Figure 049: Concept model August 2006

design development

Introduction

Architecture and Experience

Eisenman's attempt to generate an alienating architecture, which forces the individual to look inward and not to the environment for provision of psychological comfort, contains at its base an essence which is similar to the work of Tschumi. Their buildings are neither obviously metaphorical nor purely abstract structures generated through processes of mechanistic reasoning, but share a certain commentary upon reality which is discovered by experiencing their buildings. Architecture then becomes the stage upon which users can discover special, unknown aspects of their perception and understanding (Krog ????, p.62 – Creative risk taking article). Historical reference in their work as a reaction to Modernism and Modernist Postmodernism manifest both physical and metaphysical juxtapositions which make apparent the cracks, tears and fissures of existence.

Experience is enriched when meaning is uncovered in Tschumi's labyrinth, which entangles us in time ever more deeply and figures the empirical dimension of space that affects the senses before reason (Taylor 1992, p.246). Tschumi's method of architectural production contains this intuition which allows meaning to appear; but as soon as rationality attempts to grasp it, meaning disappears in the void which separates right- and left-brain activity.

The individual's experience of the proposed facility is intended to represent that which is extraneous, indefinable and forever outside the grasp and control of the rational.

Through the analysis of the site at the macro, meso and micro scales the most important aspect discovered is the concept of edge. Border, upon border, upon border the convergence of oppositions gives the site an ethereal almost sacred quality of a veil signifying transition. The response of the design to this quality becomes the primary generator of the architectural experience as the cracks, tears and fissures – the "*between*" are widened through the intervention

Conceptual Development

Rites of passage, whether birth, initiation, marriage or death brings forth a strong connection with time as these moments seem to exist as notches in the journey of the life cycle of the individual. With every passing stage the young and the old, man and woman, the community and the individual each recognizes its interdependence on the other and nature. (Elion 2001, p.29)

Architectural Translation

Theoretical ideas of the "*between*", time and ritual derived from the previous chapters comprise the concepts which drive the architectural intervention. The methodology applied involves a circular process that translates these theoretical concepts architecturally, after which the ideas are tested against practical considerations and resolved in such a manner that the theoretical concepts are strengthened by deepening their effect, while remaining functionally efficient.

For the sake of enhancing clarity the proposed building is divided into three sections, which include the burial structure, memorial and chapel. These elements are, however, never considered independently, but are connected by means of form, spatial overlapping, material usage and circulation in order to ensure a sense of uniformity throughout the building.

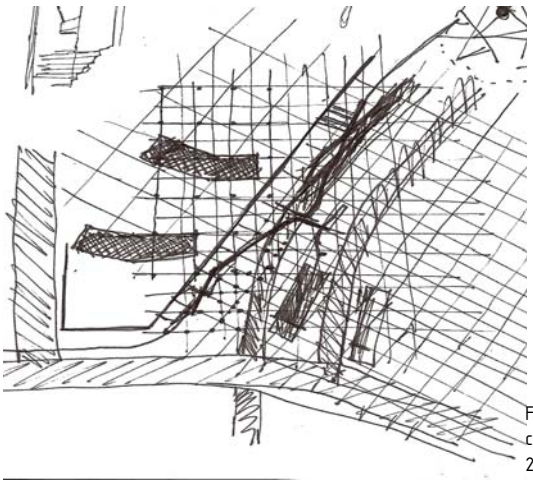


Figure 050: Concept sketch April 2006

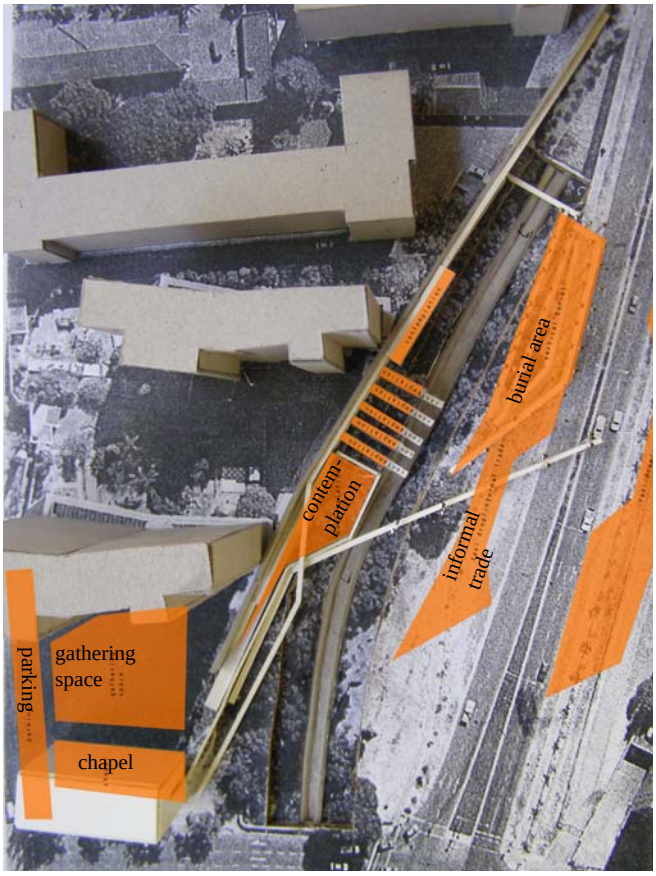


Figure 051: FIrst concept model

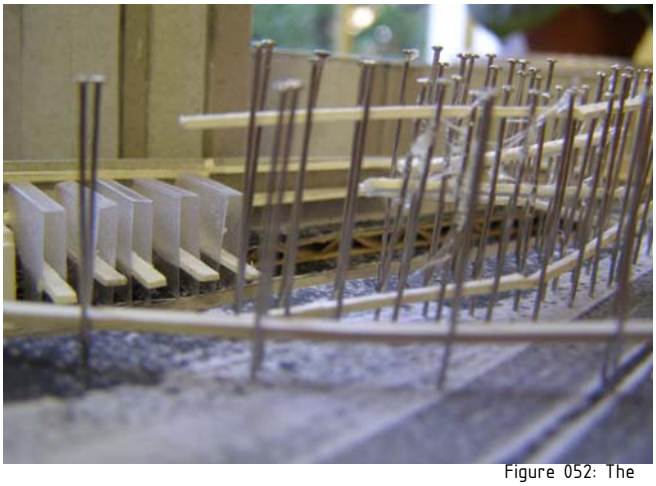


Figure 052: The idea of ramps and burial integration

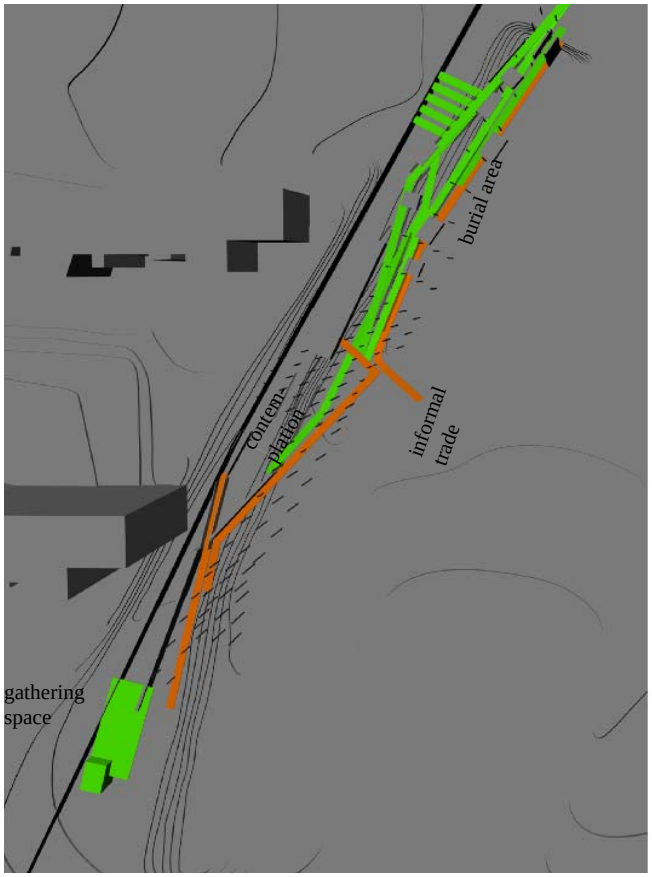


Figure 053: Three dimensional Concept June 2006

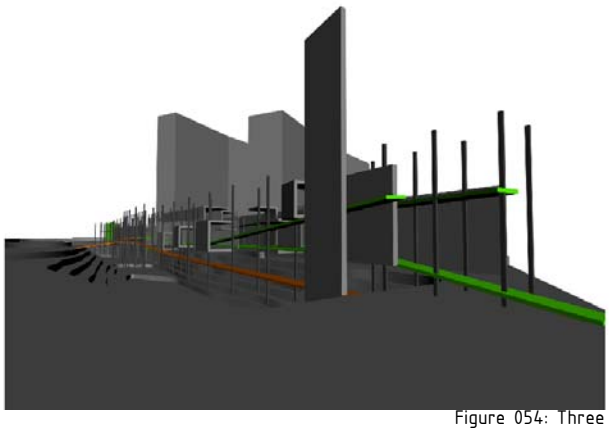


Figure 054: Three dimensional Concept June 2006

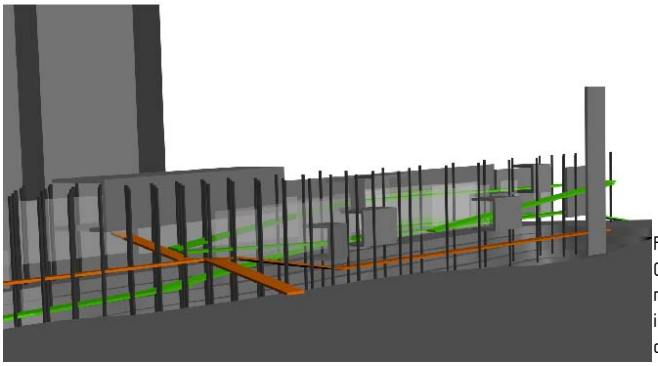


Figure 055:
Concrete fragments which float in a forest of columns

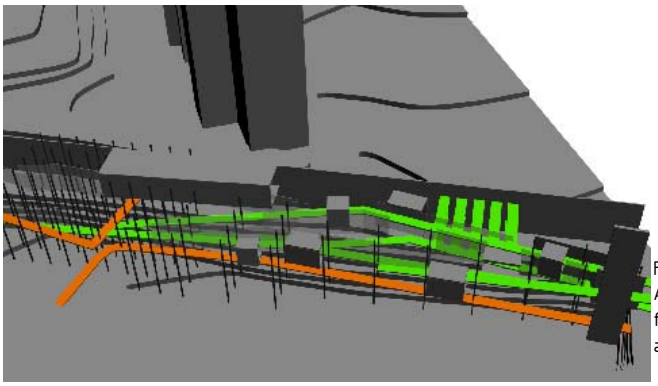


Figure 056:
A sense of fragmentation is achieved

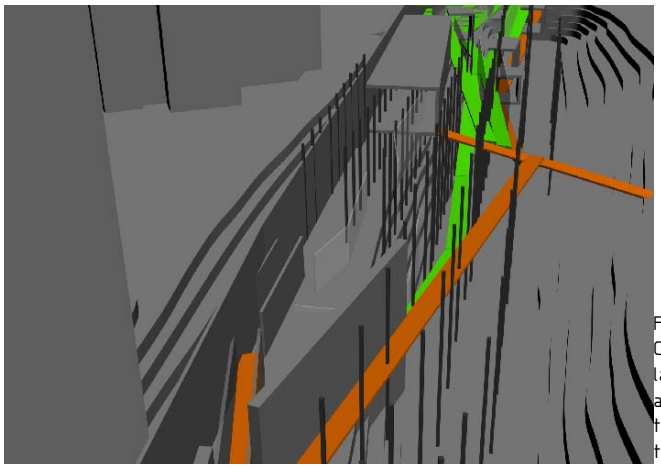


Figure 057:
Concepts of the labyrint become apparent through the conceptual translation

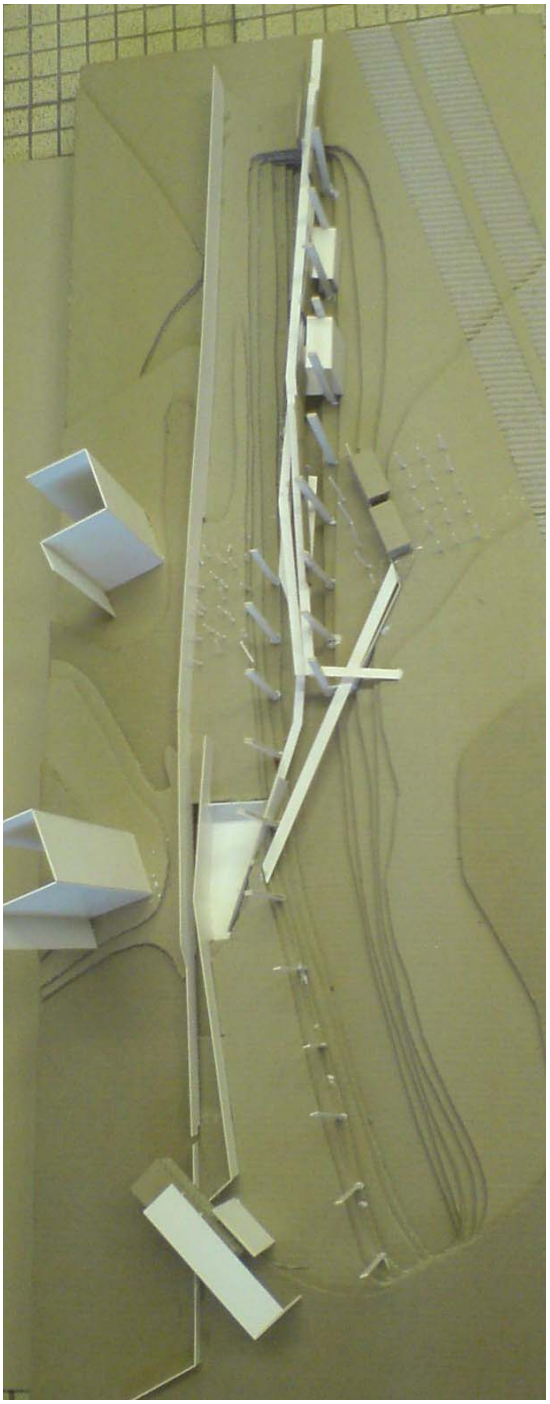


Figure 058:
Final concept model, the formal organization becomes realistic

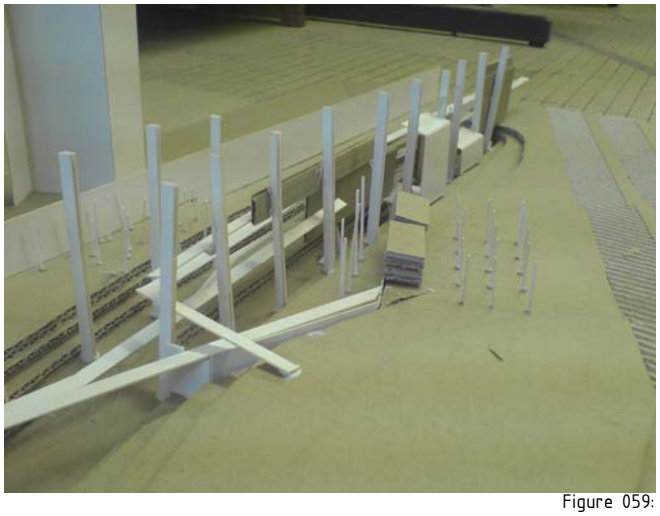


Figure 059:
Final concept model, looking at the burial structure and memorial

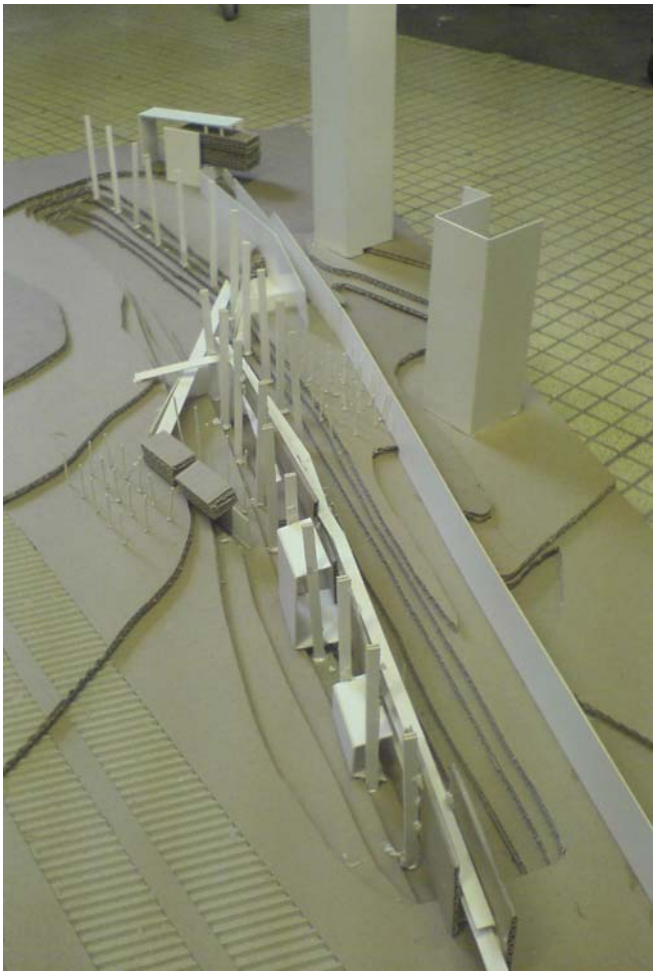


Figure 060:
Final concept model, looking at the northern entrance into the burial structure

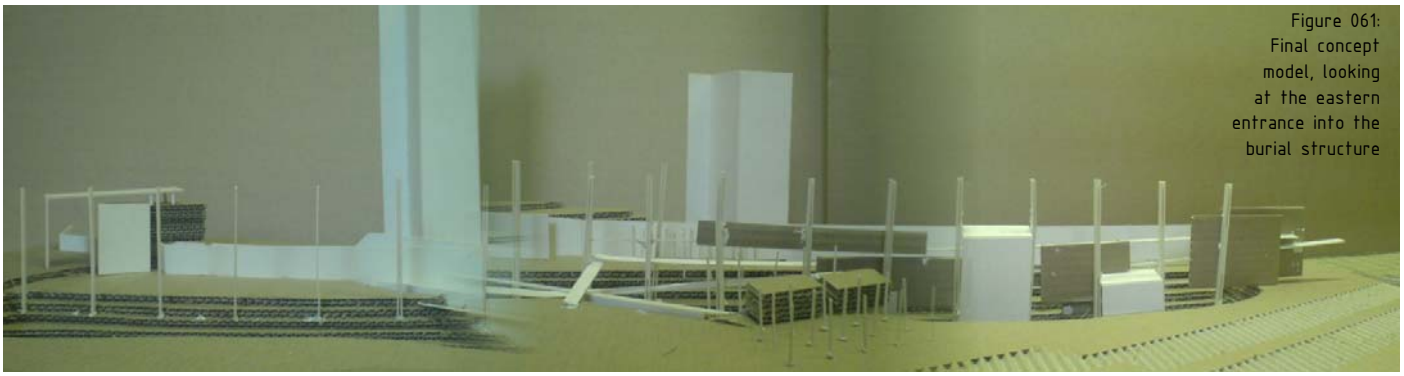


Figure 061:
Final concept model, looking at the eastern entrance into the burial structure

Site plan development

The concept of the edge drives the formal organization through contextual responses . Therefore, the place of entrance must by means of these contextual responses create a sense of gateway through which the transition from the realm of the living to the realm of the dead can be perceived.

Three entrances to the facility have been identified and defined by means of considering the opportunities presented by the linear nature of the site and proximity of the existing taxi drop and collection point.

The rectangular prisms and vertical planes respond to the rectangular nature of the urban landscape, while simultaneously responding to the natural landscape by means of utilizing timber cladding. These rigid rectangular forms signify the entrance into the facility.

These gateways are linked by movement routes which respond to the "between" condition by means of oscillating uncertainly between these realms. The structure can therefore be perceived as an edge that at once seems to connect and seperate the realms of the living and the dead.

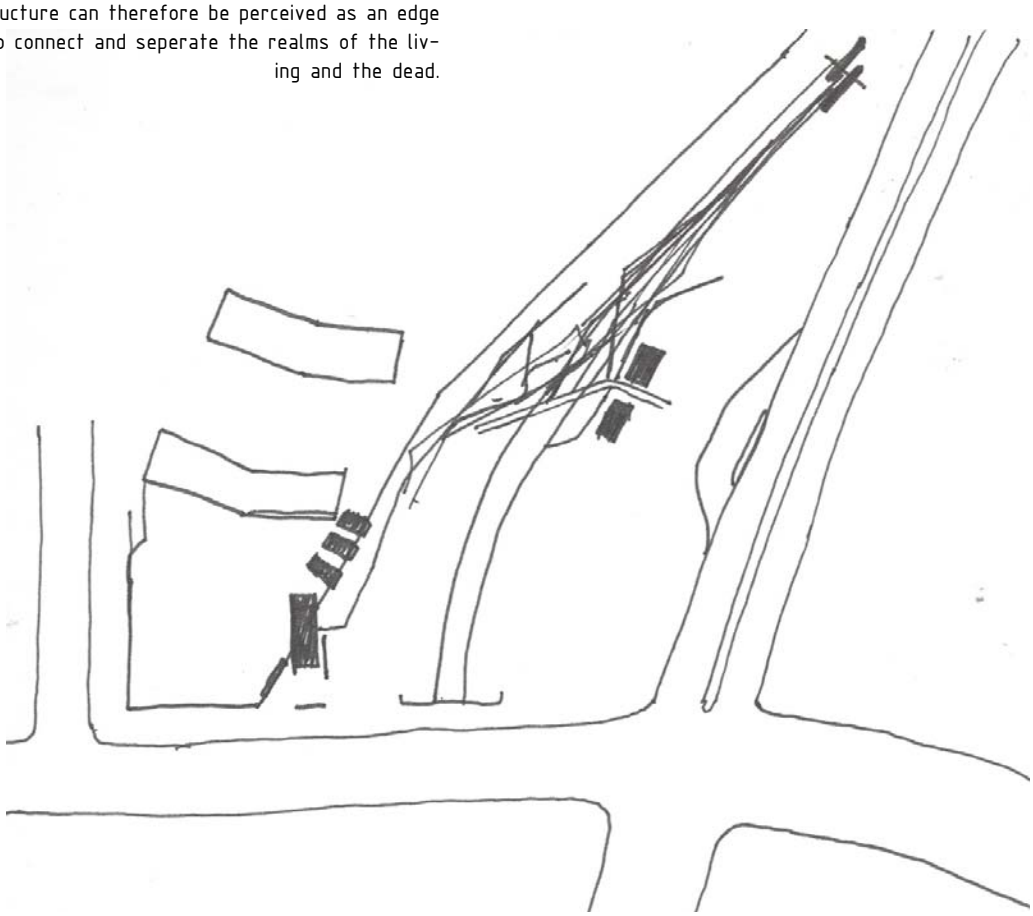


Figure 062: Concept sketch defining the boundaries of the structure

Ritual and Perception

The production of meaning, as discussed under the precedent studies section, justifies the discovery thereof by means of enriching spatial experiences that affects the senses before reason. In architecture Barthes' concept of the 'filmic' can only be experienced through a certain dialectic interaction between the mourner and structure. This perceptual interaction in architecture occurs through movement.

Through movement the spatial experience exposes and emphasizes the site as edge by the ritual that takes the mourners from being above the site to moving upon and then within it.

The design accommodates three types of users. Firstly, those partaking in the act of burial. Secondly, those revisiting a buried relative and thirdly, the public that simply use the defined movement route as a short-cut through the site.

These movement systems are explained diagrammatically in the following sections.

Circulation

Vehicles and hearse

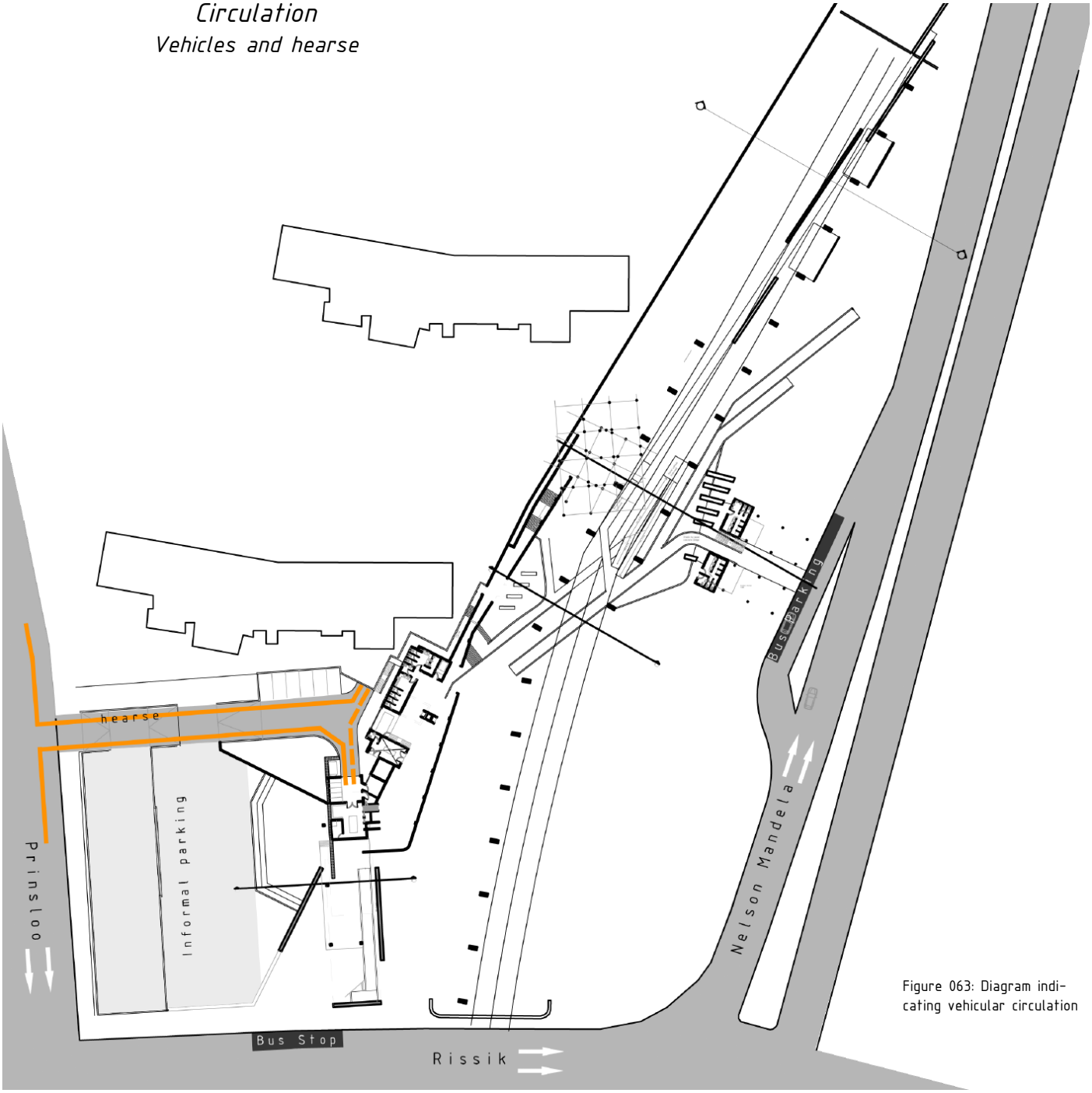


Figure 063: Diagram indicating vehicular circulation

Circulation

Coffin

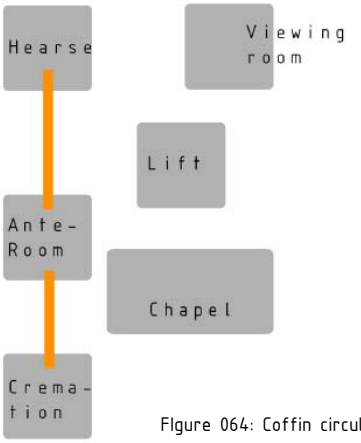


FIgure 064: Coffin circulation option 1

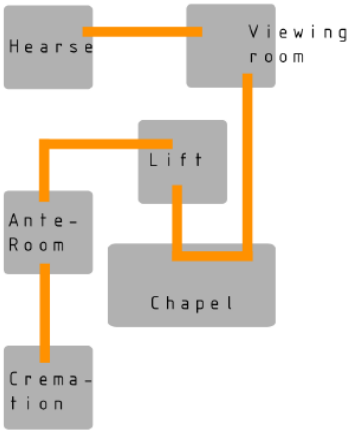


FIgure 065: Coffin circulation option 2

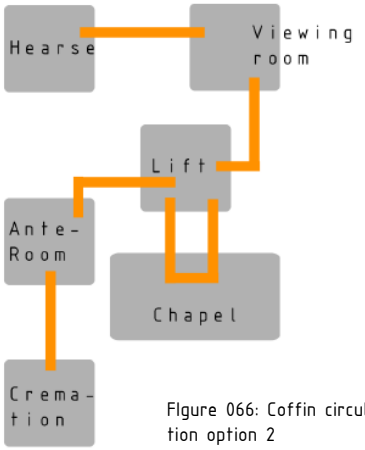


FIgure 066: Coffin circulation option 2

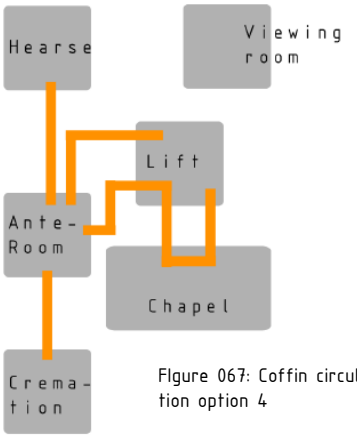


FIgure 067: Coffin circulation option 4

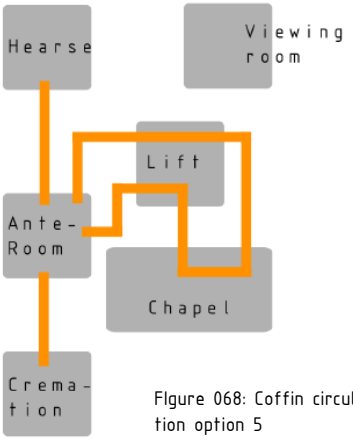


FIgure 068: Coffin circulation option 5

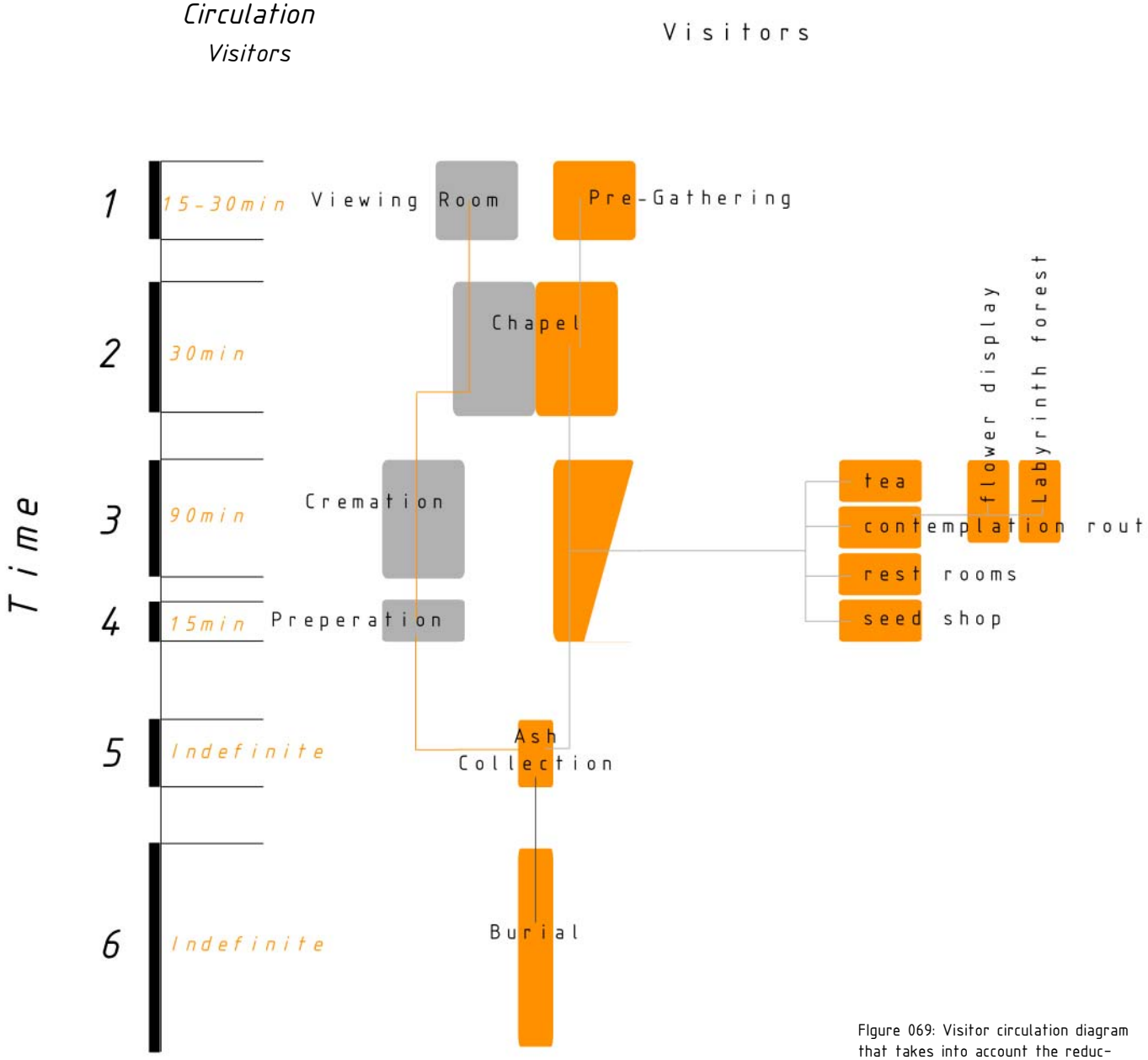


FIgure 069: Visitor circulation diagram that takes into account the reduction of visitors throughout the ritual

Visitor Attendace Prediction

Movement

The diagram indicates the ritual of burial. The orange lines represent movement and the orange squares gathering

Figure 070: Visitor circulation diagram indicating movement and gathering

Movement

The diagram indicates the movement of those who would visit a passed relative or friend

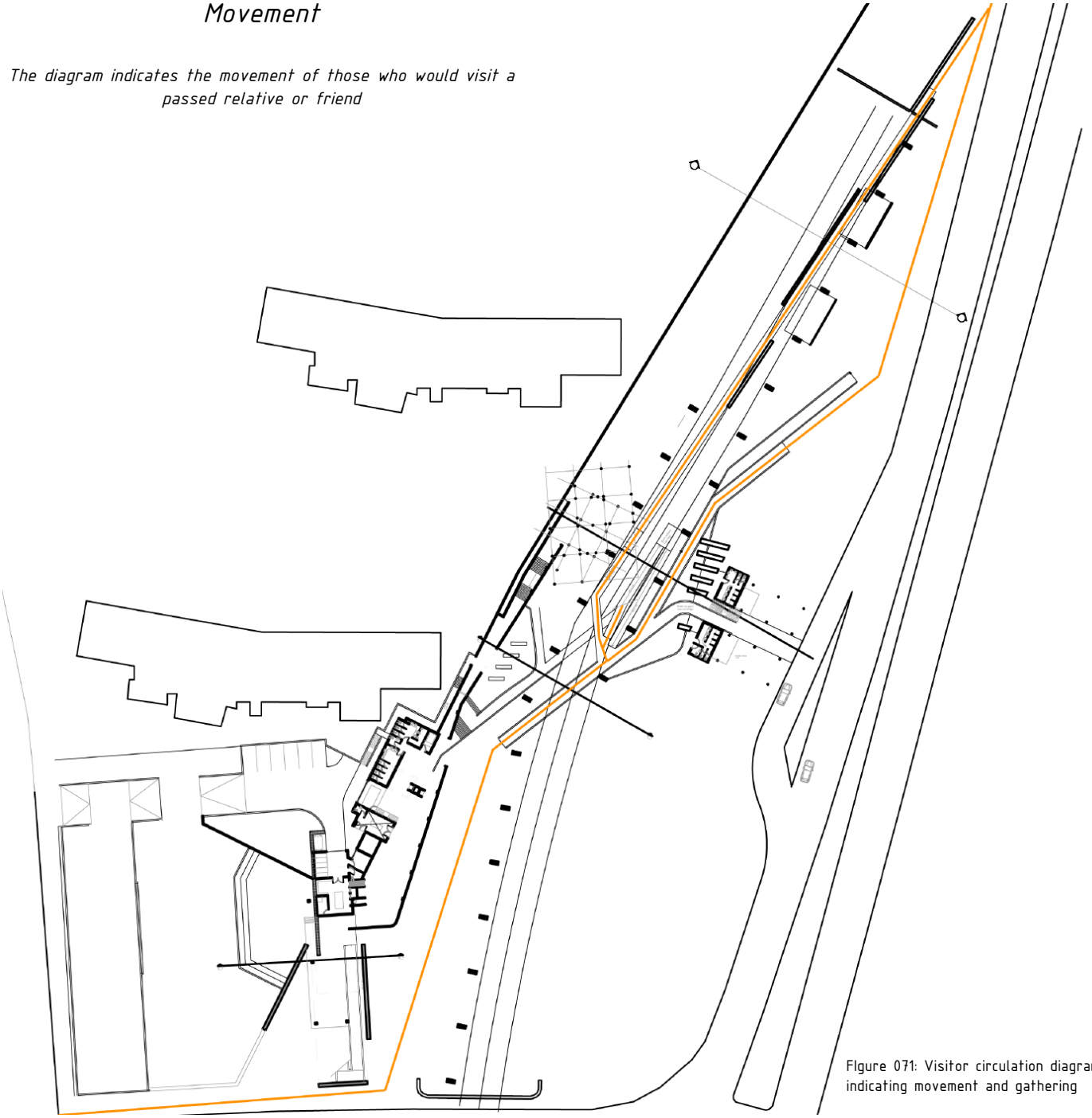


Figure 071: Visitor circulation diagram indicating movement and gathering

Movement

The diagram indicates the movement of the public simply passing by the structure as a shorter route to and from the MDC

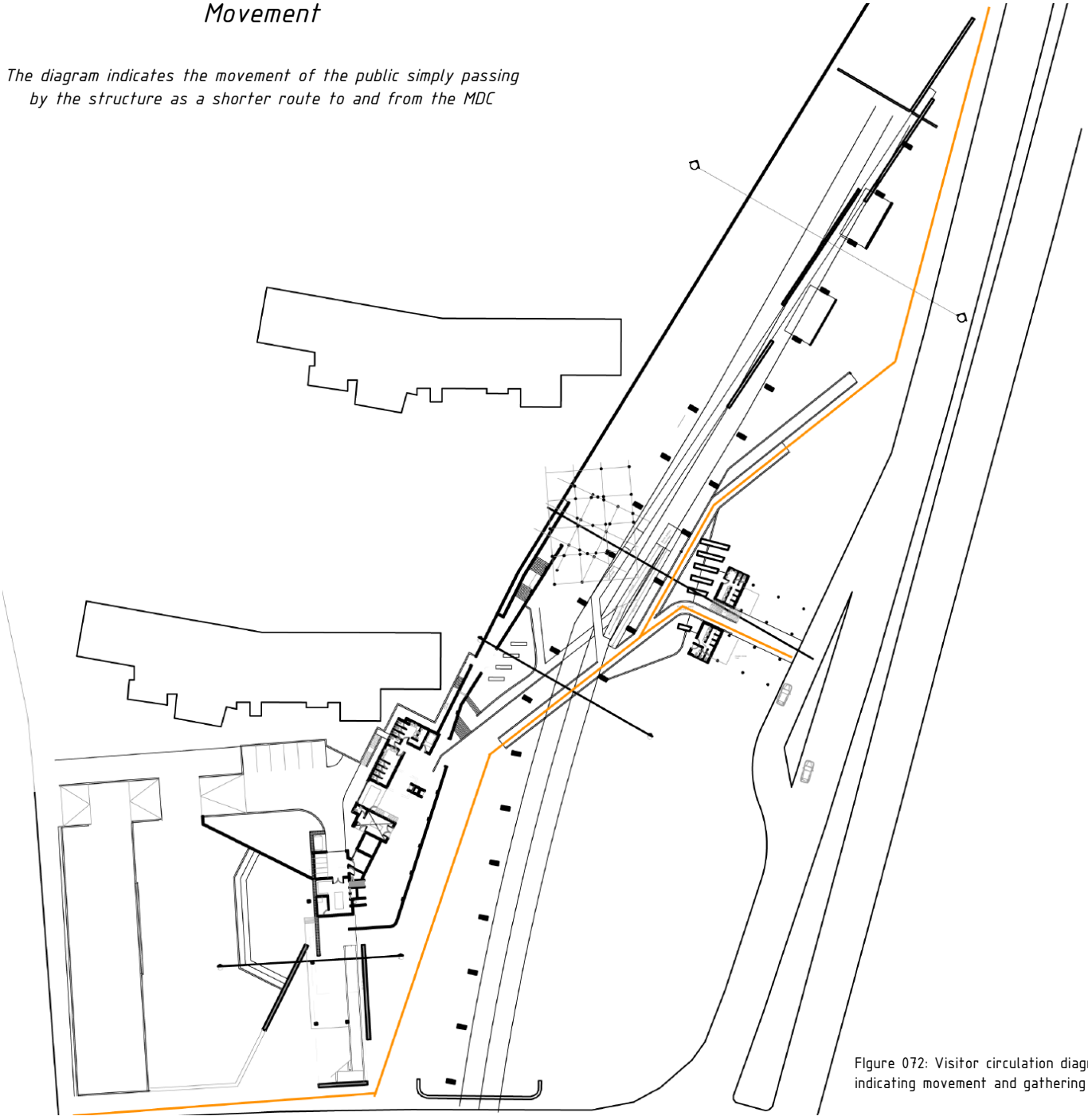


Figure 072: Visitor circulation diagram indicating movement and gathering

Water collection and storage

storage

collection

Total catchment:	950m²
Annual precipitation:	700mm
Total amount of water collected:	665 m³
	665 000 litre/year
Monthly water required by casket planter according to landscape architect (25mm/week):	100mm/month
Area of Casket planter 400*500:	0.2m²
TOTAL WATER REQUIRED/CASKET/Month:	0.02m³
	20litre/month
Nr of casket planters:	4000
Total water required/month:	80 000l
Total water required/year:	960 000litre/year
Provided:	665 000 litre/year

It rains during half of the year, the casket planters would therefore only require water for half the year, therefore half the amount:

Total water required: 480 000l/year

Surplas of 185 000 l/year

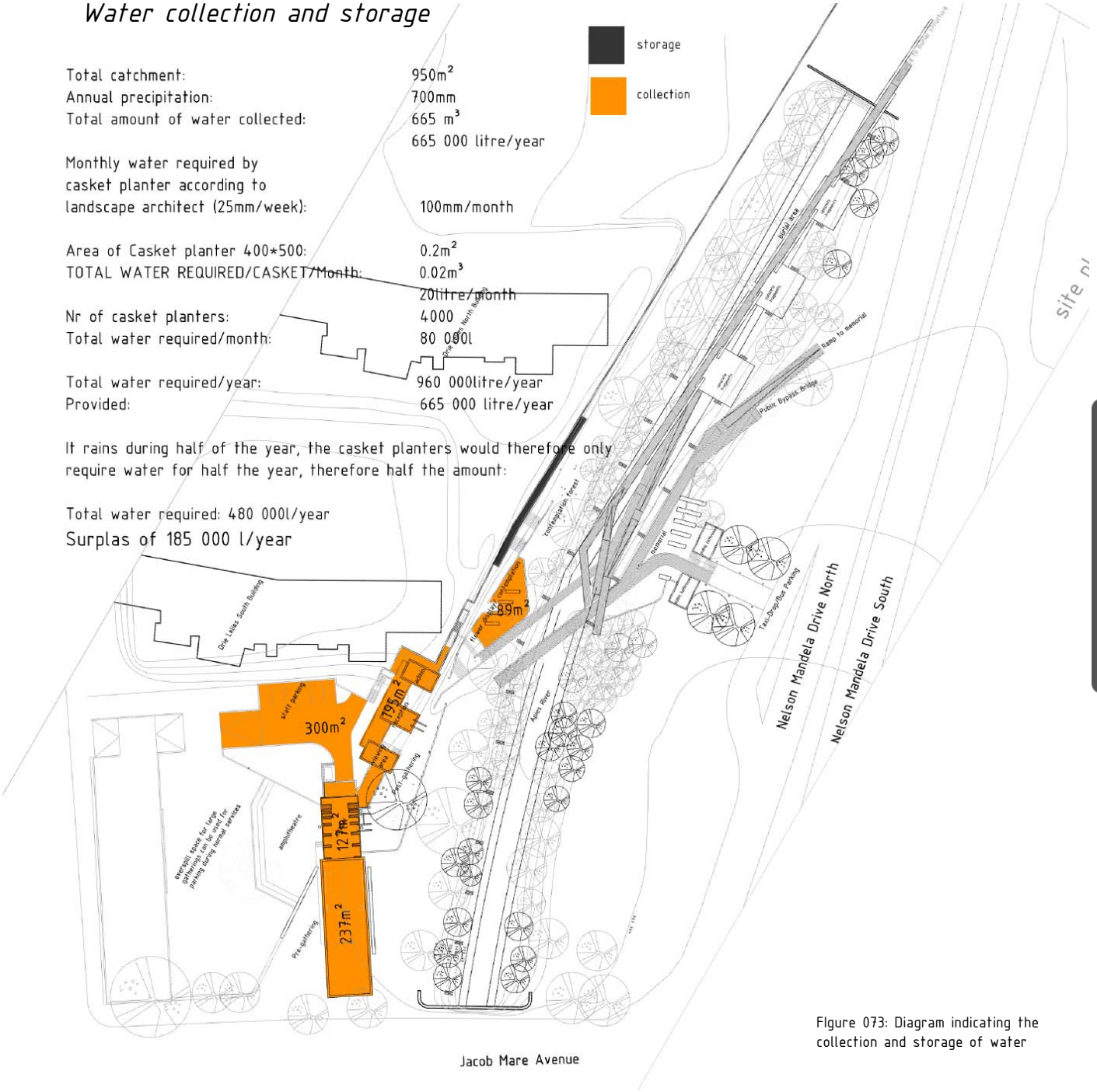


Figure 073: Diagram indicating the collection and storage of water

Figure 074: Diagram indicating the re-planting of trees

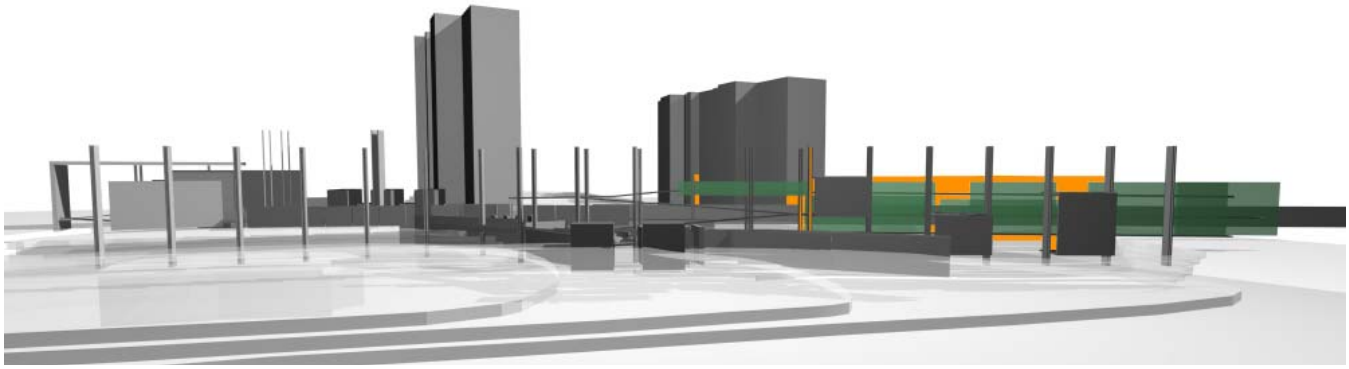


Figure 075: Three dimensional block model elevation

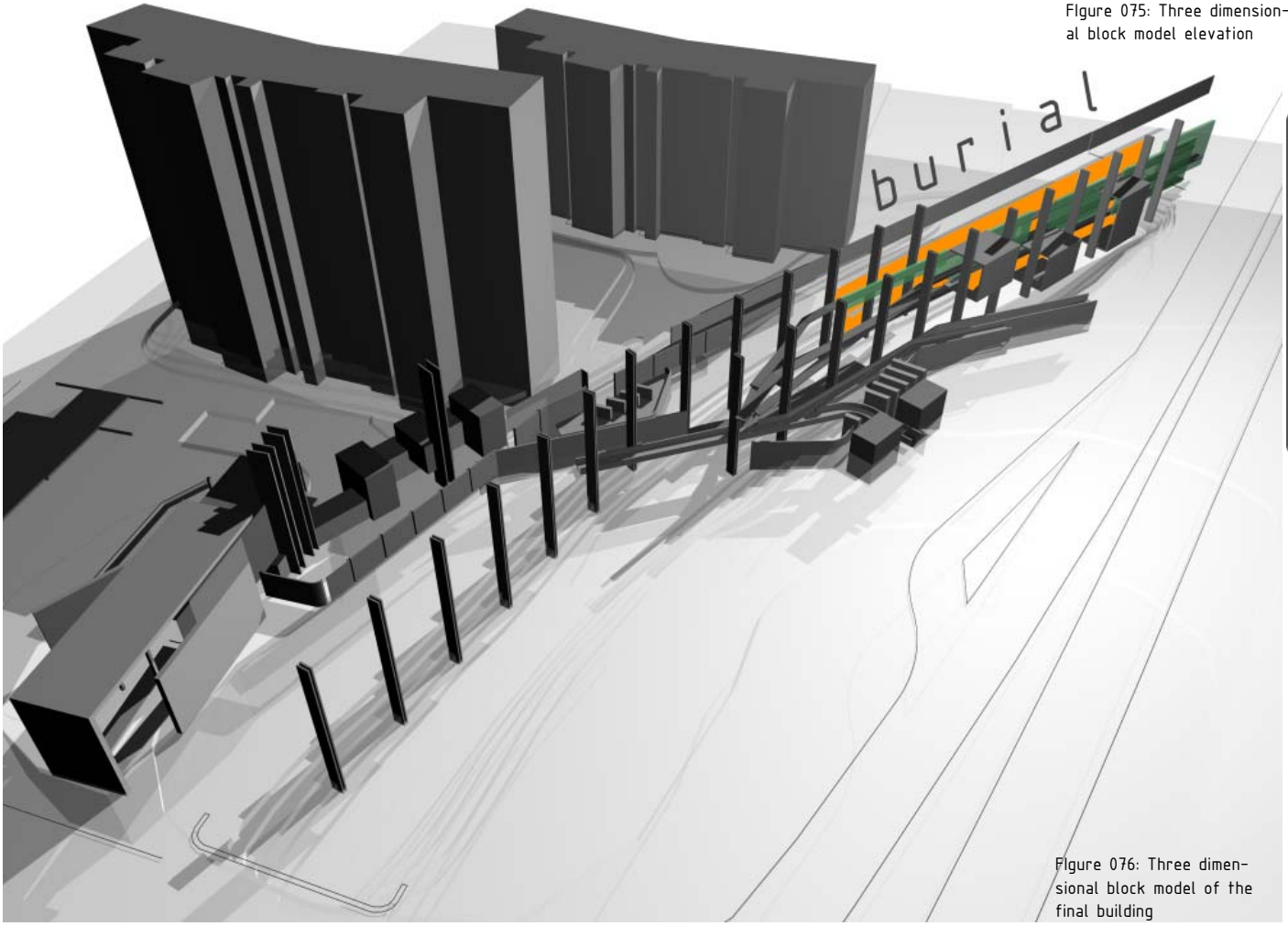


Figure 076: Three dimensional block model of the final building

Burial Structure:

Location:

The river has been defined earlier as the veil which separates the realm of the living from the dead. The implication of the presence of this "*third, the between, chora* or *différance*" is enhanced in the deep cleaving of the river into the terrain and by the rigid concave form of the concrete culvert which implies the existence of this non-space. This non-space is represented in the following diagrammatical section:

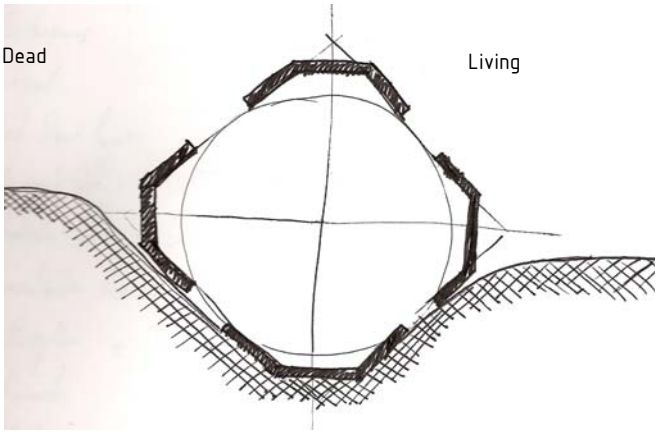


Figure 077: Diagrammatic representation of the time-space interval of 'the between' above the river

Suspending the burial structure above the river opens up the time-space of the "*between*" (similar to Eisenman's method of disfiguring in the Wexner Centre) in which the living meets the dead. As explained during the theoretical argument, the tension created where these polar opposites meet makes apparent the cracks and fissures preventing the existence of unity. The ramps which are suspended in the "*between*", makes apparent and "widens" these cracks, forever deferring completeness. The burial structure is the gap which separates the realms of the living and dead.

Form:

Ramps

After the collection of the ashes, the procession leads the mourners from the contemplation and flower display space towards the burial area. The unstable, uncertain, emotional condition of the mourners is enhanced in the ramps which seem to hover unsupported over the river, oscillating three-dimensionally left and right, back and forward. Lost in Tschumi's labyrinth, the mourners are entangled in time ever more deeply. The non-perpendicularity and non-parallel nature of the urban sculpture re-interprets Tschumi's expression in his follies. Forces which seem to converge fly apart and forces which fly apart converge in Tschumi's exploded cubes. These simultaneously converging and diverging forces are interpreted as movement vectors in the form of ramps, which seem to oscillate indecisively between the dualisms of existence and non-existence.

Platforms connect the different levels where the ramps converge and offer places of rest and lookout points. The structure will be used mostly between five and six pm since commuters who are returning home conveniently pass it. The significance of this time during the winter months is that another transition takes place in the form of the sunset. The integration of time and event results in a moment which reminds the visitor of his/her connection with time, in the form of the natural cycles often disguised behind the mass of skyscrapers. Pollution trapped in the urban heat island in combination with the Drie Lelies buildings that frame the moment dramatizes the sunsets into a surreal event. Once again, juxtaposition occurs between the artificial and natural, as the colours and textures of the sunset contrast starkly with the static,

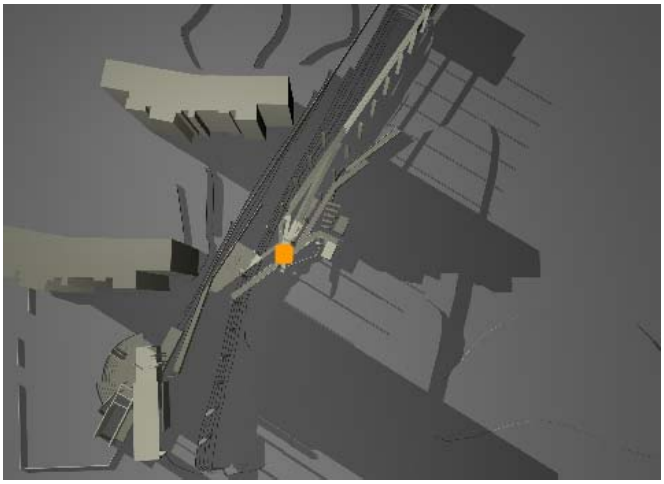


Figure 078: Shadows during winter at approximately five pm and the sunset caught between the Drie Lelies Buildings

Signage in the floor of the platforms indicates direction, and the procession resumes in the direction of the burial area. On the timber ramp the rhythmic sound of footsteps interrupts the regular occurrence of the vertical supports of the balustrade, divided by the equal intervals of the massive concrete columns. This collapses traditional time and the heterotopia functions at its full capacity.

The mourners are led into the narrow vertical garden between the green vertical planes which extend past the ramps above and below. A sense of weightlessness prevails; the cantilevered supports are hidden behind the vertical planes, and only the vertical members carrying the structure on which the boxes rest create the illusion that the ramps are supported by these secondary members. In addition their slenderness and lack of connection with the ground creates further confusion and the feeling of weightlessness is strengthened. This ethereal quality is furthermore enhanced by the sunlight which is filtered through the creeper screens and mist from the irrigation system.

Figure 79: Secrets of the woods. Image with permission from Gerrie Venter.

Tectonics

The concept of time as the continuing artist finds its physical expression most strongly in the tectonic resolution of the burial structure which will now once again be broken down into its various constituent parts for the sake of explanation; however, it should again be noted that it is the interdependent spatial relationship between these parts that determines what is experienced. In this way the senses are affected before one's reason is.

Planter caskets:

The conventional method of burying the ashes in a wall of remembrance is queried and a new concept of burial related to time is proposed. Conventionally the ashes that are placed in a casket in the niche of a face brick wall convey a sense of finality (the pyramid). If the body is not cremated but buried it is allowed to decompose; hence the body becomes part of the soil that in turn becomes part of the vegetation which eventually is ingested by insects, birds or mammals etc. The body therefore becomes part of an ecosystem and since matter cannot be destroyed, ends up as an element of infinity (the labyrinth).

What is proposed is that the cremated ashes of the deceased are mixed with soil, after which seeds of small shrubs or flowers are planted. The choice of plant material is dependent upon the choice of the relatives of the deceased (from a restricted list; refer to appendix). This allows these relatives to make their own personal

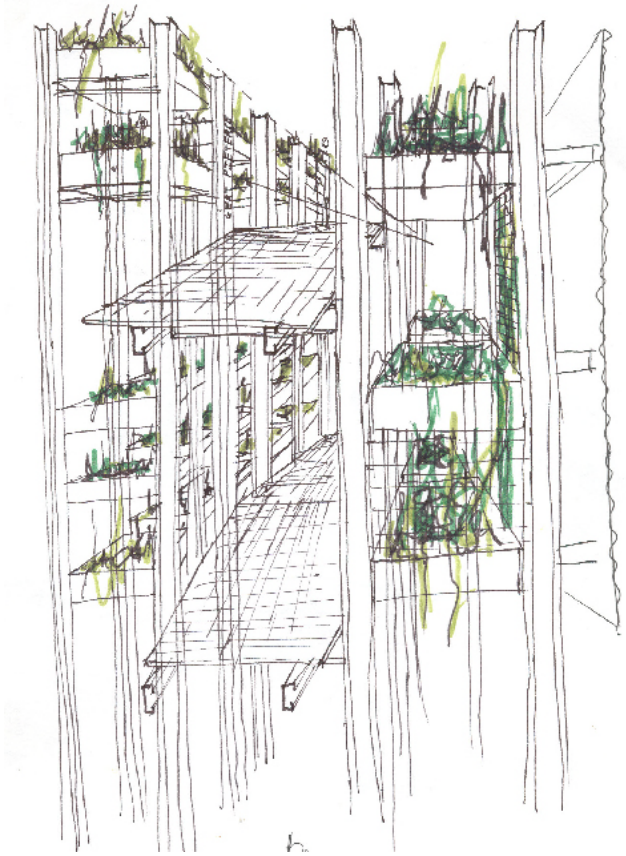


Figure 080: Initial concept sketch of burial structure

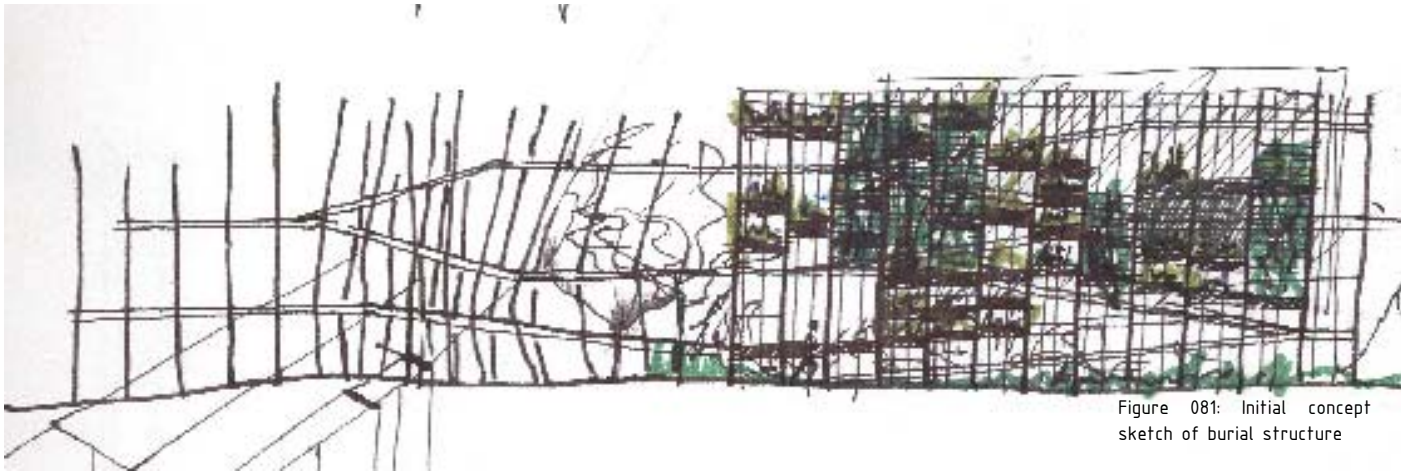


Figure 081: Initial concept sketch of burial structure

The planter caskets are organized in pre-determined vertical planes along the length of the ramp system. Each planter casket weighs approximately twenty kilograms and will be carried by two persons who will place it in position at the predetermined location.

The semi-permeable vertical plant screens between the planter caskets and the road create a sense of privacy for those either burying or visiting a deceased loved one, without isolating them from the street: this is indicated in diagram XXX. Furthermore, homogeneity when viewed from the road is created by these screens which merge the layers of different colours and the textures behind them. The vertical planes hover somewhere between earth and sky: canvases painted by time.

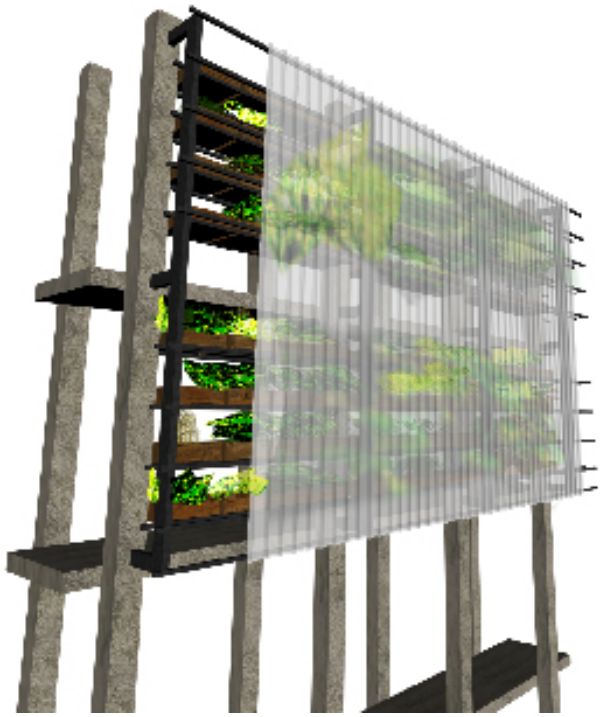


Figure 082: Initial three dimensional model of the burial structure

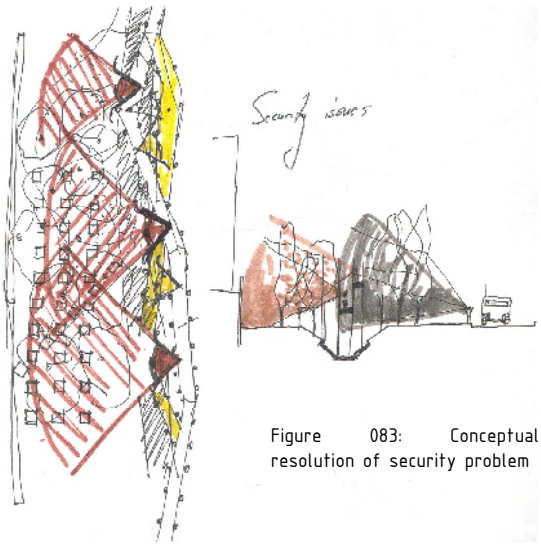


Figure 083: Conceptual resolution of security problem

Building in the channel is prohibited since large debris, for example trees, would be trapped by any foreign element there, reducing the surface flow, which would result in a snowball effect, trapping more debris. According to an interview conducted with a water engineer at the Tshwane Metropolitan Council, the fifty-year flood line lies within the boundaries of the culvert as previously indicated.

The vertical supports for the burial structure would therefore have to be placed outside the culvert. A cantilevered structural system is suggested. The following diagrams (Figures 084 – 088) indicate the conceptual development of the structure:

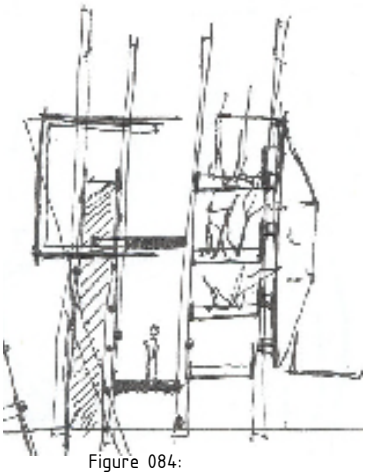


Figure 084:

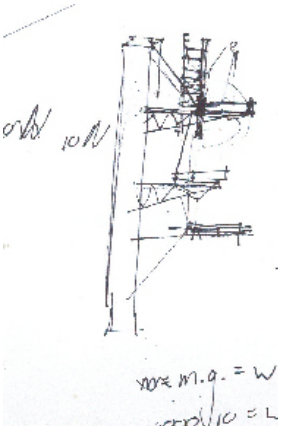


Figure 085:

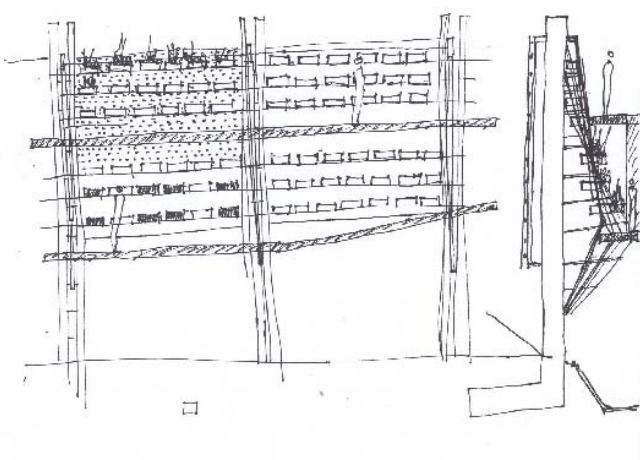


Figure 086:

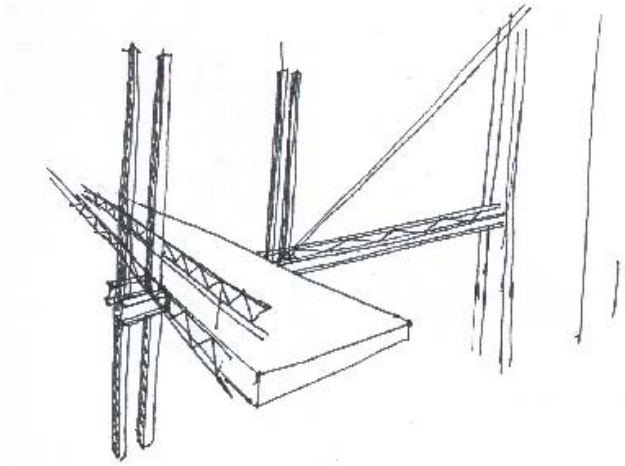


Figure 087:

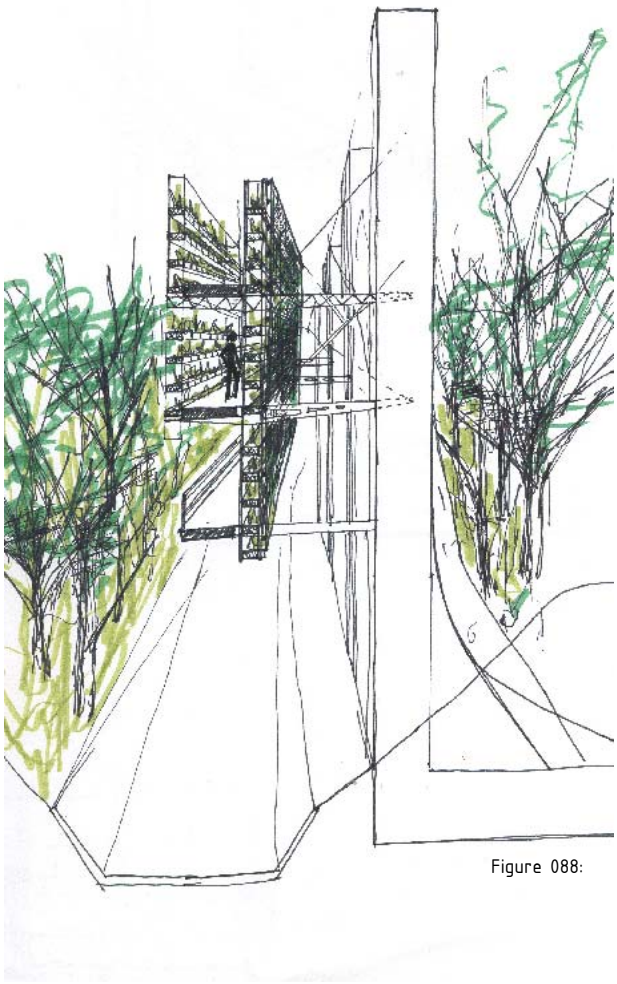


Figure 088:

This practical constraint leads to theoretical opportunities that could deepen the theorized effects in terms of the physical and psychological relationship between the structure and the mourners. The separation of the concrete columns and ramp system creates the opportunity to hide the cantilever support system behind the vertical green planes, thus generating the illusion that the ramp system is suspended in nothingness. The concrete plane furthermore follows the curvature of the river, once again drawing attention to its presence. As one drives North along Nelson Mandela Drive the effect of perspective allows the columns to appear as a massive curving vertical plain, yet movement exposes its brokenness and its permeability becomes apparent. Repetition and mass dominate the second phase of movement. The columns now appear as monumental concrete piers spaced at regular intervals. But, in the third phase as movement progresses and the structure is viewed perpendicularly, the massive piers are once again fragmented into two slender concrete planes. The sense of stability therefore decreases through progression and the concept of the labyrinth is strengthened.

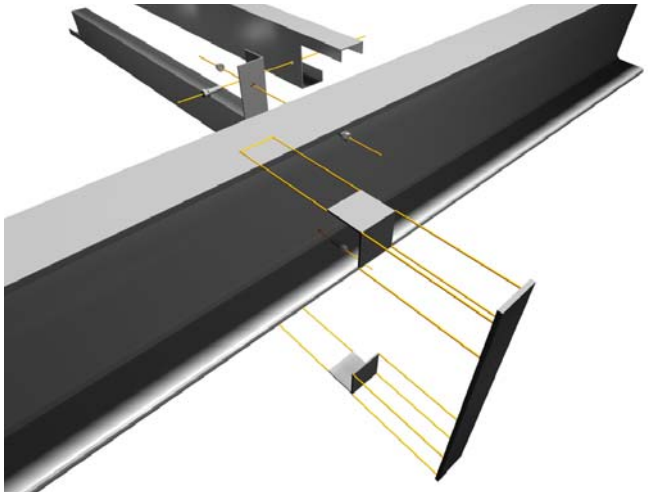


Figure 090: Exploded view of burial structure detail.

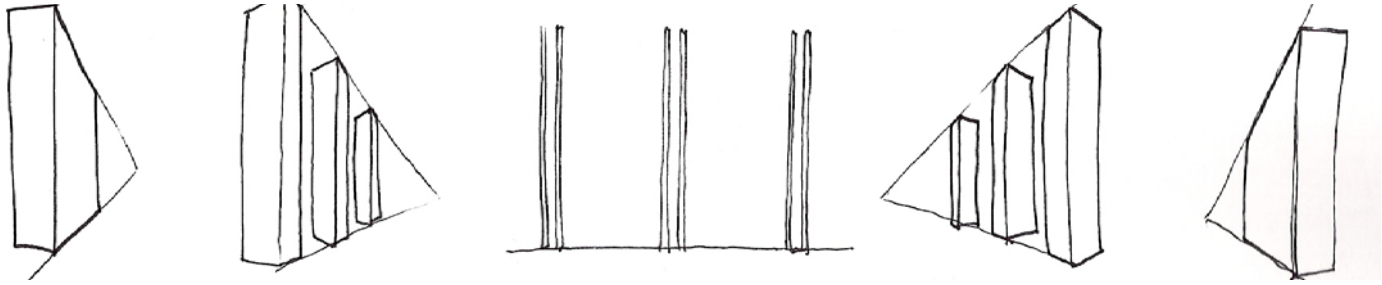


Figure 089: Explanational sketch indicating the fragmentation of the concrete columns by means of change in perception

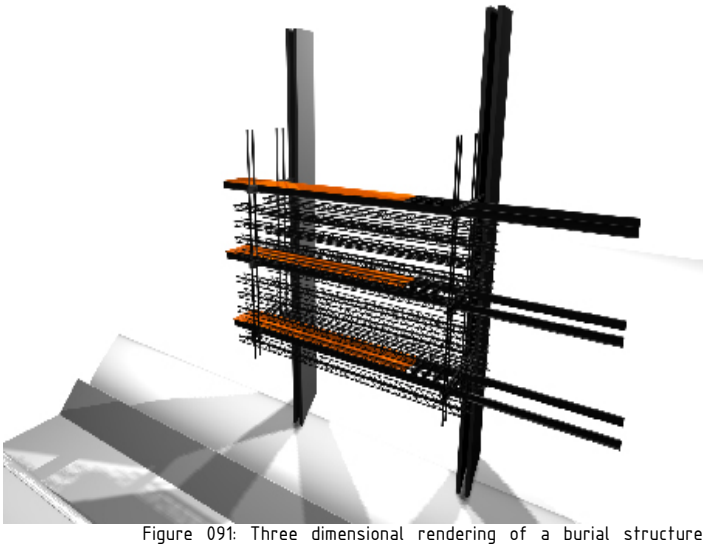


Figure 091: Three dimensional rendering of a burial structure module

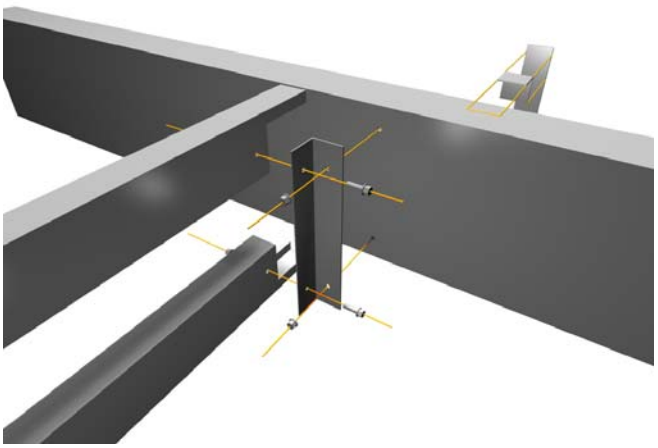
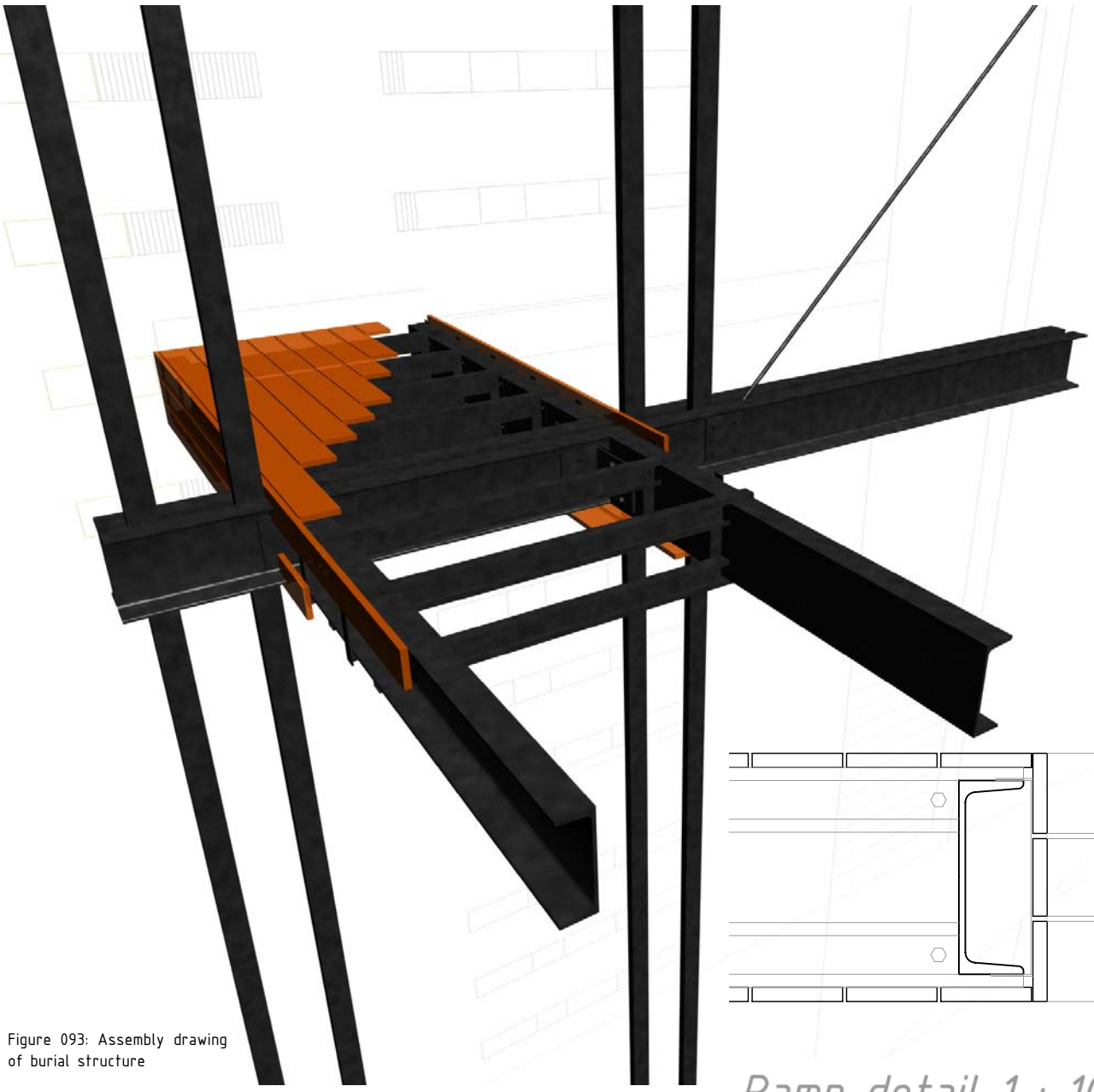


Figure 092: Assembly drawing of lipped channel steel joists connecting to the U-profile steel beams



Ramp detail 1 : 10

Figure 093: Assembly drawing of burial structure

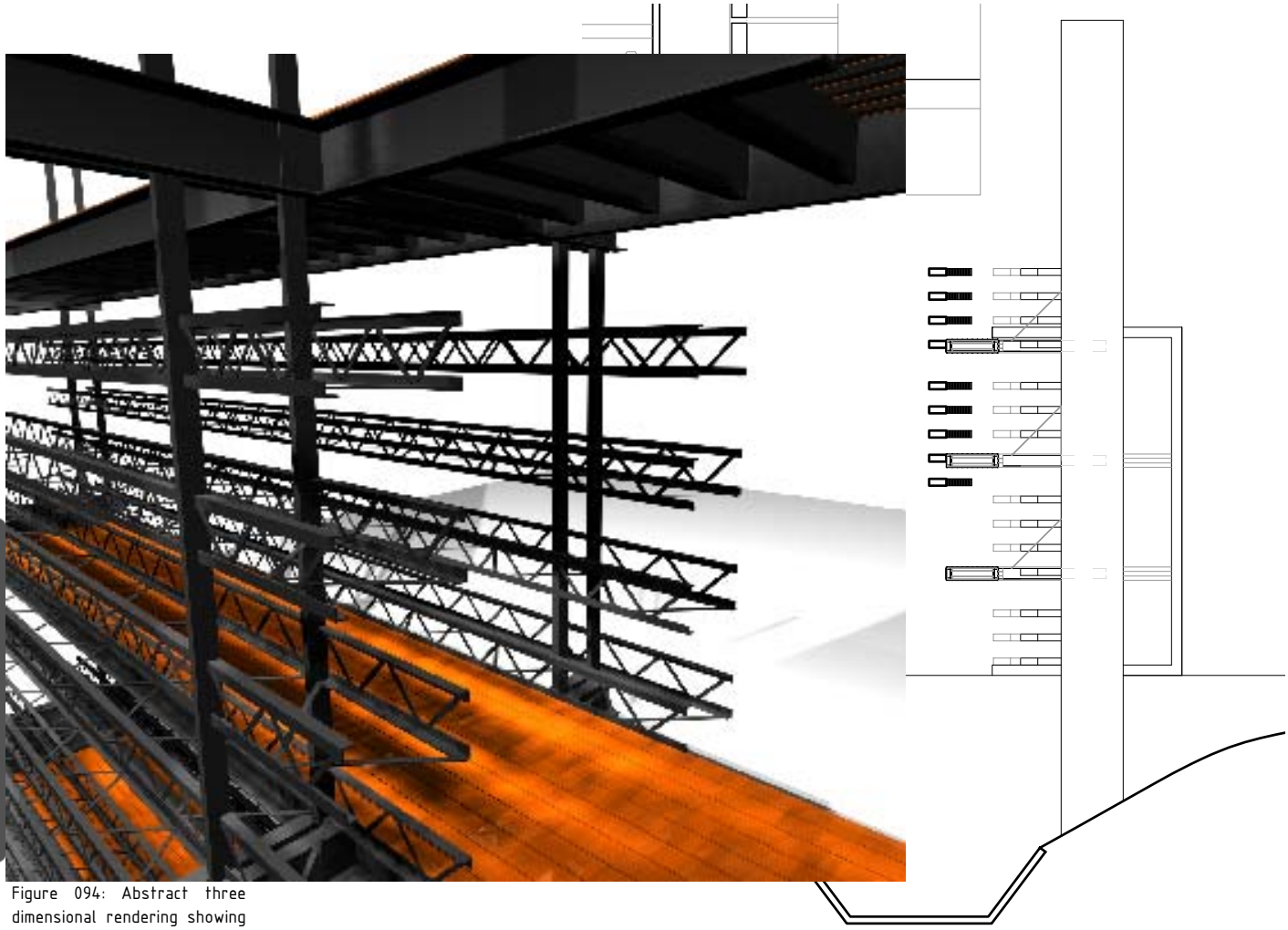
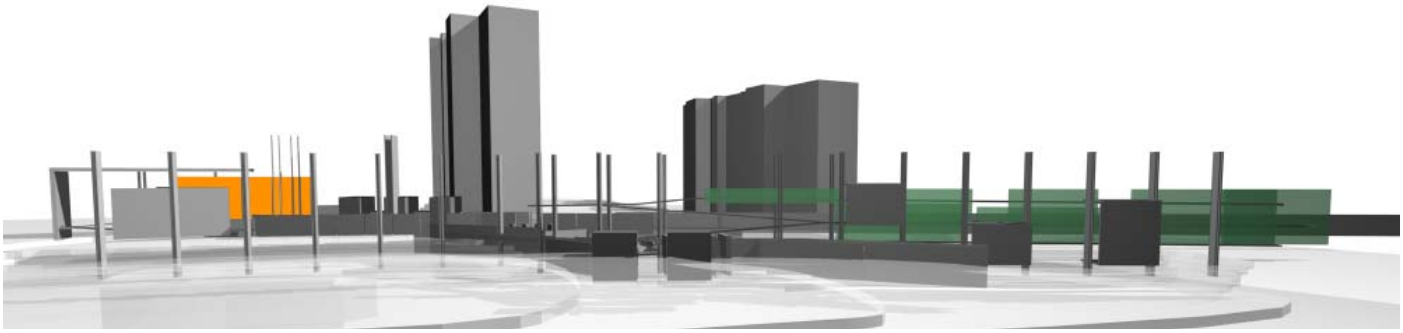


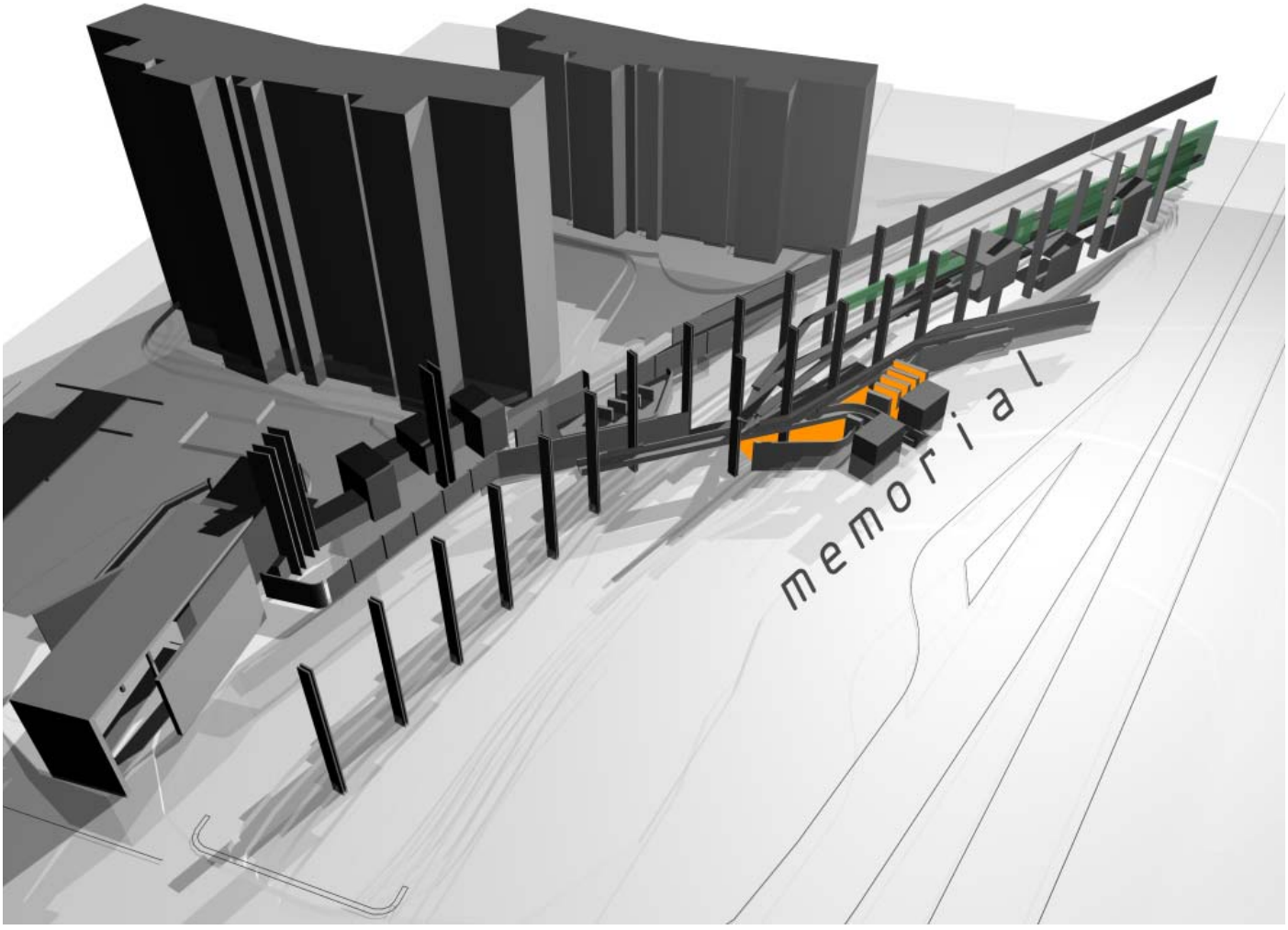
Figure 094: Abstract three dimensional rendering showing the structure which contains the planter caskets

Burial Module Section 1 : 200

In between these concrete piers, fragments of concrete boxes are attached to the burial structure. These fragments serve multiple functions. They act as gathering and overspill spaces where the final burial ritual occurs in the form of planting the seed in the planter casket: the end of the ritual signifies the beginning of a new. Furthermore, these elements allow for contemplation spaces that extend over the river edge; people visiting can sit on the edge with their feet hanging over it and appreciate the convergence of the natural and artificial. These spaces could also function as picnic areas: A heterotopic space which accommodates different events utilized by a dramatically fast-changing hybrid population.

The essence of what is achieved through the burial structure is that it is a constantly changing vertical landscape suspended between earth and sky, east and west, the realm of the living and dead. Building between widens the cracks, tears or fissures, illuminating the presence of *différance* through its disappearance. It is not constructed to escape time, but to entangle the visitor ever more deeply in it.




memorial

Memorial

The memorial of the forgotten would be a burial place for those who have died without being identified. Initially it was proposed that the memorial be dedicated to selected deceased politicians or celebrities who had contributed to the fight against apartheid. Yet, the anti-utilitarian undertone and concept of the return of the refused, neglected and negated seems to plead against another memorial honouring the heroes of our time. What about the insignificant, those whose death has gone unnoticed?

Location:

The formalization of the existing taxi stop allows direct access to the memorial linking it to the region via Nelson Mandela Drive. Its position is furthermore integrated with the burial structure by means of the public concrete bridge which is connected to one of the platforms leading into the burial area and the concrete fragments.

The site, defined as a gateway into the MDC and Pretoria, will mark the beginning of a pedestrian route which leads into the MDC and CBD through the defined precincts proposed by the MDC.

Figure 095: Possible tourist walkway through Pretoria

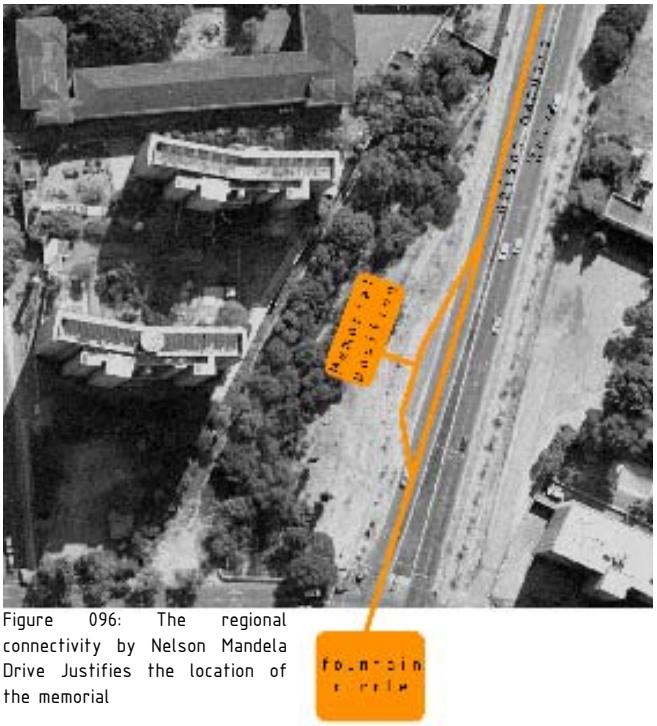


Figure 096: The regional connectivity by Nelson Mandela Drive Justifies the location of the memorial

Concepts & Meaning

The memorial space that cuts into the river bank provides an intermediate semi-public space. By means of taking away or cleaving the memorial space itself is created. Memorial walls connect the memorial to the public realm. Cleaving these walls connotes a reference to the forgotten (refuse), an abstraction of an archeological ruin through which the unknown is made known. The appropriateness of the space created by the removal of earth suggests the pre-existence of something that had been there previously, but was passed by unnoticed and is now made apparent through its absence. Presence appears through absence.

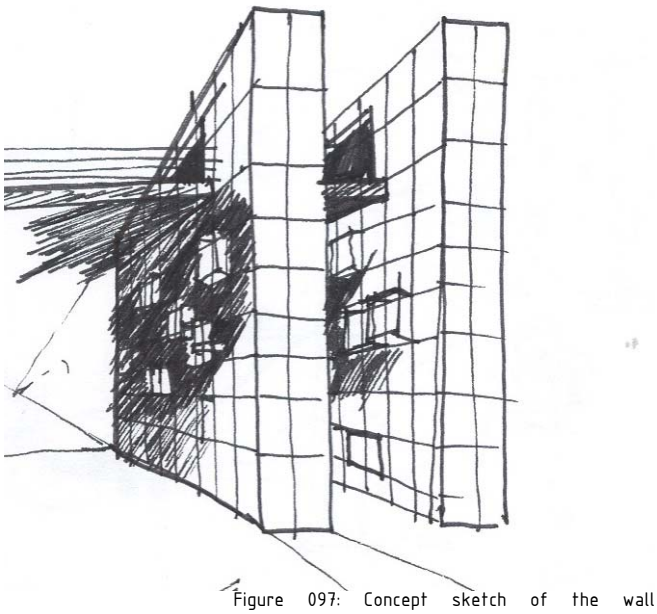


Figure 097: Concept sketch of the wall disappearing in time

Form

By means of the cleaving process the boundary implying the "*between*" is widened and drawn into the memorial space. Once again the non-perpendicularity of the design seems justified as the retaining walls respond to the ruptures of the "*between*" condition.

Materials & Ritual

The burial walls consist of removable concrete tiles fixed to a prefabricated airbrick concrete wall. After the construction is completed and all the tiles are set in position these walls appear complete. Yet, the walls are deconstructed in time: For every unidentified AIDS victim a tile is removed from the memorial walls and replaced along with his/her ashes, by volunteers from the public, in the niches provided in the fragmented concrete structures. The memorial walls are therefore deconstructed and the concrete fragments are constructed as time progresses. Once again the work of art is sculpted by the public and time.

This process allows for the respectable burial deserved by every individual no matter how insignificant.

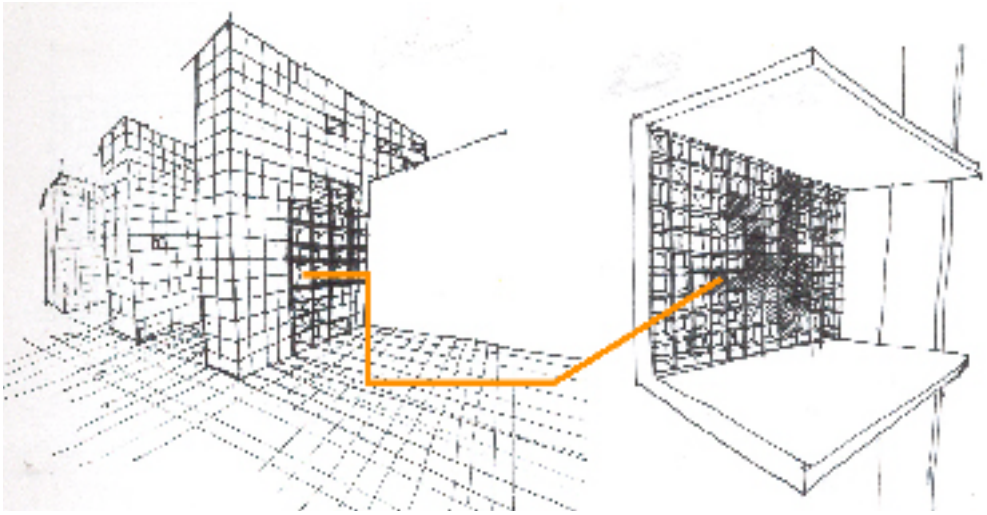


Figure 098: Concept of the positive and negative appears through the deconstructed memorial walls and constructed concrete fragments emphasizing the structure as a continuously changing process

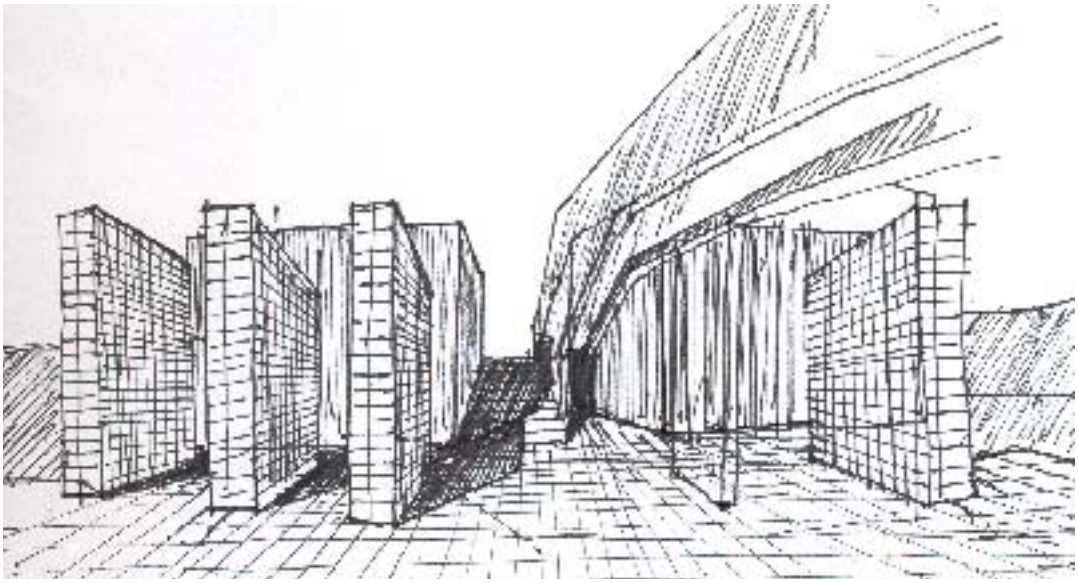


Figure 099: The tile pattern enhances the concept of cleaving

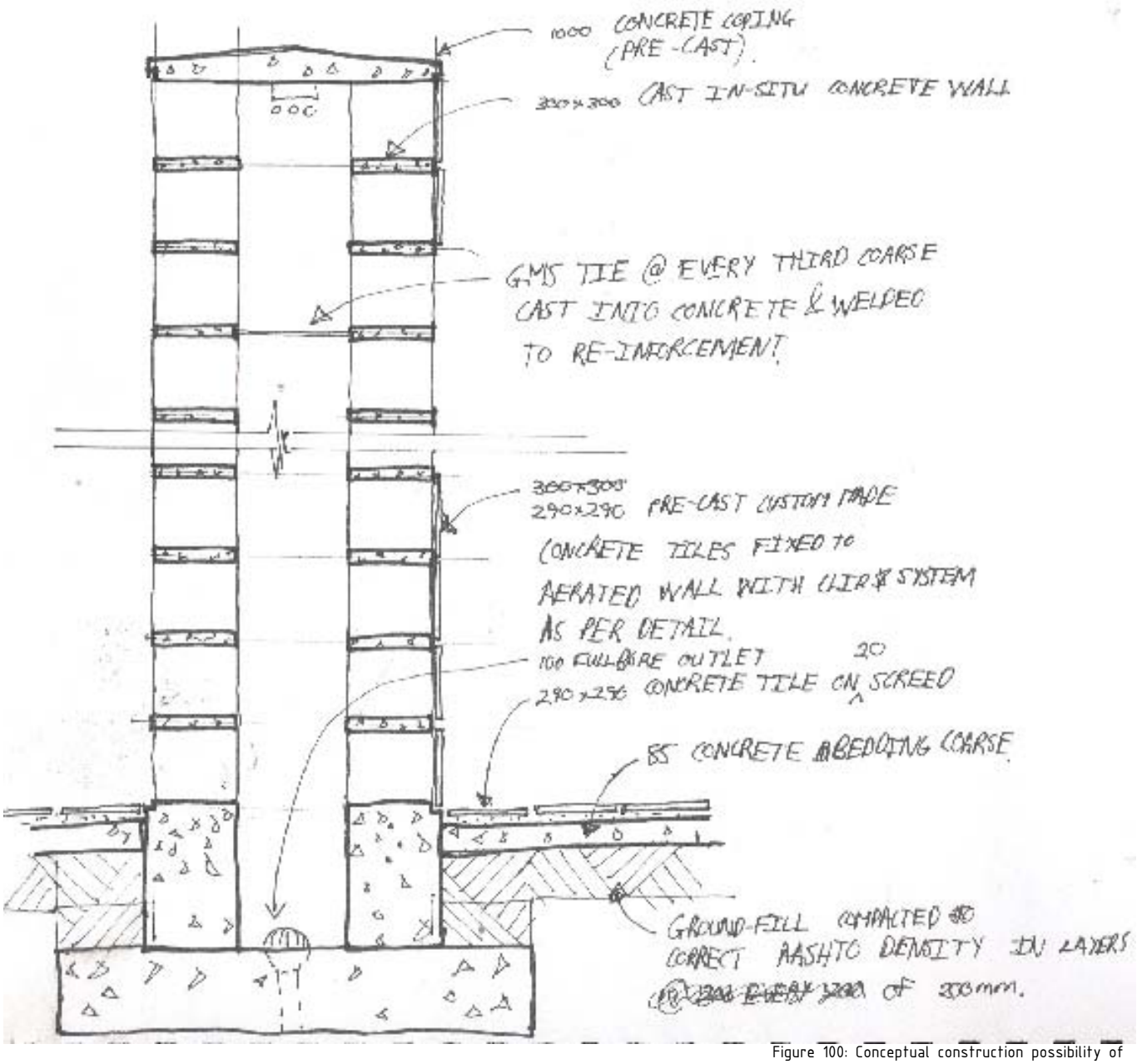


Figure 100: Conceptual construction possibility of the memorial wa;;s

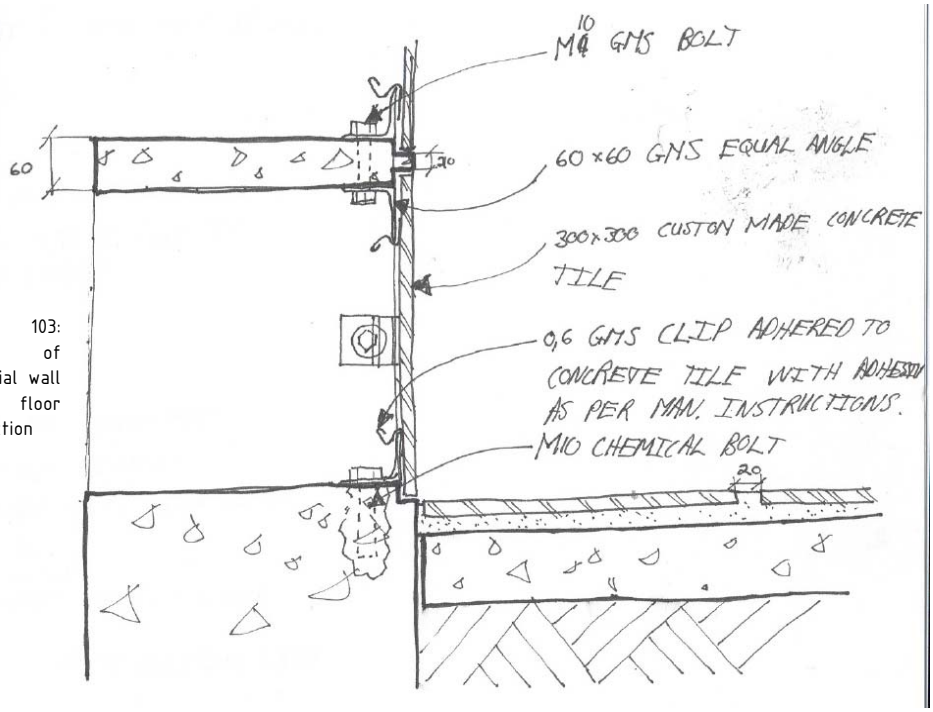


Figure 103: Derail of memorial wall and floor connection

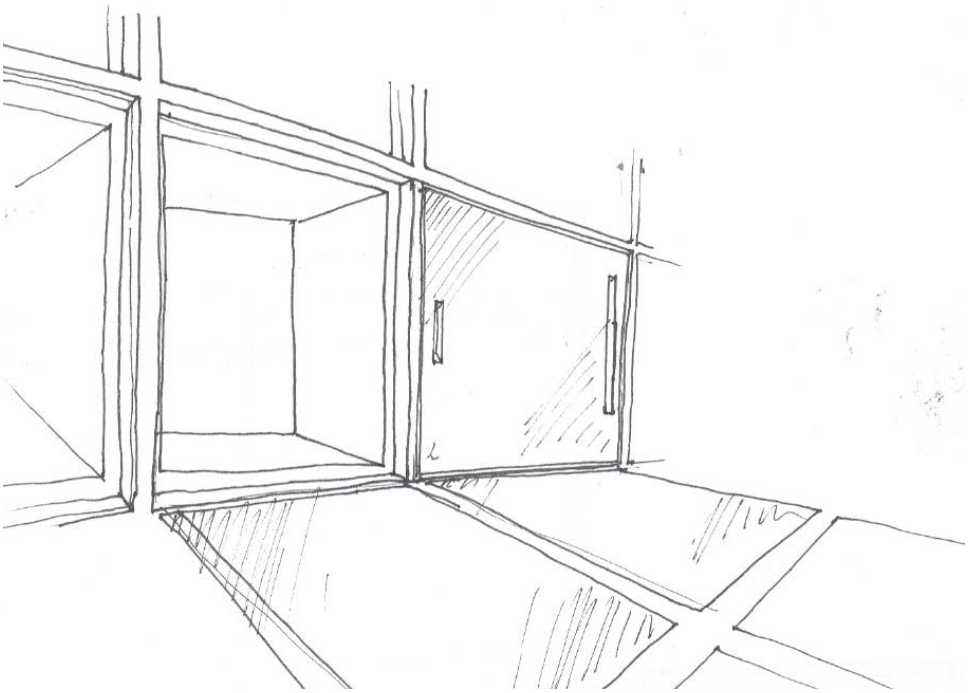


Figure 101: Three dimensional drawing of memorial wall and floor connection

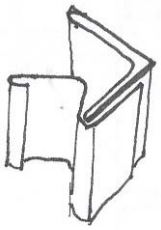


Figure 102: Clip System which connects the tiles to the concrete strcture housing the ashes

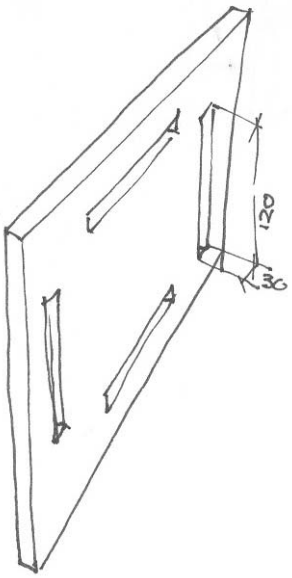
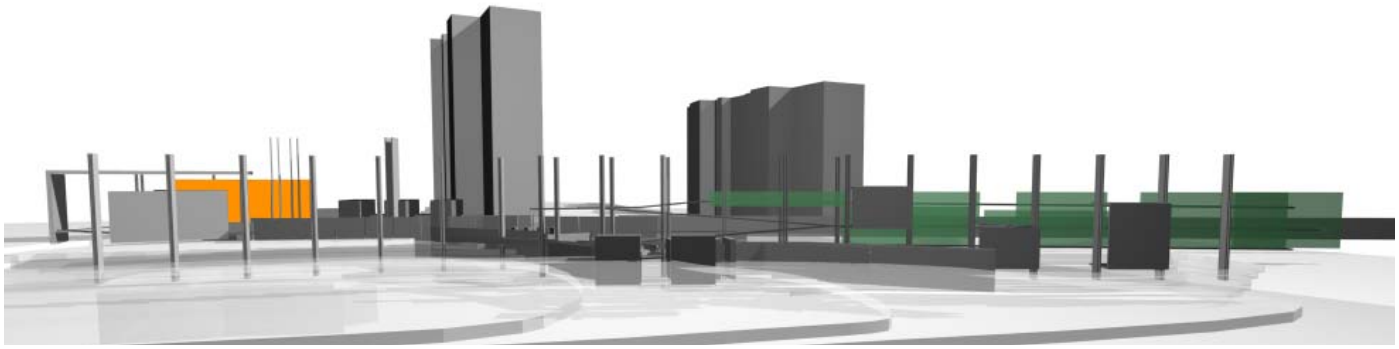
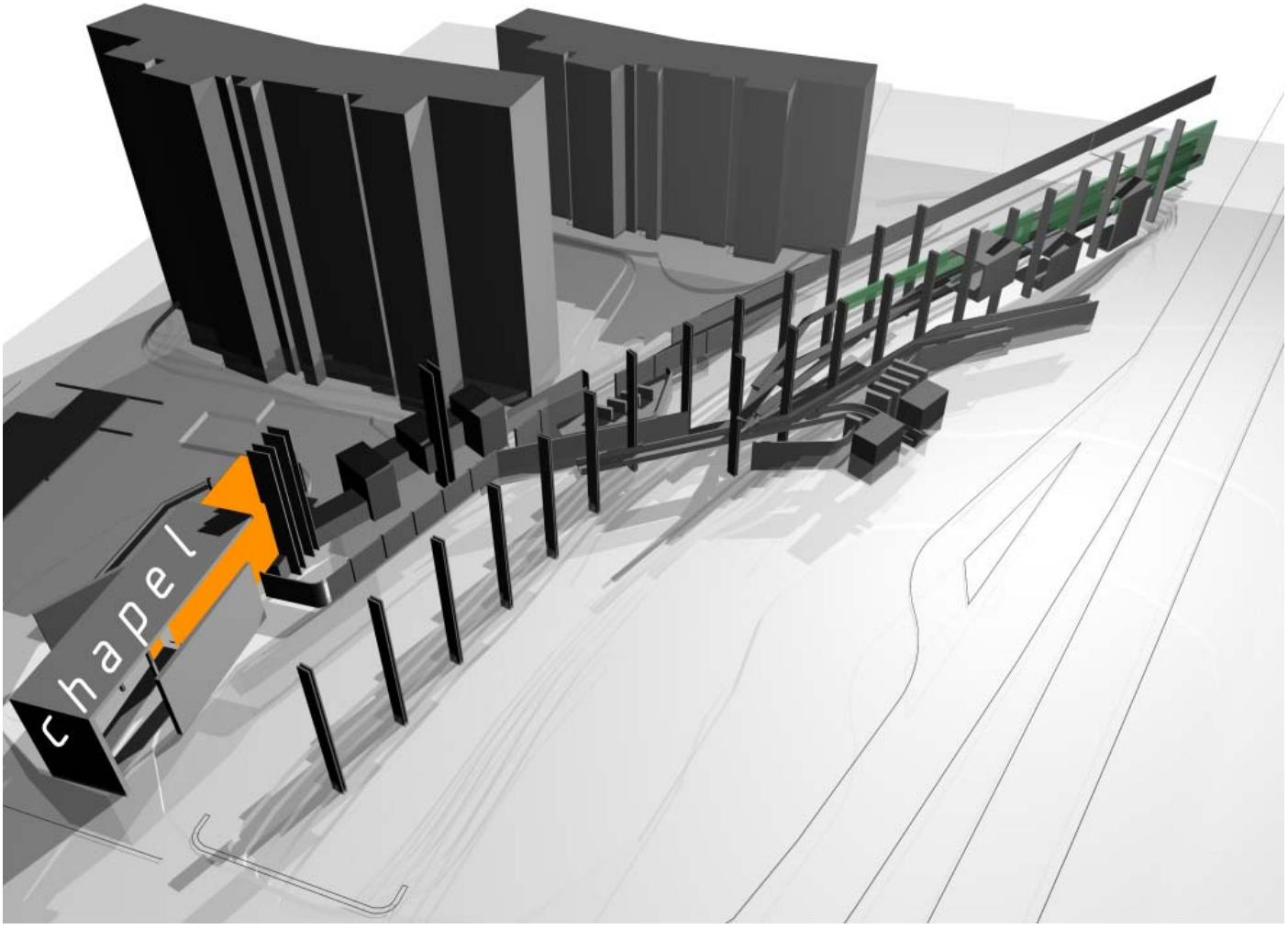


Figure 102: Tiles with slots so that the can be easily removed from the wall.




chapel

Chapel

Location

The location of the chapel on the site was determined by both theoretical and practical considerations.

Accessibility: The precedent study diagrams illustrating the movement of coffins have indicated the importance of the chapel being in close proximity to the crematorium. As shown in the physical site analysis the segment to the south of the Drie Lelies buildings is currently not utilized (Interview with landlord of the Drie Lelies buildings). The opportunity that emerges is the possibility of opening a separate circulation route for the hearse that can be accessed from Prinsloo Street, thereby servicing both the crematorium and chapel simultaneously, while separating the hearse from the public realm.

Ritual: The separation of the chapel and burial area introduces a sense of ritual that begins at the chapel and linearly directs movement through the urban sculpture into the burial area.

Opportunities: The unused space (2700m^2) south of the Drie Lelies buildings allows for the possibility of large gatherings of up to approximately 2700 people (SABS 0400). The chapel would therefore function as a preaching altar from which memorial services could be held. A similar approach in which the chapel functions as a preaching altar occurs at the Los Nogales School in Bogotá, Columbia, designed by Daniel Bonilla Arquitectos in 2002. Figures 104, 105, 106 and 107 indicate the massive wall planes which opens the interior of the chapel to the gathering space outside. No formalized amphitheatre was provided.

Figure 104: Los Nogales chapel. Functions as a preaching altar which allows for the accommodation of large gatherings by means of the wall planes which swing open.

Figure 105: Los Nogales Chapel. Wall planes closed during smaller services

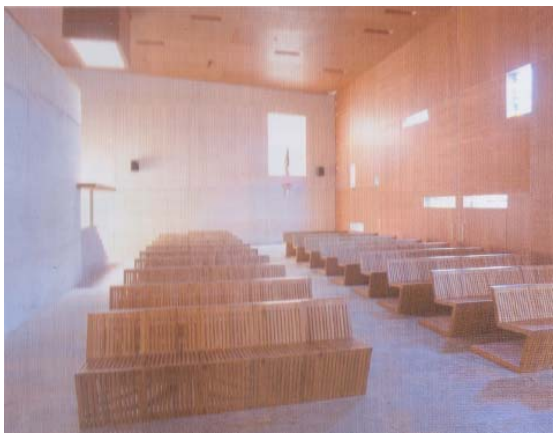


Figure 106: Los Nogales Chapel. Ethereal light quality created through the combined use of small window openings and reflective timber finishes.

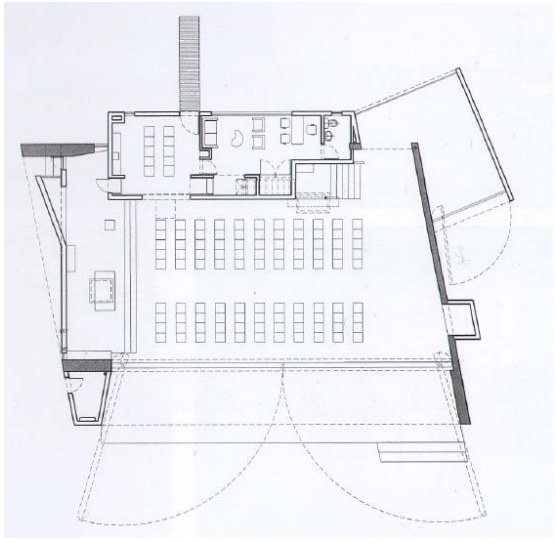


Figure 107: Los Nogales Chapel Plan Entrance to the chapel occurs through an intermediate space which allows for the eyes to adjust from the outside glare.

Form

The converging city grid fragments the functionalist Modernist box in such a way that the functional space which it used to enclose is opened, while simultaneously enclosing or defining space which was left open and undefined in its previous condition. The method employed by Masson, as described by Taylor (1992, p.240), in which the lines on his drawings open as much as they close, has been interpreted spatially by means of suspending the chapel between the fragmented planes of the concrete box so as to open the time-space of the "between" via the process of fragmentation, by means of which the chapel acquires the quality of a veil and of a spatial transition emphasizing the start of the ritual process.

The converging city grids that meet diagonally are significant because they convey a sense of explosion and change. The chapel responds to the urban context through both its orientation and form. In terms of orientation the rectangular prism which contains the chapel responds to the Western city grid and thereby incorporates the unused space to the south of the Drie Lelies buildings. Its rectilinear form furthermore responds to the rectilinear nature of the surrounding urban context.

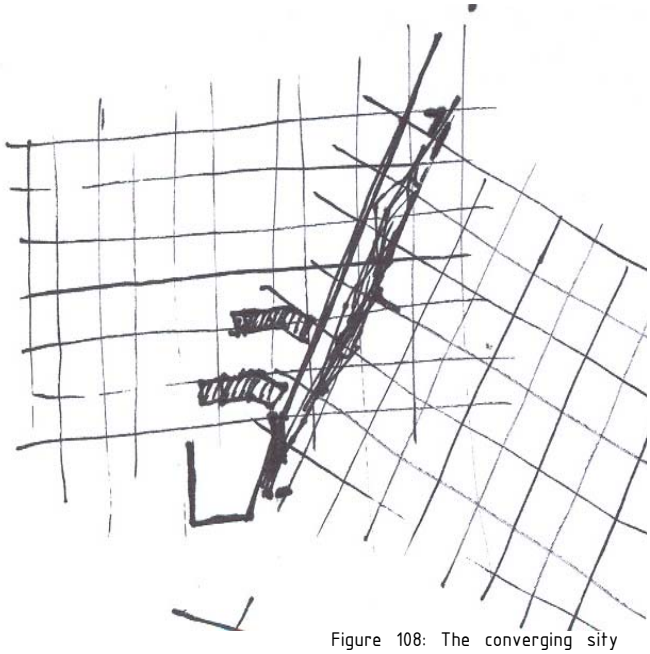


Figure 108: The converging sity grids

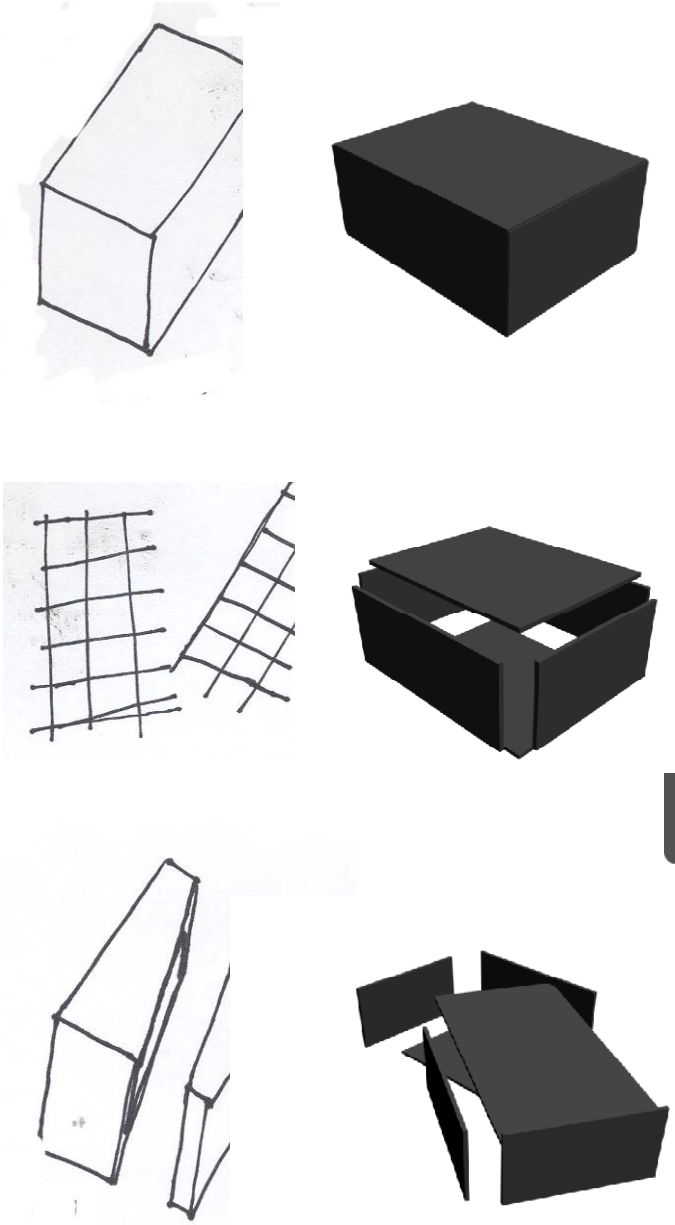


Figure 109: The formal translation of the process of fragmentation

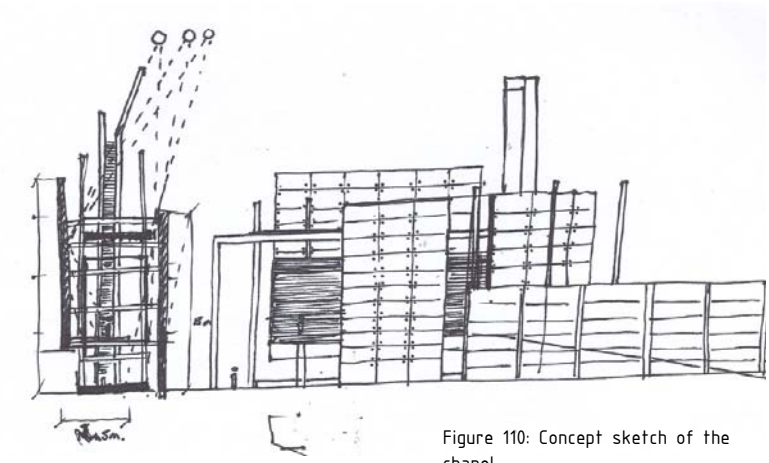


Figure 110: Concept sketch of the chapel

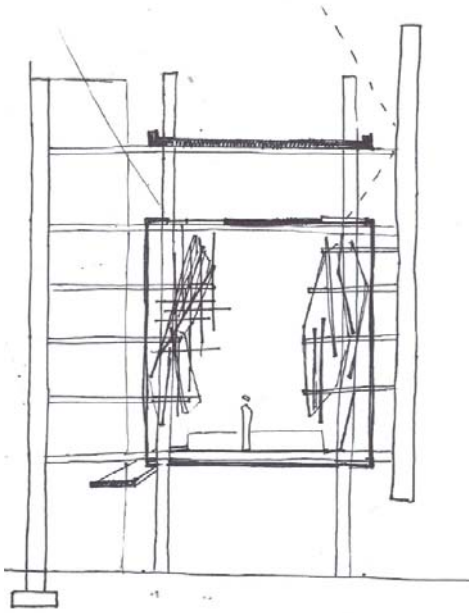


Figure 111: Early concept sketch showing scale and light transmition

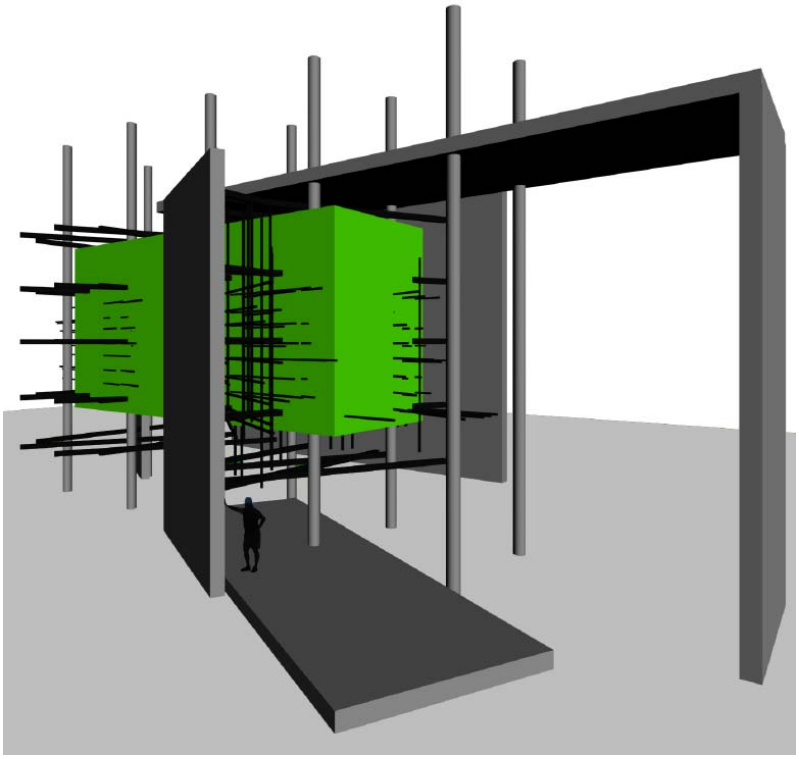


Figure 112: Conceptual three dimensional model`

The rectilinear prism is suspended between earth and sky thereby the notion of veil or edge is once again emphasized. Furthermore, when the chapel is utilized as preaching altar during large gatherings, its height above the natural ground level allows for a visual connection between the mourners and the preacher. Thus, by means of elevating the preacher above the natural ground level the need of an expansive ampitheatre is eliminated.

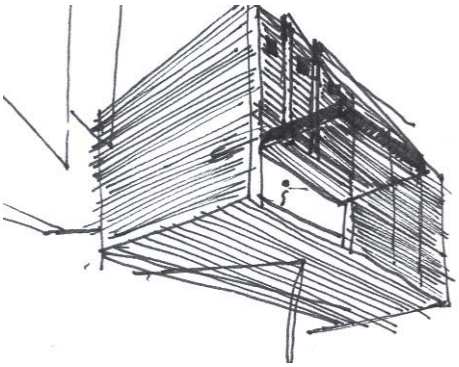


Figure 113: Chapel which opens to large gatherings

Structure

The rectangular prism which is suspended between the fragmented concrete elements must therefore be as light as possible in order to eliminate large structural members that transfer the loads from the prism to the concrete elements to the ground. This allows for the prism to be perceived as independent from the massive concrete fragments.

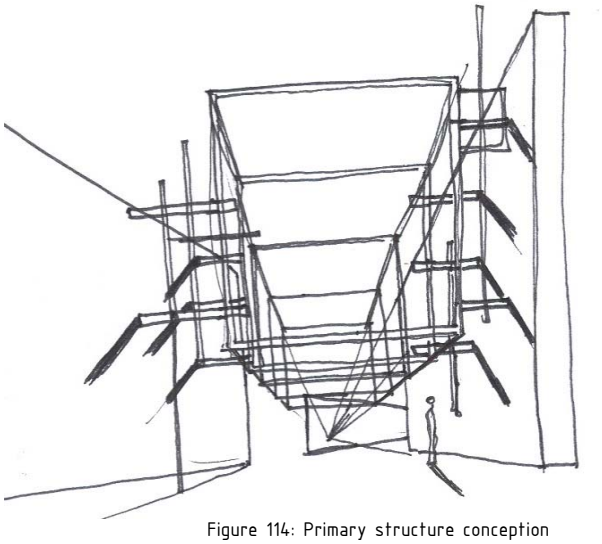


Figure 114: Primary structure conception

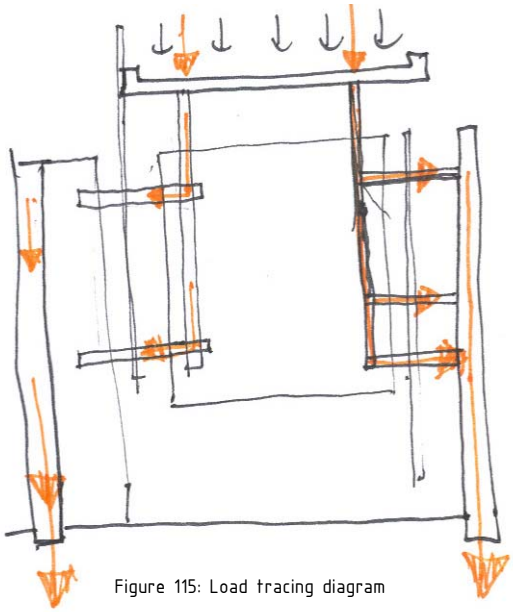


Figure 115: Load tracing diagram

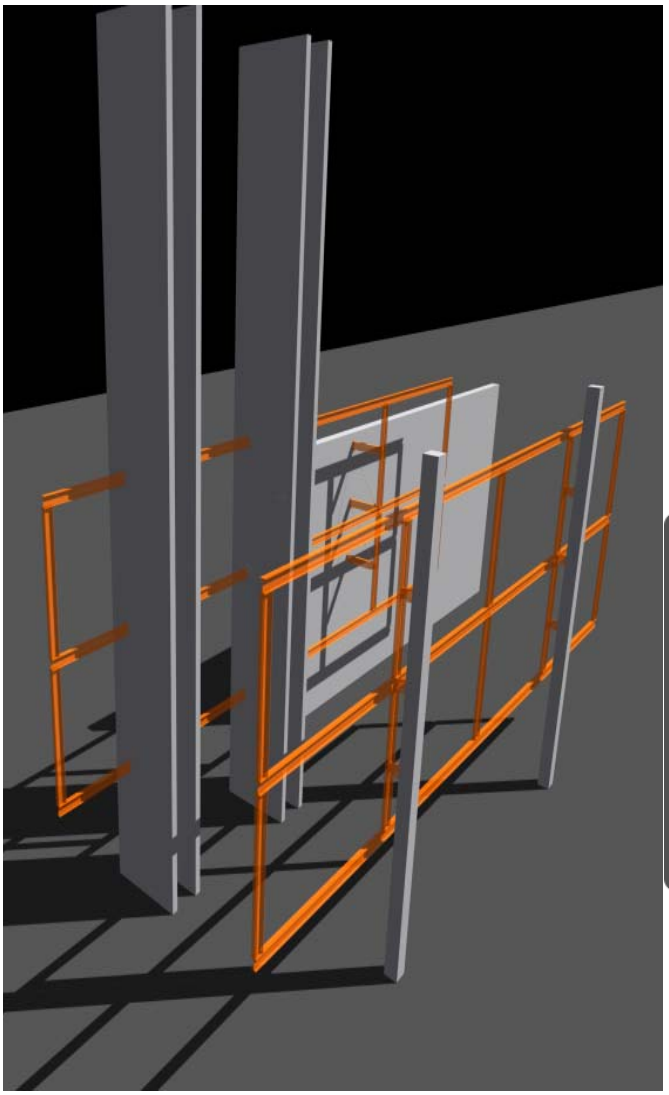


Figure 116: Primary structure load tracing digital rendering:

Primary Structural System

The vierendeel is mostly used where long spans are required and braced truss systems are not feasible as bracing is often in the way of window or door openings.

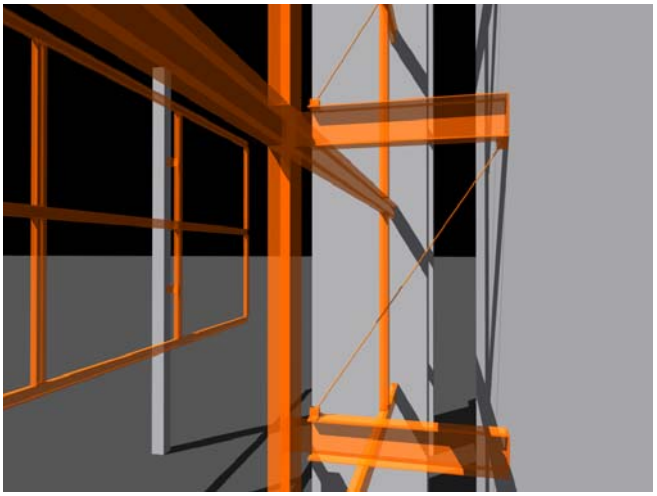


Figure 117: Primary structure load tracing digital rendering indicating connection between vierendeel truss and concrete elements.

The vierendeel truss transfers the horizontal forces of the roof and floor vertically to the concrete elements. The vierendeel truss, due to its effective depth (I_{xx}), allows for long spans. However the truss is weak along the (I_{yy}) axes and wind loads must be considered. Figure XXX indicates that the secondary structure in the form of the roof and floor plane connects and supports the trusses along the (I_{yy}) axes, thereby increasing its strength..

Secondary Structural System

Galvanized mild steel lipped channels transfer the vertical loads of the floor and roof plain horizontally to the vierendeel trusses. The cold-rolled profiles weigh less than extruded profiles while they provide sufficient depth to span between the vierendeel trusses. (Wegelin 2006, 3.12) Furthermore, workability is improved due to the reduction in section thickness and is easily handled on site

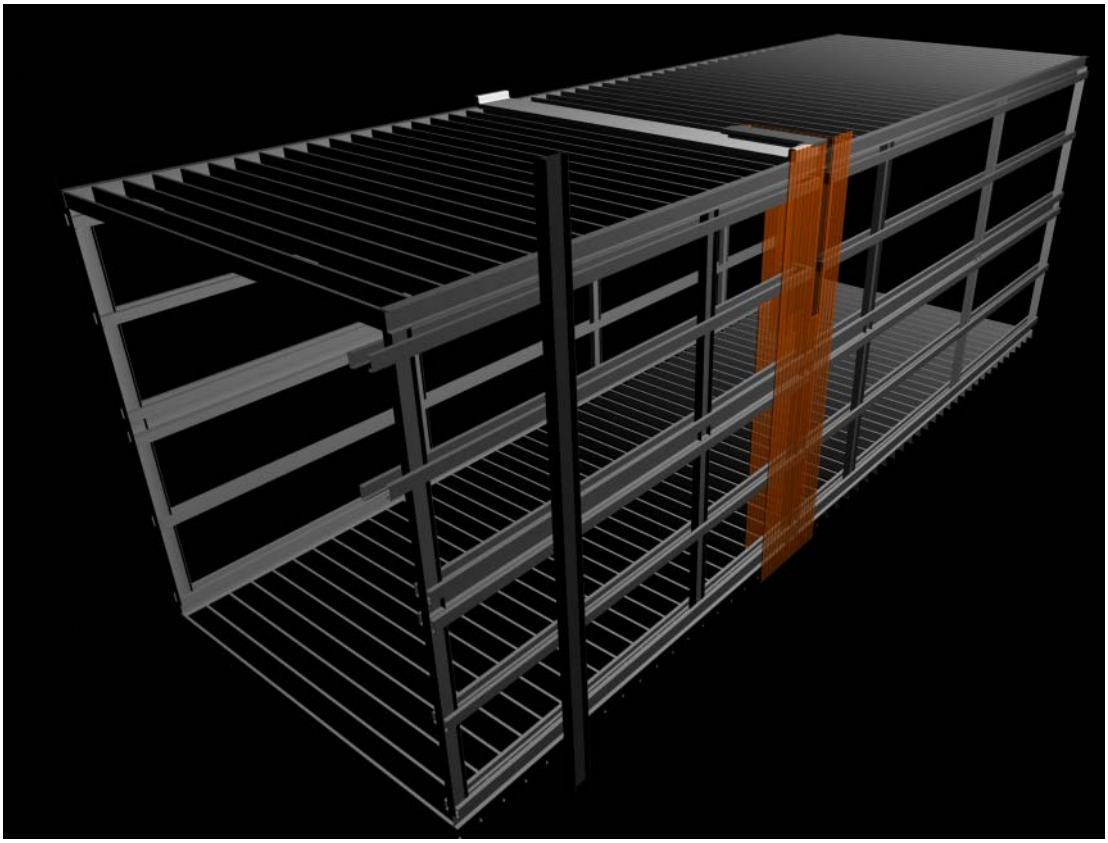
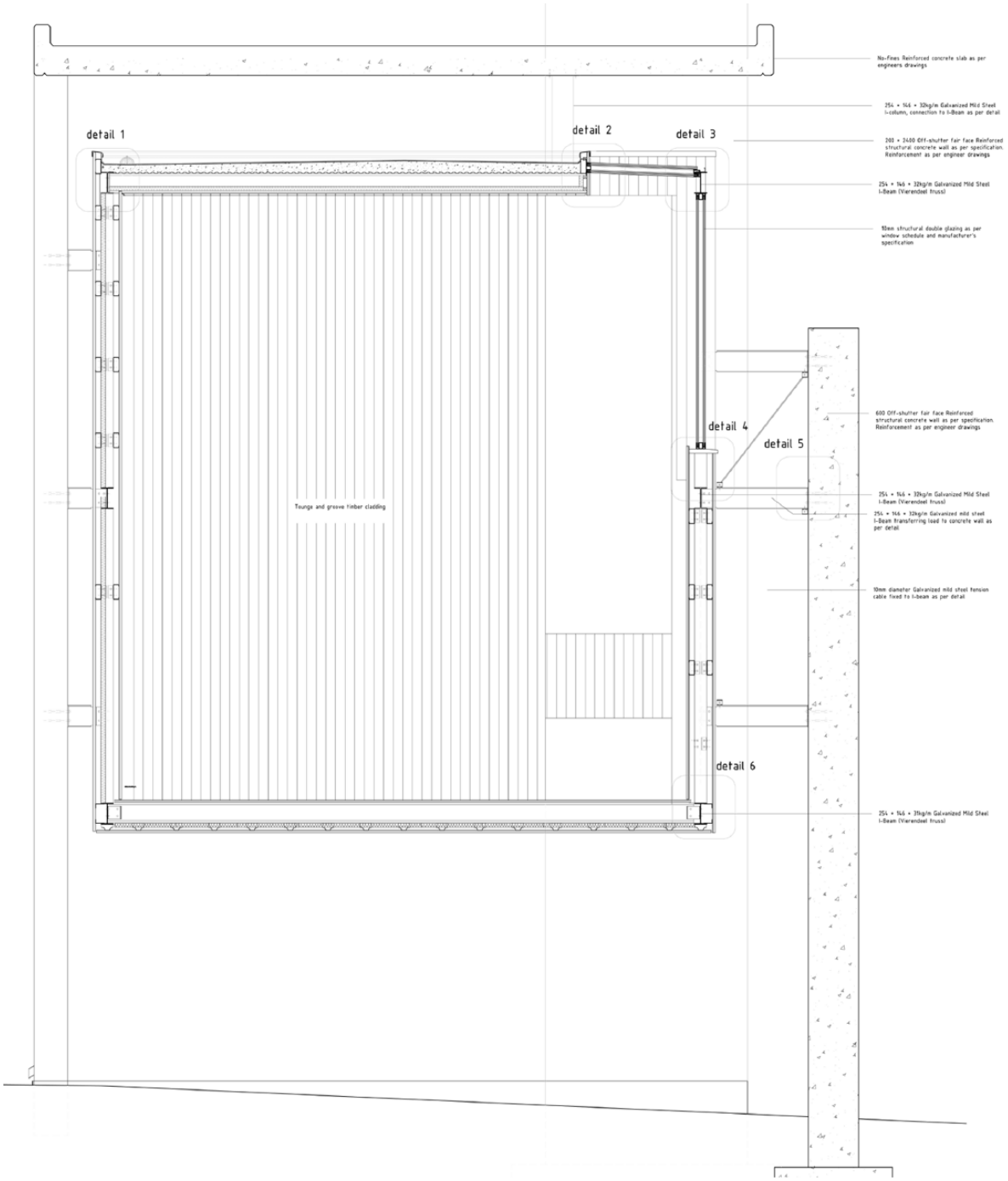
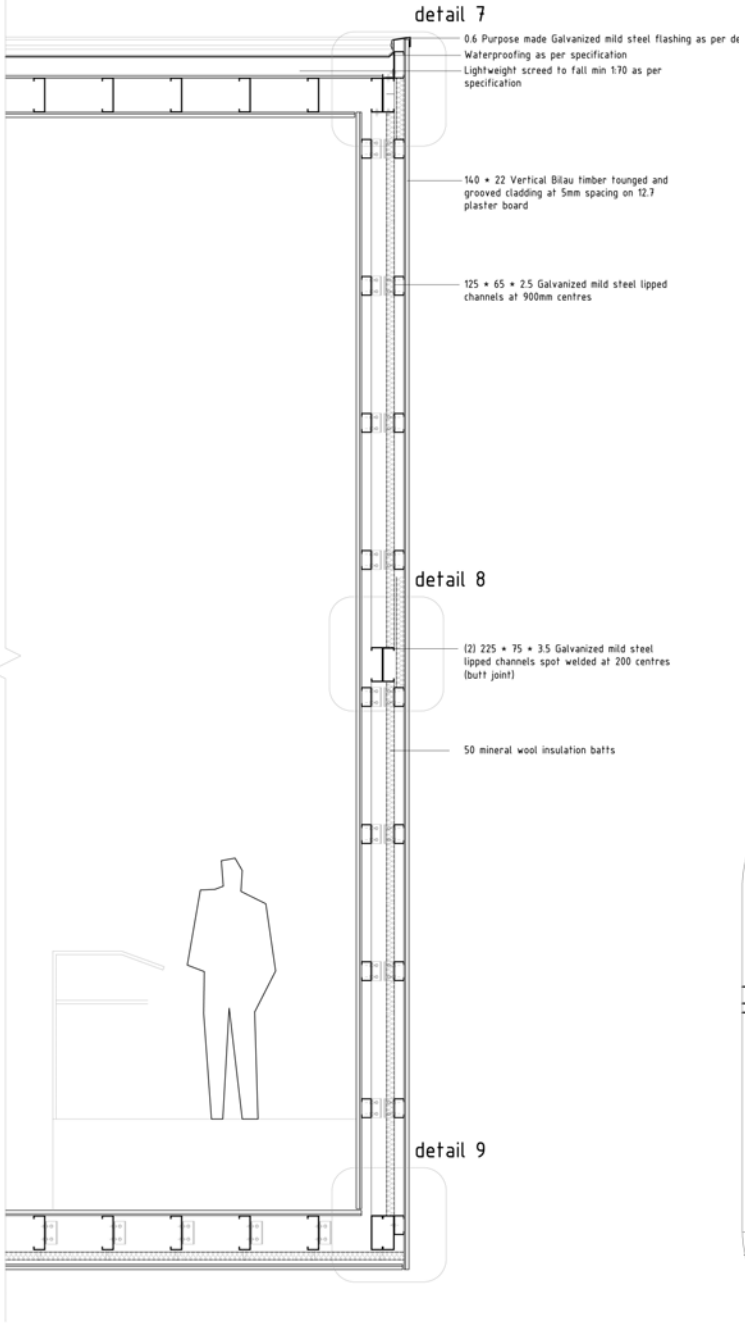
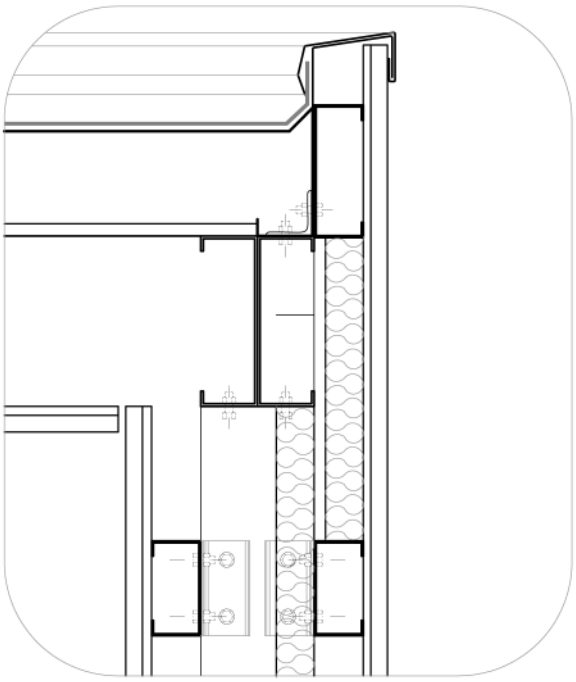


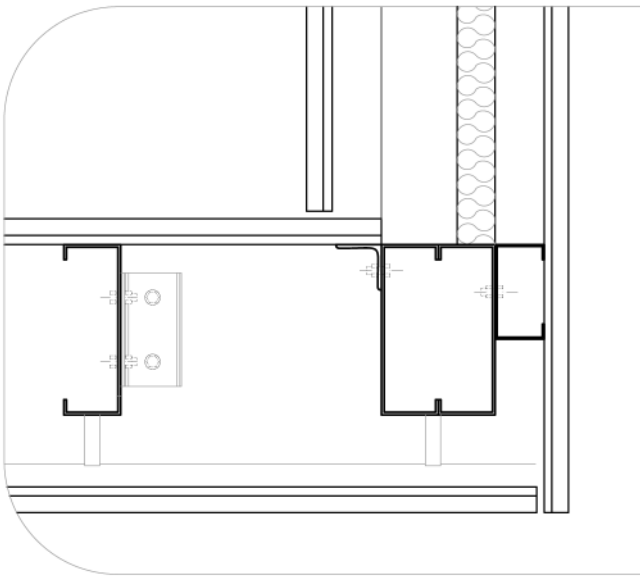
Figure 117: Secondary structure load tracing digital rendering indicating connection between vierendeel truss and lipped channels onto which the timber tounge and groove boards are fastened.


detail 1
detail 2
detail 3
detail 4
detail 5
detail 6
Tounge and groove timber cladding
No-fines Reinforced concrete slab as per engineers drawings
254 x 146 x 32kg/m Galvanized Mild Steel I-column, connection to I-Beam as per detail
200 x 2400 Off-shutter fair face Reinforced structural concrete wall as per specification. Reinforcement as per engineer drawings
254 x 146 x 32kg/m Galvanized Mild Steel I-Beam (Vierendeel truss)
10mm structural double glazing as per window schedule and manufacturer's specification
600 Off-shutter fair face Reinforced structural concrete wall as per specification. Reinforcement as per engineer drawings
254 x 146 x 32kg/m Galvanized Mild Steel I-Beam (Vierendeel truss)
254 x 146 x 32kg/m Galvanized mild steel I-Beam transferring load to concrete wall as per detail
10mm diameter Galvanized mild steel tension cable fixed to I-beam as per detail
254 x 146 x 31kg/m Galvanized Mild Steel I-Beam (Vierendeel truss)

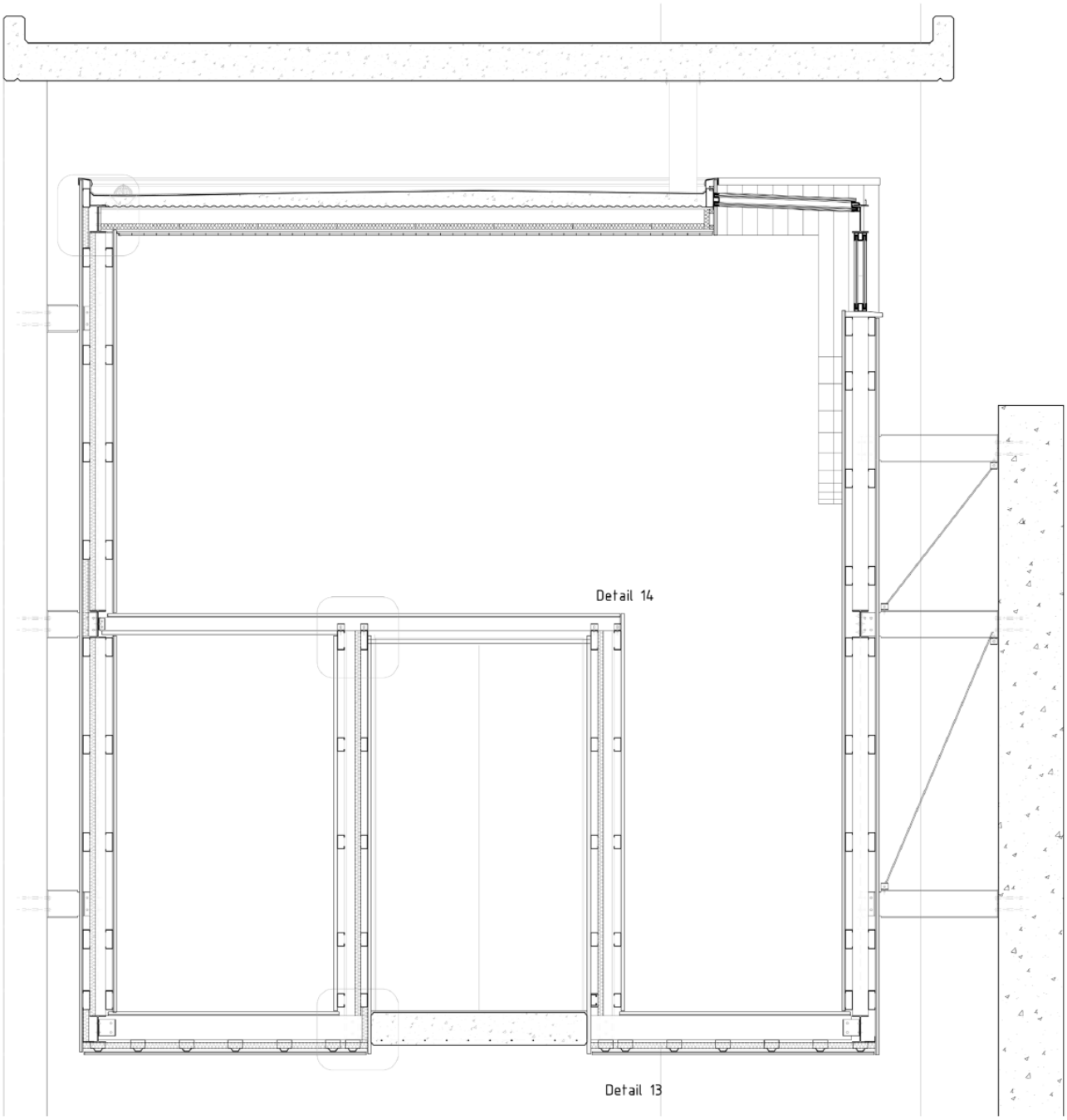


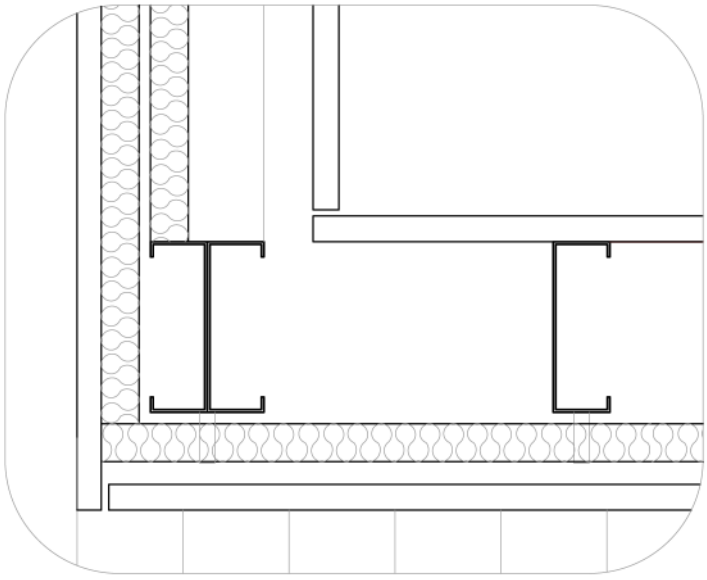


Roof and Wall Connection
Detail 1 : 10

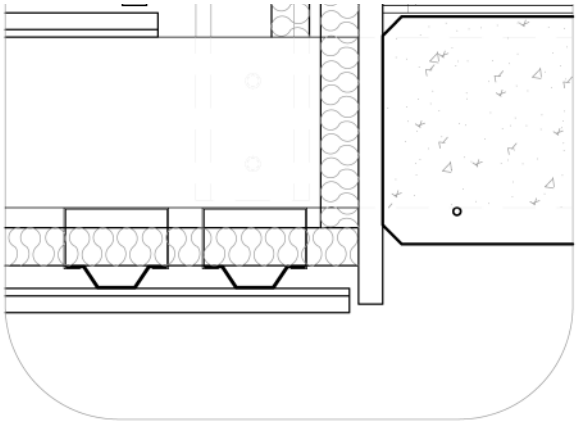


Wall Floor Detail 1

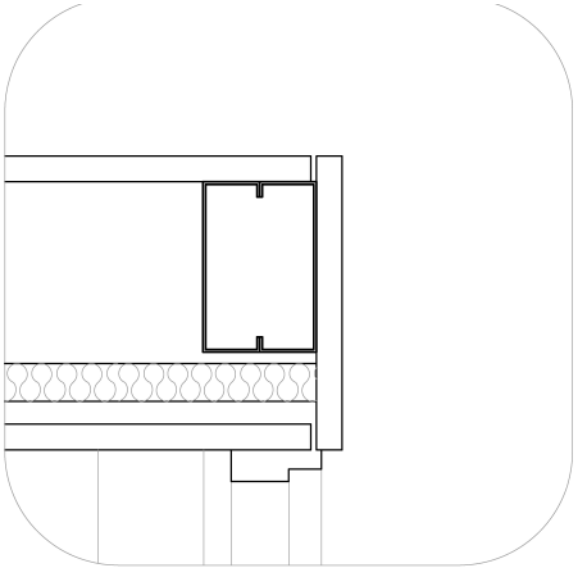

Detail 14
Detail 13



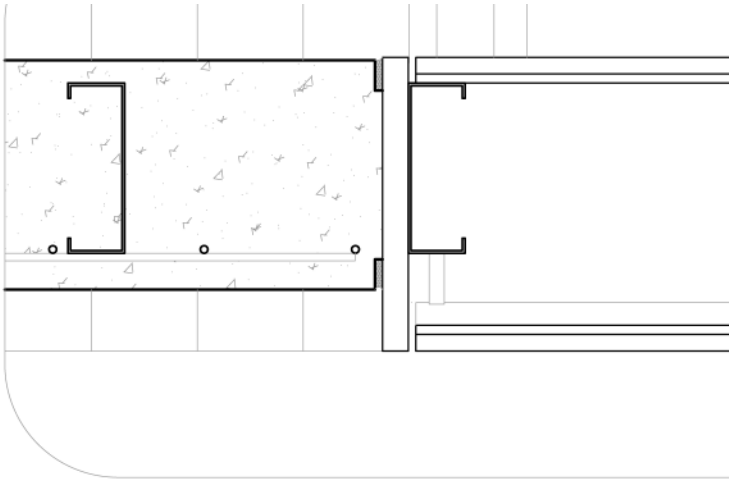
Wall and Mezzanine Floor
Connection Detail 1 : 10



Ramp and Chapel Connection
Detail 1 : 10



Mezzanine Floor
Edge Detail 1 : 10



Ramp and Chapel Connecti
Detail 1 : 10

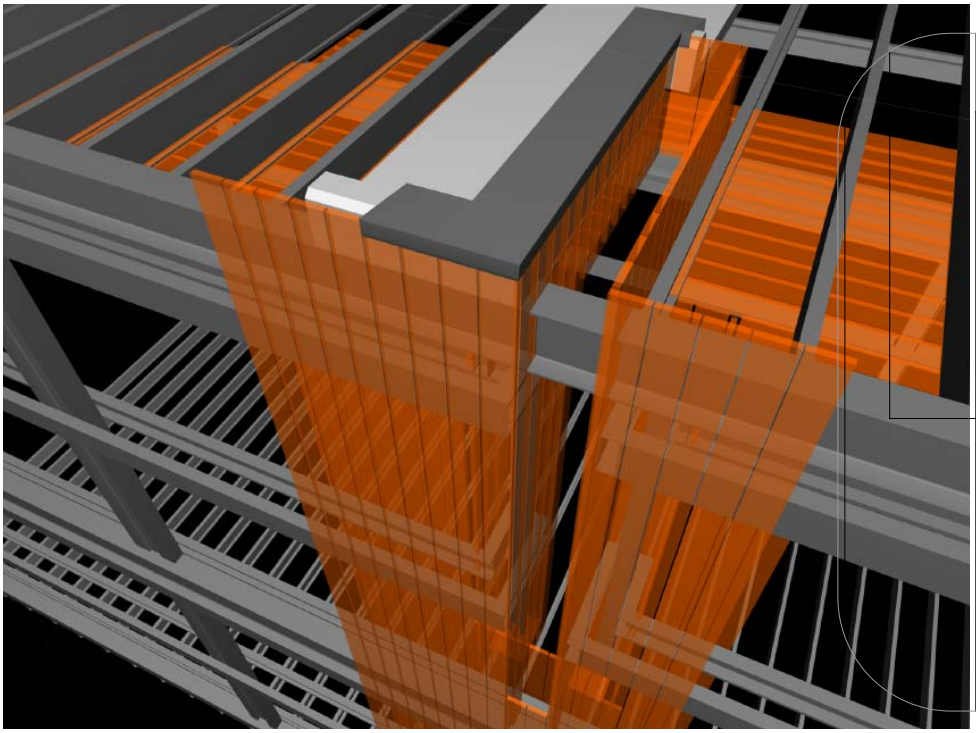
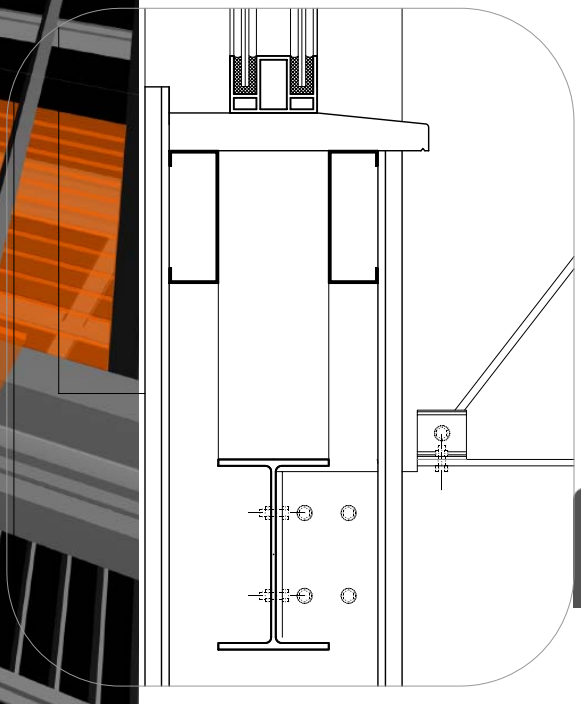
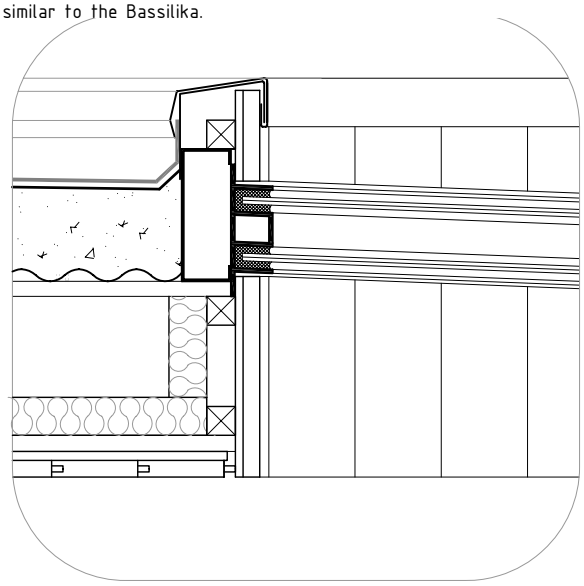


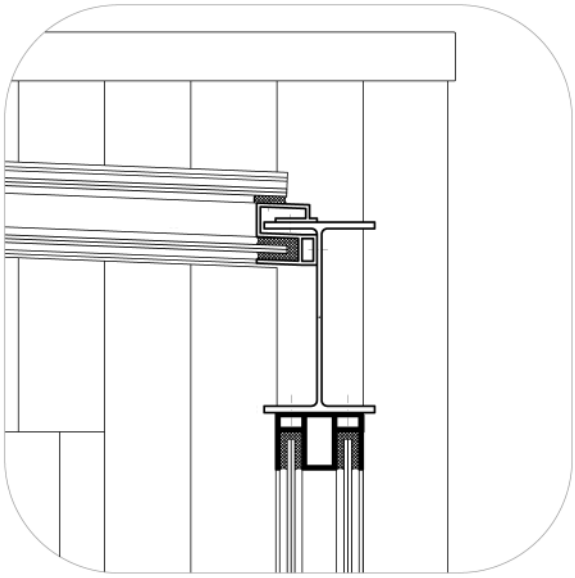
Figure 118: Opening which slices through the vertical and horizontal planes allows light into the interior similar to the Bassilika.



Window Detail 3 Scale 1 : 10



Window Detail Scale 1 : 10



Window Detail 2 Scale 1 : 10

Light

Narrow openings that slice away at the intersection of the walls and roof create planes of light which ethereally filters into the chapel. A sense of progression is created by means of simultaneously increasing the size and number of the openings from the entrance towards the preaching altar.

Figure 119: Light Planes that filter into the chapel

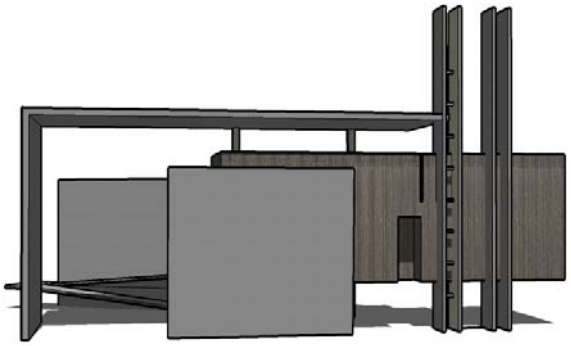


Figure 120: Indication of materials

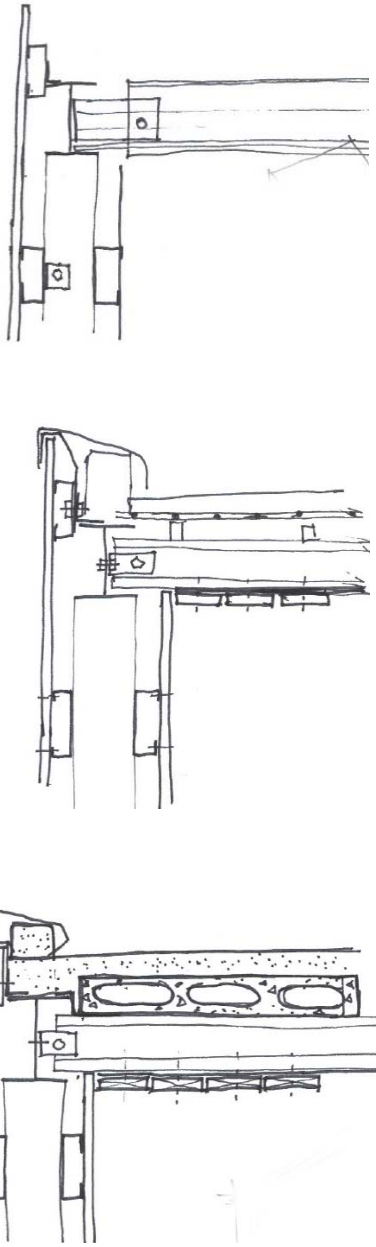


Figure 121: Roof detail conceptual development

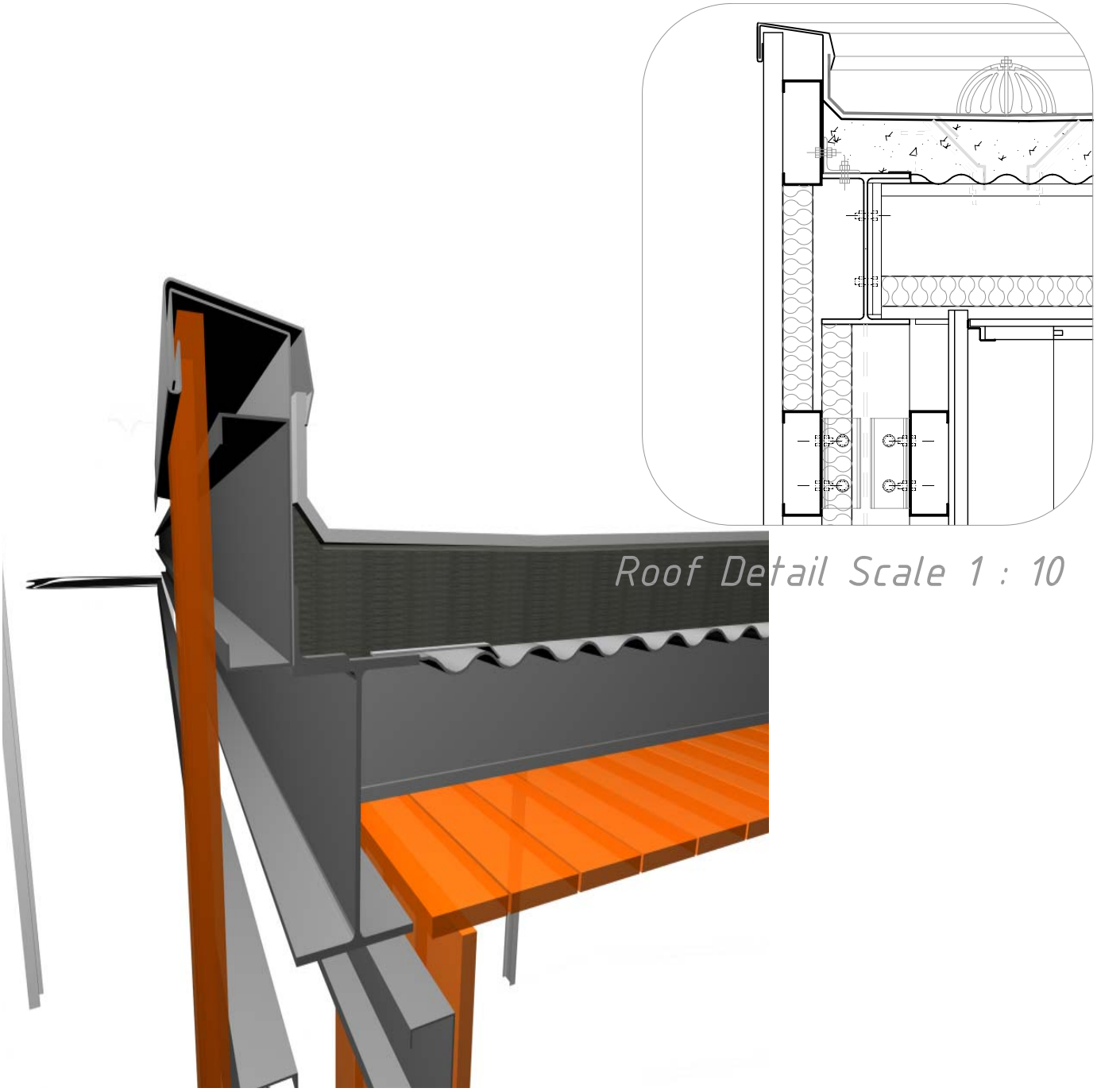


Figure 122: Roof detail resolution

Acoustics/

Inside

n order for the chapel to function efficiently in terms of acoustic performance the extended distance sound travels because of reflections should not exceed the direct travelling distance by more than ten metres as the lapse in reverberation time would result in hearing difficulties. (Interview with Pieter Nel). Absorption material provided at critical places decreases the amount of sound reflected, the following diagramattical section illustrates where the absorption material should be in order to prevent sound impediments.

Outside Noise

The inverse relationship between sound and ventilation poses a practical problem in the sense that the chapel must be ventilated and acoustically isolated from the noise generated along Jacob Mare and Nelson Mandela Drive. Double glazing is proposed and ventilation is accommodated for through the voids between the steel structural members as indicated in the figure XXX. on the following page.

Materials:

The chapel, administrative towers and public bathrooms at the memorial are clad with vertical balau timber tongue and groove boards. Their vertical placement emphasizes the sense of verticality. Once again, the concept of time as the ongoing artist finds its physical expression through the use of balau as a dynamic material whose properties (texture & colour) alter over time. By the use of balau the chapel can be perceived as the veil which responds to both the urban (as described before) and the natural context.

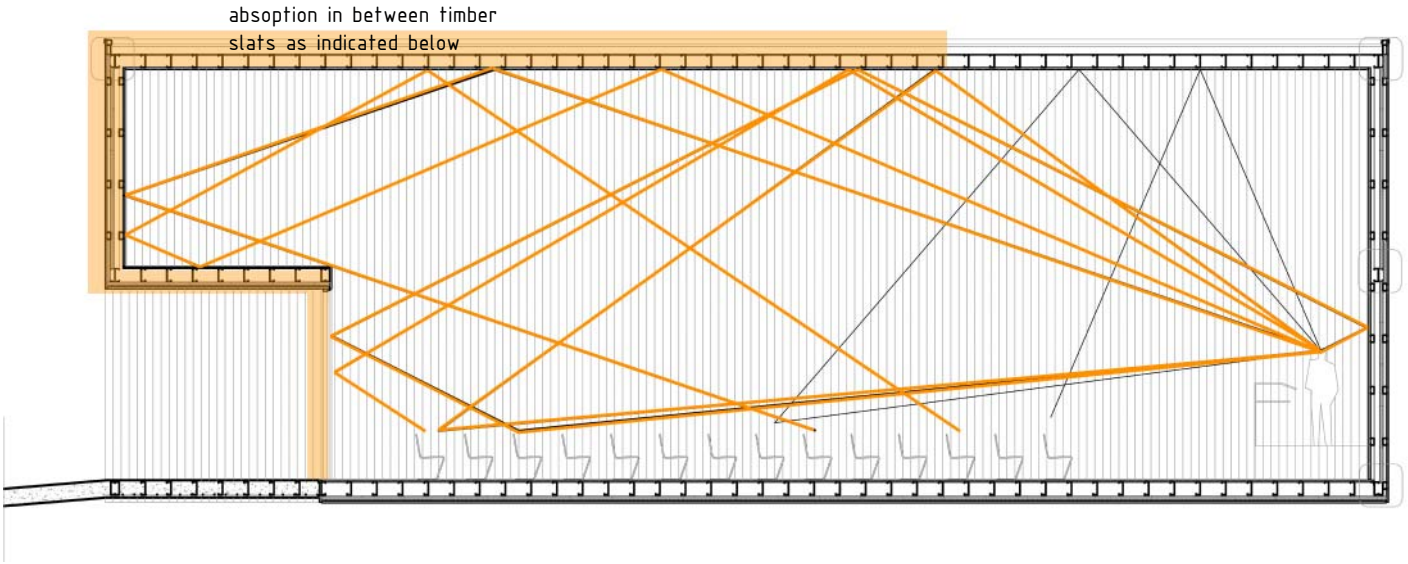


Figure 123: Acoustics

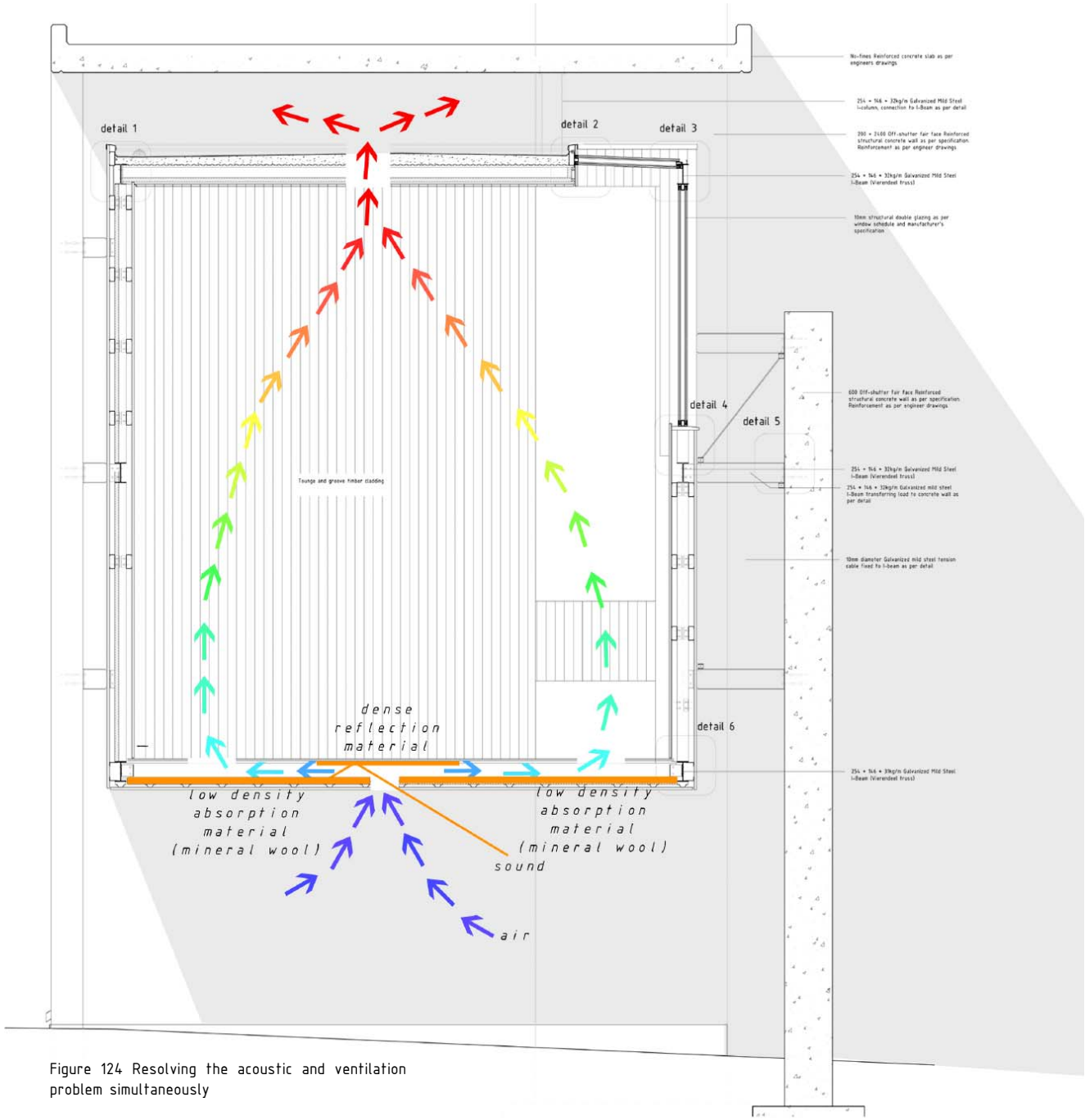


Figure 124 Resolving the acoustic and ventilation problem simultaneously

technical documentation

Conclusion

The above design has attempted to bring into being a hiding place, a place of rejuvenation, within the city. The site simultaneously valorizes the dead who have been treated almost as refuse and invites the living to accept – not to refuse – its invitation to rest and contemplation within the city itself, not at a remote and marginalized place.

Because the site's identity as edge is the result of dynamic relations between the artificial and natural, urban and rural, life and death, the building attempts to resist a sense of closure and stability. In other words the project does not attempt to dissolve neither the physical nor the metaphysical convergence of these juxtapositions but in turn to illuminate them through the extension and exposure of the site's material constituency. The intervention then emphasizes the between and transitory condition of the site by means of the architectural translation of the concepts derived from the nature of the project and the condition of the site.

Appendix 1

Project Justification

The need for cremation facilities in the South African context arises due to numerous factors. The following section considers some of these factors which contribute to this growing need.

Deaths

According to statistics, the number of reported deaths from all causes increased dramatically from 1997. The total amount of deaths during 2002, when compared to the total amount of deaths during 1997, shows an overall increase of 57 percent.

Year of death	Age (years)					Total
	0-14	15-24	25-49	50+	Unspecified	
1997	40,495	19,831	92,479	159,731	5,571	318,287
1998	47,407	22,723	113,848	178,616	5,095	367,689
1999	46,534	24,629	129,383	178,637	2,719	381,902
2000	47,419	26,252	149,391	188,714	2,193	413,969
2001	48,954	28,026	171,942	201,127	1,887	451,936
2002	56,250	30,815	199,485	210,729	1,989	499,268
Increase 1997-2002	38.9%	55.4%	115.7%	31.9%	-35.7%	56.9%

Figure 125: Amount of deaths from 1997 to 2002 [3]

Cremation statistics

Statistics in the USA as shown below clearly indicate the growing demand for this method of disposing of the deceased. Not only is the growing demand for cremation growing in America, but also in South Africa.

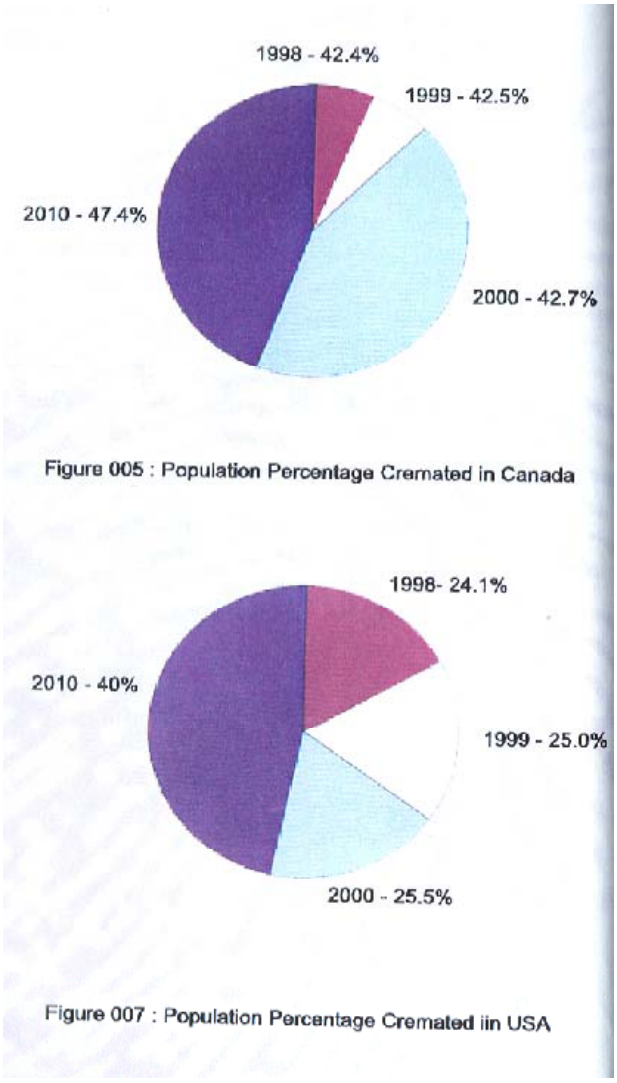


Figure 126: Population Percentage cremated in the USA and Canada.

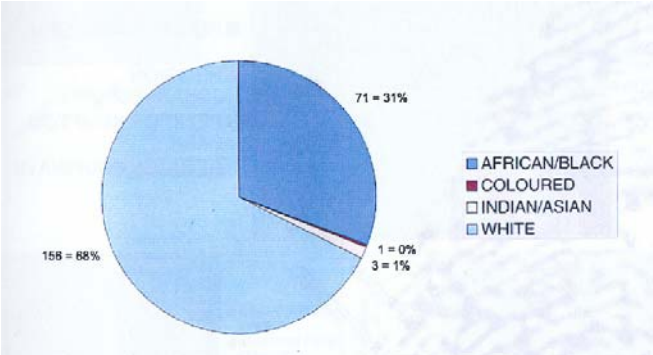


Figure 127: Pretoria crematorium statistics for October 2002

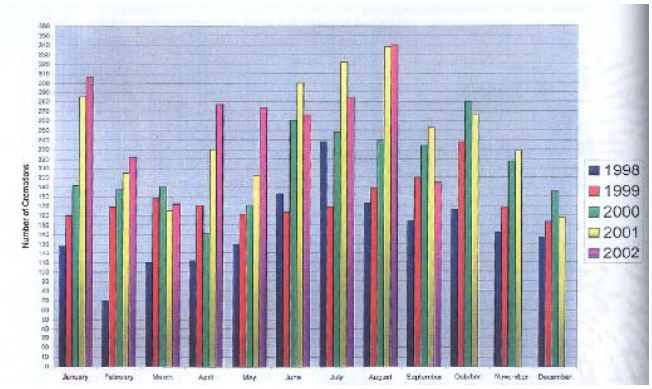


Figure 128: Kempton Park Crematorium Statistics

The average area taken up by a single grave is approximately seven square meters. (Meijer 1999, 21) On average the size of a cremation urn containing the ashes is approximately 215mm(L) X 175mm(W) X 262mm(H). The average area taken up by a single urn on plan including the niche in a cremation wall would be approximately 0.06 square meters. If the height of the cremation wall is restricted to two meters 6 urns can be inserted into the wall per 0.06 square meters of earth. Thus the average area taken up per urn now equals 0.01 square meters per urn. Burial therefore takes up seven hundred times more space than cremation.

If hypothetically considering that 499 268 people's bodies had to be disposed of during 2002 by means of burial alone and that every grave takes up approximately seven square metres of area (Meijer 1999, p.21) the total amount of ground surface taken up during 2002 would be 3 494 876 square meters or approximately 3,5 square kilometres.

If all the corpses were disposed of by means of cremation which takes up 700 times less space the total amount of occupied burial area would result to being approximately 5000 square meters. Clearly cremation as means of disposal would be more sustainable in terms of the footprint it occupies.

Social feasibility

The religions which utilize cremation as a burial rite include most Christian groups, Hindus and some reform Jewish groups. African traditional religion, Orthodox Judaism, Islam and some Christian groups prohibit the use of cremation as means of disposal of the deceased because of reasons irrelevant for the purpose of this dissertation.

According to census data the dominant religion in the Tshwane metropolitan region is Christianity. Even though Christianity is not the only religion within the region that disposes of the dead by means of cremation, the possibility of establishing an inclusive facility which is not specific to any particular religion seems unrealistic. For example, Jews are buried in a specially consecrated cemetery, which isolates the possibility of sharing the facility. Therefore a multi-denominational facility is proposed.

Appendix 3: Accommodation Schedule

Ritual Accommodation Schedule					
Space required	Size	Ventilation		Light (Lux)	Research
		Air	Allowance		
		temp(C)	W/m^2 dC		
Pre - Gathering	$130m^2$ min	Outdoors	Outdoors		SABS 0400
Viewing room	$20m^2$	15	0.17	300	Circulation around coffin
Vestry for clergy	$6m^2$	20	0.33	500	Pta crematorium
Priest room	$6m^2$	20	0.33	500	Pta crematorium
Chapel	$130m^2$ min	18	0.17	300	Standard size of chapels at crematoria in gauteng
Post - Gathering	$130m^2$ min	18-21	0.17-0.33	300	SABS 0400
Bathrooms: Men (65) wc: Total +- $17m^2$	2 ($4m^2$)	22	0.67	150	SABS 0400 table 6
Urinals:	3 ($3m^2$)				
hwb:	3 ($3m^2$)				
: Ladies (65) wc: Total +- $20m^2$	5 ($10m^2$)	22	0.67	150	SABS 0400 table 6
hwb:	3 ($3m^2$)				
Kitchen	$20m^2$			500	Appliances required
Flower Room	$50m^2$	15		300	

Crematorium Accommodation Schedule					
Ante - Room	$16m^2$	15		300	Coffin circulation ergonometric data (Neuferts Architectural Data
Furnace Room	$25m^2$	16	mechanical	300	Furnace size + Circulation
			(6/hour)		
Cremulator Room	$6m^2$	16	N/A	300	Cremulator $1m^2$ + circulation
Furnace Operator Office	$9m^2$	20	0.33	500	Desk, Cupboards etc
Administrator's Office	$9m^2$	20	0.33	500	Desk, Cupboards etc
Ash Storage	$6m^2$	15	0.17	150	Chiang 2003
Coffin Storage	$12.5m^2$	15	0.17	150	Cremations per day
Bathroom wc:1		22	0.67	150	SABS 0400
hwb:1	$6m^2$				

Appendix 3: Plant list

Season of flower	Attract insects	Propagation
Spring and autumn	Yes	From seeds or by division of clumps
Sept - Nov	Yes	From seeds or by division of clumps
Jul - Oct	Yes	Easily propagated from cutting and seeds
Winter	..and birds	From seeds or by division of clumps
Spring	Yes	Flowers only in full sun
Sept - May	Yes	Will flower in light shade
Spring	Yes	Propagate from seed. Shade
Jul - Sept	Yes	Seeds/ removing offsets from 'parent' bulbs. Sun
Anytime	Yes	Lift and replant routed runners
Aug - Nov	Yes	From seeds or by division of clumps
Sept - Jul	Yes	From seeds/cuttings or by division of rhizomes
Spring	Yes	Cuttings/ lifting and replanting rooted runners
Spring and summer	Yes	From stem cuttings/ rooted runners
Dec - Mar	Yes	From seeds or by division of clumps
Dec - Jan	Yes	From seeds or by division of clumps
Oct - Dec	Yes	From seeds or by division of clumps
Sept - Mar	Yes	Seed or cuttings
Sept - Dec	Yes	Seeds/ removing offsets from 'parent' bulbs. Sun
Sept - Nov	Yes	Dividung older clumpsand replanting younger rooted branches
Spring	Yes	From seeds or by division of larger clumps
Feb - Apr	..and birds	From seeds or by division of larger clumps
Spring and summer	Yes	Cuttings/ lifting and replanting rooted runners
Spring	Yes	Seeds
Mar - Sept	Yes	Lifting rooted runners. Needs full sun to open flowers completely
Apr - Jun	Yes	Seeds/ removing offsets from 'parent' bulbs. Shade
Spring	Yes	Seeds or cuttings. Warm sunny position
Jul - Sept	Yes	Rooted stems easily transplanted
Varies acc. To species	Yes	Seeds/ removing offsets from 'parent' bulbs.
Sept - May	Yes	Seeds itself
Jan - Apr	Yes	From seeds/cuttings or by division of tuberous roots
Sept - Feb	Yes	From seeds/cuttings or by replanting younger newly-rooted sections
Summer	Yes	From seeds or by division of larger clumps
No flowers	No	Division of rhizomes
No flowers	..and birds	From seeds or by division of larger clumps
No flowers	..and birds	From seeds or by division of larger clumps
No flowers	No	Division of rhizomes
No flowers	No	Division of larger clumps or replanting 'chickens'
No flowers	No	From cuttings or by lifting rooted runners
No Flowers	Yes	From cuttings or by lifting rooted runners
No flowers	Yes	Seed, leaves or division of larger clumps
No flowers	No	From cuttings or by lifting rooted runners
No flowers	No	From spore or division of larger clumps

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