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## Professional Engineering Services

Forensic Investigation and Structural Engineering  
Remedial Concepts to Erf 397, Durbanville  
House Leo



## Forensic Report – Rev 0

26 April 2024

Contact Person: **Melt Badenhorst** (Pr.Tech.Eng)



## Document Control Sheet

|                                                                                                                                                                                                                                     |               |                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|
| <b>Client Project Reference</b><br>Erf 397, Durbanville, Clara Anna Fountain (House Leo)                                                                                                                                            |               | <b>Internal Project Number</b><br>TechQ – 023                                        |
| <b>Title</b><br>Professional Engineering Services: Forensic Investigation and Structural Engineering Remedial Concepts                                                                                                              |               |                                                                                      |
| <b>Project Stage</b><br>Investigation and Concept Remedial Proposals                                                                                                                                                                |               |                                                                                      |
| <b>Version</b>                                                                                                                                                                                                                      | <b>Date</b>   | <b>Comment</b>                                                                       |
| Rev 0                                                                                                                                                                                                                               | 26 April 2024 | Report submitted                                                                     |
|                                                                                                                                                                                                                                     |               |                                                                                      |
|                                                                                                                                                                                                                                     |               |                                                                                      |
|                                                                                                                                                                                                                                     |               |                                                                                      |
| <b>Prepared For:</b><br>The Project Manager<br><b>National Home Builders Registration Council</b><br>27 Leeuwkop Road, Sunninghill<br><b>Johannesburg</b><br>2191                                                                   |               |  |
| <b>Prepared By:</b><br><b>TechQ Development (Pty) Ltd</b><br>OFFICE CORNER – Block C<br><b>184 Lancaster Road</b><br>Gordon's Bay<br><b>7140</b>                                                                                    |               |  |
| <b>Compiled By: Consultant</b><br><br><br><br><b>MJ Badenhorst</b> (Pr.Tech.Eng)<br><b>ECSA</b> : Pr. Reg No. 200270009<br><b>NHBRC</b> : 601551 |               | <b>Reviewed By: (Client – NHBC)</b>                                                  |

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## Annexures

- A - Forensic Investigation (April 2024): Drawings
- Drawing No. HB – 01: Forensic Investigation and Structural remedial concepts
- B - Architect drawings – Rev 10 - 2019(Grow Architecture)
- C - Water leak detection report – April 2024

## EXECUTIVE SUMMARY

This **Forensic Investigation and Structural 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 (NHBC)** in terms of the *Housing Consumer Protection Measures Act (Act 95 of 1998) and Regulations (HCPMA)*, and the *NHBC Technical Requirements at Erf 397, Durbanville (House Leo)*, Western Cape Province. This property forms part of the “**Clara Anna Fountain Estate**” development. A design review discussion session was held with the NHBC on 22 April 2024, with relevant comments incorporated in this report.

The objective of the structural remedial concepts proposed within this report is towards a safe building in accordance with the **SANS 10160-1, Table 1**. Details on the Forensic investigation and structural engineering remedial concepts are provided on the drawings in **Annexure A**.

Documentation made available to **TechQ** included the municipal approved Architect's drawing and Structural Engineering reinforced concrete foundation strip footings, all noted in **Section 1.3**.

No geotechnical investigation was conducted as the degree structural cracks and settlement of the soils in the immediate areas of the damaged structure can be classified as “low-risk” cracks.

**Section 2.2** of this report provides detail on the condition assessment of the structure and overall site properties, which portrays a sound building.

The concepts outlined in **Section 3** of this report are based on site inspections and the assessment done towards the complaints recorded by the Home Owner as record in the RFQ.

In summary, the following options are presented.

| Section                       | Concept Remedial Actions                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • 1 <sup>st</sup> Floor patio | <b><u>REMEDIAL A: Replace patio tiles and improve on water proofing</u></b> <ul style="list-style-type: none"><li>Remove existing tiles and waterproofing up to a level of 50mm below the FFL of internal room FFL</li><li>Install proper waterproofing under new tiles</li><li>Replace damaged waterproofing around full-bore on patio and seal properly</li></ul> |
|                               | <b><u>REMEDIAL B: Waterproofing to External sliding door railings</u></b> <ul style="list-style-type: none"><li>Remove existing sealant on all sliding door railings and between door frames and external walls, and replace with proper waterproofing and sealant</li></ul>                                                                                        |
|                               | <b><u>REMEDIAL C: Refit glass balustrades</u></b> <ul style="list-style-type: none"><li>Refit glass balustrades drilling new holes, properly sealed</li><li>Sealing of old holes</li></ul>                                                                                                                                                                          |

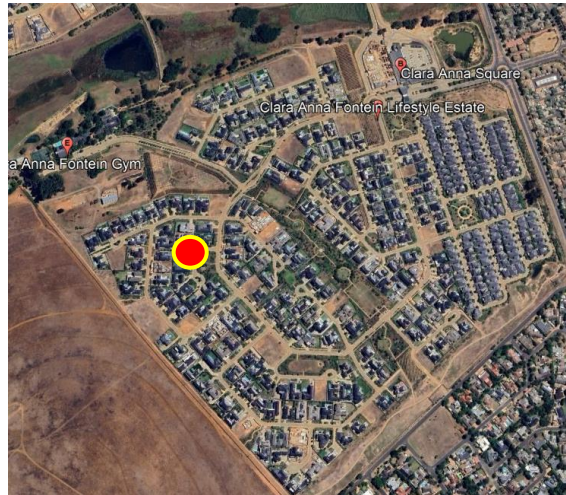
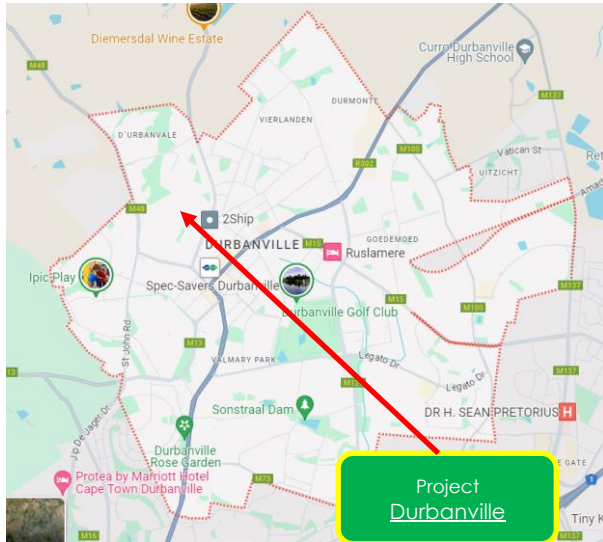
---- End of Executive Summary ----

## 1 PROJECT LOCALITY, SCOPE AND INFORMATION

### 1.1 Project Locality

**Erf 397, Durbanville (House Leo)** is located at No.16 Tsitsikamma Close, Clara Anna Fountain Estate, Durbanville within the boundaries of the **City of Cape Town** as show on the Figures below.

Site coordinates are **South: 33° 49' 20"** **East: 18° 37' 48"**



**Project Location: House Leo : Tsitsikamma Close**

### 1.2 Scope of Work

**TechQ Development (Pty) Ltd** was appointed by the **NHBC** to conduct a **Forensic Investigation** on the double-storey building 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 NHBC Technical Requirements.
- Determine the root causes of defects, report on the deformation of the existing structure and provide remedial solutions and specifications including drawings where necessary, towards the following areas as per previous reports filed by the **NHBC**:
  - Water ingress in the wall area in the garage
  - Water ingress on the window

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”.

### 1.3 Information Provided (Summary)

Information provided by the NHBC and the Home Owner 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

Municipal approved architect drawings dated January 2019 – Revision 10 (**GROW Architecture**) outlined the layout of the structure with proposed water supply and sewer drainage.

The above and other items are further elaboration in **Section 2** and detailed on the drawings in **Annexure A**.

### 1.3.2 Structural Engineering specifications and drawings

No structural engineering drawings were provided during the investigation.

## 2 FORENSIC INVESTIGATION

### 2.1 Site Topographical Survey and Site Slope

No site survey information was made available during the forensic investigation, however, indicative contour levels were detected from the Architect's layout indicating a 3,0m slope over the entire site in a western-eastern direction. This slope indicates that stormwater drainage should drain naturally from the back of the site to the front.

### 2.2 Condition Assessment

The current condition of the structure is good, except for the water leaks detected from the ground floor living room roof, water ingress on the walls in the garage and water ingress at the sliding rails of all external sliding doors on the 1<sup>st</sup> floor patio, which is probably the root cause of the defects.

The pictures below show the areas of investigation as described above. Elaborative comments are given in **Section 2.3.1** below.



**Pic 01:** Water ingress from the 1<sup>st</sup> floor roof



**Pic 02:** Water ingress in the patio tiles



**Pic 03:** Water ingress on the garage walls

### 2.3 Areas of Investigation

#### 2.3.1 Water leak from Living room ceiling

No structural engineering drawings "For Construction" were issued specifying details towards the cavity walls and waterproof prescriptions. The owner reported that the water leak in the living room only occurs after heavy rainfalls accompanied with strong south-eastern winds. This could be the possible cause of rainwater ingress along window frame panels and poor waterproof sealing of window frames and glass.

#### 2.3.2 Water ingress in the wall area in the garage

Large portions of water damp is witnessed on the inside of the northern wall of the garage. Visible leaks from the 1<sup>st</sup> floor patio are located on the north-eastern corner of the garage roof, possible from water ingress from the patio. The pictures below give a visual image of the comments above.



**Pic 04:** Water damp on the garage wall

### 2.3.3 Water ingress on 1<sup>st</sup> floor patio

The owner reported that the tiles on the 1<sup>st</sup> floor patio were replaced and repairs done to the waterproofing when the leaks were reported the first time a few years ago. Noticeably was that the finish level of the tiles on the patio was level with the sliding door rails and not draining away from the doors as shown below.



**Pic 05:** Standing water on the 1<sup>st</sup> floor patio



**Pic 06:** Tile edges not flush with tiles



**Pic 07:** Water seepage - balustrade fixing bolts

**Picture 07** above raises concern that the waterproofing not only under the tile on the patio but within the sleeves of the fixing bolts to the glass balustrades are damaged which will lead to the bolts coming loose and create a safety hazard for the occupants.

### 2.3.4 Water leak detection – Annexure C

A water leak / pressure test was conducted on the 1<sup>st</sup> floor patio area focusing on the affected areas above the living room and garage. The pictures below show alarming evidence that the blue coloured water injected along the sliding door rails and at some places between the patio and external walls, seeping into the cracks with ease.



**Pic 08:** Water ingress into gaps between the sliding door rails and patio tiles



**Pic 09:** Blue coloured water seeping into cracks in walls and patio tiling



**Pic 10:** Poor waterproofing of the full-bore trap on the patio results in leaks to the living room

The water leak detection report highlighted the following:

- All sliding door frames are set below the patio tiles.
- Gaps around the steel pillars
- Large cracks on the parapet walls

Recommendations from this report is included in the engineering solutions in Section 3 below.

## 3 ENGINEERING REMEDIAL SOLUTIONS AND RECOMMENDATIONS

In the absence of structural engineering drawings, no comment can be given towards the structural elements of the building. The Architect drawings indicate the external walls to be 280mm cavity walls. The walls of the investigating area – living room and garage - are plastered and painted as artistic finishing. **Contributing factors** towards the **possible route causes** resulting in the water leaks are elaborated on in **Section 2.3** above.

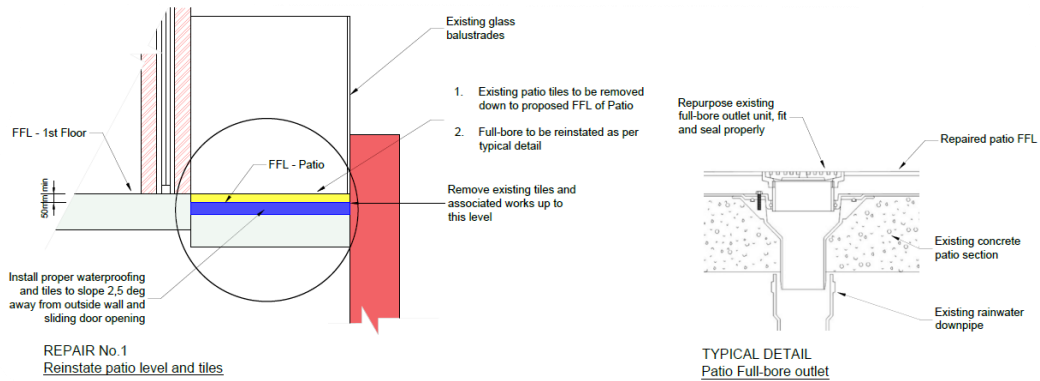
Engineering remedial concepts are categorised and described below with full details on the drawings attached as **Annexure A**.

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

### 3.1 Remedial work A: Replace patio tiles and improve on Waterproofing

The patio tiles are all set above the sliding door railing levels and in most places, water is draining towards the sliding doors. The Architect's section drawings do indicate a level difference between the patio FFL and the FFL of the internal rooms.

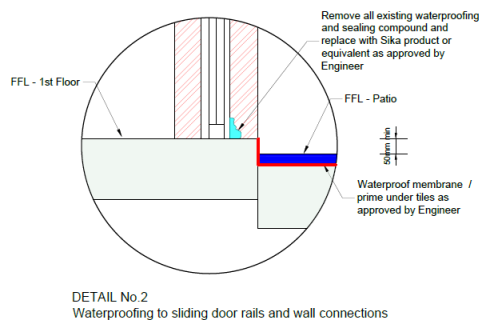
It is recommended that all the tiles be removed and a level of 50mm below the internal room FFL be kept as TOP OF TILES for the patio. Proper waterproofing to be installed from the sliding door railings, under the new tiles as well as the full-bore inlet on the western end of the patio, which is linked to a rainwater downpipe. Graphical representation of the concepts above is given below and in the drawings attached in **Annexure A**.



### 3.2 Remedial works B: Waterproofing to external sliding door railings

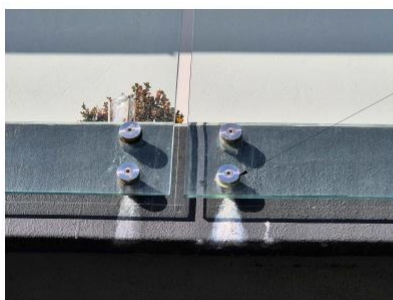
From the water leak detection exercise it was evident that most of the existing waterproofing and / or sealant applied to the sliding door connections are not functional and needs replacement.

Remedial detail is given on **drawing No. HL – Struct 01 – Rev 00** and graphically indicated below.



### 3.3 Remedial works C: Refit glass balustrades

Concern is also raised towards the integrity of the fixing bolts for the glass balustrades. The picture below indicates a cement substance “leaking” from the bolt positions. The water ingress on the patio tiles is a possible cause for this phenomenon, and re-fit of the glass balustrades are recommended as graphically shown below and detailed on the attached drawing.



Remove all glass balustrades, anchors and existing epoxy sealant, clean out and seal holes, then refit glass balustrades to supplier's specifications, after patio tiling and waterproofing has been redone

**NOTE:**  
It is highly recommended that new holed be prepared for fixing the glass balustrades to the patio soffit after all remedial works have been done to prevent worn-out holes to be re-used as fixing positions

DETAIL No. 3  
"Cement rust" on balustrade fixing anchors



#### 4 POSSIBLE ROUTE CAUSES OF DAMAGE AND CONCEPT PROPOSALS FOR REMEDIAL WORKS

**Contributing factors** towards the **possible route causes** resulting in the cracks can be some or a combination of the following.

- No engineering details towards proper measures in preventing settlement of underline soil materials or stabilisation of soils for foundations and paved areas.
- Ingress of stormwater into sub-soils on the western side of the building where gravel pebbles were imported.
- Possible poor masonry and concrete construction practice and workmanship.
- Limited to no engineering details towards brick wall stiffeners, thickening of wall planes or provision of flexible movement joints – **SANS 10400-K**.

The table below presents a summary to the forensic investigation and proposed concept options.

| Section                       | Concept Remedial Actions                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • 1 <sup>st</sup> Floor patio | <b><u>REMEDIAL A: Replace patio tiles and improve on water proofing</u></b> <ul style="list-style-type: none"> <li>• Remove existing tiles and waterproofing up to a level of 50mm below the FFL of internal room FFL</li> <li>• Install proper waterproofing under new tiles</li> <li>• Replace damaged waterproofing around full-bore on patio and seal properly</li> </ul> |
|                               | <b><u>REMEDIAL B: Waterproofing to External sliding door railings</u></b> <ul style="list-style-type: none"> <li>• Remove existing sealant on all sliding door railings and between door frames and external walls, and replace with proper waterproofing and sealant</li> </ul>                                                                                              |
|                               | <b><u>REMEDIAL C: Refit glass balustrades</u></b> <ul style="list-style-type: none"> <li>• Refit glass balustrades drilling new holes, properly sealed</li> <li>• Sealing of old holes</li> </ul>                                                                                                                                                                             |

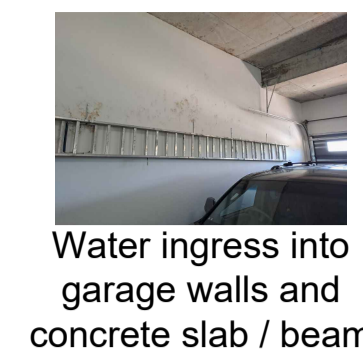
#### 5 RISKS & MITIGATION MEASURES

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 the structural deformation of the building, however, the following aspects with mitigation proposals, need to be taken into consideration in the Risk Register of the Project.

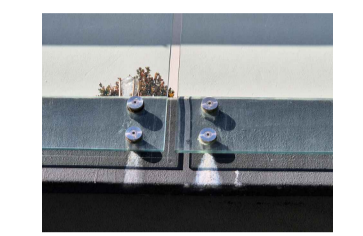
##### Risks and mitigation measures

| 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 ---



Water ingress into garage walls and concrete slab / beam



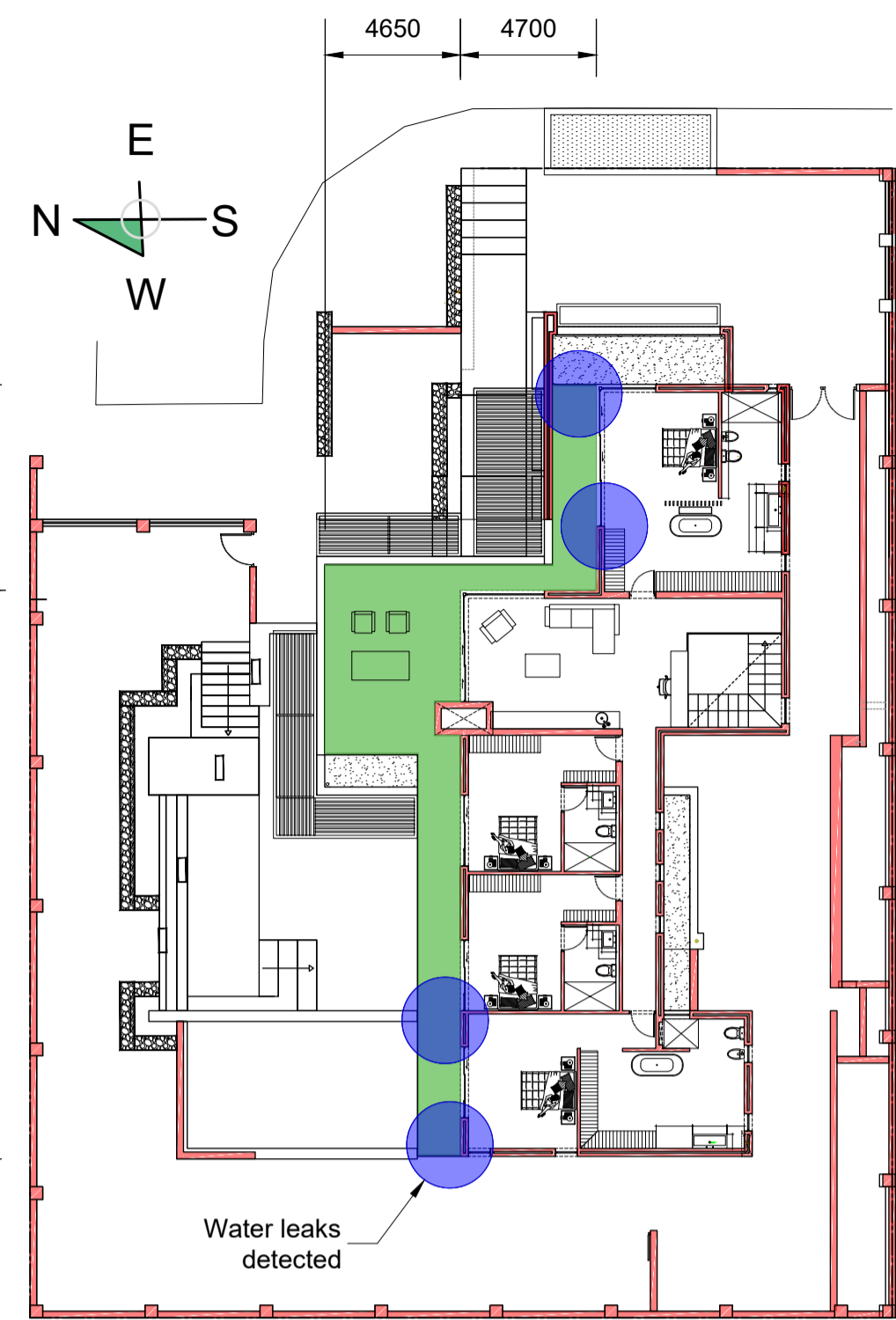
Damaged areas in waterproofing resulting in "cement" drips



Water seeps into ceiling void in Living room



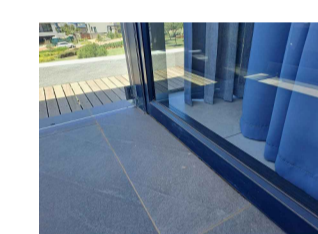
Standing water on patio sloping towards outside door opening



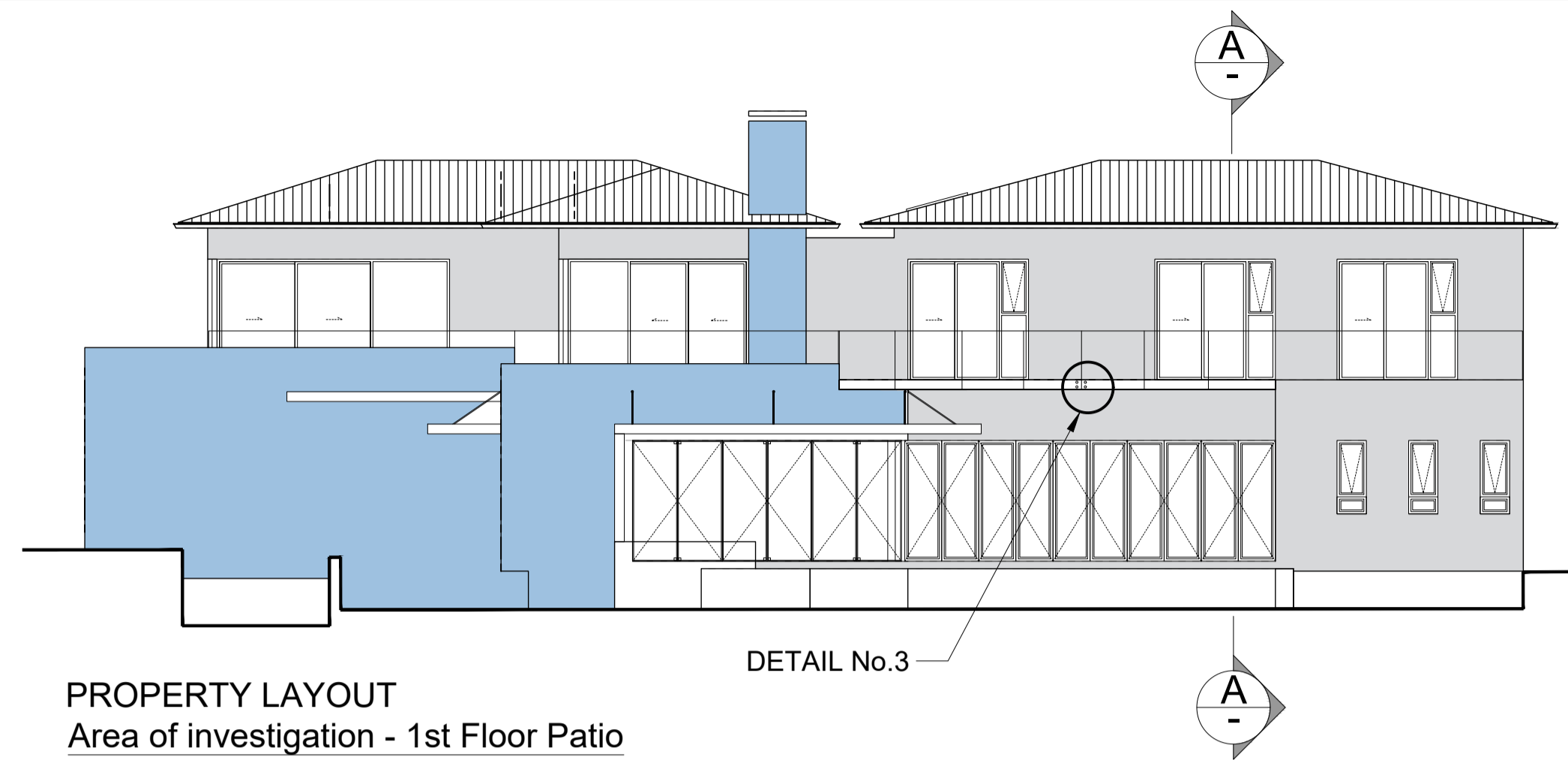
PROPERTY LAYOUT  
Area of investigation - 1st Floor Patio



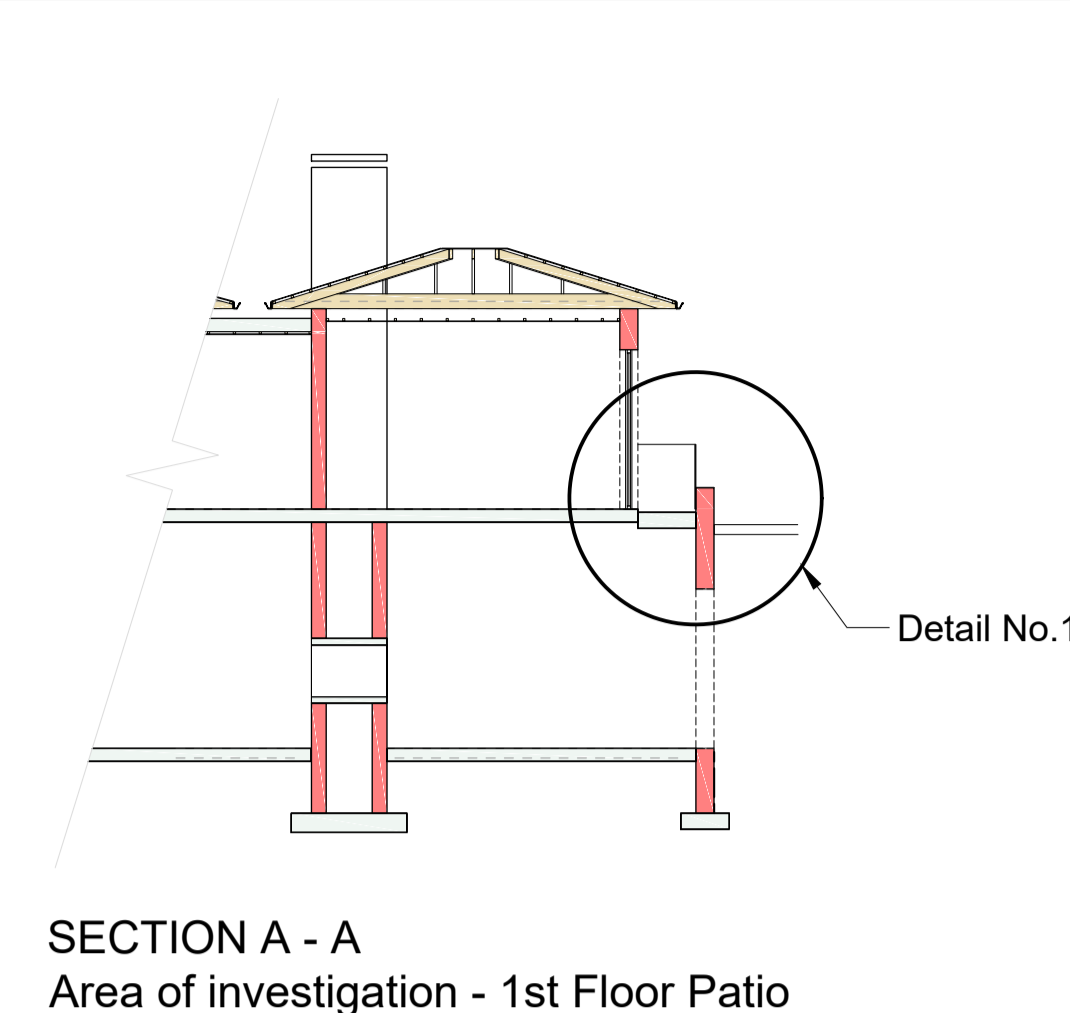
Water seeps into ceiling void in Living room



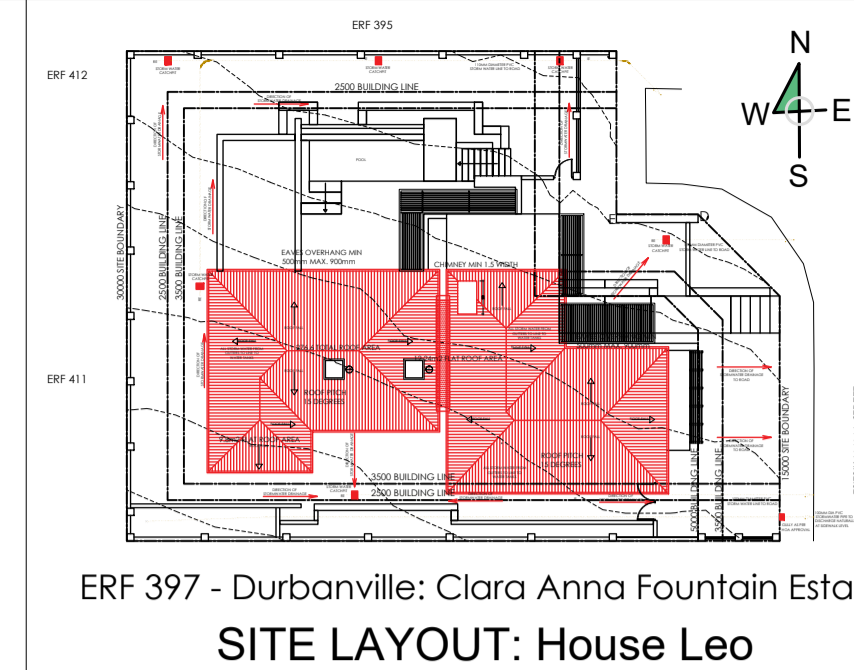
Patio tiles on same level of door sliding rails



PROPERTY LAYOUT  
Area of investigation - 1st Floor Patio



SECTION A - A  
Area of investigation - 1st Floor Patio

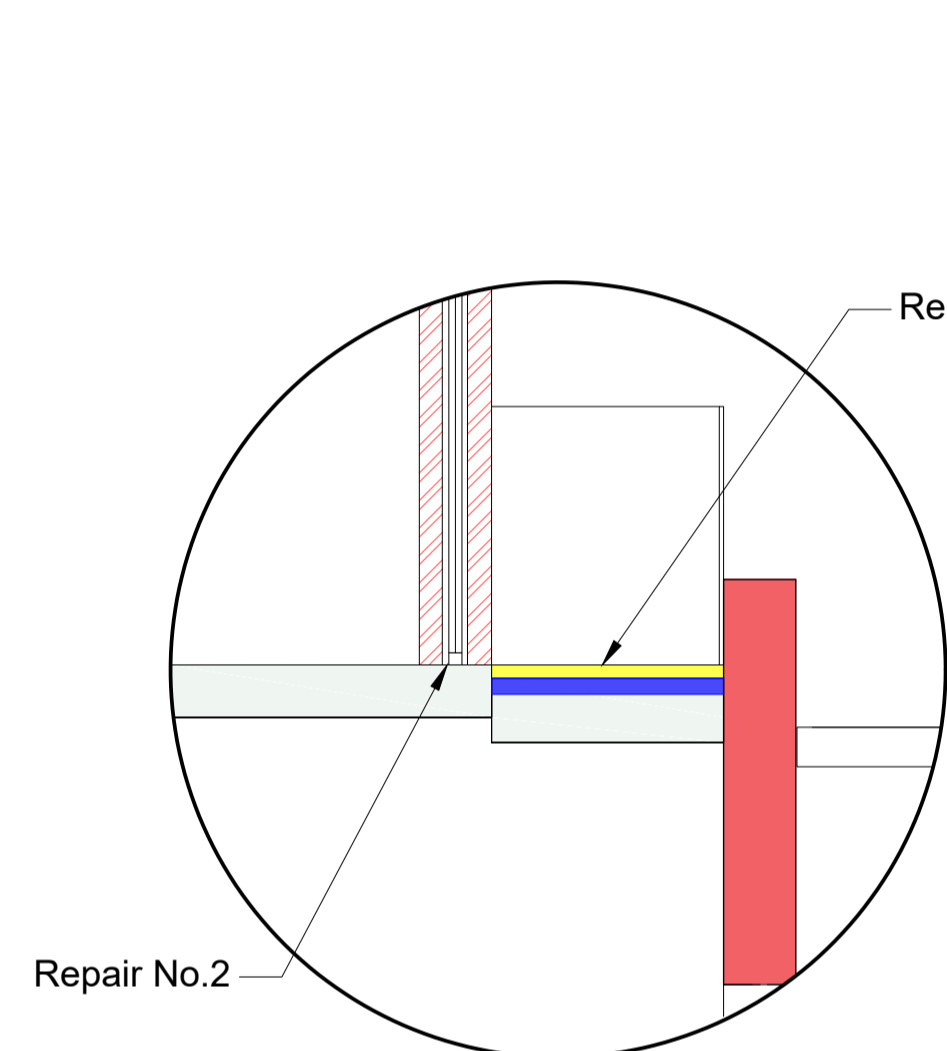


ERF 397 - Durbanville: Clara Anna Fountain Estate  
SITE LAYOUT: House Leo

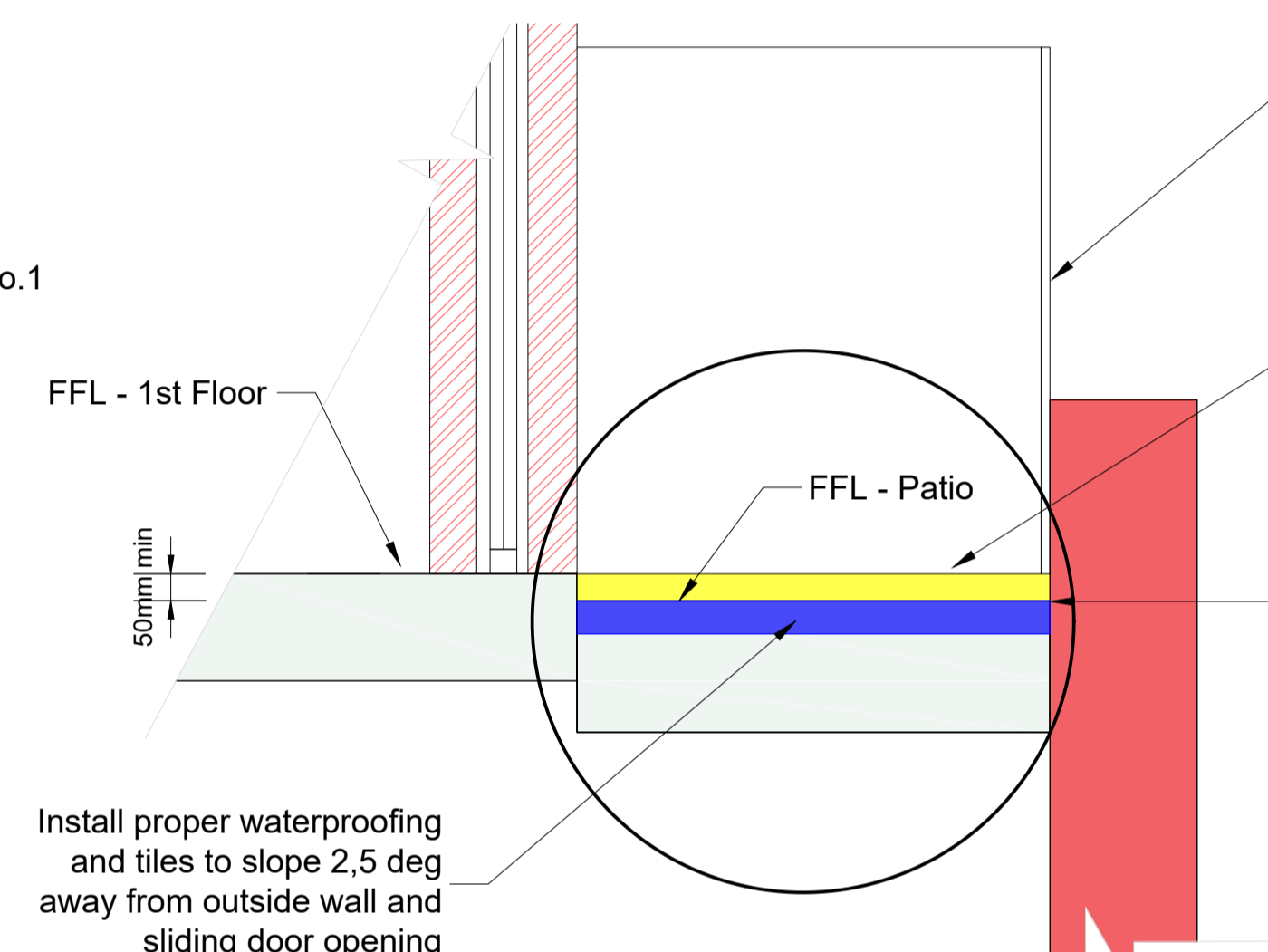
**NOTE:**

**This drawing to be read in conjunction with the Engineer's report dated 26 April 2024.**

**REMEDIAL A: REPLACE PATIO TILES AND IMPROVE WATER PROOFING**

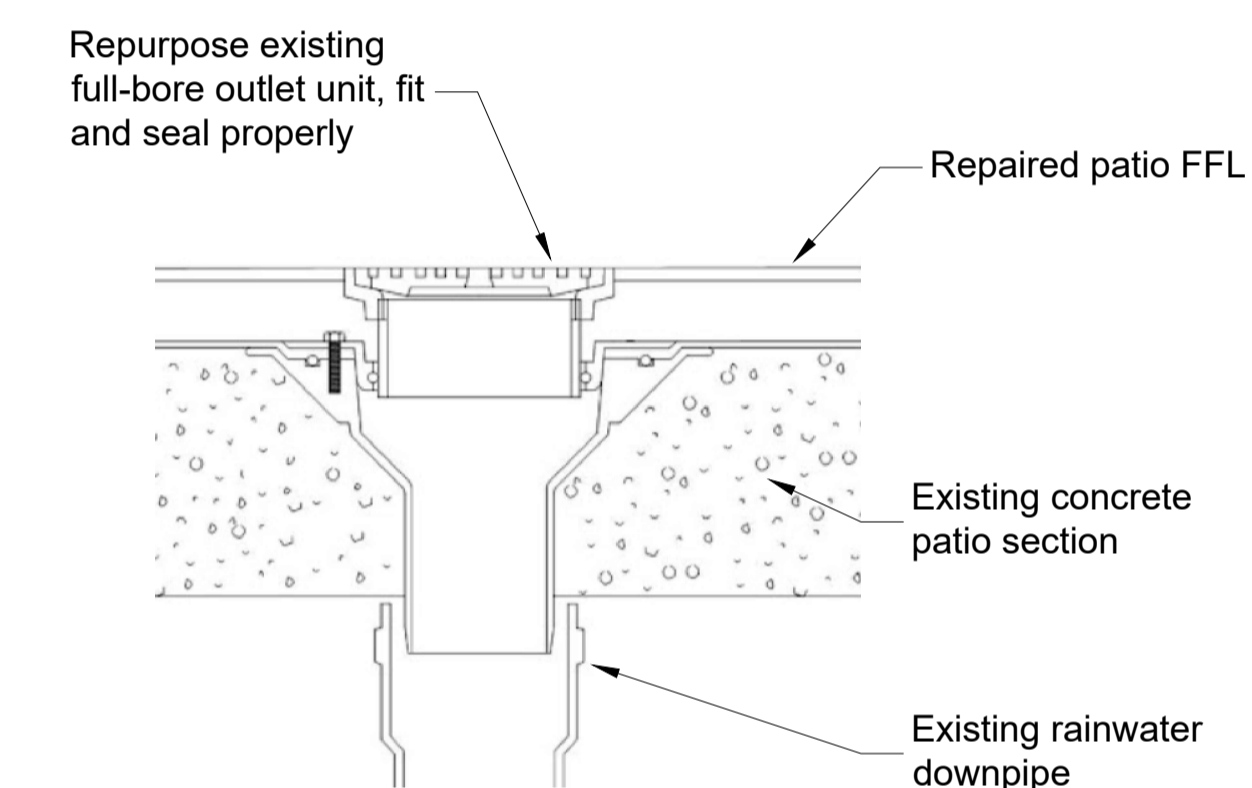


DETAIL No. 1  
Repairs to Patio walkway



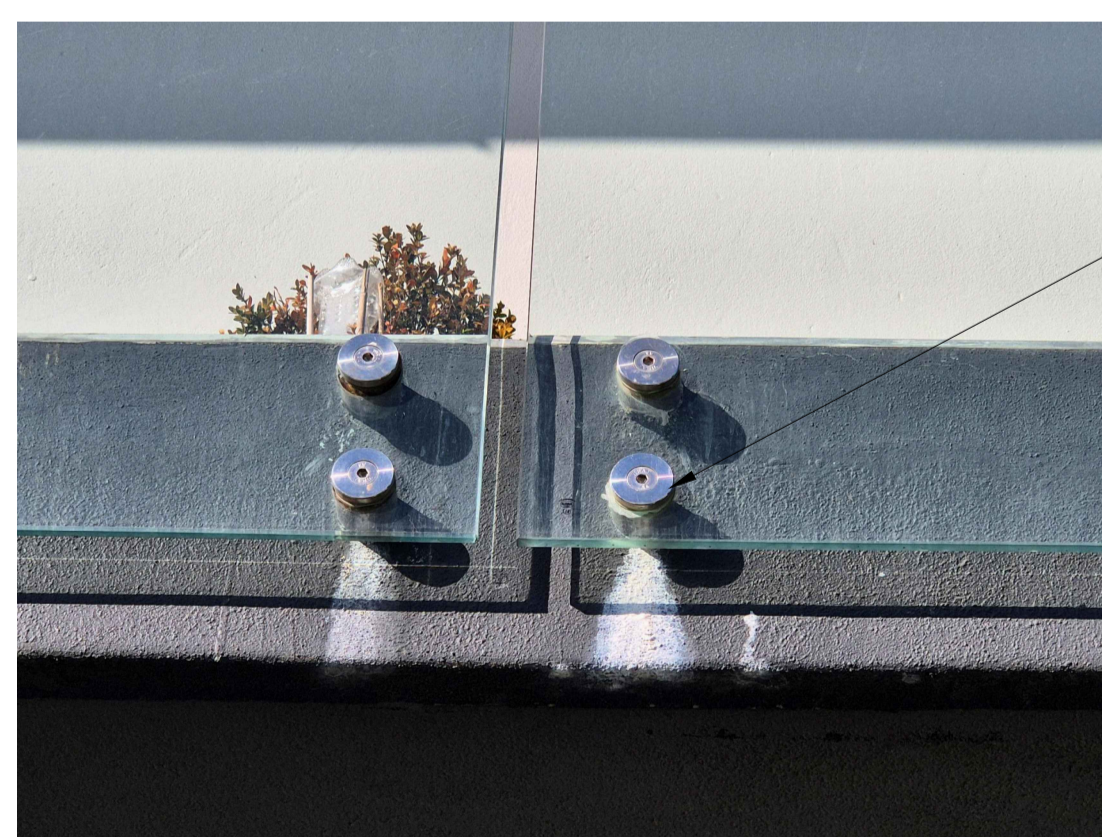
REPAIR No. 1  
Reinstate patio level and tiles

- Existing glass balustrades
- 1. Existing patio tiles to be removed down to proposed FFL of Patio
- 2. Full-bore to be reinstated as per typical detail
- Remove existing tiles and associated works up to this level



TYPICAL DETAIL  
Patio Full-bore outlet

**REMEDIAL C: REFIT GLASS BALUSTRADES**

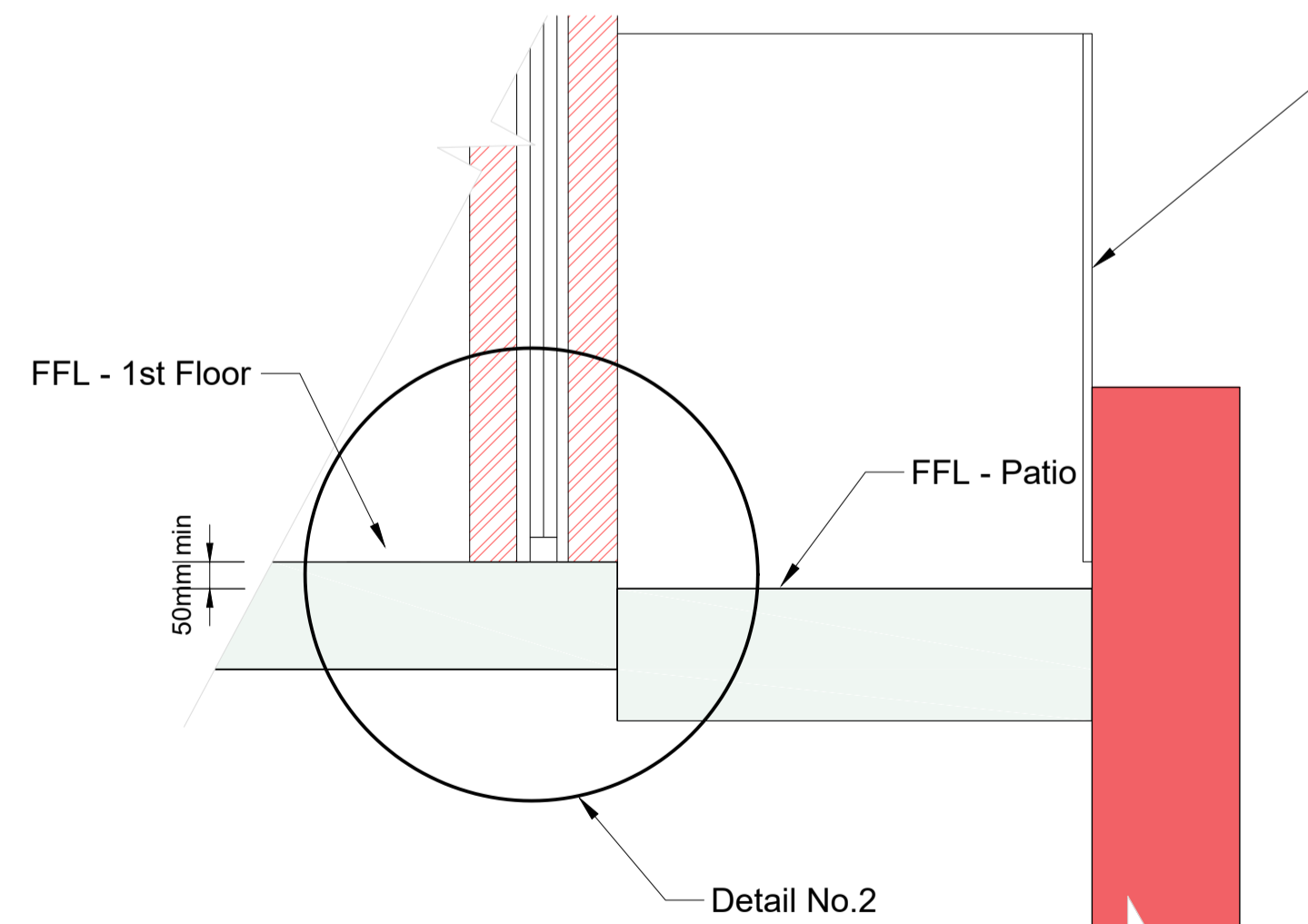


DETAIL No. 3  
"Cement rust" on balustrade fixing anchors

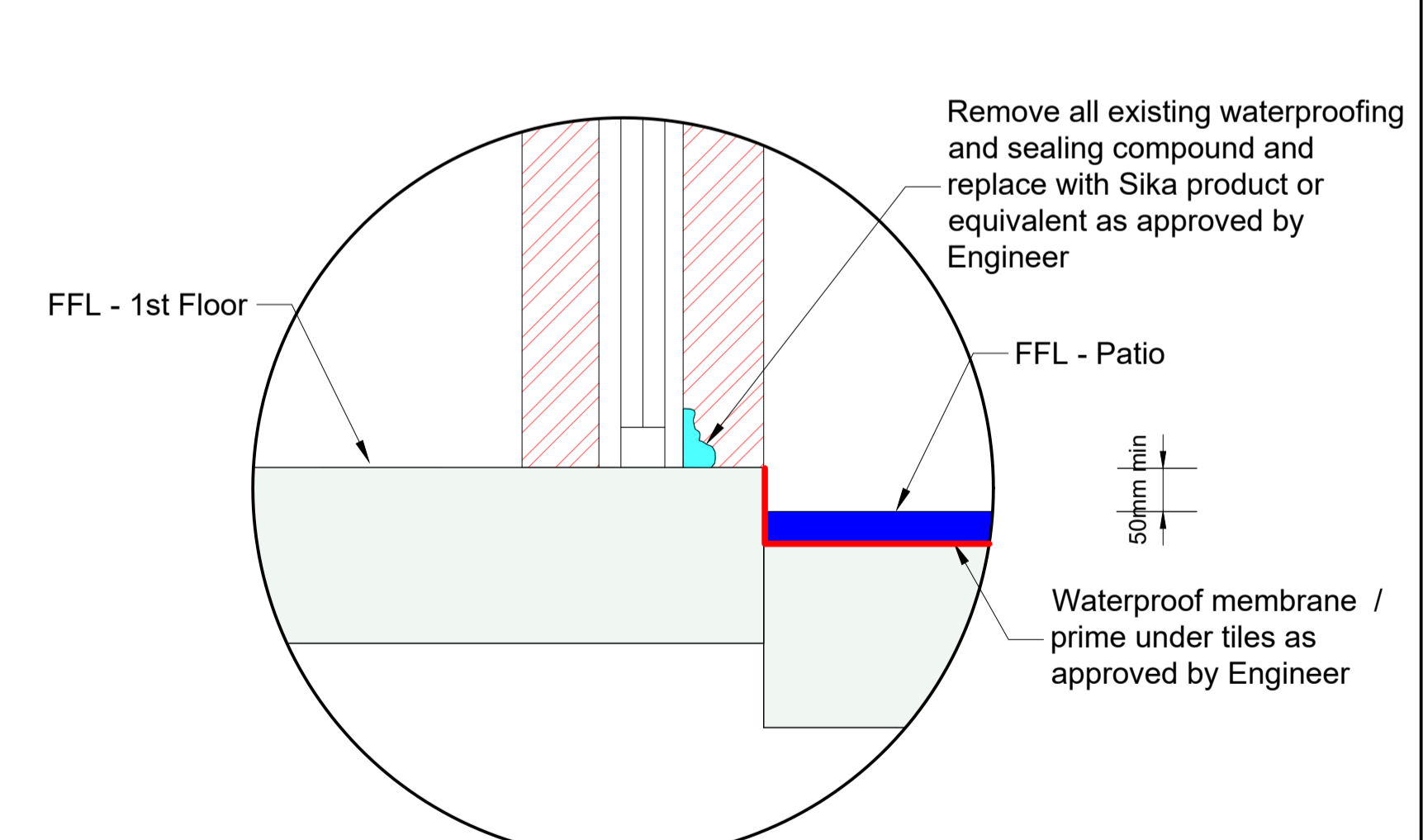
Remove all glass balustrades, anchors and existing epoxy sealant, clean out and seal holes, then refit glass balustrades to supplier's specifications, after patio tiling and waterproofing has been redone

**NOTE:**  
It is highly recommended that new holes be prepared for fixing the glass balustrades to the patio soffit after all remedial works have been done to prevent worn-out holes to be re-used as fixing positions

**REMEDIAL B: WATERPROOFING TO EXTERNAL SLIDING DOOR RAILINGS**



REPAIR No. 2  
Waterproofing to sliding door rails and wall connections



DETAIL No. 2  
Waterproofing to sliding door rails and wall connections

**NOTES:**  
No dimensions are to be scaled of any drawings. All dimensions are ratified on site with the Engineer prior to any construction.

**ISSUED FOR:**  
- INFORMATION

| No. | Date | Revision Detail |
|-----|------|-----------------|
|     |      |                 |
|     |      |                 |
|     |      |                 |



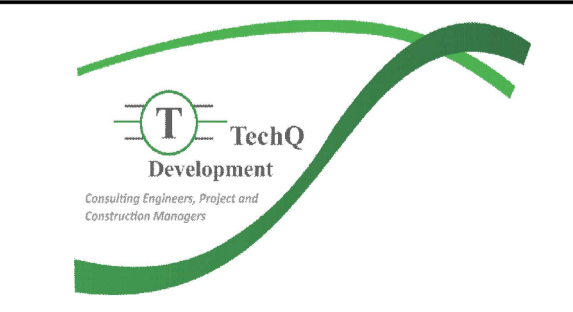
**Project Description:**  
Structural Engineering services for  
**ERF 397 - Durbanville: House Leo**  
Clara Anna Fountain Estates

**Drawing Description:** Remedial options to water ingress in garage and living areas at windows and sliding doors

| DESIGN | MJB           | DRAWN | MJB | CHECKED | MJB | SCALE         | As shown |
|--------|---------------|-------|-----|---------|-----|---------------|----------|
| DATE   | 26 April 2024 |       |     |         |     | Drawing Size: | A3       |

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DRAWING NO: HL - Struct - 01  
Rev: 00



CONSTRUCTION is hereby granted in terms of Section 13 (1) (b) of the Municipal Systems Act, 1995 for minor building work shown on this drawing. It is the responsibility of the contractor to ensure that the work is done in strict accordance with the specifications and standards of the architect / designer prior to commencement of works.

Application No.: 000070445855.

Major Contractors to ensure that all work is done in strict accordance with the specifications and standards of the architect / designer prior to commencement of works.

Regulations including:  
 a) National Building Regulations (NBR) b) South African National Standards (SANS) c) Local Municipal Authority (By-laws) d) CSIR - "Technical Guide to Good House Construction" e) National House Building Registration Council (NHBRCC) f) Estate Architectural Guidelines & Regulations (housing only) g) All other relevant Authorities GENERAL

**DRAWING STATUS**  
 The Contractor to ensure that the latest drawings are used on site prior to the commencement of work. Only the latest construction drawings issued by the Architect / Designer as "construction drawings" with a date may be used for construction of the works. All superseded drawings must be removed from the site. One set of the Local Authority Approved Plan / Drawings to be kept on site at all times. One set of the latest construction drawings to be kept on site at all times, and available for the Architect / Designer / Consultants and other Authorities.

**GENERAL**  
 Quality of materials and workmanship to comply with the latest relevant Codes & Specifications of SABS and the minimum standards of Standard Preliminaries (JBCC) and the Model Prelimaries for Trades (ASAGS 2008) and where applicable Project Specifications and/or Bill of Quantities. This drawing to be read in conjunction with other Project Drawings, Construction Documents and building contract / agreement documents. Contractors must view the site and works to allow for everything necessary to complete the works.

Contractor(s) to check the details on this drawing for compliance with standards of good building practice with particular reference to per Clause "Authorities" and report any discrepancies in writing to the Architect / Designer.

No setting out is to commence before the site boundary pegs position are verified and pointed out by the Land Surveyor. The Contractor to ensure that the correct setting out, including that which is from the boundary and building lines is done prior to commencement of ANY work. The contractor to verify all local council utility service providers and existing work(s) which is the responsibility of the contractor. The contractor to verify all levels, heights and dimensions on site and check the same against drawings before any work commences.

Any errors, discrepancies or omissions as well as queries are to be immediately reported to the Architect / Designer for clarification before any work is taken in hand.

**BRICK TIES & REINFORCEMENT**  
 Approved SABS butterfly tie wires to be used in cavity wall. Where the cavity is greater than 50mm, but less than 100mm, or the height of the wall is greater than 3m, approved SABS galvanized slip wall tie, to minimum specifications, to be used. Brickforce on parapets and gables and / or balustrade walls to be used at least every third brick course.

**DRAINAGE**  
 Closed system to conform to national building regulations. first inspection eye (I.e) to be min. 450mm below ground level with a min. fall of all 110mm diameter pipes 1:60 and a min. fall of 1:40. (SANS 10400P). Rooding eyes (r.e) to join drain in direction of flow at maximum angle 45 degrees and to be continued up to ground level & adequately, marked & protected.

**ELECTRICITY**  
 All electrical cables and wires in walls, floors, concrete soffits and ceilings shall run in SABS approved conduits and / or trunking and / or cable trays.

**ENERGY EFFICIENCY**  
 All work to comply with SANS 10400 Part XA & SANS204. If underfloor heating is installed, the floor slab must be insulated with insulation material with a minimum r-value of 1.00. Hot water supply requirements: Geysers are to be wrapped in insulation blanket with an r-value to satisfy part XA of SANS 10400. A minimum of 50 of the annual average heating requirement for hot water must be provided by means other than electric resistive heating or fossil fuels. Check with manufacturer & subject to: SANS 1307, SANS 10106, SANS 6211-1, SANS 6211-2, SANS 10254, SANS 10252-1. Where applicable, solar & heat pump installations are to be by specialists. All exposed hot water pipes <80mm in diameter must be insulated with a material that has a minimum r-value of 1.00. No doors & windows specs can be altered in any way without a recalculation. All insulation to roof, pipework etc. to be strictly adhered to.

**ENGINEERING & STRUCTURAL**  
 All structural works to be designed by a structural engineer, appointed by the Client. The engineer to specify all foundations, footings, retaining walls, masonry walls, columns, piers, concrete slabs, beams, and structural steel work. All foundations specified on drawings to be verified by engineer. Provision to be made for reinforcement where the soil conditions require stability. All structural items to be inspected by, and have passed inspection by, the engineer, prior to closing up of the work.

**FILLING MATERIAL**  
 Filling material(s) under floor slabs to consist of suitable material and to be compacted in 150mm layers, to a density of at least 90% Mod AASHTO (SANS 10400 :2010 4.4.5-7)

**FOUNDATIONS**  
 Foundations to be in accordance with appointed Engineer's details & specifications. Where Engineer is not appointed: Continuous strip foundation to be minimum 250mm thick, unless laid on solid rock, and minimum 750mm wide to load bearing or free standing walls and 400mm wide for non-load bearing masonry walls (SANS 10400 H). Foundations to boundary walls not to exceed property / erf boundary.

**GEYSER / WATER HEATING**  
 As per drawing / XA Specification. Geysers to be wrapped in 80mm thick suitable insulation blanket. All specifications to be in accordance with SANS 10252-1 & SANS 10106.

**GEYSER DRIP TRAY**  
 Drip tray to comply with SANS 11848 drip tray specification. Drip trays to be supplied with adaptor for connecting the waste pipe to the tray.

**GLAZING**  
 All glazing to comply to SANS 10400-N. Glass panels lower than 500 mm from the FFL or greater than 1m<sup>2</sup> to be minimum 6.38mm thick safety glass. All safety glazing materials (individual panels) shall be permanently marked. Such marking to be visible after installation and comply with SABS 1263. Thickness of glazing subject to wind load expectation - to be in accordance with SABS 0137. All glazed aluminium windows, residential sliding doors, shop fronts, entrances screens, window- and curtain walling, skylights and space enclosures should meet the minimum recommended performance requirements as set out by AAAMSA in their general specification for Architectural Aluminium and Glass Products. No glazed architectural aluminium products should be installed on site before relevant AAAMSA Performance test certificates for the product have been provided. Frosted / obscure glass to windows in bathrooms & toilets, or as per window schedule.

**HEALTH & SAFETY**  
 The Client is to ensure that the Contractor, in terms of the Occupational Health and Safety Act, Act 85 of 1993, with specific reference to the Construction Regulations, complies with the minimum requirements.

**HOT WATER DEMAND, STORAGE & HEATER POWER ACCORDING TO SANS 10252-1**  
 As per attached XA schedule

**LIGHTING**  
 Energy saving CFLs & LEDs to be used. Lighting to be max 5w per sqm per SANS 204. Refer to lighting schedule & XA report for detail.

**NATURAL VENTILATION & LIGHTING**  
 Provide minimum of 10% of floor area or 2m<sup>2</sup> area of opening for natural lighting to all habitable rooms inclusive of frames & glazing bars. Provide minimum of 5% of floor area or 2m<sup>2</sup> (whichever is greatest) to each habitable room (SANS 10400 G). Buildings with up to 15% fenestration area to net floor area, per storey, to comply with the minimum energy performance requirements. Buildings exceeding 15% per storey shall comply with requirements for fenestration as per SANS 204. Air leakage should comply with SANS 613.

**PLASTER**  
 Cement plaster, consisting of 5:1 sand & lime and 10% cement. Smooth steel trowelled finish internally. Smooth plastered finish externally where indicated. Stipple textured plaster to walls where applicable and indicated on elevations. Feature / Cladding walls as indicated.

**PRECAST LINTELS**  
 Lintels over all openings exceeding 1.5m with DPC (375 micron) stepped over. Openings exceeding 4.8m in width to engineer's design.

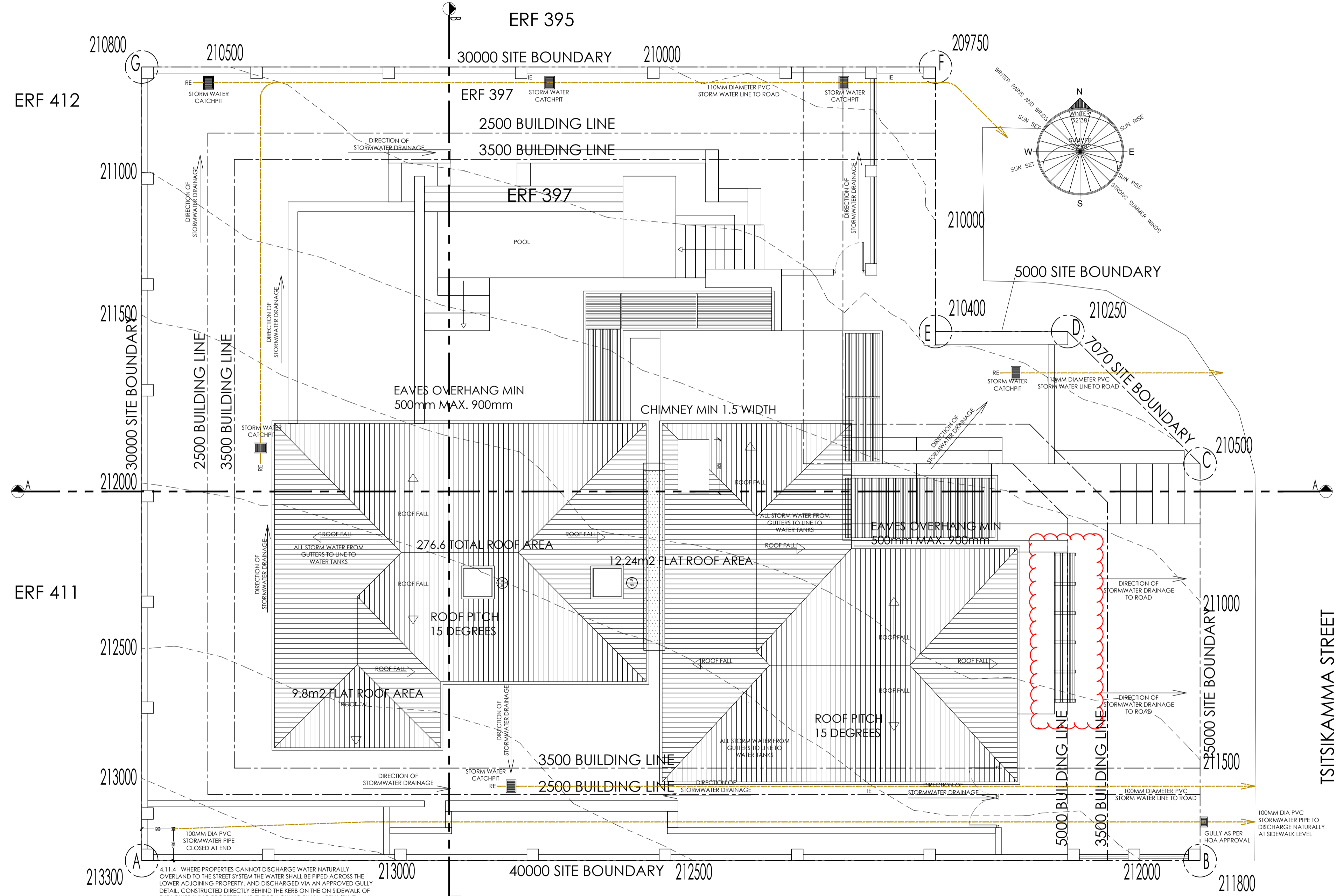
**RAINWATER GOODS**  
 250x12mm NUTEK fascias fixed with brass screws to rafter ends, or as per drawing. 100mm aluminium gutters to 75mm diameter downpipes to catchpits. 110mm diameter underground PVC piping according to stormwater layout.

**SURFACE BED**  
 Surface beds to be in accordance with appointed engineer's details & specifications. Where engineer is not appointed: selected floor finish material on 30mm cement; sand screed on 80mm thick concrete surface bed in accordance with SANS 50197-1:2002. Cement Part 1: composition, specification and conformity criteria for common cements, stone and sand to conform to SANS 1083:2006. Mesh ref no 193, to all surface beds where depth of fill exceeds 100mm. DPC 250µm (or equally approved) damp proof membrane under concrete surface beds conforming to SANS 952-1:2011, laid with minimum 250mm overlaps, to be turned up around perimeter of and, at least for full thickness of surface bed and sealed pressure sensitive tape or equally approved sealant. Clean compacted sand backfill - G7 quality 400mm minimum thick. Clean compacted sand backfill - G7 quality back to natural soil strata, 50 mm clean sand blinding layer. Trench to be cleaned and squared before casting of concrete. Blinding layer to be compacted with mechanical compactor. DPC 375µm (or equally approved) damp proof course in solid walls conforming to sabs 952-1:201, laid with minimum 250mm overlaps.

**WALLS**  
 All bricks to comply with SABS 227. All external walls to be 280mm cavity walls with clay bricks. All internal walls to be 90mm clay bricks. Walls to comply with SANS 10400 K. DPC 375µm (or equally approved) damp proof course below all sills and above all slabs, openings and other bridges to cavity walls and vertical DPC to sides of all openings. Weep holes @ 600mm intervals. DPC under cavity walls must be 150m above finished ground level and cavity beneath DPC must be filled with a mortar support fillet.

**WINDOWS & DOORS**  
 Refer to Window & Door Schedule. All windows specified on drawings to be verified by engineer. Provision to be made for reinforcement where the soil conditions require stability. All structural items to be inspected by, and have passed inspection by, the engineer, prior to closing up of the work.

SEE PREVIOUSLY APPROVED PLAN ONLY CHANGE: NEW PERGOLA



SITE, ROOF & STORMWATER PLAN  
 SCALE 1:100

| Area, Coverage & Bulk Calculations  |        |
|-------------------------------------|--------|
| Site area (m <sup>2</sup> )         | 1087.5 |
| Coverage                            | 30%    |
| Ground floor area (m <sup>2</sup> ) | 282.13 |
| First floor area (m <sup>2</sup> )  | 184.39 |
| Bulk                                | 0.43   |
| First to ground floor ratio         | 65%    |

**GENERAL NOTES:**  
 ALL DIMENSIONS AND LEVELS TO BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCING ANY WORKS  
 FIGURED DIMENSIONS ARE TO TAKE PREFERENCE TO SCALING. ALL DISCREPANCIES ON DRAWINGS OR INTENDED VARIATIONS FROM DRAWINGS ARE TO BE CLEARED WITH THE PROJECT MANAGER BEFORE COMMENCING  
 ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH REGULATIONS AS LAID DOWN IN THE NATIONAL BUILDING REGULATIONS.  
 ALL EXISTING MATERIAL REMAINS THE PROPERTY OF THE OWNER UNLESS OTHERWISE STATED.

**REVISION RECORD**

| REV NO. | DATE DRAWN | DESCRIPTION |
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**ENGINEER CERTIFICATION:**

*Boogertman Partners*  
 1st Floor Uitzicht, Tygerberg Office Park, 163 Jys Krige Dr, Plattekloof, 7500  
 T +27 21 930 9210  
 29 Oct 2019

REV 10 FOR APPROVAL



info@growarchitecture.com 2 Zelda Street  
 www.growarchitecture.com Hoheizen  
 082 681 4454 Bellville  
 072 141 7177 7530

**PROJECT:**  
 HOUSE LEO

**LOCATION:**  
 CLARA ANNA FONTEIN

**ERF:** 397  
**DRAWING:**  
 SITE & ROOF PLAN

|                                                 |                                                        |
|-------------------------------------------------|--------------------------------------------------------|
| <b>DATE:</b><br>20191028                        | <b>DRAWN:</b><br>NAB / LB                              |
| <b>SCALE:</b><br>1 : 100                        | <b>DWG. NO.</b><br>101                                 |
| <b>OWNER'S SIGNATURE:</b><br><i>[Signature]</i> | <b>ARCH. SIGNATURE:</b><br>NEIL BASSON<br>PAT 35241444 |

CONSTRUCTION is hereby granted in terms of Section 13 (1) (b) of the Municipal Systems Act 107 of 2001 for the minor building work shown on this drawing. The contractor is responsible for ensuring that the work is done in accordance with the specifications and standards set out in the drawing. All discrepancies to be listed on drawings, in writing, to the architect/designer prior to commencement of works.

Application No.: 000070445855.

Main Contractor and Sub Contractors to ensure that all work is done in strict accordance with the latest relevant Codes & Specifications of the relevant authorities including:

- a) National Building Regulations (NBR)
- b) South African National Standards (SANS)
- c) Local Municipal Authority (By-laws)
- d) CSIR - "Technical Guide to Good House Construction"
- e) National House Building Registration Council (NHBR)
- f) Estate Architectural Guidelines & Regulations (housing only)
- g) All other relevant Authorities GENERAL

**DRAWING STATUS**  
The Contractor to ensure that the latest drawings are used on site prior to the commencement of work. Only the latest construction drawings issued by the Architect / Designer as "construction drawings" with a date may be used for construction of the works. All superseded drawings must be removed from the site. One set of the Local Authority Approved Plan / Drawings to be kept on site at all times. One set of the latest construction drawings to be kept on site at all times, and available for the Architect / Designer / Consultants and other Authorities.

**GENERAL**  
Quality of materials and workmanship to comply with the latest relevant Codes & Specifications of SABS and the minimum standards of Standard Preliminaries (JBCC) and the Model Preliminary Trades (ASAGS 2008) and where applicable Project Specifications and/or Bill of Materials. This drawing to be read in conjunction with other Project Drawings, Construction Documents and building contract / agreement documents. Contractors must view the site and works to allow for everything necessary to complete the works.

Contractor(s) to check the details on this drawing for compliance with standards of good building practice with particular reference as per Clause "Authorities" and report any discrepancies in writing to the Architect / Designer.

No setting out is to commence before the site boundary pegs position are verified and pointed out by the Land Surveyor. The Contractor to ensure that the correct setting out, including that which is from the boundary and building lines is done prior to commencement of ANY work. The contractor to verify all local council utility service providers and existing work(s) which is the responsibility of the contractor. The contractor to verify all levels, heights and dimensions on site and check the same against drawings before any work commences.

Any errors, discrepancies or omissions as well as queries are to be immediately reported to the Architect / Designer for clarification before any work is taken in hand.

**BRICK TIES & REINFORCEMENT**  
Approved SABS butterfly tie wires to be used in cavity wall. Where the cavity is greater than 50mm, but less than 100mm, or the height of the wall is greater than 3m, approved SABS galvanized slip wall tie, to minimum specifications, to be used. Brickforce on parapets and gables and / or balustrade walls to be used at least every third brick course.

**DRAINAGE**  
Closed system to conform to national building regulations. first inspection eye (I.e) to be min. 450mm below ground level with a min. fall of all 110mm diameter pipes. 140 and a min. fall of 1:40. (SANS 10400P). Roding eyes (r.e) to join drain in direction of flow at maximum angle 45 degrees and to be continued up to ground level & adequately, marked & protected.

**ELECTRICITY**  
All electrical cables and wires in walls, floors, concrete soffits and ceilings shall run in SABS approved conduits and / or trunking and / or cable trays.

**ENERGY EFFICIENCY**  
All work to comply with SANS 10400 Part XA & SANS204. If underfloor heating is installed, the floor slab must be insulated with insulation material with a minimum r-value of 1.00. Hot water supply requirements: Cavity walls are to be wrapped in insulation blanket with an r-value to satisfy part XA of SANS 10400. A minimum of 50 of the annual average heating requirement for hot water must be provided by means other than electric resistive heating or fossil fuels. Check with manufacturer & subject to: SANS 1307, SANS 10106, SANS 6211-1, SANS 6211-2, SANS 10254, SANS 10252-1. Where applicable, solar & heat pump installations are to be by specialists. All exposed hot water pipes <80mm in diameter must be insulated with a material that has a minimum r-value of 1.00. No doors & windows specs can be altered in any way without a recalculation. All insulation to roof, pipework etc. to be strictly adhered to.

**ENGINEERING & STRUCTURAL**  
All structural works to be designed by a structural engineer, appointed by the Client. The engineer to specify all foundations, footings, retaining walls, masonry walls, columns, piers, concrete slabs, beams, and structural steel work. All foundations specified on drawings to be verified by engineer. Provision to be made for reinforcement where the soil conditions require stability. All structural items to be inspected by, and have passed inspection by, the engineer, prior to closing up of the work.

**FILLING MATERIAL**  
Filling material(s) under floor slabs to consist of suitable material and to be compacted in 150mm layers, to a density of at least 90% Mod AASHTO (SANS 10400 J:2010 4.4.5-7)

**FOUNDATIONS**  
Foundations to be in accordance with appointed Engineer's details & specifications. Where Engineer is not appointed: Continuous strip foundation to be minimum 250mm thick, unless laid on solid rock, and minimum 750mm wide to local bearing or free standing walls and 400mm wide for non-load bearing masonry walls (SANS 10400 H). Foundations to boundary walls not to exceed property / erf boundary.

**GEYSER / WATER HEATING**  
As per drawing / XA Specification. Geysers to be wrapped in 80mm thick suitable insulation blanket. All specifications to be in accordance with SANS 10252-1 & SANS 10106.

**GEYSER DRIP TRAY**  
Drip tray to comply with SANS 11848 drip tray specification. Drip trays to be supplied with adaptor for connecting the waste pipe to the tray.

**GLAZING**  
All glazing to comply to SANS 10400-N. Glass panels lower than 500 mm from the FFL or greater than 1m<sup>2</sup> to be minimum 6.38mm thick safety glass. All safety glazing materials (individual panels) shall be permanently marked. Such marking to be visible after installation and comply with SABS 1263. Thickness of glazing subject to wind load expectation - to be in accordance with SABS 0137. All glazed aluminium windows, residential sliding doors, shop fronts, entrances screens, window- and curtain walling, skylights and space enclosures should meet the minimum recommended performance requirements as set out by AAAMA in their general specification for Architectural Aluminium and Glass Products. No glazed architectural aluminium products should be installed on site before relevant AAAMA Performance test certificates for the product have been provided. Frosted / obscure glass to windows in bathrooms & toilets, or as per window schedule.

**HEALTH & SAFETY**  
The Client is to ensure that the Contractor, in terms of the Occupational Health and Safety Act, Act 85 of 1993, with specific reference to the Construction Regulations, complies with the minimum requirements.

**HOT WATER DEMAND, STORAGE & HEATER POWER**  
ACCORDING TO SANS 10252-1  
As per attached XA schedule

**LIGHTING**  
Energy saving CFLs & LEDs to be used. Lighting to be max 5w per sqm per SANS 204. Refer to lighting schedule & XA report for detail.

**NATURAL VENTILATION & LIGHTING**  
Provide minimum of 10% of floor area or 2m<sup>2</sup> area of opening for natural lighting to all habitable rooms inclusive of frames & glazing bars. Provide minimum of 5% of floor area or 2m<sup>2</sup> (whichever is greatest!) to each habitable room (SANS 10400 G). Buildings with up to 15% fenestration area to net floor area, per storey, to comply with the minimum energy performance requirements. Buildings exceeding 15% per storey shall comply with requirements for fenestration as per SANS 204. Air leakage should comply with SANS 613.

**PLASTER**  
Cement plaster, consisting of 5:1 sand & lime and 10% cement. Smooth steel trowelled finish internally. Smooth plastered finish externally where indicated. Slipple textured plaster to walls where applicable and indicated on elevations. Feature / Cladding walls as indicated.

**PRECAST LINTELS**  
Lintels over all openings exceeding 1.5m with DPC (375 micron) stepped over. Openings exceeding 4.8m in width to engineer's design.

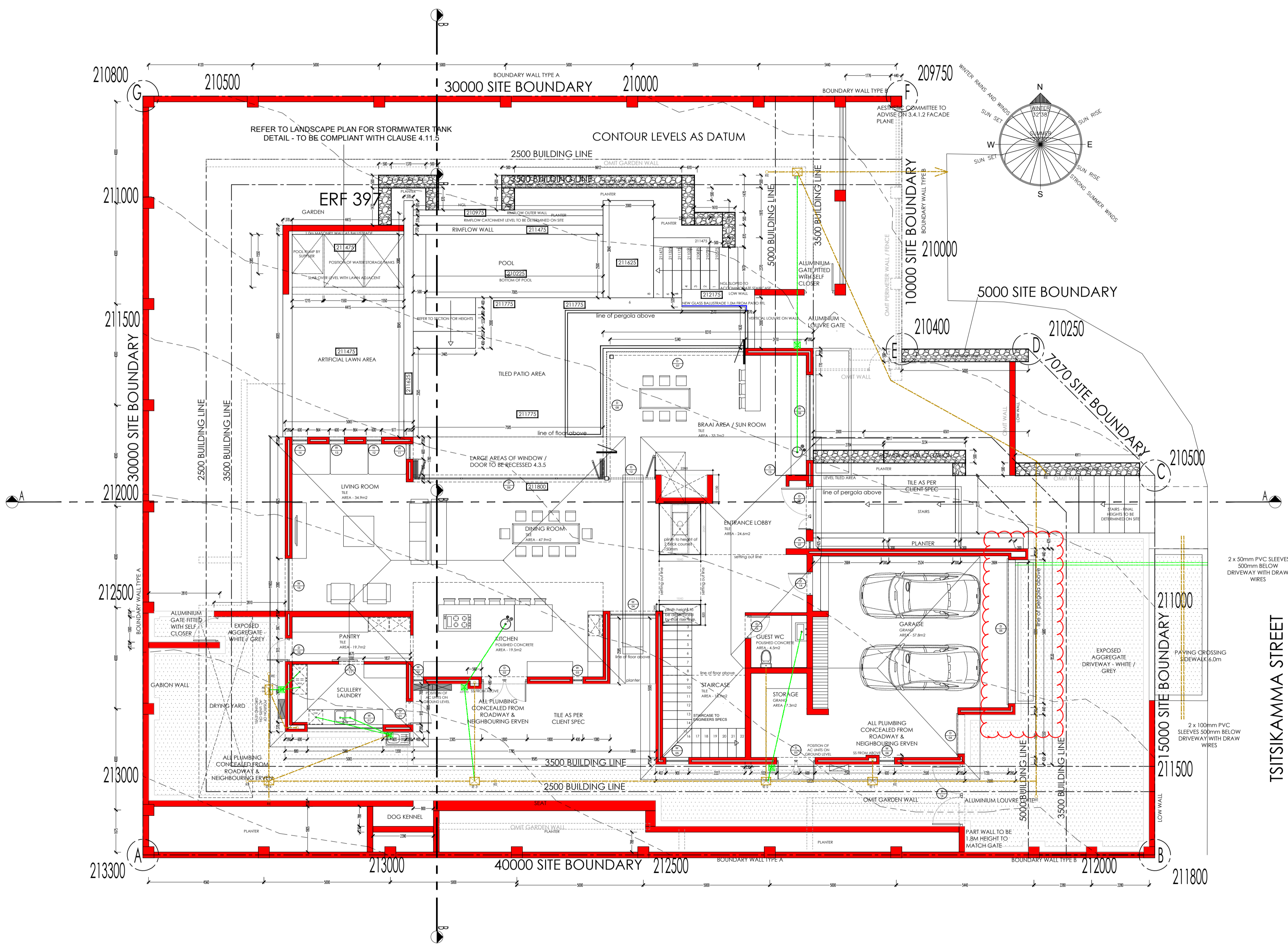
**RAINWATER GOODS**  
250x12mm NUTEK fascias fixed with brass screws to rafter ends, or as per drawing. 100mm aluminium gutters to 75mm diameter downpipes to catchpits. 110mm diameter underground PVC piping according to stormwater layout.

**SURFACE BED**  
Surface beds to be in accordance with appointed engineer's details & specifications. Where engineer is not appointed: selected floor finish material on 30mm cement; sand screed on 80mm thick concrete surface bed in accordance with SANS 50197-1:2002. Cement / Part 1: composition, specification and conformity criteria for common cements, stone and sand to conform to SANS 1083:2006. Mesh ref no 193, to oil surface beds where depth of fill exceeds 100mm. DPC 250µm (or equally approved) damp proof membrane under concrete surface beds conforming to SANS 952-1:2011, laid with minimum 250mm overlaps, to be turned up around perimeter of and, at least for full thickness of surface bed and sealed pressure sensitive tape or equally approved sealant. Clean compacted sand backfill - G7 quality 400mm minimum thick. Clean compacted sand backfill - G7 quality back to natural soil strata, 50 mm clean sand blinding layer. Trench to be cleaned and squared before casting of concrete. Blinding layer to be compacted with mechanical compactor. DPC 375µm (or equally approved) damp proof course in solid walls conforming to SANS 952-1:2011, laid with minimum 250mm overlaps.

**WALLS**  
All bricks to comply with SABS 227. All external walls to be 280mm cavity walls with clay bricks. All internal walls to be 90mm clay bricks. Walls to comply with SANS 10400 K. DPC 375µm (or equally approved) damp proof course below all sills and above all slots, openings and other bridges to cavity walls and vertical DPC to sides of all openings. Weep holes @ 600mm intervals. DPC under cavity walls must be 150m above finished ground level and cavity beneath DPC must be filled with a mortar support fillet.

**WINDOWS & DOORS**  
Refer to Window & Door Schedule. All windows and sliding faced-p-side doors to be aluminium framed. All frames to be fixed to walls with galvanized hoop iron built into wall at 600mm c/c in 3:1 cement mix.

SEE PREVIOUSLY  
APPROVED PLAN  
ONLY CHANGE: NEW  
PERGOLA



**GROUND STOREY PLAN**  
SCALE 1:100

**GENERAL NOTES:**  
ALL DIMENSIONS AND LEVELS TO BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCING ANY WORKS

FIGURED DIMENSIONS ARE TO TAKE PREFERENCE TO SCALING. ALL DISCREPANCIES ON DRAWINGS OR INTENDED VARIATIONS FROM DRAWINGS ARE TO BE CLEARED WITH THE PROJECT MANAGER BEFORE COMMENCING

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH REGULATIONS AS LAID DOWN IN THE NATIONAL BUILDING REGULATIONS.

ALL EXISTING MATERIAL REMAINS THE PROPERTY OF THE OWNER UNLESS OTHERWISE STATED.

**REVISION RECORD**

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**ENGINEER CERTIFICATION:**

Boogertman  
**Partners**  
1st Flr Uitzicht, Tygerberg Office Park,  
153 Uys Wige Dr, Plattekloof, 7500  
T +27 21 930 9210  
27. 01. 2019

REV 10  
FOR APPROVAL

**grow**  
architecture

info@growarchitecture.com      2 Zeldo Street  
www.growarchitecture.com      Hoheizen  
082 681 4454      Bellville  
072 141 7177      7530

**PROJECT:**  
HOUSE LEO

**LOCATION:**  
CLARA ANNA FONTEIN

**ERF:** 397  
**DRAWING:**  
GROUND STOREY PLAN

|                               |                                                            |
|-------------------------------|------------------------------------------------------------|
| <b>DATE:</b><br>20190128      | <b>DRAWN:</b><br>NAB / LB                                  |
| <b>SCALE:</b><br>1:100        | <b>DWG. NO.:</b><br>102                                    |
| <b>OWNER'S SIGNATURE:</b><br> | <b>ARCH. SIGNATURE:</b><br><br>NEIL BASSON<br>PAT 35241444 |

**CITY OF CAPE TOWN  
DEVELOPMENT MANAGEMENT**

**Minor Works Permit**

**SEE PREVIOUSLY  
APPROVED PLAN  
ONLY CHANGE: NEW  
PERGOLA**

**CONTRACTOR:** Only apply where deemed necessary to the material of construction detail. All discrepancies to be indicated in writing to the architect prior to commencement of work.

**AUTHORITY:** Minor Works Permit is hereby granted in terms of Section 13 (1) (b) of Act 103 of 1977, for the minor building work shown on this plan, subject to the conditions of the attached letter of authorisation.

**CONTRACTOR'S OBLIGATIONS:** The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities. The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities.

**GENERAL NOTES:** All work to be done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities. The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities.

**REVISION RECORD:**

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**ENGINEER CERTIFICATION:**

**Boogertrian Partners**  
1st Floor Uitzicht, Tygerberg Office Park,  
168 Uys Highe Dr, Playterburg, 7504  
T +27 21 938 9211  
29.01.2019

**REV 10 FOR APPROVAL**

**grow architecture**  
info@growarchitecture.com 2 6680 3969  
www.growarchitecture.com 1666666  
021 581 4454 646-646  
021 141 7177 2330

**PROJECT: HOUSE LEO**

**LOCATION: CLARA ANNA FONTEIN**

**ERF: 397**

**DRAWING: FIRST STOREY PLAN**

**DATE: 20190128** **DRAWN: NAB / LB**

**SCALE: 1 : 50** **DWG. No. 103**

**OWNER'S SIGNATURE:** **ARCH. SIGNATURE: NEIL BASSON PAT 35241444**

Authorisation is hereby granted in terms of Section 13 (1) (b) of Act 103 of 1977, for the minor building work shown on this plan, subject to the conditions of the attached letter of authorisation.

Application No: 000070445855

Approval No: 97562085

Permit No: BP/000070445855 Date: 26 Mar 2019

**CONTRACTOR'S OBLIGATIONS:** The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities. The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities.

**GENERAL NOTES:** All work to be done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities. The Contractor shall ensure that all work is done in accordance with the approved drawings and specifications. The Contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities.

**REVISION RECORD:**

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**ENGINEER CERTIFICATION:**

**Boogertrian Partners**  
1st Floor Uitzicht, Tygerberg Office Park,  
168 Uys Highe Dr, Playterburg, 7504  
T +27 21 938 9211  
29.01.2019

**REV 10 FOR APPROVAL**

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www.growarchitecture.com 1666666  
021 581 4454 646-646  
021 141 7177 2330

**PROJECT: HOUSE LEO**

**LOCATION: CLARA ANNA FONTEIN**

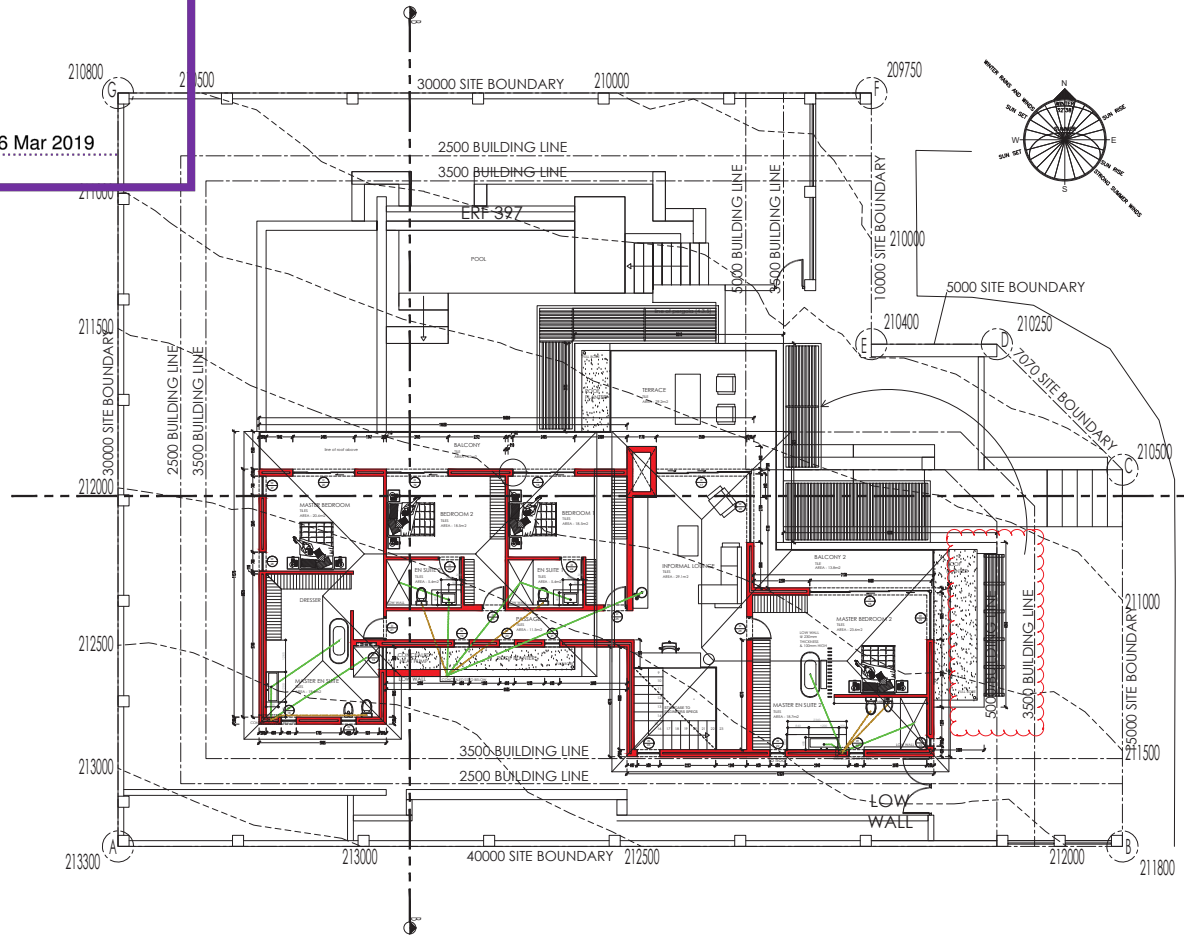
**ERF: 397**

**DRAWING: FIRST STOREY PLAN**

**DATE: 20190128** **DRAWN: NAB / LB**

**SCALE: 1 : 50** **DWG. No. 103**

**OWNER'S SIGNATURE:** **ARCH. SIGNATURE: NEIL BASSON PAT 35241444**



**FIRST STOREY PLAN**  
SCALE 1 : 100

Minor Works Permit

CONSTRUCTION SHALL BE GRANTED IN TERMS OF SECTION 13 (1) (b) OF THE NATIONAL BUILDING REGULATIONS (NBR) AND THE NATIONAL HOUSE BUILDING REGULATIONS (NHBR) AND THE NATIONAL ARCHITECTURAL GUIDELINES & REGULATIONS (NAGR) AND THE NATIONAL HOUSING REGULATIONS (NHR). THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES PRIOR TO COMMENCING WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES PRIOR TO COMMENCING WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES PRIOR TO COMMENCING WORKS.

**GENERAL**  
Quality of materials and workmanship to comply with the latest relevant Codes & Specifications of SABS and the minimum standards of Standard Preliminaries (JBCC) and the Model Preambles for Trades (ASAGS 2008) and where applicable Project Specifications and/or Bill of Quantities. This drawing to be read in conjunction with other Project Drawings, Construction Documents and building contract / agreement documents. Contractors must view the site and works to allow for everything necessary to complete the works.

**CONTRACTOR'S OBLIGATIONS**  
The Contractor to ensure that the latest drawings are used on site prior to the commencement of work. Only the latest construction drawings issued by the Architect / Designer as "construction drawings" with a date may be used for construction of the works. All superseded drawings shall be removed from the site. One set of the Local Authority Approved Plan / Drawings to be kept on site at all times. One set of the latest construction drawings to be kept on site at all times, and available for the Architect / Designer / Consultants and other Authorities.

**HEALTH & SAFETY**  
The Client is to ensure that the Contractor, in terms of the Occupational Health and Safety Act, Act 85 of 1993, with specific reference to the Construction Regulations, complies with the minimum requirements.

**NATURAL VENTILATION & LIGHTING**  
Provide minimum of 10% of floor area or 2m<sup>2</sup> area of opening for natural lighting to all habitable rooms inclusive of frames & glazing bars. Provide minimum of 5% of floor area or 2m<sup>2</sup> (whichever is greatest) to each habitable room (SANS 10400 9). Buildings with up to 15% fenestration area to net floor area, per storey, to comply with the minimum energy performance requirements. Buildings exceeding 15% per storey shall comply with requirements for fenestration as per SANS 204. Air leakage should comply with SANS 613.

**PLASTER**  
Cement plaster, consisting of 5:1 sand & lime and 10% cement. Smooth steel trowelled finish internally. Smooth plastered finish externally where indicated. Slipple textured plaster to walls where applicable and indicated on elevations. Feature / Cladding walls as indicated.

**BRICK TIES & REINFORCEMENT**  
Approved SABS butterfly tie wires to be used in cavity wall. Where the cavity is greater than 50mm, but less than 100mm, or the height of the wall is greater than 3m, approved SABS galvanized tie wall tie, to minimum specifications, to be used. Brickforce parapets and gables and / or balustrade walls to be used at least every third brick course.

**DRAINAGE**  
Closed system to conform to national building regulations. first inspection eye (I.e) to be min. 450mm below ground level with a min. fall of all 110mm diameter pipes 1:60 and a min. fall of 1:40 (SANS 10400P). Rodding eyes (r.e) to join drain in direction of flow at maximum angle 45 degrees and to be continued up to ground level & adequately marked & protected.

**ELECTRICITY**  
All electrical cables and wires in walls, floors, concrete soffits and ceilings shall run in SABS approved conduits and / or trunking and / or cable trays.

**ENERGY EFFICIENCY**  
All work to comply with SANS 10400 Part XA & SANS204. If underfloor heating is installed, the floor slab must be insulated with insulation material with a minimum r-value of 1.00. Hot water supply requirements: Geysers are to be wrapped in insulation blanket with an r-value to satisfy part XA of SANS 10400. A minimum of 50 of the annual average heating requirement for hot water must be provided by means other than electric resistive heating or fossil fuels. Check with manufacturer & subject to: SANS 1307, SANS 10106, SANS 6211-1, SANS 6211-2, SANS 10254, SANS 10252-1. Where applicable, solar & heat dump installations are to be by specialists. All exposed hot water pipes <80mm in diameter must be insulated with a material that has a minimum r-value of 1.00. No doors & windows specs can be altered in any way without a recalculation. All insulation to roof, pipework etc. to be strictly adhered to.

**ENGINEERING & STRUCTURAL**  
All structural works to be designed by a structural engineer, appointed by the Client. The engineer to specify all foundations, footings, retaining walls, masonry walls, columns, piers, concrete slabs, beams, and structural steel work. All foundations specified on drawings to be verified by engineer. Provision to be made for reinforcement where the soil conditions require stability. All structural items to be inspected by, and have passed inspection by, the engineer, prior to closing up of the work.

**FILLING MATERIAL**  
Filling material(s) under floor slabs to consist of suitable material and to be compacted in 150mm layers, to a density of at least 90% Mod AASHTO (SANS 10400 J:2010 4.4.5-7)

**FOUNDATIONS**  
Foundations to be in accordance with appointed Engineer's details & specifications. Where Engineer is not appointed: Continuous strip foundation to be minimum 250mm thick, unless laid on solid rock, and minimum 750mm wide to load bearing or free standing walls and 400mm wide for non-load bearing masonry walls (SANS 10400 H). Foundations to boundary walls not to exceed property / erf boundary.

**GEYSER / WATER HEATING**  
As per drawing / XA Specification. Geysers to be wrapped in 80mm thick suitable insulation blanket. All specifications to be in accordance with SANS 10252-1 & SANS 10106.

**GEYSER DRIP TRAY**  
Drip tray to comply with SANS 11848 drip tray specification. Drip tray(s) to be supplied with adaptor for connecting the waste pipe to the tray.

**GLAZING**  
All glazing to comply to SANS 10400-N. Glass panels lower than 500 mm from the FFL or greater than 1m<sup>2</sup> to be minimum 6.38mm thick safety glass. All safety glazing materials (individual panes) shall be permanently marked. Such marking to be visible after installation and comply with SABS 1263. Thickness of glazing subject to wind load expectation - to be in accordance with SANS 0137. All glazed aluminium windows, residential sliding doors, shop fronts, entrances screens, window- and curtain walling, skylights and space enclosures should meet the minimum recommended performance requirements as set out by AAAMSA in their general specification for Architectural Aluminium and Glass Products. No glazed architectural aluminium products should be installed on site before relevant AAAMSA Performance test certificate for the product have been provided. Frosted / obscure glass to windows in bathrooms & toilets, or as per window schedule.

**HOT WATER DEMAND, STORAGE & HEATER POWER ACCORDING TO SANS 10252-1**  
As per attached XA schedule

**LIGHTING**  
Energy saving CFLs & LEDs to be used. Lighting to be max 5w per sqm per SANS 204. Refer to lighting schedule & XA report for detail.

**PERIMETER / RETENTION WALLS**  
GENERAL NOTE: MAX 300MM SOIL RETENTION ABOVE NGL ON ALL BOUNDARY WALLS

**PRECAST LINTELS**  
Lintels over all openings exceeding 1.5m with DPC (375 micron) stepped over. Openings exceeding 4.8m in width to engineer's design.

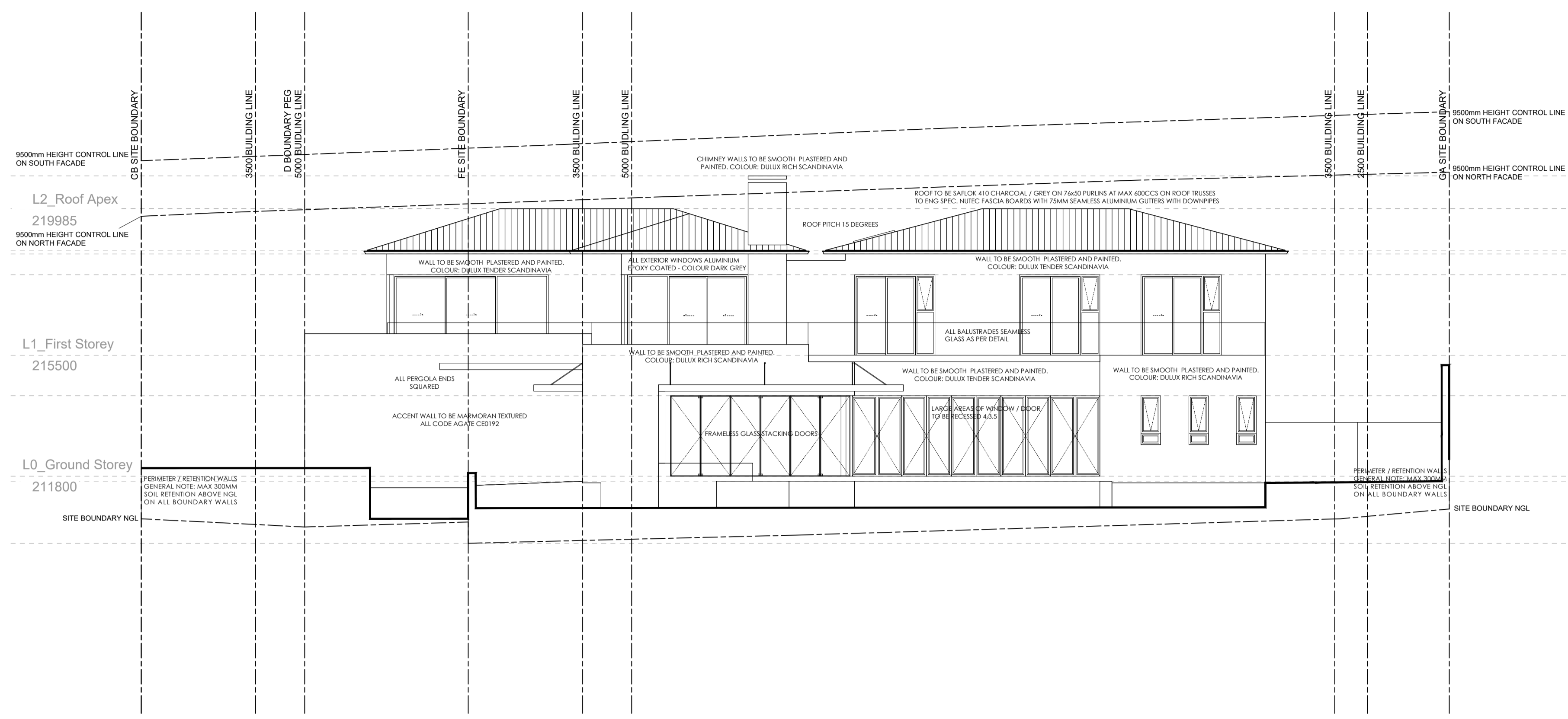
**RAINFATHER GOODS**  
250x12mm NUTEK fascias fixed with brass screws to rafter ends, or as per drawing. 100mm aluminium gutters to 75mm diameter downpipes to catchpits. 110mm diameter underground PVC piping according to stormwater layout.

**SURFACE BEDS**  
Surface beds to be in accordance with appointed engineer's details & specifications. Where engineer is not appointed: selected floor finish material on 30mm cement; sand screed on 80mm thick concrete surface bed in accordance with SANS 50197-1:2002 cement Part 1; composition, specification and conformity criteria for common cements, stone and sand to conform to SANS 1083:2006. Mesh ref no 193, to all surface beds where depth of fill exceeds 100mm. DPC 250µm (or equally approved) damp proof membrane under concrete surface beds conforming to SANS 952-1:2011, laid with minimum 250mm overlaps, to be turned up around perimeter of and, at least, for full thickness of surface bed and sealed pressure sensitive tape or equally approved sealant. Clean compacted sand backfill - G7 quality 400mm minimum thick. Clean compacted sand backfill - G7 quality back to natural soil strata. 50 mm clean sand blinding layer. Trench to be cleaned and squared before casting of concrete. Blinding layer to be compacted with mechanical compactor. DPC 375µm (or equally approved) damp proof course in solid walls conforming to SANS 952-1:2011, laid with minimum 250mm overlaps.

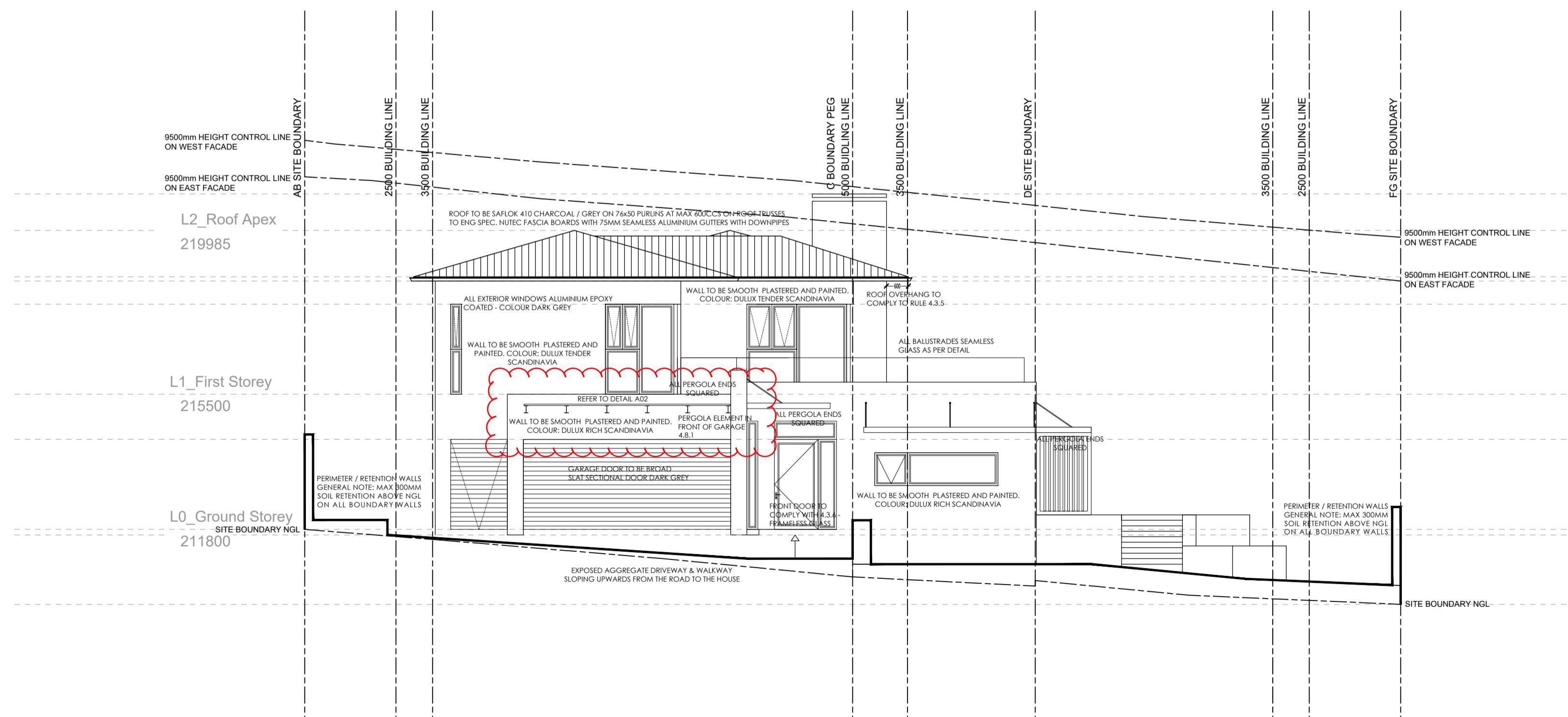
**WALLS**  
All bricks to comply with SABS 227. All external walls to be 280mm cavity walls with clay bricks. All internal walls to be 90mm clay bricks. Walls to comply with SANS 10400 K. DPC 375µm (or equally approved) damp proof course below all sills and above all slabs, openings and other bridges to cavity walls and vertical DPC to sides of all openings. Weep holes @ 600mm intervals. DPC under cavity walls must be 150mm above finished ground level and cavity beneath DPC must be filled with a mortar support fillet.

**WINDOWS & DOORS**  
Refer to Window & Door Schedule. All windows and sliding face-side doors to be aluminium framed. All frames to be fixed to walls with galvanized hoop iron built into wall at 600mm c/c in 3:1 cement mix.

SEE PREVIOUSLY APPROVED PLAN ONLY CHANGE: NEW PERGOLA



NORTH ELEVATION  
SCALE 1:100



EAST ELEVATION  
SCALE 1:100

**GENERAL NOTES:**  
ALL DIMENSIONS AND LEVELS TO BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCING ANY WORKS  
FIGURED DIMENSIONS ARE TO TAKE PREFERENCE TO SCALING. ALL DISCREPANCIES ON DRAWINGS OR INTENDED VARIATIONS FROM DRAWINGS ARE TO BE CLEARED WITH THE PROJECT MANAGER BEFORE COMMENCING  
ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH REGULATIONS AS LAID DOWN IN THE NATIONAL BUILDING REGULATIONS.  
ALL EXISTING MATERIAL REMAINS THE PROPERTY OF THE OWNER UNLESS OTHERWISE STATED.

**REVISION RECORD**

| REV NO. | DATE DRAWN | DESCRIPTION |
|---------|------------|-------------|
|         |            |             |
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**ENGINEER CERTIFICATION:**

**Boogertman Partners**  
1st Floor Jitziat, Tygerberg Office Park  
163 Lys Krige Dr, Playterhof, 7500  
T +27 21 930 9210  
29.01.2019

REV 10  
FOR APPROVAL

**grow architecture**

info@growarchitecture.com 2 Zeldo Street  
www.growarchitecture.com Hoheizen  
082 681 4454 Bellville  
072 141 7177 7530

**PROJECT:**  
HOUSE LEO

**LOCATION:**  
CLARA ANNA FONTEIN

**ERF:** 397

**DRAWING:**  
NORTH & EAST ELEVATION

|                    |                                                |
|--------------------|------------------------------------------------|
| DATE:<br>20190128  | DRAWN:<br>NAB / LB                             |
| SCALE:<br>1 : 100  | DWG. No.<br>104                                |
| OWNER'S SIGNATURE: | ARCH. SIGNATURE:<br>NEIL BASSON<br>PAT 3521444 |









# CAPE TOWN LEAK DETECTION

## & PLUMBING

☎ [021 207 3848 / 066 458 0379](tel:0212073848)

✍ [Reg No: 2020/224833/07](https://www.leakexpert.co.za)

📍 [5 Gamib Park, 41 Stella Rd, 7441](#)

✉ [info@leakdetectionandplumbing.co.za](mailto:info@leakdetectionandplumbing.co.za)

Visit our website for more: [www.leakexpert.co.za](http://www.leakexpert.co.za)

18 April 2024

TechQ Development (Pty) Ltd  
House Leo, Clara Anna Fontein  
ERF 397  
066 105 1226  
[meltbadenhorst@outlook.com](mailto:meltbadenhorst@outlook.com)

### LEAK DETECTION REPORT

Cape Town Leak Detection & Plumbing attended to the above-mentioned property on the 16<sup>th</sup> of April to conduct a leak detection test as per quote QU101818.

Upon testing, the technician located multiple waterproofing defects on the balcony:

1. All the sliding door frames are set below the floor tiles.  
This is resulting in water ingress to below the waterproofing, into the slab which then emanates into the garage, living area, and out of the slab outside.
2. Gaps around the steel pillars.  
This is resulting in water ingress into the slab which emanates into the garage and living area.
3. Large cracks on the parapet walls.  
This is causing damage to the inside of the house.

We recommend the following repairs:

1. The tiles on the balcony be relayed to below the door frames or alternatively a channel be cut in front of the door frames to allow water to flow away from the door and prevent water from seeping into the slab.
2. All the cracks and gaps be resealed.

We recommend a site meeting be held with a representative of NHBRC or Melt Badenhorst.

Please don't hesitate to contact us for any further information.

Thank you,  
Anthon Pretorius  
066 458 0379