REPORT	
For:	Technical Specification for Supply, Delivery, Installation and Commissioning of Fire Suppression system
Project Name:	Upgrade of Tuzi Gazi Waterfront Old Action Cricket Building for TNPA Offices RCB
Project Number:	408 4797
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Accepted by:

_____ _____

Accepted by: Date

_____ _____

Date

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1 General

The *Contractor* shall:

a) Supply, deliver, installation, testing and commission of the fire suppression 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.

b) Design, supply, installation and commission of the automatic sprinkler system that complies with latest ASIB rules and regulations to suit the new layout of the building, subject to the Local Fire Safety Authority acceptance as per indicated on the list of drawings.

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
4087497-6-000-M-LA-0007-01		Emergency Evacuate Plan
4087497-6-000-M-LA-0008-01		Fire Detection Upper Level
4087497-6-000-M-LA-0009-01		Fire Suppression Main Building
4087497-6-000-M-LA-0010-01		Sprinkler System Lower Level
4087497-6-000-M-LA-0012-01		Fire Detection Lower Level
4087497-6-000-M-LA-0013-01		Fire Suppression Guard House
4087497-6-000-M-LA-0014-01		Sprinkler System Upper Level

3 Standards and Regulations

REGULATION	DESCRIPTION	RELEASE
ASIB Rules and Regulations	latest edition rules for automatic sprinkler installations	Latest
SANS 10252-1	Water supply and drainage for buildings Part 1: Water supply installations for buildings	2012
SANS 10400	The application of the National Building Regulations	2011
SANS 1128-1	Firefighting equipment Part 1: Components of underground and above-ground hydrant systems	2010
SANS 1128-2	Firefighting equipment Part 2: Hose couplings, connectors and branch pipe and nozzle connections	2010

SANS 543	Fire hose reels	2004
SABS 62-1 (SANS 62-1)	Steel pipes Part 1: Pipes suitable for threading and of nominal size not exceeding 150 mm	2013
SABS 62-2 (SANS 62-2)	Steel pipes Part 2: Screwed pieces and pipe fittings of nominal size not exceeding 150 mm	2013
SABS 763 (SANS 32)	Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized coatings applied in automatic plants	1997
SABS 810 (SANS 1910)	Dry Powder (DCP) Fire Extinguishers	2003
SABS 064 (SANS 10064)	The preparation of steel surfaces for coating	2011
SABS 630 (SANS 630)	Decorative high gloss enamel paints	2009
SABS 0140-3 (SANS 10140-3)	Identification colour markings Part 3: Contents of pipelines	2003
SANS 1186-5	Symbolic safety signs Part 5: Photoluminescent signs	2006

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 accepted by the Automatic Sprinkler Inspection Bureau (ASIB) and are 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 ASIB rules and regulations.

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 Prevention of Air Locks

In order to prevent the lodgement of air, a proper inclination of pipelines shall be maintained throughout the work as per latest ASIB requirements. All sprinkler pipework shall be installed to drain back to the sprinkler valve to allow for draining of the pipework.

11 Drains and Drain Cocks

The *Contractor* shall supply and install terminal drain valves at the extremity of each distribution pipe in accordance with the latest ASIB rules and regulations.

12 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 latest edition of the ASIB rules and regulations.

All pipe supports and suspension fittings shall be installed in accordance with the latest ASIB rules and regulations in conjunction with 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.

Distribution and branch pipes shall be properly secured, and branch pipes shall be anchored within 0,15m from the last sprinkler head.

The *Contractor* shall secure all suspended using pipes clamps similar to Unistrut P75 pipe clamps, subject to the latest ASIB rules and regulations, unless otherwise specified.

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.

13 Testing

The Fire water reticulation installation shall be tested in accordance with SANS 10252-1, and any defect made good. The complete sprinkler system shall be tested in accordance with the latest ASIB rules

14 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 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

15 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.
The

16 Fire Equipment and cupboards

16.1 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.

16.2 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) 9l Wet chemical extinguishers in the kitchen area in accordance with SABS Specification 810.
b) 5kg $C0_2$ extinguishers accepted by the *Project Manager.*

All the fire extinguishers shall be installed as per fire suppression drawings.

16.3 Automatic Sprinkler System

The Automatic sprinkler system shall be designed to protected and cover the whole building in according to latest ASIB rules and regulations. The contractor shall utilise internationally recognised sprinkler design software which includes ASIB parameters to design the sprinkler system and determine the pump and tank requirements if necessary, then make provisions of such requirements if there is a need to ensure the proper functional and compliance of the Automatic Sprinkler system.

The Automatic sprinkler system shall be designed to complete compliance with all the latest ASIB rules and Local Authority laws.

The contractor shall remove the existing automatic sprinkler system of the building.

17 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.

18 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.

18.1 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.

18.2 Plant schematics and wiring diagrams shall be the latest revision and shall be framed behind glass and displayed adjacent to switchboards.

18.3 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

19 Maintenance

19.1 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.

19.2 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.

19.3 At each service visit, maintenance personnel shall, inter alia, perform the following duties in addition to any other which may be necessary.

19.3.1 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.

19.3.2 Make good any defects as required in items of the guarantee given for the plant in terms of the specification.

19.3.3 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.

19.3.4 Instruct the Client's maintenance personnel on the attention required to any item requiring more frequent attention during the service visits.

19.3.5 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.

20 Guarantee

20.1 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 are excluded from the guarantee.

21.2 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.

21 Extended Guarantee

22.1 Where certain equipment have supplier's standard guarantee clauses of which do not correspond with the guarantee Clause 19.34.1, the Contractor shall allow in the tender price for the extension of guarantees and additional charges thereof, in order to comply with guarantee clause.

22 Mechanical drawings

This is a list of mechanical drawings, which shall be read in conjunction with this specification

Drawing No.	Rev	Description
4087497-6-000-M-LA-0007-01	1	Emergency Evacuate Plan
4087497-6-000-M-LA-0008-01	1	Fire Detection Upper Level
4087497-6-000-M-LA-0009-01	1	Fire Suppression Main Building
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