CHAPTER 8: TECHNICAL DOCUMENTATION
8. TECTONIC AND MATERIAL USE

8.1 Technology Concept
The representation of memory (old) through structural independence or partnership depending on the programme (new).
As mentioned in chapter 7, the design has a noise filled and quiet section. The quiet spaces require a more solid aesthetic (scenario 1 Figure 8.1) and the noise filled section a lighter open aesthetic (scenario 2 Figure 8.1). The buffer space is a combined aesthetic as is shown in scenario 3 (Figure 8.1).

Currently Marabastad has a mostly walled architecture with some temporary structures scattered across the Marabastad area.

Material use:

Face brick (first material used in Marabastad at Schoolplaats, see Chapter 2, Figure 2.5).
Plastered brick (seen in most heritage buildings in Marabastad, see Chapter 2, Figure 2.12).
Steel profiles (represents informal nature in Marabastad and gives a light aesthetic).
Steel cladding (S-profile cladding was used for homes in Indian location).
Steel mesh (keeping with light aesthetic, allows for ventilation and security, 8.3).

8.2 Material use
The use of material is inspired by the memory and present use of materials in Marabastad. The memory of Marabastad material use was mostly temporary structures of wood and steel as the use of masonry was prohibited in the early 1920-50’s for private homes in the Indian location. Public buildings like the Orient theatre and Merriamen temple could be constructed with masonry.
8.2 STRUCTURAL DESIGN

The structure of the building consists of steel portal frames that bear the roof and floor slab loads (see detail B4 and B5). Precast concrete rib and block slabs are used so that it can be placed on top of steel structure, so that in future it can be removed. High rising walls are fixed to the steel columns to prevent out of plane buckling (see appendix A).

Figure 8.2
Structural model. Red indicate portal frame steel structures, green the secondary structure upon which the slabs are lain. (Author, 2010).
8.3 SERVICES
The services of the building are plumbing and electrical. The plumbing is controlled through shafts. The electrical services are also grouped through shafts and distributed through the hollow concrete slabs.

Figure 8.3
3D model showing service ducts and connections (Author, 2010).
8.4 SUSTAINABLE DESIGN

8.3.1 Natural Ventilation
Prevailing winds are calm and blow from the north-east in the morning backing to the north-west in the afternoon (Holm, 1990). This allows for cross-ventilation in the buildings and the placement of courtyards accommodates this (see appendix B).

8.3.2 Rainwater catchment
The rainwater gathered via the roofs of the buildings will be used for the cleaning of the workshops and classrooms, water closets and irrigation.
Max volume of run-off per year/per month
Run-off (litres) = A x (rainfall -B) x roof area
A = efficiency of collection variable = 0.8
B = loss associated with absorption = 2
Run-off housing = 67840 l = 5653 l per month
Run-off market = 48960 l = 4080 l per month
Run-off cafeteria = 56160 l = 4680 l per month
Run-off workshop = 77600 l = 6466 l per month
These figures add up to 250560 l per year that could be gathered on site (see appendix B)

Figure 8.4
Plan showing ventilation through buildings and courtyards (Author 2010).

Figure 8.5
Roof plan showing slope directions of roofs, flow of rainwater and sqm of roofs (Author 2010).
Figure 8.6
3D view where red arrows indicate movement of rainwater towards water tanks (Author 2010).
8.5 PLANS

SITE PLAN
FIRST LEVEL PLAN
ROOF PLAN
Figure 8.7
Detail of portal frame, column and roof detail
(Author, 2010).
Figure 8.8
Detail of column base. Compared to detail A1, detailing represents independent concept (Author, 2010).
Figure 8.9
Detail through sleeping quarters. See cavity wall that allows for different finishes and planes (Author, 2010).
Figure 8.10
Detail of water tank. Notice use of concrete for water pressure (Author, 2010).
Figure 8.11
Detail showing hollow concrete slabs placed upon steel structure (Author, 2010).
Figure 8.12: Detail of portal frame, showing roof construction of workshops (Author, 2010).
Figure 8.13
Detail of balcony at temporary housing. Notice solution of water drainage with the use of steel channels to control water flow (Author, 2010).
Figure 8.14 Detail of portal frame at the market, notice independent components (Author 2010).