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Professional Engineering Services

Investigation on Waterproofing Defects at

Erf 2044, Green Point

House Noth

Report – Rev 00

25 April 2025 Contact Person: Melt Badenhorst (Pr.Tech.Eng)(Pr.CPM)



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Annexures

- A - Drawing No. HNoth – Struct 01: Investigation and remedial concepts
- B - Architectural drawings (*DV8 architects – May 2018*)
- C - Structural Engineering drawings (*JTL Structures Consulting Engineers – August 2019*)
- D - Water leak detection test report (*Monster Plumbing – April 2025*)

EXECUTIVE SUMMARY

This **Investigation on Waterproofing Defects with preliminary Remedial Concept Report** is presented by **TechQ Development (Pty) Ltd** based on the *Request for Proposals (RFP)* called by the **National Home Builders Registration Council (NHBRC)** in terms of the *Housing Consumer Protection Measures Act (Act 95 of 1998)* and *Regulations (HCPMA)*, and the **NHBRC Technical Requirements at Erf 2044, Green Point (House Noth)**, Western Cape Province.

The original RFQ dated 30 January 2025 recorded water ingress through the retaining wall and water ingress in the lower bedroom, however, during the site brief and investigations numerous other locations of water damp and possible defected waterproofing were identified.

Reported by the Homeowner is that previous water damp investigation reports and remedials works were implemented, however, to little success. Such previous reports are not part of this report submission.

A water leak detection exercise was conducted to test the durability of the waterproofing in certain areas of the structure also to determine the root causes of the water damp, attached as **Annexure D**.

Architectural and Structural Engineering drawings from the design professionals are elaborated on in **Section 1** of the report and attached as **Annexure B** and **Annexure C** respectively.

Section 2 of the report outlines the affected and inspected areas with notes taken during the investigation.

The concepts remedial actions proposed in **Section 3** of this report are based on site inspections and a water leak detection exercise conducted to address the waterproofing items raised by the Homeowner as recorded in the RFQ.

NOTE: Several areas of the building as indicated in **Section 2** of this report, has evidence of structural cracks which may be the root causes to some of the waterproofing defects. **Section 2.4** of the report directs to these locations and other possible future defects. It is recommended that these areas be further investigated once the existing waterproofing has been removed, before re-waterproofing is applied.

A concept review discussion session was held with the NHBRC on 11 April 2025, with relevant comments incorporated in this report. Concept remedial activities as per the details on the drawing attached as **Annexure A** are summarised below.

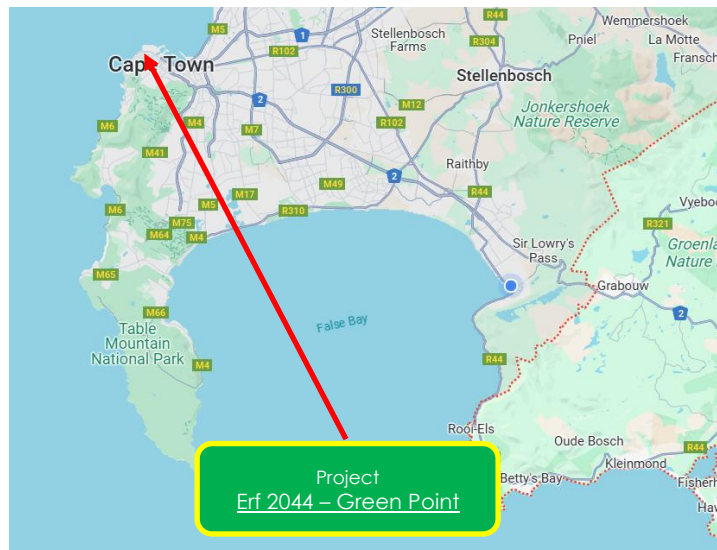
Section	Concept Remedial Actions – Drawing attached as Annexure A
<ul style="list-style-type: none">Planter Boxes, Skylight, Concrete slab and Grassed areas	<p>Activity A: Re-waterproofing</p> <p><u>Skylight</u></p> <ul style="list-style-type: none">Remove skylight, damaged waterproofing and re-seal after re-flitting light <p><u>Planter boxes, concrete slab and grasses areas</u></p> <ul style="list-style-type: none">Remove all vegetation, soils and gravel including layers of existing waterproofingBrush down with steel brush to expose concrete surfaces and seal visible cracks.Apply suitable primer to exposed concrete areas.Apply torch-on or approved Sika-Cemflex bitumen products.
<ul style="list-style-type: none">Concrete roof slab parking	<p>Activity B: Repair concrete driveway / parking area</p> <ul style="list-style-type: none">Remove all vertical and corner waterproofing layers as indicated on the drawing.Chip down and remove all loose concrete flaked surface fragments, brush down with steel brush to expose concrete surface.Remove all construction and movement joint sealant, clean joints and re-apply sealant.Apply suitable primer to exposed concrete areas.Apply torch-on or approved Sika-Cemflex bitumen products.
<ul style="list-style-type: none">Ground Floor	<p>Activity C: Repair and improve stormwater on Ground Floor</p> <ul style="list-style-type: none">Cast 75mm thick concrete slab below Pool Pumps and slope to backyard.

1 PROJECT LOCALITY, SCOPE AND INFORMATION

1.1 Project Locality

Erf 2044, Green Point (House Noth) is located at 38R Oceanview drive, Green Point, Cape Town within the municipal boundaries of the **City of Cape Town** as show on the Figures below.

Site coordinates are **South:** 33° 54' 40" **East:** 18° 24' 12"



Project Location: House Noth, 38R Oceanview Drive

1.2 Scope of Work

1.2.1 Original RFQ scope of works

TechQ Development (Pty) Ltd was appointed by the **NHBRC** to conduct an **Investigation** towards possible root causes on waterproofing defects at **House Noth** with the following specific deliverables.

Investigate defects that have manifested at the above-mentioned home and classify them in terms of the Housing Consumer Protection Measures Act (Act 95 of 1998) and Regulations (HCPMA) and the NHBRC Technical Requirements, which includes but is not limited to:

- Water ingress through the retaining wall
- Water ingress in the lower bedroom

Throughout the investigation and considerations of remedial works, special attention is drawn to **Chapter III** of the Act, clause 13(1)(b) – (i) “rectify major structural defects” and (ii) “deviation from plans or any deficiency related to design, workmanship or materials”.

1.2.2 Additional scope following site brief and site inspection

Water ingress and damp was observed on several other surfaces than those listed in the original RFQ.

During the site brief and official investigations other root causes for potential future latent defects were identified of which the Homeowners need to be made aware of, which preventative steps and overall maintenance is not covered as part of this report's remedial concepts. Areas of concern as indicated above are noted in **Section 2.4** of this report.

1.3 Information Provided (Summary)

Information provided by the NHBRC, Homeowner, design Architect and Structural Engineer involved in the planning and construction of the building, provided background to the site development and an understanding to analyse the structural system of the building.

1.3.1 Annexure B – Architect drawings

Architect drawings produced by **DV8 architects** are attached, which drawings were reviewed to ascertain the intended design approach of the building.

Waterproofing specifications are part of the Architect's drawings with detailed instructions towards the application, which needs to be read in conjunction with this report and the remedial concepts proposed.

1.3.2 Annexure C – Structural Engineering drawings

Structural engineering drawings prepared by **JTL Structures Consulting Engineers** are attached indicating all the reinforced structural elements of the building.

Of note is that no specifications towards waterproofing of any element of the building or sealing of any construction / movement joints are detailed on the drawings.

1.3.3 Annexure D – Water Leak detection

A water leak detection exercise was conducted by **Monster Plumbing** in April 2025 as part of this Project's investigation. Also outlined in this report are the several noticeable structural cracks and poor installation of previous waterproofing applications, which are the apparent root causes of the waterproofing defects, also to be noted as possible future latent defects.

2 INVESTIGATION: POSSIBLE ROOT CAUSES

The existing building is a multi-storey concrete frame structure with brick in-fill walls and divisions.

Due to the location of the building, several man-made green areas such as the plant boxes, the grass section next to the swimming pool and the section of artificial grass next to the Lounge area are found on different levels of the building. Proper waterproofing applications need to be followed for these types of features, from which the water leak detection report outlines basic inadequacies in the applications.

The following possible root causes are informed by TechQ's on-site investigation and examination of reports and drawings presented as listed in the Annexures, also to be read in conjunction with the water leak detection report attached as **Annexure D**.

2.1 Damaged waterproofing at Planter boxes, Skylight, concrete slab and Green Areas

Due to the location of the building, very little space is available for plants and grass of which areas are incorporated into the structural concrete frame of the building. Proper waterproofing of these areas needs to be done to prevent water leak and damp to adjoining sections of the structure.

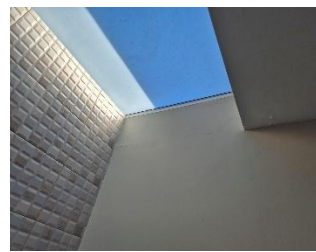
The photo album below shows the areas where inadequate and dilapidated sections of waterproofing were observed which caused the water damp to walls and floors.



Pic 01: Damaged waterproofing at corner of Plant Box.



Pic 02: Waterproofing of grassed area next to pool peeling off.



Pic 03: Water damp at Skylight edges with cracks.



Pic 04: Artificial lawn lower than water channel.

The above pictures portray evidence of deteriorated and failed waterproofing applications. The level of the artificial lawn as per **Pic 04** is lower than the installed stormwater channel and result in standing water under the artificial lawn thus creating unsafe and un-hygienic areas.

2.2 Concrete roof top – vehicle parking and driveway area

Cracked surface, damaged construction / movement joints and degraded sections of the concrete roof slab used as the driveway and vehicle parking together with rundown waterproofing against the vertical upstand beams of the area, are but a few observations on the top level of the building. The pictures below clearly show the degraded state of the concrete slab and damaged waterproofing which resulted in water damp, water leaks and water ingress to the rest of the building levels.



Pic 05: Full-bore level with surface and visible cracked concrete surface.



Pic 06: Damaged construction joints and waterproof edges.



Pic 07: Cracks in concrete slab above house entrance on 2nd Floor.

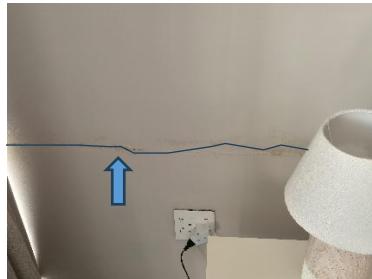
No stormwater channel is installed at the lower end of the slab. Rainwater is reported to flow over the entrance to the house and infiltrates the cracks as indicated on **Picture 07** above.

2.3 Stormwater management

The structural engineering drawing (**Annexure C**) referenced **160844-07** provides detail towards the drainage system proposed to the underside of the surface bed at ground floor level. The pictures below show areas on all levels where stormwater and other means of water leaks resulted in water ingress into the floor and walls.



Pic 08: No concrete surface below HVAC equipment on Ground Floor.



Pic 09: Water ingress in wall of lower bedroom.

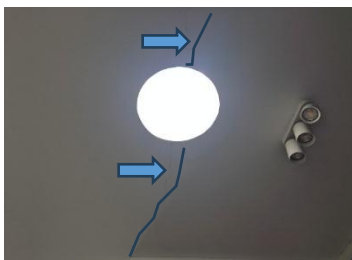


Pic 10: Rainwater from the adjacent stairwell entering the property.

Rainwater entering the property via stairwell gates located on the eastern border of the property on the ground floor and 1st floor of the building as indicated on in **Picture 10** above, adds to the damp and ingress of water into the walls and floors of the building.

2.4 Possible future causes of water damp and ingress to the property and structure

It is recommended that the Homeowner further investigate the following possible future causes of water ingress at locations where structural cracks and other non-waterproof related damages were observed.



Pic 11: Crack in concrete slab of planter box housing the skylight



Pic 12: Water damp on separating wall with neighbour.



Pic 13: Structural cracks at movement joints.

3 ENGINEERING REMEDIAL SOLUTIONS AND RECOMMENDATIONS

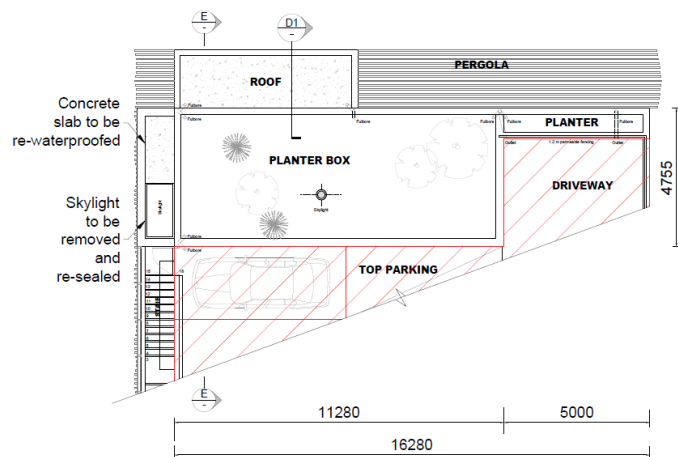
Contributing factors towards the **possible route causes** resulting in the water damp and ingress to wall and floor sections of the building are poor and damaged waterproofing application.

Investigation areas and possible route causes for the waterproof defects are elaborated on in **Section 2** above with proposed concept remedial measures given below.

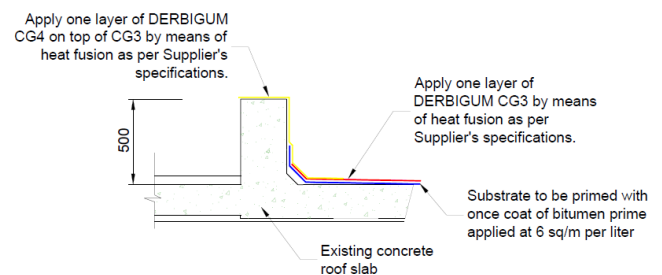
3.1 Activity A: Re-waterproofing - Planter Boxes, Skylight, Concrete slab and Grasses areas

The planter boxes, concrete slab and grasses areas all must be re-waterproofed properly. It is recommended that artificial plants and lawns be considered after the remedial works as detailed on the attached drawing in **Annexure A** have been duly completed.

The images below provide graphic illustrations of the remedial works proposed.



PLANTER BOX, SKYLIGHT and CONCRETE SLAB ON ROOF

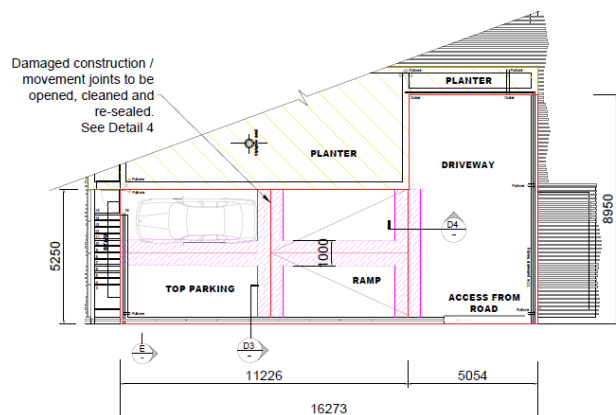


DETAIL 1
Typical Waterproofing Detail - Planter

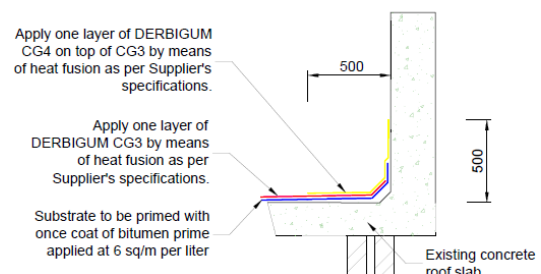
3.2 Activity B: Repair concrete driveway / parking area

The exposed concrete driveway on the top of the building shows large sections of degrading. Waterproofing on the edges of the slab and upstand beams is of sub-standard and needs to be repaired as per the details outline in Detail 3 and Detail 4 of the attached drawing as **Annexure A**.

The image below shows graphical illustrations of where the waterproofing needs to be re-done.



PARKING AREA ON ROOF



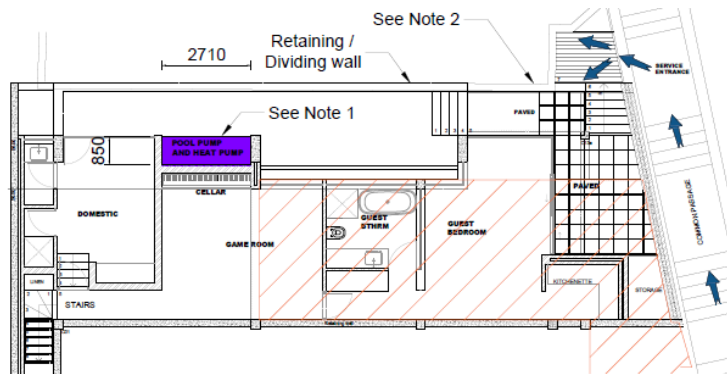
DETAIL 3
Typical Waterproofing Detail - Parking

3.3 Activity C: Stormwater Management – Ground Floor

All stormwater accumulated on the roof (top level of the building) and areas around the swimming pool are channelled via fullbores strategically situated within the building framework, however, run-off stormwater from the common passage (eastern stairwell) enters the property for which no stormwater management is planned.

As stated in the **Executive Summary**, the Homeowners are to be aware of other structural defects not addressed in this report, which causes can be prevented with regular preventative maintenance.

However, within this project, it is proposed that a 75mm concrete slab be constructed under the swimming pool pump with a slope towards the ground floor passage as detailed on the drawing attached as **Annexure A**. location of the proposed slab is indicated on the image below.



NOTES TOWARDS STORMWATER

1. Cast 75mm thick Class 15/19 concrete floor with Ref 395 mesh to slope to passage
2. Water damp to Retaining / Division wall with neighbour emanating from standing water on neighbour's adjoining building roof. This issue to be deliberated between Homeowners, building roof brought to spec and wall re-plastered and painted thereafter.

GROUND FLOOR

Also noted during the investigation and an item to be followed up by the Homeowners, is the water damp, ingress and cracks on the adjoining wall with the neighbours, of which defects are caused by the flat roof of the neighbour's building.

3.4 Summary: Engineering Solutions

The table below is a **summary** of the **remedial actions** proposed.

Section	Concept Remedial Actions – Drawing attached as Annexure A
<ul style="list-style-type: none"> • Planter Boxes, Skylight, Concrete slab and Grassed areas 	<p>Activity A: Re-waterproofing</p> <p><u>Skylight</u></p> <ul style="list-style-type: none"> • Remove skylight, damaged waterproofing and re-seal after re-flitting light <p><u>Planter boxes, concrete slab and grasses areas</u></p> <ul style="list-style-type: none"> • Remove all vegetation, soils and gravel including layers of existing waterproofing • Brush down with steel brush to expose concrete surfaces and seal visible cracks. • Apply suitable primer to exposed concrete areas. • Apply torch-on or approved Sika-Cemflex bitumen products.
<ul style="list-style-type: none"> • Concrete roof slab parking 	<p>Activity B: Repair concrete driveway / parking area</p> <ul style="list-style-type: none"> - Remove all vertical and corner waterproofing layers as indicated on the drawing. - Chip down and remove all loose concrete flaked surface fragments, brush down with steel brush to expose concrete surface. - Remove all construction and movement joint sealant, clean joints and re-apply sealant. - Apply suitable primer to exposed concrete areas. - Apply torch-on or approved Sika-Cemflex bitumen products.
<ul style="list-style-type: none"> • Ground Floor 	<p>Activity C: Repair and improve stormwater on Ground Floor</p> <ul style="list-style-type: none"> • Cast 75mm thick concrete slab below Pool Pumps and slope to backyard.

4 RISKS & MITIGATION MEASURES

Qualifications, risks and possible sensitivity issues needs to be considered in performing the proposed remedial Works during the construction stage. The main objective of the Project is repair works to the structural deformation of the garage wall, however, the following aspects with mitigation proposals, need to be taken into consideration in the Risk Register of the Project.

Risks and mitigation measures

Nature of Risk	Risk	Mitigation
Site and Construction Risks	Abnormal rainfall and restricted working space	Proper scheduling of Works, being aware of the "critical path" items and implementing effective construction methodologies, Quality Assurance and Controls.
Limiting Factors	Decanting plan	Phased implementation of Works in accordance with proper planned decanting program.
Health and Safety	Delays and Fatal	Detailed OH&S plan compiled.
Quality Assurance	Construction Management	QA and QC Inspection procedures in place and approved
	Sub-standard materials	Quality tests and Agreements in place
OH&S and Environmental	Disturbance to environment, community and workers	Focus on the environment, building rubble disposals, air and noise pollution and disruption of day-to-day operations

--- End of Report ---