APPENDIX D - TECHNICAL REPORT

SIMULATED OFFICE PROJECT 2009

TECHNICAL REPORT

FOR THE PROPOSED NEW DEPARTMENT OF TELEVISION, PERFORMANCE AND STAGING ON ERF 2330, DURBAN, FOR THE DURBAN UNIVERSITY OF TECHNOLOGY
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INTRODUCTION

This technical report should be seen as an extension of the design report and should be read in conjunction with the drawings attached as Appendix A. Due to a very tight schedule, involvement with the quantity surveying students was not possible.
CHAPTER 1 – STRUCTURAL REPORT

Systems

The building is designed with a concrete frame and brick infill on concrete. There are two types of roof systems that were implemented in this design namely a lightweight sheeting on a steel frame and a flat concrete slab, which is waterproofed to approved engineers details. The overall building structure is designed on a 85mm brick gauge to easily work out levels and other necessary structural levels.

Foundations

The building is located on a relatively stable soil conditions which is currently used as a parking lot. With that said, since the building is 5 stories in height, the recommendation is to use piling foundations. These would be designed by the structural engineer in collaboration with the geotechnical engineer.

Concrete ground beams

The columns are designed to have varying sizes depending on whether they are round or rectangular. The setting out of column deemed most economical as it allows for the parking on the lower ground and also on the upper level. The typical span of columns ranges from 5000mm to 10000mm as the accommodation calls for rooms as big as 15000mm X 10000mm and also as small as 5000mm X 2500mm. the rectangular columns are sized at 230mm X 500mm and round columns at 300mm in diameter

As the structural system uses a one way span 255mm reinforced concrete slab spanning of concrete beams at variable depths, this system allows for more height for services under the slab. The internal walkway contains 422mm deep tempering steel supporter at 2500mm centers.
Due to the maximum span of 10000mm and a minimum span of 2500mm, 680mm reinforced concrete beams for the maximum span was deemed economical. As mentioned above, the slab is 255mm deep (which corresponds with the 85mm brick gauge). Inverted concrete beams also allow for a complicated sprung floor system in allocated rooms.

**Retaining walls**

There is a light cross-fall to the site that requires the use of retaining walls on the basement level. The retaining walls are to be 345mm core walls derbigum SP4 waterproofing and agricultural drains, all to engineer’s details.

**Walls**

The exterior walls are infill to the concrete structure and comprise of 230mm plaster brick walls (some not plaster) with the outer face of the inner skin bagged and waterproofed with brixeal.

Internal walls are to be 115mm single skin plaster brick.

**Steel frames**

The steel frames used has different profiles, they range from GMS portal frames designed by the engineer to accommodate great lengths to simple I and T section GMS to accommodate shorter lengths. Separate members to be joined together to be bolted rather than welded but through welded cleats. This allow for maximum flexibility between the members.
Roofs

As mentioned above, roof system consists of three types of roof technology namely flat concrete slab, simple mono pitch roof sheeting on steel frame and multi-sloping roof sheeting on steel portal frames. In all the roof systems, steel purlins are to be used over sisalation waterproofing system. Flat concrete roof is to be waterproofed with derbigum to engineer's details.
CHAPTER 2 – FIRE REPORT

The building is designed to comply with Part T of SABS 0400. Specific noteworthy requirements include:

- 120min fire resistant enclosures for the specified occupancy, in accordance with TT 6.2, table 4
- 1 fire hose reel every 500m² with a maximum reach of 30m, in accordance with TT 34.1
- 1 fire hydrant every 100m², in accordance with TT 35.2
- 1 portal 9kg fire extinguisher for every 100m², in accordance with TT 37.4 and TT 37.5

Noteworthy components within the design that comply with these regulations and other considerations include:

- Emergency exists open outwards
- Appropriate hazardous material storage cabinets within the laboratories and a central store
- Conscious design decision in the approach to services to limit the amount of vertical ducts and thereby reduce the fire risk associated with it.
- Extensive use of signage due to the nature of the environment. These including standard fire signs in addition to signage required by the National occupational health and safety act indicating hazards and safety equipment.
- A fully automated wet pipe sprinkler system and complete stand pipe is to be installed in the theater in line with international recommendation.
- Emergency power supply in conjunction with a UPS is already a requirement for servicing.
- Electronic fire detection and an emergency communication system is to be installed.
CHAPTER 3 – SERVICES REPORT

Drainage

The building has one standard system of waste drainage linking to the existing municipal sewer line. The standard system provides for the occupancy of over 200 individual and conforms to table 5, Part of SABS 0400. With that said, minimum sizes of pipes, gradient in runs and provision of rodding and inspection eyes and gulles have been met.

Stormwater disposal

The building conforms to the requirements of Part R of the SABS 0400 and take into account:

- Gutters, downpipes, surface stormwater channels and below-ground stormwater drains in accordance with RR2
- Sizing of gutters, in accordance with RR3.1
- Number of sizing of downpipes, in accordance with table 1, RR3.2
- Access to stormwater drains at a maximum interval of 40m, in accordance with RR4

All roof run-offs are stored for use in irrigating landscaping, overflow will discharge to local authority stormwater system.

Refuse disposal

Standard refuge for disposal by the local authority is to be used and to conform with part U1 and U2 of the SABS 0400.
Air Conditioning

Lecture theaters and drama theaters require specialised systems for their environment. Since these areas are soundproofed, a specialist is to design and detail the most economical air flow system to avoid great noise that might disturb sessions. Even though the building is designed to self ventilate, fans and standard air conditioning ducting system will be used to designated areas.
CHAPTER 4 – CONCLUSION

A finished building undertakes a various number of design processes, ranging from design to technical resolution and it is important for the architect, as a principle agent, to understand these stages. Technical resolution need be finalized by the engineers from architect's design and the architecture need to be aware of services to be implemented in the building right from the concept stages.
CHAPTER 5 – BIBLIOGRAPHY

APPENDIX A – TECHNICAL DOCUMENTATION DRAWINGS

SITE PLAN
SCALE 1:500

LEFT OVER SITE ALLOCATED FOR FUTURE GROWTH