THE INFINITY STADIUM

INTENSIFYING THE SUBLIME IN POST-EVENT STADIA

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A 120 point thesis submitted to the School of Architecture and Design, Victoria University of Wellington, in partial fulfilment of the requirements for the degree, Master of Architecture (Professional).

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P R E F A C E

This thesis began in 2009 with a trip to the Allianz Arena in München, Germany (Fig. 001). As a 15 year-old, being with 60,000 fans in a Stadium was a profound experience. I became enthralled with Stadia. From then on, I began exploring this fascination by constructing small model imaginary stadia to host imaginary teams from imaginary cities (Fig. 003).

This broadened into wider architectural interests, eventually leading me to pursue architecture at university in an attempt to imbue the rest of the built environment with the magic of Stadia.

As architecture, the Stadia have hosted historic events. These events often leave an impression on the consciousness of a city, of a people and of a person. Religious and spiritual analogies are often used to describe these experiences. This is, as I discovered through the texts of Burke and Nesbitt in my fourth year theory course at Architecture School, the Sublime.

However, as I have come to find, far too often the magic is expended for the big Olympic fortnight or that massive play-off match and after the event, the Stadium lies as an oversized shell for the majority of its life. How can something that is an unrivalled example of the Sublime, functioning at a massive scale for a collective and for individuals simultaneously, be such banal pieces of insipid, uninspired and expensive engineering?

So, what if the magic did not depend on the event but was rather created by the Stadium itself?

The motivation for this thesis is to intensify a post-event Sublime - which Burke identifies as the strongest of emotions causing astonishment because of unimagined eloquence, greatness, significance, or power and is experienced by the user as awe, wonder or even dread, fear and terror – so that it can be found in the Stadium itself, after the main event.

◀ 001 Allianz Arena

002 Signal Iduna Park ▶

IMAGE REDACTED

Fig. 002 – Signal Iduna Park
Gursky, Andreas. "Dortmund." andreasgursky, 2009, www.andreasgursky.com/en/works/2009/dortmund.

ABSTRACT

The Stadium is a blend of commercialism, functionality, regulation and iconicism. At the height of its power, a Stadium is an unrivalled example of the Sublime functioning at a massive scale for a collective and for individuals simultaneously. Every year, large-scale stadia are built for events such as Olympic Games or World Cups which then become underused or even abandoned after the event has finished. Despite this, these facilities continue to be built. This thesis argues that the challenge then, is to design the Sublime into the post-event stadia architecture.

This thesis looks to explore architectural design methods that invest the post-event stadia with the Sublime. The aim is to intensify the Sublime, often found at the height of the event, in post-event situations. Explorations in scale and programming are used to test such intensifications. Can the Sublime – which, to paraphrase Burke, is “the strongest of emotions causing astonishment because of unimagined eloquence, greatness, significance, or power, and which is experienced by the user as awe, wonder or even dread, fear and terror” - be found after the event?

This research uses iterative design experimentation to tease out the Sublime at three scales: that of an installation, then a domestic scale and then an urban-public scale. This research ultimately looks to create a project that uses the Sublime as a main driver and design criterion for creating a Stadium that is as effective at low capacity as it is at full capacity through the enticement of the Sublime.

Endless amounts of gratitude must be expressed for my supervisor Simon Twose and his gentle patience, to my mum for everything ever, to Ryan Selwyn and Luke Ransfield for their critical input and unblinking faith in me and to Lisa Sorger, Jared Cotton, Hanne Lundin and Jessica Santiago for their support and putting everything into perspective. Good job everyone.

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01

CHAPTER 01
INTRODUCTION

04

CHAPTER 01
METHOD

06

CHAPTER 01
POST-EVENT

10

CHAPTER 01
THE SUBLIME

12

CHAPTER 01
THESIS
STRUCTURE

16

CHAPTER 02
INSTALLATION

42

CHAPTER 03
INTERVENTION

78

CHAPTER 04
LITERARY
CONTEXT

84

CHAPTER 04
CONTEXT:
SUBLIME + ART

88

CHAPTER 04
ARTISTIC
PRECEDENCE

96

CHAPTER 04
CONTEXT:
SUBLIME + STADIA

100

CHAPTER 04
STADIA CASE
STUDIES

120

CHAPTER 05
SITE ANALYSIS

162

CHAPTER 06
LARGE-SCALE
DESIGN ONE

190

CHAPTER 06
LARGE-SCALE
DESIGN TWO

236

CHAPTER 07
DISCUSSION +
CONCLUSION

246

CHAPTER 08
BIBLIOGRAPHY

01

INTRODUCTION

INTRODUCTION

At the time of writing, a year and a half on from the Olympics in Rio, there is widespread outcry over the state of the Olympic infrastructure, already falling into disrepair. Abandoned and empty stadia are upsetting for sports fans and citizens alike. The horrendous waste of money and resources as well as lost architectural potential is obvious.

This design-research focuses on transferring the Sublime, usually found at the height of the event, to a post-event setting. The aim is to intensify the Sublime, the philosophical concept outlined by Burke, through design-experiments at three different scales. The architectural aspects of the Sublime are incorporated through the writing of Nesbitt and Pallasmaa. The architectural aspects of the Stadium experience are outlined in the work of Flowers, Morris and Wimmer who complete the literary context for this thesis.

Architectural case studies from Tomás Dobrosi and Doparum Architects and star architect Zaha Hadid, and artistic case studies from the period of Romanticism and land artists Richard Serra and Michael Heizer, contextualise this thesis in contemporary strategies and solutions to this problem.

Finally, this thesis seeks to develop an architectural project, in a local context, that intensifies the Sublime in a Post-Event Stadium.

METHOD

To carry out design experiments intensifying the Sublime in post-event Stadia, this thesis uses an iterative design method, testing ideas over three different scales. Jane Rendell asserts that iterative design research “operates through generative modes, producing works at the outset that may then be reflected upon later” (117). This is an alternative to the established linear thesis research method of posing a question and seeking an answer. By instead developing architecture through three design experiments at installation scale, mid-scale and then large-scale, concepts are distilled, challenged and crystallised to then inform the following scale. The design generations use methods of drawing, physical and digital modelling to produce a final design outcome; the culmination of design experiments into the Sublime and site-specific design experimentation shown through representational techniques of drawings, collage, photography and modelling.

To intensify the Sublime, an understanding of the elements of the Sublime has to be established. This is achieved through interpreting the literature of Burke -among others- studying the art and architecture aligned with the Sublime and conducting design experiments to formulate the Sublime aesthetic and use it as design tool.

Site specific design grounds the design research into a framework through which the proposition can be assessed. A locally sited final project

displays the knowledge and research gained through the design investigations of the earlier iterations.

Stadium design is rife with default expectations and processes (John et al. 20). This design investigation engages multiple design techniques which Perry Kulper asserts will produce the creative speculation needed to overcome these default modes of Stadia design (274). The foundation work at each stage is mostly analogue ‘broad brush’ work. Iterations and developments are later formed through techniques of further drawing or modelling with the finalised work at each stage being brought into the digital realm.

The final design work is the outcome of the investigations into the Sublime as well as site specific design. The mixed-media representational techniques focus on emphasising the Sublime aesthetic in the architecture referencing the art of Romanticism in rendered collages. The traditional set of architectural drawings accompanying the final project seek to display the architectural realisation of the design proposition. Physical modelling aids the understanding of the Sublime aesthetic, combined with the architecture in its relationship to the land. The understanding of the Sublime is achieved through the iterative process. This design research method allows discovery to happen through design.

005 Small scale - Installation

006 Medium scale - Intervention

007 Large scale - Stadium

POST-EVENT

Stadia are among the largest solitary structures and the oldest architecture to remain thoroughly current. Although constrained with strict regulations for safety and security, building codes and standardised dimensions for sport, Stadium architecture is complex and evolving. Albert Wimmer describes the Stadium as the relationship of the solid built mass and the moveable, flowing, filling mass of the crowd. The crowd completes the architecture but the liquid mass of the crowd is formed by the solid built mass (136).

Wimmer goes further, presenting the Stadium architectural experience as four-phase: Approach, Filling/Entry, Spectacle, and Exit (140). This thesis seeks to add the Empty Stadium as the fifth phase, naming it Post-Event placing focus on it a transitional phase before the next event (Fig. 008).

POST-EVENT

APPROACH

As the Stadium enters view, the earliest notion of the Sublime is felt by the sheer scale of the Stadium dwarfing the individual below. The latently present feeling of anticipation begins to stir. Mentalities shift and usually rational people suddenly become superstitious and normally docile people experience an emotional response of ecstasy, pride or sadness. Paradoxically however, the common purpose of those approaching delivers a feeling of safety as one moves in the herd (Wimmer, 140).

FILLING

Once inside the Stadium, the previously afforded freedom of movement is restricted as people are funnelled towards their seats. Fans travel through cavern like concourses being led up, down or through; the anticipation is refreshed and imbued with a specific Stadium atmosphere, causing an inner suspense and outer tension known as Stadium hysteria (Wimmer 140).

SPECTACLE

This 'collective effervescence' (Fox, 1) plays a large social role. Morris writes of the importance of being part of the Great Tribal Gathering, to witness the ritual hunt or battle as identified in the language: attacking, defending, strategy, tactics, skills, strength, stamina, aim, bravery, champion, hero – or the pseudo religious ceremony: players worshipped, sacred turf, superstition, singing in unison, hymns, common belief (42). Here one experiences the epitome of anonymity and loss of the individual, the building, spirit

and people are all one in their own bounded universe (Wimmer, 140).

EXIT

Quicker than filling/entry, leaving the Stadium occurs alongside an emotional discharge. As people shuffle to the aisles to exit together, the equality of the Spectacle Phase is gradually dissolved as people become full individuals again outside the Stadium (Wimmer, 141).

POST-EVENT

The transitional stage, after the Stadium has emptied and before it fills again for the next Spectacle, is the focus of this thesis. Morris asserts that approaching the Stadium on a day no match is being played still creates a buzz of excitement for a fan but is harder for an outsider to understand (38). The need to create a magical aura is no longer aided by the power of the crowd, the post-event Sublime now must appeal to the individual.

Wimmer argues that the current trend of multi-purpose and cross-programme solutions turning the Stadium into a business running every day of the week erodes the cultic atmosphere of anticipation and the unique character derived from the Stadium's traditional function (Wimmer, 141). This thesis seeks to intensify the Sublime in this Post-Event phase to the level achieved in the Spectacle phase to prevent this erosion of the quality of the atmosphere or experience.

009 Night game

THE SUBLIME

Burke defined the Sublime as “the strongest of emotions causing astonishment because of unimagined eloquence, greatness, significance, or power, and which is experienced by the user as awe, wonder or even dread, fear and terror” (121). Burke places the Sublime opposite the Beautiful. According to Burke, the pleasure of the Beautiful has a relaxing effect on the fibres of the body, whereas Sublimity, in contrast, tightens these fibres. Where the Beautiful is what is well-formed and aesthetically pleasing and is derived from pleasure, the Sublime is what has the power to destroy us and is derived from pain. The preference for the Sublime over the Beautiful marked the transition from Neoclassicism to the Gothic and Romanticism (37).

Up until the late seventeenth century, the Sublime denoted literal or metaphorical height: especially the heavenly, noble or heroic. Kant linked the Sublime to feelings and ideas beyond human rationality, ideas such as Infinity, Unity, Freedom, Justice, the Absolute (White, 1). It is the irrationality, tension, violence, terror, heightened emotions, nerves and magnificence that leads to astonishment suspending all other emotions, which constitutes the Sublime (Burke, 56).

Traditionally, the architectural Sublime has been associated with the Gothic Cathedral. However, Benjamin Flowers argues that “the most powerful contemporary expression of the Sublime in architecture – where the experience of space is overwhelming, potentially terrifying, and simultaneously pleasing – are to be found not in cathedrals but stadia” (18).

010 Stormy Sea with Lighthouse ▶

011 The Fall of the Rebel Angels ▶

012 Shipwreck ▶

IMAGE REDACTED

Fig. 010 – Stormy Sea with Lighthouse by Carl Blechen
Blechen, Carl. "Stürmische See mit Leuchtturm." Wikimedia Commons, 1826,
commons.wikimedia.org/wiki/File:Carl_Blechen_-_St%C3%BCrmische_See_mit_Leuchtturm.jpg

IMAGE REDACTED

Fig. 011 – The Fall of
the Rebel Angels
Giordano, Luca. "The
Fall of the Rebel
Angels." Wikipedia,
1660-65, [it.wikipedia.
org/wiki/Luca_
Giordano#/media/
File:Luca_Giordano_-_
The_Fall_of_the_Rebel_
Angels_-_Google_Art_
Project.jpg](https://it.wikipedia.org/wiki/Luca_Giordano#/media/File:Luca_Giordano_-_The_Fall_of_the_Rebel_Angels_-_Google_Art_Project.jpg)

IMAGE REDACTED

Fig. 012 – Shipwreck
Vernet, Claude-Joseph. "Shipwreck." Wikimedia
Commons, 1759, [commons.wikimedia.org/wiki/
File:Shipwrec-vernet.jpg](https://commons.wikimedia.org/wiki/File:Shipwrec-vernet.jpg)

THESIS STRUCTURE

02

INSTALLATION

INSTALLATION

AIM

The first design experiment is an exploration seeking to qualify and distil qualities of the Sublime. These qualities will be brought through into the mid- and large-scale design experiments. The installation seeks to create an ephemeral light experience, similar to that of a floodlit Stadium at night (Fig. 015).

METHOD

As Downton suggests, the proposition can be “found and developed through the physical acts of designing” (55). In this case, the investigation sought to achieve the design of a familiar aesthetic of the night time match at the Stadium, and explore it through sketches, modelling and the eventual creation of a technical device. Through photography the visual aspects of the aesthetic are captured, compiled and sorted into a matrix and assessed and compared to distil the qualities of the Sublime.

◀ 015 Stadium aesthetic at night

016 Installation initial concept sketches ▶

017 Installation initial concept model 1

018 Installation initial concept model 2

WHAT HAPPENS IN THE TRANSITION FROM LIGHT SOURCE 1 TO 2 ?

PLAY WITH FIN SIZING : VS.
(CONTROLLED ORDER)

PLAY WITH TRANSPARENT PATTERNS → CHAOTIC ORDER

019 Ephemeral device sketch^

020 Installation experience^

PROCESS

The first iteration, of the design installation, is looking at a journey that hints at an end ephemeral atmosphere but obscures the atmosphere until arrival. This looks to explore the Approach and Filling elements with a final Spectacle.

The second iteration explores an object representing the Spectacle, which changes nature and atmosphere depending on how it is viewed.

The aim is to create an installation with an ephemeral light atmosphere similar to approaching a floodlit Stadium at night. A device has been designed to produce this and explore an 'on' state - the Spectacle - the 'off' state – the Post-Event or emptiness – and the transitions in between. The atmospheric qualities are to be produced by testing warm and cold lighting as well as reflective foil and mirrors, producing a matrix of qualities to find the best one.

Tests are also conducted on the spacing and arrangement of the fins, exploring light and shadow relationships. Screens will also be tested in an iterative manner playing with layering, patterns and opacity.

Once the ideal atmosphere has been created by projection of light through fins and screens, the rotation of the device to change the lighting direction will create new and unplanned patterns and visual and ephemeral moments. These moments will be transitional between the 'off' and 'on' stages.

021 The device ▶

MATRIX OF QUALITIES

	Warm Light	Cold Light
Reflective Film	<i>Homely lighting: Warm, fuzzy, blurry and cosy</i>	<i>Hospital lighting: Cold, fuzzy, blurry, institutional</i>
Mirror	<i>Exhibition lighting: Clear, crisp and warm</i>	<i>Night construction lighting: Cold, clear, crisp and harsh</i>

FIN - SLIT RATIO

No. of fins : No. of slits

023 Logic of the slit experiments

SCREEN OVERLAYS

Layering of screens create
complexity of patterns

Warm + reflective

Warm + mirror

1:1

1:2

1:3

2:1

3:1

A

Warm + reflective

vs

Warm + mirror

Warm + reflective

Cold + reflective

1:1

1:2

1:3

2:1

3:1

B

Warm + reflective

vs

Cold + reflective

Warm + reflective

Cold + mirror

1:1

1:2

1:3

2:1

3:1

C

Warm + reflective

vs

Cold + mirror

Warm + mirror

Cold + reflective

1:1

1:2

1:3

2:1

3:1

D

Warm + mirror

vs

Cold + reflective

Warm + mirror

Cold + mirror

1:1

1:2

1:3

2:1

3:1

E

Warm + mirror

vs

Cold + mirror

Cold + mirror

Cold + reflective

1:1

1:2

1:3

2:1

3:1

F

Cold + mirror

vs

Cold + reflective

	Warm Light Reflective Film	Warm Light Mirror	Cold Light Reflective Film	Cold Light Mirror
Warm Light Reflective Film	X	W/L	W/L	W/L
Warm Light Mirror	L/W	X	W/L	W/L
Cold Light Reflective Film	L/W	L/W	X	W/L
Cold Light Mirror	L/W	L/W	L/W	X
	L:3 W:0	L:2 W:1	L:1 W:2	L:0 W:3

1:1

1:2

1:3

2:1

3:1

037 Installation fin tests

1

2

3

4

5

038 Installation screen tests

G

Fin layout test

H

Screen layout test

Top lighting test

As an additional iteration, the direction of the light source was changed from horizontal at ground level to vertical top lighting. This iteration illuminated the device in a way which better celebrated the device but also produced a broader atmosphere in the room with clear projections on the back wall now taking focus.

039 Installation top lighting test

040 Installation top lighting diagram

DESIGN OUTCOME

The final installation, by nature of how it was designed, produces predictable results in each of the two states. Using the device in the 'on' state, with the light hitting the screens, a soft and patterned ambient lighting illuminates the ceiling creating an atmosphere similar to that of the Spectacle. In the 'off' state, with the light hitting the fins, a strong contrast between shafts of light and columns of shadow is projected onto the ceiling and the wall behind the device. This is comparable to the state of the Approach or even an empty Stadium.

The physical act of rotating the device between the states begins to show the transitional occurrences. The softer and busier atmosphere of the 'on' state transitions into the crisp and contrasted 'off' state. In between these states new hybrid patterns are projected onto the ceiling, the back wall and the device itself takes on new characteristics.

SMALL SCALE ITERATION INSTALLATION CONCLUSION

The understanding of the qualities of the Sublime established in the literature, is reinforced after this design experiment. The success of this installation was found in its abilities to convey these qualities:

Scale – Dwarfing the human: the large size of the illumination relative to the room, the user and the device as the projection filled the space.

Form – Jagged, not smooth: sharp geometries of the fins, screen edges and mirrors created striking projections.

Light and dark – Heightened drama: The obvious contrast of thin yet crisp and bright beams of light against the deep shadows in a darkened room help create the extreme atmosphere of the Sublime.

Hide and reveal – Manufacturing mystery: The unexpected illumination of the room by the device creates a tension in the hide and reveal dynamic of the Sublime.

These qualities were successful as planned, in their intended states but also more informatively, in the transitional moments. Finding elements of the Sublime when they were not expected or intended increases the intrigue in the projected atmosphere. These distilled qualities are to become design tools for further steps in the design research.

These Sublime qualities are tested further in the second design experiment in the next chapter, the mid-scale intervention.

SCALE

FORM

LIGHT + DARK

HIDE + REVEAL

03

INTERVENTION

INTERVENTION

AIM

The second design experiment is a test to further explore aspects and qualities of the Sublime discovered in the Installation, at a larger human scale. It aims to test scale and form in particular, taken from the Installation and applied as design tools in an architectural proposition. The findings from this design experiment, the first transition into architectural implementation of the Sublime, will help to inform the large-scale design experiment in the following chapters. The intervention in Te Aro Park seeks to test a human scale Sublime experience, beginning to incorporate elements of programme and site.

METHOD

For this Intervention, an initial hunch based on the aspects of the Sublime drawn from the Installation was developed (Fig. 043). This hunch was the initial design direction given by the experimentation on scale and form taken from the Installation, manifested in the form of a concept sketch. Iterative sketches developed these design hunches incorporating elements of site and programme alongside the development of the Sublime. Physical modelling was also used to test aspects of scale before a final physical and digital model was created and captured through photography and collage to assess the outcome of this mid-scale design experiment.

SITE

The three most common site contexts for Stadia are in a sports park (Fig. 045), in a landscape (Fig. 046) or in an urban context (Fig. 047) (Wimmer, M., 76). Te Aro Park was chosen as it offers a landscape – being a park - in an urban setting – downtown Wellington - in the vicinity of the performance end of Wellington with the Opera House and Cuba St nearby.

045 Stadium in a sports' complex

046 Stadium in a landscape

047 Stadium in an urban setting

048 Site: Te Aro Park

PROCESS

The beginning of the Intervention used an interpretation of the distilled Sublime qualities from the installation (Fig. 042). This was looking particularly at vertical scale and how to adapt it to human scale. Rising above the park and sinking into the ground was considered a way to articulate vertical scale within the confines of Te Aro Park. This was developed through concept sketches of form and further iterative sketches in plan illustrating design experimentation as to the Approach and Entry to the park.

The programme shifted at this point from a closed gallery type function to an open performance space intervention, to keep with the end goal of the Stadium. The limited creative output at this stage called for a return to and a critical reflection of the scope of this intervention. The performance area, the exploration into scale and the use of site to inform design decisions were all used to clarify the way the Intervention should proceed. At this stage, conceptual formal sketches in combination with site specific accurate plan sketches were the method of design discovery.

Due to the thin and long shape of the site, as well as the explorations of vertical scale, the section drawing became a crucial design tool to reshape the design thinking. Sketch iterations continued with sketch modelling being used to test vertical scale until a final model was produced and documented.

- ◀ 049 Approach and entry diagram
- 050 Initial explorations into approach, entry and spectacle ▶

ARCHITECTURAL PROPOSITION

The design intent was to create an almost gleaming Sublime monument with performance functions appearing as an oasis in its urban setting. The architectural proposition endeavoured to burrow into the ground at one and rise above it at the other, to elongate the vertical scale of the intervention within the scope of the 'mid-scale'. Iterations on the form of the intervention ranged between violently jagged and monumentally smooth. The result looked to begin piercing the sky with the tower and the secondary rectilinear forms of the shelter structures, opposing the gentle rise found along the park from the depth of one performance area to the height of the other.

The initial focus on the approach, entry and spectacle shifted to a focus on the journey across the intervention, hence the zig-zagging of the walkway between performance spaces. The Intervention became a landscape proposition engaging with the existing park, perhaps too light handed for its Sublime design intent.

051 Further explorations into
approach, entry and spectacle»

SCOPE

After initial design difficulties, clarifying the project allowed the development of the Sublime to take precedence adhering to the following programmatic requirements:

To reduce a full site building to just two small performance spaces (Fig. 052).

To be able to view the performance spaces from both above and below (Fig. 053).

To create formal performance arrangements resembling amphitheatres or stages (Fig. 054).

To use existing site and approach angles to inform intervention (Fig. 055).

052 Two performance areas viewing each other

053 View performances from above and below

054 Formal performance arrangement

055 Use site to inform design

SECTION

The section is a key design tool for Stadia (Wimmer, M., 76). It enables an understanding of the relationships between the stands (viewers) and the spectacle, landscape and structure. This is the most effective way of communicating the scale, function and form of a Stadium whether it is a simple grandstand embedded in the landscape (Fig. 056 left) or six tier mega Stadium (Fig. 056 right).

Correspondingly, the section was useful in this design experiment to portray scale shifts crucial to the Sublime and to show both the vertical form and horizontal function particularly suiting the elongated nature of the site (Fig. 057-058). The section was also used later to explore the Sublime in Stadia.

4. raised tower

4. raised tower

DESIGN OUTCOME

The final design is an urban landscape intervention with two performance spaces, one raised covered platform with seating rising up to eight metres above Te Aro Park and the second performance space sinking two metres into the ground emphasising vertical scale. These spaces are connected by a zig-zagging walkway informed by the site, which crosses the existing park's water features before spiralling up to the elevated platform or ramping down to the sunken space.

MID SCALE ITERATION INTERVENTION CONCLUSION

Upon critical reflection, this intervention was a blind alley for the design experimentation. The design failed to place the Sublime in the foreground and instead too much emphasis was given to pragmatic concerns of a landscape intervention. The attempted explorations of scale and the overly sensible formal qualities of the intervention failed to invoke the Sublime.

The scale fell short of the grand scale of the typical Sublime designed to stir emotions of weight and magnitude but was also over designed for the possibilities of relative scale design at a human scale.

The design was formally unexciting, following the existing site conditions too closely not allowing a strong design intervention to occur.

Although ultimately tangential at best, this experiment displays the perils of pragmatism and caution at the expense of the aim: the intensification of the Sublime. It showed the importance of finding other modes for following the research. The following chapters explore the large-scale design experiments returning to the fundamentals explored successfully in the installation chapter, now equipped an understanding of the difficulty of achieving the Sublime at a human and the default design habits of the designer as potential restrictions to the thesis' success.

o 6 4 Intervention mid performance one ▶

o 6 5 Intervention mid performance two ▶▶

04

CONTEXT

AIM

The aim of this chapter is to cover the context for the Sublime and Stadia, beginning with an overview of the literature of the Sublime as a philosophy of aesthetics and its role in art and architecture.

The first set of case studies then delve into the Sublime as an aesthetic philosophy that was primarily explored as a visual aesthetic in the form of Romanticism and the Gothic. The visual rules for this work can be implemented on design explorations into Sublime stadia and so, these case studies for this project are the artworks of the original era of the Sublime.

The second set of case studies look at contemporary land artists Richard Serra and Michael Heizer and their methods of landscape incisions and tectonic sculpture which use elements of the Sublime – scale of size and weight, light and dark – and how their design methods can be used to intensify the Sublime in stadia.

Literature about Stadia and the use of the Sublime in contemporary architecture then starts to give context for the final design project.

The final set of case studies look into the trends of contemporary stadia and measures them against the Sublime metrics: scale, form, light and dark, and hide and reveal. Two of these stadia, that fulfil the Sublime criteria, are selected and analysed for their success as stadia as well as their elements of the Sublime.

◀ 066 London Aquatic Centre

067 Case study topics diagrams ▶

ARTISTIC PRECEDENCE

Sublime mood, image composition

LAND ART

Tectonic form

CONTEMPORARY STADIA

Stadia design, architectural trends

LITERARY CONTEXT - THE SUBLIME + ART

The literature on the Sublime in philosophy is extensive, so too the literature on the Sublime in architecture. This literary context is not a theoretical review of the Sublime but rather an acknowledgement of the great body of work that narrows to key ideas upon which I have located my proposition. This thesis, being a design research thesis rather than a theory review, addresses the Sublime through design and therefore uses the literary context and case studies to form design strategies to further the design research.

This thesis aligns itself with the Sublime as described by Edmund Burke in the mid 18th Century, with additions to the literature by Kate Nesbitt who frames the Sublime in a contemporary setting calling the rise of phenomenology a “rebirth” of the Sublime (188).

As previously stated, the Sublime as described by Burke is “the strongest of emotions causing astonishment because of unimagined eloquence, greatness, significance, or power and which is experienced as awe wonder or even dread, fear and terror” (121). According to Nesbitt, the significance of the Sublime lies in its conceptual reach or even spiritual dimension referring to often esoteric ideas of space, time, death and the divine (177). However, growing emphasis on rationality and function and the rejection classical language on the back of the Industrial Revolution marginalised concepts like the Sublime (177). The uncanny, grotesque and Sublime were eventually buried by Modernism (Nesbitt, 180).

Martin Heidegger and Gaston Bachelard laid the ground

work for what Nesbitt calls the “rebirth” of the Sublime in the mid-20th century (Nesbitt, 177). At the beginning of the 21st century, the humanities and social sciences saw a shift in theory named the ‘Affective Turn’ that sought to overcome the over-rationalised understanding of human action (Fox, 2). Suddenly emotions were no longer just a response to events but they were also seen to shape the goals of our actions, in the form of deep affective attachments (Fox, 1). Phenomenology placed the human sensory and spiritual apprehension of phenomena in the foreground once more (Nesbitt, 177).

This design research, in seeking intensification of the Sublime, delves into the visceral and spiritual ideas of Burke’s Sublime and its effect on the ‘experiencer’ of a work of architecture. The study of the Sublime in this thesis focuses primarily on the art of Romanticism but there is also historical precedence of the Sublime in architecture such as Etienne-Louis Boullée’s Cenotaph for Newton (Fig. 068), a perfect embodiment of the use of scale, monumentality and light that defines the Sublime (Nesbitt, 178). According to Kant, the Sublime experience is the failure of the imagination’s capacity to grasp the infinity of the object (qtd. by Bourque, 167) but architecture gives a human measure to these infinite ideas and limitless spaces (Pallasmaa, 17), proving to be a medium through which the Sublime can be conveyed.

The writing of Burke and the work of Romanticism and architects such as Boullée describe visual and physical manifestations of the Sublime and show strategies of how presenting the unrepresentable, the indeterminate, or the invisible can be attempted (Lyotard as qtd. by Nesbitt, 179).

068 **Boullée’s Cenotaph for Newton**▶

IMAGE REDACTED

Fig. 068 – Boullée's Cenotaph for Newton
Boullée, Étienne-Louis. "Cenotaph for Newton." The Charnel House, 1795, [thecharnelhouse.org/
tag/etienne-louis-boullée/](http://thecharnelhouse.org/tag/etienne-louis-boullée/)

IMAGE REDACTED

Fig. 068 – Boullée's Cenotaph for Newton
Boullée, Étienne-Louis. "Cenotaph for Newton." The Charnel House, 1795, [thecharnelhouse.org/
tag/etienne-louis-boullée/](http://thecharnelhouse.org/tag/etienne-louis-boullée/)

ARTISTIC PRECEDENCE

The first set of case studies, the artistic precedents, analyse the art of the late-Renaissance, Gothicism and Romanticism art eras to establish visual rules for the Sublime aesthetic, pursued by this research. The painters of Romanticism used the Sublime atmosphere as their subject matter; it was this mood they were trying to convey, as opposed to representing the objects and figures that appeared in their paintings (Pallasmaa, 234). Pallasmaa goes on to say that this has been less common in architecture where using the mood or atmosphere was denounced as 'romantic' with its negative connotations of being shallowly entertaining (234).

Although conveying the Sublime atmosphere may seem abstract, the art of Romanticism, as the visual representation of the Sublime, follows a series of basic principles. Much like the Sublime qualities distilled in the installation chapter, the principles exaggerate scale and contrast (Fig. 069).

For scale, the paintings generally have the horizon in the bottom third giving more power to the sky. Similarly, immense landscapes fill the space below these immense skies.

The forms are jagged and violent and almost entirely vertical, like with the designed Sublime, whether they are mountains or lighthouses.

Contrasts of light and dark add drama to the paintings.

Light sources allude to the reveal of a higher power, to Divinity and to the Infinite.

These case studies with their awe inspiring landscapes are useful tools for creating a Sublime aesthetic. Romanticism as the visual representation of the Sublime brought another set of strategies into the design experimentation.

IMAGE REDACTED

Fig. 012 – Shipwreck
Vernet, Claude-Joseph. "Shipwreck." Wikimedia Commons, 1759, commons.wikimedia.
org/wiki/File:Shipwrec-vernet.jpg

01 LOW HORIZON

02 LANDSCAPE SCALE

03 VERTICAL FORM

04 LIGHT + DARK

05 DIVINE LIGHTING

IMAGES REDACTED

Fig. 070 – The Field of Waterloo
Turner, Joseph M.W. "The Field of Waterloo."
Tate, 1818, <http://www.tate.org.uk/art/artworks/turner-the-field-of-waterloo-no0500>

Fig. 073 – Hadleigh Castle
Constable, John. "Sketch for
Hadleigh Castle." Tate, 1828-9,
<http://www.tate.org.uk/art/artworks/constable-sketch-for-hadleigh-castle-no4810>

Fig. 071 – Among the Sierra Nevada Mountains
Bierstadt, Albert. "Among the Sierra Nevada."
Wikipedia, 1868, en.wikipedia.org/wiki/File:Albert_Bierstadt_-_Among_the_Sierra_Nevada,_California_-_Google_Art_Project.jpg

Fig. 074 – The Last Day of Pompeii
Bryullov, Karl. "The Last Day of
Pompeii." Wikipedia, 1830-33,
en.wikipedia.org/wiki/The_Last_Day_of_Pompeii

Fig. 072 – Stormy Sea with Lighthouse
Blechen, Carl. "Stürmische See mit Leuchtturm."
Wikimedia Commons, 1826, commons.wikimedia.org/wiki/File:Carl_Blechen_-_St%C3%BCrmische_See_mit_Leuchtturm.jpg

Fig. 075 – The Fall of
the Rebel Angels
Giordano, Luca. "The
Fall of the Rebel
Angels." Wikipedia,
1660-65, it.wikipedia.org/wiki/Luca_Giordano#/media/File:Luca_Giordano_-_The_Fall_of_the_Rebel_Angels_-_Google_Art_Project.jpg

Fig. 076 – Wanderer
Above the Sea of
Fog
Friedrich, Caspar
David. "Wanderer
Above the Sea of
Fog." Wikimedia
Commons,
1817, commons.wikimedia.org/wiki/File:Caspar_David_Friedrich_-_Wanderer_above_the_sea_of_fog.jpg

070 The Field of Waterloo

071 Among the Sierra Nevada Mountains

072 Stormy Sea with Lighthouse

073 Hadleigh Castle

074 The Last Day of Pompeii

075 The Fall of the Rebel Angels

076 Wanderer Above the Sea of Fog

Fig. 080 – Fishermen at Sea
Turner, Joseph M.W. "Fishermen at Sea." Tate, 1796, <http://www.tate.org.uk/art/artworks/turner-fishermen-at-sea-to1585>

Fig. 080 – Fishermen at Sea
Turner, Joseph M.W. "Fishermen at Sea." Tate, 1796, <http://www.tate.org.uk/art/artworks/turner-fishermen-at-sea-to1585>

Fig. 081 – Monastery Graveyard in the Snow
Friedrich, Caspar David. "Monastery Graveyard in the Snow." Boston College, 1817-19, http://www.bc.edu/bc_org/avp/cas/his/CoreArt/art/rom_fri_clcem.html

Fig. 081 – Monastery Graveyard in the Snow
Friedrich, Caspar David. "Monastery Graveyard in the Snow." Boston College, 1817-19, http://www.bc.edu/bc_org/avp/cas/his/CoreArt/art/rom_fri_clcem.html

Fig. 079 – Rocky Mountains
Bierstadt, Albert. "Rocky Mountains." The Art Blog, 1870, www.theartblog.org/2016/01/fleisher-ollmanindigo-arts-in-nyc-ppac-in-nola-delarts-great-2016-lineup-sad-noyes-news-excellent-zoe-strauss-steve-weinik-michael-andre-leah-koontz-philly-knight-cities-proposals-plus/

Fig. 012 – Shipwreck
Vernet, Claude-Joseph. "Shipwreck." Wikimedia Commons, 1759, commons.wikimedia.org/wiki/File:Shipwrec-vernet.jpg

077 The Great Day of His Wrath
078 Joshua Commanding the Sun to Stand Still
079 Rocky Mountains

080 Fishermen at Sea
081 Monastery Graveyard in the Snow
082 Shipwreck

MICHAEL HEIZER

Michael Heizer has been a prominent land artist since the 1960's. His work is ambitious and grand in scale, at times using entire landscapes (The Art Story). His work reintroduces Romantic Art and the Sublime and its scale and violent interventions make his work a fitting case study for the contemporary use of the Sublime.

Heizer's large, gravity defying and often violent work invites us to contemplate space, land and our relationship to it and explores themes of the infinite. This infinite or divine power is also portrayed through the impermanence of the work, subjected to the elements as they are and prone to decay (The Art Story).

Heizer's use of negative space is especially pertinent as a precedent for carving into Mt Victoria, as well as being a good case study for tectonic moves and use of the Sublime.

083 Potato Chip▶

084 Levitated Mass▶

085 Double Negative▶

IMAGE REDACTED

Fig. 083 – Potato Chip
Heizer, Michael. "Potato Chip." Autre,
photograph by Eric Minh Swenson,
2015, [autre.love/journal/2015/5/28/
michael-heizer-altars-gagosian-
gallery-in-new-york](http://autre.love/journal/2015/5/28/michael-heizer-altars-gagosian-gallery-in-new-york)

Potato Chip
New York,
2015,
18 ton granite rock in
steel frame,
437cm x 271cm x 233cm

IMAGE REDACTED

Fig. 084 – Levitated Mass
Heizer, Michael. "Levitated Mass."
Vancouver Island School of Art, 2012
, [www.vancouverislandschoolart.com/
imagepages/images/landenv2.jpg](http://www.vancouverislandschoolart.com/imagepages/images/landenv2.jpg)

Levitated Mass
Los Angeles,
2012,
340 ton boulder

IMAGE REDACTED

Fig. 085 – Double Negative
Heizer, Michael. "Double Negative."
LA Weekly, 1969, photograph courtesy
of Triple Aught Foundation, [www.
laweekly.com/arts/michael-heizers-
double-negative-a-journey-to-a-land-
art-landmark-2176032](http://www.laweekly.com/arts/michael-heizers-double-negative-a-journey-to-a-land-art-landmark-2176032)

Double Negative
Nevada,
1970,
15m x 9m x 457m

RICHARD SERRA

Richard Serra's land art sculptural works are further contemporary examples of the Sublime that can inform the tectonic aspects of the Stadium design.

Ferguson writes that the physical and visual weight of Serra's sculptures anchors space and form. They use gravity, mass and volume as integral components. Serra takes on the scale of nature and the city, a Sublime scale, calling attention to the "power and purity of form itself" (9). Serra makes weight both buoyant and massive; his huge steel sculptures absorb light becoming big solid volumes while also becoming almost void-like (Ferguson, 15). These aspects of Richard Serra's work draw from the Sublime and its exaggeration of scale and ideas of power and the infinite.

Serra's methodology is also well-known in the world of sculptural, particularly for his verb list. Central to the tectonics of the Sublime and to Serra's work is action—the verb. For Serra these verbs included: to crease, to fold, to roll, to name just a few (Ferguson, 15). These underpin his gravity and scale-defying work.

The works of these land artists are case studies for the effective contemporary use of the Sublime. They are useful precedents for the physical manifestation of the Sublime and its tectonics that may help to shape forms and volumes in the design experiments in the large scale design chapters.

086 **Bramme für das Ruhrgebiet** ▶

087 **Delineator 1** ▶

088 **Delineator 2** ▶

089 **The Exchange** ▶

IMAGE REDACTED

Fig. 086 – Bramme für das Ruhrgebiet by Richard Serra
McShine, Kynaston, and Lynne Cooke. Richard Serra. Sculpture: Forty Years. "Bramme fuer das Ruhrgebiet". The Museum of Modern Art, New York. 2007. Print. pp. 307.

Bramme für das Ruhrgebiet
Gelsenkirchen,
1998,
Weatherproof steel,
14.5m x 4.2m x 12.7 m

Fig. 087 – Delineator 1 by Richard Serra
McShine, Kynaston, and Lynne Cooke. Richard Serra. Sculpture: Forty Years. "Delineator". The Museum of Modern Art, New York. 2007. Print. pp. 166.

Fig. 088 – Delineator 2 by Richard Serra
McShine, Kynaston, and Lynne Cooke. Richard Serra. Sculpture: Forty Years. "Delineator". The Museum of Modern Art, New York. 2007. Print. pp. 166.

Delineator
Collection the artist,
1974-75,
Hot-rolled steel,
2.5m x 3.1m x 7.9m

IMAGE REDACTED

Fig. 089 – The Exchange by Richard Serra
McShine, Kynaston, and Lynne Cooke. Richard Serra. Sculpture: Forty Years. "The Exchange". The Museum of Modern Art, New York. 2007. Print. pp. 290.

The Exchange
Luxembourg City,
1996,
7 trapezoidal steel plates,
20m x 9m x 6m

LITERARY CONTEXT – THE SUBLIME + STADIA

This thesis uses the writing of Benjamin Flowers and Albert Wimmer as primary sources for architectural and social commentary on Stadia. It also uses the Populous Stadium Design Guide by John and Geraint to frame the design thinking in contemporary Stadia.

Stadia are currently a much-discussed subject, but mostly for their costs and the rate at which they become obsolete rather than from a design stand-point. The bulk of architectural texts on Stadia are concerned with technological or structural conditions; they are understudied by historians and are rarely included in lists of architecturally significant works (Flowers 1177).

In fact, in their Stadium design guide John and Geraint, of the contemporary stadia design-giants Populous, state that “sports stadia are not places for clever architectural games. Tight, disorientating passageways opening into great public spaces to create a sense of spatiality do not work. Clarity is the first priority at every stage” (171). This thesis argues that it this attitude that has led to the problems that the Stadium is facing as a building type.

This thesis seeks to position itself in alignment with literature asserting the Stadium as a typology is undergoing a cultural shift in the world of architecture and seeks to explore this shift with the design research. Rob Sheard

theorises that Stadia are transitioning from the “4th Generation Stadium” to the “5th”. Sheard outlines the generations thus:

1st Generation: Established at the end of the nineteenth century, these Stadia were large, uncomfortable and little more than large ‘receptacles’ for as many spectators as possible.

2nd Generation: These emerged with the spread of television in the 1950’s and the opportunity it offered to follow matches from the comfortable atmosphere of home. To compete, the familiar ‘receptacles’ were fitted with proper toilets, beer stalls and food outlets.

3rd Generation: With the rise of Disneyland, stadia were transformed into theme parks, in which sport made way for family-friendly mass entertainment as the main centre of focus. These now required better security, comfortable seating, roofed stands, lighting, shops and restaurants.

4th Generation: This is the generation that Sheard suggests we are shifting away from: a highly engineered and mediatized type of Stadium, in which the live event, merely acts as a hook upon which to hang everything else that is happening inside, to be broadcast instantaneously via satellite tv all over the world. A place of big business, the Stadium became a

highly segregated space, where private boxes, lounges, corporate and VIP areas are separated from the fan areas.

5th Generation: These new Stadia will draw the arena back into the cities, being accessible on foot (qtd. by Frank et al., 5).

Frank and Steets argue that the next generation of Stadia will attain the status of museums in the 1980s – “an absolute must for every self-respecting city” (5). The Stadium – like the other global architectural form, the skyscraper – now captures the imaginations of political leaders and the public in ways other typologies do not (Flowers, 117). Due to the large profits generated by modern sport, owners are beginning to look for ‘signature’ buildings (Flowers, 62). Stadia were historically the domain of engineering firms, reflecting the idea that Stadia were problems to be solved rather than outlets for poetic expression. However, Stadia are now moving into the “higher canon” of architecture, the cultural realm taking on the same design intentionality as cathedrals and museums where one would expect to have an architect designing them (Flowers, 65).

Stadia shifting into being thought of as ‘architectural’ should not be surprising given their scale, ritual use and the emotional range attached to them (Flowers, 65). More often than not, the Stadium is the largest building in a city. Flowers asserts that Stadia may be

displacing cathedrals as the “most powerful contemporary expression of the Sublime in urban architecture”, the experience of space being at once overwhelming, potentially terrifying and simultaneously pleasing (18).

However, the 21st century Stadium is becoming a multi-purpose or cross-programmable permanently running business which Wimmer says “erodes the cultic atmosphere of anticipation” (141): the comfort and gloss have taken the special edge off (Morris, 141). Ourousoff goes further, saying that most new Stadia are “hard to love, they reflect the values of late capitalism – stuffed with corporate boxes and concession stands” (qtd. by Flowers, 109). Frank and Steets lament the loss of the traditional football atmosphere found in contemporary Stadia. The apparently weightless glass roofs and the glass facades, the high admission prices, the control and security measures, the desire for comfort and the enticement of the wealthy fans has turned the contemporary Stadium into brand architecture, representative of global and geographically unidentifiable capital flows that shares a strong resemblance to many other Stadia (9). Populous’ London Olympic Stadium is an example of this attitude of engineered business-based Stadia. The final 85,000-seater building was chosen over the intended ambitious Stadium by Foreign Office Architects, and was labelled ‘painfully pragmatic’ (Flowers, 48). Zaha Hadid’s London Aquatic Centre, an ambitious piece of architecture this thesis uses as a case

study, became the architectural star of the 2012 Olympic Games.

The design research in this thesis seeks to fight this blandness, harnessing the Sublime in the architecture so that the meaningful experience of the Stadia is not dependent on the event, that the architecture retains its profoundness post-event. Wimmer writes of the Stadium being two completely different architectural forms, one in the state of fullness and one in the state of emptiness (134). Awareness of construction related energy consumption as well as tightening public budgets has driven the rise of legacy planning for Stadia (Flowers, 46). Stadia are now being considered as an essential part of the urban fabric, a major urban planning project that shapes our cities more than almost any other building type (John et al., 21). The impact of the Stadium on match-day extends beyond the seating bowl - it affects the city's transportation, accommodation, entertainment and hospitality sectors (Wimmer, 138). The Post-Event Stadium also has effects ranging wider

than its footprint, most notably its strong visual presence, but this new-found integration could offer further opportunities. This new urban planning trend in Stadia aligns with the design research of this theses into the post-event with the aim of transforming Stadia to break the closed and bounded universe of the sport arena (Schaeffer et al., 234) so the "surrounding neighbourhood buzzes... whether it's game day or not" (Flowers, 109).

The growing social importance of Stadia is beginning to attract architects and architectural outcomes to a sphere once dominated by engineers and engineered solutions (Flowers, 58). This provides opportunities to design with the Sublime, imbuing Stadia with the aura, or 'authority of presence, that Renshaw says is sorely lacking in contemporary cities (4). So, whether in the context of the Sublime, or the recent interest in Phenomenology, it asks the architect to create the same drama in a Stadium, regardless of the event, that a composer creates with a film score (Pallasmaa, 130).

GOING TO THE MATCH

This painting by T.S Lowry (Fig. 090) shows Burnden Park, a typical early English, inner-city, working-class neighbourhood Stadium. These stadia were often wedged between tightly packed terraced housing. The steep standing

terraces enabled massive crowds to pack into the Stadium which appeared deceptively small from the outside. Predating cars, this ritual of going to the match activated the whole neighbourhood (Edensor et al., 147).

090 **Going To The Match**▶

IMAGE REDACTED

Fig. 090 – Going to the Match

Lowry, L.S. "Going to the Match." Art UK, 1928, <https://artuk.org/discover/artworks/going-to-the-match-162423>

STADIA

To find architectural case studies for the final design project, a broad spectrum of recently built, currently iconic stadia was grouped into categories using the Sublime as a metric (Fig. 091). The categories were based on the Sublime qualities established earlier in this thesis; being large-scale, using light and/or darkness as a design feature, or having a unique or interesting physical form. Some Stadia fulfilled criteria for two categories and the two stadia chosen for analysis – London Aquatic Centre and Pancho Arena – had aspects of all three.

An overlay of the categories shows the groupings and relationships of these contemporary stadia (Fig. 092-093).

- 091 Categorisation of contemporary stadia›
- 092 Diagram of sublime categories›
- 093 Contemporary stadia analysis››

LIGHT

-Complex La Maladiere,
Switzerland
Geninasca Delefortrie Architectes
-Palace of Water Sports Kazan,
Russia
SPEECH Architectural Office
-Allianz Arena, Germany
Herzog & De Meuron

FORM

-Bergisel Ski Jump, Austria
Zaha Hadid Architects
-Cluj Arena, Romania
Dico Si Tiganas
-Warsaw National Stadium, Poland
gmp Architekten

SCALE

-Wembley National Stadium, UK
Foster + Partners
-Camp Nou, Spain
Francesc Mitjans
-Maracana, Brazil
*W. Ramos, R. Galvão, M. Feldman,
O. Valdetaro, P. Bastos, O. Azevedo,
A. Carneiro*
-Colosseum, Italy
Vespasian

FORM + SCALE

-Aviva Stadium, Ireland
Populous and Scott Tallon Walker
-Braga Municipal Stadium,
Portugal
Eduardo Souto de Moura
-Moses Mabhida Stadium, South
Africa
Gerhard le Roux
-Insular Athletics Stadium, Spain
AMP Arquitectos
-San Siro, Italy
Alberto Cugini & Ulisse Stacchini

LIGHT + FORM

-Arena Zagreb, Croatia
UPI-2M
-Beijing National Stadium, China
Herzog & de Meuron
-Pancho Arena, Hungary
Tamas Dobrosi

SCALE + LIGHT

-London Aquatic Centre, UK
Zaha Hadid Architects
-Santiago Bernabeu, Spain
M. M. Monasterio, L. A. Soler, A. Lamela

LIGHT

LIGHT + FORM

FORM

SCALE + FORM

SCALE + LIGHT

SCALE, LIGHT, FORM

SCALE

LIGHT

Jantscher, Thomas. Archdaily, 2010, www.archdaily.com/60746/multifunctional-complex-la-maladiere-geninasca-delefortrie-architectes/50090df128ba0d27a7001546-multifunctional-complex-la-maladiere-geninasca-delefortrie-architectes-photo

Complex La Maladiere, Switzerland

Konjikusic, Davor. Archdaily, 2010, www.archdaily.com/80556/arena-zagreb-upi-2m/5012a83e28ba0d147d000205-arena-zagreb-upi-2m-photo

Arena Zagreb, Croatia

LIGHT + FORM

Ivanov, Ilya. Archdaily, 2012, www.archdaily.com/409119/palace-of-water-sports-in-kazan-speech-tchoban-and-kuznetsov/51f85e30e8e44e625700017f-palace-of-water-sports-in-kazan-speech-tchoban-and-kuznetsov-photo

Palace of Water Sports Kazan, Russia

Wikipedia, 2011, en.wikipedia.org/wiki/Beijing_National_Stadium#/media/File:Beijing_national_stadium.jpg

Beijing National Stadium, China

Framepool, 2015, footage.framepool.com/en/shot/617599333-froettmaninger-berg-fc-bayern-munich-clump-of-trees-herzog-&-de-meuron

Allianz Arena, Germany

Takács, József. "Pancho Arena." Archdaily, 2014, www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2c88fc07a80c38400051b-pancho-arena-tamas-dobrosi-doparum-architects-photo

Pancho Arena, Hungary

SCALE + LIGHT

PR Cisco. JP 4 Sport, 2013, www.jp4sport.biz/wp-content/uploads/2013/04/Real-Madrid-Estadio-Santiago-Bernab%C3%A9u-q-cisco.jpg

Santiago Bernabeu, Spain

Binet, Hélène. "London Aquatic Centre." Archdaily, Hufton + Crow, 2011, <https://www.archdaily.com/161116/london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects/501555be28ba0d02f0000dfe-london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects-photo>

London Aquatic Centre, UK

SCALE, LIGHT, FORM

SCALE

Young, Nigel. Archdaily, 2017, www.archdaily.com/867281/wembley-national-stadium-foster-plus-partners/58c9b8a1e58ecee2f6000068-wembley-national-stadium-foster-plus-partners-photo

Wembley National Stadium, UK

Camp Nou, 2018, campnou.nl/wp-content/uploads/2013/05/achtergrond2.jpg

Camp Nou, Spain

Vino e cibo, 2013, www.vinoecibo.it/it/mete-e-viaggi/europa/l-autunno-oltre-le-alpi/

Bergisel Ski Jump, Austria

Dico si Tiganas, Archdaily, 2012, www.archdaily.com/210638/cluj-arena-dico-si-tiganas/50177a2128ba0d225a000acf-cluj-arena-dico-si-tiganas-image

Cluj Arena, Romania

Bredt, Marcus. Archdaily, 2012, www.archdaily.com/234031/warsaw-national-stadium-gmp-architekten?ad_medium=gallery

Warsaw National Stadium, Poland

CLADnews, 2015, www.cladglobal.com/news.cfm?codeid=317821

Moses Mabhida Stadium, South Africa

Author's own

Colosseum, Italy

Archdaily, 2008, www.archdaily.com/2822/insular-athletics-stadium-amp-arquitectos-sl/500eda3928ba0d0cc7000980-insular-athletics-stadium-amp-arquitectos-sl-image

Insular Atheltics Stadium, Spain

La Taberna, 2016, latabernaonline.com/wp-content/uploads/2016/11/braga02-855x571.jpg

Braga Municipal Stadium, Portugal

Archdaily, 2010, www.archdaily.com/153987/the-emirates-glass-leaf-awards-2011/aviva-stadium-scott-tallon-walker

Aviva Stadium, Ireland

Futbol Primera, 2014, www.futbolprimera.es/files/images/San-Siro-Maldito1.jpg

San Siro, Italy

Getty Images. Independent, 2014, www.independent.co.uk/sport/football/international/world-cup-2014-christ-the-redeemer-statue-lit-up-in-the-colours-of-argentina-and-germany-after-9602728.html

Maracana, Brazil

LONDON AQUATIC CENTRE

Zaha Hadid's London Aquatic Centre is the paragon of the contemporary Stadium designed beyond the utilitarian whilst also being designed for the post-event.

The building, the form of which is inspired by that of a diving swimmer, was built for the 2012 London Olympics with a capacity of 17,500 seats. After the Olympics - or Post-event - the two temporary stands were removed to bring the Aquatic Centre to its legacy form of a community swimming centre with 2,500 seats (Dyckhoff et al, 81). The swimming facility is spectacular, especially given its downsized and humble new programme, whilst retaining its immense Olympic-scale sublimity. It was in this legacy form that I had the pleasure of seeing the London Aquatic Centre. The Aquatic Centre's phenomenal scale and formal qualities are most visible through the spectacular roof and concrete forms.

The roof's most Sublime quality is its scale. Spanning 90 metres across and 160 metres

long, the 3000 tonne roof is supported in only three places, creating an immense columnless interior space (Dyckhoff et al, 80). Other Sublime qualities in this case study can be found in the striking forms of the diving platforms. Although more organic and curved than typical Sublime forms, the concrete platforms and finishes in this building are nevertheless visually striking.

Hadid's London Aquatic Centre as a case study is an example of the designer intending to make a statement, with Hadid herself saying "it is meant to be dramatic, meant to be a landmark, a pavilion in the park, and a very exciting building to swim in", all of which can be seen as Sublime qualities.

This building is also distinguished by its insistence that the form and design intention would dictate the engineering, rather than be dictated by it, a trait increasingly rare in many contemporary stadia which will be covered in the Literary Context chapter (Dyckhoff et al, 88).

IMAGE REDACTED

Binet, Hélène. "London Aquatic Centre." Archdaily, Hufton + Crow, 2011, <https://www.archdaily.com/161116/london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects/501555be28ba0d02f0000dfe-london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects-photo>

IMAGE REDACTED

Binet, Hélène. "London Aquatic Centre." Archdaily, Hufton + Crow, 2011, <https://www.archdaily.com/161116/london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects/5015557628ba0d02f0000df1-london-aquatics-centre-for-2012-summer-olympics-zaha-hadid-architects-photo>

IMAGE REDACTED

Hufton + Crow, "London Aquatic Centre." Architizer, 2014, <https://architizer.com/projects/london-aquatics-centre/media/1646127/>

SUBLIME ANALYSIS OF AQUATIC CENTRE

The following pages analyse the London Aquatic Centre in both its Olympic and Legacy modes (Fig. 097) against the Sublime criteria of scale – the immense interior space (Fig. 098-101), hide and reveal – how narrow enclosed entrances open up to reveal the interior (Fig. 102-104), and form – how the ceiling and ground plane perform as Sublime uninterrupted masses (Fig. 106-107).

- 097 LAC Olympic and Legacy modes ›
- 098 Scale: Olympic mode - section A-A ››
- 099 Scale: Olympic mode - plan ››
- 100 Scale: Legacy mode - section A-A ›››
- 101 Scale: Legacy mode - plan ›››

Olympic Mode
(event Sublime)

Legacy Mode
(post-event Sublime)

core functions

scale (built)

scale (perceived)

- 01 Immensity of roof span
- 02 Immensity of vertical space
- 03 Immensity of viewshafts

Olympic Mode - *section A-A*

- 01 Immense structurally uninterrupted span stand-to-stand
- 02 Immense structurally uninterrupted span end-to-end

Olympic Mode - *plan*

- 01 Immensity of roof span
- 02 Immensity of vertical space
- 03 Immensity of viewshafts

Legacy Mode - *section A-A*

- 01 Immense structurally uninterrupted span stand-to-stand
- 02 Immense structurally uninterrupted span end-to-end

Legacy Mode - *plan*

- 01 Visually and acoustically enclosed entrance
- 02 Reveals to visually and acoustically open interior

Olympic Mode - *plan*

- 01 Visually and acoustically enclosed entrance
- 02 Reveals to visually and acoustically open interior

- 01 Visually and acoustically enclosed entrance
- 02 Reveals to visually and acoustically open interior

Legacy Mode - *plan*

Section B-B

LONDON AQUATIC CENTRE FORM

Much like Richard Serra's Delineator, Hadid achieves the Sublime by hanging a seemingly impossible mass in the air evoking ideas of powerful forces of weight and gravity. The upward striving of the diving platforms play the same role as the lighthouses and cliffs of paintings of Romanticism to achieve Sublime verticality, accentuating the vertical volume held between the solid masses of the ground and ceiling.

The London Aquatic Centre is a crucial case study for its ambition, scale, form but also its successful legacy format.

- ◀◀102 Hide + reveal: Olympic mode - plan
- ◀103 Hide + reveal: Legacy mode - plan
- ◀104 Hide + reveal: section B-B
- 105 Form: Diving platforms▶
- 106-107 Form: Analysis diagrams▶

IMAGE REDACTED

Hufton + Crow. "London Aquatic Centre Diving Platforms." Archdaily, 2012, www.archdaily.com.br/br/01-36372/centro-aquatico-dos-jogos-olimpicos-de-londres-2012-zaha-hadid-architects/hufton-crow-london-aquatics-centre_zaha-hadid-architects_1313616519-zh-aquatic-008/

PANCHO ARENA

Pancho Arena in Felscut, Hungary is chosen as a case study for its dynamic organic form that unashamedly shuns the contemporary trends in Stadium design.

Designed by Tomas Dobrosi, Pancho Arena is marvel of wood lattice roof structures that sprout from pillars of reinforced concrete. Based on the principles of Hungarian organic architecture, the lattice roof is spread out over the tribunes "like the canopy of the tree line around a clearing" (Wimmer, M., 184). The high quality, organic form and dynamism of the interior is highly unusual for any Stadium and totally unexpected for a Stadium that has only 3,800 seats and serves a village of only 1,700 people (Flowers, 69).

Despite eschewing the lightness and brightness, the modern steel and glass aesthetics of contemporary stadia for organic wooden structure and a dark cave-like interior, Pancho Arena achieves the grandeur of a Stadium twenty times its size, a truly Sublime characteristic.

Its size, no bigger than it needs to be but perfectly tailored for purpose, achieves immediate post-event success. The usefulness of Pancho Arena as case study is in the way it is programmatically very modest but is entirely unrestrained in its design intention, particularly in regard to form.

108-111 Pancho Arena ▶

112 Scale: Pancho Arena plan ▶▶

113 Scale: Pancho Arena section ▶▶

114 Hide + reveal: Pancho Arena plan ▶▶▶

115 Hide + reveal: Pancho Arena section ▶▶▶

IMAGE REDACTED

Dénes, György. "Pancho Arena." Archdaily, 2014, www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2ca8ec07a80c38400051d-pancho-arena-tamas-dobrosi-doparum-architects-photo

IMAGE REDACTED

Takács, József. "Pancho Arena." Archdaily, 2014, www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2c88fc07a80c38400051b-pancho-arena-tamas-dobrosi-doparum-architects-photo

IMAGE REDACTED

Döme Jr., László.
"Pancho Arena."
Archdaily, 2014,
www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2c963c07a80096200043e-pancho-arena-tamas-dobrosi-doparum-architects-photo

IMAGE REDACTED

Dénes, György. "Pancho Arena." Archdaily, 2014, www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2c76bc07a80388e000463-pancho-arena-tamas-dobrosi-doparum-architects-photo

01 Size of contemporary stadia with sublime features
 02 Pancho Arena
 03 Playing surface

Pancho Arena - *plan*

01 Size of contemporary stadia with sublime features
 02 Pancho Arena
 03 Playing surface

Pancho Arena - *section A-A*

01 Enclosed cave-like concourse
02 Reveal to open interior

Pancho Arena - *plan*

01 Enclosed cave-like concourse
02 Reveal to open interior

Pancho Arena - *section A-A*

IMAGE REDACTED

Dobrosi, Tamás. "Pancho Arena Cross Section." Archdaily,
2014, www.archdaily.com/538826/pancho-arena-tamas-dobrosi-doparum-architects/53f2cae5c07a800962000440-pancho-arena-tamas-dobrosi-doparum-architects-cross-section

PANCHO ARENA REPRESENTATION

The representation of the Pancho Arena as shown in the above section (Fig. 116) is even verging on the art of Romanticism, strong light and dark contrasts, exaggerations in landscapes with the size of the trees and the overall organic form. The arena's rural setting and its relationship to the landscape around it are also well-thought through; a monotonous façade focuses the drama inwards (Wimmer, M., 184).

This may be an important aspect to consider for the large-scale design phase dealing with the landscape of Mt Victoria.

Taking Pancho Arena as a case study for the large-scale design phase, the aspects of modest scale, fit for purpose programming, unashamedly dynamic form and the creation of a dramatic aesthetic are all taken forward.

05

LARGE SCALE
SITE ANALYSIS

- ◀ 117 Mt. Victoria seen from city
- 118 Mt. Victoria broad context ▲
- 119 Mt. Victoria focused context ▶

SITE ANALYSIS

The site analysis chapter aims to set the foundation for the large-scale design project by integrating an understanding of the physical, social, geographical, cultural opportunities and limitations of the site: Mount Victoria, Wellington. The analysis explores observations at a wider city scale of 1:15000 (Fig. 118) or

broad context and then a more focused scale of 1:4000 (Fig. 119) for the immediate context. Initial un-scaled design tests begin to explore the formal potential of the site, followed by studies into the programmatic requirements which starts establishing a framework for the final large-scale design.

MT VICTORIA

The site selection of Mount Victoria for the large-scale design, was a response to the critical reflection of the mid-scale design that was found to be too safe and too sensible. While placing a Stadium on top of a hill is perhaps not revolutionary, cutting into a mountain or cantilevering out from one is unheralded and starts to sit in the realm of the Sublime.

Benjamin Flowers comments that placing a Stadium on a hill is “a way of forming the monumentality that reinforces power” (1181). Elevating the Stadium would give views out to the city of considerable drama while also placing the Stadium in a place of visual prominence for all of Wellington and as far as the Hutt Valley (Fig. 120). Mt Victoria’s proximity and relationship to the city provides a unique exploration into a Stadium’s relationship with its site.

John and Sheard write that stadia were historically “dictated by site, and stadia either occupied the floor of a valley with the spectators using the natural slopes for seating or were built into the shoulder of the hill” (qtd. By Flowers, 7). The mass scale of the city can start to become banal; according to Bourque something different is needed to draw the Sublime (171). Wellington is fortunate in this regard to be already surrounded by hills and mountains of a Sublime magnitude but the Stadium on the hill can draw the Sublime into the city’s built environment.

120 View from Mt. Victoria▶

121 Mt. Victoria site selection▶

INITIAL DESIGN TESTING

Even at this early site analysis stage, design tests were conducted to begin to explore the possibility of an embedded and/or cantilevered Stadium. These explorations allow focused site studies into more specific design possibilities. The sketches in section test the scale of the Stadium, in relationship to the scale of site (Fig. 122-123), whereas the aerial perspectives on the physical model or the photo collages explore the formal qualities of the potential architectural proposition (Fig. 124-127).

122 Sketch tests in section»

123 Sketch tests in section continued»»

124 Sketch tests over site model»»»

125 Sketch tests over site photo»»»

PROGRAMME

Designing a Stadium required a basic understanding of the programmatic requirements of such an arena, and one suitable for Wellington. Research into the sizes and arrangements of sporting fields and courts (Fig. 128) began to set minimum and optimum Stadium parameters to cater for the chosen sports: rectangle sports with potential expansion for track and field events. Wellington currently has no world-class rectangle sport venues. Provision for oval ground sports like cricket, AFL and baseball was considered unnecessary given Wellington's current Stadium stock including the round arenas of Westpac Stadium and the Basin Reserve.

TESTING SCALE

An important task for understanding the site was to place large and small stadia and sports fields onto site to get a realistic understanding of site in plan and section. Westpac Stadium, or alternatively a generic small football Stadium, take on a quality and scale different perhaps to its assumed size when seen at sea level (Fig. 129-130). Rotations of the stadia were also tested to adhere to guidelines on orientation for sunstrike for various sports (Fig. 131-132). Finally, scaling up shows the full magnitude of the programme when a 75,000-seater Stadium footprint is overlaid, along with various sporting field types (Fig. 133-134). It became immediately clear that Stadium planning is a massive undertaking, but that Mt. Victoria does have the required capacity, provided the Stadium can be embedded into the hill.

◀◀126 Sketch tests over site model

◀127 Sketch tests over site photo

128 Sport field sizes▶

Tennis, Volleyball, Basketball

Football
Generic Small Stadium 7,200 pax

Rugby

Athletics

Cricket
Westpac Stadium 35,000 pax

Baseball

129 Mt Victoria scale test:
Westpac Stadium-34,500 pax-

130 Mt Victoria scale test:
Small stadium-7,500 pax-

131 Mt Victoria scale test rotated:
Westpac Stadium-34,500 pax-

132 Mt Victoria scale test rotated:
Small stadium-7,500 pax-

35,000 pax Westpac Stadium

7,200 pax Small Football Stadium

133 Mt Victoria scale test: Westpac & small stadia overlaid

75,000+ pax stadium footprint

Athletics

Baseball / Concert

Football / Rugby

134 Mt Victoria scale test: 75,000 stadium including seating

MULTI-PURPOSE USE

Many close comparisons can be drawn between stadia and churches, but Flowers states one particular example in regards to their frequency of use in that a match (or mass) is the exception rather than the norm (20). Contemporary Stadium projects are beginning to explore intensifying Stadium use. One method of achieving this is creating multi-purpose or flexible stadia that can cater for multiple sports, quickly shifting between configurations. For this site analysis, sizing and configurations for rectangle sports, baseball and track and field were explored (Fig. 135). Another design trend is to create flexibility in the seating, to allow for more in the case of big events or to downsize arenas to create cosiness for smaller events. This expansion and contraction aspect was explored in the design chapters later on.

135 Possibilities for expansion for track
and field or baseball configurations▶

136 Mt Victoria Site 1:4000 @ A4▶▶

TE PAPA

45 degrees
North South
axis

Mt Victoria summit
200m

section
0 degrees
North South axis

section
15 degrees

section
45 degrees

section
90 degrees

MT. VICTORIA
WELLINGTON
Site

ORIENTAL BAY

15 degrees
North South
axis

0 degrees
North South
axis

90 degrees
North South
axis

site

MT. VICTORIA
WELLINGTON
Views

views to and from
the Hutt Valley

views to and from
the motorway,
Ngauranga

views to and from
the CBD, Thorndon

views to and from
the CBD, Kelburn,
Aro Valley

views to and from
Newtown

site

90 degrees

45 degrees

15 degrees

0 degrees
North-South axis

Stage View Out (to city) / Outside View In (to stage)

Audience View Out (to city) / Outside View In (to audience)

Sublime views to site

0

15

45

90

Sublime views from site

MT. VICTORIA
WELLINGTON
Sublime

01 WESTPAC STADIUM

02 WELLINGTON STATION

03 THE BEEHIVE

04 CENOTAPH

05 PIPITEA CAMPUS

06 QUEENS WHARF

07 ST MARY'S

08 TE PUNI STUDENT HALL

09 TE PAPA MUSEUM

10 ST GERALD'S CHURCH

11 WAR MEMORIAL

12 MUSEUM BUILDING

WELLINGTON'S DESIGNED SUBLIME

An exploration of the broader site context of Wellington, showed some buildings falling within the Sublime criteria. Buildings such as Pipitea Campus, St. Gerald's Catholic Church, Queen's Wharf, the Cenotaph, the National War Memorial and the Museum Building reference neo-classical notions of scale and form which are shifted into the Sublime by dramatic uplighting, giving illusions to great scale and monumentality. All of the buildings display the facets of the Sublime distilled in the Installation chapter: scale - whether actual, relative or perceived, it is usually vertical scaled; form - violent or monumental and usually exaggerated through the use of a plinth; contrasting light and dark or hide and reveal - embellished through dramatic upward lighting- (Fig. 141).

141 Sublime qualities of
Wellington buildings»

142 Mt Victoria 1:4000 @ A4:
Natural context»»

SUBLIME QUALITIES

SCALE

FORM

LIGHT + DARK

HIDE + REVEAL

DESIGNED SUBLIME

VERTICAL SCALE

PLINTH ELEVATION

LIGHT + DARK

UPWARD LIGHTING

TE PAPA

afternoon sun

midday sun

dense forest of
town belt

MT. VICTORIA
WELLINGTON
Natural context

MT. VICTORIA
WELLINGTON
Natural Context

Tree tops, afternoon sun + winds

Seismic forces to overcome

TE PAPA

waterfront
walking

gondola
station 01

MT. VICTORIA
WELLINGTON
Human + Vehicle
Movement

boats and ferries

ORIENTAL BAY

gondola
station 02

gondola station 03

waterfront
walking

nature walks

potential shortcut
through Mt Vic

nature walks

potential shortcut
through Mt Vic

MT. VICTORIA
WELLINGTON
Human + Vehicle
Movement

Freight shipping
and ferries

Railway lines to
Johnsonville, Kapiti,
the Hutt Valley and
the Wairarapa

Freight shipping
and ferries

Small boats

Canoe and
kayaks

Potential
gondola
access

Potential
shortcut
through
mountain

Section 0 degrees

Section 15 degrees

Section 45 degrees

Section 90 degrees

SITE ANALYSIS OVERLAY

The site analysis showed the importance of using to-scale, accurately dimensioned volumes even at broad-brush conceptual design level to grasp the true nature of the task. Using this to underpin the method of the large-scale design, the next task is to begin to integrate the learning from each of the separate investigations. The natural context in particular offers the greatest challenges and opportunities. The steepness of the site allows for a dramatic cantilever and a deeply embedded Stadium. The landscape also creates a chance to engage, maintain, celebrate or destroy the natural bush and forest on the site. This relationship of the building with the nature on site will become a major design driver. Alongside all this is the logistics of circulating people up to, filling and emptying a Stadium on such a steep site, an unprecedented undertaking at this scale. The prominent location of the Stadium places additional pressure on getting the form right, as it is visible from far afield.

Overlaying the mapping of the views, site arrangements, human and vehicular movements and the natural context findings created hotspots (Fig. 148). These hotspots are the points where architectural solutions can take on opportunities or fix problems relating to site. These areas became the focus of design iterations in the following design chapters.

Views

Natural context

Movement

Site context overlay

06

LARGE SCALE
DESIGN

LARGE SCALE DESIGN ONE

AIM

The third design experiment is the final stage of design research, at the large public scale, investigating the intensification of the Sublime in Post-Event Stadia. Using the distilled Sublime qualities found in the design work of the Installation chapter and in the context chapter with the artistic precedents, and combining them with research into Post-Event use found in the Intervention chapter and in the Context chapter with the stadia precedence, this design test is to create a site specific and programmatically constrained Stadium on Mt. Victoria.

METHOD

This investigation began with a broad conceptual approach through sketching and continued with further sketching exploring the technical aspects of Stadia such as sightline calculations to maximise capacity, proximity to the playing surface and the Sublime factors associated with Stadia arrangement. Boolean tests exploring the volume of the Stadium or the space it leaves were conducted with a digital 'broad brush' model. This design phase ended with diagrammatic plans and sections but before any visualisations were made.

$$C = \frac{(DN) + (DR) - R}{D+T}$$

$$\begin{aligned} C+R &= \frac{DN+DR}{D+T} \\ (C+R)(D+T) &= DN+DR \\ CD+CT+RD+RT &= DN+DR \end{aligned}$$

$$ND = (R+C) \times (D+T) - R$$

$$N = \frac{(R+C) \times (D+T) - R}{D}$$

$$N = \frac{(6.5+0.12) \times (18+0.8) - 6.5}{18}$$

$$N = \frac{6.62 \times 18.8 - 6.5}{18}$$

$$N = \frac{(124.456) - 6.5}{18} = 6.9142 - 6.5 = 0.4142$$

$$N = \frac{(R+C) \times (D+T) - R}{D}$$

$$N = \frac{R \cdot C \cdot T}{D} - R$$

$$N = R \cdot C \cdot T - R$$

$$N = R \cdot C \cdot T - R$$

$$R = \frac{N}{C \cdot T - 1}$$

$$N = \frac{(R+C) \cdot (D+T) - R}{D}$$

$$N = \frac{RD+RT+CD+CT}{D} - R$$

$$(N+R) \cdot D = RD+RT+CD+CT$$

$$D(N+R) - RD - RT = CD+CT$$

$$D \cdot R - RD - RT = CD+CT - DN$$

$$RT = DN - CD - CT$$

$$R = \frac{DN - CD - CT}{T}$$

$$R = \frac{DN}{T} - \frac{CD}{T} - \frac{CT}{T}$$

$$R = \frac{DN - CD - CT}{T}$$

$$D = \frac{T(C+R)}{C-N}$$

$$= - \frac{(T \times (C+R))}{(C-N)}$$

$$R = \frac{DN - C(D+T)}{T}$$

$$= \frac{(DN - C(D+T))}{T}$$

$$T = \frac{D(N-C)}{C+R}$$

$$= \frac{(D \times (N-C))}{(C+R)}$$

$$C = \frac{DN - RT}{D+T}$$

$$= \frac{(DN) - (RT)}{(D+T)}$$

$$N = \frac{RC \times DT - R}{D}$$

$$= \frac{(RC) \times (DT) - R}{D}$$

$$D = \text{Eye to focal point}$$

$$R = \text{Vert. eye to focal pt.}$$

$$T = \text{Seating row depth}$$

$$C = \text{C Value}$$

$$N = \text{River height}$$

150 Sightline calculations

153 Orientation sketches

CONSTRAINTS

General Stadium design guidelines were consulted for this thesis. The first attempt at the large-scale implemented the maximum slope of seating or 'rake' of 34 degrees, the seat width allowance of 465mm for seats without armrests, a riser height of 400mm between seats, seating rows of 800mm deep and no more than 40 seats per row. All of these factors were used in combination with C-Value calculations recommended to be between 90 and 120 (Fig. 154).

Variable	Value
N	0.41
R	6.50
D	18.00
C	0.12
T	0.80

Variable	Definition
N	Riser height
R	Eye level to focal point height
D	Eye level to focal point horizontal distance
C	C Value (clearance over spectator's head)
T	Depth of seating row

R	6.50
D	18.00
C	0.12
T	0.80
N	0.41

D	18.00
C	0.12
T	0.80
N	0.41
R	6.50

C	0.12
T	0.80
N	0.41
R	6.50
D	18.00

T	0.80
N	0.41
R	6.50
D	18.00
C	0.12

BOOLEAN TESTS

Boolean tests were used in the process as massing studies. Whereas massing studies give rough ideas of volumes for above-ground buildings, this design instead created voids in the hillside of Mt. Victoria to test the volumes for the Stadium. These tests experimented with rotation of the masses and volumes alongside the depth of the mass into Mt. Victoria varying between a large cantilever jutting out of the hill to an almost entirely interior cave (Fig. 155-159).

01

01 Boolean roof massing

70m clearance over halfway, 2nd base and throwing area.

02

02 Playing surfaces

Athletics & concert West-East axis, baseball NE-SW axis, rectangle sports North-South axis.

03

03 Seating, parking and circulation

51,000 seats @ maximum rake
Concourse underneath and surrounding seating
Parking levels underneath

156 Orientation + rotation tests

157 Boolean tests: dropping down + jutting out

158 Boolean tests: pushing in + lifting up

159 Boolean tests: rotating from N-S to NW-SE

160 Opening up the view diagram

161 Scaling up Sublime vertical voids diagram

162 Massing + boolean tests exploring exterior relationship with greater context

163 First design attempt plans 1:3000 @ A4

Playing surface level (top)

Tier 1 Level (bottom)

VIP Tier level (top right)

Tier 2 Level (bottom right)

1 - Harbour lookout	7 - Stadium seating tribunes
2 - Main rectangular field	8 - Slot for flexible sliding seating to extend venue
3 - Extended venue surface	9 - Internal circulation for back of house
4 - Back of house functions	10 - Back of seating corporate box or food functions
5 - Stadium concourse	11 - Entry / exit
6 - Vertical circulation ramps	

164 First design attempt sections 1:1500 @ A4
Longitudinal section (top),latitudinal section (bottom)

Section A-A'

Section B-B'

- 1 - Gondola
- 2 - Tier 2 concourse
- 3 - Tier 1 concourse
- 4 - Corporate box VIP areas
- 5 - Playing surface concourse
- 6 - Back of house functions

CONCLUSION

This first attempt at the large-scale design ultimately ended as a planning exercise falling short of any architectural design. As a planning exercise, the first attempt successfully integrated all of the constraints of designing a Stadium fit for world class events in relation to the angle or rake of the stands, seat and aisle widths. The design also had a successful provision for transitioning from a rectangular sport Stadium and opening up to a larger concert type venue (Fig. 163).

In a design sense however the first attempt ended with only diagrammatic level representation of 2D plans and sections. The architectural qualities were not explored in this iteration because after the planning phase an assessment of the iteration indicated a lack of the Sublime. This first attempt fell into a similar trap to modern stadia fall into in that it was just a piece of glorified engineering and planning exercise. It had a conceptual core that was based on the constraints – it was engineered - and the Sublime was going to be superficially added on top. The next attempt, having mastered managing constraints, seeks to return to the underlying aim of the thesis by starting the design with a Sublime base and integrating the planning and engineering constraints second to the architectural qualities (Fig. 166).

The aim for design attempt two is to apply the constraints to the Sublime design instead

LARGE SCALE DESIGN TWO

AIM

This revision of the third design experiment at the final stage of design research seeks to improve on the outcomes of the first attempt at the large-scale, overhauling the shortcomings in producing the Sublime qualities desired whilst maintaining the successful site and programmatic constraints.

METHOD

This investigation began with revisiting the broad conceptual approach through 'broad-brush' sketching and continued with further sketching exploring the relationship of the Stadium to the site. Further explorations were made into emphasising the Sublime nature of the Stadium and how it might integrate with the landscape to achieve this. Photo montage visualisations of the final digital model, and of the plans and sections, were produced from this stage in the representative style of the paintings of Romanticism.

167 Revisiting Sublime concepts»

168 Wider context process drawing»»

A major factor in the Sublime imagery of the 18th century is the depiction of the power of the natural world or man’s battle with nature (Burke, 42). This design experiment added this element, connecting the Stadium not only to the wider Wellington natural context (Fig. 168) but also to integrate the immediate natural context of

the hillside and the top of Mt. Victoria (Fig. 170).

Vertical penetrations offer visual connections between the concourse and the lookout on top of the hill and circulation extends to and from all parts of the hill making the Stadium an internal extension of the landscape.

169 Landscape integration diagram

Lightshafts Mt Victoria Lookout Concourse Southern Exit

Northern Pathway Entrance Seating Playing Field

170 Stadium landscape relationships

DEVELOPMENT

The development started with finalising the orientation of the playing surface and how far it cantilevered and how far it embedded into the cave. This gave the length of the cantilevers needed to hold the playing surface. Then the seating configuration was developed to enable the rectangular fields to be surrounded by the lowest seating tier as tight to the field as possible. In situations requiring the expanded surface or the athletics track, the lowest seating tier drops into the floor leaving the second seating tier close in proximity. A third seating tier rounds out the capacity at 49,000 and provides the steepness present in stadia with the highest internal Sublime qualities. As the roof cantilevers finish off the internal form, the internal experience is complete and the mass of the summit of Mt. Victoria is placed on top, giving the Stadium a hooded final exterior form.

◀ 173 Design development

174 Structural form development ▶

STRUCTURE

The structure for this design is of a gargantuan scale (Fig. 175). The structure resists gravity loads as well as resisting lateral loads caused by earthquakes. The Stadium sits on rows of cantilevers that are anchored into the hillside at two points to counter any over-turning. Organically-formed columns (Fig. 174) allow for cavernous internal spans as well as enabling the floating seating tiers and their respective concourses at each level. A curved shear wall separates the interior Stadium cave from the rest of the hillside and the approach corridors. Still larger cantilevers with spans of over 150 metres and structural depths of 27 metres visible from across the harbour arc over the playing surface and tribunes. These cantilevers also hold up the rest of the mass of Mt. Victoria that sits on top.

These structural elements achieve the Sublime with their massive scale dwarfing humans and buildings alike, their striking and visible form with the organic internal columns and tall shear walls or the rows of sharp cantilever and the approach journey to them that starts as small passageways opening up into large chambers.

UNDERGROUND

The design move of inserting the Stadium into the hillside to make it at least partially underground was intended to intensify the Sublime and create a point of difference between this Stadium and the rest of its contemporary typology.

Although potentially unprecedented for Stadia, delving into the earth has been successfully achieved most notably in metro-train stations such as London's Jubilee Line or the Moscow Metro (von Meijenfeldt, 15). Despite their increasingly multi-purpose use, Stadia—whether for indoor or outdoor use - are still predominantly built as above ground buildings on (often) open flat lots due to the large spill zones needed for the egress of tens of thousands of people. Placing a Stadium underground automatically makes a change to the contemporary typology of which this is critical. It also provides a wealth of opportunities to intensify the Sublime.

Many mountains and caves are seen as holy places. Whether elevated or deep in the earth, these places remove people from the external environment, placing them in contact with nature in one of its purest and most powerful forms (von Meijenfeldt, 21). These cave spaces are quintessentially Sublime for their scale, both for the size of the cave or mountain but also for the sheer weight of earth and rock surrounding the viewer. This weight also speaks of power and mass and the interiority has the other elements of the Sublime inherently in these cave spaces. The importance of the light in the depths of the darkness and hiding to reveal are such strong features

176 **Stadium concourse interior concept** ▶

UNDERGROUND

of such mountain-hall spaces making them a rich line of investigation for this design. Von Meijenfeldt's summary of the initial reactions to such spaces - excitement, fear, lust for adventure, search for shelter and a general amazement – further propagate the alignment to the Sublime (167). Even the drama of the divine aspect of the Sublime could be linked back to von Meijenfeldt's comparison of these spaces to Hades or the Underworld (178).

For the designer, von Meijenfeldt goes further to say that the emergence of the experience economy makes an underground interior especially appealing because the 'thematic atmosphere' is easier to create to stage evocative experiences (142). The designer can have full control of the environment: the lighting, colour, sound, form and even air can all be tailored to create, in this instance, a Sublime Stadium.

Manipulating the perceptions and prejudices of an underground space are the hardest part according to von Meijenfeldt. Making passageways legible, exits obvious and providing reference points for orientation can all ease fears but could alternatively be played with to create the Sublime (178).

This design experiment utilised vertical scale in the columns and concrete weight and form to achieve the Sublime by dwarfing those experiencing the mountain-hall space of the interior concourse (Fig. 169).

ORIENTAL BAY

gondola 03

BALAENA BAY

WEKA BAY

- ◀ 178 Stadium greater context plan
- 179 Stadium plans level 00

PLAN 00 - OLYMPIC

- 1 - Harbour lookout
- 1a - Athletics track
- 2 - Main rectangular playing field
- 2a - Sports' field / gig venue
- 3 - Tier 1 seating
- 3a - Tier 1 seating removed

- 4 - Back of house functions
- 5 - Internal back of house circulation
- 6 - Vertical circulation
- 7 - Vertical structure - columns
- 8 - Feature concrete shear wall
- 9 - Entrance hall sub-level

- 1 - City to stadium gondola terminal
- 2 - Tier 1 seating
- 2a - Tier 1 seating removed
- 3 - Commercial kitchen / storage areas
- 4 - Food stalls / shops

- 5 - Vertical circulation
- 6 - Arena entry tunnel splitting through feature columns
- 7 - Feature concrete shear wall
- 8 - Entry to / exit from venue

- 1 - Tier 2 seating
- 2 - Arena entry through columns
- 3 - Tier 2 concourse

- 4 - Vertical circulation
- 5 - Feature concrete shear wall
- 6 - Entrance hall ceiling walkways

1 - Tier 2 seating	4 - Vertical circulation
2 - Arena entry through columns	5 - Feature concrete shear wall
3 - Tier 2 concourse	6 - Entrance hall ceiling walkways

SECTION A-A'

184 Stadium long section B-B'

SECTION B-B'

185 Internal view over harbour

DESIGN OUTCOME

This second attempt at the large-scale design resolved the issues of the first attempt, realising and visualising a Stadium. The Stadium has a Sublime presence, visible from all over Wellington and functions flexibly between a fit for purpose rectangular Stadium and a Olympic sized athletics and concert venue. The Stadium is integrated into the landscape with public access into the Stadium cave available at multiple points, including above the building.

This second attempt achieved all of the same planning and engineering successes as the first attempt but brought through the learning from the Installation, Intervention and Context chapters to create a Sublime finished product.

However, the Stadium fails to explore the Post-Event in-depth beyond the flexibility of the event functions, the Stadium as a landscape

feature with its public access throughout and as a permanent visual presence.

This design experiment explored intensifying the Sublime in a post-event Stadium. The Stadium meets the metrics of the Sublime: it is large in scale both physically and in terms of its visual presence, and the interior concourse dwarves the human; the organic form in its relationship to the hill and its columns speaks of the power of nature, and the jagged form of the cantilevers gives the striking forms as found in the Installation chapter; the interior of the Stadium begins with relatively narrow passageways that open up to lighter and brighter interior concourses, which themselves also open up to the cave-mouth overlooking the harbour in the manner of light/dark and hide/reveal explored earlier in this thesis.

186 Stadium exterior visualisations›

187 View of stadium from across the harbour››

188 View of stadium from the CBD›››

◀◀◀189 Section model

190 Section model without landscape

191 Stadium model interior + seating tribunes
192 Stadium model illuminated▶

09

CONCLUSION

CONCLUSION

The aim of this thesis was to explore the Intensifying of the Sublime in Post-Event Stadia through design experimentation at three scales: a small installation, a medium intervention and large public building.

Literary research defined the Sublime in this design context and gave a framework for the design experimentation. The Installation aided with distilling the qualities of the Sublime to be used as design tools; the qualities of dramatic form, high contrasts in light and darkness, ideas of hiding to exaggerate and reveal drama and the overriding concept of a Sublime scale.

The Intervention tested the Sublime at a human scale, introducing the use of section as a useful design tool for stadia and a way of overcoming the challenges that designing at a scale that might be considered Sublime but that is also suitable, relative to a human scale, for a medium intervention.

Site analysis began the large design phase but assessing the real world context for a large-scale design experimentation. This chapter particularly explored the sizing and programme of actual stadia relative to the landscape and urban contexts and made apparent the need for integration to intensify the Sublime in this setting.

Case studies in the art of Romanticism, the Land Art movement and contemporary stadia provided design strategies for dealing with the aesthetics of the Sublime in a contemporary Stadium building.

The large-scale design experiments showed the difficulties of lifting Stadium design out of the narrow focus on the planning and engineering to bring it into the world of architectural design, a challenge all contemporary designers face in Stadium design. Along with these problems is the challenge of expanding the use of the Stadium to the Post-Event to give the Stadium greater purpose and value as an addition to the city. The second large-scale design rose above the restrictive constraints of an ordinary Stadium to produce moments of the Sublime. As the Stadium becomes a landscape feature, open to the public, the Sublime moments become publicly accessible independent of the main-event giving it a Sublime Post-Event life.

In conclusion, the design experimentation of this thesis showed that different thinking in the design of Stadia is entirely possible. Stadia do not have to be a field and four stands on a flat lot, they can integrate with their surroundings even if that means being embedded into a mountain making them at once more interesting and arguably allowing them to be more Sublime. Successful integration into these surroundings

and legacy planning start enabling Post-Event capacity, and with the architecture imbued with the Sublime these Post-Event Stadia can fight the banality of their contemporary multi-purpose counterparts.

Ultimately, through my research into intensifying the Sublime in Post-Event Stadia, I have found the need for a new typology. The current trend in Stadia is a push towards multi/cross-purpose programming and while this satisfies the Post-Event necessities, the current implementation leaves Stadia stripped of their Sublime qualities; they become another multi-function semi-public urban buildings not dissimilar to a glorified shopping mall perhaps. The Sublime is reduced or lost entirely in an attempt to relieve the Stadium of its white elephant status.

However, a solution might lie in going the other way, adding to the scale of the Stadia, fuelling the fire instead of extinguishing it. Adding to its scale and Sublimity might push the Stadium through the perilous white elephant zone leaving in as a new typology: The City Stadium. So, rather than reducing its Stadium-ness to

make it more useful Post-Event, increasing its Stadium-ness (and the Sublime that entails) to create a City Stadium leaves a Stadium still useful in the Post-Event but not devoid of its Sublime Stadium essence. The essential factor in the success of such a Stadium typology might relate to the defining characteristic of the successful city it might aspire to be: it's use of public spaces.

In relation to the design experiment in this thesis, that would mean open and public access at all times Post-Event, full landscape immersion and integration with Mt. Victoria, the playing surface being a public park (or lake), the seating tribunes becoming biking or skiing slopes, the concourses being shopping and dining avenues, the entry halls being museum or gallery spaces, the surrounding walls backing onto the concourse could even become housing (Fig 187 + 188)

Further design research into this Stadium could delve further into the direction of cross-programming for maximum Post-Event use designed in the aesthetic of the Sublime to intensify the Sublime in Post-Event City Stadia.

◀ 193 Visual presentation pin-up

194 City Stadium Post-Event long section ▶

195 City Stadium Post-Event short section ▶▶

- 1 - Adjustable floor flooded creating a lake
- 2 - Tribunes turned into ski slopes or mountain biking tracks
- 3 - Concourse as shopping and dining esplanade

- 4 - Lower concourse as gallery or museum space
- 5 - Housing embedded into or in-between structure
- 6 - Integrated circulation leading up to the summit of Mt. Victoria
- 7 - Entry hall as large theatre / expo / museum space

- 1 - Housing embedded into or in-between structure
- 2 - Lower concourse as gallery or museum space
- 3 - Concourse as shopping and dining esplanade

- 4 - Tribunes turned into ski slopes or mountain biking tracks
- 5 - Integrated circulation leading up to the summit of Mt. Victoria
- 6 - Adjustable floor flooded creating a lake

10

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4.9 The Thesis

(a) *The format and length of a 120 point thesis will be appropriate to the discipline, including bibliography, footnotes or endnotes and essential appendices, unless specific permission has been granted by the Dean of the Faculty of Graduate Research. The length of a 90-point thesis will be correspondingly shorter.*

(b) *For works of design, creation or performance, the student should include a written commentary on the work which is appropriately balanced with the creative component.*

Please read the statements below before signing:

Except where specific reference is made in the main text of the thesis, this thesis contains no material extracted in whole or in part from a thesis, dissertation or research paper presented by me for another degree or diploma.

No other person's work (published or unpublished) has been used without due acknowledgement in the main text of the thesis.

This thesis has not been submitted for the award of any other degree or diploma in any other tertiary institution.

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