Retreat to *Normality*
Architectural Respite for the Autistic World

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Explanatory Document

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Abstract

This design research project shows the development of a therapeutic retreat environment that caters for both the children who are on the autistic spectrum and their carers, which addresses the current (2018) lack of a satisfactory architectural typology. The Autistic Spectrum Disorder, ASD has been refined and defined by DSM(V) (Diagnostic and Statistical Manual of Mental Disorders Fifth Edition.) Autism is a cognitive developmental disorder affecting the basic social skills expected from an individual. It is estimated that 1 in every 66 people in New Zealand are represented by some or a number of psychological disorders described on the Autistic Spectrum.

In order to achieve this new typology, nine key design aspects are implemented. This facility includes a range of major programmes and their professional offices, e.g. water therapy, music therapy, sensory rooms, additional therapy, accommodation, cafes, withdrawal spaces, meeting rooms and medical rooms which are accompanied by a series of smaller programmes. These programmes allow for a therapeutic retreat that satisfies the problem of a place which would be natural for an ASD individual to occupy as opposed to being in conflict with it.

This project responded to the site context and embodied pertinent research literature resulting in an autistically neutral environment, demonstrating how architecture in response to the immediate site context can achieve a sense of belonging and respite from the fast paced overwhelming demands of the world we live in that is so difficult for autistic spectrum children to accommodate. The result of this research shows an architectural environment which may be able to provide the desired outcome of inclusion and respite within an ASD community.
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Acknowledgements

I would like to take this moment to thank all of those who have been there along my Architectural journey over the past 6 years. It has been a long, eye opening and life changing journey, that has helped me challenge myself to achieve things I never thought possible.

Obviously a very special thanks to my family, I would not have been able to do this without all the love and support of my amazing parents, Michelle and Colin, as well as my sister, Alyssia.

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Huge thanks to my work for being so supportive and allowing time off to complete this journey. Special thanks to Stephen Voyle for taking me on all these years ago and showing me the road of Architecture and keeping that spark ignited over the past nine years.

After all those years of High School, I am proud to say, yes Mr Thompson and Mr Dodds I eat my porridge, I have learnt to draw darker lines and not fear the mistakes but embrace them.

Last but not least, to the most influential man along this journey, Mr Dias, who introduced me to the world of Architecture while studying year 9 Graphics at High School, by showing me I had the potential to be great. You showed me that even though I was no flash artist with a paintbrush, my instruments were the pencil and ruler and with that I could design whatever my heart desired.
Research Question:

Can there be an environment where Autism is seen as “Ordinary/Normal”?
INTRODUCTION

The experience of learning difficulties personally provides the background and impetus for this research project. It attempts to benefit two groups of people, Autistic Spectrum Disorder children (ASD) and their carers. The normal, usual, contemporary human sub/urban environment continually challenges ASD people because it is either too stimulating or not stimulating enough. Focusing on young ASD boys and girls trying to develop coping strategies as they grow up in the care of their parents and other adults, it is hypothesised that the stresses experienced by both groups are relentless and continual. The facilities to provide a respite for both groups are almost non-existent.

The aim and goal here is to define a new typology of an "autistically normal" environment. If such an environment can be designed, the resulting facility will be a "home away from home" that is even more positive than the ordinary autistic home environment can cater for. This typology will attempt to define the facilities and their relationships, character and sensory qualities that will enable these two groups to live and learn in a safe nurturing environment without barriers, labels and inhibitions. The environment, an autistic resort or retreat, is to be autistically "ordinary" or "neutral" and suit the capacities of the whole spectrum of autistic youngsters and also provide a place where parents and other carers might be supported and be therefore unaffected by any negative socially and culturally induced attitudes and behaviour often experienced in the normal world, where any sense of inadequacy on the part of the parents is rendered null and void.

It has been said by many professionals that there may be a little bit of Autism in everyone. Personally, environments can often appear too loud, bright or busy for myself to function in a normal manner, therefore I can only imagine how overwhelming some environments might be for those who have a hypersensitivity (or hyposensitivity) to sensory stimuli.
Project Outline:
This project will attempt to define and design a therapeutic environment that caters for both the children who live on the autistic spectrum and their carers. It will provide a sanctuary allowing them to live in harmony without the everyday stresses of differing perceptions of the world, their own or those of society. The location for the proposed site is in Oratia in the West Auckland region. In terms of programme, this therapeutic environment will also provide a space where carers can meet others who are going through similar experiences and can provide support and understanding that may be missing in their everyday environments. Without an environment like this, it can be a very lonely isolated world where you don’t fully understand what is happening with your child or what can be done about it.

The target audience will be families with younger children but is open to cater for all ages. It will be a great place for early intervention to be supported and supplied. There will be facilities that allow families to stay for extended periods of time and also those just wanting a day stay visit. While being a facility for those who experience ASD and those who care for them, it will be open to the public to inform and teach about ASD and what tools they may need when dealing with them in everyday experiences.

The main aim of this research project is to investigate a therapeutic environment for those with ASD and their carers. The objective is to create a therapeutic environment, through architecture, that can facilitate those with ASD and make it so that it can be seen as normal. By creating these therapeutic environments the objective is to help mitigate severe Autism to a mainstream level where they can be seen more easily as “ordinary”. The hope of this is to also lift the fog around the disorder of ASD, so society can see the truth and understand these individuals better.

The aspirations of this research project is to further explore and understand the advantages of the architectural materiality and use of multi-sensory applications, within the realms of ASD. To investigate the varying ways in which the human body can engage and enhance the multi-sensory experiences. What this project has a specific focus on ASD, it seems clear that there are other psychological disorders such as Alzheimer’s, Neurological deficits, Dyspraxia and Epilepsy to name but a few, that might benefit from similar design approaches. This research project will provide an in-depth knowledge of how adaptive spaces can affect the mood and atmosphere of each individual environment creating a variety of experiences within these spaces. Creating a better appreciation for the use of the human senses, which are normally underutilised in the technological age we are now living in.

Aims and objectives:
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Scope and limitations:
Autism is a broad spectrum comprising of a vast array of deficits and characteristics. This project will be attempting to address architecturally the sensory stimuli that affects those with ASD. Whilst this disorder affects many, from all ages and races, the focus of this project will primarily be on families with children anywhere on the spectrum. Focus will be on both early intervention and a retreat from the continual confrontation between society and the autistic structure. While there will still be facilities that will! cater for all ages of sufferers, the scope of this project will be addressing the younger children. This facility will have the secondary function of a holiday retreat as it is known to be difficult for families with ASD children to take holidays due to many differing factors. This also provides a facility for ASD camps to occur in an environment that is able to fully cater to their needs.

Due to ASD having a lot to do with sensory information, multi sensory architecture is an important aspect to consider. Published opinions of experts, people with ASD as well as research into multi-sensory architecture will be consulted to understand ASD extensively and how multi-sensory architecture can help to provide the ideal therapeutic environment for those with ASD and those caring for them. Even though this paper will be addressing multi-sensory environments which are beneficial for a range of psychological disorders such as Alzheimer’s, Neurological deficits, Dyspraxia and Epilepsy to name but a few, that might benefit from similar design approaches. This research project will provide an in-depth knowledge of how adaptive spaces can affect the mood and atmosphere of each individual environment creating a variety of experiences within these spaces. Creating a better appreciation for the use of the human senses, which are normally underutilised in the technological age we are now living in.
of differing neurological deficits and disorders, these will not be considered in the scope of this research, only those multi-sensory environments that will benefit ASD.

In terms of retreats or therapeutic environments there seem to be only a few spaces that are designed for the ‘neurotypical’, there are very few designed with ASD in mind. Through initial research it became apparent that there is a gap in typology in terms of architecture that is designed for Autism, therefore this design project is attempting to fill this gap and create an environment for both ASD and their carers to relax and receive therapeutic treatment. Currently within the Auckland area there are several schools that cater for Autism but fewer still designed with Autism in mind, there are a handful of other facilities that are able to cater for ASD or have aspects which could be of beneficial gain if they were incorporated into one facility such as the sensory gardens within the Auckland Botanical Gardens and technology that has been amalgamated and deemed under the ASD umbrella. It is also important to contact organisations such as Autism New Zealand, etc. as these organisations are dealing with cases on a daily basis and constantly undergoing research to widen their knowledge base, providing up to date resources and help to families. There are several TED Talks based on ASD which are influential and crucial to this field. The architectural precedents of Peter Zumthor’s Thermal Baths and Bruder Klaus Chapel encapsulate and showcase this understanding of phenomenology where a variety of different sensory garden techniques are featured. Phenomenology, seen to be about the study of multi-sensory experiences, is crucial to further this state of knowledge. Literature precedents; “Questions of Perception: Phenomenology in Architecture” by Steven Holl; Juhani Pallasmaa and Alberto Perez-Gomez, “The Eyes of the Skin: Architecture and the Senses,” and “The Thinking Hand: Existential and Embodied Wisdom in Architecture” both by Juhani Pallasmaa, Adam Sharr’s “Hedgger for Architects” and “Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, 1965-1995.”

In order to understand Autism in its medical terms, it is imperative that the DSM(V) (Diagnostic and Statistical Manual of Mental Disorders Fifth Edition) is consulted. This particular edition reddefines Autism, where previously it was split into four separate disorders whereby it is now amalgamated and deemed under the ASD umbrella. It is also important to contact organisations such as Auckland Botanical Gardens, Autism New Zealand, etc. as these organisations are dealing with cases on a daily basis and constantly undergoing research to widen their knowledge base, providing up to date resources and help to families.

This topic required research into a range of differing fields, therefore the knowledge areas that were investigated were split into two categories of Autism, and architectural theories. The architectural theories that have precedence to this research field are those of biophilia, phenomenology and that of regionalism.

Biophilia, an architectural theory which is theorised to be the principle that is beneficial in improving health and well being to the occupants of a built environment, this is important in terms of providing a therapeutic environment that can benefit both those living on the spectrum and those caring for them. The architectural precedents of Banyan Provincial Hospital by Ancoop and the Apple store by Foster and Partners, embody the principles of biophilia with great relevance to this design project. Literature precedents; “14 Patterns of Biophilic Design: Improving Health & Well-Being in the Built Environment” by William Browning, Catherine Ryan, and Joseph Clancy, and “An Introduction to Architectural Theory 1968 to the Present” by Harry Francis Mallgrave and David Goodman, are vital sources of information in regards to this area.
The design process behind this research project will be of a cyclic nature incorporating iterative aspects and processes of continuous research-for-design and research-by-design. This research will be carried out through literature, discussions with professionals and precedent/case studies based around ASD, multi-sensory environments, phenomenology, materiality and natural elements. The research will ensure that there is a crucial banking of understanding of current knowledge and practices as well as a deeper understanding of possibilities. This project will use a process based on a qualitative response to what is designed based upon conclusions drawn from interpretations of the different research materials, architectural implications and conclusions drawn from experimental data during the process. Research will be undertaken using an investigative approach, this will entail reading a variety of texts, analysing (precedents and site), producing drawings (both by hand and digitally), model making (both by hand and digitally) and documenting the findings. A series of exploration models will be essential in terms of exploring how the design responds to the surrounding context. An array of drawings will be of high importance to show the materiality, adaptability, sensory qualities, scale, proportions and context.

Methods:

Evaluative analysis will be performed throughout the design process by assessing how successful each piece of work is in terms of responding to the research question as well as answering the aims and objectives of the research project. This assessment will be done through comparing multiple concepts and aspects against one another to see what is more successful and why this occurs and how it can be developed for the betterment of the design.

Glossary:

ASD: Autism Spectrum Disorder

Challenging Behaviour: When there is a communication barrier/breakdown causing frustration when feeling overwhelmed which results in physical outbursts.

DSM: Diagnostic and Statistical Manual of Mental Disorders

Hypersensitive/ Hyperreactivity: In terms of sensory information, this is where a person's threshold to sensory stimuli is very low and only a minuscule amount is needed to surpass their capability to manage. This can either affect them in a violent manner or can occupy all of their concentration resulting in distress.

Hyposensitive/ Hyporeactivity: In terms of sensory information, this is where a person's threshold to sensory stimuli is high and require large quantities of stimuli to trigger recognition that something is occurring. Typically children who are constantly physically active are seen as hyposensitive as they move around more in order to get the stimulation required to their threshold.

Joint attention: The ability to share focus or attention to more than one thing at a time.

Neurotypical: A person portraying normal cognitive function.
Proprioception: This is a form of touch stimulation through the use of deep pressure. Proprioceptors are found in joints and muscles, these sense deep touch and pressure and provide information about where we are in space. Giving external proprioceptive input has a calming influence on our nervous system. Some ways you can access these is through weighted blankets, babies being tightly swaddled and wearing weighted vests or clothing.

R&R: Rest and Relaxation

Social Communication: Encompasses the use of linguistics, body language and pragmatics.

Vestibular: Is our bodies balance system, to do with linear and rotary movement, and its effect on the nervous system.

Visual Clutter: Is a space that is over stimulated due to visual crowding.
Autism, also referred to as ASD (Autism Spectrum Disorder), is a cognitive developmental disorder where there are "[...] persistent [deficits] in reciprocal social communication and [...] interaction [as well as displaying] repetitive patterns of behaviour, interest or activities." Temple Grandin, autism spokesperson and person living with ASD, describes Autism as "[...] a very big continuum from very severe (non-verbal) to brilliant scientists/engineers." Autism is referred to as a spectrum disorder due to the manner in which it manifests in each case differently, depending upon the severity, developmental level and chronological age. As of 2013, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) was released with an important change to the Autism (ASD) diagnosis section. In accordance with this edition, those who may have previously fallen under the Asperger’s disorder, childhood disintegrative disorder, etc. now fall under the ASD diagnosis.

Nathan Wallis, Neuroscience Educator, explains how the autistic mind differs from that of a neurotypical person, through very subtle differences which have a profound effect on the brain and its ability to function. "An easy way to understand that, [...] is to say if I was to throw one ball at you, you would probably catch it, if I was to throw five balls at you at once there is every chance that you wouldn’t catch any of them."
There are three main characteristics associated with ASD social communication and interaction deficits. They are; 

1. Deficits in social-emotional reciprocity, nonverbal communicative behaviors, developing, maintaining and understanding relationships.

Social-emotional reciprocity deficits vary from breakdowns in conversation where it is dominantly one-sided, non-sharing of interests, lack of visible emotion and unresponsive to social interactions. Nonverbal communications whereby there is a lack of understanding in regards to reading and using body language and gestures, to poor eye contact and total lack of facial expressions. There is a common breakdown in suitable behaviors in social contexts, minimising the ability to make friends, to the absence of showing interest in amongst their peers.

Social communication and interaction:

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American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. 53-54

Autism is commonly broken down into two main deficits, Tanya Breen, a Consultant Clinical Psychologist explains, “The first is that they have to have significant difficulties with social and emotional communication and behaviour; and the second is that they have problems with restrictive and repetitive behaviours or interests.” Within these two general deficit groups there are a variety and range of traits/features.

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Four main characteristics associated with their restricted, repetitive patterns and behavior deficits are; “stereotyped or repetitive motor movements, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior, highly restricted, fixated interests that are abnormal in intensity or focus, hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment.”

Examples of stereotyped or repetitive motor movements incorporating use of objects, or speech are seen typically through regimented alignment of objects, or the flipping of objects such as coins, counters, etc., this is also noticeable in the constant tapping, flicking and rocking back and forth of the body. There is a strong desire to possess continuity, without any disruption to routines and rituals such as common greetings, eating habits and traveling the same route without diversions. Fixation or preoccupation with one particular point of focus, this could be their favourite toy or building blocks a like, at an early age which could transition into a lifelong specialty. This is often showcased through a sense of tunnel visioned focus and inability to multi-task. Hyper- or hyporeactivity to sensory stimuli is manifested in the excessive outburst when in an environment that is overstimulated, in regards to the sounds, smells, tastes, textures and appearances. This can be triggered through extreme climate change, pain tolerances, and even having to wear clothing and shoes.
How many people have ASD?

Prior to the 1990’s there was no label for Autism, with the introduction of the labelling “[…] and resources for help, more people were able to pick up on the signs […]” therefore were able to diagnose people earlier with ease. It is speculated by many sources that the great minds of the past such as Einstein, Mozart and Tesla would possibly be considered to have ASD” today.

Statistically, New Zealand does not have any data about the occurrence of ASD in its population. If it is similar to the rest of the world, 1 in 100 is the figure but recently Autism New Zealand has suggested it might be as high as 1 in 66. There are two reasons as to why there is such an increase over the years. Either there is just an increase in people developing ASD or “…[it is due to the labelling and further understanding of Autism itself]”

How do you get diagnosed with ASD?

Wendy Chung, geneticist, discusses how two individuals can be diagnosed with the same form of autism yet showcase entirely different characteristics. One that is unable to communicate without the use of pictures to touch and communicate thoughts and feelings, whilst the other has mathematical strategies, having the ability to multiply a series of numbers together in his head with ease, yet is unable to maintain eye contact or even start to converse with other individuals.

The classical diagnosis, is when a child is typically developing at a normal rate until around the age of 1½ from which there is a sudden regression of language and fine motor skills. A child who may have previously been able to communicate using sign language or pointing now is unable to communicate due to profound changes in this ability. More commonly it is a child that as an infant was hard to settle, did not like being held, only calmed down when wrapped tightly or had a pacifier, eye contact while being nurtured was vague and seemed unaware of their surroundings. These are key indicators but not necessarily definitive diagnosis that an individual is on the spectrum. Typically diagnosis are made between the ages of 2 to 3, particularly if it is a severe diagnosis as it is more apparent.

In New Zealand, most children have a series of before school checks that usually occur by the age of four, to screen for any signs of learning or behaviour disorders and are referred to a specialist paediatrician for further assessment. It is at this check that those who are on the severer end of the spectrum are picked up, are still those on the lower end of the spectrum that can fall into the cracks at this early stage. It is never too late to intervene and help those with autism however the younger they are picked up the better, ideally the professionals want to pick these children up by the age of two.

What are the most common features/ characteristics of Autism?

Impaired social communication and interaction is the most common and uniting feature. Ranging from severe disability to the point of being non-verbal to high functioning ASD having really good language and good communication but unable to utilise the subtle aspects of communication such as body language and gestures. A lot of this is about the theory of mind of ASD. Consultant Clinical Psychologist, Tanya Breen explains, “People who have good theory of mind know that everyone has their own unique thoughts and feelings. […] They might not be able to look at someone and think “I think she is looking mad at me.” Autistic people often don’t pick up the signs of danger. “11 Having no emotional interpretation, some have been known to smile and even laugh at inappropriate situations such as court cases and funerals. This is usually caused through anxiety due to being able to judge visual and social cues. More severely affected ASD people show something called joint attention. This is one of the key things in the early diagnosis of young children when a child is engaged in conversation or activity with another person and they can’t use eye contact and reciprocation, as in taking turns when playing games.

ASD’s […] impairs the basic social skills one is expected to have/design”12 whereby those with ASD typically do not understand the social rules or how to have exchanges or how their actions might be impacting on another person. “They can go from feeling normal to feeling hugely anxious, nervous or angry”13

It is common for those with ASD to respond best to visual thinking and language similar to that of animals and art. Animals are sensory based thinkers in terms of sounds, smells and gestures. This is also why pictures are used to communicate thoughts and feelings amongst the non-verbal individuals.
There are a large number of theories around what causes Autism, however, geneticist Wendy Chang explains, “There is probably not one single answer to the cause much like it is a spectrum.” Chang continues by listing out the top four potential causes for ASD, as conception of child from the increase paternal age of the father, the foetus being subjected to certain substances such as alcohol and drugs during the critical stages of brain development, medications used in treatment for epilepsy and bipolar (Valproic acid) during pregnancy, and finally genetically carried.

There are a number of genes responsible for the autistic spectrum. Usually in families there will be a bit of history on each side, however this is not always the case, mutations can occur within the gene starting new within them. The current estimate is that there are between “200-400 different genes that could cause autism.” 15 It doesn’t have to be directly mother and father, it could be carried within either family tree.

It also has to do with the environment before you were born for example fetal alcohol syndrome or fetal drug syndrome is a known contributor to engaging autism. Twins for example can have different degrees of autism. This can be explained through the concordance rates, the rate in which presence of the same trait can be seen in two individuals. In identical twins who share 100% of genetical make up as well as the womb have a rate of 77%, whilst fraternal twins only share 50% of the genetical make up and have a rate of 31%, putting this all in perspective, individual siblings share 50% of genetical make up and have a concordance rate of approximately 20% or less. 14 It is still not understood why males seem to be affected 4 to 1 to females.

One of the key points that has come from the research into ASD would have to be around the fact that humans have the considerable capability of being adaptable whereas in the case of Autism the architecture needs to be capable of adaptability for the relatively greater rigidity of the occupiers. Due to the widely varying nature of the spectrum of autism there is no base line/datum point that is consistent with all cases, everyone is so uniquely different that the architecture must be able to adapt to each individuals needs and desires.

According to Magda Mostafa, an Assistant Professor at the Department of Architectural Engineering at Cairo University, states that “...autistic behavior can be influenced favorably by altering the sensory environment, i.e. the stimulatory input, resulting from the physical architectural surroundings (color, texture, ventilation, sense of closure, orientation, acoustics, etc.)[...].” This statement was further supported by additional resources, revealing architectural design implications and programme requirements.

- Sensory sensitivities - sensory rooms and multi sensory environments important
- Acoustics
- Spatial sequencing – including circulation and way finding
- Escape spaces - Natural Sensory Havens
- Compartmentalisation
- Transitions
- Sensory zoning
- Colours and Textures
- Lighting and Heating
- Safety - staggered exits, car parking
- Sensory gardens
- Music - a very powerful tool - Music therapy
- Riding therapy - farm/animals
- Water - calming and therapeutic - Water therapy
- Responsive and adaptive environments (control - avoid unpredictability)
- Hammock, beanbags, wobbly cushions, rocking chairs
- Visual material for communication
- Speech therapy, singing lessons
- Hypo vs. Hyper
- Sense of closure and orientation
- Over excitement issues
- Play/productions to learn social cues and communications

From all the research carried out during this knowledge gathering section and from the list above, nine key design aspects were derived that encapsulated the most important qualities.
Nine Key Design Aspects:

- Acoustics
- Spatial Sequencing
- Escape Spaces
- Sensory Zoning
- Transition Zones
- Compartmentalisation
- Colour and Textures
- Lighting and Heating
- Safety

Acoustics is the most influential aspect in terms of autistic behaviours. Noisy environments cause distress as they are associated with unpredictable environments. Individuals with ASD typically use headphones and earplugs when out in public and where environments are too loud. Differing activities require various types of acoustic treatments, according to the focus requirements. Environments can be controlled by soundproofing floors, walls, windows and ceilings to minimise background noises, echo and reverberations; these environments include, calming, speech and sound isolating areas. It is important to eliminate the greenhouse effect on occupants by providing areas that would be encountered in society.

With routine being a major characteristic, spatial sequencing plays an important role in capitalising on this feature. Due to the nature of this being a therapeutic retreat, spatial sequencing upon daily routines is not feasible, however still holds importance in terms of the overall flow of functionality (i.e. reception to waiting room to medical rooms). Spatial sequencing also incorporates circulation and navigation. Within these circulation areas it is suggested that escape spaces are incorporated and visible. Ideally dead ends should be avoided, with preference on one way systems where practical and eliminate corridors as this encourages the opportunity to abscond. Colour coding spaces can also help with navigation. Spatial sequencing works best when considered with sensory zoning as well as transition zones.
Escape Spaces:

Escape spaces have an essential contribution to autistic designs. These spaces are used as immediate retreats and respite from overwhelming stimuli within the immediate environment. These can be in various shapes and sizes, from small partitioned areas to larger natural sensory havens. Escape spaces are ideally neutral in sensory stimuli or provide minimal input and are ideally customised for each individual's needs. Natural sensory havens are areas such as gardens, trees, bush, etc., they are spaces which allow for sensory inputs to be balanced naturally.

Compartmentalisation:

These are areas that confine or separate the sensory environments in which an activity is taking place. Compartmentalisation works hand in hand with transitions as it is critical that the transitioning between these differing sensory environments and activities is considered greatly. The treatment of compartmentalisation can be achieved in many different ways, from simply having a change in materiality, for example floor coverings, to different floor levels, to the harshness of a physical wall.

Transitions:

In conjunction with sensory zoning and spatial sequencing, transition zones are extremely important to help recalibrate the mind when moving between the various activity zones and differing stimuli. These transition zones can be dealt with in a variety of ways, anything from having a gradient approach of pure private to pure public realms, to a distinct change accompanied with a neutral sensory environment that indicates a shift to an independent room allowing for sensory recalibration, especially when transitioning from high to low stimuli spaces and vice versa.

Sensory Zoning:

Sensory zoning is the organising of environments in accordance with their sensory qualities rather than the traditional functional zoning. Activities/programmes should be grouped according to their stimuli levels, with transition zones to support the movement between these differing zones. Due to the heightened sense of smell being triggered for some people with ASD, keeping kitchen and bathroom environments contained and away from other activity areas is a good point to consider with ventilation being important in these zones. Visual clutter should be avoided in all zones as much as practical for the spaces.
Although there has been research suggesting what colours are best for ASD sufferers, there is no conclusive evidence indicating a specific palette, however making sure colours are not conflicting or busy as this can form a similar effect to visual clutter. Textures can have various effects on each person, therefore making sure the textures are no confusing or conflicting is important, for example, avoid having multiple contrasting textures overlapping.

Colours and textures:

Fluorescent lighting is a common sensory issue for ASD due to their tendency to flicker. Having natural lighting or lighting where the source is discrete, hidden or indirect is preferred. Underfloor heating or radiant ceiling heating has been recommended by several professionals; this is also linked to safety issues, especially in regards to radiant panels on walls.

Lighting and Heating:

Fluorescent lighting is a common sensory issue for ASD due to their tendency to flicker. Having natural lighting or lighting where the source is discrete, hidden or indirect is preferred. Underfloor heating or radiant ceiling heating has been recommended by several professionals; this is also linked to safety issues, especially in regards to radiant panels on walls.

Safety:

An area that requires considerable attention, especially where those with challenging behaviour are concerned. Areas in particular that require attention are; bathrooms, kitchens, construction, exits and play area. In bathroom environments, level access showers can be useful in regards to providing space especially for those that might lash out, trying to hit the wall or their carers when feeling distressed. Both bathrooms and kitchens share a common safety concern in terms of hot taps (and food in the kitchen area), which needs careful consideration when designing these zones. Some children with ASD lash out in fits of violence when feeling overwhelmed, therefore for their safety and others all glazing should be safety glass and it is recommended that walls are reinforced. Absconding is a very common trait due to their lack of understanding of the risks within their environments. There are several methods to combat this; one being to stagger the exits making it harder for the child to escape unnoticed, another being in the form of a catchment area or courtyard area where the child can decompress in a safe and secure environment. Safe play areas with fencing is advised to eliminate running hazards, ensuring that the fencing is a minimum of 1.8 metres with reversed palings to eliminate climbing opportunities.
Important architectural theoretical discussion appropriate to ASD seem to be phenomenology, regionalism and biophilia.

Phenomenology:
The theory of phenomenology is concerned with multi-sensory experience. It is the study of the phenomena and objects of human perceptions in regards to human senses and what the mind notices. This includes experiences of perception, memory, bodily awareness, linguistic activity, embodied action and emotion. As the technological realms have developed and become prevalent the notion of phenomenology has become an important topic of discussion, being implemented and consciously designed around. Christian Norberg-Schulz, architect and historian, continued the notion of German Philosopher, Martin Heidegger’s texts in regards to the act of dwelling and developed it into what we now know as architectural phenomenology as seen in his text ‘Genius Loci’. This theory of phenomenology has continued to develop and evolve over time. Architects such as Peter Zumthor, Steven Holl and Juhani Pallasmaa are well known today for their use of phenomenology within their designs and in their writings. These texts; Questions of Perception: Phenomenology in Architecture. “ by Steven Holl, Juhani Pallasmaa and Alberto Perez-Gomez, “The Eyes of the Skin: Architecture and the Senses.” and “The Thinking Hand: Existential and Embodied Wisdom in Architecture” both by Juhani Pallasmaa provide crucial understandings as to how we instinctively use our bodies and sense to understand our environments. These books all contain a similar theme of how the human senses are important in the understanding of architectural realms. Pallasmaa’s book ‘Eye of the Skin’ asks the far-reaching age-old question of why has the solitary sense of sight become the predominant sense in architectural design and its culture when there are five senses within the human body. Juhani Pallasmaa believes that the overall deprivation of our built environment is a direct result of the sole reliance on sight and suppression of the remaining sensory realms, also resulting in the diminishing emphasis on the spatial experiences of a built environment and architectures ability to inspire, engage and be life enhancing. In Pallasmaa’s “The Thinking Hand”, he explores the idea of a multi-sensory approach to architecture with a wider view of the role of human embodied presence through existential reactions, experiences and expressions.

The idea of phenomenology is of great importance as the particular function will require an understanding of how the roles of human perceptions and phenomenological experiences play out within the architectural realms. Every person will have a different experience due to their multi-sensory perceptions. With ASD being heavily linked to sensory experience, phenomenology plays a vital role in architectural environments.

Regionalism:

Having a strong sense of place, is the core theory to regionalism. For many years this has been an underlying tone yet has become prevalent as the world has become universal with the sense of trade, travel, etc. whereby connecting to the wider populous of human kind can be done with ease. The global sharing of information and knowledge between various industry professionals, has produced a cookie cutter approach to design with little to no regard for the immediate context. In order to keep the notion of what Christian Norberg-Schultz refers to as the ‘Genius Loci’ – ‘the spirit of place’ alive, it is essential to pay respect via cultural identity, local environments and craftsmanship. Kenneth Frampton isolates what he deems to be the fundamental principle of regionalism as “[…] a commitment to place rather than space, or, in Heideggerian terminology, to the nearness of raum, rather than the distance of spatium.” The common regionalistic approach is seen in the form of taking inspiration from the site and surrounding contexts to conceptualise new architectural forms. Alexander Tzonis and Liane Lefaivre write; “[…] a commitment to “placeness” and a use of regional design elements as a means of confronting a universalist order of architecture that is seen as dominating or oppressive. But it also contains a new idea, one which is essential to critical regionalism that of “place” whose definition goes beyond ethnicity, not to say against the grain of nationalist insularity.” In Peter Zumthor’s text Thinking Architecture, Zumthor explains what his motivations were behind his designs, and his views on how the basic

Architectural Theory: Literature Precedents:
fundamentals of construction are essential to creating an environment that is compelling and has an unmistakable presence and aura. Zumthor sees architecture as needing to have a sensuous connection to life, calling for thinking that goes far beyond form and construction, whilst having a firm foothold in its immediate surroundings bringing the fundamental elements of nature (both constructed and natural) to life.

With the notion of belonging being prevalent to a sense of normality, evoking the theory of regionalism is of great importance. This is an essential element in providing a sanctuary for those who live with ASD and their carers.

**Biophilia:**

Biophilia has been theorised throughout time but has gathered more traction in recent years alongside the movement of sustainability. This theory is about how the use of features such as water, sunlight, fresh air, natural vegetation, views of the natural environment, etc. can improve health and well-being for the occupants. This is important in terms of providing a therapeutic environment that can benefit both those living on the spectrum and those caring for them. *14 Patterns of Biophilic Design: Improving Health & Well-Being in the Built Environment* by William Browning, Catherine Ryan, and Joseph Clancy, and *An Introduction to Architectural Theory 1968 to the Present* by Harry Francis Mallgrave and David Goodman both provide vital information in regards to this area.

*14 Patterns of Biophilic Design: Improving Health & Well-Being in the Built Environment* discusses how as the world’s population continues to urbanise, the qualities of biophilic design become even more important. These qualities include how they can reduce stress, enhance clarity of thought and creativity, improve well-being and accelerate healing. This text also articulates the relationships between nature, human biology and the design of the built environment so that we may experience the human benefits of biophilia in our design applications. A section from within this text titled ‘The Patterns’ moves from the research on biophilic responses into design applications in terms of effective ways to enhance health and well being for both individuals and society. The text, *An Introduction to Architectural Theory 1968 to the Present* further enhances these views by stating that “even brief exposures to natural landscapes have a variety of notable health benefits, among them a reduction of stress, the lowering of blood pressure, improvement in our ability to focus, and, indeed, giving us a brighter outlook on life.” Sensory gardens and natural sensory havens are among the architectural design implications discovered through this research. Biophilia has a direct link to these environments whilst also complimenting several of the nine key design aspects discussed previously. This will be useful in how these adaptive environments are able to transform and uplift the quality of living within the architectural realms, further helping in linking the relationships between nature, human well-being and the built environment.
ARCHITECTURAL PRECEDENTS

Utility Shed:
Herbst Architects - Great Barrier Island

This small compact precedent is related to this project through the following aspects:

• adaptability
• hiding of visual clutter
• escape spaces - in relation to the natural haven surrounding this particular piece.
• compartmentalisation - in terms of moveable walls to redefine spaces
• natural colours and textures from which there are no conflicting or confusing combinations
• diffused, indirect natural lighting, both through the materiality of the enclosure.

Paying particular attention to the aspect of adaptability and how it has been able to successfully transform the areas into different functions by simply opening or closing walls and areas.

[Figure 13: Collection of images of Herbst Architects Utility Shed Design.]
George Clarke’s Projects:

George Clarke’s Home Garden Project and Tree house Project.

Well known English Architect George Clarke hosts a Channel 4 television program called “George Clarke’s Amazing Spaces.” The episodes involve Clarke visiting a range a small spaces whilst at the same time designing and building his own project alongside his trusted engineer, Will Hardie. These two precedents selected are two of his design builds from the series. Both of these precedents are related to this project through the following aspects:

- adaptability - areas being able to change the function, activity requirements and personal desires of the occupants
- hiding of visual clutter
- escape spaces - in relation to the natural haven surrounding these particular pieces.
- safety - in particular the garden project as there is a contained courtyard in the centre which can be observed from the surrounding areas, while in the tree house project the exits are staggered
- natural colours and textures from which there are no conflicting or confusing combinations
- transition zones
- compartmentalisation
- diffused, indirect natural lighting, both through windows as well as a series of skylights.

Paying particular attention to the aspect of adaptability and how it has been successfully achieved for this project. When the spaces are being occupied by the various individuals, the spaces are able to be adapted to fulfill each persons needs and desires.

Figure 14: Floor plan of George Clarke’s Home Garden project (Right)
Figure 15: Photo of George Clarke’s Tree house Project (Below)

Figure 16: Collection of images of George Clarke’s Home Garden project (Left)
Figure 17: Collection of images of George Clarke’s Tree house Project (Right)
Auckland Botanical Gardens:

Manurewa, Auckland

The Auckland Botanical Gardens, is not so much about the architecture but more about the implementation of a series of different zones and environments. The botanical gardens is based more upon the intention of a catalogue or encyclopedic reference instead of based upon aesthetics. This precedent is also related to this project through the following aspects:

- variety of textures in the different zones - sensory zoning and compartmentalisation.
- escape spaces - in relation to the natural haven encapsulating the site
- safety - whilst primarily being a garden there a variety a safety aspects including staggered exits and a series of central locations that are neutral in terms of gardening specific areas
- natural colours and textures from which there are no conflicting or confusing combinations
- transition zones

Paying particular attention to the aspect of how the different areas are able to successfully be transformed into this project’s intention of a sensory garden. Providing a tranquil and serene environment that can naturally balance their sensory inputs while also stimulating them when in specific areas of the garden.
Apple store

Foster + Partners - Macau, China

This particular Apple store is located in Macau, China. This particular piece of architecture was selected due to the following aspects;

- diffused, indirect natural lighting, both through the skin of the building as well as a series of skylights,
- use of planting within the transition zones and throughout the complex
- natural colours and textures from which there are no conflicting or confusing combinations
- transition zones
- compartmentalisation

Paying particular attention to the Biophilic aspects of this design, the outcome has been one of a seemingly tranquil and calm environment. These attributes and the incorporation of several of the noted key design aspects from the literature research, create an ideal precedent on how to make an environment that is able to act as a respite.

Bamyan Provincial Hospital

Arcop - Afghanistan, 2017

This particular piece of architecture was selected due to the following aspects;

- diffused, indirect natural lighting,
- use of planting within the transition zones and throughout the complex
- natural colours and textures from which there are no conflicting or confusing combinations
- transition zones
- compartmentalisation
- escape spaces - in relation to the natural haven encapsulating the site
- safety - staggered exits and a series of courtyard locations that are natural sensory havens

Particular attention is paid to the Biophilic attributes of this design, the outcome has been one of a seemingly tranquil and calm environment. These attributes and the incorporation of several of the noted key design aspects from the literature research, create an ideal precedent on how to make an environment that is able to act as a respite. This precedent also encapsulates the essence of regionalism, providing a sense of belonging.
Thermal Baths

Peter Zumthor - Vals, Switzerland, 1996

The Thermal Baths are located within the hillside of Vals, Switzerland. This particular piece of architecture was selected due to the following aspects:

• atmospheres within are rich in sensory experiences
• diffused, indirect natural lighting, both through openings as well as a series of skylights,
• acoustics - range of distinct effects in various rooms
• compartmentalisation
• transition zones
• safety - in terms of staggered entry
• natural colours and textures from which there are no conflicting or confusing combinations
• connection with immediate context
• water - calming, tranquil qualities

Paying particular attention to the multi-sensory and regionalistic aspects of this design, and how they have been successfully portrayed within the built form. These attributes and the incorporation of several of the noted key design aspects from the literature research, create an ideal precedent on how to make an environment that is able to cater to the varying needs of those with ASD whilst also creating an environment that has a sense of belonging.

Bruder Klaus Chapel

Peter Zumthor - Wachendorf, Germany, 2007

Bruder Klaus Chapel is located in the open fields of a farm, away from other buildings and infrastructure, within the Wachendorf region of Germany. This particular piece of architecture was selected due to the following aspects:

• atmospheres within are rich in sensory experiences
• diffused, indirect natural lighting, both through holes in the walls as well as an opening in the roof,
• transition from exterior to interior,
• acoustics
• natural colours and textures from which there are no conflicting or confusing combinations
• connection with immediate context

Paying particular attention to the regionalistic and multi-sensory aspects of this design, and how they have been successfully portrayed within the built form. These attributes and the incorporation of several of the noted key design aspects from the literature research, create an ideal precedent on how to make an environment that is able to create a calming and tranquil atmosphere, whilst also creating a sense of belonging.
Through composing and analysing a site mapping exercise, it became apparent that currently the main cluster of schooling, medical, information and support systems are located within the central region of Auckland. There were major gaps in the west, east and northern districts. For the residents and patients that are living in these locations it would be a very arduous trip getting this assistance due to the distance and travel involved, battling to get any form of therapy at all. Therefore as a wider strategy, therapeutic environments such as those designed within this document would need to be distributed within these locations to eliminate the stress and difficulties faced with traveling.

For the purpose of this design document, the main focus has been situated in the West Auckland cluster as these contain current schooling facilities which leads to the assumption that there are autistic students and families in close proximity. In terms of the Eastern cluster, schooling facilities would also need to be considered within the design parameters to ensure the therapeutic qualities of these environments can be supported within the education sector.

The distribution of Autism is assumed to be consistent and unbiased to any specific suburb. In analysing the West Auckland region, two sites in particular were identified. One site situated at 150 Forest Hill Road, Henderson and the other 48 Carter Road, Oratia.

To evaluate the catchment area, the sites have been analysed with regards to a maximum 30min driving time. This has meant that the Forest Hill Road site has a catchment border for Hobsonville Point, Waimauku, Piha, Kingsland and Onehunga. The site on Carter Road has a catchment border for Hobsonville Point, Kumeu, Piha, Mount Albert and Onehunga.

The site at 150 Forest Hill Road was the most appealing as it has a large land mass, not heavily contoured, multiple points of entry (street frontage) which is potentially useful in dividing up the spaces. This site offers great exposure to the North as well as being close to built up, populated residential areas, whilst still being in a rural setting close to the Waitakere Ranges and Parks, making it a tranquil environment.

However upon closer experimentation, it became apparent that the Carter Road site provides more potential and is of an optimum size. The Forest Hill Road site has a land mass that is surplus to what is required and being designed for at this time.
Chosen Site:

This proposed site is situated in the heart of Oratia. It is serviced by one road, Carter Road, having one small entry to the site along the south-eastern border and the ability of larger or a series of smaller entries to the north-eastern/eastern border. Carter Road is of a relatively quiet nature in terms of vehicle traffic, however the main road of West Coast Road in which Carter Road joins is an arterial route, meaning it is often busy during peak times.

The site is 89,367 m², with the highest point being at the south eastern flank and the lowest point being located in one of two valleys at the north western corner nearest to Carter Road. There is a 25 metre difference in gradient over the entire section; the second valley contains a pond which is stream fed and is central along the northern border of this site. This is a focal point of the site as the contours all descend to this point.

Being situated amongst the residential area of Oratia, there are no skyline obstructions impeding on views due to the lifestyle block nature of this area. On the adjacent side of Carter Road, there are several residential properties which are surrounded by dense bush within a steep valley.

Immediate Site Context:

Figure 27: Immediate site context analysis - roads and entry

Figure 28: Immediate site context analysis - contours

Figure 29: Immediate site context analysis - focal point and general analysis

Figure 28: Immediate site context analysis - contours
This site is surrounded with natural conditions including the bank of trees adjacent to the site, natural pond, and two streams in close proximity. Sunde Stream, which is nearby on the north-eastern border, and a branch of the Oratia stream, which is the water source feeding the pond on this site. With all of these natural conditions, there is plenty of opportunity to utilise these elements engaging with the immediate context.

Views of the Waitakere Rangers can be seen from the south of the site round to the north east. With the contours to the north of the site continuing to decrease in height, the northern skyline, light and views are unobstructed. The contours to the south of the site continue to increase however are unobstructed in terms of buildings and natural growth therefore views can be uninhibited. The valley to the western border is populated densely with vegetation which provides a wind barrier to the south west, the prevailing wind of Auckland.

Natural and Urban Site Context:
The Oratia town centre is a 5 minute drive away, with local orchards, community amenities and several reserves. West Coast Road has bus stops in close proximity to Carter Road however there are none on Carter Road itself, this is of little interest to this project as the likelihood of public transport being used is rather slim for a number of reasons. The closest and most notable reserve is Parrs Park, which houses several large playing fields (cricket, rugby, soccer and tennis courts), playgrounds and a local swimming school centre.

There are several activity amenities in which ASD individuals would enjoy within the community which are less than 10 minutes drive from this site. These include, Extreme Edge Rock Climbing and Arataki Visitor Centre, one of the many entries into the Waitakere Ranges. This provides the ability to engage with other activities outside of the site as well as further connections to nature. There are also numerous cafes and markets within this small community which are set within the local orchards providing a series of tranquil environments within the community.

With this site being located just outside of the main centre there is the ability to engage with a smaller community instead of being dropped into an overwhelming environment upon leaving the site. This is a good transition from the therapeutic environment back to their everyday lifestyle.
Design Process

Before being able to start designing any aspect of this research project, it was necessary to develop a design programme for the facility to understand what was needed. From the survey conducted it was concluded that the following spaces were needed:

- Car parking
- Foyer/Entry
- Reception/Information areas
- Accommodation
- Medical Rooms
- Meeting Rooms

Programme

- Withdrawal spaces
- Cafe/Restaurant
- Music Therapy
- Water Therapy
- Sensory Gardens
- Outdoor space/Playground
- Professional Offices
- Sensory Rooms/ Quiet and Active Spaces
- Animals
- Shop
- Cinema

Figure 34: Programme Matrix
From this list a series of relationship matrices were made to define what spaces were needing to be related to one another. From these matrices a series of form diagrams were produced to see how these relationships would effect the complex as a whole. It became clear through attempts at form diagrams that the matrices needed to be divided into small sections, being ‘Work’, ‘Live’ and ‘Play’, as the matrix was too complex with all the connections at once. Once these were divided up and completed they were made into further form diagrams. By breaking these down into the small sections it became clear that both the ‘Live’ and ‘Play’ sections were very similar and could be joined together with ease. The ‘Work’ form diagram was a little more complex to join however by splitting them into separate sectors this issue was easily dealt with. Once a combined form diagram was created, it was placed onto the possible sites and manipulated to fit with the site context. Through doing this exercise it became apparent that the main building was that around the ‘Work’ sector of the Professional Offices.

From the form diagrams, quick building masses were formed to the appropriate sizes and placed around the differing sites. This exercise not only helped with creating a guide to refer to when designing the complex as a whole but also helped in discovering which of the possible sites would be most beneficial to the desired outcome.
Initial Site Layout Iterations:

A series of iterations of possible building layouts on the chosen site with regards to initial responses to function were carried out through a series of sketches. All the following designs require further attention to the car parking component of the site. The layout of the main building as well as the support buildings were of a higher importance at this time. These sketches were divided into three areas of focus being Animal sector, Professional Offices (work) sector, and the Accommodation (live) sector.

Design One:
Animal - Professional Offices - Accommodation

- Feels too detached from each other. Engagement between the different functions feels like it would be difficult or have to be forced.
- Good having the accommodation away from the main road thereby reducing the risk of absconding onto a high speed road.
- Lack of engagement with the water/pond area which happens to be the main natural focus point of the site.

![Sketch design iteration of site layout option one](image-url)
**Design Two:**

Accommodation - Animal - Professional Offices

- Professional Offices feel too far away and hard to access - being the main hub of the program, should be easier to access. It is segregated and looking in on itself instead of opening out to the accompanying buildings.
- Accommodation is close to main access - higher absconding risk however natural valley near the main road could be used as a sensory garden and barrier, there is still a risk with the accommodation further away from the valley. This valley appears to only be helpful for the accommodation in direct contact.
- Animals near steeper nature of the site acting as a barrier between the facilities instead of enhancing their connection.

*Figure 40: Sketch design iteration of site layout option two*
Design Three:
Professional Offices - Animal - Accommodation

• Professional Offices better by entry - can utilise natural valley near road as a sensory garden/escape. Better axis use/sense within collection of buildings. Sense of space and courtyard, views/openings.
• Animals near steeper nature of the site acting as a barrier between the facilities instead of enhancing. However more interaction is able to occur between the two functions on either side.
• Accommodation - feels too separated from the Professional Offices which is one of the main reasons for staying at the accommodation/site.

Figure 41: Sketch design iteration of site layout option three
Design Four: Professional Offices - Accommodation - Animal

• Professional Offices and Accommodation have a better connection. The Professional Offices are better by entry - can utilise natural valley near road as a sensory garden/escape. Better axis use/sense within collection of buildings. Sense of space and courtyard, views/openings. Main foyer building may require further design once it is seen in 3D.
• Accommodation has vistas from either side - pond/water to one side and animals to the other. Greater connection to both. Not too far yet not too close to the main access route.
• Animals have their own separate routes as well as occupying the gentler slope of the site.
• Circulation between is restrained and contained. Close proximity to distribution. Working inside the circle instead of two circles being tied together.

Figure 42: Sketch design iteration of site layout option four
Site massing model

Following on from the initial iterations, diagrammatic site layout of design option four was transferred into small plasticine masses which were then places on a contour model to see the implications of this design in relation to the three dimensional context. These option was then photographed and further iterations were formed to create spaces.

Option one was a direct copy of the previous sketch.

Option two was taking the first option and making minor tweaks to building locations in regards to the contours of the site, with particular focus on the centre of the professional buildings area (larger buildings to the right of the image) whilst also creating more centres and relationships within the accommodation area (smaller buildings to the left of image). This was successful in making the centres feel inhabitable however the geometry of the buildings was creating a sense of repose and required further thought.

Option three was further developed in terms of the geometry of the buildings in the professional area. This further enhanced the idea of centres whilst also creating some echoes and defining spaces. This successfully dealt with the issue of repose however there were some concerns with the integration between the central hub and the building encompassing the waters edge.

Option four saw further changes to the buildings geometry encompassing the waters edge and location in regards to the contours, again creating and holding spaces. This iteration was able to integrate the central hub and building encapsulating the pond area whilst also further enhancing the centre of the professional buildings. The portion of the water therapy building that is penetrating the spaces formed near the hub will require further attention when explored at a larger scale.
Once having an iteration that was feeling like it would fit/belong, the design focus shifted from the broader picture of the site as a whole to the elements; this attention was moved to the accommodation module.

Children with ASD require the ability to alter their environments to suit their position on the spectrum, therefore adaptability was a central focus/function and open plan living was considered. Christopher Alexander’s pattern of thick walls was implemented, to service the plumbing areas, to allow for an adaptable main living area, this also kept the areas where smells were most likely to be produced in a contained and ventilated area, fitting in with the key design aspect of sensory zoning as well as compartmentalisation. The thick wall pattern was implemented with the intention of occupying the southern wall of the accommodation module as not to waste or hinder the views, daylighting and natural heating opportunities.

With these areas in mind the basic floor plan area was devised by considering standard areas required for bedrooms, bathrooms, kitchens and living areas. It would seem to be the case that a base area of ten metres by six metres as a starting point. With the understanding that in most cultures having a bathroom next to a kitchen without degrees of separation is culturally insensitive. Therefore

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Option five was dealing with the sense of disconnect within the accommodation area with their centres forming dead end spaces. This involved a subtle change of one accommodation unit being moved however the change was radical in the breathing space it provided as well as the relationship and connection it created with not only the context but the other adjoining units. This option then formed the base concept in which was further developed at a larger scale in a computer program.

Accommodation:

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the bathroom and kitchen are separated by four metres of storage and shelving. In the initial concept the bathroom was too exposed to the main living areas as well as the concept of the module as a whole having nothing in the geometry that was holding it in space, therefore the bathroom was made into one room, instead of three separate zones within the thick wall, with the three zones integrated to keep their functionality.

In terms of sensory issues and diversity among the various people occupying this retreat destination, both a shower and a bath are provided, some people with ASD are hypersensitive to touch (water spraying). With the key aspect of safety in mind the decision to make the bathroom one entity provided further safety in the form of containment and staggered exits. Other safety aspects considered in this area include; level access shower (for if lashing out may occur), reinforced walls, as well as all the glazing used within the accommodation module being safety glass. To avoid the possibility of knocking or playing with the hot water fixtures both the bath and shower can be closed off by bi-folding walls. This has the added bonus of allowing for a larger, more open area if the children should require assistance when using these amenities.

The kitchen area is able to be hidden away behind bi-folding walls, which reduces visual clutter as well as containing the potentially dangerous/unsafe environment. When the bi-fold walls are opened, they define the cooking area and suggest where the dining area could be. With this in mind the table is part of the storage and shelving unit between the kitchen and bathroom and is able to be pulled out and moved to wherever it is required while also letting it be stowed away when not. The seats are portable cubes, these are multifunctional as seating, lounging, bed basing, as well as being able to be moved anywhere within the space for children to create enclosures to form escape spaces or environments to suit their needs as desired. When the table and cube seats are in use or removed from their stowed location, this area is able to be transformed into an escape space as required for the children if something is to make them feel overwhelmed.

Instead of providing a completely blank canvas, windows and openings have been placed to imply workable/inhabitable spaces within the adaptable room.
The materiality of this accommodation was considered in terms of fitting in with the surrounding context as well as containing natural colours and textures, not only to satisfy the key design aspects but also to embody the theories of regionalism, biophilia as well as aspects of phenomenology. The base composition of the module is constructed out of natural stone cladding up to sill height of the windows with the remaining cladding being of a natural timber such as macrocarpa. With the base of the wall being of a solid mass, some solar heat gain can occur and radiated within the enclosed space. The interior of the spaces are lined in GIB and for the wet areas will be tiled. Acoustics are achieved through several different acoustical panels as well as soundproofing the walls, floors and ceiling to reduce echo, background noise and external noise penetration.

In order to deal with the heating aspect, the flooring will be a concrete slab with under floor heating laid within in, this will then be finished off with a timber slatted flooring with a variety of differing textured rugs for the living areas and tiles within the wet areas of the kitchen and bathroom. This will provide the ability to select the textures that are correct for each case and stow the incompatible rugs away. The timber rafters supporting the roofing structure are exposed with the capacity to hang hammocks and other swinging/rocking devices, pleasing the vestibular requirements as desired, creating a soothing and therapeutic experience. This also allows for the hammocks and other devices to be stowed away or exposed when required. Lighting, when the option of natural light is unavailable, e.g. at night, is in the form of LED lighting (as to avoid fluorescent/flickering lighting) that runs along the lower rafter seemingly unnoticed. This also has the capability of changing to a variety of differing colours and brightness levels to suit all requirements. With the use of these materials the key aspect of colours and textures, heating and lighting are satisfied.

Due to the adaptable nature of the accommodation modules the key aspect of spatial sequencing is constantly changing to meet the desired requirements. Transitions are dealt with in a gradient method, moving from entirely public to either a semi private or semi public area then proceeding into the entirely private realms. This gradual transition allows for the ASD person to assess the environment from a safe vantage point before deciding to integrate into the new environment or remain where they are. To help with these transitions the public realm consists of a continuous sensory garden, this provides a sense of tranquillity and respite across the entire site. The semi public zone is in the form of a veranda, surrounded by some plantings to make a smooth transition between the public and private realms. The semi private realm is more enclosed courtyard in which there is a paved ground with a natural stone wall creating a visual and physical barrier as well as plantings to continue this smooth transitioning. The private zone is encased within the accommodations walls. The glulam timber archways that are within the public realm create a visual connection and dialogue between the differing spaces, as well as having vegetation growing amongst the arches creating some visual barriers between the spaces helping to define the realms without segregating them.
During the process of resolving the issues faced with the accommodation module, the site layout was adapted simultaneously to respond to the buildings needs, relationships and centres of belonging. The buildings were placed upon a series of terraces and linked together by pathways of sensory gardening. A range of public centres and openings were integrated into this arrangement to allow for chance encounters as well as peaceful areas of respite.

Cafe and element:

Taking the learnings from the accommodation module, the design focus was then shifted to the cafe areas. These seemed the most logical next step as these areas would be catering to a variety of differing needs at the same time.

In regards to the acoustics of the space, the needs of the differing individuals was taken into consideration. Various acoustic panels were considered however remaining with the concept of adaptability, the conclusion of having a variety of acoustical domes would be best. These domes are multifunctional as well, with LED lighting concealed within the domes surface. This lighting is able to be a variety of different colours and brightness. These domes work by having an acoustically absorbent material, similar to what is used in an anechoic chamber. If less acoustical stimuli is desired then the dome is able to be lowered into a position that achieves the level of stimuli required, likewise if more acoustical stimuli is required then the dome is simply raised to the desired height. This also creates an ever changing visual aesthetic to the interior environment of the cafes, with a sea of differing shapes, heights and sizes of domes.

Escape spaces are always a tricky hurdle when it comes to public buildings however taking the idea of Christopher Alexander’s pattern of child cave as well and satisfying potential vestibular and proprioceptor behaviours of calming, the concept of having tables that could also act as escape spaces while being occupied was implemented. These work by removing the cube seat and exposing the cave like atmosphere under the table. To ensure that people are able to be warned that someone is under the table, LED lighting will be motion activated and will illuminate the entry to this space.

In order to create a harmonious design the materiality of the accommodation modules is repeated across the site. The walls are clad in a mixture of natural stone and timber, while the inside is tiled in the appropriate wet areas and timber flooring atop a concrete slab with underfloor heating.

Figure 60: Acoustic domes within Cafe space
Figure 61: Plastocene models of cafe seating and acoustical domes
Figure 62: Sketch of materiality of cafe courtyard
Throughout the cafe there will also be a variety of areas having assorted rugs of various textures. The colour scheme will continue to be of a nature palette as not to create any conflicting surfaces, the walls will also be kept clear of as much visual clutter as possible to make the experience as soothing as possible. Exposed rafters will be supporting the roofing and will be housing the adjustable acoustic domes. Similar to the accommodation modules the main lighting for the area will be LED strip lighting in the rafters/trusses.

Through designing the cafe for the main building, it became obvious that there would need to be a secondary cafe that would service the accommodation area to reduce the loading on the main building, this also provided the opportunity to allow facilities where the people occupying the site can cook for each other and create social connections and interactions within a like minded environment.

To combat the variance in smells and sensitivities around this, the kitchens are contained and ventilated to reduce the amount of stimuli reaching those occupying the space. By compartmentalising the kitchen area away from the main area has also created a layer of safety in making it difficult for the children to wonder into the kitchen area. Other safety features of the cafes include; both buildings having staggered exits, the main building at the foyer areas as one containment zone and the deck looking over the complex, while the accommodation cafe has the courtyard area between the farming area and building itself, all the glazing used is safety glass and the walls are reinforced.

By having two entries for the main building, there are several transition zones to be considered. The first transition is from the foyer area, with having a glazed interior frontage, you will be able to observe the environment before entering it making the transition that of a smooth nature. Alternatively the other entry is from the external decking area, this transition is added by the use of a veranda area where the transition into the open environment is added by a semi enclosed space. These transition zones are similar in the accommodation cafe area, the courtyard area between the farming area and building itself is encased in a covered veranda, while the other entry is between two glulam timber archways of the public pathway, this also provides a similar effect to that which is experienced with the veranda.

By creating a second cafe in the accommodation area a connection was created with the farming and animal area as well as linking to a cinema, performance and public hall.
with natural stone walls with timber clad aluminium gates signifying the car entry as well as a smaller gate for pedestrian entry. The second entry will be used for trucks and service vehicles accessing the farming area. Several car parking areas are provided along the main access road. In terms of safety, all the car parking areas have footpaths around the perimeter, there is also a drop off bay by the main entry to the building with an air lock lobby where the children can wait either in the lobby or in the main reception area while the parents park the car.

The walls are clad in a mixture of natural stone and timber, while the inside is finished with timber flooring atop a concrete slab with underfloor heating. In various locations there are rugs of various textures. The colour scheme will continue to be of a nature palette as not to create any conflicting surfaces, the walls will also be kept clear of as much visual clutter as possible to make the experience as soothing as possible. Exposed rafters will be supporting the roofing also housing the main lighting for the various areas with LED strip lighting in the rafters/trusses. The building is surrounded by plantings to enhance the aspects of biophilia whilst also creating a calming and tranquil effect.

In the initial concepts, the main building included the reception, foyer, cafe, shop and cinema. As the designs progressed and developed it became apparent that there was no need to separate the meeting rooms and medical rooms from the main building therefore they were incorporated under the same roof. By doing this the language of the building started to work with the rest of the site as well as providing a hierarchical structure of buildings. By having the main building at a high vantage point in terms of the surrounding buildings, this provides the opportunity to incorporate a green roof and inhabitable space above the withdrawal space below. This roof top area becomes a observation deck, providing the opportunity to survey the site for areas in which they may desire to occupy as well as the ability to potentially locate where people they know are. This observation deck is bathed in the northern light whilst also being protected from the south westerly winds with the optimum view of the central focal point of the site, the pond, as well as the views of Oratia and the Waitakere Ranges.
Spatial sequencing, compartmentalisation, sensory zoning as well as transitions are important within this building. The main entrance to the building is a gradual one through the airlock lobby, there are two additional entrances from the car parking area, these entrances are treated as covered external walkways which lead into a central courtyard with a water feature and access to the observation deck area. Within these walkways there are a series of green walls to continue the link to the outside spaces as well as carrying the calming and tranquil essence throughout the building. The spaces around this courtyard are the meeting rooms, these walkways act as the semi enclosed transition routes to either the courtyard, exterior deck space or the meeting rooms, medical rooms and main foyer. The medical rooms have a further two entries into a central courtyard with a garden, this courtyard is closed in as to provides a containment area for the children who may try to abscond from the medical rooms, this also provides a series of staggered exits for further safety. The final entry on the observation deck face of the building is that to the shops, the transition for this space is dealt with by the entry being close to the wall, this allows for the space to be surveyed before fully entering into the environment.

Within the various locations and differing functions, appropriate acoustical materials will be used through several varying acoustical panels as well as soundproofing the walls, floors and ceiling to reduce echo, background noise and external noise penetration.
Professional Offices:

To establish continuity across the site, the materiality, textures, colours, lighting and heating will be achieved in a similar way to the accommodation module. Spatial sequencing, sensory zoning and transitions are achieved through a recessed entrance which proceeds into reception area with seating, opening out into a central courtyard. This courtyard feeds the seven professional offices. Once within the offices there are distinct zones including, a meeting-discussion area, an observation area and an escape space that is able to be adapted to each individuals needs.

This courtyard is not only a method of transition but also works with the aspect safety in terms of providing a contained area as well as a staggered exit route. Other safety aspects such as the safety glass and reinforced walls are repeated across the board.

Acoustics are achieved through several different acoustical panels as well as soundproofing the walls, floors and ceiling to reduce echo, background noise and external noise penetration.
Additional Therapy and Sensory Rooms:

In the initial concepts, the additional therapy and sensory rooms were treated as two separate buildings. As the designs progressed and developed it became apparent that there was no need to separate these two spaces; therefore they were incorporated under the same roof. By doing this the language of the building started to work with the rest of the site as well as providing a hierarchical structure of buildings whilst also helping to hold the central space of the professional area.

Maintaining continuity across the site, the materiality, textures, colours, lighting and heating was achieved in a similar way to the accommodation module. Acoustics are achieved differently within the various functions of this building. The additional therapy portion has several contained rooms for yoga, exercise room, and performance (dance and drama) studios, comprised of soundproofed walls, floors and ceiling to minimise echo, background noise and external noise penetration. Within the remaining spaces several different acoustical panels will be implemented with a gradient treatment of a quieter areas gradually transitioning into louder zones nearer the exits. By having these areas contained in various zones deals with the key design aspects of spatial sequencing, compartmentalisation and sensory zoning, whilst also contributing to the aspect of safety. Safety aspects include; safety glass in all glazing, reinforced walls and staggered exits.
Transitions are important within these spaces and are dealt with in similar manners. Both programmes are fed from the central professional area courtyard. This space acts not only as a catchment area but also provides a gradual transition into the buildings from the public realm which consists of a continuous sensory garden, providing a sense of tranquillity and respite across the entire site. The walkway dividing these two programmes is treated as a covered external walkway which leads into a central courtyard and to the terraced area feeding into the valley near the entrance to the site. This area is bathed in northern light and protected from the harsh south westerly winds. This walkway also provides a smooth transition into the additional therapy rooms through several entrances. Within the sensory rooms, there are a variety of different treatments, there are a series of smaller alcoves acting as escape spaces from the larger multi-sensory environment. This larger area is split into two zones, the zone closer to the exit is of a lower stimuli level whilst the raised area towards the back of the environment is high in sensory stimuli. Both the sensory rooms and additional therapy spaces contain cube seats which are able to be moved anywhere within the space for children to create enclosures to form escape spaces or environments to suit their needs as desired, similar to the accommodation modules.

Music Therapy:
The geometry of this building successfully holds the courtyard area whilst creating an echo which can be seen in the farming area and accommodation area. Music therapy includes a range of therapeutic treatments such as group music or smaller group/solo music, singing and speech therapy.
The materiality, textures, colours, lighting and heating are achieved in a similar way to the accommodation module maintaining continuity across the site. Acoustics are achieved through the implementation of soundproofed walls, floors and ceiling to minimise echo, background noise and external noise penetration. Within the different music studies there will be a variety of acoustic panels to achieve the desired effects within the various musical needs.

Transitions, spatial sequencing, sensory zoning and compartmentalisation are accomplished by being fed from the central professional area courtyard. This space acts not only as a catchment area but also provides a gradual transition into the buildings from the public realm which consists of a continuous sensory garden, providing a sense of tranquillity and respite across the entire site. Entering into a reception and seating area further helps enhance these key design aspects. The reception area is central to this building with the group therapy rooms to the western wing and the solo/small group, which double as the singing and speech therapy rooms, are in the eastern wing.

All these therapy spaces contain cube seats which are able to be moved anywhere within the space for children to create enclosures to form escape spaces or environments to suit their needs as desired, similar to the accommodation modules. Safety aspects within this building have been approached in the same manner as the others in regards to safety glass in all glazing, reinforced walls, staggered exits and containment zones.

Water Therapy:

The form of the water therapy building has evolved throughout this process in response to the development of the surrounding buildings. Within this space there are two large separately contained therapy pools, three semi enclosed/exposed pools of various sizes and depths, four indoor pools of varying depths and sizes, seating, reception area, and changing rooms. There are two entrances, the main entry being from the professional courtyard area and the second being from the outdoor area by the pond. The facade facing the pond area is populated with viewing windows to continue the link to the focal point of the site.
Much like the treatment of the surrounding buildings the transitions into this building have been considered greatly. Spatial sequencing and transitions are achieved through the main entry being recessed, proceeding into a reception area with seating, from here there is the option of two main directions. One is to proceed down a series of stairs to go to the changing rooms or the lower level pool and exterior courtyard by the pond, or the other option is to proceed into either of the contained water therapy pools or the other smaller pools on this upper level. With this building containing water there is the added sensory element that is of a calming and tranquil effect on those with ASD.

Materiality, textures, colours, lighting and heating will be achieved in a similar way to the accommodation to maintain continuity, however this heating will only be in areas where water is not of concern, i.e. the reception area, all the water areas will be treated by having radiating ceiling panels whilst also having the water heated to body temperature.

Safety is considered immensely within this programme. Ideally this zone will be under constant supervision, coupled with reinforced walls, all glazing being safety glass, and staggered exits. The pools that are within the general spaces are all raised above finished floor level by at least 500mm.
to minimise the risk of stumbling or falling in. The larger therapy pools are contained separately, which help with safety elements whilst also fulfilling the key design aspects of compartmentalisation and sensory zoning. By having these rooms contained separately allows for the environments to be catered for the specific groups at allocated times.

Occupational Therapists well ensure that these environments are adjusted to each of the groups needs before any sessions take place.

Acoustics are achieved through several different acoustical panels on the walls and ceilings, especially in the contained rooms, as well as soundproofing the walls, floors and ceiling to reduce echo, background noise and external noise penetration.

Escape spaces are a safety issue when water is involved therefore has been excluded from consideration of this programme. However the sensory garden surrounding the building provides a sensory haven as a form of escape space.

Withdrawal Space:

The withdrawal space was included for the purpose of providing the carers an opportunity of respite while the children are able to receive therapy from professionals. What better way to get some respite than with some ‘R&R’? The withdrawal space contains; yoga studio, internal and external seating areas, indoor, semi enclosed and exposed pools/spas as well as spa treatment rooms.

Maintaining continuity across the site, the materiality, textures and colours will be achieved in a similar way to the accommodation. Heating will also be considered in a similar fashion for the areas where water is not of concern, i.e. the reception area, yoga studio and spa treatment rooms, all the water areas will be treated by having radiating ceiling panels, where indoors, whilst also having the water heated.
to various temperatures, ranging from body temperature to 40°C. Lighting will be considered in a similar fashion to the accommodation modules as well as having a series of skylights from the observation deck to light the areas underneath. Acoustics are achieved differently within the various zones of this building. The yoga studio and spa treatment rooms are comprised of soundproofed walls, floors and ceiling to minimise echo, background noise and external noise penetration. Within the remaining spaces, several different acoustic panels will be implemented with a gradient treatment of a quieter inside, gradually transitioning into a louder natural exterior environment.

As this building is meant for the carers as their withdrawal space/retreat space there is no requirement for escape spaces within this zone, however the area is encapsulated within a sensory garden whilst also encompassing the pond area, providing a sensory haven as a form of escape space.

Elements of safety i.e. reinforced walls, safety glass and staggered exits are continued in this building. With several indoor areas, these make a series of containment spaces whilst also working with the aspect of compartmentalisation. From the outdoor seating area, there is the safety of being able to observe the pond area below. An additional safety measure all heated pools are raised above finished floor level by at least 500mm to minimise the risk of stumbling or falling in.

Compartmentalisation, spatial sequencing and sensory zoning was achieved by splitting the building into two main zones, the first being the wet areas of the pools and changing rooms and the other being the dry areas consisting of the yoga studio, spa treatment rooms and seating areas.

The transitions within this space are similar to the surrounding buildings with a transition from pure outside to semi outside to pure inside and vice versa, this can be seen most clearly from the outdoor area looking over the pond. Both of the entries to the building, one from the walkway near the water therapy and the other from the walkway in the accommodation zone, are achieved through a gradual introduction via stairs. This transition allows for the space to be surveyed before fully entering into the environment. Further transitions within the space are done via stairs accompanied by glazing to allow for observation of spaces, similar to the stairs.

Figure 100: Developed plan of Withdrawal space - showing dry and wet zones as well as transitions via stairs
Figure 101: Sketch of view from pond to outdoor seating area
Figure 102: Sketch of outdoor seating area
Figure 103: Sketch of indoor seating area

Figure 104: Developed plan of Withdrawal space - showing dry and wet zones as well as transitions via stairs
Figure 105: Sketch of outdoor seating area
Figure 106: Sketch of indoor seating area
Animals/farming:

As the complex as a whole has developed so has the geometry of this building. The geometry of this building has been derived as an echo of the music therapy and cafe of the accommodation area. This building is comprised of a reception area, small animal room, horse stables and vet, engaging with a series of arenas, where children can ride horses and interact with other animals, and several paddocks where cattle, sheep and pigs are able to be interacted with. Due to being external to the built environment, acoustical treatments are out of the design parameters along with several of the key design aspects especially the escape spaces. This building is bathed in northern light whilst protected against the southern wind.

Within the internal environment of this building there is acoustical treatment to the reception area however due to the nature of the programme acoustical treatment is not required in the remaining spaces. Maintaining continuity across the site, the materiality, textures, lighting and colours will be achieved in a similar way to the accommodation. Heating is treated differently within various zones, within the reception, vet area and small animal zone, radiating ceiling panels are implemented whilst the remaining zones have no additional heating treatments.

Safety is considered immensely within this programme. Ideally this zone will be under constant supervision, coupled with safety glass in all glazing, reinforced walls and staggered exits. Compartmentalisation, spatial sequencing and sensory zoning and transitions was achieved by having this building split into three sections which also helped in creating a hierarchy between internal spaces. The first space consists of the smaller areas of reception and small animal area, the second and central area of horse stables, the final area is the veterinary rooms. Wrap around corridor encapsulating the stable area creates an ideal transition zone between the spaces.
Sensory Garden:

Instead of designing several smaller segregated areas of sensory gardens, that may have been under utilised or too far from all areas to have a beneficial effect, it was concluded that the sensory garden would encapsulate the site as a whole. This helped in terms of the theory of biophilia, regionalism and has aspects of phenomenology, whilst emphasising and enhancing the therapeutic and retreat qualities across the site.

Final Design:

With all the elements completed and site continuously being edited to respond to these elements the site has encapsulated a sense of belonging and radiates an essence of therapeutic and retreat through and through. The design was able to take the initial contours, responding, respecting and altering them as required to make an environment that is held and feels as though it was built from the site itself.

The decision to have a roof in the form of butterfly style was decided upon as it enhanced the opportunity for further gain of northern lighting, views, etc. This style also enhanced the spatial definition and zoning within the various programmes.
CONCLUSION

Can there be an environment where Autism is seen as "Ordinary/Normal"? was the architectural question for this project. This project had the intent to define a new architectural typology of an "autistically normal" environment through the design of a therapeutic environment that caters for both the children who live on the autistic spectrum and their carers.

This therapeutic retreat was designed upon nine key design aspects whilst also incorporating the focus of adaptability, which provided a calm, tranquil and ultimately a therapeutic environment whereby individuals with ASD and their carers can get a sense of respite from this designed retreat. Through activation and integration within the landscape and contours a sense of belonging was evoked and supported through the use of biophilic and regionalistic principles. This confirmed that the conclusion to the architectural question would appear to be that yes there can be such environments, this project reinforces this statement through the embodiment of the research outcomes and successful portrayal of ASD requirements.

This project addresses each aspect and programme to an adequate level, however if I was to further this research, more in-depth focus would be placed upon multi-sensory environments, to further unlock its potential and therapeutic advantages to those living with ASD. Through extensive research of a range of precedents it became apparent there was no existing architectural typology for this project to use as precedent. This meant there was a greater reliance on literature precedents along with research through designs in accordance to findings. Legislations and regulations in regards to designing for ASD are non existent and need to be addressed for future architectural environments, especially with consideration of the rising number of individuals with ASD. This project has attempted to bring these aspects to light outside of the educational realm.

In the words of Nathan Wallis, Neuroscience Educator, "At the end of the day none of us are really neurotypical, [...] For any human being if we analysis you enough we will find something that is not typical. There really is no person who is 100% neurotypical, we all have our individual quirks, its just when someone has lots of quirks we start to put a label on it." With this in mind it is my belief that the majority of aspects uncovered within this research project should be considered for all environments not just those where ASD individuals are concerned.

Further research should be conducted, as more light is shed on the ASD diagnosis and characteristics, enabling more ‘autistically neutral’ environments to occur integrating them into our communities instead of excluding them through sensory stimuli. In the aim to provide conclusive guidelines for ASD designs further research should be considered and conducted for legislations and regulations to be implemented in the future.

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Books:

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Declaration

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This Thesis/Dissertation/Research Project entitled: Retreat to Normality

is submitted in partial fulfillment for the requirements for the Unitec degree of Masters of Architecture (Professional)

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

Candidate Signature: .......................... Date: 11 Oct 2018

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