

LEHAE LA SARS

PRETORIA OFFICE

ROOF REPAIRS

TECHNICAL SPECIFICATION

MARCH 2018



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1. EXECUTIVE SUMMARY

South African Revenue Services (SARS) commissioned the investigation into the condition of the roof waterproofing, and to develop a solution to address the present leaking and damage to internal finishes.

The site is located between Bronkhorst and Lange streets, Brooklyn, Pretoria.

The work comprises of three workgroups, namely:

- a) Concrete flat roofs to be waterproofed,
- b) Pitched slate tiled roofs, where loose tiles are replaced with new, the structure waterproofed, and drainage pipes repaired where necessary.
- c) Concrete parking decks movement joints to be waterproofed.

All necessary safety measures as required by the OHSA are to be included and provided.

2. GENERAL INFORMATION

2.1. Client's Details

Refer to procurement documents

3. TERMS OF REFERENCE

South African Revenue Service (SARS) appointed Masande TVNA Consulting Engineers to investigate the condition of the roof waterproofing, and to develop a solution to address the present leaking and damage to internal finishes.

3.1. SITE INFORMATION

3.1.1. SITE DESCRIPTION

The site comprises of several blocks of buildings and roofs in terms of heights, finishes and construction. The roofs are grouped into three, namely flat concrete roofs, slate tiled pitched roofs, and parking deck. Refer to the schematic below for the grouping clarification.



Block A



Block B



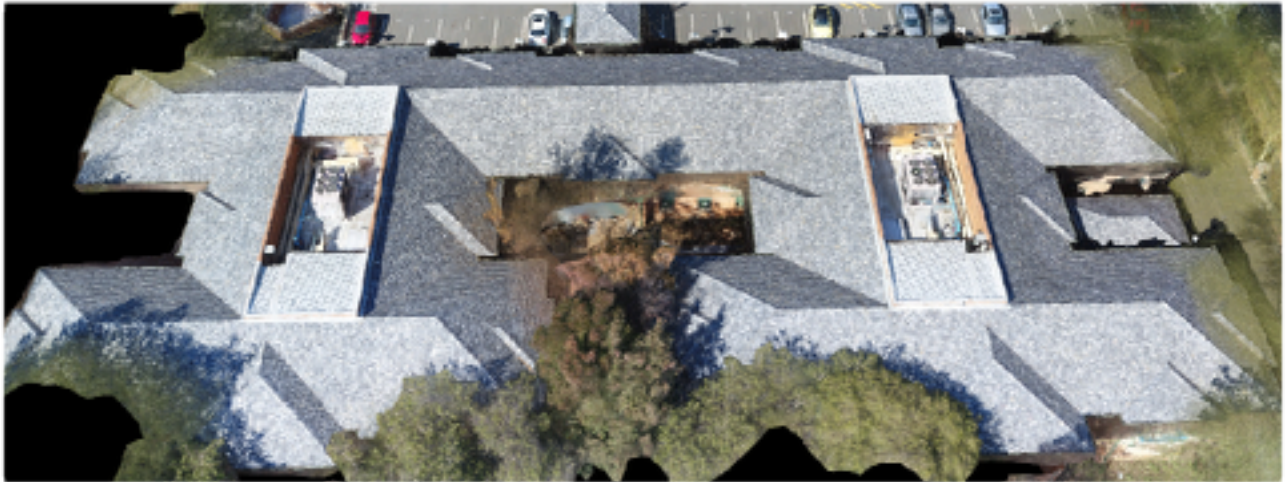
Block C



Block D



Block E & F



Block G & H

3.2. SCOPE OF WORKS

The project comprise the following four main work groups:

- Temporary access scaffolding and safety structures,
- Treatment of the concrete flat roofs and related elements,
- Treatment of the slate tiled pitched roofs and related elements,
- Treatment of the parking deck and related elements.

The groups are detailed further as follows:

3.2.1. Concrete roofs

The scope of work for this work group comprise the following:

- a) Erect safety measures as required,
- b) Strip existing torched-on waterproofing and dispose,
- c) Demolish screeds only where falls are insufficient,
- d) Apply new screeds to improved falls,
- e) Clear all fullbore drains, and if blocked, inspect by camera for repairs,
- f) Seal all outlet pipe joints in ceiling cavities,
- g) Apply new spray-on waterproofing coating with adequate side laps,

3.2.2. Slate Tiled roofs

The scope of work for this work group comprise the following:

- a) Erect safety measures as required, including all legislative and safety regulation compliance,
- b) Refit or replace loose tiles on slopes,
- c) Inspect tile underlay, and repair where necessary,
- d) Remove, seal and refit valleys, hips and ridges,
- e) Reinstall lightning conductors in place.

3.2.3. Metal Roofs

The scope of work for this work group comprise the following:

- a) Erect safety measures as required, including all approvals from local council if using pedestrian walkway space,
- b) Strip existing waterproofing seals and coatings, and dispose,
- c) Clean, inspect, repaint and seal existing metal sheeting,
- d) Replace all loose screws and fixings,
- e) Seal all flashings,
- f) Reinstall lightning conductors in place where applicable.

3.2.4. Concrete parking decks

The scope of work for this work group comprise the following:

- a) Erect safety measures, traffic accommodation and barricades as required,
- b) Record existing traffic markings, make temporary references for future replacement,
- c) Inspect existing Radflex movement joints, and repair where necessary, or replace damaged joints.
- d) Expose existing metal channel joints and underlaying joint over movement joints only, and replace with new Radflex S200 joint,
- e) Expose all movement joints, clean, remove failed joint material, and seal joint with specified joint material,
- f) Clear all fullbore drains, and if blocked, inspect by camera for repairs,
- g) Remark parking bays, numbers and other traffic direction markings

4. TECHNICAL SPECIFICATIONS

4.1. Flat slab roof

The area where the rooftop chillers and other mechanical equipment is positioned is considered confined, with difficult accessible sections. Therefor an elastic spray-on product is required to ensure proper coverage throughout.

- Strip and dispose of existing waterproofing material.
- Remove all oils, grease or other contaminants by scrubbing, rinsing and cleaning to produce a water break-free surface. Abrade surfaces where necessary by etching, blasting or grinding.
- Inspect roof falls for proper drainage, and identify areas where screeds must be modified.
- Apply new screed to minimum 1% falls to outlets, with crystalline add-mixture to supplier's application. Internal corners should be coved to 50mm and external corners radiused to 25mm. All exposed brickwork, where the waterproofing is to be terminated, must be plastered to a smooth and true finish.
- Install additional 50mm PVC scupper drainage pipes through masonry, and make good.
- Apply a polyurea-polyurethane spray-on application waterproofing membrane, products such as Stoncor Stonechem 441 or Bitumproof Inopaz H2O or similar approved. (If any alternative is offered, comprehensive comparative specifications must be provided to demonstrate matching properties). Specifications attached in **Annexure B & C**
- **Lap all sides** to suppliers' directions along all balustrades, upstands and plinths. **Counter flash** all vertical terminations with a 100mm wide strip of Pro-Struct 680 Acrylic Flashing Liquid reinforced with Pro- Struct 599 membrane (as per the Technical Data Sheet of Pro-Struct 680). The top leading edge of the counter-flashing will be terminated in either a reglet of the substrate (Minimum of 6 x 6mm joint), or a brickwork joint.
- Inspect all PVC downpipes in ceiling cavities, and **seal all pipe joints** that are accessible with suitable silicone sealant.
- **Flood Test:** On completion of the waterproofing installation, the waterproofing contractor is to seal all outlets and flood test the area, and inspect the drainage pipes upon draining for leaks. A certificate or letter is to be obtained from the main contractor establishing that the waterproofing treatment was handed over in a watertight and workmanlike manner.

4.2. Sheet metal roof

This section covers all corrugated metal roofs and sheeting.

- Remove all existing waterproofing strips and membranes.
- Clean the metal substrate thoroughly ensuring all dust, loose debris and other contaminants are removed

- Inspect the roof for loose or missing screws, and replace and repair as necessary.
- Seal all joints, fixings and other potential areas of water ingress with products such as Pro-Struct 203, reinforcing it with Pro-Struct 200 Membrane, alternatively Bitumproof BP-3000 & Paz-poly membrane.
- Apply primer to suppliers specifications.
- Apply Stoncor Alumanation 301 or Bitumproof Acrylpaz Super over ENTIRE surface.
- Inspect gutters and downpipes for any leaks, and seal as necessary.
- Specifications attached in **Annexure B & C**

4.3. Slate tiled roof

- Remove broken or damaged slate tiles, with fixing nails, and dispose.
- Inspect condition of underlying membrane, summarize and inform the Engineer of the extent of repair. Ceiling cavities are isolated with polystyrene insulation boards, which must be opened for inspection, and reinstated afterwards
- Where underlying membrane must be replaced, strip tiles for re-use, and store in safe place.
- Remove all ridges for inspection, and repair and seal underlying membrane.
- Replace underlying membrane with ABE Slatex 2000 to suppliers direction.
- Install existing tiles complete with non-corrosive nails, all ridges, hips and valleys.
- Specifications attached in **Annexure D**

4.4. Parking Deck joints

- Remove existing movement joints, covers etc, for inspection, and dispose failed joints.
- Where joints failed, supply and install new Radflex S200 A1 or similar approved joint to supplier's directions. Where joint needs refurbishment, remove and reinstall existing.
- Cut new groove for joint into asphalt,
- Cut to correct depth, and demolish underlying concrete deck to create slot for new joint,
- Trim and prepare groove for new joint material
- Finish joint against kerbs and wall upturns.
- Remove failed vertical joint material, clean, replace with backing chord and seal with Pro-struct 749 polysulphide joint sealant.
- Specifications attached in **Annexure E**

5. DRAWINGS

No formal drawings are available on the project.

The contractor must submit sketches of their proposed access and safety system for approval by the Engineer and Client prior to commencing work.

6. SCHEDULE OF QUANTITIES

PREAMBLE TO THE SCHEDULE OF QUANTITIES AND RATES

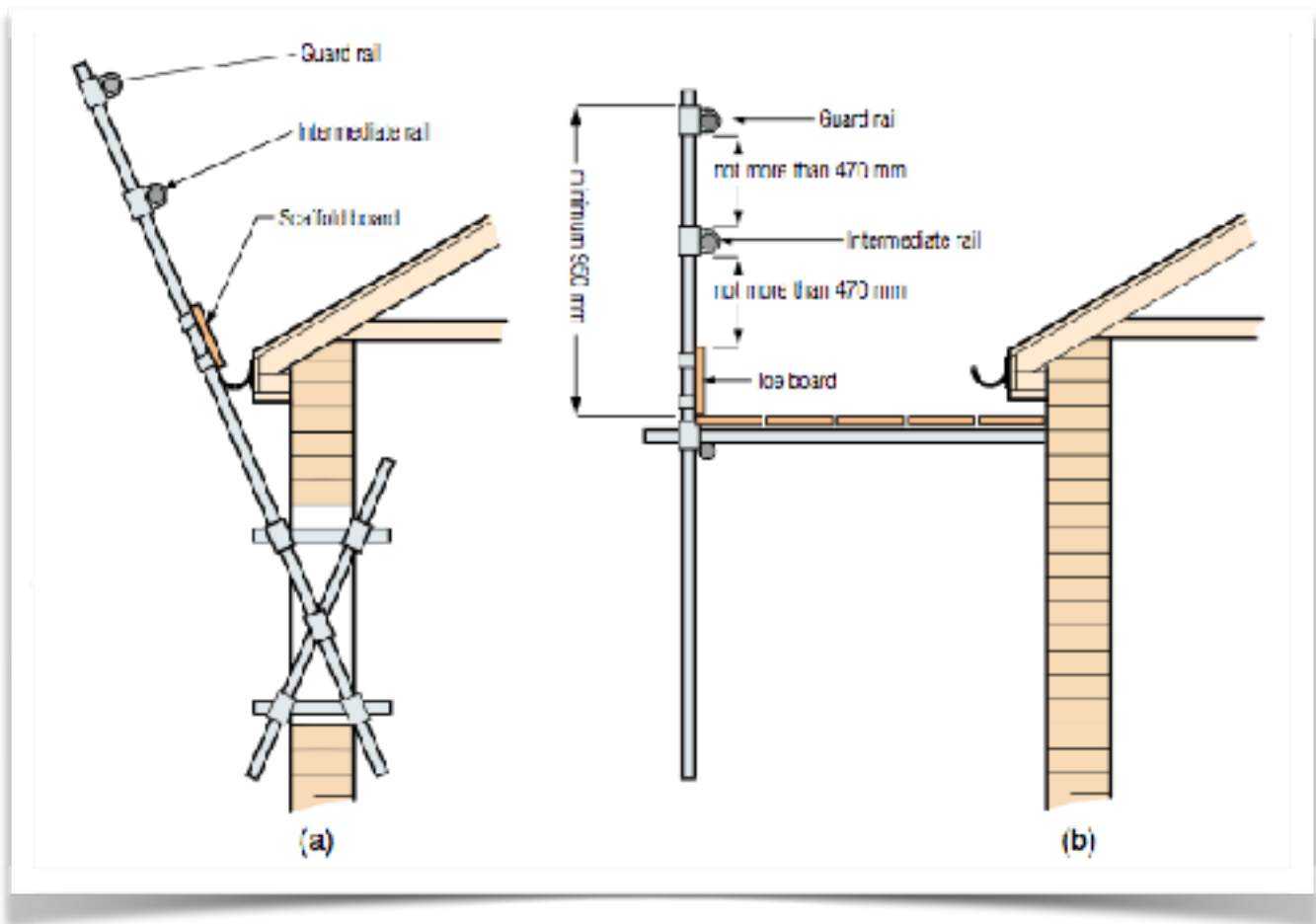
- a) The Standard Commercial Terms and Conditions, The Special Commercial Terms and Conditions, the Specifications (including the Project Specification), and any Drawings are to be read in conjunction with the Schedule of Quantities and Rates.
- b) The Schedule comprises items covering the Service Provider's profit and costs of general liabilities and of the design, manufacture, supply, installation and commissioning of temporary and permanent Works. The Proposer is at liberty to insert a rate of his own choosing for each item in the Schedule and any item against which no quantity (where applicable) or rate is entered will be considered to be covered by other items in the Schedule.
- c) The quantities and rates inserted in the Schedule are to be inclusive prices to the Employer for the work described under the several items. Such prices shall cover all costs and expenses that may be required in and for the Works, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the Tender is based. All rates and amount shall be nett, exclusive of Value Added Tax (VAT) and shall be carried to the summary page in their nett form. VAT will then be calculated on the total of the nett amounts.
- d) All quantities and rates as set forth and inserted in the Schedule and extended to the totals for each portion of the Schedule, shall be considered as being totally inclusive for the whole of the Works as stipulated, or as can reasonably be inferred from these Documents.
- e) All product guarantees are deemed to be included in the rates, and installation and application rates will include all necessary inspections and approvals to maintain guarantees.
- f) "Complete" as it is used in the Schedule means the complete system or unit as specified in the particular documents.
- g) Each item in the Schedule which is priced, shall be filled in black ink.
- h) All quantities shall be considered as final and sufficient for the work described. The Proposer shall satisfy himself as to the sufficiency of quantities but may not change quantities. Quantities shall be re-measured and payment shall be made according to the adjusted total only.
- i) In case of arithmetical errors in the multiplication of rates and quantities in the Proposal, the amount shall not be changed. In case of incorrect summation of amounts in the Proposal, the Lump Sum total shall remain fixed.

7. HEALTH AND SAFETY

Safety during construction is paramount, and the Contractor must adhere to the statutory construction regulations and other regulatory requirements.

The following serves as a guideline to the access and safety scaffolding:

- One point of entry will be allowed from street level. No access is allowed from inside the building.
- All roof structures must be inspected prior to erection of working platforms or scaffolding onto roof structures. Any discrepancies must be reported to the Engineer for assessment.
- Stacking of materials may only be done on roof sections able to withstand the load safely, and must be restricted to limit concentrated loads on the structure.
- **A secure means of entry and exit is essential.** A general access scaffold or tower scaffold (preferably of the stairway design) will be required to provide suitable access. A properly secured ladder is the minimum requirement for short term access.
- **Permanent security** guards or lockable gates will be required at the access point. Access to the site must be controlled and limited at all times.
- **Edge Protection Barriers:** All exposed roof edges to be enclosed with an edge protection barrier. Edge protection should include or be equivalent to:
 - a main guard rail at least 950 mm above the edge;
 - a toe board and brick guard where there is risk of objects being kicked off the edge of the platform; and
 - a suitable number of intermediate guard rails or suitable alternatives positioned so that there is no gap more than 470 mm.
 - Roof parapets may provide equivalent protection but if it does not, extra protection will be required as described above.
- **Crawl boards and Roof ladders:** On sloping roofs, roof workers should not work directly on tiles, as they do not provide a safe footing, particularly when they are wet. Use roof ladders and proprietary staging to enable safe passage across a roof. It must be designed for the purpose, of good construction, properly supported, and, if used on a sloping roof, securely fixed by means of a ridge hook placed over the ridge, bearing on the opposite roof or other support. It should be used in addition to eaves-level edge protection. *Gutters should not be used to support any ladder.*
- **Work platforms:** Adequate and secure work platforms from which to carry out the work are required where necessary.
- **Fall mitigation:** Providing adequate platforms and edge protection may not always be possible or reasonably practicable. If so, safety nets, soft landing systems, or other measures may be necessary to minimise the consequences of any potential injury. If nets are used it must be properly installed by competent riggers as close under the work surface as possible to minimise the distance fallen.
- **Personal fall arrest systems:** Devices such as harnesses with a sufficiently strong anchorage points are necessary throughout, the contractor must determine where the



anchorage points should be, and clearly indicate it on site. The contractor will be responsible to monitor user discipline and active monitoring for compliance.

- **Falling material:** A tidy site must be maintained to prevent material which could fall from accumulating. Material may never be thrown from a roof or scaffold, and enclosed rubbish chutes are to be used if lowering material to the ground in containers is not possible. Rubbish chutes must discharge into skips to dispose of spoil material to spoil level.
- Public safety must be maintained throughout, and all scaffolding and pedestrian walkways must be barricaded to prevent accidental or unauthorised access. Where necessary, the contractor must obtain permission from council to barricade sidewalks.

ANNEXURES:

- Annexure A: Site Plans
- Annexure B1: Material Specifications and Specsheets - WATERPROOFING
- Annexure B2: Material Specifications and Specsheets - WATERPROOFING
- Annexure C: Material Specifications and Specsheets - METAL ROOF SEAL
- Annexure D: Material Specifications and Specsheets - ROOF TILE UNDERLAY
- Annexure E: Material Specifications and Specsheets - DECK JOINT SEAL

ANNEXURE A

SITE DRAWINGS

ANNEXURE B

MATERIAL SPECIFICATIONS

WATERPROOFING

ANNEXURE C

MATERIAL SPECIFICATIONS

METAL ROOF SEAL

ANNEXURE D

MATERIAL SPECIFICATIONS

ROOF TILE UNDERLAY

ANNEXURE E

MATERIAL SPECIFICATIONS

DECK JOINT SEAL