



FROM NEGLECT TO OPPORTUNITY

Revitalizing a neglected coastline through adaptive reuse architecture that unites and celebrates

Rachel Marie Herbert
[HRBRAC001]

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Supervisor: Scott Johnston

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SUPERVISOR: Scott Johnston

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PART 01
[theory derived from site]



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(Gie, A. 2023)

ABSTRACT

This dissertation explores the notion and larger benefits of adaptive reuse architecture in becoming a catalyst for revitalisation and integration, through bringing public activity to an underutilised portion of coastline. By designing with the principles of purpose and connection, architects can create spaces that embrace the natural elements and factors such as the inevitability of weathering. This thesis explores conscious design methods associated derived from adaptive reuse principles; innovative waste management and preserving significant features associated with the existing, enhancing the site's cultural and social connections to related communities.

The project centres around the present day and future transformations of a dilapidated Crayfish Factory and it's unknown landscape, into a thriving coastal edge of opportunity. The intention of the project is to promote adaptive reuse as a means of revitalising and unifying both structure and context in the eyes of the surrounding communities. This thesis aims to unpack the challenges and opportunities that arise when working with rugged conditions, existing structures and complex neighbourhood interrelations.

The greater intention of this work is to expand upon adaptive reuse as an architectural methodology. For it to not only be seen as a means to promoting sustainable construction within the built environment but also to capitalise on the opportunity of enhancing the existing fabric and spatial relations by embracing the character of the existing with personalised intervention that merges past, present and future use. On a technical level this is understood by observing both natural weathering and designed material degradation to explore means of architecture embracing its own evolution.

This is done in the pursuit of creating 'whole' architecture. Fabricating diverse spaces and functionings to excite the everyday, all the while planting the seed of versatility for the future, allowing the structure to grow and adapt with each new generation of use. The common theme of conscious design is achieved by maintaining the narrative that buildings should not be considered as isolated objects, but rather as malleable components within a larger constantly evolving ecosystem. With this in mind, the intention of the project can also be seen in its material nature; promoting both environmental and social integration.

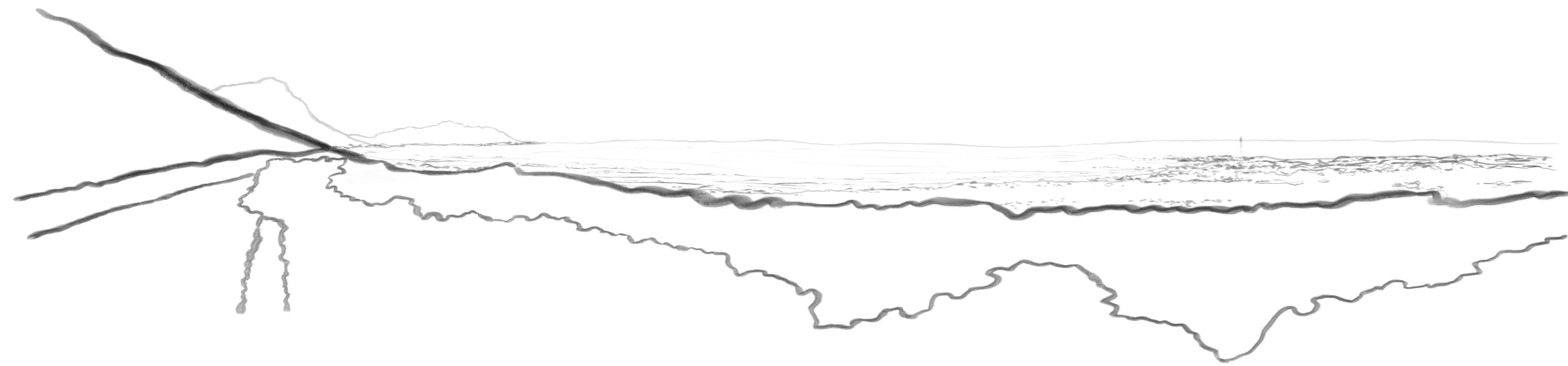


Figure 05 : Site Sketch by Author

GLOSSARY

Weathering: The process of either man-made or natural materials changing as a result of either physical or chemical reactions, the elements, materiality or time. *(Designing Buildings, 2023)*

Domicology: A new study that focuses on the social, environmental and economics characterises of the life cycling of materials and buildings within the built environment. *(Mitigation State University, 2023)*

Adaptive Reuse: The architectural process of taking an existing structure and changing or updating it's purpose to serve new means. *(Prosoco, 2021)*

Edge Condition: Is an architectural definition for a boundary zone or ending of an existing condition and where another can starts eg. Land and Sea. This both defines how we interact and perceive space as well as expresses the constant state of change of the coastline. *(Colorado Read Estate Journal, 2019)*

Revitalisation: The act of giving new energy to something. In the architectural sense, it is intending to impart use and life into an underutilised landscape. *(Vocabulary.com, 2023)*

Material Life-Cycling: The various stages of a material throughout its life; from raw collection, manufacturing and production, to use, reuse and waste. *(US EPA, O. 2015)*

Circular Metabolism: A concept that makes use of a metaphor of cities to functioning living organisms that consume and produce waste etc. In architectural sense, it is directly refers to the nature of our built environment, material consumption and waste. *(Fundacion Mar Adentro, 2023)*

Up-Cycling: A concept that refers to the repurposing or reuse of an existing item/material to serve alternative means and be given a new purpose, therefore extending it's expected product life cycle. *(Cambridge Disctionary, 2023)*

Down-Cycling: Similarly to Upcycling, the concept refers to the extension of a products lifecycle, yet differs in means. Down-cycling refers to the stripping backs and simplification of the product to material composition in order for something new to be created. *(Oberk.com, 2018)*

Ontological: The concept can be described as an ongoing informative process of creation in which there is a constant feedback loop throughout the design process informing and reforming ideas. *(Marriam-Webster, 2023)*

Anthropological: Is the study of what makes us human, how to design around human needs and takes a human focused approach informed by the biological and social sciences. *(American Anthological Association, 2023)*

Urban Mining: Is a concept that capitalises on existing structures and materials in order to avoid waste and save on production time and costs. The proposed mindset is to consciously construct with less, more efficiently. *(Holcim, 2022)*

INTRODUCTION



Figure 06 : Site Locality by Author
Neighbouring Suburbs

THEORY DERIVED FROM SITE

The purpose of this study is to explore the methodology surrounding adaptive reuse structures that transfers the architectural lens from dilapidation to one of opportunity for revitalisation and preservation. The focus is derived from a specific context; with the assistance of literature and case study analysis shall allow for the potential and opportunity to be unpacked within the identified areas. With this informed view established, we must also take into account the greater issues relating to the sustainability of the built environment, which shall be tackled through case studies of materiality and methodology of working and designing within an existing fabric. With this in mind, themes evolved naturally in response to the site and the human curiosity of abandoned structures and their various causes of degradation.

The study takes a context and site specific approach in which a small section of coastline on the outskirts of Cape Town was identified. A wild and underutilised space that possesses great opportunity for social, cultural and environmental reconnection and revitalisation. Edge conditions are notoriously dead spaces and difficult to activate, especially when dealing with such a volatile stretch of the coastline. The unpredictable and mostly untouched nature of the landscape is what peaked my interest. The area falls in-between of the suburbs ; Kommetjie, Ocean View and Scarborough. The greater area was intended to serve the public on both recreational and educational fronts, as there is an existing environmental centre and public campground with tidal pools that neighbour historic Khoisan fish traps at the foot of Kommetjie mountain.

Unfortunately over time, these facilities have become tired and underutilised by the neighbouring communities. This could be as a result of the separated and inaccessible nature of the area or the natural elements creating an unforgiving space that falls out of the realm of public knowledge and use.

The investigation into the site focuses around a disused Crayfish Factory and pier, which holds the end of the coastline and faces out into the Atlantic Ocean. The standing this structure holds within it's context, as well as mediating land and sea, lead to the desire to implement and explore the theme of adaptive reuse in the structure. The theoretical framework to be unpacked, explores the possibility of using Adaptive Reuse as a methodology for encouraging sustainability in environmental and community revitalisation. The Factory itself sits at the tip of the coastline and becomes a book end with the iconic Kommetjie lighthouse on the other side. Having an interesting past function of a bustling Crayfish Factory in a time of Cape Town's thriving fishing industry, highlights many site specific cultural and historical connections to the past. Majority of the former structure has degraded along with the largely undocumented history of the area. Upon closure of the facility in the late 90s, it fell into disrepair and this created a ripple affect felt by the rest of the coastline and negatively impacting the landscape. The neglected space stood being weathered by the elements and thus created a negative void unsafe to visit alone, resulting in mischievous behaviour taking over the landscape.

The main challenges associated with employing adaptive reuse strategies is with tailoring of design to work around the existing constraints. In such a landscape, there is an increased need to shift one's perspective towards embracing the challenge and looking beyond the degrading state, to reconsidering the space in terms of opportunity for future use and letting that drive the design process. This becomes the architectural intent of the research; to bring life and use to this part of the coastline through adapting and upgrading the factory as well as introducing new and exciting programmes and features to the landscape, which shall encourage community engagement. The main questions of the inquiry surround the chosen methodology; as it is intended to showcase adaptive reuse as a catalyst for revitalisation on both the macro and micro scales. The design process to follow this paper will explore the various means at each level of intervention in creating an engaging and multi generational space with key ties to past use and histories of the surrounding landscape and communities.



Figure 07 : Site Photograph by Author
Jetty to water [top left]

Figure 08 : Site Photograph by Author
Coastal Wildlife [bottom left]

Figure 09 : Site Photograph by Author
Factory Edge [right]

INTRODUCTION

Establishing the lenses with which to view the framework and project to follow are to be informed by relevant literature and critical analysis of case studies. This creates a lens of historical, social, cultural and environmental pillars which the project must address and balance on order to meet the requirements of the design intention – to bring activity to the underutilised landscape and turn it into something sustainable and beneficial for future generations.

The issue of the lack of site specific documentation, in both social and cultural pillars, both intrigues and frustrates in this early process of defining the intentions of the project. Curiosity is to be used as a driving force to uncover the significance of the site in the surrounding communities. This is to be carried out via interviews with local stakeholders in order to uncover and understand the local heritages, so that the design may appropriately document and preserve significant features. This uncovering process will simultaneously centre around all elements of building; from materiality to construction; in order to ascertain the best methods of preserving significant degrading elements while adapting the structure to serve new purposes.

This study will unpack various theories, draw connections and explore adaptive reuse as a means to sustainable architecture as well as a possible method of bringing life to neglected spaces intended for public use.

In pursuit of the idea of a thriving coastal edge, the design must focus around encouraging use today, as well as the longevity of the programme and its self-sustainability. The intended sustainability is to be designed to suit both the ecological context; considering the surrounding natural landscape; as well as the future of the structure, with inevitability of structure outlasting use.

This purpose of this research is to document the exploration process of the design intention which aims to answer the question *‘What are the social and cultural heritages of this forgotten landscape and how can we go beyond adaptive reuse architecture to create more resilient and integrated communities that preserve and celebrate it’s legacies.’* With the design intention to create a diverse and active site with engagement on multiple fronts, the means to achieve this intention shall be explored through the introduction of multi-use programming.

This text aims to widen the scope of adaptive reuse informed by a multidisciplinary approach in which the future of the structure and site is considered. The projects success lies in connecting the existing with the new, by rooting the structure in technology and thoughtful design. This conscious mindset is showcased in the intention of creating *‘whole’* architecture. *‘Wholeness’* is a contemporary attitude focused on enriching spaces of meaning and association. In this case, it explores how we, as architects, can go beyond mainstream adaptive reuse structures and be more aware of how our intentions could bring people and histories together in celebration. *(Stone, S. 2020)*

INTRODUCTION



Figure 10 : Álvaro Siza's Swimming Pools, Leça da Palmeira, Portugal (Divisare, 2017)

Figure 11 : Main Pool, Leça da Palmeira, Portugal (Divisare, 2017)

Figure 12 : Stairs, Leça da Palmeira, Portugal (Divisare, 2017)

Figure 13 : Ramp, Leça da Palmeira, Portugal (Divisare, 2017)

Álvaro Siza's swimming pools situated on the beach in Leça da Palmeira in Porto, Portugal are great example of how the intervention can respond to it's natural context. The pools blend into the rock faces and become an architectural method of responding appropriately based on the existing. Similarities can be drawn between the precedent and the site. The nature of being situated on the coast, the means of dealing with the elements and the publicly accessible nature make the pools a relevant precedent. The material nature also responds to the high use zones in the intervention, the brutalist hard concrete approach is both done for durability of design and flexibility to be moulded into and around the rock formations. (Divisare, 2017) This response-based architecture can inform the new attachments onto the factory and must be considerate to the existing natural features. The materiality again mimics the context in that is rugged and exposed, necessarily when dealing with water and the eroding nature of the coast.

The pools clearly integrate within the landscape and leave the boundaries between interfaces blurred. This is achieved by incorporating natural features into the architecture with many open ends to look out upon the pools for both the appreciation of the context as well as for function for satisfy and visibility. The open and viewing nature of the architecture is a theme to be brought into the proposal. The notion of eyes on the street and public presents becoming the safety feature is brought into the scheme with the differing active use times of the new interventions. The factory will operate weekly during typical working hours but the challenge lies in activating the site beyond this, to avoid vandalism and future neglect. Incorporating public elements into the scheme will allow for the site to be used on the weekend and potentially at night, extending the hours of use of the coast.

Another key characteristic of Siza's pools to be studied is the nature of the circulation. A public building must have clear entrances and paths, as well as private spaces to change as well as admin and offices. The movement routes of visitors and staff will be different, and it becomes important to understand the barriers between the two in order for the facility to function efficiently. The experiential qualities of the visitor routes are a notable feature in this scheme- dark cave like entrances into the building are designed to resemble entering into the rock face. These features create a sense of play and create a lasting experience which forms part of the legacy of the factory proposal. Creating hidden movement of pause and strategic viewing points to maximise the visual connection to untouched landscape form part of the intended user experience.

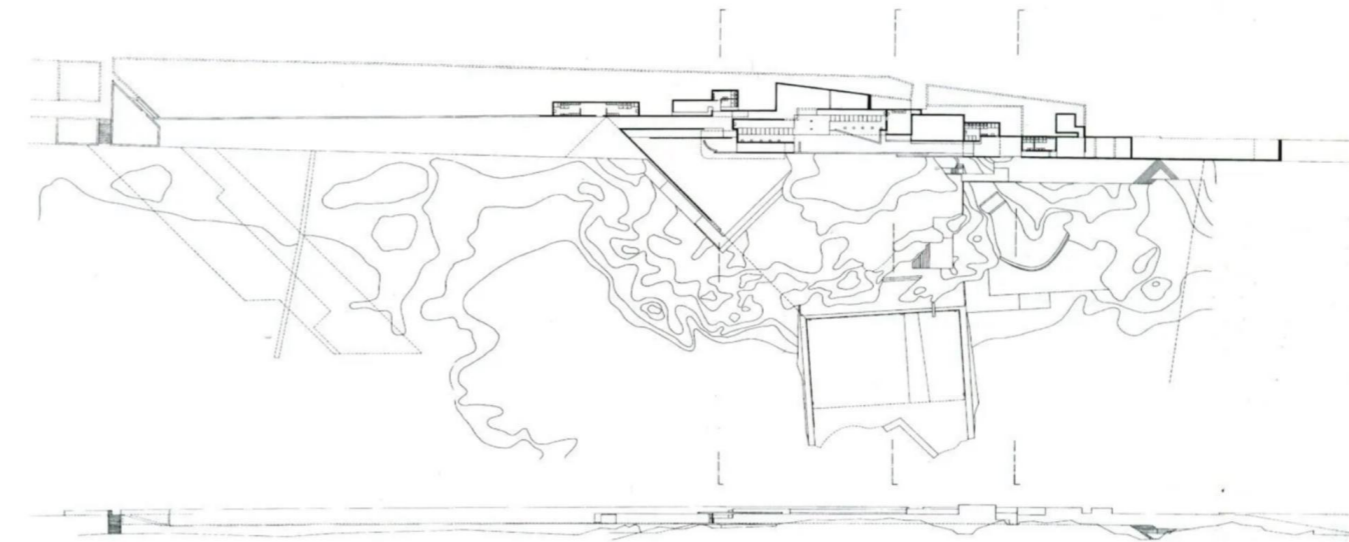
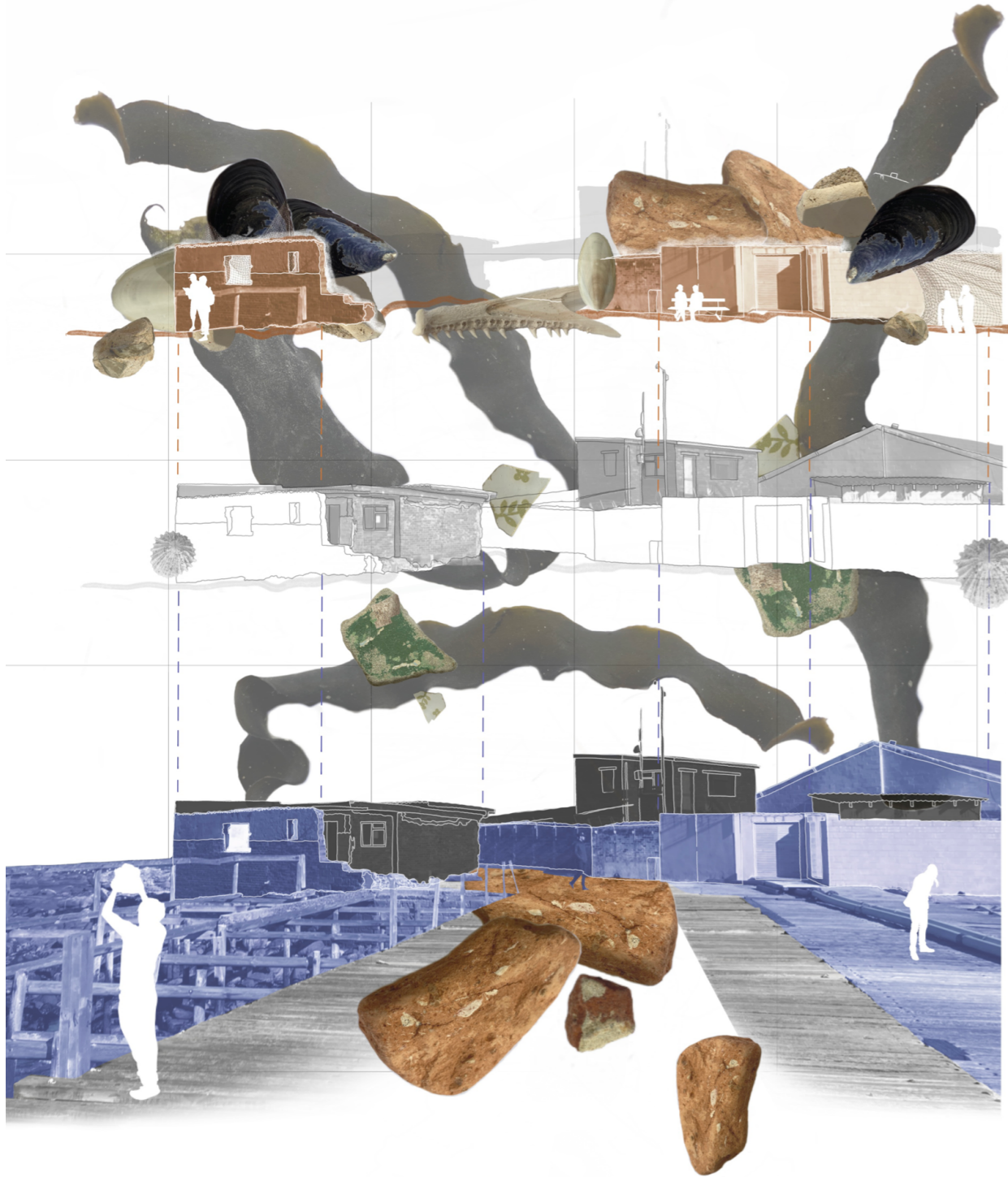


Figure 19 : Álvaro Siza's Swimming Pools, Leça da Palmeira, Portugal Plan & Section (Ismail, Z. 2019)



BEYOND ADAPTIVE REUSE

Figure 15 : Collage by Author
Adapting the Site – What to reuse?

The concept of adaptive reuse refers to the practice of repurposing existing buildings or structures to serve alternative purposes. It is an alternative to demolishing and building anew, which is considered normal practice within the built environment once a building's structure has outlived its purpose. Adaptive reuse as an architectural term that involves finding creative ways to adapt and modify the existing building to suit the new user's needs, while maintaining elements of the past structure or use. In recent times light has been shed on the realisation that existing structures pose an important contribution to the surrounding environment and landscape. Overtime the greater benefits of adaptive building can be felt beyond the new purpose and form of the structure, but also the surrounding context can be uplifted and reinvigorated.

The public benefits of adaptive reuse structures lie in their ability to preserve heritages and maintain cultural and community significance. In this case, adaptive reuse can be used as a tool to counteract the human instinct to resist change, in that a community is more likely to make use of the structure if there is a level of continuity and engagement with the context. The benefits of adaptive reuse on an industry level can be seen in the reduction of building waste typically created in the demotion process. (Stone, S. 2020) This lessens the negative impact on the environment and becomes the main driver for this methodology as a sustainable catalyst. The nature of adaptive reuse structures allow the past to co-inhabit with the present, creating a unique present day environment that is enriched by the character of its past life. These structures can often stand to bring awareness to past users or functions with reference to complicated histories which are preserved to remain relevant for future generations.

The specific approaches and techniques used to create adaptive reuse can vary vastly depending on the building, its condition, context and new intended use. The common thread in adopting this style of architecture is the upgrading of a facility to expand beyond its current life, towards something more appropriate for the user and future.

The text *'Adaptive Reuse, extending the lives of buildings'* by Lillian Wong views the principles of adaptive reuse as a means to redefine immortality of structures. Wong's interest lie in the juxtaposition created in the merging of interdisciplinary themes such as repairing, conserving, restoring and recreating. All the while, in the contemporary context, reflecting and making reference to the past. (Wong, L. 2016) The didactic role of adaptive reuse architecture can be seen in the challenging of our built environment to be more sustainable and conscious from a multitude of fronts. This perspective of adaptive reuse as a transformative means of improving the lifespan of buildings is relevant as the intended project strives to extend the life of the factory to be used by future generations as it holds a strong connection to the South African Cray-fishing industry and remains culturally significant. Through adopting the ideology behind adaptive reuse, the project can connect the past and present within the same space and thus maintain the cultural heritage of the fishing industry.

Furthering the ideals that a building can be granted a new life with the repurposing of existing elements, emerges a new area of interest know as *'Domicology'* which looks at the repurposing of abandoned structures derived from understanding their socio-

economic reasonings behind their neglected state, in hopes of altering the construction industry's preferences. (LaMore, R. 2015) The concept of *'Domicology'* is a term coined by Dr. Rex LaMore, who uses it to describe the new multidisciplinary study of the life cycle of buildings; including their design, construction, use, and eventual demolition or deconstruction. It is a field that incorporates principles from architecture, engineering, construction management, materials science and sustainability. The area of study focuses on the reasons for dilapidation and abandonment of structures, their recovery, and the promotion of responsible building practices. The purpose and relevance of such theory is to show the evolution of the built environment towards more sustainable and conscious designs. Domicologists strive for more sustainable building practices and take a focus on abandoned structures in order to access feasibility of deconstruction and recovery of buildings. This offers a unique realistic perspective of the growing problem of building waste and the demand in which buildings and houses need to be built. This new field of study aims to teach responsibility in design and engrain foresight and creative thinking into the built environment. The neglected nature of the chosen site and structure deems this literature pertinent as it directly addresses the thinking and challenges behind repurposing the old Crayfish Factory. Domicology's driving force is that of more conscious buildings, which is ingrained in us architecture students and will be showcased in the execution of the project. The responsible undertone of the project is inevitable, based on the proximity to the natural features of mountain and sea. Both of which need to be proficiently designed for and considered, to anticipate weathering and avoid further pollution.



Figure 16 : Bay Harbour Market Interior – vendor [top] (Bay Harbour Market, 2023)

Figure 17 : Hout Bay Harbour [middle top] (Cape Tourism, 2023)

Figure 18 : Bay Harbour Market informal exterior [middle lower] (Bay Harbour Market, 2023)

Figure 19 : Bay Harbour Market Interior [bottom] (Bay Harbour Market, 2023)

The principles behind adaptive reuse as transformative architecture can be extracted through case study analysis of Hout Bay Harbour’s popular ‘*Bay Harbour Market*’ which occupies an old fish factory building and becomes a relevant example of how to transform a dilapidated area and community with an adaptive intervention. The popular weekend market operates inside of a renovated fish factory within a working harbour. It draws crowds of all ages and cultures from all over Cape Town and beyond to experience and celebrate the South African spirit, creativity and diversity. (*Bay Harbour Market, 2023*) The goal of the market was to create a space that becomes a catalyst for local opportunity, job creation and development for the district. The renovation and repurposing of the factory has led to the upgrading of some of the surrounding buildings and infrastructure, which in turn increased tourism to Hout Bay. On weekends it becomes a bustling space of social integration, which offers a platform for local artists to showcase their works. The market also runs many initiatives that strive to benefit the surrounding underprivileged communities within Hout bay; Hangberg and Imizamo Yethu. (*Bizcommunit, 2012*)

This case study captures many of the benefits of working with existing structures and the great success of revitalising an area through thoughtful interventions that encourage different communities to work together. Another key component to bring into the architectural intervention is to consider the inner functioning’s of the site and programme, encouraging local employment from Ocean View, a nearby suburb which was established as a township under the group areas act of 1968.

The project strives to become a destination point for locals and tourists, similarly to the Bay Harbour Market. Another cultural and spatial commonality is the relation to the fishing industry. As a past fish factory some of the characteristics would be shared with the crayfish factory, this includes the internal functions of a factory which have remained to preserve the history and significance of the facility. Something to strive for in this instance is the manner in which the Bay harbour market uses a singular function of a market to reach far and wide in encouraging lasting social benefits to the surrounding communities. Be it through raising funding for infrastructure or providing an opportunity for the community to sell goods and gain income to support their families. This level of community integration and revitalisation of a dilapidated factory spaces becomes a good example for the Crayfish Factory to follow in order to connect the separated communities, establish community investment and make a self-sustaining facility.



Figure 20 : Bay Harbour Market fish factory sketch [left] Bay Harbour Market market sketch by author [right]

SPACES, PLACES & IDENTITIES

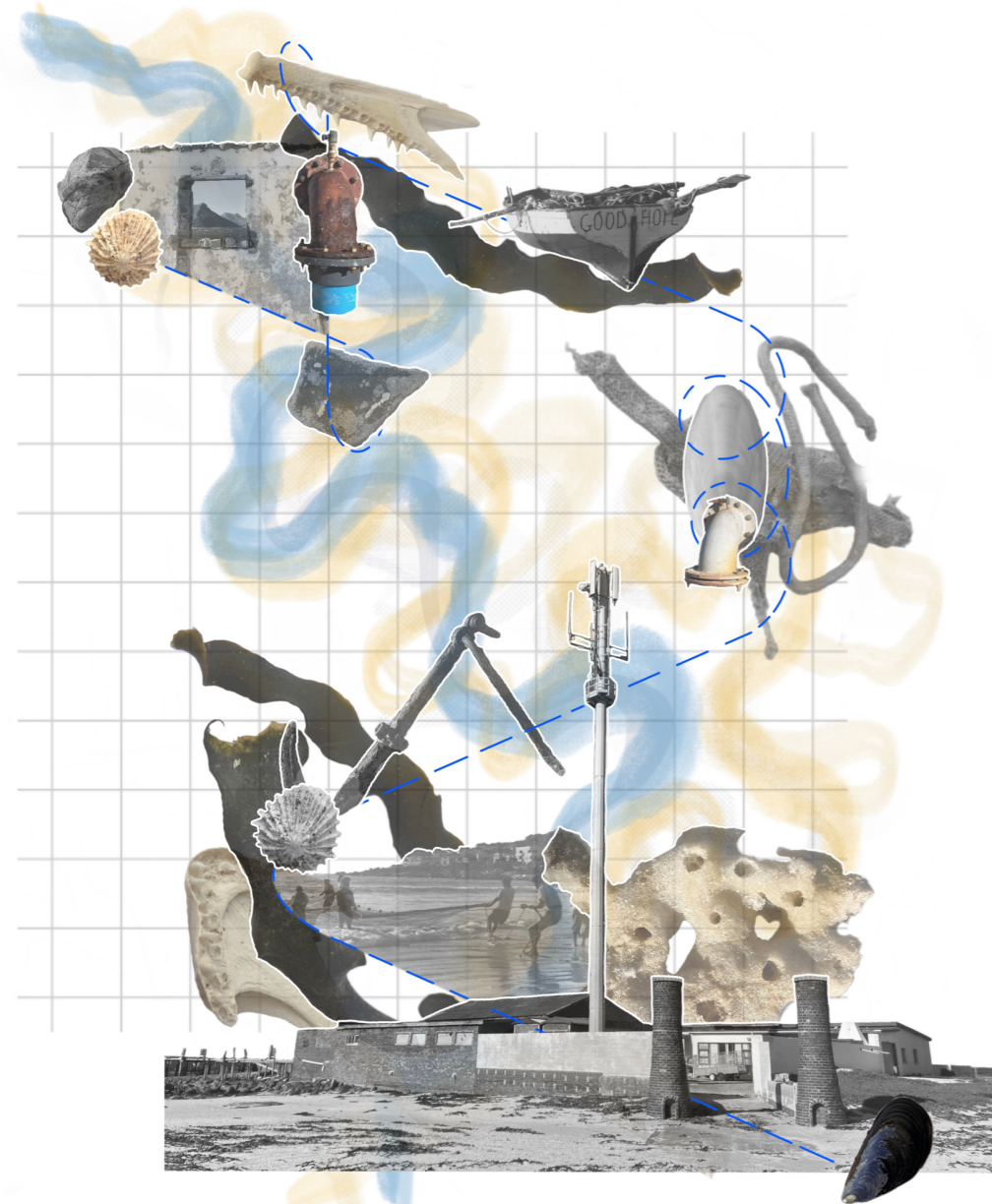


Figure 21 : Collage By Author
Fishing History on the site [left]

Figure 22 : Human thoughts and senses connected [right]
(Pixels.com, 2016)

Developing upon the theme of adaptive reuse, an important note to consider when adapting an existing space is the tangible and intangible qualities of the existing. A space can have many associations and memories ingrained in significant features of the structure. This is where spatial intelligence becomes increasingly important in the creation of a lasting architectural experience associated with memories of the past that enrich the present experience. (Stone, S. 2020) Maintaining elements from the past impacts the space created in the present. Space is treated as an abstract term with no cultural or social significance but has qualities implanted on it that express the intended nature of the architectural intention. Place however refers to a level of specificity and significance that can be summarised as a space that has meaning.

The architectural intervention will look at creating a purposeful space linking both the past and present users by means of adapting an existing structure and maintaining key elements to preserve the spatial associations and significant qualities of the context. The methodology as well as the specifics of what to keep and what to discard of becomes increasingly important and the choice must be guided by local knowledge of the site. The concept of spatial recall becomes an interesting theme to pursue into the design process as it transitions the generality of space to the specificity attached to place. It looks at the qualities of spaces created and the users experiences, with the knowledge that this is influenced by past memories. This can become the key to activating the focused landscape on a wider front as it sets the architectural intention to one of a binding nature.

The intervention intends to connect the past and the present through both the remaining structure and notable features that trigger memories of association of past users. Technology has evolved since the building of the crayfish factory in that areas may be updated in order to increase the spaces functionality, yet non-essential features may remain to preserve the character.

Spatial recall methods focus around the human senses as addressed in Marc Treib's book 'Spatial recall'. In which Treib centres the text around studying a person's ability to mentally reconstruct or remember a spatial experience. (Treib, M. 2009) It is stated that Place or environment hold the power to evoke memories beyond the physical presents. Treib stresses the idea of the preservation of space in not limited to the maintenance of the physical, it can live on in a person's memory and imagination – to be revisited later or called forward. This concept targets our human senses and makes us think about the visual, auditory, and tactile nature the space evokes. The designed stimulus could evoke an emotional link to the space by triggering memories of association. This allows for a deeper connection form between the user, the architecture and the landscape. Spatial recall methods become a valuable tool for space makers and changers as it directly shapes the intended experiences of the intervention and enriches the users understanding and memory creating a link and connection to the context. The intervention shall explore the possibility of spatial recall on past users if proved appropriate or significant to the context.

Treib highlights the importance of memory and association of the individual within a space that may evolve overtime. In the instance of the crayfish factory, the idea is to capture the evolution of the space through personal connections and memories of the factory and context to piece together the lost histories and unknowns of the site. It shall also investigate the level of importance of preserving significant motifs to later draw on those memories embedded in the physical characterises of the old structure. Various methods of achieving spatial recall involve targeting intentions towards contrasting the new from old and triggering our past experiences and connections to space and place. The intended spaces might contrast or highlight iconic features of the existing to create interesting and memorable characteristics to evoke future memories of associations. For this ideology to be a success there will need to be a sense of continuity through this evolution in order to maintain connections in adapting structures.



Figure 23 : Stairwell interior [left] (Flores & Prats, 2011)



Figure 24 : Preserved elements of the Entrance Way [right] (Flores & Prats, 2011)

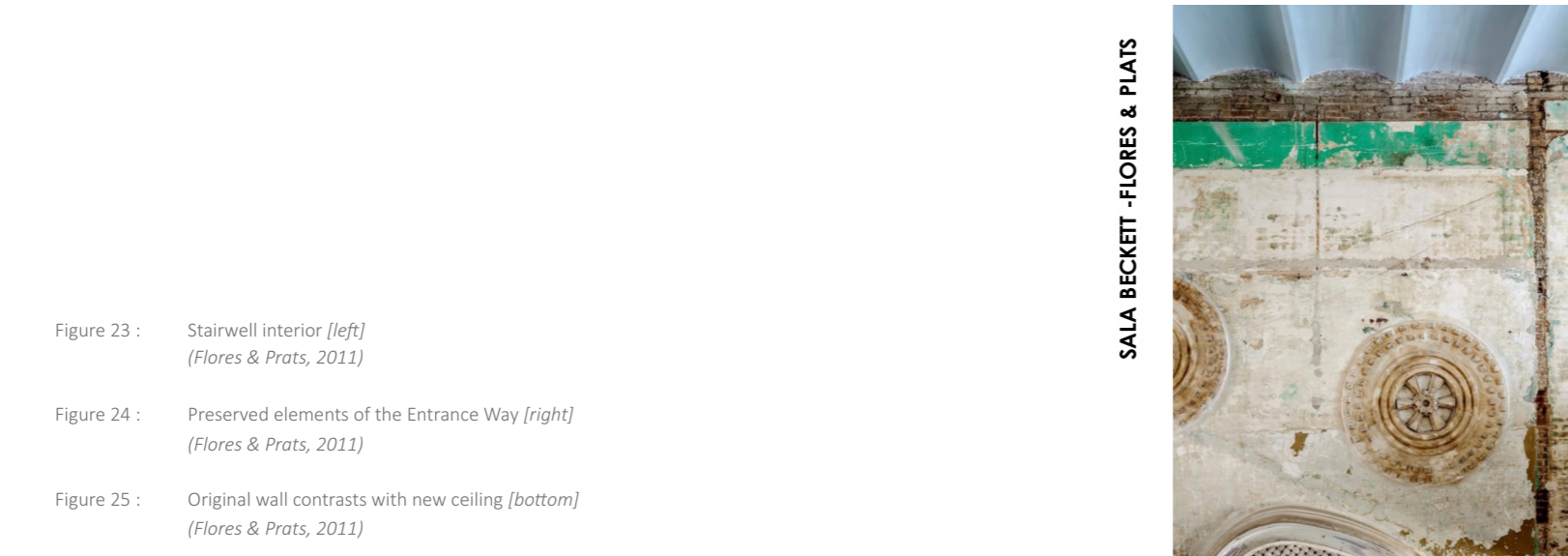


Figure 25 : Original wall contrasts with new ceiling [bottom] (Flores & Prats, 2011)

SALA BECKETT - FLORES & PRATS

SPACES, PLACES & IDENTITIES

The site holds a strong sense of history and place. The design will focus on preserving and creating memories to enrich the architecture and give the user a lasting experience, which overtime will too evolve and turn into spatial recall. Along this theme of defining and curating space comes the navigating of it. As stated the intended architecture calls for a multi-use approach in which navigating access within many programmes becomes key in managing and experiencing space. There lies the challenge at hand, of introducing and playing with how to bring ideas of access and visibility in, in an appropriate and functional way to navigate the programmes. Another area to consider in the intervention, is the opportunity to use programme and the existing connections to cultivate a strong sense of place for the surrounding communities, which in turn will encourage engagement.

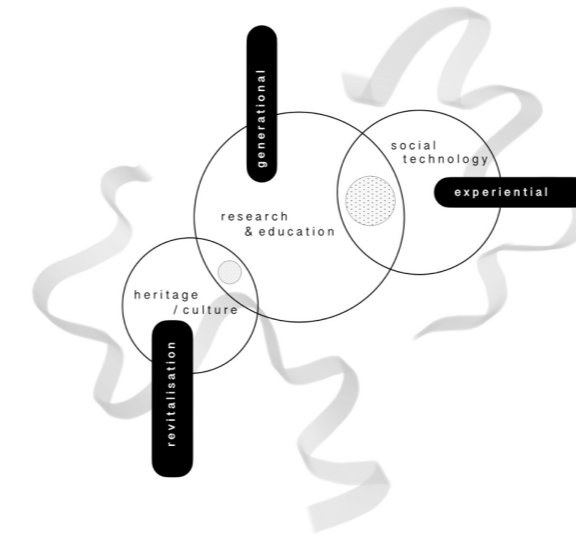
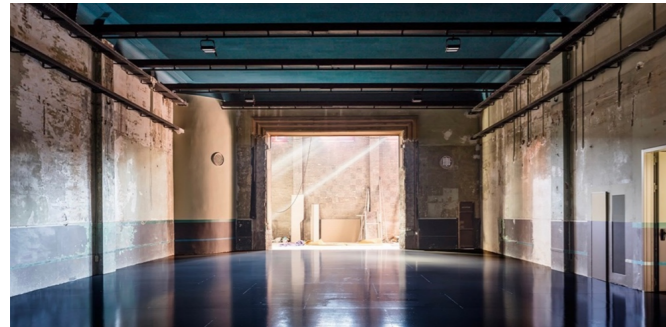


Figure 26 : Programme Navigation - Overlapping areas by Author

Having linked the physical existing space with the site's specifics and unique cultural and historical significance of place. The question of methods of place making are brought to the forefront of the challenging design process. To aid in this process, the text by Buzz Yudell and John Ruble titled 'Making Place' which is a practical take on defining the resulting place, bringing a level of simplicity to the complex process. The text categorises the process into 3 types of place which overlap and attempt to capture the richness of place to the user and architect; understanding and analysing; shaping and connecting; inhabiting and testing. (Yudell, B. Et al. 2004)

The images to on the previous page are of the internal renovations and refurbishments of 'Sala Beckett' a former social club 'Pau i Justícia' which holds personal value within the neighbourhood of Poblenou, Spain. It holds significance for many community firsts; marriages, communions etc. yet overtime became abandoned. The social club was refurbished and adapted to serve a new programme of a performance school and theatre by architects Flores and Prats. (Flores & Prats, 2011). Many of the walls and floors remain the same out of respect to the past as well as allowing them to influence the present. The building is now a place to celebrate the arts as well as the past, the neighbourhoods can visit the space again and relive their memories while creating new ones. (Archdaily. 2019)

SPACES, PLACES & IDENTITIES



SALA BECKETT - FLORES & PRATS

Figure 27 : Original Hall interior [top left] (Flores & Prats, 2011)

Figure 28 : New Hall interior [bottom left] (Flores & Prats, 2011)

Figure 29 : Original Hall Entrance [top right] (Flores & Prats, 2011)

Figure 30 : New Hall Entrance [bottom right] (Flores & Prats, 2011)

This building is another relevant case study to reflect upon and analyse the design decisions taken in an adaptive reuse project of communal significance. The structure maintains many key component, materials and textures of the past, this is done in line with spatial recall methods to evoke memories attached to space. The space is adapted wherever necessary to suit the new function – eg. Adding light to the staircase to highlight the circulation. This technique is something to be explored in a similar manner yet must be tailored to be deemed appropriate for users and context. The nature of this will be explored further with research and direct engagement with the site’s stakeholders.

The images on the previous page are the before and afters of the renovation to the main theatre space. The renovation maintains many key features of the room, with clear additions. These new additions add a unique and playful characteristic to the space - the architect’s trademark as well as evolves the space from a restoration. (Flores and Prats, 2011) The image on the right; a door detail, where the new area of work is contrasted from the existing. This highlights the level of detail required for adding new work to an existing structure. The finished project below showcases a seamless product that only enhances the character of the space. This example shows how new additions can enhance the existing fabric and not try to compete for attention. The nature of the architecture is one of continuity, as it matched new with existing in materiality and form. This seemingly passive ideology is one to be brought forward into the intervention, as the structure must not be considered in isolation and must strive to unify what is exists with the natural landscape.

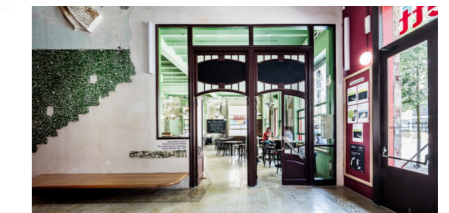
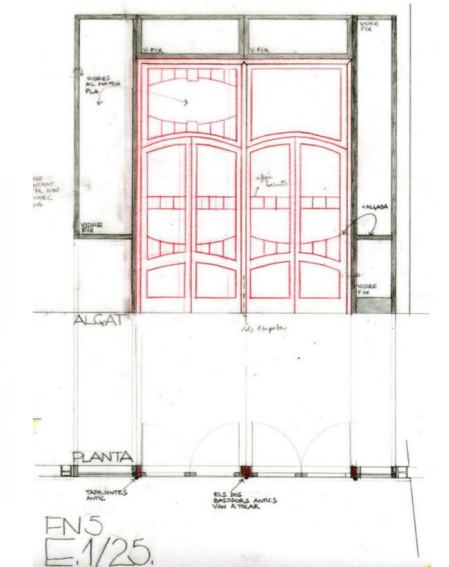


Figure 31 : Navigating the Existing sketch by author [left]

Figure 32 : Technical drawing of new door to fit within existing window frame [right top] (Flores & Prats, 2011)

Figure 33 : Photograph of finalised door [right bottom] (Flores & Prats, 2011)

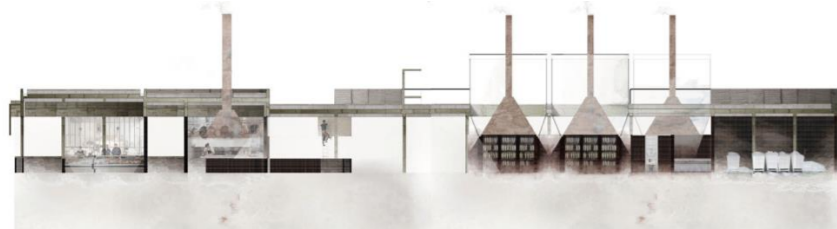


Figure 34: 'The fishing Community' pedestrians perspective (Archiford, 2019)

Figure 35: 'The fishing Community' conceptual elevation (Archiford, 2019)

Figure 36: 'The fishing Community' roof chimneys (Archiford, 2019)

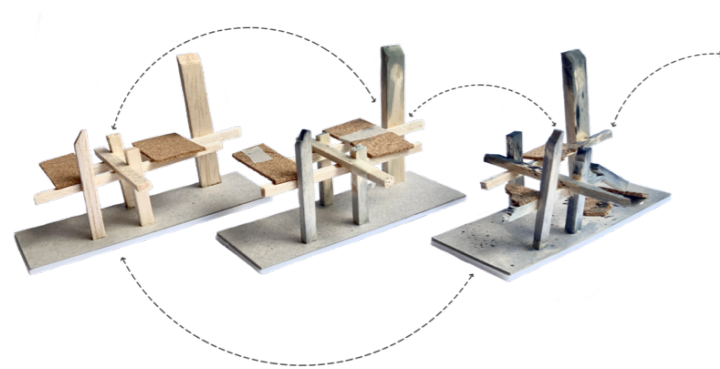
Figure 37: 'The fishing Community' Plan (Archiford, 2019)

Archiford international architects redesigned an 18th century smoking fish house in a project called 'The Fishing Community'. The project focused around integrating the new into an existing fabric. This was achieved by matching the material nature of the neighbouring buildings within the industrial alley and district. Parallels can be drawn with the simple material pallet and functionality of the existing programmes in both the Fishing Community as well as the site's dilapidated Crayfish factory.

The Fishing Community becomes a relevant example for how materiality can blend a new structure into an old context as well as how materiality can become the key to success in highly functional zones such as a factory. (Archiford, 2019) The hardy nature of the materials lends itself to durability as well as easily scrubbed down or fixed. The Fishing Community also houses a workshop, restaurant and monger area. It aims at redefining the relationships between the two, from private to public. The smoke house functions are invisible to the public yet the used items and machinery such as tools M chimneys etc become a present reminder of the factory and history of the space. On a plan these spaces must be clearly defined with a working spine that runs the length of the building, with public one end and private the other. Similar mentality will be used in the publicising of the crayfish factory. The educational attachments shall form onto the exterior and allow visitors to see into the factory but not interfere with factory operations. This creates a unique experience with the blurring of barriers into factory life. This is enabled by separate entrances and exits for the different users.

The Fishing Community forms becomes an integral part of the area Aarhus area in Denmark, which focuses on the renovation of an industrial road which still functions as a service road. The alley is a partially active space that was intended to be reinvigorated with the new architecture and public integration. Similarity to the intended proposal, the architectural intervention aims at revitalising a neglected space, working within a semi-industrial scheme of small scale fish processing which is trying to redefine the factory public relation and respect it's context.

WEATHERING



[TOP]
 Figure 38 : Site Photograph of Rubble by Author [left]
 Figure 39 : Site Photograph of Rubble by Author [middle]
 Figure 40 : Site Photograph of Rubble by Author [right]
 [BOTTOM]
 Figure 41 : Decaying Process Model by Author [bottom]
 Illustrates stages of neglect and weathering on a structure

The theme of weathering evolved as one of the initial areas of interest as it addresses the neglected site as it stands today. The degrading factory and piles of rubble spurred interest in weathering of materials. *Figure 32* on the previous page depicts the phases of deterioration and neglect; *‘active use’*; *‘degrading’*; and *‘ruin’*.

This visually represents the structure being reclaimed by its environment. The ultimate test of a structure is not its ability to stand forever but its relevance within its community which allows for it to be maintained and adapted over time. This concept of an ever-changing structure is addressed in texts such as Moshed Mostafavi’s *‘On Weathering: The Life of Buildings in Time’* which poses the idea of buildings not being static but responsive structures that evolve with time, environmental factors and human needs. (Mostafavi, M. 1993) Mostafavi challenges our mindset of *‘weathering’* as a destructive force and chooses to re-categorise it as a transformative one. This change in mindset opens up the idea of embracing the natural deterioration of building, which becomes a theme to explore architecturally.

The evolution of this theme is *‘ruination’* which is an architectural concept of the final decaying of a structure. Historically ruins have drawn much interest, the possibilities, histories and romantic notions of these structures draw out our human curiosity of what hides behind the eroding surface. In this way, ruins become physical links to the past as they embody the wearing of time. Questions of the value of ruins are brought to the forefront of the research. Depending on the ruin, its significance can be viewed from many perspectives; cultural and historic etc. John Jackson’s text titles *‘The Necessity for ruins, and other topics’* (Jackson, J.B.

1980) looks at ruins from the perspective of learning about the landscape that surrounds it as well as the varying means of interpreting such spaces through experiences, knowledge of the area and our senses.

“we admire and try to collect things not so much for their beauty or value as for their association with a phase of our past..”
 (Jackson, J. 1980; pg.89)

Jackson states that ruins possess the potential to become monuments of past legacies and can stand as reminders of important moments in history. It is not always celebration of grand gestures or horrid incidences, Jackson states that ruins become monuments of daily lived experiences –

“This kind of monument is celebrating a different past, not the past with history books, describe but vernacular passed a golden age where they are no dates or names, simply a sense of the way it used to be, history and the chronicles of every day existence”
 (Jackson, J. 1980; pg.94-95)

Renewal as an architectural concept is the concluding of an existing system in order for another new system to begin. Jackson argues that the buildings must persevere through a period of neglect before there is an incentive to take care of them and return to the original state – a term he’s coined as *‘our new concept of history’*. This mindset can be restructured as the excitement to redeem what has been neglected, an attitude reflected in the project at hand. Jackson stresses the importance of being intentional when bringing back elements of the past and to not recreate interpretations of history, another key element to consider when interviewing individuals’ personal experiences. Overall the text teaches us to embrace the inevitable by anticipating it architecturally. This encourages a shifting of our critical minds to one that seeks opportunity, even in the darkness of neglect.

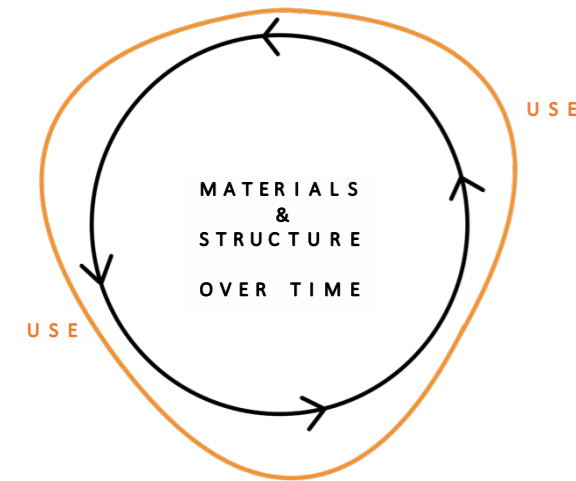
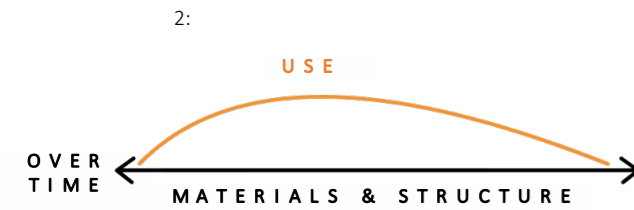


Figure 42 : Linear Consumption Diagram by Author [top]

Figure 43 : Circular Consumption Diagram by Author [bottom]

The Product Lifecycle:

The diagrams depict the existing linear material and structural lifecycle with the patterns of use decreasing over time as it becomes outdated and falls to disrepair.

The second diagram illustrates the proposed circular lifecycle of materials which embraces the term 'circular metabolism' in which there are constantly adapting existing materials and structure which extended the use of a space over time - the orange lines.

This concept sits in direct opposition to our society's fixed consumption habits. To achieve this change of mindset towards one of conscious consumption and intentional creation. There must be an awareness for the impact of our materials and structure as well as possible methods of overcoming such challenges be made commonly known and used.

"Concepts for future cities call for architects and designers to think, work, and create in a holistic, circular spirit, incorporating ecologic, industrial, social, and economic principles that would allow them to create efficient systems whereby materials live through several states of formation and use over their entire life span, without ever being seen as waste matter..."
(Hegel, D. Et al. 2014; pg. 18)

The above quote taken from the text *"Building from Waste, recovered Materials in Architecture and Construction"* which criticises the current built environments waste management system and challenges us to view waste production as an investment that needs to be returned. The text analyses the technical metabolism on industrially produced materials and explores various strategies of waste prevention. Extending the usable life of a product or material is captured in the concept of circular metabolism; reuse; repair and remanufacture. The diagrams on the previous page represent the proposed change from a linear consumption model to an infinite circular one. This requires designers and engineered to initiate the conversation of material or product death in the construction phase, not as an after thought. The text challenges us to view waste products as an opportunity to include waste as an integral component in the architectural design philosophy - similarly to the expected green building standards today. *(Hegel, D. Et al. 2014)* Methods of creating materials that adapt fall within two methods - 'By Design'; in which the element of adaptability and usability can be implemented into the design of a new product to ensure customisation over time. Eg. modular creations that can be added or subtracted from the design equation in order to grow the design

over time. This becomes difficult to design and often leads to wasted creations being discarded after use. The second method; 'By Reuse' of adapting materials is by innovative design and technology when working with existing structures. The existing nature of most materials leaves little room for adaption or reuse, thus with the combination of creative thinking and technology to recreate products from waste and/or disused materials that have already contributed to the built environment by some means. *(McDonough, W. 2002)*

The main opposition facing the 'by Design' adaptive method is the many unknowns faced when designing for future use. This often results in impersonal or inappropriate designs for the present user and context, as well as wasted effort and resources. The experiential and personal elements of the architectural intervention may be lost in oversimplification in pursuit of the multipurpose. *(Leatherbarrow, D. 2000)* This leaves the best method of adapting materials as reusing what exists. When working with the existing technology and innovation become the main tools with which to explore this concept derived from sustainability. The typically fixed nature of materials in construction must be reimagined to one that is mouldable allowing for growth with the users - this becomes a reactive driving force for material innovation. Working from the perspective of dilapidated structures and the principles of adaptive reuse, the opportunity for material reform and repurposing is high. The site has many piles of debris, as seen on page 23, which pose the greatest opportunity for reformation and repurposing, as it would be destined for the landfill.

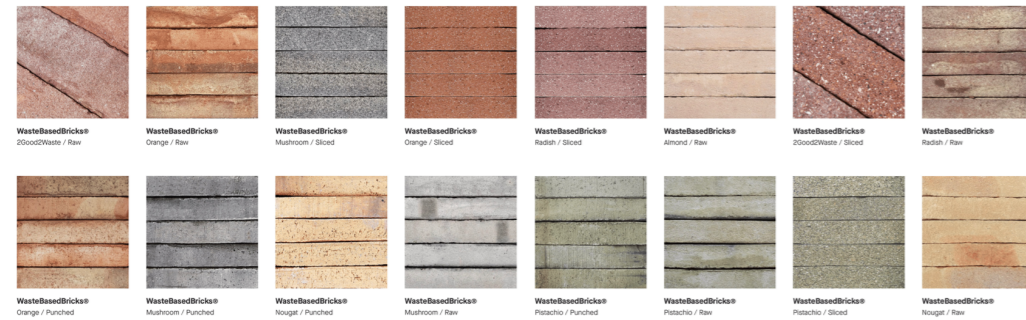
STONE CYCLING



[TOP]
Figure 44 : Photograph of construction debris [left] (Stone Cycling, 2023)

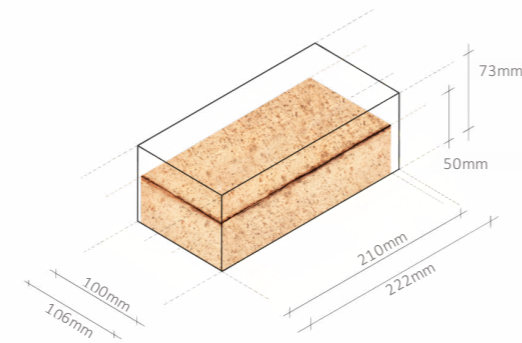
Figure 45 : Photograph of crushed debris [middle] (Stone Cycling, 2023)

Figure 46 : Photograph of sorted crushed debris [right] (Stone Cycling, 2023)



[BOTTOM]
Figure 47 : WastebasedBricks colour variety [left] (Stone Cycling, 2023)

Figure 48 : Waste Based Brick vs. Normal ROK Brick Sketch by Author



WEATHERING

One of the biggest waste materials of a construction site or when working with existing structures is the rubble; concrete; brick etc. the work of a recycled brick company 'Stone Cycling' a Dutch company which looks at addressing the issue of the lack of resources and overflowing construction waste by embracing the principles of 'downcycling' as a construction process. (Hegel, D. Eg al. 2014) They have created a varying array of recycled bricks with the original being the focus of the case study. Their flagship products 'WasteBasedBricks' is a no maintenance brick comprised from at least 60% waste and is suitable for external and internal use, completely customisable and industry compliant.

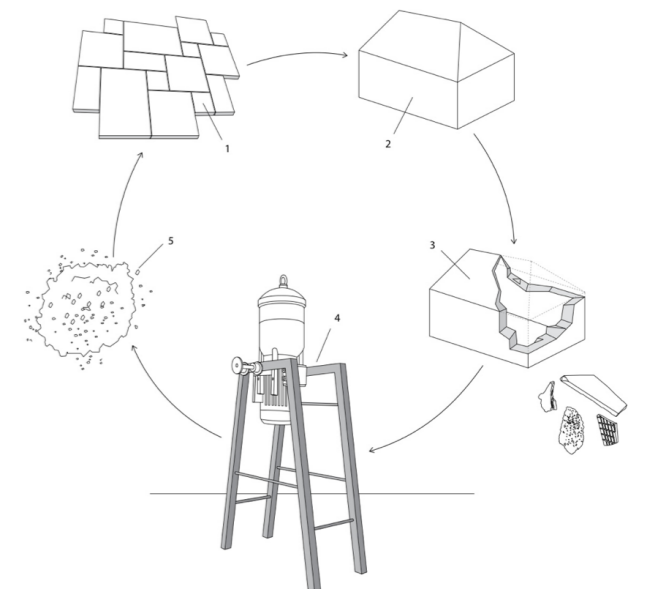
The product takes a typically daunting and complex process of wanting to use more sustainable materials in construction and has worked out the process and packaged it conveniently. The reuse of existing construction debris – a waste product- the reformation process leads to the outcome of a new construction product comprised of waste. This process becomes an example of 'By Reuse' adaptive methods and of embracing circular consumption and construction. What makes this method of reuse possible in the nature of the brick lifecycle, it is never ending as debris is taken, crushed and reformed with additives to create such a versatile new product and then crushed once disused and demolished. The personalised nature of the product is what is appealing on an aesthetic level - making waste chic to the consumers - becomes a vital selling factor which impacts the usability and increases the likelihood of the design becoming mainstream. The company is constantly evolving and striving to meet the growing demand for a more sustainable product by proposing a fire carbon neutral bricks by 2026.

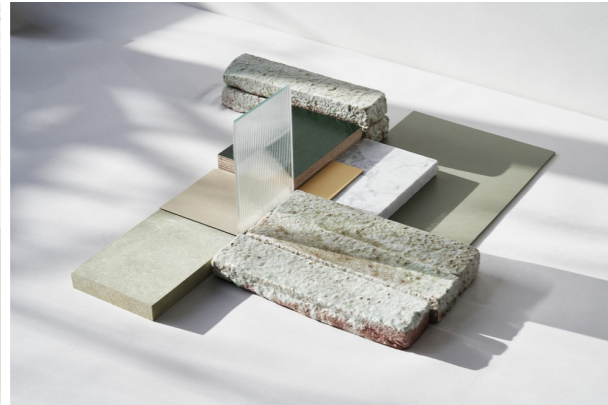
Stone Cycling address the inevitability of material death through the process of collecting demotion waste, sorting the waste into usable pieces before being formed into grain sized pieces and further processed in the production facility. A 60% waste mix is produced and moulded into the required shape, after setting, it is then dried, fired and tested. A benefit of this WasteBasedBrick over standard bricks is the drying time is often faster owing to the product composition. The dried bricks are fired in a natural gas fuelled kiln – at each step of the process there is an awareness of the greater impact of producing construction materials. In this case their suppliers and production partners compensate the carbon emissions by planting trees. Creating beautifully unique materials from waste products becomes a form of recycling as it makes use of waste and thus minimises the impact on the environment associated with new material production. This case study aims at normalising the use of reclaimed materials by shifting the aesthetics towards a high end, visually appealing finish and with a completely customisable product, to encourage consumer uptake.

When analysing the case study with the intention of implementing a similar process of new material creations from waste product, the reality of cost, transport and skill set needed to achieve this standard of product became unlikely to be adopted in the South African context. This being said, the ideology of creating a product from the debris and rubble is maintained and could be integrated on a higher level that expands beyond the site. A bigger picture was created of extending the material reformation process beyond the factory renovation and reuse, but to a scale that benefits the greater communities and can create employment and help integrate the new factory structure within it's surroundings.

The relevance of this case study is the ideology of making use of what exists in excess on the site – debris and rubble. When adapting the existing structure there will be the inevitability of more construction waste created. Exploring various ways in which to capitalise on the construction process, example being a brick creation facility is made on site and can be transformed into another structure to serve new means beyond it's intended purpose. Another opportunity could be to set up a facility near the site that processes rubble and creates new products as currently nothing exists in this section of Cape Town, this would bring purpose and opportunity to those in search of job opportunities and skills development.

Figure 49 : Diagram of construction Process (Stone Cycling, 2023)



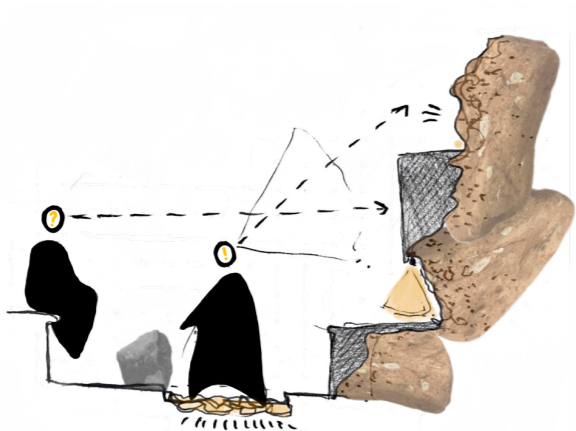


[TOP]
Figure 50 : WastebasedGlaze 'Mint' colour [left]
(Stone Cycling, 2023)

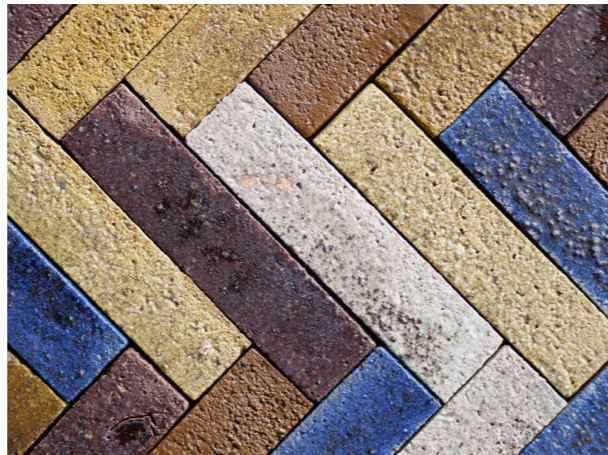
Figure 51 : New Custom 'Mint' Colour Glazed designed to match interior pallet [right]
(Stone Cycling, 2023)

[BOTTOM]
Figure 52 : Experiential Space Sketch by Author [left]

Figure 53 : WastebasedGlaze colour variety [right]
(Stone Cycling, 2023)



STONE CYCLING



WEATHERING

The principle behind the WasteBasedBrick construction process is what shall be taken forward into the design process, creating a focus around the greater potential social-economic impact of materials and transforming waste into something functional. The company Stone Cycling are interesting as they have chosen to approach the market with the efficiency of other high end bespoke materials yet differ to their competitors as the principles behind the company are derived from a sustainable foundation. This will generally lead them to outrank their competitors as similar products are not comprised of recycled materials, resulting in some clients preferring more conscious construction with little visual difference.

Stone cycling's strength is their highly customisable process of creation. It is known that materiality and lighting greatly impact the spatial and atmospheric qualities of physical space, and as previously discussed materiality and form can be used to evoke sensory reactions. Stone Cycling are aware of this and encourage architects and developers to reach out to create a custom solutions for their project. Through collaboration distinctive building materials can be created to suit the intentions of the space. In this case study, Stone Cycling and Studio Mixtura's 'alchemist' Daria Biryukova developed a custom green wastebasedglaze that would decorate the interiors of the Dutch company 'twentyten'. The client company acts as a creative incubator for young talent which focuses on image creation, production design and much more, in which texture and colour are used to create a memorable feature wall in the studio. The waste-based glazing was created by local ceramic manufacturers to be an eye-catching and engaging feature of a façade or in this case, an interior wall.

This example showcases the impact simple design intentions can have on a space. Emotive responses are triggered with colour and texture, which could become a potential means of designing spatial recall methods and linking identity and place. Similarly to the waste bricks, the exact execution of the product will not be achievable in this context, but the mentality behind the nature of the designing of a product will be considered in the design process to follow. The reformation of debris to bricks becomes the methodology by which materials evolve with nature. This case study illustrates the merging of design and technology to minimise dilapidation and building waste; how materials adapt 'By Reuse'.

This case study can become an example of Kevin Lynch's theories (Lynch, K. 1972) addressed in the text 'What time is this Place' which argues that we perceive and navigate urban spaces by being influenced by both the physical form of the design but noticeable features of the built environment. This is done through landmarks and distinctive architecture that both forms and informs our mental mapping of our surroundings as well as memories of association, which help us navigate our environments. Lynch's concept of 'temporality' of design refers to the nature of our built environment, how it changes over time and how users experience the spatial evolution.

This can be seen in Stone cycling's product, which evolved in response to the waste problem and was designed to be customisable to the clients spatial requirements. In the instance of the design intention, the architecture is intended to preserve existing memories and create lasting experiences of the new architecture. This highlights materiality's connection and role in

defining and creating spatial qualities appropriate for the context. Understanding this relationship is crucial in creating meaningful and sustainable architecture.

WEATHERING

EVOLVING MATERIALS

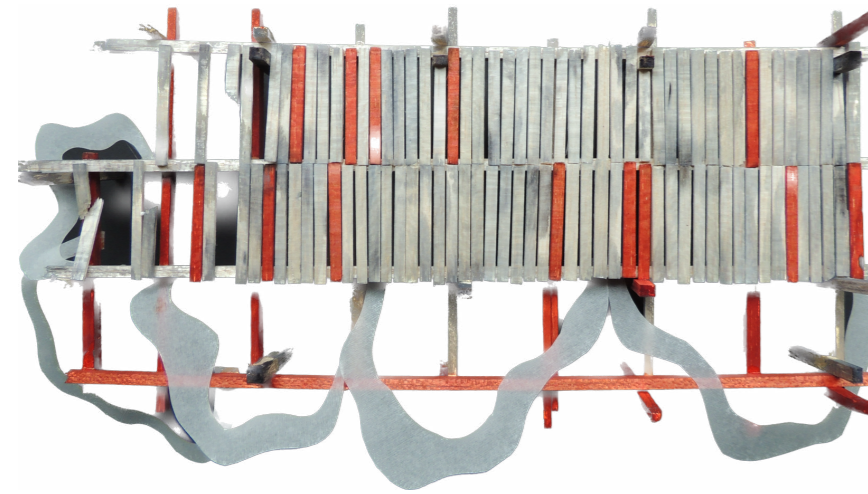


Figure 54 : ARCHI Maki Model by Author [left]
Captures the process of an existing neglected structure once refurbished and whole, developing into something else and expanding beyond its built constraints

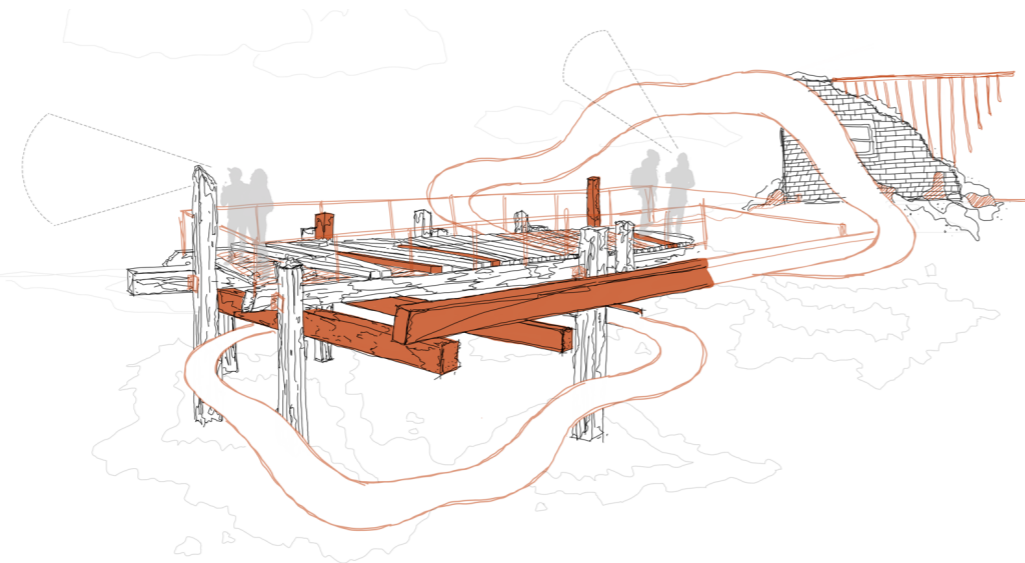


Figure 55 : Sketch of the structure's evolution by Author [right]
Illustrating the site's existing pier in the process of being reformed and providing function

This next section explores an element of the 'by Design' method of materials adapting. It focuses on the material execution evolving over time to suit more appropriate means in a modern context. This is as opposed to the product or material being designed from the onset to adapt over time. The more organic process can be observed as the intended function of the materiality remains, yet the impact of spatial qualities evolves with the user.

Structures strive for continuity, this is achieved through extended use and upgrading of a building which prolongs its natural life. These loved structures express the interconnected relationship the structure has with time and its users. As per the theorist Stewart Brand who's book 'How buildings learn' examines this interconnected relationship and which elements of a structure adapt with ease and thus are better suited to evolve over time. (Brand, S. 1994) This can be summarised as the mindset that buildings are fluid and dynamic structures, not fixed objects, allowing for modifications to better suit the different users and contexts. Brand identifies and explores the concept of 'shearing layers' which becomes a referenced example for the different building layers and their rates and abilities to change or be replaced. Brand states that with technological advances, there is increased availability and means to create more adaptable materials and buildings and thus sustainable more structures. It merely requires a unique perspective and greater attention to material knowledge when going about altering a building's structure and material life cycle.

The architectural intention and this research aims to explore within the existing context of adaptive reuse structures, the challenging interconnected relationship between user and building through materiality, it's production process and the lasting social impact of the project to bind it to the context and community. The key to maximising this relationship will fall to the technological expression and thorough design. David Leatherbarrow is another theorist that attempts to quantify and unpack the relationship between architecture, technology and the natural environment. He develops the concept that technology can aid and enhance the relationship a building has with its surroundings. (Leatherbarrow, D. 2000) This considerate mindset should be brought forward into the architectural process to come, as it establishes the idea of buildings as being reactive and responsible to a greater context. The architectural process so far this year has attempted to come to grips with the notion of a degrading structure becoming whole again. This will be achieved through bringing activity to the site through introducing new functions and making use of technology to adapt materials and influence spatial qualities to create a lasting experience. This can be summarised as the structure is designed to grow into a new version of itself, when given a second chance at life. The first Archi_Maki exercises conducted as a class is depicted above. The model and sketch illustrate the broken pier of the site being upgraded to the point of functioning - the red infills. This then allows for new life to take over the structure in new and exciting ways, this energy ripples out to the surrounding context and invites revitalisation and renewal beyond the structure.

Through technology the structure will be permanent and the occupation and programme temporary. The intervention must embrace all of Leatherbarrow's principles for interconnected architecture in order to create appropriate structures, that support themselves within the coastal landscape.

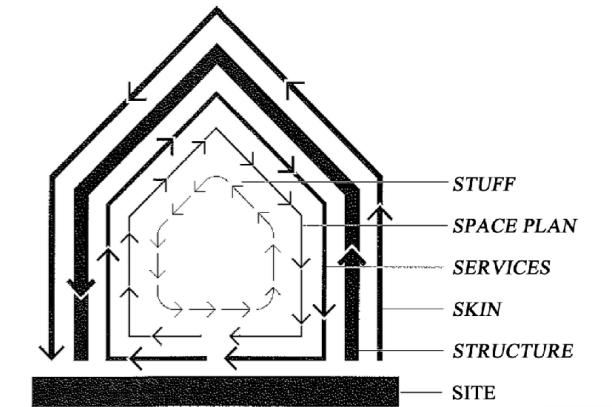


Figure 56 : Shearing Layers Diagram
(Brand, S. 1994)

SEAWEED CONSTRUCTION



[TOP]
Figure 57 : Old and New Seaweed Cottages Compared [left]
(Vandkunsten Architects, 2013)

Figure 58 : New Seaweed Construction – Wall Detail [middle]
(Vandkunsten Architects, 2013)



[BOTTOM]
Figure 59 : New Seaweed Cottage in Context [left]
(Vandkunsten Architects, 2013)

Figure 60:: New Seaweed House - Material pallet [middle]
(Vandkunsten Architects, 2013)

[BOTTOM]
Figure 61 : Old Seaweed Cottage in Context [left]
(Vandkunsten Architects, 2013)

Figure 62 : New Seaweed Construction – Material Detail [middle]
(Vandkunsten Architects, 2013)

EVOLVING MATERIALS

The combination of materiality and technology can be used to bridge historical and cultural divides, which are often experienced after a large passing of time. In this case study, the material use of seaweed as an insulating and rooting material evolves from a traditional to modern setting. Traditionally the seaweed is layered to form a roofing material used for centuries on the island of Læsø in the North Sea. The context to the study follows the restoration of an 150 year-old seaweed house called 'Kaline's House' and the new modern neighbour paying homage to the local traditions and history of the island via transforming the traditional materiality into a modern variation. The 'Realdania Byg Foundation' bought the historic house as well as the natural plot of land next door. There was a competition for local architects, in which the dutch firm Vandkunsten won the rights to design a small 90m² summer house appropriate for the landscape. The brief outlines the needs for it to respect local Læsø traditions, while still fitting in with the natural landscape and it's modern construction material and time. (Vandkunsten, 2012)

The firm focused on maintaining tradition through materiality quality and form but from the modern perspective of renewing the unique and natural material of Seaweed. Which simultaneously targets many of the important issues facing the construction industry surrounding sustainability and access to construction materials in an isolated context. The modern untraditional take on a traditional design stems from experimental construction to test the material limits. Designed to resemble and function as a simple traditional house on the interior as well as the overall East-West orientation of the structure aligns the local building traditions.

The materiality of the local and abundantly available 'Eelgrass' seaweed traditionally served as insulation and a roofing material of the old cottages. The new Seaweed Cottage reinterprets the material to form a roofing, cladding and insulating material; the structure is clad in seaweed pillows held together with wool netting, the timber framed walls hold seaweed stuffed to form insulation between load bearing members and lastly the interior is also clad with stuffed seaweed upholstered with linnet fabric. (Archello, 2013) Seaweed has great acoustic and insulating properties as it is able to absorb and emit moisture to regulate temperatures indoors. The material nature of the woven seaweed allows this style of house to perform better in relation to other structures with regards to CO₂ emissions over a 10 year period, owing to the binding nature of the ancient material. (Hegel, D. Eg al. 2014)

Another modern day take on renewing traditional houses is that Vandkunsten's modern cottage has been designed for easy assembly and disassembly, by making use of prefabrication construction techniques, to both keep costs down and minimise the wear on the surrounding natural environment. To summarise the case study through the lens of David leatherbarrow's 'Uncommon Ground: Architecture, technology and Topography'. The nature of the interconnected relationship can be tracked in a timeline of architecture, context and the evolution of material technologies.

Leatherbarrow pushes for an integrated architectural approach that enforces consideration and awareness of the impacts of construction with respect to the natural context and ecosystems – aligning with both the brief of the project as well as its execution. (Leatherbarrow, D. 2000) What makes this case study unique is both the following and deliberate break away from tradition.

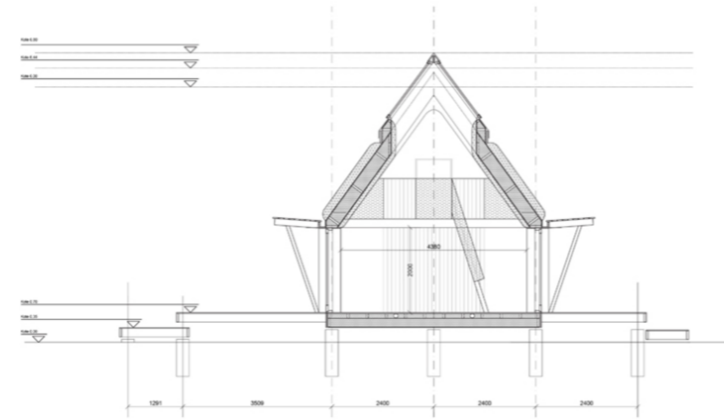


Figure 63 : New Seaweed Construction – drawing set [left] (Vandkunsten Architects, 2013)

Figure 64 : New Seaweed Construction – Section [right] (Vandkunsten Architects, 2013)

There is great focus on present day usability as well as paying homage to the past and preserving its traditions while adding something new and exciting so future generations will also engage with history at different points. (Vandkunsten, 2012) The cottages themselves stand as individuals within the landscape that both challenge and feed off one another when considered as examples of how a building can adapt over time with regards to its user's needs, aesthetic values yet maintaining a similar spatial quality through materiality. Seaweed is considered the ultimate sustainable material as it can be directly compared to commonly used mineral insulation. It is non-toxic and fireproof and has a product lifecycle beyond 150 years. (Inhabitat, 2013)

The case study is relevant as it deal with organic seaweed, which is widely available material on the site, as well as it encourages the methodology of adapting and modernising an old structure while maintaining historical and cultural significance. This will benefit the intention which strives to achieve a level of continuity through form and materiality, yet test the limits of conventional material in search of connecting structures and landscape.

Similarly to the debris recycling example, the architectural intention deals with similar materiality yet differs in context and intended application. Building requirements in South African do not mention seaweed construction, so this execution becomes unachievable in this context. However the project does hope to employ more sustainable construction methods and materials eg. low-carbon solutions to lessen the carbon footprint associated with construction. The project also intends to make use of existing natural and man-made materials found on site, to both connect the structure to the landscape as well as showcase and alternative architectural identity for the area. The project shall adopt a similar mindset to Vandkunsten with regards to being respectful and resourceful- project also faces an abundance of washed up seaweed.

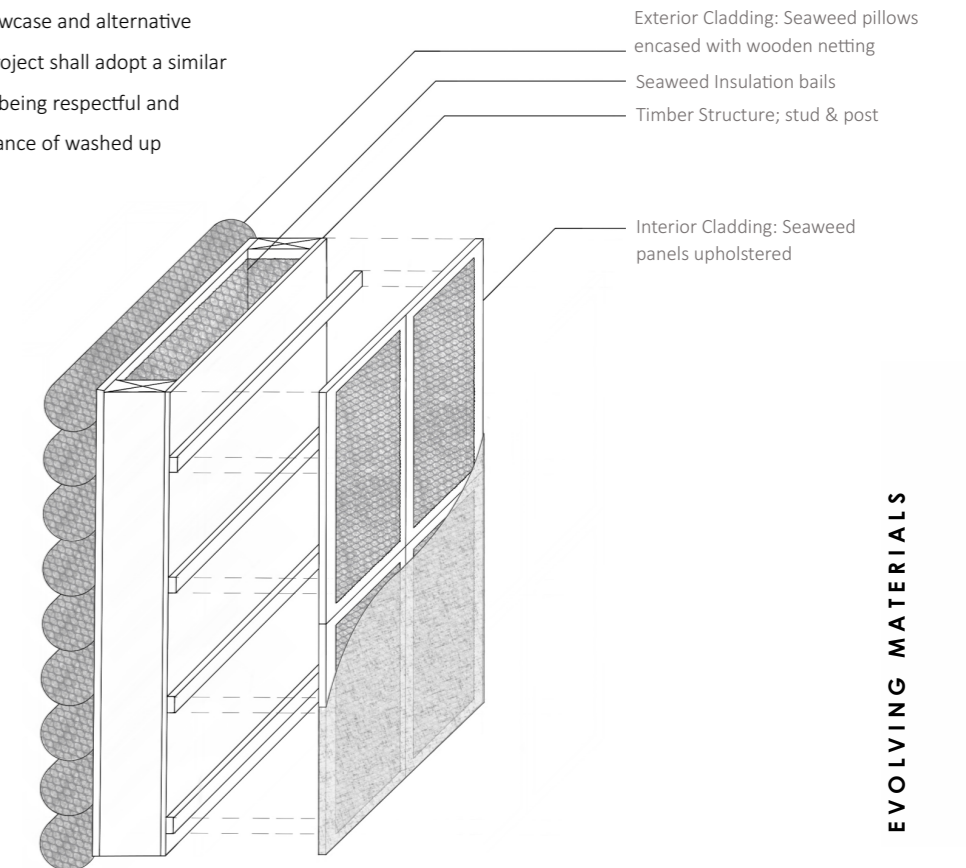


Figure 65 : Seaweed Construction Axo – by Author



Figure 66 : Forsyning Helsingør Power Plant – Exterior detail [top left] (SSAB, 2018)

Figure 67 : Forsyning Helsingør Power Plant – Exterior [bottom left] (SSAB, 2018)

Figure 68 : Perforated COR-TEN Steel [right] (SSAB, 2018)

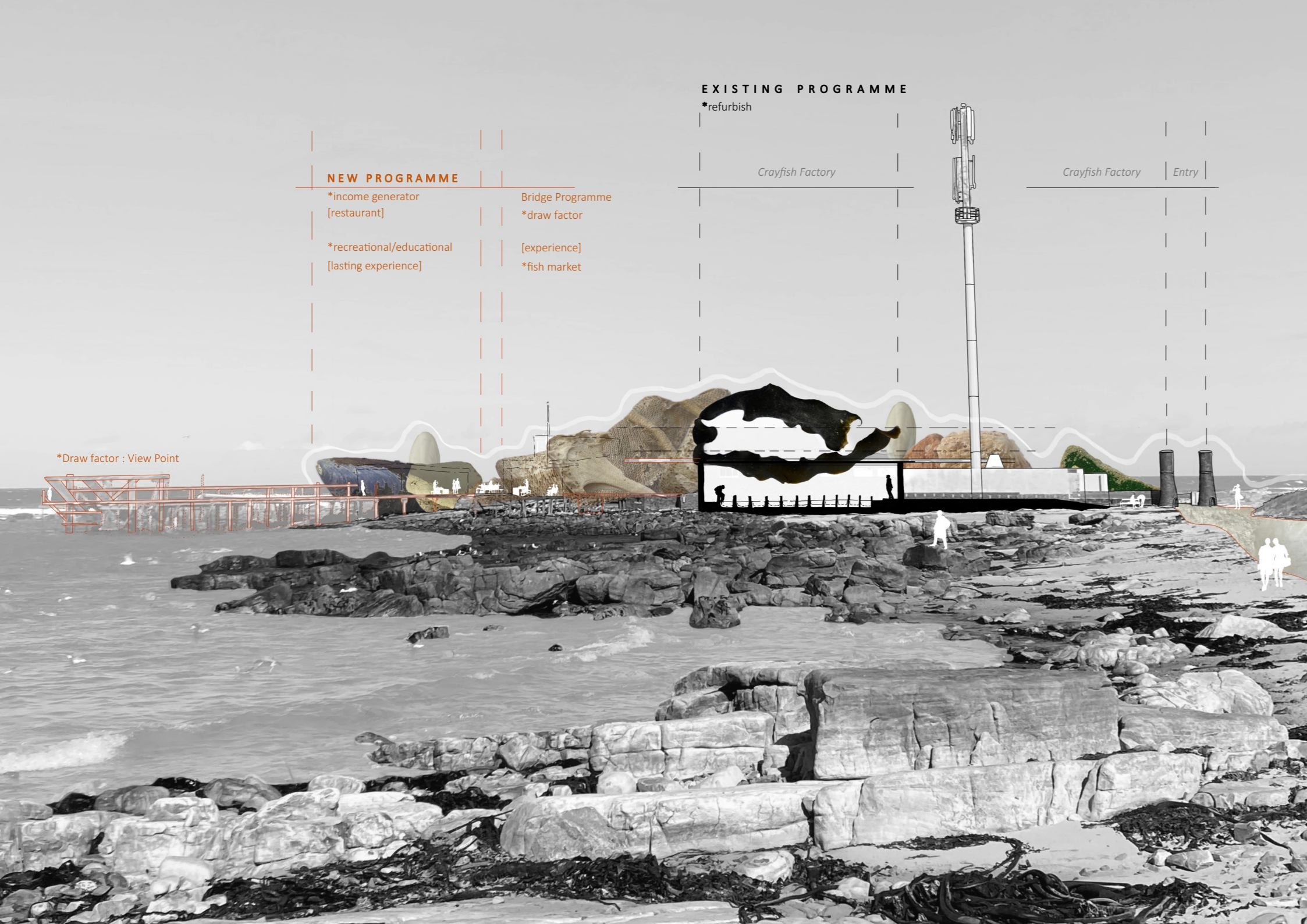
To conclude the topic of material evolution, we focus on a material designed to dramatically change overtime in self-preservation. Most metals when exposed to air and water begin to oxidise, a chemical reaction takes place which causes oxides to form on the surface of the metal. These oxides cause the metal to corrode and rust, which damages the structural integrity of the material and overtime will cause it to erode. This can be prevented through keeping the metal away from moist environments and treating or sealing it; with oil, paint or grease. Steel is an alloy which is a metal comprised of a multiple metallic elements, some of which provide natural resistance to corrosion. Stainless steel contains chromium which reacts and oxidises faster than iron can, this results in the formation of a protective film that prevents further attack and rusting. (Corrosionpedia. 2019)

Weathering Steel - Corten Steel as the brand name - is the referred to material in this case study. The nature of the material captures the dynamic relationship between technology and environmental influences. Weathering steel is designed to embrace natural material weathering by being designed to eliminate the need for protective coatings, typically required for building with steel. The steel forms a stable rust-coloured covering which becomes a self-made thin protective layer of erosion, which forms once exposed to the elements. In this instance, weathering steel is allowed to form a naturally oxidised finish which prevents further corrosion. This oxidised coat has also been designed to protect the material from other corrosive effects caused by the elements, including rain and snow. (SSAB, 2018)

The bright colour of the oxidised steel, known as the 'patina' is what makes Corten so recognisable and popular in outdoor and exposed settings. Concern is raised over the intended lifespan of weathered steel, but in general use it has a longer lifespan than that of bare cold rolled steel. Using a heavier gauge steel is a potential method of increasing the life span of the weathered steel in less than ideal environments. Provisions must be made for drainage and caution must be taken to ensure no water pools on the surface, as this will accelerate the corrosion and material lifecycle. Weathering steel is not rust-proof, in the wrong or extreme conditions the red 'patina' will fail in protecting the rest of the metals which continue to corrode, compromising the steel. Interestingly weathering of the steel is inherently slower in less urbanised environments, as polluted air becomes a catalyst for corrosion beyond necessity for material preservation.

The relevance of the material is in the intersection of technology, nature and design. The nature of Corten is designed to change overtime which directly impacts the quality of the space. The natural material evolution is what drew our attention with how to create interest in typical steel forms. The ideology of a naturally reactive material illustrates a possible means of connecting the structure to its surrounding landscape. This case study raised the important fact of the project; dealing with extreme environmental conditions; often very unforgiving on many materials. This brought forward questions of the stereotomic nature of the interventions intended material pallet. The architectural intent may be centred around differing and contrasting material compounds; having elements of the structure seen as permanent and some as temporary to showcases the influence of nature on the structure.

This links back to Kevin Lynch's theories of temporality in design, the passing of time will be captured in the space which shall encourage a deeper meaning through materiality. The changing of the materials could also assist in the navigating of programme, become a communication tool to direct movement and access within the purposed multipurpose programme. This must be a thoughtful process as it simultaneously will impact the intended spatial qualities and user experiences. The structure will establish a balance between temporality and permanence to mediate the context as well as anticipate the weathering of the structure. The weathering of the structure could be designed to encourage local engagement and for the surrounding communities to take ownership of the space through designed maintenance.



CONCLUDING THOUGHTS

On a surface level the site appears a ruin, a forgotten space of dilapidation and detriment, yet with a deeper look it poses a richness of existing legacies and significance to the coast. The facility poses great architectural opportunity to stand as a piece of Cape Town's fishing legacy through uncovering and integrating the social potential achieved when designing beyond typical adaptive reuse architecture. The opportunity can be unlocked through the introduction of new functions that facilitate engagement from the surrounding communities. This becomes a means with which architecture can unite socially in working towards a thriving coastal edge.

Reflecting upon the design intent as a means of bringing purpose and use to a neglected landscape through repurposing and adapting old inappropriate architecture as a means to righting the wrongs of the past by integrating the structure into its context. Another component of the architectural intent this is the ideology of continuous architecture that encourages new life through adaptation in order to grow with future users. The idea of preservation is both embraced and challenged at the same time. This paradox pays homage to the current cultural legacies an association with the fishing industry, yet the scheme realises the inevitable decline and unsustainable nature of the industry. Thus, more the multi-use scheme that is designed around the public interface. To achieve this level of self-awareness or conscious architecture relies on the architect's contextual understanding and following of the interconnected principles of architecture. This rounded approach will ensure resilient architecture that reinforces and enhances the character of the existing, while mediating past and present.

Through searching for architectural 'wholeness' the answer to 'How can we go beyond adaptive reuse' can attempt to be answered in the establishing of an interdisciplinary approach that through form and programme encourage connection beyond the facility. This can be seen as engagement on a macro level and integration into the natural and social contexts.

This research allowed us to view the various methods by which materiality can aid in the preservation of place and the unique character and identity of the existing. It also enabled the exploration of a building over time and potential future forms and material weathering. If the architecture adapts, it shall minimise areas of neglect from forming, this will both positively benefit the surrounding areas and negate building waste from becoming a social and environmental issue. By exploring case studies that focus on changing our perceptions of waste and dilapidated structures to ones of opportunity, there will be more design innovation and unique architectural projects.

This text stands as a benchmark for the architectural proposal and form a theoretical framework of reference to be used in quantifying the interconnected relationship of architecture, landscape and community through technology. The research conducted established a mindset which shall guide and shape the project towards purposeful and socially conscious architecture. Through working beyond the principles of adaptive reuse as a catalyst for opportunity the neglected coastline of Cape Town will be revitalised and reconnected to its context, forming an active coastal edge.

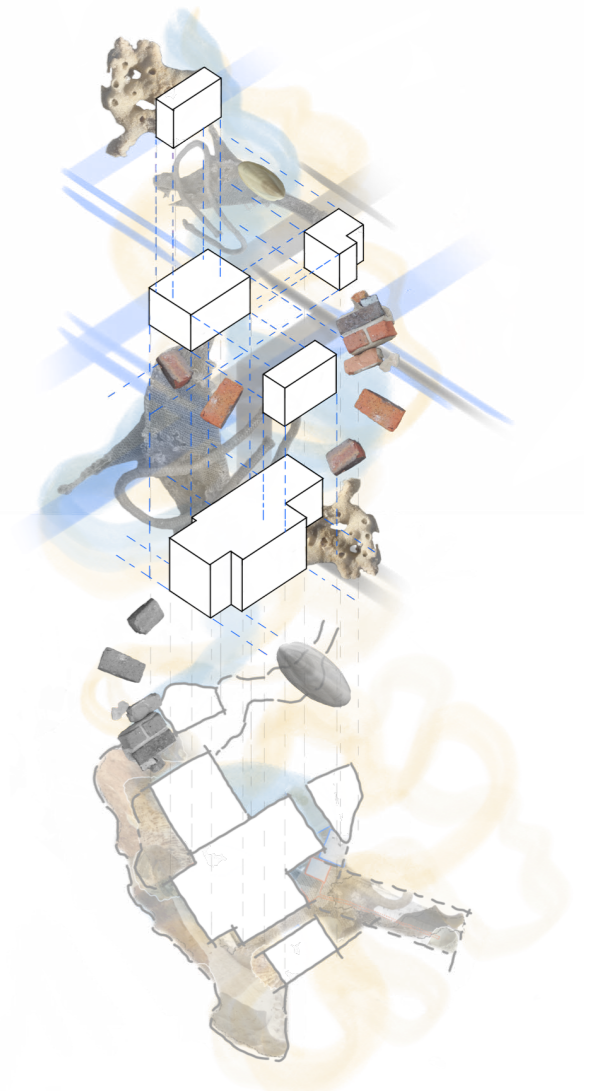
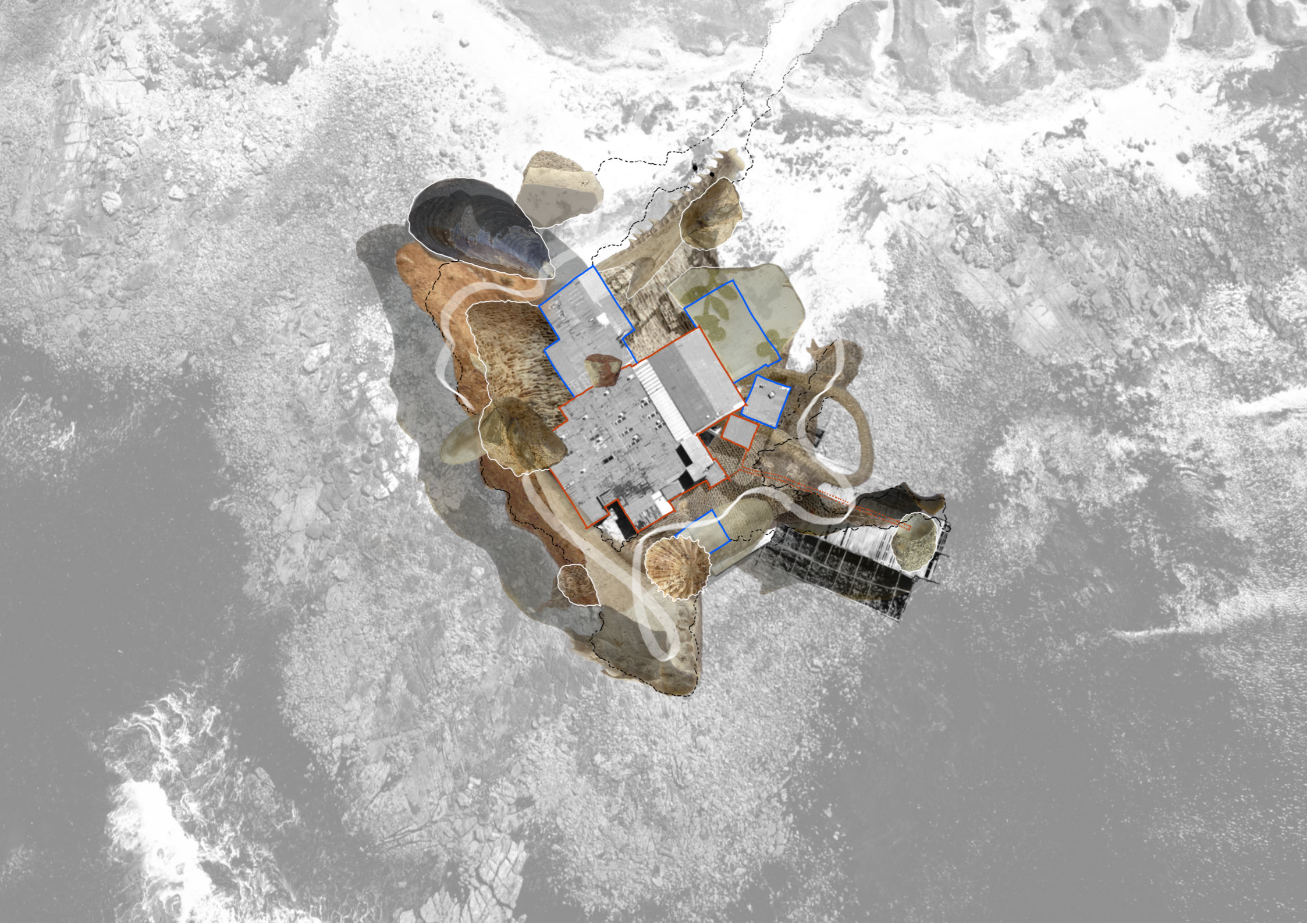


Figure 69 : Abstracted Section by Author [Previous page]

Figure 70 : Navigating the design process by Author [right]

Figure 71 : Abstracted Plan by Author [next page]

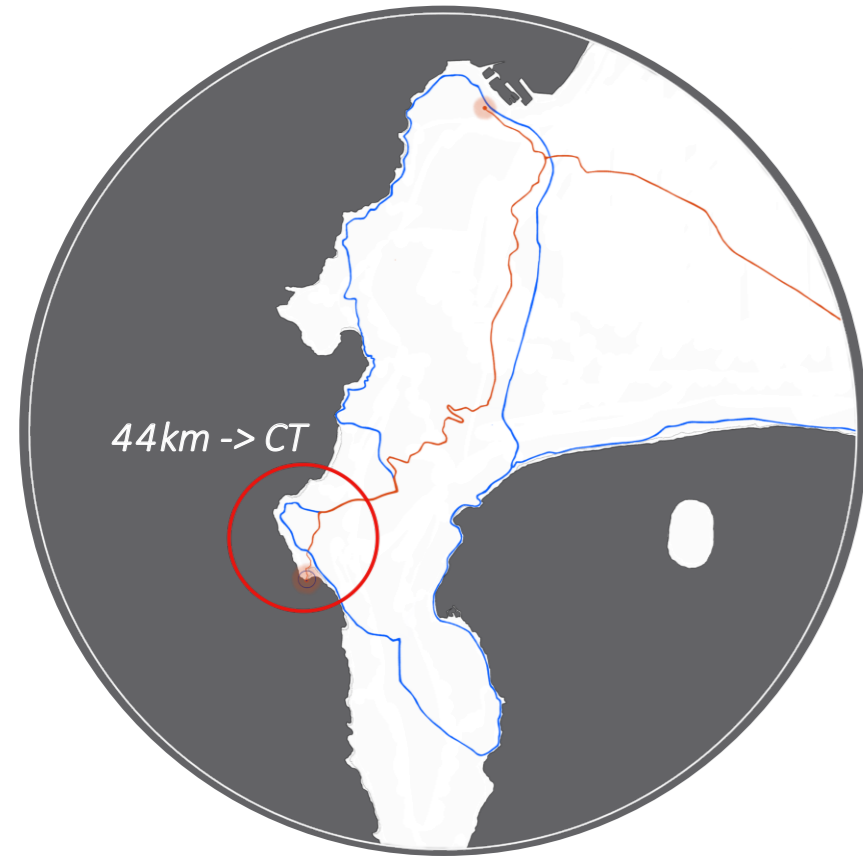


PART 02

[contextualizing site - macro view]

CONTEXTUALIZING SITE :

[portion of coastline in the deep south]



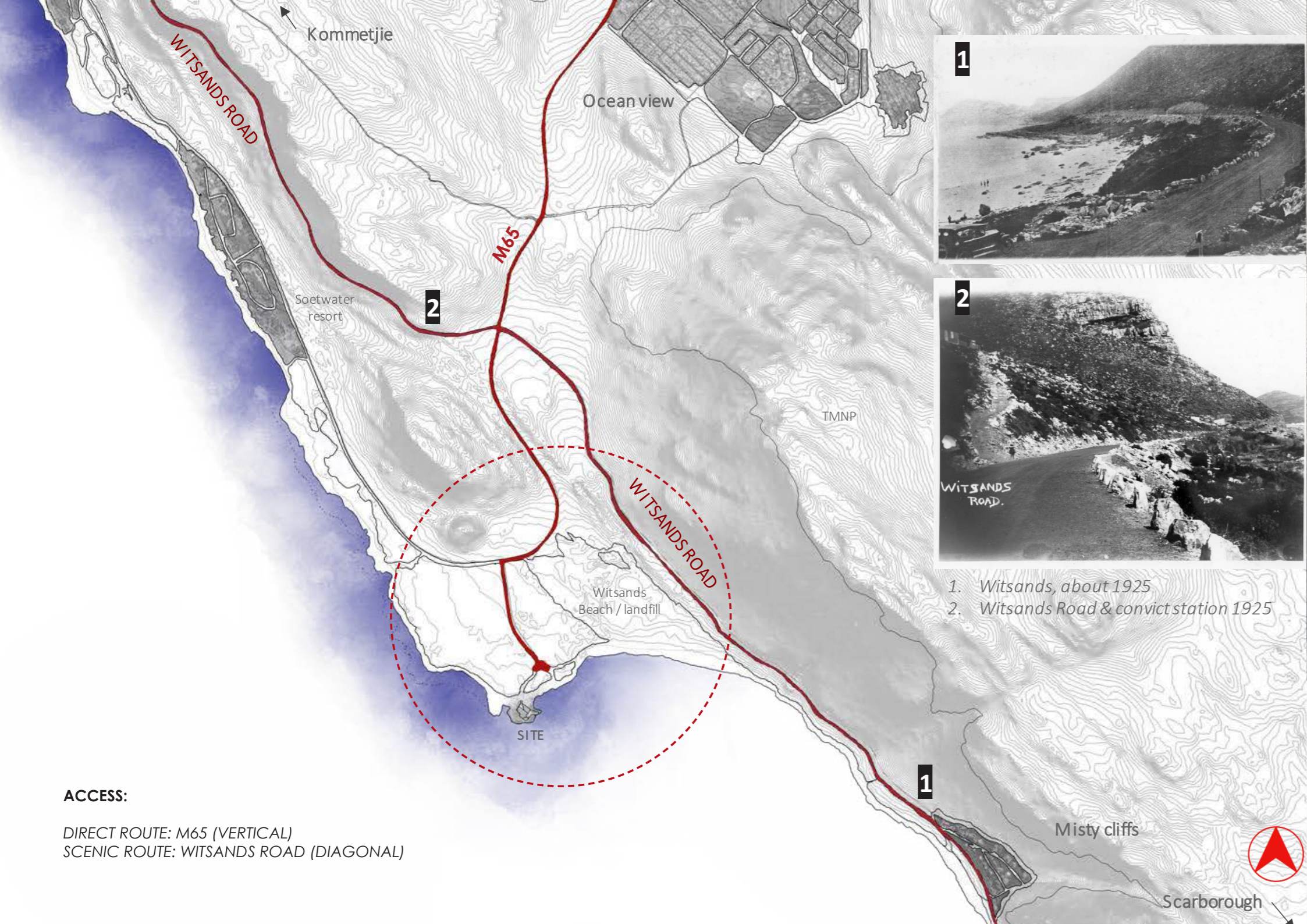
situated on a tourism route :

- the site sits on the outskirts of Cape Town; **44km from the City** center and along a famous tourism route towards Cape Point Nature Reserve.
- the landscape is mostly **untouched by urban sprawl** as it sits just outside of Table Mountain National Park and adjacent to the reserves protected marine waters
- Witsands beach is a **popular recreational destination** for wave surfers, kite surfers and wind surfers, owing to the waters being conducive for big wave surfing
- the area is **popular throughout the summer** and crayfishing seasons, yet becomes uninhabited the rest of the year and the infrastructure becomes battered by the elements with little economic means of maintaining itself

surrounding neighborhood communities:

- Kommetjie - 1902
- Ocean View - 1968
- Misty Cliffs - 1932
- Scarborough - 1890

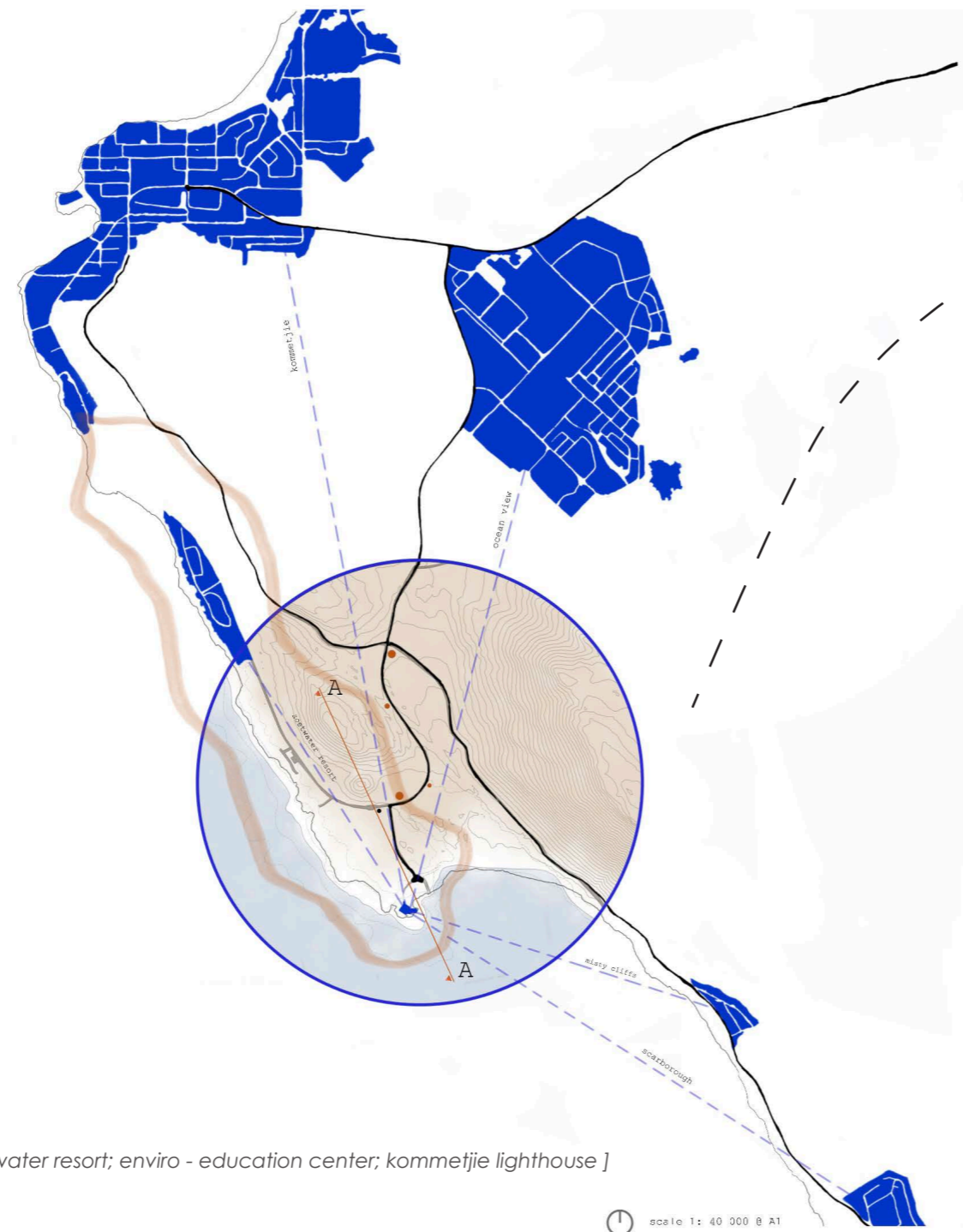




1. Witsands, about 1925
 2. Witsands Road & convict station 1925

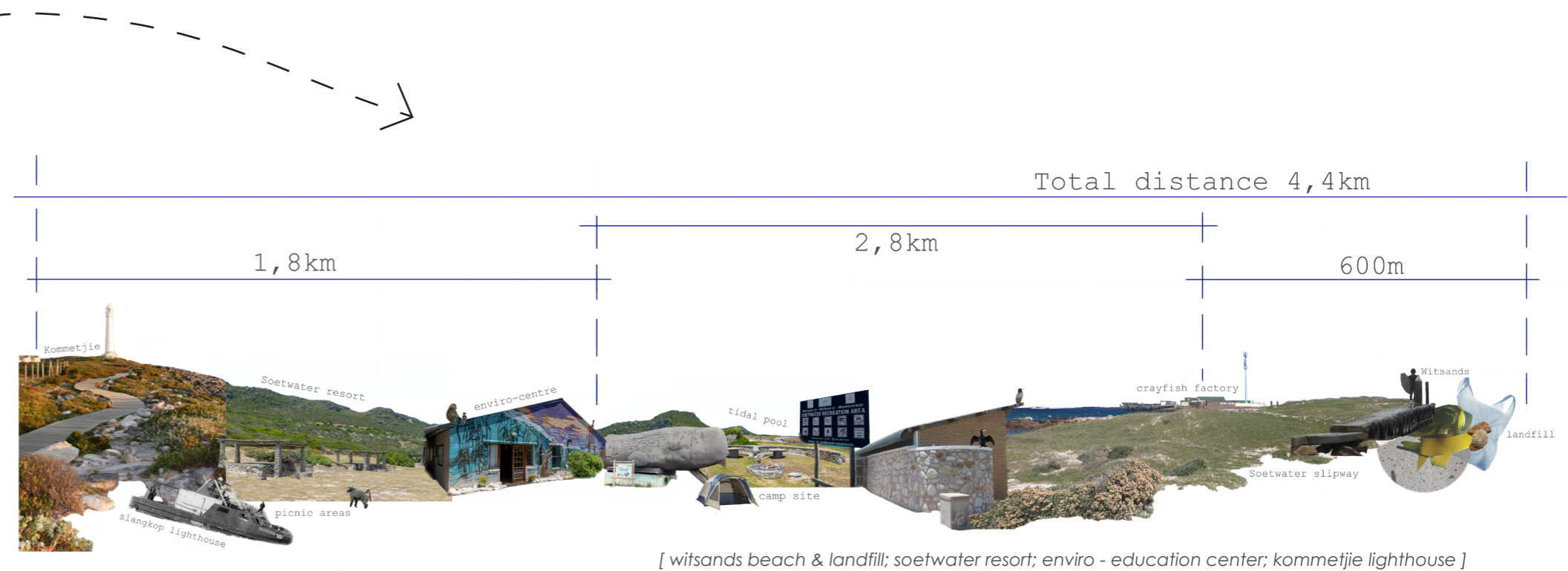


[the site today]
 34°10'43.4"S 18°20'35.4"E



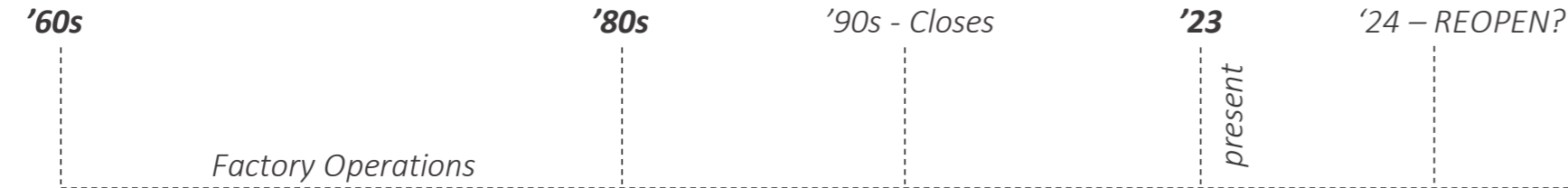
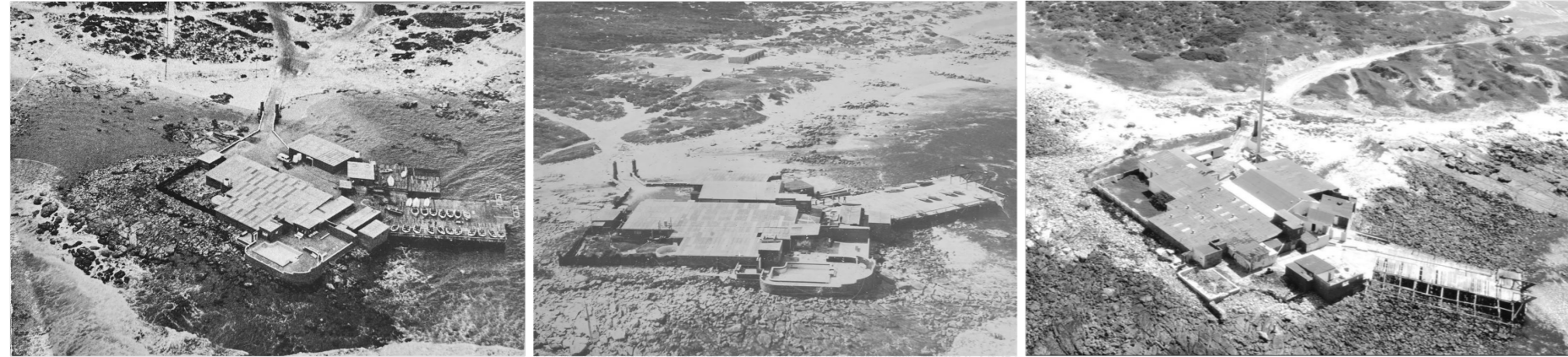
EXISTING COASTLINE:

[witsands beach & landfill; soetwater resort; enviro - education center; kommetjie lighthouse]



CONTEXT - HISTORICAL

[the crayfish factory over the years]



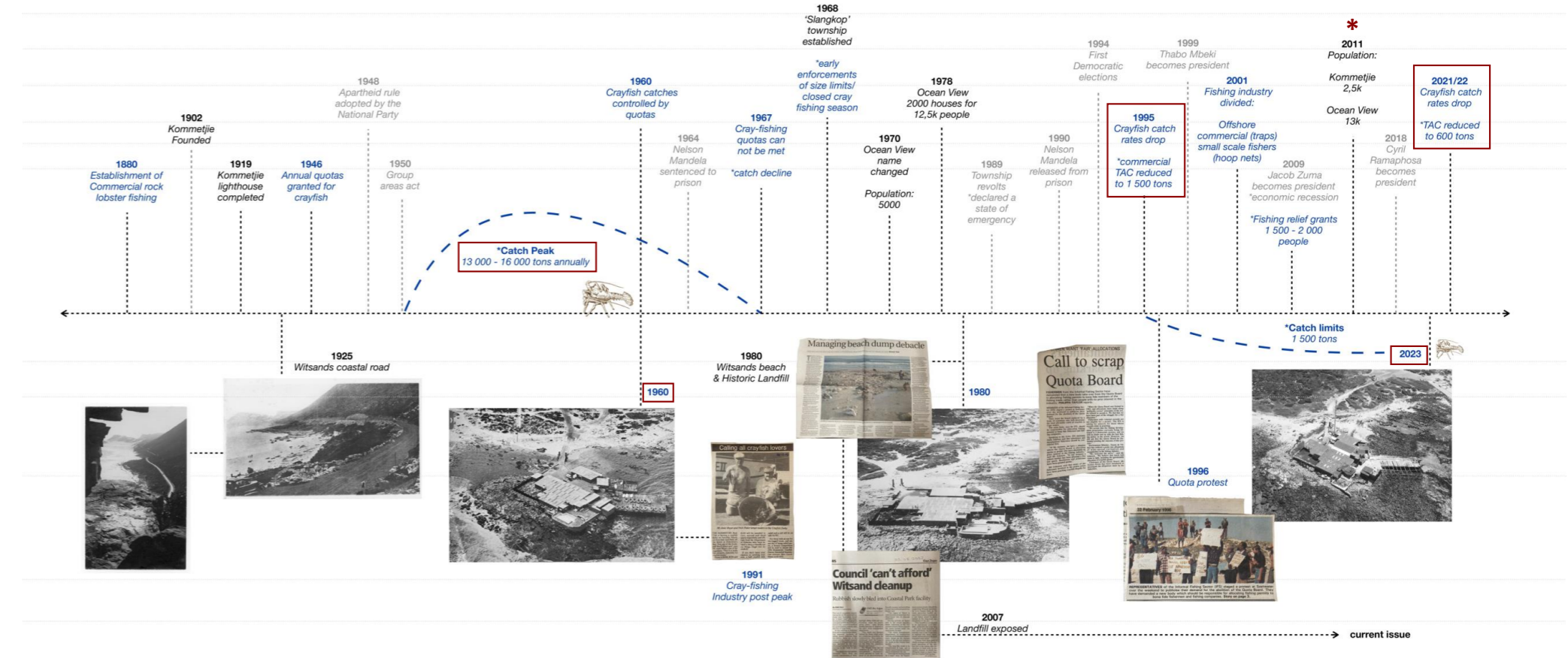
pin-pointing the site within known history

- The time-line above tracks the history of the factory itself in isolation.

- The time-line on the right tracks the factory in relation to the evolution of the quota systems of rock lobster, cultural and legislative changes that impact the people of South Africa which impacted the surrounding communities.

to note:

- the factory was built at the peak to TAC limits of 16000 tons annually.
- the final closure was at the enforcement of the quota systems and therefore the catch limit was not able to support the factory alone
- at present TAC sits at 600 tons



HISTORICAL - CONTEXT

[in relation to significant fishing & general South African history]

PROPOSED PROGRAMMATIC INTRODUCTION:
[multi-use public facility]

Existing functions to remain; factory operations; crayfish capture & export; fish capture & processing.

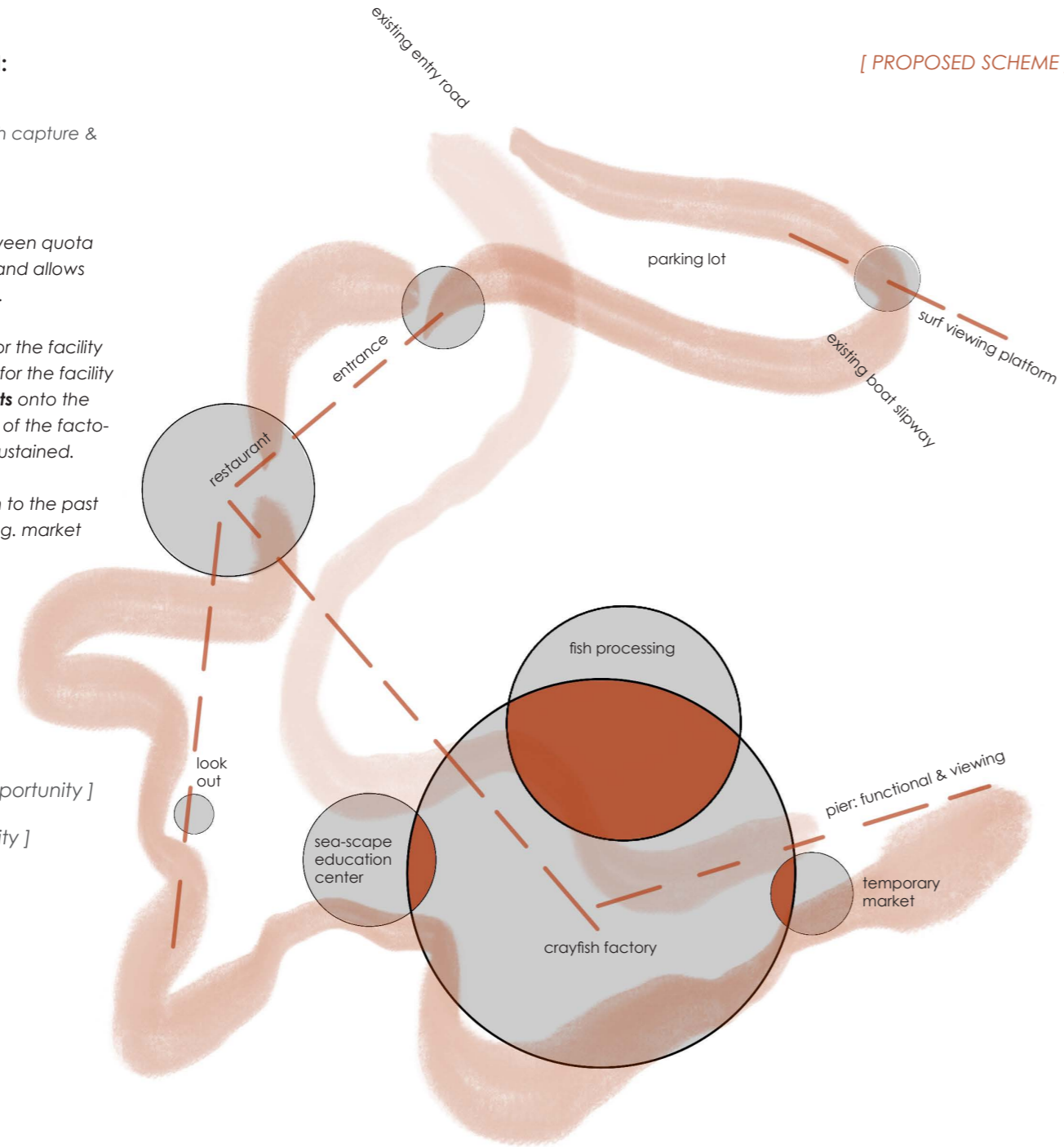
Information gained from **tracking the relationship** between quota developments, historical overfishing and crayfish demand allows the **unsustainable** nature of the factory to be exposed.

The introduction of a **tourism** focused scheme allows for the facility to become more **self-sufficient** and provides a means for the facility to function into the future. The **educational attachments** onto the facility aims at planting the seed for the next **evolution** of the factory space once the crayfish industry can no longer be sustained.

In this final form; the factory would become a museum to the past functions while entertaining the new uses of the site - eg. market space for local goods.

[bringing the public into the site = economic opportunity]

[public into the factory = educational opportunity]



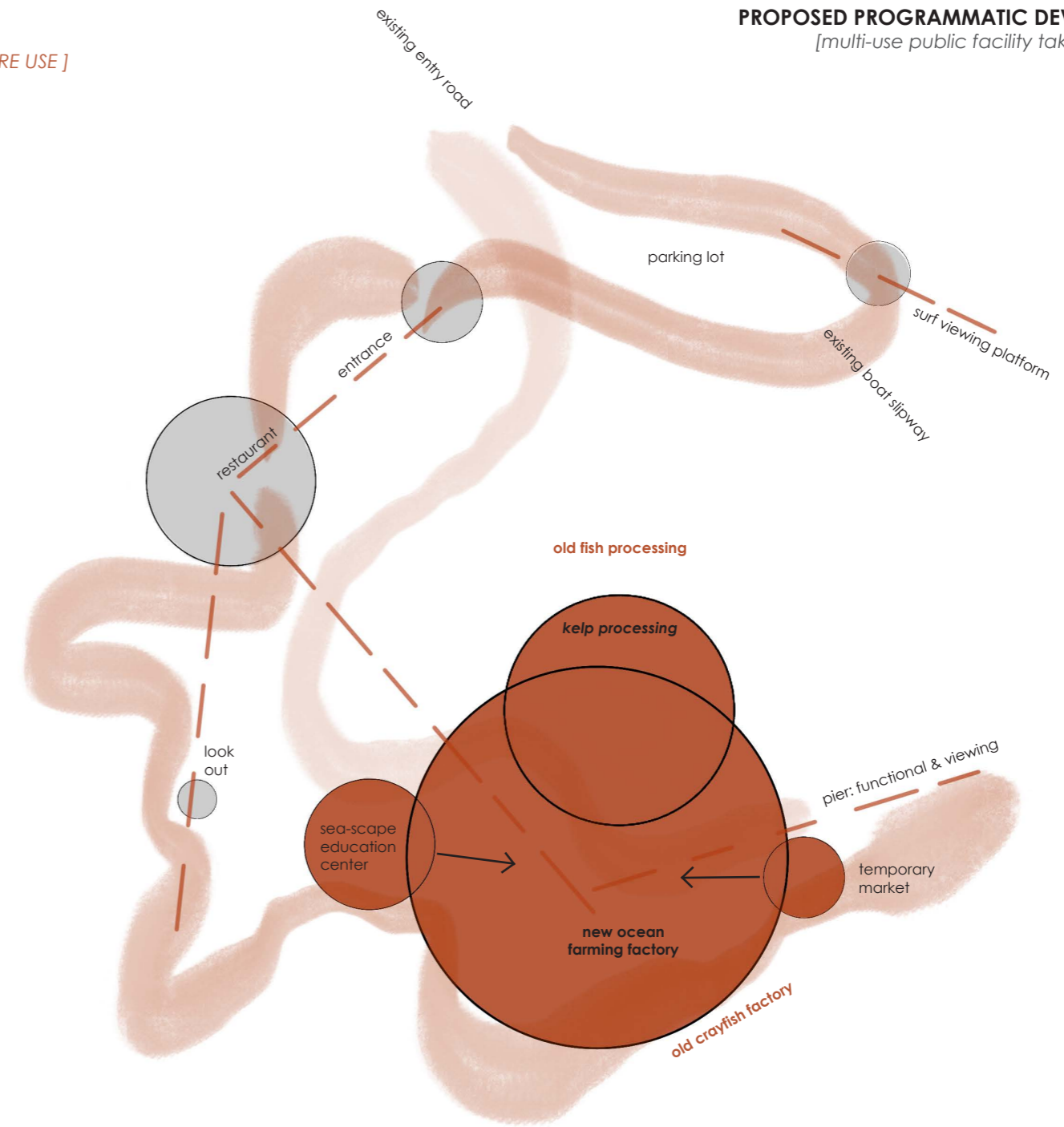
[PROPOSED SCHEME]



[FUTURE USE]

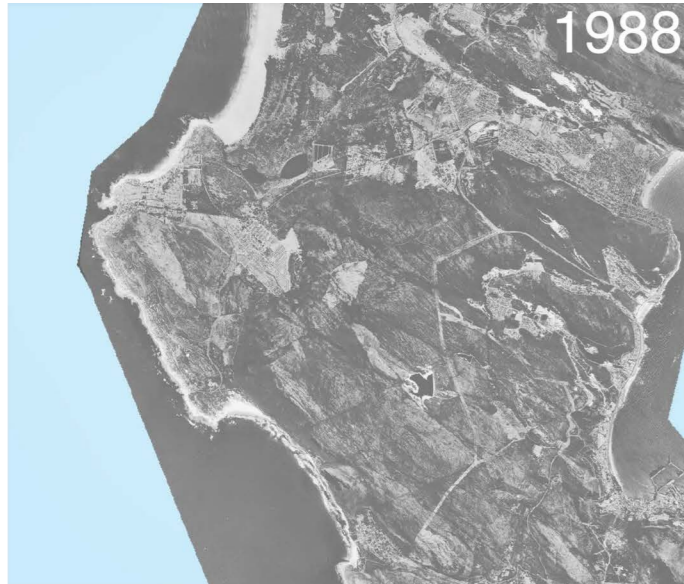
PROPOSED FUNCTIONALITY

PROPOSED PROGRAMMATIC DEVELOPMENTS:
[multi-use public facility takes over old fishing factory]



CONTEXT - HISTORICAL/ENVIRONMENTAL

[the development of the Witsand Historical landfill; an issue until present day]



1988

- Witsands historical landfill active

2009

- Witsands historical landfill issue resurfaces

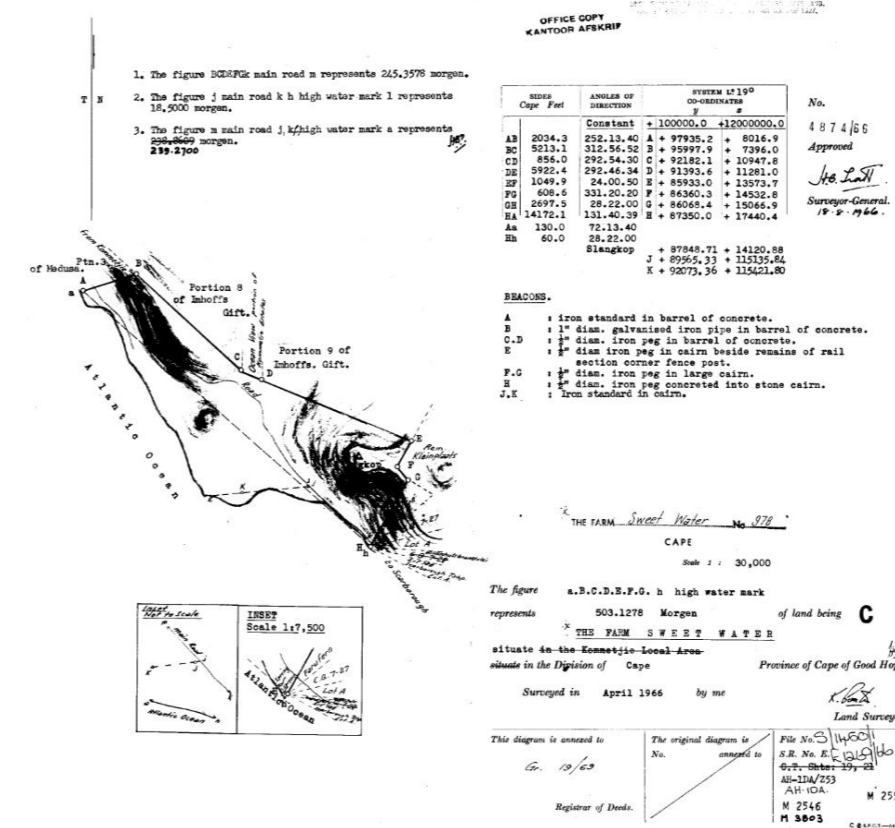
2022

- Witsands historical landfill remains an issue



* local paper 2009: documenting the ongoing environmental disaster;

*present day: awareness, constant monitoring & clean up

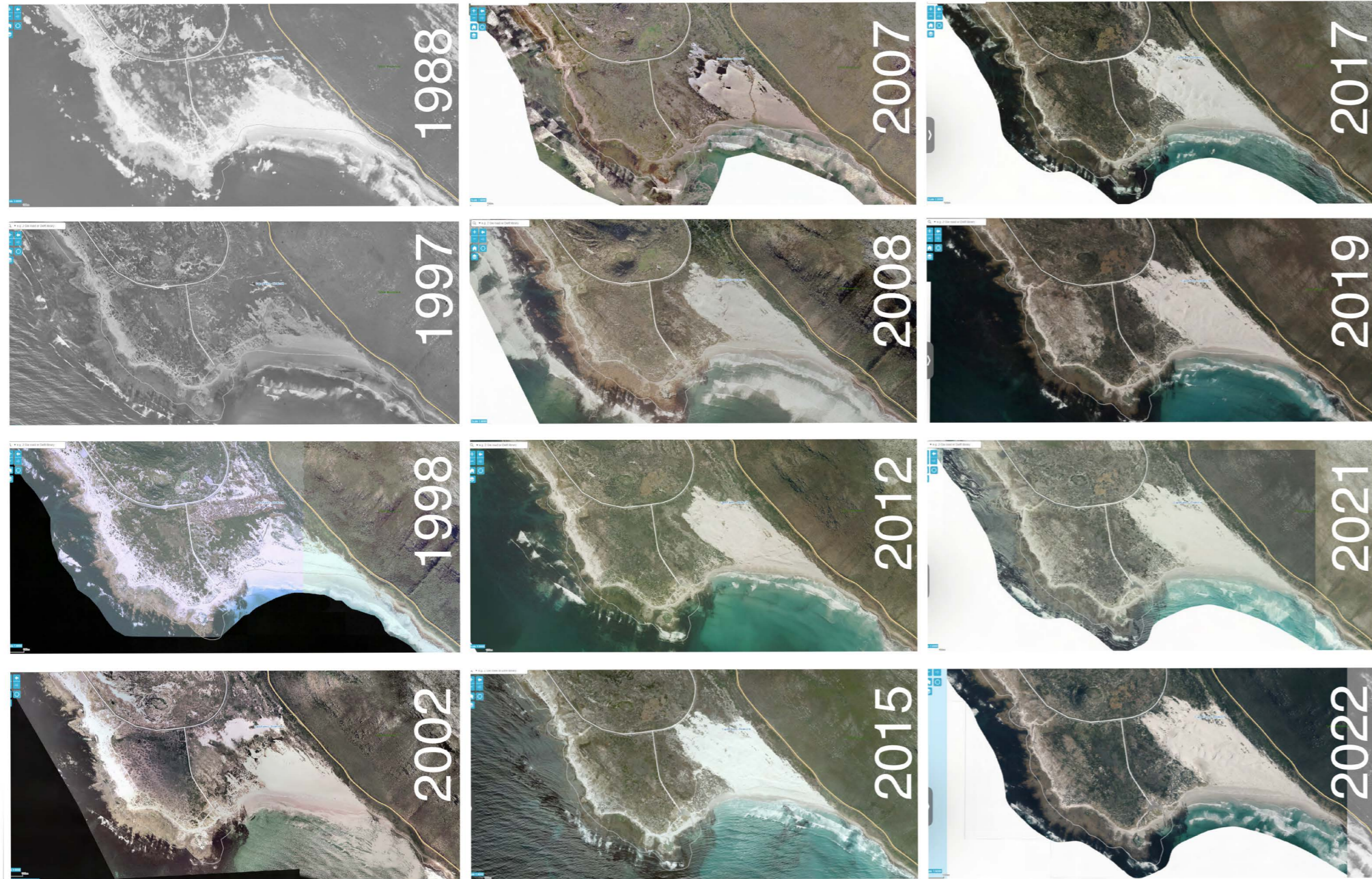


* falls part of un-zoned land within the soetwater resort



CONTEXT - ENVIRONMENTAL

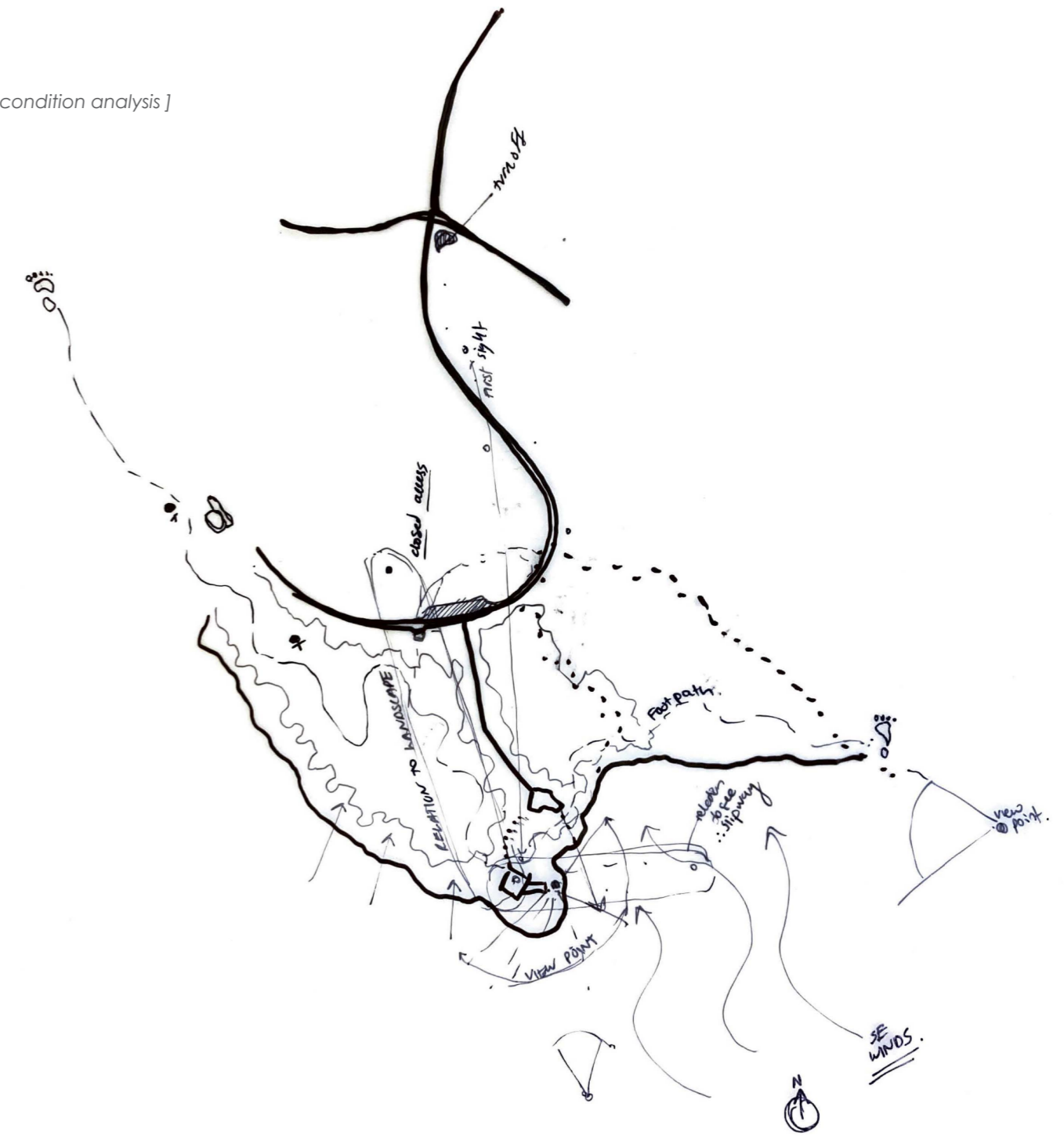
[the site sits on the edge of Table Mountain National Park, est. 1998]



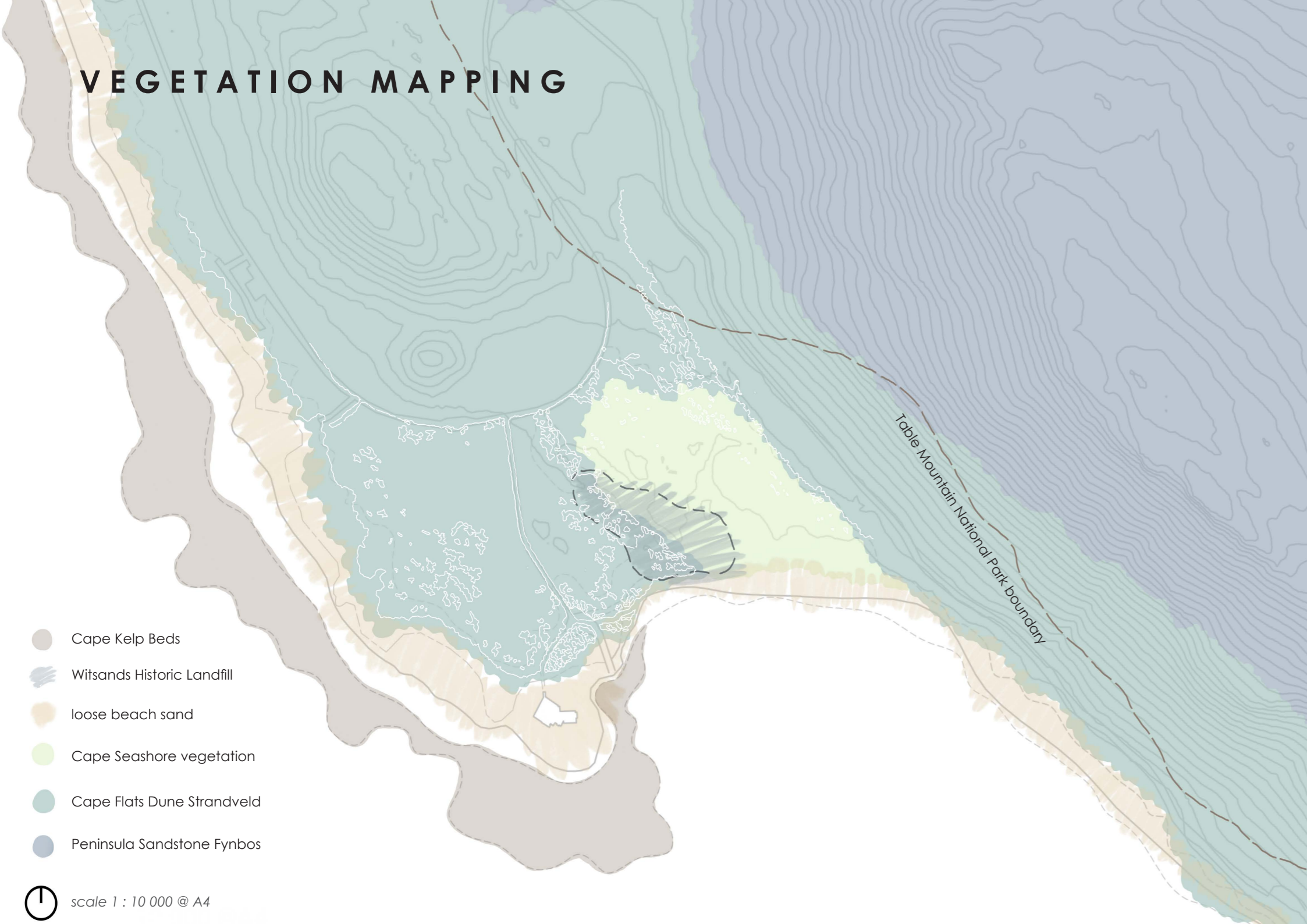
[SITE OVER THE YEARS]

SITE ANALYSIS:

[edge condition analysis]



VEGETATION MAPPING



- Cape Kelp Beds
- Witsands Historic Landfill
- loose beach sand
- Cape Seashore vegetation
- Cape Flats Dune Strandveld
- Peninsula Sandstone Fynbos

scale 1 : 10 000 @ A4

SITE ANALYSIS : ENVIRONMENTAL

[unique and diverse vegetation throughout the site]



peninsula sandstone fynbos
 Status: least threatened
 Type: tall trees; tall shrubs; low shrubs

cape flats dune strandveld
 Status: **endangered**
 Type: tall shrubs; low shrubs; succulent shrubs; grasses

cape kelp forrests:
 Status: least threatened
 Type: kelp; parasitic algae

cape seashore vegetation:
 Status: least threatened
 Type: low shrubs; succulent shrubs; succulent herbs



closer look at cape flats dune strandveld:

Status: **endangered**

Type: tall shrubs; low shrubs; succulent shrubs; grasses



metalasia muricata



olea exasperata



rhus glauca



rhus laevigata



roepera flexuosa



osteospermum moniliferum

plant scale:



cape seashore vegetation:

Type: low shrubs; succulent shrubs; succulent herbs



cape flats dune strandveld:

Type: tall shrubs; low shrubs; succulent shrubs; grasses



peninsula sandstone fynbos:

Type: tall trees; tall shrubs; low shrubs

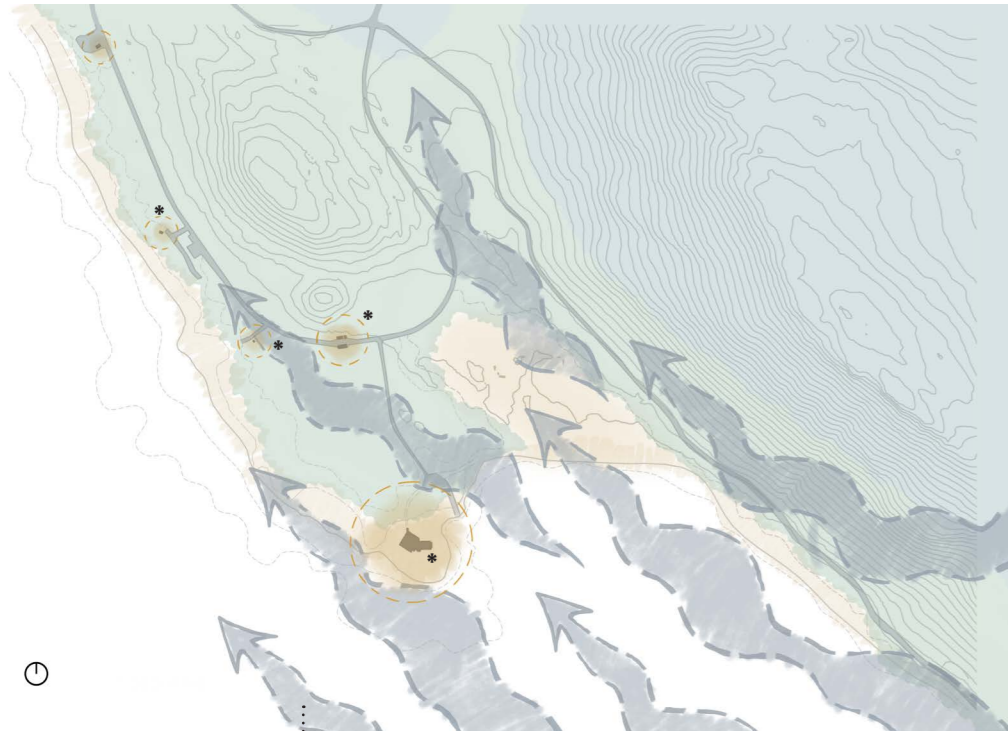
SITE ANALYSIS: ELEMENTAL

[edge condition analysis]

scale 1 : 10 000 @ A4

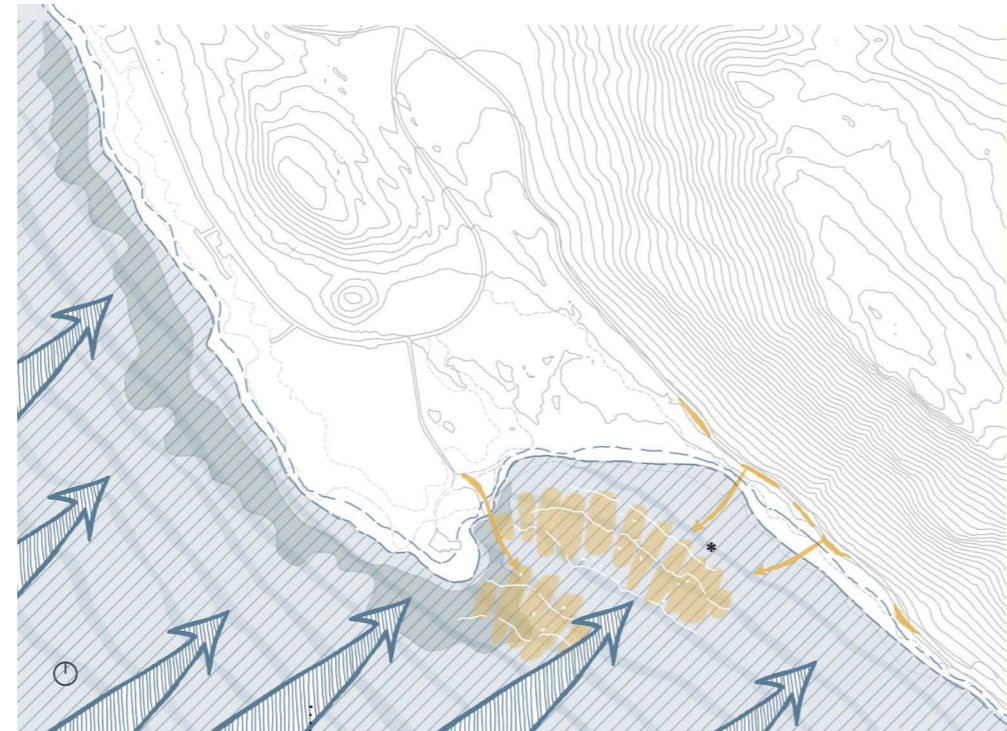
SITE ANALYSIS : ELEMENTAL

[weathering factors]



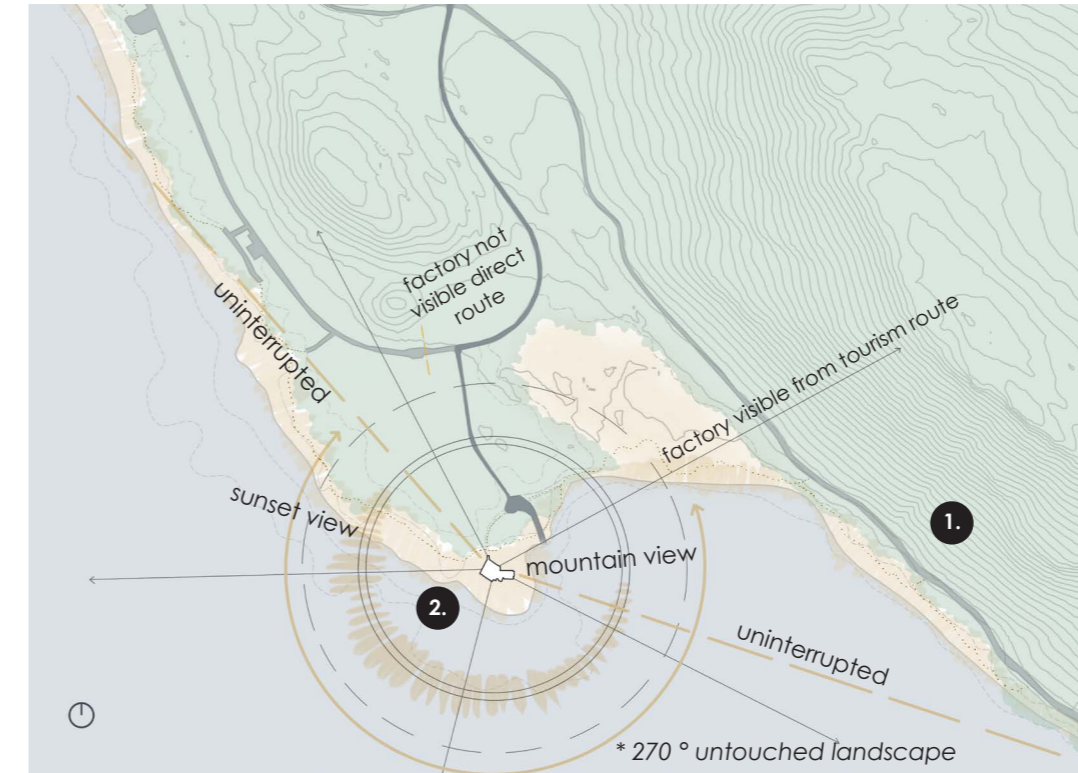
wind:
exposed: South/ South Easter
protected: North/North wester

*** existing structures**
- crayfish factory
- soetwater entrance
- soetwater ablutions



Swell:
exposed: onshore/ SW
protected: offshore/ NE

*** recreational zone**
- surfing
- wind surfing etc.
[parking areas yellow]



SITE ANALYSIS : EXPERIENTIAL

[spatial memory & experience driven architecture]

[mountain views from the factory]



[ocean views from the factory]

1.



MAPPING & MAKING

digitizing the uncharted:

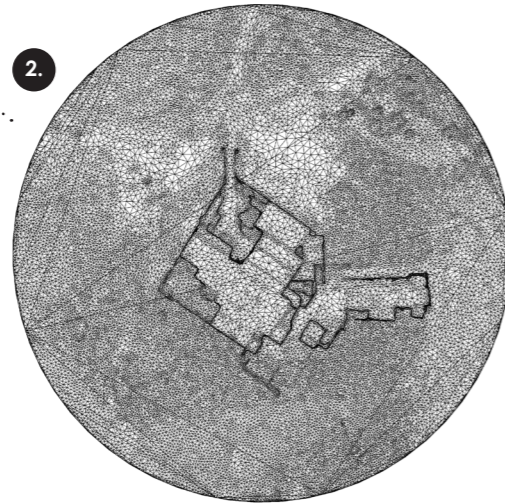
[capturing detailed textures of the existing]

Made use of aerial drones to capture the existing factory structure; it's textures & form [weathering & ruin]

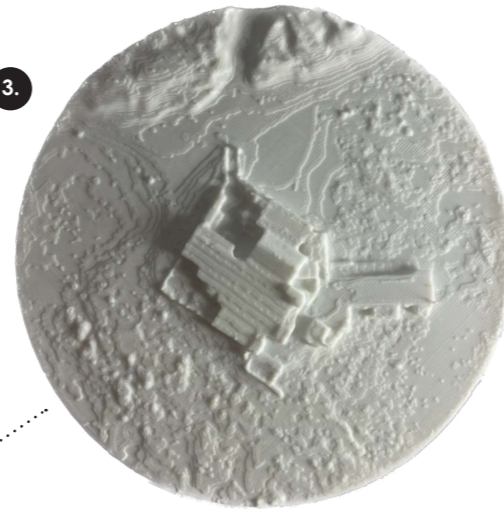
challenge:

- the edge condition = inaccessible [air / foot]
- undocumented part of the world; [below sea level]
- exposed environmental conditions

2.



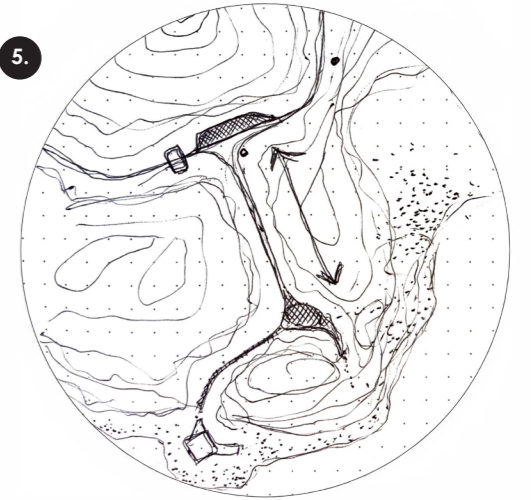
3.



4.



5.



6.



- created a series of **3D printed models** of the landscape and structure to help understand the height and spatial relations when working between scales

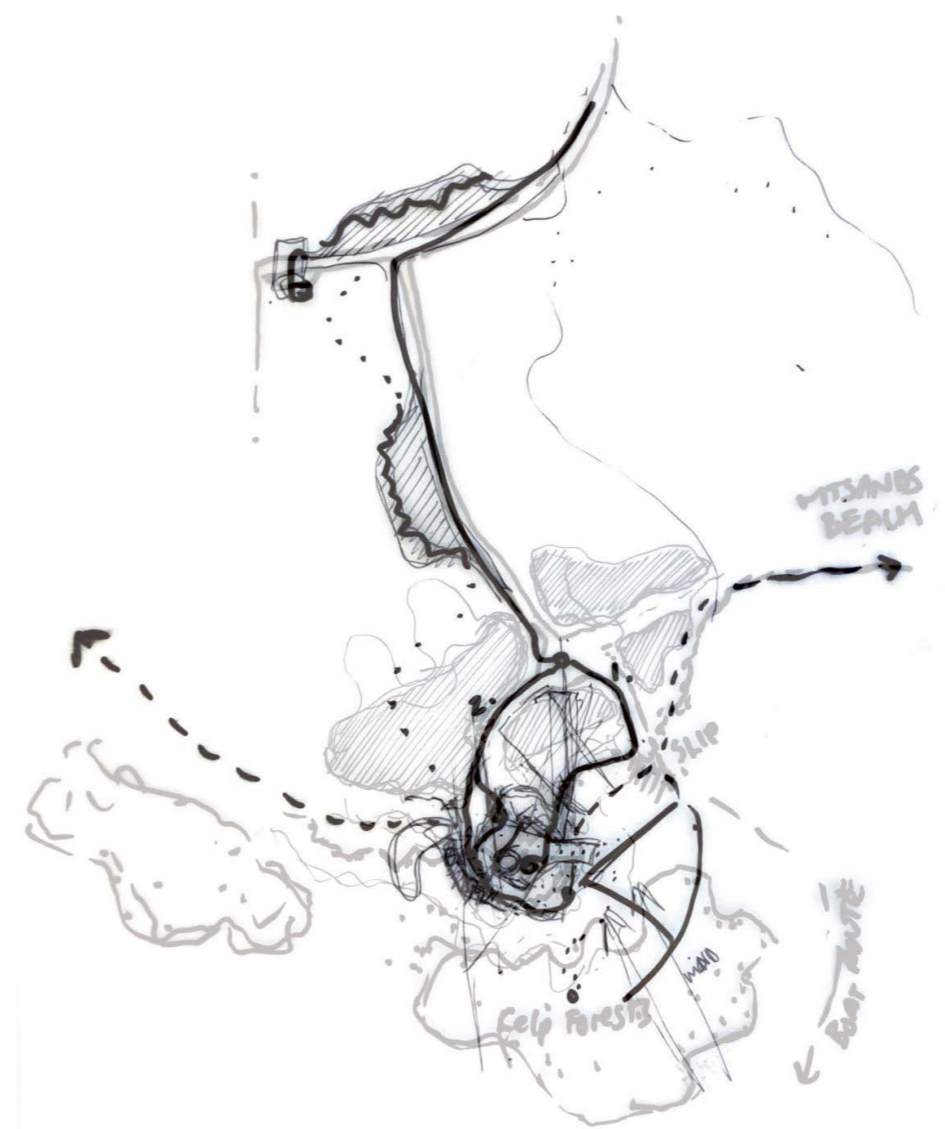
- **massing models** used to explore **potential intervention placements** based upon contours and surrounds ; how could the mountain range facilitate a conversation towards the factory

digital to the physical :

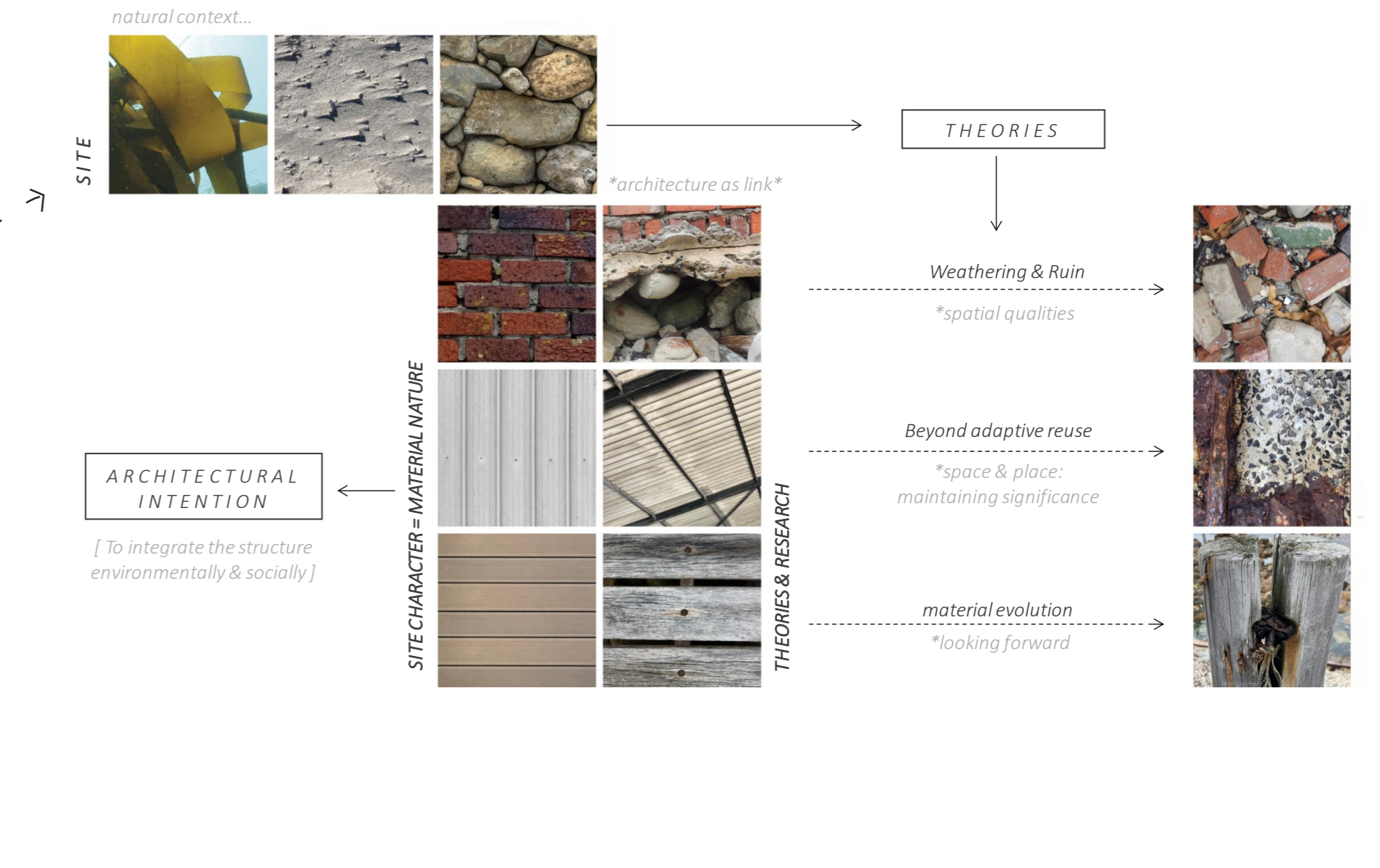
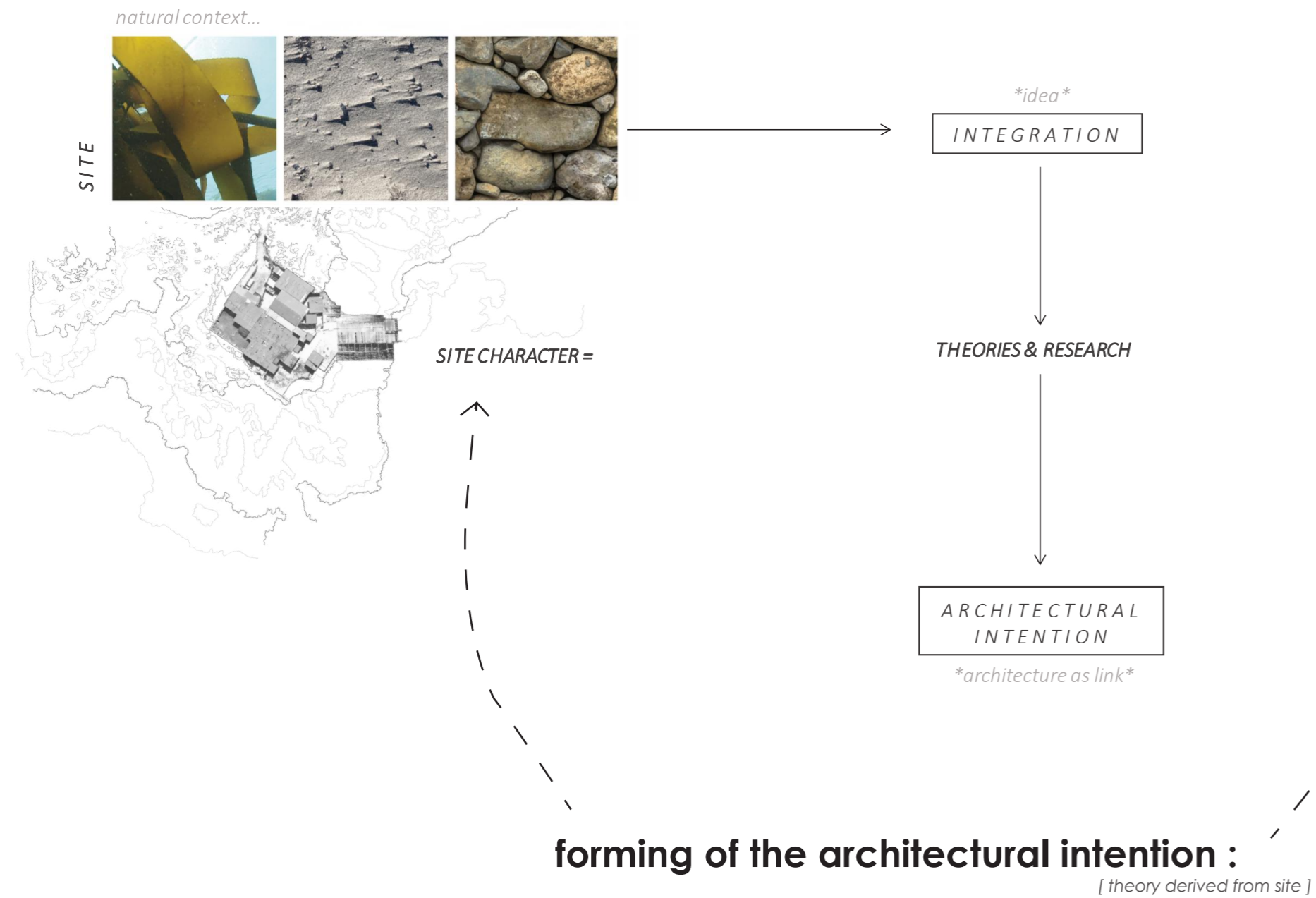
[3D explorations testing scale]



scale 1 : 10 000 @ A4



architectural approach
[at an urban scale]



[architectural intention]

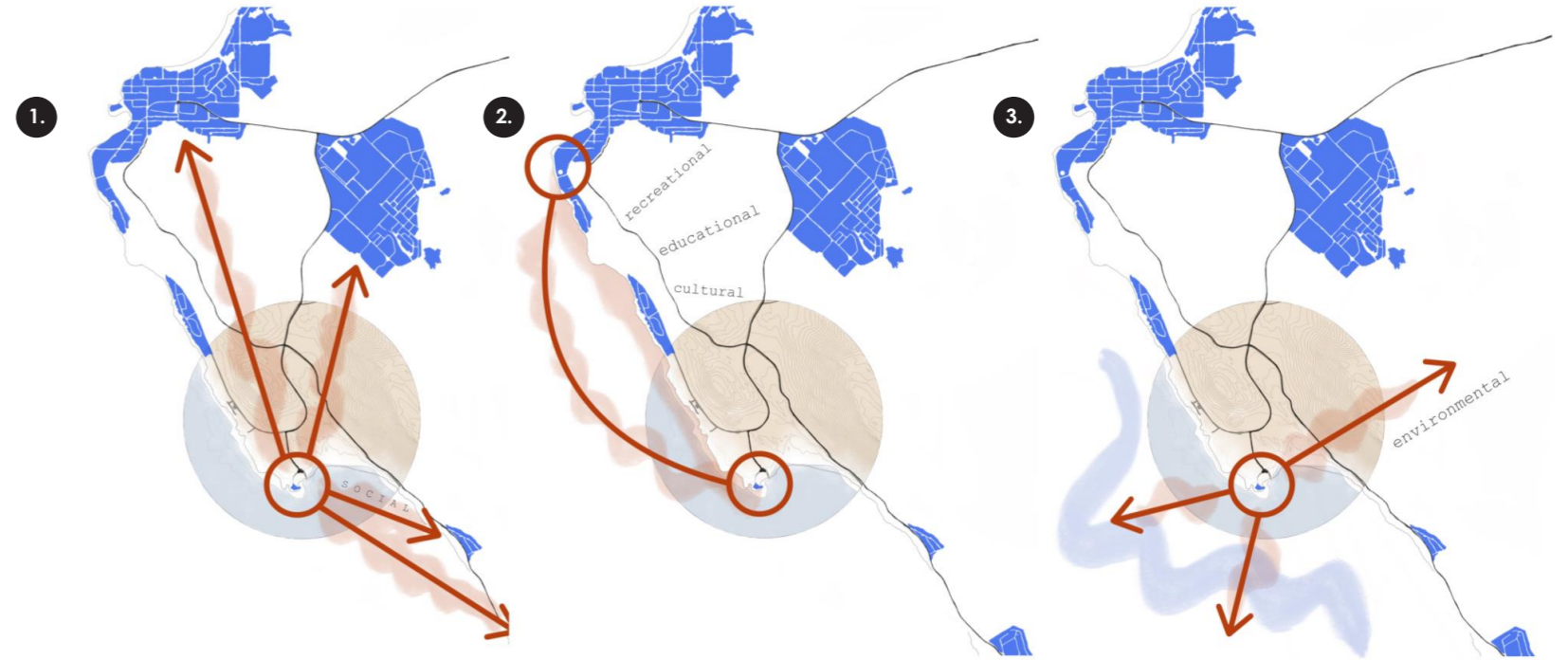
from neglect ...



ARCHITECTURAL INTENTION

?

→ ... to opportunity :
[opportunity through three lenses]



* connect separated suburbs
SOCIAL

* unlock precinct
EXPERIENTIAL

* bridge between land & sea
ENVIRONMENTAL

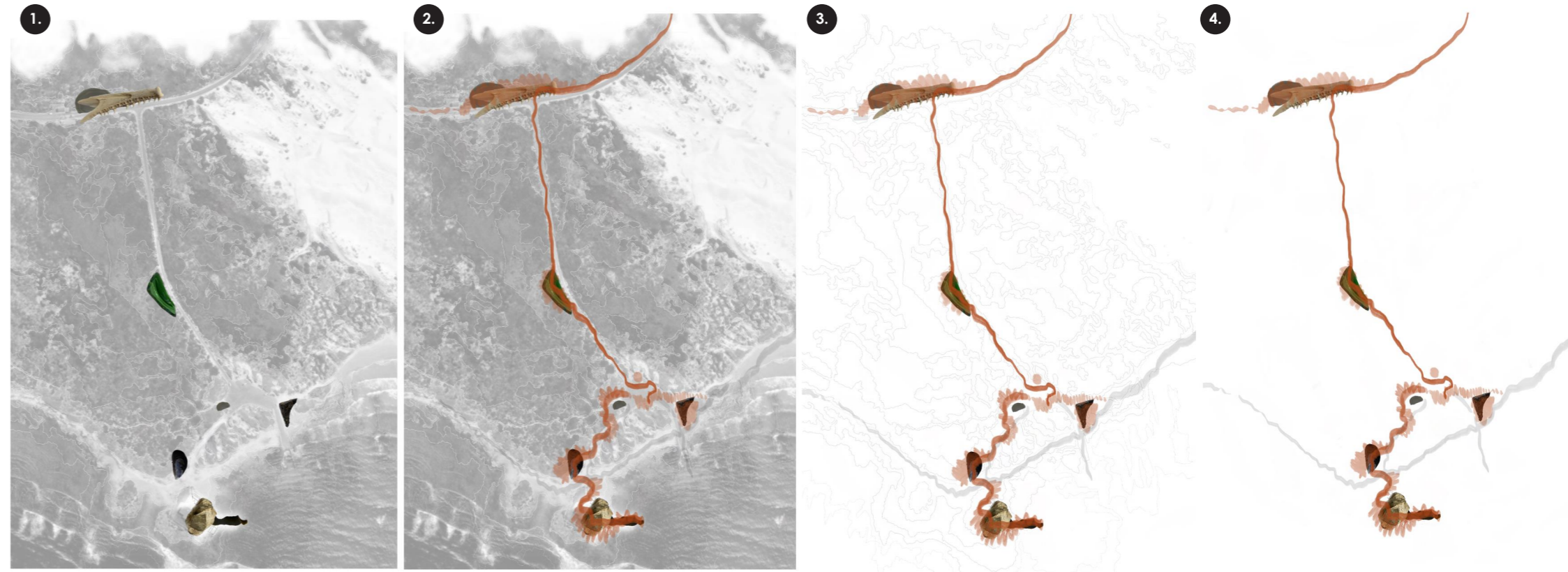
FOUND MATERIALS : SPATIAL PLANNING

[naturally weathered materials found on site & used to define the proposal spatially]



1. dried kelp
2. fish mandible
3. dried cloth & string
4. cuttle fish shell
5. rock cement emulsification
6. fresh glass

7. construction rubble from ruins
8. dune creature mandible
9. red sedimentary rock
10. rock encased with concrete
11. sharp brick piece
12. sea glass



occupying the site with pieces of site :

[how to maintain the character of the site with new architecture]

formalizing the abstract :

[working with the site's existing amenities]

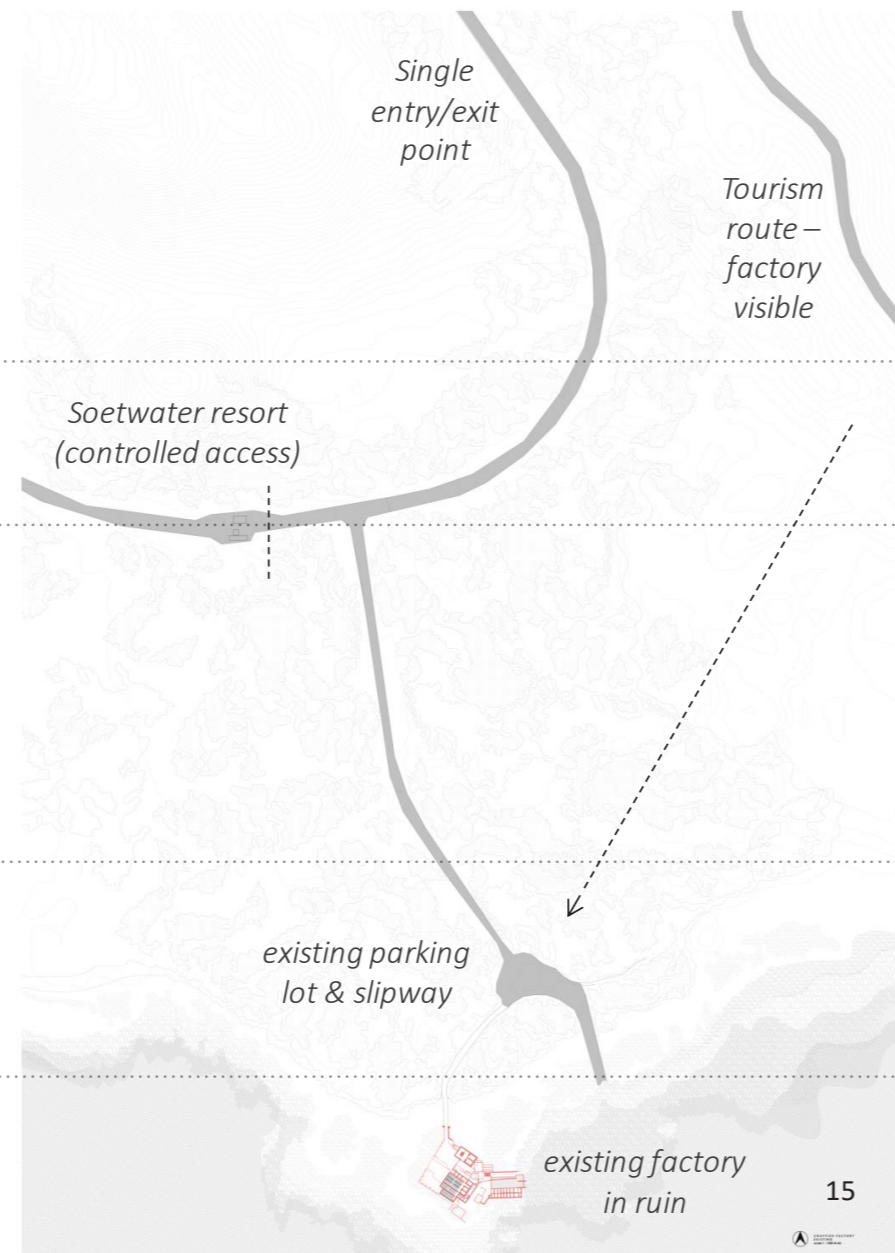
1. tarred road to carpark
2. tarred car park
3. tarred formal slipway for boats
4. informal sand road to factory
5. informal surfer access off slipway
6. single entry & exit point

1.



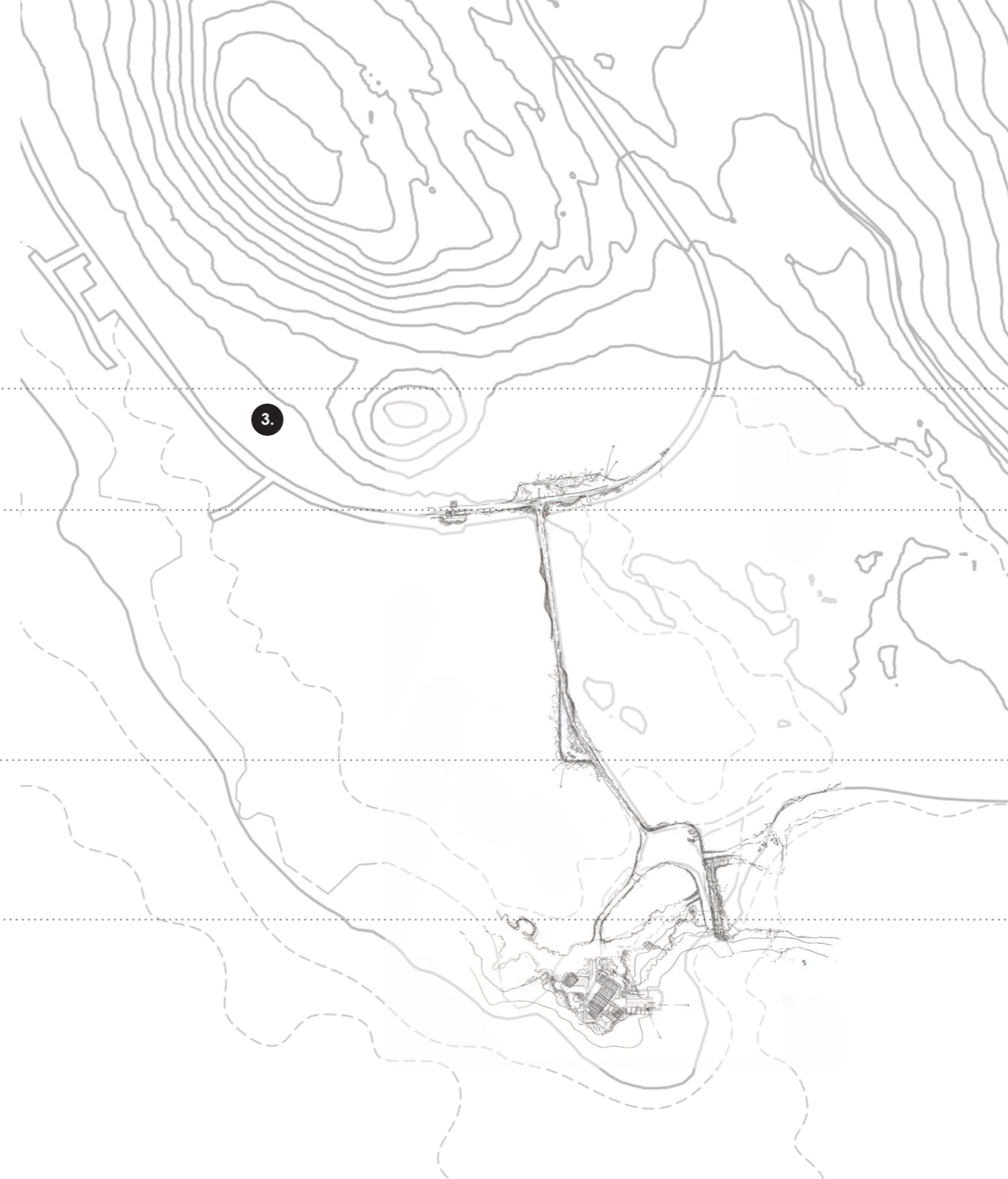
[abstracted proposal for spatial planning]

2.

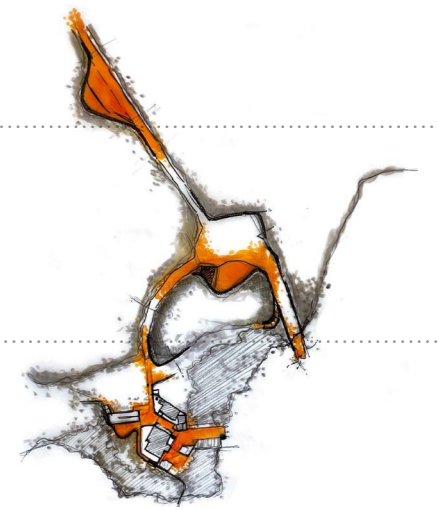


[formalized plan of the existing]

3.



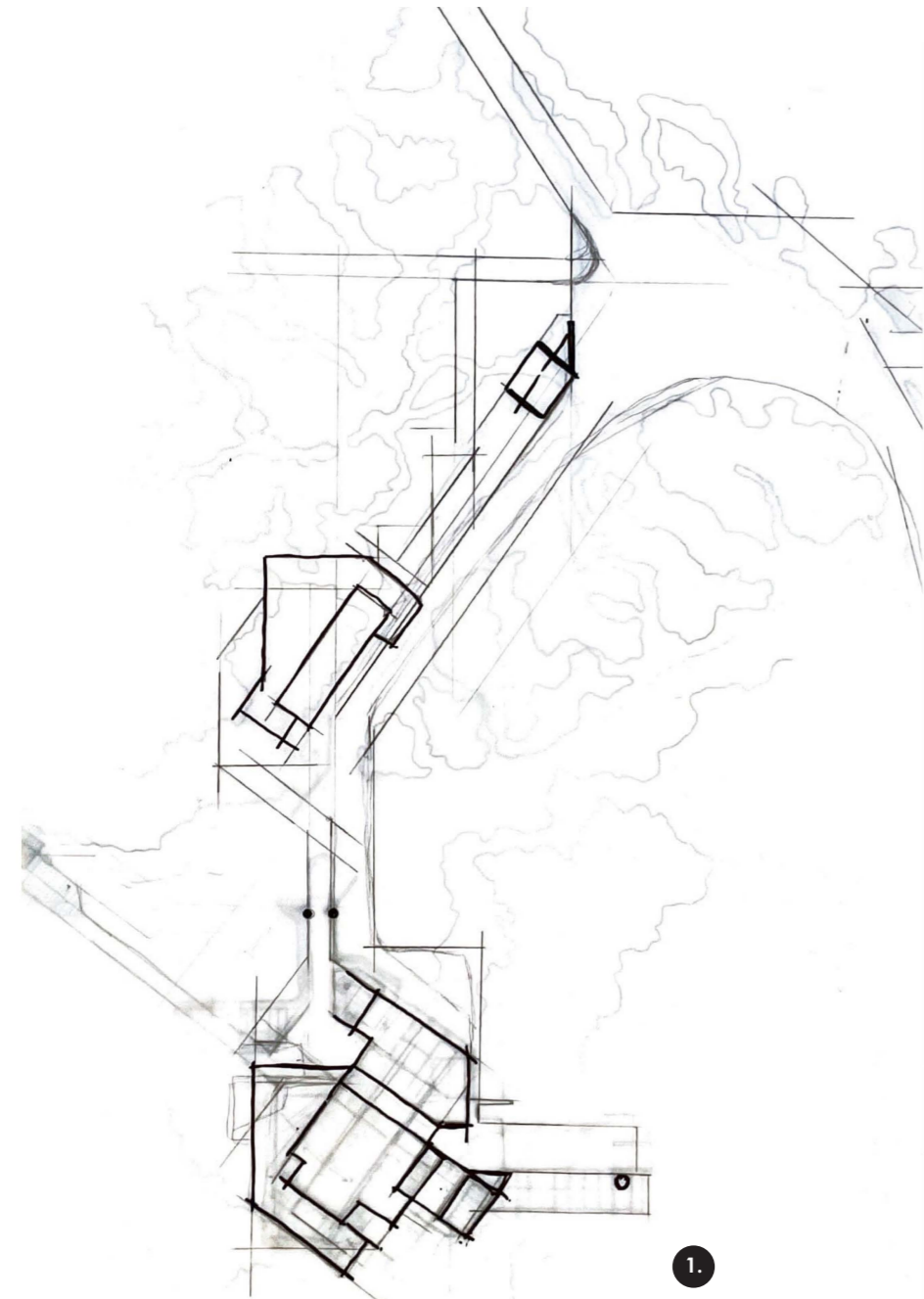
4.



[initial site sketches of urban proposal]

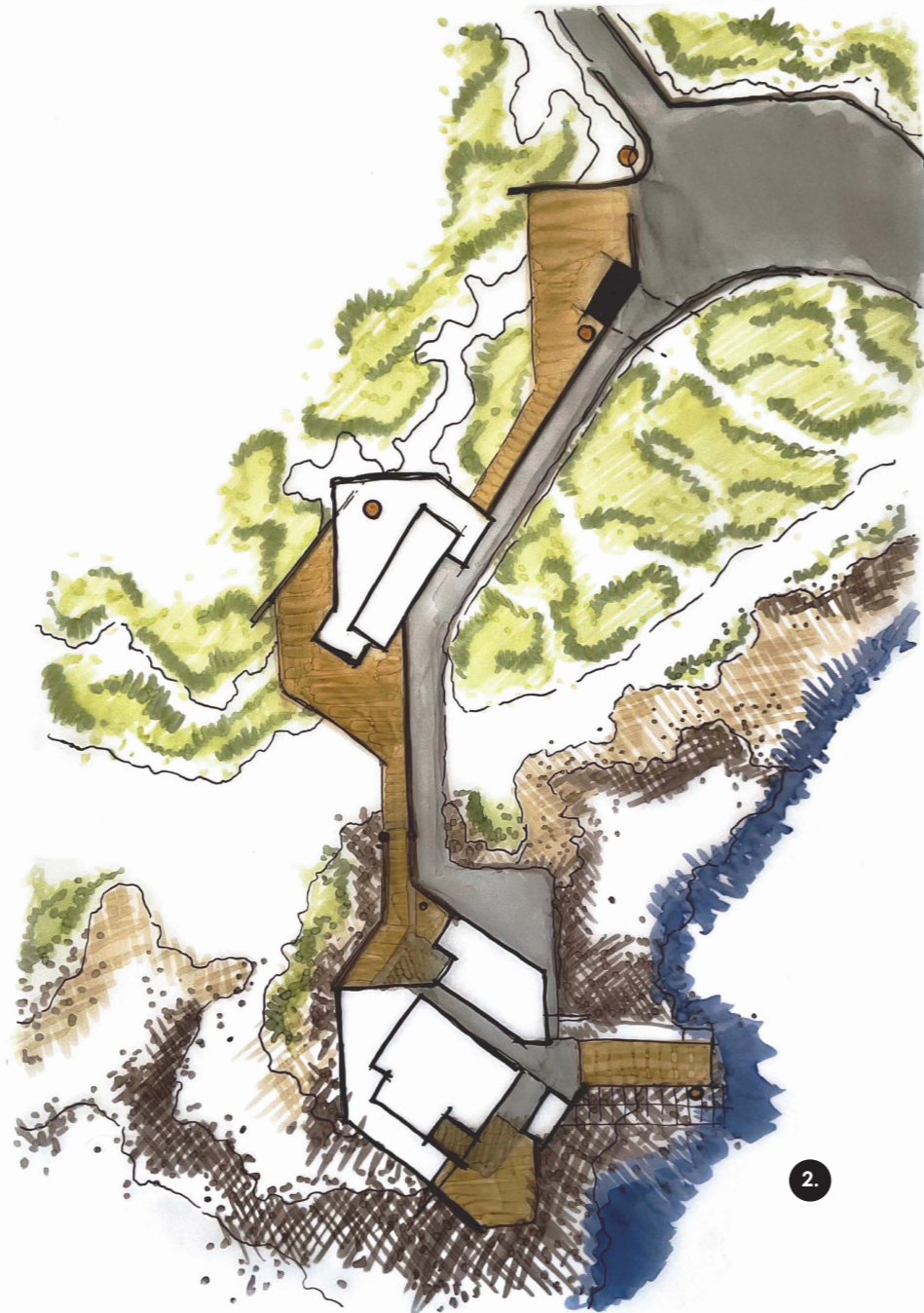
NEW SCHEME:

1. gravel pull over zones for rest
2. picnic zones / braai facilities
3. pull over zone on single lane road; allow traffic to pass
4. formal entry/exit from slip way for pedestrians
5. formal viewing platform for sport spectators
6. intervention at the factory that draws public use



[site sketches of the proposed staggered intervention]

[bringing in the environmental layer]



proposed intervention:

[working with the existing factory functions & embracing the tourism of the area & natural landscape]



→ Coastline check in point (entrance to boardwalk)

→ Medium sized restaurant (150 seater)

→ Ocean museum/ seascape education centre

→ Existing crayfish, white mussel & fish processing factory

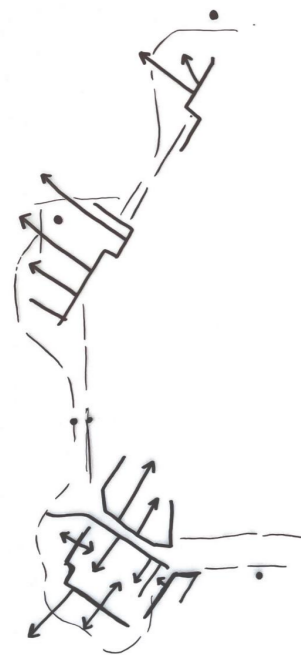
→ Temporary ocean market space

[inside the proposal]

FORMING OF ARCHITECTURAL PRINCIPLES:

[working with the idea of a staggered intervention to activate a larger portion of site]

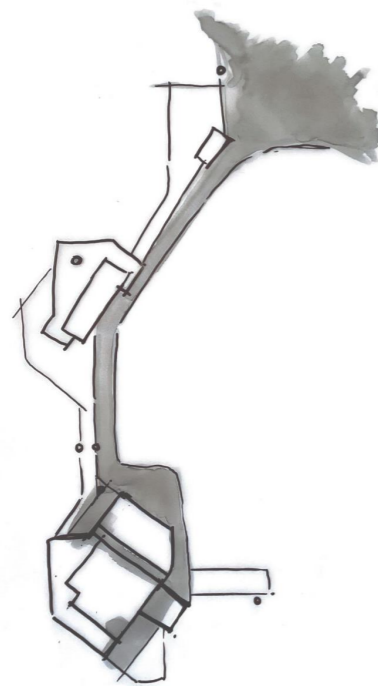
1.



[OUTWARD FACING]

1. visual connection to the surrounding landscape ; form to look out

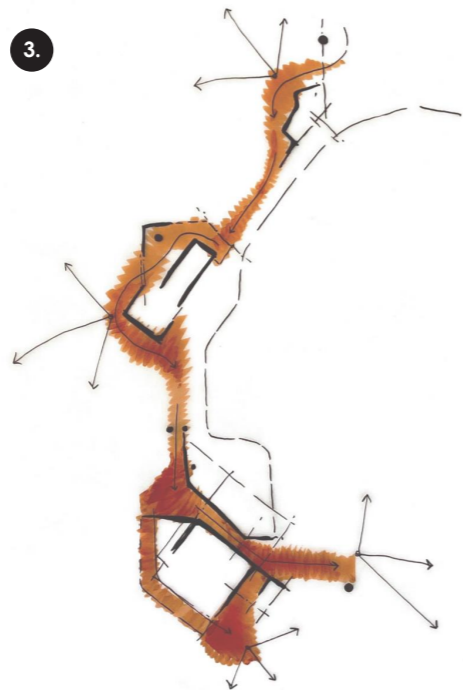
2.



[ESTABLISH ROUTES]

2. establish a pedestrian route of access; separate from the existing sand vehicle route

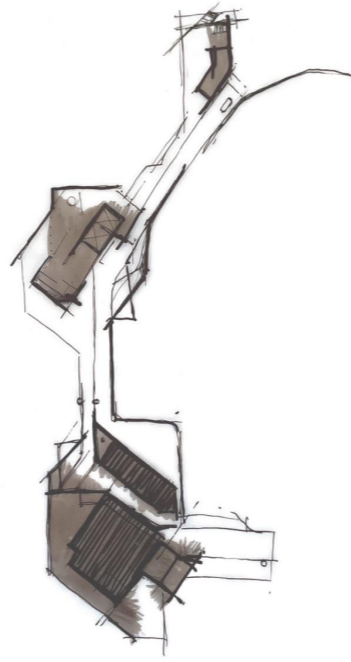
3.



[JOURNEY & DESTINATION]

3. moments of rest along movement route ; idea of pedestrian journey and destination

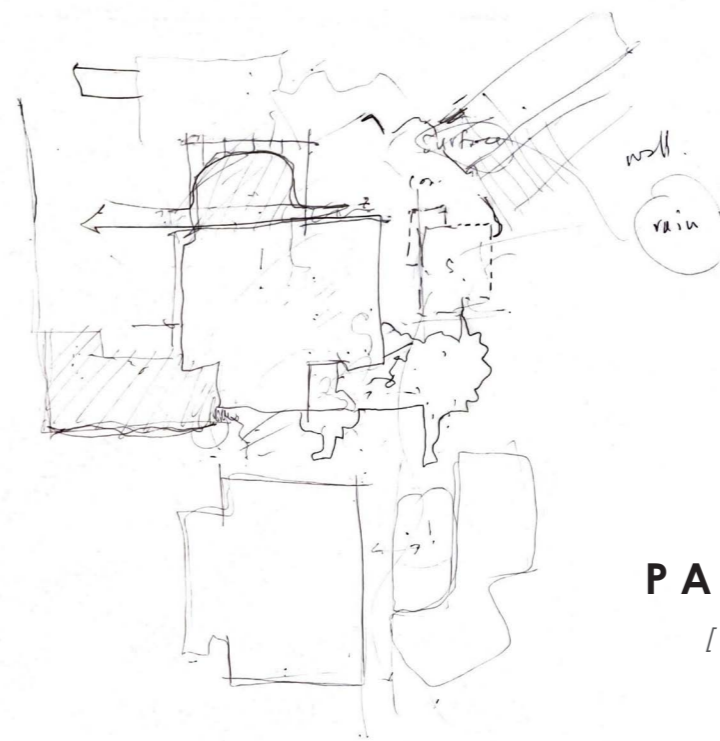
4.



[BLURRED EDGES]

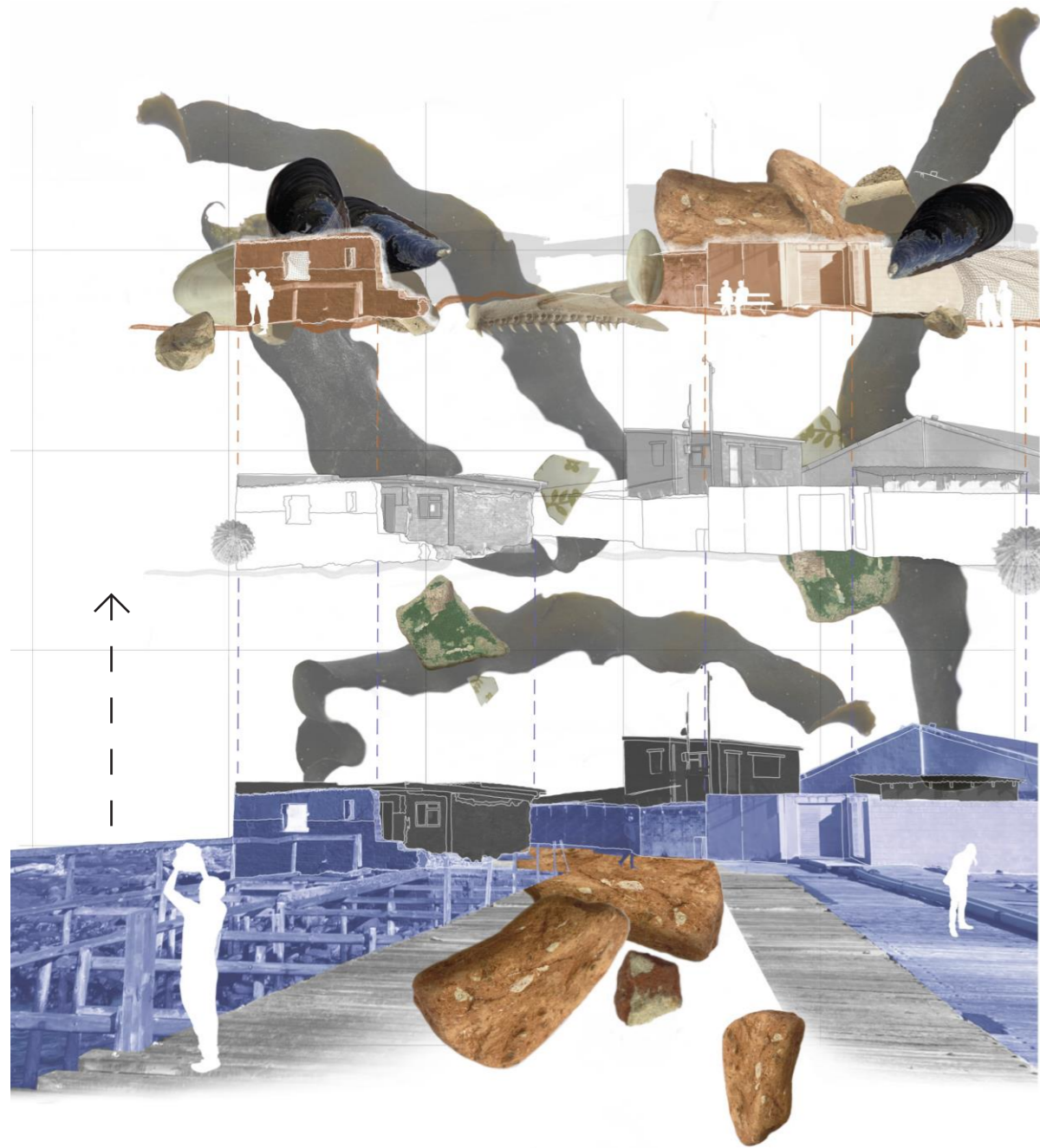
4. building expanding beyond structure into the landscape; softening build & natural threshold





PART 03

[structure beyond adaptive reuse]



'beyond adaptive reuse'

↑
letting the new scheme adapt

↑
developing a related scheme

↑
deciding what to use / discard

- **theory** behind working beyond adaptive reuse

- principles around adaptive reuse **re-imagine** how an existing structure will change to **serve a new purpose**, thus replacing the original purpose.

- this intention is about **transforming the use**, slowly and with community investment to ensure **the idea progresses with time**

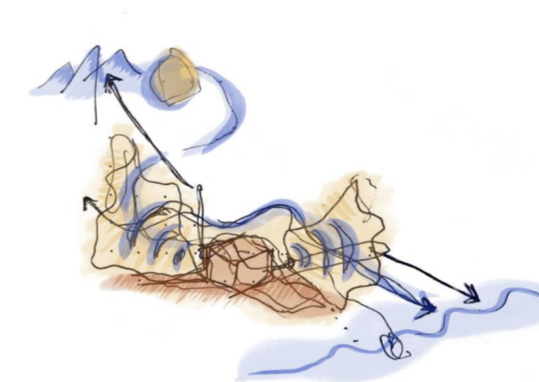
- introducing a **multidisciplinary** approach will help the facility from from a singular purpose while all the while becoming **self-sufficient**

ARCHITECTURAL CONCEPTS:

[architectural intention of bringing use & activity to a neglect site]

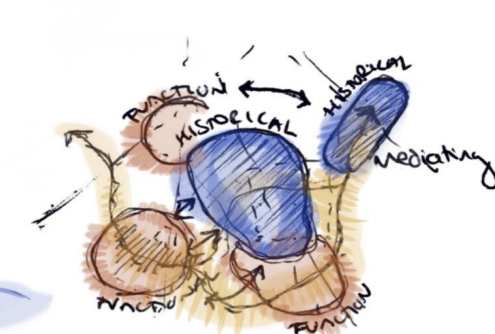
↓
informed by:
theory & architectural intent

ENVIRONMENTAL



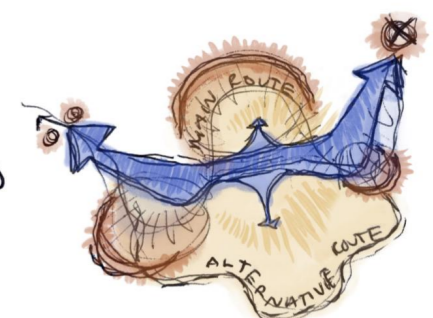
[structure connecting land/sea
unifying with context]

SOCIAL



[structure mediating
past/present/future]

EXPERIENTIAL

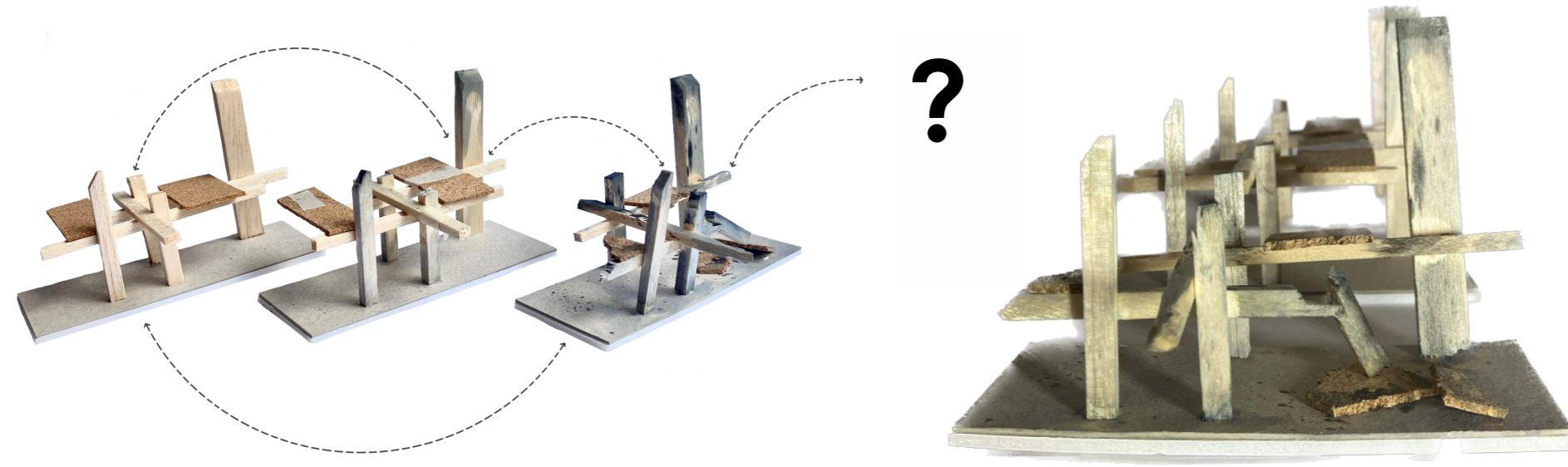


[idea of structure as destination
with route established]

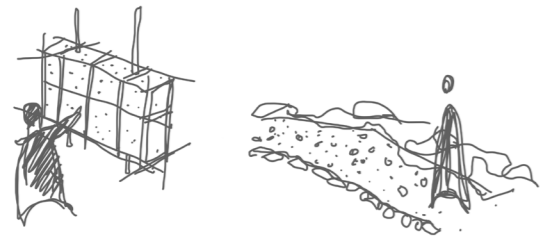
[architectural intention of bringing use & activity to a neglect site]

THE INEVITABILITY OF WEATHERING:

[how to maintain the character of the site & design for the future of the structure]



- the design must **embrace the natural context** by making use of existing materials
- challenge the idea of **temporarily & permanence** with designed **degradation & maintenance** to encourage community involvement & link identities & space
- making use of **existing & waste materials** to form the new design is both more **sustainable** and poetic;



[reusing construction debris in gabion cages in walls & ass aggregate for roads]

[making the new...

CAPTURING SITE CHARACTER : THROUGH MATERIALITY

EXPERIENTIAL

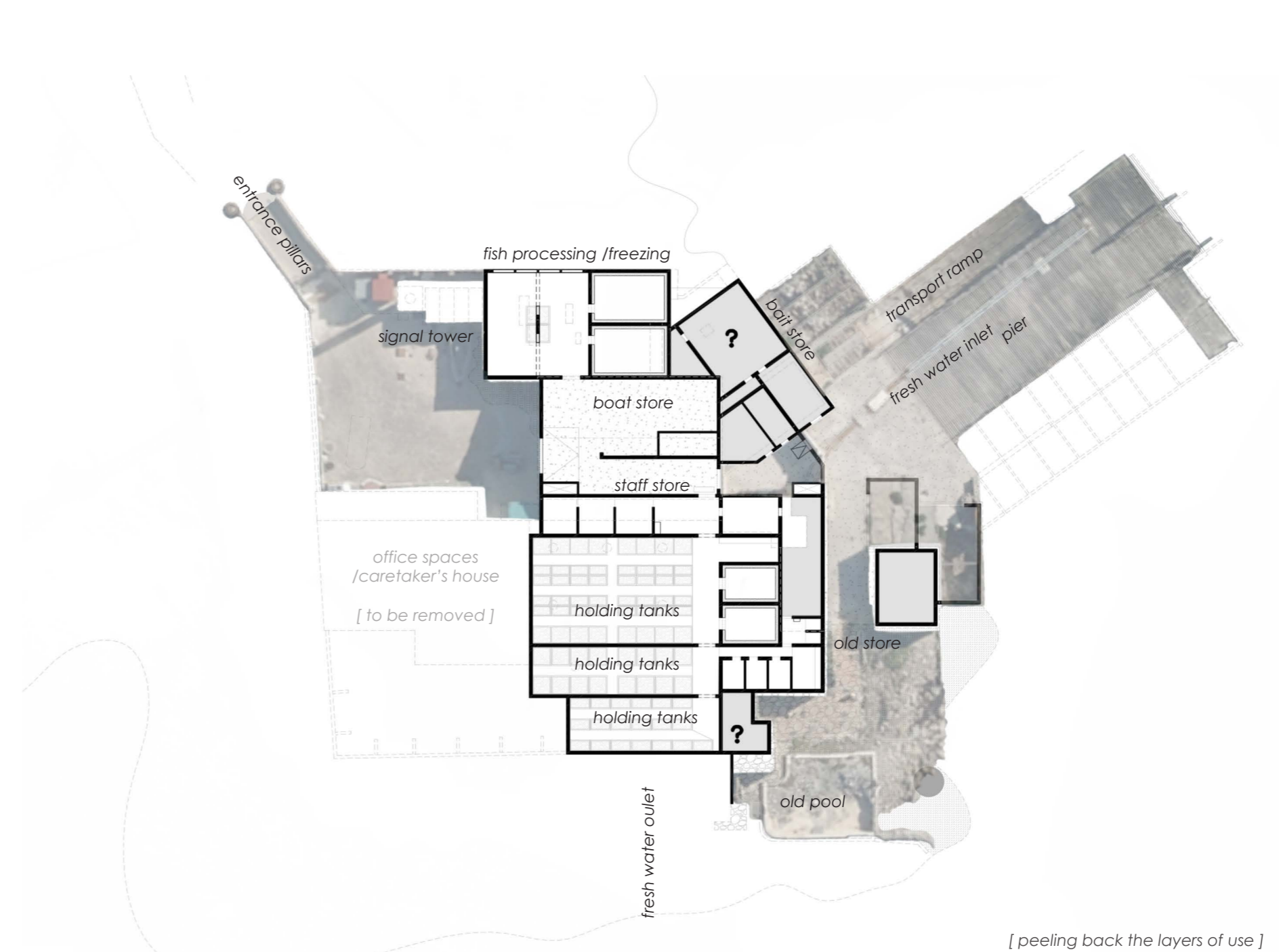


[how can these worn and waste elements form an integral part of the new intervention]

... from the old]



scale 1 : 500 @ A4



scale 1 : 500 @ A4

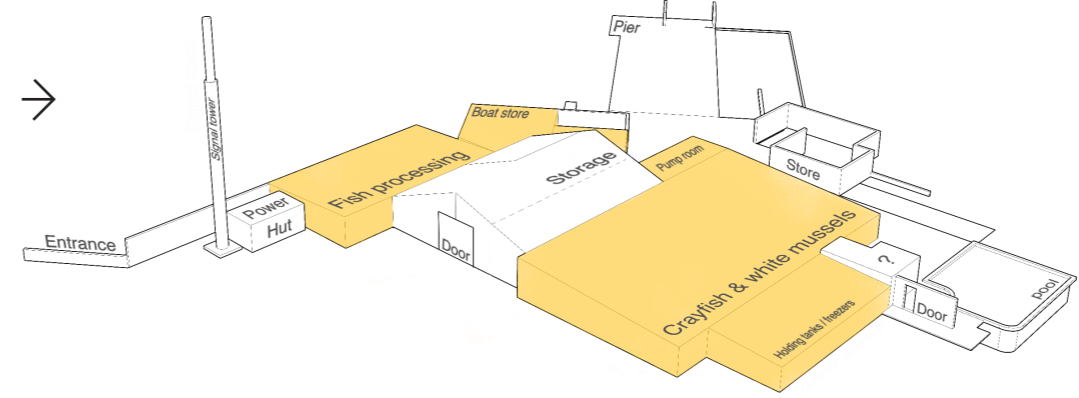
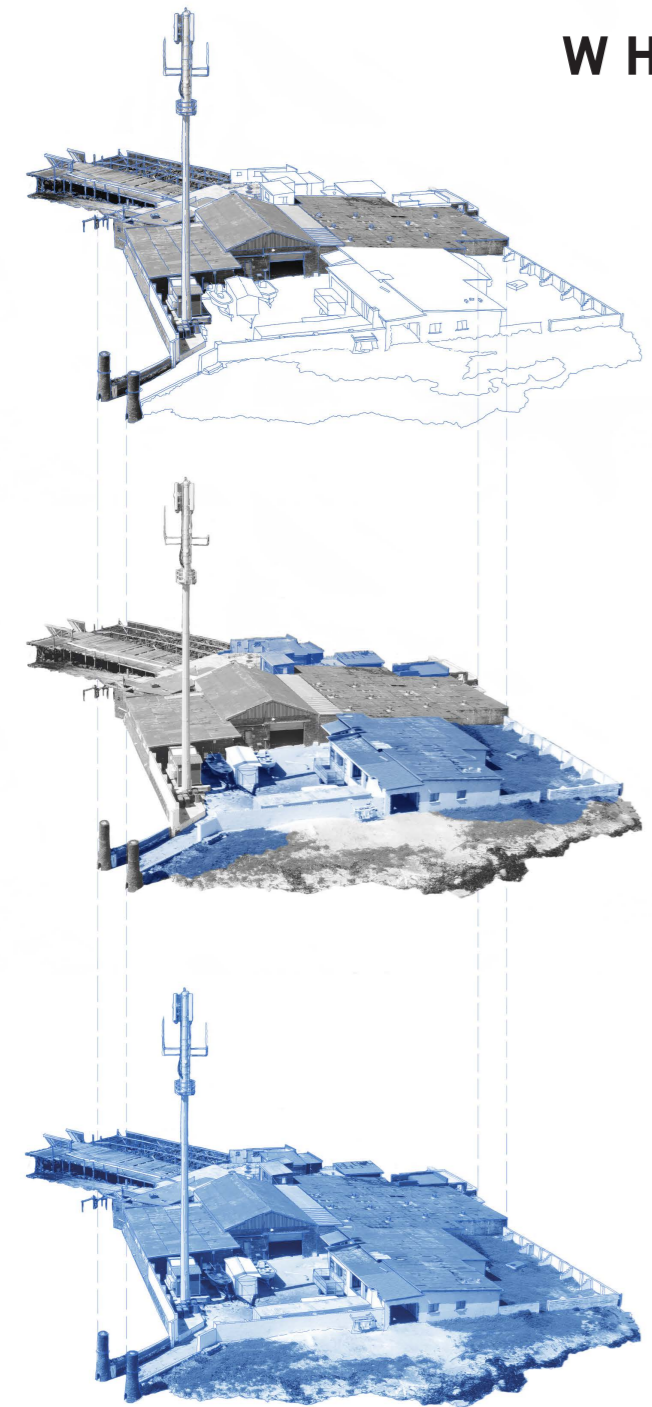
WHAT TO MAINTAIN FROM THE PAST?

[what features are necessary for functioning; iconic to spatial memory]

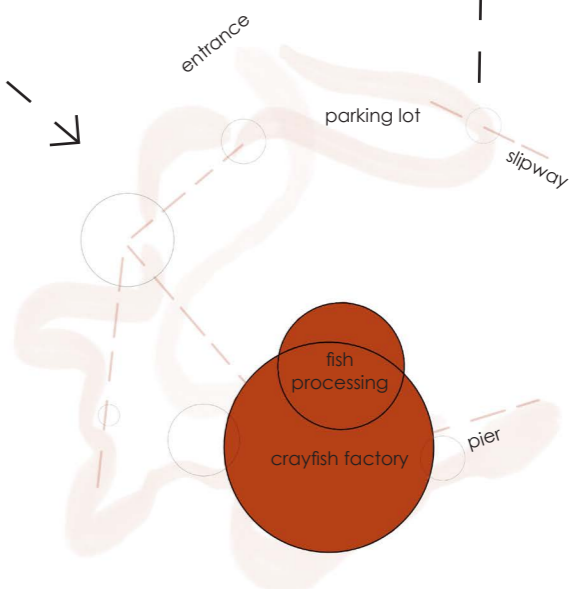
3. where to now?
play with the essential and tie into the new

2. identify the essential from the non-essential:
what to do with the waste?

1. Analyses the existing:
critical analysis of the structure in relation to the site



design process



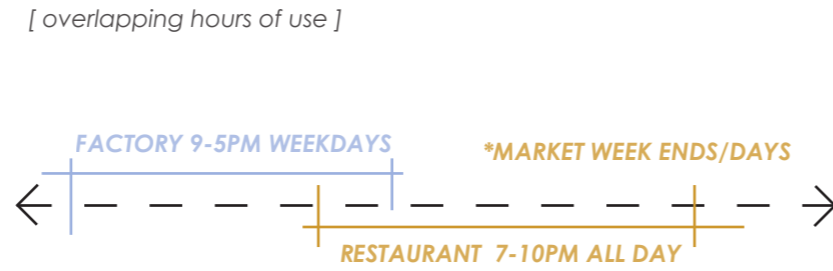
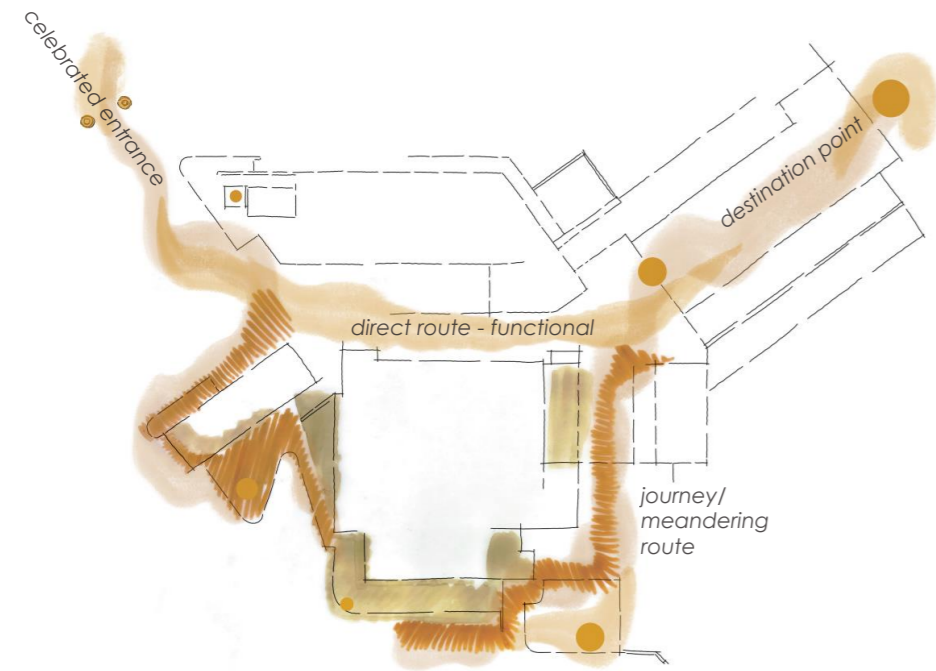
FACTORY FUNCTIONING:

[maintaining the necessary & iconic features of the factory]

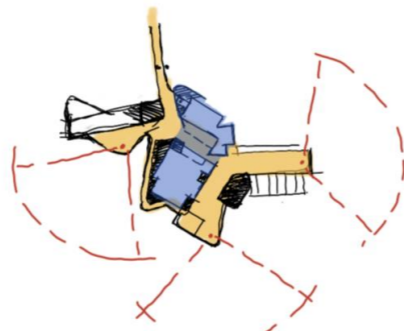
FUNCTIONALITY IN MULTI-USE:

[clarifying movement routes; access; spatial barriers, & programmatic thresholds]

navigating past & present functions: ←



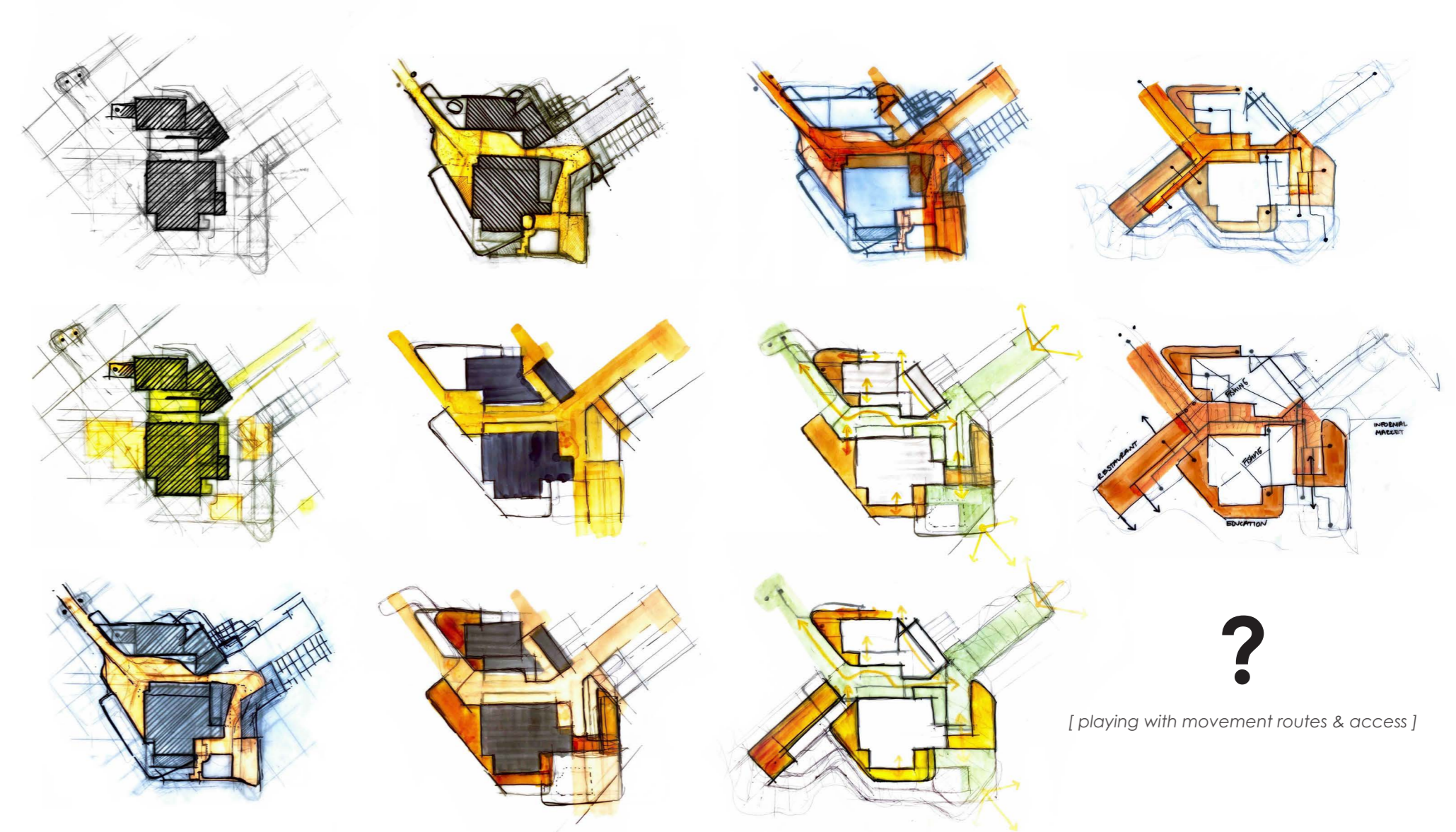
SOCIAL



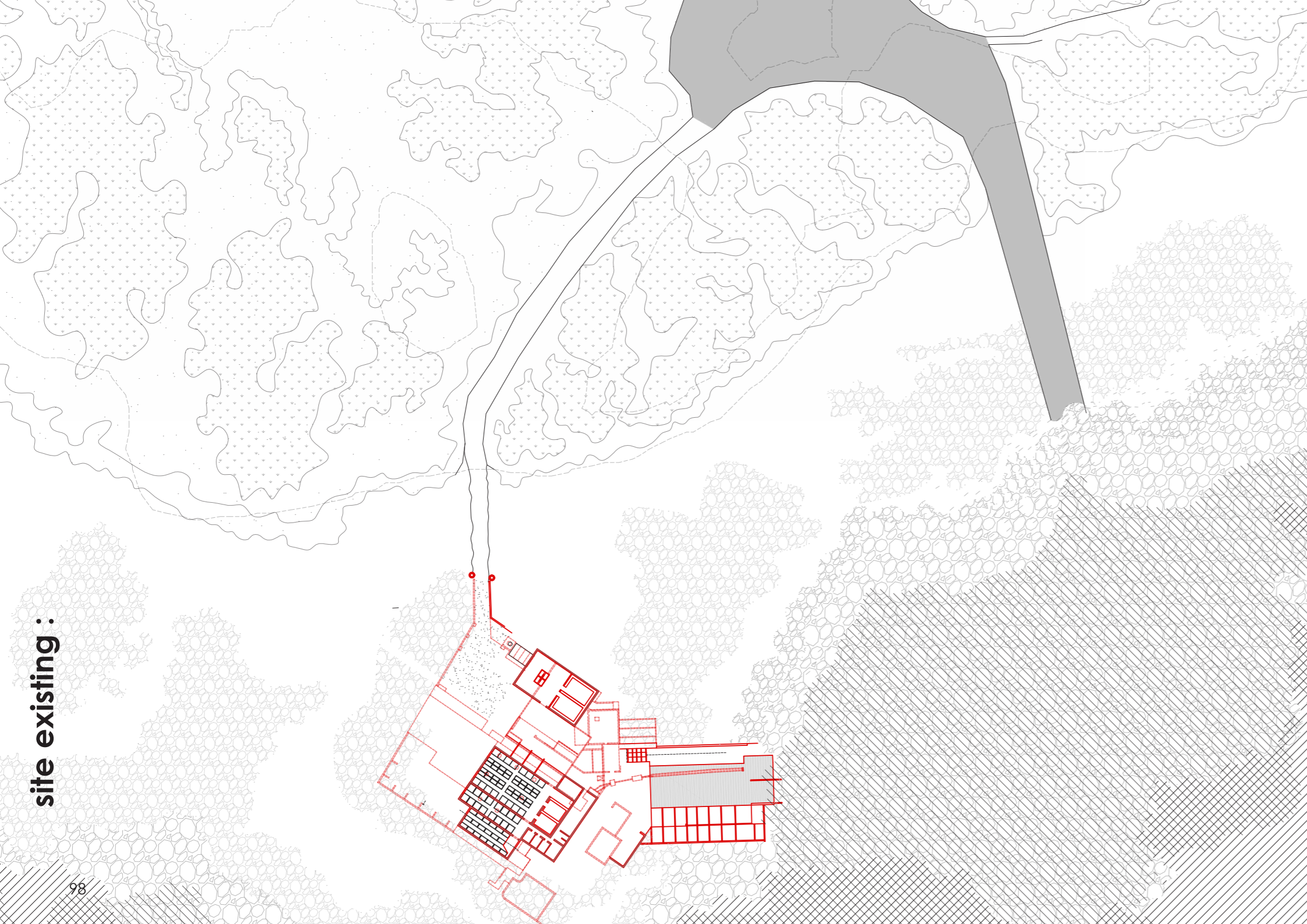
[diagrammatic representation of journey with rest spots]

establish the idea of a journey:

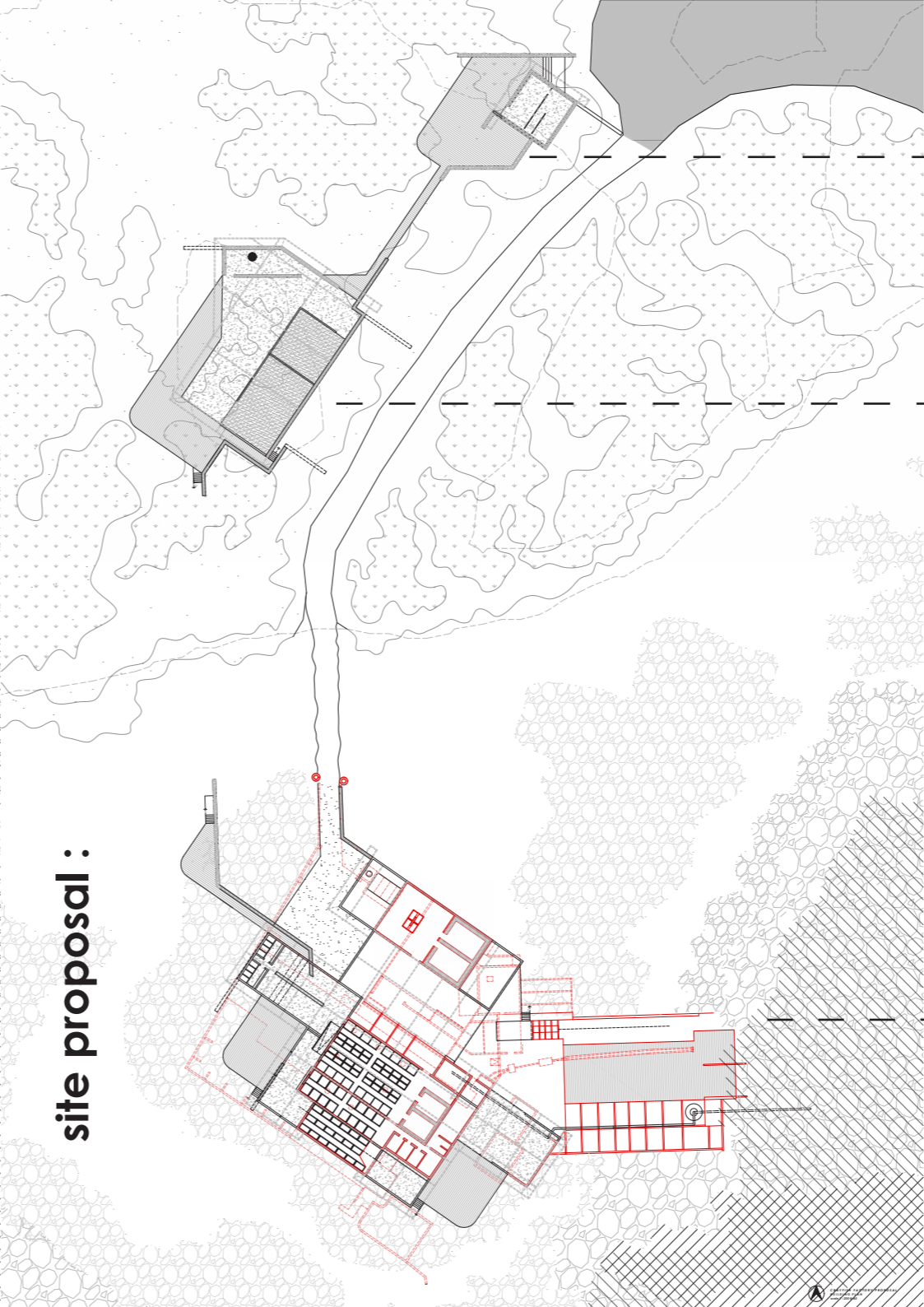
- program feeds into the scheme along the way; **maintaining activation** & interest
- the **journey** is the **experiences**; relating to spatial theories & memory
- the **route** becomes a **celebration** of the **context** & structure
- rest points/**viewing platforms** along the way to capitalize on the **natural views**



[playing with movement routes & access]



site existing :



site proposal :

[FUNCTIONALITY]

- 1. entry / check in point**
- monitoring entry/exit
 - ticketing
 - eyes on the site; safety

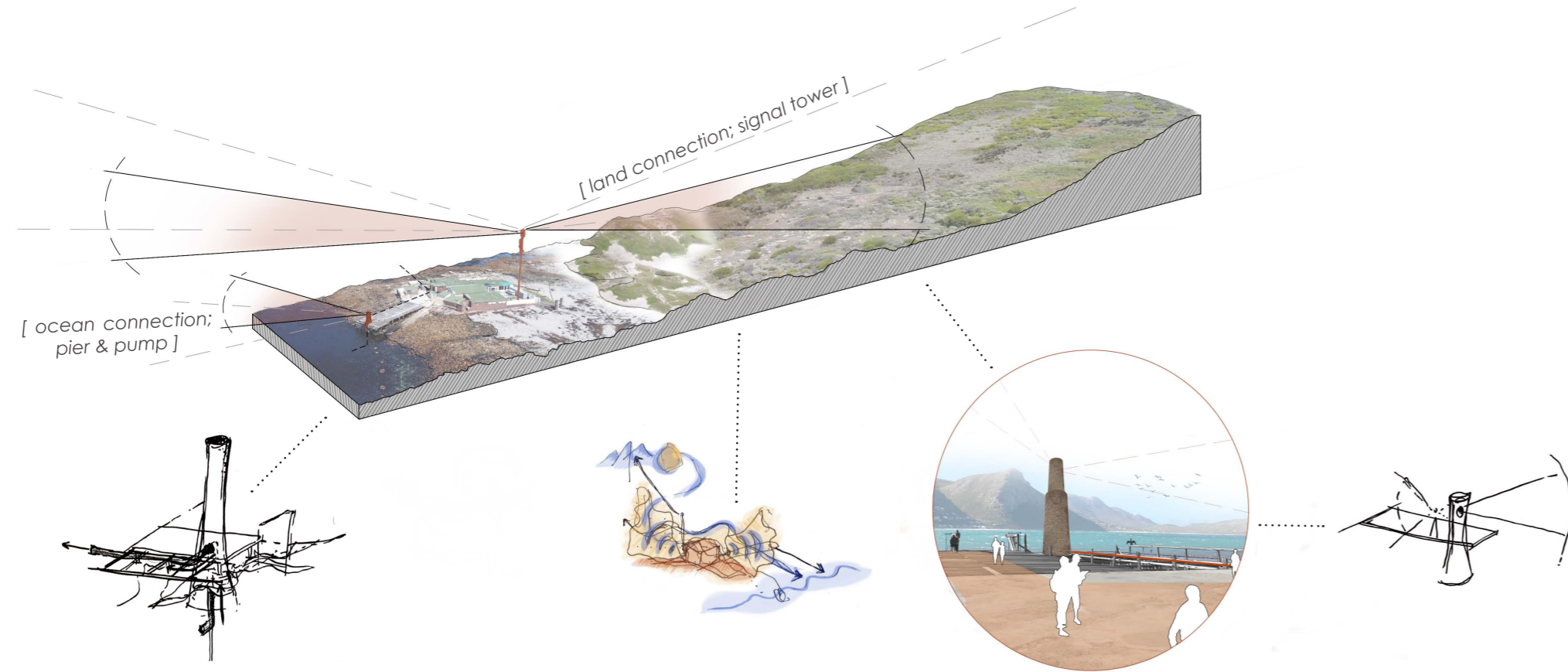
- 2. restaurant & viewing deck**
- income generator
 - programmatic connection to factory (local seafood)
 - appreciation of context

- 3. Factory attachments**
- sea-scape education center; looking into the factory
 - the factory functions adapted to hold black & white mussels
 - temporary function of a market space; catering for local sellers

* catering for tourism
 * introduction of new scheme to slowly grow [future use]

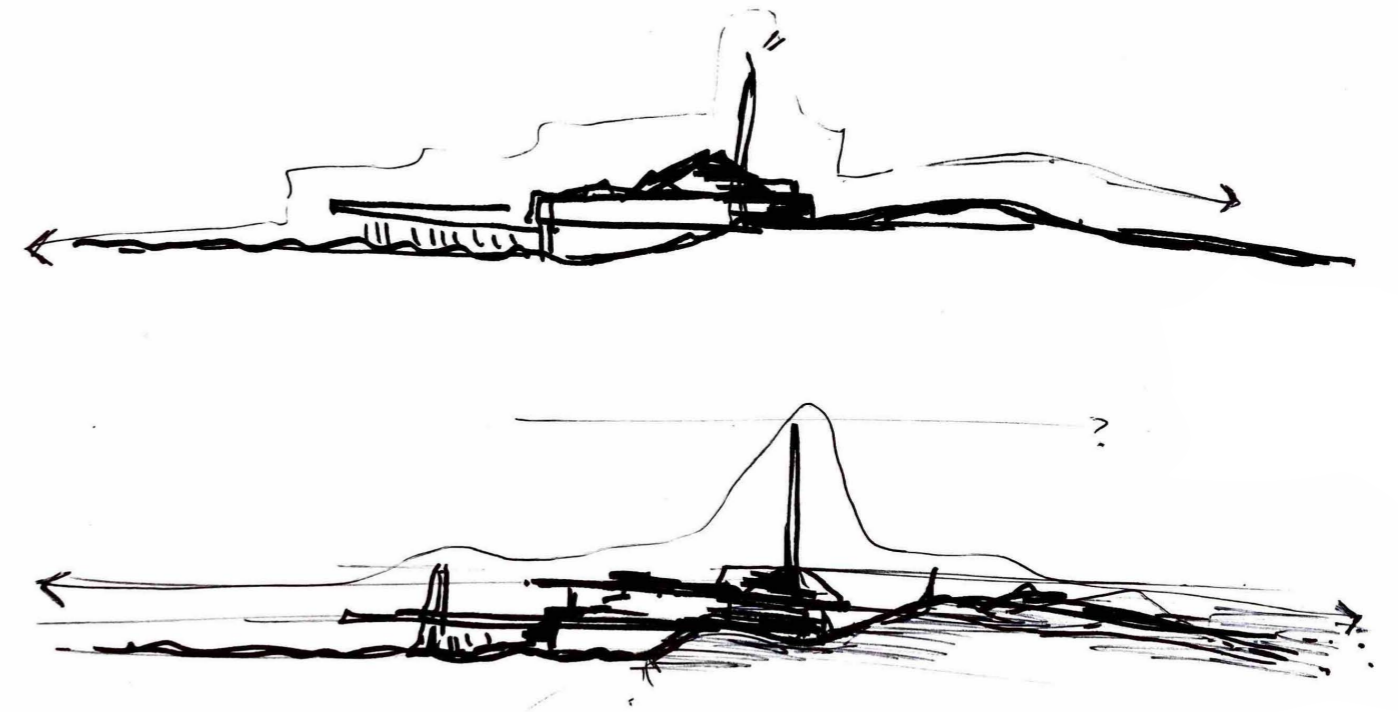
connections beyond the structure :

[visually linking land & sea/ structure to context]



intentions behind sea tower :

- **connection** between land & sea
- destination at the end of the movement routes [idea of **journey completed**]
- notable feature; **memorable** & recognizable [shaping spatial identities]
- **functionality** - pump house for fresh water intake for crayfish tanks [**celebrating** the inner workings of the factory]

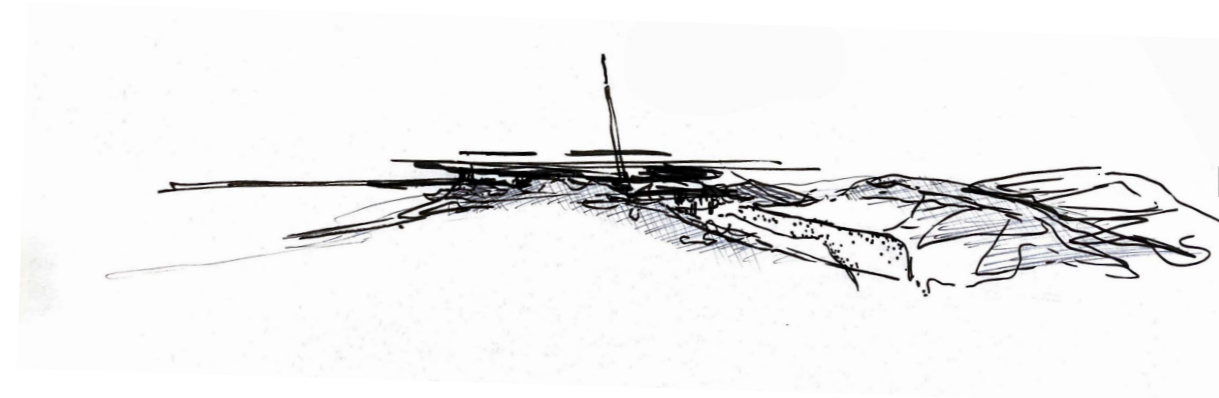


connection to context :

[flat landscape inspires long horizontal planes]

**Architecture that aims to redefine the Crayfish Factory to
the surrounding communities and landscape**

[from a delegate space of neglect to a thriving coastal edge of opportunity]

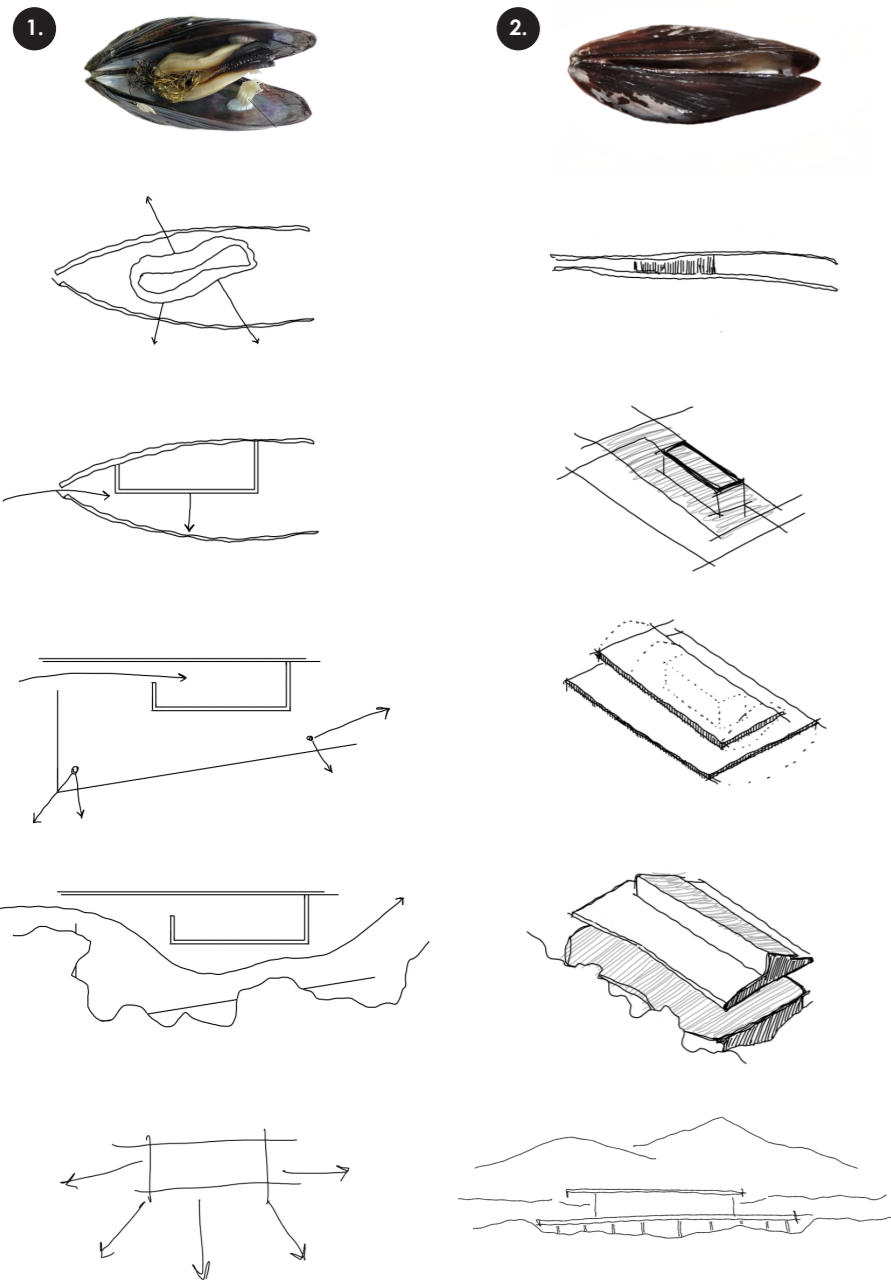


PART 04

[the materialization of the coastal factory]

IDEOLOGIES OF FORM :

[inspired by black mussel shells; opening & closing]



1. black mussel shell with central mussel to function:

2. strong horizontals surround the center; structure comes from center

3. rationalizing form; functioning at the core

4. entry/exit points/movement routes/unobstructed views out

5. movement routes; horizontal extensions into the landscape

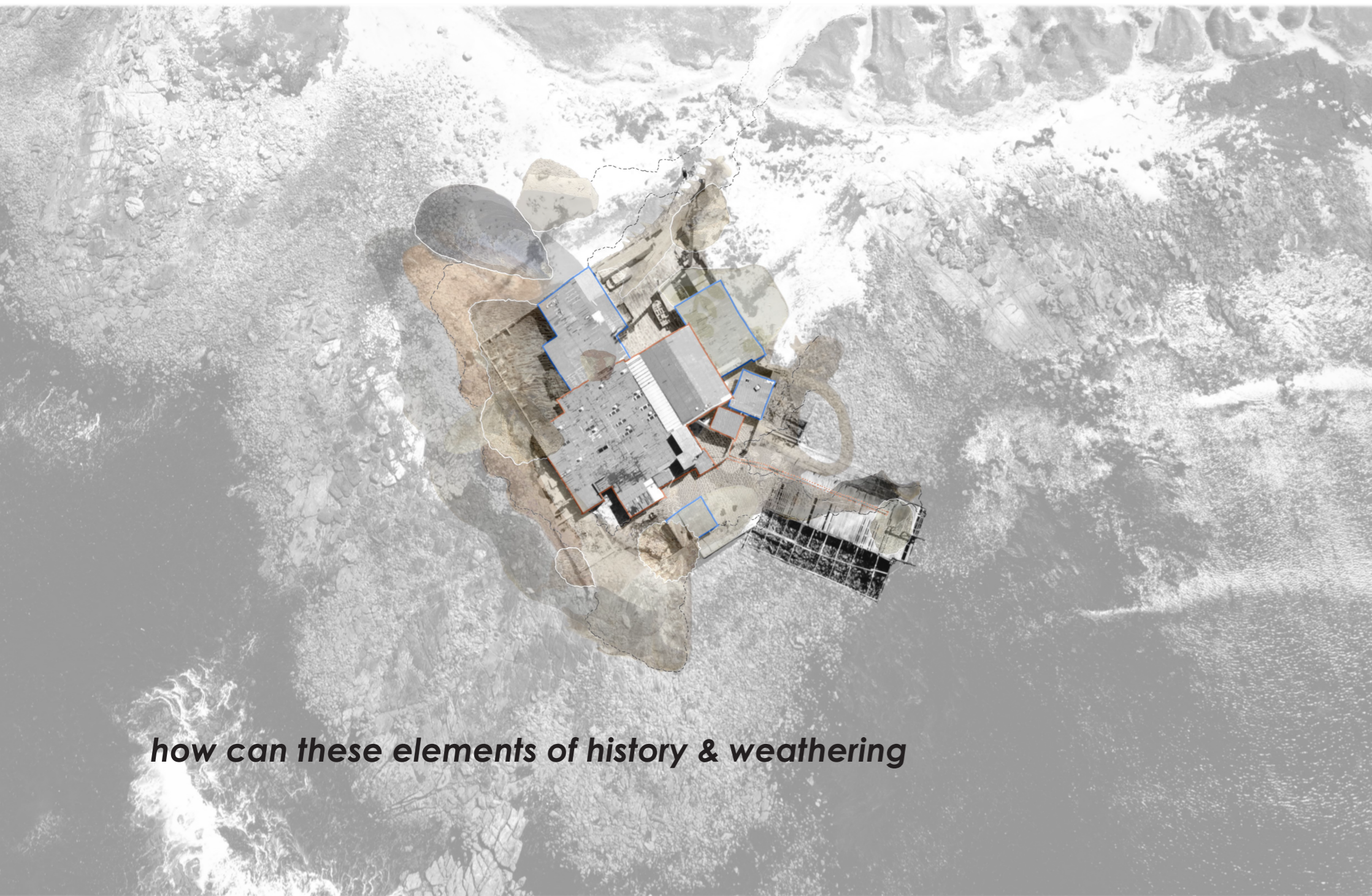
6. roof-scape to mimic mountain-scape



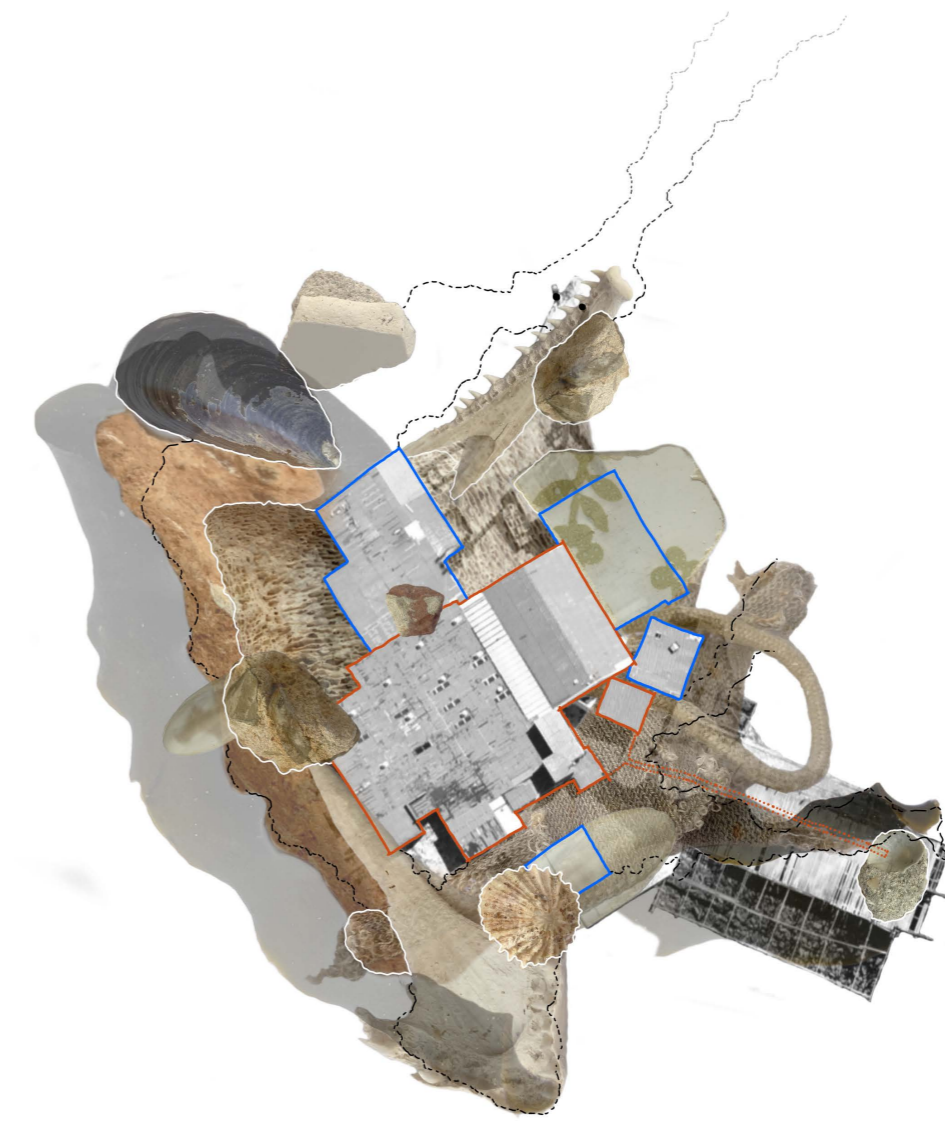
on site materials



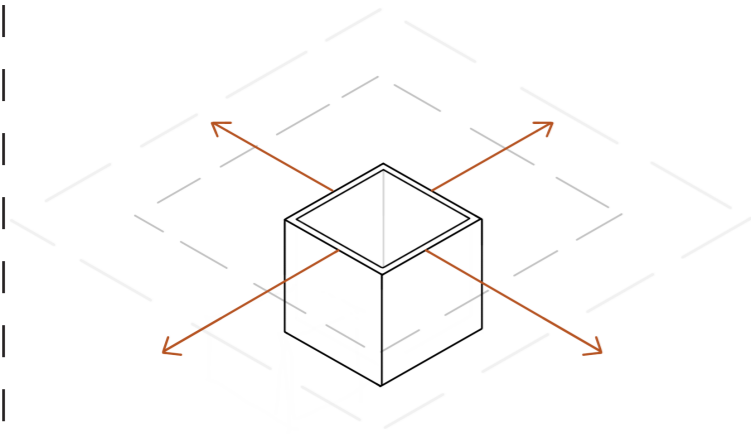
new materials



how can these elements of history & weathering



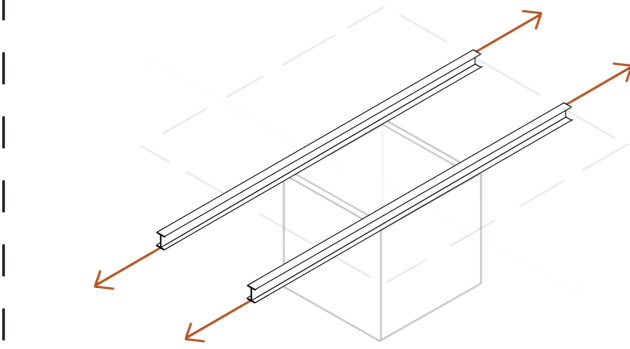
... inform the new?



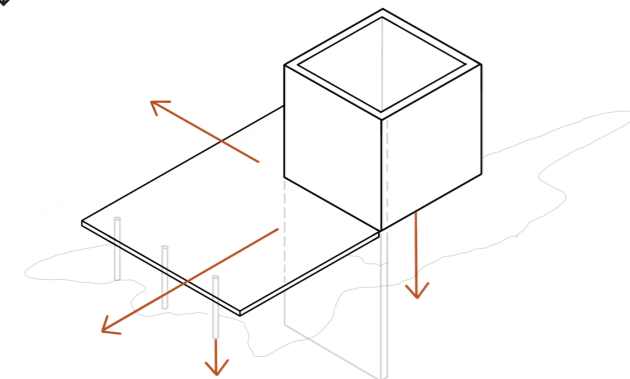
structural logic :

[the structure floats above the dune scape; suspended from a solid core]

1. establishing of central core to ground the structure
[masonry construction]

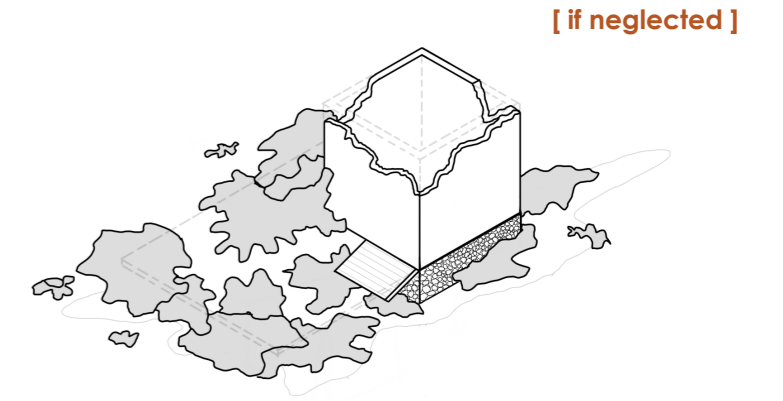


2. substructure extends from core to create horizontal planes
[steel & concrete]



3. further horizontal attachments; extending into the landscape
[timber deck]

[the process of the structure being reclaimed by the landscape [back to ruin]



[adapt use]

[turning point]

[during use]

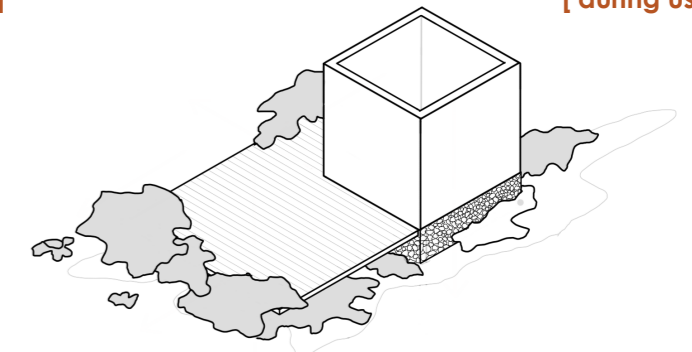
the inevitable passing of time: function & users change

- the nature of the intention is designed to **embrace the context** at present and to only become more integrated as time passes

- if left to fall to neglect; the is **reclaimed by nature**; thus completing the architectural intention of unifying structure and landscape

- the intention itself strives to **avoid** such an **end** with the introduction of an **alternative program** once factory operations can no longer be supported.

- this narrative simply **suggests an alternative ending** to the scheme that still follows the ideologies expressed



[post construction]

[over time]

coastal integration: alternative future

[how the structure is designed to weather with time]

architecture, landscape & user experience :

[how the architecture embodies the principles and concepts of unity and activity]

expressing that context is the cornerstone to the scheme :

the architecture is second to the landscape; structure looks out at every opportunity



[creating a sense of place & association]



[conceptual collages of the intended space]



[development of site character & looking at threshold spaces]

maintaining the character of the site in use & occupation :

work in progress populated collages express the spatial characteristics of the intervention



coastal integration:

[strong horizontal planes mimic the flat landscape and help blend the structure in the dune-scape]



thank you.

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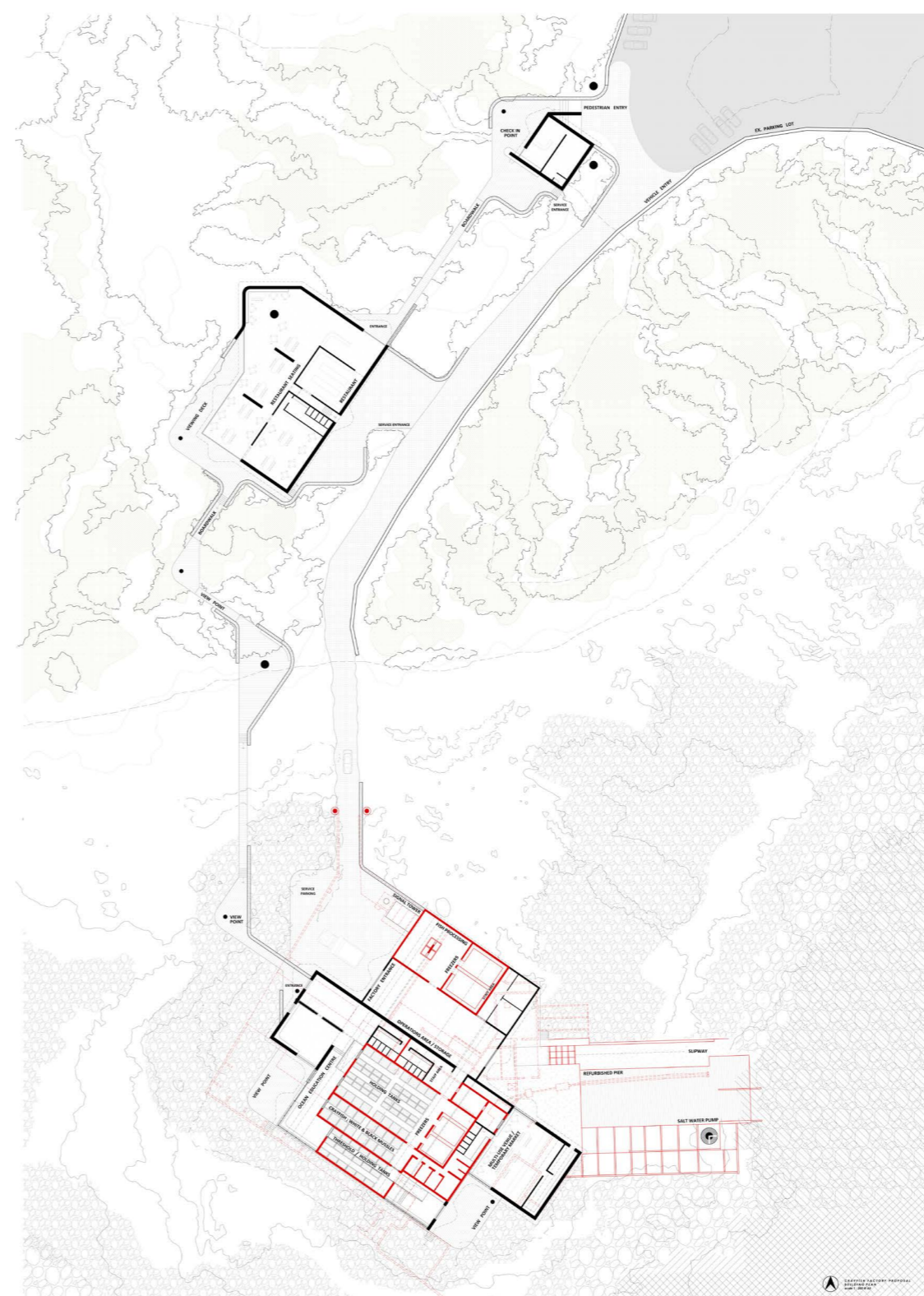
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IMAGE LIST:

1. Herbert, R. 2023 - site sketch
2. Herbert, R. 2023 - Cape Town Map
3. Herbert, R. 2023 - site collage
4. Gie, A. 2023 – arial drone photography
5. Herbert, R. 2023 - site sketch
6. Herbert, R. 2023 - Locality; Deep South Map
7. Herbert, R. 2023 - site photos
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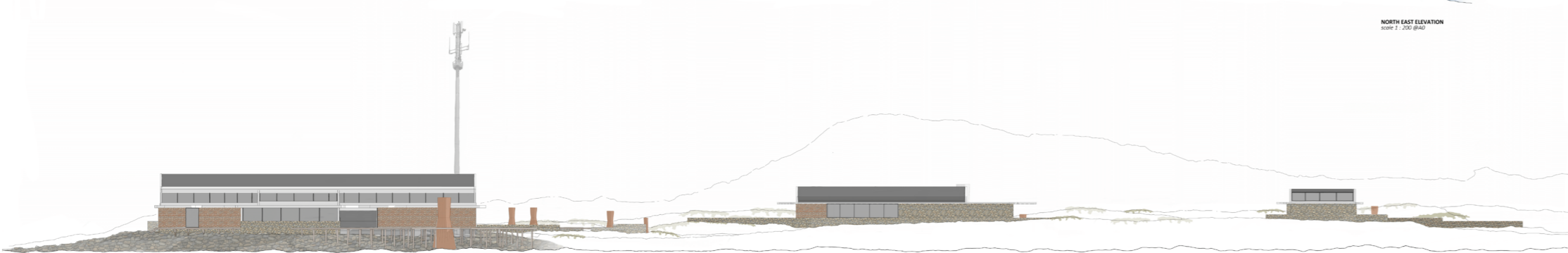
APPENDIX

[final works, presentation & ethics clearance]





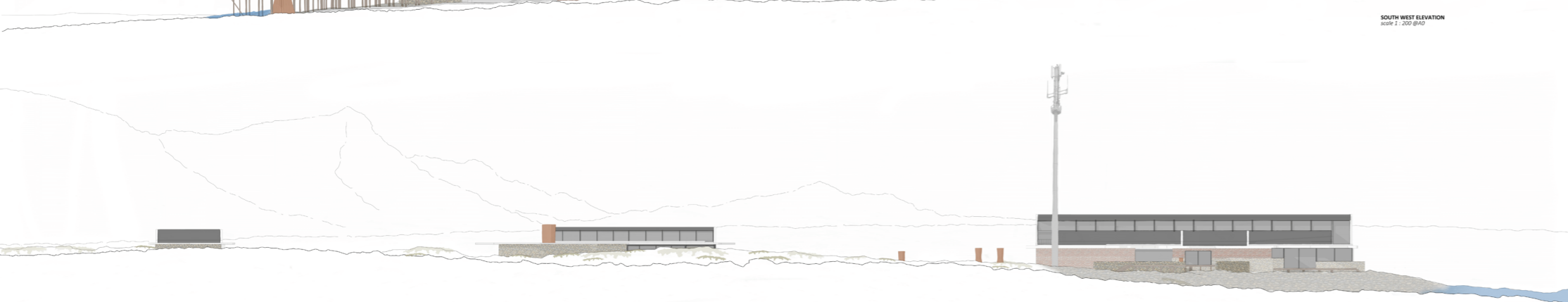
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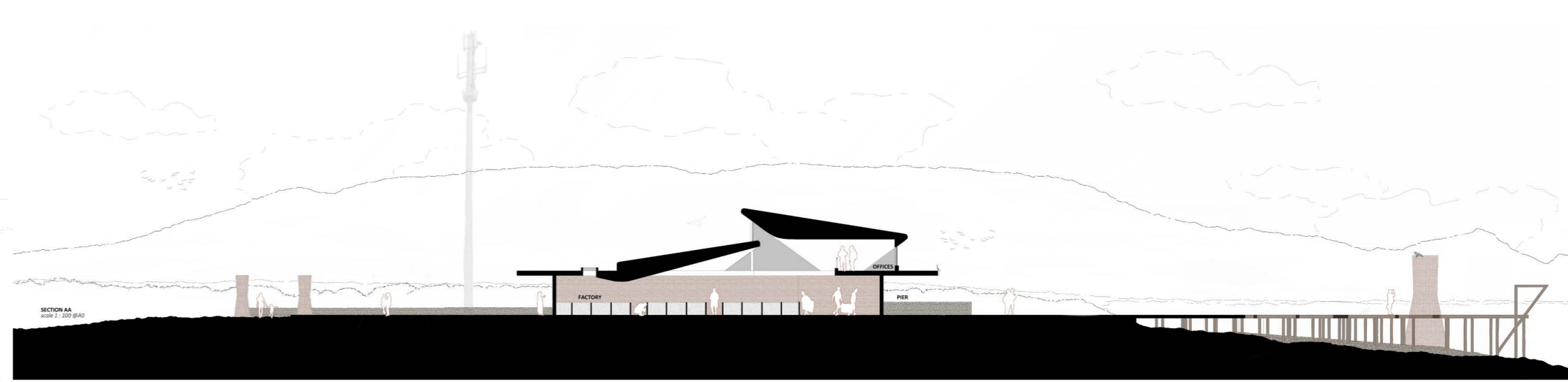
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SOUTH WEST ELEVATION
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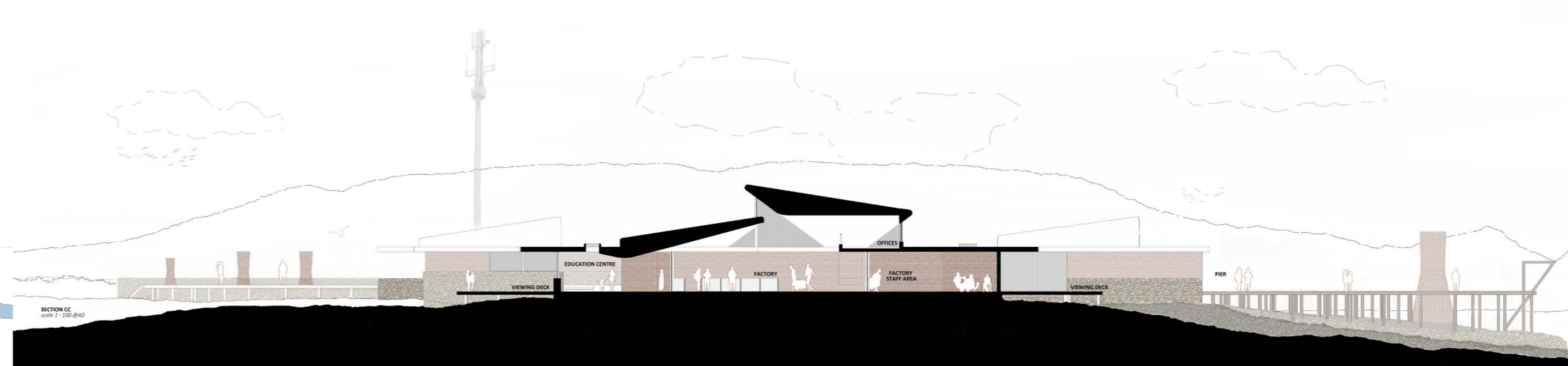
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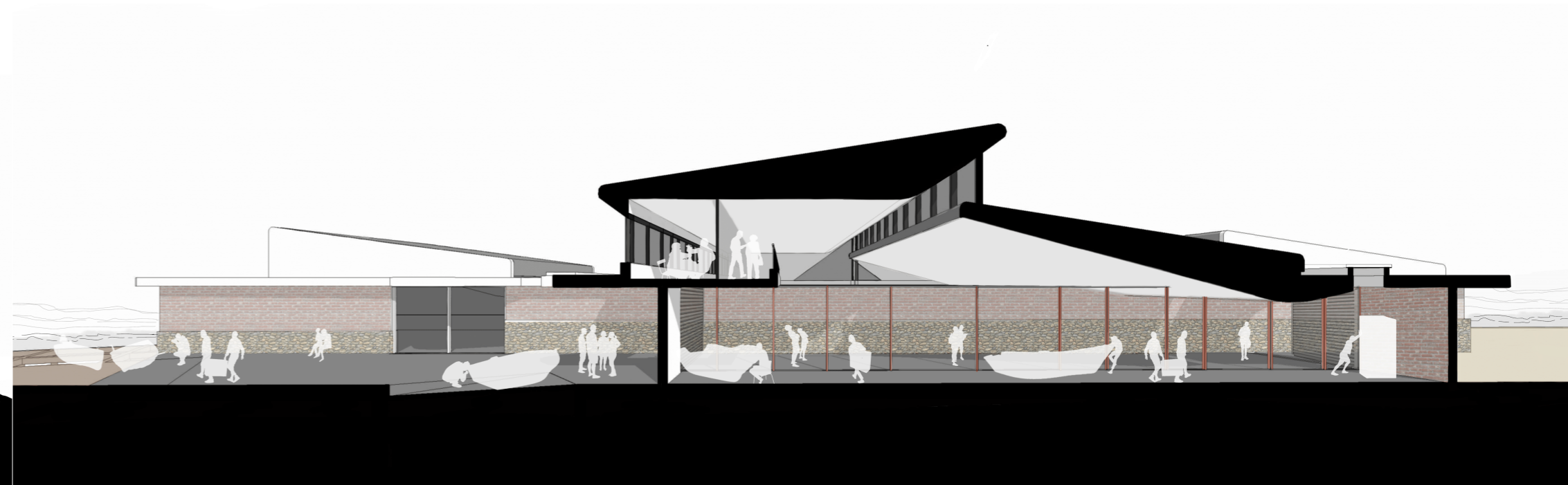
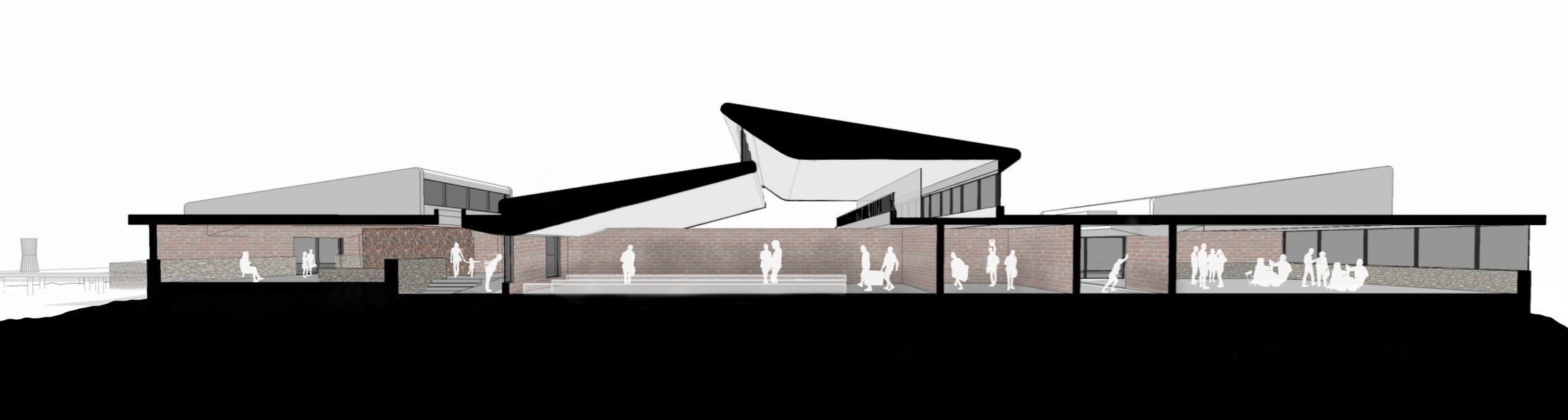
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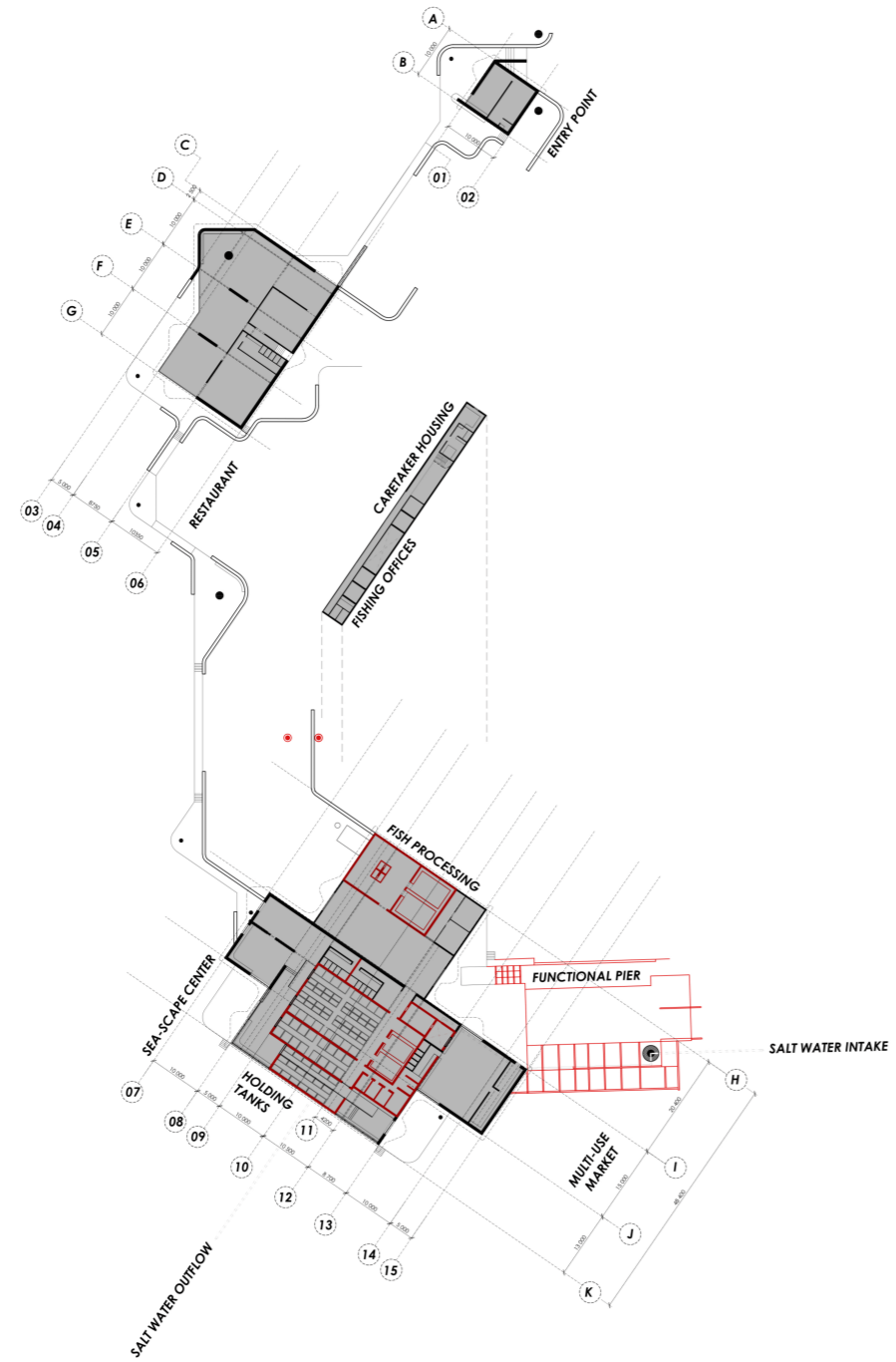


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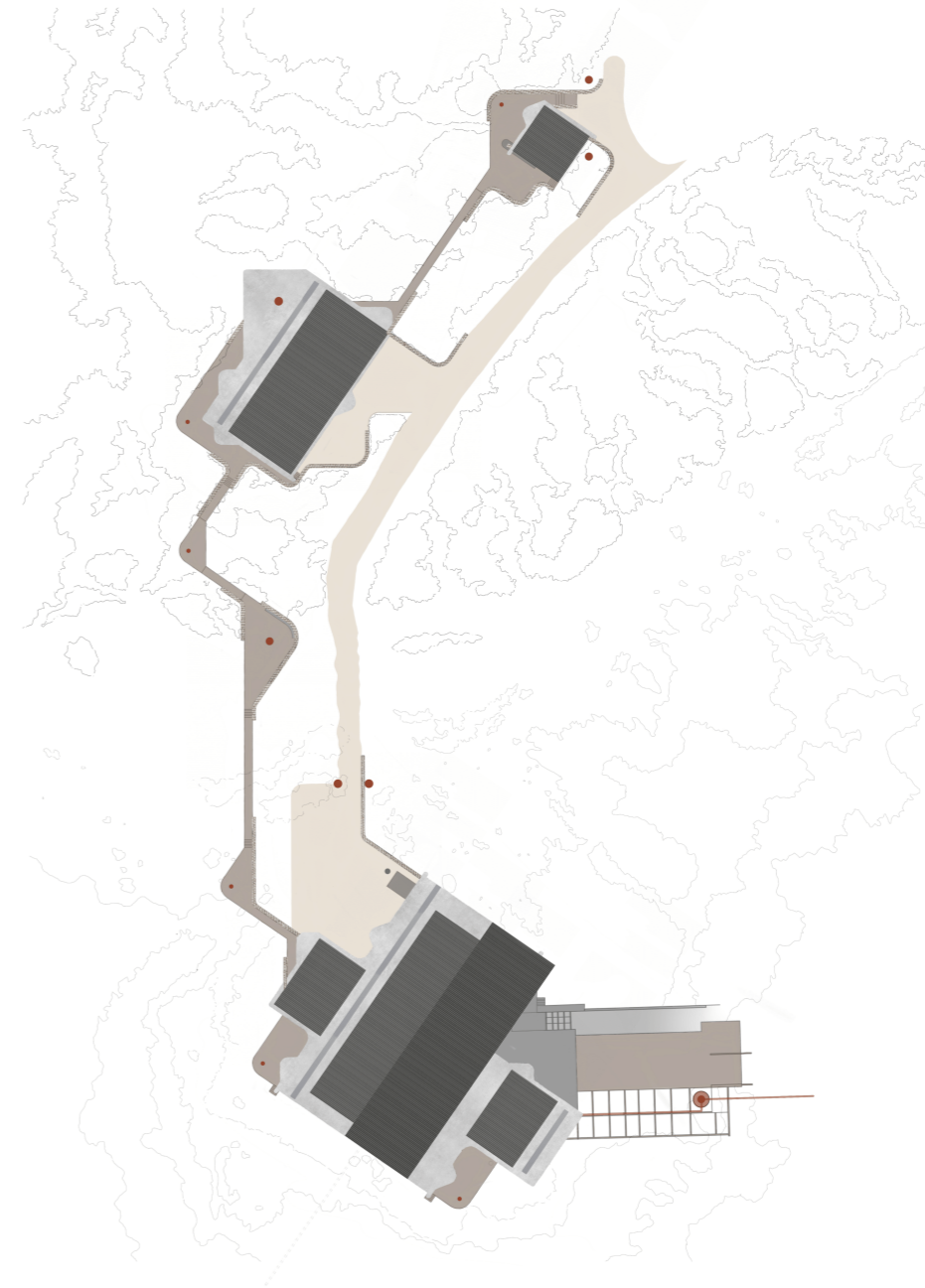


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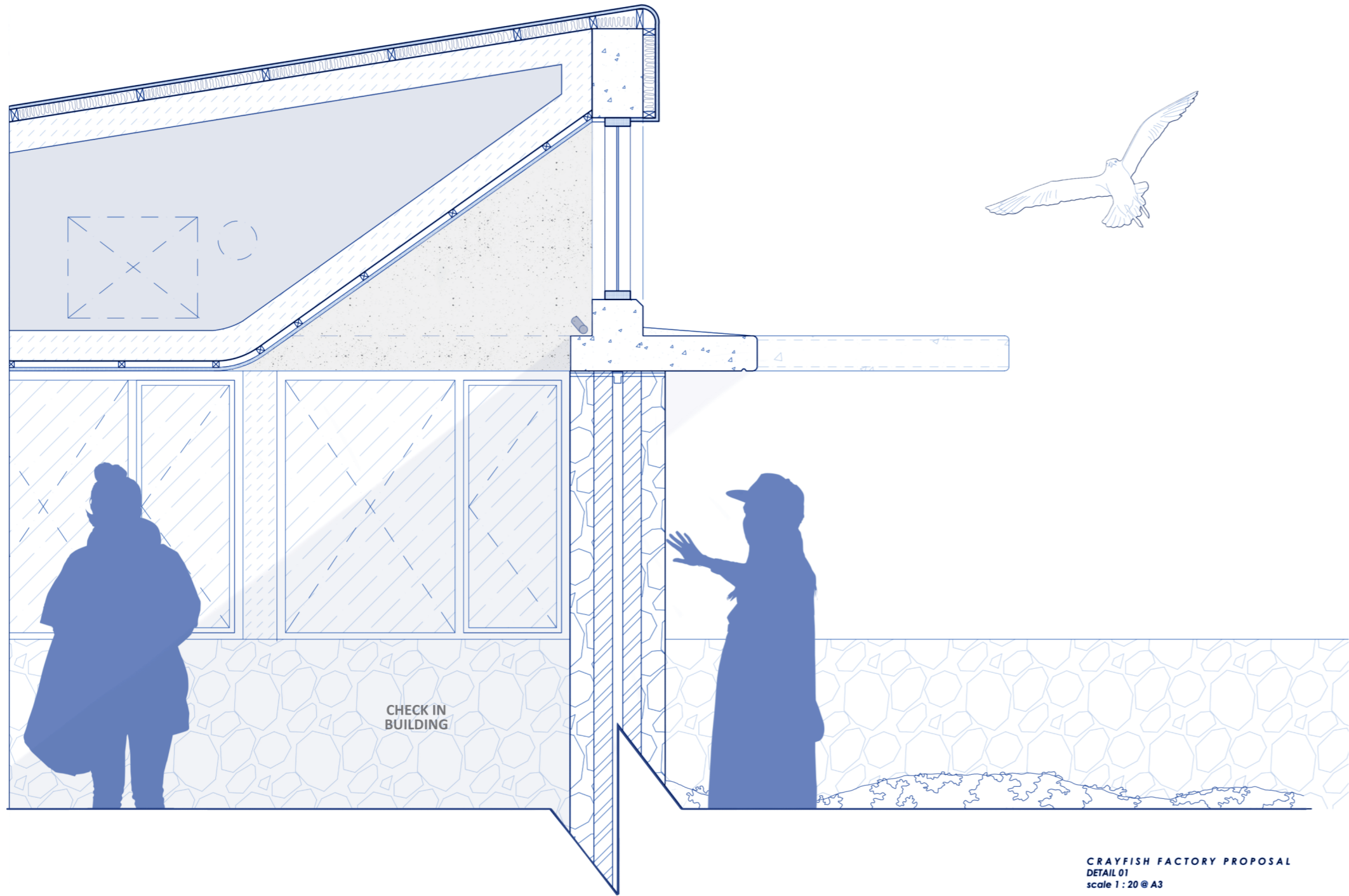




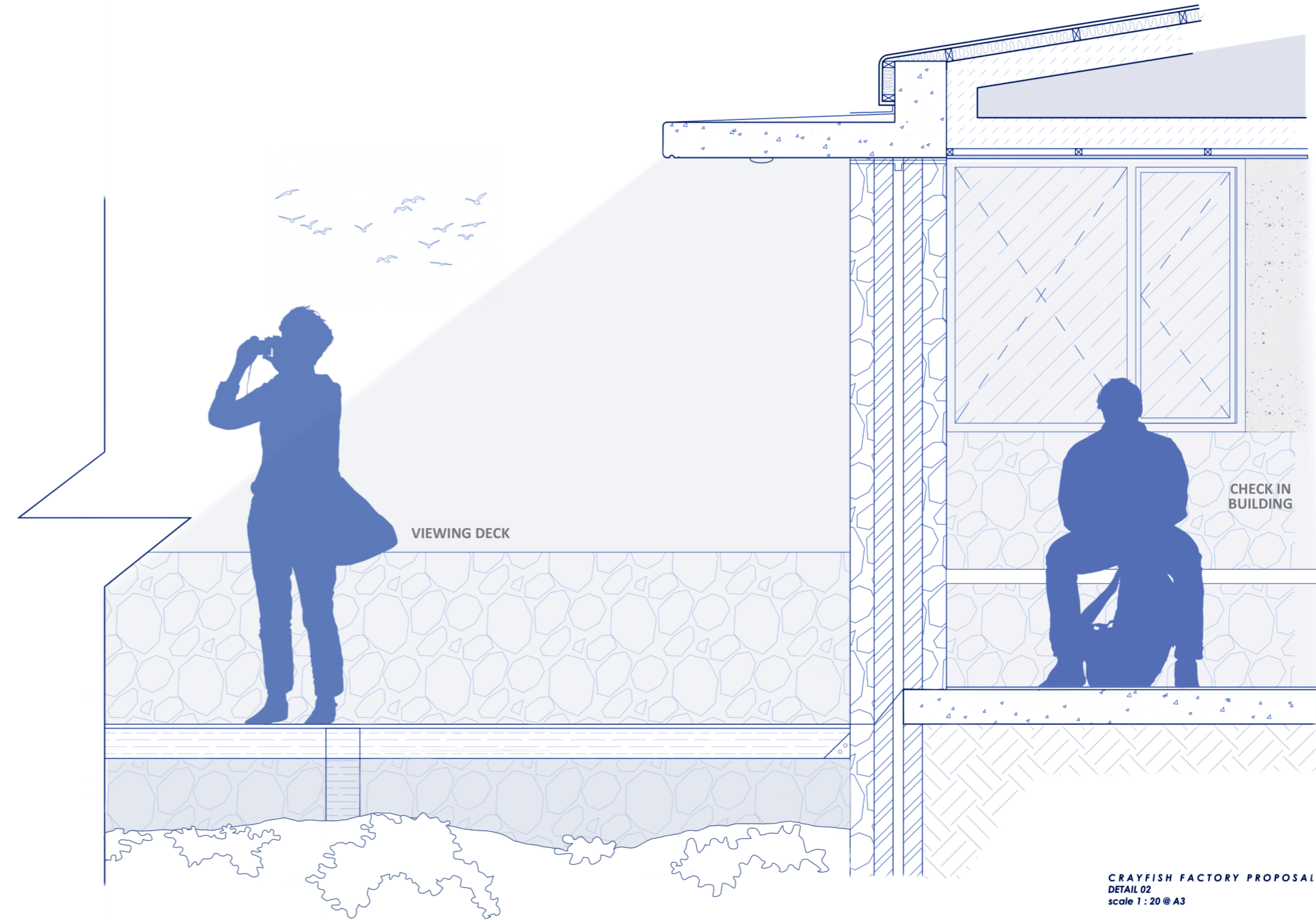
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STRUCTURAL PLAN
scale 1:500 @A2



CRAYFISH FACTORY PROPOSAL
ROOF PLAN
scale 1:500 @A2



CRAYFISH FACTORY PROPOSAL
 DETAIL 01
 scale 1 : 20 @ A3



CRAYFISH FACTORY PROPOSAL
 DETAIL 02
 scale 1 : 20 @ A3











PRE-SCREENING QUESTIONNAIRE OUTCOME LETTER

STU-EBE-2023-PSQ000817

2023/11/13

Dear Rachel Herbert,

Your Ethics pre-screening questionnaire (PSQ) has been evaluated by your departmental ethics representative. Based on the information supplied in your PSQ, it has been determined that you do not need to make a full ethics application for the research project in question.

You may proceed with your research project titled:

From Neglect to Opportunity

Please note that should aspect(s) of your current project change, you should submit a new PSQ in order to determine whether the changed aspects increase the ethical risks of your project. It may be the case that project changes could require a full ethics application and review process.

Regards,

Faculty Research Ethics Committee