

Baseline

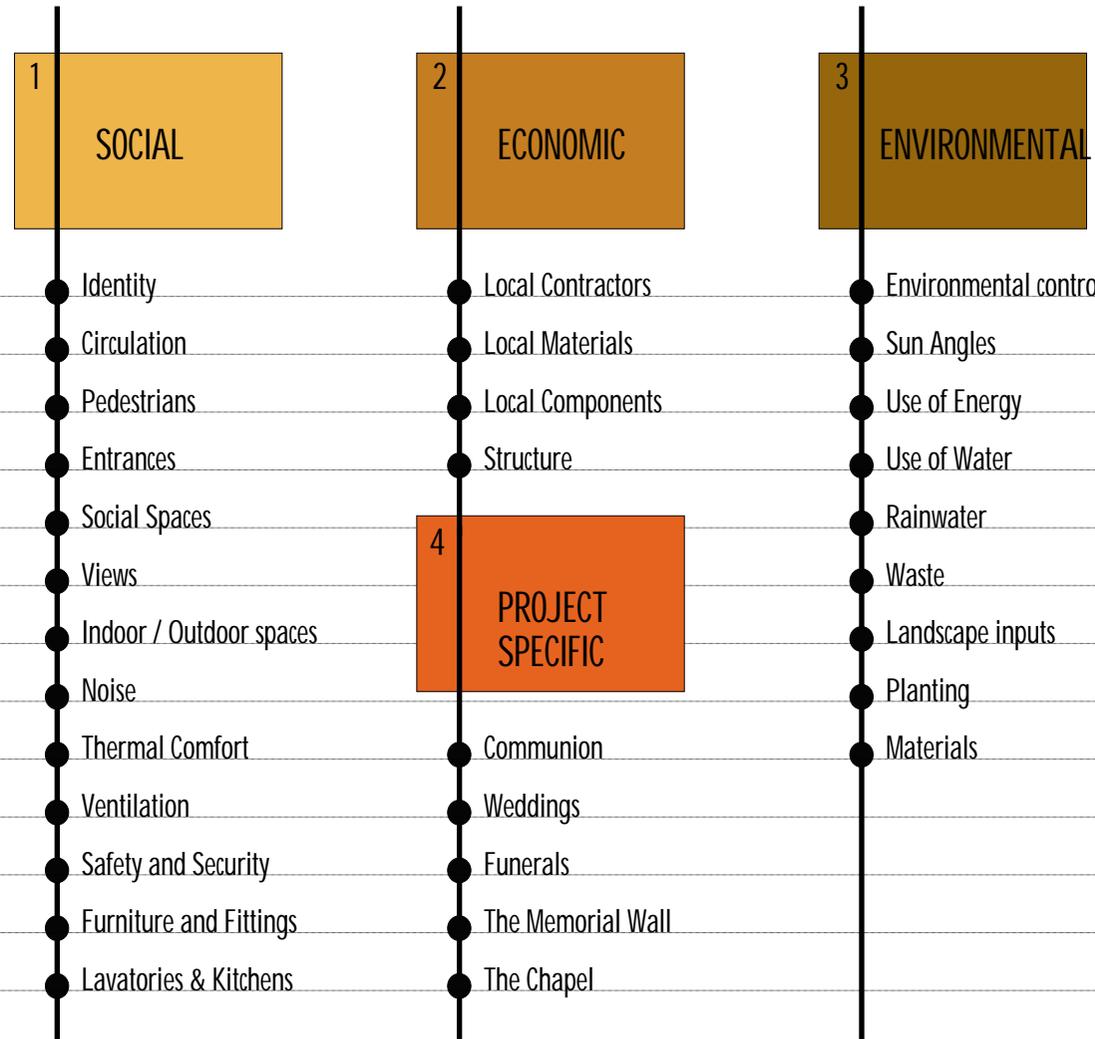


Table 11: Baseline elements

This diagram illustrates the contents of the Baseline research. The SBAT tool has been used to identify relevant topics that need to be addressed. The three main areas in the SBAT comprise the Social, Economic and Environmental aspects. The fourth facet is project specific and refers to Christian activities and facilities.

From the Baseline Table it is evident where the areas of most importance lie. This scheme is definitely more concerned with the social aspects than with the economic or environmental.

The congregation has a known budget. In this case they have R60 million at their disposal. Finances are not a major issue. For the congregation it is more valuable to have professional and adequate facilities that further the Gospel, than facilities that are economical as possible. This does not allow for irresponsible decision making and unnecessary use of available funds.

As Christians it is important to utilize environmental friendly methods and procedures. God commands Adam to tend to the earth and all its living things. It is thus our mandate to look after our natural resources. Therefore, certain methods of conservation are implemented.

In the remaining part of the document, these baseline aspects will be discussed and where applicable, the technical resolution. Due to the huge scale of this project, the Memorial Wall and Chapel encompass most of the technical resolution. The design discussion forms part of the technical analysis. A detail design overview on the Chapel and Memorial Wall will follow at the end.

Social Identity

Target Description:

The combination of all the buildings on the site must be harmonious and create a definite unique identity for the Church.

How is this Achieved?

The architecture must be unequalled in appearance and character. It must become a landmark for this area. This can be done with interesting architectural forms, material use and colour. The image of the buildings should portray its use. It is architecture with a definite message of the Good News. It is an image of God's majesty and truth.

The buildings must be recognized as Christian Church. The user or viewer is made aware of this by using the most important symbols of the congregation: the Cross, the Dove and the Water. The cross symbolizes Jesus while the Dove represents the Spirit. The water personifies the abundant blessings from God that needs to be distributed to the world. The most important Biblical colours: red, blue, purple and white will also give identity to the architecture.

One must be aware that the site is enormous and small detail will only be noticed when close by and on the site. For people, merely passing by, to realize the identity of the buildings, a larger element will be necessary. This could be in the form of an abstract tower or huge cross on the building or in the landscape. It is crucial for this well defined element to be visible from most areas around the site.

Prioritization

Facility		
Foyer	5	Essential 5
Auditorium	4	High Req 4
Bookstore	3	Medium Req 3
Kitchen	2	Medium Req 3
Hall	3	Medium Req 3
Chapel	5	Low Req 2
Memorial W.	5	Low Req 2
Coffee shop	3	No Req 1

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FIGURE 283: Plan of Church for year 2000 by Richard Meier. (Meier, 1999: 78)

FIGURE 284: Computer Model of Church for year 2000. (Meier, 1999: 78)

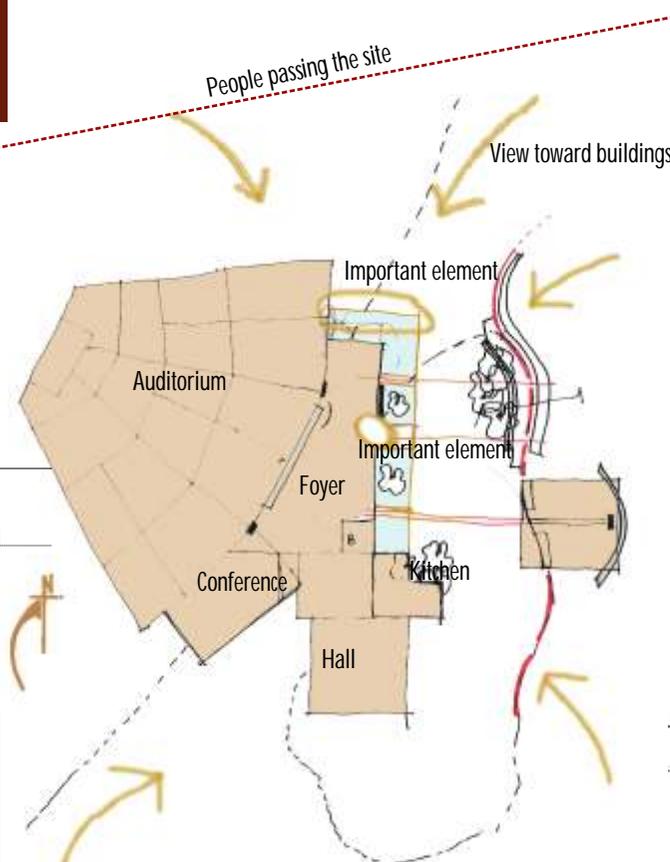


FIGURE 282: Concept design showing points of importance to position landmark elements.

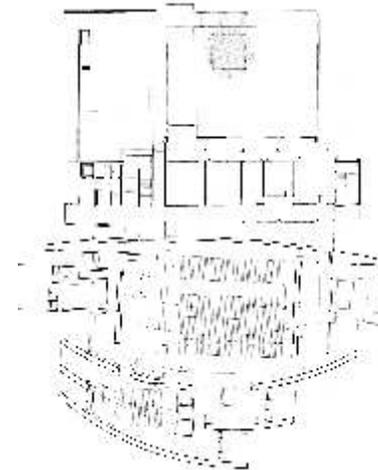


FIGURE 283: Plan of Church for year 2000 by Richard Meier.



FIGURE 284: Computer Model of Church for year 2000.

The Memorial Wall, Chapel and garden are filled with water features, Biblical plants and images of the cross. Because water is such an important part of the vision of the congregation, it becomes a unique element within the architecture. It has a deeper meaning than just aesthetics.

The Chapel has its very own identity and anyone visiting the structure will experience a fresh feel of space. The Chapel is exposed to the elements and is at the mercy of the weather conditions. This will result in no two visits being exactly the same. Any person will have a unique experience. This is further stimulated by using a combination of materials such as off shutter concrete, timber, natural stone and copper. The materials have deeper meanings relating to Biblical truths. Refer to 'Tabernacle' p4. The shapes of the roof structure are unusual and further strengthens the unique identity.

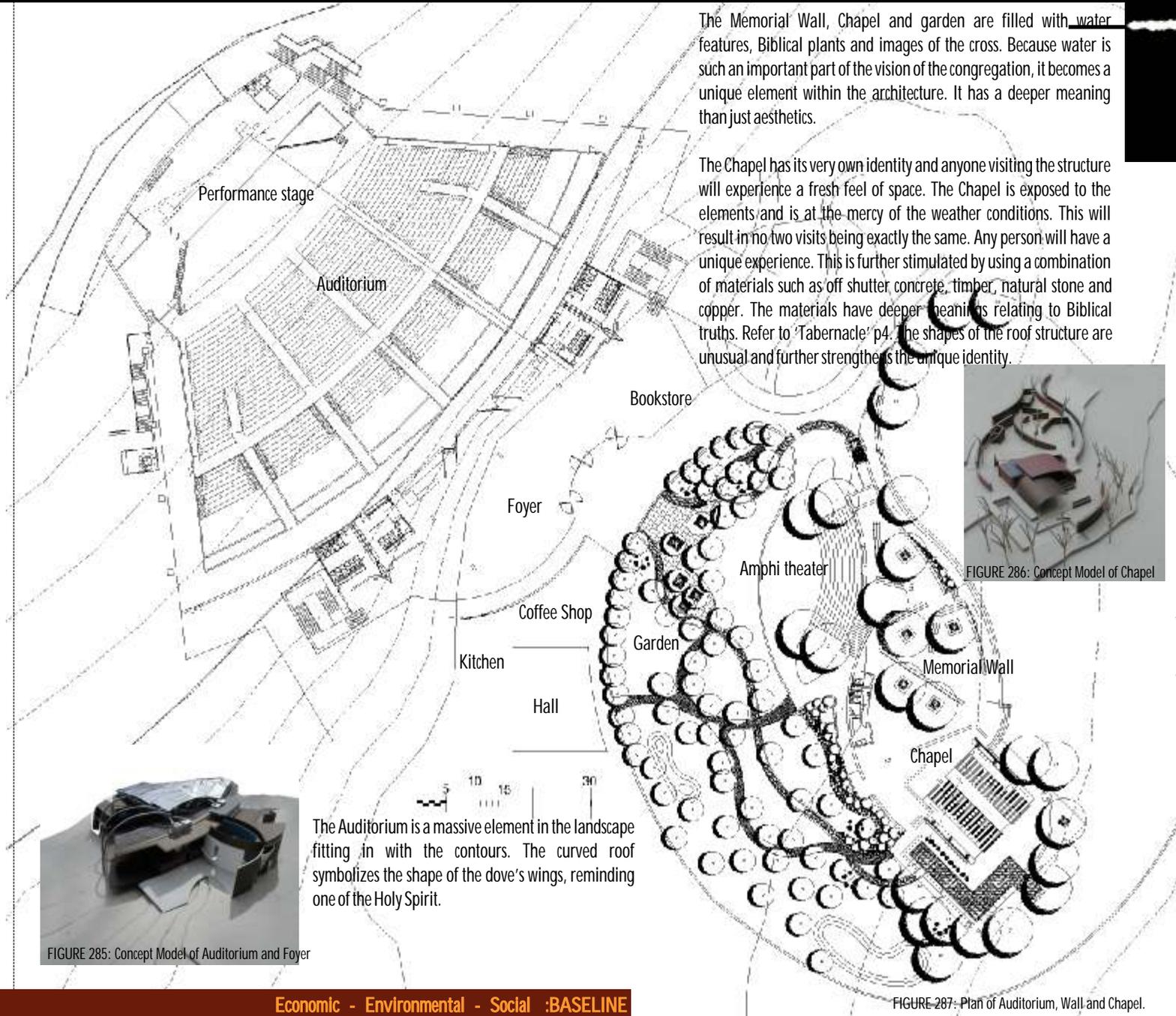


FIGURE 286: Concept Model of Chapel



FIGURE 285: Concept Model of Auditorium and Foyer

The Auditorium is a massive element in the landscape fitting in with the contours. The curved roof symbolizes the shape of the dove's wings, reminding one of the Holy Spirit.

Social Circulation

Target Description

All circulation routes must be easy to follow, especially those leading into the Auditorium. All circulation routes should be safe and include religious elements.

Prioritization

Facility	Priority	Req Level
Foyer	5	Essential 5
Auditorium	5	High Req 4
Bookstore	3	Medium Req 3
Kitchen	3	Medium Req 3
Hall	3	Medium Req 3
Chapel	4	Low Req 2
Memorial W.	3	Low Req 2
Coffee Shop	4	No Req 1

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FIGURE 288: Concept Layout illustrating circulation.

Circulation in and between the Chapel and Memorial Wall can be more intricate and have a certain level of surprise. Circulation into the main area of the Chapel should be clearly visible and also have a minimum width of 2250mm. The positioning of the other spaces related to the Chapel and Memorial Wall can be more composite, see Figure 291: C. Corridor widths must not be less than 875mm. (T&A, 1998:30)

FIGURE 293: Minimum Corridor Width Memorial Wall and Chapel.



How is this Achieved?

Interior circulation must be undemanding to follow. If possible, it should comprise of linear movement where the destination is in view. Material finishes such to ensure a smooth and even surface acceptable for the use of wheelchairs. All level changes and transitions between different floor coverings must cater for the disabled. Ramps can be at a maximum of a 1:12 slope.



FIGURE 289: A - Linear circulation from a common point.



FIGURE 290: B - Linear circulation with changes in movement at nodes.



FIGURE 291: C - Composite circulation where important points are centers of activities.

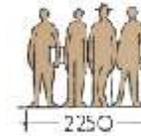


FIGURE 292: Minimum Corridor Width for Auditorium and Foyer.

The circulation in the Foyer and Auditorium will differ from circulation of the Memorial Wall and Chapel. Circulation in the Foyer and Auditorium must be legible and adequate. In other words, there should always be enough room for the number of people moving along the circulation routes. The minimum width of circulation corridors for the Foyer and Auditorium is 2250mm. (T&A, 1998:30) This will allow for the easy movement of 3 people, and acceptable movement for 4 people.

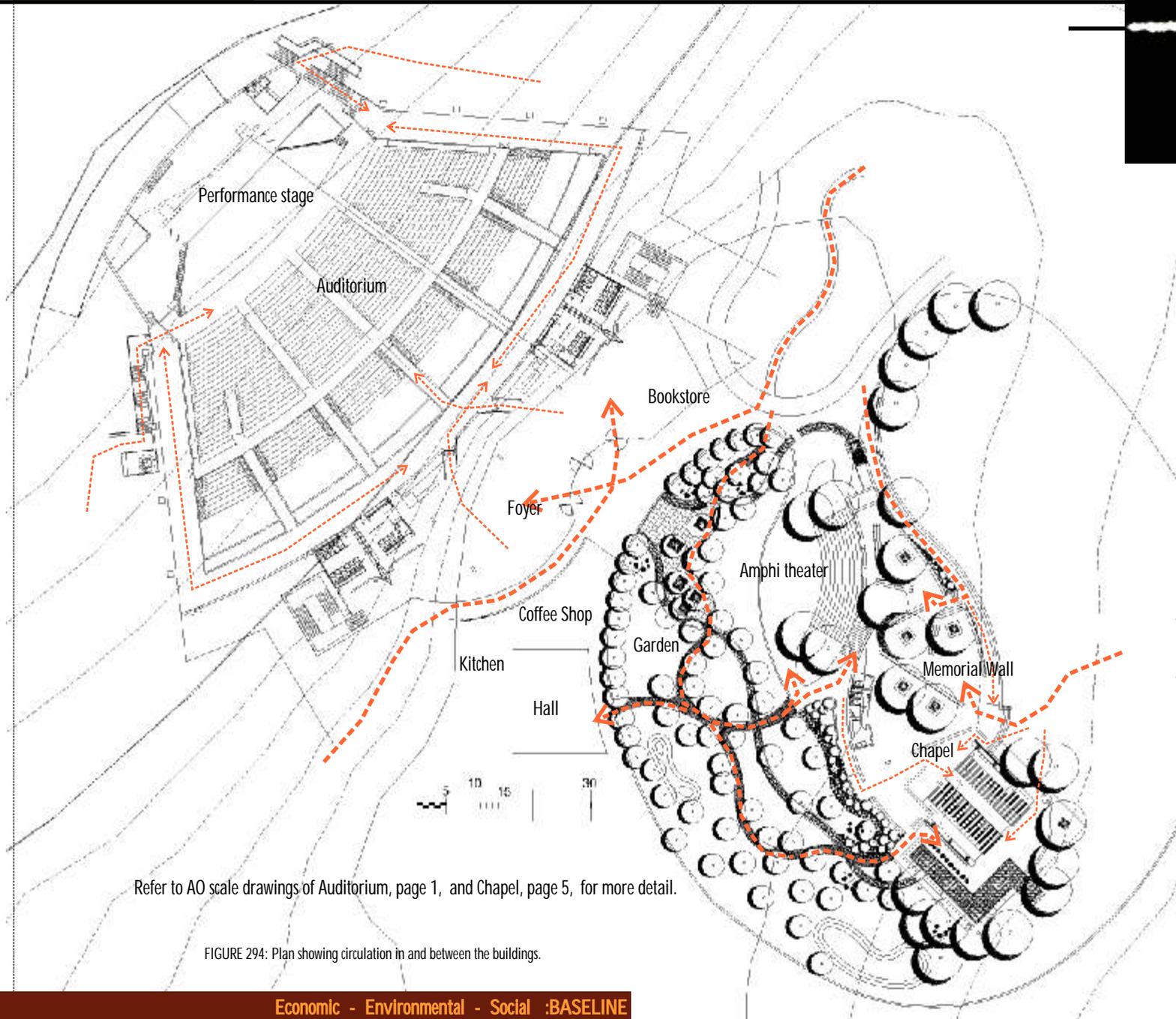
FIGURE 289: A - Linear circulation with from a common point. (Ching, 1996:253)

FIGURE 290: B - Linear circulation with changes in movement at nodes. (Ching, 1996:253)

FIGURE 291: C - Composite circulation where important points are centers of activities. (Ching, 1996:253)

FIGURE 292: Minimum Corridor Width for Auditorium and Foyer. (T&A, 1998:30)

FIGURE 293: Minimum Corridor Width Memorial Wall and Chapel.



The circulation in and around the Auditorium is of a linear nature. This is necessary for people to quickly and easily find their way.

However, the movement to the Chapel and Memorial Wall need not be as hurried. These paths of movement comprise composite circulation. People are forced to slow down and look around while the viewpoints are changing along the pathway. With the slowing down of movement, people are more aware of their immediate surroundings. They become more at ease and start to enjoy the outdoor setting. The pathway through the garden becomes a sanctuary for a tired soul.

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Circulation through the Memorial Wall area comprise of interrupted linear lines. A person coming to commemorate a departed loved one will most probably already know where the specific niche is situated. Thus the person will walk directly to the desired point following the path of choice. The plan layout allows for different routes to the same spot. The interrupted circulation results in slow movement. This is favorable in creating privacy for the users. It is usually the case that people fall silent and move cautiously when in the presence of a cemetery or memorial area.

Social Pedestrians

Target Description:

The site layout and building design must respond to the needs of the pedestrian.

How is this Achieved?

The site consists of 18ha and is a very large area if one has to cover it by foot. The major activities included in the first building phase must be positioned closely together to minimize traveling distances. Pedestrian routes from the entrances onto the site and parking areas must be kept as short as possible. Provide walkways with smooth surfaces suitable for wheelchair users and easy for walking with accompanying direction notice boards.

Prioritization

Facility			
Foyer	5	Essential	5
Auditorium	4	High Req	4
Bookstore	5	Medium Req	3
Kitchen	2		
Hall	4	Low Req	2
Chapel	5		
Memorial W.	4	No Req	1
Coffee shop	5		



FIGURE 295: Bushstone

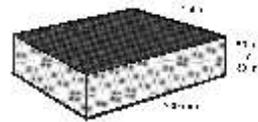


FIGURE 296: Bushstone



FIGURE 297: Irregular ceramic



FIGURE 298: Pebbles.

These are a few examples of exterior walkway finishes. Different materials must be used for different areas. The variety will create richness and character. Materials with an African image is preferred. Natural elements always blend in together quite well. The paving will influence the overall experience of the space.

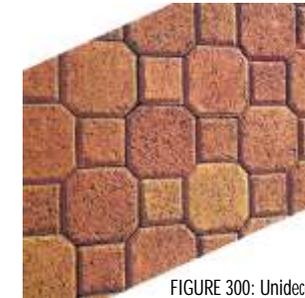


FIGURE 300: Unidecor Paving1.



FIGURE 301: Pebbles and concrete blocks.

FIGURE 295: Bushstone (Grinaker precast,1992)

FIGURE 296: Bushstone Dimensions. Grinaker precast,1992)

FIGURE 297: Irregular ceramic tiles. (Mathews, 2003:19)

FIGURE 298: Pebbles. (Mathews, 2003:19)

FIGURE 299: Concrete Paving. (The Grinaker Service)

FIGURE 300 Unidecor Paving1. (The Grinaker Service)

FIGURE 301: Pebbles and concrete blocks. (Mathews, 2003:67)

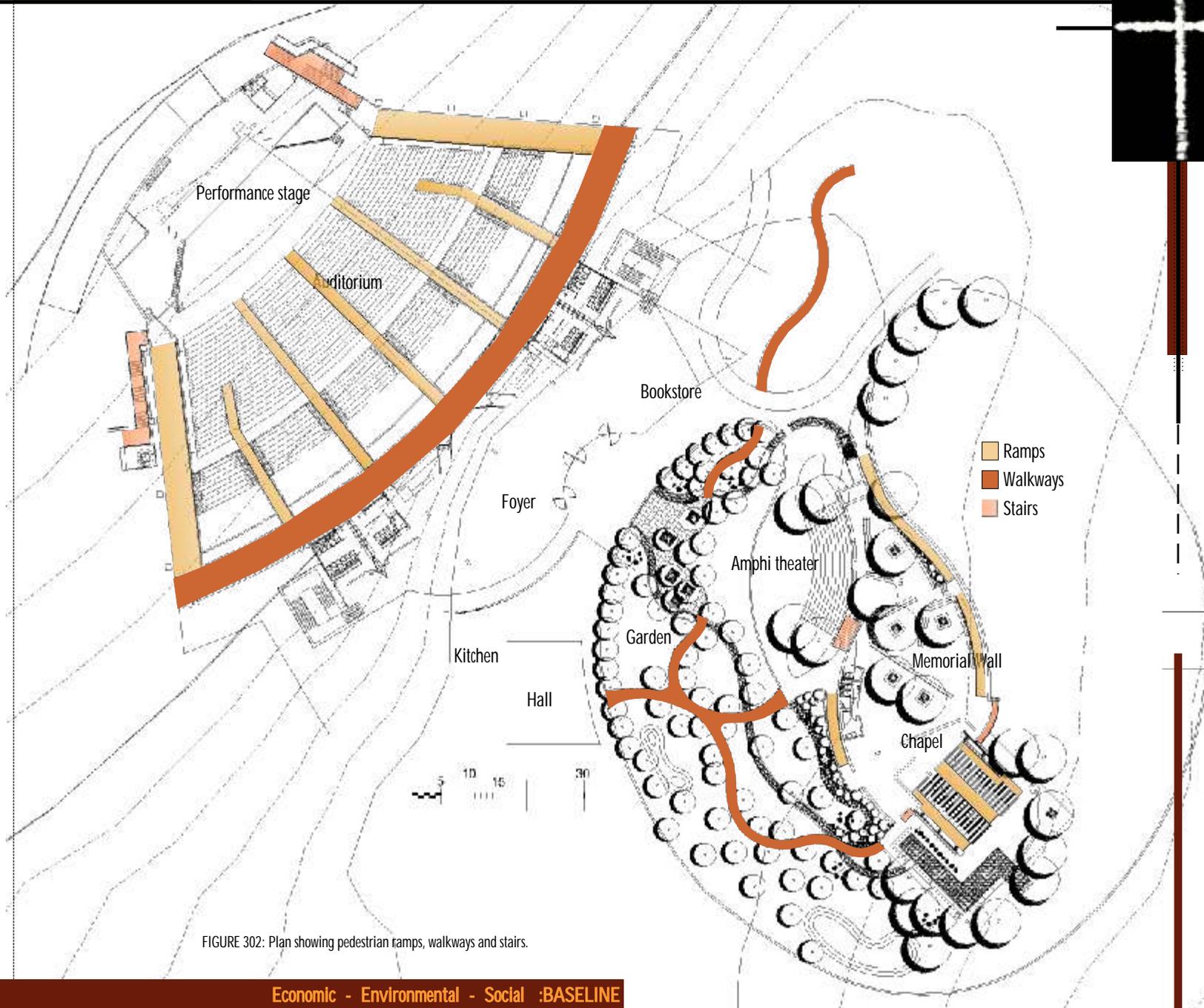


FIGURE 302: Plan showing pedestrian ramps, walkways and stairs.

Social Entrances

How is this Achieved?

1. Practical entrances

The entrances into the Foyer should be distinct and there should be enough entrances. The people arriving are lead to enter the building through the Foyer space; the other entrances leading directly into the auditorium would be closed except those at the back of the auditorium. This will gently force the people to move along a certain route. It is possible to have certain entrances closed because the people are arriving over a period of half an hour and congestion is not a problem before a service. When the service or activity is done, all exits must be opened to empty the Auditorium in approximately 5 minutes. Then the people can leave directly from the Auditorium in all directions to where their vehicle is parked or to their next destination. There must be at least three entrances into the Foyer and 8 - 10 entrances into the Auditorium.

2. Symbolism and experience

The experience of exiting the building is as important as entering. The designer wants to create a certain religious atmosphere for the users before and after a service or activity. When entering, the user must be reminded that there is rest in Jesus and that His burden is light. Jesus is the gate to heaven and peace. (John 10:9) For city dwellers, green trees and running water is a means to rest and relax. The use of vegetation and water features will prepare the user for the eminent interaction between man and God.

Upon exiting the building the user must be reminded of the Holy Spirit, symbolized by water, the promise of God's continuous companionship. The landscaping is vital in composing the grace and love of God. Again moving underneath trees and hearing bubbling water create freshness and energy. A person must feel renewed in spirit, body and mind after hearing the Word of God and being in His presence in the company of other believers.

The entrance to the Chapel does not have to be as prominent as the entrances into the Foyer. What is more important is the route towards the Chapel. The user should experience an expectation to meet what lies ahead. All elements must not be revealed at once but spaced over the whole length of the route. This Chapel is closely linked with the Memorial Wall and Biblical Garden.

In the adjacent photograph, Tadao Ando has succeeded in creating an expectation of what lies beyond the two walls, awareness of the route.

Target Description:

The entrances to the Foyer, Chapel and Auditorium are very important in making the user aware of a transition from one space into another. The entrances and exits must be adequate for the number of people using the building.



FIGURE 303: Concept on movement.

Prioritization

Facility			
Foyer	5	Essential	5
Auditorium	5	High Req	4
Bookstore	3	Medium Req	3
Kitchen	3	Low Req	2
Hall	4	No Req	1
Chapel	5		
Memorial W.	4		
Coffee shop	4		

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FIGURE 304: Entrance to Water Temple by Ando. (Ando, 12:160)

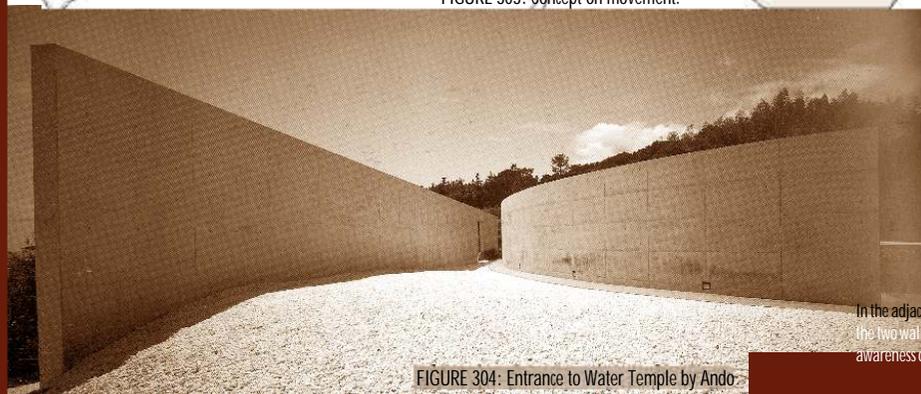
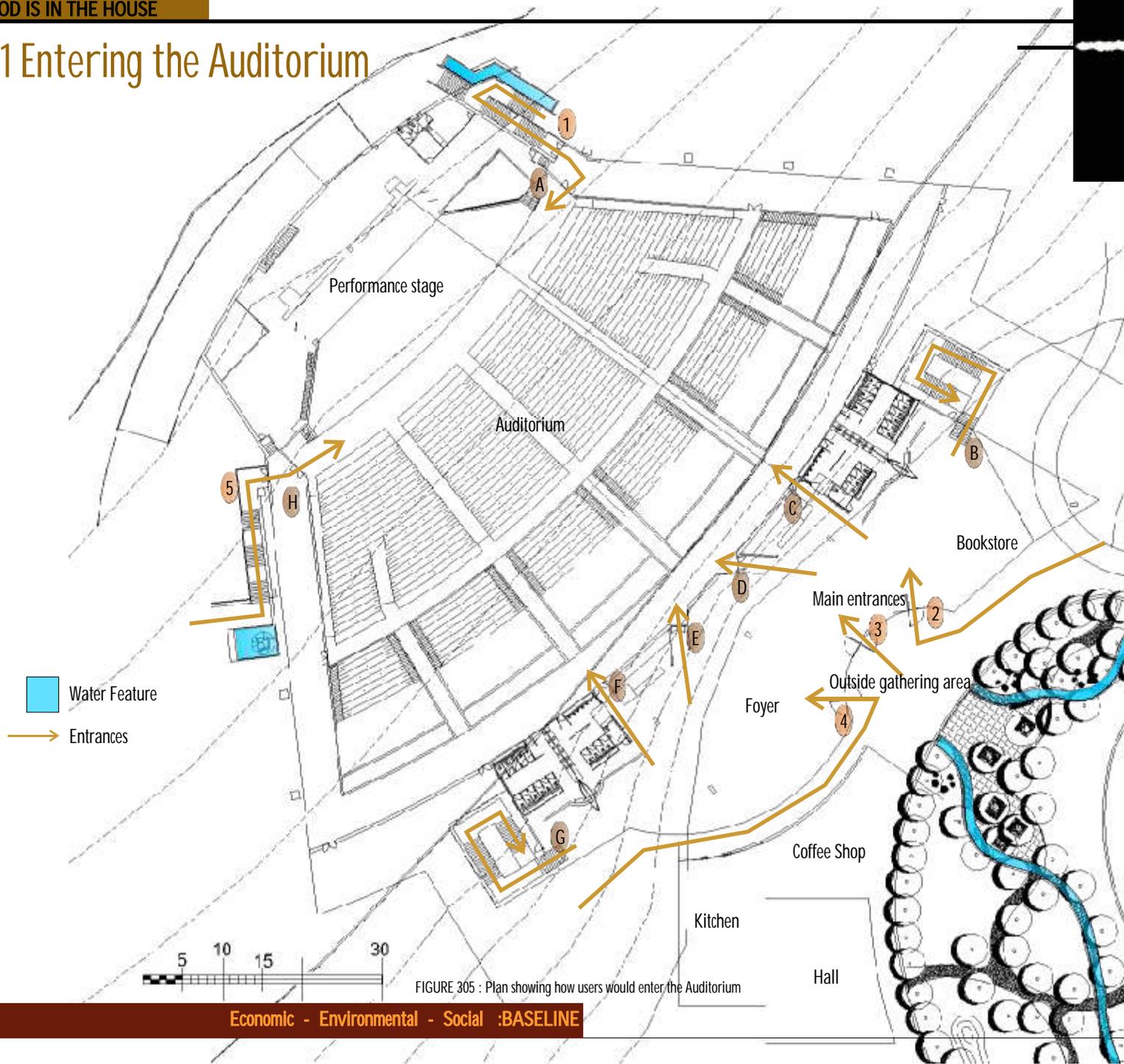


FIGURE 304: Entrance to Water Temple by Ando

1.1 Entering the Auditorium

Social



1 - 5: Entrances into the building
 A - H: Entrances into the Auditorium

Inside the Foyer, the user has a choice either to walk directly into the foyer through entrances C, D, E, and F; or to ascend with the staircases B and G to the middle and upper gallery. The user can also enter at the sides of the stage. The circulation route around the Auditorium is suited for wheelchair users and they can enter either at the Foyer or at the stage. Thus there is a choice of entrances and people can use the nearest entrance to where they have parked.

FIGURE 305 : Plan showing how users would enter the Auditorium

Social

1.2 Leaving the Auditorium

1 - 9: Leaving the building
A - J: Exiting the Auditorium

There are more exits than entrances. People now have a choice to either exit closest to their vehicle or move towards the main entrances and socialize at the Coffee Shop and garden.

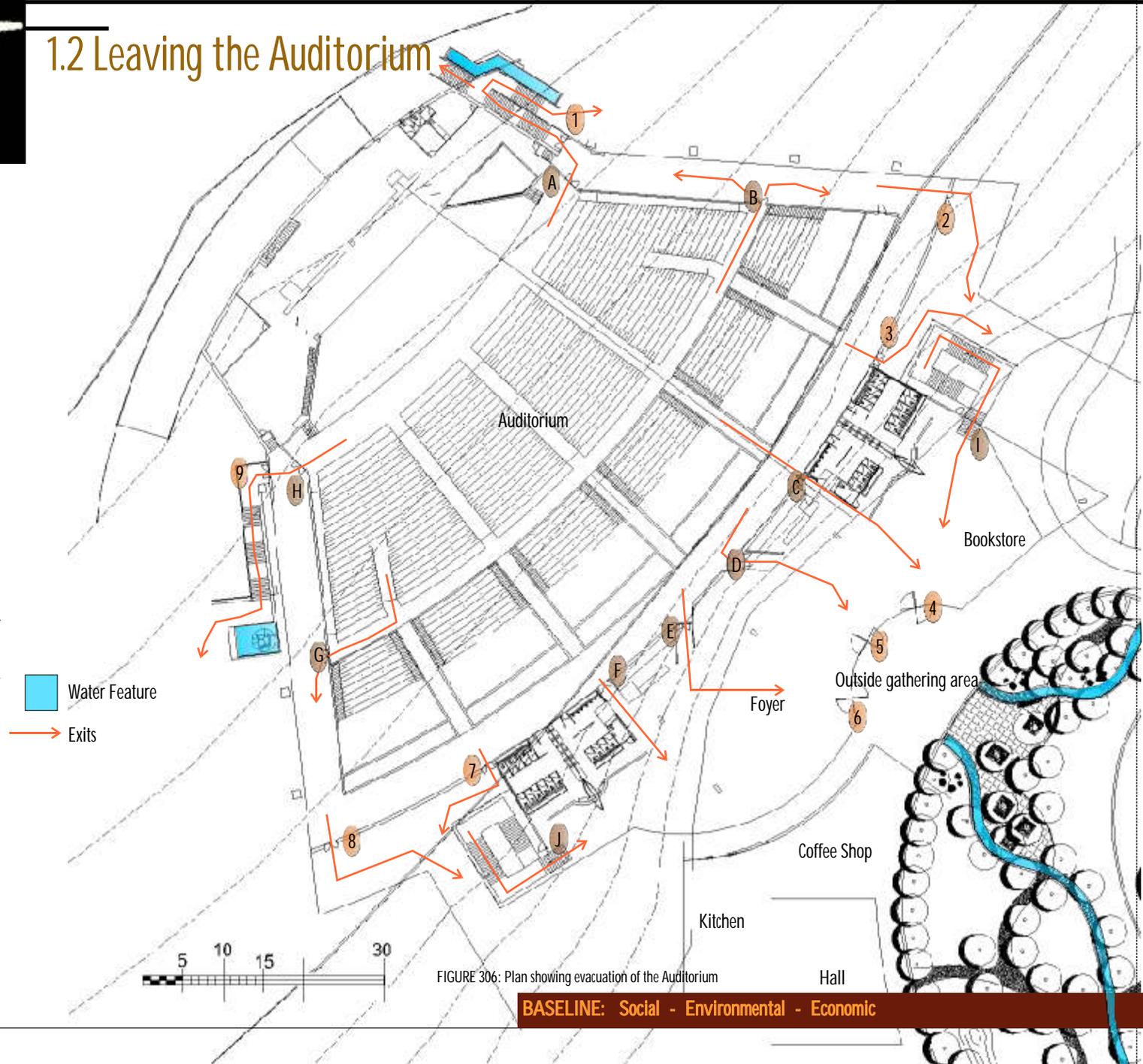


FIGURE 306: Plan showing evacuation of the Auditorium

2. Symbolism and Experience

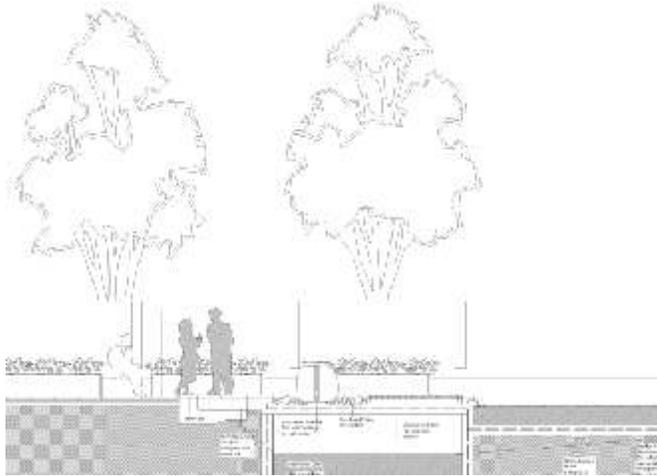


FIGURE 307: Section through Water feature and ramp entrance to the Memorial Wall. Refer to A0 drawing page 3, no 3.1

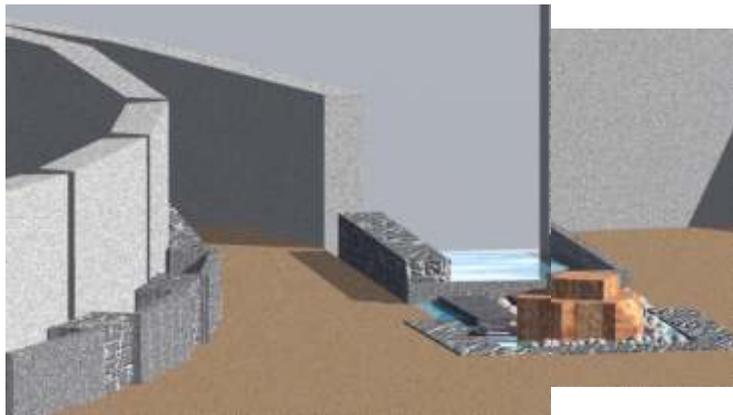


FIGURE 308: Water feature and ramp entrance to the Memorial

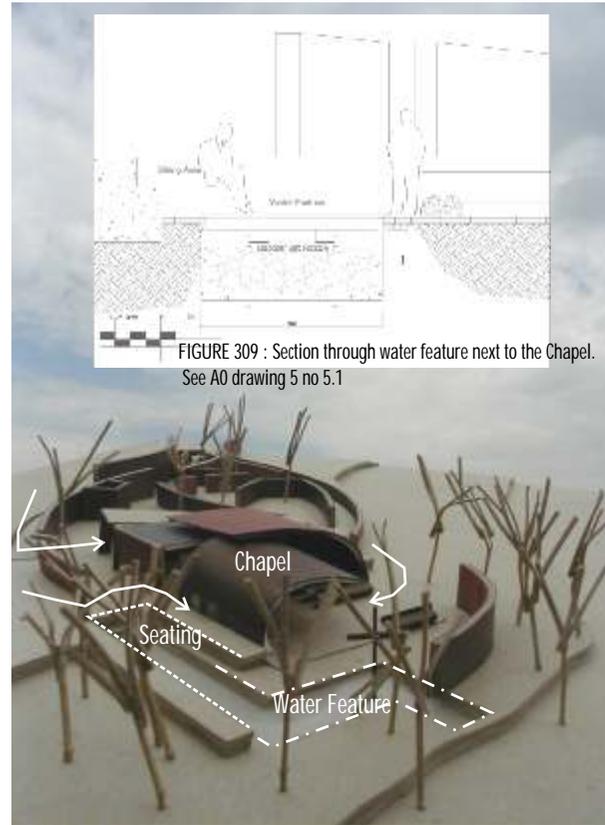


FIGURE 309 : Section through water feature next to the Chapel. See A0 drawing 5 no 5.1

FIGURE 310: Entrances into the Chapel in combination with the water feature

The water is constantly in motion to produce the soothing sound of running water. The materials used to construct the water features include: pigmented concrete, natural stone and clay tiles. In the adjacent three dimensional representation of an entrance to the Memorial wall, one can see that the different elements create possibilities of individual contemplation and small group interaction. The entrance ramp leading down into the Memorial area is curved and thus conceals what lies beneath. The curved walls draws the user to explore the unseen beyond. This element lends itself to expectation and surprise. The water runs from the top part into the semi-private Memorial area, thus linking the two.

Social

Social

Social Spaces

How is this Achieved?

The most frequently used social spaces will be outside the Foyer and the Chapel as well as inside the Foyer. Both spaces will be occupied simultaneously before and after services or other activities. Options of standing and sitting must be provided. The Coffee Shop and Bookstore should open directly onto these social areas to promote business.

The huge size of the site provides tremendous possibilities to create small and intimate social spaces. These social spaces can be distributed around the Chapel and Biblical Garden as well as around the Auditorium in less frequently used areas. These spaces can consist of seating and some form of vegetation. More elaborate spaces can include water and other architectural elements like walls.

Target Description:

Social spaces must induce social gathering and interaction before and after activities. Provision for unfavourable weather conditions is essential.

Prioritization

Facility		
Foyer	5	Essential 5
Auditorium	3	High Req 4
Bookstore	5	Medium Req 3
Kitchen	1	Low Req 2
Hall	2	No Req 1
Chapel	3	
Memorial W.	3	
Coffee Shop	5	

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FIGURE 311: Benches and trees.

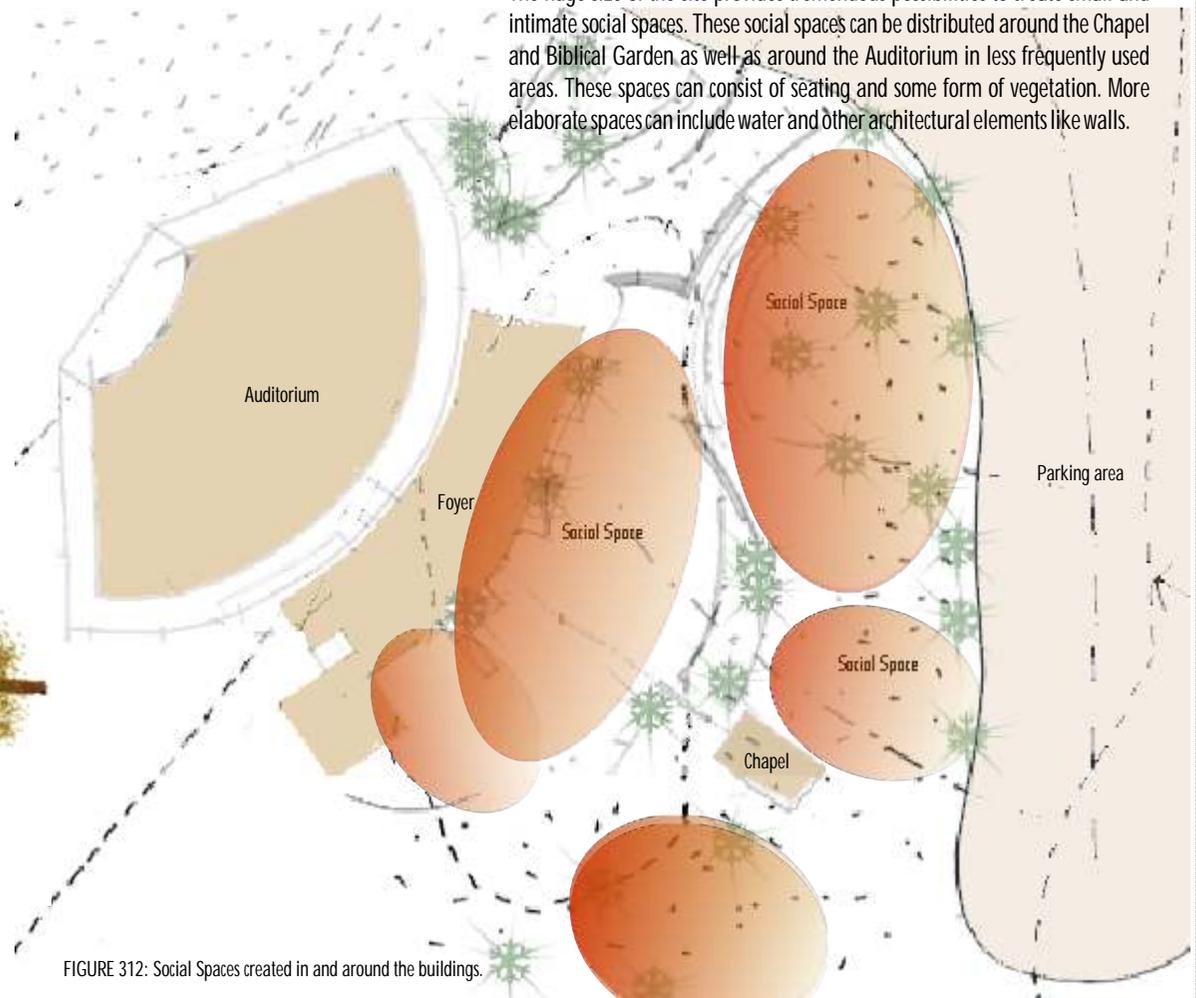


FIGURE 312: Social Spaces created in and around the buildings.

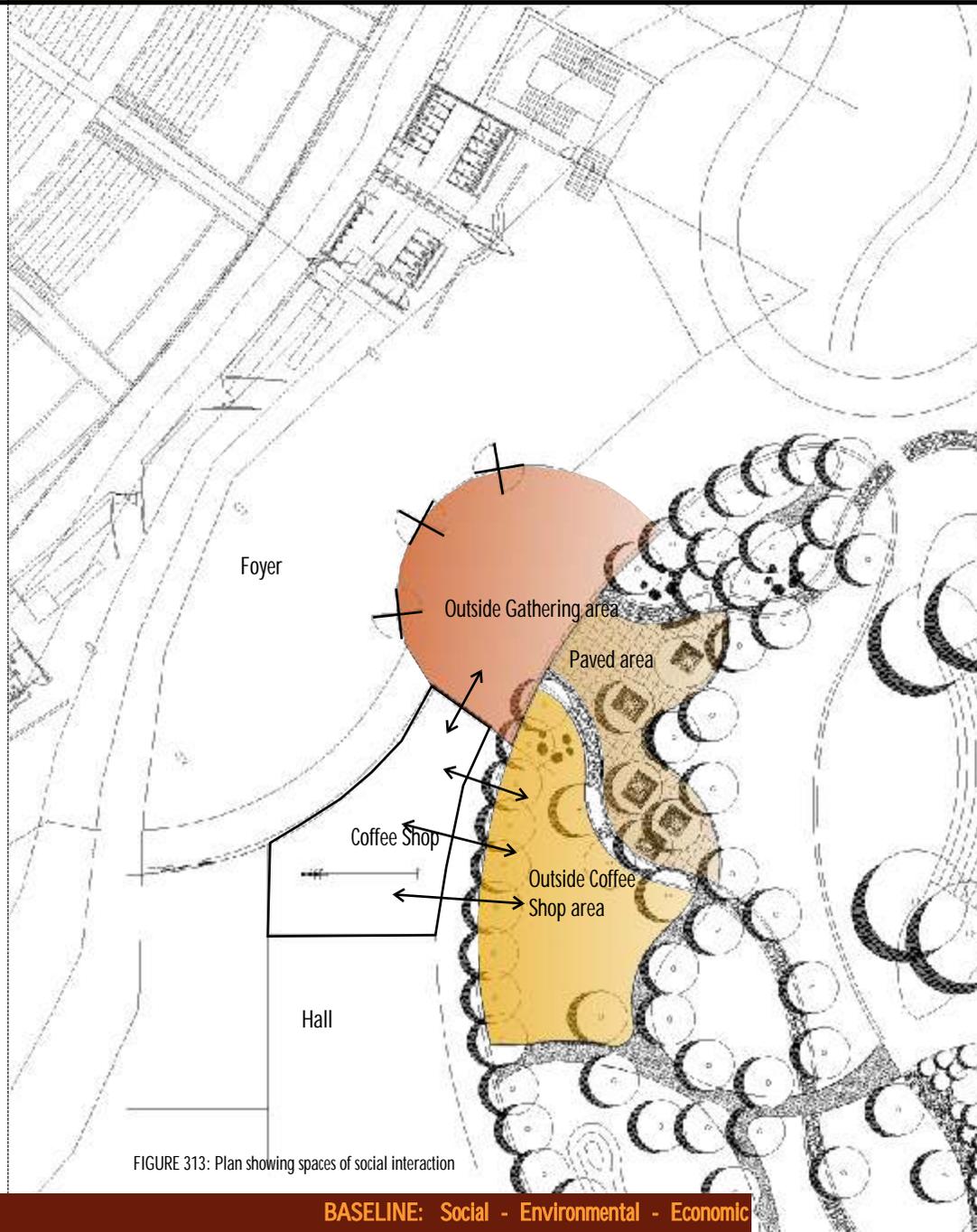


FIGURE 313: Plan showing spaces of social interaction

The Auditorium is in itself tremendously big. One feels dwarfed inside and it is very hard to create a feeling of intimacy inside such a huge space. It will then be in the intimate character of the outside gathering area and garden where the visitor is prepared for the service.

Water and vegetation is used in combination with hard and soft surfaces to facilitate social interaction between people, before and after services.

The Coffee Shop is positioned close to the main entrance to attract people coming in and going out.

The paved area directly across the main entrance creates a space where people can stand or sit while socializing. The tree planters are used as seating. This area is surrounded by grass and two water canals.

This is an ideal area for people to meet before and after activities or services. The bubbling water, green grass, Biblical plants and trees will create a peaceful ambience and people will want to linger. The paved area draws people to explore further and follow the path leading to the tranquility of the Chapel.

The Coffee Shop lives out onto the garden, linking to the gathering area and thus promoting business. People living in the city are tired of constantly being surrounded by huge buildings and hard surfaces. A Coffee Shop viewing onto greenery will be the choice above others. Future development of the Therapy Center will then be positioned as to also live onto the garden.

Social Views

How is this Achieved?

Direction of movement, pathways and the ordering of elements will direct the user to partake in certain views inside and outside of the building. What are the intentions of the different views? The reality of such a community church is that many different and sometimes conflicting emotions will be experienced. Different views will serve different hearts at different times. Views around the Foyer, Chapel, Memorial wall and Biblical garden can be facilitated by architectural elements and vegetation. Views have a lot to do with circulation and approach.

Target Description:

In most of the spaces, views onto certain elements inside; or views onto the landscape outside are crucial in creating the desired atmosphere. All possible views must be explored.

Prioritization

Facility		
Foyer	4	Essential 5
Auditorium	2	High Req 4
Bookstore	4	Medium Req 3
Kitchen	2	Low Req 2
Hall	3	No Req 1
Chapel	4	
Memorial W.	4	
Coffee Shop	4	

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FIGURE 314: View towards the Catholic Church in Taos, 17th century. (Ching, 1996:233)

FIGURE 315: View when approaching Notre Dame Du Haut. Le Corbusier. (Ching, 1996:230)

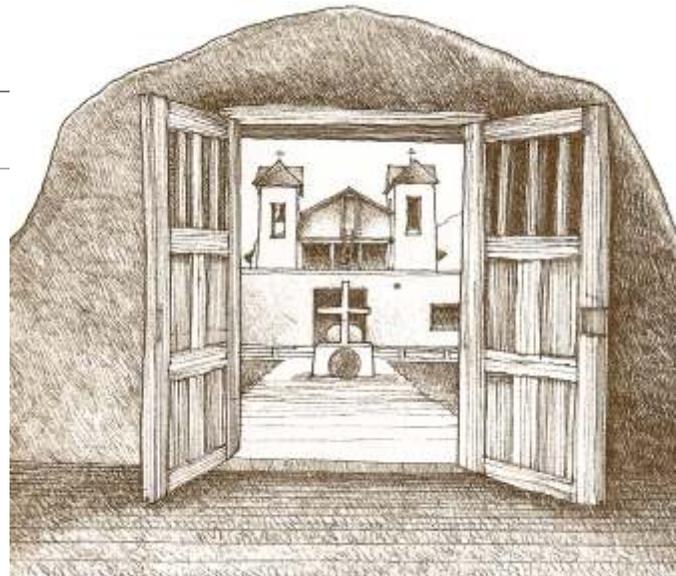


FIGURE 314: View towards the Catholic Church in Taos, 17th century

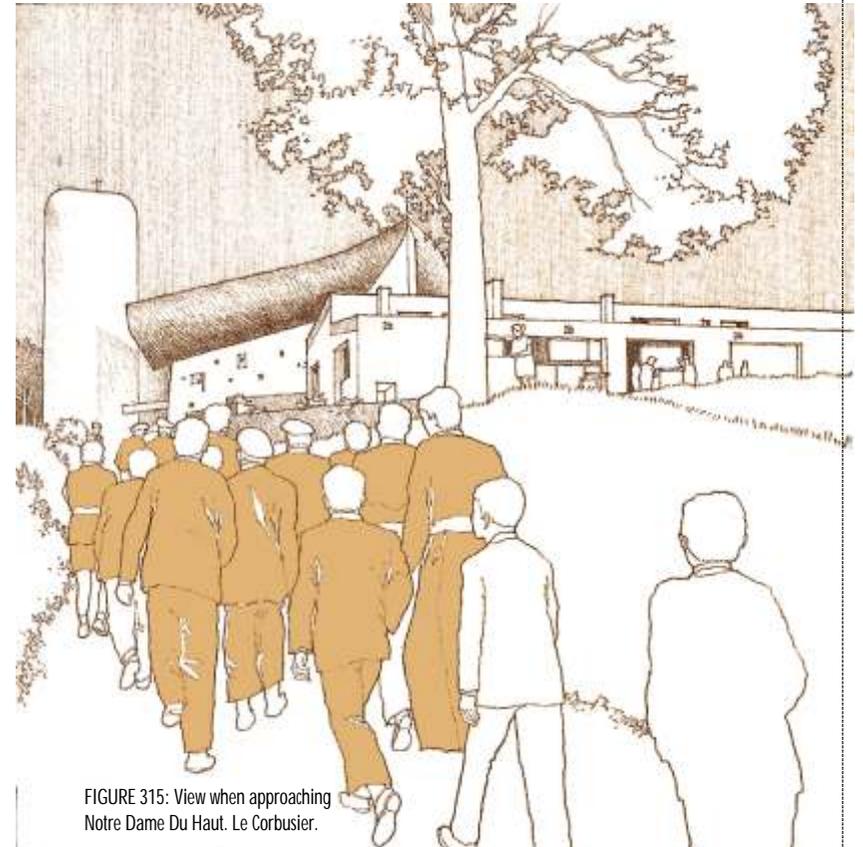


FIGURE 315: View when approaching Notre Dame Du Haut. Le Corbusier.



FIGURE 316: View from the garden towards the Cross at the Chapel.

When one is moving through the garden along the pathway towards the Chapel, one will see the sculpture of the cross behind the tree stems. The tree stems together with the image of the cross points to the crucifixion and the price that was paid for every human. One sees the cross even before one sees the Chapel. The focus is on the cross. Any Christian would then be reminded of life's purpose: to become more and more like Jesus, God's Son. The Cross is positioned in water with its image being reflected. Again one realizes that the character of the Son must be reflected in each Christian for the world to witness. The Cross will be lighted in the evening. Again reminding one that God is the light on our path and in our lives. Psalm 18:28 'You, O Lord, keep my lamp burning, my God turns my darkness into light.' (NIV, 1998:802)

Similarly, the curved copper roofs of the Chapel catches the eye as one proceeds down the pathway. The two curving roofs can be seen as two arms enveloping anyone underneath. It becomes a protective shelter for the broken hearted and a safe haven for those in need of rest. The copper material embodies meaning in that copper reminds us of the voluntary suffering of the Lord Jesus. It is in His suffering that we find rest for he carries the burdens of the world on His shoulders.

When walking down the ramp towards the Memorial Wall, one looks onto the walls from above. The planters on top of the wall are planted with Biblical flowers. These flowers are grouped according to colour, resulting in strips of colour. Colourful flowers will bring joy to most people. Flowers are often used to personify grief and people like to leave a single flower or a small bunch at the niche. The sight of the colourful flowers will slightly ease an aching heart and make the journey to the specific niche a bit easier.



FIGURE 317: Looking down the ramp into the Memorial Wall

Social

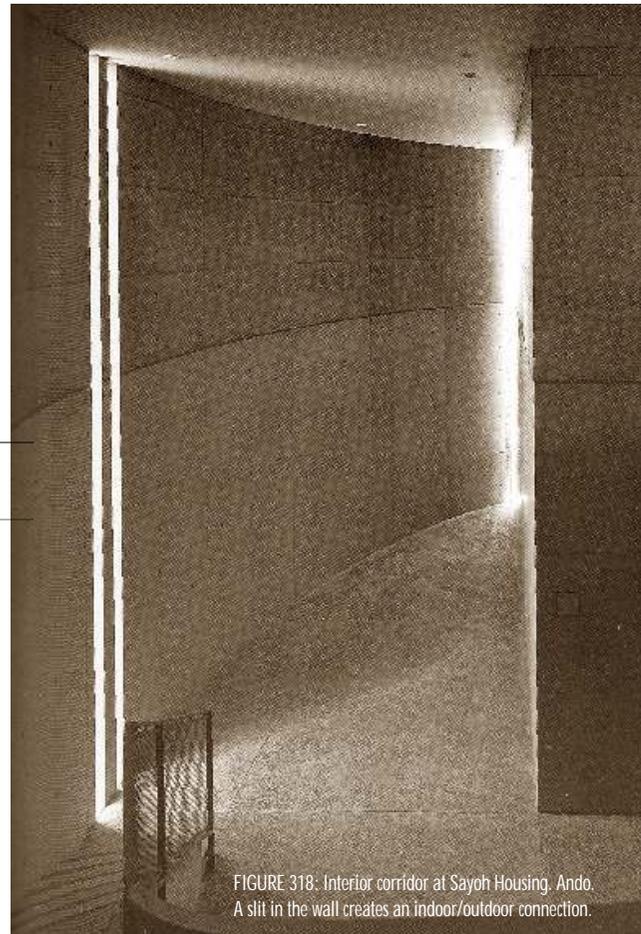
Indoor / outdoor connection

Prioritization

Facility			
Foyer	5	Essential	5
Auditorium	2	High Req	4
Bookstore	5	Medium Req	3
Kitchen	2	Low Req	2
Hall	3	No Req	1
Chapel	5		
Memorial W.	5		
Coffee shop	5		

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FIGURE 318: Interior corridor at Sayoh Housing. (Ando, 12:145)

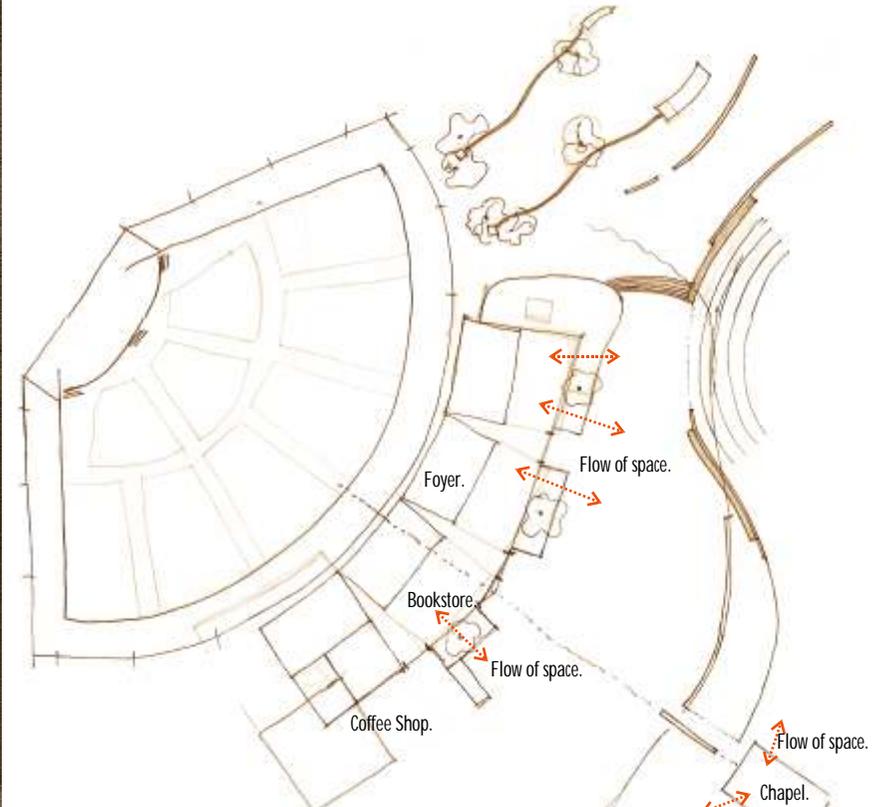


Target Description:

Space must flow between the exterior and interior of the Foyer, Chapel, Bookstore and Coffee Shop.

How is this Achieved?

The facades of the Foyer should be light and predominantly transparent. Transparency will facilitate the connection between the outside and inside. It will further improve this quality if the transparent components can be opened to allow the flow of air into the interior. The combination of glass, timber and concrete must facilitate the flow of space. The Chapel must link to the outdoor space of the Biblical Garden and Memorial Wall.



The Chapel is open to the elements. Contact between indoor and outdoor becomes inevitable. The outdoors lurks into the inside and mingles with one's perception of interior and exterior. Light penetrates from all sides and ventilation occurs depending on the direction of air movement.

With the indoor / outdoor connections of the Chapel it is important to control the short distance views onto the gardens. A feeling of privacy and seclusion is created by the placement of vegetation and trees around the open parts of the Chapel. However, people will be able to look across the landscape through the trunks of the trees. The proximity of the vegetation brings nature into the Chapel.

The garden pedestrian walkway meanders and ends at the water feature of the Chapel. One can not see the entire Chapel until the end of the path. This creates an expectation and a definite experience of the transition between the outdoors and inside the Chapel.

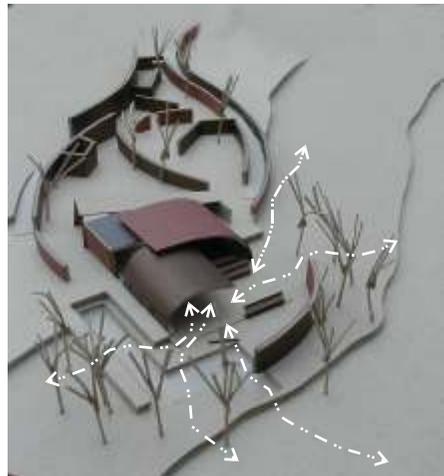
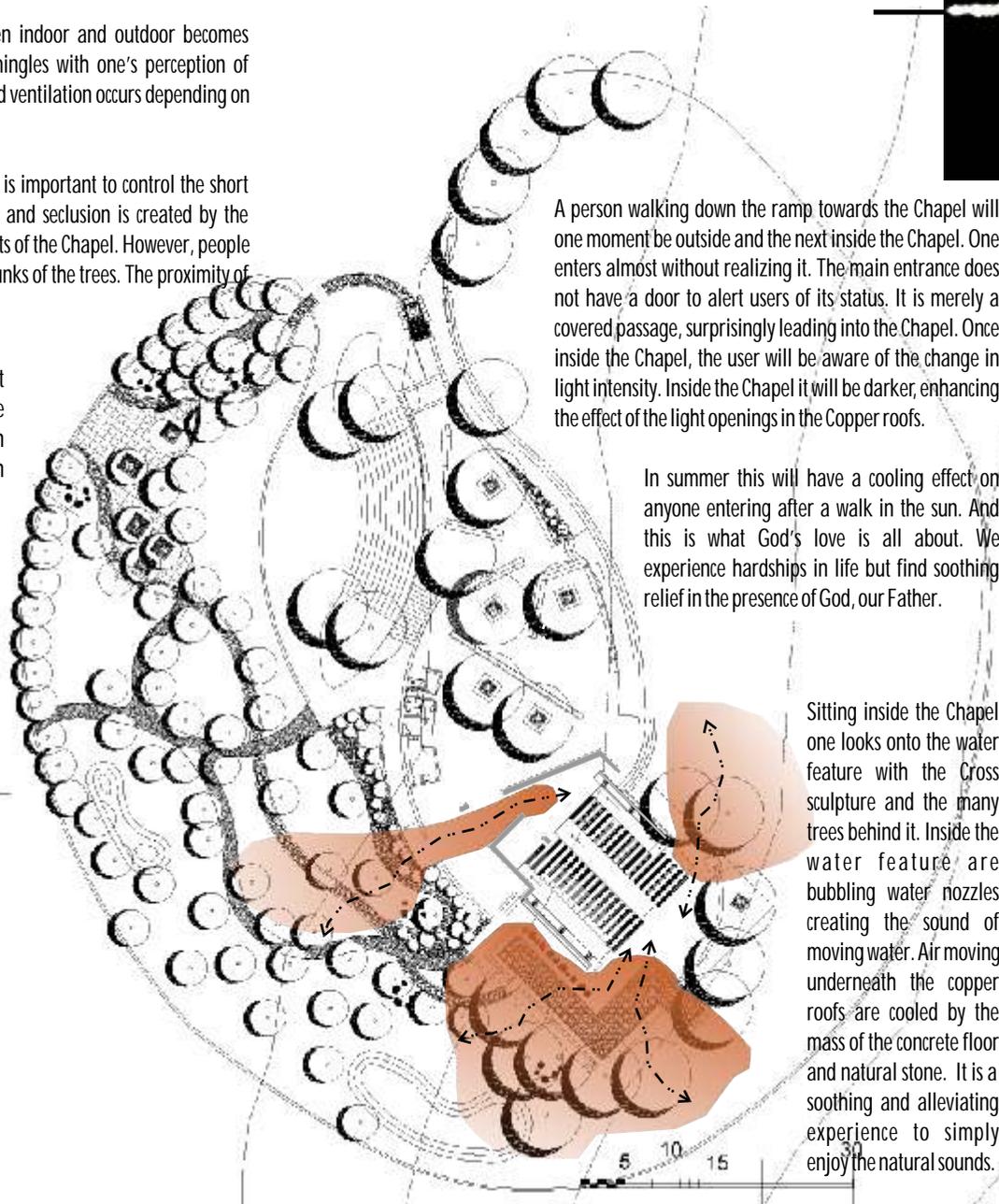


FIGURE 320: Concept model of Chapel showing the indoor / outdoor connections.



A person walking down the ramp towards the Chapel will one moment be outside and the next inside the Chapel. One enters almost without realizing it. The main entrance does not have a door to alert users of its status. It is merely a covered passage, surprisingly leading into the Chapel. Once inside the Chapel, the user will be aware of the change in light intensity. Inside the Chapel it will be darker, enhancing the effect of the light openings in the Copper roofs.

In summer this will have a cooling effect on anyone entering after a walk in the sun. And this is what God's love is all about. We experience hardships in life but find soothing relief in the presence of God, our Father.

Sitting inside the Chapel one looks onto the water feature with the Cross sculpture and the many trees behind it. Inside the water feature are bubbling water nozzles creating the sound of moving water. Air moving underneath the copper roofs are cooled by the mass of the concrete floor and natural stone. It is a soothing and alleviating experience to simply enjoy the natural sounds.

FIGURE 321: Plan of Chapel showing the indoor / outdoor connections.

Social Noise

Target Description:

Excessive noise levels must be avoided. Noise must be limited to acceptable levels. The Ambient sound level in the Auditorium may not exceed 20 dBA. (T&A, 1998:193) Adequate audibility is crucial to the success of the Auditorium, Chapel and Conference room. It is not to be compromised.

How is this Achieved?

Inside the Auditorium measures must be taken to ensure excellent acoustics. The walls and roof of the Auditorium are required to have a weight of 4 to 5 kg/sqm to reduce externally generated noise. (T&A, 1998:193) Acoustic panels and sound reflectors can be used on the inside. However, the Auditorium space is so large that one cannot rely on the natural dispersion of sound, but will have to utilize electronic sound. According to Frans van der Merwe, a musician and acoustic guide, says that an auditorium must either rely on natural sound or electronic sound. To design for both is not possible. (Van der Merwe, 2003) An acoustic consultant must do the positioning of the electrical speakers.

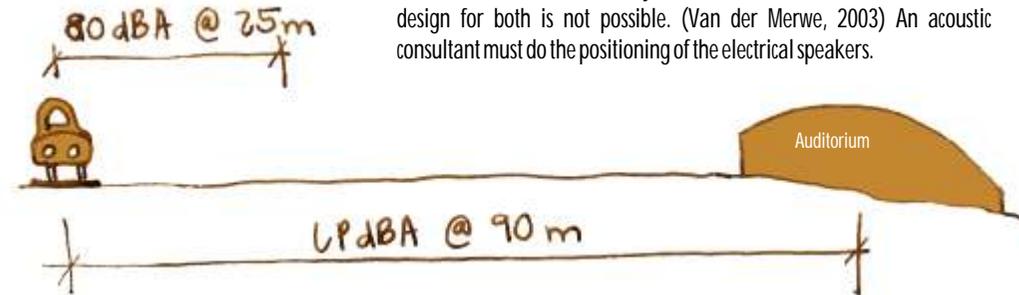
Prioritization

Facility		
Foyer	3	Essential 5
Auditorium	5	High Req 4
Bookstore	2	Medium Req 3
Kitchen	1	Low Req 2
Hall	4	No Req 1
Chapel	5	
Memorial W.	-	
Coffee Shop	2	

Calculating the traffic noise of De Villbois Street:

Say that the traffic noise is 80 dBA at its worst 25 meters from the road. The distance between the road and the Auditorium is on average 90 meters.

Calculate the ambient noise level at the Auditorium...assume that the only reduction in noise level is due to geometric divergence.



$$L_{P_{x2}} = L_{P_{x1}} - 10 \log(K_x) \quad [dBA] \quad K_x = \frac{x_2}{x_1}$$

$$L_{P_{90m}} = L_{P_{25m}} - 10 \log\left(\frac{90}{25}\right)$$

$$L_{P_{90m}} = 80 \text{ dBA} - 5,6$$

$$L_{P_{90m}} = 74 \text{ dBA}$$

From the calculation it is evident that the ambient noise level still needs to drop with 54 dBA to reach the required level. This will be achieved by means of the construction and materials used for the roof, walls and floors of the Auditorium. Good wall solutions are:

- a masonry cavity wall with 220 leaves with a 120 cavity where the walls are plastered with no ties and fitted with 2 x 50 glass wool insulation
- 200 mm dense reinforced concrete
- 300mm plastered rough concrete.

Thermal Comfort Social

How is this Achieved?

In summer, passive combined with mechanical and natural ventilation, will be used in the Auditorium. Adjustable openings must be provided in the Auditorium when it is unnecessary to use mechanical ventilation. In winter warm air can be distributed into the auditorium from underneath the seats and onto the stage. Heating in winter will benefit the users but is not such a high priority in South Africa's moderate climate. The body heat from the people might be enough to heat the Auditorium slightly. Heating will only be installed if the budget allows for it because it is not a high priority. Another method to control the internal temperature in winter, is to install a trombe wall on the northern side of the auditorium. This possibility is discussed under Environmental Control later on.

The ventilation control room must be positioned such that the ambient noise levels produced do not disturb the activities inside the buildings. Sound absorptive paneling might be necessary to dampen the noise levels.

Target Description:

Thermal comfort is more important in some spaces than others. It is crucial that the level of thermal comfort inside the Auditorium is sufficient in winter and in summer. If the occupants feel comfortable it will enhance the effectiveness of the message. Happy and comfortable people will listen and concentrate better.

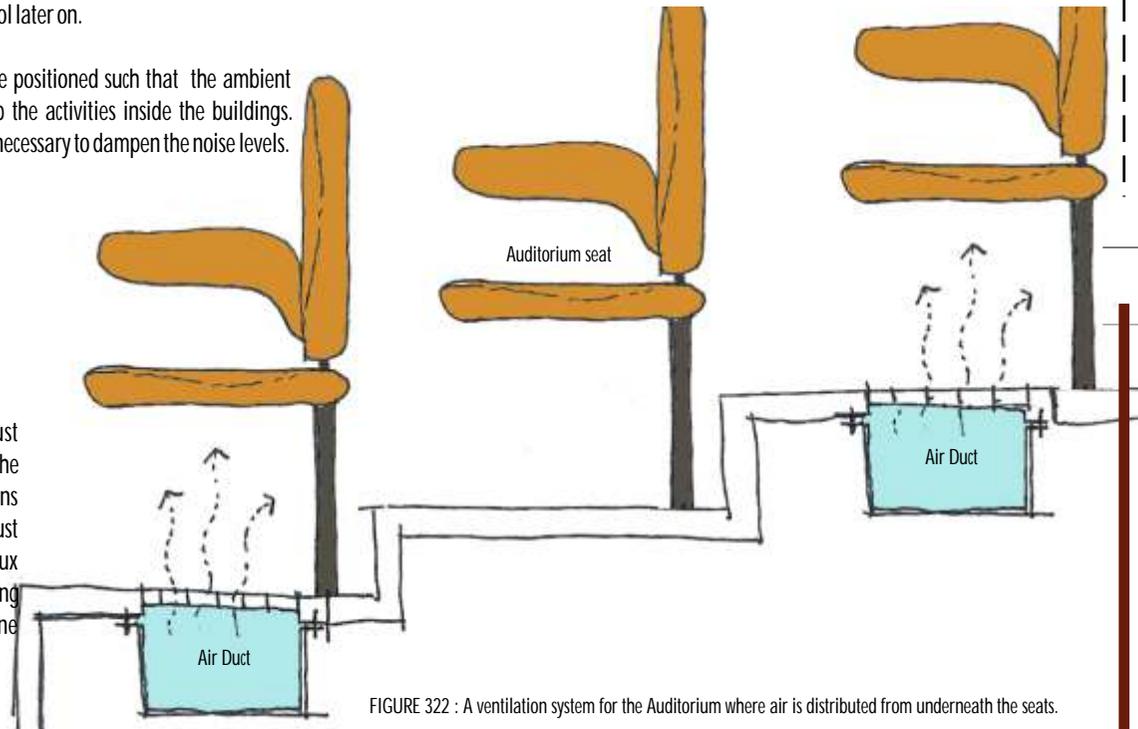


FIGURE 322 : A ventilation system for the Auditorium where air is distributed from underneath the seats.

The air inside all spaces must continually be of high quality. The ventilation speed, whether by means of natural or mechanical means, must be sufficient to ensure a decent influx of fresh air. Do calculations during design finalization to determine effective ventilation.

Prioritization

	Facility	
Essential 5	Foyer	3
High Req 4	Auditorium	4
Medium Req 3	Bookstore	2
	Kitchen	3
	Hall	3
Low Req 2	Chapel	3
	Memorial W.	-
No Req 1	Coffee Shop	3

Social Ventilation

How is this Achieved?

Natural ventilation is when air moves through openings in the building facades such as windows and doors. In warm climates like Pretoria 'through ventilation' is used. (T&A, 1998:385) Windows to be used for natural ventilation should be easy to open while maintaining high security levels. In the Foyer, the user can be made aware of natural ventilation by a slight breeze at times; this will form part of the atmosphere. The positioning of adjustable openings must be thoroughly planned. Air moving at a speed of less than 0.1m/s will result in stuffiness. (T&A, 1998:385) It is however important to remember that with natural ventilation there would be the appearance of dust. A compromise is made to save energy, used for cooling or heating, and to rather slightly increase the cleaning costs.

Ventilation rates:

For a Church building, a ventilation rate of 3,5 liters / second / person is required. (SABS 0400, 1990:112) For maximum use, there will be 10 000 people in the Auditorium. Thus 35 000 liters / second is necessary. An adequate ventilation rate not producing too much noise will be 4m/s.

$$35\ 000\ \text{lit/s} = 35\ \text{m}^3/\text{s}$$

$$\frac{35\ \text{m}^3/\text{s}}{4\ \text{m/s}} = 9\ \text{m}^2\ \text{duct space}$$

The required area of duct releasing fresh air is 9 square meters. This means that the total area of all the outlets into the auditorium must be 9 square meters.

Target Description:

The required ventilation must be provided naturally as far as possible, except in the Auditorium, Kitchen and Conference room where passive ventilation will be used.

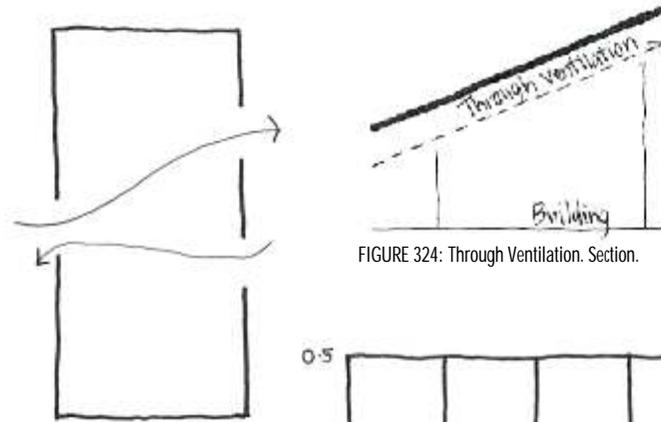


FIGURE 323: Through Ventilation. Plan

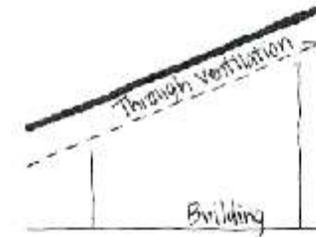


FIGURE 324: Through Ventilation. Section.

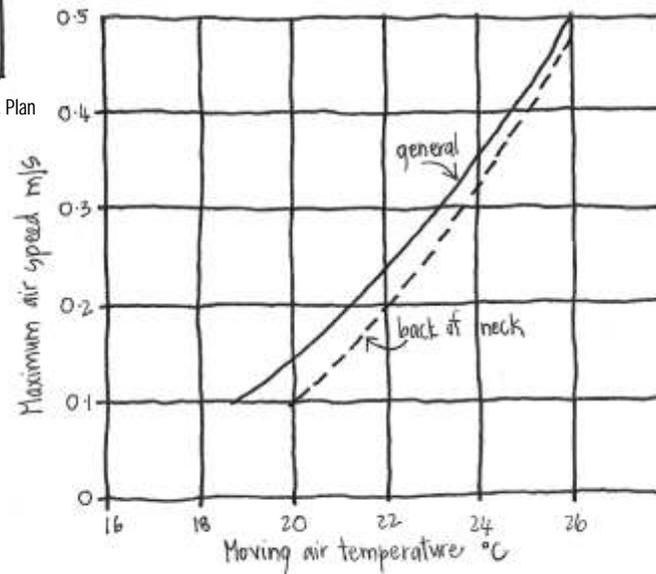


FIGURE 325: Acceptable Air Speeds

Prioritization

Facility		
Foyer	4	Essential 5
Auditorium	5	High Req 4
Bookstore	4	Medium Req 3
Kitchen	5	Low Req 2
Hall	4	No Req 1
Chapel	4	
Memorial W.	-	
Coffee shop	4	

FIGURE 323: Through Ventilation. Plan. (T&A, 1998: 386)

FIGURE 324: Through Ventilation. Section.(T&A, 1998: 386)

FIGURE 325: Acceptable Air Speeds (t&a, 1998:386)

Theatre

Social

2. How can this be applied to the Church?

It will cost a tremendous amount of money to install fully mechanical ventilation and cooling in the Auditorium. It will also use an extensive amount of energy to operate. Passive ventilation is definitely the answer. Since the foyer space is very large, enough space for bed rocks is available.

1. This Theater uses passive ventilation for the cooling of the auditorium. The system is simple but very effective. Air is taken in by vertical air ducts through the suction of the internal fans. The air moves through the fans and a filter where it is then forced through a bed of rocks underneath the foyer. The rocks will cool the air before it enters the auditorium to a more suitable temperature. The cool air enters the auditorium from underneath the seats. As soon as this air is heated it will move upwards and leave the building through the extraction ducts. The minimum amount of energy is required in the process.

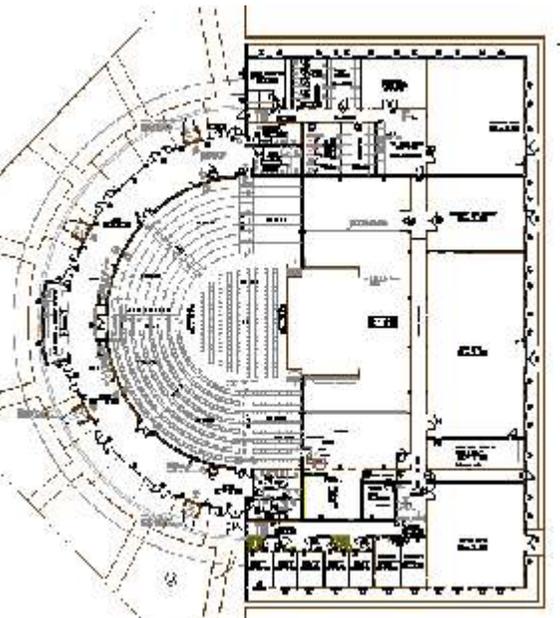


FIGURE 326: Plan of the auditorium.

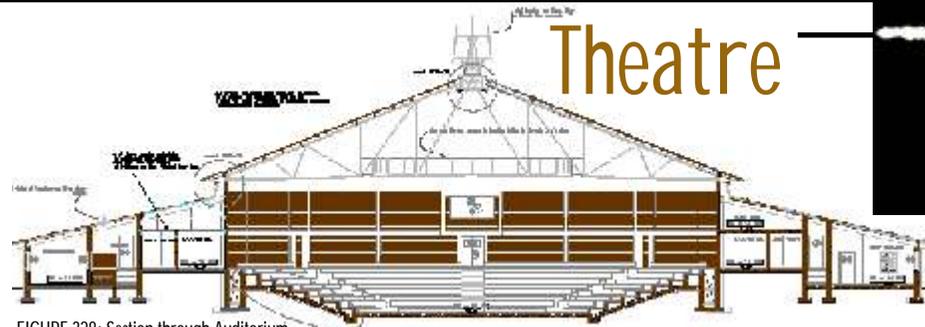


FIGURE 328: Section through Auditorium..

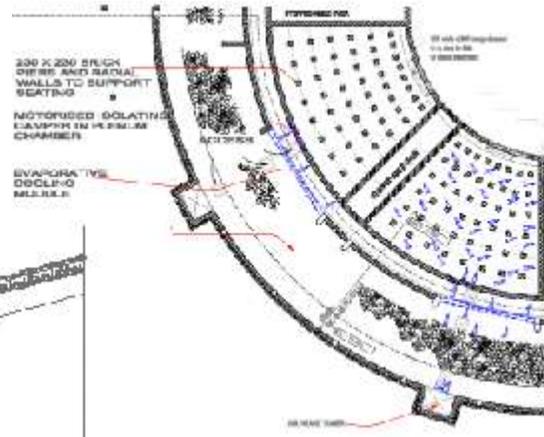


FIGURE 329: Detail of the ventilation system in plan.

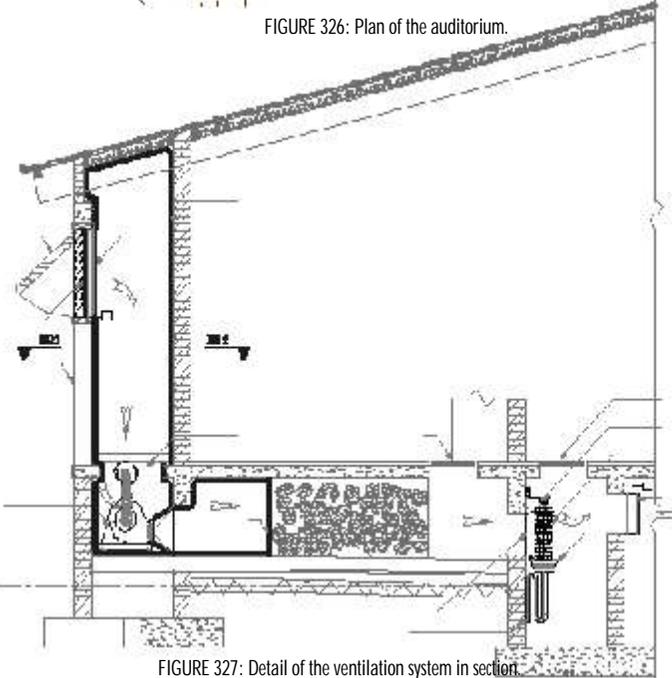


FIGURE 327: Detail of the ventilation system in section.



FIGURE 330: The rock bed during Construction.

FIGURE 326: Plan of the auditorium. (Nel, 2002:37)

FIGURE 327: Section through Auditorium. (Nel, 2002:38)

FIGURE 328: Detail of the ventilation system in plan. (Nel, 2002:40)

FIGURE 329: Detail of the ventilation system in section. (Nel, 2002:39)

FIGURE 330: The rock bed during Construction. (Nel, 2002:41)

Social

1. This system makes use of the temperature of the ground. 2 to 3 meters under ground the temperature seems to stabilize and becomes constant.

2. How can this be applied to the Church building?

The current concept design suggests a large open space in front of the foyer. This will be an ideal length of space to implement this system. The system will work even better if this earth cooling is combined with cooling by means of rock beds.

The earth tube can be situated close to the Chapel and run all the way to the foyer. There the air can be forced over a rock bed. The result would be very favorable temperatures inside the building.

An air duct is situated 46 meters uphill from the building. This earth tube has a diameter of 610mm and is buried at a depth of 1 800mm. It brings cooled air in summer and warmed air in winter.

The air moves into the tube and is either cooled or warmed by the constant temperature of the soil. When it enters the building, the temperature is much more acceptable.



FIGURE 333: View from the bottom.

Passive Ventilation

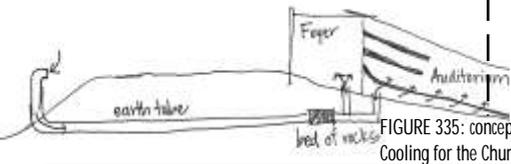


FIGURE 335: concept of passive Cooling for the Church.

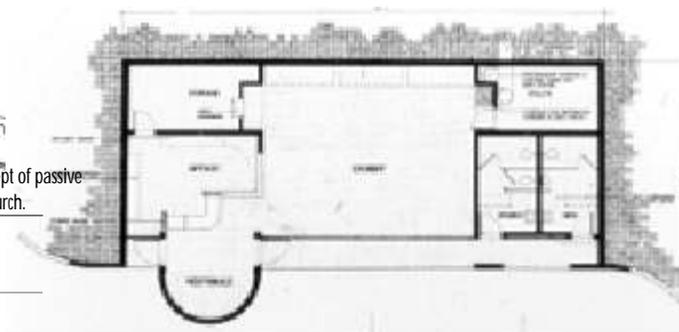


FIGURE 331: Plan.

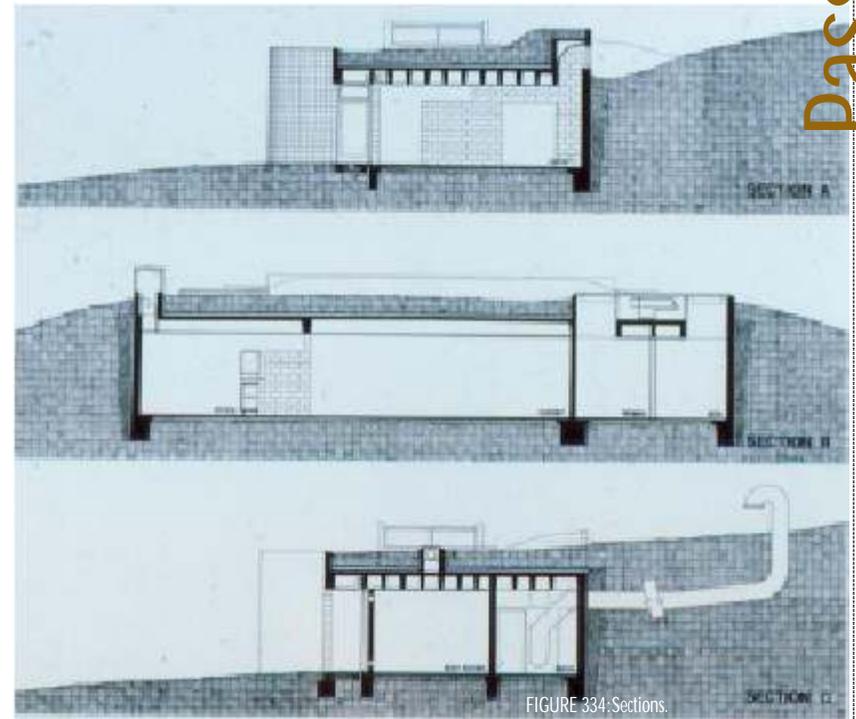


FIGURE 334: Sections.



FIGURE 332: View from the top showing air duct.

FIGURE 298: Plan. (Reynolds, 2002:38)

FIGURE 299: View from the top showing air duct. (Reynolds, 2002:38)

FIGURE 300: View from the bottom. (Reynolds, 2002:38)

FIGURE 301: Sections. (Reynolds, 2002:38)

How is this Achieved?

Safety and security of the people: it is of utmost importance that the users of the site feel safe and secure at any point on the site, whether inside or outside the buildings. This can only be achieved by means of thorough property security, eyes inside buildings looking to the outside every now and then, open circulation routes and adequate lighting in the evenings. Persons coming at night to visit the Memorial Wall, Prayer Garden or Chapel must feel safe. The designer suggests that local community members are employed to patrol the site since it is such a big area to cover.

Safety and security of the property: The main entrances onto the site must provide security checkpoints with the practicability of closing up. It would be ideal to have a complete open site but this is certainly not advisable in South Africa, thus the site will have to be fenced.

The buildings must be fitted with alarm systems and lockable entrances. All glazing must be secured either by means of burglar bars or thick safety glass. During the day the foyer, Chapel, Bookstore and Coffee shop will be open. Parts of the Chapel can be left open at night for people visiting the memorial wall and prayer garden. Sufficient lighting during the evenings is crucial to minimize crime.

Safety & Security

Target Description:

Although safety and security is a very high priority, spaces like the foyer and chapel require being open most of the time to accommodate people wanting to pray and so forth. Distinguish between personal safety and security and the safety and security of the property.

Social

Prioritization

Essential	5		
High Req	4		
Medium Req	3		
Low Req	2		
No Req	1		
		Facility	
		Foyer	4
		Auditorium	5
		Bookstore	5
		Kitchen	5
		Hall	4
		Chapel	4
		Memorial W.	-
		Coffee Shop	5

Social

Furniture & Fittings

Target Description:

The furniture and fittings should be of good quality and serve its purpose well. People must feel comfortable in all spaces, inside and outside.

How is this Achieved?

The selected furniture must correspond to human proportions. The Foyer and Auditorium will for example have different kinds of furniture and fittings. Furniture materials must have relatively low maintenance while still be comfortable. Seating in the Auditorium must be soft and comfortable, while seating in the foyer can consist of harder materials since it will be used for shorter time periods. The selection of furniture and fittings will influence the character of the interior and exterior. Exterior furniture must be hard wearing and durable.

The furniture and fittings must also remind the user of the religious setting. The use of light and views to the outside can greatly enhance the experience when using the furniture. The photograph of Tadao Ando's building gives a good idea of what is to be achieved. See FIGURE 303.

Prioritization

Facility		
Foyer	4	Essential 5
Auditorium	5	High Req 4
Bookstore	3	Medium Req 3
Kitchen	4	Low Req 2
Hall	3	No Req 1
Chapel	5	
Memorial W.	4	
Coffee shop	4	

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FIGURE 336: Hall on the first floor of I House. Ando. (Ando, 12:46)

FIGURE 337: Birch Plywood Oiled Chairs by Maarten van Severen. (Architectural Design, 2002:44)

FIGURE 338: Worm Bench by Michael Ryan. (Architectural Design, 2002:71)

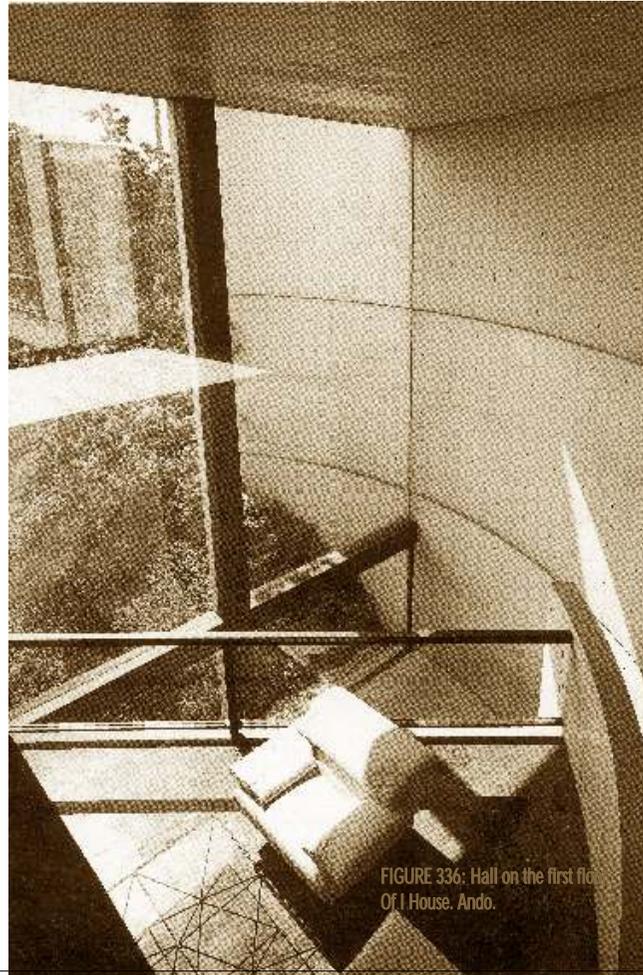


FIGURE 336: Hall on the first floor of I House. Ando.



FIGURE 337: Birch Plywood Oiled Chairs by Maarten van Severen.



FIGURE 338: Worm Bench by Michael Ryan.

BASELINE: Social - Environmental - Economic



Lavatories & Kitchens

Social

How is this Achieved?

Most of the lavatories will be positioned adjacent to the foyer space. These will serve the Conference room, Auditorium, Bookstore, Foyer Space and Biblical garden. Separate Lavatories must be installed proximate to the Chapel, Kitchen and Hall for the activities in these spaces. Preferably the lavatories must be provided with natural ventilation where possible, otherwise mechanical ventilation.

The industrial Kitchen will be used to cater for activities in the Auditorium, Foyer, Hall, Bookstore, Conference room, Chapel and Coffee Shop. The Kitchen must link directly with the Foyer, Hall and Coffee Shop for easy transfer of food and drink between the kitchen and these spaces. The kitchen must also be provided with an outside service entrance for deliveries and removals accessible for delivery vehicles.

Target Description:

An adequate number of lavatories for women and men should be provided. It must be positioned close to a circulation route for easy access and direction. Make provision for disabled persons.

The large industrial kitchen should be adequately furnished with the necessary fittings and have proper circulation and access for staff and service vehicles.

Fitting	Foyer/Auditorium		Hall		Chapel		Kitchen Unisex
	Men	Women	Men	Women	Men	Women	
Water closet	20	40	2	7	2	7	2
Hand washbasin	20	20	5	5	5	5	1
Urinal	20	-	5	-	5	-	-
Disabled Provision	1	1	1	1	1	1	-

TABLE 12: Number of sanitary fittings required based on SABS 0400.

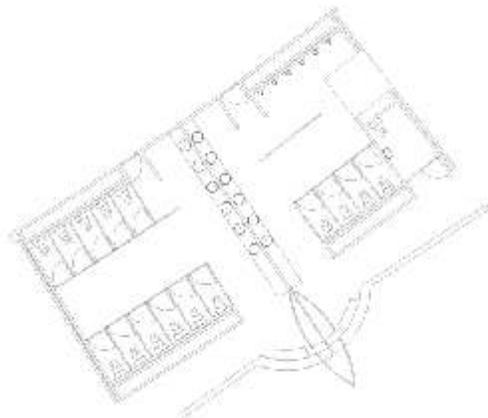


FIGURE 339: Ablution in the Auditorium



FIGURE 340: Ablution outside the Chapel

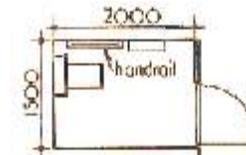


FIGURE 341: Recommended WC cubicles for The wheelchair user.

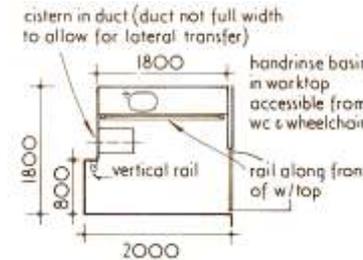


FIGURE 342: An alternative solution for the wheelchair user.

Prioritization

	Facility	
Essential 5	Foyer	5
High Req 4	Auditorium	5
Medium Req 3	Bookstore	3
	Kitchen	4
	Hall	4
Low Req 2	Chapel	5
	Memorial W.	-
No Req 1	Coffee Shop	-

FIGURE 341: Recommended WC cubicles for The wheelchair user. (T&A, 1998:342)

FIGURE 342: An alternative solution for the wheelchair user. (T&A, 1998:342)