

THE TRIPPLE

*An Architectural Design Vision
for Sustainable and Energy Efficient Tourism
in The Mediterranean Climate*

ZEYNEP NAZ YELKEN

To my family that have been by my side and provided unconditional love and support

To my friends that have always tried to lift me up

To my tutors:

Ir. Thomas Offermans

Ir. Arie Bergsma

Dr. Regina Bokel

Ir. Christien Janssen

that guided me throughout the year and allowed me to express my architectural potential to the fullest.

To Dr. John Ebejer from the University of Malta that spared me his time to discuss tourism and architecture with me multiple times.

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*The Ripple
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INTRODUCTION

“Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment ...”

UNWTO, 2022

Countries that are rich in their natural beauty, culture, and climate conditions have always become targets of architectural tourism developments. Especially in the 20th century, with the unstoppable growth of globalization, mass tourism became the main solution for accommodating large amounts of touristic movement profitably. Extensive constructions that offered a sense of globalized luxury, while holding significant amounts of tourists in isolated bubbles of tourism activities showed potential for short-term profits (Dredge, 2022, p. 277). This vision not only encourages a blindsided view for tourists to disregard the impact on environmental and cultural assets of visited locations, but also creates a consumerist design vision and user behaviour for tourism developments in general. Additionally, within the development of these projects, the importance of local stakeholders is kept as a secondary importance, which affects the sustainability and resilience of local communities (Jojic, 2019, p. 158). Considering the clear shift towards experience and culture-oriented tourism in Europe, it is necessary to follow an all-around vision (Jesse Maida, 2023). However, an all-around application of sustainable tourism focusing on energy efficient projects that benefit both local and commercial interests still lacks development. This also reflects heavily on the [building] energy and resource consumption by heating, cooling, and lighting (Mejjad et al., 2022, p. 4.) A major issue of tourism projects is the high amount of energy and resource consumption throughout

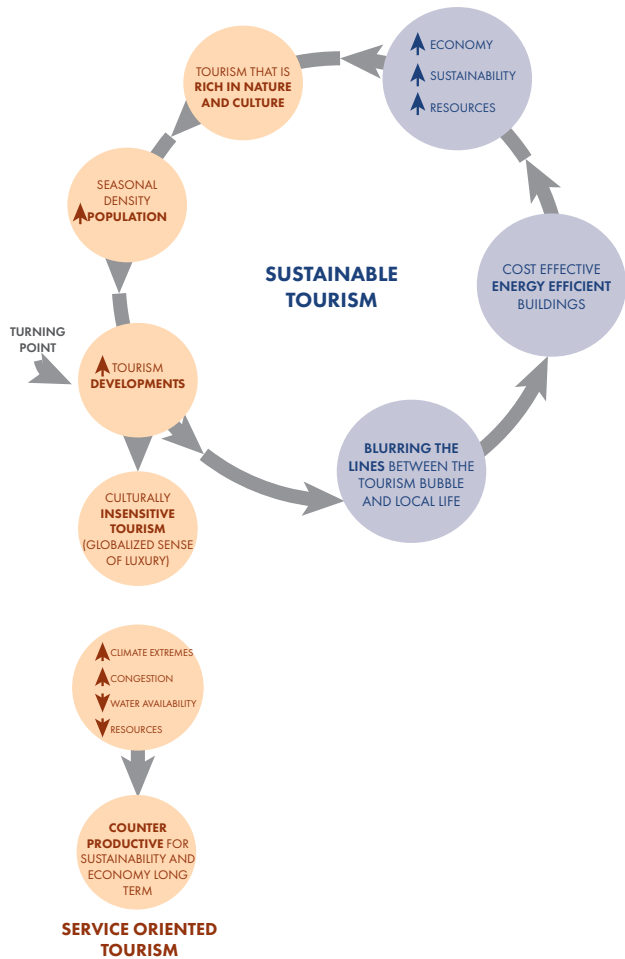
the lifespan of buildings. This is especially important since buildings accommodate tourists for long periods of time regardless of the resources they consume. Considering over 50% of building energy consumption is related to buildings heating, cooling, and lighting, it is important to investigate a solution relevant for the tourism industry (UCLA, 2015). Moreover, “growing desire for better indoor environment, energy demand for heating and cooling is expected to increase steadily” especially when it comes to the Mediterranean context (Imessad et al., 2014). This can bring an even higher energy demand trend for locations like the Mediterranean region.

As one of the effective methods of achieving energy efficiency in buildings, passive design strategies show potential to be integrated in the tourism industry. The potential of passive design strategies is significant since it aims to mitigate climate change through detailed evaluation, research, and architectural design. This makes passive design strategies highly appealing as it focuses on 'low tech' and cheaper solutions unlike high-tech services that might consume more energy and investments to perform well. It is also shown that implementation of passive design strategies "has proven to be highly effective, which translate into significant energy savings and mitigation of GHG (greenhouse gases - carbon dioxide, methane and nitrous oxide) emissions" (Elaouzy & El Fadar, 2022a, p. 15; Ritchie et al., n.d.). It is also relevant to develop a strategic vision for building efficiency for a high consumption-oriented sector like tourism.

One of the reasons for the lack of passive design strategy adaptation is based on a "clear lack of regulations, policies and funding programs to encourage building owners [or designers] to apply passive design strategies" (Elaouzy & El Fadar, 2022a, p. 15). Recognizing this research gap, as well as the lack of sustainable advancements in the tourism

sector (the high profit and low-cost vision), the deployment of a low cost and design-oriented solution shows potential. Related to the lack of guidelines and regulations for passive design strategies, an important factor is to "consider the coordination of various passive strategies with the characteristics of the building in question, and the local climate" (Elaouzy & El Fadar, 2022b). Therefore, it is relevant to determine which strategies are appropriate for selected building "characteristics." A critical point in this situation is that indoor temperature control is heavily dependent on thermal comfort of the users. This energy demand is, therefore, significantly controlled by the user experience or behavior and may vary from person to person. This issue comes together with the consumerist tourism mentality that the sector promotes for the users. However, in order to promote sustainable tourism industry, it is essential to create a vision for climate conscious buildings and people. Therefore, the research aims to implement passive design strategies to create an ideal indoor environment to promote less need for climate control and lighting. Moreover, creating a foundation for passive architecture in tourism developments can lead to adaptation of these strategies to be easier and more appealing for designers. Therefore, the thematic research objective aims

to develop a passive design manual for tourism developments in the Mediterranean climate. First, this research will dive into understanding which passive strategies are relevant for the Mediterranean climate. Later, these strategies will be evaluated according to their applicability in selected building characteristics relevant for tourism the tourism product (hotel). This manual will later be used for the development of the overall design project to integrate appropriate strategies in the selected site.





“for a sustainable tourism development,
the architectural design needs to address both
its impact on energy & resource consumption
and social/cultural sustainability to benefit both
local and commercial interest.”

This brings the main research question:

How can [architectural tourism developments such as] hotels minimize their energy consumption with effective and efficient implementation of passive design strategies in the Mediterranean climate and promote application of these strategies?



RESEARCH

Research Methodology

In order to make the researched information accessible and adaptable, it is important to create a design manual/guide for tourism developments in the Mediterranean regio/climate. This can ensure the accessibility and availability of information which can be utilized seamlessly during the project development phase. This is done after the initial literature research based on passive design, tourism management and hotel design study cases (See Appendix A for methodology overview).

Understanding applicable passive design strategies

To be able to assess the potential of passive design strategies effectively, these strategies are filtered according to their applicability for the Mediterranean climate. This is achieved

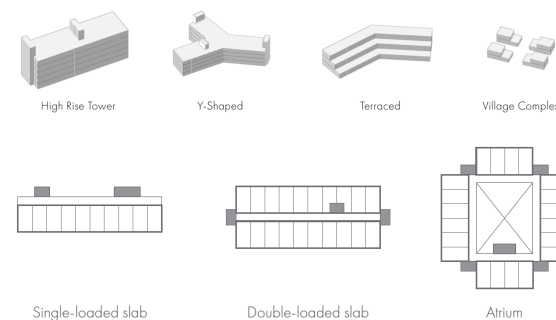


Figure 1 Selected 4 morphologies and 3 typologies that are commonly used in hotel designs.

through a review of literature and research papers focusing on passive design strategies applied in the Mediterranean climate on different projects and research. As a focus location, Malta, is chosen to perform a climate analysis and further deepen the knowledge on the Mediterranean climate.

Define analysis criteria and context

The methodology for constructing a passive design manual for tourism developments focuses on; performing architectural and technical evaluations for passive design strategies on hotel designs. These hotel designs are defined as the most common morphological and typological options used in projects currently. Therefore, the context of the research is defined as 4 morphologies: High-rise tower, y-shaped, terraced and village complex and 3 typologies: single-loaded slab, double-loaded slab, and atrium. Assessing architectural and technical evaluation on these design contexts can help provide an overview of the most appealing options for tourism developments. The architectural evaluation is based on considering conditions that are highly valuable for both hotel designs and passive design strategies. By understanding these themes, it is possible to create criteria of evaluation for both design restriction (for hotel design) and design

applicability [for passive design.] These criteria are gathered through case studies of existing hotels in the Mediterranean region and research papers on tourism theory and passive design in the Mediterranean. These assessment criteria are orientation, number of accommodation units, facade openings & privacy and landscape & outdoor activities.

Simulate energy demand

The selected simulation method is through a Rhino, Grasshopper plug-ins Solemma-ClimateStudio with the assistance of Energy Plus and Ladybug plug-in for solar analysis. The simulation creates spatial composition for 4 morphologies and 3 typologies and aims to understand the energy load and passive design potential. A part of this analysis tests the effectiveness of natural ventilation passive design on hotel en suite guestrooms and hotel hallways on Solemma-ClimateStudio. The solar passive design potential is done by understanding the overall solar exposure and the facade area that requires shading according to solar exposure over 6 hours during the day.

Assess architectural design freedom

To bring an architectural perspective to the success and application of passive design strategies, two architectural assessments are made. The first part focuses on design adaptability by understanding which design criteria are affected to achieve different types of passive design strategies and suggests most appropriate morphologies and typologies. The last part aims to point out the architectural design potential that these morphologies and typologies can offer along side their previously found energy performance. These suggestions and conclusions are made through case studies and architectural evaluations.



Figure 2 Four main design decision makers that are important for both hotel design and passive design. (left to right: Orientation, Amount of accommodation units, Facade openings and privacy & Landscape and outdoor activities)

Evaluate and synthesize

This is finalized with the data gathered from energy simulations and solar analysis as well as architectural assessments. The combination of all evaluation types is gathered to see which morphologies show most potential (either by being the most energy efficient, most architecturally flexible, or adaptable) and listed. All the design requirements, opportunities, constraints, and conclusions are synthesized in a design manual to provide an overview of passive design implementation in tourism developments. Additionally, the passive design manual will be used starting from the early design phase to investigate integration of passive design strategies on the existing building in Marsaskala. The strategies will be integrated by trying to satisfy the architectural design opportunities (mentioned in the design manual) and optimal energy efficiency. Therefore, it is expected to create a feedback loop between the design manual and the project.

State-of-the-art

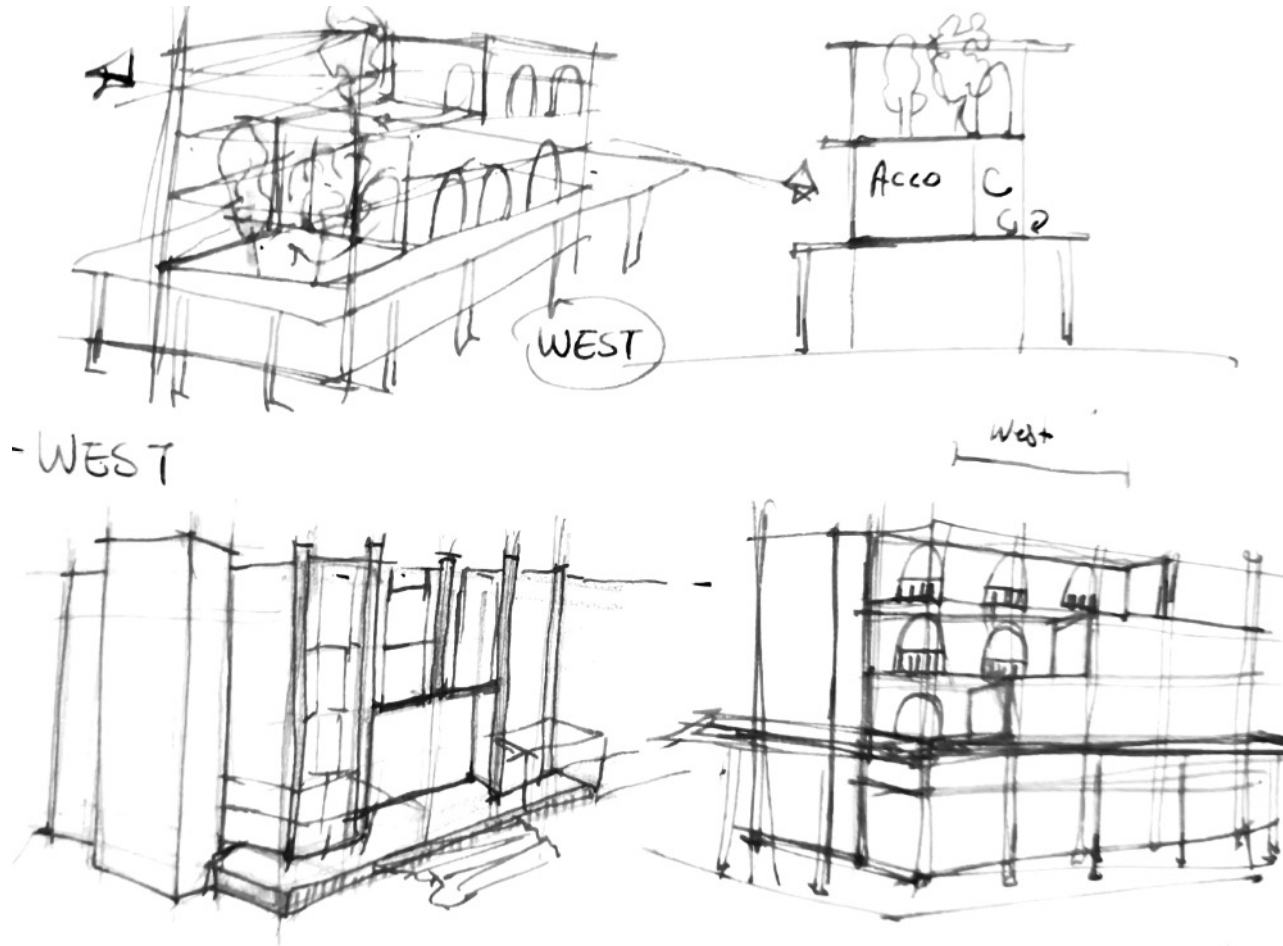
By understanding the profit driven environment of the tourism industry, it becomes essential to find an integrated, efficient and affordable solution. The role of the architect in this sense also becomes a moderator of all these different aspects and themes. Considering the high energy demand in hotel developments that last as long as the facilities are used and the need for “luxurious” spaces, the architect becomes very important.

As a result, integration of passive design strategies in the most effective way possible promises an optimal and affordable way of solving the issue. Even beyond the energy concerns, by giving more power to the architect, it becomes possible to integrate solutions related to social, ethical and other environmental issues.

Therefore, the role of the architect should not only become a designer, but moderator, developer and a negotiator between the environment that tourism developments create. In other words, it is highly important to put attention to the dynamic and the balance between local and commercial stakeholders. x







Research Results

The outcome of the architectural and technical evaluation helped developing a design manual that gives an overview of passive design strategies available for the mediterranean climate. This overview suggests design requirements, restrictions, and effectiveness on the context of 4 morphologies and 3 typologies. Within the design manual, orientation, solar passive design and natural ventilation passive design are discussed. The research also performed architectural and technical evaluations on solar and natural ventilation passive design.

The overall results for solar passive design vary significantly for each design type and it is important to point out the relation between solar exposure and the need for solar protection. Cases where solar exposure is higher than the 'need for solar protection' will be ideal as they can provide more daylighting and consequently decrease lighting energy loads. This is also important to decrease material needed for facade shading. Therefore, y-shaped morphology is the least appealing option due to its high need for solar protection relative to solar exposure. When it comes to multi-story morphologies, High-rise towers and terraced are the most ideal for daylighting and the amount of solar protection needed. Natural ventilation passive design and solar shading show variety in their adaptability for

For Morphology

1. Village Complex
2. High-rise tower
3. Terraced

For Typology

1. Single-loaded slab
2. Atrium
3. Double-loaded slab

Figure 3 Most effective morphologies and typologies for solar passive design. Considering the need for shading and overall solar exposure.

hotel design, so it is ideal to suggest ranked options.

In this evaluation, direct passive design methods have more weight due to their higher energy impact. In terms of passive design applicability, the village complex morphology has the most freedom in integrating passive design strategies due to the character of the design having separate units of accommodation. When it comes to the other morphologies, terraced morphology shows the next best potential with major drawbacks for cross ventilation potential. This success is also dependent on the orientation of the terraced morphology as it can be single-directional. High-rise towers and y-shaped morphologies show similarities in their concepts. However, for high-rise towers as the connection with the ground level is lesser, evaporative cooling may become challenging. This becomes a similar drawback for y-shaped in the case of multiple levels (for example over 5 levels.)

For typologies, the distinction is highly visible

Passive Strategies		Most preferred to least preferred by developers->				Most preferred to least preferred by developers->		
		Morphology				Typology		
		High rise tower	Y shaped	Terraced	Village Complex	Single loaded slab	Double loaded slab	Atrium
Only Solar Protection	Before (kWh/m ² /yr)	55	55,2	51,5	71,7	57,4	55,9	62,9
	After (kWh/m ² /yr)	50,7	51,3	49,3	61,9	50,6	51,9	59
	Impact (% kg CO ₂ /m ² /yr)	8%	7%	4%	14%	12%	7%	6%
Passive Ventilation Cooling (With solar shading)	Before (kWh/m ² /yr)	50,7	51,3	49,3	61,9	50,6	51,9	59
	After (kWh/m ² /yr)	37	37,4	36,8	37,9	35,3	37,7	41,5
	Impact (% kg CO ₂ /m ² /yr)	27%	27%	25%	39%	30%	27%	30%
Total Decrease in Energy Load		35%	34%	30%	52%	42%	35%	36%

Figure 3 Results of energy demand simulations on selected morphologies and typologies. The figure shows the energy demand decrease after solar passive design and natural ventilation passive design.

with single-loaded slab showing the most potential for overall passive design applications. This is followed by the atrium and double-loaded slab respectively. The biggest constraint is faced with double loaded-slab due to creating closed and compact spaces. Compactness can be useful in passive design as well; however, in terms of natural ventilation passive design, it is less appreciated.

The energy performance before and after passive design strategies also suggest nuance. According to the results, the distinction between total percentage decrease in energy load (%) and the final energy consumption per area annually (kWh/m²/yr) is important. Although the village complex becomes a superior option with 52% decrease in the energy load, it has the highest energy consumption per area with 37,9 kWh/m²/yr. Therefore, it is important to prioritize energy consumption over percentage decrease for drawing conclusions. As a result, the terraced morphology becomes the lowest energy-consuming morphology per area

annually with 36,8 kWh/m²/yr. A very important difference for village complex and terraced morphologies is also their direct contact with the ground (compared to other morphologies where the ground level is public functions.) This causes significant energy save for hotel designs and makes terraced morphology especially ideal for locations with complex topography.

For typologies, by far the most effective and efficient option is single-loaded slab with both lowest energy consumption of 35.5 kWh/m²/yr and energy decrease of 42%. Although the total decrease in the energy load for the atrium is 36% (compared to 35% for the double-loaded,) double-loaded slab becomes a more ideal option with energy load 37.7 kWh/m²/yr (compared to 41.5 kWh/m²/yr for atrium.) This makes atrium typology a less preferable option compared to double-loaded slab for hotel design. However, atrium can still be integrated as solar chimneys to promote a stack effect rather than a complete building typology.

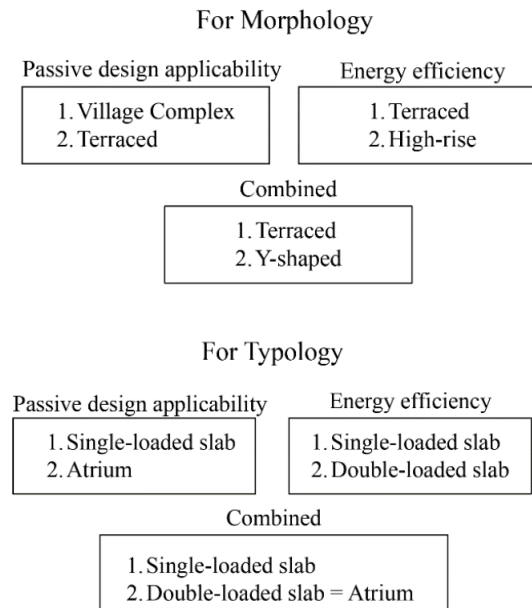


Figure 4 Most effective morphologies and typologies after solar passive design and natural ventilation passive design. According to the overall energy load per area annually.

Architectural design opportunities is a highly important criteria and can help achieve sustainability goals related to hotel design from a social and contextual perspective. These opportunities can help promote healthier relationships with the stakeholders to create healthier communities and overall, a more sustainable design vision. The simulations show that Y-shaped morphology has the highest potential by allowing opportunities for all design

criteria. This is due to its radial spread over the context which allows opportunities for all-around views, zoning, landscaping, and creating different levels of public-private interactions. It is also a high-density accommodation morphology which makes it a profitable design choice for developers. The second-best option is the terraced morphology which achieves a multi-story quality without being intrusive to the context with stacked terraces and only facing limitations for orientation. From a design point of view, terrace morphology offers potential for social interactions and a seamless connection between ground level and upper levels. The last morphologies are equally the effective high-rise tower and village complex. The high-rise tower morphology shows potential for achieving high-density accommodation zones and allowing attractive views without privacy issues. This design morphology is especially weak with relating to its context due to the multi-story aspects. The village complex, however, shows strengths in weaker criteria of the high-rise tower: orientation and landscaping & outdoor activities. These are due to the scale of the accommodation zones being significantly smaller allowing flexibility for relating to the context. Village complex also offers opportunity for a more diverse masterplan with zoning and clustering. Synthesizing all evaluation sections of the research gives an overview of strengths and weaknesses of selected morphologies and typologies. The

synthesis suggests that terraced morphology shows an overall competency in all categories in a uniform manner. This is followed by the village complex, y-shaped and high-rise tower. An important detail is related to architectural design opportunities. If several design criteria are less important for the designer, then the lack of this design opportunity will not be critical for the success of the morphology or typology. Therefore, it is important to understand which criteria are

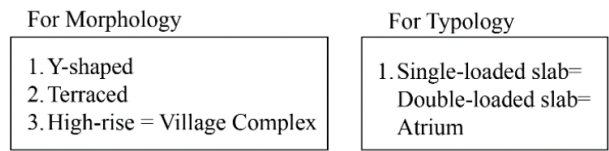


Figure 5 Most effective morphologies and typologies for architectural design potential. According to 4 hotel/passive design criteria that was developed.

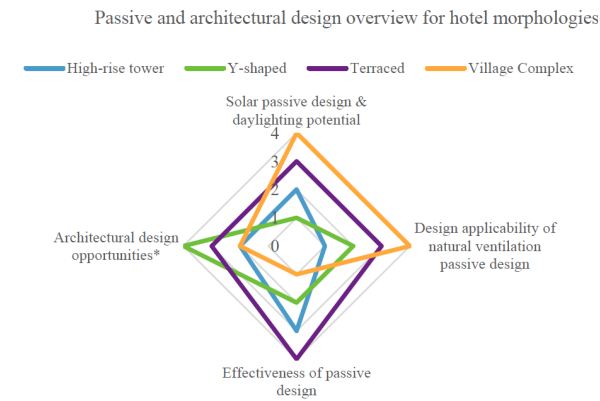


Figure 6 Passive design and architectural freedom assessment overview for hotel morphologies. (*the design opportunities

available in morphologies and typologies.

For typologies the results suggest success for single-loaded slab typology both for architectural design freedom and energy efficiency. This is followed by atrium typology which shows significant success in passive design applicability and passive solar protection. Finally, double-loaded slab as the most profitable and commonly used typology for hotel design, shows better energy performance compared to atrium.

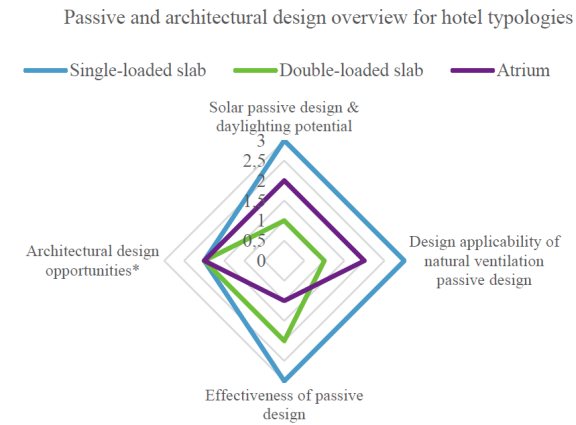


Figure 7 Passive design and architectural freedom assessment overview for hotel morphologies. (*the design opportunities



CONTEXT & PROJECT DEVELOPMENT

Why Malta?

The selected site is in Malta in the town of Marsaskala. The town of Marsaskala is expected to grow more than 40% over the years for both the local and touristic population and becomes an appealing spot for its closeness to the capital and the airport. The climate issues on the island are faced with higher consequences (such as scarcity of resources, drought, lack of water sources, high seasonality, and high consumption-oriented tourism) and therefore

requires a more thorough implementation when it comes to design decisions. Malta is also the 5th biggest contributor to EU for travel and tourism-based GDP and expected to grow this industry by 80% between 2024-2028 (Chapman & Speake, 2011; Vella & Malta Tourism Authority, n.d.). So, the site is chosen as an “extreme” climate context regarding the Mediterranean climate and tourism development in the Mediterranean region.



+80% Economic Contribution
of Tourism forecasted increase of tourism in Malta
between 2024-2028



5th Biggest Contributor to EU
for travel & tourism based GDP & 15% of Maltese
GDP is based on tourism

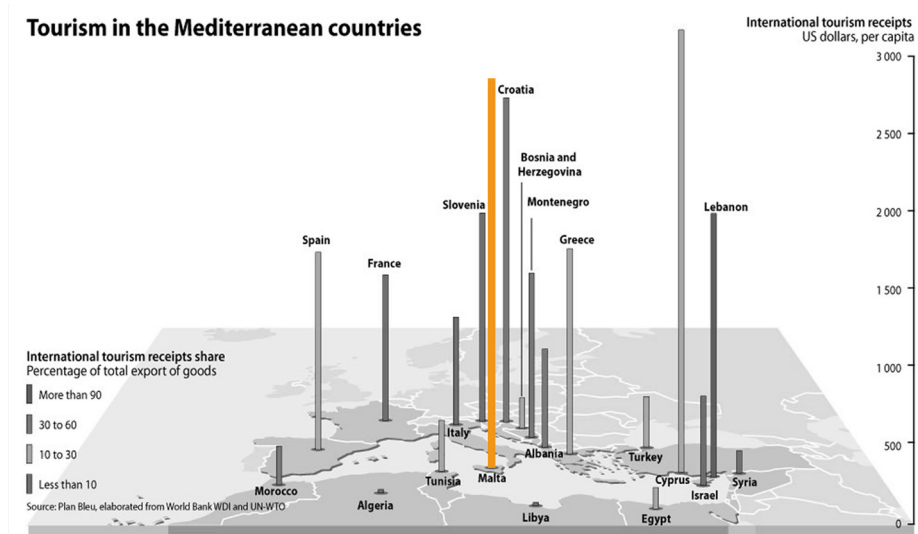


Figure 8 Tourism as a product density in the Mediterranean countries. Malta highlighted in orange.

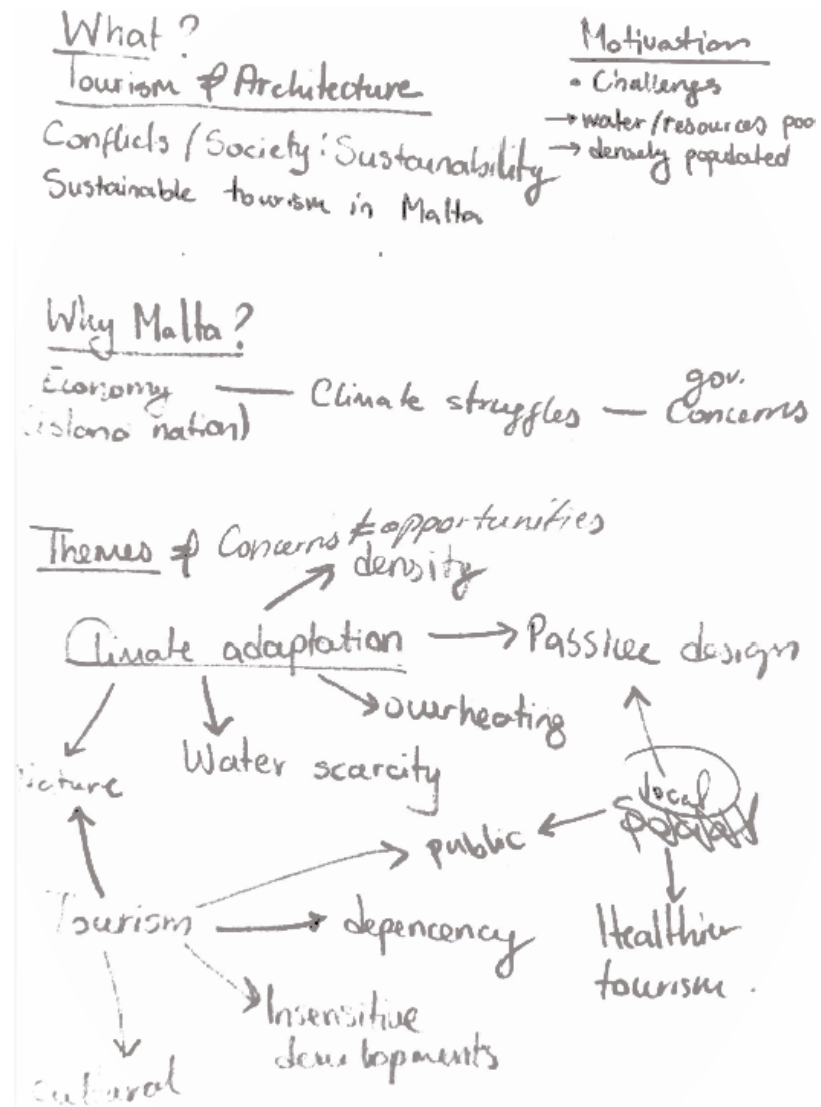
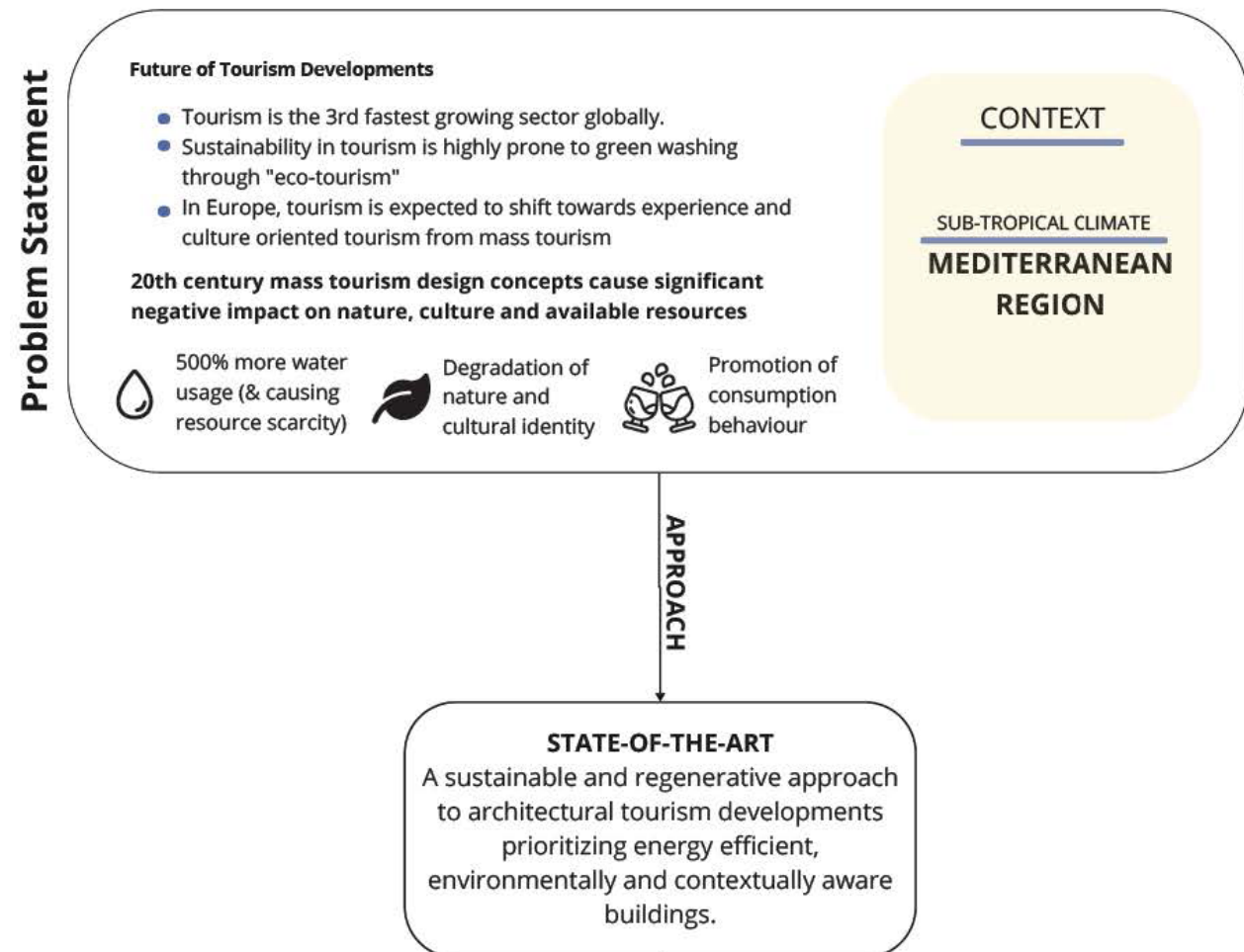


Figure 9 Self-made sketch during the project development phase

Problem statement & Context

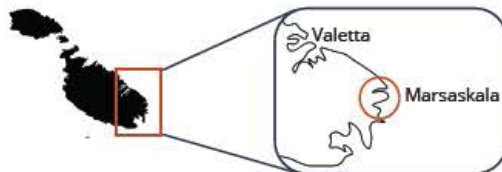


RELEVANCE TO CHOSEN SITE

Selected Site

WHERE?**Malta, Marsaskala**

1. Expected 50% increase for local and touristic population
2. Nearby historic and natural sites
3. Former fishing town turned tourism spot in 90s & 2000s
4. Left for deterioration of local economy after the fall of mass tourism (hotels) functions

WHY MALTA?

Issues that are faced in other Mediterranean countries are heightened in Malta due to being an island country. These realities of Malta makes it an extreme context of exploration.

Realities & Challenges of Malta

1. Small area, water and **resource poor** & densely populated
2. Dependency on tourism
3. High Service and **consumption oriented tourism** that **deteriorates the resources and local identity**
4. **Strong seasonality** (of tourism activities)
5. Significant interest on tourism developments regardless of issues faced

UNDERSTANDING Hotel Program Development

The development of a hotel requires various considerations ranging from spatial organization, materialization, location and creating a sense of belonging for the consumer. Therefore, hotel design and development are a heavily profit-based system to ensure the most efficient way of hosting residents and allowing a group of public programs to benefit internal business. For this reason, various program organization is done to ensure that this internal business thrives throughout the day[De Roos, n.d.]. Whether it would be an urban hotel or a coastal resort, there are common patterns in spatial organization that are important to understand to implement the best passive design strategies.

One way of categorizing the spatial organization is the types of programs present. These programs are mainly accommodation units, back-of-house, Food, and beverages (also known as F&B for restaurants, cafes, and bars), Lobby and outdoor facilities. Although these are some of the most common programs, depending on the size and type of the hotel such as SPA, event space, sports facilities, and shops.

In most cases, the public functions are organized on the ground level, occasionally on first levels creating an open flow of public functions. This is to “make sure that the residents are

entertained, have a ‘sense of being’ and are occupied during the day” [S&claw et al., n.d.]. Therefore, in terms of public and private relations, the building can be divided into three parts: Private (accommodation units), Public (day/nighttime activity zones, F&B and other facilities) and semi-private (Back-of-house: service, maintenance, employee zones, service accessibility etc.)

To be able to ensure the profitability of the hotel the ratios of these functions are also important. Several study cases from the Mediterranean region suggest an overall idea for these ratios (see Appendix A). Usually, the expected ratio for hotel accommodation units varies from 60% to 70% to have a profitable business[De Roos, n.d.]. This proceeds with back-of-house that varies from 10-20%, F&B with 10-15%, event space 2-3% and occasionally retail with 3% to compensate for a lower accommodation ratio.

The design decisions that might have an impact on the passive design of a hotel can be summarized into 3 considerations:

1. Maximizing the amount of accommodation units and repetition of these units
2. Orientation and views
3. Accessibility and openness of the public zones to maximize internal business to thrive.

Grand Park Hotel Rovinj / 3LHD

Location: Rovinj, Croatia
Area: 46813 m²

Accommodation Units: 45 %
Lobby: 1%
SPA: 5%
Back-of-house: 23%
Food & Beverages: 14%
Retail: 3%

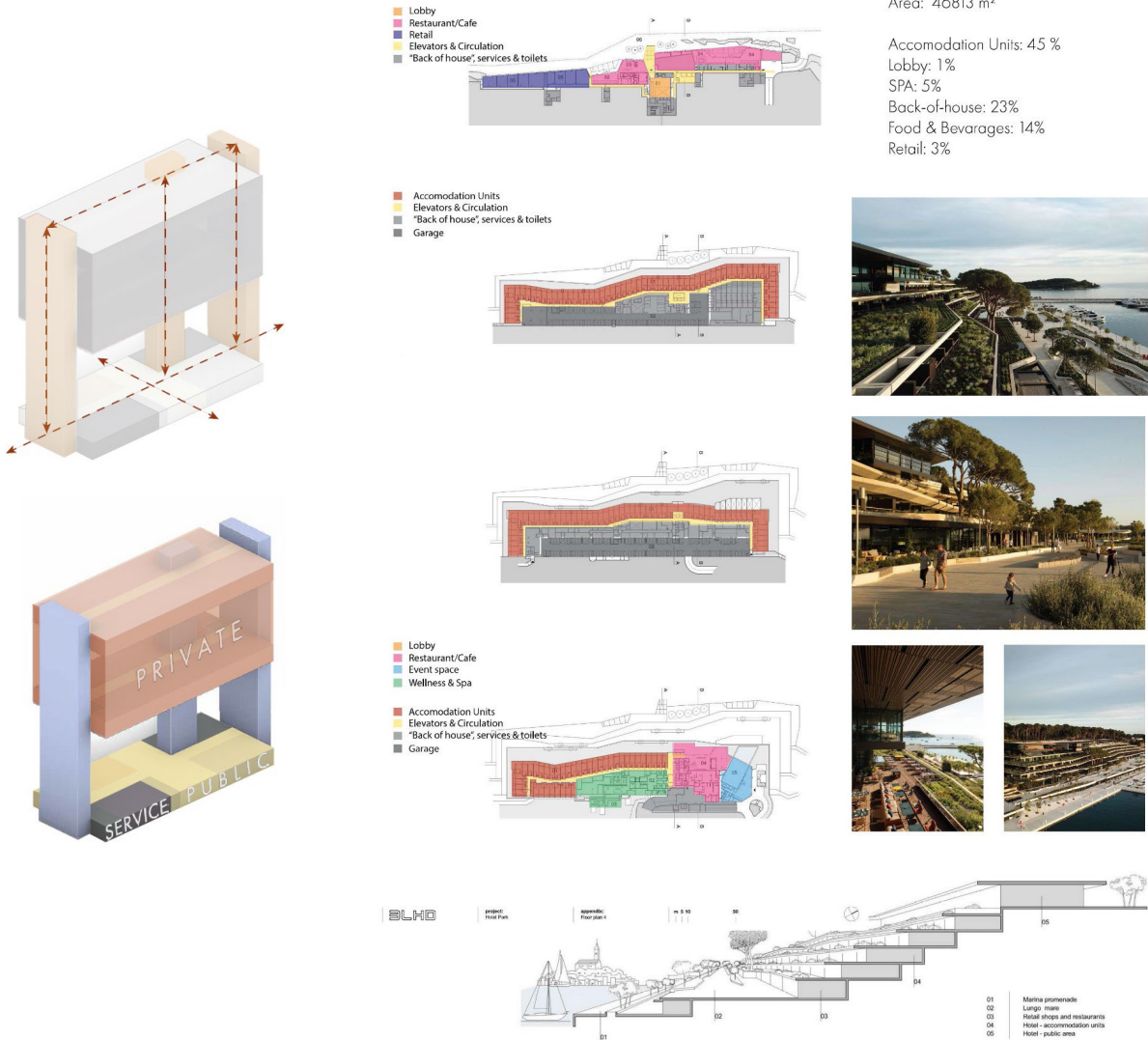
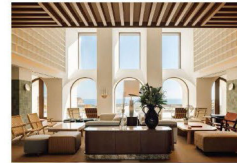


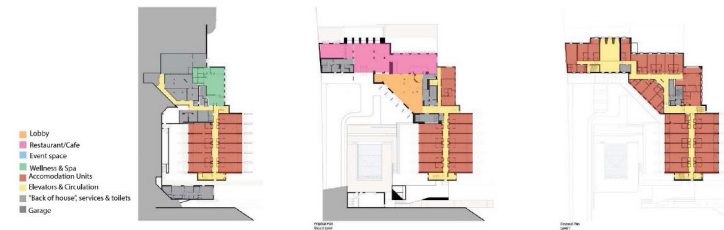
Figure 10 Hotel circulation & public private divisions and Grand Park Hotel program analysis

Aethos Ericeira Hotel / Pedra Silva Arquitectos



Location: Ericeira, Portugal
Area: 3750 m²

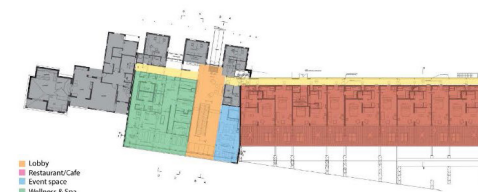
Accommodation Units: 50 %
Lobby: 4%
SPA: 8%
Back-of-house: 30%
Food & Beverages: 14%



Casadelmar Hotel / Jean-Francois Bodin

Legend for Casadelmar Hotel:

- Lobby
- Restaurant/Cafe
- Event space
- Wellness & Spa
- Accommodation Units
- Elevators & Circulation
- "Back of house", services & toilets
- Garage



Legend for Casadelmar Hotel:

- Lobby
- Restaurant/Cafe
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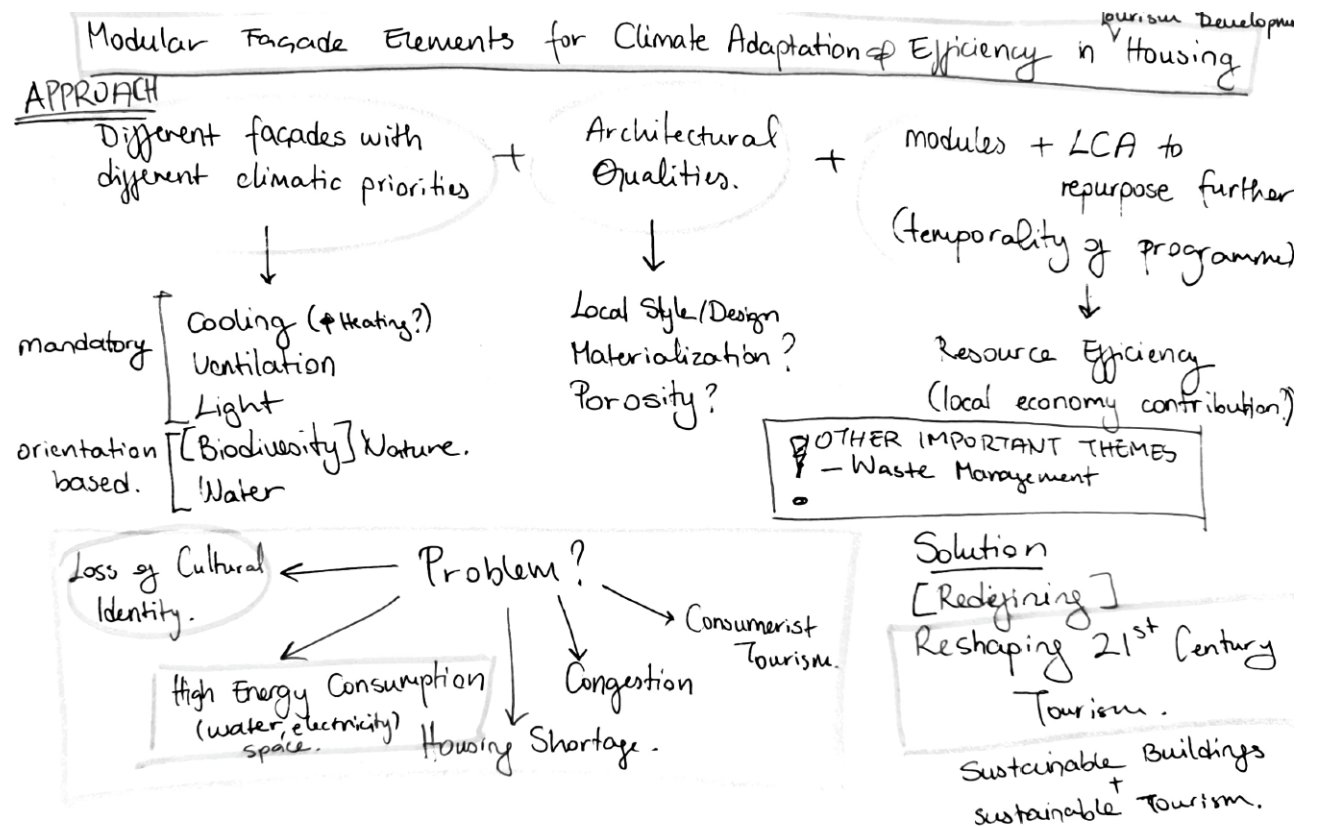
Location: Porto-Vecchio, France
Area: -

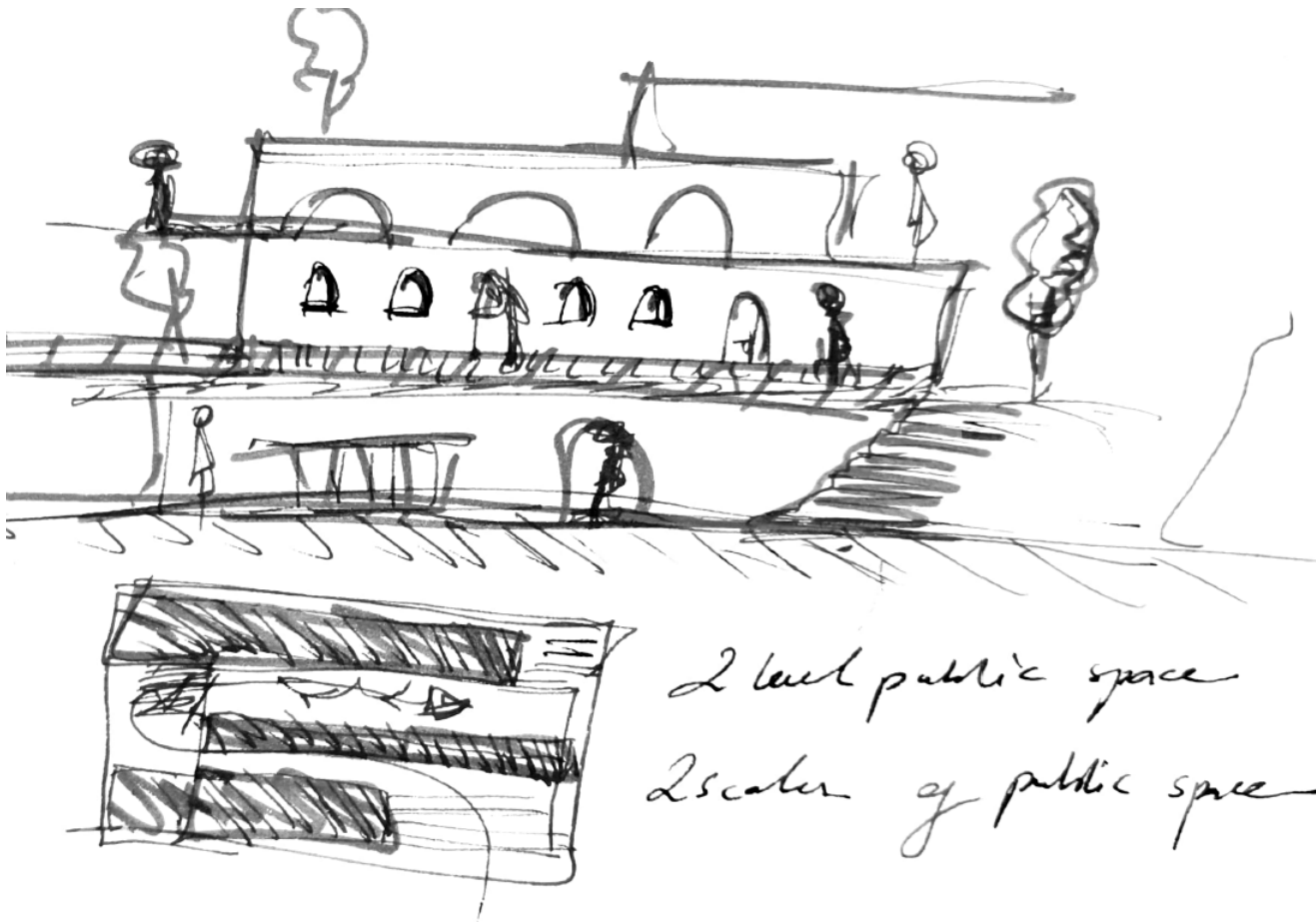
Accommodation Units: 50 %
Lobby: 4%
SPA: 8%
Back-of-house: 30%
Food & Beverages: 14%



Figure 11 Aethos Ericeira Hotel & Casadelmar Hotel program analysis







UNDERSTANDING

The People, Malta - Marsaskala



As an island country in the middle of the Mediterranean Sea, Malta is an important touristic destination. Just like many other Mediterranean countries, Malta also struggles with energy, water and resource scarcity and deteriorate the existing ecosystem. Due to the small size (one fifth of the Netherlands) it is highly common to travel between cities and towns for touristic, business or other reasons. It is also an appealing location for many tourists due to english being one of the local languages and ease of getting around.



Marsaskala in this contexts is a small coastal town in the east of the country. It used be a highly appealing getaway-town for many local and international tourists until the 4-star hotel closed down in early 2000s. This event effected both the local economy and turned the attention towards other coastal towns for tourists.

Although the government wanted to revitalize this area multiple times, the proposed projects for the existing locations have been either too expensive, not profitable enough or too intrusive towards the local community.



Asset Recognition & Public Interview

Considering the impact of tourism developments on the local community, an asset recognition chart was created. This chart aimed to understand how to develop the fitting amenities and functions that the town itself can benefit as well. It strongly focuses on the idea of placemaking and contemplated how to invite locals into touristic zones. The chart aims to create a link between understanding opportunities, assets and weaknesses of the site to introduce amenities that can help. The second method focuses on public interviews

with the locals of Marsaskala. 20 people have been interviewed about the abandoned hotel and its impact to the town before and after its run. The interview also included which amenities the locals would prefer having in the town. The main consensus was since the shut down of the hotel, the activities that can be done in the down deteriorated. Which pushed locals to go to other cities in for weekend activities. There was also significant interest towards functions like restaurant shops and recreation centers.

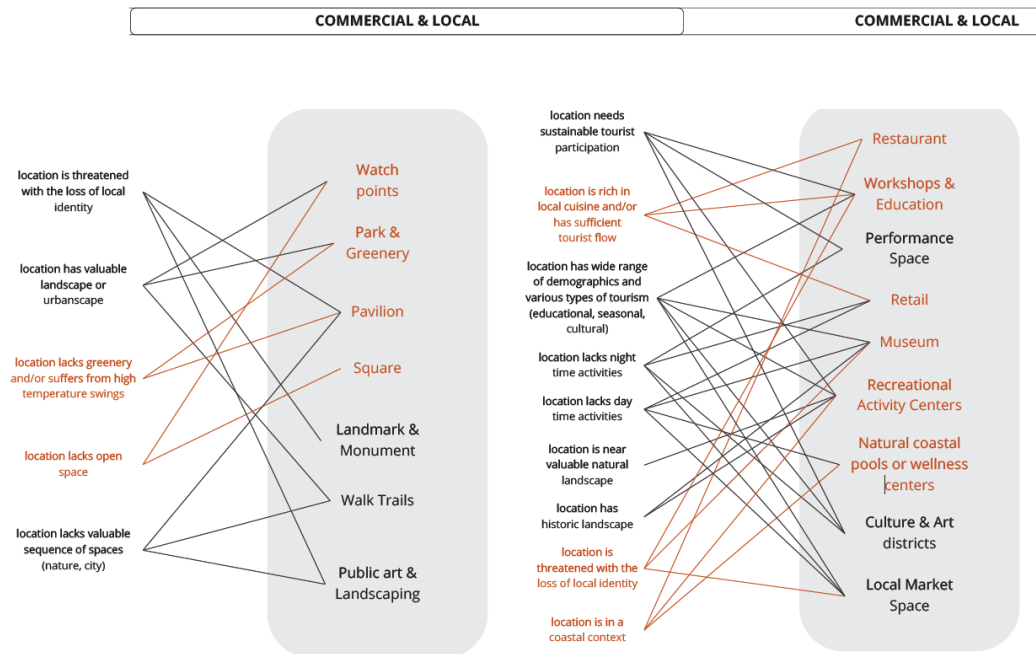


Figure 12 Asset recognition chart

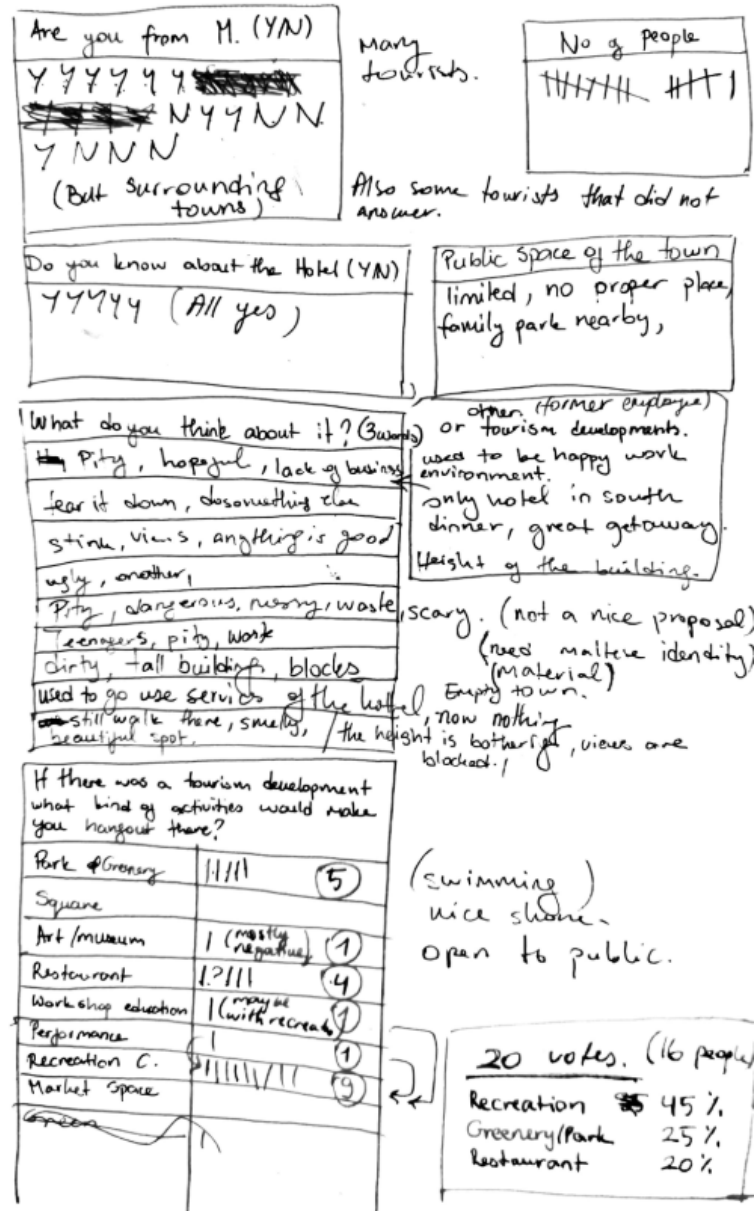


Figure 13 Self made sketch showing public interview results.

UNDERSTANDING

The Opportunities

After conversations with the locals and the asset recognition chart, it was possible to create 2 scenarios for the tourism development. The first scenario focuses on redeveloping the selected site into a new hotel development without the inclusion of accessible social amenities. The second scenario focuses on distributing the GFA partially for the social amenities that local community can also access. Considering that the biggest issue with hotel developments is privatization of the context, it became clear to follow a different method.

Therefore, a building program that integrated accessible social amenities and functions is essential to create common space between local and commercial stakeholders.

As a result, option 2 became the foundation for the concept development phase. The idea of creating common space also sparked the idea for exploration and interaction which became essential to the project.

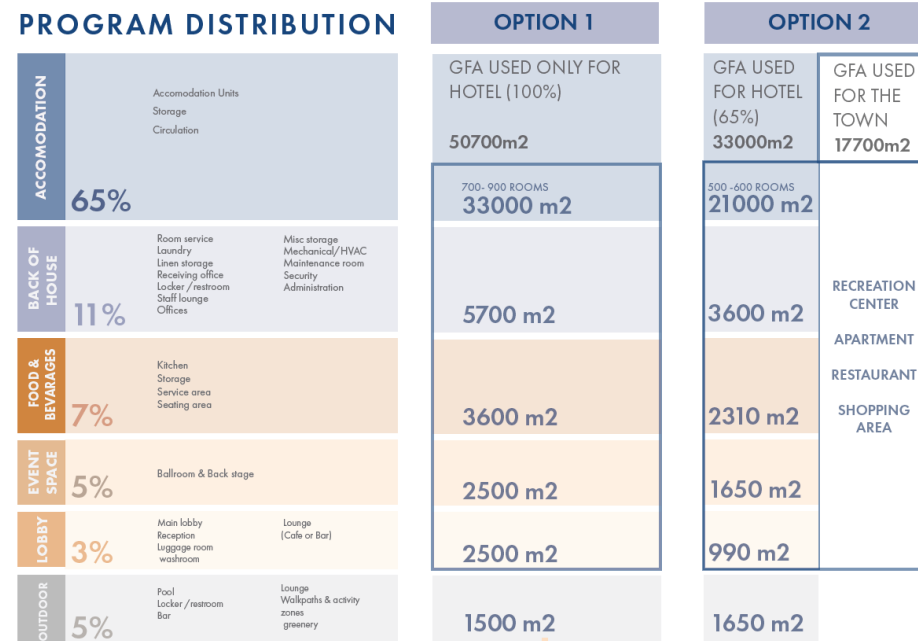


Figure 14 Two scenarios for project development. Option 1 focusing on only hotel development. Option 2 focusing on hybrid program with hotel and public amenities.

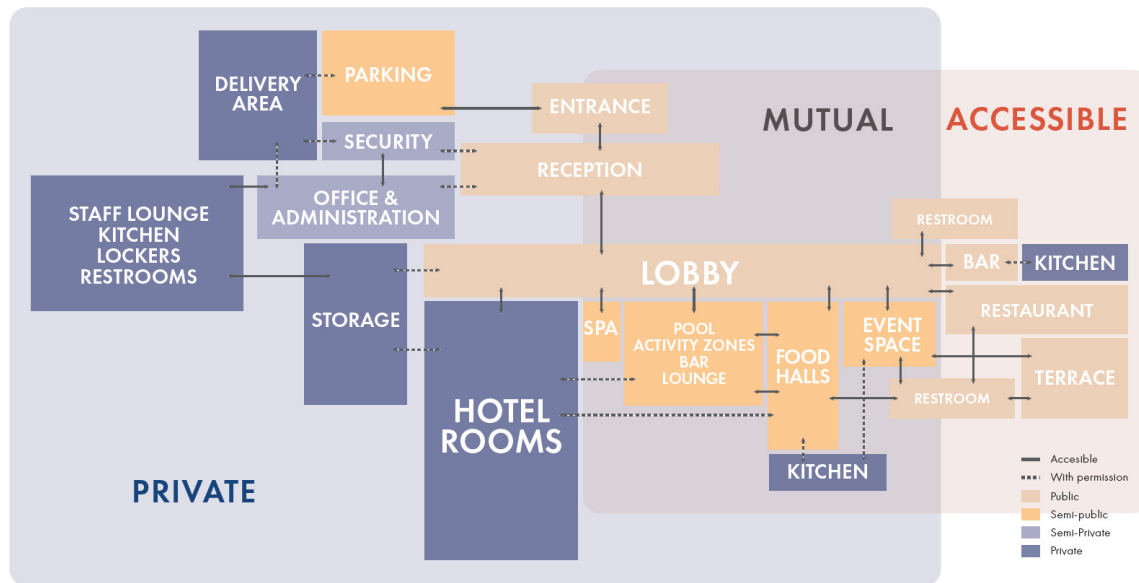


Figure 15 Proposal for public&private zones of the hotel and suggesting accessible zones for local stakeholders.

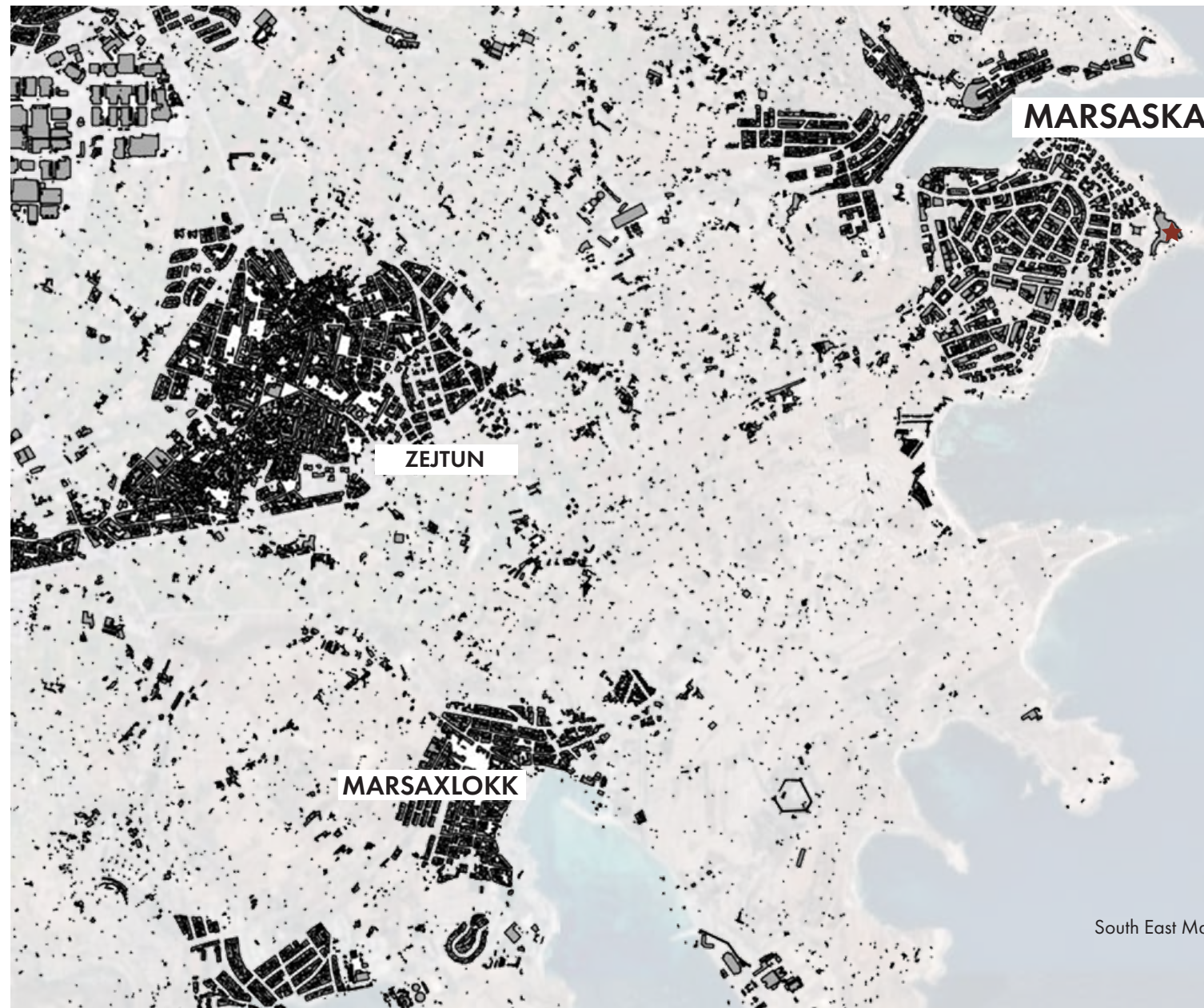
One of the important things about hotels is the idea of creating the feeling of home while also offering security and luxury. This means that several parts of the hotel will be accessible by public, it needs to be integrated well to the rest of the private functions.

work seamlessly and evoke the idea of taking a stroll in your neighbourhood. As a result, it is aimed create a natural environment for both of these stakeholders to come together and experience the benefits that both parts offer.

The main idea of the concept is to locate restaurants, shops and cafes on one public zone. This will ensure that locals can use the facilities and the touristic residents would need to “leave” the hotel to access them. This should



SITE



South East Ma

LA



South East of Malta

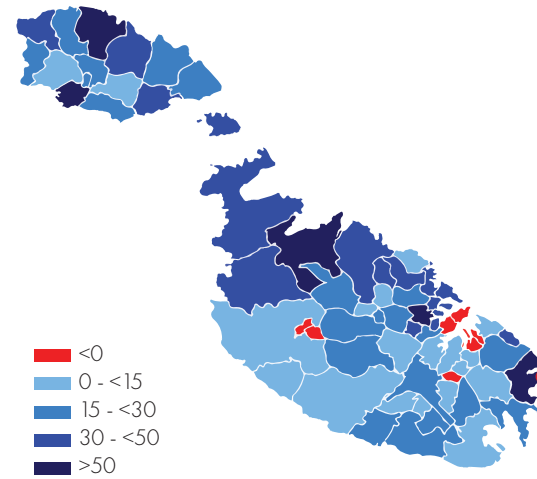
Perhaps one of the assets of what makes Malta an attractive holiday destination is the coziness and the natural beauty it offers. The south east of Malta, which is also where Marsaskala is located, offers various small towns that are used as getaway towns. Towns like Marsaskala & Marsaxlokk are known to be fishermen's towns that have regular market days and attract tourists weekly.

Malta - Urban Development

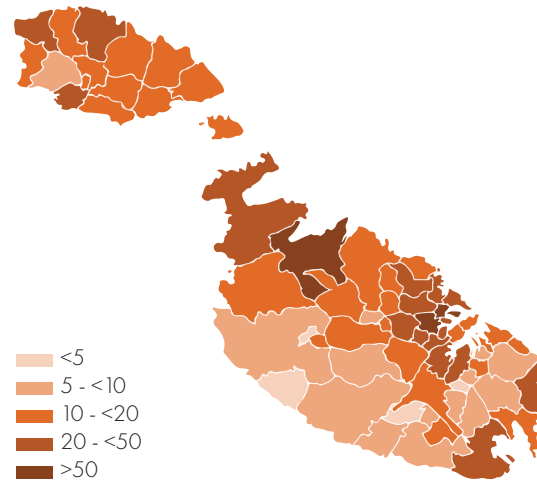
★ Site 1:30000



Percentage change in total population between 2011 and 2021 by locality

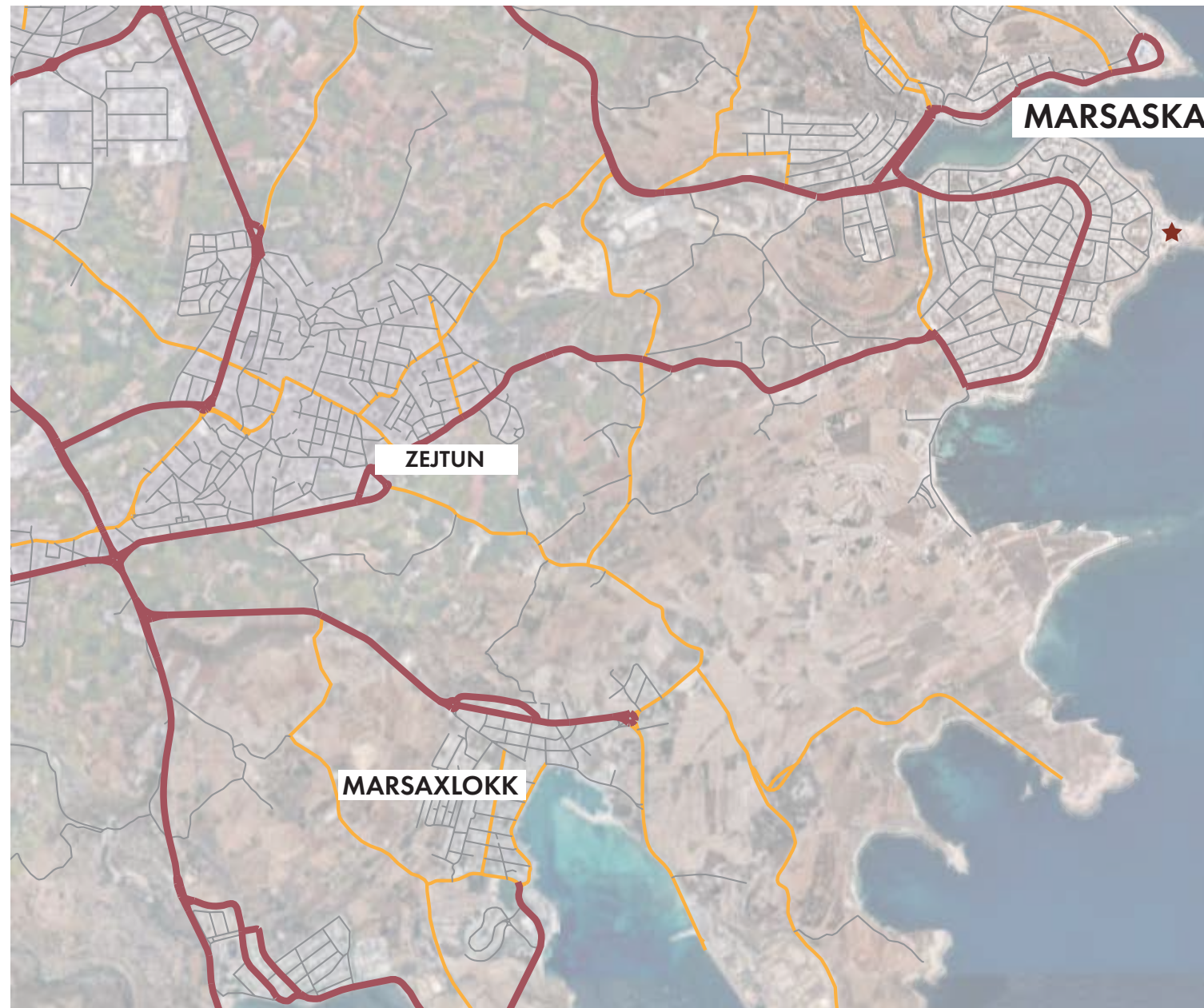


Percentage of foreigners to the total population of each locality 2021



Future Projections

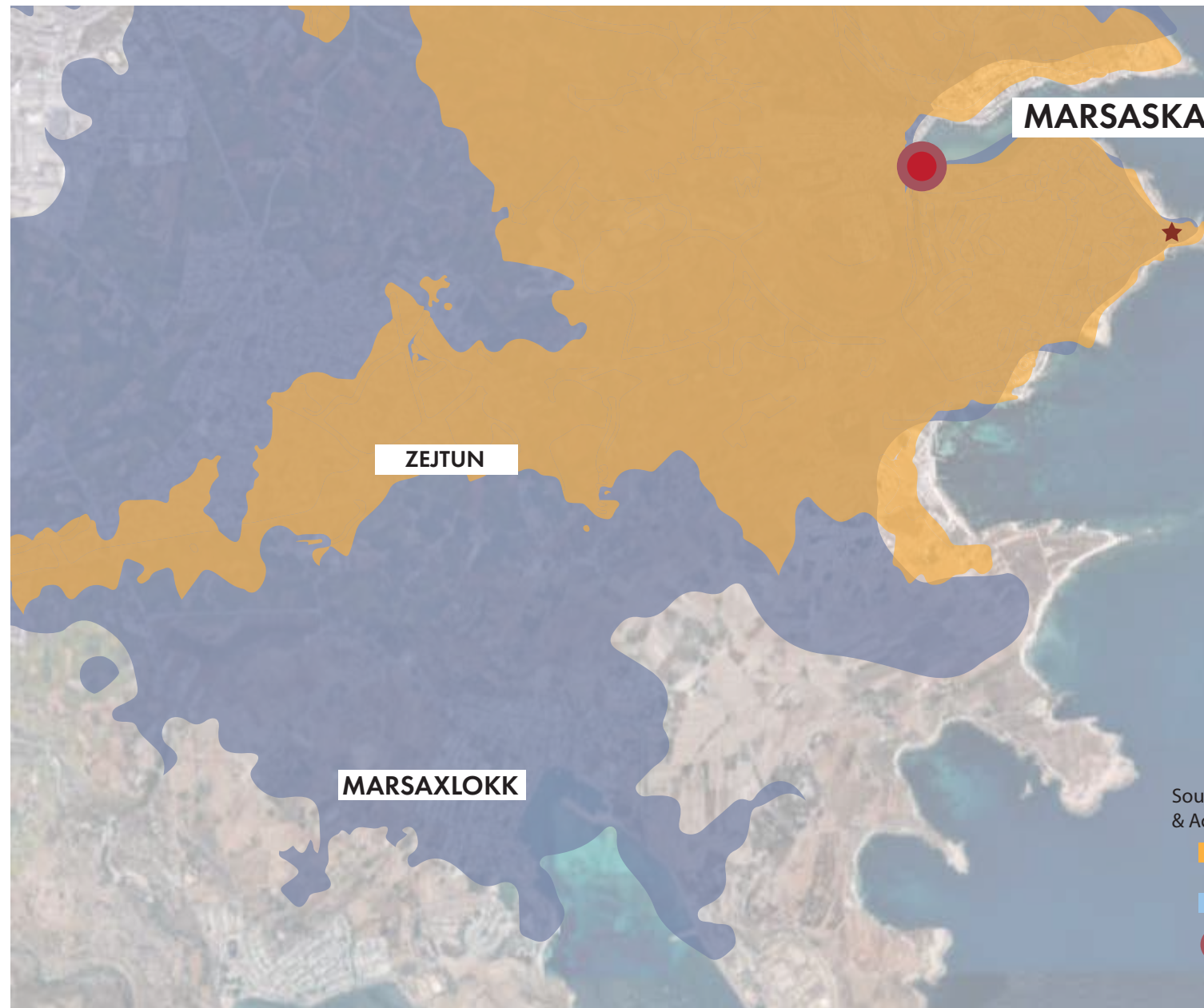
What makes Marsaskala especially important for tourism developments is its potential for growth. For the past 10 years Marsaskala had more than 50% growth of population and between 20-50% growth for foreign population. This emphasises the gradual interest in the area as well as the increase in foreign population that reside in Marsaskala long-term.





Mobility

Maltese and tourists are heavily depended on private and public transportation since it is very common to visit different parts of the island for work or leisure. Within the south eastern region, Marsaskala is relative disconnected from the rest of the smaller towns. This is most likely due to its loss of attractions since the hotel closes down. Instead, Marsaxlokk became the next spor for leisure.

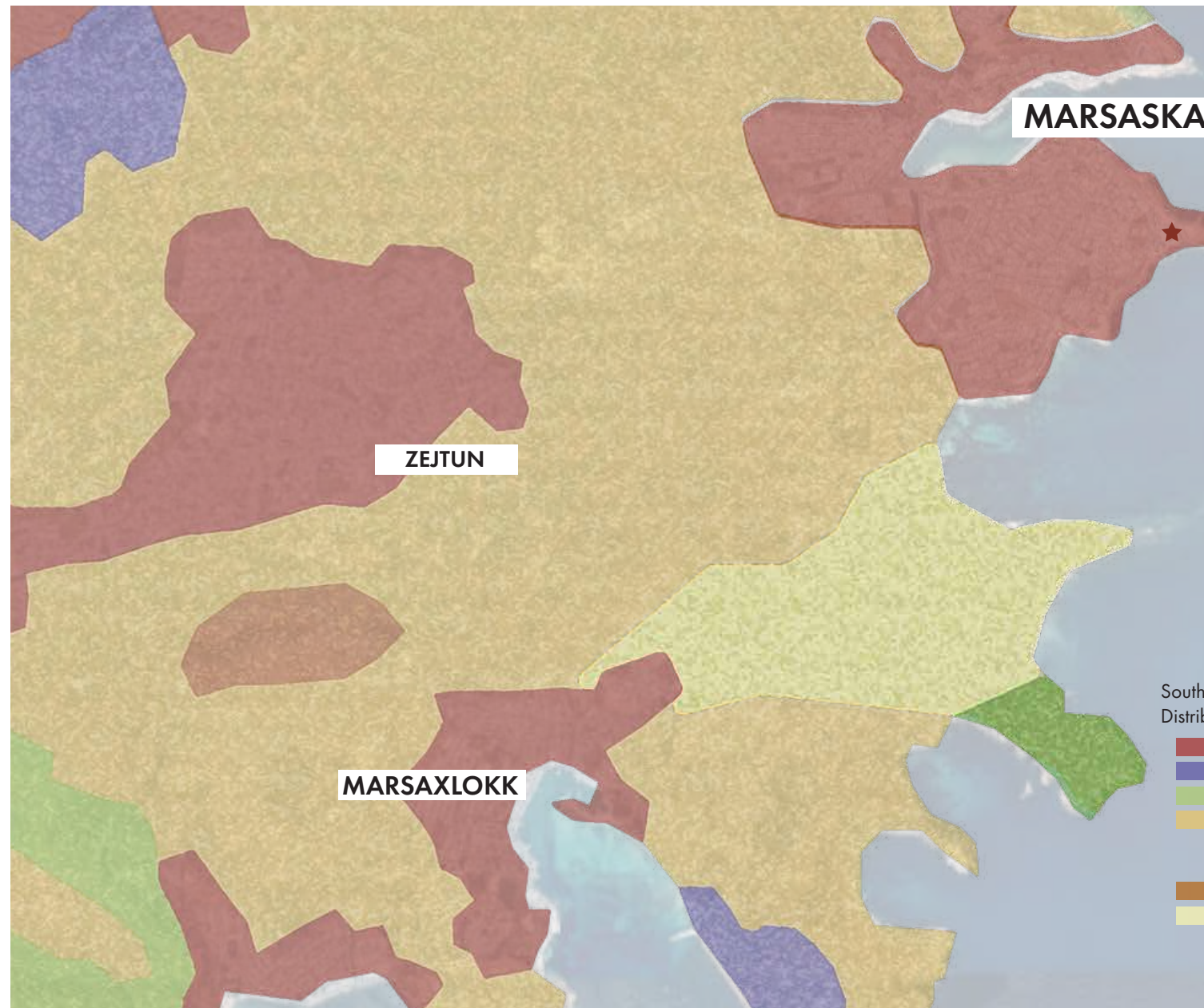




Mobility

Development of an inviting tourism project can also attract local and touristic visitors from different towns. Conclusions of the public interview was also addressing how the locals were leaving Marsaskala for weekends to visit other towns. This was mainly due to lack of functions in the town.

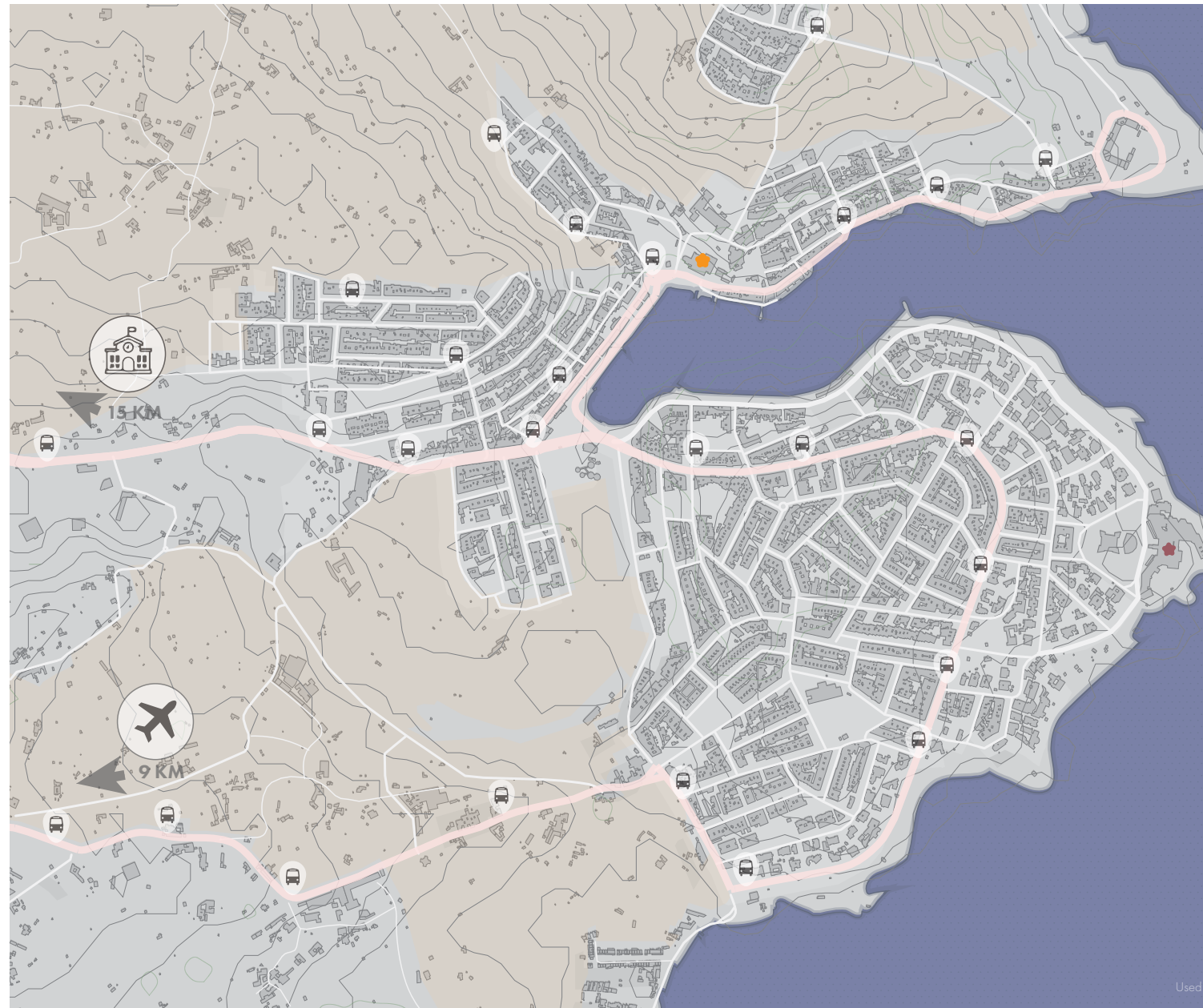
Therefore, it becomes highly valuable to create attraction points to increase the attraction towards Marsaskala. The distance between these two important towns are no more than 10 minutes by car and 20 minutes by public transport.





Land Use

In order to increase the activities around this region, various nature walks and cycle routes can be made between Marsaskala and Marsaxlokk. The land use map suggest the presence of valuable vegetation sites, vineyards and protected nature zones which can strengthen the touristic value significantly.

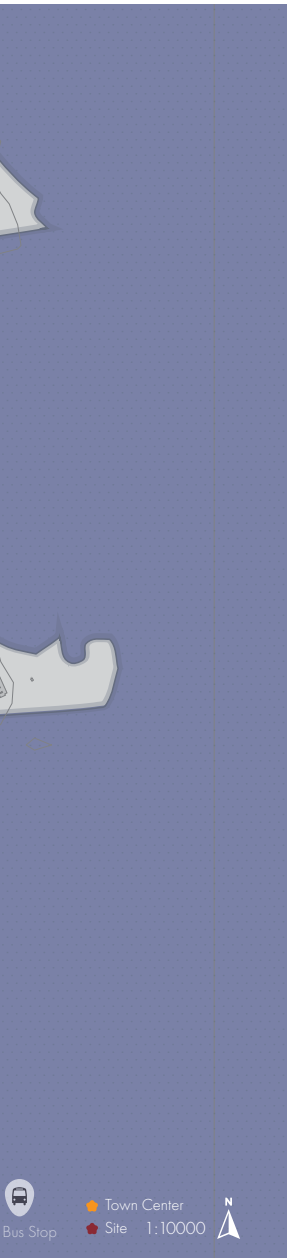




Town Mobility

Marsaskala is located near the airport and the capital Valetta which makes it a good base for tourists to reside. The main public transport is the bus line which passes through the town center and the resident heavy zones.

By having the main mobility street close to the inland, it is possible to create walkable streets near the coast. This would also encourage walking towards the development area.





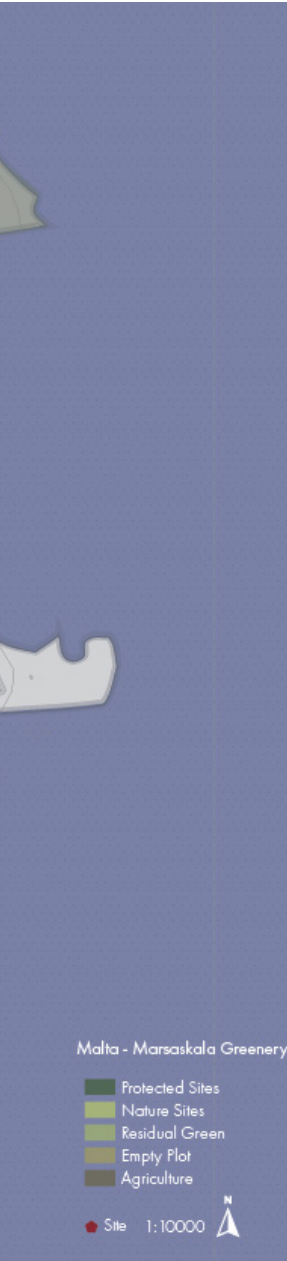


Public Spaces

One of the biggest weaknesses of Marsaskala is the lack of public space and activities. Perhaps the only existing, and highly valuable public space is the coastline. The coastline, however, stops when it reaches the abandoned hotel once more emphasizing the privatization of tourism developments. Around the site, it is also possible to recognize locations with historic value (on the west of the site) and a small protected green zone (south of the site.)

These locations show significant potential to be integrated back to the town and the development area.





Greenery

Majority of the greenery around the town is reserved for agriculture. However, towards west of the site the presence of the historic watch tower St. Thomas is an essential landmark to be considered while developing the project. Moreover, the green strip that continues towards the south is a protected zone rich in biodiversity. These to natural assets add opportunities for the tourism development and offer various types of activities.





Town Amenities and Program

Perhaps one of the weakest element of Marasaskala is the lack of variety of program in the town. Majority of the shops and restaurants are zoned either towards the town center (which has the least amount of residents) or towards the inland residential zones.

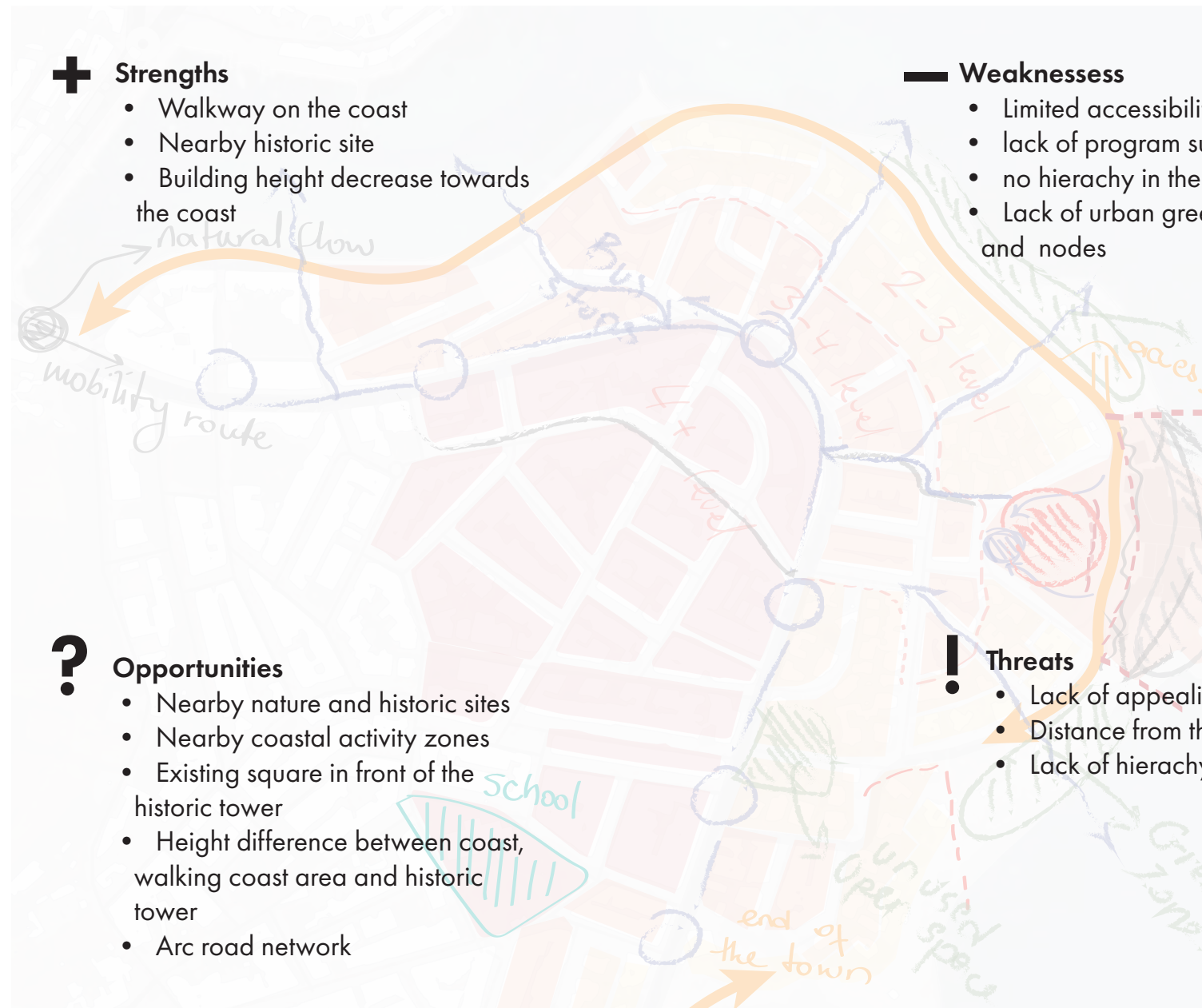
This further shows the lack of public promenade, square, watchpoints or shopping zones which can further help the day-to-day life of the town.

Malta - Marsaskala Building Functions

- Small Scale Hotel & Accomodation
- Shops
- Cafes & Restaurants
- Pharmacy
- Residential

Site 1:5000





ty and mobility
urrounding the site
residential zone
enery, furniture



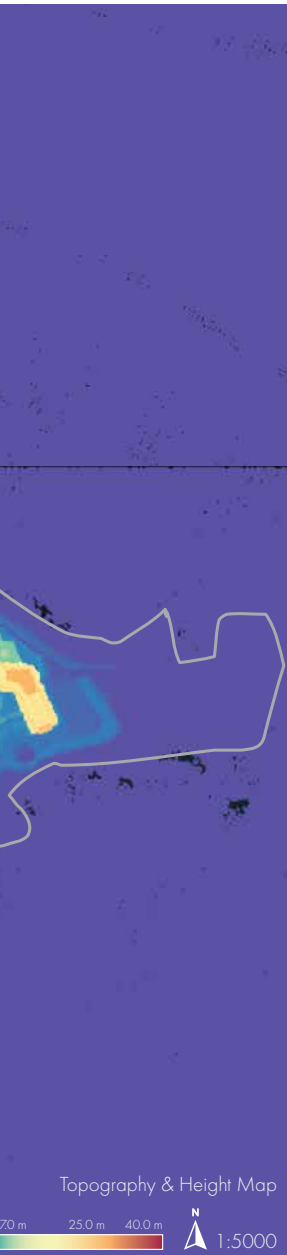
Sal. H. Pens

Some
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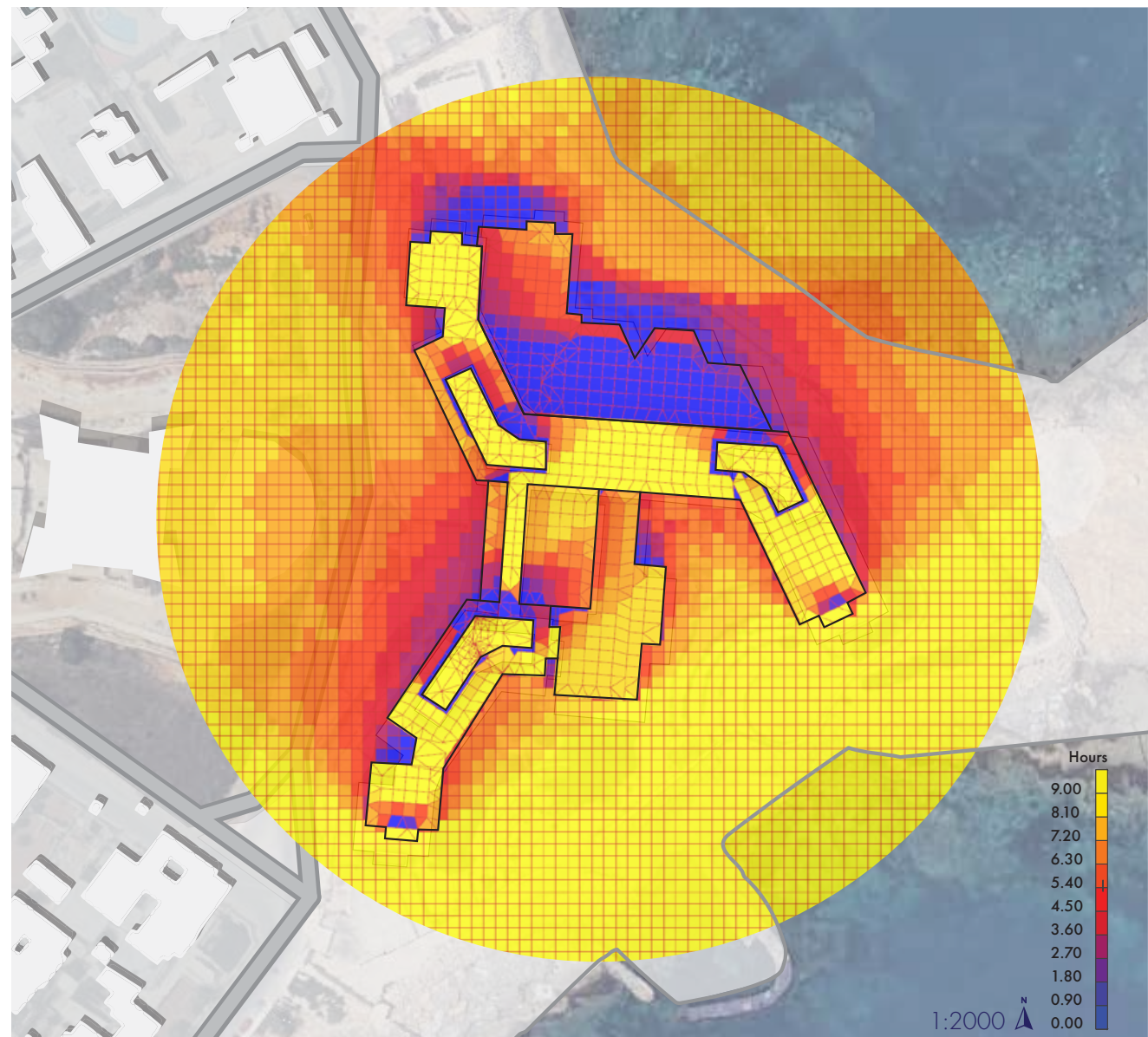




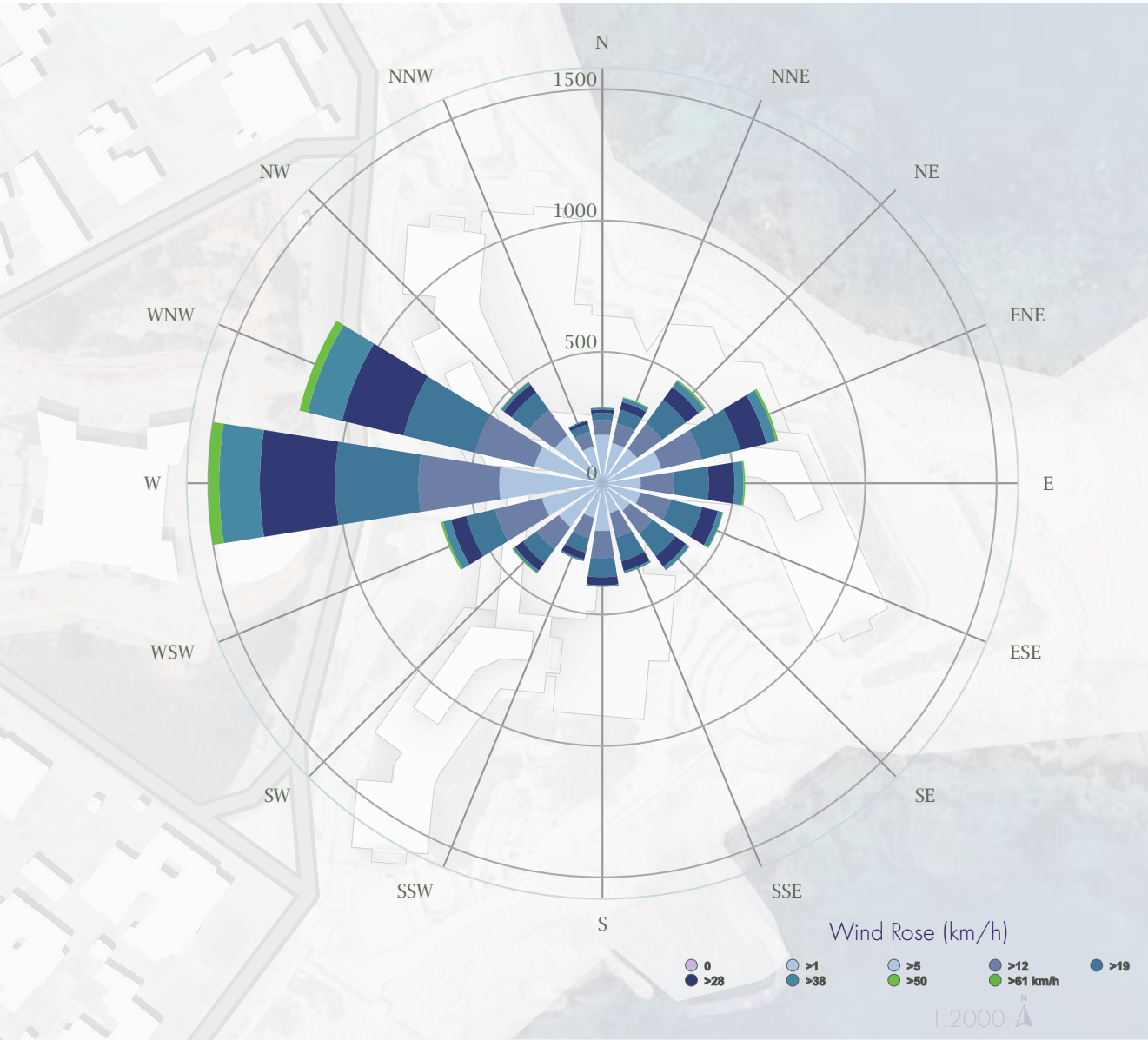
Topography & Building Heights

One of the first things to recognize is initially the dense residential zone towards the west. The topography and the buildings heights gradually decrease towards the coastline with an exception of St. Thomas Tower and the abandoned hotel. Here it is also possible to see the intrusiveness of the existing building with its morphology and height.

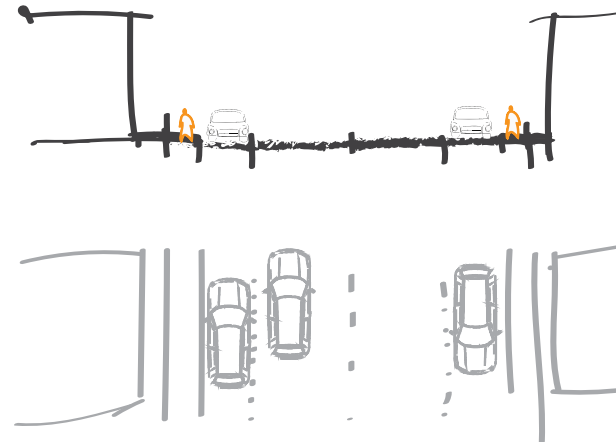
Solar Exposure



Wind Rose



Existing Urban Context: Streets







PLOT AREA
~ 22800 m²

EXISTING BUILDING

COVERAGE AREA
~15 800 m²
(BCR 69%)

**GROSS FLOOR
AREA (GFA)**
~50 700 m²

Existing Situation

The existing situation of the building is at an abandoned state and stripped of all cladding materials. The plot area is 22800m² and the building is covering 69% of this plot area. The Gross Floor Area is 50700m² which makes the abandoned hotel a 5 storey building.

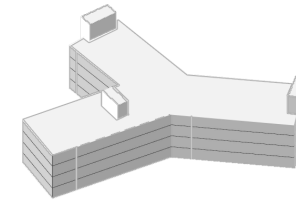




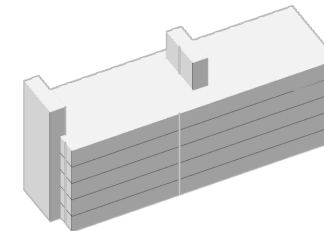
Existing building Morphology & Typology

Looking back into the design manual, it is important to recognize which morphologies and typologies the abandoned hotel fits. As some of the most profitable and dominant options, the existing building follows a Y-shaped morphology and high rise tower morphology. The existing structure shows that the building had double-loaded slab typology. This situation creates a building with a sharp and intrusive character. Moreover, when it comes the passive design, the morphologies and typologies are some of the most difficult to be effective for integrating passive design strategies effectively,

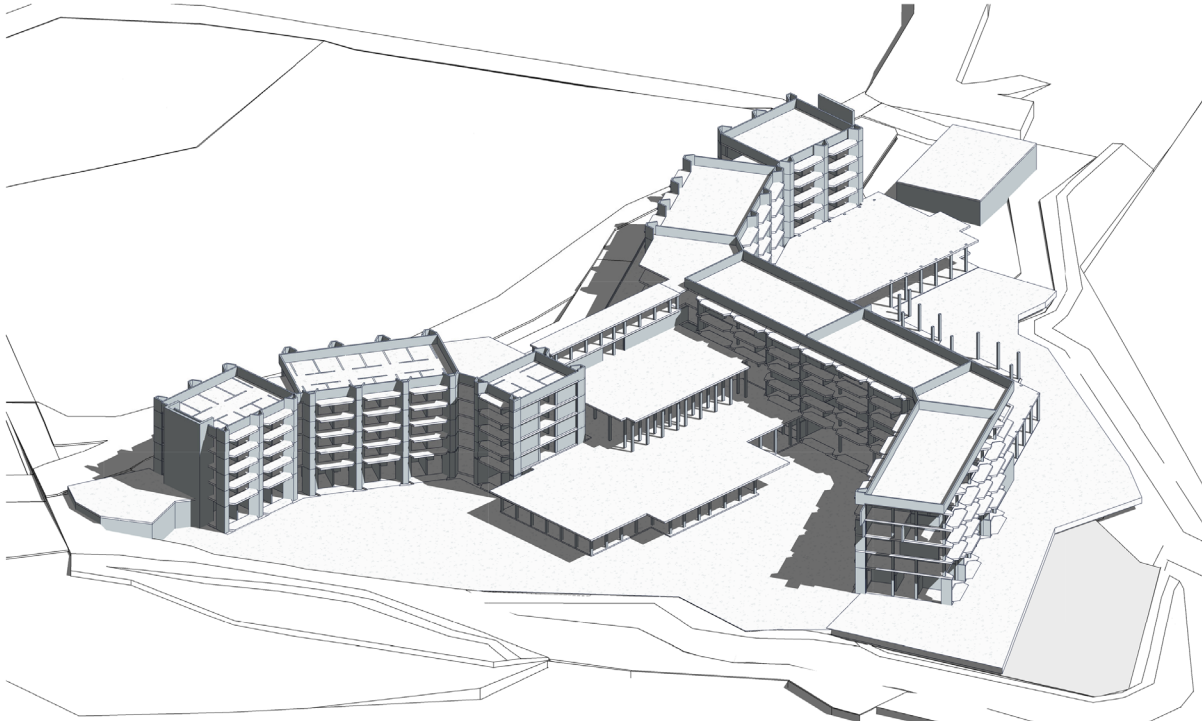
Currently, the abandoned hotel is left with a concrete column-beam-slab construction and fully cladded with limestone. Limestone is also the local material for Malta and has high thermal mass which can be effective for keeping the building cool.



Y-Shaped



High Rise Tower



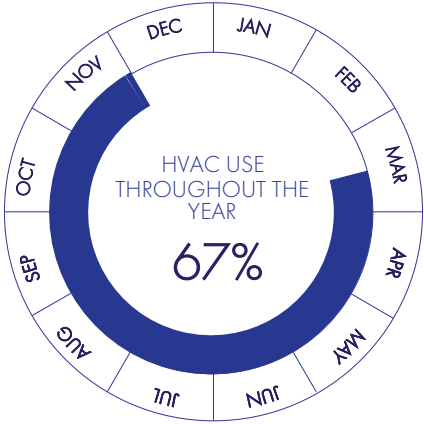
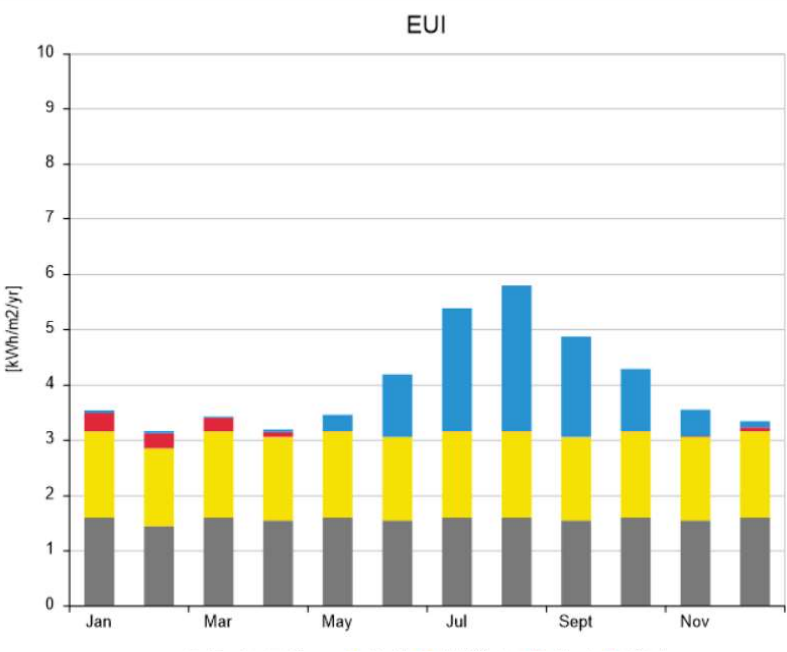
Passive Design & Energy Use

After the existing building is analysed with the perspective of passive design (according to the passive design manual generated during the design phase,) several issues were found. Considering the solar exposure, orientation and wind direction, the existing building has significant east&west facing facades which increases the cooling loads during summer. For the context of the mediterranean region, this can be highly problematic.

A simple energy simulation as part of the research phase also emphasized this conclusion. Without active use and integration of passive design the time from for actively using HVAC systems is at least 9 months of the year.

A goal of the project will be to minimize this time frame as much as possible to create a self-reliant tourism product.







DESIGN VISION

Concepts: Benefiting local & commercial stakeholders

The essential goal of a new sustainable hotel vision doesn't only focus on energy efficiency. It also needs to ensure sustainability at a community level. Considering the privatization aspect of a hotel development, the project aims to juxtapose this consumerist tourism vision to a shared luxury vision.

Exploration

An important part of this vision is to encourage touristic visitors to leave their "hotel bubbles" and local stakeholders to feel welcomed in the area. A way of achieving this is making sure all of the public functions are accessible by all. This further encourages informal and formal interactions between the stakeholders.

Interaction

High seasonality is another issue that needs to be resolved. Especially for small attractive towns like Marsaskala, it is essential to develop a concept where all-year-around tourism can respectfully maintain.

Adaptation

Finally the spatial composition should maximize the effectiveness of passive design. Moreover, encouraging the active use of passive design actions will be important to explore in the design.



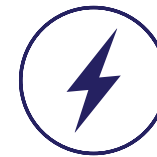
EXPLORATION

NEW ROLE FOR A HOTEL
URBAN SCALE



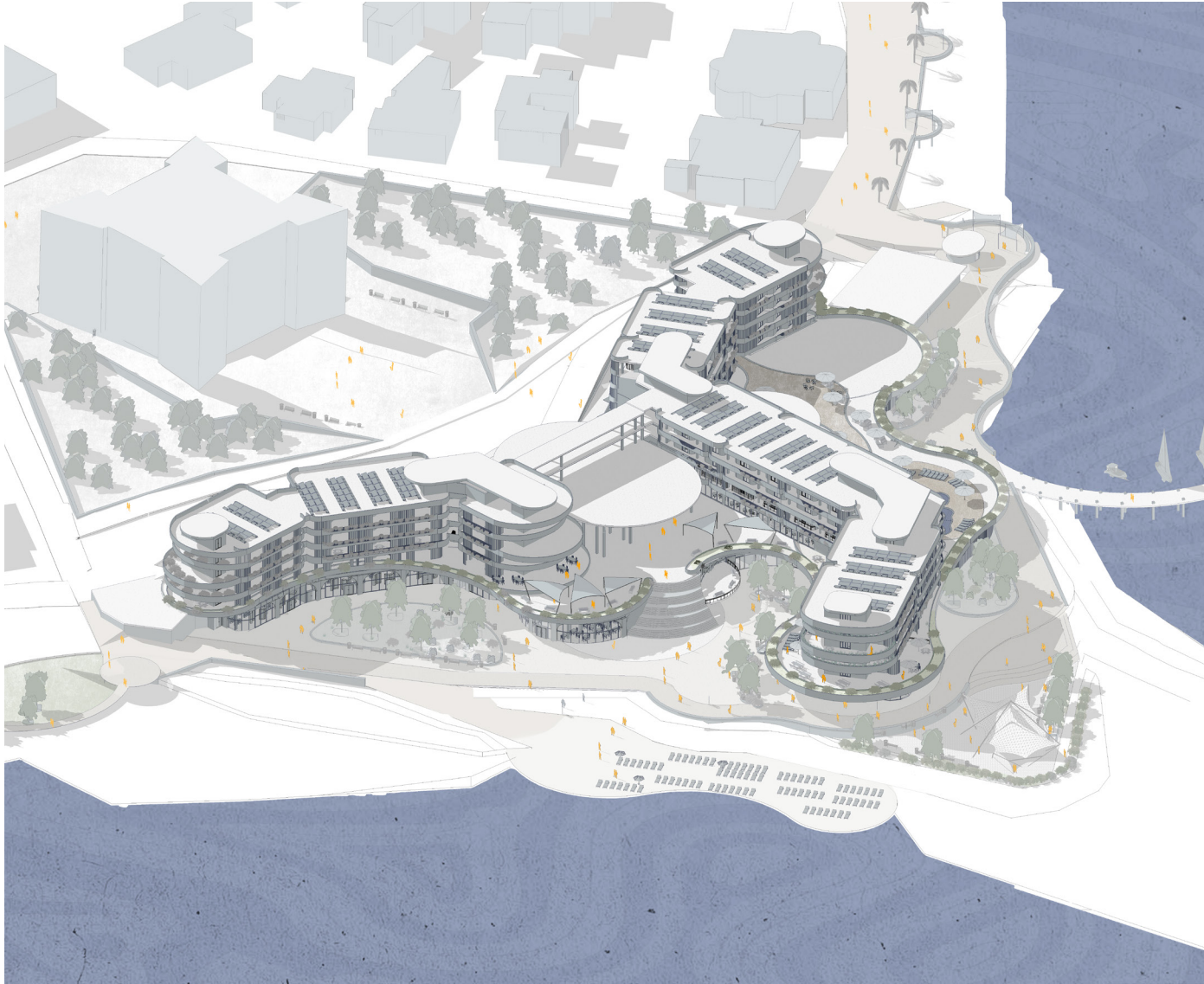
INTERACTION

BUILDING SCALE
PASSIVE DESIGN



ADAPTATION

BLURRING BORDERS
ENERGY



EXPLORATION : NEW ROLE FOR A HOTEL

Developing a new for a hotel needs to start with its interaction relative the context. Currently, the abandoned hotel has negative association in the town.

The exploration concept focuses diminishing this negative reputation by opening up the development site for public access. The first step for this is improving the accessibility. The project aims to integrate walkable streets and a coastal promenade which connect the development area to the rest of the town. As a result the hotel becomes a hub for the town which holds various amenities and activities that locals can also use. Especially improving the relationship of the existing building with the historic St. Thomas tower is very important. By creating a public park and a promenade in front of the hotel, it is aimed to add value and respect to the existing assests of the site.

The second step of the concept focuses on adjusting the accessibility of hotel functions. By focusing on having restaurants and cafes on ground level, the hotel residents are encouraged to leave private zones of the hotel and walk around the building. These areas are also accessible by local residents which creates multiple common spaces.



EXPLORATION

NEW ROLE FOR A HOTEL
URBAN SCALE



INTERACTION: ENCOURAGING COMMUNITIES

One of the biggest issues with tourism locations is the high seasonality and the isolation of local stakeholders from commercial stakeholders. Therefore, it is essential to create the environment where the tourists can adjust to existing communities. This will create a new norm in tourism developments to promote openness and interaction.

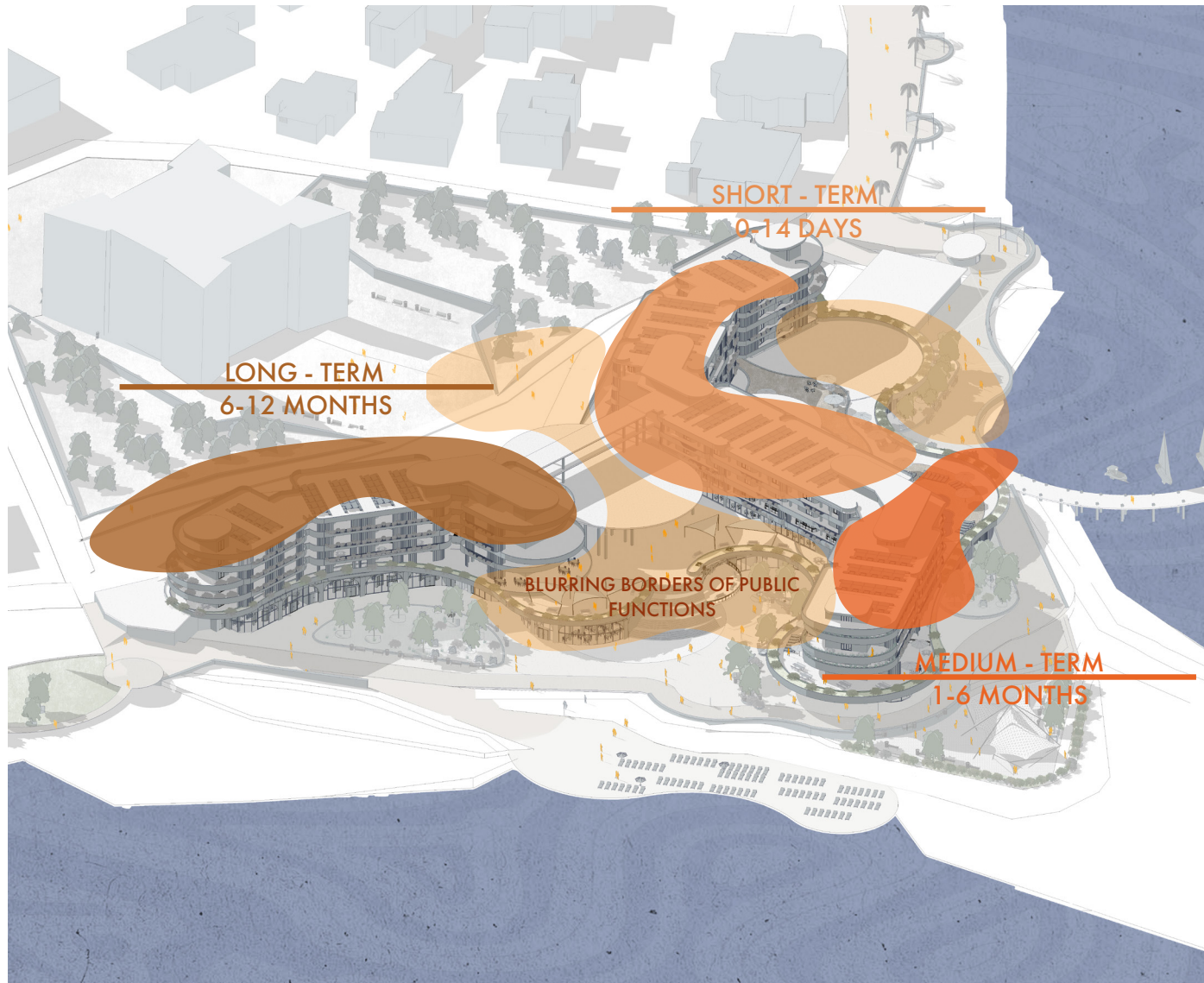
Therefore, the interaction concept offers the idea of combining 3 different types of accommodation types within the development zone. This can not only ensure that there's always life within the tourism area but also encourage developing a more open relationship with the context. So, the project focuses on integrating long (6-12 months,) medium (1-6 months,) and short (1-14 days) term accommodation within same building.

This is also important to reflect within the building by integrating common spaces through terraced morphologies. Combining the interaction concept with the conclusions of the research suggesting terraced morphologies is an valuable opportunity realized in the project.



INTERACTION

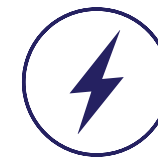
BUILDING SCALE
PASSIVE DESIGN



ADAPTATION: PROMOTING CHANGE IN BEHAVIOUR

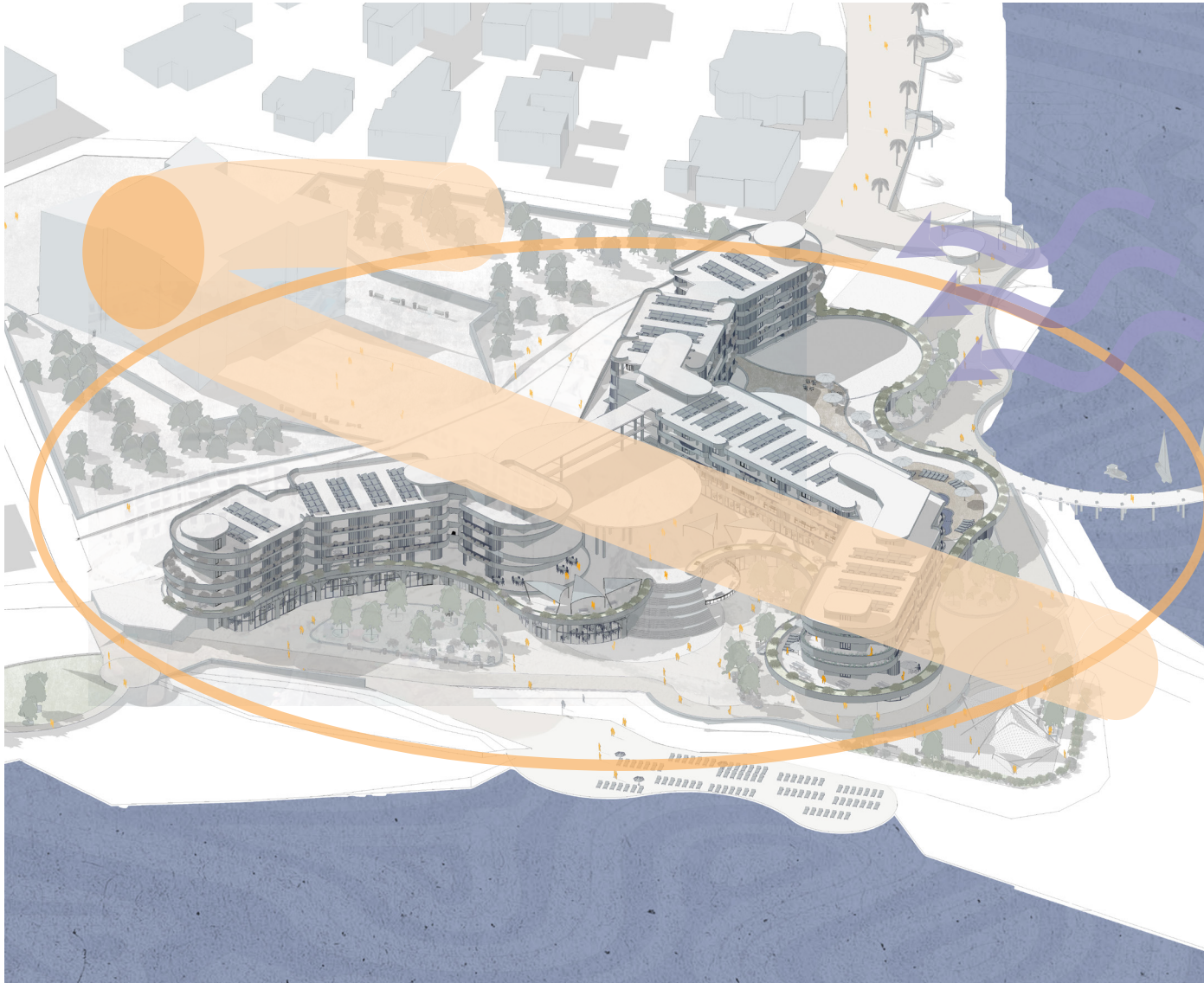
The adaptation concept focuses on creating the best environment for residents to rely on passive design. Specifically focusing on natural ventilation and solar protection strategies, it is aimed to create spaces where people are encouraged to keep their windows/shaders open. Moreover, it is aimed to achieve a significant decrease on the time period for HVAC use. This eventually helps creating a hotel that promotes the use of passive design strategies while actively decreasing its energy impact on the location.

These strategies are also accompanied by integration of greenery, water harvesting during winter and energy harvesting with solar panels.



ADAPTATION

BLURRING BORDERS
ENERGY



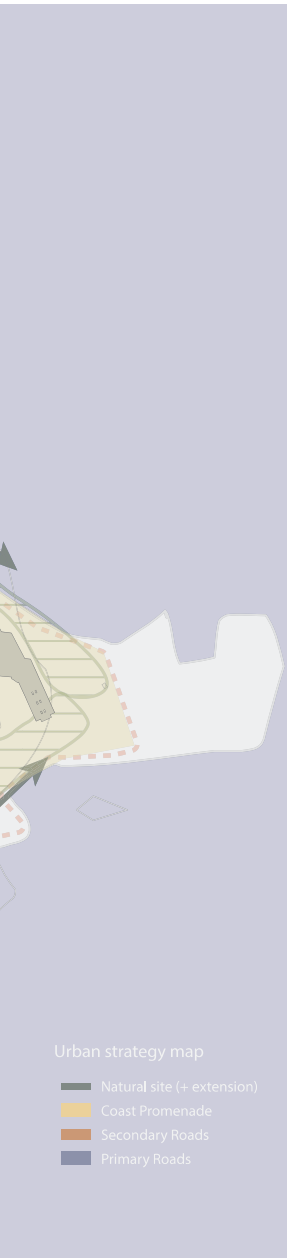


THE RIPPLE



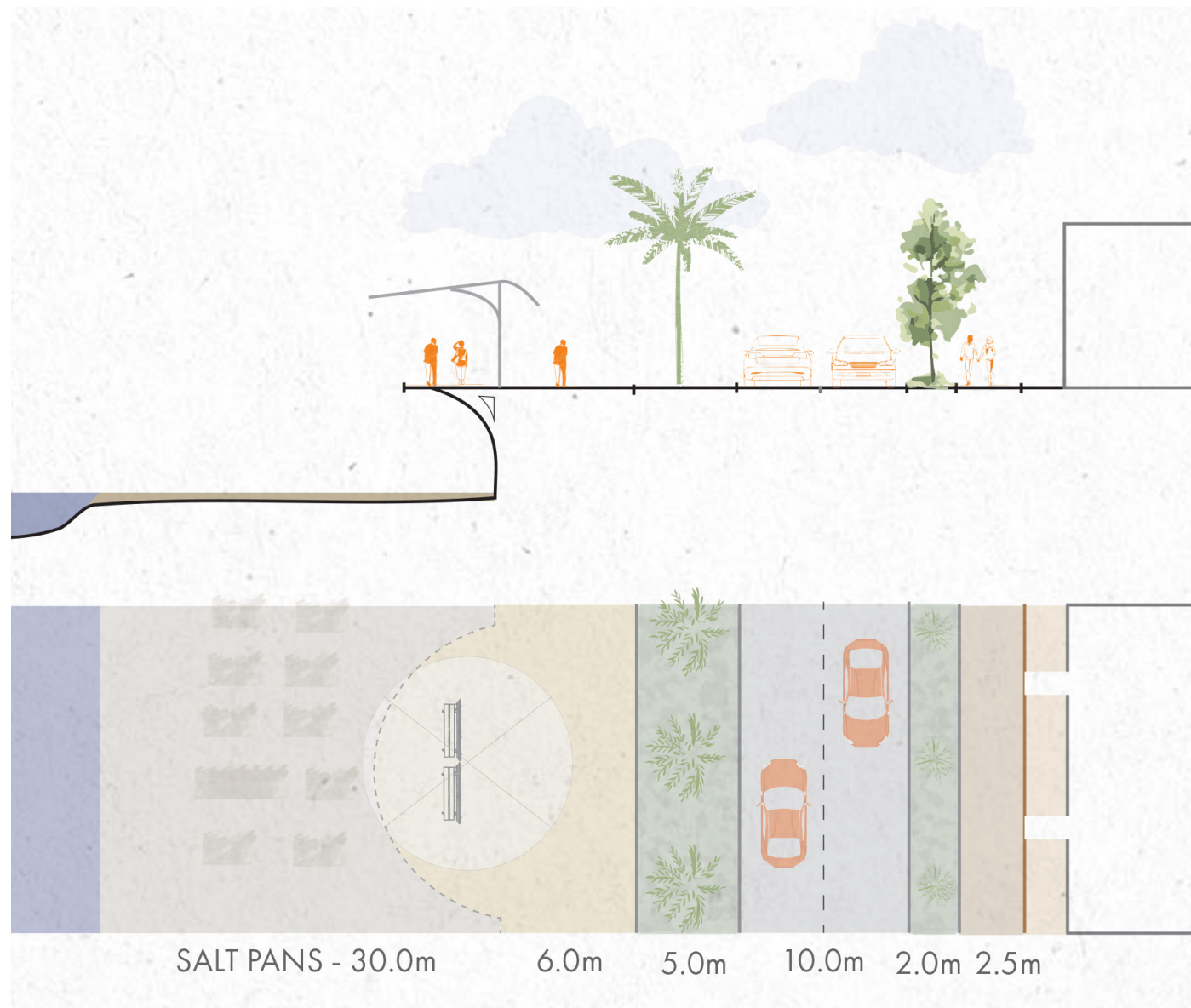
Urban Strategy

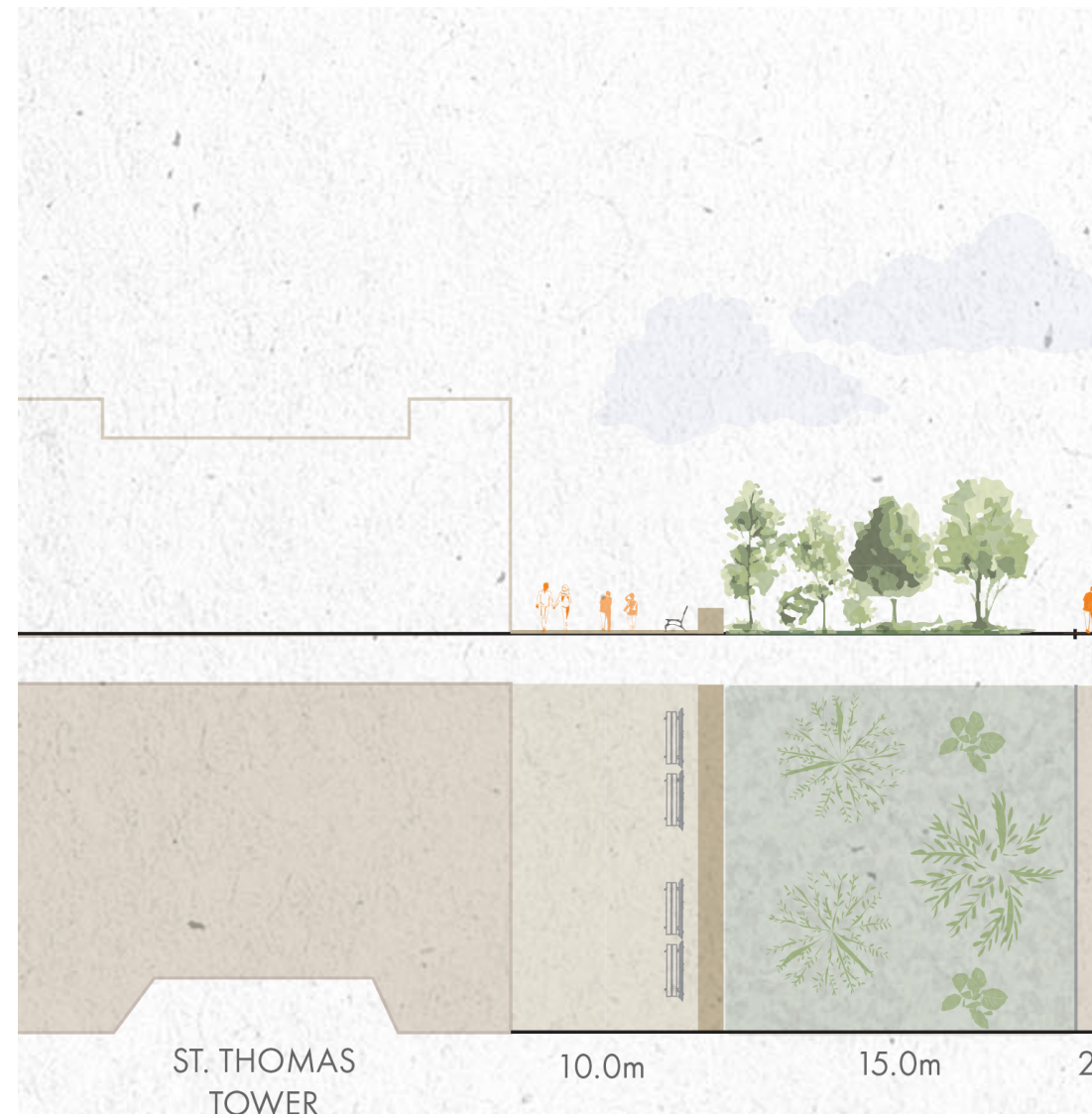
The urban strategy focuses on improving the accessibility and connection of the hotel to the rest of the town. Therefore, it is important to introduce a hierarchy to the town and emphasize the coastal promenade. This is supported with connecting the development zone with St. Thomas tower and create a hub for both touristic and commercial functions to take place.

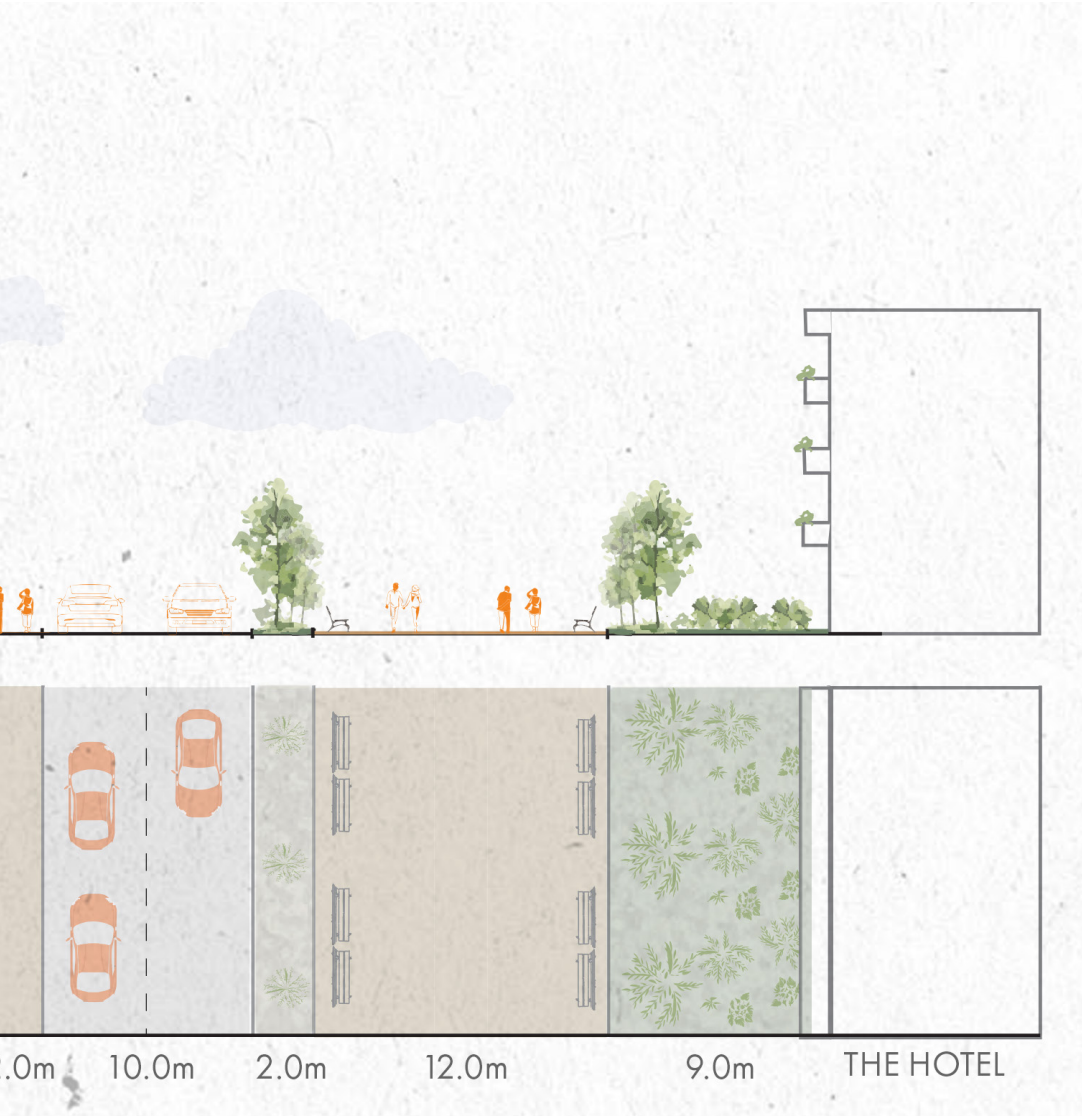


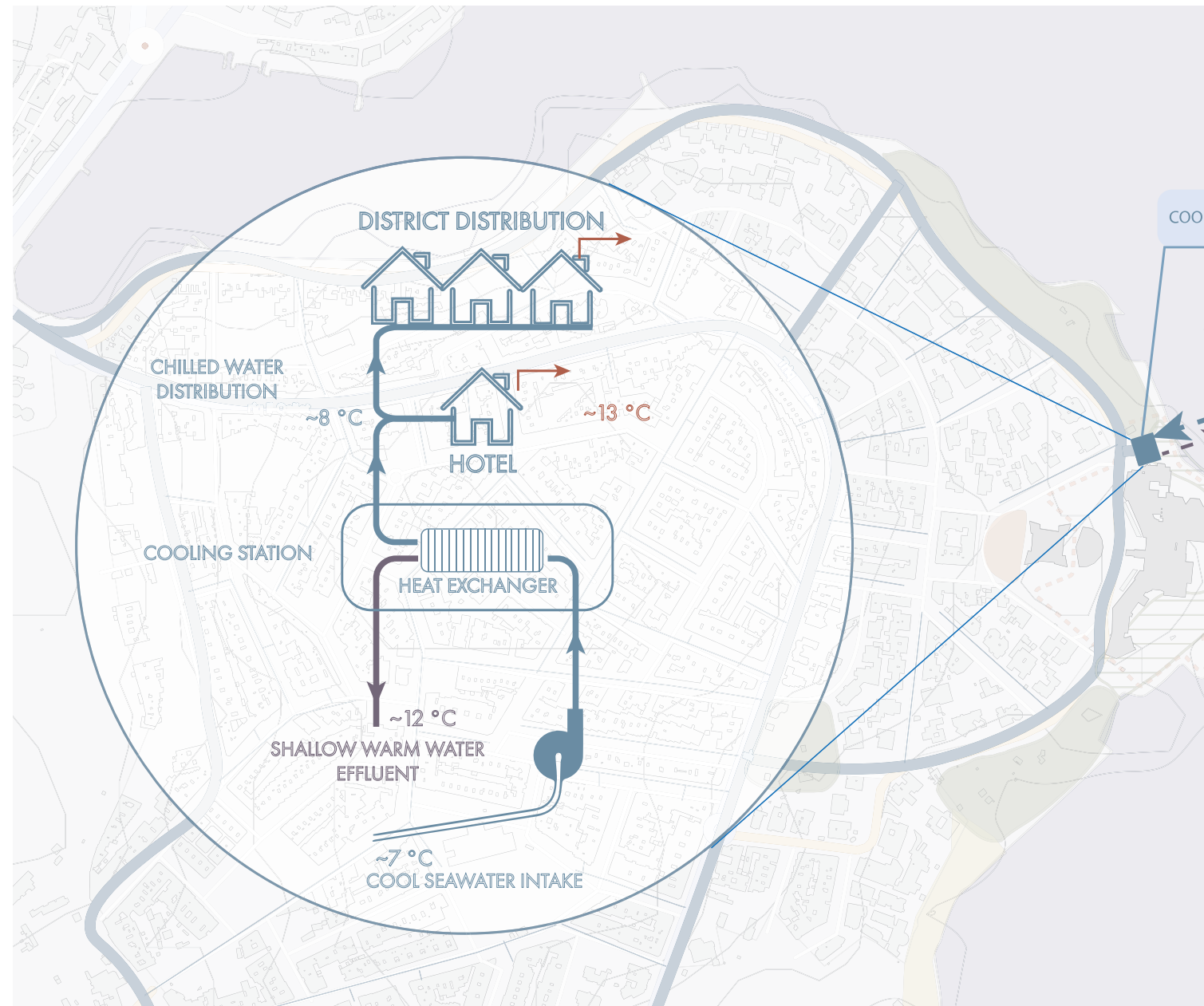
Coastal Promenade & Residential Zone Streets

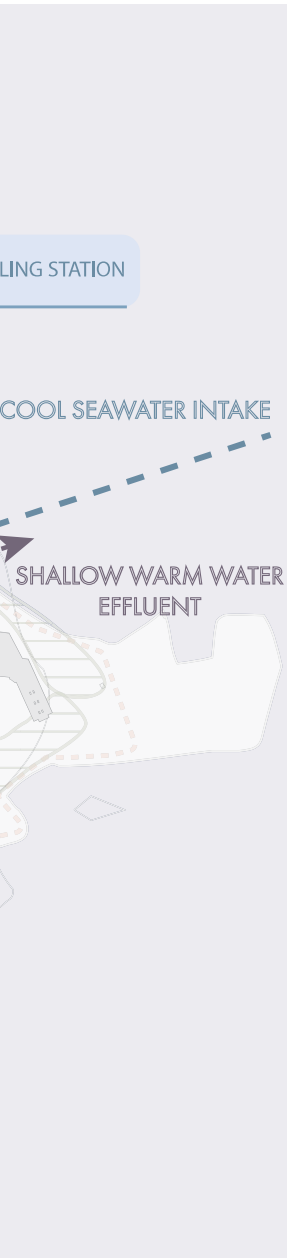
The coastal promenade focuses on creating zones for public furniture accompanied with canopies for shading. It also integrates greenery to create a clear division between the residential zone, roads and pavement zone.









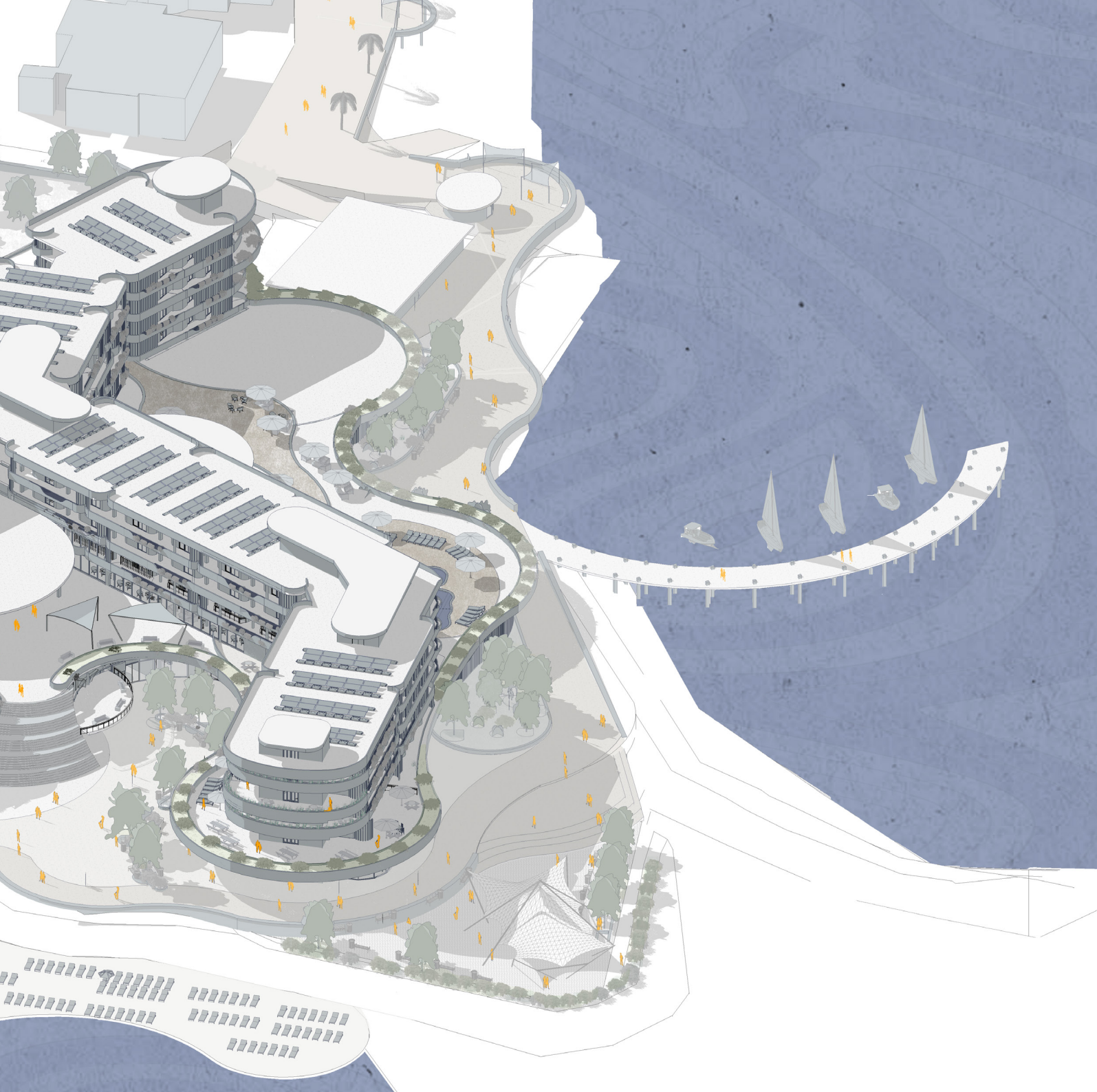


Sustainable Cooling

It is not enough to solely rely on passive design for creating a comfortable indoor climate. Therefore, the hotel development also integrates Deep Sea Cooling to propose a sustainable way of cooling the building. This system comes with a cooling station which is located on the development site.

The scale of such a system can also be enough for a whole town. Therefore, the tourism project becomes a provider for the rest of the town and offers a sustainable source for cooling their buildings.











The Masterplan

The overall project emphasized softening the overall image of the building by adapting to the coastal context. The sharp and aggressive character of the building is juxtaposed with a continuous coastal promenade that invites people into the site.

The masterplan offers different scales and types of public space which ranges from watchpoints, swimming zones to shopping zones.















- 1 - City watchpoint
- 2 - Event Space
- 3 - Lobby
- 4 - Bar
- 5 - Back of House
- 6 - SPA
- 7 - Shops, Cafes, Shopping Square
- 8 - Event Square
- 9 - Restaurant
- 10 - Technical room & storage
- 11 - Swimming zone
- 12 - Park
- 13 - Garage

Ground Floor Plan
1 - City watchpoint
2 - Event Space
3 - Lobby
4 - Bar
5 - Back of House
6 - SPA
7 - Shops, Cafes & Shopping Square
8 - Event Square
9 - Restaurant
10 - Technical Room & Storage
11 - Swimming Zone
12 - Park
13 - Garage (long-term access)
1:1000









Site Plan
1 - Short-term accommodation
2 - Terrace Lounge Bar
3 - Swimming Pool
4 - Lobby
5 - Medium-term accommodation
6 - Watchpoint
7 - Entrance hall/canopy
8 - Long-term accommodation
1:1000

1 - Short-term accommodation
2 - Terrace Lounge Bar
3 - Swimming Pool
4 - Lobby
5 - Medium-term accommodation
6 - Watchpoint
7 - Entrance hall/canopy





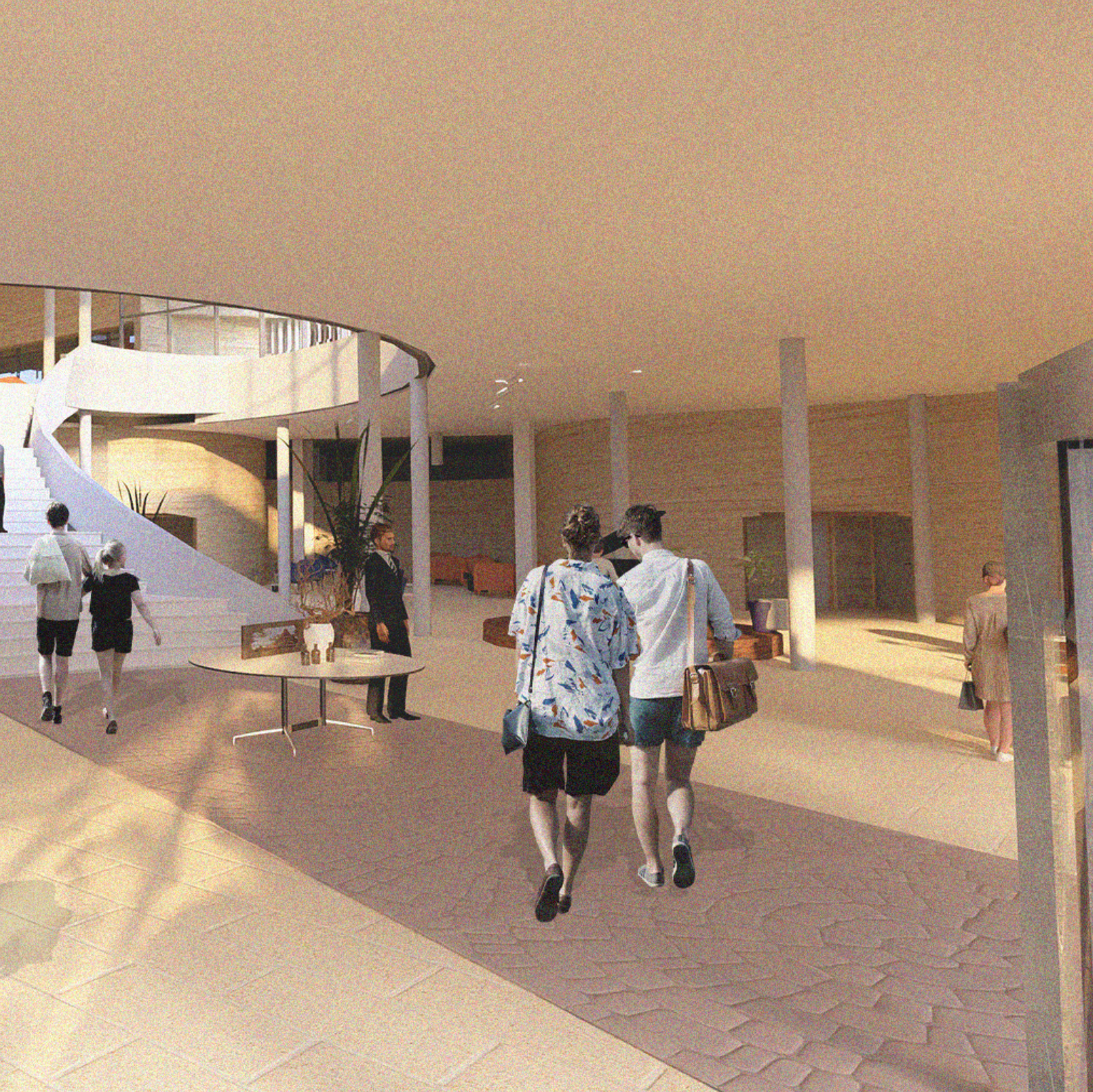








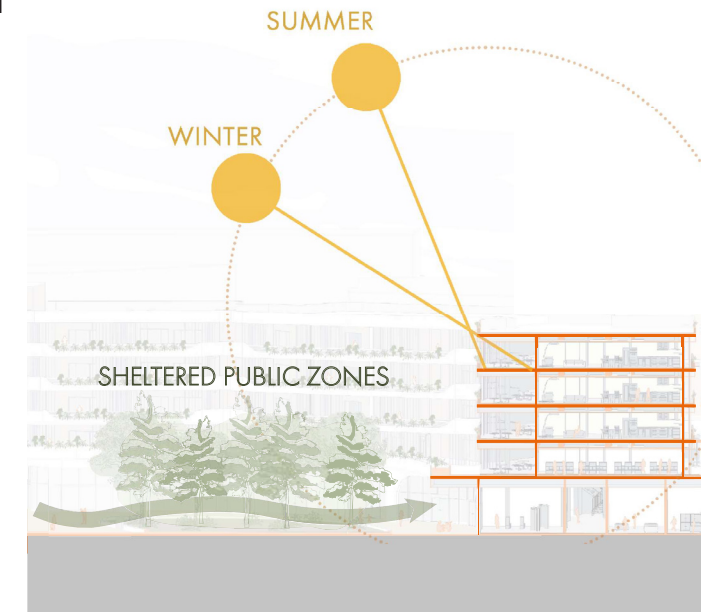


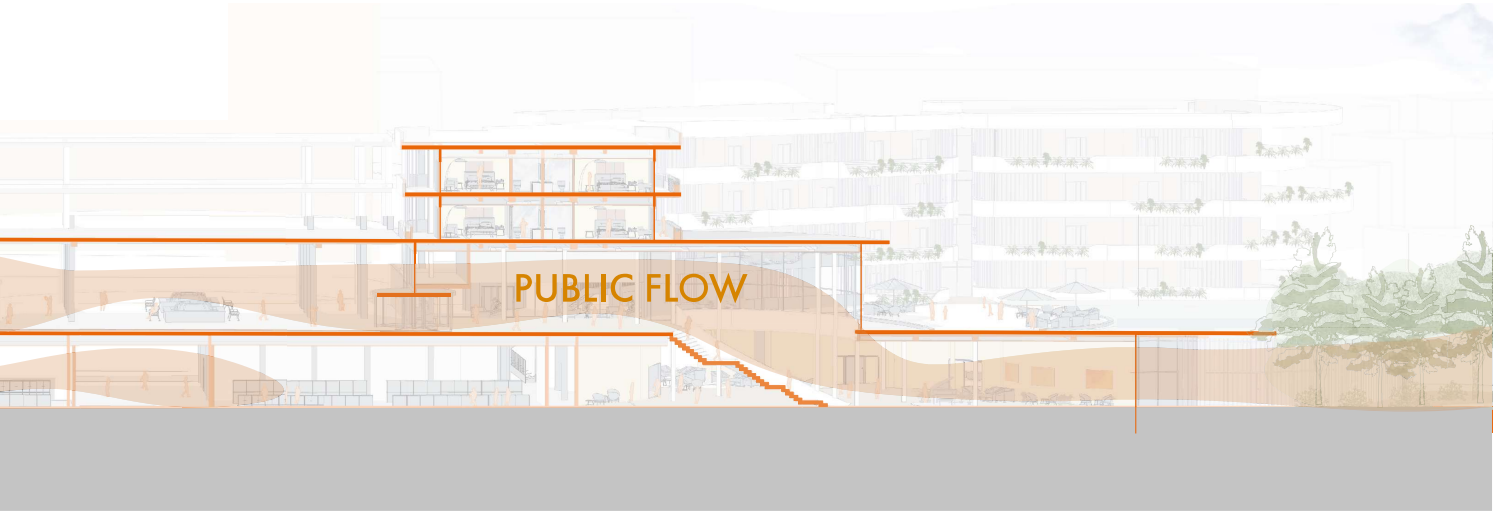
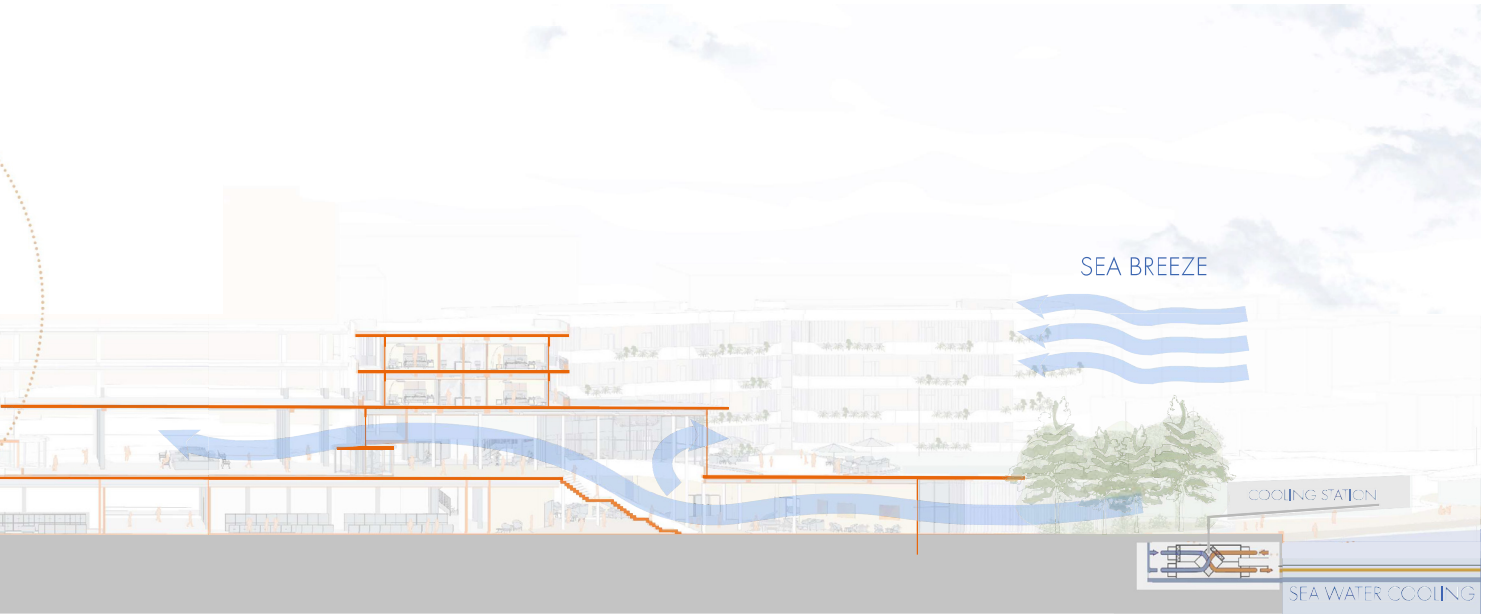


Connected Spaces & Passive Design

The conclusions of the design manual suggested that it is more effective to promote stack and cross ventilation for public space. Therefore, it has been essential to combine two different levels which are also the two lobbies that the hotel offers. The height difference is seamlessly integrated through open spaces that have bars and cafes for residents to use.

This allows the sea breeze to pass through the building effectively promoting cross ventilation as the air heats up. This also seamlessly allows the public flow to penetrate the building. As a result, the hotel becomes an inviting open zone for commercial and local stakeholders to enjoy. It is also quite common to offer some of the facilities of a hotel towards the public (with tickets or payments) so it still respects the privacy of the residents upstairs.









Accommodation

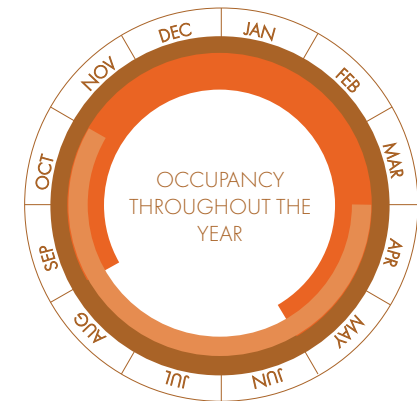
The Ripple offers variety of accommodation types to create temporary homes for 3 types of time periods.

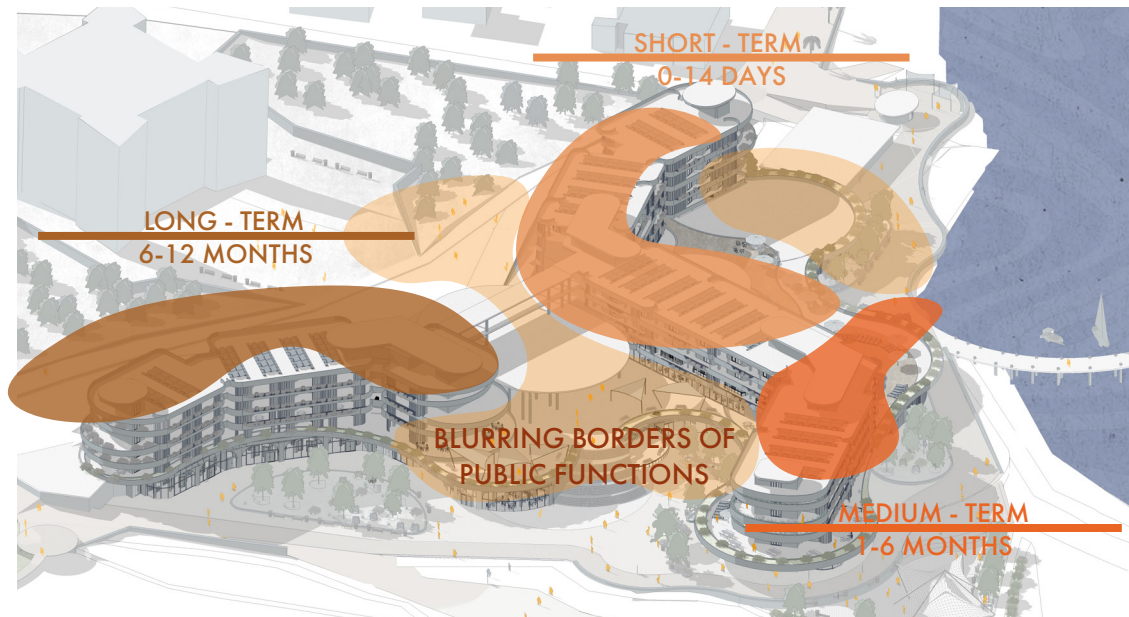
The short term accommodation units make up the main accommodation type. The ripple offers 144 short term accommodation with 3 different hotel rooms.

The medium term accommodation units focus on shared living and has a combination of en-suite bedrooms and a living room. The residents of this zone can also enjoy an all around terraces that surround the living zones. There are 16 bedrooms that are part of the shared living type.

The long term accommodation units are located on the south end of the hotel. This area is slightly isolated from the rest of the accommodation zones as they offer 16 apartments with a variety of bedrooms.

144 SHORT TERM ACCOMMODATION UNITS
16 LONG TERM ACCOMMODATION UNITS
16 MEDIUM TERM SHARED ACCOMMODATION UNITS





Long-term Accommodation

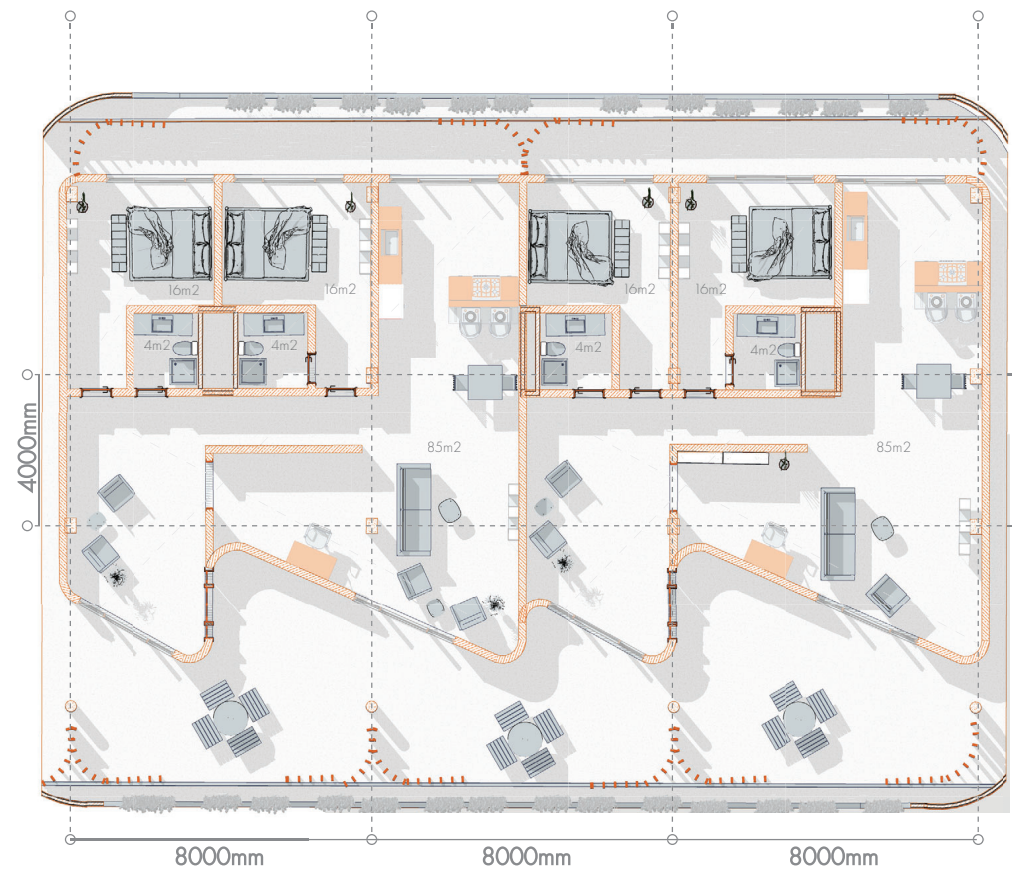


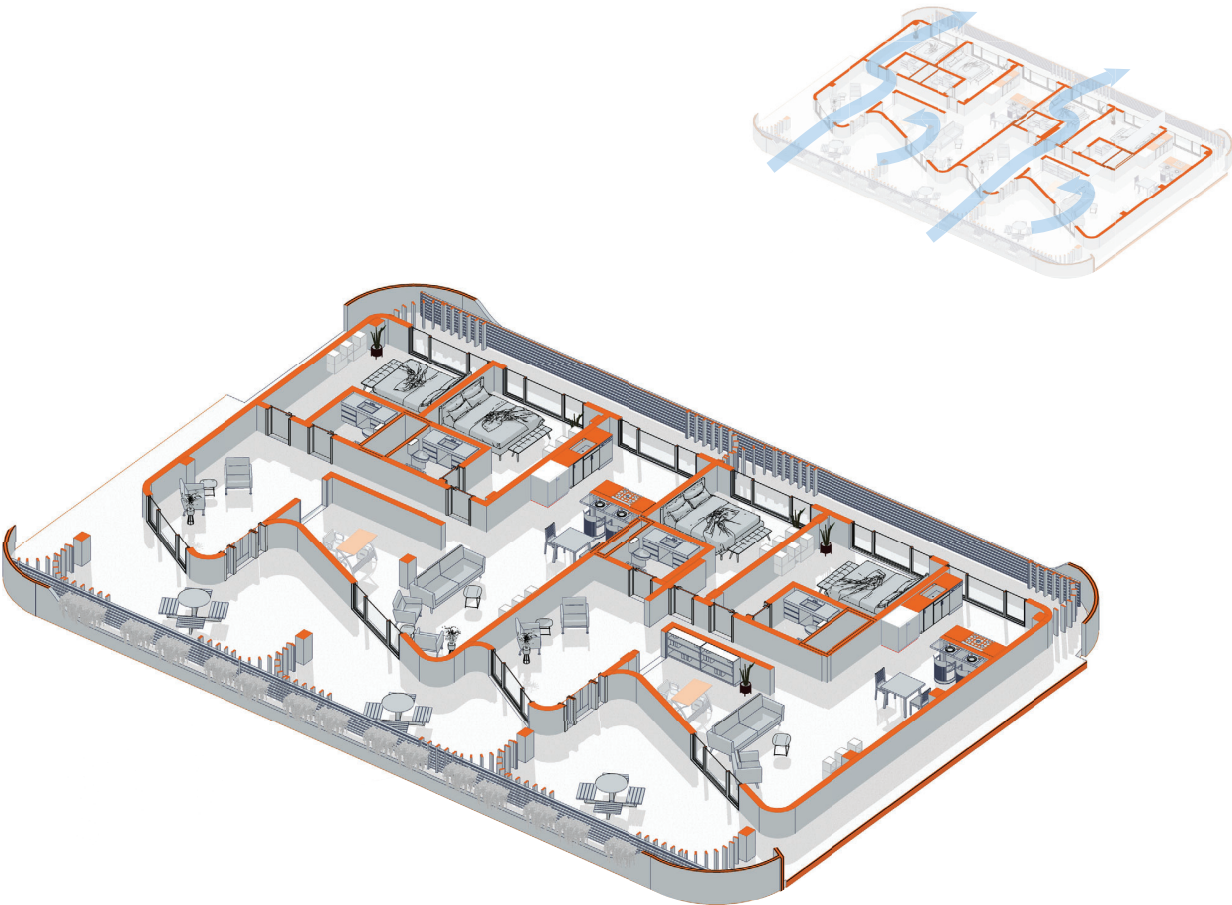
Long term accommodation offers 3 different types of apartments that ranges from 1 bedroom to 3 bedroom. This accommodation can act as a summer house which is appealing for families or as long term elderly accommodation.

4x **1+1**
net A: 76m²

8x **2+1**
net A: 110m²

4x **3+1**
net A: 130m²





Medium-term Accommodation

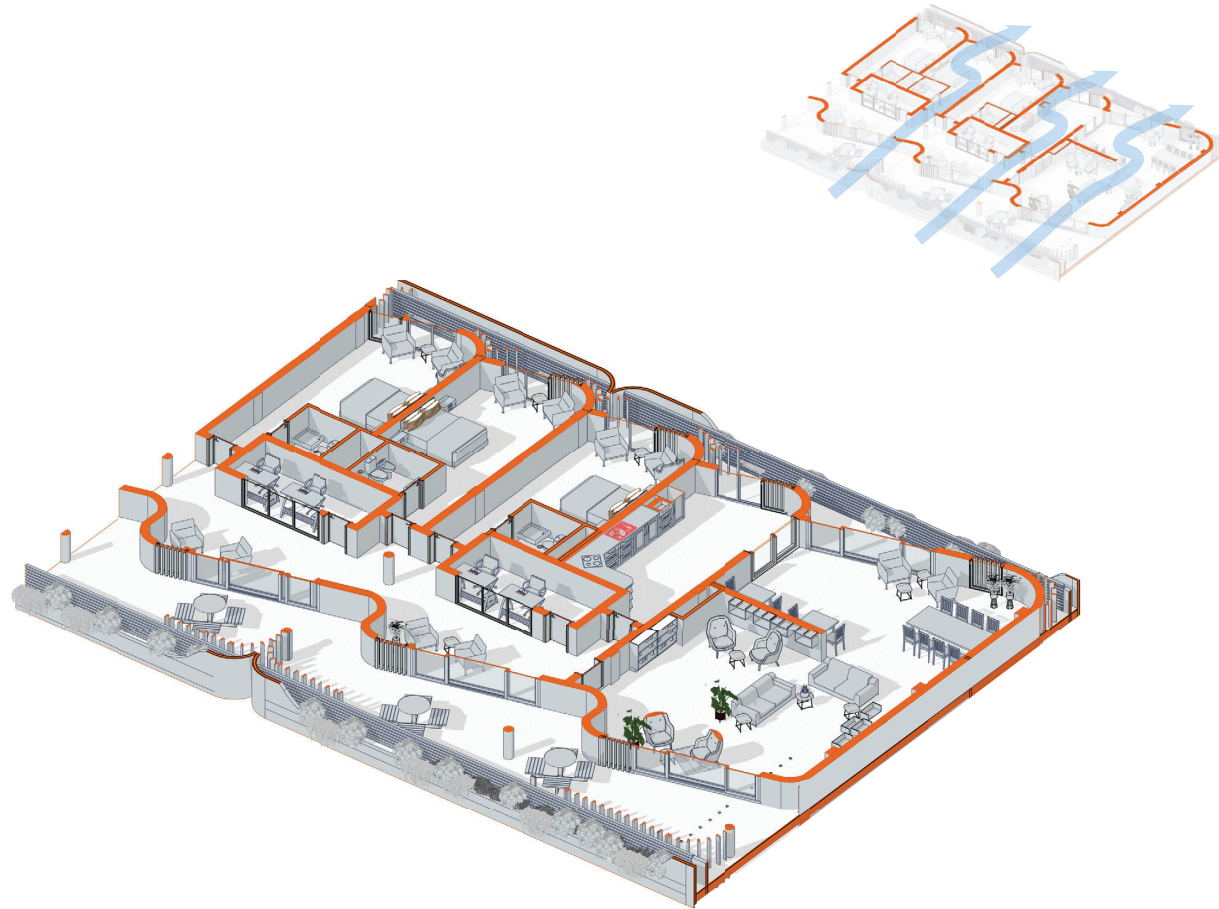


This type of living offers a luxurious way of shared living. It is highly ideal for digital nomads or couples whom are more open to interact and expand their network.

private en-suite bedroom net A: 25m2

shared spaces net A: 170m2







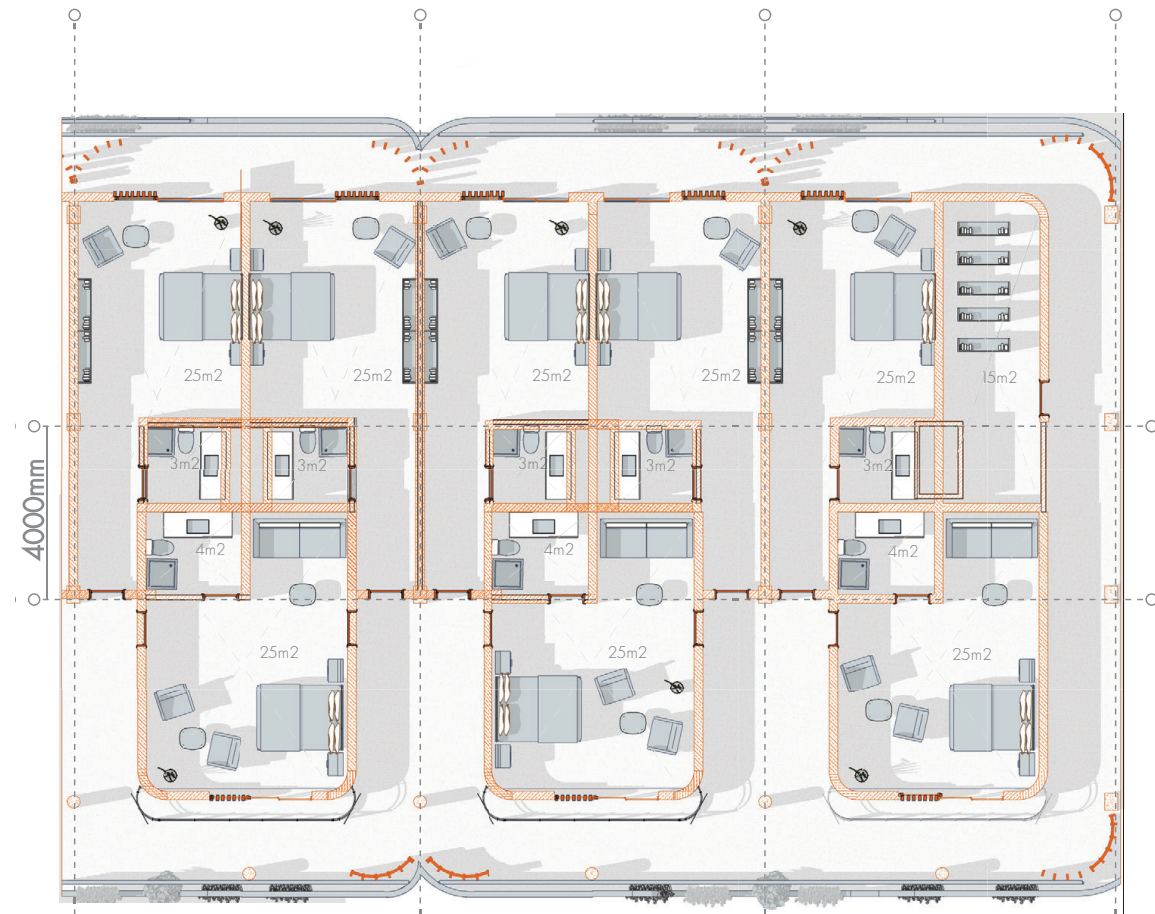


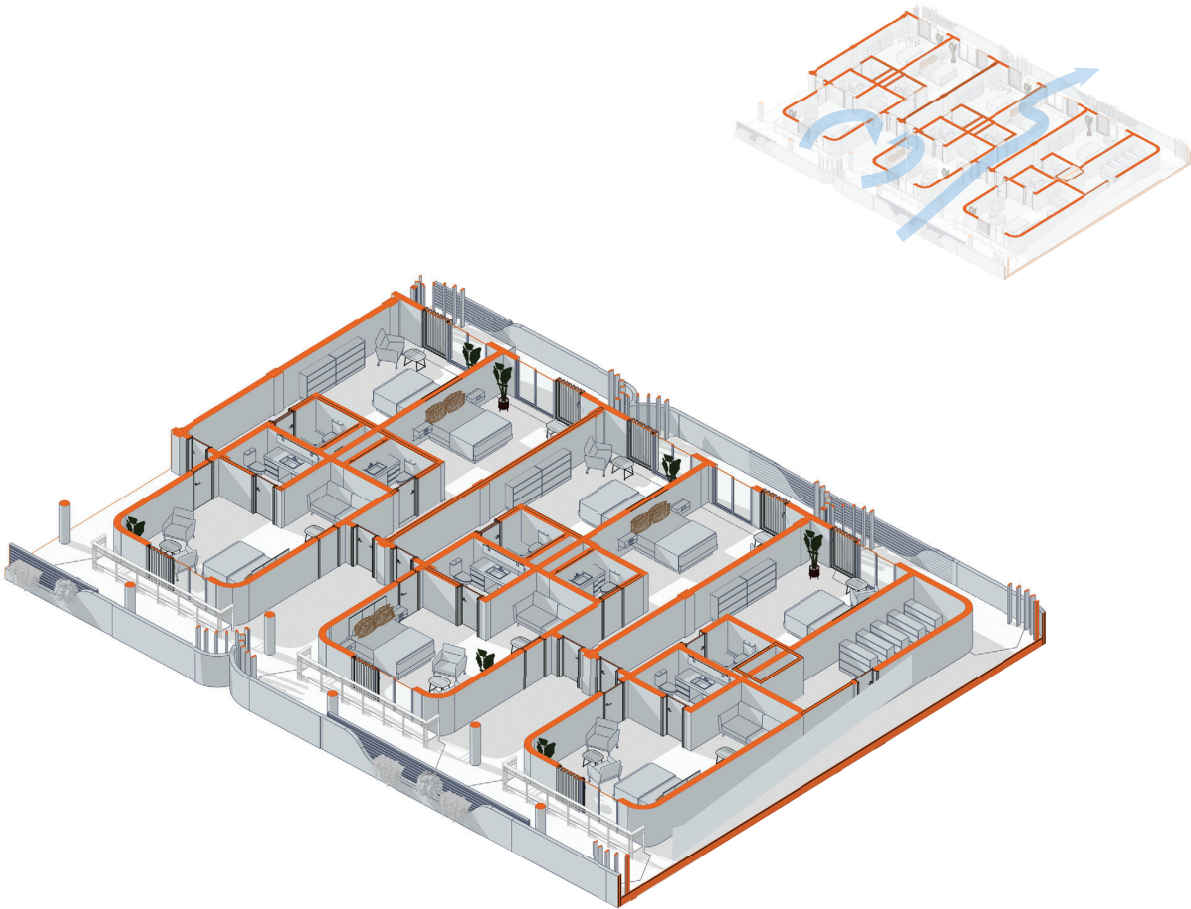
Short-term Accommodation

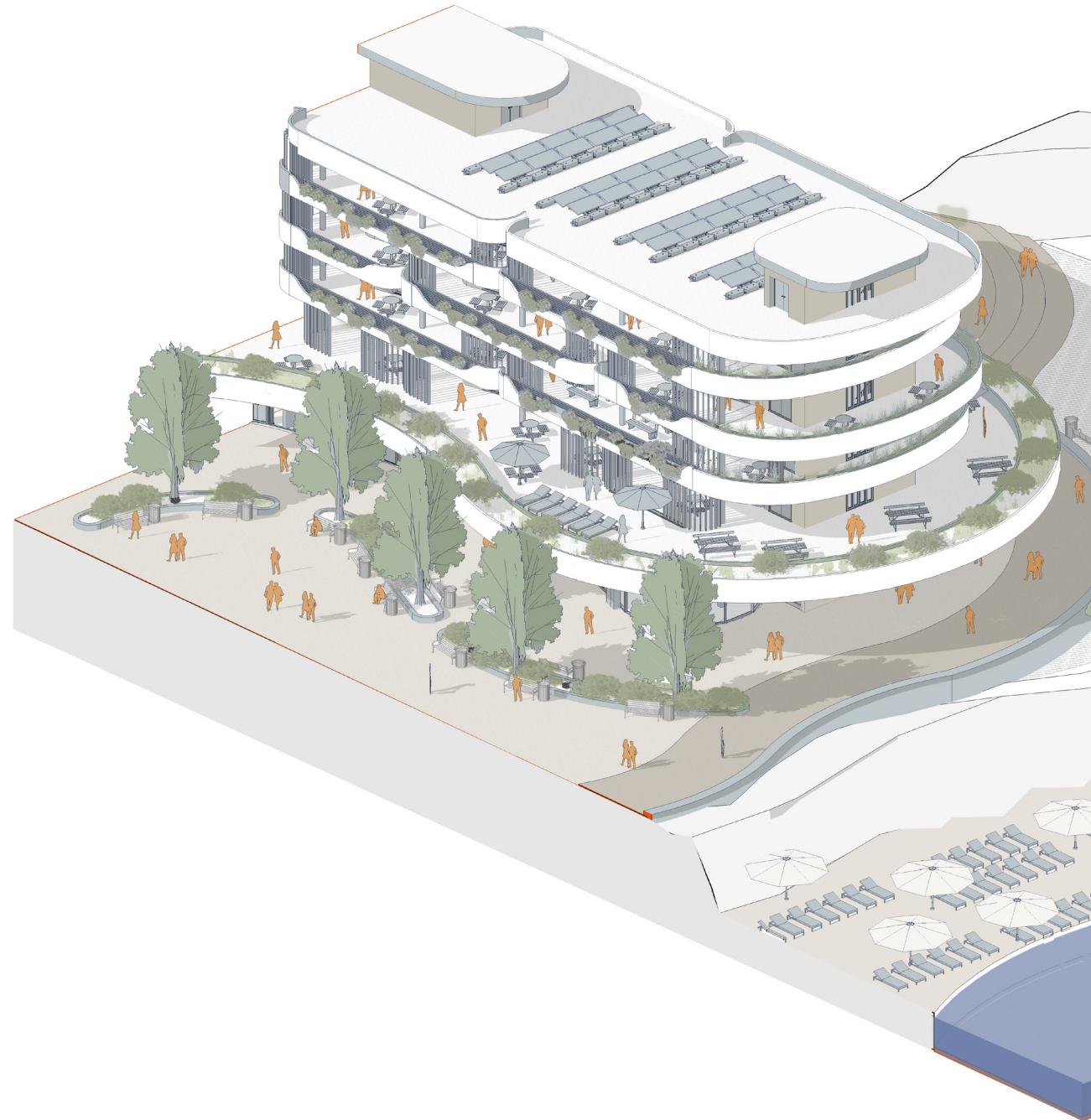


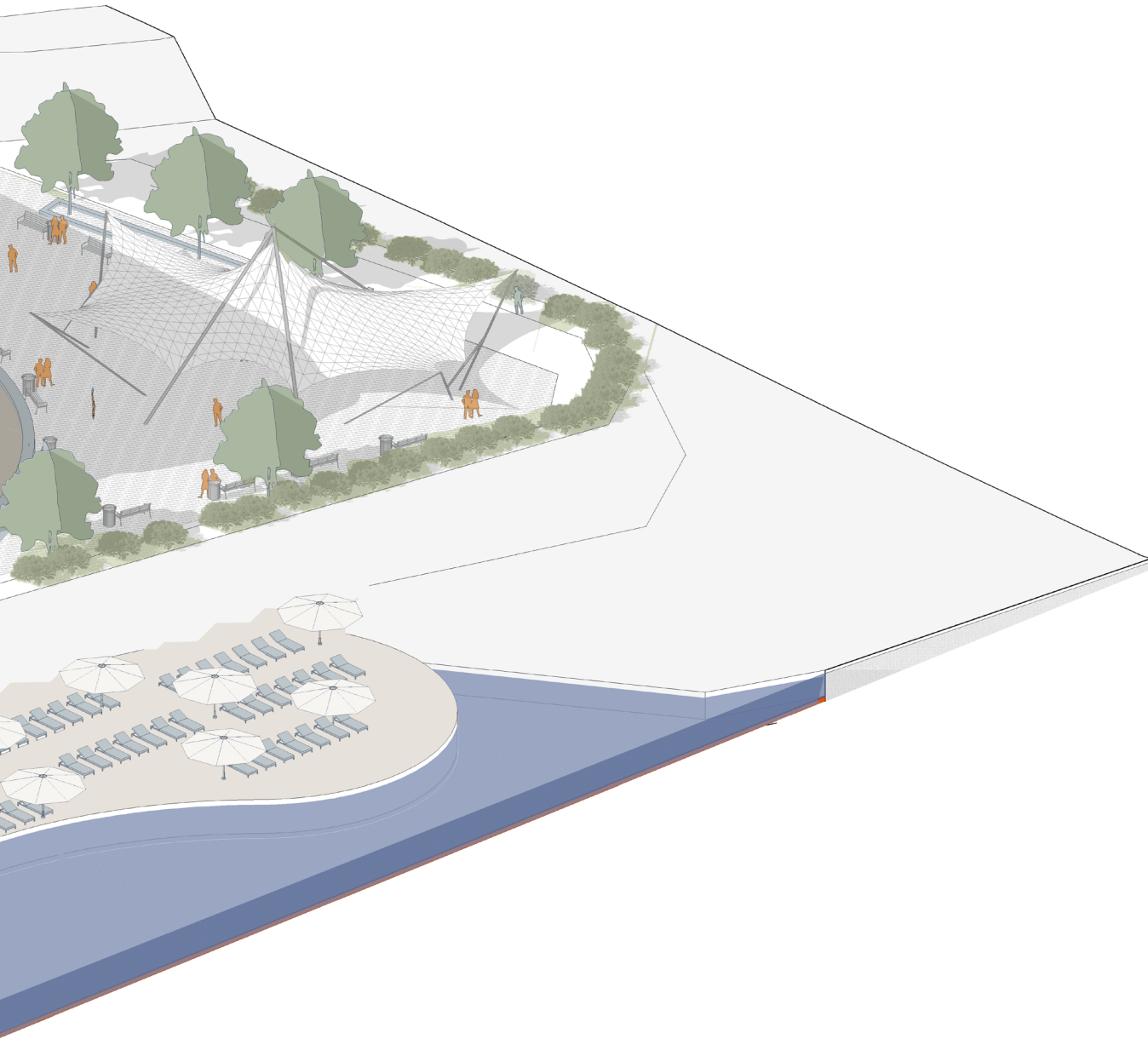
Short term accommodation type is the typical summer vacation hotel rooms. However, the organisation of the spaces and openings ensure that the passive design strategies is highly effective for a typical hotel room as well.

private en-suite bedroom net A: 27m²









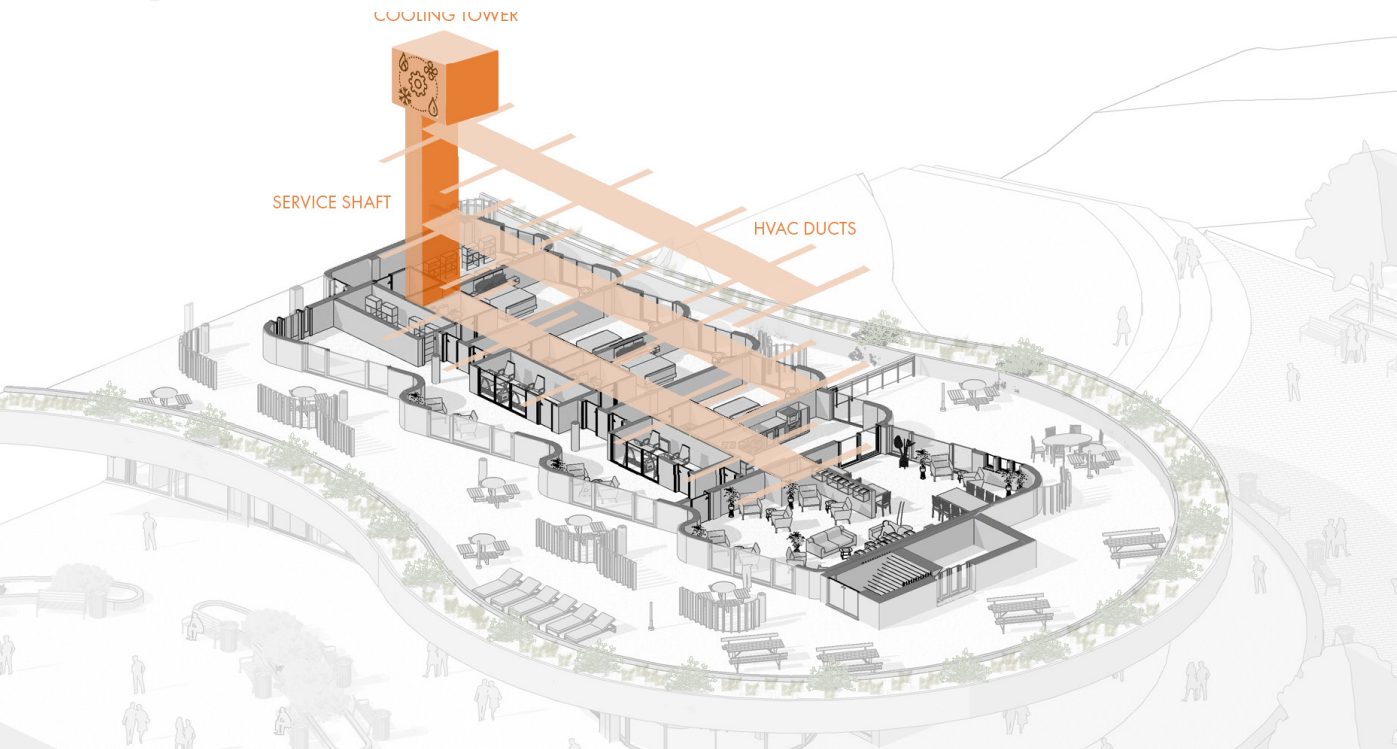
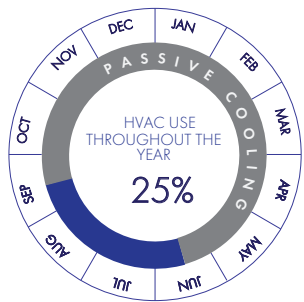
Services & HVAC

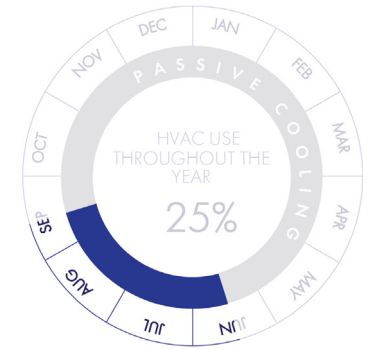
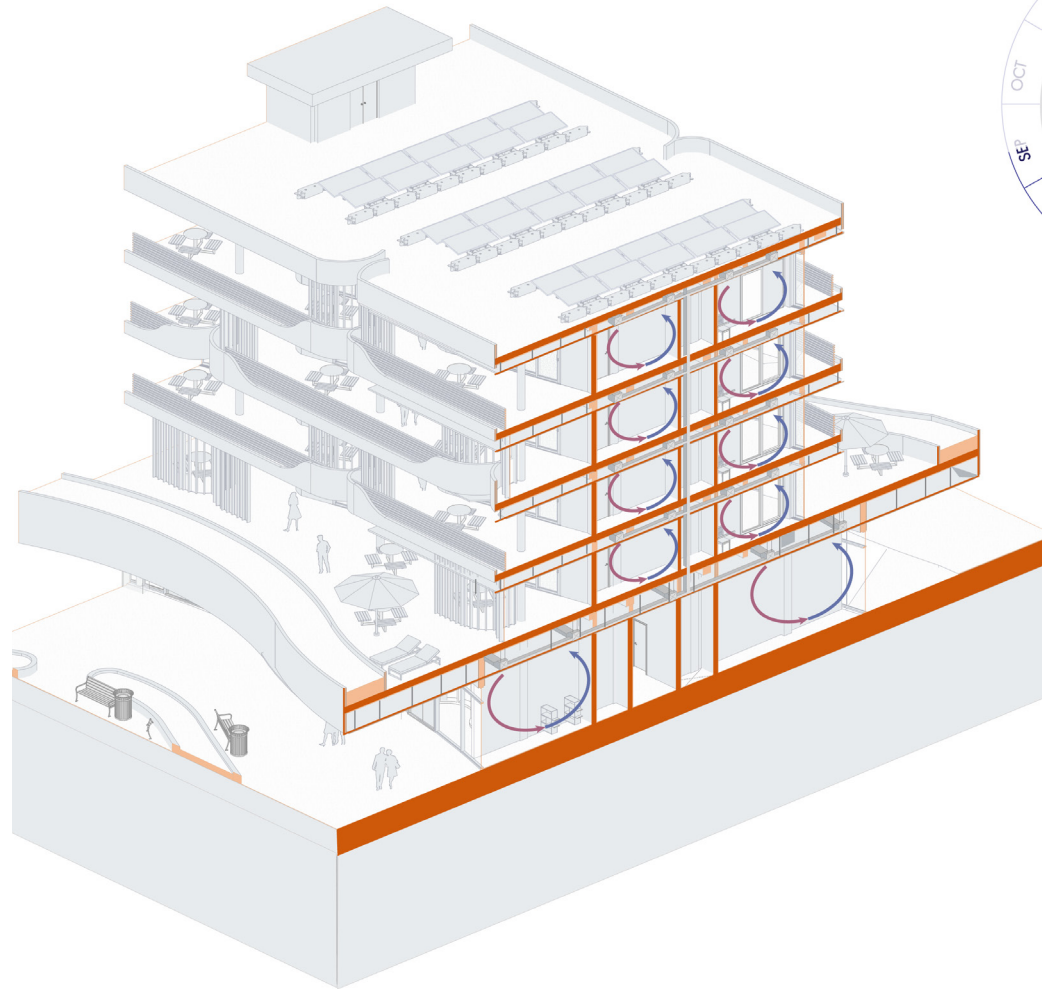
The energy simulations suggest that after implementing the conclusions from the design manual (such adapting the morphology into terraced morphology and typology to single-loaded slab,) it is possible to decrease the HVAC reliance to 25%. This is a significant decrease for a hotel only using HVAC between june and september. The hotel relies on a decentralized system to allow flexibility between hotel rooms and shared spaces.

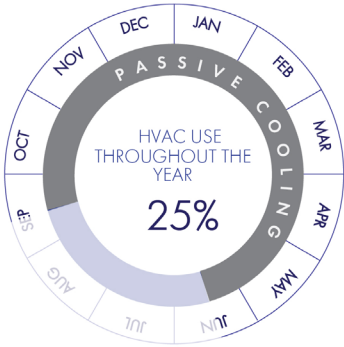
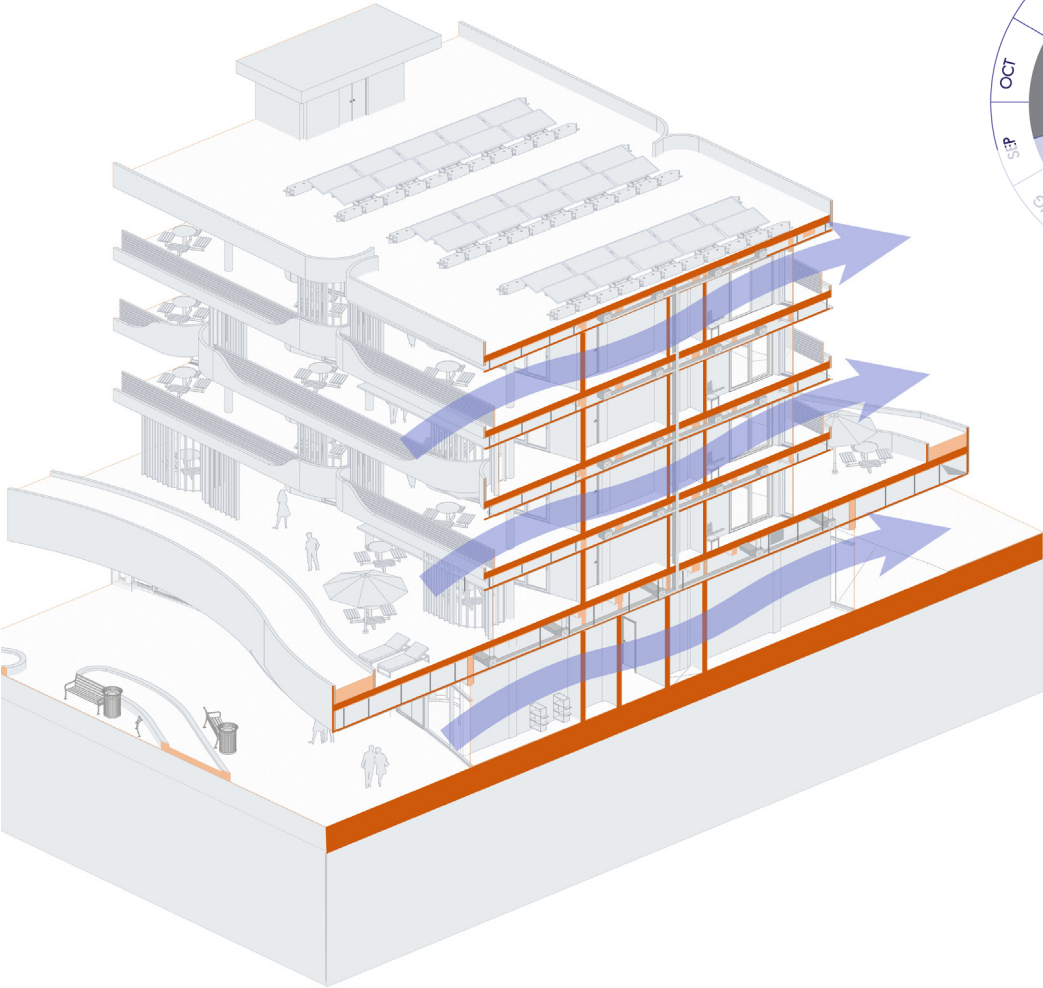
Additionally, even when the HVAC system is used to cool down the building, this will be managed with Deep Sea Cooling which is one of the most sustainable ways of cooling a building.

Therefore, the service zones are adjusted to integrate HVAC ducts in the suspended ceiling. The cooling tower is located in the rooftop of each accommodation type.

After the passive design strategies, the hotel can rely on natural ventilation and solar protection to maintain a comfortable indoor temperature. This means that the building can function passively for up to 9 months of the year.





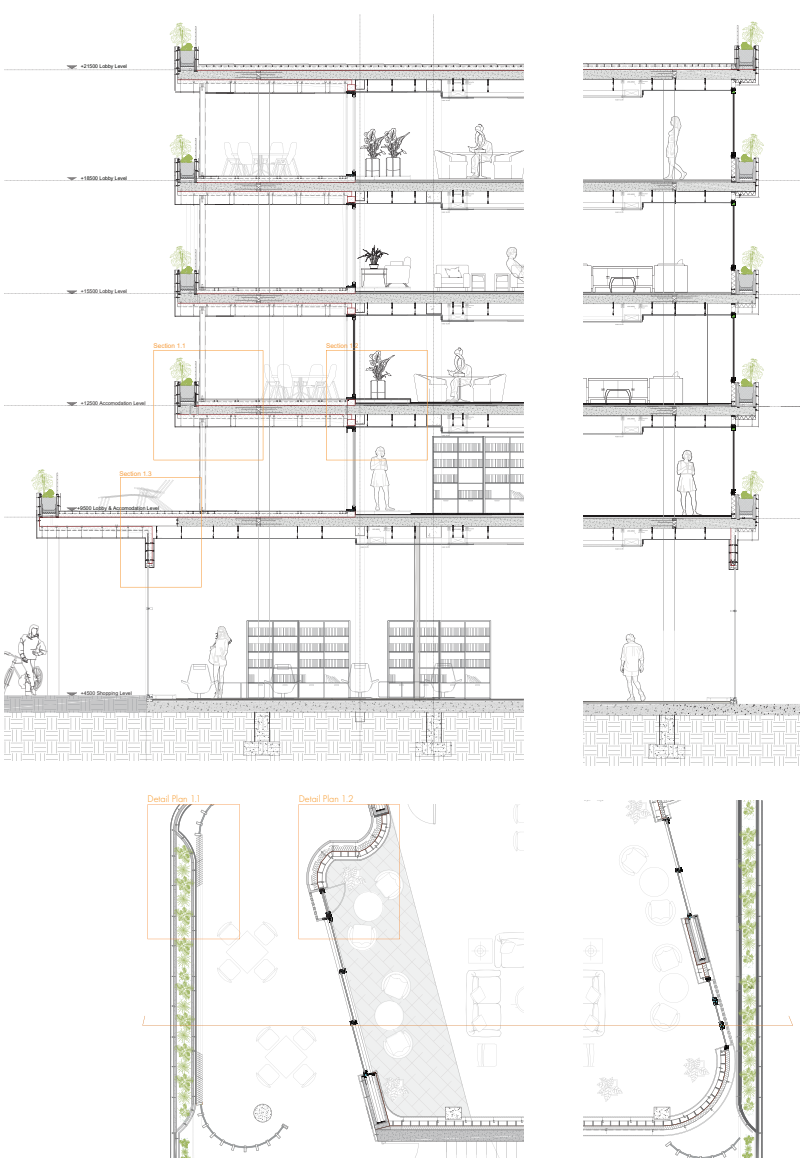


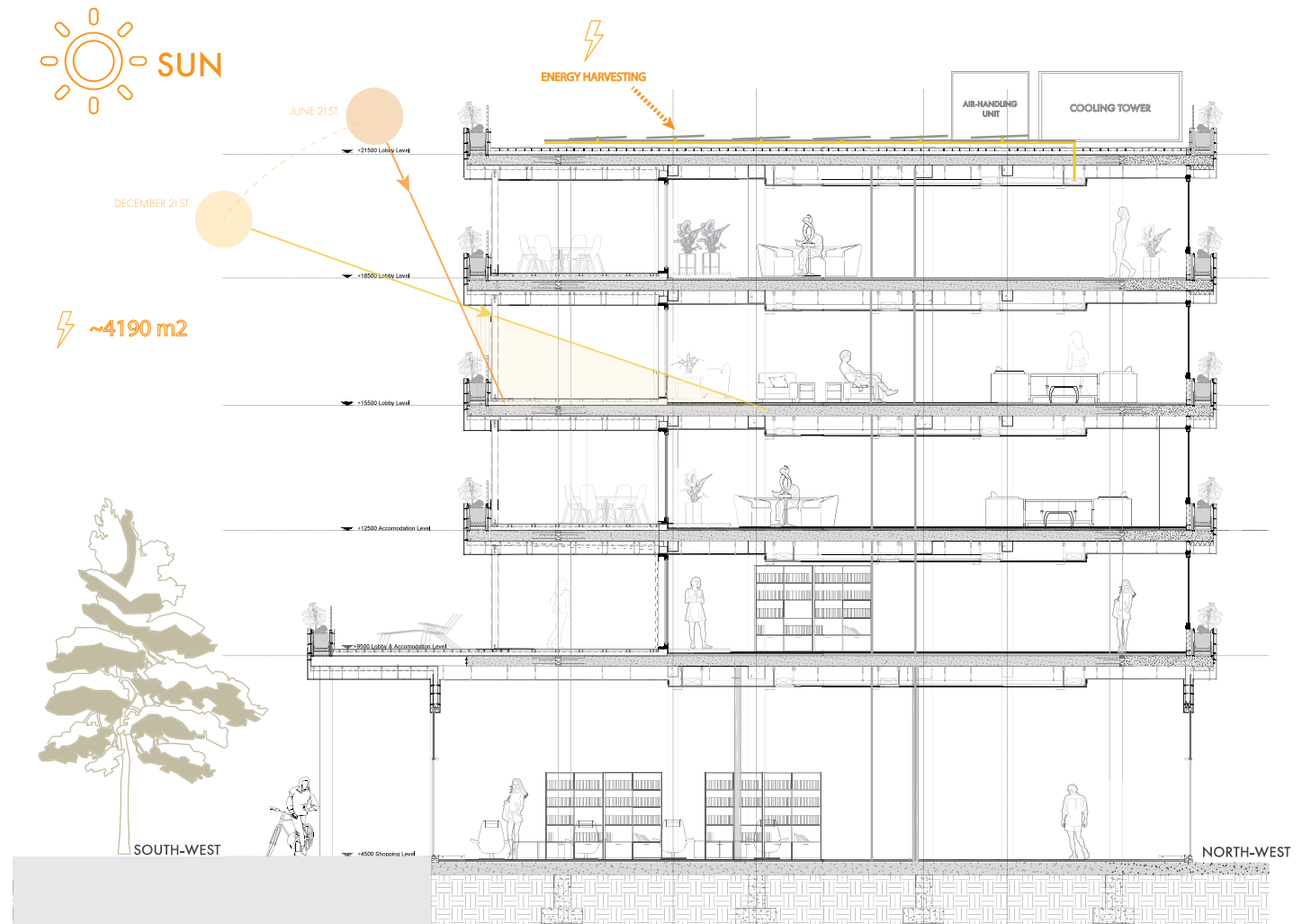
Fragment Detail

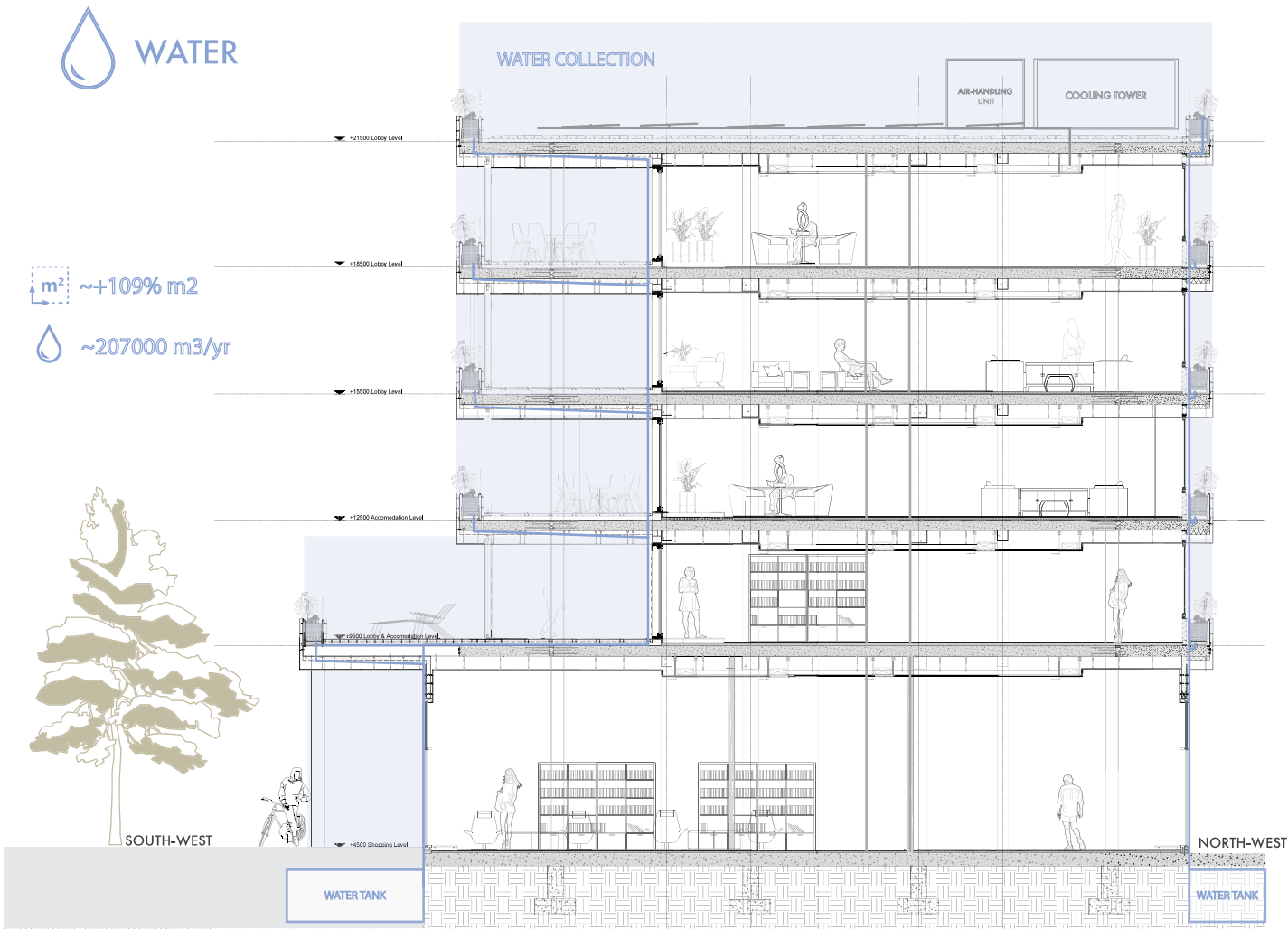
When zoomed into the building section, it is possible to see the rest of the sustainability measured integrated into the building. The building relies on solar panels to maintain the HVAC systems to be used during hot time periods.

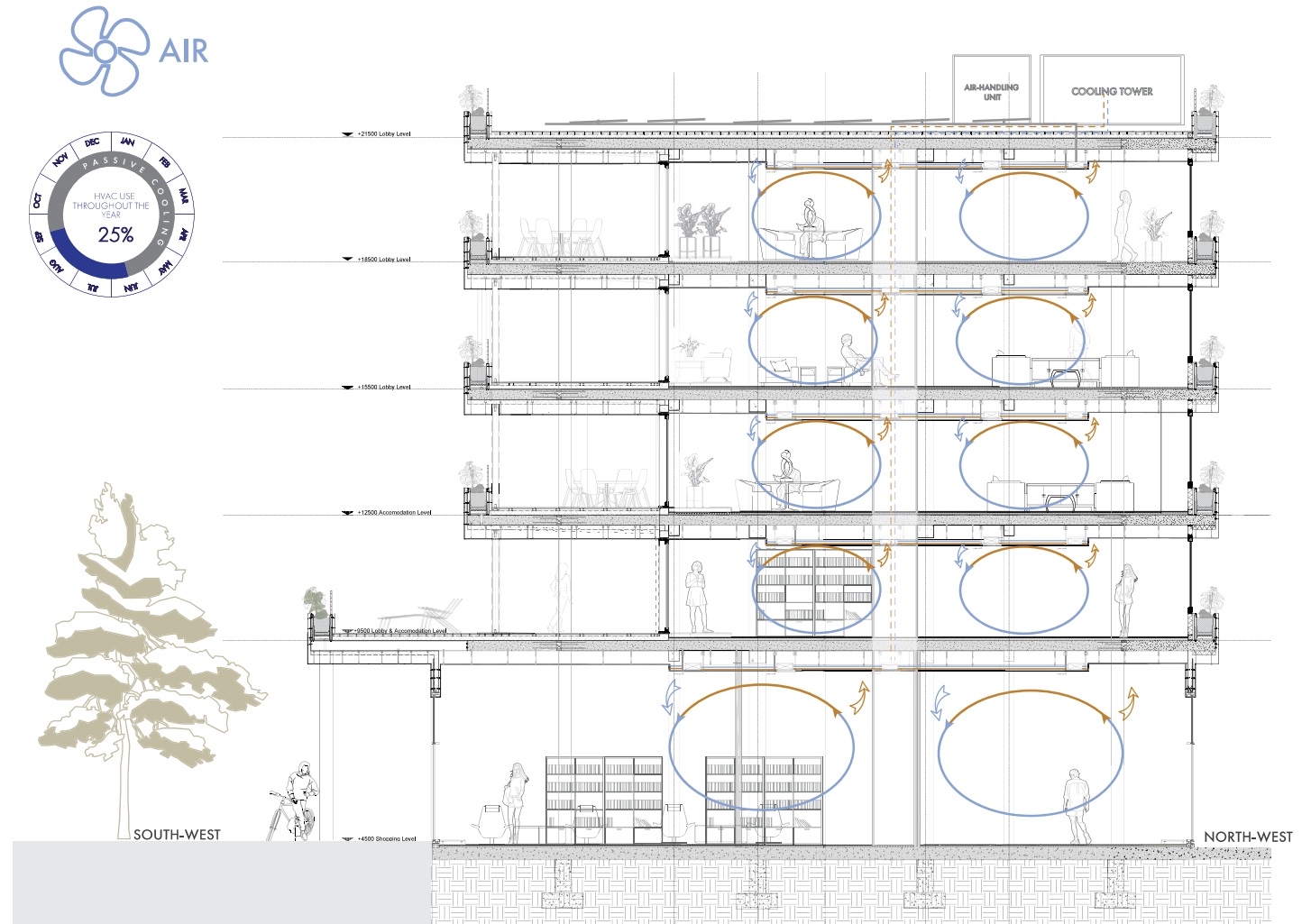
The building also has an integrated green terrace that promotes the use of terraces and seamlessly connects inside-outside. This is the main method of promoting a change in behaviour for the users. By integrating architectural elements that blur the inside-outside borders. For example, the exterior floor cladding is extended towards the indoor space which connects the indoor space to the terrace.

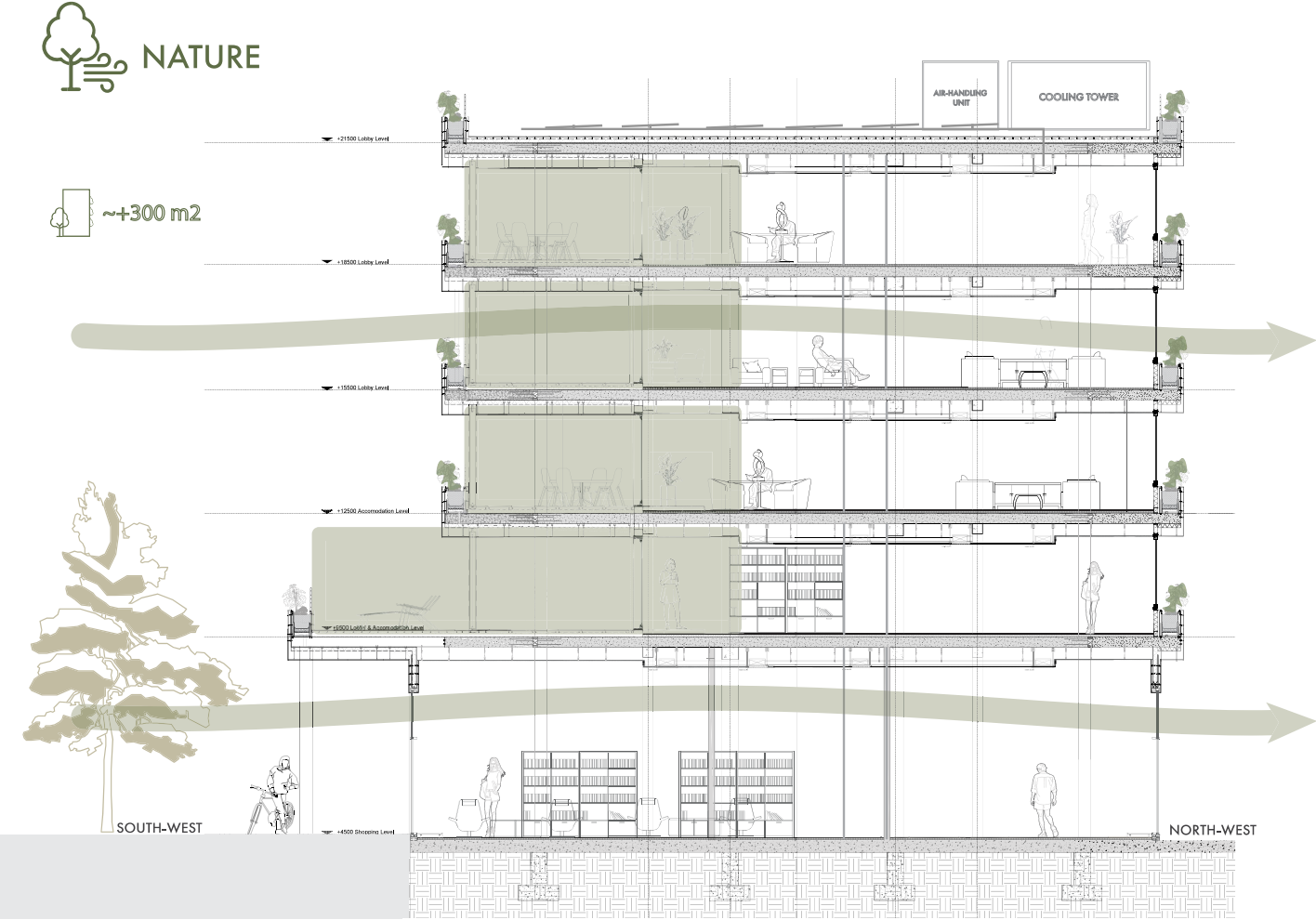
The shading elements also help to extend the use of terraces and keep the openings open. By adapting the distances and orientation it is possible to create a protected corridor and achieve different levels of privacy.

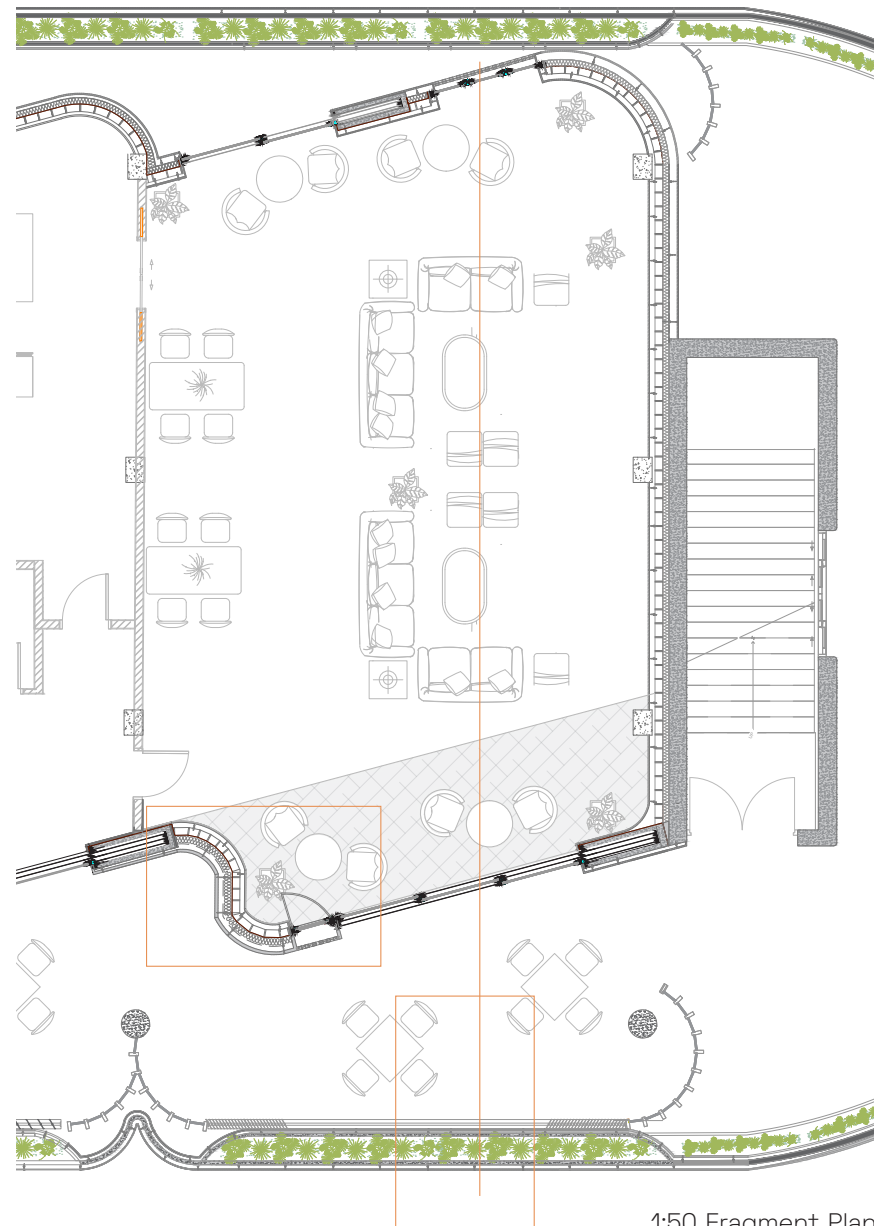




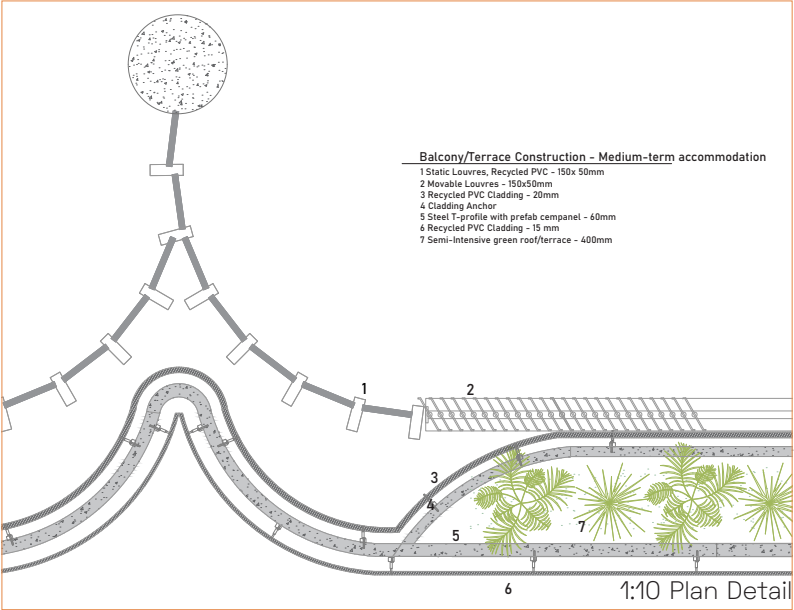
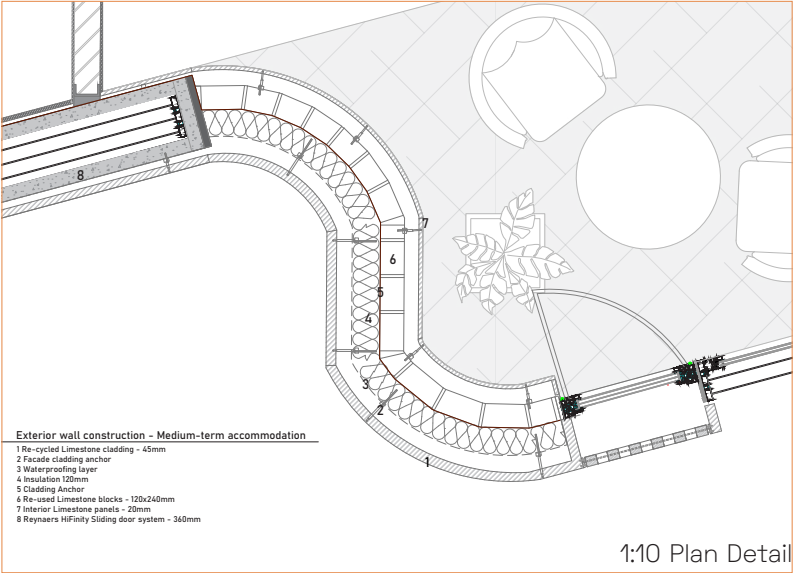






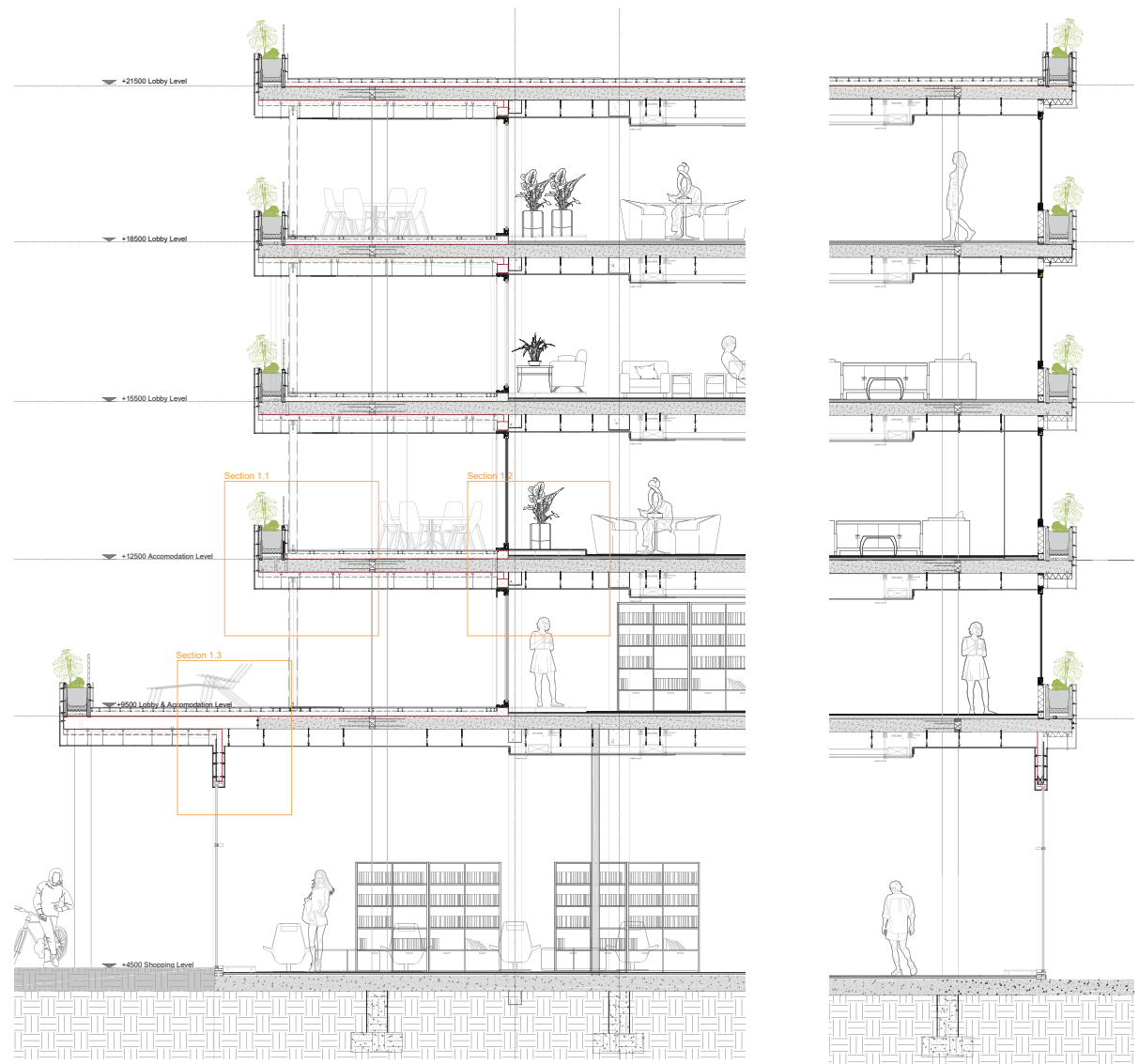


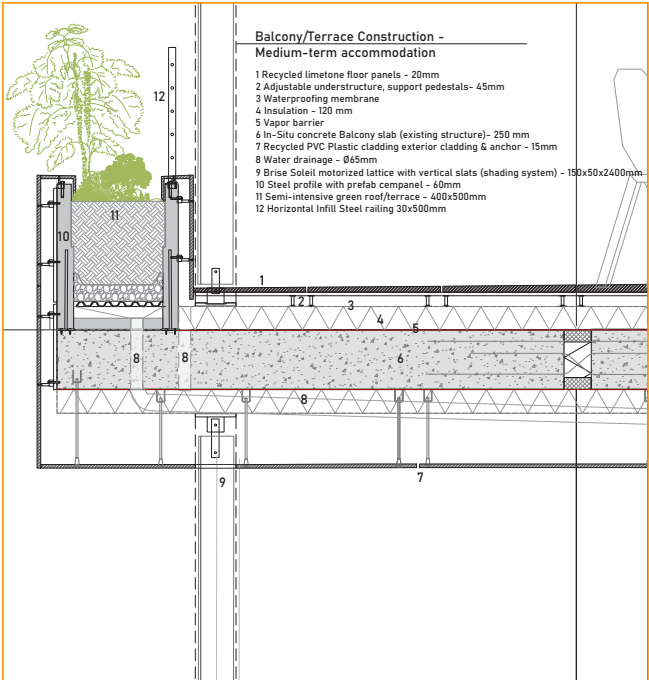
1:50 Fragment Plan



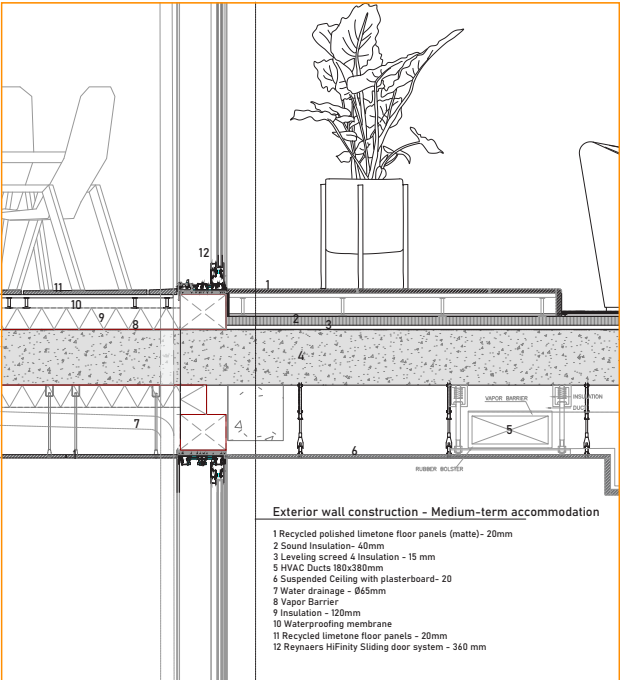




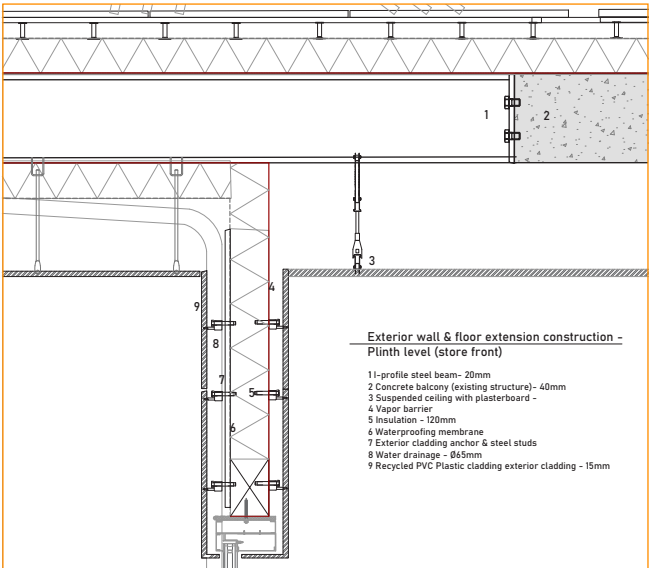




1:10 Section Detail 1

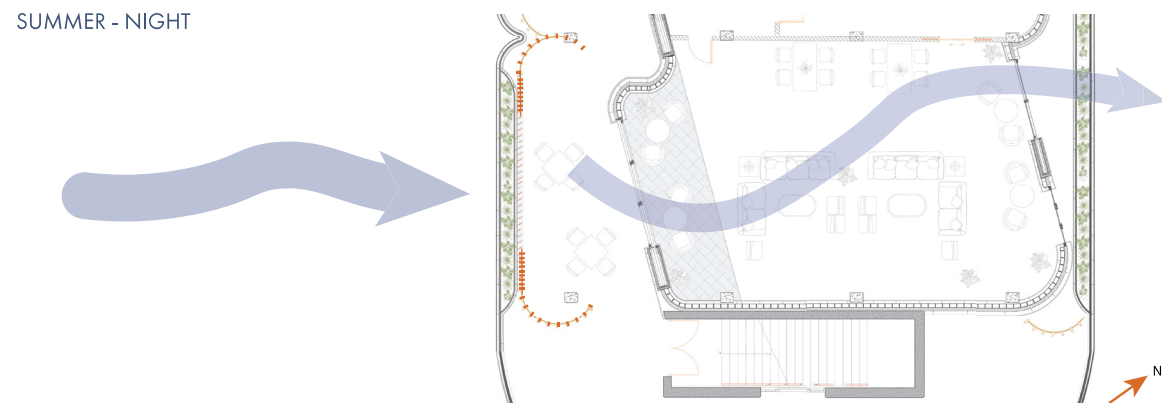
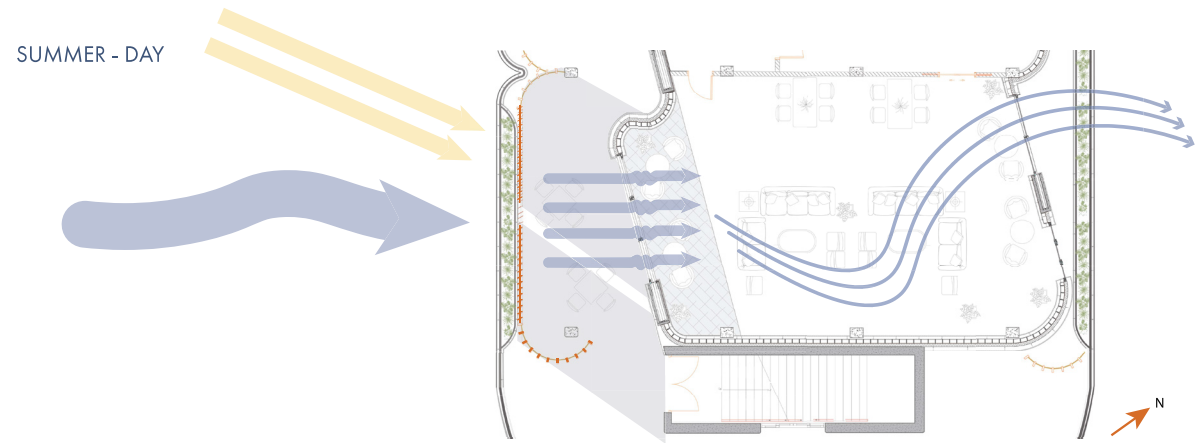


1:10 Section Detail 2

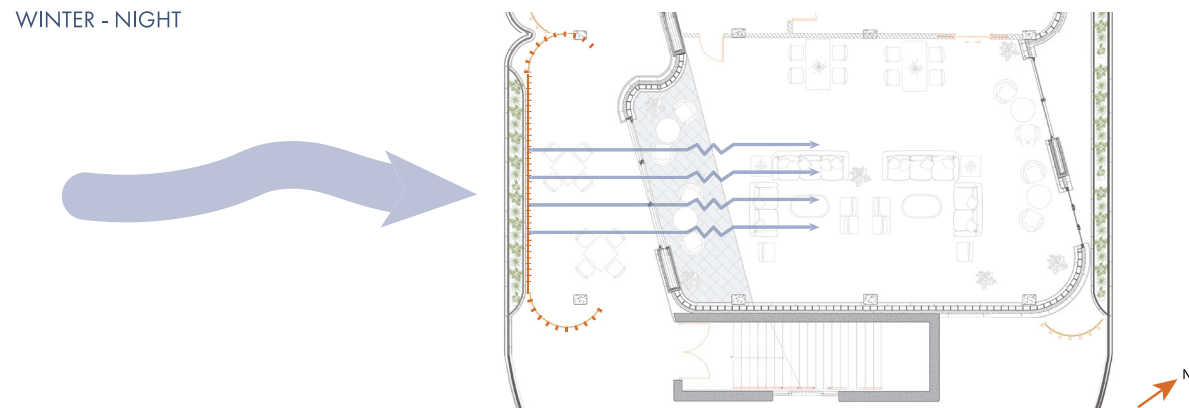
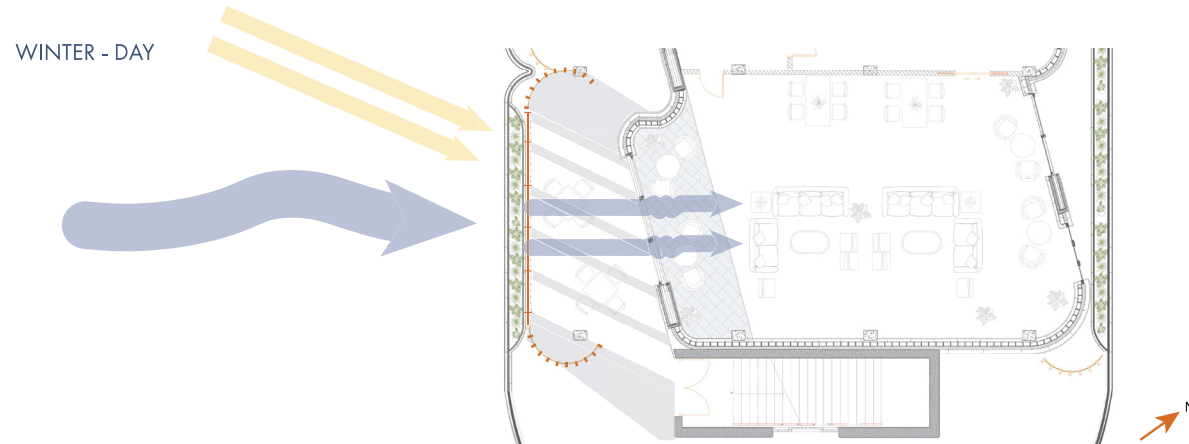


1:10 Section Detail 3

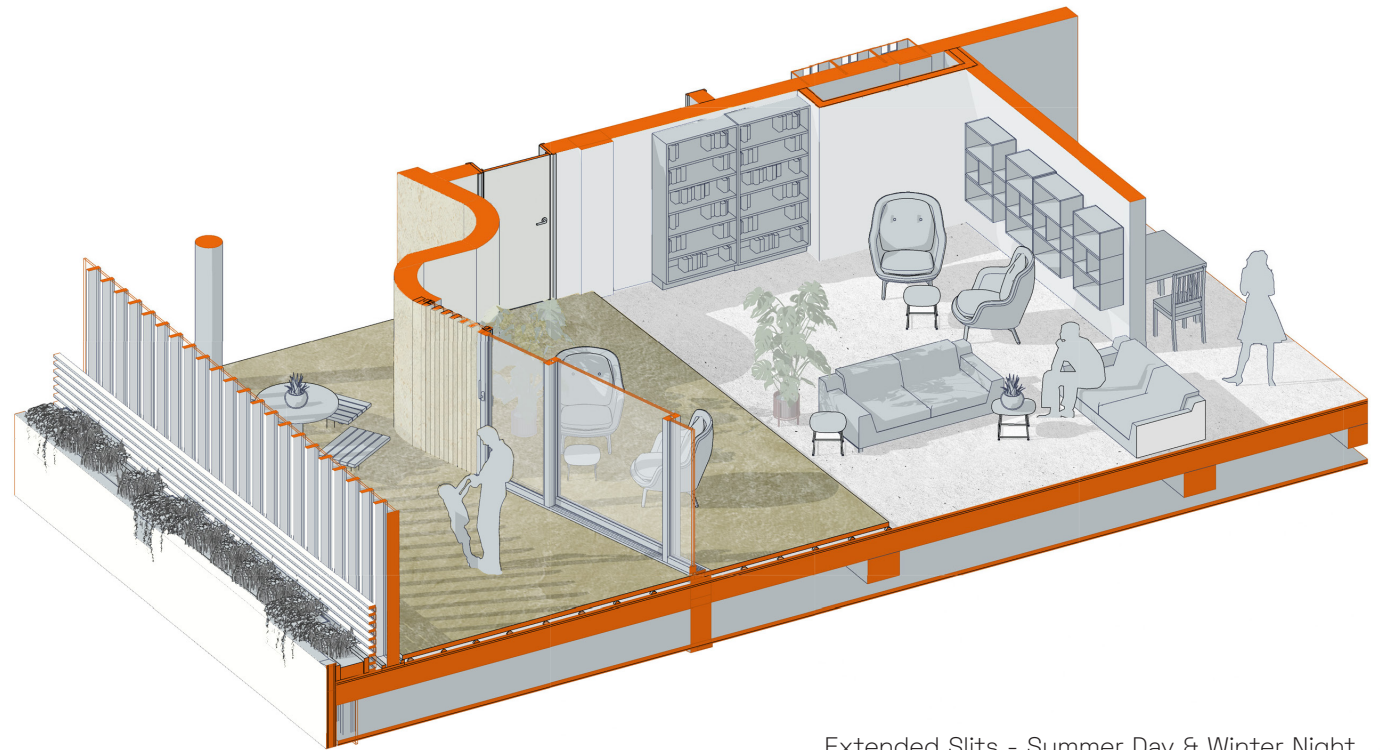
Summer passive design strategy



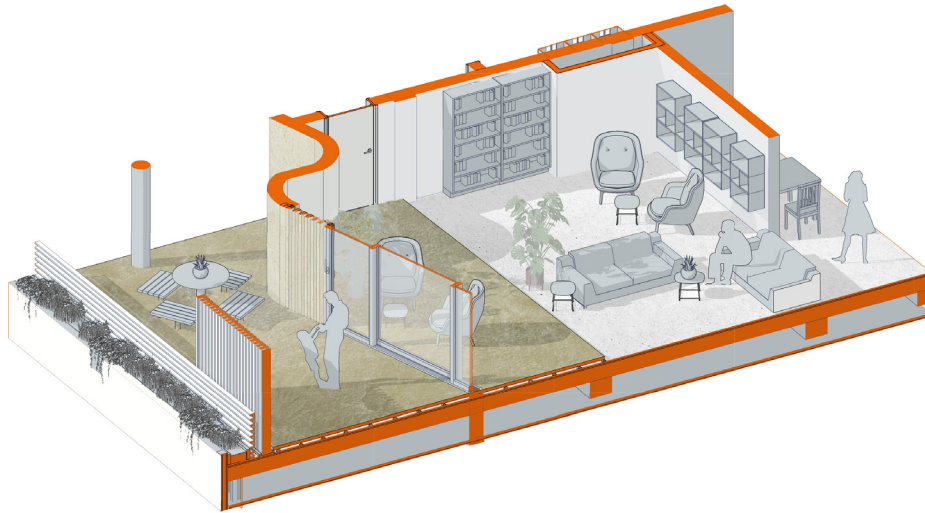
Winter passive design strategy



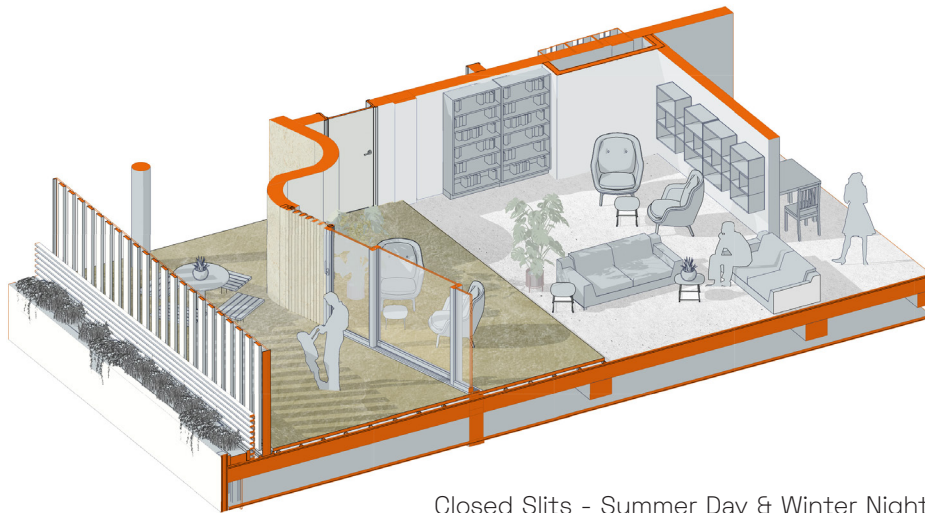
Shading Element Adaptation



Extended Slits - Summer Day & Winter Night



Open Slits - Summer Night & Winter Day/Night



Closed Slits - Summer Day & Winter Night

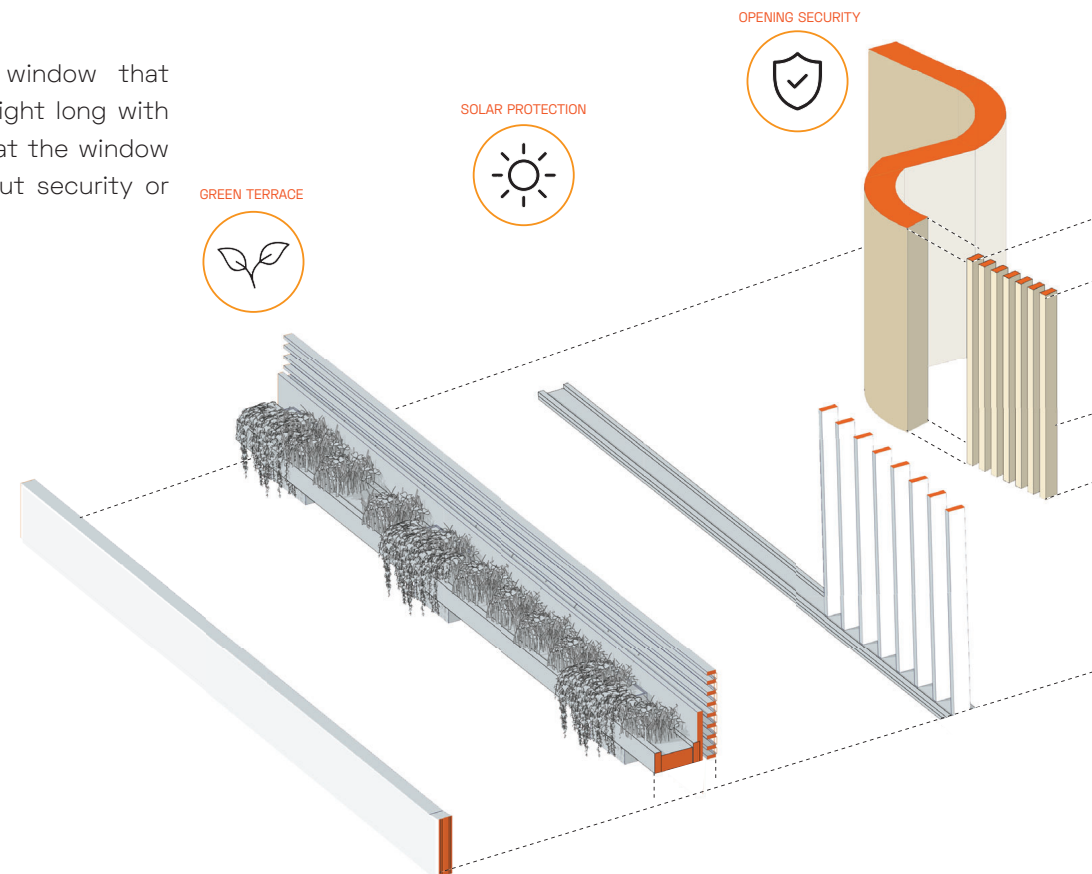




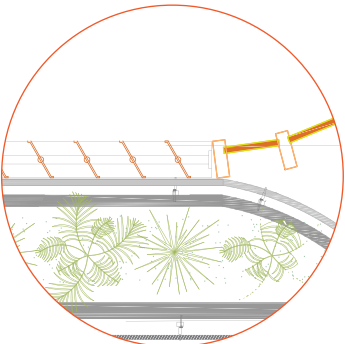
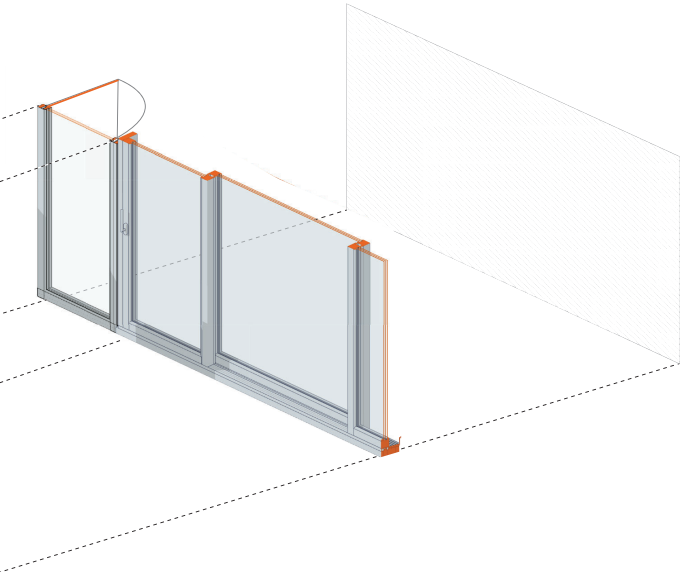
Promoting A Change in Behaviour

Passive design is heavily dependent on user behaviour. The Ripple aims to promote a change in behaviour by created spaces that blurr the lines of inside and outside. By doing this, keeping the windows open as long as possible is ensured. This is complimented by the green terrace and shading elements that optimide the comfort and aesthetics to create a comfortable indoor/outdoor space.

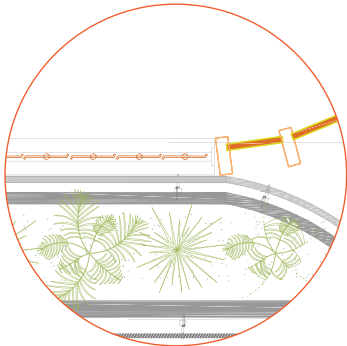
Moreover, by implementing a window that can be opening from inside all night long with security slits in front ensures that the window can be left open all night without security or insect concerns.



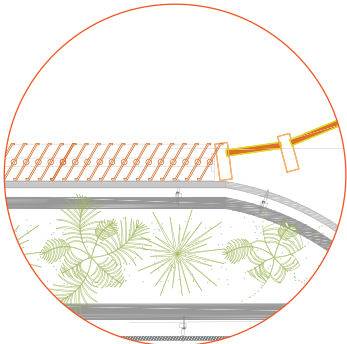
INTECT PROTECTION



SUMMER DAY/ WINTER DAY



SUMMER DAY/ WINTER NIGHT



SUMMER NIGHT/ WINTER DAY


Adaptation & Reuse

As a result, the Ripple shows how it is possible to implement passive design strategies by using the design manual to achieve energy efficient tourism projects.

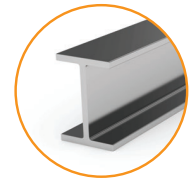
This was achieved also with the vision of building conservation and re-use of materials. Therefore ~85% of the existing structure was kept intact. Additionally, ~10% of re-cycled PVC is implemented as shading elements. Majority of the existing limestone blocks were either reused to reconfigure the interior walls or compressed into new cladding material.

In terms of energy, the simulations show that the dependency on HVAC has been decreased by nearly 50%. This equates a ~20% decrease in CO2 emission annually due to building HVAC. Such decrease means that the hotel can save up to 21% of its budget which would mostly go for maintaining a comfortable indoor climate.

Lastly, implementation of solar panels also help to facilitate the HVAC system which creates a building that can achieve energy neutrality between 85-95 %.

~85% 
existing structure preserved

~5%
STEEL



~50%
CONCRETE

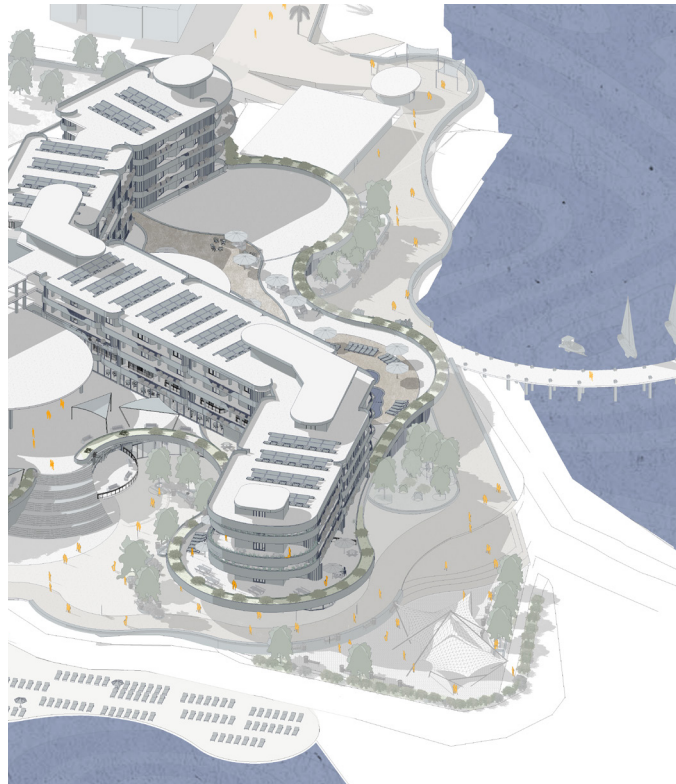


~9%
RE-CYCLED PVC



~18%
RE-USED LIMESTONE



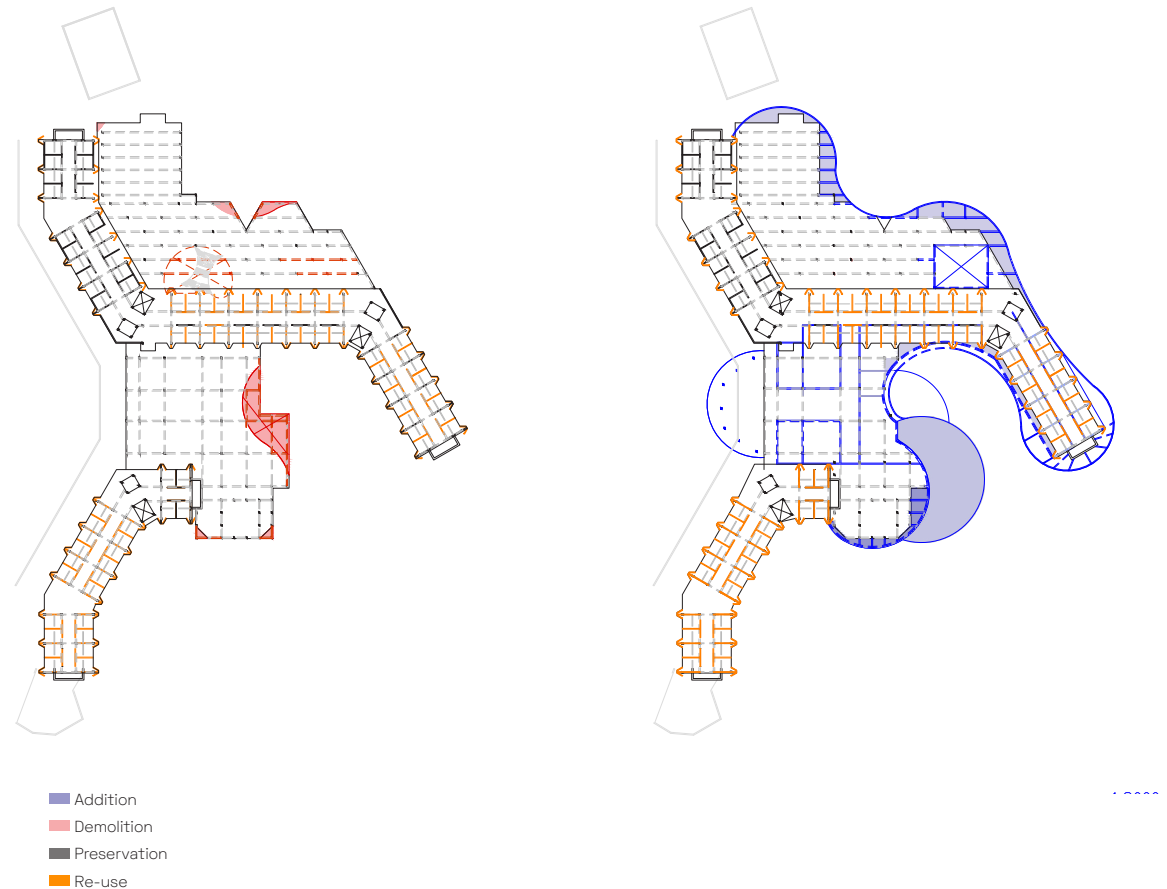


Demolition, Preservation & Addition

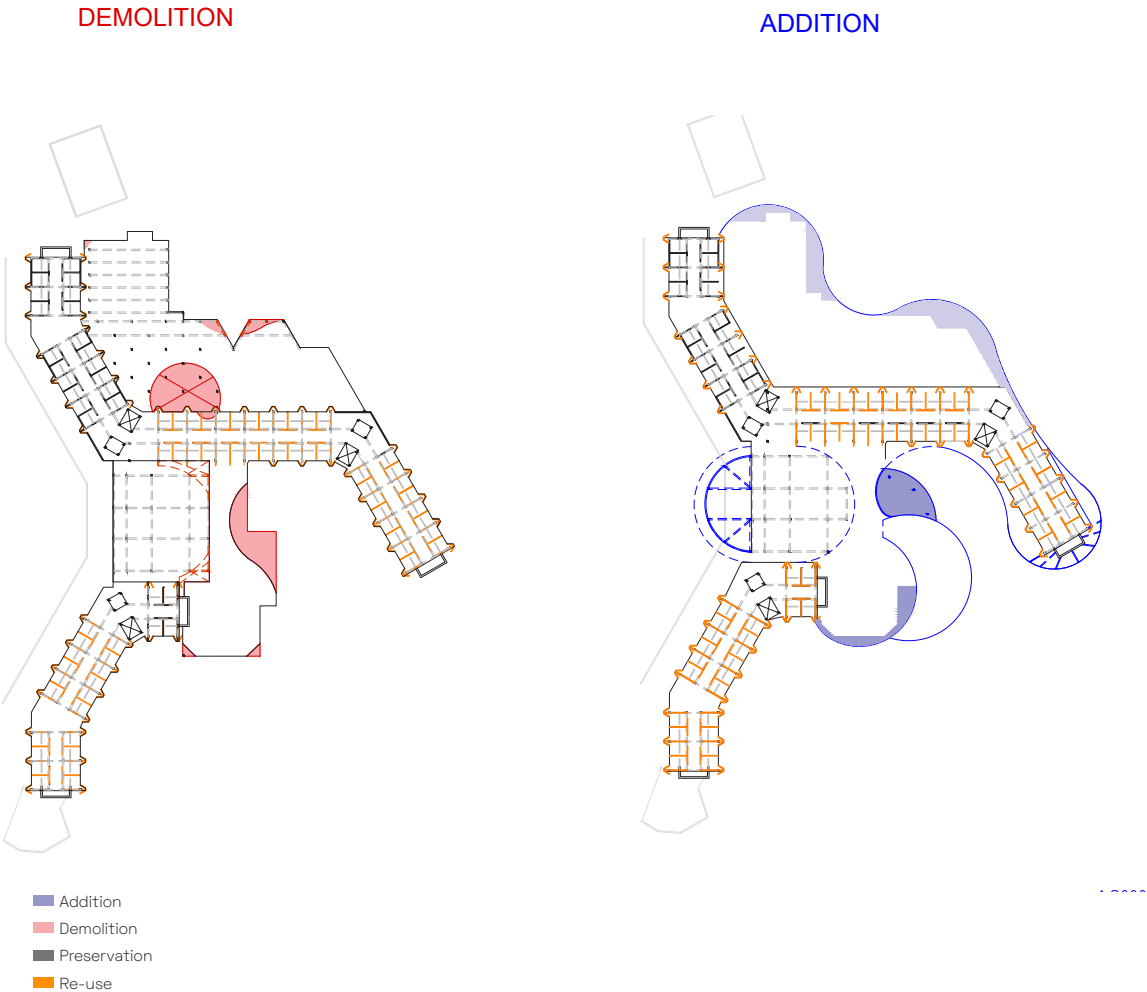
Ground level

DEMOLITION

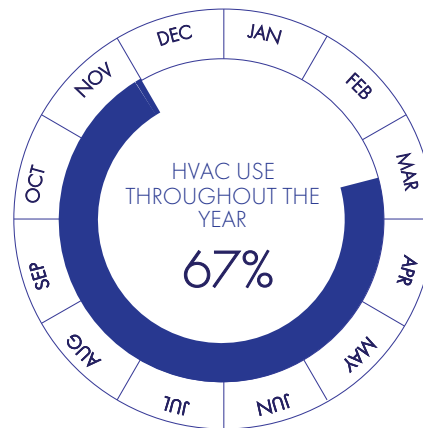
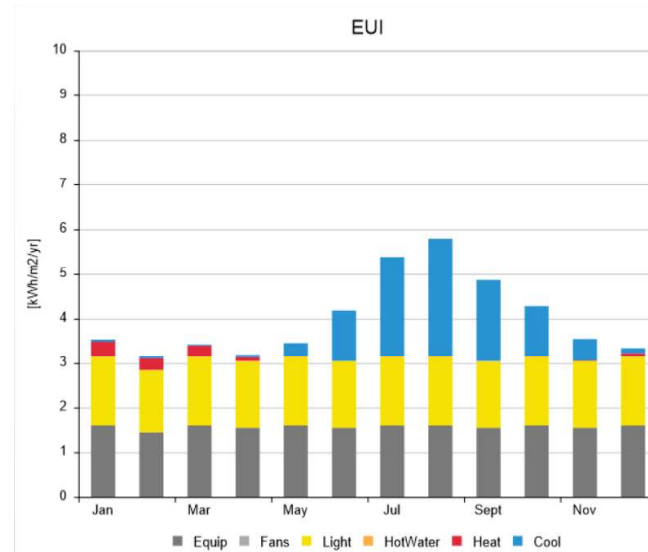
ADDITION



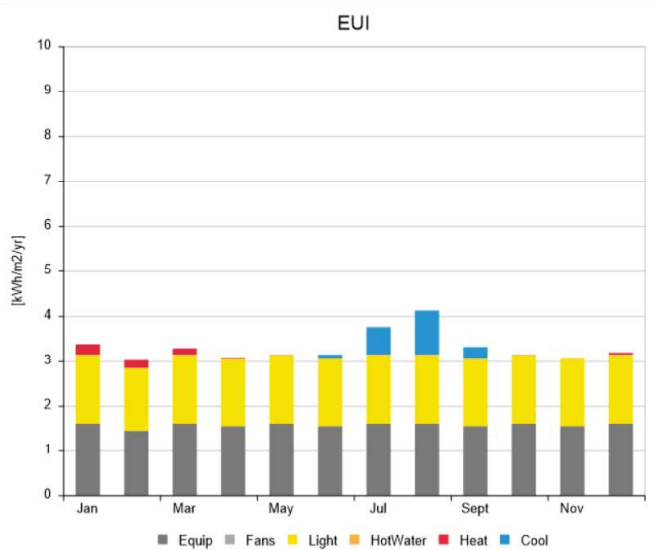
First level



Before Passive Design Strategy



After Passive Design Strategy



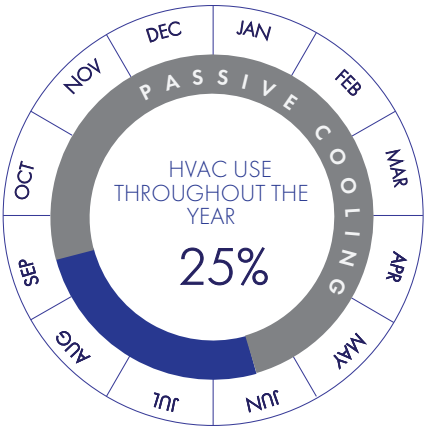
~20% /m2/a



85-95% Energy neutral



-21% /m2/a



Conclusion

By recognizing the future growth of the tourism sector, as well as the consumerist tourism products, the Ripple aimed to generate a new tourism vision. During this development, the Ripple rethinks the role of the architects and aims to emphasize how it can be used to integrate sustainability concepts. Moreover, by choosing an integration topic like passive design, it is aimed to show that it is possible to decrease HVAC demands significantly.

The research tried to achieve this integration through transforming the morphology and typologies into the terraced and single-loaded slab versions which were proven to be most effective for passive design. As a result, it became clear that 2/3 decrease was achieved in terms of HVAC demand in a year.

This was further deepened during the urban and architectural design phase by focusing on creating spaces and environments where the passive design can be used optimally. This meant that the spatial configuration and openings had a predetermined strategy that needed to be followed.

Perhaps the most challenging aspect about passive design is the user behaviour. The fragment and details showcased how the

architectural design aims to promote a shift in behaviour by providing a quality that attracts users to behave in a certain way. By blurring the borders between outdoor and indoor spaces it is encouraged to enjoy outdoor spaces keeping the openings on as long as possible. Moreover, in order to benefit night cooling, relevant security and insect protection measures are made to create comfort for users to leave their windows open.

From the perspective of the local stakeholders, the Ripple aimed to blur the boundaries by inviting them into the hotel. By making some of the hotel amenities accessible, it was possible to create a common ground between tourists and local stakeholder. By increasing this interaction, it is possible to expose two perspectives within the same environment.

This is further promoted through combatting the high-seasonality issue of tourism products. By introducing a 3-type accommodation system, it became possible to maintain “life” throughout the year.

As a result, the Ripple tried to suggest a solution for cultural, environmental, commercial and ethical issues through architectural and technical interventions.

Although the research did not focus on existing buildings, the project aimed to showcase the potential of transformation projects when it comes to tourism products. By showing the possibility of adapting buildings that were (possibly) designed without the active and continuous implementation of passive design strategies, the potential became clear.

Therefore, the Ripple aims to showcase the possibility of developing profitable projects that can have smart passive design implementations. The conclusions showcase the significant success these strategies can make also for existing buildings. Not to mention, these strategies are design driven strategies that give power to the architect without causing significant increase in investments.

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