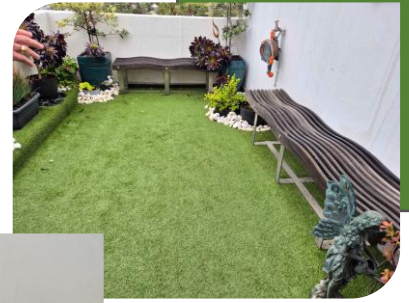


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Ref: DM2025 – WC – SE - 048

Professional Engineering Services

Structural Engineering and Waterproofing Investigation with
Remedial Concepts to
Erf 4114, Table View, Cape Town
House Barnard (Unit 11)

8 August 2025 Contact Person: **Melt Badenhorst** (Pr.Tech.Eng)(Pr.CPM)

Document Control Sheet

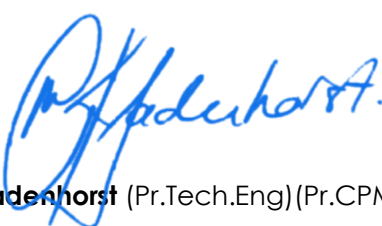
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- A - Investigation (August 2025): Drawings
HBAR – 01: Investigation Notes and Concept proposed remedial works
- B - Architect drawings – JBJ Architecture (October 2020)
- C - Independent water leak / detection assessment (July 2025)

EXECUTIVE SUMMARY

This **Investigation and Engineering 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 4114, Table View (House Barnard)*, Western Cape Province. This property forms part of the “**Blue Tides**” apartment building.

The **RFQ** requested inspections to be conducted at Unit 8, however, the Barnard family resides at **Unit 11**. As extension to the scope, a high-level investigation was done to other random units of the apartment building to ascertain if similar defects were evident, elaborated on in **Section 1.2.2** of this report.

The investigation was guided by the footprint architect drawings of the building. A design review discussion session was held with the NHBRC on 22 July 2025, with relevant comments incorporated in this report.

This investigation concluded that the causes of structural defects, water ingress and damp to be as a result of the following site development areas, dully elaborated on in **Section 2** of this report.

- Poor pavement construction and stormwater management on the ground level resulting into standing water and seepage of stormwater into the subsoil affecting the underlain surfaced earthworks and foundations.
- Isolated areas where the outside balcony patio level is higher than the inside finished floor level resulting in rainwater draining into the apartments.
- No drainage slope, poor and inadequate waterproofing to the balcony patio areas.
- Blocking of wheep-holes in external brickwork resulting in water damp in walls.

The concepts outlined in **Section 3** of this report are based on site inspections and the assessment done towards the structural elements and waterproofing workmanship of the building which need to be further developed for construction and remedial purposes.

The table below provides a summary of the remedial concepts proposed for Unit 11 (Barnard residence) in addressing the pertinent defects, however, similar detailed investigation is proposed for the other units of the complex to prevent further deterioration of the structure, which will result into health and safety challenges.

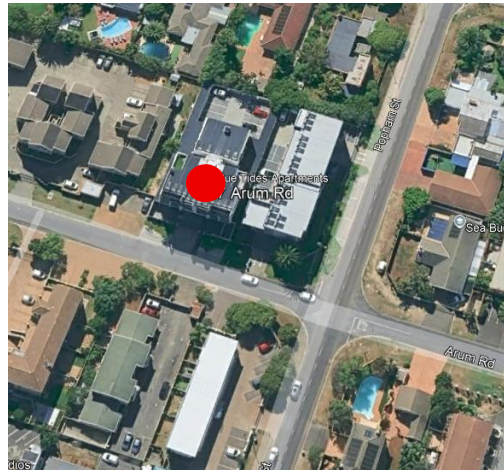
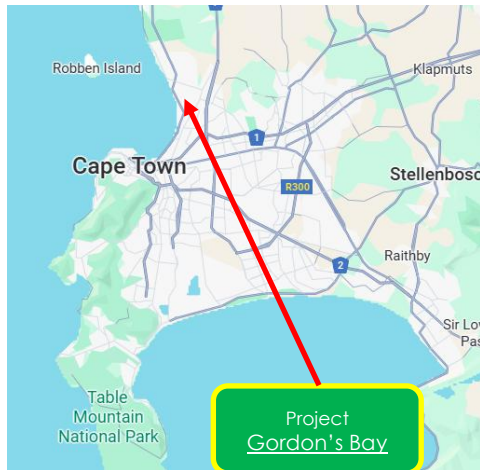
Area of Defect	Concept Remedial Actions – Drawing attached as Annexure A
• Balcony (Southern Façade)	<u>Waterproofing and Improved stormwater drainage</u> • Remove existing tiles, re-slope the screed to achieve adequate drainage slope, apply torch-on waterproofing and replace tiles. Screed, tile adhesive and tile grout to be mixed with Sika Cemflex bonding agent as per spec. • Replace steel balustrades – ensure galvanised structure and bolts.
• Balcony (Northern Façade)	<u>Waterproofing and improved stormwater drainage</u> • Remove existing artificial grass, tiles and waterproofing on surface and walls. • Roughen existing concrete surface, lay down screed (min 50mm) to slope towards existing full bores and finish off with torch-on waterproofing and tiles. • New screed, tile adhesive and tile grout to be mixed with Sika Cemflex bonding agent as per spec.
• Internal and external walls	<u>Correct wheep holes and repair water damp areas</u> • Open up closed wheep holes on external facades of the building. • Sand down damp areas, allow to dry and paint to match existing.
• Crack repair	<u>Crack repair – Lath metal mesh</u> • Expanded metal lath mesh application repairs to cracks on internal and external walls.

1 PROJECT LOCALITY, SCOPE AND INFORMATION

1.1 Project Locality

Erf 4114, Table View (Blue Tides : Unit 11 - House Barnard), is located at No.37 Arum Street, Table View within the boundaries of the **City of Cape Town** as show on the Figures below.

Site coordinates are **South:** 33° 49'19" **East:** 18° 29'03"



Project Location: House Barnard (Blue Tides : Unit 11)

1.2 Scope of Work

1.2.1 Focus area: Unit 11 – Barnard Residence

TechQ Development (Pty) Ltd was appointed by the **NHBC** to conduct an **Investigation** on the multi-story building with the following specific deliverables, as elaborated on in **Section 2** of this report.

- Investigate defects that have manifested at **Unit 11 (Barnard residence)** and classify them in terms of the Housing Consumer Protection Measures Act (Act 95 of 1998) and Regulations (HCPMA) and the NHBC Technical Requirements.
- Determine the root causes of structural defects and waterproofing failures resulting in water ingress and dampness to walls and ceilings with remedial solutions and specifications drawings where necessary, including issues as per previous reports filed by the **NHBC**.

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 High-level inspection to other units and ground level stormwater management

The RFQ stipulated that inspections to other random units of the building be conducted to ascertain the degree of similar defects than those located at **Unit 11 – Barnard residence**. The photo album below was composed gathering defected areas from 6 x other units. It clearly records that similar and, in some cases, a higher degree of defectiveness of especially the waterproofing to balconies were observed in the units visited.

Of great concern is the poor workmanship towards the southern balcony of **Unit 14** where the finished level of the balcony is higher than the inside finished floor level of the bedroom area, which is against all building regulations, norm and standards. This results rainwater draining under the inside laminated wooden floor covering area as indicated in **Pic No. 09** in the photo album below.

Attention also needs to be given to the surface stormwater management on natural ground level. Poor pavement construction, **Pic No. 02**, results in seepage of standing water into earthworks layers which will result

in settlement of paving and differential movement of foundations, alluring structural cracks in the structure.



Pic 01: Rainwater ponding at down-pipe locations.



Pic 02: Large openings between segmented pavers.



Pic 03: Weepholes blocked and roof cladding coming loose.



Pic 04: Water damp collecting on soffit of parking roof.

The photo album below provides pictures of water damp, water ingress and structural cracks located at other units of the building complex, similar to those located at Unit 11 (Barnard residence).



Pic 05: Water seepage and cracks – Unit 16



Pic 06: Water seepage and cracks in staircase slab.



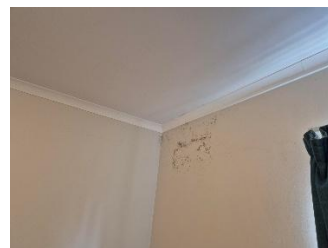
Pic 07: Structural crack in kitchen wall.



Pic 08: Water damp collecting on window sills.



Pic 09: Unit 14 – Balcony level higher than inside FFL.



Pic 10: Black moulding against bedroom wall and ceiling.



Pic 11: Rising damp on internal wall.



Pic 12: Water ingress dangerously near electric plug

The above pictures are a fair representation of similar defects located at Unit 11 which are spread over the full footprint of the building and necessitates thorough investigation and urgent remedial attention.

1.3 Information Provided (Summary)

Information provided by the NHBRC, Home Owner and Architect provided background to the site development and an understanding to analyse the structural system and present concept structural proposals.

1.3.1 Architectural drawings – Annexure B

Architect drawings dated October 2020 (**JBj Architecture**) defined the Complex layout of the multi-storey building with elevations and sections. The following items are noted and elaborated on in **Section 2** below.

- No stormwater drainage proposal
- No waterproofing details to either the roof or balcony / patio areas.

1.3.2 Water leak assessment – Annexure C

An independent water leak / ingress detection investigation assessment was also conducted as part of the investigation of which report is attached as **Annexure C**.

2 INVESTIGATION

The following section only focuses on the investigation done on **Unit 11 – Barnard Residence**.

2.1 4th Floor - Entrance to Units 11

The original RFQ requires structural engineering and waterproofing investigation to **Unit 11 – Barnard Residence**, which entrance is located on the **4th Floor** via the escalator lifts.

The main apparent defect on this floor is water ingress causing damp to floor and walls due to limited to no slope of the patios floor areas. Structural cracks on the walls, as also detected in other units of the complex, is from possible settlement of the building foundations due to poor stormwater management and systems as visualised in **Pic 01** and **Pic 02** in **Section 1.2.2** above.

The photo album below shows the water ingress, water damp and structural cracks on the **4th Floor** of the apartment. Location of the affected areas are indicated on the drawings attached as **Annexure A**.



Pic 13: Standing water on southern patio, no drainage.



Pic 14: Cracks in wall at expansion joint, water ingress.



Pic 15: Soaked southern patio, no drainage with blocked outlet.



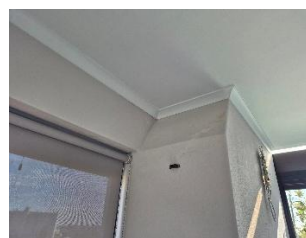
Pic 16: Water damp and crack against wall.



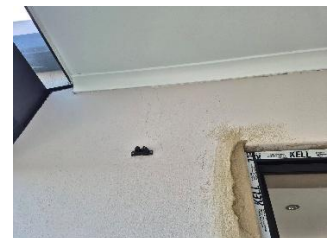
Pic 17: Crack at movement joint with plaster peeling off.



Pic 18: Water damp and crack against beams and ceiling.



Pic 19: Water damp on walls of braai area.



Pic 20: Crack above opening and water damp against wall.

The pictures above show a general repetitive cause of defect in water damp and structural cracks.

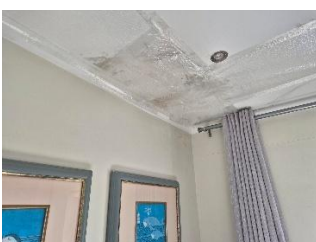
2.2 3rd Floor – Bedrooms and Bathrooms of Unit 11

Severe water damp, and in the event of heavy rainfall, dripping water from the ceiling in the northern bedroom (Bedroom 1 on drawing) are the mayor cause of defect on this level of Unit 11. Closed and non-functional wheep-holes on the external façade of the building, as indicated in **Pic 21** below, is the main reason for rain water to filter from the external brick layer of the cavity wall into the inner brick layer of the cavity wall.

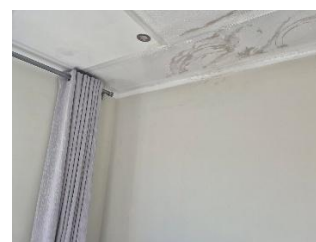
The photo album below captures the visuals of the water damp, seepage and effect it has on the concrete ceiling of the 3rd Floor and internal walls.



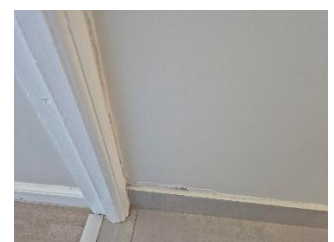
Pic 21: Water damp against wall and division of 4th and 3rd Floor.



Pic 22: Water damp from 4th Floor patio area.



Pic 23: Water damp on ceiling and crack against wall



Pic 24: Floor skirting loose from water damp and crack in floor.

3 POSSIBLE ROUTE CAUSES OF DEFECTS

Contributing factors towards the **possible route causes** resulting in the water damp, water ingress and structural cracks can be some or a combination of the following.

- Little to no slope of patio areas with no drain pipes / fullbores.
- Settlement of structure foundations due to poor stormwater management and systems on natural ground level.
- Closed, blocked and non-functional weep holes in external walls of the structure.
- Poor or non-functional waterproofing under patio floor covering.

The independent water leak / ingress assessment report attached as **Annexure C** also highlights the above as the main causes of the defect located within **Unit 11**.

4 ENGINEERING REMEDIAL SOLUTIONS AND RECOMMENDATIONS

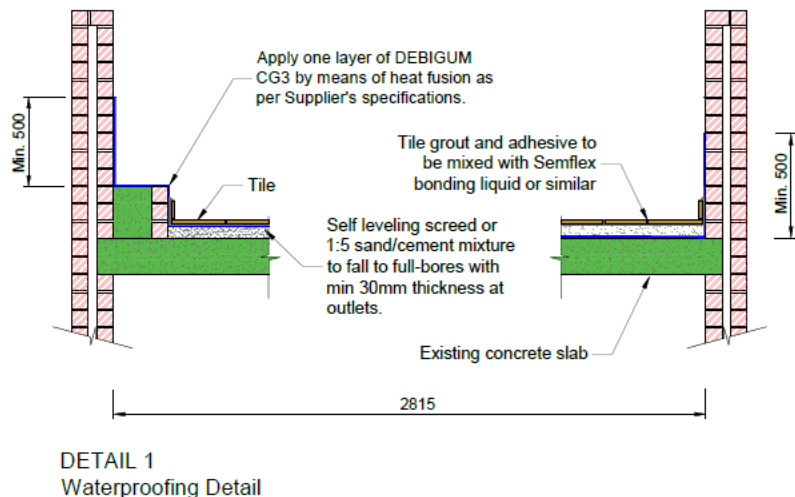
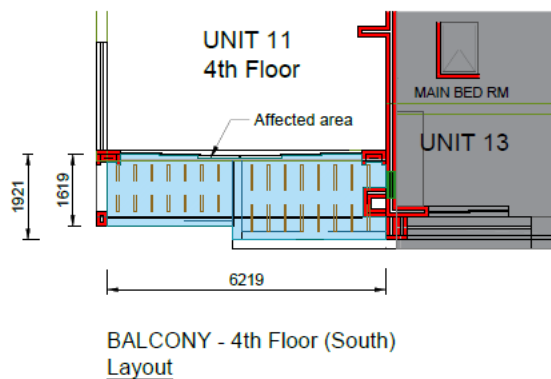
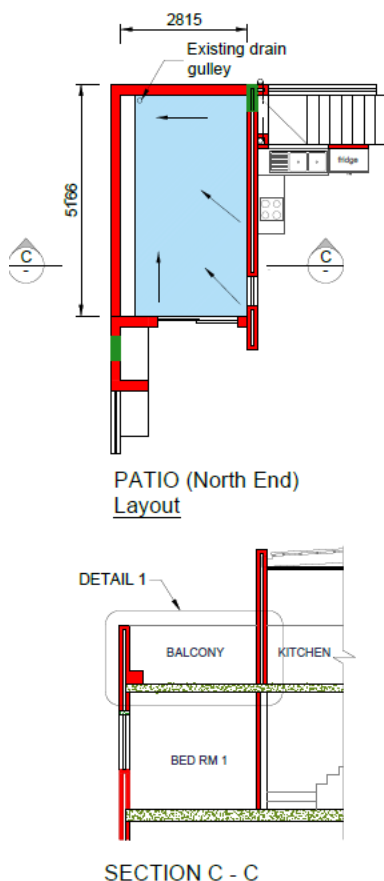
Engineering remedial concepts are categorised and described below with full details on the drawings attached as **Annexure A**.

Graphical representation of the rehabilitation works is also given below for ease of reference.

4.1 Waterproofing patio areas

Proper waterproofing to all patios, on **3rd Floor** and **4th Floor**, needs to be done. Procedures of remedial works are detailed on the drawing attached as **Annexure A**.

Of importance is that the screed, tile adhesive and tile grout used during the remedial works must be mix in proportions as per the supplier's specification to ensure proper waterproofing of these layers, using **Sika Cemflex bonding agent** or similar approved.



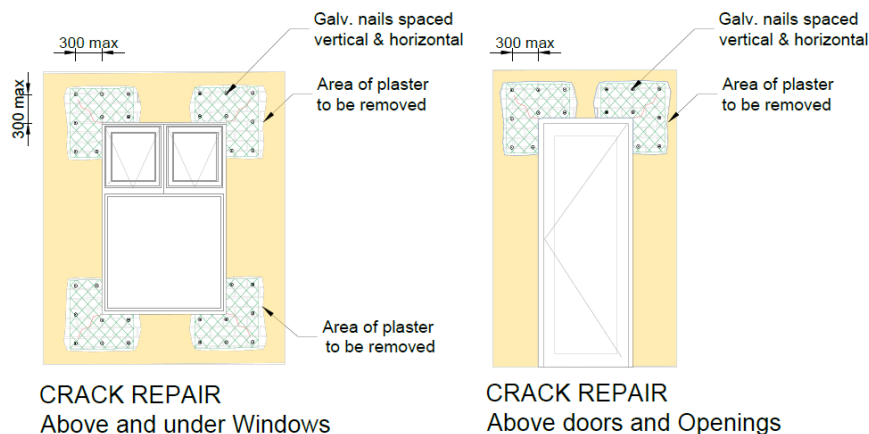
4.2 Correct wheep hole and repair water damp areas

Water damp and ingress is controlled with functional wheep holes at finish floor levels and above opening (doors and windows). All wheep holes needs to be inspected, cleaned out and any coverings removed to ensure functionality thereof.

Damp areas detected on walls must be sand down, plaster added where necessary and painted to match similar areas.

4.3 Crack repairs – Lath metal mesh

Expanded metal lath application repairs is recommended to low- and high-level cracks on both external and internal walls as detailed on **dwg No. HBAR – 01**.



In summary, the following remedial concept repair works are presented.

Area of Defect	Concept Remedial Actions – Drawing attached as Annexure A
Balcony (Southern Façade)	<u>Waterproofing and Improved stormwater drainage</u> - Remove existing tiles, re-slope the screed to achieve adequate drainage slope, apply torch-on waterproofing and replace tiles. Screed, tile adhesive and tile grout to be mixed with Sika Cemflex bonding agent as per spec. - Replace steel balustrades – ensure galvanised structure and bolts.
Balcony (Northern Façade)	<u>Waterproofing and Improved stormwater drainage</u> - Remove existing artificial grass, tiles and waterproofing on surface and walls. - Roughen existing concrete surface, lay down screed (min 50mm) to slope towards existing full bores and finish off with torch-on waterproofing and tiles. - New screed, tile adhesive and tile grout to be mixed with Sika Cemflex bonding agent as per spec.
Internal and external walls	<u>Correct wheep holes and repair water damp areas</u> - Open up closed wheep holes on external facades of the building. - Sand down damp areas, allow to dry and paint to match existing.
Crack repair	<u>Crack repair – Lath metal mesh</u> Expanded metal lath mesh application repairs to cracks on internal and external walls.

5 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 improve waterproofing and attend to structural cracks to **Unit 11** of the complex, 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 ---