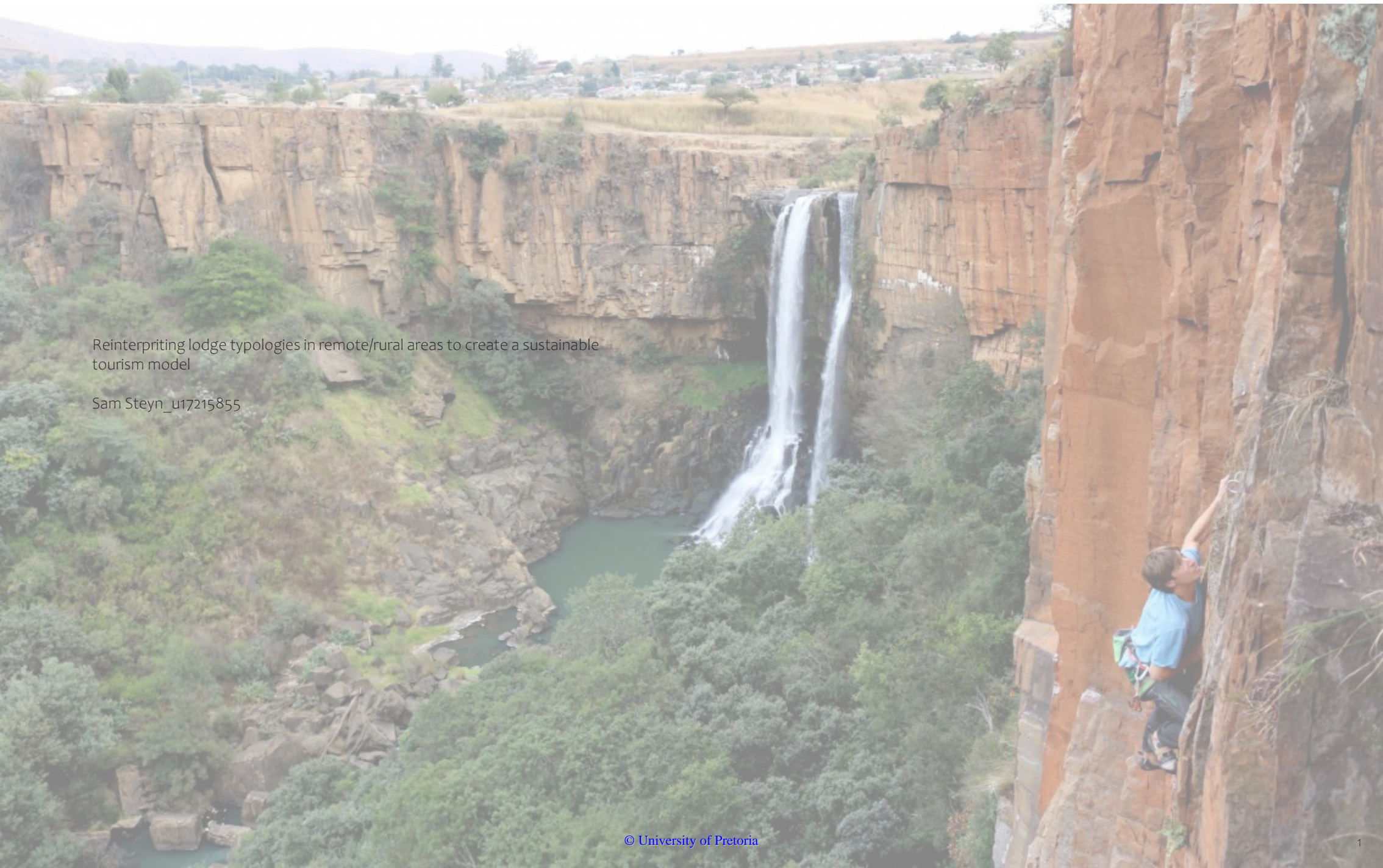


# ABOVE THE WATERFALL

Reinterpreting lodge typologies in remote/rural areas to create a sustainable tourism model

Sam Steyn\_u17215855



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# DECLARATION

In accordance with Regulation 4(c) of the General Regulations (G.57) for dissertations and theses, I declare that this thesis, which I hereby submit for the degree of Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma, or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

SIGNATURE

DATE 07/11/2022



# ABSTRACT

The focus of this dissertation will be on realising the potential of tourism as an economic driver in remote post-industrial or post-productivism towns and understanding the barriers that may be preventing it from maximising its impact. The town of Emgwenya (formerly Waterval Boven) will be used as a case study to investigate how the existing systems can be adapted to accommodate and take advantage of tourism activity.

## ABOVE THE WATERFALL

Reinterpreting lodge typologies in remote/rural areas to create a sustainable tourism model

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Location: Emgwenya, South Africa

Program: Lodge, market space, public viewing space

Institution: University of Pretoria

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Research Field: Regenerative Cities

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# 1 POSITION AND SITUATION

## 1.1 INTRODUCTION

South African small towns, specifically ones in rural or remote areas, are often in a state of economic decline. This can be attributed to the fact that they do not receive the same level of government aid as urban areas even though more than a quarter of the population live in rural areas (Haywood et al., 2020). In addition to the lack of government funding many of these towns are in a post-industrial or post-productivism state caused by the collapse of the industry they were formed around (Atkinson, 2008). Due to the monofunctional purpose they were built around, and ultimately depend on, these towns are often unable to adapt to the change and find themselves in a state of economic decline.

The economic development of these areas could significantly alleviate poverty and urban migration by providing additional centres for opportunity (Atkinson, 2008). Due to the remoteness of many of these towns they often possess an abundance of wildlife, untouched wilderness and historical character. These qualities present the opportunity for tourism to become an economic driver and breathe new life into dilapidated towns (Haywood et al., 2020).

The focus of this dissertation will be on realising the potential of tourism as an economic driver in remote post-industrial or post-productivism towns and understanding the barriers that may be preventing it from maximising its impact. The town of Emgwenya (formerly Waterval Boven) will be used as a case study to investigate how the existing systems can be adapted to accommodate and take advantage of tourism activity.

## 1.2 BACKGROUND AND INITIAL ANALYSIS

Emgwenya was constructed in the 1890s as a railway stop between Pretoria and Maputo. The town formed in the area due to the dramatic change in topography as it is at the beginning of the large escarpment that rapidly descends towards the lowveld.

Interestingly the topography has influenced its use as a passage of trade long before the arrival of colonists, evidence of this is in the form of wide stretched stone circle ruins throughout the area which were home to the Bakoni tribe (Alfred, n.d.). The activity of the tribe is thought to have ended around 1825 due to the Mfecane wars.

The decline of activity of the newly formed town of Emgwenya was far less violent. In the 1960s work began to automate and electrify the railway network of NAZASM. The shift from steam trains to electric ones meant that there was far less maintenance required and centres like Emgwenya became redundant (Berr, 2015: online). Further decline followed as the railway industry shrunk in favour of trucks.

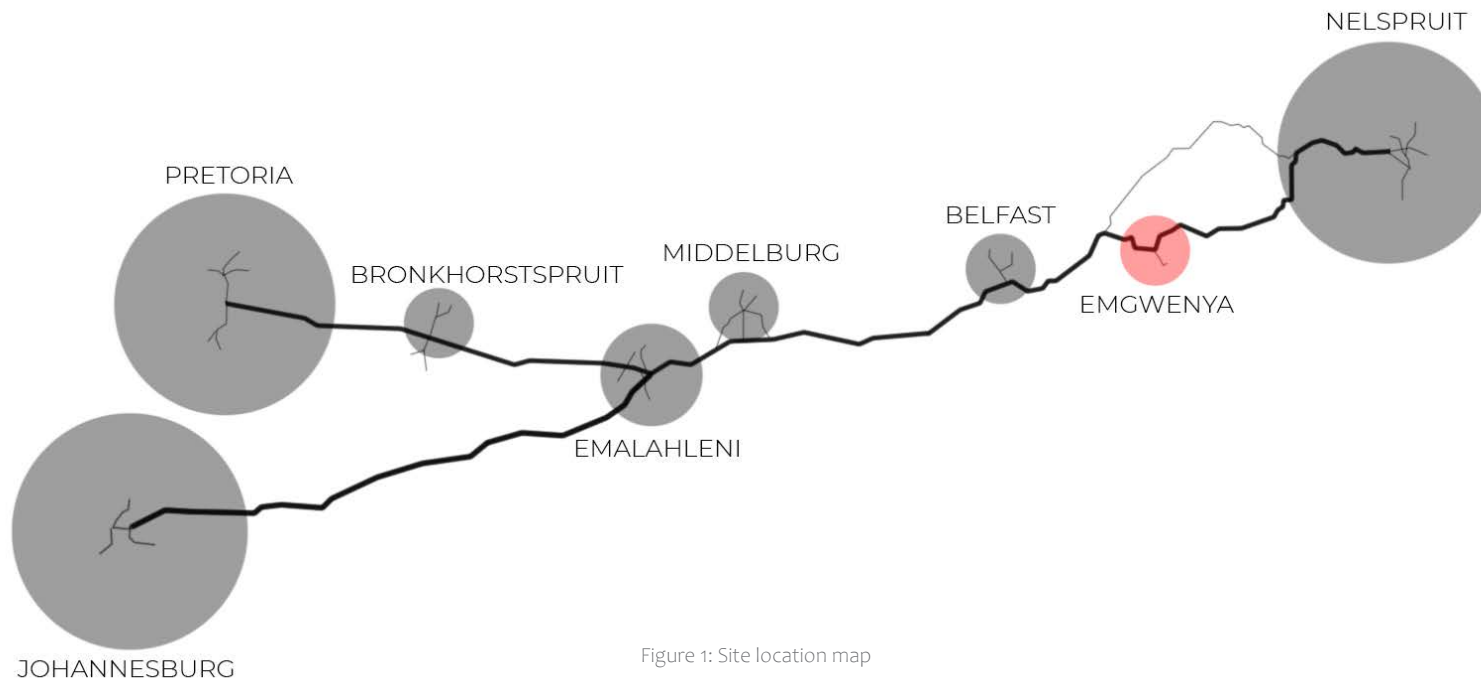


Figure 1: Site location map

The town does have a potential lifeline in the form of adventure tourism and eco-tourism. The cliff sides throughout the area have been developed by rock climbers since the 1980s and the area is an internationally recognised climbing destination, other activities that take place in the area include high-lining, mountain biking, hiking and trout fishing. Every weekend tourists travel to the area to partake in these activities. Despite the presence of constant tourism activity in the area, throughout the year, the town remains in a state of disrepair and decline.

The current condition of the tourism accommodation and activities is separated from the town itself. It could be argued that the reason for this is to be closer to where activities would take place, however, the Eastern Border of the town is cut off by dramatic cliff faces that are home to many of the area's best climbing routes, as well as a large waterfall. A comparison can also be drawn between areas that host similar activities where the town is not circumvented such as Montague in the Western Cape. The area around Montague is also rich with opportunities for adventure tourism however unlike Boven those that choose to visit for those reasons do not seek accommodation closer to the cliff faces but rather within the town.



Figure 2: Image of rock climbing in Emgwenya



Figure 3: Image of slacklining in Emgwenya



A comparison of the towns shows obvious differences that could explain the attitudes towards the towns. As opposed to Montague Emgwenya possesses little to no formal restaurants, eateries, or entertainment that tourists could partake in in the evenings whilst not participating in outdoor activities. The historical development and spatial planning of the towns also sheds light on possible reasons why Emgwenya has not seen the emergence of tourism activity within the town itself. The town of Waterval Boven was built during the apartheid era and was divided into two sections.

The Western half of the town is more formalised with larger houses built from stone and rigid street grids. The Eastern half of the town, which is separated from the town by a natural ridge, was the designated labour camp and developed more informally with smaller houses built from cheaper materials. The result of the spatial divide is that the Eastern half has become an informal settlement with the conditions that are associated with informal settlements being a consequence. These conditions being high density, impoverished, a lack of public services including clean water, and a lack of public spaces for commerce and recreation. It was my opinion that the conditions of an informal settlement could prevent tourists from wanting to engage with the town due to physical and psychological discomfort, however, upon visiting the site I observed the conditions to be less severe than anticipated but still in need of improvement which could be achieved through an increase in traffic through the town and a greater connection to the Western side of town as well as the escarpment to the East.

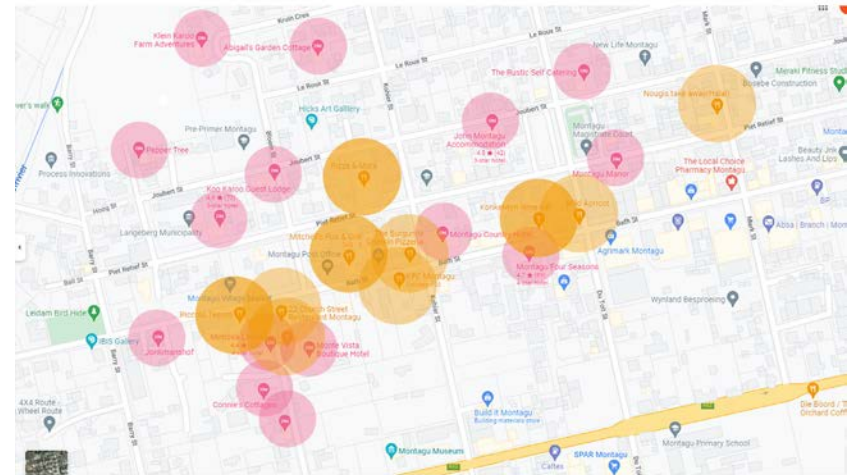


Figure 4: Accommodation and restaurant density map of Montague

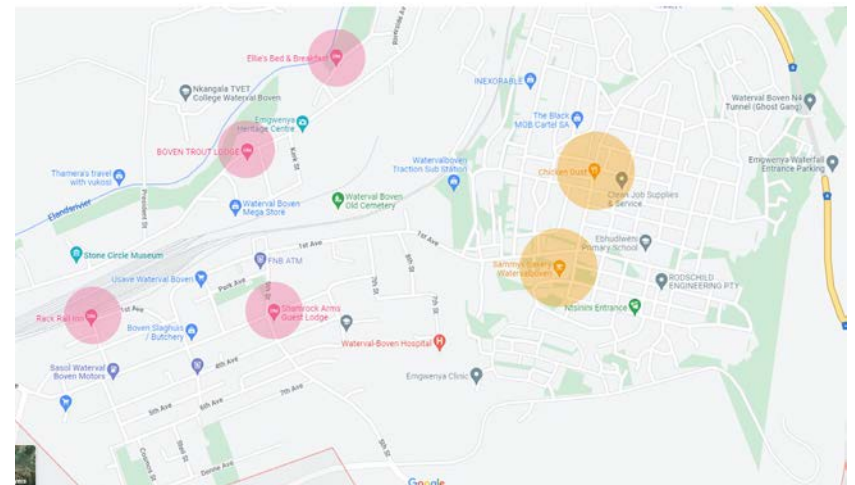


Figure 5: Accommodation and restaurant density map of Emgwenya

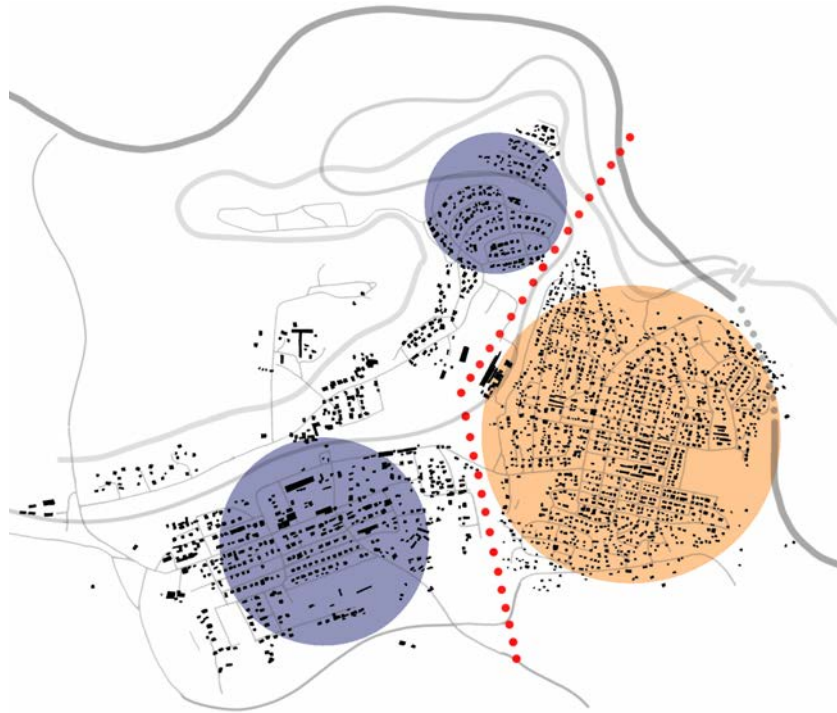


Figure 6: Nolly map of Emgwenya showing East West divide

In summary the existing tourism structures of Emgwenya are unsustainable as they do not benefit the local community. By reconnecting the town to the surrounding economic drivers the condition of the town can be improved to match the success of similar areas such as Montague.



Figure 7: Photo of Western side of Emgwenya



Figure 8: photo of Eastern side of Emgwenya

## 1.3 INITIAL NORMATIVE POSITION

In order to design a lodge that facilitates sustainable tourism a holistic approach to architecture is necessary. A holistic approach requires one to think beyond the needs of the primary function of an intervention, to understand the impact that it will have on the surrounding community and environment as well. The aim of a holistic approach is to create a sensitive architecture that has a positive effect on its surroundings.

## 1.4 STATEMENT OF PROBLEMS

### 1.4.1 GENERAL ISSUE

Post-industrial or post-productivism towns in South Africa often suffer from the inability to evolve (Atkinson, 2008). In the wake of losing the economic drivers, which were the catalysts for the creation of the town, they fall into a state of decline. The mono functionality of industrial towns makes their collapse inevitable.

### 1.4.2 REGIONAL ISSUE

Current lodge typologies, especially in 3rd world countries, lack effective urban integration. They are generally isolated in remote areas. This is done for a multitude of reasons including safety, easier access to place-based resources, more tranquil spaces etc. The issue with this is that they become exclusive and do not benefit the local community. A new typology that caters for tourist satisfaction levels whilst also having a public interface is necessary.

Another urban issue that needs to be addressed is the temporary nature of tourism venues. The intervention will only be occupied by tourists during weekends and holiday seasons, what happens to the space during the week needs to be addressed as they should not become abandoned spaces but rather, they should function as public spaces to be used by the community where possible.

### 1.4.3 ARCHITECTURAL ISSUE

Lodge typologies in developing nations are generally placed in remote areas for a reason, whether its safety or for the authentic experience of natural environments and the escapism they provide. It is important to address the tourist experience and ensure that the architecture allows for integration with the local community without compromising tourist safety or perceived safety as well as the experiences that are associated with remote areas. Put simply it is important to identify the characteristics that make remote lodge typologies successful and ensure that these characteristics are not lost in the transfer to a more urban location.

Another issue is the potential harm the intervention could cause. Place-based resources and the tranquil environment that they provide as well as their functional use for rock climbing are what attract tourists to the area. The intervention will need to protect these place-based resources in order to be successful, in addition to that it should aim to improve the functional aspects of the area by making it easier to access these spaces.

## 1.5 THEORETICAL FRAMEWORK

### 1.5.1 REGIONAL RESPONSE

It is important to consider the history and regional character of the town. The town and surrounding area have a lot of heritage value however it is also important to be critical of the existing structures and question if it is relevant to respond to them, in this respect a critical regionalist approach is adopted. Given that the initial motivation and influence for the development of the town no longer exists should the new development rather respond to the current situation or intended future situation. The town was previously a pit stop on the way to the intended destination and as such the development, especially the labour camps that form the Eastern side of the town, were built in a rush and may not have been appropriate responses to the area. The intention is to transform the town into a destination of its own and with that new identity a new architectural identity may be more appropriate (Shulman, 2012).

### 1.5.2 ECOLOGICAL DESIGN

The new primary economic drivers of the area are its natural place-based resources. The new design should aim to protect these resources and where possible improve them (Owen & Hes, n.d.). This can be done by using architecture as a platform for experiencing the environment or by actively improving the conditions of the environment. Research into the ecology of the area is crucial to ensure that the intervention is sensitive to the natural habitats, these considerations are addressed in greater detail in section 3.9.

### 1.5.3 MONUMENTALITY OF ARCHITECTURE

The relationship between architecture and tourism in many cases is quite direct. Architecture can be an expression of an area's history and can communicate that to visitors who are unfamiliar to the area allowing tourists to immerse themselves into the culture of the area and enhance the experience. Monumental architecture or buildings have been shown to be effective tourist attractions by themselves (Scerri, Edwards & Foley, 2018). If there is a lack of monumental architecture within a town it could be argued that that town is less likely receive regular tourist visits. In the case of Emgwenya the surrounding natural environment is the monumental tourist attraction, however, it is not that easy to access.

For a building to be monumental does not necessarily need to stand out and dominate the landscape, it can also be monumental by creating a unique and memorable user experience for example the boomslang path in Cape Town, therefore, Emgwenya could benefit from an architecture that enhances the experience of the area.

### 1.5.4 SUSTAINABLE TOURISM

Due to the unique indigenous cultures, untouched natural landscapes, wildlife and ideal weather conditions small communities throughout Africa are being promoted as ideal holiday destinations, especially for first world countries who benefit from the exchange rate. Whilst the development is positive it is also important to be critical of the existing typologies that support these tourism activities. Existing lodge typologies are generally exclusive and remote, because of this the money spent by tourists doesn't get distributed evenly. This system is unsustainable as it does not benefit the community and enforces economic segregation. For tourism to be sustainable it needs to benefit and develop the area to raise the standard of living for locals as much as possible (Kuzior et al., 2021).

### 1.5.5 ADVENTURE TOURISM.

Adventure tourism is a form of tourism that is reliant on the presence of natural resources that allow for recreational activities, generally physical activities, to take place. The advantage of adventure tourism is that due to the specialised nature of the activities it generally presents greater opportunity for economic development in the form of guided tours, gear rental, coaching, etc.

Adventure tourism is categorised as either hard adventure or soft adventure. Hard adventure are activities that are perceived as riskier and require more preparation. Soft adventure is considered less risky and is more accessible. Hard adventure caters to a niche group of people due to the perceived risk associated with it and the effort required to do the activity. Soft adventure on the other hand has a much wider audience.

The same sport could fall into both categories depending on the accessibility of the area and infrastructure supporting it. At the moment the climbing and other activities in Waterval Boven would be considered hard adventure due to its inaccessibility. The development of the area could make the area more accessible and appealing to a wider audience.

## 1.6 RESEARCH METHODOLOGY

### 1.6.1 PERSONAL EXPERIENCE

I am an enthusiastic climber and an active participant in the community. I will be borrowing from my own experiences and knowledge of the area which I have visited numerous times to participate in events and used various places as accommodation including staying in the Eastern township.

### 1.6.2 HOLISTIC DESIGN APPROACH

Holistic design is an approach to design in which you design with the whole system in mind. The purpose of the mentality is to take into consideration the impact the intervention will have beyond its own primary function. A holistic approach is required to understand both the psychological and physiological needs of the tourists, as well as the economic needs of the local community.

### 1.6.3 EVIDENCE BASED DESIGN

The purpose of evidence based design is to understanding the aspects that make a successful building based on an analysis of relevant precedents. Existing lodge typologies are successful in attracting tourists, the dissertation will reinterpret the typology to create interaction with the local community and create the opportunity for businesses to be generated from this exchange. This need to be done without negatively affecting the “primary” function and economic driver of the intervention (the lodge). the aim of the dissertation is for the characteristics (physical, social, psychological) that make lodges appealing to be preserved when transferring the facility from a remote environment to a townscape environment.

Multiple precedents with different approaches to designing in nature will be studied to determining the characteristics and resultant experiences created by those spaces. This can then be compared to the desired spatial requirements and experiences of the intervention to determine the most appropriate response to the site and program.

## 1.7 POSTULATION OF PROGRAMME

For a development to be sustainable it needs to be multifunctional, a lodge functions as a point of attraction however other programs are necessary to distribute income throughout the community as well as to diversify income streams to be less dependent on a singular economic driver. The dependence of an area on a single economic driver creates a fragile system, however, generating multiple economic opportunities does not take place over night or without an initial catalyst for growth. For this reason, a phased approach will be taken by first capitalising on the existing opportunity for adventure tourism at the edge of the town. Additional programs will be generated using tourism as its initial driver, but with the intention of gaining independence from external support to create a more robust and dynamic economy.

Phase 1 programs aim to attract tourists to the area by providing places to stay and appealing public space that encourages interaction. Phase 2 programs will capitalise on the presence to tourists and phase 3 programs are intended to limit the dependence of the town on tourism making the local community self-sufficient and more resilient to change.

### Phase 1

Adventure lodge – The Eastern side of town borders the escarpment which is an established climbing area with top quality routes available as well as a beautiful waterfall. the area is not frequented as often as other climbing spots in the area and that is largely due to the lack of accommodation nearby and the difficulty of accessibility. The initial intervention will be to create a lodge that will attract tourist to stay in town rather than at a remote camp site. Creating greater exposure of tourists to the town will create opportunities for the local community to develop economic relationships with the visitors. The intervention should not be centrally place as it will cut the tourists off from the place-based resources (natural environment), rather, it will be placed on the edge of the town and be a mediation point between the natural and urban spaces.

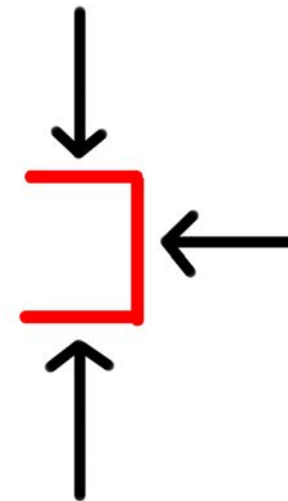


Figure 9: Phase one intention diagram

## Phase 2

Restaurants, coffee shops, fresh produce store etc – Currently visitors to the area by all their food supplies from where they live and bring it with them to the camp sites. Speaking from experience this takes considerable planning, effort and you are very limited on what you can bring due to space and cooking/refrigeration facilities. Additionally, after a long day of physical exertion it can be very unappealing to then have to start the long process of making a fire to eventually cook on. If there were easily available and appealing restaurants near the lodge than tourists would certainly take advantage of the more convenient option.

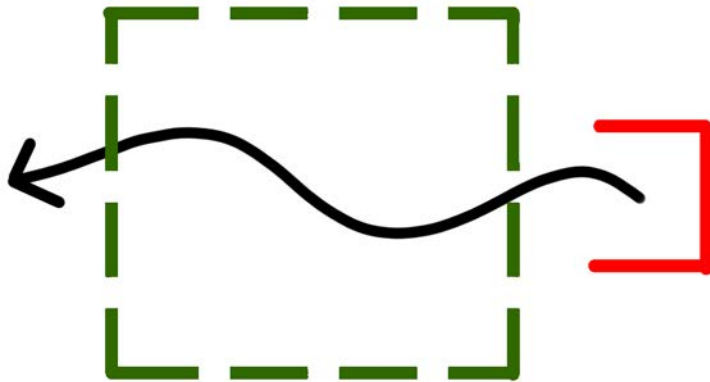


Figure 11: Phase two intention diagram

## Phase 3

Timber Craft – another one of the existing but disconnected economic drivers in the area is the forestry industry. The industry the moment only deals with the raw production and harvesting of timber in the area and not the processing phase. The supply of timber could translate into a processing and manufacturing opportunity. The goods developed could be used to improve the condition of the town and even used to develop the above-mentioned programs, and in the process develop a new regional identity. The products would also be exported from the town to bring in more income to the local economy.

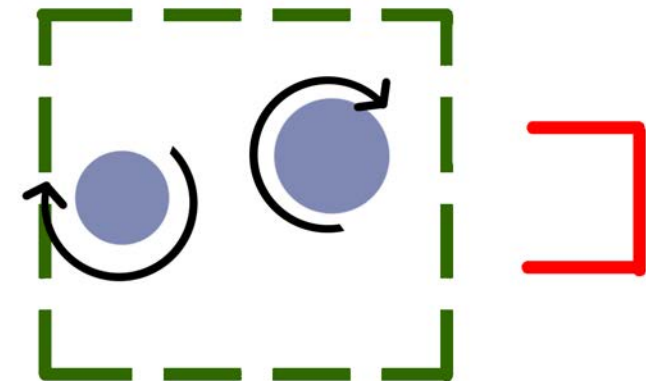


Figure 12: Phase three intention diagram

## 1.8 CONCLUSION

In this dissertation I aim to determine the barriers preventing existing tourism from having a relationship with the local community. The objective is to establish a relationship between tourists and the local community to create sustainable growth and to develop programs that alleviate the local community's dependence on external economic aid (tourism), whilst also maintaining tourism satisfaction levels by preserving the natural environment and authentic experiences. At the same time the intervention will prioritise the conservation of the natural resources of the site as it is recognised as the economic driver of tourism in the area. The design will reconnect the town to the natural environment and will soften the barriers between the two.

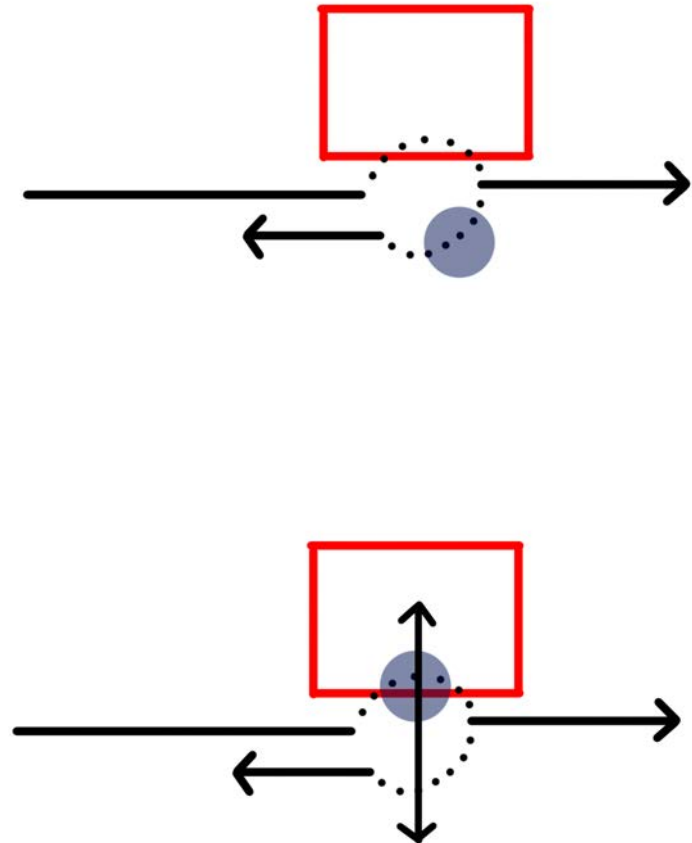


Figure 13: diagrams of current condition vs the condition the intervention aims the achieve



## 2 DESIGN RESEARCH

## 2.1 INTRODUCTION

In this chapter the spatial, economic, and experiential implications of different approaches to the intervention and site will be investigated. First a site analysis will be presented to define the issues and informants currently present on site. From the analysis an initial response was generated with a set of goals which were postulated in the first chapter. Finally, the initial response is examined and refined to better suit the intentions.

## 2.2 EXISTING CONDITIONS

### 2.2.1 EXISTING LODGE TYPOLOGIES/CHARACTERISTICS

Campsites in the area which are located farther south along the escarpment are highly successful in attracting users to stay. The issue with these typologies is not their inability to function but rather that they do not contribute to the community/town which make it unsustainable tourism. They do however function well in terms of satisfying tourist needs which is why they continue to function. These positive characteristics are essential to understand and preserve in the new intervention.

Pros:

1. Easy access to escarpment and natural environment – The primary group that is attracted to stay in the area are rock climbers as well as cyclists. The escarpment has been developed and bolted\* for many years and offers some of the best rock-climbing routes in the world. The beautiful views also make it an appealing area to go cycling, train running or hiking.
2. Diversity of accommodation – the accommodation facilities cater for a wide range of clients. There is an affordable camping ground with shared bathroom and kitchen facilities for less financially stable groups (students).

The next option up are the perma-tents, followed by the self-sufficient cabins and finally the luxury suite cabins. The diversity in accommodation options means that there is a greater diversity of clients that will visit across all age groups and social statuses. This contributes to the accommodation facilities always being occupied.

3. Safety – The secluded location away from the town gives these accommodation facilities a sense of security. An important aspect to consider when designing the new lodge will be to maintain a sense of isolation.
4. Views/environment – One of the main attraction points for areas like these are the spectacular environments and feeling of escape from city life. A sense of escape will be one of the harder experiences to preserve when designing due to the proximity to the town and its activity. Whilst its important to integrate the town and the lodge certain programs (such as dwelling units) should be isolated and immersed in the natural environment to allow for a remote experience.

\*Bolted: while climbing it's necessary to anchor yourself to the wall at regular intervals for safety in case you fall. this can be done by placing your own gear that has an expansion mechanism in cracks as you go or if the route has been bolted you can simply clip into the pre-set bolts as you go. Placing your own gear requires more experience, skill and is ultimately more dangerous, as such it is only done by a small percentage of climbers. Bolted routes are much safer and have a much greater number of participants.

Cons:

There are also negative aspects to consider which the new intervention could improve upon.

1. Difficult road access – The current roads to these remote locations are all dirt roads which are not always well maintained and deteriorate whenever it rains. This makes it difficult to access for anyone who does not own a 4x4.
2. No access to food – The remote location also means that there are no nearby restaurants or grocery stores, and the ones in the town are too far away and difficult to access due to the road conditions. As a result, those who stay at the spots must bring food from home, that adds to the planning needed for a trip which could discourage those who would prefer more convenience.

### 2.2.2 CURRENT/PROPOSED SITE

The proposed site location for the new lodge is on the eastern edge of the town. The site is an intersection point of a number of features including the main road, the railway, river, town edge and cliff edge. The site also includes the old steam train tunnel which is no longer in use as the railway has been diverted.



Figure 14: Nolly diagram of Emgwenya showing proposed site and prominent features



Main Road



River



Nodes



Railway

1. Access – Currently access to the site bypasses the town itself. There is no opportunity created for there to be an interaction between visiting tourists and the town itself. By creating a physical link through the intervention to mediate an exchange between groups economic opportunity will form.

Natural Cliff edges as well as the ones created from blasting the old steam train tunnel form barriers that the intervention will aim to bridge. Creating access to the town as well as the cliff faces across from the site will immediately create more activity at the node.

2. Experiences – The site boasts spectacular views of the escarpment as well as the waterfall. Additionally, the old steam train tunnel can be used to access an existing, albeit dilapidated, timber viewing deck. The experience of walking through a dark, somewhat unsettling, tunnel that causes sensory deprivation to then be abruptly met with a wide-open view of the waterfall is quite powerful to say the least. This experience of contrast will be represented in the design of the building.

3. History – The town was developed as a train station stop between Pretoria and Maputu. The town itself was split into two sides, the western side was the formal town that housed the main officials and officers whereas the eastern side was the designated labour camp. The division is obvious by the use of a natural ridge used to separate them as well as the different architectural styles. The buildings on the western side are larger plots of land with a very formal grid arrangement and the building have been constructed in stone masonry that were sourced from the rock blasted out when making the railway tunnel. the buildings on the eastern side by contrast are much smaller and clustered together in a denser and more organic (informal) layout.

Before the occupation of the area by the colonists it was occupied by a large African tribe known as the Bakoni. The remnants of the tribe are clear to see from the extensive stone circles in the area. The settlement is believed to have formed as a result of metal work exchange economies along a trade route, the tribe also used rock to create water retention systems for agricultural purposes.



Figure 15: Aerial views of site

## 2.3 OUTLINE OF GOALS

- Rehabilitation – to mend scars in the landscape created by the construction of the train tunnel and to improve the conditions of the neglected town.
- Mediate edges – the intervention should transition users from the urban to natural environment without detracting from the natural aesthetic
- Reinterpret lodge typology – existing lodge typology is remote and exclusive; intervention will establish a relationship between the lodge and the town.
- Connect town to existing economic drivers
- Sustainable tourism

## 2.4 CREATING A RELATIONSHIP BETWEEN THE TOWN AND THE NEW LODGE

1. relationship between users facilitated by intervention

The initial idea was to reinterpret the programs of a lodge and categorise them according to how private and safe they need to be vs, ones which could become more public whilst still maintaining tourism satisfaction and comfort levels.

2. Relationship between users facilitated by town (with the intervention acting as the catalyst).

The other option is to focus primarily on experiential aspects from a tourist point of view. In this scenario there would be less integration between tourists and the local community within the actual intervention. Rather by having a lodge so close to the town tourists would choose to explore the town itself. Exchange takes place at nodes within the town or along an axis leading towards the lodge.

3. Relationship between locals and the construction of the intervention

It may be the case that maintaining tourism satisfaction levels can not be achieved if the lodge is acting as a platform of exchange, especially in a township environment. In this case the lodge can contribute to the development of the town by facilitating exchange within the town, as mentioned above, and by utilising the community during the construction phase.

Forestry is one of the primary economies within the area and many of the locals are employed at the SAPPI plant down the road. The creation of a timber processing workshop which utilises local skills to fabricate the materials that will be used to build the lodge, after which the workshop can be used by the community to manufacture and export goods.

## 2.5 RELATIONSHIP WITH LANDSCAPE THROUGH PRECEDENTS

The primary focus of precedent studies done was to understand different ways of designing in natural environments. Specifically, to understand the way in which the object has been integrated into the landscape and what effect that has on the perception of the intervention from the outside and the effect the intervention has on the user experience within. The technique or combination of techniques will be used to achieve the desired outcome on the proposed site.

## 2.5.1 COROMANDEL



Figure 16: Photo of Coromandel, Sydney Press, Dullstroom

This method would work well to ensure that the natural aesthetic of the site is protected, additionally the sunken and hidden typology lends itself to being very private. One draw back of the method could be that without a downward facing slope the view of the surrounding area could be cut off. The focus would shift toward the interior intimate spaces that would need to be very well designed. These designs place nature as the building and do not impose on the landscape.



Figure 17: Diagram interpreting Coromandel

- Blend
- Cut and fill method of digging into the site in order to disappear
- Preserves the natural aesthetic and maintains an authentic experience of the environment

## 2.5.2 WOODHOUSE HOTEL



Figure 18: Photo of Woodhous Hotel

The mimic technique can be used to create an intervention that is recognisable as architecture from the natural environment, however, it is respectful to its surroundings by mimicking the language and regional character. This method can be used to create architecture that allows for an outward experience of its surroundings as opposed to an inward experience of space. The difficulty in the technique is identifying the key characteristics of an area to respond to create an architecture that is truly of the place. In the case of Emgwenya its bright orange cliff faces, and verticality would be its defining characteristics which could be mimicked with overlapping panels of Corten steel or similar material.



Figure 19: Diagram interpreting Woodhous hotel

- Mimic
- The architecture mimics the form of the environment to be of the place whilst still standing out
- Can be achieved through the use of simplified forms, local materials or a combination of the two.

### 2.5.3 CAMP ADVENTURE OBSERVATION TOWER



Figure 20: Photo of Camp Adventure Observation tower



Figure 21: Diagram interpreting Camp Adventure Tower

- Juxtapose
- Blatantly stands out from the environment in term of form
- Allows users the experience the environment in a way they were unable to do so before
- Materials used respond the surroundings making its form less intrusive

The juxtapose method makes a bold assertion on the landscape which could if not executed well be detrimental to the natural aesthetic. What is worth understanding about the method is the experience that the intervention creates from within the building looking out. These buildings allow for users to experience the environment around them in a way that would not be possible without the building.

In a similar way rock climbing allows for those who are doing it to have an experience of seeing things that cannot be seen or felt from a distance. An intervention on the site that allows none rock climbing visitors to experience similar feelings and views as a rock climber would. This could result in a unique tourism attraction.



## 2.5.4 SELVIKA



Figure 22: Photo of Selvika project

- Turns an infrastructural need into an experience
- Reframes the way users move through the site
- Forces users to experience the site in new ways

In this project there was a focus on curating views of the surrounding area, designing from the inside out and framing specific views that may not have been noticed otherwise. Similar to the tunnel in Boven the design shifts people experience from interior to exterior to enhance the views.

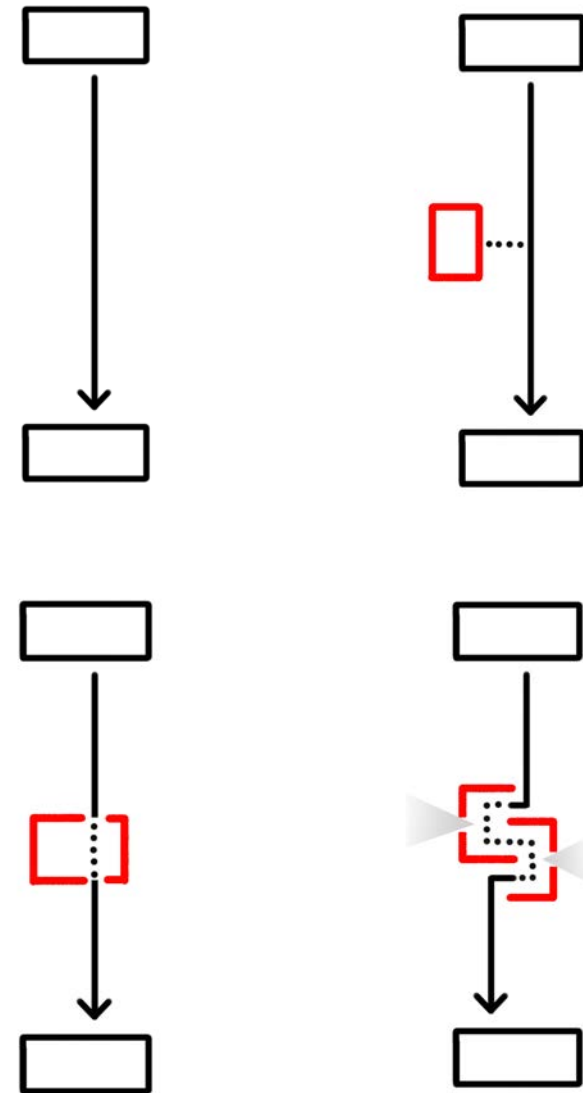


Figure 23: Diagrams interpreting Selvika project

## 2.5.5 QUARRY GARDENS



Figure 24: Photo of Quarry Gardens

- Rehabilitation
- Transforms a scared landscape into a desirable location
- Reclaims the site as a public space
- Site transitions back to its original use

This project deals with similar circumstances of rehabilitation of a landscape and reclaiming an industrial site for public use. The building mimics the cliff faces through its materiality and reprograms the site by providing a platform from which to access and experience it.

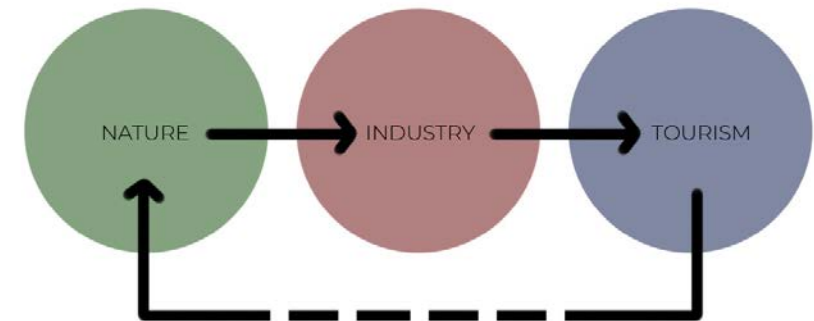


Figure 25: Diagram interpreting Quarry Gardens

## 2.6 INITIAL RESPONSE

Based on the precedent studies, a criteria for the design was determined which is as follows;

1. Access – the initial response was to form an axis by extending a road from the town through to the site to act as the main entrance from the town that leads directly to a public viewpoint.

Multiple stair systems to bridge vertical barriers were also done including a large stair retaining system to rehabilitate the stone dump that was created from excess rubble blasted from the tunnel

2. Zoning – an agricultural buffer zone was created between the private residential of the town and the private areas of the lodge. This does however cut the town for from accessing the cliff edge and views, at the same time the need to protect the cliff edge from the township possibly growing over it may justify the barrier.

The other option for creating privacy for tourist was to have suspended cabins along the cliff edge however they run the risk of being too detrimental to the natural aesthetic.

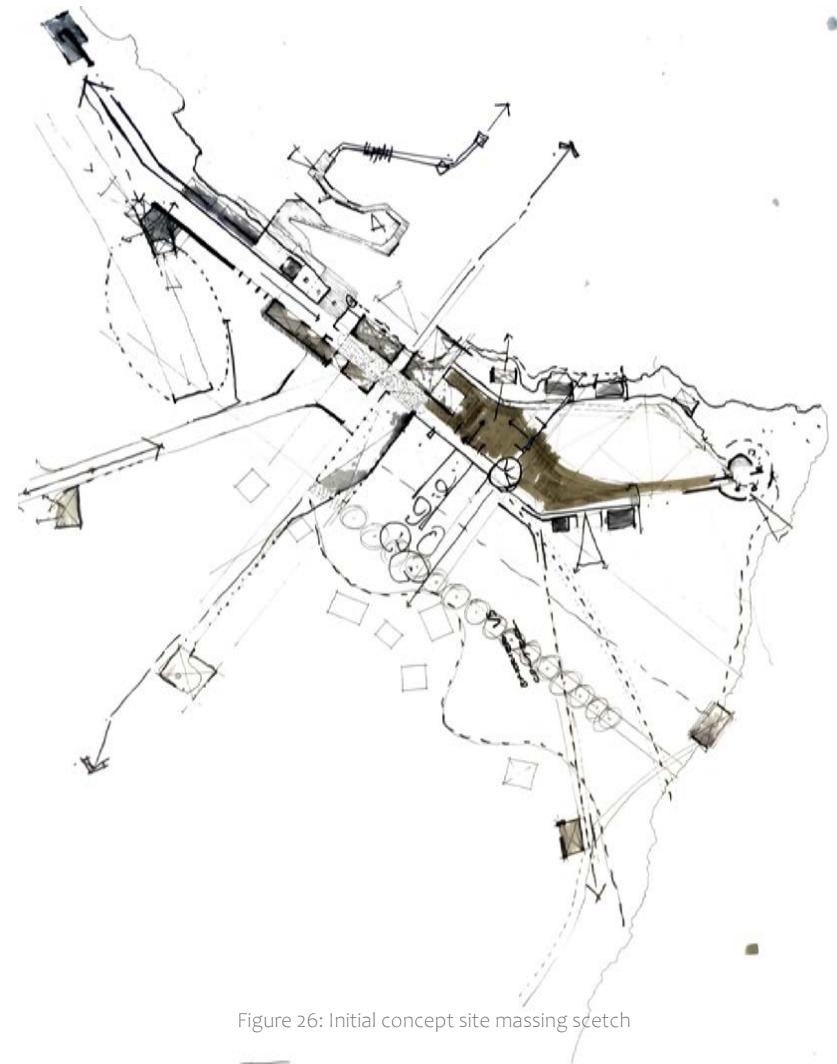


Figure 26: Initial concept site massing sketch

## 3 SYNTHESIS

### 3.1 INTRODUCTION

In the following chapter the intentions of the project are translated into design decisions. The design decisions led to multiple structural solutions which have varied cost implications, material requirements, environmental impacts and experiential outcomes. The structural solutions were then examined against the initial project intentions and compared to precedents to determine the most appropriate solution.

This chapter will briefly reiterate the project intentions and subsequent design and technological decisions and iterations made in response to said intention.

### 3.2 PROJECT INTENTIONS

The success of a lodge relies heavily on the experience that they create for users. Remote lodge typologies can easily provide desirable experiences due to the all-round scenic views, noise quality and privacy created by being away from developed areas. Whilst remote lodges are very successful, they are also exclusive and only beneficial to a small group of individuals who profit from them and often do not benefit the locals as much as they potentially could. In the case of Emgwenya a lodge integrated with the town could have an extremely beneficial impact on the economic growth of the area. A roadblock to creating a lodge that is integrated with the town of Emgwenya is that the condition of the town is not appealing to tourists in general given the informal and impoverished nature of its settlement.



Figure 27: 3D Revit model of project

The question became how to import the characteristics of a remote area into a lodge that is integrated into a town environment? It became clear that a fully integrated lodge, as in one that would be located in the centre of the town, would not be an appropriate solution. Rather a semi-integrated typology situated on the edge of the town would be more appropriate. The lodge could then have access to the town and the beautiful natural environment surrounding it and create layers of public and private space to cater for tourism satisfaction levels. The Eastern edge of town was chosen as the site as it also provides direct access to escarpment. The decision was made to place parts of the intervention on the steep cliff faces located at the site to create natural visual and acoustic barriers that will assist in creating a remote experience for users. By placing the intervention on the cliff face it also prevents itself from becoming a visual barrier between the town and the escarpment allowing any public space created between the lodge and the town to benefit from the beautiful views.



Figure 28: Unit placement diagrams

### 3.3 CLIFF FACE ATTACHMENT

After the decision was made to place parts of the lodge on the cliff face the various methods of attaching to a cliff face had to be considered. Firstly, it needed to be decided if the intervention would cut into the cliff face and form part of the face in a seriocomic manner or if the structure would be an attachment that extrude from the cliff face.

Cutting into the cliff face could have the benefit of being more visually sensitive to the area as well as generating materials (stone) that can be used in other parts of the building. It does however pose a number of challenges such as the ability to blast/cut accurate holes and spaces out of a cliff face safely and the need for many columns and limited space sizes to support the weight of the earth above. Additionally, the cliff faces are a place-based resource and are the primary source of tourism in the area. The construction process of blasting could cause severe damage to the faces as such the option of pinning to and extruding from the wall was chosen instead.

Whilst more sensitive to the face itself the design still has a number of challenges associated with it. Including how the structure would be supported, how materials would be gotten to the side of the cliff safely, what the size limitations of the structure would be, what would be the most appropriate materials and construction methods and what the visual impact of the building and its support structures would be. The first step was to determine how exactly the structure would be attached to the cliff face.

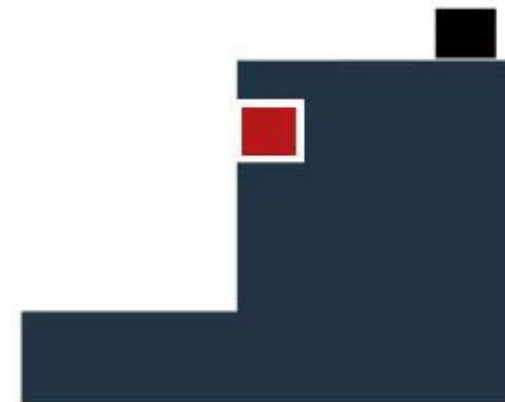


Figure 29: Diagrams comparing cut in vs clip on construction methods

The first option was to have a steel support structure that the building would sit on top of. This method would require deep anchors to be drilled into the face and the support structure would be clearly visible and potentially detracts from the aesthetic. The second option was to have supporting beams at the top and bottom that would be drilled into the face. Without the use of a triangular system the beams would have to be quite large and heavy and would require very deep anchor holes to be drilled.

The third option and the one that I decide to go with is a suspension system. Cables in tension attach above the structure from the cliff face to steel beams that form part of the roof structure and in compression against the wall. Given the steel beams are in compression they do not require deep anchors to be fixed to the cliff face. The cable whilst exposed can be far thinner than the steel beams that would have been needed to support the structure from below and thus have far less of a visual impact. The cable system is also a reference to the portaledge tent systems that rock climbers use when climbing large walls that cannot be done in a single day.



Figure 30: Portaledge tent

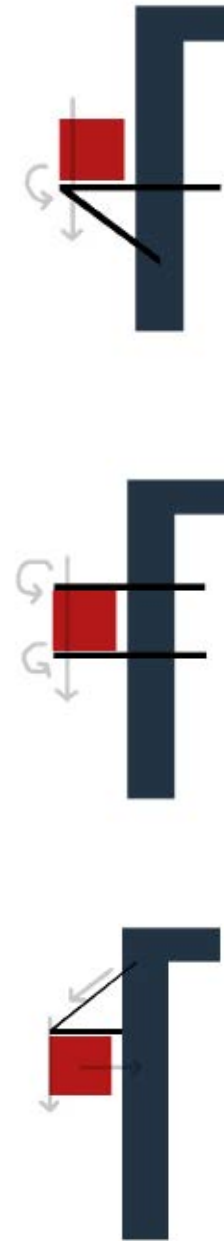


Figure 31: Method of attaching to cliff face diagrams



The size of the structure would still need to be limited specifically with how far the structure can cantilever away from the cliff face so that the angle of the support cables are optimal. Long linear structures that were determined as the optimal solution for the design as well as a few duplex structures. Additionally appropriate materials need to be used to reduce the weight of the structure. The main support structure will be steel for safety and durability, the internal walls floor and ceiling will be locally sourced timber whilst the outer cladding will be a combination of timber and light steel panels that will be allowed to weather to begin to mimic the orange colour of the cliff face rock.

The private dwelling units need to be suspended away from the cliff allowing for a public circulation route between the cliff face and the unit. This ensures privacy and an unobstructed view for the users of these dwelling units. The space between the unit and the cliff face creates an entrance point that resembles the experience of walking through the existing tunnel when accessing the viewing platform. Whilst walking through the tunnel light fades away and the space engulfs the user in a sensory deprecating space, towards the end of the tunnel light slowly begins to return and at the end the user is abruptly turned 90 degrees and exposed to the valley and waterfall. The abrupt transition enhances the grandeur of the subsequent views and the sound of the waterfall, and the light draw the user towards the view-point and create anticipation. By creating an intimate space between the unit and the rock face the structure will emulate the experience created by the tunnel and articulate the threshold of the units.

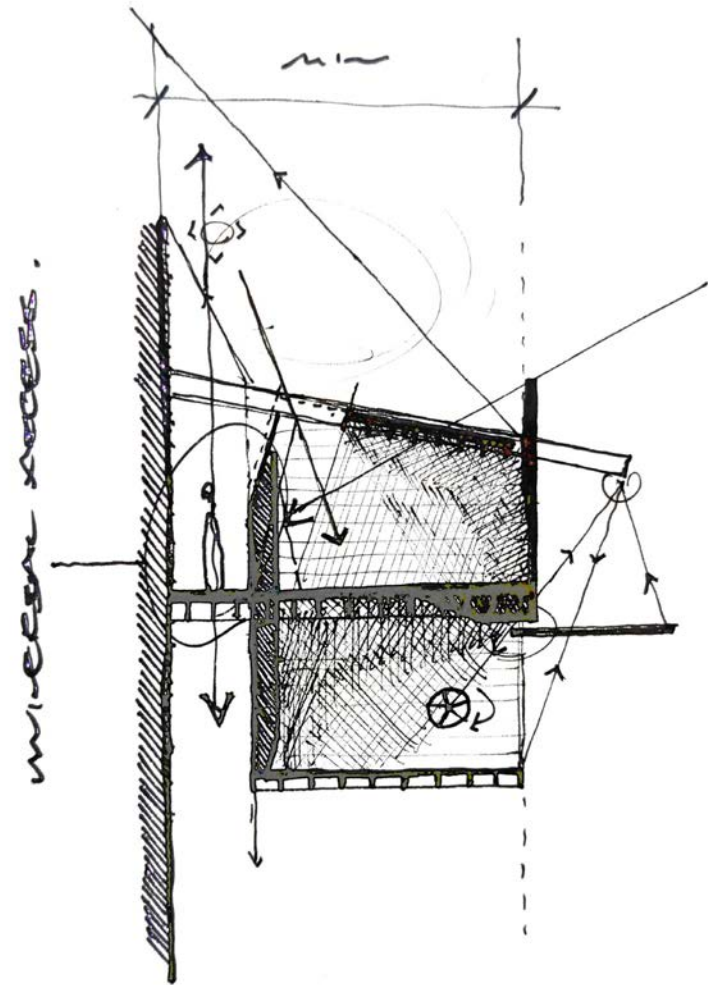
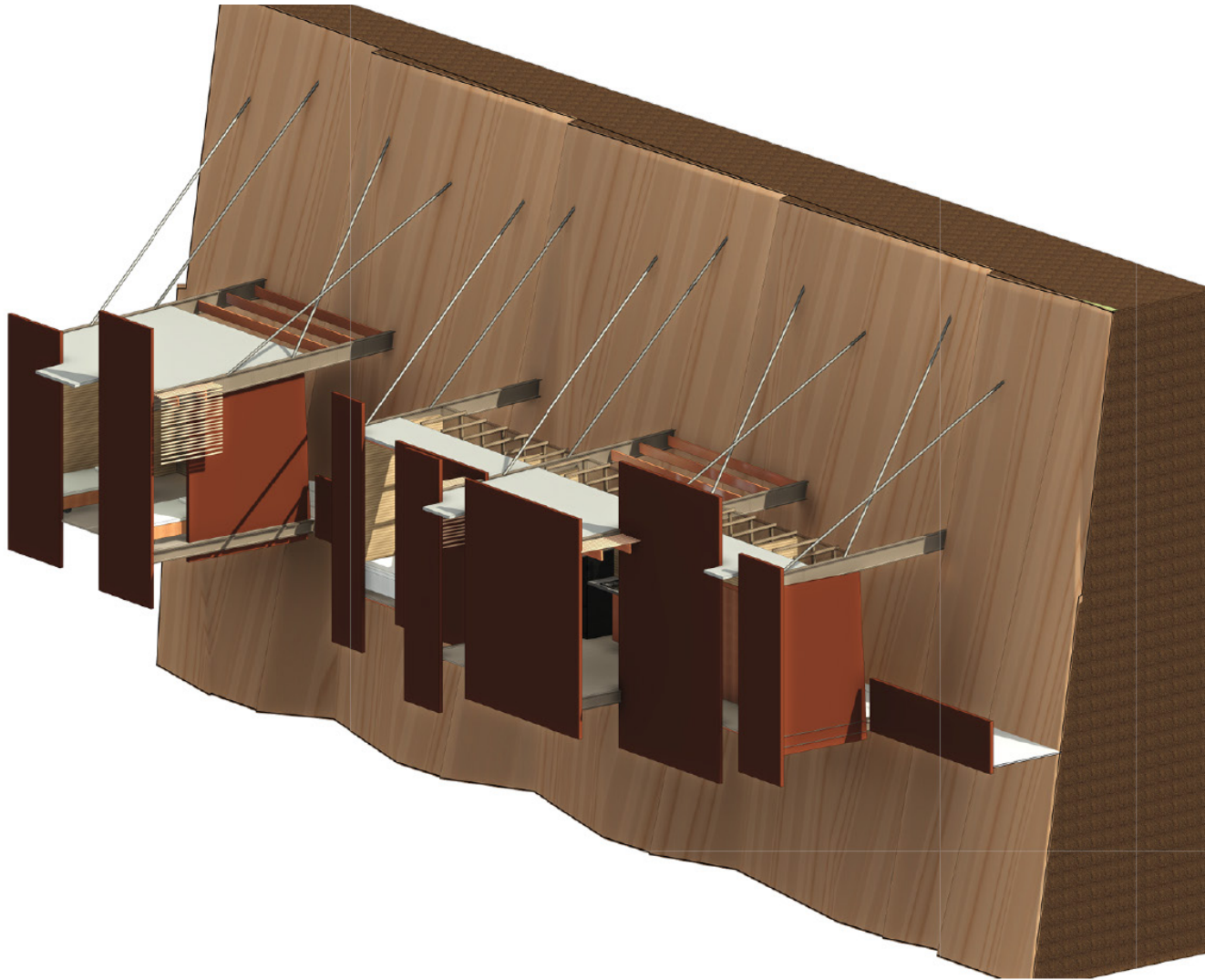


Figure 33: Initial section exploring constraints of attaching to cliff face



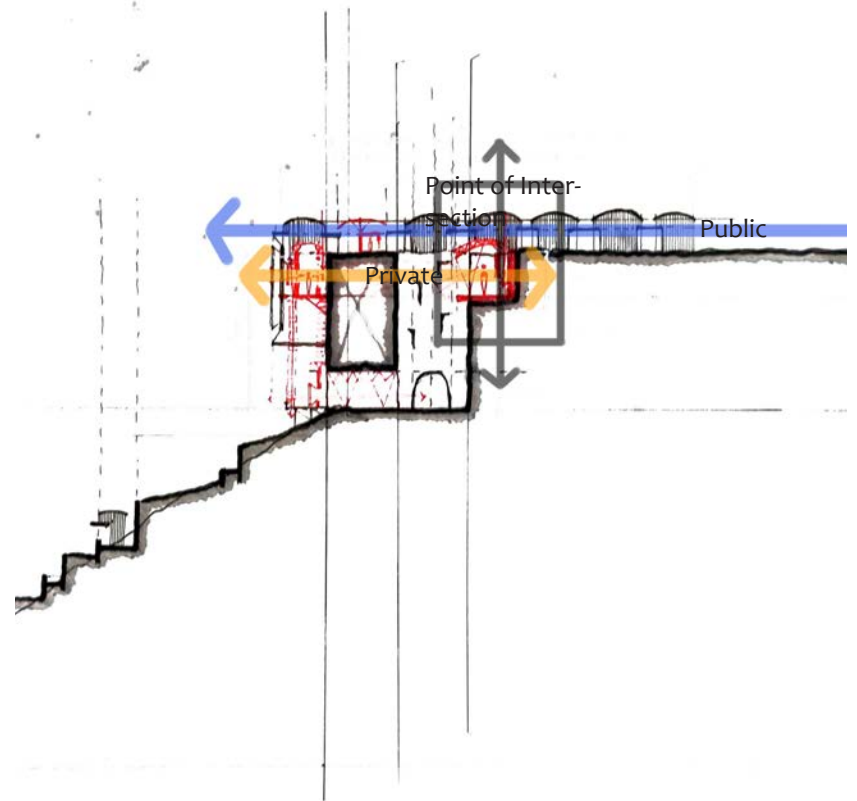
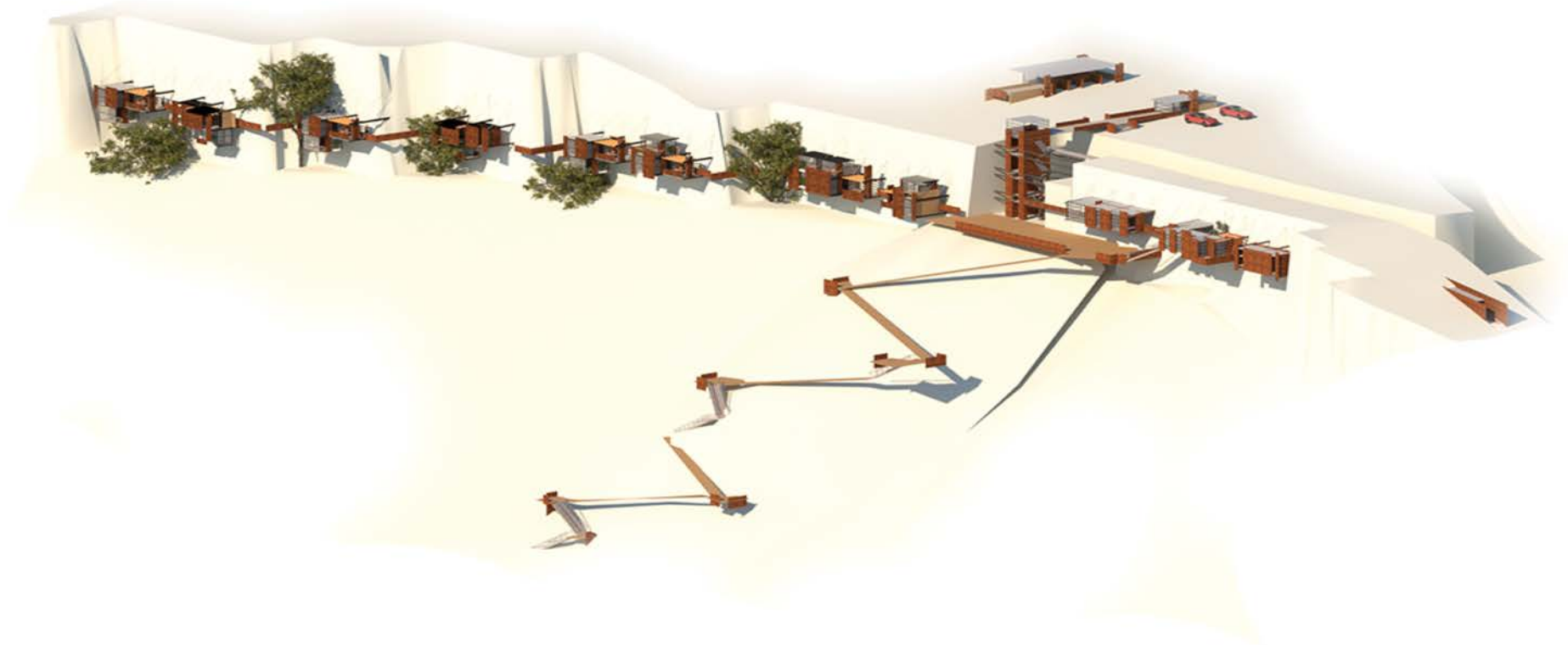
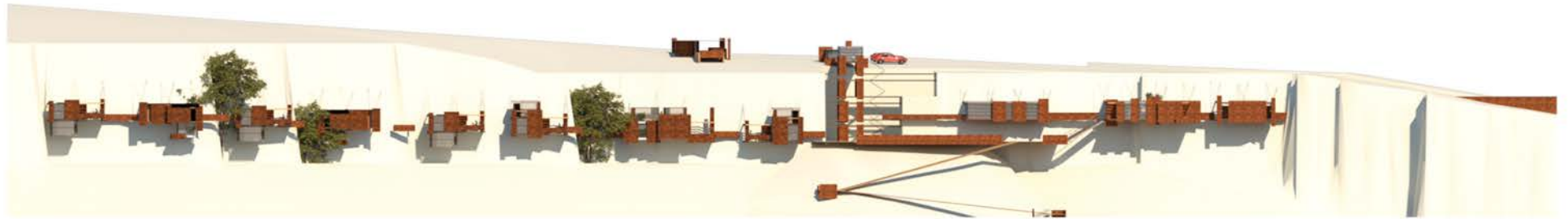
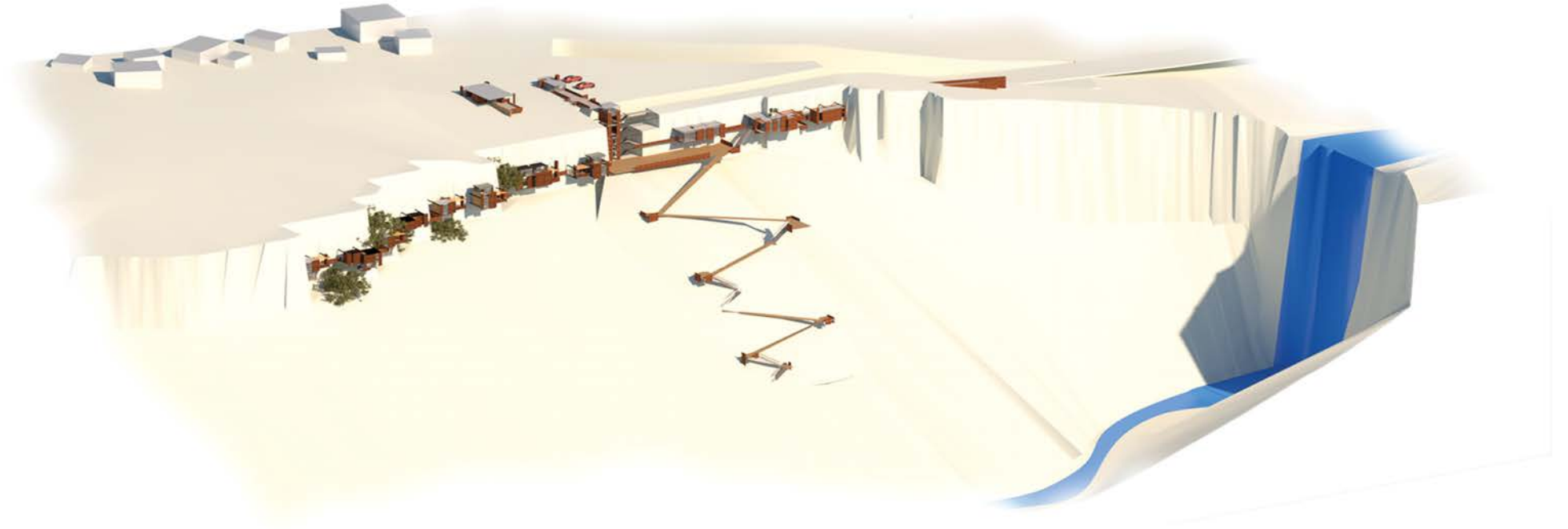


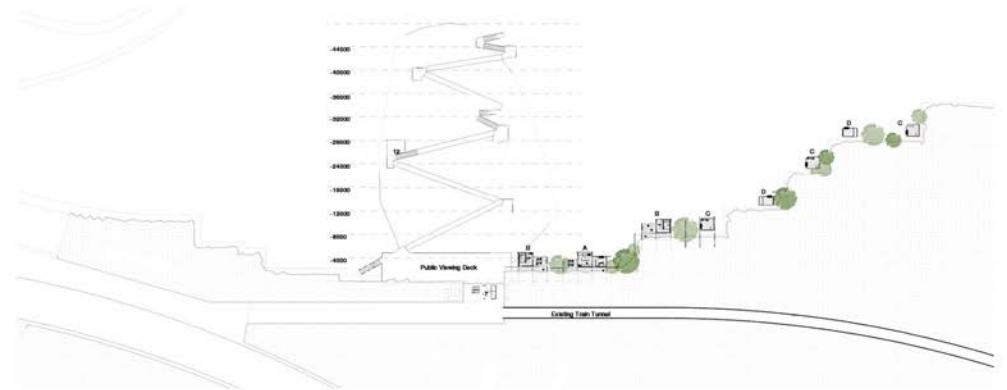
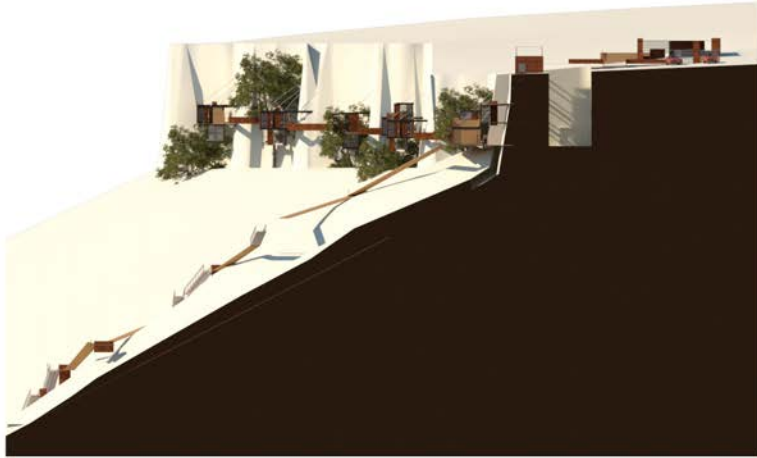
Figure 34: Private vs Public site map and section

### 3.4 FINAL DESIGN

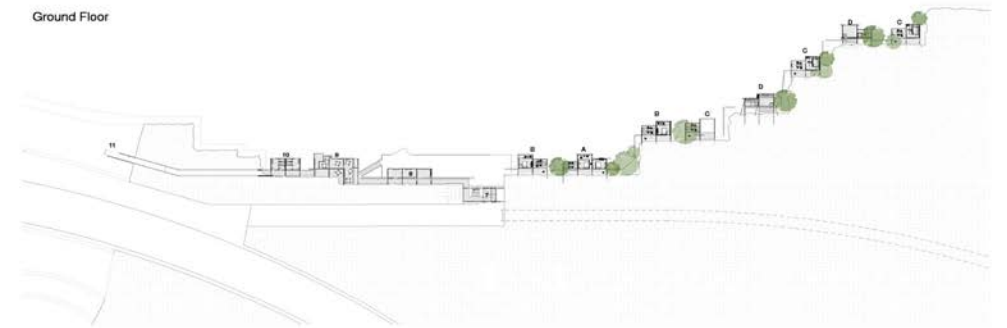




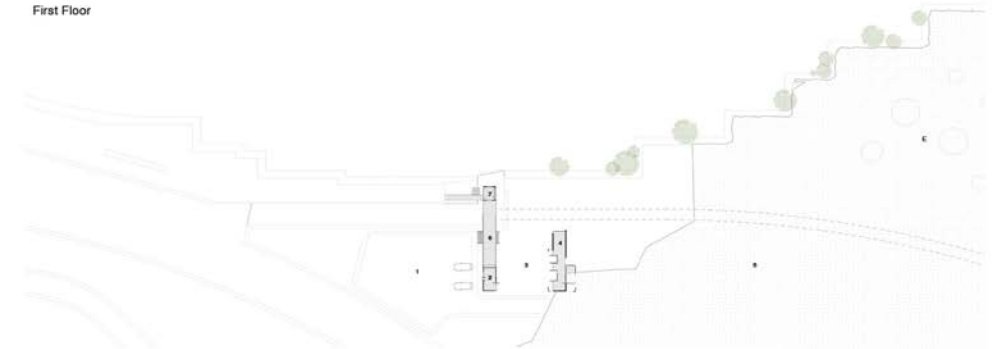
# LEVELS



Ground Floor



First Floor



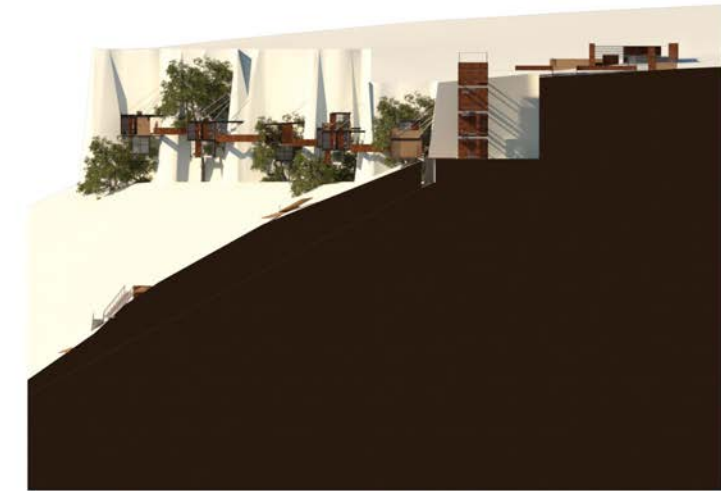
Second Floor - Top of cliff face

- Public Access**
- 1. Parking
  - 2. Reception - Changing area
  - 3. Public square
  - 4. Market

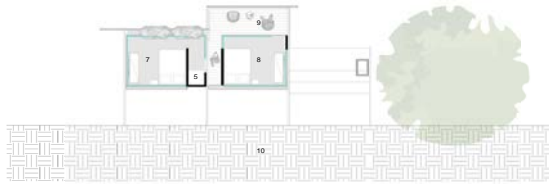
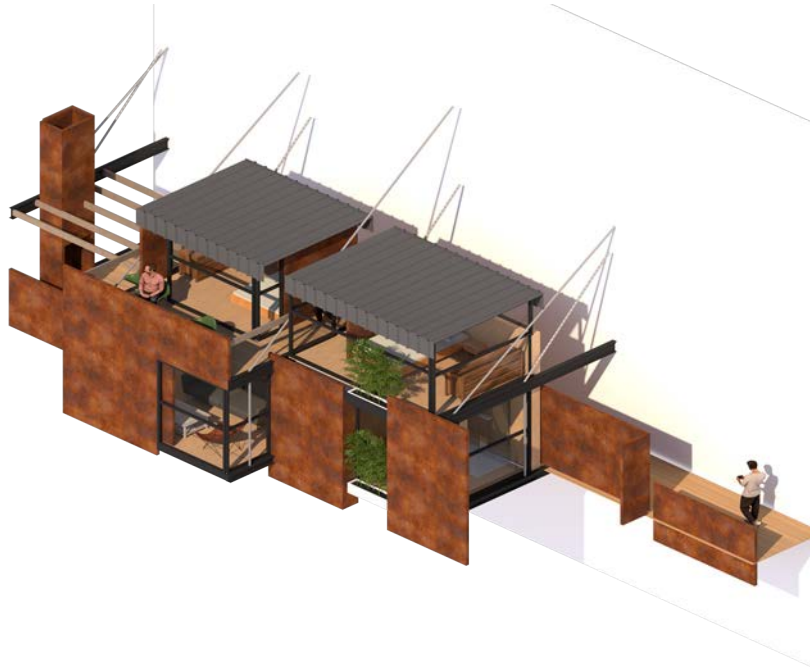
- 5. Main entrance
- 6. Train
- 7. Elevator - Stairs
- 8. Kitchen

- 9. Restaurant
- 10. Public toilets
- 11. Warehouse entrance
- 12. Utility entrance

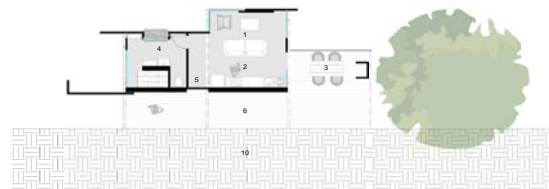
- Private Access**
- A. Little box A
  - B. Little box B
  - C. Little box C
  - D. Little box D
  - E. Campsite



# UNIT TYPE: A



Upper level floor plan



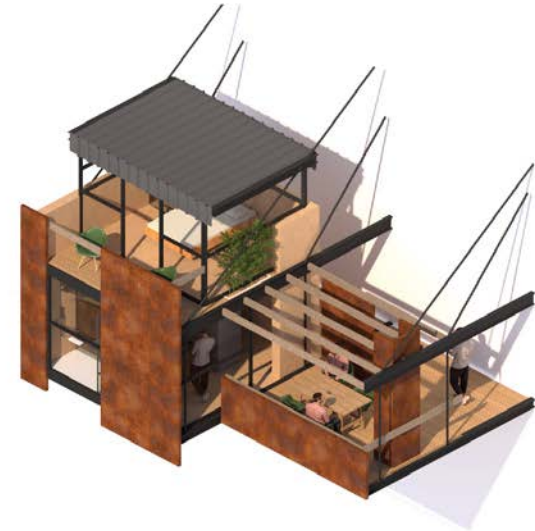
Lower level floor plan - Access level

- 1. Lounge
- 2. Kitchen
- 3. Sleep/Brak
- 4. Bathroom
- 5. Ladder
- 6. Access Path
- 7. Bedroom One
- 8. Bedroom Two
- 9. Stair
- 10. Cliff Face

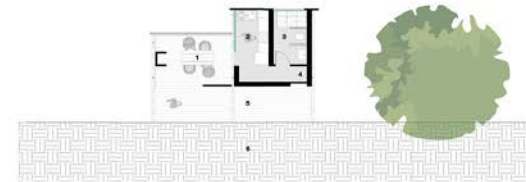
0 3m  
Scale: 1:100



# UNIT TYPE: B



Upper level floor plan



Lower level floor plan - Access level

- 1. Sleep/Brak
- 2. Kitchen
- 3. Bathroom
- 4. Ladder
- 5. Access path
- 6. Cliff face
- 7. Bedroom
- 8. Stair

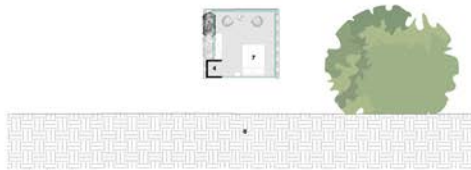
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Scale: 1:100



# UNIT TYPE: C



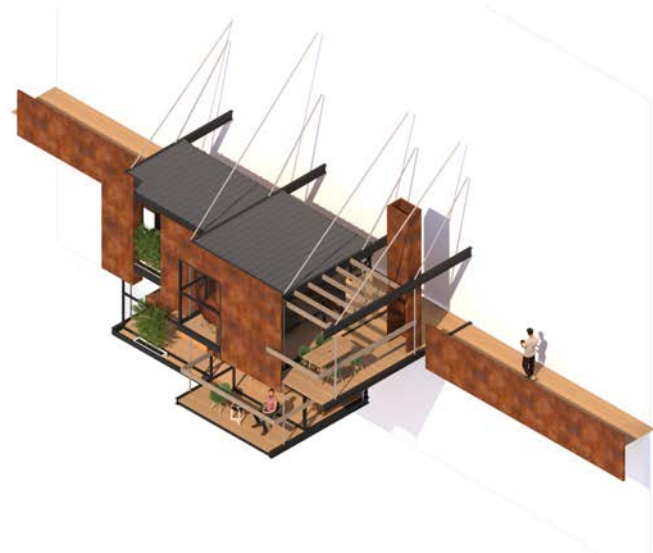
Upper level floor plan - Access level



Lower level floor plan

- |             |                |              |  |
|-------------|----------------|--------------|--|
| 1. Storage  | 5. Access path | Scale: 1:100 |  |
| 2. Storage  | 6. Cliff face  |              |  |
| 3. Bathroom | 7. Bedroom     |              |  |
| 4. Larder   |                |              |  |

# UNIT TYPE: D



Upper level floor plan - Access Level

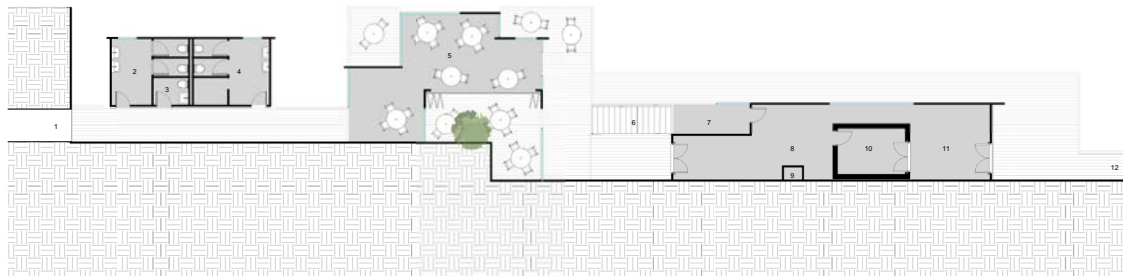
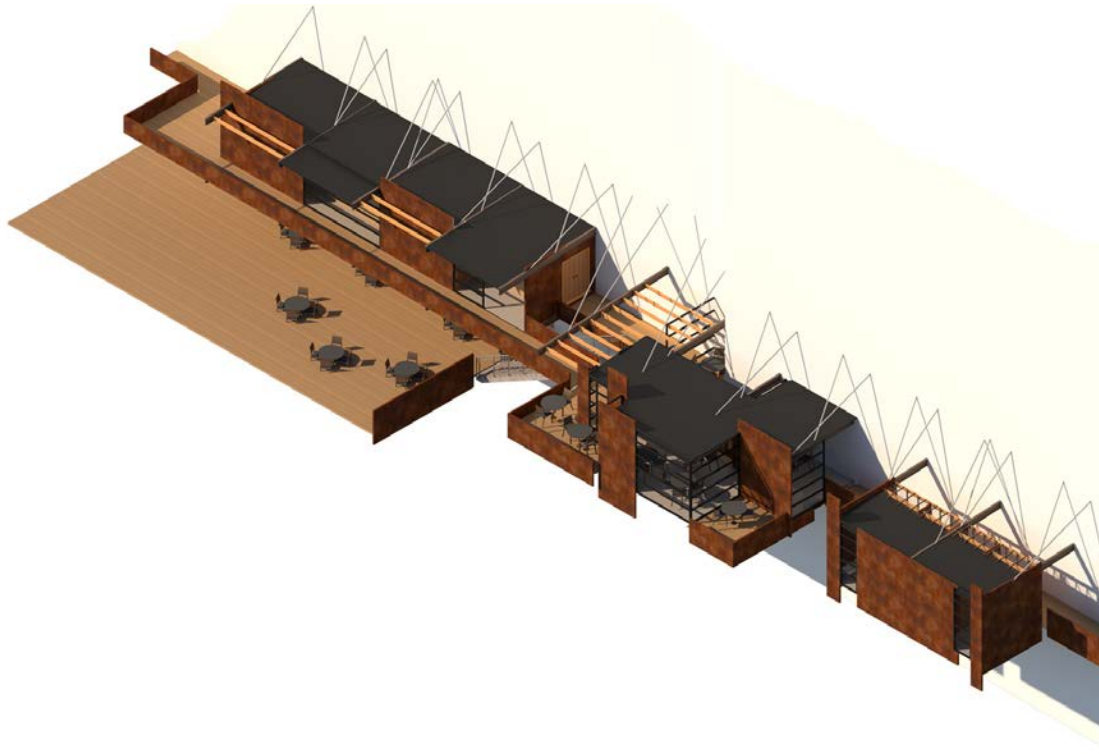


Lower level floor plan

- |             |                |  |
|-------------|----------------|--|
| 1. Lounge   | 4. Access Path |  |
| 2. Storage  | 5. Bedroom One |  |
| 3. Storage  | 6. Bedroom Two |  |
| 4. Bathroom | 7. Bedroom     |  |
| 5. Larder   | 8. Cliff Face  |  |



# RESTURANT



- 1. Tunnel to waterfront
- 2. Women's Toilet
- 3. Disabled Toilet
- 4. Men's Toilets
- 5. Restaurant
- 6. Stairs to deck
- 7. Restaurant reception
- 8. Kitchen
- 9. Goods hoist to deck below
- 10. Cold storage
- 11. Refuse and clean up area
- 12. access to elevator

0 3m  
Scale: 1:100







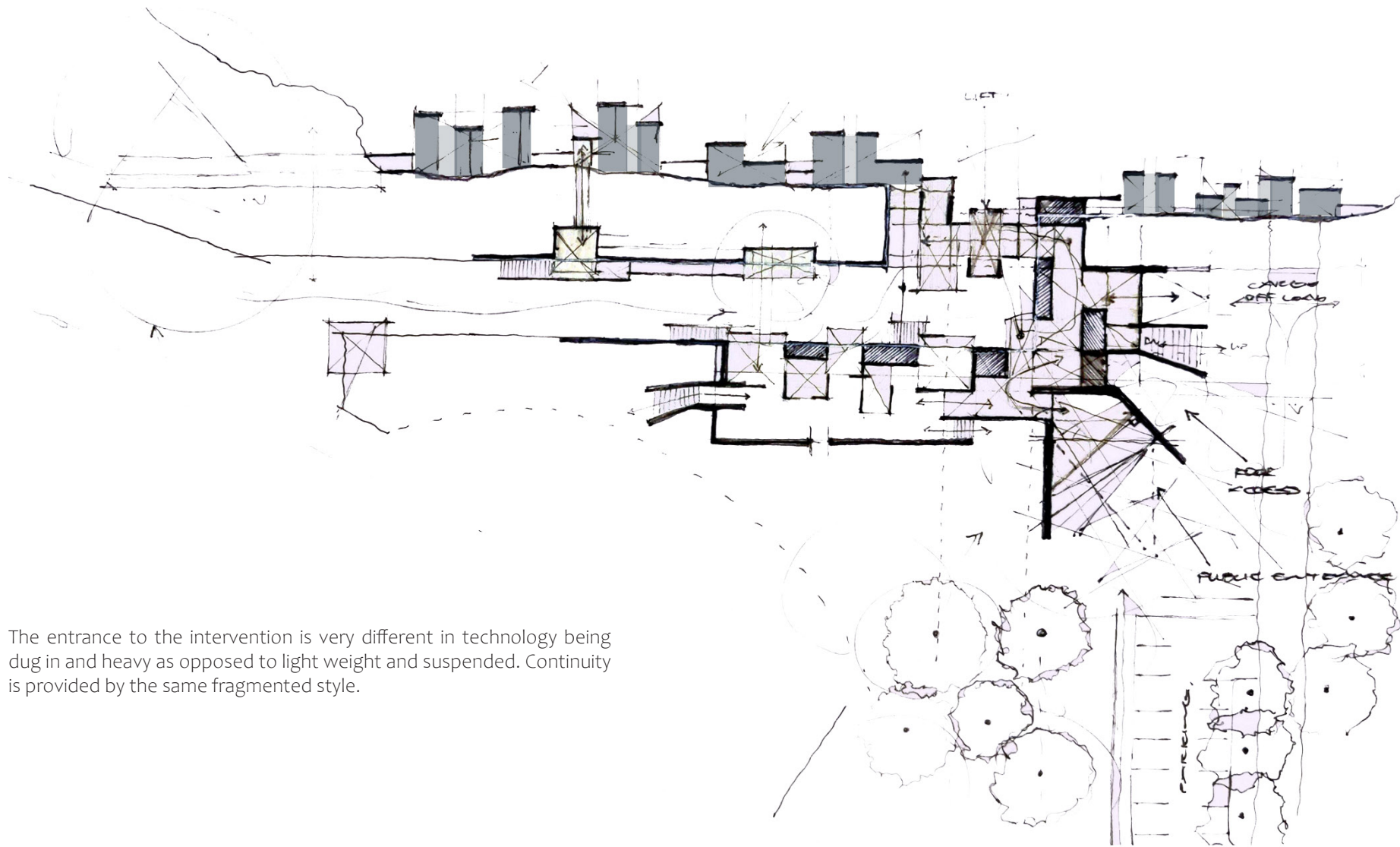
### 3.5 STRUCTURE



Figure 35: 3D Revit render of single unit

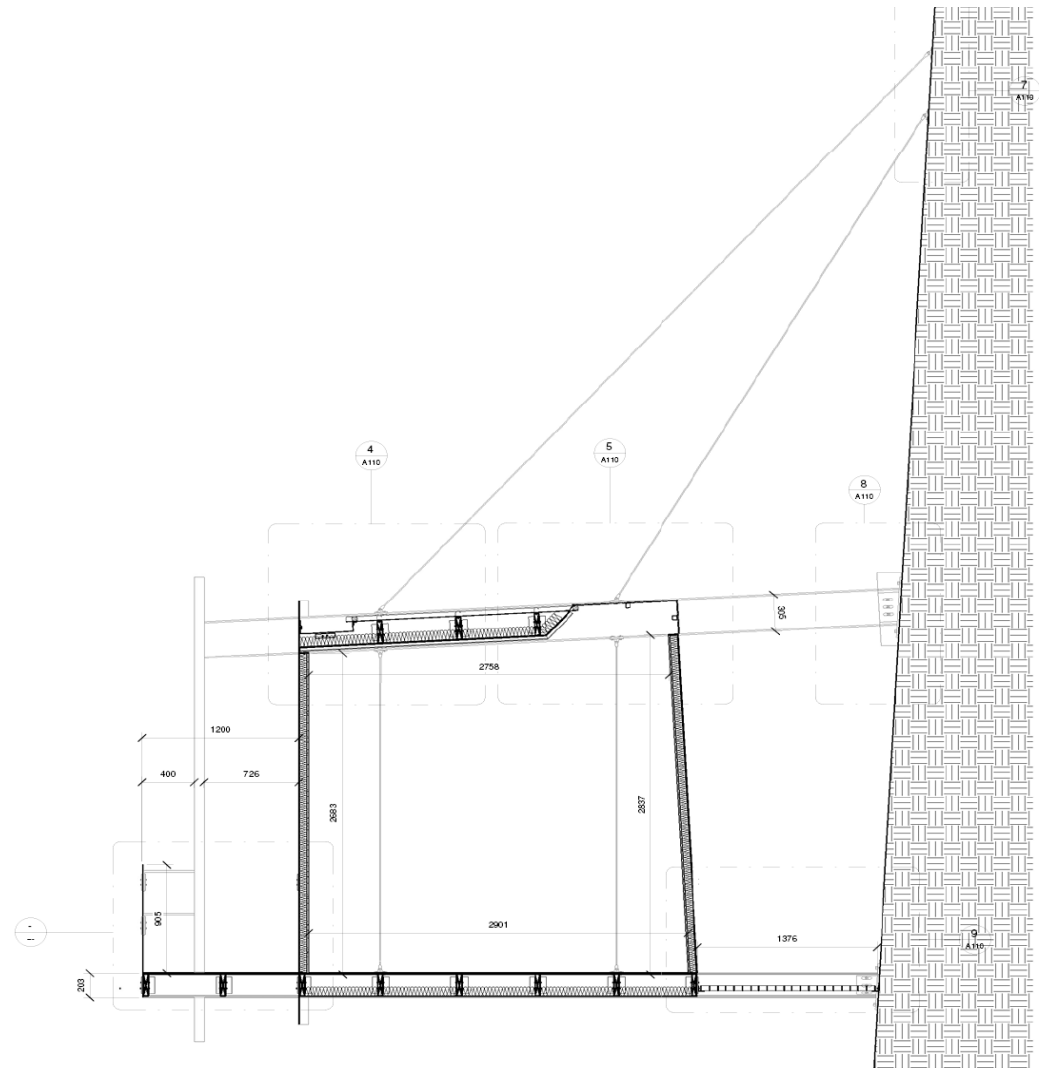
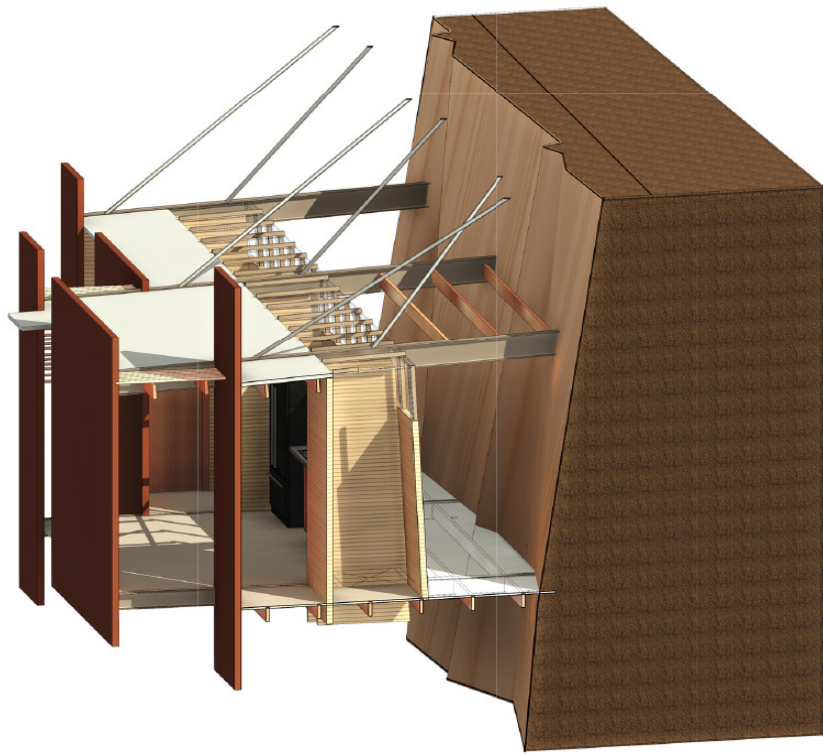
Along the cliff face the building is long and narrow as a result of the limited distance the structure can be cantilevered from the cliff. The limitation is for both structural and aesthetic reasons, the greater the cantilever the greater the number of supports would need to be, and the limited height of the cliff face above mean the cable fixing can only go so high. This is an important consideration when considering the angle for load distribution through a cable system becomes weaker as the angle decreases. From an aesthetic point of view the farther from the cliff the structure sticks out the more obstructive it may appear; the intention of the project is for the structure to be as seamless as possible. The increased size and quantity of support structure would also be a visual detractor.





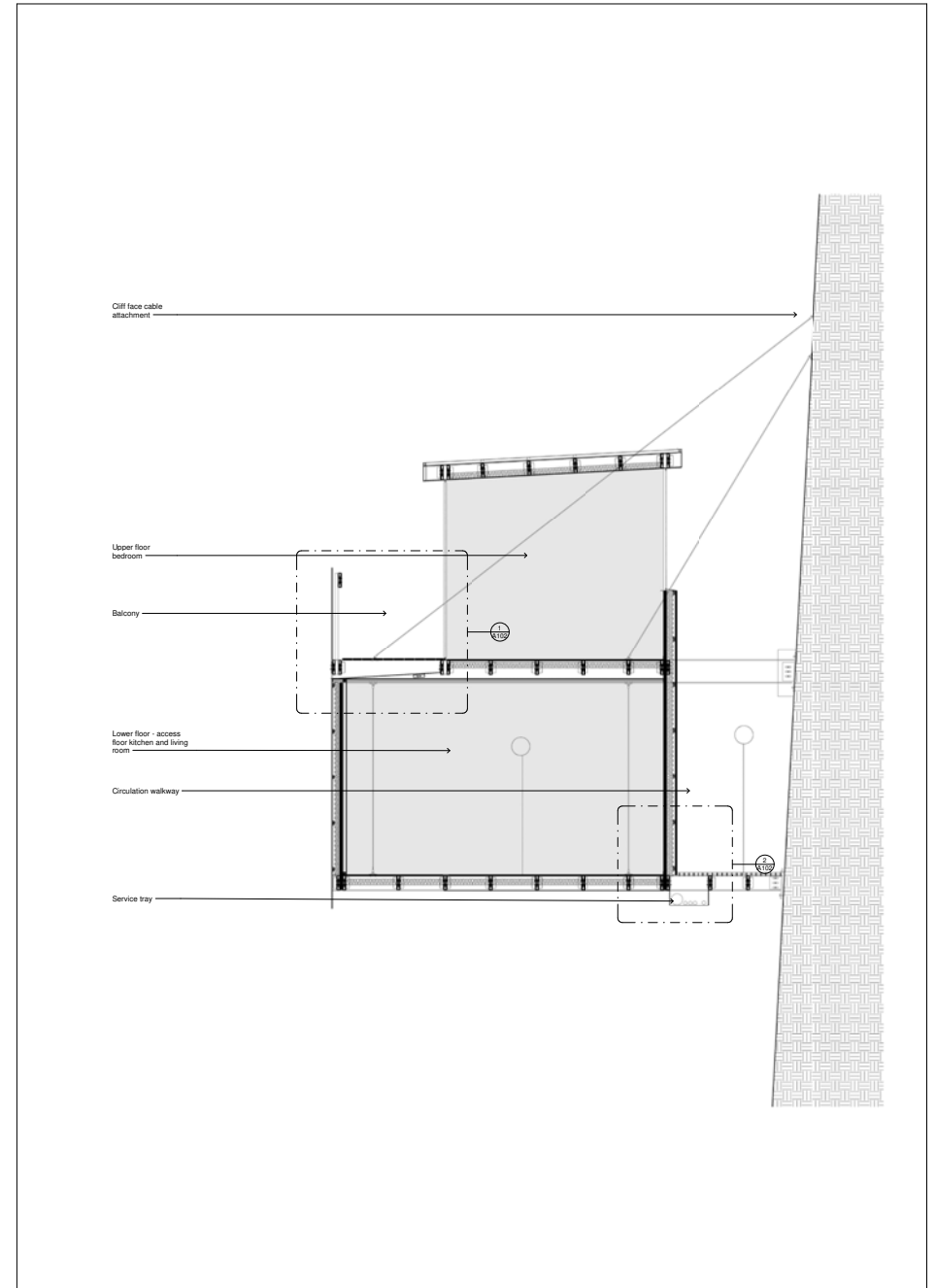
The entrance to the intervention is very different in technology being dug in and heavy as opposed to light weight and suspended. Continuity is provided by the same fragmented style.

Figure 37: Plan showing relationship between entrance and cliff face units



2 Section 1  
1 : 20

# SECTION B





### 3.6 ROOF DETAILS

One of the details that need to be resolved was the attachment point of the cable and the roof. Multiple cables need to be able to attach anywhere along the roof according to an engineer's specification without compromising the waterproofing of the roof. Additionally, the cables also need to attach to the bottom of the roof structure down towards the suspended floor structure. This was solved by using a 305 steel I-beam that fits the entire roof structure between its two flanges. This allows the cables to be fixed to the top and bottom of the I beam without having to go through the roof sheeting or ceiling board.

The use of cables as the support structure for the floor in a top down system as opposed to a bottom up system reduces the strength (compressive) normally required by walls allowing them to be much thinner and lighter.

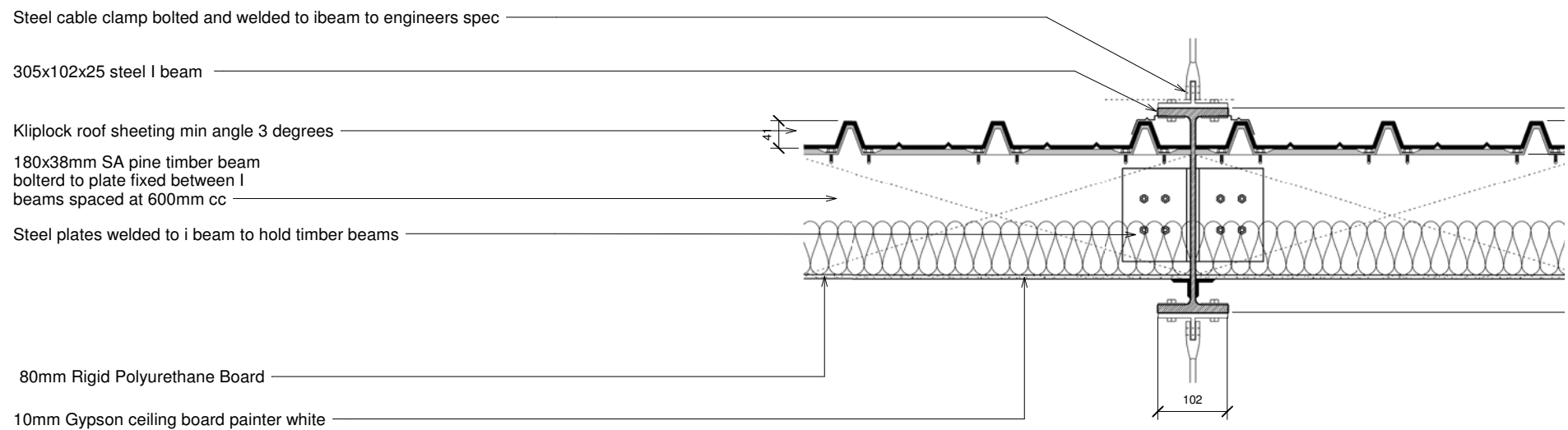


Figure 38: Roof Detail 1

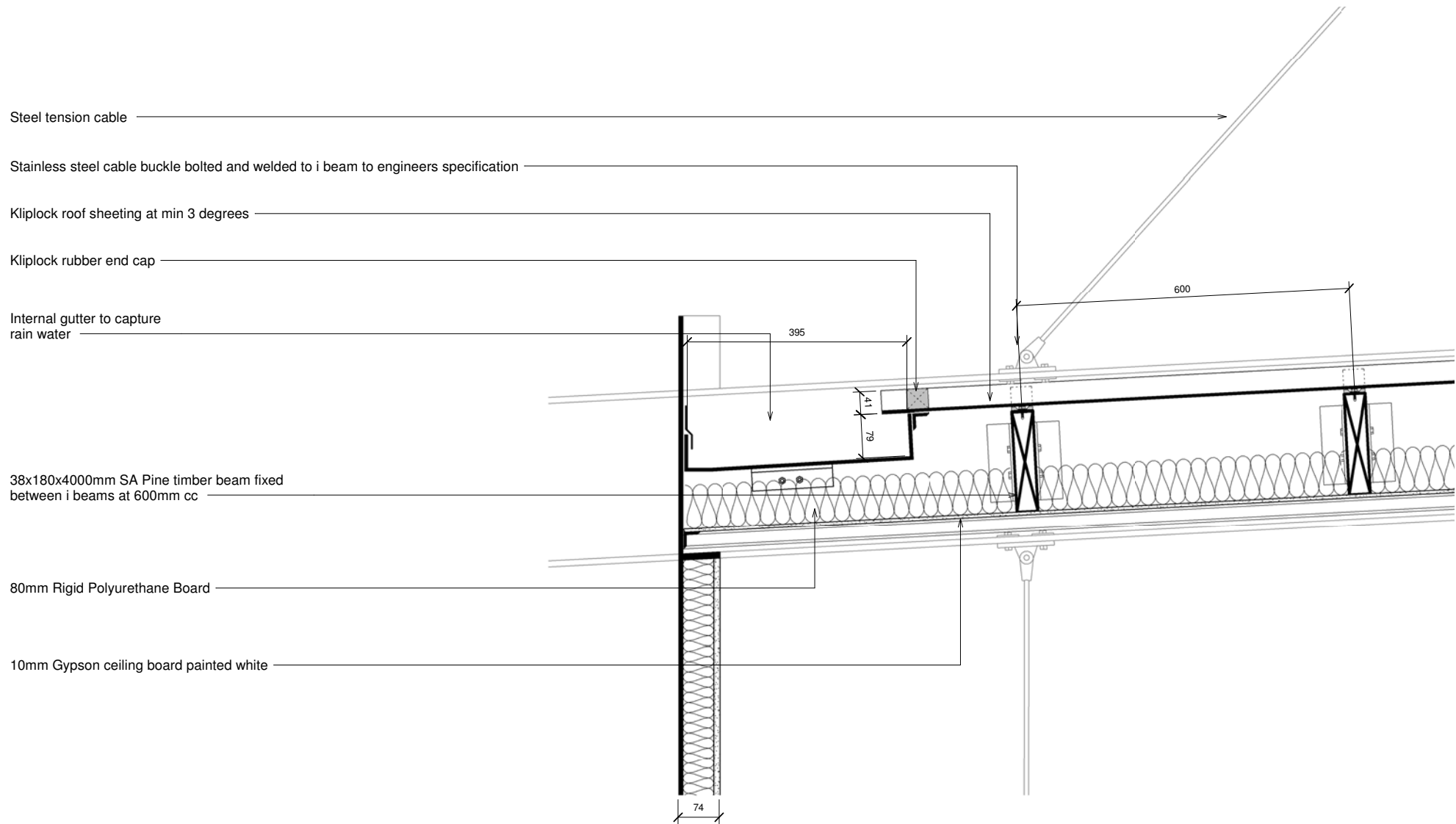
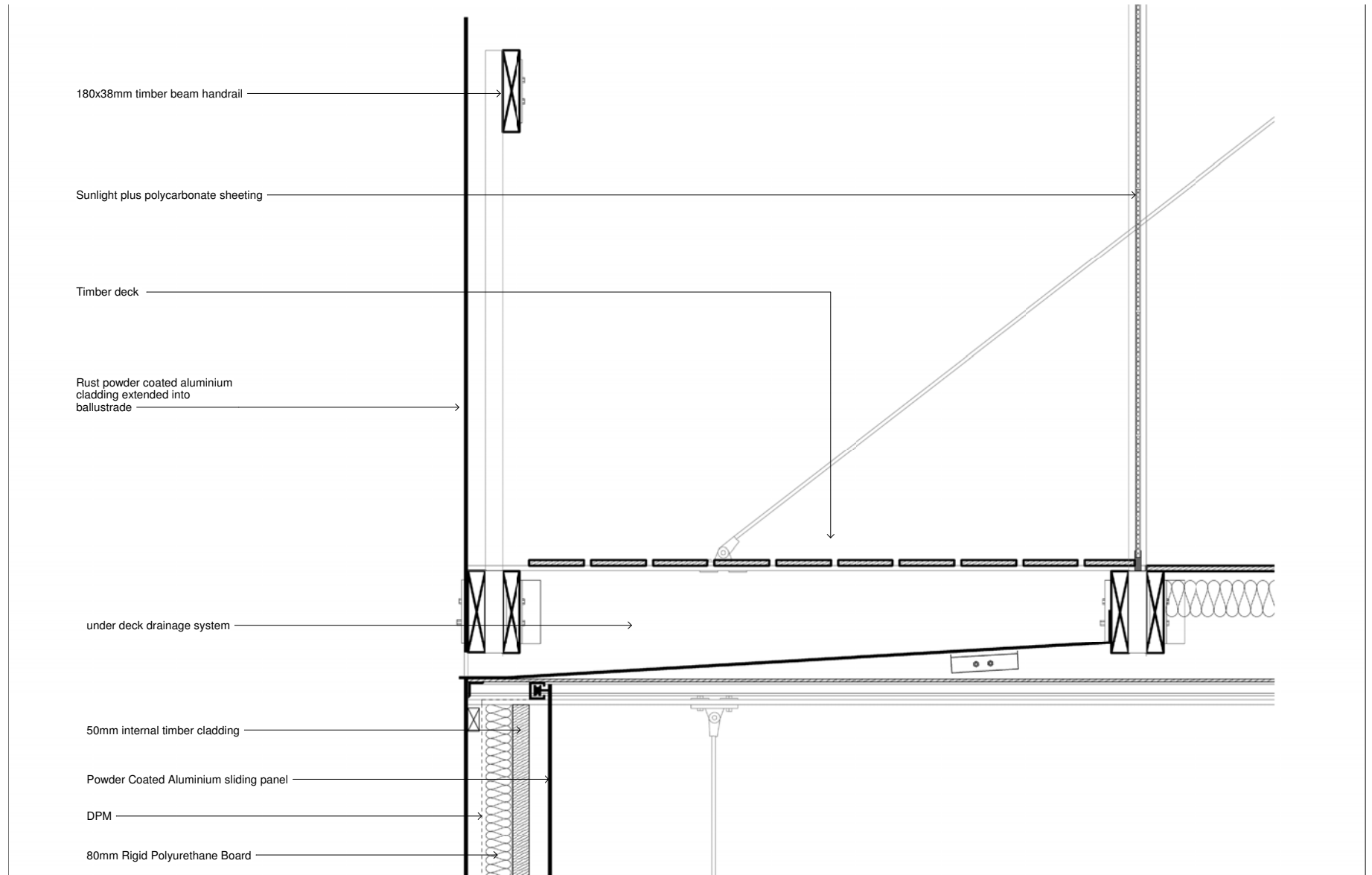
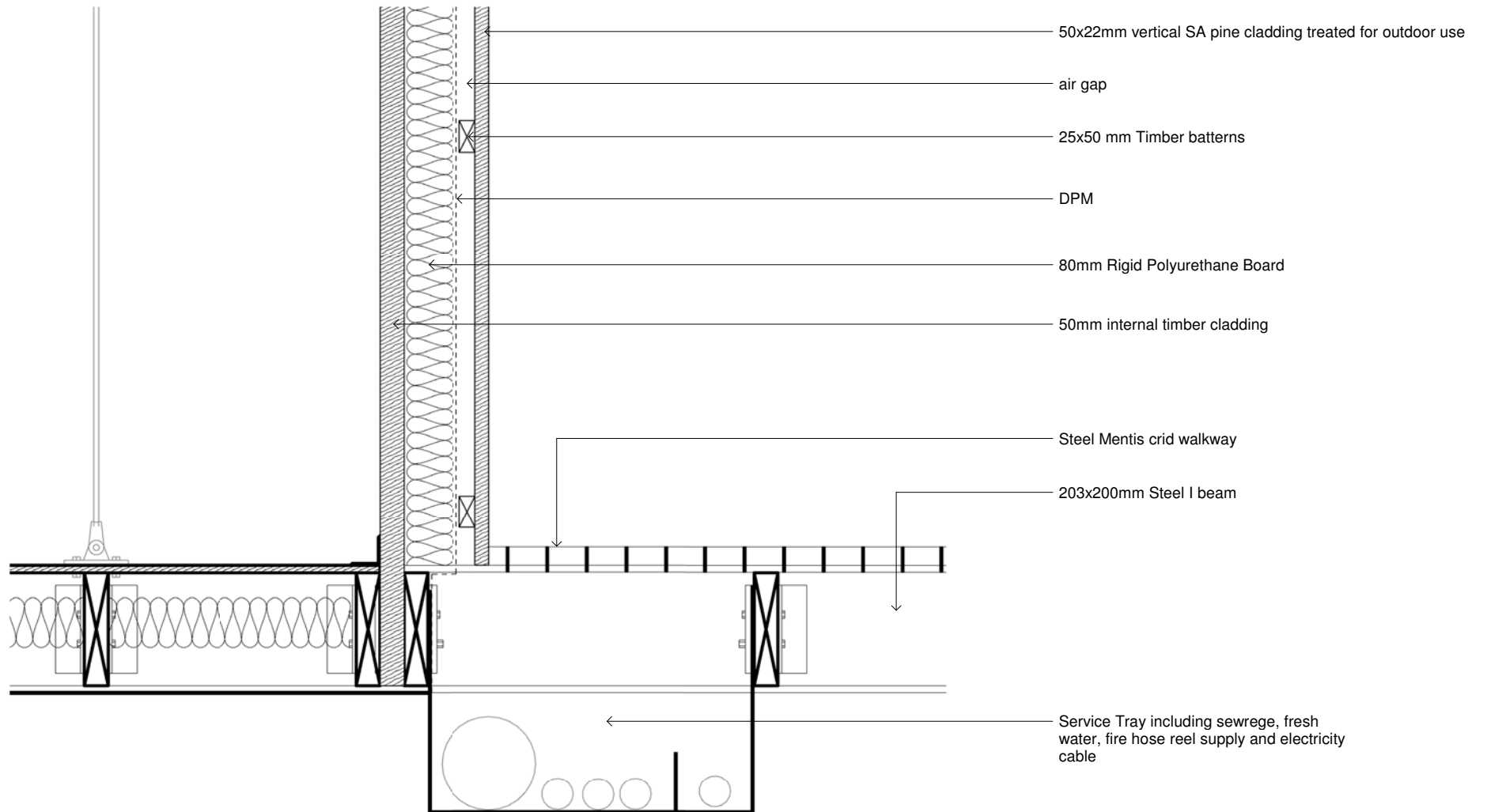


Figure 39: Roof Detail 2

### 3.7 FLOOR DETAILS





### 3.8 LIGHT AND HEAT

The north orientation of the cliff face is optimal for solar heat gain however the area is very warm, and the gains should be limited during summer months. For consistent year-round light a skylight system utilising a translucent polycarbonate will be used at the south end of the roof specifically over areas like kitchens that require good consistent light quality.

The cliff face is also North facing which combined with the shallow depth of the cliff face structures means that light quality should be easy to achieve with the correct size and quantity of openings which was determined using Sefaria. The most desirable views are orientated towards the East (the valley) and the West (the waterfall). Openings to accommodate for these views have been implemented with the appropriate vertical shading devices to prevent excessive heat gains.

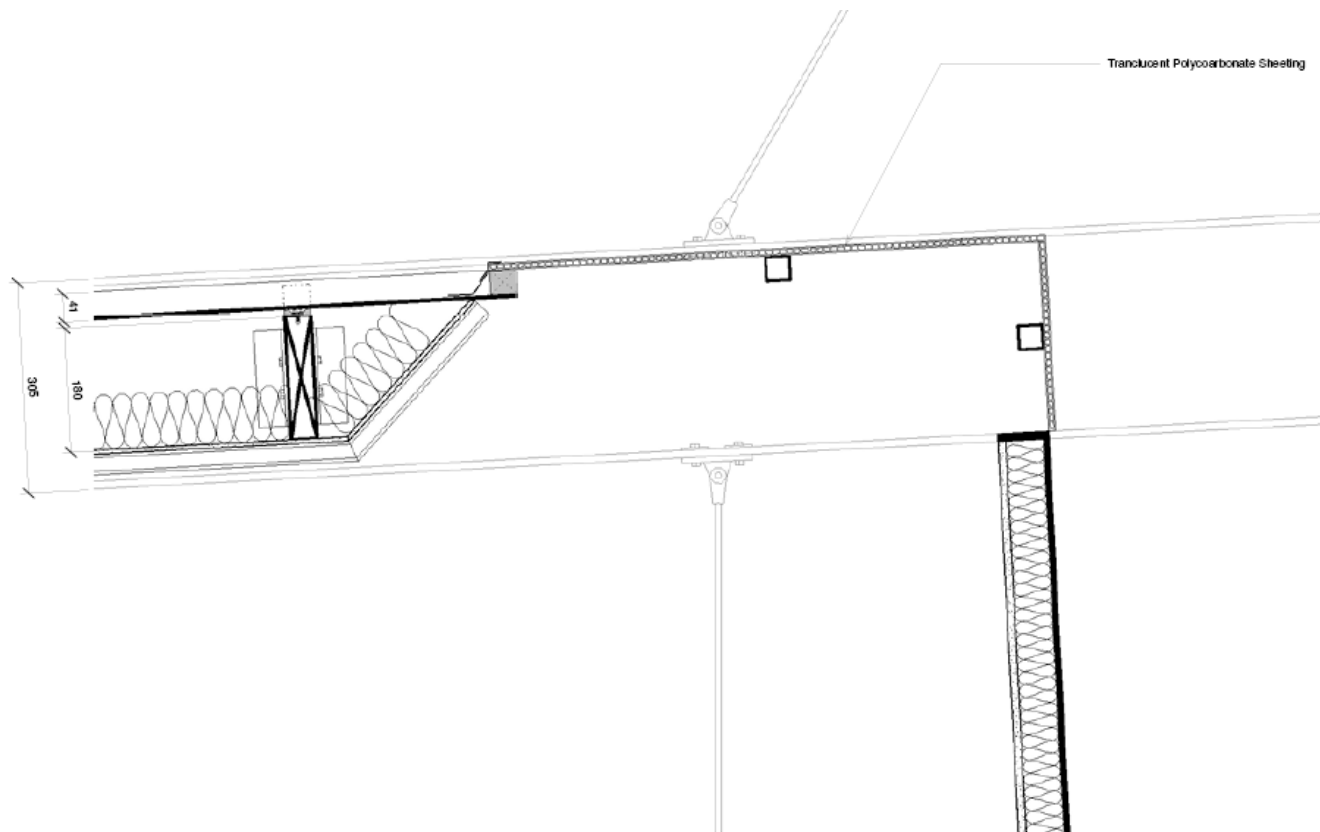
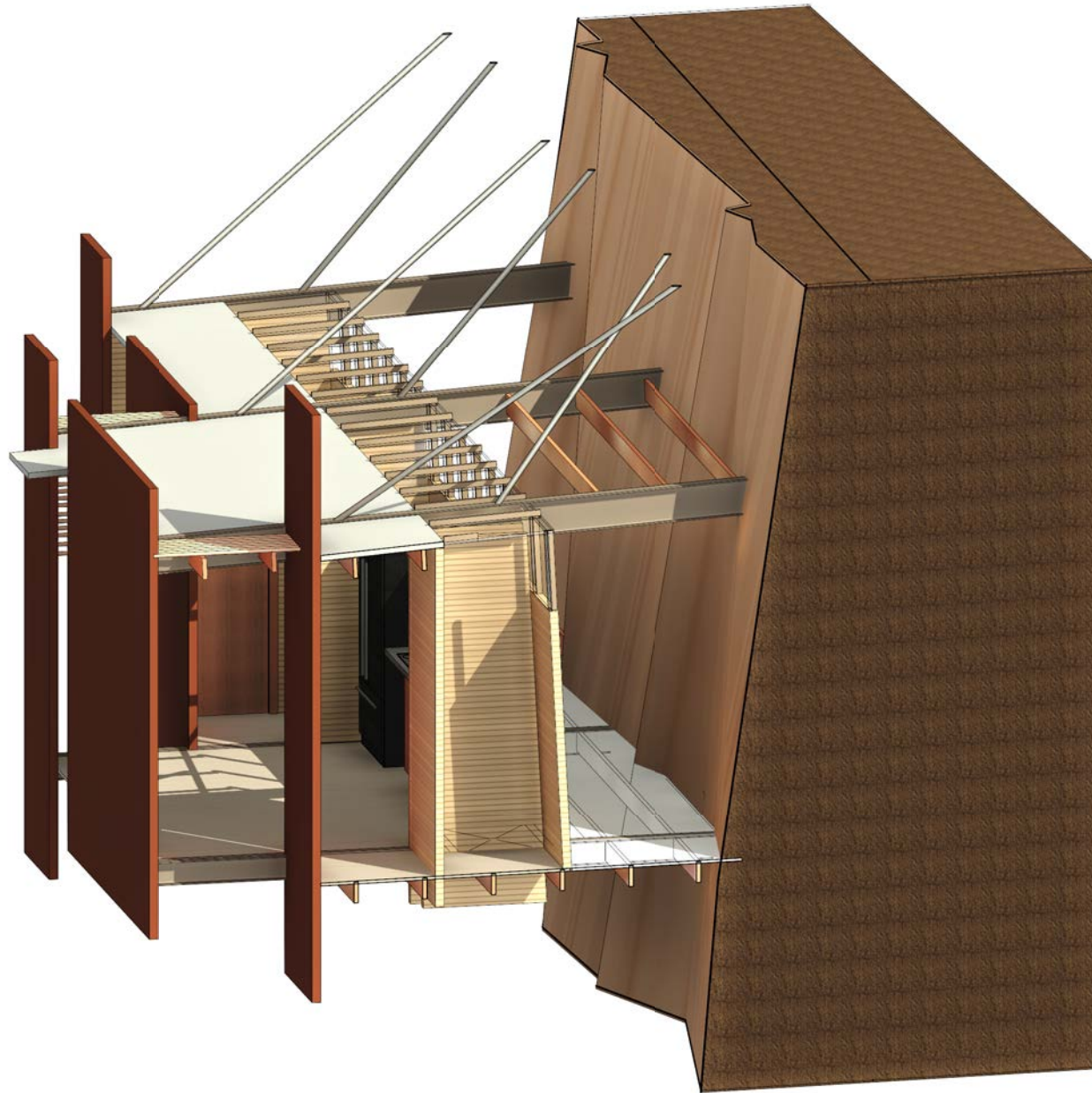


Figure 40: Roof detail 3



②

Figure 41: 3D section of cliff face unit

## 3.9 COOLING SYSTEMS

The limited openings and light weight structure lends itself to excessive heat gains during the summer months which is dealt with through technology and configuration of spaces.

### 3.9.1 TECHNOLOGY

The skin of the structure whilst light and thin will utilise layers and air cavities to thermally regulate the building as well as possible. Additionally, an evaporative cooling system will be utilised during the summer. The cliff faces can heat up dramatically during the summer which will be taken advantage of in the summer. By having water sprayed on the walls as they begin to heat up the water will then evaporate and create cool air that will then be passed through the structure.

### 3.9.2 CONFIGURATION

On plan the structure is configured to allow airflow through all rooms. In the case of duplex units the living spaces which will be primarily occupied during the day have been placed on the lower level so that they benefit from the additional massing of the level above to remain cooler during the day. The bedroom which is primarily occupied at night when heat gain is not an issue is located on the upper floor.

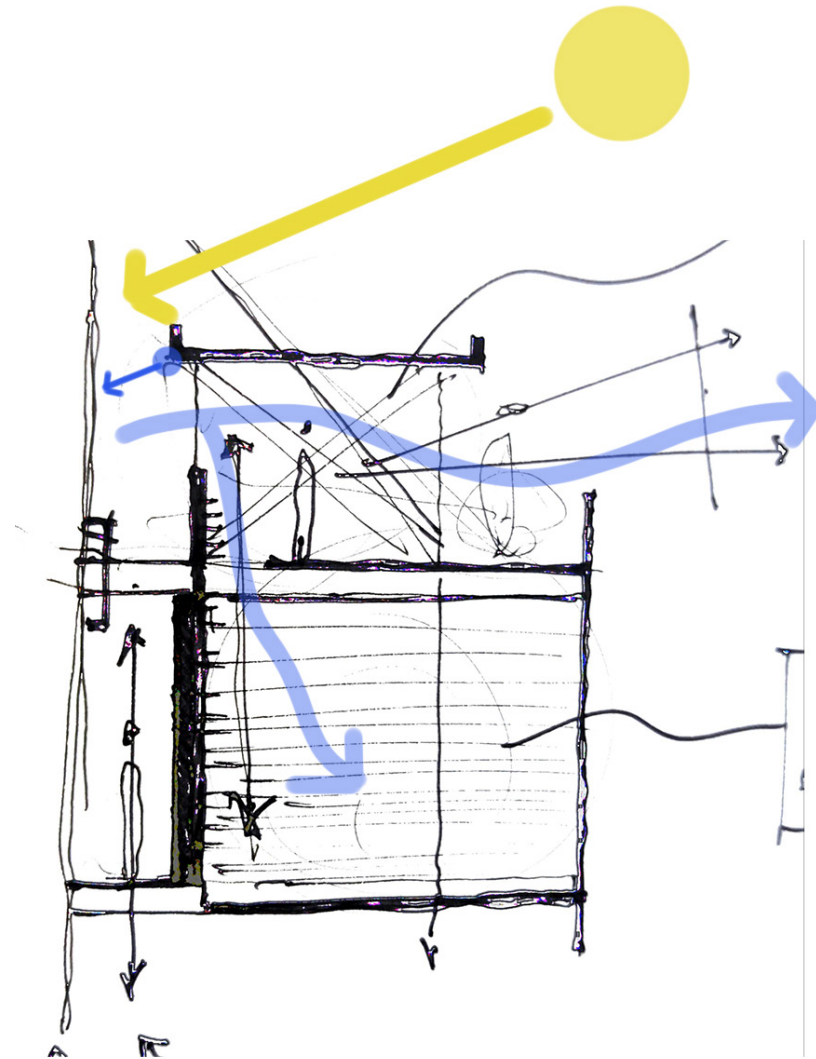


Figure 42: Evaporative cooling sketch

### 3.10 WATER SUPPLY AND SEWERAGE

The transportation of water and sewerage to units on the cliff face will be done utilising a service duct running under or within the balustrade of the universal access walkway between the units and the cliff face. The sewerage pipes need to run at a 1:40 slope which will result in a gradual rise in height of the access walkway. Given the rise and the desire for units to remain in a fairly straight line and not curve upwards the units will be accessed from the lower level at the beginning of the walkway and from the upper level at the end of the walkway. The bathroom will always be on the level of the walkway resulting in a slight shift in configuration of units at the beginning and at the end.

### 3.11 TOWN – LODGE INTERFACE

The transition from the town to the lodge is articulated differently from the units attached to the cliff face given the different social exchanges they aim to achieve. Whilst the units on the cliff face aim to create privacy and focus attention outwards towards the scenery, the reception and market space that transitions the town towards the structure aims to give users a view of the destination of the cliff face and valley before bringing users into an internally focused public area. This is done by cutting into the earth allowing the users to see over the reception area when approaching. Once descending into the public courtyards defined by retaining walls and the structures of the market stalls and reception area.

Unlike the structure along the natural cliff face where the structure is suspended in order to be sensitive to the heritage value of the face the same approach will not be taken towards the cliff faces created during the construction of the railway tunnel. The inward facing cliff faces are less sensitive due to their artificial nature as well as the fact that they are not exposed to views from the outside and do not form part of the natural cliff face and the view of the valley.

### 3.12 REHABILITATION

To the north of the cliff face there is a large gravel and stone debris deposit that is a result of construction of the original railway tunnel. Excess stone and rubble that was not usable for construction materials were dumped off the side of the cliff, the result of this is a large heap of soil stone sediment on which no vegetation has been able to grow. The heap is a noticeable eye sore that detracts from the beauty of the area. The design creates an access pathway that weaves its way down the slope, the new access point, which provides access to the bottom of the waterfall and the beginning of a hiking trail, also stabilises the slope and provides irrigation from underneath the walkway.

The slope is at a steep angle (roughly 35 Degrees) thus biodegradable tubular netting will be used to hold the topsoil in place until the grass takes hold, after which trees and other indigenous bushes in the area can be introduced to the system.

### 3.13

On the cliff face lightweight materials need to be used for the structure to be feasible. Weathered steel that when oxidised will resemble the colour and characteristics of the orange cliff faces will be used for the outer cladding of the cliff face units. The benefit of the suspended system means the walls have no structural (compressive) forces on them and can thus be purely aesthetic in design. In addition to steel the structure will use locally sourced timber as an interior material that provides continuity throughout the design. In the reception area local stone will be used to respond to the history of stone construction in the area.



### 3.14 SBAT REPORT

#### SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL

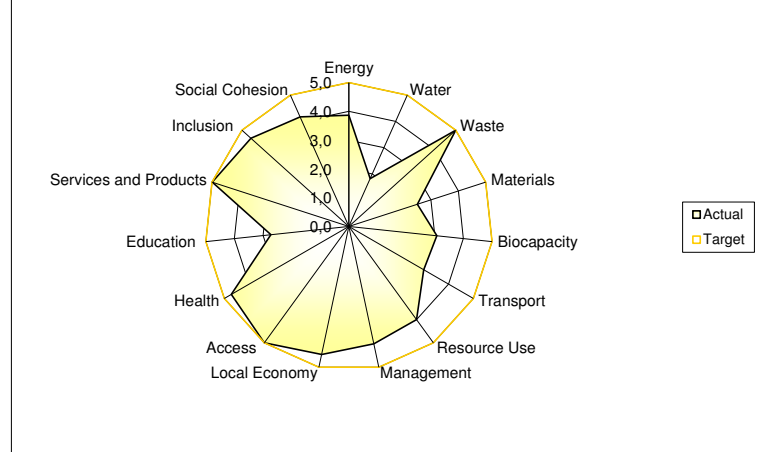
1,04

Achieved
<b>SB SBAT REPORT</b> <span style="float: right;"><b>3,9</b></span>

**SB1 Project**  
Above the Waterfall

**SB2 Address**  
Emgwenya

**SB3 SBAT Graph**



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,3
Economic	4,1
Social	4,2
<b>SBAT Rating</b>	<b>3,9</b>

SB5 EF and HDI Factors	Score
EF Factor	3,8
HDI Factor	4,1

SB6 Targets	Percentage
Environmental	65
Economic	83
Social	85

**SB7 Self Assessment:** Information supplied and confirmed by

Name	Date
Signature	

**SB8 Validation:** Documentation validated by

Name	Date
Signature	

**SB9 Validation Report Version**

<b>IVR</b>
------------

Figure 43: SBAT Report

## 4 CRITICAL REFLECTION

## 4.1 INTRODUCTION

The economic decline of post industrialised town throughout South Africa can be attributed to the lack of government funding designated towards them in the wake of losing their primary economic drivers. It can also be, in some cases, attributed to the inability to adapt to change and develop or foster new revenue streams. In the case of the former railway town Emgwenya a viable lifeline exists in the form of adventure tourism which is already ongoing in the area but disconnected from the town itself. The disconnection is due to multiple factors including a lack of public space for recreational purposes, no accommodation, a disconnection from the natural environment (place-based resource) and allure of more remote areas and the experiences they provide.

The proposed intervention addresses these issues through research and the subsequent application of that research into the design and technological development of an architectural solution. The final design outcomes and reflection upon the process will be explored in this chapter.

## 4.2 DISSERTATION OUTCOMES

The desired outcomes of the intervention are for it to capitalise on the pristine natural environment surrounding the town through a sensitive intervention that protects the aesthetic of the area whilst also acting as a source of economic growth to create a sustainable tourism model.

### 4.2.1 ECONOMIC IMPACT

To support economic growth the intervention has created a greater connected from the town to the natural environment and has placed the lodge along this route creating an opportunity for an intersection of public and private spaces. A public holding space was created in this intersection to act as a point of exchange between locals and tourists to facilitate economic growth opportunities.

By suspending the private units off of the cliff face a barrier is created between public and private without visually impairing the view of the valley from the public space above. It also provides tourists with a spatial experience that would not be so easily obtained without the intervention and creates a novel experience that will attract a wider audience of tourists to the area.

### 4.2.2 IMPACT ON NATURAL AESTHETIC

The building, whilst clearly legible as a man-made structure, speaks the same language as its surroundings and does not become the primary focus point in the area, rather is of equally visual significance. The building is almost entirely unseen when approached or viewed from the town due to most of it being suspended from the cliff faces. The building can only be seen fully from the other side of the valley, which is rarely occupied, and even so the building mimics the language of the cliff face to appear smaller and less intrusive to not detract from the environment.

The intervention has also rehabilitated parts of the site that were damaged during the construction of the old railway tunnels and has restored the vegetation that was lost within the valley where refuse was dumped. The intervention justifies its presence in the beautiful environment by the fact that it had already been damaged by previous work which the new structure amends. Such a structure may not be justifiable in an untouched a pristine environment.

## 4.3 CRITICAL REFLECTION

Whilst the intervention is successful in some regards there are limiting factors to the concept and areas that could be improved upon which will be discussed below.

### 4.3.1 STRUCTURAL FEASIBILITY

Whilst the structure is theoretically sound, and if built would work, the construction process would be difficult and require contractor with a high degree of skill. The site is however easily accessible, and the construction process could utilise prefabricated components that are then lowered by a crane and pinned in place.

A far more extensive survey of the cliff, one which I did not have the resources to do, would be necessary and may have design change implications, the surveyor would need to be a specialist which would cost more. Whilst construction is taking place the cliff face could be altered if a weak spot is found in the rock which would require on sight changes to the design, in this circumstance the fragmented nature of the design whereby each unit is separate from one another works in favour of flexibility.

### 4.3.2 FINANCIAL FEASIBILITY

The size of the intervention (the number of rooms and occupancy) would need to be limited regardless of the techniques used to conceal it otherwise it would overpower the area and run the risk of damaging the overall aesthetic and experience of the place. The limited number of rooms available mean that the impact from tourism would not have an exponential effect which means the establishment of other industries will still be necessary.

The limited size would also limit the rate at which the client would make their money back, this coupled with the high construction cost due to its specialised nature may make the project a risky investment. A more realistic project may see the residential units placed on top of the cliff face with a limited number of public viewing platforms placed along the cliff face. There are however many projects that have taken the risk of spending great amounts of money to create a unique experience, when there were cheaper alternatives, and have been very successful. These projects are mostly based overseas, and the concept may not be suitable for the economic climate of Emgwenya or South Africa.

## 4.4 CONCLUSION

The dissertation was an exploration of new design approach towards lodge typologies in the 3rd world conditions and the relationships that could be created between tourists and the local community by developing alternative barrier systems and creating spaces of intersection, the concept can be further built upon and iterated in other scenarios throughout the country. Additionally, it explored how architecture can enhance the experience of space by utilising advanced technology systems. In my career as an architect, I hope to continue to utilise and develop technologies that redefine how we inhabit space and the experiences we have within them.

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