

A detailed pencil sketch of a mountain landscape. The left side features a steep, craggy mountain slope. At the base of the mountain, a long, low building with a series of windows and a flat roof is visible. To the right of this building, a taller, more complex structure with a sloped roof and a chimney-like feature is sketched. The background shows more distant, softer mountain peaks. The overall style is architectural and conceptual.

INFLUX

Architecture responsive to conditions of flux

By Nicola Bowman

A 120 point thesis submitted to the School of Architecture and Design,
Victoria University of Wellington, in the fulfilment of requirements for
the degree of Masters of Architecture.

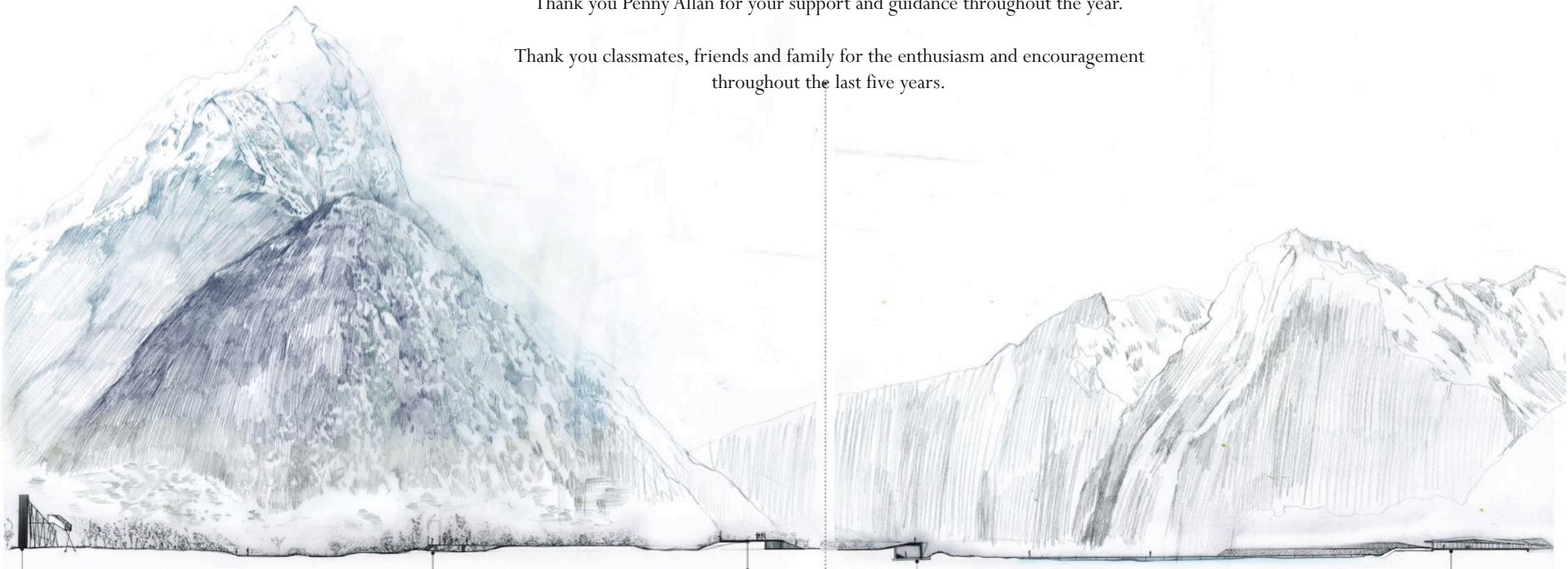
Victoria University Wellington:

Date: March 2013

Acknowledgements

Thank you Penny Allan for your support and guidance throughout the year.

Thank you classmates, friends and family for the enthusiasm and encouragement throughout the last five years.



Abstract

Milford Sound is extremely vulnerable to visitor fluctuation. The vertical landforms and pristine natural landscape attracts over 500,000 tourists to the site each year. Due to the remote location and restrictions on developing accommodation in National Parks, Milford Sound is a day-trip-destination. This generates high volumes of tourists that arrive and leave at the same time, causing congestion and immense pressure on the facilities and the surrounding natural landscape at Milford Sound Village. Although the small township is built for visitors, the current visitor facilities do not respond to daily and seasonal visitor fluctuations. The buildings are at capacity at peak time and are empty and underutilised at low times. This has significant implications for the experience of the site, there are increasing reports of visitors feeling crowded (Booth, 2010). The unresponsive built fabric also impacts the state of the surrounding natural environment by preventing natural processes and ecosystems from thriving. With visitor numbers on the rise (McNeill, 2005), Carey (2003) questions how many people can “they continue to pump into a destination before you start to remove the attraction from the destination”.

Situated alongside resilience thinking, flux is a topic of heightened relevance within architectural thinking, yet it has received very little attention. This thesis proposes responsive approaches to accommodating flux, through ‘static’ architectural forms. By introducing a series of hybrid and connected structures, architectural form is developed symbiotically with function, as a means of exploring operative forms of architecture. Architectural responses to flux have been primarily researched through design. The design outcome is a connected network of visitor facilities that acts as an ‘instrument’ in the landscape, reorganising the flow of visitors. Six concrete pavilions, connected by pathways, collect and disperse visitors along the site, encouraging an immersion experience in the World-Heritage listed natural environment. The architecture is constructed of buried, floating, carved and balanced elements. This thesis presents an example of architecture that creates an experience of engaging with the landscape and not with the crowds.

Research question

How can the design of network of visitor facilities accommodate visitor flux and enhance a visitor experience at Milford Sound?

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CHAPTER ONE

Introduction

1.1 INTRODUCTION TO FLUX

Architects are showing more interest in flux as it provides an approach to designing responsively in complex environments, including cities and large urban sites. Flux is continuous change; it is unpredictable, uncontrollable and inevitable. Delalex (2006) refers to flux as a “transformation in time”(p.34). This transformation can occur at any rate and can be altered by external and internal influences and conditions. Flux supports the process of transformation and distribution of materials, matter, energy and information across regions. Being a state, flux cannot be bound to style or form; therefore it has useful applications in many fields and disciplines such as biology, philosophy and architecture.

Thinking about a world in flux is a concept with a long lineage. In all its interpretations from Darwin's late Eighteenth Century biological theories to Twentieth Century thinking, Delalax (2006) recognizes the shape of flux is constantly changing. Architectural responses to flux are broad, but are critically important when considering the current state of the world and its future.

Flux provides a future-proofing strategy that allows an exchange of information to cross multiple borders and disciplines. When applied to architecture, flux encourages more open and receptive responses. This takes place through multidisciplinary strategies within the realms of architecture, landscape, ecology and urbanism. As looking beyond the single discipline of architecture increases the capacity for architecture to respond to wider contexts of flux, this research will utilise interdisciplinary approaches. This thesis approaches flux as a design opportunity, rather than a problem.

1.2 PROBLEMS IN THE DISCIPLINE

When approaching flux in architecture, significant implications arise for the development of form. For architecture to be responsive, this raises the issue of “how much design is enough?” If the architectural outcome is too speculative it will result in a strategy rather than a form. On the other hand, if the form is too specific it may reduce the capacity for architecture to accommodate flux.

Architectural strategies that prioritise processes of flux tend to have less considered formal outcomes. This takes place within OMA’s *Tree City Proposal* for the design of an urban park in Toronto. *The Tree City Proposal* presents a framework of flexible landscape clusters that propose to “grow now and build later” (Czerniak, 2001, p.76). This open ended approach fails to offer a tangible solution to Toronto’s problems of flux.

On the other hand, architectural approaches that are preoccupied with formal outcomes are typically less responsive to flux. Architectural form that is founded on stability, solidity and hierarchy to determine the material fact, leaves little room for the form to adjust with change. This typically results in autonomous forms, limiting architecture to be capable only of responding to the internal changes within the building (Taki, 2002). This can be understood in the exoskeleton form of Foster and Partner’s Sainsbury Centre. With the structure and services within the perimeter of the form, the interior space is open and can be used for a range of uses. However, by not considering extrinsic changes, this reduces the capacity for building to respond to flux.

Accommodating flux in architecture is an on-going challenge within practice and discourse, and raises an example of a ‘process versus form’ argument. As flux can be openly interpreted, architectural responses to flux tend to be general. In order to design responsive and site specific architecture, particular conditions of flux need to

be identified and tested against a site-specific criteria.

This thesis is not interested in mimicking the process of flux through plastic, transformable, or biological forms; rather it is developing strategies for static forms to be operative as a means to design responsive architecture.

Daily Visitor numbers at Milford Sound (March 2011-2012)

		Month												
		Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-11	Feb-11	Mar-11
Day	1	1734	1419	829	600	462	308	888	509	1073	1584	1908	1724	
	2	1768	901	776	485	633	379	589	674	1226	1424	3209	1913	
	3	1913	932	702	429	555	549	607	809	1279	1312	2911	1523	
	4	1728	1064	607	534	638	460	630	1220	1049	1765	2540	1355	
	5	1504	1141	807	526	616	429	579	1226	1102	1527	2462	1807	
	6	1811	1129	565	582	536	305	458	979	1540	1463	2252	1795	
	7	2150	1090	671	456	514	464	582	799	1170	1473	2034	1704	
	8	1905	1310	670	553	26	446	529	638	1535	1771	2086	1782	
	9	2021	1200	708	512		645	512	816	1425	1686	2344	1635	
	10	1569	1149	679	329		545		702	1775	1428	1859	1922	
	11	1679	937	515	501		713	353	680	1295	1489	1982	1853	
	12	1672	1344	802	457		506	635	957	1513	1592	2050	1880	
	13	1968	1155	565	427		587	762	1029	1547	1420	1686	2062	
	14	1342	1319	589	324	57	306	942	837	1516	1505	1725	1906	
	15	2076	1276	674	347	56	15	892	781	1342	1487	1468	1984	
	16	1711	1243	567	385	478	5	947	795	1950	1623	2154	2302	
	17	1872	1354	580	328	667	377	553	754	1596	1714	1819	2169	
	18	1414	1444	725	180	592	605	648	675	1617	1733	2029	1526	
	19	1641	1326	639	293	510	493	760	971	1449	1704	1758	2029	
	20	1866	1367	621	345	697	525	812	946	1515	1804	1572	2217	
	21	1810	1702	638	510	489	582	1007	735	1885	1805	1923	1903	
	22	1647	1522	567	602	458	502	693	883	1736	1867	2237	2158	
	23	1538	1405	595	516	41	486	795	927	1555	1838	2841	2117	
	24	1530	1700	576	386	34	566	481	611	1991	1372	2456	1616	
	25	1498	1676	493	217	189	525	683	704	1680	1498	2373	1668	
	26	1014	1408	602	456	301	524	712	963	1555	2132	2558	2201	
	27	1365	1476	666	370	476	496	838	849	1556	2905	1957	2101	
	28	1393	1545	485	480	8	548	781	1002	1458	2693	1925	1598	
	29	1244	1035	483	476	388	675	1189	815	1916	2805	2138		
	30	1602	598	500	627	501	742	831	874	2036	3018	1538		
	31	442		403			618	1051		2296				

Figure 1.1: Diagram of daily visitor numbers at Milford Sound
March (2011-March 2012)

Created by author.

1.3 VISITOR FLUX AT MILFORD SOUND

Located within Fiordland National Park, Milford Sound experiences intense conditions of flux. Extremely active between 10am and 4pm, This tourist mecca receives high volumes of tourists arriving departing at the same time. On a busy day the site receives up to 4000 visitors in the daytime, dropping to only a few visitors at night. In addition to daily flux, there is also seasonal flux: the numbers of visitors substantially drop to an average of 40 people per day in winter (fig.1). These visitor statistics are unprecedented in New Zealand, making it a unique case study to explore architectural responses to flux.

3018

Highest number of visitors recorded for a single day.

5

Lowest number of visitors recorded for a single day.

500,000 +

Estimate for annual tourist numbers (McNeill,2005).

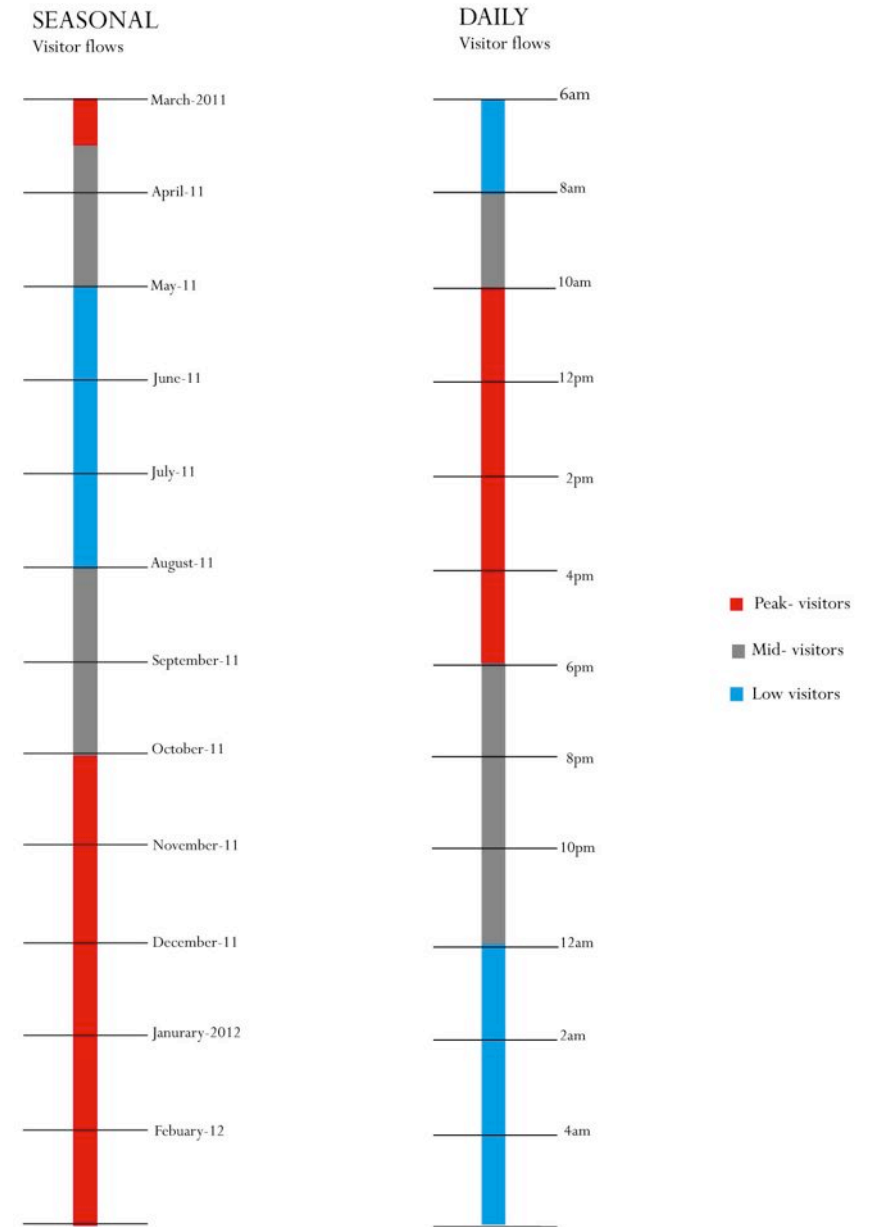


Figure. 1.2: Diagram showing the seasonal visitor flux at Milford Sound (March 2011 to March 2012). Created by author.

Figure. 1.3: Diagram showing the daily visitor flux at Milford Sound (March 2011 to March 2012). Created by author.

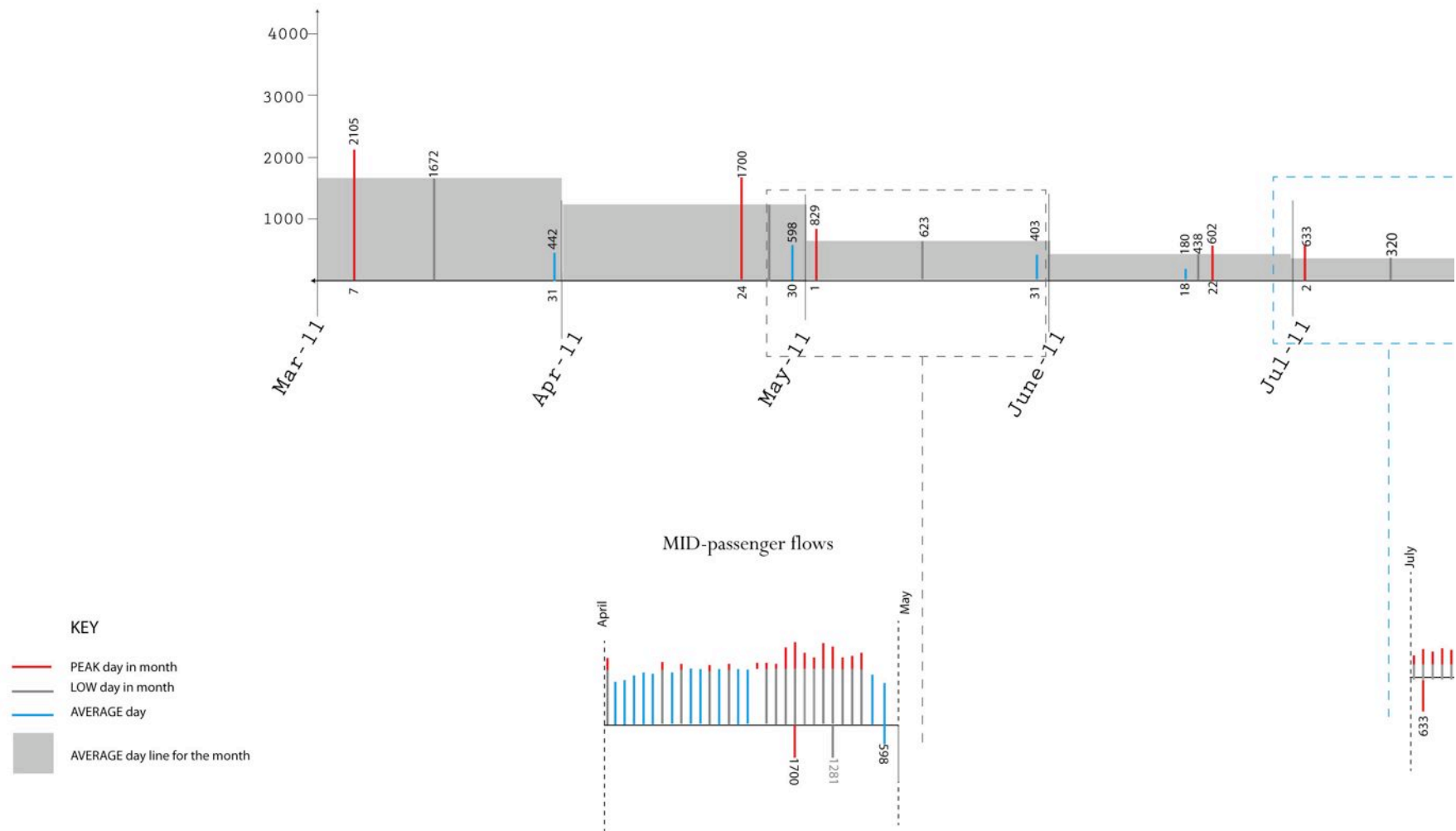
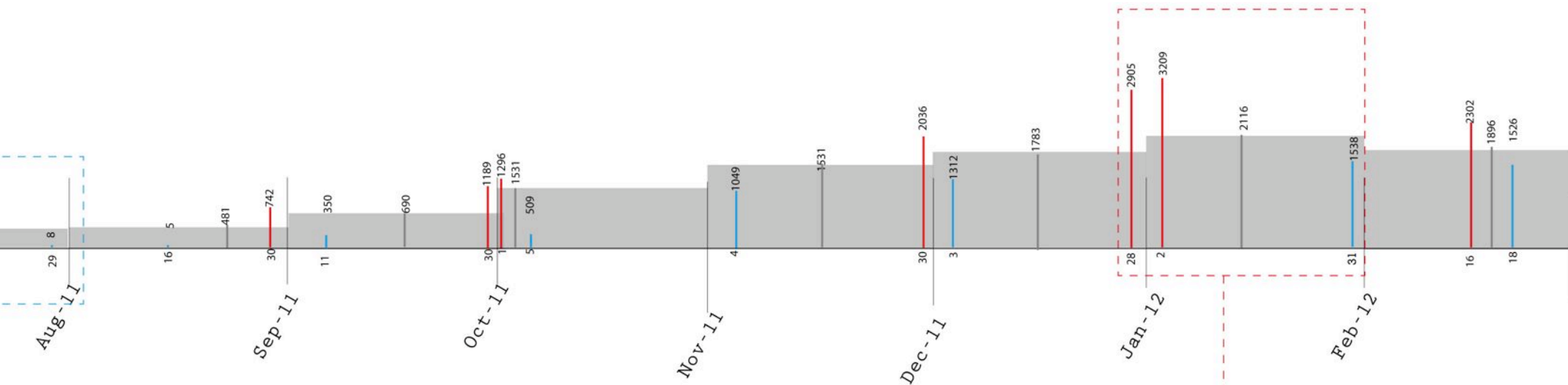
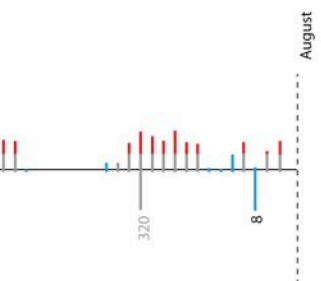


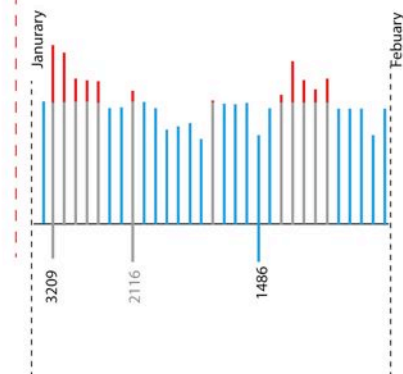
Figure 1.4: Diagram showing the annual visitor numbers at Milford Sound (March 2011 to March 2012).

Created by author.

LOW- passenger flows



PEAK- passenger flows



1.4 THESIS STRUCTURE

Part 1

Part one presents an introduction to flux, the site and the design scheme. The design primarily responds to the condition of flux, related to the daily and seasonal fluctuations of visitor populations at Milford Sound. Both a master plan and a detailed development of one of the buildings is presented in *Chapter Four: The Scheme*. Flux is a primary consideration of the design and forms the focus of the theoretical research.

Part 2

A literature review and case study analysis investigates flux, supported by a discussion of the relevance of the proposed scheme.

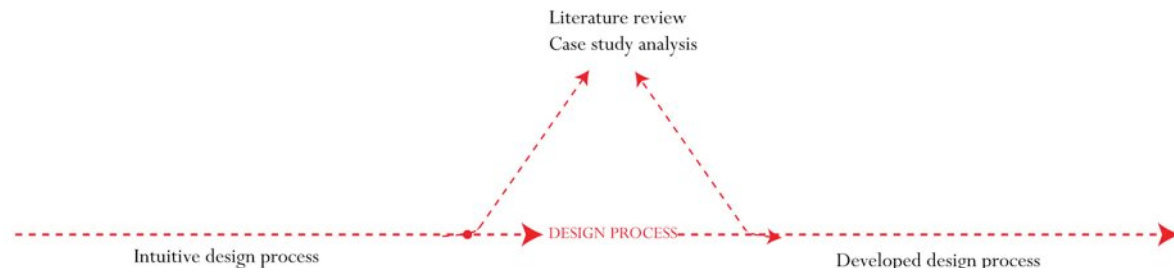


Figure 1.5 Research through design diagram.
Created by author.

CHAPTER TWO

Methodology

2.1 RESEARCH THROUGH DESIGN

This thesis uses a research through design methodology. This research method focuses on architectural strategies that respond to flux. These strategies were initially developed through an intuitive design process. Ten strategies were identified as key themes of flux and were developed through a literature review and case study analysis. By organizing the strategic approaches from the literature review and the formal approaches from the case study analysis into a diagram, this generates a network of possible strategies to design responsively to flux. Critical analysis of the design research is conducted to assess the significance of the design outcome in relation to current practice and discourse.

The design process has been interpreted into the diagram fig.2.2 and fig 2.3. The diagram maps fig 2.2 maps the intuitive design process and the diagram, fig 2.3 outlines the critical reflection of the design process.

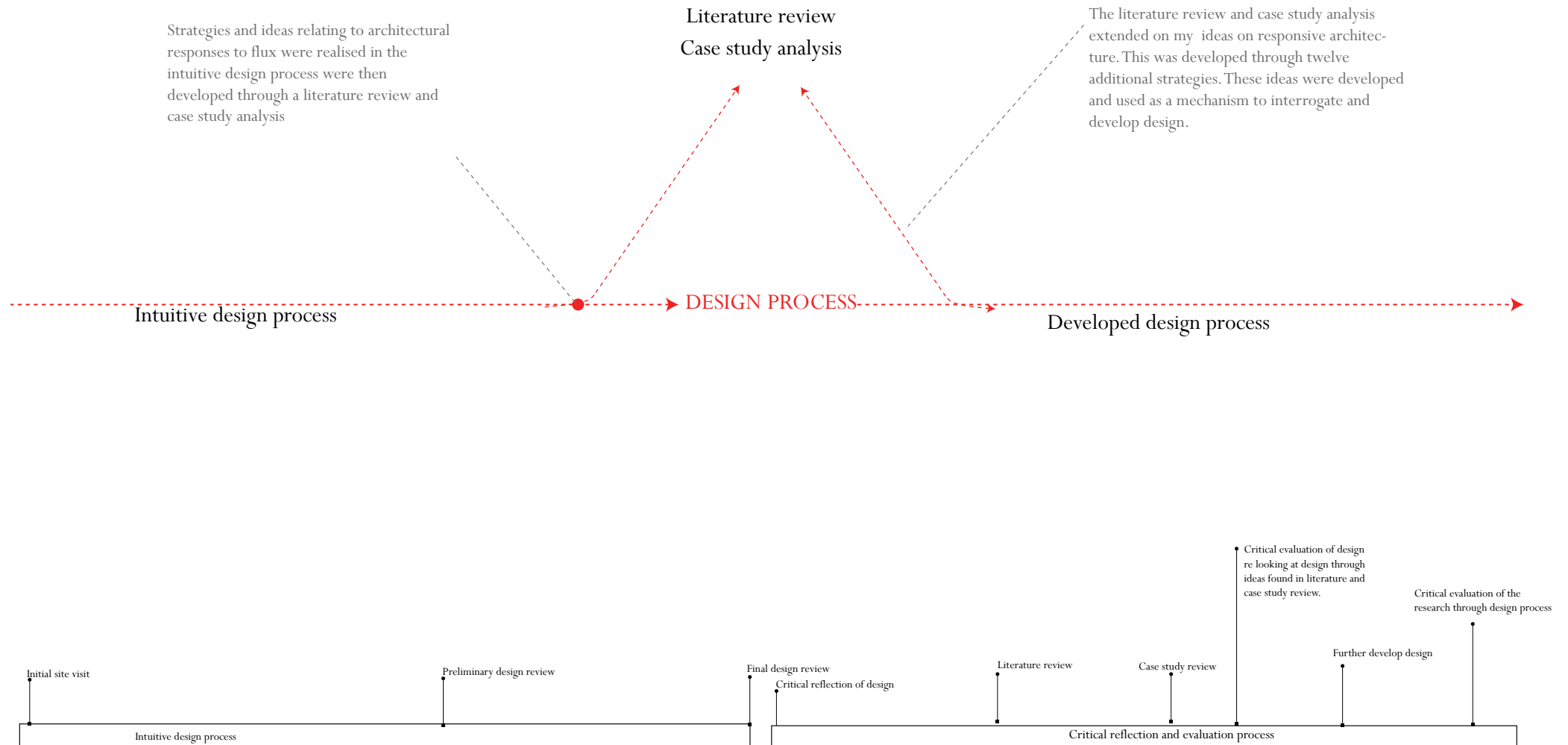


Figure 2.1. Strategies for flux diagram
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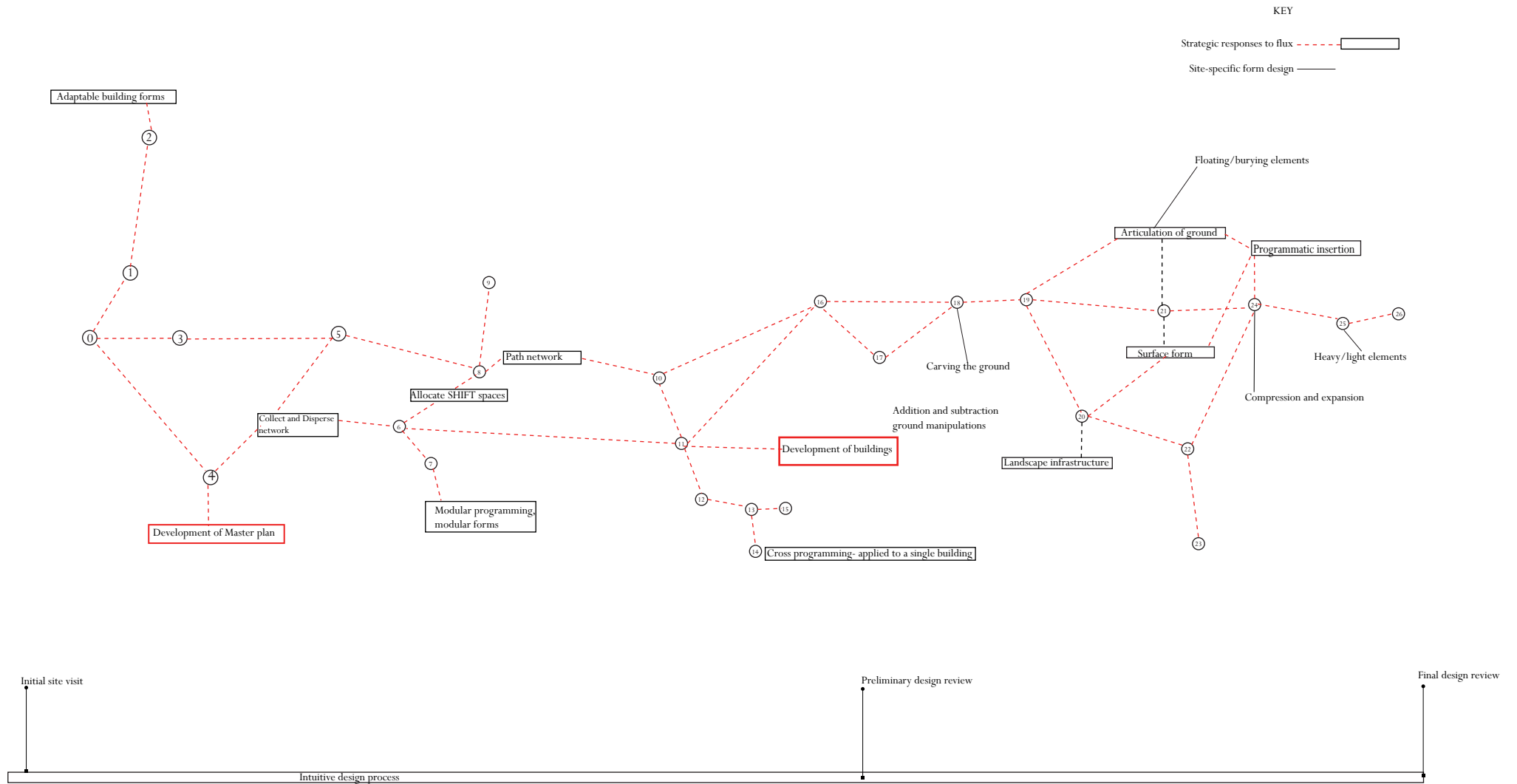


Figure 2.2. Diagram mapping the initial design process.

Created by Author

Week Ten strategic responses from the initial design phase

- ② - - - - - Adaptable building forms
- ④ - - - - - 'Collect - disperse' network of buildings connected by paths
- ⑥ - - - - - Allocate 'Shift Spaces' between the building and landscape
- ⑦ - - - - - Path network
- ⑧ - - - - - Modular programming, modular forms
- ⑭ - - - - - Cross programming-applied to a single building
- ⑲ - - - - - Articulation of ground
- ⑳ - - - - - Landscape infrastructure
- ㉑ - - - - - Surface form
- ㉔ - - - - - Programmatic insertion

Design Process:

Architectural responses that accommodate flux were initially developed in the initiative design phase. The design process has been interpreted into the diagram figure 2.2. The numbers represent the weeks of the year and the lines represent avenues of thinking through the design process. If the line is connected to a higher number (week) then the design process progressed. If the line stops, it shows where reevaluation took place and new avenues were required. Critical analysis of the design process highlights ten strategies to design responsively for flux in both frameworks and forms.

The design led research process revealed the challenges of designing form within a process driven brief. Initial formal responses to flux failed to respond to the wider conditions of site. Frameworks were then utilised to manage and organise the site, and to anticipate changes in visitor population between peak and low periods. In order to specify form, the frameworks were calibrated against site-specific design criteria to ensure that architectural forms are operative and appropriate to the landscape. A selection of strategic and formal strategies that developed during the design process is discussed in Appendix A.

Strategic Procedures

Specific Procedures

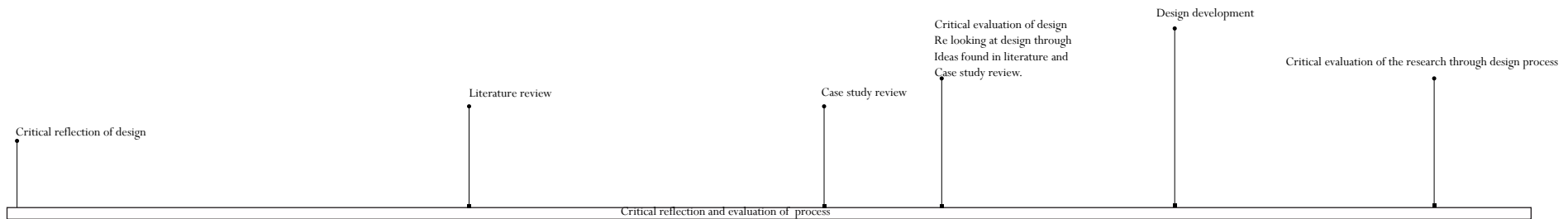
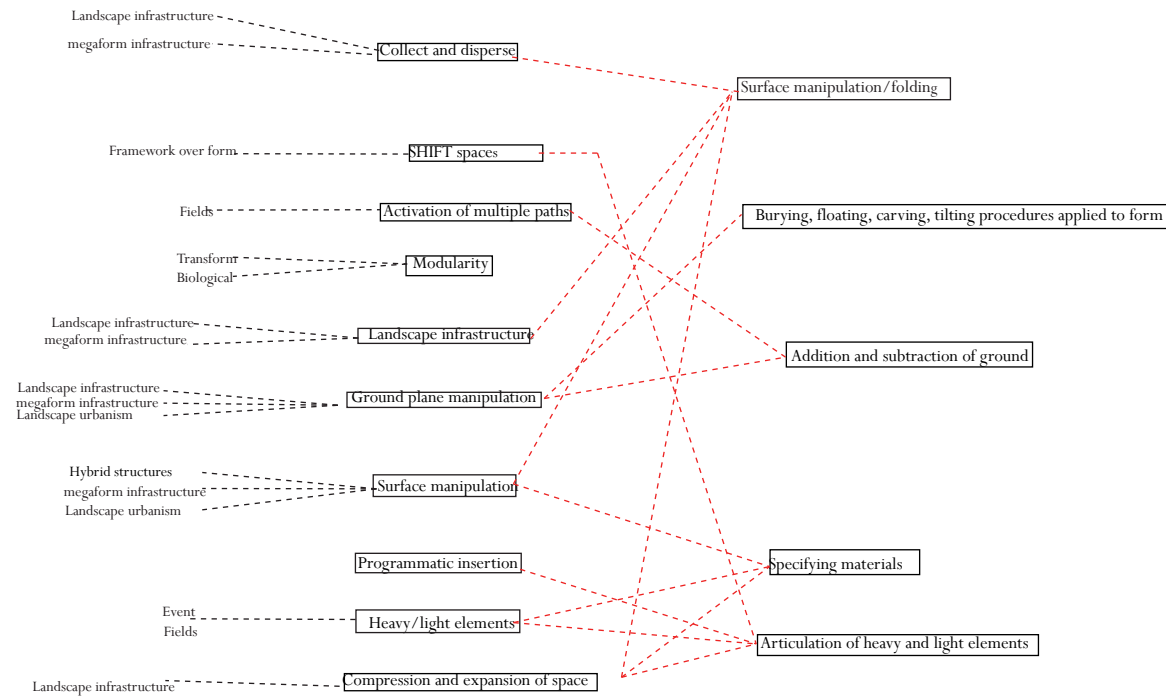


Figure 2.3. Diagram showing the critical reflection and evaluation process.

Created by Author

The critical reflection process analyses the process of specifying strategic approaches to design site-specific and responsive architecture. This process comprises of working back and forward through strategic and formal procedures and models. Either starting with specific forms, design explored ways that static forms could be more responsive by developing them against strategic methods. For example, if starting with burying/floating ground strategies, these could be developed strategically through landscape infrastructure techniques. This would test the buried/floating architectural elements to formally serve flows of people and natural ecosystems. This process explored a multiplicity of ways to develop design.

Formal development has been discussed in more detail in Appendix B.

CHAPTER THREE

Background



Figure 3.1. Map showing the location of Milford Sound within New Zealand.
Created by author

3.1 INTRODUCTION TO SITE

Milford Sound is located within the Fiordland National Park and the Te Wahipounamu -Sound West New Zealand World Heritage area (Ensor,2010). The park is renowned for its outstanding natural landscape; the vertical landforms, deep fiords and a vast expanse of natural flora. Its biodiversity and abundant wildlife are key natural attributes of the site. In 1986, the extraordinary beauty of the landscape was recognised by the United Nations and it was made a World Heritage Area, one of the only three in the country (Fiordland National Park Management Plan, 2007). As Milford Sound is the only location within the park that has road access to the sea, it has been developed as a 'gateway' for visitors to experience the impressive landscape.

Milford Sound is a tourist Mecca in a very remote location. Tourists must have to travel a long way to experience Milford Sound. Being a 'day-trip-destination' it attracts large tourist influxes on a daily basis, creating a tourist bottleneck. The 2005 Milford Sound Transport report states that 90% of tourists are only there for one day and over 55% of these tourists embark on a twelve-hour bus journey to and from Queenstown (p.7). Due to the long journey to and from Queenstown, tourists arrive and depart quickly, causing the site to be extremely active between 10am and 4pm. The remote location, lack of accommodation, and limited space to develop, makes the site vulnerable to visitor flux.

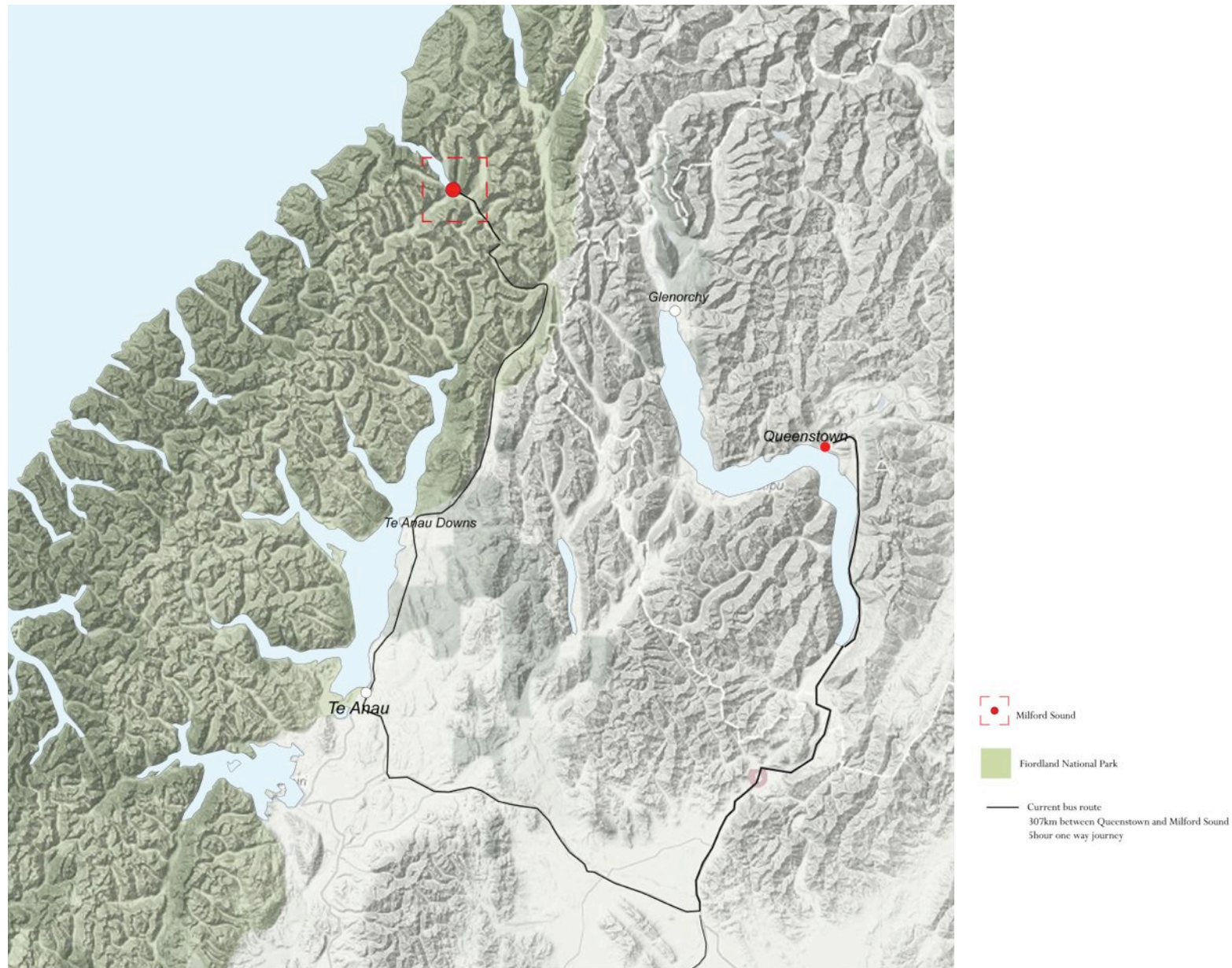
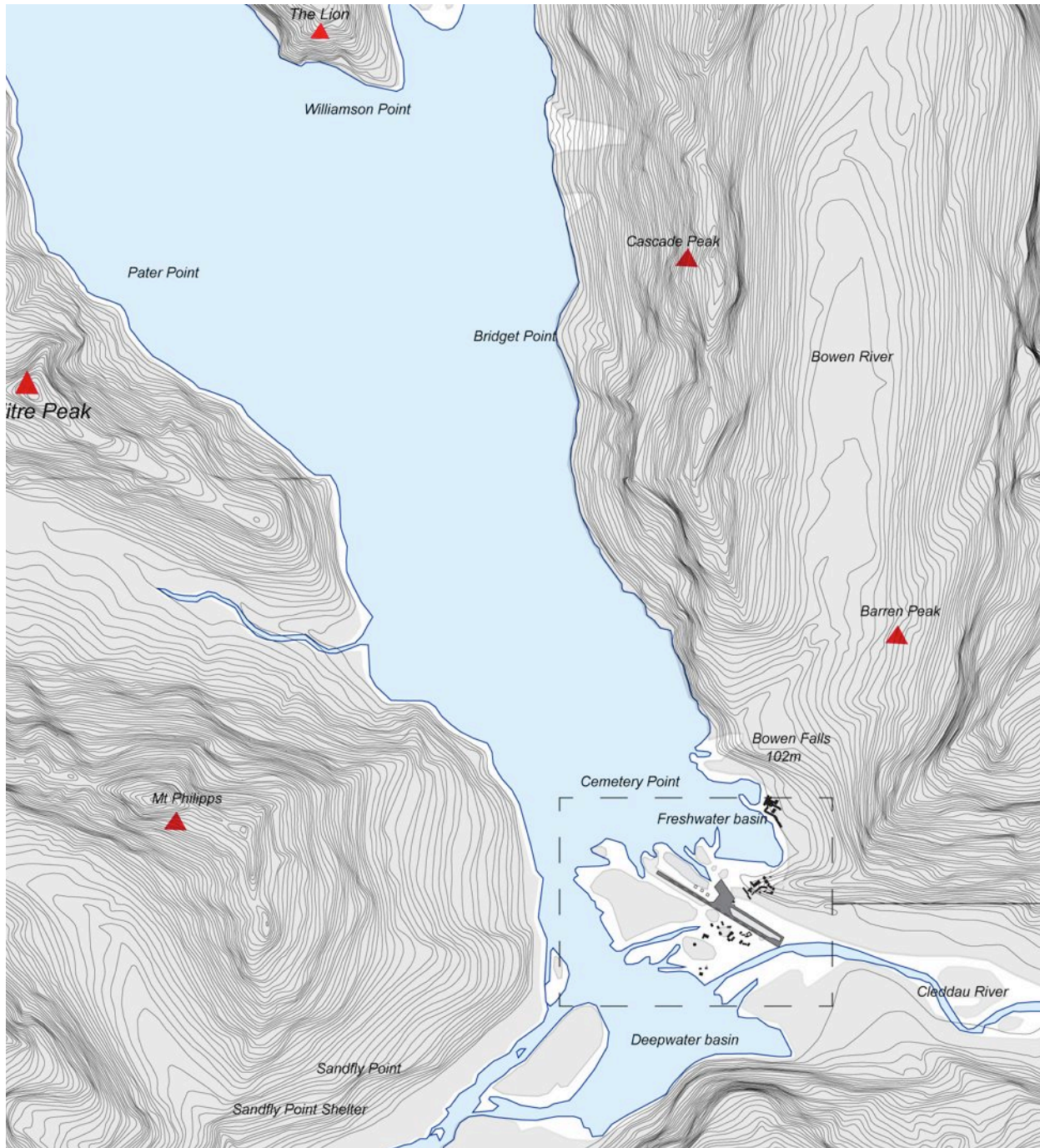


Figure 3.2. Map showing the location of Milford Sound within the Fiordland National Park.
Created by author



3.2 THE SITE

The small town ship is located on a small stretch of reclaimed land on the Cleddau Delta and is surrounded by a number of outstanding natural features. These include, Mitre Peak, the Lion, Bowen falls, The Fresh Water Basin and the Deep Water Basin (p.27) These natural attributes attract over 500,000 tourists to Milford Sound every year, and this number is on the rise (McNeill,2005).

Figure 3.3. Map showing the location of Milford Sound Village within the Milford Sound area.

Created by author



Figure 3.4. : Site Map of Milford Sound Village
Retrieved from www.maps.google.nz

3.3 PROBLEM

Identifying that visitor flux is not the problem but a condition of the site, this thesis argues that the problem is situated within the design of the built environment, which fails to effectively respond to daily, and seasonal visitor flux. By not responding to flux, these visitor fluctuations cause immense pressure on the current facilities, buildings and surrounding natural landscape, which have led to visitor crowding.

Organization of Buildings

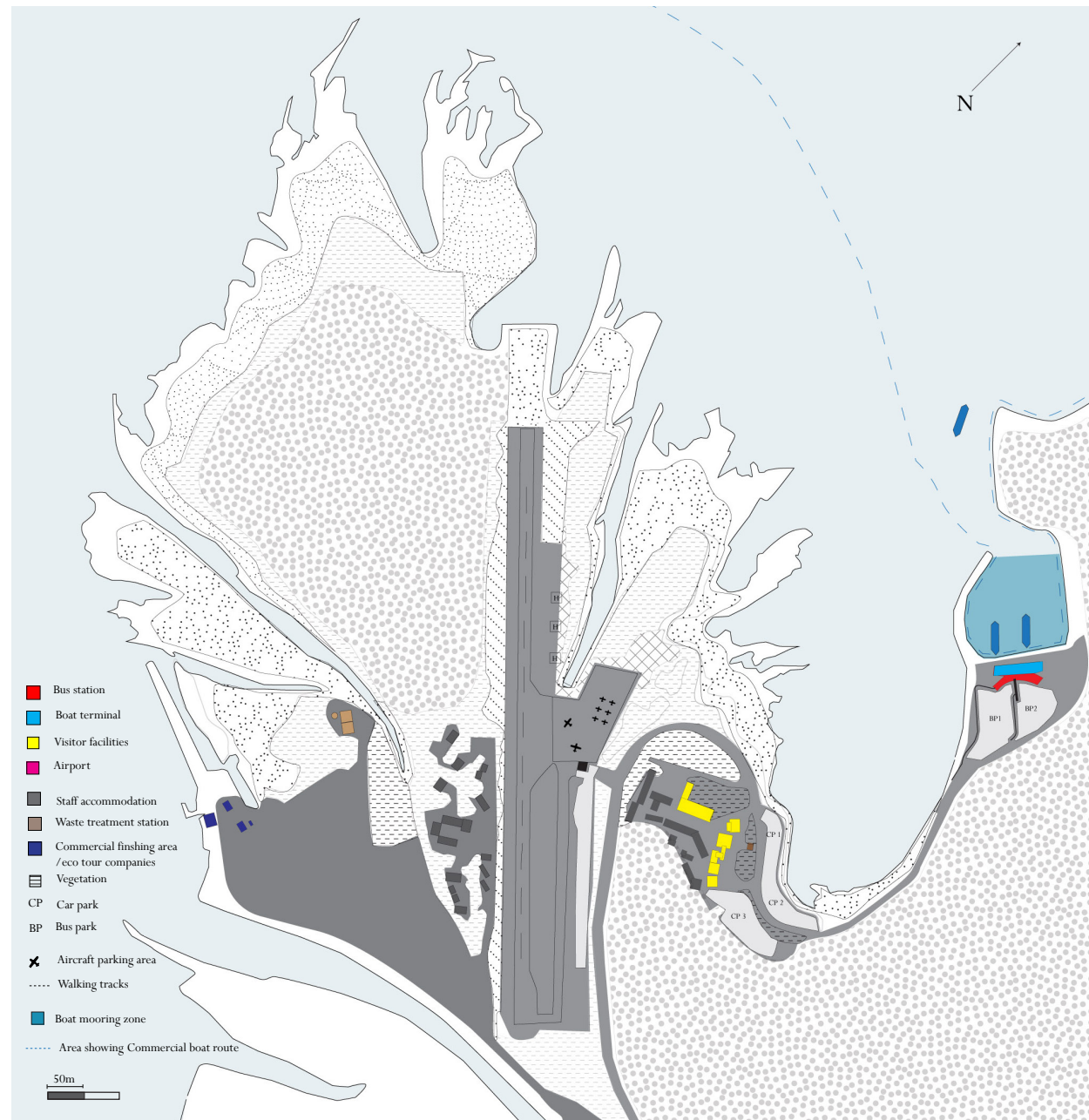
A consortium of authorities, businesses and government departments collectively oversee management at Milford Sound Village (Riddell, 2004). This shared management of the site has generated a fractured layout and organization of visitor facilities. Here, disconnected buildings sprawl across the landscape leading to an in cohesive and unresponsive layout.

The organization of facilities at Milford Sounds is primarily transit orientated. Within the current scheme the organization of built form often has a negative impact on visitor experience. This lack of consideration results in noise disturbances (airport, boat terminal) and visual disturbances and crowding (car park, boat terminal). By focusing on shifting people from one vehicle to the next, the current layout fails to consider how the built environment can enhance the experience of the site, promote visitor immersion within the natural environment or respond to conditions of visitor flux.

Figure 3.5. Site map diagram, organisation of the built fabric at Milford Sound Village.

Created by author

Current layout of site : vehicle dominated



Planes

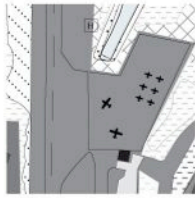


Figure 3.6. Problem diagram: Noise disturbance.
Created by author.

Noise disturbance

On a busy day in summer, there are 40 takeoffs and landings every hour. The planes are old and noisy and require a large runway. These factors significantly impact on the visitor experience. As the planes only take 2-6 people at a time, this inefficient mode of transport is not viable for future development and is likely to be replaced with quieter and spatially efficient helicopters.

Cars

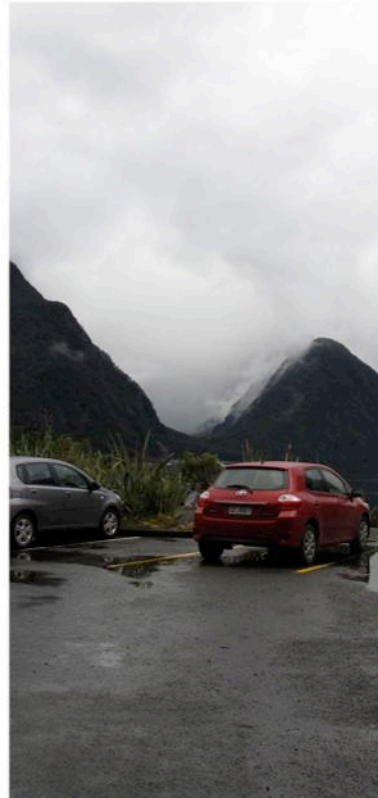


Figure 3.7. Problem diagram: Visual Disturbance.
Created by author.

Visual disturbance

Bus/Boat

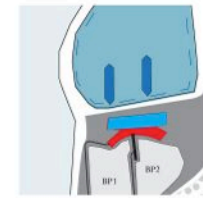


Figure 3.8. Problem Diagram: Crowding.
Created by author.

Crowding

For visitors who travel to Milford Sound by bus, they have limited time to experience the site, as they are quickly off loaded from the bus and loaded on to the boat. At peak times this causes significant crowding, not unlike that of urban environments, detracting from an immersed experience of the natural environment.

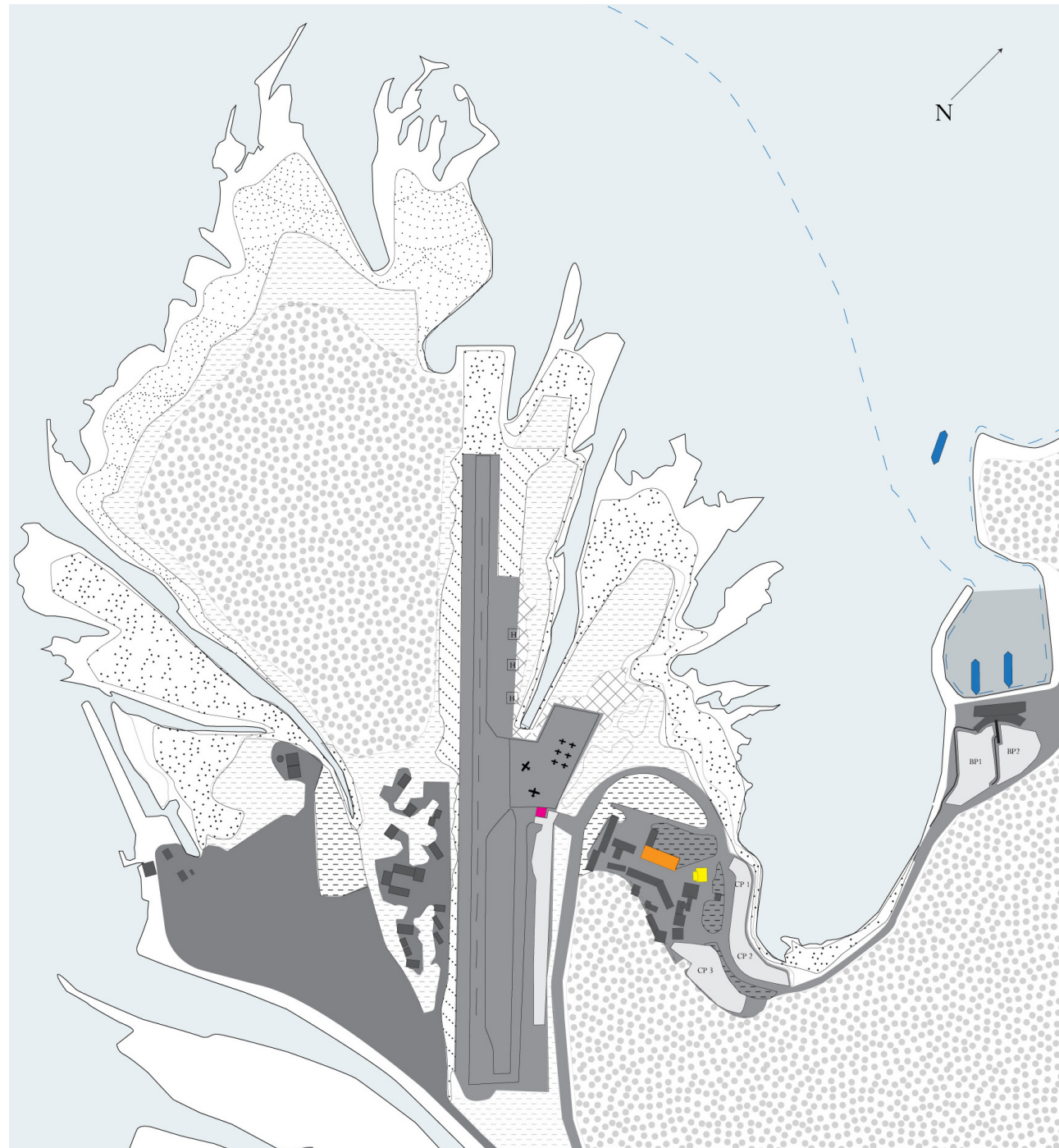


Figure 3.9. Problem: Current building form.
Created by author



Figure 3.10. Problem: architectural form of the current airport building
Created by author



Figure 3.11. Problem: architectural form of the current cafe building
Created by author



Figure 3.12. Problem: architectural form of the Mitre Peak Hotel building
Created by author

Opportunities missed

This thesis identifies two significant opportunities that the current scheme fails to exploit.

Viewing the natural landscape

Viewing the landscape is one of the most valued activities for tourists at Milford Sound (Booth, 2010). The current organisation of the site detracts people from viewing the landscape. Currently the landscape is predominantly viewed within vehicles and car parks, failing to encourage visitors to be immersed in the natural environment. Site plan (fig. 3.13) indicates key views of the landscape, which the built environment also fails to exploit.

Views of natural significant features

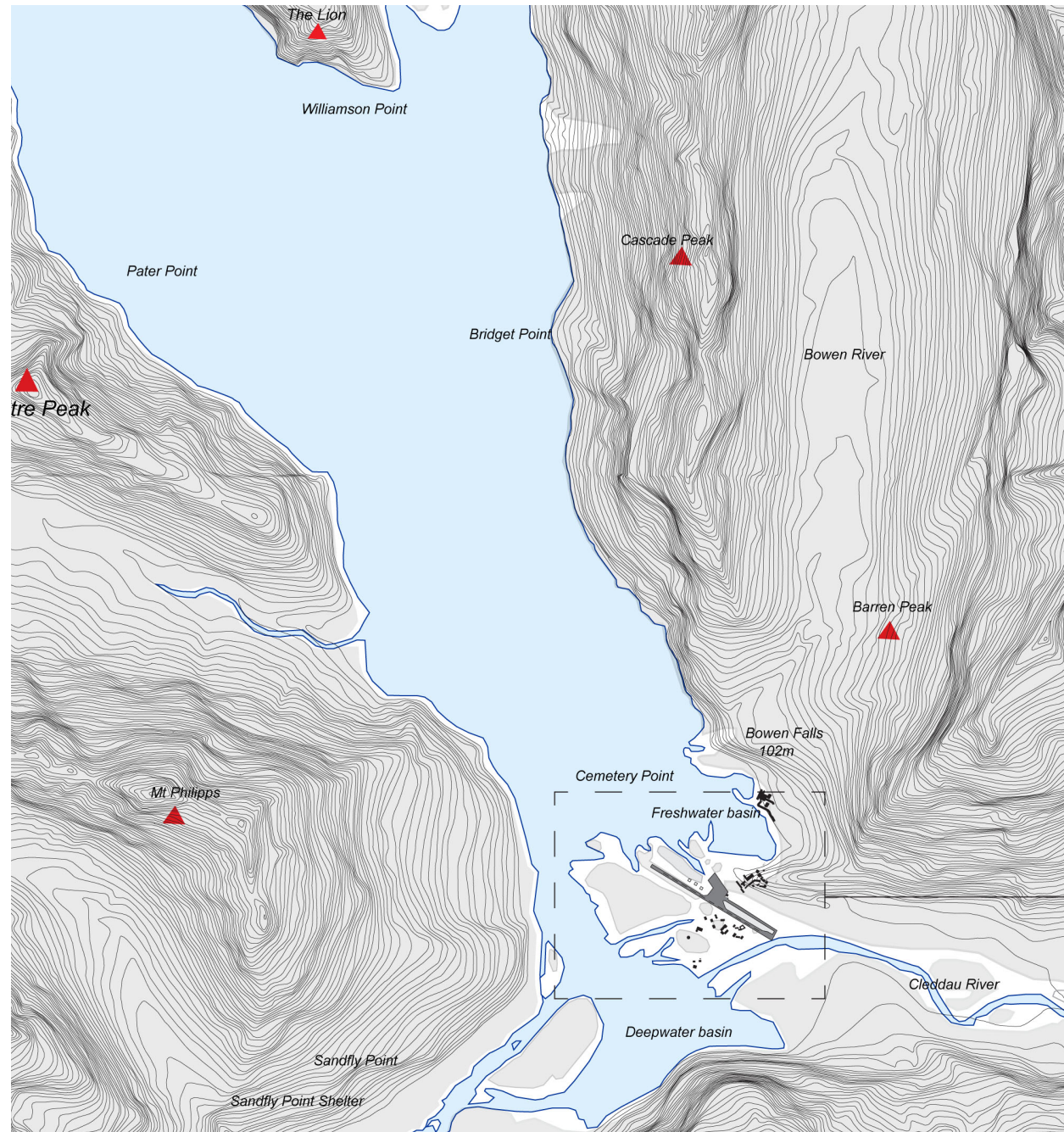
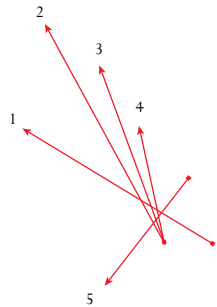


Figure 3.13. Site map highlighting natural attributes at Milford Sound

Created by author

Views of natural attributes at Milford Sound

1. Mitre Peak

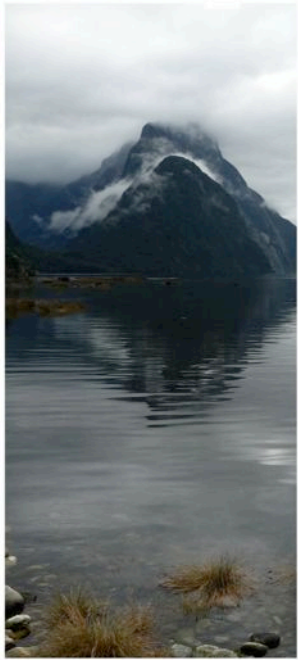


Figure .3.14. Mitre Peak
Created by author

2. 'The Lion'

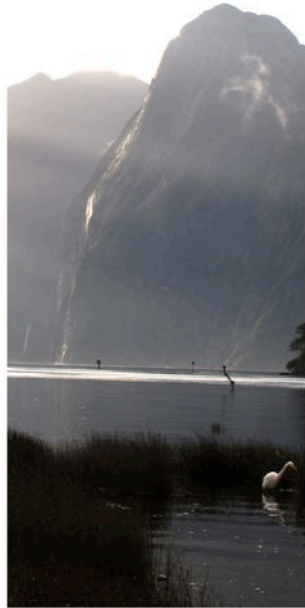


Figure 3.15. 'The Lion'
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3. Bridget Point

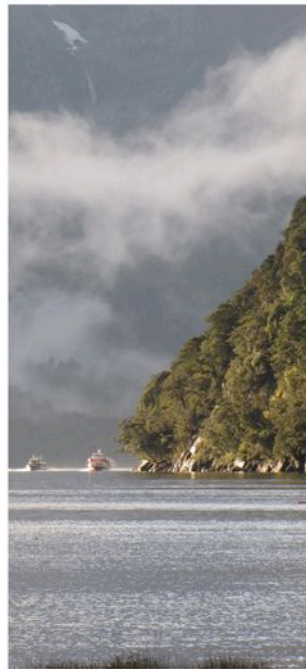


Figure 3.16. Bridget Point
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4. Bowen Falls

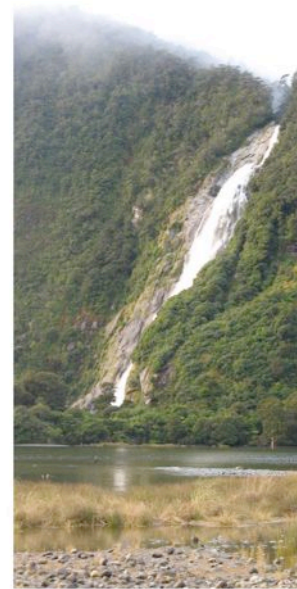


Figure 3.17. Bowen falls
Created by author

5. Arthur Valley



Figure 3.18. Arthur Valley
Created by author

An opportunity is missed.

Opportunities missed

An immersion experience with the surrounding natural environment.

The current layout defines a barrier between the built environment and the natural environment at the site. This layout encourages people to move between vehicles quickly and does not encourage people to go off the beaten track and experience the site at their own time.

Diagram NAME (Fig) shows a pallet of natural environment from around the Milford Sound area. While, the same plant species and ecologies exist on the site, the current organisation of the built environment effectively fences them from the visitor. This lack of immersion is an opportunity missed.

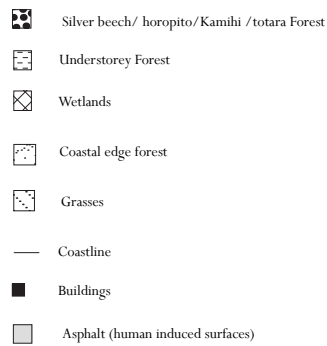
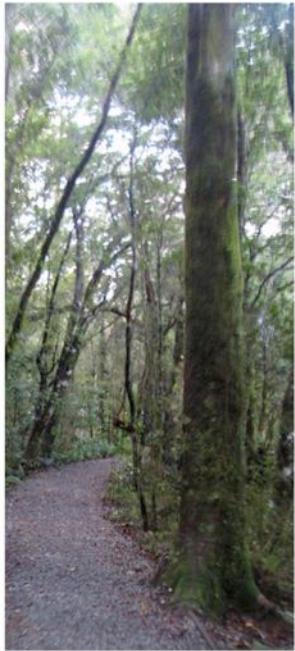


Figure 3.19. Site map diagram, showing the boundaries and features of the natural landscape and built landscape

Created by author

KEY EXPERIENCES IN THE NATURAL LANDSCAPE

Silver beech/ horopito/Kamihi /totara forest



*Figure 3.20. Silver beech/
hotopitin/totara forest*
Created by author

Understorey forest

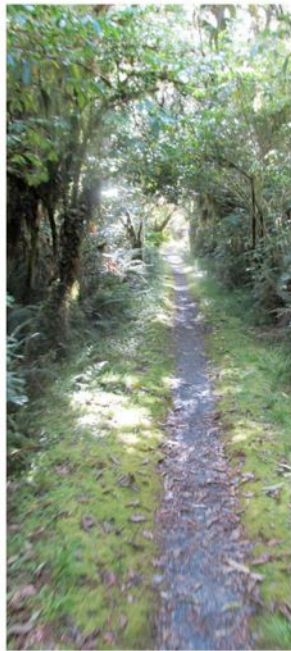


Figure 3.21. Understorey forest
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Grasses

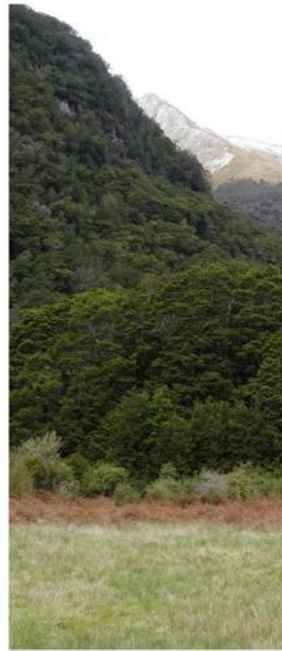


Figure 3.22. Grasses
Created by author

Wetlands



Figure 3.23. Wetlands
Created by author

Coastal edge forest

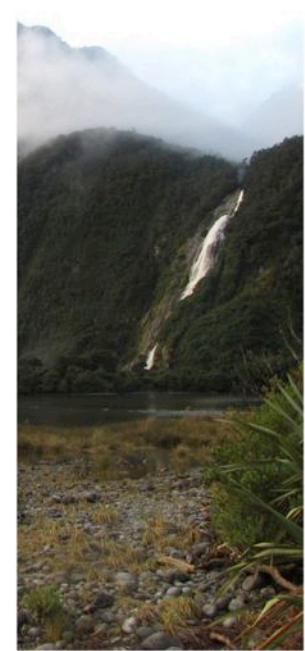


Figure 3.24. Coastal edge forest
Created by author

Impacts of unresponsive built environments

Significant implications arise from the unresponsive built fabric concerning the use and experience of the site. For example, crowding promotes a negative perception of the site. Some visitors have stated that the site feels more “like an international airport”, than a World Heritage destination (Riddell, 2004).

This unresponsive built environment has also led to sprawl and ad hoc development which threaten the natural ecosystems from thriving, with Carey (2003) suggesting; “Nowhere in the country do the pressures of tourism bite as deeply into the environmental concerns” . This highlights the friction between development and conservation at Milford Sound. With visitor numbers growing, limited space to develop, as well as restrictions for developing additional overnight accommodation, it is imperative that the built environment is more responsive to flux.

*Figure 3.25. Experiencing
Milford Sound by boat*
Created by author



3.4 PROPOSED SOLUTIONS

Developing buildings in pristine environments is a delicate issue, and development needs to be addressed in a sensitive way in order to sustain the values of natural landscapes.

Fast track to Milford Sound

Currently new transit connections to Milford Sound are being proposed to indirectly relieve congestion and crowding at Milford Sound. These schemes include implementing a monorail, tunnel or gondola as ways to spread the flow of visitors throughout the day. However, local authorities at Milford Sound have recognized that there will still be problems of congestion at the Milford end (Riddell, 2004).

This research argues that the unresponsive built fabric at Milford Sound is the source of the problem, not congestion or crowding, and investigates the potential to redevelop the existing site and visitor facilities in a way that is more responsive to visitor flux and the landscape.

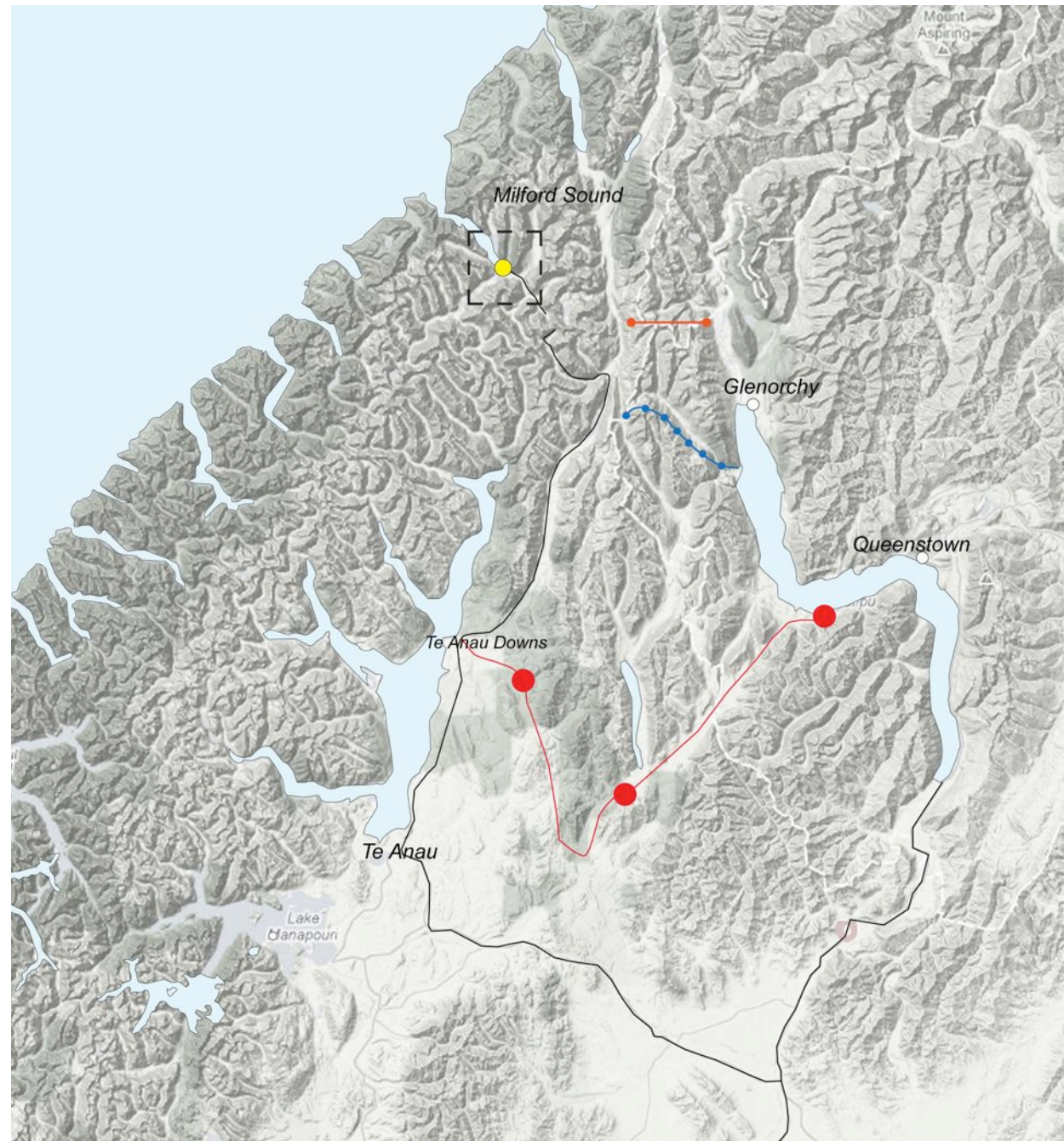
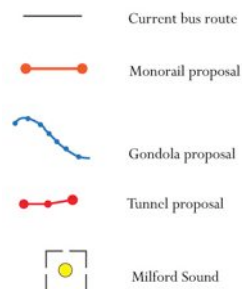


Figure .3.26. Possible solutions: map showing the Transit schemes

Created by author

Proposed solutions in this research:

Redeveloping the master plan
solution 1: Transit solution 2:

Problem:
Transit dominated layout



Current scheme
■ Natural fabric of the site
□ Built fabric of the site

Figure 3.27. Problem diagram: transit orientated layout
Created by author

Proposed solution:
pedestrian dominated layout



Proposed scheme
■ Proposed area for the natural fabric of the site
□ Proposed area for the built fabric of the site

Figure 3.28. Problem diagram: transit orientated layout
Created by author

Disperse visitor facilities across the site

This strategy to 'disperse' visitor functions is a direct response to alleviate visitor crowding on the site.

Problem:
'Concentrated'

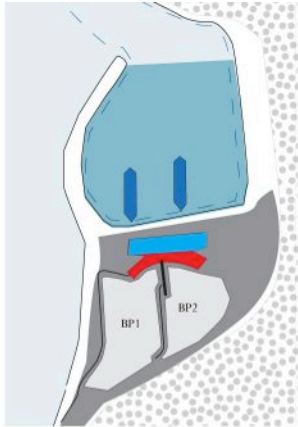


Figure .3.29. Problem diagram:
'concentrated'
Created by author

Proposed Solution:
'Disperse'

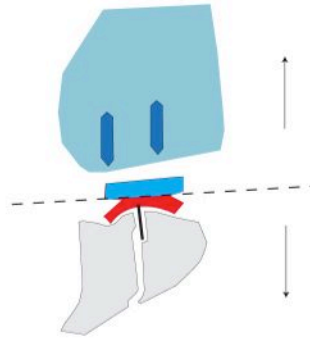


Figure .3.30. Proposed solution
diagram: Disperse
Created by author

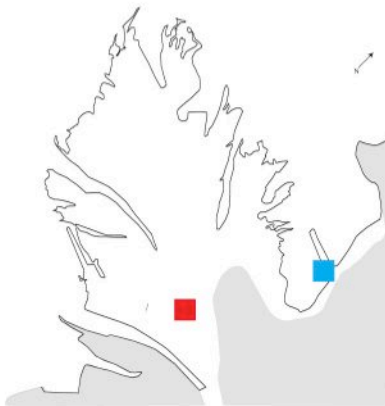


Figure .3.31. Proposed solution
diagram: Relocate
Created by author

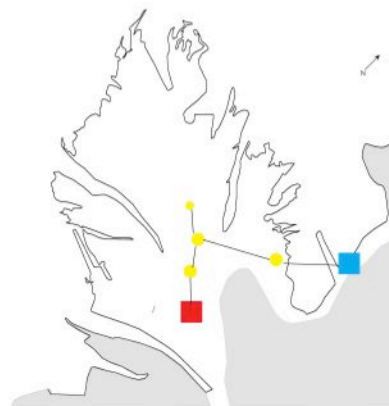


Figure .3.32. Proposed solution
diagram: Re-link
Created by author

Formal responses that engage with the landscape

Managing visitor flux and congestion at the source of the problem, this thesis proposes an approach to developing architectural form within national parks without detracting from precious natural landscapes. This research will focus on sensitive formal approaches to design buildings in pristine landscapes that also enhance visitor experience with the landscape.

Promote views of the landscape through architecture

Framing views



Figure 3.33. Proposed solution diagram: Frame views of the landscape through architecture
Created by author

Exploiting views

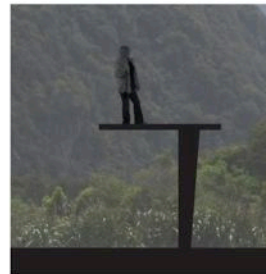


Figure 3.34. Proposed solution diagram: exploit views of the landscape through architecture
Created by author

Architectural forms that interacts with the landscape

Tilting elements



Figure 3.35. Proposed solution diagram: tilting architectural elements
Created by author

Buried elements

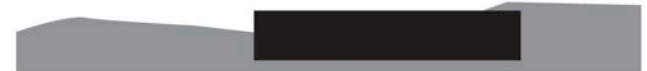


Figure 3.36. Proposed solution diagram: buried architectural elements
Created by author

Balancing elements



Figure 3.37. Proposed solution diagram: balancing architectural elements
Created by author

Floating elements



Figure 3.38. Proposed solution diagram: floating architectural elements
Created by author



CHAPTER FOUR

The Scheme

How can the design of network of visitor facilities accommodate visitor flux and enhance a visitor experience at Milford Sound?

Proposed development scheme for Milford Sound

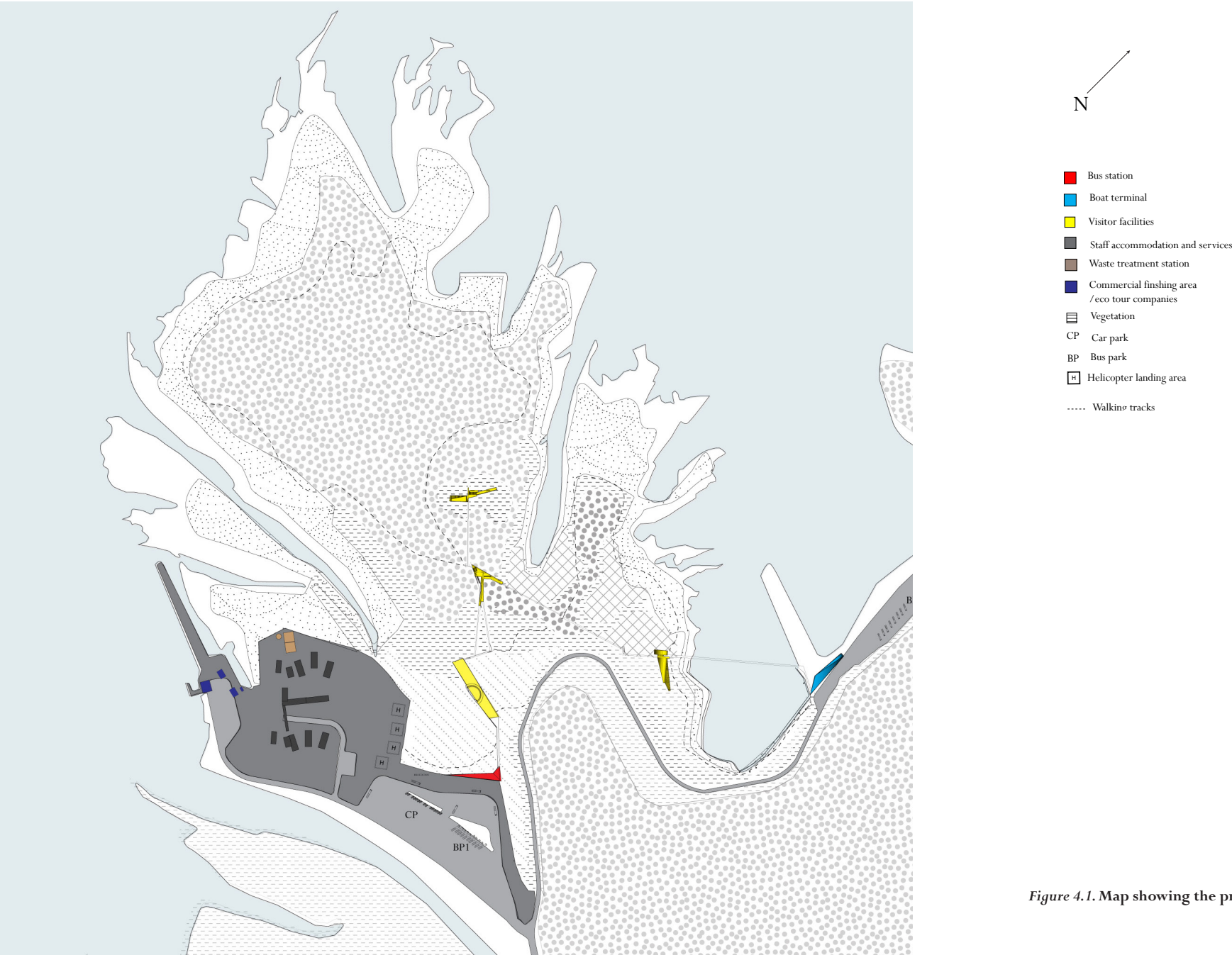


Figure 4.1. Map showing the proposed scheme
Created by author

4.1 MASTER PLAN

The current built fabric needs a total overhaul in order to be more responsive to daily and seasonal visitor fluctuations and enhance visitor experiences. A new master plan has been developed to respond to these issues and wider considerations of the site.

A new master plan has been developed to respond to these issues and to better organise the environment at the Milford Sound Village. By focusing on the wider aspects of the site (rather than designing a single building), the master plan is able to direct development, and allow for change.

The master plan sets out a range of strategies to reorganise the site to be more responsive to visitor fluctuations.

The master plan has identified five key aspects of the site;

- The network of visitor facilities
- Regeneration of nature
- Organisation of transport
- Staff accommodation and services hub
- Fishing and eco-tourism hub

This research will primarily focus on the development of the network of visitor facilities and will also discuss a landscape regeneration scheme. Providing a method to develop buildings in sensitive sites, the form and organisation of the visitor infrastructure sets up strategies to alleviate crowding, while providing strategies to enhance visitor experiences.

Network of visitor facilities



Figure 4.2. Map highlighting the network of visitor facilities scheme

Created by author

Key considerations

This intervention focuses on designing a pedestrian experience of the site. This has been explored through a 800 metre 'dispersed visitor network' which is a collection of visitor buildings connected by walkways.

Response to flux

Discussed in detail on page 42 in fig 4.7.

Regeneration of nature



Figure 4.3. Map highlighting the regeneration of nature scheme

Created by author

Key considerations

This scheme priorities the regeneration of nature on the site. By removing the airstrip and replacing it with native vegetation, this will allow a complete ecological regeneration across the Cleddau Claw. This will encourage an authentic and diverse natural ecosystem on site, enhancing the visitor experience.

Response to flux

The 'regeneration of nature proposal' is discussed in more detail on page 60.

A 'Shift space' strategy has been employed and will be discussed in more detail on page 62 in Fig 4.30 and fig 4.31.

The waterfront area provides the clearest and most spectacular views of Mite Peak. This area has been regenerated so that visitors can experience the views and the foreshore forest without being disrupted by vehicles.

Organisation of transport



Figure 4.4. Map highlighting the organisation of transport scheme

Created by author

Key considerations

The organisation of transit areas has been carefully considered, ensuring that vehicles do not detract from the visitor experience. Following the concept, 'out of site and out of mind,' places with vehicles have been designed to be hidden out of view.

Key moves

Relocation of the bus shelter to the southern end of the existing air strip. A secondary bus shelter facility at the boat terminal provides additional vehicle parking and a turnaround bay.

Response to flux

Employing primary and secondary parking areas, ensures vehicle congestion will be mitigated at peak times.

Staff accommodation and services hub



Figure 4.5. Map highlighting the staff accommodation and services hub

Created by author

Key considerations

Location of the staff and services area is in-between the Fishing/eco-tourism hub and the network of visitor facilities. The visitor accommodation is surrounded by vegetation so that it is hidden from view.

Fishing and eco-tourism hub



Figure 4.6. Map highlighting the fishing and eco-tourism hub

Created by author

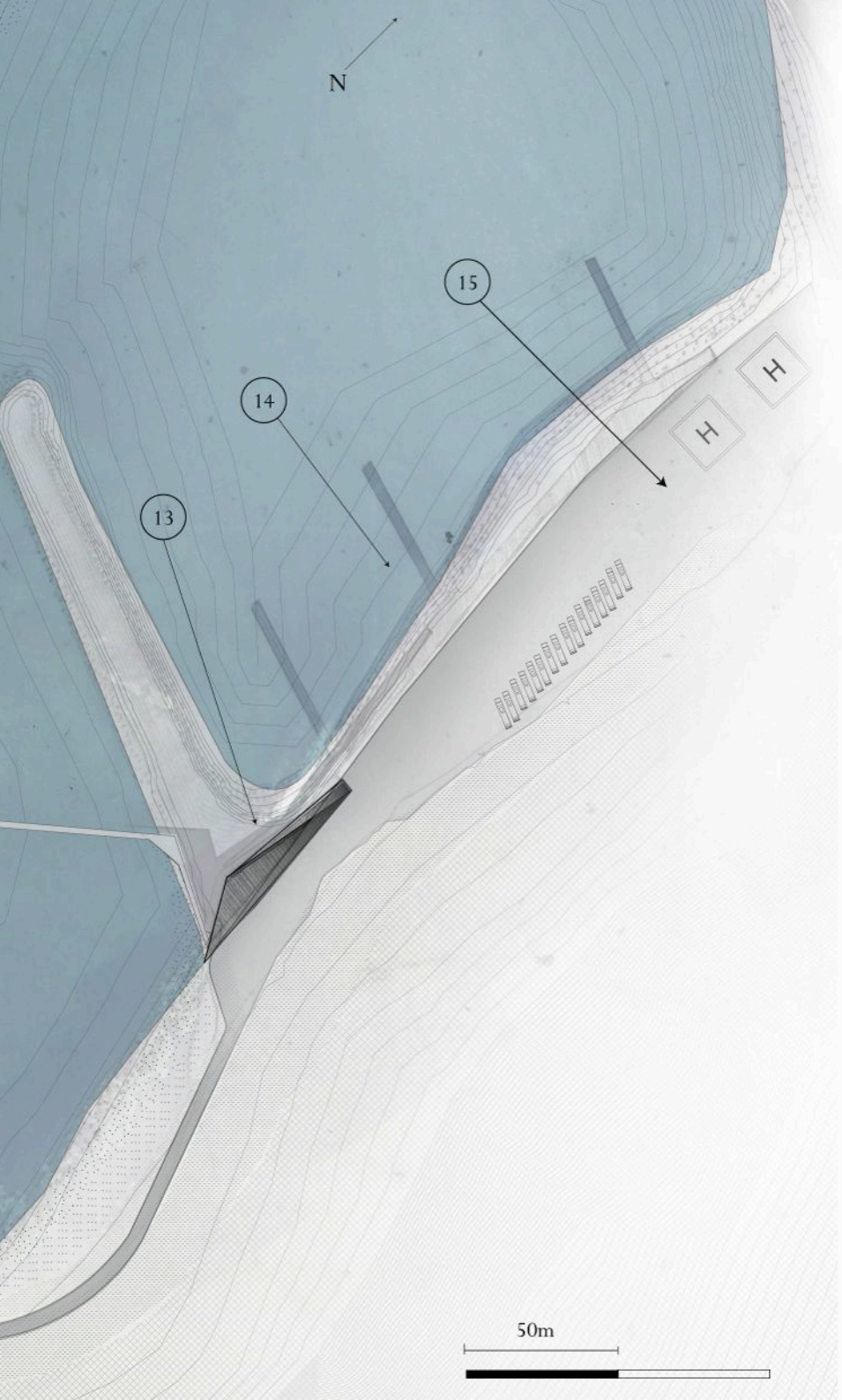
Key considerations

This area is private use, excluding a small eco-tourism company. The master plan recognises that this area is not visited by many people, therefore this area will remain largely unchanged.



Figure 4.7. Site Plan showing the network of visitor facilities scheme

Created by author



- 1 Bus shelter: The bus station is designed to be the primary drop-off and pick up zone for visitors. The larger building is the main entry point to the pedestrian walkway. At peak times, there are additional entry points to the education building
- 2 Walkway: Open field, grass and shrub landscape.
- 3 Education building: This is the main shelter which provides educational activities, café, ticket booths and various viewing platforms. It is also a DOC information centre that provides information and staff areas.
- 4 Walkway: going from the understory forest to the canopy forest.
- 5 Raised walk way: going from the understory forest to the canopy forest.
- 6 Viewing platform: This is the tallest built structure at the site at 19 meters. The higher level provides a viewing platform and the lower level hosts a small information centre and wildlife feeding station.
- 7 Walkway to accommodation: through a canopy forest.
- 8 Accommodation: This is the fourth hut in the Milford tramp. At Peak times this accommodation is primarily for Milford track walkers. At low times, this accommodation facility will be available for the wider public.
- 9 Wetland walkway: path goes through a range of natural ecosystems from the tall canopy forest to the wetlands; enhancing the visitor experience by providing a cross section of the natural landscape.
- 10 Viewing platform
- 11 Recreation Hub: This building accommodates a kayak hire operation, education facilities and cafe. .
- 12 Tidal mudflat walkway: Walkway over the water. This intervention presents a way to experience the mudflat tidal ecosystems. It is designed to be a temporary walkway. The main walkway to the boat terminal is around the coast line walking through the foreshore forest
- 13 Boat terminal: This building is designed to be a boat terminal and also a secondary bus shelter (for those that don't do the walk form the primary bus station). This building facilities movement of people; either from the walkway to the boat, or from the seconder bus shelter to the boat.
- 14 Boat terminal: This building is designed to be a boat terminal and also a secondary bus shelter (for those that don't walk form the primary bus station). This building facilitates movement of people; either from the walkway or second bus shelter to the boat.
- 15 Additional vehicle parking and turnaround point. This space has been identified as the Emergency Response Centre.



Figure 4.8. Elevation 1.0 showing the network of visitor facilities scheme.

Created by author

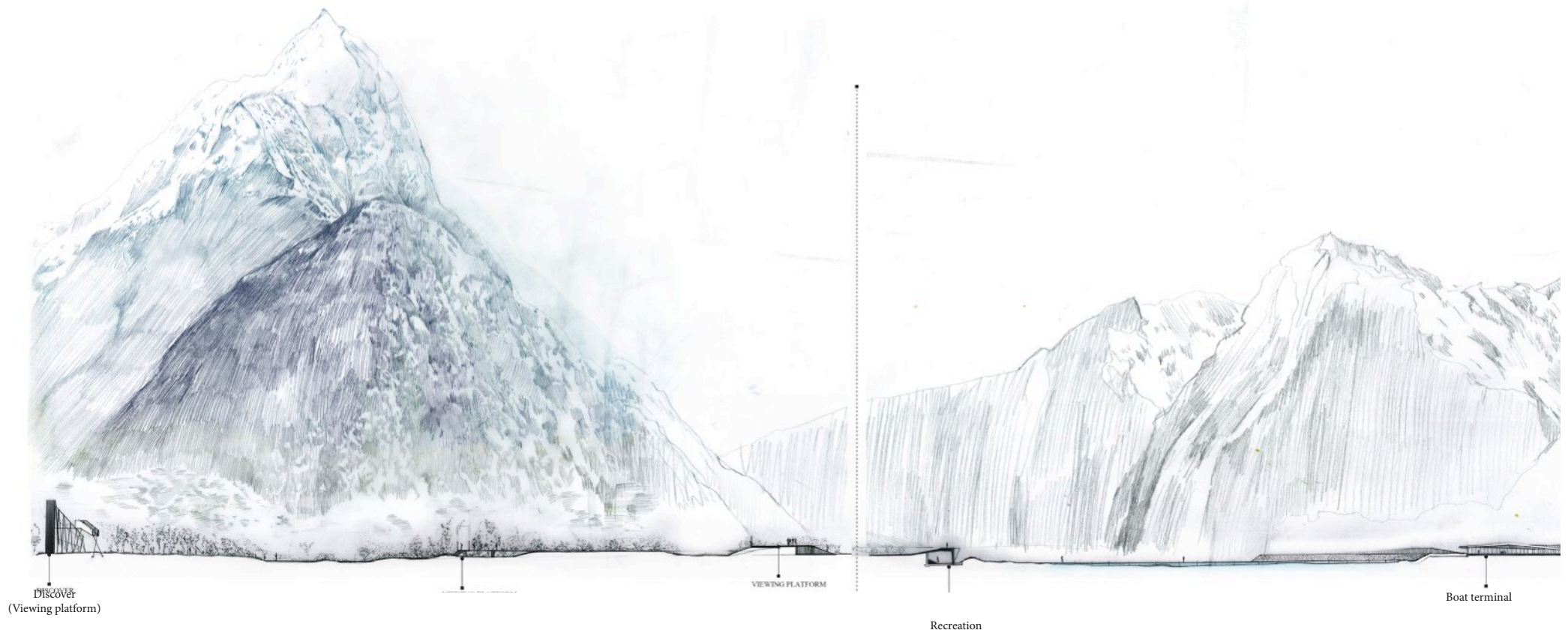


Figure 4.9. Elevation 2.0 showing the network of visitor facilities scheme
Created by author

Figure .5.0. Elevation 3.0 showing the network of visitor facilities scheme
Created by author

Disperse

The network of visitor facilities is a pedestrian infrastructure. It proposes a new connection that links the proposed bus shelter to the proposed boat terminal. Composed of a network of nodes (visitor buildings) and paths (walkways), the network of visitor facilities is a primary response to reduce visitor crowding.

Formal response to crowding

“Collect and Disperse”

A network of buildings and walkways are designed to alleviate the perception of crowding at Milford Sound. The dispersed layout of buildings creates nodes of density in the landscape. This form also provides a mechanism to facilitate visitor movement along the site. The visitor buildings act as ‘collection’ points, encouraging visitors to gather, pause and rest. The paths are designed to act as ‘dispersal’ points; narrow paths to promote visitor movement across the site. By directing and controlling the flow of visitors through the site visitor crowding will be mitigated.

A series of distributed buildings throughout the landscape is more suitable for managing visitor flux than designing a single building. As is the case with the existing terminal, a single building would amplify the effects of crowding, whereas a network would minimise crowding by dispersing people to various locations in the site.

‘Collect’ and ‘Disperse’

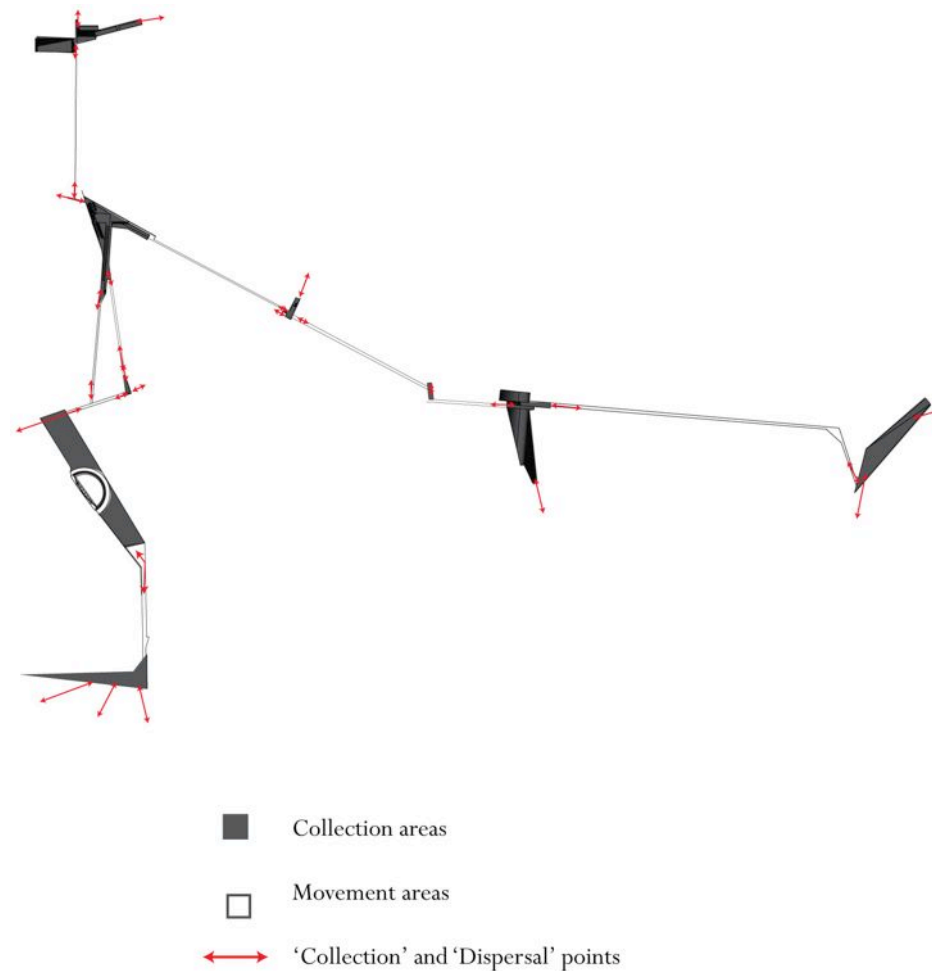


Figure 4.11. Diagram showing the ‘collect’ and ‘disperse’ strategy
Created by author

Plan of single building



Figure 4.12. Diagram of a single building in the landscape

Created by author

Figure 4.14. Diagram showing the proposed visitor movements within a single building.

Created by author

Plan of network of buildings and walkways

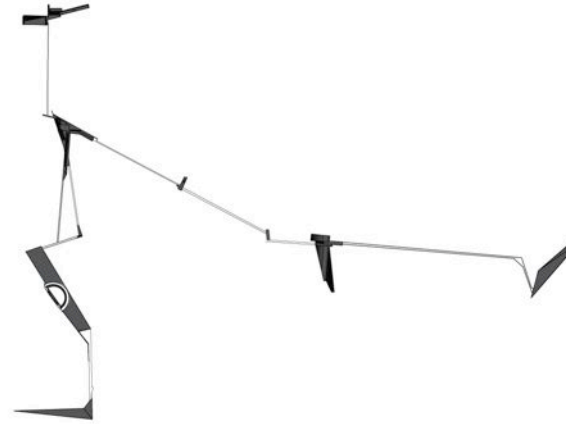


Figure 4.13. Diagram of a network of visitor facilities

Created by author

Figure 4.15. Diagram showing the proposed visitor movements within the network of visitor facilities

Created by author

Programmatic response to crowding

“Programmatic Insertion”

In response to the limited space to develop buildings at Milford Sound, programmatic infiltration provides a strategy to organise the activities on site and anticipate changes between low and peak periods. A selection of site-specific programmes has been assigned to specific nodes (buildings), including a bus station, educational facilities, viewing platforms, accommodation, recreation, and boat terminal. This strategy is designed to support mid-season visitor populations. At peak times, additional ticket booths, educational activities and additional walkways will be activated. At low times, programmatic insertion will activate DOC support programmes, accommodation, and educational programmes. Architectural form, developed in consideration to the programs and locations outlined in this strategy, provides a means to enhance the visitor experience with the landscape.

By establishing areas for encounters and activities and movement, this directs the visitor activities and flows to ensure that there won't be too many people at one spot at the same time. The development is designed for pedestrians. It encourages visitors to experience the site at their own leisure and not dictated by timetables.

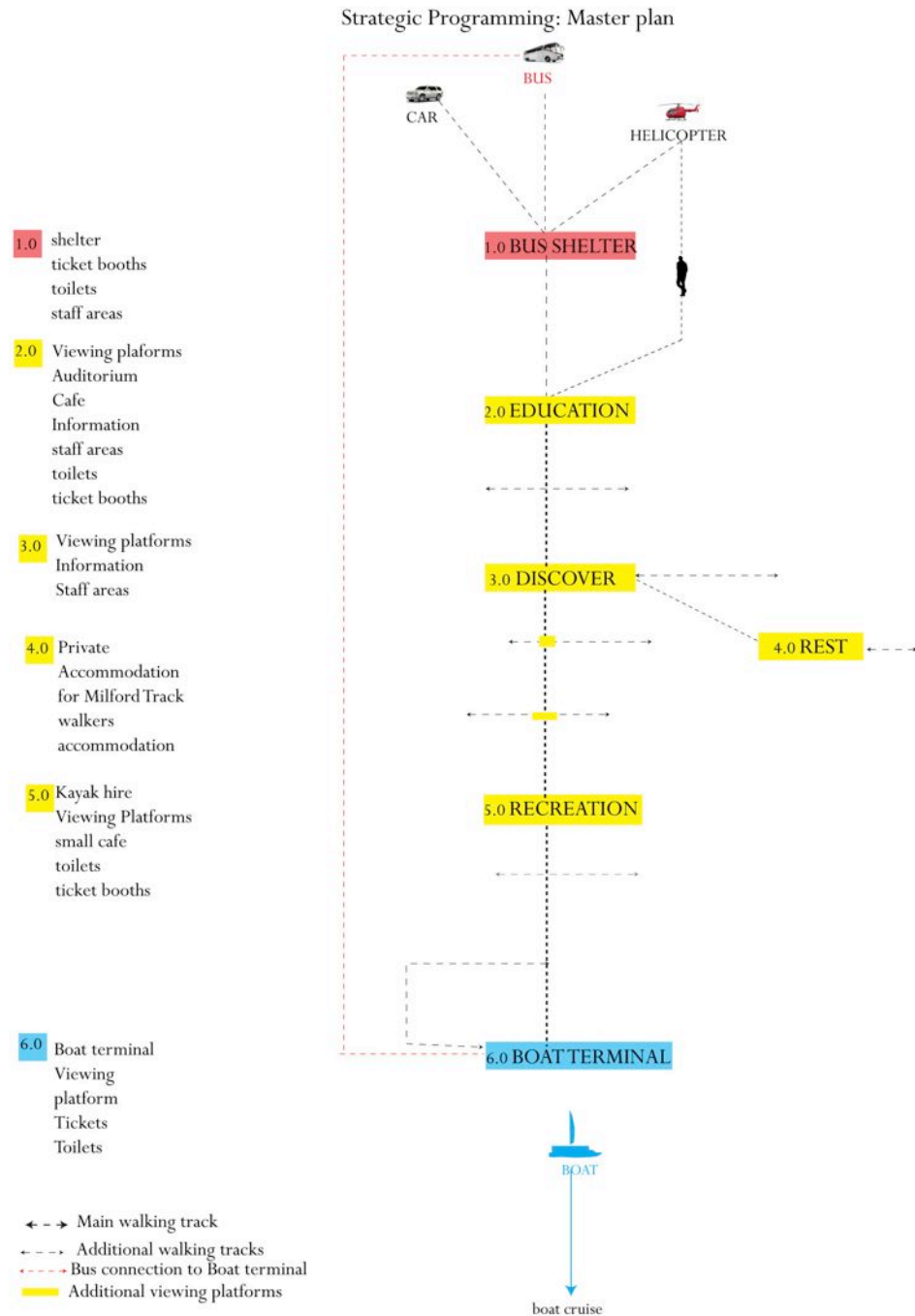


Figure 4.16. Diagram showing the strategic programming strategy

Created by author

Response to limited space to develop buildings in sensitive landscapes

This strategy is a development of fig.4.16. Architectural form will be developed in consideration to the locations and programmes set out in fig 4.16.

.In response to the limited space to develop buildings at Milford Sound, programmatic infiltration provides a strategy that encourages architectural form to function. By allocating spaces for encounters and activities it encourages architecture to operate at a range of scales, from territorial to human. This encourages the superstructure to be more capable to anticipate change and can more easily adjust to suit new conditions without losing modularity or form. This approach accommodates change without encouraging sprawl or ad hoc development.

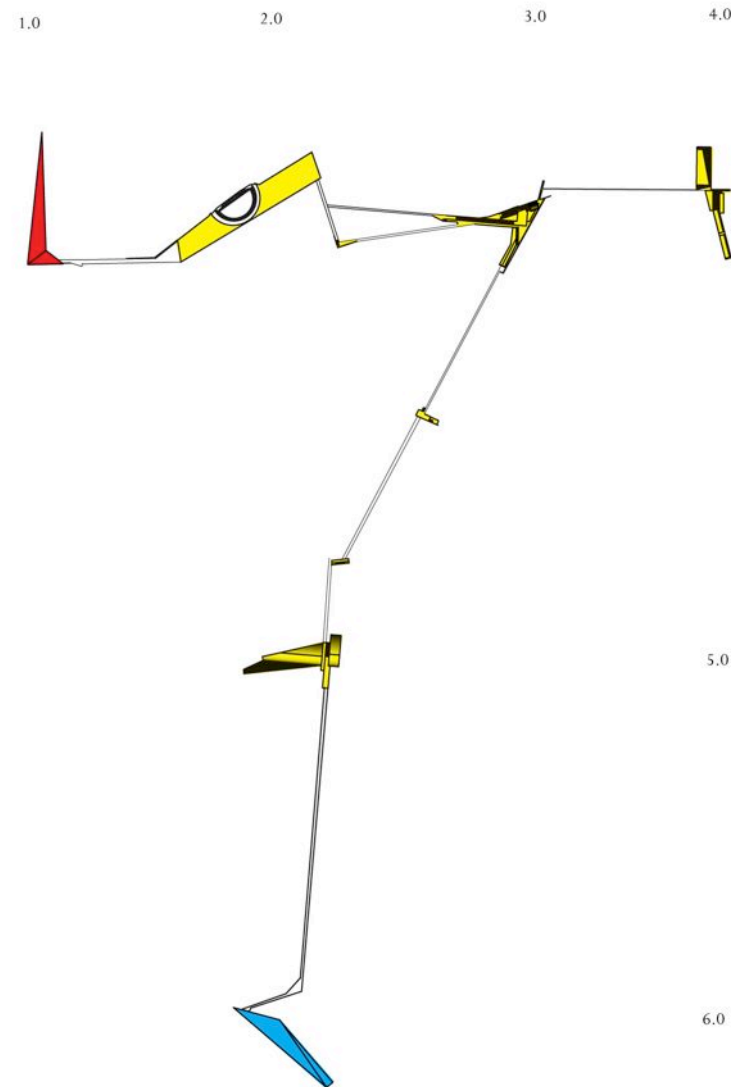


Figure 4.17. Diagram showing the allocation and application of the strategic programming strategy into built form
Created by author

Promotion of visitor experience

The organisation of the visitor infrastructure creates a journey in the landscape. Architecture is used as a tool to design the visitor experience of the landscape by framing views, facilitating movement below and above the surface within contracted and expanded spaces. Other spaces are dominated by nature, creating a range of visitor experiences throughout the landscape

PROMOTION OF A VISUAL STRATEGY:
Activities, encounters and view.

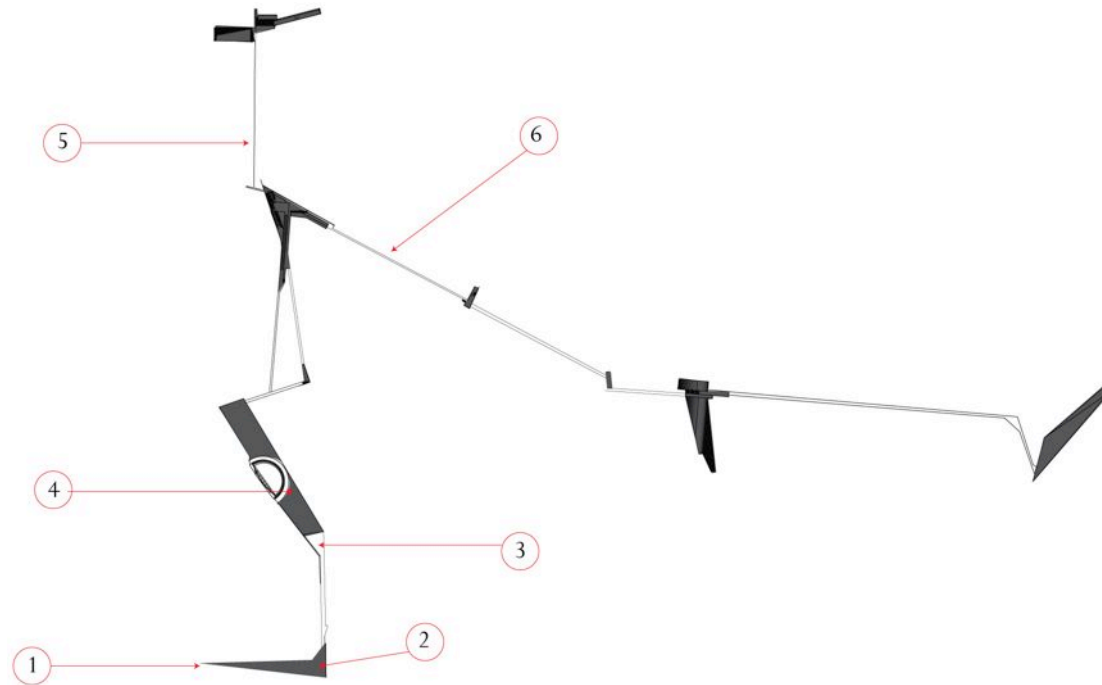


Figure 4.18. Reference diagram showing the location of a selection of activities, views and encounters
Created by author



Figure 4.19. Perspective: arrival at the bus shelter
Created by author

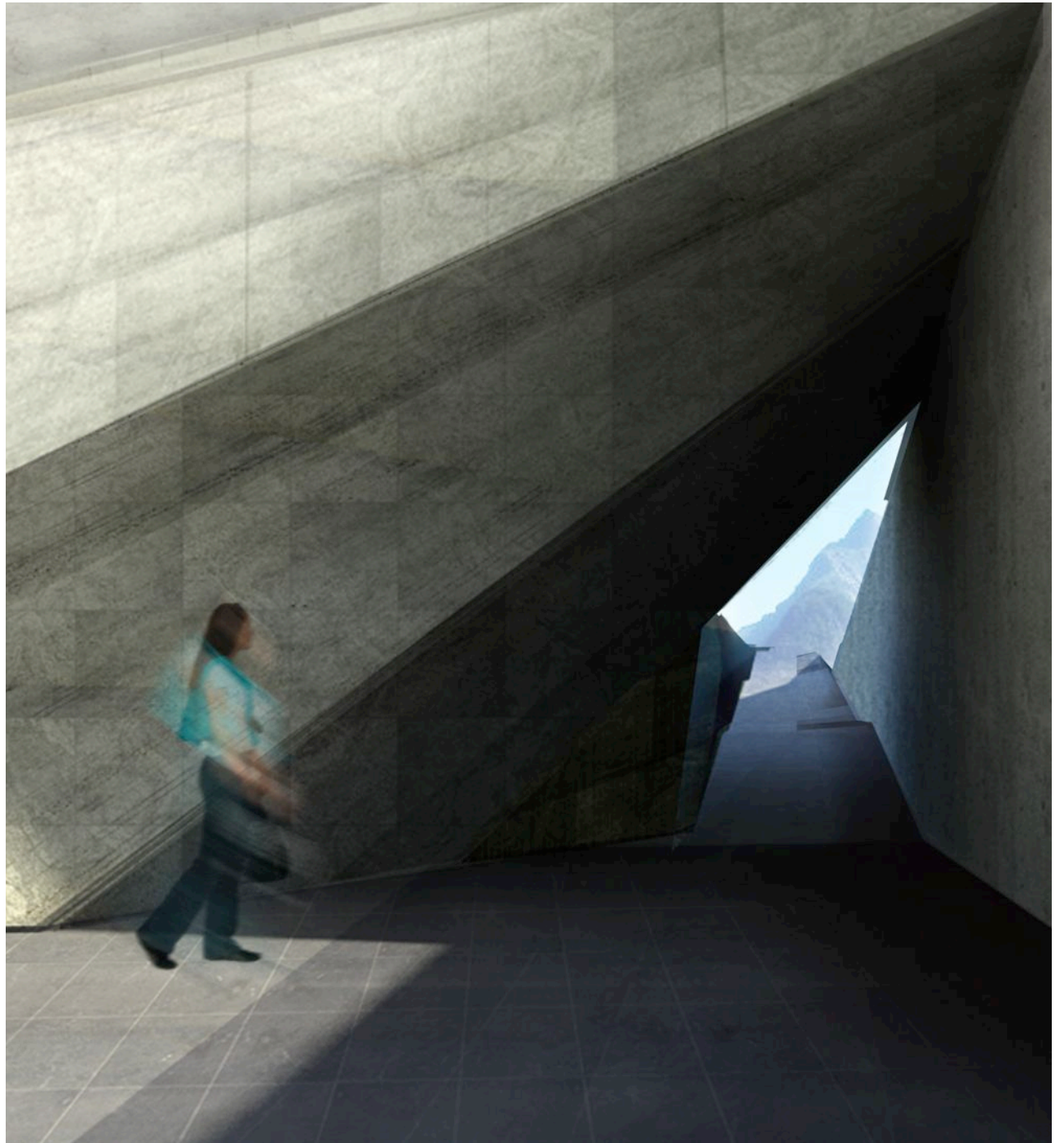


Figure 4.22. Perspective: looking at the education building
Created by author



Figure 4.23. Interior perspective: inside the education building
Created by author





Figure 4.24. Perspective: walking within the canopy forest
Photograph taken by author



Figure 4.25. Perspective: walking along the wetland walk
Photograph taken by author

Regeneration of nature proposal:

This strategy proposes that the natural landscape regenerates on its own accord. In this strategy the growth and development of fauna evolves over time. A selection of site-specific plant species have been identified throughout the site.

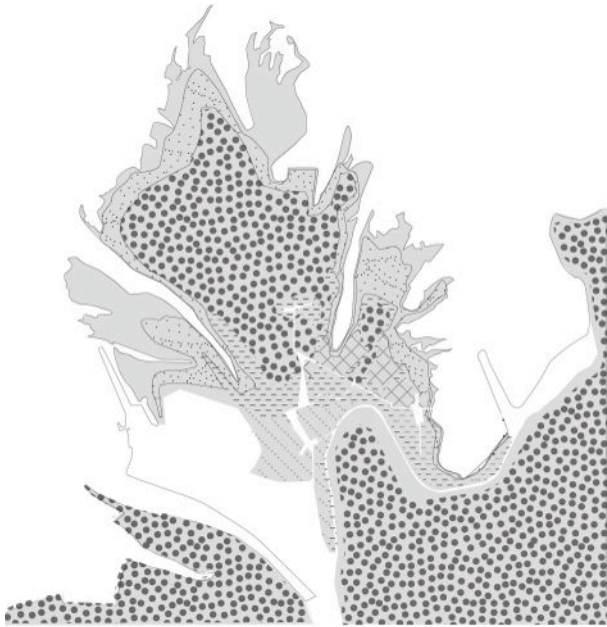


Figure 4.26. Diagram: regeneration of nature strategy phase peak visitor season
Created by author

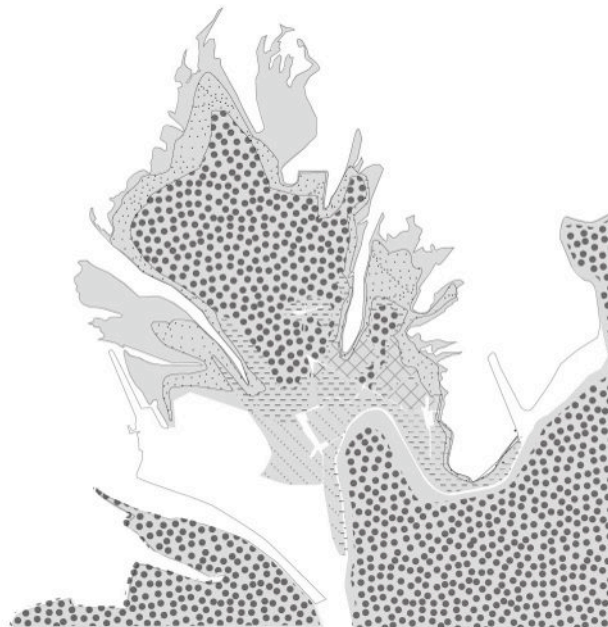


Figure 4.27. Diagram: regeneration of nature strategy phase low visitor season
Created by author

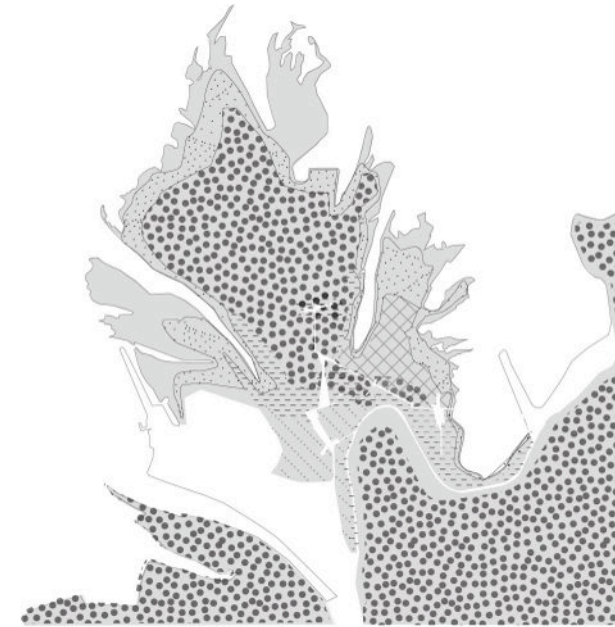


Figure 4.28. Diagram: regeneration of nature strategy, possible natural ecology layout in the future
Created by author

Silver beech/ horopito/Kamihī /totara Forest



Understorey Forest



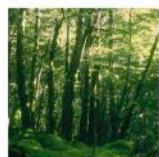
Wetlands



Grasses/flax



Coastal edge forest



Silver beech
Nothofagus menziesii
canopy tree



Silver beech
Nothofagus menziesii
canopy tree



kahikatea
Dacrydium cupressinum
tall podocarp

Shrubs



shrubby wineberry
Aristotelia fruticosa
shrub



broadleaf
Griselinia littoralis
tall shrub



Native broom
Carmichaelia
shrub



koromiko
Hebe salicifolia
tall shrub



Mahoe
Melicetyus ramiflorous
small tree



Kamahi
Weinmannia racemosa
canopy tree



Stinkwood
Coprosma foetidissima
shrub



Mingimingi
Coprosma propinqua
shrub

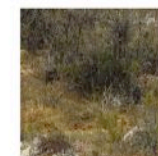
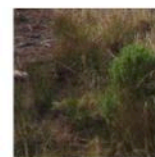


Figure 4.29. Department of Conservation (2013). Native Plants

[Diagrams: Showing a pallet of site specific plant species at the site]
Created by author

Shift space: cross programming areas of the site.

In response to the seasonal visitor fluctuations, the ‘shift space’ strategy cross programmes visitor functions with landscape functions to allow for changes between peak and low seasons. ‘Shift space’ is designated to areas of built form and landscape that can adapt and allow for change. For example at peak times, the landscape area will be sacrificial space, as it will be used as an extra path. At low times, when the path is not needed, the landscape will be left to regenerate. This concept was developed further through materiality and form.

‘Shift space’ also provides spaces within and outside buildings to adapt and change in light of changes in visitor populations. This strategy is specific to this project and could have possible applications for other interventions in pristine landscapes.









-  Silver beech/ horopito/ Kamihi / totara Forest
-  Understorey Forest
-  Wetlands
-  Coastal edge forest
-  Grasses
-  Coastline
-  Buildings
-  Asphalt (human induced surfaces)



Figure 4.30. Diagram: ‘shift space ‘at peak visitor season.
Created by author



Summary of Part One

The network structure provides a framework to anticipate changes. This addresses the impacts and implications of visitor flux on the landscape. By allocating zones for development, vegetation areas, and rehabilitation areas of sensitive landscape, growth can be directed (between low and peak times) and change can be anticipated. This provides an approach to use the site more effectively and in way that preserves the natural values of the landscape. All four strategies have wider applications to respond to various aspects of the site.

Figure 4.31. Diagram: 'shift space 'strategy at low visitor season
Created by author

4.2 EDUCATION BUILDING

A detailed design for the education building as a means to generate site specific architecture that engages with the landscape. The design explores architectural forms that interact with the landscape and formally respond to flux.

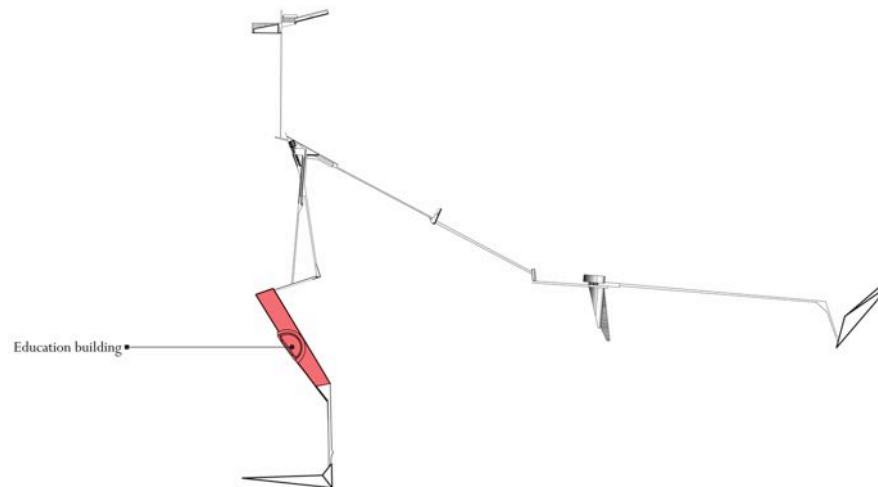


Figure 4.32. Reference diagram: showing the location of the education building

Created by author

Architecture that engages with the landscape

Form

The built form is designed to interact with the landscape; the large concrete surfaces and elements have been tilted, cantilevered, uplifted, buried and folded into the landscape in a way that challenges the heavy forms to appear light. This is notable in the roof form of the education building as the long rectangular roof dips down in the centre to form a semi-circular structure. This creates an impression that the roof plane is balancing in the landscape. Delicate forms are also expressed through the design of slender profiles, long spans and hovering planes. The design exploits the structural capabilities of concrete to appear light. This is achieved through post-tension reinforced concrete systems that are able to work in tension as well as compression. This enables the structure to span longer distances to allow for large, uninterrupted interior spaces. This creates large-scale elements and spaces that inform a sense of 'grandness' and 'emptiness' that are associated with the experience of the surrounding alpine landscape.

Materiality

Concrete has been predominantly used to exploit the 'delicacy' of building in pristine landscapes. Typically associated with weight, the use of concrete, aligned with the visual 'weight' of the landscape, is paradoxically employed to appear 'light' and 'delicate.' The design also reuses and integrates local materials to enable a closer connection with place. This is suggested through re-using the concrete/asphalt from the air-strip in the construction of the buildings and walkways. By re-using existing materials this presents a sustainable and cost effective material option, as there will be less reliance on sourcing materials from outside the area. Local stone and rock have also been incorporated, as seen in the walls of the education building. Finishing techniques of the concrete and the stone have been considered through exposing the raw stone, exposing pre-cast concrete surfaces and polishing surfaces to give the impression that the ground has been cleanly cut.

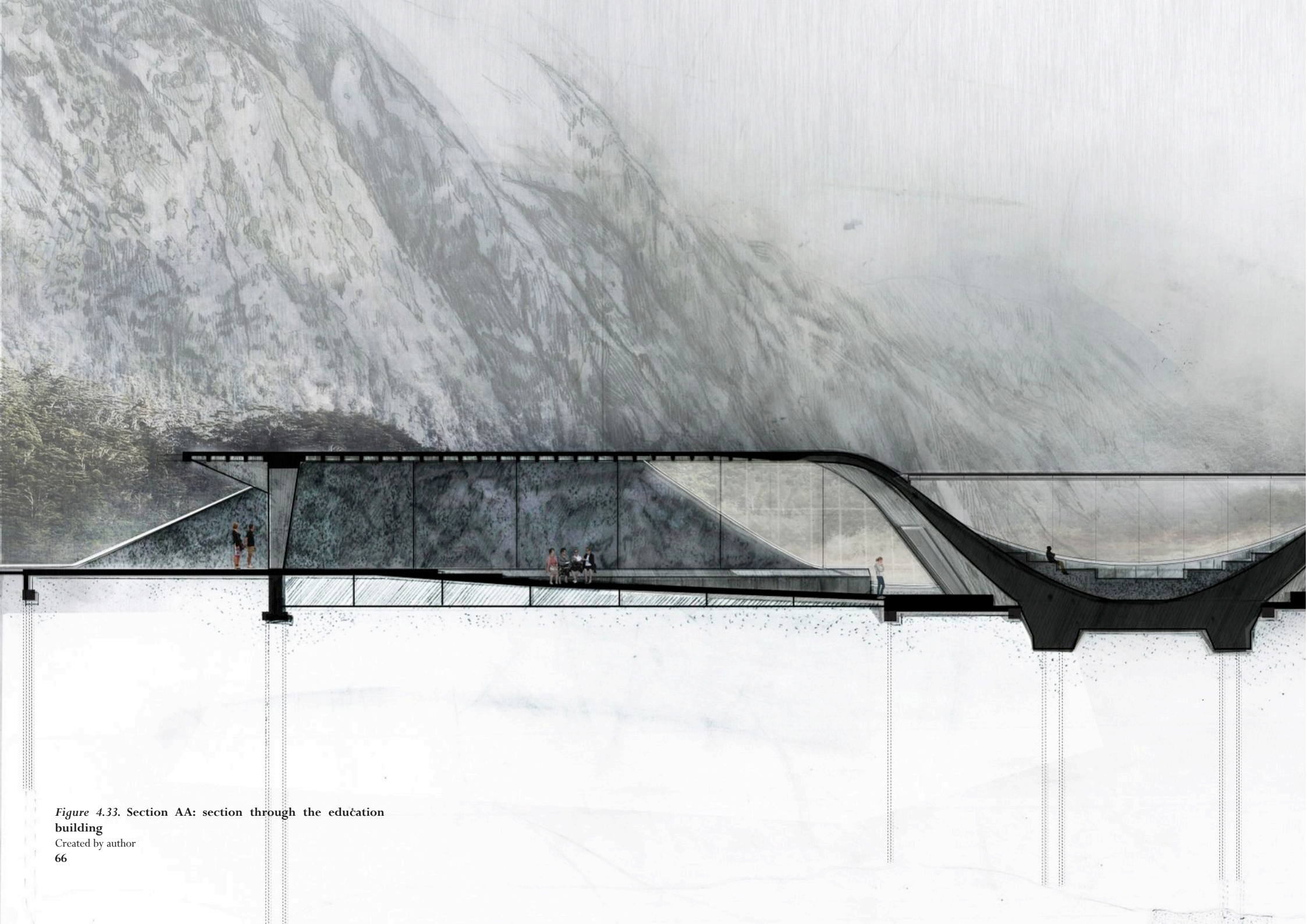
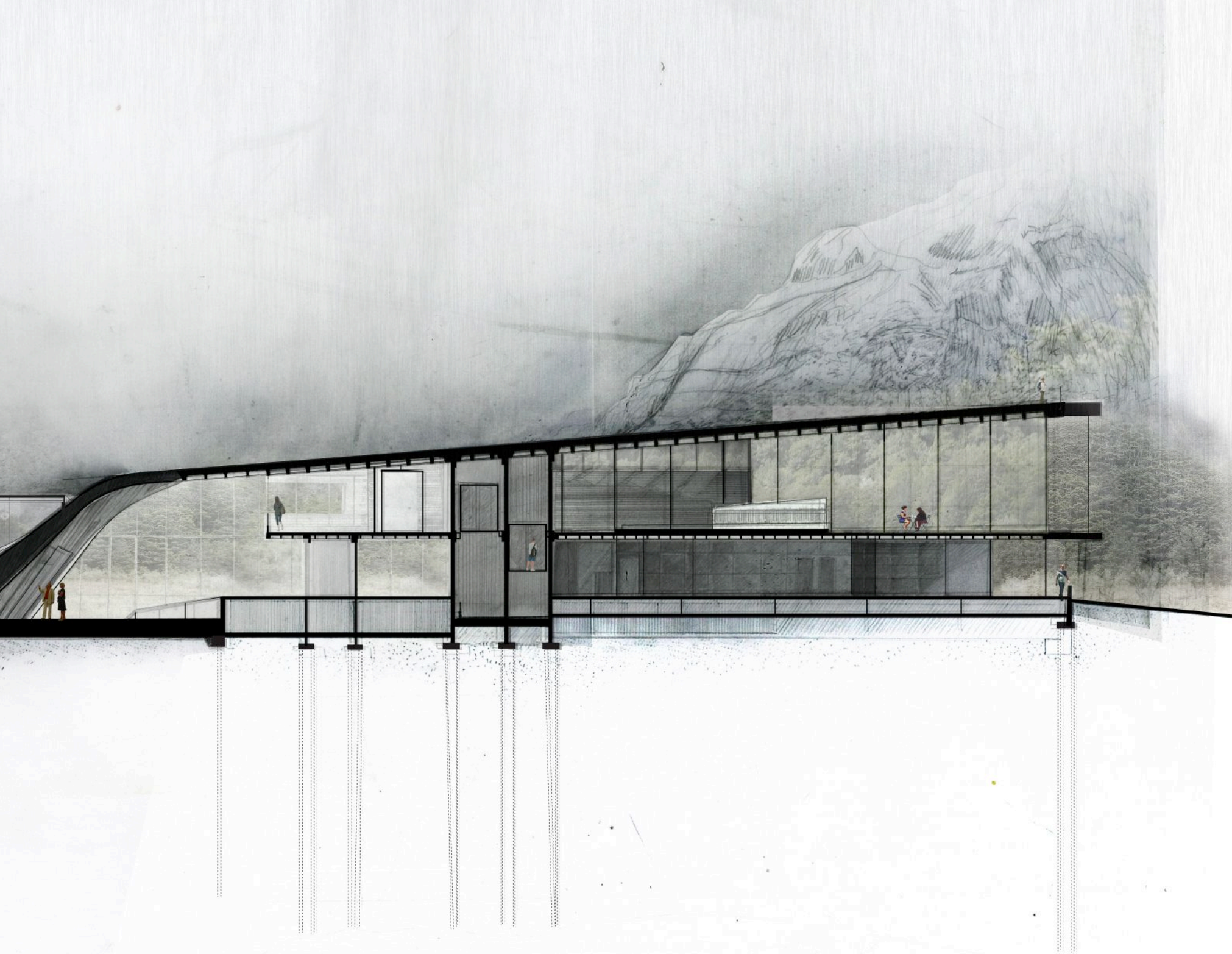


Figure 4.33. Section AA: section through the education building

Created by author



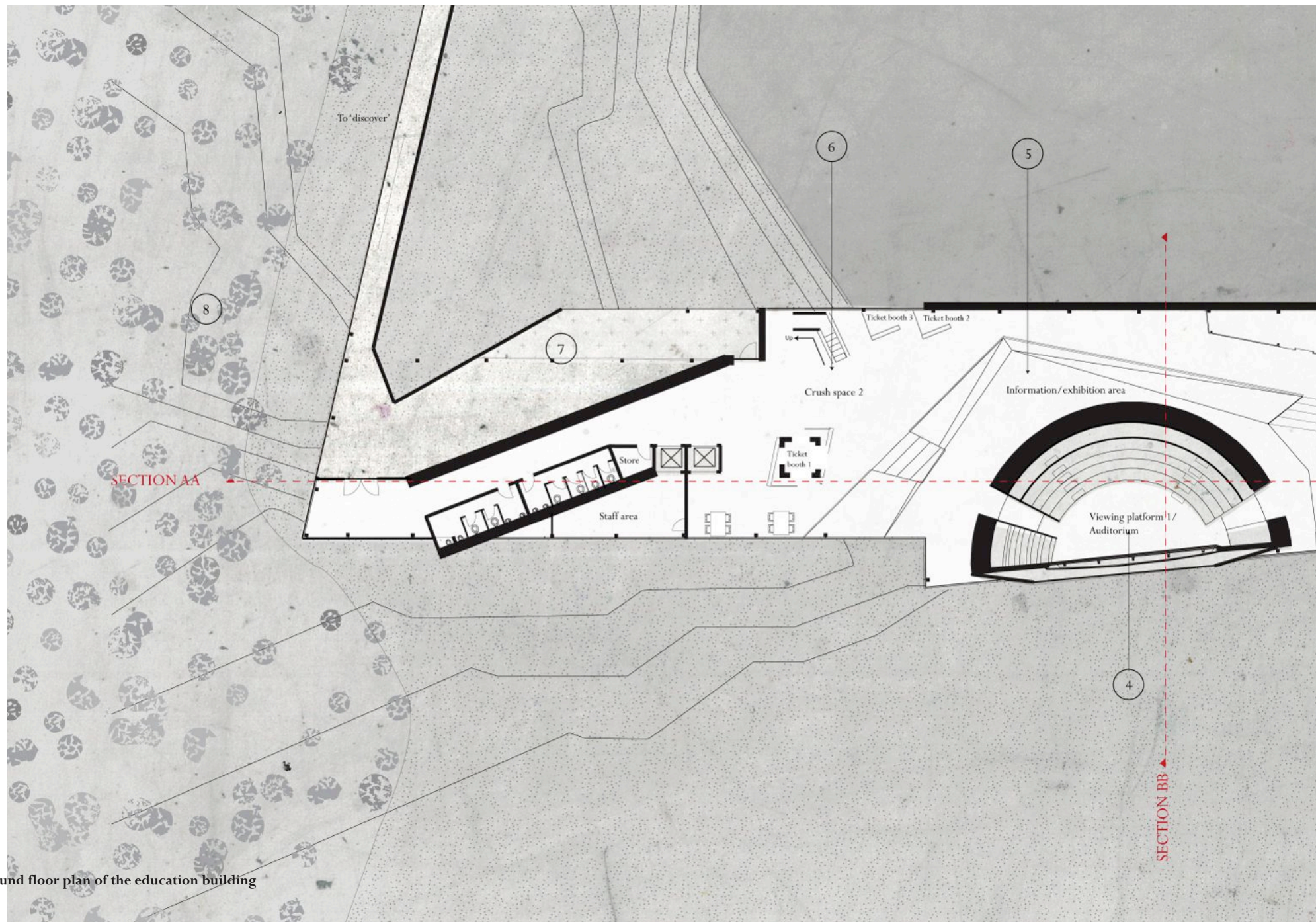
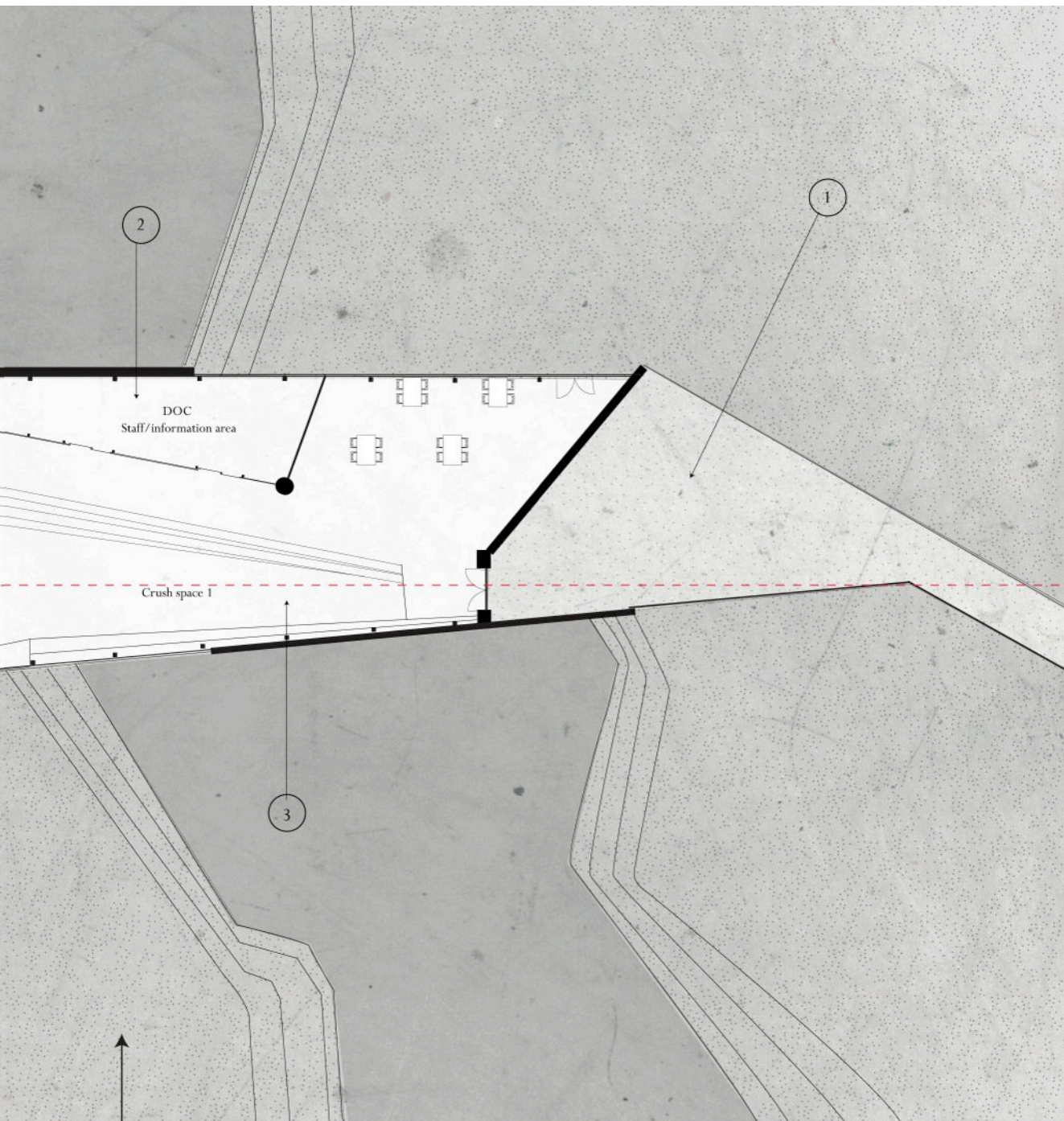


Figure 4.34. Ground floor plan of the education building

Created by author



1

Outdoor 'collection', 'filter' and 'disperse' space.

2

Crush Space one. This area designed as a 'catchment ' space ' that can accommodate a range of functions. The open spaces, ramped surfaces, and stairs provide a 'network of opportunities sand suggest ways that the space

3

This space is designed to be permeable and adjustable. It is composed of glass panels and sliding doors. The staff members can open it up, wand closer it off when required.

4

Amphitheatre: This space is a viewing platform and an auditorium space.

5

Information and exhibition area.

6

Crush space two: At peak times, this area will be utilised as an addition information and ticket booth area. This take the pressure of the information and ticket booth area at the boat terminal.

7

Indoor/out door shift space. This 'shift' space encourages an interaction between the natural landscape and the architecture during the high and low visitor seasons. At peak times, this area is used for an additional shelter and activity space for visitors. At low times, this area will be left to develop, nature will regenerate at its own time.

8

Understory/canopy forest

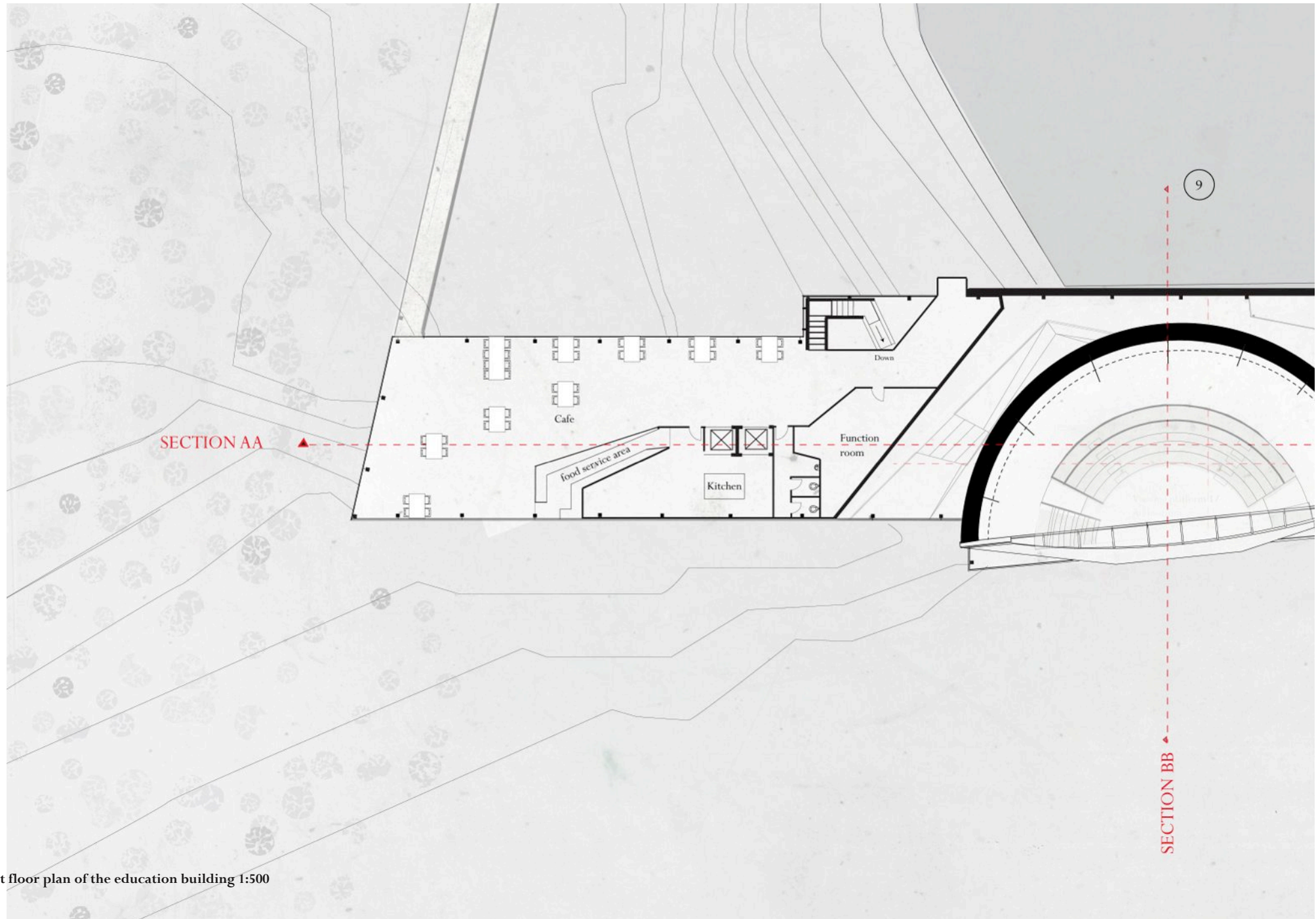
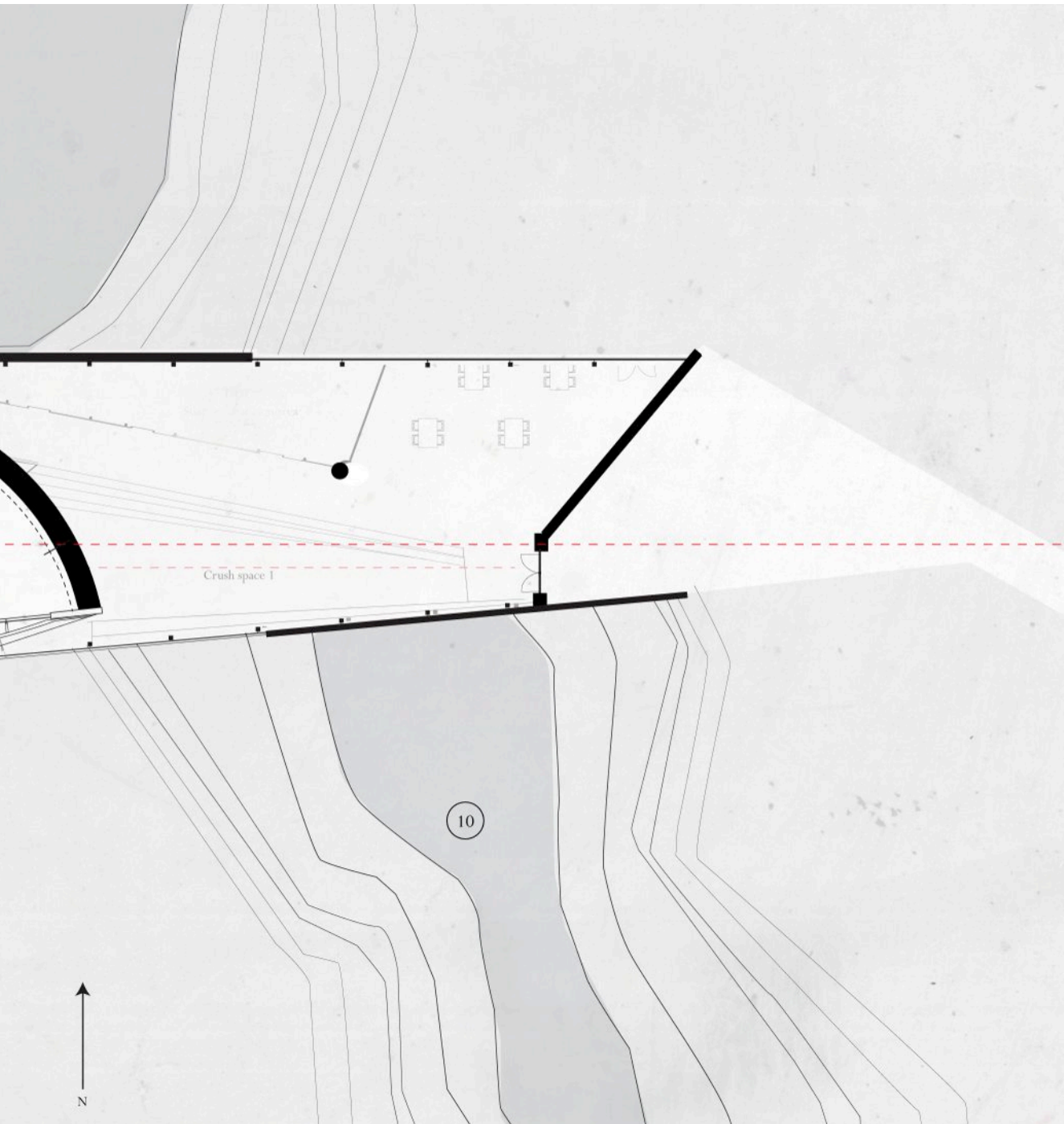


Figure 4.35. First floor plan of the education building 1:500
Created by author
70



9

In order to gain access to the roof viewing platform, visitors must go outside and follow a path over the hill to get to the viewing platform.

10

Area where the roof surface seamlessly meets the surface of the natural landscape. This promotes connectivity.



View A

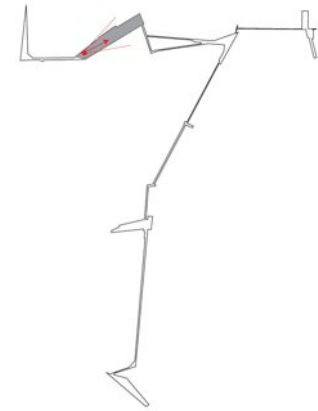


Figure4.36. Interior perspective. View A.

Created by author

View B

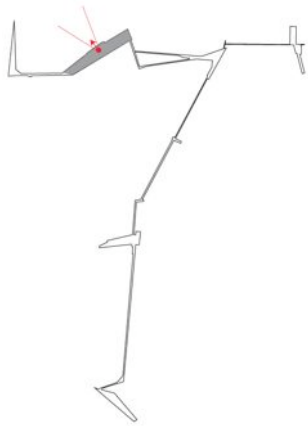
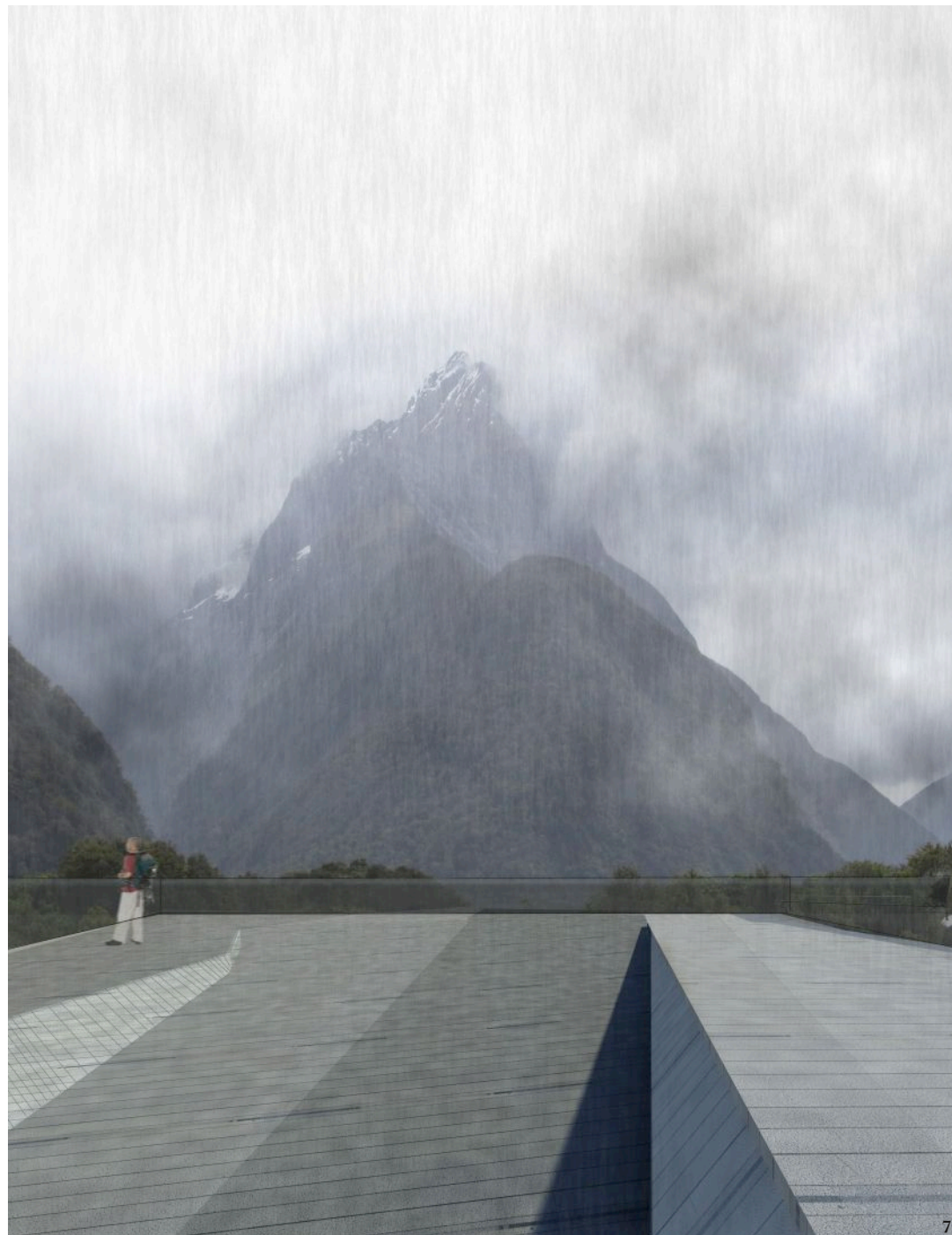
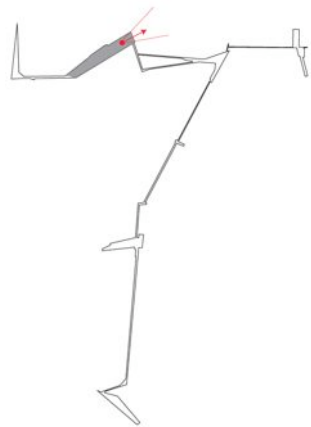


Figure 4.37 Interior perspective: View B.
Created by author

Figure 4.48. Exterior perspective: View C.

Created by author

View C



Responsive Architectural Forms

Articulated ground

Through a process of refilling, architecture and ground are constructed symbiotically with consideration of soft and hard edges. This can be understood through the sectional relationships within the education building. The landscape has been reconstructed as an undulating natural plane and the education building forms a long rectangular form within it. In areas where the architecture meets the ground surface, a formal continuity is established allowing programmatic flexibility and change upon the constructed surface. In other areas there is a distinct separation between the smooth, untouched ground surface and geometric form of the building. This distinguishes a hard edge that defines building and landscape. This dialogue between architecture and landscape encourages visitors to experience the landscape, not only on the surface but also below and above. This enhances the visitor's understanding of the landscape, drawing attention to the mountains (Mitre Peak) and the native vegetation (Mount Cook Lilies) at their feet.

Starting on the current flat airstrip, the design of architecture forms a narrow rectangular form in the landscape. Through a process of refilling, the landscape is reconstructed into undulating hills that surround the building. Refer to Appendix B.

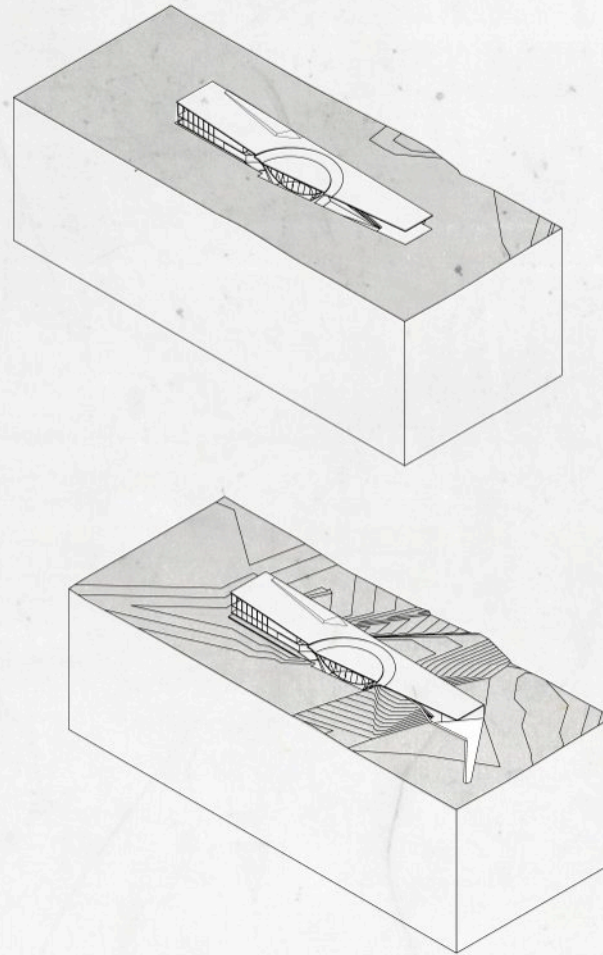


Figure 4.42. Diagram: showing the refilling process.

Created by author



Figure 4.43 Section BB 1:200

Created by author

Surface forms:

Through a process of surface articulation, the building form can be responsive. The slightly folded surfaces create ramps to encourage pedestrian flows. Dramatically tilted surfaces inform enclosures and encourage areas to stop, rest, and sit on. The design of continuous surfaces between architecture and landscape increase programmatic flexibility as the spaces can be used for a range of visitor and landscape functions.

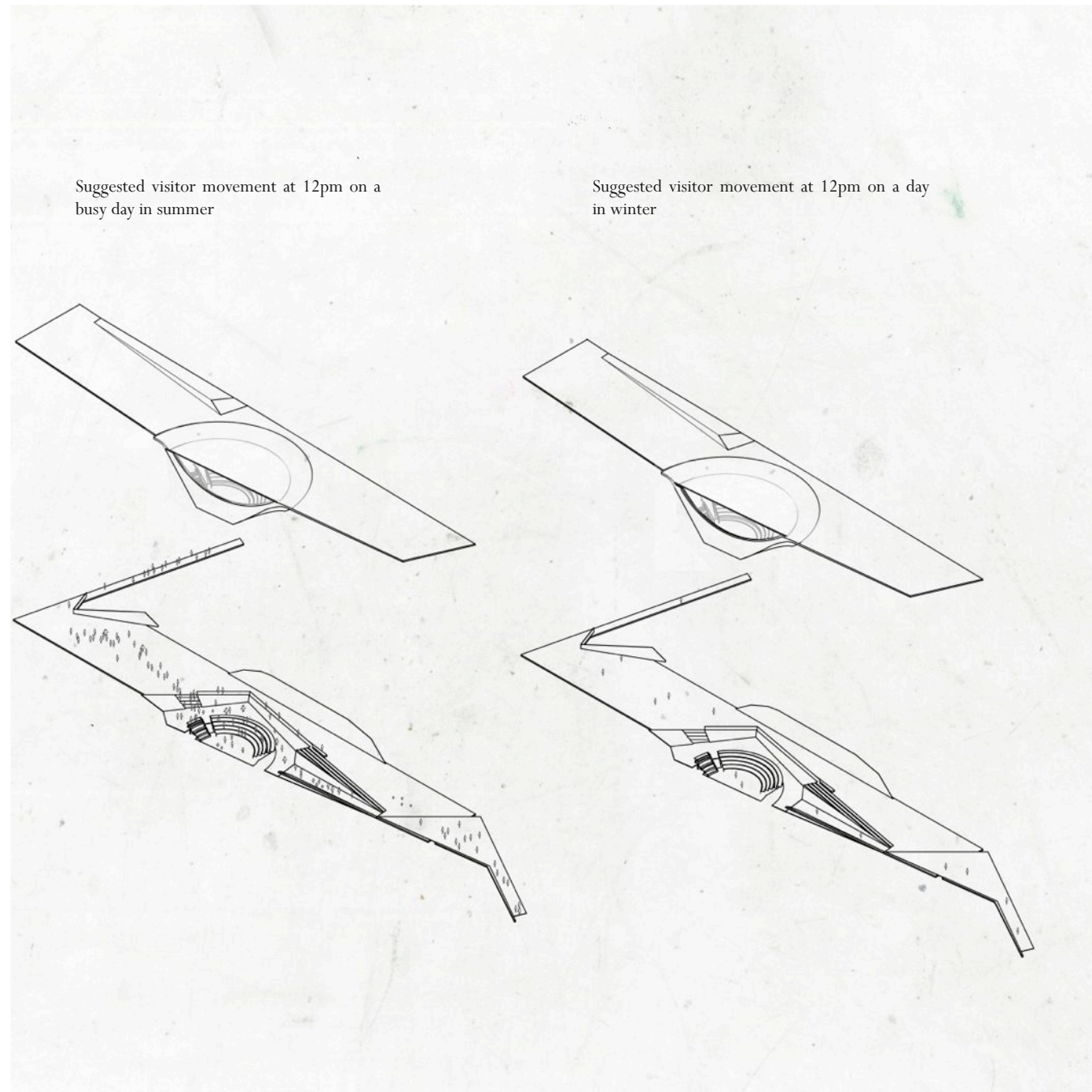


Figure 4.44. Axonometric diagram of the roof and ground floor surface in the education building.
Created by author.

CHAPTER FIVE

Literature review and case study analysis

5.1 LITERATURE REVIEW

Architectural approaches to flux are broad and wide ranging. Theories that relate to change within the research and practice of architecture, landscape architecture and urbanism identify flux and interpret flux at different times and in many different ways. This literature review looks into four broad themes and highlights projects that respond to flux in a similar way. This thesis shows architectural and urban responses to flux from the nineteenth-century to today. The projects investigated in the literature review all respond to change by anticipating change rather than designing to restricting it.

Evolution

Urban responses to flux can be traced to Darwin's Theory of Evolution 'On the Origin of Species' published in 1858. Marshall and Batty (2009) applied Darwin's Theory of Evolution to the field of urbanism as it provided a lens to view the way that cities can grow and change. In this context, "Darwinian Evolution is fundamentally unpredictable; change can go in any direction; today's model may well be obsolete tomorrow; and everything in the city system – businesses, technologies, land uses, building types – must be prepared to innovate and adapt to survive" (Marshall, Batty, 2009, 464). Patrick Geddes also looked at the evolution of cities as a way to view change (Geddes, 1915). In contrast to Darwin, "Geddes' philosophy seems to imply urban evolution as a sort of gradual unfolding, almost as if cities emerged and grew according to some kind of developmental programme" (Marshall, Batty, p.464). Both Darwin's and Geddes' ideologies of evolution have provided platforms of knowledge for viewing change that can be interpreted in many fields of research including urban design and architecture and these ideas are still current today.

Mega-structure movement.

The mega structure movement offers a 'city within a building' concept shaped by flows and infrastructures to be responsive to change. (Bhatia, N, Infranet/Lateral Office, 2011). In the late 1950s, the Japanese Metabolists responded to flux through a biomorphic lens prioritising the natural flows of air, water, and people (Allen, S., McQuade, M., 2011). According to the Metabolist, architecture was like an organism where the buildings adapted, plugged in, stacked and expanded. The advent of information technology that occurred in the 1960s influenced a shift from biomorphic models that responded to shifting conditions towards one that was informational (Delalex, 2006). This shift was registered in the works of Archigram, Superstudio and Archizoom, which proposed an open and virtual architecture, consistent with the conditions of informational networks and cybernetic environments (Delalex, 2006). Bhatia (2011) believes the work of this era concentrates too much on the internal systems of the architectural object and fails to acknowledge the systems of environment that envelope architecture.

Anticipating unpredictably

Through an application of biologist Weaver's concept of 'organised complexity' into urban design, Jane Jacobs understood the city to behave in a state of organised complexity. "No matter what you try to do to it, it is what it is" (Jacobs, 2011, p.565). A theory of organised complexity helps us to understand the city as unpredictable, requiring it to be approached through a range of scales and contexts in order to improve its environment. Chaos and Complexity theory emerged later in the 1980s and offered another way to view change by celebrating unpredictably and the unknown. Chaos and Complexity theory requires embracing both complexity and dynamics, accepting uncertainty and focusing on adaptation and evolution rather than avoidance mechanisms (Ulo, M., Brebbia,

C.a., Enzo, T., 2006). This approach is renowned in the works of Rem Koolhaas of OMA and Bernard Tschumi. When applied to large urban sites, both architects favoured organisational strategies over designing absolute form, resulting in hybrid architectural forms that were multilayered and continuous.

3.14 Biological

The current influence in architecture is to try to make buildings more life-like. Allen (2011) states that "for the past two decades the dominant working metaphor in advanced architecture has been biological: a desire to make architecture more lifelike, that is to say, more fluid, adaptable, and responsive to change" (p.20). Contemporary methods can be realized through an informational approach, which is animated by the virtual works of Greg Lynn and institutionalised through the Master's Program at the Architectural Association School of Architecture (AA). Using computer programs to simulate emergent processes allows the possibility of 'growing' buildings (Ots, 2011). This approach limits the potential of flux in architecture as an evolving form, as once the building is brought to a stage of completion, the form freezes.

Landscape urbanism is another theory that aims to be more responsive, as it looks not to the biology of individual species but to the collective behavior of ecological systems as a model for cities, buildings, and landscapes (Allen, S., McQuade, M., 2011). This approach often results in landform typologies where the architecture is defined by large surface planes that have been folded and warped to create an artificial topography and landscape.

Approaches that respond to flux

This thesis focuses on strategies to design architecture responsively to flux. I have summarized twelve strategies to respond to flux from the literature to help further understand flux and see how these strategies might be useful for my research, and further develop responsive architectural forms.

The variety of approaches: evolution, megastructure, anticipating unpredictably and biological can be distilled into a number of gestures or strategies which are listed below.

1. Framework over form:

Design employs an organisational framework to accommodate flux and not a form.

2. Event:

Event space refers to architecture as a catalyst and promoter for social activities (Angelil, Lee, 2003).

3. Fields:

Fields employs loose and flexible organizations within a larger context.

4. Biological:

Biological architecture is designed to be like an organism so it should be open and adaptable

5. Information: Plug-In

“Informatic” networks contained structures that adapted by plugging in components to allow for constant change. (Delalax,2006,p. 25).

5. Landscape urbanism:

Landscape urbanism incorporates field like organizations as a means to distribute and channel flows of energy, information and people on site.

6. Megaform infrastructure:

The mega-form is the concept of a city in a building and it can be conceived as an active biological machine in the landscape.

7. Informational/virtual:

Negotiating the physicality of megastructures with the virtuality of “informatic networks Delalax,2006,p. 25).

8. Transform or operating parts:

Operational features are designed within the building to change the way the buildings can be used.

9. Information/animation:

Information modeling makes it possible to design buildings that can grow or evolve new formal configurations in response to specific forces and constraints.

10. Open building principal:

OBP is the concept of fixed building fabric and loose interior that allows for changes if use in the future.

11. Information: animation: Information modeling makes it possible to design buildings that can grow or evolve new formal configurations in response to specific forces and constraints

12. Diagram: Architecture is a built interpretation of a diagram (Zaera,et.al 2002).

These strategies will be further explored in relation to form in the case study review. For the purposes of this research, each strategy will be explored through one case study.

5.2 CASE STUDY ANALYSIS

The following case studies are a selection of projects from the 1960s to today that are examples of architecture that have responded to flux. While each project is a specific response to a particular set of circumstances, by virtue of their scale and complexity, they can still serve as a series of tests for responsive strategies towards flux in the twenty-first century. The approaches seen in the case studies vary, ranging from projects that favor process to projects that favor form. In all cases, approaches to designing for flux are primarily strategic. Each case study has been redrawn in axonometric. By presenting all the case studies in the same format, I have provided a method to compare and critically reflect on how flux has been translated into form for each of the case studies.

1. Framework over form:

Tree City proposal for Toronto, Canada, 2000.
OMA

Strategic approach to respond to flux:

The tree city diagram scheme opts to “grow now and build later”(Czerniak, 2001,p.76). “Landscape elements will be planted incrementally over time, gradually building up the park’s mass into flexible patchwork of planted clusters separated by open undesignated areas”(p.74). This provides a strategy to direct the parks activities as well as manage the parks growth.

Resultant form:

No architectural form.

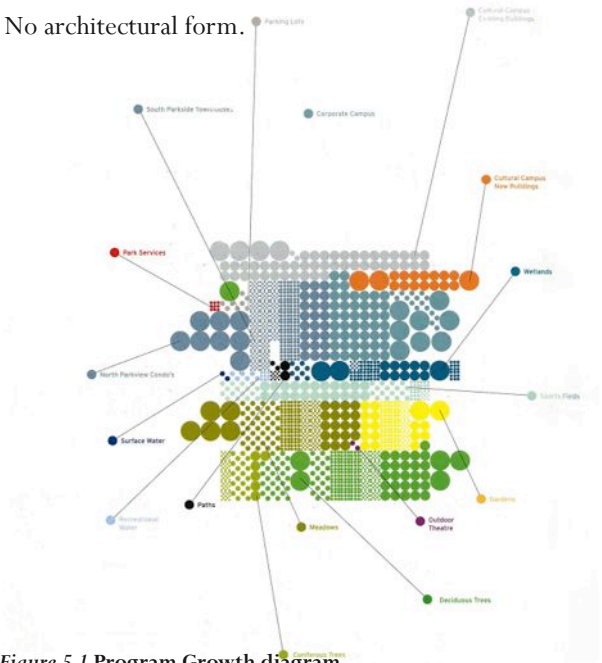


Figure 5.1 Program Growth diagram.

Czerniak, J. (2001).
84

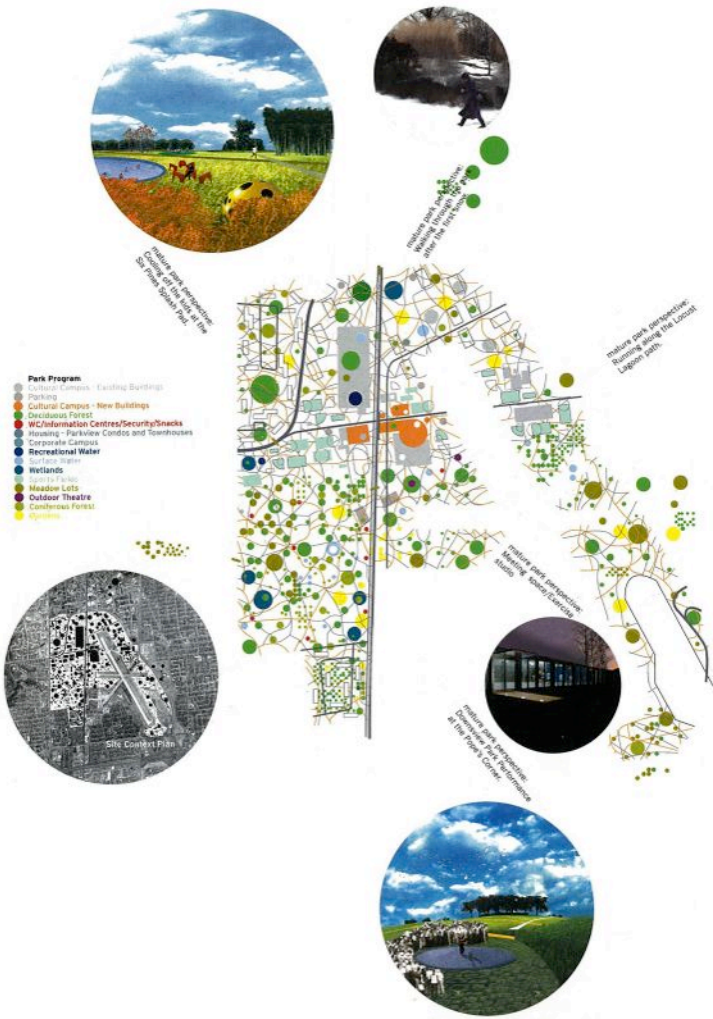


Figure 5.2. Grow the Park diagram
Czerniak, J. (2001).

2. Event:

Competition entry for Yokohama Market District, Japan
1992.OMA

Strategic approach to respond to flux:

Programmatic infiltration.

“We have avoided designing buildings with their inevitable limitations and separations; continuous and formless, the project engulfs the site like a programmatic lava. It became obvious that we had to invent programs to fill the rest of the day, which would achieve maximum use of the existing infrastructure”. (Koolhaas, 1995, p.1124)

Resultant form:

Inarticulate container, warped and ramping surfaces.

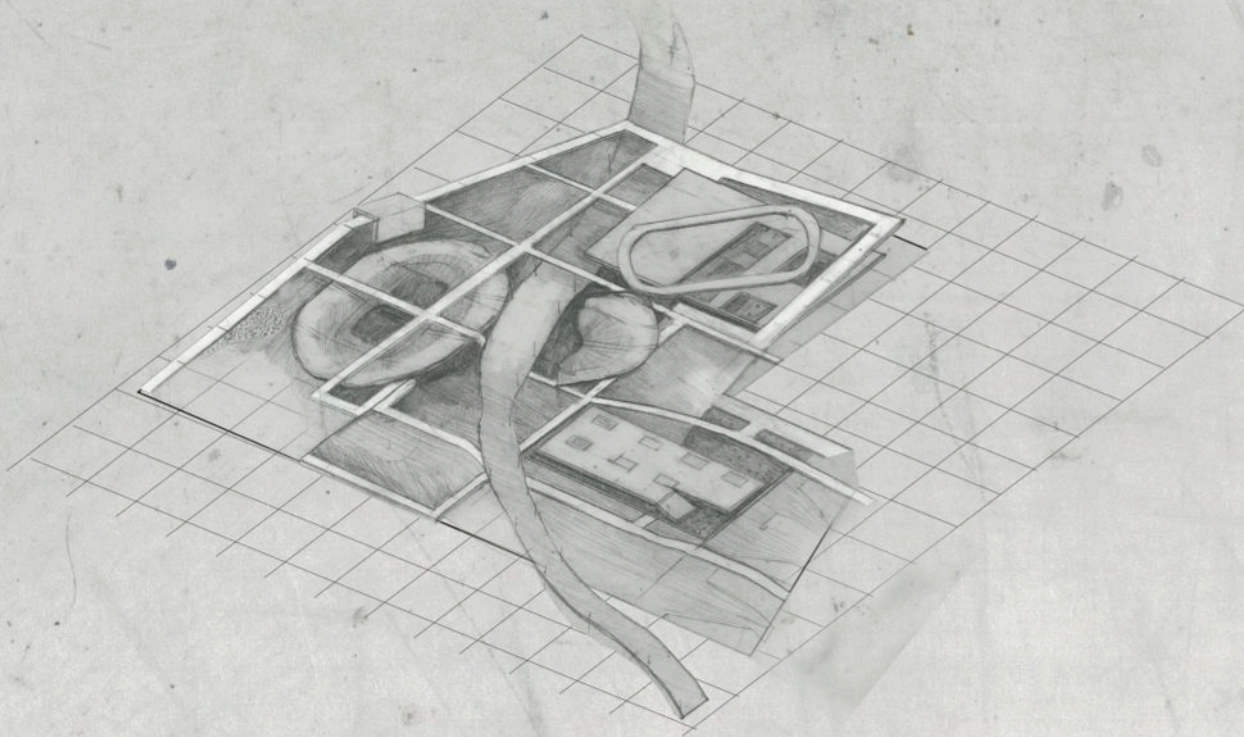


Figure .5.3. Axonometric drawing of form: Yokohama
Market District Proposal
Created by author.

3. Fields:

Parc de la Villette, Paris, 1982-1998

Bernard Tschumi

Strategic approach to respond to flux:

Strategy of differences and collisions of form and function. A composition of three autonomous elements is superimposed on the site (Hardingham, Rattenbury, 2012,p.35).

“Points (folies) are placed at 120 metre intervals as a common denominator for all events. Each folie is essentially 10x10x10 metre cube that can be transformed or elaborated. Lines (routes) form an orthogonal system of pedestrian movement, including the cinematic promenade. Surfaces(thermal gardens) for all the activities requiring large expanses for horizontal play”. (Hardingham, Rattenbury, ,2012, p.35).

Resultant form:

A city that is a massive grid, framework structure.

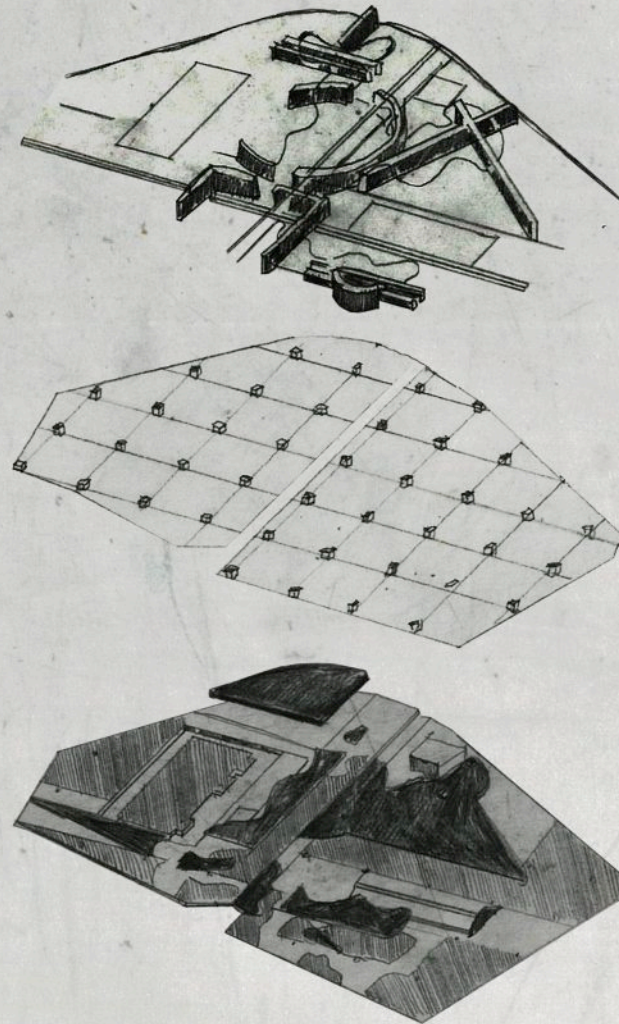


Figure .5.4 Axonometric drawing of form: Parc de la Villette

Created by author.

4.0 Informational-Plug-In

Plug In city ,Peter Cook, 1964.

Strategic approach to respond to flux:

Plug In City is a linear city housed in a high narrow grid system. (Schaik, Martin van , Mácel, O., 2004. p.69).

The spaces formed by the grid is where the crane plugs in everything that makes the city, from living rooms to parking lots.

Resultant form:

A city that is a massive grid, framework structure.

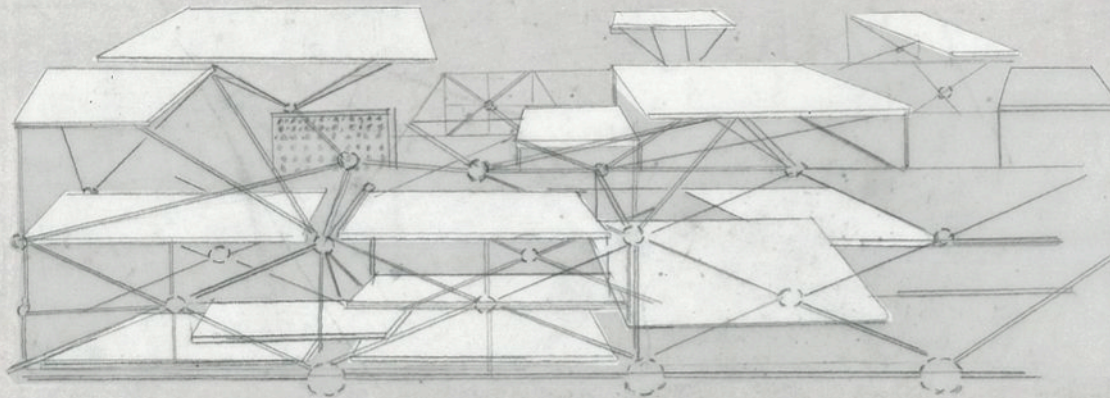


Figure .5.5 Axonometric drawing of form: Plug-In City
Created by author.

5. Biological

Nakagin Capsule Tower, Tokyo Japan, 1972: Kisho Kurokawa.

Strategic approach to respond to flux:

Designed for people on the move, 140 self-contained capsules can be installed, rearranged and replaced on large towers (Lin.Z ,2010, p. 236).

Resultant form:

Capsule architecture: self-contained capsules that can easily be moved rearranged and replaced.

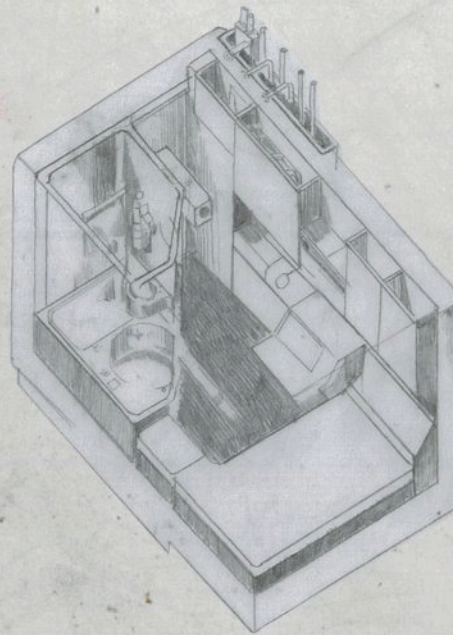


Figure .5.6 Axonometric drawing of form: Nakagin Capsule Tower
Created by author.

6. Informational virtual

Sendai Mediatheque, Sendai, Miyagi, Japan 1998-2001.
Toyo Ito.

Strategic approach to respond to flux:

Using digital media and using methods of 'blurring and simulation', the building translates society's conditions into architecture. (Witte, 2002, p.75).

Resultant form:

Transparent and translucent forms building forms

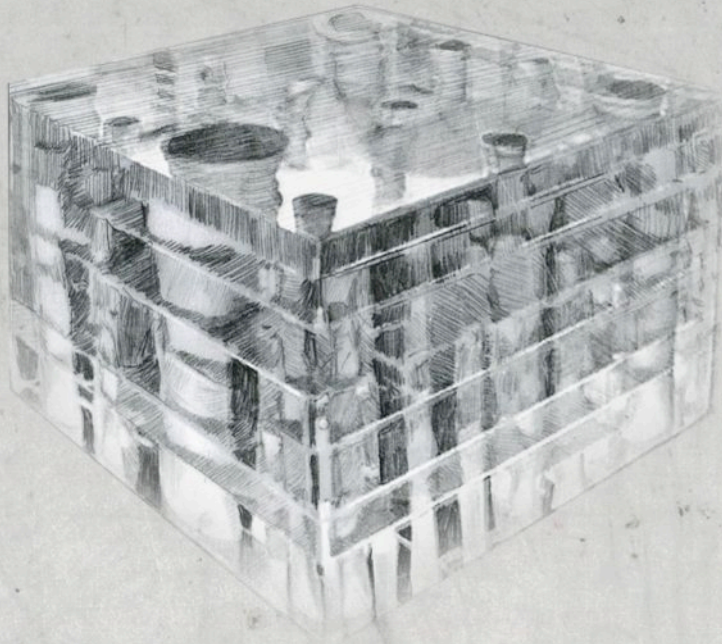


Figure .5.7 Axonometric drawing of form: Sendai Mediatheque

7. Megaform infrastructure:

Proposal for Gwanggo Lakeside Park, Suwon, Korea, 2008
Stan Allen Architects

Strategic approach to respond to flux:

Architecture expanded to the scale of territory finds new programmatic potentials by behaving like a landscape (Allen, McQuade, 2011, p. 225).

Resultant form:

Pier structure expanded to the scale of a Megaform.

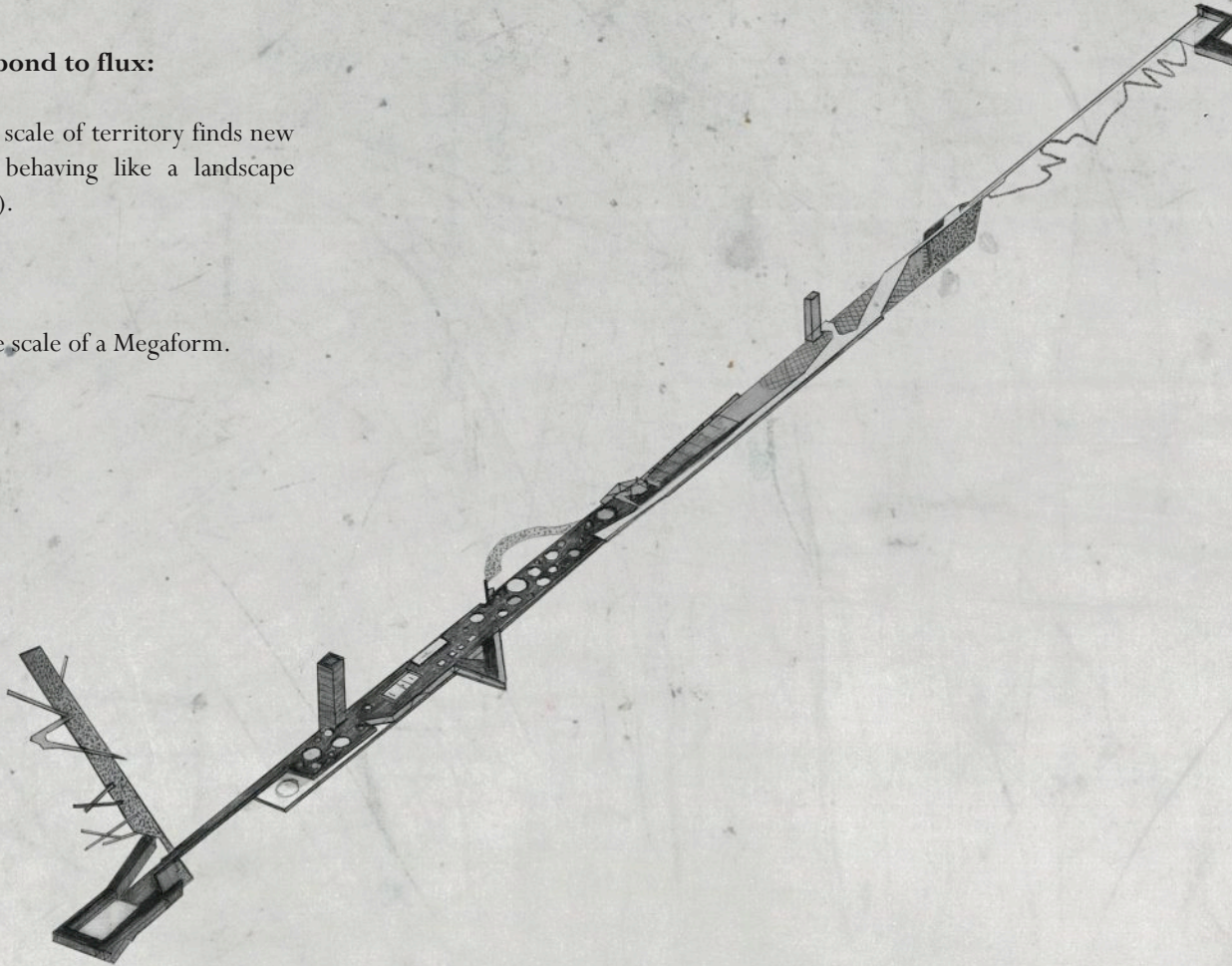


Figure 5.8 Axonometric drawing of form:
Proposal for Gwanggo Lakeside Park
Created by author.

8. Transform or operating parts:

Curtain house, Tokyo, 1995.
Shigeru Ban

Strategic approach to respond to flux:

The exterior walls are transformable so that the home can be either open to the public, or enclosed and private. This is achieved by opening and closing a large white polyester curtain and sliding doors. (Buntrock, D, Choi, Don. ,2001)

Resultant form:

Adaptable built envelope.

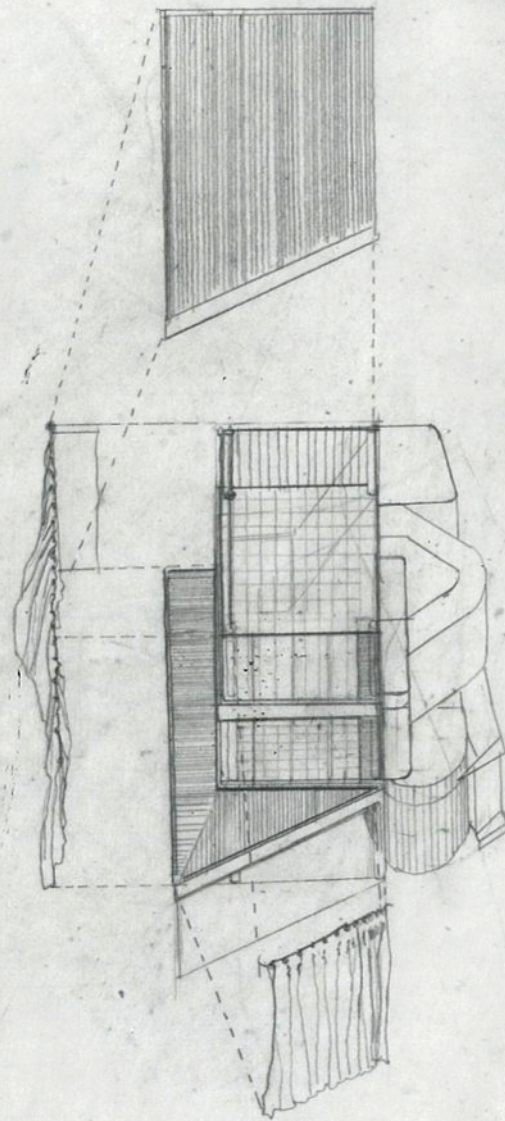


Figure .5.9 Axonometric drawing of form: Curtain House
Created by author.

9. Landscape urbanism:

Olympic Sculpture Park, Seattle, 2001-2007
Weiss/Manfredi Architecture/Landscape/Urbanism

Strategic approach to respond to flux:

Seattle uses the elements of infrastructure to address specific-issues of program; not only movement, but the display of large-scale artworks (Allen, McQuade, 2011 p.27).

Resultant form:

The park is a hybrid form unfolds as a continuous Z-shaped landscape (Pearson, 2007).

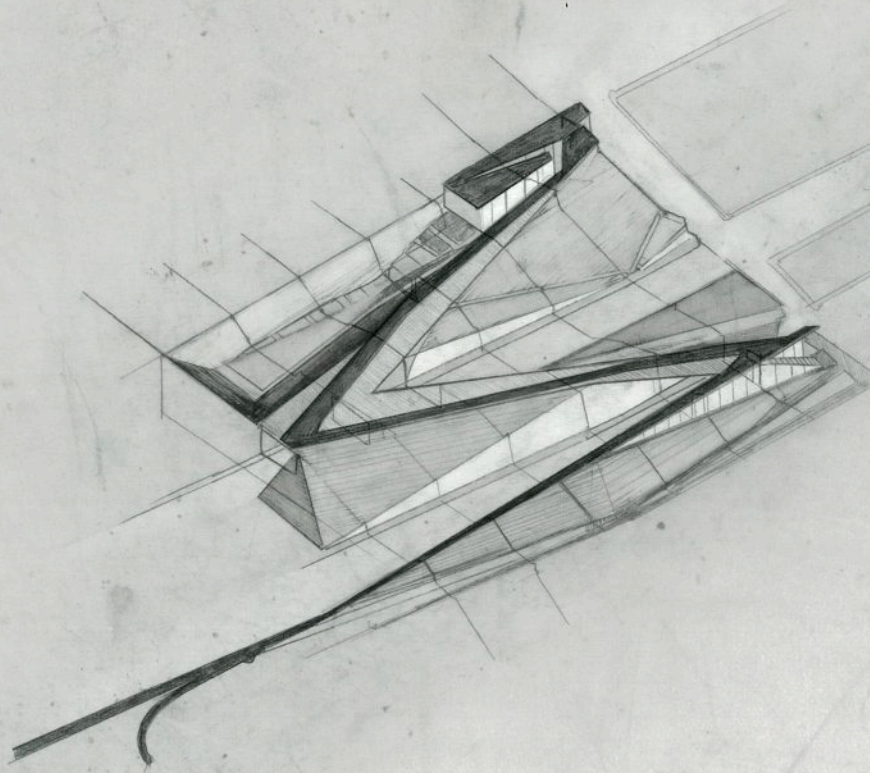


Figure 5.10 Axonometric drawing of form: Seattle Olympic sculpture Park
Created by author.

10. Open building principal:

Sainsbury Centre, Norwich, UK, 1974-1978, Foster + Partners

Strategic approach to respond to flux:

The structure and services are located at the perimeter of the built form. This creates open and unobstructed interior space.

Resultant form:

Rigid exterior, open plan interior.

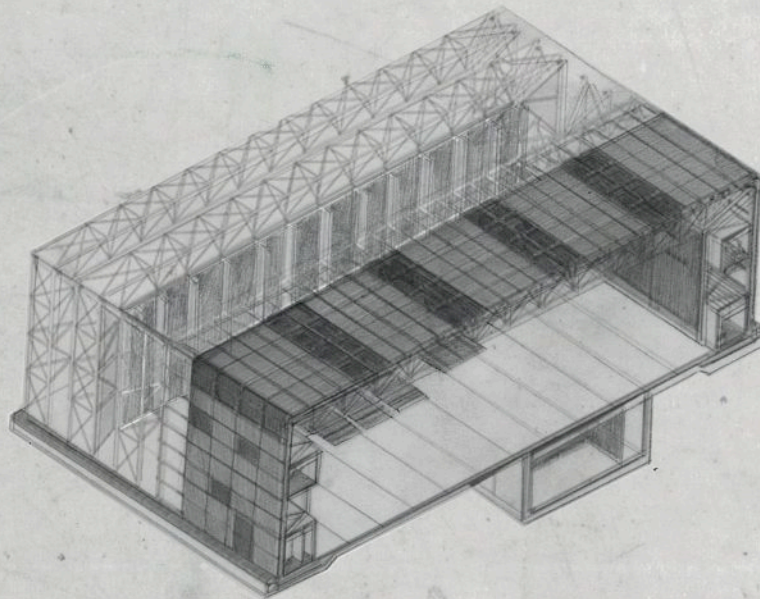


Figure 5.11. Axonometric drawing of form: Sainsbury
Centre for Visual Arts
Created by author

11. Diagram

Yokohama Port Terminal, Japan, 1995-2002

Foreign Office Architects.

Strategic approach to respond to flux:

Circulation was organised and then “architecture” deployed on the circulation diagram.(Zaera, ,et.al 2002,p.11)

Resultant form:

Typographical surface forms.

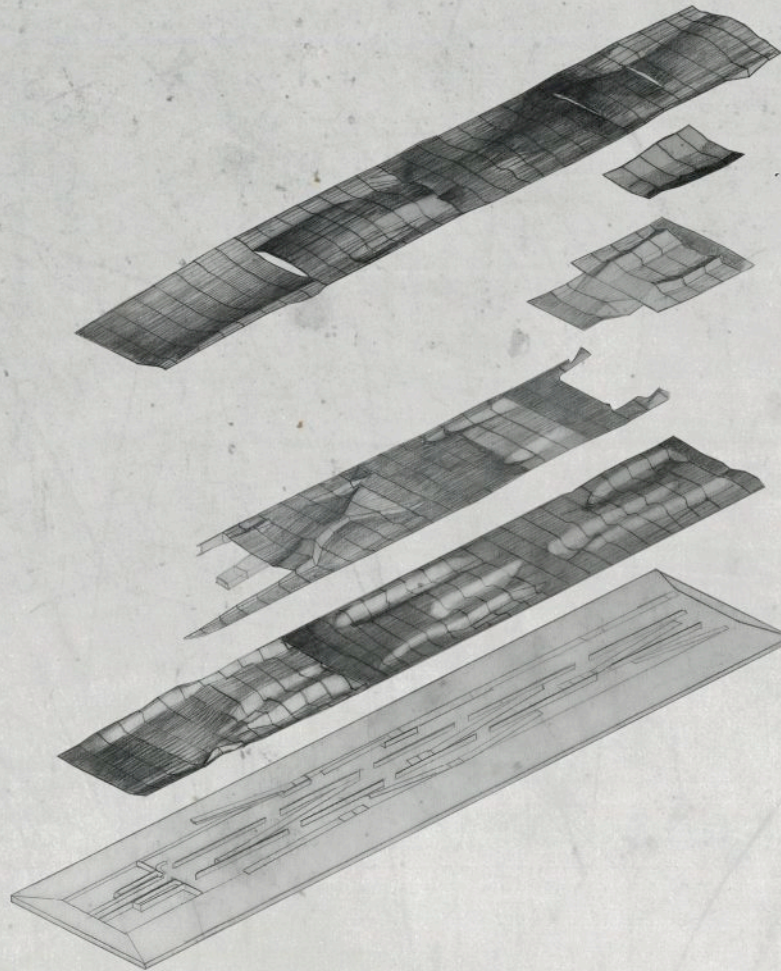


Figure 5.12 Axonometric drawing of form:
Yokohama Port Terminal

Created by author.
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12.Information/ animation:

Leisure Centre for the 2004 Olympic Games, Athens,
Greece, 2003-2003, Ali Rahim

Strategic approach to respond to flux:

“Using computer modelling, we created a dynamical system model composed of pressures correlated to the four categories of leisure activities”. The dynamical system was actualized”. (Rahim, 2006, p.31).

Resultant form:

Fluid, continuous forms.

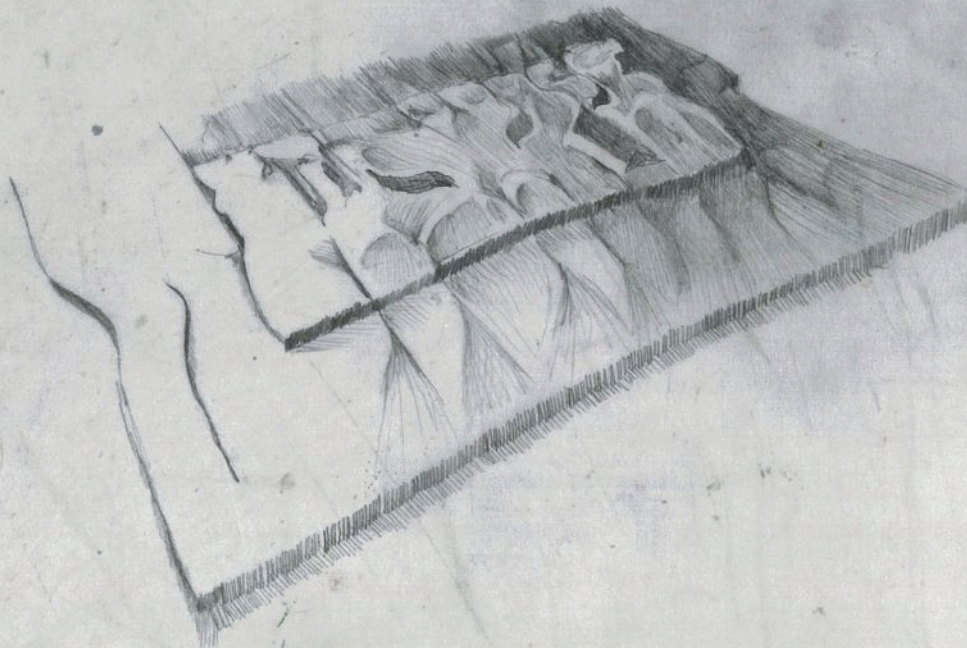


Figure .5.13 Axonometric drawing of form: Proposal for a Leisure Centre for the
2004 Olympic Games
Created by author.

Strategies for flux:

I have organized the twelve strategies from the literature review and the twelve formal tactics from the drawing analysis into a diagram. The purpose of the diagram is to set out a network of possibilities to design architecture for flux. This diagram can be used at any stage of the design process to help develop and evaluate design. In order to use the diagram effectively, the designer must test it against a set of criteria specific to the project or site.

The diagram works like a continuum, as there is no set place to start. On the left hand side are the ten tactics that I extracted from the literature and case study analysis. In the middle column is a list of case studies. On the right hand side is a list of formal tactics in which the spatial dimensions respond to fluxes.

For example the starting point might be form. I have explored surface forms in my research. Following the red line, this leads to the Olympic Sculptural Park by Weiss and Manfredi. If I want to find out what strategic approaches this project is relevant to I follow the red lines further towards the left hand side to find that this project is applicable to 'fields' and landscape urbanism. That gives me two departure points to further research how my project can be more responsive. This diagram implies a multiplicity of ways to approach a flux. One approach leads to another, providing a network of possibilities.

Network of possibilities for flux

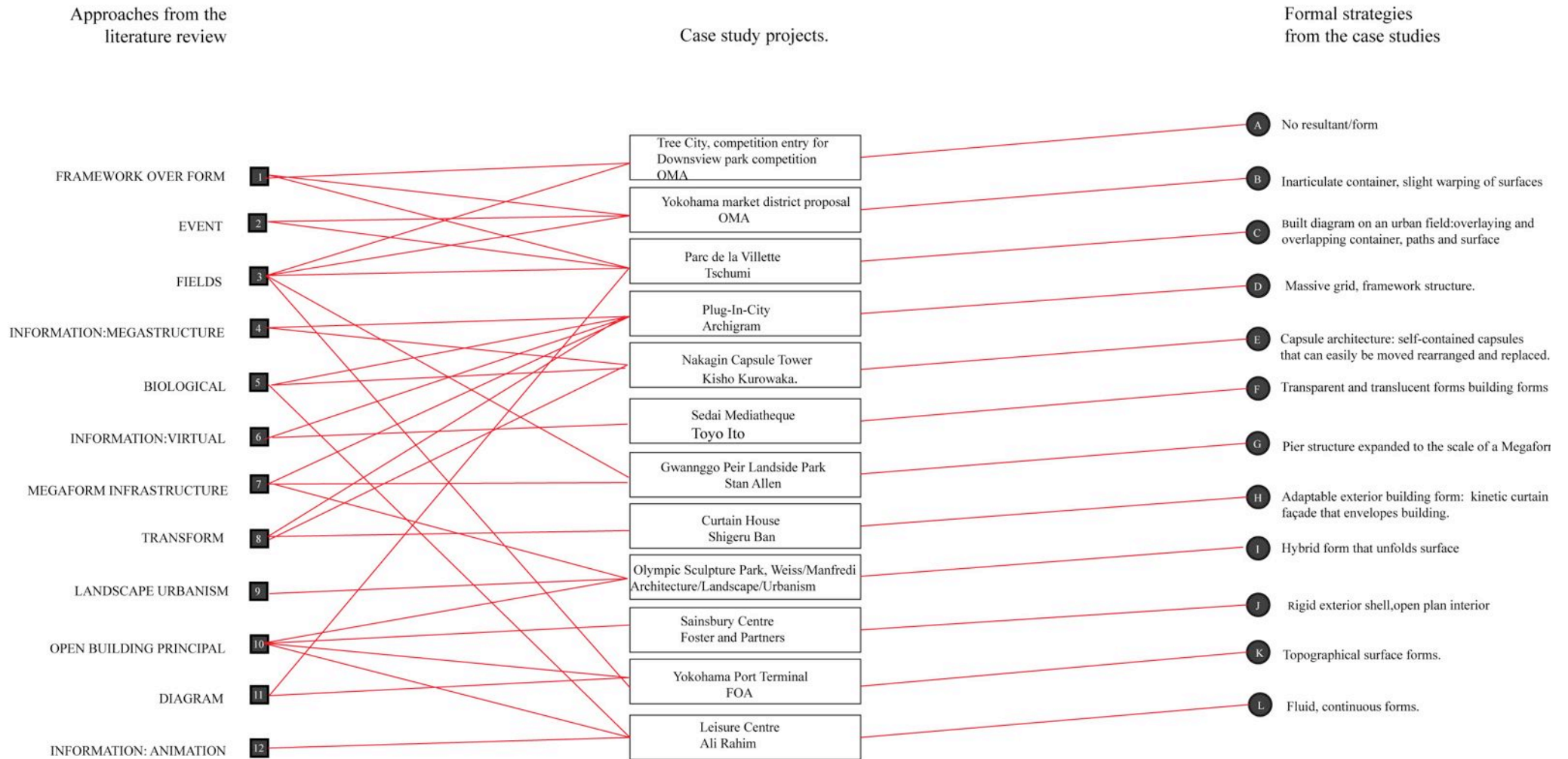


Figure .5.14. Strategies for flux diagram

Created by Author
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CRITICAL REFLECTION OF THE LITERATURE REVIEW AND CASE STUDY ANALYSIS

The approaches that have been researched in both the exploratory design and the literature and case study review are primarily strategic. They are usually a process or a translation of process into form. The challenge for this thesis is to define an absolute form. This offers more ways to design strategically for flux , but these ideas need to specified in order to design site-specific architecture.

CHAPTER SIX

Discussion

6.1 CRITICAL REFLECTION OF THE LITERATURE REVIEW AND CASE STUDY REVIEW

As the literature case-studies demonstrate, architectural approaches to flux are broad and wide ranging. While these approaches are primarily strategic they can be interpreted through a range of mediums, including both frameworks and forms. As flux is not singular or static, it requires approaches from multiple outlooks. As opposed to singular approaches, which only offer singular solutions, multiple approaches can be utilized to respond to the diverse and ever-changing conditions of flux. Within this approach, there are both strengths and weaknesses. These are discussed below.

Strengths:

By viewing the problem through a wide range of lenses, this multiplicity promotes responses that more readily anticipate the changing conditions of flux. Unearthing new solutions to readily evolving conditions, this encourages architecture to search beyond the confines of the discipline. Offering largely intangible outcomes, these strategies can be easily manipulated to respond to change. For this reason, these approaches are often employed for master plans, management of larger sites and urban frameworks.

Multiplicity of ways to use and interpret master plans.

Through strategic organisations, dynamic infrastructures, provisional programmes, and participatory processes, frameworks can be interpreted and utilised in a number of ways (Czerniak, 2001). When applied to urban parks, the frameworks seen in the Downsview Park proposal by OMA (Fig 5.1, 2000) tend to use frameworks to scaffold

the site and anticipate future changes. OMA's *Tree City Proposal* (Fig 5.2, 2000) employs a diagram of landscape and recreation clusters to manage and support the parks growth. This strategic plan can be used as a departure point to further develop the activities at the park over time.

Multiplicity of ways interpret and activate form

Within contemporary practice, the concept of 'horizontal' has been used as a mechanism to open up architecture to extrinsic changes and wider disciplines such as landscape and urbanism (Allen, 2011). When interpreted into built form, 'horizontal' is translated into surface forms, articulated ground planes, and hybrid forms. These formal approaches can be seen in the continuous surfaces forms of OMA's *Yokohama Market District proposal* (Fig. 6.1) 1992). This proposal offers a wide range of strategies for form to activate programmatic potentials on the site without an overbearing pretention of form. As Koolhaas et al. (1995) notes, the project avoids designing buildings with their inevitable limitations and separations; "continuous and formless, the project engulfs the site like a programmatic lava... inventing programs to fill the rest of the day, which would achieve maximum use of the existing infrastructure" (p. 1124). The topological surface forms of FOA's *Yokohama Port Terminal* (Fig. 6.2, 1995) and the folded surfaces seen in Weiss and Manfredi's (2001) design for the *Olympic Sculptural Park* (fig. 6.3) are also used as tools to activate the site. The forms shown in these three case studies demonstrate how 'horizontal' can be employed as a formal device to generate new potentials to activate site.

Weaknesses:

Intangible solutions that do not physically impact site

The intangible and conceptual nature of these frameworks can also be seen as a weakness. By not physically addressing the site, these frameworks fail to directly add to, impact, or improve the site. As these ideas lack formal or physical substance they tend to result in universal typologies that fail to address site-specific concerns. This highlights the challenge of formalizing flux in a way that can still respond to the specific conditions of site.

Inarticulate forms that resemble universal typologies rather than site specific architecture.

Building on this problem, Allen (2010) suggests architecture is at risk of becoming "diluted" within this "expanded field" of multiplicity (p.38). Offering universal outcomes that lack tangible formal solutions, projects that favour frameworks are often "diluted" of architecture. Within interdisciplinary investigations, this thesis argues that architecture should remain central to discussion to avoid this unfavourable outcome.

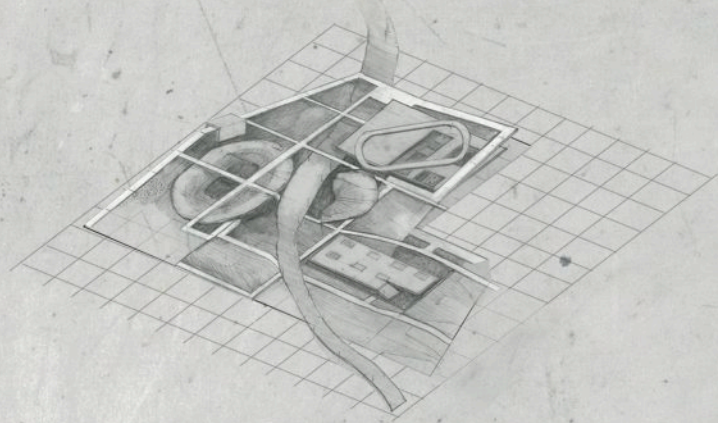


Figure .6.1. Axonometric drawing of form: Yokohama Market District Proposal
Created by author.

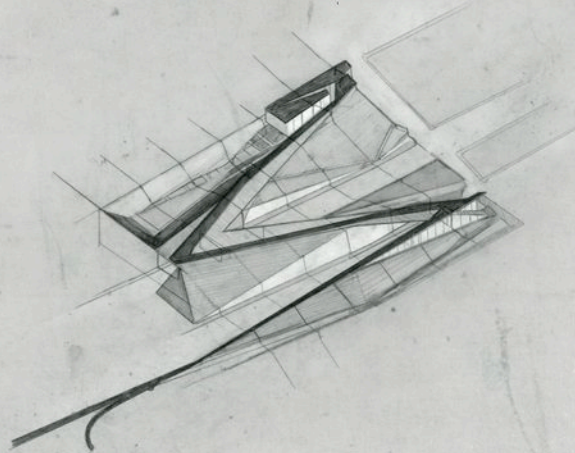


Figure .6.2 Axonometric drawing of form: Seattle Olympic sculpture Park
Created by author.

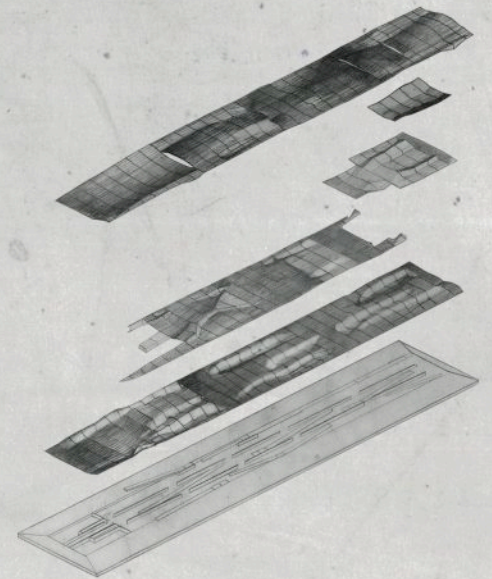


Figure .6.3 Axonometric drawing of form: Yokohama Port Terminal
Created by author.

6.2 IDENTIFYING THE GAP

A concerning gap exists between frameworks that indirectly anticipate change and static forms that stall change. As a primary response to accommodate flux, both research and design has focused on strategies for static forms that encourage a multiplicity of functions. Developed through the design and literature review, this thesis has focused on multidisciplinary approaches that encourage more open and responsive architectural forms. This strategy promotes the development of a multiplicity of functions to respond to the changing nature of flux

Research through design

When approaching flux in architecture, implications arise for the development of form. Frameworks tend to be speculative and fail to specify forms, while forms tend to define borders, restricting the capacity for architecture to adjust and accommodate flux.

The problems of flux identified at Milford sound require concrete and tangible solutions. However, as form limits the capacity to accommodate wider contexts of flux, this was not a suitable investigation to begin development. Instead, frameworks were primarily utilised to scaffold the site, resulting in a strategic master plan (page 39). The tension between conceptual frameworks and tangible forms was approached throughout the design process. These issues were raised in the design process and have been discussed in more detail in appendix A.

The master plan provides an overall strategy to manage and organise the site and sets up a platform to direct growth and anticipate change. Architectural approaches responded to the specific issues of crowding through dynamic concrete forms. By utilising a range of responsive strategies that address general and specific contexts of

flux, the design outcome can operate at a range of scales - making it more responsive to change. Architecture that functions to enable process while privileging form provides an example of a resonate architecture that allows for adaption and represents place.

Identifying how design contributes to the discipline

Situated alongside resilience thinking, flux is a topic of heightened relevance within architectural thinking - yet it has received very limited attention. Broadly scanning relevant developments within the discipline has unearthed new interpretations and case studies that are of relevance to this investigation. This translation process offers new material that builds on the limited body of knowledge surrounding flux and architecture.

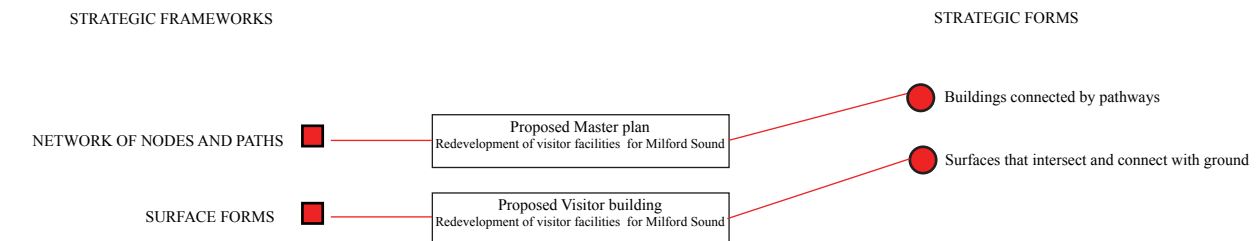
As the realm of flux favours open-ended and non-defined outcomes, specific formal responses, such as the proposed Milford Sound development, offer limited contribution to this subject. Rather, a range of framework and form strategies and a network of possibilities offer a productive development within this field. This research highlights two examples of strategic frameworks and forms that were developed in the design process.

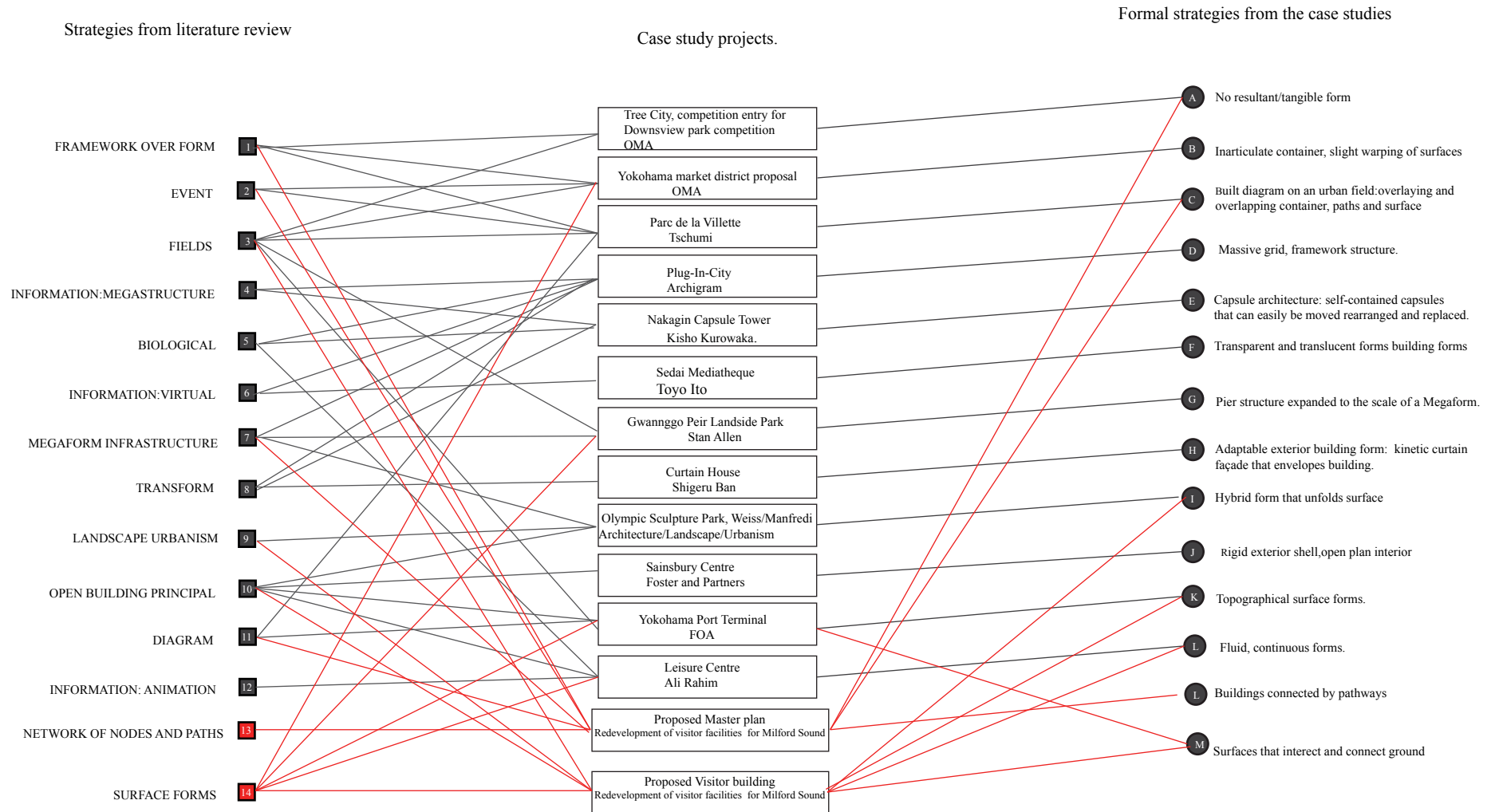
FRAMEWORKS

The design process developed a ‘network of nodes and pathways’ strategy to manage and organise the site at Milford Sound.

FORMS

There is a need for tangible architecture that is responsive to visitor flux at Milford Sound. With visitor numbers on the rise and with a limited space to develop, this places a large responsibility on the built fabric to be more responsive (McNeill, 2005). This thesis explored the potential of static forms that intersect and connect with ground as an approach to respond to this unique condition.





The red lines suggest possible avenues to explore responsive approaches.

Figure 6.4. Strategies for flux diagram
Created by Author

Further applications for design

The diagram offers a network of strategies providing multiple options at once. The diagram has been used to evaluate the strategic framework and forms from the design and provide a network of possible avenues to further enrich and develop design. In order to specify the strategic possibilities, I asked the following questions:

FRAMEWORKS

Q: What strategic approaches have I considered in my design?

- Network of nodes and paths
- Programme Infiltration
- Landscape infrastructure

Diagram: What projects use a similar approach, and what are the strategic outcomes?

Framework strategies have been listed below:

- 1 Framework over form
- 2 Event: Cross programming functions to activate site
- 3 Fields: Design of open spaces and surfaces
- 6 Megaform infrastructure: pedestrian infrastructure
- 9 Open Building Principal

This presents five strategic frameworks to further develop 'responsive' framework strategies.

FORMS

Q: What formal organisational strategies have I already considered in my design?

- Articulated surfaces
- Surface form

Diagram: What projects use a similar approach, and what are the formal outcomes

Formal strategies have been listed below.

- B Warping surfaces
- G Architecture forms expanded to the scale of territory
- I Hybrid forms
- J Rigid shell, open plan interior
- K Topological surface forms
- L Fluid, continuous forms

This presents six formal approaches to further develop 'responsive' tangible forms.

The following eight strategies are show possible avenues that could be developed further into the strategic and formal options to design responsive architecture at Milford Sound. These approaches both show departure points to further develop design.

3 B

3 G

3 K

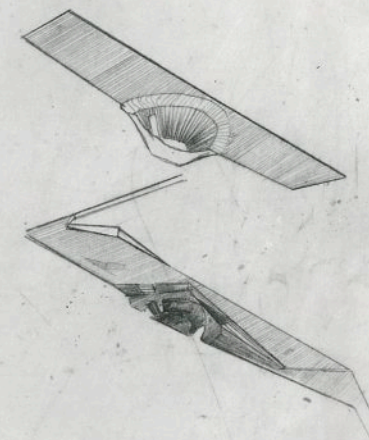
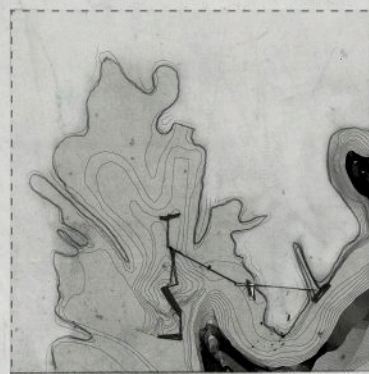
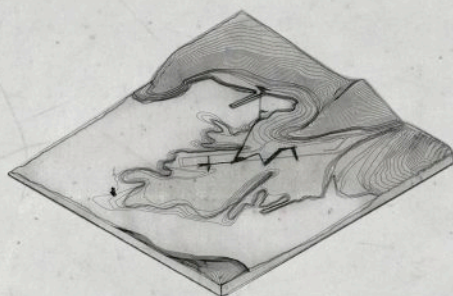
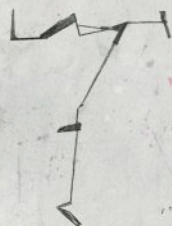
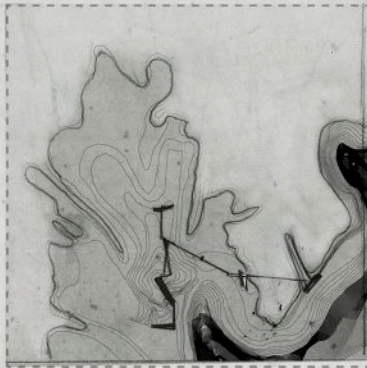


Figure 6.5. Drawing g suggesting further applications for FIELDS and built diagram
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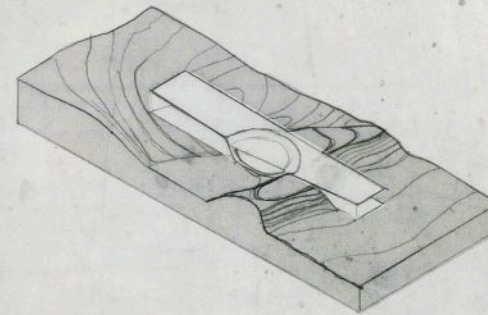
Figure 6.6 Drawing suggesting further applications for FIELDS and mega.form. Created by author.
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Figure 6.7 Axonometric drawing suggesting further applications for FIELDS and topological surface forms.
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*Figure .6.8 . Drawing suggesting further applications for **FIELDS** and **megaform** infrastructure.*
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*Figure 6.9. Drawing suggesting further applications for **LANDSCAPE URBANISM** and **hybrid forms**.*
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10 J

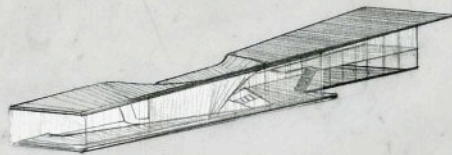


Figure 6.10 Axonometric drawing showing further applications for OPEN BUILDING PRINCIPAL and rigid shell, open interior.
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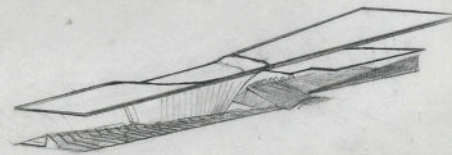


Figure 6.11. Axonometric drawing showing further applications for OPEN BUILDING PRINCIPAL atypical surface forms.
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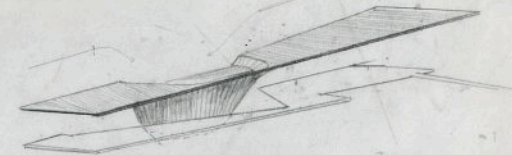


Figure 6.11. Axonometric drawing showing further applications for OPEN BUILDING PRINCIPAL and fluid continuous forms.
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6.3 POSSIBILITIES FOR THE CONTEXT

While the research and design specifically responds to the high fluctuations of visitors at Milford Sound, the wider implications are also relevant within other natural environments that experience visitor flux. With nearly 30 percent of New Zealand's landmass a "protected landscape environment" (De Blij et al., 2011, p443), along with increased visitor forecasts (Page, 2012, p34), the findings of this thesis have a wide application. The network of visitor facilities presents a formal strategy to collect and disperse visitors in a way that enhances their experience with the surrounding landscape. Employing frameworks and form, which respond to visitor flux, this opens up possibilities for rethinking visitor facilities within our pristine landscapes.

6.4 POSSIBILITIES FOR THE DISCIPLINE

The context at Milford Sound presents a unique situation of extreme daily visitor flux within a remote, pristine landscape. This condition is unique in that the extreme population flux occurs within an ecological sensitive space with little room to develop. This intensifies the reliance of the physical built environment to respond to both cultural and environmental conditions of the site. Possibilities for the discipline have been explored and identified in the literature review diagram.

Literature review diagram

This research argues that architectural approaches to flux should primarily consider a multiplicity of approaches, rather than a single strategy, as a means for architecture to be more responsive. This has been proven through the literature review diagram, which organises a range of strategic methods to design both frameworks and forms that are responsive to flux. By acknowledging the potentials within frameworks and forms, and working between them, this unearths a network of possibilities. Expanding knowledge of architecture that responds to flux, the diagram offers architects a productive way forward.

CHAPTER SEVEN

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Chapter two: Methodology

Fig. 2.1. Diagram highlighting the research through design process. Created by author.

Fig. 2.2. Diagram mapping the initial design process. Created by author.

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Chapter three: Background

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Fig.3.10. Problem: architectural form of the current airport building. Photo taken by author.

Fig 3.11. Problem: architectural form of the current cafe building. Photo taken by author.

Fig 3.12. Problem: architectural form of the Mitre Peak Hotel building. Photo taken by author.

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Fig.3.15. 'The Lion'. Photo taken by author.

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Fig 3.20. Silver beech/hotopitin/totara forest. Photo taken by author.

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Fig.3.33. Proposed solution diagram: Frame views of the landscape through architecture. Created by author.

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- Fig.4.9. Elevation 2.0 showing the network of visitor facilities scheme. Created by author.
- Fig.4.10. Elevation 1.0 showing the network of visitor facilities scheme. Created by author.
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- Fig.4.18. Reference diagram showing the location of a selection of activities, views and encounters. Created by author.
- Fig.4.19. Perspective: arrival at the bus shelter. Created by author.
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- Fig.4.24. Perspective: walking within the canopy forest . Photo taken by author.
- Fig.4.25. Perspective: walking along the wetland walk . Photo taken by author.

Fig.4.26. Diagram: regeneration of nature strategy phase peak visitor season. Created by author.

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Fig.4.33 Section AA: section through the education building. Created by author.

Fig.4.34. Ground floor plan of the education building. Created by author.

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Fig. 4.36. Interior perspective: View A. Created by the author.

Fig. 4.37. Reference diagram showing View A. Created by the author.

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Fig. 4.39. Interior perspective: View B. Created by the author.

Fig.4.40 Exterior perspective: View C. Created by author.

Fig. 4.41. Reference diagram showing View C. Created by the author.

Fig.4.42. Diagram: showing the refilling process. Created by author.

Fig 4.43. Section BB. Created by author.

Fig.4.44. Axonometric diagram of the roof and ground floor surface in the education building. Created by author. ▸

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Fig 6.4. Diagram: Strategies for flux. Created by author

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Fig.6.6. Drawing suggesting further applications for FIELDS and megaform. Created by author.

Fig.6.7. Drawing suggesting further applications for FIELDS and topological surface forms. Created by author.

Fig.6.8. Drawing suggesting further applications for FIELDS and megaform infrastructure. Created by author.

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Fig.6.10. Drawing showing further applications for OPEN BUILDING PRINCIPAL and rigid shell, open interior. Created by author.

Chapter seven: Appendix A

Fig.7.1. Early concept sketches of the network of visitor facilities. Created by author.

Fig.7.2. Diagrams and drawings: Cross programming within a single building Created by author.

Fig.7.3. Drawing: relocation and relink. Created by author.

Fig.7.4 Drawing: ecological connections. Created by author.

Appendix B

Fig.7.5 Formal studies: responsive architectural form. Created by author.

Fig. 7.6 Refilling.

In Kuma (1999). Kengo Kuma : geometries of nature. Milano : L'arca. Created by author

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Fig. 7.12 Surface folding.

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Fig. 7.13. Surface folding

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7.3 Appendix A

Dispersed network of visitor facilities, phasing strategy. (Week 4)

Network strategies were primarily used as frameworks to organize the facilities at Milford Sound into a network structure. Composed of nodes (buildings) and paths (walkways), the dispersed network of visitor facilities is a pedestrian infrastructure that collects and disperses visitors across the site.

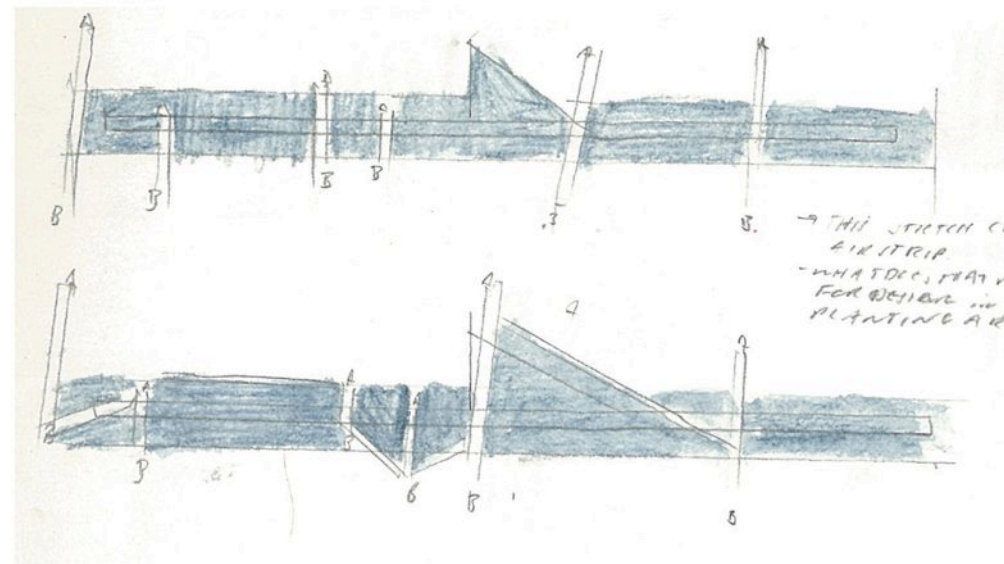
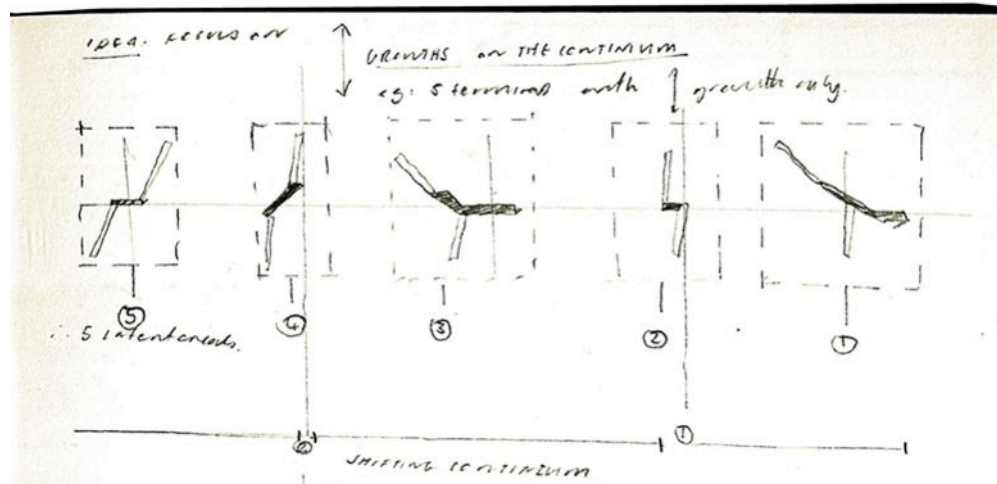


Figure. Early concept sketches of the network of visitor facilities.
Created by author.

Cross programming within a single building (week 15)

Cross programming a car park with a bird aviary was explored as a method to maximize the use of car park buildings on site. At peak times the structure would function as a car park, and in low times it could function as a bird Aviary. By restricting the design of form to a mechanical car stacking system this reduced the buildings capacity to respond to the wider flux issues and the natural context. As a consequence, the design shifted focus to strategic frameworks as a means to address the wider context and conditions on the site.

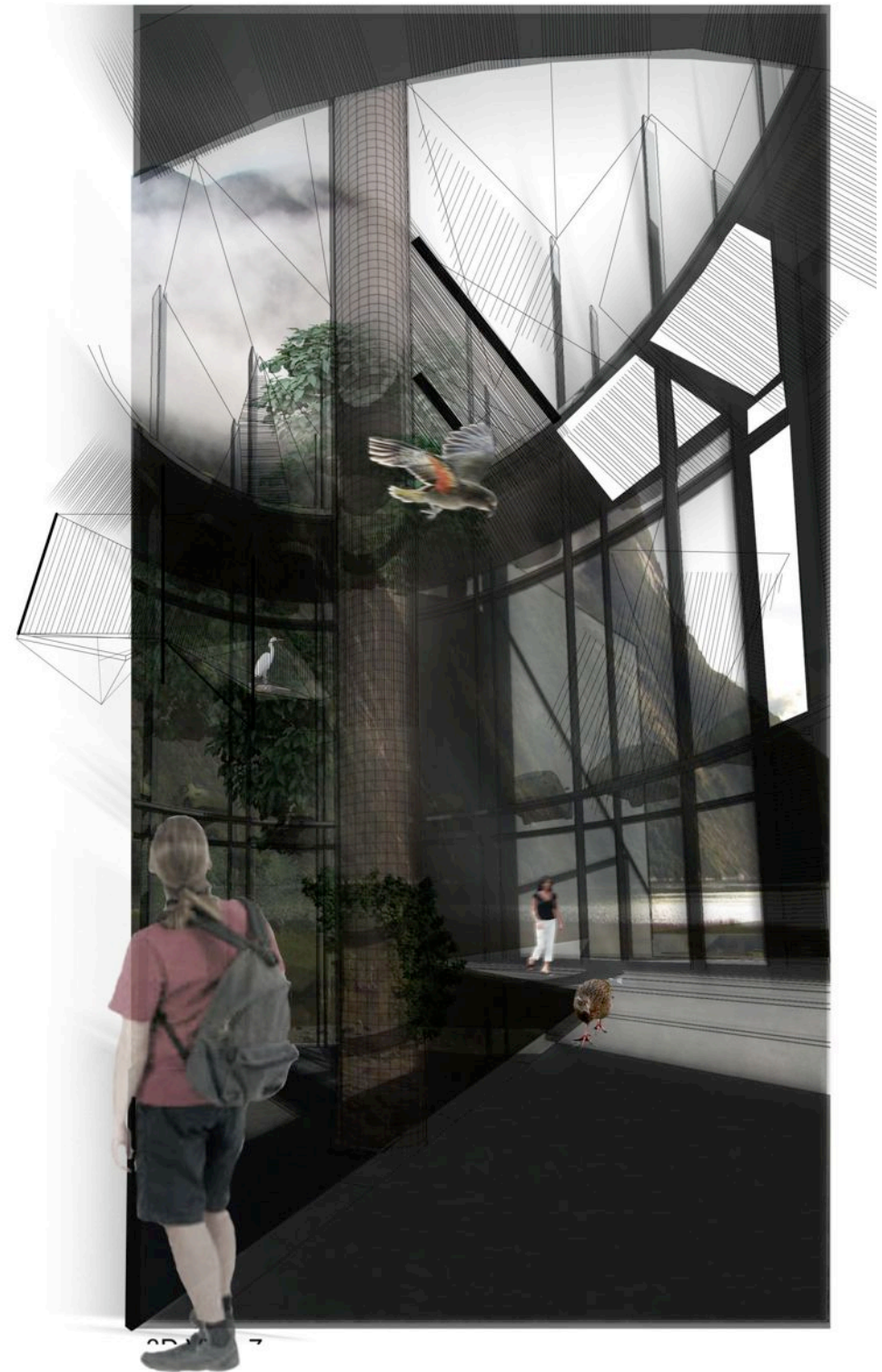
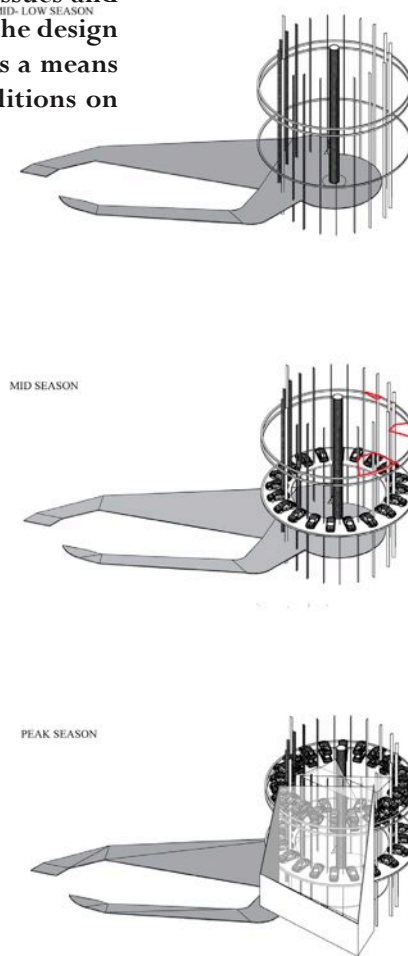


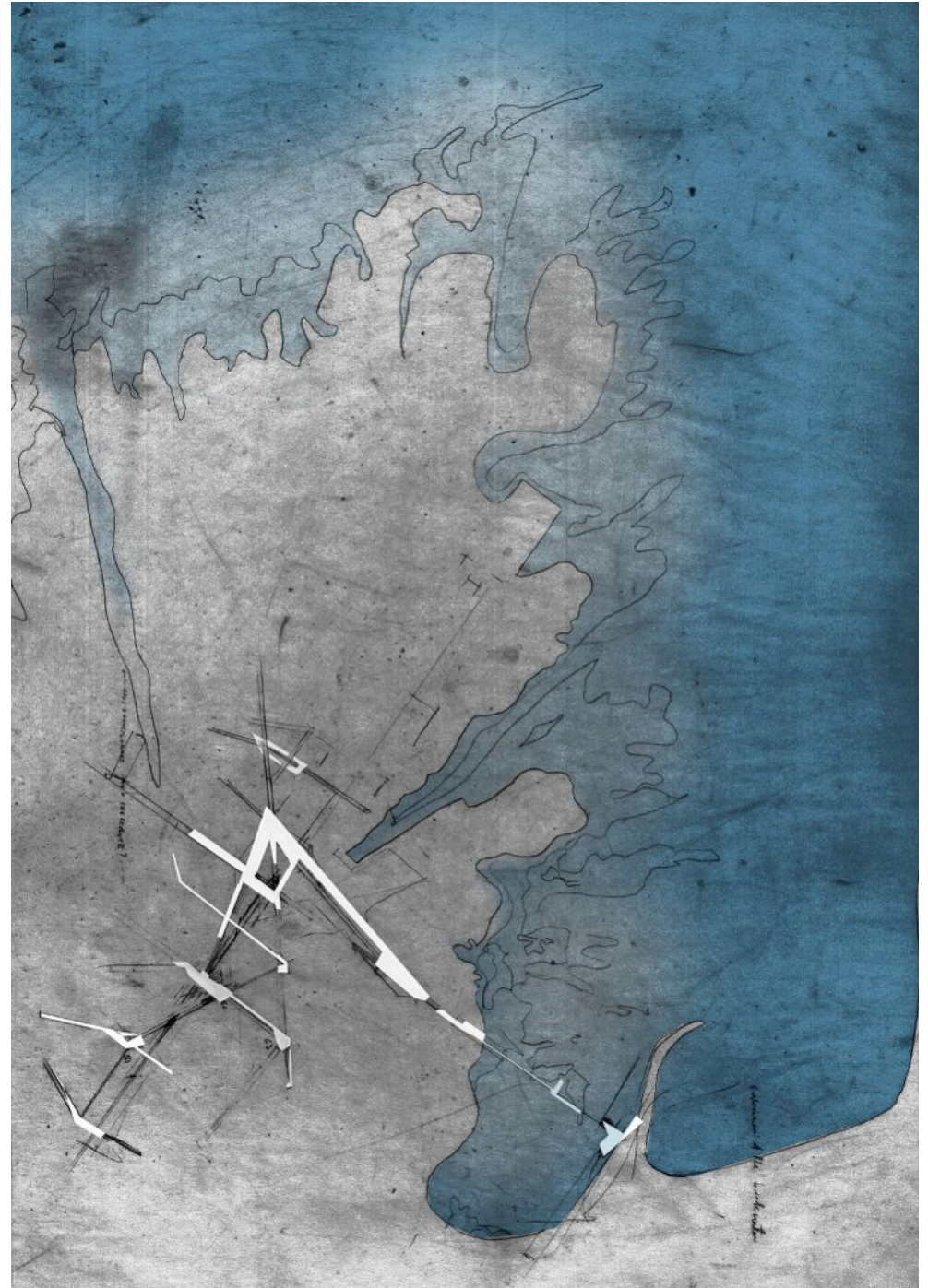
Figure 7.2. Diagrams and drawings: Cross programming (within a single building)
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Relocation and Re-link (week 18)

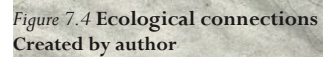
This design strategy explores the possibilities of exploiting pedestrian connection on the site. This scheme places emphasis on designing and developing a mega scale pedestrian walkway, through architectural form.

Design explores the potential of the invention at the scale of a master plan. This study explores long and thin elements in the landscape.

Figure 7.3. Relocation and Relink.
Created by author



This design strategy focuses on establishing and improving ecological connections on the site. I found that ecological connections did not need to be a priority in re-developing the site as the size of the human induced damage was not large enough to impact the flows of wild-life and ecological systems. Emphasis was then placed on preserving the natural values of the landscape through design of a visitor experience. These ecological connections were considered through the regeneration of nature scheme presented in the design scheme (page 60).



APPENDIX B

Informed design

In order to design site-specific architecture, the design process shifted priority from the design of strategic frameworks to the design of specific forms. This process focused on developing site specific qualities within responsive forms. Architectural form was initially developed with consideration to the strategic. Master plan frameworks. These forms were then manipulated to be delicate. In order to test the success of static forms that are responsive, the building was analyzed in relationship to and master plan and phasing strategies.

Site specific criteria

A site specific criteria was used to specify strategic approaches. The natural setting is a dominant feature of the site. This is a key consideration for the s site-specific design criteria as the design of buildings in pristine landscape must be sensitive.

Site -specific design considerations:

- The development of architecture must be sensitive. Design needs to consider how the buildings physically interact with the landscape.
- Architectural form should add to the experience of being immersed in the landscape.

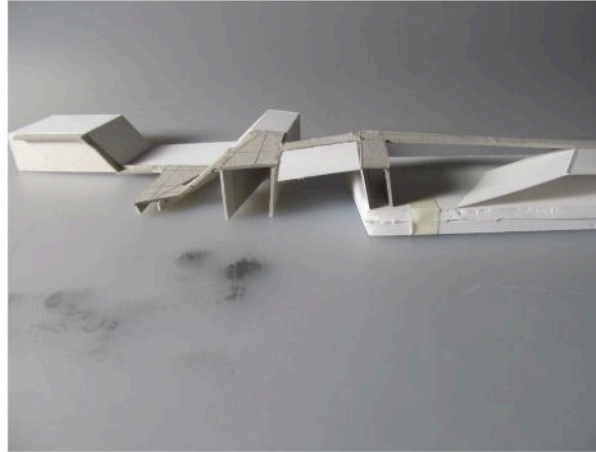
New develop schemes need to offer ways to improve the current infrastructure and facilities on site.

Initial formal modelling

Through a process of physical modelling, the physical relationship between architectural form and landscape was investigated. The four photos on the right show this process.

Additional research into relevant case studies explored a range of methods for architecture to engage with the landscape. Through manipulation of architectural form and ground plane, ideas of refilling, valleys and trenches, burying and surface folding have been explored to engage architectural and landscape. These ideas have been explored and tested against my developed design of the education building.

'Surface folding' to create walkways and enclosures

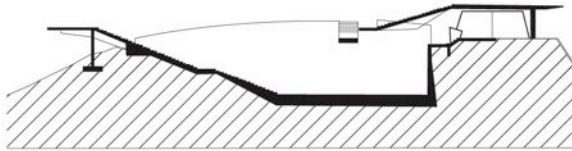


exploration of 'long, thin forms that 'balance' in the landscape.



Figure 7.5 Form studies: responsive architectural forms
Created by author

Kiro San Observatory



Case study 1: KiroSan, Japan, 1994, Kengo Kuma.

Refilling:

The KiroSan Observatory is designed as a narrow slit buried in the landscape. The natural site of the observatory park has been restored to its original form through a process of refilling.

My response

I had adapted this concept to see what opportunities arise when I test it with my project. Starting on the current flat airstrip, the design of architecture forms a narrow rectangular form in the landscape. Through a process of refilling, the landscape is reconstructed into undulating hills that surround the building.

My response

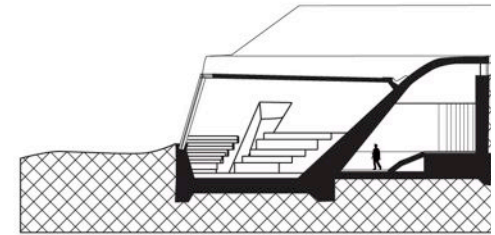
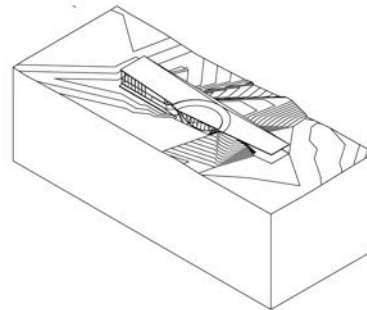
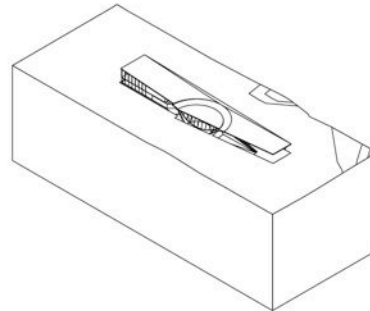


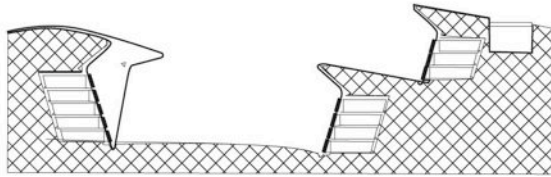
Figure 7.6 Refilling.

In Kuma (1999). Kengo Kuma : geometries of nature.
Milano : L'arca. Created by author

Figure 7.7 Refilling.
Created by author

Igualada Cemetery

My response



Section: Igualada Cemetery.

Casestudy 2: Igualada, Barcelona, Spain, 1985-1994,
Enric Miralles and Carme Pinos.

Valleys and trenches

The architectural forms are sunk into the ground to create a constructed landscape of valleys and trenches. Through a process of exaction the architecture is embedded within the landscape.

My response

This was translated into my design through the configuration of a central passage that carves through the landscape. In order to create a trench like form, the landscape has been constructed to meet the roof level of the building. The others side of the building is left open to reveal a carving form in the landscape.

Figure 7.8. [Valleys and trenches. Section of the Igualada Cemetery.]
In Zabalbeascoa, A., Miralles, E. & Pinos, C. (1996). *Igualada cemetery*. London: Phaidon.

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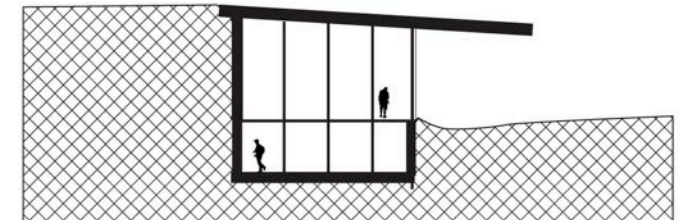
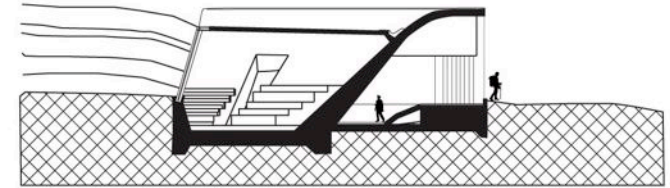
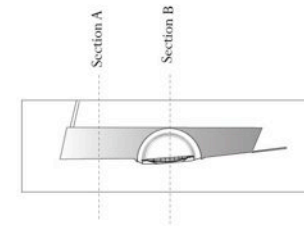
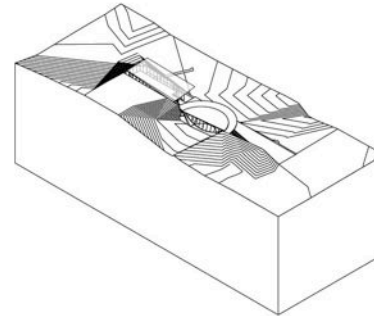
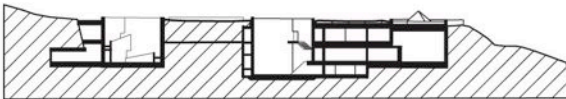


Figure 7.9 Valleys and trenches.
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Chichu Art Museum

My response

Tadao Ando buries the museum underground



Adapted diagram of a section cut through the Chichu Art Museum

Case study 1: Chichu Art Museum
Naoshima island, Japan, 2004
Tadao Ando

Burying

The Chichu Art Museum has been buried underground. By submerging the buildings entire volume below the ground in order to preserve that natural scenery (Hatakeyama, 2005).

Instead of burying, this concept design raises the natural ground level to gain the same experience of primary viewing the landscape.

Figure 7.10. Burying
Hatakeyama, N. (2005). Chichu Art Museum : Tadao Ando builds for Walter De Maria, James Turrell, and Claude Monet. Ostfildern : Hatje Cantz.
Created by author

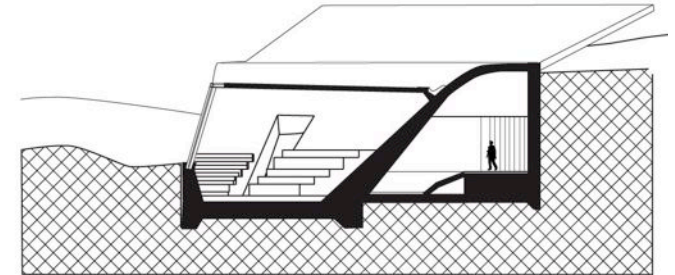
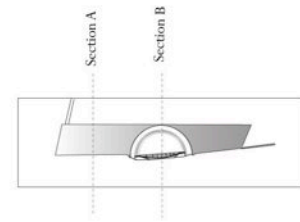
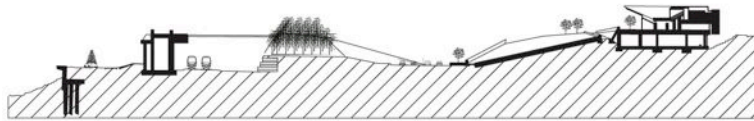


Figure 7.11 Valleys and trenches.
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Olympic Sculpture Park

My response



Case study 4:
Olympic Sculpture Park, Seattle, 2001-2007
Weiss/Manfredi Architecture/Landscape/
Urbanism

SURFACE FOLDING

Seattle:

The surface has been folded to create a hybrid form, which integrates architecture, infrastructure and landscape.

This was explored through overlaying the surface of the landscape with the roof surface of the building in hopes of creating a hybrid form.

Figure 7.12 Surface folding.

In Weiss, M (2008). *Weiss/Manfredi : surface/subsurface*. New York : Princeton Architectural Press.

Created by author.

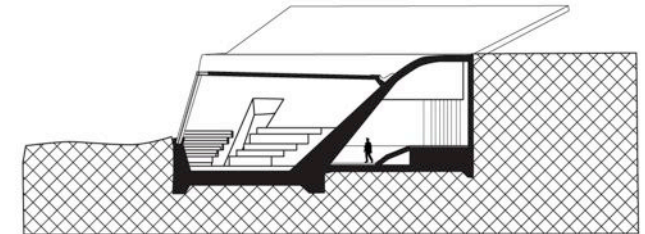
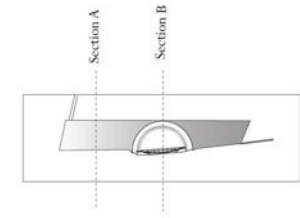
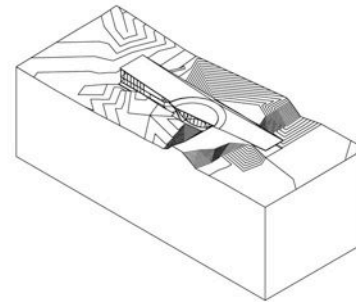


Figure 7.13. Surface folding
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