

Figure 8.1. Initial technical sketch. Author, 2016.

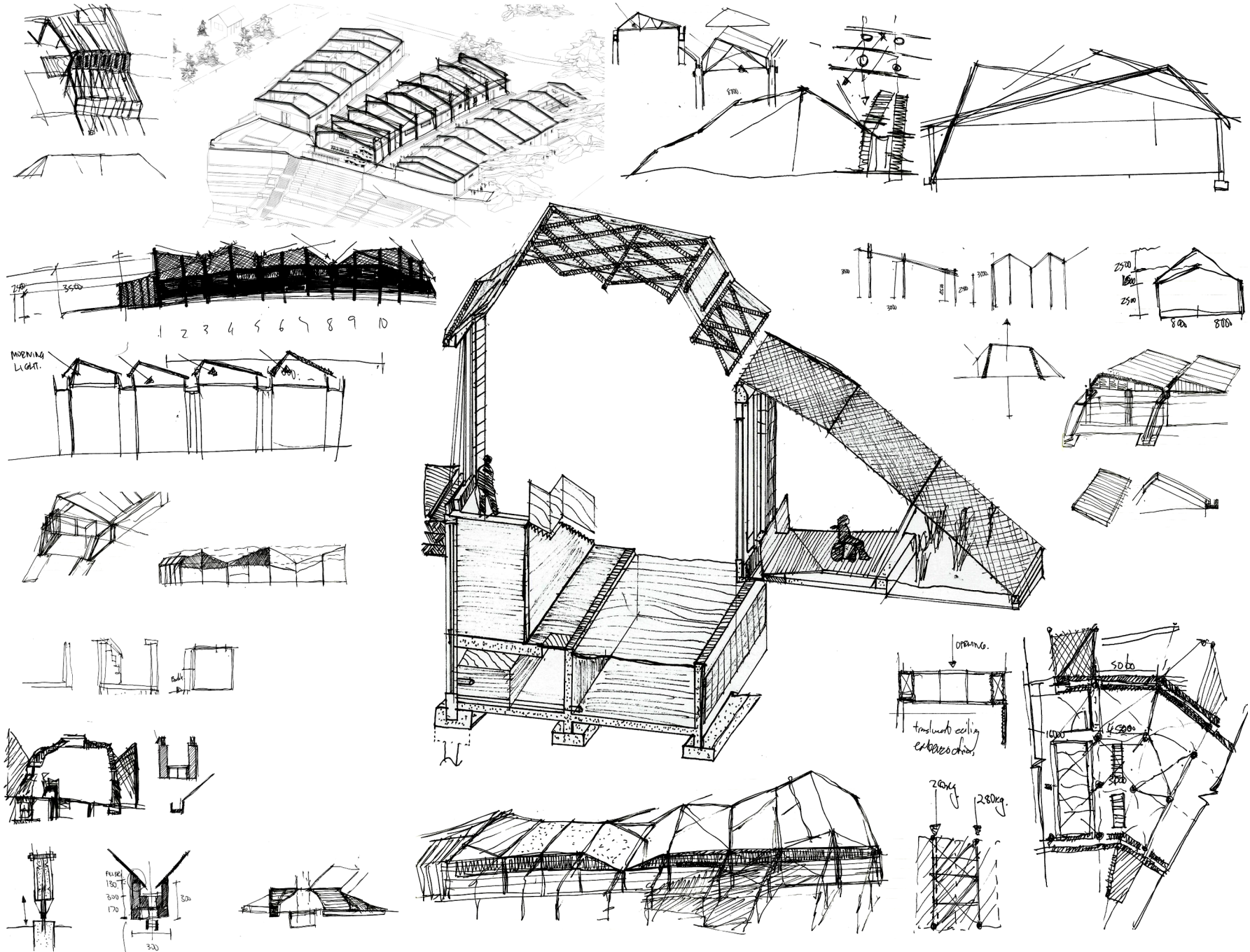


Figure 8.3. Technical iteration 02 - process drawings, Author, 2016.

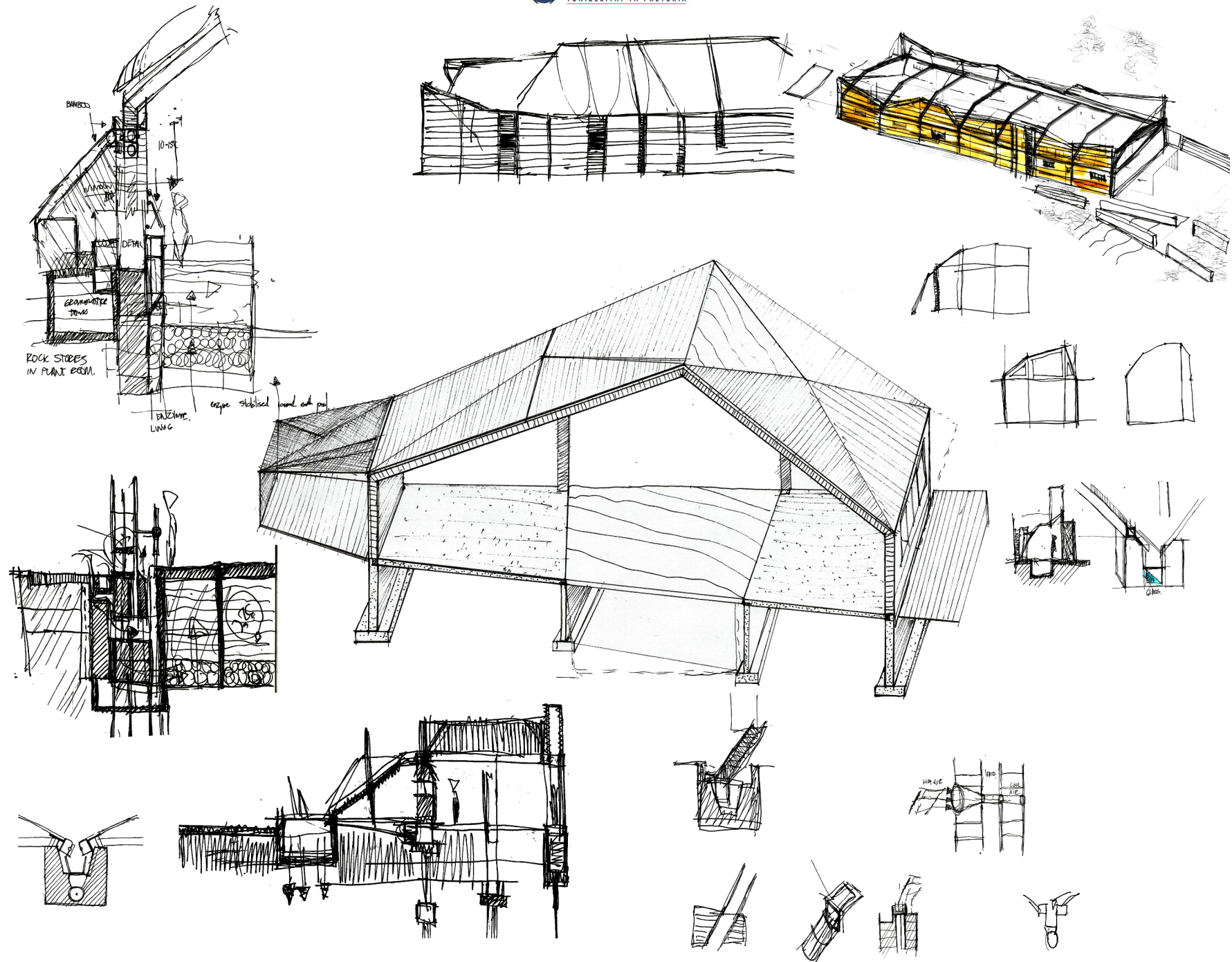


Figure 8.4. Technical iteration 03 - process drawings, Author, 2016.

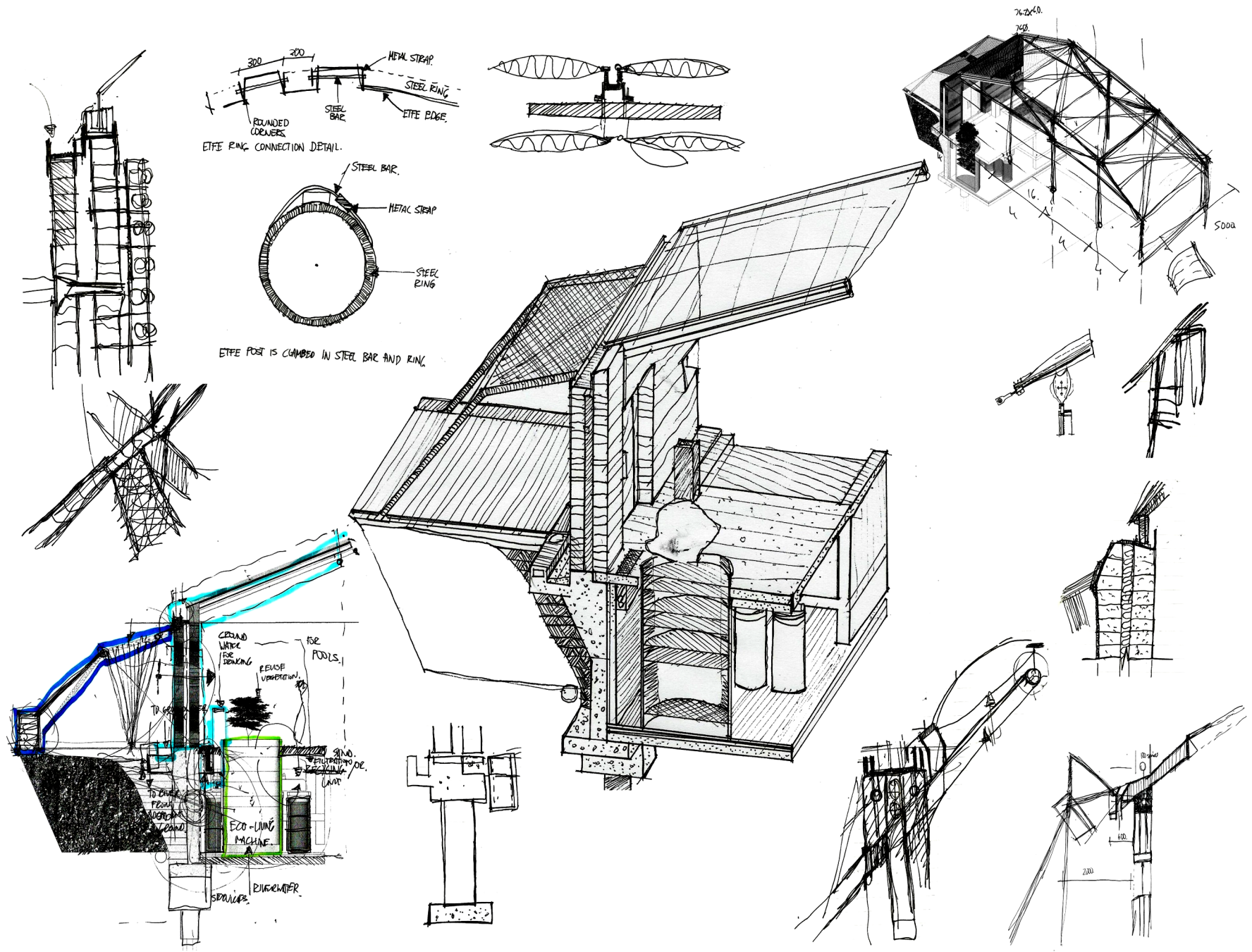


Figure 8.5. Technical iteration 04 - process drawings, Author, 2016.

8.1 TECHNICAL CONCEPT

8.1.1 INTEGRATED WATER ARCHITECTURE

Professor Herbert Dreiseitl (cited in Margolis & Chaouni, 2014:7) contends that water has played a major technical role in the design of structures in both the natural and urban landscape. Margolis and Chaouni (2014:19) states that an integrated water cycle management (IWCM) system draws on multiple sources of water, as found in the hydrological cycle, and forms part of an inclusive, redundancy factored strategy that can be adapted to conventional building construction. This system makes a closed-loop water system more effective than standard water management practices (Margolis & Chaouni, 2014:19).

The aim of the study is for the proposed building to be integrated into the natural water cycle, which was explored in technical process iterations 01- 04 (see Figure 8.2 - 8.5) and later revised in iterations 04 and 05 (see Figures 8.8 - 8.20). This aim is expanded and architecturally translated in a manner which expresses the building's embeddedness in the hydrological cycle, as shown in Figure 8.6. The tectonic solution expands further to accommodate eco-living machine services which would form an integral part of the building's water reticulation and which would close the building's regenerative water loop. The ETFE roof system (tectonic), passive and active and reticulation are integrated in the building's floor system.

The technical concept thus translates the hydrological cycle and how it physically circulates water. An integrated water system should include purified river water, water harvested from the atmosphere, rainwater collected from the building's roof, and fresh groundwater according to Margolis & Chaouni, (2014:19).

The building's relationship with the hydrological cycle can be understood in terms of the surfaces (tectonic) and sources (stereotomic) relative to the water cycle. This principle can be understood as the manner in which walls, floors and roofs are related to the hydrological cycle, as shown in Figure 8.7. The tectonic concept functionally expresses the manner of exposing and using rainwater, river water, evaporation, and the site's groundwater in order to meet the building's water requirements and to further regenerate the surrounding urban context.

The building expresses tectonic lightness through the use of an ETFE roof that factors climatic conditions (daylight and shading) to provide the necessary lighting and thermal comfort for making an indoor pool environment habitable. The ETFE roof system also possesses integrated shading technology, and its surface is able to collect rainwater in an articulate manner (see Figure 8.31).

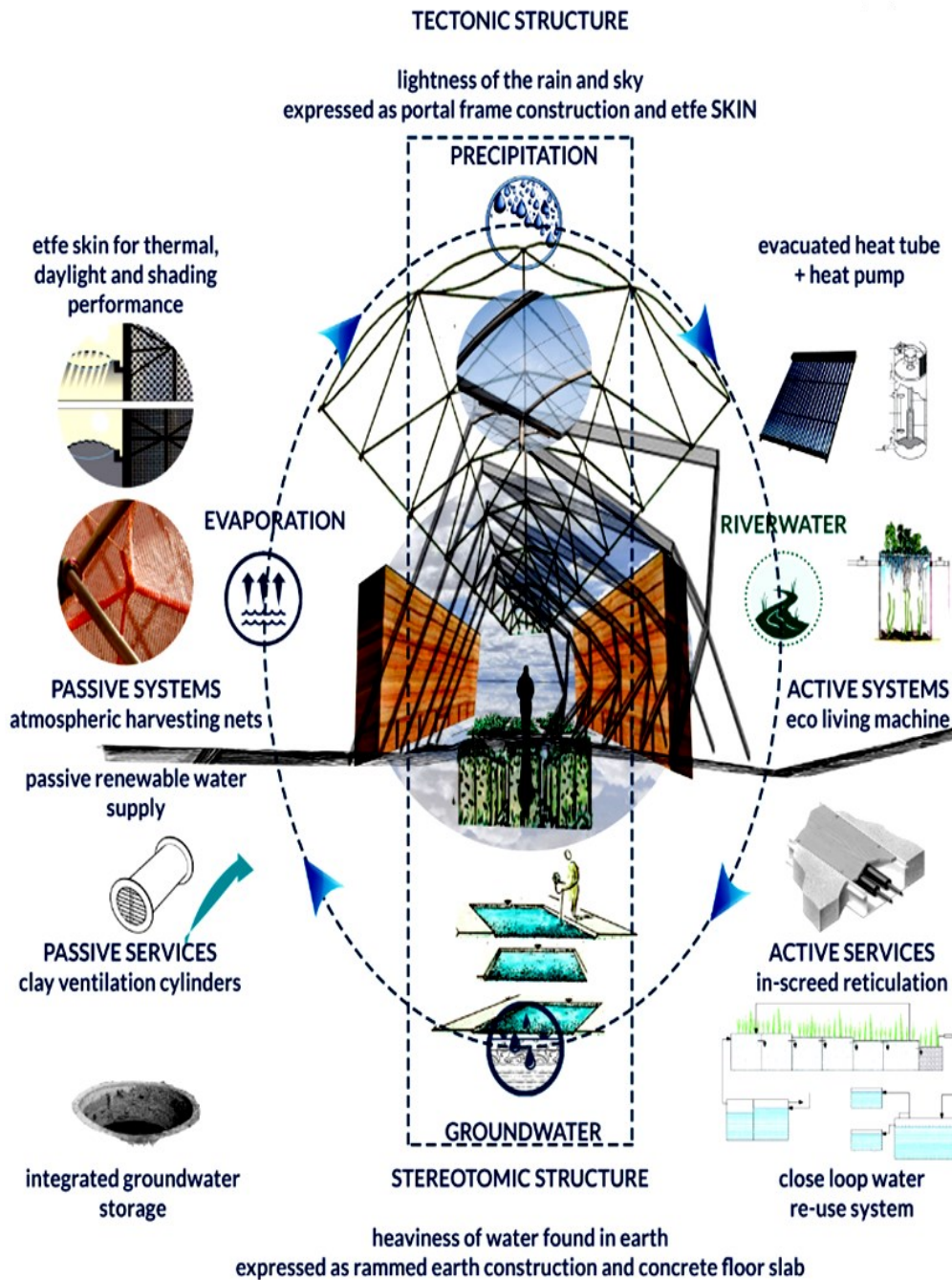


Figure 8.6. Tectonic Concept. Author, 2016.

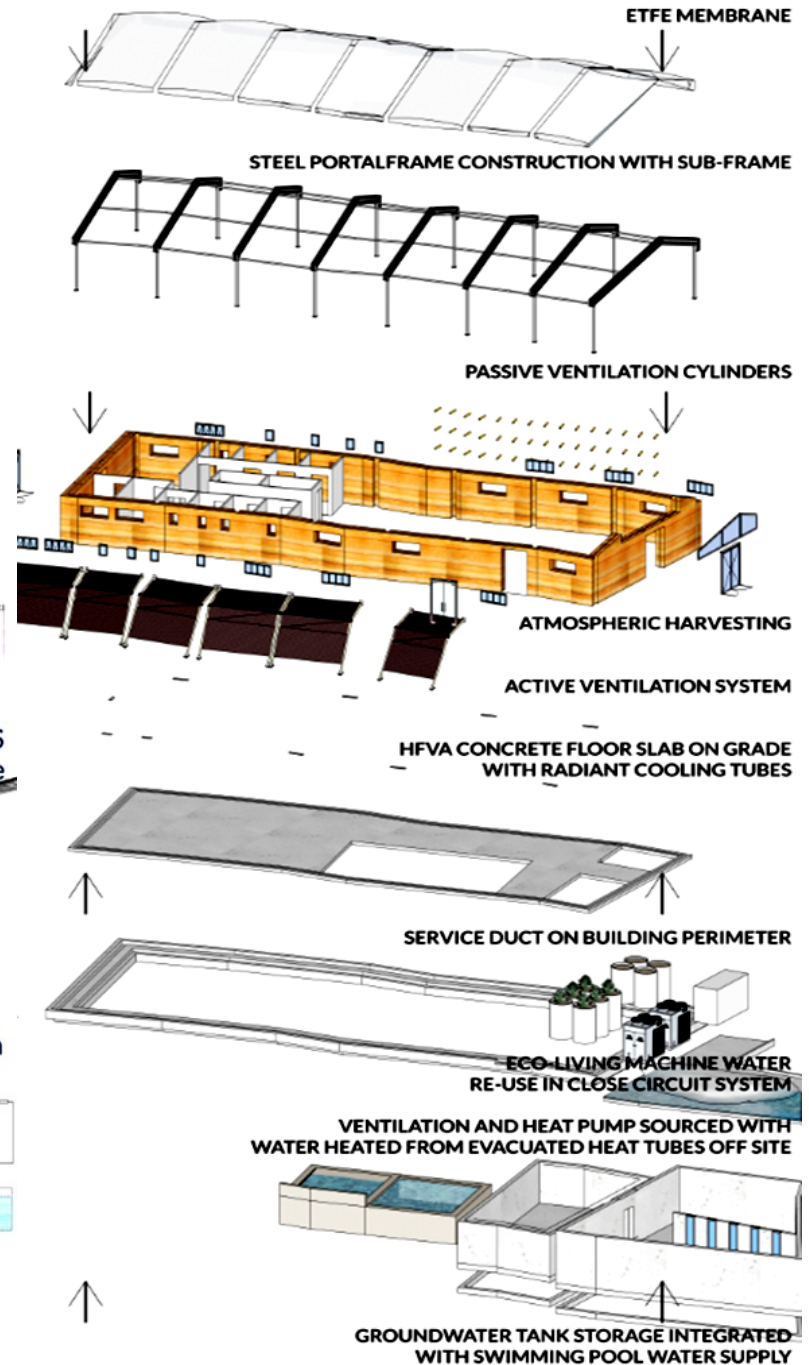
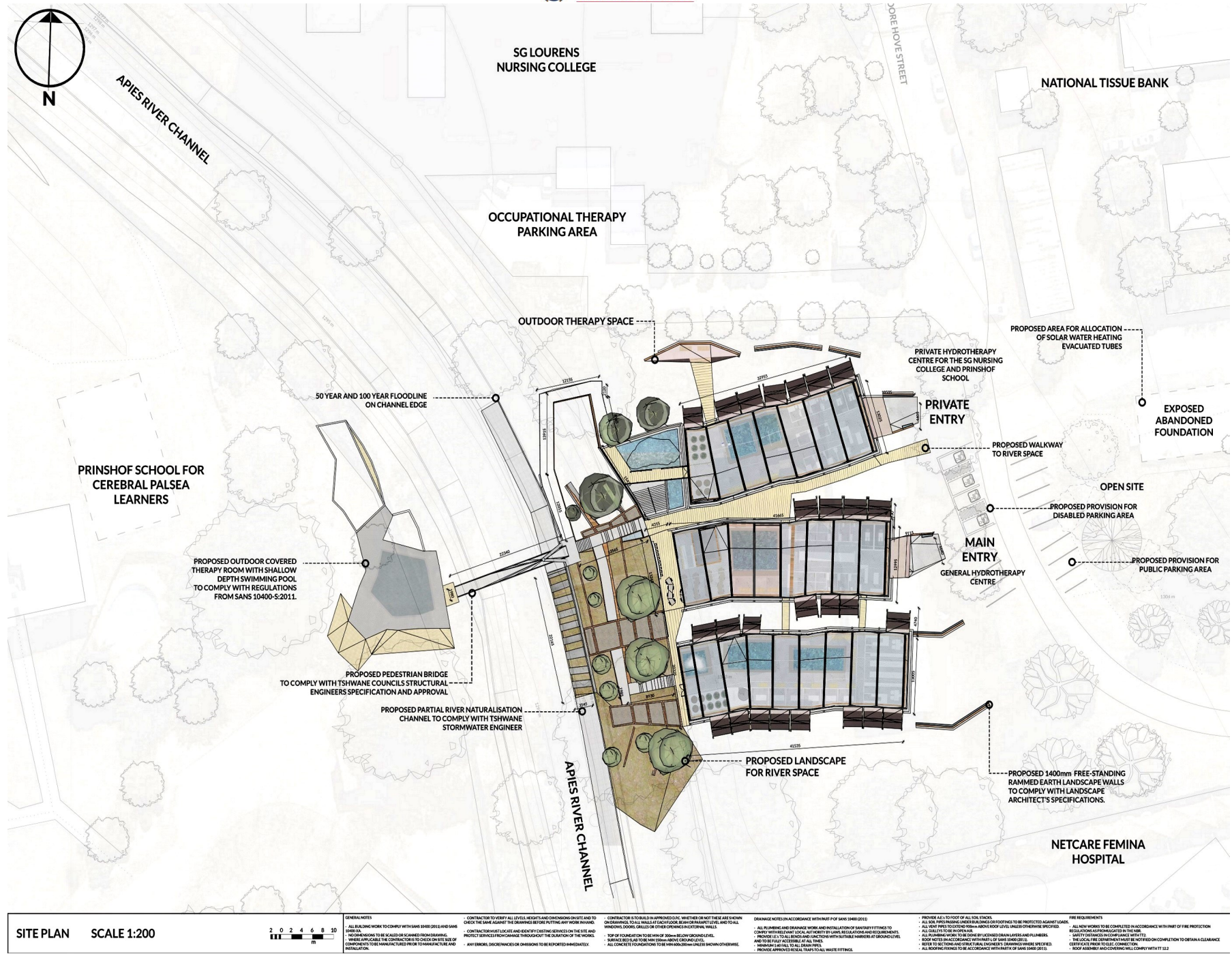
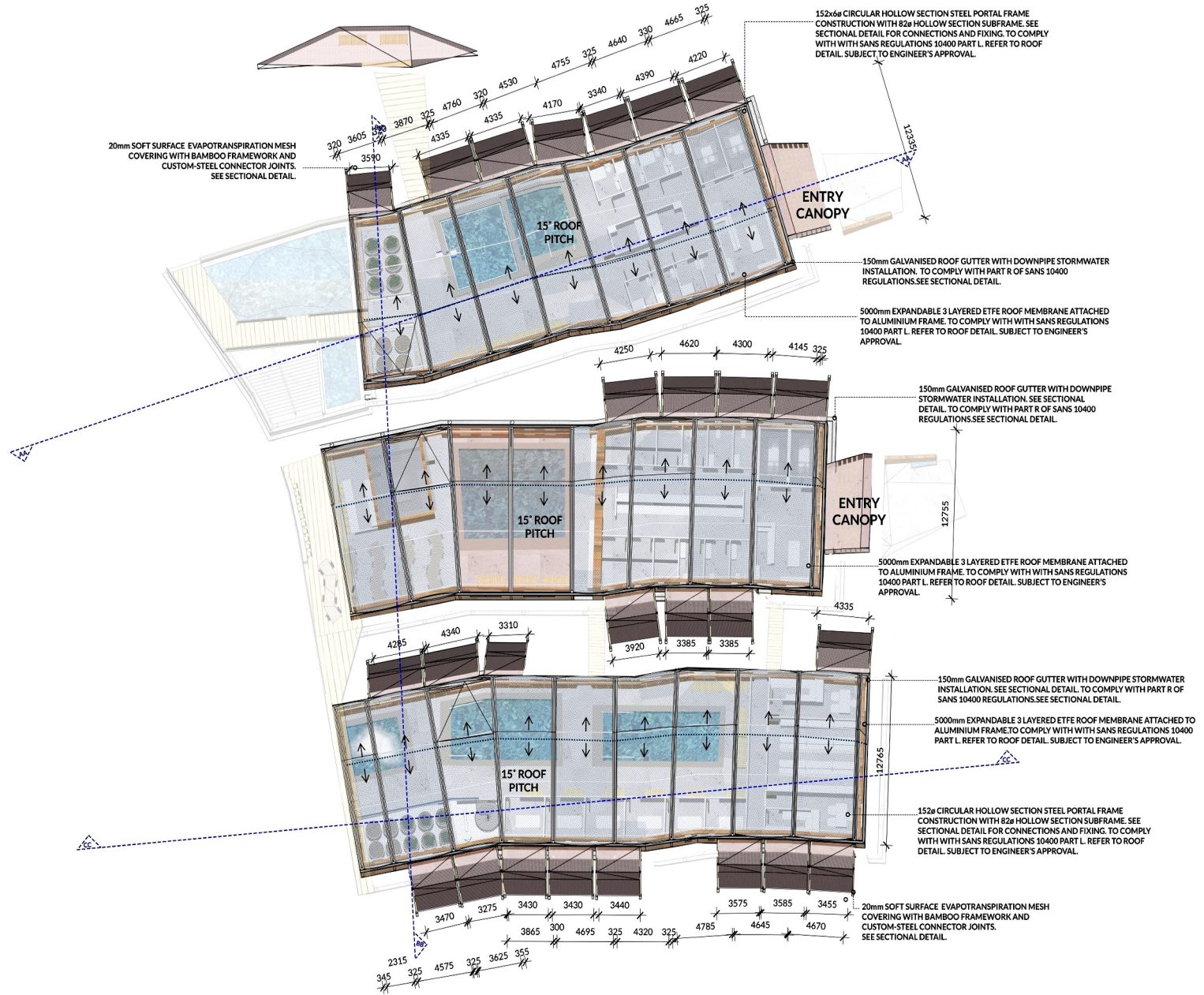
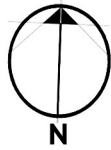


Figure 8.7. Building axonometric showing the various building components. Author, 2016.



<p>SITE PLAN SCALE 1:200</p> <p>2 0 2 4 6 8 10 m</p>	<p>GENERAL NOTES</p> <p>CONTRACTOR TO VERIFY ALL LEVELS, WEIGHTS AND DIMENSIONS AND TO CHECK THE SAME AGAINST THE DRAWINGS BEFORE PUTTING ANY WORK IN HAND.</p> <p>CONTRACTOR TO LOCATE AND IDENTIFY EXISTING SERVICES ON THE SITE AND PROTECT SERVICES FROM DAMAGE THROUGHOUT THE COURSE OF THE PROJECT.</p> <p>ANY ERRORS, OMISSIONS OR OMBATIONS TO BE REPORTED IMMEDIATELY.</p>	<p>CONTRACTOR TO VERIFY ALL LEVELS, WEIGHTS AND DIMENSIONS AND TO CHECK THE SAME AGAINST THE DRAWINGS BEFORE PUTTING ANY WORK IN HAND.</p> <p>CONTRACTOR TO LOCATE AND IDENTIFY EXISTING SERVICES ON THE SITE AND PROTECT SERVICES FROM DAMAGE THROUGHOUT THE COURSE OF THE PROJECT.</p> <p>ANY ERRORS, OMISSIONS OR OMBATIONS TO BE REPORTED IMMEDIATELY.</p>	<p>DRAINAGE NOTES (IN ACCORDANCE WITH PART 6 OF SANS 10400:5:2011)</p> <p>ALL DOWN-Pipes AND GUTTERS MUST BE INSTALLED IN ACCORDANCE WITH THE LOCAL AUTHORITY'S PLANS, REGULATIONS AND REQUIREMENTS.</p> <p>PROVIDE ALL FALLS AND SLOPES WITH THE NUMBER OF GRADIENTS AND TO BE EASY ACCESSIBLE AT ALL TIMES.</p> <p>MINIMUM BE FALL TO ALL DRAIN PIPES.</p> <p>PROVIDE APPROVED RESAL TRAPS TO ALL WASTE FITTINGS.</p> <p>FIRE PREVENTION</p> <p>ALL NEW WORKS TO BE COMPLETED IN ACCORDANCE WITH PART 6 OF THE PROTECTION REGULATIONS APPROPRIATE TO THE RISK.</p> <p>SAFETY PRESENT IN ALL PHASES OF THE PROJECT.</p> <p>THE LOCAL FIRE DEPARTMENT MUST BE NOTIFIED UPON COMPLETION TO OBTAIN A CLEARANCE CERTIFICATE PRIOR TO OCCUPANCY.</p> <p>ROOF ASSEMBLY AND COVERING WILL COMPLY WITH T123.</p>
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Figure 8.8. Technical Iteration 04 - Site Plan. Author, 2016.



<p>ROOF PLAN SCALE 1:100</p>	<p>GENERAL NOTES</p> <ul style="list-style-type: none"> ALL BUILDINGS WORK TO COMPLY WITH SANS 10400 PART L AND SANS 10400 PART R. CONTRACTOR TO VERIFY ALL LEVELS, HEIGHTS AND DIMENSIONS ON SITE AND TO CHECK THE SAME AGAINST THE DRAWINGS BEFORE FIXING ANY WORK IN PLACE. CONTRACTOR TO LOCATE AND IDENTIFY EXISTING SERVICES ON THE SITE AND PROTECT EXISTING SERVICES OR PROVIDE THE SERVICES TO THE WORK. ANY ERRORS, DISCREPANCIES OR OMISSIONS TO BE REPORTED IMMEDIATELY. 	<p>CONCRETE NOTES</p> <ul style="list-style-type: none"> CONTRACTOR TO BUILD IN APPROVED CEMENT, SAND OR NOT THESE ARE GIVEN OTHERWISE. LOCAL SAND IS TO BE USED UNLESS OTHERWISE SPECIFIED. CONTRACTOR TO PROVIDE PROTECTIVE COVERING TO PROTECT ALL EXPOSED CONCRETE SURFACES FROM DAMAGE. TOP OF FOUNDATION TO BE FINISH (SHOWS BELOW GROUND LEVEL). FINISH TO BE AS SHOWN UNLESS OTHERWISE SPECIFIED. ALL CONCRETE FOUNDATIONS TO BE MINIMUM 100mm UNLESS OTHERWISE SPECIFIED. 	<p>DRAINAGE NOTES IN ACCORDANCE WITH PART P OF SANS 10400 (2011)</p> <ul style="list-style-type: none"> ALL DOWNPIPE AND DRAINAGE WORK MUST BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL. CONTRACTOR TO PROVIDE LOCAL AUTHORITY BY-LAWS, LOCAL AUTHORITY REGULATIONS AND TO BE FULLY ACCESSIBLE AT ALL TIMES. PROVIDE APPROVED REDDIL TRAPS TO ALL DRAIN PIPES. 	<p>PROTECTION NOTES</p> <ul style="list-style-type: none"> PROVIDE ALL TO PROTECT ALL EXISTING SERVICES. ALL DOWN PIPE PIPING UNDER BUILDINGS OR FOOTINGS TO BE PROTECTED AGAINST LOADS. ALL DOWN PIPE TO BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE SPECIFIED. ALL DRAIN PIPES TO BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE SPECIFIED. REFER TO STRUCTURAL DRAWINGS FOR DRAINAGE AND DRAINAGE DETAILS. REFER TO STRUCTURAL DRAWINGS FOR DRAINAGE AND DRAINAGE DETAILS. ALL ROOFING WORK TO BE ACCORDANCE WITH PART P OF SANS 10400 (2011). 	<p>THE REQUIREMENTS</p> <ul style="list-style-type: none"> ALL WORK MUST BE COMPLETED IN ACCORDANCE WITH PART OF THE PROTECTION REGULATIONS APPROVED BY THE LOCAL AUTHORITY. THE LOCAL AUTHORITY MUST BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK. THE LOCAL AUTHORITY MUST BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK. ROOF WORK MUST BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.
	<p>GENERAL NOTES</p> <ul style="list-style-type: none"> CONTRACTOR TO VERIFY ALL LEVELS, HEIGHTS AND DIMENSIONS ON SITE AND TO CHECK THE SAME AGAINST THE DRAWINGS BEFORE FIXING ANY WORK IN PLACE. CONTRACTOR TO LOCATE AND IDENTIFY EXISTING SERVICES ON THE SITE AND PROTECT EXISTING SERVICES OR PROVIDE THE SERVICES TO THE WORK. ANY ERRORS, DISCREPANCIES OR OMISSIONS TO BE REPORTED IMMEDIATELY. 	<p>CONCRETE NOTES</p> <ul style="list-style-type: none"> CONTRACTOR TO BUILD IN APPROVED CEMENT, SAND OR NOT THESE ARE GIVEN OTHERWISE. LOCAL SAND IS TO BE USED UNLESS OTHERWISE SPECIFIED. CONTRACTOR TO PROVIDE PROTECTIVE COVERING TO PROTECT ALL EXPOSED CONCRETE SURFACES FROM DAMAGE. TOP OF FOUNDATION TO BE FINISH (SHOWS BELOW GROUND LEVEL). FINISH TO BE AS SHOWN UNLESS OTHERWISE SPECIFIED. ALL CONCRETE FOUNDATIONS TO BE MINIMUM 100mm UNLESS OTHERWISE SPECIFIED. 	<p>DRAINAGE NOTES IN ACCORDANCE WITH PART P OF SANS 10400 (2011)</p> <ul style="list-style-type: none"> ALL DOWNPIPE AND DRAINAGE WORK MUST BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL. CONTRACTOR TO PROVIDE LOCAL AUTHORITY BY-LAWS, LOCAL AUTHORITY REGULATIONS AND TO BE FULLY ACCESSIBLE AT ALL TIMES. PROVIDE APPROVED REDDIL TRAPS TO ALL DRAIN PIPES. 	<p>PROTECTION NOTES</p> <ul style="list-style-type: none"> PROVIDE ALL TO PROTECT ALL EXISTING SERVICES. ALL DOWN PIPE PIPING UNDER BUILDINGS OR FOOTINGS TO BE PROTECTED AGAINST LOADS. ALL DOWN PIPE TO BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE SPECIFIED. ALL DRAIN PIPES TO BE INSTALLED TO A MINIMUM OF 100mm ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE SPECIFIED. REFER TO STRUCTURAL DRAWINGS FOR DRAINAGE AND DRAINAGE DETAILS. REFER TO STRUCTURAL DRAWINGS FOR DRAINAGE AND DRAINAGE DETAILS. ALL ROOFING WORK TO BE ACCORDANCE WITH PART P OF SANS 10400 (2011). 	<p>THE REQUIREMENTS</p> <ul style="list-style-type: none"> ALL WORK MUST BE COMPLETED IN ACCORDANCE WITH PART OF THE PROTECTION REGULATIONS APPROVED BY THE LOCAL AUTHORITY. THE LOCAL AUTHORITY MUST BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK. THE LOCAL AUTHORITY MUST BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK. ROOF WORK MUST BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.

Figure 8.9. Technical Iteration 04 - Roof Plan. Author, 2016.

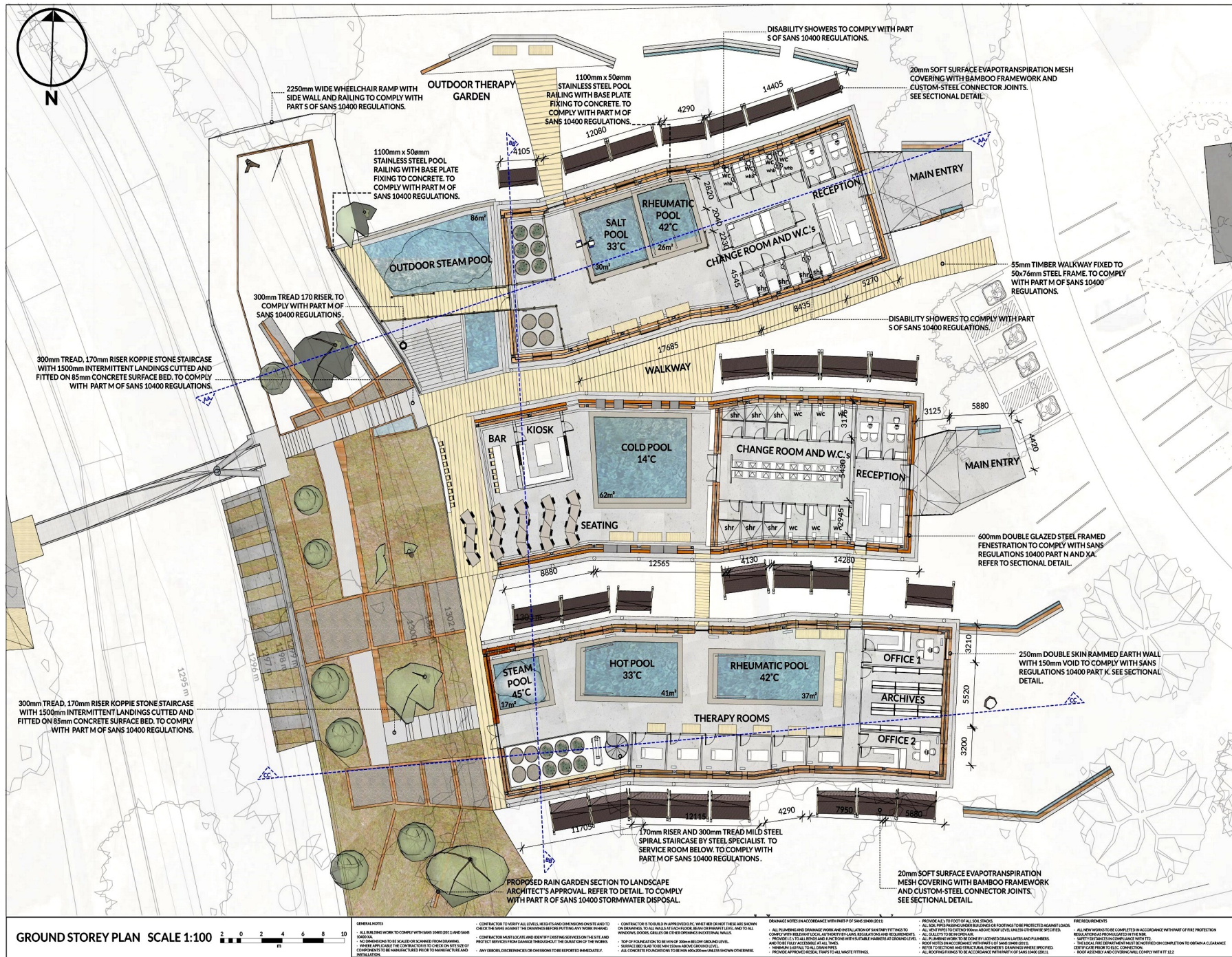


Figure 8.10. Technical iteration 04 - Ground Storey Plan. Author, 2016.

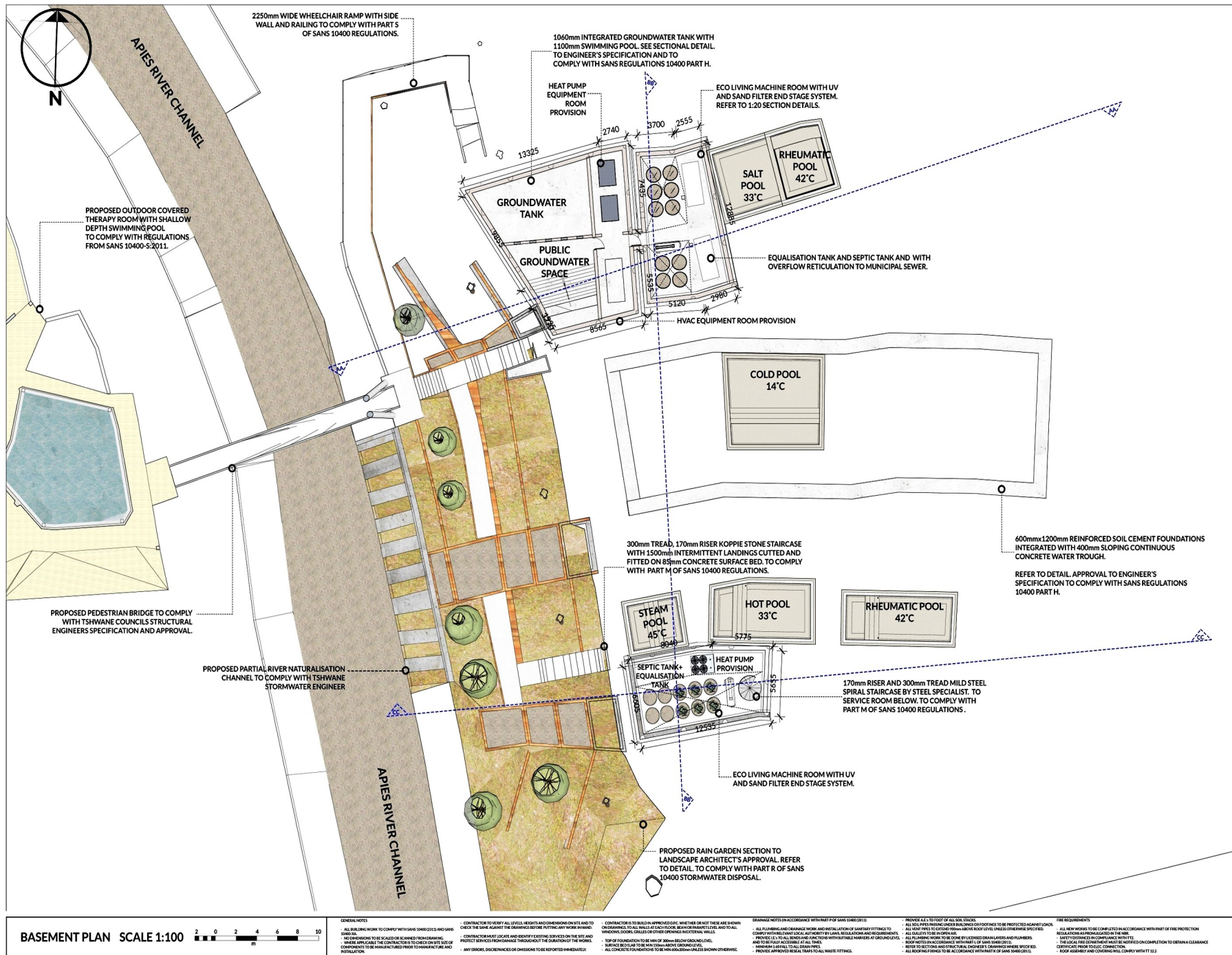


Figure 8.11. Technical iteration 04 - Basement Plan. Author, 2016.