TRANSNET NATIONAL PORTS AUTHORITY

STRUCTURAL ASSESSMENT REPORT

SITE: EX-ENSIMBINI SITE, MAYDON WHARF, DURBAN

COMPILED: TNPA PORT ENGINEERING DEPARTMENT

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1. Contents

List of Figures

1. Introduction

2. Site location and description

The site is called Ex-Ensimbini site located Parker Road, in Maydon Wharf as depicted below, is approximately 39 718 m² in total land extent. The site features a guard house with access control, warehouses, electrical substation, road and rail accessibility, weighbridge area and stockpile yards, administration and other buildings.

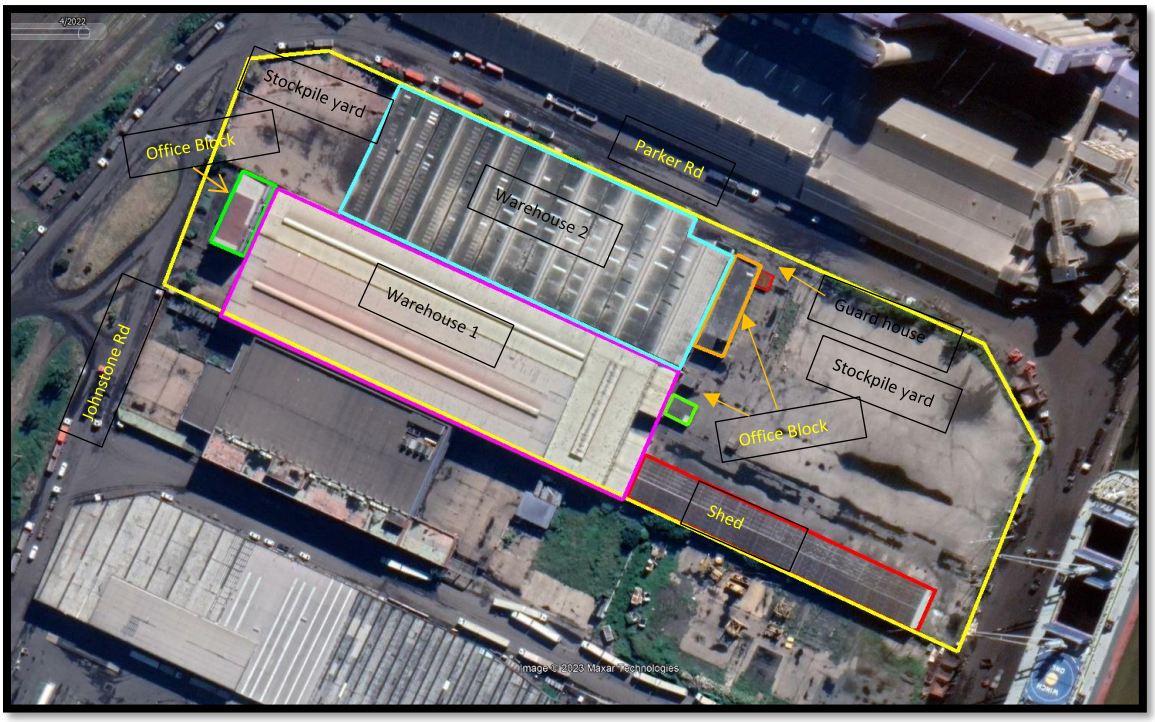


Figure 1: Showing Site location and Labels for the inspection at Ex-Ensimbini site

3. Assessment of existing structures

3.1. Guard House

The guard house and boom are located at the Parker Road entrance of the site. The guard house in a brick and mortar structure with basic services. The guardhouse has an asbestos roof and metal windows with burglar bars installed.

Figure 2:Guard House and Boom

3.1.1. Observations

Observations	Photographic records
Structure (Exterior) • The structure is adequate and no visible structural damage and structural cracks. • The aesthetics of the building is in poor condition.	

• The asbestos roof and fascia boards are damaged. • There is no roof drainage as the gutters have been damaged and removed.	
Structure (Interior) • There are no visible structural defects and no major cracks. • There is no ceiling installed in the guard house which presents a health risk due to the asbestos sheeting. • There is no electrical compliance with cabling and electrical fittings installed with no discernable planning or safety consideration.	
Canopy Structure • The canopy structure bridging the guard house and office block is a structural risk. The rafters are supported by a metole pole which is not fixed to the ground. This configuration is prone to collapse and visible deflections are noted. • There is no proper structural support for the canopy or drainage provided	

therefore, there are signs of rainwater damage to the adjacent brick wall supporting the canopy structure.	

3.1.2. Summary

The guard house's overall is structurally sound with no major defects noted on the main structural elements. The exterior of the structure lacks proper finishes, there is an asbestos roof where certain parts show water damage leading to the damage of the adjacent brick wall. There are no major structural cracks on both the exterior and the interior of the guardhouse. The adjacent canopy structure needs to be properly supported or removed. There is no notable roof drainage present.

3.1.3. Recommendations

It is recommended that the following actions are taken:

- Replace asbestos roof and provide proper roof drainage prevent any water ingress,
- Install proper building finishes,
- Install compliant electrical and ventilation system.

3.2. Office Block

The office block is located adjacent to the guardhouse and is also a brick and mortar structure. The roof structure is built using timber rafters and asbestos sheeting. The interior of the building is made up of a mixture of dry wall partitioning and internal brickwork. There are intact mechanical fixtures such as air-conditioning units and fire suppression systems in place.

Figure 3: Office Block 1

3.2.1. Observations

Observations	Photographic record
Structure (Exterior) The overall structure of the building is adequate. Minor cracks were noted on the exterior wall. The cracks are due to the enclosed previous door opening.	
Structure (Interior)	

• There are damaged sections of asbestos roof sheeting with large openings which has led to severe water ingress and animal infestation.. • The suspended ceiling has visible damage to façade and interior supports. • The electrical wiring system has been severely vandalized. • The interior wall structures are adequate and do not display any major defects. • The upper-level wooden floor is not deemed safe and posed a safety hazard.. • The interior partition are not in good condition and fire rating could not be determined.	 

3.2.2. Summary

The overall structure of the building is good with no major structural defects noted in the visual assessment. The cracking noted on the exterior wall pose no structural risk and can be repaired by redoing the brickwork to engineering standards. The damage noted to the roof is severe and requires immediate attention.

3.2.3. Recommendations

It is recommended that the following interventions are taken:

- Minor cracks repairs on the exterior structure,
- Asbestos roof to be replaced,

- Interior finishes such as the ceilings, flooring and partitions require replacement,
- Electrical wiring to be repaired / replaced to ensure compliance.

3.3. Perimeter Shed

The Perimeter shed is a steel portal frame structure which is covered on three sides with steel sheeting. The structure comprises of 39 steel columns connected to concrete plinths, Refer to figure 4. The structure cladding is inconsistent with ad hoc repairs to cladding noted. The base of the columns are encased in irregular sized concrete blocks to provide protections against accidental damage by machinery.

Figure 4: Shed located adjacent to the perimeter of the nearby site

3.3.1. Observations

Observations	Photographic record
Structure • It was noted that there are signs of corrosion on the columns, bracing, beams, and sheeting. • Damage and deflection of infrastructure is evident, this is noted by the bent columns and the lighting service ducts. • It was also evident that the eaves beams and purlins show signs of buckling. • There are collision damage visible to the gutter and sheeting of the shed. Various different types of sheeting were used in ad hoc repairs of the years. The different sheeting exhibits different material properties such as different thicknesses and corrosion levels. • The interior paving within the shed is in good condition. • Signs of Ponding and drainage problems at the front to the back of the shed is evident which might be caused by the fact that the floor is sloping towards the back wall of the shed and potentially causing corrosion to the	 

sheeting and exposed steel structural elements. • Some interior columns are damaged due to accidental collisions. The columns have deflected significantly and may pose a structural risk if left unattended.	
Plinths • About 50% of plinths are damaged • The steel is exposed on plinths which makes them prone to corrosion and further degradation.	

3.3.2. Recommendations

All corroded steel sheeting needs to be replaced. Structural steel members that exhibit corrosion need to be treated to prevent further corrosion. All deflected columns, purlins, eaves beams and bracing are to be replaced. The Shed surface to be regraded to ensure that any water flows towards the stockpiling yard or into a stormwater drainage system. The gutter and drainage system of the roof to be repaired and directed into stormwater system.

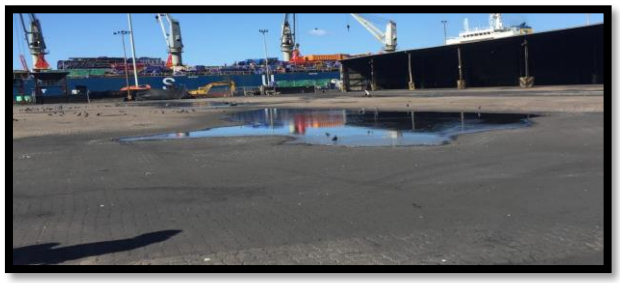
3.4. Stockpile yard

The stockpile yard adjacent to the perimeter shed is a flat area located centrally in the site. Stockpile Yard surface comprises of interlocking blocks and has a rail siding going through the site till the end of the boundary. There was no drainage system noted within the yard complex.

Figure 5: Stockpile yard adjacent to the perimeter shed

3.4.1. Observations

Observations	Photographic record
Damaged Stockpile yard Surface • There are visible damage and settlement noted on the yard paving blocks which has resulted in the ponding evident on site.	

	
Stormwater Drains and manholes • There are blocked drains within the stockpile area which has resulted in the inefficient drainage of the site and ponding.	
Perimeter Drainage Channel • It is evident that the perimeter channel is blocked with stockpiled material resulting inefficient drainage of stormwater.	

Coal Dust residue • The coal stockpile residue dust has also been evident and has influence the poor draining and ponding since there are stormwater drains are blocked	

3.4.2. Summary

The stacking yard needs resurfacing and reprofiling to ensure a safe operating surface and efficient drainage of the yard. There are no visible drainage points within the yard and therefore the runoff generated on the site is uncontrolled and may have environmental impacts if allowed to go into the municipal system.

3.4.3. Recommendations

It is recommended that the following actions are taken:

- Unblocking of stormwater drainage system,
- Cleaning and repair of perimeter open channel drains,
- Yard resurfacing and proper sloping or profiling.

3.5. Warehouse 1

Warehouse 1 is a steel portal frame structure which was extended in length. The original wall consists of a concrete block infill and the extended portion wall section consists of steel sheeting. The original warehouse has a concrete finished floor and the extended portion has an interlocking concrete floor, Refer to figure 6. Four rail sidings go through the warehouse. Two of them go to the boundary of the site on the Quayside.

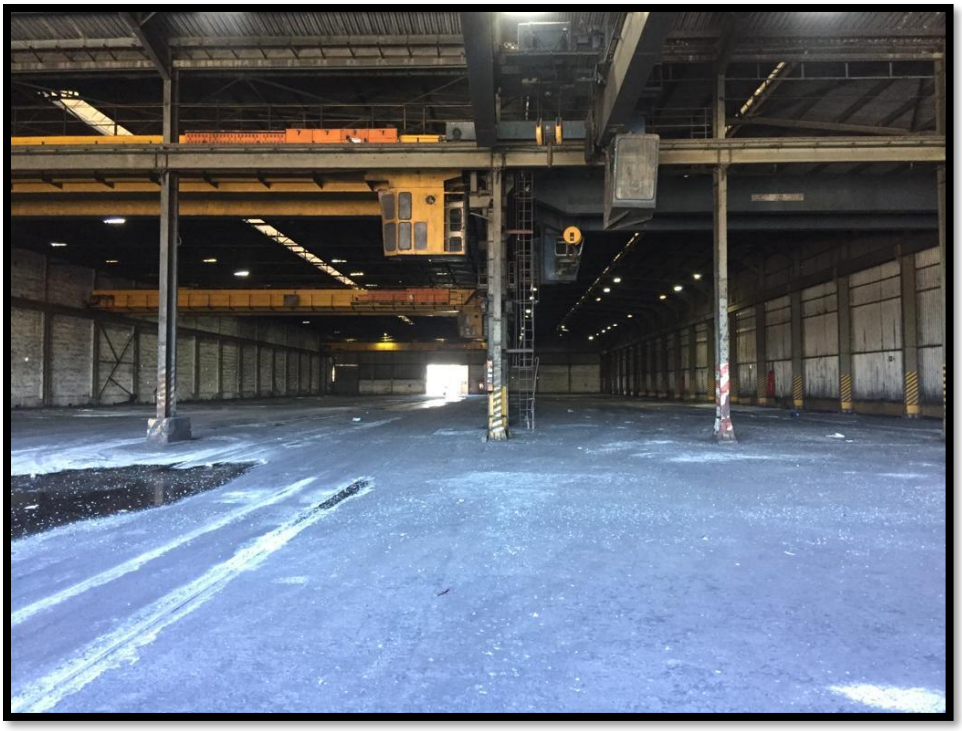


Figure 6: Warehouse 1

3.5.1. Observations

Observations	Photographic record
• Signs of leakage on the roof sheeting. Minor holes are evident; however roof is in a good condition. • Signs of corrosion on the interior sheeting.	

3.5.2. Recommendations

The condition of the concrete floors is satisfactory; however, they need to be repaved and profiles in order to prevent water ponding. Steel members need to be treated to prevent corrosion. The machinery and the sprinkler system are required to be tested to ensure compliance and utilization of the systems. Minor holes in the roof need to be repaired.

3.6. Warehouse 2

Warehouse 2 is a steel portal frame. The wall consists of a concrete block infill to about 7.6 meters in height and thereafter an asbestos sheeting infill. The original warehouse has a concrete finished floor. The warehouse does not have a sprinkler system in place.

Figure 7: Warehouse 2

3.6.1. Observations

Observations	Photographic record

- Signs of leakage on the asbestos roof sheeting with voids present in the sheeting and water ingress within the walls.
- Signs of damage on the asbestos wall sheeting.
- Damage and deflection of columns and column bases, this is noted by the deflected columns and the completed detachment of the concrete column bases from the floor.
- Exposed reinforcement of the floor slab.

3.6.2. Recommendations

The condition of the concrete floors are poor, they require immediate attention. The entire building needs to be waterproofed, and all of the asbestos sheeting is required to be removed and replaced. The stability

of the warehouse is a concern since most of the interior column inspected by the team were detached from the floor, it is therefore recommended that all concrete plinths and deflected columns be replaced.

3.7. Office Block (Admin Building)

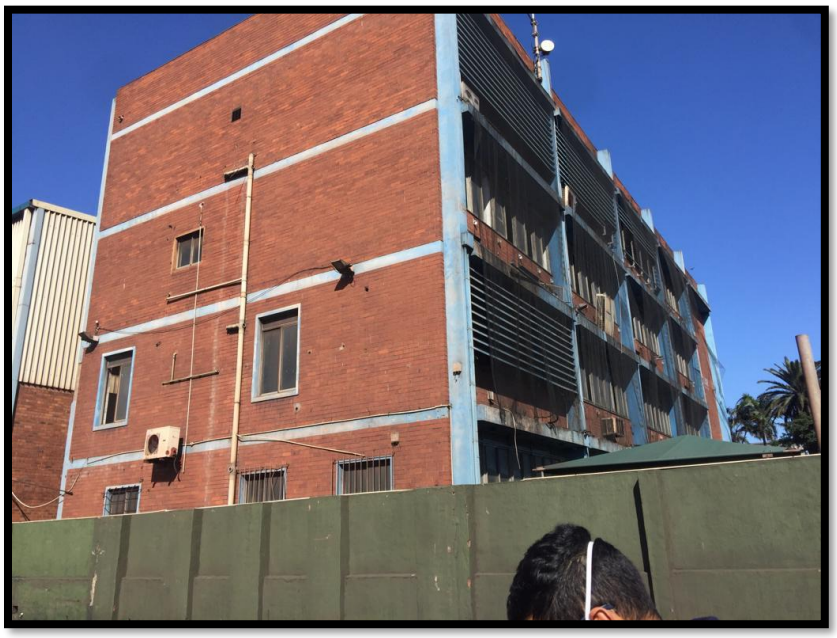


Figure 8: Office Block (Admin building)

3.7.1. Observations

Observations	Photographic record
Structure Exterior • The overall structure of the building is adequate and structurally sound. • No visible cracking on the walls. • No visible signs of major water ingress.	
Interior of the Building	

• The building has been totally vandalized. • The air conditioning system has been removed and left multiple voids on the exterior walls.. • The suspended ceiling has been damaged and removed. • The wall partition walling has been damaged. • The majority windows and door frames have been damaged, removed or stolen. • Electrical equipment and wiring system has been totally stripped.	 

3.7.2. Recommendations

The building is structurally sound. It requires a total renovation and installation of finishings in both the interior and the exterior of the building.

4. Limitations

The assessments carried out thus far is a visual assessment only. The visual assessment was limited by access granted as well as permanent fixtures such as ceiling boards, material and machinery that could not be moved. The following tests was excluded from the scope:

- Material testing,
- Leak detection,

- Flood testing,
- Service detection,
- Load capacity testing.

The structures assessed and the conclusion and recommendations thereof were based on the current function of the structures. The study did not consider any change in operations.

5. Conclusions

In can be concluded that some if the structures assessed in the report are structurally sound as stated in the report, however it must be noted that some structures do require extensive work to be fully functioning and compliant to health and safety regulations, therefore repairs have to be enacted before any occupation can take place.