

This chapter focuses on the main design generators and substantiates the decision-making process within the theoretical, practical and historical contexts of the dissertation.



Figure 7.1 Weathered surfaces on Magazine Hill (Author, 2011)



Figure 7.2 Stained wall in existing Flame Tracer building (Author, 2011)

7.1 Background

In Chapter 7 the proposed brass foundry on Magazine Hill is explained within the parameters of 7 main design generators that influenced the process of decision-making throughout the developmental stages of the design progression. The generators address design concerns regarding the theoretical premise, building programme, commemorative aspects, environmental aspects, heritage legislation, site-based influences and architectural experience.

7.2 Theoretical premise

Within the context of Magazine Hill, this dissertation explores an architecture of alter egos, where multiple identities and layered memories define spaces that are simultaneously physical and metaphysical. The physical character of space present in the decayed fabric of Magazine Hill relates to the experience of abandoned space, the weathered building elements, ruination and the smell of decay that only manifests with the passing of time. The physical character of space on Magazine Hill thus relates to experiential time that focuses on the experience of the present, therefore weathered space is left unaltered in the design.

Its alter ego, the metaphysical character of space present on the site, relates to the historic activities that accompany a time frame passed, where the memory of past activities and use is constantly provoked through experience. This character of space thus responds to referential time, where physical attributes of weathered space refers to previous use and historic occupancy. It is within the alter egos of space where the architectural experiences of the site and the brass foundry are explored.

The weathering of architectural materiality implies that buildings take on the qualities of place and events, whether it be stains and residual deposits brought on by the rightful claims of nature, or bullet holes and explosion damage caused by historical events. In both mentioned cases the process of decay unfolds a narrative that strengthens the building's existence and persistence in time. This dissertation's design resolution is thus focused on the idea that ruination can inform creation, and emphasises the fact that the death of one building element can lead to the revelation of another.

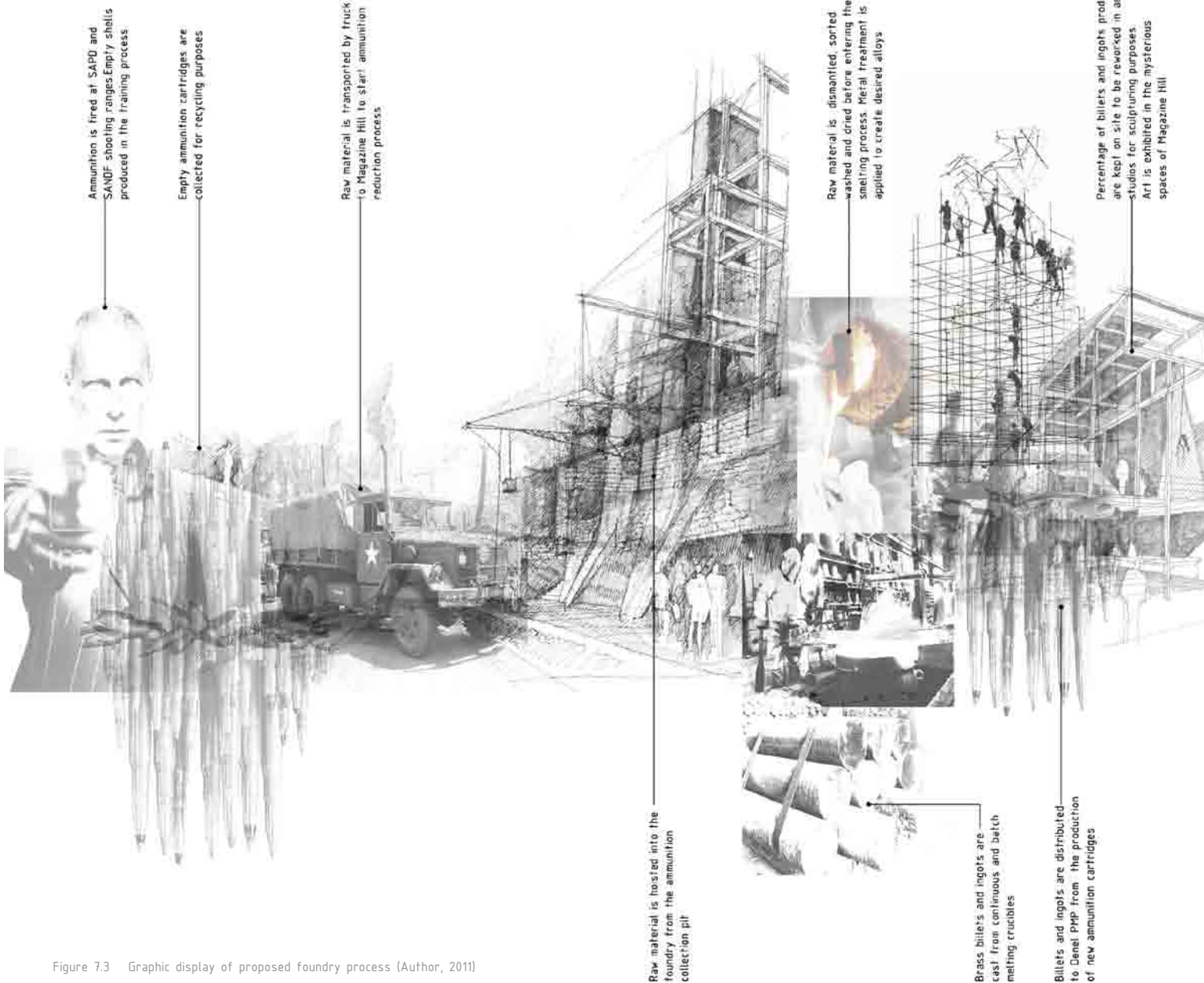


Figure 7.3 Graphic display of proposed foundry process (Author, 2011)

7.3 Foundry process

7.3.1 Brief process outline

The design of the brass foundry integrates an industrial process of ammunition reduction with an experiential route that unveils the rich history of ammunition production on Magazine Hill. The experiential quality of this journey is governed by a series of foundry processes that are revealed along the route as the visitor progresses through the site. It is within this subtle integration of site and programme that the past, present and future of Magazine Hill can be experienced and imagined.

The foundry process functions within 2 different procedures, with each process requiring diverse spatial needs in terms of lighting, volume, services and materiality. The first main process is accommodated in a furnace tower which extends from the existing ammunition bunker. It is in this industrial space where the ammunition cartridges are reduced to billets and ingots, the raw format of non-ferrous metals. After the end product has been produced, the raw material is stored and distributed to Denel PMP, while the second foundry procedure reworks remaining material on site in a series of new artist studios.

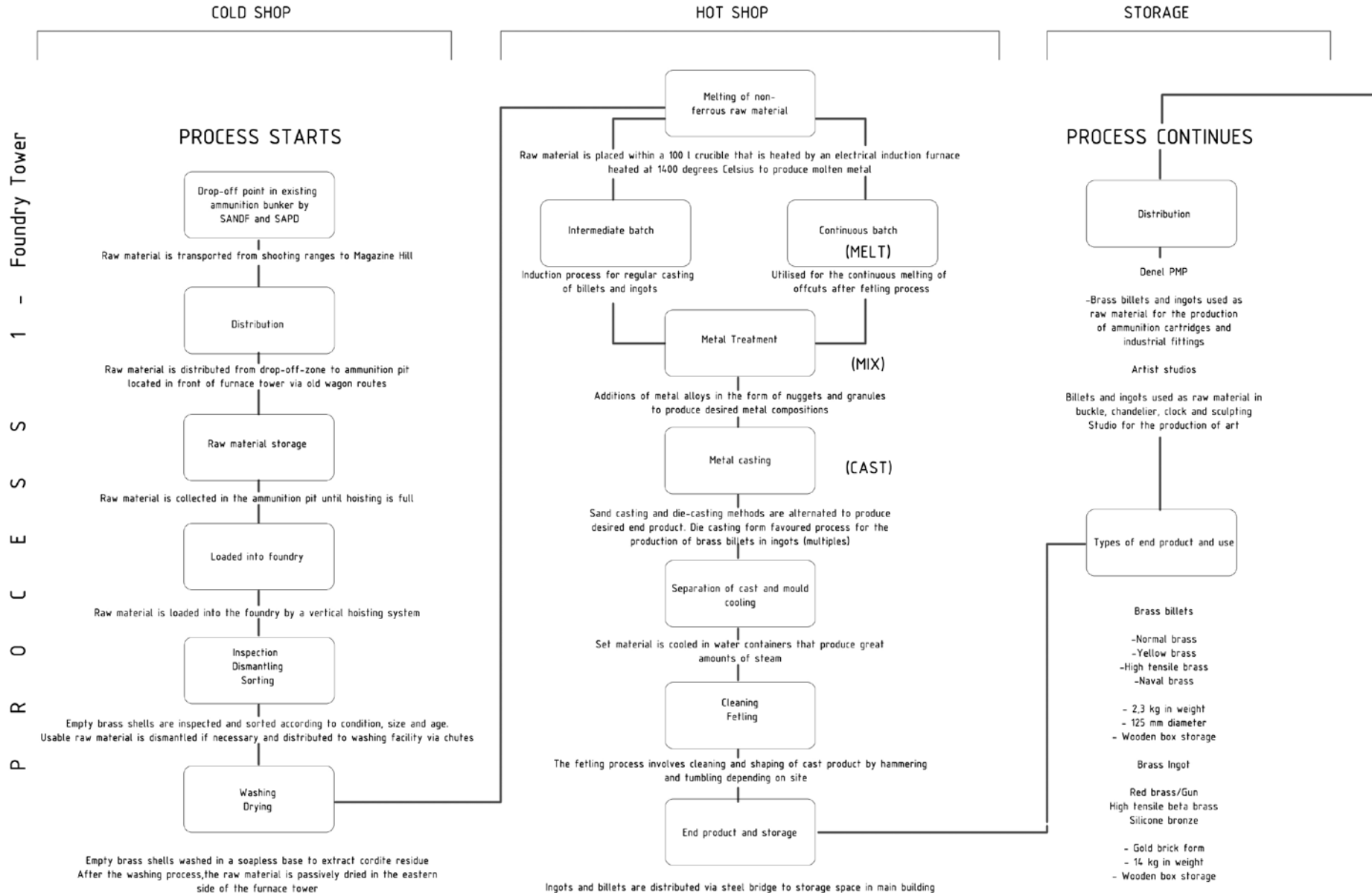


Figure 7.4: Technical display of proposed foundry process (Author, 2011)



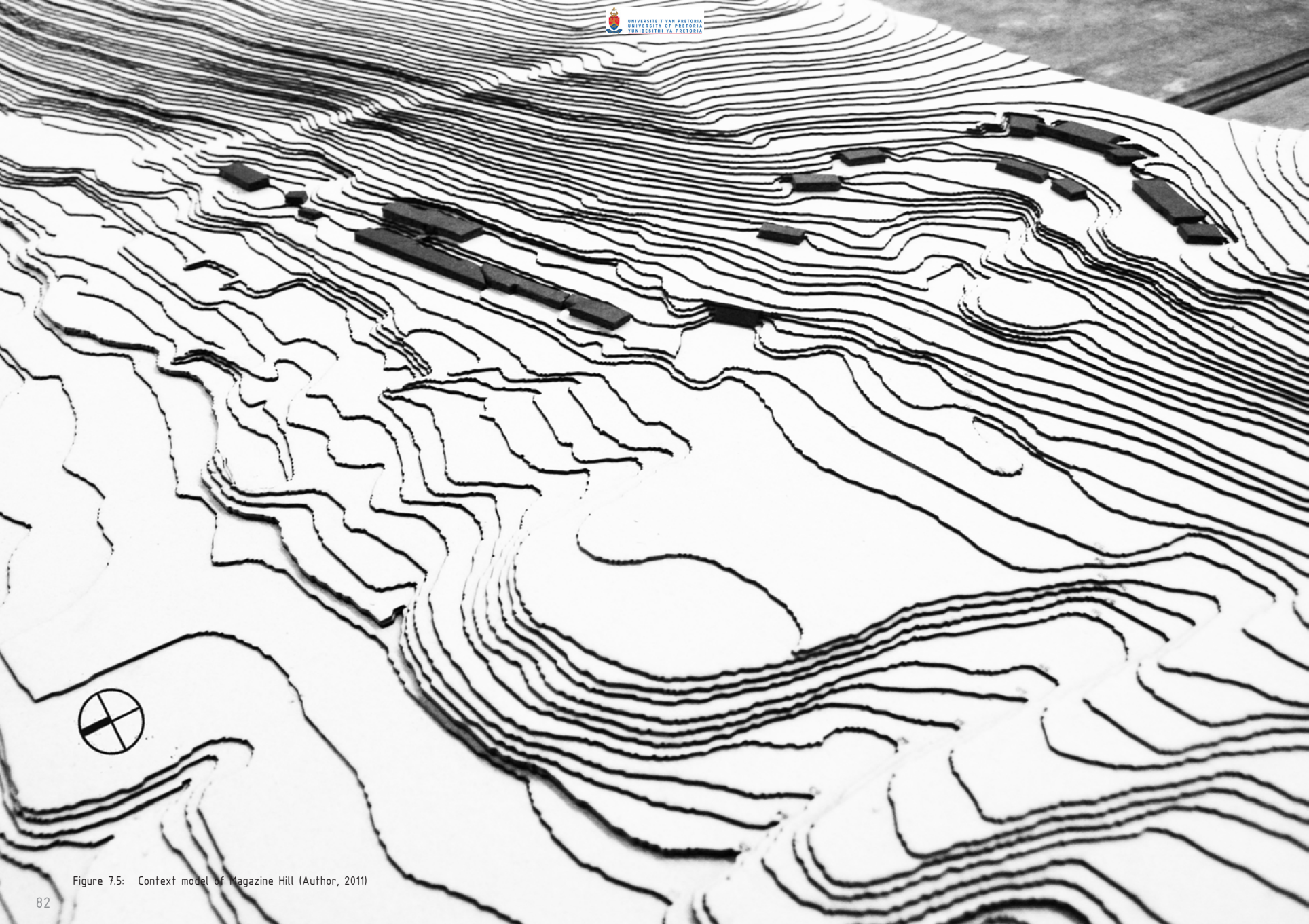


Figure 7.5: Context model of Magazine Hill (Author, 2011)

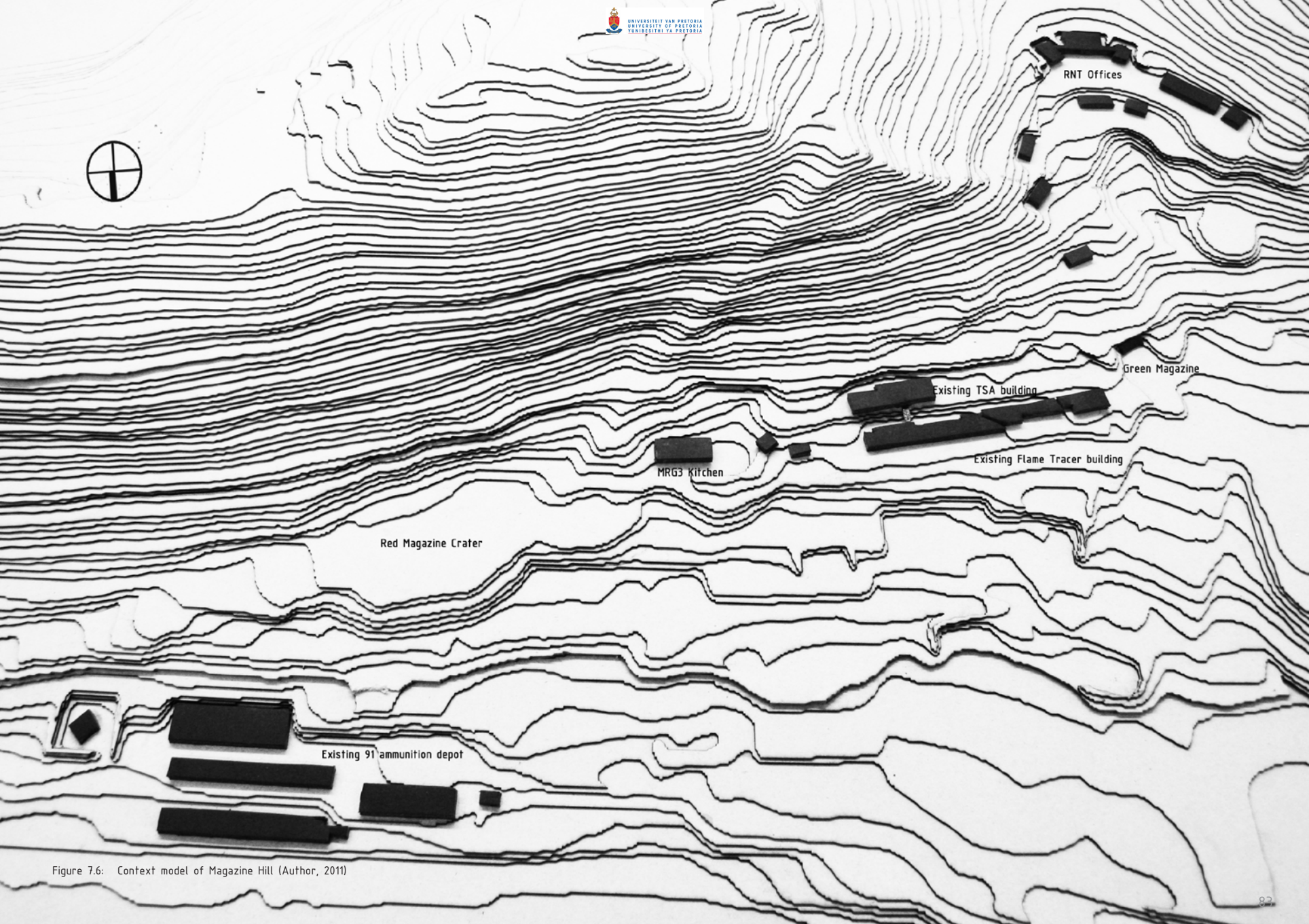


Figure 7.6: Context model of Magazine Hill (Author, 2011)

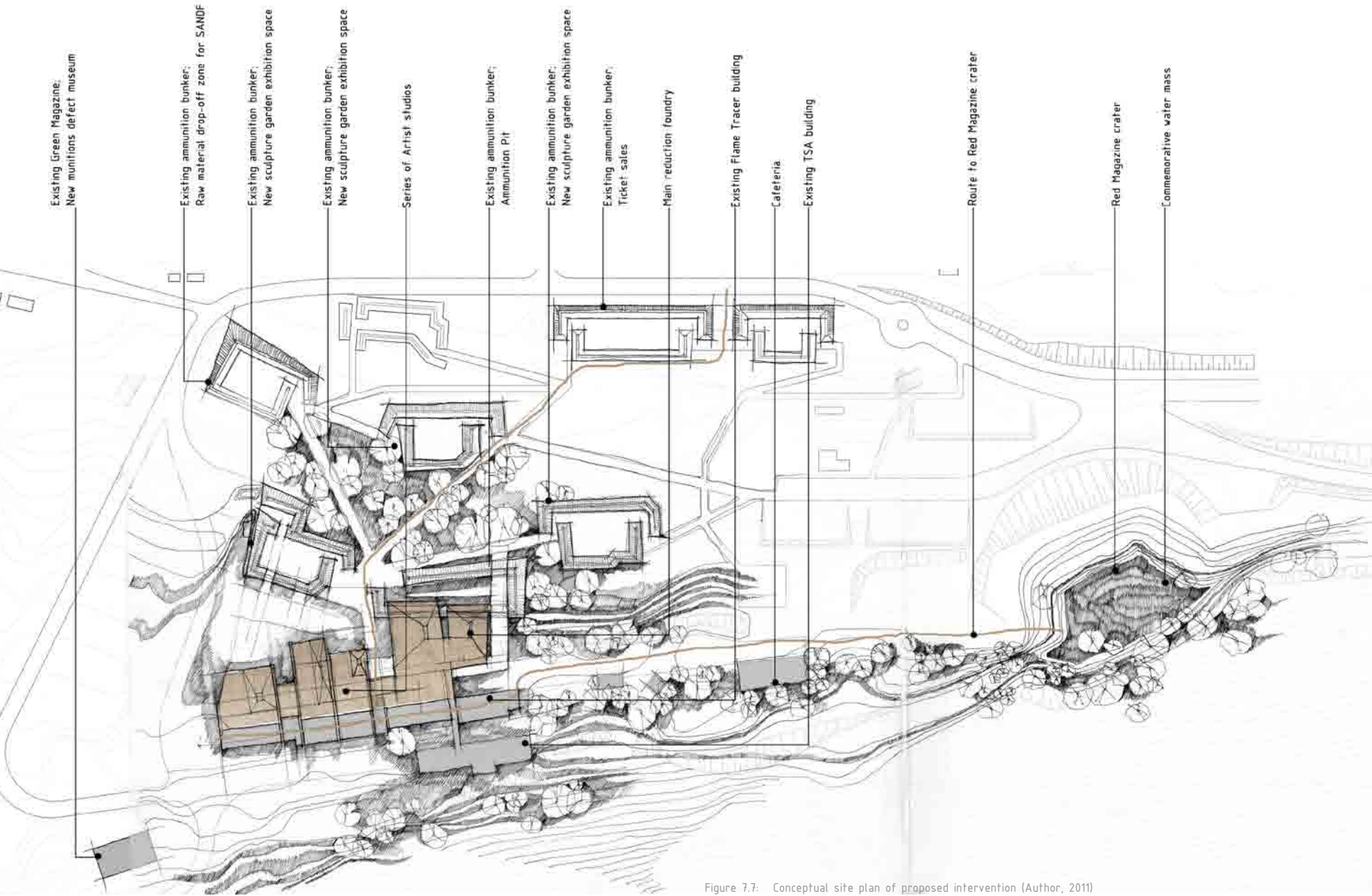


Figure 7.7: Conceptual site plan of proposed intervention (Author, 2011)

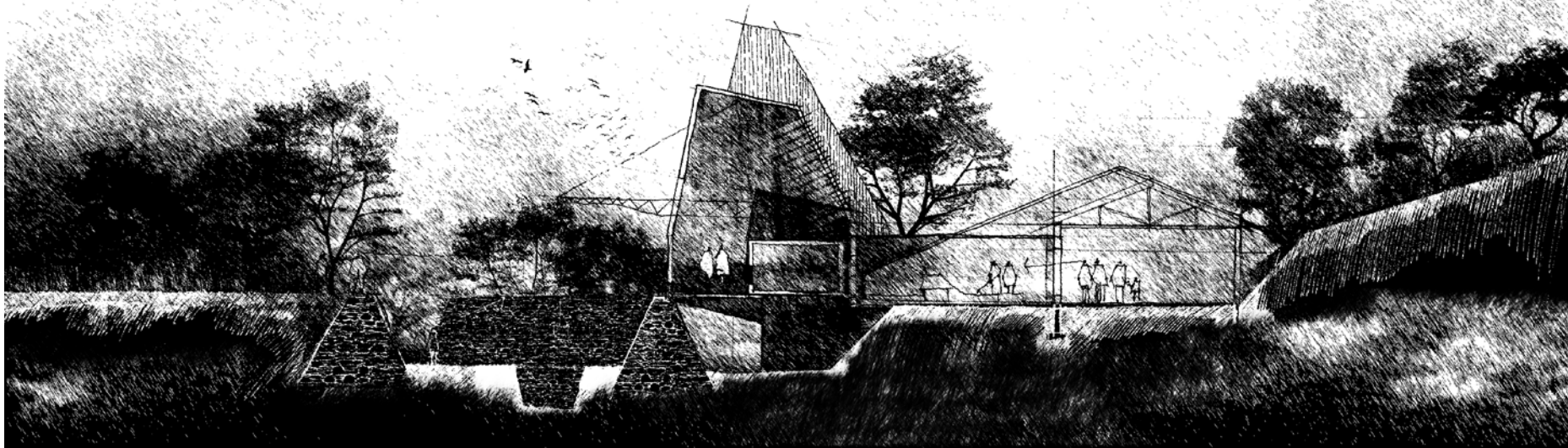
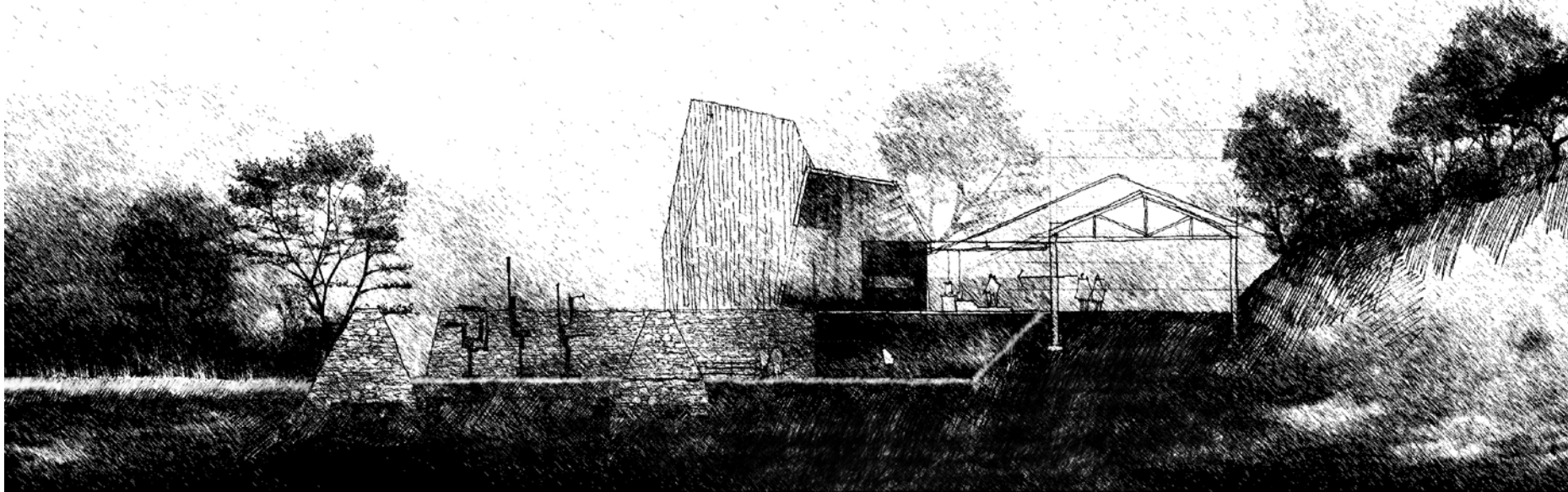


Figure 7.8: Early conceptual work, building sections (Author, 2011)



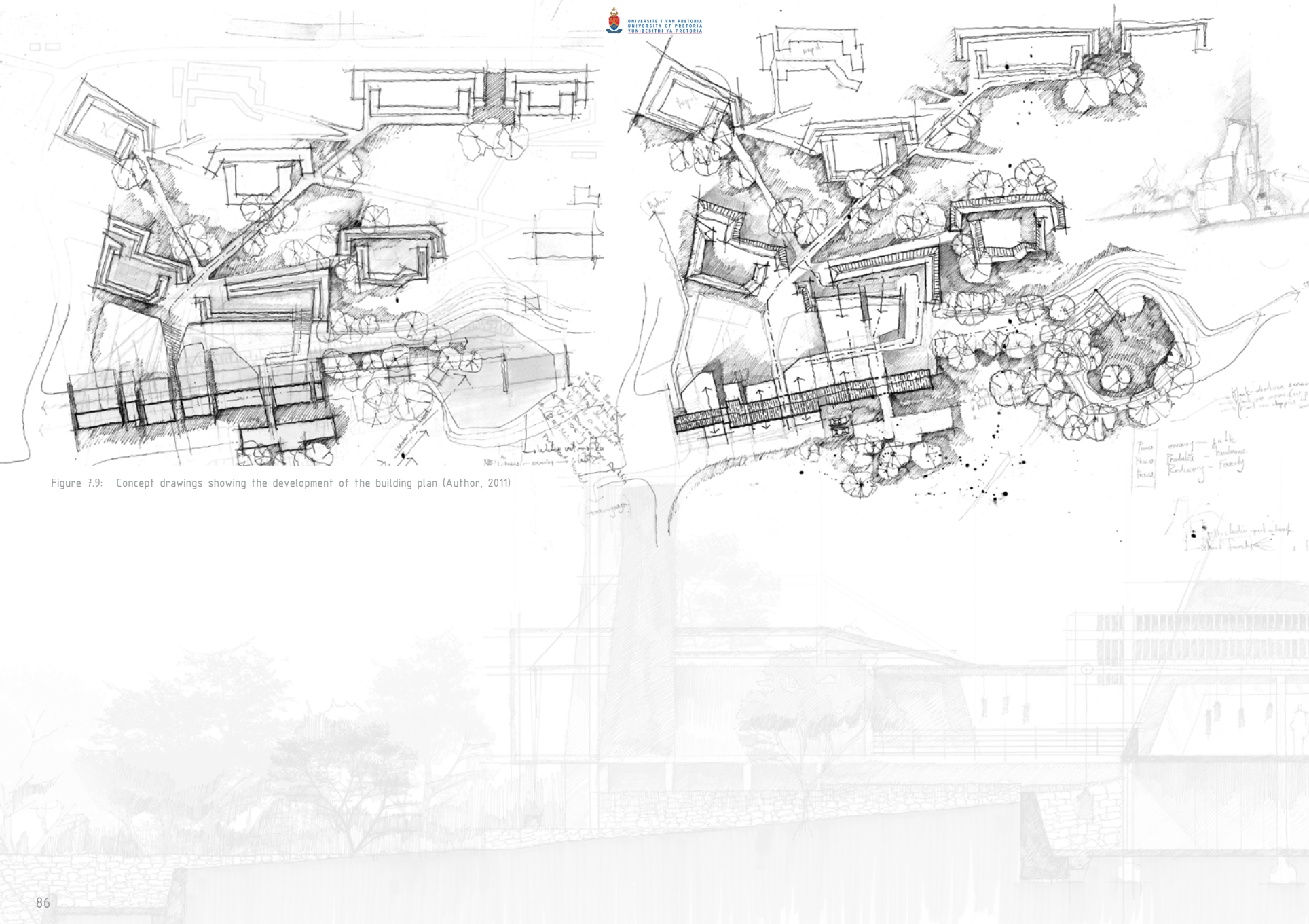
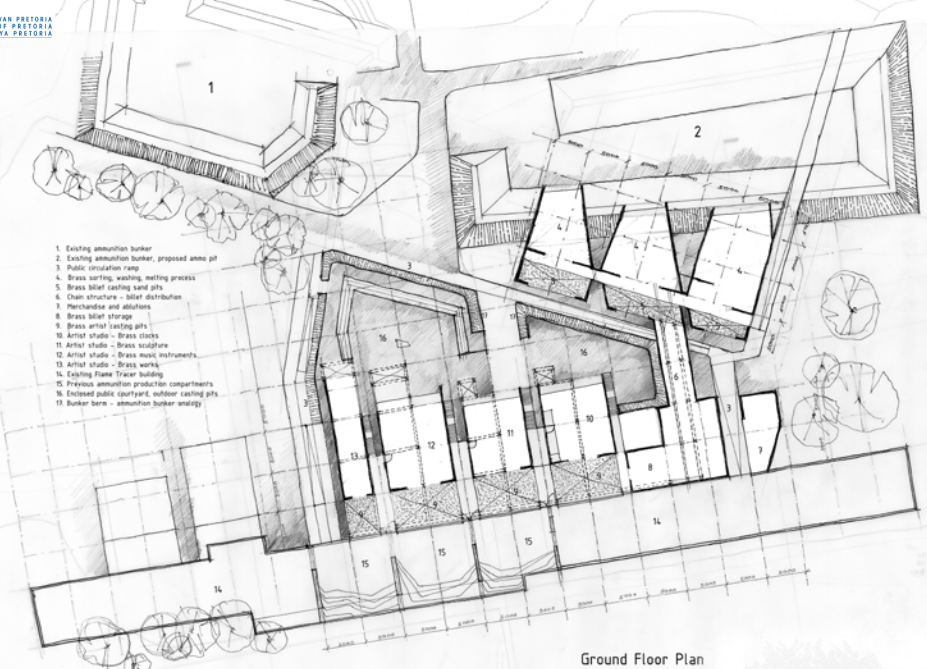
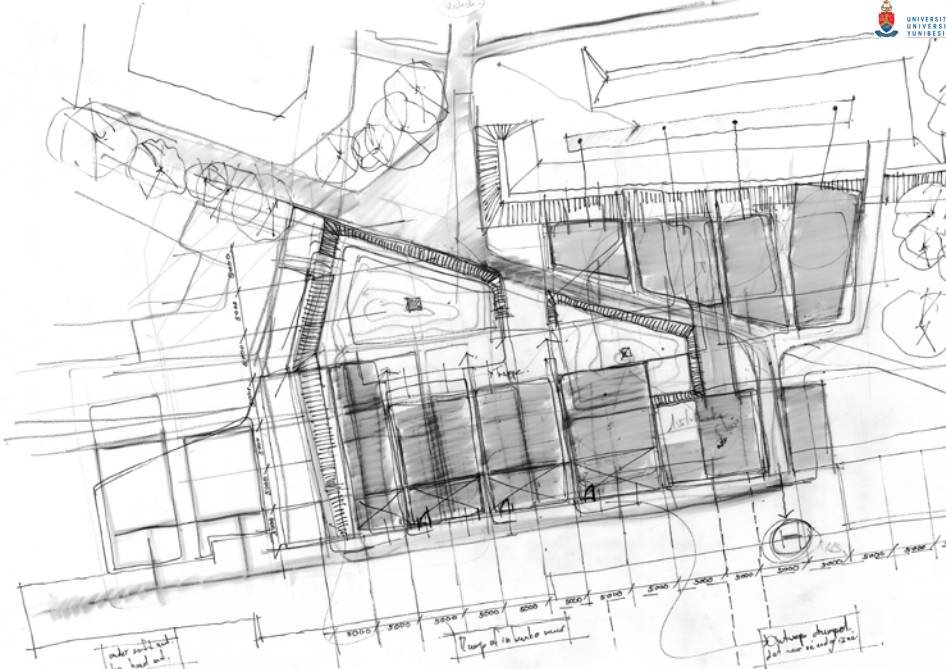


Figure 7.9: Concept drawings showing the development of the building plan (Author, 2011)



Ground Floor Plan

7.4 Site generators

From the initial developmental stage of Magazine Hill (Fort Commeline, 1881) the site had been designed to function as a secretive entity within the natural hilltop landscape. In 1894 when the underground ammunition magazines were constructed on site as part of the second fortification plan for Pretoria, the same concept of veiled architecture concluded a new typology for hidden military infrastructure. The design of the ammunition bunkers with internal production facilities followed the same construction methodology after Magazine Hill was labelled as one of the first sites for military industrialism in the country. This inherent typology of built form on Magazine Hill forms a conceptual platform for space that reveals and space that conceals.

Throughout the design of the route through the site and foundry, this concept of revealing and concealing space is utilised to enrich spatial experience. The old wagon routes that form circulation platforms between the exhibition bunkers define concealing space, while the interiors of the bunkers themselves identify revealed space, revealing exhibited sculptures. The different foundry processes are also experienced to be revealed and concealed along the route through the foundry. This journey through the site strengthens the visitor's interpretation of the hilltop landscape, complying with the third principle of the Eneme Charter which states that a connection should be established between users and the site for individual interpretation (ICOMOS, 2005)

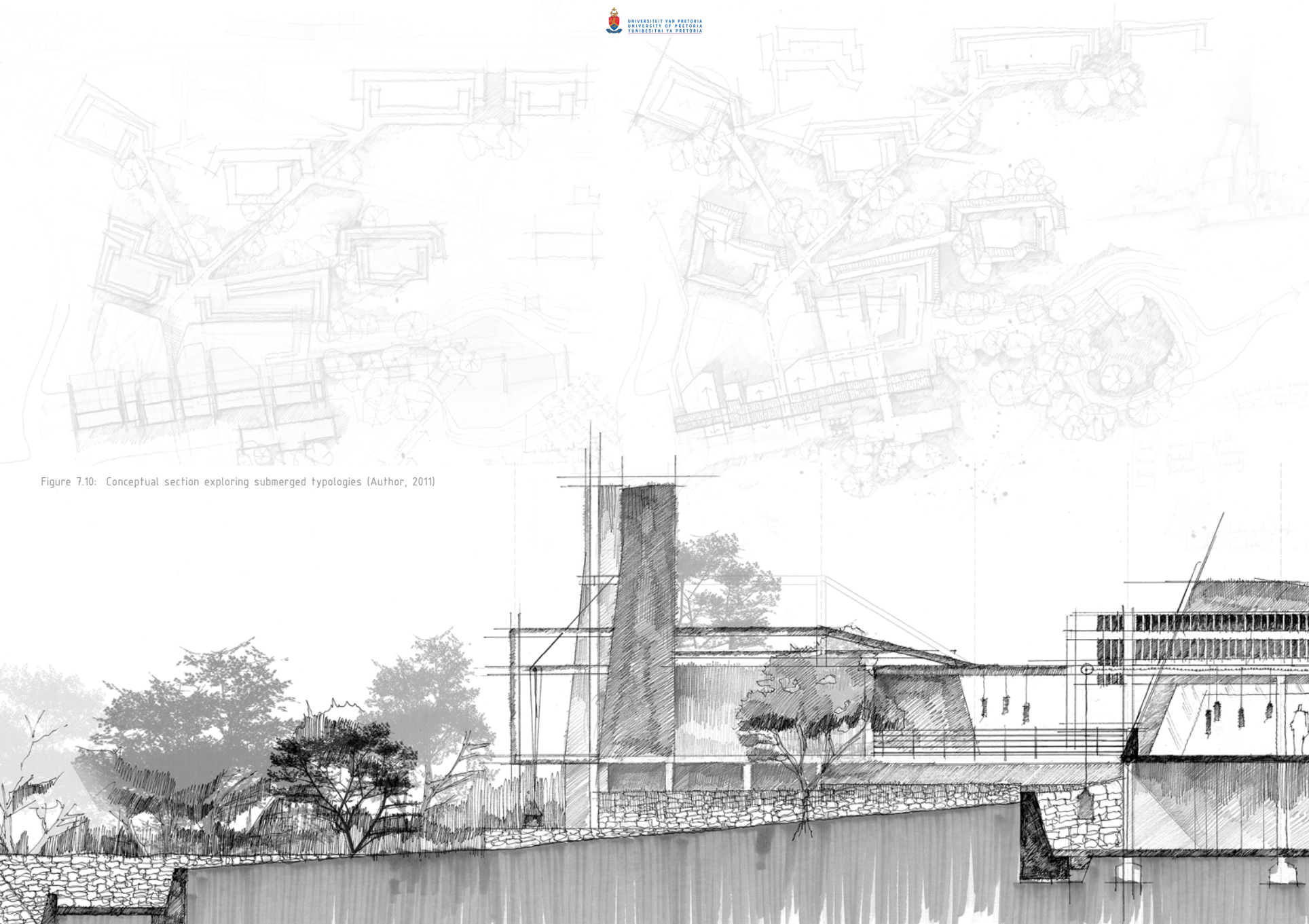
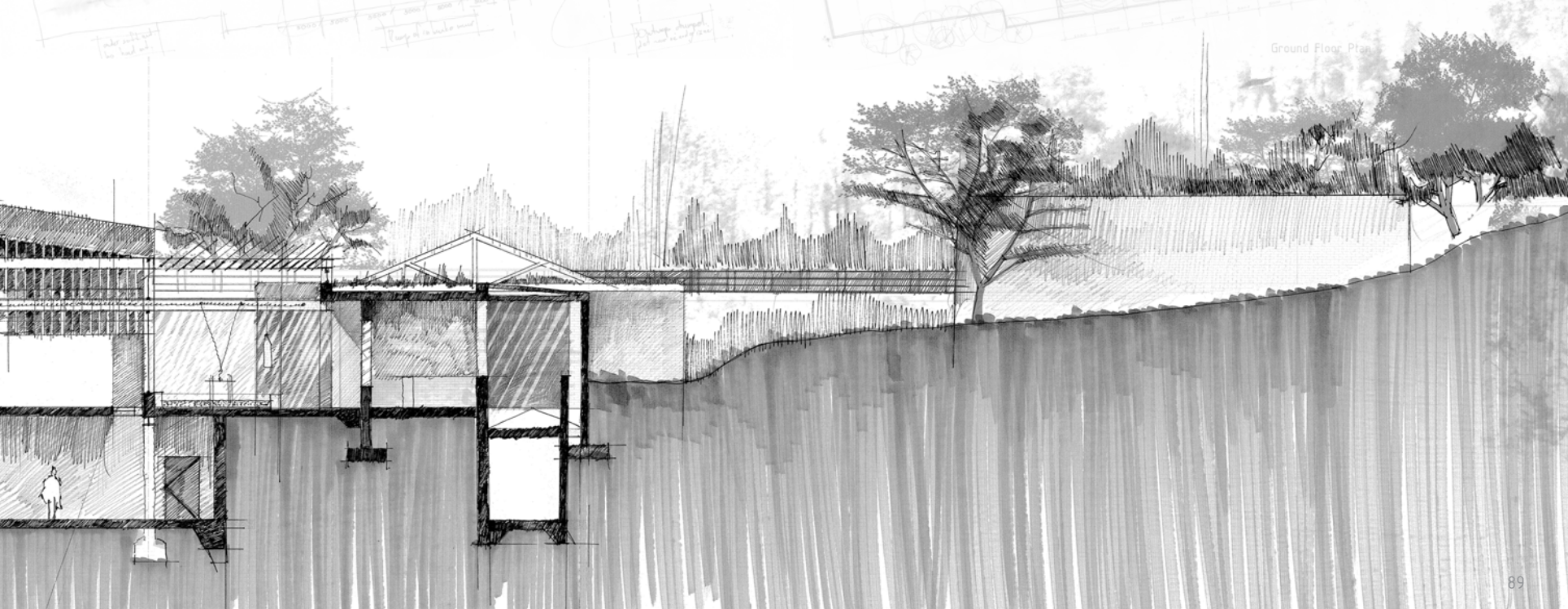


Figure 7.10: Conceptual section exploring submerged typologies (Author, 2011)



- 1 Existing seminar hall
- 2 Existing seminar hall, proposed area for
- 3 Public circulation ramp
- 4 Brass sitting, waiting, meeting grounds
- 5 Brass toilet, waiting, wash gals
- 6 Chair structure - toilet distribution
- 7 Reception and ablutions
- 8 Brass toilet storage
- 9 Brass toilet loading gals
- 10 Artist studio - Brass store
- 11 Artist studio - Brass sculpture
- 12 Artist studio - Brass music instruments
- 13 Artist studio - Brass workshop
- 14 Existing Plaster Tracer building
- 15 Practice seminar production compartment
- 16 Existing public courtyard outdoor seating gals
- 17 Boiler house - seminar boiler energy

Ground Floor Plan



Existing Ammunition bunker

Ammunition shell pit

Crane structure
Pully system for shell hoist

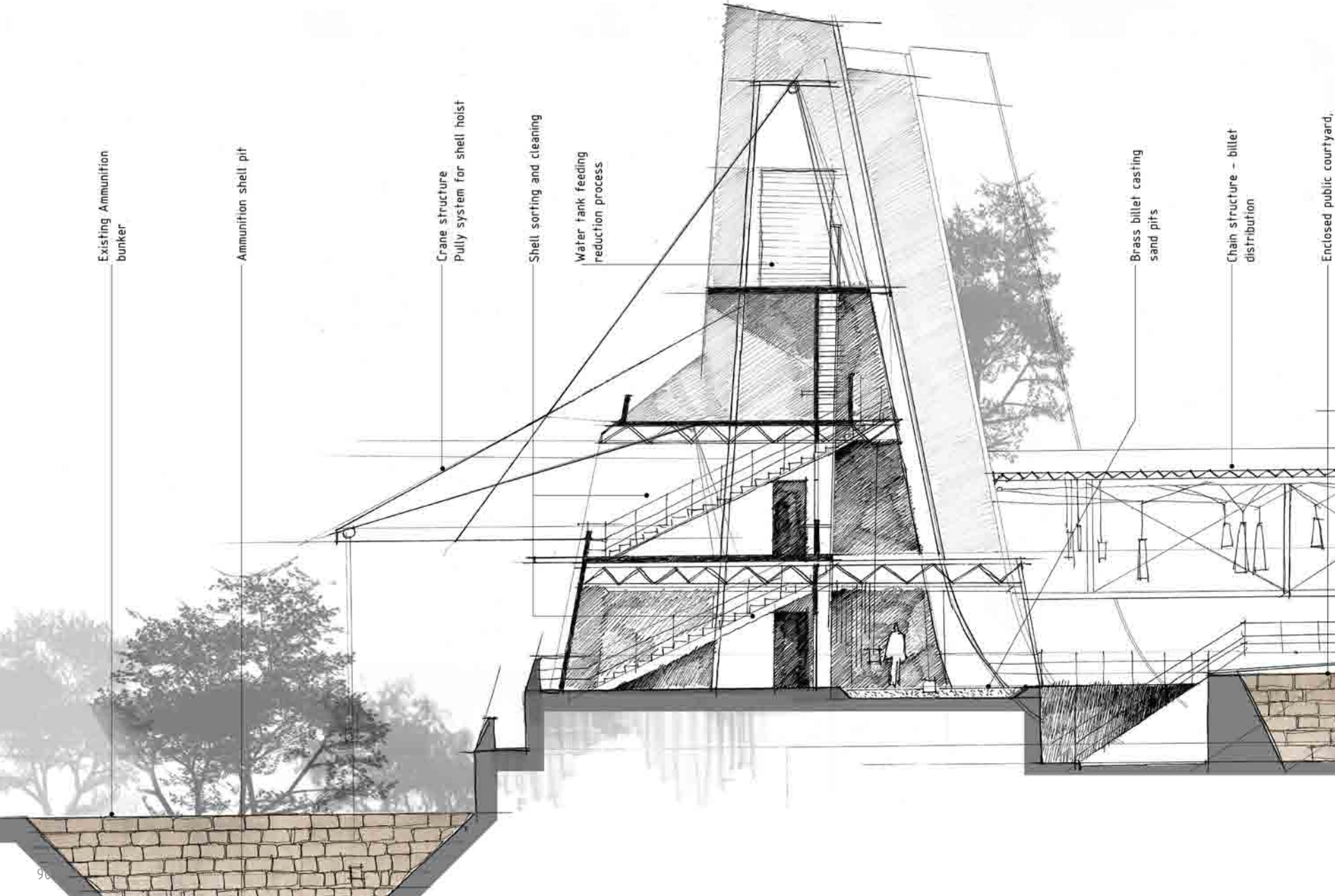
Shell sorting and cleaning

Water tank feeding
reduction process

Brass billet casting
sand pits

Chain structure - billet
distribution

Enclosed public courtyard,



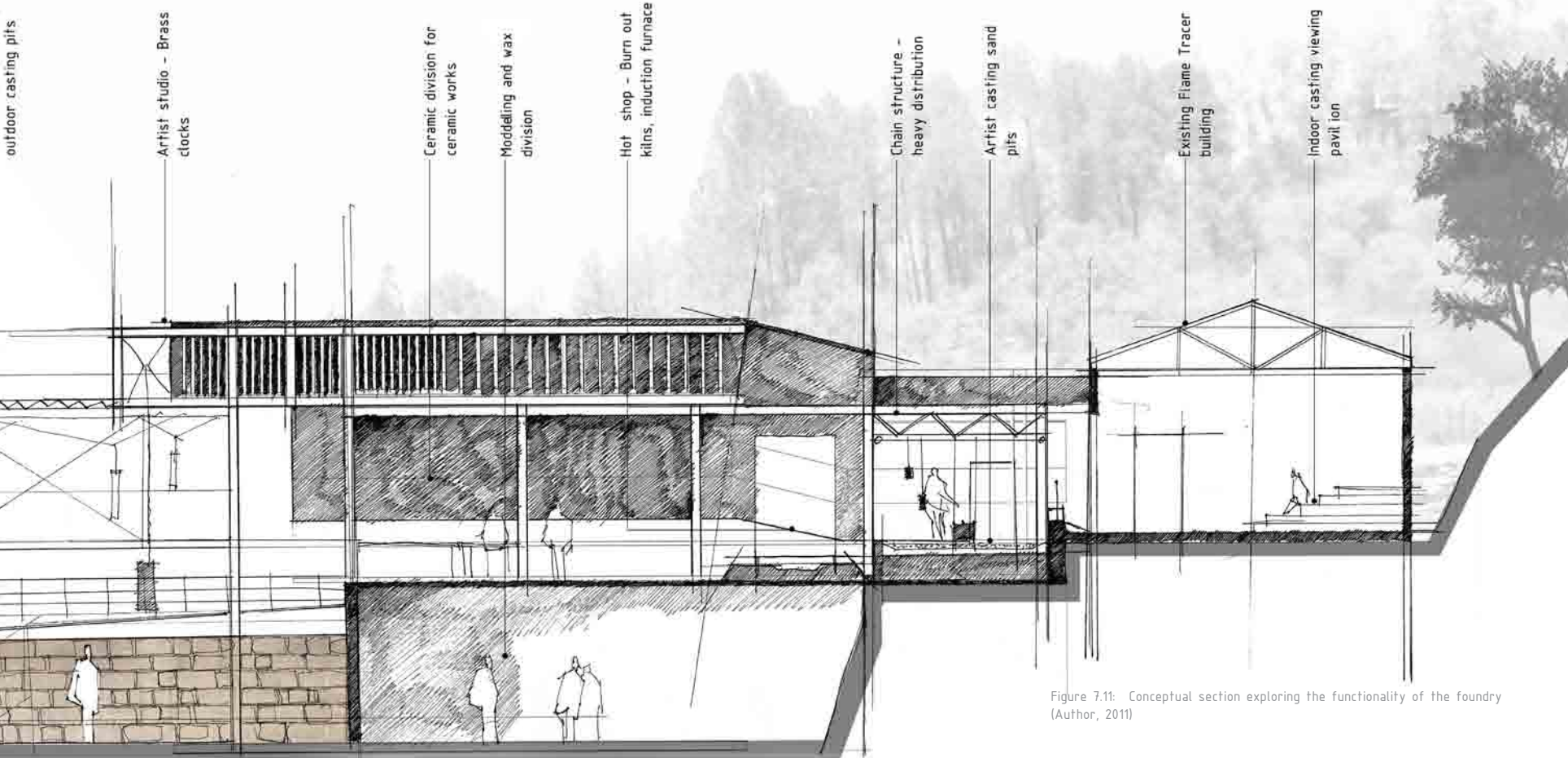


Figure 7.11: Conceptual section exploring the functionality of the foundry (Author, 2011)



Figure 7.12: Concept model of brass foundry
(Author, 2011)



23
New 6 mm Laminated glass clerestory window to be installed in aluminum window frames in existing Flame Tracer building to house for natural day lighting.

24
EXISTING ROOF NOTE:
Existing roof for corrugated iron roof sheeting of existing Flame Tracer building to be removed. New roof to be installed on new steel frame. The roof to be installed on new steel frame. The roof to be installed on new steel frame. The roof to be installed on new steel frame.

25
ROOF NOTE:
100 x 250 x 3 SA 588 Grade 4 galvanized steel purlins to be laid on plywood sub-layer and fixed with flush joint to 200 x 75 x 7.5 hot rolled parallel flange channels. Corrosion treatment to be supplied by Electonac Industries, South Africa.

26
Existing 220 masonry Kirkness Red brick wall of existing Flame Tracer building, with wall window openings @ 2000 mm intervals, no steel props in upper floors.

27
EXISTING STEEL NOTE:
Existing roof truss members to be 40 x 40 x 5 hot rolled steel angle iron, bolted to 4 mm structural gusset plate, allowing for 4 member joints on each plate. Approx gusset plate to be cut on centerline to accommodate existing roof truss. Existing cut gusset plates to be fixed to new IPE 200 hot rolled steel columns with structural bolts to allow for vertical structural movement of new and old roof systems.

28
IPE 200 hot rolled steel beam to form primary structure for roofing system.
New reinforced concrete foundation as per engineer's specification.

20
ROOF NOTE:
100 x 250 x 3 SA 588 Grade 4 CorTen roof plate to be laid on plywood sub-layer and fixed with flush joint to 200 x 75 x 7.5 hot rolled parallel flange channels. Corrosion treatment to be supplied by Electonac Industries, South Africa.

21
2500 x 1200 x 12 mm plywood for form concrete sub-surface for the separation of waterproofing, fire proofing and roofing material. Fixed to 200 x 75 x 7.5 hot rolled parallel flange channels.

22
125x50x20x3 Cold formed lipped channel. Fixed to IPE 200 structural columns @ 840 cc.

23
40 mm SAGEX NULITE Expanded polystyrene (EPS) insulation with a density of min 100 kg/m³ to be placed between 125x50x20x3 cold formed lipped channels with 83 degree slope of roof. Block and tie-in vertical beam system to be suspended from IPE 200 hot rolled steel, been for vertical distribution of raw material.

24
Entrance into existing Flame Tracer building
Basement ventilator clerestory window with slatted precast concrete coping for water diversion.
140 mm (max thickness) Reinforced gravelly type stone retaining wall to be constructed on a 300mm reinforced concrete pad foundation with provided weep holes @ 1/3rd of wall surface.
100 mm Precast concrete steps lead on 1000 mm loose packed gravel bed on compacted soil.

19

18

17

16

16 x 2500 mm Translucent Opening Roof waterproofing aluminum louvre and gutter system with Hylabrite UV treated top panels for UV penetration with spiral pipe system. To be installed between 200 x 75 hot rolled parallel flange channels according to Louvre's specifications.

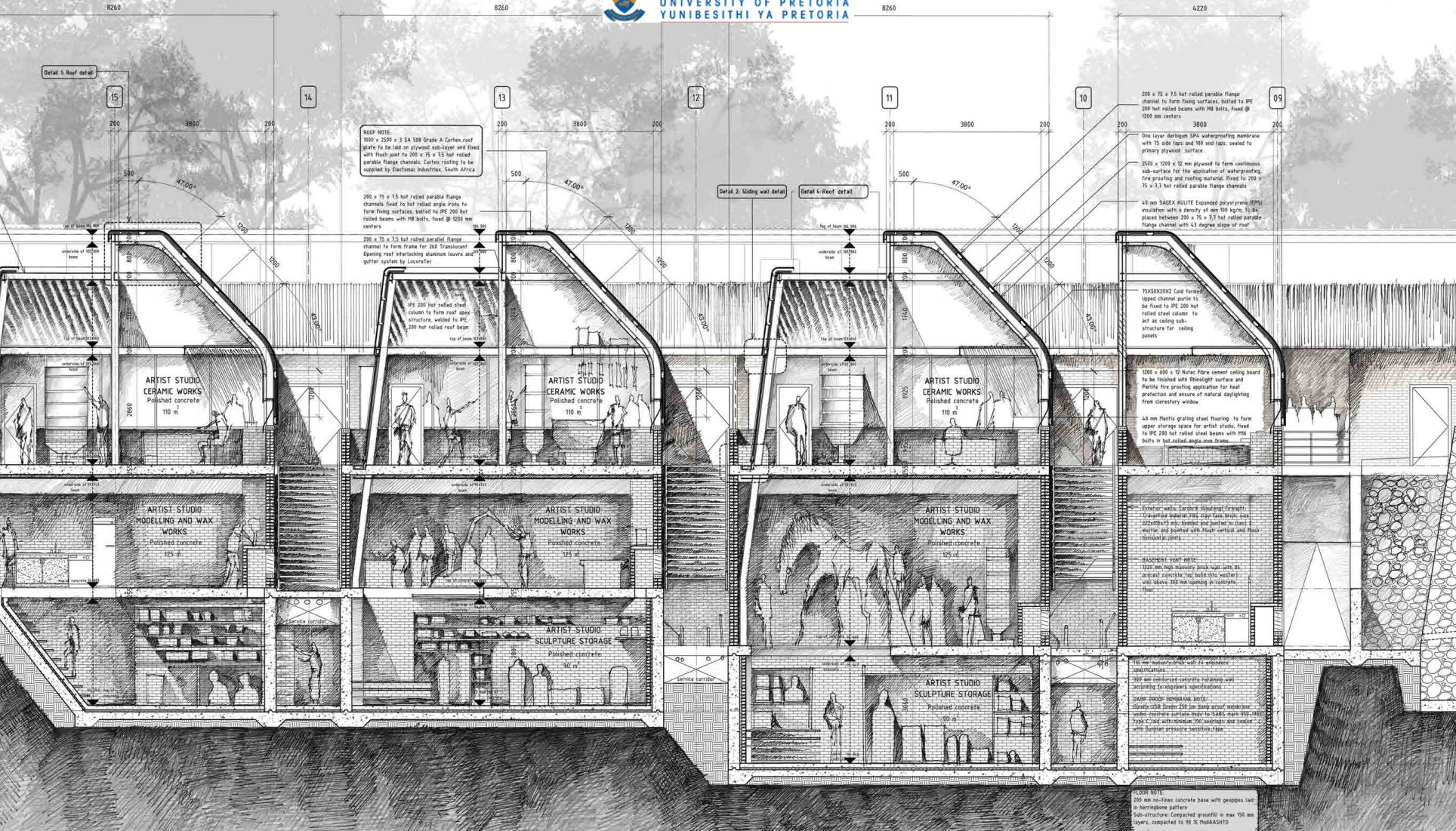
17
125x50x20x3 Cold formed lipped channel. Fixed to IPE 200 structural columns @ 840 cc.
3360 mm high composite sliding wall panel to be fixed on 100x50 hot rolled PPC channel frame, sliding in a vertical adjustable top guide and bottom track system. All specifications to comply with Initiatum Column Straightaway 900 track and wheel system.

18
Exterior walls: Corobal (Basalt) Firelight 11.7mm fire-rated FBS clay face brick, size 212x104x73 mm, bedded and jointed in thick 2 mortar and pointed with flush vertical and flush horizontal joints.
100 mm precast concrete retaining wall.
100 mm loose packed gravel bed on compacted soil.

19
Damp proofing: 40mm thick bituminous membrane under concrete surface bed to 1000 mm high on 100 mm loose packed gravel bed. 150 mm concrete slab with 20mm concrete surface layer.
ROOF NOTE:
200 mm fire proof concrete slabs with 20mm gap in between slabs.
Sub-structure: completed structure in max 100 mm levels, completed to 70% of 1000 mm.

20
BILLET AND INGOT STORAGE
Polished concrete
133 m²

21
BILLET AND INGOT STORAGE
Polished concrete
133 m²



ROOF NOTE:
1000 x 2500 x 3 SA 588 Grade A Corfen roof plate to be laid on plywood sub-layer and fixed with flush joint to 200 x 75 x 3.5 hot rolled parallel flange channels. Corfen roofing to be supplied by Electrofen Industries, South Africa

200 x 75 x 3.5 hot rolled parallel flange channels fixed to hot rolled angle irons to form fixing surfaces, bolted to IPE 200 hot rolled beams with M8 bolts, fixed @ 1200 mm centers

200 x 75 x 3.5 hot rolled parallel flange channel to form frame for 200 Translucan® spraying roof waterproofing aluminum downer and gutter system by Louretec.

IPE 200 hot rolled steel column to form roof steel structure, welded to IPE 200 hot rolled roof beam

200 x 75 x 3.5 hot rolled parallel flange channel to form fixing surfaces, bolted to IPE 200 hot rolled beams with M8 bolts, fixed @ 1200 mm centers

One layer deribam® DPA waterproofing membrane with 30 side laps and 150 end laps, sealed to primary plywood surface

2500 x 1200 x 12 mm plywood to form continuous sub-surface for the application of waterproofing, fire proofing and roofing materials, fixed to 200 x 75 x 3.5 hot rolled parallel flange channels

40 mm SAGEX KILITE Expanded polystyrene (EPS) insulation with a density of min 100 kg/m³, to be placed between 200 x 75 x 3.5 hot rolled parallel flange channel with 0.3 degree slope of roof

75X50X2002 Cold formed light gauge channel section to be fixed to IPE 200 hot rolled steel column to act as ceiling sub-structure for ceiling panels

1200 x 600 x 12 Hovot Fibre cement ceiling board to be finished with thinlight surface and Pericor fire proofing application for heat protection and ensure all material complying from fire safety window

40 mm Plastic grating steel flooring to form upper storage space for artist studio, fixed to IPE 200 hot rolled steel beams with M8 bolts to hot rolled angle iron frame

Exterior walls: Corcor® lightgrey finish; 100mm insulation; 100mm concrete base; 100mm brick; 100mm plaster and sand; 100mm plaster and sand; 100mm plaster and sand

BASINMENT UNIT NOTE:
1200 mm high masonry brick wall with 100mm concrete base; 100mm plaster and sand; 100mm plaster and sand

110 mm masonry brick wall; 100mm concrete base; 100mm plaster and sand; 100mm plaster and sand

100 mm reinforced concrete slab with 100mm aggregate for structural specifications

BASE NOTE:
100mm reinforced concrete base with pebbles laid in herringbone pattern
Sub-structure: Compacted gravel in max 150 mm layers, compacted to 10% Proctor AASHITD

FLOOR NOTE:
100 mm no-fines concrete base with pebbles laid in herringbone pattern
Sub-structure: Compacted gravel in max 150 mm layers, compacted to 10% Proctor AASHITD

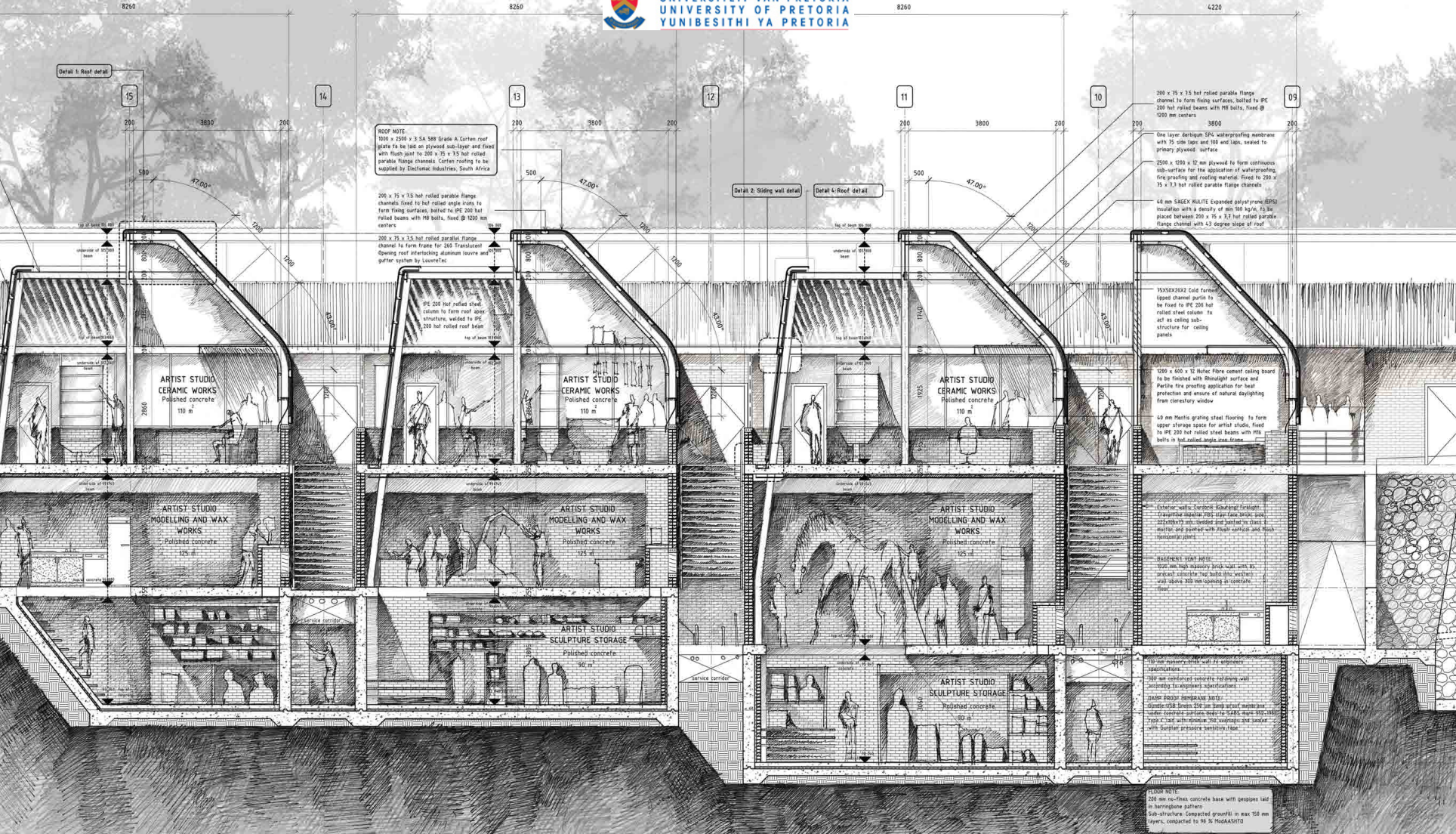
Detail 3: Roof detail

Detail 2: Sliding wall detail

Detail 4: Roof detail

09

FLOOR NOTE



Detail 1: Roof detail

200 x 75 x 7.5 hot rolled parallel flange channel to form frame for 200 Translucent Opening roof interlocking aluminum louvre and gutter system by Louvretec.

ROOF NOTE:
900 x 200 x 3 SA 588 Grade A Carbon roof plate to be laid on plywood sub-layer and fixed with flush joints to 200 x 75 x 7.5 hot rolled parallel flange channel. Carbon roofing to be supplied by Emfamec Industries, South Africa

200 x 75 x 7.5 hot rolled parallel flange channel to form frame for 200 Translucent Opening roof interlocking aluminum louvre and gutter system by Louvretec.

Detail 2: Sliding wall detail

Detail 4: Roof detail

200 x 75 x 15 hot rolled parallel flange channel to form facing surfaces, bolted to PE 200 hot rolled beams with M8 bolts, fixed @ 1200 mm centres

One layer fibreglass GFR waterproofing membrane with 75 side tape and 100 end laps, sealed to primary plywood surface

2500 x 1200 x 12 mm plywood to form continuous sub-surface for the application of waterproofing, fire proofing and insulating materials, fixed to 200 x 75 x 7.5 hot rolled parallel flange channel

48 mm SAKRE KALITE Expanded polystyrene (EPS) insulation with a density of min 50 kg/m³, to be placed between 200 x 75 x 7.5 hot rolled parallel flange channel with 45 degree slope of roof

15X5X20X2 Cold formed square channel section to be fixed to PE 200 hot rolled steel column to act as ceiling sub-structure for ceiling panels

1500 x 600 x 12 Hotset fibre cement ceiling board to be finished with fibreglass surface and Pericite fire proofing application for heat protection and ensure of natural daylighting from clerestory window

48 mm flexible grating steel flooring to form upper storage space for artist studio, fixed to PE 200 hot rolled steel beams with M8 bolts in hot rolled angle steel frame

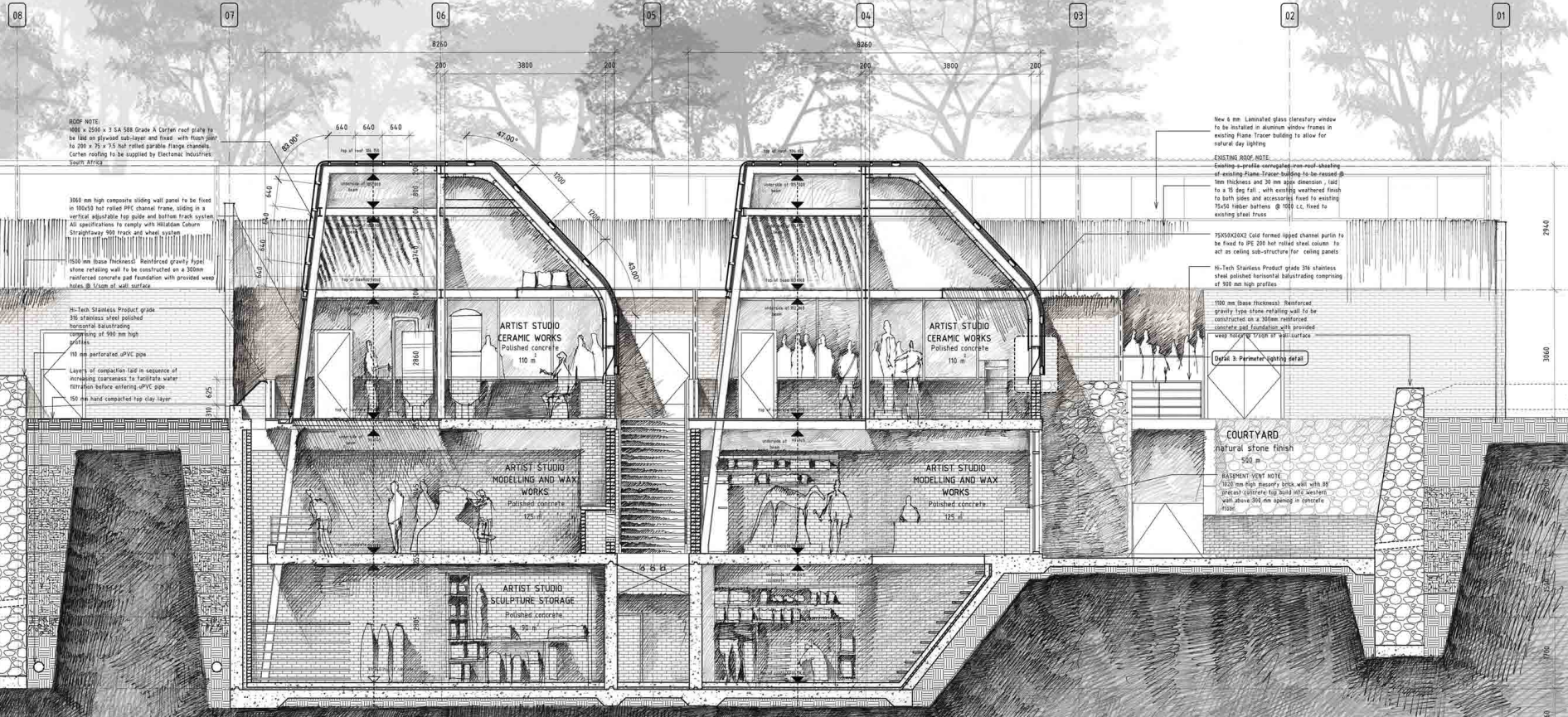
External walls: Corobroc Aquaplast 100mm 12 layer the master 700 grey face brick, 100 x 200 (100) mm, finished and painted in Class 1 finish, and painted with Akzo Nobel and Akzo Monocoat paint

BRICKWORK ROOF BRICK: 100mm high quality brick with min 8% absorbent water for top built brick, western wall above 100 mm square in concrete floor

30 mm masonry brick wall An exterior identification for all masonry concrete retaining wall identified for slipshod identification

DAMP PROOF MEMBRANE JAMB: Concrete masonry 200 mm damp proof membrane water concrete surface with 100mm masonry 100 mm x 100 mm with 100mm 100 waterproof and sealed with Soudure pressure sensitive fibre

FLOOR NOTE:
200 mm rebar concrete base with peepoles laid in homogeneous gaffers
Sub-structure: compacted gravel in max 150 mm layers, compacted to 95% Proctor



ROOF NOTE
400 x 250 x 3 S4 S88 Grade A Curran roof plate to be laid on plywood sub-layer and fixed, with flash joint to 200 x 75 x 75 hot-rolled galvanized flange channels. Curran roofing to be supplied by Electrical Industries, South Africa.

3500 mm high composite sliding wall panel to be fixed in 100x50 hot-rolled PVC channel frame, sliding in a vertical adjustable top guide and bottom track system. All specifications to comply with Hilti/Imacon Colours Straightaway 900 track and wheel system.

100 mm (base thickness) Reinforced gravelly light stone retaining wall to be constructed on a 300mm reinforced concrete pad foundation with provided weep holes @ 1/2m of wall surface.

Hi-Tech Stainless Product grade 316 stainless steel polished horizontal battens comprising of 900 mm high profiles.

100 mm perforated uPVC pipe.
Layers of compaction 100 in sequence of mechanical compact to facilitate water retention before entering uPVC pipe.
150 mm hand compacted top clay layer.

8250 290 3800 290 8250 290 3800 290

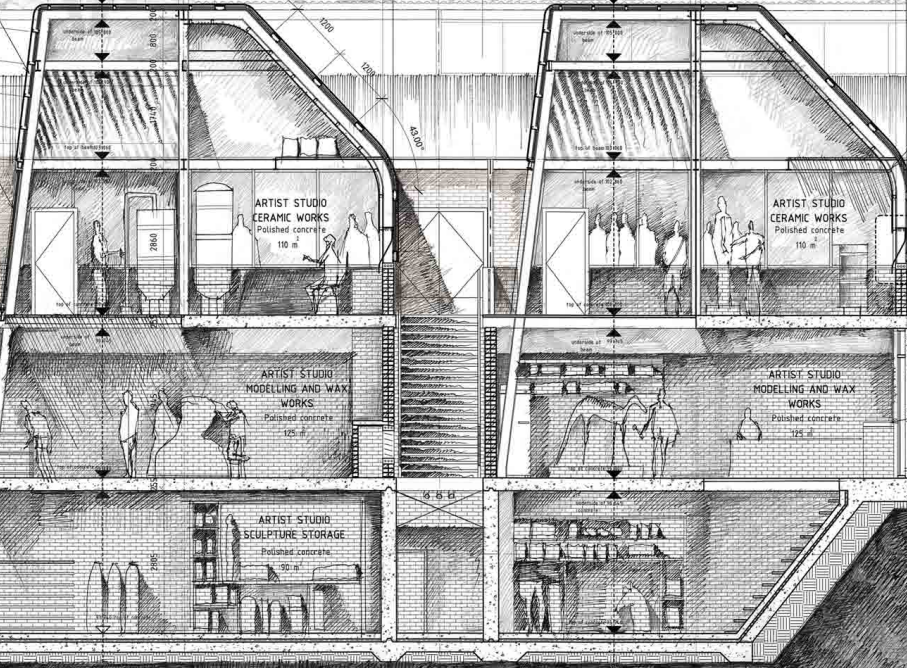
640 640 640
85.00°
45.00°
45.00°
45.00°
45.00°

310 425

190 125 110 110

190 125 110 110

190 125 110 110



New 6 mm Laminated glass glazery window to be installed in aluminum window frames on existing Flame Tracer Building to allow for natural day lighting.

EXISTING ROOF NOTE
Existing corrugated metal roof-shedding of existing Flame Tracer Building to be removed. 20 mm thickness and 20 mm slope. Installation to be to a 15 deg fall, with certified weathered finish to both sides and accessories fixed to existing 100x10 timber rafters @ 1000 c/c fixed to existing steel truss.

70x50x3202 Cold formed light gauge channel purlin to be fixed to P10 200 hot rolled steel column to act as ceiling sub-structure for ceiling panels.

Hi-Tech Stainless Product grade 316 stainless steel polished horizontal battens comprising of 900 mm high profiles.

100 mm (base thickness) Reinforced gravelly light stone retaining wall to be constructed on a 300mm reinforced concrete pad foundation with provided weep holes @ 1/2m of wall surface.

Duralit 3 Perimeter lighting detail.

COURTYARD natural stone finish 500 m²

RAISEMENT VENT NOTE
400 mm high masonry brick wall with 50 mm clear openings for brick masonry weepers. Wall above 200 mm openings in concrete floor.

01

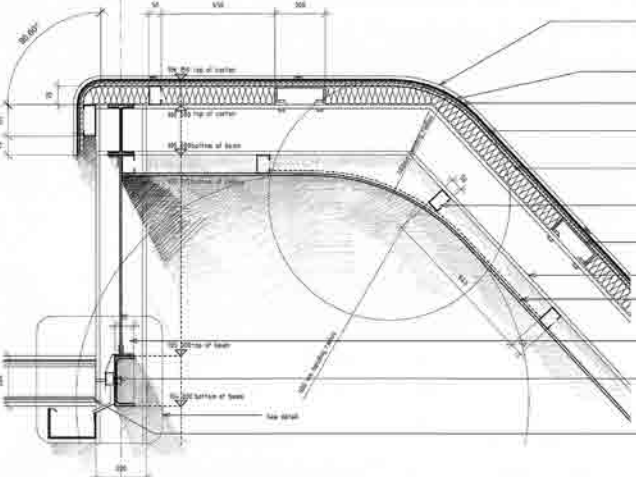
2945

3060

7 -

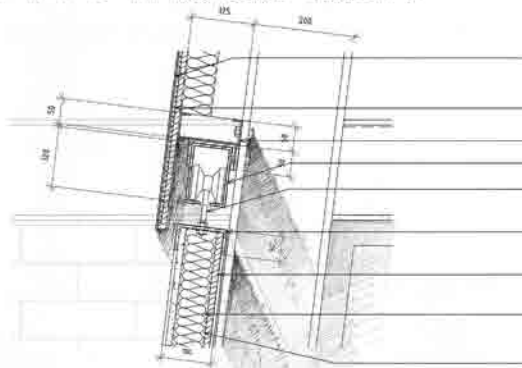
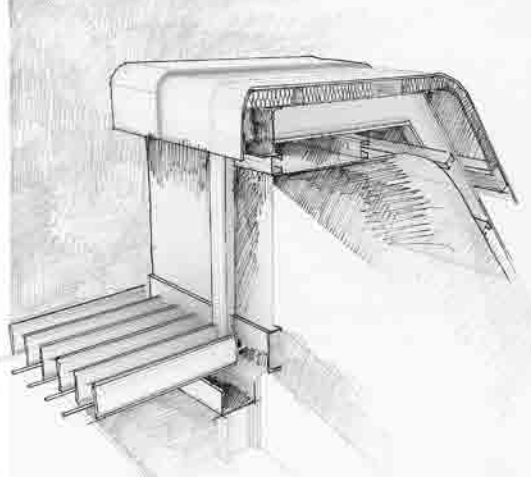
700

10M

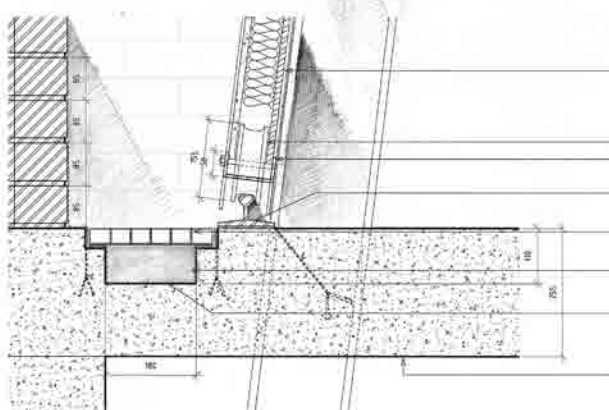


- 000 x 200 x 0.9 EA 100 Grade A Corten roof plate to be laid on plywood sub-deck with finish with waterproofed waterproofed slope to 200 x 75 x 2.5 hot rolled parallel flange channel. Corrosion coating to be applied by Barmec Insulation, South Africa.
- One layer strapping 3% waterproofing membrane with 75 mm lap and 50 mm lap, used to primary plywood surface
- 0.3 mm fire proofing membrane to be laid on 20 mm plywood surface
- 200 x 200 x 12 mm plywood to form continuous sub-deck for the application of waterproofing fire proofing and insulating materials. Fixed to 100 x 75 x 2.5 hot rolled parallel flange channel
- 10 mm SAEK R AUSTE Expanded polystyrene EPS insulation with a density of min 20 kg/m³ to be placed between 200 x 75 x 2.5 hot rolled parallel flange channel with 15 mm gap at roof
- 100x100x10 Cold Rolled Light Steel Joist to be fixed to PE 200 hot rolled steel channel to act as ceiling infrastructure for lighting system
- 200 x 75 x 2.5 hot rolled parallel flange channel with vector channels to form ceiling surface, fixed to PE 200 hot rolled beam with 90 joints, fixed @ 1000 mm centers
- PE 200 hot rolled steel beam to form primary structure for lighting system
- 200 x 200 x 20 mm Glass fibre cement ceiling board to be fixed with knockout surface and female fire proofing application for heat protection and electrical of ceiling (weighting 150 kg/m²) ceiling surface. Ceiling can be be achieved with 20 mm cement rendering board
- 100 x 500 mm Glass fibre window frame with a 10 mm clear and heat glass with ACO/ self cleaning treatment from PG Glass
- 200 x 75 x 2.5 hot rolled parallel flange channel to be used to PE 200 hot rolled colour of 200 mm. Beams to form ceiling structure for tubular retaining beam and gutter system
- 80 x 200 mm Insulation Sliding Wall Retaining window frame and gutter system with 200x75x2.5 hot rolled steel for 80 mm separation with wind and water. It is to be installed between 200 x 75 hot rolled parallel flange channel according to supplier's specifications.

DETAIL 1: ROOF DETAIL SCALE: 1:10

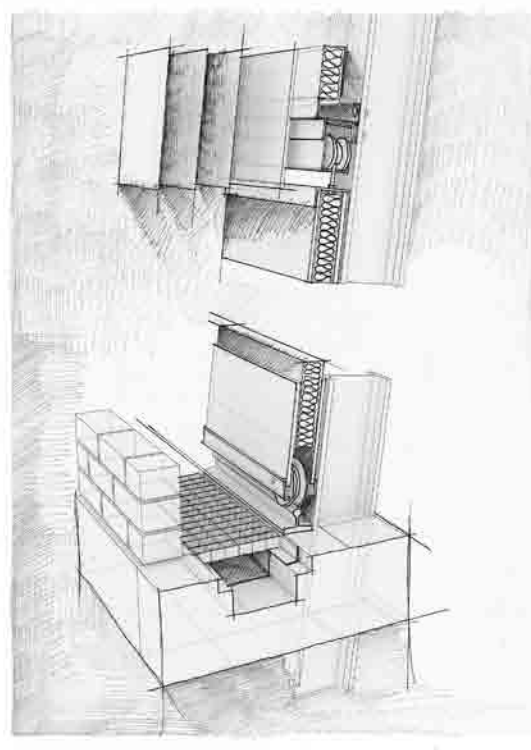


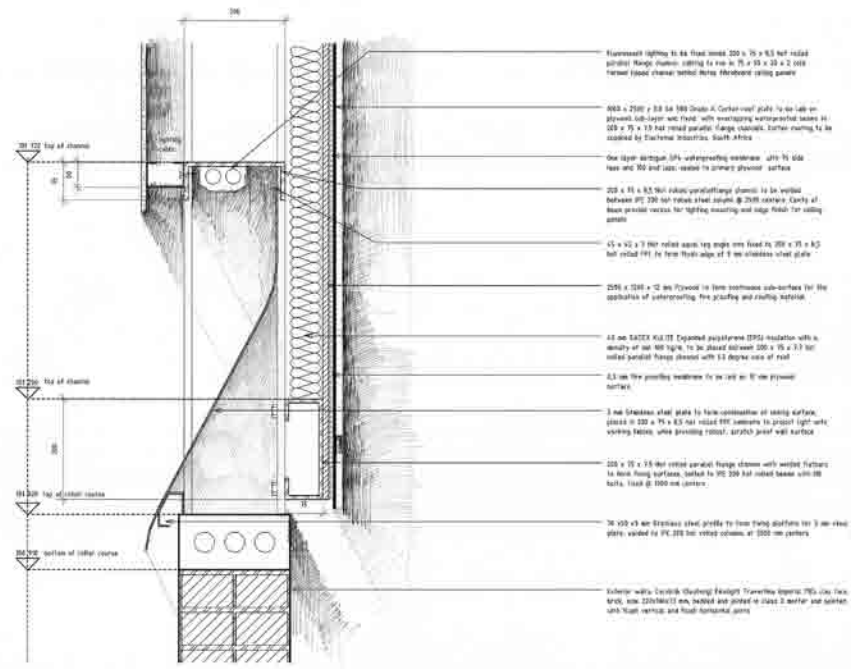
- 000 x 200 x 0.9 EA 100 Grade A Corten roof plate to be laid on plywood sub-deck with finish with waterproofed waterproofed slope to 200 x 75 x 2.5 hot rolled parallel flange channel. Corrosion coating to be applied by Barmec Insulation, South Africa
- One layer strapping 3% waterproofing membrane with 75 mm lap and 50 mm lap, used to primary plywood surface
- 0.3mm SAEK R AUSTE Cold Rolled Light Steel Joist to be fixed to PE 200 structural channel @ 1000 mm
- 100 x 500 mm hot rolled parallel flange channel to form ceiling and gutter system. It is to be installed between 200 x 75 hot rolled parallel flange channel according to supplier's specifications.
- Two gable supports vertical ball as per Master Eckert, provided @ 1000 mm centers
- 800 mm high composite sliding wall panel to be fixed to 100x100 hot rolled PE 200 channel frame sliding in a vertical adjustable top guide and bottom track system. All applications to comply with Hilti/Deubor Slidingway 100 track and wheel system
- 800 mm high composite sliding wall panel to be fixed to 100x100 hot rolled PE 200 channel frame sliding in a vertical adjustable top guide and bottom track system. All applications to comply with Hilti/Deubor Slidingway 100 track and wheel system
- 10 mm SAEK R AUSTE Expanded polystyrene EPS insulation with a density of min 20 kg/m³ to be placed between 200 x 75 x 2.5 hot rolled parallel flange channel
- 0.3 mm fire proofing membrane to be laid on 20 mm plywood surface



- 100 mm high composite sliding wall panel to be fixed to 100x100 hot rolled PE 200 channel frame sliding in a vertical adjustable top guide and bottom track system. All applications to comply with Hilti/Deubor Slidingway 100 track and wheel system
- 75 mm thick 400 bottom roller as per Hilti/Deubor
- 80 x 50 x 2 hot rolled parallel flange channel to form frame and bottom guide of composite wall
- 10 x 12 mm bottom track to be placed at 200 mm from fixed with 20 mm gap bracket in concrete support. Bottom track as per Hilti/Deubor Slidingway 100 bottom roller sliding with system
- 10 mm-reversible Hilti/Deubor to be placed in concrete installation on 80 x 50 x 2.5 hot rolled parallel flange channel
- 200 x 75 mm aluminium extrusion gutter used to gutter system fixed
- One layer strapping 3% waterproofing membrane with 75 mm lap and 50 mm lap, used to primary concrete surface by Barmec/Deubor
- 85 mm-thick concrete floor as per engineer's specifications

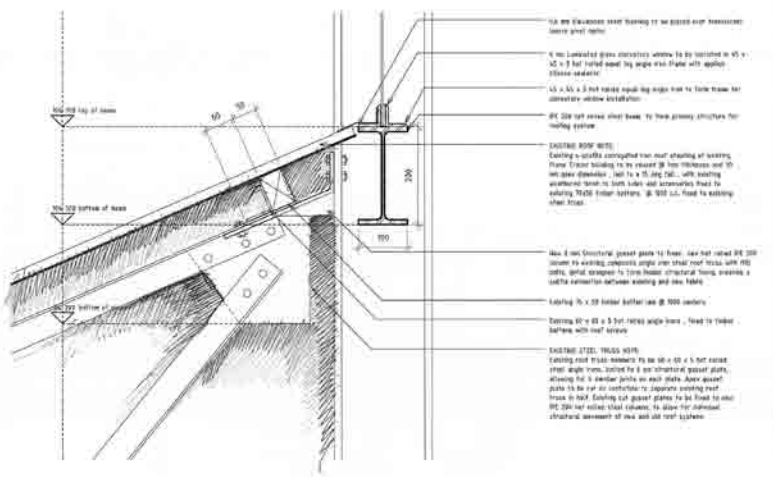
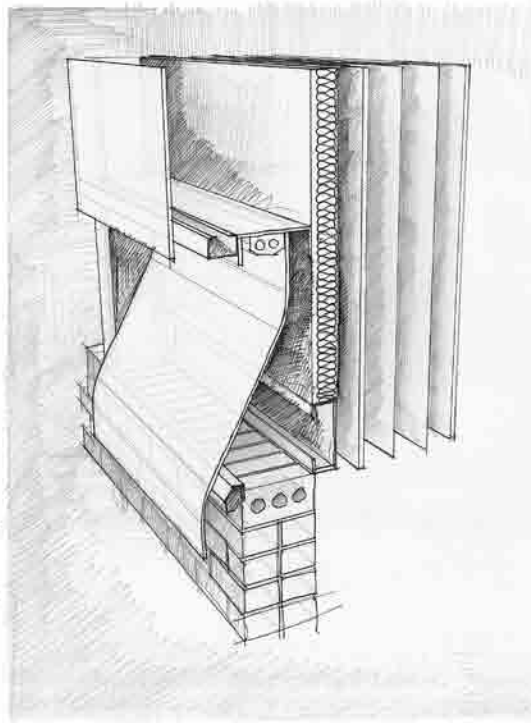
DETAIL 2: SLIDING WALL DETAIL SCALE: 1:5



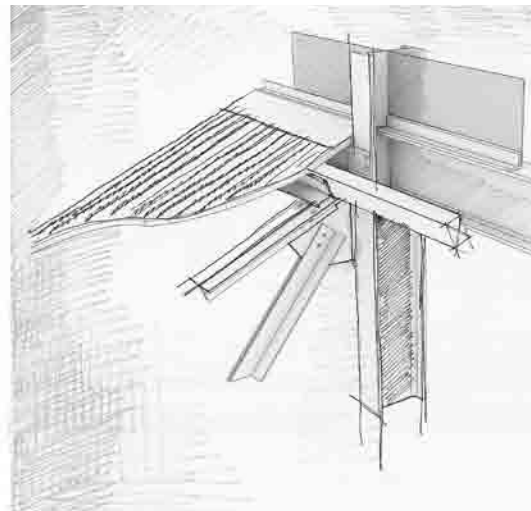


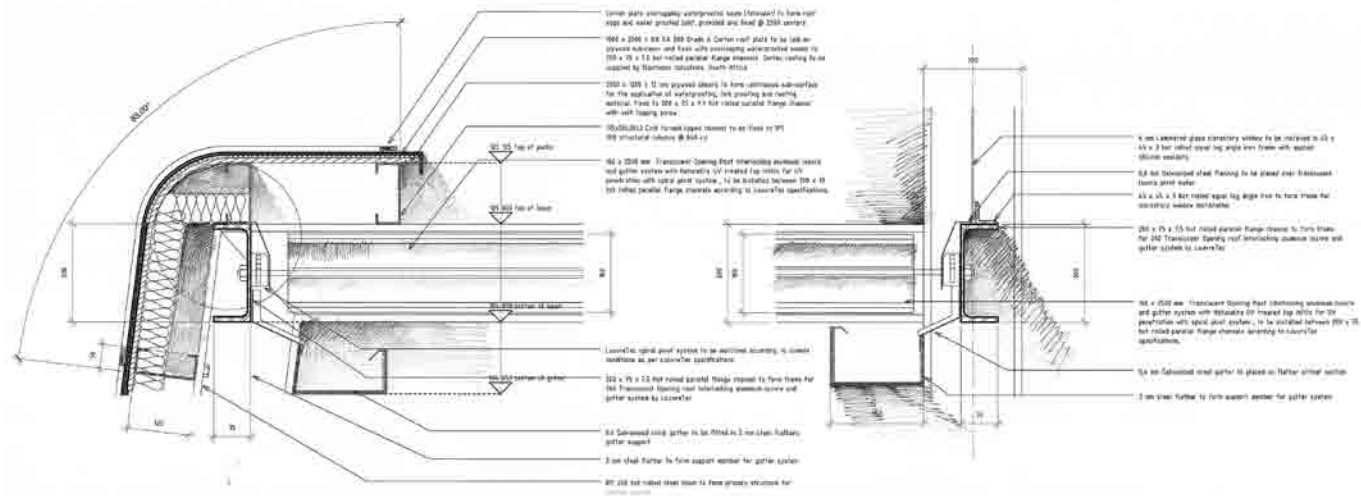
- Fluorescent lighting to be fixed inside 200 x 75 x 15 x 2.5 mm channel (channel lighting to be fixed to 75 x 15 x 2.5 x 2.5 mm channel fixed channel using fluorescent spring gasket)
- 100 x 2100 x 2.5 mm 180 Degree A Carter roof profile to be used on glass sub-cover and fixed with neoprene waterproofed beams to 125 x 75 x 15 mm metal parallel flange channel, further fixing to be supplied by structural subcontractor, South Africa
- One layer 400gsm GFS waterproofing membrane with 70 dia base and 50 mm cast, used to primary glassed surface
- 225 x 41 x 8.5 mm Galvalume perforated flange channel to be welded between PVC 200 dia metal sheet supports @ 200 mm centres. Gully of beam provide access for lighting mounting and edge finish for ceiling panel
- 45 x 42 x 3 mm metal screw leg angle iron fixed to 200 x 75 x 8.5 mm metal PVI for floor finish edge of 3 mm stainless steel plate
- 250 x 120 x 12 mm Plywood to form soffits sub-surface for the application of waterproofing the glazing and ceiling interior
- 40 mm GAFEX K111 Expanded polystyrene (EPS) insulation with a density of not less than 20 kg/m³ to be placed below 200 x 75 x 8.5 mm metal parallel flange channel with 10 degree rise of roof
- 45 mm fire proofing membrane to be set on 10 mm plywood surface
- 3 mm Stainless steel plate to face continuation of ceiling surface, placed in 225 x 75 x 8.5 mm metal PVI channels to protect light wire, wiring cables, when providing raised, airlock joint wall surface
- 225 x 15 x 1.5 mm metal parallel flange channel with welded fixings to steel fixing surfaces, fixed to PVC 200 dia metal beam with 10 bolts, fixed @ 100 mm centres
- 30 mm x 40 mm Stainless steel profile to form fixing brackets for 3 mm steel plate, fixed to PVC 200 dia metal beams at 100 mm centres
- Interior walls: Ceramic Cladding, Fastlight Travertine Granite Tiles, 100 mm thick brick, size 230/110/77 mm, bonded and pointed in class 2 mortar and plaster with 10mm vertical and horizontal joints

DETAIL 3: PERIMETER LIGHTING DETAIL SCALE: 1:5

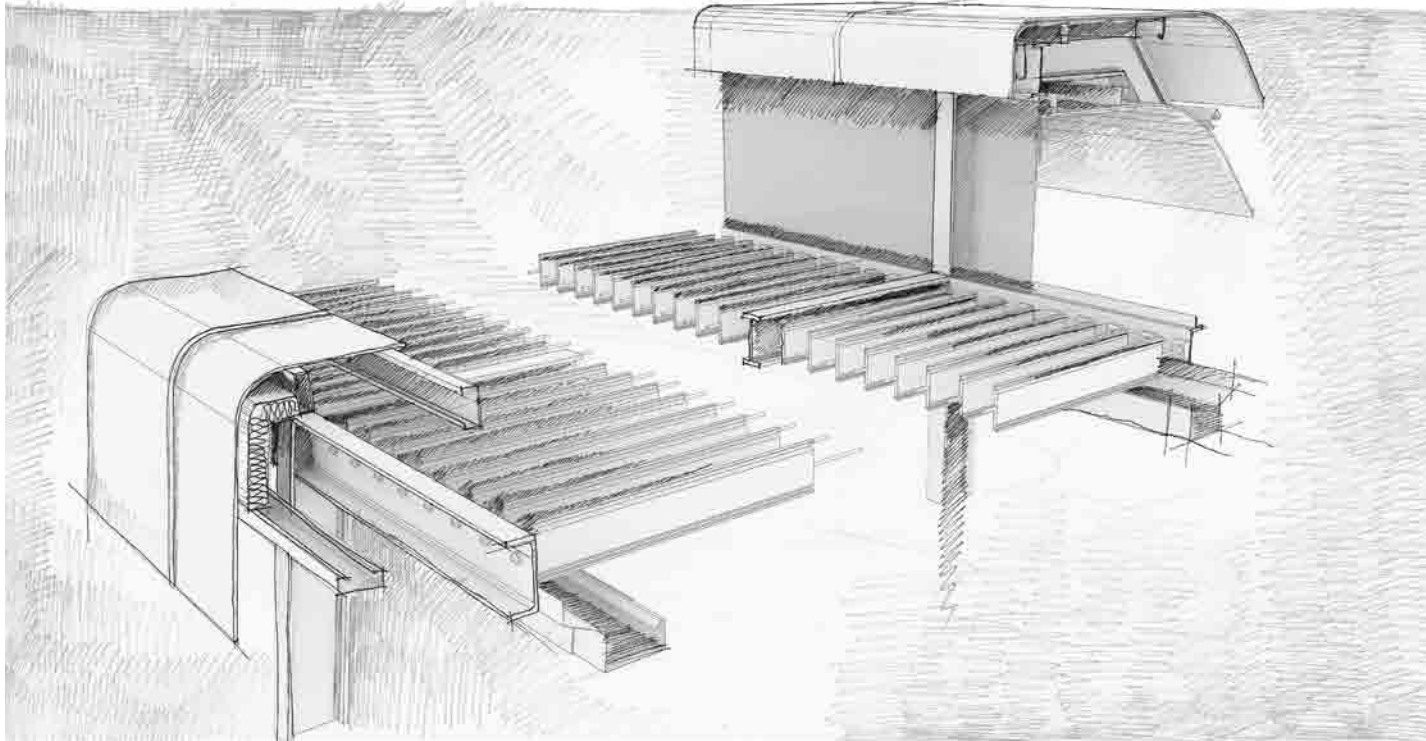


- 100 mm Expansion joint bearing to be placed over finished beam level only
- 4 mm Leadlined glass glazing system to be installed in 45 x 42 x 3 mm metal fixed by angle iron frame with applied silicone sealant
- 45 x 45 x 3 mm metal equal leg angle iron to form frame for glazing system installation
- PVC 200 dia metal sheet beam to form primary structure for roofing system
- EXISTING ROOF RIBS: Existing is a single corrugated iron roof sheeting with existing Frame Tracer building to be raised @ 100 mm above and 10 mm below expansion joint to a 100 mm dia, with existing waterproofing down to beam level and waterproofing fixed to existing TRIS timber battens, @ 100 mm, fixed to existing steel beam
- 100 mm 4 mm Coextruded glass pane to fixed over metal PVC 200 channel to existing composite angle iron steel roof truss with PVC 200 dia metal expansion to form beam structural fixing, ensuring a tight connection between existing and new table
- Galvalume 75 x 120 metal gutter pan @ 100 mm centres
- Galvalume 40 x 40 x 3.5 mm 180 deg angle beam - fixed to timber battens with roof fixings
- EXISTING STEEL TRUSS WITH: Existing roof steel truss members to be 40 x 40 x 4 mm corner steel angle iron, fixed to 4 mm structural galvalume plate, allowing for 4 mm metal joints on roof plate. Above galvalume plate to be up to construction to support existing roof truss to roof steel galvalume plate to be fixed to steel PVC 200 dia metal sheet trusses, to allow for additional structural assessment of new and old roof systems



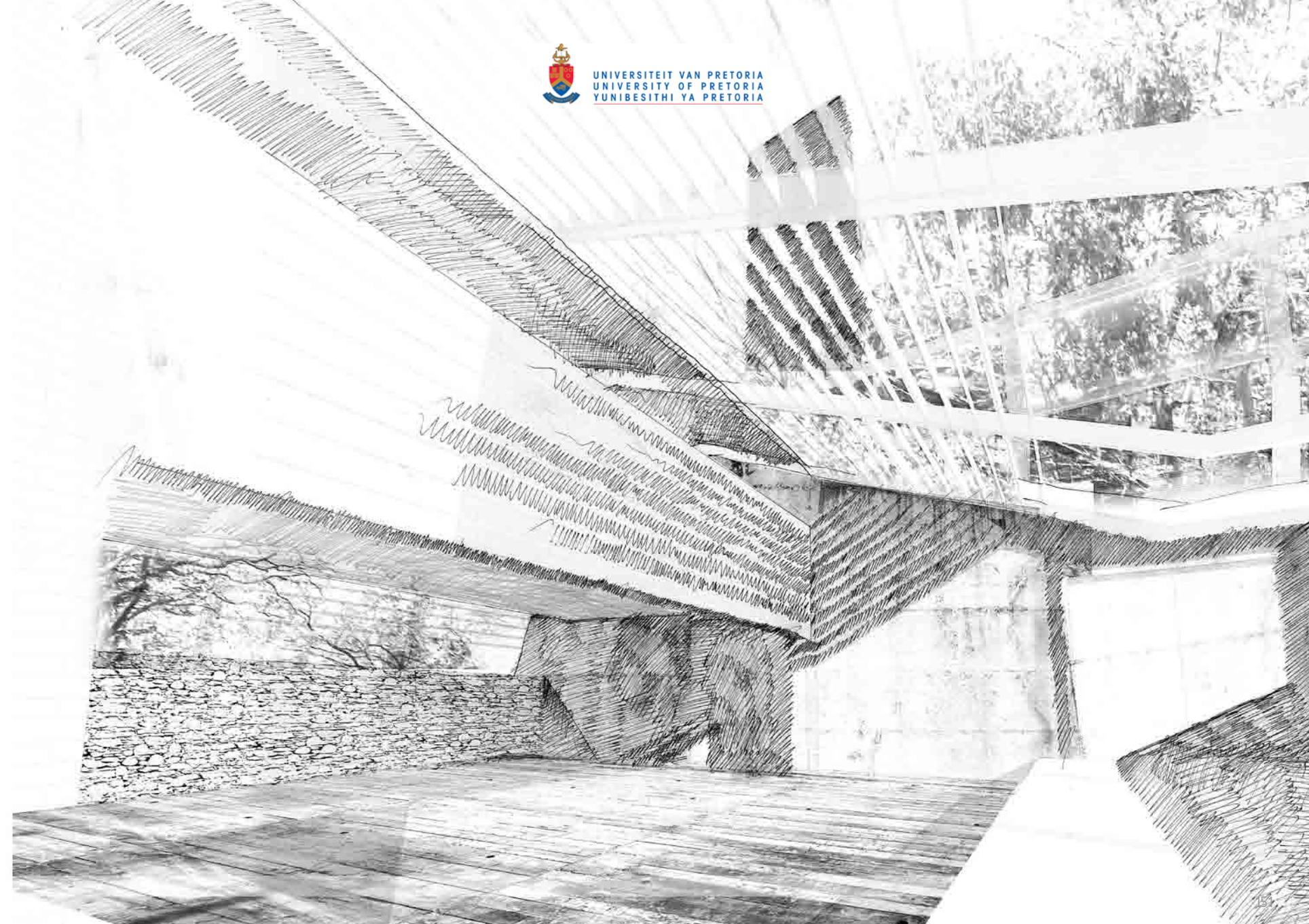


D E T A I L 4 : ROOF DETAIL SCALE: 1:5





UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



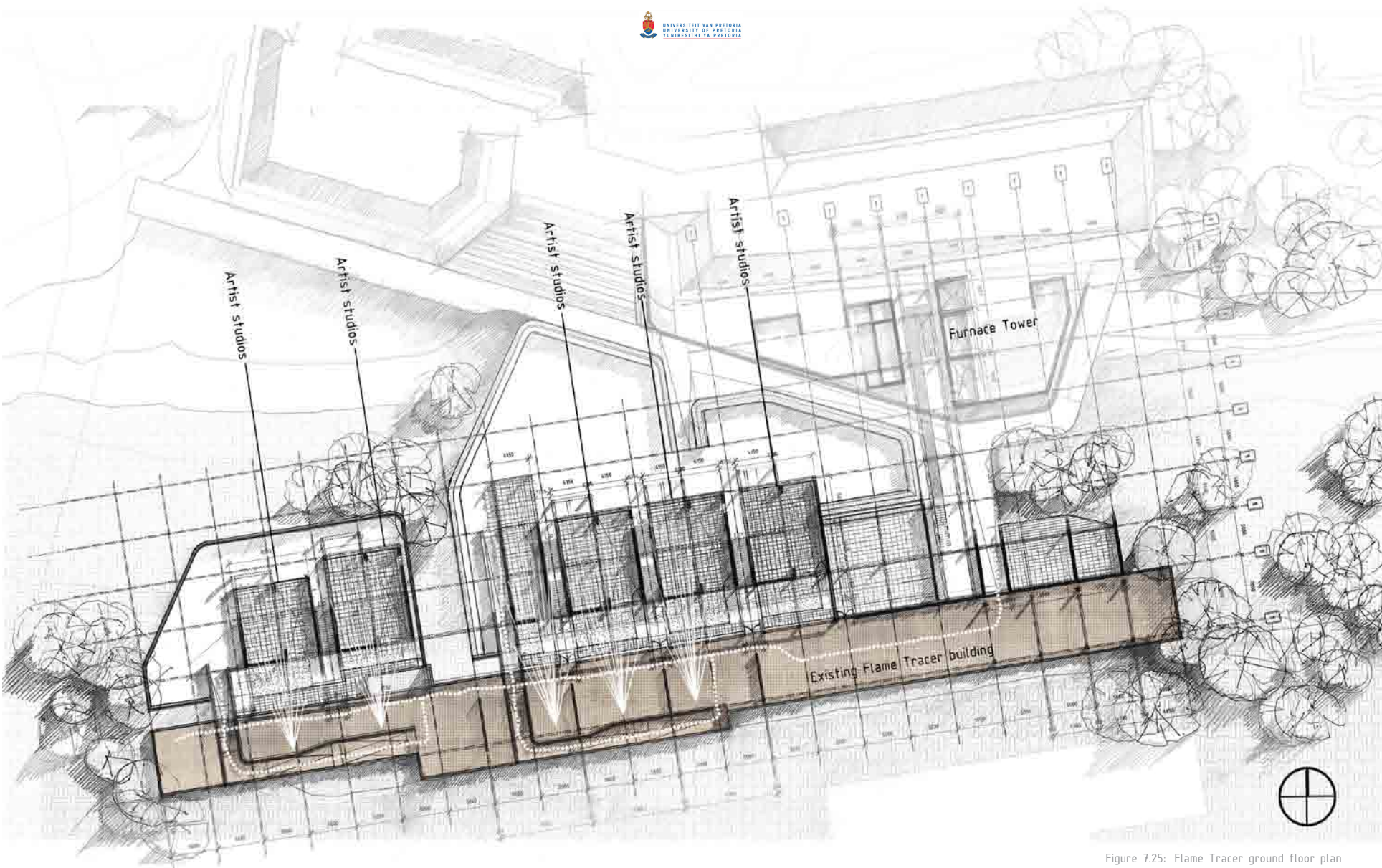


Figure 7.25: Flame Tracer ground floor plan showing artist studio additions, nts (Author, 2011).

Figure 7.26: Exploded view showing interventions in existing building (Author, 2011)

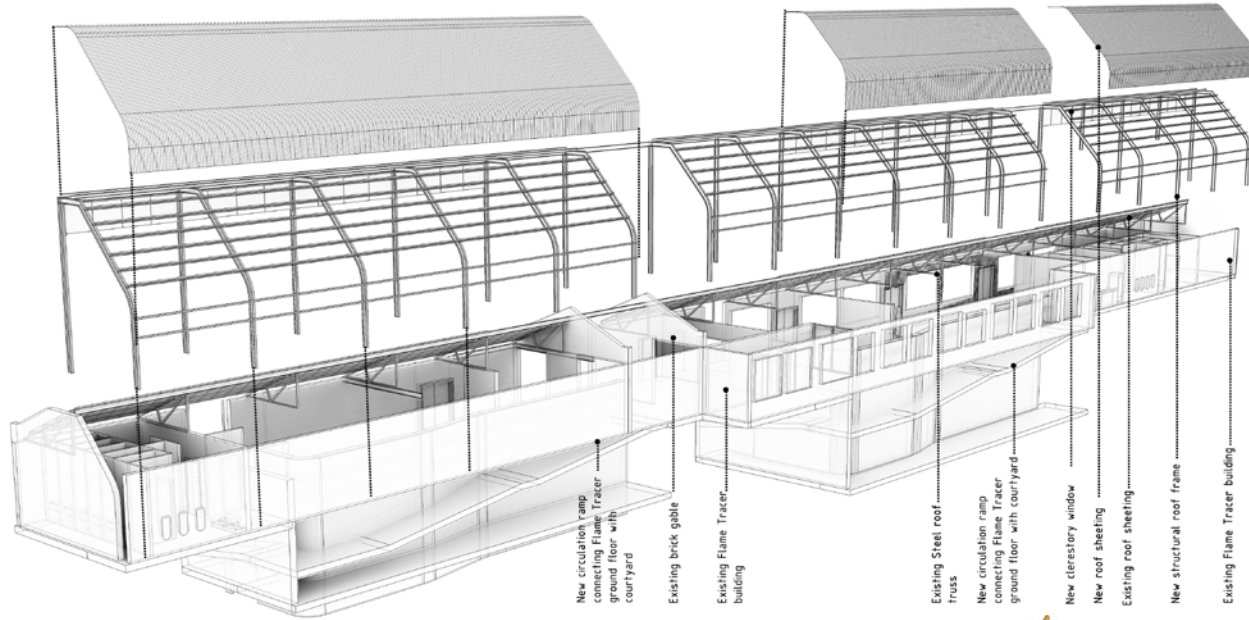
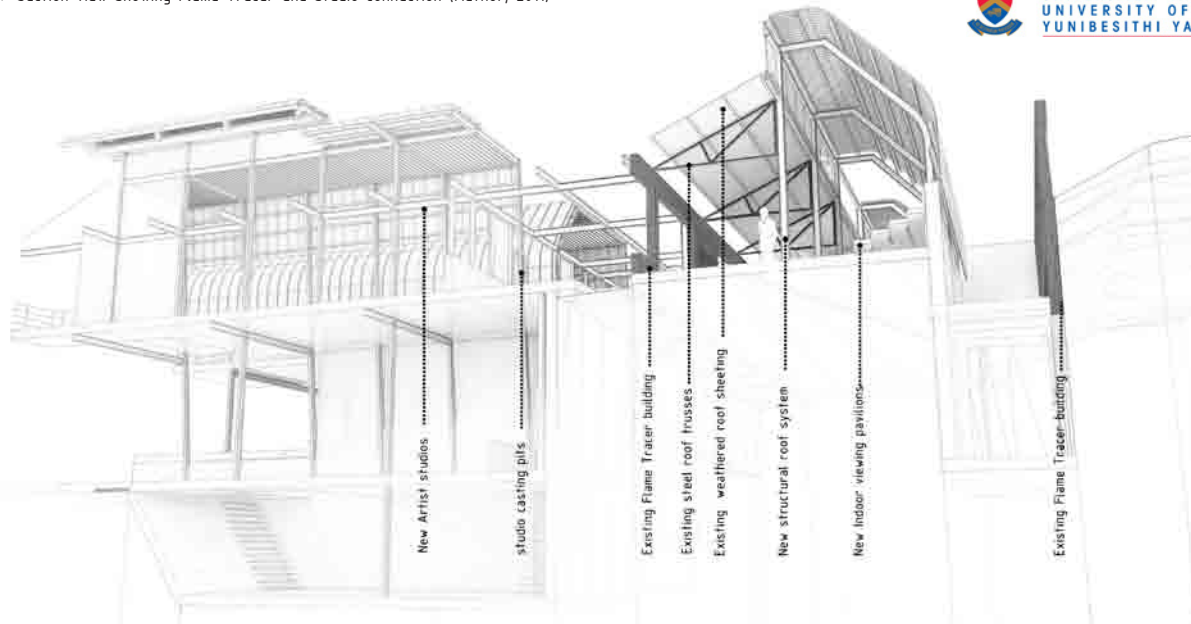


Figure 7.27: Section view showing Flame Tracer and studio connection (Author, 2011)



This design element allows the visitor to experience the art of ammunition reduction within the context of ammunition production, commemorating the large scale production lines of Magazine Hill. The act of commemoration is thus focused on the interpretation of old (ammunition production) and new (ammunition reduction) processes as an ongoing activity, as stipulated in Principle 1 of the Ename Charter (ICOMOS, 2005). Again commemorative design is not encapsulated within a static memorial or monument, but rather experienced as an active construct that does not only relate to the past, but also the future of Magazine Hill.

The weathered state of the building is left unaltered, while allowing the process of ruination to continue with the passing of time. This design approach stresses the mortality of architecture and distinguishes clearly between old and new fabric. A new roof structure is introduced that alternates in covered and uncovered spaces, changing spatial experience in terms of volume, light quality and views as the visitor progresses through the Flame Tracer building. Minimal disturbances in the existing fabric, with the exception of the new roof resolving spatial requirements, comply with Article 28 of the Burra Charter, stating that additions should have the potential to sustainably add knowledge or spatial value to the existing (ICOMOS, 1999). Pockets of viewing spaces are injected into the different building compartments, creating a series of architectural experiences that strengthen the interpretation of both the existing and the contemporary (Ename Charter, Principle 1 – Access and understanding). It is within the Flame Tracer building where one escapes from reality to memory.

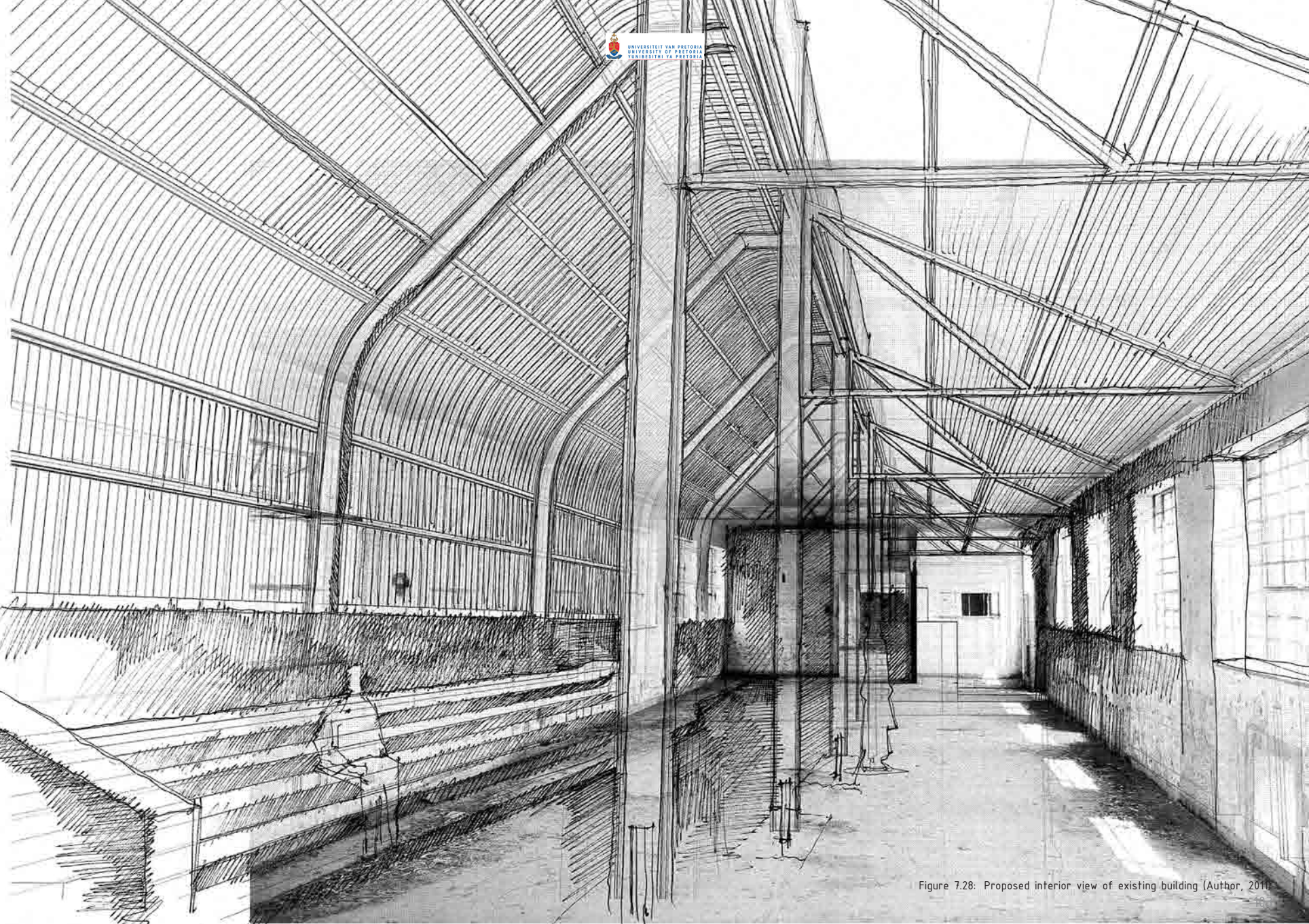


Figure 7.28: Proposed interior view of existing building (Author, 2011)

Forming a spatial extension of the Flame Tracer building, the artist studios are designed according to the "cire perdue" or lost wax method of sculpture production that was used by bronze artists in ancient Rome (CPA, 2011). This methodology is still practiced by most contemporary artists today, enabling the sculptor to produce a vast range of art sizes (personal communication with Potts, 23 May, 2011). The studio thus needs to accommodate this diverse scale range of art production and allow for adjustability.

The studio is divided vertically into 3 storeys, with the top floor forming a continuation of the Flame Tracer building space, the middle floor extending out onto the courtyard where studio practice can be observed from the north, and the bottom storey accommodating sculpture storage. Each artist studio is further divided into 4 secondary studios. The modelling and wax studios define the middle floor space, while the ceramic works and hot shop are located on the top floor. The north facade is fitted with a vertical hoist that distributes larger art pieces and foundry machinery between the aforementioned work spaces.

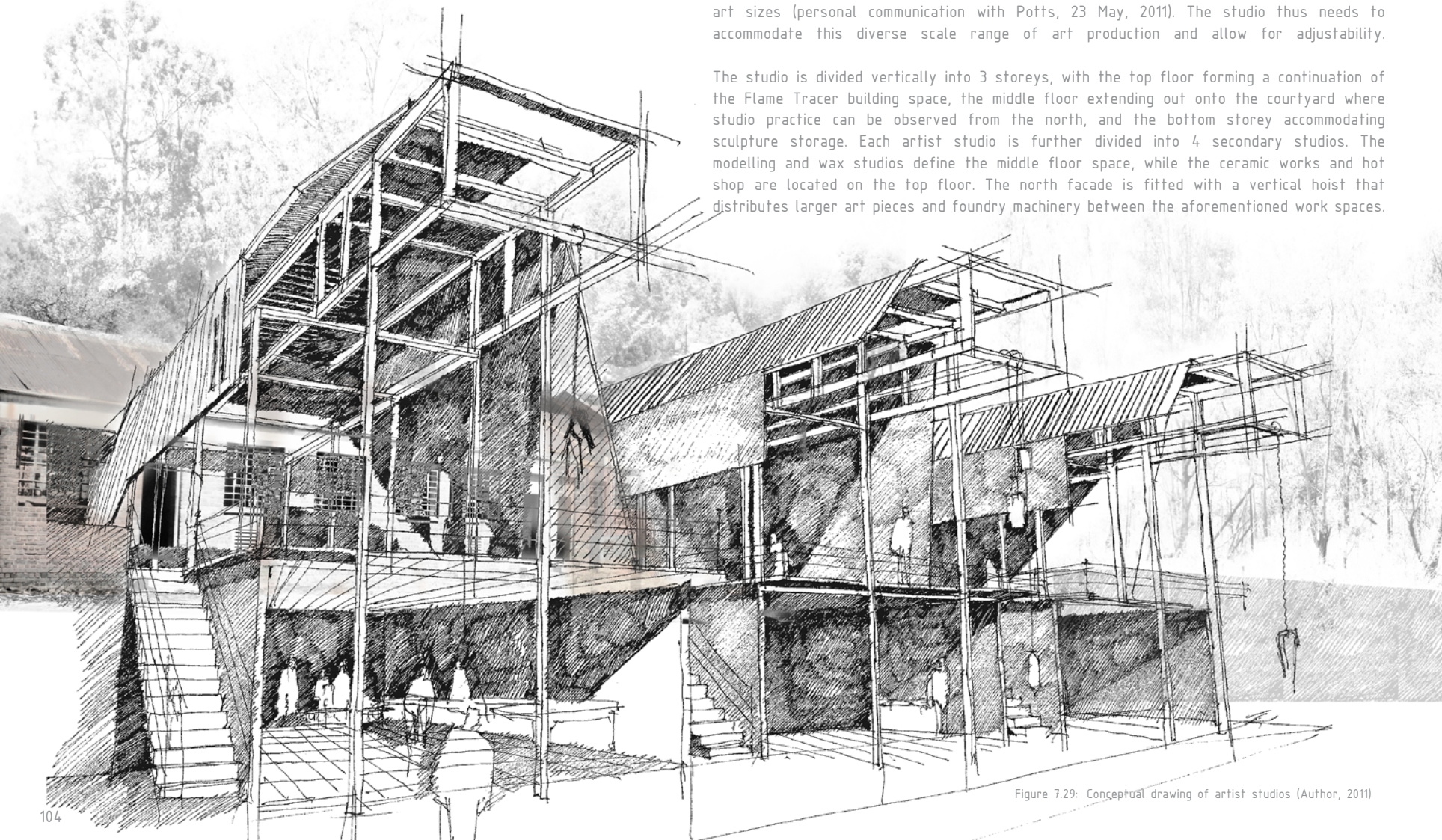
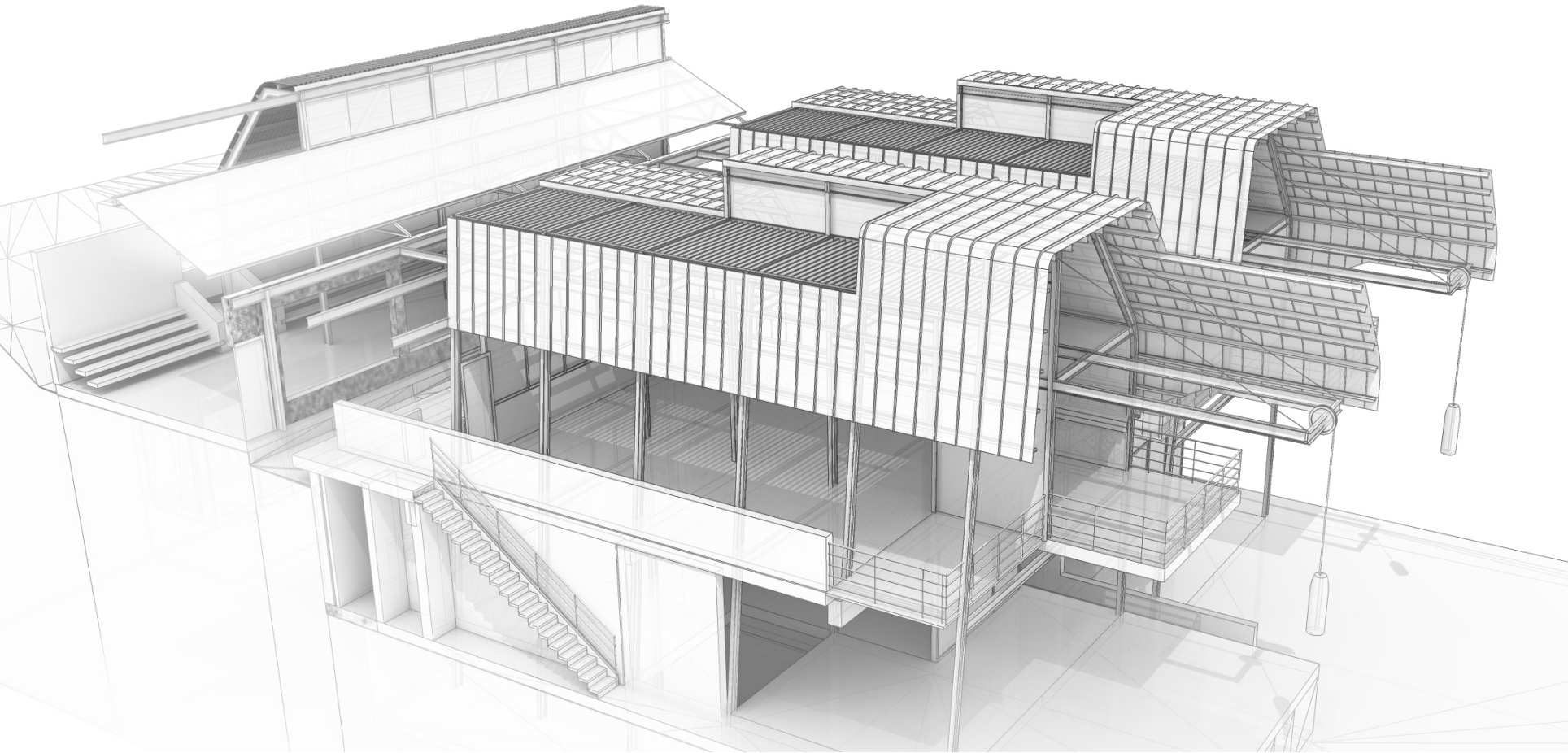


Figure 7.29: Conceptual drawing of artist studios (Author, 2011)



Figure 7.30: Layout drawing of artist studio (Author, 2011)

The western facade is defined by a steriotomic edge that blocks western solar penetration, while the eastern facade forms an adjustable typology that alternates according to user needs. Adjustable flooring further allows for vertical modification of space to accommodate bigger foundry machinery, stretching the concept of workspace adaptability. The artist studios thus function as permanent exhibitions in the new courtyard space that capitalise on the future projections of Magazine Hill, enforcing the statement that ruination can inform creation.



7.5 Summary of Environmental considerations (As discussed in detail in chapter 7)



7.5.1 Social sustainability

1. The building programme specialises in a reduction process of obsolete ammunition, forming a catalyst in the SANDF environmental programme called Green Soldiering. The proposed foundry forms an environmental statement of the SA Army.
2. Brass ingots and billets are produced from recycled ammunition cartridges and distributed to Denel PMP for ammunition production. A portion of raw material is kept on site for the production of art, thus forming a horizontal integration programme that contributes to social sustainability among local artists.
- 3 The foundry creates work opportunities for prison inmates and the SA army, thus contributing to a skill transfer process.
- 4 The foundry is dependent on the public as a tertiary source of raw material, thereby providing the public with a financial incentive and awareness of recyclability potential.
5. An agricultural belt is proposed in the urban precinct

7.5.2 Environmental sustainability

5. The topography of Magazine Hill is utilised to harvest rainwater in the Red Magazine crater, forming both a commemoration pool and water body to supply buildings with water for foundry use and sanitation purposes.
- 6 A water harvesting strategy that harvests water from washing and cleaning tables and sends grey water through a biofilter pit for secondary use is implemented in the furnace tower.
- 7 The existing massive bunker wall in the furnace tower is converted into a trombe wall system that ventilates the storage basement and provides a hot air system to dry washed ammunition cartridges.
- 8 Passive ventilation systems in the tower hot shop are developed as a commemorative steam feature in the design.
9. The series of artist studios are orientated north for maximum daylighting illumination and sufficient thermal comfort control.
10. Sliding eastern wall panelling provides the artist studios with adjustable options, optimising passive ventilation, natural daylighting illumination, and extending spatial qualities beyond the limited workshop space.
11. An interlocking louvred roof system allows studio workers to ventilate hot shops vertically, control natural light quality for working purposes and allow for rain water penetration if open studio space needs to be cleaned.
12. Sufficient insulation is provided in roof structures that are exposed to direct solar radiation, strengthening thermal comfort in studio spaces.
13. Water harvesting strategies in artist studio space is defined by sloping floors diverting water flow to catchment areas in the public courtyard where bio filter pits purify grey water for foundry use.
14. Dual flush sanitation systems are stalled, with CFL and LED lighting panels utilised for lighting strategies in studio ablutions and kitchenettes. Sufficient daylighting illumination allows for lighting systems to be active only at night.



Conceptual sketch of artist studio louvre roof (Author, 2011)