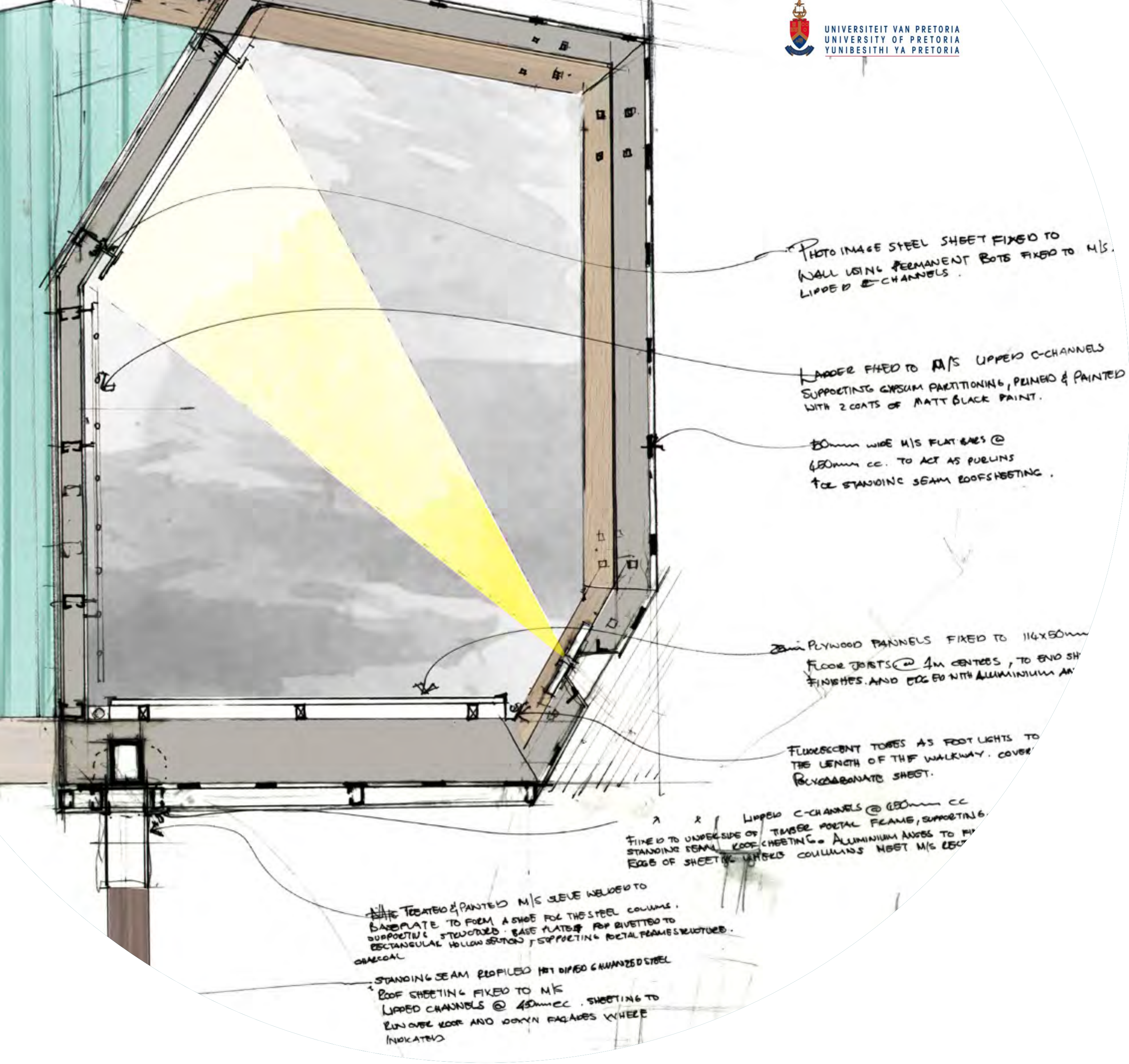


Figure 12: Texture as design informant.

12

EXPLORING TECHNÉ

Tectonic and material exploration are shown in this chapter.

"We shape our buildings and thereafter they shape us" – WinstonvChruchill (1944)

12.1. TECTONIC CONCEPT

The intervention will consist of two main element types, namely permanent and impermanent. The material choices, construction and fixing methods have been considered in terms of these two states.

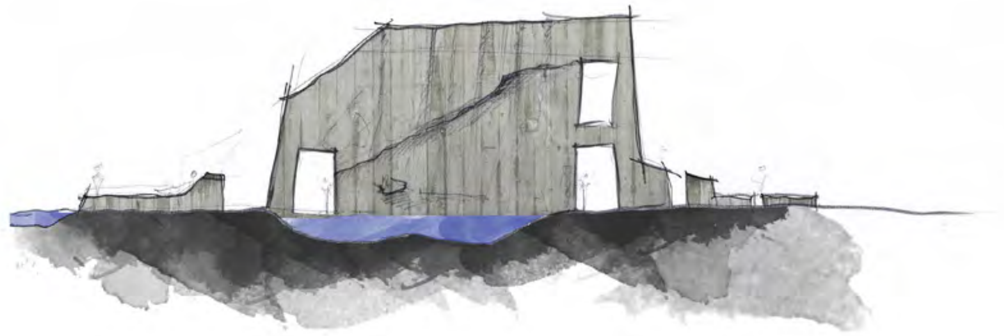
To respond to the ever changing and transient nature of the site, portions of the proposed intervention will be able to be dismantled and re-erected on another site. Once this black box of the park has recorded what is needed and has added to the nature of the park and its surroundings, it can be removed and relocated elsewhere in the city to docu-ment alternative situations and conditions.

This portion of the pavilion is made from premanufactured rib-like elements that are clad using premanufactured 'sandwich' panels that are then wrapped in cladding. The means by which these elements join together is simple; easy to erect and dismantle. The cladding is continuous and, due to the nature of the programme, has no openings punched into the façade which creates a monolithic and solid aesthetic.

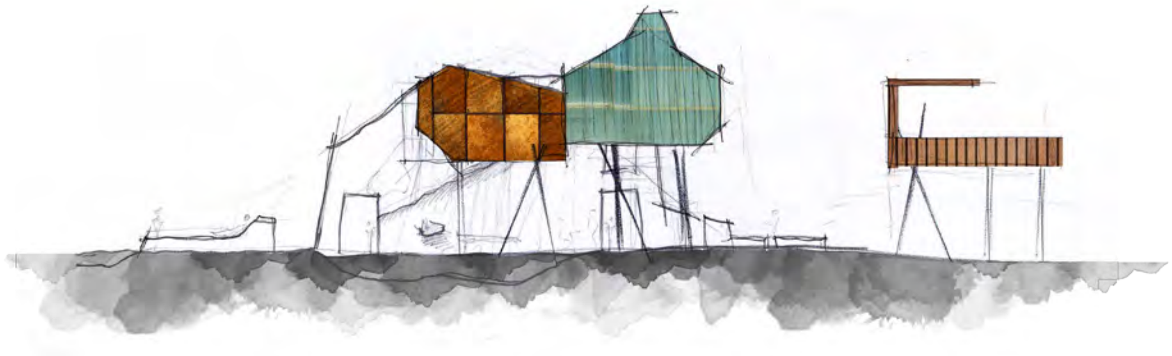
Once the temporary structures are removed, the permanent elements will remain. They are formed from concrete that appears to grow from the park, creating a network that will form part of the historic layering of the area. These elements are sculptural in nature, and are designed to create intimate spaces as well as form anchor points for public infrastructure to attach to or build from. The presence of these will act as informal memorials to remind people of the absence of the pavilion. Through these fragments the collective memory of the events and people connected to the pavilion as well as the pavilion itself will be maintained.

The permanent elements will become ruins in the landscape which will weather over time. There has been an on-going fascination with ruins and why people find them intriguing and fascinating. If buildings are the most accessible and understood forms of archive then ruins offer people an insight into the not only time, but also give indications as to the reason for their decay.

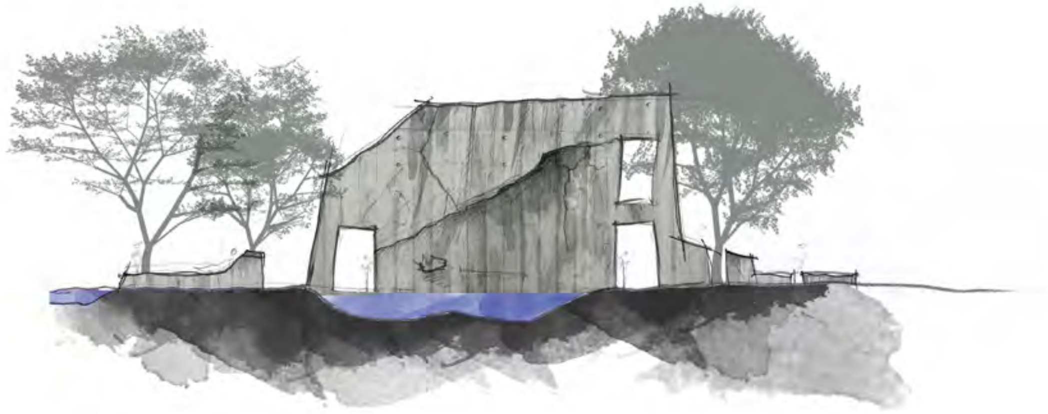
12.2. PERMANENCE AND TEMPORALITY



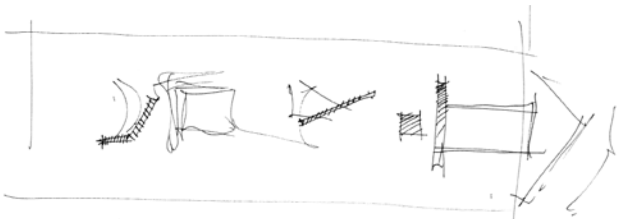
PHASE 1 - concrete elements that form sculptural elements for seating, playing and as support of basic infrastructure like public toilets.



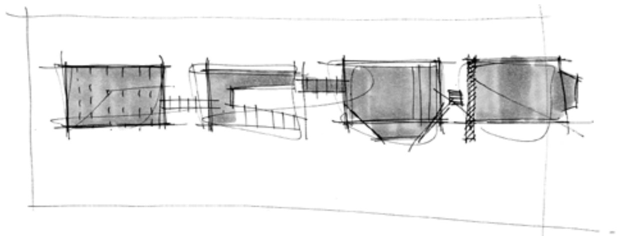
PHASE 2 - introducing the temporary elements that hover above the ground plane. These spaces are entirely enclosed and appear as heavy and solid forms that invert the commonly accepted forms of buildings.
The pods are clad in materials that are in various states of weathering that give the enhanced understanding of time in the built form



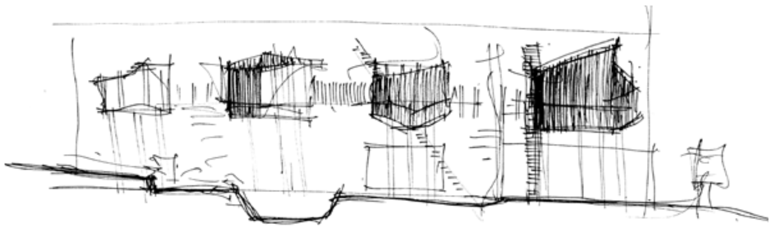
PHASE 3 - Once the pavilion is removed the concrete elements remain. These then become permanent features in the park and will eventually be grown over adding a new dimension to the park landscape.



PHASE 1 - Concrete elements form part of the landscape, creating spaces for interaction and recreation in the park



PHASE 2 - Concept plan sketch of pavilion



PHASE 2 - Concept elevation sketch indicating tectonic concept

The structural concept for the design consists of the following themes for investigation:

- Permanence and impermanence of structure

  Making use of permanent and movable parts in the pavilion design.

- Creating a pavilion that lightly touches the ground plane, respecting the park as a green public space
- Structure that appears to extend from or pierce into the landscape
- Strategies for creating sculptural forms with solid building elements

Opposite Page:

Figure 12.1: sequence of sketches indicating phases of construction and deconstruction of the pavilion

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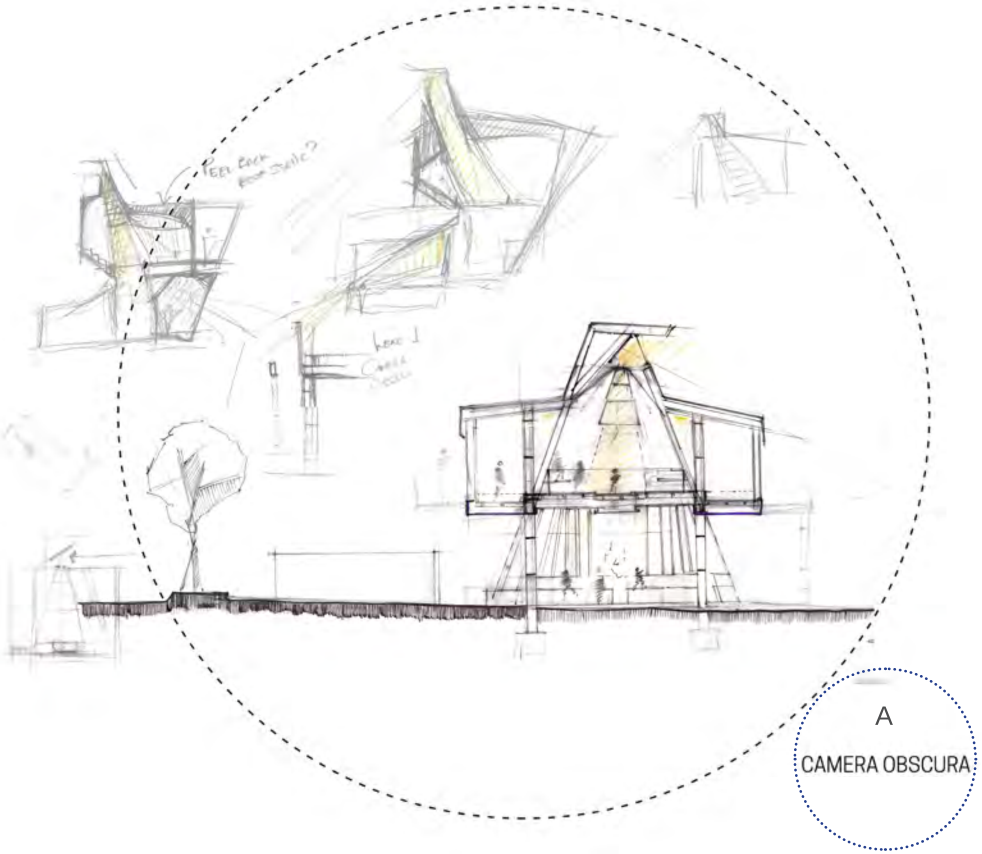
Figure 12.2: sequence of sketches indicating tectonic concept of pavilion

12.3. CONSTRUCTION EXPLORATION - ITERATION 1

Exploring steel construction



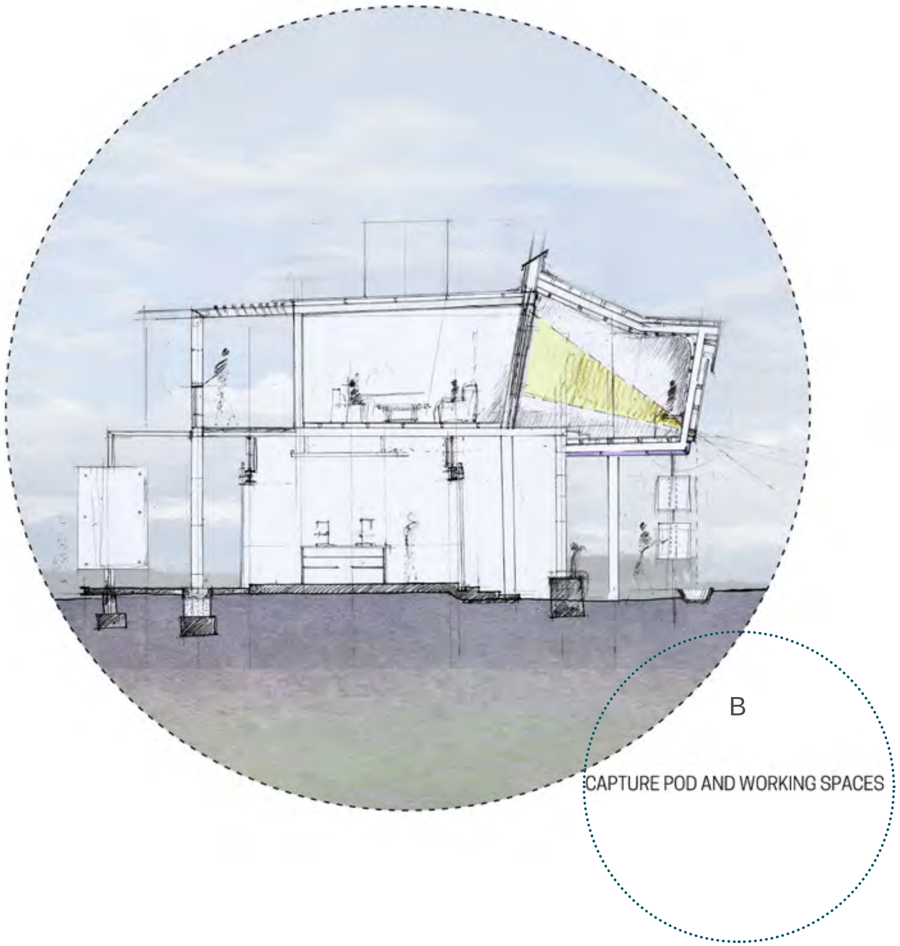


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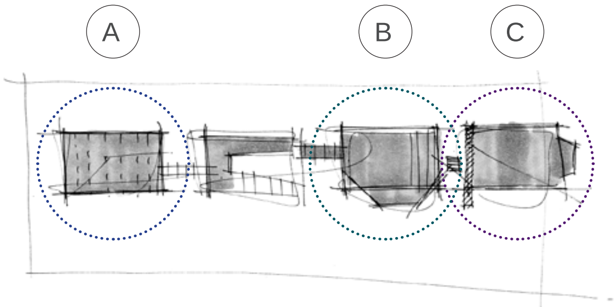
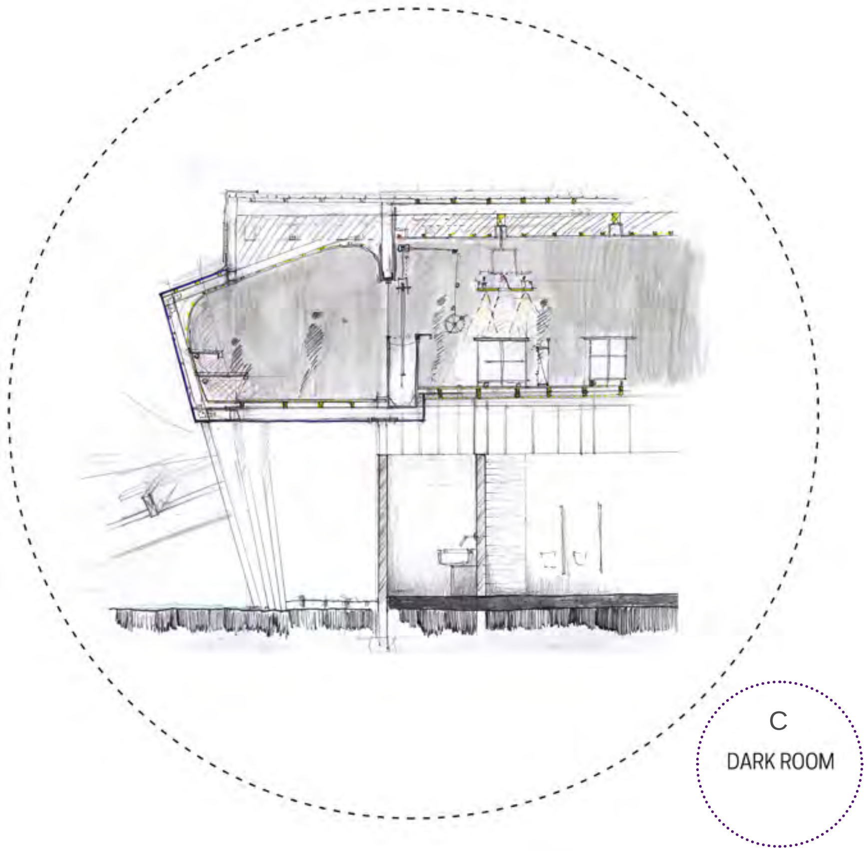
Figure 12.3: First construction iterations explored on section.

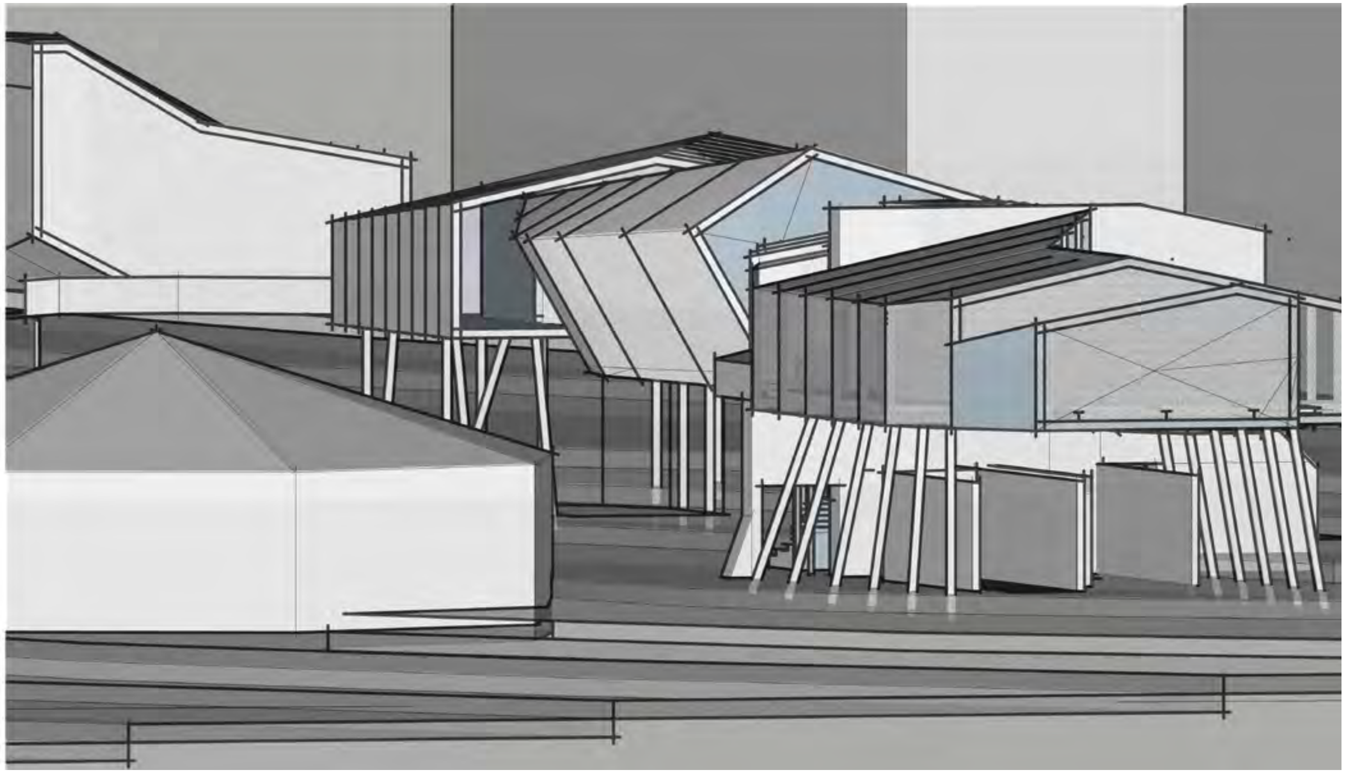




This first attempt at construction exploration was the starting point for the development of the tectonic concept (page 181).

The method employed here did not do justice to the sculptural qualities of the design. The structure appeared heavy and rigid and the connection between the ground plane and the elevated plane was under-developed.

12.4. STRUCTURAL CONCEPT



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3-D view of *urban archive* pavilion.

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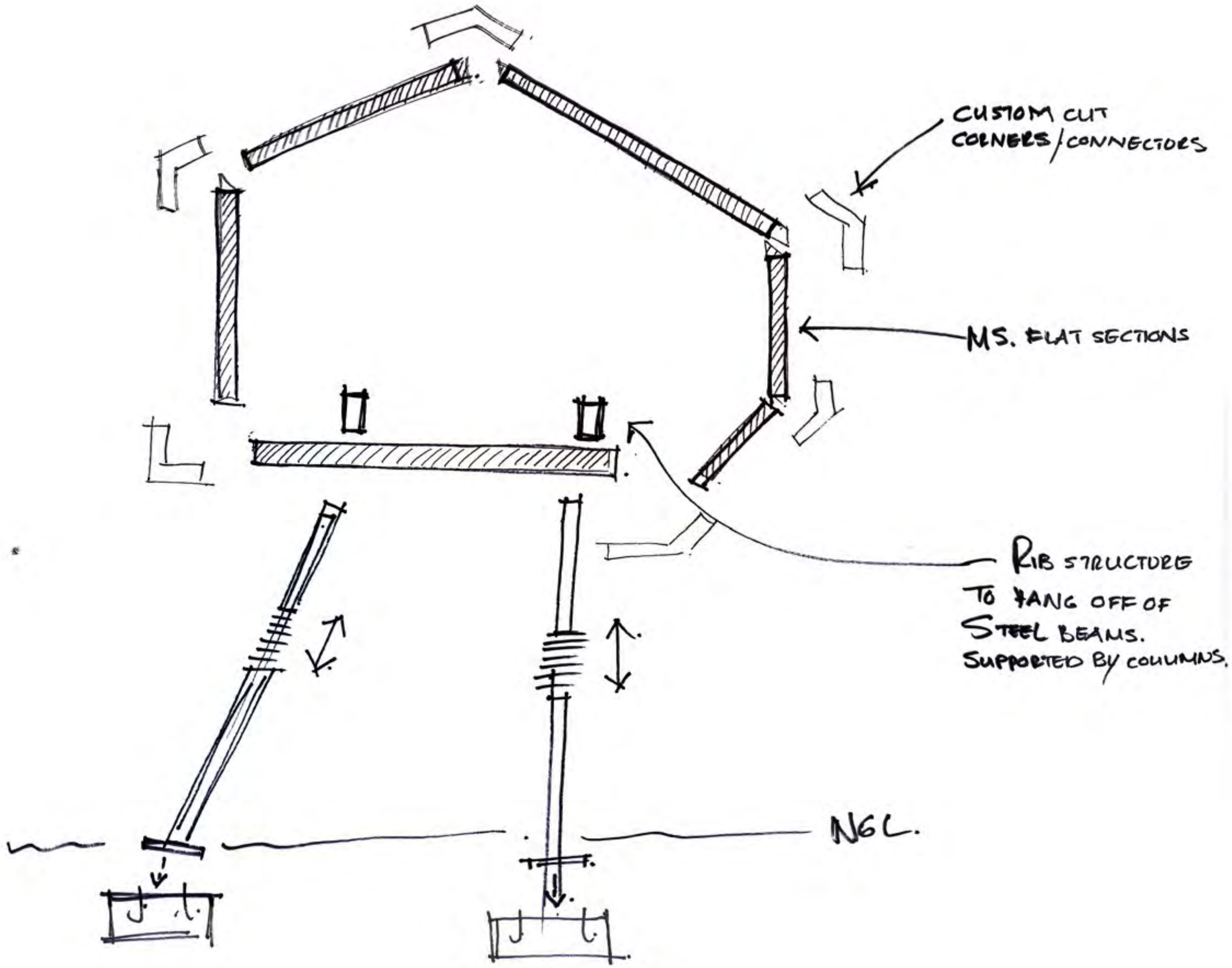
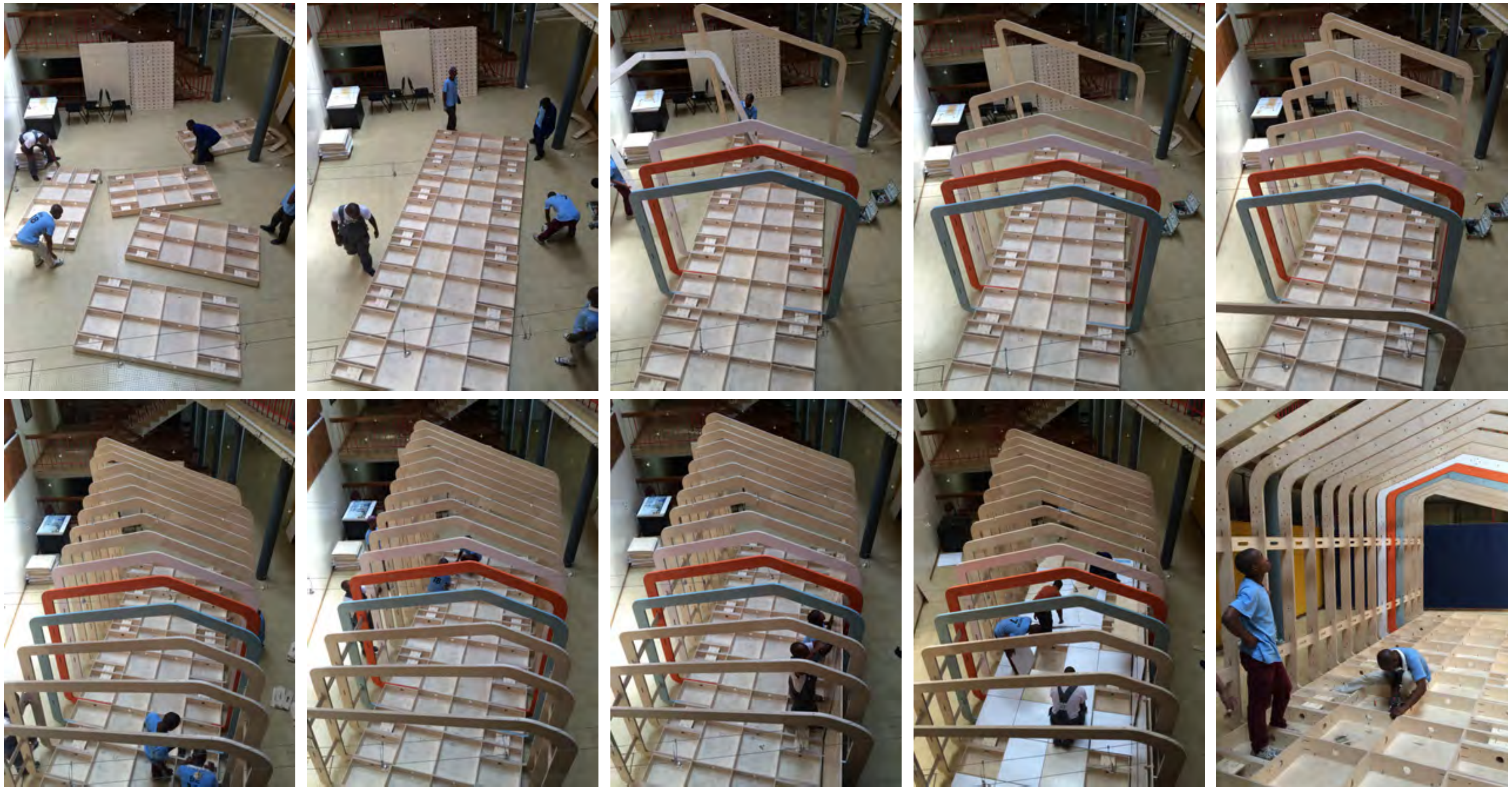
Figure 12.4: Tectonic concept sketch (Author, 2016)


CUSTOM CUT CORNERS/CONNECTORS
MS. FLAT SECTIONS
RIB STRUCTURE TO HANG OFF OF STEEL BEAMS. SUPPORTED BY COLUMNS.
NGL.



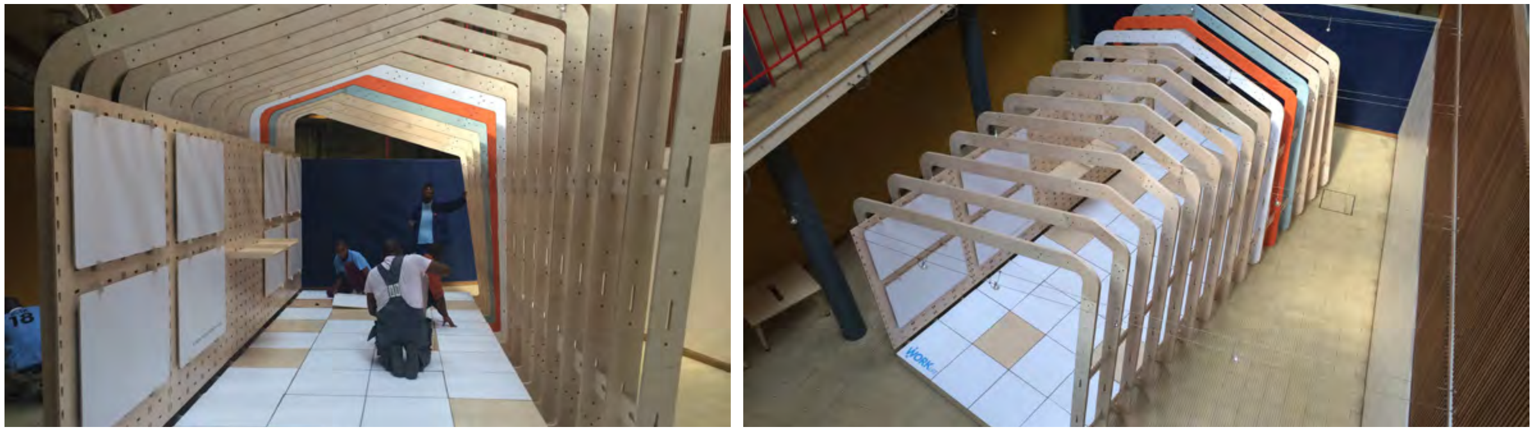


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Figure 12.5: Completed Co-Space blimp. (Raw Studios, 2015)

Figure 12.6: Diagram of assembly.

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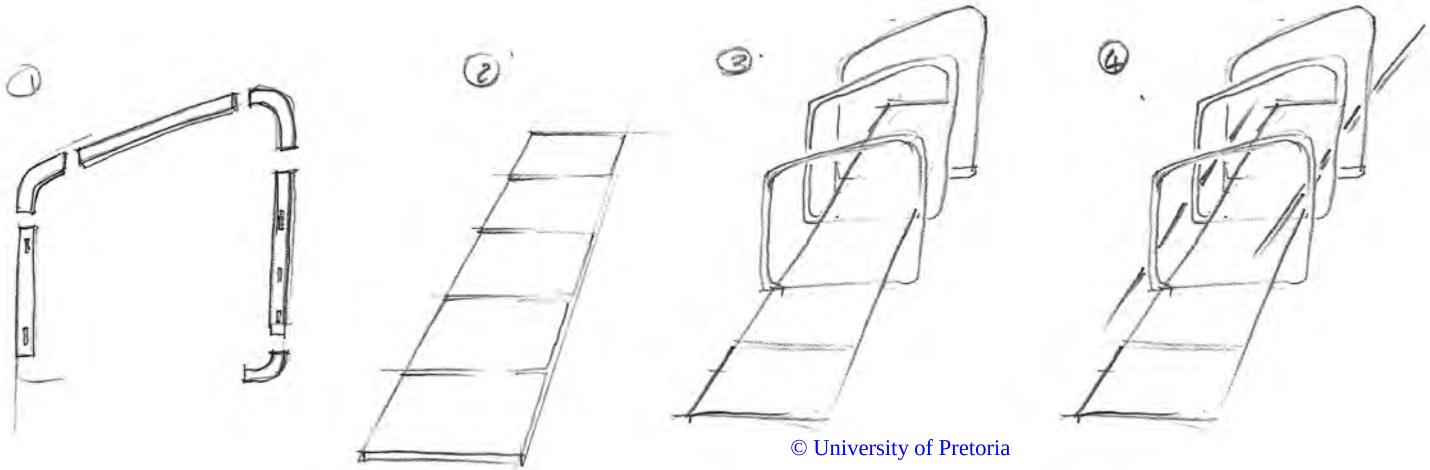
Figure 12.7: Range of images showing the assembly of the Raw Studios Co-Space pod - example of premanufactured elements, erected on site at Boukunde, Universty of Pretoria. (Swart, 2015)

Local case study - structure

The raw studios Co-Space is a pre-manufactured pod that is easily assembled and dismantled due to the nature of the components and fixing methods that are used. The floor, structure and display panels were all developed in their studio in Pretoria using imported plywood and a range of machinery. The studio makes a range of office furniture, from chairs to adjustable shelving and desks, but the Co-Space is an example of the first prototype for creating a complete space.

By using two dimensional, three metre high ribs, Raw Studios has managed to create an object that is spatially and formally enticing by gradually adjusting the shape of each rib. This is a simple method of creating a desired form and the way the elements are used and joined together allows for easy manufacture and assembly.

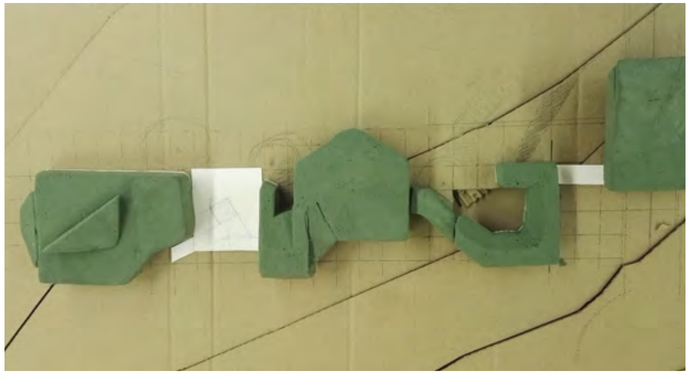
By using the principals of this design and construction method, a larger scale application could be viable for the creation of the pavilion.

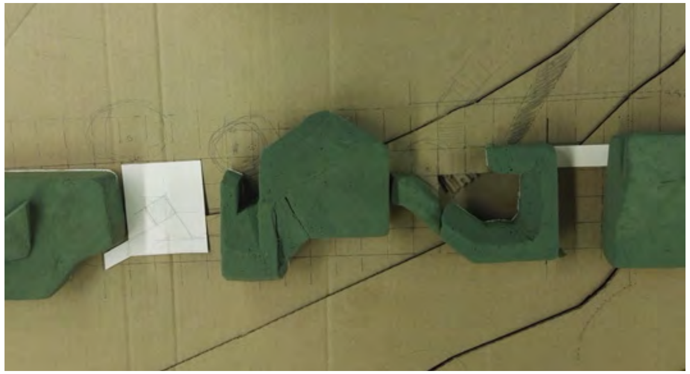


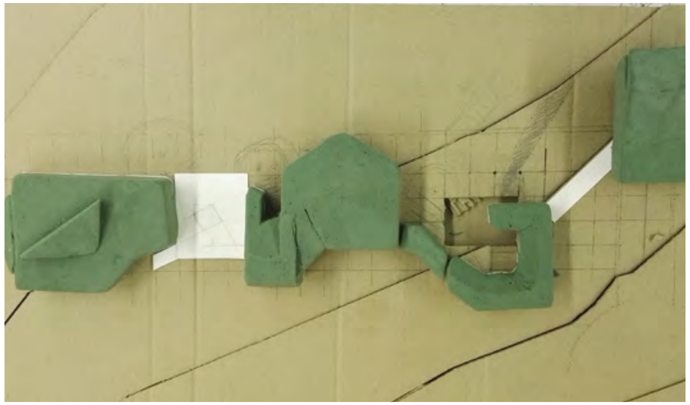
ASSEMBLY METHOD

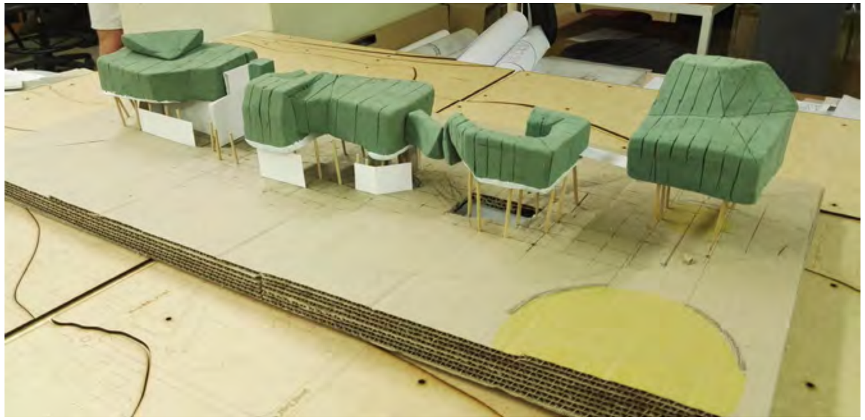
- The plywood ribs are assembled using the straights and the custom cut corner pieces.
- The floor panels are assembled.
- Ribs are fixed to floor panels in pre-made slots.
- Stabilising struts are then threaded through the rib structure. These keep the ribs erect and prevent them from falling in on each other by keeping the spacing between them.

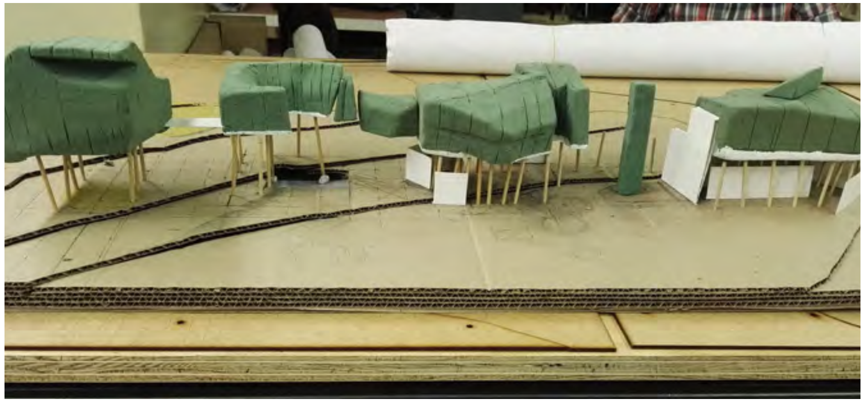
12.5. IMPLEMENTING CONCEPT











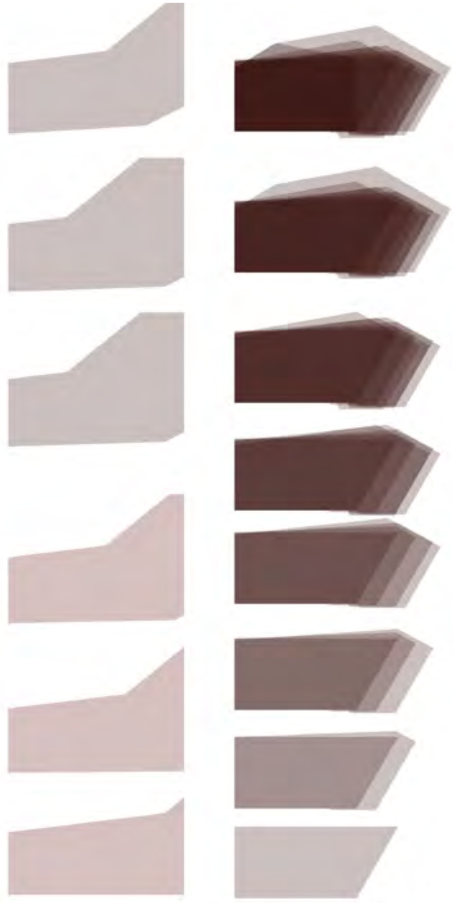


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Figure 12.8: Model cut into 2,5m intervals.

Figure 12.9: Images depicting the *slicing* of the form to create ribs.

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Figure 12.10: Images of 1-100 concept model.

The method used to extract the forms of the ribs was rather hands-on. A 1-100 concept model was built to represent the pods and the desired forms. The model was then cut into strips at 2,5m intervals. Each piece was traced and the forms were scanned and redrawn in Archicad and Sketch-up where the ribs could be assembled and clad.

These forms were later adjusted when sections were drawn and investigated, providing each space with the required or desired spatial quality.

12.6. BUILDING SYSTEMS

Water Management

Completed Pavilion

When pavilion is operational the water demand can be broken down as follows:

- Kitchenette - 1.1*l* per person/per day (including cleaning)
- Toilet (in house) - 7*l* per person/per day
- Dark rooms - 100*l* per week x 2 dark rooms = 200l per week
- Cleaning - 25*l* per week

There will be approximately 5 people working in and around the building each day (this is an average including weekends and holidays). Therefore the requirements per person per day could be calculated as follows:

5(1l+ 7l) + (225l ÷ 7) = 72.142 l/day for the enclosed spaces in the pavilion

The public ablutions will play the biggest role in the consumption of water. Based on the population of Joubert Park in 2001 the usage of the public amenity can be calculated as follows:

29 000 people in 2001, therefore approximately 30 000 people in 2016.

If 20% of the local population visit the park on a daily basis (not merely for commuting) there are approximately 6000 people who visit the park each day. An estimated half of these use the public restrooms each day with 5 bathroom facilities scattered throughout the park. Therefore approximately **600 people** will frequent this public toilet on a daily basis.

Products Installed

Water efficient flush valve urinals	-	1,5*l*/flush
Toilets with leak free cisterns with dual-flush mechanism	-	3-6*l*/flush
Aerated push-button taps	-	1-3*l*/wash*

Men's Toilet

If 20% of the men who visit this facility use the w.c. & 80% use the urinal -

300x20/100 x 5l = 300l/day

300x80/100 x 1.5l = 360l /day

Female Toilet

300x4l = 1 20

Communal Wash-up Area

600x2l = 1200l/per day

* The average flow of water through taps is 15l/minute. Using aerated low flow taps with self-closing taps the washing usage can be reduced to 6l/minute. The total usage per wash is determined by the amount of time the tap is left running. This can be restricted by using self-closing taps which run for periods of 30seconds, ensuring a 1-3l water usage per wash.

This gives us a total demand of 1 860l of water per day for the public w.c. If we use the water from the basins to flush toilets we can reduce this demand to 800l/day (total demand - basin usage - 10% wasteage).

Therefore the **total demand for the pavilion, in its completed state, is 872.1/day.**

Storage Required

Based on the alongside information it was deduced that a storage facility of **87m³** is required to meet the demands of this facility in the dry months. This storage will take the form of a submerged concrete reservoir and some tanks that will feed directly to the building.

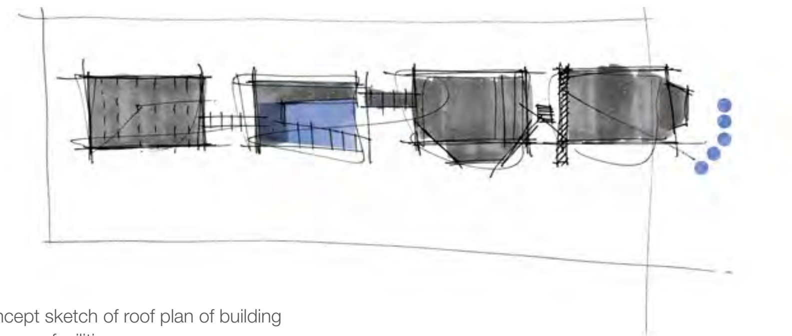
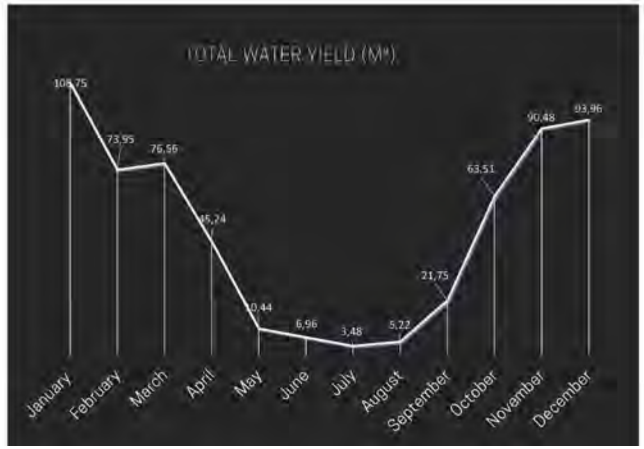


Figure 12.11: Concept sketch of roof plan of building indicating water storage facilities.

Figure 12.12: Graph indicating the total water demand (Pieterse, 2014)

Figure 12.13: Graph indicating the total water yield (Ibid.) Tables indicating the rain water harvesting capacity, water yield and water budget for both the initiation phase and the first year of operation (Ibid.)



RAIN WATER HARVESTING DATA

DESCRIPTION	AREA (m²)	RUNOFF COEFF. (C)
Roof structures	640	0,9
Paving A	310	0,8
Gravel	80	0,2
Lawn	300	0,1
Other	0	0
TOTAL AREA (A)	1330,00	
WEIGHTED C		0,66

TOTAL WATER YIELD

MONTH	AVE RAINFALL, P (m)	CATCHMENT YIELD (m³) (Yield = PxAxC)	ALTERNATIVE WATER SOURCE (m³)	TOTAL WATER YIELD (m³)
January	0,13	108,75	0,00	108,75
February	0,09	73,95	0,00	73,95
March	0,09	76,56	0,00	76,56
April	0,05	45,24	0,00	45,24
May	0,01	10,44	0,00	10,44
June	0,01	6,96	0,00	6,96
July	0,00	3,48	0,00	3,48
August	0,01	5,22	0,00	5,22
September	0,03	21,75	0,00	21,75
October	0,07	63,51	0,00	63,51
November	0,10	90,48	0,00	90,48
December	0,11	93,96	0,00	93,96
ANNUAL AVE.	0,70	600,30	0,00	600,30

WATER BUDGET - INITIATION PHASE

C1 WATER BUDGET INNITIATION PHASE

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
September	21,8	31,3	-9,5	0,0	0,0
October	63,5	33,0	30,5	30,5	30,5
November	90,5	32,1	58,4	88,9	88,9
December	94,0	33,9	60,1	149,0	100,0
	269,7	130,2	139,5		

WATER BUDGET - YEAR 1

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
January	108,8	33,9	74,9	223,9	100,0
February	74,0	30,4	43,6	267,5	100,0
March	76,6	31,3	45,3	312,8	100,0
April	45,2	29,5	15,7	328,5	100,0
May	10,4	29,6	-19,1	309,3	80,9
June	7,0	27,8	-20,9	288,5	60,0
July	3,5	28,7	-25,2	263,3	34,8
August	5,2	30,4	-25,2	238,1	9,6
September	21,8	31,3	-9,5	228,6	0,1
October	63,5	33,0	30,5	259,1	30,6
November	90,5	32,1	58,4	317,5	89,0
December	94,0	33,9	60,1	377,6	100,0
ANNUAL AVE.	600,3	371,7	228,6		

Pieterse, 2014. *The Water Management Model.*

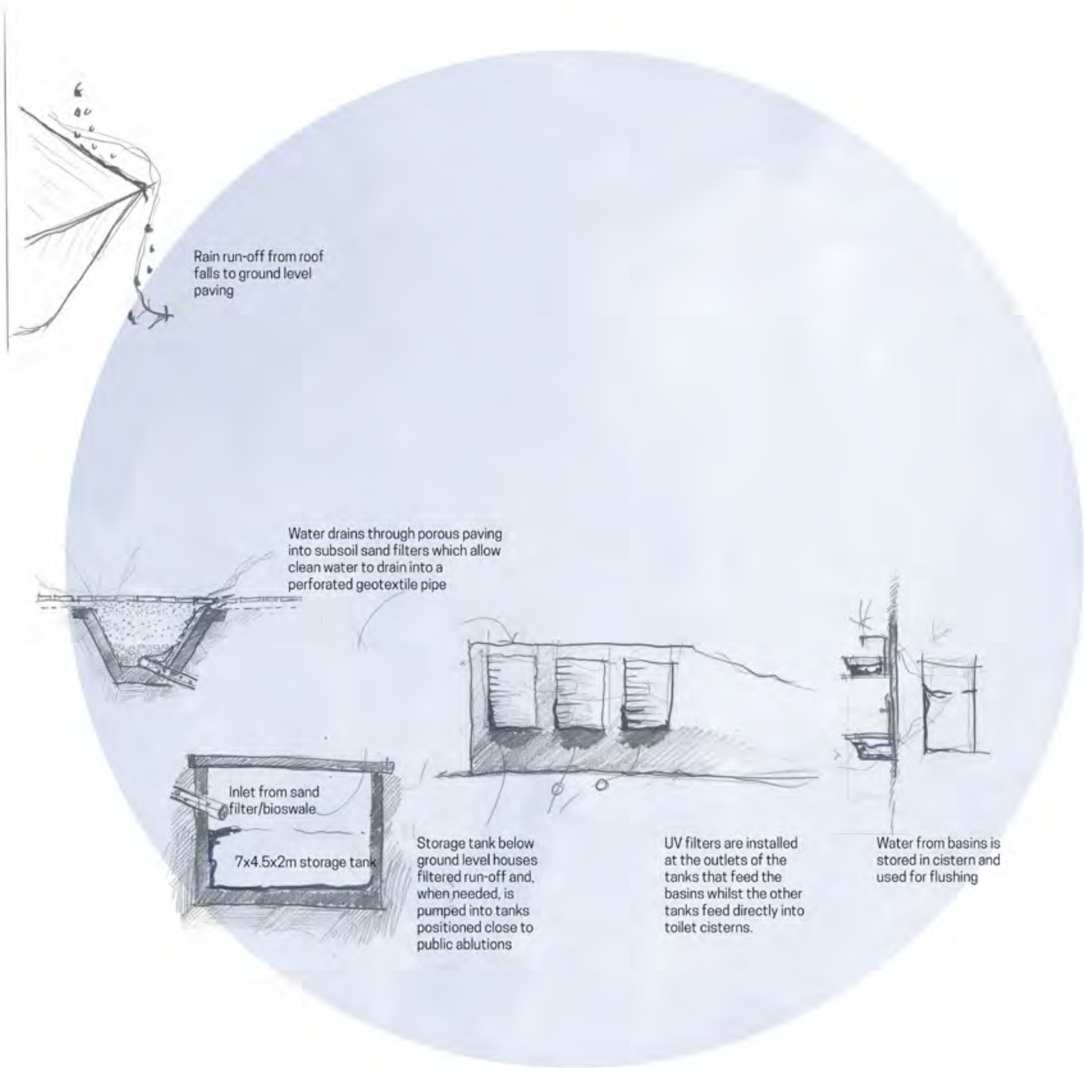
Permanent Infrastructure Post-Pavilion

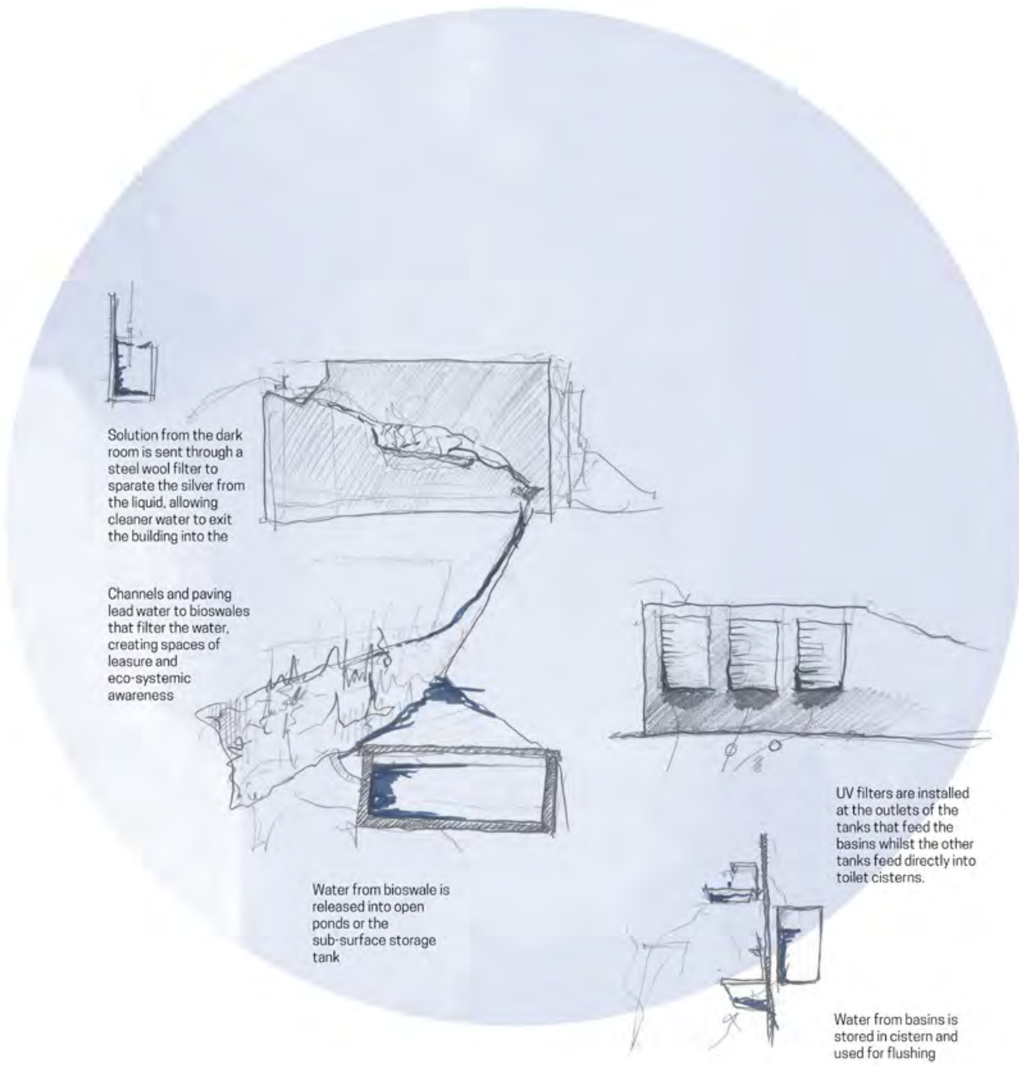
Similarly when the building has been removed the demand will still be based on the public toilet facilities that support the bandstand event space. Therefore the same usage applies here:

Men's Toilets	-	660*l* per day (for urinals and w.c.s)
Female Toilets	-	1200*l* per day
Communal wash-up	-	1 200*l* per day
General Cleaning	-	25*l* per day

Therefore the proposed water storage systems will remain to support the ablution block and the excess can be used for cleaning of the bandstand area or irrigation.

Water treatment diagrams stemming from different points of origin:





12.7. 1-20 SECTION ITERATIONS

Iteration 1 - Steel ribs

Mild steel as the structural rib material.

The cladding structure was pulled inward making the extents of the ribs the outer most structural element. The cladding was then hung off the purlins using premanufactured hangers.

Threaded rods with washers and clamps were used as a means to space the ribs making them easy to install and dismantle.

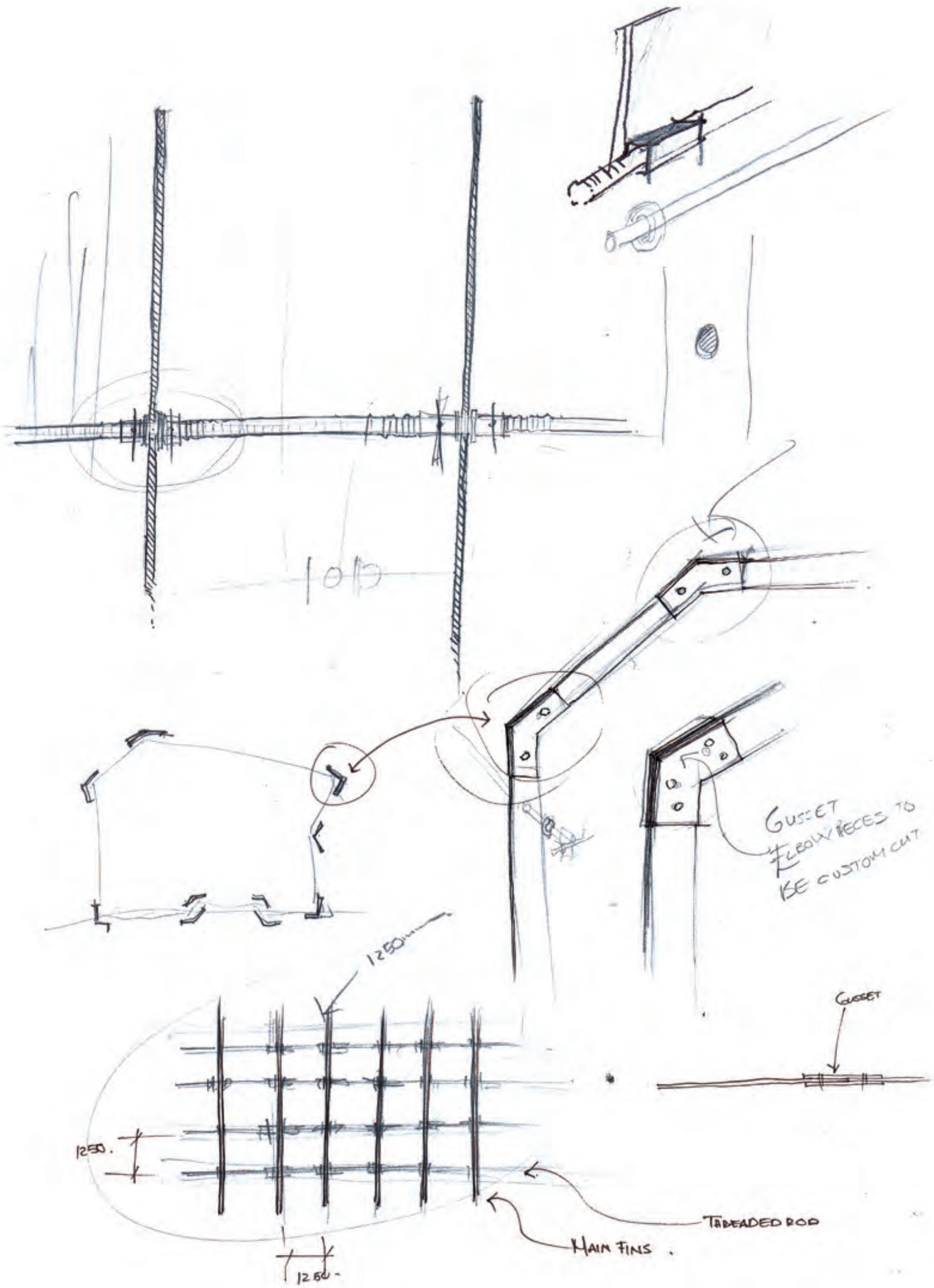
An element was introduced that extended from the ground plane through the pod, creating an anchor point for stability of the structure. Each pod should include an anchoring member.

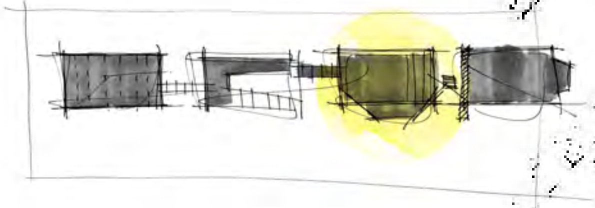
Positive aspects:

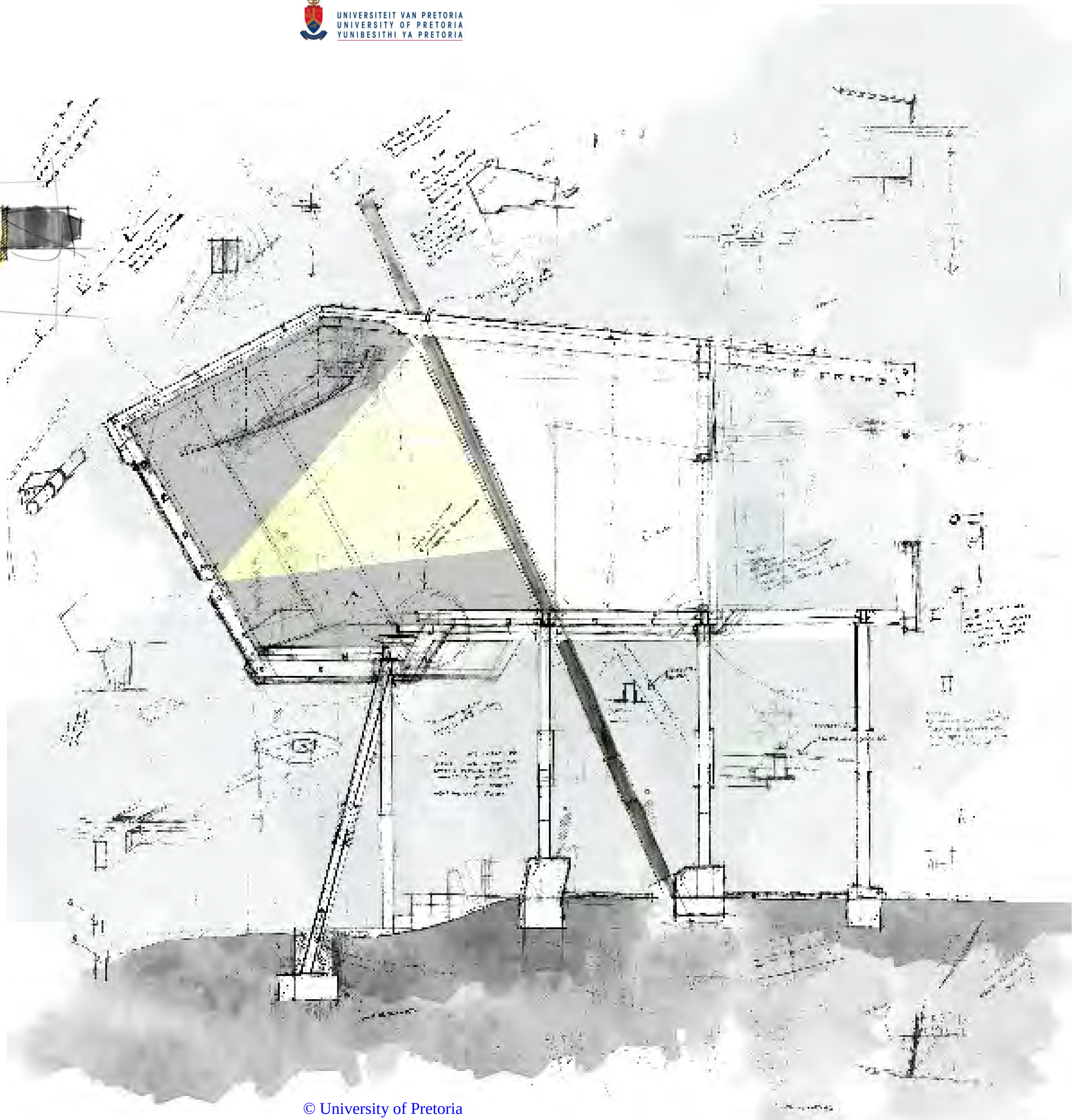
- Methods of easy assembly were explored
- Corner pieces were introduced as special elements to connect the straights.
- The structure remains light.

Negative aspects:

- The structure was not braced well.
- The fins appeared unstable.
- The thin edges of the steel are a health hazard when moving through dark spaces.







Iteration 2 -Structural timber

In this instance timber was used as the structural element, both for the ribs and the support columns. The thickening of the members resulted in a heavier structure, detracting from the overall form of the pavilion. The solidity of the pavilion should be promoted when it is clad, in order to strongly juxtapose the portions of the intervention where the structure is exposed to the public.

The timber columns required an alternative adjustment method, therefore steel brackets and bolts were used as a means of fixing and adjusting the column height. This hampered the freedom of adjustability that the first iteration's column-adjusting method provided. The use of steel pegs in the timber column may also eventually strip the timber so the holes would have to be lined with steel plugs to ensure longevity.

Concrete ground elements as markers of intimate social spaces were introduced, in this case in the form of a pond and seating underneath the pod investigated. This space is an exhibition space with sculptural elements printed with photographs of the park suspended from the structural ribs in the void of the pod.

Cladding of certain sides of the pod with translucent polycarbonate sheets was introduced as a means to gradually expose certain portions of the structure to the park, leading up to the entirely translucent camera obscura pod

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Figure 12.14: 1-20 section - iteration 2 (Author, 2016)

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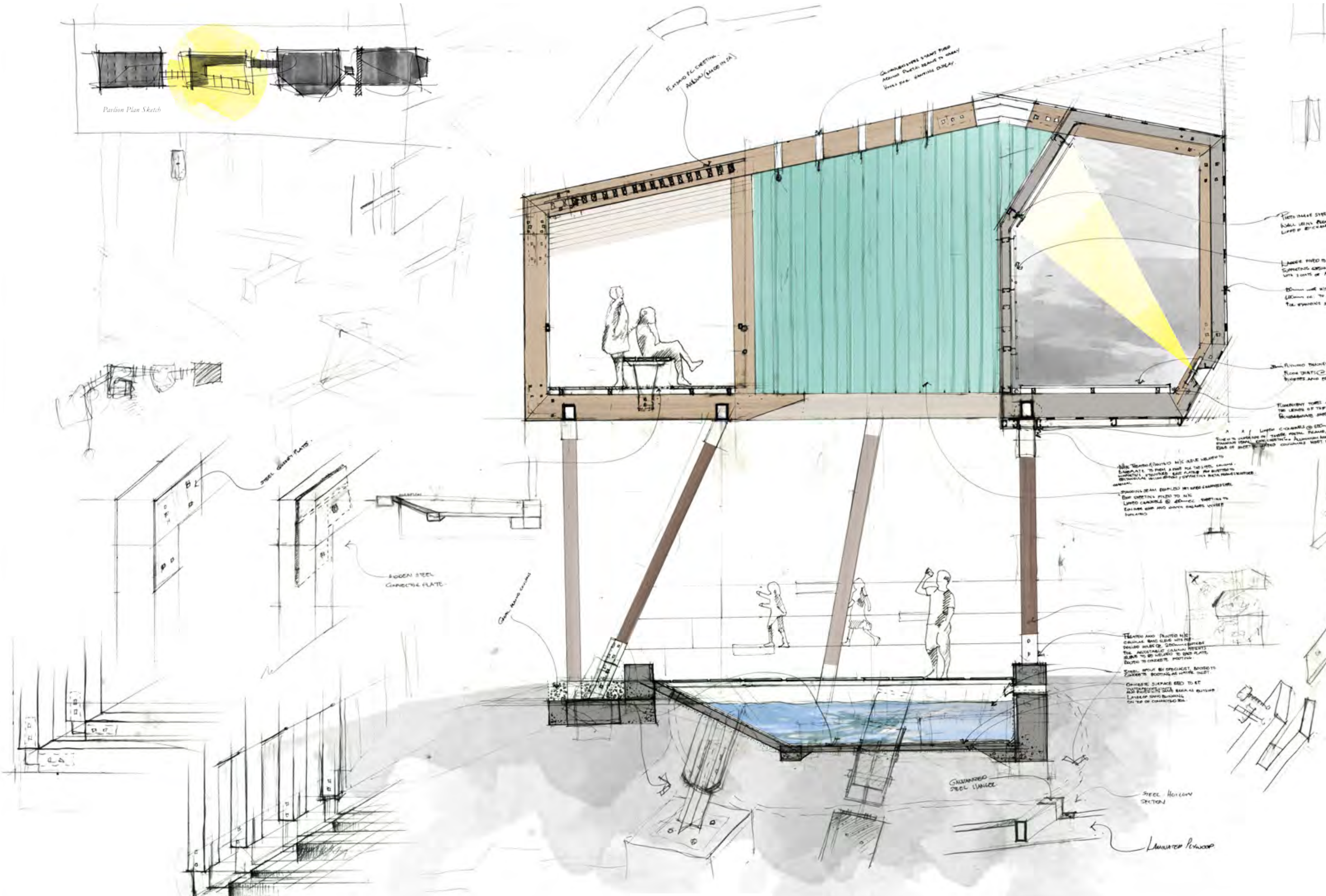
Figure 12.15: Example of steel and timber corner connection (Glenfort, 2014)


Pavilion Plan Sketch
Hidden steel connector plate
Galvanised steel angle
Steel hollow section
Laminated Plywood

The pavilion columns are adjustable to make the structure more flexible when being erected on various sites.

The footings of the columns are submerged so that the columns appear to *grow from the landscape,* stretching from the ground plane, disappearing into the cladding of the structure above.

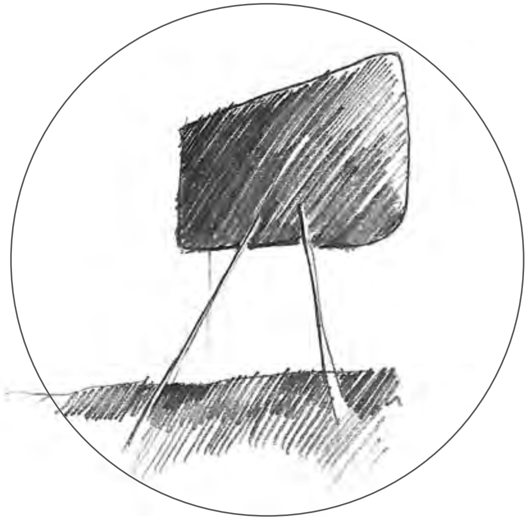


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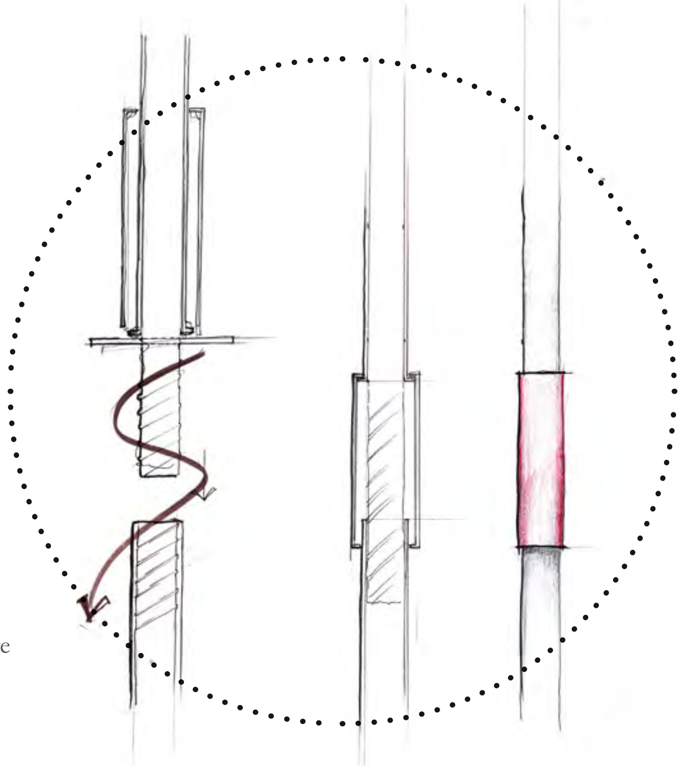
Figure 12.16: 1-20 section - iteration 1Opposite page:

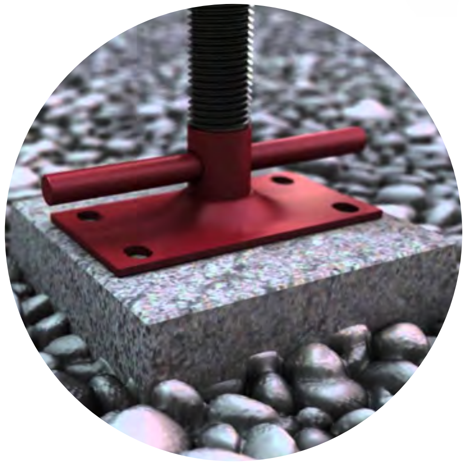
Figure 12.17: Sketch of adjustable column concept (Author, 2016)

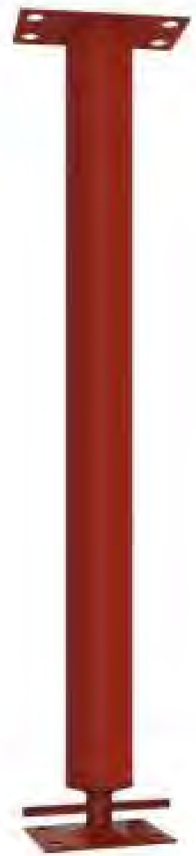
Figure 12.18: Images from Tiger Brand for adjustable steel columns (Tiger Brands, n.d.)

12.8. COLUMN DETAIL



The support columns are adjustable so the height can be altered according to the terrain of the various sites on which the pavilion will be housed. The mechanism used is adapted from beam and block construction were permanent columns are installed and adjusted using negative and positive threading in the column parts and then fixed in place with concrete or similar.





Column iteration 1 - adjustable length

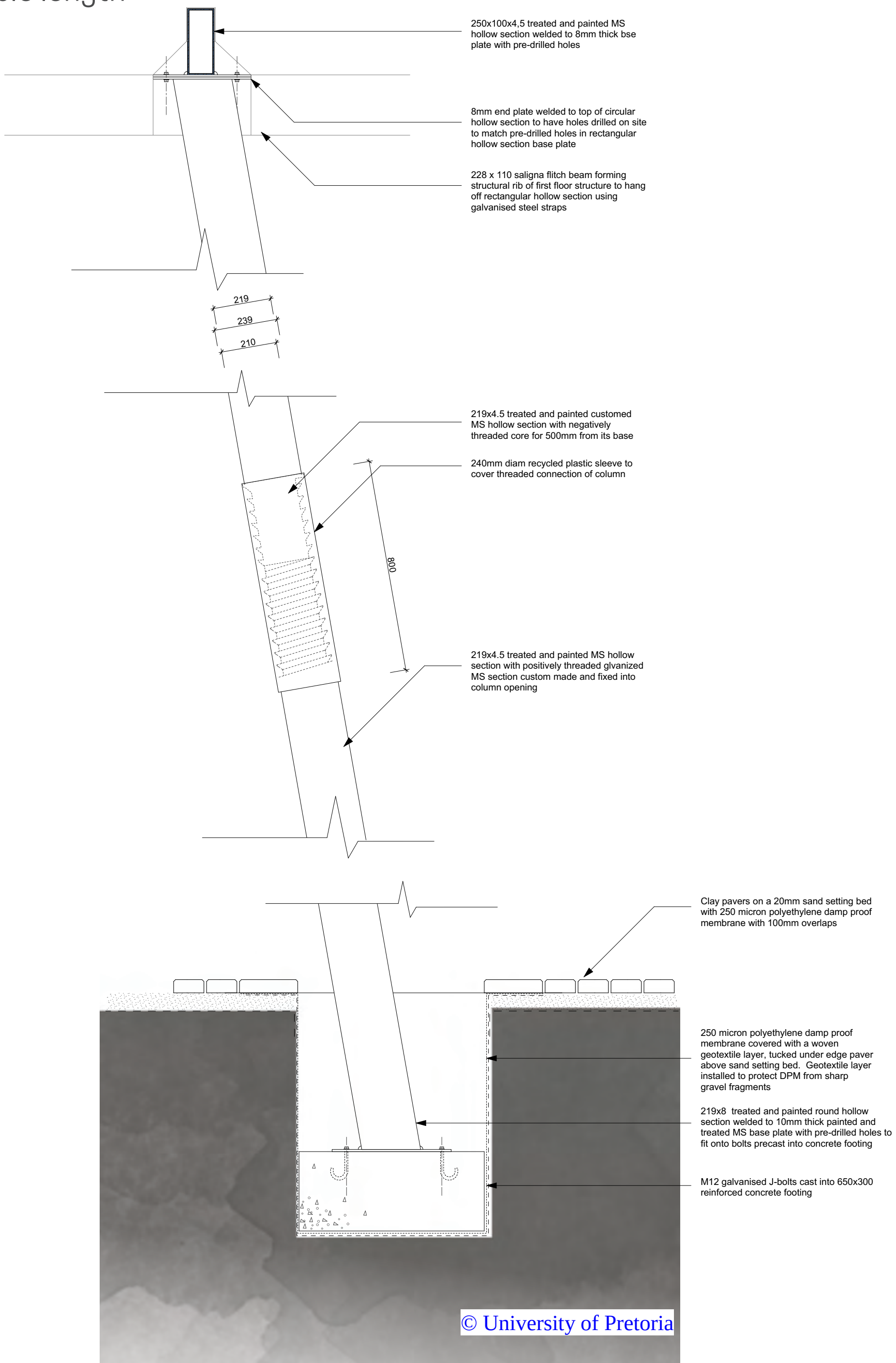


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Figure 12.19: Detail of adjustable column

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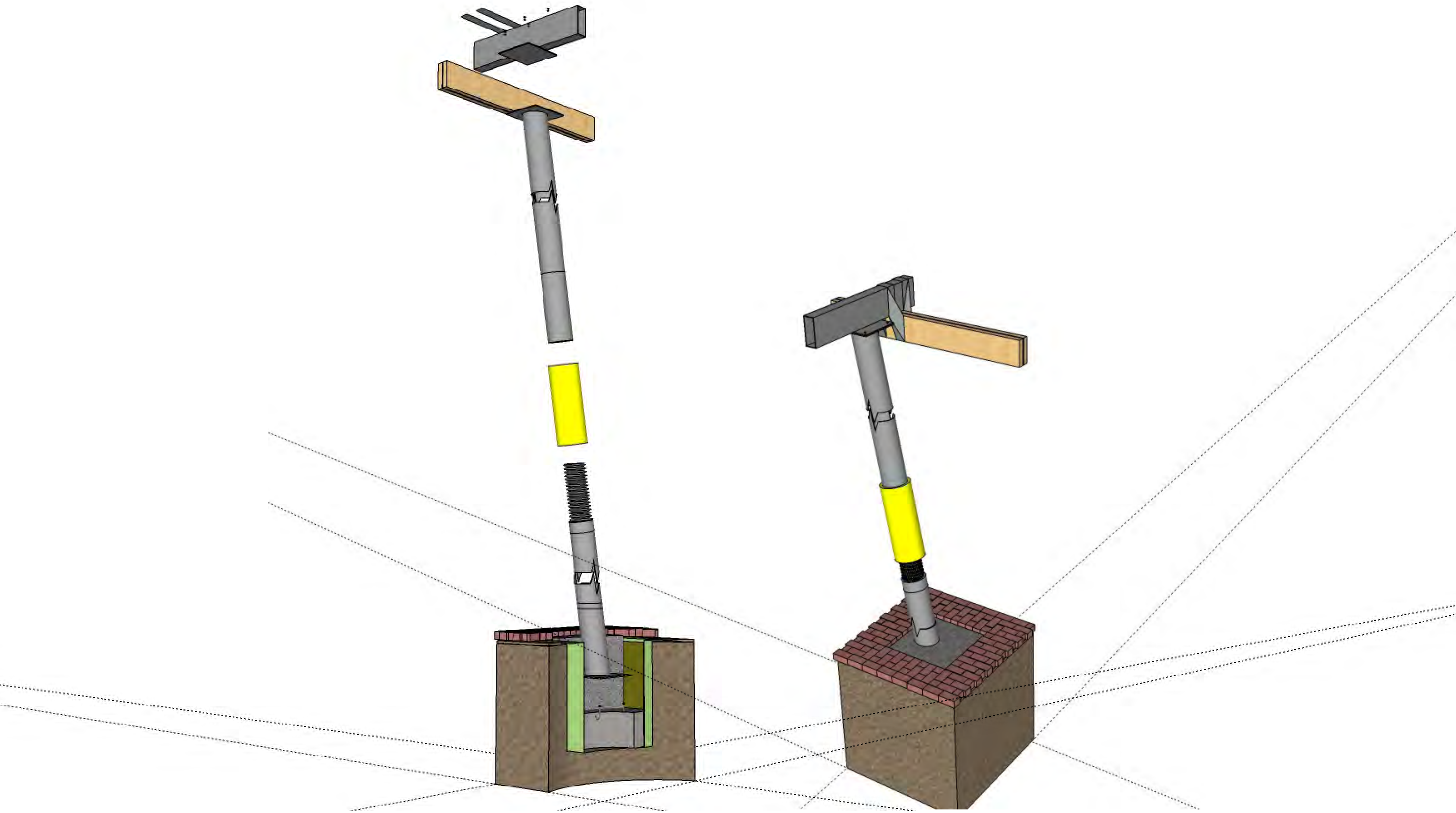
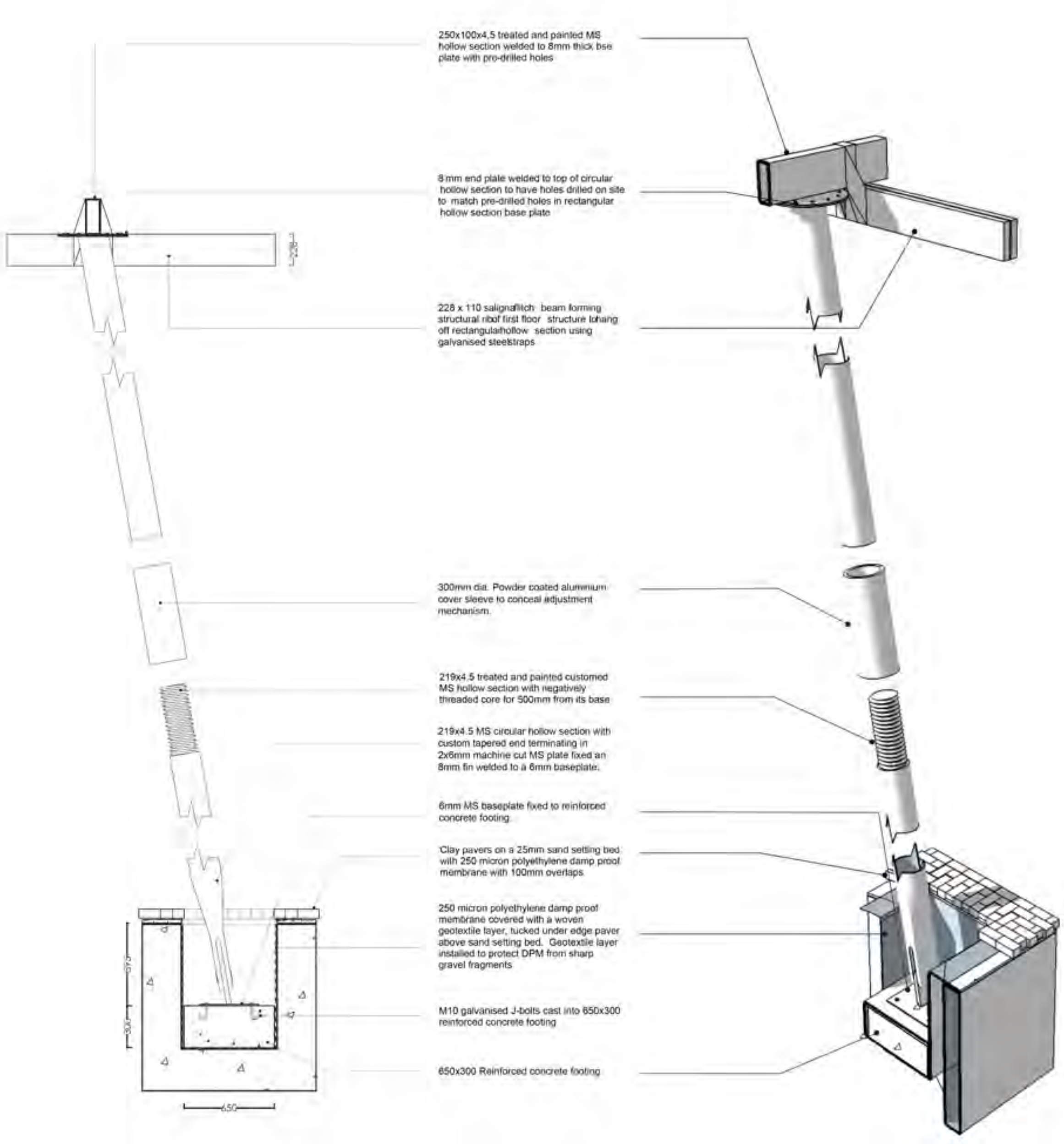
Figure 12.20: Exploded diagram showing assembly of column.

Figure 12.21: Image of complete column.

Figure 12.22: Concept sketch showing columns extending into ground and into pavilion above.

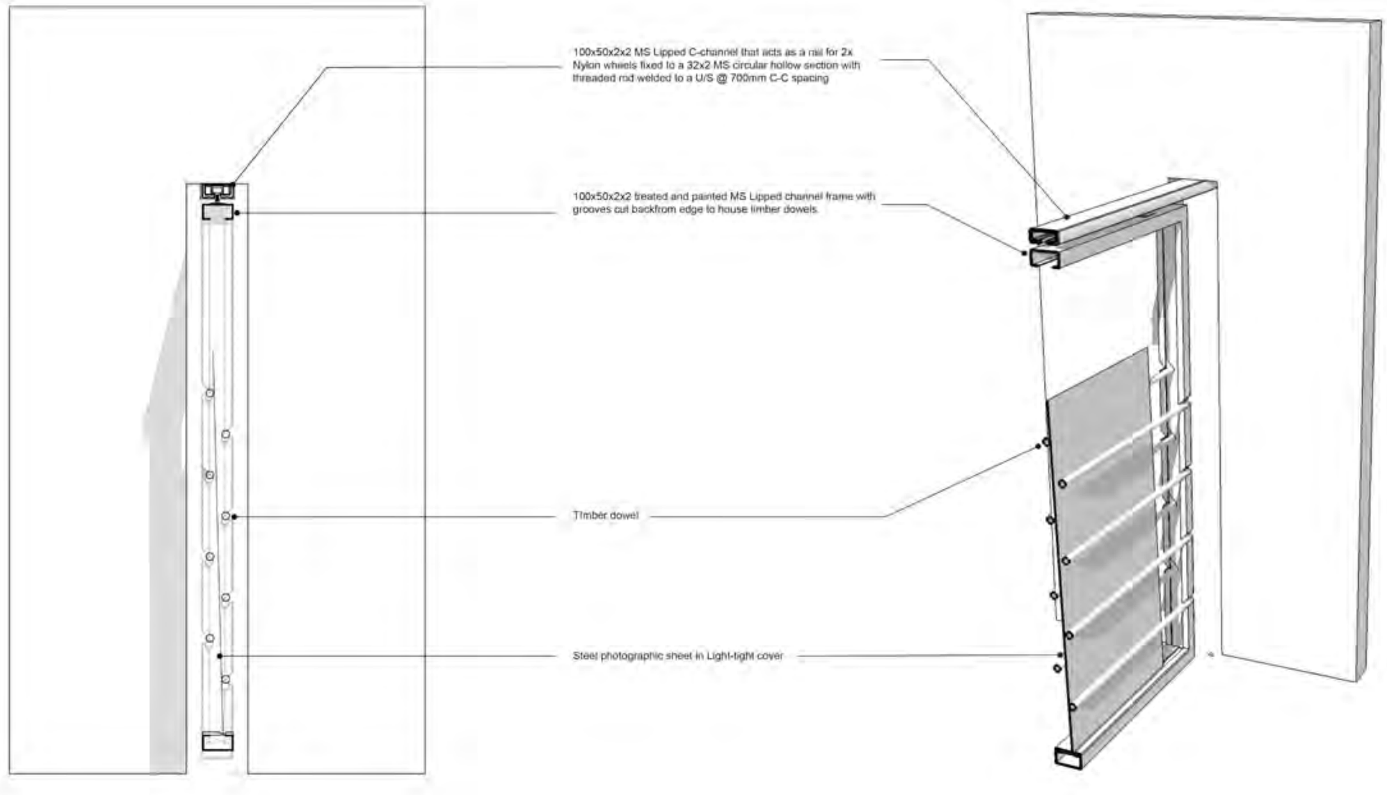


Column iteration 2 - adjustable length and angle



Detail of column
Scale 1:20

Detail of movable casing for photographic panels



12.9. MATERIAL PALETTE CONCEPT

Approach - permanence and decay

The theme of permanence and temporality should be continued when selecting materials for the project. These materials do not necessarily have to deteriorate themselves, but should be indicative of passing time. Materials that display more reluctance to change should be used for permanent elements whereas materials that are affected by time can be representative of the temporary. Such materials make the viewer aware of the continuum of time and the affects this time has both on architecture and on themselves.

Ruinophilia (Boym, 2011) is a term for our current fascination with ruins. They act as placeholders and reminders of our temporary position in the expanse of time. The overlapping of the built and nature create an unintentional architecture that can only take place over time, creating elements that are beautiful in their degradation. The ruin becomes nature's canvas, an opportunity for expressing and creating something out of the ordinary. Ruins, in a sense, are the unintentional memorials that are in a constant state of change, resulting in a platform for time, the built and the natural to exist in harmony. "Ruins make us think of the past that could have been and the future that never took place" (ibid.).

Similarly the permanent structures should be made of materials that promote the collaboration with the natural, while maintaining form so as to remind the viewer of the once complete pavilion. These materials are therefore more resistant to change.

The materials used to clad the forms of the pavilion on the other hand, should adopt an appearance of decay, while still maintaining longevity. The seeming decay will emphasize the temporal nature of the pods, giving suggestion to their ultimate removal.

The contrast between the materials of permanence and those representing impermanence will then be in contrast with each other, emphasizing the effects of time.

Still, there is a tougher, more critical edge to the acceptance of the decay of buildings and their inevitable ruin that places architecture in a unique position to inform our understanding of the human condition and enhance its experience. Chiefly, this is to include in design a degree of complexity, even of contradiction embodied in the simultaneous processes of growth and decay in our buildings that heightens and intensifies our humanity. – Lebeus Woods, 2012

PERMANENCE AND DECAY

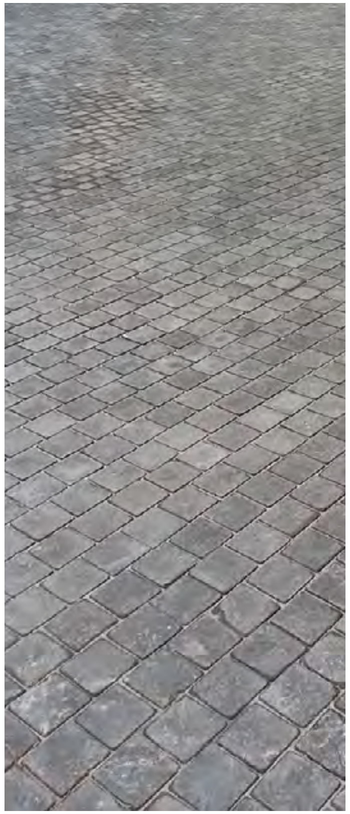
Opposite page:

Figure 12.23: Second World War ruin (Goosey, 2011)

12.10. PERMANENT PALETTE

Ground plane surface palette

FAST



FAST

TRANSITION

SLOWING DOWN

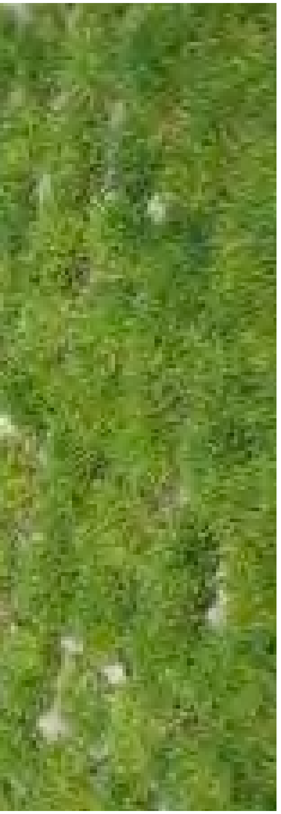
30mm Thick red asphalt made with recycled aggregate and tinted with a recycled glass pigment additive.

Dove grey square clay pavers.

Blurring lines between park and the built by softening the edges of walkways..

Merging walkways with the park creating slower paced movement routes.

Figure 12.24: Images indicating materials to be used in the design of the ground floor plane



TRANSITION

SLOW

Rocks embedded in concrete used as an edge accent

SLOW

Crusher dust used in slower moving areas, around seating areas and to blur the edge between open and enclosed.

REST

ACCENT

River rocks used as accents around planters.

PERMANENT SCULPTURE

Materials for the ground plane were chosen according to the ease of movement when walking over them and their haptic qualities. They were arranged from fast to slow and will be implemented in spaces accordingly.

12.11. TEMPORARY PALETTE

Case study:

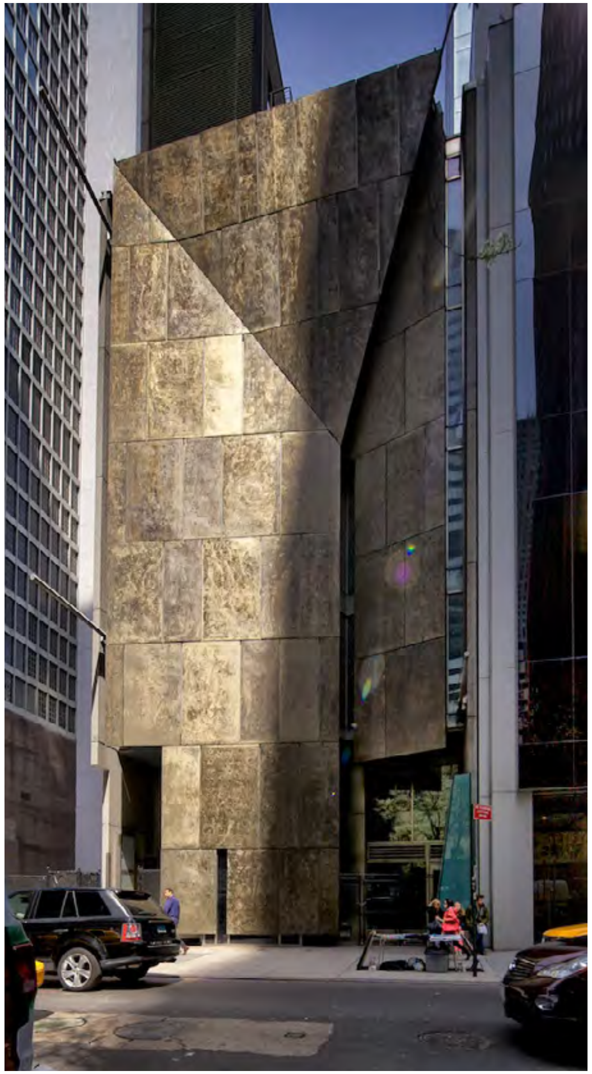
Materials that give the illusion of age

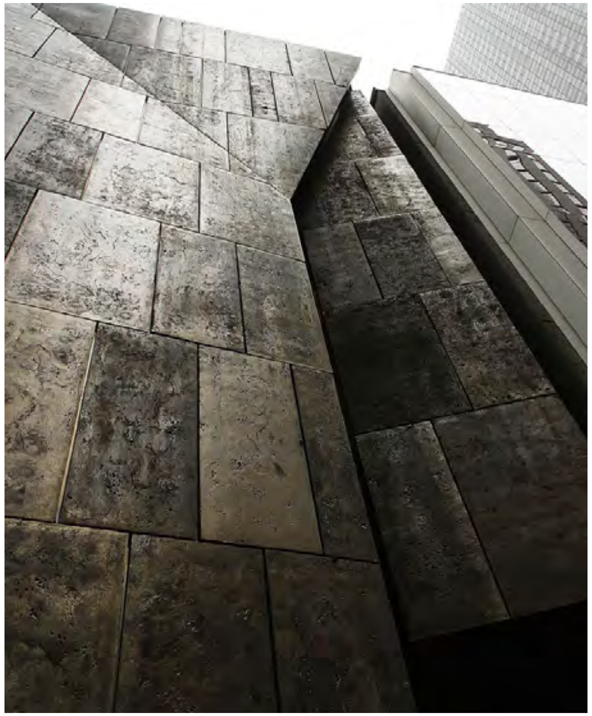
The American Folk Art Museum facade

One of my favourite architectural projects of all time, the once American Folk Art Museum (demolished in 2014) displayed ingenuity in the creation of its façade. The building nestled between the high-rises of New York, silently and respectfully placed and designed to not attract immediate attention but rather to develop interest. The demolition of this project caused an uproar in architectural communities resulting in major upsets regarding the Diller Scofidio + Renfro extension project for the Museum of Modern Art.

The façade of the building comprised of metal panels made from Tombasil, a white bronze alloy. The panels were poured onto a concrete surface, giving each panel a unique textured finish. The presence of copper in the material gave the panels colour properties that transcended the static. With each shift of light, the façade would change colour, responding to the amount and type of light falling on it.

The panels are essentially impervious to decay but give the appearance of being weathered despite this. When the building was completed in 2003 it looked like it had always been there, a contemporary ruin in the city fabric





Opposite page:

Figure 12.25: Close up of facade panels. (Axis Facades, 2012)

Current page:

Figure 12.26: In Memoriam: American Folk Art Museum (Careaga, n.d)

Figure 12.27: In Memoriam: American Folk Art Museum (Careaga, n.d)

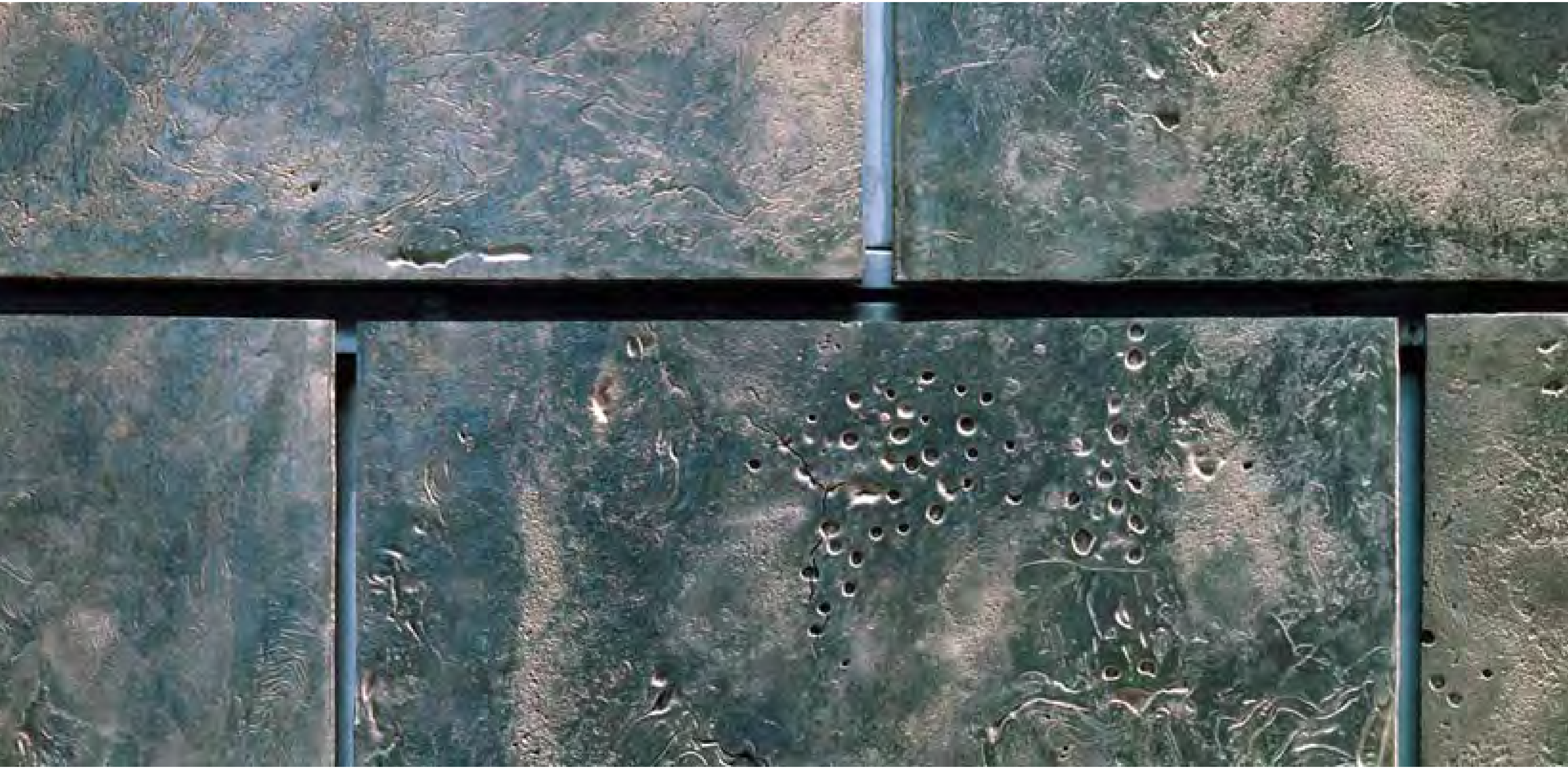


Image exploration of *temporary* materials

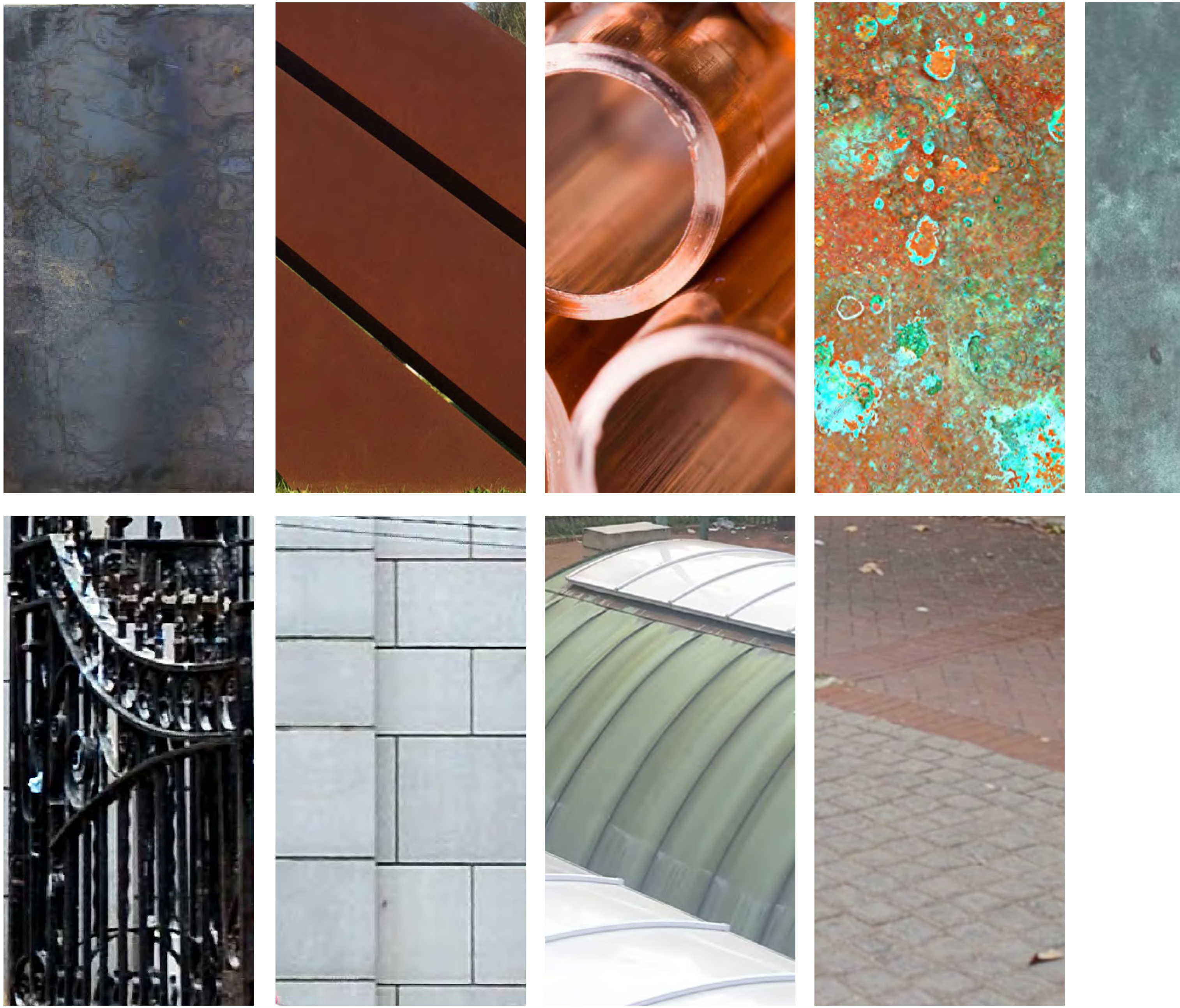


Image exploration of materials that could be used in the making of permanent and temporary elements of the pavilion.

The materials investigated fir the cladding are able to rust and form petinas. In this way the building will change over its life span on the site

These materials can also be pre-aged to give the effect of weathering prior to the pavilion's erection on site.

The structure is built from steel and timber. Steel adds to the robustness needed when designing a movable structure. Structural timber is used to support the steel members and act as bracing between ribs. Timber is also used for its haptic qualities, creating a warmer and more inviting visual appearance when designing in a park.

while timber offers the haptic qualities desired when

The materials chosen ae also complimentary of th ematerials afound on site.

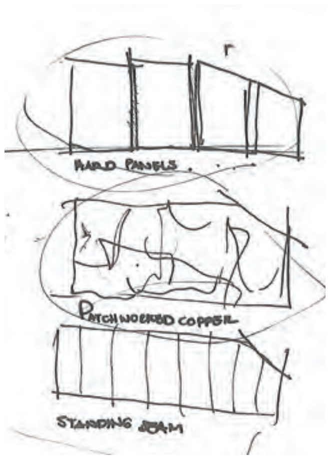
Top row of images:

Figure 12.28: Materials investigated including cor-ten, copper, cross-laminated timber, structural timber and steel.

Bottom row of images:

Figure 12.29: Existing materials palette as found on site.

Exploration of copper cladding options



Photographic exploration of various methods of applying copper cladding.

The intention of this exploration is to find an appropriate finish that will create a solid and weighted aesthetic for the pavilion forms. The type of cladding chosen should not be fixed in such a manner that the material is destroyed in the process of dismantling the pavilion.

Current page:

Figure 12.30: Series of copper cladding variations.

Opposite page:

Figure 12.31: Exploration of texturing copper panels.

Induced weathering of copper and zinc sheets

SAND-BLASTED AND DIPPED IN ACID

By rubbing acid onto the panel a more weathered appearance was achieved than the panels which were merely dipped.

SAND-BLASTED

This resulted in a monotonous finish which, although textured, dis not weather as desired.

SAND-BLASTED AND PARTIALLY DIPPED IN ACID

In this instance a green patina started to form. This was induced by the acid used.

BACK-SIDE OF PREVIOUS PANEL

The sand-blasting imprinted a texture on the back of the panel which created a different light condition on its surface.

ACID APPLIED USING SPONGE & STEEL WOOL

The rough application lead to an appealing weathered aesthetic.

Physical exploration of textures and colour qualities of copper-based sheets.

An exploration to understand induced weathering and texture qualities that can be achieved when using a copper - zinc sheet (90% copper to 10% zinc).

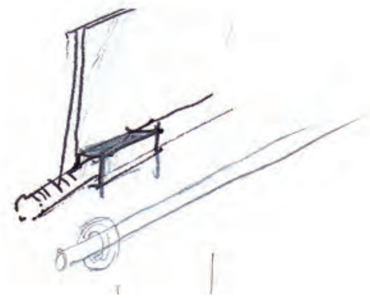
This material is the same sheeting used to manufacture bullets. This sample piece was obtained from Pretoria Metal Pressings, a sub-division of Denel.

The sheets where dipped and rubbed with various acid solutions as well as sand-blasted to better understand the properties of the material.

Once the final construction method is chosen the cladding method and form of induced weathering will be chosen.

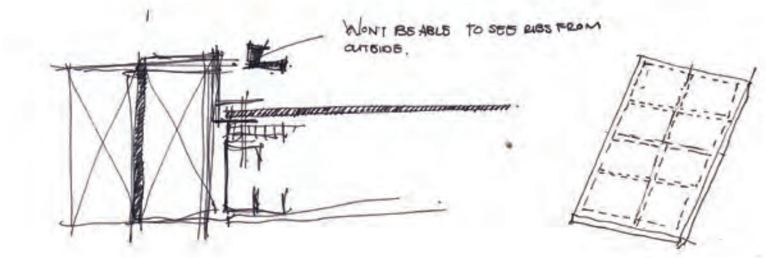
12.12. PANEL FIXING ITERATIONS

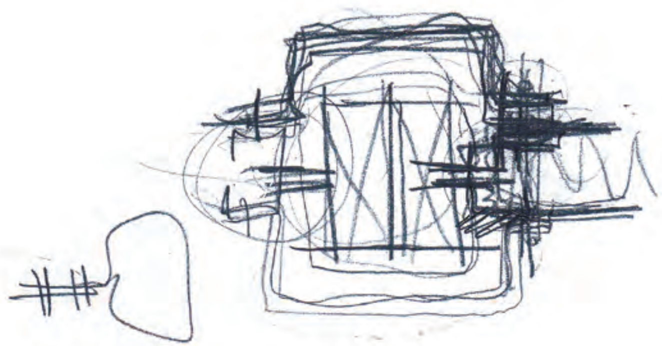
Progression of fixings



Hanging the panels onto the structure.

Exposing the structure through the cladding pattern on the facade.

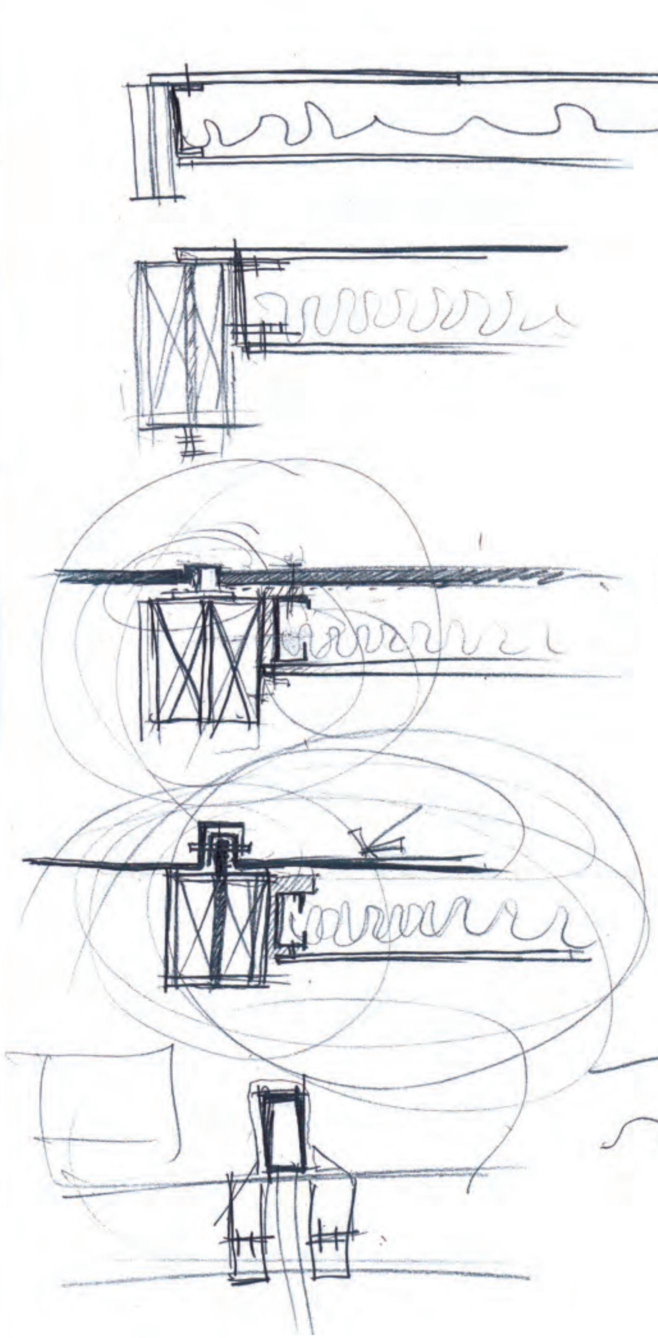




Lipped channels act as anchoring points for mild steel hangers as a means to fix cladding panels to structure.

Current and opposite page:

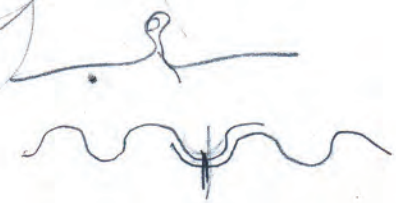
Figure 12.32: Series of sketches indicating the progression of the fixing designs.



Steel “sandwich” pannels.

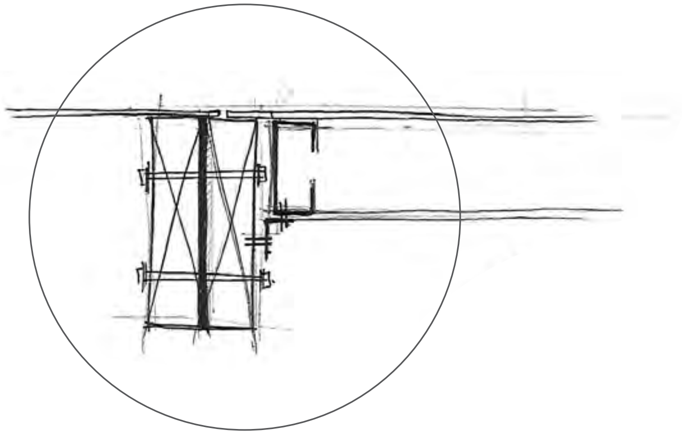
Spacer between cladding panels.

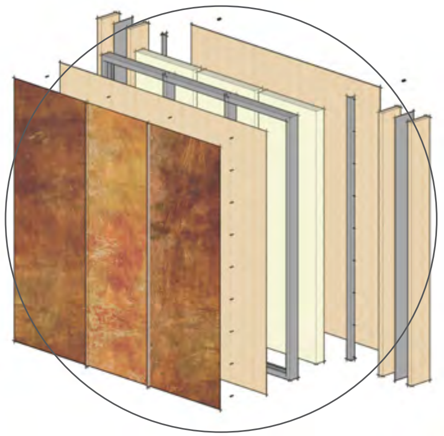
Structure as a means to connect cladding panels.



Connection between stabilising members and ribs at the base of the structure.

Panel fixed to inside of structural rib





In this construction method in this exploration is fixed to the inside of the structural rib using steel angles. There were both positive and negative aspects in this detail.

Postive aspects:

- Using steel lipped channels provides a space for the required insulation to be installed, making the building thermally sufficient.
- The plywood panel between the steel frame and the copper cladding acts as a buffer between corrosive materials.
- Steel purlins can be spaces according to copper widths (less than 900mm)

Negative aspects:

- Panels may prove difficult to handle on site.
- Oddly shaped panels will be difficult to construct.
- The manufacturing may prove over-complicated for the type of pavilion.
- Water-proofing proved to be challenging on intersections with the cladding being pre-fixed to the panels.

This construction method was presented in the technical crit in September and it was suggested that an easier method, utilising the steel in the structural ribs for potential fixing methods.

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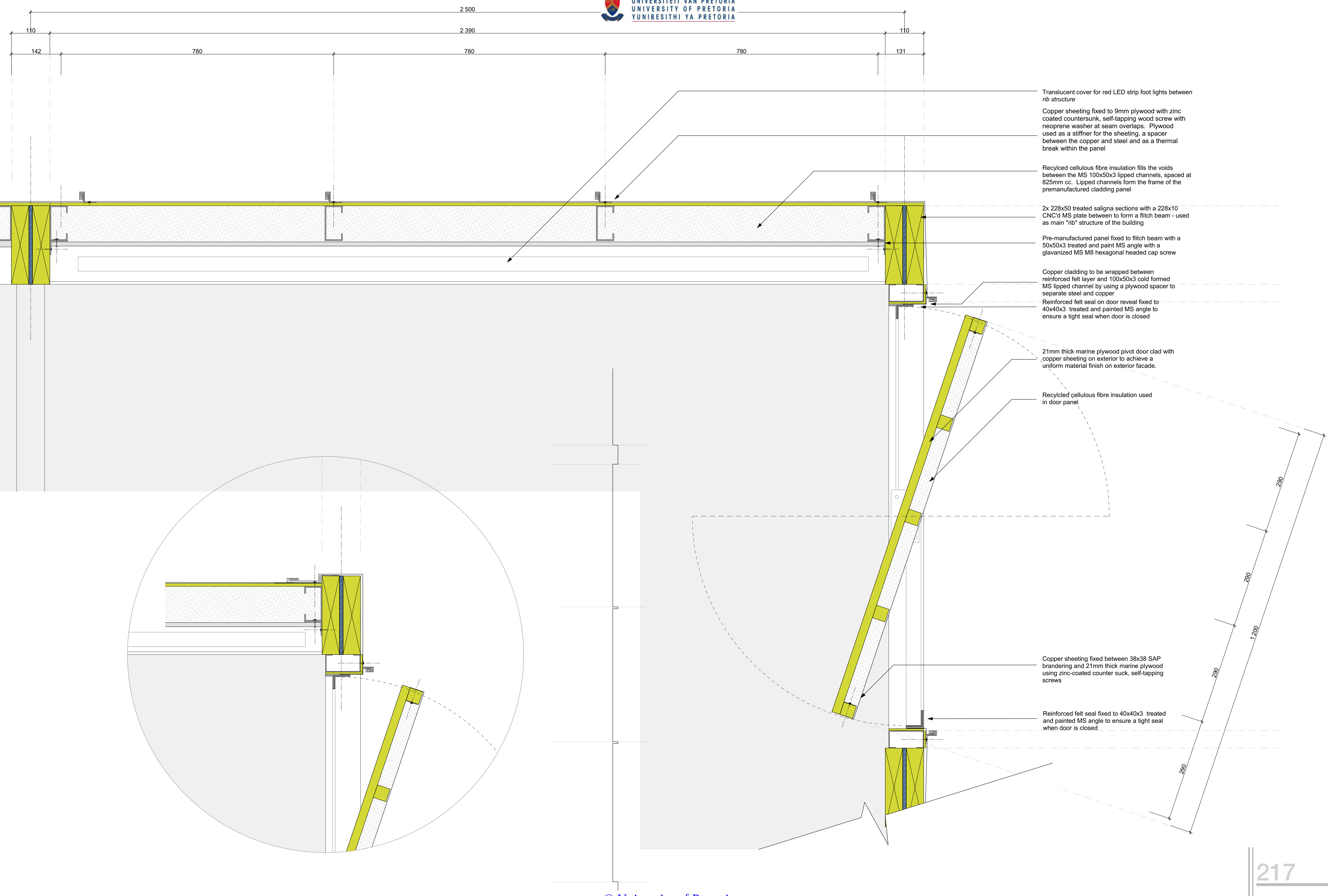
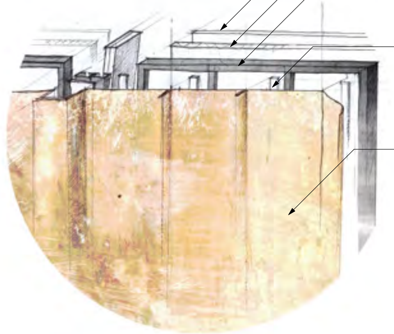
Figure 12.33: A series of images depicting the connection between sandwich panels and ribs using mils steel angles.

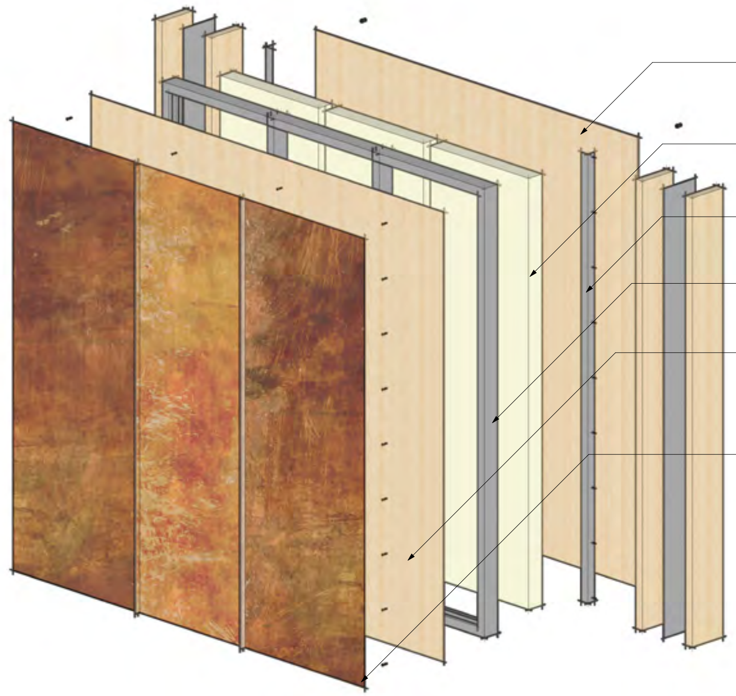

2 500
110
2 390
110
142
780
780
780
131
Translucent cover for red LED strip foot lights between *rib structure*
Copper sheeting fixed to 9mm plywood with zinc coated countersunk, self-tapping wood screw with neoprene washer at seam overlaps. Plywood used as a stiffner for the sheeting, a spacer between the copper and steel and as a thermal break within the panel
Recylced cellulous fibre insulation fills the voids between the MS 100x50x3 lipped channels, spaced at 825mm cc. Lipped channels form the frame of the premanufactured cladding panel
2x 228x50 treated saligna sections with a 228x10 CNC'd MS plate between to form a flitch beam - used as main "rib" structure of the building
Pre-manufactured panel fixed to flitch beam with a 50x50x3 treated and paint MS angle with a glavanized MS M8 hexagonal headed cap screw
Copper cladding to be wrapped between reinforced felt layer and 100x50x3 cold formed MS lipped channel by using a plywood spacer to separate steel and copper
Reinforced felt seal on door reveal fixed to 40x40x3 treated and painted MS angle to ensure a tight seal when door is closed
21mm thick marine plywood pivot door clad with copper sheeting on exterior to achieve a uniform material finish on exterior facade.
Recylcled cellulous fibre insulation used in door panel
Copper sheeting fixed between 38x38 SAP brandering and 21mm thick marine plywood using zinc-coated counter suck, self-tapping screws
Reinforced felt seal fixed to 40x40x3 treated and painted MS angle to ensure a tight seal when door is closed
290
290
290
290
1 200

12.14. PANEL ITERATIONS

Steel frameed panels



COMPOSITION OF PRE-MANUFACTURED CLADDING PANELS - ITERATION 1



COMPOSITION OF PRE-MANUFACTURED CLADDING PANELS - ITERATION 2

Figure 12.34: Opposite page:

Figure 12.35: A series of sketches exploring external fixing methods for panels made from cross-laminated timber.

Figure 12.36: Current page:

Figure 12.37: Diagrams showing two iterations of the composition of cladding panels.

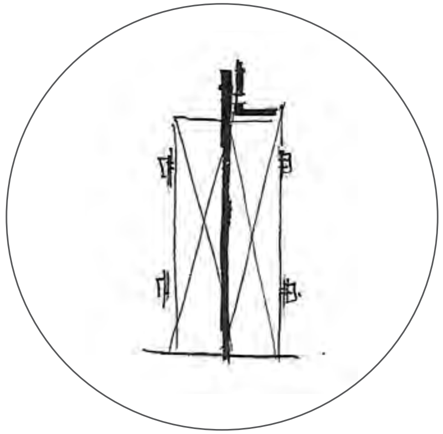
Cross laminated timber panel fixed to steel member of rib.

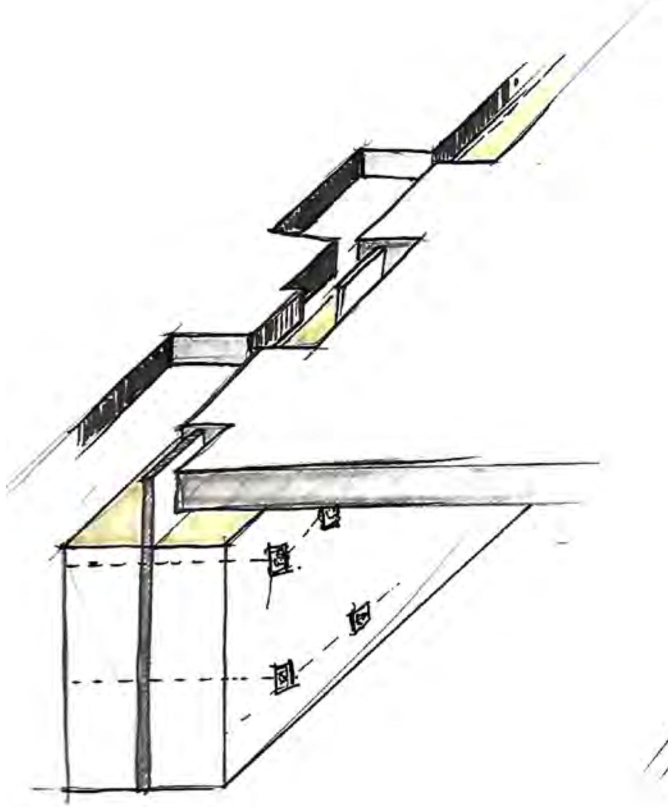
This method uses cross-laminated timber as a full panel instead of a steel constructed frame with infill.

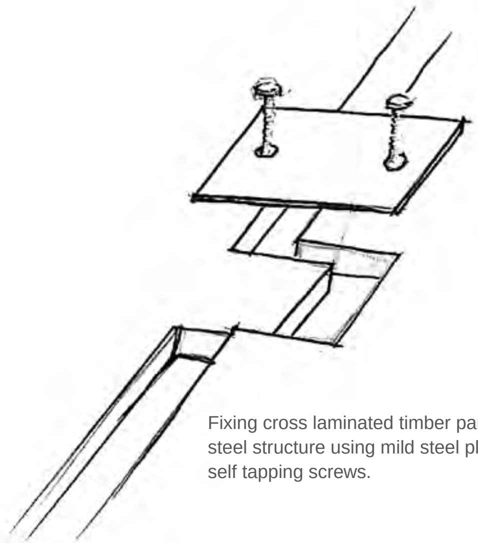
The benefits of using this material is

- that it offers structural support;
- can be easily cut to almost any size and shape in a factory;
- creates an already finished wall panel in the interior.

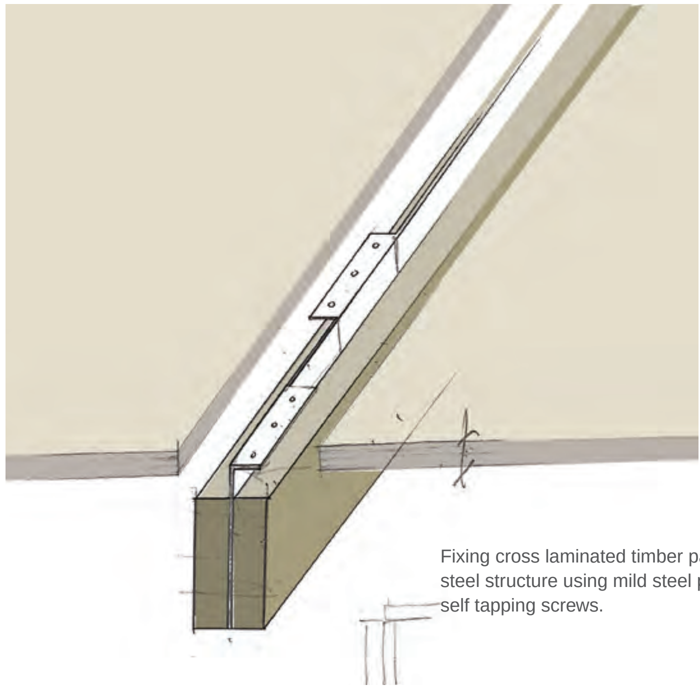
This exploration will be investigated in greater detail at a later stage.







Fixing cross laminated timber panels to steel structure using mild steel plates and self tapping screws.



Fixing cross laminated timber panels to steel structure using mild steel plates and self tapping screws.

12.15. TECTONIC MODEL

Model depicting tectonic concept of support structure, rib structure and cladding.

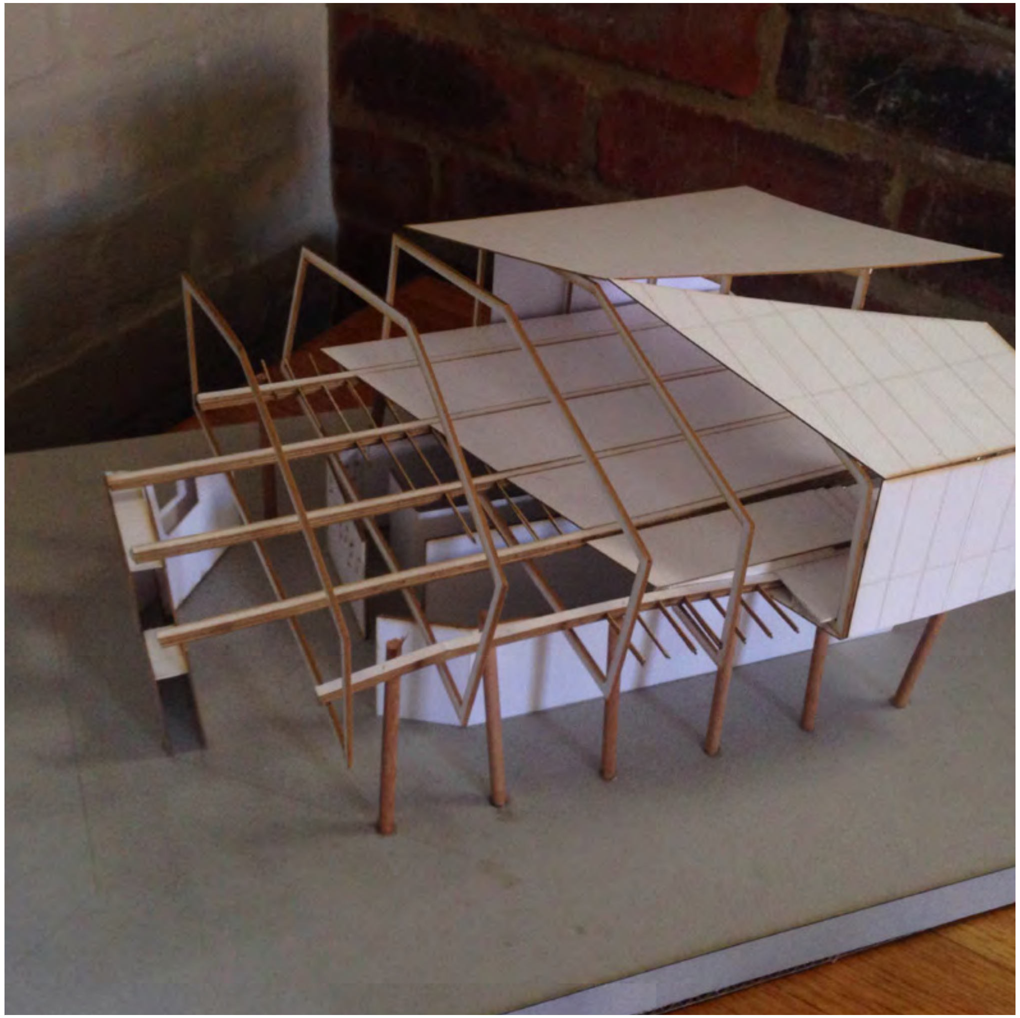
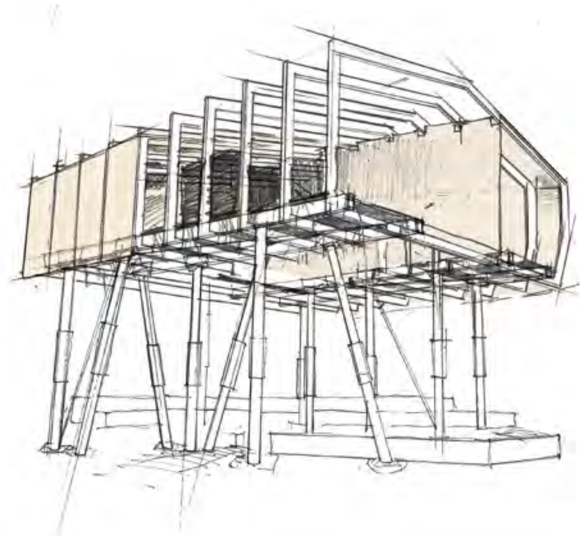
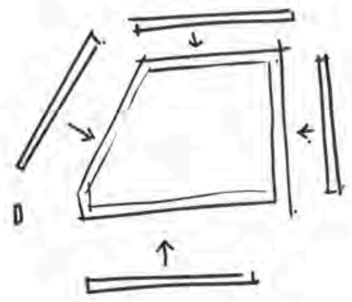


Figure 12.38: Photographs of first construction model (scale 1:50)

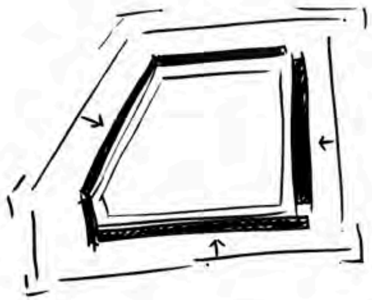
Assembly series

Figure 12.39: Sequence of assembly

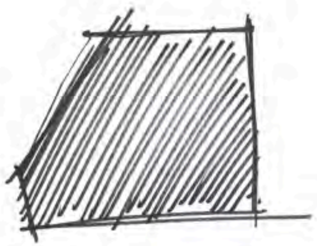




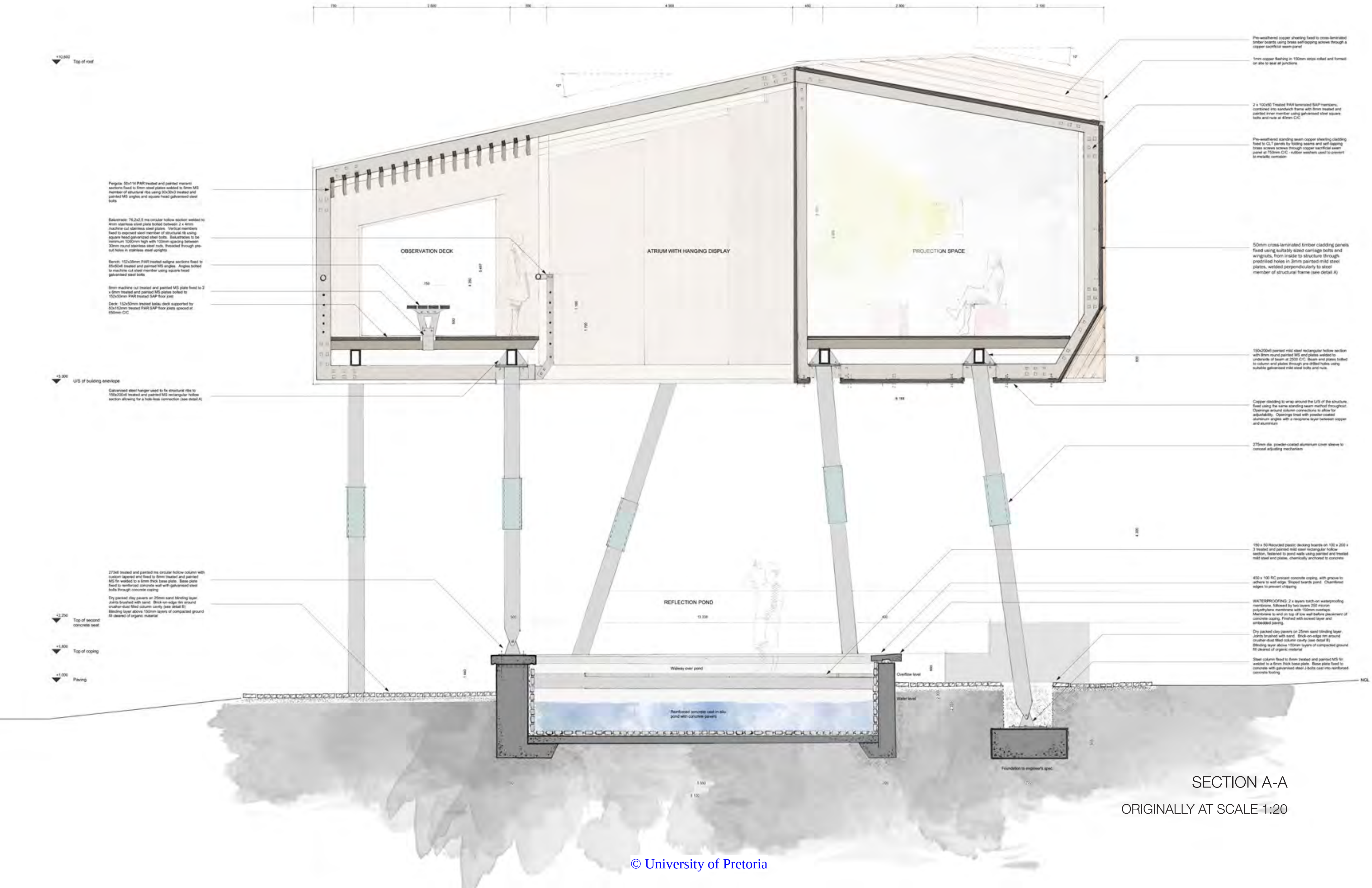
Laminated timber panels fixed to structural ribs.



The building is then wrapped in copper cladding.



The anonymous object.



SECTION A-A

ORIGINALLY AT SCALE 1:20

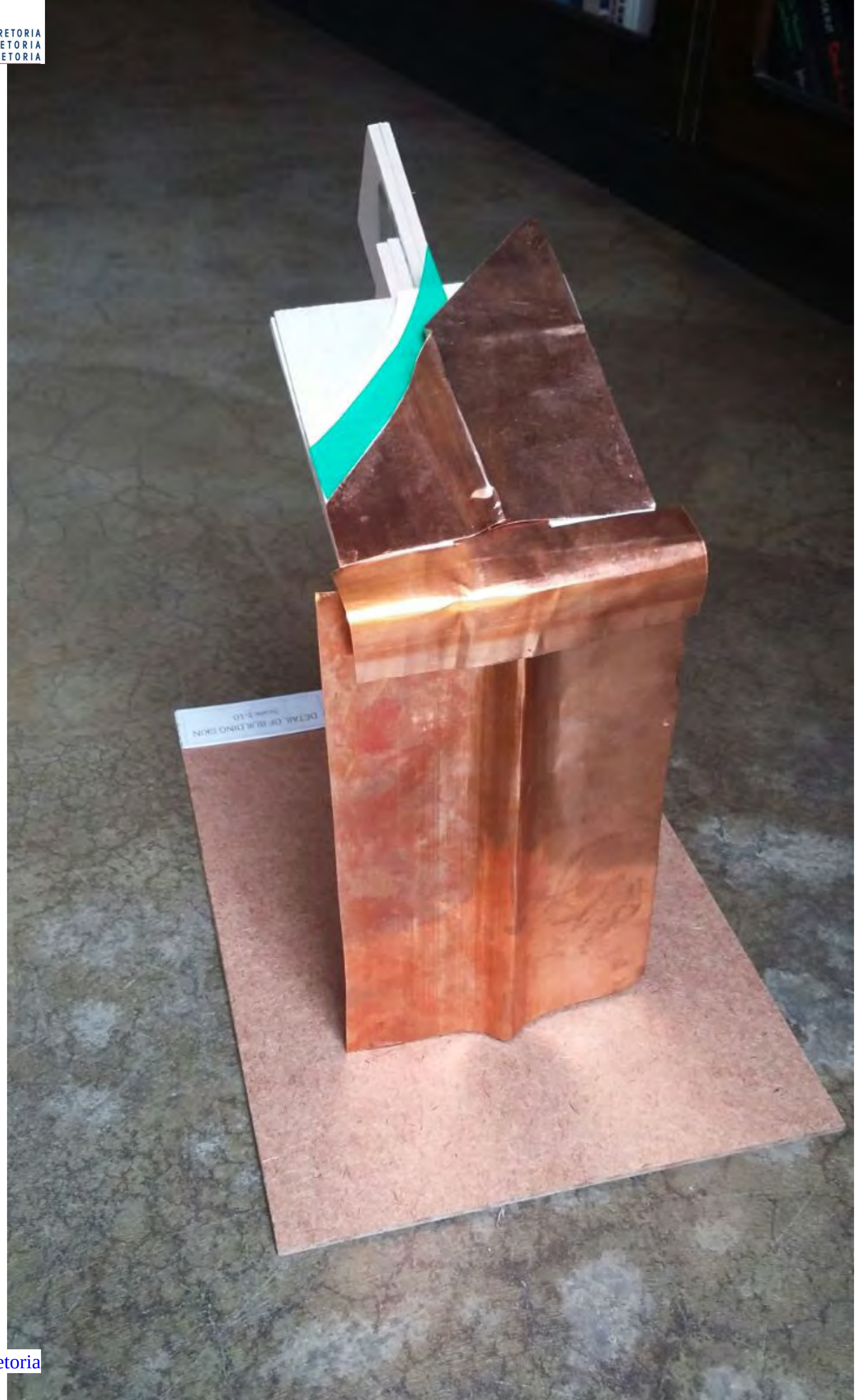
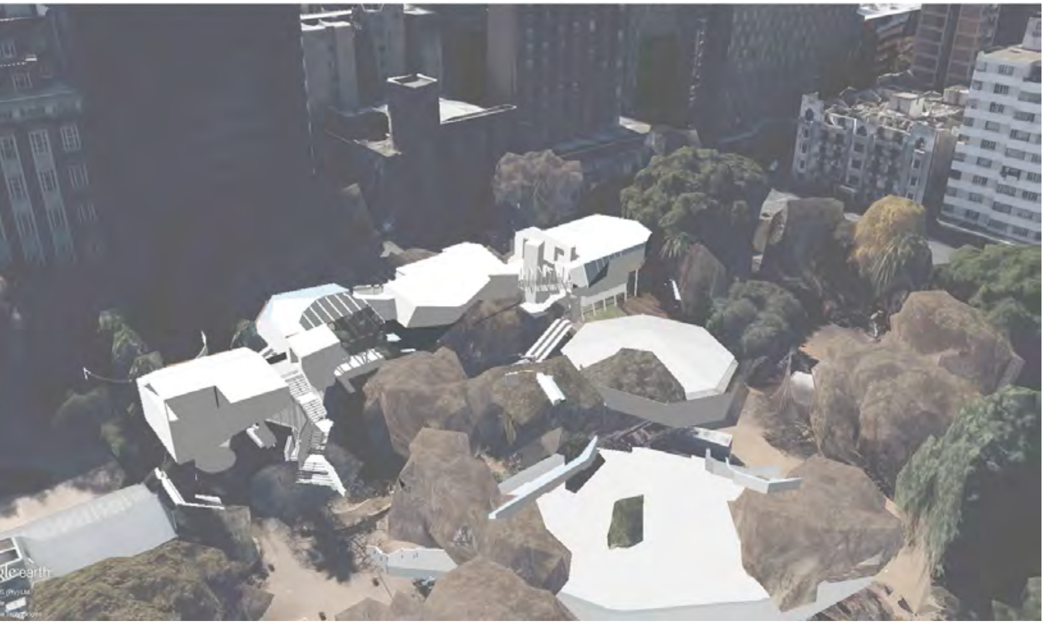


Figure 12.40: Photographs of detail model

DETAIL MODEL OF BUILDING SKIN

ORIGINALLY AT SCALE 1:10



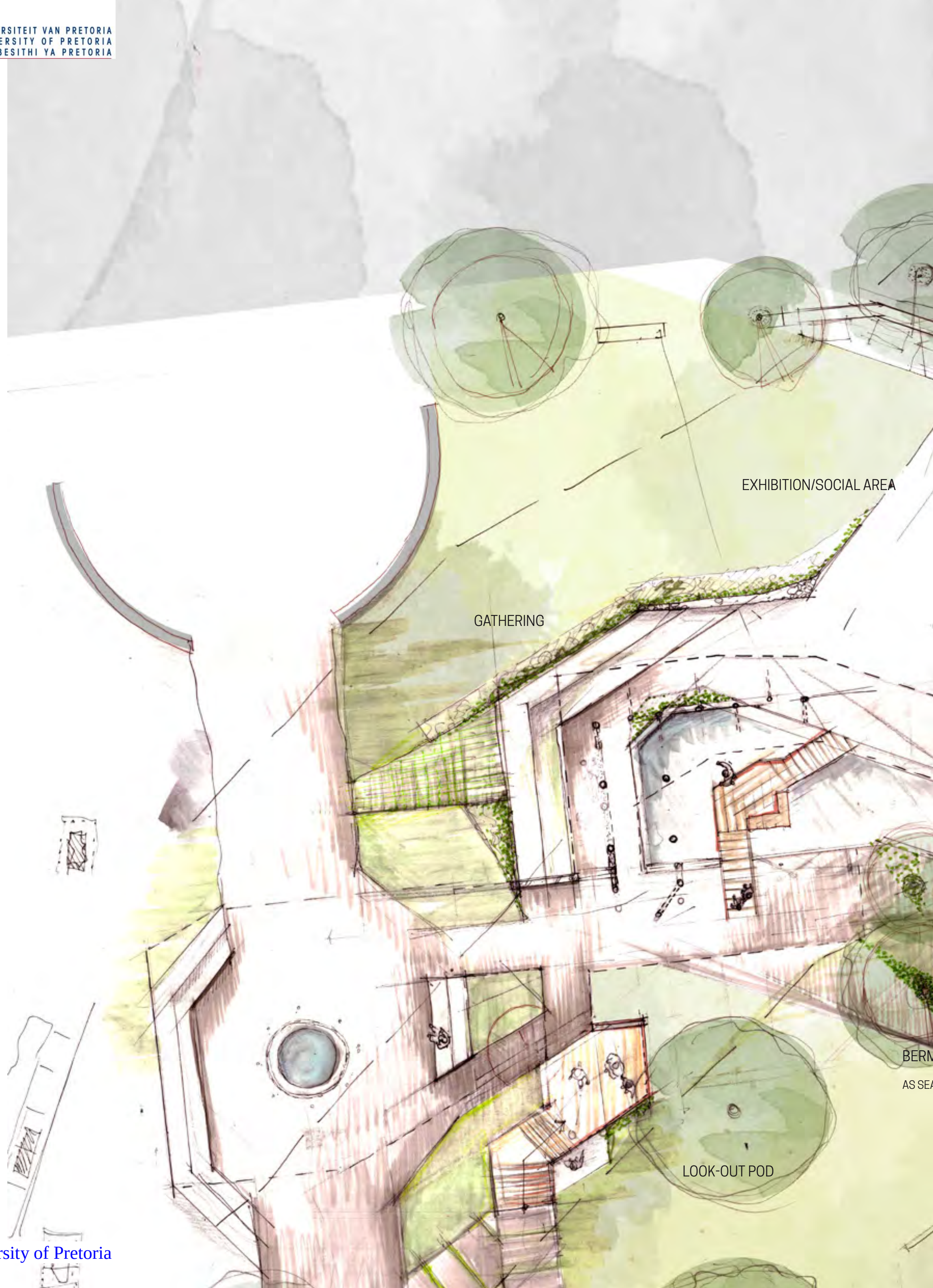
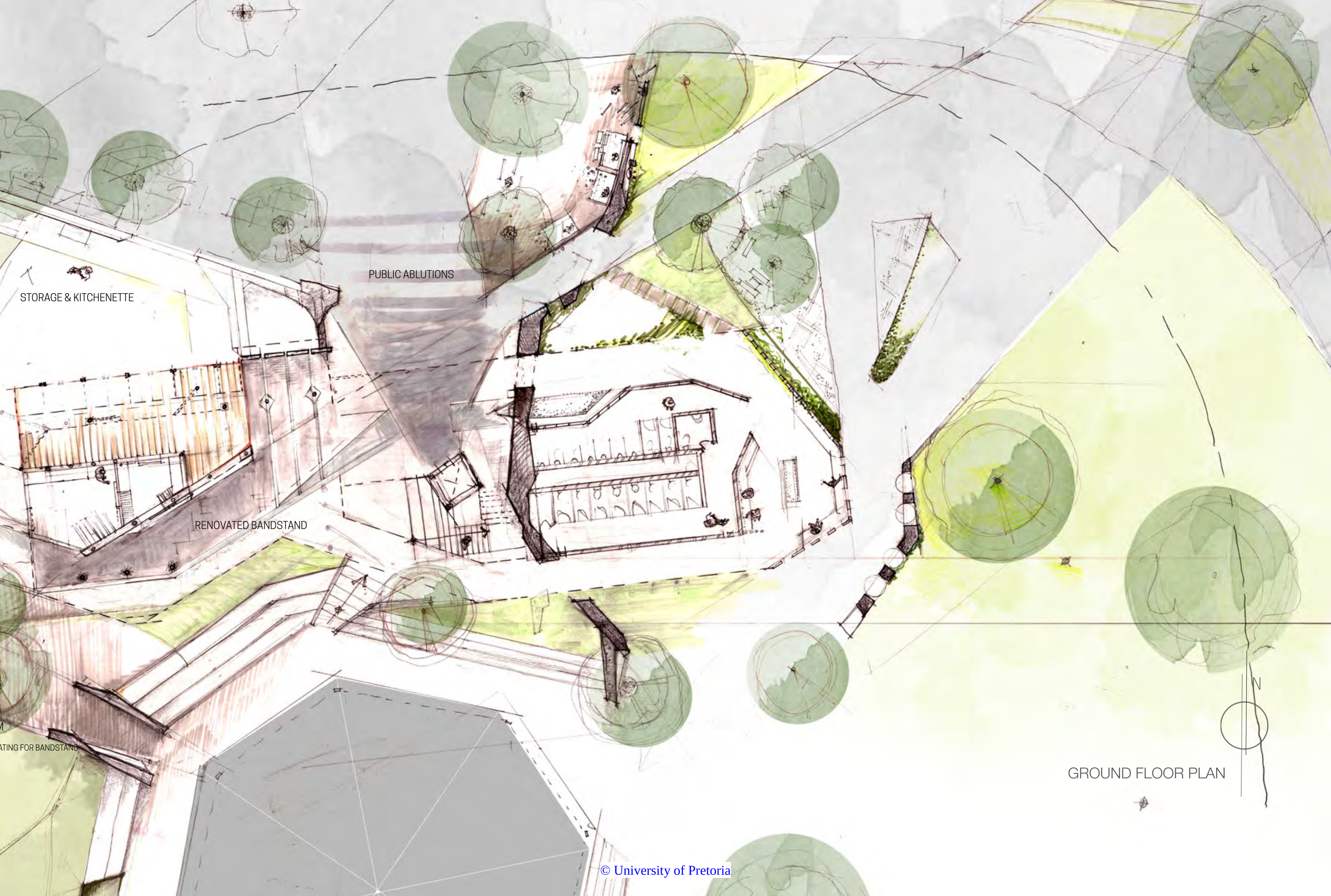


Figure 12.41: Building in context.

Figure 12.42: Ground floor plan.


STORAGE & KITCHENETTE
PUBLIC ABLUTIONS
RENOVATED BANDSTAND
ATING FOR BANDSTAND
N
GROUND FLOOR PLAN

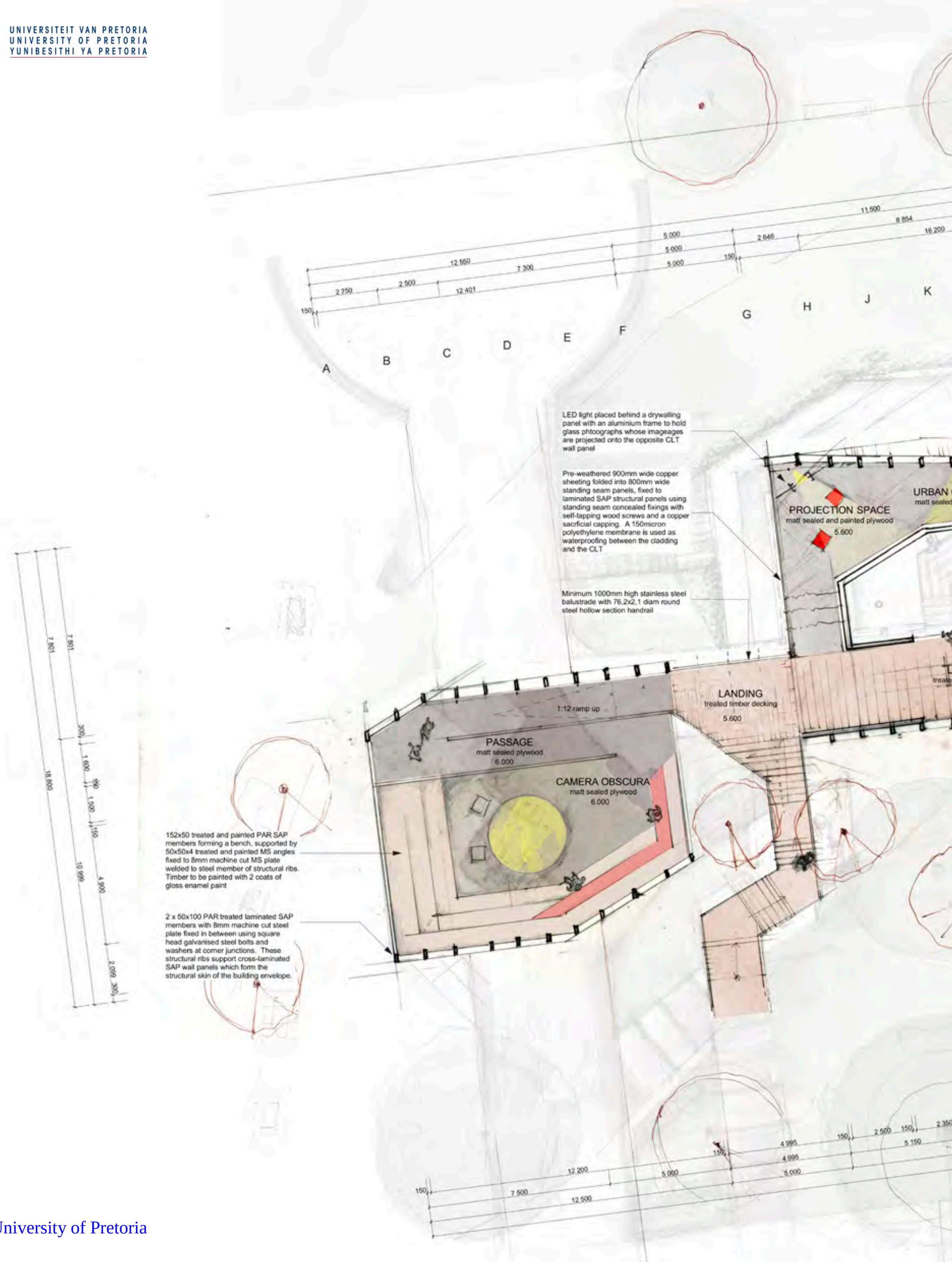
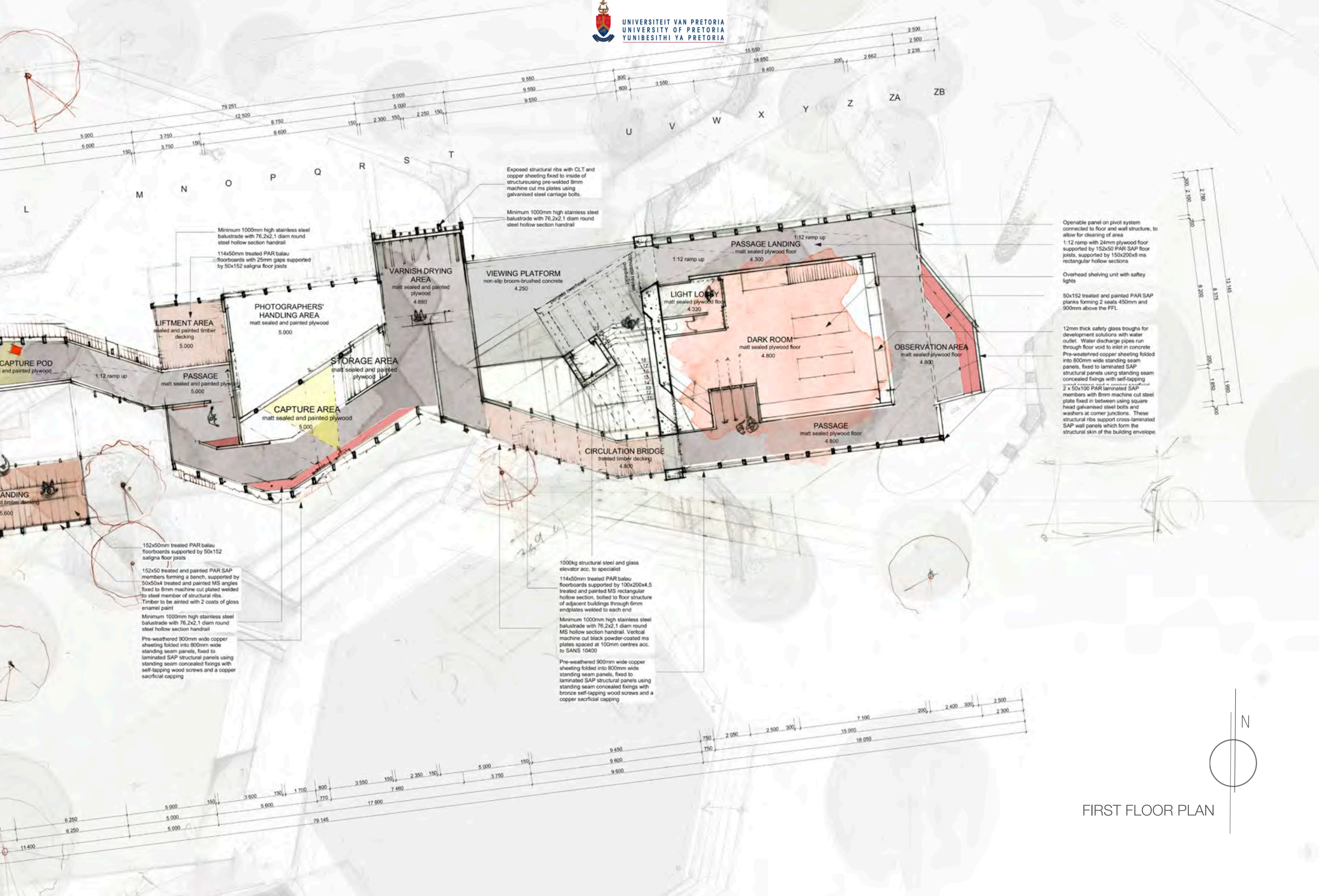


Figure 12.43: Ground floor plan.

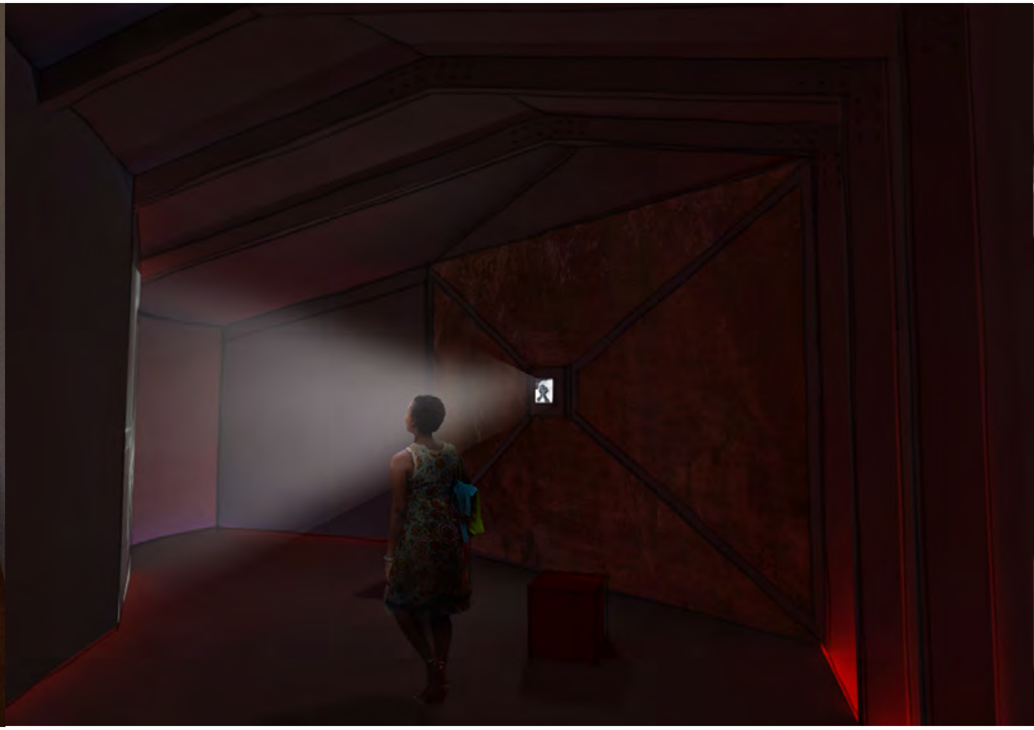

VARNISH DRYING AREA
matt sealed and painted plywood
4.880
VIEWING PLATFORM
non-slip broom-brushed concrete
4.250
PASSAGE LANDING
matt sealed plywood floor
4.300
1:12 ramp up
LIGHT LOBBY
4.330
DARK ROOM
matt sealed plywood floor
4.800
OBSERVATION AREA
matt sealed plywood floor
4.800
PASSAGE
matt sealed plywood floor
4.800
CIRCULATION BRIDGE
treated timber decking
4.800
PHOTOGRAPHERS' HANDLING AREA
matt sealed and painted plywood
5.000
LIFTMENT AREA
sealed and painted timber decking
5.000
STORAGE AREA
matt sealed and painted plywood
CAPTURE AREA
matt sealed and painted plywood
5.000
PASSAGE
matt sealed and painted plywood
5.000
CAPTURE POD
Exposed structural ribs with CLT and copper sheeting fixed to inside of structureusing pre-welded 8mm machine cut ms plates using galvanised steel carriage bolts.
Minimum 1000mm high stainless steel balustrade with 76,2x2,1 diam round steel hollow section handrail
114x50mm treated PAR balau floorboards with 25mm gaps supported by 50x152 saligna floor joists
Openable panel on pivot system connected to floor and wall structure, to allow for cleaning of area
1:12 ramp with 24mm plywood floor supported by 152x50 PAR SAP floor joists, supported by 150x200x8 ms rectangular hollow sections
Overhead shelving unit with saftey lights
50x152 treated and painted PAR SAP planks forming 2 seats 450mm and 900mm above the FFL
12mm thick safety glass troughs for development solutions with water outlet. Water discharge pipes run through floor void to inlet in concrete
Pre-weatehred copper sheeting folded into 800mm wide standing seam panels, fixed to laminated SAP structural panels using standing seam concealed fixings with self-tapping
2 x 50x100 PAR laminated SAP members with 8mm machine cut steel plate fixed in between using square head galvanised steel bolts and washers at corner junctions. These structural ribs support cross-laminated SAP wall panels which form the structural skin of the building envelope
152x50mm treated PAR balau floorboards supported by 50x152 saligna floor joists
152x50 treated and painted PAR SAP members forming a bench, supported by 50x50x4 treated and painted MS angles fixed to 8mm machine cut plated welded to steel member of structural ribs. Timber to be ainted with 2 coats of gloss enamel paint
Minimum 1000mm high stainless steel balustrade with 76,2x2,1 diam round steel hollow section handrail
Pre-weathered 900mm wide copper sheeting folded into 800mm wide standing seam panels, fixed to laminated SAP structural panels using standing seam concealed fixings with self-tapping wood screws and a copper sacrficial capping
1000kg structural steel and glass elevator acc. to specialist
114x50mm treated PAR balau floorboards supported by 100x200x4,5 treated and painted MS rectangular hollow section, bolted to floor structure of adjacent buildings through 6mm endplates welded to each end
Minimum 1000mm high stainless steel balustrade with 76,2x2,1 diam round MS hollow section handrail. Veritcal machine cut black powder-coated ms plates spaced at 100mm centres acc. to SANS 10400
Pre-weathered 900mm wide copper sheeting folded into 800mm wide standing seam panels, fixed to laminated SAP structural panels using standing seam concealed fixings with bronze self-tapping wood screws and a copper sacrficial capping
N
FIRST FLOOR PLAN

CAMERA OBSCURA

REFLECTION DEC

Figure 12.44: Interior renders depicting the haptic qualities of the enclosed spaces

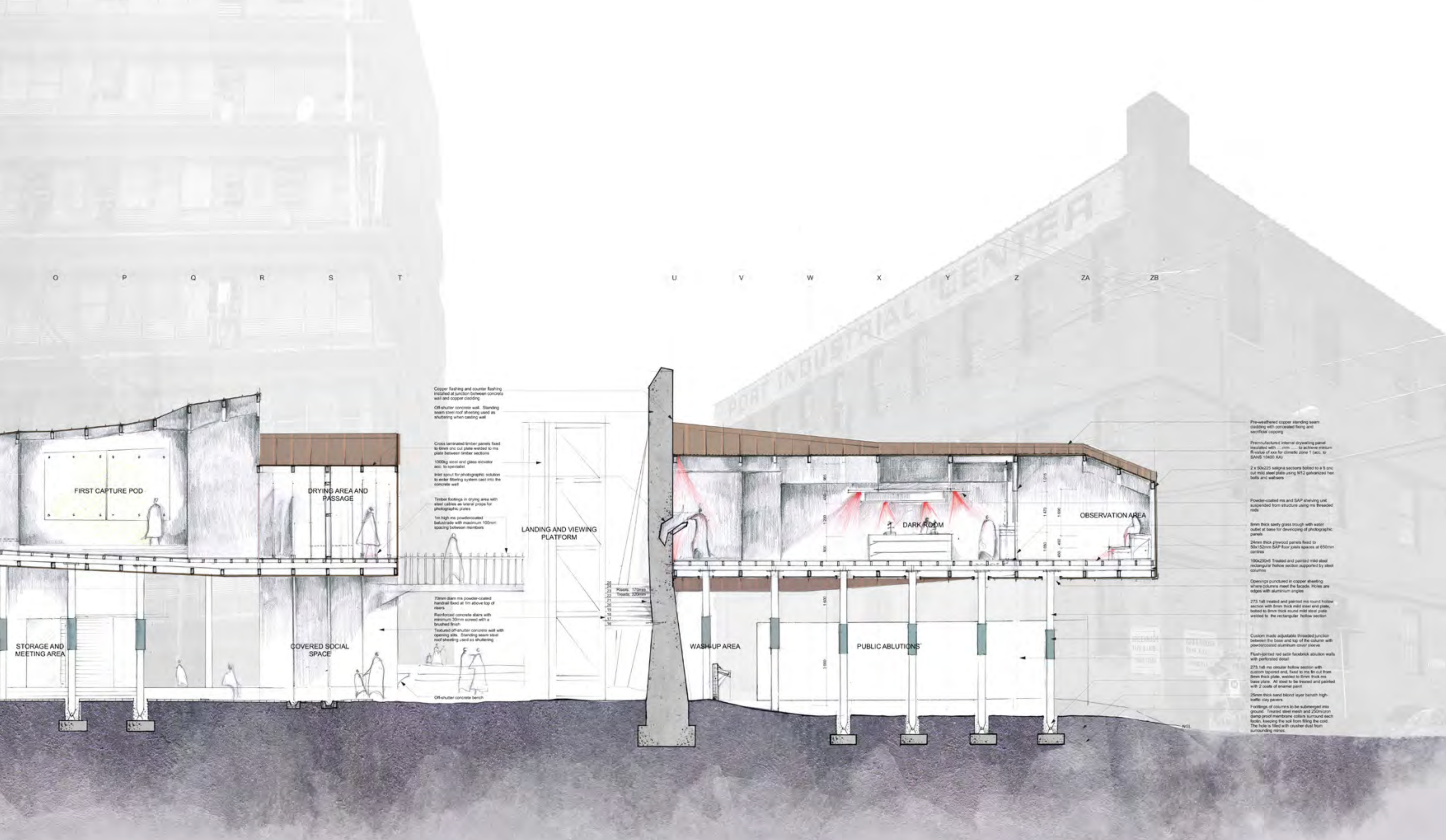
CK



PROJECTION ROOM

CAPTURE POD


A
B
C
D
E
F
G
H
J
K
L
M
N
+13,493
Top of canopy
Mirror fixed to pivot mechanism of camera obscura
Copper flashing and counter flashing installed at junction between concrete wall and copper cladding
Pre-weathered copper sheeting fixed to cross laminated timber panels using concealed by steanding seam detail with sacrificial capping piece
+10,554
Top of roof
3 tiered lenses adjusted using a pulley system to focus the image projection
24mm thick varnished plywood seating with mechanically ventilated air inlets and red LED strips beneath
24mm thick plywood panels fixed to 50x152mm SAP floor joists spaces at 600mm centres
100x200x6 Treated and painted mild steel rectangular hollow section,supported by steel columns
2 x 50x225 saligna sections bolted to a 8 cnc cut mild steel plate using M12 galvanized hex bolts and wahsers
+6,414
FFL
+5,850
U/S of cladding
+5,260
U/S of cladding
273.1x8 treated and painted mild steel round hollow section with 8mm thick mild steel end plate, bolted to 8mm thick round mild steel plate welded to the rectangular hollow section
Custom made adjustable threaded join between the base and top of the column with powdercoated aluminum cover sleeve
Existing brick walls
Smooth steel shuttered concrete bench
273.1x8 ms circular hollow section with custom tapered end, fixed to ms fin cut from 8mm thick plate, welded to 8mm thick ms base plate. All steel to be treated and painted with 2 coats of enamel paint
+1,715
25mm thick sand binding layer beneath high-traffic clay pavers
+0,000
Soil compacted in 150mm layers
Reinforced concrete pond to be waterproofed with 2 layers torch on waterproofing membrane and lined with clay pavers to match exterior floor finish. Waterproofing to wrap above concrete edge with facebrick coping. Internal corners of pond to be chamfered.
CAMERA OBSCURA
LANDING
LOBBY
VIEWING DECK
PASSAGE
PARK ENTRANCE
RELAXATION AREA
HANGING EXHIBITION SPACE



SECTION B-B

ORIGINALLY AT SCALE 1:50

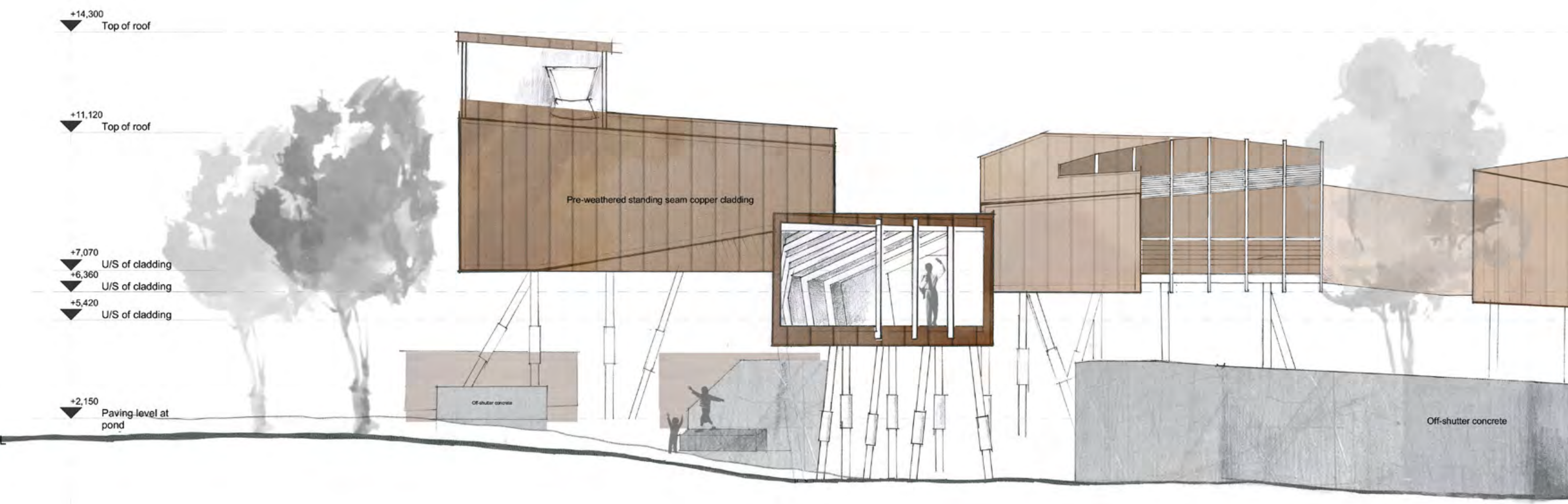
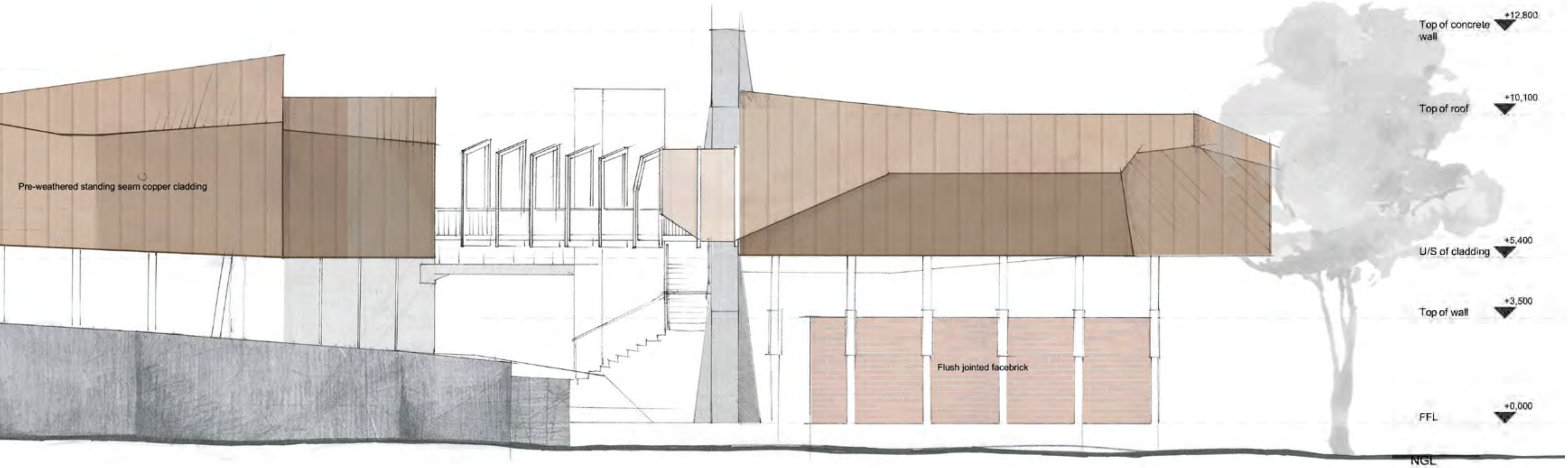


Figure 12.45: South elevation



SOUTH ELEVATION (FROM PARK)

ORIGINALLY AT SCALE 1:100

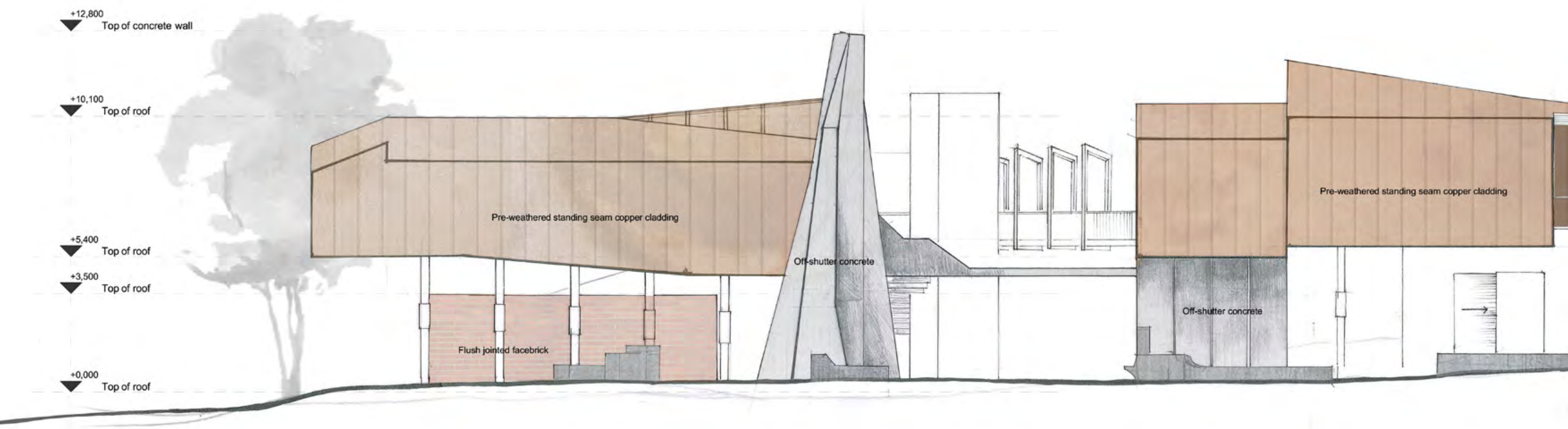
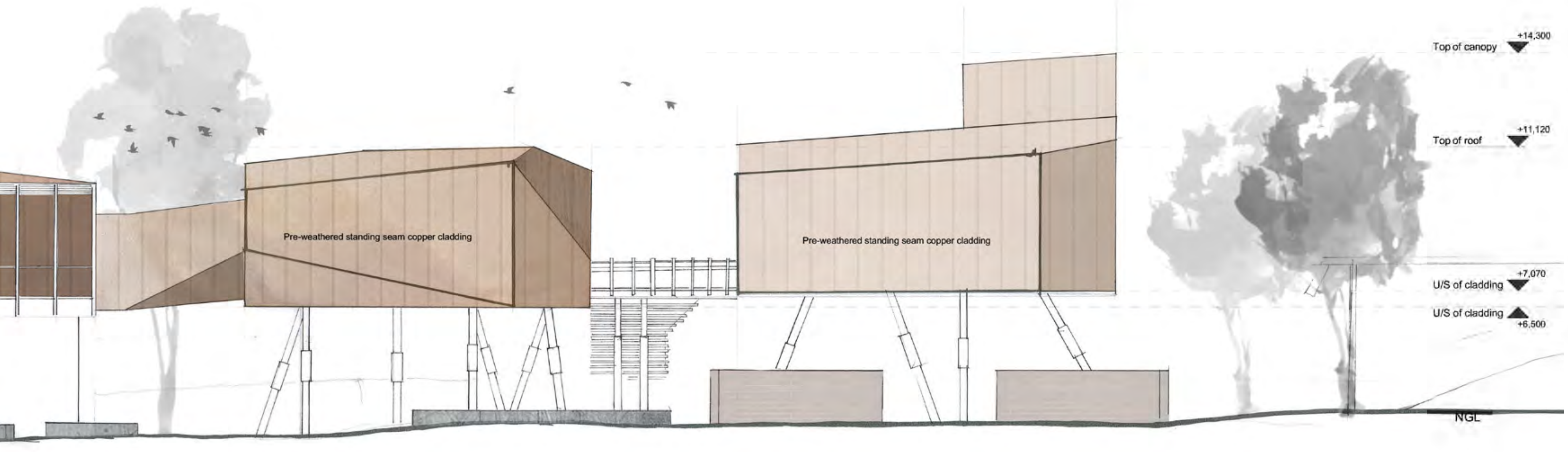


Figure 12.46: North elevation



NORTH ELEVATION (FROM CITY)
ORIGINALLY AT SCALE 1:100

VIEW FROM THE STREET

Figure 12.47: Renders of a view from the street.

REMNANTS REMAINING IN JOUBERT PARK

ENTRANCE TO PARK WITH JAG IN THE BACKGROUND

VIEW FROM CENTRAL
PATHWAY OF PARK