ASSESSMENT OF NICD BLOCK B AND BLOCK C AT SANDRINGHAM

ORDER NO.: 1431042

STRUCTURAL ASSESSMENT REPORT REV 0

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PROJECT:

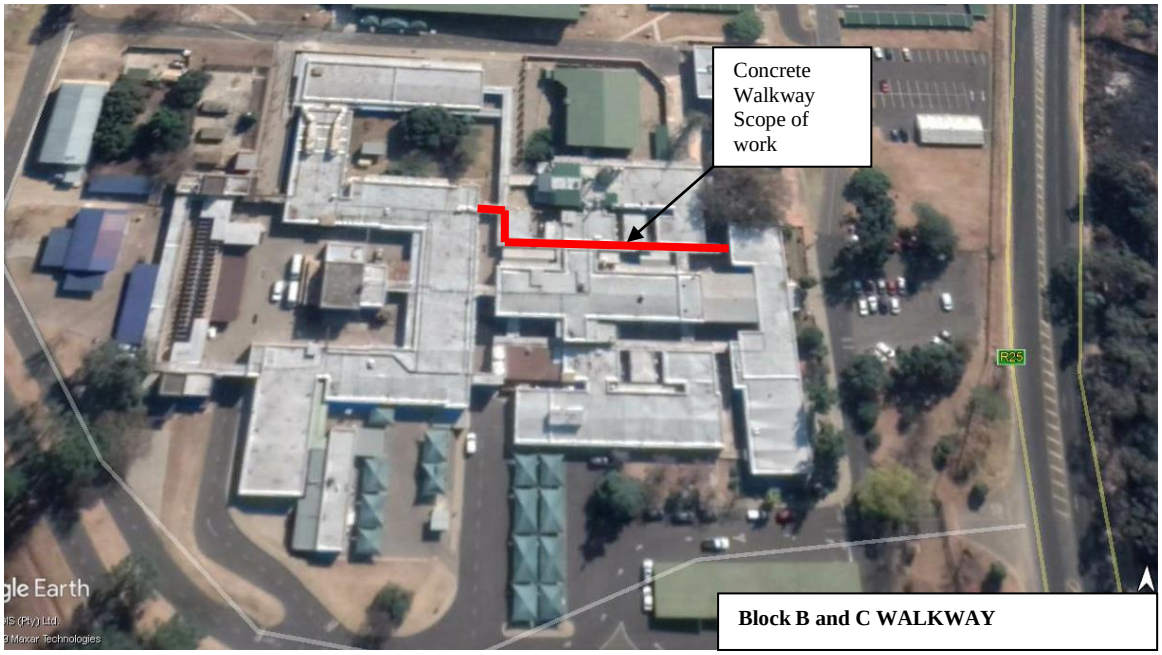
ASSESSMENT OF NICD BLOCK B AND C AT SANDRINGHAM

ASSESSMENT REPORT

I N D E X

1. LOCALITY PLAN

SITE LOCALITY PLAN



Block B and C WALKWAY

2. GENERAL BACKGROUND AND SCOPE

2.1 INTRODUCTION

The National Health Laboratory Service appointed Bahlaphing Consulting cc as the structural Engineer of the above-mentioned project to assess and recommend remedial solution to existing concrete walkway canopy between block B and C.

The Department building Services is responsible for maintenance of all facilities within the site. The building structure in discussion showed signs of concern to the maintenance team hence the recommendation for this project.

This project was initiated for the existing infrastructure repair and upgrading at the National Health Laboratory Service. This contract on assessment, repair and upgrading projects is divided into three phases:

Phase 1: Status quo investigation and Preliminary design
Phase 2: Design and documentation
Phase 3: Construction

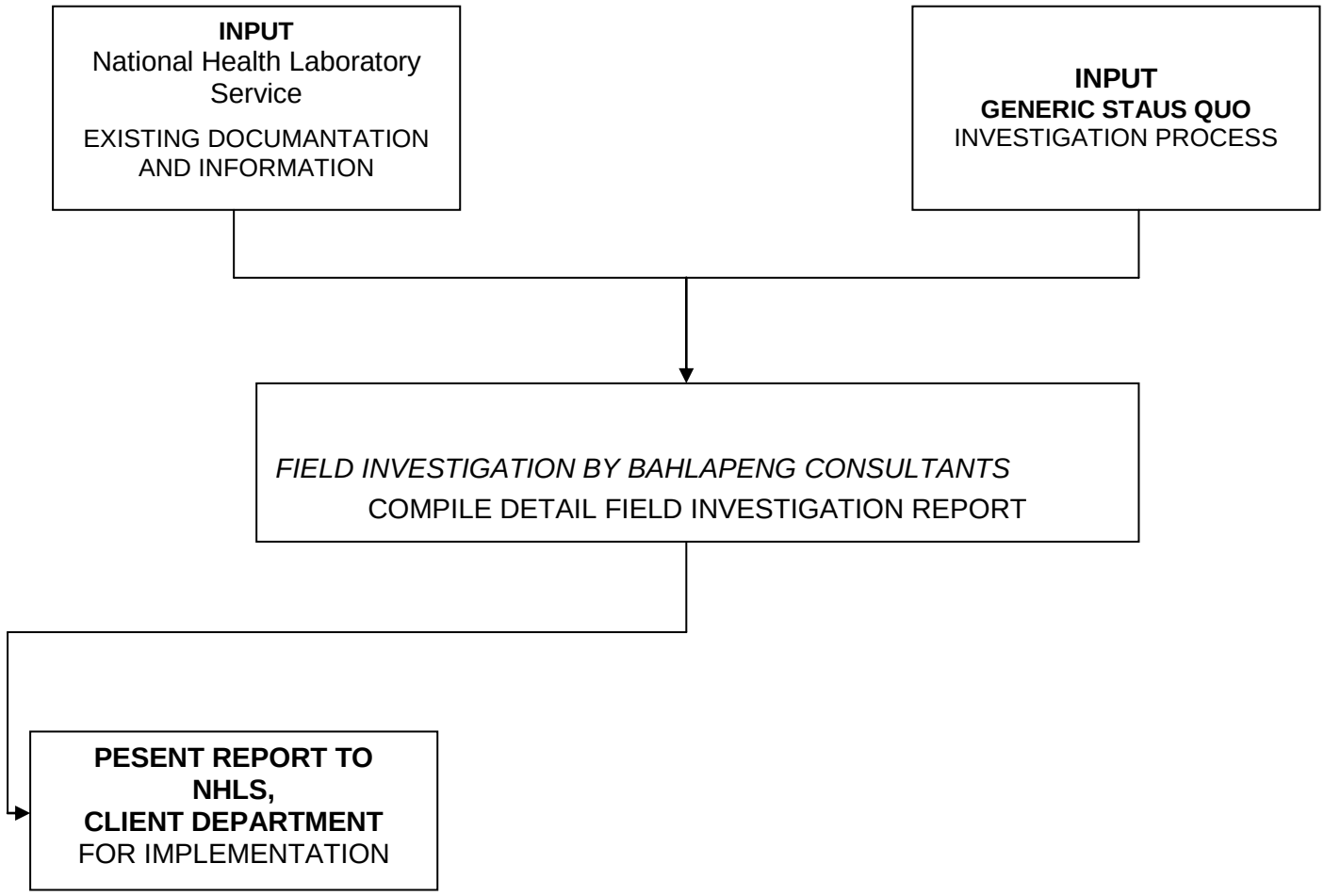
The objective with the Status Quo Report is to document the status quo of the facilities and upgrades. The Status Quo Report will be used to:

- Provide a basis for the National Health Laboratory Service to determine the content of repair and upgrading contracts based on the scope of work represented in the Status Quo Report.
- Use the scope of work in the Status Quo Report for the preliminary design, design and documentation and construction of repair and upgrading.

- Guide upgrading planning and budgeting

2.2 FORMAT OF INFORMATION GATHERING

FIGURE 2: STATUS QUO INVESTIGATION FLOW CHART



2.3 PROJECT TEAM

- Project coordinator: Mrs. Palesa Mlambo
- Structural Engineer: Mr. Glen Thabo Aphane
- Civil Engineer: Mr. Glen Thabo Aphane

2.4 REFERENCES

The following institutions and individuals contributed to the compilation of this report, whether by supplying information or assisting in the gathering of information.

- National Health Laboratory Service –Sandringham Office
    - Mr. Gunthern, Tel (011) 386-6422 (Maintenance Team)

3. DESCRIPTION OF THE PROJECT

3.1 Brief Project Description

The scope is limited to the concrete canopy between block B and C of National Health Laboratory Service. The scope is to assess the structural defect seen on the canopy slab and recommend a solution to render the canopy safe for utilisation by public.

The building life span was mentioned as over 50 years.

3.2 Location

The project is located in Gauteng Province. Access to site can be obtained by travelling along N3 south to Johannesburg and out at Modderfontein Road. The site is located on the right hand site from R25 as per the locality plan above.

3.3 Climatic Conditions

The regular pattern of weather in this project location occurs. The area receives its rainfall during summer season. The temperature in summer can reach 30 degree Celsius and the area is humid. The project site can be classified as moderate according to figure 4: Micro Climatic Regions of South Africa, TRH 4.

3.4 Terrain and Topography

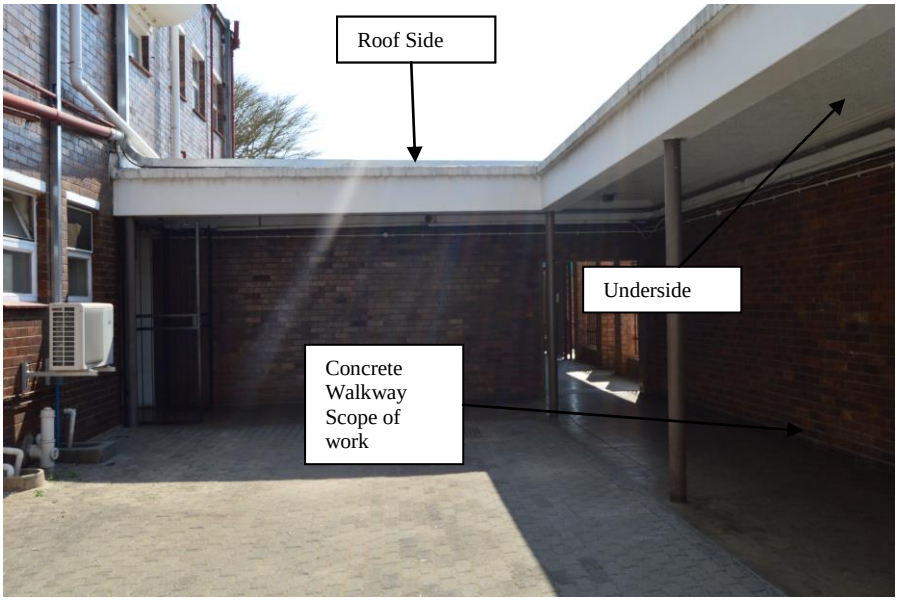
The topography of site can be classified as flat.

4. SCOPE OF WORK

Bahlaphing Consultant is appointed to provide professional engineering civil and structural services. The appointment is for the assessment, design, documentation and construction monitoring.

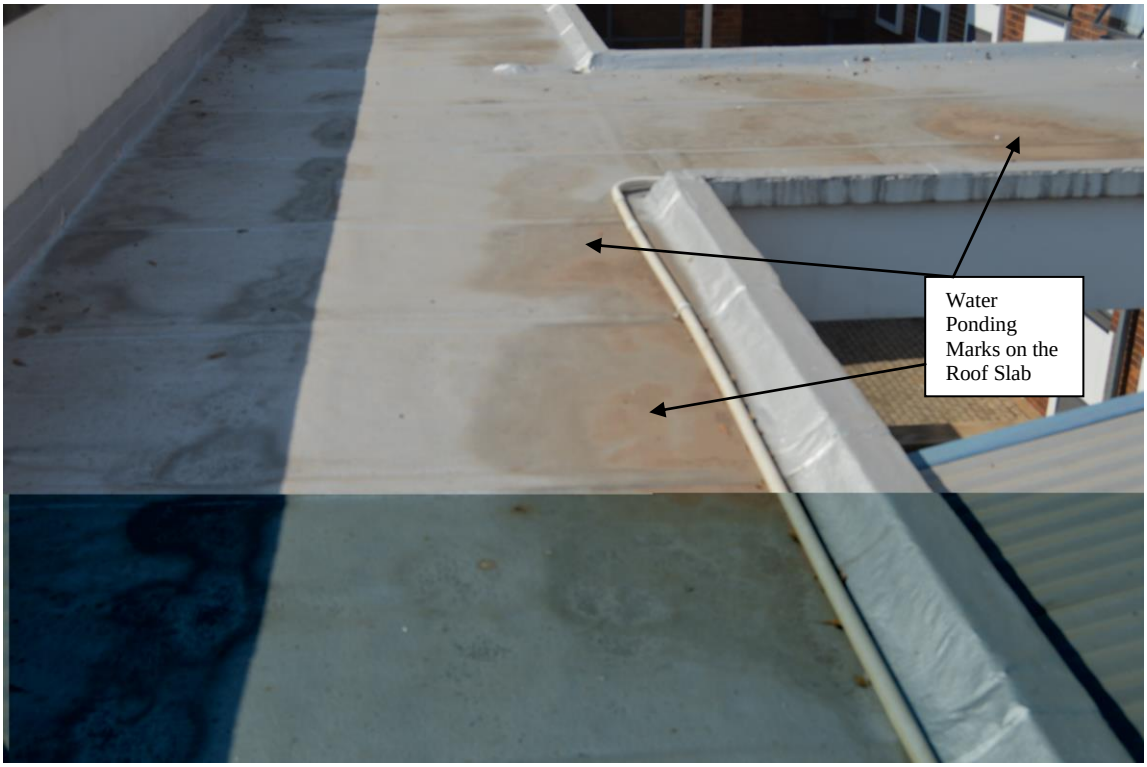
The onsite investigation comprised of visual inspection and equipment scans of concrete. The visual inspection was conducted on the 8th August 2019 and the findings are as follows:

- Concrete canopy was recently painted underside and waterproofed membrane applied to the roof side. We have however noticed that there is no enough drainage point to drain the whole slab. We have seen water ponding spots which are highly detrimental to the concrete structure. The pictures below shows the water ponding on roof side and corrosion marks on the underside.

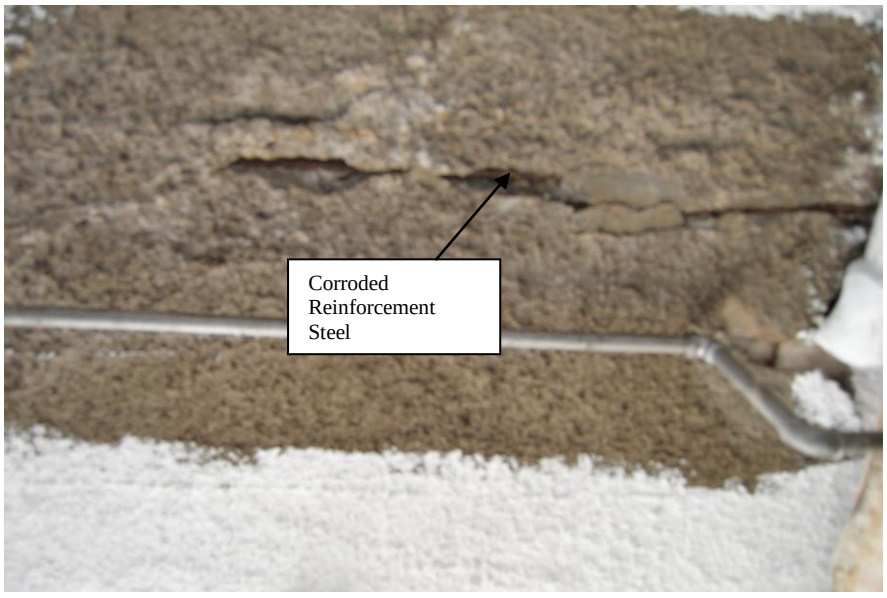



Corrosion Marks on the Underside of the slab


Water Ponding Marks on the Roof Slab



- We have noticed that most of the slab area is not draining during rainfall season. Water then finds a way into the concrete which is not allowed. Water result in corrosion of structural reinforcement which then weakens the structure. We could not check the state of corrosion as it destruct structural integrity. The picture below shows the corroded reinforcement steel.



- Waterproofing membrane was not designed in such a way that it will direct water to the discharge point. We do not have a record of how long the reinforcement steel was exposed to rain water due to non draining slab. The effect of water ingression into concrete are however very detrimental to the integrity of the structure.

The equipment scans of concrete were conducted on the 6th September 2019 and the findings are summarized as follows:

- There is no water trapped in the slab.
- Concerned water stained areas identified in visual had slight oxidation of reinforcement bars.
- Concrete strength is still adequate for structural function. See **Appendix C.**
- Reinforcement beyond localized is still in good condition.

5. DISCUSSION AND RECOMMENDATIONS

Based on site investigation discussed above, we recommend the following:

- Break open the existing slab on isolated problematic areas to clean oxidized reinforcement and reconstruct to original state by doweling and application of high strength drawing as recommended by **Appendix B**. Adequate support should be in place before any reinforcement can be exposed.

- Redesign the roof drainage system to remove ponding water on existing slab. The system should include screed to eliminate flat areas that result in ponding. Existing waterproofing membrane will be damaged and repaired should the screen be required. Provide gutters and downpipes to direct water to ground storm water system.

- Repair all the structural joints to prevent water leakage on slab.

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6. APPENDICES

APPENDIX A

BAHLAPHING APPOINTMENT LETTER

APPENDIX B

CONCRETE REINFORCEMNT SCAN RESULTS

APPENDIX C

CONCRETE COMPRESSIVE STRENGTH TEST RESULT