A JOURNEY THROUGH SOUND AND LIGHT
- Waikumete cemetery new development

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I would like to thank my supervisors, Mike Austin and Jeanette Budgett, for their knowledge, guidance, encouragement, and criticism. Furthermore, I am grateful for the assistance of my husband, parents and friends. Your support and criticisms are appreciated.

I would also like to thank Bob Russel of Davis Funerals, my landlord, Sue Hansen, and Unitec alumna, Komal Bhatt of the Landscape Department. They were willing to listen to my ideas and answered my questions. Thanks for their time and patience.
BACKGROUND OF THE PROJECT

Memory, death and burial

The crisis of memory

Our rapidly developing society has presented a crisis of memory since the Modernist movement. It is not only an issue in architecture which cuts the bond with its past, but also occurs in every aspect of our society. In the book, Present Past: Modernity and the Memory Crisis, the author expresses “the urgency of concern with memory in the modern period”. Memory is important in constructing our self-consciousness and identity. But it is also a problem which continuously influences us. The author calls it “the source of culture disquiet”. Hence, facing the past is crucial for knowing ourselves, for solving problems and for facing the future. However, “the boundary between past and present used to be stronger and more stable than it appears to be today”.

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2 Ibid.vii.
The denial of death

I have a very personal reason for choosing this topic. At the beginning of this term, my grandma passed away. Since she is the first death in our family, when she died, I suddenly realized how short life is. Before this happened, I never thought about death and took my life for granted. But I guess, generally speaking, one of the common attitudes towards death is a deliberate disinterest. As far as I know, the topic of death is taboo in Asian culture. From the film Departure, I found out that in the Japanese culture, the subject of death is considered unclean and being a mortician is a career discriminated against by others. 4 It is a similar attitude in Chinese culture. We seldom mention this topic and even believe that talking about it would bring bad fortune. In our language, number four is nearly homophonous to the word “death,” so this number is considered an unlucky number. This phenomenon in both Chinese and Japanese cultures is not unique; the fear of death is human nature. In Sigmund Freud’s book, he explained our attitude towards death, thus, “We have shown an unmistakable tendency to put death aside, to eliminate it from life”. 5 We cannot imagine our own death. In front of such situation, we always treat ourselves as spectator.

The issue of burial

The issue of the lack of burial space is not fresh news. The November 12, 2012 issues of the New Zealand Herald claims that the largest cemetery in New Zealand will be full by 2020.6 Similarly, a study of cemeteries released by the Auckland Council in March 2016 reveals that firstly, the number of deaths is 8000 per year and by 2038 it will reach 12,000 per year due to population growth in the older age groups. Secondly, Auckland Central-West has the least burial space. Thirdly, the Council’s next step is to investigate potential land for a new cemetery.7

Besides the increase in the number of deaths, burial methods also contribute to the shortage of land. The most common type of burial in New Zealand nowadays is the flat plaque lawn cemetery which has been proven to waste land and is costly to maintain.8

Needless to say, the lack of land for burial is an issue that needs to be solved urgently.

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PROJECT OUTLINE

Within the backdrop of the crisis of memory in the contemporary world, the denial of death in human nature, and the urgent need for burial plots, a new cemetery is proposed to build in Auckland. A cemetery is a storeroom of memories of our city which serves a basic human need to memorialize and be memorialized.\(^9\) It is so crucial for us because “memories are stepping stones from the past and the future,” which links generations.

In the process of site selection, I found out a research by the former Waitakere City Council to support “either expansion of the Waikumete cemetery, or purchase and development of a replacement site”.\(^{10}\) The study concluded that “the most prudent option was to continue

\(^9\) Ibid.p10.

operating the Waikumete cemetery and to utilize a combination of expansion into undeveloped land and more land-efficient burial and ash interment methods”.

The report also suggested more use of mausolea and ash plots.

So my design is in accordance with the conclusion of the research for the development of the Waikumete cemetery.

AIMS OF THE PROJECT

Since architecture is a discipline that closely bonds with the experience of our physical world, a “place” is needed to rebuild our experience of death. Here, people can become more sensitive to the environment and improve their thinking towards the living. They will be easily trapped in thought and their deep memories could be aroused by these feelings. As Geoffery Scott stated in his book:

…architectural experience. It may begin as a sensuous perception, but as such it is necessarily more transient and occasional than its remembered significance, and more isolated and particular than when fused by reflection with the rest of our remembered life. Its significance outlives it in the mind. There is, therefore, so to say, a literary background to the purely sensuous impression made upon us by plastic form, and this will be the more permanent element in our experience.

11 Ibid. 32

The quotation clearly expresses the relationship between our sensation and memory. People could have rich perceptions of a place. And those perceptions could arouse some emotions in their memories. Also, their experience in a place would construct a new memory. So, what I want to create is more than a building but a peaceful and strong atmosphere, within which the bereaved could feel the power of serenity and recover themselves; the others could reminisce and rethink life for a while.

**RESEARCH QUESTION**

To achieve the aims of creating a powerful and peaceful atmosphere through a new cemetery, 2 questions have been proposed:

1. What are the key elements for creating such atmosphere?

2. How can they be expressed?
STATE OF KNOWLEDGE IN THIS FIELD

THE HISTORY OF CEMETERY FROM ROMAN TIMES

The Necropolis

The necropolis was a classical mortuary archetype during Roman times. Such public burial zones were located on the outskirts of Roman cities, known as the pomerium. The early Roman cities often had no physical walls and the pomerium as a religious boundary was meant to deter aliens. This can be demonstrated in the archeology of the Pompeiiian city in which its necropolis was built around the road leading to the city, near the city gates. However, although the burial place of the dead was located on the outskirts of Roman cities, it did not hinder the interaction and communion between the living and the dead. Indeed, the relatives visited tombs regularly to offer food and wine, as Edwin Heathcote describes in his book, Modern builders: Modern architecture and death, “… When Vesuvius erupted in AD 79, it caught one family

14 Ibid. 17.
banqueting inside one of the tombs near the Herculaneum Gate… illustrating the closeness which
the living often retained with the dead”.15

Catacombs

Catacombs are the archetype of the resurrection. This is the concept of a human being coming back to life after death. Apparently, the tradition of the cemetery had been gradually changed because of the belief in the resurrection of Christ that began in the 2nd century. The original Roman custom was cremation while Christians and Jews buried their dead based on the concept of the resurrection.16 As van der Meer stated in his book,

“Since most Christians and Jews at that time belonged to the lower classes or were slaves, they usually lacked the resources to buy land for burial purposes. Instead, networks of tunnels were dug in the deep layers of Tufo which occurred naturally on the outskirts of Rome. At first, these tunnels were probably not used for regular worship, but simply for burial and, extending pre-existing Roman customs, for memorial services and celebrations

Fig 1: Divine Service in the Catacombs of St. Calixtus, A.D. 50. Richard Davey, History of mourning, CreateSpace Repressed Publishing; Reprint edition (August 1, 2013), p19

15 Ibid.18.
of the anniversaries of Christian martyrs.”¹⁷

In 380, Christianity became the state religion. Christians were able to build a church within the city. However, catacombs were built as Christians wished to be near the martyrs; the dead were increasingly buried in church cemeteries. But catacombs began to be violated by the

Fig 2: Jules Eugène Lenepveu: The Martyrs in the Catacombs
http://fr-peint.blogspot.co.nz/2015/03/paintings-of-martyrdom-1855.html

Ostrogoths, Vandals and Lombards. Thus, in the 10th century, in order to protect the remains, holy relics were transferred to above-ground basilicas. Catacombs were gradually forgotten for centuries until they were rediscovered by Antonio Bosio in 1578.18

The space of catacombs is made up of underground tunnels with loculi (cavities) on the wall (Fig.2). Besides loculi, catacombs also have other types of space, including the arcosolium (Fig.3), sarcophagus, forma, cubiculum (Fig.6 and Fig.7) and crypt (Fig.8) or chamber (Fig.4 and Fig.5).

Fig 3: Arcosolium with Perforated Slab

Fig 4: Vaulted Chamber with Columns.

Fig 5: Perspective of Lower Chamber.

Fig 6: Cubiculum with Arcosolia

Fig 7: Section of Cubicula with Lupanar

Fig 8: Crypt of Saint Peter and Saint Paul.

http://www.storyofasoul.com/resources/valeria.html
Buried in Church

After holy relics were transferred inside the church, the space beneath them became the space for burial. Because the presence of sacred remains signified the sanctity of their surroundings, everyone wanted to be buried near these remains. Thus, the burial space in churches began to spill over from the underground to the church yard. A new hierarchy was also established. Again, as Heathcote stated, “The best spaces inside the church were reserved for the wealthiest citizens, the spaces near the church for the emergent middle classes, and the spaces on the peripheries were communal graves for the poor”.¹⁹ The Church also charged higher fee for the better plots.

However, during the 17th century, the new demand for new and large cemeteries away from the church and in the center of the city was based on two reasons. One, there was a growing number of dissenters who were unwilling to pay the church the burial fee. Second, the Black Death occurred during this period, which reinforced the demand.

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Buried in a Garden

Burial traditions were changed based on the idea of an arcadia during the Enlightenment Age in the 18th century. But actually, this was the revival of the classical idea which dates back to the tradition of classical antiquity. This can be seen in Poussin’s paintings, The Arcadian Shepherds (Fig 9), which Heathcote explains in his book, “Poussin was illustrating the elegiac tradition and the idea of an Arcadia which, despite the idyllic state of the life which it supports, bears testimony to an earlier civilization which has disappeared, here represented by the tomb”.20

Based on the idea of Arcadia, Rousseau chose his resting place in a garden, in the center of a small island in Ermenonville, which popularized the tradition of burial. ((Fig 10) This can be seen in Princess Diana’s grave, also located in a small island in Althorp Park. Needless to say, this is a great example to demonstrate this tradition.

20 Ibid., p14.
Fig 10: The island of poplars and the tomb of Jean-Jacques Rousseau
http://www.parcsafabriques.org/cartespo/carpo3.htm
Garden burial plots are closely linked with the notion of the English landscape garden based on freemasonry’s ritual and iconography. They also exerted an influence on Boullee’s series of vast cemeteries. He designed such enormous cemeteries set within Arcadian landscape, as seen in Newton’s Cenotaph. (Fig, 11) Obviously, the giant mass of his design was inspired by the great memorials of ancient Rome. Such influence not only affected his unrealized design, but also the actual burial traditions. The Père Lachaise Cemetery (Fig 12), which opened in 1804, inherited the burial tradition of the Roman and English garden landscape. It is not only a city of the dead in a distinct urban area but also serves as a public garden. The difference between Père Lachaise Cemetery and the Necropolis of the Romans is that the former was located on the edge of the city whereas the Necropolis of the Roman times was located outside the city.\footnote{Ibid, 25.}
Fig 12: Pierre Courvoisier, View of Pere Lachaise Cemetery from the Entrance, 1815
https://commons.wikimedia.org/wiki/File:Courvoisier_-_View_of_Pere_Lachaise_Cemetery_from_the_Entrance.jpg
Fig 11: Design for a Cenotaph to Sir Isaac Newton, 1784, E-L Boullee.
https://mythstalesandlies.wordpress.com/2012/10/31/the-temple-of-death-cenotaph-for-isaac-newton/
THE PRECEDENT STUDY

A closer view of three different precedent modern cemetery, namely, Igualada Cemetery, Brion Cemetery and KAZE-NO-OKA Crematorium, exhibits different expressions of the cemetery journey. However, they share some common points and inherit burial traditions from history.
Igualada Cemetery

For the design of the Igualada Cemetery, the architect used a harsh way to merge it with nature. He carved a deliberate, tortuous route into nature. Also, the materials he used, concrete and reinforcement bars, show how they are subject to time. They slowly decayed and have become part of the landscape. Several design strategies are used in this design:

1. Taking advantage of the contour. The whole cemetery merges with its environment.
2. The cemetery is designed as a park, breaking the horrible impression of what a cemetery used to be.
3. A series of spaces is constructed by a linear organization. Walking through the cemetery is like going through a ritual.
4. Materials include local stone, concrete and steel bar. Their rough texture construct an appearance that the design is part of nature.
5. Light is part of the design considerations.
6. Land is efficiently used by the vertical burial way. (Fig 14)

Fig 13: circulation and merging into landscape
http://deathbyarchitect.pbworks.com/w/page/24680378/案例研究─igualada%20cemetery%20(Enric%20Miralles)
Fig 14: light environment of different space

http://deathbyarchitect.pbworks.com/w/page/24680378/案例研究─igualada%20cemetery%20(enric%20miralles)
Brion Cemetery

Brion cemetery by Scapa is a great example illustrating the reality of Geoffrey Scott’s words. With the journey of Brion cemetery, people could have a sensitive perception of their environment. Their memory and emotion are evoked by a peaceful and powerful atmosphere. The sounds of water and light are the clues leading the way of this journey. George Ranalli described Scarpa’s work this way, “The triumphant masterwork of Scarpa’s final years, raising his material, formal, and symbolic inquiry to a poetic level unparalleled in its time” 23

Three elements are crucial for creating this poetic environment:

1. The various senses, such as hearing, visual, smell and tactile are considered in the design. Visual sense is always the dominate element of a building. However, in Brion cemetery, other sensations are used during the journey. For example, at the starting point, visitors travel through a dark passage where they could hear the sounds of water flowing beneath the floor. With the dark environment, people feel their way through the sense of hearing.

Fig 15: a linear organization and space contrast in Lingering Garden and Brion cemetery


Edwin Heathcote, Monument builders: Modern Architecture and Death, (Wiley; 1 edition, March 2, 1999), 205.)
2. The idea of the frame is a major theme of the spatial composition. This design method quite often appears in traditional Chinese gardens. This is not strange because Carlo Scarpa was interested in Japan and his design was influenced by the oriental culture.

3. In Brion cemetery, a series of spaces consists of a linear organization and the surprising space is created by a contrast of narrow and spacious as well as darkness and brightness. (Fig. 15) This design also often appears in Chinese gardens. For example, visitors travel through a narrow, zigzag and dim space and then enter the outdoor courtyard in the lingering garden. During this process, people suddenly see the light then feel surprised by the contrasting space. Similarly, in the Brion Cemetery, visitors walk through a gloomy passage then enter the garden. The contrast of space has the Brion couple’s tomb prominent.

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The journey through KAZE-NO-OKA Crematorium feels like listening to delicate music. The rhythmic movement allows visitors to pause and promotes their thinking. Starting with the building approach, transitional spaces are emphasized; each functional space for ceremonies (funeral hall, cemetery, and waiting lounge) is kept at a specific distance to allow for pause and reflection. How is the rhythmic journey created? Several architectural methods are applied in the design which are summarized in the following:

1. Different qualities of light are applied in different parts of the crematorium. The functional spaces are also arranged as a linear organization. The route begins at the courtyard where it is bright. Then, visitors enter the threshold where nature light shoots from a skylight, implying that the ritual sequence begins. On the way to the ceremony hall, visitors go through a corridor where the lighting changes from direct to indirect. After entering the chapel, the light environment becomes even darker. On the way to the committal chamber, visitors pass through a dim corridor where the indirect light comes through the linear skylight. The important point of the journey is the committal chamber where an inner courtyard with a reflection pond invites light to come in. The last point is the enshrinement room where indirect light enters.

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Fig 16: illustration of space sequence in KAZE-NO-OKA Crematorium
https://nz.pinterest.com/pin/535787686892978754/
light shoots from the skylight. In short, during the whole process, the light is rigorously controlled.

2. Transitional spaces are emphasized in the process of the ritual. (Fig 16) If the journey going through the KAZE-NO-OKA Crematorium is like a music, the transitional space is the prelude, which is slow and heavy. Then the dim light offers certain brightness for transitional space and foil atmosphere. The use of light is controlled to focus on functional parts, such as the altar in the ceremony hall, the shrine in the enshrinement room and the committal chamber.
Summary of the precedent study

Although these three precedents have different functions and scale, namely, the Igualada Cemetery serves the public, the Brion cemetery is a family tomb, the KAZE-NO-OKA Crematorium is for cremation, they share some common points of design. 1 Their topic is all about death.

2 A series of spaces is constructed by a linear organization.

3 A sense of discovery is created during the process.

4 Light and material are both deliberately considered.
**CONTEXT**

**Auckland context**

*Population*

The population in Auckland shows diversity. According to the 2013 census of the Auckland Council, the largest ethnic in population is European, which occupies 59.3%. The second largest group is Asian, accounting for 23.1% of the total population. Another useful fact for the project is the age structure in Auckland. The long-term national and global trend is that the older population is small but keeps growing due to the fact that people live longer and fertility rates decline. (Fig 17) These facts contribute to the rising number of deaths. According to a study of cemeteries completed by the Auckland Council in March of 2016, the number of deaths is 8000 per year, while by 2038 it will reach 12,000 per year.

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27 Ibid.16

28 *Waikumete Cemetery Reserve Management plan*, Reginal Strategy and Policy Committee Auckland Council 2015, p31
Fig 17: Age-sex structure, Auckland only (2006 and 2013)
Cultural reflection

Since Auckland is a multicultural city, funerals processions are celebrated differently according to different beliefs about death, such as Christian, Jewish, Muslim, Buddhist, Hindu and Maori, etc. They all have different funeral rituals closely related to the circulation and function of a new cemetery.

Christians believe the deceased will go to heaven after they die so they treat funerals as a time of celebration. Generally speaking, once the person dies, his relatives visit the funeral home to discuss

Fig 18: illustration the process of the body

the details of the funeral with funeral director. The ceremony could be held at home, the deceased person’s church, the funeral home or the chapel of the cemetery. Christians may be buried or cremated according to their wishes. After the ceremony, their body will be delivered to crematorium or cemetery. According to the deceased’s preference, if they choose cremation, their ash may be scattered or buried in a cemetery with a headstone.

The body in the funeral procession in the Jewish culture is similar to that of Christians. However, cremation or embalming is not accepted.\textsuperscript{30} On the other hand, in the Hindu culture, Hindus are cremated as they believe the process of burning will release their spirit. Similarly, Buddhists also believe in rebirth. Being cremated or burial follows the deceased’ wish. In Maori culture, the body is usually buried rather than cremated so it could be returned to mother of earth.\textsuperscript{31}

\textsuperscript{30} Ibid.

\textsuperscript{31} Ibid.
52 cemeteries in Auckland are owned by Auckland Council in which 37 are currently active. Manukau Memorial Gardens, North Shore Memorial Park, and Waikumete Cemetery are three main regional cemeteries.32

Except for shortage of land, the burial method is another current issue for cemeteries. For example, the flat plaque lawn cemetery is one of the main configurations in these three cemeteries. This concept was established about 65 years ago with the hope that it would ease the cost of maintenance in the traditional cemeteries. Also, without a headstone, that would permit multiple uses for cemeteries. However, the flat plaque lawn cemetery has proven to be a failure, which needs costly and constant maintenance of the lawn. Another problem is the identification of plaques. Many people complain it is not easy to find the plots.33


33 Ibid. p13.
Introduction of Waikumete cemetery

Location

Waikumete Cemetery is located in Glen Eden, west Auckland, which is the largest operating cemetery in New Zealand.\footnote{Waikumete Cemetery Reserve Management plan, Reginal Strategy and Policy Committee Auckland Council 2015, p24} Approximately 15% of all burial in Auckland is provided by Waikumete Cemetery. It sits along Great North Road, a 25-minute drive to Auckland CBD and 5-minute walk to Glen Eden Train Station. Due to its accessible location, Waikumete Cemetery not only provides services for west Auckland, but also for the population of the wider Auckland isthmus.\footnote{Ibid.24.}
Fig 20: the location of Waikumete Cemetery in Auckland
Komal Bhatt, *Cemeteries as healing landscapes*
Service

There are three chapels and a crematorium in Waikumete Cemetery, offering services for burial, cremation and ash interment. A series of burial options, including conventional and eco burial, ash interment and memorial plaque, and mausolea are provided. In connection to ethnicity and denominations, the older area was divided into groups. However, the modern lawn format is not differentiated between culture and religion. However, the Maori, Hebrew and Muslim groups have their exclusive land, which is approximately 2 hectares. Moreover, Waikumete Cemetery also provides services for returned army.36

36 Ibid.26.
Fig 21: Bird eye view of Waikumete Cemetery
Landscape characters

The landscape characters of Waikumete Cemetery have shaped its current framework. That is to say, the development of the cemetery has followed its topography. The current burial area is sited in the area of easier contour, whereas hillside area remains undeveloped and vegetated due to the fact that the steep slope, streams, riparian margins make it hard to use. The earliest areas to be developed are located on the southeast along Glen View Road, with the original cemetery entrance at Waikumete Road, close to the Glen Eden train station.37 (fig 21)

37 Ibid.p69.
Future planning

An urgent issue Waikumete Cemetery is facing in the near future is the shortage of land. The capacity for new burial at the moment is less than 2.8 hectares of cleared land. And with approximately 400 new burial plots required annually, the current estimate is, the cemetery will reach its burial capacity by 2018.38

In order to solve the issue, new development is necessary for expansion into the portion of the vegetated upper hillside of Waikumete Cemetery.39 In the Proposed Auckland Unitary Plan, the Significant Ecological Areas have been identified to enable cemetery expansion into 18 hectares of the current 43 hectares of vegetated areas.40 The new land expansion will satisfy the need of burial plots for the next 50 years until 2060. The remaining 25 hectares of vegetated area will be protected as the Significant Ecological Areas.

38 Ibid.p31
39 Ibid.p32
40 Ibid.p39.
Programme

Before the design is generated, three main questions should be considered.

1 In the above context, the crisis of memory in contemporary society is mentioned. Since our rituals and traditions are bonded with our memory, how to organize the different functions to reflect ritual is crucial;

2 As to the issue of lack of land for burial, an efficient burial method should be considered;

3 In the Proposed Auckland Unitary Plan, the vegetated land in Waikumete Cemetery will be developed. Is it possible for the new cemetery to be integrated with nature?

Waikumete cemetery currently are divided into two big parts, historical cemetery and modern cemetery. Unlike historical cemeteries which are divided into different areas according to ethnic groups, modern cemeteries do not differentiate according to ethnicity or religion, except specific groups that require their own plots, like Maori and Muslim. In addition, modern cemeteries are divided into two kinds of burial areas according to the wishes of the deceased. (Table 22) One kind of space is for burial while the other is for ash interment. There are varieties of space for ash or body depending on the choice of the deceased. The funeral process is a process of choice. Generally, it depends on culture or religion. Then, the resting place for the remains and the details of the grave should be chosen as well.
Based on the process of funeral arrangements and the types of resting place for the remains, the functional requirements are:

1. Space for ash plots
2. Space for burial of the body
3. Space for holding ceremonies
4. Space for the memorial
5. Space for other services (catering space, toilet, storage, etc.)

Table 22: Summary of different religion processing the body

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<th>Religion</th>
<th>Way of processing the body</th>
<th>Space</th>
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<td>Christian, Catholics, Jewish, Muslim, Buddhists, Maori</td>
<td>Burial</td>
<td>Conventional burial, eco-burial, lawn burial, mausolea, urupa</td>
</tr>
<tr>
<td>Christian, Hindu, Sich, Buddhists</td>
<td>Cremation</td>
<td>Lawn burial, mausolea, ash interment, columbarium (niche) wall</td>
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Based on the process of funeral arrangements and the types of resting place for the remains, the functional requirements are:

1. Space for ash plots
2. Space for burial of the body
3. Space for holding ceremonies
4. Space for the memorial
5. Space for other services (catering space, toilet, storage, etc.)
From the site study, there are three chapels in Waikumete Cemetery. Two of them are located at the main building complex and another is the historic Chapel of Faith in the Oaks located near the Waikumete Rd entrance which is also available for funeral services. So there is no need for a chapel design. But a space for holding the ceremony of other ethnic groups is needed.
Space for ash plots

Except for ashes after cremations taken away by the family to be scattered in other places, the Waikumete Cemetery provides a series of spaces for processing ash, including ash plot, memorial gardens, arboreta, niche wall, lawns for scattering or interment ash.\footnote{Ibid.p26}

One of the wrong impressions on the process of cremation which reduces human remains to ashes, is an end in itself, but it is not. “Cremation is a preparation for memorialization, just as burial is”.\footnote{Cemetery Planning Manual, New Zealand Master Monumental Masons’ Association (INC.), August 1991, p15} So it does not mean it must be a way of saving land. “A small residue does not necessarily restrict the size of monument.”\footnote{Ibid.p41} The ash plots could also have a headstone as burial plots do.

But two kinds of space for ashes should be highlighted and included in the new cemetery design, which is burial plot and niche wall. Given the issue of shortage of land, the way of interring in ash plots or niche walls has been proven to be very efficient. “The amount of land

\footnote{Ibid.p26}

\footnote{Cemetery Planning Manual, New Zealand Master Monumental Masons’ Association (INC.), August 1991, p15}

\footnote{Ibid.p41}
required is almost negligible."44 Each of the ash plots includes two sets of ashes covered with small plaque on the berm.45 And the size of each ash plot is 600 millimeter length and 200 millimeter width deep. 46

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44 *Waikumete Cemetery Reserve Management plan*, Reginal Strategy and Policy Committee Auckland Council 2015, p26

45 Ibid.p26

46 Cemetery Planning Manual, New Zealand Master Monumental Masons’ Association (INC.), August 1991, p40
Space for burial of the body

Choices for burial could be quite diverse as well. Waikumete Cemetery provides the service for conventional burial with headstone, flat plaque lawn burial, nature burial, and mausolea. Two notable points regarding the mausolea is worth mentioning. First, the desire for “pre-purchased chambers within the two public mausolea have been very strong”.

One of the important reasons is that families desire to purchase adjacent spaces to create a family set. Second, the mausolea is an efficient burial way and could be located on the steeper slope. The size of each chamber is 1200 width, 2400 length and 600 depth.

47 Waikumete Cemetery Reserve Management plan, Reginal Strategy and Policy Committee Auckland Council 2015, p27
48 Ibid. p27.
Space for holding the ceremony

As mentioned above, there are three chapels in Waikumete Cemetery. But it is still necessary to provide a space for other ethnic groups to hold their funeral ceremony. Some dimension of the auditoria should be studied. One, is the space of row to row. For fix chair, the minimum clear way for passing through is 300 mm and the row to row dimension is usually no less than 850mm. The seating density could be 500-750 mm wide by 760-1400 mm row to row dimension.

There is a formula to calculate the floor slope:

\[ Dl = \text{distance from eye of front row to APS} \quad El = \text{vertical height of eye of first row above focal plane} \]

head clearance C: \( C1 = 60\text{mm minimum (view between heads in front)} \quad C2 = 120\text{mm (reasonable viewing standards)} \)

\[ N = \text{number of rows in seat bank} \quad T = \text{The distance from row to row} \]


Figure 23: sections of auditorium

33.19 Seating density, from 0.38 m² to 1.05 m² per person
Another element that needs to be considered is the capacity of the space. The largest chapel in Waikumete Cemetery provides 110 seats, while the smaller one seats 60 people. \(^{51}\) So the new ceremony hall will provide 60-110 seats.

\(^{51}\) *Waikumete Cemetery Reserve Management plan*, Reginal Strategy and Policy Committee Auckland Council 2015, p25
Design Exploration

Understanding the site

1. The Waikumete Cemetery could be seen as two parts, historical and modern. The burial plots of the historical part are currently almost full and are located on the easier contour. On the other hand, the new site for future development is the hillside with a steeper slope. The burial type in the historical cemetery is mainly plat plaque lawn and conventional tomb with headstone. But these two types of burial is hard to be applied on the hillside. As mentioned above, the mausolea is a good way to take advantage of the steeper slope. So, for new development, a burial way aside from the conventional burial should be considered. (figure 24-1)

2. The main entrance of the Waikumete Cemetery is located at Great North Road. Acemena Ave is running through the whole cemetery and cutting it into two parts, the old and the new. A new cemetery should be accessible based on existing roads and construction of new roads should be reduced as least as possible. (figure 24-2)

3. One of the tough parts for utilizing the new site is the existing streams. There are five streams flowing down the hillside. How to take advantage of them rather than destroying them should be considered in the new cemetery. It is a similar issue for the existing vegetation; protect-
ing trees rather than cutting them down is another issue that needs to be thought of in the design. These two issue can be summarized in how to integrate with nature. (figure 24-3.4)

4. The existing distribution of the buildings is shown in figure 24-6. Please note that the main chapel and crematorium are near the main entrance.

5. The track of the sun's movement is shown in figure 24-5. It is one of the design elements that might need to be considered for the next exploration.
Figure 24: Site analysis
Original concept

The design process is not totally a result of logic; it does have a creative part. The function of a cemetery is not complex. But to be driven merely by answering the functional needs seems inadequate as such an approach does not create a space which touches the visitors’ inner world.

At this stage, a series of things arises in my mind, such as linear sequence, a place full of discovery, catacomb in history, five existing streams flowing down through the site, taking advantaging of contour, etc. At the beginning of this research project, the importance of a memorial to our city as well as individuals needs to be stressed. How to create a space full of memory is another question appearing in my mind.

As I close my eye, the reality of the world disappears and I enter an imaginary world. At the start, it is fairly dark and I could not see anything. Then a linear light appears in front of me and leads my way. (Fig 26) I follow this clue and another clue also leads my way in the darkness, which is the sound of water beneath my feet. Then, the environment
becomes bright. There is a hole in front of me where light comes through and shows another vision.

This other vision is about streams falling down from the hill and becoming waterfalls which washes the memorial wall made up of black stone. The visitors look up names on the wall, touching the flowing water and hearing the loud sound created by the water falls. (Fig.25, 27)

These are my original visions about the new cemetery and which I am drawing. The location and scale of the circle still need to be explored.
Site selection

The ideal site is located at the bottom of the hill where streams are gathering together. But for a perfect location, more explorations were made. In the first exploration, the diameter of the circle is just 80 meters and sits at the location where the four streams meets. (Fig 28-1) One of concerns for this trial is that the scale of the circle is quite big for people. So, the size was reduced to a diameter of 70 meters. The other idea is about the stream. When several streams gather together, they become a bigger stream. During the process of the second exploration, the circle of the memorial wall was moved to the point where three streams are merging, forming a small river; the fourth stream converged into the small river. (Fig 28-2) All these elements made for an interesting landscape.

Fig 28: The process of site selection
Configuration of function

The functional requirements for the new cemetery include a space for burial plots, ash plots, memorial wall, ceremony hall, catering and other services, such as toilet and storage room. Making the configuration of function, the ritual of funeral should be understood.

In general, for choosing the most appropriate burial for the deceased, the ritual sequence is that the family gathers at the ceremony hall first, then go to burial plots. Finally, they might go to catering area depending on their choice. For cremation, the family usually uses the chapel of crematorium, then wait at the crematorium before going to the space of ash plots.

Besides consideration of funeral ritual, a space sequence to create a discovery journey for the user regarding the architectural aspect should also be part of the deliberation. In the precedents study, one of the useful mythologies is space contrast.

Fig 29: illustration rhythm of space sequence
In stage 1, the original concept of the memorial wall and ash plots tunnel is realized into a linear space sequence by applying the mythologies of space contrast. Visitors will meander in a dark and narrow tunnel and then enter a bright and spacious space. (Fig.29)

The function for holding ceremony is added in stage 2. Before I visited the funeral manager of Davis Funerals, Bob Russel, a chapel for Christians was one of the main functions. But according to him there is no need to build one more chapel in Waikumete Cemetery, although a space for holding funeral ceremony for other ethnic groups is necessary. During the stage 2, a layout including a chapel was created. The location of the chapel was chosen based on the layout of the traditional church, which is the main entrance placed at the west. (Fig. 30) The burial plots with four layers, like the Igualada Cemetery, follows the contour. So the trip for the deceased’s family is from the chapel to the burial plot. If they are interested to have more, then they can visit the memorial wall and ash plots. For the other visitors, the process of the cemetery trip is
from the ash plots tunnel, memorial wall, burial plot to the chapel.

A contradiction of the master plan in stage 2 is that it is based on the more consideration of function rather than a rhythm of space sequence in terms of the architectural aspect. One more, the circulation is accessible but not touching enough.

In the exploration of stage 3, the chapel is deleted and a space for holding ceremony is created underneath the memorial wall. (Fig. 31) Compared to stage 2, the circulation is simpler and clearer. People will travel through a dim ash tunnel, then enter a small courtyard outside, then walk into a dark underground space for the ceremony hall, and then have a moment of rest at the cafe in a semi-open space with trees. Finally, they go back to the parking by going through a passageway under the sun.

_Circulation_

Based on the different religions and different ways of processing the body, the circulation in the new cemetery would also be different.

1. For those who choose cremation, the circulation is:

One day for cremation: Crematorium chapel (or funeral home, home, temple, etc.)- Crematorium- Parking area - back home

Another day: Parking area- Ash plots passage - Memorial wall- Catering space (According to the choice of the family)- Passage outside with shelter-Parking area

2. For those who choose burial and use ceremony hall of new cemetery:
Parking area- Ash plots passage - Ceremony hall underground- Burial plots around ceremony hall- Catering space (According to the choice of the family)- Memorial wall- Passage outside with shelter-Parking area

If the burial plot around the ceremony hall is full, the circulation could be: Parking area- Ash plots passage -Ceremony hall underground- Burial plots on the hillside- Catering space (According to the choice of the family)- Passage outside with shelter-Parking area

Fig 31: Illustration the generation of ceremony hall in stage 3
Space Sequence

The space sequence of the whole circulation is organized by a linear arrangement. This includes a series of primary space joined together by the connection of transient space. The methodology of space contrast is applied between the different spaces. Light is a clue leading the way of visitors through the whole circulation. Controlled light is applied in functional and transient spaces. During the whole journey, visitors go through the changing of darkness and brightness; the changing of light environment gives them different psychological effects. In general, at first, they suffer a moment of depression due to the effect of light environment. However, they are gradually exposed to brightness at the end of the journey, where they enjoy sunshine and begin to think life is so good. (Fig.32)

Light and void

Among our five senses, the largest proportion of information is provided by our eyes, so the quality of the design of the lighting environment largely determines our psychological feeling. Besides, light is one of the elements that influences visitors’ feeling; it is an important hint which strings the different spaces.

This section is an exploration of the light environment in two primary interior spaces, ash plots area and ceremony hall. The boundary of void limits the range of light. So, in order to achieve a different quality of light, different types of void are utilized.
Two different methods are used, namely, computer simulations of light environment and physical model making.

Fig 32: Illustration of space sequence
Section view through void 1- Slipped void of ash plot tunnel

The light type of entrance is direct light and diffusely reflected light. First, the direction of light shoots on the wall and intersects with the long hole of the wall at a certain moment in a day. Then the wall diffuses the light, providing soft light to the internal space. The light

Fig.33: Ground floor plan and entrance section a-a
environment is comparatively strong compared to that of the central ash tunnel. Light environment simulation of the ash plots entrance and corridor, showing the shadow change of 2ed September in figure 34.

Fig 34: Light environment simulation of 2ed September- Entrance
Section view through void 2- narrow strip void of ash plots tunnel

Narrow strip void: path circuit around the top edge of the lower void and light scatters along a long and narrow void. The quality of light is diffused light in the morning. As the height of the sun at noon becomes long, a trip shape light directly shoots on the ground and then the light gets diffused. Besides controlled light providing a dim and scared light environment, the main function of strap light is a hint leading the way forward. (Fig 35, 36)
Fig. 36: Light environment simulation of ash plots tunnel
Section view through void 3 - central round void of ceremony hall

Central round void: Light shoots down into the void from high levels, becoming the visual focus in a very dark light environment. So a scared atmosphere is created by the light.

Fig.37: Light environment simulation of ceremony hall by physical model
Sound

Besides light as one of the powerful elements to create an atmosphere, sound is also a crucial element that needs to be considered in the design. However, the sense of sight is so dominant, that sound sometimes is easily ignored by the user. One of the useful methodologies is to weaken the sense of vision, so the dimmed environment is created by controlled light. This section is to explain the relationship between sound and light in different spaces. (fig.38-1)
First, it is the ash plots tunnel. In the chapter above regarding light, we know a narrow light strap is created in the ash plots tunnel and the light environment is comparatively dim. In this dim space, the visual sense becomes weak, while the auditory sense becomes sensitive. The sound is created by water beneath the floor. Visitors could hear a faint sound of flowing water. A quiet environment is created not because there is no sound at all but a small sound could be heard.

The second space visitors enter is an outside courtyard which is a connection of ash plot tunnel and ceremony hall.

At the end of the ash plot tunnel, the light environment becomes bright and perception becomes rich. Sounds from birds and waterfall falling on the ground from far away could be heard. Then visitors enter the burial plots gallery and ceremony hall which are totally quiet places. Contrast this to the loud sounds of the memorial wall square, where the water flows rapidly to the ground. (fig.38-2)
Rethinking of scales

This study is an exploration of the psychological effect caused by the different scales. The diameter of the memorial wall circle is 70m which seems right from the view of the site plan. But it might be an unsuitable scale from a human perspective. First, the Sketchup model is made to simulate how it feels on the computer. (Fig. 39-1)

Assuming one person is standing at point A and looking towards point B. The perception view is fig 39-2. Furthermore, how does the different distance feel in reality? More tests are made. One effective method is to feel different scales in reality. Two examples are found to illustrate scales, one is Fo Guang Shan Buddhist Pagoda in Auckland, the other is S. Michele Cemetery near Venice.
Fig 39-1: The diameter of the memorial wall circle is 70m

Fig 39-2: Perception view from A to B
Fo Guang Shan Buddhist Pagoda

This exploration illustrates the perception of a linear space about 45 meters long (fig 40-1) which has some similarity to ash plots tunnel and the distance about 60 meters long. Figure (fig 40-2) and figure (fig 40-3) separately shows the perception from point A to B and point A to C.

Fig 40: Perception view from A to B
Another example is S. Michele Cemetery near Venice, which makes a good reference of scale. One part of this cemetery is the lawn cemetery divided into several blocks. The size of one of the blocks is about 68m in length square. Figure 41-3 is a perspective view from point A to point B in figure 41-2. The similarity of S. Michele Cemetery and the current design of the new cemetery in Waikumete Cemetery is the distance from eye to the wall. So we could know how 68m is felt by humans in reality. The other point that can become a reference of the S. Michele Cemetery in the new cemetery design is the wall height which is about 4m. Hence, from this example, the perceptive view from the eye to the wall could exemplify the sense of scale of 68m length.
Fig 41: Perception view from A to B
One of the worries regarding scale is that the square is too big for people. But the study of the San Michele Lawn Cemetery illustrates how 68m feels in reality, while it does not lose a sense of scale. One of the differences is that the floor of the current design is hard material while that of San Michele is grassland. A strategy for the improvement of the current design is to decrease the hardness of the floor. As a result, water is introduced. A shallow pool is located in the centre of the square, as shown in the following figure 42.

Fig 42: A shallow pool in the centre of the square
The other method is the introduction of trees to add more contents to the square. How many trees should be plant is considered. The maximum situation is the square is full of trees but may damage the purity of the original concept. So, the number of trees is reduced to the current figure shown in figure 43.

Fig 43: The consideration of tree planting
Path and spatial experience

In this chapter, spatial experience will be revealed as one moves through the path. Interior renderings are involved as the methodology to express how it is felt being inside, so the public will have a better understanding of inside space. Path are shown in Fig 44 and Fig 45.
Fig 44: Ground floor plan
Fig 45: Site plan

1. parking

2. ash plots

4. parking

5. burial plots
Ash plots corridor

The journey begins at the entrance of the ash plots corridor. After one walks from the parking area, a linear shape building flowing toward a small lake will be revealed in front. And in order to enter the building, he will come across the lake and step on several stone paves where lotuses are floating on either side.

The walk through stone paves and into the building is the first pause of this journey. He may stop at this space, where, on the right hand is a linear hole on the blue stone wall framing the view outside. The height of the hole is just eye level. One could observe the outside view through this hole. As one turns around, a washbasin made of stone, a long bench made of timber and a semi-circle door would be noticed in this space. There might be another person bending in front of the basin and washing his face after crying and then having a sit on the bench for a moment. Then, continuing on the journey, he passes through several steps and follows a linear light ahead. The linear light overhead is the only light source in this narrow space, so it is quite dim here. At the moment, the sense of hearing and touch are becoming sensitive as the environment becomes dark and a faint sound of water flowing beneath the

Fig 46-1: Plan of entrance
floor could be heard, while the rough texture of the stone wall could also be felt as the figure tips gliding across the wall. As one walks straight forward, hundreds of names carved on the ash plots pass through. Then he might stop and stand in front of a particular plaque and read a stranger’s story amidst the dim light. At the end of the ash plots, the environment becomes bright and noisy. One gets more information, such as

Fig 46-2: Spacial experience of entrance
the sound of birds, wind and water falling down far away, including a view of the trees, waterfall, blue sky, stone wall, as well as the smell of fresh air and grass.

Fig 47: Spacial experience of ash plots tunnel
After finishing the journey to the ash plots, one will get through a semi-circle door to a small courtyard which is a transition space, where he could either continue his journey to the ceremony hall or walk around the memorial wall or just stay here and have a sit for a moment. Once in an open space, he would feel relief after walking through a dark tunnel. Then he could turn right and walk through a canopy and then turn left down to a ramp. A canopy at the entrance to the ceremony hall is with a round sky light and light cast a round shape on the concrete wall implying there is indeed an entrance. (fig.48)
Fig 48: Spacial experience of courtyard
Burial gallery in front of the ceremony hall

After going through the entrance, one begins the other journey. The burial gallery is a curving passage where light comes through the pool. The shade of water is shoot on the ground. On the left hand, there are hundreds of plaques of burial plots carved on the wall, while on the right hand is a memorial wall made up of concrete. As one walks through the passage, he passes by hundreds of names. (Fig.49)

Fig 49: Spacial experience of burial gallery
Towards the middle of the round passage, the door of ceremony hall appears. Inside is a space for an amphitheater right in front. Soft light is reflected on the round and front wall, whereas a strong round shape light is casted on the ground, drawing the viewer’s attention to the center. (Fig 50)
Fig 50: Spacial experience of ceremony hall
Catering space

After visiting the ceremony hall, one still continues the journey in the round burial gallery. Towards the end, a semi-open space appears, full of trees and with the sky light coming in. It is a space for families to hold a party at the end of funeral. People can have a fine time enjoying the food, talking and laughing here. This space is meant to have a full of sound of people talking and laughing and birds singing. It seems like after a long, dark way, where one may suffer depression, is a space so alive, allowing one to appreciate life is so beautiful. Then outside this space is a linear courtyard with stairs up to the ground.
Memorial wall square

On the ground, a square is enclosed by a circle of black memorial wall that contains thousands of names are carved on it. A stream flows down from the hills and washes out the said wall, with a huge sound made by water hitting the ground. The shallow pond at the centre of the square reflects all the objects, such as the blue sky, green hills, and even the black memorial wall. A child may squat by the side of pond and stare at the fish in the pond. (Fig.51)
Fig 51: Spacial experience of Memorial wall
Burial plot areas

In order to get to the burial plot areas, one must pass through a passage carved on the hill then enter the main burial area designed like a mausoleum-like burial plots spreading along the contours. Four layers of burial plots are overlaid together. And the track of the burial plots is fully covered with trees where the sunlight filters through. While walking, one can hear the sounds of nature, such as the song of birds or insects. It projects a peaceful atmosphere despite all the sadness that permeates the place. It also provides a link, bringing both the living and the dead together in spirit. In the middle of the walk, a large cantilever structure is part of the landscape so visitors can have a full view of the whole Waikumete Cemetery and even as far as Auckland city in the distance. The path to the burial area is connected to the existing road of the Waikumete Cemetery. So the coffin could be brought to burial area either by vehicle passing through the roads or carried by the bereaved family going through whole route. (Fig.52)
Fig 52: Entrance to burial plots area
Critical Appraisal

Back to the questions that need to be answered by the design

Three issues that need to be addressed at the beginning of this research project are the crisis of memory, denial of death and burial issues in Auckland. How does the design respond to them?

First, the proposal itself, to build a cemetery in Auckland, responds to the issue of crisis of memory in contemporary society. As mentioned above, just like a museum, a cemetery is another repository of memory of our city. If a cemetery could become a place full of attraction for the public, then its educational function will be revealed. So how to create an attractive cemetery will be a question that needs to be answered.

The second issue is the common attitude towards death, which is the denial of its reality. This psychological state is an outcome of the fact that most people fear and, thus, avoid it. “But the more reluctant we are to look death in the eye, the less we know about it and the more we may come to fear it. And by not recognizing the inevitability of death, we may be denying ourselves the opportunity to live well.”

52 Margot Shwass, Last words- Approaches to Death In New Zealand’s Cultures and Faiths, ( Bridget Wiliams Books Limited, 2005), p14
wretched cycle. To break the vicious cycle, one of the efficient methods is we come to know more about death. So the education function of a cemetery should be a shared responsibility.

The third in the burial issues in Auckland is shortage of burial space. For Waikumete Cemetery, due to less capacity of the current cemetery, a new development will be made on the vegetal hillside. This will be a take-off from the common – and conventional burial method in the city, which uses a headstone or lawn burial with plaque. This means then that tress will be cut down if new development is carried out. Hence, to utilize land efficiently, to protect the existing vegetation and to create an attractive place for the public are questions that should be solved by the new cemetery design.

*How does the design respond to the questions?*

The question of how to create an attractive place for the public, looking at it from a visitor’s point of view, means building a place that will leave a positive impression on him, thus, adding more to the individual’s experience in this place. Two architecture strategies will address this. One of the architectural methodologies is a ritual created by a series of functions strung by linear arrangement. Further, a series of surprising spaces is created by spatial contrast. The other methodology is creating an atmosphere in each space that involves the different sensations, such as hearing, sight, and touch. Sounds, light, water are three basic elements which the design emphasizes.
The new cemetery design will answer the other two questions as well, namely, efficient land use and protection of existing vegetation. First, the study of the history of cemetery in western culture helps find a way to break through the existing burial model. In the process, a series of ways of burial were discovered. For one, the multilayers of burial plots lying over and under is not a fresh thing but already appeared about 2,000 years ago in the catacombs of the Roman empire. This mausoleum-like burial method is also found in some modern cemeteries, like the Igulada cemetery in Spain and the San Michele cemetery near Venice. Both apply the new cemetery design which has an efficient use of land and takes advantages of deep slope and keeps more vegetation. Second, the natural landscape of the site is preserved. Both vegetation and streams are kept. In fact, the latter has also become part of the cemetery so the interaction between water and users has been created.


David Littlefield (Author), Pamela Buxton (Editor), Metric handbook: planning and design data (3rd edition), Routledge; 3 edition (17 Dec. 2007).


Two architecture strategies are applied to create a touching place. One of the architectural methodologies is a ritual created by a series of functions strung by linear arrangement. Further, a series of surprising spaces is created by spatial contrast. The other methodology is creating an atmosphere in each space that involves the different sensations, such as hearing, sight, and touch. Sounds, light, water are three basic elements which the design emphasizes.
8 Non-denominational Chapel

9.10 From catering space to ground
A Journey Through Sound and Light
11 Entrance to ash plots area

12 Stairs to ash plots area
Declaration

Name of candidate: .................................................. Cheng yan Wang ..................................................

This Thesis/Dissertation/Research Project entitled: A journey through Scoorl and High - Waitakere Cemetery new development is submitted in partial fulfillment for the requirements for the Unitec degree of Master of Architecture (Professional).

Principal Supervisor: .................................................. Michael Anstyn ..................................................

Associate Supervisor/s: .................................................. Jeanette Budget ..................................................

CANDIDATE'S DECLARATION

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: .................................................................

Candidate Signature: .................................................. Date: 30/10/2016 ..................................................

Student number: .................................................. 1308046 ..................................................
Full name of author: Chengyan Wang

Full title of thesis/dissertation/research project ('the work'):
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