

# LIFE LESSONS FROM THE LANDSCAPE

## SPATIAL EDUCATION FOR EARTHQUAKE PREPAREDNESS



A THESIS  
BY SAMANTHA KATE MCGAVOCK



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BY

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# ABSTRACT

Architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape and providing places where interaction is focussed around seismic issues. The continued awareness of changes to our landscape, potential loss of life, property, and national cultural or historical artefacts is an important means by which future preparedness can be encouraged. This thesis argues that an awareness of the message to safeguard one's future and one's family's futures could be understood through a spatial experience.

This thesis proposes an architectural approach for seismically active contexts using a specific site – a recreational reserve called Harcourt Park in Upper Hutt – as a design research case study. The site is of great geological significance to the Wellington region and New Zealand as its natural landmarks can be used to measure and publicly witness the direct effects of seismic movement along the Wellington Fault line which runs through the centre of the site. The thesis uses architecture to transform the site into a living memorial, which recognises the past devastating earthquakes in New Zealand and provides for the commemoration of losses from future damaging earthquakes should public preparedness not improve. The architecture also functions as an earthquake education facility and geologist research facility in order to enhance the educational experience of the site. The intention of the thesis is to use architecture as a means of actively enhancing public awareness of the need to understand and prepare for the effects of seismic activity.

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# INTRODUCTION 1

## 1.1: SCOPE OF INVESTIGATION

This architectural design-research has been conducted in Wellington, New Zealand at a time when the upheaval surrounding Canterbury's devastating and highly unexpected<sup>1</sup> seismic surge still remains unsettled. Through mobile witnessing, internet sites, and other media sources, Wellington residents have been provided ways to keep up to date with the effects of more than 1400 earthquakes which have shaken Canterbury soil over a twelve month period<sup>2</sup>. While Canterbury has held the spotlight in this flood of public attention, the media has also highlighted Wellington's own seismic vulnerability; focussing on the current incapacity of the city's infrastructure and built fabric to outlive a major earthquake<sup>3</sup>.

The New Zealand Institute of Architects (NZIA) and New Zealand Institute of Landscape Architects (NZILA) have responded to this issue with the seminar series *Talking Cities*, a public seminar created to discuss and promote better ways of building and planning with earthquake preparedness in mind. A discussion began during seminar three regarding a concern that the public might forget about the risks associated with living in an earthquake prone region as media attention diminishes and time passes. Maurice Halbwachs calls this *collective forgetting*, a phenomenon where group memory gradually erodes over time, not out of 'social ill will nor indifference' but

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1 Briole, Pierre and Marcello and others de Michele. "The hidden fault that caused the February 2011 Christchurch earthquake." 2010. GNS Science. 26 June 2011 <<http://www.gns.cri.nz/Home/News-and-Events/Media-Releases/Most-damaging-quake-since-1931/Canterbury-quake/Hidden-fault>>.p.1

2 Nicholls, Paul. Christchurch earthquake map. 14 November 2011. 12 November 2011 <<http://www.christchurchquakemap.co.nz/>>.p.1

3 Frykberg, Laura. "What would happen if a major quake hit Wellington?" 1 March 2011. 3 News. 23 May 2011 <<http://www.3news.co.nz/What-would-happen-if-a-major-quake-hit-Wellington/tabid/423/articleID/200453/Default.aspx>>.p.1

Jolliff, Emma. "3 News." 13 September 2010. Would Wellington Survive an Earthquake? 23 May 2011 <<http://www.3news.co.nz/Would-Wellington-survive-an-earthquake/tabid/423/articleID/175740/Default.aspx>>. p.1

rather because group members fade away and other important events and issues arise which take precedent in the minds of the populace.<sup>4</sup> Those who were in Wellington at the time of the Canterbury earthquakes are not immune to this public amnesia. This is because their individual memories – which indeed comprise the collective – are not lived personal experiences; they are instead secondary memories of the experiences of others. These experiences can be witnessed and re-witnessed through digital, mobile and networked media almost anywhere, so that the future and past are collapsed into an extended present<sup>5</sup> and the significance and emotion of the actual event is at a risk of being lost. Collective forgetting is concerning when one considers that the risks associated with living in an earthquake prone region never actually disappear, whereas people's attitude towards the earth beneath their feet is ever changing, becoming frightened and prepared or unnerved and complacent depending on the earth's apparent instability. At the best of times, New Zealander's generally choose not to associate New Zealand nature with violent and life changing events such as earthquakes;<sup>6</sup> however in times of seismic crisis there is no denying the truth that comes to the surface.

## **1.2: PROBLEM STATEMENT**

Architecture in seismically active regions needs to be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity so that the public do not forget the risks associated with living in such areas.

## **1.3: RESEARCH INTENTION**

The principle intention of this research is to ascertain how architecture can be used to highlight the underlying prevalence of earthquake activity within seismically active contexts using a specific site – a recreational

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4 Halbwachs, Maurice and F.J. and Ditter V.Y. trans. Ditter. *The collective memory*. New York: Harper and Row, 1980. p. 82

5 Reading, Anna. "The London bombings: Mobile witnessing, mortal bodies and global time." *Memory Studies* (2011): 298-311. p.300

6 Clark, Nigel. "Cultural studies for shaky islands." Bell, Claudia and Matthewman, Steve ed. *Cultural studies in Aotearoa New Zealand : identity, space and place*. New York: Oxford University Press, 2004. 3-18.p.6

reserve called Harcourt Park in Upper Hutt – as a design research case study, in order to remind or inform the public about the importance of earthquake preparedness.

## **1.4: RESEARCH APPROACH: METHODOLOGY, STRUCTURE AND THEORETICAL BASIS**

**CHAPTER 2: CONTEXTUAL ANALYSIS:** The intention of this section of research is to uncover places where *indicators of seismicity* exist, considered here to be a constructed object or spatial experience which reminds the public of the presence of seismicity in the region, such as earthquake prone building signage, seismically retrofitted building traces, the transportable *Tour Guide for Fault Finders* brochure and permanent signage indicating various fault-lines and geologically significant sites throughout the Wellington region. With this knowledge, it is then possible for architectural intervention to be introduced as a considerate player in an existing network so as to compliment that which is already present. A key network where architecture could be introduced is within the currently undervalued *Fault Finders* trail. A trail map can be found on the Wellington City Council website, indicating thirteen geologically significant sites in the Wellington region,<sup>7</sup> which are then marked with permanent signage upon arrival at the sites. This thesis proposes that architecture could be introduced at Harcourt Park (stop number thirteen on the trail) as a means of highlighting the prevalence of seismicity within an established wider network. Architecture goes beyond signage because it invites intimate social engagement with the seismic features, so that the interaction itself enters the collective memory with far more resilience.

**CHAPTER 3: THE ARCHITECTURAL REMINDER:** This section begins by discussing the memory Wellington's majority holds for New Zealand's past earthquakes and how this can be used to encourage preparedness within the community. In the last 100 years there have been no earthquakes which have caused mass destruction or death in the Wellington region, for many Wellington residents memories of New Zealand's most devastating earthquakes at Murchison (1929; magnitude 7.8; 17 fatalities), Hawke's Bay (1931; magnitude 7.8; 256 fatalities), Inangahua (1968; magnitude 7.1; 3 fatalities) and most recently Canterbury (2010-2011;

<sup>7</sup> Anonymous. "The Wellington fault - A tour guide for fault finders." 15 July 2011. GNS Science. 15 July 2011 <[www.gns.cri.nz/Wellingtonfault](http://www.gns.cri.nz/Wellingtonfault)>.p.1-2

magnitude 6.3; 182 fatalities)<sup>8</sup> are instead compiled of secondary witnessed memories from the media, information sites and oral history. These secondary memories constitute what Maurice Halbwachs refers to as the *collective memory*. The living memorial concept is then discussed as an effective architectural type for maintaining the collective memory within specific communities. The term *living memorial* is suitable because it describes a memorial which goes beyond the sole purpose of commemoration. Instead, a secondary function is adopted to ensure that the memorial continues to live on within the community it is serving such as education, research and other community facilities. The living memorial concept was introduced at the close of World War Two in North America and was adopted by New Zealand in the form of War Memorial Halls as a way of avoiding duplicated or over-shadowed World War One memorial statues<sup>9</sup>. While these living war memorials did not have the imperative of preparedness, the concept can be advanced and applied to earthquake memorials for the purpose of future preparedness. Two case studies of such living earthquake memorials are discussed, firstly, *The Disaster Reduction and Human Renovation Institution* in Kobe, Japan provides a strong programmatic precedent for a building which encourages future preparedness, however the architecture itself is limited to the exhibition of dioramas, and is not integrated with the landscape in a dynamic way, which is the advancement that the current architectural investigation in this thesis offers. The second case study, *The Church: Acts of God* designed in Newcastle, Australia provides a poetic example as to how architecture, landscape and occupation can be integrated and utilised to promote earthquake preparedness by committing to faith in God. The current architectural investigation advances this case study by addressing secular rather than sacred imperatives. The programmatic imperatives of the current architectural investigation require education, research and commemoration to occur at once within a site which is publicly available to all who wish to use it as opposed to a place which exists specifically to increase an awareness of God.

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8 Anonymous. "New Zealand disaster timeline." 3 July 2011. New Zealand history online. 3 July 2011 <<http://www.nzhistory.net.nz/culture/new-zealand-disasters/timeline>>. pg1

9 Maclean, Chris, Jock Phillips and Debbie Willis. *The sorrow and the pride : New Zealand war memorials*. Wellington: GP Books Historical Branch, 1990. p. 137

#### **CHAPTER 4: LIFE LESSONS FROM THE LANDSCAPE: ARCHITECTURE INFORMED BY A SEISMIC SITE:**

The investigation is questioning how the ever-present threat of seismic catastrophe can be communicated to the public through architecture, so that they remain vigilant and prepared. This is therefore the ‘life lesson’ that can be extracted from the constantly transforming landscape and expressed using architectural language. This section begins with a discussion regarding typical social responses of *Earthquake Architecture*, as considered by New Zealand engineer and architectural academic Andrew Charleson. It is argued here that typical symbolic or formal references to seismic issues are limited representations of site, which prioritise physical aspects of site and above psycho-environmental aspects. A range of architectural theorists including, Norberg-Shultz, Steven Holl, Tadao Ando and Oswald Mathias Ungers advocate the consideration of both physical and psycho-environmental aspects of site in order to create architecture which is rooted to the genius loci of place. Kevin Thwaites and Ian Simkins landscape architecture theory *The Experiential Landscape* is introduced as a means of uncovering and understanding the genius loci of place, and expressing this through built form.

**CHAPTER 5: RESEARCH SITE ANALYSIS: HARCOURT PARK:** This research focuses on stop thirteen of the Wellington *Fault Finders Trail* as a case study, a recreational park and seismologically significant site in Upper Hutt called Harcourt Park. The site’s geological significance is due to the dynamic relationship between the Wellington fault-line which runs through the site and a series of river terraces which lie perpendicular to the fault axis. The movement of the Indo-Australian and Pacific Plates can be measured using these river terraces as natural landmarks. The park is treated as a research site for architectural investigation and an exemplar to demonstrate how architecture can be used to highlight aspects of seismicity in other areas. This section of research is a primary site analysis through field work which is analysed using the Experiential Landscape methodology set out by Thwaites and Simkins to ensure that physical and experiential aspects of site are both considered in the architecture’s conception.

**CHAPTER 6: ARCHITECTURAL INVESTIGATION:** An architectural investigation was then conducted at this research site – Harcourt Park – exploring how architecture can be used to communicate land

transformation over time as a result of seismic activity, therefore expressing the importance of ongoing disaster preparedness. The architectural investigation is also primarily questioning how architecture can act as a public reminder, an active participant in the promotion of disaster preparedness. Key theoretical and site-specific imperatives determine the outcome of architecture at this site, which are summarised in a table as a part of the 'design methodology' sub-section. In this way, the architecture is solving a set of landscape problems while simultaneously resolving the over-arching theoretical imperative of the thesis.

The proposed program for the design research is a living memorial which commemorates the most devastating past earthquakes in New Zealand while also providing space for future commemoration of the losses which will follow future earthquakes should disaster mitigation not increase. In this way, the living memorial concept is extended to also allow the imperative of encouraging preparedness. This arrangement can be likened to a shared headstone when a husband and wife are to be buried side by side. If the husband were to die first, the wife is faced with a blank space below her name which will be filled with her date of death when the time comes, which she has to witness every time that she visits the grave to commemorate her loved one. The blank space acts as a reminder to the wife that death will eventually come, and she is therefore reminded about the importance of living a healthy and full life. The architecture also functions as an earthquake education facility and geologist research facility as a means of enhancing the educational experience of the site.

As an approach to allow visitors to engage with the two major river terraces at the site on both sides of the fault-line (therefore witnessing the transformation of site from multiple positions), the design proposes to create four individual pieces of architecture, symbolically representing the four educators of site. A system of identification for the individual buildings has therefore been applied to assist in simplifying the complexity caused by cross-programming and building separation. Four titles are assigned to the buildings, which are emblematic of the program type within. In this way, the program is not limited by the assignment of the title 'Research Lab', rather the title allows for all programs to exist at once while ensuring that the architectural imperatives are met. These educators, the *Guide*, the *Curator*, the *Tutor* and the *Groundskeeper* are



employed symbolically to communicate land transformation at Harcourt Park as a way of expressing the ever-present nature of seismicity and the importance of preparedness. The process of research site analysis and its translation into architecture through design is fundamental to the over-arching thesis and is a focus of this enquiry.

**CHAPTER 7: CONCLUSION:** The conclusion discusses how the research has met the primary intention of developing architecture which highlights the underlying prevalence of seismic activity and serves as a public reminder communicating the importance of earthquake preparedness. The conclusion considers how key theoretical and site specific imperatives have influenced the proposed architectural intervention at Harcourt Park. Finally limitations of the model are discussed and areas for future research are presented.



# CONTEXTUAL ANALYSIS 2

## 2.1: INTRODUCTION

This thesis argues that architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape. Such architectural intervention then becomes an indicator of seismicity, considered here to be a constructed object or spatial experience which reminds the public of the presence of seismicity in the region. Such indicators currently manifest in different forms throughout the Wellington region. This chapter investigates existing indicators of seismicity such as; earthquake prone building signage, seismically retrofitted building traces, the transportable *Tour Guide for Fault Finders* brochure and permanent signage indicating various fault-lines and geologically significant sites throughout Wellington. With this knowledge, it is then possible for architectural intervention to be introduced as a considerate player in an existing network so as to compliment that which is already present. Architecture goes beyond the signage which presently indicates earthquake prevalence by encouraging social engagement with dynamic seismic features and the after-effects of disaster, in turn emphasising the importance of preparedness in the minds of visitor's.

## 2.2: INDICATION OF EARTHQUAKE PRONE BUILDINGS

Wellington City Council's Earthquake Prone Building Policy has been developed under the requirements set out in The Building Act 2004 which;

*"...expresses the government's objective for earthquake-prone buildings to be strengthened to the appropriate seismic standards, or alternatively, demolished. It has an underlying objective to reduce the potential for injury, loss of life, or damage to other property that may result from the effects on buildings of a moderate earthquake."*<sup>10</sup>

Following the first unveiling of Wellington City Council's Earthquake Prone Building List on March 4th 2011, there has been an outbreak of red (high priority), blue (moderate priority), green (low priority) and yellow (passive)<sup>11</sup> coded signs in the entranceways of 219 affected buildings.<sup>12</sup> These signs are intended to warn

<sup>10</sup> Anonymous. "Earthquake prone buildings policy." 2009. Earthquake prone buildings policy. 12 September 2011 <<http://www.wellington.govt.nz/plans/policies/earthquake/pdfs/earthquake.pdf>>. p.2

<sup>11</sup> ibid p.6

<sup>12</sup> Anonymous. "Wellington City Council." 5 December 2011. List of earthquake prone buildings as at: 5/12/2011. 13 December 2011 <<http://www.wellington.govt.nz/services/earthquake/pdfs/eq-bldgs-list.pdf>>. p. 1-9



patrons that the building they are about to enter could be a particularly dangerous place to be in the event of an earthquake. Currently nine buildings (including the Wellington Town Hall, State Opera House, and the Old Public Trust Building) also find themselves in the worst case or ‘high priority’ scenario, where signage also indicates that buildings need to be vacated, strengthened or demolished within a matter of months.<sup>13</sup>

132 Cuba Street was one of the most prominent and well-patronised buildings<sup>14</sup> to be given a final notice. The New Zealand Heritage Places Trust category two building has received media and public attention due to its high priority status and is now closed. For months, patrons of Ernesto Cafe (the building’s former key commercial tenant) were greeted at the door with a red warning sign, informing them that the building “will have its ultimate capacity exceeded in a moderate earthquake”<sup>15</sup> classing it as earthquake prone. In this particular situation, the signage also informed patrons and staff that the building must be strengthened or vacated by October 30th 2011. Despite the building being classified and publicised as a worst case scenario, staff member Marie Groenendijk told Wellington’s Dominion Post that from what she had seen, the signage had not scared off customers,<sup>16</sup> and that personally she was not concerned about working in the building. Patrons Brian, Sue and Bridget Pidford shared this attitude, claiming they “were unfazed about dining in a quake-risk building”.<sup>17</sup> Mr Pidford told the Dominion Post: “I’m not worried till it starts shaking and then I’ll be out the door as fast as I can.”<sup>18</sup> This unfazed attitude demonstrates the incapacity of signage to successfully communicate seismic danger to the public because signage fails to offer opportunities for interactive social response and can be ignored or completely over looked.

13 Schouten, Hank. Wellington buildings on quake notice. Wellington: Dominion Post, 2011. pg 1

14 ibid pg 1

15 Anonymous. “Earthquake prone buildings policy.” 2009. Earthquake prone buildings policy. 12 September 2011 <<http://www.wellington.govt.nz/plans/policies/earthquake/pdfs/earthquake.pdf>>. p.4

16 Schouten, Hank. Wellington buildings on quake notice. Wellington: Dominion Post, 2011.pg 1

17 ibid pg 1

18 ibid pg 1

FIG 1: (LEFT) Earthquake prone building final notice. 132 Cuba Street, Wellington. Source: Authors own

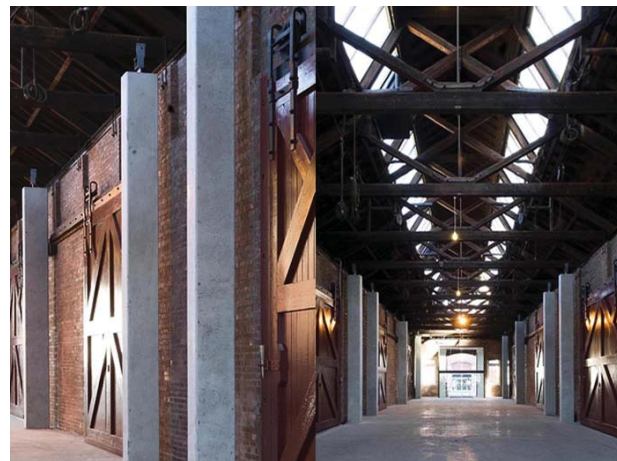
FIG 2: (RIGHT) Vandalised earthquake prone building signage. Ghuznee Street, Wellington. Source: Authors own

## 2.3: INDICATION OF SEISMICALLY RETROFITTED BUILDINGS

Due to local code requirements, certain buildings within the Wellington region require seismic retrofitting in order to remain certified or improve their certification category.<sup>19</sup> In some instances, such as non-heritage buildings, the designer and client might choose to make alterations obvious. In such cases, the traces of seismic retrofitting are left as permanent indicators of seismic prevalence to those who engage with the building. While these traces are not explicit to all lay patrons, certain overt changes to structure can be read as something specifically technical and new even if the structural implication of such alterations is not fully understood. An example of such seismic retrofitting occurs at Shed 13, a historic building constructed in 1905 on the Wellington waterfront, currently tenanted by Mojo Coffee. Here, retrofitting technologies include the use of Fibre Reinforced Polymer (FRP), vertical post-tensioning (to improve in-plane and out-of-plane performance) and the use of controlled-deflection yielding devices<sup>20</sup> which are visible within the building's interior. Without the presence of signage, the prevalence of seismicity can be understood spatially, where the decision to improve a buildings seismic performance reminds the public that the risk of earthquake

19 Anonymous "Earthquake prone buildings policy." 2009. Earthquake prone buildings policy. 12 September 2011 <<http://www.wellington.govt.nz/plans/policies/earthquake/pdfs/earthquake.pdf>>. p.5

20 Thornton, A. "Twenty-five years of strengthening Wellington ." 2010 NZSEE conference proceedings. Wellington: NZSEE, 2010. p.8



activity is ongoing and commands constant vigilance.

In other cases, such as heritage buildings, the age, type, structure or material of a building might require an incognito retrofit, where minimal or no visual changes to the appearance of a building should be apparent. In such instances, visual traces of retrofitting are not left as indicators of the prevalence of seismicity. Instead, the reminder of seismicity lies in the public's experience of the retrofit process. If, for example, patrons are denied access to a building or asked to temporarily relocate, the interruption to their daily life acts as a reminder of earthquake threat. Again the prevalence of seismicity within a region is understood experientially by understanding the importance of building maintenance to mitigate earthquake risk, even at the expense of convenience.

Fig 3 (left) Interior showing seismic retrofit, Shed 13, Wellington

Source: <http://www.ccm.co.nz/projects/heritage/shed-13/>

Fig 4 (right) Signage informing patrons of earthquake retrofit.

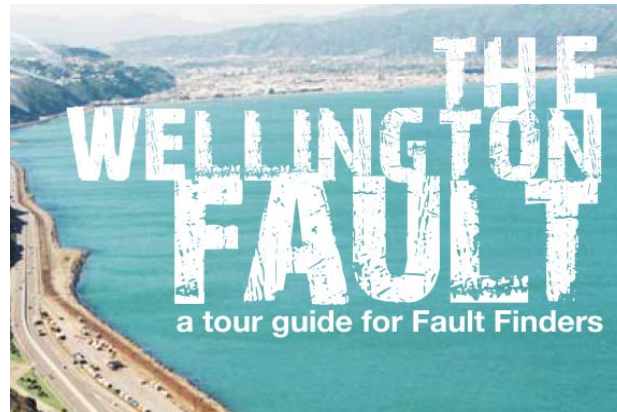
'City stop' convenience store, Courtney Place, Wellington. Source:  
Authors own

## 2.4: INDICATION OF GEOLOGICAL FEATURES, EARTH TRANSFORMATION OVER TIME AND THE WELLINGTON FAULT FINDERS TRAIL

Throughout the Wellington region there is an abundance of interesting geological features which cause and result from seismic activity. Indicators of Wellington's three major fault-lines, the Wellington Fault, Ohariu Fault, and Wairarapa Fault<sup>21</sup> are located at certain points by permanent signage. The Wellington Fault is the chief fault in the region which runs from the Cook Strait, through Thorndon to the ferry terminal area, then offshore and into Lower and Upper Hutt<sup>22</sup>. Along this fault thirteen significant seismological sites have been collated by GNS Science and the Earthquake Commission (EQC) into a network called *The Wellington Fault Finders Trail*. A brochure can be downloaded from the internet to guide one's way towards the different destinations which include; Te Papa, Mt Victoria lookout, Red Rocks and Long Gully, Hawkins Hill and Wind Turbine, Tinakori Road and Botanic Garden, Thorndon, Hutt Motorway, Petone Foreshore and William Street, Wainuiomata Hill, Hutt Road and Te Mome Road, Taita Gorge, Mains Rock and Riverstone

21 Anonymous. "Heritage earthquakes." 12 August 2011. Wellington city libraries. 12 August 2011 <<http://www.wcl.govt.nz/heritage/earthquakes.html>>. pg 1

22 Perrin, N and P Wood. Defining the Wellington fault within the urban area of Wellington city. Client report. Wellington: Institute of geological and nuclear sciences limited, 2003. pg 12.





Terraces and Harcourt Park as sites of particular geological interest to the region.<sup>23</sup> The Tour Guide for Fault Finders brochure serves as a transportable indicator of seismicity for these thirteen sites, which is often supplemented by permanent signage indicating arrival at the sites. Within this network, a suitable site for the introduction and testing of an architectural response exists at Harcourt Park in Upper Hutt. Architecture goes beyond signage by allowing visitors to interact with dynamic seismic features of site. Such architecture would serve the overall network by providing a destination; an occupiable place to pause and reflect the network in its entirety.

## 2.5: CONCLUSION

This thesis argues that architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unrelenting transformation of the landscape. While indicators of seismicity already exist in different forms such as earthquake prone building signage, seismically retrofitted building traces, the transportable Tour Guide for Fault Finders brochure and permanent signage indicating fault-lines and geologically significant sites throughout Wellington, there is further opportunity for the introduction of architecture which enhances an awareness of seismic prevalence by communicating the constant transformation of the landscape. While it would not be a suitable solution to introduce architecture at all of the thirteen sites along the Fault Finders trail, it is argued that architectural intervention would strengthen the public's awareness of seismic issues as part of a greater network, even from a single location. A suitable site for architectural intervention exists at a recreational park called Harcourt Park, which is stop number thirteen on the Tour Guide for Fault Finders and is currently unoccupied. This site is treated as a research site – an exemplar as to how architecture could strengthen public awareness in other earthquake prone regions.

FIG. 5 (LEFT) The Wellington Fault, a tour guide for fault finders brochure. Source: <http://gns.cri.nz/Home/Learning/Science-Topics/Earthquakes/Virtual-Tours>

FIG. 6 (RIGHT) Signage indicating Wellington fault scarplet, Harcourt Park, Upper Hutt. Source: <http://www.ilankelman.org/disasterdeaths.html>

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<sup>23</sup> Anonymous "The Wellington fault - A tour guide for fault finders." 15 July 2011. GNS Science. 15 July 2011 <[www.gns.cri.nz/Wellington-fault](http://www.gns.cri.nz/Wellington-fault)>. pg. 2



# THE ARCHITECTURAL REMINDER 3

## 3.1: INTRODUCTION

The architecture proposed within this thesis seeks to encourage earthquake preparedness by commemorating devastating earthquakes in New Zealand and reserving space for future commemoration of New Zealand earthquakes should people not choose to mitigate risk. Hence, this section begins by discussing the partial and incomplete secondary memories that Wellington's majority holds for New Zealand's most devastating earthquakes at Murchison (1929; magnitude 7.8; 17 fatalities), Hawke's Bay (1931; magnitude 7.8; 256 fatalities), Inangahua (1968; magnitude 7.1; 3 fatalities) and most recently Canterbury (2010-2011; magnitude 6.3; 182 fatalities) which constitute the collective memory of the public and how these memories can be used to encourage earthquake preparedness within the community. The collective memory concept was first introduced by French philosopher and sociologist Maurice Halbwachs in his writings *La Mémoire collective* (On Collective Memory) 1950.<sup>24</sup> Halbwachs argues that memory is a specifically social phenomenon<sup>25</sup>, a group memory that exists outside of the lives of the individual. His model emphasises the 'partial and incomplete nature of past recollections'<sup>26</sup>, attributing the ability to piece disparate memory fragments together through interaction with external stimuli. Halbwachs maintains that such interaction provides a framework into which remembrances can be woven. Architecture is a useful mechanism in collecting and maintaining the collective memory of a community as it provides a physical setting for interaction to occur between visitors. Architecture which is focussed on the issue of seismic prevalence allows a place for visitors to bring their disparate memory fragments related to the subject; memories from a museum – visited as a child – explaining the devastation at Hawkes Bay, memories from a conversation with a friend who has been

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24 Halbwachs, Maurice and FJ and Ditter V.Y trans. Ditter. *The collective memory*. New York: Harper and Row, 1980. pg 27

25 Whitehead, Anne. *Memory*. London and New York: Routledge, 2009. pg 123

26 Whitehead, Anne. *Memory*. London and New York: Routledge, 2009. pg 126

refused insurance for her fallen home in Canterbury, or perhaps lived memories of a smaller earthquake felt at work in Wellington when one realises they have not organised a place to meet their husband or children at school. Within architecture, such incomplete memory fragments – which may be overlooked individually – are collected and given weight and meaning.

The living memorial is an architectural type which provides opportunities for interaction that allows the collective memory of a community to come together. The term living memorial describes a memorial which goes beyond the sole purpose of commemoration. A secondary function such as education, research or community support is adopted to ensure that the memorial remains useful and can live on within the community it is serving. The living memorial concept was introduced at the close of World War Two in North America and was adopted by New Zealand in the form of War Memorial Halls, as a way of avoiding duplicated or over-shadowed World War One memorial statues.<sup>27</sup> While these living war memorials did not have the imperative of preparedness, the concept can be advanced and applied to earthquake memorials for the purpose of future preparedness. Two case studies of such living earthquake memorials are discussed.

Firstly, *The Disaster Reduction and Human Renovation Institution* was created to commemorate the 5,000 people who died and honour the 300,000 who were made homeless by the 7.2Mw earthquake<sup>28</sup> and encourage future preparedness following the 1995 Kobe earthquake in south-central Japan. This building functions as a memorial and also provides facilities for education about earthquakes and disaster preparedness. The building features several dioramas and documentary films. The function of The Disaster Reduction and Human Renovation Institution case study is similar to that which is proposed as a means of meeting the imperatives of this thesis. The physical architecture of the Kobe case study is restricted to the containment of exhibits and dioramas, whereas the architecture proposed within this thesis advances the Kobe case study as it tests a fundamentally different approach by integrating architecture and landscape as

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<sup>27</sup> Maclean, Chris, Jock Phillips and Debbie Willis. *The sorrow and the pride : New Zealand war memorials*. Wellington: GP Books Historical Branch, 1990. p. 137

<sup>28</sup> Anonymous. "Kobe earthquake." 1 December 2011. Kobe Earthquake. 1 December 2011 <<http://www.georesources.co.uk/kobehigh.htm>>. pg 1

an evidentiary and informative experience that does not even need any exhibits to achieve this goal.

A case which comes closer to such integration of architecture and landscape is The Church: Acts of God, an un-built architectural proposal by Michael Ostwald, Chris Tucker and Michael Chapman following the 1989 earthquake in Newcastle, Australia. This case proposes a building for religious observance, within a church left in an un-sound state for more than a decade after the earthquake. Using architecture, landscape and the participation of occupants, the case explores the relationship between faith and natural forces or 'Acts of God'. This case is different from the former in that it relies upon and relates to the conditions of site in a dynamic way, which contributes to the reading of the architecture as a measurement of faith. Without the use of dioramas or exhibits, visitors to the church are able to see the effect that their faith has on the architecture. In a religion specific way, this building encourages future preparedness by encouraging visitors to put their faith in God. While this building successfully integrates landscape, architecture and occupants, the architecture proposed within this thesis addresses secular rather than spiritual imperatives. The programmatic imperatives of the architectural investigation within this thesis require education, research and commemoration to occur at once at a site which is publicly available to all who wish to use it as opposed to a place which exists specifically to increase an awareness of God.

### **3.2: WELLINGTON: REMEMBERING THE NATIONS SEISMIC HISTORY**

In the last 100 years there have been no earthquakes which have caused mass destruction or death in the Wellington region. Within this timeframe the most devastating earthquakes in New Zealand have occurred at Murchison (1929; magnitude 7.8; 17 fatalities), Hawke's Bay (1931; magnitude 7.8; 256 fatalities), Inangahua (1968; magnitude 7.1; 3 fatalities) and most recently Canterbury (2010-2011; magnitude 6.3; 182 fatalities)<sup>29</sup>. While the majority of Wellington's community did not personally experience these disasters, information or relayed experience from these moments is readily available. For the first three earthquakes, information consists of images and facts which can be found online, in literature and museums as well as some oral

<sup>29</sup> Anonymous. "New Zealand disaster timeline." 3 July 2011. New Zealand history online. 3 July 2011 <<http://www.nzhistory.net.nz/culture/new-zealand-disasters/timeline>>. pdf

history. At times of crisis or threat, this history resurfaces and is set alongside the current, as a means of demonstrating or comparing the level of devastation.<sup>30</sup> Due to technological advances, the experience and effects of the recent Canterbury earthquakes are more readily accessible. This is the first of New Zealand's major earthquakes where the cell phone has been at hand, allowing photography and film to capture the event at multiple positions. Such information could then be shared globally with others through the cell phone itself or through the internet – which was less developed at the time of the Inangahua earthquake – to be witnessed and re-witnessed in what Anna Reading has termed 'global time', a timeframe of multiple and intersecting temporalities which has arisen from digitisation and globalisation.<sup>31</sup>

While the majority of Wellington residents' individual memories of earthquake devastation are based on the experiences of others, Wellington has been targeted in the media as a collective which is susceptible to earthquake devastation now and in the future. When setting the scene at the beginning of this thesis it was discussed that the media highlighted Wellington's incapacity to cope with an earthquake of a similar magnitude to that in Christchurch. Local government reactions and increases in 'survival kit' items being purchased<sup>32</sup> indicate that earthquake safety temporarily became a key concern of Wellington's community. For Maurice Halbwachs, the collective memory includes "remembrances of events and experiences that are of concern to the greatest number" which are "sufficiently general and impersonal"<sup>33</sup> so that they may be retained as members of the collective move or pass on. In these terms, the impersonal memories of past earthquakes and subsequent local concern constitute a significant part of Wellington's collective memory. Halbwachs argues that the collective memory is most effectively maintained through interaction with external stimuli, such as conversation with an old friend.<sup>34</sup> To this end, architecture can be an active participant in maintaining Wellington's collective memory regarding earthquake risk and safety, by providing places where interaction is focused around seismic prevalence.

30 Boyer, Christine M. *The City of Collective Memory*. London: The MIT Press, 1994. p.377

31 Reading, Anna. "The London bombings: Mobile witnessing, mortal bodies and global time." *Memory Studies* (2011): 298-311. p.298

32 Jolliff, Emma. "Quake a wake up call for Wellington." 2 March 2011. 3 News. 2011 23 May <<http://www.3news.co.nz/Quake-a-wake-up-call-for-Wellington/tabid/423/articleID/200584/Default.aspx>>. p.1

33 Whitehead, Anne. *Memory*. London and New York: Routledge, 2009. p.129

34 Halbwachs, Maurice and F.J. and Ditter V.Y. trans. Ditter. *The collective memory*. New York: Harper and Row, 1980. p.62

### 3.3: THE LIVING MEMORIAL CONCEPT – AN ACTIVE COMMUNITY REMINDER

The term living memorial describes a memorial which goes beyond the sole purpose of commemoration. A secondary function such as education, research or community support is adopted to ensure that the memorial remains useful and can live on within the community it is serving. The need for living memorials was identified even before World War Two ended in order to avoid duplication or overshadowing of existing memorial statues cast to commemorate World War One. In England in 1944, the Royal Society of Arts held a conference which was summarised in a booklet published by the War Memorial Advisory Council:

*“This fact [of too many monuments] compels a re-examination of the question of memorials lest ill considered duplication of those of the last war should result... the key word of the larger memorials should be recreation.”<sup>35</sup>*

The same idea was prevalent in North America where a survey of proposed war memorials in 1945 presented a strong preference for living memorials rather than purely symbolic ones. Of the 125 memorial projects examined, 64 playgrounds, 30 community centres, 15 parks, 11 theatres and 5 halls were proposed, while no one suggested the creation of a new statue.<sup>36</sup> The growing trend of useful memorials had become apparent in New Zealand in the years following the First World War, but the concept was repressed by Allen and Montgomery and did not come into fruition until the centennial memorials of 1940.<sup>37</sup> The living memorial concept was then encouraged by the Labour government’s subsidy for any local memorial which was:

*“...vitally living, something that from the very nature of its use and enjoyment will ever keep before us and the generations that follow us that freedom of life and personal expression for which our men and woman fought and fell.”<sup>38</sup>*

35 The passage quoted is taken from background papers in Internal Affairs (IAA) National Archive Series IA 1, 174/1/2. Biographic details of the English booklet are not provided.

36 Anonymous. “War memorial survey.” War memorial survey. 1945. p. 174

37 Anonymous. Official circular on war memorials. Official circular on war memorials. Wellington: Minister of internal affairs, 1946. p. 2

38 *ibid* p.40

Such freedom of life and personal expression was a key imperative and secondary function which supplemented commemoration within living War Memorial Halls. These living memorials did not have the imperative of preparedness; however an important advancement that this thesis is making is the application of the living memorial concept to an earthquake memorial for the purpose of future disaster preparedness, within a city where the devastation being commemorated and used to encourage preparedness occurred elsewhere.

The living memorials that were constructed to commemorate WW2 in New Zealand responded to public desire at the time<sup>39</sup> however the social and cultural context in 1940's New Zealand was fundamentally different to today. A measure of a contemporary public preference for living or purely symbolic memorials can be gauged from a recent public forum which responded to a news article in The Press titled *How to remember our dark days*<sup>40</sup> regarding a suitable memorial for the Canterbury earthquakes and from the *Christchurch City Draft Plan* which has responded to public input through the *Share an Idea* website which

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39 Maclean, Chris, Jock Phillips and Debbie Willis. *The sorrow and the pride : New Zealand war memorials*. Wellington: GP Books Historical Branch, 1990. p. 139

40 Moore, Christopher. "How to remember our dark days." 6 June 2011. The Press. 8 June 2011 <<http://www.stuff.co.nz/the-press/news/christchurch-earthquake-2011/5401890/How-to-remember-our-dark-days>>. p.1





generated more than 58,000 visits during the six weeks it operated.<sup>41</sup> 44 people responded to the How to remember our dark days article, of which 25% favoured a living memorial concept, 15.9% preferred the purely symbolic, 22.7% suggested the preservation of ruins, 29.5% did not state which they would prefer and 6.9% would prefer their to be no memorial at all. The Christchurch City Draft Plan introduces plans for two types of memorials, one is symbolic; “to honour the lives of those who died in Christchurch’s earthquakes and provide a place to pay respect”<sup>42</sup> which is “a space rather than an object; a place visitors can enter into and experience an emotional response, rather than simply look at an object.”<sup>43</sup> The second proposed memorial has been called the EPI Centre, an Earthquake Preparedness and Information Centre which will function as “a purpose-built museum, research institute, education and entertainment facility to learn about earthquakes and recognise the role they have played in transforming the identity of Christchurch.”<sup>44</sup> The designer of the future Christchurch earthquake memorial will face some complex challenges, as it will need to represent a series of disasters rather than a single event. The unusual nature of this case is “both a challenge and an opportunity for the expression of memory.”<sup>45</sup>

41 Anonymous. Draft central city plan: volume 1. Government Document. Christchurch: Christchurch City Council, 2011. pg 3

42 ibid pg 24

43 ibid pg 24

44 ibid pg 24

45 ibid pg 24



FIG. 5 (LEFT) The Wellington Fault, a tour guide for fault finders brochure. Source: <http://gns.cri.nz/Home/Learning/Science-Topics/Earthquakes/Virtual-Tours>

FIG. 6 (RIGHT) Signage indicating Wellington fault scarplet, Harcourt Park, Upper Hutt. Source: <http://www.ilankelman.org/disasterdeaths.html>

FIG. 9 Whakatane War Memorial Sports Stadium Source: <http://www.whakatane.info/archive/story.146591.html>

FIG. 10 Kawakawa War Memorial Park Source: <http://www.nzhistory.net.nz/media/photo/kawakawa-war-memorial-park>

Below, two living memorial case studies are explored which have been chosen because the architecture itself is fundamentally situated at opposite ends of a functional – poetic spectrum and both encourage earthquake preparedness in different ways. The first case study, *The Disaster Reduction and Human Renovation Institution* in Kobe Japan provides a strong programmatic precedent for a building which encourages future preparedness, however the architecture itself is limited to the exhibition of dioramas, and is not integrated with the landscape in a dynamic way, which is the advancement that the current architectural investigation in this thesis offers. The second case study, *The Church: Acts of God* designed in Newcastle, Australia provides a poetic example as to how architecture, landscape and occupation can be integrated and utilised to promote earthquake preparedness by committing to faith in God. The current architectural investigation advances this case study by addressing secular rather than sacred imperatives. The programmatic imperatives of the current architectural investigation require education, research and commemoration to occur at once within a site which is publicly available to all who wish to use it as opposed to a place which exists specifically to increase an awareness of God.

### **3.4: CASE STUDIES**

#### **THE DISASTER REDUCTION AND HUMAN RENOVATION INSTITUTION – KOBE JAPAN**

The first case study to be explored is The Disaster Reduction and Human Renovation Institution which was created to commemorate the 5,000 people who died, honour the 300,000 who were made homeless by the 7.2Mw earthquake<sup>46</sup> in 1995 and encourage future preparedness within the community. The institution provides a useful programmatic precedent for the architectural investigation within this thesis. The institution provides facilities to educate the public about earthquakes and disaster prevention. The museum is spread over five floors and two buildings. In the west building, Level One hosts a guidance room, where two programs for learning about earthquakes are held, each lasting thirty minutes. Level two provides a station where information from the most recent natural disasters around the world is displayed, a gallery about disaster

<sup>46</sup> Anonymous. "Kobe earthquake." 1 December 2011. Kobe Earthquake. 1 December 2011 <<http://www.georesources.co.uk/kobehigh.htm>>. pg 1

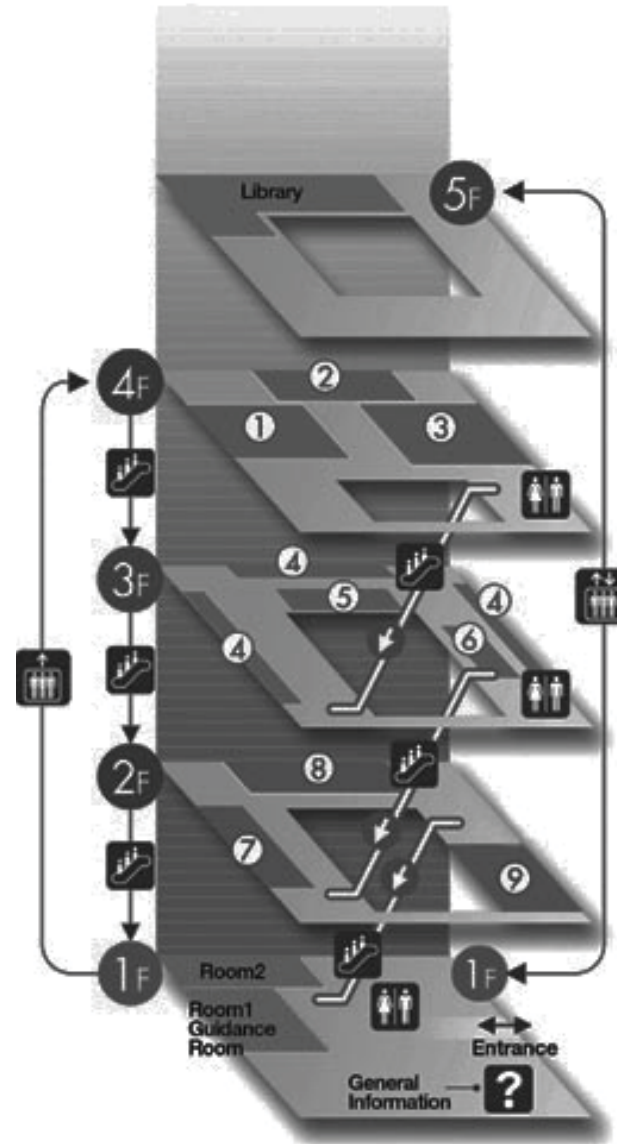
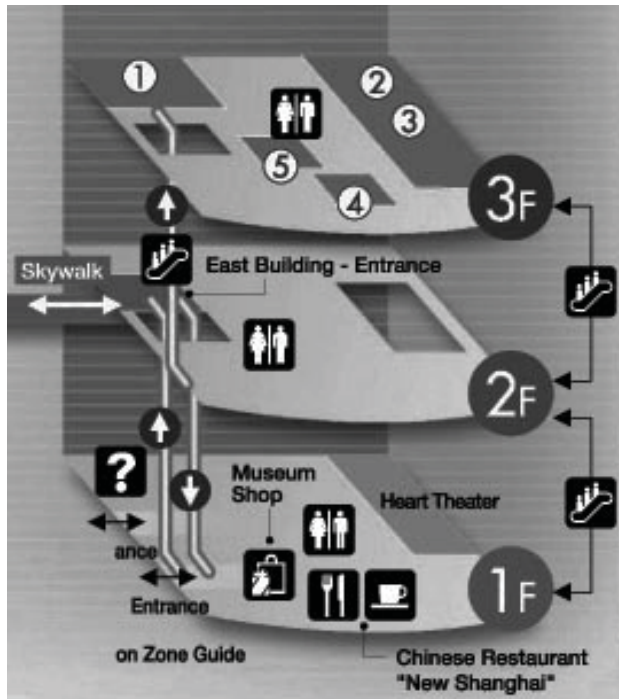


FIG. 11 (LEFT TOP) Diorama of streets following Kobe Earthquake. The Disaster Reduction and Human Renovation Institution – Kobe Japan

Source: [http://www.att-japan.net/modules/tinyd0/rewrite/tc\\_258.html](http://www.att-japan.net/modules/tinyd0/rewrite/tc_258.html)

FIG. 12 (LEFT BOTTOM) East exhibition zone diagram. The Disaster Reduction and Human Renovation Institution – Kobe Japan

Source: [http://www.dri.ne.jp/english/kanran/east\\_floor.html](http://www.dri.ne.jp/english/kanran/east_floor.html)

FIG. 13 (RIGHT) West exhibition zone diagram. The Disaster Reduction and Human Renovation Institution – Kobe Japan

Source: <http://www.dri.ne.jp/english/kanran/index.html>

prevention for the future and a space where workshops regarding disaster prevention and mitigation are held.<sup>47</sup> Level three hosts a memories corner where earthquake-related memorabilia are displayed along with messages from those who experienced the devastating quake, a set of five dioramas showing the road to recovery after the earthquake, the recital corner where movies are played showing what happened during and after the earthquake and where survivors talk about their experience. Level four provides a theatre which shows a seven minute movie of the earthquakes tremendous power and devastation, dioramas reproducing scenes of streets immediately after the earthquake occurred and The Great Earthquake Hall which shows a documentary about the reconstruction process and community involvement. The east building hosts the entrance, museum shop, and restaurant as well as three movies; Miracles of the Planet of Life, A Song in the Praise of the Water Planet, The Treat of Wind and Water Disasters and a gallery exhibiting approaches to disaster prevention and reduction from local citizens and international disaster reduction organisations.<sup>48</sup>

A 2004 survey of 1,065 high school students from five prefectures of Japan conducted by Rajib Shaw (Researcher at the Disaster Management Planning Hyogo Office, United Nations Centre for Regional Development (UNCRD), Kobe, Japan) and Koichi Shiwaku Hirohide Kobayashi and Masami Kobayashi (from the Graduate School of Global Environmental Studies, Kyoto University, Kyoto, Japan) indicates that such educational methods are an effect way of encouraging earthquake education within youth in Japan. The survey, conducted to understand the impact of earthquake and education on awareness, found that school education can provide a useful knowledge base regarding earthquakes, within which active methods of disaster education such as conversation, experiencing and visual aids were found to be the most effective. The survey also uncovered that familial, community and self education were the more successful methods of realising and deepening decision making skills and subsequent actions. The survey concluded that “school education, coupled with self, family and community education can help a student to develop a culture of disaster preparedness, which, in turn, will urge them to take right decisions and actions as an adult.”<sup>49</sup>

<sup>47</sup> Anonymous. “West building exhibition zone.” 12 November 2011. Disaster reduction and human renovation institution. 12 November 2011 <<http://www.dri.ne.jp/english/kanran/index.html>>. pg 1

<sup>48</sup> Anonymous. “East building exhibition zone.” 12 November 2011. Disaster reduction and human renovation institution. 12 November 2011 <[http://www.dri.ne.jp/english/kanran/east\\_floor.html#east01](http://www.dri.ne.jp/english/kanran/east_floor.html#east01)>. pg 1

<sup>49</sup> Shaw, Rajib, Koichi Shiwaku Hirohide Kobayashi and Masami Kobayashi. “Linking experience, education, perception and earthquake

The programmatic imperatives of The Disaster Reduction and Human Renovation Institution case study are similar to those proposed within this thesis. The proposed architecture within this thesis goes beyond The Disaster Reduction and Human Renovation Institution by advancing the integration of architecture and landscape. The physical architecture of the Kobe case study is restricted to the containment of exhibits and dioramas, whereas the architecture proposed within this thesis tests a fundamentally different approach by integrating architecture and landscape as an evidentiary and informative experience that does not even need exhibits to achieve the goal of earthquake awareness and disaster preparedness education.

#### **THE CHURCH: ACTS OF GOD – NEWCASTLE, AUSTRALIA**

A collection of ‘un-built’ architecture was created collectively by Michael Ostwald, Chris Tucker and Michael Chapman following the 1989 earthquake in Newcastle, Australia which killed 12 people and decimated a number of buildings. Each example reconceptualises the site to include both physical aspects of place such as topographic and environmental conditions as well as psycho-environmental aspects of place such as popular culture, politics and social concerns which have been neglected in east coast Australian architecture since the 1970’s.<sup>50</sup> This work relies upon nature, the passage of time and myth-making to come into fruition. The project which responds most specifically to the seismic aspects of place is *The Church: Acts of God* which took its catalyst from an existing church located on the edge of the city’s industrial zone that was left in an un-sound state for more than a decade following the 1989 earthquake. Across the road from the church, on the large industrial estate, is the CSIRO centre for scientific inquiry and environmental observation. The two organisations, scientific and religious, might have different attitudes towards the cause and effect of the earthquake,<sup>51</sup> based on science or faith. The Church was supported by large ‘temporary’ props that structurally reinforced the building and remained for more than fifteen years after the earthquake.<sup>52</sup> The designers put forward a building for religious observance, where faith and natural forces exist in an uneasy

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preparedness.” Disaster Prevention and Management 13.1 (2004): p.42

50 Ostwald, Michael J, Chris Tucker and Michael Chapman. *Residue : architecture as a condition of loss*. Melbourne and Victoria: RMIT University Press, 2007. p.10

51 *ibid.* p.213

52 *ibid.* p.206



balance. Ostwald, Tucker and Chapman propose;

*“...that the original spiritual relationship between weathering, natural disasters, architecture and faith be reanimated as an important mechanism for the critical reconnection of the poetic, numinous or transcendent power of architecture with its functional role.”<sup>53</sup>*

Rather than altering the existing church, this project considers the relationship between ‘acts of God’ and earthquakes using contemporary architectural language at a nearby vacant parcel of land. The new design;

*“...positions gravitational force alongside sacrificial weathering to investigate the ability of architecture to elucidate the fragile, but undeniably structural, role that faith can play in sustaining the contemporary place of worship.”<sup>54</sup>*

The design proposes the construction of a freestanding masonry wall in the trench of a waterway atop a culvert which has land built up on either side to reduce the risk of regular flooding in the area. This wall becomes the fixed point in a balance system; on the north side of the wall – in the direction of the CSIRO building – are a series of large spherical weights, and on the south – in the direction of suburbia – is a timber structure which acts as the inhabitable church, upon wheels that are fit into inclined concrete slots in the ground. The system begins in equilibrium; however the weight of the lead is constant whereas the weight of the church fluctuates depending on variations in attendance to the church. The minister preaches from the concrete wall and as fewer people attend they can hear and see the minister up close and clearly. As more people attend the church, the gap between the minister and the audience widens, allowing more people to see and hear and also allowing the weight of faith to be expressed in the architecture.

*“People inside would be able to hear the tension in the structure blending with the voice of their minister, and even feel the movement of their church in opposition to the fixed weights on the opposite side of the wall. In*

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53           ibid. p.206

54           ibid. p.215

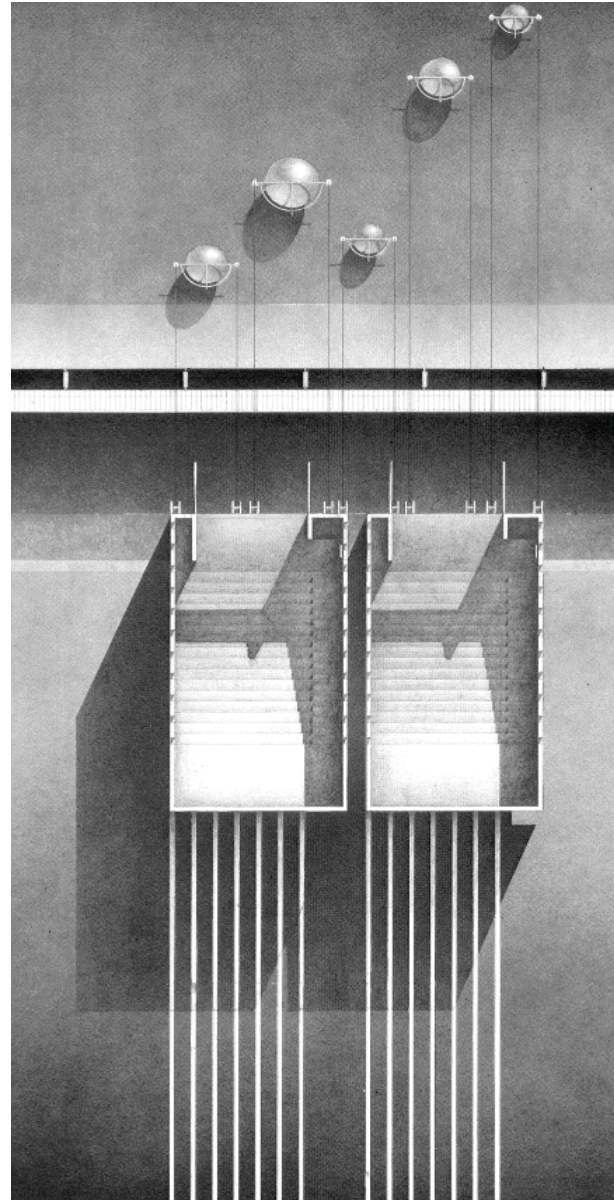
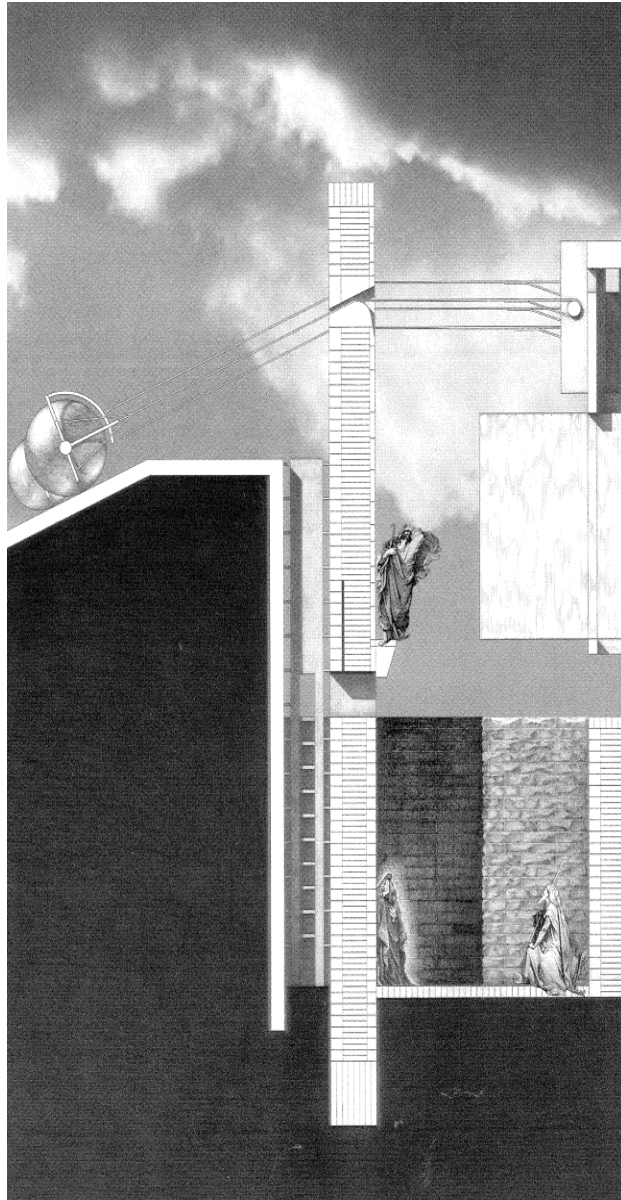


FIG. 14 (LEFT) Section: The Church, Newcastle Australia (un-built work)  
indicating free-standing masonry wall as fixed point in balancing system

Source: Ostwald, Michael J, Chris Tucker and Michael Chapman. *Residue : architecture as a condition of loss*. Melbourne and Victoria: RMIT University Press, 2007. p. 225

FIG. 15 (RIGHT) Plan: The Church, Newcastle Australia (un-built work), indicating inhabitable church (centre) spherical weights (top) and indented tracks for wheels (bottom)

Source: Ostwald, Michael J, Chris Tucker and Michael Chapman. *Residue : architecture as a condition of loss*. Melbourne and Victoria: RMIT University Press, 2007. p. 223

*this way, the balance between faith and science is manifest in architectural form. Yet, both faith and science can be shaken.”<sup>55</sup>*

In an earthquake or “Act of God” the tension rods holding the steel weights snap, so that they roll violently down the hill into the neighbouring CSIRO building and industrial estate, as the church slides into suburbia. The result of this work is an expectant structure which waits for an act of God to be fully activated, existing in a delicate interplay of balance between science and spiritual faith. While this building successfully integrates landscape, architecture and occupants, the architecture proposed within this thesis addresses secular rather than spiritual imperatives. The programmatic imperatives of the current architectural investigation require education, research and commemoration to occur at once at a site which is publicly available to all who wish to use it as opposed to a place which exists specifically to increase an awareness of God.

### **3.5: CONCLUSION**

This section began with a consideration of the partial and incomplete secondary memories that Wellington’s majority holds for New Zealand’s most devastating earthquakes which constitute the collective memory of the public and how these memories can be used to encourage earthquake preparedness within the Wellington community. The origins of the collective memory concept were explained from the context of French philosopher and sociologist Maurice Halbwachs early twentieth century writings *La Mémoire collective*, 1950 (On Collective Memory).<sup>56</sup> Halbwachs defines the collective memory as a group memory that exists outside of the lives of the individual made up ‘partial and incomplete nature of past recollections’<sup>57</sup> which are reawakened through interaction with external stimuli.

It was then offered that architecture is a useful vessel for the gathering of collective memories by providing a physical setting for interaction between visitors and the site, architecture or other people. Architecture

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55        *ibid.* p.215

56        Halbwachs, Maurice and FJ and Ditter V.Y trans. Ditter. *The collective memory*. New York: Harper and Row, 1980. p.68

57        Whitehead, Anne. *Memory*. London and New York: Routledge, 2009. p.126



which is focussed on the issue of seismic prevalence allows a place for visitors to bring their disparate memory fragments related to the subject of earthquakes. Within architecture, such incomplete memory fragments – which may be overlooked individually – are collected and given weight and meaning. The living memorial concept argues that a memorial can do more than simply commemorate events past, but can be used to encourage interaction and maintain the collective memory of a community. The term living memorial was described as a memorial which goes beyond the sole purpose of commemoration where a secondary function such as education, research or community support is adopted to ensure that the memorial remains useful and can live on within the community it is serving. The origins of the living memorial concept were discussed, having originated in North America and then appearing in New Zealand in the 1940's in the form of War Memorial Halls. While these living war memorials did not have the imperative of preparedness, the concept can be advanced and applied to earthquake memorials for the purpose of future preparedness. Two case studies of such living earthquake memorials were then discussed, The Disaster Reduction and Human Renovation Institution in Kobe Japan and The Church: acts of God in Newcastle Australia. While each case provided useful insight into the pragmatic and poetic possibilities of living earthquake memorials, shortfalls were identified in both examples which are to be addressed by the architectural proposal offered within this thesis. Firstly, the architecture offered within this thesis addresses secular rather than the spiritual imperatives which were explored in The Church: acts of God so that the message of earthquake preparedness is available to people from all walks of life. Secondly, the physical architecture of The Disaster Reduction and Human Renovation Institution is restricted to the containment of exhibits and dioramas, whereas the architecture proposed within this thesis advances the Kobe case study as it tests a fundamentally different approach by integrating architecture and landscape as an evidentiary and informative experience that does not even need any exhibits to achieve the goal of earthquake awareness and disaster preparedness education.



# LIFE LESSONS FROM THE LANDSCAPE 4

## **4:1: INTRODUCTION**

The principle intention of this research is to ascertain how architecture can be used to highlight the underlying prevalence of seismic activity within the Wellington region in order to remind or inform the public about the importance of earthquake preparedness. This thesis argues that architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape. While the case studies in the previous chapter provided interesting precedents as to how this imperative could be achieved, this thesis explores a fundamentally different approach by integrating architecture and landscape as an evidentiary and informative experience that does not require exhibits or dioramas and which is available to all members of the public. This section contextualises a theoretical framework, and sets out a specific methodology which articulates how successful integration between landscape and architecture can be achieved.

The chapter begins with a discussion regarding typical social responses of Earthquake Architecture, as considered by New Zealand engineer and architectural academic Andrew Charleson. It is argued here that typical symbolic or formal references to seismic issues are limited representations of site, which prioritise physical aspects of site above psycho-environmental aspects. A range of architectural theorists including Christian Norberg-Shultz, Steven Holl, Tadao Ando and Oswald Mathias Ungers advocate the consideration of both physical and psycho-environmental aspects of site in order to create architecture which is rooted to the genius loci of place. Kevin Thwaite's and Ian Simkin's landscape architecture theory The Experiential Landscape is introduced as a means of understanding the genius loci of place, and expressing this through built form. While this theory has already been tested in landscape architecture and urban planning discourses, this thesis applies the same methodology to the architectural design problem of how built form

can rearticulate important physical and psycho-environmental site aspects through architectural language.

#### **4:2: THE DISCREPANCIES OF EARTHQUAKE ARCHITECTURE**

Engineer and architectural academic Andrew Charleson considers earthquake architecture to be that which expresses some aspect of earthquake action or resistance architecturally. He maintains that the expressive possibilities of architecture can be categorised into two groups. The first is a straightforward approach, where seismic resisting structure is integrated and expressed architecturally. The second is when architectural concepts contain metaphoric or symbolic reference to seismic issues.<sup>58</sup> Charleson suggests that earthquake architecture is a means of generating a regional architectural response given the geophysical setting of their region; however it is not an established architectural movement. Christopher Arnold suggests that this “may be due to the psychological desire to deny the prevalence of earthquakes”.<sup>59</sup>

There are extensive examples from both categories of earthquake architecture discussed within the Earthquake Architecture chapter of Charleson’s book *Seismic Design for Architects*.<sup>60</sup> Some metaphoric and symbolic references include the expression of movement articulated through continual manipulation of building form in Eisenman’s *Guardiola House*,<sup>61</sup> the images of ruins that have been frozen in time by *SITE*,<sup>62</sup> the multiple references to faults, fissures and ruptures in buildings such as Pete Bossley’s *Keatly House*<sup>63</sup> and Gordon Matta-Clark’s *Splitting House*.<sup>64</sup> While these examples provide clear and easily read visuals about earthquake activity, they can also be considered shallow contextual interpretations because they prioritise physical aspects of site while psycho-environmental aspects are overlooked. Environmental psychologists Mirilia Bonnes’s and Gianfranco Secchiaroli’s research (1995) concludes that architects tend to

58 Charleson, Andrew. “Earthquake architecture.” Charleson, Andrew. *Seismic design for architects*. Oxford, 2008. p.251

59 Arnold, Christopher. “Architectural aspects of seismic resistant design.” *Proceedings of the Eleventh World Conference on Earthquake Engineering*. Elsevier Science Ltd., 1996. p.10

60 Charleson, Andrew. “Earthquake architecture.” Charleson, Andrew. *Seismic design for architects*. Oxford, 2008. p.251-

61 Nakamura, Toshio. *Peter Eisenman*. Tokyo: A+U Publishing Co., c1988. p.60

62 Muschamp, Herbert, Alison Sky and James Wines. *SITE*. New York: Rizzoli, c1989. p.37

63 Wallis, Robert T. *The poetics of earthquake in architectural design*. Wellington, 1991. p.22

64 Lee, Pamela. *Object to be Destroyed: The Art of Gordon Matta-Clark*. Cambridge: MIT Press, 1999. p.28-29

focus primarily on physical attributes of site, whereas psychology is more focussed on psycho-environmental processes such as territoriality and privacy.<sup>65</sup> The inclusion of both physical and psycho-environmental site aspects is advancement of earthquake architecture that the architectural design in this thesis intends to make.

#### **4:3: PHYSICAL AND PSYCHO-ENVIRONMENTAL ASPECTS OF SITE**

A consideration of both physical and psycho-environmental aspects of site is of great importance to many architectural theorists who aim to integrate landscape, nature or site with their architecture. This thinking stems from architectural theorist Norberg-Schulz's writing about the genius loci of site also referred to as spirit of place, a concept which endeavours to unite both physical and spiritual elements in place. Norberg-Schulz draws both from eighteenth century writings of Alexander Pope and writings on phenomenology of Maurice Merleau-Ponty (1962) in his discussion about this concept. He believes that each individual place has its own spirit which is rooted in the natural environment and arises pre-given from the place's intrinsic physical characteristics. Successful human intervention depends on the designer's ability to identify and then respond to those particular genius loci.<sup>66</sup> German architect and theorist Oswald Mathias Ungers agrees that architecture should be in a constant dialogue with the genius loci for which it is created, when it develops the form, the language, the formal repertory, or the vocabulary, out of this context. For Ungers, architecture that has no relationship with the spatial and conceptual conditions of site becomes an empty gesture, devoid of meaning.<sup>67</sup> While Ungers considers all architecture in general, a lack of relationship between spatial and conceptual site conditions would be particularly detrimental to the architecture proposed within this thesis, which intends to integrate architecture and landscape as an evidentiary and informative experience as a means of increasing an awareness of seismic prevalence and the importance of disaster mitigation.

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65 Bonnes, M and G Secchiaroli. Environmental psychology: A psycho-social introduction. London: Sage, 1995. p.23

66 (Norberg-Schulz) (Simkins and Thwaites 32) Norberg- Schulz, Christian. Meaning in western architecture. New York: Praeg Press, 1975. p.65

67 Ungers, Oswald Mathias. Architecture as Theme . 1982. p.77

Architects Steven Holl and Tadao Ando are examples from western and eastern culture who stress the importance of architecture's integration with nature or landscape in their writings. The stand made by both architects for the careful consideration of nature in design is in line with the intentions of the architecture proposed within this thesis.

Steven Holl believes that "architecture and site should have an experiential connection, a poetic link."<sup>68</sup> He maintains that a constructive transformation in modern life is possible when the link between site and architecture are found and expressed in new ways. Holl explicitly considers the importance of physical and psycho-environmental processes of site as he implements his Anchoring theory which considers the importance of a building's site to be "more than a mere ingredient in its conception. It is its physical and metaphysical foundation."<sup>69</sup> Holl believes that;

*"When a work of architecture successfully fuses a building and situation, a third condition emerges. In this third entity, denotation and connotation merge; expression is linked to idea which is joined to site."*<sup>70</sup>

Regarding physical aspects of site, Holl states that the resolution of "the functional aspects of site and building, the vistas, sun angles, circulation, and access are the physics" that demand the "metaphysics" of architecture" and then, related to the psycho-environmental aspects of site he claims that a "building transcends physical and functional requirements by fusing with a place, by gathering the meaning of a situation."<sup>71</sup> Holl maintains that a building has one site and in this one situation, its intentions are collected. In this sense architecture is an extension, a modification establishing absolute meanings relative to a place so that the architecture is bound or 'anchored' to one place. While site specificity is not integral to all great architecture, Holl's writing indicates the advantages that site specific architecture may have if it is appropriately done. Such site specificity is relevant to the architectural investigation carried out within this thesis, which requires

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68 Holl, Steven. Anchoring : selected projects 1975-1991 . New York: Princeton Architectural Press, c1991 p.9

69 ibid p.9

70 ibid p.9

71 ibid p.10

particular sub-site architectural responses to occur as a means of communicating the transformation which seismicity has caused within a single recreational park. Holl believes that architecture “should not so much intrude on a landscape as it should serve to explain or illuminate it.”<sup>72</sup> Efforts to illuminate a site might not be simple replication of its current context, but may be ideas cultivated from a first encounter with the site, mediations upon such initial ideas, or a complete reconsideration of existing topography.

In line with Holl, architect Tadao Ando claims that human life is not intended to oppose nature and endeavour to control it, but rather to draw nature into an intimate association in order to find union with it. Architectural theorist Kate Nesbitt asserts that “one can surmise that he [Ando] is familiar with Christian Norberg-Shulz’s and Kenneth Frampton’s writings on Heidegger and architecture”<sup>73</sup> Ando asserts that when architecture and nature are properly integrated, architecture then transforms nature through abstraction, altering its meaning.

Ando also considers the new landscape which is introduced with the creation of architecture, and therefore has “a responsibility to draw out the particular characteristics of a given place.”<sup>74</sup> He advises that the considerate designer should then try to understand what it is that the site itself is seeking, composing architecture by “seeking an essential logic inherent in the place.”<sup>75</sup> Similarly to Holl, Ando states that it is a responsibility of the architecture to draw out the site’s formal characteristics as well as its “cultural traditions, climate, and natural environmental features, the city structure that forms its backdrop and the living patterns and age old customs that people will carry into the future.”<sup>76</sup>

Ando identifies a significant distinction between Western and Eastern attitudes to nature in that “Japanese culture emphasises a spiritual threshold between the building and nature, as opposed to a physical boundary

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72        *ibid* p.10

73        Ando, Tadao. “Architecture, nature, and the constructed site.” Nesbitt, Kate. *Theorizing a new agenda for architecture: An anthology of architectural theory*. New York: Princeton Architectural Press, 1996. 456-461.p. 456

74        *ibid*. p. 456

75        Ando, Tadao. *Beyond horizons in architecture*. Executive Committee for “Tadao Ando-Beyond Horizons in Architecture”, 1992. p.75-76

76        *ibid* p.75-76

in Western culture.”<sup>77</sup> He believes that contemporary architecture has a role to play in providing people with architectural places that allow them to feel the presence of nature through mutable permeation. While the attitude to nature in the East and West may vary, both Holl and Ando clearly identify why the integration of landscape or nature and architecture is important, which is evidenced in their built work. The following section introduces a methodology for site analysis which has been developed by landscape architecture academics Kevin Twaithes and Ian Simkins of the University of Sheffield. Their methodology provides a means of understanding the genius loci of place, and expressing this through built form, in keeping with the recommendations of Norberg-Shultz, Ungers, Holl and Ando whose attitudes have provided a theoretical backing to the standpoint of the architectural investigation within this thesis.

#### **4.4: THE EXPERIENTIAL LANDSCAPE**

Landscape architecture academics Kevin Twaithes and Ian Simkins have created a clear methodology to assist those involved in analysis and design of the outdoors with a vocabulary and methods that can help them read the experiential potential and character of existing outdoor settings, inform how they are changed and how new ones are made. While the pair acknowledges that their work is “especially relevant to those who work in the discipline of landscape architecture and urban planning”<sup>78</sup> and is indeed set within the academic framework of these disciplines, this thesis extends their concept by applying the Experiential Landscape methodology to an architectural scenario, which intends to create architecture that integrates successfully with the existing site it occupies.

The experiential landscape concept attempts to improve the human experience of the outdoor environment by drawing together spatial and experiential dimensions as a unified whole. The architecture proposed within this thesis seeks to enhance the human experience of site as an educational encounter, where the architecture is an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unrelenting transformation of the landscape. It is also “a way to make hidden experiential

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<sup>77</sup> *ibid.* p. 456-457

<sup>78</sup> Simkins, Ian and Kevin Thwaites. *Experiential Landscape*. New York: Routledge, 2007. p.xi



dimensions in outdoor places explicit”<sup>79</sup> therefore illuminating unknown aspects of the site to visitors, which is an objective of this design-research. Such unknown aspects of Harcourt Park are those which evidence the relationship between the Wellington fault-line and the river terrace risers which lie adjacent to it. When this relationship is illuminated and evidenced through architecture, visitors of the site could then understand the way seismic activity transforms what appear to the naked eye to be solid and permanent aspects of the landscape.

While the experiential landscape concept is well grounded within the theoretical frameworks of place-making and environmental psychology, Twaites and Simkins did not want their work to remain as a theoretical position. Instead, their principal intention was to translate relevant research findings in such fields into usable recommendations, vocabulary and methods.

Orientation, place attachment and neighbourhood awareness are three aspects of human experience that form the theoretical cornerstone of experiential landscape. Within these three areas, four components of experiential landscape are conceived. These crucial spatial sensations are called centre, direction, transition and area (CDTA). Centre relates to the experience of location, direction to the awareness of continuity and extent, translation relates to where a sense of change is occurring and area relates to the wider sense of environmental coordination that can give a sense of being somewhere as opposed to somewhere else. The table which follows has been extracted from the Experiential Landscape text, detailing the spatial and experiential dimensions of centre, direction, transition and area<sup>80</sup> which provide a framework for the site analysis of Harcourt Park in the following chapter.

The principle intention of this research is to ascertain how architecture can be used to highlight the underlying prevalence of seismic activity within the Wellington region in order to remind or inform the public about the importance of earthquake preparedness. *Centre* is the most valuable spatial dimension to be considered in terms of the principal intention of this thesis. The research area centre explores the seismological aspects of

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79        *ibid* p.xxiv

80        *ibid* p.49

SPATIAL DIMENSION	EXPERIENTIAL DIMENSION
<p>CENTRE</p> <p>Subjectively significant location engendering a sense of here-ness and proximity.</p>	<p>Attachment of significance</p> <p>Social imageability: functional use, goals and motivations, physical features, social meanings.</p> <p>Restorative benefit: being away, extent, fascination, and compatibility.</p> <p>Social interaction and territoriality: communication, primary, secondary and public territory.</p>
<p>DIRECTION</p> <p>Subjectively significant continuity engendering a sense of there-ness and future possibility.</p>	<p>Orientation: Movement: Choice, imagination, and attention.</p> <p>View: landmarks, views and vistas, sequence.</p> <p>Change: direction and level; entrances, exits and gateways; atmosphere and function.</p>
<p>TRANSITION</p> <p>Subjectively significant point, or area, of change engendering a sense of transformation in mood, atmosphere, or function.</p>	<p>Change: direction and level; entrances, exits and gateways; atmosphere and function.</p>
<p>AREA</p> <p>Subjectively significant realm engendering a sense of coherence and containment.</p>	<p>Public and private awareness: private, semi-private, semi-public, public.</p> <p>Thematic continuity: rhythm, pattern, coordination in texture, space, form, detail, symbol, building type, use, activity, degree of maintenance, topography.</p>

Harcourt Park and the effects that they have on the social imageability of place. The sub-category centre also considers the social interaction which occurs at the site, which begins to identify areas where architecture can improve the interaction between visitors as a means of strengthening the public's collective memory regarding seismicity. The remaining three spatial dimensions are of secondary importance; *direction* and *transition* are analysed as a means of understanding the spaces in-between the site's seismic aspects or centres, so that they can be strengthened through architectural integration with site. *Area* is essentially a means of assessing how the experiential landscape of Harcourt Park is understood as a whole entity.

#### **4:5: CONCLUSION**

This section began with a discussion regarding typical social responses of Earthquake Architecture, as considered by New Zealand engineer and architectural academic Andrew Charleson. It was argued that typical symbolic or formal references to seismic issues are limited representations of site, which prioritise physical aspects of site above psycho-environmental aspects. A range of architectural theorists including, Christian Norberg-Shultz, Steven Holl, Tadao Ando and Oswald Mathias Ungers were discussed who advocate the consideration of both physical and psycho-environmental aspects of site in order to create architecture which is rooted to the genius loci of place. Kevin Thwaite's and Ian Simkin's landscape architecture theory The Experiential Landscape was introduced as a means of understanding the genius loci of place, and expressing this through built form. While this theory has already been tested in the landscape architecture discourse, this thesis applies the same methodology to the architectural design problem of how built form can rearticulate important physical and psycho-environmental site aspects through architectural language. The following chapter extends the explanation and application of this theory as it provides the framework for analysis of Harcourt Park, the research site for architectural testing.



# RESEARCH SITE ANALYSIS 5

## 5.1: INTRODUCTION

This research site has been chosen from the Wellington Fault Finders trail as an exemplary site to investigate how architecture can be used to highlight the underlying prevalence of seismic activity within the Wellington region in order to remind or inform the public about the importance of earthquake preparedness. The analysis of site is framed within Kevin Twaites's and Ian Simkins's Experiential Landscape concept, to ensure that physical and experiential aspects of site are both considered in the architecture's conception, in keeping with the recommendations of architectural theorists Christian Norberg-Shultz, Steven Holl, Tadao Ando and Oswald Mathias Ungers whose ideas were discussed in the previous chapter. The concept of Experiential Landscape is

*"structured in such a way as to provide those involved in analysis and design of the outdoors with a vocabulary and methods that can help them read the experiential potential and character of existing outdoor settings, inform how they are changed and how new ones are made."*<sup>81</sup>

Thwaites and Simkins are "trying to present a way of looking at the world as much as describing a set of tools and methods for understanding and making new outdoor places."<sup>82</sup> Because Thwaites and Simkins work in the discipline of landscape architecture, in academia and practice, their thoughts are rooted in this context. While their concepts are meant to be specifically relevant to those involved in landscape architecture and urban planning, they hope "that anyone with an interest in the relationship between people and their outdoor world will find something of value."<sup>83</sup> This thesis argues that architecture can be conceived and

81 Simkins, Ian and Kevin Thwaites. Experiential landscape. New York: Routledge, 2007. p .xi

82 ibid p.xi

83 ibid p.xi

FIG. 16: (FAR LEFT) Diagram indicating Kevin Twaites's and Ian Simkins's Experiential Landscape CDTA structure  
Source: Authors recreation of information from Simkins, Ian and Kevin Thwaites. Experiential landscape. New York: Routledge, 2007. p. 77

designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape. With this imperative in mind, the site analysis chapter contains five sections, four of which detail findings within the Experiential Landscape framework of spatial and experiential sensations known as CDTA: centre (“subjectively significant location engendering a sense of here-ness and proximity.”),<sup>84</sup> direction (an awareness of the possibility of continuity, understanding of the routes which allow continuity and anticipation between centres), transition (that which “allows us to experience difference between adjacent places.”)<sup>85</sup> and area (“at one and the same time the product of combinations of centre, direction and transition, and a recognisable entity in itself as a whole.”)<sup>86</sup>

For ease of comprehension the four characteristics of CDTA are arranged as four separate sections; however, it should be stated that these four components do not manifest within space as independent entities, arranged next to each other for visitors to pass through. Rather CDTA appear to people as a seamless continuity of place experience, which they are a part of and which changes according to “the environmental attributes present, their scale, and the meanings and associations that people project onto them.”<sup>87</sup> The fifth section is a conclusion which summarises the findings of the site analysis chapter, leading into the design chapter which discusses how these findings influence change so that the integration between landscape and architecture can educate visitors are about the prevalence of seismicity and remind them about the importance of earthquake preparedness.

## 5.2: CENTRE

The spatial dimension centre is described by Thwaites and Simkins as a “subjectively significant location engendering a sense of here-ness and proximity.”<sup>88</sup> Such a sense of ‘here-ness’ and proximity is due to an attachment of significance which can be attributed to strong social imageability, restorative benefit or

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84        ibid p.49

85        ibid p.69

86        ibid p.74

87        ibid p.70

88        ibid p.49

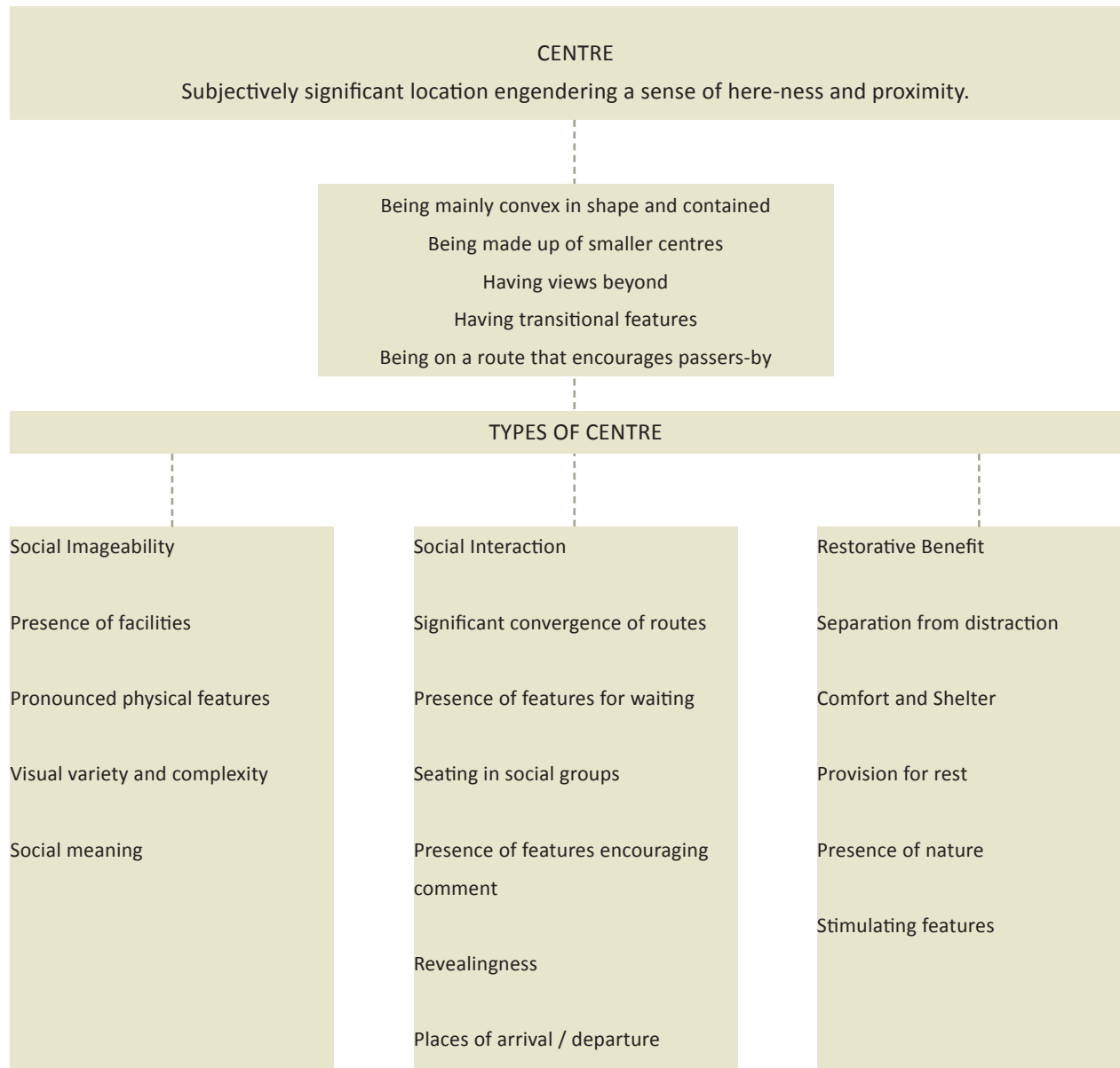


FIG. 17: Diagram explaining key characteristics of spatial dimension centre

Source: Authors recreation of information from Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p. 66

opportunities for social interaction. Each of these terms is specifically defined by Thwaites and Simkins within the Experiential Landscape context, which is summarised at the forefront of each sub-section below.

## **SOCIAL IMAGEABILITY**

The first contributor to the success of a centre is the social imageability of place. Thwaites and Simkins observe that both physical form<sup>89</sup> and social associations<sup>90</sup> make a place memorable. Social imageability strengthens as places become layered with social meaning because they provide functional necessities, are compatible with personal or collective goals or because of valued physical or social functions.<sup>91</sup> In keeping with Bonnes and Secchiarioli<sup>92</sup> thoughts, Thwaites and Simkins conclude that “these characteristics constitute a totality of social imageability implying that places become especially significant when they have particular physical or social value, are able to satisfy specific needs, and are regularly visited.”<sup>93</sup> The Experiential Landscape methodology of site analysis requires a consideration of four site aspects which collectively strengthen the

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89 Lynch, Kevin. *The image of the city*. Cambridge: MIT Press, 1960. p.35

90 Stokols, D. “Group X place transactions: some neglected issues in psychological research on settings.” Magnusson, D. *Towards a psychology of solutions: an interactional perspective*. Nillside: Lawrence Erlbaum, n.d. 393-415. p.12

91 *ibid* p.12

92 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.41

93 *ibid* p.41





social imageability of place. The presence of facilities, pronounced physical features, visual variety and social meaning of Harcourt Park are described below.

**PRESENCE OF FACILITIES:** The site includes: the original house and outbuildings currently used as a caretaker's house and equipment storage, car parking off Akatarawa and Norbert streets, one large



Far left to right

FIG. 18 Outdoor stage, Harcourt Park, Upper Hutt

Source: Authors own

FIG. 19 Playground, Harcourt Park, Upper Hutt

Source: Authors own

FIG. 20 Site plan indicating key facilities, Harcourt Park, Upper Hutt

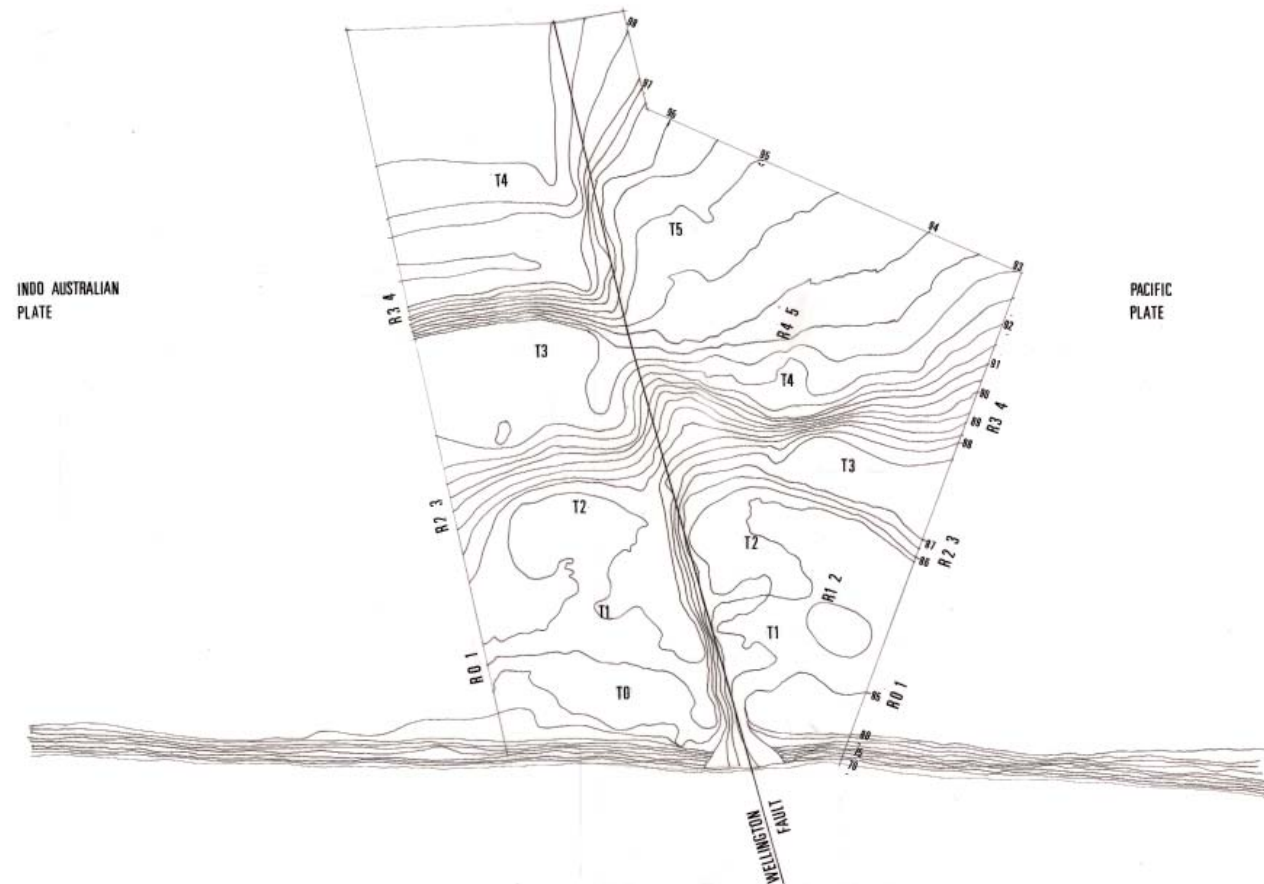
Source: Authors own

playground and one smaller playground intended to be used by toddlers, a paddling pool, an outdoor stage and amphitheatre, Frisbee golf facilities, a large field, picnic tables, barbeque and public toilets.<sup>94</sup>

**PRONOUNCED PHYSICAL FEATURES:** The most pronounced physical features are the Hutt River, which runs along the west perimeter of the site, and the flights of terraces which have been left behind as the

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<sup>94</sup> Anonymous. Harcourt Park management plan. Local Council Document. Upper Hutt: Upper Hutt City Council, 1983. p.5



river has eroded into the earth. After depositing gravels derived from glacial erosion, a period of down cutting began which left flights of terraces along the banks of the Hutt River. Because the river terraces straddle the Wellington fault-line perpendicularly, each terrace indicates horizontal displacement resulting from major earthquake activity after successive terraces were created. The offsets show a cumulative dextral slip on the fault where the individual offsets range from ca 10 m (T1/ youngest) to several tens of meters (T3/ oldest).<sup>95</sup> Degradation or incisional gravel river terraces such as these are important features in New

<sup>95</sup> Little, Timothy, et al. "Coseismic strike slip at a point during the last four earthquakes on the Wellington fault near Wellington, New Zealand." *Journal of geographical research* (2010): p.13

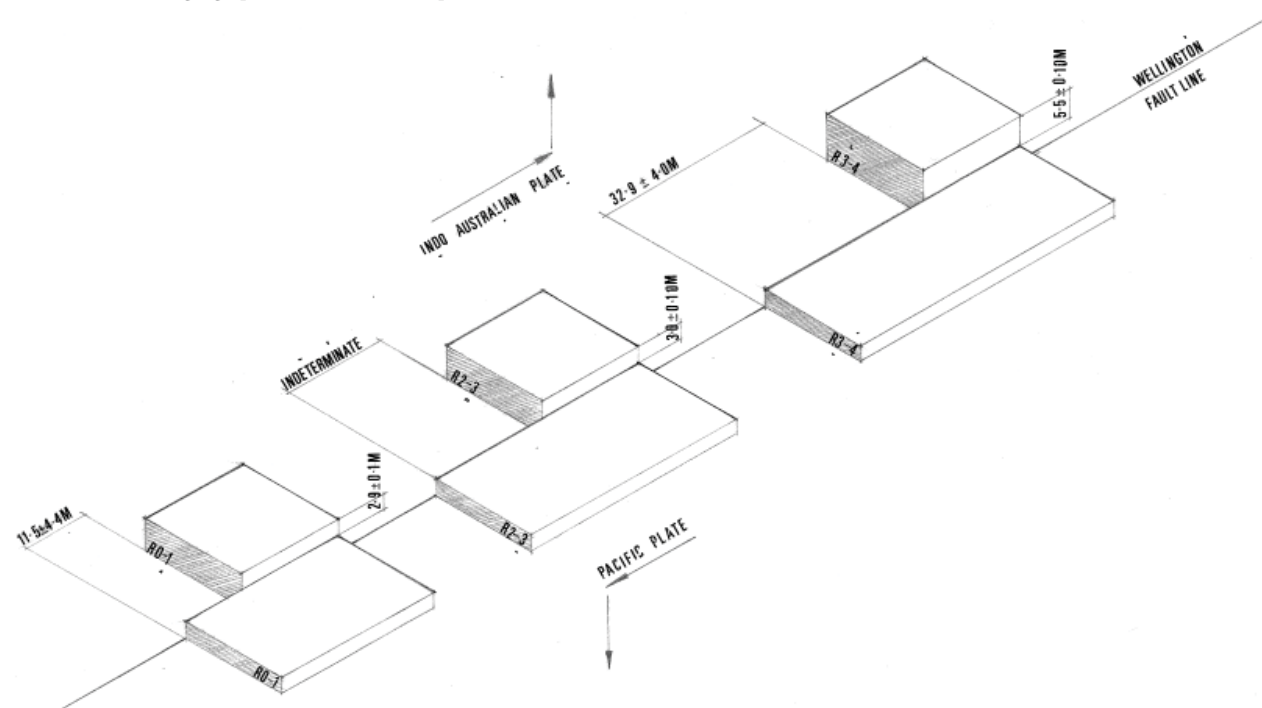


FIG.21 (FAR LEFT) Sub-terrainian site plan indicating contours, terrace risers and fault-line. Source: Authors own  
FIG. 22 (RIGHT) Diagram describing movement of Pacific and Indo-Australian tectonic plates over time, as evidenced by the river terraces at Harcourt Park, Upper Hutt. Source: Authors own

Zealand's landscape. They play a key role in developing conceptual models for how strike-slip faults (such as the Wellington Fault) and rivers interact with each other to result in a displaced flight of river terraces.<sup>96</sup> Following the latest earthquake near Harcourt Park (which displaced T3 by approximately 5.3m) the Hutt River eroded to near its current level, stranding the riser T1 above it. If the typical pattern was to continue at the site, the currently un-faulted T1 terrace is poised to act as a marker following the next single event slip to occur on the Wellington Fault.<sup>97</sup> For this reason, the park's terraces should be preserved for future measurement. Local geologist Timothy Little has identified areas which have already been altered by man which could be developed and those which are close to their original state and should be protected. Another rare geological feature on the site is an exposed fault plane at the bank of the river which presents young gravels in a vertical position rather than horizontal layers as they are normally positioned.<sup>98</sup>

**VISUAL VARIETY AND COMPLEXITY:** The pronounced physical features of site provide visual variety and complexity which the proposed architectural intervention can highlight through framed views and orientation, so that visitors can recognise the terrace risers as seismically significant aspects of site.

**SOCIAL MEANING:** Harcourt Park is maintained by the Upper Hutt City Council as a recreational reserve, open to all members of the public. The park's facilities are utilised by locals and the geological features draw scientific and educational interest both locally and internationally. The river terrace sequence provides a unique landscape for the Wellington region which is visually prominent to visitors. Remnants of man-made structures such as stone paths and walling, homestead and farm buildings provide the atmosphere of a local farm, conserving the history of a now suburban area. There is also seasonal interest from exotic plantings and native bush.<sup>99</sup>

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96 Lensen, G. J. "The general case of progressive displacement of flights of degradational terraces." *New Zealand journal of geology and geophysics* 7 (1964): p.86

97 Little, Timothy, et al. "Coseismic strike slip at a point during the last four earthquakes on the Wellington fault near Wellington, New Zealand." *Journal of Geographical Research* (2010): p.19

98 Anonymous. *Harcourt Park Management Plan*. Local Council Document. Upper Hutt: Upper Hutt City Council, 1983. p.5

99 *ibid* p.5

## RESTORATIVE BENEFIT

The second contributor to the success of a centre is the restorative benefit of place. Thwaites and Simkins observe that the “need for people to relax and recuperate is widely recognised to be important, and places which include nature or water have been found to be particularly conducive”.<sup>100</sup> Research has also suggested that restorative places are those that offer certain experiential conditions, which Thwaites and Simkins have summarised as the separation from distraction, comfort and shelter, provision for rest and the presence of nature and stimulating features.

**SEPARATION FROM DISTRACTION:** The site is a destination, a peaceful place to relax and play away from the distractions of home and work. The topography of the site means that visitors are blocked from any road noise on the eastern perimeter.

**COMFORT AND SHELTER:** The only shelter provided on site is that which covers the outdoor stage. The site is not a comfortable place to be in poor weather conditions.

**PROVISION FOR REST:** In good weather, the site is a suitable place to rest. There is however nothing built to enhance or encourage this resting and would be in the form of lying on the ground in the sun or active relaxation like playing with children. The site would not be a suitable place to rest in poor weather conditions.

**PRESENCE OF NATURE:** The majority of the park’s vegetation is made up of rough pasture and patches of lowland beech and podocarp forest. Exotic trees and shrubs are located around the homestead and in the site’s southwest corner, some of which are nearing maturity. There is only limited natural regeneration of native species occurring at the site, due to pressure from sheep grazing in the past, people using the park and environmental changes. The Harcourt Park Management Plan does not require that the native bush

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100 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.41

remains in its natural state, as it does not form a complete ecological association.<sup>101</sup>

Two soil types exist at Harcourt Park which reflects the river soil formation. Adjacent to the river the soil is of moderate fertility and has medium drainage, here Heretaunga stony silt loam is composed of “powdery stony loam overlain on a stony silt loam on stones and boulders.”<sup>102</sup> Approximately parallel to the river and midway through the site, the soil changes to a Heretaunga mottled silt loam composed of “a powdery silt loam overlain on a silty clay loam on silts and gravels; this area is of high fertility and has slow drainage.”<sup>103</sup>

**STIMULATING FEATURES:** The most stimulating features of the site are the geological features which have been described in the previous social imageability section, the river terraces and the Wellington fault-line. Architecture can be used to enhance awareness of these features which provide a tangible example of the unremitting transformation of the landscape therefore encouraging earthquake preparedness.

## **SOCIAL INTERACTION**

The third and final contributor to the success of a centre is the opportunity for social interaction to occur within a place. Thwaites and Simkins observe that the provision of places where people congregate or pass one another are important as they stimulate conversation and interaction between strangers, especially if there is a presence of features or activity which encourage comment.<sup>104</sup> The Experiential Landscape site analysis methodology suggests the consideration of five site aspects which encourage social interaction within a place. These are; a significant convergence of routes, presence of features for waiting, seating in social groups, presence of features encouraging comment and a high level of revealingness where little is visually hidden from visitors.

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101 Anonymous Harcourt Park management plan. Local Council Document. Upper Hutt: Upper Hutt City Council, 1983 p.5

102 *ibid* p.5

103 *ibid* p.5

104 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.66

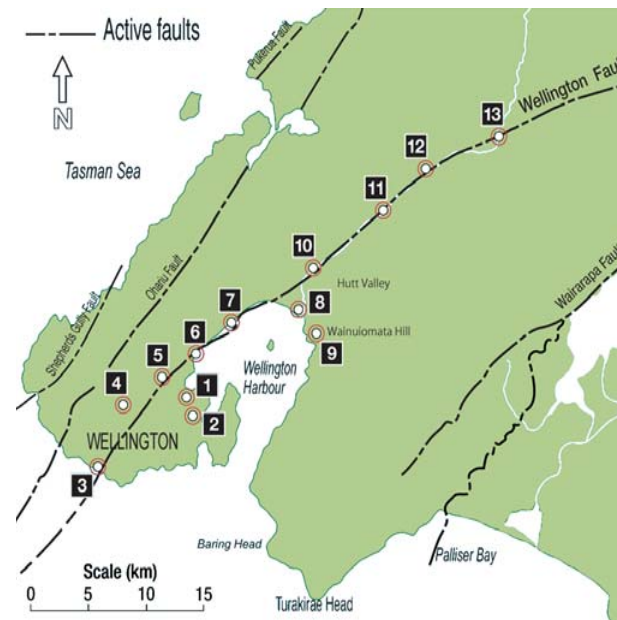
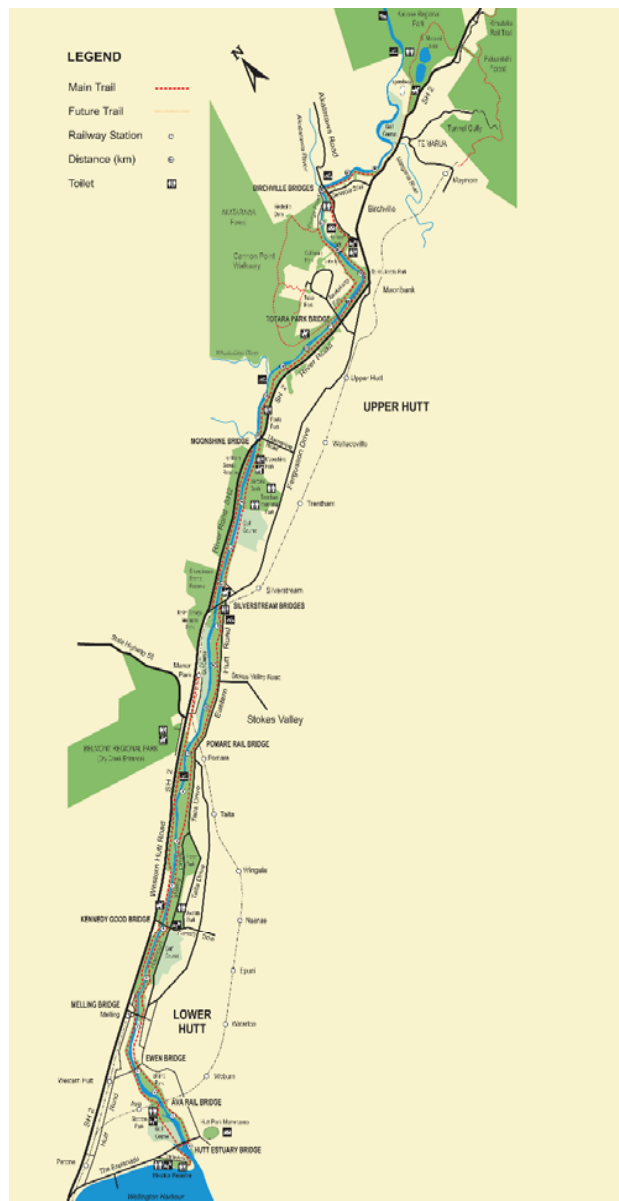


FIG. 23 (LEFT) Hutt Valley River Trail Map  
Source: <http://www.gw.govt.nz/assets/Parks-and-Recreation/Misc/Hutt-River-Trail-map.pdf>  
FIG. 24 (RIGHT) Wellington Fault Finders Trail Map  
Source: <http://gns.cri.nz/Home/Learning/Science-Topics/Earth-quakes/Virtual-Tours>

**SIGNIFICANT CONVERGENCE OF ROUTES:** Harcourt Park is a significant destination in two key networks: the Wellington Fault Finders trail and the Hutt Valley River Trail. Within the site itself, there is a convergence of routes when the primary pedestrian route through the site interacts with either of the two secondary pedestrian routes or the two vehicular entrances.

**PRESENCE OF FEATURES FOR WAITING:** The only features for waiting are the picnic tables and seats which are scattered around the site, none of which are under shelter.

**SEATING IN SOCIAL GROUPINGS:** There is one area of the site where a group of six picnic tables and a barbeque constitute what is referred to in the Upper Hutt City Council's Park Management Plan<sup>105</sup> as a Picnic Zone. There is no shelter in this area.

**PRESENCE OF FEATURES ENCOURAGING COMMENT:** The geological features described in the social imageability section encourage comment amongst visitors who understand their significance.

**REVEALINGNESS:** There is little that is hidden from patrons of this park, except by the natural form of the topography and the homestead. All fences and boundaries are low lying and permit visual access to all areas.

### 5.3: DIRECTION

Centres do not exist in isolation from other kinds of spatial experience, rather “the very sensation of location seems to depend on the simultaneous awareness of a realm beyond the immediately proximate.”<sup>106</sup> Gordon Cullen summarises this relationship between locality and that which lies beyond when he writes that “no sooner do we postulate a HERE than automatically we must create a THERE, for you cannot have one without the other.”<sup>107</sup> An awareness of direction strengthens the sense of centre. Thwaites and Simkins show that three

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105 Anonymous. Harcourt Park management plan. Local Council Document. Upper Hutt: Upper Hutt City Council, 1983. p.6

106 Simkins, Ian and Kevin Thwaites. Experiential landscape. New York: Routledge, 2007. p.66

107 Cullen, Gordon. The concise townscape. Oxford: Architectural Press, 1971. p.10



KEY:

SOCIAL IMAGEABILITY

SOCIAL INTERACTION

RESTORATIVE BENEFIT

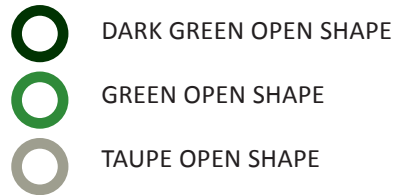


FIG. 25 Site plan indicating areas of social imageability, social interaction and restorative benefit. Source: Authors own

interconnecting categories of experience conceptualise a sense of direction which are linear containment (that which “presents the awareness of the possibility of continuity and presents a way of realising that possibility”),<sup>108</sup> route (that which “extends beyond the awareness of a potential continuity to the actual act of going from here to there”)<sup>109</sup> and anticipation (where there should be an “incentive provided by generating a sense of anticipation: that there might be something desirable or perhaps yet unknown that encourages us to want to access, or possibly just contemplate, realms beyond”).<sup>110</sup> The Experiential Landscape site analysis methodology identifies specific constituents of direction which are divided into two groups and can assist in the analysis of linear containment, route and anticipation. Firstly, kinetic constituents of direction include enclosure, rhythm, ease of movement and a clear primary route. Secondly, sensory constituents of direction include exploration and mystery, view, smell and sound and a linearity of floor scape.

**LINEAR CONTAINMENT:** The linear containment of place describes that which presents an “awareness of the possibility of continuity and presents a way of realising that possibility.”<sup>111</sup> Linear continuity is similar to centre in that it provides a sense of containment beyond which a visitor may be aware of a sense of direction and can identify its route. The linear containment which currently exists at Harcourt Park is strong due to a lack of physical enclosure and clear paths for movement between individual centres and that which lies beyond. For example, when a visitor is utilising the playground they are situated within a centre and are also aware of how they would move beyond that centre to another or back onto the primary path and through the site, or onto the grass landscape which surrounds the playground location. There is an ease of movement along the primary and secondary routes through the site; however there are no paths which lead to key facilities such as the toilets and outdoor stage. These destinations might be difficult to reach in a wheelchair or with a stroller if weather conditions are poor. The lack of linearity in Harcourt Park’s floorscape does two things simultaneously. Firstly it encourages multiple positions of ‘here-ness’ where the aspects of centre speak more loudly than the aspects of direction. At the same time, the lack of linearity provides mystery, a

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108 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.66

109 *ibid.* p.66

110 *ibid.* p.66

111 *ibid.* p.66

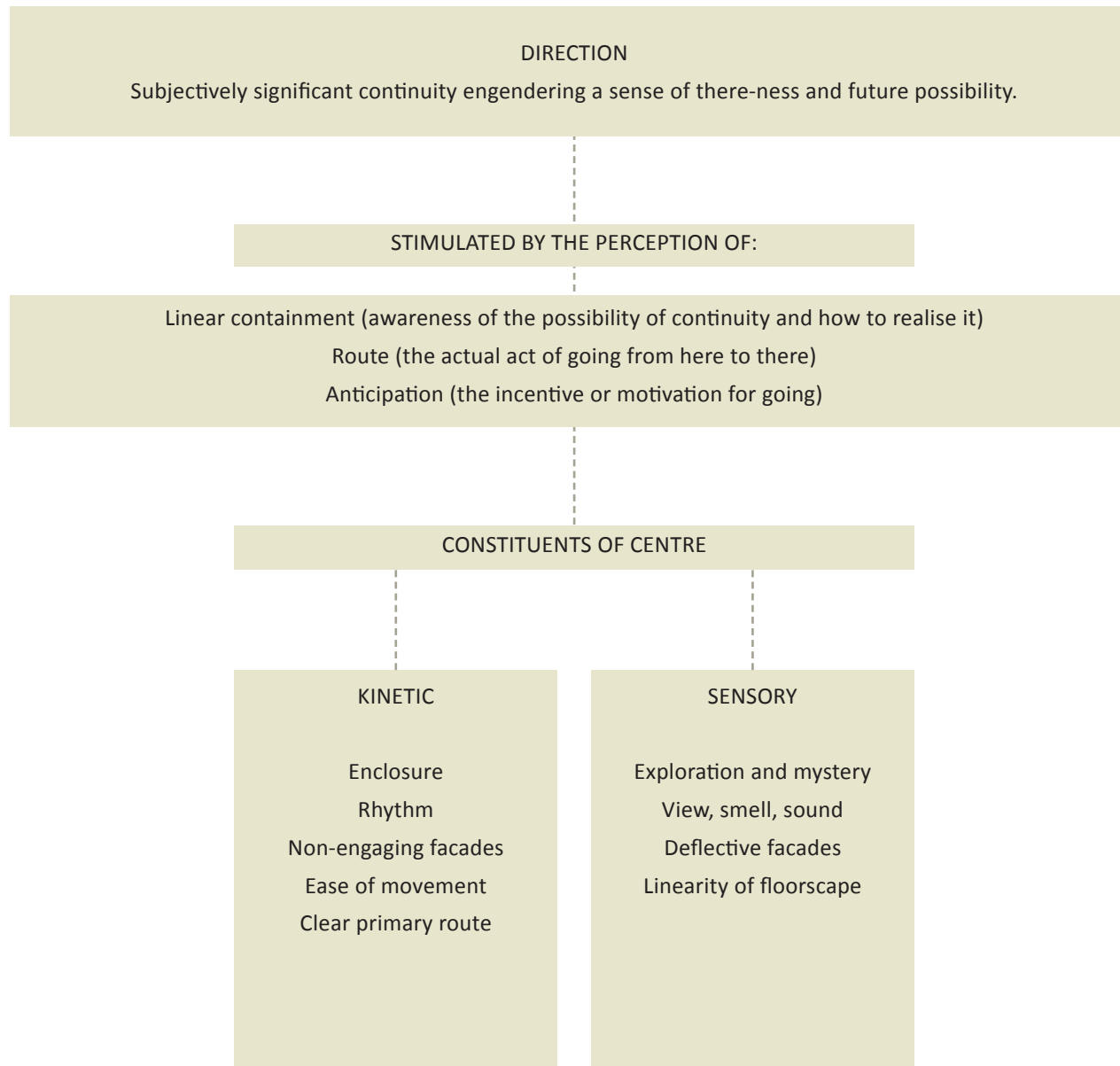


FIG. 26 Diagram explaining key characteristics of spatial dimension direction  
Source: Authors recreation of information from Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p. 69

sense of possibility, but also potential disorientation. The architectural intervention will address this concern of disorientation while also enhancing awareness of the prevalence of seismic activity.

**ROUTE:** The second category which strengthens a sense of direction is route, described by Thwaites and Simkins as that which “extends beyond the awareness of a potential continuity to the actual act of going from here to there.”<sup>112</sup> Environmental aspects within Harcourt Park which relate to this are the paths upon which visitors can travel should they choose to move from ‘here’ to ‘there’. Within the park there is one key path directly through the centre, overlying the Wellington Fault Line in an east west direction. From this there are two secondary paths, one leading to an adjoining motor lodge and one leading through a heavily planted zone creating a short bush walk. These paths are described through graphics and text on an information board upon arrival to the site and are not difficult to navigate under normal conditions.

**ANTICIPATION:** The third category which strengthens a sense of direction is anticipation where there should be an “incentive provided by generating a sense of anticipation: that there might be something

112      *ibid.* p.66



KEY:

MOVEMENT

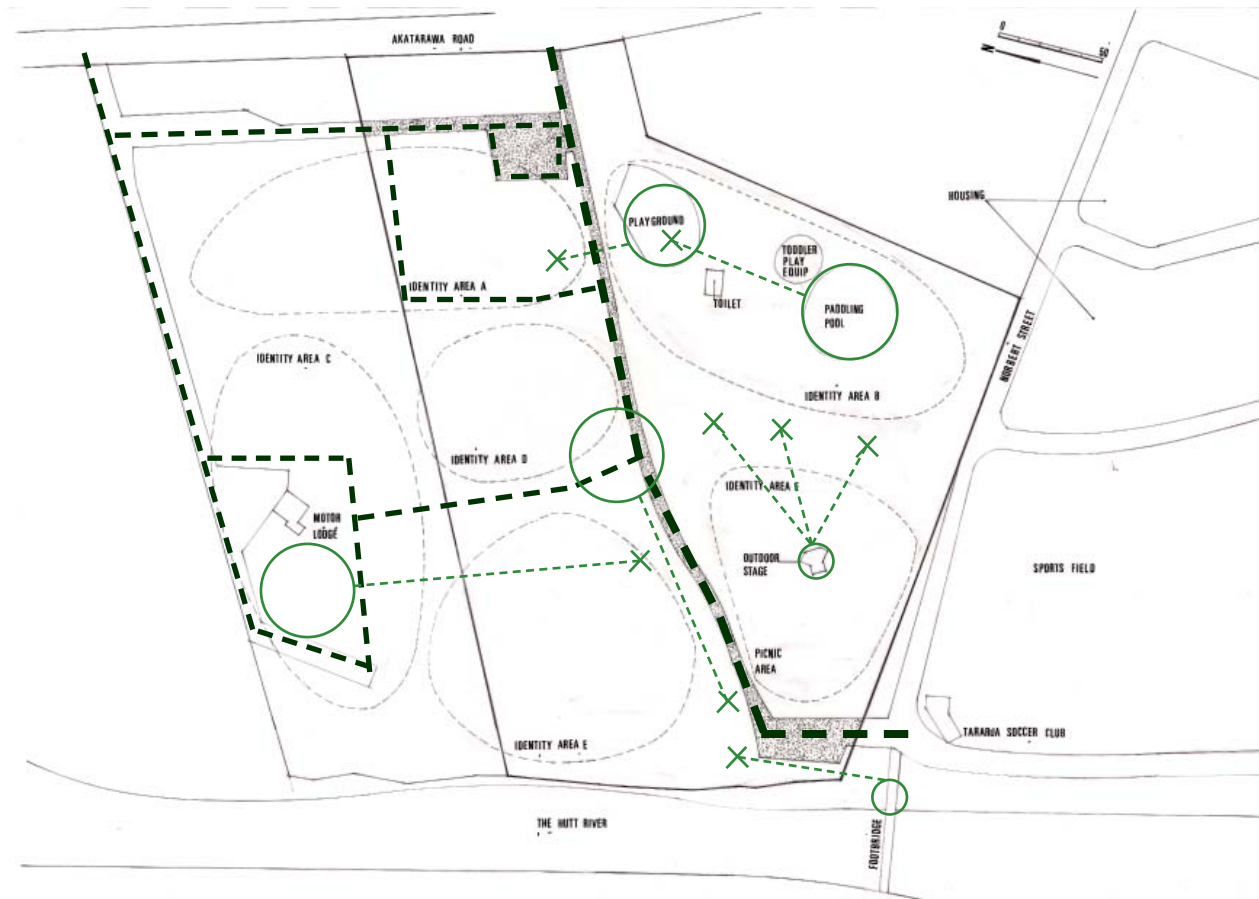


DARK GREEN DASHED LINE. Direction marked by arrow if single directional. Pause marked by a cross.

VIEW



GREEN Cross denotes standpoint, target denotes objective, dashed line denotes view line.



Far left to right:

FIG. 27 Photo of primary pathway through Harcourt Park, Upper Hutt, which overlies the Wellington fault-line. Source: Authors own

FIG. 28 Photo of secondary pathway through bush, Harcourt Park, Upper Hutt. Source: Authors own

FIG. 29 Site plan indicating key views and movement through Harcourt Park, Upper Hutt. Source: Authors own

desirable or perhaps yet unknown that encourages us to want to access, or possibly just contemplate, realms beyond”.<sup>113</sup> Environmental attributes within Harcourt Park which relate to this are those “which stimulate a sense of mystery and anticipation, an encouragement to explore”.<sup>114</sup> The varied topography of the site causes visual complexity and a sense of exploration, mystery and future possibility; a first time visitor might struggle to understand the extent of the recreational reserve because the topography hides and then reveals different aspects of the site as a visitor heads towards the west, only then to be surprised by the river at the other side. In terms of sight, smell and sound; firstly views towards the man-made facilities such as the playgrounds encourage movement in that direction for those who are interested, however the river terraces themselves, the sites of geological interest, do not have this same pull, as there is no path leading in their direction, and nothing to do once you arrive. There are no prominent smells which lead people through the site or encourage people to head to a new destination. The sound of the river may cause intrigue and encourage people to move in that direction.

## 5.4: TRANSITION

Thwaites and Simkins define the sensation of transition as that which “allows us to experience difference between adjacent places.”<sup>115</sup> Norberg- Schulz describes transitions as “the glue that binds together other spatial components to form a coherent whole.”<sup>116</sup> Another way to look at transition is to consider what it contributes to the development of a spatial language:

*“Transition is the punctuation of spatial language. Just as with punctuation in text it allows us to experience spatial continuity as sequences of comprehensible passages by intervening in the continuity at intervals to provide rhythm and structure to the whole... Just as there are different kinds of punctuation marks to generate comprehension in text, so there are different kinds of transition that help comprehension in the*

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113      *ibid.* p.66

114      *ibid.* p.66

115      *ibid.* p.69

116      Norberg-Schulz, Christian. *Genius loci: Towards a phenomenology of architecture*. London: Academy editions, 1980. p.27

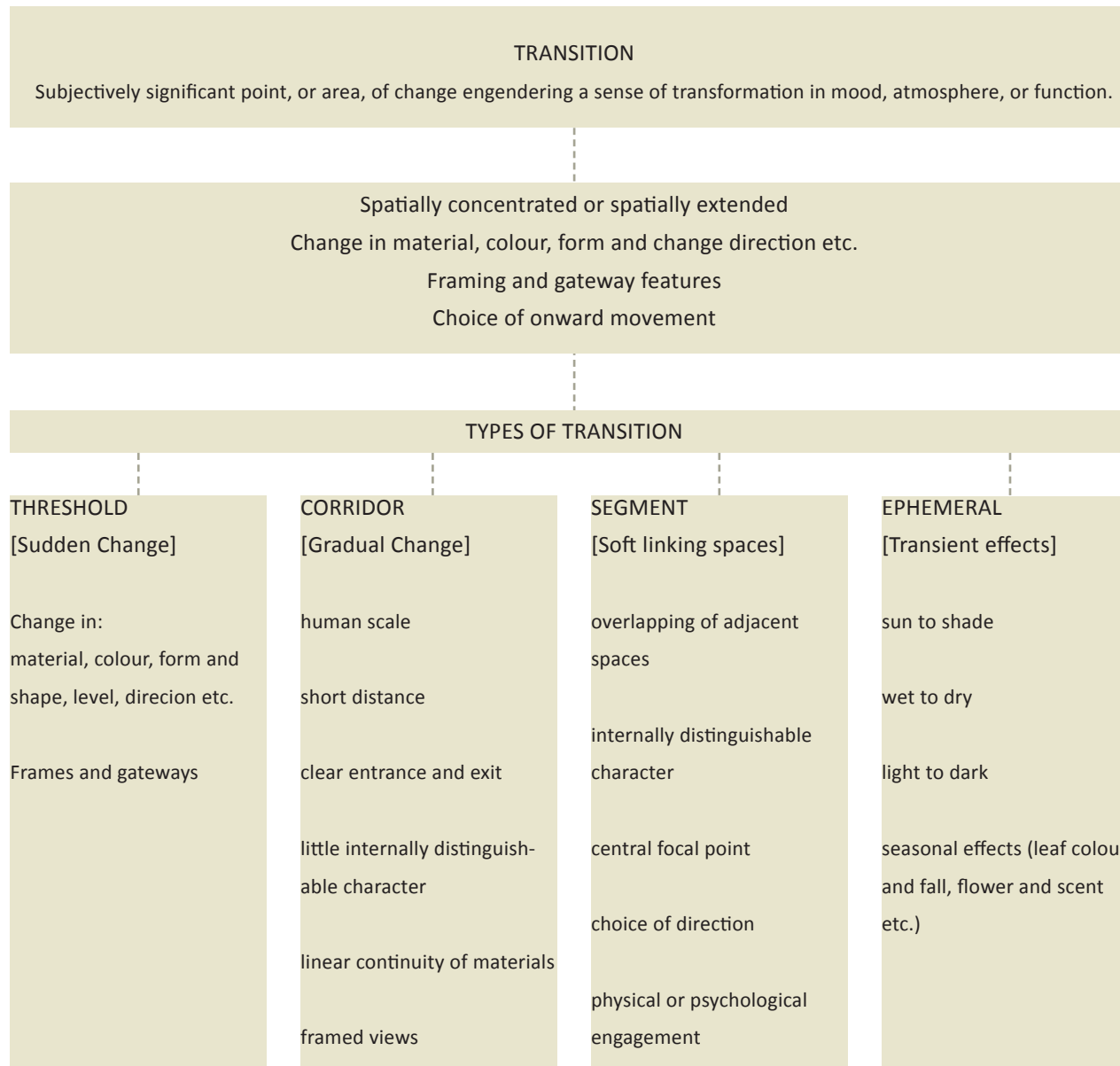


FIG. 30 Diagram explaining key characteristics of spatial dimension transition  
Source: Authors recreation of information from Simkins, Ian and Kevin Thwaites. Experiential landscape. New York: Routledge, 2007. p. 73



*spatial realm.* ”<sup>117</sup>

The transitions being analysed here are those which occur within the landscape as opposed to physical thresholds such as doors which occur in architecture. Therefore by reapplying the Experiential Landscape concept to architecture, a new vocabulary will be introduced to the transition sub-category. The focus will still be on the transitions between architecture and the site, as opposed to the transitions which occur within the architecture itself, as these transitions are those which allow the mutable permeability of nature and architecture which Ando described in the previous chapter as being of great importance. The different kinds of transition which Thwaites and Simkins identify are threshold, corridor, segment and ephemeral transition.

**THRESHOLD:** Thwaites and Simkins consider that the threshold is “probably the simplest form of transition because it occurs in an instant defined usually by quite an abrupt contrast on either side of it.”<sup>118</sup> The threshold can also “create the most impact, because of its immediate and abrupt nature.”<sup>119</sup> The most

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117 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.70





118 *ibid* p.70

119 *ibid.* p.70





KEY:

THRESHOLD		TWO DARK GREEN PARALLEL LINES
CORRIDOR		TAUPE DASHED LINE
SEGMENT		GREEN HASHED LINE
EPHEMERAL		DARK GREEN DIAMOND LINE



Far left to right:

FIG. 31 Gate between main park and Motor Lodge.Example of threshold within Harcourt Park, Upper Hutt. Source: Authors own

FIG. 32 View over pedestrian foot bridge, key access to Harcourt Park, Upper Hutt. Source: Authors own

FIG. 33 Site plan indicating key transitions in Harcourt Park, Upper Hutt. Source: Authors own

perceptible thresholds currently present on site are those which separate the site from its surroundings: the main entrance on Akatarawa Street and the secondary entrance on Norbert Street, and the gateway which separates the park from the neighbouring motor lodge, suggesting a change in ownership and level of privacy.

**CORRIDOR:** Thwaites and Simkins consider that the corridor “is spatially more expansive than a threshold in that it delivers its transitional experience gradually rather than abruptly”.<sup>120</sup> The corridor delivers its transitional experience more gradually than a threshold and therefore aptly describes the transitional experience of approaching or leaving the site via the footbridge, or the experience of entering and exiting the more densely planted areas of the site.

**SEGMENT:** The segment is usually formed by the overlapping of two adjacent spaces. Segments have attributes of transitional space as well as attributes of centre. They are often the spatial entities that soften the hard unbroken edges between spaces. There are segments of space present around the perimeter of the playground and swimming facilities at the site, where the predominant playing equipment is located in the centre, fading into the play space provided by the grass fields at the playgrounds edge.

**EPHEMERAL TRANSITION:** An ephemeral transition recognises qualities of the environment that can generate strong transitional sensations but are not permanent features. Such ephemeral transitions occur at multiple positions between sun and shade and also changes in wind exposure caused by variations in season, topography and other shelter such as trees. Another ephemeral transition which occurs at the site is that caused by the strong geological features. One can move from one tectonic plate to the next by simply crossing over the primary pathway, without really noticing it has happened. The changes of level between each terrace riser are also ephemeral changes, as the materials, level of enclosure or light have not changed.

5.5: AREA

Area is a quality of experiential landscape as a whole, whereas centre, direction and transition are qualities of smaller experiential landscapes. Area is the quality that gives an experiential landscape its sense of identity and is part of what makes it possible to distinguish from other places. Area also has a similar characteristic to centre in that areas can be experienced within areas. Thwaites and Simkins consider that area is “at one and the same time the product of combinations of centre, direction and transition, and a recognisable entity in itself as a whole.”<sup>121</sup>

**THEMATIC CONTINUITY:** This characteristic of area refers to continuity of rhythm and pattern, and a coordination of texture, space and form, detail and symbol, building type, use and activity, degree of maintenance and topography. The thematic continuity of this site lies within the presence of nature, the

121 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p.74

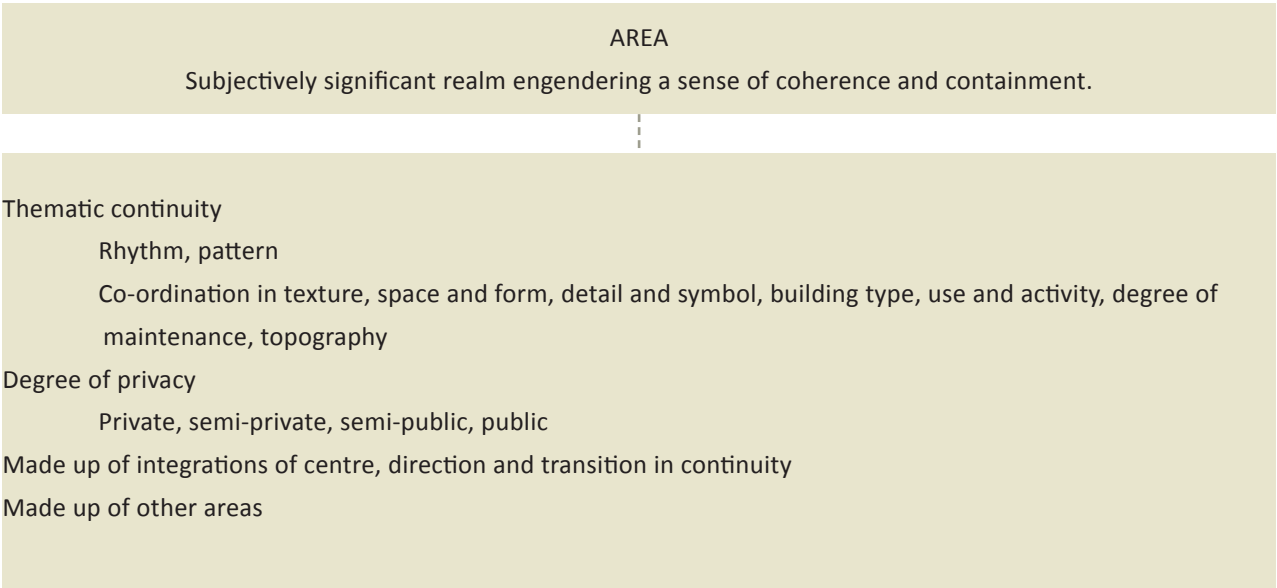






Fig. 34 Diagram explaining key characteristics of spatial dimension transition  
Source: Authors recreation of information from Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p. 76

KEY:

AREA		DARK GREEN THICK AND THIN LINE
SEMI PRIVATE		DARK GREEN DASHED LINE
SEMI PUBLIC		GREEN DASHED LINE
PUBLIC		TAUPE DASHED LINE



patterns of tree planting, and the textures of grass, soil, gravel and stone.

**DEGREE OF PRIVACY:** Harcourt Park exists as a public park, accessible by anybody at any time. Within the park there are however semi-public zones such as the outdoor stage, semi-private zones such as the motor lodge surroundings, and toilet block and private zones such as the groundskeeper's home, personal campervans and the inside of toilet cubicles.

**INTEGRATIONS OF CENTRE, DIRECTION AND TRANSITION IN CONTINUITY:** While the previous sections show that Harcourt Park contains experiential landscape qualities, there are ways in which this site could be intensified as an experiential destination using architecture which are addressed in the architectural investigation which follows.

## 5.7: CONCLUSION

To conclude this chapter, the key findings from site analysis are summarised in a chart which follows indicating requisite issues in each sub-category of CDTA and how each of these issues will enhance the ability of architectural design to meet the objective of the thesis.

FIG. 35 (FAR LEFT) Site plan indicating level of privacy within Harcourt Park, Upper Hutt. Source: Authors own

SUB-CATEGORY:	REQUISITE ISSUE:	HOW EACH ISSUE ENHANCES THE ABILITY OF THE ARCHITECTURAL DESIGN TO MEET THE OBJECTIVE OF THE THESIS:
<b>CENTRE</b>		
Social imageability	The uniqueness of this site lies within its geographical and seismological significance to the region. There is however a lack of attention, to the terrace risers and fault line which are such vital aspects of the site.	This deficit could be addressed by strategically using architecture to highlight the river terraces as individual centres, drawing attention to them by creating clear and enticing directional routes and strengthening the user's appreciation of the site's transformation over time by enhancing the transitions between each terrace.
Restorative benefit	<p>The only shelter provided on site is that which covers the outdoor stage. The site is not a comfortable place to be in poor weather conditions.</p> <p>There are no constructed provisions for rest.</p> <p>The presence of nature is crucial to the site's continuance as a recreational park which contributes to the site's restorative benefit.</p>	<p>Architecture could greatly enhance the restorative benefit of the site, by providing comfort and shelter and provision for rest and introducing more stimulating features for psychological engagement.</p> <p>The architecture should also be considerate of existing vegetation and consider how the architecture can assist with drainage of the different soil types at individual sub-sites.</p> <p>When architecture enhances the restorative benefit of the site, it will be more comfortable and accessible in all weather conditions, allowing visitors to learn about the prevalence of seismic activity at any time</p>

Social interaction	There are limited places at the site where significant routes converge, features are provided for waiting, or there is seating in social groupings.	Architecture could also be used to increase opportunities for social interaction by introducing converging routes, a stronger presence of features for waiting, seating in social groups, features which encourage comment and strengthen the sense of arrival and departure. It is important that social interaction can occur at the site, to allow the public's collective memory of earthquake history to come together, so that disparate memory fragments can come together and gain weight and meaning.
<b>DIRECTION</b>		
Linear containment	The lack of linearity in Harcourt Park's floorscape does two things simultaneously. Firstly it encourages multiple positions of 'here-ness' where the aspects of <i>centre</i> speak more loudly than the aspects of <i>direction</i> . At the same time, the lack of linearity provides mystery, a sense of possibility, but also potential disorientation.	Architecture could enhance the sense of direction and attention towards the seismically significant aspects of site by enhancing the incentive or motivation to move towards them and by presenting the sense of possibility, exploration and mystery
Route	There are no paths which lead to the river terrace risers, which may be difficult to access in a wheelchair or in poor weather conditions	The space in-between the individual buildings at the four sub-sites should be considered so that the path between the buildings is accessible, therefore allowing the public to appreciate the whole education about landscape transformation that the four architectural pieces create

Anticipation	The varied topography of the site causes visual complexity and a sense of exploration, mystery and future possibility	Architecture can heighten this sense of exploration, mystery and future possibility by framing views of what is to follow. In this way the visitor is always aware that the transformation of site continues and further exploration and education can occur
TRANSITION		
Threshold Corridor Segment Ephemeral transition	The analysis of transition at Harcourt Park has addressed that which exists in nature rather than that which is made possible through the introduction of architecture	Architecture would introduce to the site a greater variety of transitional spaces –the threshold, corridor, segment and ephemeral – which allow visitors to enter, choose, pause, slow down, look, wait awhile, appreciate, explore and finally exit different spaces knowing that they have been somewhere more significant than that which they experience within the generalities of space.
AREA		
Thematic continuity	The thematic continuity of this site lies within the presence of nature, the patterns of tree planting, and the textures of grass, soil, gravel and stone.	The materiality of the architecture introduced at the site should integrate with the existing natural thematic continuity of the site
Degree of privacy	Harcourt Park exists as a public park, accessible by anybody at any time.	The architecture should not restrict access to any member of the public so that anybody is able to learn about the prevalence of seismicity and importance of prevalence, therefore wheelchair access should be considered carefully



The site considerations summarised here are considered alongside key theoretical imperatives in the architectural investigation which is described in the following chapter.



# ARCHITECTURAL INVESTIGATION 6

## 6.1: INTRODUCTION

This architectural investigation seeks to resolve the principle research intention, which is to ascertain how architecture and landscape can be integrated as an evidentiary and informative experience about the prevalence of seismicity and subsequent need for disaster preparedness within the Wellington region. The architectural exploration takes place within Harcourt Park, a recreational reserve which has been analysed using Thwaites and Simkins Experiential Landscape methodology in the previous chapter. This area of research offers a unique expansion of the Experiential Landscape concept which has been limited to landscape architecture and urban planning scenarios and is now applied to an architectural problem. Thwaites and Simkins write how they hope “that anyone with an interest in the relationship between people and their outdoor world will find something of value”<sup>122</sup> in their work. This thesis then questions whether value can be found in this particular circumstance.

The architectural investigation combines key theoretical imperatives regarding collective memory and living memorial concepts and theories related to the integration of landscape and architecture as well as key site specific imperatives which are categorised by Thwaites and Simkins spatial dimensions; centre, direction, transition and area. A matrix of these imperatives features in the next section which details the design methodology to be followed.

The integration of these imperatives has resulted in four separate pieces of architecture which are located at four sub-sites. Two architectural pieces are integrated with the oldest river terrace where one piece of architecture is situated on the Indo- Australian side of the Wellington fault-line and one on the Pacific side

122 Simkins, Ian and Kevin Thwaites. *Experiential landscape*. New York: Routledge, 2007. p. xi

of the fault-line; the other two architectural pieces integrate with the second oldest river terrace which also sit on opposite sides of the fault-line. These sub-sites have been selected because they allow for the architecture to interact with the two major terrace risers on both sides of the fault-line simultaneously. Over time the architecture will witness gradual dextral slip of the tectonic plates from multiple positions or a more instant shift if a major earthquake occurs. The architecture does not however rely on future transformation to be fully engaged, rather the built form freezes past tectonic movement and its effects in place through architectural gesture, suggesting movement without actually having to move. While the architecture responds to the same set of theoretical imperatives, the site specific imperatives at each sub-site direct some of the architecture's agenda, meaning that a set of landscape problems are dealt with while simultaneously transforming the site into an educational experience.

The living memorial program of this architecture requires three programs to coexist within one site, divided into four individual buildings. The first is commemoration of New Zealand's most devastating earthquakes, and provision for the future commemoration of Wellington's losses following a major earthquake in the region, should disaster preparedness not occur. The second is education about earthquakes and disaster preparedness which can be experienced individually or with others as part of a school field trip or group visit. The third requires provision for research to occur, regarding land transformation at Harcourt Park and surrounding sites, as well as other disaster mitigation work and individual research. These programs do not sit separately from each other; rather they coexist within the separate pieces of architecture, allowing commemoration, education or research to feature and function as they are required. A system of identification for the individual buildings has therefore been applied to assist in simplifying the complexity caused by cross-programming and building separation. Four architectural titles are assigned to the four buildings, which are emblematic of the program type within. In this way, the program is not limited by the assignment of the title 'Research Lab', rather the title allows for all programs to exist at once while ensuring that the architectural imperatives are met. In this way, the architecture becomes the site's educators which each boast individual teaching methods and provide the last motivation for the architecture to metaphorically shift and then be locked in place.

The first building is the *Guide*, located on the Indo-Australian Plate side of the oldest river terrace riser. The Guide is the first piece of architecture to be approached when entering the site from the main entrance on Akatarawa Street. Within the architecture's program, the Guide prioritises education by introducing the other three buildings to the visitor, demonstrating the transformation of site that has occurred at Harcourt Park over time. The second building is the *Curator*, located on the Pacific Plate side of the oldest river terrace riser. The Curator allows for education and research to occur and receives its name because it presents active, to the minute research to visitors in a gallery space, while also allowing visitors to witness researchers working within the architecture. The third building is the *Tutor*, located on the Indo-Australian Plate side of the second oldest river terrace riser. The Tutor allows for group and individual research to occur. This is a useful work space for school trips or individual work. The fourth building is the *Groundskeeper*, located on the Pacific Plate side of the second oldest river terrace riser. The Groundskeeper prefers a hands-on teaching experience and encourages visitors to get right down into the earth. The Groundskeeper provides spaces which facilitate field-work, a drying room and storage for field equipment.

## **6.2: DESIGN METHODOLOGY**

The following matrix describes the key theoretical imperatives which direct the architectural decisions made at each of the four individual sub-sites. The matrix includes theoretical imperatives, regarding collective memory and living memorial concepts and theories related to the integration of landscape and architecture as well as key site specific imperatives which are categorised by Thwaites and Simkins spatial dimensions; centre, direction, transition and area. While the theoretical basis established by Thwaites and Simkins was based on landscape architecture this architectural design invites architecture to strategically participate with their concepts in order to achieve a unique objective.

The architecture will:

THEORETICAL IMPERATIVES:	PRIMARY	SECONDARY
Collective memory	1. Advance the living memorial concept, commemorating losses from New Zealand's most devastating earthquakes as a means of encouraging <i>future preparedness</i> within Wellington	2. Encourage interaction between visitors, architecture and site so that partial and incomplete past recollections of earthquakes can be interwoven and form a collective memory
Landscape	3. Integrating architecture and landscape as an evidentiary and informative experience that does not even need any exhibits to achieve the goal of earthquake awareness and disaster preparedness education.	4. Advance typical social responses of Earthquake Architecture by integrating physical and above psycho-environmental aspects of site
Site specific imperatives:		
Centre	5. Communicate the dynamic relationship between seismicity and the pronounced physical features of site through architecture	6. Improve the restorative benefit of site by allowing separation from distraction, places for rest, comfort and shelter
Direction	7. Present an awareness of the possibility of continuity between individual sub-sites, and a way of realising that possibility	8. Generate a sense of anticipation: that there may be something desirable or unknown that encourages the visitor to want to access, or possibly just contemplate, that which lies beyond
Transition	9. Introduce a range of transition types as a means of articulating the difference between adjacent places	
Area	10. Intensify the quality of Harcourt Park's experiential landscape as a whole, through the spatial dimensions centre, direction and transition	

### 6.3: INHABITANTS, OCCUPANTS AND VISITORS OF THE PRESENT AND FUTURE

The living memorial program incepts a temporal complexity where neither the past, present nor future takes precedence. Therefore current user groups are not the only people to be considered in this architectural investigation. According to Jan Birksted, the temporal dimensions of landscape and personal experience transport “the past into the present, blurring past and present, recreating the present as past.”<sup>123</sup> The design research component of this thesis concerns a number of user groups, not only those currently affected by the introduction of architecture to the site, but also those who will utilise the site in the future. The architecture affects the site’s current users, the students young and old who visit the site on field trips, the performers and supporters who come to utilise the outdoor stage, the youth who visit the site to play, the parents who accompany them or come alone for time out, the neighbours who use the site as thoroughfare, the geologist who visits the site to take measurements and samples, the keen public – local and international – who flock to the site to see why the geologist has chosen to study here and to witness the earth’s transformation over time.

The future occupants of the site are hopefully all of those mentioned above, but in a greater magnitude, as the intention of the architectural intervention is to raise awareness of seismically significant sites, by integrating architecture and landscape as an evidentiary and informative experience about the prevalence of seismicity and subsequent need for disaster preparedness within the Wellington region. After inevitable future earthquakes along the Wellington fault-line, the geologist takes a more prominent position at the site, utilising the terraces as natural markers to measure the distance that the tectonic plates have moved over time.<sup>124</sup> Because the memorial aspects of the architecture are poised to commemorate loss within Wellington after a devastating earthquake (if disaster preparedness has not improved) the site’s social significance could change and draw another user group of mourners, who come to pay their respect to human victims and buildings lost.

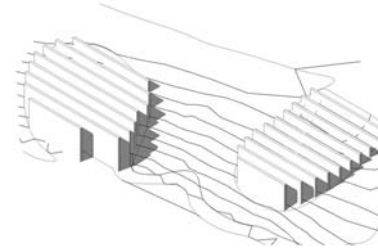
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123 Birksted, Jan. *Landscape of memory and experience*. New York: E & FN Spon, 2000. p.3

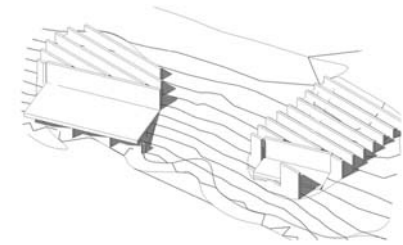
124 Berryman, K.R. “Late quaternary movement on the Wellington fault in the Upper Hutt area, New Zealand.” *New Zealand journal of geology and geophysics* 33 (1990): p.263-264

THE  
GUIDE

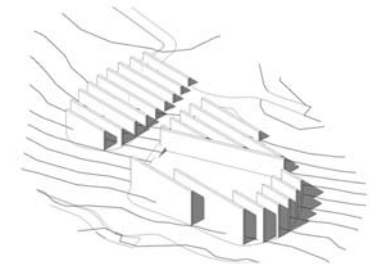
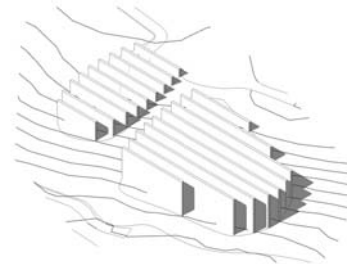
NORTH-SOUTH AXIS



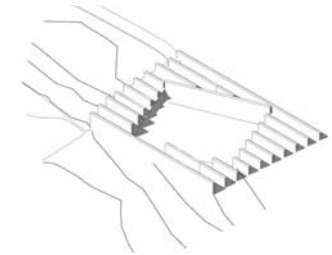
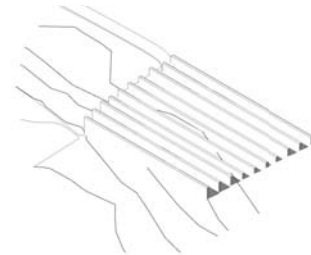
ORIGINAL RIVER CURRENT  
DIRECTION



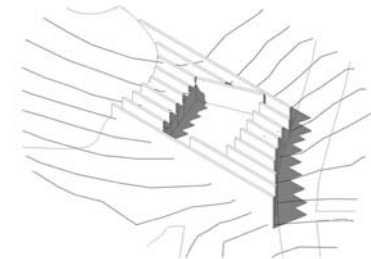
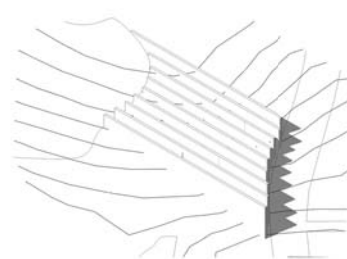
THE  
CURATOR



THE  
TUTOR



THE  
GROUNDSKEEPER





VISTA  
ORIENTATION

SACRED MEASUREMENT SPACE

FAULT-LINE AXIS

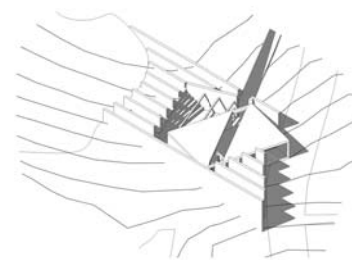
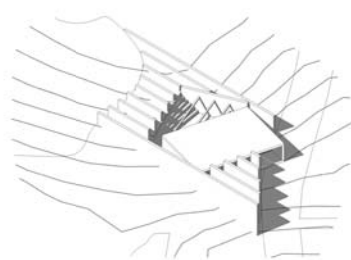
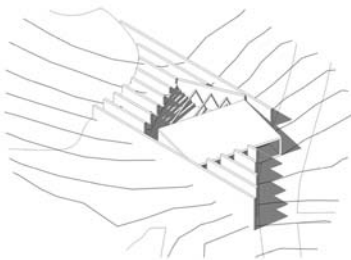
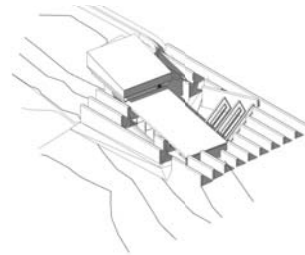
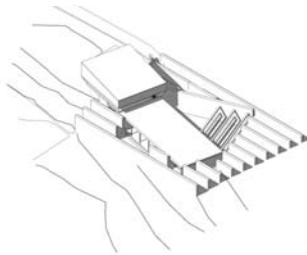
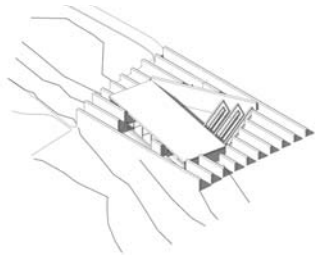
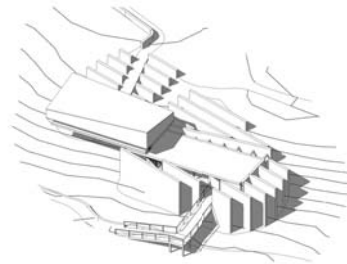
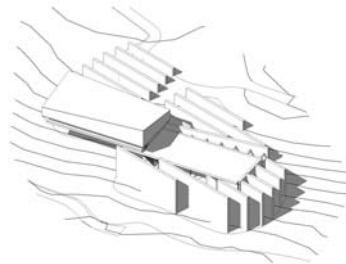
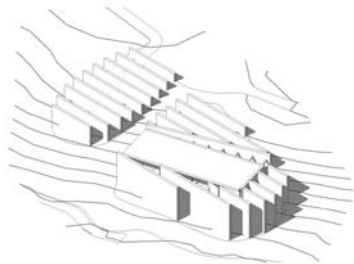
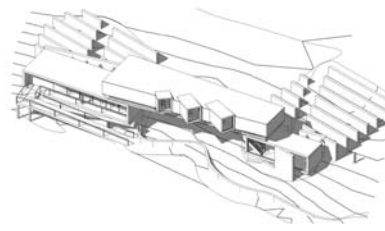
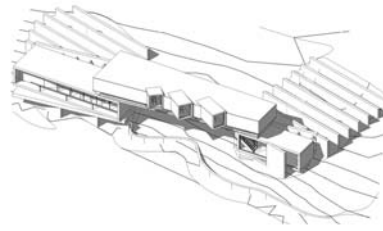
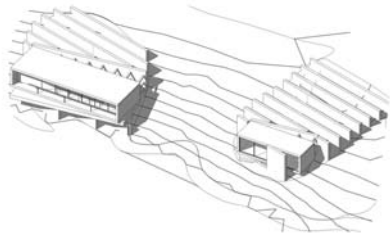


FIG. 36 Table of diagrams indicating architectural responses of individual buildings to key aspects of site transformation at Harcourt Park, Upper Hutt. Source: Authors own

## 6.4: DOCUMENTING SITE THROUGH ARCHITECTURAL LANGUAGE

This section describes how architectural language is used to communicate the relationship between seismicity and aspects of site so that architecture and landscape are integrated as an evidentiary and informative experience, describing how the site has transformed over time. Five aspects of site are utilised to communicate the difference between the four individual sub-sites. The *north-south axis* is adopted first as a starting point, which educates visitors about sunlight and global orientation and provides the base line upon which the other architectural language can be written. The *transformation measurement areas* (which educates visitors about the spaces which geologists/ seismologists can use for future land transformation measurement), *original river terrace orientation* (which educate the visitors about the historic river position), the *altering contour of each individual river terrace segment* (which educate visitors about unimpeded views and transformation shifts caused by shifts in the riverbed) and *fault line direction* (which educate visitors about transformation shifts caused by earthquakes) are the remaining site aspects which direct the architecture to manifest differently at the four sub-sites. While this section primarily considers key imperatives three and five from the matrices on page 68, the architectural responses to other imperatives are discussed throughout.

The first aspect of site which the design research component of this thesis investigation responds to is a characteristic which remains true for all situations and that is the north-south axis. In the proposed architecture, the north-south axis has been marked by reinforced concrete walls which become the primary structural system of the architecture. These walls are spaced equidistantly from each other – two meters apart – a distance determined by the typical spacing of gravestone rows. This means that the primary structural system of the architecture becomes the primary element of an ongoing earthquake memorial, bearing the names of the buildings and human lives that have been destroyed by earthquake on New Zealand soil to date. The initial wall height is 300mm, gauged from the Indo-Australian tectonic plate side of the oldest river terrace. Therefore as visitors approach the site, they are greeted by walls not too dissimilar to those in a cemetery, the most symbolic representation of a memorial site, setting the tone of the site as



FIG. 37 Perspective showing names of past earthquake victims on 'The Curator's' north-south concrete walls. Source: Authors own





a significant place. As visitors move down the contour of the first river terrace they realise that the height of the gravestone wall – while always set to the same datum height – appears to grow in height because of the change in topography; the walls, encrypted with hundreds of names reach a height of four meters at the base of the first terrace segment. When there are no more names of victims and building losses, the walls continue, suggesting that these empty, waiting spaces may be filled with the names of destroyed buildings and deceased people after future earthquakes, as a way of encouraging vigilance and preparedness. These walls – the first reference to site and to the space as a significant architectural reminder – become the lines upon which the rest of the architectural language is written.

The second aspect of site which the architectural design research intervention responds to are the useful measurement spaces which are areas of land that local geologist Timothy Little has identified as being close to their geological origin, seemingly untouched by man and useful for future transformation measurement.<sup>125</sup> The architecture protects these areas from outside or within, so that the useful spaces are left untouched. The ground plane of the architecture is raised above these useful measurement spaces in order to highlight their importance to the site's prolonged significance and use. In the upper levels of the architecture the view is directed downwards through down-angled windows which separate the wall and floor so that the focus of the interior space is on the useful ground beneath. This separation between wall and floor is made possible by a light steel supporting frame, meaning that from a distance the first floor appears to be detached and hovering above the ground floor level. This intensifies the sense that the ground beneath this section of building is significant and should not be touched.

The third aspect of site which the architecture interventions respond to is the original river terrace orientation which is taken from the position of the Indo-Australian segment of the oldest river terrace. This is the first architectural component which pierces the primary concrete walls. This action alters the meaning of the walls as being set in stone – a memorial to a time past – for when “ruins are uncovered they are irrevocably

FIG. 38 (FAR LEFT) Section showing wall height of ‘The Guide’ relative to terrace contour. Source: Authors own

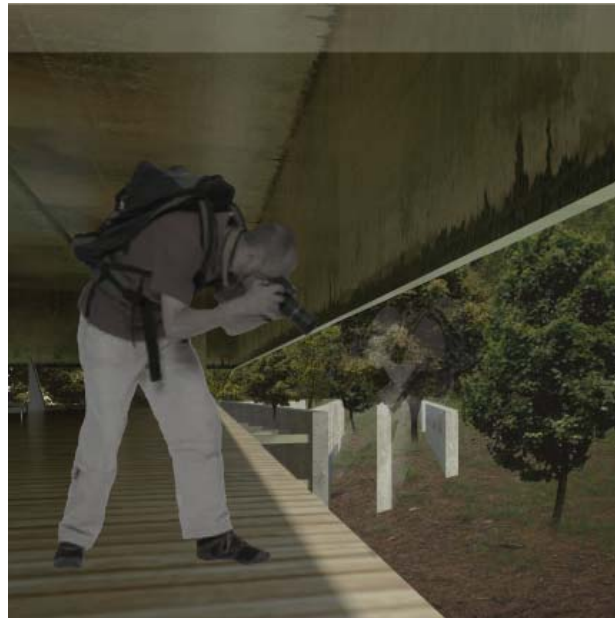
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125 Little, Timothy, et al. “Coseismic strike slip at a point during the last four earthquakes on the Wellington fault near Wellington, New Zealand.” *Journal of geographical research* (2010): p.13

changed, they become part of the present.”<sup>126</sup> The visitor faces both the names of past victims and the blank ‘waiting’ walls at eye level. This axis remains constant throughout each of the buildings, providing an L-shaped cradle within the concrete walls, upon which the inhabitable architecture is positioned. This L-shaped cradle fundamentally disassociates the architecture from its context on a visual, formalist and typological point of view. The

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126 Roth, Michael S, Claire Lyons and Charles Merewether. *Irresistible decay : ruins reclaimed*. Los Angeles: The Getty Research Institute for the History of Art and the Humanities, c1997. p.25



cradle presents a notion that all of the buildings are held in a concrete hand, the hand always remains at the same orientation, whereas the orientation of the inhabitable architecture is driven by its own site-specific imperatives.

The fourth aspect of site which the architecture responds to is the altering contour of each individual river terrace segment. Upon the L-shaped cradle (the historic reference to the original river direction) the current contour orientation of each terrace determines the stance of the inhabitable architecture, always facing the vista from that particular point. This shift in movement is locked in place by a series of steel struts, between the back wall of the L-shaped cradle and the back wall of the inhabitable space. The steel struts separate the light-weight timber inhabitable structure (which communicates a sub-site specific shift towards the vista) from the heavy weight concrete L-shaped cradle (which communicates a site specific historic orientation of the original river terrace). While this change of orientation marks the horizontal tectonic movement, the vertical movement is marked by the height of the concrete north-south walls. The Indo-Australian plate continues to act as the ‘par-dictum’, so that the walls begin at the gravestone height of

300mm at the top of each terrace. On the other side of the fault-line, the wall heights at each terrace change in relation to the vertical movement between the Pacific and Indo-Australian plate.

The fifth key aspect of site which the architecture responds to is the fault line direction. As the principal route through the site lies atop the Wellington Fault-line, this language is reapplied in the proposed architecture as a means of allowing access to the newly formed architecture. To this end, the entry and exit points to each building follow the direction of the fault-line, piercing through the architectural elements that have been set



FIG. 39 Perspective showing sacred space from interior within 'The Guide'. Source: Authors own

FIG. 40 Perspective of 'The Curator' showing steel strut separation between the inhabitable architecture (current river terrace direction) and the concrete cradle (original terrace direction reference).

Source: Authors own





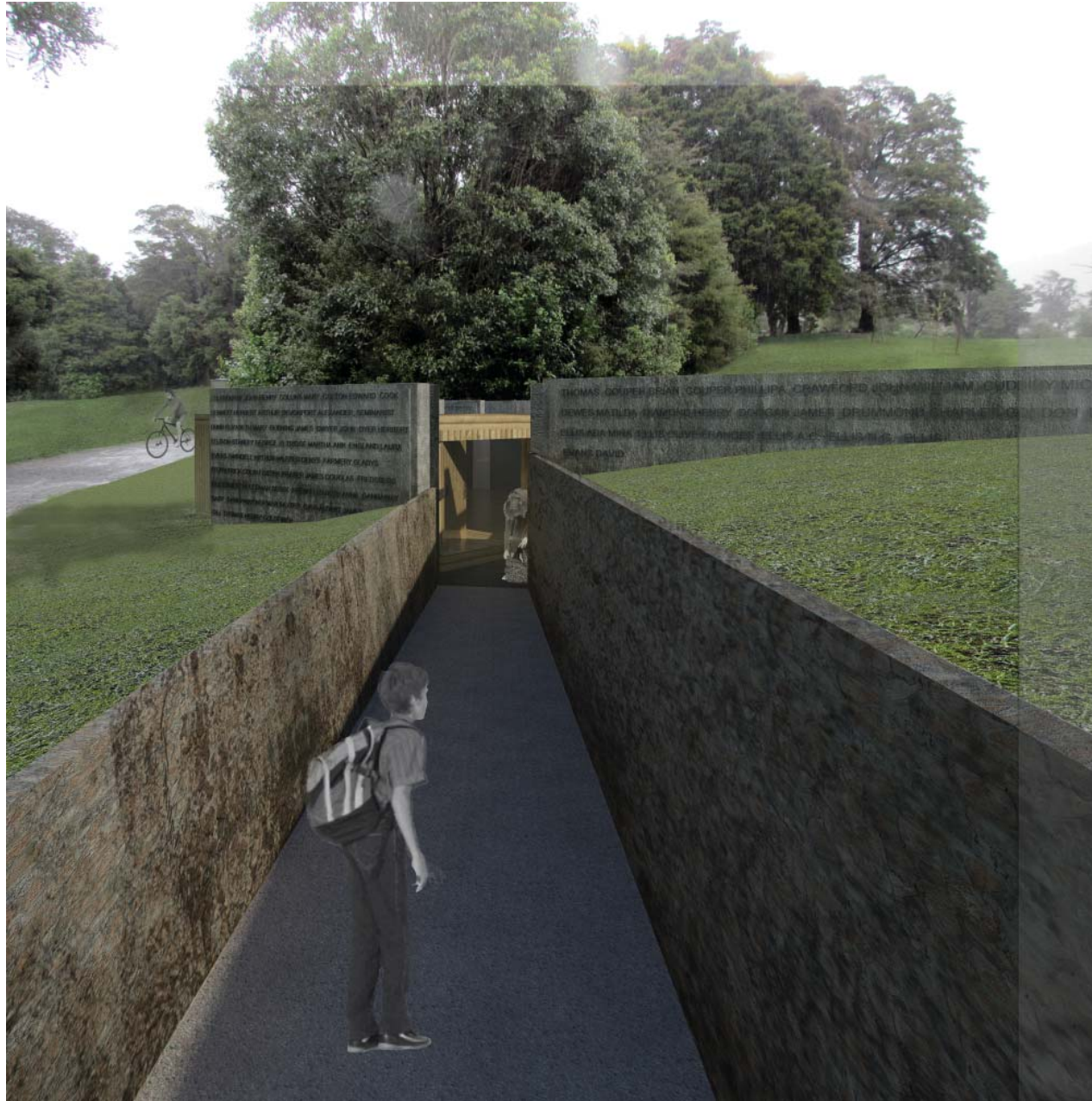


FIG. 41 (FAR LEFT) Perspective showing orientation of 'The Guide' towards vista.

Source: Authors own

FIG. 42 Perspective of entrance to 'The Groundskeeper' showing excavated ramp which follows fault-line axis

Source: Authors own

in place to reference the other four aspects of site, in the same manner that the fault line cuts through such vital elements of the earth.

This section has described how architectural language has been used to communicate the relationship between seismicity and aspects of site at Harcourt Park. These key geological aspects of site have been used to command the base physical elements of the architecture, locking the development in place to one particular situation. When combined, these geological references show internal complexity and transformation, an interesting evolution, describing how the site has transformed over time so that the architecture and landscape are integrated as an evidentiary and informative experience.

## **6.5: ARCHITECTURE'S FOUR EDUCATORS**

The living memorial program of this architecture requires three programs to coexist within one site, divided into four individual buildings, situated at four sub-sites. A system of identification for the individual buildings has been applied to assist in simplifying the complexity caused by cross-programming and building separation. Four titles are assigned to the four buildings, which are emblematic of the program type within. The individual buildings then become the site's educators which each boast individual teaching methods and provide the last motivation for the architecture to shift and then be locked in place. Below, the four pieces of architecture are introduced, as the Guide, the Curator, the Tutor and the Groundskeeper discussing how each piece of architecture contributes to the goals of the thesis.

### **THE GUIDE**

The Guide is the first piece of architecture that visitors approach as they enter the site from Akatarawa Street, located on the Indo-Australian tectonic plate segment of the oldest river terrace. The Guide is the old-timer of the site – having lived there for the longest time – and demands attention and respect from the remaining site below. He welcomes visitors with an open arm which extends into and slightly overlaps



FIG. 43 Perspective showing 'The Guide' demanding attention from site  
Source: Authors own



the primary circulation route, proposing the option to enter or pass through. This arm takes the form of the first concrete north-south wall, upon which the encryptions of building losses in the Murchison, Hawke's Bay, Inangahua and Canterbury earthquakes are made which entice new visitors to read on and enter the architecture. A slow corridor transition between site and architecture is created by an access path which is cut into the primary concrete walls, so that the visitor enters into the memorial walls and down into the first enclosed space. The visitor is then led up into The Lookout, bridging over the

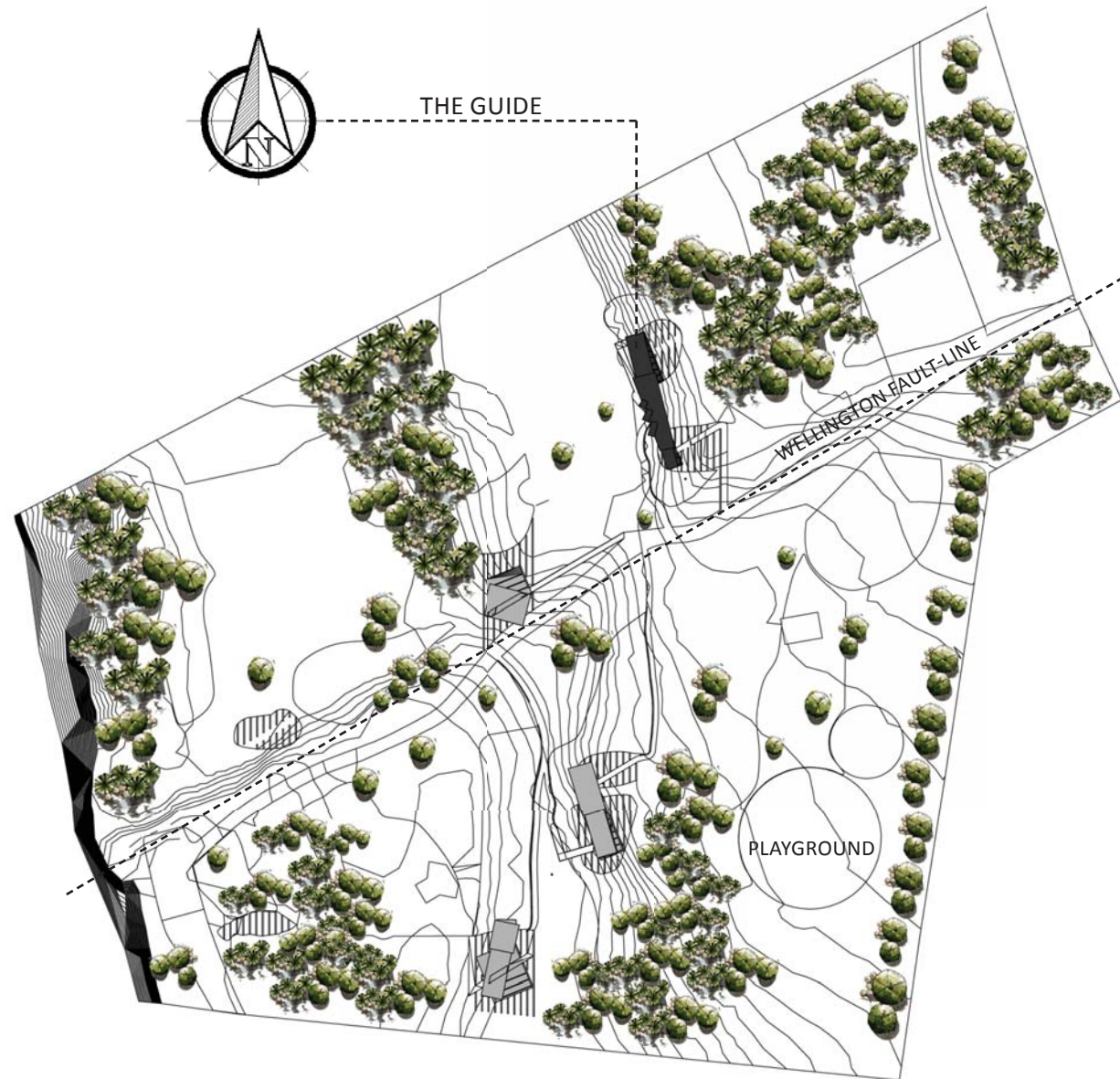


first of the site's measurement spaces. In this space, the instructor presents to visitors the site they are about to explore within three viewing chambers, each one purposely positioned to frame the three remaining pieces of architecture. The intention is to provide visitors with an understanding of where it is that they are going and how they can go about getting there, strengthening the spatial sensation of direction. The Guide also provides explanation as to the significance of the sacred space, so that it can be understood without explanation from the remaining architectural educators. Before visitors depart, the Guide provides space for visitors to prepare, to re-group, eat and drink or use bathroom facilities before they embark on their journey forward. The transition from architecture to site again occurs through a corridor type descent, down a ramp which overlooks the site beyond and allows visitors to find their bearings one last time before they reach ground level. The visitor then walks along a new path and meets the primary path, to continue on and find the next building, the Curator, which has been identified from within the Guide.



FIG. 44 (FAR LEFT) Exterior perspective showing preparation space within The Guide. Source: Authors own

FIG. 45 Interior perspective within the Guide, showing viewing chambers facing remaining three buildings / river terrace risers. Source: Authors own





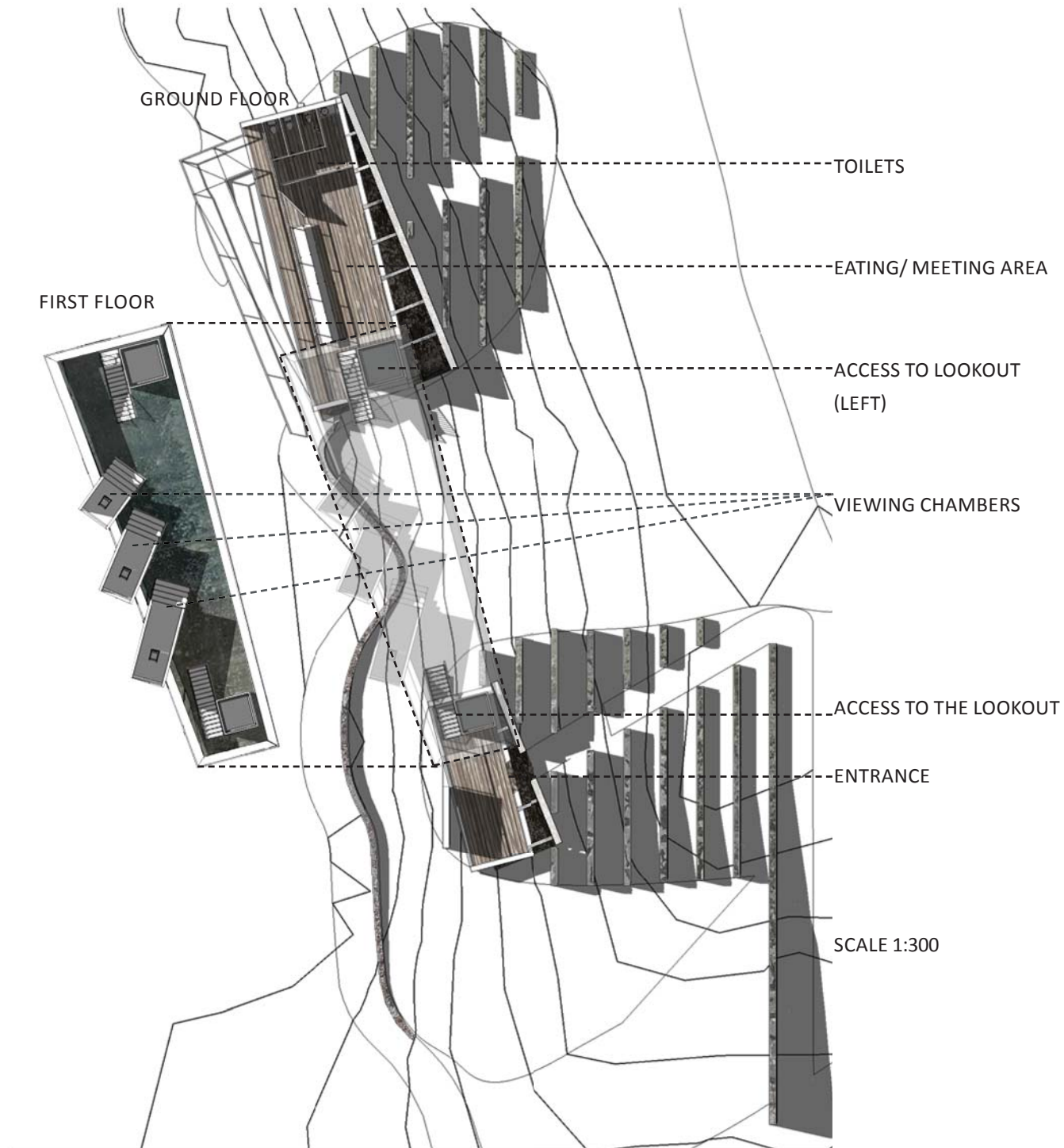


FIG. 46 (FAR LEFT) Site plan showing location of The Guide. Source: Authors own

FIG. 47 'The Guide' plan. Ground floor and first floor (excerpt)  
Source: Authors own

## THE CURATOR

The Curator is the instructor's right-hand woman; they have lived at the site for the same amount of time and yet drifted apart, as 1400 years and five major earthquakes came between them causing



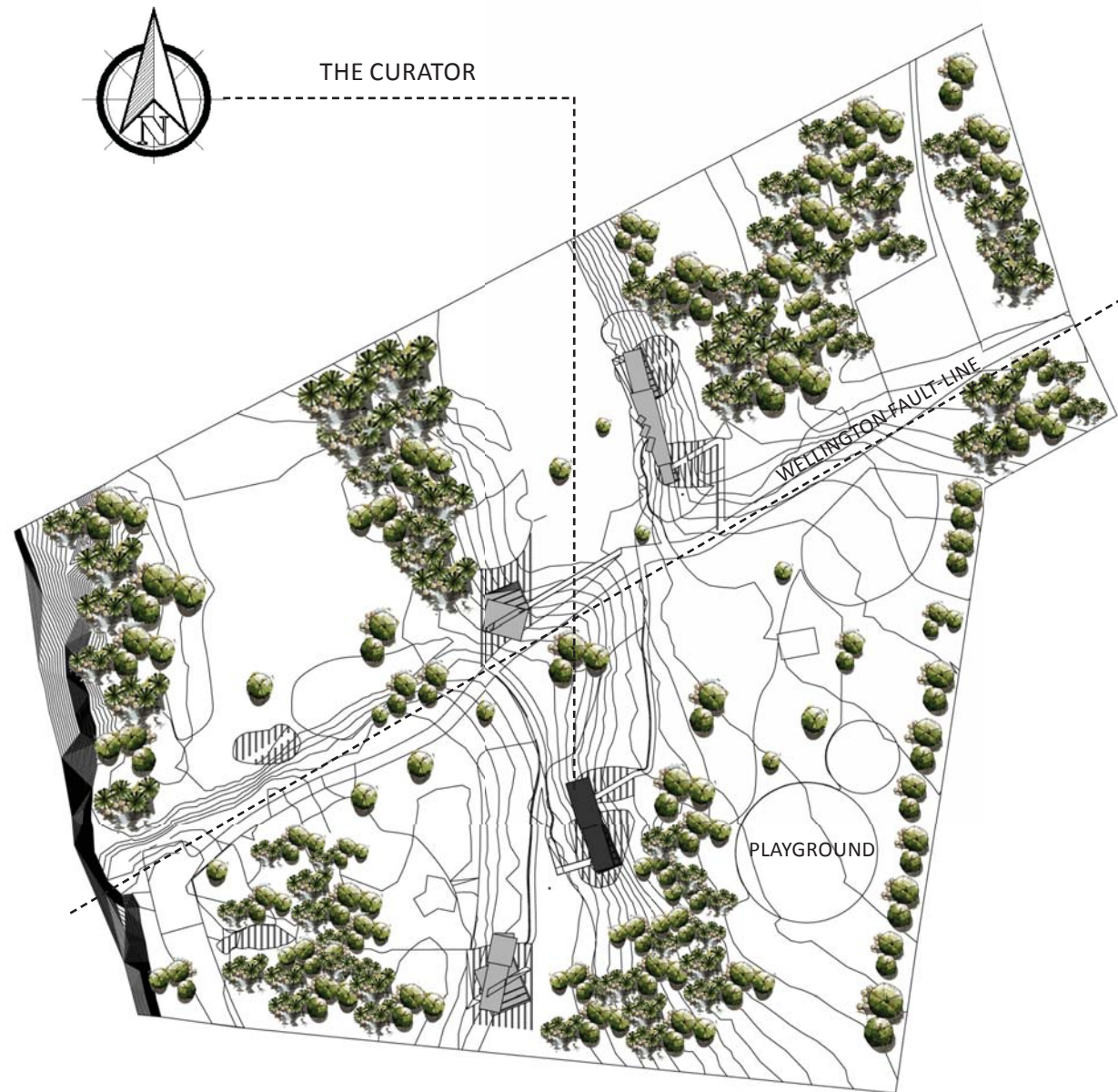
a dextral slip (horizontal displacement) of  $32.9 \pm 4.0\text{m}$  and a north-up throw (vertical displacement) of  $5.2 \pm 0.10\text{m}$ , which is reflected by the distance between the Guide and the Curator (horizontal) and the height of the primary concrete north-south walls (vertical). During this time, the Curator's purpose has changed and her horizons have expanded to include more than this single site. Because of the different topography of this sub-site, the visitor ascends toward the architecture on a raised path, rather than descending upon entry into the Guide. Here, the visitor enters the first floor initially which is raised above the useful measurement space below, and cantilevers beyond the primary concrete walls. Within this space, Curator hosts a gallery which closes off any view to the outside other than the ever-present measurement space beneath, instead presenting electronic panels of measurement information and records from global positioning devices and seismographs throughout New Zealand, the Pacific Rim and the world. Due to the Curator's fastidious nature, the information is electronically updated to the minute, emphasising the ongoing prevalence of seismicity world-wide and reminding visitors that earthquake's can happen at any time. The Curator keeps visitors interested by shaking her secondary floor each time there is an





FIG. 48 (FAR LEFT) Interior perspective within 'The Curator' showing pathway past the workroom toward seismograph display. Source: Authors own

FIG. 49 Interior perspective within 'The Guide' showing the gallery space and floor movement. Source: Authors own



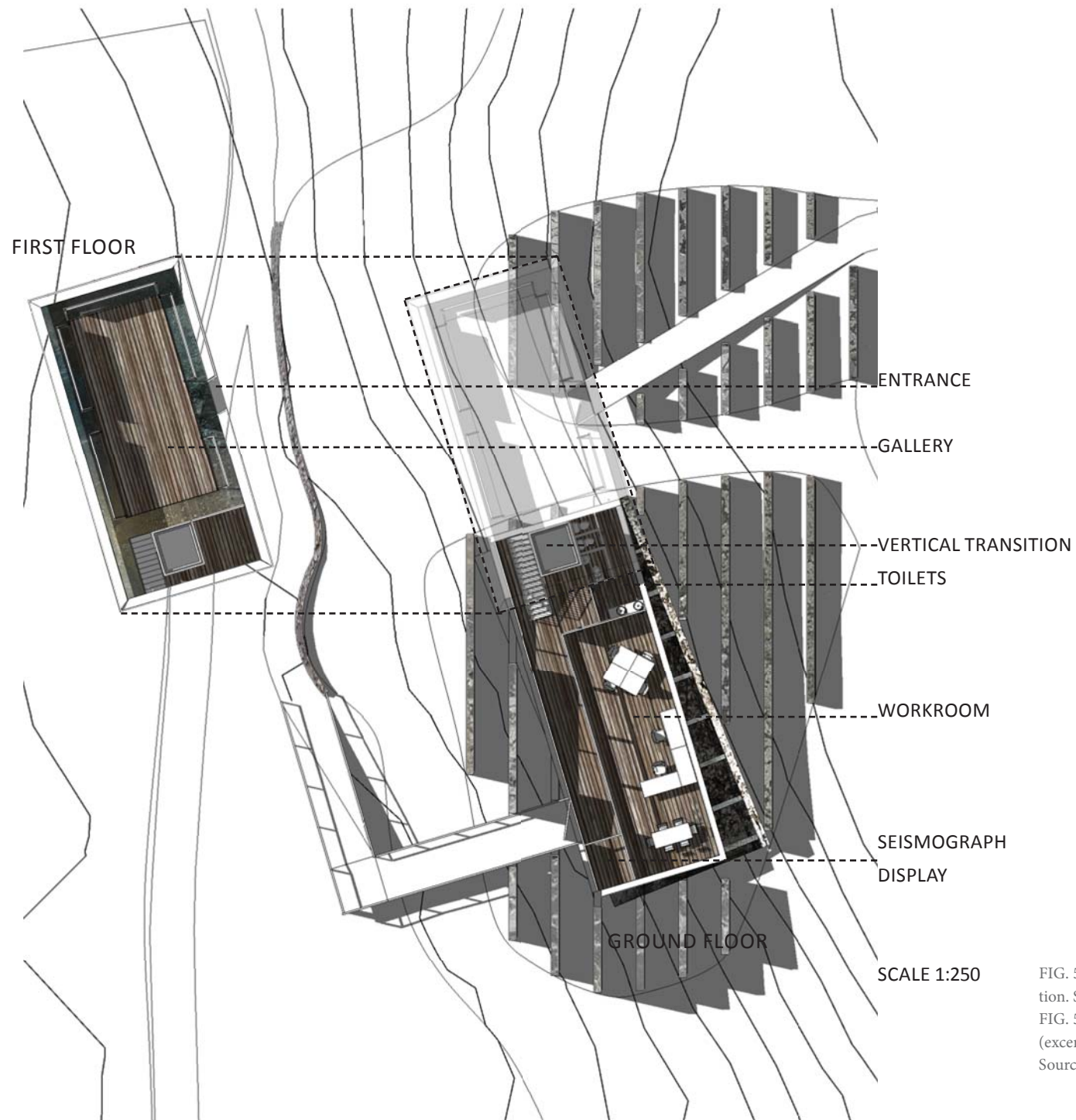


FIG. 50 (FAR LEFT) Site plan indicating 'The Curator' location. Source: Authors own

FIG. 51 'The Curator' plan. Ground floor and first floor (excerpt)

Source: Authors own



earthquake over 4.0 Mw around the world, with an increase in intensity corresponding to that which occurs. Once visitors have spent enough time in the gallery they head down to The Workroom, where the Curator's most important associates can work on their research. This is a semi-private space which the majority of visitors view from a public corridor. The Curator displays the site's seismograph and GPS at the end of this corridor, drawing people forward and out into the open air. The transition between architecture and site is a similar gradual descent

along a ramp which aligns visitors with a new path that meets up with the original primary route or a new path which leads to the Tutor on the same side of the fault-line, one terrace riser down toward the river.

### THE TUTOR

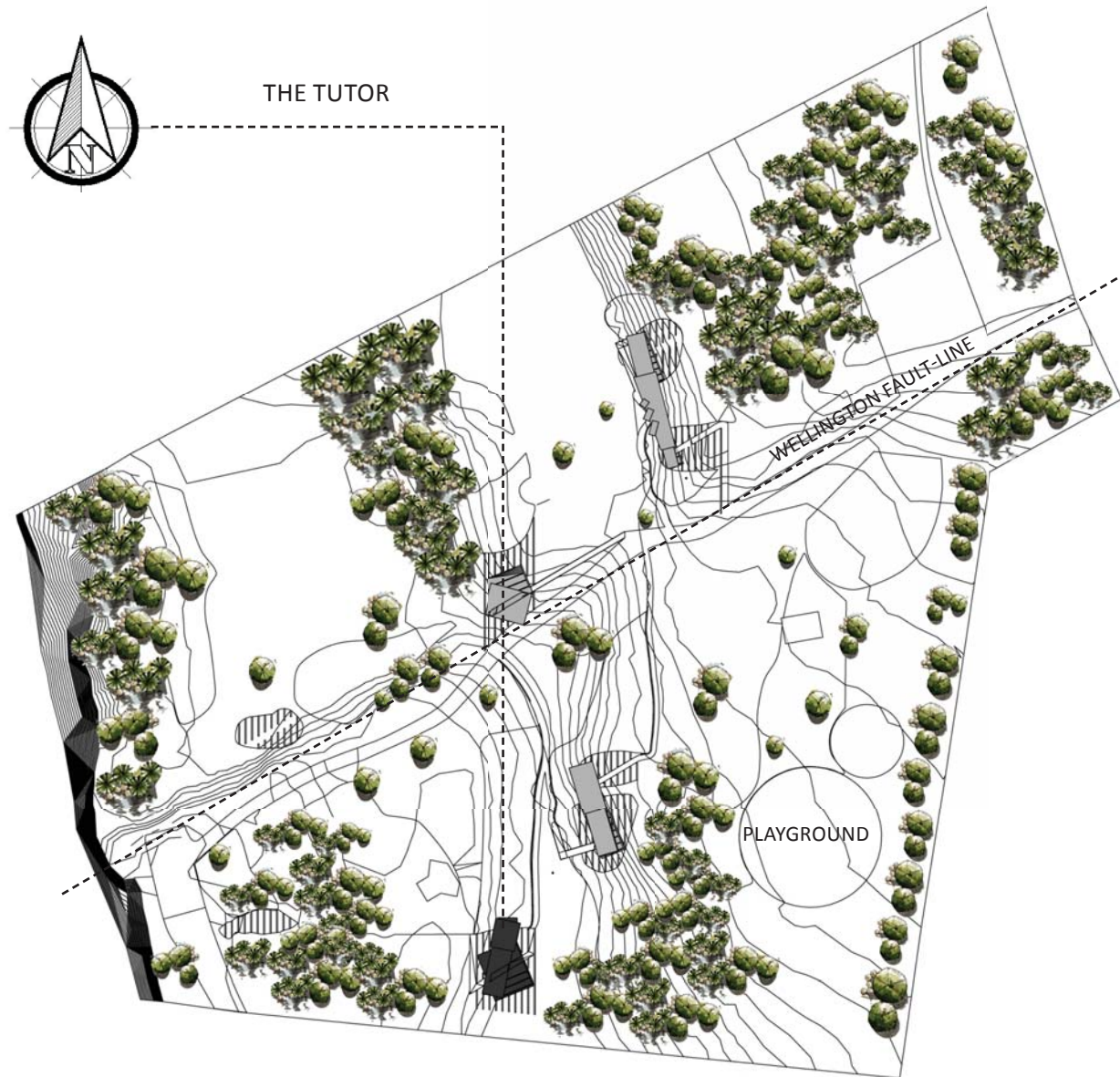
Still on the Pacific Plate, one terrace down from The Curator, The Tutor exists to help visitors with their own learning and development, whether they are on a primary, secondary or tertiary field trip or have ventured to the site independently for personal research or interest. The transition between site and architecture takes place at ground level, again along the axis of the fault-line. The corridor which allows access to and from the building moves directly through the ground floor without interfering with the serious study area on the first floor which cantilevers over the useful measurement space. Here, the Tutor





FIG. 52 (FAR LEFT) Interior perspective showing The Tutor's learning zone. Source: Authors own

FIG. 53 Exterior perspective showing The Tutor and existing outdoor stage Source: Authors own





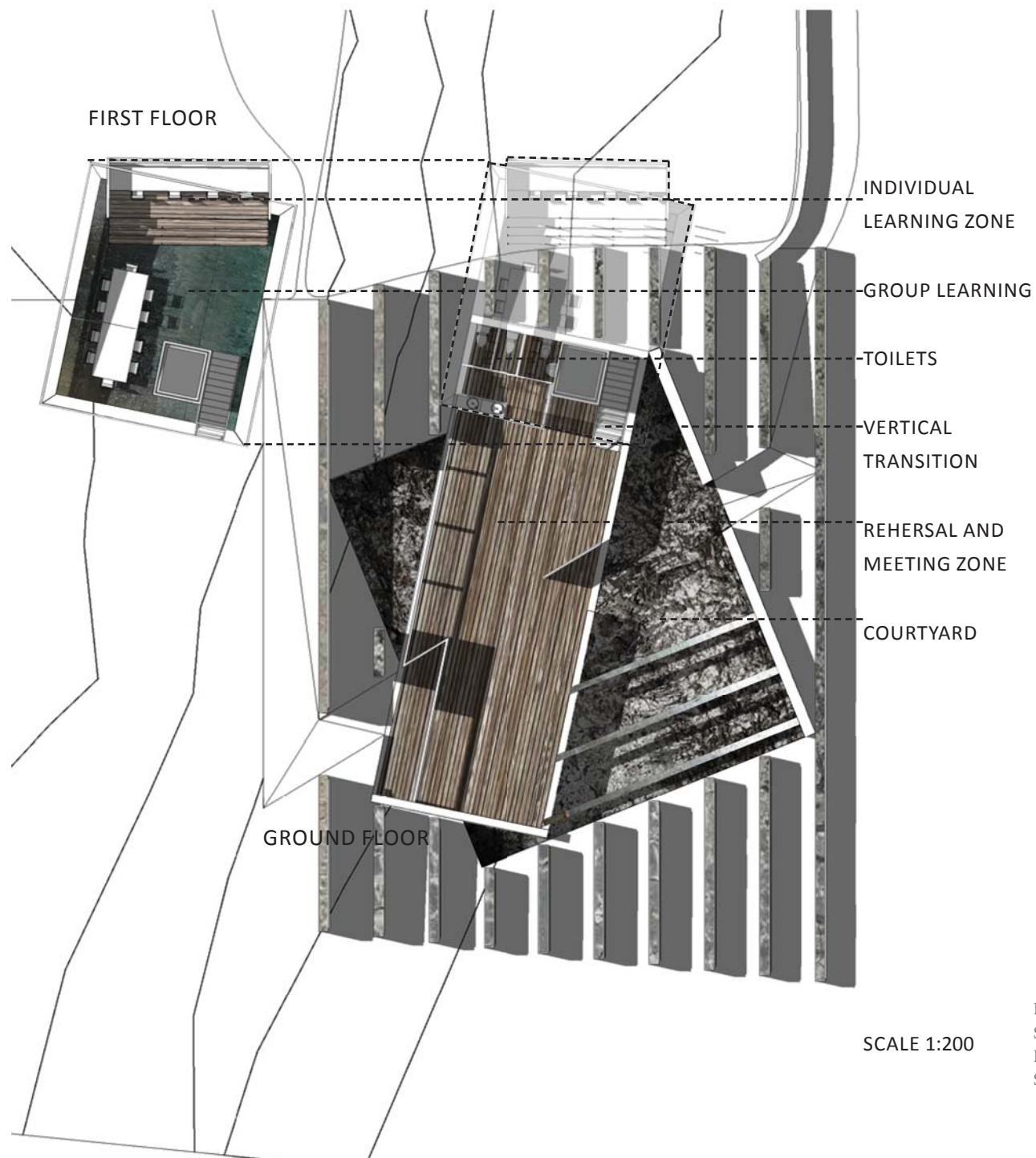


FIG. 54 (FAR LEFT) Site plan indicating 'The Tutor' location.  
 Source: Authors own  
 FIG. 55 'The Tutor' plan. Ground floor and first floor (excerpt)  
 Source: Authors own

provides space for individual and group study. The Tutor's new-age approach to teaching recognises that people learn in a range of ways. Because of this she remains flexible and can change to facilitate large group meetings, or rehearsals for those who are utilising the existing outdoor stage. The Tutor has less experience at the site than The Guide and The Curator and looks back toward them for advice, while still asserting herself as a key member of the education team.

#### **THE GROUNDSKEEPER**



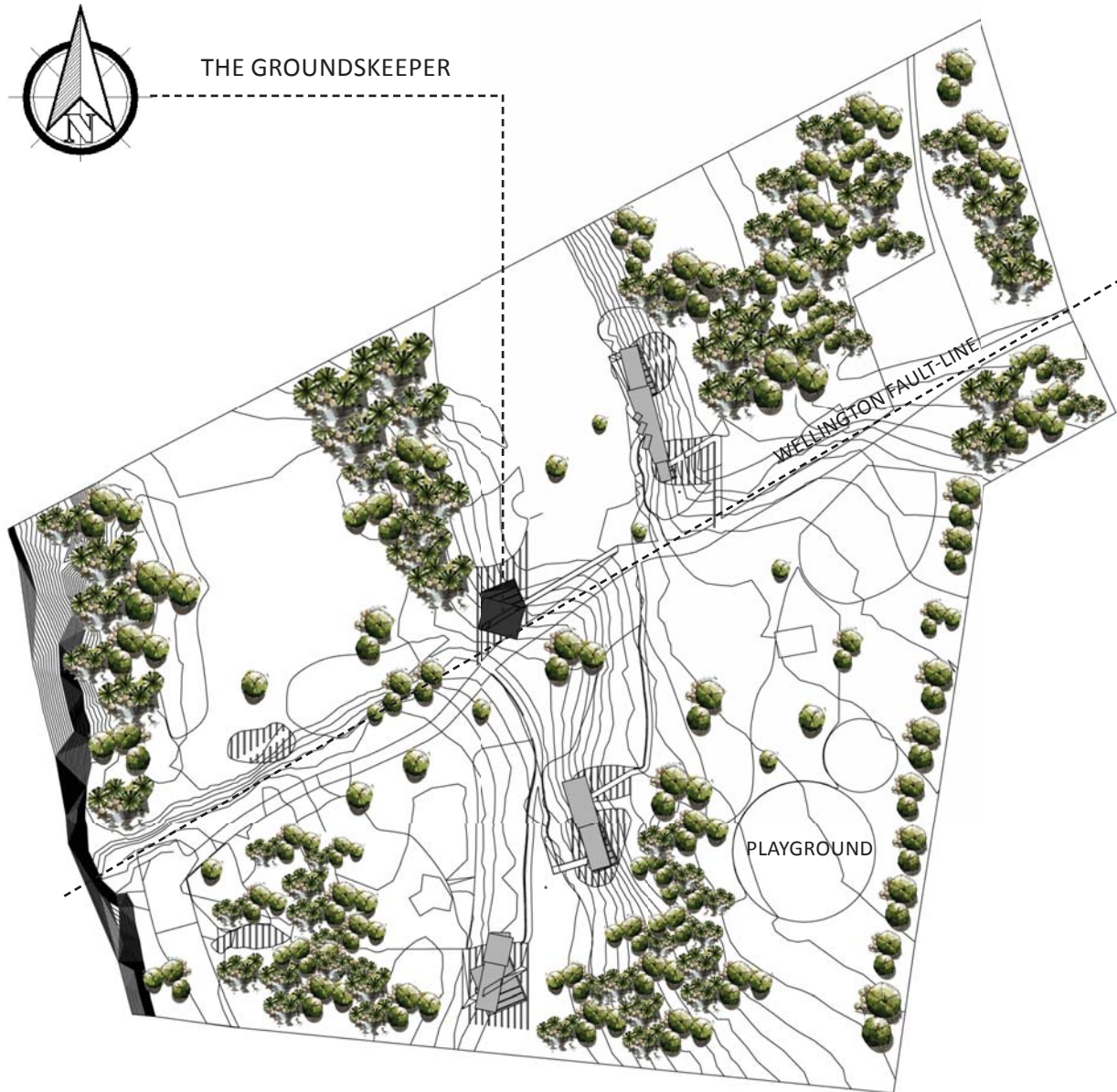
The fourth architectural educator is The Groundskeeper, who sits on the Indo-Australian plate one terrace down from The Instructor. The Groundskeeper and the Tutor reside on the same terrace riser, but have been separated by successive earthquakes to be displaced by  $5.5 \pm 0.10$  m (North-up) and an indeterminate horizontal displacement which is estimated to be approximately  $22 \pm 5.0$  m, which again is evidenced by the distance between the two buildings and the height difference between the concrete north-south walls. The transition between site and architecture is a slow descent into the earth which emphasises the position of the architecture as being within excavated ground. The Groundskeeper prefers a hands-on teaching experience and encourages visitors to get right down into the earth. This transition becomes ephemeral within the architecture itself, as the fault-line axis (which allows physical access into the building) is traced along the roof of the architecture, so that light permeates the interior space from above, marking the fault-line axis on the floorscape and leading visitors through the building. The Groundskeeper provides spaces which facilitate field-work: a drying room and storage for field equipment, as well as social spaces to relax and enjoy time out. The great distance between the walls marking the original river direction and





FIG. 56 (FAR LEFT) Perspective showing The Groundskeeper's outdoor courtyard  
Source: Authors own

FIG. 57 Exterior perspective showing The Groundskeeper's relationship to the ground (foreground) and proximity to the Guide (background)  
Source: Authors own





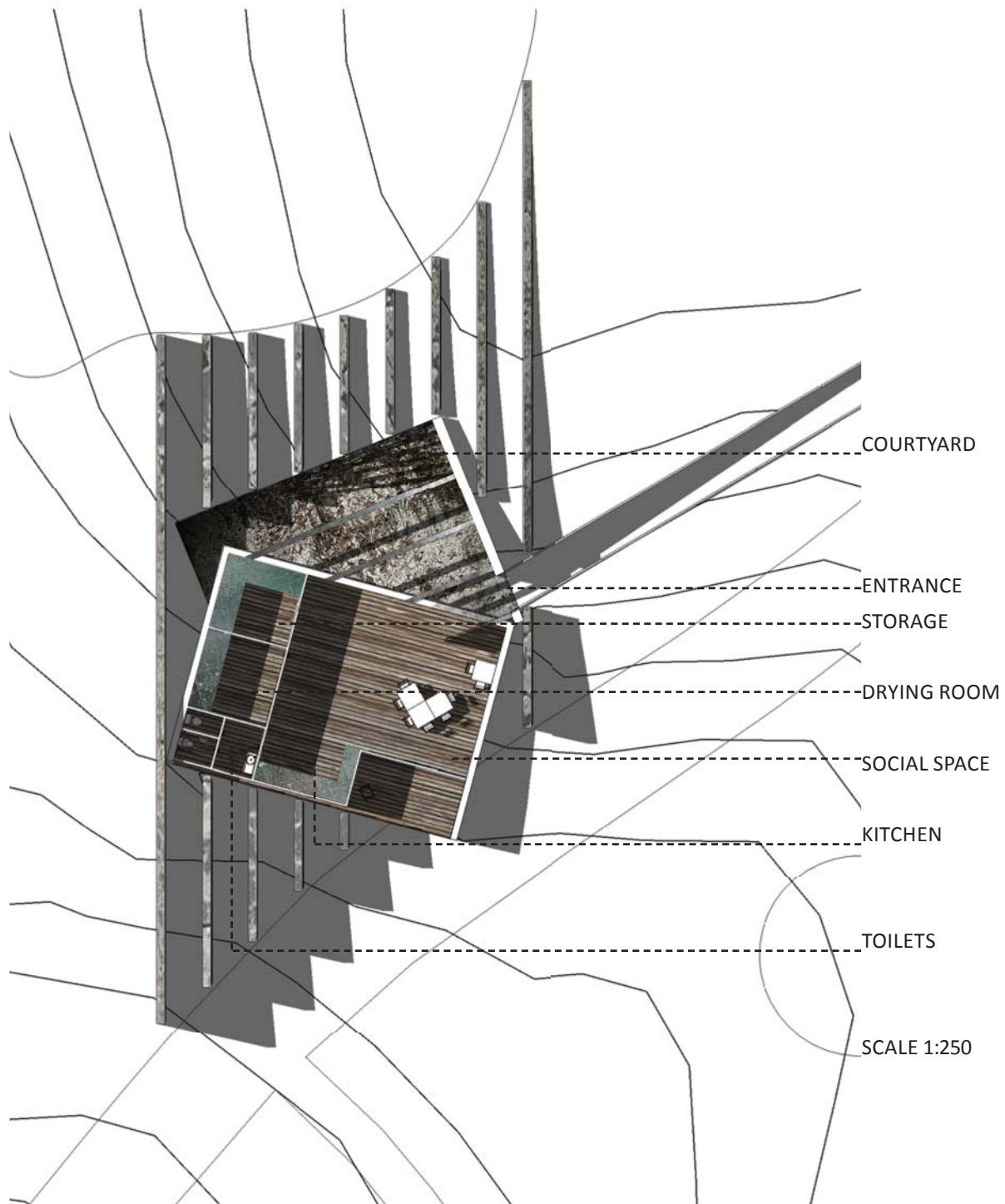


FIG. 58 (FAR LEFT) Site plan indicating 'The Groundskeeper' location  
 Source: Authors own  
 FIG. 59 'The Groundskeeper' plan. Ground floor and first floor (excerpt)  
 Source: Authors own

the orientation of the current contour, allows an outdoor courtyard and seating for group discussion and orientation. The transition from the architecture back into the site is a distinct threshold, where visitors find themselves moving from the architecture straight onto the original primary path through the site, essentially on top of the fault-line. In chapter seven it was mentioned that “transition is the punctuation of spatial language”<sup>127</sup> and in this way, the abrupt change between architecture and site marks the end of an architectural experience, so that visitors are aware the educational experience is complete and they may continue to use the site or architecture as they please.

## 6.4: CONCLUSION

The intention of this architectural investigation was to resolve the principle research intention, which is to ascertain how architecture and landscape can be integrated as an evidentiary and informative experience about the prevalence of seismicity and subsequent need for disaster preparedness within the Wellington region. This area of research has offered a unique expansion of the Experiential Landscape concept which has been limited to landscape architecture and urban planning scenarios and is now applied to an architectural problem.

The architectural investigation has combined key theoretical imperatives regarding collective memory and living memorial concepts and theories related to the integration of landscape and architecture as well as key site specific imperatives which are categorised by Thwaites and Simkins spatial dimensions; centre, direction, transition and area. The integration of these imperatives resulted in four separate pieces of architecture. While the architecture responded to the same set of theoretical imperatives, the site specific imperatives at each sub-site directed some of the architecture’s agenda meaning that a set of landscape problems were dealt with while simultaneously transforming the site into an educational experience. Because the living memorial program of this architecture required three programs to coexist within one site, divided into four individual buildings, a system of identification for the individual buildings has been applied to assist in simplifying the complexity caused by cross-programming and building separation. Four titles were assigned

to the four buildings, the Guide, the Curator, the Tutor and the Groundskeeper.

The architecture presented here has intensified the sense of place as an Experiential Landscape as it has been defined by Thwaites and Simkins. The architecture enhances individual centres at each of the site's former river terraces, encouraging users to explore the natural physical aspects which are of utmost importance to the site as places for future geological field work. The architecture enhances the sense of direction and transition within the site through the creation of moments which frame views to be discovered, places which encourage the visitor to slow down and appreciate certain aspects of site, and secondary pathways which urge visitors to move beyond the centre of the park and explore the geological features of interest.



# CONCLUSION 7

The principle intention of this research was to ascertain how architecture can be used to highlight the underlying prevalence of seismic activity within earthquake prone regions in order to remind or inform the public about the importance of earthquake preparedness. The underlying demand for architecture which addresses this imperative was identified through analysis of the Wellington Region's existing indicators of seismicity which revealed that signage was largely used as a means of reminding the public that they are in a seismically prone region. This thesis argues that architecture could go beyond such signage by encouraging social engagement between visitors and with dynamic seismic features and the after-effects of disaster, in turn emphasising the importance of preparedness in the minds of visitor's. The goal then became to create an exemplary piece of architecture at the research site Harcourt Park which demonstrates how architecture can meet the principle thesis imperative.

The design was driven by theoretical and site specific imperatives which arose from the literature review and site analysis. Key theoretical imperatives claimed that the architecture should;

1. Advance the living memorial concept, commemorating losses from New Zealand's most devastating earthquakes as a means of encouraging future preparedness within Wellington.
2. Encourage interaction between visitors, architecture and site so that partial and incomplete past recollections of earthquakes can be interwoven and form a collective memory.
3. Integrate architecture and landscape as an evidentiary and informative experience that does not need exhibits to achieve the goal of earthquake awareness and disaster preparedness education.

4. Advance typical social responses of Earthquake Architecture by integrating physical and above psycho-environmental aspects of site.

A case study which responded to constraints similar to the first two theoretical imperatives is The Disaster Reduction and Human Renovation Institution which was discussed as a useful programmatic precedent in chapter three. It was deduced that the physical architecture of the Kobe case study is restricted to the containment of exhibits and dioramas, whereas the architecture proposed within this thesis tests a fundamentally different approach by integrating architecture and landscape as an evidentiary and informative experience that does not need exhibits to achieve the goal of earthquake awareness and disaster preparedness education. A case study which addressed constraints similar to all four of this thesis's theoretical imperatives is the The Church: Acts of God which was also discussed in chapter three. While this building successfully integrates landscape, architecture and occupants, the architecture proposed within this thesis addresses secular rather than spiritual imperatives. The programmatic imperatives of the current architectural investigation require education, research and commemoration to occur at once at a site which is publicly available to all who wish to use it as opposed to a place which exists specifically to increase an awareness of God.

This thesis proposed an architectural approach for seismically active contexts using a specific site – a recreational reserve called Harcourt Park in Upper Hutt – as a design research case study. The site was chosen because of its great geological significance to the Wellington region and New Zealand, as its natural landmarks can be used to measure movement along the Wellington Fault line which runs directly through the centre of the site. The site was also well positioned within the Wellington Fault Finders trail and the Hutt Valley River Trail, meaning that the architecture could contribute to an understanding of seismic prevalence within greater networks. The site's interesting geological features also provide challenging constraints and opportunities for design investigation.

Harcourt Park was analysed within the framework of Kevin Thwaites and Ian Simkins Experiential Landscape



as a way of ensuring that physical and experiential aspects of site were both considered in the architecture's conception; in keeping with the recommendations of the architectural theorists discussed in chapter four. Through this analysis, site specific constraints and opportunities were identified and summarised on page 68 concluding that the architecture should;

1. Communicate the dynamic relationship between seismicity and the pronounced physical features of site through architecture.
2. Improve the restorative benefit of site by allowing separation from distraction, places for rest, comfort and shelter.
3. Present an awareness of the possibility of continuity between individual sub-sites, and a way of realising that possibility.
4. Generate a sense of anticipation: that there may be something desirable or unknown that encourages the visitor to want to access, or possibly just contemplate, realms beyond.
5. Introduce a range of transition types as a means of articulating the difference between adjacent places
6. Intensify the quality of Harcourt Park's experiential landscape as a whole, through the spatial dimensions centre, direction and transition

This thesis argued that an awareness of the message to safeguard one's future and one's family's futures could be understood through a spatial experience; that architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape. Theoretical backing for this standpoint was provided by architectural theorists Christian Norberg-Shultz, Steven Holl, Tadao Ando and Oswald Mathias Ungers who each believe

that the careful integration of architecture and landscape can illuminate the genius loci of site.

The thesis also maintains that a continued awareness of changes to our landscape, potential loss of life, property, and national cultural or historical artefacts is an important means by which future preparedness can be encouraged. Such continued awareness is possible within the architecture of a living memorial, which commemorates the losses caused by devastating earthquakes in New Zealand's past, and is also prepared to commemorate losses following future earthquakes in New Zealand if disaster preparedness does not improve within the community at large. The architectural proposal within this thesis extends the living memorial concept which was introduced in New Zealand in the form of War Memorial Halls, as well as the cases discussed in chapter three which commemorate loss and encourage earthquake preparedness in different scenarios. The living memorial is an architectural vessel which allows the collective memory of the public to be gathered in one situation. In this way, disparate memory fragments – which may be overlooked individually – are given weight and used to encourage preparedness within a region which has not suffered a damaging quake in the past 100 years.

The architecture highlights the site's transformation over time, which in turn emphasises the unrelenting movement beneath the feet of New Zealander's; reminding the public to remain vigilant and prepared. As a means of responding to the first site-specific imperative (communicate the dynamic relationship between seismicity and the pronounced physical features of site) the architecture responds to five key geological aspects of this seismic site communicate both permanence and transformation in order to understand how the site has changed over time. The north-south axis was adopted first as a starting point, which educates visitors about sunlight and global orientation and provides the base line upon which the other architectural language could be written. The transformation measurement areas (which educates visitors about the spaces which geologists and seismologists can use for future land transformation measurement), original river terrace orientation (which educate the visitors as the historic river position), the altering contour of each individual river terrace segment (which educate visitors about unimpeded views and transformation shifts caused by shifts in the riverbed) and fault line direction (which educate visitors about transformation

shifts caused by earthquakes) are the remaining site aspects which directed the architecture to manifest differently at the four sub-sites.

The sub-sites were selected because they allowed for the architecture to interact with the two major terrace risers on both sides of the fault-line simultaneously. Two architectural pieces are integrated with the oldest river terrace where one piece of architecture is situated on the Indo- Australian side of the Wellington fault-line and one on the Pacific side of the fault-line; the other two architectural pieces integrate with the second oldest river terrace which each sit on opposite sides of the fault-line. Over time the architecture will witness gradual dextral slip of the tectonic plates from multiple positions and more instant displacement if a major earthquake occurs along the fault. The architecture does not however rely on future transformation to be fully engaged, rather the built form freezes past tectonic movement and its effects in place through architectural gesture, suggesting movement without actually having to move. While the architecture responded to the same set of theoretical imperatives, the site specific imperatives at each sub-site direct some of the architecture's agenda, meaning that a set of landscape problems are dealt with while simultaneously transforming the site into an educational experience.

A system of identification for the individual buildings was been applied to assist in simplifying the complexity caused by cross-programming and building separation. Four titles were assigned to the four individual buildings, which are emblematic of the program type within. The Guide, the Curator, the Tutor and the Groundskeeper are located at the two oldest river terraces at the site, on either side of the fault line. Each of these architectural educators responds differently to micro-site aspects and has specific programmatic conditions. The Guide exists to introduce visitors to the site, explaining the placement of the other architectural educators and the transformations which have existed at the site. The Curator educates visitors about the wider scale of seismic transformation, beyond that which occurs at the specific site. The Tutor allows space for visitors to reach their individual goals; field trip exercises, individual or group research or personal discovery. The Groundskeeper provides a place which facilitates hands-on site measurement and field work. Together, these buildings work as the educators of site, explaining the site's transformation over

time and therefore communicating the ever-present threat of seismic movement and catastrophe.

The design demonstrated that it is possible to create architecture which highlights the underlying prevalence of earthquake activity in seismically active regions and informs the public about the importance of earthquake preparedness but with limitations. This study could be advanced in the future by applying the same methodology of site analysis and design within different earthquake prone sites. Further study could also be improved by conducting constructive discussion groups with potential users throughout the design process to ensure that the architectural language can be understood by a cross section of people so the intended educational experience will not be lost in translation between the architect and the users.

The concept of collective forgetting has been discussed within this thesis, which describes a phenomenon where group memory fades over time. During the 'Talking Cities' public seminar, which discussed lessons learnt from the Canterbury earthquakes, members of the New Zealand Institute of Architects (NZIA) and New Zealand Institute of Landscape Architects (NZILA) voiced their concern that Wellington's public may forget the importance of disaster mitigation as time passes and media attention diminishes. This issue of collective forgetfulness is concerning considering that the risk of seismic activity in an earthquake prone region never actually changes, while peoples attitude towards seismic risk fluctuates, depending on the apparent stability of the earth. This was an important issue to resolve architecturally as it provided an alternative to signage as a means of communicating earthquake prevalence, using architectural language which is commonplace to those from the NZIA and NZILA who recognised a need for permanent public reminders to begin with.

Architecture can be conceived and designed as an active participant in enhancing awareness of the prevalence of seismic activity by illuminating the unremitting transformation of the landscape. The message to safeguard ones future and ones family's future by increasing earthquake preparedness can be understood through a spatial experience if architecture is integrated with the landscape and communicates the possibility of loss should such an increase not occur.

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