

Figure 7.1. Design development sectional sketch, Author, 2016.

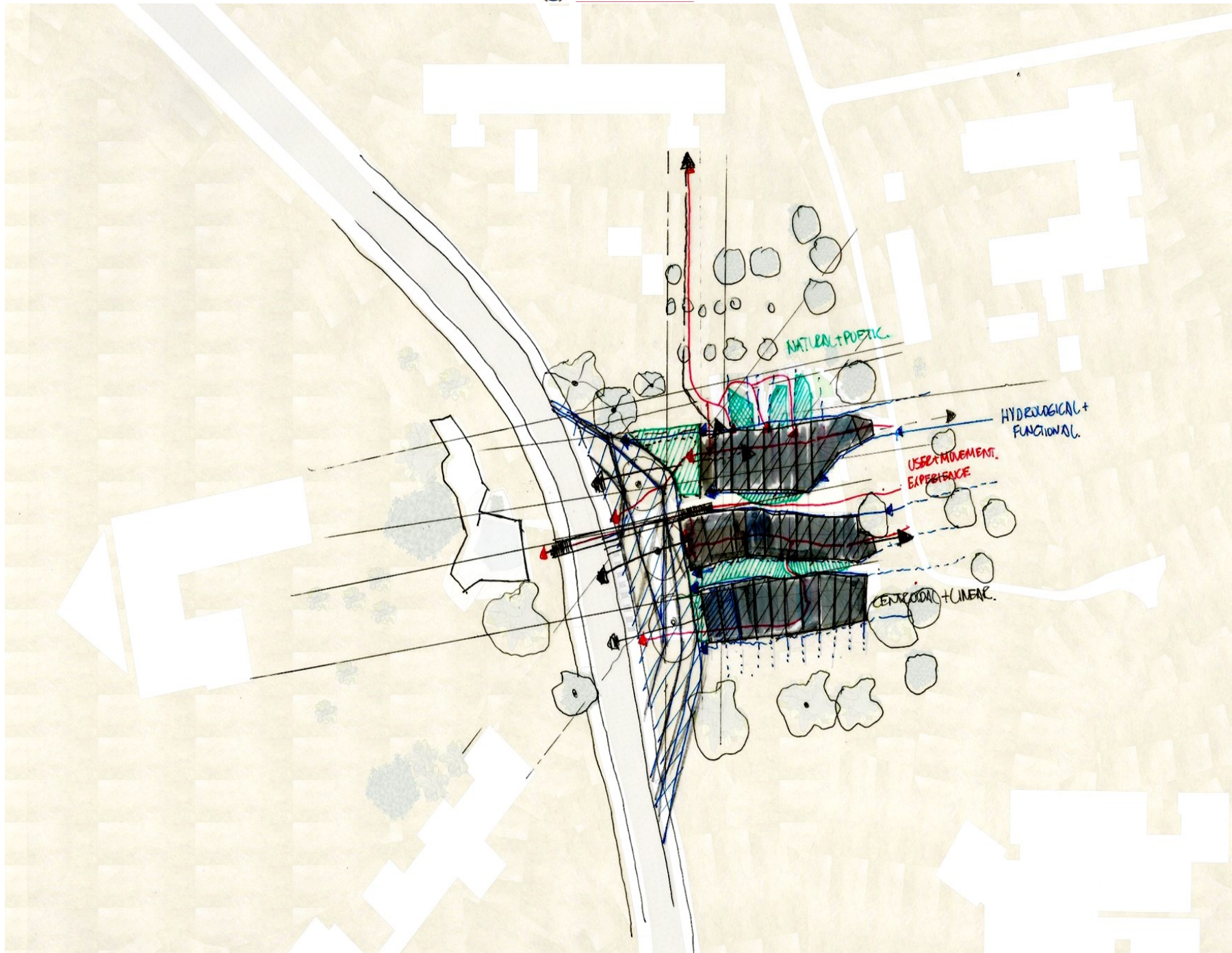


Figure 7.2. Design development parti diagram - iteration 03, Author, 2016.



## 7.1 DESIGN DEVELOPMENT

With the conceptual generators in place, the functional placement of the design requires critical consideration due to various aspects, as formulated in the design parti diagram (see Figure 7.2) and as discussed below.

### 7.1.1 HYDROTHERAPY SPACE

The northern linear space of the site is a feedback space in relation to the SG Lourens Nursing College. The location of the space will reduce the distance between the college and the hydrotherapy centre for nurses and will initiate a sense of private space versus public space in the overall scheme. The middle linear space will be the main entry point and will mediate the administrative functions of the northern and southern linear river spaces.

### 7.1.2 RIVER WATER AND RIVER SPACE

The proposed intervention requires the river channel to be cut into, which poses numerous physical and logistical difficulties, as well as major physical effort to make it viable (see Figure 7.4). The therapeutic connection between the river space and the proposed hydrotherapy centre is maintained by making the upper parts of the river space into a landscape space that connects with the river. Pedestrian access is simplified to a single linear space that initiates from Theodore Hove Street (see Figure 7.2).

### 7.1.3 INTEGRATED WATER STRATEGY

Groundwater, river water, and as well as water used in exterior therapy spaces require passive water technologies to mediate the hydrological cycle in relation to the proposed building. Figure 7.3 is a basic diagram interpreting the hydrological cycle with regard to the building's insertion on site.

Groundwater storage, eco-living machines, and atmospheric harvesting nets will be used to create a regenerative water cycle on site as well as to 'embed' the building in the hydrological cycle. A steel frame and membrane roof structure will balance the functional and poetic aspects regarding rainwater collection and the thermal regulation of indoor pool spaces.

Medium-sized borehole and pump systems which are placed in designated plant rooms are a pre-requisite for harvesting groundwater. Atmospheric harvesting mesh collectors, such as those proposed for use by the Warka Water Project (Warka Water, 2015), collect water which is sourced through a process of evaporation and transpiration and thereby supply to the surrounding landscape.

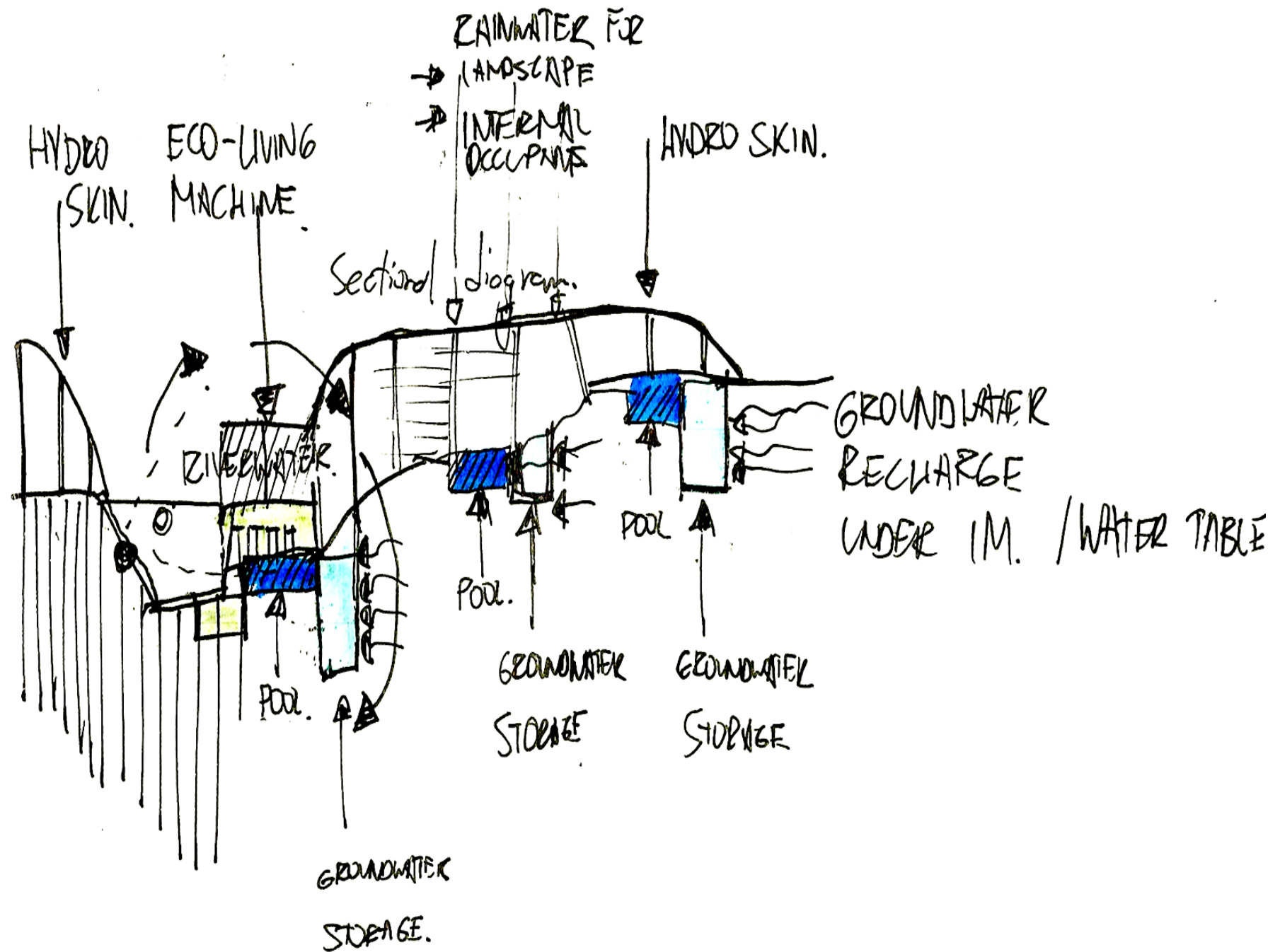


Figure 7.3. Basic sectional sketch appropriating hydrological functions to each space, Author, 2016.



## 7.2 SPATIAL DESIGN ITERATIONS

### 7.2.1 ITERATION 01 - RIVER SPACE

The first iteration, represented by Figure 7.5, attempted to create a comfortable spatial relationship between the conditions of the Apies River channel and its surroundings. A disadvantage of the first attempt was the over-concentration of architectural elements in the proposed space, causing the design to appear disconnected and creating a lack of cohesion between the surrounding urban condition and the river (see Figure 7.5). This included the placement and allocation of the river landscape. Ramps were introduced to bridge the height difference between the lower and upper parts of the site. The pool spaces, courtyard spaces, and therapy spaces, were arranged to branch away from the main circulation passage space (see Figure 7.6).

### 7.2.2 ITERATION 02 - SITE EXCHANGE

The second iteration was intended to bridge the river and its surroundings (see Figure 7.7). The design was intended to form a dialogue between the natural and built-spaces; however, there was a lack of a hierarchical architecture devices to structure the intervention. The importance of spatial exchange between natural and pool spaces was better communicated by later iterations (see Figure 7.8). The

configuration of the second iteration was basic in its intention of expressing a relationship between the stereotomic and tectonic, as part of the hydrological cycle. The main water courtyard spaces worked in conjunction with linear circulatory spaces in order to connect the spaces together hierarchically. Instead of one main bridging connection, four smaller pedestrian bridge connections were considered for the third iteration.

### 7.2.3 ITERATION 03 - WATER SPACE

The third iteration intended to build on the design of the second iteration, as it best translated the idea of a hierarchy with regard to the transition from and relationship of natural river space to built space (see Figure 7.9). A disadvantage of the third iteration was that the intervention was too rigidly set in the landscape and became increasingly fixed on a radial footprint. The vertical and horizontal proportions of the intervention confronted the issue of viewing the river as a connecting intervention in relation to the surrounding buildings. As 'veins' that translate river space, it suggested a revision in the parti configuration (see Figure 7.2). The administrative and office rooms, change rooms, and medical archives were placed furthest from the river space.

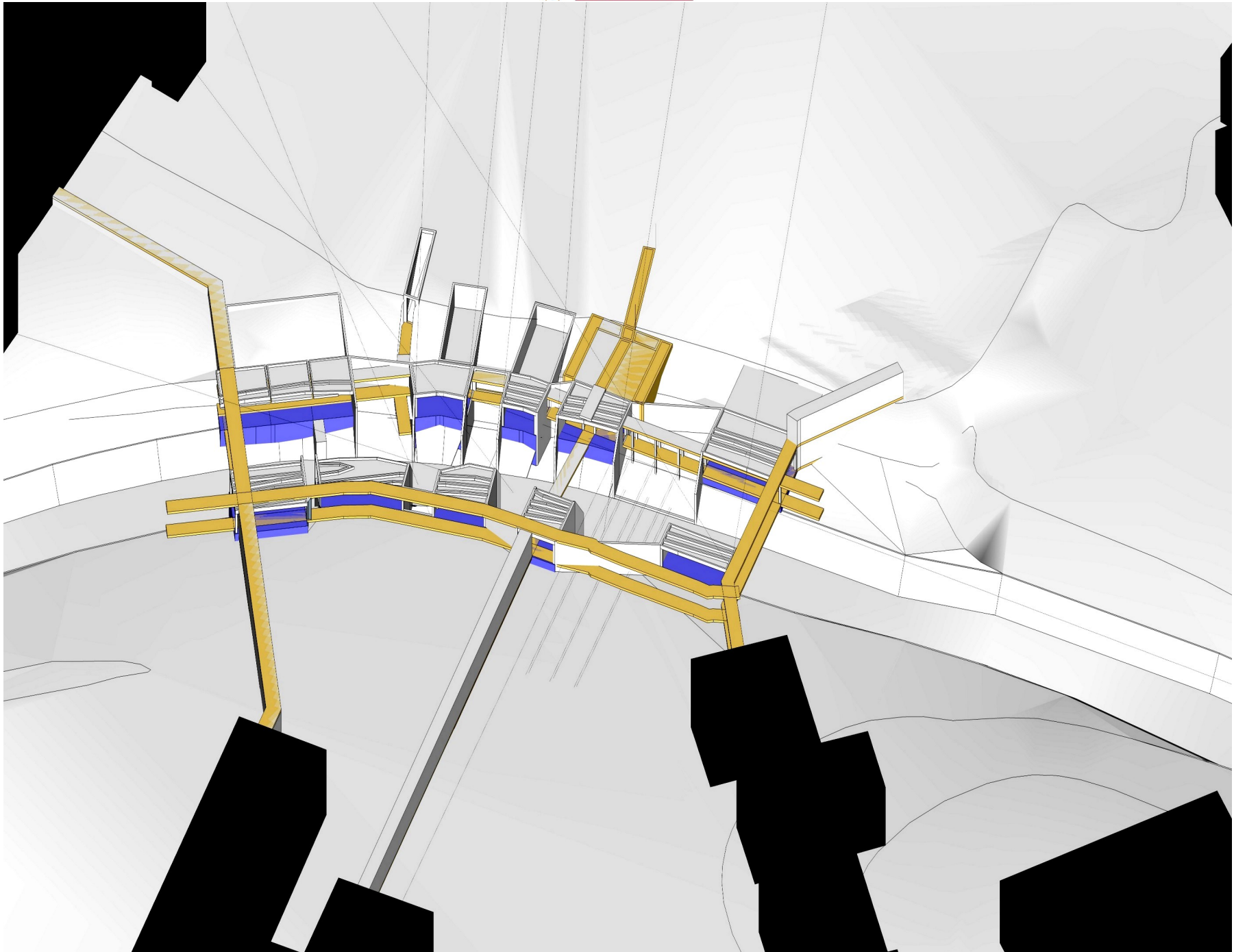


Figure 7.4. Iteration 01 - Linear river extension resulting from Iteration 01, Author, 2016.





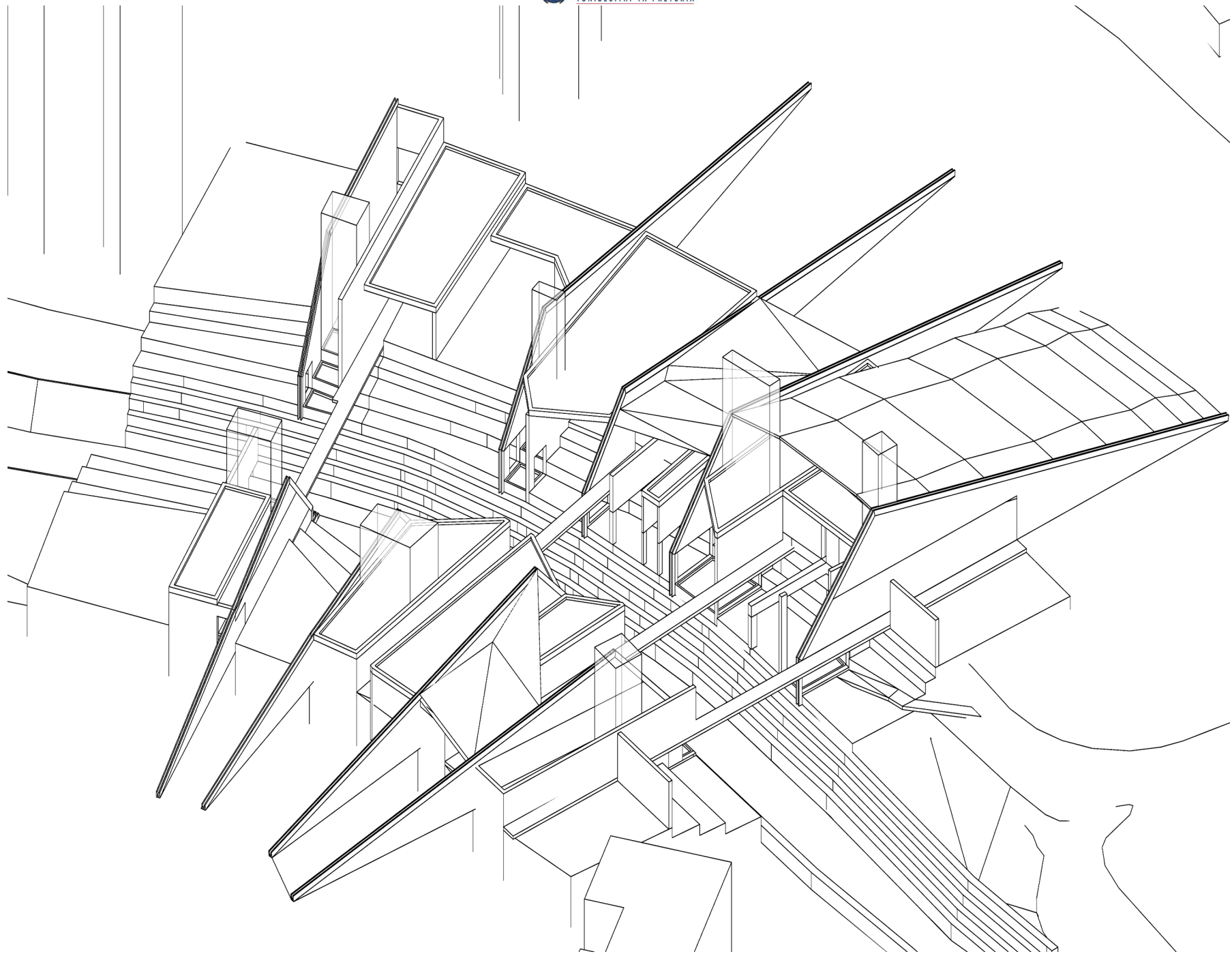


Figure 7.6. Iteration 01 – Overhead axonometric showing spatial intentions in a radial manner relative to the site and river, Author, 2016.





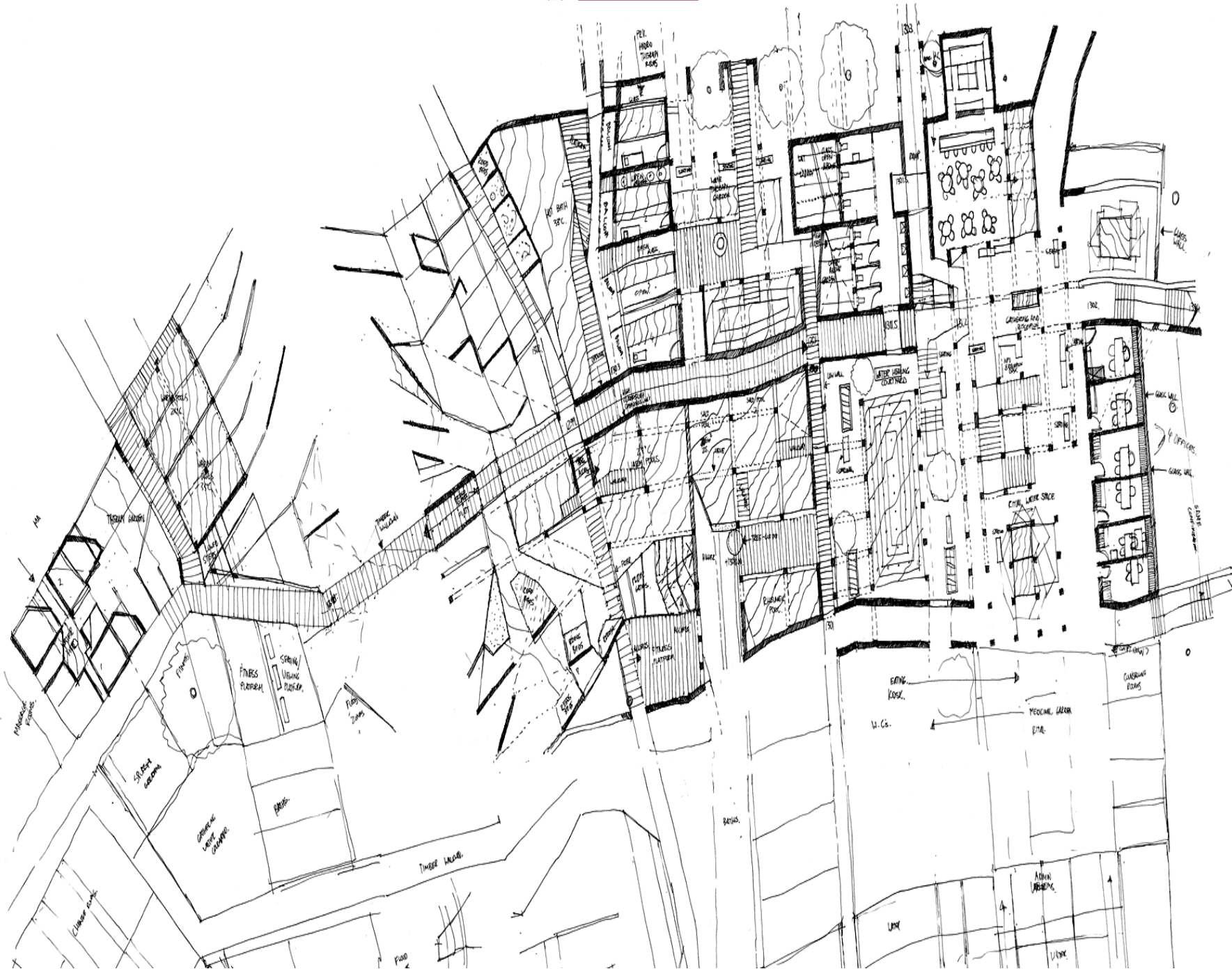


Figure 7.8. Iteration 02 - Perpendicular river extension plan resulting from Iteration 01, Author, 2016.



## 7.3 SKETCH PLANS

### 7.3.1 SITE PLAN

The overall site must be considered in the larger context of the Prins Hof Medical District (see Figure 7.9). In addition, the intervention not only has to address the river on a vertical level, but it also has to address the building's functions and its surroundings on a horizontal level. This approach shows the basis of how the building will address the overall urban condition as part of an anchor point in the water framework set out by Erasmus et al. (2016).

### 7.3.2 ROOF PLAN

The roof is intended as an organic structure and will be made either of a tectonic steel frame or a bamboo frame. The building framework suggests the use of lightweight concrete panels or an alternative lightweight material. The roof will be the main architectural surface specifically manipulated to collect rainwater (see Figure 7.10), while still keeping the rainwater cycle in mind.

### 7.3.3 GROUND STOREY PLAN

The ground storey plan (see Figure 7.11) addresses the site entry and building, and it shows the administrative spaces, private therapy spaces, and counselling rooms. These spaces will contain the main functions of the hydrotherapy centre. This floor introduces the user to the indoor pool spaces that can be shared by all users.

### 7.3.4 POOL MEZZANINE PLAN

The pool mezzanine plan (see Figure 7.12) focuses on the creation of a space to connect the above-ground storey and the lower river spaces. The main functions of the hydrotherapy facility are combined with recreational functions. The space is cut into the earth. Private therapy rooms will be located on this floor to take advantage of the cut-in method in order to enhance the users' spatial experience and to facilitate the creation of quiet, dark therapy spaces.

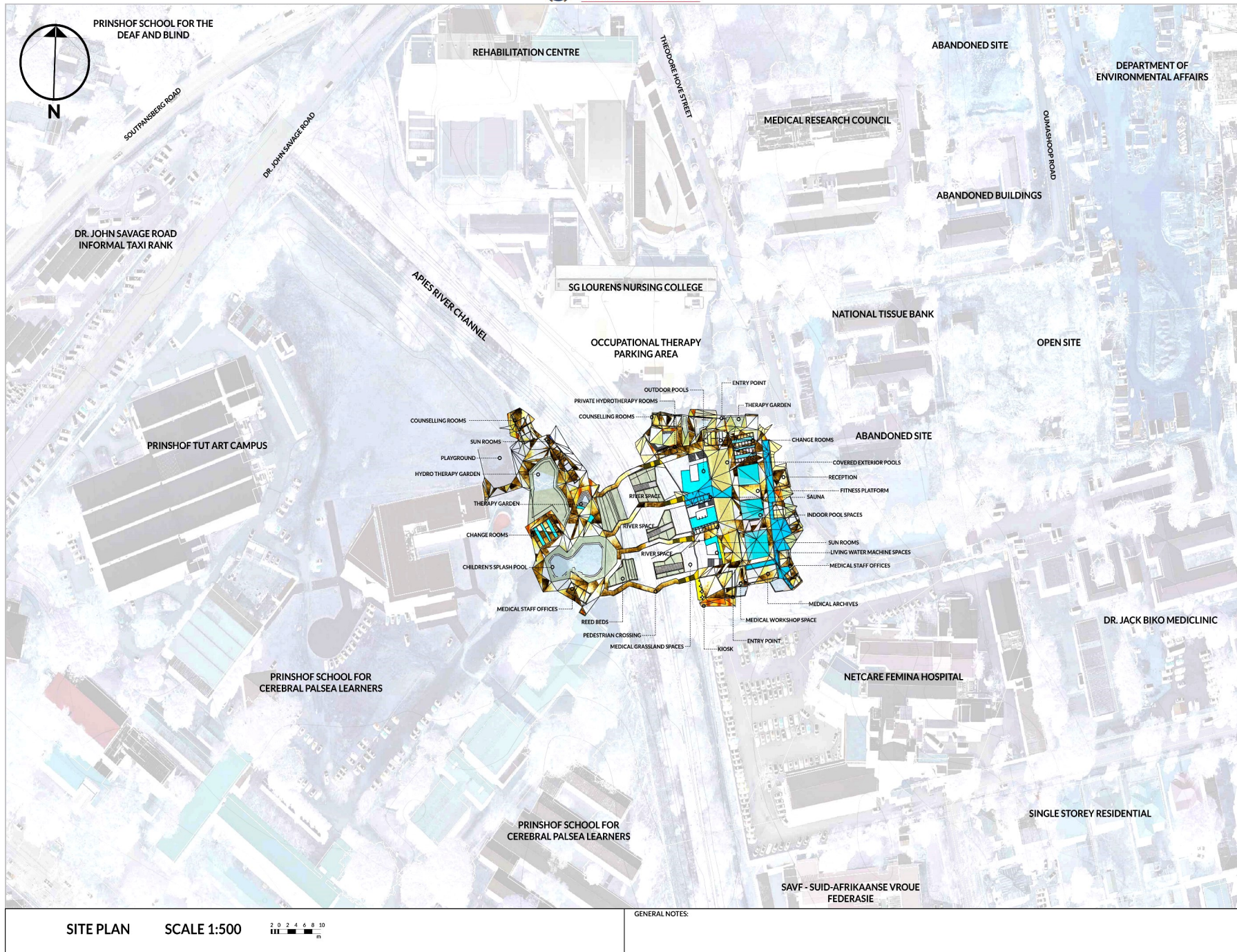


Figure 7.9. Iteration 03 – Site Plan synthesising Iteration 01 and 02 that realises a connected urban potential for the hydrotherapy centre. Author, 2016.



SG LOURENS NURSING COLLEGE



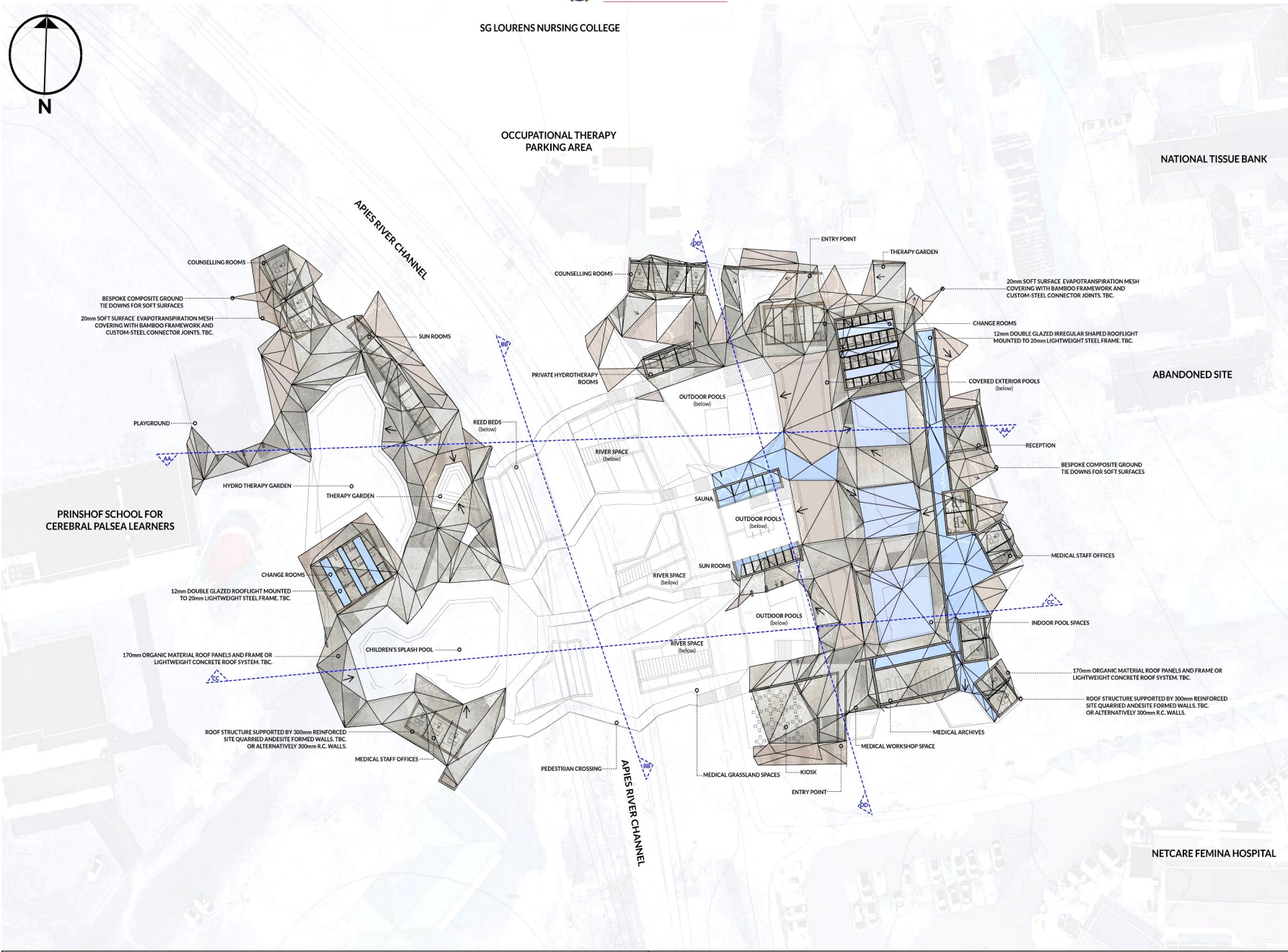
OCCUPATIONAL THERAPY  
PARKING AREA

NATIONAL TISSUE BANK

PRINSHOF SCHOOL FOR  
CEREBRAL PALSEA LEARNERS

ABANDONED SITE

NETCARE FEMINA HOSPITAL



ROOF PLAN SCALE 1:200



GENERAL NOTES:

Figure 7.10. Iteration 03 – Sketch Roof plan. Author, 2016.





GROUND STOREY PLAN SCALE 1:200



GENERAL NOTES:

Figure 7.11. Iteration 03 - Sketch Ground plan. Author, 2016.





Figure 7.12. Iteration 03 – Sketch Pool Mezzanine plan. Author, 2016.

## 7.3 SKETCH PLANS

### 7.3.5 RIVER SPACE PLAN

The river space is considered a core space (see Figure 7.12), connecting the river to the building. It becomes a space of exchange between the river and the spatial experience of water. The use of water purification beds is intended in this space. These natural technologies will be exposed in order to make the public passively aware of the building's core function in relative to water conservation. This space will use purifying beds made of reeds to facilitate the natural water purification process.

### 7.3.6 SECTIONS

The overall site, as drawn in general sections in Figure 7.13, is seen in the context of its relationship with the Prinshof Medical District. As abovementioned, the intervention thus needs to address the river on a vertical level as well as on a horizontal level.

### 7.3.7 ELEVATIONS

The intimate qualities of the site relative to the openness of the overall extent of the area, as drawn in general elevations in Figure 7.14, will be retained. The building will be a single-storey building on all elevations, and it will have various potential entry points in relation to the Netcare Femina Hospital, the SG Lourens Nursing College, and, most importantly, the Prinshof Cerebral Palsy School to which the building must offer a covered walkway to enable access to the facilities.



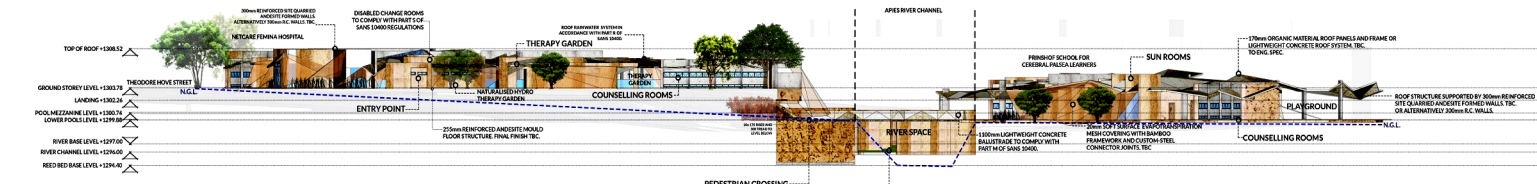


Figure 7.13. Iteration 03 – Sketch River Spaces plan. Author, 2016.





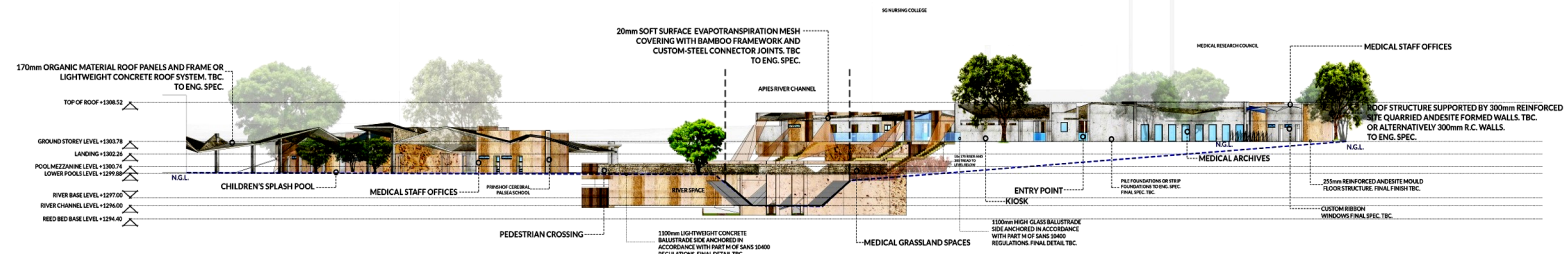
Figure 7.14. Iteration 03 – Sketch Sections. Author, 2016.



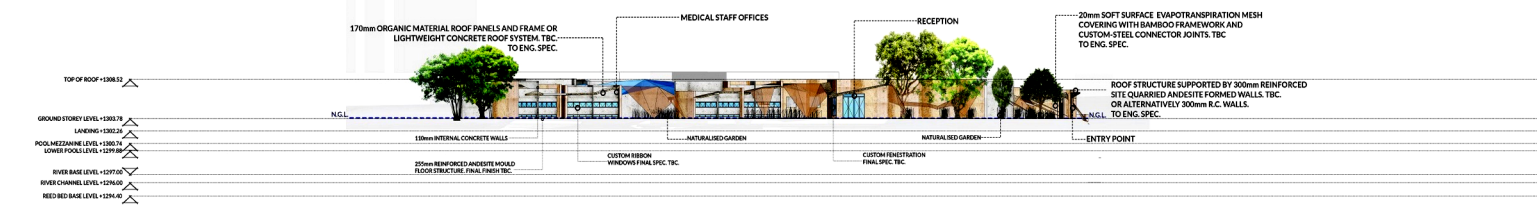
NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION

ELEVATIONS SCALE 1:200



GENERAL NOTES:

Figure 7.15. Iteration 03 – Sketch Elevations. Author, 2016.



## 7.4 DESIGN SUMMARY

### 7.4.1 REFLECTION AND REVIEW

The design required adherence to the concept of the proposed building being embedded in the hydrological cycle. Thus, a less organic and more structurally functional strategy was required with regard to the third design iteration (see Figure 7.13).

However, all three iterations had certain advantages which were then incorporated into the final design. For example, the first design iteration (see Figures 7.4 and 7.6) captured the relationship between the building and the river. Ideas for further iterations include the amalgamation of various spaces, for example, the viewing deck being combined with a kiosk, in response to the lessened occupancy requirements regarding the river spaces.

In the second iteration (see Figure 7.8), more attention was given to the adjacent riparian vegetation and less attention to the surrounding trees. Walls were used to break the scale of the openly accessed river spaces. More attention was given to the effect the surrounding site trees could have in the allocation of natural green spaces.

Awareness of the use of existing trees as natural elements to be incorporated in the outdoor therapy spaces was realised in the third iteration. The overall expansive and regenerative potential of the site was fully explored by the third design iteration (see Figure 7.16). However, it lacked a sense of

threshold and an understandable approach to making river space experiential. Limitations of the third iteration included access and circulation issues, and the threshold between public and private spaces that would require attention in order to make an understandable and comprehensive intervention focusing on the experience of the river.

### 7.4.2 CONCLUSION

The systemic water strategy for the building needs to be seen in its regenerative capacity. Thus, the proposed hydrotherapy centre needs to respond to the surrounding buildings and landscape. A technical strategy in implementing the intervention should combine water harvesting with an experiential approach. In addition, in the process of design and resolution, the building's drainage needs should be taken into account.

Eco-living machine systems are robust in regenerating a building's current water usage for operational use (Lohan & Kirskey, 2012:12). The manner of translating the building's conceptual elements in terms of its structure, skin, services, and eco-systemic sustainability should embed the building and take advantage of the hydrological cycle. The fourth design iteration considers these aforementioned aspects (see Figure 7.16) and moves towards a technical resolution of the building process.



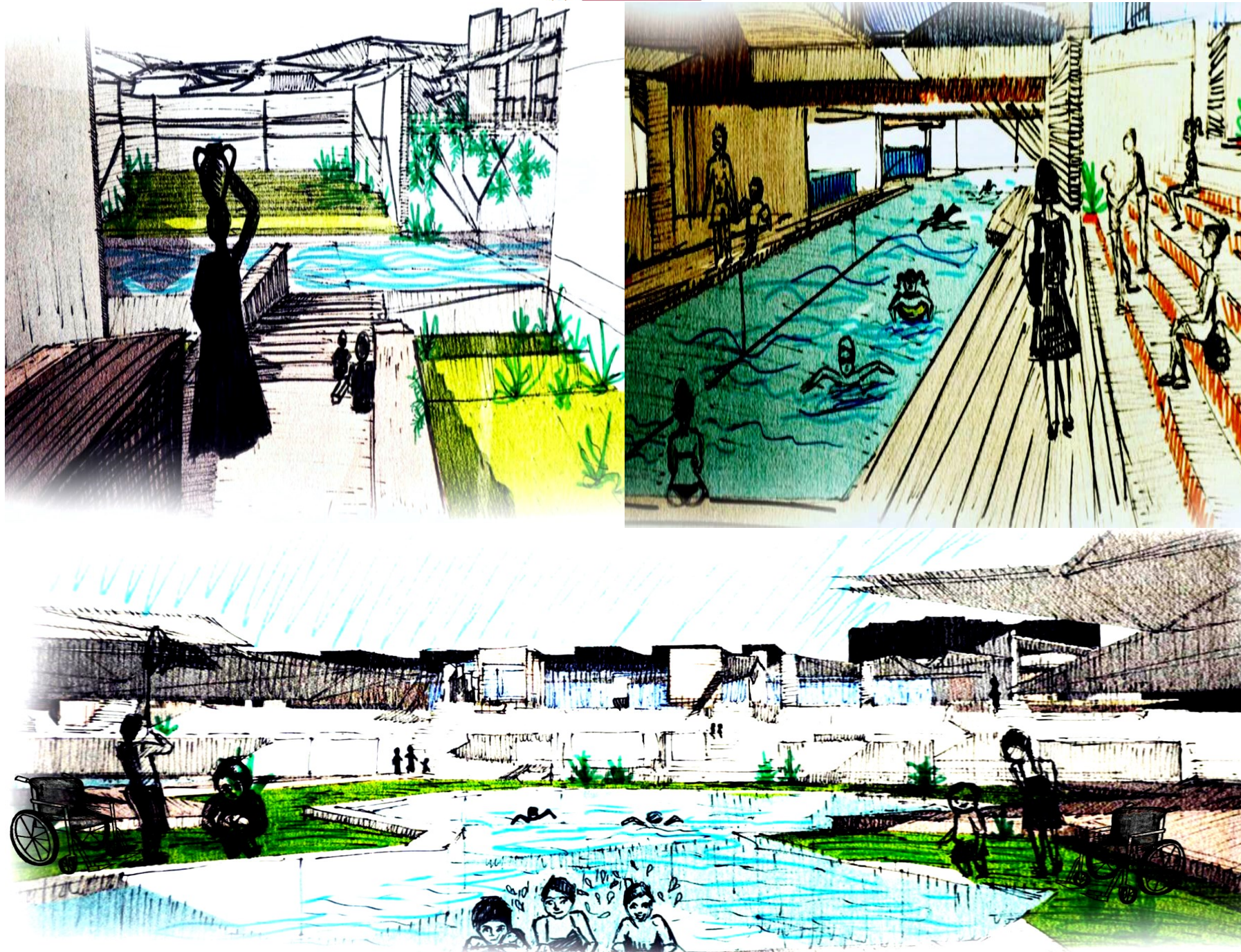


Figure 7.16. Iteration 03 – Perspectives of river spaces and pool spaces. Author, 2016.