

light, texture and sound in a training centre for the blind and visually impaired.

Design Research Project APG5058S

Submitted in partial fulfilment of the requirements for the degree Master of  
Architecture (Professional)

by

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# introduction

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Occupants of contemporary buildings are finding themselves in a similar position to complainants of Modernist architecture in the 1950's: lack of connection between themselves and the building. Unlike before, this disconnection is due to architect's lack of attention to the needs of their human occupants as a result of the unquestioned, ocular-centric society in which they live.

"To put it simply, architecture that looked good on photographs was popular [During the 20<sup>th</sup>C]. And photogenic architecture is an architecture of shapes and forms; in other words, it has characteristic shapes. But in the 21st century, direct experience gained by visiting a site personally is becoming increasingly important for people. Through the direct experience of the object and the spatial entities people are hoping to experience an emotional input. In this situation, light and materials become the most important factors in a design. Direct communication between the material, the light and the human body is created. We live in an age in which architecture must be newly defined and must take these connections into account."<sup>1</sup>

KENGO KUMA suggests that fashion driven architecture is a thing of the past as occupants begin to demand more from the space that they inhabit.

This project aims for an architecture that connects building and occupant through the use of light, and materials, and the connection of them and the human body.

Programme: a training centre for the blind and visually impaired that aims to assist the reintegration of the non-sighted and sighted communities through their economic independence. The building would also offer spaces such as a café and a conference centre that would generate funds, making the running of the building itself self-reliant.

Through interviews and discussions with various member of the Cape Town Society for the Blind I have come to learn more about what it is like to be blind.

- As most proclaimed 'blind' people are actually visually impaired, light is of crucial importance.
- Acoustics play an extremely important part of their navigation through a building.
- Blind and visually impaired people are far more in tune with textures in architecture.



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1. The first part of the document discusses the importance of understanding the needs of the community. It emphasizes that any intervention must be based on a thorough understanding of the local context, including the cultural, social, and economic factors that shape the community's experiences. This involves conducting extensive research and engaging with community members to ensure that the intervention is relevant and effective.

2. The second part of the document focuses on the role of the government and other stakeholders in supporting community development. It highlights the need for a multi-sectoral approach, where different organizations and individuals work together to address the various challenges faced by the community. This includes providing financial support, technical assistance, and creating opportunities for community members to participate in decision-making processes.

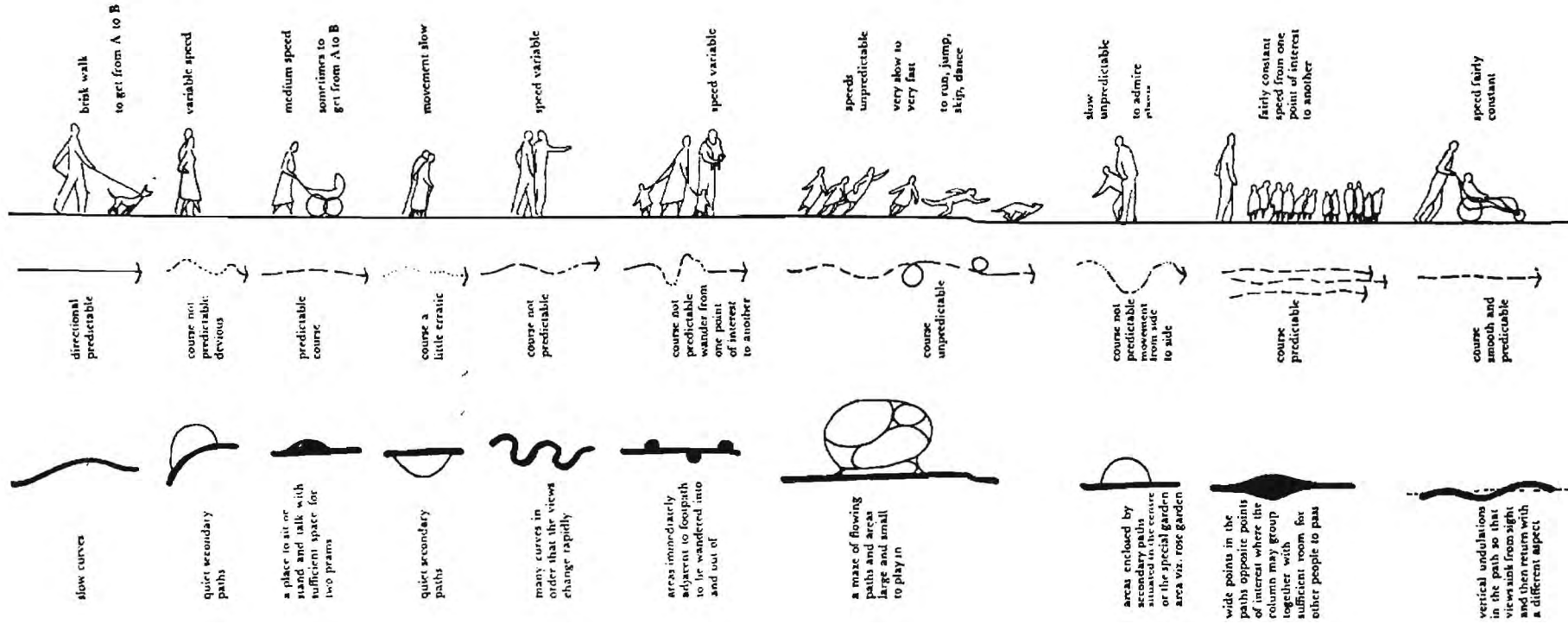
3. The third part of the document discusses the importance of building the capacity of community members. This involves providing training and education to help individuals develop the skills and knowledge needed to improve their lives and contribute to the development of their community. It also emphasizes the need for ongoing support and mentorship to ensure that the community members are able to sustain the benefits of the intervention over time.

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# theory + tech. docum

006



002.1

# ent summaries

# 002

As is a good process of design development, it is better to start with too much and narrow down by the exclusion of weaker ideas, rather than to start with too little and have to build them into something they are not.

I began my project with many broad and diverse theories and objectives. Effectively I was trying to apply everything I knew about architecture into this project. One of the most crucial things that I have learnt through this year's long process of design was that to make a strong convincing project it needs to be focused and selective in its objectives.

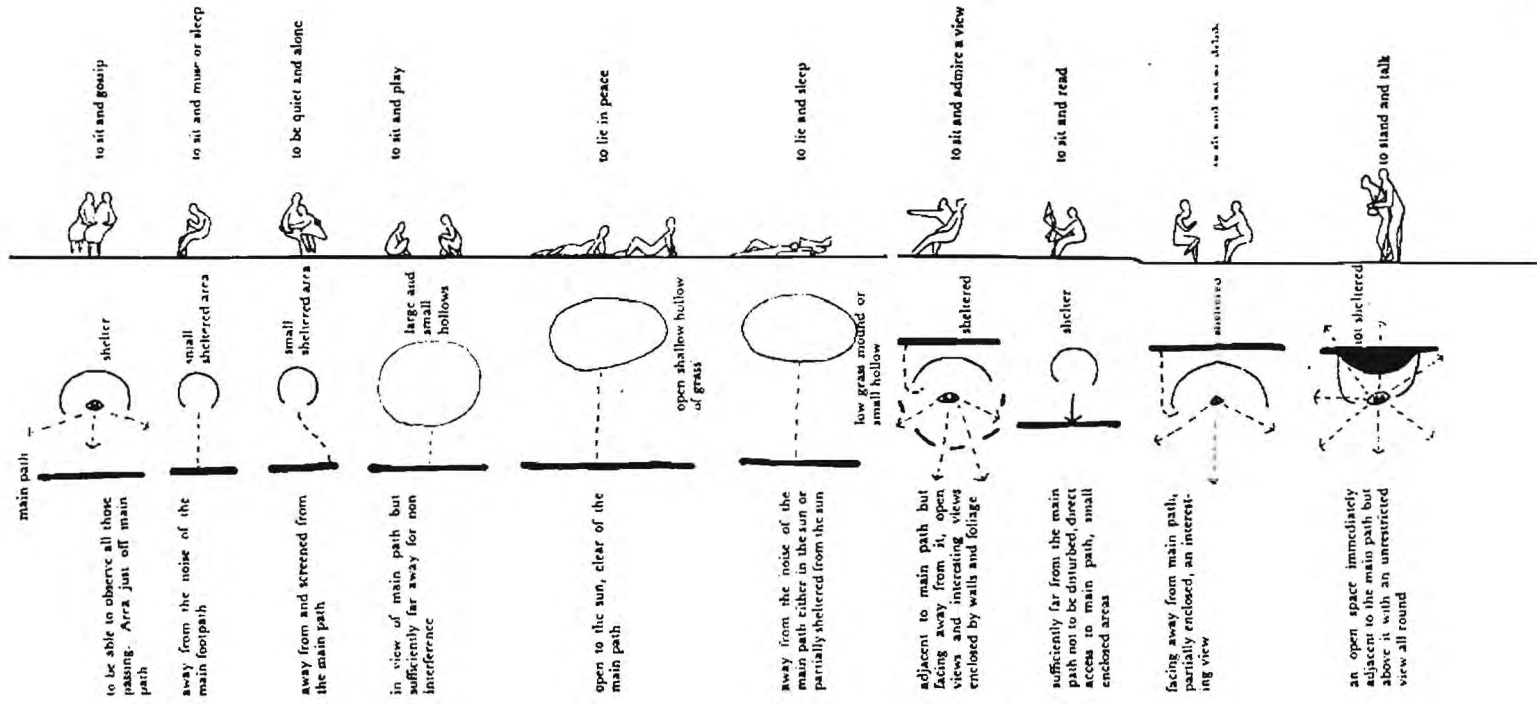
My theory and technical papers of the first semester set up a good launch pad from which I could truly decide where I wanted this project to go.

theory doc: 'architecture's unconscious influence on human psychology'

As I have discussed in 001 Introduction, the starting point for my thought process at the beginning of this year was that the occupant of many contemporary buildings had been largely forgotten. Architectural design was driven by a march toward popular culture and fashion and, often, the basic needs of the occupant had been neglected.

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My theory document began with a general spread of research on how human beings are affected by the space around them. Even though we are extremely complex and diverse, and are affected and influenced by our own context and culture, I was interested to explore what common truths exist.

"Though designer's explanations of the relationship between man and the environment are likely to be presumptive, anecdotal, ideological, or self-referent, they do not necessarily exclude the truth or evade reality. But, now we do need to find ways of turning them into hypothesis which can be tested by the paradigms of the natural sciences. If we frame our hypothesis carefully, we may even help the natural sciences to explain more than they have been able to."

#### prospect and refuge

This diagram 002.1 + .2 recognizes the need for both ideas of refuge and prospect: the solid line indicating safety (refuge) and the arrows pointing outward indicating opportunity (prospect). The notion of prospect and refuge was put forward by British geographer JAY APPLETON which stems from APPLETON's 'habitat theory' published in his *The Experience of Landscape* (1975). APPLETON's theory attempts to identify taste in art as 'an acquired preference for particular methods of satisfying inborn desires.' As human beings, APPLETON

suggested that our desires are for safety and opportunity, and, in using these desires in design, we could predict the emotional outcome that a space would have on an occupant.

"[the 'habitat theory'] predicts that humans are attracted to art and circumstances that have:

- broad, unclouded vistas
- visible places for easy refuge (a copse of trees, caves)
- water
- plants
- a smattering of prey species

It further predicted that we should like spaces when:

- we are at the *edge*, such that our back is protected (rather than the middle where we are most exposed)
- We are covered, rather than open to the sky"

APPLETON's 'habitat theory' suggests that we should like space that is optimal for survival.

Despite our dominance as a species on this planet, we are feeble, defenseless creatures. We have no protection mechanisms, poor senses, no weather protection; and subsequently need a place of protection, shelter, privacy and refuge in order to feel safe. Prospect, opposed to refuge, forms a powerful contrast. We are ambitious and intelligent beings and enjoy a view to assess situations from a distance. As stated in the quotation above, we feel more comfortable when we can see places to hide as well as opportunity to eat and drink. Although this theory is near impossible to prove in human aesthetics, it has been shown to be noticeably true of animals in the wild.

GRANT HILDEBRAND brought the theory to the attention of the world of architecture with his publication *The Wright Space: Patterns and Meaning in Frank Lloyd Wright's Houses* (1991). FRANK LLOYD WRIGHT's architecture of prospect and refuge employs the use of low ceiling heights, careful configuration of enclosed and open spaces (refuge); as well as views of natural environment (prospect). See diagram 002.3.

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"An architectural work generates an indivisible complex of impressions. The live encounter with FRANK LLOYD WRIGHT's 'Falling Water' weaves the surrounding forest, the volumes, surfaces, textures and colours of the house, and even the smells of the forest and the sounds of the river, into a uniquely full experience."<sup>3</sup>

The theory of prospect and refuge starts to suggest a humanistic spatial preference. If you are not able to see, I argue that it is still important that the feeling of prospect and refuge is conveyed to the occupant. It is not the visual appreciation for prospect and refuge that is important anyway: rather it is the psychological situation of prospect and refuge. If anything, without the sense of vision it is more important to convey this due to the heightened vulnerability of blind and visually impaired people. To achieve this, the architect needs to have a good understanding and appreciation of the other human senses and how architecture can be understood through them.

#### the human senses

The document then went on to explore how we experience space through our other senses. This was to explore how I could design an architecture that would converse with its occupants through their senses.

3 JIHANI PALLASMAA *The Eyes of the Skin: Architecture and the Senses* (2005)

Most interestingly in this chapter of research is PALLASMAA's reference to the sensory 'system'. This is crucial to remember as our senses do not operate independently from one another. They work as a complex, yet fully integrated system. As MERLEAU-PONTY elaborated: "My perception is not a sum of visual, tactile and avoidable givens: I perceive in a total way with my whole being. I grasp a unique structure of the thing, a unique way of being which speaks to all my senses at once."<sup>4</sup> Our senses make up an amazing system that works to collect information about our environment. This information is then sent to our brain for analysis and interpretation, in a method of comparative understanding - our memory.

Blind and visually impaired people have had to rely on their 'other' senses in order to make their way around an ocular-centric society, and so, are far more in tune with their surroundings. Whereas a sighted person would only need to look up for a sign for information, a non-sighted person would have to recognize a less obvious sensory clue, such as a identifiable sound. When designing an architecture that 'speaks to the senses', it should not be focused on the stimulation of individual senses, but should rather be designed as a complete system where each sensory stimuli corresponds with another of the same space and no mixed signals are sent. This creates an opportunity for

4 quoting MERLEAU-PONTY, *DA 07: Tangible Light: Integration of the Senses and Architecture*, JIHANI PALLASMAA, p11

the creation of spatial identity creation to assist with general navigation and orientation of blind and visually impaired people (VIP).

Although we have a multitude of senses, there are only a few that are appropriate to architecture: namely, touch, sound, and sight. The sense of touch will be designed for using careful application of materials; the auditory sense will be designed for using volume, and the careful employment of reflective and absorptive surfaces; and the visionary sense will be designed for using strong day-lighting (to assist VIP as well as the sighted people of the building). Used together, perhaps another sensory system is created: architectural spatial understanding. The design of texture, sound and day-lighting in this building would work together to create space appropriate for program with an identifiable character that would help locate the occupant within the building.

#### interviews

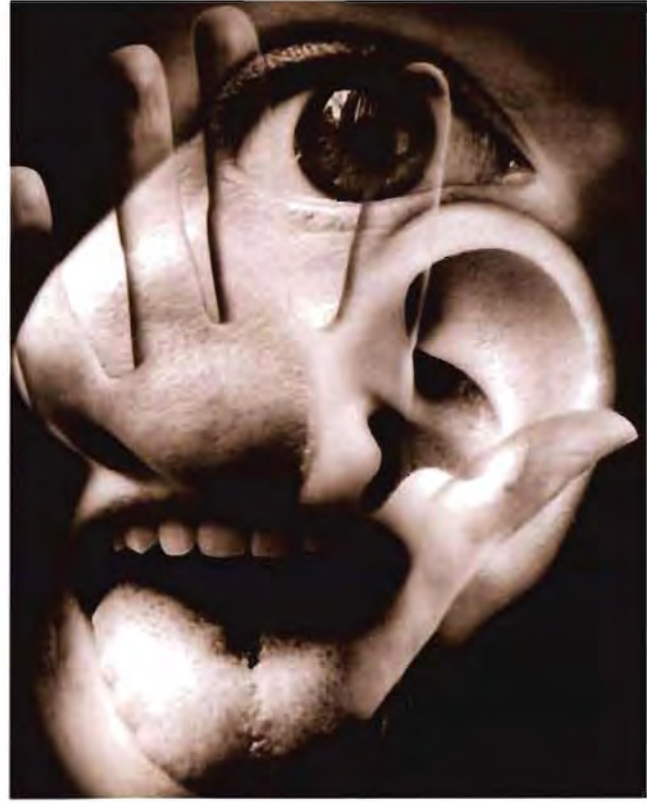
The last section of the document set about organizing interviews with blind and visually impaired people. This would give me insight as to what it is like to experience space without sight. Interesting these interviewees were not able to help me directly as they could only describe space as it has been designed for sighted people, they could not imagine space that is designed specifically for them. The interviews subsequently took a differ-

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003.2



ent form, as taking them to unfamiliar yet conventional spaces did not result in useful data. The findings of the interviews will be discussed in 003 Further Research.

technology doc: materiality and sound

materials and the celebration of making

As one of my main driving concerns behind this project was about the connection of occupant and building, topics such as the celebration of making, and natural vs artificial materials were discussed. Both stem from a method of occupant and building connection through subconscious familiarity and recognition: the process of making through handcraft, as well as memory and familiarity of natural materials in preference of alienating, characterless, unrecognizable manufactured materials.

Rather than using materials as 'veneers' that are applied to an already designed building, and rather than letting material determine the form of the building; I propose that the two should be used as a collaborative composite where the total design of the building (both its form and employed materials) is influenced by the environment and concept envisioned by the architect. The atmosphere or 'sense of the space,' the manner in which each

space interacts with the body both physically and mentally, must be decided upon first; and then the making of it would be the employment of form and material as an alliance of architectural tools.

acoustics

"... But our cities have lost their echo all together. The wide, open spaces of contemporary streets do not return sound, and in the interiors of today's buildings echoes are absorbed and censored. The programmed recorded music of shopping malls and public spaces eliminates the possibility of grasping the acoustic volume of space. Our ears have been blinded."<sup>5</sup>

"Sight isolates, whereas sound incorporates; vision is directional, whereas sound is omni-directional. The sense of sight implies exteriority, but sound creates an experience of interiority. I regard an object, but sound approaches me; the eye reaches, but the ear receives. Buildings do not react to our gaze, but they do return our sounds back to our ears."<sup>6</sup>

<sup>5</sup> PALLASMAA, *The eyes of the Skin: Architecture of the Senses*, p 51

<sup>6</sup> PALLASMAA, *The eyes of the Skin: Architecture of the Senses*, p 49

JUHANI PALLASMAA draws our attention to the importance of sound in architecture, implying the vast experiential difference between 'seeing' and 'hearing'. The careful acoustic consideration in architectural space has powerful effects on its occupants: Even though we are often unaware of the acoustic quality of a space, hearing is a hugely significant component to our experience and understanding of space. "When the soundtrack is removed from a film, for instance, the scene loses plasticity and senses of continuity and life. Silent film, indeed, had to compensate for the lack of sound by a demonstrative manner of overacting."<sup>7</sup>

Spaces within my building have been designed to celebrate different sound qualities, but in doing so are carefully tuned for their function. Further research on sound can be found in chapter 003 Further Research.

<sup>7</sup> PALLASMAA, *The eyes of the Skin: Architecture of the Senses*, p 49



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# further research

016



003.2



003.3



003.1

# 003

precedent

01

project: Centre for the Blind and Visually Impaired

architect: Taller de Arquitectura - Mauricio Rocha

location: Mexico City, Mexico

diagrams: 003.1 - 003.3

The Centre for the Blind and Visually Impaired in Mexico City is a recent project published on the reputable on-line source [www.archdaily.com](http://www.archdaily.com). It was interesting for me to study a contemporary example with a program almost identical to mine.

Interesting points that I took away from this project were:

1. The Centre's use of a 'blind wall'. This wall encircles the campus and acts as an acoustic barrier, enabling a clean sound, therefore making it a useful tool for navigation.
2. "The floor plan can be read as a series of filters which stretch out from the entrance

017

003.1 different 'blocks', different character  
003.2 volume break-down and the 'blind wall'  
003.3 light guide

003.4



003.4 'raw' materials, sun-light  
003.5 diffused day-light from above



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in a series of strips."<sup>1</sup> This is designed with the understanding of the linear movement necessary for the design for the blind and visually impaired community.

3. Each function is grouped and has its own structural characteristics making the spaces easily identifiable.

This project is designed in a way that is very reliant on climate. A building as open to the elements as this example would not work in Cape Town. Overall, this building does present some interesting ideas of how to design for blind and visually impaired people.

02

project: House, a Concrete Family Home

architect: Yutaka Yoshida Architect Associates

location: Kohgo, Japan

diagrams: 003.4 - 003.5

In this precedent study I was interested in Yoshida's use of 'raw', real and tactile materials, as well as his use of sun-lighting and day-lighting.

<sup>1</sup> ARCHDAILY, *Centre for the Blind and Visually Impaired, Taller de Arquitectura - Mauricio Rocha*.

03

project: Minimalist House, 2009

architect: Shinichi Ogawa and Associates

location: Okinawa, Japan

diagrams: 003.6 - 003.8

In correlation with the idea that blind and VIP prefer linear movement, the idea of linear spaces became interestingly appropriate. This minimalist project gives an idea of what can be achieved in a very narrow space. Ogawa does employ the use of a light and ventilation chimney along the site, sacrificing a slither of space but allowing for fresh air and natural light to penetrate the space.

place, time and being in architecture in Japanese architecture, Kevin Nute

PLACE: Sense of BELONGING: Highlighting inherent features of CONTEXT

TIME: Sense of ALIVENESS: Integration of Natural Phenomenological Changes.

BEING: Sense of UNIQUENESS: Expression of inherent properties of NATURAL MATERIALS and HANDCRAFT.

"The responsive design strategies highlighted here enable people to feel connected to a particu-

lar place, moment or material being, and thereby seemingly more at home, alive, or unique to themselves. Wider use of some of these devices could it seem help to sustain environmental and cultural identities against the homogenizing effects of globalization, but also heighten our appreciation of our own peculiar condition of being here now."<sup>2</sup>

Essentially this theory is the basis for how a building can converse with its occupant and connect him to that moment in time. This reading extended my understanding of psychology of space substantially, and I aim to include an element of each in my project.

stair versus ramp

As is natural for a sighted architect trying to accommodate for a blind occupant, stairs seem a difficult and dangerous component. However, through my interviews with Bashir and Insaaf and through further research I have found that stairs, provided that they are not unnecessarily steep and have handrails, are not difficult for blind and VIP people to navigate at all. Ramps also are extremely inefficient as they take up a huge amount of space.

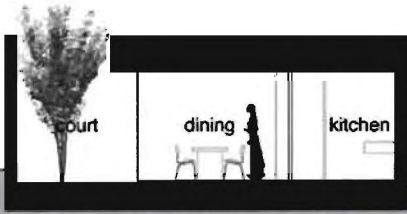
The stair design of my building would need to be generous and slow, with an opportunity to break and pull out of the way at some point at midpoint. The Centre for Accessible Environments in the

<sup>2</sup> Kevin Nute, *Place Time and Being in Japanese Architecture*, p164

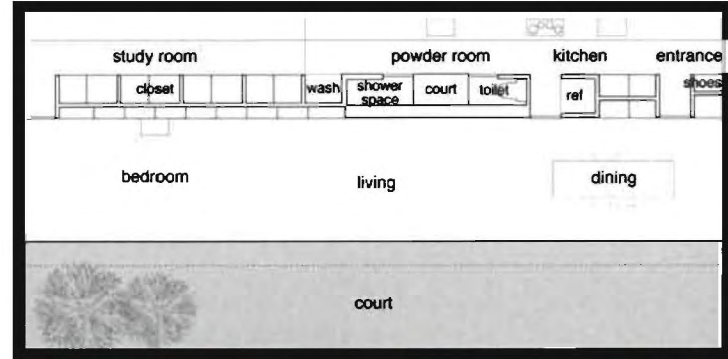
020

003.6 exterior shot, interior focus  
003.7 section + plan  
003.8 linear space, light chimney

003.7



X-X' section



003.6



003.8

United Kingdom has developed a series of restrictions that would ensure a safe environment for a blind and VIP user. See [www.aec.co.uk](http://www.aec.co.uk).

See diagram: 003.9.

design for the blind and VIP

'Vision Australian' is a department focused on blind and low vision services. In [Appendix B](#) they have published a hugely useful document named 'Accessible Design For Public Buildings' which outlines basic principles and rules of thumb in the design of space for blind and visually impaired people.

further acoustic research

As I read, I began to realize the absolute importance of acoustics in space and how little attention architects seem to give it. I am surprised that there is so little information on the topic of aural architecture, especially when compared to architecture driven by aesthetics. This is probably due to a few factors: a lack of means to record this information: aesthetic architecture can be drawn in journals and archived; common language is not adequate to explain different auditory conditions and situations; and our society is so ocular-centric that little importance is given to the auditory sense. Possibly as a result of these factors, educational institutions pay it little attention too.

"Thousands of visual artist, civil engineers, architectural historians, and social scientists have created a comprehensive symbolic language and an extensive literature for visual architecture, whose intellectual foundation draws on archaeology, engineering, history sociology, anthropology, evolution, psychology, and science. In contrast, even though aural architecture shares the same intellectual foundation, its language and literature are sparse, fragmented and embryonic."

The only references that I could find in the field of auditory architecture are listed below:

>HOPE BAGENAL and ALEX WOOD (1931): recognised the social and cultural aspects of aural architecture.

> R. MURRAY SCHAFER(1977): formulated the concept of the soundscape as a mixture of aural architecture and sound sources, created disciples who have passionately extended and applied its initial concept.

> CHRISTOPHER ALEXANDER (1979): "The life that happens in a building or a town is not merely anchored in the space but made up of the space itself."

> JUHANI PALLASMAA (1996): explicitly rejected dominance of visual sense, importance of auditory sense!

>THOMAS SCHERIDAN KAREN and VAN LENGEN (2003): architecture schools should include it in course work to achieve "a richer, more satisfying built environment."

From my reading the most interesting and possibly useful points are as follows:

a

> People do not use their sense of hearing in the same way. However, where they do, they form what can be described as a sub-culture. As sound has different importance and is needed in different ways depending on the sub-culture, it is crucial that as an auditory architect the sub-culture of your occupant is understood. Mine is the sub-culture of architect, and my focus is on the sub-culture of the blind.

b

> An auditory architect effectively designs, according to SCHAFER, soundscapes. Unlike aesthetic architecture, soundscapes can never be static, they are constantly changing.

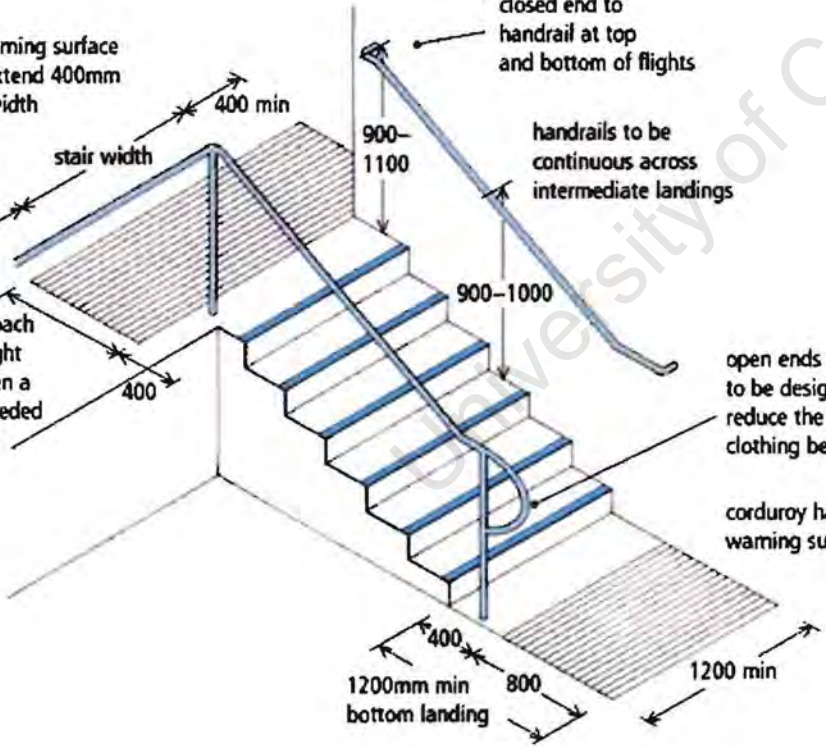
To use the analogy of a cooked meal as the soundscape:

soundscape = raw ingredients (the sonic event) + the cooking style (auditory architecture)

corduroy hazard warning surface at top of steps to extend 400mm min beyond flight width

400 min  
stair width  
400 min

800mm when approach to the steps is straight on and 400mm when a conscious turn is needed to reach the step

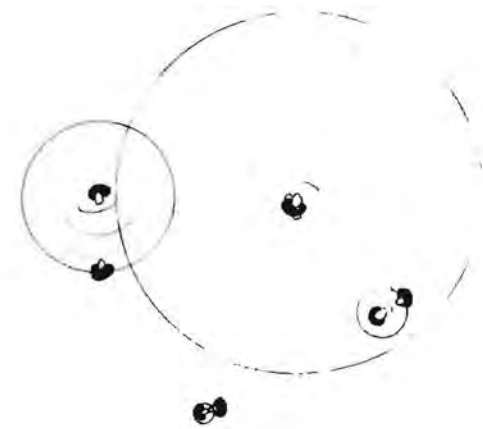


closed end to handrail at top and bottom of flights

handrails to be continuous across intermediate landings

open ends of handrail to be designed to reduce the risk of clothing being caught

corduroy hazard warning surface



c

> Sound is more complex than light as it is intrinsically linked with time. In a very real sense sound is time. FULL sonic illumination requires a mixture of continuous and transient energy over a wide range of frequencies, amplitudes and locations. Because experiencing sound requires time and because spatial acoustics are difficult to record, auditory memory plays a large role in acquiring the ability to hear space. Dependant on long-term memory: unreliable unless it has been a crucial part of your life, ie. you are non-sighted. Also, we rely on unpredictable and inconsistent sonic illumination from human activity. OUR EXPERIENCE OF AURAL ARCHITECTURE IS FRAGILE AND PERISHABLE.

d

> The concept of an acoustic arena (see 011 Bibliography and Glossary. Careful design of acoustic arenas could influence my design quite dramatically. It is the understanding of sound spatially, where people of an acoustic arena become a community as they all share the ability to hear an acoustic event. Sonic events seem to engage in a battle for supremacy, as louder sounds would claim more area in an acoustic soundscape than smaller sounds. However, the smaller sound has claimed an acoustic arena of its own, subsequently reducing the size of the large sounds arena. If a person is creating sound through speech, it can be said that you are outside of his acoustic arena if his words

are inaudible, however, he would be contributing to the arena that you are part of and would cause your arena to reduce in size.

This concept reiterates the dynamic nature of sound in comparison to the static nature of physical architecture, and begins to introduce the complex social aspect of creating soundscape or claiming acoustic arenas due to personal sonic events.

EDWARD T. HALL spoke about the Poxemics of acoustic arenas saying how they differ between different situations, and would vary further according to culture. A general understanding of acoustic arenas for conversation is:

1 INTIMATE SPHERE: [350mm] reserved for intimate friends and relatives

2 PERSONAL SPHERE: [1m] for acquaintances

3 CONVERSATIONAL SPHERE: [3-4m] oral interchange with strangers

4 PUBLIC SPHERE: [beyond 4m] determined by acoustic horizon, impersonal and anonymous.

diagram: 003.10

"WE CAN ONLY APPRECIATE THE IMPORTANCE OF AURAL ARCHITECTURE WHEN WE RECOGNISE THE INTERWOVEN RELATIONSHIP BETWEEN SPATIAL AWARENESS, SOCIAL BEHAVIOUR, AND THE DESIGN OR SELECTION OF PHYSICAL SPACE."<sup>3</sup>

07 references:

*Acoustic Design*, TEMPLETON AND SAUNDERS

see Appendix C

*Spaces Speak, are you Listening? Experiencing Aural Architecture*, BARRY BLESSER and LINDA-RUTH SALTER

see Appendix D

*Sound Advice*, PROF. O. PRICE-LEWIS.

see Appendix E

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<sup>3</sup> *Spaces Speak, are you Listening? Experiencing Aural Architecture*, BARRY BLESSER and LINDA-RUTH SALTER, p56

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial statements and for providing a clear audit trail. The second part of the document focuses on the role of the auditor in verifying the accuracy of these records and in providing an independent opinion on the financial statements.

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# context + site choos

026





- 1 new site
- 2 salt river market
- 3 salt river train station
- 4 old biscuit mill
- 5 ctsb

#### Cape Town Society for the Blind:

My investigation began at the CTSB, based in Salt River and one of the biggest problems that blind and visually impaired people encounter in their navigation through a city is inconsistency or constant change of venue. This is due to their reliance on memory. Therefore, it is important to keep movement patterns as constant and familiar as possible. It is important to remember here, no matter how obvious, blind and visually impaired people cannot drive and their independent movement through the city is affected substantially. The location of my site then would be along the same movement route as is used by members of the society currently. The pedestrian route from Salt River Train Station to the CTSB is well understood among the community, and keeping this consistent became an interesting aspect in the choosing of the site for their new building.

salt river

see diagram 004.1.

I traced the route myself and was horrified at the dangerous Salt River circle that needed to be navigated en-route to the CTSB. Keeping in mind the dangers of crossing roads as a blind person, I tried to minimise the amount of crossings necessary.

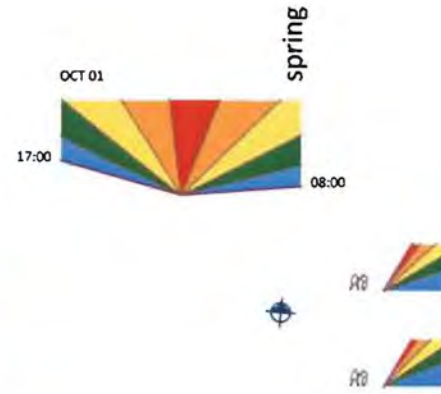
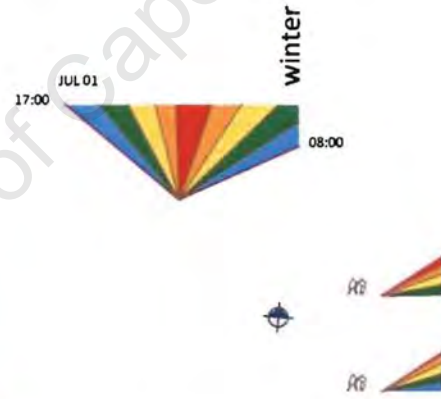
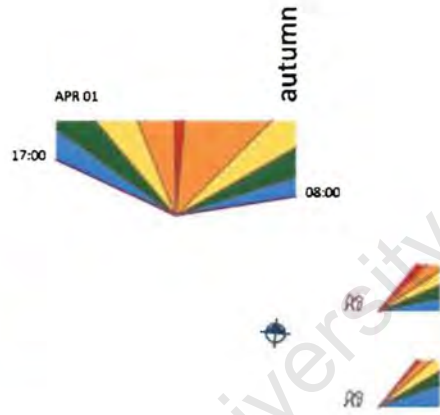
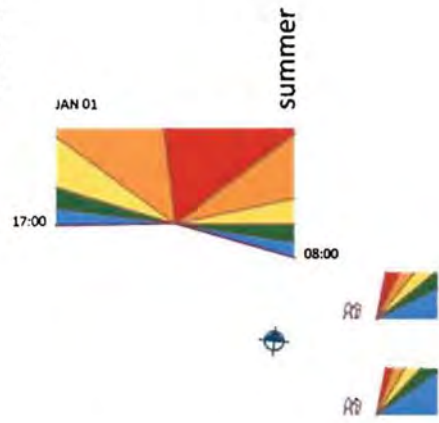








032



004.5



004.2



004.3



004.4

I discovered an open site adjacent to the Locomotive Hotel on Salt River Circle. This site was approximately 600m<sup>2</sup> and provided an opportunity for realistic development.

See diagrams 003.2 - 4.

Moving the society closer to Lower Main Road was important to attract as much external involvement as possible: for general interest and awareness, and from a capital generation prospect.

The regeneration of the surrounding area through strong gentrification would give the new building for the society good opportunity to be part of the second phase of the city as Cape Town's business district extends. Surrounded by important nodes such as the Old Biscuit Mill, the Salt River Market and the busy Salt River train station, there is potential for the site to become part of a new and exciting urban condition.

The new site fell inside a heritage zone, eliminating risk of development of the northern boundary neighbours - The Locomotive Hotel. This was an important element as, in an area on the verge of mass regeneration, the risk of neighbouring buildings soaring to their maximum bulk and subsequently affecting light and ventilation to your site is a harsh reality.

See diagram 003.5 for sun angles throughout the year.

ERF 165487

zoning: C2 [General Commercial 3]

setbacks: g,1, 2 = 0m; other storeys = 4.5m

bulk factor: 3.7

habit room fac.: 34

height restriction: 7

area: Approximately 600m<sup>2</sup>. North and South boundaries are 30m in length, and East and West boundaries are 20m.

access: The site is blinkered - typical to the area - and so, has two access points: Durham Avenue, a busy and noisy street and would act as the main pedestrian entry point; and Perry Street, a much more private street, seldom used for pedestrian or vehicular access.

orientation: North boundary is shared with the heritage act protected Locomotive Hotel, which is approximately 12m in height. Morning East light will be blocked during the first hours due to a commercial block standing at approximately 16m in height, but on the opposite side of Perry Street.

other: The site is on a very gentle slope, running up from the north corner to the south corner, and rising approximately 1m over that 20m span.

relevant appendix:

Appendix F: Heritage Map; Zoning Map; Heritage Resources Section - Districts A & D. [Locomotive Hotel specifically]; Council Regulations and Restrictions.

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DEPARTMENT OF COMMUNICATIONS  
COMMUNICATIONS ENGINEERING

1. The following is a list of the names of the members of the committee that was appointed to investigate the matter mentioned in the title of this report.

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# accommodation schedule

036

existing:

005.1

	m <sup>2</sup>	notes	
<b>general admin</b>	<b>64m<sup>2</sup></b>		<b>notes:</b>
ceo	12m <sup>2</sup>		> it makes sense to group functions into zones: 01 general admin; 02 training; 03 workshops + work zones; 04 public realm (café/showroom); and 05 office space to let.
ceo's pa	12m <sup>2</sup>		
finance department	20m <sup>2</sup>		
fundraising team	20m <sup>2</sup>		
shared kitchen	24m <sup>2</sup>	small kitchen used for basic foods; microwave and kettle	
<b>training admin</b>	<b>116m<sup>2</sup></b>		> many of the functions below can be condensed and arranged in a more practical manner allowing for same programme using less m <sup>2</sup> .
head of training	12m <sup>2</sup>		> different programme has different lighting requirements, as light is coming from above alone, zones which require more light will be located at the top of the building.
[range]	36m <sup>2</sup>	3 separate 12m <sup>2</sup> offices	
trainers	20m <sup>2</sup>	2 people in the same office	
social worker + placement officer	24m <sup>2</sup>		
shared meeting space	24m <sup>2</sup>	the shared meeting space and the volunteer space could be the same space	
volunteer team space			
<b>computer labs</b>	<b>165m<sup>2</sup></b>		<b>order of light requirements:</b>
computer lab 01	49m <sup>2</sup>	lab 01 = blind people training; lab 02 = visually impaired people training	[sighted occupants]
computer lab 02	49m <sup>2</sup>	> specialised lighting conditions? possibly differing layout	<b>01 office space to let</b>
office	12m <sup>2</sup>	direct connection to lab 01 and 02	<b>02 general admin</b>
store	6m <sup>2</sup>	[as above]	[vip + non-sighted occupants]
media centre	49m <sup>2</sup>	at the moment this centre is for hire and is used for individual internet work. (it <u>not</u> needs light)	<b>03 workshops + work zones</b>
<b>conference centre</b>	<b>105m<sup>2</sup></b>	graduation ceremonies are held here and miss the opportunity to spill out to an outdoor area	<b>04 training</b>
<b>craft skills centre</b>	<b>116m<sup>2</sup></b>		<b>05 public realm (café/showroom)</b>
care advice	49m <sup>2</sup>	regardless of sight, it would be depressing to sit in an area with no light for a long period	
cloth weave	49m <sup>2</sup>	[as above]	> this logic will help order the building: office space to let will be placed on the top floor; general admin will be below; workshops and training section will be below that; and the public realm will be at the bottom enabling strongest design with light and the contrast it can create.
office	12m <sup>2</sup>		> do not forget <b>appropriate sized ablutions</b> for public level AND workshops.
store	6m <sup>2</sup>		
<b>shared kitchen</b>	<b>73m<sup>2</sup></b>		
kitchen	24m <sup>2</sup>		
dining area	49m <sup>2</sup>		
<b>office space for hire</b>	<b>147m<sup>2</sup></b>	as much as possible, proves to be good continual income	
<b>workshop</b>	<b>378m<sup>2</sup></b>	natural light important for areas that are occupied for long periods	
main workshop	280m <sup>2</sup>		

Initially I planned to make this building's program a business generator for the blind and VIP community, providing a stepping stone for the graduates of the CTSB. I later realized the society is working in a completely retrofitted environment, inappropriate to the needs of blind and VIP. Their current location is not helping them work efficiently at all and is not encouraging a good work environment.

The society needed a new facility that would: streamline their efforts to create economic independence for their members; and make their presence felt to encourage investment and interest. Additionally this building should be a celebration of a sensory experience in space.

Diagram 005.1 shows my careful study of the CTSB's current facilities and their relative sizes. In diagram 005.2, I began to digest the information, and begin to adapt it with the help of the head of the training department, Quinton.

In an effort to make the most logical of layouts, as is recommended for blind and VIP occupants, I began to order the spaces into 'zones'. The logical grouping of spaces would assist with the orientation of the occupants, already improving their current situation.

I grouped these zones again to allow for their distribution throughout the building: group 1, 2 and 3 were situated together as the first point of contact with a visitor.

See diagram 005.3 + .4

Work set-up for the general administration and training administration departments were reconfigured into an open plan office encouraging a more team orientated working environment. In their current location, these departments are separated into separate offices as a result of the building's design. The CEO still has a separate space and there are two new meeting areas within each department for meetings and private discussions.

The current workshop area feels like a sweatshop in decline. There is a significant amount of wasted space in this area and does not aid the feeling of productivity or activity at all. The space is too big.

One of the major problems in this building is that it has members that have become stagnant in an easy, comfortable environment and are rotting in the depths of their building. One of the main emphases that the new building would have is the reintegration of blind and VIP in society. The building would have to be smaller to encourage the movement of people through the building from trainees to economically independent members of the community. The workshop area that I have de-

veloped subsequently, will act as a training workshop encouraging the fully qualified members to set out to develop new premises for private business, and allow for new trainees to begin to develop new skills.

I decided that accommodation should be added, as through discussions with Interviewee Bashir, I realized that travelling around the country for a blind or VIP was extremely difficult. They would have to find new accommodation every time they travelled and, as they are very reliant on memory, this constant change would be disorientating. I decided, therefore, that to encourage economic independence and freedom of inter-city movement of the blind community, temporary accommodation at this central location would be key.

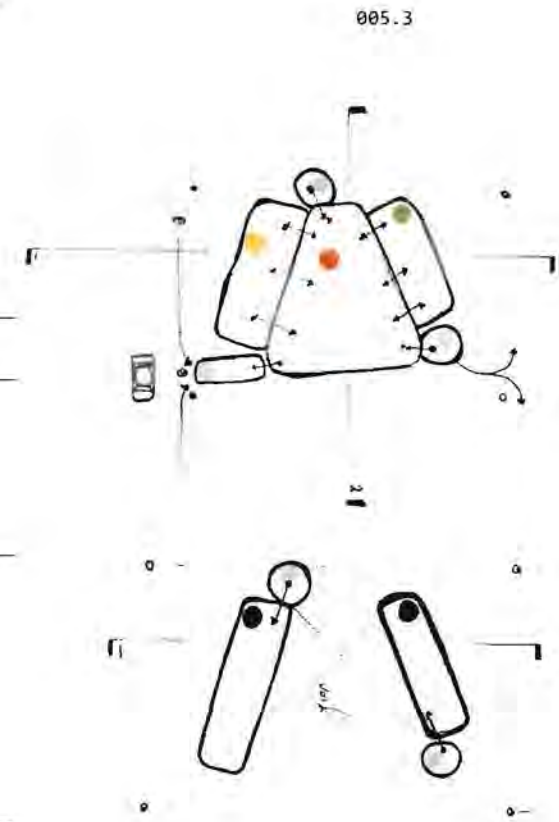
Subsequently, 6 small accommodation units were added to this program. They would be identical as to allow for familiarity upon a return visit, and would be comfortable with facilities to cook. However, they would be tight in an effort to make them temporary and short-term, acting as a landing pad for travelling blind and VIP rather than providing a long term solution.

finishing workshop	49m <sup>2</sup>	
store	49m <sup>2</sup>	
<b>showroom</b>	<b>200m<sup>2</sup></b>	at the moment, separated from workshop and café: should be connected
<b>cafe45</b>	<b>120m<sup>2</sup></b>	including kitchen and all seating space
<b>total existing</b>	<b>1484m<sup>2</sup></b>	
<b>new:</b>		
<b>01 performance   atrium space</b>	<b>±200m<sup>2</sup></b>	this area will be a multipurpose space used as a shared outdoor space which will link the main conference room and the bistro   café and add a much needed space for events and music performance.
<b>02 office space to let</b>	<b>±200m<sup>2</sup></b>	this can be located on the top floors where the condition of lateral openings changes for sighted occupants. roof area, with light chimneys forming and articulating of the spaces.
<b>03 seminar   meeting room</b>	<b>49m<sup>2</sup></b>	this space would be used for business meetings and training seminars
<b>Total NEW</b>	<b>±450m<sup>2</sup></b>	
<b>overall TOTAL</b>	<b>1934m<sup>2</sup></b>	
<b>&gt;&gt; SITE</b>	<b>600m<sup>2</sup></b>	ground floor
	<b>2220m<sup>2</sup></b>	maximum allowed on site [7 storey height restriction and bulk factor of 3.7]

038

## ordering of new spaces:

zone 01:		atrium
zone 02:		café   bistro
zone 03:		conference centre
zone 04:	workshop   showroom	
zone 05:		training   admin

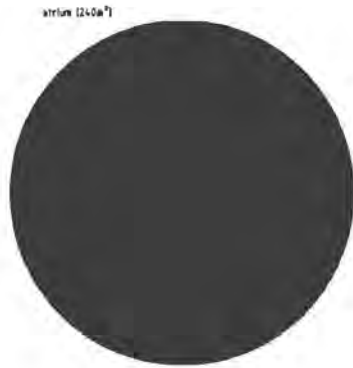


## new schedule:

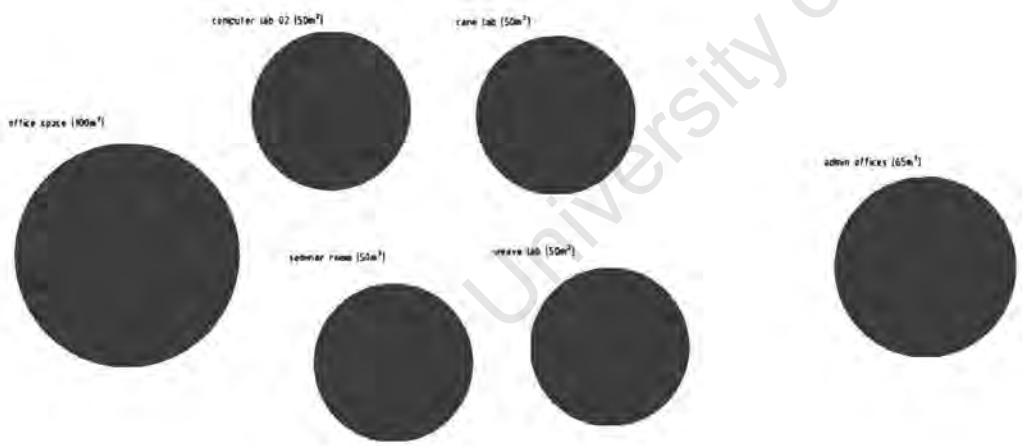
	m <sup>2</sup>	[existing]	notes	notes:
<b>Zone04</b>	<b>400m<sup>2</sup></b>			<b>main ablutions calc.</b>
workshop > cane > weave > product completion	250m <sup>2</sup> 50m <sup>2</sup>	378m <sup>2</sup>	I found that the existing space was too large and was underutilised. If the space was more carefully designed, far more could happen in a far better environment. Natural light is important as people will be spending a large amount of time in this space.	work out how many people could fit in café + conference room. this will determine the m <sup>2</sup> of the abluion facilities.
> office computer lab 01 ablutions	25m <sup>2</sup> 50m <sup>2</sup> 15m <sup>2</sup>		dark conditions as it is on a floor of its own, separate ablutions will be necessary.	120m <sup>2</sup> - 20% [kitchen] = 96m <sup>2</sup> 96m <sup>2</sup> - 15% [circulation] = 81m <sup>2</sup> of seating
delivery pick up store	30m <sup>2</sup> 30m <sup>2</sup>		Adjacent to perry street, lockable storage and easy vehicular access.	<u>rule of thumb: 1.5m<sup>2</sup> per person</u> 81 / 1.5 = 54 people! male: 2 urinals; 1 WC; 3 basins [12m <sup>2</sup> ] female: 3 WC; 3 basins [12m <sup>2</sup> ] disabled: 1 WC; 1 basin [4m <sup>2</sup> ] total: 28m <sup>2</sup> [convert to <b>30m<sup>2</sup></b> ]
<b>Zone 01+02+03</b>	<b>600m<sup>2</sup></b>			> then, 600m <sup>2</sup> - [01+02+03+05+06] = <u>04 242m<sup>2</sup> [convert to 240m<sup>2</sup>]</u>
café, kitchen + seating area	120m <sup>2</sup>	120m <sup>2</sup>	will double up as a showroom of products with an opportunity for guided tours to the workshop and store. more interactive way of exhibiting products, and help show their general usefulness.	<u>advantages to new programme:</u> 01 more carefully designed space, a building purpose made rather than retro-fitted
conference centre + store room front desk + filing room	100m <sup>2</sup> 20m <sup>2</sup>	105m <sup>2</sup>	this, we agreed, was a good size for the venue. it would be more useful if the space could be made smaller according to function.	02 performance space and heart to help generate funds and locate occupants.
atrium ablutions	240m <sup>2</sup> 30m <sup>2</sup>		much needed performance space which forms heart of the new building [see notes along-side]	03 more useful conference centre to generate additional funds.
06 circulation	90m <sup>2</sup>		rough calculation: 15% of maximum floor area: 600m <sup>2</sup> x 15% = 90m <sup>2</sup>	04 separated zones catagorised
<b>Zone 05</b>	<b>300m<sup>2</sup></b>			
offices cane weaving computer lab 02 seminar room	100m <sup>2</sup> 50m <sup>2</sup> 50m <sup>2</sup> 50m <sup>2</sup> 50m <sup>2</sup>	116m <sup>2</sup> 49m <sup>2</sup> 49m <sup>2</sup> 2x49m <sup>2</sup>	600m <sup>2</sup> - 240m <sup>2</sup> = 360m <sup>2</sup> 360 - 15% = <u>±300m<sup>2</sup></u> Therefore, 150m <sup>2</sup> on each side of the atrium space.	
<b>missing</b>				
general admin	65m <sup>2</sup>		not sure where this should go at the moment	

# 040

zone 01 + 02 + 03



zone 04



zone 05

The diagrams along side represent the relative sizes of each space, helping me quantify them and configure an appropriate layout.

NOTE: Since this exercise, I have reduced the required size of the workshop, and added accommodation to the program.

The accommodation I thought should be linked to zones 4 and 5 to allow for a kind of community feel.

However, as I will discuss in 007 Analysis of Space, I will keep the main circulation routes private to allow for a feeling of privacy and security for the accommodation occupants.

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial statements and for providing a clear audit trail. The second part of the document outlines the various methods used to collect and analyze data, including both qualitative and quantitative techniques. The final part of the document provides a detailed analysis of the results obtained from the study, highlighting the key findings and their implications for practice and policy.

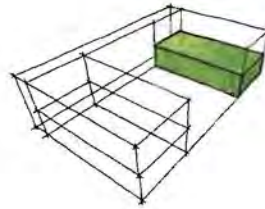
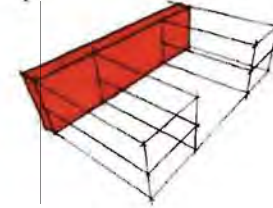
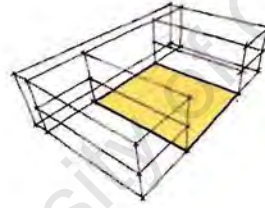
1. Introduction  
2. Literature Review  
3. Methodology  
4. Results  
5. Discussion  
6. Conclusion



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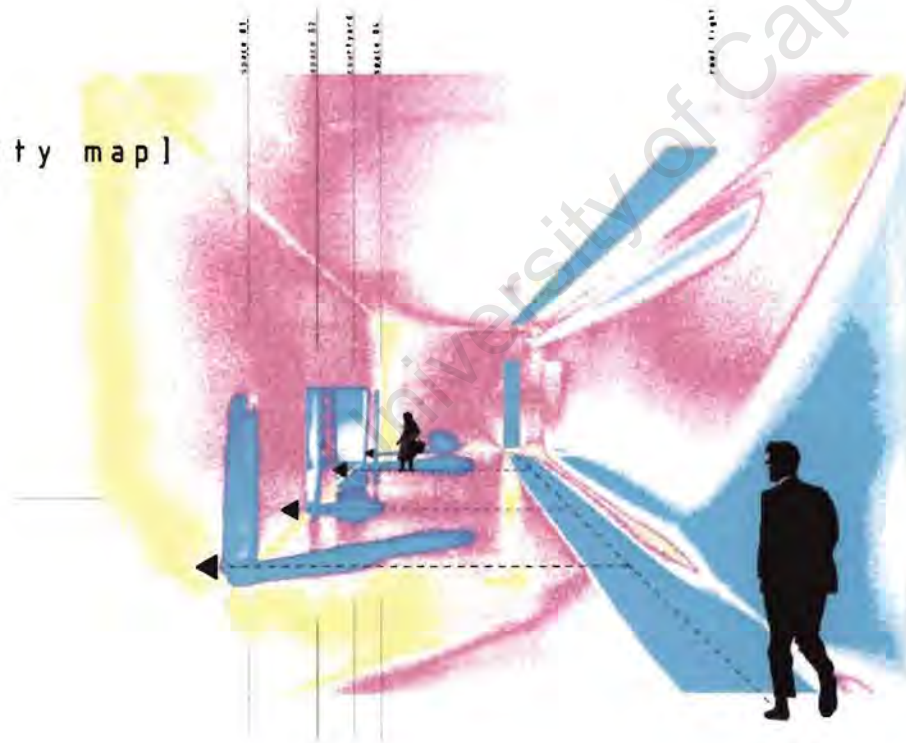
# initial design invest

044



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[radiosity map]



006.2

The beginning of my design explorations looked at the need for a linear movement pattern through the building. To design a more complicated system of movement would result in the blind and visually impaired occupant's disorientation. This principle should be applied in designing movement within spaces as well.

The buildings on either side of the site, on the North and South boundaries, started my thinking that this project should be very internally focused.

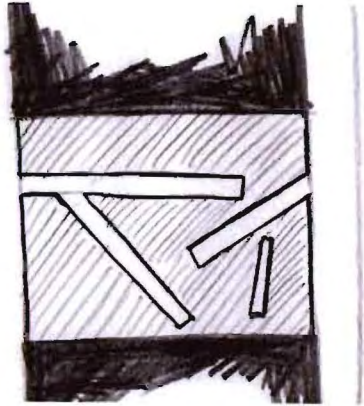
My first sketch design stemmed from these two main ideas as well as a reference to the existing row houses that existed on the site previously. This design allowed for an internal focus, a linear passage of movement as well as a large open courtyard type space in the centre that would act as the 'lung' of the building. Fresh air and a huge amount of natural light could be captured with an open space such as this.

See diagram 006.1.

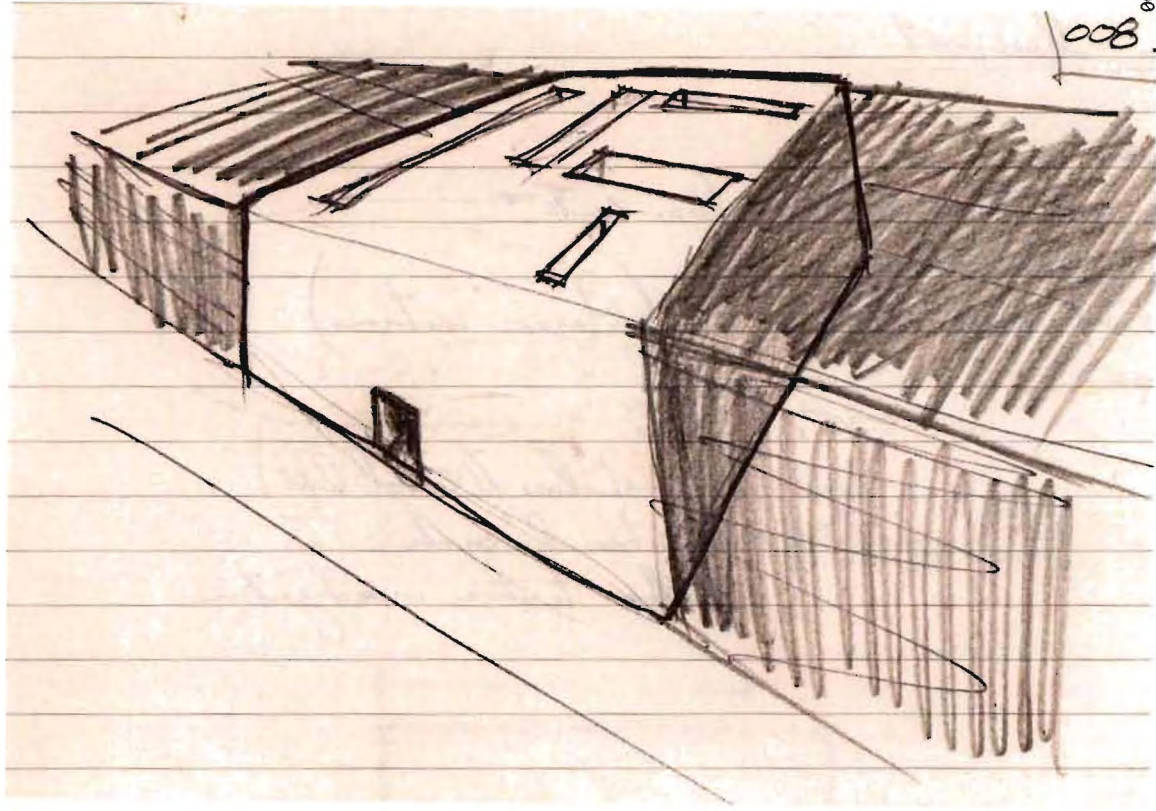
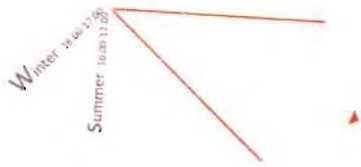
However, these sets of ideas were leading me to a too conventional type of design and I took a few steps back.

One of the many interesting factors I discovered when working with my interviewees was that natural light is more important to visually impaired

006.3



046



006.5

006.4

people that it is for sighted people. According to the aforementioned 'Vision Australian', visually impaired people need up to 2 to 3 times more natural light. Artificial light is disorientating and confusing. Natural light also added an element of sensory stimulation through the sense of touch, so even blind occupants would be able to enjoy it.

Diagram 006.2 is an experiment with light as a navigational tool.

My next sketch design was focused on the movement of light over the site and allowed light to cut through the spaces at different time of the day. This design fell short when I discovered the difference between sun-lighting and day-lighting. Sun-lighting is direct light, whereas day-lighting is diffused, indirect light.

See diagram 006.3 for sketch design based on diagram 006.4 [natural lighting throughout the day averaged on time of year,

I then came up with a concept that would make my building different. A box only punctured at the roof. This idea would allow me to control different kinds of light and quantities thereof to enter the space, as well as exploring a building that is focused internally, doing away with the idea of a view. As blind people cannot enjoy a view and sighted people would be distracted by it and would not as easily be involved in any other sensory

stimuli because of it, I deemed the need for windows unnecessary.

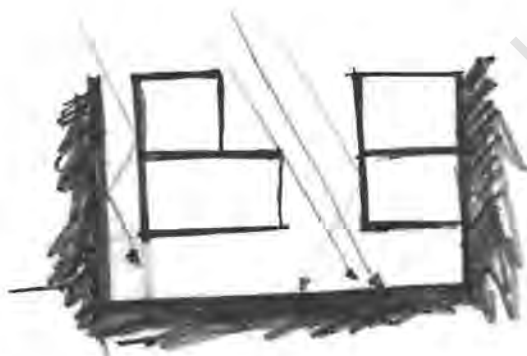
See diagram 006.5.

Today, it seems that sizes and positions of openings are not considered carefully enough, and light in a building is strewn across every space without a thought of individual lighting requirements. These roof lights would be orientated and sized according to the amount and type of day-light that would be required for the type of space that it is servicing.

The layout of spaces was then organized according to a grouping system discussed in 005 Accommodation Scheduling, where the ground floor was given to more public space and the upper floors were saved for more private spaces.

Atriums were cut into the space to allow for generous amounts of day-light to the ground floor. Light chimneys would struggle to provide adequate lighting to some of these areas.

See diagram 006.6.



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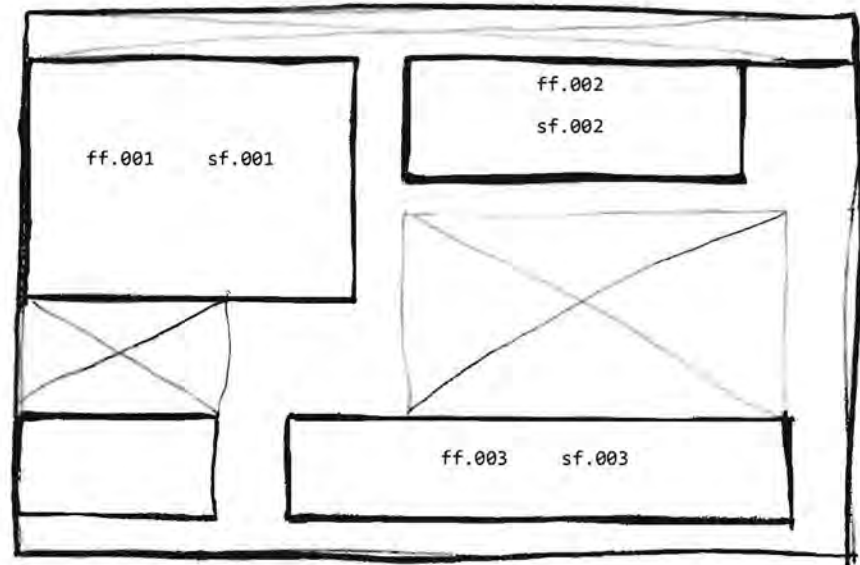
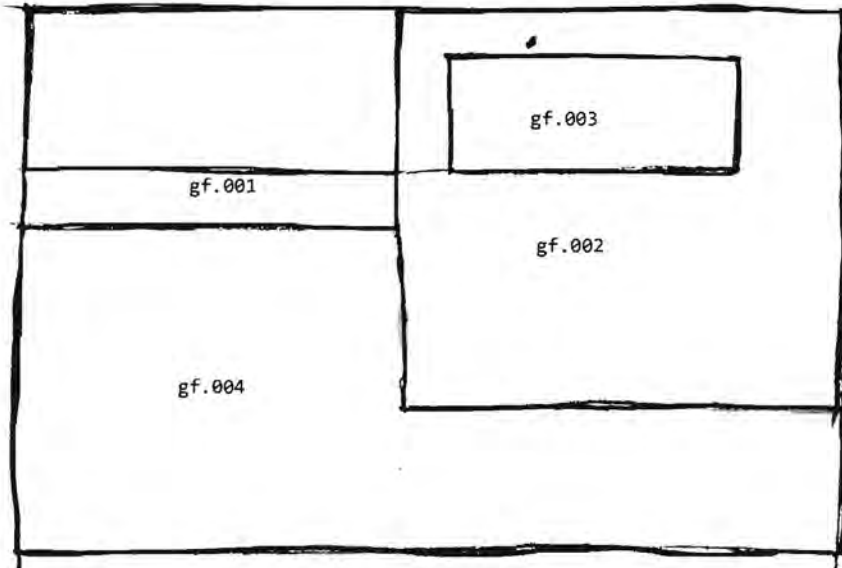
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# analysis of spaces

050



# 007

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The characteristic difference and independence of these spaces is to assist navigation and orientation. The specific character forming of these spaces, through the use of '01 acoustics', '02 texture' and '03 light' would help non-sighted and sighted occupants alike to orientate themselves within the building. Some spaces have key characteristics and will be listed and described through the section '04 other'.

Each key space has been given a code so that they can be easily found on diagram 007.1 and each category can be easily located.

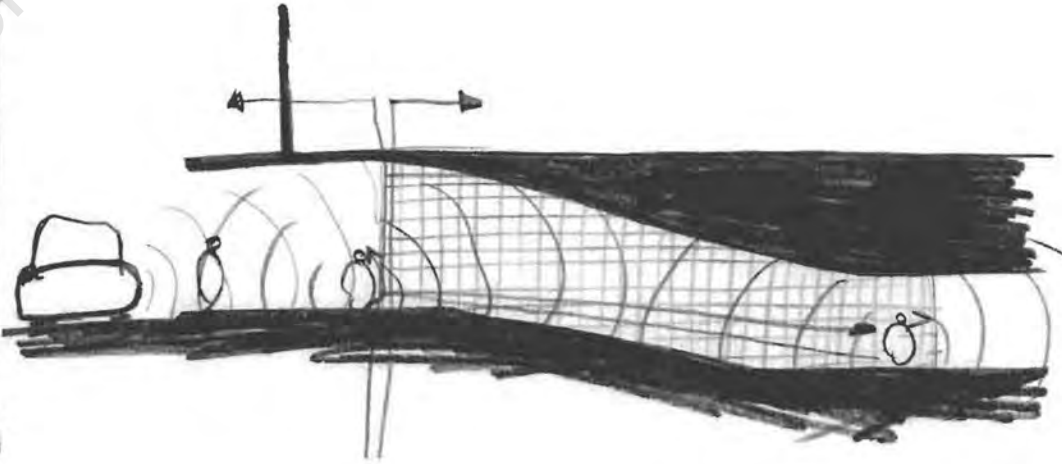
#### key

level: gf [ground floor]; ff [first floor]; sf [second floor]

number: 001, 002, 003 [in order of when would encounter the space]

category: 01 [acoustics]; 02 [texture]; 03 [light]; 04 [other]

eg. gf.001. 01 = is located on the ground floor; is the first space you would encounter; and is being discussed in terms of its acoustics.



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entrance passage = gf.001

See diagrams 007.gf.001.1 - 3

gf.001.01 - Based on what is known as an anechoic chamber, this space serves as a 'cleanser' of the urban noise of Salt River Circle. An anechoic chamber is an unnatural phenomenon where none of the possible 6 sides of your environment reflect sound. This gives the impression that you are suspended in mid-air, and is an uncomfortable place to be, often resulting in uneasiness and even nausea.

As my aim for this space is rather to give a noticeable 'quiet' to the occupant in preparation for their entry to the building and to assist in their unsighted navigation of the space, I have designed only 3 acoustic reflective surfaces (the others are fully absorptive): The entrance door, the exit door, and the floor to generate the sonic event that will be reflected by the other reflective surfaces. The echo of the occupant's footsteps will indicate how far away the next point of access is as it would be a direct sound only. If the other surfaces were reflective, the sound would mix as it reverberates around the space and would be confusing and disorientating.

The absorptive walls and ceiling are based on the design of automobile acoustic testing chambers, comprising a series of projected fibreglass triangles that work to dissipate as much sound as possible.

The end doors are double glazed with large lettering. Partially sighted people do not enjoy glass sliding doors in general as they seem invisible to them. However, in this set up their position would be easy to identify due to the cleanness of sound as well as the large lettering. These doors would be tuned to automatically open earlier than is normal, in case of any possible collision.

gf.001.02 - The materials here are hard and durable, as this is the most public of spaces in the building.

The first difference in texture between the street and the building that the occupant will feel is the floor surface. This surface will be hard and will distribute the sound of footsteps to aid in navigation.

There will be handrails on either side of the passage allowing for easy navigation through the space and protection from the projecting sound absorption. The handrails will be made of a stainless steel, as it reflects the light well making it easier to find for VIP and, although it is hardy and tough, would begin to introduce the quality of the building they are about to enter.

gf.001.03 - The entrance passage will be very dark, making a massive contrast from the glare and brightness of the street. This forms another technique in marking the obvious transition from street to building.

Light from the main atrium | performance space will filter into the end of the passage, as will light from the street at the opposite end.

Additionally, there will be a strip of light running the length of the passage, further assisting the linear movement through the space.

The wall surfaces, ceiling and floor surface are all dark as to emphasise and contrast with the light penetrating the space.

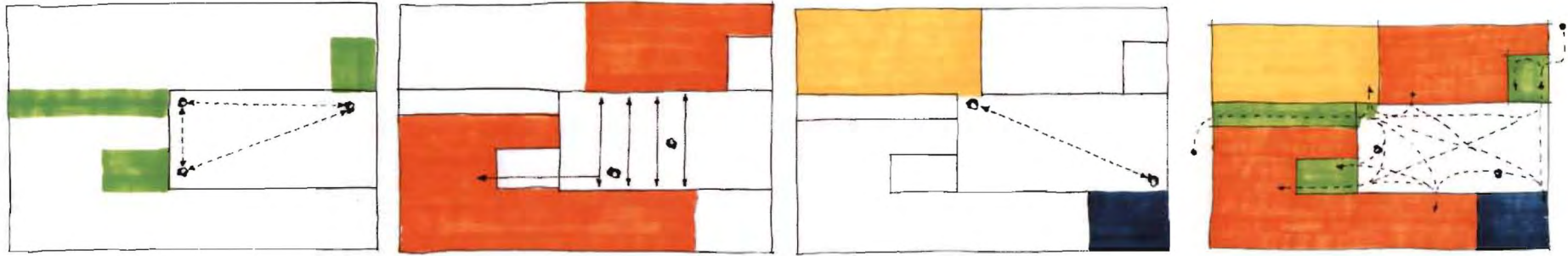
gf.001.04 - An gentle ramp down, at the ratio of 1:12, will further separate the street and the inside of the building and is a useful direction informer to an unsighted person: down means in, up means out.

atrium = gf.002

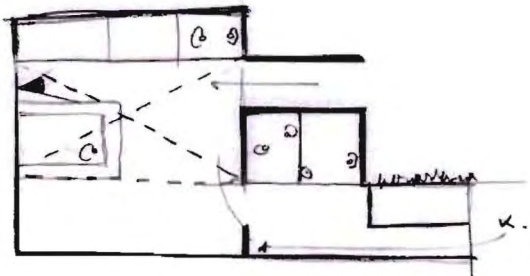
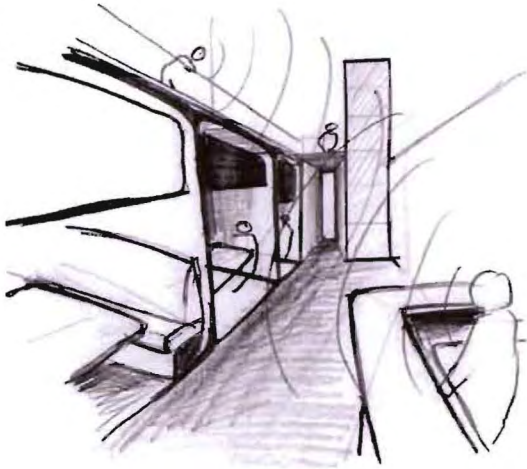
gf.002.01 - This space is important acoustically as it works to carry sound cues from various sources in other parts of the building order to help the navigation of the occupant. Major sound cues such as the café|bistro, the workshop, and the bathrooms are all accessible from this point and will help lead the occupant in the correct direction.

Sound reflection is important in the creation of a 'sound box' type effect. Much like the box of a guitar, sound channelled through a reflective 'box' is exaggerated and illuminated. Sound boxes were created via the use of relatively narrow concrete

054



007.gf.002.1-4



007.gf.003.1-2



007.ff.003.1

corridors that help push sound into the space in a directional manner.

It is important, therefore, that only some of the surfaces are reflective. In this case too much reflectivity will lead to mixing of the sounds and confusion as to the direction of their source.

gf.002.02 - Similar to the materials experienced in gf.001, materials here are hardy. The floor is polished concrete but is broken at crucial and potentially dangerous moments such as the beginning of a set of stairs or a direction change in the circulation design. This 'other' floor area is a rubber in-lay which sounds different and feels different, making it hard to not notice.

As is described in 008 Making and Materialisation, walls are set out in a rectilinear fashion. Walls running along the East - West axis are all made of concrete, whereas walls running along the North - South axis are of varying texture. At this level, the 'other' wall surface is rammed earth. This texture will begin to tell the story of the building as it was dug into the ground and would clearly indicate that it is the ground floor.

gf.002.03 - The entrance passage leads straight into a covered walkway allowing pooled reflected north light to spill gently into the space.

Precast concrete fins act as light reflectors and will diffuse light so that there will be no shadow

patches. This is important to the visually impaired occupant as a heavy contrast such as this in an open space would seem like a solid object.

gf.002.04 - Referring back to my initial research of the 'psychology of space', the idea of 'prospect and refuge' is explored first in this space. The walkway along the space is underneath a cover, but is looking out onto a space of possible 'prospect'. This situation is said to be the most comfortable of spaces for a human being's psychology, and will help ease the occupant into a feeling of safety and opportunity, which the CTSB should be.

Circulation is pushed into this space in order to give it continuous activity. On the levels above, however, circulation is pushed to the perimeter in order to make it private.

See diagrams 007.gf.002.1 - 4

conference centre = gf.003

gf.003.01 - The conference centre is a space that accommodates graduation ceremonies as well as group sessions, all of which are hugely reliant on acoustics designed for speech. Acoustic requirements for speech contrast heavily with requirements for music, as described in more detail in 003 Further Research. It is important that there is adequate sound absorption in the space to nullify reflection of sound which would cause syllables in speech to clash and mix, and result in complete

incomprehensible speech. It is also important to carry sound to the back of the room and so a reflective ceiling panel system has been designed. The floor will be carpeted and the walls will also aid in the absorption of sound. The ceiling on the other hand is made up of reflective panels so that the sound can travel to the back of the room.

Double glazed sliding doors will allow the space to be separated from the rest of the building both physically and acoustically.

gf.003.02 - The conference centre's textural make-up is dictated by the specific sound requirements that it has. As I have mentioned, the floor is carpeted to absorb sound. The side wall adjacent to the atrium is heavily curtained which allows for doors to be fully open or closed. The opposite side and the back wall are clad with sound absorbent panels.

gf003.03 - These absorbent panels are white in colour which would help reflect light into the space if it is required. The only light source is from the atrium, and this can be controlled carefully. The heavy black curtains as I have mentioned allow for total black-out as is required by the society for special functions such as their famous 'dinner in the dark'.

gf003.04 - The ceiling height of this space is important to help generate a sense of volume and to allow depth for sound reflective panels.

## café | bistro = gf.004

gf.004.01 - The café | bistro provides a complex variety of acoustic spaces. As you can see in diagram xx alongside: a. there is a space where the sound of a café is celebrated, and the workshop can be heard from above creating an awareness of the building's 'other' function; b. there is space for intimate conversation with good acoustic specification for speech; and c. there is an area for a closed off 'soundscape', allowing for maximum privacy.

The entrance point of the café includes a centralised coffee and sandwich bar which would illuminate the space with the sounds and smells of a café. The acoustics in this space are meant to celebrate the hustle and bustle of this busy and noisy programme.

Adjacent is a space for intimate conversation where the acoustics are controlled carefully. Through the design of sound absorbent booths and low ceilings conversations can happen easily over the hubbub of the noisy section a.

Behind a double glazed walling system is the private section, designed in contrast to the other spaces for its absolute acoustic privacy, and for the use of predominantly board meetings.

gf.004.02 - The textures of these areas correspond and are dictated by their acoustic character.

Section a. has a large amount of raw and exposed surfaces which reflect a large amount of sound, whereas section b. is enclosed in soft furnishings making up its booths. Section c. is enclosed with glazed walls and the remaining textures give a strong corporate feel, for example, stainless steel handles.

gf004.03 - In section a. there is strong natural light penetration thanks to the double volume space above. Section b. is only receives reflected light, while section c. enjoys filtered light through the staircase and planting on its northern edge.

weave workshop = ff.001

ff.001.01 - Just as the café bistro is connected acoustically to the workshop, so is the workshop connected to the café bistro. The sound of the workshop is meant to be enhanced through the reflection of sound off the concrete walls that encompass it. This sound is controlled through the use of absorbent ceilings so that conversations between workers can happen. It is meant to give a communal feel to encourage a good working environment.

ff.001.02 - As is necessary for any hardy workshop, the floors and walls are tough and durable. The walls are masonry and remind the worker of the idea and importance of craft.

ff001.03 - Light is the most crucial factor in

this space as people would spend their entire day here. It was important for me to introduce a variety of different light types in this space: namely reflected light from the 'light chimney' at the north edge, and strong direct light at the north edge.

computer lab 01 = ff.002

computer lab 02 = sf.002

I have grouped the computer labs as they only differ in terms of their light consideration.

ff.002.01 + sf.002.01 - Due to many classes being held in this space, good acoustic absorption is important to allow for a good speaking environment, as well as a good level of privacy for individual work. The volume of the space will be brought down, low above the computers to allow for this good level of acoustic privacy.

ff.002.02 + sf.002.02 - In accordance with the acoustic requirements of the space, the floor will be carpeted and acoustic ceiling would be used throughout and at varying heights. The walls on the other hand would be masonry to continue the idea of a workshop and training centre.

ff.002.03 - Due to the different lighting preferences of blind and VIP while using a computer, computer lab 01 will be significantly darker, relying almost solely on the illumination of the

computers.

sf.002.03 - Computer lab 02 however would allow for a far greater deal of natural light.

ff.002.04 + sf.002.04 - computers generate a lot of heat and through the use of desk height ventilators, can be used or discarded.

accommodation = ff.003

ff.003.01 - Largely due to the blind and VIP sense of vulnerability, the accommodation units are designed in a way that will give them a sense of security. They will be heavily separated acoustically, and sounds from the rest of the building will not penetrate these private spaces. The acoustic absorbers of these spaces will be hidden in a complex timber wall structure, and the only opening to the rest of the building is a long, thin ventilation window that is set deep in the wall.

ff.003.02 - Here the textures become far more domestic. The deep cavity concrete wall, designed to transmit heat or coolth from the ventilation system, will be wrapped in carpet and the remaining walls are all timber. The floor is a suspended timber floor system and a carpet marking the 'sleeping zone' is provided.

ff.003.03 - Light to the accommodation spaces is provided via smaller light chimneys running along the North-South axis allowing for reflected

morning and evening light, as these spaces will be used predominantly at these times. Light from these chimneys will pool at the kitchen units and bathroom and would be on the opposite side of the room from the door assisting in movement from one side to the other.

ff.003.04 - These units are long and narrow providing the easiest space to navigate for blind and VIP's. They are all identical in order for easy and familiar use during a second visit, repeating the idea that non-sighted people are reliant on memory.

As will be described in 009 Ventilation Strategy, the temperature of the accommodation units will be regulated via the northern wall. This wall is made up of a thermal mass rock store encasing the heat coil of the ground heat pump. One could expect the temperature of the room to be different the rest of the building due to heat or coolth radiation from the thermal walls.

training administration department = sf.001

The training administration department provides office and meeting space for the trainers who are made up of sighted and non-sighted people.

sf.001.01 - The acoustics of this space are important to consider as there will be 6 people sharing the same space. Here I have played with total absorption, minimum reflection. This will enable

telephone calls and other conversations to happen simultaneously helping to create a hub of activity without it being too intrusive. A similar method of sound absorption as can be seen in gf.001 with the use of aggregated wall surfaces to help dissipate sound.

sf.001.02 - The textures of this space are influenced by the acoustic design of the space where the walls and ceilings are designed to break up sound. However, the timber floor of the circulation area is continued into this space to help provide a warm and natural feel.

sf.001.03 - As this space is at the top floor of the building natural lighting from above becomes very easy to achieve. To help connect sighted people to the outside world visually, the roof over this area will be largely glass with reflecting fins to create a very bright workspace.

Designing these spaces to be full of their own character dictated by their function is something that I found to be a new and interesting part of the process of architectural design. Even though these spaces are different, they are tied together in a unified design via the same basic principles: diffused, day-light from above [light], language of material variance and progression [texture], and the acoustic language developed to assist navigate and orientate occupants [sound].

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It is essential to ensure that all data is entered correctly and consistently.

3. Regular audits should be conducted to verify the accuracy of the information.

4. The second section covers the various methods used for data collection and analysis.

5. These methods include surveys, interviews, and focus groups.

6. Each method has its own strengths and weaknesses, and should be chosen based on the specific needs of the study.

7. The third part of the document provides a detailed overview of the data analysis process.

8. This includes identifying patterns, trends, and correlations within the data.

9. Statistical tools and software are often used to facilitate this process.

10. Finally, the document concludes with a summary of the key findings and recommendations.

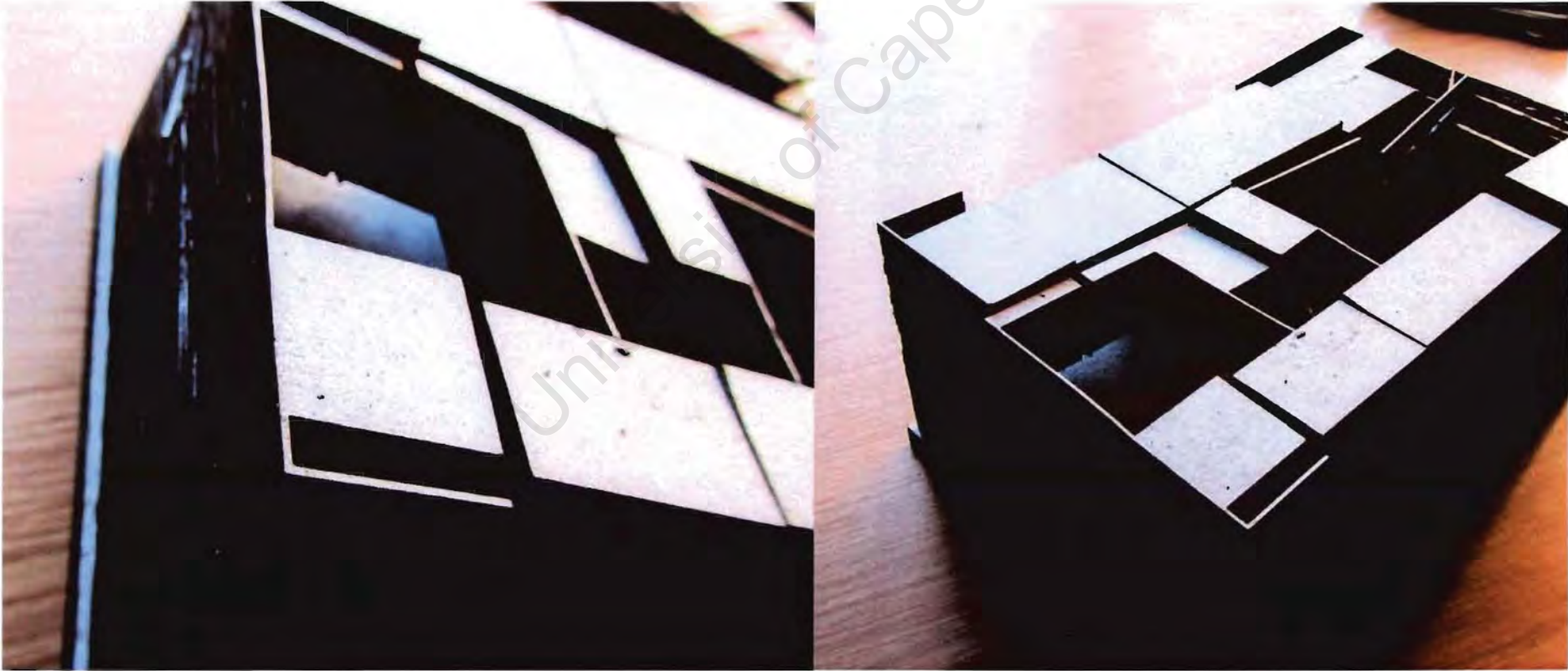


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# materialisation + ma

060



008.1

#### design influences

My initial concept of a 'box, punctured only in the roof' began to direct my first ideas of how this building would be made: a solid block that has been carved into to create spaces. See diagram 008.1.

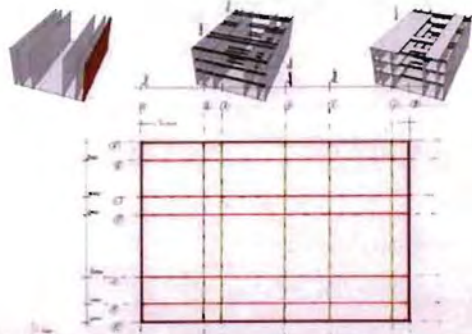
This idea, as I have discussed in 006 Initial Design Investigation, spoke about some of the specific requirements that a blind and visually impaired occupant would introduce, ensuring the unconventional and unique nature of this architecture.

- a. Blind and VIP have no need for a view.
- b. Blind and VIP prefer linear spaces.
- c. Blind and VIP's need for natural light is two to three times as great as sighted people.
- d. However, this light needs to be diffused. Direct light casts shadows and shadows become disorientation and confusing.

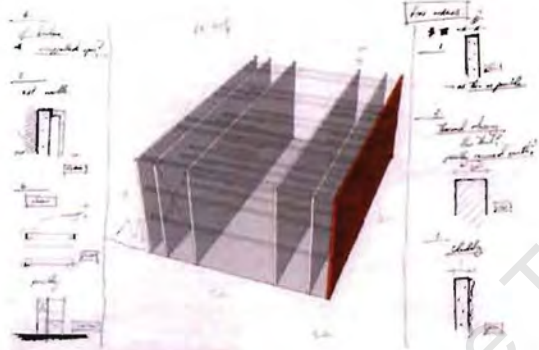
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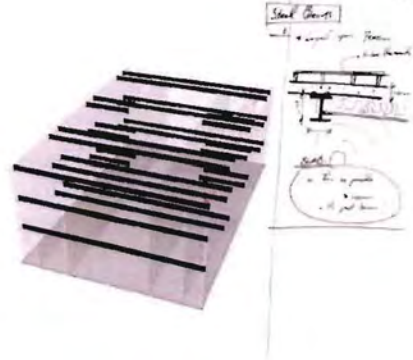
008.2



008.3



008.4



008.5

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- e. Clean, unconfused 'soundscaping' is crucial for Blind and VIP's navigation and orientation in space. Thus, noise from the street needed to be cut out, and spaces needed to be acoustically separated.

The site introduced some restrictions and requirements of its own. As described in 004 Context and Site Choosing.

- a. Salt River circle is a very noisy environment.
- b. It is blinkered and only has accessible edges on the east and west boundaries.
- c. Its north edge will not change in the midst of the gentrification of the area as it is adjacent to an important heritage site, allowing for a design that could actually rely on north light.

My initial design sketches based on these factors lead me to a much lighter structure than I originally anticipated and I began to notice a consistency in my design of thin, fin-like walls running along the site from east to west, punctured as movement was required through them. These fins began as a result of both a linear circulation system,

and a system of light and ventilation chimneys - this orientation offering greatest opportunity to reflect north light into the space.

My sketches began to look like a 'stack of cards' instead of a 'carved out block'. See diagram 008.2.

Additionally, a consistency in both the axis and materiality of these 'fins' would aid as an orientation device to the occupants. Immediately, upon touching them, the direction of their movement would be confirmed.

#### structure

See diagrams 008.3 - 5, meeting with structural engineer, Brian Richardson. 008.3 = establishment of structural grid; 008.4 = rationalisation of concrete fin structure: 200mm thick concrete walls; addition of structural 'I' beams: 254 x 146mm.

It began to make sense that the 'fins' became the real structure of the building, leading to my decision to construct them with concrete. The use of columns was not an option as they become dangerous obstacles for blind and visually impaired people, and a punctured wall posed a much more predictable and safe option.

Applied here, concrete is useful as:

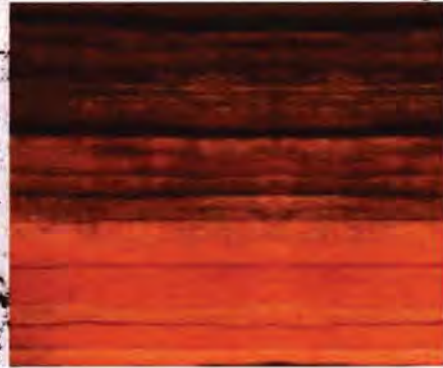
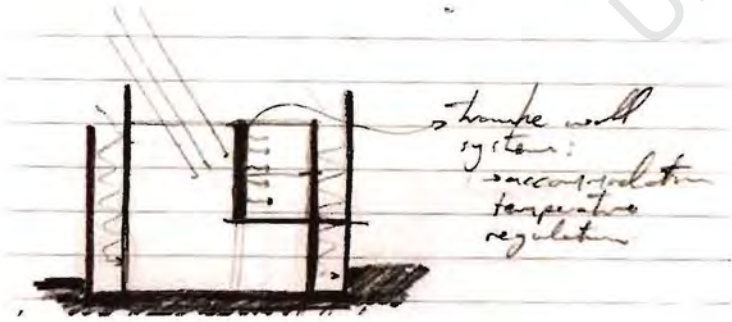
- a. it reflects light well. Running along the east - west axis allows for the maximum amount of reflected north light capturing. See diagram 008.6.
- b. it reflects sound well. In the articulation of the internal soundscape of the building, reflective surfaces are as important as absorptive surfaces.
- c. it would allow me freedom in the selection of the walls running along the perpendicular axis as they would not need to be structural.

Shear forces along the east - west axis would be countered via concrete end walls.

As concrete is a fairly cold and uninteresting material to the touch - and, in this case, would only tell the story of how the building stands up - the selection of the other materials needed to tell a different story.

The loads of the floors and the connection between the fin walls would be made via Steel 'I' beams. These elements offered an opportunity for the fixing of acoustic paneling as well as the location

008.6



008.7

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Delft

of artificial lighting that would reflect upwards and give diffused light to the space below.

The combination of steel, concrete, suspended ceiling, as well as timber floorboards offered an easier package to modify and control the levels of sound and reverberation transferred through the structure.

material selection

See diagram 008.7.

In agreement with my Technical Document of the first semester of this year, materiality would be a crucial component within this building. The sense of touch would be celebrated with my careful selection and application of materials.

It was important for me not to hide, clad or even treat any surface that may be touched. The reason for this was that the story and the truth of the building should be told via the sense of touch, backing a Modernist idea of 'truth to materials'. This was first explained in this project in the application of concrete as a structural component due to our universal understanding of its structural properties.

In my technical document I spoke about how natural materials and hand-crafted surfaces can connect people to a building. To the touch, natural materials remind people of their own sense of being in

the real world [described by Japanese theory and discussed in 003 Further Research], and handcrafted materials offer an understanding of the process of making. Both needed to be considered and included in an effort to enhance the connection of occupant and building.

Walls running North to South, now free from structural responsibility, could, in their variations, begin to explain the spaces that they enclosed.

On the ground floor - cut about a meter into the site - rammed earth walls would be used. Rammed earth walls offer fantastic sound and temperature insulation and have an interesting and unique texture. This material, as it is heavy and awkward to construct, especially on upper floors, and would effectively speak about how this building was cut into the ground, would only be used on this level. This would make for a clear signal to the non-sighted occupant as to their location within the building.

On the first and second floors masonry walls would be used in the workshop and training areas, and a heavily insulated timber walling system would be used for the accommodation units. The obvious textural difference and our inherent understanding of each of their material properties would assist in the occupant's orientation.

Handcraft and workmanship would be emphasized through the use of thin 50mm paver bricks in the

masonry walls, and acoustics would be improved through a double skinned design with an insulated cavity. The solidity that these walls would also allow for the mounting of heavy shelving needed in this workshop environment.

The idea of handcraft would be celebrated again in the design of the timber walls. Timber offers a very different feel in its materiality in comparison to masonry. It is far warmer and has a more domestic feel due to its lesser durability.

Additionally to wall surface, floor surfaces and handrails would be touched by the occupant and so, would change much like the system of wall surfaces: as one enters a more private area, so the surfaces would become more domestic; and as materials needed to be hard wearing, so the material became more hardy.

In addition to this TGSI [Tactile Ground Surface Indicators] were used to demarcate hazards such as level changes or direction changes. These surfaces are a rubber inlay which, as well as being an obvious texture difference, also has a very different sound quality, making them extremely hard to ignore.

The use of 'raw' materials is a testimony towards **Kevin Nate's Place, Time and Being in Japanese Architecture**. A sense of place translated through the use of soil from the site; and a sense of being through the expression of the timber.

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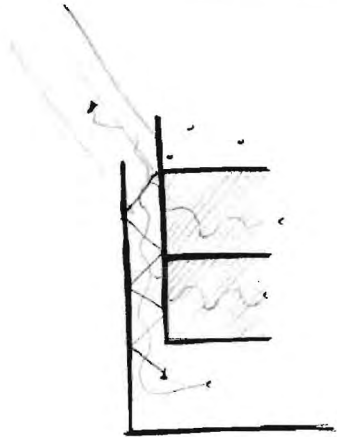


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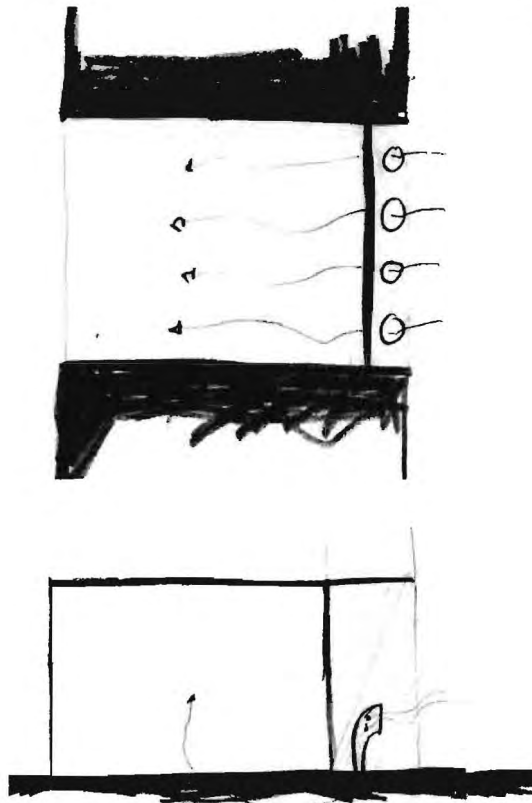


# ventilation + temp.

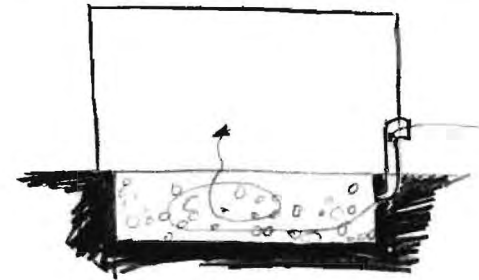
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009.1

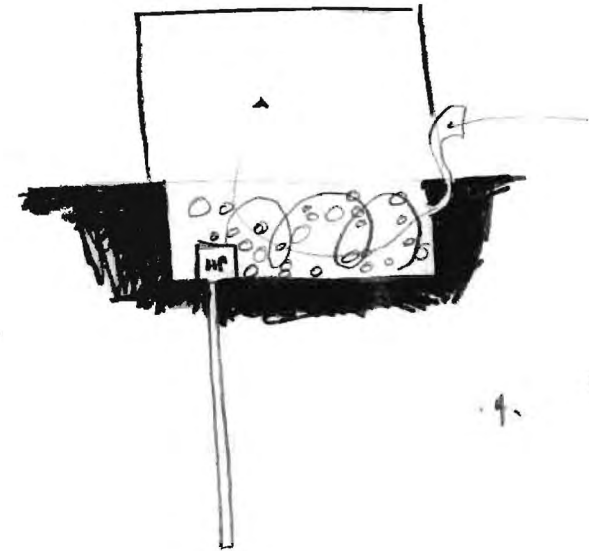


009.3



3

009.4



009.5

009.2

009.1

009.2

An inherited complication to opening a building only at its roof is ventilation. Without careful design, air within the space would not circulate and would become stale.

Through my initial design sketches, I began to develop the idea of ventilation and light chimneys. These would be housed within the concrete fins of the exterior sections of the design and would work passively to draw air up and through the space.

See [diagram 009.1](#).

air out

To make use of the Stack Effect I needed to ensure that I was creating a negative pressure pocket of air through its heating and rising. However, I could further assist the drive of the system through the use of Cape Town's significant wind factor via the design and application of wind cowls, see [diagram 009.2](#).

This dual system would ensure that air would be pulled through my building at all times of the day. However, this introduced the next complication and that is where the fresh air would be drawn from?

air in

As the system relied on movement of air from the bottom to the top of the building, I would need to draw air from the bottom. Durham Avenue has significant traffic and air from this road would be far from fresh. My other option was the Perry Street side. Perry Street is a largely unused road and is used twice a day by traffic as workers of the block behind arrive in the morning and leave in the evening. This side of the building is largely in shade and would allow for cool air to be brought in during the summer months.

See [diagram 009.3](#).

temperature regulation

So, I began to realise that control of the ventilation of this building offered an opportunity to control its temperature. The air temperature brought directly from outside of the building needed to be moderated, and a 'rock store' provided a passive method of this moderation. Air would be brought in from Perry Street and would pass over the rocks which retain, through their thermal massing, the consistent ground temperature.

See [diagram 009.4](#).

After the outside air had been moderated it could then be heated or cooled using a Ground Heat Pump System. These systems, although they run on elec-

tricity, are extremely efficient creating 5kw/h of energy for every 1kw/h it requires. This system would circulate water through piping that would wrap around the rocks of the 'rock store', controlling their temperature.

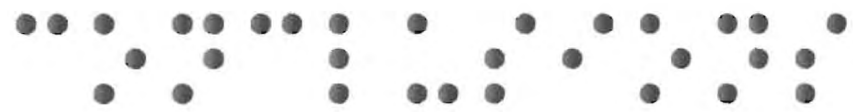
See [diagram 009.5](#).

This fresh and now temperature engineered air would be allowed to enter the space through ventilation slot in the main atrium space.

This coil of piping would run up the structural walls of the accommodation units and would radiate either warmth or coolth, depending on the requirement, through the massing of the unit's northern walls.

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# conclusions

072

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## conclusion

The research aspect of this project was incredibly interesting as it touched on many different spheres: psychology; the human body and its senses; ideas from Japanese architecture suggesting simple truths in what would connect occupant and building; specifics of what it is like to experience space without the distracting and oversimplifying sense of sight; acoustics and echo-location; materiality and the importance texture; and even the technical resolution of a building only open at the sky.

I feel that I have designed a building that will make that crucial connection between occupant and building once again. Through a language of material progression and variation as well as a system of circulation and acoustics, I have created a space that sighted people could navigate blindfolded. I think principles from this project can and should be carried to my future designs ensuring a good standard of space designed for people.

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1. The first part of the document discusses the importance of understanding the needs of the community. It highlights the role of the university in providing relevant education and research that addresses these needs. The text emphasizes the need for a holistic approach that considers social, economic, and environmental factors.

2. The second part of the document focuses on the role of the university in promoting social justice and equality. It discusses the importance of providing access to education for all, regardless of their background or financial status. The text also highlights the need for the university to be a center for research and innovation that addresses the challenges of the community.

3. The third part of the document discusses the role of the university in promoting sustainable development. It highlights the importance of research and innovation that addresses the challenges of the environment and the need for a sustainable future. The text also discusses the role of the university in promoting social and economic development.

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## glossary

*Acoustic Arena*

A region where people are part of a community that share the ability to hear a sonic event. It is also the experience of a social spatiality, where a listener is connected to the sound-producing activities of other individuals.

*Acoustic Horizon heard.*

The maximum distance between listener and source where the sonic event can still be

*Anechoic Chamber*

[ ... ] is relatively large, approx. 2000m<sup>3</sup>. Its 6 surfaces are covered with fibre-glass wedges up to a meter in length and it has a wire mesh floor. It is unique as any other environment would have at least one side that is reflective of sound to some degree. It often gives a strange feeling of pressure and discomfort, and sometime nausea. You become aware of the beating of your heart and your breathing.

*AW*

Andrew Wade

*CTSB*

Cape Town Society for the Blind

*Diffuser*

Panels that work to break up or dissipate sound.

*Directional sound*

Sound that is only be heard from source, no reflected sound.

*Experiential Region*

Background noise is a virtual boundary in acoustics. We will only hear a conversation that is above this said boundary. therefore, the level that is beyond the virtual boundary is the experiential region.

*MS*

Michele Sandilands of MSa

*MSa*

Michele Sandilands Architects

<i>Passive acoustic object</i>	We can identify characteristics of the object in space due to its influence on sound reflection
<i>Reflector</i>	Usually large sheets of impervious materials, flat or curved. to reflect successfully, their smallest dimension must be greater than half a wavelength of the sound.
<i>Sonic event</i>	The making of a sound, for example a clap.
<i>Sonic perception</i>	Reflected of the sound.
<i>Soundscape</i>	A mixture of aural architecture and sound sources
<i>Surround sound</i>	Reflective wall surfaces, so sound bounces of all of them.
<i>POA</i>	Plan of action
<i>VIP</i>	Visually impaired person

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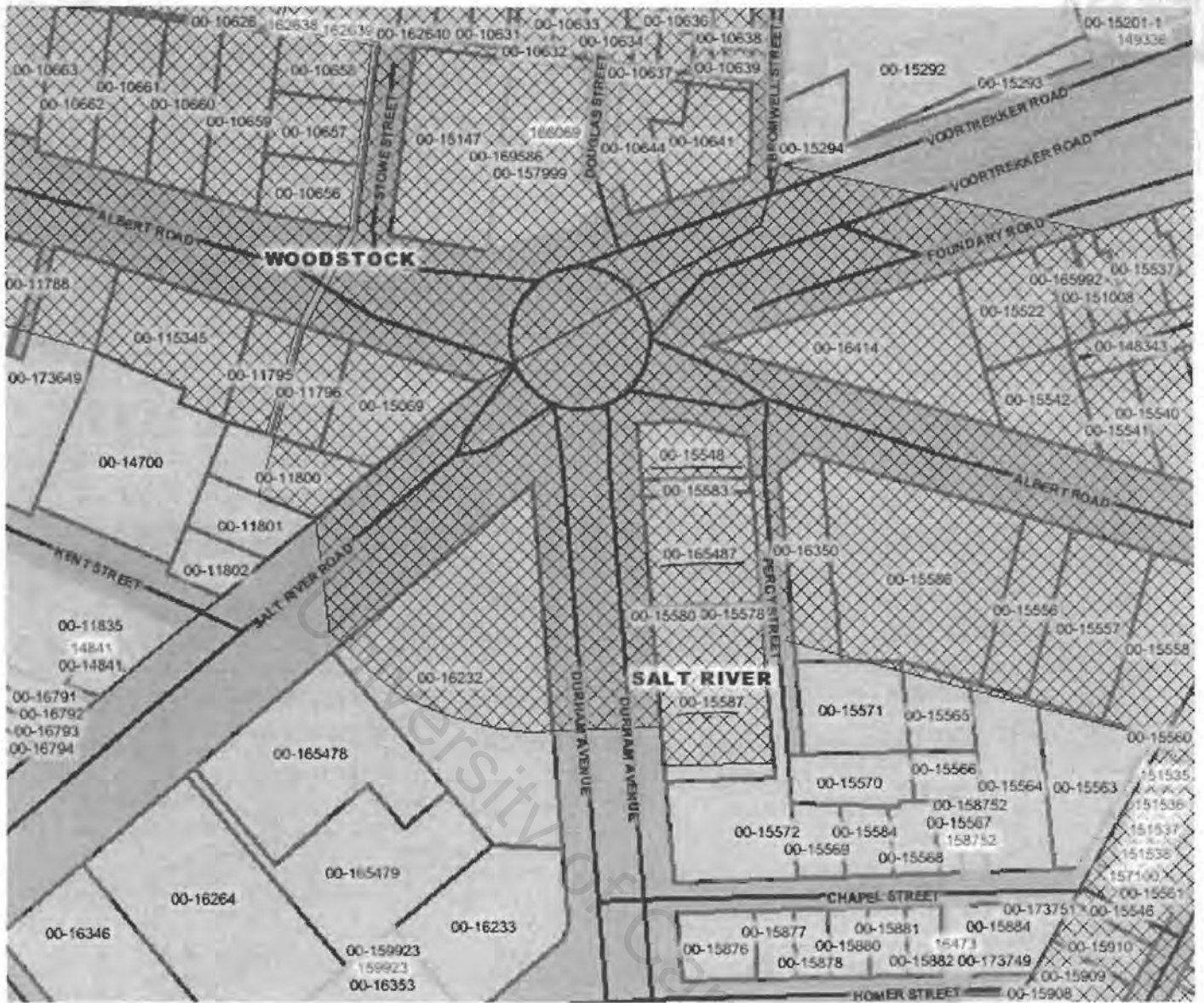
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Appendix F

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Harald = Section 108 → LUPO 'lacunae'  
[www.capetown.gov.za](http://www.capetown.gov.za)

S.34 of NHTA.





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Filename

## STRATEGY & PLANNING - ENVIRONMENTAL & HERITAGE MANAGEMENT

### Heritage Resources Section-Districts A & D

The Property/Building on Erf \_\_\_\_\_ (Area)

1. Is located in an Urban Conservation/Special Area
- Is located in a proposed Urban Conservation/Special Area
- Is located outside any declared Urban Conservation or Special Area

#### 2. A listed/Graded Property/Building

- Grade 3(a)
- Grade 3(b)
- Grade 3(c)

An ungraded Property/Building

#### 3. Older than 60 years and therefore protected under Section 34 of the National Heritage Resources Act No. 25 of 1999 *managed/permit*

Not older than 60 years of age

Of undetermined age

- Grade 3(a)- Property/Building/Site recognised to be of outstanding local architectural, aesthetic and/or historical value or intrinsic value for social historical, scenic or aesthetic reasons
- Grade 3(b)- Property/Building/Site recognised to be of considerable local architectural, aesthetic and/or historical value or intrinsic value for social historical, scenic or aesthetic reasons
- Grade 3(c)- Property/Building/Site recognised to be of considerable local contextual value for social historical, scenic or aesthetic reasons

Signature..... Heritage Resources Section, City of Cape Town

Date.....

TABLE III:

(subsection (3))

GENERAL BUSINESS AND GENERAL COMMERCIAL USE ZONES:  
 SETBACKS FOR POINTS ON MAIN BUILDINGS AND OUTBUILDINGS  
 THERETO FROM STREET BOUNDARY

Setback of point from street boundary				
Sub-zone	Ground storey	1st and 2nd storeys	Other storeys	Other storeys
1	2	3	4	
B1, C1	0 m	4, 5 m	0, 6h	
B2, C2 B3, C3	0 m	0 m	4, 5 m	
B4, C4	0 m	0 m	0 m	
B5, C5	0 m	0 m	See section 67	
B6, C6	0 m	0 m	See section 100	

TABLE IV:  
(subsection (3))

## GENERAL BUSINESS AND GENERAL COMMERCIAL USE ZONES:

REQUIRED SETBACKS FOR POINTS ON MAIN BUILDINGS  
AND OUTBUILDINGS THERETO FROM COMMON BOUNDARY

Setback of point from common boundary						
Sub-zone	Ground, 1st and 2nd storeys	Other storeys	Ground storey	1st storey	2nd storey	Other storeys
1	2	3	4	5	6	7
B1, C1	0 m	0, 6h	0 m	4, 5 m	4, 5 m	0, 6h
B2, C2 B3, C3	0 m	4, 5 m	0 m	0 m	4, 5 m	0, 6h
B4, C4	0 m	0 m	0 m	0 m	0 m	0 m
B5, C5	0 m	0 m	0 m	0 m	0 m	0 m
B6, C6	0 m	0 m	0 m	0 m	0 m	0 m

(5) In the application of the foregoing tables, except as hereinafter provided, the following provisions shall apply -

EXTRACT SCHEME REGULATIONS

USE ZONE	COVERAGE ALL BUILDINGS	COVERAGE DWELLING UNITS	BULK FACTOR	HABIT ROOM FAC (PLATS)	HEIGHT RESTRICTS	SETBACK (STREET)	SETBACK (CORNER)
Single Dwelling Residential	50%	50-55%	-	-	3	3-4.5m	0-3m
Intermittent Residential	50%	50-55%	-	-	3	3-4.5m	0-3m
Group Dwelling Residential	50%	50-55%	-	-	3	3-4.5m	0-3m
General Residential	50%	50-55%	2.2	34	9	7.5m/0.6h sec.60	4.5m/0.6h
R2	50%	50-55%	1.8	34	9	7.5m/0.6h	4.5m/0.6h
R3	50%	50-55%	1.2	34	7	4.5m/0.6h	4.5m/0.6h
R4	50%	50-55%	0.8	30	7	4.5m/0.6h	4.5m/0.6h
R5	50%	50-55%	0.4	28	3	9.0m/1h	9.0m/1h
R6	50%	50-55%	0.4	28	3	15m	15m
R7	50%	50-55%	1.2	34	7	4.5m/0.6h	4.5m/0.6h
R8	50%	50-55%	1.2	34	7	4.5m/0.6h	4.5m/0.6h
R9	50%	50-55%	1.5	34	7	4.5m/0.6h	4.5m/0.6h
R10	50%	50-55%	5.5	34	25m	0m	0m
R11	50%	50-55%	0.5	25	4	4.5m/0.6h	4.5m/0.6h
R12	50%	50-55%	0.6	30	sec. 66	sec. 65	sec. 66
Special Business	100% control building line	-	1.0	34	3	0-4.5m	0-3m
General Business	100	-	1.2	34	7	sec.60(3)	sec. 50(3)
B2	100	-	3.7	34	7	sec.60(3)	sec. 50(3)
B3	100	-	3.7	34	7	sec 50(3)	sec 50(3)
B4	100	-	5.6	34	25m	sec 50(3)	sec 50(3)
B5	100	-	p26	34	sec 67	sec.67	sec.67
General Commercial	100	-	sec 100	34	sec100	sec.100	sec.100
C2	100	-	1.2	34	7	sec.60(3)	sec.60(3)
C3	100	-	3.7	34	7	sec.60(3)	sec.60(3)
C4	100	-	5.6	34	25m	sec.60(3)	sec.60(3)
C5	100	-	p26	34	sec 67	sec.67	sec.67
C6	100	-	sec100	34	sec100	sec.100	sec.100
General Ind.	100	-	unlimited	34	unlimited	-	-
Notious Ind.	100	-	unlimited	34	unlimited	-	-

Notes



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Use Zone	Buildings Permitted	Buildings permitted only with the consent of Council
1	2	3
General Business [Hotel]	Blocks of Flats Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Institutions Places of Assembly Places of Instruction Places of Worship Residential Buildings Restaurants Shops Workshops, subject to sub-section (4)	Builder's Store Off-Course Totalisator Public Garages Service Stations
General Commercial	Blocks of Flats Builder's Store Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Industrial Buildings Institutions Places of Assembly Places of Instruction Places of Worship Public Garages Residential Buildings Restaurants Shops Workshops	Off-Course Totalisator Scrap or Salvage Buildings Service Stations
General Industrial	Builder's Store Industrial Buildings Public Garages Scrap or Salvage Buildings Workshops	Blocks of Flats Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling houses Institutions Off-Course Totalisator Places of Assembly Places of Instruction Places of Worship Residential Buildings Restaurants Special Industrial Buildings Service Stations Shops

## appendix B

### Acoustic Design, TEMPLETON AND SAUNDERS

#### NOTES:

##### acuity:

> straight ahead and 3deg of axis in either direction gives us best directional sound. by using both ears as a pair we have a good idea of distance and source.

##### sensitivity:

> human ear range 1000 - 5000 Hz

> selective interpretation by the brain; 'cocktail effect'. ability to overhear a specific conversation amongst many - tuning in.

##### spatial characteristics:

> 01 **surround sound**: reflective wall surfaces, so sound bounces off all of them

> 02 **directional sound**: non-reflective surfaces, sound can only be heard from source

##### acoustic devices:

> **reflectors** and **diffusers**: both are used in auditoria acoustics, the former to direct sound to distant seats to reinforce direct sound, the latter to help mix the sound from a number of sources, and give good balance to the sound.

> **reflectors**: usually large sheets of impervious materials, flat or curved. to reflect successfully, their smallest dimension must be greater than half a wavelength of the sound. **SMALLER SIZED PANELS ACTUALLY WORK AS DIFFUSERS.**

##### standards:

> **conference halls**: group discussion. Ceiling should be kept **low** and be sound **reflective**; carpeted floors and sound absorptive wall finishes; when farthest listener exceeds 10m make use of pa system.

> **lecture theatres**: overhead sound-reflective surfaces are used to reinforce the direct sound and not lose the impression of the source of the sound. Farther back from the stage, surfaces are made to 'damp' the reflected sound, otherwise the sound would 'blur' - loss of clarity. On average, **speech syllable** duration is between 0.2sec and 0.3sec. Rooms suitable for speech should have rapid decay characteristics and surfaces should be positioned for powerful primary reflections to avoid masking of the vulnerable direct sound.

## appendix C

### *Spaces Speak, are you Listening? Experiencing Aural Architecture,* BARRY BLESSER and LINDA-RUTH SALTER

#### NOTES:

> sensing spatial attributes does not require special skills - all human beings do it: a rudimentary spatial ability is a hardwired part of our genetic inheritance.

>>>> **my thoughts: in dulling the light and using it as a navigational tool and where it is needed as well as cutting out distracting view of the outside world, other senses become more in tune. i then use our inherent ability of spatial awareness to navigate and understand space. through the reflection of the sound we are also aware of its material makeup.**

#### sound lingo:

> [01] **sonic event:** clap

> [02] **sonic perception:** reflection of the sound

> [03] **passive acoustic object:** we can identify characteristics of the object

> a wall then has an aural manifestation even though it is not the original source of the sound. we can **'see with our ears'**.

> **"blindness is less socially and emotionally burdensome than deafness. some cultures revere the role of the blind 'seer' who has learned to accentuate the gift of listening as a better means for 'seeing' the future."**<sup>1</sup>

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<sup>1</sup> BARRY BLESSER and LINDA-RUTH SALTER. *Spaces Speak, are you Listening? Experiencing Aural Architecture.*

> "From this broad perspective it is clear that hearing contributes to a wide range of experiences and functions. Hearing, together with its active complement, listening, is a means by which we sense events in life, aurally visualise spatial geometry, propagate cultural symbols, stimulate emotions, communicate aural information, experience the movement of time, build social relationships, and retain a memory of experiences. To a significant but underappreciated degree, aural architecture influences all of these functions."<sup>2</sup>

> "AN AURAL ARCHITECT: refers to the properties of space that can be experienced by listening. An aural architect, acting as both an artist and a social engineer, is someone therefore who selects specific aural attributes of a space based on what is desirable in a particular cultural framework. With skill and knowledge, an aural architect can create a space that induces such feelings as exhilaration, contemplative tranquility, heightened arousal, or a harmonious and mystical connection to the cosmos. An aural architect can create a space that encourages or discourages social cohesion among its inhabitants. In describing the aural attributes of a space, an aural architect uses a language, sometimes ambiguous, derived from the values, concepts, symbols, and vocabulary of a particular culture."<sup>3</sup>

**IMPORTANT >>>>** "Thousands of visual artist, civil engineers, architectural historians, and social scientists have created a comprehensive symbolic language and an extensive literature for visual architecture, whose intellectual foundation draws on archaeology, engineering, history sociology, anthropology, evolution, psychology, and science. In contrast, even though aural architecture shares the same intellectual foundation, **its language and literature are sparse, fragmented and embryonic.**"

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<sup>2</sup> BARRY BLESSER and LINDA-RUTH SALTER. *Spaces Speak, are you Listening? Experiencing Aural Architecture*, p04

<sup>3</sup> BARRY BLESSER and LINDA-RUTH SALTER. *Spaces Speak, are you Listening? Experiencing Aural Architecture*, p05

## > why?

[01] lack of means to store this information, journals and archives don't work

[02] language for describing sound is weak and inadequate

[03] today's culture is fundamentally orientated toward VISUAL communications, people neglect the importance of hearing - thus, little value toward auditory spatial awareness

[04] maybe as a result of all of this - given little recognition from educational bodies

## references:

> JUHANI PALLASMAA (1996): explicitly rejected dominance of visual sense, importance of auditory sense!

> R. MURRAY SCHAFER(1977): formulated the concept of the soundscape as a mixture of aural architecture and sound sources, created disciples who have passionately extended and applied its initial concept.

>THOMAS SCHERIDAN KAREN and VAN LENGEN (2003): architecture schools should include it in course work to achieve "a richer, more satisfying built environment."

>HOPE BAGENAL and ALEX WOOD (1931): recognised the social and cultural aspects of aural architecture.

> CHRISTOPHER ALEXANDER (1979): "The life that happens in a building or a town is not merely anchored in the space but made up of the space itself."

>>>> People do not use their sense of hearing in the same way. However, where they do, they form what can be described as a

**sub-culture.** Mine is the sub-culture of **architect**, and my focus is on the sub-culture of the **blind**.

## auditory spatial awareness

> we know about measuring acoustic processes and sensory detection, but less about the phenomenology of aural space.

>>02.1 - SOCIAL - influences social behaviour: some spaces emphasise privacy or aggravate loneliness; others reinforce social cohesion.

>>02.2 - NAVIGATIONAL - allows us to orient in and navigate through a space. [replaces vision in places of darkness or with visual disability]

>>02.3 - AESTHETIC - affects our aesthetic sense of space. devoid of acoustic features, a space is as sterile and boring as barren, gray walls.

>>02.4 - MUSICAL - enhances our experience of music and voice.

## a functional model of spatial awareness:

> First, pure tones, raw sound evoke consistent results from us as human beings.

> Last, high-impact, emotionally engaging listening. In this case, sound produces a visceral response, a heightened arousal (THAYER, 1989), and an elevated state of mental and physical alertness.

Personal meanings for the listener. Personal experience and memory.

> OVERT AFFECT: strong feelings, emotions; SUBLIMINAL AFFECT: subtle arousal, moods.

>> One can ignore sounds all together, so to make sighted people aware of it i will reduce their sense of sight so to force their use of their other senses.

> Aural Experience: Step 01 - sensation [detection]; Step 02 - perception [recognition]; Step 03 - affect [meaningfulness].

> DESIGN A SOUNDSCAPE! p15 they are alive by definition, they can never be static.

= both the sonic event [raw ingredients] + the aural architectural environment [cooking style].

> BY RESPONDING TO HUMAN PRESENCE, AURAL ARCHITECTURE IS DYNAMIC, REACTIVE, AND ENVELOPING. IN CONTRAST, BECAUSE HUMAN BEINGS DO NOT POSSESS AN INTRINSIC MEANS FOR GENERATING LIGHT, A SPACE DOES NOT REACT TO OUR VISUAL PRESENCE, WHICH MANIFESTS ITSELF THERE ONLY THROUGH INTERRUPTED OR REFLECTED LIGHT - AS SHADOWS OR MIRROR IMAGES.

> SOUND IS ALSO MORE COMPLEX THAN LIGHT: time!! is central to sound. "sonic illumination". in a very real sense sound is time. FULL sonic illumination requires a mixture of continuous and transient energy over a wide range of frequencies, amplitudes and locations.

> Because experiencing sound requires time and because spatial acoustics are difficult to record, auditory memory plays a large role in acquiring the ability to hear space. Dependant on long-term memory: unreliable unless it has been a crucial part of your life, ie.

you are non-sighted. CANNOT communicate aural architectural history/heritage. ALSO, WE RELY ON UNPREDICTABLE AND INCONSISTANT SONIC ILLUMINATION from human activity. OUR EXPERIENCE OF AURAL ARCHITECTURE IS FRAGILE AND PERISHABLE.

>>> SPACELESSNESS: no reflection of sound, only direct sound. Echo-free (anechoic) environment

> typical anechoic chamber: relatively large, 2000m<sup>3</sup>; 6 surfaces covered with fiberglass wedges up to a meter in length; wire mesh floor. UNIQUE as any other environment would have at least ONE side that is reflective of sound to some degree.

> strange feeling of pressure and discomfort, and sometime nausea,

> beating of heart and breathing not masked

> low frequencies sometimes are NOT absorbed: feeling of ill-defined pressure

> normal sounds seem strange and remote.

> JOHN CAGE [contemporary music composer] (1961) - pure sound does not exist naturally

> We can recognise aural personalities of categorised space: however, does depend on the user.

EXPERIENTIAL ATTRIBUTES OF SPACE:

> for HEARING, volume is primary and boundary is secondary.

> EXPERIENTIAL REGION: background noise as a VIRTUAL BOUNDARY. we will only hear a conversation that is above this said boundary. therefore, the level that is beyond the virtual boundary is the experiential region.

> ACOUSTIC HORIZON: maximum distance between listener and source where the sonic event can still be heard.

> ACOUSTIC ARENA: a region where people are part of a community that share the ability to hear a sonic event.

> SOUND SOURCES ENGAGE IN A KIND OF DARWINIAN COMBAT; LOUD SOUNDS CLAIM MORE AREA FOR THEIR ARENAS THAN SOFT SOUNDS. LISTENERS EXPERIENCE THIS DYNAMIC AS ENHANCING OR DEGRADING THEIR AUDITORY CHANNELS; AN AURAL ARCHITECT CAN CONCEPTUALISE AND MANIPULATE THIS INTERPLAY AMONG THE CHANGING ARENAS.

> background noise is essential for determining the boundary of an acoustic arena.

>>>>>>> NOISE NEED NOT BE OVERWHELMING OR BOTHERSOME TO HAVE A SOCIAL IMPACT ON THE INHABITANTS WITHIN THEIR ACOUSTIC ARENAS.

> physical space is static : it is up to the occupants to change their arenas by modifying their social and sonic behaviour. aural architecture is adaptive and dynamic, while physical space remains static ... important to imagine what sonic events might happen in any arena, and how the physical space I design can influence this.

> THE ACOUSTIC ARENA IS THE EXPERIENCE OF A SOCIAL SPATIALITY, WHERE A LISTENER IS CONNECTED TO THE SOUND-PRODUCING ACTIVITIES OF OTHER INDIVIDUALS.

> PERHAPS DESIGN FOR SPACES WHERE YOU CAN MODIFY YOUR ARENA: CLOSE OR OPEN TO OTHER ARENAS ... etc

> Nature's Aural Architecture: evolution of species - Possibly why Xhosa people speak so loudly! EVOLVED A SENSE OF TERRITORY BASED ON THE SIZE OF OUR ACOUSTIC ARENA.

>>>> BACKGROUND NOISE ALSO PARTITIONS SPACE INTO MANY SMALL ACOUSTIC AREAS, CREATING A MATRIX OF TINY VIRTUAL CUBICLES.

> historic AUDITORY CONNECTION WITH THE STREET: SCHAFER (1978) - Sitting at home without moving from your chair, you were intimately connected to the street. IMPORTANCE OF SOUND GENERATING FLOORING FOR CIRCULATION AREAS ... added issue of security for the blind.

>>>>>>>>> CONCEPT OF SOUNDMARKS, p30

SOCIAL SPHERES AND ACOUSTIC ARENAS:

PROXEMICS: EDWARD T. HALL (1966)

= the experiential manifestation of anthropological distance, varies between cultures.

1 INTIMATE SPHERE: [1-2ft] reserved for intimate friends and relatives

2 PERSONAL SPHERE: [1m] for acquaintances

3 CONVERSATIONAL SPHERE: [3-4m] oral interchange with strangers

4 PUBLIC SPHERE: [beyond 4m] determined by acoustic horizon, impersonal and anonymous.

>strangers encountering an intimate sphere will often talk more softly ...

>>> WE CAN ONLY APPRECIATE THE IMPORTANCE OF AURAL ARCHITECTURE WHEN WE RECOGNISE THE INTERWOVEN RELATIONSHIP BETWEEN SPATIAL AWARENESS, SOCIAL BEHAVIOUR, AND THE DESIGN OR SELECTION OF PHYSICAL SPACE.

NAVIGATING SPACE BY LISTENING:

"We are how we live - there is no generic human being".

>> " A listener using cognitive strategy to transform auditory cues into an image of a space, by sensing the doorway to the bathroom late at night, for example, is experiencing the NAVIGATIONAL SPATIALITY of aural architecture."

>KISH [echolocation teacher] p39

>>>>>>>>INSTEAD OF DRAWING PHYSICAL BOUNDARY, BEGIN WITH THE DRAWING OF **AUDITORY ARENAS** APPROPRIATE TO EACH LOCATION OR PROGRAMME.

## appendix D

*Sound Advice*, PROF. O. PRICE-LEWIS.

### NOTES:

- > Simple room shape = fewer natural frequencies. Therefore, more difficult to provide good listening conditions.
- > Cubical rooms with  $l \times h \times b$  all equal have the worst listening conditions; rooms with odd shapes have the best.
- > Projections into the room assist in the reverberation process of scattering sound.
- > Reverberation period is an extremely important part, and is governed by the volume and absorption of sound properties of the space
- > Music: greater reverberation better = fullness of tone
- > Speech: smaller reverberation better = clarity

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