vane-type as specified in the design documents, designed for use in both horizontal and vertical piping.

4.8.2 Approvals and Certifications:

- Flow switches must be supplied with the following documentation:
    - UL Listing or FM Approval certificate.
    - Third-party testing and certification to ASIB and SANS standards.
    - Manufacturer's documentation verifying suitability for fire protection systems, including performance data and activation settings.
    - Factory test certificates verifying activation flow rate and delay settings.

4.8.3 Flow Switch Specification:

- Flow switches must have an adjustable activation delay, typically 0-60 seconds, to avoid false alarms due to pressure surges or transient flows.
- Each flow switch shall be rated for a minimum working pressure of 1200 kPa (12 bar) and a maximum pressure rating suitable for the system's hydraulic conditions.
- Flow switches must be sensitive enough to detect flows equivalent to the activation of a single sprinkler head.

4.8.4 Material and Construction:

- Flow switches must have enclosures rated at least IP54 for indoor use and IP65 for outdoor installations, ensuring protection against dust and water ingress.
- Switch housings shall be made from durable, corrosion-resistant materials, such as brass or stainless steel, suitable for use in wet environments.
- All internal components, including the paddle or vane mechanism, must be designed for long-term durability and reliability in fire protection applications.

4.8.5 Electrical and Signal Requirements:

- Flow switches must be capable of providing a dry contact output signal compatible with standard fire alarm control panels.
- Electrical connections must be rated for 24V DC or 230V AC, as specified in the design documentation.

4.8.6 Mounting and Connection:

- Flow switches must have 1-inch or 2-inch NPT threaded connections or flanged connections, as specified in the design documents.
- Switches must be supplied with mounting hardware, including bolts and gaskets, to ensure a secure, leak-proof installation.
- The paddle or vane length must be suitable for the pipe size and flow conditions as specified in the design.

4.9 **Alarm Devices:**

4.9.1 Alarm Device Types:

- The following types of alarm devices are required for the fire protection system:
    - Water Motor Gongs: Mechanical alarm devices activated by water flow, providing a loud audible warning.
    - Electronic Alarm Bells: Provide distinct audible signals upon activation of water flow or other system conditions.
    - Strobe Lights: Visual alarm devices to signal system activation in areas where audible alarms may not be sufficient.

4.9.2 Approvals and Certifications:

- Manufacturer's documentation confirming the devices' suitability for use in fire protection systems and compliance with environmental conditions for indoor or outdoor use.

4.9.3 Alarm Device Specifications:

- Water Motor Gongs:
    - Suitable for outdoor installation, with weather-resistant construction.
    - Minimum sound output of 90 dB at 3 meters.
    - Wall-mountable with a gong diameter of 300mm.
- Electronic Alarm Bells:
    - Minimum sound output of 85 dB at 3 meters.
    - Suitable for both indoor and outdoor environments.
    - 24V DC with a continuous tone sound output.
    - Wall-mountable.
- Strobe Lights:
    - Minimum flash rate of 60 flashes per minute.
    - Red light with a minimum intensity of 100 candelas and a 360° coverage angle.
    - Visibility range meets ASIB and SANS guidelines.
    - Ceiling-mountable.

4.9.4 Material and Construction:

- Alarm devices must be constructed with the following:
    - Enclosures rated at least IP54 for indoor use and IP65 for outdoor installations.
    - Housings made from durable, corrosion-resistant materials, such as polycarbonate or ABS plastic, to withstand environmental conditions.

- Electrical components designed for long-term durability and reliability under fire protection conditions.

4.9.5 Electrical and Signal Requirements:

- Alarm devices must have the following features:
  - Compatibility with standard fire alarm control panels.
  - Electrical ratings suitable for the site's power supply (24V DC or 230V AC), with an acceptable voltage range of ±10%.
  - Dry contact inputs/outputs to interface with the fire alarm system, allowing activation and monitoring of alarm conditions.
  - Terminals within the alarm devices clearly labelled.
  - Wiring diagrams provided for easy installation and maintenance.
  - Cable entry via conduit or cable glands.
  - Wiring: 2.5mm² stranded copper wire.

4.9.6 Finish and Coating:

- All alarm device enclosures must be finished in red with a weather-resistant powder coating suitable for the environment in which they will be installed.
- The coating must be factory-applied and meet the relevant ASIB and SANS standards for durability and longevity.

4.10 **Fire Department Connections (FDCs):**

4.10.1 Fire Department Connection Types:

- FDCs shall be compatible with local fire department hose fittings.
- FDCs must be suitable for:
  - Siamese Connections: Double inlet connections for supplementing water supply to the sprinkler system.
  - Storz Couplings: As required for rapid hose attachment in local jurisdictions.

4.10.2 Approvals and Certifications:

- FDCs must be supplied with certification and test certificates demonstrating compliance with UL or FM standards, as well as ASIB and SANS requirements.
- The manufacturer must provide documentation confirming the suitability of the FDCs for use in fire protection systems, including performance data and pressure ratings.

4.10.3 FDC Specifications:

- FDCs shall be sized as specified in the design documents, typically 100 mm (4 inches) inlet diameter or as required by local fire authority regulations.
- Connections must be compatible with local fire department hose fittings and must include threaded or quick-connect adapters as specified.

- FDCs must have check valves or non-return valves to prevent backflow into the public water supply.

4.10.4 Material and Construction

- FDCs must be constructed from corrosion-resistant materials, such as brass, bronze, or stainless steel, suitable for long-term use in outdoor environments.
- All components shall be resistant to corrosion, UV degradation, and salt spray.
- FDCs shall incorporate tamper-resistant features to prevent unauthorized operation.
- FDC inlet caps shall be provided with chains or tethers to prevent loss.

4.11 **Pipe Supports and Hangers:**

4.11.1 Pipe Support Types:

- Pipe supports and hangers shall be used to securely fasten sprinkler pipes to the building structure, ensuring stability and proper alignment in accordance with ASIB 12th Edition Rules
- Types of supports include:
    - Adjustable Clevis Hangers: Clevis hangers shall be adjustable with a minimum rod size of 10 mm and a load capacity as specified in the design documents. Clevis hangers shall be used for general-purpose pipe support where pipes are installed at a distance below the supporting structure exceeding 300 mm.
    - Rod Hangers: Rod hangers shall be used for suspending pipes from ceilings in areas with a ceiling height greater than 4 meters. Rod hangers shall have a minimum rod size of 10 mm and a load capacity as specified in the design documents.
    - Pipe Clamps: Pipe clamps shall be used to secure pipes to walls or ceilings where the distance from the supporting structure is less than 300 mm. Clamps shall be fabricated from steel with a minimum thickness of 2 mm and have a hot-dipped galvanized finish.
    - Trapeze Hangers: Trapeze hangers shall be used for supporting multiple pipes where it is impractical to support from the building structure.
    - Roller Supports: Roller supports shall be used for pipes that require movement due to thermal expansion, in accordance with the manufacturer's specifications.
    - U-bolts: U-bolts shall be used for supporting pipes from beams where the pipe run is perpendicular to the beam. U-bolts shall have a minimum diameter of 12 mm and a load capacity as specified in the design documents.
    - Seismic Bracing: Seismic bracing shall be provided where required, to provide additional support for pipes in areas subject to seismic activity, in accordance with ASIB 12th Edition Rules, Section 4078.
- All pipe supports and hangers must comply with relevant SANS standards, including but not limited to SANS 10287:2018, Section 6.3.3, and ASIB 12th Edition Rules.

4.11.2 Material and Construction:

- Supports and hangers shall be constructed from galvanized steel or stainless steel to prevent corrosion in both indoor and outdoor environments.
- For outdoor installations or areas with high humidity, supports and hangers shall be constructed from stainless steel with a minimum grade of 316L.
- All components, including bolts, nuts, and washers, must be made from materials compatible with the pipe material to prevent galvanic corrosion.
- Where copper piping is used, supports and hangers shall be isolated from direct contact with the copper using non-conductive bushings or sleeves.
- Supports must be designed to accommodate thermal expansion and contraction of pipes without causing stress on joints.
- The expected range of thermal movement shall be calculated in accordance with the pipe manufacturer's specifications and local building codes.

4.11.3 Support Spacing

- The maximum spacing between pipe supports shall be in accordance with ASIB standards, based on pipe diameter and material:
  - 25 mm (1 inch) pipes: Maximum spacing of 2 meters.
  - 50 mm (2 inches) pipes: Maximum spacing of 3 meters.
  - 100 mm (4 inches) and larger pipes: Maximum spacing of 4 meters.
- Hanger spacing must ensure that pipes remain level and stable during normal operation and under fire conditions.
- The supplier shall submit calculations demonstrating that the chosen support spacing will adequately support the weight of the pipes and water under both static and dynamic conditions.
- Exceptions to the maximum spacing requirements shall be made where pipes are subject to unusual loads or vibrations, as specified in the design documents.

4.11.4 Finish and Coating

- All supports, hangers, and bracing components must have a corrosion-resistant finish suitable for the environmental conditions in which they will be installed.
- Coatings must be factory-applied and meet or exceed ASIB and SANS standards for long-term durability.
- Steel surfaces shall be cleaned and prepared to a minimum of SSPC-SP 6 (or equivalent) before coating application.

4.12 **Sprinkler Test and Drain Assemblies:**

4.12.1 Assembly Types:

- The following test and drain assemblies are required for the fire sprinkler system, complying with ASIB and SANS 10287 standards:

- Test Valve Assemblies: For simulating sprinkler flow to test system functionality without discharging water from the system. Must include a tapped outlet, (not exceeding 25 mm), taken from the side or top of the test valve and not the bottom where sediment may accumulate, with a 3 mm diameter orifice fitted to a drip union for testing the water motor alarm.
- Drain Valve Assemblies: For draining water from the system during maintenance or repairs.

4.12.2 Approvals and Certifications:

- A Type Approval listing for test and drain assemblies which confirms compliance with SANS 10287 must be provided.
- The manufacturer must provide documentation confirming that test and drain assemblies meet all pressure and flow requirements for fire protection use.

4.12.3 Assembly Specifications:

- Test valve assemblies must include a calibrated orifice to simulate the flow of a single sprinkler head, enabling accurate testing of water flow and alarm functionality.
- Drain valves must be capable of handling the full flow rate of the connected piping, with sizes typically ranging from 25 mm (1 inch) to 50 mm (2 inches), as specified in the design.
- Each assembly must be designed for a minimum pressure rating of 1200 kPa (12 bar) or as required by the system specifications.

4.12.4 Material and Construction:

- Test and drain assemblies must be constructed from corrosion-resistant materials, such as brass, bronze, or stainless steel, suitable for long-term use in fire protection systems.
- Valves within the assemblies must include durable seals and seats, designed to prevent leaks during operation.
- Handles and other moving parts must be made from materials resistant to wear and corrosion, ensuring ease of operation over the assembly's lifetime.

5 Installation Requirements

5.1 **Contractor Responsibilities:**

5.1.1 The contractor shall ensure full compliance with the ASIB Rules, SANS 10287: Automatic Sprinkler Installations for Fire-Fighting Purposes, and all other relevant SANS codes and local authority requirements throughout the installation process.

5.1.2 All work shall be carried out by competent persons who are qualified and experienced in the design, installation, and commissioning of fire sprinkler systems. Personnel shall hold appropriate certifications and registrations where required, such as registration with the Engineering Council of South Africa (ECSA).

5.1.3 The contractor is responsible for ensuring that all equipment and materials used in the installation are new, of approved types, and comply with the relevant SABS and ASIB requirements.

5.1.4 The contractor shall coordinate with other trades and services to prevent conflicts and ensure that the installation does not interfere with other building systems.

5.1.5 All necessary permits, approvals, and inspections shall be obtained and coordinated by the contractor.

5.1.6 The contractor must submit the following documentation to the Employer prior to the installation:

- A copy of the installer's certificate of competence, as issued by ASIB or a similar recognized industry authority.
- A certificate of compliance for all welding procedures, as required by SANS/ISO 15614 SET.
- Welder qualification certificates, as required by ISO 9606 Part 1.
- Hydrostatic test certificates for all components and pipework, as required by ASIB and SANS.
- Endurance test certificates for all pumps, as required by ASIB and NFPA20.
- Approval certificates for all control panels, as required by ASIB.
- Test records for all electrical components and circuits, as required by ASIB and SANS.
- Flushing records, including pressure and flow rates during flushing, as required by ASIB and SANS.
- A copy of the listings and approvals for all components and plant used in the system.

5.2 **Control Valve Sets:**

5.2.1 Control valve assemblies shall be installed in accordance with ASIB Rules, SANS 10287, and the manufacturer's instructions.

5.2.2 Each sprinkler system shall be provided with an installation control valve set comprising an alarm valve, main stop valve, pressure gauges, test and drain facilities, and all necessary fittings.

5.2.3 Control valves shall be installed in readily accessible and protected locations, with adequate clearance for operation, maintenance, and inspection.

5.2.4 Valves shall be clearly labelled and signposted in accordance with SANS 1186-1: Symbolic Safety Signs—Part 1: Standard Signs and General Requirements and SANS 10140-3: Identification of Installations—Fire Protection Installations, indicating their function and the area they control.

5.2.5 Tamper switches or other supervisory devices shall be installed where required to monitor the status of critical valves and shall be connected to the building's fire alarm system or monitoring station.

5.3 **Sprinkler Installation:**

5.3.1 Sprinklers shall be installed strictly in accordance with the manufacturer's instructions, ASIB Rules, and SANS 10287.

5.3.2 Sprinklers shall be carefully screwed into the branch lines using the manufacturer's recommended sprinkler wrench to prevent damage to the sprinkler orifice and deflector.

5.3.3 Under no circumstances shall sprinklers be reused or relocated after installation. Damaged or previously activated sprinklers shall be replaced with new ones.

5.3.4 Sprinklers shall be installed with the frame arms aligned parallel to the branch pipe to ensure proper spray pattern and avoid obstructions known as "pipe shadow".

5.3.5 Sprinklers shall be protected from contamination during installation. Protective covers or caps shall be used to prevent ingress of foreign matter but must be removed prior to commissioning.

5.3.6 The contractor shall ensure that the correct type and temperature rating of sprinklers are installed in each location, as per the approved design and hazard classification.

5.3.7 Special care shall be taken to avoid damage to sprinklers during installation, including during ceiling installation and other trades' work.

5.4 Valve Installation

5.4.1 All valves shall be installed in accordance with the approved design drawings, manufacturer's instructions, ASIB Rules, and relevant SANS standards.

5.4.2 Valves shall be installed with sufficient clearance for easy operation, maintenance, and inspection, considering accessibility and safety.

5.4.3 Main stop valves shall be located in an easily accessible position, allowing rapid isolation of the water supply in case of emergency or maintenance.

5.4.4 Valves shall be clearly labelled and signposted in accordance with SANS 1186-1: Symbolic Safety Signs—Part 1: Standard Signs and General Requirements and SANS 10140-3: Identification of Installations—Fire Protection Installations, indicating their function and the area they control.

5.4.5 Valves shall be protected from mechanical damage, environmental conditions, and unauthorized operation. Where necessary, valve handles shall be locked or secured in the appropriate position.

5.4.6 Pressure-reducing valves, non-return valves, and other specialty valves shall be installed where specified, ensuring correct orientation and compliance with design requirements.

5.4.7 All valves controlling water supplies to sprinklers shall be supervised (monitored) or provided with tamper-proof seals to prevent unauthorized closure.

5.4.8 Control Valve Sets shall comply with:

- Each sprinkler system shall be provided with an installation control valve set comprising an alarm valve, main stop valve, pressure gauges, test and drain facilities, and all necessary fittings.
- Control valves shall be installed in readily accessible and protected locations, with adequate clearance for operation, maintenance, and inspection.
- Tamper switches or other supervisory devices shall be installed where required to monitor the status of critical valves and shall be connected to the building's fire alarm system or monitoring station.

5.5 Pipework Installation

5.5.1 Pipes shall be accurately aligned, adequately supported, and securely fixed to the building structure using approved hangers and supports in accordance with ASIB Rules.

5.5.2 Pipe supports shall be designed to accommodate the weight of the pipes filled with water, plus an allowance for potential additional loads, such as seismic or thermal expansion forces.

5.5.3 Expansion joints, loops, or flexible couplings shall be provided as necessary to accommodate thermal expansion and contraction, building movement, or seismic activity, without imposing undue stress on the pipework or joints.

5.5.4 Pipe joints shall be made using approved methods, such as threaded joints, grooved couplings, flanged connections, or welded joints, as specified in the design and in compliance with ASIB Rules and relevant SANS standards.

5.5.5 All pipe fittings, valves, and accessories shall be compatible with the pipe materials and suitable for fire protection service.

5.5.6 Pipes shall be installed to minimize pressure losses, avoid unnecessary changes in direction, and facilitate efficient water flow.

5.5.7 The interior of all pipes, fittings, and components shall be clean and free from debris before installation.

5.5.8 Open pipe ends shall be capped or plugged during installation to prevent entry of foreign materials.

5.6 **Pump Installation:**

5.6.1 Fire pumps shall be installed on a secure and level foundation, designed to support the pump assembly and minimize vibrations during operation.

5.6.2 The foundation shall be constructed in accordance with the pump manufacturer's recommendations and ASIB Rules.

5.6.3 Pumps shall be installed in a dedicated pump room or enclosure that complies with ASIB Rules and relevant SANS codes, providing protection from environmental factors and adequate space for maintenance and operation.

5.6.4 The pump room shall be equipped with appropriate lighting, ventilation, drainage, and fire protection measures as required.

5.6.5 Suction and discharge piping shall be installed to minimize turbulence and pressure losses, using long-radius bends, straight lengths, and eccentric reducers where appropriate.

5.6.6 OS&Y gate valves or approved gear-operated butterfly valves shall be used on pump suction and discharge lines, installed to allow proper isolation and maintenance.

5.6.7 All pumps shall be installed with necessary accessories, including pressure gauges, flow meters, test headers, automatic starting mechanisms, and relief valves as specified.

5.6.8 Electrical connections, control panels, and instrumentation shall be installed by qualified personnel in accordance with ASIB Rules, relevant SANS codes, and local electrical regulations.

5.6.9 Diesel-driven pumps shall have fuel supply systems, exhaust arrangements, and starting systems installed in compliance with ASIB Rules and manufacturer recommendations.

5.7 **Alarm Devices:**

5.7.1 Alarm devices shall be securely mounted using appropriate brackets and hardware, ensuring durability and reliability.

5.7.2 Water motor gongs shall be installed on the exterior of the building near the main alarm valve or as specified, ensuring audibility throughout the protected area.

5.7.3 Electronic alarm devices shall be connected to the fire detection and alarm system where required, ensuring integration and proper signaling.

5.7.4 Visual alarm devices (strobe lights) shall be positioned to ensure visibility from all key areas within the protected space.

5.7.5 All wiring and connections shall be carried out by qualified personnel, complying with local electrical codes, ASIB Rules, and SANS standards.

5.8 **Sprinkler Test and Drain Assemblies:**

5.8.1 Test and drain assemblies shall be installed at appropriate locations as specified in the design documents and in accordance with ASIB Rules.

5.8.2 Assemblies shall have threaded or flanged connections compatible with the system piping and shall include all necessary fittings to ensure a leak-proof installation.

5.8.3 Each assembly shall be securely mounted using appropriate supports or brackets, allowing for safe and convenient operation.

5.8.4 Test connections shall be arranged to permit full flow testing of alarms and drain lines, discharging to a safe location without causing damage or hazards.

5.8.5 Pressure gauges, flow switches, and other monitoring devices shall be installed as required to facilitate testing and maintenance.

5.9 **Protection and Coordination**

5.9.1 The contractor shall protect all components of the sprinkler system during installation from damage, corrosion, and contamination.

5.9.2 Coordination with other trades is essential to prevent conflicts and ensure that sprinkler piping and components are not obstructed or damaged by other installations such as ductwork, electrical conduits, or architectural features.

5.9.3 Penetrations through fire-rated walls and floors shall be properly sealed using approved firestop materials to maintain the integrity of fire separations, in accordance with SANS 10177: Fire Testing of Materials, Components and Elements Used in Buildings.

5.9.4 Where sprinklers are installed in areas with suspended ceilings or other obstructions, the contractor shall ensure that the sprinkler deflectors are installed at the correct distances below the ceiling, and that ceiling tiles or panels do not interfere with sprinkler operation.

6 Identification and Painting

6.1 General Requirements

6.1.1 All components of the fire sprinkler system shall be properly identified and painted in accordance with the latest ASIB Rules, relevant SANS codes, and local authority requirements.

6.1.2 Identification markings and signage shall be durable, legible, and resistant to environmental conditions, ensuring long-term visibility.

6.1.3 Paints and coatings used shall be suitable for the intended application, providing protection against corrosion and environmental degradation.

6.1.4 All signage and labelling shall comply with:

- SANS 1186-1: Symbolic safety signs—Part 1: Standard signs and general requirements.
- SANS 10140-3: Identification of installations—Part 3: Fire protection installations.

6.2 Valve Identification

6.2.1 Labelling Requirements:

- All valves shall be clearly labelled with their function (e.g., "Main Stop Valve," "Zone Control Valve," "Drain Valve") and any relevant information such as the zone or section served.
- Valve labels shall be durable, weather-resistant, and securely affixed to the valve or adjacent structure.
- Labels shall be made of materials such as engraved laminate, stainless steel, or anodized aluminium.

6.2.2 Legibility and Visibility:

- Letters and symbols on the labels shall be of sufficient size and contrast to be easily legible from a distance of at least 1 meter.
- Labels shall not be obscured by pipe insulation, structural elements, or other equipment.

6.3 Tank Identification and Painting

6.3.1 Certification and Labelling:

- Each water storage tank shall have a certification plate securely affixed to the exterior in a visible location.
- The certification plate shall include:
    - Approval number.
    - Name of the manufacturing company.
    - Date of manufacture.
    - Type of tank (e.g., welded steel, sectional steel, bladder tank).
    - Confirmation of the presence of a vortex inhibitor.
    - Required inspection interval (typically every 3 years).

6.3.2 Painting and Protective Coatings:

- Internal Surfaces:
    - Surfaces to be painted shall be sand-blasted or grit-blasted to a cleaning degree of Sa 3 (white metal cleaned) in accordance with SANS 10064.
    - A protective coating comprising at least one coat of an anti-corrosive primer with a dry film thickness of 25 µm shall be applied immediately after cleaning (e.g., an epoxy zinc-rich primer).

- After 24 hours, apply one of the following or an equivalent protective coating to achieve a total dry film thickness of at least 225 µm:
  - Epoxy tar paint.
  - Vinyl resin-based coating.
  - Chlorinated rubber resin-based coating.
  - Polyurethane resin-based coating.
- Allow the paint to dry for one week before filling the tank with water.

- External Surfaces:
  - The external surfaces shall be painted with a suitable weather-resistant coating to protect against environmental exposure.
  - Color shall comply with local authority requirements or as specified by the engineer.

- Alternative Protective Coatings:
  - If alternative protection is used, the lining shall be applied and maintained per the manufacturer's recommendations.

6.3.3 Maintenance:

- The protective coating shall ensure that the tank does not require significant maintenance for at least 3 years after painting.

6.4 Fire Control Panel Identification

6.4.1 Color Coding**:**

- Control panel enclosures shall be finished in RAL 3000 Flame Red.

6.4.2 Labelling Requirements:

- Each control panel shall be labelled with:
  - Manufacturer’s name and model number.
  - Serial number.
  - Electrical ratings (voltage, current).
  - Approval marks (e.g., UL, FM, or ASIB).
- Labels shall be made of 304 stainless steel, minimum 1.5 mm thick, with engraved text of at least 5 mm in height.

6.4.3 Function Identification:

- All switches, indicators, and controls on the panel shall be clearly labelled with their function.

6.5 Fire Pump Identification

6.5.1 Labelling Requirements:

- Each pump shall have a durable nameplate securely affixed, displaying:
  - Manufacturer's name.
  - Model number.
  - Serial number.
  - Rated flow (L/min) and pressure (kPa).
  - Direction of rotation (for motor-driven pumps).
  - Approval marks (e.g., UL, FM, or ASIB).

6.5.2 Materials:

- Nameplates shall be made of corrosion-resistant materials such as stainless steel or brass with engraved or stamped lettering.

6.6 Valve Identification

6.6.1 Labelling Requirements:

- Each valve shall have a manufacturer's nameplate indicating:
  - Manufacturer's name.
  - Valve model and type.
  - Pressure rating.
  - Approval marks (e.g., UL, FM, or ASIB).
  - Directional flow indicators for non-return (check) valves.

6.6.2 Installation:

- Labels shall be installed in a visible location without obstructing valve operation or maintenance.

6.7 Pressure Gauge Identification

6.7.1 Labelling Requirements:

- Each gauge shall be labelled with:
  - Manufacturer's name and model number.
  - Serial number.
  - Measurement range and accuracy class.
  - Approval marks (e.g., UL, FM, or ASIB).
- Each gauge shall have a weather-resistant tag with a unique identification number for maintenance tracking.

6.7.2 Specifications:

- Gauges shall have scales in kilopascals (kPa).
- The measurement range shall be appropriate for system pressures, typically twice the system working pressure.

6.8 **Flow Switch Identification**

6.8.1 Terminal Labelling:

- Terminals within the flow switch enclosure shall be clearly labelled to indicate their function for ease of installation and maintenance.

6.8.2 Enclosure Markings:

- The enclosure shall display:
  - Manufacturer’s name and model number.
  - Serial number.
  - Electrical ratings.
  - Approval marks (e.g., UL, FM, or ASIB).

6.9 **Fire Department Connections (FDCs)**

6.9.1 Signage and Identification:

- Each FDC shall be clearly identified with a sign reading "FIRE DEPARTMENT CONNECTION—SPRINKLER" or as required by local authorities.
  - Signs shall comply with SANS 1186-1 and be:
  - Minimum 150 mm x 200 mm in size.
  - Made from durable materials like cast aluminum or stainless steel.
  - Include reflective elements for visibility in low-light conditions.
- Signs shall be securely attached above the FDC using tamper-resistant fixings.

6.9.2 Identification Plates:

- FDCs shall have plates indicating:
  - Manufacturer's name.
  - Model number.
  - Approval marks (e.g., UL, FM, or ASIB).
  - Maximum pressure rating.

6.10 **Sprinkler Identification**

6.10.1 Markings:

- Sprinklers shall be marked on the body or deflector with:
    - Nominal orifice size.
    - Type of distribution pattern.
    - Approving authority.
    - Sprinkler Identification Number (SIN).

6.10.2 Temperature Ratings and Fusible Bulb Color Codes:

- The color of the glass bulb indicates the temperature rating:
    - 57°C: Orange.
    - 68°C: Red.
    - 79°C: Yellow.
    - 93°C: Green.
    - 141°C: Blue.
    - 182°C: Mauve.
    - 204°C / 260°C: Black.

6.10.3 Installation Verification:

- The contractor shall ensure that the correct sprinklers (type and temperature rating) are installed as per the design specifications.

6.11 Orifice Plate Identification

6.11.1 Tagging:

- Orifice plates shall have a projecting identification tag that is readily visible.

6.11.2 Stamped Information:

- Tags shall display:
    - Orifice diameter (in millimeters).
    - Flow rate used for calculation (L/min).
    - Pressure drop across the orifice (kPa).
    - K-factor of the orifice.

6.12 Storage Risk Signage

6.12.1 Stack Height Signs:

- In storage and process risk areas, stack height signs shall be prominently displayed at the maximum allowable storage height.

6.12.2 Specifications:

- Signs shall be:
    - Minimum 500 mm x 500 mm in size.
    - Display lettering at least 35 mm in height.
    - Clearly state:
        - Type of storage risk limitation.
        - Design density of discharge specific to the area.

6.12.3 Placement:

- Signs shall be located where they are easily visible to personnel involved in stacking operations.

6.13 **Painting of Pipework and Components**

6.13.1 Color Coding

- All exposed fire protection pipework shall be painted in Signal Red (color code RAL 3000 or equivalent) unless otherwise specified.

6.13.2 Preparation and Application:

- Surfaces shall be properly prepared (cleaned and primed) before painting, following the paint manufacturer's recommendations.

6.13.3 Compatibility:

- Paints and coatings used shall be compatible with the pipe material and suitable for the environmental conditions.

6.13.4 Other Services:

- Non-fire protection services shall be painted and color-coded in accordance with SANS 10140-1 and SANS 10140-2.

6.14 **General Signage and Identification**

6.14.1 Compliance:

- All signage shall comply with SANS 1186-1 and SANS 10140-3.

6.14.2 Durability:

- Signs shall be made of materials resistant to fading, corrosion, and weathering.

6.14.3 Placement:

- Signage shall be placed in locations that are easily visible and not obstructed.

6.14.4 Multilingual Requirements:

- Where required by local regulations, signs shall include multiple languages or internationally recognized symbols.

6.15 *Contractor* Responsibility:

6.15.1 The *Contractor* is responsible for ensuring all identification and painting meet the specified standards and shall rectify any non-compliant work at their own expense.

7 Corrosion Protection

7.1 Pipework Protection

7.1.1 Galvanized Steel Pipes:

- The galvanizing process shall comply with SANS 121 (ISO 1461) for hot-dip galvanized coatings on fabricated iron and steel articles.

7.1.2 External Corrosion Protection:

- Pipework exposed to corrosive environments (e.g., areas with high humidity, coastal exposure, chemical vapors, or outdoor exposure) shall be provided with additional protective coatings to comply with ISO C5 requirements.
- Suitable protective coatings may include:
    - Epoxy coatings.
    - Polyurethane coatings.
    - Vinyl-based coatings.
- Coatings shall be applied following the manufacturer's instructions and relevant SANS standards, ensuring proper surface preparation and application techniques.

7.1.3 Underground Pipes:

- All underground pipes shall be protected against corrosion using appropriate coatings and wrappings.
- Bituminous paint is not regarded as adequate protection for underground pipework.
- Protective measures shall comply with SANS 121 and SANS 10285 (Pipeline corrosion protection).
- Protective methods may include:
    - Polyethylene sleeving.
    - Cathodic protection (where applicable).
    - Specialized coatings and wrappings designed for buried service.

7.2 Sprinkler Protection

7.2.1 Corrosive Environments:

- In premises or portions of premises where corrosive vapors are prevalent, sprinklers shall be:
    - Provided with an approved corrosion-resistant coating applied by the manufacturer.
    - Alternatively, coated twice with a good quality petroleum jelly:

- First coat applied before installation.
- Second coat applied after installation.

- Maintenance of Petroleum Jelly Coatings:
  - Coatings shall be renewed at periodic intervals as necessary.
  - Before reapplication, existing coatings must be thoroughly wiped off.
- Glass Bulb Sprinklers:
  - For glass bulb type sprinklers, the anti-corrosion treatment need only be applied to the body and yoke.
  - Care must be taken to avoid coating the glass bulb itself.

8 Testing and Commissioning

8.1 General Requirements

8.1.1 All testing and commissioning shall be conducted in strict accordance with the latest ASIB Rules, SANS 10287: Automatic Sprinkler Installations for Fire-Fighting Purposes, and all other relevant SANS standards.

8.1.2 Testing shall be performed by competent personnel experienced in fire sprinkler systems, under the supervision of a qualified engineer.

8.1.3 The contractor shall ensure all testing is completed prior to ceiling installation to allow for any necessary adjustments.

8.2 Testing and Commissioning Plans

8.2.1 Preparation and Submission:

- The contractor shall prepare a comprehensive Testing and Commissioning Plan, detailing all procedures, methodologies, and sequences for the testing and commissioning of the sprinkler system, including:
  - Scope of tests to be conducted (flushing, hydrostatic pressure tests, functional tests, pump testing, and endurance tests).
  - Equipment and instrumentation to be used for testing.
  - Test conditions and acceptance criteria based on ASIB Rules.
  - Detailed timelines and schedules for each testing phase.
  - Emergency procedures and safety protocols during testing.

8.2.2 Sign-Off and Approval:

- The Testing and Commissioning Plan must be reviewed, signed, and stamped by the appointed Commissioning Engineer, including their ECSA Pr. Eng. number.
- The signed Testing and Commissioning Plan must be submitted to the Employer's Engineer for review and formal acceptance before any testing or commissioning activities begin on site.

- No testing or commissioning work shall commence without written approval of the Testing and Commissioning Plan by the Employer's Engineer. Any deviations from the approved plan must be documented, justified, and re-submitted for approval before implementation.

8.3 Flushing and Cleaning

8.3.1 Flushing Procedures:

- All pipework shall be thoroughly cleaned and flushed before final connection to sprinkler heads to remove debris, scale, or contaminants that could obstruct water flow. Flushing should be done in accordance with ASIB Rules, ensuring sufficient flow rates and duration.

- Flushing shall not be performed against closed valves to prevent damage or excessive pressure buildup.

8.3.2 Documentation:

- Flushing records shall include the date and time of flushing, sections flushed, flow rates, durations, and personnel involved. These records shall be submitted to the *Employers* Engineer for review

8.4 Hydrostatic Pressure Testing

8.4.1 Testing Procedures:

- After flushing, the system shall be subjected to a hydrostatic pressure test at 1.5 times the maximum system working pressure, or as specified by ASIB Rules. For sprinkler systems, the minimum pressure shall not be less than 1,800 kPa.

- The test pressure must be maintained for a minimum of 2 hours without any leaks or loss of pressure. Testing should not be performed against closed valves

8.4.2 Underground Pipework:

- Hydrostatic testing for underground sections must be completed before backfilling. If the section passes inspection, the contractor may proceed to backfill open trenches at joints and connections.

8.5 Functional Testing

8.5.1 Control Valves and Alarms:

- Test all control valves, alarm valves, pressure switches, flow switches, and ancillary equipment to verify proper operation under system conditions. Ensure that alarm signals are correctly transmitted to the central fire alarm system or monitoring station

8.5.2 Flow and Pressure Tests:

- Conduct flow and pressure tests to confirm that the system meets the design criteria, including required flow rates and pressures for the most hydraulically demanding areas. These tests must verify compliance with design densities and coverage areas as per ASIB requirements.

8.5.3 System Operation Tests:

- Simulate fire conditions to test the automatic starting of pumps, valve operations, and alarm activations. Verify the operation of jockey pumps, ensuring they do not maintain system pressure with an open sprinkler without starting the main pump.

8.6 Pump Testing and Commissioning

8.6.1 Hydrostatic Test:

- The pump casing must undergo a hydrostatic test at 1.5 times the working pressure for a minimum of 15 minutes

8.6.2 Performance Tests:

- Performance tests should include:
    - Churn Test (zero flow condition)
    - Rated Flow Test (pump delivers rated flow at rated pressure)
    - 150% Flow Test (pump delivers 150% of rated flow at no less than 65% of rated pressure)

8.6.3 Runout Compliance:

- Ensure the pump duty point intersects the system curve appropriately, passing to the left of the pump's maximum allowable operating point (runout). Both the favorable (highest flow, lowest pressure) and remote (lowest flow, highest pressure) areas of operation should be verified.

8.6.4 Endurance Test - Diesel Engine Driven Pump

- The diesel engine-driven pump set shall be run at the pump duty point (Qmax) for a continuous duration of 6 hours.
- If the diesel engine requires rebuilding or replacing after installation, the pump set shall be retested on-site or at a suitable test bed for a minimum of 6 hours.
- During the test, the following parameters shall be recorded at zero flow (churn), 25%, 50%, 75%, 100% (Qmax), and 110% (runout) of Qmax:
    - Engine speed
    - Suction and delivery pressure
    - Flow rate
- Each point shall be clearly indicated on the test curve.
- Hourly records during the test shall include:
    - Ambient temperature
    - Lubricating oil temperature
    - Rise in temperature of the cooling water
    - Cooling water flow rate
    - Engine speed
    - For engines equipped with a heat exchanger: initial temperature and the rise in temperature of the engine closed-circuit cooling water

- Pump gland temperature
- Bearing temperatures

8.6.5 Endurance Test - Electric Motor Driven Pump

The electric motor-driven pump set shall be run at the pump duty point (Qmax) for a continuous duration of 6 hours.

If the electric motor requires rewinding or replacing after installation, the pump set shall be retested on-site or at a suitable test bed for a minimum of 6 hours.

During the test, the following parameters shall be recorded at zero flow (churn), 25%, 50%, 75%, 100% (Qmax), and 110% (runout) of Qmax:

Motor speed

Suction and delivery pressure

Flow rate

Each point shall be clearly indicated on the test curve.

Hourly records during the test shall include:

Ambient temperature

Motor bearing temperatures

Stator temperature

Bearing temperatures

8.6.6 Documentation:

- A detailed test report, including flow rates, pressures, pump performance curves, and observations, which shall be signed by the commissioning engineer together with their ECSA Pr. Eng number, should be submitted to the *Employers* engineer for acceptance. Certification by a recognized authority acceptable to the ASIB is required.

8.7 **Third-Party Inspections and Compliance**

8.7.1 Mandatory Inspections:

- Arrange inspections by ASIB or other regulatory bodies. Ensure all aspects comply fully with applicable standards and regulations

8.7.2 Deficiencies and Corrections:

- Address any deficiencies identified during inspections at the contractor's expense. The works will only be considered complete once the ASIB certifications are provided and handover cannot be done prior to this.

8.8 **Witnessing:**

- All testing shall be witnessed by the *Employers* engineer and the *Contractor* shall ensure that the dates for testing and commissioning are provided a minimum of 2 weeks in advance of any activities. Should any testing or commissioning be done without the proper witnessing of such by the *Employers* Engineers, the *Contractor* will be required to repeat all testing and commissioning activities at their own cost.

9 Documentation and Handover

9.1 **Completion Certificates:**

9.1.1 The contractor must provide completion certificates for all tests conducted. Each certificate must be certified by a competent person, confirming that the tests meet all applicable standards and specifications.

9.2 **As-Built Drawings:**

9.2.1 Submit detailed as-built drawings that reflect any modifications made during the installation process.

9.2.2 Drawings should include all piping, sprinkler locations, control valves, and any other relevant components.

9.2.3 Drawings must be provided in both hard copy and electronic format (PDF and native file formats).

9.3 **Test Reports:**

9.3.1 The contractor must submit comprehensive test reports, including:

- Flushing records, detailing sections flushed, flow rates, and dates.
- Hydrostatic pressure test results.
- Pump test data, including flow rates, pressures, and test curves.
- Alarm system test results, verifying signal transmission and system functionality.

9.4 **Operation and Maintenance (O&M) Manuals:**

9.4.1 General Requirements:

- Supply four sets of O&M manuals in hard copy and electronic format (USB drive with PDFs and native file formats).
- Manuals must comply with ASIB guidelines, SANS 10287, and industry best practices for fire sprinkler systems.
- O&M manuals shall be detailed and organized to assist the owner in the correct operation, maintenance, and troubleshooting of the sprinkler system.

9.4.2 Contents of O&M Manuals:

- System Overview:
  - A general description of the sprinkler system, including its purpose, coverage areas, and design parameters.
  - Details of installed capacities, such as flow rates, pressures, and design density.
  - System schematics, including layout plans and hydraulic calculations for the sprinkler system.

- System Diagrams:
    - Diagrams illustrating the layout of the sprinkler system, including piping, control valves, fire pumps, and water supply connections.
    - Electrical schematics relevant to pump control panels, alarm systems, and monitoring connections.
    - System riser diagrams and control valve arrangement.

9.4.3 Equipment Data:

- Detailed Information for Each Component:
    - Manufacturer, model, size, and rating of all key components such as sprinkler heads, control valves, flow switches, fire pumps, jockey pumps, and pressure relief valves.
    - Performance data including speed, flow rates, pressure ratings, and temperature limitations.
    - Contact details for local representatives of equipment manufacturers for future support.

9.4.4 Operating Instructions:

- System Operation:
    - Step-by-step procedures for the initial start-up, regular operation, and system shutdown.
    - Guidelines for routine weekly and monthly inspections, including visual checks for leaks, corrosion, or physical damage.
    - Instructions for operating under normal conditions, as well as procedures for dealing with system impairments or emergency shut-offs.
    - Templates for logging routine inspections, tests, and system status.

9.4.5 Inspection and Maintenance Procedures:

- Scheduled Maintenance:
    - Maintenance schedules for weekly, monthly, and annual activities as recommended by ASIB and equipment manufacturers.
    - Detailed checklists for maintenance of control valves, flow switches, fire pumps, alarm valves, and sprinkler heads.
    - Lubrication schedules for pumps and valves, where applicable.
    - Instructions for routine cleaning and flushing of system components to prevent obstructions and ensure optimal water flow.
- System Testing:
    - Procedures for conducting hydrostatic pressure tests, flow tests, pump tests, and alarm system tests.

- Guidelines for verifying the proper function of control valves, alarm devices, and pressure switches.
- Instructions for recording and analyzing test results to ensure compliance with design criteria.

9.4.6 Reference Documents:

- Supporting Documentation:
  - Tender specifications, a complete list of drawings, and as-built record drawings.
  - Copies of all test reports and commissioning records, including hydrostatic pressure tests, flow tests, and flushing records.
  - Certificates of compliance and approvals from ASIB or the relevant authority having jurisdiction.

9.4.7 Manufacturer's Data:

- Descriptive Literature
- Performance Data
- Detailed Operating Instructions

9.4.8 Troubleshooting Guide:

- Common Issues and Solutions

10 *Contractor* Maintenance Responsibilities

10.1 **Maintenance Period:**

10.1.1 The *Contractor* is responsible for the maintenance of the complete sprinkler installation for a period of twelve (12) months following the issuance of the 'Practical Completion' certificate by the *Employers* Engineer. This period ensures that the system remains in optimal working condition and adheres to ASIB rules.

10.2 Monthly Maintenance Visits:

10.2.1 The *Contractor* shall conduct monthly maintenance visits as part of a preventive maintenance program approved by the *Employers* Engineer. These visits are intended to inspect, test, and maintain the sprinkler system, ensuring continued compliance with design and performance criteria.

10.3 **Scope of Maintenance:**

10.3.1 During each maintenance visit, the contractor shall perform the following activities:

- Inspection and Testing:
  - Inspect all control valves, flow switches, and alarm devices for correct operation and proper positioning.
  - Check for signs of leakage, corrosion, or physical damage to sprinkler heads, pipework, and valves.

- Operate all valves through their full range to verify smooth operation and proper supervision.
- Test the system's ability to deliver the required flow and pressure to verify that design criteria are met.

- Pump Testing:
  - Conduct a no-flow (churn) test for a minimum of 10 minutes to verify pump readiness and operational status.
  - Perform a full-flow test monthly to confirm pump performance against the design specifications, including rated flow and pressure values.
  - For diesel engine-driven pumps, inspect fuel levels, battery status, and coolant levels. Test the automatic start system during each visit.

- Tank Maintenance:
  - Verify water levels in the tanks and inspect the functionality of makeup systems.
  - Check the exterior of tanks for signs of damage, corrosion, or leakage. Ensure that fill valves, overflows, and vents are operating correctly.

- Control Panels and Alarms:
  - Inspect control panels for moisture, damage, or tampering.
  - Test indicator lights, displays, and ensure that communication with the central fire alarm system is functioning correctly.

- Documentation and Reporting:
  - Maintain detailed records of each maintenance visit, including dates, tasks performed, test results, and any issues or corrective actions taken.
  - Update the sprinkler system logbook and ensure that records are available for review by the Engineer, fire authorities, or insurers upon request

10.3.2 Corrective Actions and Repairs:

- Any defects or issues identified during the maintenance visits must be promptly addressed by the contractor. Repairs or replacements of faulty components must be completed to restore the system to its operational state.
- Replacement parts must comply with original equipment specifications and be sourced from approved suppliers as specified in the ASIB rules

10.3.3 Emergency Repairs:

- The contractor is responsible for attending to any emergency repairs or issues that may arise within the twelve-month maintenance period, even outside of scheduled visits. This includes addressing system impairments, leaks, or faults that could impact the system's ability to function as designed.
- All emergency repairs should be documented and reported to the Engineer immediately, with details of the cause, corrective actions taken, and verification of restored functionality.

10.3.4 Training for Owner's Personnel:

- As part of the handover process, the contractor shall provide training to the owner's designated personnel on the proper operation and basic maintenance of the sprinkler system. This training shall include guidance on routine inspections, emergency procedures, and the upkeep of maintenance records.

10.3.5 Handover and End of Maintenance Period:

- At the end of the twelve-month maintenance period, the contractor must submit a comprehensive final report summarizing all maintenance activities, repairs, and tests conducted during the period.
- The report must be signed by the contractor's responsible engineer, including their ECSA Pr. Eng number, and submitted to the Employer's Engineer for review and approval.
- Upon approval, the contractor shall hand over all maintenance responsibilities to the owner or appointed maintenance service provider.

11 Guarantee and Extended Warranty

11.1 **General Guarantee:**

11.1.1 The contractor shall guarantee all materials, equipment, and workmanship provided and installed as part of the sprinkler system installation. The guarantee shall be valid for a period of twelve (12) months, commencing from the date of issuance of the Practical Completion Certificate by the Engineer.

11.1.2 During this twelve-month period, the complete installation, including all system components such as sprinkler heads, control valves, fire pumps, piping, and alarm systems, shall be guaranteed against defects arising from both patent and latent defects, as well as issues resulting from faulty materials or poor workmanship.

11.1.3 Normal wear and tear due to standard system operation is excluded from this guarantee.

11.2 **Extended Warranties for Key Components:**

11.2.1 Sprinkler Heads:

- A minimum 1-year manufacturer warranty against manufacturing defects is required.

11.2.2 Valves, Pumps, Pipework, Flow Switches and Fire Department Connections:

- A minimum 2-year manufacturer warranty against defects in materials and workmanship is required.

11.2.3 Control Panels, Pressure Gauges, Alarm Devices and Pipe Supports:

- A 5-year manufacturer warranty against defects in materials and workmanship is required.

11.3 **Scope of Guarantee:**

11.3.1 The guarantee shall cover the replacement of any parts, components, or equipment that become defective during the guarantee period at no additional cost to the Client. This includes, but is not limited to:

- All spare parts and appurtenances required to restore the system to its intended functionality.
- All associated costs, including labour, travel expenses, materials, and transportation necessary for the repair or replacement of defective components.

11.3.2 The contractor shall be responsible for carrying out all repairs or replacements promptly to ensure the system remains fully operational and compliant with design criteria throughout the guarantee period.

11.4 **Supplier's Extended Guarantees:**

11.4.1 Where certain equipment or components provided by the contractor carry standard guarantees from the manufacturer that exceed the twelve-month period, the contractor shall transfer the benefit of such extended guarantees to the Client. This includes any remaining warranty coverage for major components like fire pumps, controllers, and valves.

11.4.2 The contractor shall include the cost of extending any manufacturer's guarantees to match the twelve-month guarantee period or as specified for individual components in the technical specification in their tender price, ensuring seamless coverage for the Client.

11.5 **Guarantee Documentation:**

11.5.1 The contractor shall provide the Client with all guarantee documentation, including:

- A formal written guarantee covering the scope outlined above.
- Copies of any extended manufacturer warranties for equipment.
- Contact information for the contractor's service department for reporting defects or claims under the guarantee.

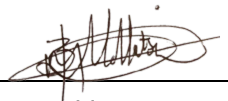
Annexures H - Technical Specification for Design, Supply, Delivery, Installation and Commissioning of Fire Detection system

REPORT	
For:	Technical Specification for Supply, Delivery, Installation and Commissioning of Fire Detection system
Project Name:	Mechanical Equipment Installation at 06 Toulon Road Building in The Port of Durban
Project Number:	XNDE.0039
Author:	Moeketsi Mahlatsi
Owner:	Transnet
Client:	Transnet National Port Authority
Project Sponsor:	Transnet National Port Authority
Project Manager:	Sanelisiwe Shozi
Revision Number:	A
Approved by:	Aslam Haffejee
Release Date:	15-05-2025
Print Date:	15-05-2025
Template Date:	01/05/2012
Document No:	XNDE.0039-SP-002

Distribution	
Name:	Title:
	Engineering Manager

DOCUMENTATION DISTRIBUTION, REVISION AND APPROVAL HISTORY

REVISION NUMBER	DATE	DISTRIBUTION/ REVISION	PREPARED BY	REVIEWED BY	APPROVED BY
A	19-08-2025	CONSTRUCTION REVIEW	M.M	A.H	A.H

Prepared by:  20/08/2025

Moeketsi Mahlatsi — Date

Reviewed by:  21/08/2025

Aslam Haffejee (senior Engineer) — Date

Approved by:  21/08/2025

Aslam Haffejee (Senior Engineer) — Date

ADDITIONAL SIGNATORIES:

Accepted by:

(Eng. Manager) — Date

Accepted by:

(Senior Project Manager) — Date

ADDITIONAL SIGNATORIES (TNPA):

Accepted by:

_____ _____

Date

Accepted by:

_____ _____

Date

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1 GENERAL

The additional technical specification in this section shall be read in conjunction with the Works Information.

Should there be any conflict between any parts of this document then sections shall be considered in the following order of priority:

Technical Specification; Works Information; and Drawings.

2 STANDARDS

Full compliance shall be required as stipulated in the following standards.

The Materials and Equipment covered in this specification are to be manufactured and tested in accordance with the following latest revisions of standards:

- BS EN 50136: Alarm systems. Alarm transmission systems and Equipment.
- SANS 10142: Wiring Code
- SANS 10114-1: Interior lighting
- SANS 10400: National Building Regulations
- SANS 10139: Fire Detection & Alarm systems for buildings,
- SANS 7629 & 7846: Electric cables specifications
- Occupational Health and Safety Act (Act 85, 1993)
- Local Municipal by-laws and regulations
- Local fire regulations
- Regulations of the Independent Communications Authority of South Africa (ICASA)
- CIBSE Commissioning Code C: Automatic Controls

The entire fire detection system shall comply with the latest edition of SANS 10139:2021 (Edition 4) and the relevant parts of the SANS 10400-T:2024, specifically concerning fire detection and evacuation safety.

All detection and alarm components must be EN 54 certified and installed in accordance with BS EN 54-14

The design of an automatic fire detection system, the equipment supplied for the system, and the installation of such equipment shall be in accordance with the Standards listed below. The equipment and components shall be deemed to have been tested and approved by a reputable and recognised international test laboratory to prove compliance with at least one or more of these Standards. Copies of test certificates shall be provided by the contractor with their tenders:

- EN 54: Components of automatic fire detection systems
- BS 5445: Components of automatic fire detection systems
- BS 5839: Fire detection and alarm systems for buildings

Material for which a SANS specification exists, shall be in accordance with such a specification, and shall bear the SABS mark.

All equipment used shall originate from suppliers which have been certified in accordance with SABS ISO 9001 (ISO 9001) for quality assurance. Copies of certificates of approval shall be provided by the contractor with their tenders.

Equipment designed to BS 5446, Fire systems for residential premises, or similar other standards are not acceptable.

3 SITE CONDITIONS

The site of the existing building for Clothing store refurbishment is within the Port of Durban.

The site is subjected to the following prevailing conditions:

3.1 External Condition

Summer ambient	: 40°C Dry Bulb Maximum
Winter ambient	: 16°C Minimum
Humidity	: Average 77%
Altitude	: 0 m at sea level

3.2 Internal Condition

Summer	: 24 °C Dry Bulb – 55% Relative Humidity
Winter	: 22 °C Dry Bulb – 55% Relative Humidity

The building is positioned in a severe coastal environment; therefore, equipment offered shall be suitably corrosion resistant for such conditions.

4 SCOPE OF WORKS

The extent of works covered in this document comprises the detailed design, supply, installation, testing, commissioning and training of a complete Fire Detection System, which comprises of the following:

- Fire Alarm Control panel.
- Optical Smoke, fire beam and Heat Detector units.
- Manual Call Stations.
- Fire alarm sounders and sirens.
- Fire rated cabling.
- Control System for control of HVAC systems in the fire alarm conditions.
- All accessories and miscellaneous equipment to ensure proper functioning of the systems.
- Supplying of O&M Manuals and training; and
- 12 Month Warrantee Period.

5 WORK UNDERTAKEN BY OTHERS

The work not included in the installation is as indicated in the Works Information, including the following as indicated in this section.

- All builder's work including penetrations through wall partitioning, brick walls and concrete structures
- Major wireways (cable trays and trunking) and conduits for electronic cabling.
- Main electrical supplies to electronic equipment positions; and
- Main ICT communication infrastructure will be provided by ICT department.

6 DESIGN

Any uncertainty which may exist in regard to the specification requirements shall be submitted to The Engineer in writing.

The requirements and design standards of the specification shall be adhered to unless otherwise approved by the Authority or its authorised representative in writing.

Small items of equipment forming part of a system are not covered by this specification.

However, it is still required that the total system shall comply with the highest standard of the design and fire protection practice.

6.1 Fire Detection System

The Fire Detection system shall be supplied and installed as per this specification, engineer's drawings, and relevant standards.

The system consists of a main Fire Control Panel (FCP) located within the reception room that is always manned. Smoke and heat detector units are to be installed throughout the building as indicated on The Engineer's drawings. Cabling of the system will be done in dedicated wire ways for the fire system.

The system shall be integrated ("hard-wired") to the following equipment / systems which are to be supplied and installed by other sub-contracting companies. Allowance for all necessary controls and equipment to activate/disable the equipment must be provided for.

- Fresh Air and Air-Conditioning system – to disable operation of the systems;

6.2 Audible and Visual Alarms

Alarm sounders must provide a minimum sound pressure level (SPL) of 65 dB(A) or 5 dB(A) above ambient noise, whichever is greater, at all accessible points in the occupied space.

Visual Alarm Devices (VADs) compliant with EN 54-23 shall be provided in all areas subject to high ambient noise or where occupants may have hearing impairment.

All calculations and placements shall be submitted for approval prior to installation.

7 MATERIALS

All materials used on the contract shall be new and of the very best of their respective types and kind.

All equipment and parts used in a particular system shall originate from one supplier as far as practicably possible.

8 ZONING

8.1 Fire Zoning

Devices shall be grouped into zones as follows, unless the zones are indicated on the drawings and/or Supplementary Specification:

- A zone shall not have more than 20 field devices.
- Each building floor shall have a minimum of two (2) separate zones.
- The floor area of a single zone shall not exceed 2000m².
- Every floor of a building larger than 300m² shall be on a separate zone.
- Every area enclosed by fire walls shall be on a separate zone.
- In an analogue addressable system, each zone shall be enclosed by 2-line isolators.

A minimum of 20% spare capacity shall be allowed in the design of the control panels, loops, zones, etc. The control panel shall have facilities to accommodate a further two detectors' circuits, additional

to the required number of zones, without having to replace or add additional cabinets (extensions) to the control panel, unless specified otherwise.

8.2 Control Panel and System Architecture

The system shall be fully addressable and capable of identifying the exact location (zone and device) of any fire alarm or fault condition.

Conventional panels will not be accepted unless approved in writing by the engineer for small, low-risk facilities under 100 m².

The fire detection system shall support zoning, isolation, and history logging functionality for event review and fault diagnostics.

8.3 Integration with Other Systems

The fire detection system shall be fully interfaced with:

- The automatic sprinkler system (for flow switch and valve monitoring),
- HVAC smoke control or shutdown relays,
- Emergency lighting and public address system,
- Access control override and fire door release mechanisms

9 ACCESS LEVELS

The levels of access (modified) applicable to the control panels are as follows.

Level 1: No password or key: Access by members of the public. In addition, the "silence" function shall be accessible or operational.

Level 2: Password or key: Access by the person responsible for the system and trained on the system, and for system maintenance.

Level 3: Password or key: Access by persons trained to reconfigure the system.

Level 4: Password or key: Access by persons authorised by the system owner to allocate passwords to levels 2 and 3.

a) Access by persons trained and authorised by the manufacturer to repair, or to alter the firmware, thereby changing its basic mode of operation.

10 INSTALLATION METHODS & MATERIALS

10.1 Devices

The base of a detector shall always be mounted in the area which it protects so that the indicator LED can be seen from the doorway which normally provides access to the room. The indicator LED shall face towards the main entrance or lobby or side of main approach in the passage.

Bases shall be provided with dust caps to protect the base against dust and dirt whilst construction work is in progress. This is only applicable to bases that contain electronic components.

Surface mounted units shall be solidly fixed to the wall by means of their back plates.

Manual call point units shall be mounted at 1,4m above finished floor level, unless otherwise indicated on the Engineer's drawings.

10.2 Circuit Wiring

The following methods are acceptable for the wiring of detector circuits:

- Steel conduit and conduit accessories cast into, or built into, the building structure and wired with insulated conductors of a type which complies with the requirements of this specification.
- Steel conduit and conduit accessories, surface mounted in building structures and wired with insulated conductors of a type approved by the Department.
- Wires and cables may also be installed in wiring trunking and armoured cable may also be installed on cable trays, as specified in this specification.
- Cables with stranded wires shall be terminated by the crimping on of lugs. No stranded wires without lugs will be accepted.
- T-Junctions shall be made only in approved draw boxes at detector outlets
- Separate wiring installations for detector circuits, evacuation communication wiring, audible alarms, electrical lock wiring, card reader wiring, AC and DC power circuits, remote control circuits and monitor wiring, video cables, computer cables, etc., shall all be done in separate conduit- or trunking installations. Detector wiring shall not be installed together with any other wires in wireways.
- Detector wiring may share the same draw boxes or expansion joint boxes with other firefighting system wiring or security system wiring, but the boxes shall be subdivided by means of steel plates.
- All electrical work and wiring associated with "FIRE DETECTION SYSTEMS" shall be carried out in compliance with the requirements of the "STANDARD SPECIFICATION FOR ELECTRICAL INSTALLATIONS" of the Client.
- Cables installed over vertical distances of more than 1,5m, shall be properly supported at intervals of less than 1,5m.

10.3 Conduit & Accessories

The Contractor for the fire detection system shall be responsible for the supply and installation of all conduits, conduit accessories, wiring trunking and cable trays, as may be necessary or required for the system, unless specified otherwise.

Conduit and conduit accessories shall be cast in, or built into, the building structure in new buildings. No surface mounting will be acceptable in new buildings or structures.

Surface mounted conduit and conduit accessory work will be allowed only in existing buildings.

Steel conduit and conduit accessories surface mounted on building structures, steelwork, and woodwork, shall be done neatly and in straight lines and shall be saddled at 1 m centres with spacer saddles.

M4 machine screws shall be used for fixing of spacer saddles onto steelwork. Suitable holes shall be drilled and tapped in the steelwork for this purpose.

Steel conduit and conduit accessories, surface mounted in roof spaces of buildings or structures with pitch roofs, shall follow the roof structural elements.

The quality of materials and the methods of installation of steel conduit and conduit accessories.

shall be carried out in compliance with the requirements of the "STANDARD SPECIFICATION FOR ELECTRICAL INSTALLATIONS" of the Client and SANS 10142.

Conduit installations shall be done in such a way that detector circuit wiring can be done without interruption and without T-joints.

Round draw boxes for detectors shall be mounted hard against the ceiling in the case of false ceilings or ceilings of pitch roof buildings and detector bases shall be mounted against boxes so that no open wiring occurs anywhere in a conduit and wiring system.

No Sprague tubing or PVC conduits shall be used in detector circuit wiring systems. Only flexible conduit which is not of the spiral type may be used in special applications.

10.4 Wiring Trunking & Cable Trays / Ladders

To be supplied and installed by electrical sub-contractor.

11 EQUIPMENT REQUIREMENTS

11.1 Fire Control Panel (FCP).

11.1.1 General

Main FCP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply in an economical space saving single board design. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system-controlled devices.

11.1.2 Operator Control

a) Acknowledge Switch:

Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

b) Alarm Silence Switch:

Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silence-able by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

c) Alarm Activate (Drill) Switch:

The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

d) System Reset Switch:

Activation of the System Reset switch shall cause all electronically latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.

e) Lamp Test:

The Lamp Test switch shall activate all local system LEDs, light each segment of the LED and display the panel software revision for service personal.

11.1.3 System Capacity and General Operation

a) The control panel or each network node shall provide or be capable of 200 intelligent/addressable devices.

b) The control panel or each network node shall include Form-C alarm, trouble, supervisory, and security relays rated at a minimum of 5 amps @ 40Vdc.

c) It shall also include four Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notification Appliance Circuits.

d) The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, Gentex, Wheelock, Advanced or similar Notification Appliances.

e) The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual colour coded system status LEDs, and an alphanumeric keypad with easy touch rubber keys for the field programming and control of the fire alarm system.

f) The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes.

g) The system shall allow the programming of any input to activate any output or group of outputs. Systems that have limited programming (such as general alarm), have complicated programming (such as a diode matrix), or require a laptop personal computer are not considered suitable substitutes.

h) The FCP shall support up to 20 logic equations, including "and," "or," and "not," or time delay equations to be used for advanced programming. Logic equations shall require the use of a PC with a software utility designed for programming.

i) The FCP or each network node shall provide the following features:

- Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.
- Detector sensitivity test.
- Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
- Nine sensitivity levels for alarm, selected by detectors. The system shall support sensitive advanced detection laser detectors. The system shall also include up to nine levels of Pre-alarm, selected by detector, to indicate impending alarms to maintenance personnel.
- The ability to display or print system reports.

- Alarm verification, with counters and a trouble indication to alert maintenance personnel when a detector enters verification 20 times.
- Rapid manual station reporting (under 3 seconds) and shall meet requirements for activation of notification circuits within 10 seconds of initiating device activation.
- Periodic detector test, conducted automatically by the software.
- Self-optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its pre-alarm level to just above normal peaks.
- Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
- Walk test, with a check for two detectors set to same address.
- Control-by-time for non-fire operations, with holiday schedules.
- Day/night automatic adjustment of detector sensitivity.
- Device blink control for sleeping areas.

j) Network Communication:

The FCP shall be capable of communicating on a Local Area Network (LAN), firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol.

11.1.4 Central Microprocessor

a) The microprocessor shall be a state-of-the-art, high speed, 16-bit RISC device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, Flash memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.

b) The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory and shall not be lost even if system primary and secondary power failure occurs.

c) The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system ,primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.

d) A special program check function shall be provided to detect common operator errors.

e) An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.

f) For flexibility and to ensure program validity, an optional Windows (TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download and have the ability to upgrade the manufacturers (FLASH) system code changes. This program shall also have a verification utility, which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in incompliance with the NFPA 72 requirements for testing after system modification.

11.1.5 System Display

a) The system shall support an 80-character display. The display shall include an 80- character backlit alphanumeric Liquid Crystal Display (LCD) and a full PC style QWERTY keypad.

b) The display shall provide all the controls and indicators used by the system operator:

- The 80-character display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.

c) The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

d) The display shall also provide Light-Emitting Diodes:

- The 80-character display shall provide 12 Light-Emitting-Diodes (LEDs) that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PRE-ALARM WARNING, SECURITY ALARM, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, ALARM SILENCED, Controls Active, Pre-Discharge, Discharge and Abort.

e) The display shall provide a QWERTY type of keypad:

- The 80-character display keypad shall be an easy-to-use QWERTY type of keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.

f) The system shall support the display of battery charging current and voltage on the 80character LCD display.

11.1.6 Signalling Line Circuits (SLC)

a) Each FACP or FACP network node shall support one SLC. Each SLC interface shall provide power to and communicate with up to 159 intelligent detectors (ionization, photoelectric or thermal) and 159 intelligent modules (monitor or control) for a loop capacity of 318 devices. SLC shall be capable of NFPA 72 Style 4, Style 6, or Style 7 (Class A or B) wiring.

b) CPU shall receive analogue information from all intelligent detectors to be processed to determine whether normal, alarm, pre-alarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analogue information shall also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.

11.1.7 Communication Interfaces

The system shall include two serial RS-232 interfaces. Each interface shall be a means of connecting peripherals.

The system shall also include a communication port to enable Ethernet TCP/IP (BACnet IP) protocol-based communication with the main security server.

11.1.8 Enclosures

The control panel shall be housed in a cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.

The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. For convenience, the door may be site configured for either right- or left-hand hinging.

11.1.9 Power Supply

The fire alarm panel and all associated field devices shall be provided with 24-hour standby battery capacity, with an additional 30 minutes of alarm operation.

Battery calculations must be submitted with panel technical data and approved prior to installation.

a) A high tech off-line switching power supply shall be available for the fire alarm control panel or network node and provide 6A of available power for the control panel and peripheral devices.

b) Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.

c) Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger for use with batteries which allow for 4hrs of uninterrupted power or may be used with an external battery and charger system. Battery arrangement may be configured in the field.

d) The power supply shall continuously monitor all field wires for earth ground conditions, and shall have the following LED indicators:

- Ground Fault LED
- AC Power Fail LED
- NAC on LED (4)

e) The main power supply shall operate on 240Vac, 50 Hz, and shall provide all necessary power for the FACP.

f) The main power supply shall provide a battery charger using dual-rate charging techniques for fast battery recharge and be capable of charging batteries up to which shall be sized to last 4hrs.

g) All circuits shall be power-limited, per UL864 requirements.

11.1.10 Auxiliary Field Power Supply – Addressable

a) The auxiliary addressable power supply is a remote 24Vdc power supply used to power Notification Devices and field devices that require regulated 24Vdc power. The power supply shall also include and charge backup batteries.

b) The addressable power supply for the fire alarm system shall provide up to a minimum of 6.0 amps of 24Vdc regulated power for Notification Appliance Circuit (NAC) power or 10 amps of 24Vdc general power. The power supply shall have an additional 0.5 amp of 24Vdc auxiliary power for use within the same cabinet as the power supply. It shall include an integral charger designed to charge backup batteries to last 4hrs.

c) The addressable power supply shall provide four individually addressable Notification Appliance Circuits that may be configured as two Class "A" and two Class "B" or four Class "B" only circuits.

d) The addressable power supply shall provide built-in synchronization for certain Notification Appliances on each circuit without the need for additional synchronization modules. The power supply's output circuits shall be individually selected for synchronization. A single addressable power supply shall be capable of supporting both synchronized and non-synchronized notification devices at the same time.

e) The addressable power supply shall operate on 240Vac, 50Hz.

f) The interface to the power supply from the Fire Alarm Control Panel (FACP) shall be via the Signalling Line Circuit (SLC) or other multiplexed means Power supplies that do not use an intelligent interface are not suitable substitutes. The required wiring from the FACP to the addressable power supply shall be a single unshielded twisted pair wire. Data on the SLC shall be transmitted between 24Vdc, 5Vdc and 0Vdc at approximately 3.33kbaud.

g) The addressable power supply shall supervise for battery charging failure, AC power loss, power brownout, battery failure, NAC loss, and optional ground fault detection. In the event of a trouble condition, the addressable power supply shall report the incident and the applicable address to the FACP via the SLC.

h) The addressable power supply shall have an AC Power Loss Delay option. If this option is utilized and the addressable power supply experiences an AC power loss, reporting of the incident to the FACP will be delayed. A delay time of zero, two, eight or sixteen hours shall be programmable.

i) The addressable power supply shall have an option for Canadian Trouble Reporting and this option shall be programmable.

j) The addressable power supply mounts in either the FACP back-box or its own dedicated surface mounted back-box with cover.

k) Each of the power supply's four output circuits shall be programmed for Notification Appliance Circuit or General Purpose 24Vdc power. Any output circuit shall be able to provide up to 2.5A of 24Vdc power.

l) The addressable power supply's output circuits shall be individually supervised when they are selected to be either a Notification Appliance Circuit when wired Class "A" or by the use of and end-of-line resistor. When the power supply's output circuit is selected as General 24Vdc power, the circuit shall be individually supervised when an end-of-line relay is used.

m) When selected for Notification Appliance Circuits, the output circuits shall be individually programmable for Steady, March Time, Dual Stage or Temporal.

n) When selected as a Notification Appliance Circuit, the output circuits of the addressable power supply shall have the option to be coded by the use of a universal zone coder.

o) The addressable power supply shall interface and synchronize with other power supplies of the same type. The required wiring to interface multiple addressable power supplies shall be a single unshielded, twisted pair wire.

p) An individual or multiple interfaced addressable power supplies shall have the option to use an external charger for battery charging. Interfaced power supplies shall have the option to share backup battery power.

11.1.11 Specific System Operations

a) Smoke Detector Sensitivity Adjust: A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window and have a minimum of 9 levels.

b) Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification delay shall be programmable from 0 to 60 seconds and each detector shall be able to be selected for verification. The FACP shall keep a count of the number of times that each detector has

entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

c) Point Disable: Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.

d) Point Read: The system shall be able to display or print the following point status diagnostic functions:

- Device status
- Device type
- Custom device label
- View analogue detector values
- Device zone assignments
- All program parameters

e) System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system status.

f) System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 800 events. Up to 200 events shall be dedicated to alarm and the remaining events are general purpose. Systems that do not have dedicated alarm storage, where events are overridden by non-alarm type events, are not suitable substitutes. Each of these activations will be stored and time and date stamped with the actual time of the activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety. The history buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable substitutes.

g) Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyse the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be enunciated on the system display, and printed on the optional printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.

h) Pre-Alarm Function: The system shall provide two levels of pre-alarm warning to give advance notice of a possible fire situation. Both pre-alarm levels shall be fully field adjustable. The first level shall give an audible indication at the panel. The second level shall give an audible indication and may also activate control relays. The system shall also have the ability to activate local detector sounder bases at the pre-alarm level, to assist in avoiding nuisance alarms.

i) Software Zones: The FACP shall provide 100 software zones, 10 additional special function zones, 10 releasing zones, and 20 logic zones.

j) The fire alarm control panel shall include a walk test feature. It shall include the ability to test initiating device circuits and notification appliance circuits from the field without returning to the panel to reset the system. Operation shall be as follows:

- Alarming an initiating device shall activate programmed outputs, which are selected to participate in walk test, for 3 seconds.
- Introducing a trouble into the initiating device shall activate the programmed outputs for
  8 seconds.
- All devices tested in walk test shall be recorded in the history buffer.

k) Water-flow Operation:

An alarm from a water-flow detection device shall activate the appropriate alarm message on the main panel display turn on all programmed notification appliance circuits and shall not be affected by the signal silence switch.

l) Supervisory Operation:

An alarm from a supervisory device shall cause the appropriate indication on the system display, light a common supervisory LED, but will not cause the system to enter the trouble mode.

m) Signal Silence Operation:

The FACP shall have the ability to program each output circuit (notification, relay, speaker etc.) to deactivate upon depression of the signal silence switch.

n) Non-Alarm Input Operation:

Any addressable initiating device in the system may be used as a non-alarm input to monitor normally open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.

11.2 Fire Detection Field Components

11.2.1 General

a) Addressable devices shall use simple to install and maintain decade, decimal address switches. Devices shall be capable of being set to an address in a range of 001 to 159.

b) Addressable devices, which use a binary-coded address setting method, such as a DIP switch, are not an allowable substitute. Addressable devices that require the address be programmed using a special tool or programming utility are not an allowable substitute.

c) Detectors shall be intelligent (analogue) and addressable and shall connect with two wires to the fire alarm control panel Signalling Line Circuits.

d) Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash green under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady red illumination by the control panel, indicating that an alarm condition has been detected. If required, the LED flash shall have the ability to be removed from the system program. An output connection shall also be provided in the base to connect an external remote alarm LED.

e) The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system. The panel on a time-of-day basis shall automatically adjust sensitivity.

f) Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance.

g) The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base options shall include a sounder base with a built-in (local) sounder rated at 85 DBA minimum, a relay base and an isolator base.

h) The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel.

i) Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).

j) Detectors will operate in an analogue fashion, where the detector simply measures its designed environment variable and transmits an analogue value to the FACP based on real time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analogue value of each detector.

k) Addressable devices shall store an internal identifying code that the control panel shall use to identify the type of device.

l) A magnetic test switch shall be provided to test detectors and modules. Detectors shall report an indication of an analogue value reaching 100% of the alarm threshold.

m) Addressable modules shall mount in a 100 mm square, 54 mm deep electrical box. An optional surface mount Lexan enclosure shall be available.

11.2.2 Addressable Manual Fire Alarm Box (Manual Call station)

a) Addressable manual fire alarm boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.

b) All operated stations shall have a positive, visual indication of operation and utilize a key type reset.

c) Manual fire alarm boxes shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word "FIRE" shall appear on the front of the stations in raised letters, 44 mm or larger.

11.2.3 Intelligent Photoelectric Smoke Detector

The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

11.2.4 Intelligent Thermal Detectors

Thermal detectors shall be intelligent addressable devices rated at 58°C and have a rate-of-rise element rated at 9.4°C per minute. It shall connect via two wires to the fire alarm control panel signalling line circuit.

11.2.5 Advanced Multi-Criteria Intelligent Detector

a) The intelligent multi criteria detector shall be an addressable device combining two sensing elements in a single sensing device providing the ability to detect two major elements of a fire. The detector design shall allow sensitivity setting between 1% and 4% per 30cm obscuration.

b) The detector shall include a photoelectric sensing element, thermal sensing element.

11.2.6 Addressable Control Module

a) Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered polarized audio/visual notification appliances.

b) The control module NAC may be wired for Style Z or Style Y (Class A/B) with a current rating of 2 Amps for Style Z and 3 Amps for Style Y.

c) Audio/visual power shall be provided by a separate supervised circuit from the main fire alarm control panel or from a supervised remote supply.

d) For multiple circuit control a module shall be available that provides 6 Style B or 3 Style D control circuits.

11.2.7 Addressable Releasing Control Module

a) An addressable Flash-Scan releasing module shall be available to supervise and control compatible releasing agent solenoids.

b) The module shall operate on a redundant protocol for added protection.

c) The module shall be configurable for Style Z or Style Y (Class A/B) and support one 24Vdc solenoids.

11.2.8 Addressable Relay Module

a) Addressable Relay Modules shall be available for HVAC control and other network building functions. The module shall provide two relays rated at up to 3 Amps resistive and up to 2.0 Amps inductive. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to ensure that 100% of all auxiliary devices energize at the same time on the same pair of wires.

b) For multiple relays control a module shall be available that provides 6 programmable relays.

11.2.9 Isolator Module

a) Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC Class A or Class B branch. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module shall be provided for each floor or protected zone of the building.

b) If a wire-to-wire short circuit occurs, the isolator module shall automatically open-circuit (disconnect) the SLC. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section.

c) The isolator module shall not require address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.

d) The isolator module shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

11.2.10 Batteries

a) The battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.

b) The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.

c) If necessary to meet standby requirements, external battery and charger systems may be used.

12 TESTING & COMMISSIONING

The testing of the system shall be done in the presence and to the satisfaction of an authorised representative of the Client and the Project Manager.

Tests shall include simulation of fire conditions in each zone to prove the efficiency of all aspects of the system to the satisfaction of the Client and Project Manager.

All equipment, material, etc., which may be necessary for these tests shall be supplied by the Contractor, including a suitable smoke generator.

The Contractor shall do his own complete commissioning tests before the actual first take-over tests are done. This is to satisfy himself that everything is working and is in accordance with the specification.

13 OPERATING & MAINTENANCE MANUALS

13.1 Operating Instructions

Instruction cards, clearly indicating the procedure to be followed in the event of a "FIRE" alarm, shall be supplied, and framed under Perspex in approved teak or non-ferrous material frames.

The instruction cards shall be in English and at least one other official language to be decided in conjunction with the client. The frame shall be neatly mounted on the walls alongside the control panel and external indicator panels respectively, where they can be clearly read.

In the case of the control panel, the instruction card shall also clearly state the procedure to be followed in the event of a "FAULT" alarm.

Four Sets of Operating and Maintenance Manuals shall be prepared in the form as suggested by BS 5839-1. All O&M Manuals and As-built drawings shall be supplied on USB in both PDF and native format with four sets of hard copies.

Plant schematics and wiring diagrams shall be the latest revision and shall be framed behind glass and displayed adjacent to switchboards.

The operating and maintenance manuals shall include but not be limited:

- Descriptive Information

  This section shall consist of but not be limited to;

  - General description,
  - Design parameters,
  - Building load,
  - Installed capacities,
  - Principal components,
  - Refrigeration piping distribution schematics
  - Air distribution schematics
  - Control schematics

- Electrical board schematics

- Equipment data

  This section shall consist of but not be limited to;

  - Equipment designation
  - Manufacturer and model
  - Manufacture local representative
  - Size and rating
  - Speed, pressure and temperature limitations

- Operating instructions

  This section shall consist of but not be limited to:

  - Starting and stopping procedures
  - Time switch functions
  - Seasonal adjustments
  - Sequence under loading and unloading
  - Normal operation and tripped conditions
  - Logs and records to be kept

- Inspection and maintenance

  This section shall consist of but not be limited to;

  - Inspection Schedules and Checklist.
  - Lubrication Schedules.
  - Air Filter Maintenance Schedules.
  - Routine Replacements, Adjustments and Calibrating.
  - Routine Cleaning, Painting and Protection.
  - Inspection and Maintenance Logs and Records to be kept.

- Reference documents

  This section shall consist of but not be limited to:

  - Tender Specification & Drawing List
  - As built Record Drawings
  - Test Reports
  - Commissioning Reports

- Equipment manufacturer data

  This section shall consist of but not be limited to:

  - Descriptive literature
    - Catalogue Cuts, Brochures or Shop Drawings
    - Dimensioned Drawings
    - Materials of Construction
    - Parts Designations
  - Operating characteristics
    - Performance Tables and Charts
    - Performance Curves
    - Pressure, Temperature, and Speed Limitations
    - Safety Devices
  - Operating Instructions
    - Pre-start Checklist
    - Start-up Procedures
    - Inspection during Operation
    - Adjustment and Regulation
    - Testing
    - Detection of Malfunction
    - Precautions
  - Inspection instructions procedures
    - Normal and Abnormal Operating Temperature, Pressure and Speed Limits.
    - Schedule and Manner of Operation
    - Detection Signals
  - Maintenance instructions procedures
    - Schedule of Routine Maintenance.
    - Procedures.
    - Troubleshooting Chart
  - Parts list
  - Service contracts

13.2 Maintenance

13.2.1 Allow for the maintenance of the complete installation for a period of TWELVE (12) MONTHS after 'practical' completion certificate has been issued by the Engineer. Visit the installation once a month on the basis of a proper preventive programme approved by the Engineer.

13.2.2 Report to an official nominated by the Client on arrival and again on leaving their premises on each visit. Such person, who has been nominated by the Client, shall sign a Service Report giving details of corrected temperature and humidity readings taken, etc.

13.2.3 At each service visit, maintenance personnel shall, inter alia, perform the following duties in addition to any other which may be necessary. Make good any defects as required in items of the guarantee given for the plant in terms of the specification.

13.2.4 Attend to any complaints made with respect to the installed plant by the authorized person mentioned in the foregoing. No other person shall have any right to instruct the Selected Subcontractor or make any complaint.

13.2.5 Instruct the Client's maintenance personnel on the attention required to any item requiring more frequent attention during the service visits.

13.2.6 A major service shall be executed in the sixth and twelfth month of the maintenance period shall be to the satisfaction of the Employer's Engineer. This major service shall include all annual servicing functions as recommended by the manufacturers of material and equipment supplied and/or installed under this contract.

13.3 As-Built Documentation and Handover

Upon project completion, the contractor shall submit:

- Final as-built drawings in CAD and PDF format,
- Cause-and-effect matrix,
- Panel configuration files and access passwords,
- Operation and Maintenance (O&M) Manual,
- Logbook per Clause 38 of SANS 10139,
- Test certificates and commissioning reports.
- Handover will not be accepted without full documentation and verification sign-off.

13.4 Guarantee

13.4.1 The *Contractor* shall guarantee the materials, apparatus and workmanship delivered and installed by him. The guarantee shall be valid for a period of twelve months starting on the date when the practical completion certificate is issued. The complete installation shall be guaranteed against defects as a result of patent and latent defects of the apparatus, as well as against faulty materials and workmanship. Fair wear and tear is excluded from the guarantee.

13.4.2 The guarantee shall provide for all parts, spares and appurtenances which become defective during the guarantee period, to be replaced free of charge to the Client. All costs of labour, out-of-town allowances, materials and transportation required to replace such part of a defective installation shall be borne by the Selected Subcontractor and shall be included in his guarantee. The Selected Subcontractor shall cede to the Client the remainder of any equipment guarantee which he has received from his suppliers, and which may extend beyond the period of twelve months mentioned herein.

13.5 Extended Guarantee

13.5.1 Where certain equipment have supplier's standard guarantee clauses of which do not correspond with the required guarantee of twelve (12) months, the Contractor shall allow in the tender price for the extension of guarantees and additional charges thereof, in order to comply with guarantee clause.

14 DOCUMENTATION & DRAWINGS

14.1 Block Plan

a) An approved block plan, indicating the zones and appropriate zone reference numbers, shall be installed at all control panels.

b) The block plan shall be discussed with the Fire Prevention Officer of the Department before manufacturing takes place.

c) The block plan shall have a professional appearance. Text shall be in English and at least one other official language to be decided in conjunction with the Department and the User Department. A freehand drawing or badly finished plan will not be acceptable.

d) The block plan shall clearly indicate the position of the zone in which a fire has started, when read together with the displays and indications on the control panel.

e) Non-fading material shall be used for the artwork. The block plan shall be mounted in a frame behind glass, or shall be covered with a transparent stick-on material, to protect the artwork.

f) The block plan shall be mounted in an approved position at the control panel.

g) For an addressable system, the addresses of all field devices shall be shown on the block plan.

14.2 Training Programme

The *Contractor* shall allow in their tender prices for a training course, to train on site at least four (4) persons, as nominated by the Client from his own operating personnel. The training shall be adequate for the installation, to ensure that operating staff fully understand the system. During this period, the personnel shall be made fully conversant with the operation of, and daily maintenance required for, each item of equipment of the system. The training, especially on computer equipment and control

panels, shall be of such a standard that will enable the client to carry out his own in-house training of other personnel.

The training course shall start only after first take-over inspection of the system.

The training course shall be carried out in English.

The O&M Manual of the contract shall include a full description of the contents of the training course, as referred to in clause above.

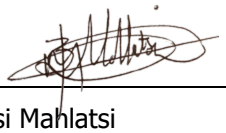
Annexures I - Technical Specification for Design, Supply, Delivery, Installation and Commissioning of Fire Detection system

REPORT	
For:	Technical Specification for Supply, Delivery, Installation and Commissioning of Fire Equipment system
Project Name:	Mechanical installation at Toulon Road Building in the Port of Durban
Project Number:	XNDE.0039
Author:	Moeketsi Mahlatsi
Owner:	Transnet
Client:	Transnet National Port Authority
Project Sponsor:	Transnet National Port Authority
Project Manager:	Sanelisiwe Shozi
Revision Number:	A
Approved by:	Aslam Haffejee
Release Date:	02-07-2025
Print Date:	02-07-2025
Template Date:	01/05/2012
Document No:	XNDE.0039-SP-003

Distribution	
Name:	Title:
	Engineering Manager

DOCUMENTATION DISTRIBUTION, REVISION AND APPROVAL HISTORY

REVISION NUMBER	DATE	DISTRIBUTION/ REVISION	PREPARED BY	REVIEWED BY	APPROVED BY
A	20-08-2025	CONSTRUCTION REVIEW	M.M	A.H	A.H

Prepared by:  20/08/2025

Moeketsi Mahlatsi Date

Reviewed by:  21/08/2025

Aslam Haffejee (senior Engineer) Date

Approved by:  21/08/2025

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Accepted by:

(Eng. Manager) Date

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ADDITIONAL SIGNATORIES (TNPA):

Accepted by:

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Date

Accepted by:

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Date

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1 GENERAL

The Contractor shall Supply, deliver, installation, testing and commission of the fire equipment system, consisting of a Fire Hose reel and fire hydrants for the fire water reticulation and fire extinguishers that complies with the requirements of SANS 10252-1, SANS 10400-T and subject to Local Fire Safety Authority acceptance.

2 DRAWINGS AND APPROVAL

Suitable layouts for the required fire services are indicated on the Employer's drawings referred to in the list of drawings below.

Drawing No.	Rev	Description
NT2137-249-501	05	GROUND FLOOR FIRE PROTECTION LAYOUT
NT2137-249-502	05	FIRST FLOOR FIRE PROTECTION LAYOUT

3 STANDARDS AND REGULATIONS

All works, equipment, and services described in this document shall comply with the latest published edition of the applicable South African National Standards (SANS):

REGULATION	DESCRIPTION
SANS 10252-1	Water supply and drainage for buildings Part 1: Water supply installations for buildings
SANS 10400	The application of the National Building Regulations
SANS 1128-1	Firefighting equipment Part 1: Components of underground and above-ground hydrant systems
SANS 1128-2	Firefighting equipment Part 2: Hose couplings, connectors and branch pipe and nozzle connections
SANS 543	Fire hose reels
SABS 62-1 (SANS 62-1)	Steel pipes Part 1: Pipes suitable for threading and of nominal size not exceeding 150 mm
SABS 62-2 (SANS 62-2)	Steel pipes Part 2: Screwed pieces and pipe fittings of nominal size not exceeding 150 mm
SABS 763 (SANS 32)	Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized coatings applied in automatic plants
SABS 810 (SANS 1910)	Dry Powder (DCP) Fire Extinguishers
SABS 064 (SANS 10064)	The preparation of steel surfaces for coating

SABS 630 (SANS 630)	Decorative high gloss enamel paints
SABS 0140-3 (SANS 10140-3)	Identification colour markings Part 3: Contents of pipelines
SANS 1186-5	Symbolic safety signs Part 5: Photoluminescent signs

4 PIPES AND FITTINGS

The *Contractor* shall ensure that all piping, fittings and valves used in the installation be new and of an accepted type capable of withstanding a test pressure of 1500 kPa but not less than 1.5 times the maximum working pressure of the installation and maintain such test pressure for at least 1 hour.

The *Contractor* shall ensure that all rigid piping be non-galvanised mild steel manufactured in accordance with SANS 62 (medium grade), unless otherwise specified and shall be new or unused.

The *Contractor* shall ensure that all pipes shall be free of rust, flakes or other faults. Notwithstanding the above stipulations, the *Contractor* shall ensure that all underground pipes shall be HDPE with suitable transition connectors to metal above ground pipes in accordance with SANS 763.

5 PIPE JOINTS

The *Contractor* shall ensure that all threaded pipe joints shall be made with an accepted cold-water pipe-jointing compound and flanges when used shall be bolted together with accepted gaskets. Pipe threads shall be standard right-hand Whitworth. Mechanical pipe-joints i.e. "Klambon", "Victaulic", or other pipe joints accepted by the *Project Manager* may be used provided they have been installed strictly in accordance with the instructions of the manufacturer.

6 CUTTING OF PIPES

The *Contractor* is warned that, when using conventional pipe cutters, all burrs and lips are to be removed by proper reaming of the cut end before threading to ensure that the original diameter is obtained.

The *Contractor* shall ensure any pipes with ends of reduced diameter found on the Site shall be removed and the *Contractor* may be required to dismantle completed work so as to convince the *Project Manager that* no such pipes were used elsewhere in the installation.

7 WELDING

The *Contractor* shall ensure welding in-situ without the prior permission of the *Project Manager* and without necessary "hot work permit" shall not be permitted.

The *Contractor* shall ensure welded joints shall be properly machined and the use of a welding torch for making holes shall not be permitted. Distribution pipes with welded crosses and tees shall be provided with female thread so that the branch pipes can be connected in the conventional way. All welded joints shall be hydraulically tested to 1500 kPa but not less than 1.5 times the maximum working pressure of the installation and maintain such test pressure for at least 1 hour.

Welded joints in branch pipes will not be permitted.

8 WATER SUPPLY

A single water supply connection with a nominal diameter of 150mm, connecting from the water mainline must be provided. This water will be supplied from the municipal line directly into the main header supply for the building. The position, excavation and backfill must be coordinated with the Contractor, via the civil engineering layouts for connection to the internal supply line. Isolation valves, pressure gauges to be installed for the maintenance or troubleshooting.

The *Contractor* shall, from this point on, commence with the supply and installation of all manifolds, piping, valves, etc. as required to complete the works listed above.

9 PRESSURE GAUGES

The *Contractor* shall ensure that all pressure gauges used comply with the latest edition of the SANS standards.

The *Contractor* shall supply and install the above-mentioned pressure gauges onto the Feeder main of the fire hose reel reticulation at each fire hose reel as indicated in the list of detail drawings to facilitate periodic testing of the Equipment.

All pressure gauges installed shall have not less than 100 mm face diameter with porcelain faces registering 1500 kPa.

Their connections shall be taken from purpose made outlets on the valves and shall comprise a "U" tube without any fittings (elbows etc.) with all bends neatly executed.

The gauges shall be fitted upright with brass shut-off cocks or other accepted means of shut-off so as to permit their removal under pressure, if required.

10 SLEEVES AND PIPE SUPPORTS

The *Contractor* shall ensure that, where so required, positions and quantities are indicated on drawings and provided to the Project Manager timeously.

The *Contractor* shall supply and install all pipe supports, clamps and other suspension fittings.

All pipe supports and suspension fittings and the spacing thereof shall comply with the requirements as laid out in the SANS standards and in accordance to the manufacturer's recommendations.

All components forming part of the pipe support assembly shall be mild steel construction with hot dip galvanised or zinc electroplated finish.

All rising mains shall be secured by means of pipe clamps equal or accepted equivalent to Cabstrut split clamps.

The *Contractor* shall provide a drawing showing full details of the sizes and manner of the suspension fittings, to the Project Manager for its acceptance.

11 TESTING

The Fire water reticulation installation shall be tested in accordance with SANS 10252-1, and any defect made good.

12 PAINTING

The *Contractor* shall paint all new portions of the fire hose reel pipework. Before painting is undertaken, all work shall be thoroughly cleaned of rust, scale, etc., by brushing with a stiff wire brush wherever necessary. A prime coat of high-quality zinc chromate primer shall be applied before delivery to the Site. After installation, all fittings shall also be primed with zinc chromate primer and where the primer has come off the pipes, these shall be re-primed where-after two coats of high gloss paint shall be applied. Unless otherwise specified, the colour of the high gloss paint shall be similar to signal red as per SANS regulations.

The final coat of paint shall be applied only after the system has been tested, but before the ceiling boards are installed. The final coat shall not be applied without the express consent of the Contractor. Pipe supports and other fittings, which are not directly in contact with the pipe work, shall be painted the same colour as the ceilings

13 INFORMATION REQUIRED WITH TENDER

The *Contractor* shall supply the information as requested in the Schedule of Equipment and Materials (supplied later for tender), together with their Offer.

14 FIRE EQUIPMENT AND CUPBOARDS

14.1 Fire Hydrants

The new Fire hydrants shall comply with SANS 1128 and as per fire suppression drawings to the acceptance of the local Fire Brigade and in accordance with SANS 10400 as specified.

14.2 Hydraulic Performance Requirements

- Each hose reel shall deliver a minimum of 30 L/min at 300 kPa at the nozzle.
- Each hydrant shall deliver a minimum of 1,200 L/min at 300 kPa measured at the branch pipe nozzle.
- Hydraulic calculations must be submitted to prove compliance and shall consider simultaneous flow for the worst-case scenario.

14.3 Fire Equipment Cupboards

Where hose reels or extinguishers are installed in cupboards or cabinets, these enclosures shall be:

- Constructed from non-combustible materials
- Lockable, with fire safety break glass access
- Ventilated to prevent condensation damage
- Cabinetry shall conform to SANS 1475-2 and local fire department recommendations.

14.4 Fire hose reels:

The fire hose reels shall be 30 meter long, 20 mm diameter fire hoses reels of the (non-swivel type) that comply with SANS 543, including all valves, pressure gauges nossels, etc., all are accepted by the Local Fire Safety Authority and in accordance with SANS 10400 as specified.

The *Contractor* shall fix the fire hose reels against walls with new 10 mm diameter hook or rag bolts, not less than 150 mm long and built into walls in 3:1 cement mortar.

The *Contractor* shall install the fire hose reels so that the centre of each fire hose reel is 1500 mm above finished floor level.

The *Contractor* shall install the wall brackets and dust cover for the hose reels.

The *Contractor* shall commission, test and certify compliance to statutory regulations of the entire fire hose reel installation.

14.5 Fire extinguishers

The *Contractor* shall supply, install and commission a number and type of fire extinguishers as indicated on the List of Drawings.

The fire extinguishers shall all be in accordance with SANS 10400 and to the acceptance of the local Fire Safety Authority.

The *Contractor* shall install extinguishers on appropriate accepted wall mounted hangers complete with timber backing board, with the handle height at 900 mm above floor level.

All new extinguishers shall be of the refillable handheld portable types according to the capacities indicated.

a) 6l Wet chemical extinguishers in the kitchen area in accordance with SABS Specification 810.

b) 4.5kg Dry Chemical Powder extinguishers accepted by the Project Manager.

All the fire extinguishers shall be installed as per fire suppression drawings.

Portable fire extinguishers shall be installed at:

- Maximum travel distances of 15 m for Class A & B risks
- Within 10 m of flammable liquid or electrical equipment
- Along escape routes and near final exits
- Placement shall comply with SANS 10400-T:2024 Table 1 and be indicated on fire strategy drawings. Under-specification of extinguishers will not be accepted.

15 MARKING AND SIGNPOSTING

The safety signage shall all be in accordance with SANS 1186-5 and be to the acceptance of the local Fire Safety Authority.

16 OPERATING AND MAINTENANCE INSTRUCTIONS

The *Contractor* shall ensure there are no leakages in the system during operation of the system. The system shall be subjected test pressure of 1500kpa, but not less than 1.5 times the maximum working pressure of the installation and maintain such test pressure for at least 1 hour.

Four Sets of Operating and Maintenance Manuals shall be prepared in the form as suggested in and As-built drawings shall be supplied on USB in both PDF and native format with four sets of hard copies.

Plant schematics and wiring diagrams shall be the latest revision and shall be framed behind glass and displayed adjacent to switchboards.

The operating and maintenance manuals shall include but not be limited:

- Descriptive Information

  This section shall consist of but not be limited to:

  - General description,
  - Design parameters,
  - Building load,
  - Installed capacities,
  - Principal components,
  - Refrigeration piping distribution schematics
  - Air distribution schematics
  - Control schematics
  - Electrical board schematics

- Equipment data

  This section shall consist of but not be limited to:

  - Equipment designation
  - Manufacturer and model
  - Manufacturer local representative
  - Size and rating
  - Speed, pressure, and temperature limitations

- Operating instructions

This section shall consist of but not be limited to:

- Starting and stopping procedures
- Time switch functions
- Seasonal adjustments
- Sequence under loading and unloading
- Normal operation and tripped conditions
- Logs and records to be kept

- Inspection and maintenance

  This section shall consist of but not be limited to;

  - Inspection Schedules and Checklist.
  - Lubrication Schedules.
  - Air Filter Maintenance Schedules.
  - Routine Replacements, Adjustments and Calibrating.
  - Routine Cleaning, Painting and Protection.
  - Inspection and Maintenance Logs and Records to be kept.

- Reference documents

  This section shall consist of but not be limited to;

  - Tender Specification & Drawing List
  - As built Record Drawings
  - Test Reports
  - Commissioning Reports

- Equipment manufacturer data

  This section shall consist of but not be limited to;

  - Descriptive literature
    - Catalogue Cuts, Brochures or Shop Drawings
    - Dimensioned Drawings
    - Materials of Construction
    - Parts Designations
  - Operating characteristics
    - Performance Tables and Charts
    - Performance Curves
    - Pressure, Temperature, and Speed Limitations
    - Safety Devices
  - Operating Instructions
    - Pre-start Checklist
    - Start-up Procedures
    - Inspection during Operation
    - Adjustment and Regulation

- Testing
- Detection of Malfunction
- Precautions

- Inspection instructions procedures
  - Normal and Abnormal Operating Temperature, Pressure and Speed Limits.
  - Schedule and Manner of Operation
  - Detection Signals
- Maintenance instructions procedures
  - Schedule of Routine Maintenance.
  - Procedures.
  - Troubleshooting Chart
- Parts list
- Service contracts

17 MAINTENANCE

17.1 Allow for the maintenance of the complete installation for a period of TWELVE (12) MONTHS after 'practical' completion certificate has been issued by the Engineer. Visit the installation once a month on the basis of a proper preventive programme approved by the Engineer.

17.2 Report to an official nominated by the Client on arrival and again on leaving their premises on the occasion of each visit. Such person, who has been nominated by the Client, shall sign a Service Report giving details of corrected temperature and humidity readings taken, etc.

17.3 At each service visit, maintenance personnel shall, inter alia, perform the following duties in addition to any other which may be necessary.

17.3.1 Check all control systems and safety devices, air flow switches, manometers, etc. for correct functioning and replace defective items or any other items as necessary.

17.3.2 Make good any defects as required in items of the guarantee given for the plant in terms of the specification.

17.3.3 Attend to any complaints made with respect to the installed plant by the authorized person mentioned in the foregoing. No other person shall have any right to instruct the Selected Subcontractor or make any complaint.

17.3.4 Instruct the Client's maintenance personnel on the attention required to any item requiring more frequent attention during the service visits.

17.3.5 A major service shall be executed in the sixth and twelfth month of the maintenance period and shall be to the satisfaction of the Employer's Engineer. This major service shall include all annual servicing functions as recommended by the manufacturers of material and equipment supplied and/or installed under this contract.

17.4 Maintenance and Inspection Requirements:

17.4.1 Fire extinguishers and hose reels shall be maintained in accordance with SANS 1475-1.
17.4.2 Monthly visual inspections and annual servicing shall be logged in a fire equipment register kept on-site.
17.4.3 All servicing and refilling must be done by a SABS-registered fire equipment servicing company, with valid permits.
17.4.4 Inspection tags shall be securely attached to each unit and updated after each service.

18 GUARANTEE

18.1 The *Contractor* shall guarantee the materials, apparatus and workmanship delivered and installed by him. The guarantee shall be valid for a period of twelve months starting on the date when the practical completion certificate is issued. The complete installation shall be guaranteed against defects as a result of patent and latent defects of the apparatus, as well as against faulty materials and workmanship. Fair wear and tear is excluded from the guarantee.

18.2 The guarantee shall provide for all parts, spares and appurtenances which become defective during the guarantee period, to be replaced free of charge to the Client. All costs of labour, out-of-town allowances, materials and transportation required to replace such part of a defective installation shall be borne by the Selected Subcontractor and shall be included in his guarantee. The Selected Subcontractor shall cede to the Client the remainder of any equipment guarantee which he has received from his suppliers and which may extend beyond the period of twelve months mentioned herein.

19 EXTENDED GUARANTEE

19.1 Where certain equipment have supplier's standard guarantee clauses of which do not correspond with the guarantee Clause 17.3.4, the *Contractor* shall allow in the tender price for the extension of guarantees and additional charges thereof, in order to comply with guarantee clause.

Annexures K - Engineering Drawing Standards

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ENGINEERING DRAWING STANDARDS



MAWABO TYEBI

DOCUMENTATION CONTROL PAGE

Document Control

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Version History

Version No.	Date	Changed By	Nature of Amendment
1	23 Apr. 24		First draft

Signatories

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1. PURPOSE

The purpose of this document is to ensure that all CAD files and drawings are created in a logical and consistent format, and in a manner reflecting consistent design and drawing practice during the execution of capital and maintenance projects within Transnet National Ports Authority (TNPA).

2. SCOPE AND OBJECTIVES

This standard applies to all capital and maintenance engineering and design drawings, and to be applied by engineering personnel within Transnet National Ports Authority (TNPA), as well as external contractors and consultants appointed by TNPA, whom are responsible for developing, creating and issuing drawings.

All engineering staff, Contractors and Consultants that are involved in the production of drawings for TNPA, will be issued with this standard and must ensure compliance. It is noted that where fabrication shop details are required, it is not necessary for the contractor to comply with these standards and their own draughting packages may be used. However, TNPA templates should be used for all submissions.

General drawing practice shall comply with current discipline-specific South African Standards.

2.1 Applicability

These Guidelines are applicable to all TNPA Ports.

2.2 Deviations

Where existing infrastructure and project specific conditions require deviation from this document, such deviations must be approved by the relevant Drawing Office Manager of TNPA.

3. LEGISLATION, REGULATION AND REFERENCE DOCUMENTS

- ISO 216: Writing Paper and certain classes of printed matter.
- ISO 9001: Quality management systems- Requirements
- SANS 10144: Detailing of steel reinforcement for concrete.
- SANS 10143: Building Drawing Practice
- SANS 1044-2: Welding Part II: Symbols
- SANS 10111: Engineering Drawing Part 1,2 and 3
- SANS 282: Bending dimensions of bars for concrete reinforcement.
- South African Institute of Steel Construction (SAISC) Standard

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- BS 3939: Graphical symbols for electrical power, telecommunications, and electronic diagrams
- ENG-P-0105: Engineering Drawings *(Referenced procedure to be revised and assigned a new document number)*.
- ENG-GL-0103: Revision of Technical Documents *(Reference procedure to be revised and assigned a new document number).*

4. RESPONSIBILITY

Administrators of the Drawing Standards are responsible for monitoring the implementation of the Standards and ensuring adherence to the Standards.
Any proposed changes to the Drawing Standards must be submitted to the TNPA' Centre of Excellence (COE) for review and approval. Final approval vests with the COE and subject to the extent of the variations, final approval shall be the responsibility of the Centre of Excellence (where deemed necessary).

5. PROCEDURE

This standard should be read together with Engineering Procedure ENG-P-0105: Engineering drawings and ENG-GL-0103 *(Referenced procedure to be revised and assigned a new document number).*

6. DRAWING STANDARDS

6.1 Glossary of Terms

COE	Centre Of Excellence
TNPA	Transnet National Ports Authority
IED	Infrastructure Engineering Design
ISO	International Standards Organization
SANS	South African National Standards
2D	Two Dimensional
3D	Three Dimensional
CAD	Computer Aided Design
DGN	MicroStation format graphics files and suffix
DWG/DXF	AutoCAD format graphics files and suffix
RVT	Revit format graphics files and suffix
DR4	Civil Designer format graphics files and suffix

6.2 Software

Only the most current versions of software shall be used, and the type to be used is subject to the nature of the project end expected end results.
All Civil Engineering related drawing work can be executed in AutoCAD, MicroStation and Civil Designer. Drawing work that has Building, Structural, Marine, Mechanical and Electrical infrastructure can be drawn with the use of Revit and AutoCAD. In cases where an alternative software is used, it should be compatible with the aforementioned software without tempering with the accuracy of contents of the drawing and the CAD standards.

6.3 Units

All drawings will conform to SI units (Systems International).
In model space, objects should be drawn in real world units. i.e., 1 unit = 1 meter.

6.4 Language

All notes, comments and text will be in the English language (UK Standard)
All instructions on a drawing shall be in the imperative tense i.e.: Pipe to be cut, connection to be welded, etc.

6.5 Templates

A template with all title blocks, text attributes, layer or level controls must be used when starting a new drawing. Templates are set up for each specific discipline i.e., Civil must use their specific templates, Architects their specific template etc. These discipline specific templates contain the discipline specific layer or level control.

Drawings/models must be done in model space. Viewports must then be created in the paper space at the required scale.

General notes must be done in paper space i.e., on the actual drawing sheet and any additional notes specific to the contents of the drawing to be done in model space. Text size and font to be maintained throughout

6.6 Drawing Sizes

The drawing sheet sizes tabled below are of the international Standards ISO 216:

Designation	Trimmed Size (W x L)
A0	841 x 1189
A1	594 x 841
A2	420 x 594
A3	297 x 420
A4	210 x 297

Table 1: Sheet Sizes

Long drawings, where necessary for wiring/circuit diagrams, cable run diagrams, track layouts etc. shall be prepared with widths equal to the widths of "A" series sheets, as required.

6.7 Scales

The requirements of scale settings are as follow:
When using model space, the design must always be full size, i.e., active scale = 1:1.
The title block shall not be scaled.

The viewport will be created on the drawing sheet (in paper space) and scaled to the required scale, rather than trying to scale the drawing sheet to a scale.

In the case of non-dimensional drawings such as diagrammatic drawings, the viewport must be scaled to suit the drawing sheet.

Where there are different scales in a drawing, it is preferred to indicate "AS SHOWN" in the title block to prevent errors.

Different vertical and horizontal scales may be chosen in order to exaggerate a profile or to clarify thin layers of a section.

The preferred scales are:

1:1	1:2	1:5
1:10	1:25	1:50
1:100	1:20	1:500
1:1000	1:200	1:5000
1:10000	1:2000	1:50000
1:100000	1:20000	

Table 2: Drawing Scales

6.8 Draw Scales

The following tables will assist in selecting the correct text size, dim scale, and XP Scales.

Draw scale = 1:1 (mm)

Required Scale	Dim Scale	XP Scale	Text Size				
			1.8	2.5	3.5	5	7
1:1	1	1	1.8	2.5	3.5	5	7
1:2	2	0.5	3.6	5	7	10	14
1:5	5	0.2	9	12.5	17.5	25	35
1:10	10	0.1	18	25	35	50	70
1:20	20	0.05	36	50	70	100	140
1:25	25	0.04	45	62.5	87.5	125	175
1:30	30	0.0333	54	75	105	150	210
1:50	50	0.02	90	125	175	250	350
1:100	100	0.01	180	250	350	500	700
1:200	200	0.005	360	500	700	1000	1400
1:250	250	0.004	450	625	875	1250	1750
1:500	500	0.002	900	1250	1750	2500	3500
1:1000	1000	0.001	1800	2500	3500	5000	7000
1:2000	2000	0.0005	3600	5000	7000	10000	14000
1:2500	2500	0.0004	4500	6250	8750	12500	17500
1:5000	5000	0.0002	9000	12500	17500	25000	35000
1:10000	10000	0.0001	18000	25000	35000	50000	70000

Table 3: Draw Scales (1:1) mm

Draw scale = 1:1000 (m)

Required Scale	Dim Scale	XP Scale	Text Size				
			1.8	2.5	3.5	5	7
1:1	0.001	1000	0.0018	0.0025	0.0035	0.005	0.007
1:2	0.002	500	0.0036	0.005	0.007	0.01	0.014
1:5	0.005	200	0.009	0.0125	0.0175	0.025	0.035
1:10	0.01	100	0.018	0.025	0.035	0.05	0.07
1:20	0.02	50	0.036	0.05	0.07	0.1	0.14
1:25	0.025	40	0.045	0.0625	0.0875	0.125	0.175
1:30	0.03	33.3333	0.054	0.075	0.105	0.15	0.21
1:50	0.05	20	0.09	0.125	0.175	0.25	0.35
1:100	0.1	10	0.18	0.25	0.35	0.5	0.7
1:200	0.2	5	0.36	0.5	0.7	1	1.4
1:250	0.25	4	0.45	0.625	0.875	1.25	1.75
1:500	0.5	2	0.9	1.25	1.75	2.5	3.5
1:1000	1	1	1.8	2.5	3.5	5	7
1:2000	2	0.5	3.6	5	7	10	14
1:2500	2.5	0.4	4.5	6.25	8.75	12.5	17.5
1:5000	5	0.2	9	12.5	17.5	25	35
1:10000	10	0.1	18	25	35	50	70

Table 4: Draw Scale (1:1000) m.

XP Scale = Draw Scale / Plot Scale

Dim Scale = Plot Scale / Draw Scale

Text Size = Plot Scale / Draw Scale x Text Size required

Draw Scale = 1 if you are drawing in millimetres, 1000 if you are drawing in meters.

Plot Scale = The scale that you wish your drawing to be plotted at e.g., 1:50, 1:50 000

Text Size = The size that you need to draw the text entities at.

Text Size required = The size of the text that you require on your print.

6.9 Text Attributes

All text in drawings should be in the respective layer of the service/structure they belong to i.e., *C_EX_SEWER TXT, A_N_BR TXT* and shall be as described in the table below. All text properties (font size, width factor, font type and colour) contained in the title block shall not be tempered with and all properties be as per template drawing.

FONT TYPE AND FONT SIZE USAGE GUIDELINE

Item	Font Type	Colour	Text Width Factor	Font Size (mm) (when viewed on Paper Space)
Drawing Title Heading	Arial Narrow	Green (3)	1	5
Drawing Title Scale	Arial Narrow	Yellow (2)	1	2.5
Notes on Site Layouts	Arial Narrow	Green (3)	1	2.5
Dimensions	Arial Narrow	Green (3)	1	2.5
Existing Structures and Services (not affected by scope)	Arial Narrow	Grey (8)	0.7	2.5
Existing Structures and Services (part of scope)	Arial Narrow	Red (1)	1	2.5
New Structures and Services	Arial Narrow	Green (3)	1	2.5
Grid (Civil)	Arial Narrow	Grey (8)	1	3.5
Grid (Building)	Arial Narrow	Red (1)	1	3.5
ERF Numbers	Arial Narrow	Grey (8)	1	5

Table 5: Font Types and Sizes

6.10 Dimensioning

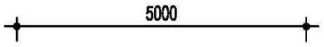
Dimensions should comprise the following properties:

- All detailed dimensions shall be in millimetres.
- All elevations shall be in metres up to 3 decimal places, and clearly indicated, i.e.: EL 23.000 m
- Co-ordinates shall be stated in metres to 3 decimal places.
- Dimensioning must be done whilst in paper space, in an active viewport. This is done so that the dimension size will always be consistent in scale i.e., it will be relative in scale to the scale that the viewport is set at.
- Dimensions are not to be exploded.
- Text size to suit text attributes as tabled in clause 6.9 above.
- Arrow sizes should be 2.5mm when viewed on paper. If it is deemed necessary, standard text sizes should be applicable to arrow/leader sizes, i.e., 1.8mm, 2.5mm, 3.5mm etc.

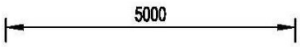
Examples:



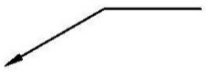
Dimension with oblique line



Dimension with dot



Dimension with arrow



Leader

Figure 1: Dimension Styles

6.11 Hatching

All hatching to be done in accordance with SANS 10143 as a first preference. Specialist hatching can be used where deemed necessary

6.12 Standard Pen Thicknesses

PEN NO. & LINE COLOR		LINE THICKNESS	
1. RED		0.13	
2. YELLOW		0.25	
3. GREEN		0.35	
4. CYAN		0.5	
5. BLUE		0.7	
6. MAGENTA		0.15	
7. WHITE		0.25	
8. DARK GREY		0.05	
9. LIGHT GREY		0.13	

Figure 2: Pen Palette (All Black)

The standard colours indicated above should be printed in black. In cases where a colour print is necessary, the rest of the pen palette can be utilized as needed. It is preferable for existing elements to be drawn in a light colour. e.g., colour 8 (Dark grey), and newer elements to be drawn in colour 3,4, and 5.

6.13 Layer Control

Standard layers with their own identities will be used in all drawings, indicating if *New or Existing*. The following categories apply:

a) Common layers (without discipline prefix)
b) Architectural layers (A_)
c) Civil layers (C_)
d) Structural layers (S_)
e) Electrical, light and power layers (E_)
f) Mechanical layers (M_)
g) Overhead Track Equipment layers (O_)
h) Signal layers (N_)
i) Telecommunications layers (V_)
j) Perway layers (P_)
k) G.I.S. / Land surveying layers (G_)

There are no specific layers set out in this document; save to say that text and all different objects and features must be named in its own layer.

Should further Layers or Levels be required the discipline specific prefix should be used.

LAYER NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
0	STANDARD LAYER	WHITE	CONT	MONO	YES
VPORT	VIEWPORTS IN LAYOUTS	254	CONT	NORMAL	NO
FRAME	TITLE BLOCK FRAME	WHITE	CONT	MONO	YES
LOGOS	LOGO LAYER	WHITE	CONT	MONO	YES

Table 6: Common Layers

It is not preferred to use any of the layers above for discipline specific layers. All layers should be categorized by the discipline, new or existing and the service or structure to which they present.

LAYER NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
A_N_BR	NEW BRICKWALLS	RED	CONT	MONO	YES
A_X_BR	EXTG BRICKWALLS	YELLOW	CONT	MONO	YES
A_X_BR-TXT	NEW BRICKWALL TEXT	GREEN	CONT	MONO	YES
A_N_CONC	NEW CONCRETE	GREEN	CONT	MONO	YES
A_X_CONC	EXTG CONCRETE	YELLOW	CONT	MONO	YES
A_DOOR	DOORS	MAGENTA	CONT	MONO	YES
A_FIT	FITTINGS	CYAN	CONT	MONO	YES
A_FLFIN	FLOOR FINISH	8	CONT	MONO	YES
A_GRID	GRIDLINES	9	CENTRE	MONO	YES
A_HIDE	HIDDEN LINES	CYAN	HIDDEN	MONO	YES
A_N_PART	NEW PARTITIONS	BLUE	CONT	MONO	YES
A_X_PART	EXTG PARTITIONS	YELLOW	CONT	MONO	YES
A_REM	DEMOLISH/REMOVE	9	DASHED	MONO	YES
A_WIN	WINDOWS	MAGENTA	CONT	MONO	YES
A_SITE	SITE AND LOCALITY PLANS	RED	CONT	MONO	YES
A_DIM	DIMENSIONS	RED	CONT	MONO	YES
A_BR-N2	CAVITIES	RED	CONT	MONO	YES
A_SEW	DRAINAGE PLAN	GREEN	CONT	MONO	YES
A_SW	STORMWATER PLAN & SECTION	RED	CONT	MONO	YES
A_BL	BUILDING LINE	8	HIDDEN	MONO	YES

Table 7: Typical Architectural Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
C_X_BENCH	BENCHMARKS	WHITE	CONT	MONO	YES
C_N_BLD	PROPOSED BUILDINGS	GREEN	CONT	MONO	YES
C_X_BLD	EXISTING BUILDINGS	RED	CONT	MONO	YES
C_N_CHAIN	CHAINGE	MAGENTA	CONT	MONO	YES
C_N_CULV	PROPOSED CULVERTS	GREEN	CONT	MONO	YES
C_X_CULV	EXISTING CULVERTS	MAGENTA	CONT	MONO	YES
C_X_FNC-PC	EXISTING FENCING- PRECAST	MAGENTA	DIVIDE	MONO	YES
C_X_FNC-ST	EXISTING FENCING-STEEL/WIRE	CYAN	FENCE3	MONO	YES
C_N_FNC-PA	FENCING-PALISADE	YELLOW	FENCE2	MONO	YES
C_N_FNC-PC	FENCING-PRECAST CONCRETE	YELLOW	DIVIDE	MONO	YES
C_N_FNC-ST	FENCING-STEEL/WIRE	YELLOW	FENCE3	MONO	YES
C_GRID	GRID LINES	251	CONT	MONO	YES
C_N_KERB	PROPOSED KERBING	GREEN	CONT	MONO	YES
C_X_KERB	EXISTING KERBING	8	CONT	MONO	YES
C_N_PAV	NEW PAVING	WHITE	CONT	MONO	YES
C_N_SEW	PROPOSED SEWER	40	DASH/DOT	MONO	YES
C_X_SEW	EXISTING SEWER	41	DASH/DOT	MONO	YES
C_N_SW	PROPOSED STORMWATER	150	DIVIDE	MONO	YES
C_N_SW-TXT	PROPOSED STORMWATER TEXT	GREEN	CONT	MONO	YES
C_X_SW	EXISTING STORMWATER	151	DIVIDE	MONO	YES
C_X_SW-TXT	EXISTING STORMWATER TEXT	RED	CONT	MONO	YES

Table 8: Typical Civil Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
S_STEEL1	DETAIL1:5/1:10	GREEN	CONT	MONO	YES
S_STEEL2	PLAN/SECT/ELEV	WHITE	CONT	MONO	YES
S_STEEL3	DET/PLAN/SECT	YELLOW	DASHED	MONO	YES
S_STEEL4	DETAIL1:2	CYAN	CONT	MONO	YES
S_STEEL5	PLAN/SECT/ELEV	RED	CONT	MONO	YES
S_STEEL6	PLAN/SECT/ELEV	RED	DASHED	MONO	YES
S_STEEL7	DETAILS	YELLOW	DASHED	MONO	YES
S_STEEL8	EXISTING	RED	DASH/DOT	MONO	YES
S_CONC1	FOUND/PLAN	GREEN	CONT	MONO	YES
S_CONC2	REBAR DETAIL	GREEN	CONT	MONO	YES
S_CONC3	REBAR FOUND	YELLOW	CONT	MONO	YES
S_CONC4	REBAR FOUND	YELLOW	DASHED	MONO	YES
S_CONC5	REBAR FOUND	WHITE	CONT	MONO	YES
S_WALLS	WALLS	RED	CONT	MONO	YES
S_HATCH	PROPOSED HATCH	8	CONT	MONO	YES
S_HATCH EX	EXISTING HATCH	15	CONT	MONO	YES
S_SLABLINE	SLAB LINE	MAGENTA	CONT	MOMO	YES
S_REBAR	REBAR	CYAN	CONT	MONO	YES
S_COLUMN	COLUMN PLAN	GREEN	CONT	MONO	YES

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
S_CONC	CONCRETE SECTION	CYAN	CONT	MONO	YES
S_REBAR	REBAR SECTION	RED	CONT	MONO	YES
S_DIMENSIO	DIMENSION	RED	CONT	MONO	YES
S_BEAM_DS	BEAM DS	BLUE	CONT	MONO	YES
S_BEAM_US	BEAM US	BLUE	CONT	MONO	YES

Table 9: Typical Structural Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
E_CABLE	ELECTRICAL CABLES BELOW SURFACE	222	ELEC-1	MONO	YES
E_CDUCT	DOWN CONDUCTORS	BLUE	CONT	MONO	YES
E_COND	CONDUITS	WHITE	DASH	MONO	YES
E_DBOARD	DISTRIBUTION BOARDS	YELLOW	CONT	MONO	YES
E_EARTH	EARTH SPIKE	RED	CONT	MONO	YES
E_EX	EXISTING ELECTRICAL	9	CONT	SCREEN60	YES
E_LUM	LUMINAIRES	RED	CONT	MONO	YES
E_PSKIRT	POWER SKIRTING	245	DASH	MONO	YES
E_REM	REMOVED/OBSOLETE ELEC ITEMS	CYAN	DASH	MONO	YES
E_SW-SOC	LIGHT SWITCHES, SOCKET OUTLETS	WHITE	CONT	MONO	YES
E_WIRE	ELECTRICAL WIRING	YELLOW	CONT	MONO	YES
E_ELP	ELECTRICAL LIGHT POLE	RED	CONT	MONO	YES
E_HLM	HIGH LIGHT MAST	RED	CONT	MONO	YES

Table 10: Typical Electrical Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
M_AIRCON	AIRCONDITIONERS	MAGENTA	CONT	MONO	YES
M_DUCT	AIRCON DUCTING	WHITE	CONT	MONO	YES
M_FANS	EXTRACTOR & CEILING FANS	CYAN	CONT	MONO	YES

Table 11: Typical Mechanical Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
O_X_STRC	EXISTING STRUCTURES	WHITE	CONT	MONO	YES
O_N_STRC	PROP. STRUCTURES	RED	CONT	MONO	YES
O_X_MOFF	EXISTING MAKE OFF WIRES	WHITE	CONT	MONO	YES
O_N_MOFF	PROP MAKE OFF WIRES	RED	CONT	MONO	YES
O_X_EARTH	EXISTING EARTH WIRE	WHITE	CONT	MONO	YES
O_N_EARTH	PROP EARTH WIRE	BLUE	DASH	MONO	YES
O_X_TLINE	EXISTING TRANS -MISSION LINE	WHITE	CONT	MONO	YES
O_N_TLINE	PROP TRANS -MISSION LINE	GREEN	CONT	MONO	YES
O_X_NEG	EXISTING NEG. RETURN	WHITE	C-DOT	MONO	YES
O_N_NEG	PROP NEG. RETURN	BLUE	C-DOT	MONO	YES

Table 12: Typical Track Equipment Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
N_N_EQ	PROPOSED SIGNAL EQUIPMENT	232	CONT	MONO	YES
N_X_EQ	EXISTING SIGNAL EQUIPMENT	231	CONT	MONO	YES
N_X_CAB	SIGNAL CABLES EXISTING	201	PHANTOM	MONO	YES
N_N_CAB	SIGNAL CABLES NEW	201	DIVIDE	MONO	YES

Table 13: Typical Signals Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
V_N_CB	PROPOSED COMMS CABLES	202	PHANTOM	MONO	YES
V_X_CB	EXISTING COMMS CABLES	201	PHANTOM	MONO	YES
V_NAV	NAVIGATION EQUIPMENT	214	CONT	MONO	YES
V_N_OPTIC	PROPOSED FIBER OPTIC CABLE	192	PHANT2	MONO	YES
V_X_OPTIC	EXISTING FIBRE OPTIC CABLE	191	PHANT2	MONO	YES
V_N_PNT	PROPOSED VOICE/DATA POINT	YELLOW	CONT	MONO	YES
V_X_PNT	EXISTING VOICE/DATA POINT	9	CONT	MONO	YES
V_REM	REMOVED/OBSOLETE COMMS ITEMS	CYAN	DASH	MONO	YES

Table 14: Typical Communications Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
B_ABUT	ABUTMENT	GREEN	CONT	MONO	YES
B_BOL	BOLLARD	GREEN	CONT	MONO	YES
B_BORE	BOREHOLES	YELLOW	CONT	MONO	YES
B_CENT	CENTRE LINE	RED	CENTRE	MONO	YES
B_CONC	CONCRETE	GREEN	CONT	MONO	YES
B_CONTH	CONCRETE THIN	RED	CONT	MONO	YES
B_CONTHK	CONCRETE THIC	GREEN	CONT	MONO	YES
B_CONMED	CONCRETE MED	YELLOW	CONT	MONO	YES
B_CONHIDT	CONC HIDE THIN	RED	DASHED	MONO	YES
B_CONCHID	CONC HIDE MED	WHITE	DASHED	MONO	YES
B_CONCHAT	CONC HATCH	RED	CONT	MONO	YES
B_CONCSHA	CONC SHADE	11	GREYSCALE	GREY	YES
B_CONCPIPE	CONC PIPES	WHITE	CONT	MONO	YES
B_CADAS	CADASTRALS	RED	CONT	MONO	YES
B_CAISS	CAISSONS	WHITE	CONT	MONO	YES
B_DECK	DECK SLAB	WHITE	CONT	MONO	YES
B-FEND	FENDERS	WHITE	CONT	MONO	YES
B_GRID	GRID LINES	RED	CENTRE	MONO	YES
B_KEYPL	KEY PLAN	YELLOW	CONT	MONO	YES
B_LOGRID	LO GRIDLINES	RED	CONT	MONO	YES

Table 15: Typical Marine Layers

NAME	DESCRIPTION	COLOUR	LINE TYPE	PLOT STYLE	PLOT
P_CAT-G	CATTLE GRID	GREEN	CONT	MONO	YES
P_GR-LAY	LAYERWORKS	35	CONT	MONO	YES
P_TACHY-T	TACHY TEXT	WHITE	CONT	MONO	YES
P_TACHY-L	TACHY LEVEL	WHITE	CONT	MONO	YES
P_TACHY-L	TACHY POINTS	WHITE	CONT	MONO	YES
P_RD-G	ROAD GRAVEL	41	DASHED	MONO	YES
P_RD-M	ROAD MAIN	WHITE	CONT	MONO	YES
P_RD-S	ROAD SIGNS	WHITE	CONT	MONO	YES
P_TR-DES	TRACK DESIGN	RED	CONT	MONO	YES
P_TR-CO	TRACK CO-ORDS	WHITE	CONT	MONO	YES
P_TR-F	TRACK FUTURE	ORANGE	CONT	MONO	YES
P_TR-C	TRACK CENTRE LINE	WHITE	CENTER	MONO	YES
P_TR-TO	TRACK TURNOUTS	WHITE	CONT	MONO	YES
P_TR-UP	TRACK UPLIFT	252	HIDDEN	MONO	YES
P_TR-S	TRACK SLEEPERS	WHITE	CONT	MONO	YES
P_TR-R	TRACK RAILS	WHITE	CONT	MONO	YES
P_TR-EQ	TRACK EQUIPMENT	WHITE	CONT	MONO	YES
P_TR-SUR	TRACK SURVEYED	WHITE	CONT	MONO	YES
P_TEL-T	CABLE ROUTE TELCOM	201	PHANTOM	MONO	YES
P_TEL-N	CABLE ROUTE NEOTEL	201	DIVIDE	MONO	YES
P_TEL-TR	CABLE ROUTE TRANSNET	201	DASHDOT	MONO	YES
P_SUBS-D	SUBSOIL DRAIN, GEOFABRIC,	111	CONT	MONO	YES

Table 16: Typical Perway Layers

6.14 Section Lines

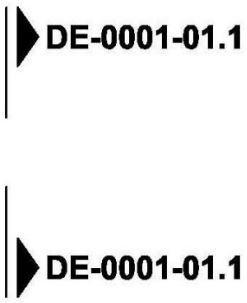


Figure 3: Section Lines

Section lines are to be as above. They are to be inserted as a block from the symbols' library.

6.15 North Sign



Figure 4: North Sign

The North Point above is to be used. It is to be inserted as a block from the symbols' library.

6.16 The Title Block

The Title Block must reflect the following:

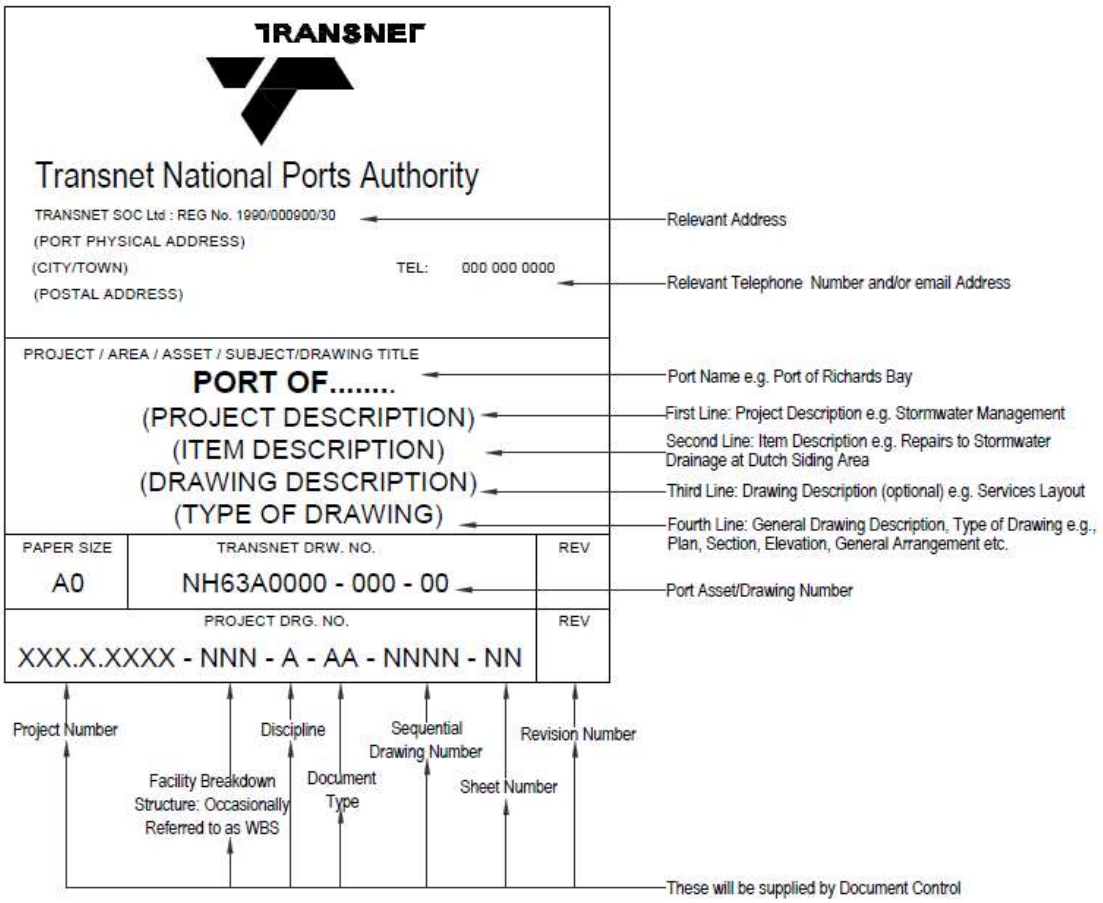


Figure 5: Title Block

6.17 Fields in the Signature Block

The Fields in the title block must reflect the following:

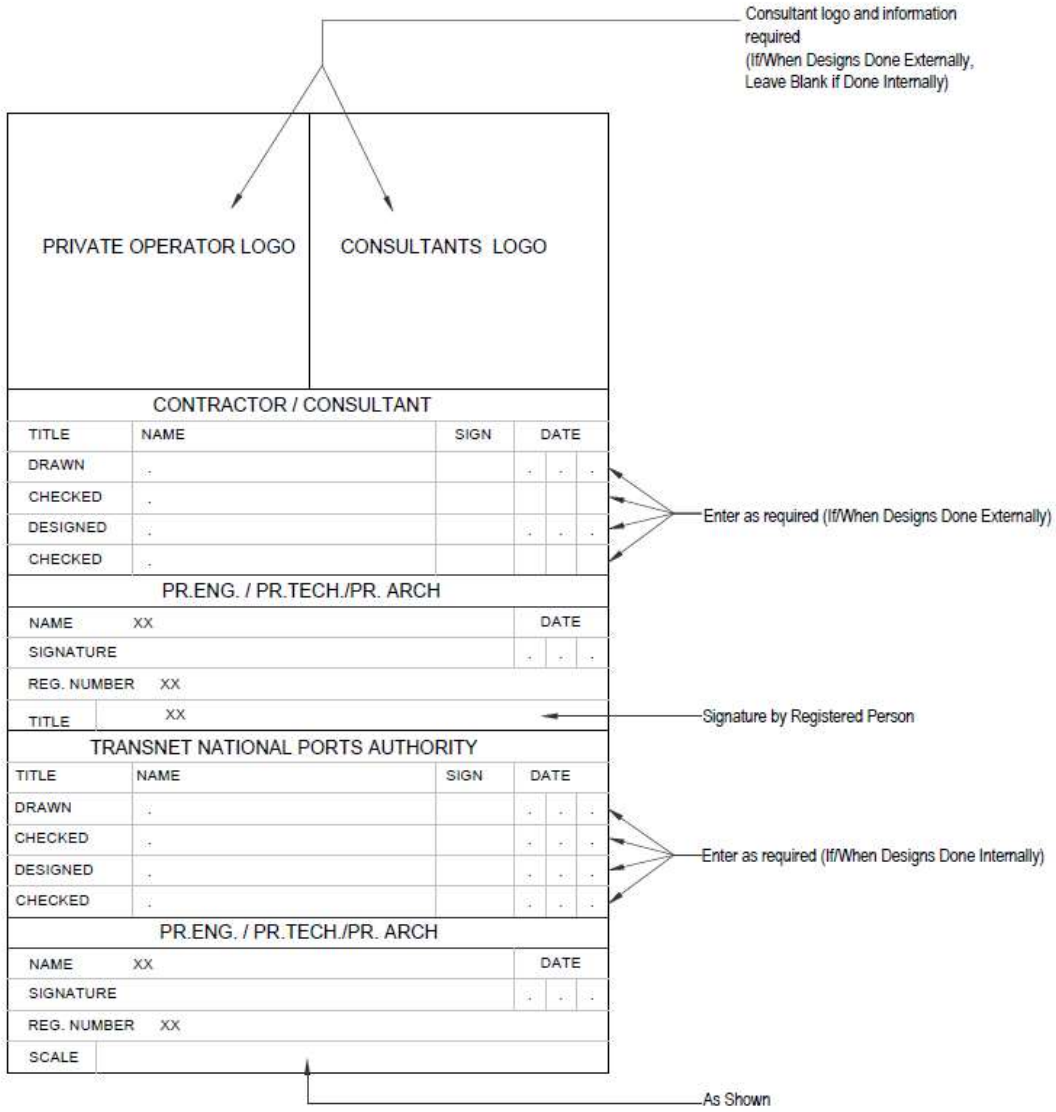


Figure 6: Signature Block

6.18 Revised Drawings

- All amendments to drawings must be clearly referenced and indicated on the original drawing together with the draughtsperson's name and date. The amendment block has provision for a checker's signature, an approval signature and a date.
- Drawings and amendments to drawings shall be indexed as follows:
- Internal TNPA issue to have and issued for issued for tender shall be in alphabetical sequence marked with applicable review description. Numbering such as `A, B, C etc.
- Construction drawings: No. to be numerical i.e..: 1, 2, 3 etc.
- As built drawings: ZZ (it is to be noted that revisions numbers may vary subject to the project and/or Transnet drawing number)
- All drawings shall have the revision raised to the next applicable revision reference (as stated above) which shall be inserted in the revision box of the drawing title block before any drafting is started.

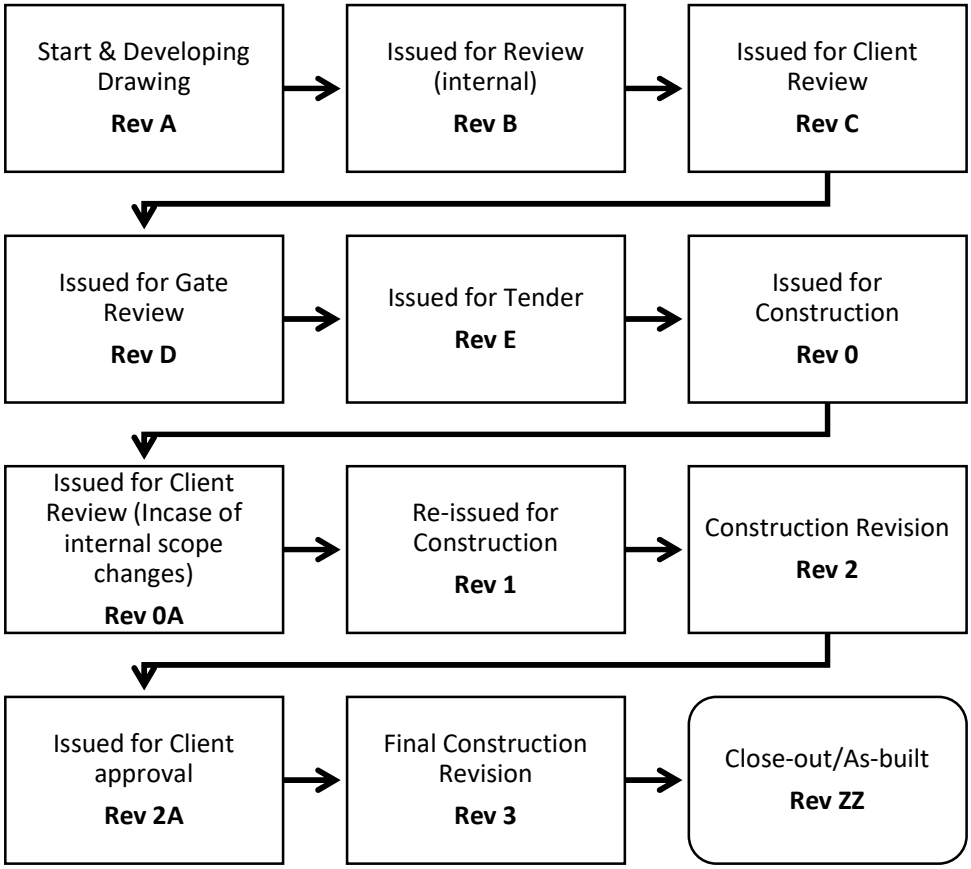


Figure 7: Typical Drawing Revision Sequence

Previously revised drawings to be saved as and re-named to reflect the current revision number. Revisions to be noted from bottom to top and previous revision clouds to be removed from drawings.

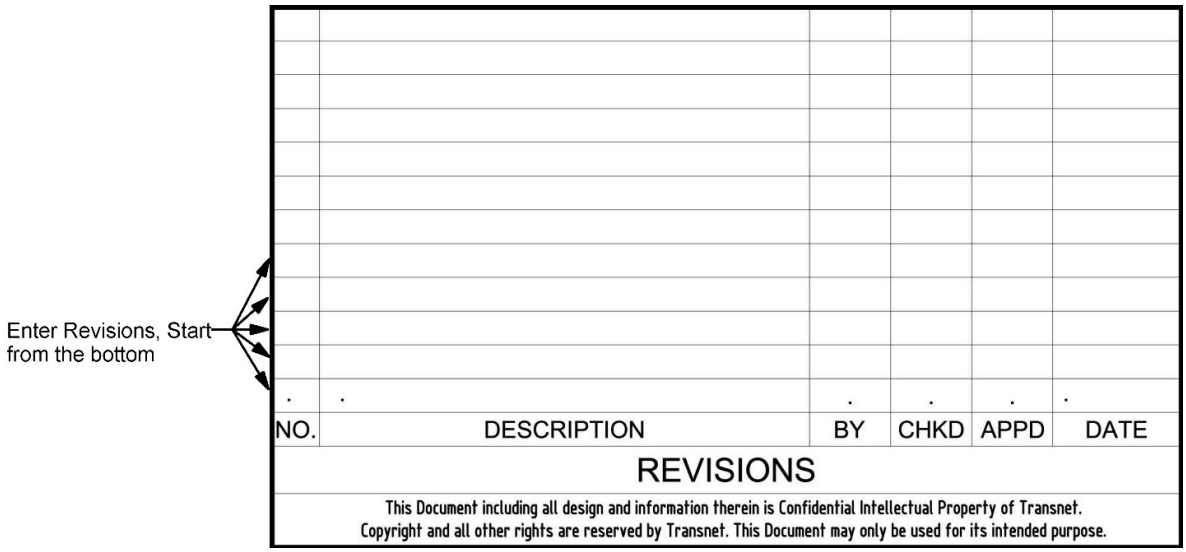


Figure 8: Revisions in the Title Block

6.19 Revision & Hold Clouds

- All revised aspects on a drawing must be annotated by means of a “Revision” cloud wherever practical and a triangle with the revision number therein.

- “Hold” clouds should be used wherever applicable and practical to indicate hold status within the drawing.

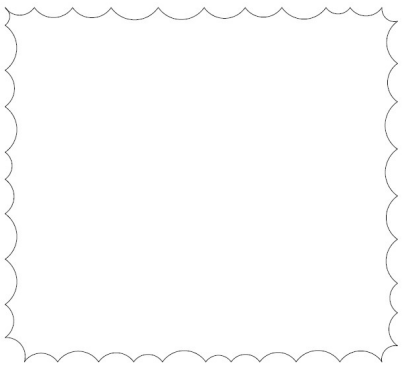


Figure 9: “On-Hold” Cloud

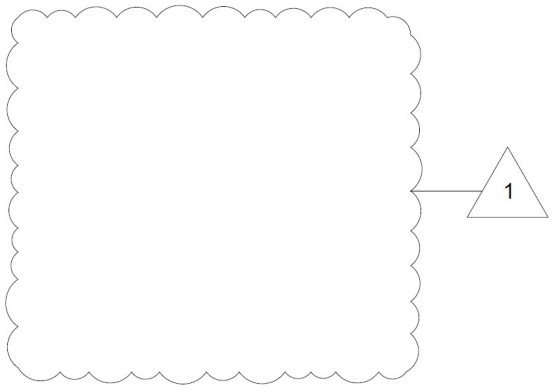


Figure 10: “Revision” Cloud

6.20 Reference Drawings

Drawing number as reflected in drawing title.
Drawing description as per general drawing description in title block.

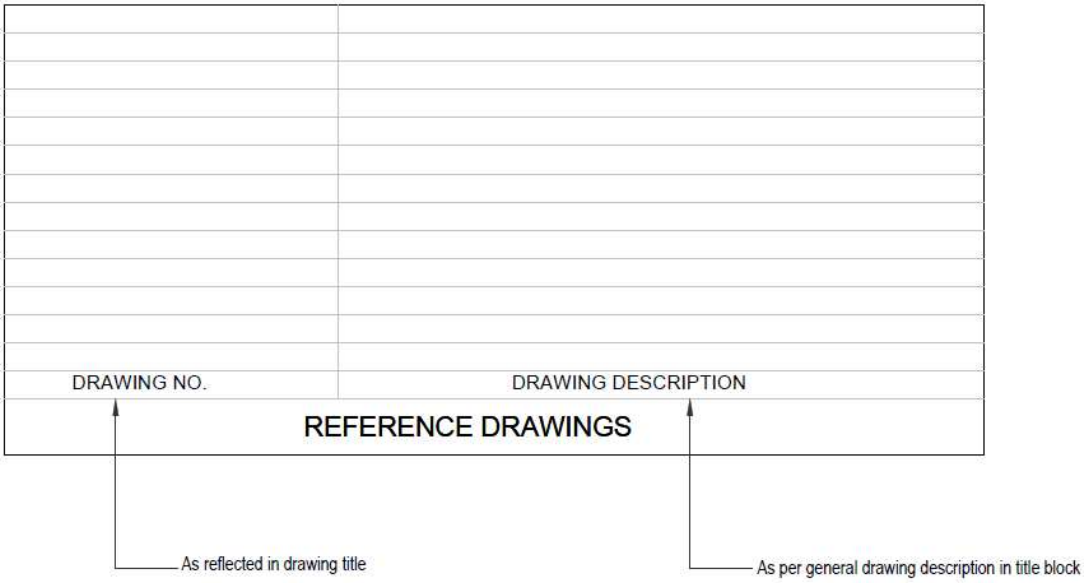


Figure 11: Reference Drawings

6.21 Key Plan Use

Key plans for different areas in the project are provided and should be referenced in. This approach allows any changes to the key plan to appear immediately on all drawings plotted from that point on.
Note: The drawing subject area is to be hatched on the current drawing.

6.22 Symbols and abbreviations

For Standard symbols Refer to:

- SANS 10143: Building drawing practice.
- SANS 1044: Welding Part II: Symbols
- BS 3939: Graphical symbols for electrical power, telecommunications and electronic diagrams.

If it is necessary to use symbols which are not standard national symbols, or located on the Transnet template, a new symbol may be created with its description tabled on the applicable drawing.

6.23 Legend

Legends should be set up as indicated in the image below.

Note: These are typical Civil Engineering services, the list can be adjusted to suit.

A Cad format of the legends is comprised in the Drawing Office library.

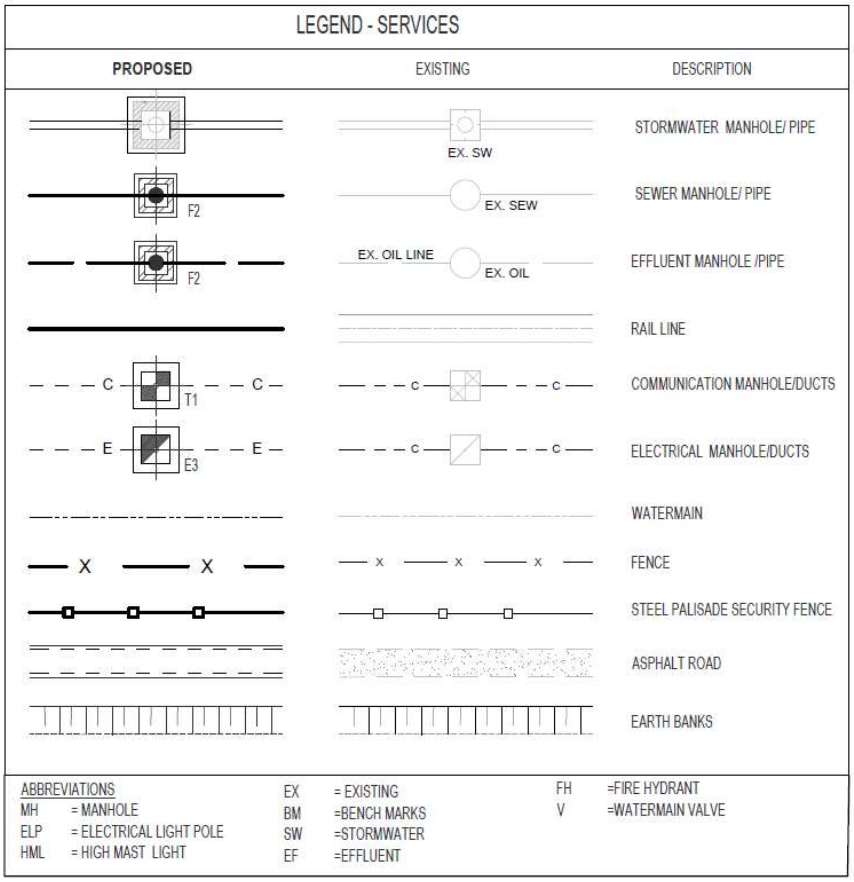


Figure 12: Typical Legend

6.24 Identification of Views

All views shall be identified in the following format:

- The two main forms of projection shall be used namely third and first angle projection.
- Indicate scale only if scale varies from title block scale.
- Reference to a drawing where a section or a detail was taken is required if the view is shown on another drawing.
- Letters shall be used for details. Numbers shall be used for elevations and sections. Do not use letters “I” and “O”.

Type	Format	Example
Details	Alpha	DETAIL A
Section	Numeric	SECTION 1
View	Alpha	VIEW X
Items	Alpha	ITEM A – TROLLEY FRAME

Table 17: Identification of Views

Annexures L - Standard for uniformity in Engineering and Construction

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DEPARTMENT OF PUBLIC WORKS

NOTICE 423 OF 2019

Construction Industry Development Board

DEVELOPMENT THROUGH PARTNERSHIP

CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

STANDARD FOR UNIFORMITY IN ENGINEERING AND CONSTRUCTION WORKS CONTRACTS

AUGUST 2019

This standard is issued in terms of sections 4(f), 5(3)(c) and 5(4)(b) of the Construction Industry Development Board Act 38 of 2000 read with Regulation 24 of the Construction Industry Development Regulations, (as amended) issued in terms of section 33.

The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 27831 of 22 July 2005, Board Notice 99 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice 9 of 2008 in Government Gazette No 30692 of 1 February 2008, Board Notice 11 of 2009 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010 and Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015.

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1 Scope
2 Normative references
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4 Requirements
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4.2.1 General
4.2.2 Activities associated with the solicitation of tender offers
4.2.3 Competitive selection procedures

4.3 The evaluation of tenders on functionality
4.3.1 Process for evaluation of Tenders on Functionality
4.3.2 Functionality in different contracting strategies

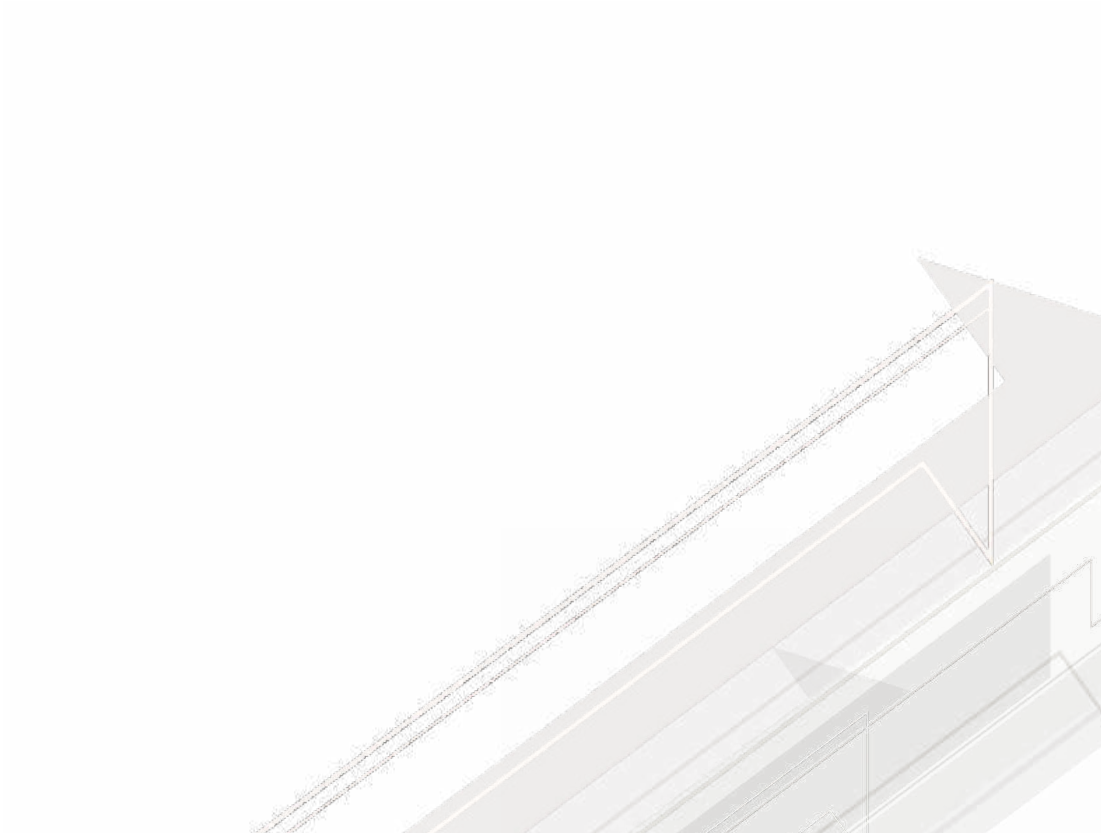
4.4 Procurement documents
4.4.1 General
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4.4.4 Submission Data
4.4.5 Subcontracting as a condition to tender
4.4.6 Scope of work

4.4 Applying the cidb register of contractors to public contracts

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Annex A: Standard Tender Notice and Invitation to Tender
Annex B: Form of Offer and Acceptance
Annex C: Standard Conditions of Tender
Annex D: Standard Conditions for the calling for Expressions of Interest
Annex E: Standard Notice and Invitation to submit an Expression of Interest
Annex F: Record of Addenda to Tender Documents
Annex G: Compulsory Enterprise Questionnaire



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STANDARD FOR UNIFORMITY IN ENGINEERING AND CONSTRUCTION WORKS CONTRACTS

1. Scope

This standard establishes requirements for engineering and construction works contracts aimed at bringing about standardisation and uniformity in construction contracts documentation, practices and procedures.

2. Normative references

The following referenced documents are for the application of this standard.

For undated references, the latest edition of the referenced document (including any amendments) applies.

2.1 Conditions of Contract for Construction for Building and Engineering Works designed by the Employer ("Red Book") as published by the International Federation of Consulting Engineers (FIDIC).

2.2 Conditions of Contract for Plant and Design-Build for Electrical and Mechanical Plant and for Building and Engineering Works, designed by the Contractor ("Yellow Book") as published by the International Federation of Consulting Engineers (FIDIC).

2.3 Conditions of Contract for EPC Turnkey Projects ("Silver Book") as published by the International Federation of Consulting Engineers (FIDIC).

2.4 Conditions of Contract for Design, Build and Operate Projects ("Gold Book") as published by the International Federation of Consulting Engineers (FIDIC).

2.5 General Conditions of Contract for Construction Works as published by the South African Institution of Civil Engineering.

2.6 JBCC Series 2000 Principal Building Agreement as published by the Joint Building Contracts Committee.

2.7 JBCC Series 2000 Minor Works Agreement as published by the Joint Building Contracts Committee.

2.8 NEC3 Engineering and Construction Short Contract as published by the Institution of Civil Engineers.

2.9 NEC3 Engineering and Construction Contract as published by the Institution of Civil Engineers.

2.10 Short Form of Contract ("Green Book") as published by the International Federation of Consulting Engineers (FIDIC).

2.11 Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017 (as amended).

2.12 South African Bureau of Standards, SANS 10845-1, Construction procurement – Part 1: Processes, methods and procedures.

2.13 South African Bureau of Standards, SANS 10845-2, Construction procurement – Part 2: Formatting and compilation of procurement documentation.

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2.14 South African Bureau of Standards, SANS 10845-3, Construction procurement – Part 3: Standard conditions of tender.

2.15 South African Bureau of Standards, SANS 10845-4, Construction procurement – Part 4: Standard conditions for the calling for expressions of interest.

3. Definitions

For purposes of this standard, the following definitions apply:

3.1 **black people** means Africans, Coloureds and Indians -

(a) who are citizens of the Republic of South Africa by birth or descent; or

(b) who became citizens of the Republic of South Africa by naturalisation -

(i) before 27 April 1994; or

(ii) on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.

3.2 **capability** means the abilities necessary to perform at the required level;

3.3 **capacity** means the resources (human capital, financial, physical assets, systems, procedures) which a tenderer puts at the disposal of the project to select, fund and execute the work;

3.4 **conflict of interest** means any situation in which someone in a position of trust has competing professional or personal interests which make it difficult for him to fulfill his duties impartially, an individual or the tenderer is in a position to exploit a professional or official capacity in some way for his personal or for corporate benefit, or incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee;

3.5 **contracting strategy** means strategy that defines the nature of the relationship which the employer wishes to foster with the contractor, which in turn determines the risks and responsibilities between the parties to the contract and the methodology by which the contractor is to be paid;

3.6 **contract data** means document that identifies the applicable conditions of a contract and states the associated contract-specific data;

3.7 **design and build** means contract in which a contractor designs a project based on a brief provided by the employer and constructs it;

3.8 **develop and construct** means contract based on a scheme design prepared by the employer under which a contractor produces drawings and constructs it;

3.9 **design by employer** means contract under which a contractor undertakes only construction based on full designs issued by the employer;

3.10 **employer** means an organ of state entering into a contract with a contractor for the provision of engineering and construction works;

3.11 **expression of interest** means a request for respondents to register their interest in undertaking a specific contract or to participate in a project or programme and to submit their credentials, so they may, in terms of the employer's procurement procedures, be invited to submit a tender offer should they qualify or be selected to do so;

3.12 **financial offer** means the cost of the procurement in monetary terms;

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3.13 **form of offer and acceptance** means the documents that formalize the legal process of offer and acceptance;

3.14 **functionality** means the ability of a tenderer to provide engineering and construction works in accordance with specifications as set out in the tender documents;

3.15 **invitation to tender** means formal invitation to qualified tenderers to make a written offer for construction works;

3.16 **list of returnable documents** means document that lists everything the employer requires a tenderer to include with the tender submission;

3.17 **management contractor** means contract under which a contractor provides consultation during the design stage and is responsible for planning and managing all post contract activities for contractors and the performance of the whole contract;

3.18 **notice and invitation to submit an expression of interest** means the document that alerts respondents to submit their credentials in order to be admitted to an electronic database or to be invited to submit tenders should they satisfy the stated criteria;

3.19 **potentially emerging enterprise** means an enterprise which is least 50 percent owned, managed and controlled by black people;

3.20 **preference** means points awarded for Broad-Based Black Economic Empowerment (B-BBEE) status level of contribution;

3.21 **pricing assumptions** means the document that provides the criteria and assumptions which are assumed in the contract and which the tenderer has taken into account when developing his prices, or target in the case of target cost contracts;

3.22 **quality** means totality of features and characteristics of a product or service that bears on the ability of the product or service to satisfy stated or implied needs;

3.23 **scope of work** means the documentation that specifies and describes the engineering and construction works which are to be provided and any other requirements and constraints relating to the manner in which the contract work is to be performed;

3.24 **services contract** means the contract for the provision of labour or work, including knowledge-based expertise, carried out by hand, or with the assistance of equipment and plant;

3.25 **site information** means the document that describes the site as at the time of tender, to enable the tenderer to price tender and to decide upon the method of working and programming;

3.26 **submission data** means document that establishes the respondent's obligations in responding to a call for an expression of interest and the employer's undertakings in administering the process of calling for and receiving expressions of interest;

3.27 **term contract** means a contract that enables the employer to order work during a prescribed period at agreed rate;

3.28 **tender data** means the document that establishes the tenderer's obligations in submitting a tender and the employer's undertakings in administering the tender process and evaluating tender offers;

3.29 **tenderer** means a cidb registered sole proprietor, partnership or trust who establishes a company or close corporation in terms of the Companies Act, 1973 or the Close Corporations Act, 1984; submitting a tender offer;

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3.30 **tender notice** means a formal communication to tenderers to submit competitive tenders;

3.31 **tender offer** means a written offer to carry out engineering and construction works under given conditions, usually at a stated price, and which is capable of acceptance and conversion into a binding contract;

3.32 **threshold** means a monetary value of a procurement contract established in any legislation governing procurement or by the executive of an institution, below which a procedure must be used.

4 Requirements

4.1 General

Procurement of construction works shall be undertaken in accordance with:

a) the provisions of legislation regulating procurement;
b) the cidb Code of Conduct for all parties engaged in Construction Procurement published in terms of section 5(4) of the Construction Industry Development Board Act.

4.2. Solicitation of tender offers

4.2.1 General

4.2.1.1 Tender offers shall be solicited using one of the Standard Procurement Procedures and Tender Evaluation Methods described in Table 1.

4.2.1.2 As a general rule, engineering and construction works contract shall be solicited using Standard Methods of procuring different categories of engineering and construction works contracts in accordance with the provisions of Table 2.

4.2.1.3 The scope of work, terms and conditions and prices that are negotiated in the negotiation procedure, the proposal procedure using the two-stage system or the competitive negotiation procedure shall be in the best interests of the employer.

4.2.1.4 Minutes of such negotiations and the reasons for pursuing such procedures shall be kept for record and audit purposes.

4.2.1.5 Subject to section 23(2) of the Construction Industry Development Board Act, 38 of 2000, all tender offers above the prescribed tender value published by the Minister shall include a condition that such contracts comply with the cidb best practice standards, published in terms of project assessment scheme.

4.2.2 Activities associated with the solicitation of tender offers

4.2.2.1 Preparation of procurement documents

a) Procurement documents for engineering and construction works contract shall in general:

i) require tenderers to submit particulars sufficient for the employer to evaluate their tenders and to assess their status, capabilities and capacities to perform the contract;
ii) set out, in a clear and unambiguous manner, the criteria by which tenders are to be evaluated;
iii) define the risks, liabilities and contractual obligations of the parties to the contract;
iv) define the nature and quality of construction works to be provided in the performance of the contract.

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Table 1: Standard Procurement Procedures and Tender Evaluation Methods

Procedure			Description
PP1	Negotiation procedure		A tender offer is solicited from a single tenderer.
PP2	Competitive selection procedure		Any procurement procedure in which the contract is normally awarded to the contractor who submits the lowest financial offer or obtains the highest number of tender evaluation points.
	PP2A	Nominated procedure	Tenderers that satisfy prescribed criteria are accepted to an electronic data base. Tenderers are invited to submit tender offers based on search criteria and their position on the data base. Tenderers are repositioned on the data base upon appointment or upon the submission of a tender offer.
	PP2B	Open procedure	Tenderers must submit tender offers in response to an advertisement by the employer to do so.
	PP2C	Qualified procedure	A call for expressions of interest is advertised and thereafter only those tenderers who have expressed interest, satisfy objective criteria and who are selected to submit tender offers, are invited to do so.
	PP2D	Quotation procedure	Tender offers are solicited from not less than three tenderers in any manner the employer chooses, subject to the procedures being fair, equitable, transparent, competitive and cost-effective.
	PP2E	Proposal procedure using the two-envelope system	Tenderers submit technical and financial proposals in two envelopes. The financial proposal is only opened should the technical proposal be found to be acceptable.
	PP2F	Proposal procedure using the two-stage system	Non-financial proposal are called for. Tender offers are then invited from those tenderers that submit acceptable proposals based on revised procurement documents. Alternatively, a contract is negotiated with the tenderer scoring the highest number of evaluation points.
	PP2G	Shopping procedure	Written or verbal offers are solicited in respect of readily available goods obtained from three sources. The goods are purchased from the source providing the lowest price once it is confirmed in writing.
PP3	Competitive negotiation procedure		A procurement procedure which reduces the number of tenderers competing for the contract through a series of negotiations until the remaining tenderers are invited to submit final offers.
	PP3A	Restricted competitive negotiations	A call for expressions of interest is advertised and thereafter only those tenderers who have expressed interest, satisfy objective criteria and who are selected to submit tender offers, are invited to do so. The employer evaluates the offers and determines who may enter into competitive negotiations.
	PP3B	Open competitive negotiations	Tenderers must submit tender offers in response to an advertisement by the employer to do so. The employer evaluates the offers and determines who may enter into competitive negotiations.

Table 2: Standard methods for procuring different categories of engineering and construction works contracts

Category of contract	Type of contracting strategies	Definitions	Standard Procurement Procedure
Engineering and construction works	Design by employer	Contract under which a contractor undertakes only construction based on full designs issued by the employer	PP2B Open Procedure
	Design and build	Contract in which a contractor designs a project based on a brief provided by the employer and constructs it	PP2E Proposal Procedure using two-stage system PP2C Qualified Procedure and eligibility criteria framed around the attainment of a minimum functionality score or requirements PP3A Restricted Competitive Negotiation Procedure
	Develop and construct	Contract based on a scheme design prepared by the employer under which a contractor produces drawings and constructs	

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Category of contract	Type of contracting strategies	Definitions	Standard Procurement Procedure
	Management contractor / Construction Management	Contract under which a contractor provides consultation during the design stage and is responsible for planning and managing all post contract activities for contractors and the performance of the whole contract	PP3B Open Competitive Negotiation Procedure

4.2.2.2 The employer shall apply the Register of Contractors as a requirement to any contracting strategy in Table 2 above for engineering and construction works contract.

4.2.3 Competitive negotiation procedures

4.2.3.1 The competitive negotiation procedures shall be used to negotiate with a number of responsive and qualified tenderers in order to arrive at the most acceptable offer in terms of one of the methods for the evaluation of tenders.

4.2.3.2 The employer shall negotiate with responsive and qualified tenderers when using the competitive negotiation procedures through one or more rounds of competitive negotiations, based on their rankings or the number of tender evaluation points, until the remaining tenderers are invited to submit final offers. During such negotiations, the employer:

a) shall ensure equal treatment of all tenderers and not provide any requirements, criteria, guidelines, documents, clarification or other information relative to the negotiations in a discriminatory manner which may give some tenderers an advantage over others;
b) may provide for the negotiated procedure to take place in successive stages in order to reduce the number of tenders to be negotiated with, by applying the evaluation criteria disclosed in the procurement documents that are issued to tenderers;
c) may not reveal to the other participants solutions proposed or other confidential information communicated by a tenderer participating in the process without that tenderer's agreement;
d) may request that tender offers be clarified, specified and fine-tuned provided that such clarification, specification, fine-tuning or additional information does not:

   i) involve changes to the basic features of the tender process or the tender data; or
   ii) alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect on the tender process; and

e) shall close the negotiation with tenderers when solutions which are capable of meeting its needs are identified, inform the tenderers accordingly and call for best and final offers.

4.2.3.3 Tenderers shall be informed of the competitive negotiation process and notified of the evaluation criteria and associated weightings in the tender data. The evaluation criteria associated with each successive round of negotiations shall not be varied. Tenderers shall be notified in advance of the weighting attached to each category or subcategory of evaluation criteria whenever another round of offers is called for.

4.3 Evaluation of Tenders on Functionality

Generally, tender submissions are evaluated in terms of "Financial offer and preference". In the event of "functionality" being introduced as part of an evaluation criteria, such a requirement must be stated in the tender documents.

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4.3.1 Process for Evaluation of Tenders on Functionality

4.3.1.1 The evaluation criteria for measuring functionality must be objective.

4.3.1.2 The tender documents must specify-

a) the evaluation criteria for measuring functionality;
b) the points for each criteria and, if any, each sub-criterion; and
c) the minimum qualifying score for functionality.

4.3.1.3 The minimum qualifying score for functionality for a tender to be considered further-

a) must be determined separately for each tender; and
b) may not be so-
   i. low that it may jeopardize the quality of the required engineering and construction works; or
   ii. high that it is unreasonably restrictive.

4.3.1.4 Points scored for functionality must be rounded off to the nearest two decimal places.

4.3.1.5 A tender that fails to obtain the minimum qualifying score for functionality, as indicated in the tender documents is not an acceptable tender.

4.3.1.6 Each tender that obtained the minimum qualifying score for functionality must be evaluated further in terms of price and the preference point system and any objective criteria envisaged in regulation 11 of the Preferential Procurement Regulations, 2017 (as amended).

4.3.2 Functionality in different Contracting Strategies

To apply the different contracting strategies, works shall be classified as follows:

- **Simple/straightforward/routine work -** where the tasks or activities are of a straightforward nature in terms of which inputs are relatively well known and outputs can be readily defined.
- **Complex work -** characterised by requirements for higher levels of skills, greater resources or not well defined inputs and outputs.
- **Specialist work -** requiring considerable innovation, creativity, and expertise or skill (or both) or work that has a high downstream impact.

Note: The value of the project or quantities shall not be used to determine whether the project is of a complex or specialist nature.

4.3.2.1 **Design by an employer**

a) If the construction works contract is deemed to be simple or straightforward or routine. No functionality criteria shall be specified in the tender data.
b) If the construction works contract is deemed to be of a complex or specialist works, the employer may, in the tender data, specify functionality criteria and such criteria shall include:

   i. Relevant applicable trades or skills in accordance with the scope of works; or
   ii. Suitably qualified professional person in the built environment; or
   iii. Any other legislated requirements as per the scope of works.

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Note: The following contracting strategies are deemed to be deployed in circumstances where construction works contracts are of a complex or specialist works.

4.3.2.2 **Develop and Construct**

The employer must, in the tender data, specify functionality criteria and such criteria shall include:

i. Professionals registered with relevant built environment professions councils.
ii. Demonstrated experience of key personnel in relation to the scope of works.
iii. Any other legislated requirements as per the scope of work.

4.3.2.3 **Design and Build/Construct**

The employer must, in the tender data, specify functionality criteria and such criteria shall include:

i. Professionals registered with relevant built environment professions councils.
ii. Demonstrated experience of key personnel in relation to the scope of works.
iii. Any other legislated requirements as per the scope of work.

4.3.2.4 **Management Contract**

The employer must, in the tender data, specify functionality criteria and such criteria shall include:

i. Professionals registered with relevant built environment professions councils.
ii. Demonstrated experience of key personnel in relation to the scope of works.
iii. Any other legislated requirements as per the scope of work.

4.3.3 Where functionality is evaluated, at least three persons who are fully conversant with the technical aspects of the scope of works shall undertake such evaluation.

4.4 Procurement documents

4.4.1 General

4.4.1.1 Construction procurement documents for engineering and construction works shall be formatted and compiled in accordance with the approach adopted under the headings contained in:

a) Table 3: Calling for expressions of interest; or
b) Table 4: Tenders are invited using a three-volume; or
c) Table 5 Tenders are invited using a single volume;
d) Table 6: Standard headings and sequencing of documents in the contract.

Table 3: Documents that relate to a call for expressions of interest

Contents		Function and broad outline of contents
Number	Heading	
Part E1: Submission procedures		
E1.1	Notice and invitation to submit an expression of interest	Alerts respondents to submit their credentials in order to be admitted to an electronic database or to be invited to submit tenders should they satisfy the stated criteria.
E1.2	Submission data	Establishes the rules from the time a call for an expression of interest is advertised to the time a submission is evaluated.

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Part E2: Returnable documents		
E2.1	List of returnable documents	Ensures that everything the employer requires a respondent to include in his submission is included in, or returned with, such a submission.
E2.2	Submission schedules	Contains documents that the respondent is required to complete for the purpose of evaluating submissions.
Part E3: Indicative scope of work (where appropriate)		
E3	Indicative scope of work	Indicates to respondents what the contract is likely to entail so that they can make an informed decision as to whether or not they wish to respond and, if so, structure their submission around the likely demands of the project.

Table 4: Standard headings and sequencing of documents when soliciting tenders where a three-volume approach is adopted

Volume	Contents		Broad outline of contents
	Number	**Heading**	
Volume 1	**TENDERING PROCEDURES**		
	T1.1	Tender Notice and Invitation to Tender	Ensures that everything the employer requires a tenderer to submit with the tender is included in or returned with the tender submission.
	T1.2	Tender Data	Establishes the rules from the time a tender is invited to the time a tender is awarded.
Volume 2	**RETURNABLE DOCUMENTS**		
	T2.1	List of Returnable Documents	Ensures that everything the employer requires a tenderer to submit with the tender is included in or returned with the tender submission.
	C1.1	Form of Offer and Acceptance	Formalizes the legal process of offer and acceptance.
	C1.2	Contract Data (Part 2: Data provided by the contractor)	Identifies the applicable conditions of contract and associated contract-specific data that collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.
	C2.2	Activity Schedule or Bills of Quantities	Records the contractor's prices for providing engineering and construction works which are described in the scope of work section of the contract.
	T2.2	Returnable Schedules	Contains documents that the tenderer is required to complete for the purpose of evaluating tenders and other schedules which, upon acceptance, become part of the subsequent contract.
Volume 3	**CONTRACT**		
	Part C1: Agreement and Contract Data		
	C1.2	Contract Data (Part 1: Data provided by the employer)	Identifies the applicable conditions of contract and associated contract-specific data that collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.
	Part C2: Pricing data		
	C2.1	Pricing Assumptions	Provides the criteria and assumptions which it is assumed (in the contract) that the tenderer has taken into account when developing the prices, or target in the case of target and cost-reimbursable contracts.
	Part C3: Scope of Work		
	C3	Scope of Work	Specifies and describes the engineering and construction works which shall be provided and any other requirements and constraints relating to the manner in which the contract work shall be performed.
	Part C4: Site information (engineering and construction works contracts only)		
	C4	Site Information	Describes the site at the time of tender to enable the tenderer to price his tender and to decide upon the method of working and programming, and risks.

4.4.1.2 The contract arising from the solicitation of tender offers using a three-volume approach or the Negotiated Procedure shall be formatted and compiled under the headings contained in Table 6.

4.4.1.3 The Tender Notice and Invitation to Tender shall, as a minimum, contain the wording provided in Annex A.

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Table 5: Standard headings and sequencing of documents when soliciting tenders where a single volume approach is adopted

Contents		Function and broad outline of contents
Number	**Heading**	
TENDER		
Part T1: Tendering procedures		
T1.1	Tender Notice and Invitation to Tender	Alerts tenderers to the nature of the engineering and construction works required by the employer and must contain sufficient information to enable them to respond appropriately.
T1.2	Tender Data	Establishes the rules from the time a tender is invited to the time a tender is awarded.
Part T2: Returnable documents		
T2.1	List of Returnable Documents	Ensures that everything the employer requires a tenderer to submit with the tender is included in or returned with the tender submission.
T2.2	Returnable Schedules	Contains documents that the tenderer is required to complete for the purposes of evaluating tenders and other schedules which, upon acceptance, become part of the subsequent contract.
CONTRACT		
Part C1: Agreement and Contract Data		
C1.1	Form of Offer and Acceptance	Formalizes the legal process of offer and acceptance.
C1.2	Contract Data	Identifies the applicable conditions of contract and associated contract-specific data that collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.
Part C2: Pricing data		
C2.1	Pricing Assumptions	Provides the criteria and assumptions which it is assumed (in the contract) that the tenderer has taken into account when developing the prices, or target in the case of target and cost-reimbursable contracts.
C2.2	Pricing schedules / Activity Schedule or Bills of Quantities	Records the contractor's prices for providing engineering and construction works which are described in the scope of work section of the contract.
Part C3: Scope of Work		
C3	Scope of Work	Specifies and describes the engineering and construction works which shall be provided and any other requirements and constraints relating to the manner where the works shall be performed.
Part C4: Site information (engineering and construction works contracts only)		
C4	Site Information	Describes the site at the time of tender to enable the tenderer to price his tender and to decide upon his method of working and programming, and risks.

Table 6: Standard headings and sequencing of documents in the contract

Contents		Broad outline of contents
Number	**Heading**	
Part C1: Agreements and contract data		
C1.1	Form of Offer and Acceptance	Formalizes the legal process of offer and acceptance.
C1.2	Contract Data	Identifies the applicable conditions of contract and associated contract-specific data that collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.
Part C2: Pricing data		
C2.1	Pricing Assumptions	Provides the criteria and assumptions which it is assumed (in the contract) that the tenderer has taken into account when developing the prices, or target in the case of target and cost-reimbursable contracts.
C2.2	Activity Schedule or Bills of Quantities	Records the contractor's prices for providing engineering and construction works which are described in the scope of work section of the contract.
Part C3: Scope of Work		
C3	Scope of Work	Specifies and describes the engineering and construction works which shall be provided and any other requirements and constraints relating to the manner in which the contract work shall be performed.
Part C4: Site information (engineering and construction works contracts only)		
C4	Site Information	Describes the site at the time of tender to enable the tenderer to price the tender and to decide upon the method of working and programming, and risks.

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4.4.1.4 The Form of Offer and Acceptance with a schedule of deviations provided in Annex B shall be used with minimal contract specific amendments to form the basis of agreements arising from the solicitation of tender offers.

4.4.1.5 The Notice and Invitation to submit an Expression of Interest shall, as a minimum, contain the wording provided in Annex D.

4.4.1.6 The Record of Addenda to Tender Documents and the Compulsory Enterprise Questionnaire contained in Annexes F and G, respectively, shall form part of the Returnable Documents in all procurement documents issued by employer.

4.4.2 Tender Data

4.4.2.1 The Tender Data shall reference the Standard Conditions of Tender contained in Annex C.

4.4.2.2 The tender offer validity period provided for in the tender data shall not exceed twelve (12) weeks. Any extension beyond twelve (12) weeks must be approved by the Accounting Officer.

4.4.2.3 The Tender Data associated with a Standard Tender Evaluation Method shall reference the method to be used by the employer.

4.4.3 Contract data

4.4.3.1 The contract data in respect of prime or main contracts must reference one of the following standard industry forms of contract unless the publishers of such forms of contract indicate that such a form of contract is not suited for the intended application:

a) Engineering and Construction Works Contract -
   i) General Conditions of Contract for Construction Works (GCC);
   ii) Conditions of Contract for Construction, Conditions of Contract for Plant and Design-Build, Conditions of Contract for FIDIC EPC/Turnkey Projects, Conditions of Contract for Design, Build and Operate Projects or Short Form of Contract;
   iii) JBCC series 2000 Principal Building Agreement or Minor Works Agreement; or
   iv) NEC3 Engineering and Construction Short Contract or NEC3 Engineering and Construction Contract.

4.4.3.2 The standard industry forms of contract shall be used with minimal project specific variations and additions which do not change their intended usage.

4.4.3.3 Guarantees required in engineering and construction contracts shall not substantially differ from the samples provided by the drafters of the forms of contract listed in paragraph (4.4.3.1a) or the form as provided in the contract. Such guarantees shall in the case of a fixed guarantee not exceed 10% of the contract price or, in the case of a variable guarantee not exceed 12, 5%, and shall be stated in the contract data.

4.4.3.3.1 Forms of Guarantees shall, where the parties otherwise agree; include one or more of the following:

a) Guarantee issued by an insurance company duly registered in terms of the Insurance Act (Long Term Insurance Act No 52 of 1998 or Short Term Insurance Act No 53 of 1998) or a bank duly registered in terms of the Banks Act No 94 of 1990; or
b) A cash deposit paid in the name of employer; or
c) A payment reduction against payment certificates; or
d) Combination of (a) to (c) above.

4.4.3.4 The deduction of retention monies, as stated in the contract data, shall not exceed 10% of any amount due to a contractor. Where guarantees are provided in terms of 4.4.3.3, the total amount of retention monies held shall not exceed 5% of the contract price.

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4.4.4 Submission Data

4.4.4.1 The Submission Data shall reference the Standard Conditions for the Calling for Expressions of Interest contained in Annex D.

4.4.5 Subcontracting as a condition of tender

If feasible to subcontract for an engineering and construction works contract, an employer must apply subcontracting to advance designated groups in accordance with the provisions of sections 9 and 12 of the Preferential Procurement Regulations, 2017 (as amended).

4.4.6 Scope of work

4.4.6.1 The scope of work shall, wherever possible be:

a) described in terms of performance rather than the design or descriptive characteristics, and
b) based on national or international standards, where such exist.

4.4.6.2 Requirements in the form of specifications, plans, drawings, designs, testing and test methods, packaging, marking or labelling or conformity certification shall not create trade barriers. Reference to any particular trademark, name, patent, design, type, specific origin or producer shall not be made unless there is no other sufficiently precise or intelligible way of describing the characteristics of the work. Such reference shall be accompanied by the words "or equivalent".

4.5 Applying the cidb register of contractors to public contracts

4.5.1 Subject to regulation 6 read with regulation 25 of the Construction Industry Development Regulations, 2004 (as amended), contractor grading designations shall, where appropriate, be described in all procurement documents by a three-digit alpha-numeric where the first character is a number representing the tender value designation and the next two characters are capital letters representing the designation for the class of engineering and construction works.

4.5.2 The following wording must be included in the Notice and Invitation to Tender in all engineering and construction works contracts:

It is estimated that tenderers must have a cidb contractor grading designation of …. or …... or higher...

Note: Delete "or …." where only one class of construction works is applicable.

4.5.3 The following wording must be included in the Tender Data, where the class of work is designated in terms clause 4.5.1:

Clause number (refer to Annex C)	
C.2.1	Only those tenderers who are registered with the cidb, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a ….. Or …….*. class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: 1. every member of the joint venture is registered with the cidb; 2. the lead partner has a contractor grading designation in the ….. or …….* class of construction work; or not lower than one level below the required grading designation in the class of works construction works under considerations and possess the required recognition status. 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a or ….* class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

** insert class of construction work. Delete "or …." where only one class of construction works is applicable.*

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4.5.4 The following wording must be included in the Notice and Invitation to submit an Expression of Interest in respect of engineering and construction works, where the contractor grading designation is based on the estimated value of a tender that may arise:

Respondents must have a contractor grading designation of … or ……or higher.

Note: Delete "or …." where only one class of construction works is applicable.

4.5.5 The following wording must be included in the Submission Data:

Clause number (refer to Annex E)	
E.2.1	Only those respondents who are registered with the Construction Industry Development Board, or are capable of being so registered within twenty-one (21) working days from the closing date for submission of tenders, in a contractor grading designation of . . . . or . . . . * or higher, are eligible to have their submissions evaluated.

**insert contractor grading designation for one or two classes of construction works. Delete "or …." where only one class of construction works is applicable.*

4.5.6 The following wording must be included in the Submission Data:

Clause number (refer to Annex E)	
E.2.1	Joint ventures are eligible to have their submissions evaluated provided that: 1. every member of the joint venture is registered with the cidb not later than twenty-one (21) working days from the closing date for tenders; 2. the lead partner has a contractor grading designation in the ….. or …….* class of construction work; or not lower than one level below the required grading designation in the class of works construction works under considerations and possess the required recognition status. 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than the required contractor grading designation.

** insert class of construction work. Delete "or …." where only one class of construction works is applicable.*

4.5.7 Where an employer promotes potentially emerging enterprises within a framework of a targeted development programme as contemplated in terms of the Construction Industry Development Regulations:

a) the wording provided in the Notice and Invitation to Tender in terms of 4.5.2 shall be amended as follows:

It is estimated that tenderers must have a cidb contractor grading designation of …… or ……. or higher. ….. or …….** potentially emerging enterprises who satisfy criteria stated in the Tender Data may submit tender offers.*

** insert estimated contractor grading designation in one or two construction classes, as relevant.*
*** insert one contractor grading designation below estimated contractor grading designation*

Note: Delete "or …." where only one class of construction works is applicable.

b) the wording in the Tender Data provided in terms of 4.5.3 shall be amended as follows:

Clause number (refer to Annex C)	
C.2.1	The following tenderers who are registered with the cidb, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated: a) contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a ….. or …….*. class of construction work; and b) contractors registered as potentially emerging enterprises with the cidb who are registered in one contractor grading designation lower than that required in terms of a) above and who satisfy the following criteria:.....**

** insert class of construction work. Delete "or …." where only one class of construction works is applicable.*
***state criteria relevant to employer's targeted development programme*

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c) the wording provided in terms of 4.5.4 shall be amended as follows:

Respondents must have a contractor grading designation of … or ….. or higher. ….. or …… potentially emerging enterprises who satisfy criteria stated in the Submission Data may submit expressions of interest.

Note: Delete "or …." where only one class of construction works is applicable.

d) the wording in the Submission Data provided in terms of 4.5.5 shall be amended as follows:

Clause number (refer to Annex D.)	
D.2.1	The following respondents who are registered with the cidb or are capable of being so registered within twenty-one (21) working days from the closing date for the submission of tenders are eligible to have their submissions evaluated: a) those respondents who are registered with the Construction Industry Development Board or are capable of being so registered within twenty-one (21) working days from the closing date for submission of tenders, in a contractor grading designation of ….. or ……*or higher; and b) contractors registered as potentially emerging enterprises with the cidb who are registered in one contractor grading designation lower than that required in terms of a) above and who satisfy the following criteria: ……..**

** insert contractor grading designation for one or two classes of construction works. Delete "or …." where only one class of construction works is applicable.*
***state criteria relevant to employer's targeted development programme.*

e) details appropriate to any support provided must be stated in the Contract Data, the Pricing Data and the Scope of Work, as relevant.

4.5.8 Employers, wherever appropriate, in support of industry development, shall in the application of the register of contractors, promote the participation and development of registered contractors by means of one or more of the following:

a) unbundling projects into smaller contracts;
b) implementing targeted development programmes to support potentially emerging contractors in accordance with the provisions regulations 25(8) of the Construction Industry Development Regulations;
c) requiring a prime contractor to subcontract defined portions of the works to such contractors in accordance with the provisions of 4.4.5.

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Annex A

Standard Tender Notice and Invitation to Tender

	Guidance Notes
..... invites tenders for	*Enter the name of the employer and describe briefly what is to be procured, and if appropriate, over what time period.*
It is estimated that tenderers must have a cidb contractor grading of . . . or . . . . or higher.	*Omit where:* *i) the contract involves goods or services; or* *ii) the employer promotes potentially emerging enterprises in engineering and construction works.* *Insert best estimate of required contractor grading designation.*
It is estimated that tenderers must have a cidb contractor grading of . . . or . . . . or higher. ..... or ..... potentially emerging enterprises who satisfy criteria stated in the Tender Data may submit tender offers.	*Omit where:* *i) the contract involves goods or services; or* *ii) the employer does not promote potentially emerging enterprises in engineering and construction works.* *Insert best estimate of required contractor grading designation and one contractor grading designation lower before "potentially emerging".*
Preferences are offered to tenderers who	*Briefly indicate the nature of the preferences that are applicable, if so desired.*
Only tenderers who ..... are eligible to submit tenders.	*Where applicable, state essence of eligibility criteria.*
The physical address for collection of tender documents is: ..... Documents may be collected during working hours after 09:00 on	*Enter data*
A non-refundable tender deposit of R.....payable in cash or by bank guaranteed cheque made out in favour of the Employer is required on collection of the tender documents.	*Omit if not a requirement. Amend wording if cheques or cash are not acceptable.*
Queries relating to the issue of these documents may be addressed to Mr/Ms . . . . ., Tel No. . . . . , Fax No. . . . . E- Mail	*Enter data*
A compulsory clarification meeting with representatives of the Employer will take place at . . . . . on . . . . .. starting at . . . . hrs.	*Omit if not a requirement*
The closing time for receipt of tenders is . . . . . hrs on . . . . . . Telegraphic, telephonic, telex, facsimile, e-mail and late tenders will not be accepted.	*Enter data and delete that which does not apply*
Tenders must only be submitted on the tender documentation that is issued.	
Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.	

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Annex B

Form of Offer and Acceptance

Note: *1 This form of offer and acceptance is identical to that contained in Annex F of SANS 10845 - 1: Construction Procurement Processes, Procedures and Methods.*

2 SAICE's Practice Manual #1, The use of South African National Standards in Construction Procurement, provides guidance on the formulation of the wording for the actual offer where it is not based on the offered total of prices.

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of: ……

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS ……..Rand (in words);

R……. (in figures) (or other suitable wording)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

Signature(s)				
Name(s)				
Capacity				
for the tenderer				
	(Name and address of tenderer)			
Name and signature of witness			Date	

Acceptance

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1 Agreements and contract data, (which includes this agreement)

Part C2 Pricing data

Part C3 Scope of work

Part C4 Site information and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

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Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five (5) working days of the date of such receipt notifies the employer in writing of any reason why he/she cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.[1]

Signature(s)				
Name(s)				
Capacity				
for the Employer				
	(Name and address of employer)			
Name and signature of witness			Date	

[1] *As an alternative, the following wording may be used:*
Notwithstanding anything contained herein, this agreement comes into effect two working days after the submission by the employer of one fully completed original copy of this document including the schedule of deviations (if any), to a courier-to-counter delivery / counter-to-counter delivery / door-to-counter delivery /door-to-door delivery /courier service (delete that which is not applicable), provided that the employer notifies the tenderer of the tracking number within 24 hours of such submission. Unless the tenderer (now contractor) within seven working days of the date of such submission notifies the employer in writing of any reason why he/she cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

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Schedule of Deviations

Notes:

1. *The extent of deviations from the tender documents issued by the employer before the tender closing date is limited to those permitted in terms of the conditions of tender.*
2. *A tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.*
3. *Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.*
4. *Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract.*

1 Subject _____

Details _____

2 Subject _____

Details _____

3 Subject _____

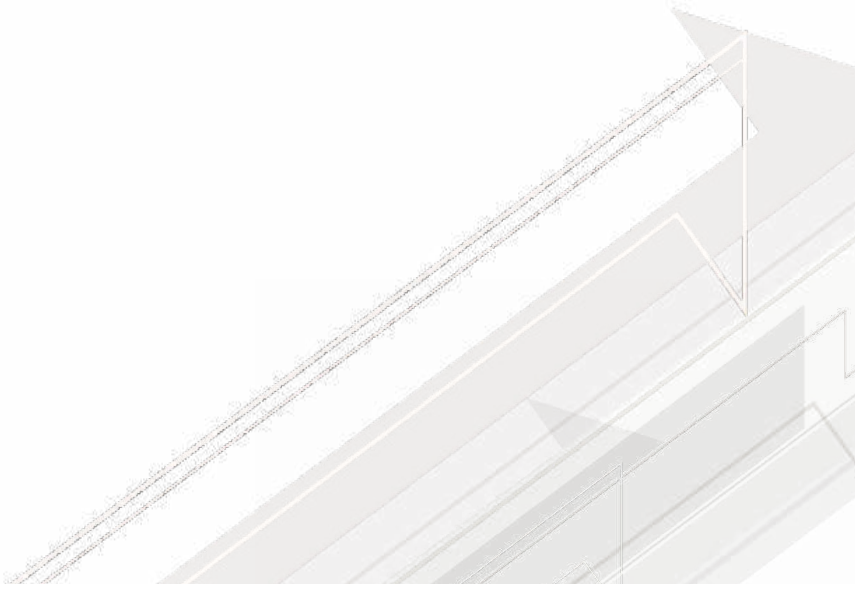
Details _____

4 Subject _____

Details _____

By the duly authorised representatives signing this agreement, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification or change~~s~~ to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.



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Annex C

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:

i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

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c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;

b) funds are no longer available to cover the total envisaged expenditure; or

c) no acceptable tenders are received.

d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

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C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

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C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

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C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

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C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

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C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where

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applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) complies with the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer*'s* opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work*,*
b) significantly change the Employer*'s* or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

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C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or
c) arithmetic errors in:

(i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
(ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer’s obligations in submitting a tender and the employer’s undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	**Qualitative interpretation of goal**
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.

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Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

a) Open and record tender offers received
b) Determine whether or not tender offers are complete
c) Determine whether or not tender offers are responsive
d) Evaluate tender offers
e) Determine if there are any grounds for disqualification
f) Determine acceptability of preferred tenderer
g) Prepare a tender evaluation report
h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer*'s* information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
c) has the legal capacity to enter into the contract;
d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
e) complies with the legal requirements, if any, stated in the tender data; and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,
b) inclusion of some of the returnable documents and
c) other revisions agreed between the employer and the successful tenderer.

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C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

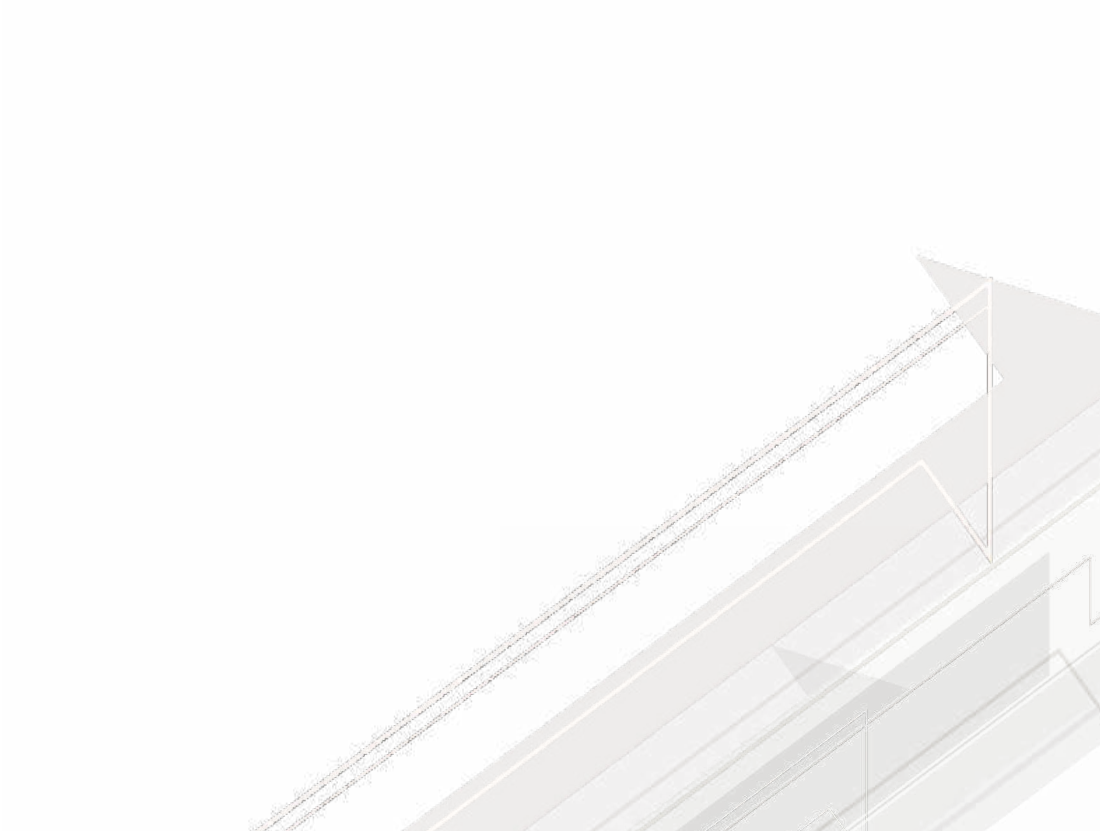
An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.



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Annex D

Standard Conditions for the calling for Expressions of Interest

D.1 General

D.1.1 Actions

D.1.1.1 The employer and each respondent submitting an expression of interest shall comply with these conditions for calling for expressions of interest. In their dealings with each other, they shall discharge their duties and obligations as set out in D.2 and D.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anti-competitive practices.

D.1.1.2 The employer and the respondent and all their agents and employees involved in the submission process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Respondents shall declare any potential conflict of interest in their submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

D.1.1.3 The respondent shall not make a submission without having a firm intention and the capacity to proceed with the next stage of the procurement process.

D.1.2 Supporting documents

The documents issued by the employer for the purpose of obtaining expressions of interest are listed in the submission data.

D.1.3 Interpretation

D.1.3.1 The submission data and additional requirements contained in the submission schedules that are included in the returnable documents are deemed to be part of these conditions for the calling for expressions of interest.

D.1.3.2 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

a) **conflict of interest** means any situation in which:

i. someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially.

ii. an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit.

iii. incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and

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c) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels

D.1.4 Communication and employer's agent

Each communication between the employer and a respondent shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a respondent. The name and contact details of the employer's agent are stated in the submission data.

D.2 Respondent's obligations

D.2.1 Eligibility

Submit an expression of interest only if the respondent complies with the criteria stated in the submission data and the respondent, or any of his/her principals, is not under any restriction to do business with the employer.

D.2.2 Cost of submissions

Accept that the employer will not compensate the respondent for any costs incurred in the preparation and delivery of a submission.

D.2.3 Check documents

Check the submission documents on receipt, including pages within them, and notify the employer of any discrepancy or omission.

D.2.4 Acknowledge addenda

Acknowledge receipt of addenda to the submission documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the submission data, in order to take the addenda into account.

D.2.5 Clarification meeting

Attend the clarification meeting(s) at which respondents may familiarize themselves with the proposed work, services or supply (and location, etc.) and raise questions. Details of the meeting(s) are stated in the submission data.

D.2.6 Seek clarification

Request clarification of the submission documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the submission data.

D.2.7 Making a submission

D.2.7.1 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

D.2.7.2 Seal the original and each copy of the submission as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the submission data, as well as the respondent's name and contact address.

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D.2.7.3 Accept that the employer shall not assume any responsibility for the misplacement or premature opening of the submission if the outer package is not sealed and marked as stated.

D.2.8 Information and data to be completed in all respects

Accept that submissions, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

D.2.9 Closing time

Ensure that the employer receives the submissions at the address specified in the submission data not later than the closing time stated in the submission data. Proof of posting shall not be accepted as proof of delivery. The employer shall not accept submissions submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the submission data.

Accept that, if the employer extends the closing time stated in the submission data for any reason, the requirements of these conditions for expressions of interest apply equally to the extended deadline.

D.2.10 Clarification of submission

Provide clarification of a submission in response to a request to do so from the employer during the evaluation of submissions.

D.3 Employer's undertakings

D.3.1 Respond to clarification

Respond to a request for clarification received up to five (5) working days before the submission closing time stated in the submission data and notify all respondents who attended the clarification meetings, if any, of those responses.

D.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the submission documents to each respondent during the period from the date of the calling for expressions of interest until seven (7) working days before the closing time for submissions stated in the submission data. If, as a result, a respondent applies for an extension to the closing time stated in the submission data, the employer may grant such extension and, shall then notify it to all respondents.

D.3.3 Late submissions

Unless otherwise stated in the submission data, return submissions received after the closing time stated in the submission data, unopened, (unless it is necessary to open a submission to obtain a forwarding address), to the respondent concerned.

D.3.4 Opening of submissions

D.3.4.1 Record the name of each respondent whose submission is opened and acknowledge receipt of each submission.

D.3.4.2 Make available the names of the respondents that made submissions prior to the closing time for submissions to all interested persons upon request.

D.3.5 Non-disclosure

Not disclose to respondents, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of submissions until after the evaluation process is complete.

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D.3.6 Grounds for rejection and disqualification

Determine whether there has been any effort by a respondent to influence the processing of submissions and instantly disqualify a respondent if it is established that he/she engaged in corrupt or fraudulent practices.

D.3.7 Test for responsiveness

Determine, on opening and before detailed evaluation, whether each submission received:

a) meets the requirements of these conditions for the calling for expressions of interest;
b) has all the substantive provisions properly and fully completed and signed, and
c) is responsive to the other requirements of the call for expressions of interest.

D.3.8 Non-responsive submissions

Reject all non-responsive submissions.

D.3.9 Evaluation of responsive submissions

D.3.9.1 Appoint an evaluation panel of not less than three persons. Evaluate submissions using the evaluation criteria established in the submission data.

D.3.9.2 Notify the respondents of the outcome of the evaluation process within two (2) weeks of the evaluation report being accepted by the employer.

D.3.10 Provide written reasons for actions taken

Provide upon request written reasons to respondents for any action that is taken in applying these conditions, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of respondents or might prejudice fair competition between respondents.

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Annex E

Standard Notice and Invitation to submit an Expression of Interest

	Guidance
Expressions of interest are invited for the provision of ……	*Describe briefly what is to be procured, and if appropriate, over what time period.*
The Employer is ……..	
……	*Describe objective selection criteria and provide any other pertinent information.*
The physical address for collection of documentation is: …….. Documents may be collected during working hours after ……. on ……..	
Queries relating to the issues of these documents may be addressed to Mr/Ms . . . . ., Tel No. . . . . , Fax No. . . . . E-mail	

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Annex F

Record of Addenda to Tender Documents

The undersigned confirm that the following communications received from the employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed		Date	
Name		Position	
Tenderer			

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Annex G

Compulsory Enterprise questionnaire

The following particulars must be furnished. In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: cidb registration number, if any:

Section 4: CSD number:

Section 5: Particulars of sole proprietors and partners in partnerships:

Name*	Identity number*	Personal income tax number*

* *Complete only if sole proprietor or partnership and attach separate page if more than 3 partners*

Section 6: Particulars of companies and close corporations

Company registration number:

Close corporation number:

Tax reference number:

Section 7: SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 8: SBD 6 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 9: SBD8 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 10: SBD9 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise:

i) authorizes the employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order;

ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and

iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed		Date	
Name		Position	
Enterprise name			

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Annexures M - Bayhead Warehouse Design Mechanical

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18 November 2024

TRANSNET SOC LIMITED

NEW CLOTHING FACILITY IN THE PORT OF DURBAN

Mechanical Detailed Design Report

Project No:	Date:	Report Status:
NT2136-247	18 November 2024	Client Review

Carried Out By:	Commissioned By:
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Synopsis:

Mechanical Detailed Design Report

Function:

Mechanical Building Services

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1. Introduction

The following detailed design report outlines the final design philosophy of Mechanical Engineering Design which is split into the following categories:

- Fire Protection
- Domestic Water Reticulation
- Heating, Ventilation, and Air-Conditioning

This report aims to indicate NATAKA's detailed design and assumptions made which are based on current best practices and addresses the client's specific needs and requirements. In addition, NATAKA has applied sustainable 'green' building best practice concepts where appropriate, this has been done for the partial scope of mechanical engineering.

This report seeks to gain client approval of the different types of services deemed most suitable for this type of application so that procurement of mechanical equipment can go ahead.

1.1. Project Background

Transnet has adopted a new approach to strategic thinking, Segment Strategy, to drive SA's trade competitiveness. The Segment Strategies represent a fundamental change for Transnet, away from a divisional, modal service offering to strategic participation and structured collaboration in integrated commodity supply chains. In responding to the Segment Strategy as contemplated by Transnet SOC Ltd, Transnet National Ports Authority (TNPA) formulated the KZN Ports Master Plan Strategy which is underpinned by *inter alia,* positioning the Port of Durban as a premier Automotive Terminal and Container hub.

It was determined that handling automotive and loading to ship across a "flattened pier section" at a constant level between quay walls can greatly increase automotive throughput at a seaport. This philosophy was thought to be appropriate for the Durban Port, and it could be implemented through a variety of Port modifications, including the expansion of the Automotive Terminal onto the Ocean Terminal Pier. It is against this backdrop that TNPA

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initiated numerous work packages focusing on the relocation projects in order to achieve the abovementioned aspirations.

This scope is part of the relocation work packages and shall solely focus on the refurbishment of 06 Toulon Road Building at Bayhead precinct in the Port of the Durban. This refurbishment project is initiated to accommodate the TNPA's clothing store which is currently located at an area earmarked for the Automotive Terminal expansion.

The benefits of refurbishment of 06 Toulon Road building at Bayhead precinct in the Port of the Durban are as follows:

- Providing safe working environment for TNPA employees
- Optimization of Port Land usage
- Supporting the KZN Logistics Hub Development
- Economies of scale in terms of shared services (security, cleaning, etc.)

This document covers the mechanical detailed design for all building services falling under the mechanical scope for the proposed establishment. The work has been carried out as per the technical requirement (for general, mechanical), standard specification, and drawings. These criteria were intended to be a guide for the design of all related mechanical building services with the objective that the same shall be built to satisfy the functional & serviceability requirements, and also be economical & safe.

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Engineering judgment has been exercised in applying these to particular working space within the warehouse building. The New Clothing Facility is designed to consist of the following area to be furnished with building services:

- Collection Area
- Sick Bay
- Main Warehouse Area
- Dispatch
- Server Room
- Packing Area
- Kitchen
- Ablutions
- Boardrooms
- Offices

1.2. Scope of Services

The purpose of this section is to identify all aspects of the Mechanical installation. The following is included in the scope:

- Mechanical HVAC
- Wet services
    - Cold and hot water reticulation from the municipal connection that is provided by the Civil Engineer.
    - Internal sanitary drainage up to the nearest manhole to the building line that is provided by the Civil Engineer.
- Fire Engineering
- External and Internal

The following is excluded from the scope

- External sanitary drainage *(Civil Engineer)*
- Establishing the municipal water connection and connection details *(Civil Engineer)*
- Rainwater system *(Architect)*

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- Submission to Local Authority *(this is normally done by the Architect)*

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2. Wet Services

2.1. General

This section shall seek to clarify and finalize the wet services design parameters and assumptions made during the inception stage design. The intent of the design is to provide Fit for purpose, robust, resilient, and sustainable system as summarized above.

2.2. General Design Parameters

The proposed design flow rates are as listed in table 2.1 below:

FITTING/FIXTURE	COLD WATER FLOW RATE	HOT WATER FLOW RATE
Water Closet (WC) In-wall cistern	10 Litres/minute	N/A
Flush Valve (WC)	65 Litres/minute	N/A
Urinal (UR)	10 Litres/minute	N/A
Wash Hand Basin (WHB)	10 Litres/minute	10 Litres/minute
Shower (SHR)	12 Litres/minute	12 Litres/minute
Hose Bib Tap (20mm)	25 Litres/minute	N/A
Wash trough	20 Litres/minute	20 Litres/minute
Sink	12 Litres/minute	12 Litres/minute

Table 2.1: Space Design Parameters

2.3. Domestic Cold and Hot Water Storage

Coldwater consumption is estimated at 1,5L per sqm as per SANS 10252-2. However, since this facility is located within a well-developed precinct, there is no need to provide a storage tank to cater to the domestic water supply as this would be fed from a reliable municipal water supply infrastructure.

Hot water consumption is estimated to be 35L per capita per day, hence assuming a total of 10 people effectively utilizing the New Clothing Facility, a total of 200L hot water storage has been adopted for this scheme.

2.4. Water Reticulation Design Parameters

The pipes shall be designed in accordance with SANS 10252-1 and the manufacturer's technical information. The domestic water system is designed on the basis that there is:

- A guaranteed water supply from the Municipality.
- Guaranteed water pressure from the Municipality.

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- Guaranteed water quality from the Municipality.

Pipes were also sized to suit the operational requirements of the chosen brassware and sanitary ware fixtures. The flow velocity shall be a minimum of 0.5 m/s and shall not exceed 1.5m/s inside buildings and 2.0m/s outside of building/underground. Operating pressure will be a minimum of 200kPa and a maximum of 600kPa.

All pipes have been sized to avoid high-velocity sound transmission noise. Additionally, the fixing brackets with rubber lining will assist in reducing sound transmission.

2.4.1. Cold Water Reticulation System Description

Domestic municipal water will be provided to the site via the municipal connection situated in a dedicated position at the development close to entrance by the Civil Engineer, which must be a minimum of 110mm (diameter). However, the current installation consists of a 50mm Diameter HDPE Line which has adequate pressure for fire stopping but fails to provide required flowrate for Hydrants requirements. This has been circumvented by ensuring that an independent fire water storage tank is erected with a dedicated pump to feed fire ring main at 1200L/min to satisfy hydrants requirements.

The municipal line will then T-Off as indicated in figure 2.4.1 below to provide a fire connection.

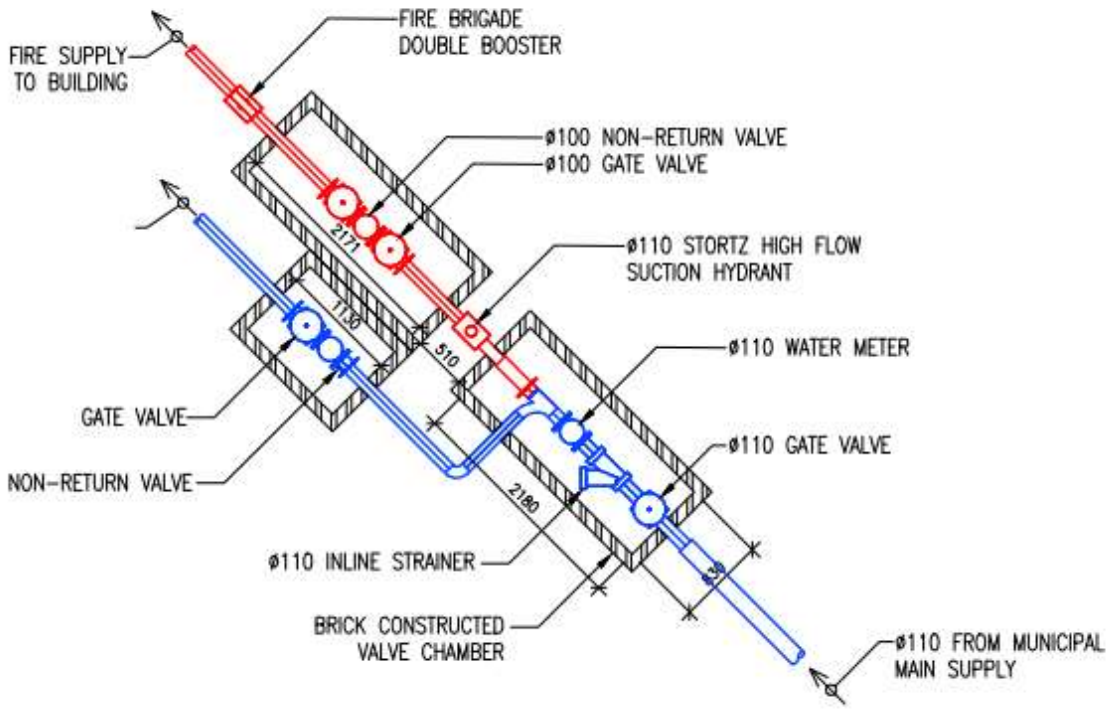


Figure 2.4.1.: Water and Fire Connection

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2.4.2. Hot Water System Description

The proposed system is a 'constant temperature hot water generator'. Thie type generates hot water at a constant temperature and at a constant rate. It is the most efficient and cost-effective system to operate. The hot water is stored in a pressurized tank of hote water cylinder and reticulated into the facility. The primary source of energy is provided by the Heat Pump with supplementary heating provided by the electrical back-up elements.

Hot water cylinder will located in a dedicated plant area in the ground floor, with all the required components as per SANS 10254. The heat pump shall generate hot wate at 55 – 60^{0}C and ensure a return temperature of no less than 45 – 50^{0}C. Thye hot water reticulation will be a circulation system and the return pipes must return to the cylinder of hot water genearator. The piping shall be fully insulated and ensure minimal heat loss. The insulation for all hot water piping shall be compliant with SANS 10400-XA.

The system has been designed that a maximum temperature loss of 10^{0}C is maintained from thr heat source to the point of use, rendering a minimum temperature of 50^{0}C at the point of use. The system performance will be monitored to ensure optimum effiency and compliance to design parameters. Figure 2.4.3 below shows the hot water generation plant schematic.

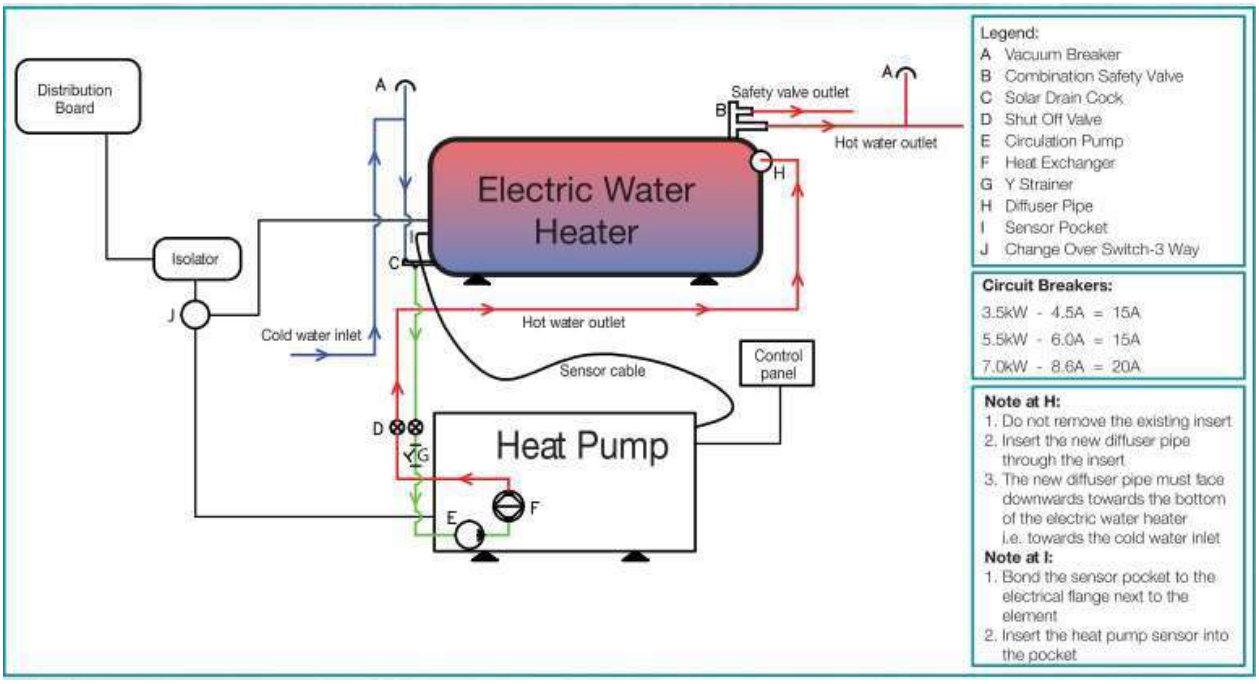


Figure 2.4.3: Hot WaterSchematic

2.4.3. Insulation

All hot water piping shall be insulated with suitable non-combustible insulation material as per the pipe material according to SANS 10252-1; SANS 10400-XA and SANS 204. All insulation will have an Ozone Depletion Potential (ODP) of zero.

2.5. Sanitary and Drainage

A “one pipe” system with “back vents” will be used. The pipe network will be designed to suit each room/facility's unique requirements. The soil and waste effluent will be safely conveyed through a piped system externally and connect to a main municipal manhole as reflected on the civil layouts.

The drainage system ventilation pipes connect the various drainage systems and discharge them to the atmosphere at a high point above the roof level. Maintenance of the drainage system shall be provided by strategically placed rodding eyes and access fittings. W.C.’s will be bolted to the floor/wall to facilitate their removal to gain access to the soil pipes. Access will be provided, in common areas to stacks and branches in plumbing ducts.

Floor drains shall be installed in all bathrooms, toilets, tea kitchens, ablution facilities, plant rooms, and in the kitchen. The floor drains shall have 50 mm diameter to 100 mm diameter outlets as shown on the drawings prepared by the Architect and shall have removable covers to provide direct access into the drain pipes. The floor drains shall have side inlets where necessary as shown on the drainage drawings by others.

2.6. Materials

Robust materials with a long service life shall be used. Materials shall be widely available and easy to repair and maintained by the maintenance staff.

2.6.1. Material Specification for Domestic Water

The following materials are accepted for the potable hot and cold water system:

- Copper Class 1 for hot and cold water piping
- Schedule 62 GMS piping for cold water piping only
- HDPE class 10 for underground cold water piping
- HDPE class 16 for underground hot water piping

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2.6.2. Material Specification for Sanitary Drainage

The following materials are accepted for the drainage system:

- HDPE (above and below ground piping)
- PVC-u (un-plasticized polyvinyl chloride) for below ground installation
- PVC-u (un-plasticized polyvinyl chloride) for above-ground installation

It is recommended that all drainage piping in the ceiling voids and sensitive areas be fitted with sound insulation to reduce the possibility of noise transmission. Another option to assist in reducing possible noise transmission is to use silent HDPE piping. This shall be used in areas where the noise levels are a nuisance to the public.

2.7. Monitoring and Control

The recommendation is to make provision for a rudimentary system of visual and audible alarms for all critical systems to ensure immediate response to systems failures to ensure catastrophic failures can be avoided. These alarms shall be located within the plant rooms in close proximity to the equipment and duplicated in the building control room or security room for external monitoring by staff.

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3. Fire Protection

3.1. General

This section covers the Fire Protection Systems required in terms of Part T of SANS 10400:2020 and SANS 10252-1. All the buildings within this establishment are to be provided with fire protection equipment in accordance with this specification.

3.2. Fire Risk Assessment & Solutions

This facility has been classified as J2 – Moderate Risk Storage Facility where occupants may not be familiar with the surroundings in terms of SANS 10400 Part A. Due to the nature of the occupants to be accommodated within these premises, a fire incident may cause harm to the occupants. For this reason, all aspects of passive and active fire safety shall be addressed.

Compliance with the SANS 10400-T shall address all fire safety requirements with special attention to the following:

- The stability of structural elements shall be 120 minutes.
- Each dormitory shall have at least two emergencies exists to the outside.
- Smoke detection and fire alarm system category L1 and P2 shall be installed in accordance with SANS 101039.
- The width of escape routes and stairs shall not be less than 1500mm.
- Travel distance to the nearest exit shall be restricted to less than 45 meters.
- Dead-end corridors shall be less than 10 meters.
- Emergency lighting to last 120 min and photoluminescent signage shall be installed.

3.3. Automatic Sprinkler Installation

The building is more that 500m^2 floor area storing goods susciptable to fire ignition and therefore the automatic sprinkler system is going to be implemted for the scheme.

The design of the Automatic Sprinkler Installation has been designed in accordance with rules and regulations ASIB 12th Edition and SANS 10287. All pipe sizes have been hydraulically calculated using a commercial software FLOWNEX. The automatic sprinkler system will feature a Diesel pump to cater for Category 3 goods on shelves up to 2,2m high, but not wider than 1,0m. Pump to cater for Extra High Hazard 7,5mm/min density over 260 sq/m Area of Operation. This Diesel Pump has been designed for a Pump duty 3200 l/min @ 500 kPa. Tank Effective capacity of 290 cu/m.

The Pump house shall further be furnished with a Jockey Pump which has been selected to have a pump duty of 56L/min at 500kPa set to kick in at 450kPa to boost the system pressure back to 500kPa. The selected pump is a LOWARA 3SV12 Model as reflected in the fire protection drawings.

Pressure switches have been used to provide fire suppression system fault indications for high and, low water pressure, fire pump start initiation on a fall in pressure, and pressure maintenance pump (jockey pump) control, with low pressure initiating a pump start, and high pressure initiating a pump stop. Pressure switches are also used on dry system valves to actuate alarms.

Sprinklers for protection of office areas are fast response, Pendant spray, with a temperature rating of 68°C, white epoxy coated, 13.5mm orifice, and 19mm male NPT thread.

Pump room sprinklers shall be replaced with sprinkler heads with a temperature rating of 141^{0}C, white epoxy coated, 13.5mm orifice, and 19mm male NPT thread.

The Pump Room is furnished with a Hydrant Diesel pump with a duty of 1200 l/min @ 500 kPa. Tank Effective capacity to cater for 90 minutes flow, or 110 cu/m Effective capacity.

Total tank Effective capacity of 400 kL for both . Actual capacity will be 504 kL.

3.4. Fire Hose Reels, Extinguishers, Hydrants & Signage

The provision of fire extinguishers, hose reels, and hydrants shall be in accordance with SANS 10400-T. Water supply shall be from the municipal mains for hose Reels, however, for Hydrants the fire water shall be from a pressed steel tank of 90kL capacity as reflected in the accompanying drawings. The minimum pressure at the hose reels and hydrants shall be maintained within the range of 300- 600kPa.

3.4.1. Fire Hose Reels

Fire hose reels shall comply with SANS 543 and shall be maintained in accordance with SANS 1475-2 and shall be placed within reach of 6 meters in any space. Fire hose reels shall be fitted with a 30m long reinforced red rubber hose of the internal diameter of 20mm nominal bore, with a 4.8mm internal diameter chromium-plated brass nozzle. Fire hose reel pipes above ground shall be color-coded signal red A11.

3.4.2. Fire Extinguishers

Portable fire extinguishers shall comply with the requirements in SANS 1910, and shall be installed, maintained, and serviced by competent persons in accordance with SANS 1475-1 and SANS 10105-

1. The extinguishing medium shall comply with the appropriate requirements of SANS 1151 or SANS 1910 as relevant, and such a mobile fire extinguisher is kept in a readily accessible position. Dry chemical powders extinguishers shall be provided for general applications.

3.4.3. Hydrants

Hydrant installation shall be installed to comply with SANS 1128-1. Hydrants shall be provided so that no part of the building shall be more than 60 meters from a hydrant. Pipes supplying water to hydrants shall not be less than 75mm nominal diameter. All hydrants above ground shall be color-coded signal red A11.

3.4.4. Fire Signage

Marking and signposting shall be of the photoluminescent type generally with EXIT signs being of the illuminated type all complying with the relevant sections of SANS 1186. All signage shall comply with the requirements of SANS 10114-2 regarding emergency lighting.

Emergency exits signage shall be fitted with battery backup to last 60 minutes.

3.4.5. Fire Detection and Alarm System

Fire detection and Alarm systems shall be installed and maintained to comply with SANS 10139. Fire detection category L1/P1 shall be provided in all warehouse spaces. The detailed scope of fire detection has been covered elsewhere by the Electrical Engineer.

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4. Mechanical HVAC

4.1. HVAC System

The HVAC system for this project is a combination of back-to-back midwall split units with cassette units for boardrooms and other offices.

TABLE 4.1

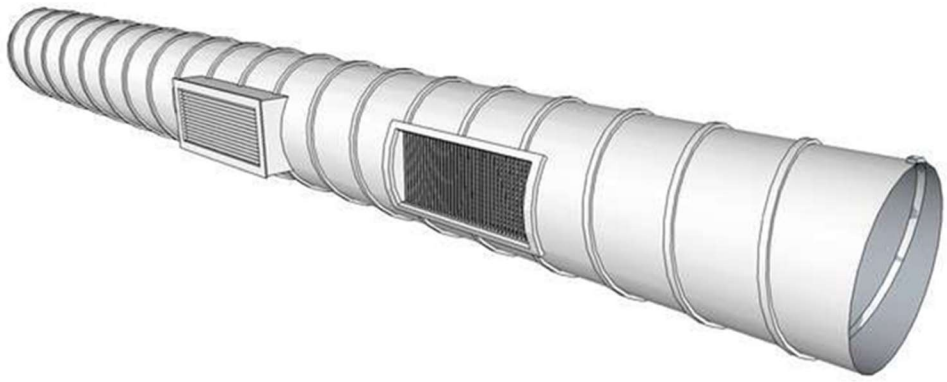
	
Midwall Split Unit for Offices	***Cassette Units for Boardrooms***
	
Typical Outdoor Unit	***Wall Mounted Controllers***

4.1.1. Typical installation

The air conditioning units have been designed to be strategically installed to ensure maximum air circulation in the cooling zones.As for the area with midwall split units, the units shall be installed 200mm below the ceiling level. Each unit shall have a dedicated wired controller on the wall at 1400mm above finished floor level. The controller to enable on/off switching, fan speed control, and temperature selection.

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For Dispatch and Packing Area a dedicated artificial ventilation system shall be installed as reflected in the accompanying HVAC drawings with a typical installation as reflected below:



4.2. Ventilation

4.2.1. Toilet Ventilation:

Ventilation assessment was conducted for all rooms checking compliance for natural ventilation with a threshold of Openable Window area 5% of Floor area. All areas not meeting this requirement were then considered for artificial ventilation.

TABLE 4.2a

	Space Description	Room Length (m)	Room Width (m)	Room Height (m)	Room Air Volume (m^3)	ACH	Flowrate (m^3/h)	Room Floor Area (m^2)	5% Floor Area (FA)	Windows Schedule Code	Quantity of Windows	Window Frontal Area (WA)	Openable Window Area (WA)	Okay/ Fail
1	Boardroom	8.985	4.200	2.8	106	10	1057	37.7	1.89	W08	3	2.88	4.32	OKAY
2	Manager's Office	6.520	4.200	2.8	77	2	153	27.4	1.37	W08	1	2.88	1.44	OKAY
3	Office 2	3.520	4.200	2.8	41	2	83	14.8	0.74	W08	1	2.88	1.44	OKAY
4	Office 3	4.645	4.200	2.8	55	2	109	19.5	0.98	W07	2	2.40	2.40	OKAY
5	Office 4	4.645	4.200	2.8	55	2	109	19.5	0.98	W07	2	2.40	2.40	OKAY
6	Office 5	4.645	4.200	2.8	55	2	109	19.5	0.98	W07	2	2.40	2.40	OKAY
7	Dispatch 2	16.400	5.390	2.8	248	2	495	88.4	4.42	W03	2	0.72	0.72	FAIL
8	Packing	15.490	5.390	2.8	234	2	468	83.5	4.17	W04	2	1.44	1.44	FAIL
9	Paraplegic Ablution	4.200	4.200	2.8	49	15	741	17.6	0.88	W04	1	1.44	0.72	FAIL
10	Change Room	2.200	5.390	2.8	33	15	498	11.9	0.59	W03	1	0.72	0.36	FAIL
11	Female Change Room	3.500	5.390	2.8	53	15	792	18.9	0.94	W05	1	2.10	1.05	OKAY
12	Office 1	3.500	5.390	2.8	53	2	106	18.9	0.94	W06	1	3.15	1.58	OKAY
13	Kitchen	6.200	5.390	2.8	94	10	936	33.4	1.67	W03	2	0.72	0.72	FAIL
14	Dispatch 1	3.500	5.390	2.8	53	2	106	18.9	0.94	W05	1	2.10	1.05	OKAY
15	M Change Room	3.420	5.390	2.8	52	15	774	18.4	0.92	W02	2	0.72	0.72	FAIL
16	F Change Room	3.420	5.390	2.8	52	15	774	18.4	0.92	W02	2	0.72	0.72	FAIL
17	Collection Area	7.290	7.120	2.8	145	2	291	51.9	2.60	None	0	0.00	0.00	FAIL
18	Sick Bay	4.120	3.500	2.8	40	2	81	14.4	0.72	None	0	0.00	0.00	FAIL
19	Server Room	3.000	3.500	2.8	29	2	59	10.5	0.53	None	0	0.00	0.00	FAIL

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All the rooms that coluld not meet natural ventilation threshold have been identified and considered for artificial ventilation as reflected below:

TABLE 4.2b

	Space Description	Room Length (m)	Room Width (m)	Room Height (m)	Room Air Volume (m^3)	ACH SANS 10400 Part:O	Flowrate (m^3/h)	Design Flowrate (Litres/s)	FAN Flowrate (Litres/s)	Okay/ Fail
1	Dispatch 2	16.400	5.390	2.8	248	2	495	138	2269	Okay
2	Boardroom	8.985	4.200	2.8	106	10	1057	294	513	Okay
2	Manager's Office	6.520	4.200	2.8	77	2	153	43	513	Okay
3	Packing	15.490	5.390	2.8	234	2	468	130	2269	Okay
4	Paraplegic Ablution	4.200	4.200	2.8	49	15	741	206	210	Okay
5	Change Room	2.200	5.390	2.8	33	15	498	138	140	Okay
6	Kitchen	6.200	5.390	2.8	94	10	936	260	260	Okay
7	M Change Room	3.420	5.390	2.8	52	15	774	215	220	Okay
8	F Change Room	3.420	5.390	2.8	52	15	774	215	220	Okay
9	Collection Area	7.290	7.120	2.8	145	2	291	81	85	Okay
10	Sick Bay	4.120	3.500	2.8	40	2	81	22	25	Okay
11	Server Room	3.000	3.500	2.8	29	2	59	16	0	Okay

The ablution areas shall be mechanically ventilated in accordance with the code SANS-10400 Edition 3 Part O “Lighting and Ventilation” by means of extract air fans and ducting system.

The mechanical ventilation in the ablutions shall be through a wall mount fan with an aluminum weather louver, the fans shall be operated through proximity sensors to prolong the life of the fans.

Some zones shall be ventilated through a ducted system with occupation sensors linked to the tube fan. The extract air valves above the ablutions shall be connected by means of a flexible connection and sheet metal ducting to the main extract ducting.

To ensure optimal ventilation, aluminum doors grilles are to be fitted to the entrance to toilet areas.

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4.3. Areas to be Air-Conditioned / Ventilated

Table 4.3a below gives a schedule of areas to be heated, ventilated, and air-conditioned.

Table 4.3a: Schedule of Areas

	Space Description	System
1	Boardroom	Air Conditioned
2	Manager's Office	Air Conditioned
3	Office 2	Air Conditioned
4	Office 3	Air Conditioned
5	Office 4	Air Conditioned
6	Office 5	Air Conditioned
7	Dispatch 2	Artificial Ventilation
8	Packing	Artificial Ventilation
9	Paraplegic Ablution	Artificial Ventilation
10	Change Room	Artificial Ventilation
11	Female Change Room	Artificial Ventilation
12	Office 1	Air Conditioned
13	Kitchen	Artificial Ventilation
14	Dispatch 1	Artificial Ventilation
15	M Change Room	Artificial Ventilation
16	F Change Room	Artificial Ventilation
17	Collection Area	Air Conditioned
18	Sick Bay	Air Conditioned
19	Server Room	Air Conditioned

4.4. Ambient Design Conditions

Based on conditions recorded in Durban:

Summer 31.0°C DB and 20°C WB

Winter 10.0°C DB

The above conditions are the mean average maximum and minimum temperatures recorded in the area and which are normally not exceeded on more than ten days in a year.

4.5. Inside Controlled Conditions

For air conditioned area:-

Summer 22,5°C db at 50% R.H.

Winter 21,0°C db

The above temperatures are those at which the majority of people are considered to be comfortable, as indicated on a Comfort Chart, and which are accepted as standard indoor design conditions in South Africa, for office areas.

The temperatures would be controlled within a tolerance of ± 2.0°C.

maximum during summer	24.5°C db
minimum during winter	19.0°C db

The relative humidity would not be positively controlled but would be indirectly controlled within the comfort range as a result of the design and selection of the cooling plant.

4.6. People Density

This warehouse has been designed to accommodate 10 Operation Staff and 15 Office Staff members.

4.7. Outdoor Air Ventilation Rates

Outdoor air requirements have been allowed in accordance with the South African National Building Regulations SANS 10400 Edition 3 Part 0 and XA at 7.5 l/s/m^2 or 2 ACH for the Offices and 15 ACH for the ablution areas. For other rooms refer to the ventilation Table above.

4.8. Lighting Load

The calculations have allowed for a lighting load equivalent to the following in all areas: (Electrical Consultant to check/confirm)

Stdent Domitories	**10 watts/m²**
Server Room	**10 watts/m²**

4.9. Equipment Loads

Equipment loadings equal to **10 watts /m²** have been allowed in the conference/ meeting areas only.

4.10. Refrigerant Charge

The refrigerant charge that would be used on the Direct Expansion systems would be R410A.

4.11. Building cooling & heating electrical loads

The average **electrical power consumption will be in the order of 40 W/m²**, excluding, toilet or kitchen.

4.12. Solar Shading

Internal shading like medium to light-colored blinds are required on the East, West, and North facades for glare control – by others. External shading devices like louvers are required for large

glass areas. Using external shading devices on North and West glass facades, to block out solar influx into the air-conditioned spaces is recommended.

The mechanical engineer will be responsible to review the **thermal properties only** of the glazing itself. Glazing supply, frame selection, obtaining client approval, and installation is by others. A glass with a U-Value 2.1 W/m²°C will be targeted for, but in our calculations allowed for a Glass with a U value of 5.0 W/m²°C. The assumption is that there would be no thermal break between glass and frame.

Low-e coating: No objection against using Low-E glass as long as a minimum it conforms to the U-value and SC as per this report.

Shading Coefficient: We strongly recommend glass to have a good shading coefficient of less than 0.5

It must be noted that while it is understood that user openable windows could be included in the design (offices/boardroom), the HVAC system is sized that during peak conditions all windows are closed to minimize infiltration of hot/cold air into the air-conditioned zone.

4.13. Building Insulation

According to SANS 10400-XA. Architect and Structural engineer to refer and ensure compliance with the details in the standard itself. In brief :

- Mechanical Engineering will be responsible to review the thermal properties of the wall construction. The architect to be responsible for detailing the external walls or partitions to achieve the required U-value, lasting for at least 25 years, and detailing the waterproofing and water vapor proofing. The Fire Consultant will be responsible to review the detail in terms of fire and smoke integrity.
- The structure must be sealed with an acceptable vapor barrier to minimize the ingress of moisture into the populated areas.
- Insulation to be detailed by architect installed by the builder.

4.14. Ceiling Voids

The absolute minimum ceiling void to the office areas where the indoor units are located should be a clear **450**mm deep (HVAC Zone). Access panels or removable panels will be required for maintenance access to units, fire dampers, fans, etc.

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4.15. Noise Levels

The equipment shall be selected to provide the following maximum noise levels:-

Offices	30db (@ night), 35db (day)
Air conditioned space	40db
Public Space	NC 45db

Other equipment such as extract fans shall be selected not to exceed the maximum ambient noise levels allowable for the area as dictated by the Local By-Laws.

4.16. HVAC Control system

The proposed HVAC system in the Warehouse and offices is a combination of midwall split and cassette units and thus central air conditioning will not be applicable.

4.17. Plant Maintenance

1 Year Service and Maintenance of the HVAC plant will be included in the Tender Documents. To ensure that the HVAC system operates effectively and optimally, and to lengthen the lifespan from the plant the HVAC plant is to be serviced regularly and maintained even after 1 year by a specialist and approved HVAC contractor in accordance with the product service requirements.

4.18. Long Lead Items

We confirm below the extended list of anticipated long-lead items as per the current market situation:

Item	**Procurement time**
Cassette Units	2-3 Weeks
Dispatch Fans	3-4 Weeks
Electrical Panels	3-4 Weeks
Motor Control Panels	6-8 Weeks
Piping & Fittings	5-6 Weeks
Ducting	3-4 Weeks
Diffusers & Grilles	2-3 Weeks

4.19. Exclusions

The following additional provisions would be allowed for by the electrical, plumbing, and building contractors:-

4.19.1. Electrical

Power Supply Connections

The following items are in the scope of the electrical contractor, not the HVAC contractor

- Lightning Protection around the building and over the HVAC outdoor plant.
- 400 Volt, 3 Phase, 4 wire electrical supplies would be required to serve the air conditioning and ventilation plant on the lower ground level. The electrical contractor would provide power to each outdoor unit and fans on the roof. The HVAC contractor would distribute power from the distribution boards to the individual HVAC equipment – outdoor units and fans. Terminate with a suitable rated outdoor isolator adjacent to each HVAC equipment.
- 240V, single-phase, 50Hz isolators, 16Amp (or plug with shaved earth pin) to each indoor unit.
- Load shedding signals are wired to all air-conditioning and ventilation switchboards.
- All final terminations in air conditioning panels by the electrical contractor.
- Fault Levels - plant rooms, fans, etc. 10 kA
- Fire Detection

Fire Signals

- A fire signal provided by the Electrical Contractor, from a smoke detection system is required to be connected to the relevant fans control boards (on roof and basement). The fans and control boards form part of the Ventilation Contractor's contract (air conditioning subcontractor to provide potential-free contact for signal termination).
- Provide a fire signal to the control board for smoke dampers. Board by HVAC contractor.

4.19.2. Plumbing

Drain Connections And Water Supplies

The following items are in the scope of the plumbing contractor, not the HVAC contractor

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- Water for make-up and filter cleaning points as shown on drawings – typically one 40mm water point on the roof, (with a floor drain.
- Trapped floor drains in all air conditioning plants as shown on the drawin

5. Cost Estimate

The total construction costs for the mechanical installation are as per Contract Bill of Quantities.

6. Standards

The design of the above-mentioned Mechanical Engineering is the subject of a rational design by a professional engineer. The Rational design is based on the basic engineering performance criteria of the following South African and British Documents:

- SANS 10400-A: General principles and requirements
- SANS 10400-P: Drainage
- SANS 10400-O: Lighting and Ventilation
- SANS 10400-T: Fire Protection
- ASHRAE: Applications
- SANS 10400-Q: Non-water-borne means of sanitary disposal
- SANS 10400-XA: Energy usage in buildings
- SANS 10252-1: Water supply installations for buildings
- SANS 10252-2: Drainage Installation for buildings
- SANS 10254: The installation, maintenance, replacement, and repair of fixed electric storage water heating systems.
- SANS 151: Fixed electric storage water heaters
- SANS 204: Energy efficiency in buildings
- SANS 241-1: Microbiological, physical, aesthetic, and chemical determinants.
- SANS 241-2: Application of SANS 241-1
- Below is a list of the relevant specifications and regulations:

STANDARD/REGULATION	DESCRIPTION
Act 103 of 1977	National Building Regulations & Building Standards Act
Act 85 of 1993	The Occupational Health & Safety Act
BS 476-10:2009	Fire Tests on Building Materials and Structures
EN12101	Smoke Ventilation Systems
SANS 10400	The Applications of the National Building Regulations
SANS 10252-1	Water Supply and Drainage for Buildings – Part 1: Water Supply Installations for Buildings
SANS 1151 & SANS 1910	Portable Rechargeable/Refillable Fire Extinguishers
SANS 1475 -1 & SANS 10105 - 1	Installation, Maintenance, and Servicing of Portable Fire Extinguishers
SANS 1475 -2, SANS10105-1, SANS 543 and SANS 10400-Part W	Installation, Maintenance, Water Supply, and Servicing of Fire Hose Reels
SANS 1128 – 1 and 2	Installation, Maintenance, and Servicing of Fire Hydrants
SANS 10139	Fire detection and alarm systems for buildings — System design, installation.
SANS 10114-2	Interior Lighting Part 2: Emergency Lighting
SANS 1186	Fire Escape and Fire Equipment Signage.
SANS 1091: 2004 Edition 2	National Colour Standard

Annexures N - Project Industrial Relations Policy and Management Plan (PIRPMP)

Transnet Capital Projects Contractor Industrial/Employee Relations Requirements

1. PURPOSE

The purpose of this Tender Return Schedule is to ensure that the Contractors

understand:

1.1 Transnet Capital Projects ("TCP") Industrial/Employee Relations requirements so as to ensure that Industrial/Employee Relations ("IR/ER") are managed effectively on sites.

1.2 TCP IR/ER policies and procedures are adhered to.

2. PRINCIPLES

2.1. ER/IR policies and procedures of Transnet are to be adopted by all contractors on Transnet site to ensure that the following principles are enshrined:

2.1.1 Compliance with all applicable legislation that governs labour relations in the Republic of South Africa.

2.1.2 Compliance with all applicable industrial agreements and relevant Sectorial Determination.

2.1.3 Compliance with local labour agreements that are negotiated between contractor employer associations and organised labour.

2.1.4 Compliance with the notion of fair labour practices as developed by the judgements and rulings of the CCMA, Labour Courts and the Labour Appeal Court in the Republic of South Africa.

2.1.5 Fair and equitable terms and conditions of employment that are, as far as possible and practicable, uniform and standardised across the project, through the mechanism of individual project labour agreement.

2.1.6 Compliance with all project procedures, rules and regulations that are prescribed, introduced or implemented by Transnet's duly authorised representatives.

3. APPLICABILITY

3.1 The provisions of this Industrial/Employee Relations Tender Requirements shall be applicable to all Main Contractors and Subcontractors.

3.2 It is acknowledged by TCP that the Contractor has its own established Industrial/Employee Relations policies, procedures, and systems and that various industrial relation systems and statutory instruments are already in effect which differ between various industries, contractors and labour unions involved.

3.3 Neither this document nor the actions of the TCP diminishes the responsibilities

of the Contractor to implement and comply with its own industrial relations, in compliance with the required legislations and collective agreements.

3.4 Where any aspects of the employment relationship is not governed by the IR Plan, or aspects of those conditions require amendment to meet the needs of the Project, then the revised standard is evolved in consultation between the Contractor and the Project IR Practitioner.

4. EMPLOYEES CODE OF CONDUCT

4.1 All the Contractor's employees on the Project shall sign a Code of Conduct on behaviour. The purpose of this code is to ensure Contractor employees' good behaviour whilst on the Project, protects Transnet reputation as a good corporate citizen.

4.2 Contractors are to ensure that the requirements of the code are included on all employment contracts to the Project.

5. VALIDITY OF COLLECTIVE BARGAINING SYSTEMS & STATUTORY INSTRUMENTS

In order to promote a high standard of Industrial/Employee Relations Management and to ensure a consistent, uniform approach, the Contractor/Subcontractor shall recognise all various legislations and agreements signed with organised labour in their relevant industry.

6. AUDIT

6.1 Transnet, at its own discretion, may, at any stage of the Project, conduct an audit of the IR Policies, procedures and practices of the Contractor or any of its Sub-contractors, or any other issues impacting on the IR of the Contractor and/or the Site in order to establish whether acceptable standards are being maintained. The Contractor and or Sub-contractor shall give full cooperation and shall provide all information required to conduct the audits.

7. TCP INDUSTRIAL RELATIONS REQUIREMENTS PACK:

7.1 POLICIES

7.1.1 Recruitment policy (secondment, local community & expatriates)
7.1.2 Accommodation and transport policy
7.1.3 Sexual harassment policy
7.1.4 Induction policy
7.1.5 Training policy
7.1.6 Substance abuse policy
7.1.7 Remuneration policy (payslip)
7.1.8 Retention skill policy
7.1.9 Travel allowance and reimbursement policy

7.1.10 Accommodation policy
7.1.10 BBBEE policy

7.2 PROCEDURES

7.2.1 Grievance procedure
7.2.2 Disciplinary code and procedure
7.2.3 Mobilisation and demobilisation procedures
7.2.4 Health & safety medical testing procedure
7.2.4 Strike handling plan
7.2.5 Dispute resolution procedure

8. BARGAINING COUNCILS

8.1 The contractor shall provide the proof of membership (certificate), if Contractor belongs to a Bargaining Council.

9. CONTRACTOR IR CONSULTANT

9.1 The Contractor shall appoint a full-time Competent Site IR Consultant, approved by Transnet with at least relevant qualifications/ 5 years minimum experience to manage and co-ordinate their industrial relations activities and to assist in speedy resolution of dispute that may arise on site and to ensure that labour harmony prevails.

9.2 Should the Contractor's IR be deficient, Transnet reserves the right to ask for further appointments of full time IR professionals.

10. RECRUITMENT OF LABOUR TO THE PROJECT

10.1. No employee shall attend Site Induction Programme or commences work on the project without the required approval of the Transnet ER/IR Practitioner.

10.2. No employee shall receive project induction and badging until the Contractor has submitted proof to the Project IR Practitioner that the Contractor's employee has signed a Contract of Employment and received induction from the contractor in regard to the conditions of service and benefits whilst on the Project.

10.3 Semi & Unskilled Labour

10.3.1. The Contractor/Subcontractor shall employ local semi & unskilled labour and ensures that such local labour is skilled to perform the required tasks. Local labour is defined as "those persons residing permanently within the Local Municipality or part thereof, or within a 100km radius of the Project Site.

10.3.2. Due regard is to be given to regional and sectorial employment equity

targets.

10.4 Skilled Labour

10.4.1. The Contractor/Subcontractor shall only utilise seconded labour for the purposes of providing core skills to the Project in circumstances where the required skills are not available in local vicinity of the site.

10.5 Expatriate Employees

10.5.1. The Contractor/Subcontractor shall only utilise expatriate labour for the purposes of providing core skills to the Project in circumstances where the required skills are not available in South Africa.

10.5.2 No expatriate labour shall be employed on Site without the necessary work permit being issued.

The Contractor provides, at the time of the Project, a labour histogram indicating the numbers of expatriate, core (skilled) and locally employed employees. The histogram is revised on a regular basis to accurately reflect the Contractor' needs and submitted to the Project IR Practitioner.

11. INDUCTION

11.1 The Contractor/Subcontractor shall conduct site induction at its own expense covering the following aspects 2 weeks before commencement of any work on site:

11.1.1.1 General site procedure
11.1.1.2 Sectorial determinations and collective agreements
11.1.1.3 Grievance procedure
11.1.1.4 Dispute resolution procedure
11.1.1.5 Demobilisation procedure
11.1.1.6 Disciplinary code and procedure
11.1.1.7 Training policy
11.1.1.8 Accommodation and transport policy
11.1.1.9 Substance abuse policy
11.1.1.10 Communication structure
11.1.1.11 Pre-medical examination
11.1.1.12 Reading and understanding salary advice

11.2 Contractor/Subcontractor Site Industrial Relation Consultant shall submit mobilisation report to TCP IR/ER within 48 hours prior to commencement of work on site.

11.3 Attendance at this induction is compulsory for all Contractors' employees and all employees attend these induction programmes before being permitted to work on Site.

11.4 No employee of the Contractor is permitted to commence work on Site unless in

possession of a valid Site Access card issued by the Contractor following an induction.

12. MOBILISATION

12.1 The Contractor shall submit a mobilization form on Contractor's letterhead with the following:

12.1.1 Name and Surname of Employee,
12.1.2 ID and Company Number of the Employee,
12.1.3 Mobilization Date,
12.1.4 Applicable rate of pay,
12.1.5 Occupation and job grade of Employee,
12.1.6 Contact Details of Employee,
12.1.7 Person Employee is reporting to, and
12.1.8 Demobilization date, etc.

12.2 Should the Employees not be demobilized as indicated on the mobilization forms, the contractor shall submit on monthly basis to the Project IR Practitioner a list indicating names of employees, demobilization dates, revised date and reasons for the extension of the demobilization dates.

13. STRIKE HANDLING PLAN

13.1 The Contractor/Subcontractor shall ensure that its employees understand relevant LRA provisions (section 64) which focus on industrial action processes.

13.2 The Contractor/Subcontractor shall ensure that the strike contingency handling plan is updated and communicated to all relevant parties.

13.3 No negotiations and/or related feedback by employees shall occur on TCP premises.

13.4 The Contractor/Subcontractor shall compensate TCP for any costs incurred to provide additional security to deal with the Contractor/Subcontractor employees during the labour unrest.

13.5 In the event of the Contractor becoming aware of the potential IR incident/labour union dispute or upon the occurrence of such an incident/dispute, the Contractor immediately reports the details thereof verbally to the Project IR Practitioner, followed by a written daily comprehensive report at 08.30am detailing the industrial action events of the previous day. The Daily Comprehensive Report must provide at least the following information:

13.5.1 Industrial incident report,
13.5.2 Attendance register,
13.5.3 Productivity / progress to schedule reports,

13.5.4 Operational contingency plan,
13.5.5 Site security report,
13.5.6 Industrial action intelligence gathered

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

13.7 The Contractor submits, irrespective of the occurrence of incidents/disputes or not, a Weekly IR Report, by 9.00am each Monday, to the Project IR Practitioner and via the Project Director's Document Control Office.

13.8 Contractor/Subcontractor management delegates will participate in the daily industrial action teleconference as arranged/communicated by TCP ER/IR.

14. LABOUR HARMONY

The Contractor/Subcontractor shall encourage labour harmony in the workplace through fair and transparent labour relations practices with employees, employee representatives and organised labour representatives.

16. REMUNERATION POLICY & PAYROLL PROCEDURES

16.1 The Contractor/Subcontractor shall comply with best practices of payment and administration of wages by implementing a proper payroll system that is in line with labour law requirements such as deductions of Employees Income Tax, Unemployment Insurance Fund, Workman's Compensation and/or any other statutory deductions from the employees. Standard wage rates shall be adhered to as per relevant sectorial determination.

16.2 The Contractor/Subcontractor shall resolve pay queries expeditiously, in terms of its Human Resources procedures.

16.3 The Contractor/Subcontractor shall ensure that employees understand the salary advices.

17. SKILLS DEVELOPMENT

17.1 The contractor shall submit monthly report to TCP IR/ER on the skills development programmes.

17.2 The Project Manager/HR shall evaluate the Contractor's IR submissions and monitors the skills development programmes.

17.3 The Contractor/Subcontractor has a responsibility to ensure that skills transfer initiatives and development programmes are implemented.

17.4 The Contractor/Subcontractor shall aid and facilitate this process by implementing

on-the-job training initiatives in order to assist in the transfer of skills to local employees.

17.5 The contractor shall submit to TCP programme indicating retention of skills.

18. SOCIO-ECONOMIC CONTRIBUTION TO LOCAL COMMUNITY

18.1 Socio-economic contribution to the closest local community that will leave a legacy after the project i.e.
- 18.1.1 Education,
- 18.1.2 Health,
- 18.1.3 Security,
- 18.1.4 Infrastructure,
- 18.1.5 Above to be for the betterment of the local community's daily lives

19. FACILITIES

Facilities such as toilets, change facilities (for both females and males) and smoke areas, etc. are to be provided to employees as guided by legislation.

20. SUBSTANCE ABUSE

20.1 The Contractor/Subcontractor shall ensure that substance abuse management processes are aligned to relevant legislation.

21. COMMUNICATION AND CO-ORDINATING STRUCTURES

TCP requires that certain communication structures and forums be established, for the purpose of ensuring a uniform approach to IR/ER issues and a free flow of information amongst all relevant parties.

21.1 Weekly IR Practitioners' Meeting (WIRPM)

- 21.1.1 The WIRPM consists of the Contractor IR Manager, under the chairmanship of the Project IR Practitioner,
- 21.1.2 The Project IR Practitioner arranges for and distributes minutes to the Contractor,
- 21.1.3 Only Contractor IR Manager attends the meeting and distributes minutes to their sub-contractors.

22. Project IR Coordinating Committee (PIRCC)

- 22.1 The PIRCC consists of the Project Manager/Employer Site Management, Security Manager, Contractor Site Manager and Contractor IR Manager, under the chairmanship of the Project IR Practitioner,
- 22.2 The PIRCC meets at least once a month, or more often if circumstances so warrant. Attendance by the Contractor Site Manager at these meetings is a contractual obligation,
- 22.3 The Project IR Practitioner arranges for minutes to be taken of each meeting, which are circulated to all Contractors,

22.4 The PIRCC will consider IR circumstances of a strategic nature on the Project and in the light thereof:

22.4.1 Discuss existing or potential IR problems and possible solutions,
22.4.2 Exchange ideas and, where necessary, make recommendations to the Project Manager for action on IR Plan issues,
22.4.3 Participate in any forum established by the Project Manager to promote sound IR on the Project,
22.4.4 Ensure that all members of the Committee are adequately informed in a timely manner on all IR aspects of the Project.
22.4.5 The Contractor represents its interests and those of its sub-contractors at the PIRCC.

22.2 Contractor Employee In-house Communication Forum (CCF)

22.2.1 The Contractor establishes an in-house Communications Forum (Employee Representative body) in respect of its establishment and takes the necessary steps to ensure that this forum remains effective and functional.

22.2.2 The Project IR Practitioner or his delegate is entitled to attend meetings of the Communications Forum as an observer,
22.2.3 Copies of the minutes of the meeting of the Communications Forum are sent to the Project IR Practitioner for follow ups and records purposes.

22.2.4 The Contractor shall that ensures, to the satisfaction of the Project IR Practitioner, that proceedings at this forum are properly communicated to their workforce.

22.2.5 CCF meets at least once twice a month, or more often if circumstances so warrant.

23. REPORTING

23.1 Weekly IR Report

The Contractor submits, by 09.00am each Monday, Weekly IR Report for the week to the Project IR Practitioner and to the Project Director's Document Control Office, showing the number of people per day on Site associated with its Contractor, employed by the Contractor and its Sub-contractors on Site. Information relating to the Contractor's Service Providers and visitors to Site are also included in the report.

Industrial Relations requirements, the LRA, BCEA or any statutory regulations, the Main Contractor will be served with a notice of non-compliance .The breach must be rectified within a reasonable period and failure to do so will result in the Main Contractor being in breach of its contract.

Recommended by:

Oupa Radise

GM: TCP Human Resource and Comms

Date.....19/6/2014

Approved by:

Charl Moller

GE: Transnet Capital Project

Date.....2014.08.18.

Annexures O - How to Access and Register eTenders

TRANSNET

LEARNER GUIDE



TRANSNET

E-SUPPLIER

PORTAL TRAINING

OUR **LEARNING JOURNEY**

1 Purpose & Outcomes

2 Step by Step Guide

3 Conclusion

4 Glossary: Acronyms

5 Glossary: Portal Actions

6

7

Purpose & Outcomes

Purpose

The purpose of this module is to enable participants to understand and effectively use the eSupplier Portal. Learners will gain the knowledge and practical skills required to perform supplier registration, tender bidding, and contract approval activities in line with organisational processes and compliance requirements.

Learning Outcomes

By the end of this module, participants will be able to:

Registration
Capture and submit supplier registration details, including business, partner, transformation, and address information.
Tender Bidding
Log an intent to bid on the portal.
Upload bid documentation in the required formats.
Capture pricing schedules accurately.
Complete and submit scorecards for evaluation.
Contract Approval
Review contracts for approval within the system.
Use contract chat and communication functions to resolve queries and finalise approval.
System Use
Apply knowledge of the eSupplier Portal to confidently perform supplier-related activities in support of organisational compliance and operational requirements.

TRANSNET



TRANSNET

E-SUPPLIER

PORTAL TRAINING

Supplier Registration

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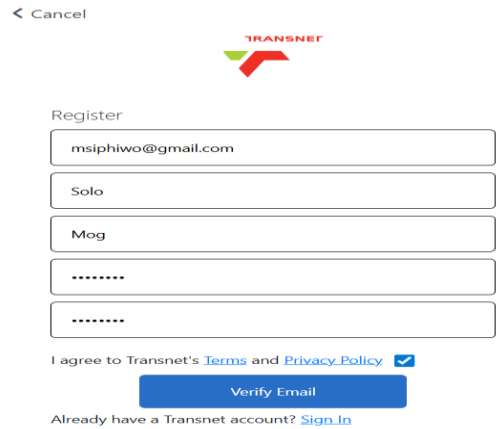
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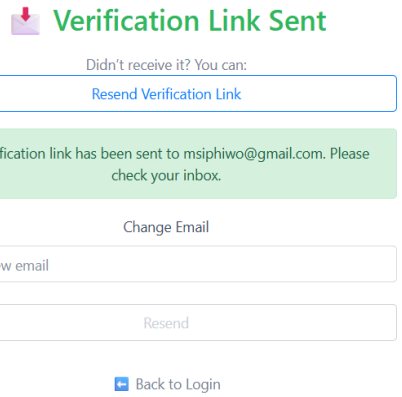
Registration:

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Click the sign up link.
Step 3: Populate the registration details:

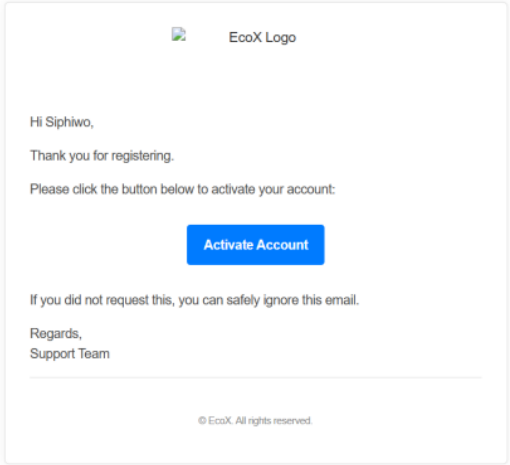
- Populate your Email
- Populate your Name
- Populate your Surname
- Populate your Password and Confirm password

Step 4: Click the check box once you have agreed to the Terms and read all the policies.
Step 5: Click the verify email link button





Transnet Verification Code



Registration (Organisation Information)

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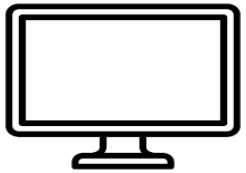
Supplier/Bidder

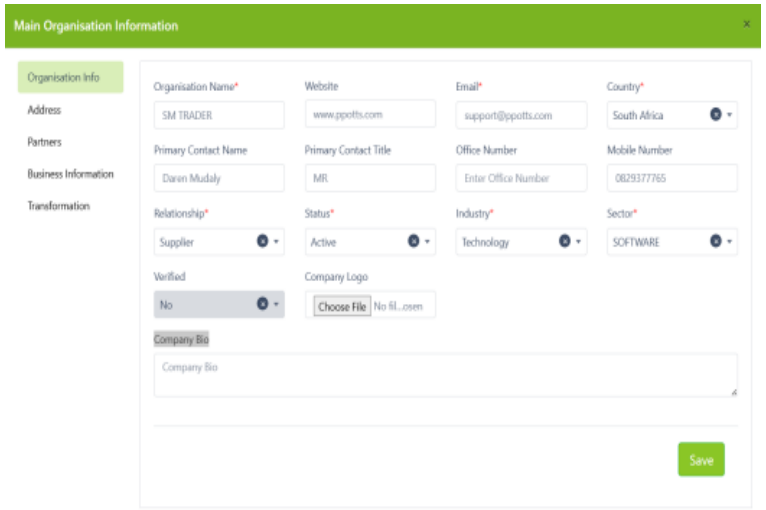
Registration (Organization information):

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Populate your email and password details, then click sign button.
Step 3: Clicks the Supplier relationship management button.
Step 4: Click the manage button.
Step 5: On the Organization info button (Populate):

- Organization Name*
- Website
- Email*
- Country*
- Primary Contact Name
- Primary Contact Title
- Office Number
- Mobile Number
- Relationship*
- Status*
- Industry*
- Sector*
- Upload
- Company Logo
- Company Bio

Step 6: Then click the save button





Maintain and Manage Company Address Info.

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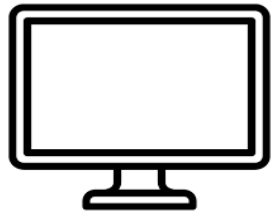
Supplier

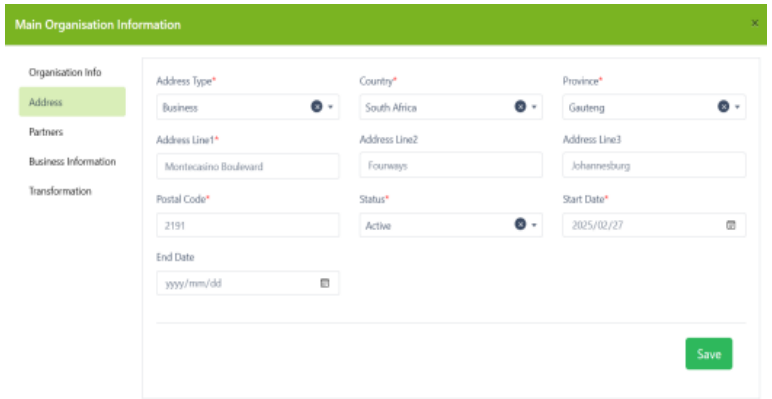
Registration (address):

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Populate your email and password details, then click sign button.
Step 3: Clicks the Supplier relationship management button.
Step 4: Click the manage button.
Step 5: On the Address button (Populate):

- Address Type*
- Country*
- Province*
- Address Line1*
- Address Line2
- Address Line3
- Postal Code*
- Status*
- Start Date*

Step 6: Then click the save button





Maintain The Company Partners Information

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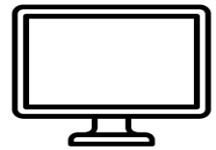
Supplier/Bidder

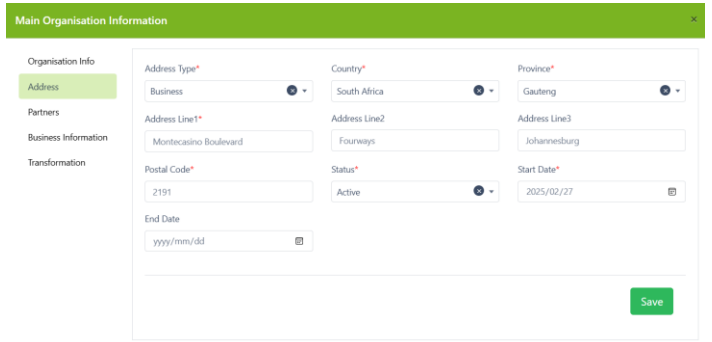
Registration (Partners):

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Populate your email and password details, then click sign button.
Step 3: Clicks the Supplier relationship management button.
Step 4: Click the manage button.
Step 5: On the Partners button (Populate/Select):

- Partner*
- Relationship*
- Start Date*
- End Date
- Populate the Agreement text field
- Populate the Terms text fields

Step 6: Then click the save button





Manage and Maintain Business Information

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Supplier

Registration (Partners):

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Populate your email and password details, then click sign button.
Step 3: Clicks the Supplier relationship management button.
Step 4: Click the manage button.
Step 5: On the Business information button (Populate/Select):

- Trading Name*
- Company Registration Number*
- Year of Incorporation*

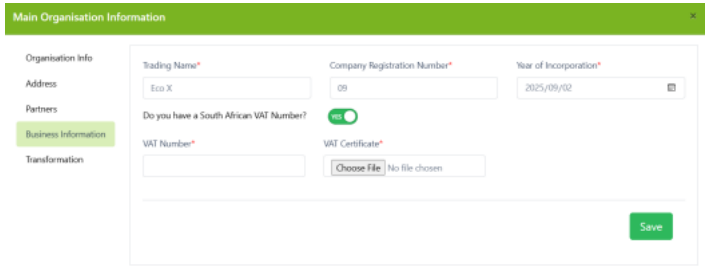
Step 6: Click the YES option on the radio button for: Do you have a South African VAT Number?

(If yes option is selected)

- Populate VAT No.
- Upload the VAT Certificate

Step 6: Then click the save button





Manage the Transformation

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Supplier

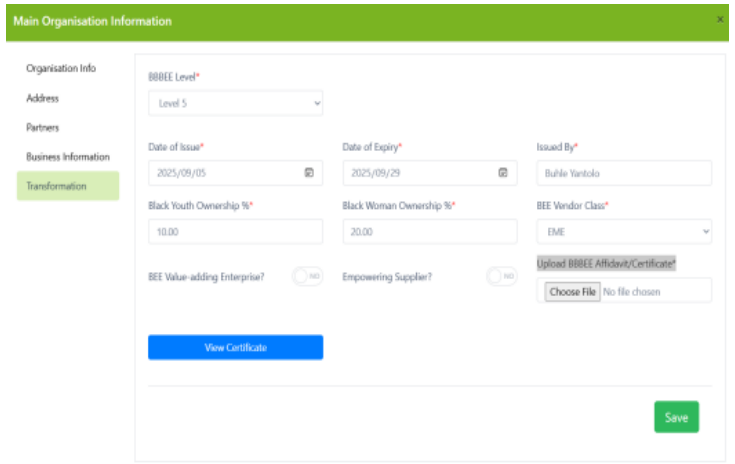
Registration (Transformation):

Step 1: Search for the Supplier Relationship Portal using the URL: <E-supplier Portal Link>
Step 2: Populate your email and password details, then click sign button.
Step 3: Clicks the Supplier relationship management button.
Step 4: Click the manage button.
Step 5: On the transformation button (Populate/Select):

- BBBEE Level*
- Date of Issue*
- Date of Expiry*
- Issued By*
- Black Youth Ownership %*
- Black Woman Ownership %*
- BEE Vendor Class*
- Black Youth Ownership %*
- Black Woman Ownership %*
- BEE Vendor Class*
- (Click the yes or no option on the radio button) BEE Value-adding Enterprise?
- (Click the yes or no option on the radio button) Empowering Supplier?
- Upload BBBEE Affidavit/Certificate*

Step 6: Then click the save button





Applying for Bids

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Supplier/Bidder

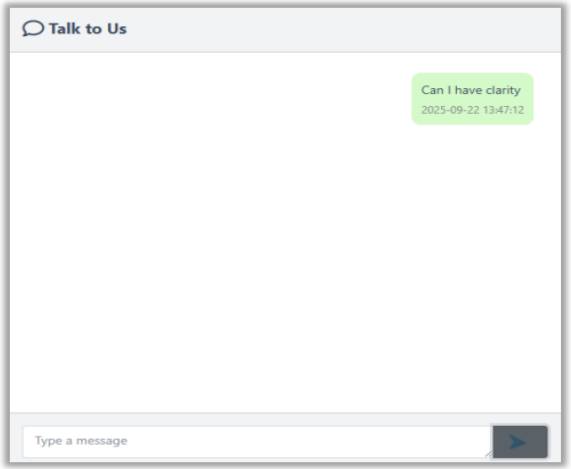
Applying for Bids

Step 1: Log on to the **Supplier Relationship Portal**. (**<E-supplier Portal Link>**)
Step 2: View the **Open Tender Tab**.
Step 3: View the **relevant tender**.
Step 4: Click **View details**.
Step 3: Click the **Log Intent to bid radio button** to **Yes**.



Ask for Clarity

Step 1: Click the ask for **clarity tab.**
Step 2: Type the message in the text bar, then click the **send arrow**



Submit Tender Documentation

1
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Supplier

Step 1: Click the Submit Tender Documents button (blue)
Step 2: Click on the mandatory tab.
Step 3: Choose a file form your local, click the Upload Documents button to upload the document in this Section.
Step 4: Click on the Essential tab.
Step 5: Choose a file form your local, click the Upload Documents button to upload the document in this Section.
Step 6: Click on the non-essential tab.
Step 7: Choose a file from your local, click the Upload Documents button to upload the document in this Section.
Step 8: Click on the other tab.
Step 9: Choose a file from your local, click the Upload Documents button to upload the document in this Section



Pricing & Scorecard Captured

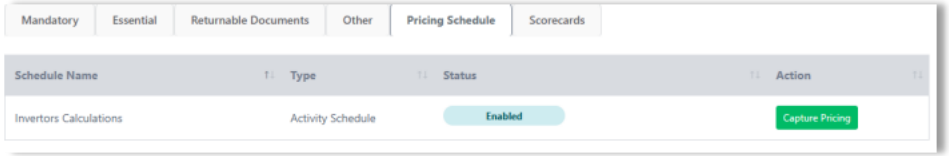
1
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Supplier/Bidder

Pricing Captured

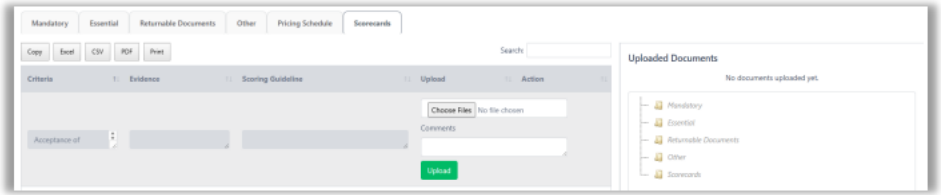
Step 1: Click on the Pricing schedule tab.
Step 2: Click the Capture Pricing button, Capture your rating on each line item.
Step 3: Click the Submit pricing button.





Scorecard Captured

Step 1: Click the Score card tab.
Step 2: Click the Choose file button, then upload a file.
Step 3: Type a comment on the comment section.



Tender Bid is submitted

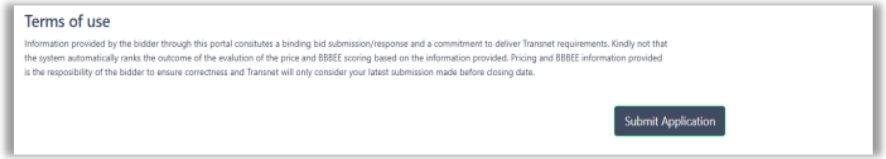
10

Supplier

Submit Tender Bid

Step 1: Click my intents tab.
Step 2 Click the View detail button on the tender.
Step 3: Click the Submit Tender Document button
Click the submit application button.
Step 4: Click the Submit Application button.





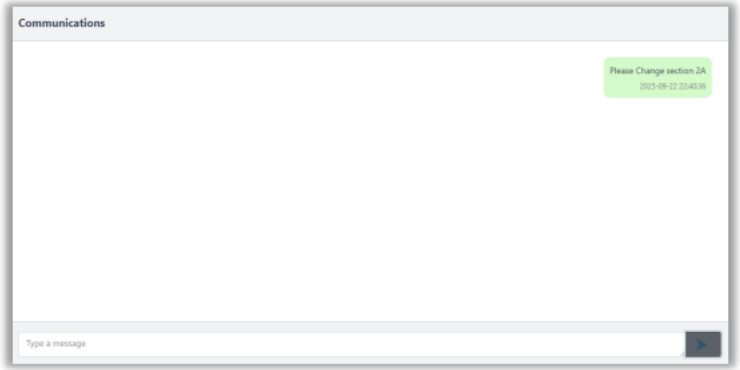
Supplier Response

Supplier

Supplier Response

Step 1: Login the Supplier Relationship Portal.
Step 2: Click on the SRM tab.
Step 3: Click on the documentation tab.
Step 4: Click on the contract tab.
Step 5: Click on the folder with the shared contract (MSA) to preview the documentation.
Step 6: View the Chat section and add comments related to the shared MSA and click send



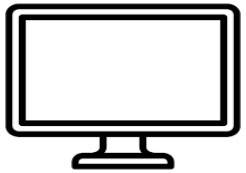


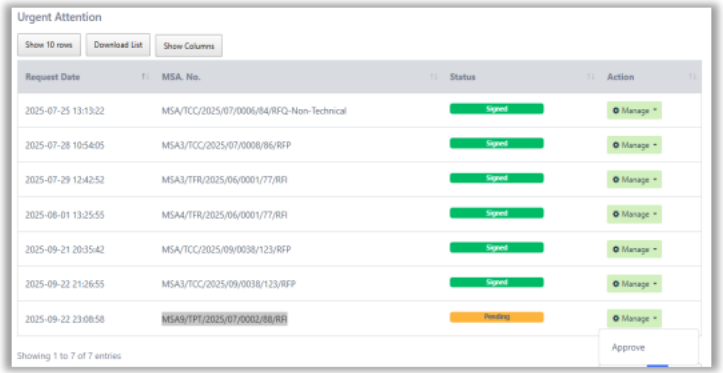
Supplier Approval

Supplier/Bidder

Supplier Approval

Step 1: Login the Supplier Relationship Portal.
Step 2: Click on the SRM tab.
Step 3: Click on documentation tab.
Step 4: Search for the Contract on the Urgent attention table.
Step 5: Click the manage button then click Approve button.





TRANSNET

FULL-SCREEN IMAGES

TRANSNET

E-SUPPLIER

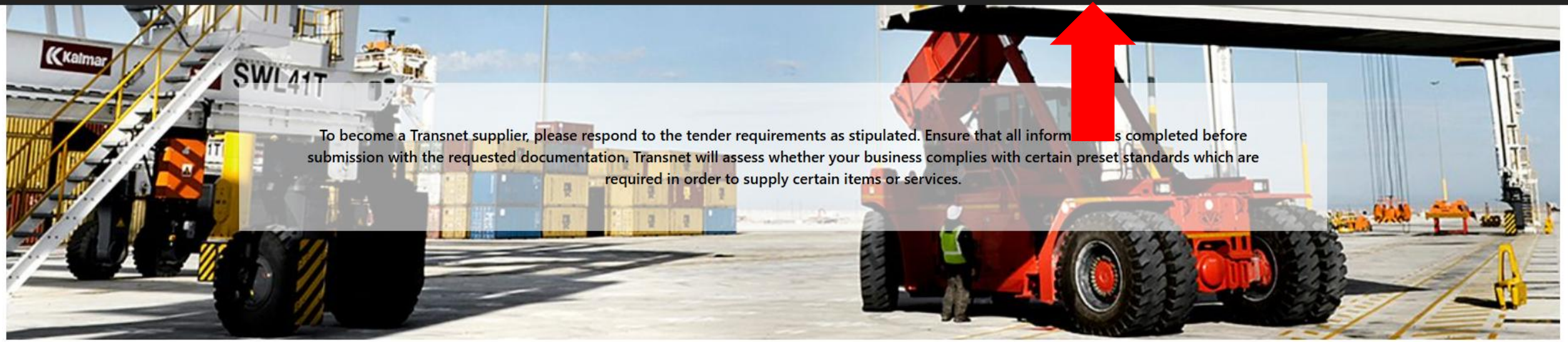
PORTAL TRAINING



Transnet SRM



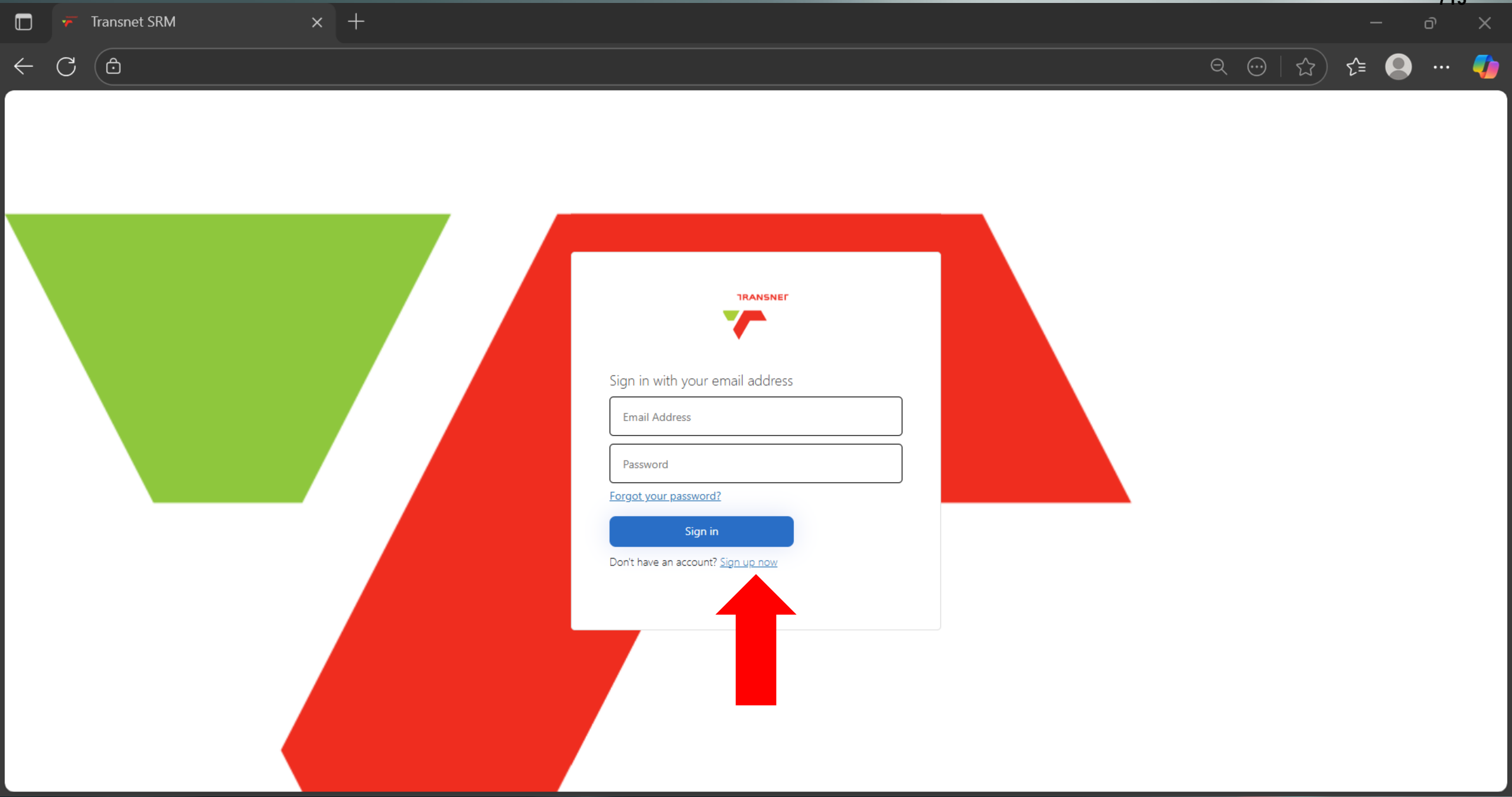
HOME | ADVERTISED TENDERS | OTHER TENDERS | CONTACT | SIGN IN/REGISTER | SCM COMPLAINTS | HELP GUIDE



To become a Transnet supplier, please respond to the tender requirements as stipulated. Ensure that all inform s completed before submission with the requested documentation. Transnet will assess whether your business complies with certain preset standards which are required in order to supply certain items or services.

PUBLICATION OF TENDER

When Transnet needs to procure goods, services or works, it does so through one Tender Search for construction tenders. Regarding quotations, Transnet will Transnet does not have its own database of prospective suppliers. It makes use of


Transnet SRM
TRANSNET
Sign in with your email address
Email Address
Password
Forgot your password?
Sign in
Don't have an account? Sign up now

Transnet PPD

Mikail Ansari

Home

Complaints

Hi Mikail,

What work would you like to do?

To become a Transnet supplier, please respond to tender requirements as stipulated. Ensure that all information is completed before submission with the requested documentation. Transnet will assess whether your business complies with certain preset standards which are required in order to supply certain items or services.

View Advertised Tenders

My Submitted Intents

My Bid Document Submission

Supplier Profile Management



Transnet PPD

Mikail Ansari

Home / Advertised Tenders

Complaints

Advertised Tenders

Open Tenders | Other Tenders

Filter

All

Search

Show 10 entries

Reference Numbers	Tender Name	Description	Briefing Session	Closing Date	Status	Action
TE/2025/05/0004/56/RFP	Build a new electric car prototype for South Africans	Build a new electric car prototype for South Africans	-	2025-07-15	Open	View Details

Showing 1 to 1 of 1 entries

Previo Next

Transnet PPD

Mikail Ansari

Home / Advertised Tenders

Complaints

Advertised Tenders

Open Tenders | Other Tenders

Filter

All

Search

Show 10 entries

Reference Numbers	Tender Name	Description	Briefing Session	Closing Date	Status	Action
TE/2025/05/0004/56/RFP	Build a new electric car prototype for South Africans	Build a new electric car prototype for South Africans	-	2025-07-15	Open	**View Details**

Transnet PPD

Mikail Ansari

Home / Advertised Tenders / TE/2025/05/0004/56/RFP

Complaints

Submission Intent Details

Tender Details

Tender Reference Number: Published
TE/2025/05/0004/56/RFP

Name of Tender:
BUILD A NEW ELECTRIC CAR PROTOTYPE FOR SOUTH AFRICANS

Description:
BUILD A NEW ELECTRIC CAR PROTOTYPE FOR SOUTH AFRICANS

Tender Type:

Contact Person:
Pepper Potts (Support)

Log an intent to Bid
NO



Date Published:
07/14/2025

Time Published:

Closing Date:
07/15/2025 12:00:00 AM

Location Of Service:
National

Tender Category:

Attachments:

Transnet PPD

Mikail Ansari

Home / Advertised Tenders / TE/2025/05/0004/56/RFP

Complaints

Submission Intent Details

Tender Details

Tender Reference Number: Published
TE/2025/05/0004/56/RFP

Name of Tender:
BUILD A NEW ELECTRIC CAR PROTOTYPE FOR SOUTH AFRICANS

Description:
BUILD A NEW ELECTRIC CAR PROTOTYPE FOR SOUTH AFRICANS

Tender Type:

Contact Person:
Pepper Potts (Support)

Log an intent to Bid
YES

Date Published:
07/14/2025

Time Published:

Closing Date:
07/15/2025 12:00:00 AM

Location Of Service:
National

Tender Category:

Attachments:

Transnet PPD

Mikail Ansari

Home

Complaints

Hi Mikail,

What work would you like to do?

To become a Transnet supplier, please respond to tender requirements as stipulated. Ensure that all information is completed before submission with the requested documentation. Transnet will assess whether your business complies with certain preset standards which are required in order to supply certain items or services.

View Advertised Tenders

My Submitted Intents

My Bid Document Submission

Supplier Profile Management



Transnet PPD

Mikail Ansari

Home / My Intents

Complaints

My Intents

Show columns All

Search

Show 10 entries

Reference Number	Tender Name	Description	Briefing Session Date	Intent Logged Date	Logged By	Closing Date
TPL/2025/05/0001/55/RFI	Diesel	Please tender this tender	- -	06/08/2025 13:03:38	Mikail Ansari	14/07/2025 12:00 AM

Tender Status Cancelled

Action View Details

Transnet PPD

Mikail Ansari

Home / My Intents / TPL/2025/05/0001/55/RFI

Complaints

Submission Intent Details

Tender Details | Ask for Clarity

View Tender Documents

Tender Reference Number: Cancelled
TPL/2025/05/0001/55/RFI

Name of Tender:
DIESEL

Description:
PLEASE TENDER THIS TENDER

Tender Type:
RFP

Contact Person:
Tshepo Moganetsi

Log an intent to Bid
YES

Date Published:
07/14/2025

Time Published:

Closing Date:
07/14/2025 11:00:00 PM

Location Of Service:
Gaueng

Tender Category:
Normal Goods and Services

Transnet PPD

https://srm.ecox.io/portal/procurement/supplier_relationship_management/tenders/detailed/bid_submissions/55

Mikail Ansari

Mandatory | Essential | Returnable Documents | Other

⚠ Please take note before uploading

- Duplicate documents are not permitted
- There's a 50MB file size limit per upload
- Please allow yourself sufficient time to upload documents and consider your internet speed

Required Document(s):

- Company registration documents
- Tax clearance certificate
- BBBEE certificate (if applicable)
- Bid proposal and pricing schedule
- Technical compliance documents
- Any other tender-specific requirements

⚠ This tender is Cancelled and no longer accepting document submissions.

Uploaded Documents

- Mandatory
  - 1MandatoryExample.txt
  - 1MandatoryExample_UeaGY16.txt
- Essential
  - 2EssentialExample.txt
- Returnable Documents
  - 3NonEssentialExample.txt
- Other
  - 4Other.txt

Transnet PPD

Mikail Ansari

Home

Complaints

Hi Mikail,

What work would you like to do?

To become a Transnet supplier, please respond to tender requirements as stipulated. Ensure that all information is completed before submission with the requested documentation. Transnet will assess whether your business complies with certain preset standards which are required in order to supply certain items or services.

View Advertised Tenders

My Submitted Intents

My Bid Document Submission

Supplier Profile Management



Transnet PPD

Mikail Ansari

Home / Procurement / Tender Management / SRM

Complaints

Overview | Documentation

Comp ABCD (Supplier)

www.abc.co.za

support@abc.co.za

Manage

Status

Invoices Paid	Outstanding	Orders
ZAR 0	ZAR 0	ZAR 0

Top Product / Service Orders

Recent Communication

28/02/2025 12:52:20

Invitation for RFP

Request for Procurement:

Procurement software

View more

Transnet PPD

Mikail Ansari

Home / Procurement / Ten

Complaints

Main Organisation Information

- Organisation Info
- Address
- Partners
- Business Information
- Transformation

Organisation Name*: Comp ABCD

Website: www.abc.co.za

Email*: support@abc.co.za

Country*: South Africa

Primary Contact Name: Primary contact name

Primary Contact Title: Primary contact title

Office Number: Enter Office Number

Mobile Number: 00000

Relationship*: Supplier

Status*: Active

Industry*: Technology

Sector*: SOFTWARE

Verified: No

Company Logo: Choose File No fil...osen

Company Bio: Company Bio

Save

View more

View more

View more

Request for Procurement: Procurement software

Company Bio

Transnet PPD

Mikail Ansari

Home / Procurement / Ten

Complaints

Main Organisation Information

- Organisation Info
- Address
- Partners
- Business Information
- Transformation

Address Type*: Business Address

Country*: South Africa

Province*: Gauteng

Address Line1*: 123

Address Line2: 123

Address Line3:

Postal Code*: 2196

Status*: Active

Start Date*: 03/09/2025

End Date: dd/mm/yyyy

Save

Quick Information About Comp ABCD

Company Bio

View more

Request for Procurement: Procurement software

View more

28/02/2025 12:52:20

Invitation for RFP

Request for Procurement: Procurement software

View more

Transnet PPD

Mikail Ansari

Home / Procurement / Ten

Complaints

Main Organisation Information

- Organisation Info
- Address
- Partners
- Business Information
- Transformation

Trading Name*

Trading Name

Company Registration Number*

Company Registration Number

Year of Incorporation*

dd/mm/yyyy

Do you have a South African VAT Number?

NO

Save

Comp ABCD (Supplier)

www.abc.co.za

support@abc.co.za

Manage

Quick Information About Comp ABCD

Company Bio

Top Product / Service Orders

Recent Communication

28/02/2025 12:52:20
Invitation for RFP
Request for Procurement: Procurement software
View more

28/02/2025 12:52:20
Invitation for RFP
Request for Procurement: Procurement software
View more

28/02/2025 12:52:20
Invitation for RFP
Request for Procurement: Procurement software
View more

Transnet PPD

Mikail Ansari

Home / Procurement / Tender Management / SRM

Complaints

Comp ABCD (Supplier)

www.abc.co.za

support@abc.co.za

Manage

Overview

Documentation

ces Paid

0

Outstanding

ZAR 0

Orders

ZAR 0

Top Product / Service Orders

Recent Communication

28/02/2025 12:52:20

Invitation for RFP

Request for Procurement:

Procurement software

View more

Transnet PPD

Mikail Ansari

Home / Procurement / Tender Management / SRM

Complaints

Comp ABCD (Supplier)

www.abc.co.za

support@abc.co.za

Manage

Quick Information About Comp ABCD

Company Bio

Overview | **Documentation**

Shared Documents

Organisational Documents

Contracts

Urgent Attention

Show 10 rows | Download List | Show Columns

Request Date	MSA. No.	Status	Action
No data available in table			

Showing 0 to 0 of 0 entries

Previous | Next

Transnet PPD

Mikail Ansari

Home / SRM / Contracts

Complaints

- TPL/2025/05/0002/69/RFI
- TE/2025/05/0008/68/RFP
  - Master Sercive Agreement
    - Master Sercive Agreement
- TCC/2025/06/0010/84/RFP
- TRIM/2025/06/0001/86/RFI
- TFR/2025/07/0001/98/RFI

TRANSNET



Conclusion

In conclusion, the module on the Supplier Relationship Management (eSupplier Portal) External Portal is designed to equip learners with the knowledge and practical skills needed to confidently navigate and use the system. The objectives of this module were to guide learners in performing key activities such as supplier registration, tender bidding, and contract approval, while ensuring that these processes align with organisational standards, compliance requirements, and effective system use.

By completing this module, learners are now better prepared to apply their learning in real work situations, contributing to efficient supplier management and improved organisational performance.

Congratulations on completing the module! Your dedication to learning and engaging with the system demonstrates your commitment to professional growth and the success of your organisation. The skills you have gained—registering suppliers, managing tenders, and approving contracts—are not just processes to follow, but tools to make your work more efficient, accurate, and impactful.

We encourage you to continue applying these skills confidently, share your knowledge with colleagues, and seek opportunities to innovate within your role. Your contribution strengthens the organisation and ensures that supplier management is carried out with excellence and integrity.

Thank you for your active participation, curiosity, and commitment to learning. Your efforts make a real difference.

Glossary

Acronym / Term	Definition
SRM	Supplier Relationship Management – A system used to manage supplier interactions, registration, tendering, and contract processes.
Portal	An online platform that allows suppliers and buyers to access SRM functionalities.
Supplier	A company or individual providing goods or services to the organisation.
Buyer	An individual or team responsible for sourcing, tender management, and contract approval in the organisation.
Administrator	A user role responsible for managing system settings, user roles, and overall portal administration.
Registration Details	Information provided by a supplier during portal sign-up, including personal, business, and contact information.
Business Information	Details about a supplier's company, including trading name, registration number, year of incorporation, VAT status, and company bio.
Partners Information	Details of business partners associated with the supplier, including relationship type, agreement terms, and relevant dates.
Address Information	Supplier's company address details, including address type, province, postal code, and status.
Transformation	Supplier compliance information, including B-BBEE level, ownership percentages, and empowerment status.
Tender Bidding	The process by which suppliers express intent to bid, submit pricing, and upload required documentation.
Pricing Schedule	A detailed capture of pricing for each tender item submitted by the supplier.
Scorecard	A document or template used to evaluate or rate supplier submissions for tenders.
Contract Approval	The process by which contracts are reviewed, communicated, and approved within the portal.
Master Agreement (MSA)	A standard contract between the organisation and suppliers outlining terms, conditions, and obligations.
Chat / Communication Section	Portal feature enabling suppliers and buyers to ask questions, clarify requirements, and communicate about contracts.
Open Tender Tab	Portal section displaying all available tenders that suppliers can view and apply for.
Log Intent to Bid	Supplier action to indicate interest in submitting a tender for a specific opportunity.
Mandatory / Essential / Non-Essential Tabs	Categories in the portal where suppliers upload required or optional tender documentation.
Documentation Tab	Portal section where contracts, agreements, and other relevant supplier documents are stored and accessed.

Glossary of Portal Actions

Action / Process	Definition / Description
Supplier Registration	Creating a supplier account on the SRM portal by providing personal, business, partner, address, and transformation information.
Manage Organisation Information	Updating and maintaining the supplier's company details, including company name, website, contact information, industry, sector, and company bio.
Manage Company Address	Capturing and updating the supplier's official address details, including address type, province, postal code, and status.
Manage Partners	Recording and maintaining information about business partners, including relationship type, agreement terms, and relevant dates.
Manage Business Information	Capturing essential company details such as trading name, registration number, year of incorporation, and VAT information.
Manage Transformation	Recording supplier B-BBEE compliance information, including ownership percentages, empowerment status, and uploading supporting certificates or affidavits.
View Open Tenders	Accessing available tender opportunities in the portal for which suppliers can submit bids.
Log Intent to Bid	Indicating a supplier's interest to participate in a specific tender.
Submit Tender Documentation	Uploading required files in the appropriate categories (mandatory, essential, non-essential, other) to support a tender bid.
Capture Pricing Schedule	Entering detailed pricing information for each tender item in the system.
Capture Scorecard	Completing the evaluation form or template associated with the tender submission, including any comments or ratings.
Submit Tender Bid	Finalising and submitting all tender-related information, including documents, pricing, and scorecards, for consideration.
Ask for Clarity	Using the portal chat or communication feature to request additional information or clarification regarding a tender.
Contract Collaboration / Supplier Response	Engaging with buyers via the portal to discuss, comment, and respond to contract documents such as the Master Service Agreement (MSA).
Contract Approval	Reviewing, finalising, and approving contracts in the portal, ensuring compliance with organisational requirements.
Documentation Tab	Portal section where all contracts, tender documents, and supporting supplier files are stored and accessible.
Chat / Communication Section	Portal feature that allows suppliers and buyers to communicate directly about tenders, contracts, and related processes.
SRM Tab	Main portal section where suppliers manage registration, tenders, contracts, and communication activities.

Annexures P - The Broad-Based Black Economic Empowerment Commission's Practice Guide 01 of 2022

the dti Campus, 77 Meintjies Street, Sunnyside, Pretoria, Gauteng, 0002
Tel: +27 (12) 394 1535 Fax: +27 (12) 394 2535
Private Bag X84, Pretoria, Gauteng, 0001

Email: RamareM@beecommission.gov.za

B-BBEE COMMISSION
a member of the dti group

THE BROAD-BASED BLACK ECONOMIC EMPOWERMENT COMMISSION'S

PRACTICE GUIDE 01 of 2022

DETERMINING THE VALIDITY OF A BROAD-BASED BLACK ECONOMIC EMPOWERMENT VERIFICATION CERTIFICATE, B-BBEE SWORN AFFIDAVIT AND CERTIFICATE ISSUED BY THE COMPANIES AND INTELLECTUAL PROPERTY COMMISSION

A. Introduction

1. The Broad-Based Black Economic Empowerment Commission ("B-BBEE Commission") is an entity established by the Broad-Based Black Economic Empowerment Act 53 of 2003 as amended by Act 46 of 2013 ("the Act"), to oversee the implementation of the Act, which includes provision of practice guides, explanatory notices, non-binding advisory opinions and clarification services to improve the understanding of the Act.

2. This Practice Guide is issued as a non-binding guide purely to assist with the interpretation of B-BBEE documentation presented by measured entities to ensure consistency in the application of the Act. Should this Practice Guide not be clearly applicable to your specific set of facts at any given time, you are advised to approach the B-BBEE Commission for a non-binding advisory opinion, which will be more specific to your set of facts.

3. This Practice Guide does not constitute a legal document or a ruling of the B-BBEE Commission on the issue concerned. Further, although this Practice Guide is not binding on the B-BBEE Commission, it does set out the approach that the B-BBEE Commission is likely to take on any matter relating to implementation of B-BBEE including determining the validity of B-BBEE sworn affidavits, B-BBEE verification certificates and certificates issued by the Companies and Intellectual Property Commission (CIPC) for B-BBEE purposes.

4. This Practice Guide replaces Practice Guide 01 of 2018 as of **01 November 2022**.

A. Purpose of this practice guide

5. The B-BBEE Commission has over the years continued to be inundated with requests from various stakeholders to confirm validity of B-BBEE certificates, sworn affidavits and CIPC certificates, which process has resulted in the B-BBEE Commission issuing a number of advisory letters to the affected entities to advise of invalidity of such documentation and the need to withdraw the invalid B-BBEE verification certificates or sworn affidavits/CIPC certificates. Thus, the purpose of this Practice Guide is to set out the approach for stakeholders to determine the validity of B-BBEE certificates or sworn affidavits/CIPC certificates for consistency.

6. The five elements of B-BBEE adopted in the Codes of Good Practice (the Codes) each have a specific purpose and together provide an integrated intervention to empower black people as envisaged in the Act. Further, the Act allows for B-BBEE verification, which is a measure used to determine compliance with the Act, and results in the issuing of a B-BBEE verification certificate.

7. A B-BBEE verification certificate, a sworn affidavit and a B-BBEE certificate issued by the CIPC is evidence of a measured entity's compliance with the Act over a particular period. Such compliance is based on B-BBEE related information of a measured entity in line with the applicable Codes as per Section 9 (1) of the Act.

8. It is contrary to the Act for a measured entity to trade with an invalid/inconclusive or incorrect B-BBEE verification certificate or sworn affidavit/CIPC certificate. The preferential procurement spend or economic activity that was directed by measured entities to a supplier or entity on the basis of an invalid B-BBEE document cannot be recognised during a B-BBEE measurement process, therefore, it is critical to determine the validity of B-BBEE verification certificates or sworn affidavits/CIPC certificates presented by measured entities in order to access an economic opportunity both in the public and private sector.

B. Determining validity of a sworn affidavit for B-BBEE compliance

9. The legal dictionary (https://legal-dictionary.thefreedictionary.com/Affadavit) defines a sworn affidavit as a written statement of facts voluntarily made by a person under an oath or affirmation administered by a person authorized to do so by law.

10. In terms of the Codes, Exempted Micro-Enterprises (EMEs) and black controlled and owned Qualifying Small Enterprises (QSEs) only have to use a sworn affidavit to indicate their B-BBEE

compliance status. Government introduced this mechanism specifically to reduce the cost of doing business and regulatory burden for these entities.

11. The Department of Trade, Industry and Competition (**the dtic**) has designed sworn affidavit templates and qualifying measured entities must use these templates, which can be accessed on **the dtic** website. It is acceptable to use the templates on the letterhead of the measured entity.

12. The only time an EME can be verified by a South African National Accreditation System (SANAS) accredited verification professional is when it wishes to maximise its B-BBEE points and move to a higher B-BBEE recognition level, and that must be done using the QSE Scorecard.

13. The exception to this is only with regard to the Transport Sector where EMEs have a choice of obtaining accounting officer letter or get verified and be issued with a B-BBEE verification certificate by a SANAS accredited professional or agency because the Integrated Transport Sector Code has not been aligned to the amended Generic Codes.

14. Also, start-ups that are EMEs but wish to tender for contracts of R10 million in value or above must be verified using the QSE scorecard, and for tenders of R50 million and above must be verified using the generic scorecard.

15. Further, the Construction Sector Code, provides for EMEs whose annual turnover is R1.8 million for Built Environment Professionals and R3 million for Contractors or less to obtain automatic recognition levels and these do not require to undergo verification except in instances where they elect to enhance their B-BBEE status levels. In those circumstances there is a requirement for these EMEs to contribute towards empowerment by complying with the 40% sub-minimum on skills development element and in ensuring compliance with the skills development element, these EMEs are required to be verified by a SANAS accredited verification professional or agency.

16. Furthermore, the Generic Codes and the Financial Services Sector Code have granted an option to 51% and 100% black owned QSEs to undergo a verification process from a SANAS accredited verification professional if they so choose. However, for consistent application, EMEs in the Financial Services Sector should only obtain a sworn affidavit, and not a B-BBEE verification certificate as there is nothing to verify.

17. **The following pointers are key in determining the validity of a sworn affidavit**:

a) Name/s of deponent as they appear in the identity document and the identity number must be completed.
b) Designation of the deponent as either the director, owner or member must be indicated in order to know that the person deposing to the sworn affidavit is duly authorised. A deponent is able to tick more than one option if the person is a director and owner of the entity.
c) Name of enterprise must be cited as per the enterprise registration documents issued by the CIPC, where applicable, including the enterprise business address.
d) Percentage of ownership held by black people, black female and black designated groups. For designated groups, the percentage must be indicated for each sub-category or nil where there is none. In the case of specialised enterprises as per Statement 004, the percentage of black beneficiaries must be reflected.
e) Indicate the total annual revenue for the year under review and whether it is based on audited financial statements or financial statements or management accounts. Please select one option.
f) Indicate the full financial year end (day/month/year) as per the enterprise's registration documents, which was used to determine the total revenue. This must be the recent financial year end.
g) Select the B-BBEE Status level based on black ownership percentage. An enterprise can only have one B-BBEE status level.
h) Empowering supplier status must be indicated. For QSEs, the deponent must select the basis for which the empowering supplier status is based on.
i) Date of signature for both the deponent and Commissioner of Oath must be the same. If using the first **dtic** template for sworn affidavits, where provision is not made for Commissioner of Oath signature date, the date of the deponent will be regarded by default as the signature date for Commissioner of Oath.
j) Commissioner of Oath cannot be an employee or ex officio of the enterprise because, a person cannot by law, commission a sworn affidavit in which they have an interest. Please note that the B-BEE Act does not determine the qualification for Commissioner of Oaths, this is done in terms of the Justice of Peace and Commissioners' of Oaths Act, 1963 (Act No. 16 of 1963) which is administered by the Department of Justice and Constitutional Development (DOJ & CD). Therefore any queries regarding the legitimacy of a Commissioner of Oath need to be directed to DOJ & CD.
k) A B-BBEE sworn affidavit is valid for a period of 12 months calculated from the date the sworn affidavit was commissioned, for example, if the sworn affidavit is commissioned on 12 August 2022, it will expire on 11 August 2023.

C. B-BBEE Certificate issued by the Companies and Intellectual Property Commission

18. **the dtic** through government Gazette Number 38765 published on 6 May 2015, mandated CIPC to issue B-BBEE certificates for EMEs and start-up enterprises, in its efforts to reduce cost of business for small businesses. A certificate issued by CIPC has the same status as a B-BBEE sworn affidavit.

19. Subsequently, CIPC issued a Customer Notice indicating that B-BBEE certificates can be applied for via e-services on the CIPC website (www.cipc.co.za), at CIPC Self Services Terminals when registering or filing Annual Returns.

20. **The following conditions apply when an enterprise uses the CIPC services for obtaining a B-BBEE certificate**:

    a) Only directors of a company or members of close corporations can apply for a B-BBEE certificate.
    b) Only companies and close corporations with a turnover of less than R10 million can apply via CIPC.
    c) The enterprise's status must be "In Business".
    d) All Annual Return filings for the relevant company or close corporation need to be up to date;
    e) Application for a B-BBEE certificate can be done at any time (not only when registering a company or filing returns), provided that an application for the certificate which is still valid, was not done already.
    f) Applicant must agree to the B-BBEE terms and conditions.
    g) A director or member amendment must be filed if the director or member's email address or telephone is not correct or up to date.

21. A CIPC certificate can be submitted to the B-BBEE Commission for attention of Mr. Madidimalo Ramare at MRamare@beecommission.gov.za to confirm if it was generated from the CIPC system. However, on face value, the following information must appear on the certificate:

    a) Name of enterprise, registration number and business address.
    b) Date of issue and expiry adding to twelve months (e.g 9 June 2018 to 8 June 2019) must be indicated.
    c) Percentage of total black ownership, black female ownership and total white ownership.
    d) Certificate number.
    e) Barcode with tracking number.

f) Barcode with enterprise number.
g) B-BBEE Status and procurement recognition level.
h) **the dtic** logo on the top left corner, and CIPC logo on the top right corner.
i) CIPC watermark.

D. Determining validity of a B-BBEE Verification Certificate for B-BBEE compliance

22. An entity that qualifies in terms of the B-BBEE Act to undergo a B-BBEE verification process, can only do so with a verification professional or agency that has been accredited by SANAS or a B-BBEE Verification Professional Regulator that may be appointed by the Minister of Trade, Industry and Competition.

23. B-BBEE verification means the process and activities conducted by a verification professional or agency to assess, verify and validate that the score awarded to a measured entity is a result of individual scorecard elements supplied by a measured entity, and to evaluate B-BBEE transactions in order to provide an indicative B-BBEE score and certification based on the principles of B-BBEE as per the Codes.

24. A B-BBEE verification process is important in assuring parties that rely on the score achieved by the measured entity and reflected on their B-BBEE Verification Certificate (refers to the B-BBEE verification certificate issued by the verification professional or agency which reflects the overall B-BBEE Status of a measured entity and scoring allocated for each scorecard element verified in respect of the measured entity) and that the information on which the certificate was issued is acceptable, and has been independently verified, and is free from misstatements.

25. Therefore, the role of a verifier is to assess, verify and validate both disclosed and undisclosed B-BBEE related information of the measured entity. The verification thereof should be based on the principles contained in the B-BBEE Act and relevant Codes, by applying the verification methodologies outlined in the Framework for accreditation and verification by all verification agencies (also known as the verification manual) as well as the Accreditation of B-BBEE Verification Agencies document issued by SANAS (also referred to as the R47-03). Important to note that a verifier is not to provide clarity or opinion on interpretation of any B-BBEE matter as such clarity must be sought from the B-BBEE Commission using the contact details mentioned below.

26. **A B-BBEE Verification Certificate shall identify the following information**:
a) The name and identifiable physical location(s) of the measured entity as per the CIPC records.

b) The registration and VAT number of the measured entity.

c) The dates of granting of the B-BBEE score/the period of validity, which is the initial issue date (e.g. 7 October 2021 to 6 October 2022) and the expiry date of the verification certificate.

d) The revision or reissue date if applicable. .

e) A unique identification number including revision number if applicable.

f) The standard and/or normative document, including the issue and/or revision used to evaluate the client (amended codes / specialised or respective sector codes).

g) The name and/or mark/logo of the B-BBEE verification agency.

h) The scorecard against which the measured entity has been verified (Generic / QSE).

i) The B-BBEE status level.

j) The SANAS Accreditation Symbol on the verification certificate.

k) The B-BBEE procurement recognition level.

l) Score per element including total score achieved.

m) Black ownership percentage.

n) Black Female ownership percentage.

o) Black designated group percentage:

- Black Youth percentage
- Black Disabled percentage
- Black Unemployed percentage
- Black People living in Rural areas percentage
- Black Military Veterans percentage

u) Modified flow has been applied, indicate yes or no.

v) Exclusion principle used, indicate yes or no.

w) Recent financial year end used (day/month/year).

x) Discounting principle used, indicate yes / no.

y) Empowering Supplier status, indicate yes / no.

z) Name and signature of technical signatory

aa) Amendments to certificate to be clearly documented.

bb) A consolidated certificate to state as such and refers to attachment of the measured entities that are consolidated with registration and vat numbers.

cc) In terms of the reflection of the level and points on the B-BBEE verification certificate, the following is applicable:

- Participated in Y.E.S Initiative yes / no
- Achieve Y.E.S Target and 2.5% Absorption yes / no
- Achieve 1.5 x Y.E.S Target and 5% Absorption yes / no
- Achieve Double Y.E.S Target and 5% Absorption yes / no

27. The recipient or user of a B-BBEE verification certificate can contact any of the accredited verification professionals or agency that is said to have issued the B-BBEE verification certificate, to request confirmation on the issuance of B-BBEE certificate. The recipient or user is also advised to use the SANAS website to verify the accreditation status, accreditation period and scope of accreditation for the verification professional or agency. The SANAS website also has a list of all verification professionals or agencies whose accreditation status has been withdrawn, or suspended, because a verification professional or agency cannot issue a B-BBEE certificate if the accreditation status has expired, withdrawn or suspended.

28. The recipient or user of the B-BBEE verification certificate, sworn affidavit or B-BBEE certificate issued by CIPC is also allowed, as part of its due diligence processes, to request any relevant additional information or documents from the measured entity in order to validate the credibility of the information recorded on the B-BBEE verification certificate, sworn affidavit/CIPC B-BBEE certificate.

29. It is also the responsibility of the recipient or user of the B-BBEE verification certificate or sworn affidavit/CIPC certificate to specify if measured entities ought to furnish an original or copy including certified copy of the B-BBEE verification certificate or sworn affidavit/CIPC certificate.

E. Penalties as per the B-BBEE Act

30. Trading with an invalid or fraudulent B-BBEE certificate or sworn affidavit/CIPC certificate may constitute an offence in terms of Section 13O (1) (a) of the B-BBEE Act, which state that a person commits an offence if that person knowingly misrepresents or attempts to misrepresent the broad-based black economic empowerment status of an enterprise, and the B-BBEE Commission may institute an investigation in terms of Section 13J of the B-BBEE Act. In addition, Section 13A of the B-BBEE Act has empowered organs of state and public entities to cancel any contract or authorisation awarded on account of false information knowingly furnished by or on behalf of an enterprise in respect of its broad-based black economic empowerment status.

31. If an entity is found to have violated the B-BBEE Act, the B-BBEE Commission is empowered to act accordingly as guided by the B-BBEE Act and this can result in the entity that violated the B-BBEE Act to be fined up to 10% of its annual turnover, and individuals involved could be imprisoned for up to 10 years, and / or fined. Specifically, an offence under section 13O (2) could lead to imprisonment of up to 12 months, or a fine, or both the fine and imprisonment.

32. In terms of section 13O (2) a verification professional, procurement officer or any official of an organ of state or public entity who becomes aware of the commission of, or attempt to commit any offence referred to under section 13O (1) and fails to report it, is guilty of an offence.

33. This Practice Guide is issued as a guide purely to assist with the interpretation and testing the validity of a B-BBEE verification certificates and sworn affidavit/CIPC certificates, and does not constitute a legal document or ruling of the B-BBEE Commission.

34. This Practice Guide may be updated anytime by the B-BBEE Commission if there are any material changes arising from developments in the application of the B-BBEE Act. In such an instance, an amended version will be published to replace this one.

35. For any queries or further clarity on this Practice Guide, kindly feel free to contact us at the following contact details:

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Private Bag X31
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Issued by the B-BBEE Commission

19 October 2022

Annexures Q - Regulation Governing the Administration of an Oath or Affirmation

REGULATIONS GOVERNING THE ADMINISTERING OF AN OATH OR AFFIRMATION

Act

Published under

GN R1258 in *GG* 3619 of 21 July 1972
as amended by

GN 1648 in *GG* 5716 of 19 August 1977
GN R1428 in *GG* 7119 of 11 July 1980
GN R774 in *GG* 8169 of 23 April 1982

The State President has, in terms of section 10 of the Justices of the Peace and Commissioners of Oaths Act, 1963 (Act 16 of 1963), been pleased to make the following regulations:

1 (1) An oath is administered by causing the deponent to utter the following words: 'I swear that the contents of this declaration are true, so help me God'.

(2) An affirmation is administered by causing the deponent to utter the following words: 'I truly affirm that the contents of this declaration are true'.

2 (1) Before a commissioner of oaths administers to any person the oath or affirmation prescribed by regulation 1 he shall ask the deponent-

(a) whether he knows and understands the contents of the declaration;

(b) whether he has any objection to taking the prescribed oath; and

(c) whether he considers the prescribed oath to be binding on his conscience.

(2) If the deponent acknowledges that he knows and understands the contents of the declaration and informs the commissioner of oaths that he does not have any objection to taking the oath and that he considers it to be binding on his conscience the commissioner of oaths shall administer the oath prescribed by regulation 1(1).

(3) If the deponent acknowledges that he knows and understands the contents fo the declaration but objects to taking the oath or informs the commissioner of oaths that he does not consider the oath to be binding on his conscience the commissioner of oaths shall administer the affirmation prescribed by regulation 1 (2).

3 (1) The deponent shall sign the declaration in the presence of the commissioner of oaths.

(2) If the deponent cannot write he shall in the presence of the commissioner of oaths affix his mark at the foot of the declaration: Provided that if the commissioner of oaths has any doubt as to the deponent's inability to write he shall require such inability to be certified at the foot of the declaration by some other trustworthy person.

4 (1) Below the deponent's signature or mark the commissioner of oaths shall certify that the deponent has acknowledged that he knows and understands the contents of the declaration and he shall state the manner, place and date of taking the declaration.

(2) The commissioner of oaths shall-

(a) sign the declaration and print his full name and business address below his signature; and

(b) state his designation and the area for which he holds his appointment or the office held by him if he holds his appointment *ex officio*.

[Subreg. (2) substituted by GN 1648 of 19 August 1977]

5 .....

[Reg. 5 deleted by GN R774 of 23 April 1982]

6 A commissioner of oaths shall not charge any fee for administering any oath or affirmation or attesting any declaration.

7 (1) A commissioner of oaths shall not administer an oath or affirmation relating to matter in which he has interest.

(2) Subregulation (1) shall not apply to an affidavit or a declaration mentioned in the Schedule.

8 Government Notice R1206, dated 15 December 1961, is hereby withdrawn.

Annexures R - Approved Guarantee Issuers

APPROVED GUARANTEE ISSUERS

ABSA BANK LIMITED GROUP
BANK OF AMERICA, N.A
BANK OF CHINA LIMITED GROUP
BARCLAYS BANK PLC GROUP
BESA MEMBERS
BNP PARIBAS GROUP
CHINA CONSTRUCTION BANK GROUP
CITIBANK GROUP
CREDIT SUISSE GROUP
DEUTSCHE BANK GROUP
FIRSTRAND BANK LIMITED GROUP
GOLDMAN SACHS INTERNATIONAL
HSBC HOLDINGS GROUP
INVESTEC BANK LTD
JPMORGAN CHASE BANK GROUP
MORGAN STANLEY
MACQUARIE BANK LIMITED
NEDBANK LTD
SOCIETE GENERALE BANK GROUP
STANDARD BANK GROUP
STANDARD CHARTERED BANK GROUP
AFRICAN BANK LTD
BIDVEST BANK LTD
CAPITEC BANK LTD
DISCOVERY BANK LTD
GRINDROD BANK LTD
ABN AMRO Bank N.V.
BANCO BILBAO VIZCAYA ARGENTARIA S.A
Coöperative Rabobank U.A.
CREDIT AGRICOLE CORPORATE AND INVESTMENT BANK
DANSKE BANK
INDUSTRIAL DEVELOPMENT CORPORATION
ING Bank N.V.
KBC BANK
LANDESBANK BADEN-WUERTTEMBERG
MIZUHO BANK, LTD
NATIONAL AUSTRALIA BANK LIMITED
SKANDINAVISKA ENSKILDA BANKEN
SUMITOMO MITSUI BANKING CORPORATION
SVENSKA HANDELSBANKEN AB
AIG SOUTH AFRICA
CONSTANTIA INSURANCE LTD
CREDIT GUARANTEE INSURANCE CORPORATION
GUARDRISK INSURANCE
HOLLARD INSURANCE COMPANY
INFINITY INSURANCE
LOMBARD INSURANCE GROUP
MUTUAL & FEDERAL
RENASA INSURANCE COMPANY
SANTAM
BRYTE INSURANCE COMPANY LTD
ZURICH INSURANCE PLC