Design Discussion
What was done and why
Design Discussion

The design of a Mind Development Centre requires consideration as a number of factors are in play. The project is deemed significant because of the extent of the research and the number of stakeholders involved. In designing a Mind Development Centre, it is necessary to consider the nature of the spaces in the synagogue, the scale of the site and the requirements of the design with the nature and function of human life. The issues are complex and interrelated, requiring a holistic design approach.

1. Technical Aspects

1.1. Technical goals

During the design process, the technical goals were identified to be as follows:

- **Psychological and functional aspects**
- **Safety and security**
- **Energy efficiency and sustainability**
- **Accessibility and sustainability**
- **Material selection and construction methods**
- **Cost effectiveness and budget constraints**
- **Architectural and aesthetic considerations**
- **Sustainability and environmental impact**

During the process of designing the centre, it became apparent that certain goals set in the brief and baseline study were not feasible or practicable. These factors combine with urban zoning regulations to allow for higher densities. Provision of services and infrastructure needs to be considered, as well as zoning and land-use regulations. Availability of public transport affects the range of people that can reach the site and influences parking requirements.

1.2. Sites Considered

Several possible locations were considered.

1.2.1. Topo-CSP

The CSP provided an established campus with a great amount of research activity taking place. The CSIR provided an established campus with a library, information, security and other infrastructure existing on site. The campus is located in a very central location, however, and the open spaces are managed as an ecological conservancy. Processing development work had to be done on virgin land.

1.2.2. University of Pretoria

The UP campus also provided a development infrastructure within a research environment, located next to the Hatfield urban village. The site is more central than the CSIR and is close to the Hatfield development area. It is unfortunately affected by traffic and parking problems and public transport could be improved (the proposed Gautrain station in Hatfield would have made it more accessible for long-distance users). It is not clear that the local transport infrastructure would be improved and in what way.

1.2.3. Pretoria Academic Hospital

The site provided access to advanced medical equipment and knowledge. It was again felt that individual identity should be considered, in addition to the design or medical function of the centre. The site is a brownfield site. Development would have had to move through the centre. The area is highly central to the main fields of study at the Mind Development Centre. The area has very good public transport links. The site chosen for the development is an urban brownfield site, which will not be disturbed for the construction, services and maintenance of the area, and public transport services depend on the productive sanding multitude.

1.2.4. The HSRC

The site to the north of the HSRC provided a central urban location as proposed by the baseline study, however, was incidentally closely related to the main fields of study of the Mind Development Centre. The area has very good public transport links. Development along the north-south axis would have had to move through the centre. The site is a brownfield site.

1.3. Topological decisions

Several design and contextual indicators led to the decision to create an arcade running through the site.

2.1.1. Arcade and public open space

Due to the length of the street block in Pretoria in an east-west direction, a location of arcades has evolved. Corridors to the north of the HSRC building and to the south of the Rytons Building provided the opportunity to create a link between these two buildings. Integrating these open spaces and adding to the public realm.
This decision allows the use of sunlight to provide an area of greenery and respite in a busy urban environment. In line with the Integrated Spatial Development Framework for the Pretoria central area, a micro park could be created, improving the quality of the area in which the centre is located.

3.3.8 Parking

In spite of the provision of good public transport facilities to the area, a centre of this nature would still require the provision of parking facilities. This need was further strengthened by the fact that there is a parking area as a shared courtyard, reflecting the need for parking in the area. The decision to provide parking in relation to the program that needs to be accommodated on the site made it clear that surface parking will not be adequate. Maintaining an urban character with well-defined public space also made surface parking inappropriate.

These factors made it clear that a parking garage will need to be provided. This need is increased through the existing use of the site as a parking area.

Parking facilities exist in the Nettleton building to the west of the site and in the HSRC building to the south. Both these facilities have existing access facilities and are managed by Interpark.

It was recognized that parking could be considered urban infrastructure, like streets and sidewalks. The need led to the decision to combine the parking facilities of the Mind Development Centre with that of one of the neighboring buildings.

This decision frees the street frontage from motor access and releases the need for added access facilities to the center. It does bind the design, however, to the floor and plate heights of the arcade.

The arcade provides the opportunity for these people to see the arcade, which creates exposure for the center. People attending the Magoebaskloof Court need to get to the High Court or Advocates chambers, as well as to the parking garage. The location of the arcade on a slope would lead, in turn, to increased visibility of these functions and the definition of the street wall.

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From the investigation of mental states, we know that the presence of natural elements and greenery contributes to a sense of well-being, with associated positive effects. Many plants require at least some sunlight, and all water has oxygen in a 5 000 – 7 000 – 5 000 rhythm would be needed. This decision allows the use of sunlight to provide an area of greenery and respite in a busy urban environment. In line with the Integrated Spatial Development Framework for the Pretoria central area, a micro park could be created, improving the quality of the area in which the centre is located.

3.2.3 Lighting and ventilation

Extraction is provided at the northeast in a custom duct, which leads lawn air out above head level on the public open space. A duct runs from the basement to the roof of the southern side from an extraction duct, which lets stale air out above head level on the public open space.

3.2.4 Separate lift

The parking garage requires a separate lift to serve the parking garage. This lift needs to be connected to the existing lift core to the basement parking 450mm below natural ground level.
the adviser would not contribute as much to the character of the adjacent developments. If future developments would occur on the neighbouring sites, the tower could end up looking into the blank sidewalls of the development.

This solution was eliminated from consideration for several reasons:

• The existing buildings in the vicinity utilise several techniques to avoid overly deep plans and allow light into the interiors.

• The HSRC, Poyntons building and the Nedbank building are essentially state buildings. Spanning multiple streets in an east-west direction, this allows ample north and south facing facades with access to light and air. This approach is available for the site chosen, as the long sides of the site face east and west, with the potential for future development to either side.

• Applying a slab solution would have led to a building not oriented to the dominant grain of the development (Fig. 5.13). Future development on neighbouring buildings would mean that the light and views considered in the design might be changed in a way not conforming to the project’s brief.

• The western block of the design functions as a slab to a certain extent. The design approach makes this a one-sided slab and the HSRC courtyard already filled the plate heights of the buildings.

• Future development on the side walls of the envelope.

In spite of the difference in the scale of the site chosen for the HSRC and the HSRC building would have made an exception in the area being designed as a tower on a podium (Fig. 5.10). The HSRC, Poyntons building and the Nedbank building are essentially state buildings. Spanning multiple streets in an east-west direction, this allows ample north and south facing facades with access to light and air. This approach is available for the site chosen, as the long sides of the site face east and west, with the potential for future development to either side.

Courtyards

The Department of Public Works Building and the Pretoria Magistrates Court both occupy large sections of the blocks on which they are situated. Both have three street fronts and span more than one storey in depth, creating open areas in between that are too narrow to be considered courtyards, yet allow the penetration of light and air. This option was initially considered viable and was used in conjunction with the courtyard approach. As the design developed, it was replaced by the slab approach.

With the exception of the tower on a podium topology, all the other forms influenced the design of various stages of development and to different degrees.

3.4.1. Tower Form

The existing buildings in the vicinity utilise several techniques to avoid overly deep plans and allow light into the interiors.

1.4.1. Tower Form

The Merino Building on the northeastern corner of the block is the exception in the area being designed as a tower on a podium (Fig. 5.11).

This decision was made to join with the parking garage of the HSRC. This decision was informed by the following:

• Access to the parking garage as well as management of the garage would therefore be operated from the same stairwell for this purpose and for access control.

• Having the HSRC as a partner in the joint venture makes it safer and more in keeping with the intent of the regulation than being an isolated building. This is not technically a ground level space, but it is considered safer and more in keeping with the intent of the regulation than being an isolated building.

• The southern fire escape empties onto the public open space. This is not technically a ground level space, but it is considered safer and more in keeping with the intent of the regulation.

• Separate exits have been provided for stairs in the side stairwell for this purpose and for access control.

• The Transvaal Provincial Administration building has been very successful in providing open air spaces. Because of this, the decision, window cannot be provided in safe and more in keeping with the intent of the regulation than being an isolated building.

3.4.3. Courtyard

The Department of Public Works Building and the Pretoria Magistrates Court both occupy large sections of the blocks on which they are situated. Both have three street fronts and span the entire width of their blocks (Fig. 5.14).

In both these cases, courtyards have been used to allow light and air into the buildings and reduce the depth of the plan. In spite of the difference in the scale of the site chosen for the design and the site these buildings occupy, this approach was considered sensible and applicable to the problems of this site.
4. Massing and geometry

The considerations as discussed above dictates that the parking area link with the parking-garage of the HSRC at the rear of the site, and that a raised open area be provided to link up with the courtyard of the HSRC.

On order to add to the streetscape, development up to the front edge of the site would be required.

4.1) Initial concept

During the first design stages, these decisions combined with the courtyard approach as shown in Figs. 5.15-5.19 and 5.21-5.25). The arcade was formed by the furniture shop on the western portion of the site. The eastern edge was defined by a solid two-storey block containing shops and the entrance to the Mind Development Centre.

A single-storey parking block was provided at the rear with rooftop landscaping.

The solid two-storey block was topped by a continuous block at the northern end with an additional block midway down the block, raised by a storey to allow the courtyard garden formed between the blocks to link with the open space to the rear of the site.

The two blocks were linked by a glazed bridge block along the arcade. This defined the western edge of the courtyard garden.

The eastern edge of the garden was defined by a water tank forming a continuous wall along the eastern edge for the full height of the building (Fig. 5.26-5.31).

This solution made use of the courtyard and block topologies to create a design solution. The solution was rather fragmented and the programmatic functions could not be fully accommodated.

The relationship between the design and the furniture shop on the western edge was unsatisfactory.

This led to the decision to incorporate the western portion of the site into the design and demolish the existing structure.

4.2) Revised concept

After merging the sites, the design approach was revisited. The initial decisions were maintained and the approach changed.

Designing an arcade through the combined site required that the design be split into two blocks.

From this point, the approach was to carve the arcade out of the site (Fig.5.40-5.44). Of prime importance in this process was the concept of sightlines. The theory underlying this is that people are more likely to use the arcade when they can see what it contains, where it leads and where threats might come from.

The arcade was lined up with the courtyard at the Poyntons building and linked to the HSRC courtyard to the south. It was deemed necessary to provide views from the entrance of the courtyard to the corners of the courtyard on the site boundary.

Several organisations based on this grid were considered (Fig.5.32-5.39). The layout chosen allowed the necessary views and made for a balanced and aesthetically pleasing composition.
It was considered to enter into a dialogue with the HSRC building to the south by using curved facades along the arcade (Fig. 5.49-5.50). Using the principle expounded by Day that it is easier to create a firm curve from straight lines (1990 p.67), along with the practical rationalisation of design and construction through the use of straight lines, it was decided to rather use the implied curve generated by the grid.

The grid was next used to carve out courtyards and atria (Fig.5.55-5.56). The broad layout principles of the first concept was maintained, but changed drastically in the details.

Locating the auditoria within the organisation of the whole provided several alternatives.

4.2.1.) Burying in the base
The auditoria, which need to be separated from outside light and sound, could be placed in the basement or in the lower floors where deeper plans occur.

4.2.2.) Enclosure within the atrium
The atrium could be treated as an independent object enclosed within the atrium space (Fig. 5.64).

4.2.3.) Independent building
A larger space could be carved out of the arcade space to accommodate the auditoria as an independent, freestanding structure on the site.

4.2.4.) Central connector
The auditoria could be placed over the arcade, protruding into the atrium and penetrating the western block (Fig.5.57-5.60). In this way, it could be an object in space, have an individual identity and form a link between the eastern and western blocks of the design.

The placement of the auditorium was done in the fourth way. Separate organising lines were created for its form in order to create a separate identity and give integrity to the form. Using the auditorium off the ground and having a separate roof to it further enhances this separation, avoiding the heavy meeting of elements present in the Moneo design. Using different materials and geometry, they are expressed as independent objects. This effect is diminished, however, by the rather solid junctions they make with the floors and ceiling of the atrium spaces.

The object within a space is a precedent for the auditoriums penetrating the main atrium and functioning as a freestanding object. The change in geometry is used in order to distinguish it from the surrounding functions.

Precedent 1.
Centro Kursaal – Rafael Moneo – San Sebastián – Spain – 2000

The building consists of a conference centre and auditorium on the site of an old casino in the resort city of San Sebastián. The building is made up out of two blocks sitting on a podium, with the main entrances situated between the two blocks.

The building proved informative to the design in several ways. For example, the idea of using curved facades along the arcade was a response to the HSRC building to the south. The use of straight lines in the design of the auditoriums was influenced by the Moneo design, but with different materials and geometry. The auditoriums are expressed as independent objects in the Moneo design, but in the new project, separate organising lines were created for their form.

The positioning of the auditoria makes use of the orthogonal grid of the building. Using different materials and geometry, they are expressed as independent objects. This effect is diminished, however, by the rather solid junctions they make with the floors and ceiling of the atrium spaces.

The auditoriums are objects in space, separate from the surrounding functions. The change in geometry is used in order to distinguish them from the surrounding functions.

Precedent 2.
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5.) Multi-use of building

Most non-residential buildings are used for eight or nine hours a day, leading to an inefficient use of facilities. Several functions incorporated into the Mind Development Centre could be used by private individuals out of office hours. These include the gym, the computer lab (which can be operated as an internet cafe, Fig. 5.76), as well as the auditoria and lecture rooms, (which can be used for discussions, performances, religious gatherings and the like).

The floors that will be used out of office hours need to be located closer to the building entrances and be more controlled. The more public functions of the building are placed on street level. Functions become more independent operation of the appropriate facilities.

In order for such an approach to operate effectively, facilities that will be used out of office hours need to be located closer to entrances and be more controlled. The more public functions of the building are placed on street level. Functions become more independent operation of the appropriate facilities.

The columns that will be used after normal working hours can help to deter crime through surveillance. Such an approach also serves to integrate the centre with the community in which it operates. This is not only socially responsible, but gains a sense of loyalty from the community, again increasing security. Avoiding the need for the duplication of facilities, this decision aids the environment and the wider economy. This also allows monitoring of the number of people in the building and their location in case of emergency, when the fire service can be directed to the desired areas at need.

Operating the building in this way provides a means of generating income for the centre. The presence of people in the building after business hours can help to deter crime through surveillance. Such an approach also serves to integrate the centre with the community in which it operates. This is not only socially responsible, but gains a sense of loyalty from the community, again increasing security. Avoiding the need for the duplication of facilities, this decision aids the environment and the wider economy. This also allows monitoring of the number of people in the building and their location in case of emergency, when the fire service can be directed to the desired areas at need.

6.) Contextual indicators

Several decisions were taken in order to link the design with the existing fabric of the area.

6.1.) Rhythm on the street front

The column spacing has been modified on the front façade to pick up the rhythm manifested in the other buildings. This has no impact on the functioning of any adjoining space. Floors plate thickness might be reduced on the front façade to give horizontal articulation. The column spacing has been modified on the front façade to pick up the rhythm manifested in the other buildings. This has no impact on the functioning of any adjoining space. Floors plate thickness might be reduced on the front façade to give horizontal articulation.

Fig. 5.79. Floor planning of the site. All the area that will be used after hours face onto the atrium.

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6.2.) Multi-use of building

When some of the centre's facilities are being used after hours, access control and security becomes very important. It is possible to limit entrance to the building to one entrance at a reception desk. This also allows monitoring of the number of people in the building and their location in case of emergency, when the fire service can be directed to the desired areas at need.

6.3.) Rhythm on the street front

The facades of central Pretoria buildings usually consist of modular, repetitive bays or panels (Fig. 5.77). The compositions normally pick up the rhythm manifested in the other buildings. This has no impact on the functioning of any adjoining space. Floors plate thickness might be reduced on the front façade to give horizontal articulation.
consist of a primary horizontal element and a secondary vertical expression (Fig. 5.78).

As part of the environmental system, a second skin has been added to the front of this. The skin also consists of horizontal and vertical banding. The composition is balanced, however, not on regular tones, but on a random arrangement of horizontal and vertical elements. The distance between consecutive elements is calculated on the golden ratio.

The base rectangle from which these intensities were calculated, the rectangle covering the area between the sidewalk, the road, and the roof, is a golden rectangle. This random arrangement derives from the statement that “randomness is the highest form of order.” It was further inspired by Thom’s theory of random coherence. The form includes quantum effects in the brain. Quantum effects are unpredictable and random.

The decision to use the golden rectangle is based on the mathematical association with life and growth. It further inspired by Hameroff’s theory of the functioning of the mind, which includes quantum effects in the brain.

6.2.1.1 Sound control

The northern façades on Church Street with steel and traffic noise. The double skin will dampen the noise, improving the quality and usability of the interior spaces.

6.2.2 Privacy

The random arrangement of fornsing used for the skin will contribute to a sense of privacy that the spaces, without interfering with views or light.

6.2.3 Pavement canopy

The pavement canopy serves to make the building more user-friendly. It makes it easier to manage water of structures protected by it.

Such a canopy caters to the deflection of sound from the upper levels. This pertains particularly to noise arising from the interaction of pavements.
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The Mind Development Centre did not include any functions at roof level that might benefit from such a feature. The external areas are designed as heavy, structural fins attached to the upper floors. These structural fins provide an external architrave-element on the arcade facades, supporting shading and mobile sculpture. The architrave connects to two slabs, the forces in the arcade structure can be distributed over more supports, allowing a usually lighter solution.

3.1 Architecture sun shading and structure

The architecture addresses both the need to provide solar shading to the upper floors as well as an opportunity to support the mobile sculpture without additional supports. As the architrave connects to two slabs, the forces in the arcade structure can be distributed over more supports, allowing a usually lighter solution.

7.1 Structure

The structural grid was aimed at optimising the amount of parking in the basement levels without degrading the design of the aboveground building. This reinforced concrete frame has been used throughout the design. The column is spanned by a double box-beam supported on a massive concrete wall at the northern end and two large voids would disappear and become merely holes in the building.

Should concrete construction have been used, the concrete elements would read as part of the external environment that transforms a potentially threatening construction into a coherent whole inspired the use of these very superficial conflicts. Creativity and acceptance, even male and female, can be achieved in the human brain. The processes of analyses and integration, becoming an expression of the hemispheric specialisation in the human brain, the processes of analyses and integration, creativity and acceptance, even male and female, can be achieved in the human brain. The processes of analyses and integration, creativity and acceptance, even male and female, can be achieved in the human brain. The processes of analyses and integration, creativity and acceptance, even male and female, can be achieved in the human brain.

Fig. 5.88. The crematorium at night.

Precedent 3

The crematorium is set in an early 20th century cemetery in the suburbs of Berlin. Massive concrete elements combine with glass and light screens to provide a dignified building where the crematorium serves as a place of rest.

Fig. 5.89. The entrance to the crematorium.

The crematorium is set in an early 20th century cemetery in the suburbs of Berlin. Massive concrete elements combine with glass and light screens to provide a dignified building where the crematorium serves as a place of rest. The crematorium is set in an early 20th century cemetery in the suburbs of Berlin. Massive concrete elements combine with glass and light screens to provide a dignified building where the crematorium serves as a place of rest.

Fig. 5.87. Neuritransmitters in the brain.

Fig. 5.86. The_HERSHEY of the space it provides and the connection with the eastern side of the public open space.

Fig. 5.85. Column, showing part of the HSRC Building.
Stephenson Bell utilised an existing light well in the centre of the block to create a top-lit atrium space, which allows the residential units a dual aspect and gives interior views to the functions adjoining it. This atrium is linked with a small, existing atrium. This approach is used in the Mind Development Centre to avoid deep plan areas without access to light and views. The main atrium is linked with the courtyard garden on the third floor in order to provide a flowing space and serve as a stack tower.

Precedent 2 (cont.)

Moneo’s use of stairs and walkways in the atrium spaces articulates the need to animate an atrium at the higher levels. Although the linking bridges and staircases in the atrium would have been a functional necessity, the decision to express these as sculptural entities rather than repetitive flights and corridors was at least in part informed by Moneo’s example.

Precedent 1 (cont.)

Fig. 5.90. The atrium of the Kursaal.

Fig. 5.91. The atrium in the Smithfield Buildings.

Fig. 5.92-5.94. Various views of the atrium in the design.